SIEMENS SIPMOS 1983/84

SIEMENS

# SIPMOS

## Small Signal Transistors
## Power Transistors

Data Book 1983/84

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# SIPMOS
## Small Signal Transistors
## Power Transistors

## Data Book 1983/84

SIEMENS AKTIENGESELLSCHAFT

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The sign ∅ on drawings denotes diameter.
A comma in the outline drawings and tables as well as in the individual data sheets represents the decimal point.

## Small Signal Transistors

| Type | Ordering code | $V_{DS}$ V | $I_D$ A | $R_{DS\,(on)}$ Ω | Case | Page |
|---|---|---|---|---|---|---|
| **P channel** | | | | | | |
| ▼ BSS 110 | Q62702-S0489 | – 50 | –0,17 | 10,0 | TO 92 | 72 |
| ▼ BSS 92 | Q62702-S0458 | –200 | –0,15 | 20,0 | TO 92 | 50 |
| **N channel** | | | | | | |
| BSS 100 | Q62702-S0483 | 100 | 0,23 | 6,0 | TO 92 | 64 |
| BSS 87 | Q62702-S453 | 200 | 0,50 | 6,0 | SOT 89 | 38 |
| BSS 89 | Q62702-S455 | 200 | 0,30 | 6,0 | TO 92 | 42 |
| BSS 91 | Q62702-S457 | 200 | 0,35 | 6,0 | TO 18 | 46 |
| BSS 93 | Q62702-S459 | 200 | 0,50 | 6,0 | TO 39 | 52 |
| BSS 95 | Q62702-S461 | 200 | 0,80 | 6,0 | TO 202 | 56 |
| BSS 97 | Q62702-S463 | 200 | 1,50 | 2,0 | TO 202 | 60 |
| BSS 101 | Q62702-S0484 | 200 | 0,16 | 12,0 | TO 92 | 68 |

## Power Transistors

| Type | Ordering code | $V_{DS}$ V | $I_D$ A | $R_{DS\,(on)}$ Ω | Case | Page |
|---|---|---|---|---|---|---|
| **N channel** | | | | | | |
| BUZ 10 | C67078-A1300-A2 | 50 | 12 | 0,1 | TO 220 | 76 |
| BUZ 10A | C67078-A1300-A3 | 50 | 12 | 0,12 | TO 220 | 81 |
| ▼ BUZ 11 | C67078-A1301-A2 | 50 | 30 | 0,04 | TO 220 | 86 |
| ▼ BUZ 11A | C67078-A1301-A3 | 50 | 25 | 0,06 | TO 220 | 90 |
| BUZ 14 | C67078-A1000-A2 | 50 | 39 | 0,04 | TO 3 | 94 |
| BUZ 15 | C67078-A1001-A2 | 50 | 45 | 0,03 | TO 3 | 99 |
| BUZ 17 | C67078-A1600-A2 | 50 | 32 | 0,04 | TO 238 | 104 |
| BUZ 18 | C67078-A1601-A2 | 50 | 37 | 0,03 | TO 238 | 109 |
| ▼ BUZ 71 | C67078-A1316-A2 | 50 | 12 | 0,1 | TO 220 | 301 |
| ▼ BUZ 71A | C67078-A1316-A3 | 50 | 12 | 0,12 | TO 220 | 306 |
| BUZ 20 | C67078-A1302-A2 | 100 | 12 | 0,2 | TO 220 | 114 |
| BUZ 21 | C67078-A1308-A2 | 100 | 19 | 0,1 | TO 220 | 119 |
| BUZ 23 | C67078-A1002-A2 | 100 | 10 | 0,2 | TO 3 | 124 |
| BUZ 24 | C67078-A1003-A2 | 100 | 32 | 0,06 | TO 3 | 129 |
| ▼ BUZ 25 | C67078-A1011-A2 | 100 | 19 | 0,1 | TO 3 | 133 |
| BUZ 27 | C67078-A1602-A2 | 100 | 26 | 0,06 | TO 238 | 138 |
| ▼ BUZ 28 | C67078-A1608-A2 | 100 | 18 | 0,1 | TO 238 | 142 |
| ▼ BUZ 72A | C67078-A1313-A3 | 100 | 9,0 | 0,25 | TO 220 | 311 |
| ■ BUZ 30 | C67078-A1303-A2 | 200 | 7,0 | 0,75 | TO 220 | 147 |
| BUZ 31 | C67078-A1304-A2 | 200 | 12,5 | 0,2 | TO 220 | 152 |
| BUZ 32 | C67078-A1310-A2 | 200 | 9,5 | 0,4 | TO 220 | 156 |
| ■ BUZ 33 | C67078-A1004-A2 | 200 | 7,2 | 0,75 | TO 3 | 161 |
| BUZ 34 | C67078-A1005-A2 | 200 | 14 | 0,2 | TO 3 | 166 |
| BUZ 35 | C67078-A1014-A2 | 200 | 9,9 | 0,4 | TO 3 | 170 |
| ▼ BUZ 36 | C67078-A1018-A2 | 200 | 22 | 0,12 | TO 3 | 175 |

▼ New type
■ Not for new design!

| Type | Ordering code | $V_{DS}$ V | $I_D$ A | $R_{DS (on)}$ Ω | Case | Page |
|---|---|---|---|---|---|---|
| BUZ 37 | C67078-A1603-A2 | 200 | 13 | 0,2 | TO 238 | 179 |
| BUZ 38 | C67078-A1611-A2 | 200 | 18 | 0,12 | TO 238 | 184 |
| ▼ BUZ 73A | C67078-A1317-A3 | 200 | 5,8 | 0,6 | TO 220 | 316 |
| BUZ 60 | C67078-A1312-A2 | 400 | 5,5 | 1,0 | TO 220 | 275 |
| ▼ BUZ 60 B | C67078-A1312-A4 | 400 | 4,5 | 1,5 | TO 220 | 279 |
| BUZ 63 | C67078-A1016-A2 | 400 | 5,9 | 1,0 | TO 3 | 283 |
| ▼ BUZ 63 B | C67078-A1016-A4 | 400 | 4,5 | 1,5 | TO 3 | 287 |
| BUZ 64 | C67078-A1017-A2 | 400 | 10,5 | 0,4 | TO 3 | 291 |
| BUZ 67 | C67078-A1610-A2 | 400 | 9,6 | 0,4 | TO 238 | 296 |
| ▼ BUZ 76 | C67078-A1315-A2 | 400 | 3,0 | 1,8 | TO 220 | 330 |
| ▼ BUZ 76A | C67078-A1315-A3 | 400 | 2,6 | 2,5 | TO 220 | 335 |
| ■ BUZ 40 | C67078-A1305-A2 | 500 | 2,5 | 4,5 | TO 220 | 188 |
| BUZ 41A | C67078-A1306-A3 | 500 | 4,5 | 1,5 | TO 220 | 193 |
| BUZ 42 | C67078-A1311-A2 | 500 | 4,0 | 2,0 | TO 220 | 198 |
| ■ BUZ 43 | C67078-A1006-A2 | 500 | 2,8 | 4,5 | TO 3 | 203 |
| BUZ 44A | C67078-A1007-A3 | 500 | 4,8 | 1,5 | TO 3 | 208 |
| BUZ 45 | C67078-A1008-A2 | 500 | 9,6 | 0,6 | TO 3 | 213 |
| BUZ 45A | C67078-A1008-A3 | 500 | 8,3 | 0,8 | TO 3 | 218 |
| ▼ BUZ 45B | C67078-A1008-A4 | 500 | 10 | 0,5 | TO 3 | 223 |
| BUZ 46 | C67078-A1015-A2 | 500 | 4,2 | 2,0 | TO 3 | 228 |
| BUZ 48 | C67078-A1605-A2 | 500 | 7,8 | 0,6 | TO 238 | 233 |
| BUZ 48A | C67078-A1605-A3 | 500 | 6,8 | 0,8 | TO 238 | 238 |
| ▼ BUZ 74 | C67078-A1314-A2 | 500 | 2,4 | 3,0 | TO 220 | 320 |
| ▼ BUZ 74A | C67078-A1314-A3 | 500 | 2,0 | 4,0 | TO 220 | 325 |
| BUZ 80 | C67078-A1309-A2 | 800 | 2,6 | 4,0 | TO 220 | 340 |
| BUZ 80A | C67078-A1309-A3 | 800 | 3,0 | 3,0 | TO 220 | 344 |
| BUZ 83 | C67078-A1012-A2 | 800 | 2,9 | 4,0 | TO 3 | 348 |
| BUZ 83A | C67078-A1012-A3 | 800 | 3,4 | 3,0 | TO 3 | 352 |
| BUZ 84 | C67078-A1013-A2 | 800 | 5,3 | 2,0 | TO 3 | 356 |
| BUZ 84A | C67078-A1013-A3 | 800 | 6,0 | 1,5 | TO 3 | 361 |
| BUZ 88 | C67078-A1609-A2 | 800 | 4,3 | 2,0 | TO 238 | 366 |
| BUZ 88A | C67078-A1609-A3 | 800 | 5,0 | 1,5 | TO 238 | 371 |
| BUZ 50A | C67078-A1307-A3 | 1000 | 2,5 | 5,0 | TO 220 | 243 |
| BUZ 50B | C67078-A1307-A4 | 1000 | 2,0 | 8,0 | TO 220 | 247 |
| ▼ BUZ 53A | C67078-A1009-A3 | 1000 | 2,6 | 5,0 | TO 3 | 251 |
| ▼ BUZ 54 | C67078-A1010-A2 | 1000 | 5,3 | 2,0 | TO 3 | 255 |
| BUZ 54A | C67078-A1010-A3 | 1000 | 4,6 | 2,6 | TO 3 | 259 |
| BUZ 57A | C67078-A1606-A3 | 1000 | 2,5 | 5,0 | TO 238 | 263 |
| BUZ 58 | C67078-A1607-A2 | 1000 | 4,3 | 2,0 | TO 238 | 267 |
| BUZ 58A | C67078-A1607-A3 | 1000 | 3,7 | 2,6 | TO 238 | 271 |

▼ New type
■ Not for new design!

## 1. Type Designation Code for Discrete Semiconductors

This type designation code applies to discrete semiconductor devices – as opposed to integrated circuits –, multiples of such devices, semiconductor chips, and darlington transistors.

A basic type number consists of:
two letters followed by a serial number

### 1.1 First letter

gives information about the material used for the active part of the device.

A Germanium or other material with an energy band gap of 0.6 to 1.0 eV
B Silicon or other material with an energy band gap of 1.0 to 1.3 eV
C Gallium-arsenide or other material with an energy band gap of 1.3 eV or more
R Compound materials (for instance cadmium-sulphide)

### 1.2 Second letter

indicates the function for which the device is primarily designed (see note 1).

A Diode: signal, low power
B Diode: variable capacitance
C Transistor: low power, audio frequency
D Transistor: power, audio frequency
E Diode: tunnel
F Transistor: low power, radio frequency
G Multiple of dissimilar devices; miscellaneous devices
H Diode: magnetic sensitive
L Transistor: power, radio frequency
N Photocoupler
P Radiation detector: high sensitivity phototransistor; solar cell.
Q Radiation generator: light emitting diode LED; laser (see note 2)
R Control or switching device: low power: e.g. thyristors; diacs; triacs (see note 2); unijunction transistors UJT; programmable unijunction transistors PUT; silicon bidirectional switch SBS; etc.
S Transistor: low power, switching
T Control or switching device: power, e.g. thyristors, triacs (see note 2)
U Transistor: power, switching
W Surface acoustic wave device
X Diode: multiplier, e.g. varactor, step recovery
Y Diode: rectifying, booster
Z Diode: voltage reference or regulator; transient voltage suppressor diode (see note 2)

Note: (1) Low power type = $R_{th\,JC} > 15\,°C/W$
Power type = $R_{th\,JC} < 15\,°C/W$
(2) With special third letter: see under serial number, next page.

### 1.3 Serial number

- Three figures, running from 100 to 999, for devices primarily intended for consumer equipment (see note 3).
- One letter (Z, Y, X, etc. . . .) and two figures running from 10 to 99, for devices primarily intended for industrial/professional equipment.

This letter has no fixed meaning, with the following exceptions:

A: for triacs after second letter R or T.

F: for emitters and receivers in fiber-optic communications, after second letter G, P, or Q (see note 4).

L: for lasers in non-fiber-optic applications, after second letter G or Q (see note 4).

T: for tri-state bicolor LEDs after second letter Q.

W: for transient voltage suppressor diodes after second letter Z.

**Examples of basic type numbers**

| | |
|---|---|
| BUZ | Silicon, power switching |
| BSS | Silicon, low-power signal transistor |
| BF970 | Silicon, RF transistor |
| CQY17 | GaAs, light emitting diode, industrial type |
| RPY84 | CdS, photoconductive cell, industrial type |

## 2. Symbols (alphabetical)

| | |
|---|---|
| $C$ | Capacitance |
| $C_{iss}$ | Input capacitance |
| $C_{oss}$ | Output capacitance |
| $C_{rss}$ | Reverse transfer capacitance |
| $D = \frac{t}{T}$ | Duty cycle |
| $di/dt$ | Diode current transconductance |
| $f$ | Frequency |
| $g_{fs}$ | Forward transconductance |
| $I_D$ | Continuous drain current (dc drain current) |
| $I_{D\,puls}$ | Pulsed drain current |
| $I_{DR}$ | Continuous reverse drain current (dc current, reverse diode) |
| $I_{DRM}$ | Pulsed reverse drain current (pulsed dc current, reverse diode) |
| $I_{DSS}$ | Zero gate voltage drain current |
| $I_F$ | Forward on-current |
| $I_{GSS}$ | Gate-source leakage current |
| $P_D$ | Power dissipation |
| $P_{DM}$ | Maximum power dissipation |
| $Q_{rr}$ | Reverse recovery charge |
| $R_{DS\,(on)}$ | Drain-source on-state resistance |
| $R_{GS}$ | Gate-source resistance |
| $R_L$ | Load resistance |
| $R_{th\,JA}$ | Thermal resistance (chip-ambient air) |

Note: (3) When the supply of these serial numbers is exhausted, the serial number may be expanded to four figures (consumer types) and three figures (industrial types).

(4) In the case of second letter G, the first letter ought to be defined in accordance with the material of the main optical device.

| | |
|---|---|
| $R_{th\ JC}$ | Thermal resistance (chip-case) |
| $R_{th\ JSR}$ | Thermal resistance (chip-substrate rear side) |
| $t_{d\ (off)}$ | Turn-off delay time |
| $t_{d\ (on)}$ | Turn-on delay time |
| $t_f$ | Fall time |
| $t_{off}$ | Turn-off time |
| $t_{on}$ | Turn-on time |
| $t_p$ | Pulse time |
| $t_r$ | Rise time |
| $t_{rr}$ | Reverse recovery time |
| $T_{amb}$, $T_A$ | Ambient temperature |
| $T_{case}$, $T_C$ | Case temperature |
| $T_j$ | Operating temperature, chip temperature |
| $T_{sold}$ | Soldering temperature (max.) |
| $T_{SR}$ | Temperature of substrate rear side |
| $T_{stg}$ | Storage temperature |
| $V_{(BR)\ DSS}$ | Drain-source breakdown voltage |
| $V_{CC}$ | Supply voltage, switching-time measurement |
| $V_{DGR}$ | Drain-gate voltage |
| $V_{DS}$ | Drain-source voltage |
| $V_{GS}$ | Gate-source voltage |
| $V_{GS\ (th)}$ | Gate threshold voltage |
| $V_I$ | Input voltage |
| $V_{is}$ | Isolation test voltage |
| $V_{op}$ | Operating voltage |
| $V_{SD}$ | Diode forward on-voltage |
| $Z_{th\ JC}$ | Transient thermal impedance (chip-case) |

**3. Terms (alphabetical)**

| | |
|---|---|
| Ambient temperature | $T_{amb}$, $T_A$ |
| Capacitance | $C$ |
| Case temperature | $T_{case}$, $T_C$ |
| Continuous drain current (dc drain current) | $I_D$ |
| Continuous reverse drain current (dc current, reverse diode) | $I_{DR}$ |
| Diode current transconductance | $di/dt$ |
| Diode forward on-voltage | $V_{SD}$ |
| Drain-gate voltage | $V_{DGR}$ |
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ |
| Drain-source on-state resistance | $R_{DS\ (on)}$ |
| Drain-source voltage | $V_{DS}$ |
| Duty cycle | $D = \frac{t}{T}$ |
| Fall time | $t_f$ |
| Forward on-current | $I_F$ |
| Forward transconductance | $g_{fs}$ |
| Frequency | $f$ |
| Gate-source leakage current | $I_{GSS}$ |
| Gate-source resistance | $R_{GS}$ |
| Gate-source voltage | $V_{GS}$ |

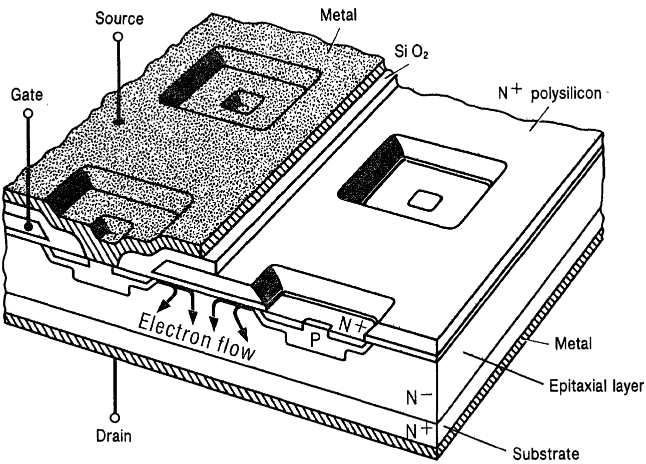
| | |
|---|---|
| Gate threshold voltage | $V_{GS\,(th)}$ |
| Input capacitance | $C_{iss}$ |
| Input voltage | $V_I$ |
| Isolation test voltage | $V_{is}$ |
| Load resistance | $R_L$ |
| Maximum power dissipation | $P_{DM}$ |
| Operating temperature, chip temperature | $T_j$ |
| Operating voltage | $V_{op}$ |
| Output capacitance | $C_{oss}$ |
| Power dissipation | $P_D$ |
| Pulsed drain current | $I_{D\,puls}$ |
| Pulsed reverse drain current (pulsed dc current, reverse diode) | $I_{DRM}$ |
| Pulse time | $t_p$ |
| Reverse recovery charge | $Q_{rr}$ |
| Reverse recovery time | $t_{rr}$ |
| Reverse transfer capacitance | $C_{rss}$ |
| Rise time | $t_r$ |
| Soldering temperature (max.) | $T_{sold}$ |
| Storage temperature | $T_{stg}$ |
| Supply voltage, switching-time measurement | $V_{CC}$ |
| Temperature of substrate rear side | $T_{SR}$ |
| Thermal resistance (chip-ambient air) | $R_{th\,JA}$ |
| Thermal resistance (chip-case) | $R_{th\,JC}$ |
| Thermal resistance (chip-substrate rear side) | $R_{th\,JSR}$ |
| Transient thermal impedance (chip-case) | $Z_{th\,JC}$ |
| Turn-off delay time | $t_{d\,(off)}$ |
| Turn-off time | $t_{off}$ |
| Turn-on delay time | $t_{d\,(on)}$ |
| Turn-on time | $t_{on}$ |
| Zero gate voltage drain current | $I_{DSS}$ |

**4. Standards**

IEC Publication 147-OC, part 0; IEC Publication 147-1, part 1; IEC Publication 147-2 G, part 2; DIN 41791, part 9; DIN 41792, part 6; DIN 41858; diode: DIN 41741.

## 1. Information in brief

**SIPMOS power transistors**
(**Si**emens **P**ower **MOS**)
The SIPMOS technology is a modern manufacturing process for MOS field-effect components. Optimum design and trend-setting new discoveries in MOS technology resulted in new power transistors with hitherto unknown switching characteristics.
The basic SIPMOS structure is that of planar MOS devices with vertical current flow. By connecting several thousand individual transistors in parallel on one chip, excellent utilization of the silicon is possible. The attainable breakdown voltage is not limited by the gate geometry. Due to the special gate geometry, extremely short, reproducible channels (current paths) are possible. This again results in extremely low $R_{DS\ (on)}$ values.
In all the MOS transistor structures – as is also the case for SIPMOS – the current flow is controlled by an electric field. These components are, therefore, frequently referred to as MOS FETs (**M**etal **O**xide **S**emiconductor **F**ield **E**ffect **T**ransistors).



Cross section of a SIPMOS transistor

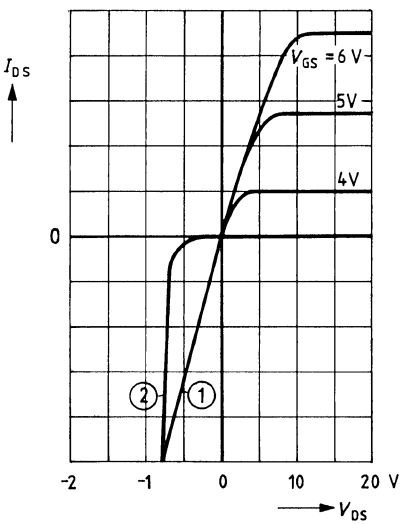
### 1.1 Cross section of a SIPMOS transistor

In the figure, the substrate thickness of the silicon is shown very much reduced in comparison with the other layers. An epitaxial N layer is grown on an $N^+$ substrate with contact metallization. The individual source cells, consisting of $N^+$ and P regions are then implanted into the epitaxial layer. The $N^+$ polysilicon gate covers the surface of the chip in form of a grid. Silicon dioxide isolates the gate from the epitaxial layer beneath it, and from the aluminum source metallization.
The aluminum source layer connects the individual source cells through the holes in the gate grid and, at the same time, acts as bonding pad. The gate is left free in one small area of the chip for wire bonding. Each cell is an individual transistor capable of functioning independently. The individual transistors are connected in parallel by the source metallization.

**1.2 Function**

When $V_{GS}$ is greater than $V_{GS\ (th)}$, a thin region enhanced with electrons is generated beneath the gate in the P region. This results in an N-conductive region between source and the lower $N^+$ region of the chip, i.e. the drain. Current can now flow through the chip in both directions. The usually more important direction of the current is from drain to source when $V_{GS}$ is greater than 0 and the drain-source voltage is positive (transistor function). The inversion layer that forms the channel in the P region beneath the gate electrode, continues in form of an enhancement zone in the epitaxial layer beneath the whole gate surface. This ensures that the current is distributed through the region between two cells, resulting in good utilization of the silicon.
When $V_{GS}$ is less than $V_{GS\ (th)}$, no electrons can cross the P barrier from source to drain. The transistor blocks the current flow when the drain-source voltage is positive. This voltage is reduced by a space-charge region formed in the epitaxial layer. Thickness and doping concentration of this layer are thus decisive for the blocking capability of the transistor. When the drain-source voltage is negative, however, current can flow from source to drain through the PN diode. This diode function is an integral property of the transistor.

**1.3 Typical output characteristics**




① Reverse diode characteristic; forward
② Reverse diode characteristic; reverse

If, however, a positive voltage is simultaneously applied to the gate, the on-resistance $R_{DS\ (on)}$ of the transistor operates in parallel with the forward resistance of the diode. This means that at $I_F$ equal to or less than 0.6 times $R_{DS\ (on)}$, the device functions as a diode with a very low forward voltage (less than Schottky diodes), so that a SIPMOS transistor can also be used as a diode with an extremely low forward voltage drop.

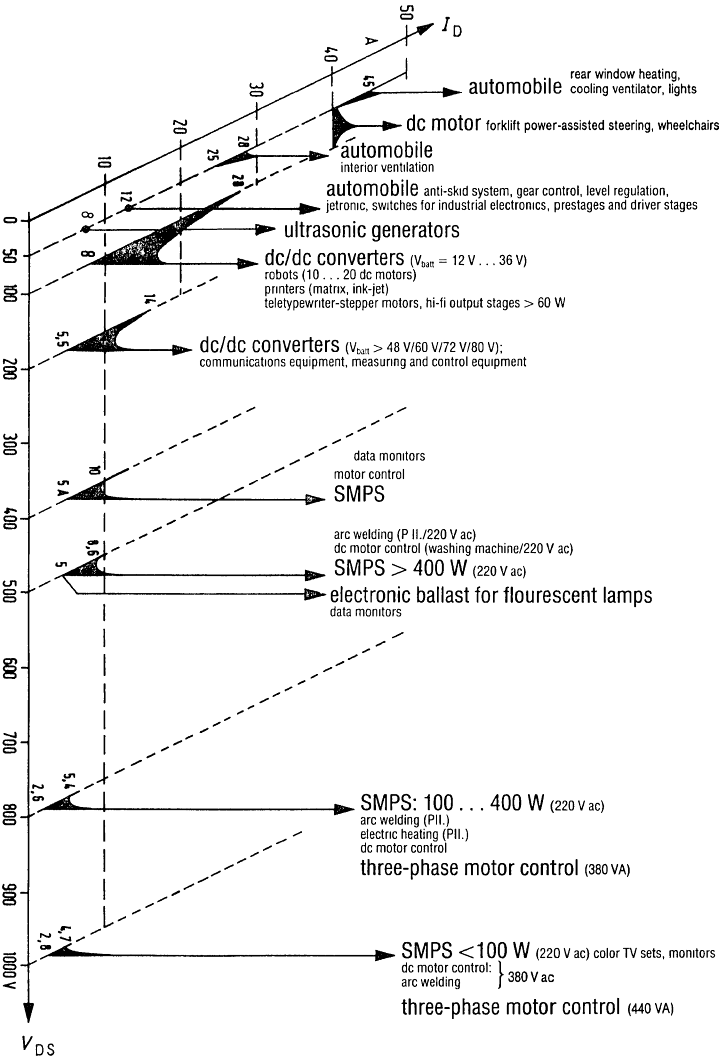
### 1.4 Features and applications

SIPMOS transistors open a new dimension in circuit design. They permit the combination of fast switching times with high output power but low driving power. They feature high input resistance in the on-state, $R_{DS\ (on)}$ values of some hundredths of ohms to several ohms, a switching time in the nanosecond range, and no storage time as FETs do not have any CSE. Due to the special chip structure, and the positive temperature coefficient of $R_{DS\ (on)}$, SIPMOS transistors show no second breakdown across the total range of the maximum ratings.
Circuits using SIPMOS transistors are simpler and more robust than was previously possible. One drawback is, that the on-state resistance of transistors with breakdown voltages above 300V is higher than the equivalent values for bipolar transistors of the same size. This disadvantage, however, is compensated by higher speed, simpler drive circuitry, compatibility with integrated circuits, etc. SIPMOS power components will replace bipolar components in many areas in the next few years. Additionally, SIPMOS transistors will enable many solutions that could previously not be implemented.
SIPMOS transistors can be used as very fast switches in power supplies, dc voltage converters, switched-mode power supplies, power inverters, broadband amplifiers, audio amplifiers, RF linear amplifiers, microcomputer and computer interfaces (VLSI compatible), ultrasonic generators, etc. SIPMOS transistors are voltage-controlled devices and have only capacitive charge currents. To extend the output power, they can easily be connected in parallel. The drive power is not dependent on the switched output power, so that the drive circuit can be of the same design for a 10W stage, as for a 1000W stage.
SIPMOS transistors are capable of switching output power in the kW range in less than 100ns. During circuit layout, care must therefore be taken, that for these fast switching times, the shortest line lengths possible are chosen to avoid interference oscillation.

#### 1.4.1 Features

- high switching power up to 5kW
- simple operation in parallel for even higher power
- extremely fast switching time
- switching time is settable
- high frequency
- high current and voltage handling capability
- no second breakdown
- no storage time
- linear characteristics

### 1.4.2 Main areas of application



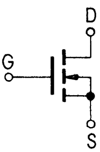
### 1.4.3 Functional circuit diagrams

The following explanations apply to SIPMOS transistors of the N-channel type. A gate-source voltage value which is smaller than the gate threshold voltage results in a highly resistive drain-source path. A value greater than the gate threshold voltage results in a low-resistive drain-source path.

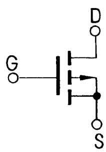
Should the source connection potential be located above the one of the drain connection, the transistor will function as a bipolar diode; i. e. current flows from source to drain. If a positive voltage is simultaneously applied to the gate, the on-resistance $R_{DS(on)}$ of the transistor operates in parallel with the forward resistance of the diode. With a reverse current in the range 0 to approximately $I_{SD} = 0.6/R_{DS(on)}$, this results in a lower resistance value.

**Circuit diagrams**

**N channel**

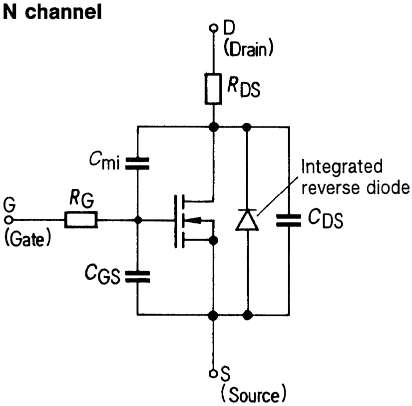



**P channel**

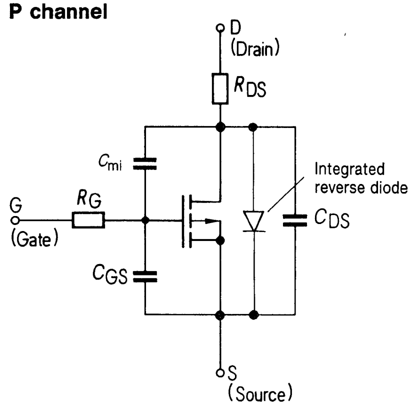



**Equivalent circuit diagrams**

**N channel**




**P channel**




### 1.5 Capacitances

The capacitance values for $C_{iss}$, $C_{oss}$, and $C_{rss}$ stated in the data sheets depend on temperature and have the following characteristics, expressed in terms of the capacitance values stated in the equivalent circuit diagram ($R_G$ and $R_{DS}$ are neglected, refer to test circuit in paragraph 6.5)

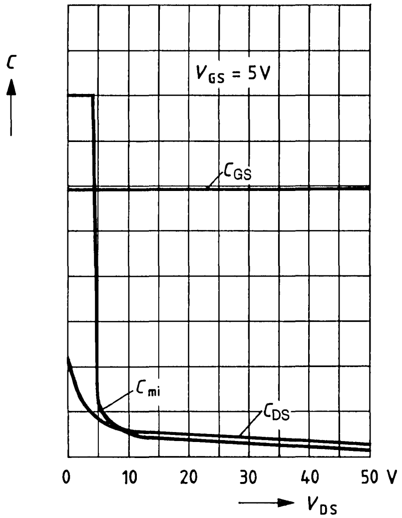
$C_{iss} = C_{GS} + C_{mi}$

$C_{oss} = C_{DS} + C_{mi}$

$C_{rss} = C_{mi}$

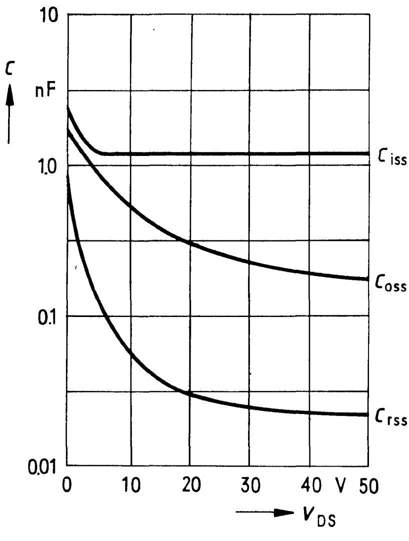
The Miller capacitance and the drain-source capacitance are dependent on the drain-source voltage, whereas the gate-source capacitance $C_{GS}$ is independent of voltage. The resistance $R_G$ is the gate resistance resulting from the internal structure of the transistor. $R_{DS}$ represents the drain-source on-state resistance (see equivalent circuit diagramm in paragraph 1.4.3).

**Miller capacitance**




The input capacitance ist not linear. As long as the drain voltage is lower than the gate voltage, the input capacitance is determined by the relatively large Miller capacitance and finally becomes linear.

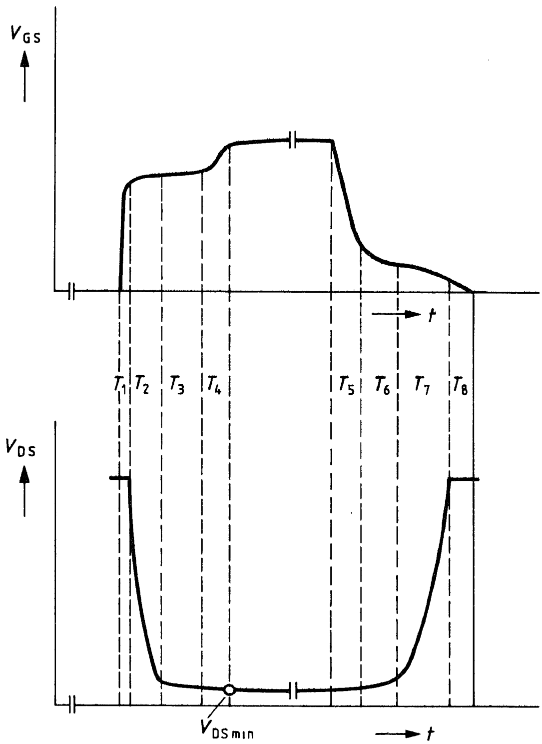
**Input capacitance shown for the BUZ 32**



### 1.6 Switching behavior

The switching behavior of SIPMOS transistors is essentially affected by the Miller capacitance. The Miller capacitance reaches its maximum value when $V_{DS}$ is smaller than $V_{GS}$. In order to switch the transistor, the Miller capacitance must be charged or discharged, respectively. The time required for this depends on the input current available. This current, however, is only required during the switching process.
The switching time of SIPMOS transistors is practically independent of the temperature.

**Switching behavior of SIPMOS transistors**




| | | |
|---|---|---|
| $t_{d\,(on)}$ | turn-on delay time | ($\approx T_1$) |
| $t_r$ | rise time | ($\approx T_2$) |
| $t_{d\,(off)}$ | turn-off delay time | ($\approx T_5 + T_6$) |
| $t_f$ | fall time | ($\approx T_7$) |

The turn-on time can be divided into four well defined intervals:

$T_1$ The input capacitance ($C_{GS} + C_{mi}$) is charged up to the threshold voltage. The transistor remains non-conductive.

$T_2$ The transistor is switched on and behaves as a Miller integrator. The output voltage drops rapidly, as the Miller capacitance is small. The gate voltage is virtually constant.

$T_3$ The transistor continues to function as a Miller integrator but with the maximum Miller capacitance. The on-state resistance decreases more slowly. The current already reaches its maximum value, but the forward loss is still considerably higher than in the saturated condition.

T4 The transistor is almost fully conductive, but the Miller capacitance continues to be charged until the voltage $V_{DS\,min}$ is reached. This ends the turn-on process; after that, no input current flows any longer. The Miller capacitor is charged:
$C_{mi\,max} \times V_{i\,max}$.

The turn-off time can be divided into the following four intervals:

$T_5$ The transistor is fully conductive and does not yet function as a Miller integrator, but the excess charge in $C_{mi\,max}$ is already being discharged.

$T_6$ The transistor begins to function as a Miller integrator, with the maximum Miller capacitance. The output voltage rises slowly, the output current, however, only varies insignificantly.

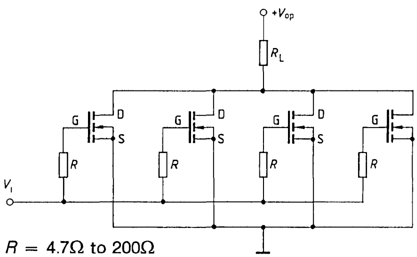
$T_7$ $V_{GS} < V_{DS}$. The Miller capacitance is already small, the current decreases, the output voltage rises rapidly. The transistor changes to its off state.

$T_8$ The transistor is turned off, the input capacitance, however, continues to be discharged. This terminates the switching process.

**1.7 Parallel operation**

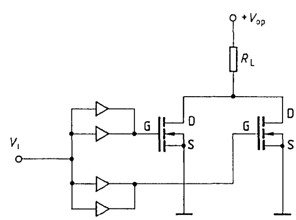
Paralleling of SIPMOS transistors is possible without difficulty, but it should be borne in mind that oscillations may occur due to the very high transconductance of MOS FETs, i.e. due to the very large current variations. Such oscillations can be avoided inserting a decoupling resistor per gate or a separate driver circuit.

Parallel operation with gate resistors




$R$ = 4.7Ω to 200Ω

Parallel operation with separate driver circuit




**1.8 MOS handling**

The input (gate-source) must be protected against a voltage that exceeds the maximum ratings. The transistor can be destroyed by even momentary voltage spikes.
MOS FETs must be protected against electrostatic charges. The general handling regulations for electrostatically critical semiconductors must be adhered to. The sensitivity to static charges increases with decreasing chip area and the resulting, smaller input capacitance $C_{iss}$. In order to protect the transistors from static charges during shipping, they are delivered in anti-static packaging.

**1.9 Use of the indices**

- Voltages

  As a rule, two indices are used defining the points between which the voltage is measured.
  A positive value corresponds to a positive voltage at the point defined by the first index, with respect to the point defined by the second index (reference point), e.g. $V_{G\,S}^{+\,-}$.

- Currents
  As a rule, at least one index is used. A positive current value corresponds to a positive current which enters the component at the terminal defined by the first index, e.g. $I^{+}_{G}{}^{-}_{S}$.

**2. Absolute maximum ratings**

The limits stated in the data sheets are absolute limit values. If one of these limits is exceeded, it can lead to the destruction of the component, even if the other limits are not fully utilized. If not otherwise stated, the limit values apply to 25° C.

**2.1 Drain-source voltage $V_{DS}$**

Maximum permissible value of the voltage between drain and source.

**2.2 Drain-gate voltage $V_{DGR}$**

Maximum permissible value of the voltage between drain and gate, when bridging gate-source with a predefined resistance.

**2.3 Continuous drain current $I_D$**

Maximum permissible value of the direct current at the drain connection.

**2.4 Pulsed drain current $I_{D\ puls}$**

Maximum permissible peak value of the drain current during pulse operation as specified in the diagram "safe operating area" for a respective pulse width and duty cycle.

**2.5 Gate-source voltage $V_{GS}$**

Maximum permissible value of the voltage between gate and source.

**2.6 Maximum power dissipation $P_D$**

Maximum permissible power dissipation of the transistor.

**2.7 Operating temperature range $T_j$**

The range of the permissible chip temperature, within which the transistor may be operated continuously.

**2.8 Storage temperature range $T_{stg}$**

The temperature range within which the transistor may be stored or transported without electrical load.

**2.9 Soldering temperature $T_{sold}$**

The maximum permissible temperature during soldering at the terminals of the component, at a specified distance to the case and for a specified time.

**2.10 Thermal resistance $R_{th\ JC}$**

Thermal resistance between chip and case at thermal equilibrium.

**2.11 Thermal resistance $R_{th\ JA}$**

Thermal resistance between chip and ambient air at thermal equilibrium.

**2.12 Thermal resistance $R_{th\ JSR}$**

Thermal resistance between chip and substrate metallization rear side at thermal equilibrium.

### 3. Electrical characteristics

The values stated under "electrical characteristics" are to be taken as typical values. In many cases, these electrical characteristics are supplemented by limit values.
The values apply to 25 °C if no other temperature is specified.

**3.1 Drain-source breakdown voltage $V_{(BR)\ DSS}$**
The voltage between the drain and source at a specified drain current; gate and source short-circuited.

**3.2 Gate threshold voltage $V_{GS\ (th)}$**
The value of the gate-source voltage at a specified drain current and at a specified drain-source voltage.

**3.3 Zero gate voltage drain current $I_{DSS}$**
The value of the drain current at a specified drain-source voltage and short-circuited gate-source.

**3.4 Gate-source leakage current $I_{GSS}$**
The value of the gate leakage current at a specified gate-source voltage and short-circuited drain-source.

**3.5 Drain-source on-state resistance $R_{DS\ (on)}$**
The value of the resistance between the drain and source at a specified gate-source voltage and drain current.

**3.6 Forward transconductance $g_{fs}$**
Ratio between the change in drain current for a given change in gate-source voltage at specified drain-source voltage and specified drain current.

**3.7 Input capacitance $C_{iss}$**
That capacitance measured between gate and source connections with drain-source connections short-circuited for ac voltages. The values of the dc voltage between gate-source and drain-source connections, as well as the measuring frequency are specified.

**3.8 Output capacitance $C_{oss}$**
That capacitance measured between the drain and source connections with the gate-source connections short-circuited for ac voltages. The values of the dc voltage between gate-source and drain-source connections, as well as the measuring frequency are specified.

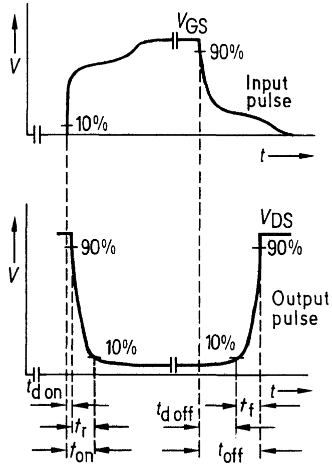
**3.9 Reverse transfer capacitance $C_{rss}$**
That capacitance measured between drain and gate with the source connected to ground. The values of the dc voltage between gate-source and drain-source, as well as the measuring frequency are specified.

**3.10 Turn-on time $t_{on} = t_{d\ (on)} + t_r$**
Sum of:
the turn-on delay time $t_{d\ (on)}$ measured between the 10% value of the gate-source voltage and the 90% value of the drain-source voltage, and the rise time $t_r$ measured between the 90%

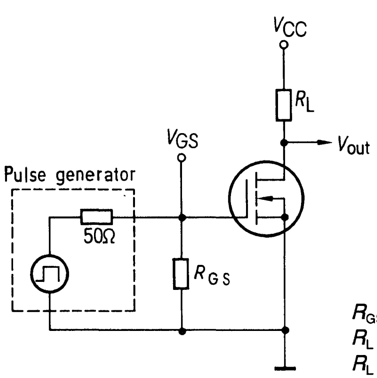
value and the 10% value of the drain-source voltage.
Circuitry and parameter are specified.

**3.11 Turn-off time** $t_{off} = t_{d\ (off)} + t_f$
Sum of:
the turn-off delay time $t_{d\ (off)}$ measured between the 90% value of the gate-source voltage and the 10% value of the drain-source voltage,
and the fall time $t_f$ measured between the 10% value and the 90% value of the drain-source voltage.
Circuitry and parameter are specified.

**3.12 Definition of switching times**




**3.13 Test circuit for measuring the switching time**




$R_{GS}$ = 10Ω or 50Ω (refer to data sheet)
$R_L$ = 10Ω power transistors (BUZ★★)
$R_L$ = 100Ω small signal transistors (BSS★★★)

## 4. Reverse diode characteristics

### 4.1 Continuous reverse drain current $I_{DR}$

Maximum permissible value of the dc forward current.

### 4.2 Pulsed reverse drain current $I_{DRM}$

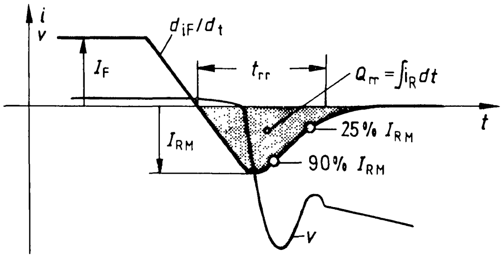
Maximum permissible peak value of the reverse diode current for pulse operation. The duty cycle is the same as the one specified for the transistor.

### 4.3 Diode forward on-voltage $V_{SD}$

Diode forward voltage between source and drain in the on-state. The forward current $I_F$, the voltage $V_{GS}$, and the chip temperature $T_j$ are specified.

### 4.4 Reverse recovery time $t_{rr}$ and reverse recovery charge $Q_{rr}$

Respectively stated is a typical value for the test and auxiliary conditions specified in the data sheet (refer to figure according to DIN 41 782).




## 5. Diagrams

### 5.1 Power dissipation $P_D$

The power dissipation $P_D$ is shown versus case temperature $T_{case}$.

### 5.2 Typical output characteristic

Drain current $I_D$ is shown versus drain-source voltage $V_{DS}$, with $V_{GS}$ and pulse width as parameter.

### 5.3 Safe operating area

Maximum drain current $I_D$ shown versus drain-source voltage $V_{DS}$. Parameters are pulse width, duty cycle, and case temperature. Within this range, all values of $I_D$ and $V_{DS}$ are permitted, if they do not thermally overload the transistor.

### 5.4 Typical transfer characteristic

Drain current $I_D$ is shown versus gate-source voltage $V_{GS}$. Parameters are chip temperature $T_j$, pulse width, and drain-source voltage $V_{DS}$.

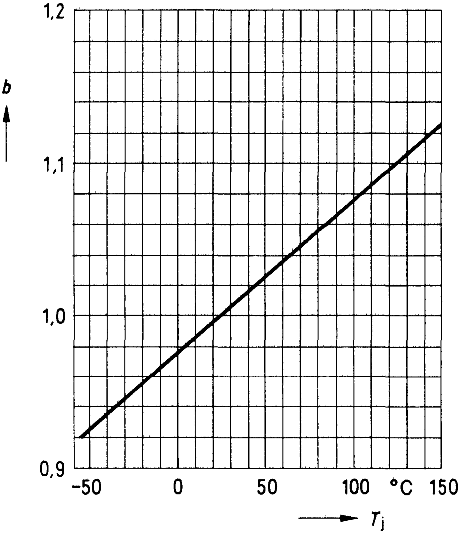
### 5.5 Typical transconductance $g_{fs}$ versus continuous drain current $I_D$

The forward transconductance is shown versus the drain current. Parameters are pulse time and drain-source voltage $V_{DS}$.

**5.6 Drain-source on-state resistance $R_{DS\,(on)}$**
Chip temperature shown versus the permissible operating temperature range. The minimum characteristic represents only a lower spread presently determined in production.

**5.7 Drain-source breakdown voltage $V_{(BR)\,DSS}$ versus chip temperature $T_j$**
A constant "*b*" is entered dependent on the chip temperature over the permissible operating temperature range, for which the following mathematical relationship holds true:

$V_{(BR)\,DSS}\,(T_j) = b \times V_{(BR)\,DSS}\,(25\,°C)$.




**5.8 Continuous drain current $I_D$ versus case temperature $T_{case}$**
Shown is the maximum permissible dc drain current versus case temperature.

**5.9 Typical capacitances**
The input capacitance $C_{iss}$, the output capacitance $C_{oss}$, and the reverse transfer capacitance $C_{rss}$ are shown versus the drain-source voltage at a frequency $f$ of 1 MHz and a gate-source voltage $V_{GS}$ of 0V.

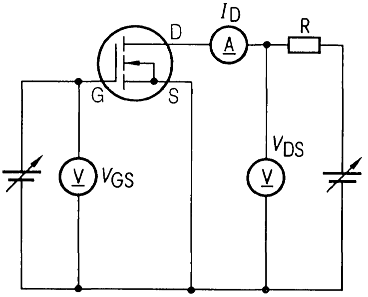
**5.10 Gate threshold voltage $V_{GS\,(th)}$**
The spread of the gate threshold voltage $V_{GS\,(th)}$ is shown versus the chip temperature $T_j$ at parameters $V_{DS} = V_{GS}$ and $I_D$.

**5.11 Transient thermal impedance $Z_{th\,JC}$**
The transient thermal impedance response $Z_{th\,JC}$ is shown versus pulse widh at a specified duty cyle $D = t/T$.

**5.12 Forward characteristic of the integrated "reverse diode"**
Continuous reverse drain current $I_{DR}$ shown versus forward voltage $V_{SD}$. Pulse width is parameter.

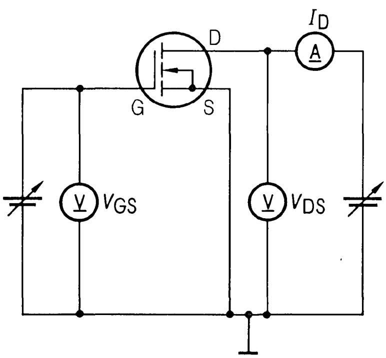
**6. Test circuits (according to DIN 41792, sheet 6, and IEC 147-2G)**
The temperature values for the specified parameters, stated in the data sheets, are to be adhered to during the respective measurements.

## 6.1 Continuous drain current $I_D$




Schematic circuit diagram to measure the continuous drain current $I_D$
R serves as protective resistor. The specified gate-source voltage $V_{GS}$ is set. If $V_{GS}$ is specified to be 0V, gate and source must be short-circuited.

## 6.2 Drain-source on-state resistance $R_{DS\ (on)}$

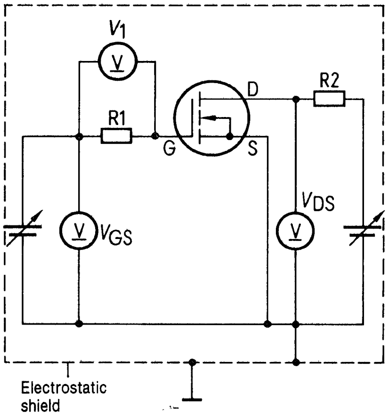



Schematic circuit diagram to measure the drain-source on-state resistance $R_{DS\ (on)}$.
Generally, the drain-source on-state resistance $R_{DS\ (on)}$ is measured in the saturation range. The internal resistance of the voltmeter $V_{DS}$ must be considerably higher than the on-resistance $R_{DS\ (on)}$.

## 6.3 Gate threshold voltage $V_{GS\ (th)}$

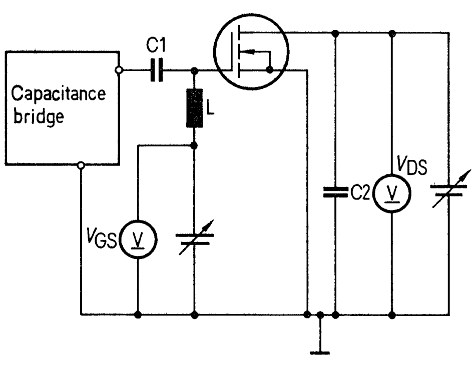
(Refer to schematic circuit diagram 6.1) The gate-source voltage, starting from the value 0, is slowly increased until the specified continuous drain current $I_D$ is reached. Parameter is the drain-source voltage $V_{DS}$ which has the same rating.

### 6.4 Gate-source leakage current $I_{GSS}$



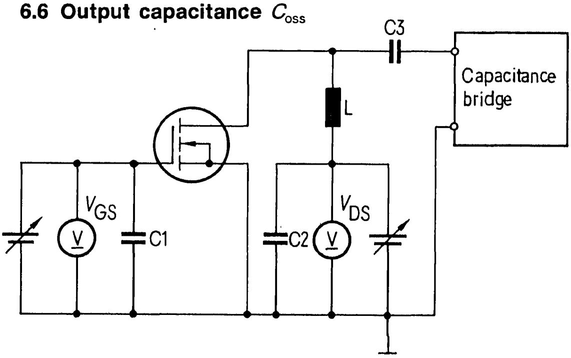

Schematic circuit diagram to measure the gate-source leakage current $I_{GSS}$
$R_1$ and $R_2$ serve as protective resistors. The value of $R_1$ should be lower than $V_{GS}/100\ I_{GSS}$. $V_1$ is a very sensitive voltmeter with an internal resistance of at least 100 times the value of $R_1$. The leakage current is given by $I_{GSS} = V_1/R_1$.
The circuit must be electrostatically shielded. Care must be taken that the measurement is not falsified by leakage currents caused by the circuit layout.

### 6.5 Input capacitance $C_{iss}$



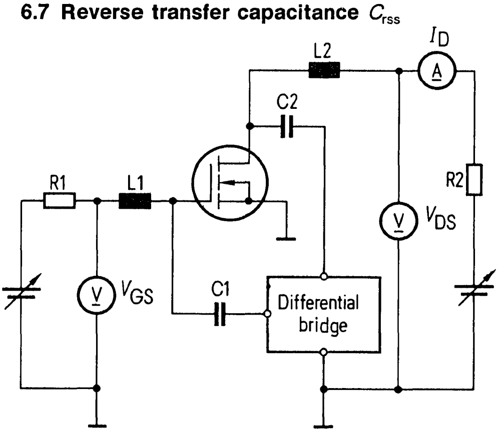

Schematic circuit diagram to measure the input capacitance $C_{iss}$, using a bridge without dc passage.
The capacitors $C_1$ and $C_2$ must form a short circuit at the measuring frequency. The inductor L decouples the dc supply.

### 6.6 Output capacitance $C_{oss}$




Schematic circuit diagram to measure the output capacitance $C_{oss}$, when using a bridge without dc passage.
The capacitors $C_1$, $C_2$, and $C_3$ must form a short circuit at the measuring frequency. The inductor L decouples the dc supply.

### 6.7 Reverse transfer capacitance $C_{rss}$




Schematic circuit diagram to measure the reverse transfer capacitance $C_{rss}$ when using a bridge without dc passage.
The capacitors $C_1$ and $C_2$ must form a short circuit at the measuring frequency. The inductors $L_1$ and $L_2$ decouple the dc supply.

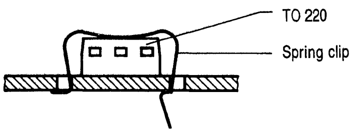
### 7. Mounting instructions

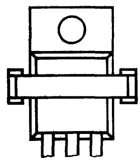
The transistors may be mounted in any position.
The leads should be bent in a bending device. If it is necessary to bend the leads by hand, the lead must be held with pliers between the bending point and the header without causing notches. Repeated bending of the leads should be avoided.
For insulated mounting of transistors in the cases TO 204 (TO 3), TO 220, and TO 202, note the increased thermal resistance between transistor and heat sink.

## 7.1 Mounting procedures

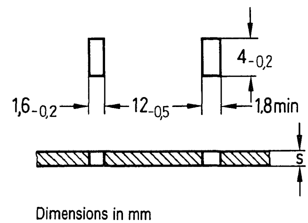
### 7.1.1 Mounting with spring clip[1])

**Non-insulated construction**



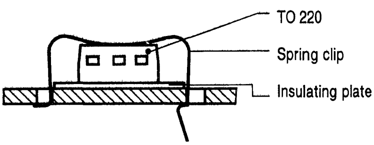



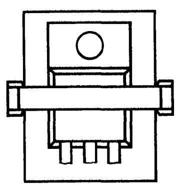
**Chassis center spacing**



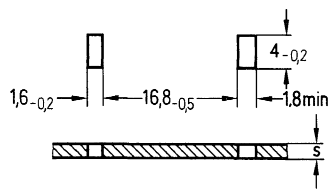

Chassis thickness $s$ = 1 to 2 mm
Contact pressure $F$ = 100 to 250 N

**Insulated construction**



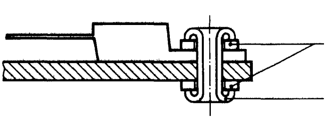
**Chassis center spacing**




Chassis thickness $s$ = 1 to 2.5 mm
Contact pressure $F$ = 100 to 250 N

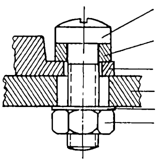
### 7.1.2 Rivet mounting

The prefabricated rivet head must always be located at the terminal side, and at least one planar washer (in accordance with DIN 433) is to be provided at the snaphead side as well as one at the heat sink side. During riveting, it has to be observed that the parts will not be deformed and that the bias will be maintained during head formation.




[1]) The spring clip is not included in delivery.

### 7.1.3 Screw mounting




This kind of mounting is considered the most suitable, provided that it will be effected properly.

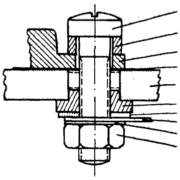
Please observe:
Heat sinks or mounting plates made of aluminum must at least have a thickness of 2 mm; with copper the minimum value is 1.2 mm. Smaller thickness will cause heat sink deformation which is impermissible for the heat transition.

The mounting hole in the mounting plate has to be levelled down; the maximum diameter is 3.7 mm. Countersinking may not show a diameter larger than 4 mm. The screw head should not be located directly on the terminal, but over the pressure plate to distribute the force properly. The nut must always be at the mounting plate side an should be secured by a spring washer (DIN 137).
Screw tools must not touch the plastic package. Therefore, cross-slotted screws are preferred.

Mounting torque:
The recommended mounting torque for M3 and M3.5 screws is 60 Ncm with the screw material 5.8. This results in a mounting force of max. 1600 N.

Compared with 60 Ncm, applying a max. torque of 80 Ncm to such screws will not improve the thermal contact resistance considerably.

### 7.1.4 Screw mounting with insulated construction




This construction permits a maximum leakage path of 1.0 mm. That corresponds to insulation group Ao according to VDE 0110 for 250 V ac (rms).
The hole diameter in the heat sink may be between 3.8 mm and 5.5 mm.
The hole has to be levelled down.
With the maximum diameter, the contact surface must be flat up to the hole edge.
During assembly, particularly when passing the screw through the mica washer, it has to be observed that this mica washer will not be damaged.
Screw tools must not touch the plastic package; therefore, cross-slotted screws are preferred.
The mounting torque should not exceed 60 Ncm with the insulated construction.
For packages TO 204 (TO 03) and TO 238, rivet or screw mounting may optionally be effected as insulated version.

### 7.2 Heat dissipation

In order to achieve better heat dissipation, power transistors are mounted on heat sinks. In these cases, the thermal resistance of the chip through the heat sink to ambient air $R_{th\,JA}$ is given by:

$R_{th\,JA} = R_{th\,JC} + R_{th\,CA}$

The thermal resistance of the heat sink $R_{th\,CA}$ is calculated according to the following approximative equation (flat plate cooling fins – not applicable for heat sink with profile):

$$R_{th\,CA} = \frac{3.3}{\sqrt{\lambda\,d}}\,C^{\,0.25} + \frac{650}{A}\,C$$

λ thermal conductance of the heat sink in W/K cm

| Material | λ (W/°C cm) |
|---|---|
| Aluminum | 2.1 |
| Copper | 3.8 |
| Brass | 1.1 |
| Steel | 0.46 |

d thickness of the heat sink in mm

A area of the heat sink in $cm^2$

C correction factor for the position and surface of the heat sink according to the following table:

| Surface<br>Position | shiny | blackened |
|---|---|---|
| vertical | 0.85 | 0.43 |
| horizontal | 1 | 0.5 |

This formula applies to approximately square-shaped heat sinks if the transistor, mounted in the center of the heat sink, represents the only heat source on that heat sink. The values of the constants and of C hold true in static air up to an ambient temperature of approx. 45 °C, if no heat radiating components are in the vicinity.

Thermal resistance of a mica washer $R_{th}$ (K/W)

| Case | Thickness of the dry washer | | washer, greased on both sides, |
|---|---|---|---|
| | 50 μ | 100 μ | reduces the resistance by: |
| TO 204<br>(TO 3) | 1.25 | 1.5 | 0.9 K/W |
| TO 220 | 1.5 | 2.0 | 0.8 K/W |
| TO 202 | 8.0 | 10 | 4.0 K/W |

Commercially available insulating washers result in better thermal resistance than mica washers do.

### 7.3 Soldering instructions

Every semiconductor is extremely sensitive to the exceeding of its maximum permissible chip temperature. When soldering semiconductors, care must be taken that the component will not be thermally overloaded. The chip temperature may not exceed 200 °C during the soldering of silicon components (max. 1 minute). The leads must not be subject to high mechanical stress during soldering.

### 7.3.1 Small signal transistors (BSS★★★)

**Soldering data for the plastic packages TO 202, TO 92, SOT 89**

| Soldering temperature | Lead length 0.5 mm | Lead length 1.5 mm | Lead length 5 mm |
|---|---|---|---|
| 245 °C | 4.0 s | 5.0 s | 10.0 s |
| 260 °C | 3.0 s | 5.0 s | 5.0 s |
| 300 °C [1]) | 2.5 s | 3.0 s | 5.0 s |

**Soldering data for the metal cases TO 18, TO 39**

| Soldering temperature | Lead length 0.5 mm | Lead length 1.5 mm | Lead length 5 mm |
|---|---|---|---|
| 245 °C | 5.0 s | 6.0 s | 13.0 s |
| 260 °C | 3.5 s | 4.0 s | 10.0 s |
| 300 °C [1]) | 3.0 s | 3.5 s | 8.0 s |

### 7.3.2 Power transistors (BUZ★★★)

**Soldering data for the metal case TO 204 (TO 3)**

| Soldering temperature | Lead length 1.6 mm | Lead length 5 mm |
|---|---|---|
| 245 °C | 15 s | 20 s |
| 260 °C | 12 s | 15 s |
| 300 °C [1]) | 10 s | 15 s |

**Soldering data for the plastic packages TO 220, TO 238, TO 202**

| Soldering temperature | Lead length 1.6 mm | Lead length 5 mm |
|---|---|---|
| 245 °C | 7 s | 10 s |
| 260 °C | 7 s | 7 s |
| 300 °C [1]) | 4 s | 7 s |

### 7.4 Maintenance

As they are electrical components without moveable parts, transistors are generally maintenance-free. The insulation of the transistors, however, is neither protected against splashing and dripping, nor against dust. In order that the insulation and the heat dissipation of the transistors will not be impeded, transistors and heat sinks should be cleaned from time to time.

## 8. Quality specifications

### 8.1 Delivery quality

In this data book, the delivery quality of semiconductors is characterized by maximum ratings and by deviation limits of characteristic data.

[1]) These values apply only when using a soldering iron.
The lead length L is measured from the soldering point.

### 8.2 Acceptance quality

To judge the acceptance quality level (AQL) of delivery lots, certain AQL values have been provided for the sampling inspection of the quality characteristics (attributes). Inspection by attributes is based on the single sampling plan for normal inspections, inspection level II in accordance with DIN 40080 (or IEC Publ. 410, ABC-STD-105D).

### 8.3 Classification of defects

A defect will exist if a component characteristic does not correspond to the data sheet specification. The defects are classified according to their type and their extent.

#### 8.3.1 Defect type

- Defects at cases and terminals
- Defects in the electrical features

#### 8.3.2 Defect extent

- Tolerance defect: exists when a characteristic value exceeds the permitted range.
- Total defect: exists when any functional application of the component is excluded.

### 8.4 AQL table

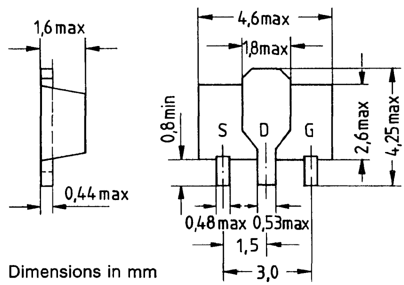
| Defect type | AQL value |
|---|---|
| total defects | 0.1 |
| sum of defects in electrical features | 0.4 |
| sum of defects at cases and terminals | 0.4 |

The AQL values do not characterize the actual quality of the individual delivery lots, but when applying the sampling inspection plan they determine the degree of acceptance or rejection. The average defect percentage in delivery is generally less than the AQL values.

# Small Signal Transistors

**Description** SIPMOS small signal FET, N-channel enhancement mode
**Case** Plastic package SOT 89 in accordance with JEDEC
Marked: KA
Approx. weight 0,1 g

| Type | Ordering code |
|---|---|
| BSS 87 | Q62702-S453 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{SR}$ = 60 °C | $I_D$ | 0,50A |
| Pulsed drain current, $T_{SR}$ = 25 °C | $I_{Dpuls}$ | 1,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 4,0W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C… +150 °C |
| **Thermal resistance**[1] | $R_{thJSR}$ | ≤30K/W |
| | $R_{th\ JC}$ | – |

[1]) Ceramic substrate: 0,7 mm thick; 2,5 mm² area

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source-breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5 mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 4<br>8 | 60<br>200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 200<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source-leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 5,5 | 6,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,3A |

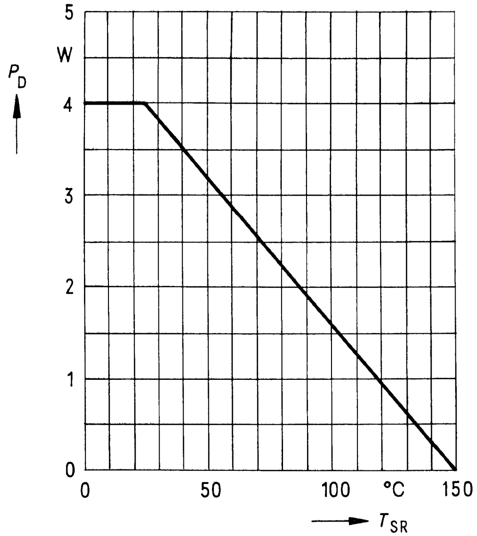
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,14 | 0,1 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,3A |
| Input capacitance | $C_{iss}$ | – | 110 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 20 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 5 | – | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 5 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,28A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 15 | – | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 20 | – | | |
| | $t_f$ | – | 15 | – | | |

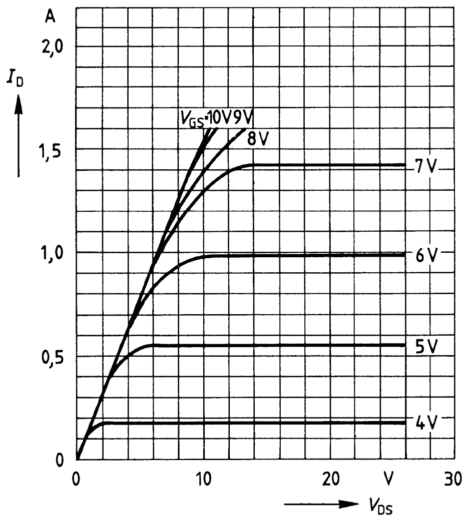
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,5 | A | $T_{SR}$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 1,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,4 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

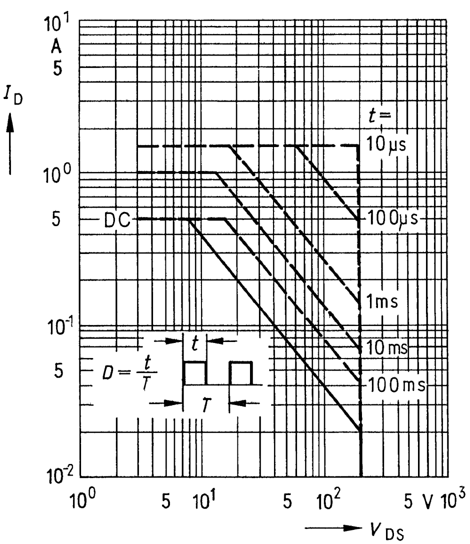
**Power dissipation** $P_D = f(T_{SR})$



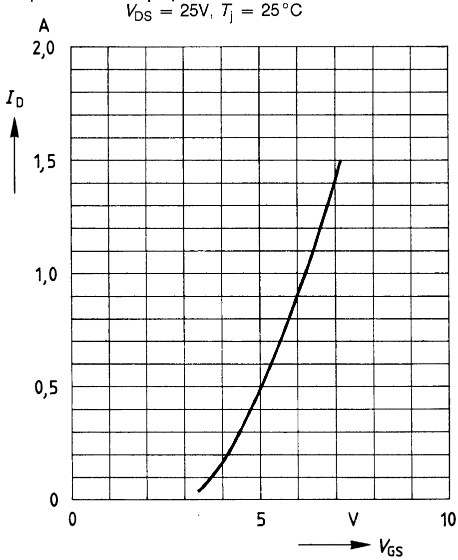

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



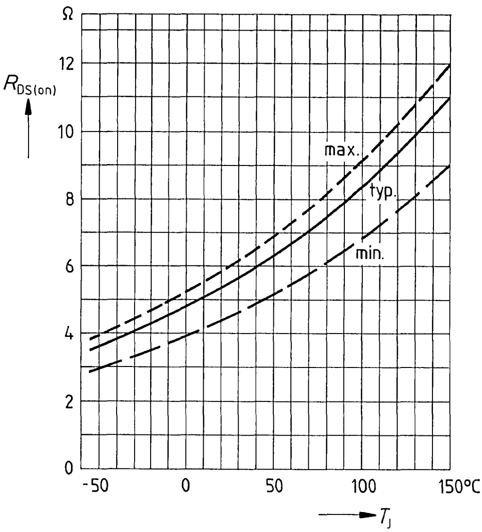

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{SR} = 25\,°C$



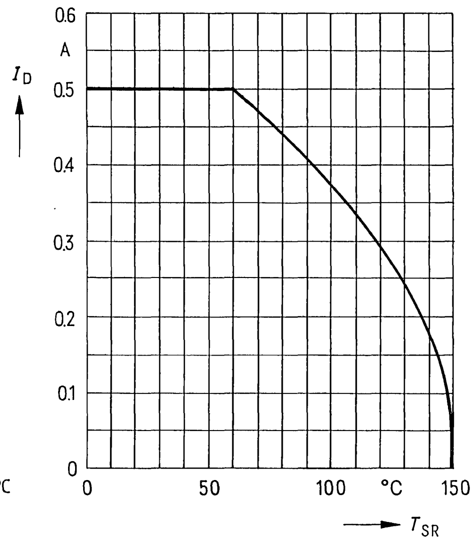

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



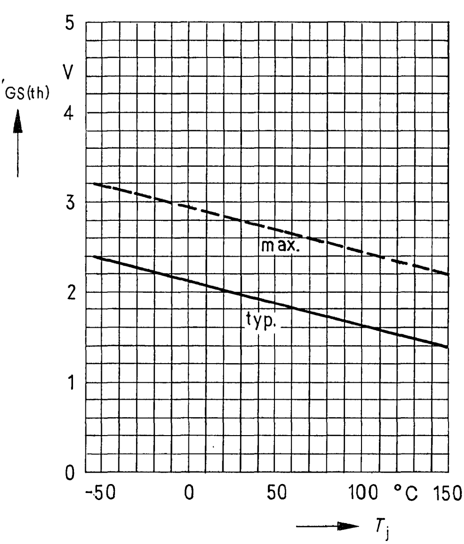
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)




**Continuous drain current** $I_D = f\,(T_{SR})$



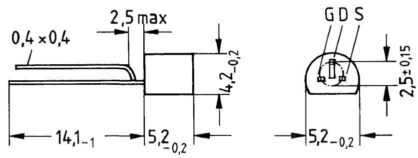

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10\ mA$



**Description** SIPMOS small signal FET, N-channel enhancement mode

**Case** Plastic package 10 A 3 in accordance with DIN 41 868, or TO 92 in accordance with JEDEC. Approx. weight 0,2 g

| Type | Ordering code |
|---|---|
| BSS 89 | Q62702-S455 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{amb}$ = 25 °C | $I_D$ | 0,30A |
| Pulsed drain current, $T_{amb}$ = 25 °C | $I_{Dpuls}$ | 0,90A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 1W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| **Thermal resistance** | $R_{th\,JA}$ | ≤125K/W |
| | $R_{th\,JC}$ | – |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 4<br>8 | 60<br>200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 200<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 5,5 | 6,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,3A |

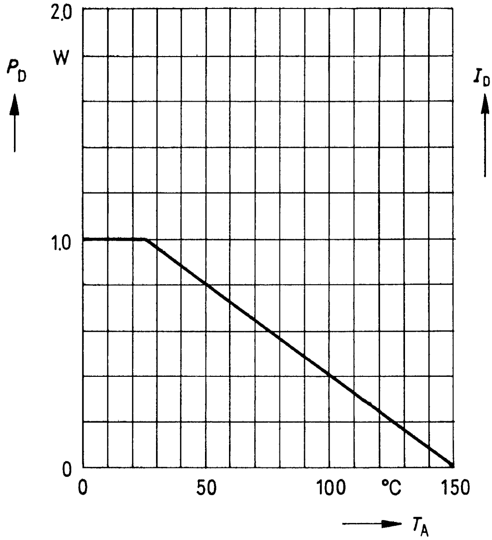
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,14 | 0,2 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,3A |
| Input capacitance | $C_{iss}$ | – | 110 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 20 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 5 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 5 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,28A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 15 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 20 | – | | |
| | $t_f$ | – | 15 | – | | |

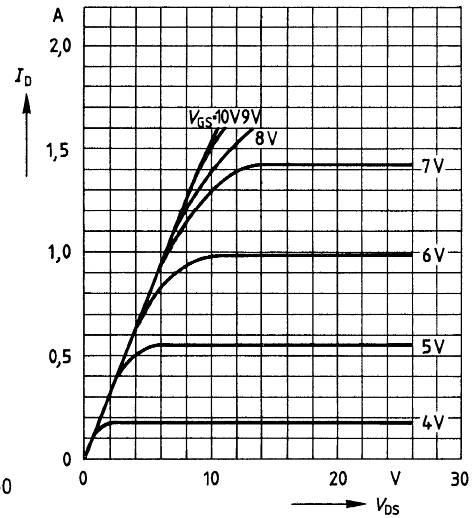
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,3 | A | $T_A$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 0,9 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

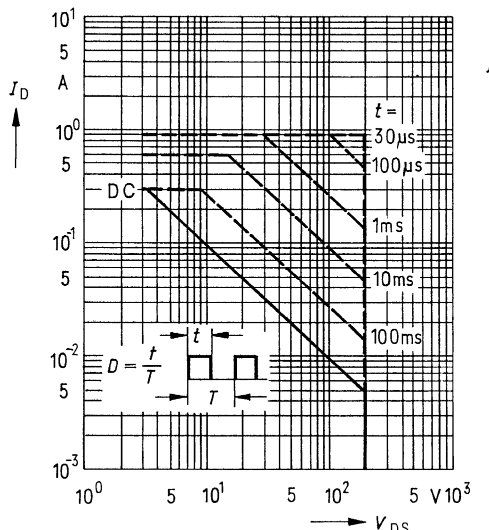
**Power dissipation** $P_D = f(T_{amb})$



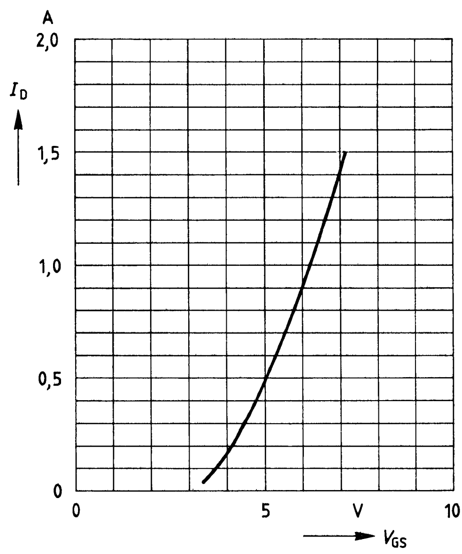

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



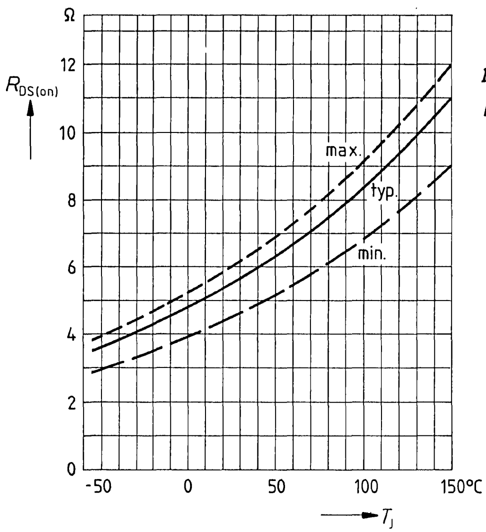

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{amb} = 25°C$



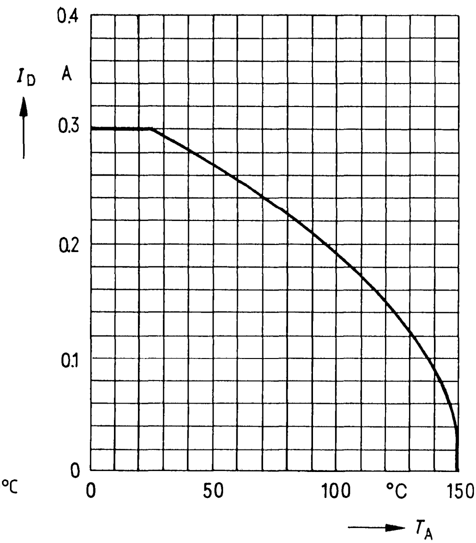

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



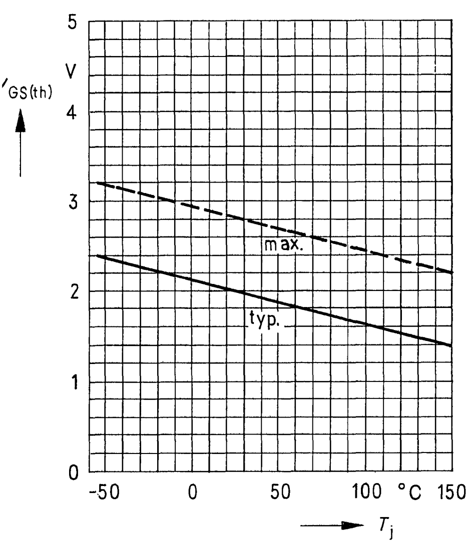
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)




**Continuous drain current** $I_D = f\,(T_{amb})$



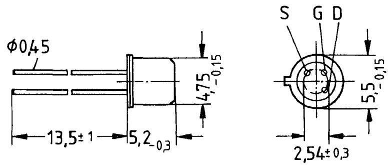

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS},\ I_D = 10$ mA



**Description** SIPMOS small signal FET, N-channel enhancement mode

**Case** Metal case 18 A 3 in accordance with DIN 41 876, or TO 18 in accordance with JEDEC. Approx. weight 0,3 g

| Type | Ordering code |
|---|---|
| BSS 91 | Q62702-S457 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 0,35A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 1,0A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 1,5W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| **Thermal resistance** | $R_{th\ JA}$ | ≤300K/W |
| | $R_{th\ JC}$ | ≤83K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 4<br>8 | 60<br>200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 200<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 5,5 | 6,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,3A |

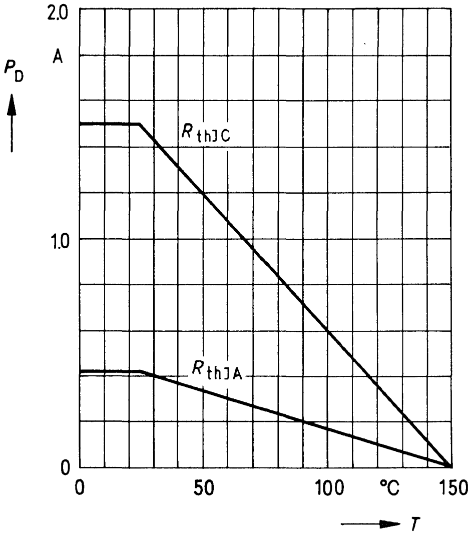
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,14 | 0,2 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,3A |
| Input capacitance | $C_{iss}$ | – | 110 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 20 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 5 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 5 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,28A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 15 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 20 | – | | |
| | $t_f$ | – | 15 | – | | |

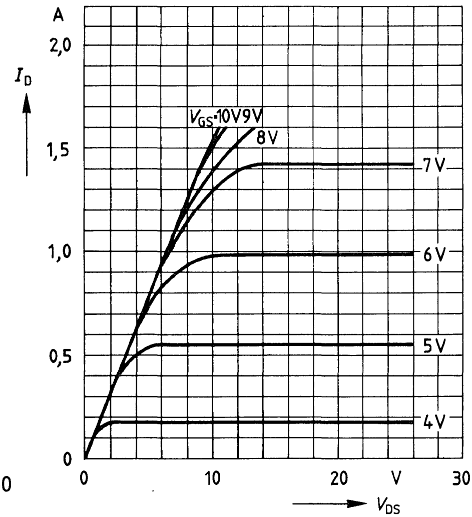
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,35 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 1,0 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

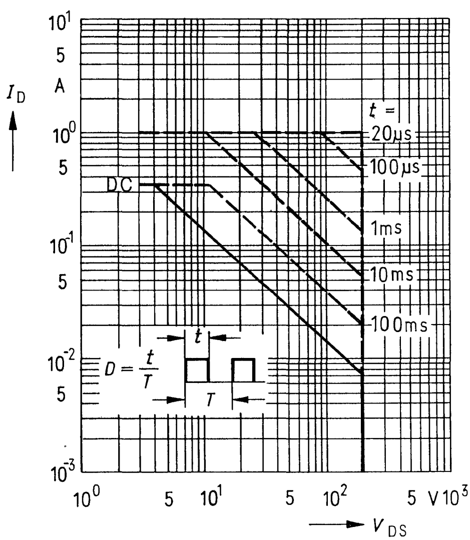
**Power dissipation** $P_D = f(T)$



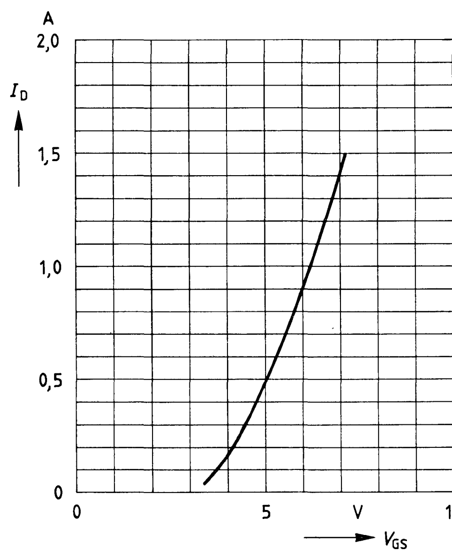

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



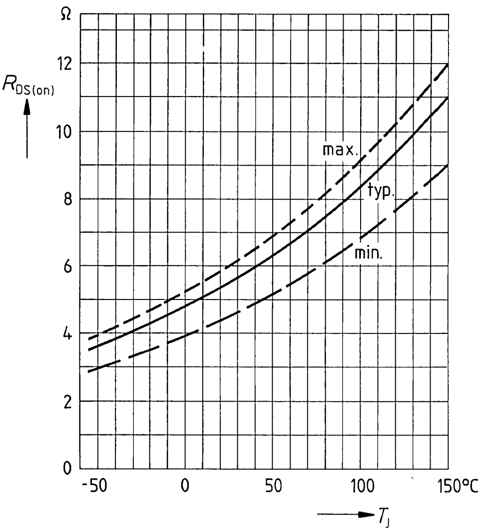

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



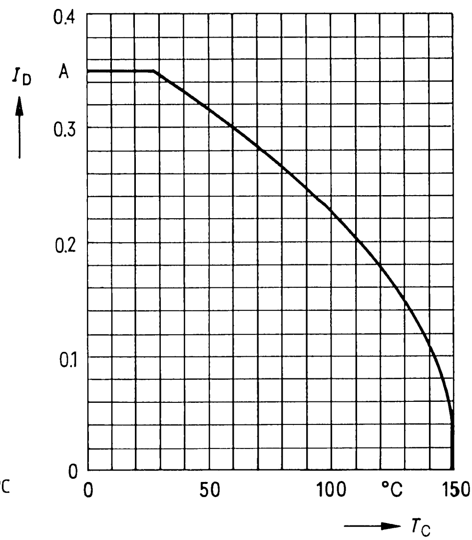

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



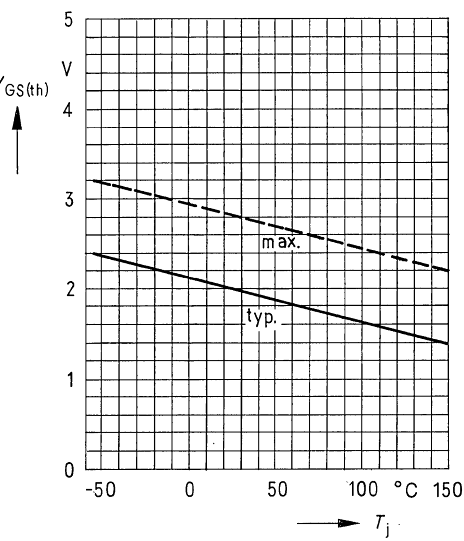
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)




**Continuous drain current** $I_D = f\,(T_{case})$



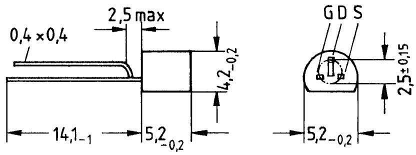

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS},\ I_D = 10$ mA



**Preliminary data!**

**Description** SIPMOS small signal FET, P-channel enhancement mode
**Case** Plastic package 10 A 3 in accordance with DIN 41 868, or TO 92 in accordance with JEDEC.
Approx. weight 0,2 g

| Type | Ordering code |
|---|---|
| BSS 92 | Q62702-S0458 |




Dimensions in mm

| | | |
|---|---|---|
| **Absolute maximum ratings** | | |
| Drain-source voltage | $V_{DS}$ | –200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | –200V |
| Continuous drain current, $T_{amb}$ = 35 °C | $I_D$ | –0,15A |
| Pulsed drain current, $T_{amb}$ = 25 °C | $I_{Dpuls}$ | –0,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 1W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | –55 °C ... +150 °C |
| **Thermal resistance** | $R_{th\,JA}$ | ≤125K/W |
| | $R_{th\,JC}$ | – |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | −200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = −1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | −0,8 | −0,2 | −2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = −1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | −4<br>−8 | −60<br>−200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = −200V<br>$V_{GS}$ = 0V |
| | | – | – | −0,2 | | $T_j$ = 25 °C<br>$V_{DS}$ = −60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | −10 | −100 | nA | $V_{GS}$ = −20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 20 | Ω | $V_{GS}$ = −10V<br>$I_D$ = − 0,1A |

### Dynamic ratings

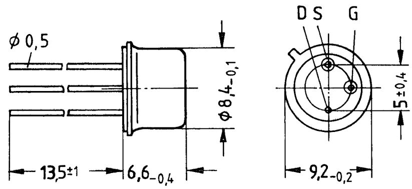
| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 45 | 70 | – | mS | $V_{DS}$ = −25V<br>$I_D$ = − 0,1A |
| Input capacitance | $C_{iss}$ | – | 80 | – | nF | $V_{GS}$ = 0V<br>$V_{DS}$ = −25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 15 | – | pF | |
| Reverse transfer capacitance | $C_{rss}$ | – | 5 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 7 | – | ns | $V_{CC}$ = −30V<br>$I_D$ = − 0,25A<br>$V_{GS}$ = −10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 30 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 40 | – | | |
| | $t_f$ | – | 30 | – | | |

### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | −0,15 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | −0,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | −1 | −1,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

**Description** SIPMOS small signal FET, N-channel enhancement mode
**Case** Metal case 5 C 3 in accordance with DIN 41 873, or TO 39 in accordance with JEDEC. Approx. weight 1,6 g

| Type | Ordering code |
|---|---|
| BSS 93 | Q62702-S459 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 0,50A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 1,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 2,5W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| **Thermal resistance** | $R_{th\,JA}$ | ≤188K/W |
| | $R_{th\,JC}$ | ≤50K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 4<br>8 | 60<br>200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 200<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 5,5 | 6,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,3A |

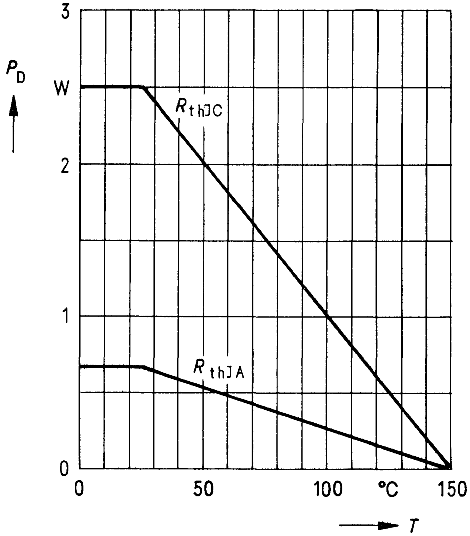
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,14 | 0,2 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,3A |
| Input capacitance | $C_{iss}$ | – | 110 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 20 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 5 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 5 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,28A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 15 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 20 | – | | |
| | $t_f$ | – | 15 | – | | |

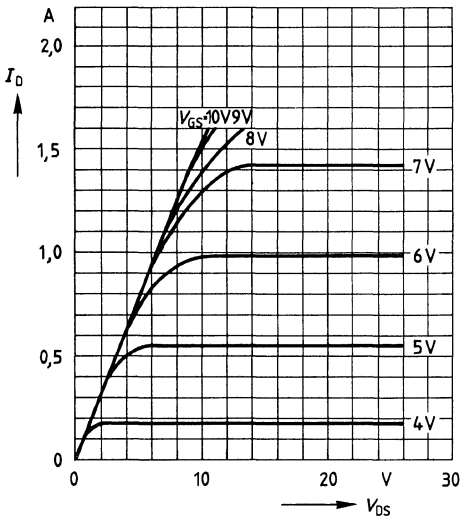
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,5 | A | $T_A$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 1,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

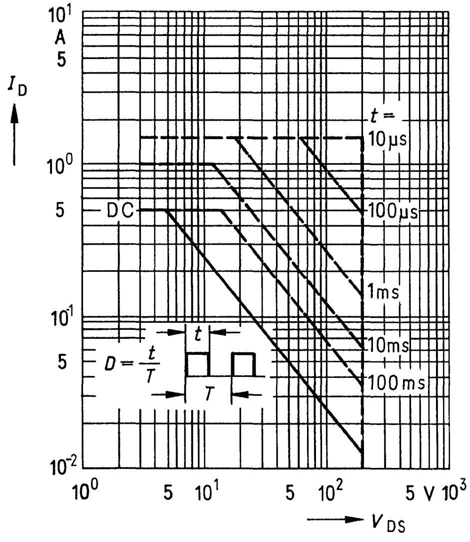
**Power dissipation** $P_D = f(T)$



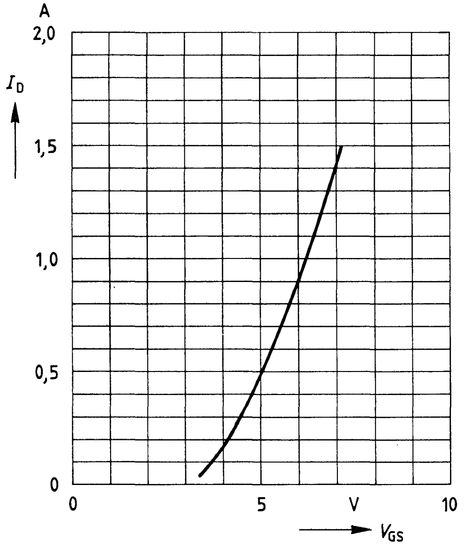

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 μs pulse test,
$T_{case} = 25\,°C$



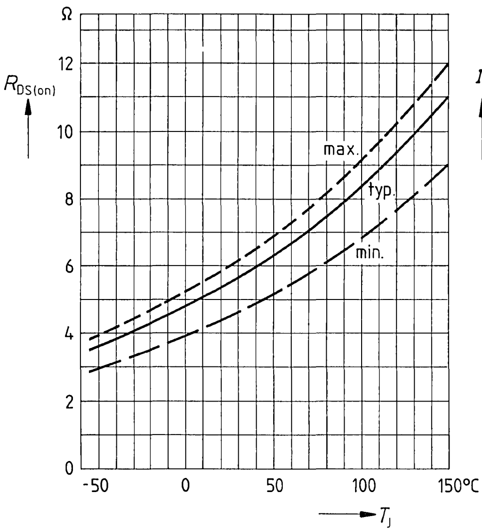

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



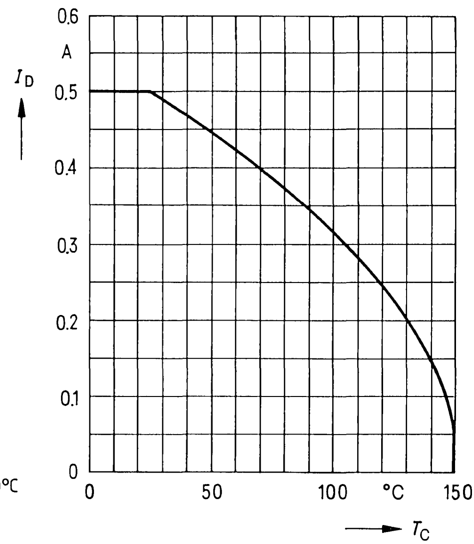

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 μs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



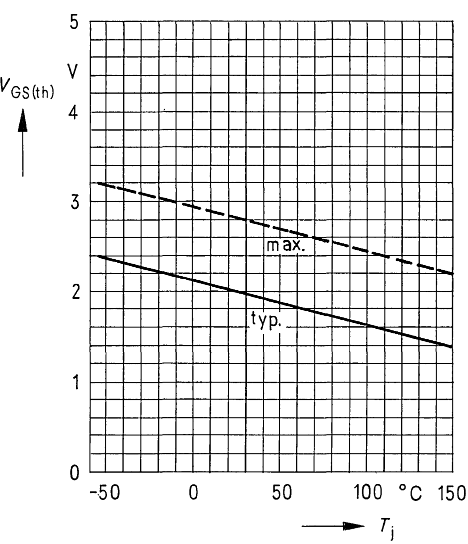
**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)




**Continuous drain current** $I_D = f(T_{case})$

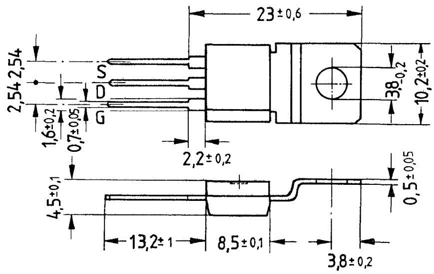



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



**Description** SIPMOS small signal FET, N-channel enhancement mode
**Case** Plastic package TO 202 in accordance with JEDEC
Approx. weight 1,8 g

| Type | Ordering code |
|---|---|
| BSS 95 | Q62702-S461 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{amb}$ = 35 °C | $I_D$ | 0,80A |
| Pulsed drain current, $T_{amb}$ = 25 °C | $I_{Dpuls}$ | 2,4A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 8,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| **Thermal resistance** | $R_{th\ JA}$ | ≤65K/W |
| | $R_{th\ JC}$ | ≤15K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | V | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 4<br>8 | 60<br>200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °V<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 200<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 5,5 | 6,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,3A |

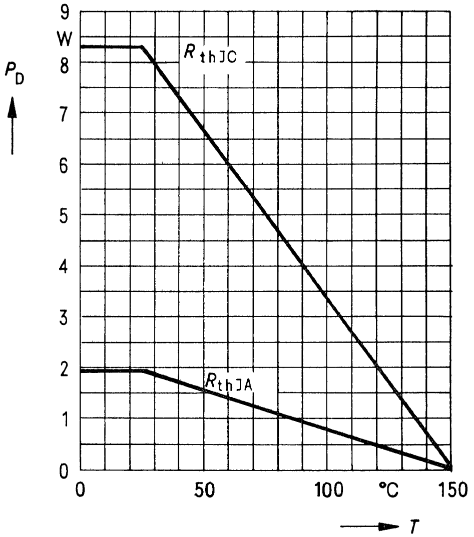
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,14 | 0,2 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,3A |
| Input capacitance | $C_{iss}$ | – | 110 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 20 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 5 | – | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 5 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,28A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 15 | – | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 20 | – | | |
| | $t_f$ | – | 15 | – | | |

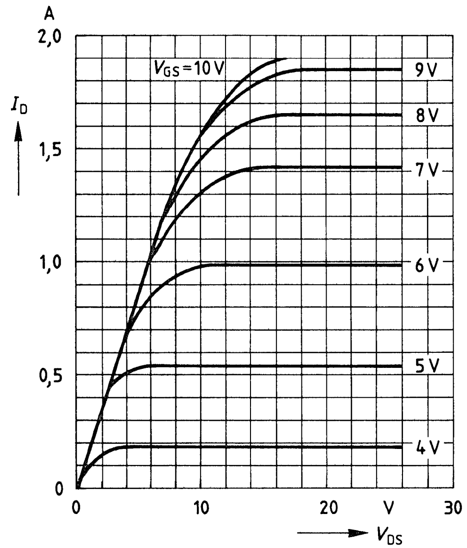
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,8 | A | $T_A$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 2,4 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

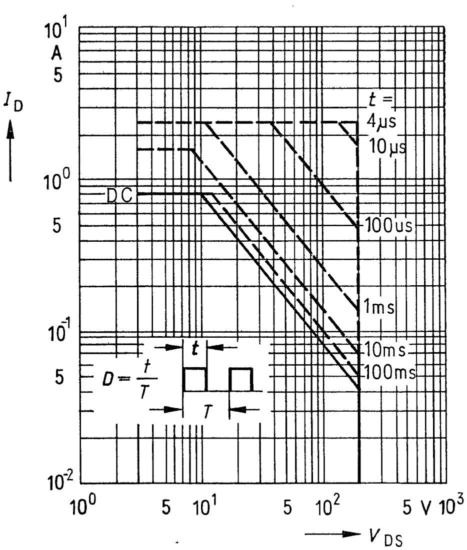
**Power dissipation** $P_D = f(T)$



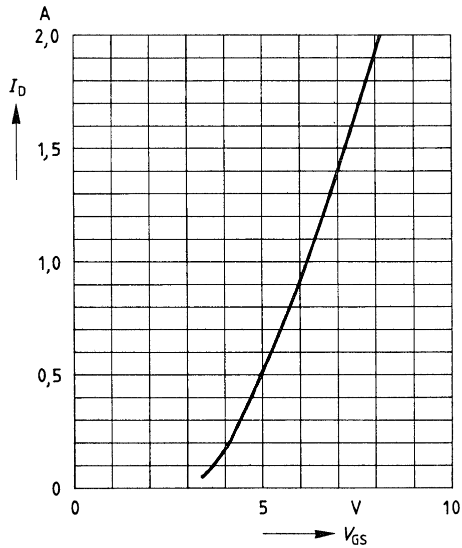

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



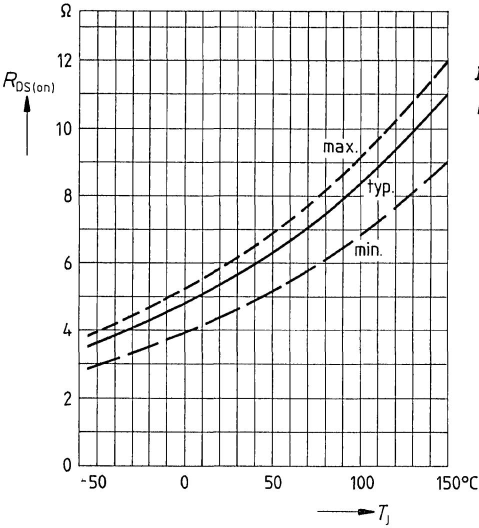

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



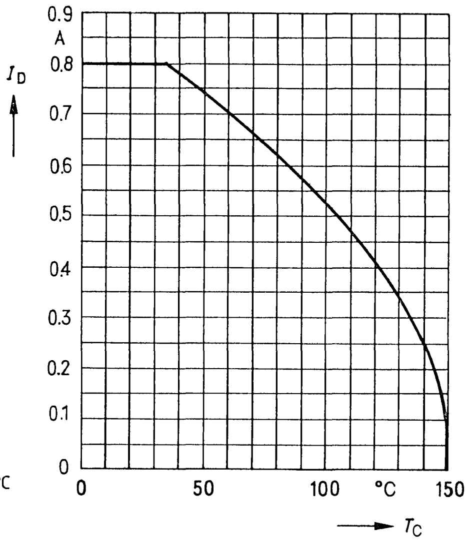

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



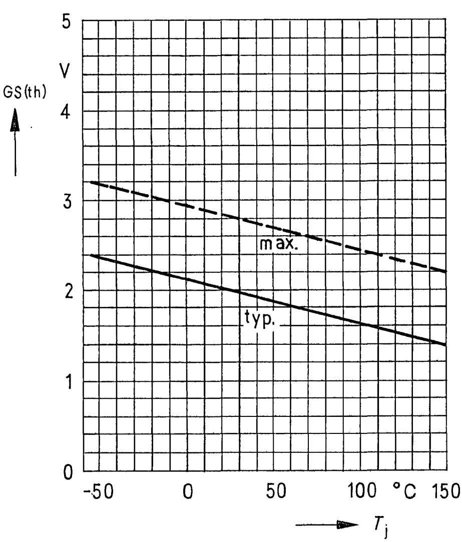
**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)




**Continuous drain current** $I_D = f(T_{case})$

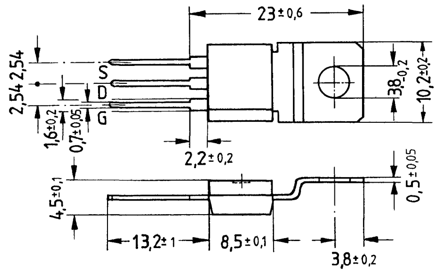



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 10 mA



**Description** SIPMOS small signal FET, N-channel enhancement mode
**Case** Plastic package TO 202 in accordance with JEDEC
Approx. weight 1,8 g

| Type | Ordering code |
|---|---|
| BSS 97 | Q62702-S463 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 1,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 4,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 10W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C… +150 °C |
| **Thermal resistance** | $R_{th\,JA}$ | ≤65K/W |
| | $R_{th\,JC}$ | ≤12,5K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unles otherwise specified)

**Static ratings**

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 4<br>8 | 60<br>200 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 200<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,75A |

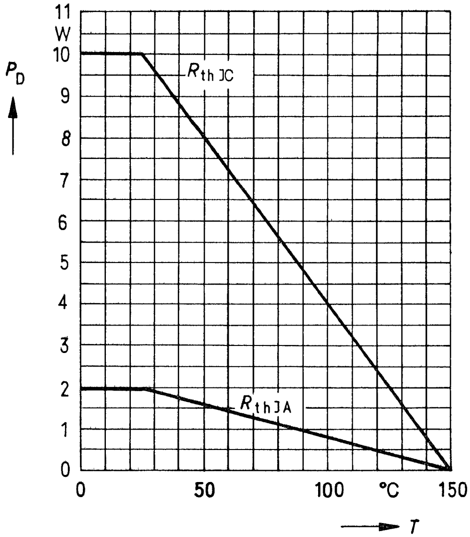
**Dynamic ratings**

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,5 | 1 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,75A |
| Input capacitance | $C_{iss}$ | – | 375 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 60 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 3 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,29A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 15 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 40 | – | | |
| | $t_f$ | – | 20 | – | | |

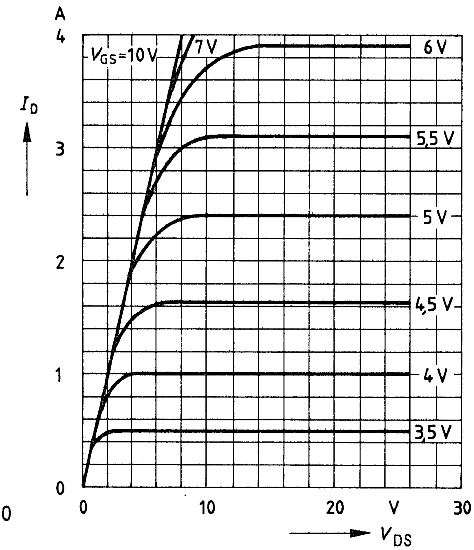
**Reverse diode**

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 1,5 | A | $T_A$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 4,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

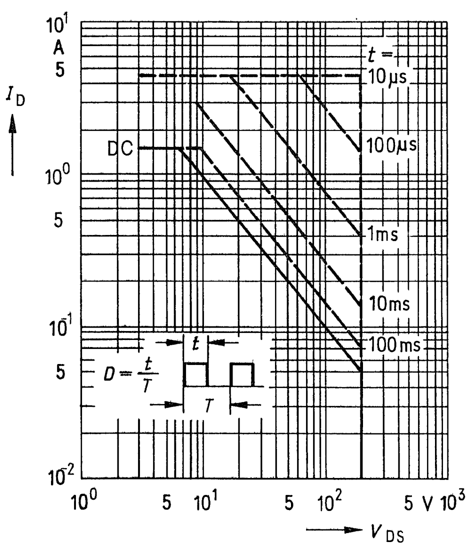
**Power dissipation** $P_D = f(T)$



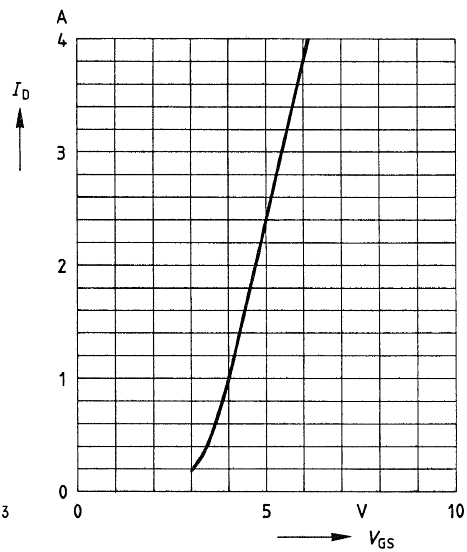

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



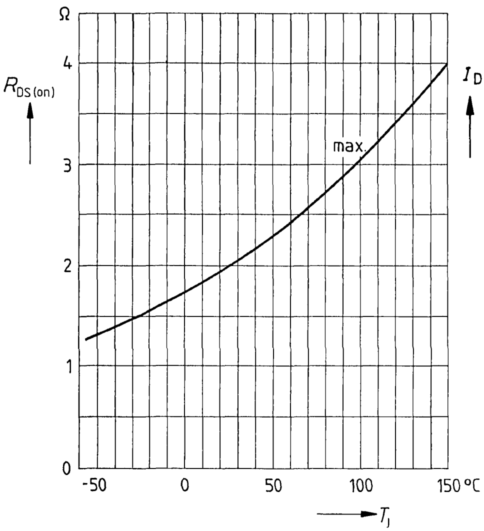

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



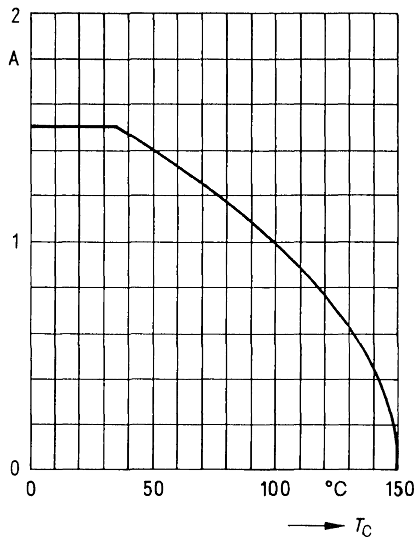

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



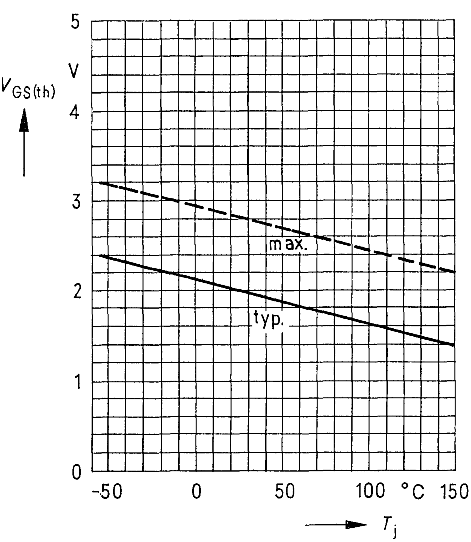
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)




**Continuous drain current** $I_D = f\,(T_{case})$



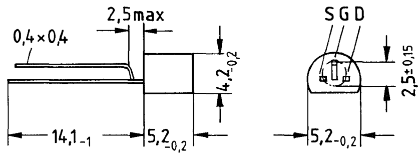

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS},\ I_D = 10$ mA



**Description** SIPMOS small signal FET, N-channel enhancement mode

**Case** Plastic package 10 A 3 in accordance with DIN 41 868,
or TO 92 in accordance with JEDEC.
Approx. weight 0,2 g

| Type | Ordering code |
|---|---|
| BSS 100 | Q62702-S0483 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{amb}$ = 25 °C | $I_D$ | 0,23A |
| Pulsed drain current, $T_{amb}$ = 25 °C | $I_{Dpuls}$ | 0,7A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 0,63W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| **Thermal resistance** | $R_{th\,JA}$ | ≤200K/W |
| | $R_{th\,JC}$ | – |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

**Static ratings**

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 1<br>2 | 15<br>60 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 10<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 60V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 6,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 0,12A |

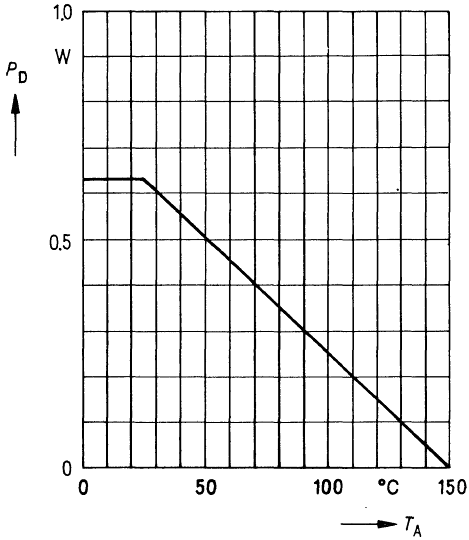
**Dynamic ratings**

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,08 | 0,12 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 0,12A |
| Input capacitance | $C_{iss}$ | – | 20 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 9,0 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 4,0 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 2 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,28A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 5 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 10 | – | | |
| | $t_f$ | – | 5 | – | | |

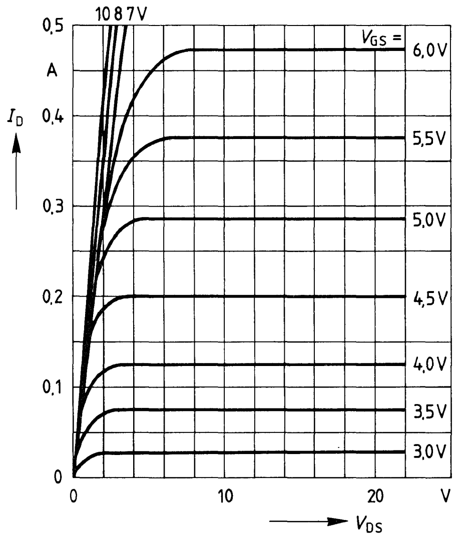
**Reverse diode**

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,23 | A | $T_A$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 0,7 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,3 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

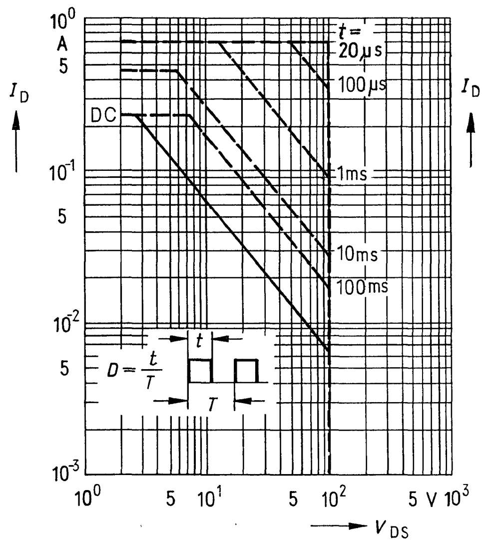
**Power dissipation** $P_D = f(T_{amb})$



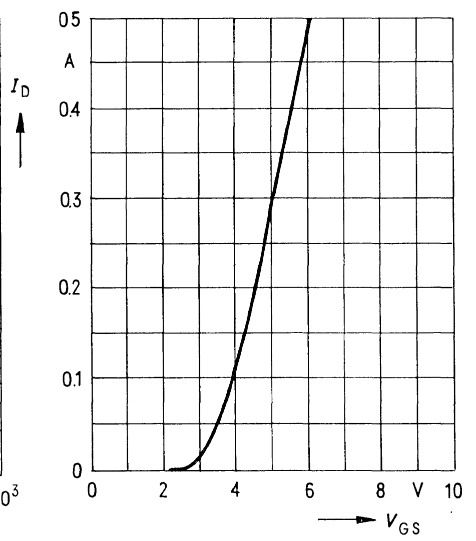

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



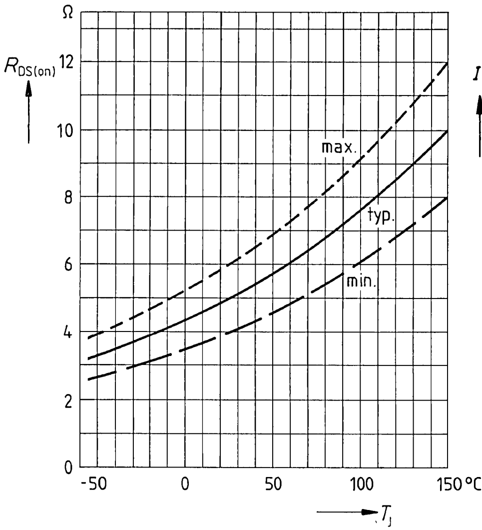

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{amb} = 25\,°C$



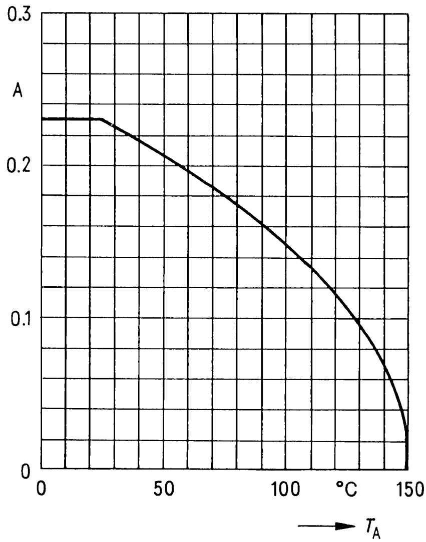

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



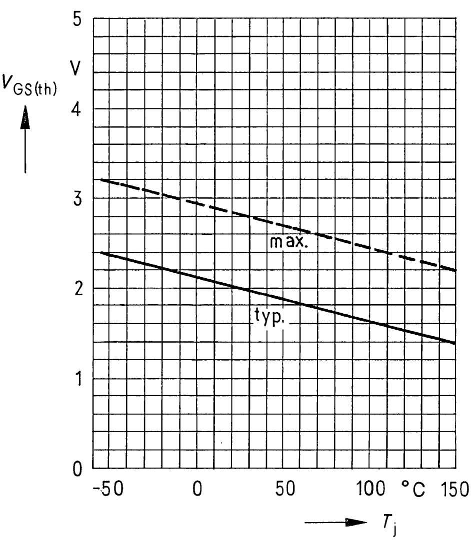
**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)




**Continuous drain current** $I_D = f(T_{amb})$

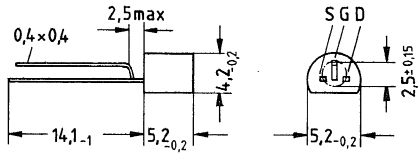



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS},\ I_D = 10$ mA



**Description** SIPMOS small signal FET, N-channel enhancement mode
**Case** Plastic package 10 A 3 in accordance with DIN 41 868, or TO 92 in accordance with JEDEC.
Approx. weight 0,2 g

| Type | Ordering code |
|---|---|
| BSS 101 | Q62702-S0484 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{amb}$ = 25 °C | $I_D$ | 0,16A |
| Pulsed drain current, $T_{amb}$ = 25 °C | $I_{Dpuls}$ | 0,45A |
| Gate-source voltage | $V_{GS}$ | ± 20V |
| Max. power dissipation | $P_D$ | 0,63W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | − 55 °C ... + 150 °C |
| **Thermal resistance** | $R_{th\ JA}$ | ≤ 200K/W |
| | $R_{th\ JC}$ | − |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 0,8 | 2,0 | 2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 1<br>2 | 15<br>60 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| | | –<br>–<br>– | –<br>–<br>– | 30<br>–<br>– | nA | $T_j$ = 25 °C<br>$V_{DS}$ = 130V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 12 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 80mA |

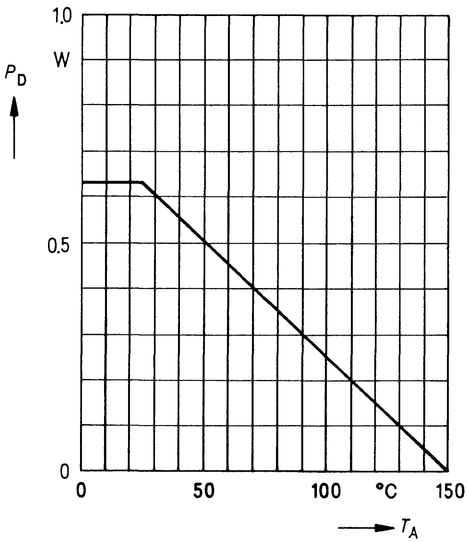
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,06 | 0,1 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 80mA |
| Input capacitance | $C_{iss}$ | – | 20 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 6 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 2,5 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 2 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 0,27A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 5 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 10 | – | | |
| | $t_f$ | – | 5 | – | | |

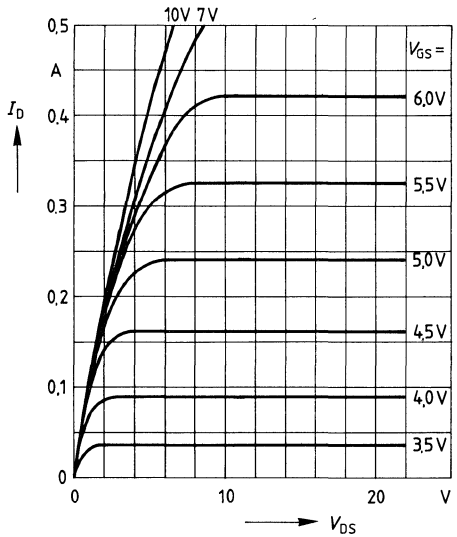
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 0,16 | A | $T_A$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 0,45 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

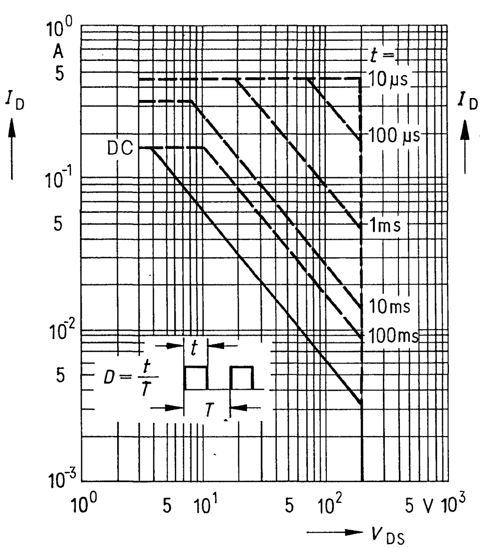
**Power dissipation** $P_D = f(T_{amb})$



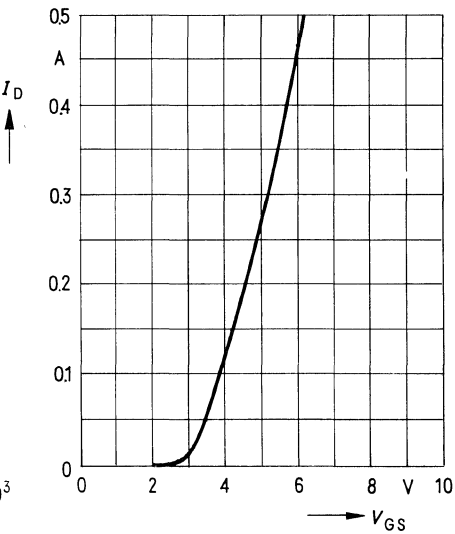

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



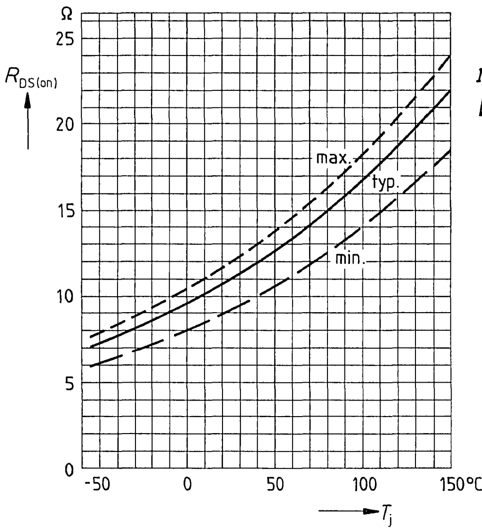

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{amb} = 25\,°C$



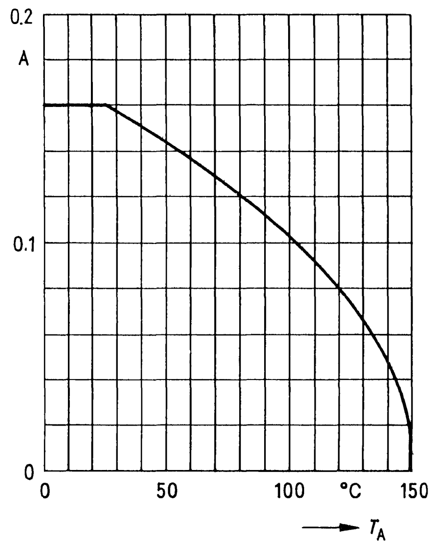

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



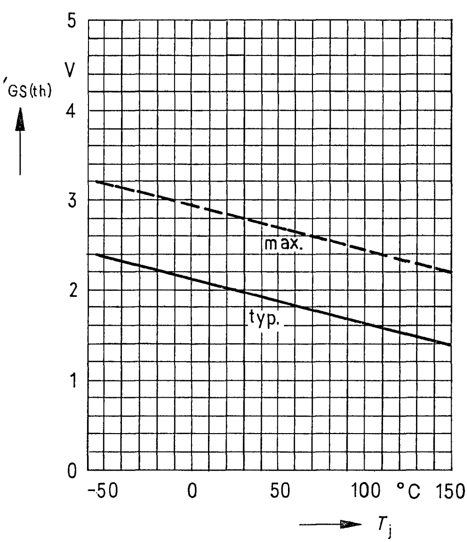
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)




**Continuous drain current** $I_D = f\,(T_{amb})$




**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA

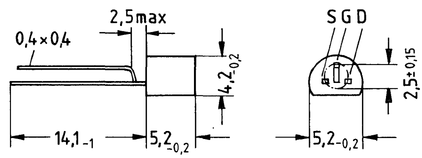


**Preliminary data!**

**Description** SIPMOS small signal FET, P-channel enhancement mode

**Case** Plastic package 10 A 3 in accordance with DIN 41 868, or TO 92 in accordance with JEDEC. Approx. weight 0,2 g

| Type | Ordering code |
|---|---|
| BSS 110 | Q62702-S0489 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | – 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | – 50V |
| Continuous drain current, $T_{amb}$ = 34 °C | $I_D$ | – 0,17A |
| Pulsed drain current, $T_{amb}$ = 25 °C | $I_{Dpuls}$ | – 0,5A |
| Gate-source voltage | $V_{GS}$ | ± 20V |
| Max. power dissipation | $P_D$ | 0,63W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | – 55 °C ... + 150 °C |
| **Thermal resistance** | $R_{th\ JA}$ | ≤ 200K/W |
| | $R_{th\ JC}$ | – |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | −50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = −0,5mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | −0,8 | −0,2 | −2,8 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = −1mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | −1<br>−2 | −15<br>−60 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = −50V<br>$V_{GS}$ = 0V |
| | | – | – | −0,1 | | $T_j$ = 25 °C<br>$V_{DS}$ = −25V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | ±10 | ±20 | nA | $V_{GS}$ = ±20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 10 | Ω | $V_{GS}$ = −10V<br>$I_D$ = − 0,1A |

### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 25 | 50 | – | mS | $V_{DS}$ = −25V<br>$I_D$ = − 0,1A |
| Input capacitance | $C_{iss}$ | – | 20 | – | nF | $V_{GS}$ = 0V<br>$V_{DS}$ = −25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 15 | – | pF | |
| Reverse transfer capacitance | $C_{rss}$ | – | 8 | – | | |
| Turn-on time $t_{on}$<br>($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 4 | – | ns | $V_{CC}$ = −30V<br>$I_D$ = − 0,27A<br>$V_{GS}$ = −10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 10 | – | | |
| Turn-off time $t_{off}$<br>($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 20 | – | | |
| | $t_f$ | – | 10 | – | | |

### Reverse diode

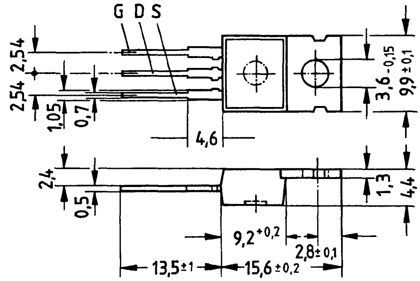
| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | −0,17 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | −0,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | −1 | −1,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | – | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | – | – | µC | |

# Power Transistors

**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 10 | C67078-A1300-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 100 °C | $I_D$ | 12A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 36A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,085 | 0,1 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

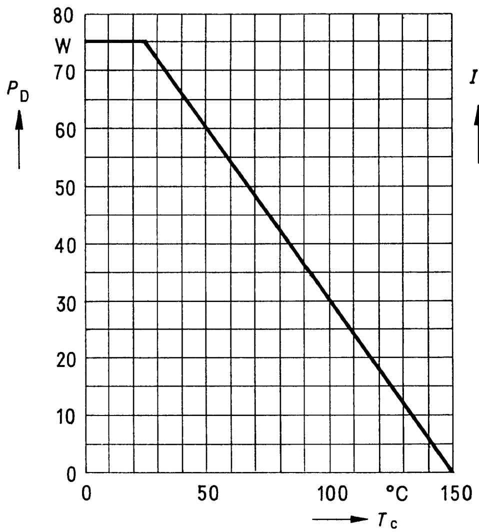
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 4,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 400 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 120 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

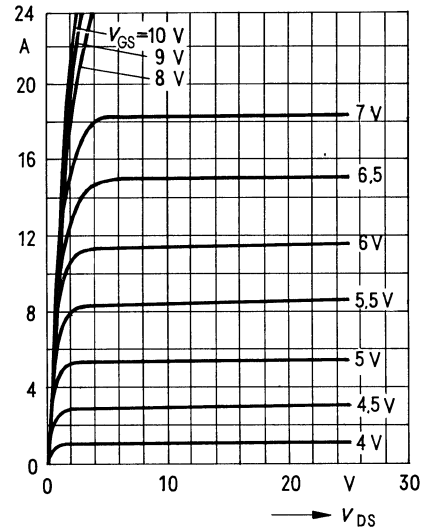
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 12 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 36 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 150 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,0 | – | µC | |

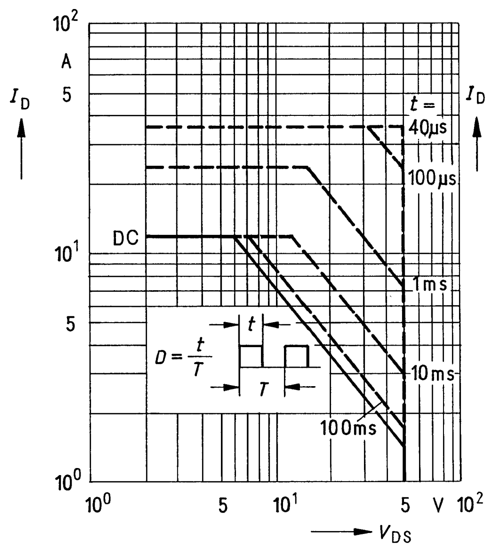
**Power dissipation** $P_D = f(T_{case})$



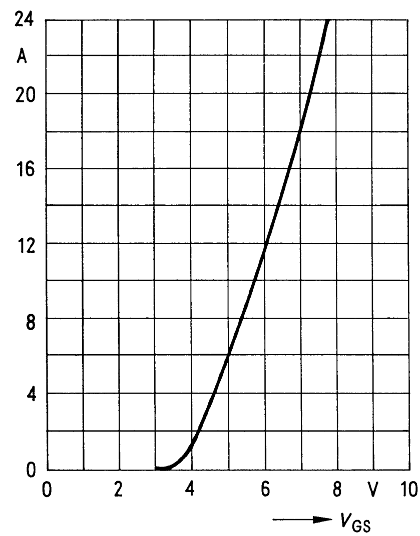

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 μs pulse test,
$T_{case} = 25°C$



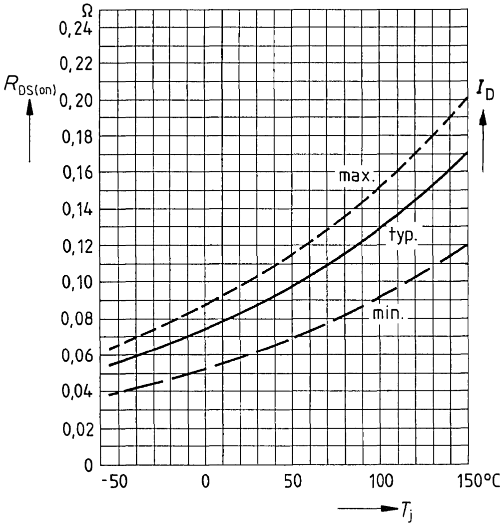

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



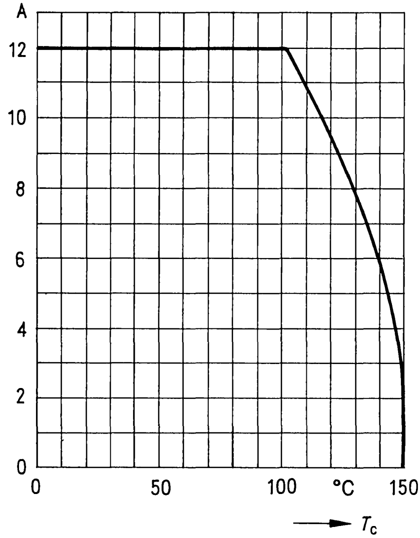

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 μs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



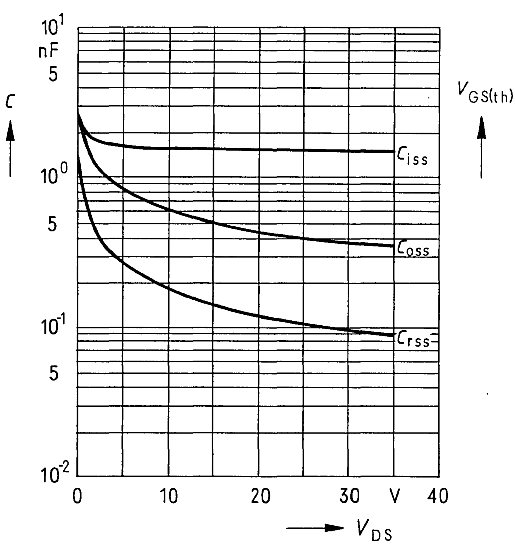
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)



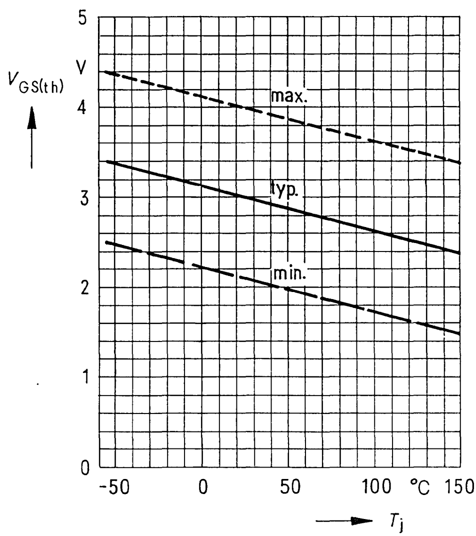

**Continuous drain current** $I_D = f\,(T_{case})$



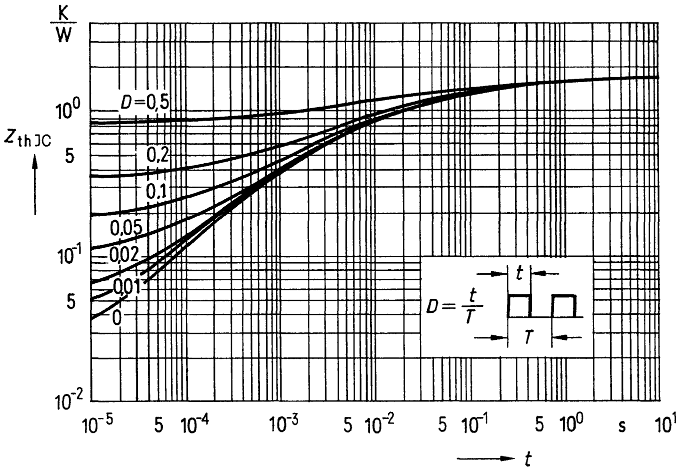

**Typical capacitances** $C = f\,(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



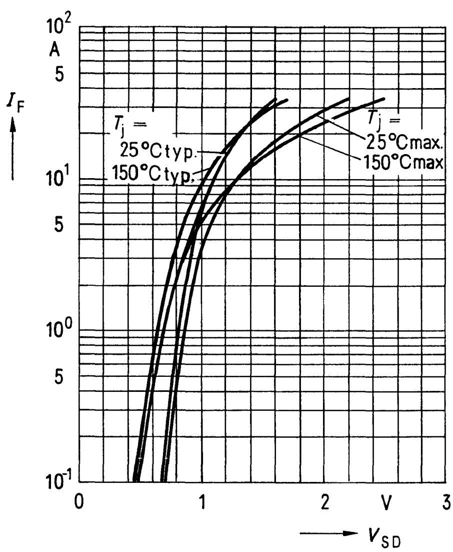

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



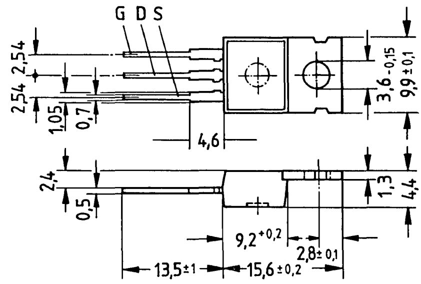

**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p$ = 80 µs



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 10 A | C67078-A1300-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 90 °C | $I_D$ | 12A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 36A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |

| | | |
|---|---|---|
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | 0,11 | 0,12 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

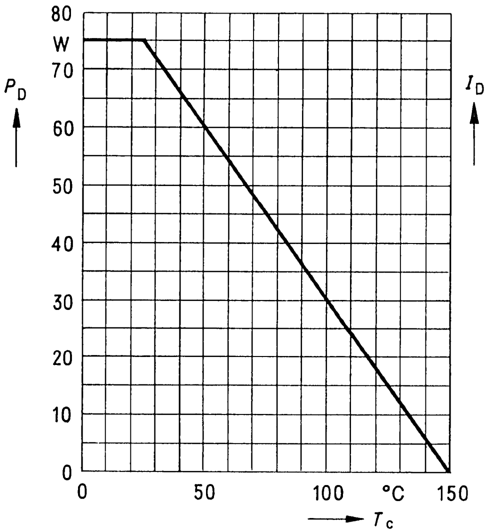
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 4,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 400 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 120 | – | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d(on)}$ + $t_r$) | $t_{d(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d(off)}$ + $t_f$) | $t_{d(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

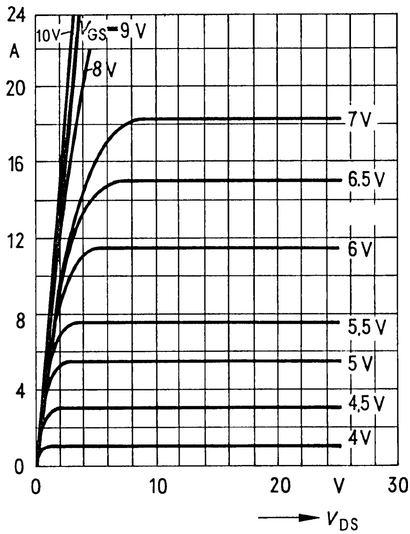
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 12 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 36 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 150 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1 | – | µC | |

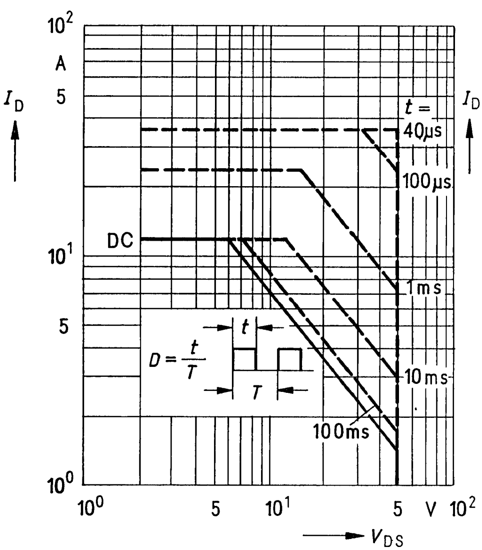
**Power dissipation** $P_D = f(T_{case})$



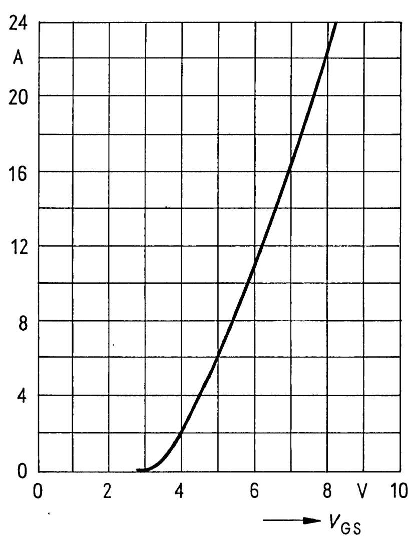

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



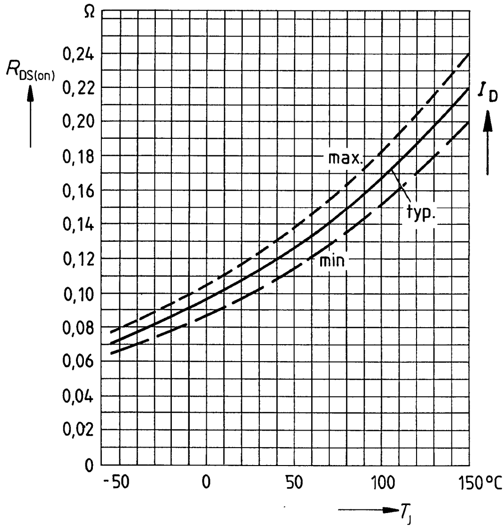

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



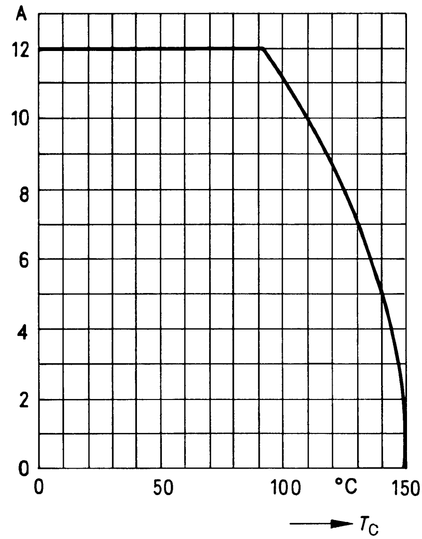

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



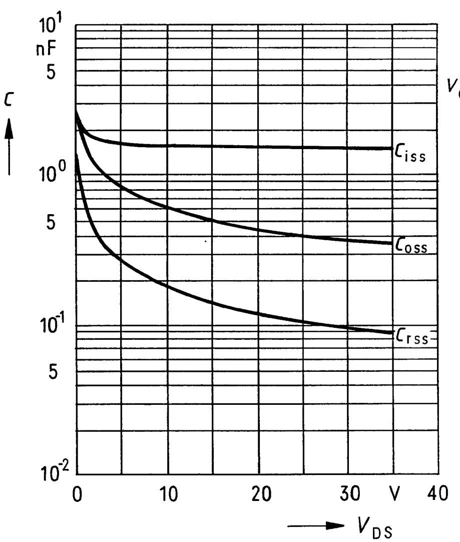
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)



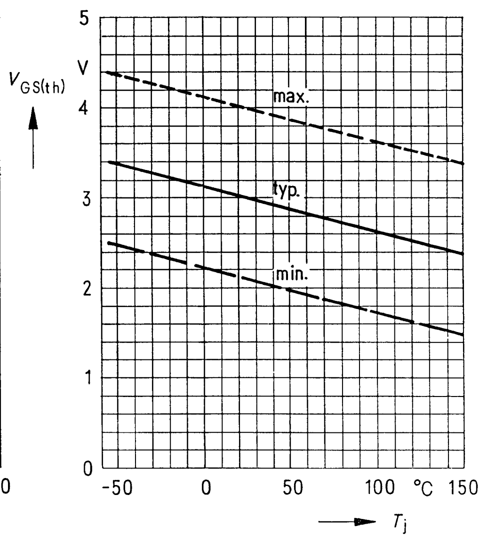

**Continuous drain current** $I_D = f\,(T_{case})$



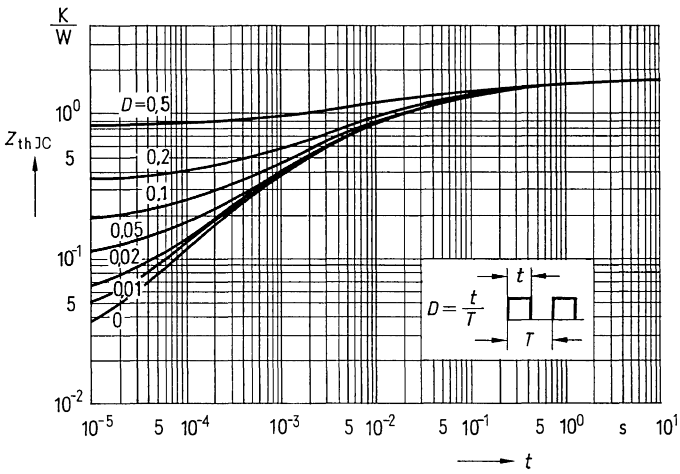

**Typical capacitances** $C = f\,(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



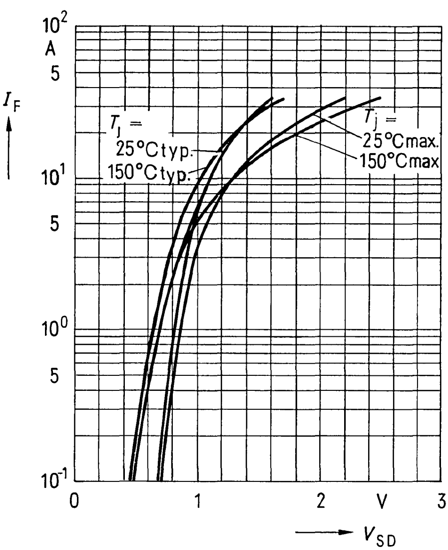

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



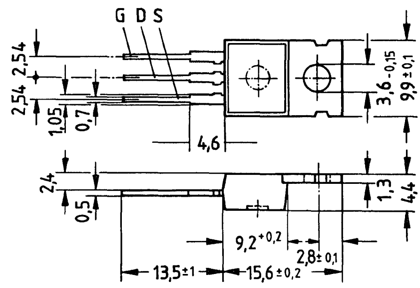

**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 11 | C67078-A1301-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 30A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 90A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,04 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 15A |

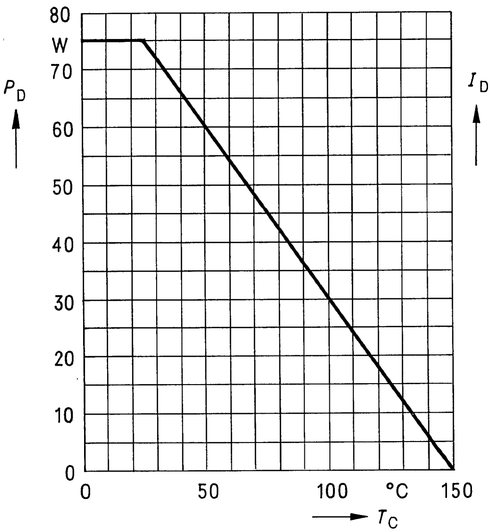
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 4,0 | 8,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 15A |
| Input capacitance | $C_{iss}$ | – | 900 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 800 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 360 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 220 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 600 | – | | |
| | $t_f$ | – | 450 | – | | |

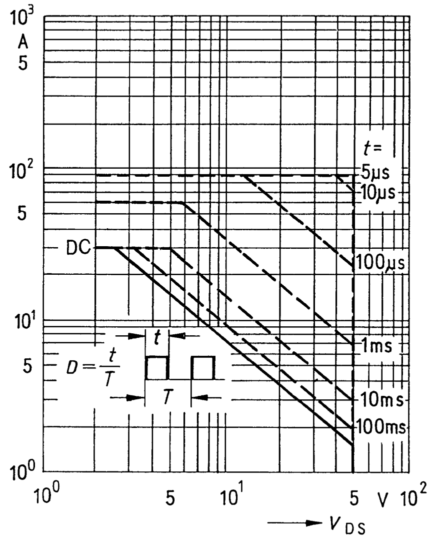
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 30 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 90 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,7 | 2,6 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,25 | – | µC | |

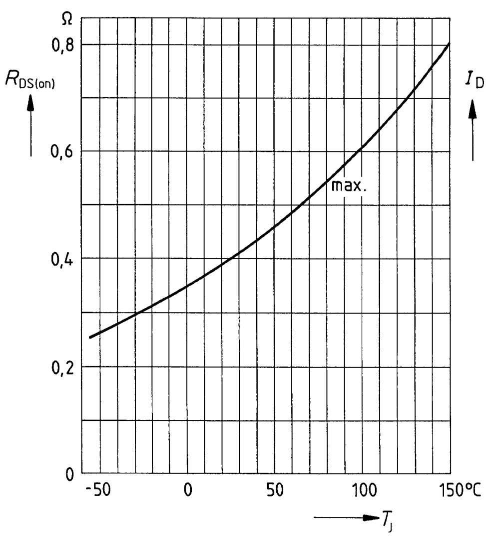
**Power dissipation** $P_D = f(T_{case})$



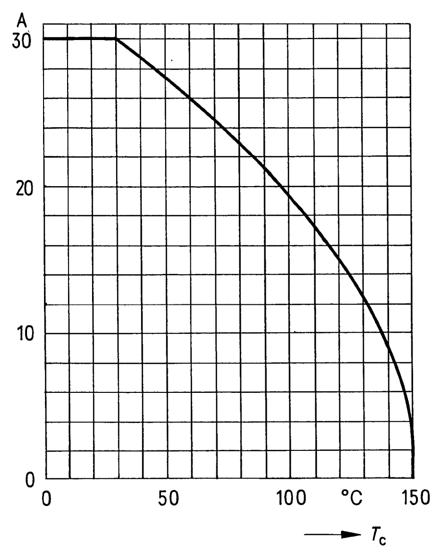

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



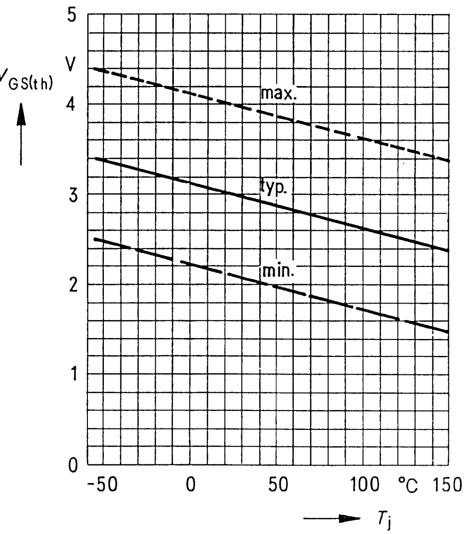

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



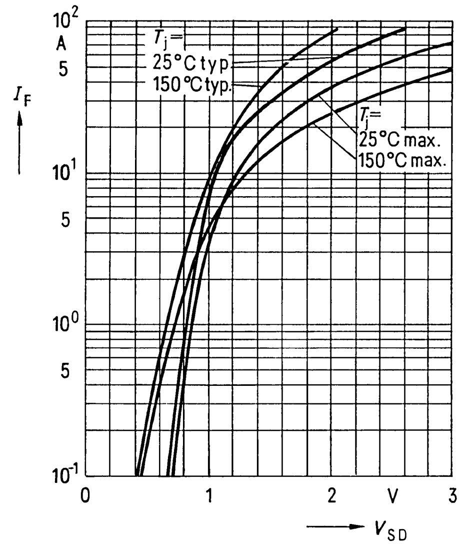

**Continuous drain current** $I_D = f(T_{case})$



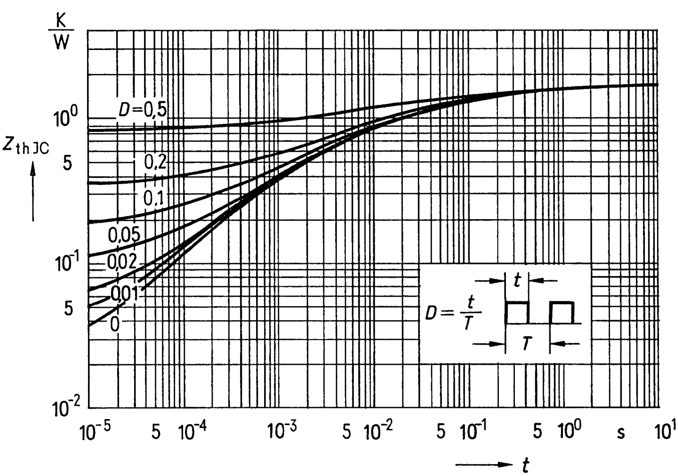
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



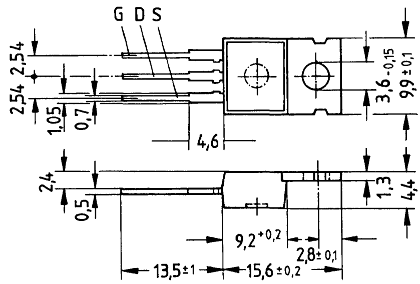

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 11 A | C67078-A1301-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 25A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 75A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ <br> $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,06 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 15A |

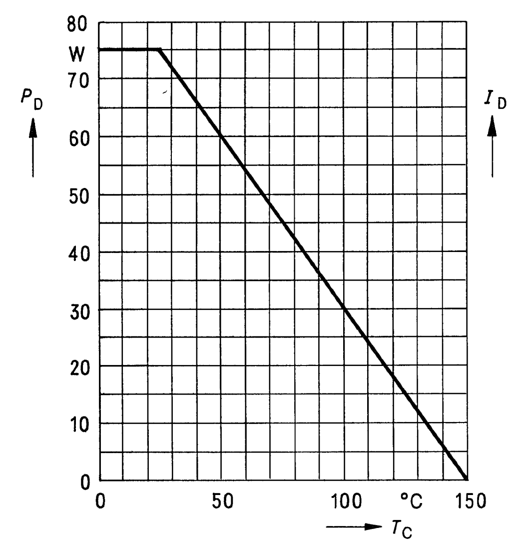
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 4,0 | 8,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 15A |
| Input capacitance | $C_{iss}$ | – | 900 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 800 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 360 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 220 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 600 | – | | |
| | $t_f$ | – | 450 | – | | |

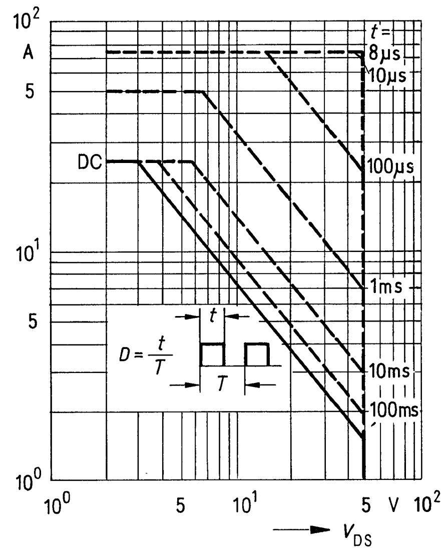
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 25 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 75 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,6 | 2,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,25 | – | µC | |

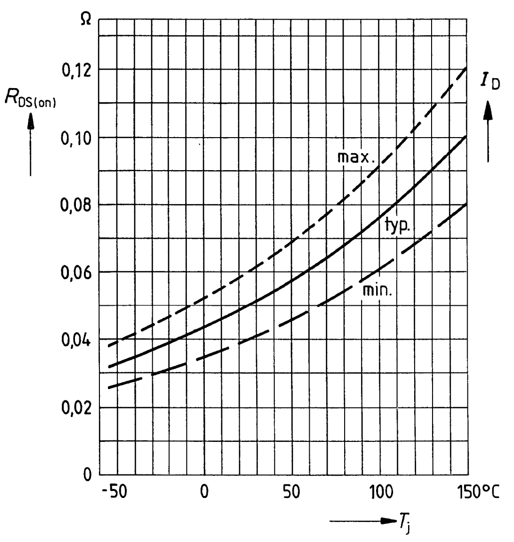
**Power dissipation** $P_D = f(T_{case})$



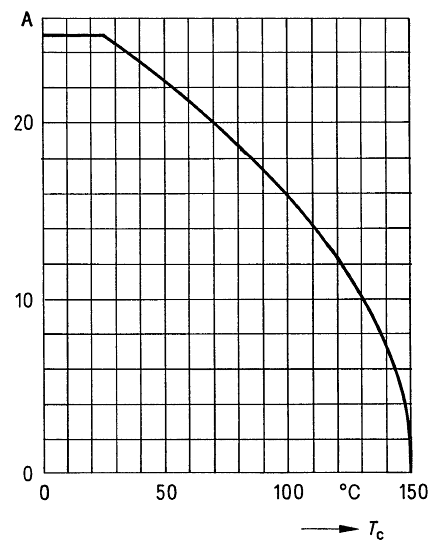

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



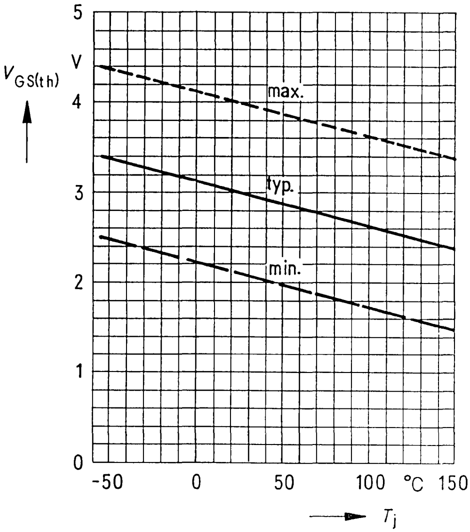

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



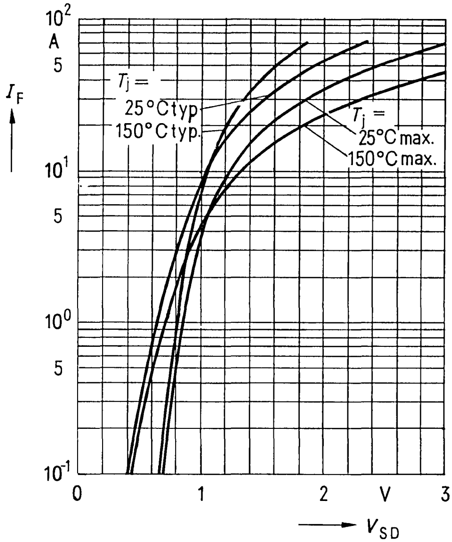

**Continuous drain current** $I_D = f(T_{case})$



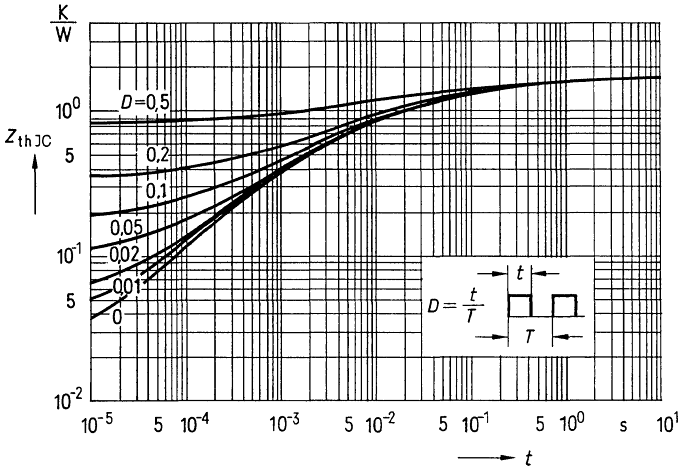
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs

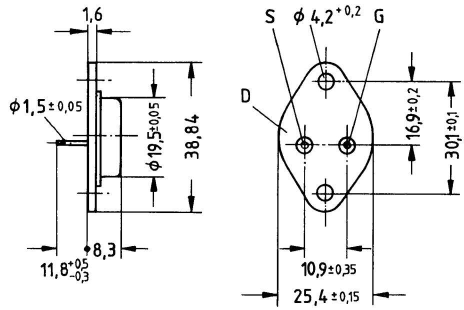



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872,
or TO 204 AE (TO 3) in accordance with JEDEC.
Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 14 | C67078-A1000-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 39A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 115A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 50 | 65 | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | 0,035 | 0,04 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 22A |

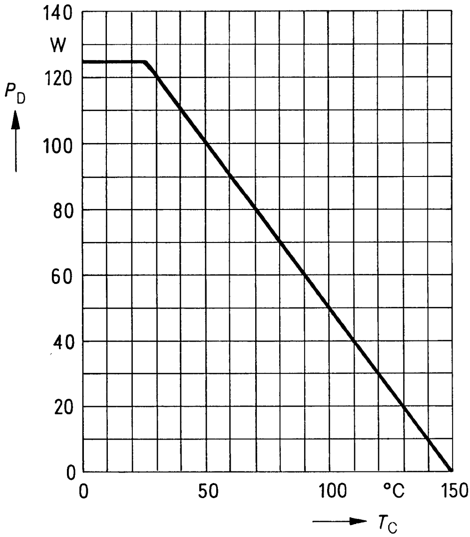
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 7,0 | 18,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 22A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 1300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 600 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

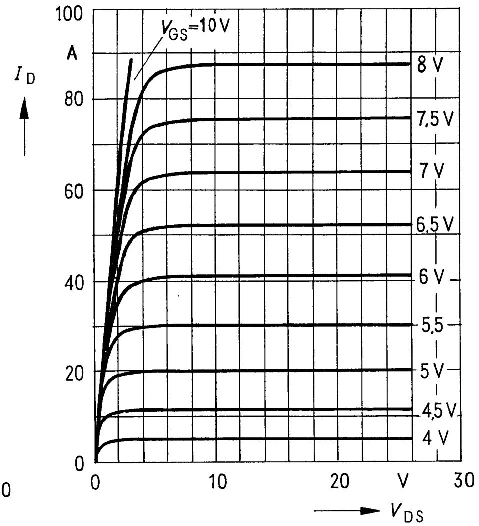
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 39 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 115 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 2,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 150 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,0 | – | µC | |

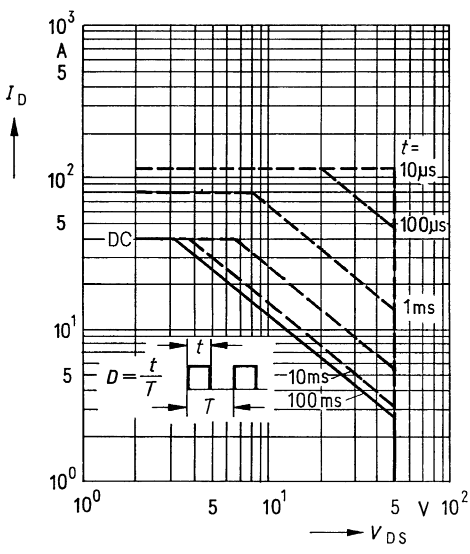
**Power dissipation** $P_D = f(T_{case})$



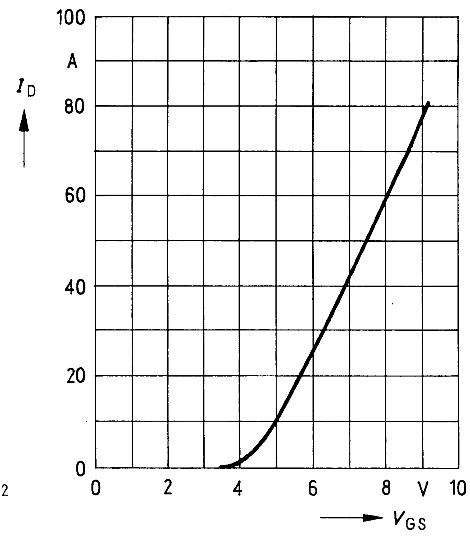

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



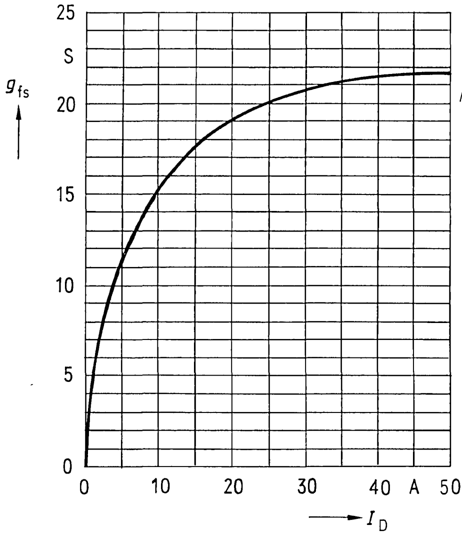

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



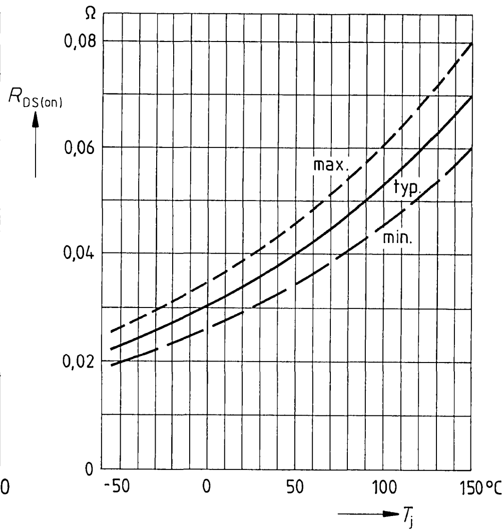

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



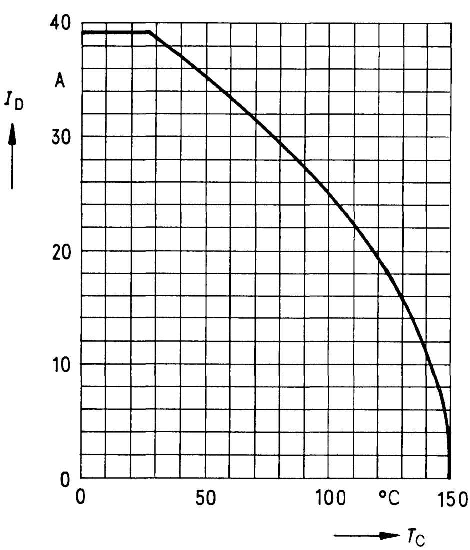
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



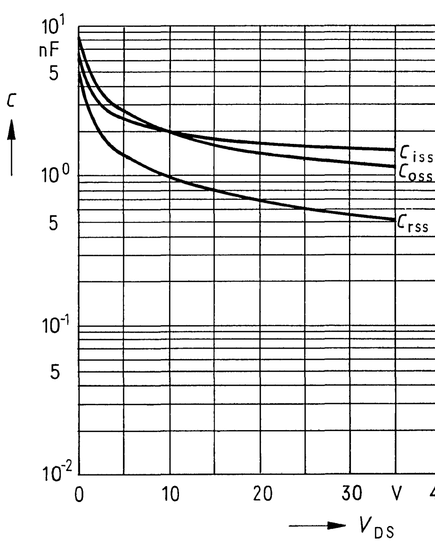

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



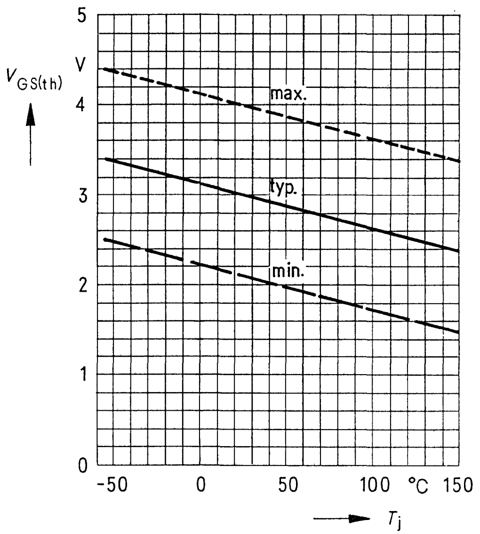

**Continuous drain current** $I_D = f(T_{case})$



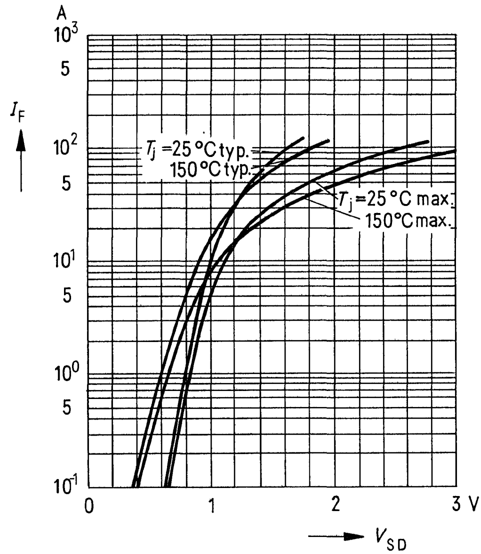

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



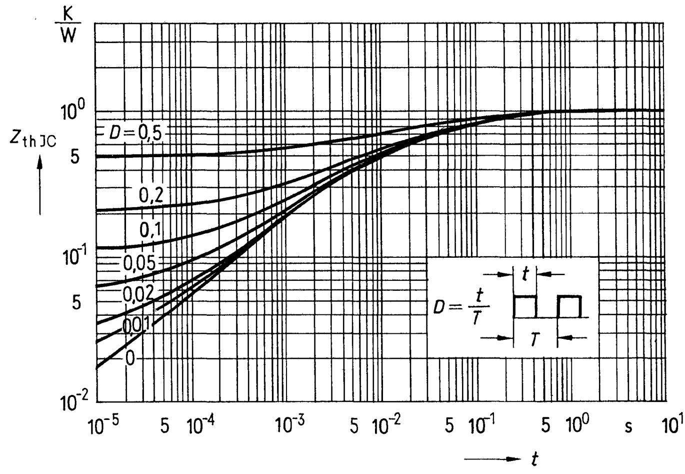
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



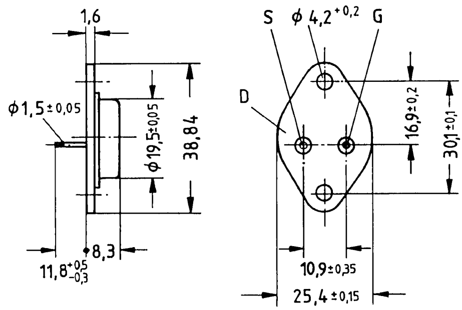

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AE (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 15 | C67078-A1001-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 45A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 135A |
| Gate-source voltage | $V_{GS}$ | $\pm 20$V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | $-55\ °C \ldots +150\ °C$ |
| Isolation test voltage ($t = 1$ min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | $\leq$35K/W |
| | $R_{th\ JC}$ | $\leq$1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | 65 | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,025 | 0,03 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 22A |

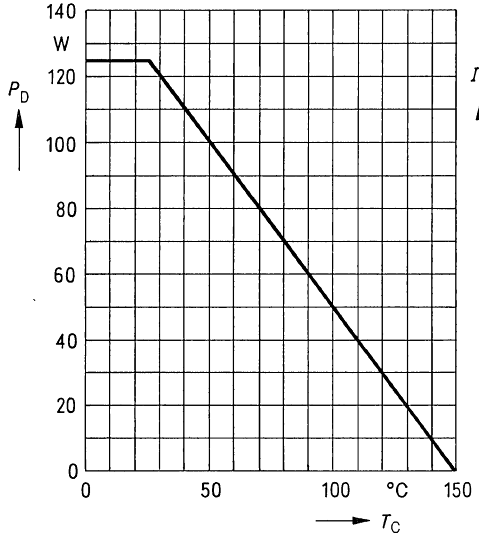
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 7,0 | 18,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 22A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 1300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 600 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

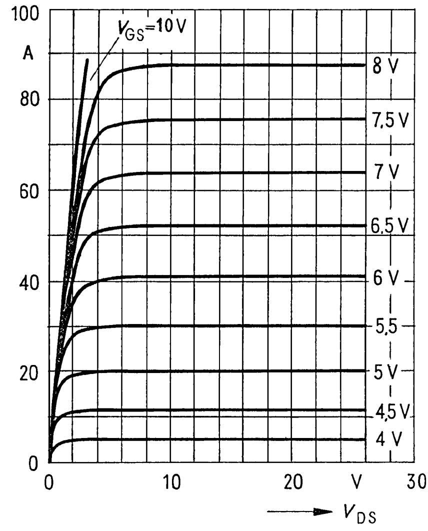
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 45 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 135 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,6 | 2,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 150 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,0 | – | µC | |

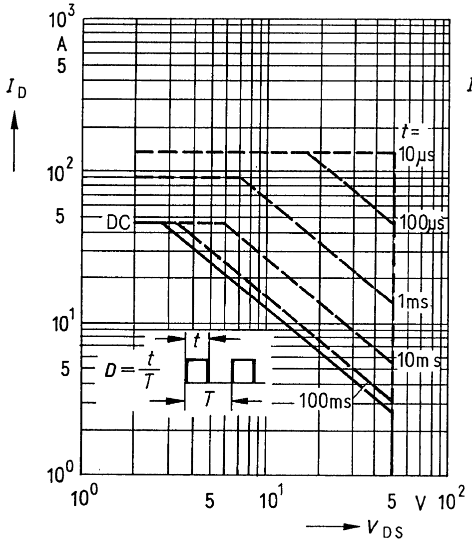
**Power dissipation** $P_D = f(T_{case})$



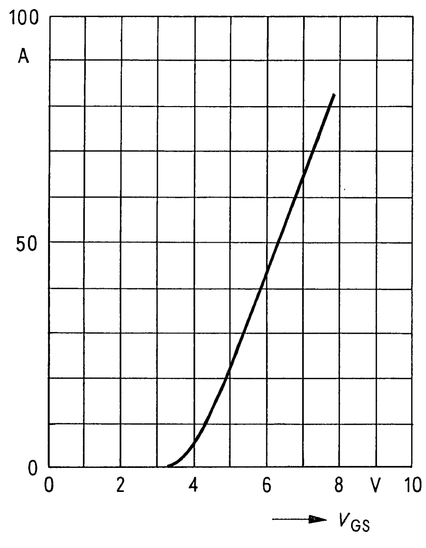

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



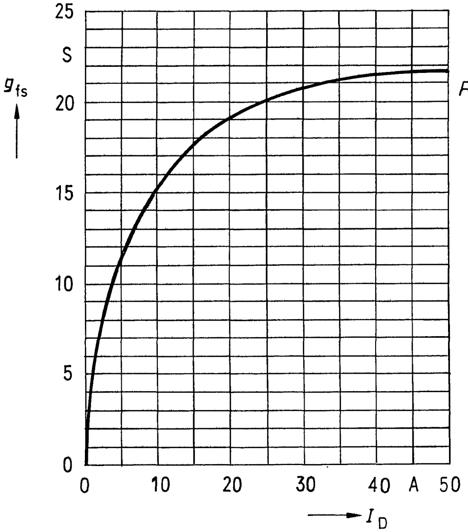

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



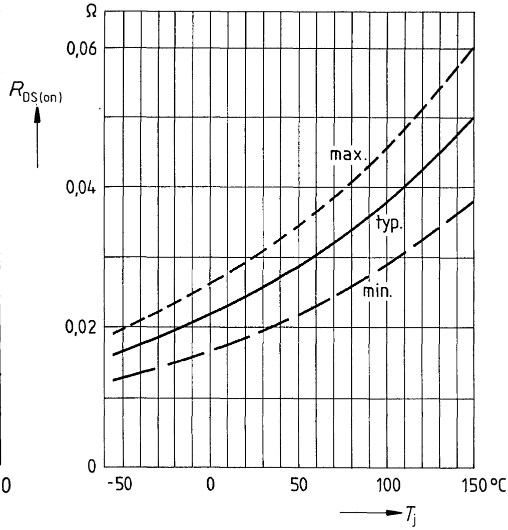

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



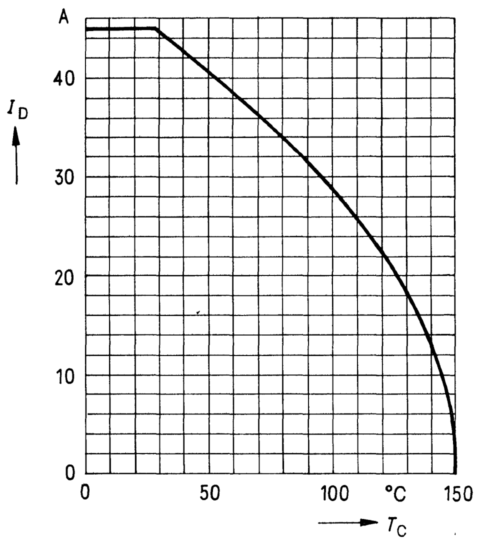
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



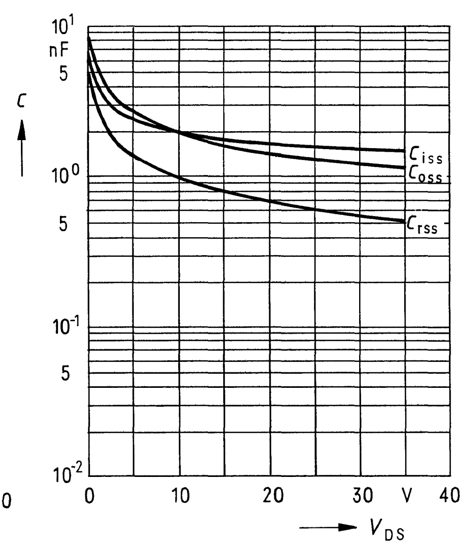

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



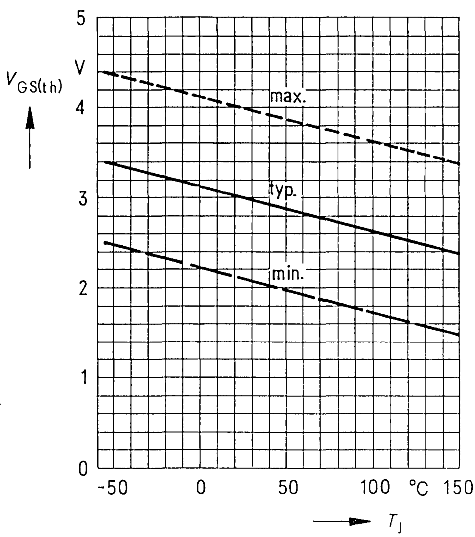

**Continuous drain current** $I_D = f(T_{case})$



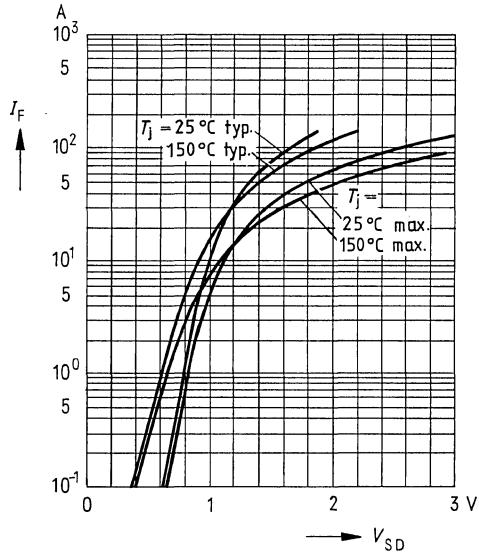

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



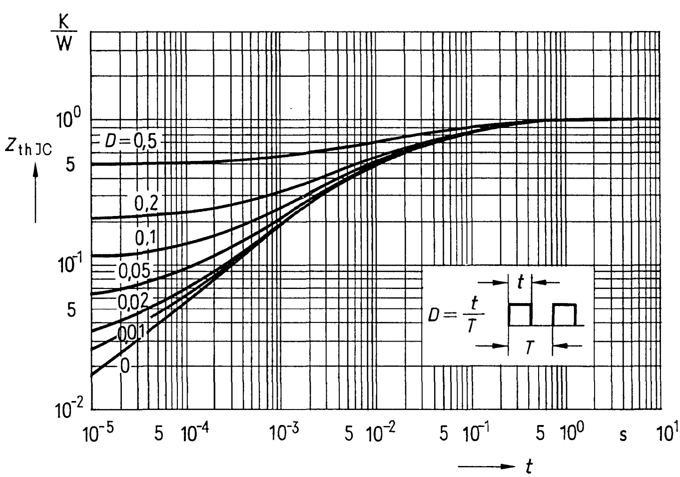
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



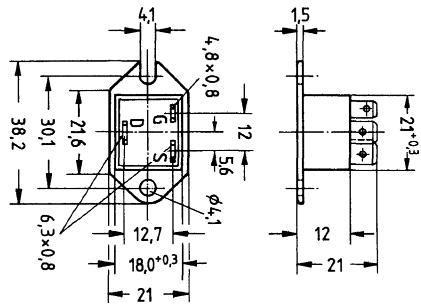

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 17 | C67078-A1600-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 32A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 95A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500Vdc[1]) |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | 65 | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,035 | 0,04 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 22A |

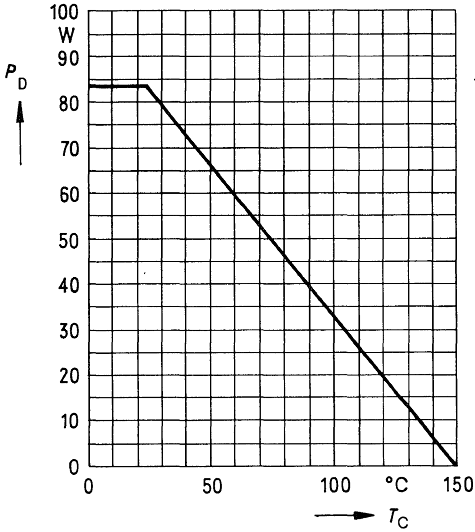
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 7,0 | 18,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 22A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 1300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 600 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

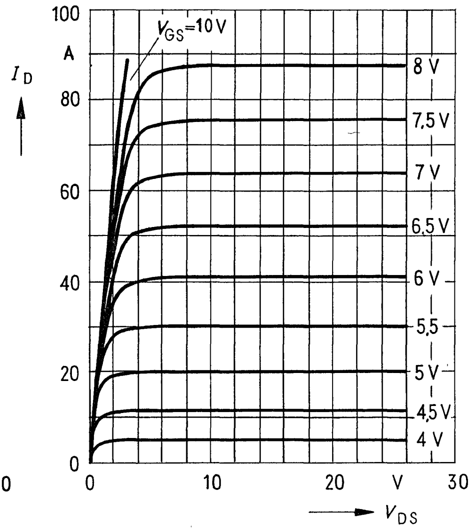
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 32 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 95 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 2,0 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 150 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,0 | – | µC | |

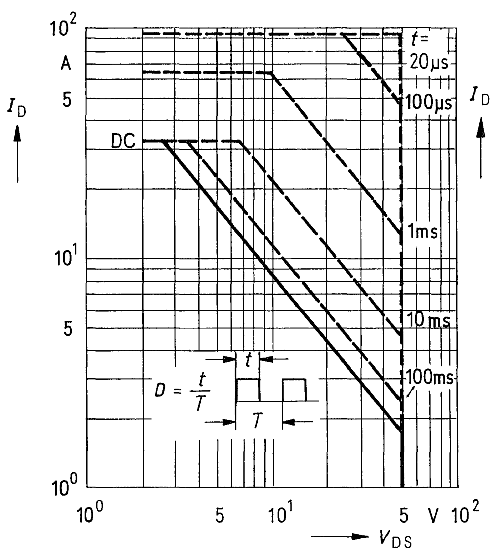
**Power dissipation** $P_D = f(T_{case})$



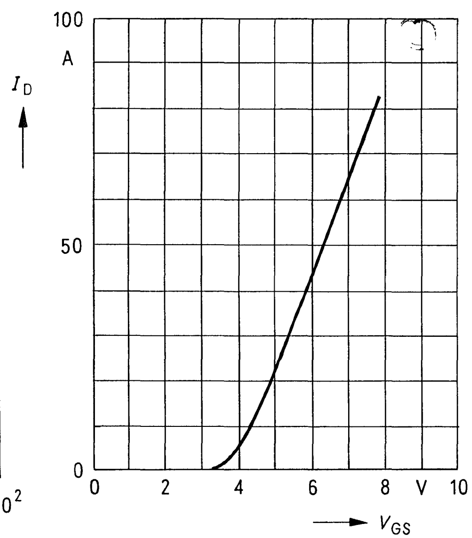

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25$ °C



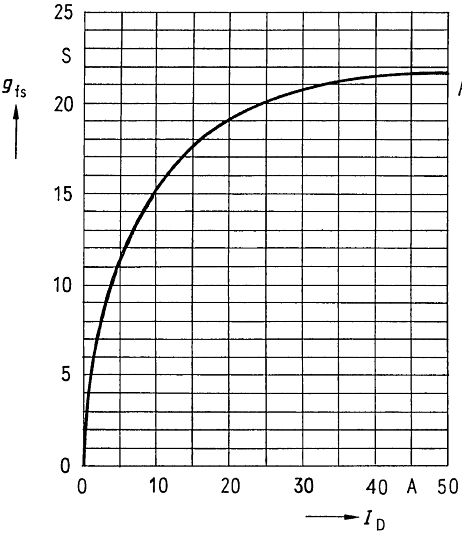

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25$ °C



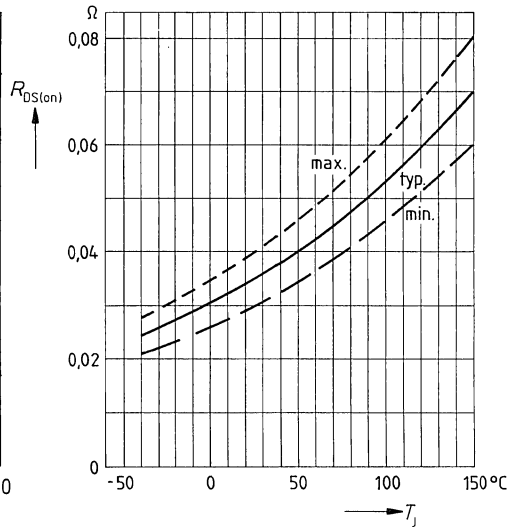

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25$V, $T_j = 25$ °C



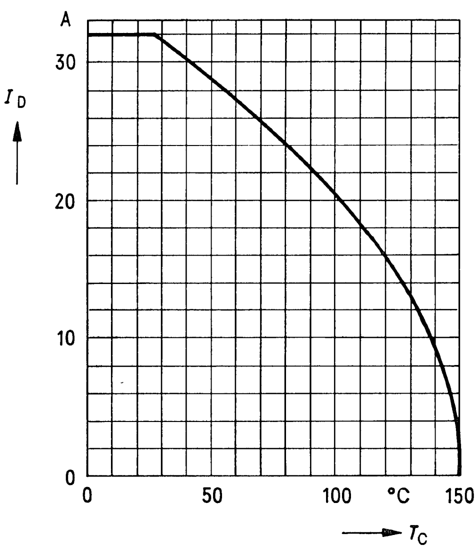
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



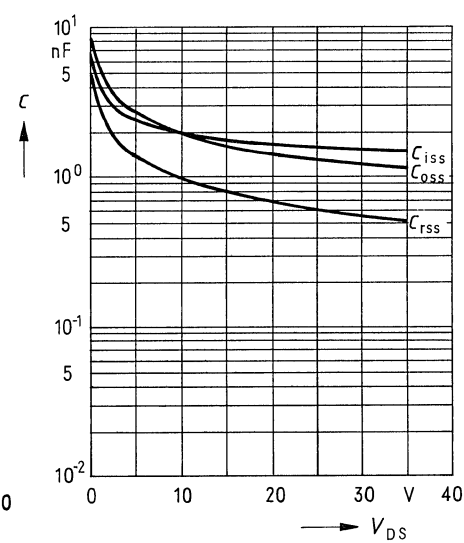

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



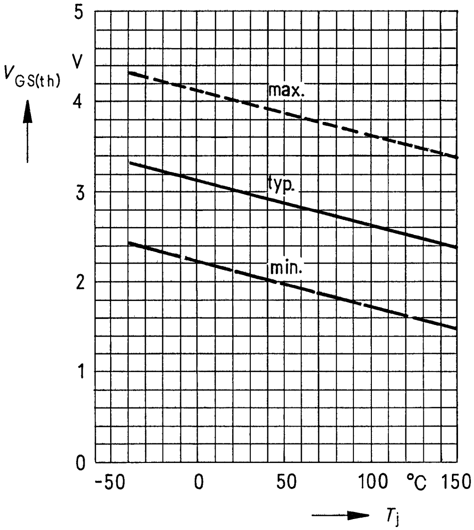

**Continuous drain current** $I_D = f(T_{case})$



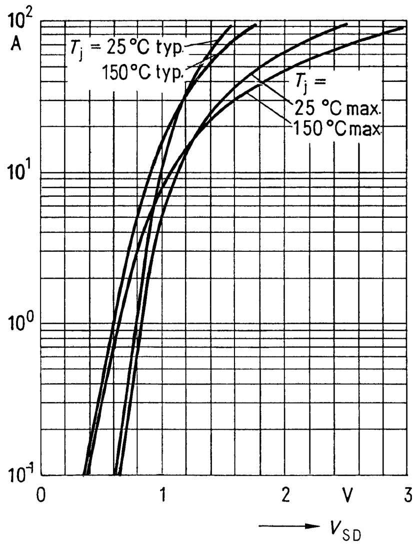

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



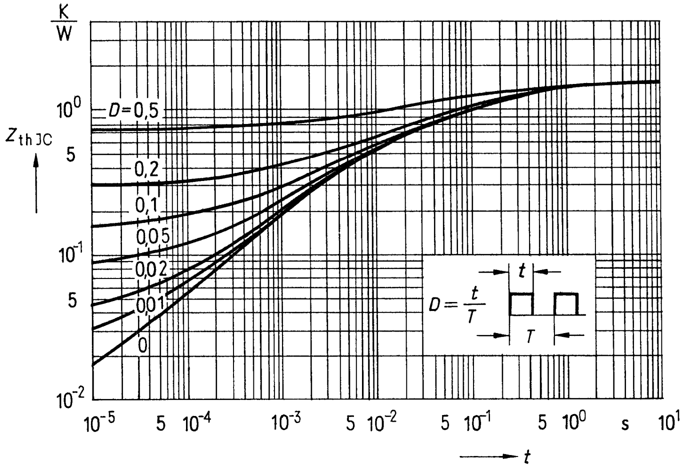
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



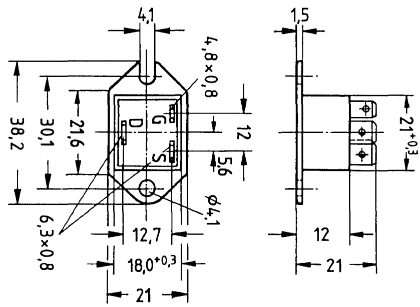

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 18 | C67078-A1601-A2 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 37A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 110A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500Vdc[1]) |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | 65 | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,025 | 0,03 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 22A |

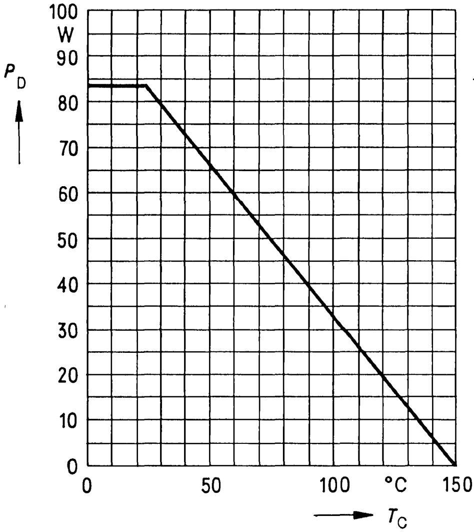
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 7,0 | 18,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 22A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 1300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 600 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

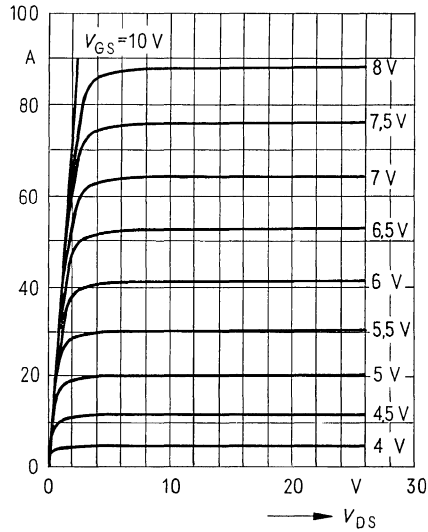
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 37 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 110 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 2,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 150 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,0 | – | µC | |

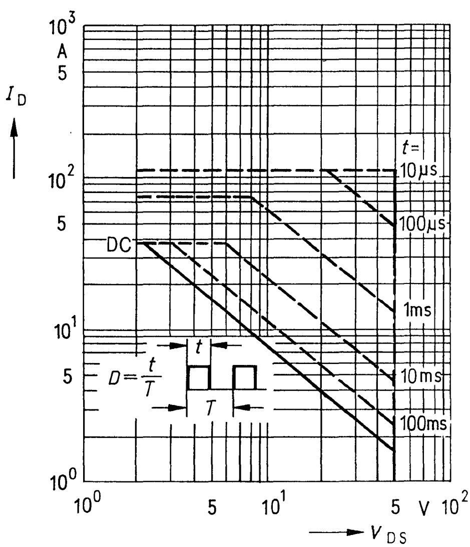
**Power dissipation** $P_D = f(T_{case})$



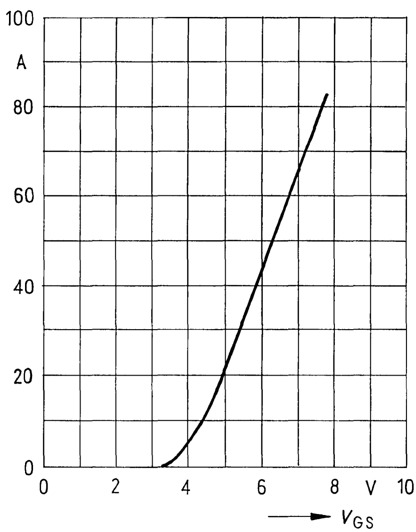

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



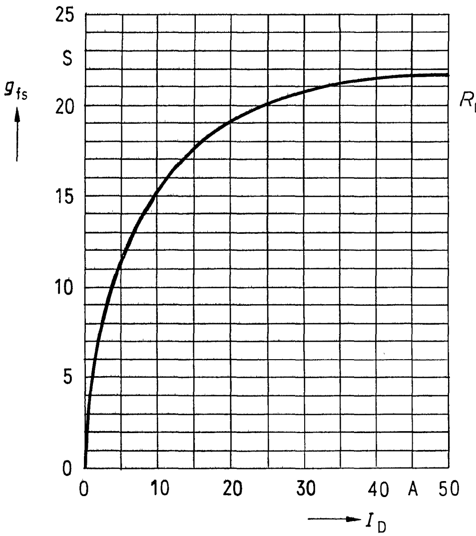

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



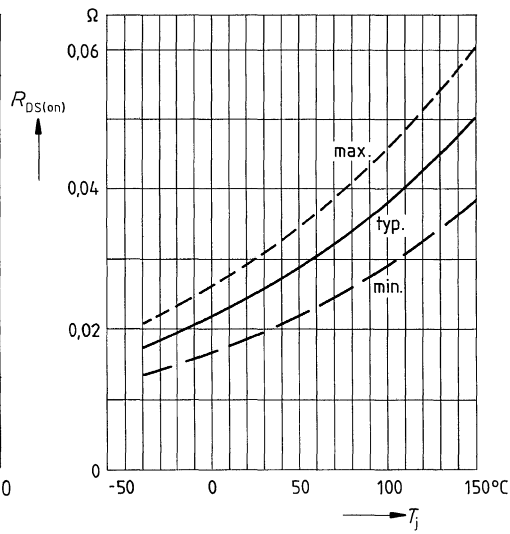

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



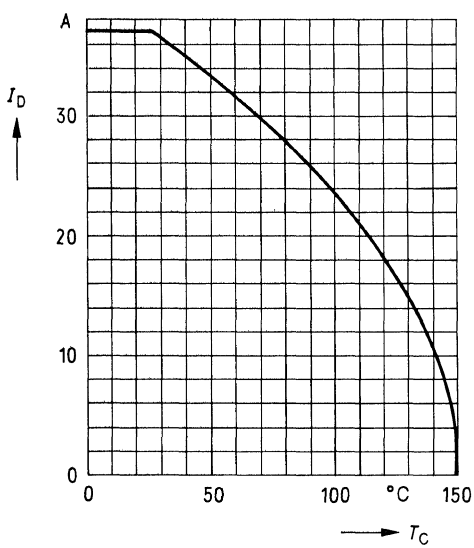
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 μs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



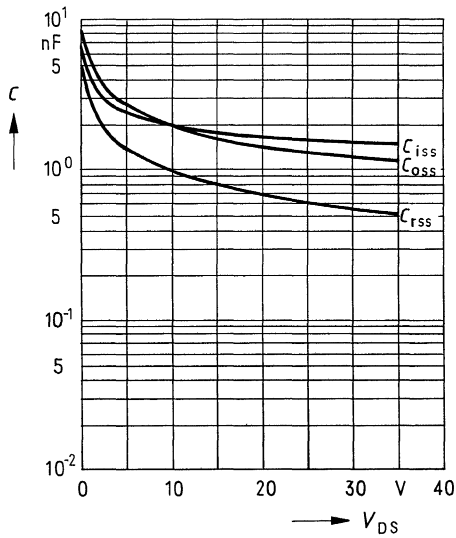

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



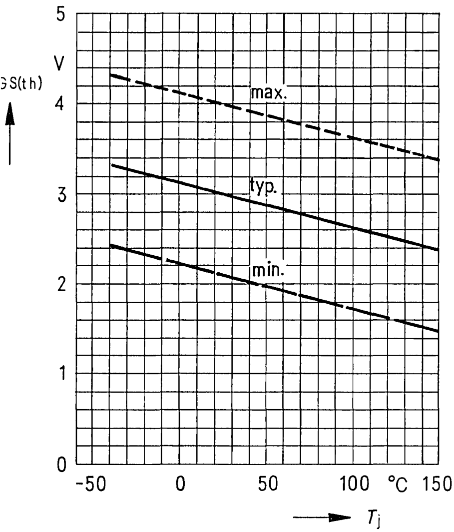

**Continuous drain current** $I_D = f(T_{case})$



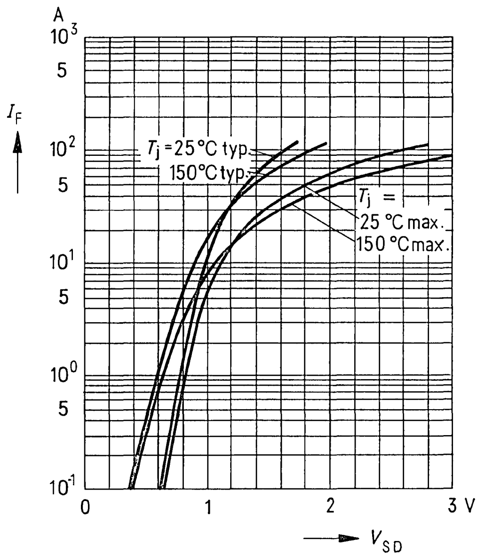

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



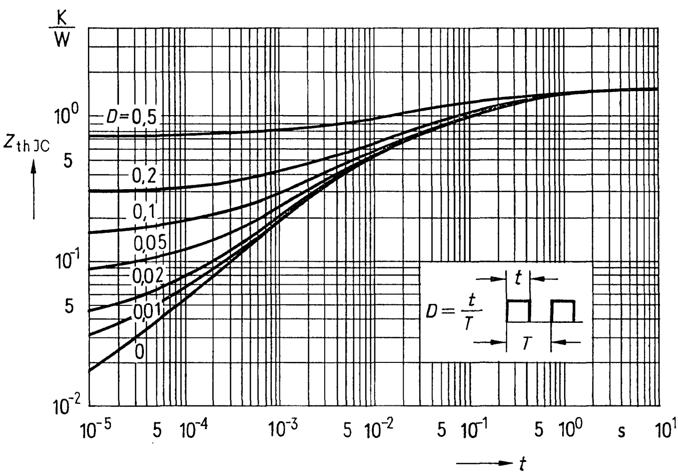
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



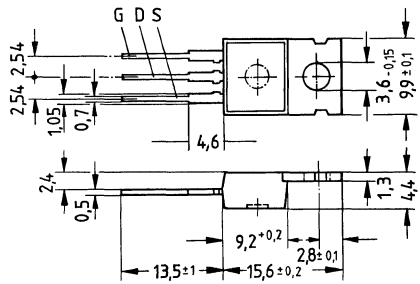

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 20 | C67078-A1302-A2 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case}$ = 50 °C | $I_D$ | 12A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 36A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,15 | 0,2 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

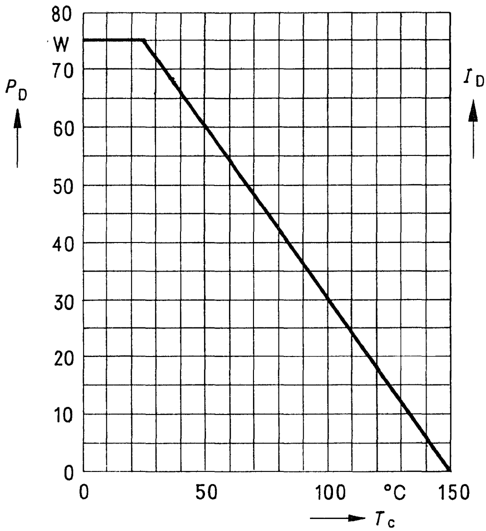
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 4,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 1500 | 1900 | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | 450 | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 80 | 120 | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

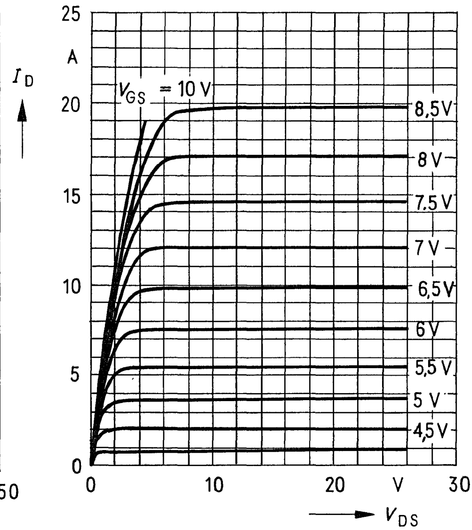
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 12,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 36,0 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,6 | – | µC | |

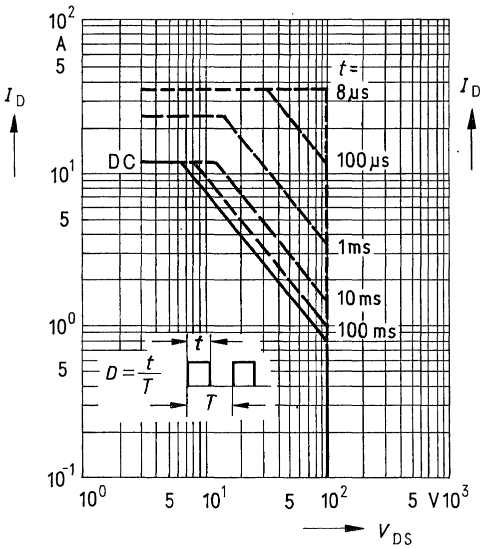
**Power dissipation** $P_D = f(T_{case})$



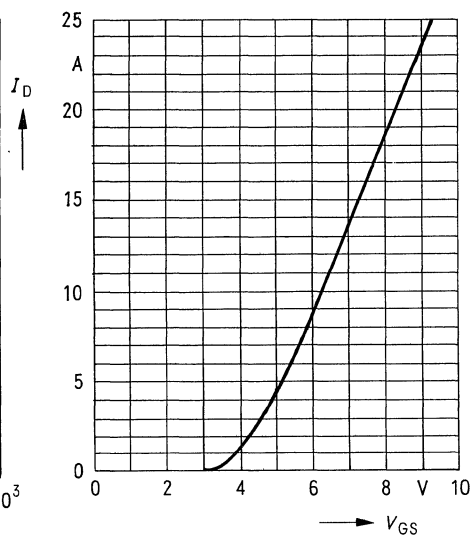

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



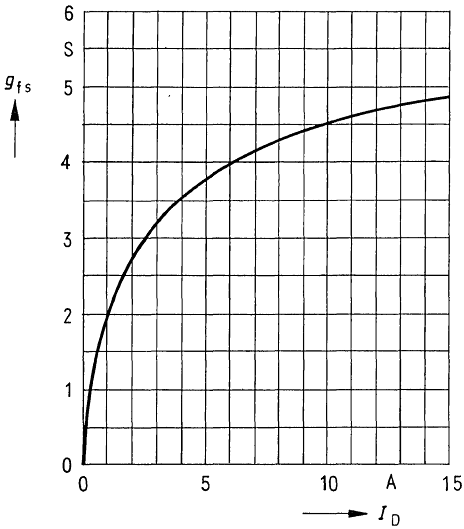

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



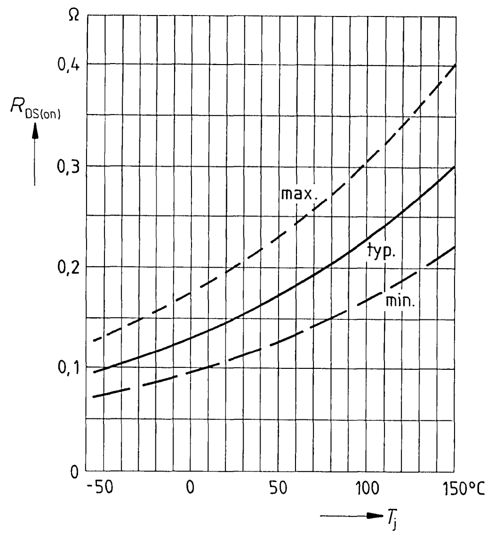

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



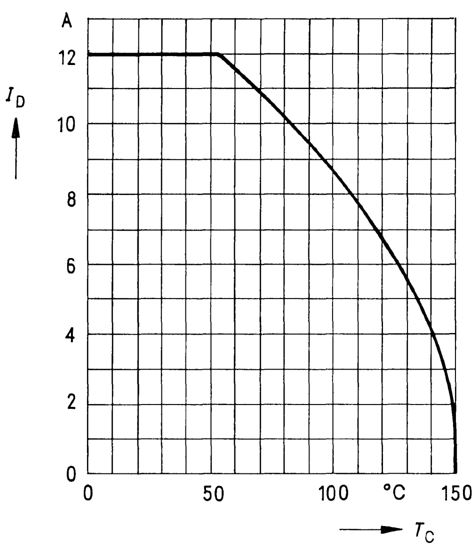
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



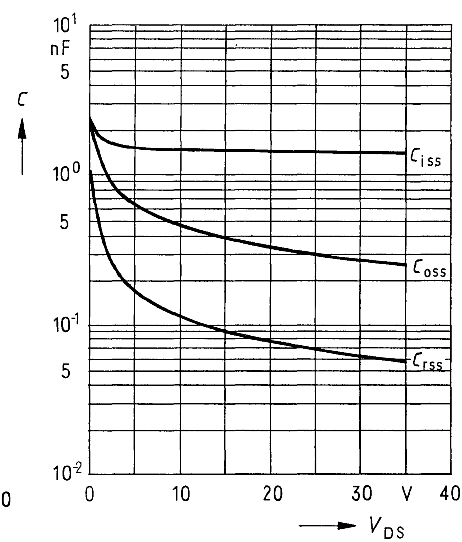

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



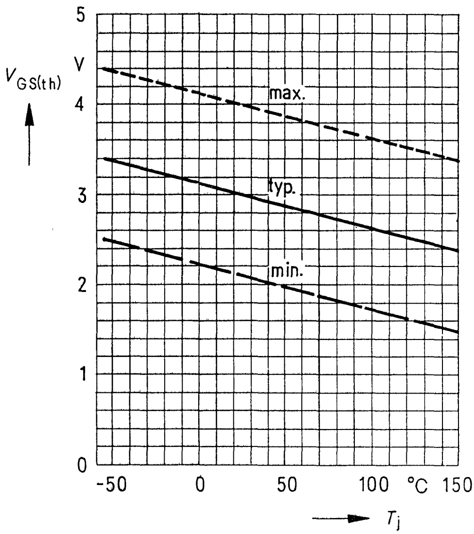

**Continuous drain current** $I_D = f(T_{case})$



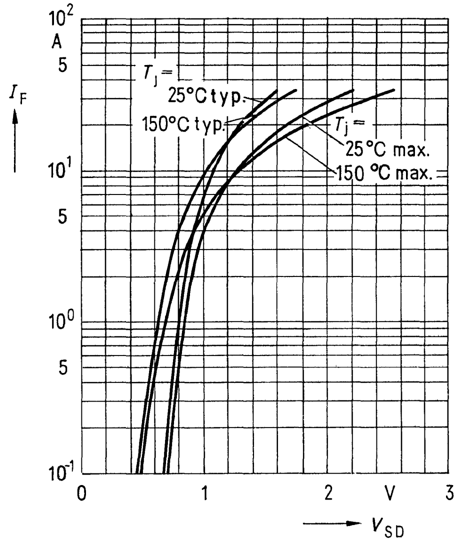

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



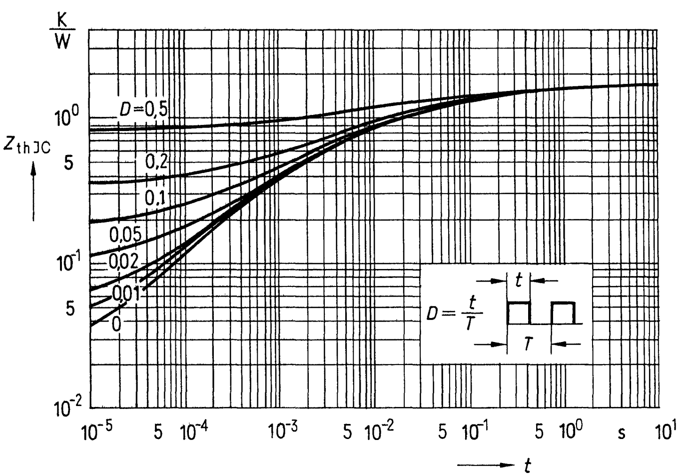
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



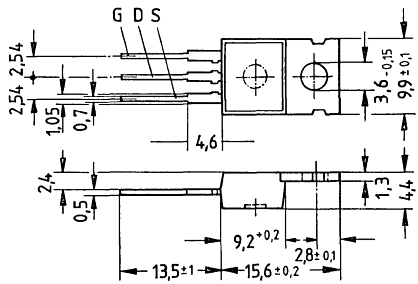

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 21 | C67078-A1308-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 19A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 57A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,09 | 0,1 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 9A |

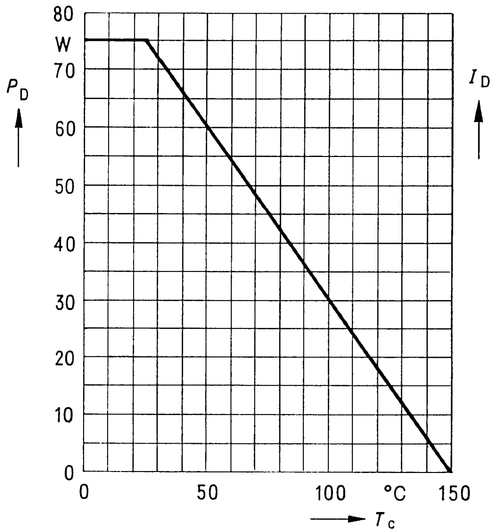
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 4,0 | 8,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 9A |
| Input capacitance | $C_{iss}$ | – | 900 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 450 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 200 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 35 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 120 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 600 | – | | |
| | $t_f$ | – | 320 | – | | |

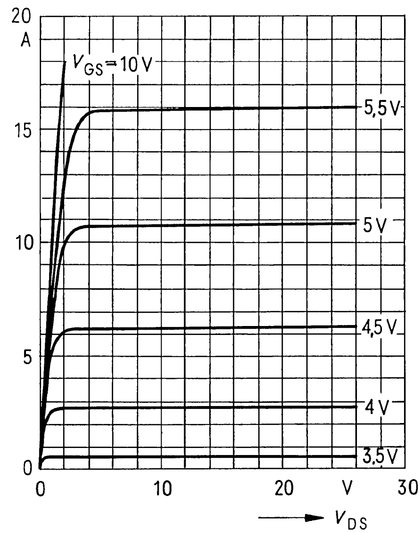
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 19 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 57 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 2,1 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,25 | – | µC | |

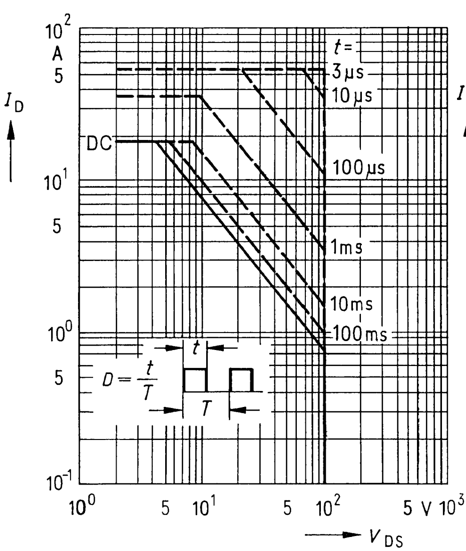
**Power dissipation** $P_D = f(T_{case})$



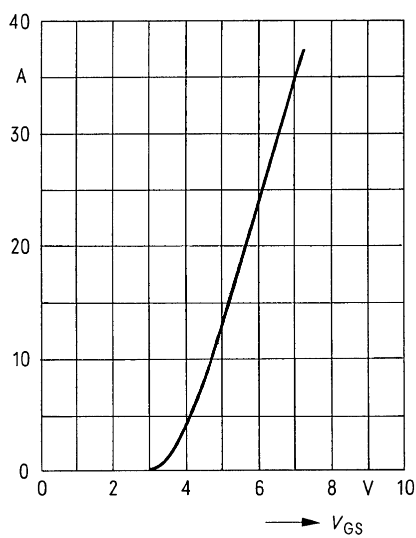

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 μs pulse test,
$T_{case} = 25\,°C$



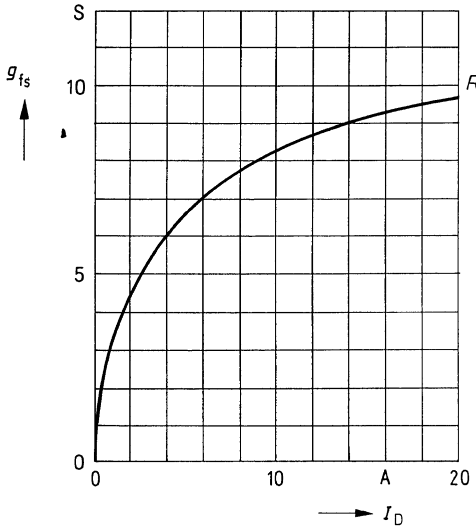

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



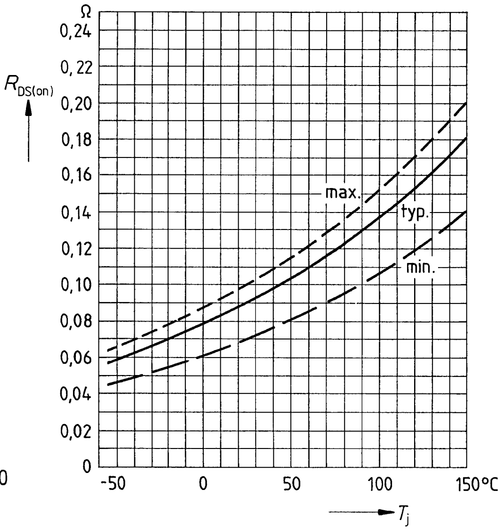

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 μs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



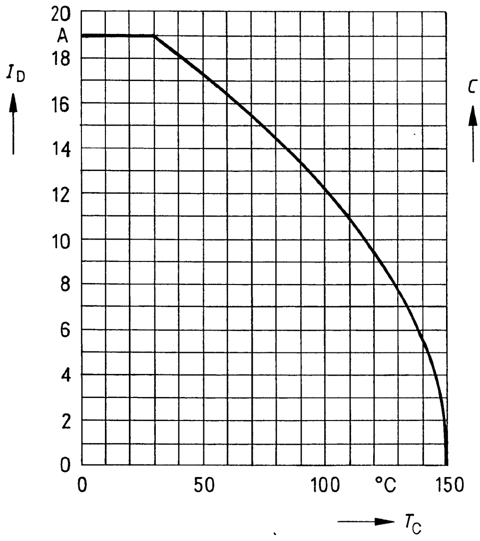
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



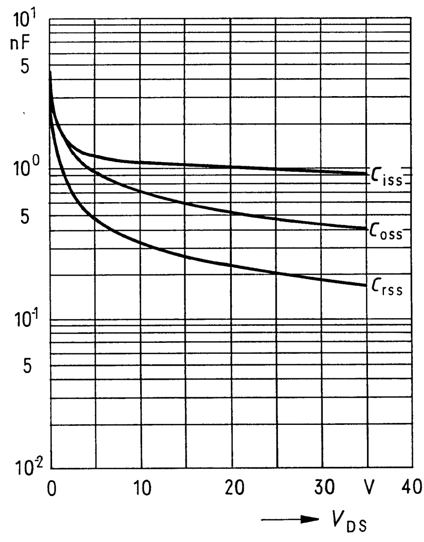

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



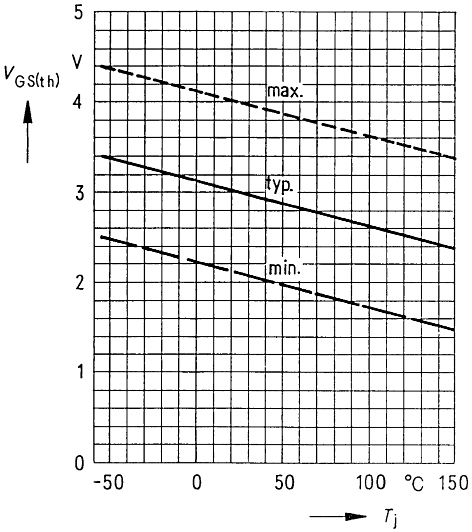

**Continuous drain current** $I_D = f(T_{case})$



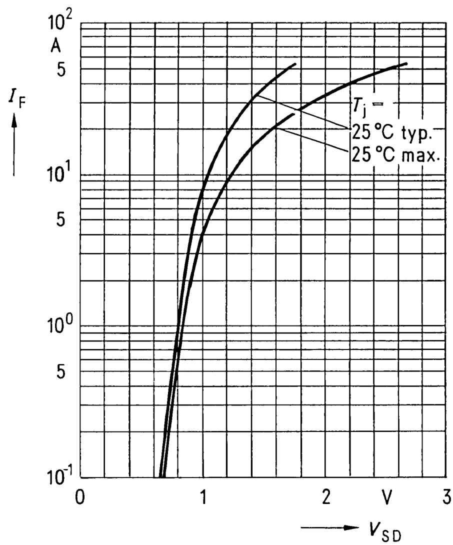

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



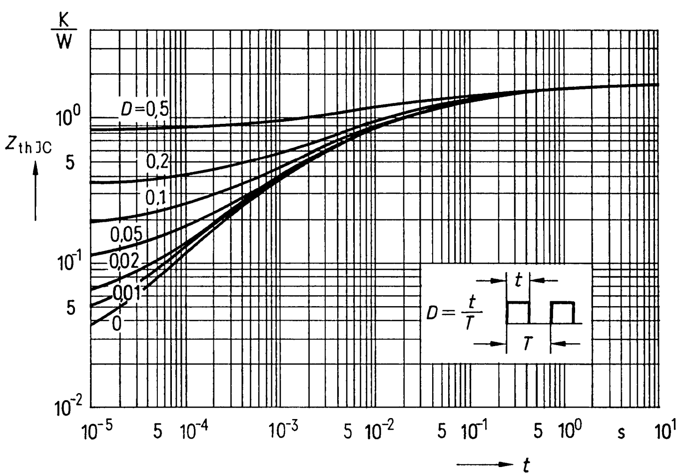
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs

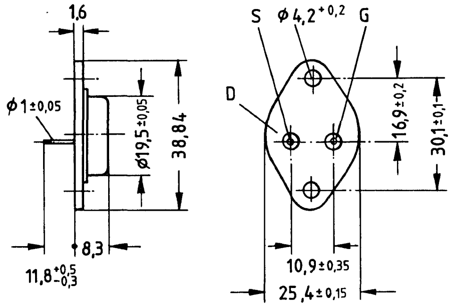



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 23 | C67078-A1002-A2 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case}$ = 85 °C | $I_D$ | 10A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 30A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | 0,15 | 0,2 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

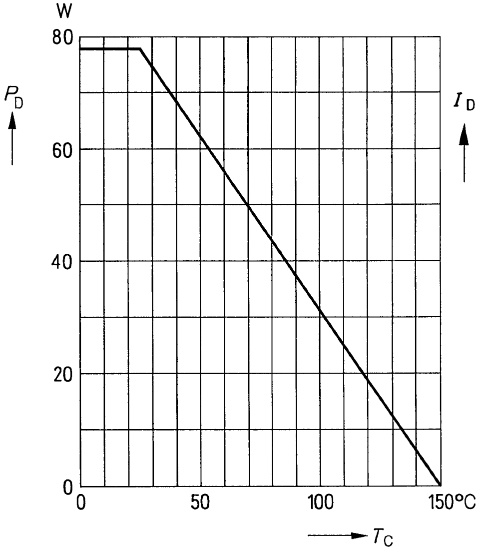
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 4,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 1400 | 1700 | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | 450 | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 80 | 120 | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

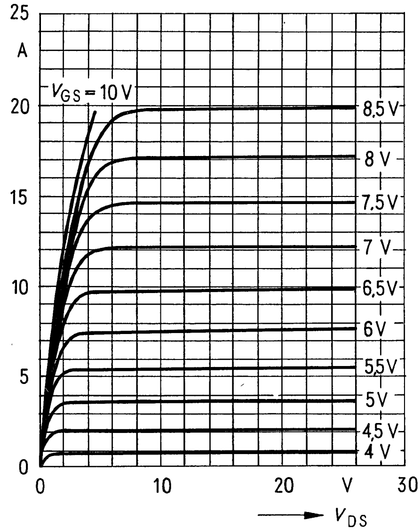
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 10,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 30 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,6 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{IF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,6 | – | µC | |

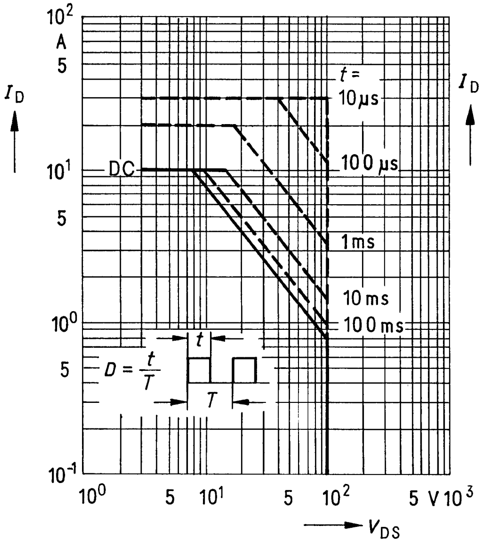
**Power dissipation** $P_D = f(T_{case})$



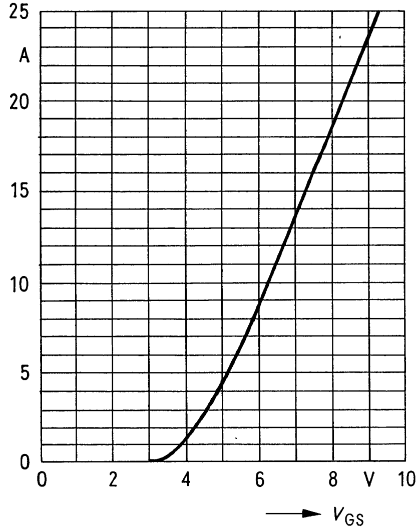

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



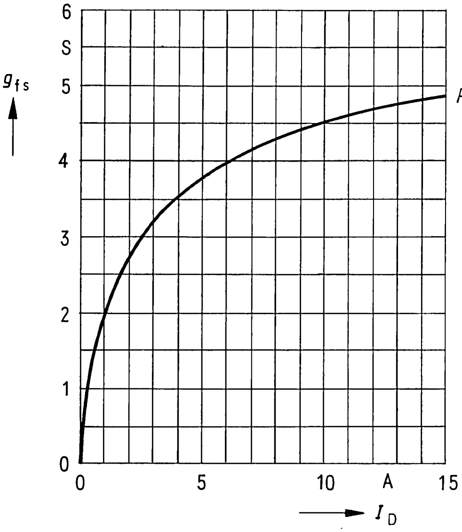

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



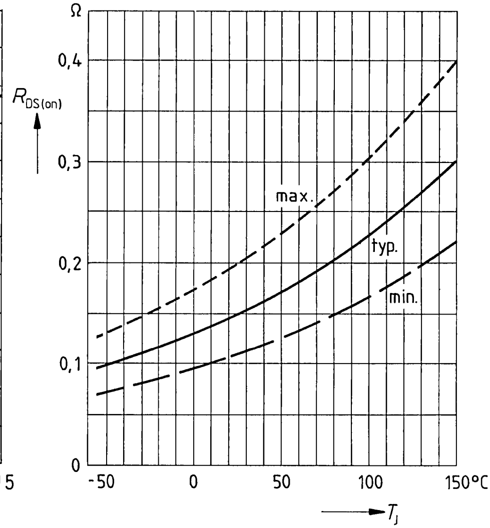

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



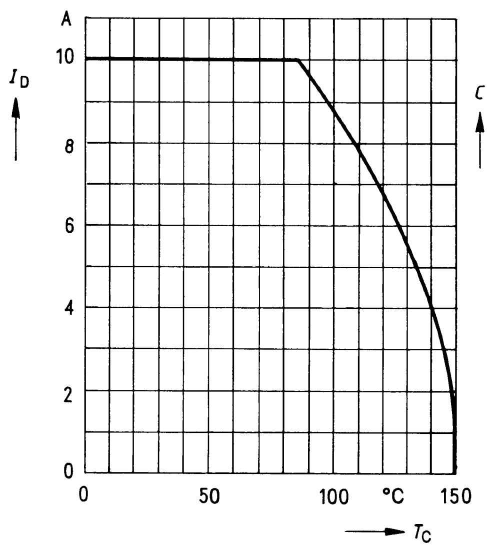
**Typical transconductance** $g_{fs}$ = f ($I_D$)
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25°C



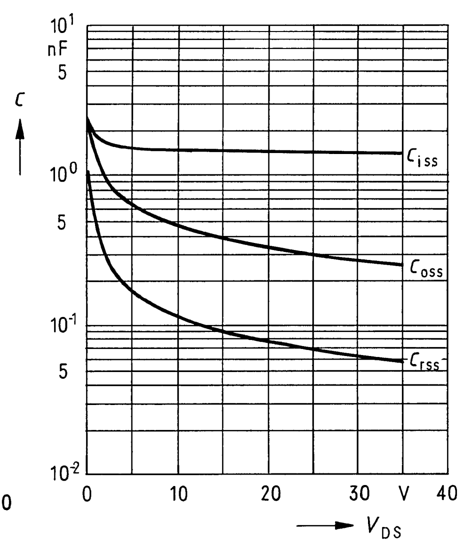

**Drain-source on-state resistance**
$R_{DS\,(on)}$ = f ($T_j$)
(spread)



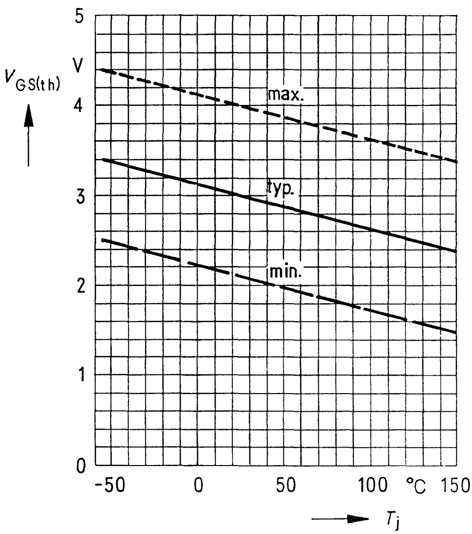

**Continuous drain current** $I_D$ = f ($T_{case}$)



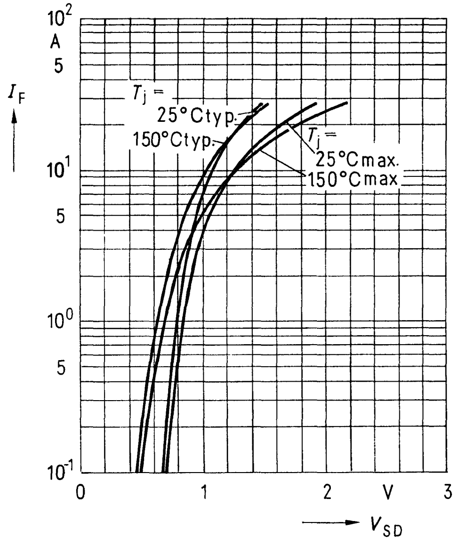

**Typical capacitances** $C$ = f ($V_{DS}$)
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



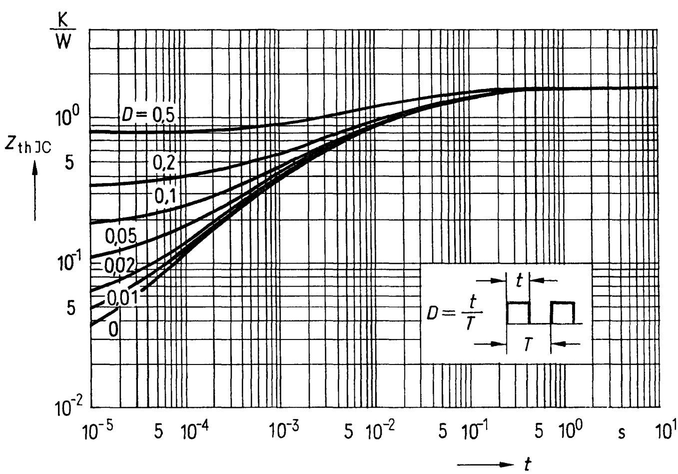
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



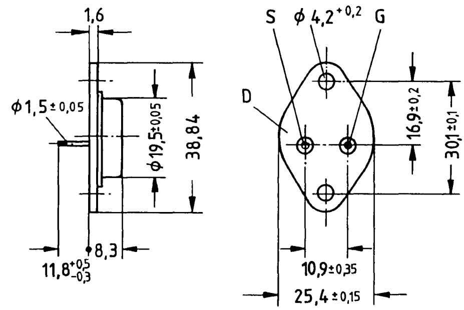

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AE (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 24 | C67078-A1003-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 32A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 95A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ <br> $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,055 | 0,06 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 16A |

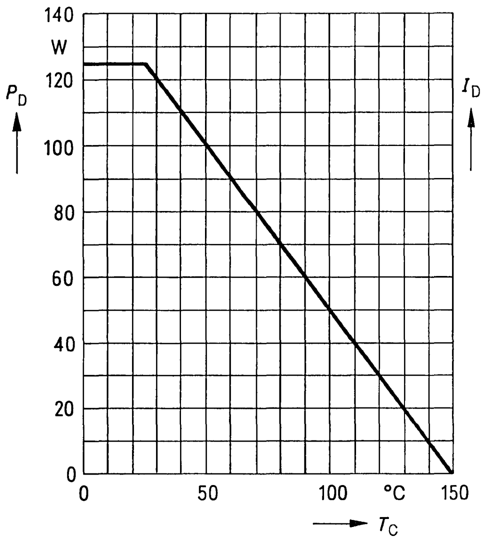
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 6,0 | 10,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 16A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 900 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 500 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

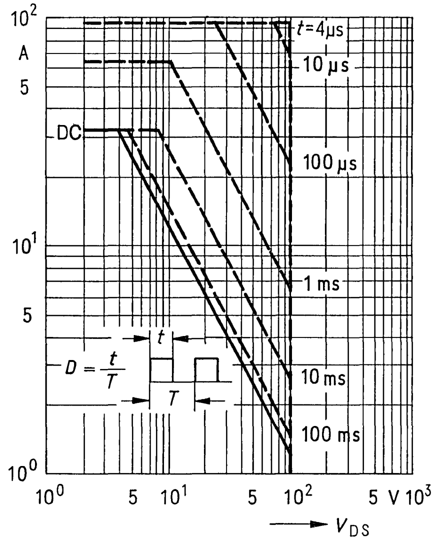
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 32 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 95 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 2,0 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,6 | – | µC | |

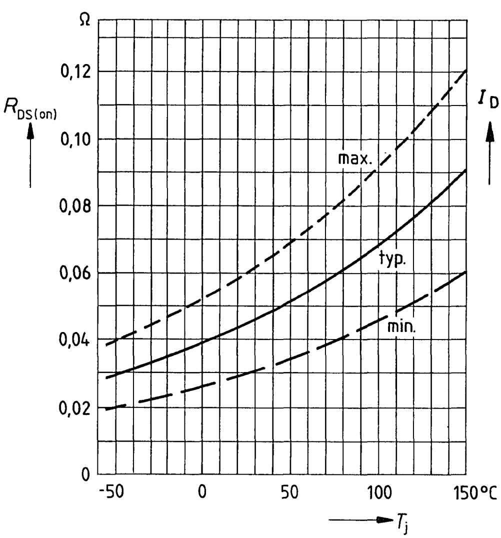
**Power dissipation** $P_D = f(T_{case})$



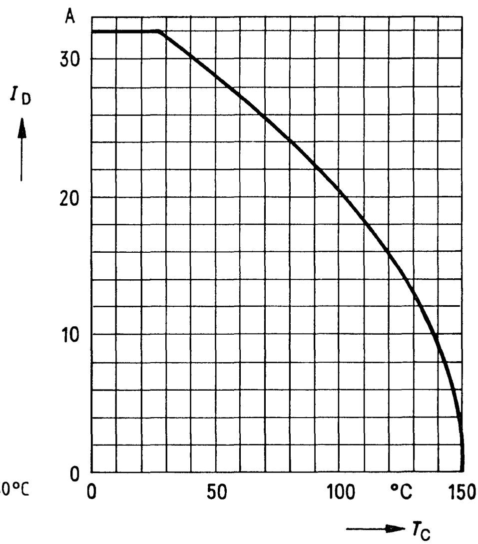

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



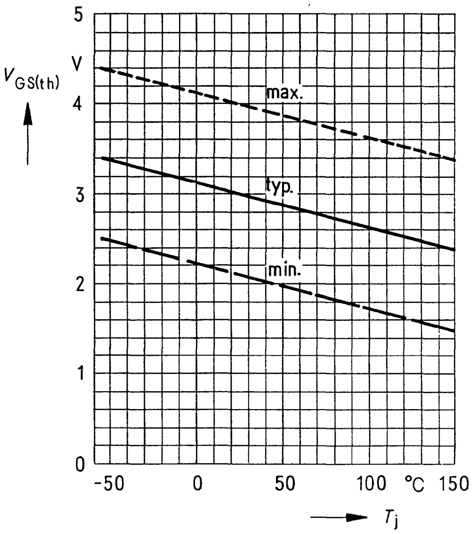

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
**(spread)**



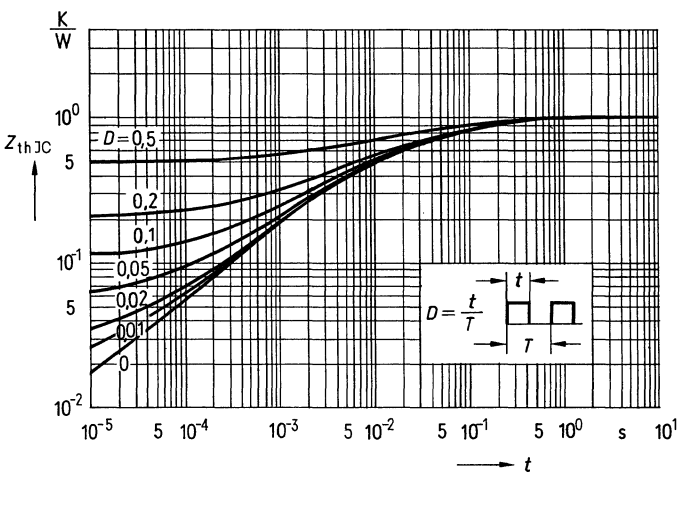

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f\ (T_j)$
parameter: $V_{DS} = V_{GS},\ I_D = 10\ mA$



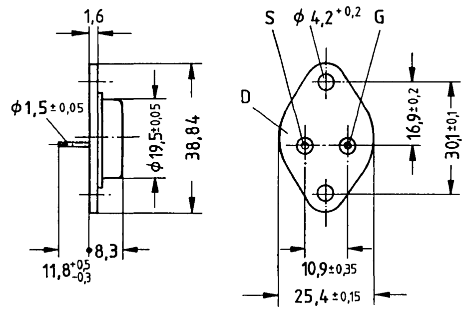

**Transient thermal impedance** $Z_{thJC} = f\ (t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AE (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 25 | C67078-A1011-A2 |



Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 19A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 57A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,09 | 0,1 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 9A |

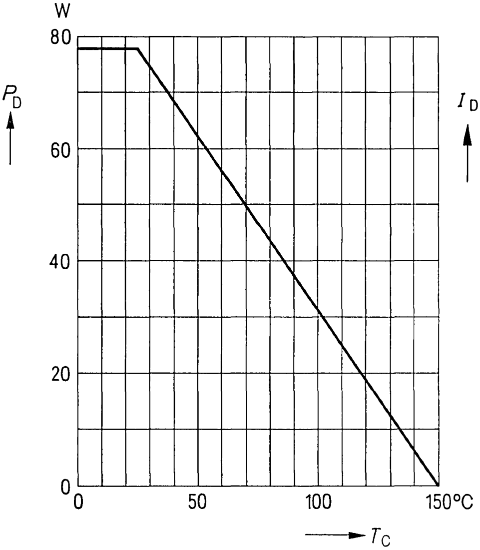
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 4,0 | 8,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 9A |
| Input capacitance | $C_{iss}$ | – | 900 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 450 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 200 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 35 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 120 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 600 | – | | |
| | $t_f$ | – | 320 | – | | |

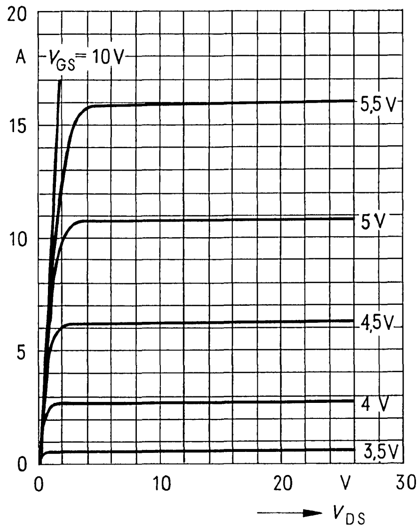
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 19 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 57 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 2,1 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,25 | – | µC | |

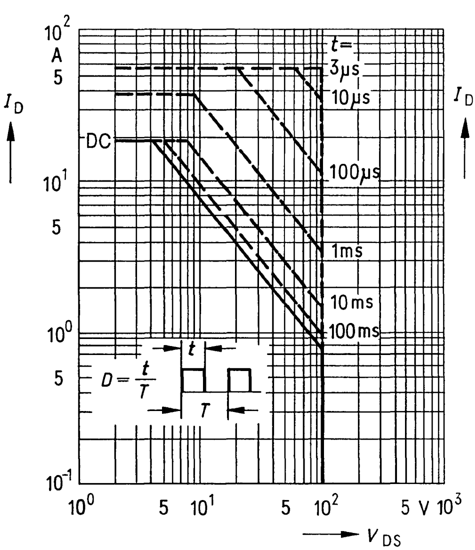
**Power dissipation** $P_D = f(T_{case})$



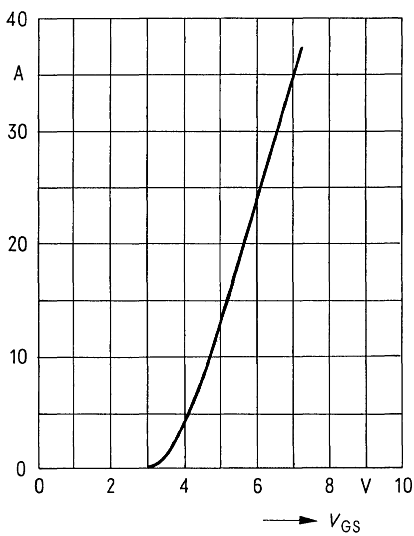

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



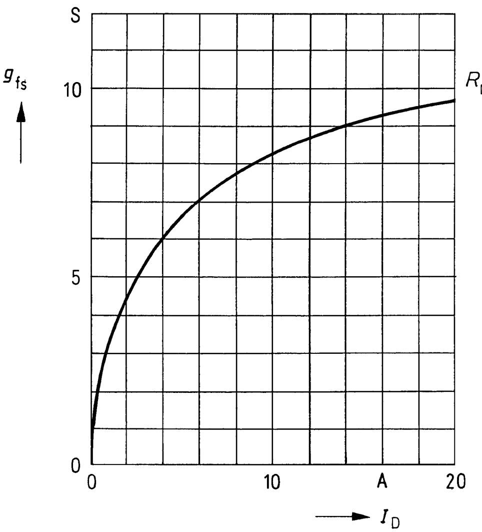

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



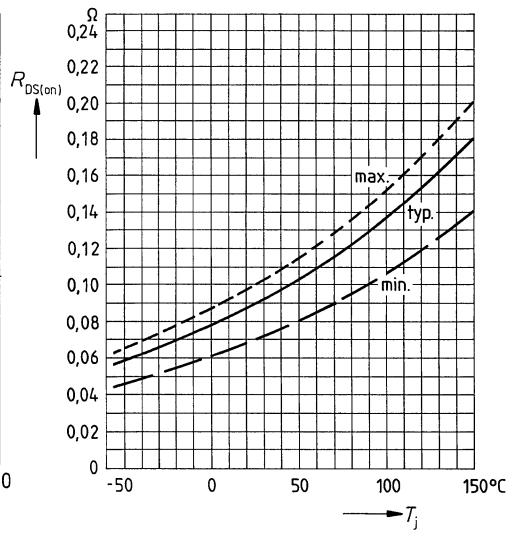

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



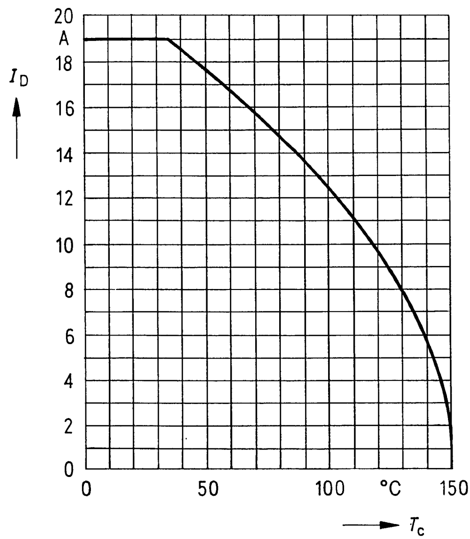
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



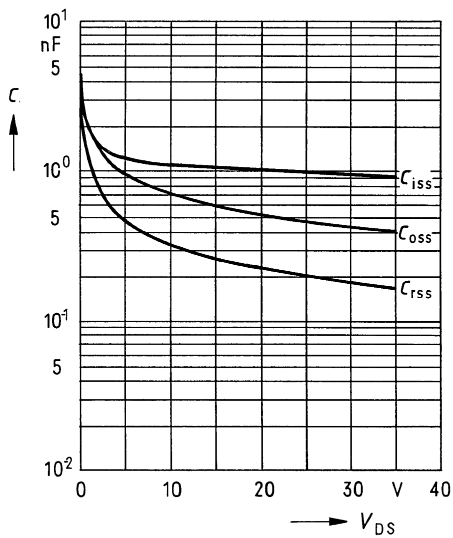

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



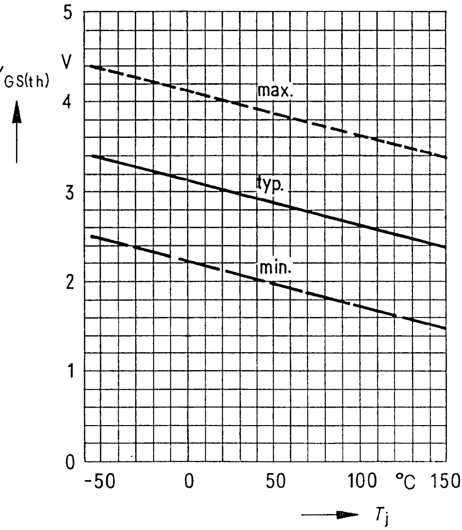

**Continuous drain current** $I_D = f(T_{case})$



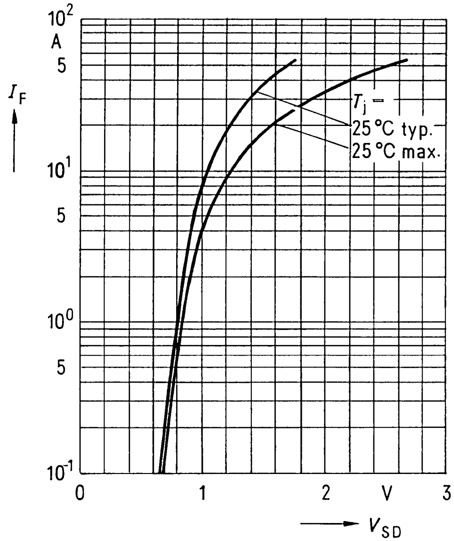

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



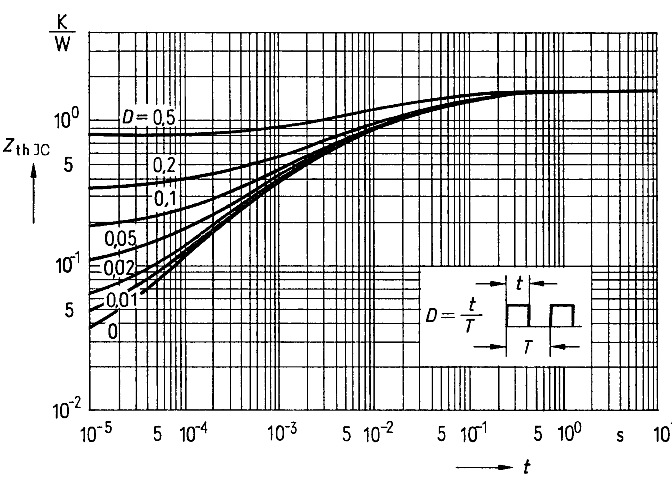
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



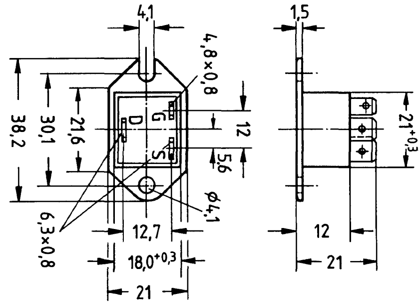

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 27 | C67078-A1602-A2 |



Dimensions in mm

| | | |
|---|---|---|
| **Absolute maximum ratings** | | |
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 26A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 75A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −40 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500 Vdc[1]) |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,55 | 0,06 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 16A |

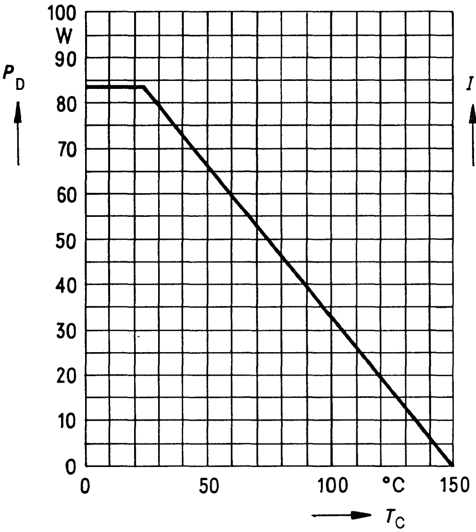
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 6,0 | 10,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 16A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 900 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 500 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

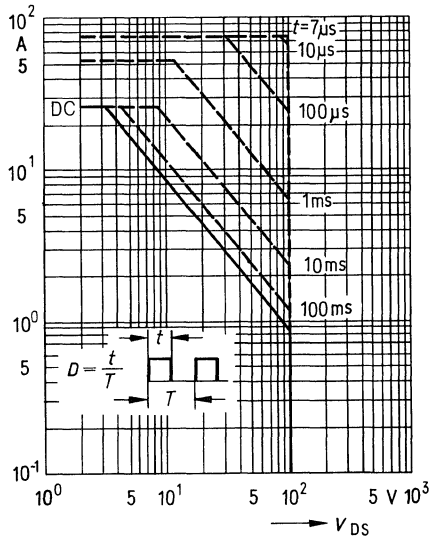
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 26 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 75 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 1,6 | – | µC | |

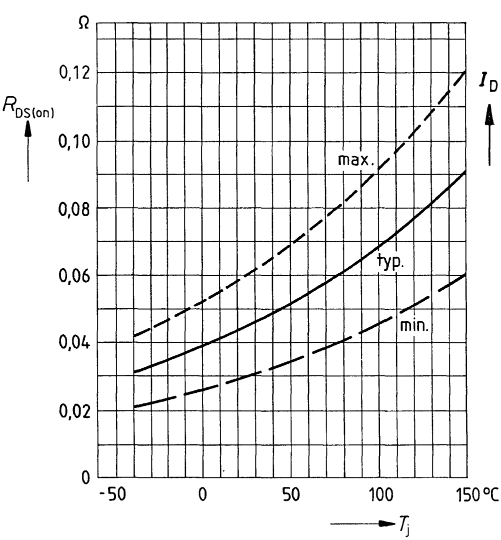
**Power dissipation** $P_D = f(T_{case})$



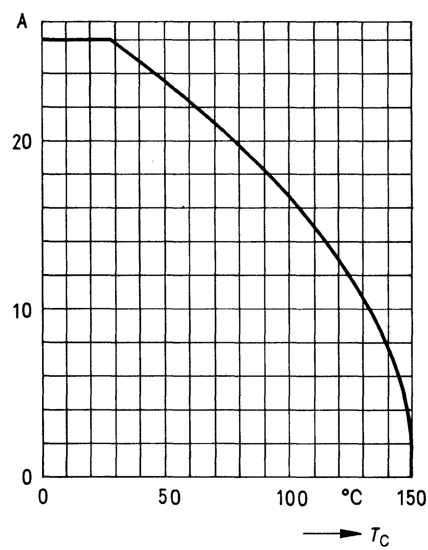

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



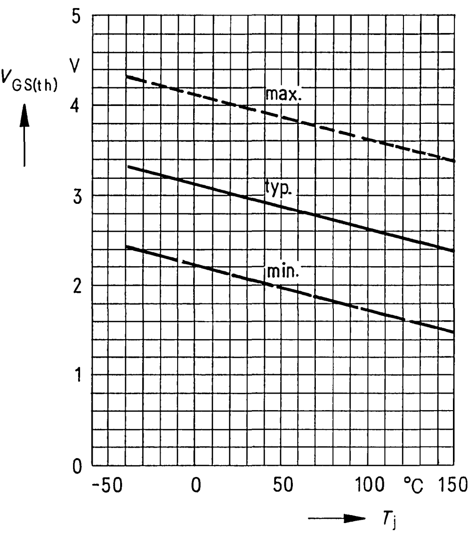

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



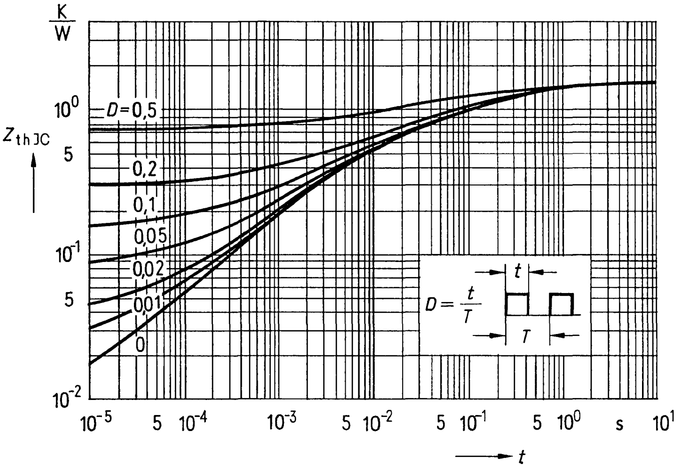

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



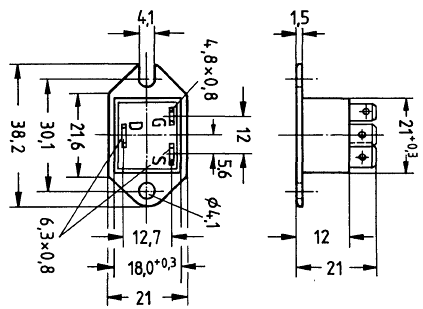

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 28 | C67078-A1608-A2 |



Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 18A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 54A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 70W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −40 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500 Vdc[1]) |
| **Thermal resistance** | $R_{th\,JA}$ | – |
| | $R_{th\,JC}$ | ≤1,78K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,09 | 0,1 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 9A |

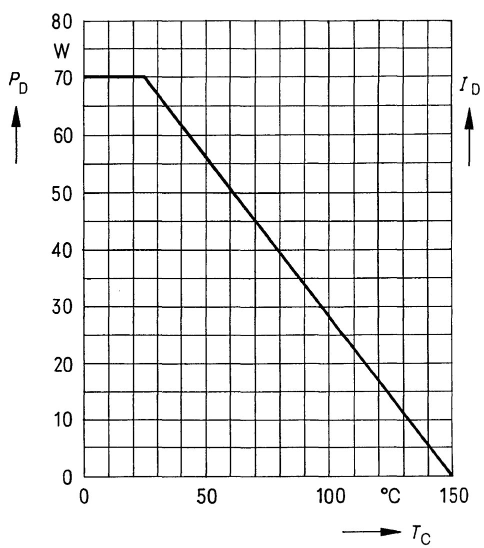
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 4,0 | 8,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 9A |
| Input capacitance | $C_{iss}$ | – | 900 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 450 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 200 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 35 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 120 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 600 | – | | |
| | $t_f$ | – | 320 | – | | |

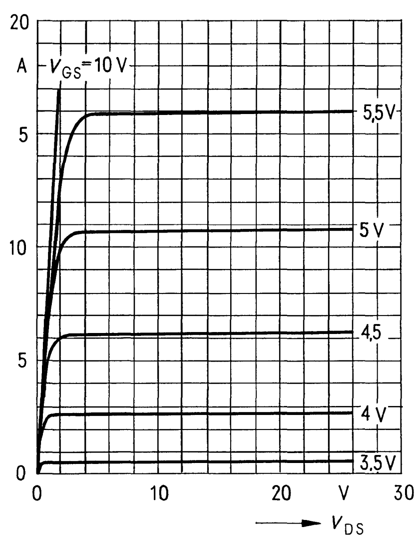
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 18 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 54 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 2,0 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,25 | – | µC | |

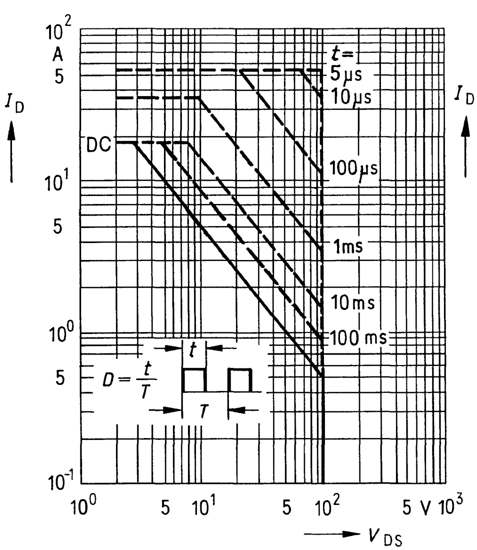
**Power dissipation** $P_D = f(T_{case})$



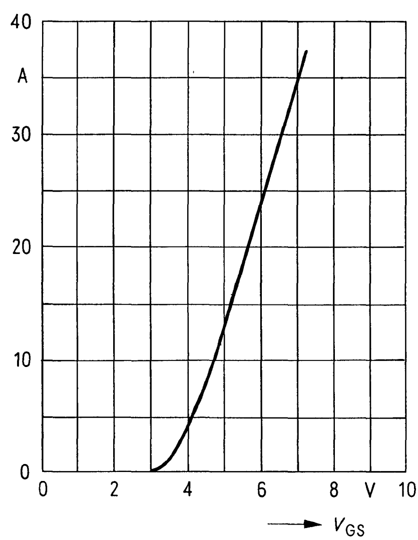

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



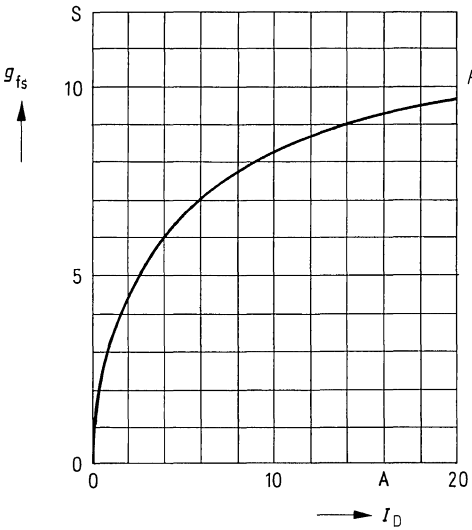

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



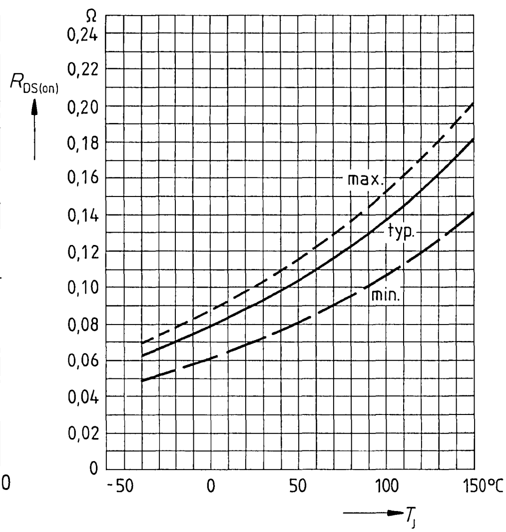

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



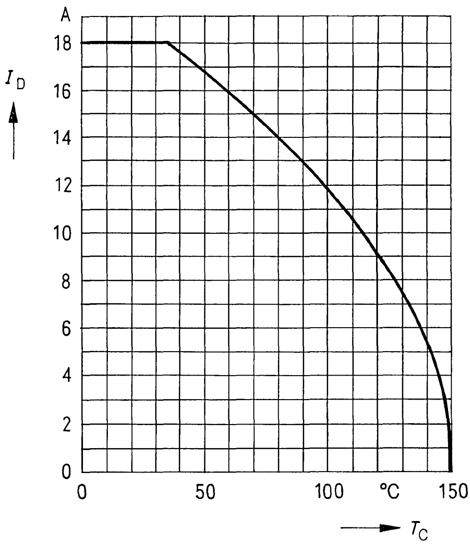
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 μs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



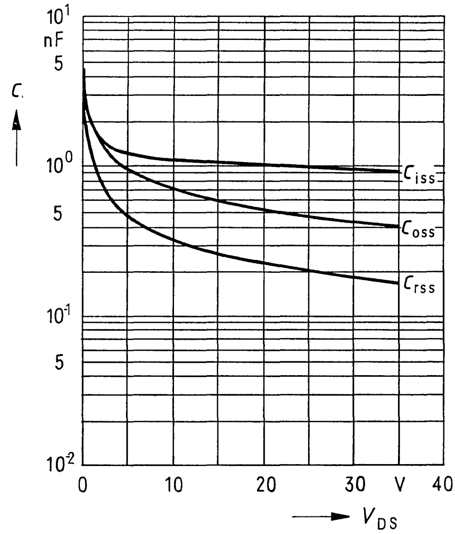

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



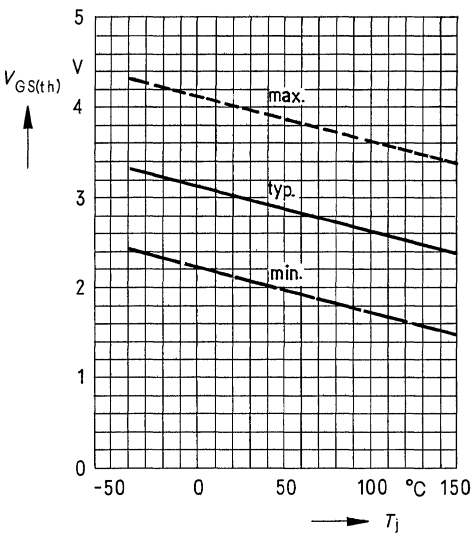

**Continuous drain current** $I_D = f(T_{case})$



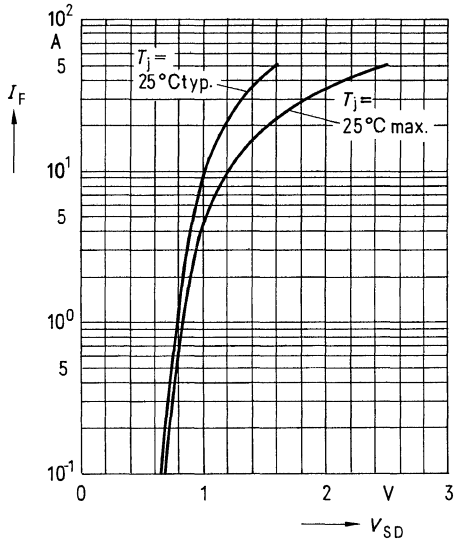

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



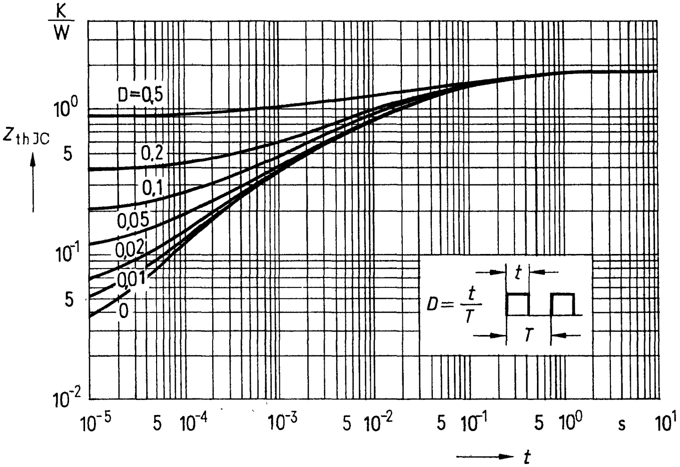
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



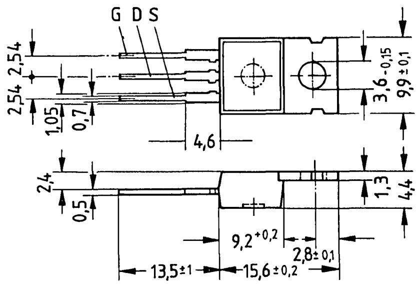

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 30 | C67078-A1303-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 7,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 21 |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$, $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | 0,45 | 0,75 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 4,5A |

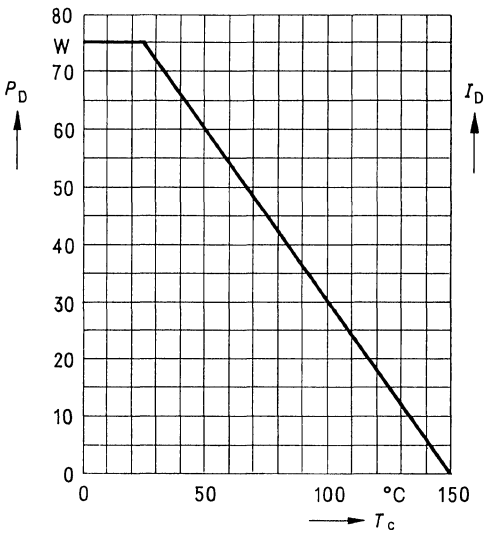
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,2 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 4,5A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

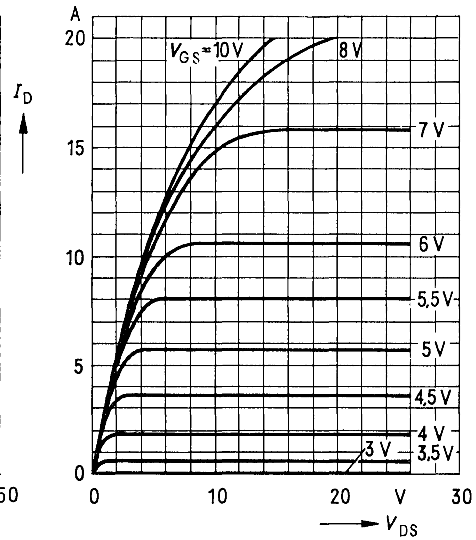
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 7,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 21 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,5 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/μs |
| Reverse recovery charge | $Q_{rr}$ | – | 6 | – | μC | |

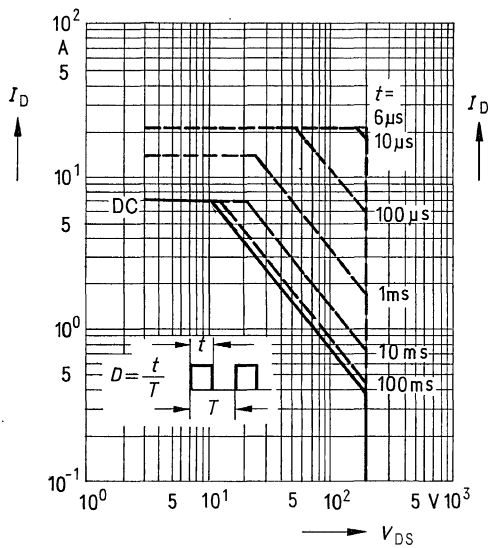
**Power dissipation** $P_D = f(T_{case})$



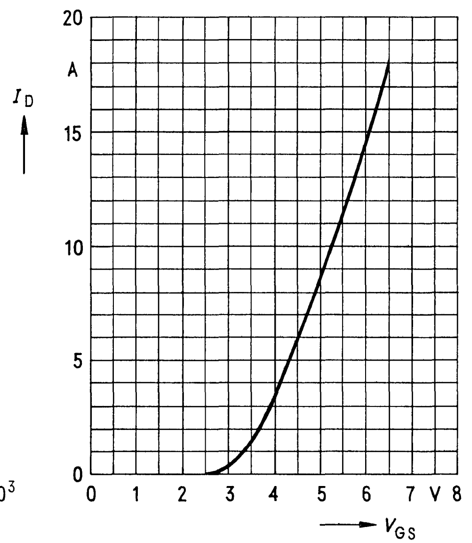

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



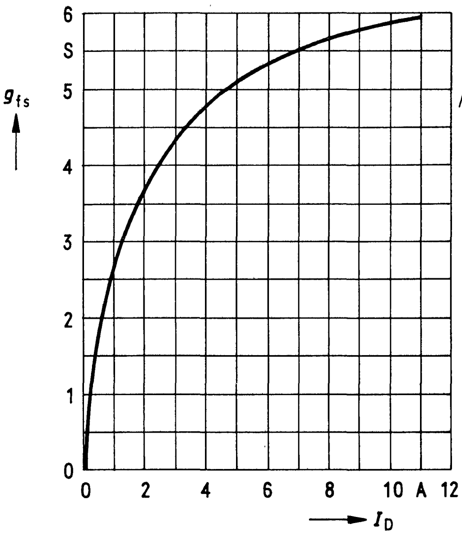

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



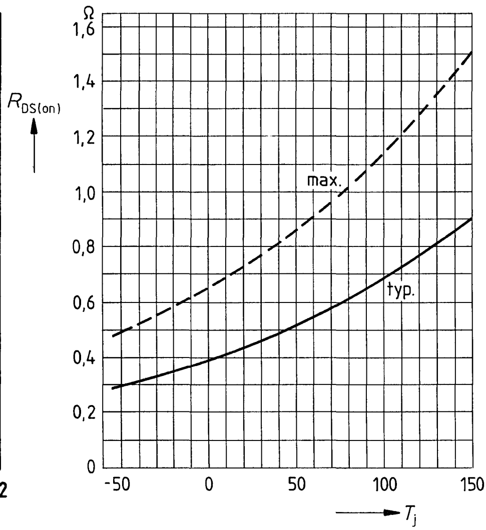

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



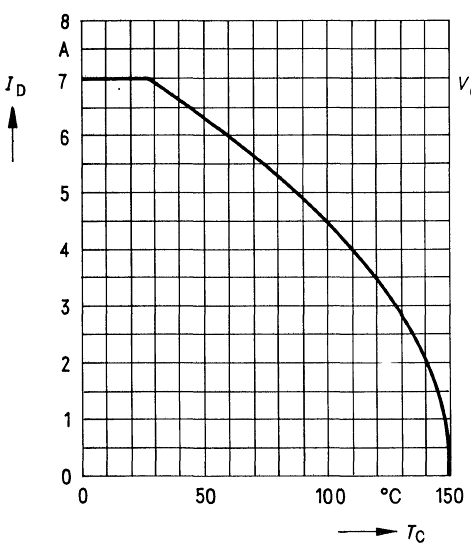
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 μs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



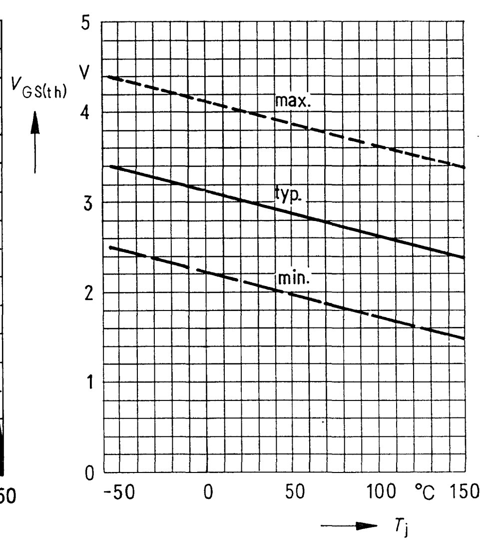

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



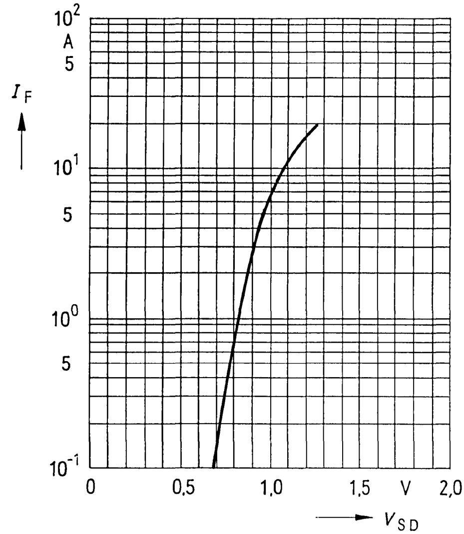

**Continuous drain current** $I_D = f(T_{case})$



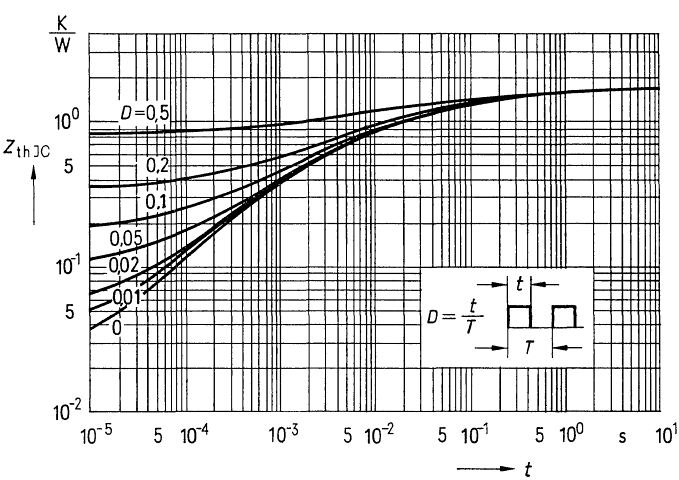

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 10 mA



**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$

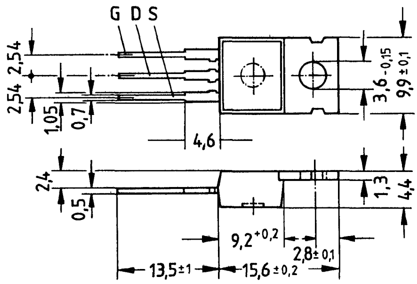



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 31 | C67078-A1304-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 45 °C | $I_D$ | 12,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 37A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,17 | 0,2 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

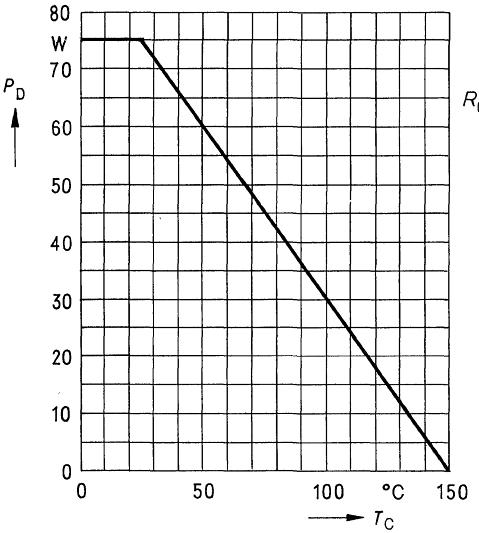
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 1000 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 140 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 35 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 120 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 540 | – | | |
| | $t_f$ | – | 250 | – | | |

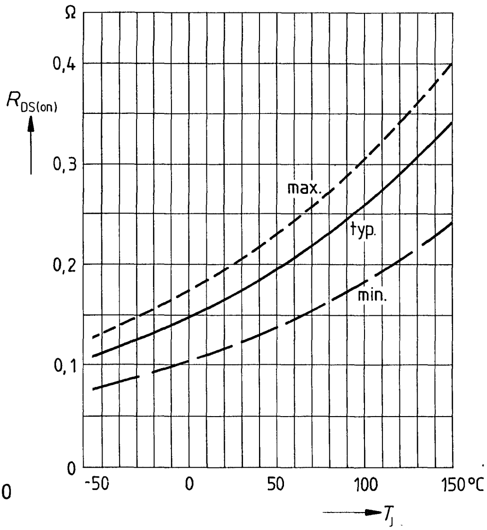
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 12,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 37 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

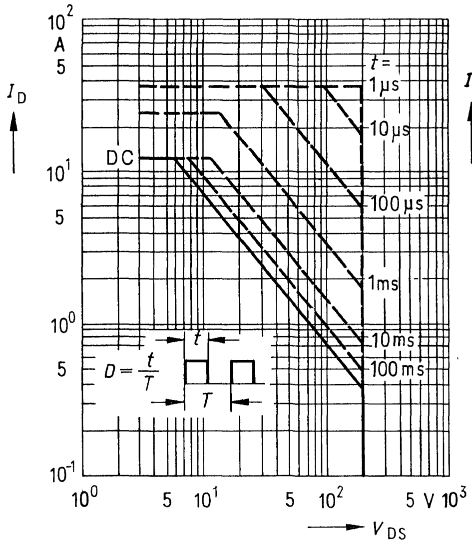
**Power dissipation** $P_D = f(T_{case})$



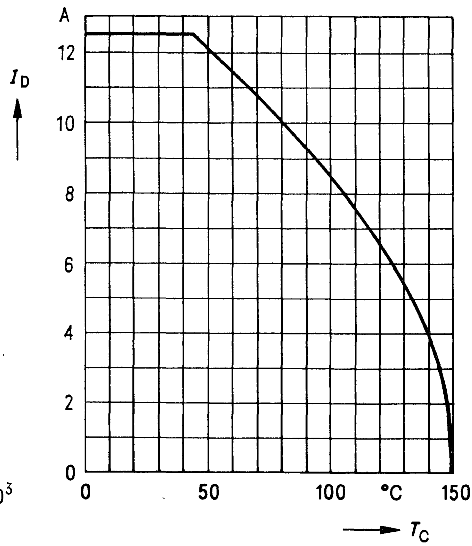

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



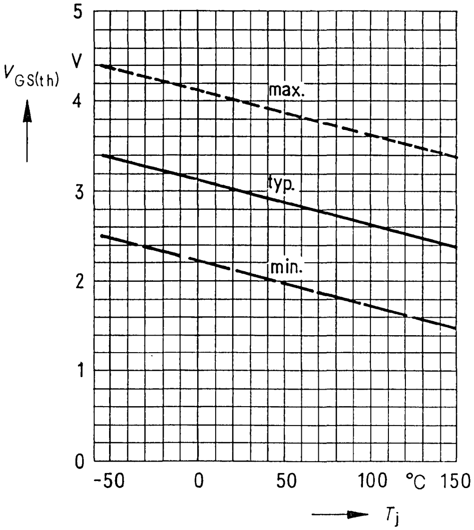

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



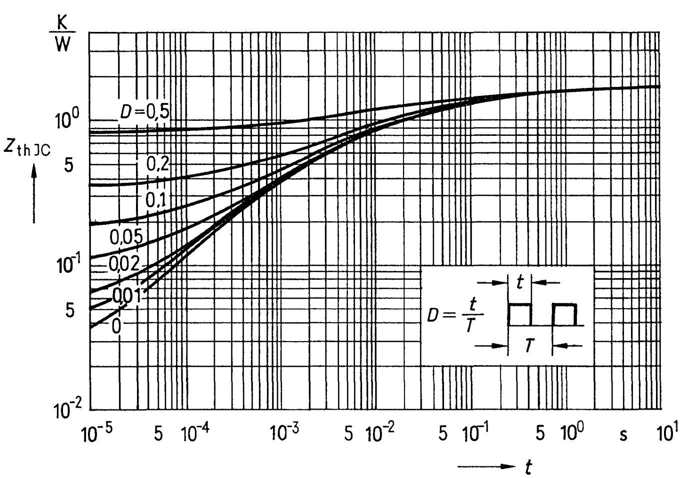

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



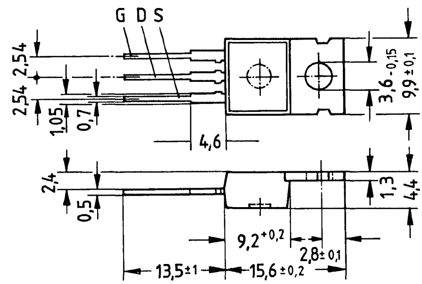

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 32 | C67078-A1310-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 9,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 28A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ <br> $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |

**Thermal resistance**

| | | |
|---|---|---|
| | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics | | | Unit | Conditions |
|---|---|---|---|---|---|---|
| | | min. | typ. | max. | | |
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,35 | 0,4 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 4,5A |

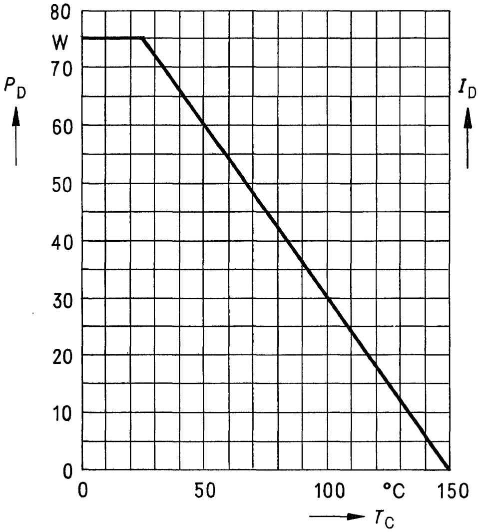
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,2 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 4,5A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

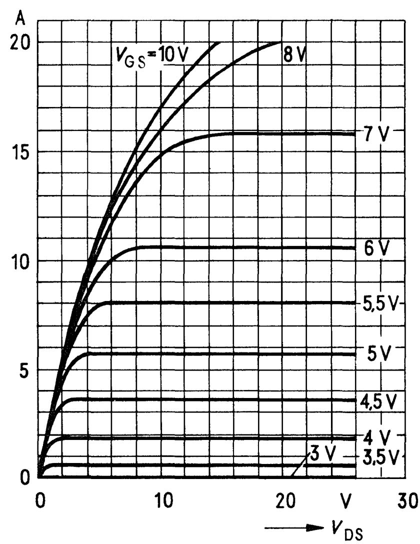
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 9,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 28 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

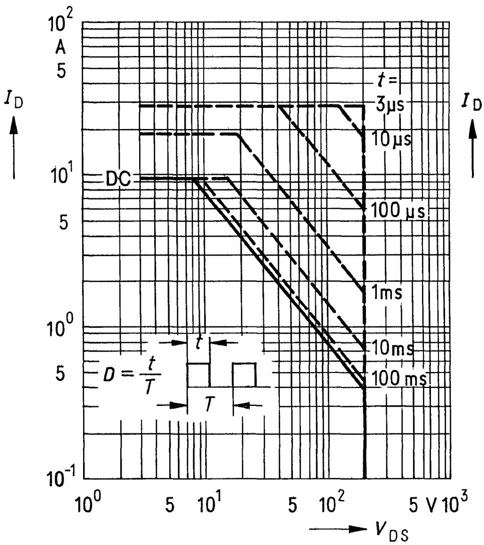
**Power dissipation** $P_D = f(T_{case})$



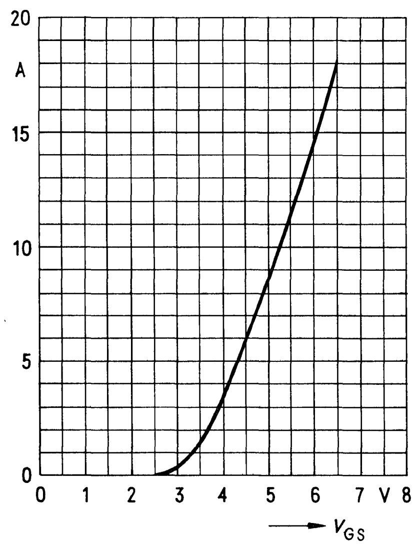

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



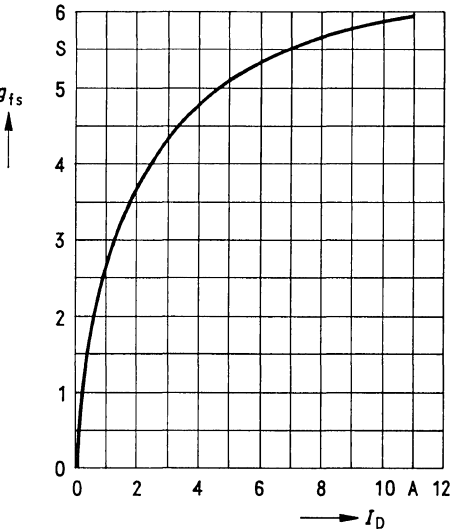

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



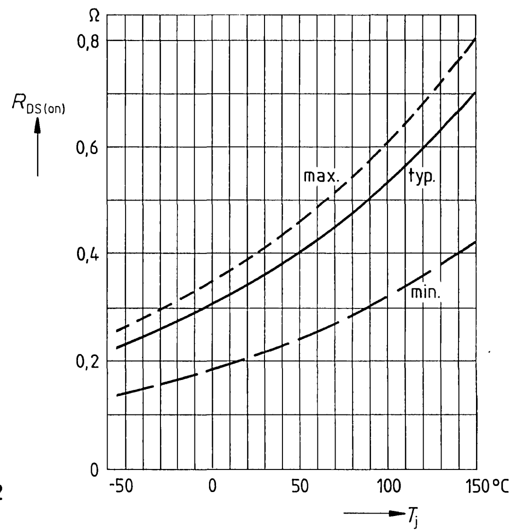

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



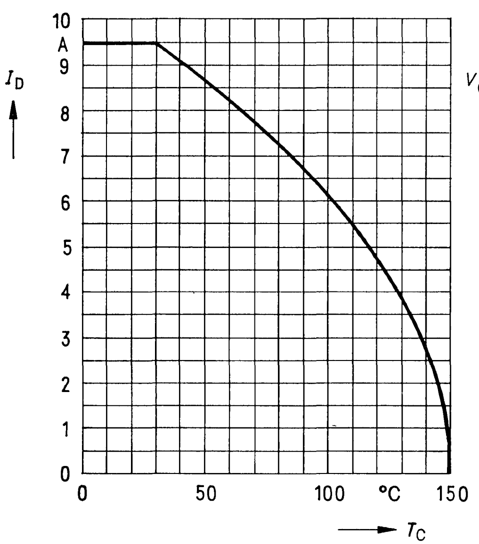
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



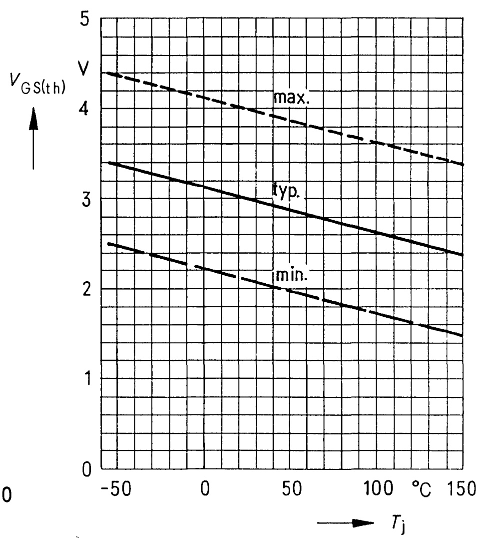

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



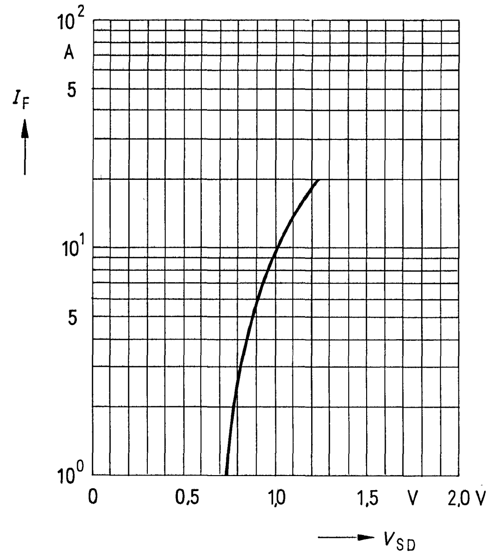

**Continuous drain current** $I_D = f(T_{case})$



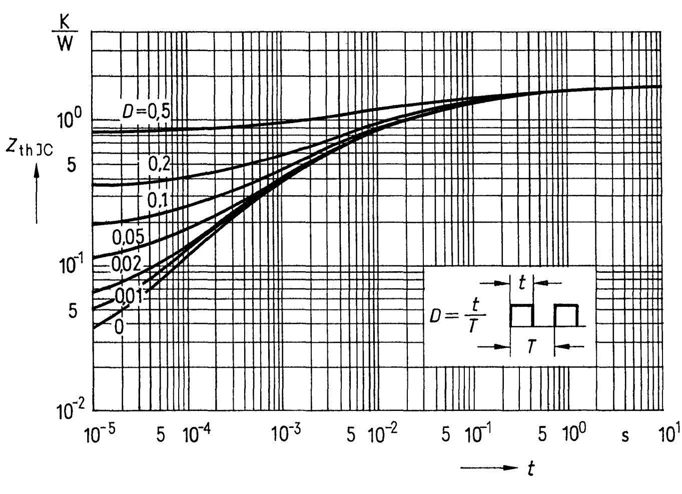

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$



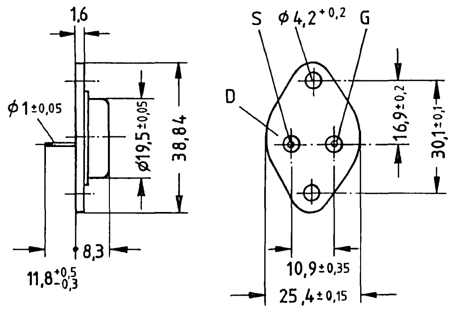

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 33 | C67078-A1004-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 7,2A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 21A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,5 | 0,75 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 4,5A |

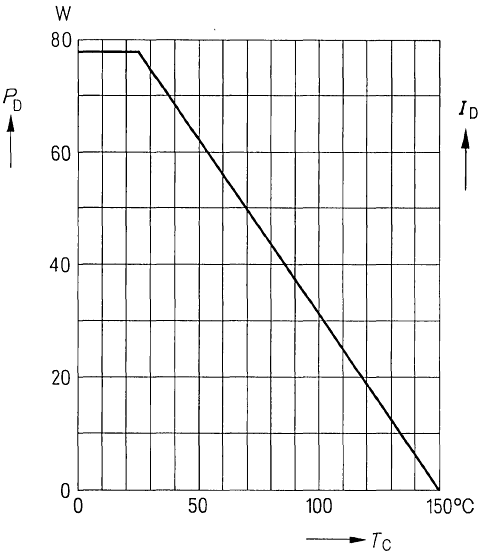
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,2 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 4,5A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

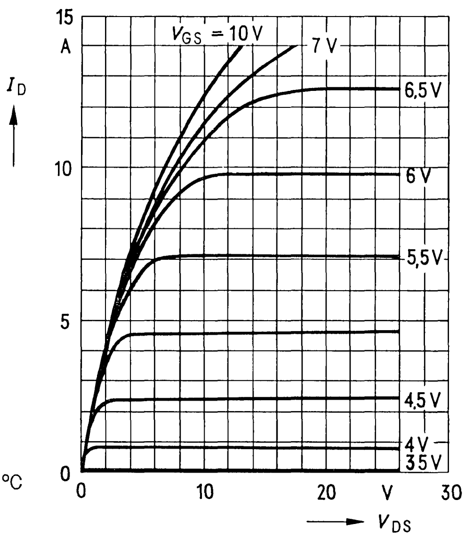
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 7,2 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 21 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,5 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

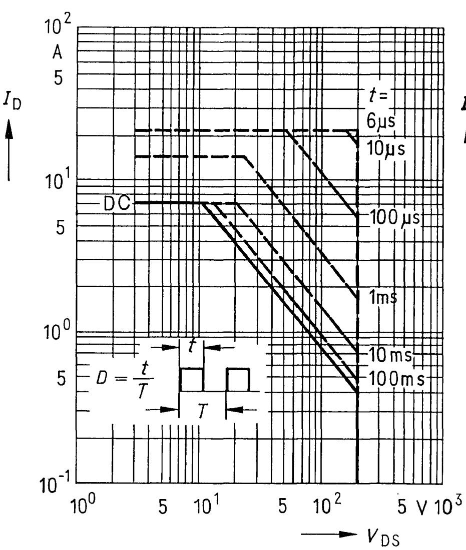
**Power dissipation** $P_D = f(T_{case})$



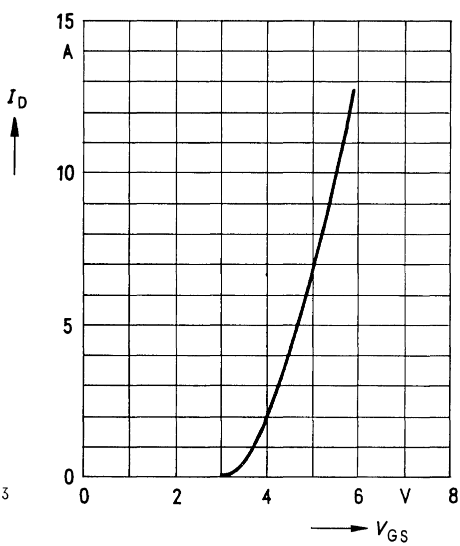

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



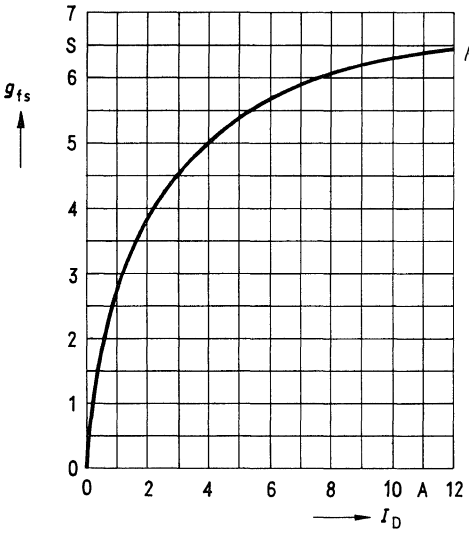

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



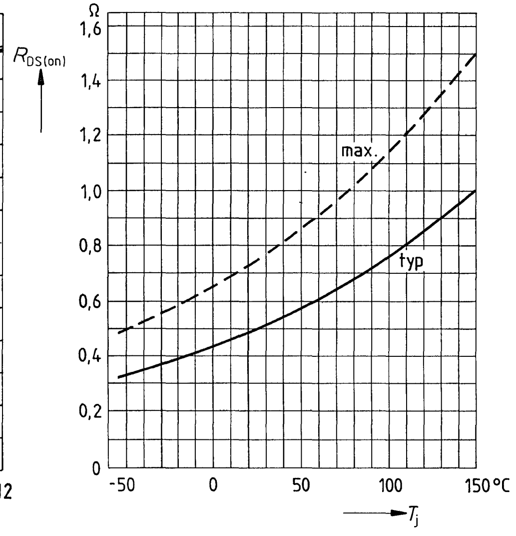

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



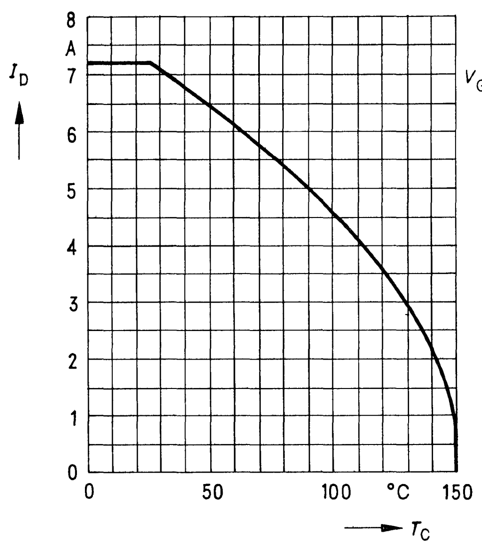
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



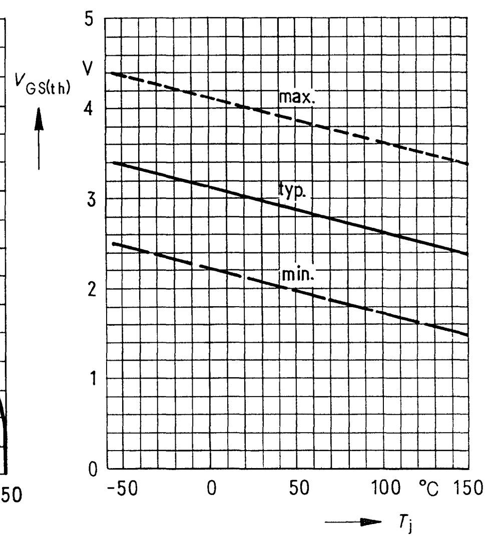

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



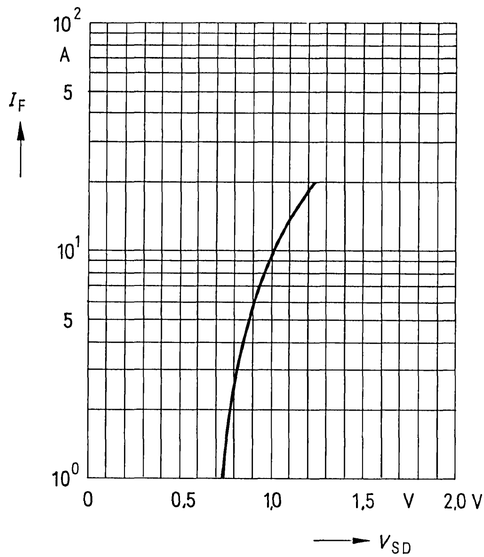

**Continuous drain current** $I_D = f(T_{case})$



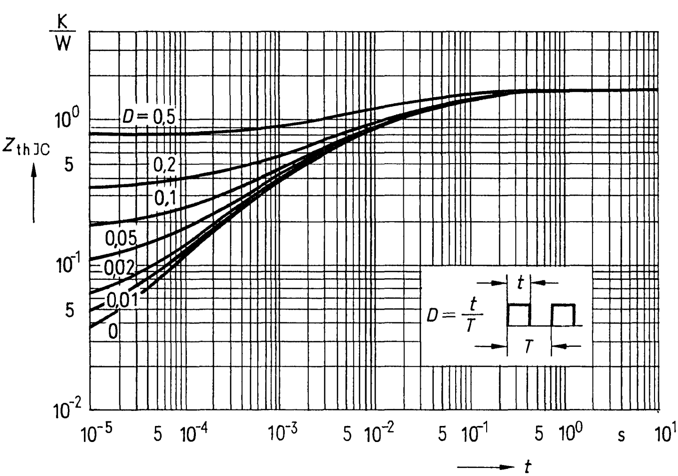

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$

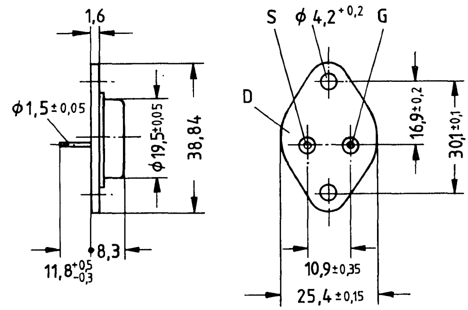



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AE (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 34 | C67078-A1005-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 14A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 42A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ ≐ 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,17 | 0,2 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 7A |

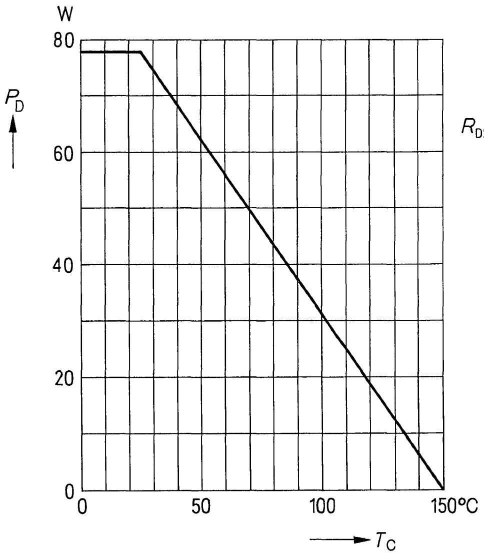
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 7A |
| Input capacitance | $C_{iss}$ | – | 1000 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 140 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 35 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 120 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 540 | – | | |
| | $t_f$ | – | 250 | – | | |

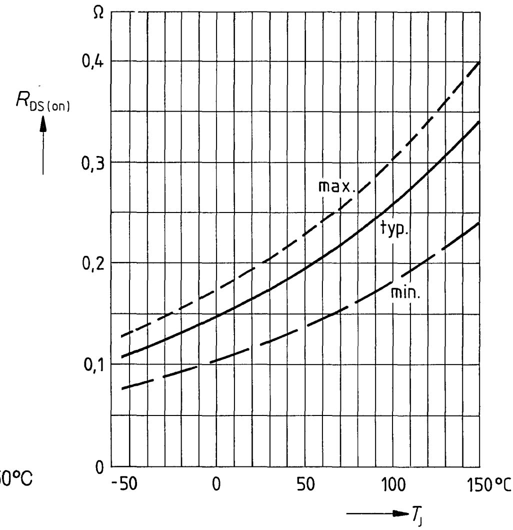
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 14 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 42 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 1,9 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

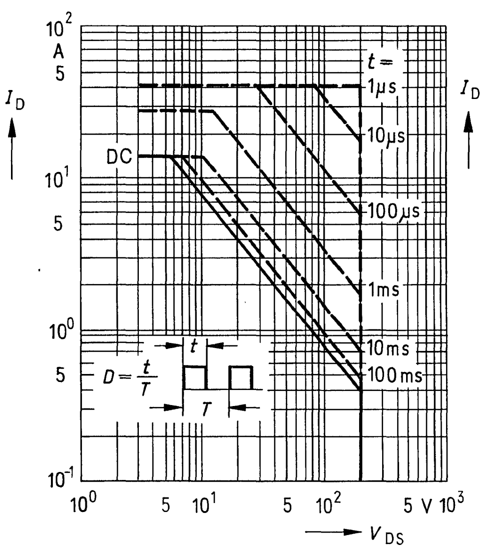
**Power dissipation** $P_D = f(T_{case})$



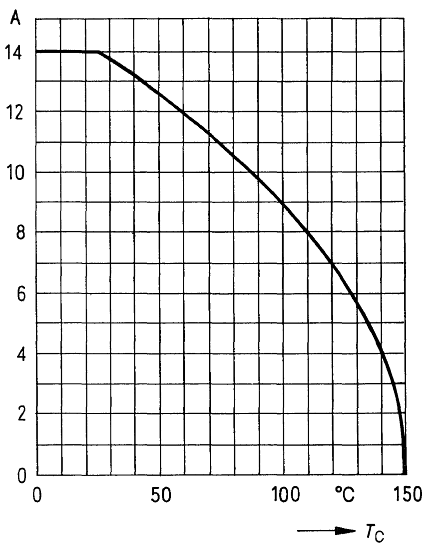

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



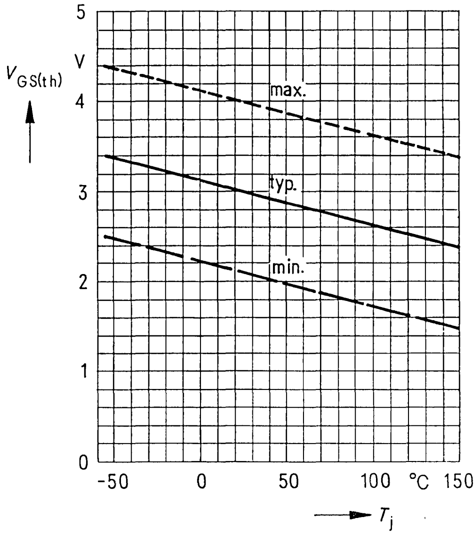

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



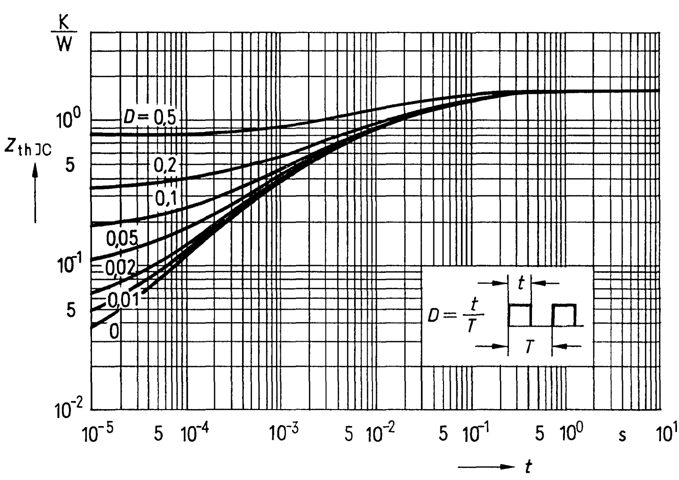

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA

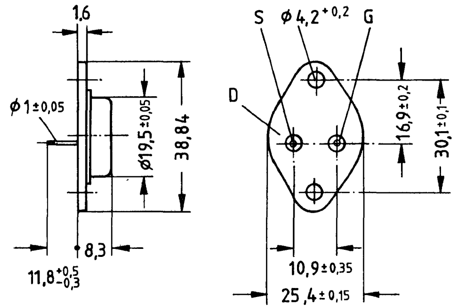



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 35 | C67078-A1014-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 9,9A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 29A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t = 1$ min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,35 | 0,4 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 4,5A |

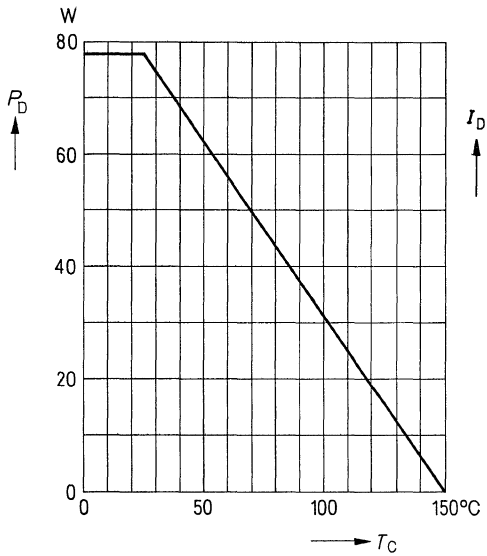
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,2 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 4,5A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 20 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 60 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 120 | – | | |
| | $t_f$ | – | 60 | – | | |

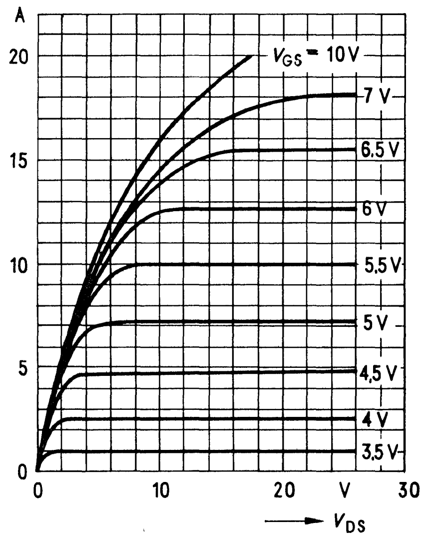
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 9,9 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 29 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,7 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6 | – | µC | |

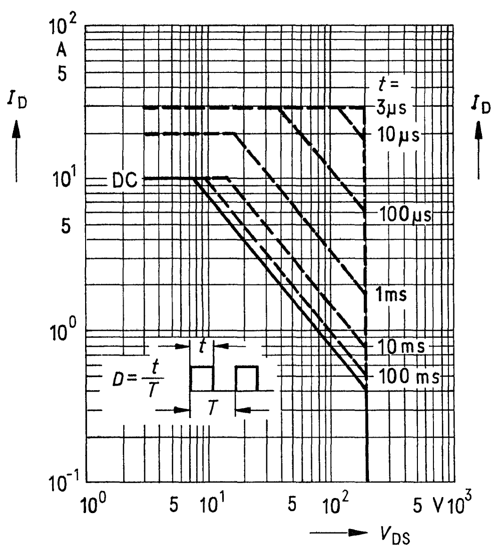
**Power dissipation** $P_D = f(T_{case})$



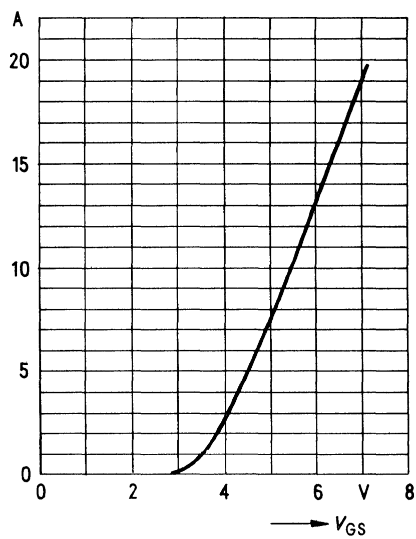

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



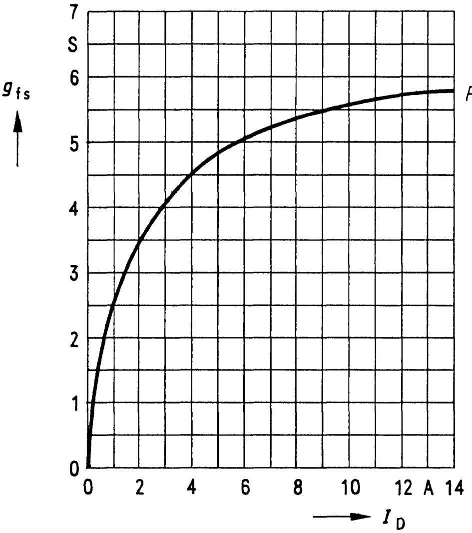

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



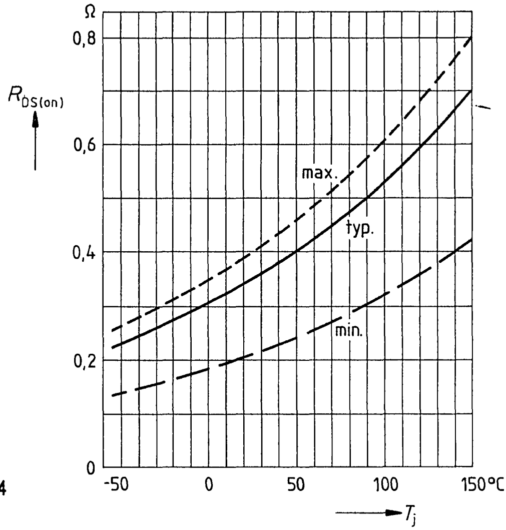

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



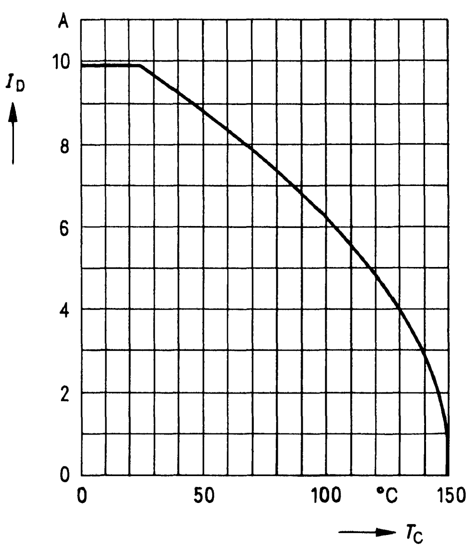
**Typical transconductance** $g_{fs}$ = f ($I_D$)
parameter: 80 μs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25°C



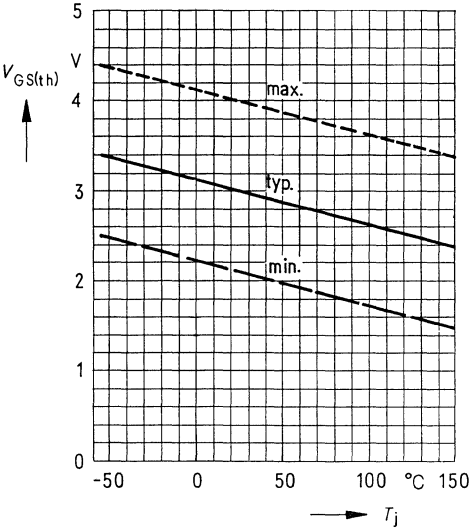

**Drain-source on-state resistance**
$R_{DS (on)}$ = f ($T_j$)
(spread)



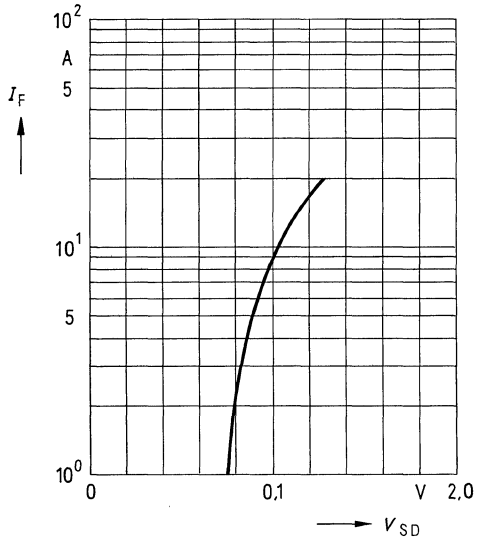

**Continuous drain current** $I_D$ = f ($T_{case}$)



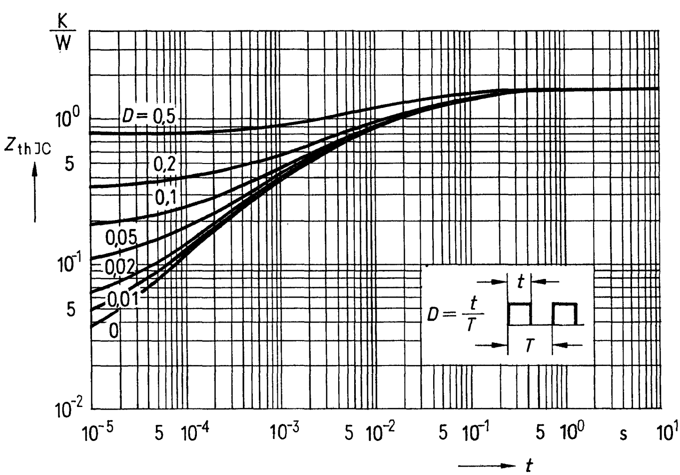
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



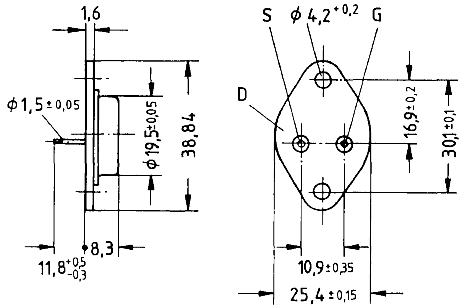

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872,
or TO 204 AE (TO 3) in accordance with JEDEC.
Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 36 | C67078-A1018-A2 |




Dimensions in mm

| | | |
|---|---|---|
| **Absolute maximum ratings** | | |
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case} = 30\ °C$ | $I_D$ | 22A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 65A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | – | 0,12 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 11A |

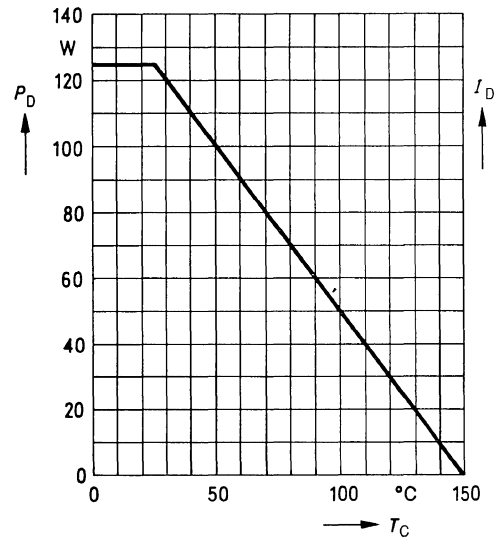
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 9,0 | 13 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 11A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 900 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 500 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

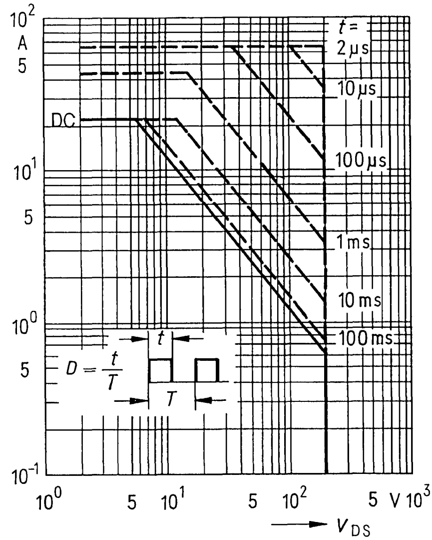
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 22 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 65 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,2 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6 | – | µC | |

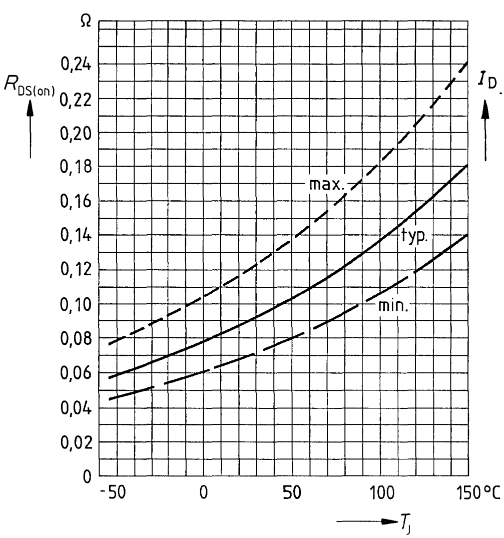
**Power dissipation** $P_D = f(T_{case})$



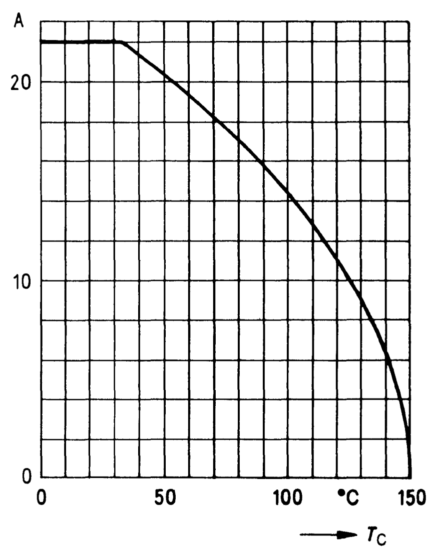

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



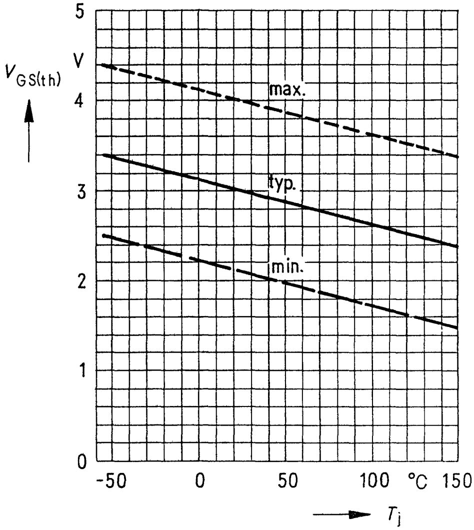

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



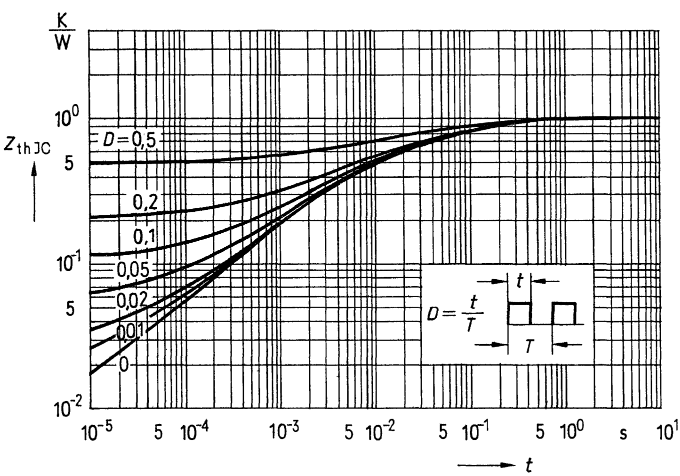

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



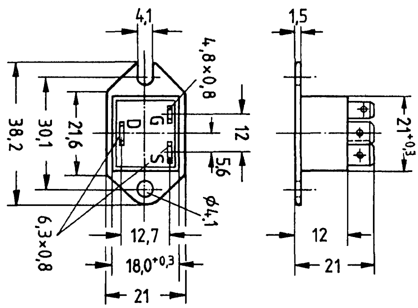

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 37 | C67078-A1603-A2 |



Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case} = 30\ °C$ | $I_D$ | 13A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 39A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 70W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C… +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500 Vdc[1]) |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,78K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,17 | 0,2 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 7A |

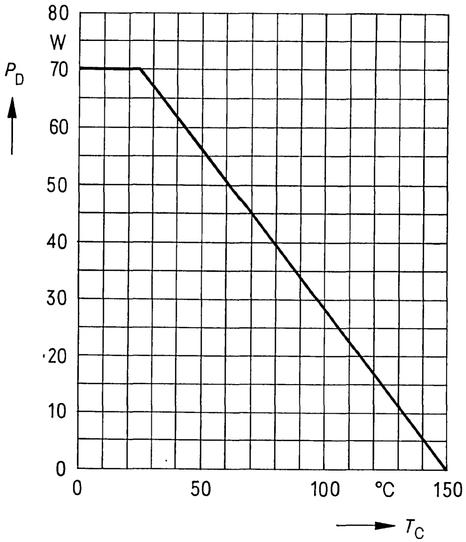
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 7A |
| Input capacitance | $C_{iss}$ | – | 1000 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 140 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 35 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 540 | – | | |
| | $t_f$ | – | 250 | – | | |

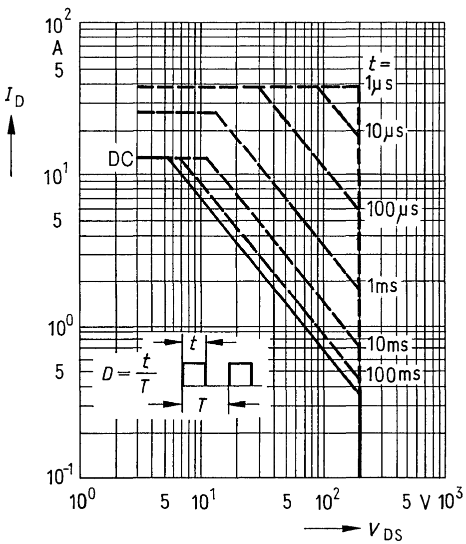
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 13 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 39 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,8 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6 | – | µC | |

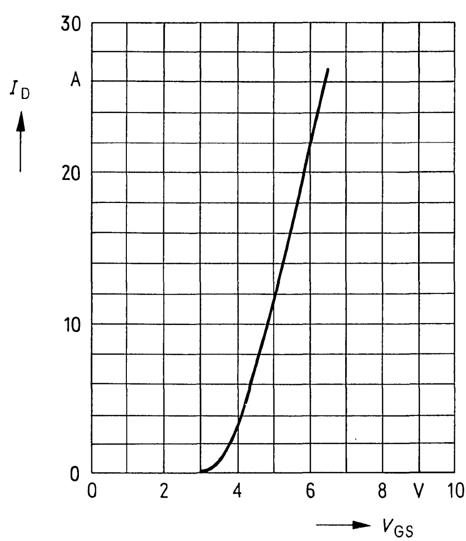
**Power dissipation** $P_D = f(T_{case})$



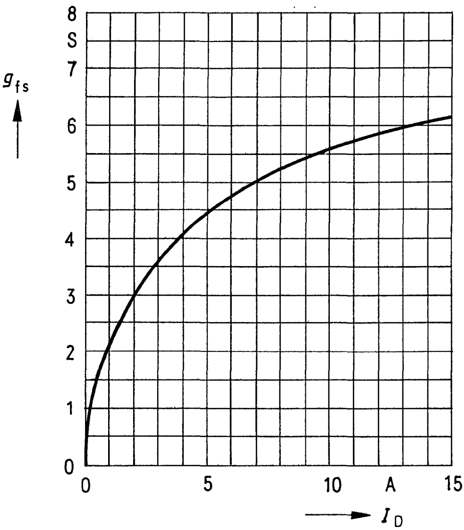

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



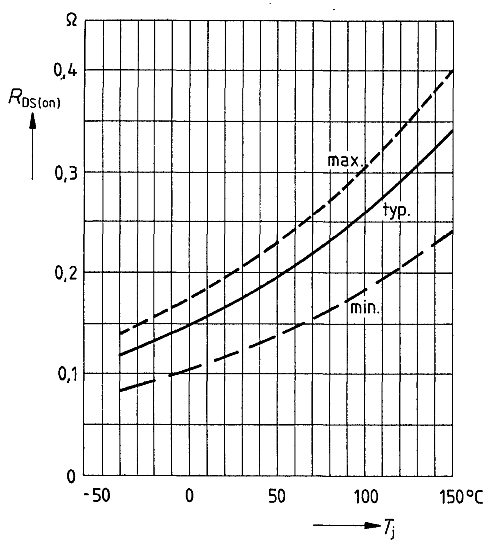

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



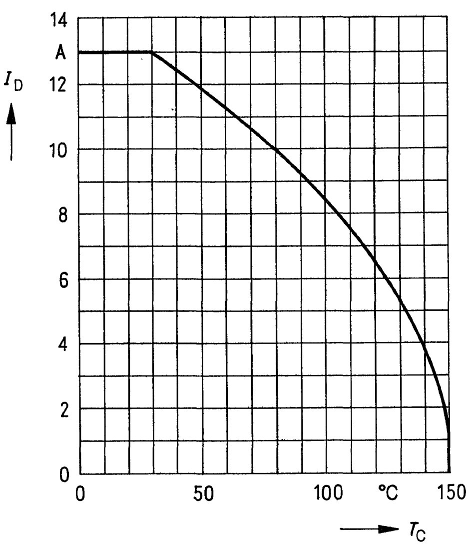
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



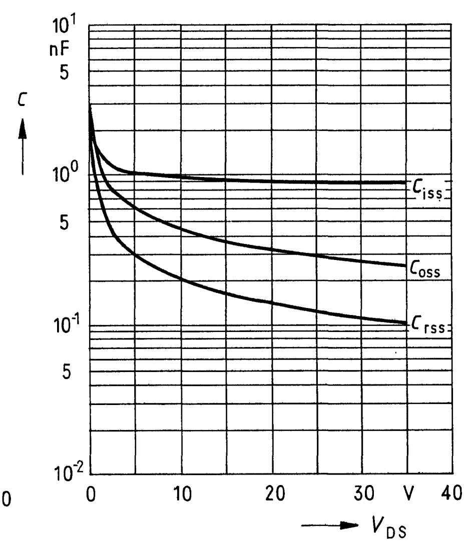

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



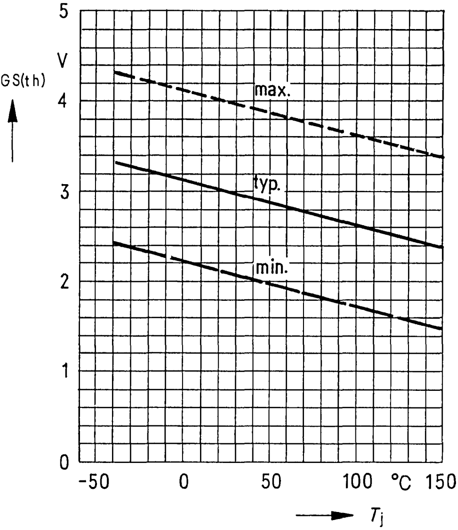

**Continuous drain current** $I_D = f(T_{case})$



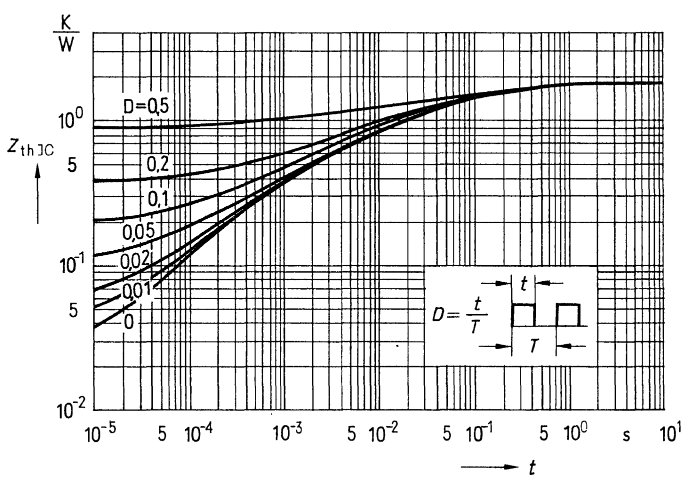

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



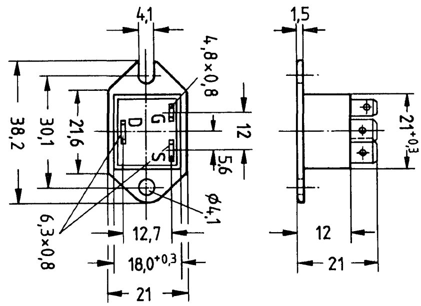

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 38 | C67078-A1611-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 18A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 55A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500Vdc[1]) |
| **Thermal resistance** | $R_{th\,JA}$ | – |
| | $R_{th\,JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,12 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 11A |

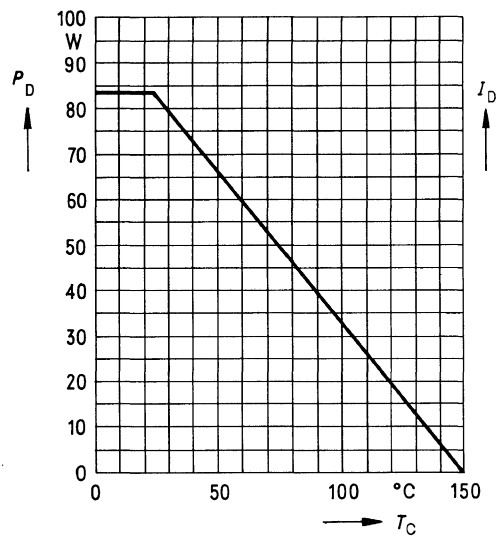
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 9,0 | 13 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 11A |
| Input capacitance | $C_{iss}$ | – | 1500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 900 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 500 | – | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 200 | – | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 300 | – | | |
| | $t_f$ | – | 200 | – | | |

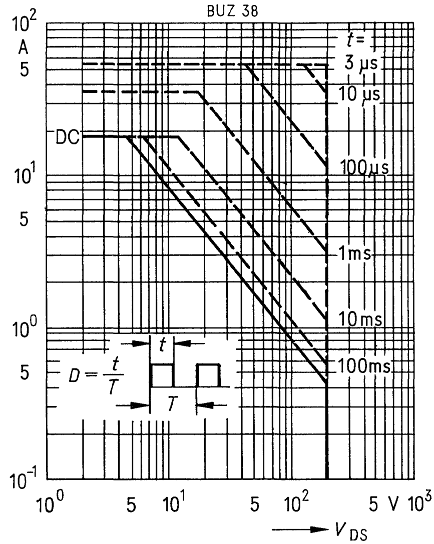
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 18 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 55 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,6 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 400 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6 | – | µC | |

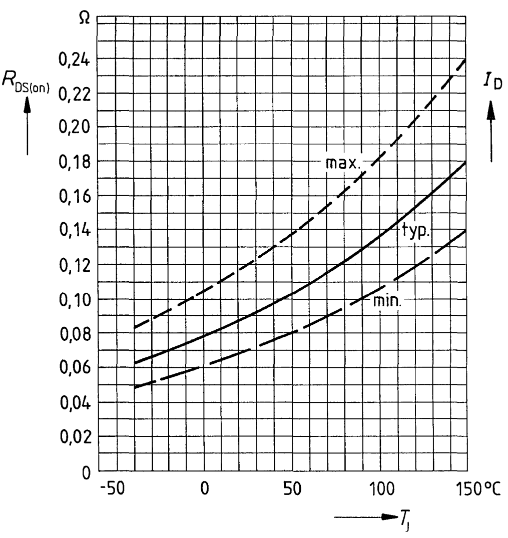
**Power dissipation** $P_D = f(T_{case})$



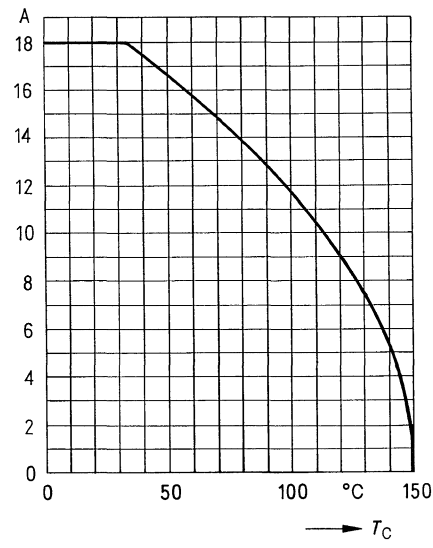

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



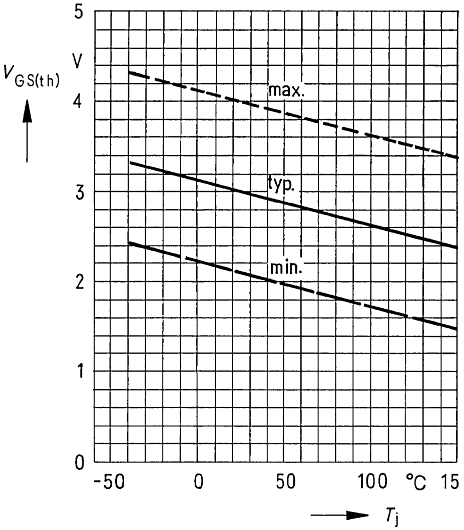

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



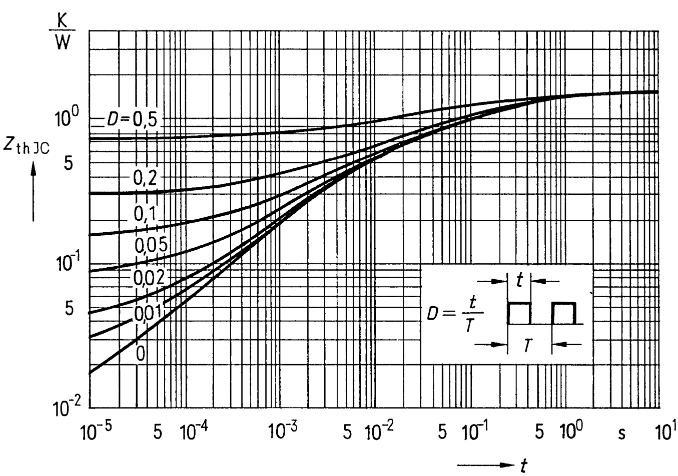

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



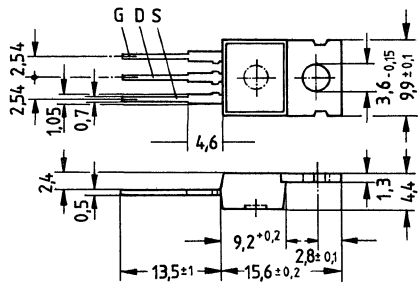

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 40 | C67078-A1305-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 45 °C | $I_D$ | 2,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |

**Thermal resistance**

| | | |
|---|---|---|
| | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 3,0 | 4,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

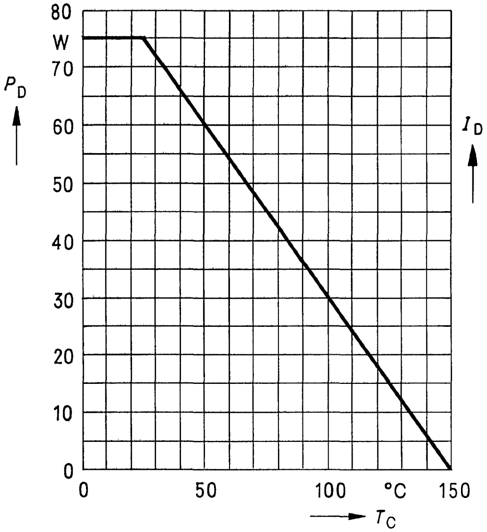
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,5 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

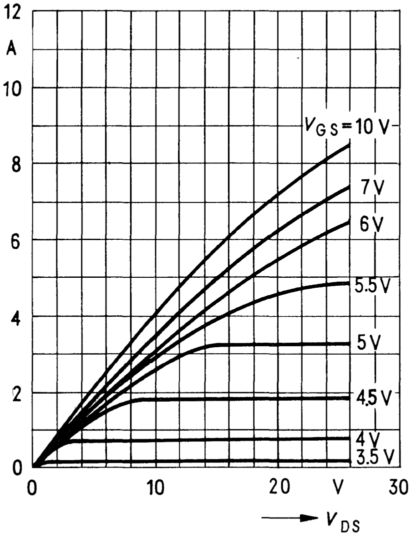
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,3 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

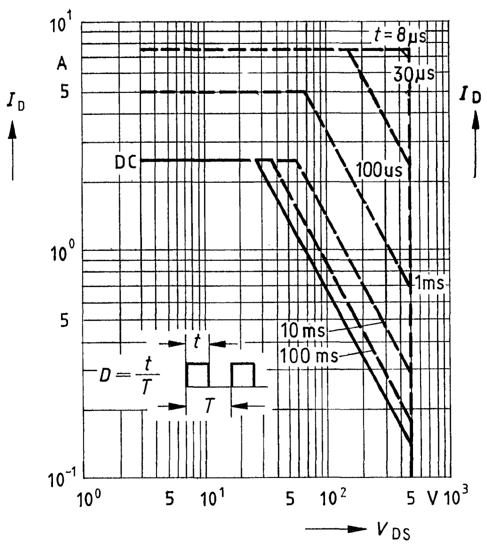
**Power dissipation** $P_D = f(T_{case})$



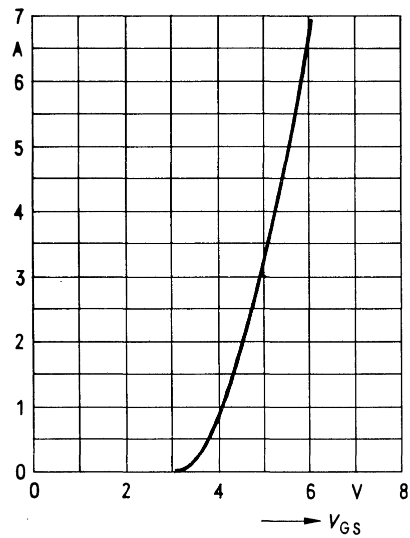

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



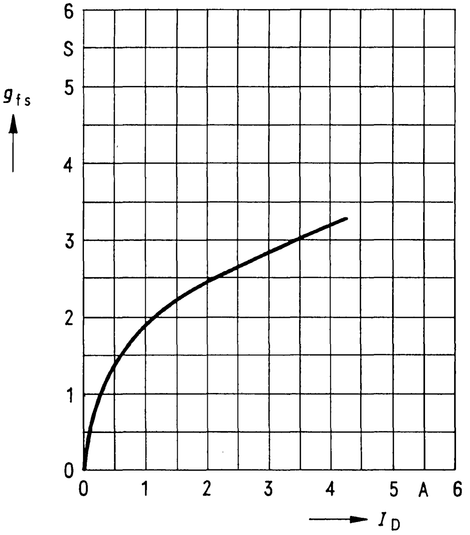

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



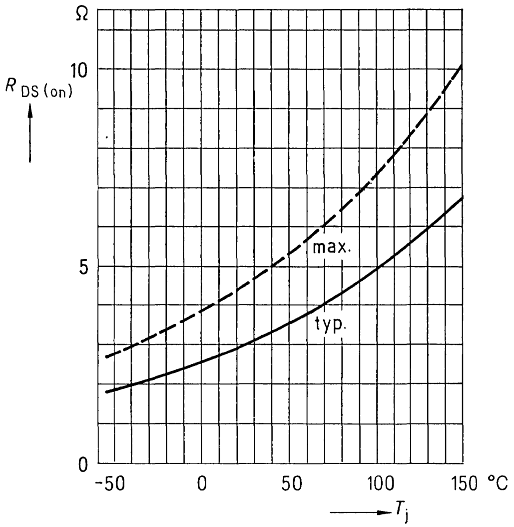

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



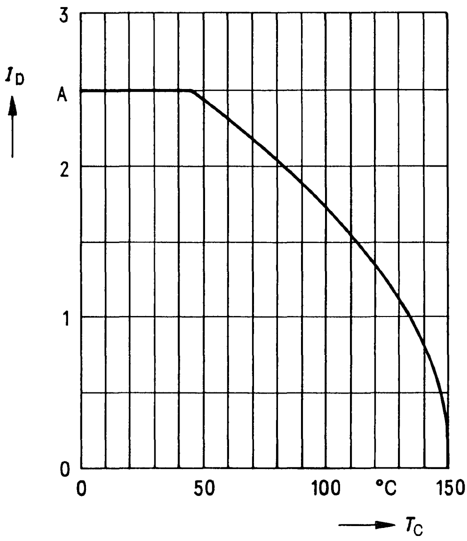
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



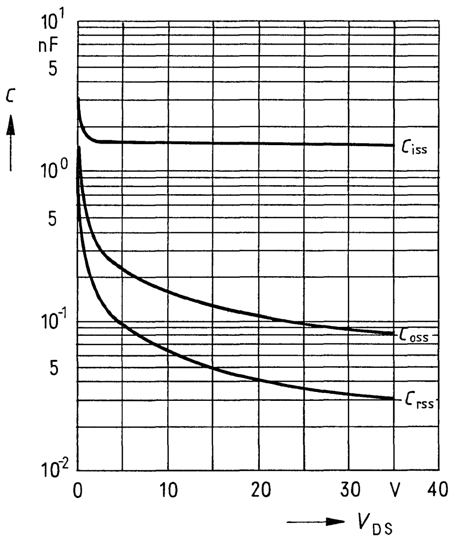

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



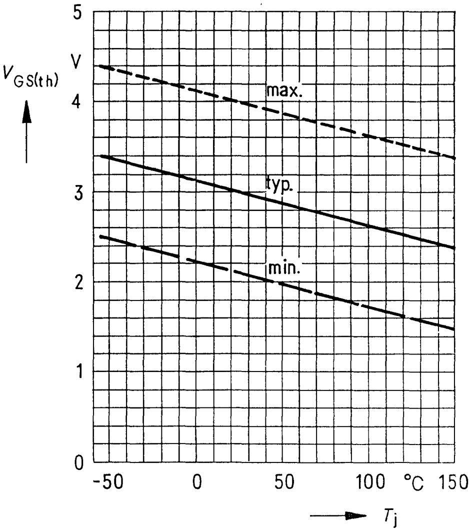

**Continuous drain current** $I_D = f(T_{case})$



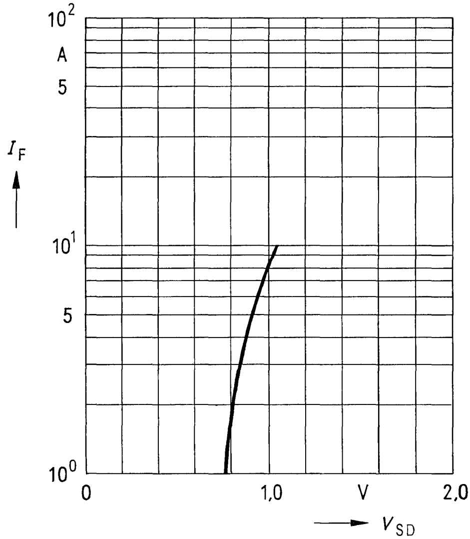

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



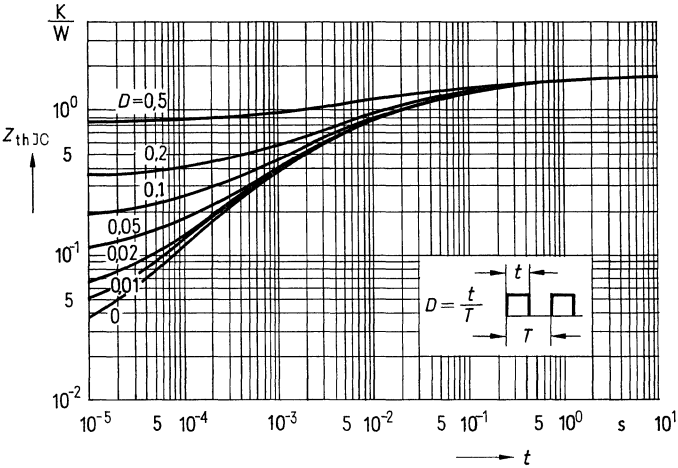
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs

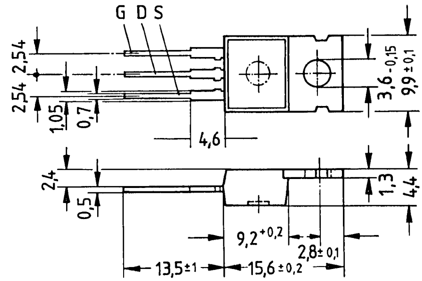



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 41 A | C67078-A1306-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 4,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 13A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |

**Thermal resistance**

| | | |
|---|---|---|
| | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | 1,4 | 1,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

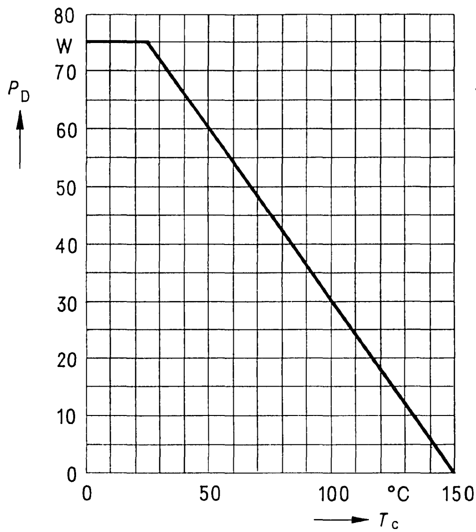
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,5 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,7A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

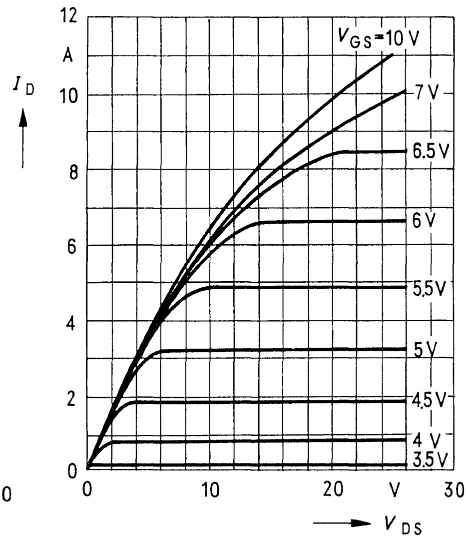
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 13 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,5 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

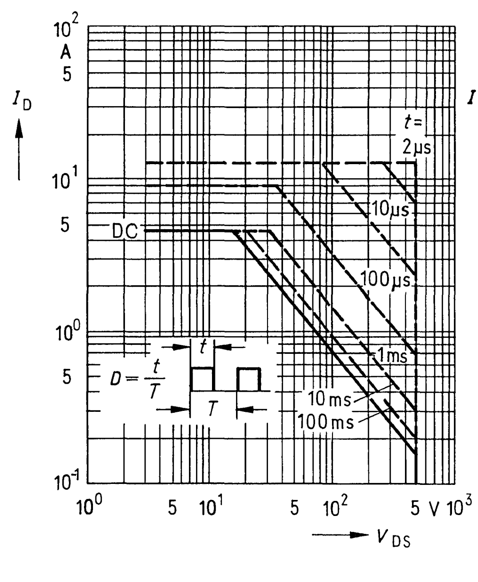
**Power dissipation** $P_D = f(T_{case})$



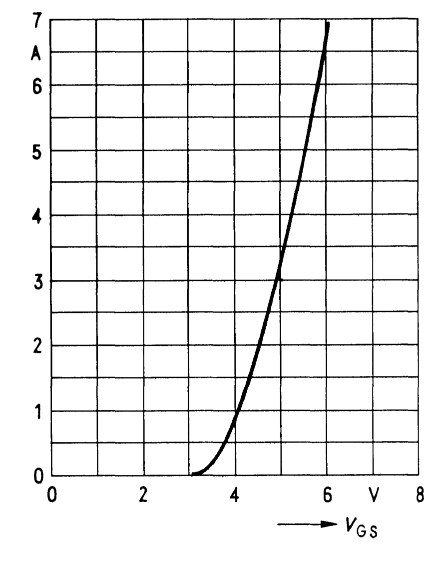

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



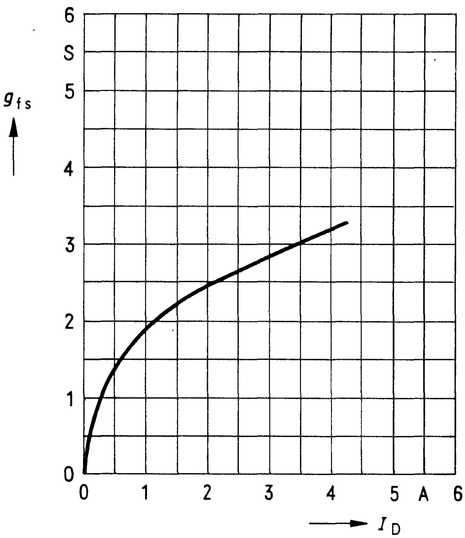

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



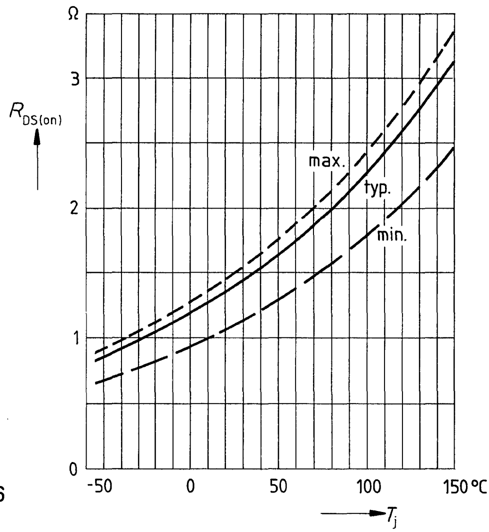

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25\,V$, $T_j = 25\,°C$



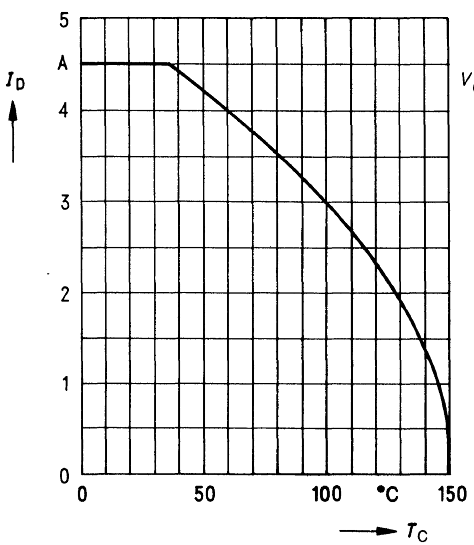
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



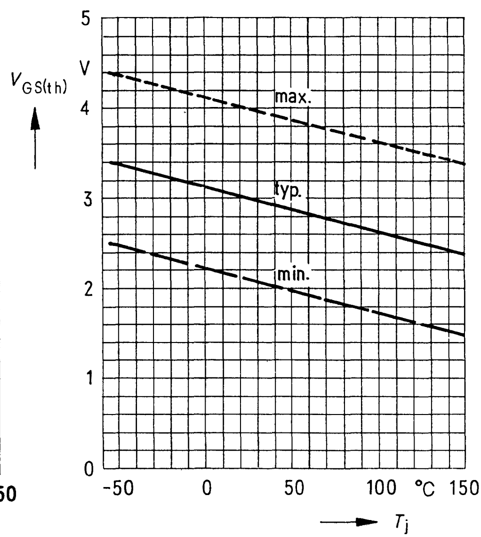

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



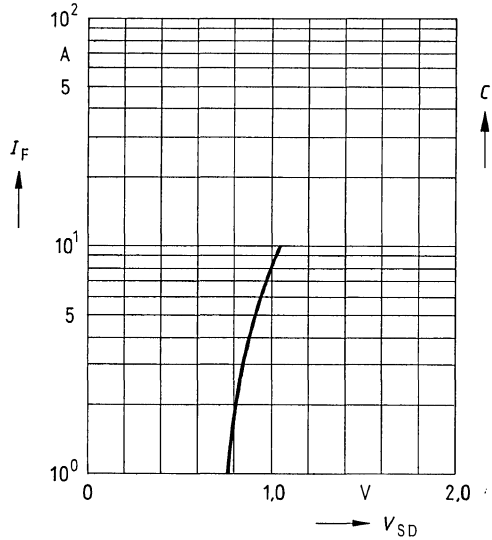

**Continuous drain current** $I_D = f(T_{case})$



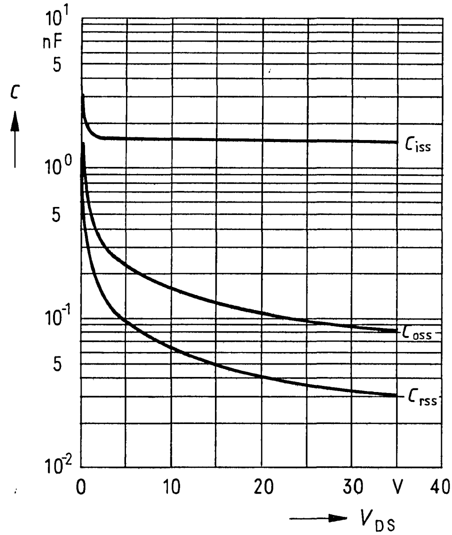

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



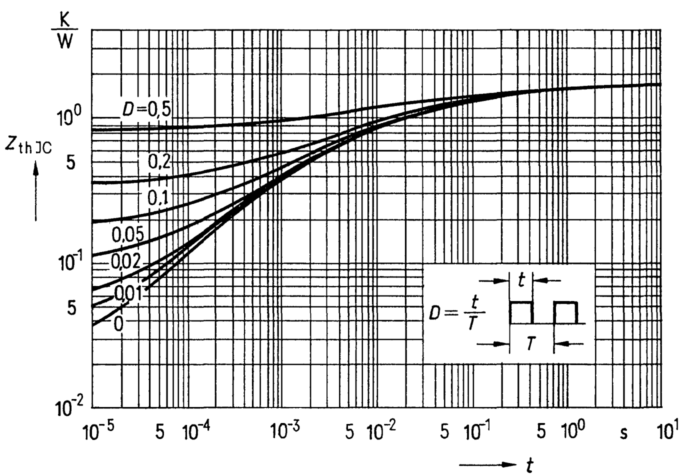
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



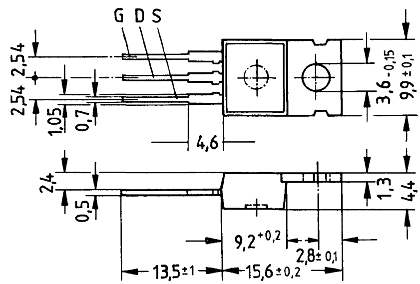

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 42 | C67078-A1311-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 4,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 12A |
| Gate-source voltage | $V_{GS}$ | ± 20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | − 55 °C ... + 150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\ JA}$ | ≤ 75K/W |
| | $R_{th\ JC}$ | ≤ 1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | 1,8 | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

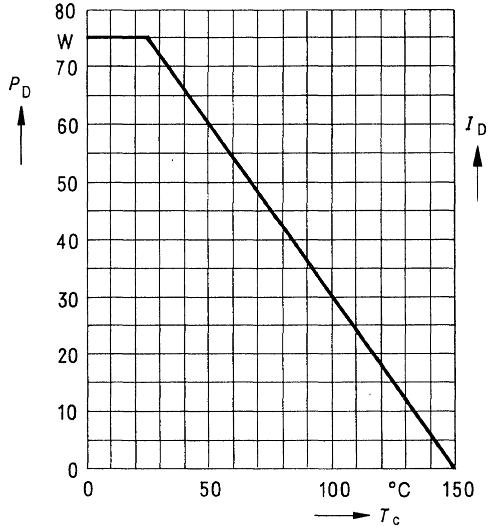
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,5 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

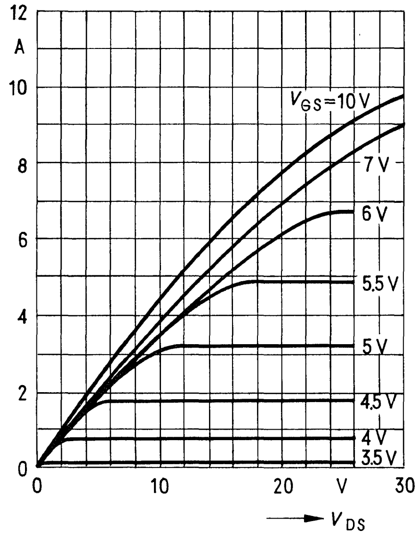
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 12 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,5 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

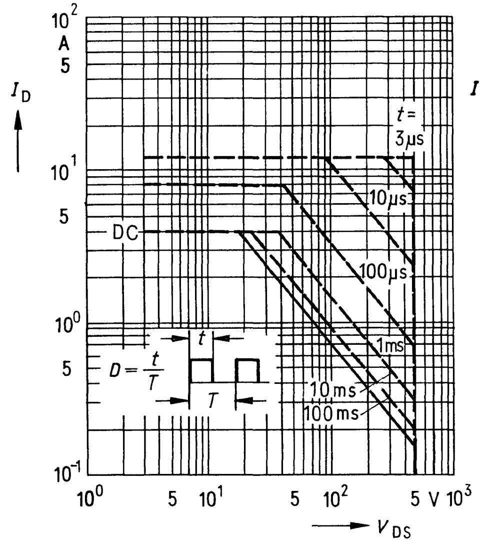
**Power dissipation** $P_D = f(T_{case})$



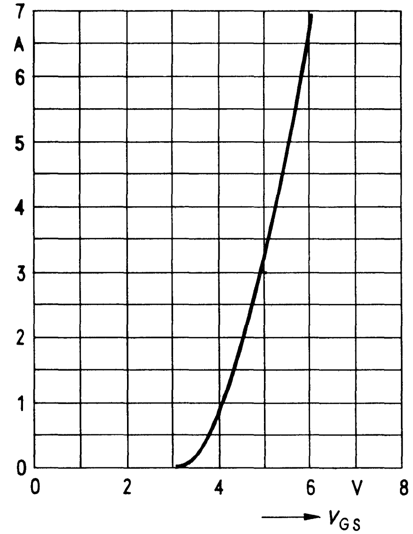

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



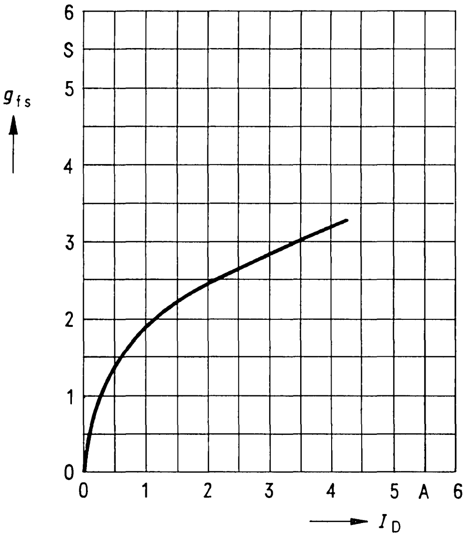

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



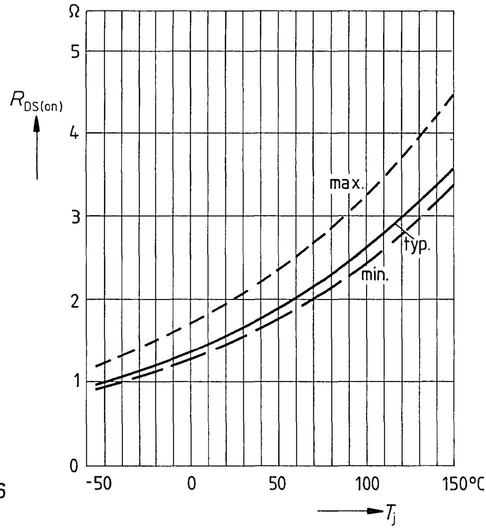

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



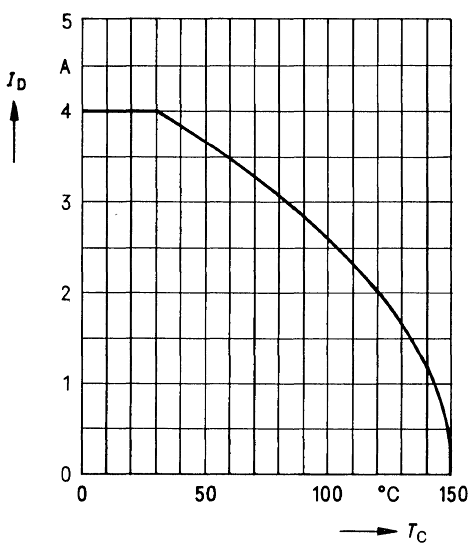
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25°C



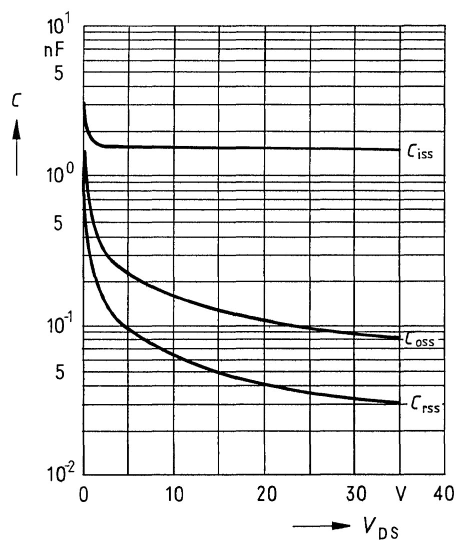

**Drain-source on-state resistance**
$R_{DS\ (on)} = f(T_j)$
(spread)



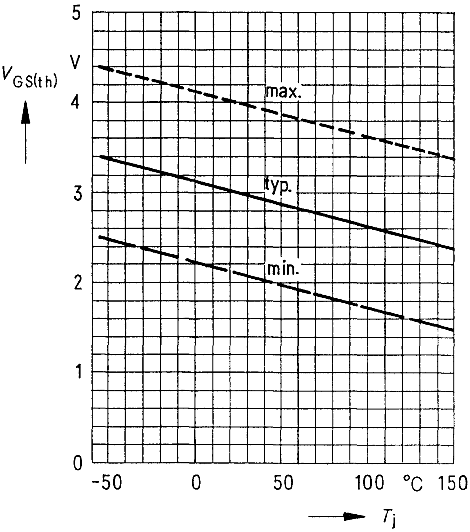

**Continuous drain current** $I_D = f(T_{case})$



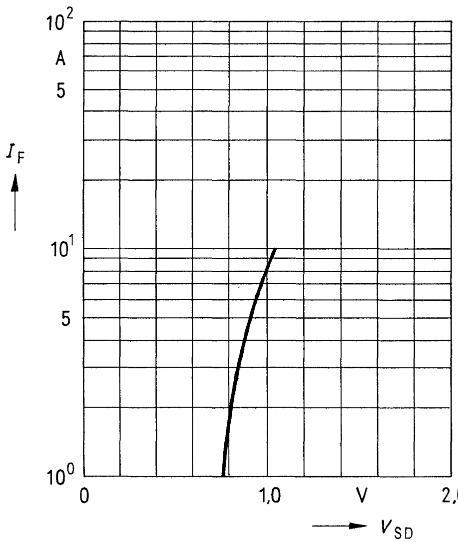

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



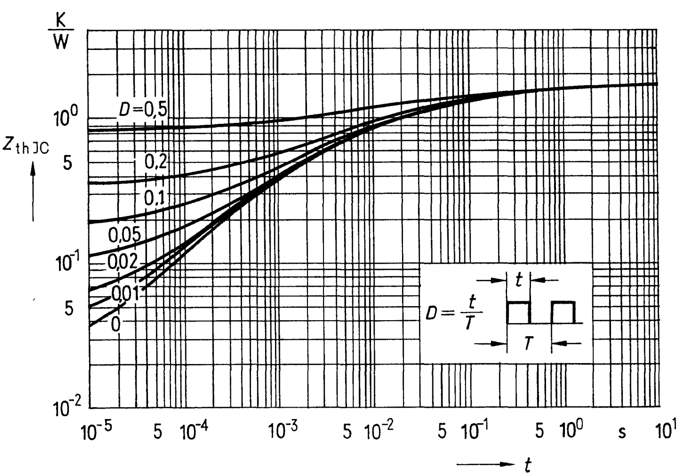
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs

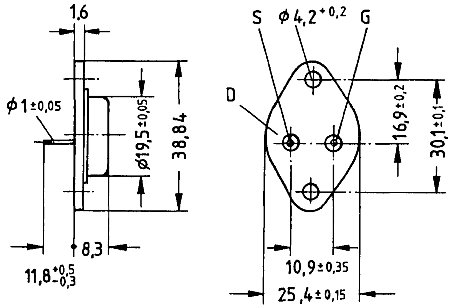



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 43 | C67078-A1006-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 2,8A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 8,0A |
| Gate-source voltage | $V_{GS}$ | ± 20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\ JA}$ | ≤ 35K/W |
| | $R_{th\ JC}$ | ≤ 1,6K/W |

# Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 3,0 | 4,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

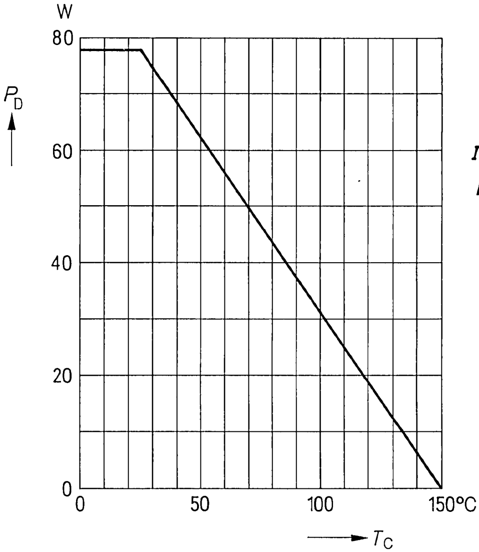
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,5 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,1A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

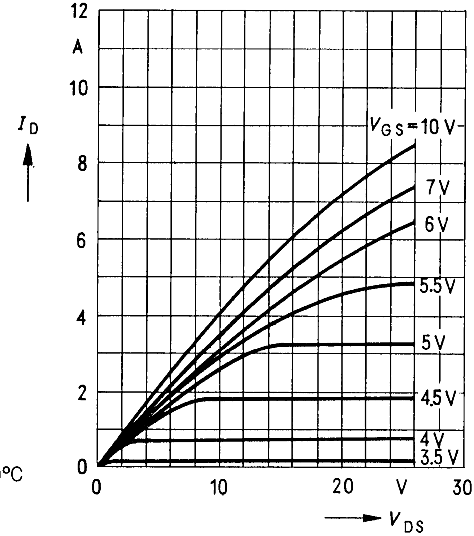
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,8 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 8,0 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

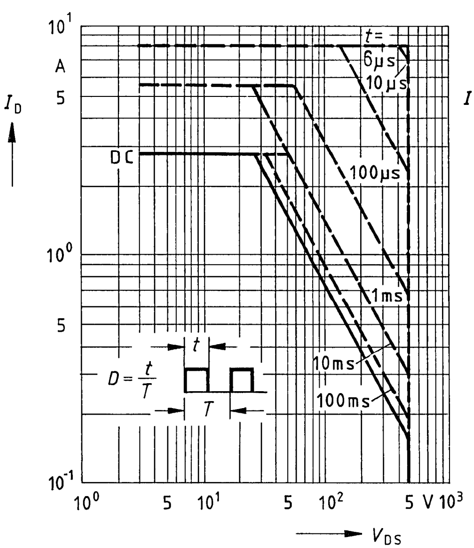
**Power dissipation** $P_D = f(T_{case})$



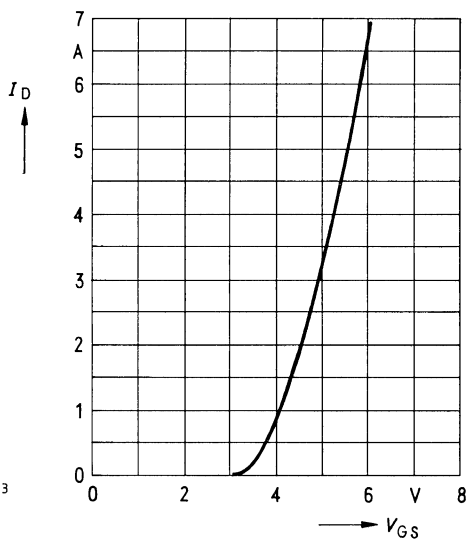

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case}$ = 25°C



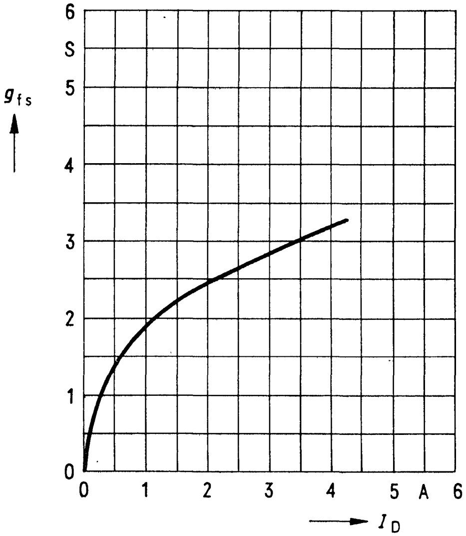

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D$ = 0.01, $T_{case}$ = 25°C



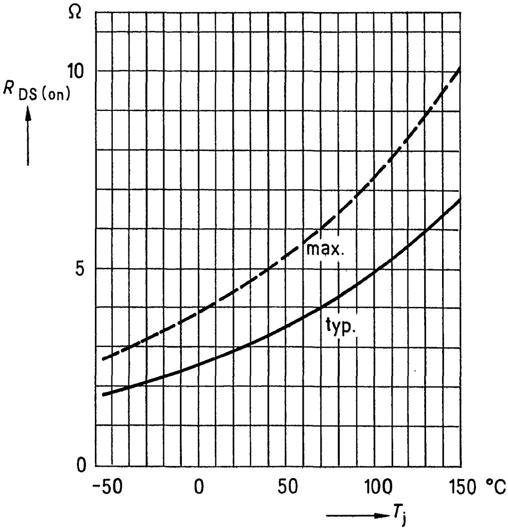

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25°C



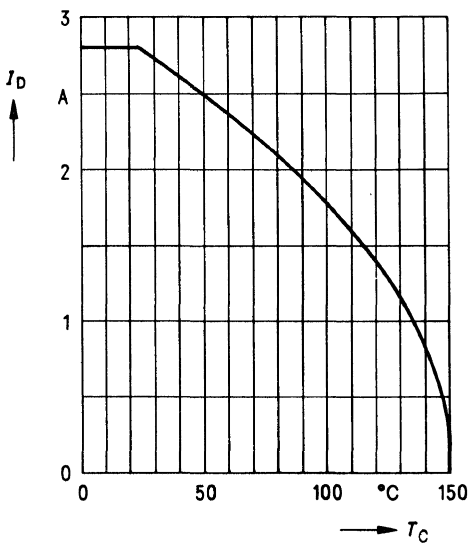
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



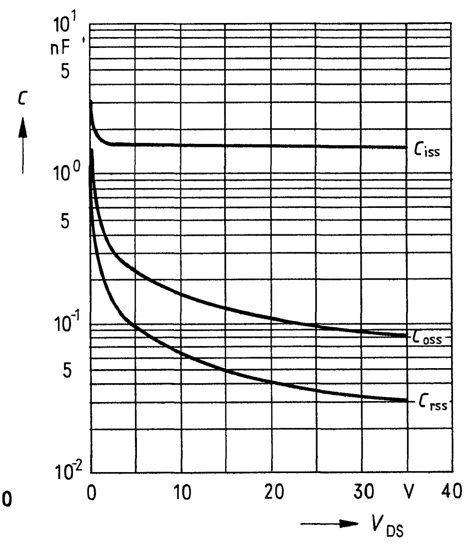

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



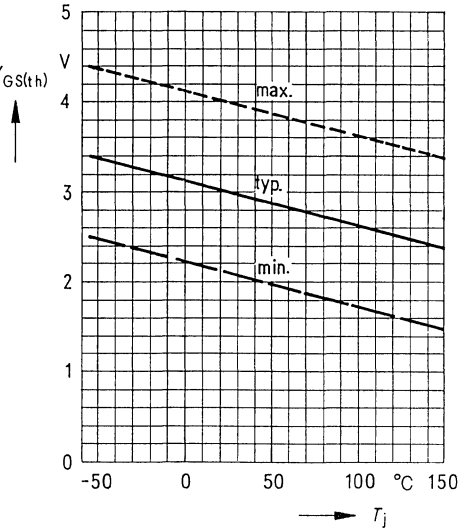

**Continuous drain current** $I_D = f(T_{case})$



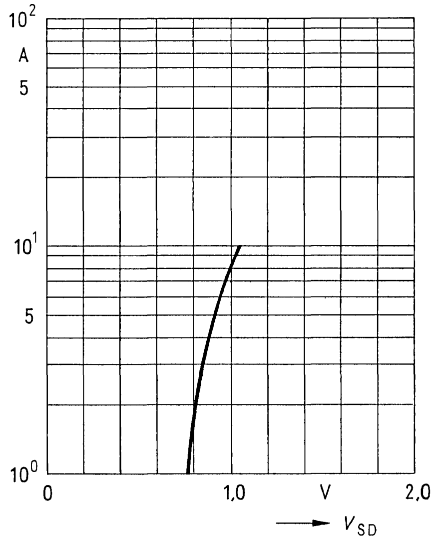

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



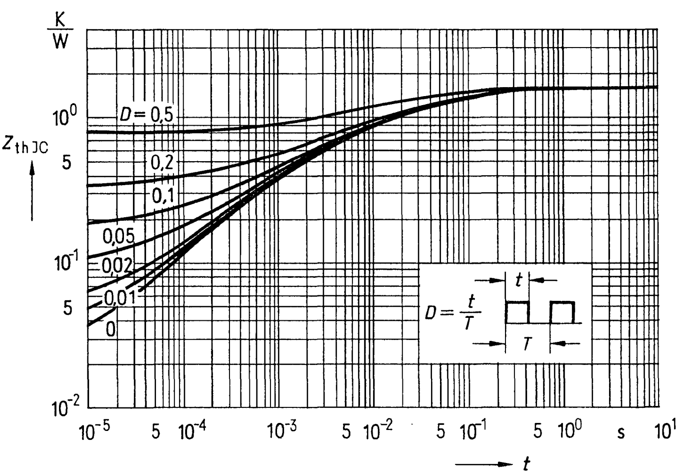
**Gate threshold voltage** $V_{GS(th)} = f\ (T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f\ (V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$



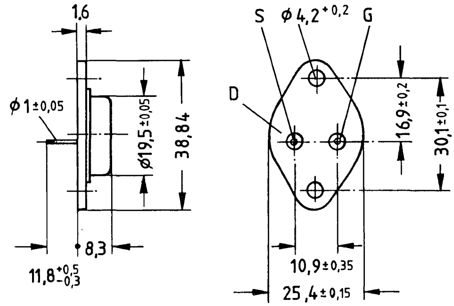

**Transient thermal impedance** $Z_{thJC} = f\ (t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 44 A | C67078-A1007-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 4,8A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 14A |
| Gate-source voltage | $V_{GS}$ | $\pm$20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | $-55\ °C \ldots +150\ °C$ |
| Isolation test voltage ($t = 1$ min) | $V_{is}$ | – |

**Thermal resistance**

| | | |
|---|---|---|
| | $R_{th\ JA}$ | $\leq$35K/W |
| | $R_{th\ JC}$ | $\leq$1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

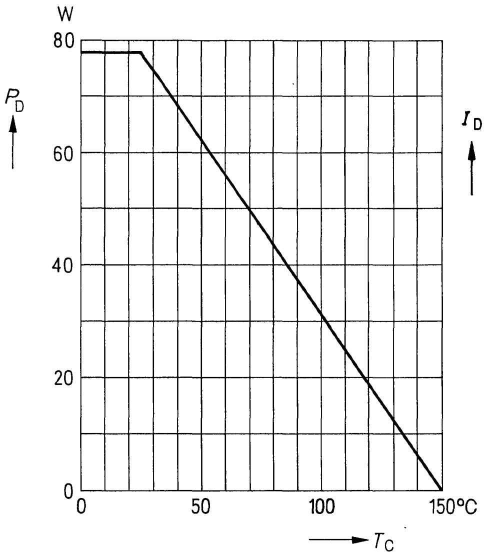
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,5 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,6A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| ($t_{on} = t_{d\,(on)} + t_r$) | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ | $t_{d\,(off)}$ | – | 160 | – | | |
| ($t_{off} = t_{d\,(off)} + t_f$) | $t_f$ | – | 100 | – | | |

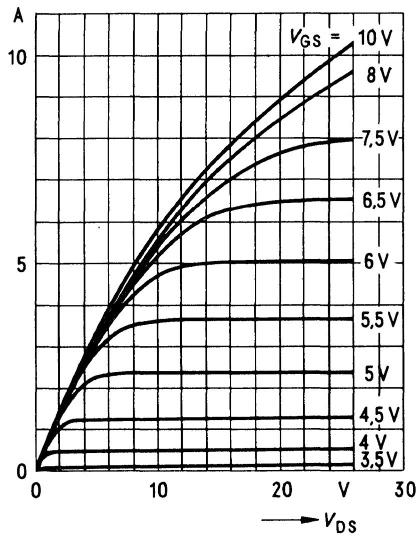
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,8 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 14 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,5 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

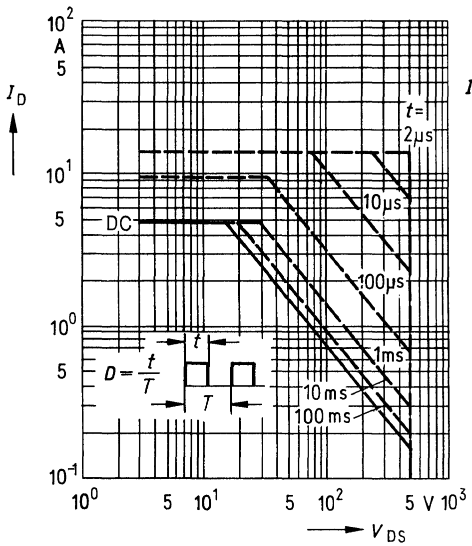
**Power dissipation** $P_D = f(T_{case})$



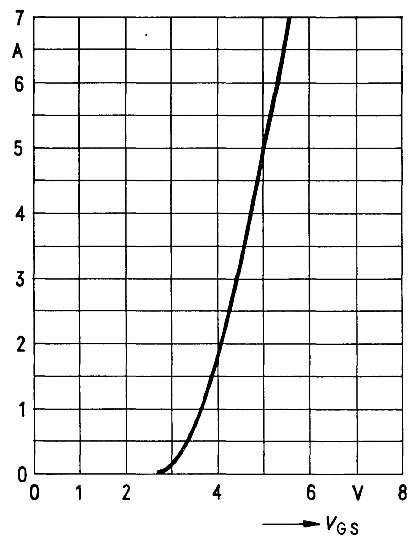

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



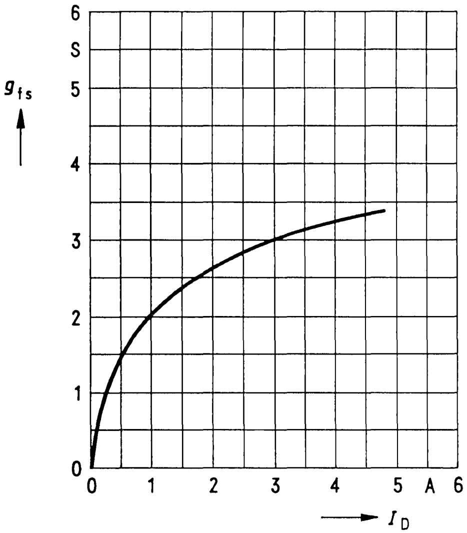

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



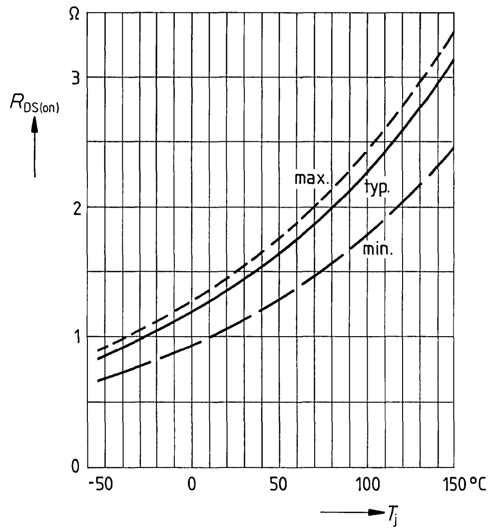

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



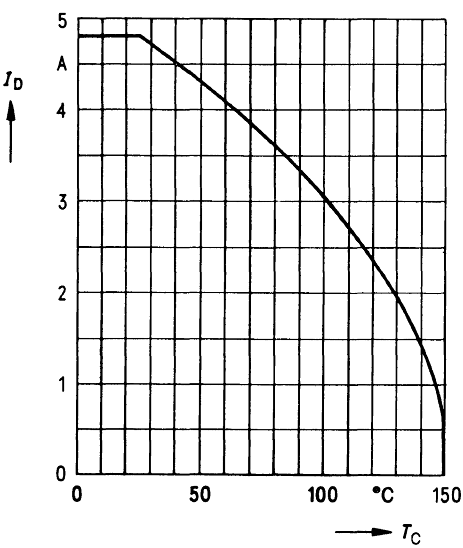
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



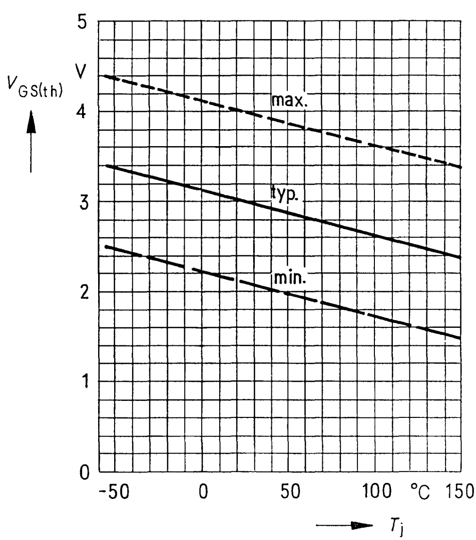

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



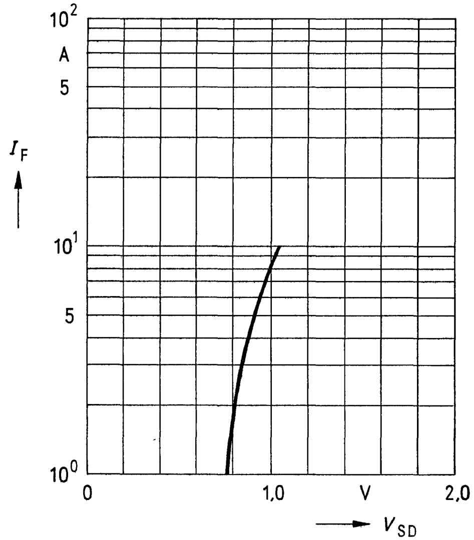

**Continuous drain current** $I_D = f(T_{case})$



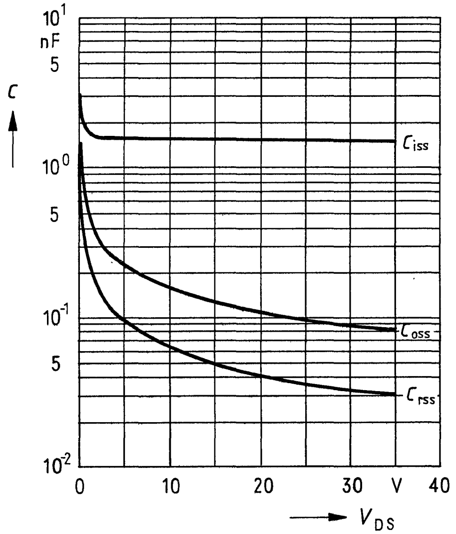

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



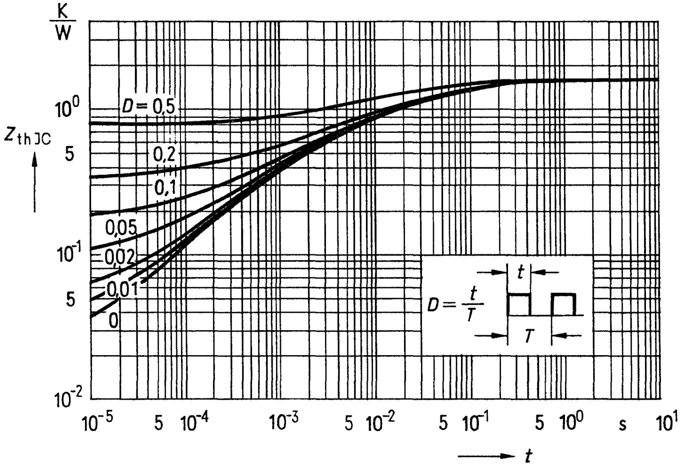
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



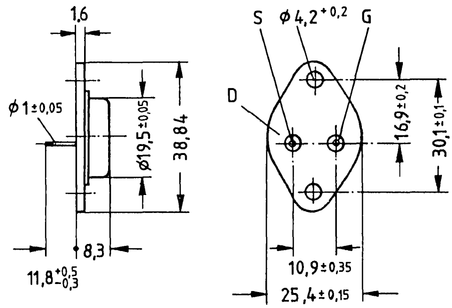

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 45 | C67078-A1008-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 9,6A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 28A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\ (th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\ (on)}$ | – | 0,55 | 0,6 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

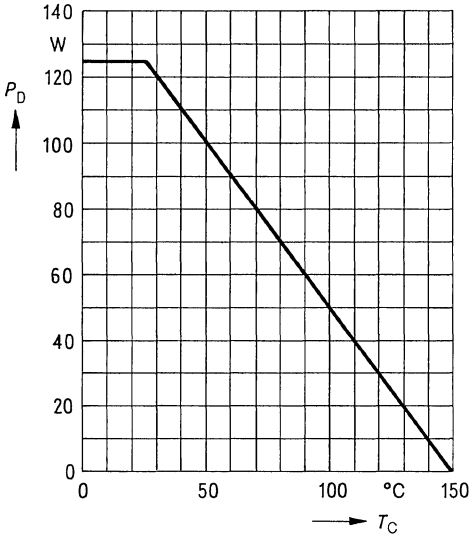
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\ (on)} + t_r$) | $t_{d\ (on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\ (off)} + t_f$) | $t_{d\ (off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

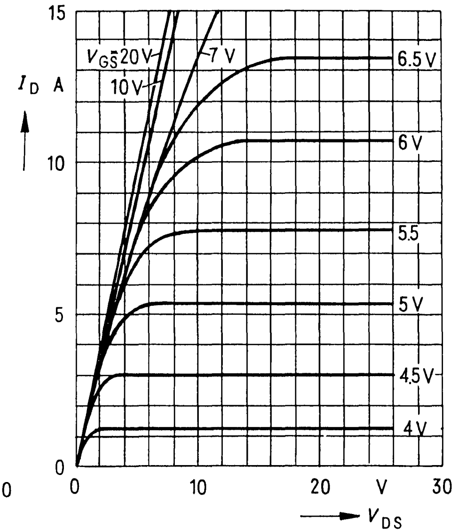
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 9,6 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 28 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

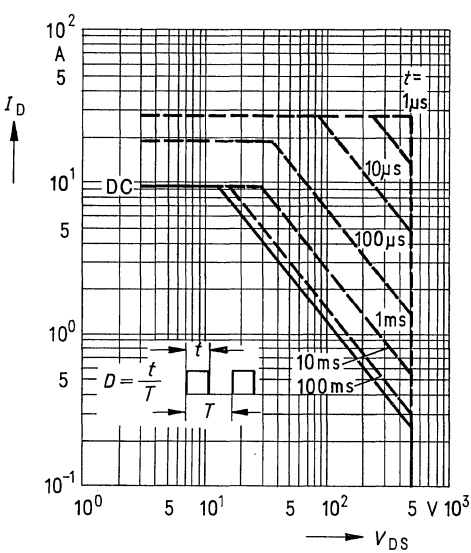
**Power dissipation** $P_D = f(T_{case})$



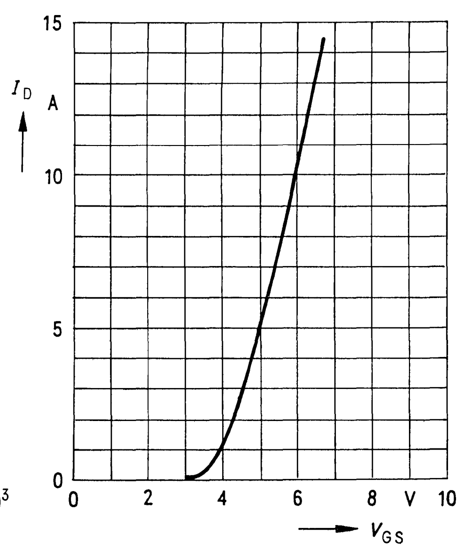

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



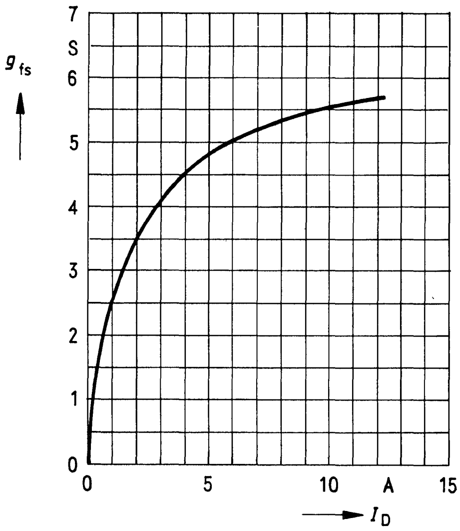

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



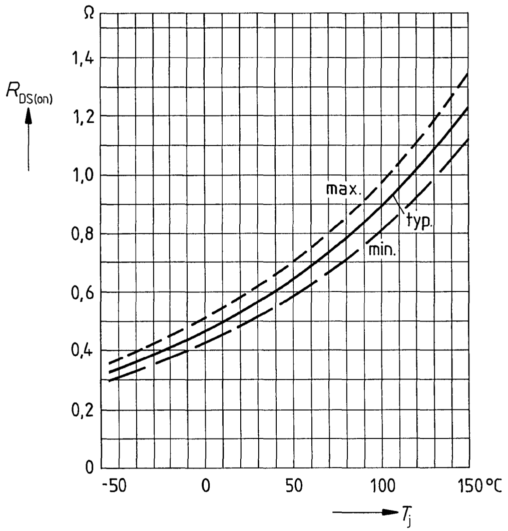

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



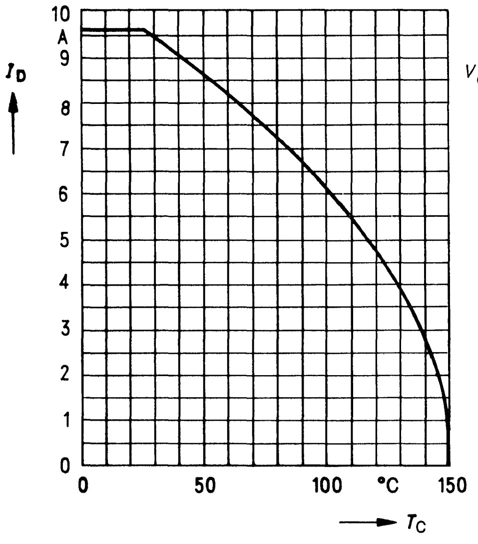
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



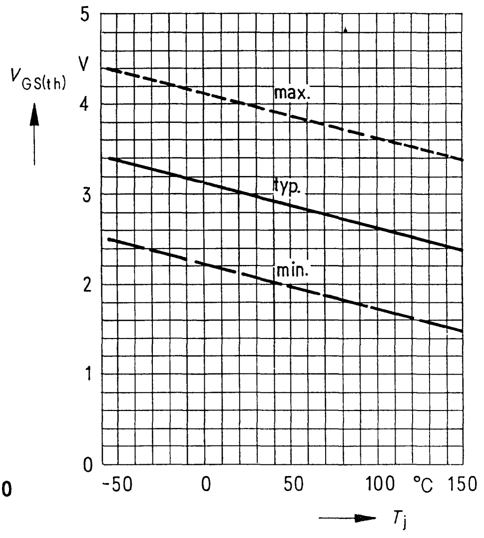

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



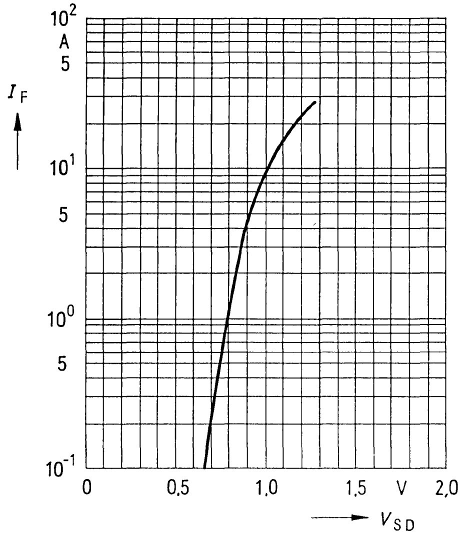

**Continuous drain current** $I_D = f(T_{case})$



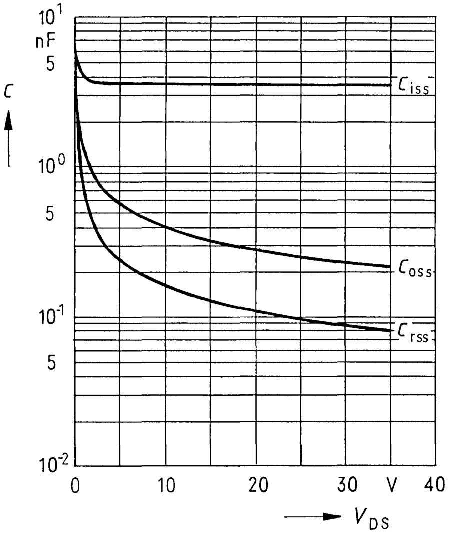

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



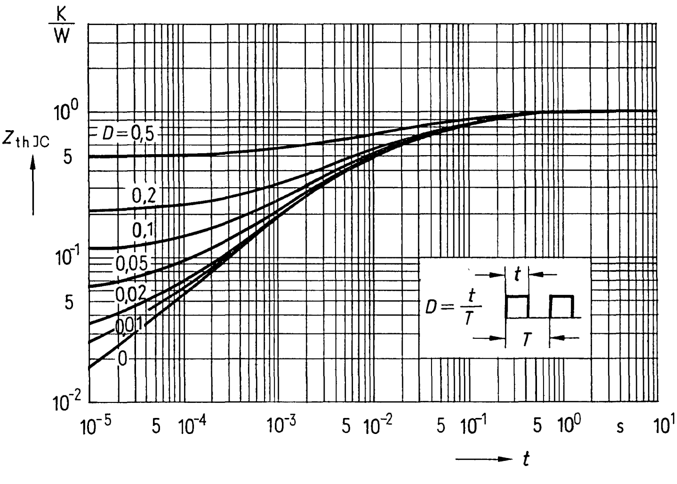
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



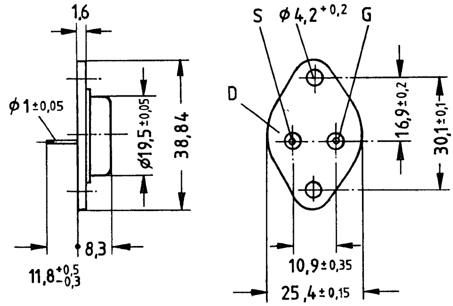

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872,
or TO 204 AA (TO 3) in accordance with JEDEC.
Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 45 A | Q67078-A1008-A3 |



Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case} = 25\,°C$ | $I_D$ | 8,3A |
| Pulsed drain current, $T_{case} = 25\,°C$ | $I_{Dpuls}$ | 24A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤ 1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 0,7 | 0,8 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

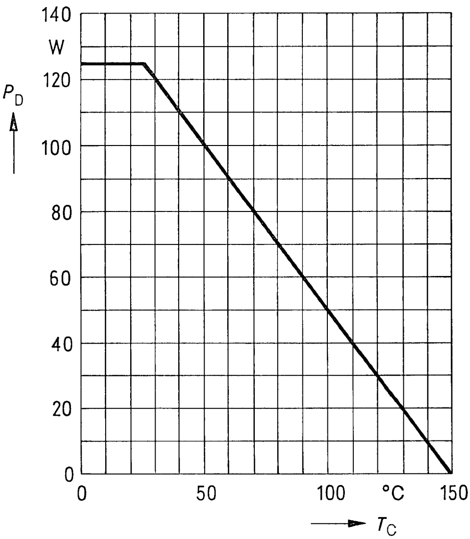
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

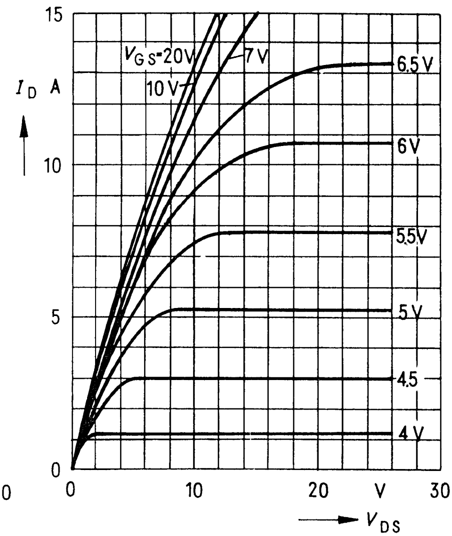
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 8,3 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 24 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,6 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

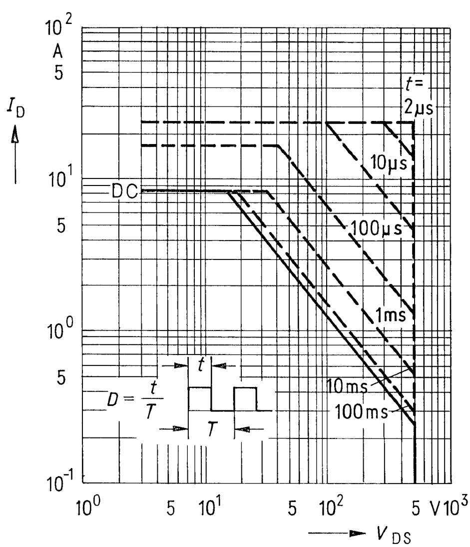
**Power dissipation** $P_D = f\,(T_{case})$



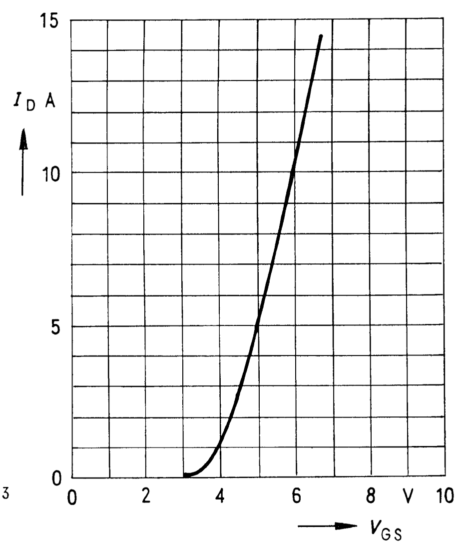

**Typical output characteristics** $I_D = f\,(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



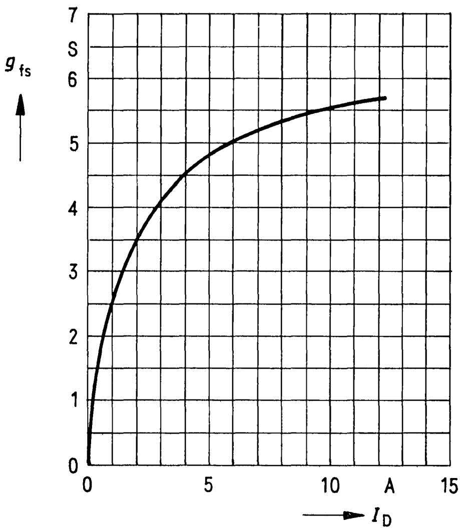

**Safe operating area** $I_D = f\,(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



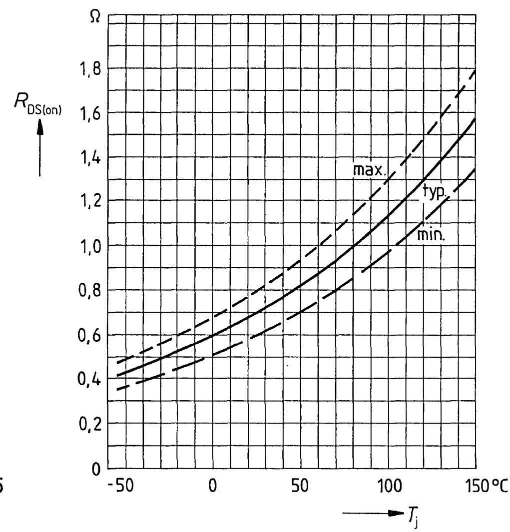

**Typical transfer characteristic** $I_D = f\,(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



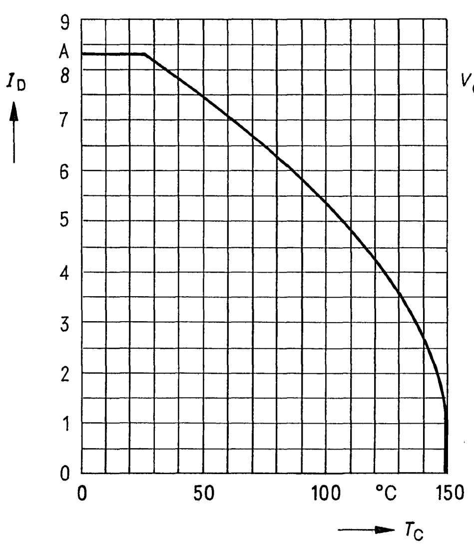
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



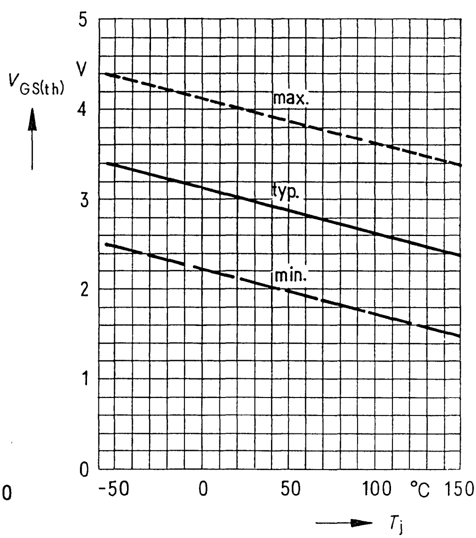

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



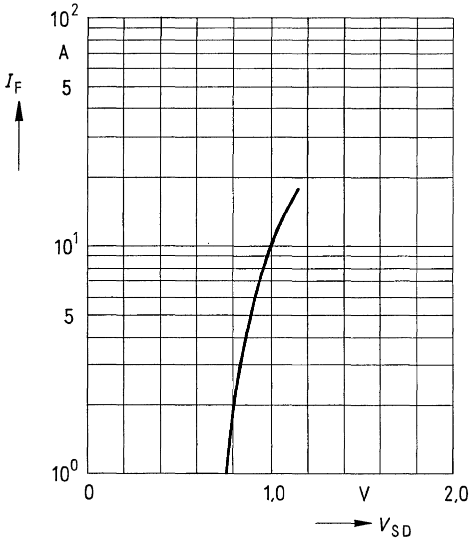

**Continuous drain current** $I_D = f(T_{case})$



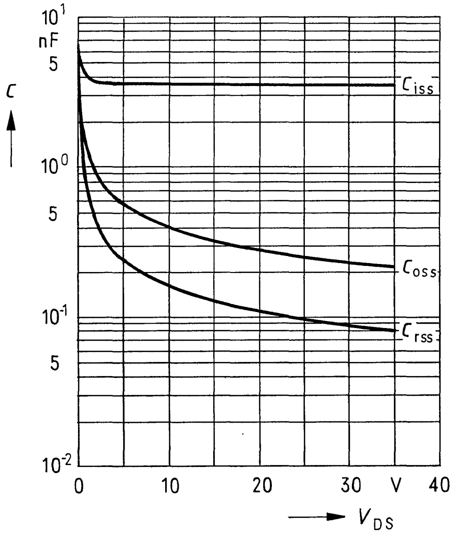

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



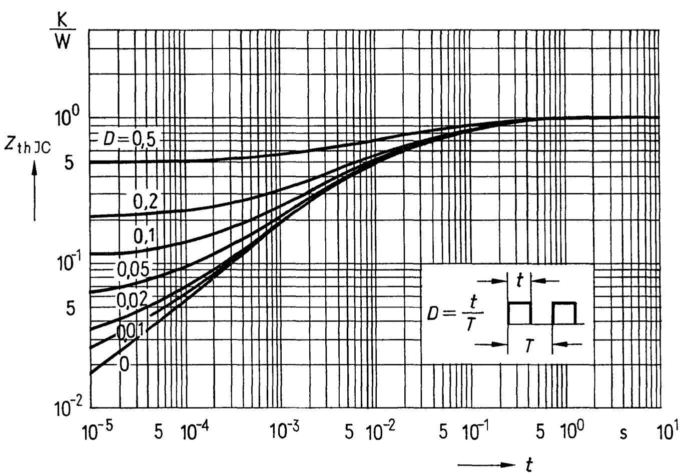
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



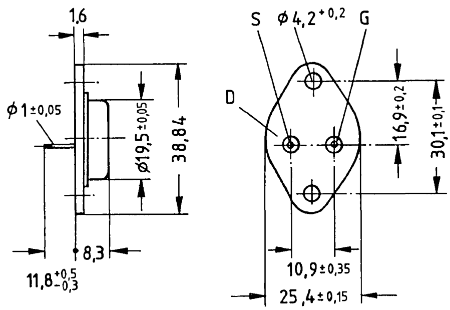

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872,
or TO 204 AA (TO 3) in accordance with JEDEC.
Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 45 B | C67078-A1008-A4 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 10A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 30A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

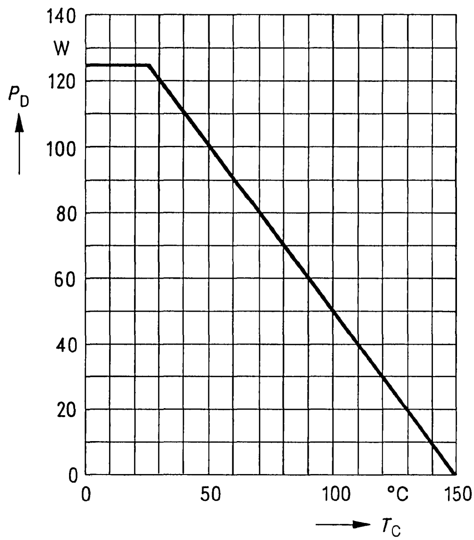
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3,5 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

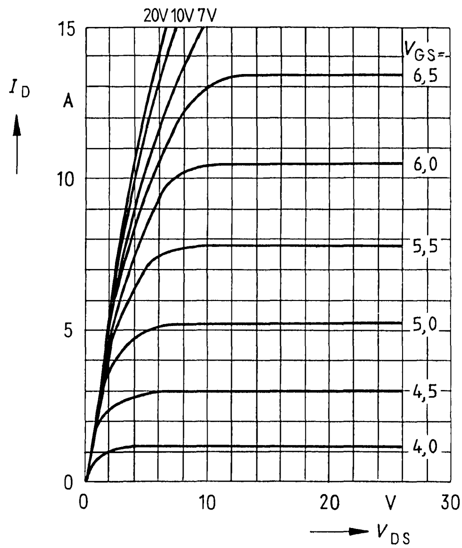
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 10 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 30 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

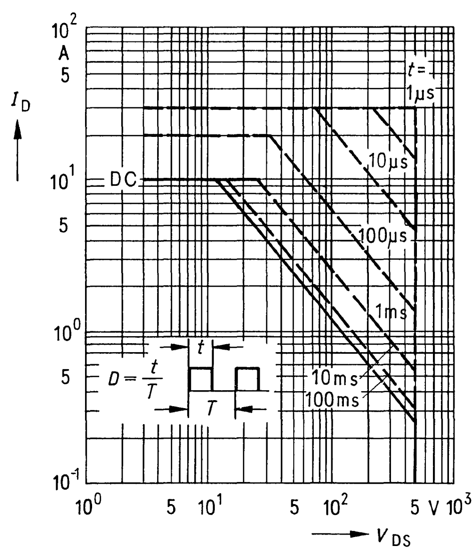
**Power dissipation** $P_D = f(T_{case})$



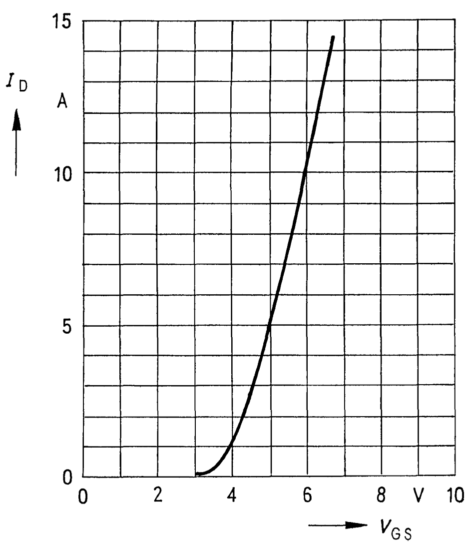

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



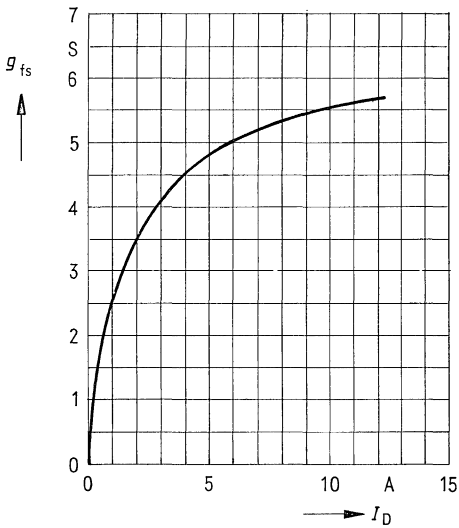

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



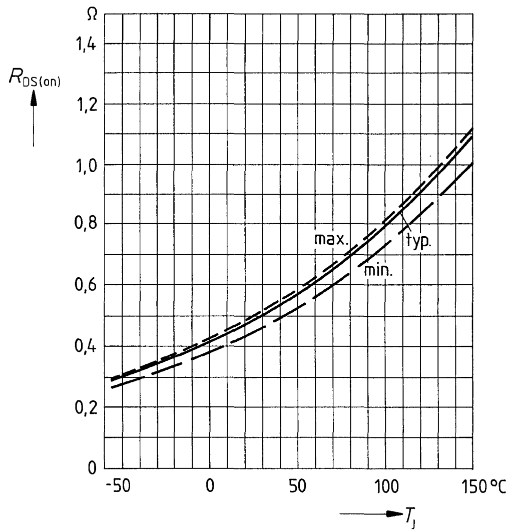

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



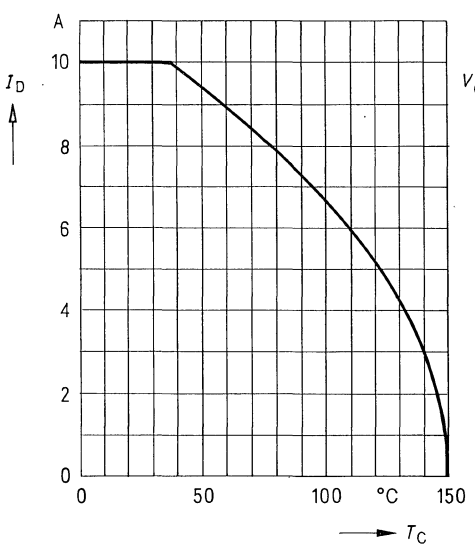
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



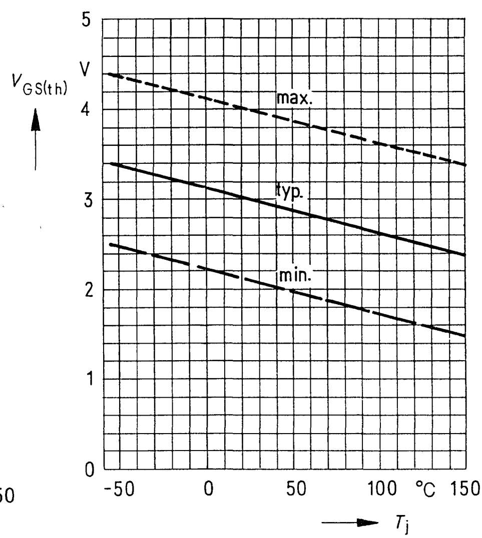

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



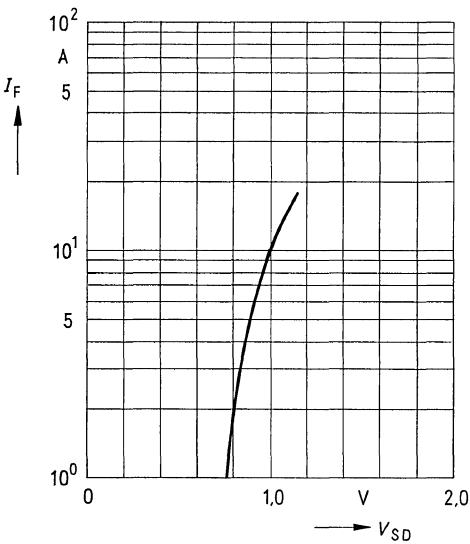

**Continuous drain current** $I_D = f(T_{case})$



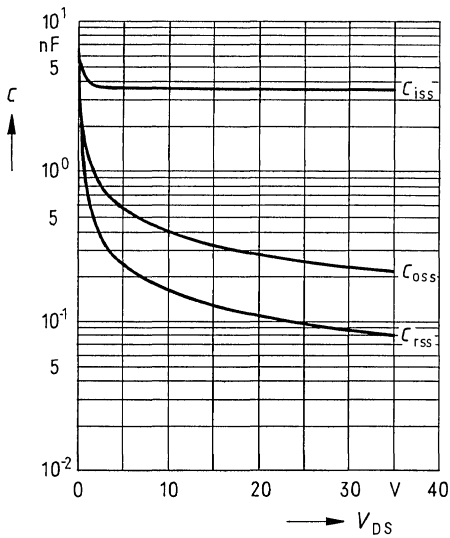

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



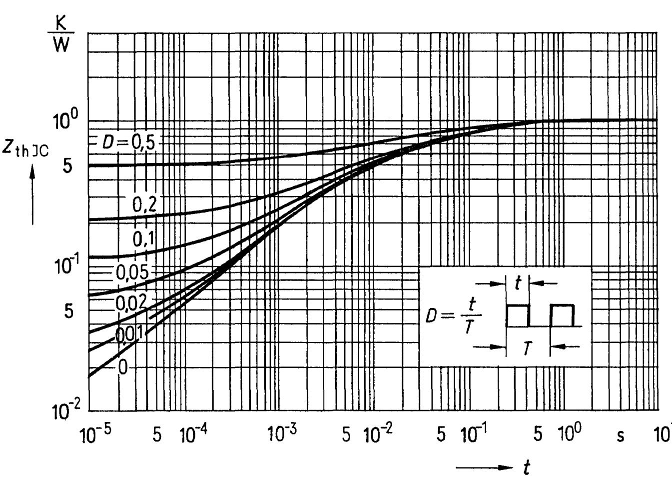
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz

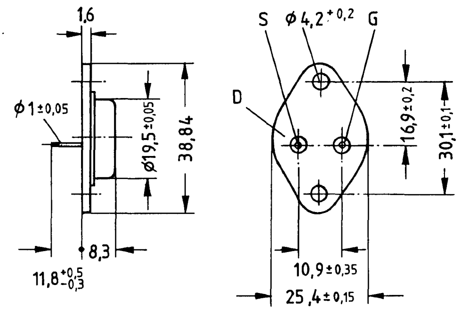



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 46 | C67078-A1015-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 4,2A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 12A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 1,8 | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

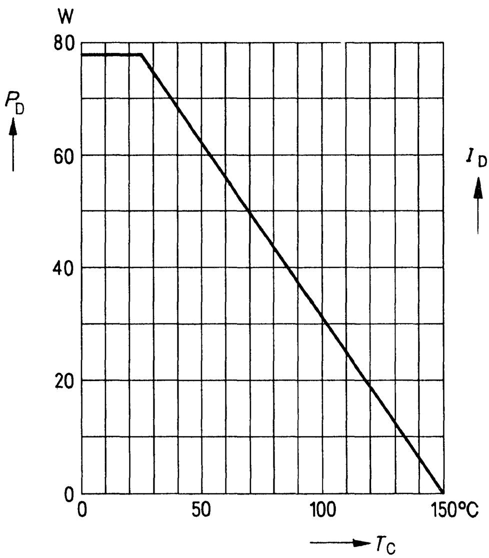
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,5 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

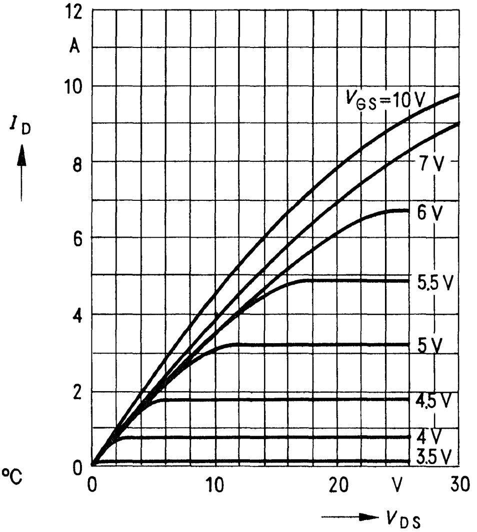
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,2 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 12 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 6,0 | – | µC | |

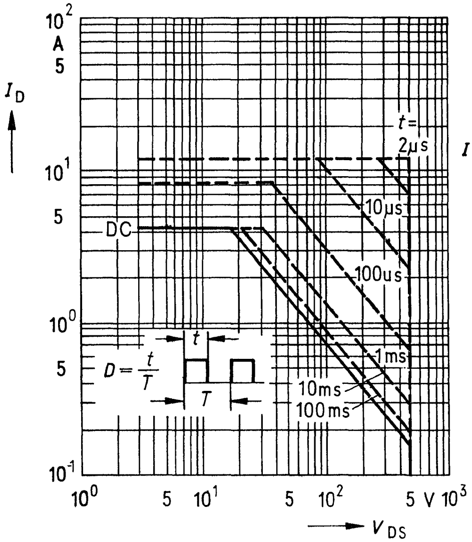
**Power dissipation** $P_D = f(T_{case})$



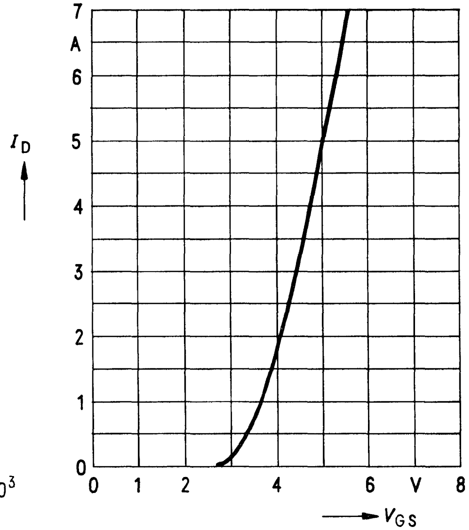

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 μs pulse test,
$T_{case} = 25\,°C$



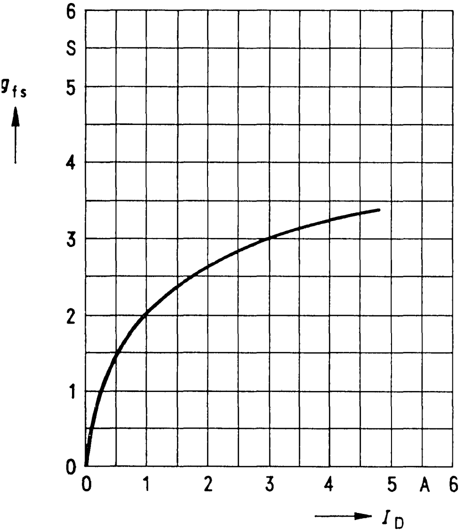

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



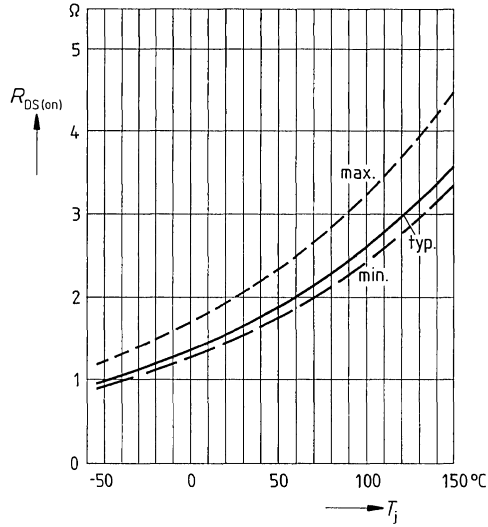

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 μs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



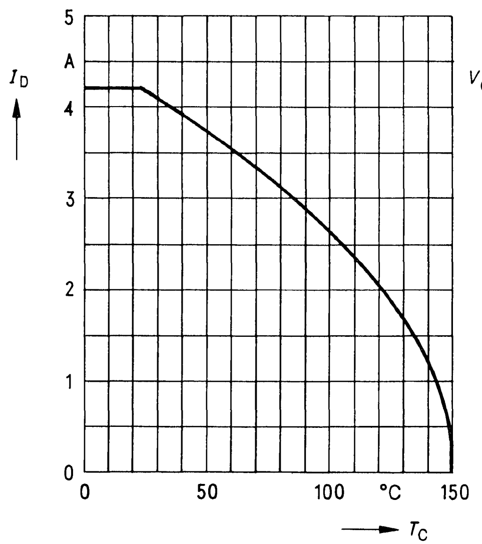
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



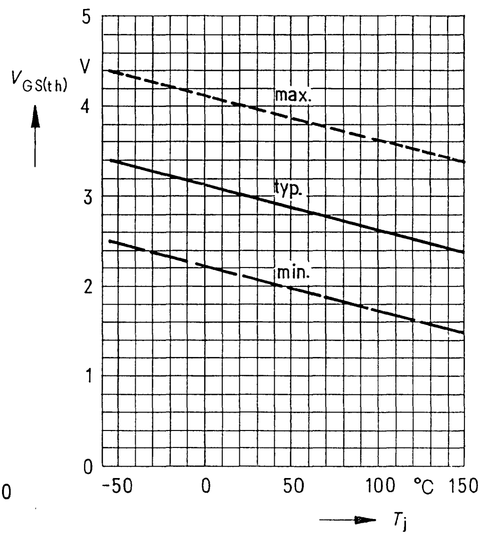

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



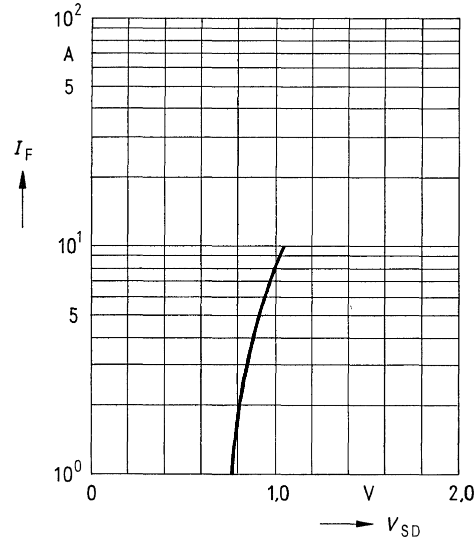

**Continuous drain current** $I_D = f(T_{case})$



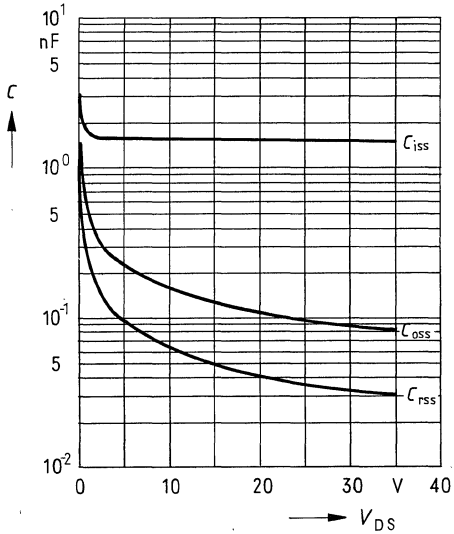

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



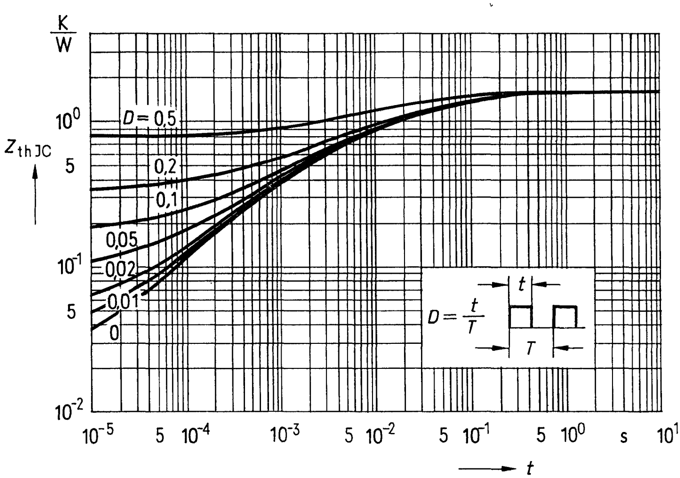
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1\ MHz$

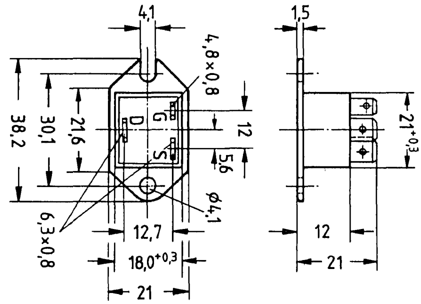



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 48 | C67078-A1605-A2 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 7,8A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 23A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500Vdc[1]) |
| **Thermal resistance** | $R_{th\,JA}$ | – |
| | $R_{th\,JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,6 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

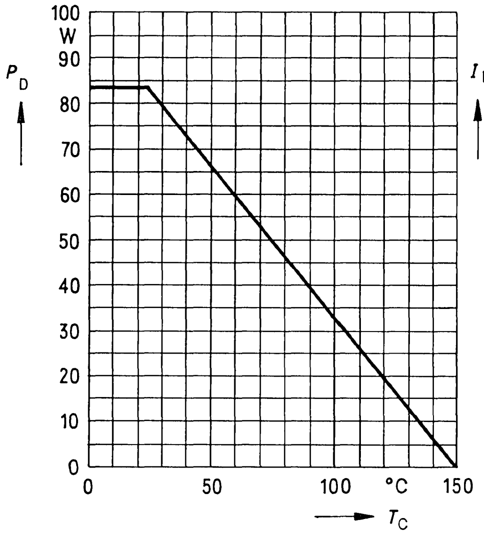
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

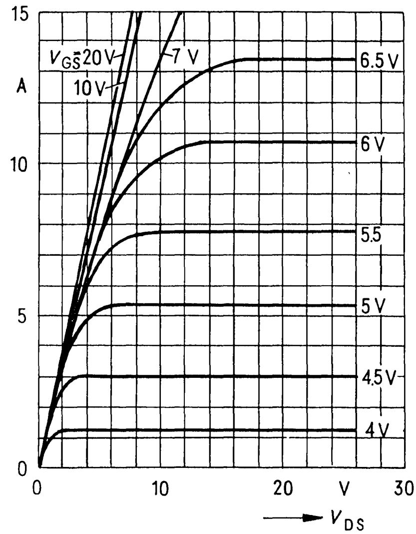
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 7,8 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 23 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,6 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/μs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | μC | |

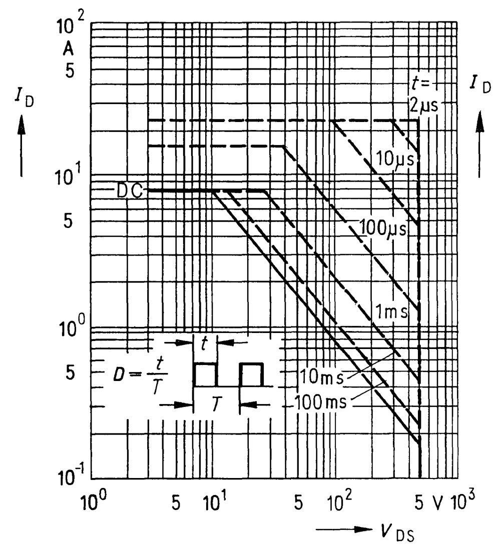
**Power dissipation** $P_D = f(T_{case})$



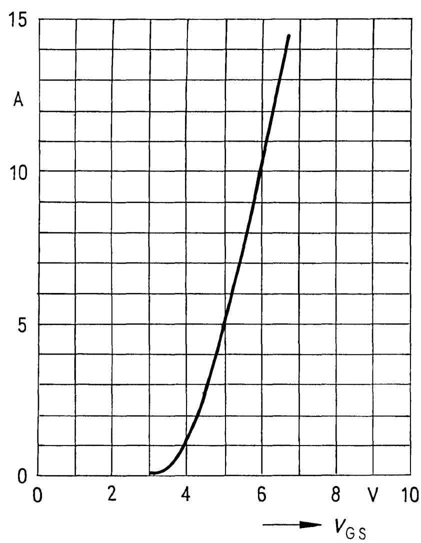

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



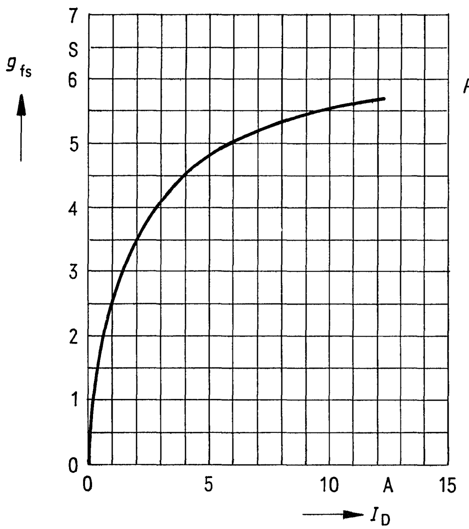

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



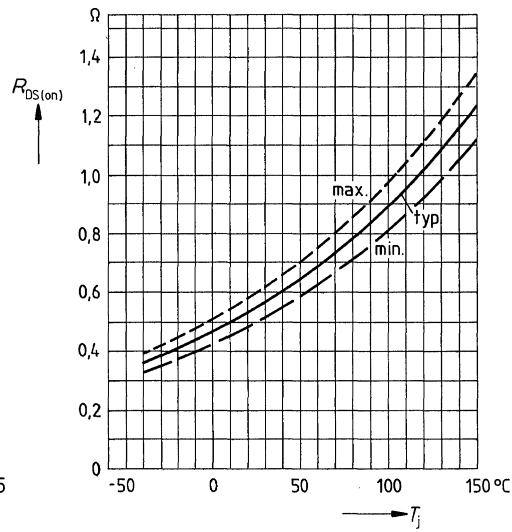

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



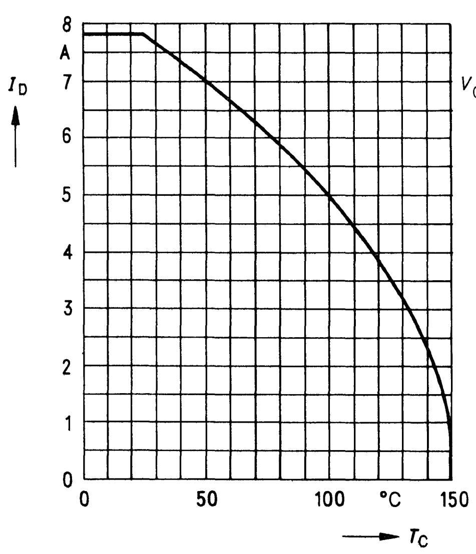
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



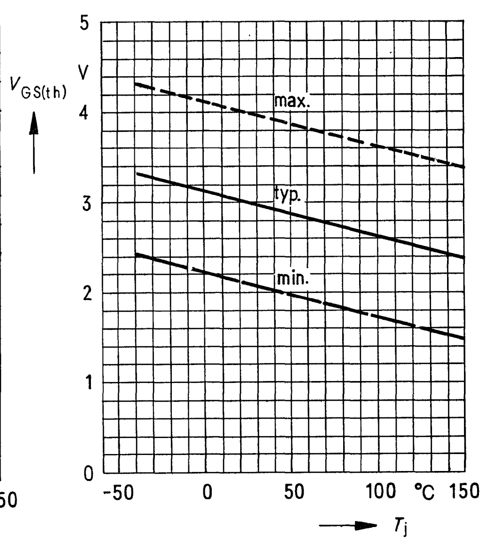

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



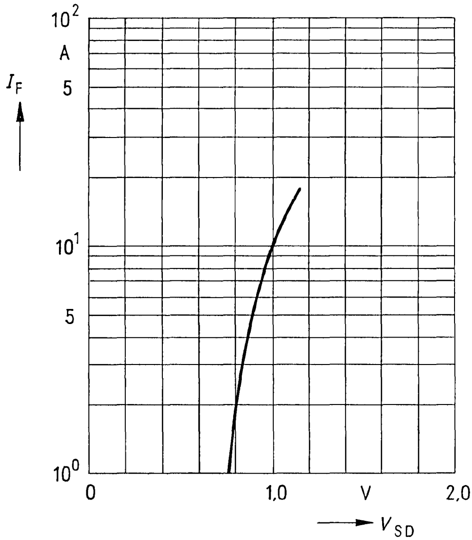

**Continuous drain current** $I_D = f(T_{case})$



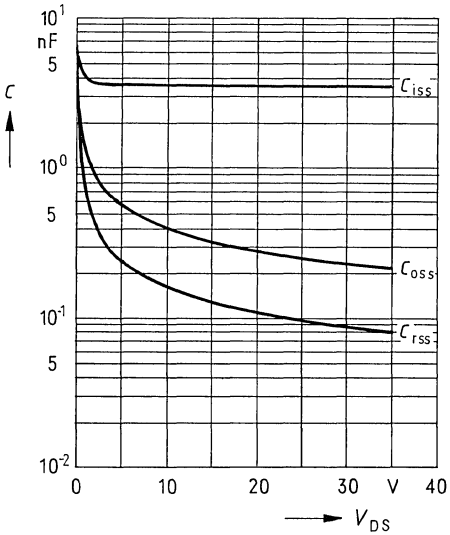

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



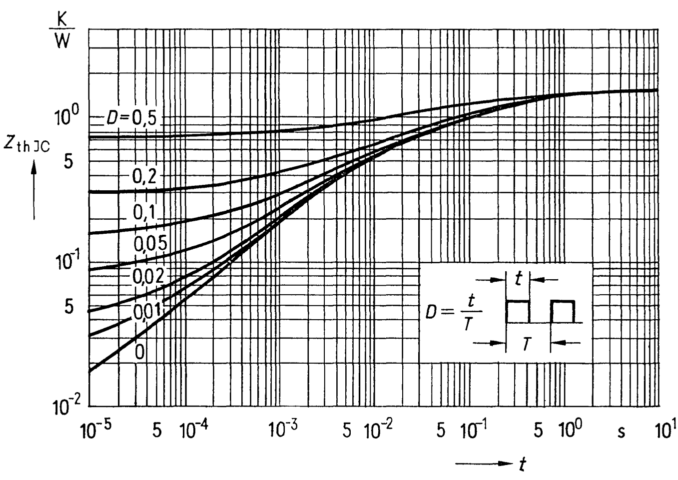
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



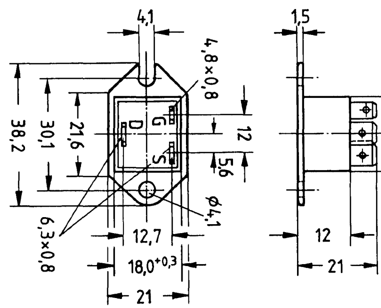

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 48 A | C67078-A1605-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 6,8A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 20A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500Vdc[1] |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,8 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

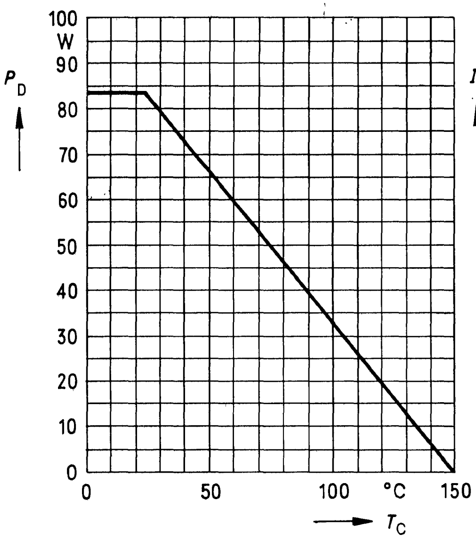
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 5,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

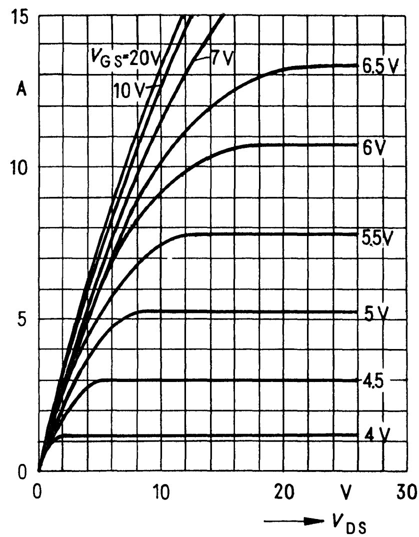
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 6,8 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 20 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,55 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

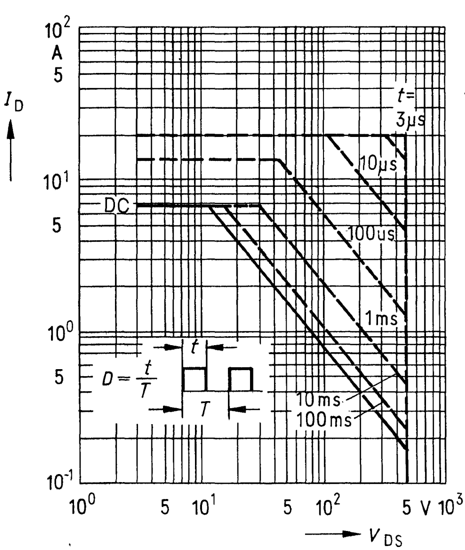
**Power dissipation** $P_D = f(T_{case})$



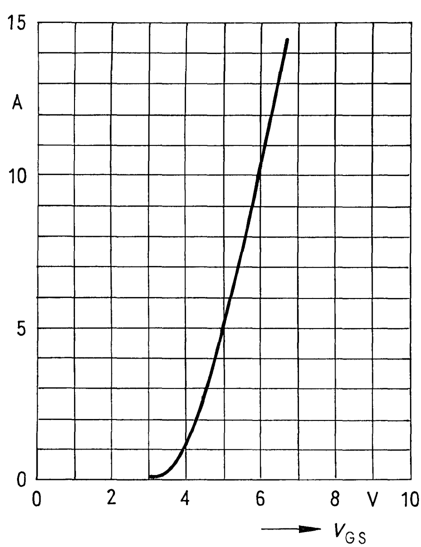

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



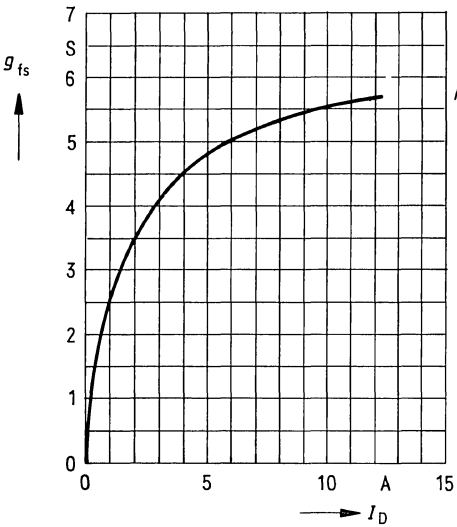

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



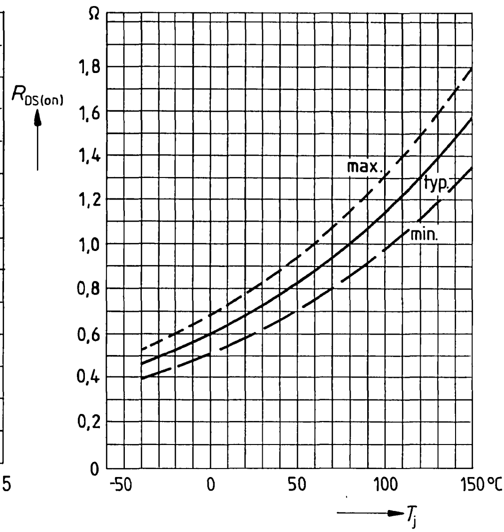

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



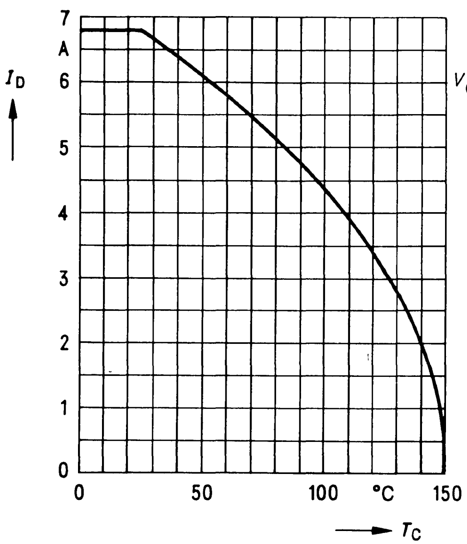
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25°C



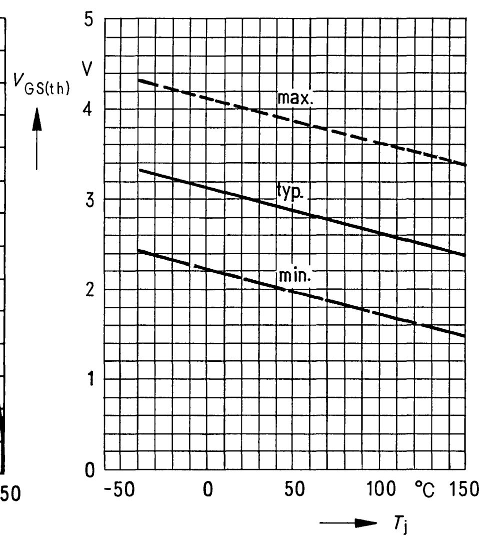

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



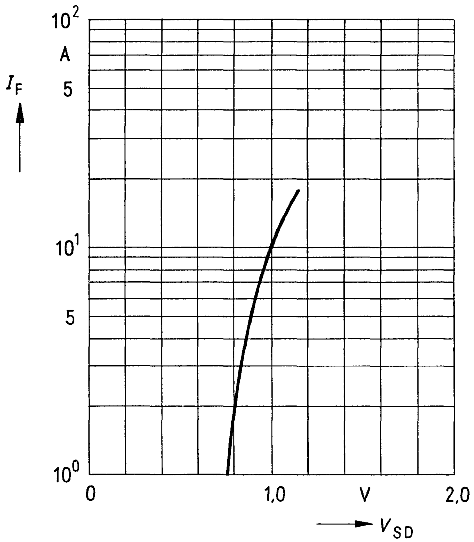

**Continuous drain current** $I_D = f(T_{case})$



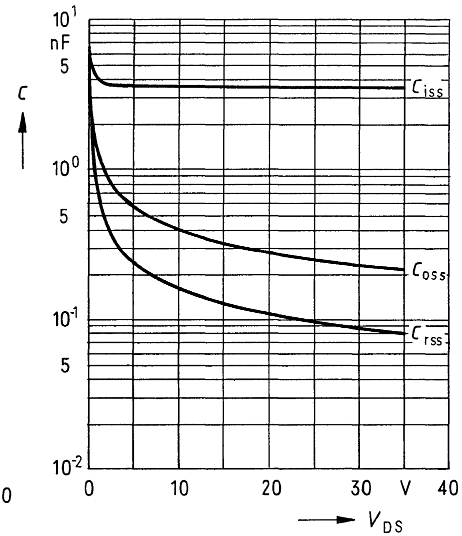

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 10 mA



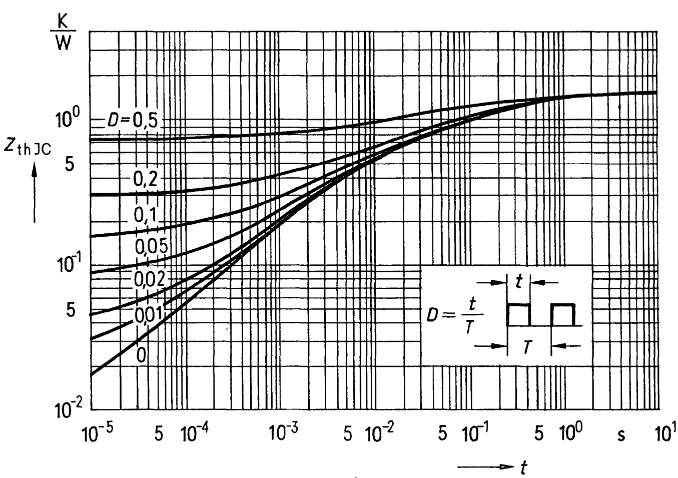
**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



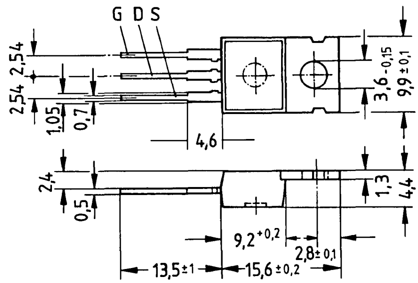

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 50 A | C67078-A1307-A3 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 2,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 5,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

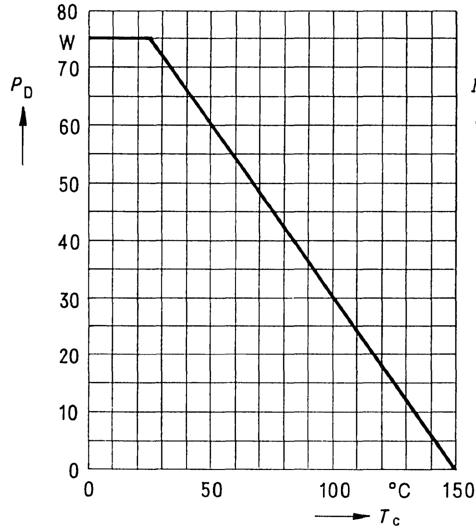
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,7 | 1,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

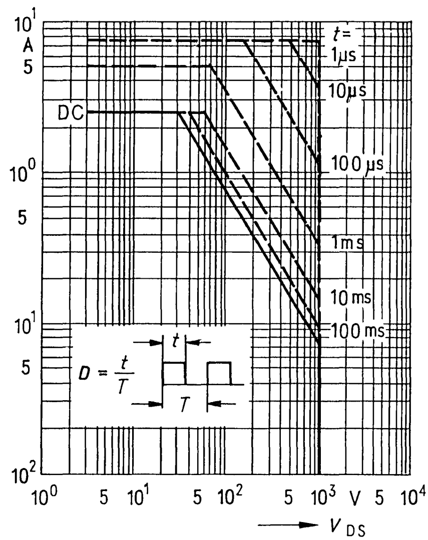
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2500 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 250 | – | µC | |

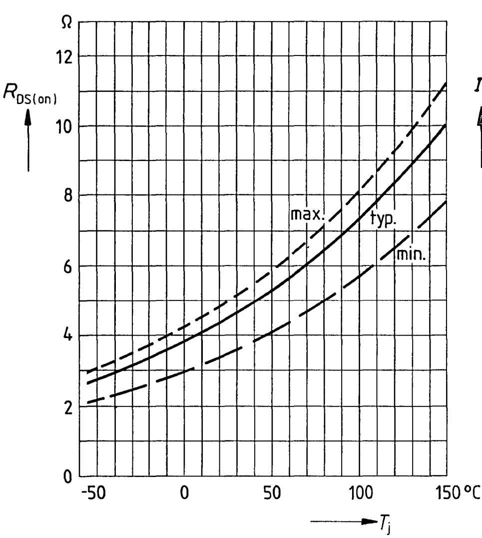
**Power dissipation** $P_D = f(T_{case})$



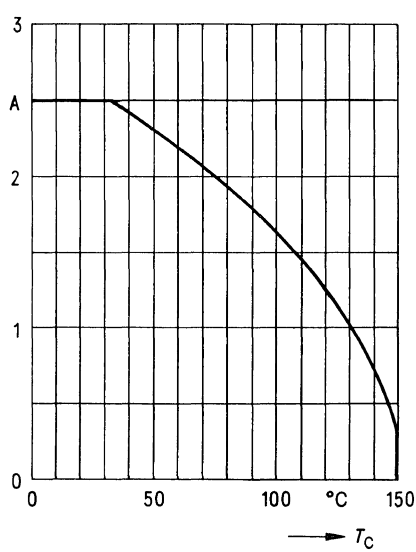

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



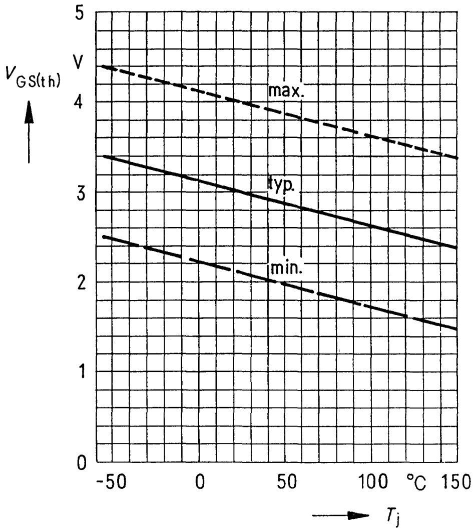

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



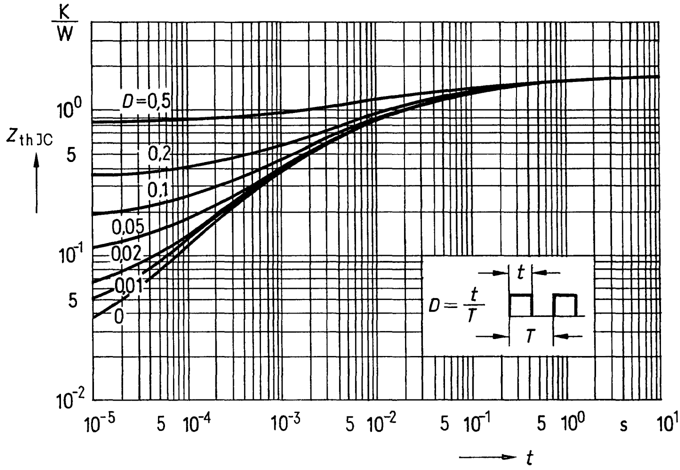

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



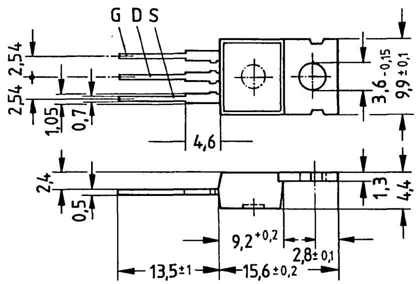

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 50 B | C67078-A1307-A4 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 2A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 6A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | <1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 8,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

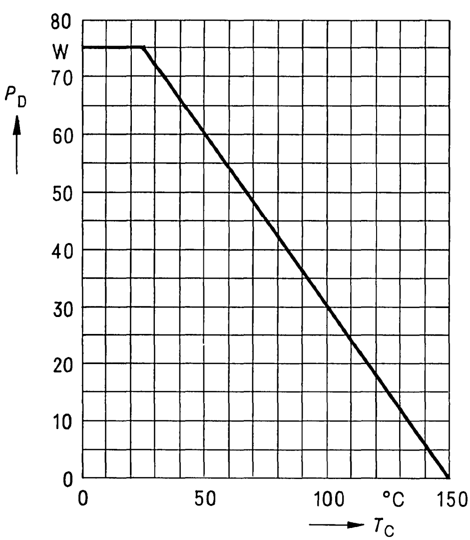
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,7 | 1,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 1,7A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

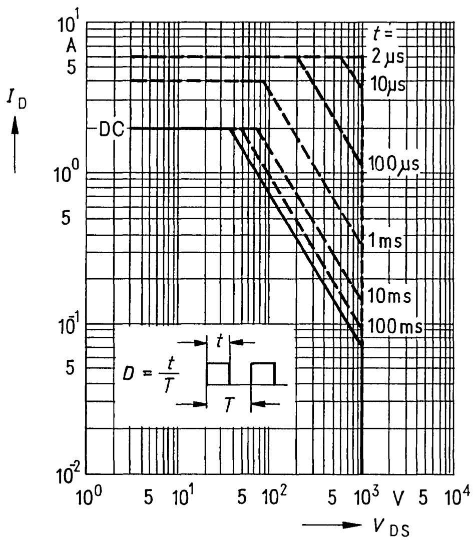
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 6 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,30 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 15 | – | µC | |

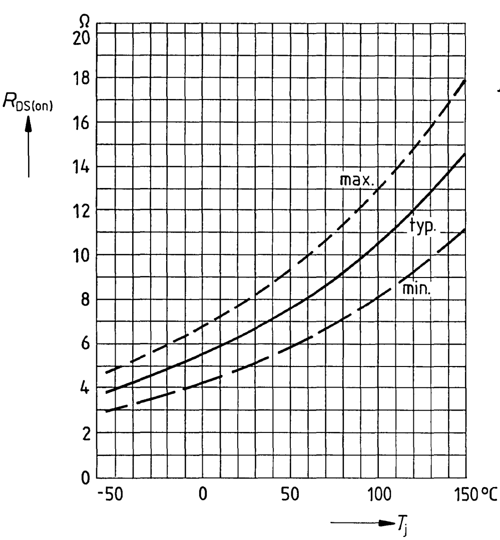
**Power dissipation** $P_D = f(T_{case})$



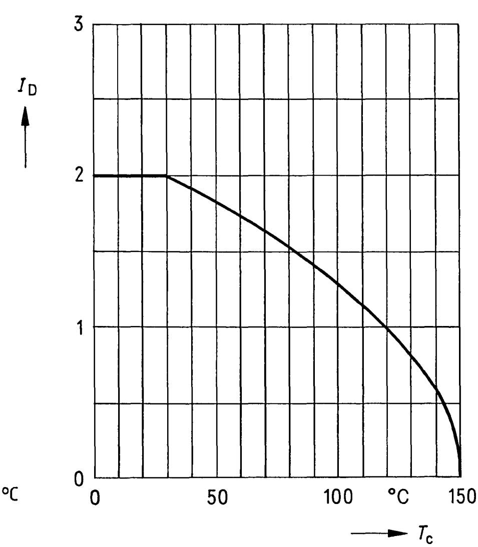

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



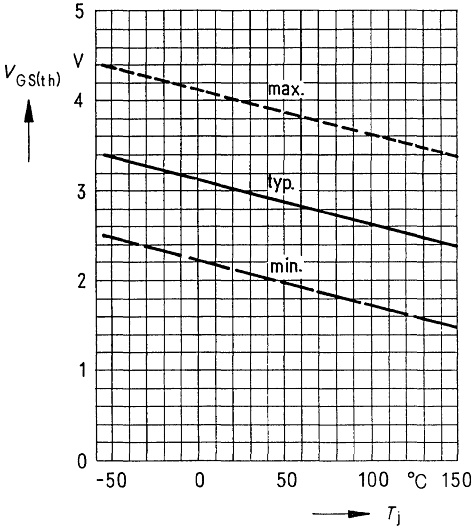

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
**(spread)**



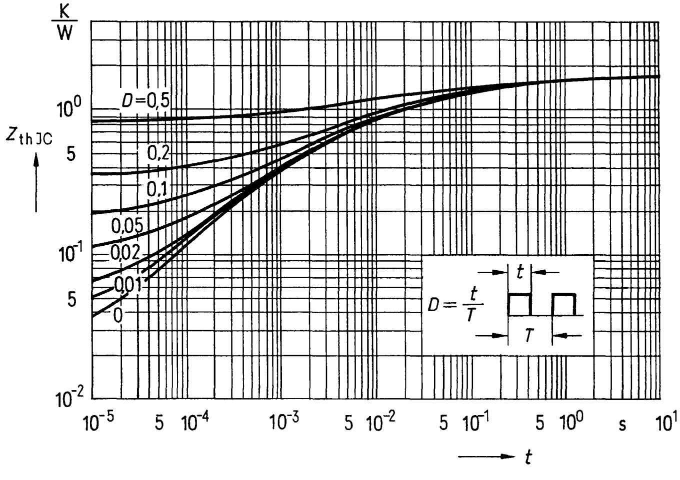

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA

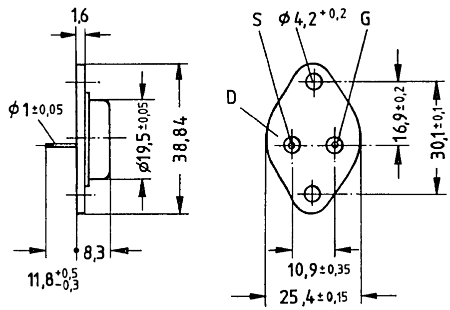



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 53 A | C67078-A1009-A3 |




Dimensions in mm

## Absolute maximum ratings

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 2,6A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 5,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

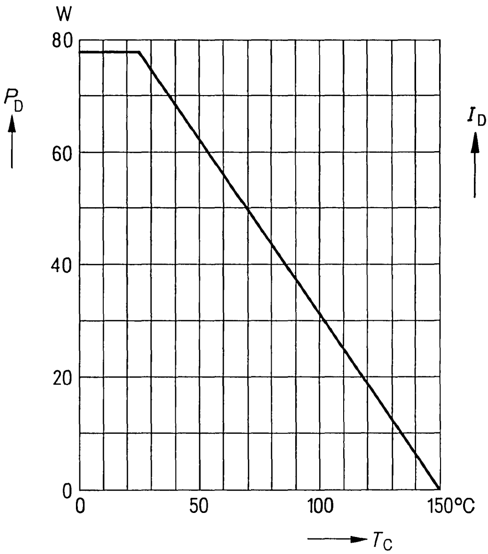
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,7 | 1,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

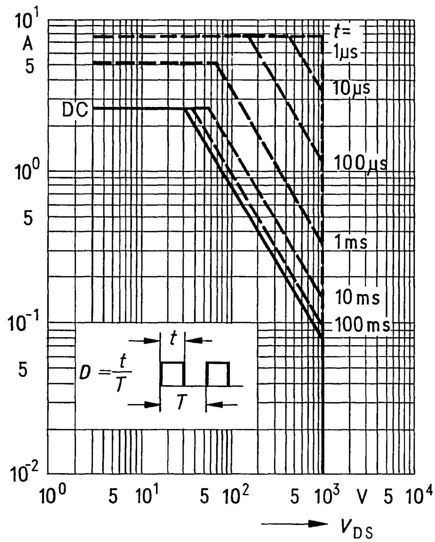
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,6 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 15 | – | µC | |

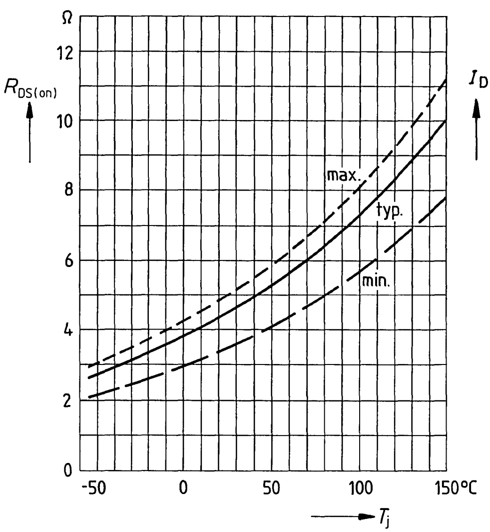
**Power dissipation** $P_D = f(T_{case})$



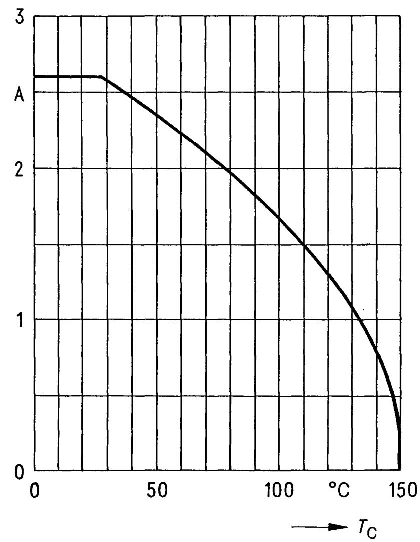

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



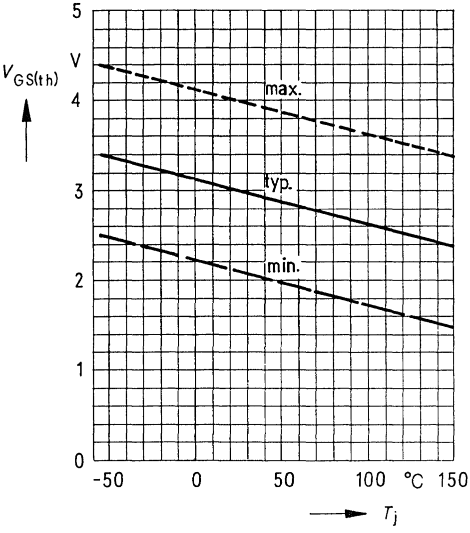

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



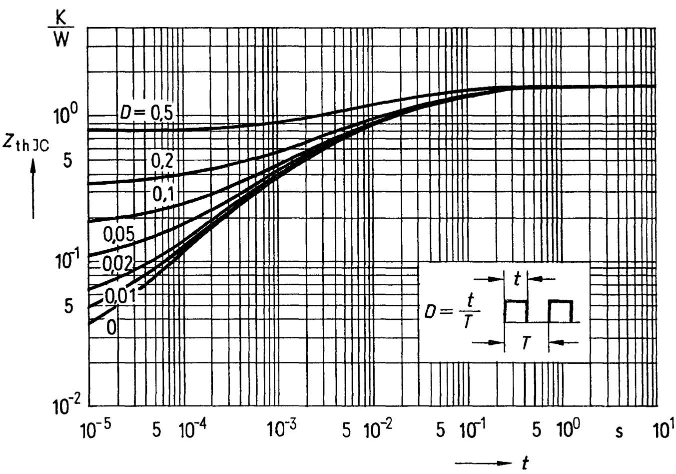

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



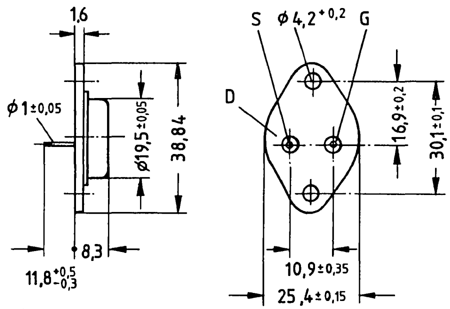

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 54 | C67078-A1010-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 5,3A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 15A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

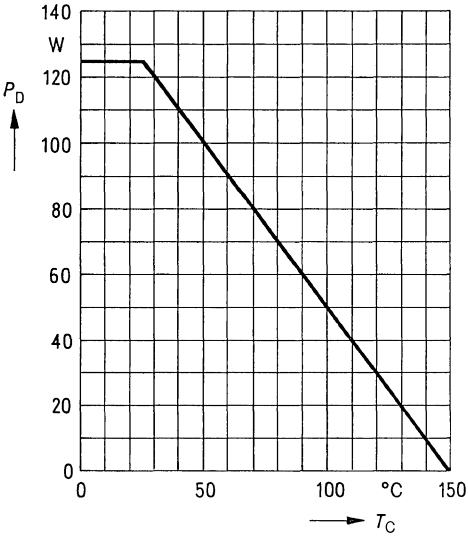
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,4 | 2,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 140 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

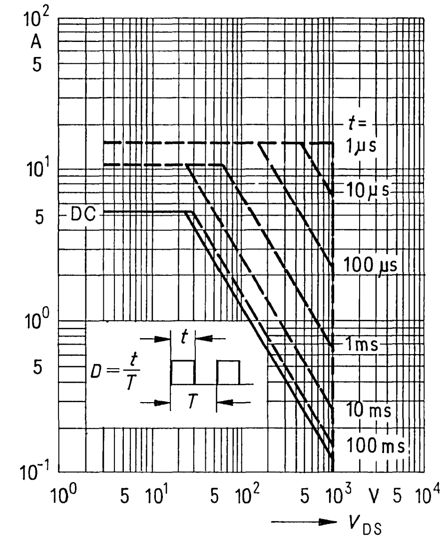
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 5,3 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 15 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 30 | – | µC | |

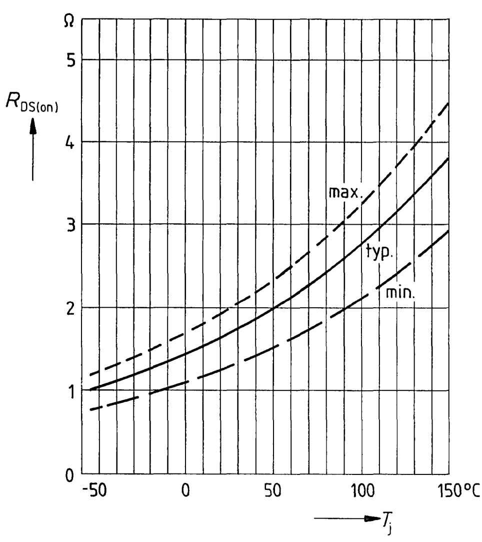
**Power dissipation** $P_D = f(T_{case})$



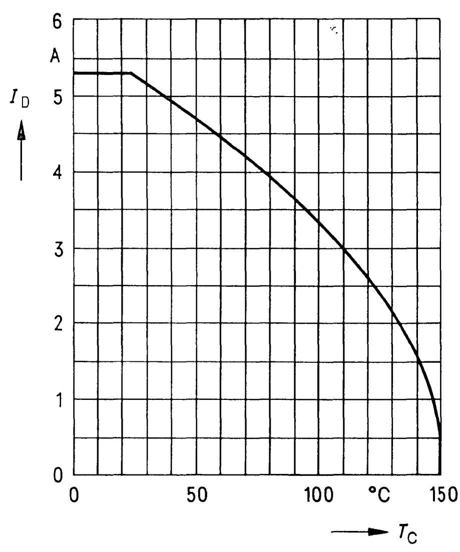

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



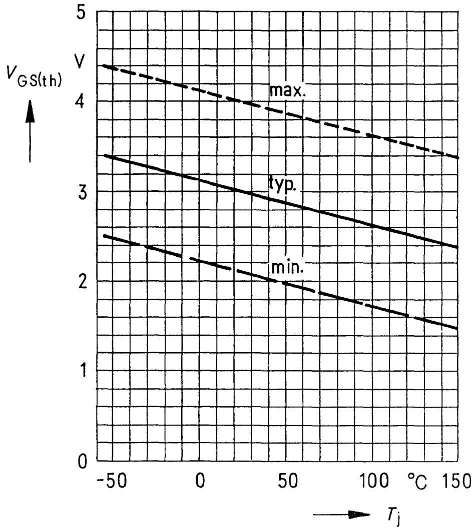

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



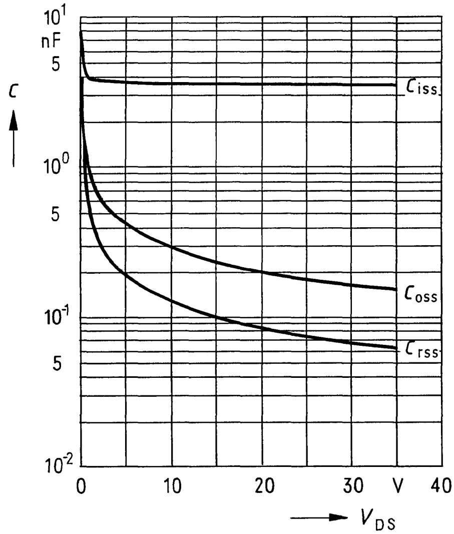

**Continuous drain current** $I_D = f(T_{case})$



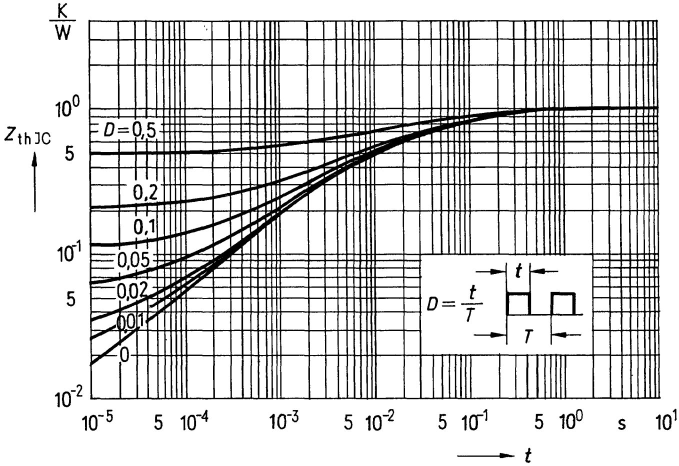
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



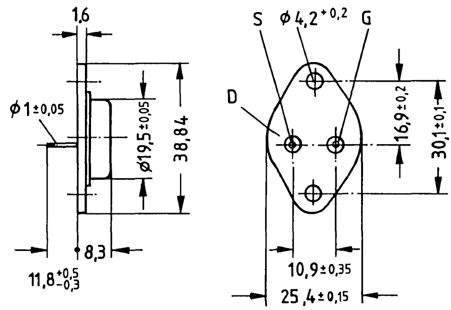

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872,
or TO 204 AA (TO 3) in accordance with JEDEC.
Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 54 A | C67078-A1010-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS} = 20$ kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case} = 25\,°C$ | $I_D$ | 4,6A |
| Pulsed drain current, $T_{case} = 25\,°C$ | $I_{Dpuls}$ | 13A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t = 1$ min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,6 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

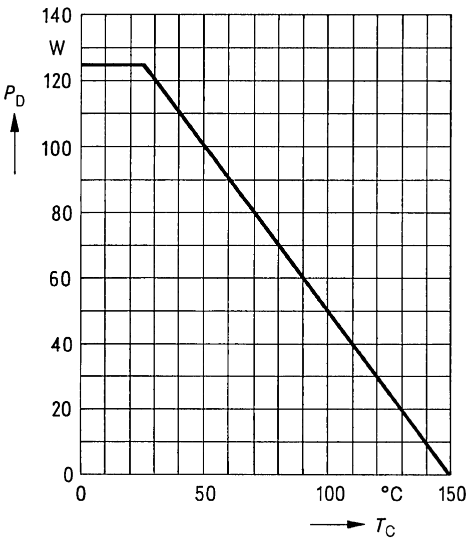
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,4 | 2,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,4A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 140 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

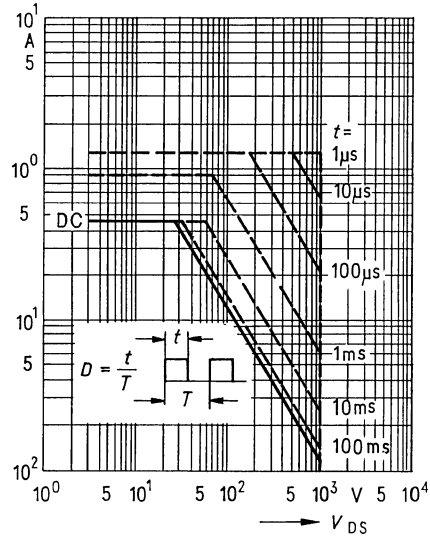
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,6 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 13 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 30 | – | µC | |

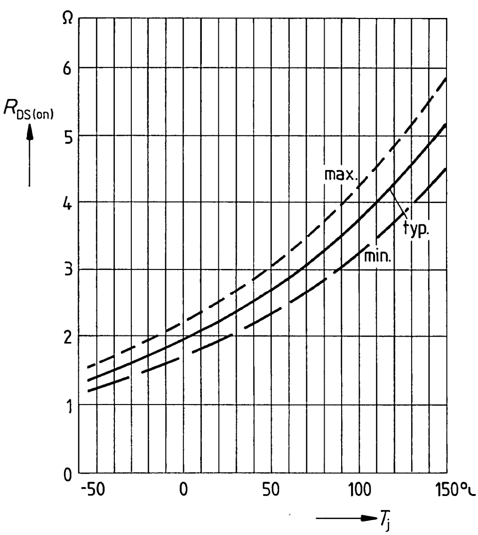
**Power dissipation** $P_D = f(T_{case})$



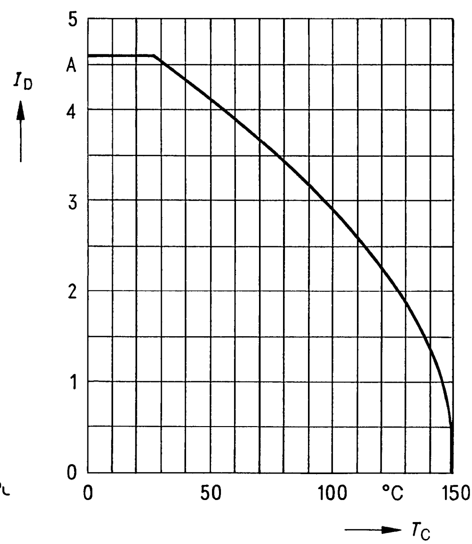

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



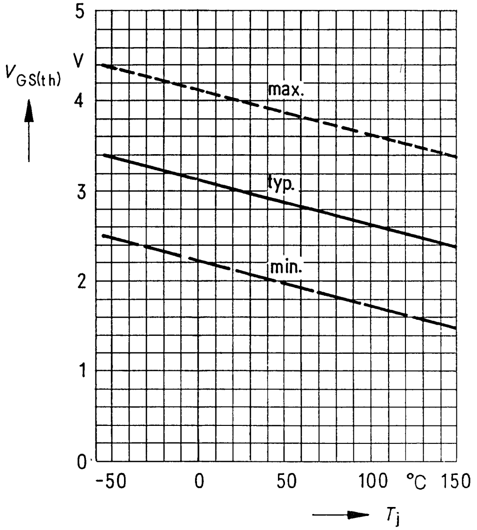

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



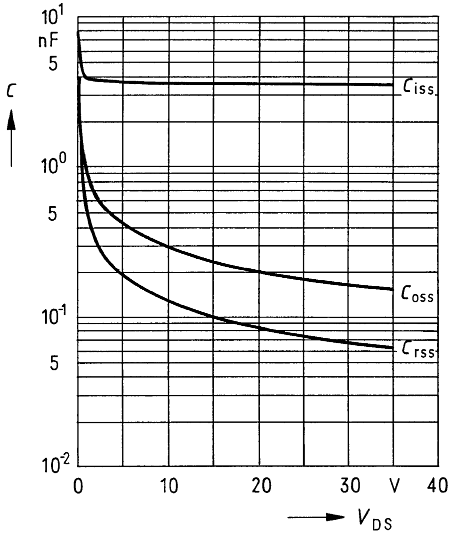

**Continuous drain current** $I_D = f(T_{case})$



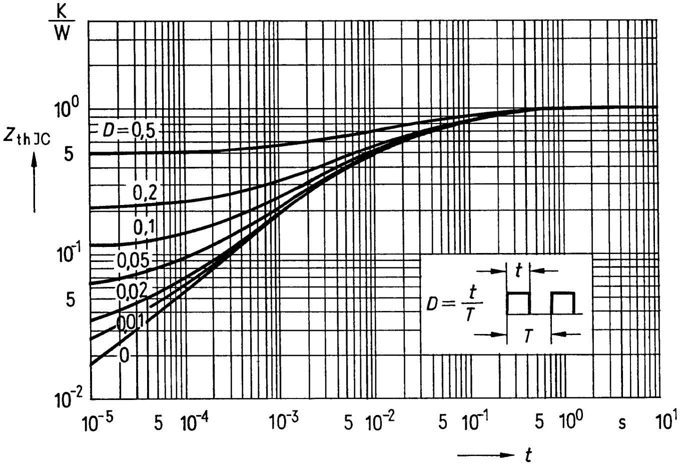
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



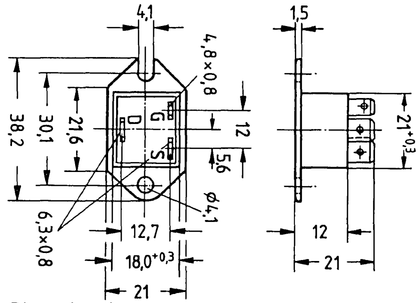

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 57 A | C67078-A1606-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 2,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 70W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 3500Vdc[1]) |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,78K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 4,5 | 5,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

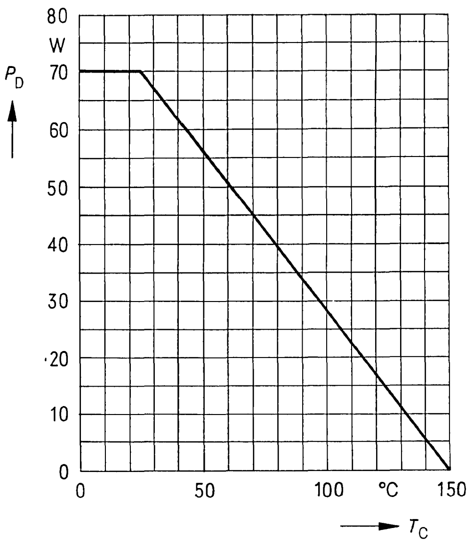
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 0,7 | 1,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

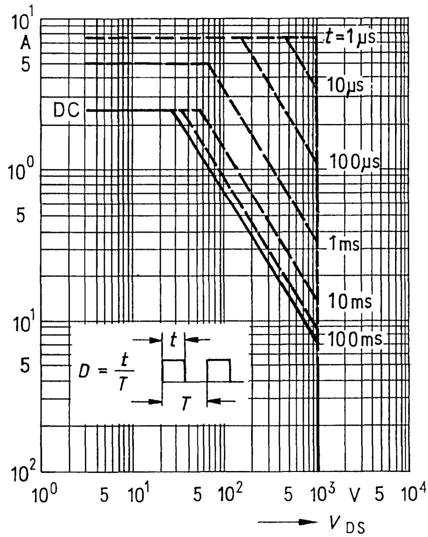
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,25 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 15 | – | µC | |

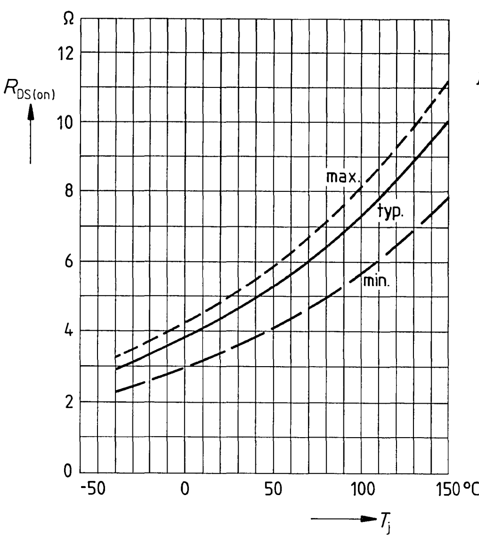
**Power dissipation** $P_D = f(T_{case})$



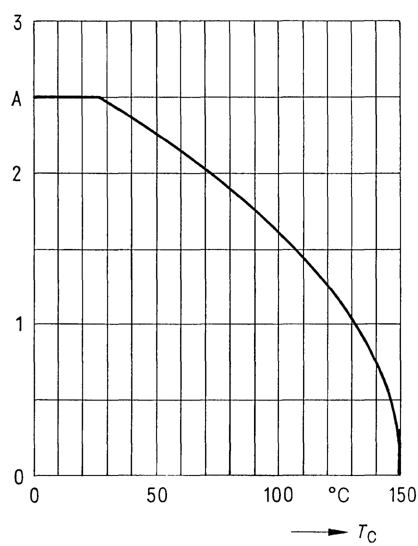

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



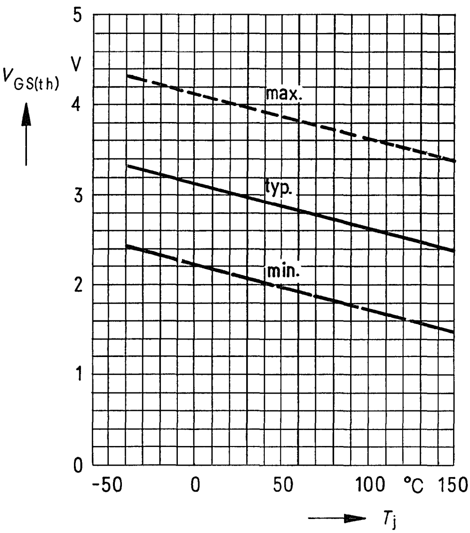

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



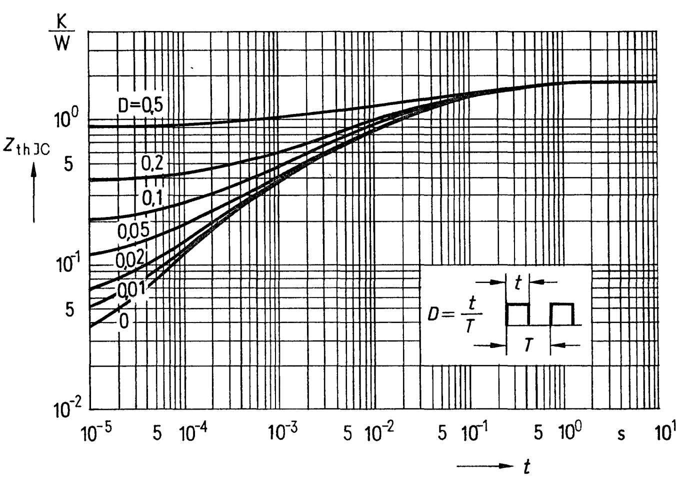

**Continuous drain current** $I_D = f(T_{case})$



**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



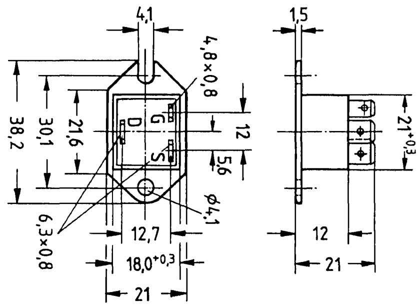

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
| --- | --- |
| BUZ 58 | C67078-A1607-A2 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
| --- | --- | --- |
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 4,3A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 12A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −40 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 3500Vdc[1]) |
| **Thermal resistance** | $R_{th\,JA}$ | – |
| | $R_{th\,JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,1 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

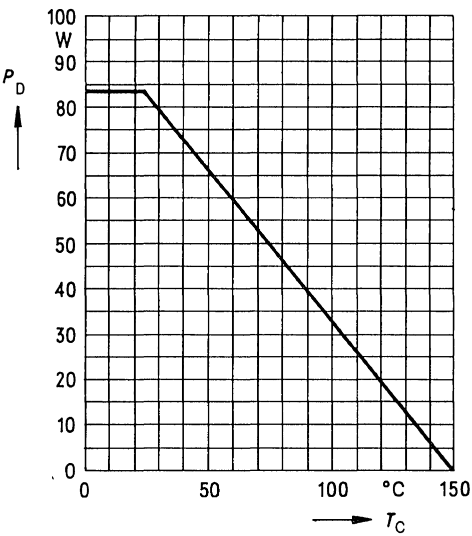
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,4 | 2,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 140 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

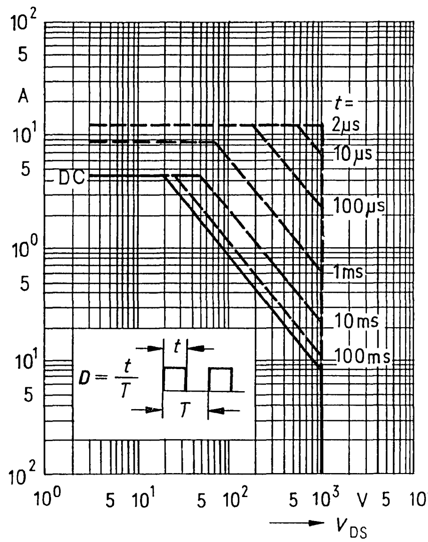
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,3 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 12 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 30 | – | µC | |

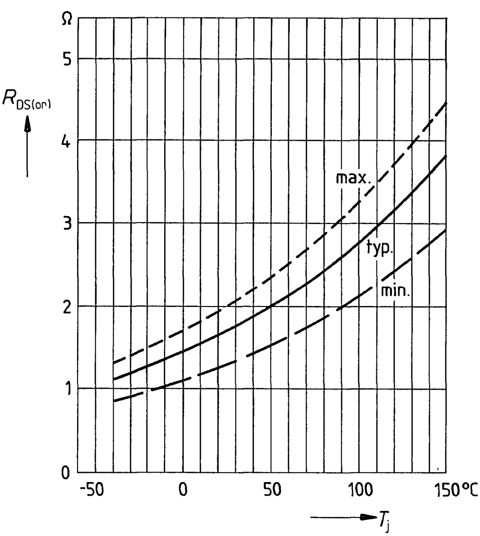
**Power dissipation** $P_D = f(T_{case})$



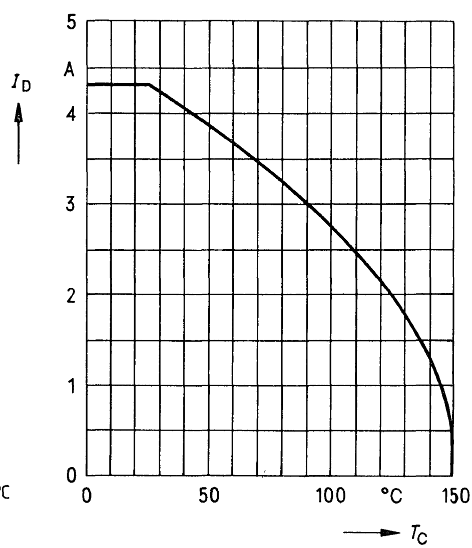

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0{,}01$, $T_{case} = 25\,°C$



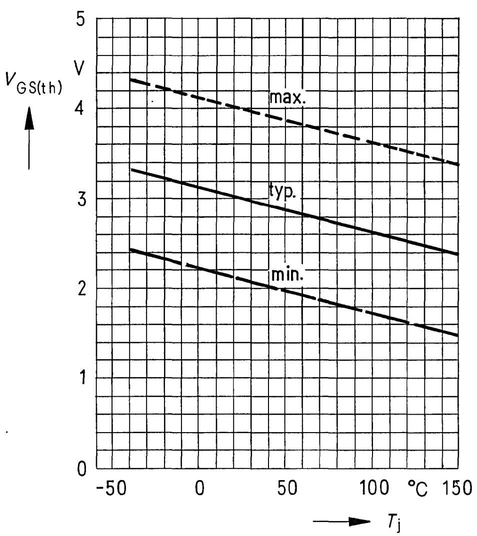

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



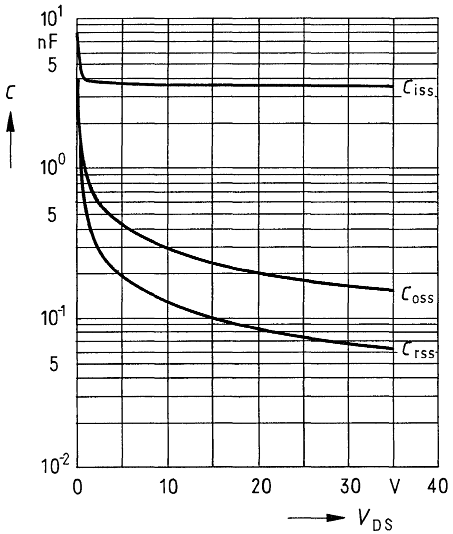

**Continuous drain current** $I_D = f(T_{case})$



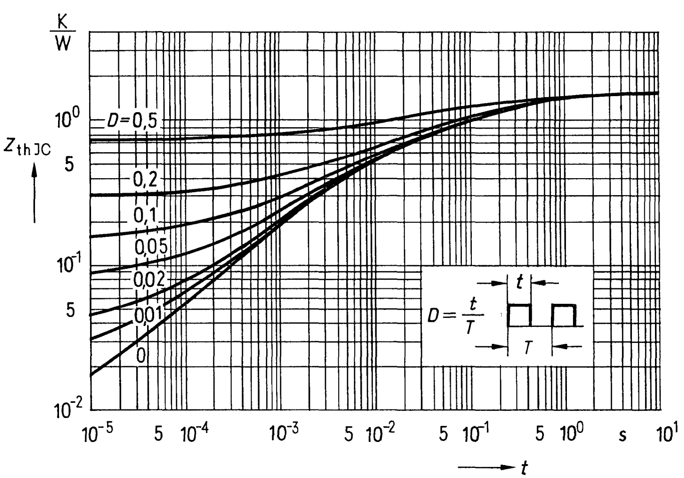
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



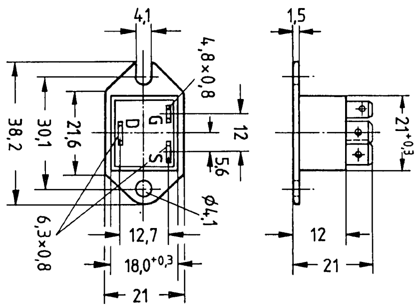

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 58 A | C67078-A1607-A3 |



Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 1000V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 1000V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 3,7A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 11A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 3500Vdc[1]) |
| **Thermal resistance** | $R_{th\,JA}$ | – |
| | $R_{th\,JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 1000 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 1000V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,6 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

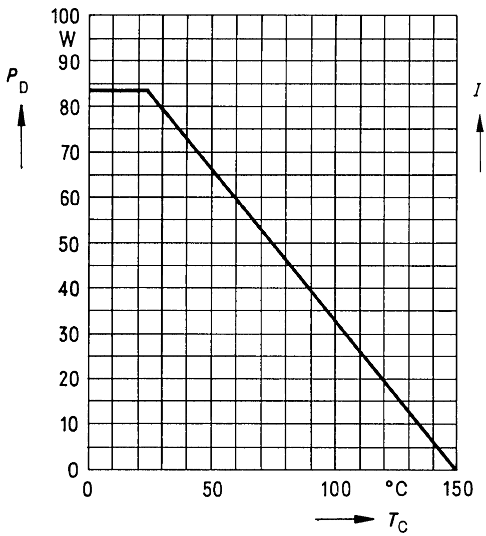
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,4 | 2,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,4A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 140 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

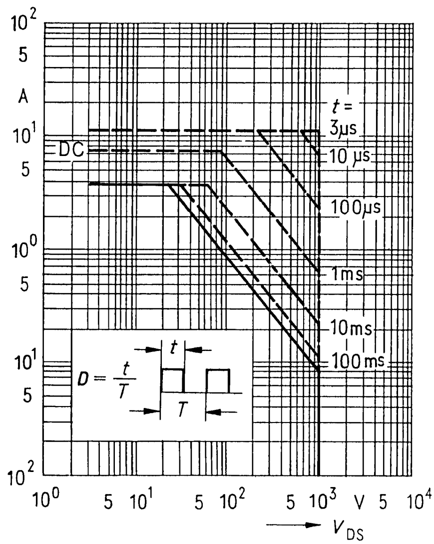
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 3,7 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 11 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 2000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 30 | – | µC | |

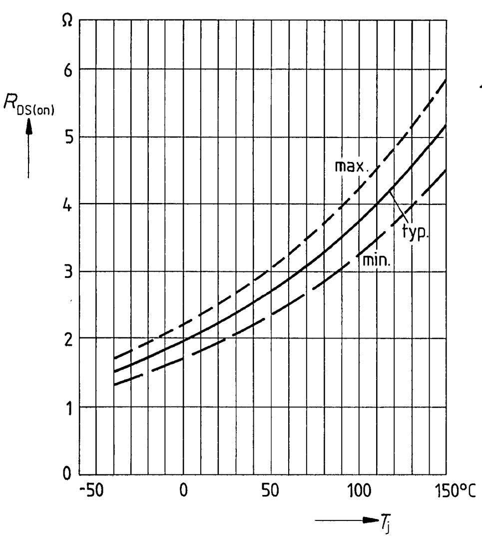
**Power dissipation** $P_D = f(T_{case})$



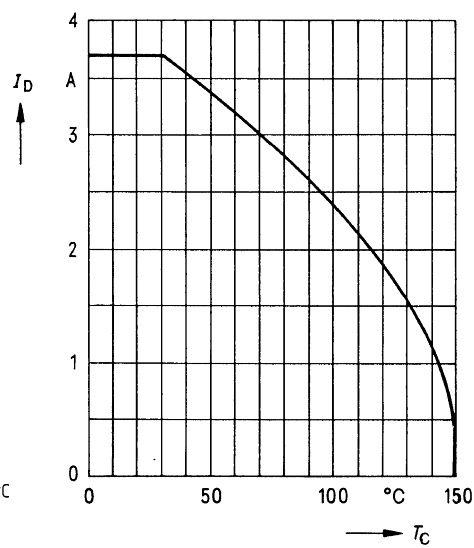

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



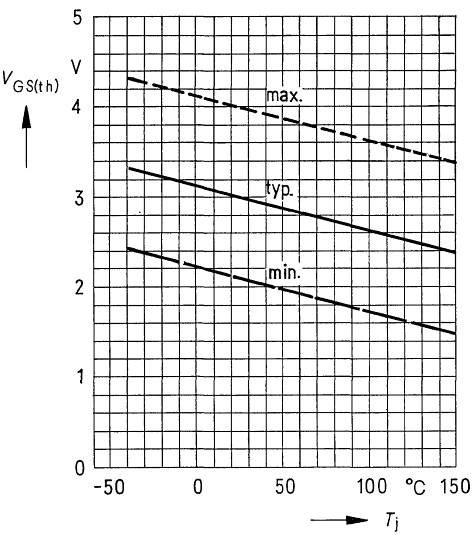

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



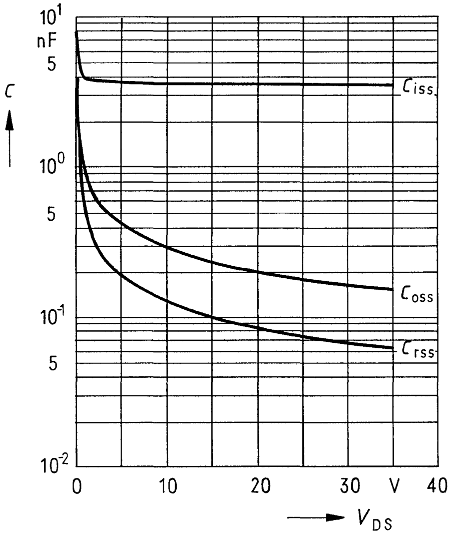

**Continuous drain current** $I_D = f(T_{case})$



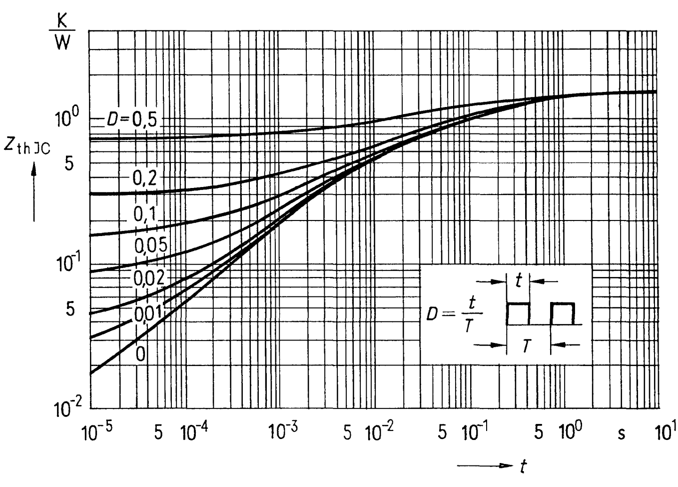
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz

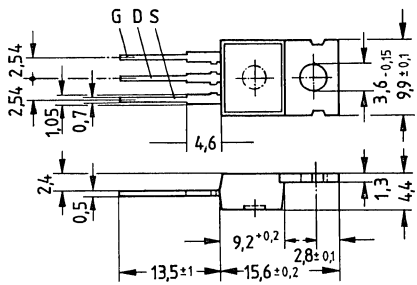



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 60 | C67078-A1312-A2 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 5,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 16A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... + 150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | – | 1,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

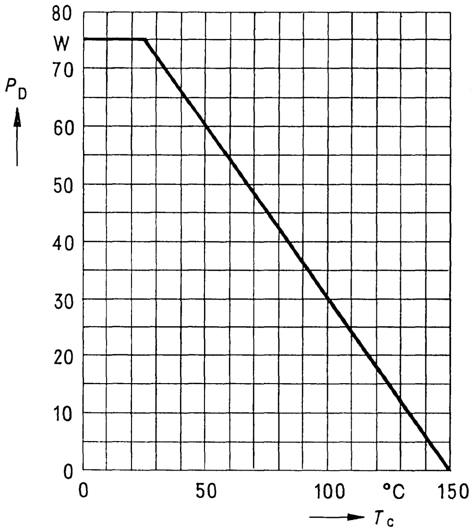
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,7 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on}$ = $t_{d(on)}$ + $t_r$) | $t_{d(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,7A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off}$ = $t_{d(off)}$ + $t_f$) | $t_{d(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

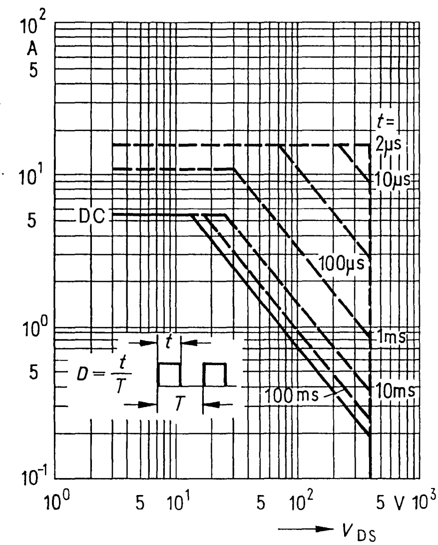
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 5,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 16 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,6 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 5 | – | µC | |

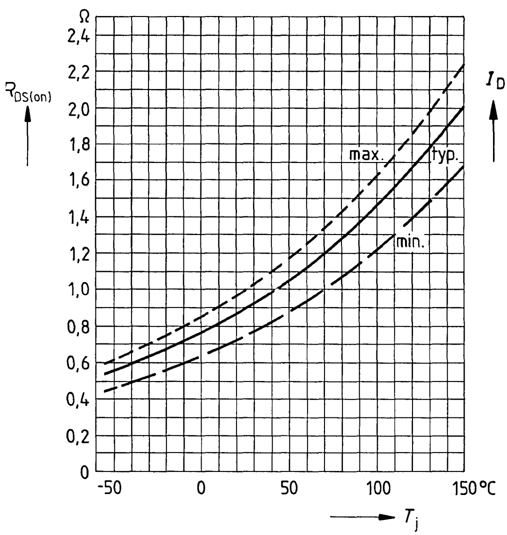
**Power dissipation** $P_D = f(T_{case})$



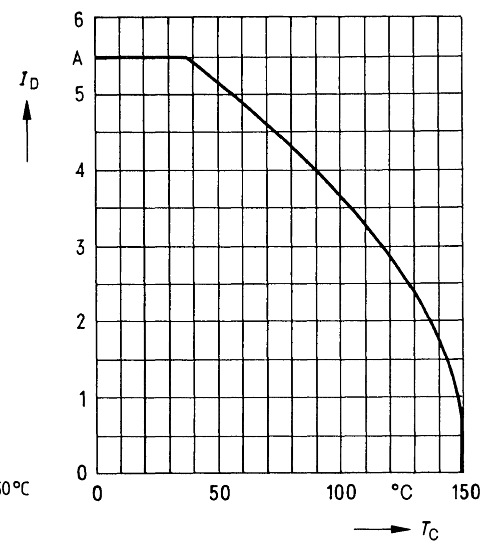

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



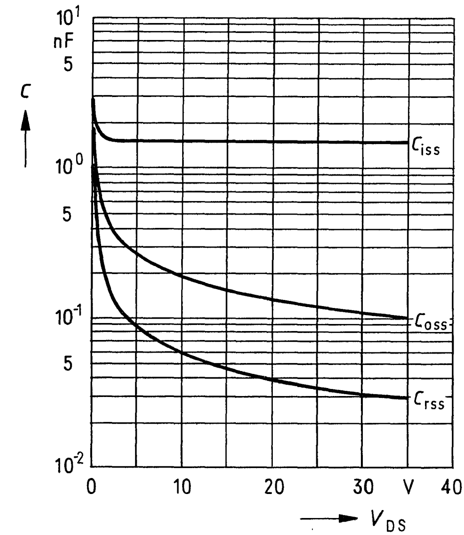

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



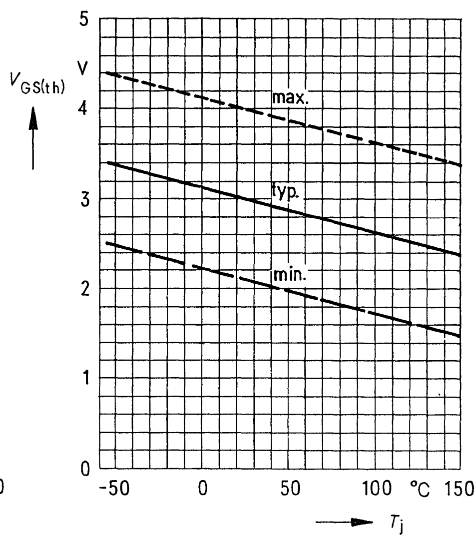

**Continuous drain current** $I_D = f(T_{case})$



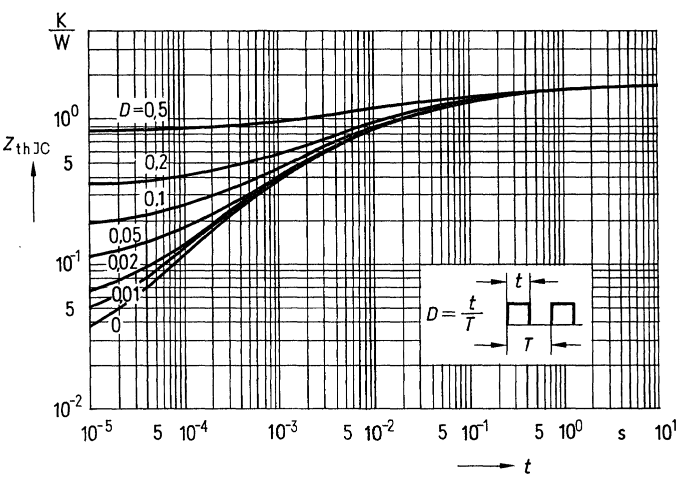
**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz




**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA

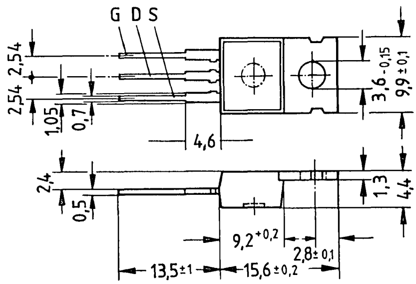



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



| | |
|---|---|
| **Description** | SIPMOS power FET, N-channel enhancement mode |
| **Case** | Plastic package 14A3 in accordance with DIN 41 869,<br>or TO 220 AB in accordance with JEDEC.<br>The drain connection is conductively connected to the mounting flange.<br>Approx. weight 2 g |

| Type | Ordering code |
|---|---|
| BUZ 60 B | C67078-A1312-A4 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 4,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 13A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$, $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

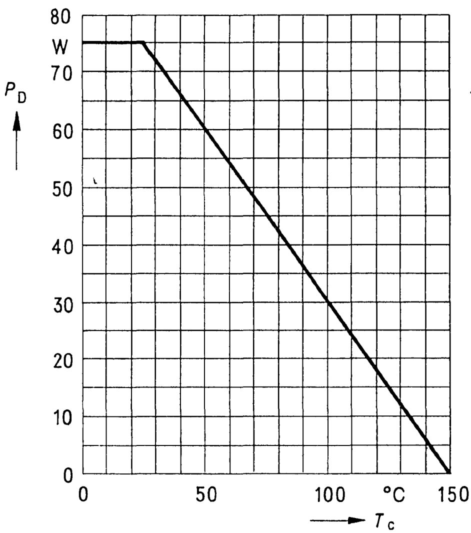
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,7 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,6A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

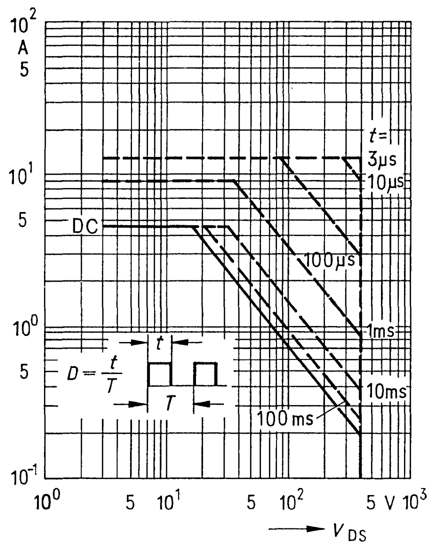
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 13 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,50 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 5 | – | µC | |

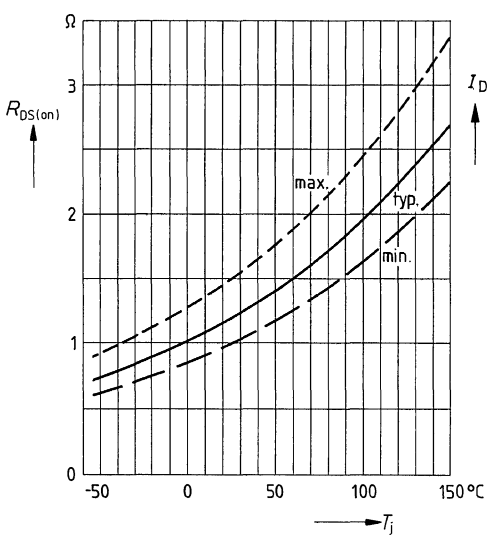
**Power dissipation** $P_D = f(T_{case})$



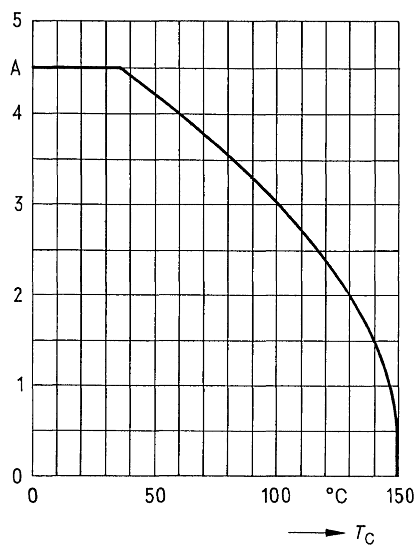

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



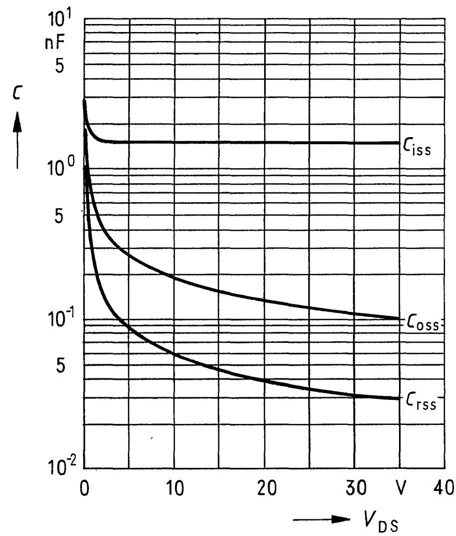

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



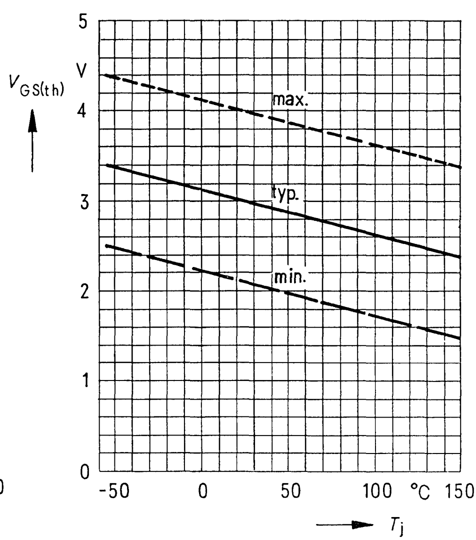

**Continuous drain current** $I_D = f(T_{case})$



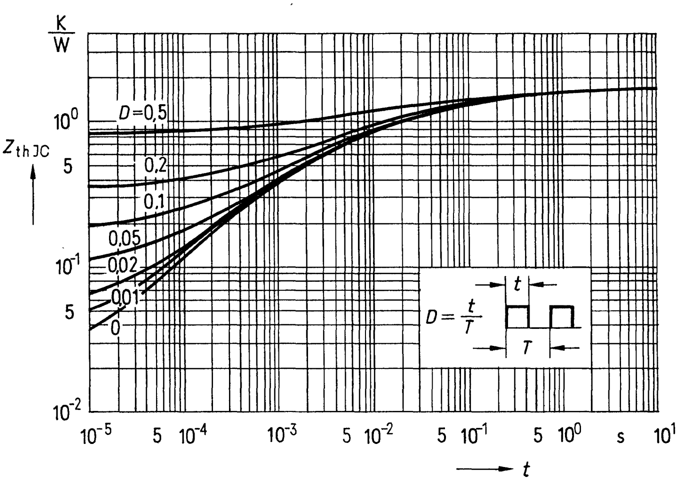
**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz




**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA



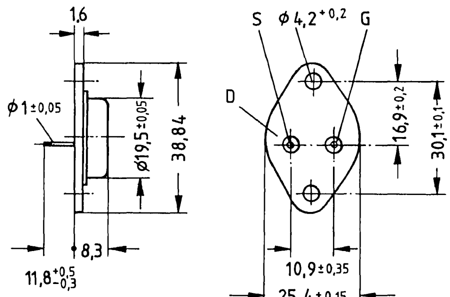

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 63 | C67078-A1016-A2 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 5,9A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 17A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,6K/W |

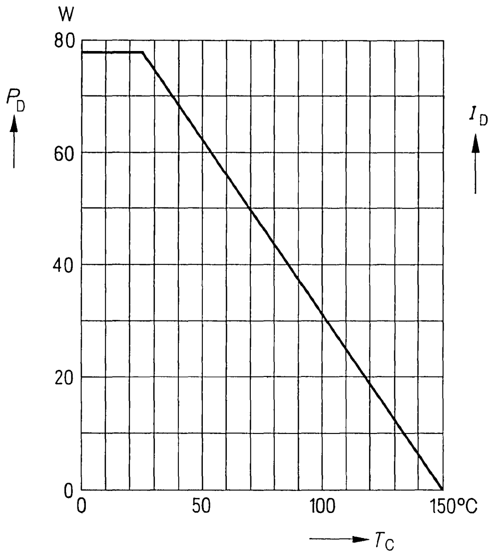
## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

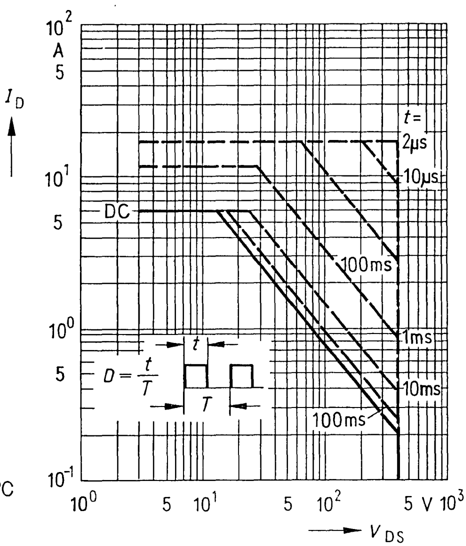
**Static ratings**

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |
| **Dynamic ratings** | | | | | | |
| Forward transconductance | $g_{fs}$ | 1,7 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,7A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |
| **Reverse diode** | | | | | | |
| Continuous reverse drain current | $I_{DR}$ | – | – | 5,9 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 17 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,2 | 1,65 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 5 | – | µC | |

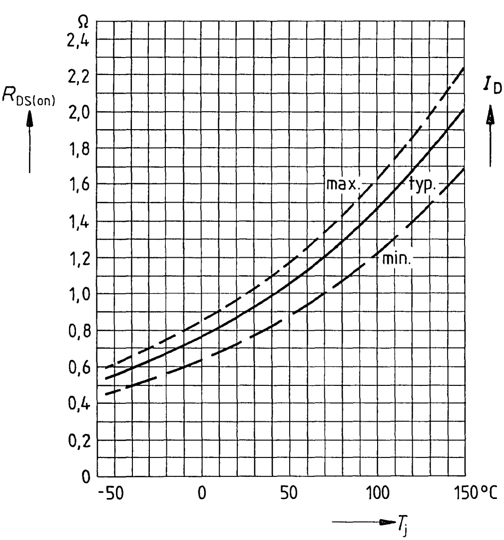
**Power dissipation** $P_D = f(T_{case})$



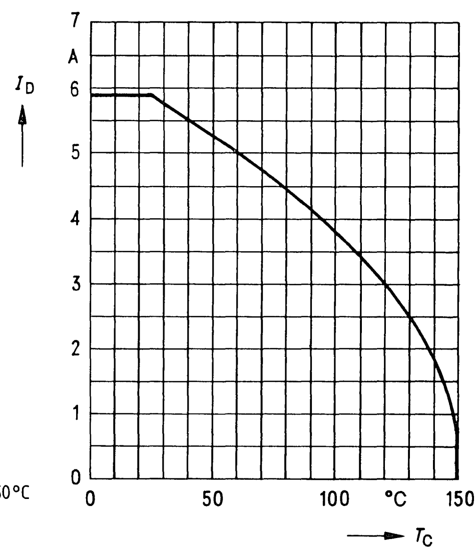

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



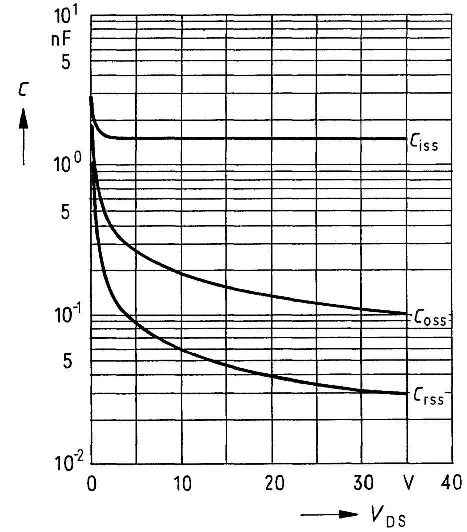

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



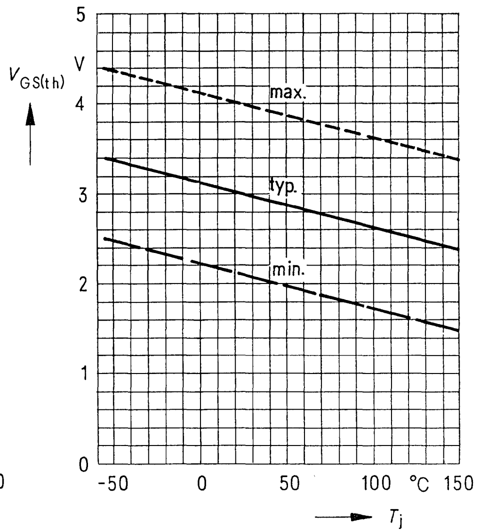

**Continuous drain current** $I_D = f(T_{case})$



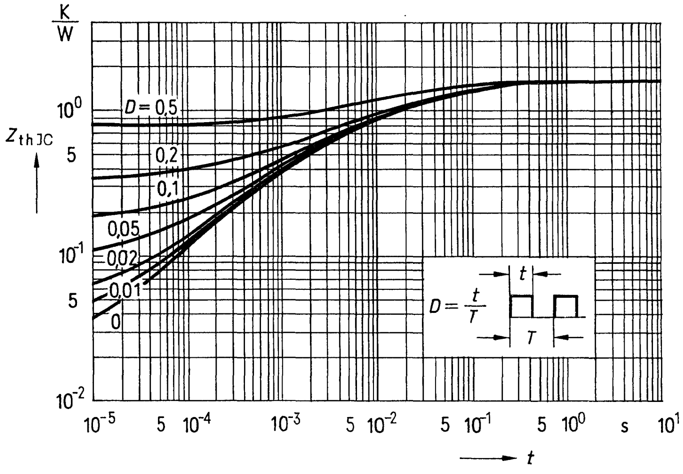
**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz




**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA

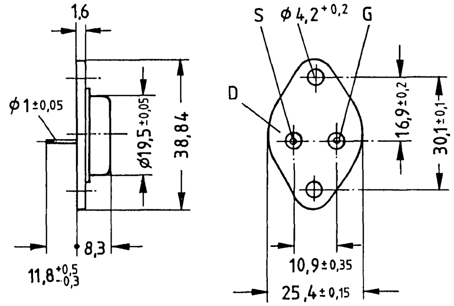



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 63 B | C67078-A1016-A4 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 40 °C | $I_D$ | 4,5A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 13A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics | | | Unit | Conditions |
|---|---|---|---|---|---|---|
| | | min. | typ. | max. | | |
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 2,5A |

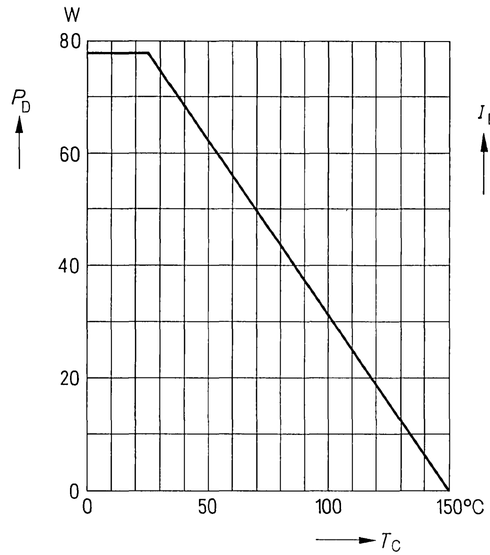
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,7 | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 2,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,6A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 160 | – | | |
| | $t_f$ | – | 100 | – | | |

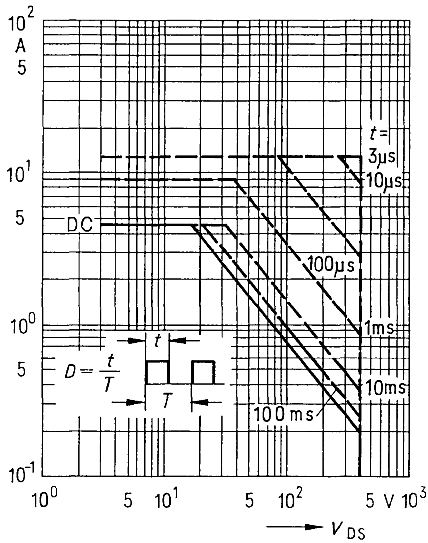
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 13 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,15 | 1,50 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 5 | – | µC | |

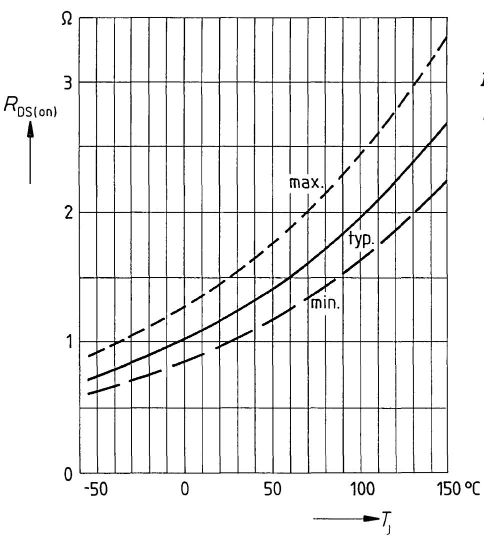
**Power dissipation** $P_D = f(T_{case})$



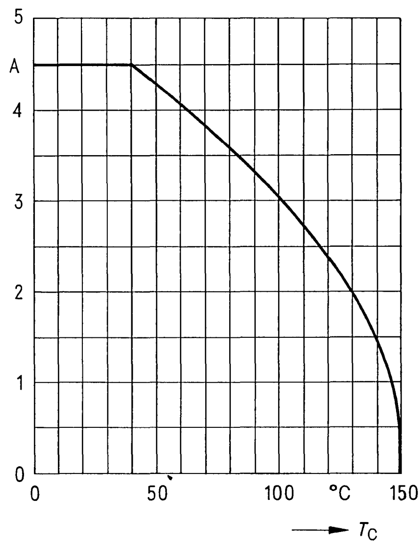

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



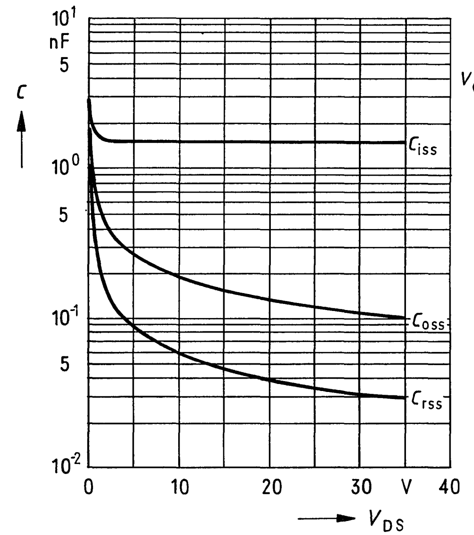

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



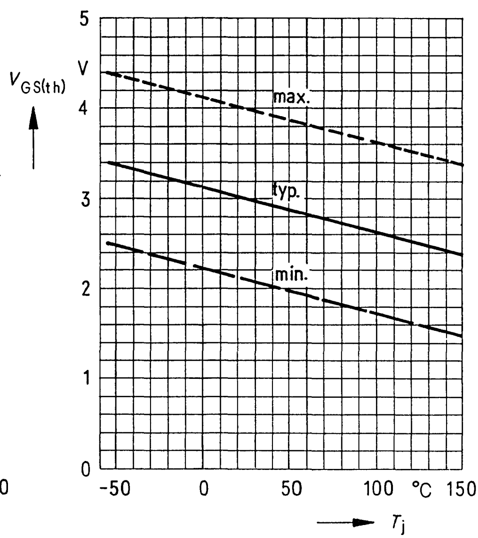

**Continuous drain current** $I_D = f(T_{case})$



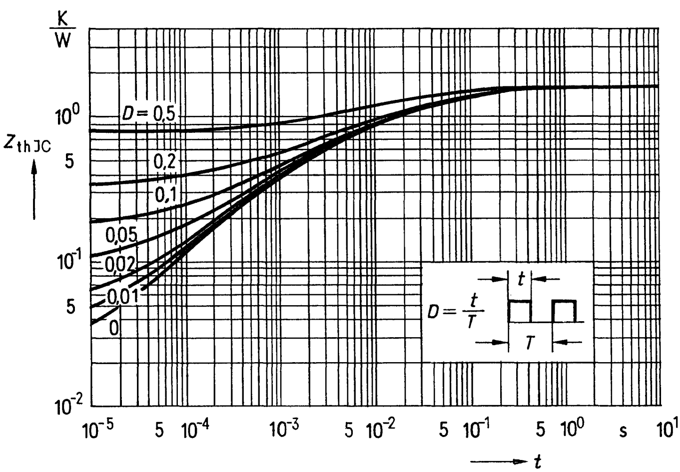
**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz




**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA

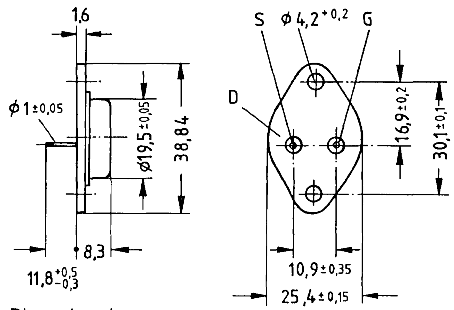



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 64 | C67078-A1017-A2 |



Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case} = 50\ °C$ | $I_D$ | 10,5A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 31A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,4 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

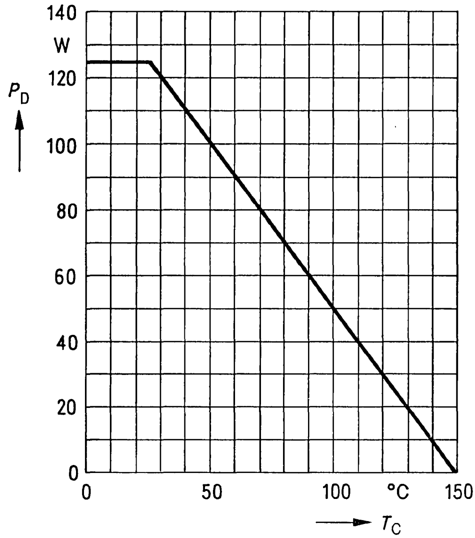
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,3 | 4,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 120 | – | | |
| Turn-on time $t_{on}$<br>($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$<br>($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

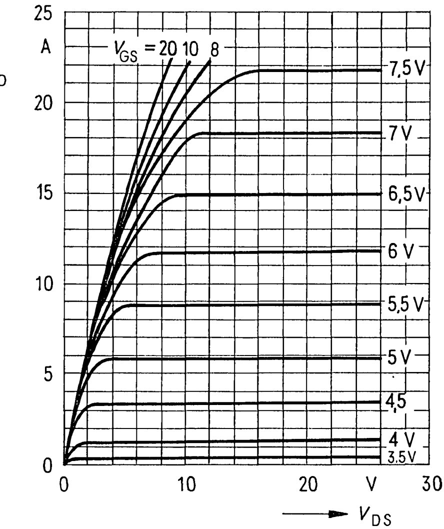
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 10,5 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 31 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 10 | – | µC | |

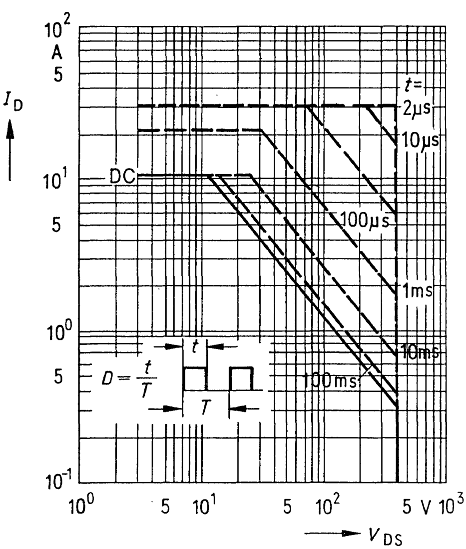
**Power dissipation** $P_D = f(T_{case})$



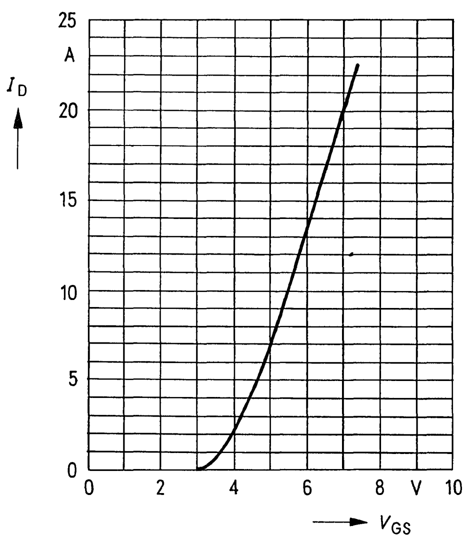

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



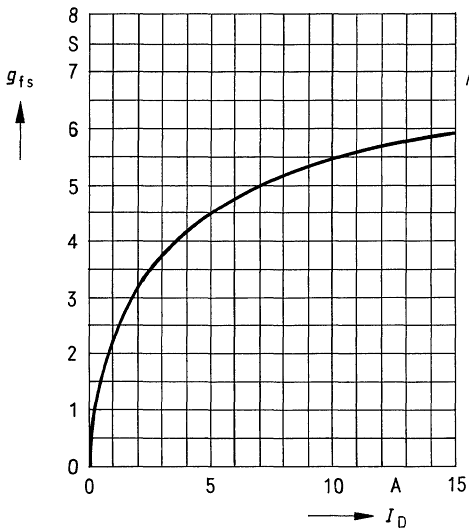

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



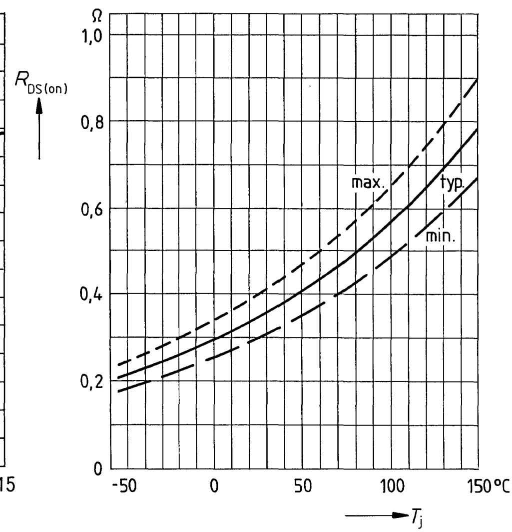

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



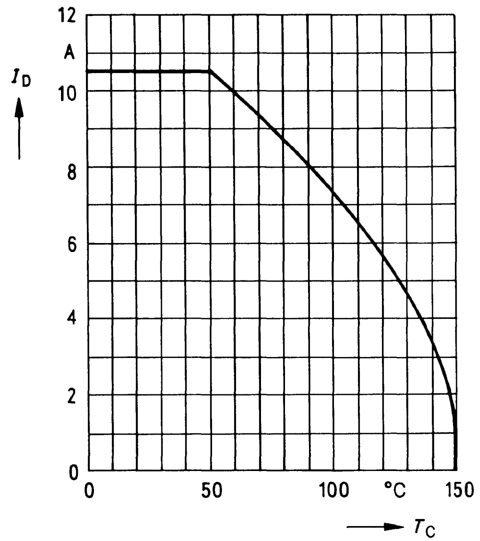
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



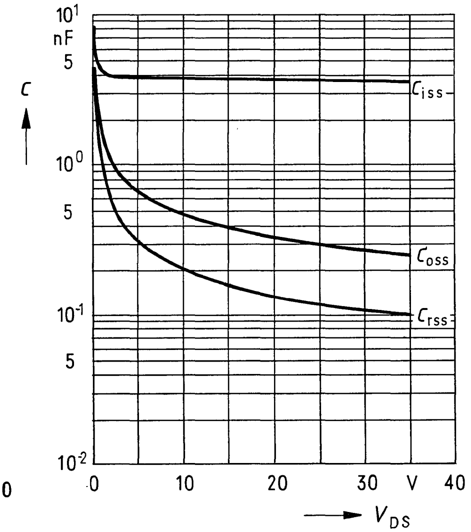

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



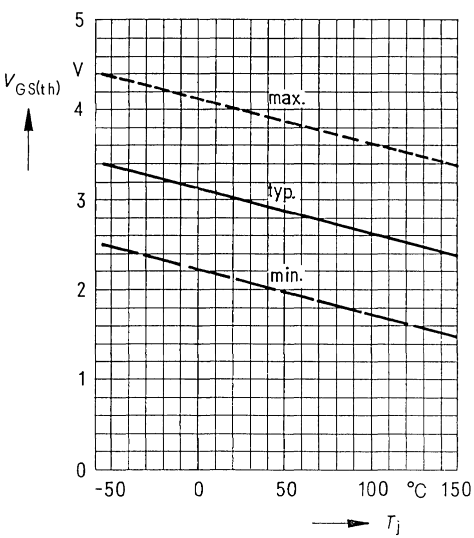

**Continuous drain current** $I_D = f(T_{case})$



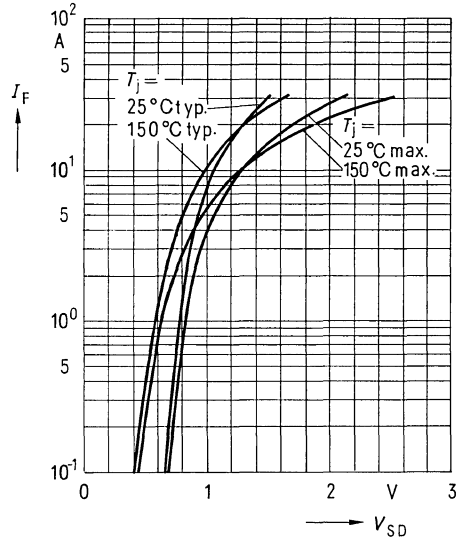

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



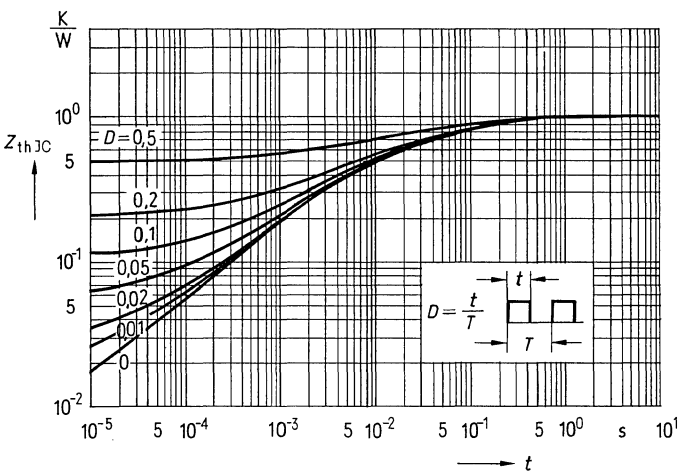
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



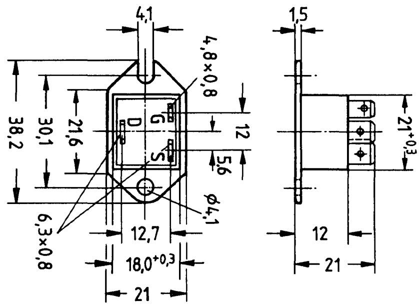

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 67 | C67078-A1610-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 9,6A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 28A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 2500Vdc[1]) |
| **Thermal resistance** | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,4 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

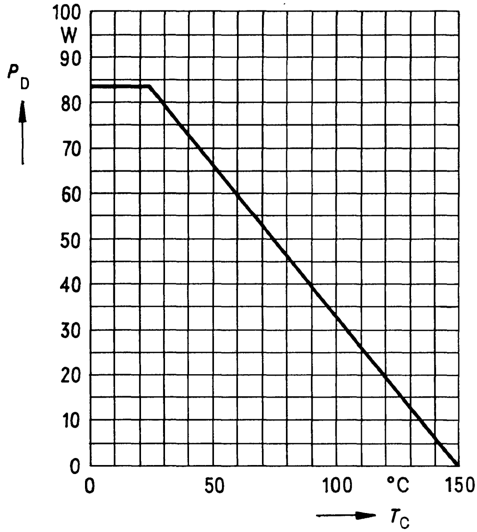
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,3 | 4,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 3600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 300 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 120 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 50 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 450 | – | | |
| | $t_f$ | – | 100 | – | | |

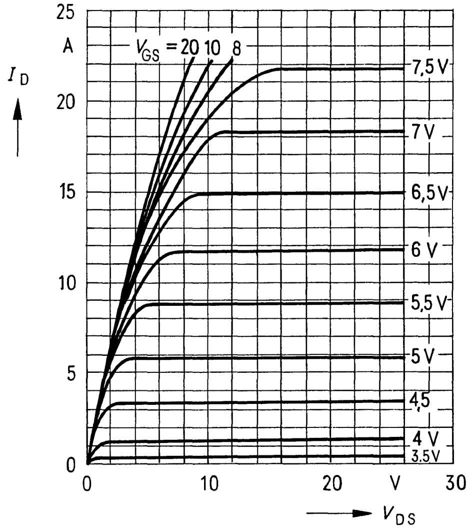
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 9,6 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 28 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,3 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1000 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 10 | – | µC | |

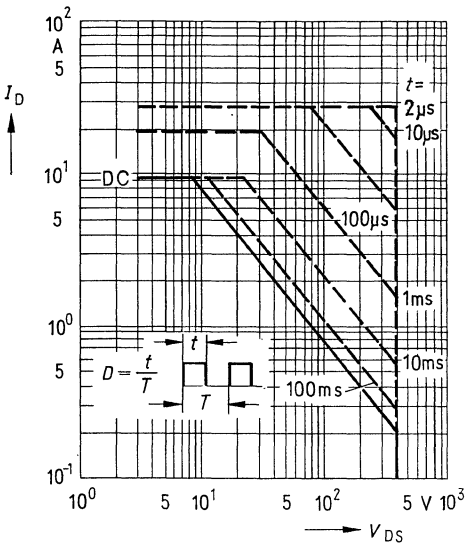
**Power dissipation** $P_D = f(T_{case})$



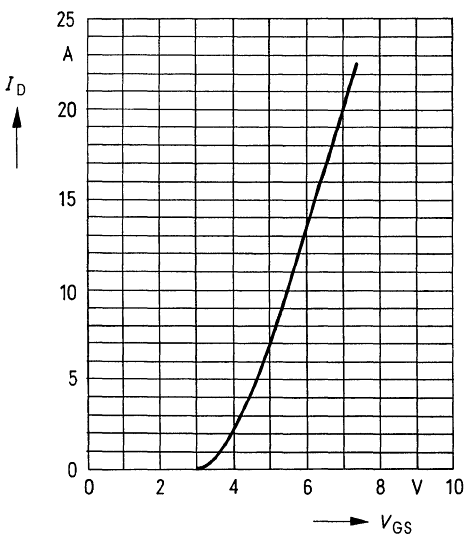

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



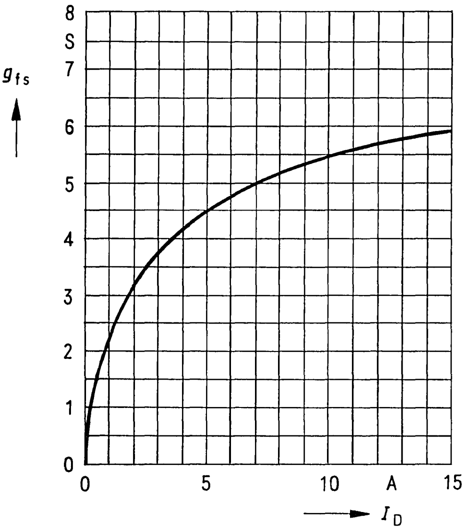

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



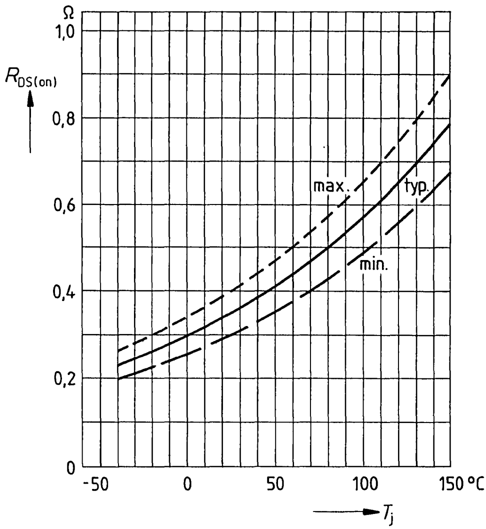

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



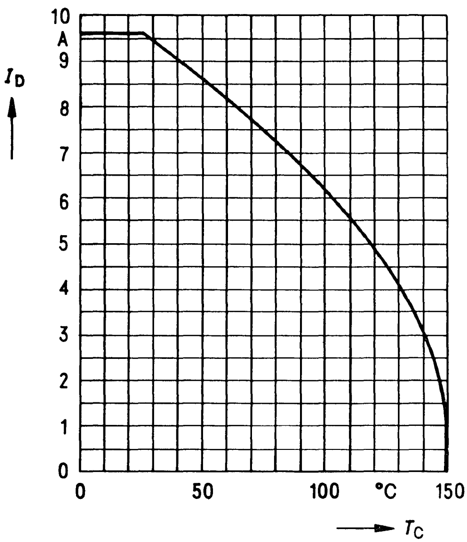
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



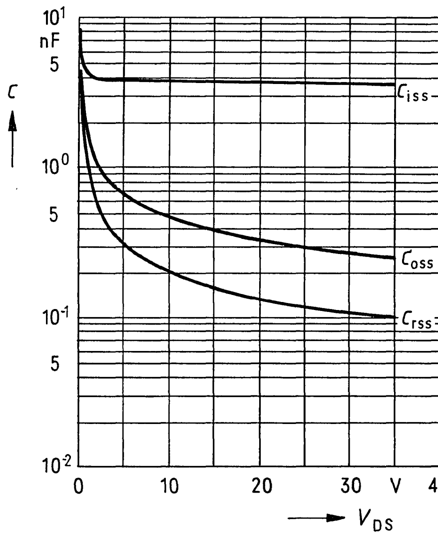

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



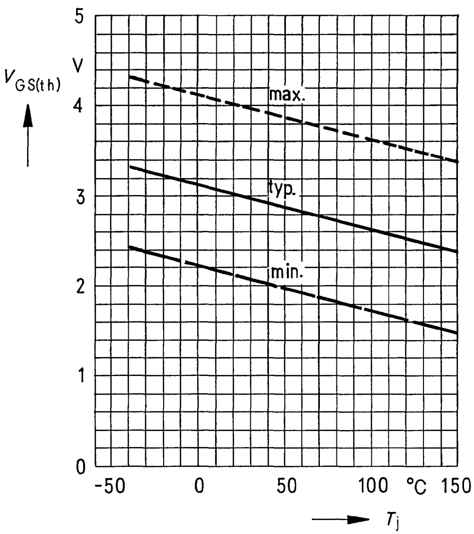

**Continuous drain current** $I_D = f(T_{case})$



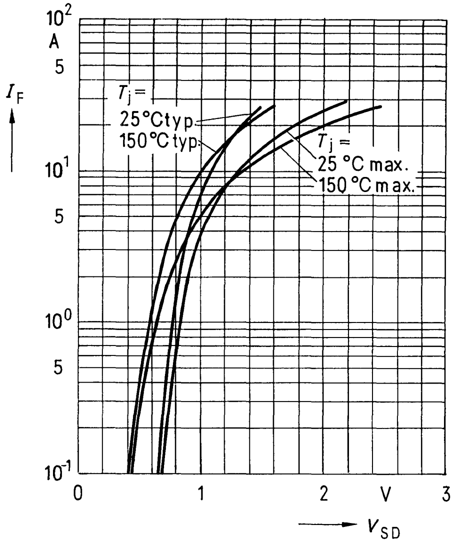

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



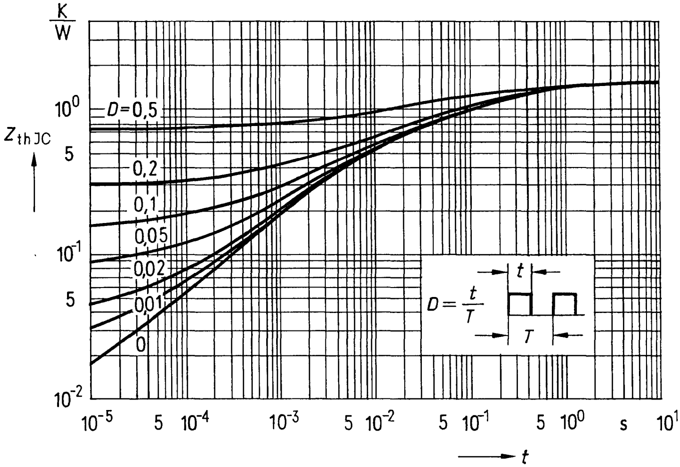
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



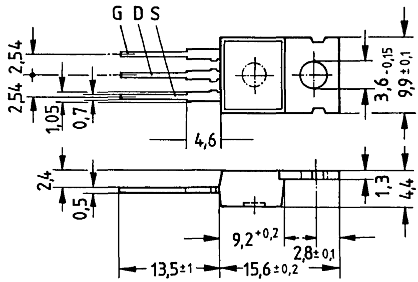

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 71 | C67078-A1316-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 60 °C | $I_D$ | 12A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 36A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,1 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,1 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

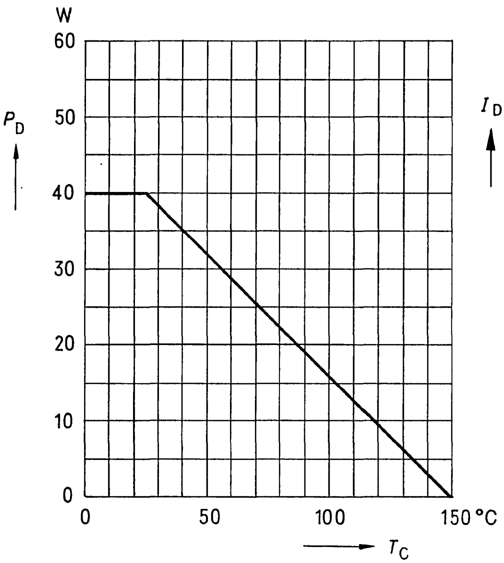
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 4,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 480 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 280 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 160 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 10 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 150 | – | | |

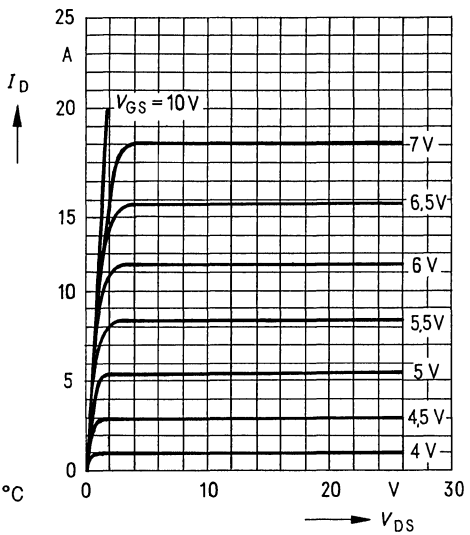
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 12 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 36 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,6 | 2,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 120 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,15 | – | µC | |

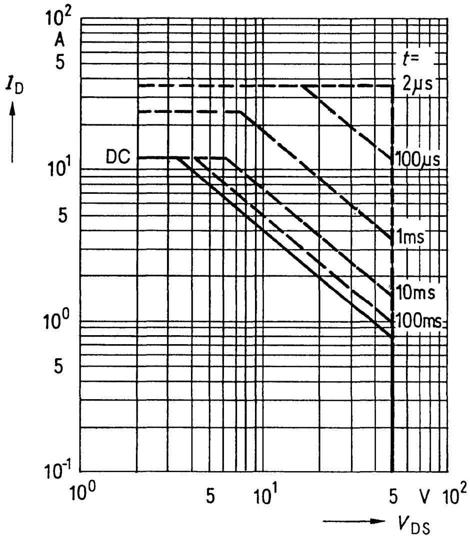
**Power dissipation** $P_D = f(T_{case})$



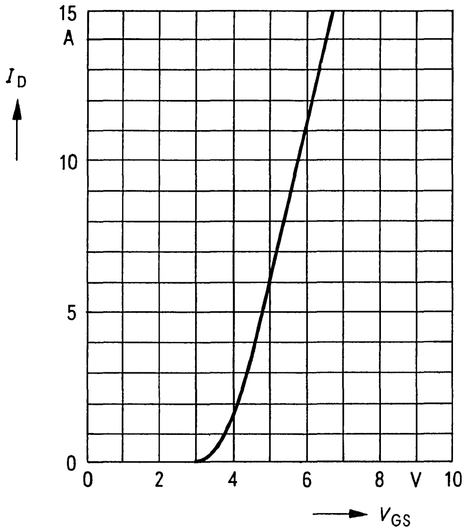

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



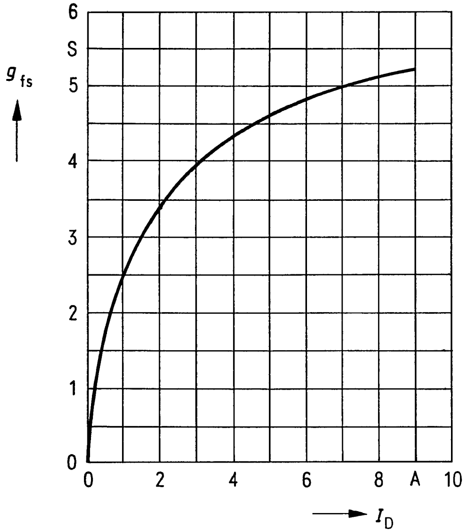

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



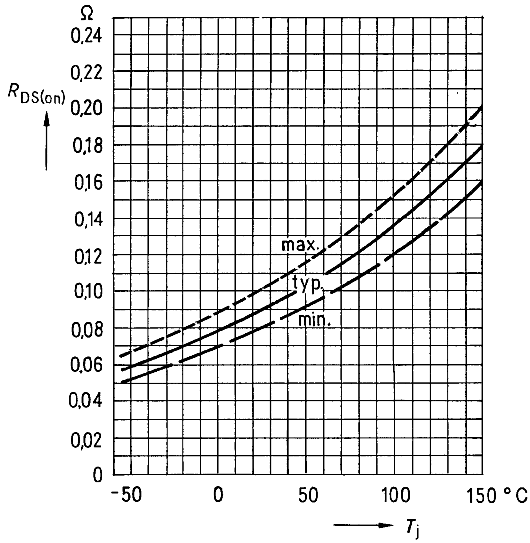

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



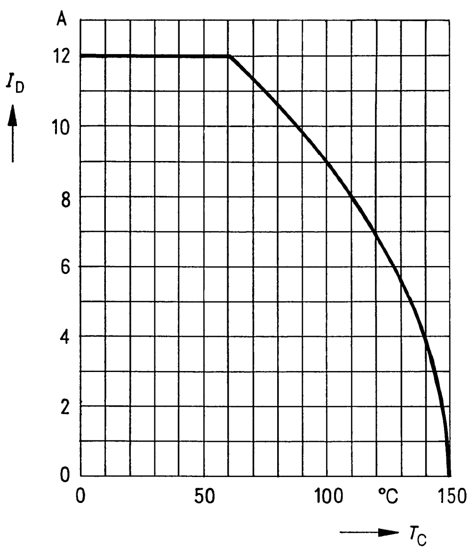
**Typical transconductance** $g_{fs}$ = f ($I_D$)
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



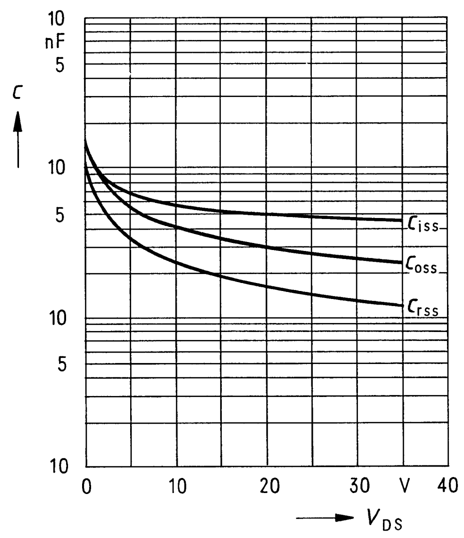

**Drain-source on-state resistance**
$R_{DS\ (on)}$ = f ($T_j$)
(spread)



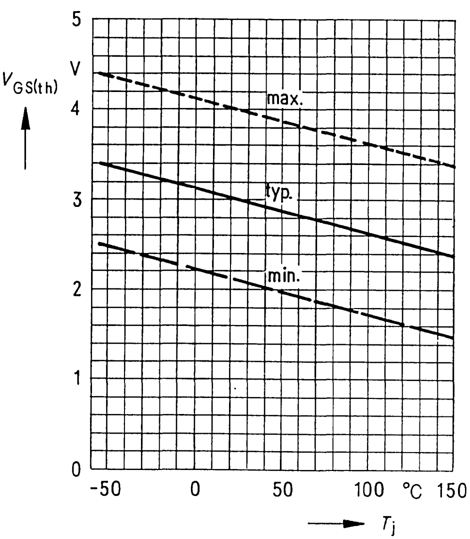

**Continuous drain current** $I_D$ = f ($T_{case}$)



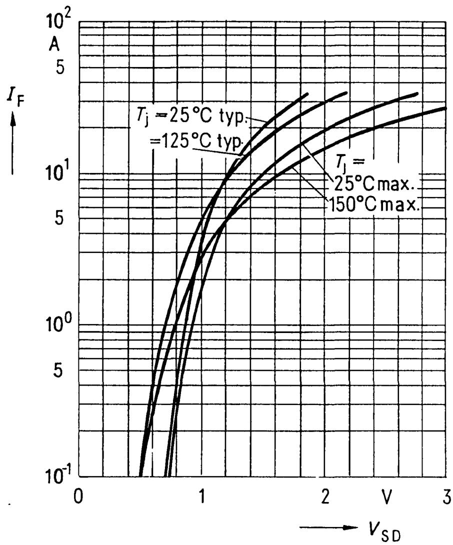

**Typical capacitances** $C$ = f ($V_{DS}$)
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



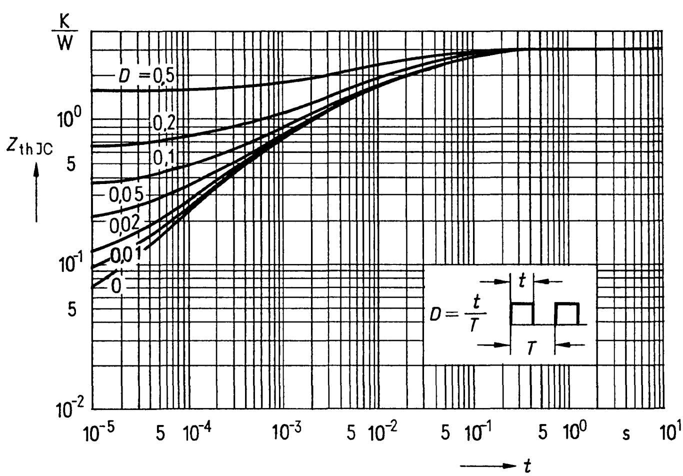
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



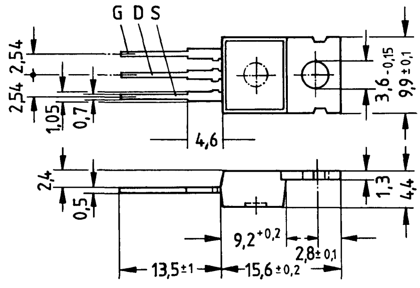

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 71 A | C67078-A1316-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 50V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 50V |
| Continuous drain current, $T_{case}$ = 40 °C | $I_D$ | 12A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 36A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 50 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,1 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 50V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,12 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 6A |

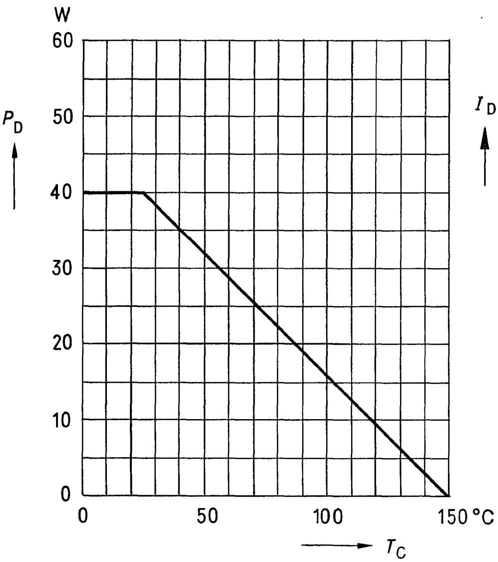
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 3,0 | 4,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 6A |
| Input capacitance | $C_{iss}$ | – | 480 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 280 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 160 | – | | |
| Turn-on time $t_{on}$<br>($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$<br>($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 150 | – | | |

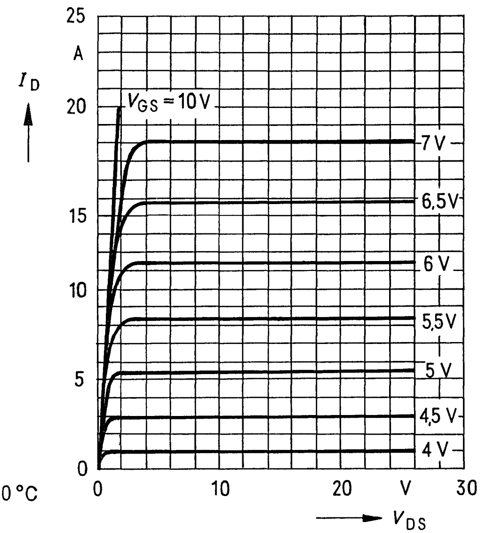
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 12 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 36 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,6 | 2,2 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 120 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,15 | – | µC | |

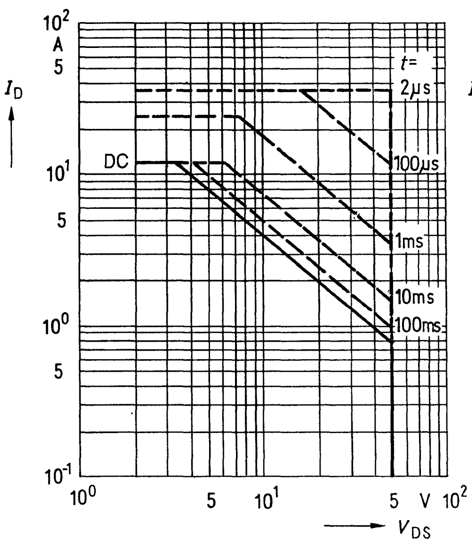
**Power dissipation** $P_D = f(T_{case})$



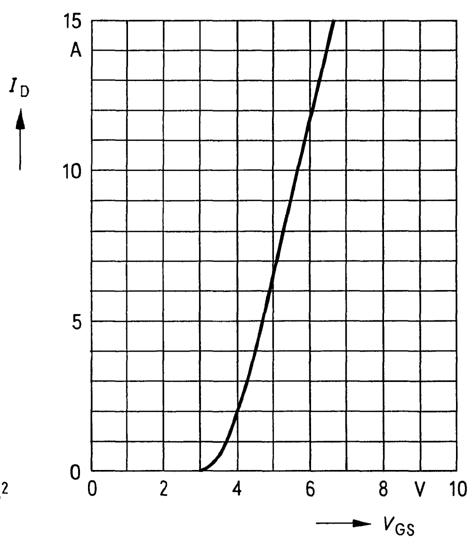

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



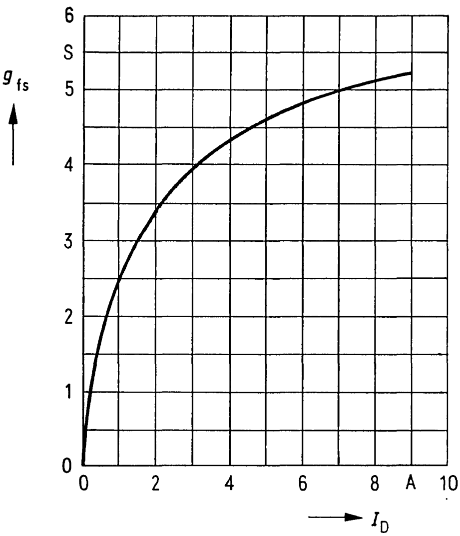

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



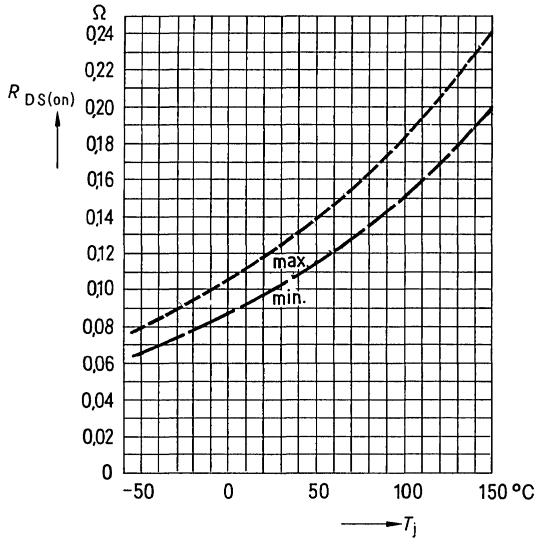

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



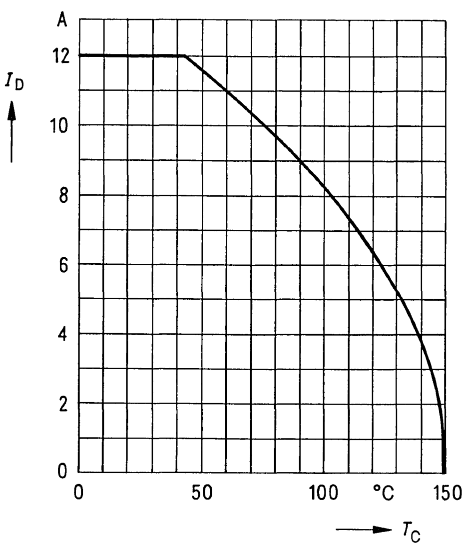
**Typical transconductance** $g_{fs} = f\,(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



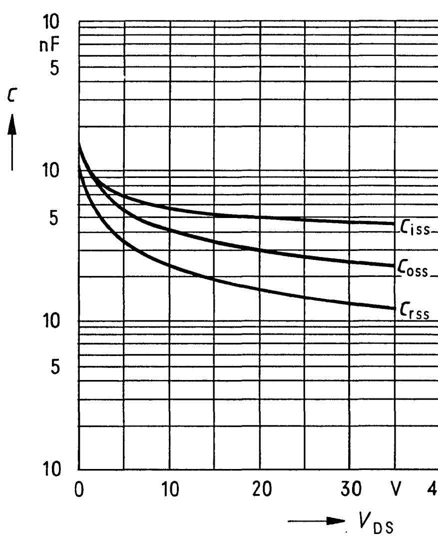

**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)



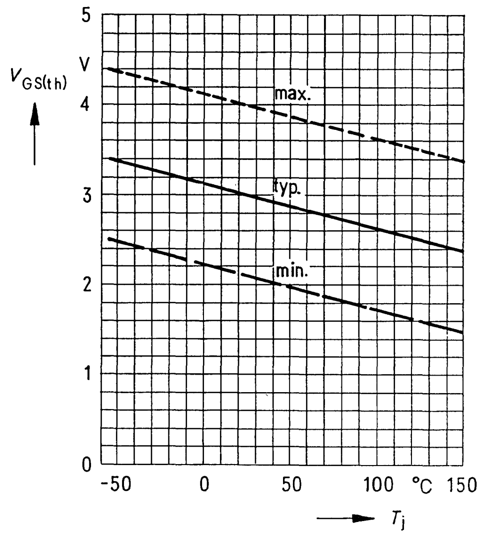

**Continuous drain current** $I_D = f\,(T_{case})$



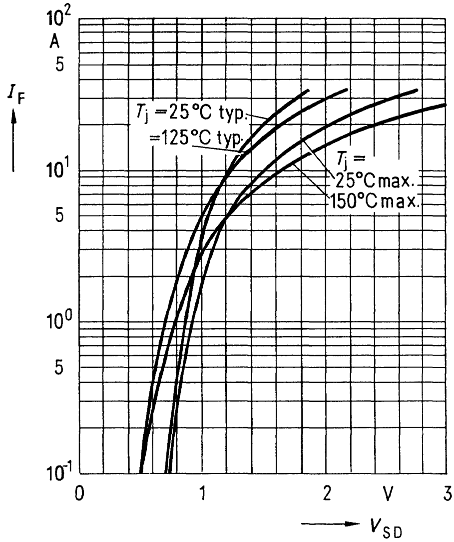

**Typical capacitances** $C = f\,(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



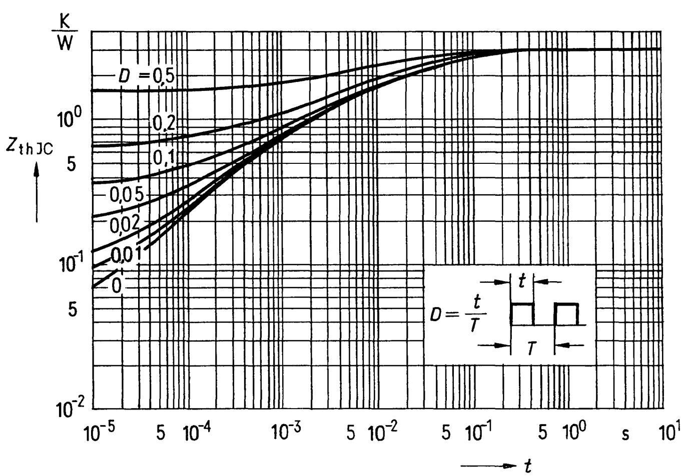
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS},\ I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



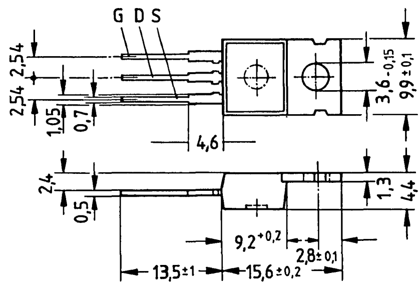

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 72 A | C67078-A1313-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 100V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 100V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 9,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 27A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage temperature range | $T_j$, $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 100 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 100V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | – | – | 0,25 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 5A |

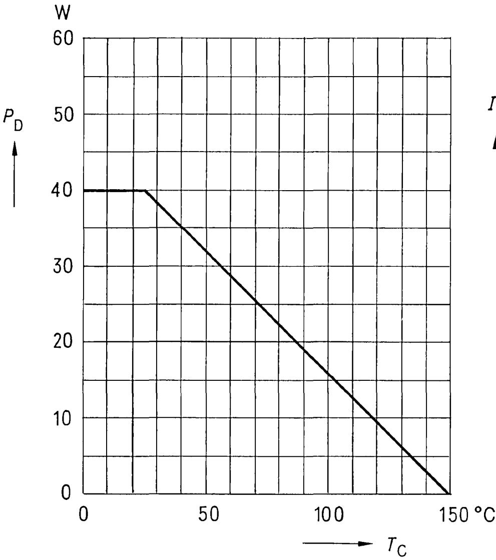
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,7 | 3,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 5A |
| Input capacitance | $C_{iss}$ | – | 440 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 150 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 80 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d(on)} + t_r$) | $t_{d(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,9A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d(off)} + t_f$) | $t_{d(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 150 | – | | |

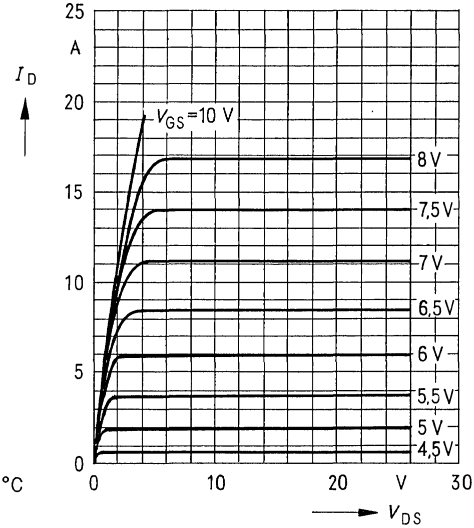
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 9,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 27 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,5 | 2,0 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 170 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,30 | – | µC | |

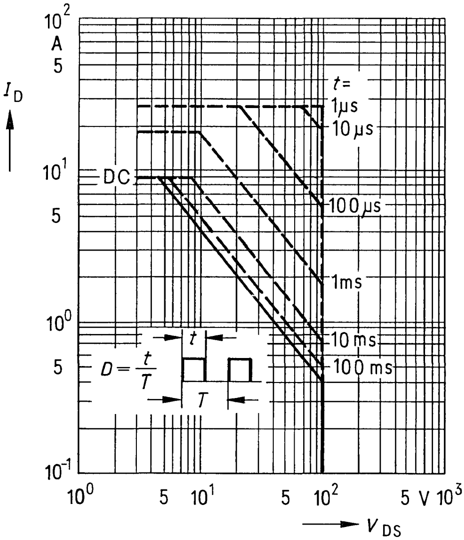
**Power dissipation** $P_D = f(T_{case})$



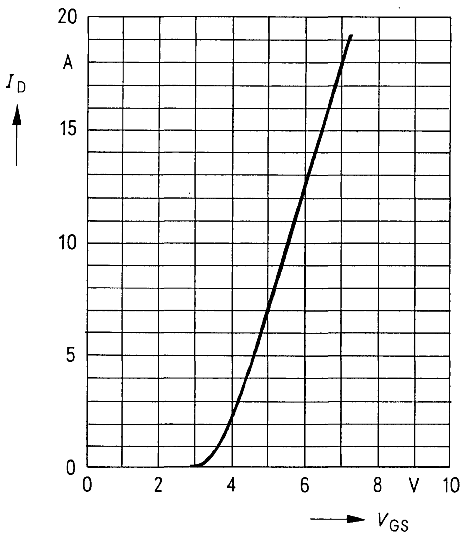

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 μs pulse test,
$T_{case} = 25\,°C$



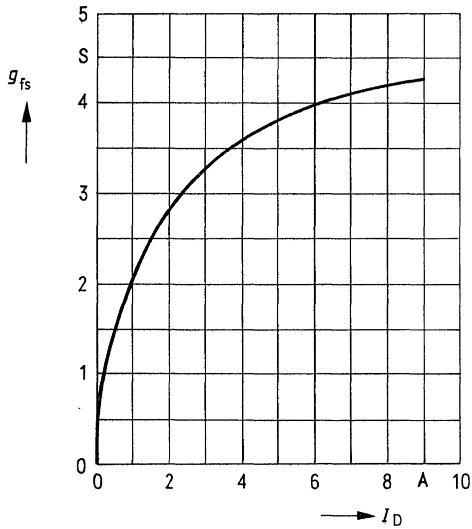

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



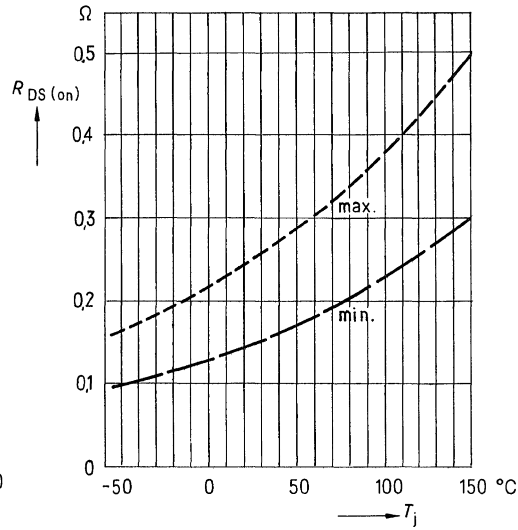

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 μs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



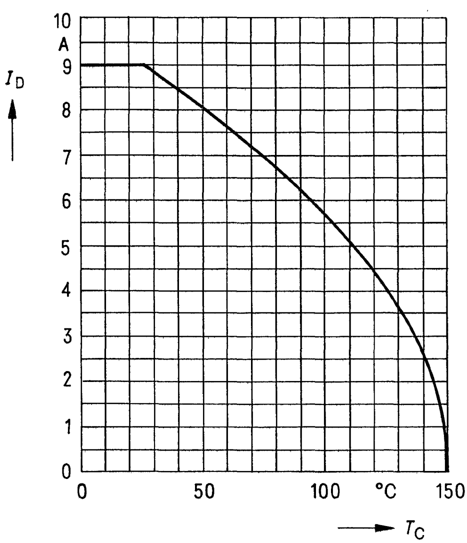
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



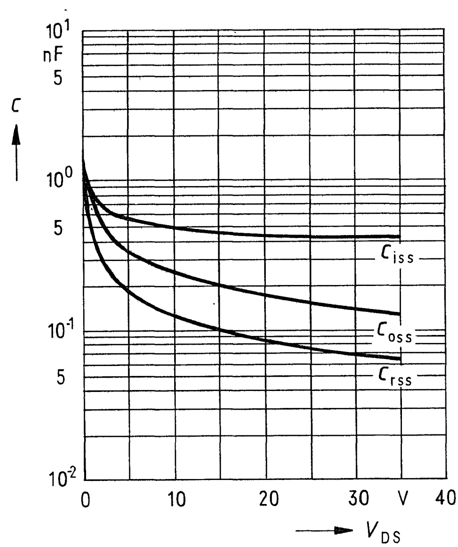

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



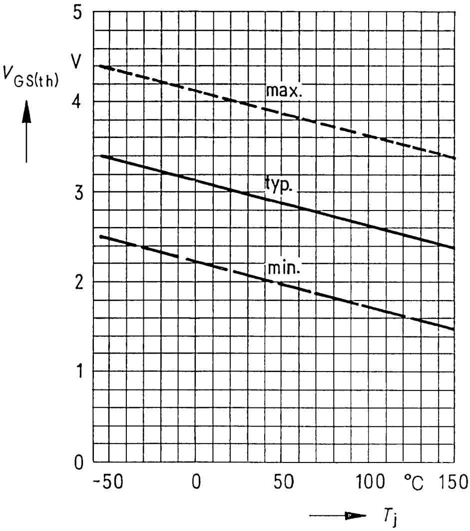

**Continuous drain current** $I_D = f(T_{case})$



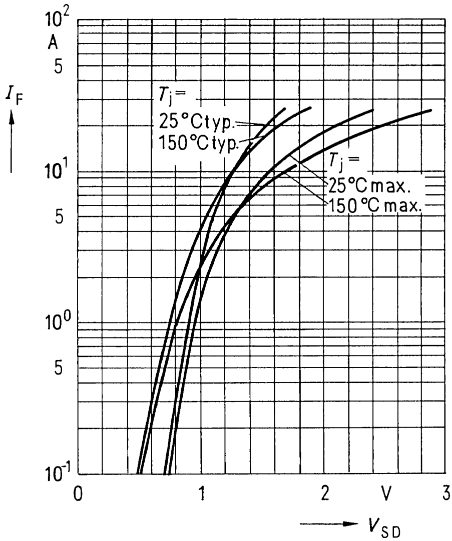

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



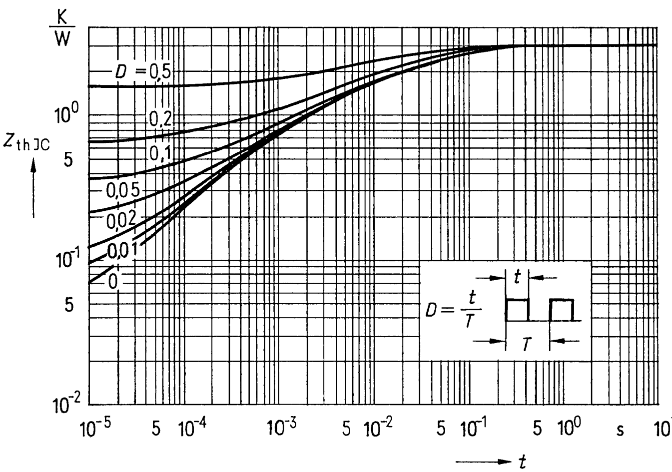
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



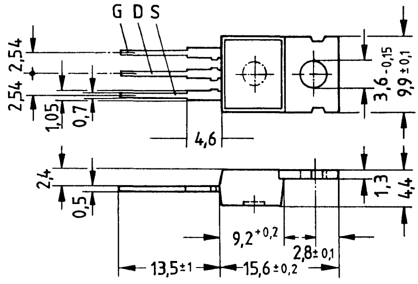

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 73 A | C67078-A1317-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 200V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 200V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 5,8A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 17A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 200 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 200V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 0,6 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 3,5A |

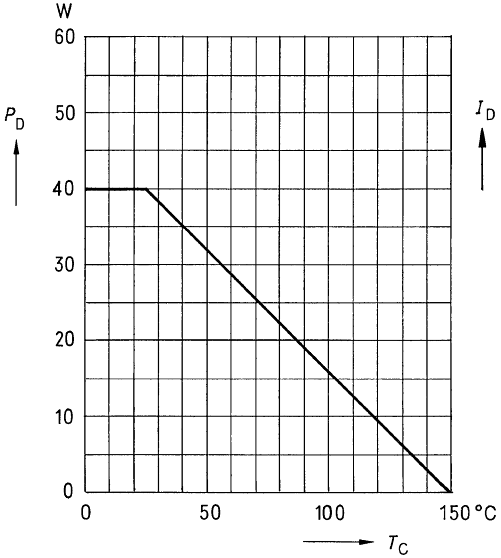
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 2,2 | 3,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 3,5A |
| Input capacitance | $C_{iss}$ | – | 450 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 120 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 60 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,8A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 190 | – | | |
| | $t_f$ | – | 130 | – | | |

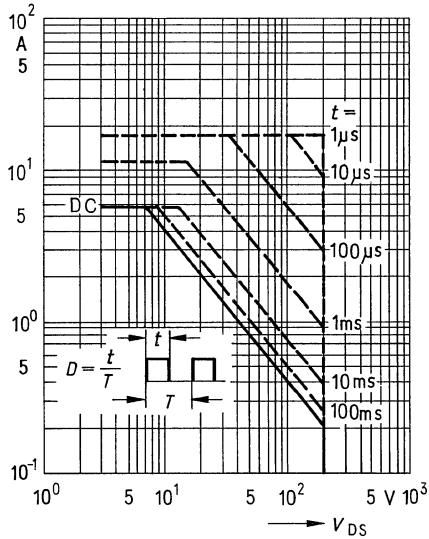
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 5,8 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 17 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,4 | 1,7 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 200 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 0,6 | – | µC | |

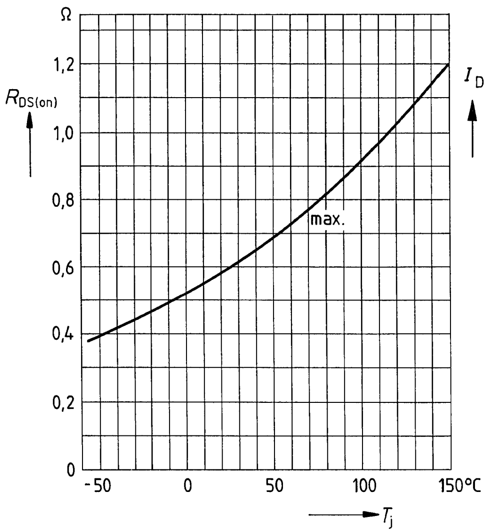
**Power dissipation** $P_D = f(T_{case})$



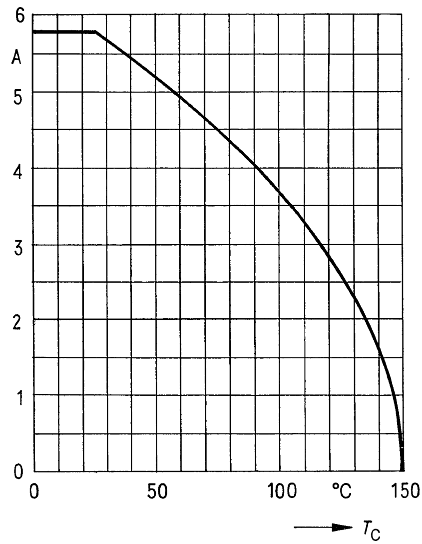

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



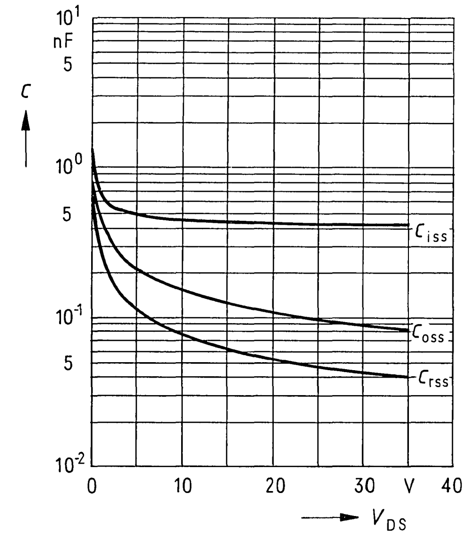

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



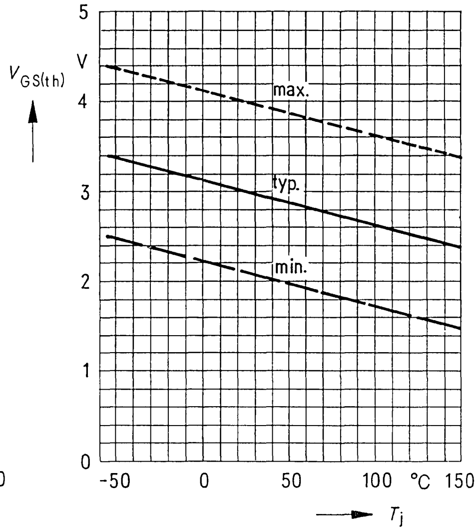

**Continuous drain current** $I_D = f(T_{case})$



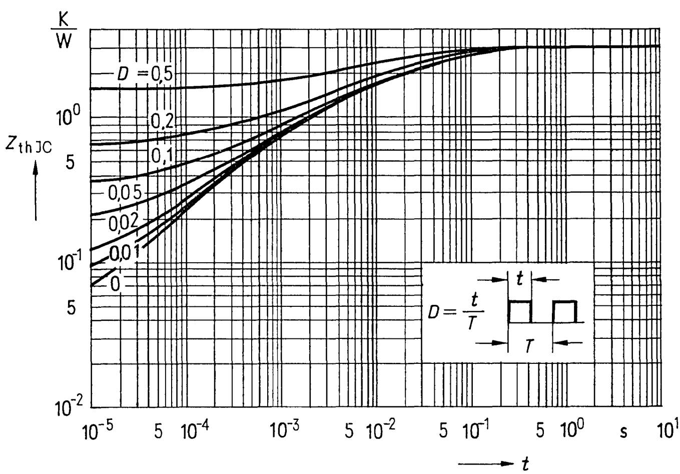
**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, f = 1 MHz




**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 10 mA



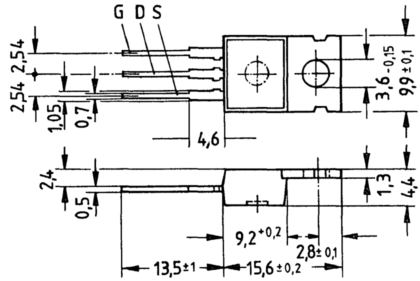

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 74 | C67078-A1314-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 2,4A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |

| | | |
|---|---|---|
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 2,6 | 3,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,2A |

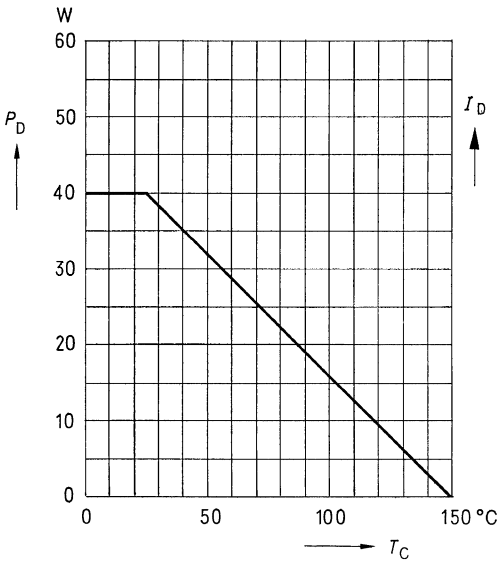
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | – | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,2A |
| Input capacitance | $C_{iss}$ | – | 350 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 50 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 20 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 150 | – | | |
| | $t_f$ | – | 100 | – | | |

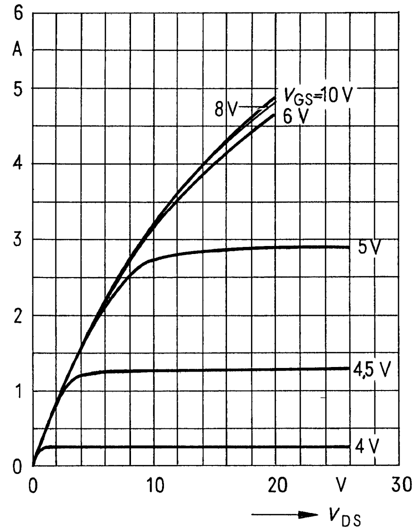
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,4 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 350 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 3,5 | – | µC | |

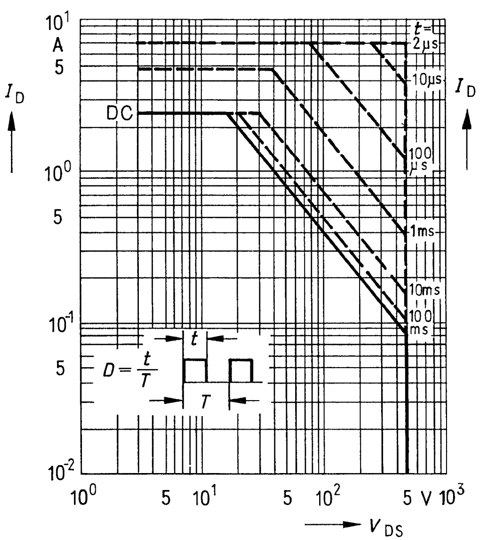
**Power dissipation** $P_D = f(T_{case})$



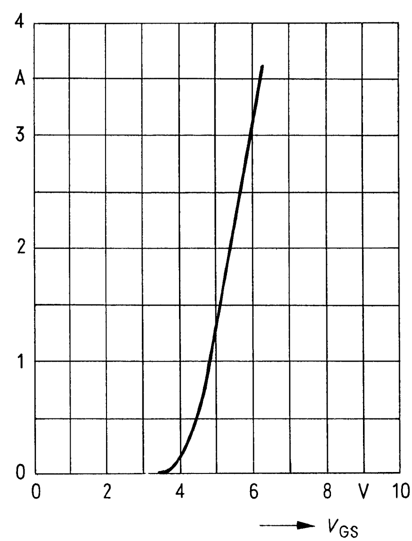

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



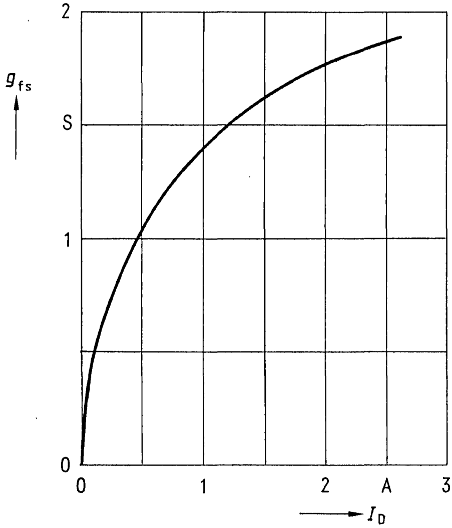

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



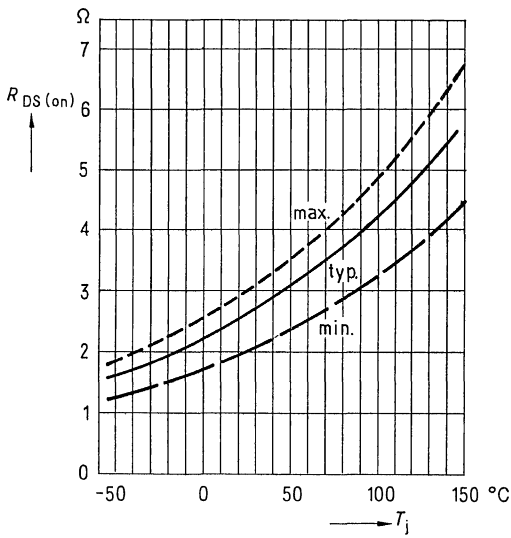

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



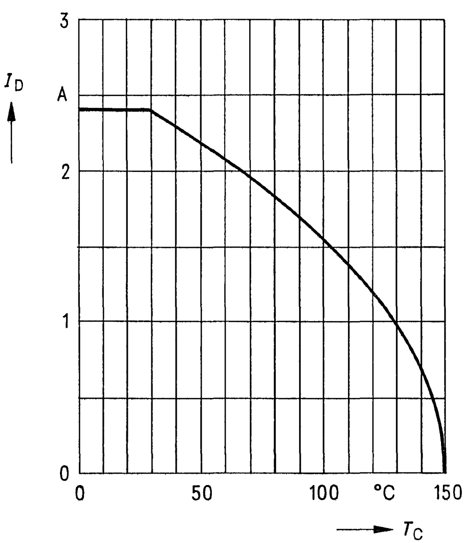
**Typical transconductance** $g_{fs} = f\,(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



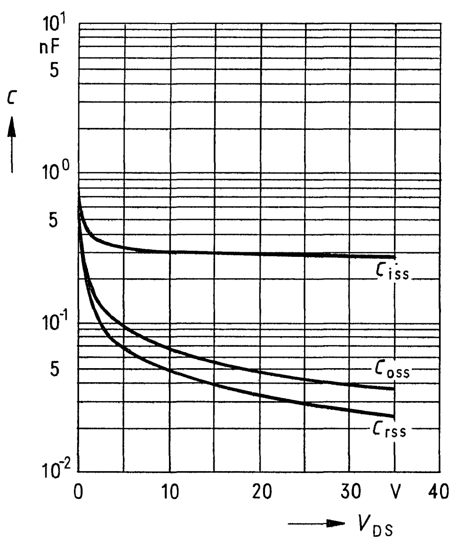

**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)



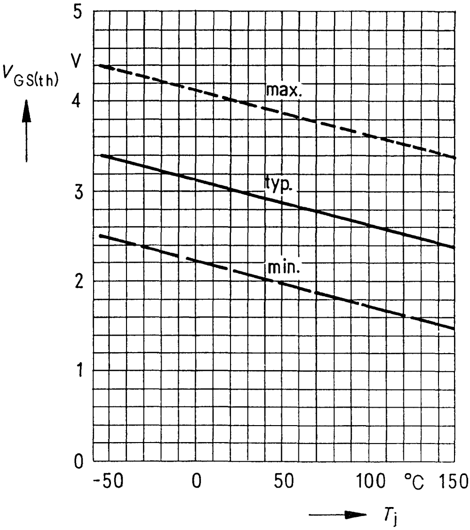

**Continuous drain current** $I_D = f\,(T_{case})$



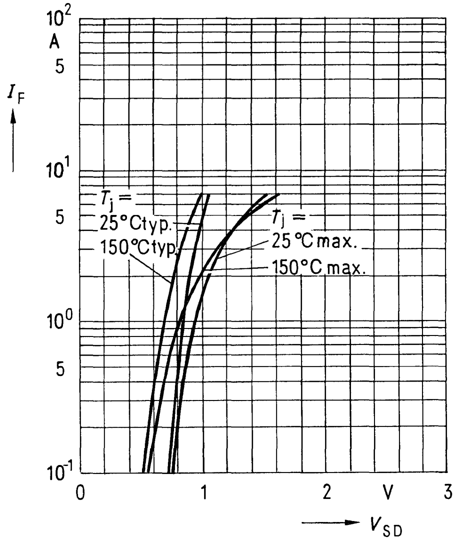

**Typical capacitances** $C = f\,(V_{DS})$
parameter: $V_{GS}$ = 0, $f$ = 1 MHz



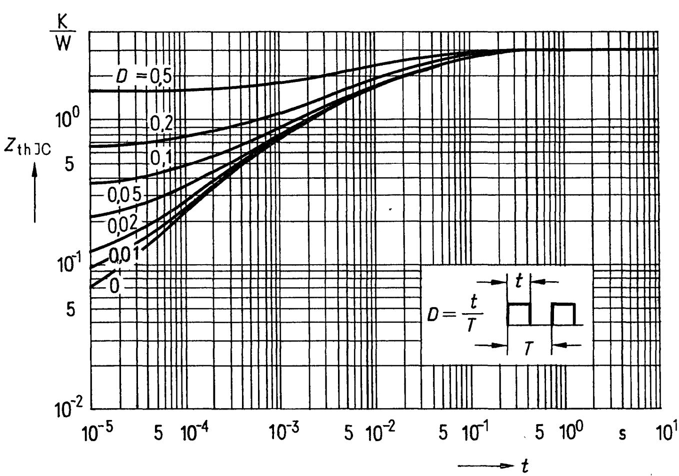
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80\ \mu s$



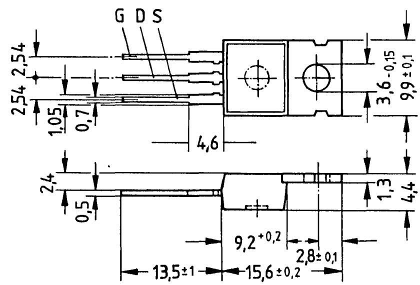

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 74 A | C67078-A1314-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 500V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 2,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 6,0 |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 500 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 500V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 3,6 | 4,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,2A |

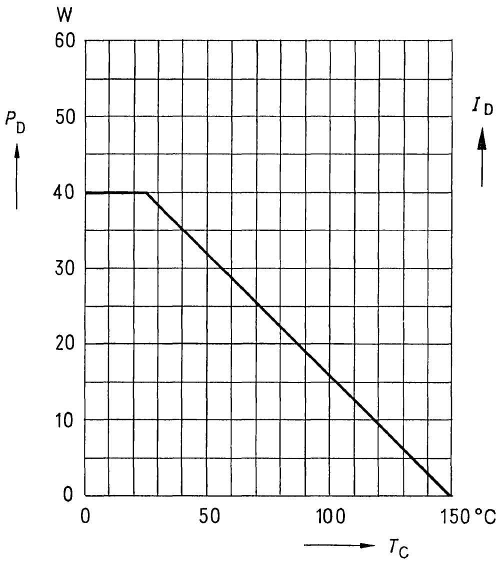
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | – | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,2A |
| Input capacitance | $C_{iss}$ | – | 350 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 50 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 20 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,1A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 150 | – | | |
| | $t_f$ | – | 100 | – | | |

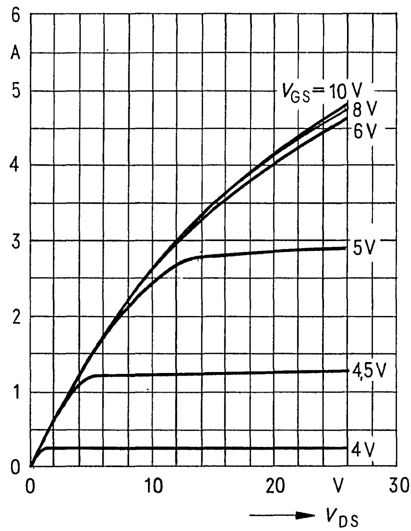
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 6,0 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 350 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 3,5 | – | µC | |

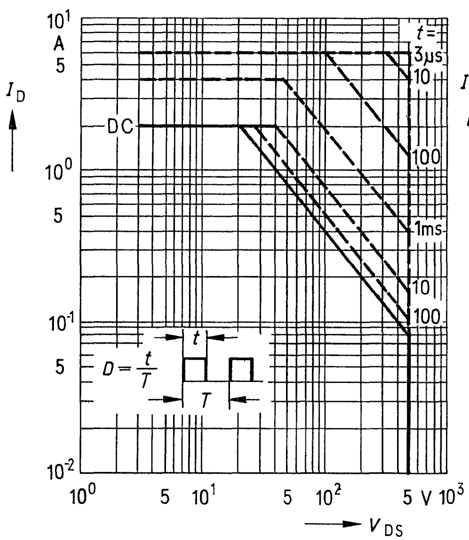
**Power dissipation** $P_D = f(T_{case})$



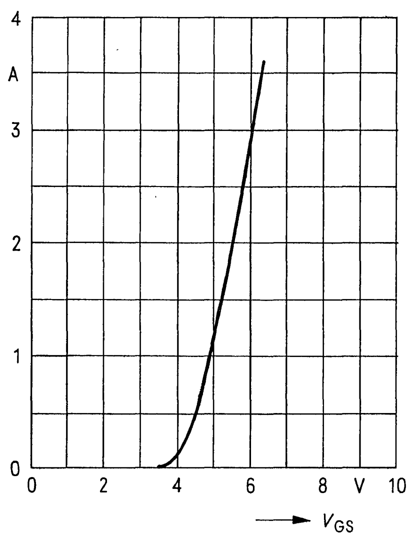

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case}$ = 25 °C



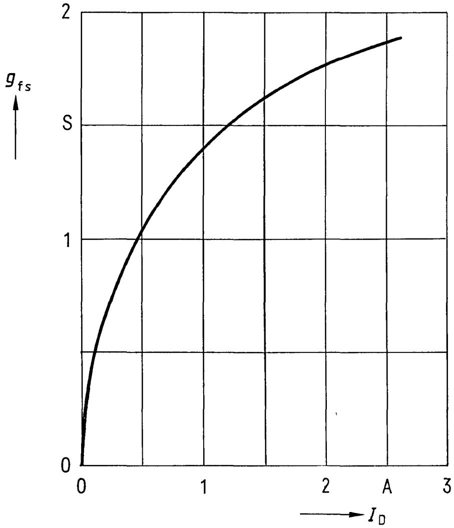

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D$ = 0.01, $T_{case}$ = 25 °C



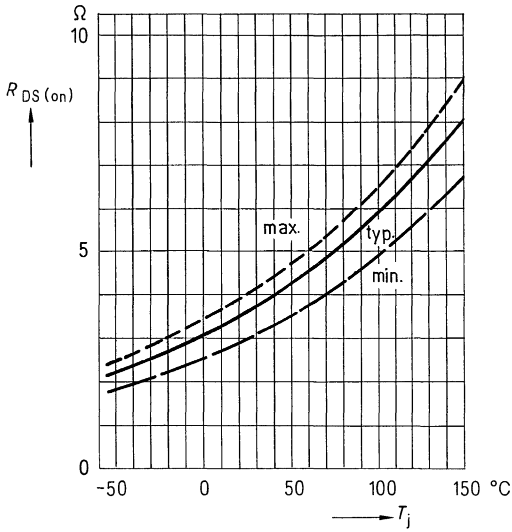

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



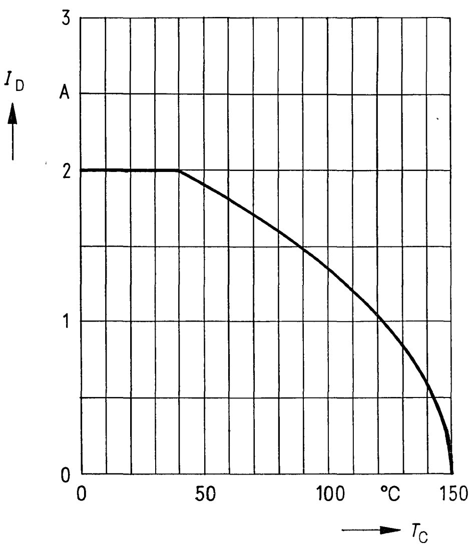
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



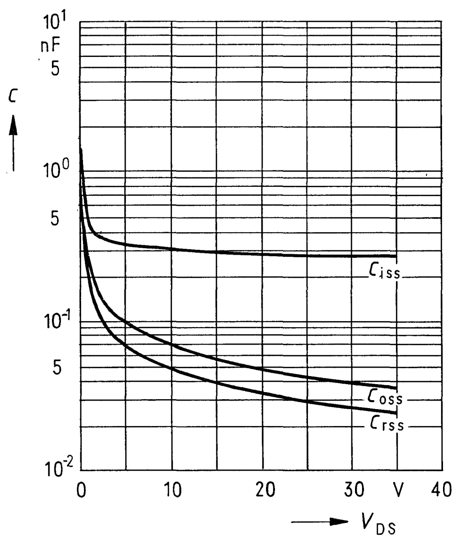

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



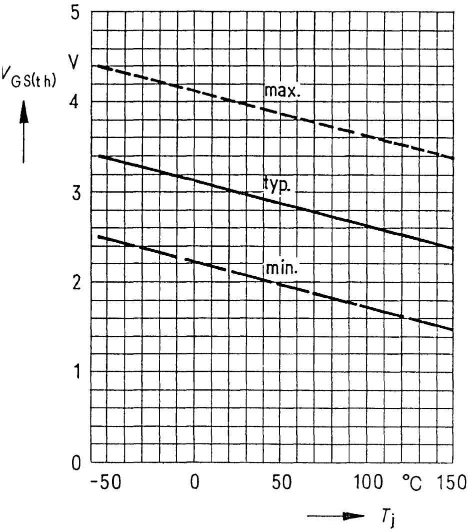

**Continuous drain current** $I_D = f(T_{case})$



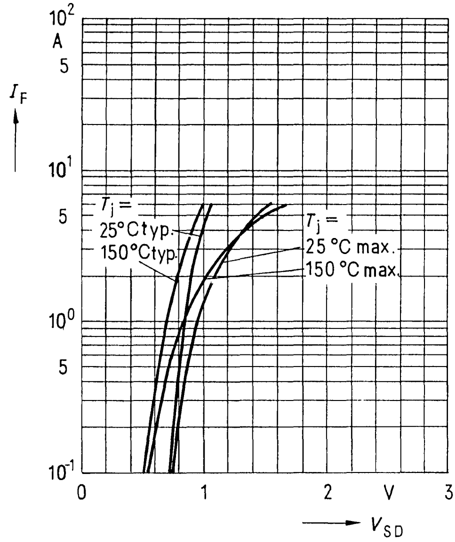

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



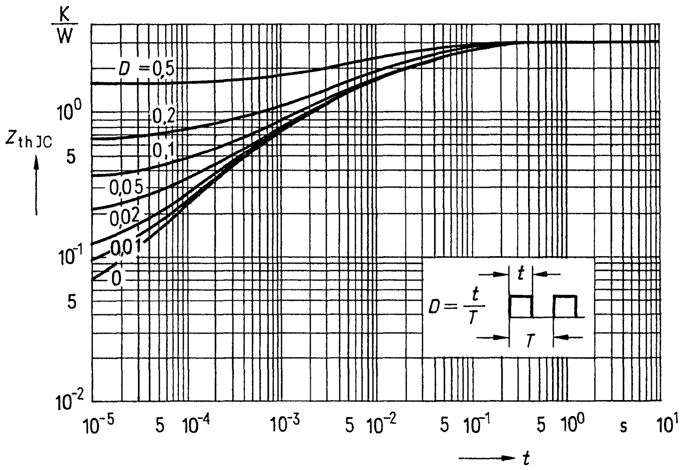
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



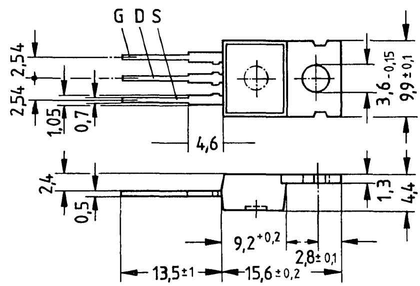

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 76 | C67078-A1315-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 35 °C | $I_D$ | 3,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 9,0A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,8 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

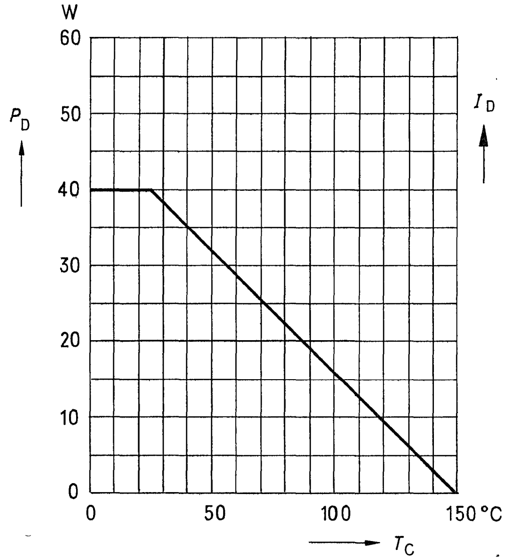
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | – | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 420 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 60 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 25 | – | | |
| Turn-on time $t_{on}$ | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| ($t_{on} = t_{d\,(on)} + t_r$) | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ | $t_{d\,(off)}$ | – | 150 | – | | |
| ($t_{off} = t_{d\,(off)} + t_f$) | $t_f$ | – | 100 | – | | |

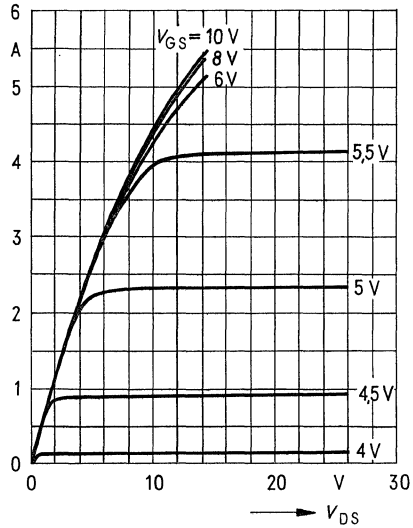
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 3,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 9,0 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 300 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 2,5 | – | µC | |

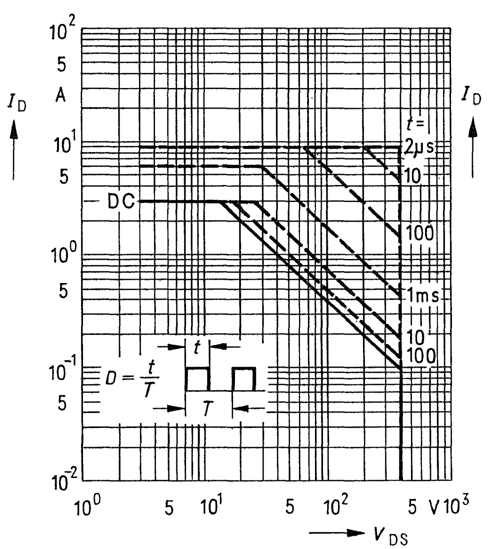
**Power dissipation** $P_D = f(T_{case})$



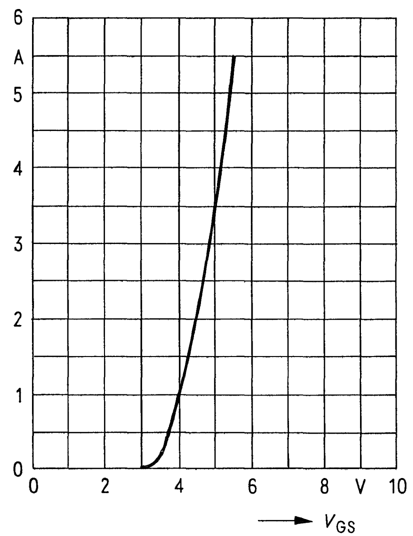

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



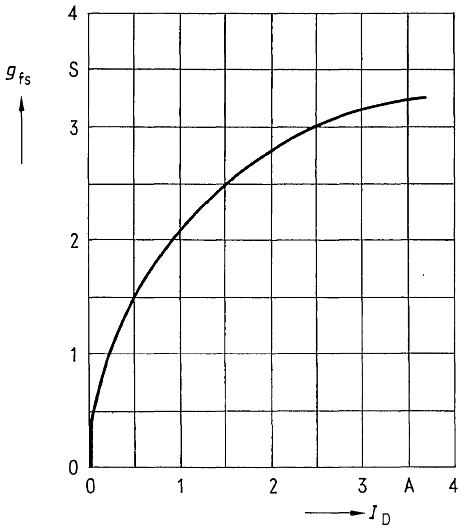

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



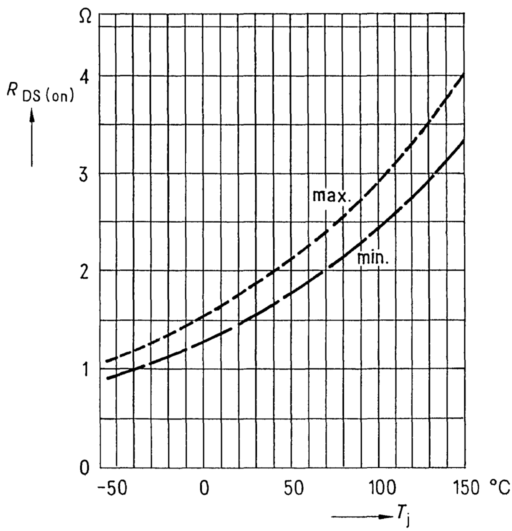

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



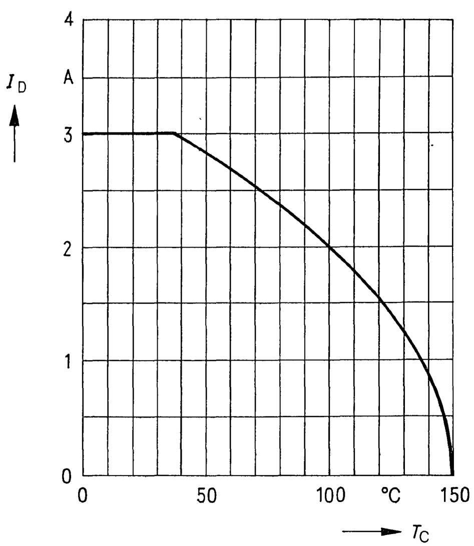
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



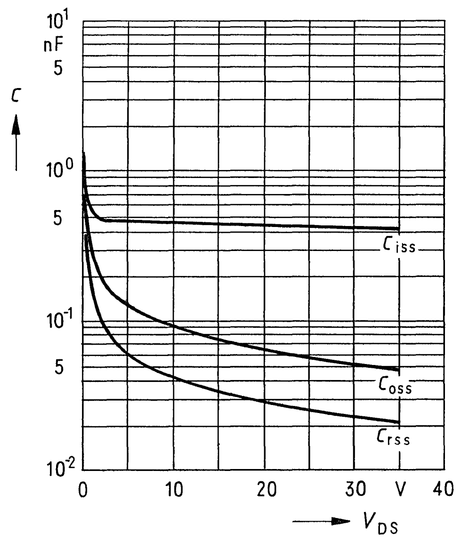

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



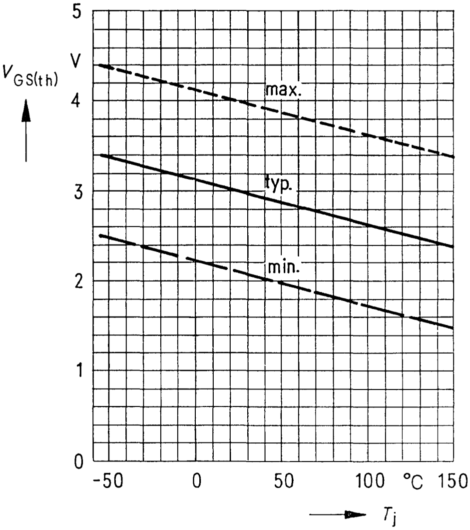

**Continuous drain current** $I_D = f(T_{case})$



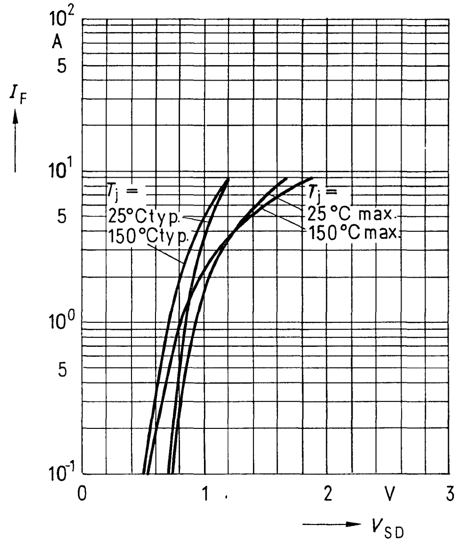

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



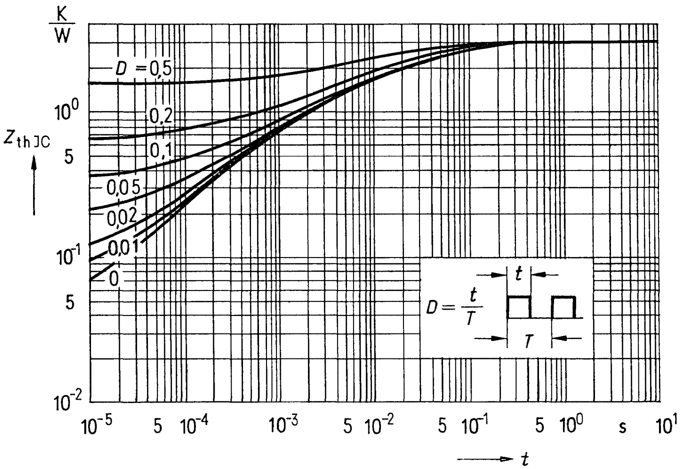
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p = 80$ µs



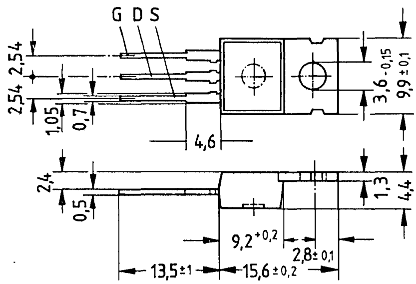

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869,
or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 76 A | C67078-A1315-A3 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 400V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 400V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 2,6A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 40W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C… +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤3,1K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 400 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 25<br>50 | 250<br>1000 | µA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 400V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | 2,2 | 2,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

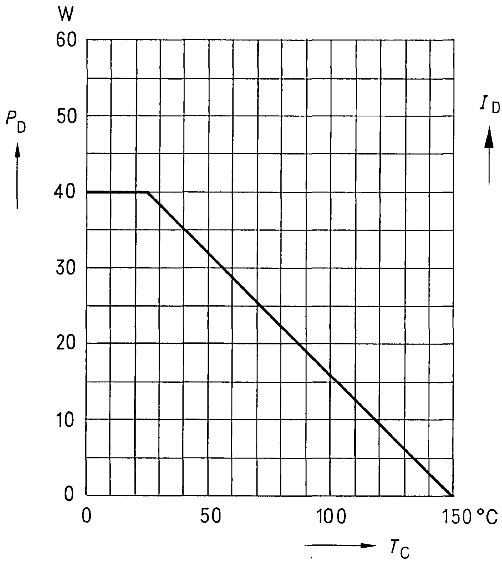
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | – | 2,5 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 420 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 60 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 25 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 30 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,4A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 150 | – | | |
| | $t_f$ | – | 100 | – | | |

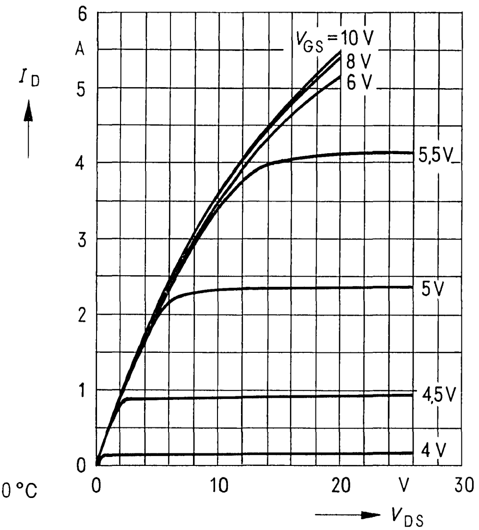
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,6 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 300 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{IF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 2,5 | – | µC | |

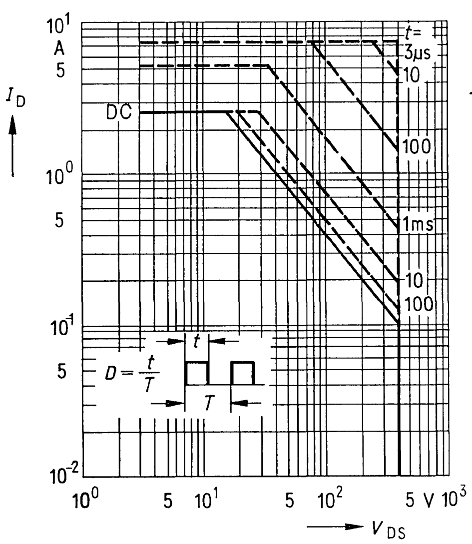
**Power dissipation** $P_D = f(T_{case})$



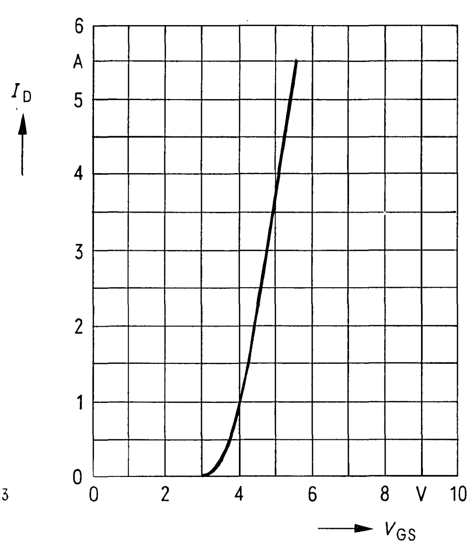

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25°C$



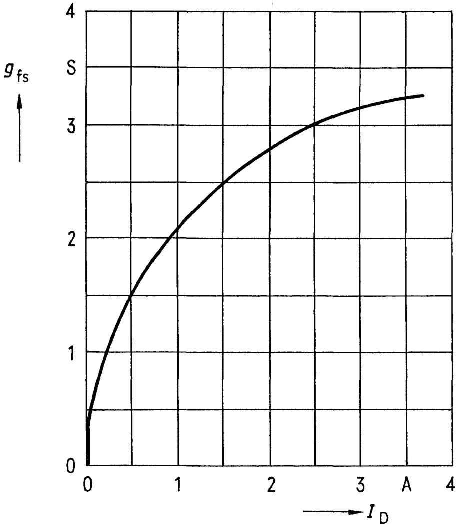

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25°C$



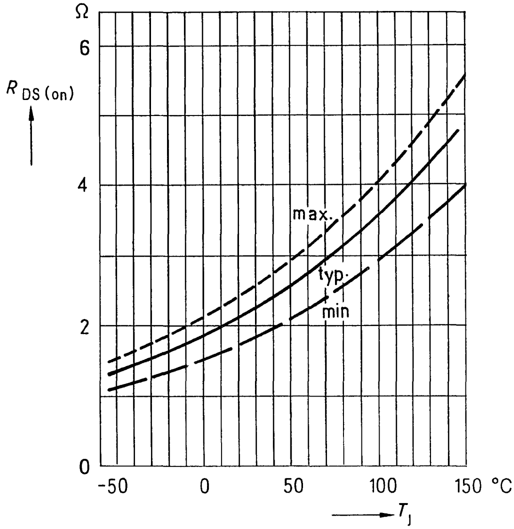

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



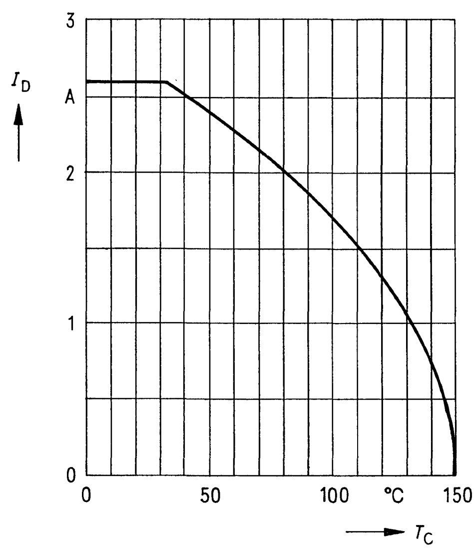
**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$



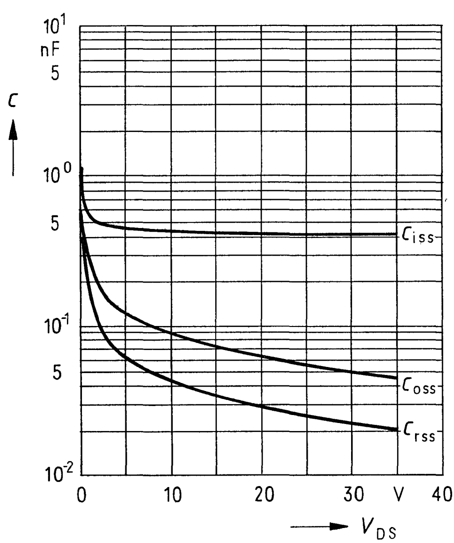

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



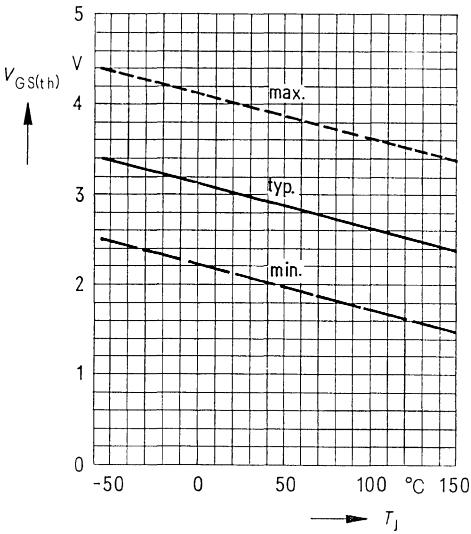

**Continuous drain current** $I_D = f(T_{case})$



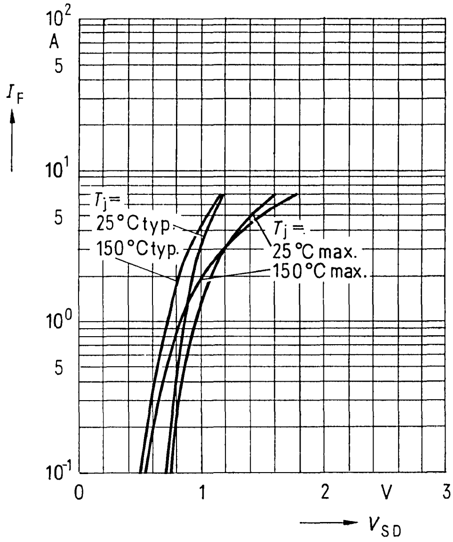

**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



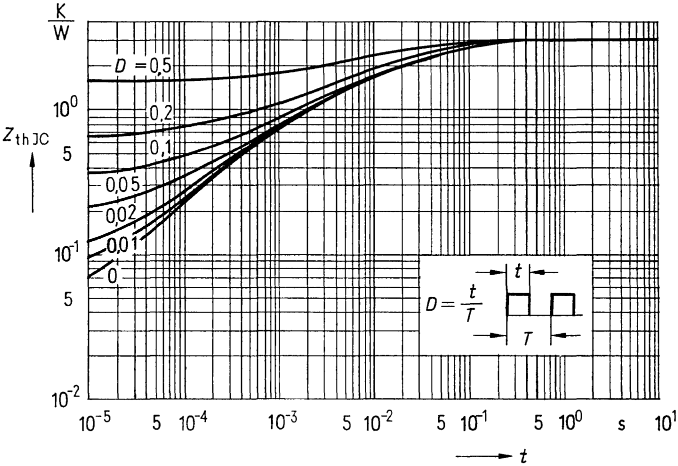
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 10 mA




**Forward characteristic of reverse diode**
$I_F = f(V_{SD})$
parameter: $T_j$, $t_p$ = 80 µs



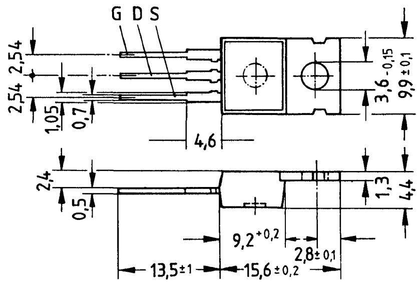

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC. The drain connection is conductively connected to the mounting flange. Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 80 | C67078-A1309-A2 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case}$ = 45 °C | $I_D$ | 2,6A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 7,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C… +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤75K/W |
| | $R_{th\ JC}$ | ≤ 1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 4,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

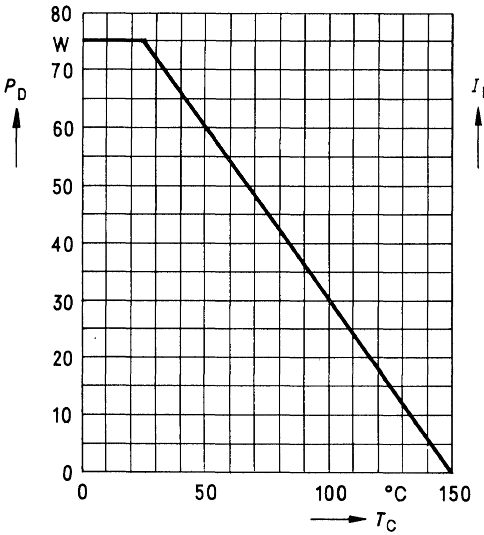
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,0 | 1,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,1A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

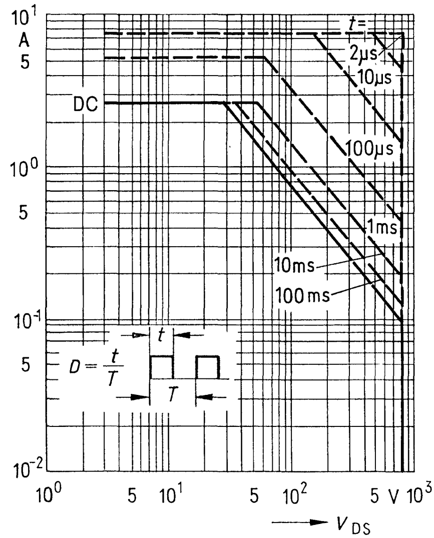
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,6 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 7,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

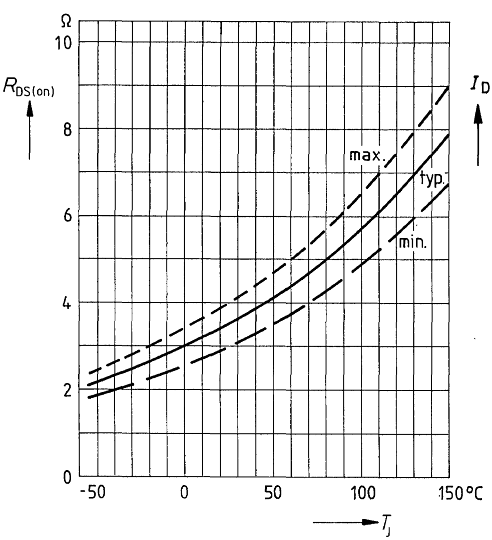
**Power dissipation** $P_D = f(T_{case})$



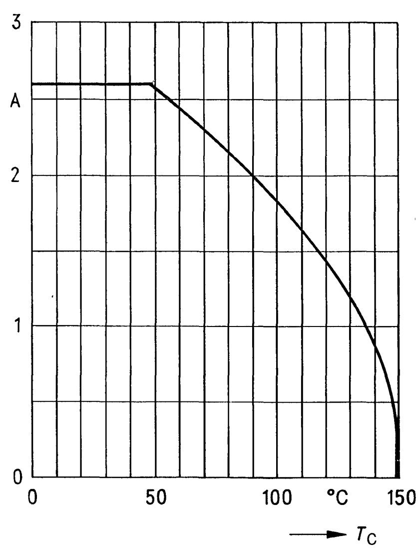

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



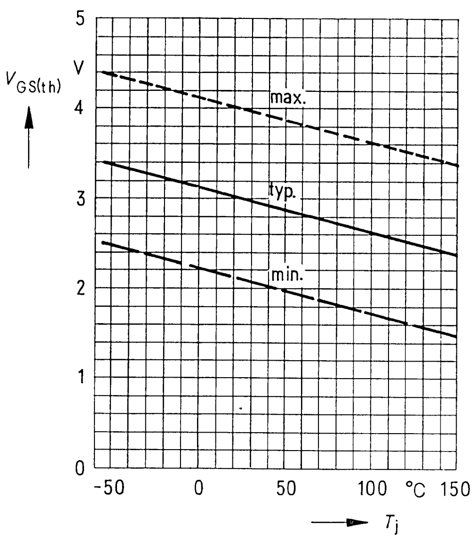

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



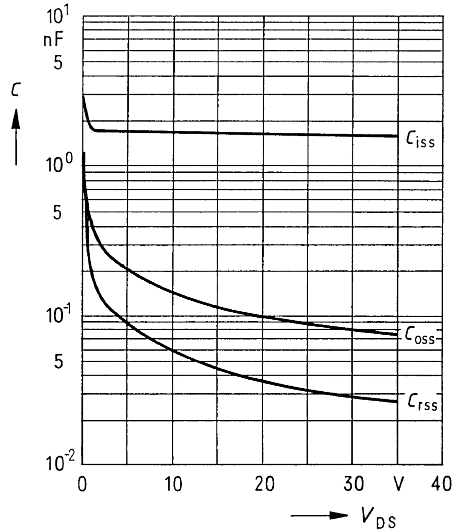

**Continuous drain current** $I_D = f(T_{case})$



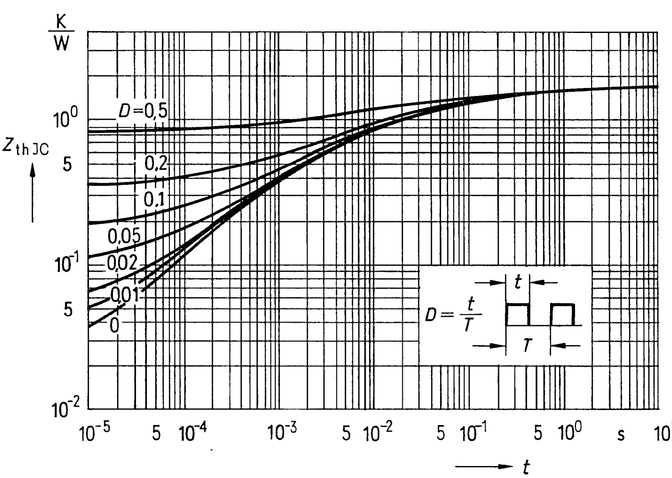
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



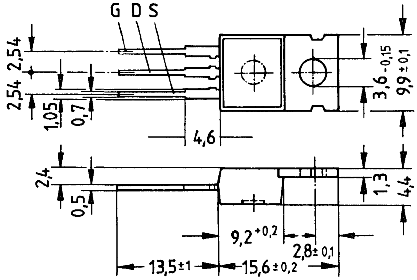

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package 14A3 in accordance with DIN 41 869, or TO 220 AB in accordance with JEDEC.
The drain connection is conductively connected to the mounting flange.
Approx. weight 2 g

| Type | Ordering code |
|---|---|
| BUZ 80 A | C67078-A1309-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case}$ = 45 °C | $I_D$ | 3,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 9,0A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 75W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤75K/W |
| | $R_{th\,JC}$ | ≤1,67K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 3,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

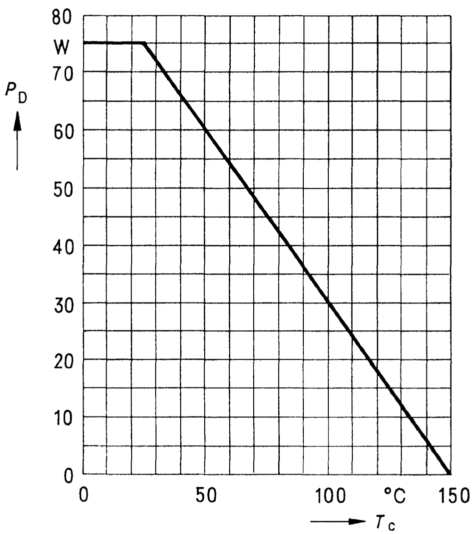
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,0 | 1,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on}$ = $t_{d\,(on)}$ + $t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off}$ = $t_{d\,(off)}$ + $t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

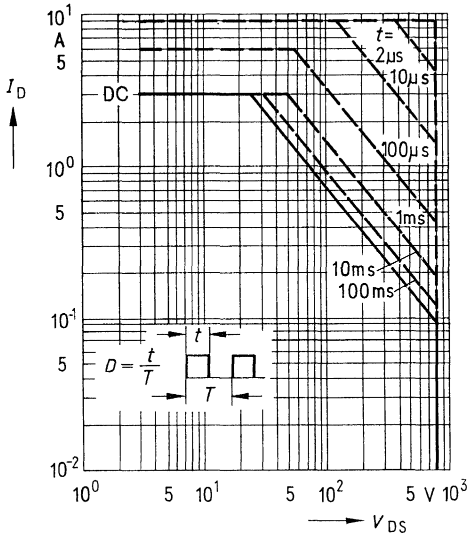
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 3,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 9,0 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

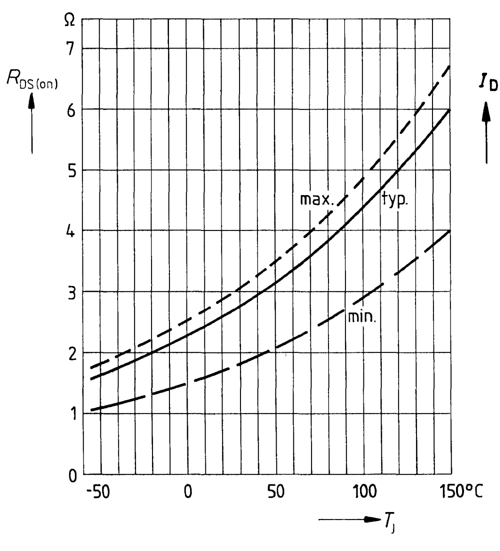
**Power dissipation** $P_D = f(T_{case})$



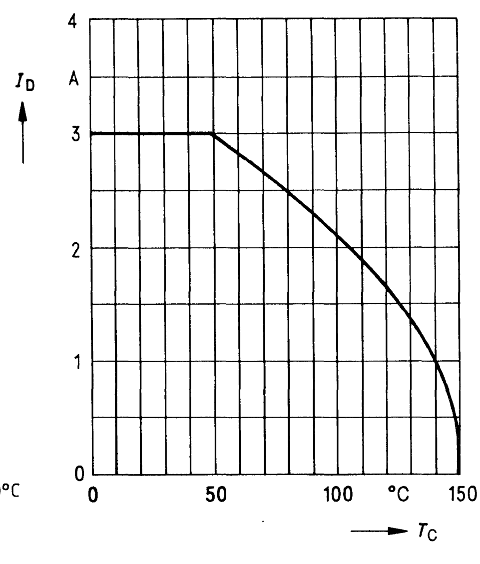

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



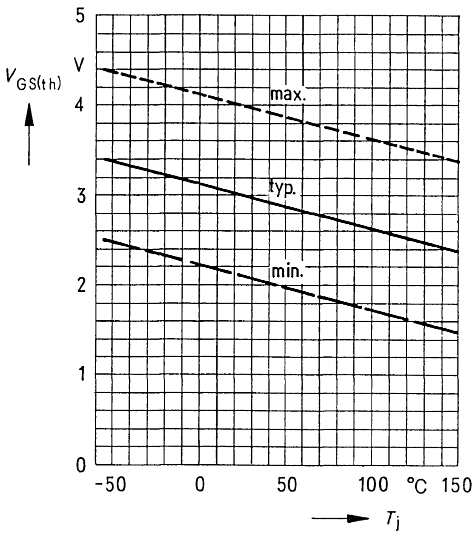

**Drain-source on-state resistance**
$R_{DS(on)} = f(T_j)$
(spread)



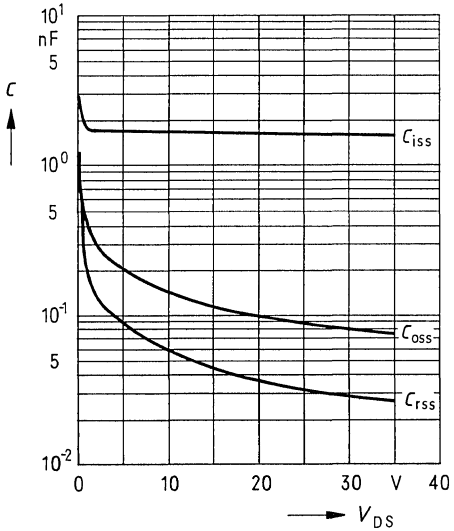

**Continuous drain current** $I_D = f(T_{case})$



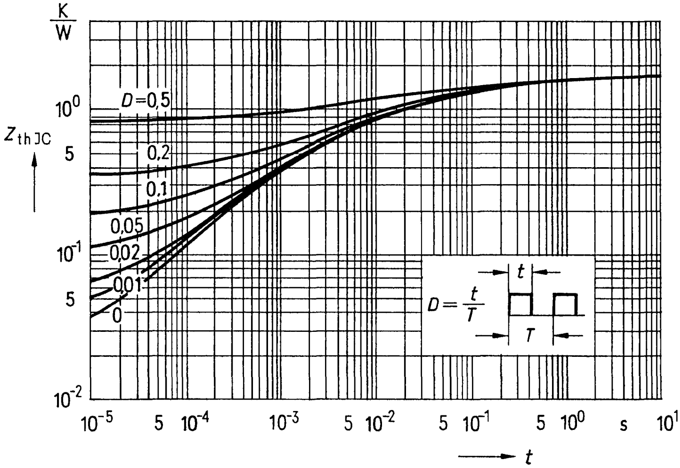
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



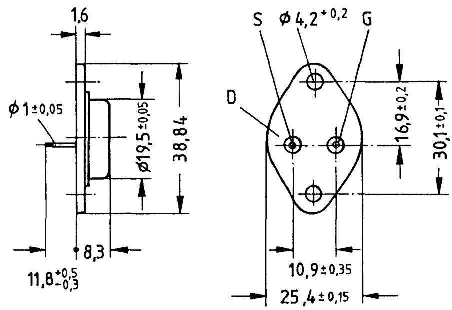

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 83 | C67078-A1012-A2 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case}$ = 30 °C | $I_D$ | 2,9A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 8,5A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage | $T_j$ | |
| temperature range | $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 4,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

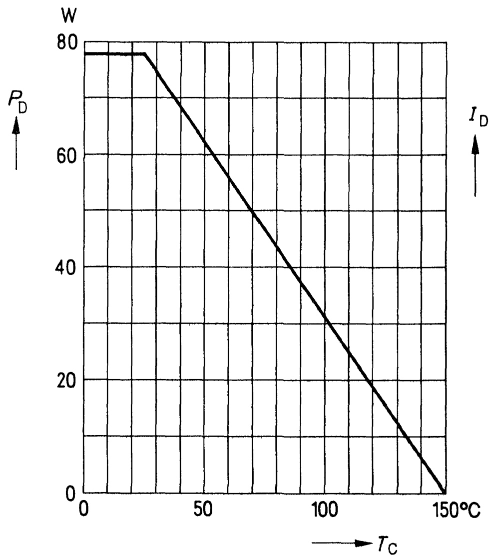
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,0 | 1,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,1A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

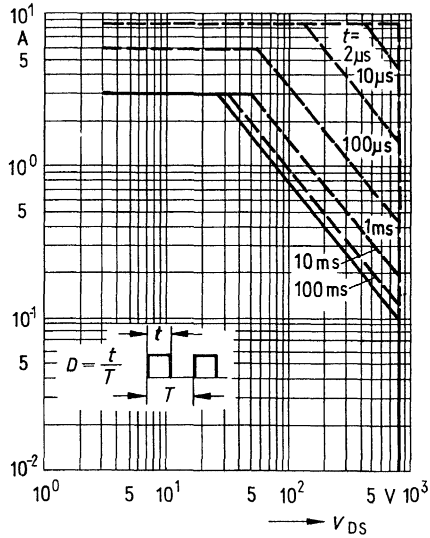
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 2,9 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 8,5 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,05 | 1,3 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

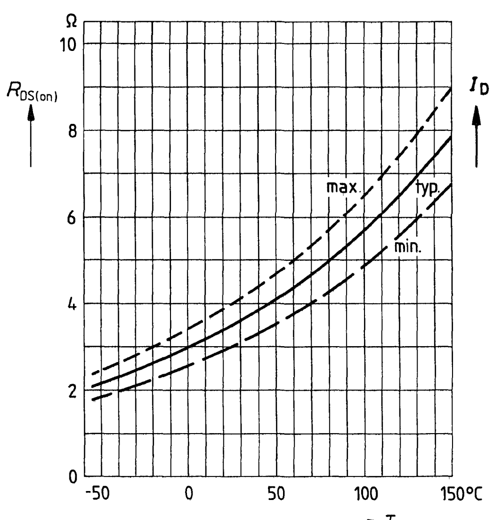
**Power dissipation** $P_D = f(T_{case})$



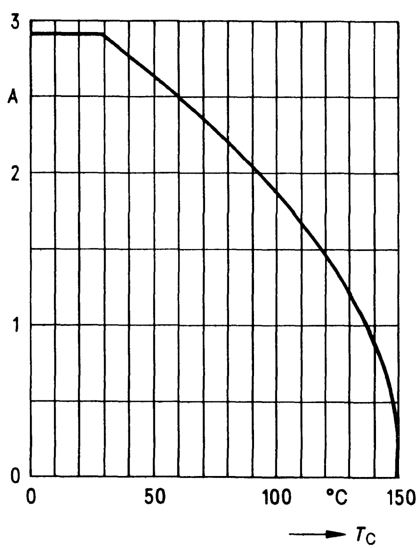

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



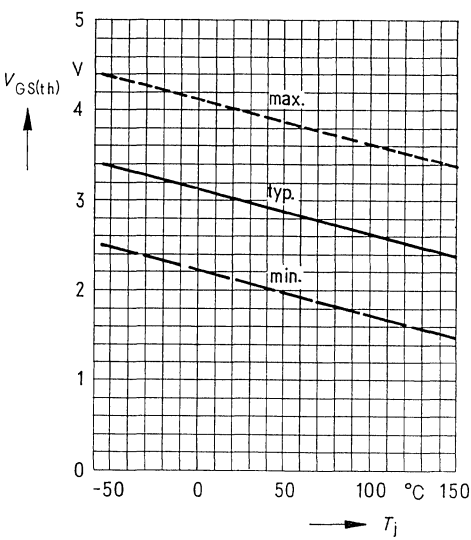

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



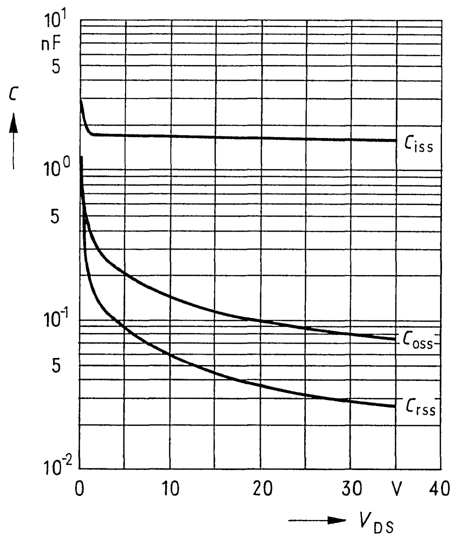

**Continuous drain current** $I_D = f(T_{case})$



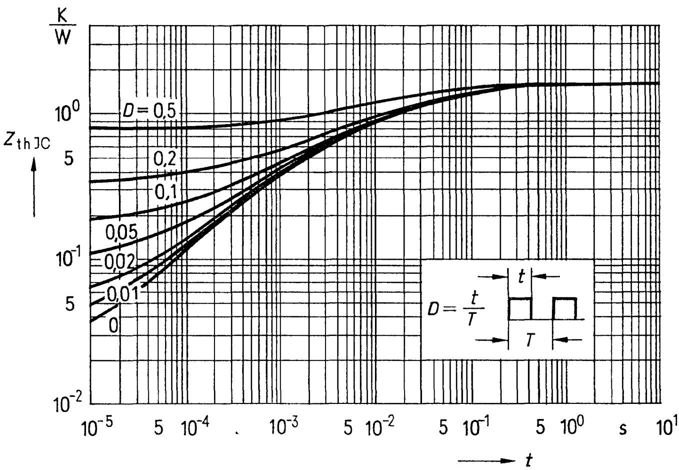
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz

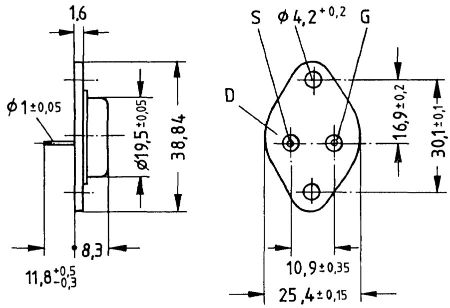



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 83 A | C67078-A1012-A3 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 3,4A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 10A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 78W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | − |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,6K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics | | | Unit | Conditions |
|---|---|---|---|---|---|---|
| | | min. | typ. | max. | | |
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 3,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 1,5A |

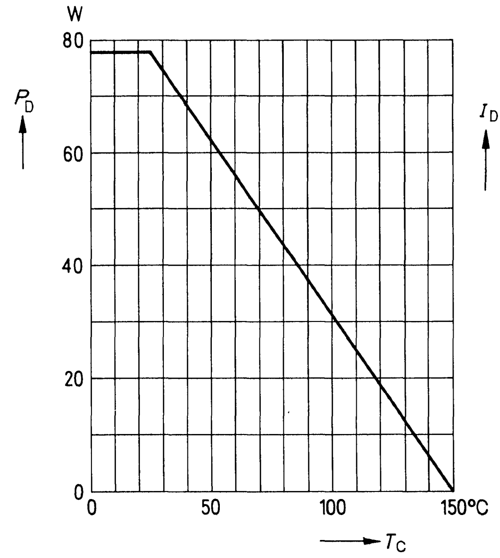
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,0 | 1,8 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 1,5A |
| Input capacitance | $C_{iss}$ | – | 1600 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 90 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 30 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 40 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,3A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 50Ω |
| | $t_r$ | – | 70 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 200 | – | | |
| | $t_f$ | – | 100 | – | | |

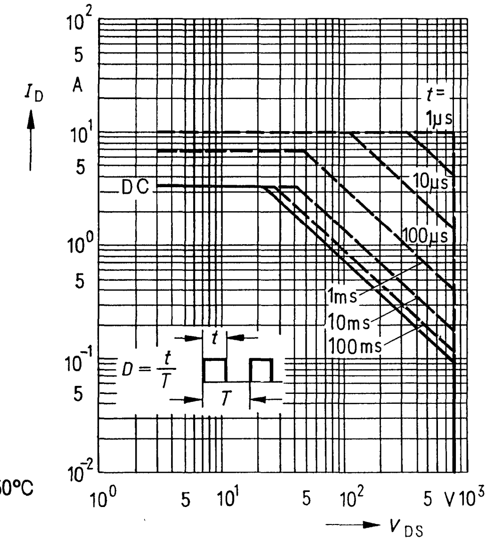
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 3,4 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 10 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,35 | V | $I_F$ = 2 × $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2 × $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 12 | – | µC | |

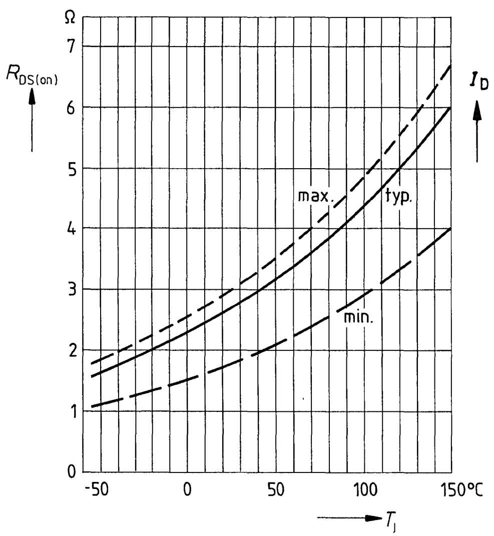
**Power dissipation** $P_D = f(T_{case})$



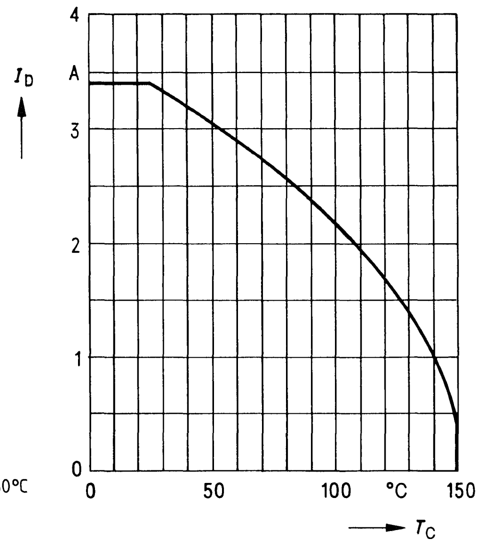

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



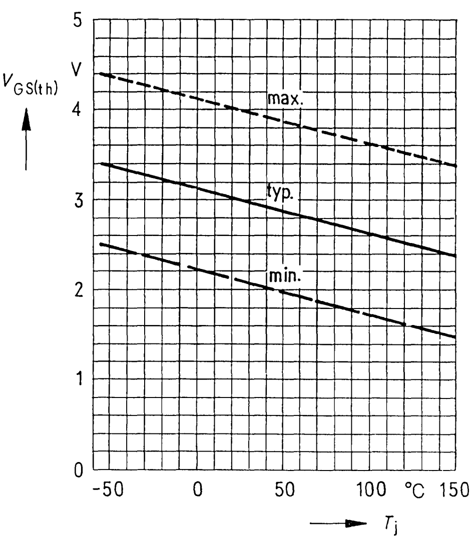

**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



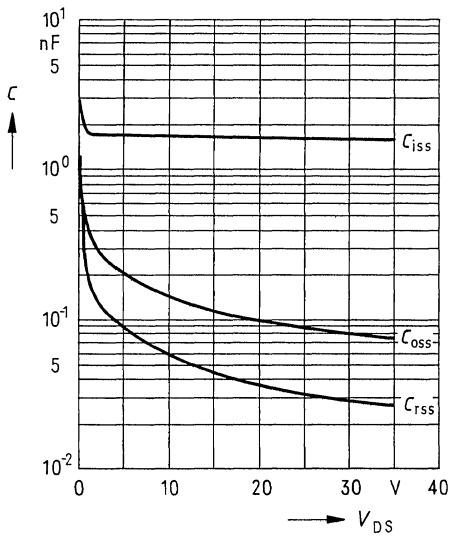

**Continuous drain current** $I_D = f(T_{case})$



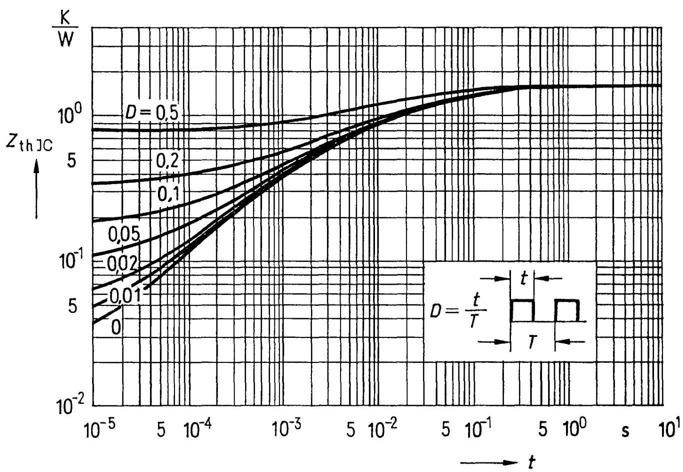
**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical capacitances** $C = f(V_{DS})$
parameter: $V_{GS} = 0$, $f = 1$ MHz



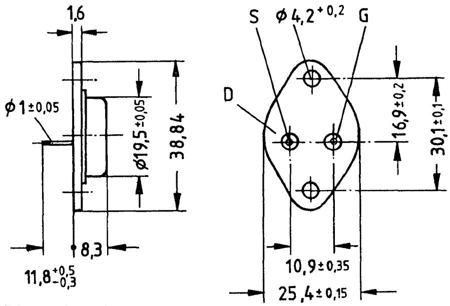

**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 84 | C67078-A1013-A2 |




Dimensions in mm

| **Absolute maximum ratings** | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 5,3A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 15A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\,JA}$ | ≤35K/W |
| | $R_{th\,JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 3A |

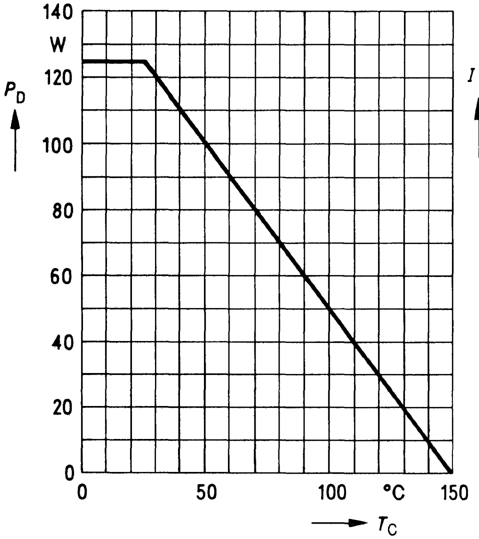
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,8 | 3,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 3A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$<br>($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$<br>($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

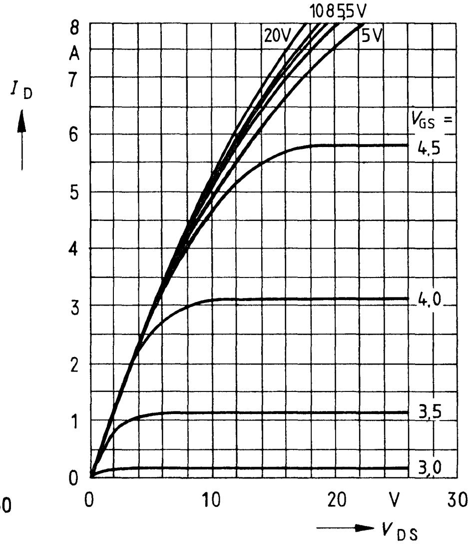
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 5,3 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 15 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,0 | 1,45 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 25 | – | µC | |

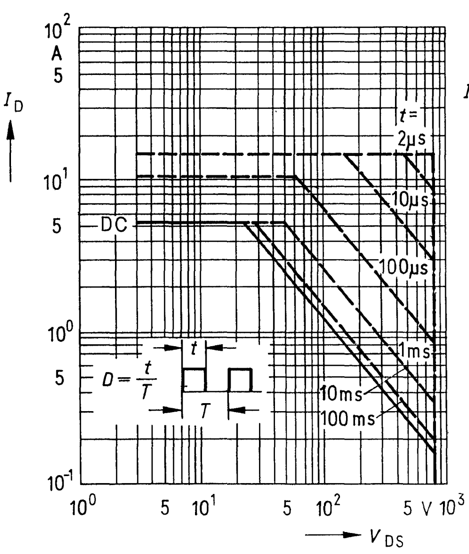
**Power dissipation** $P_D = f(T_{case})$



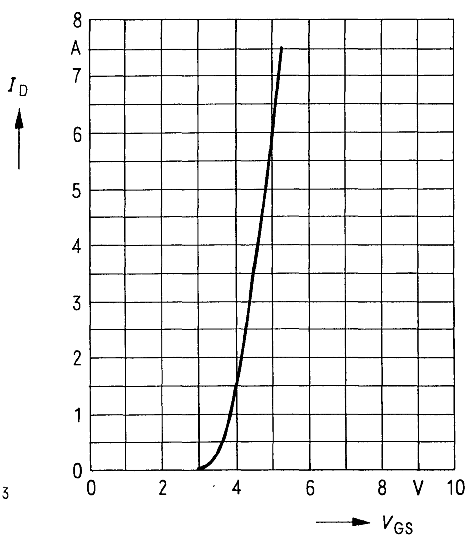

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



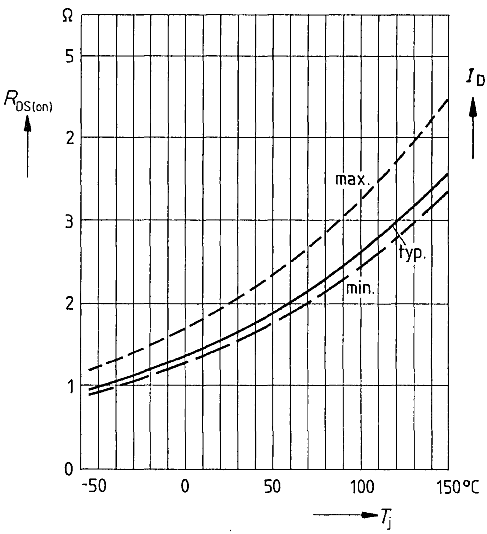

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



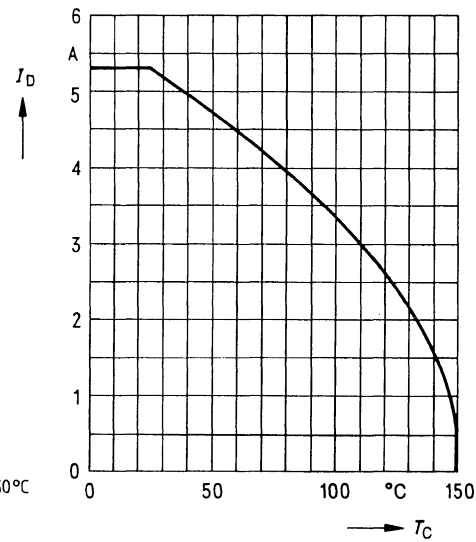

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



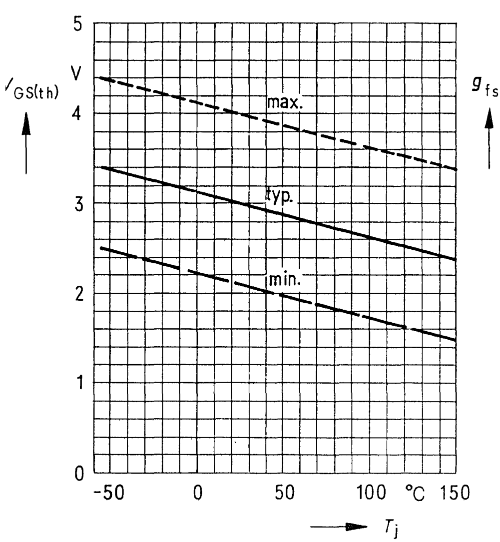
**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



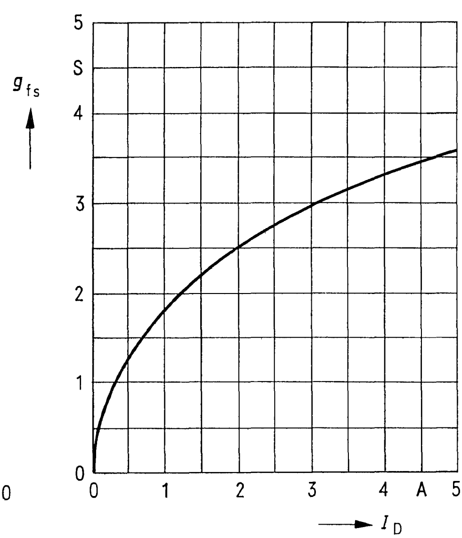

**Continuous drain current** $I_D = f(T_{case})$



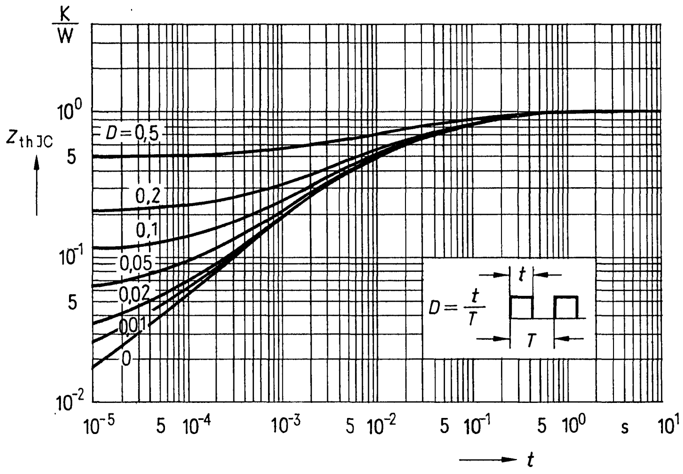

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25°C$

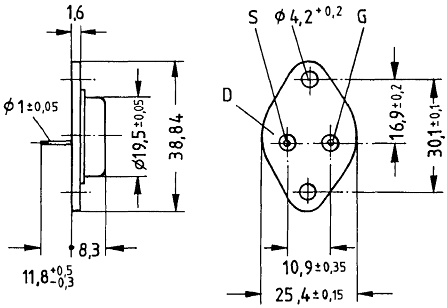


**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Metal case 3A2 in accordance with DIN 41 872, or TO 204 AA (TO 3) in accordance with JEDEC. Approx. weight 12 g

| Type | Ordering code |
|---|---|
| BUZ 84 A | C67078-A1013-A3 |




Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 6,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 18A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 125W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −55 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | – |
| **Thermal resistance** | $R_{th\ JA}$ | ≤35K/W |
| | $R_{th\ JC}$ | ≤1,0K/W |

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 3A |

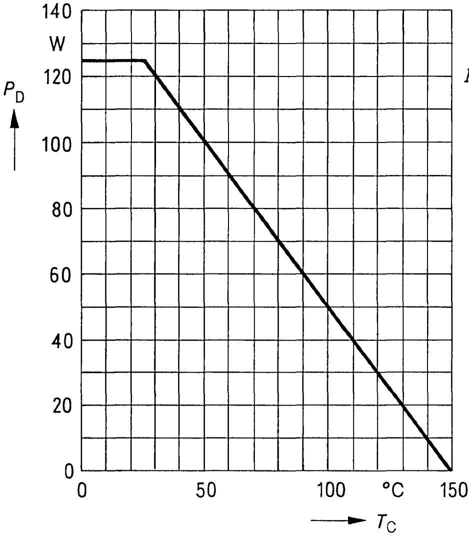
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,8 | 3,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 3A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,6A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

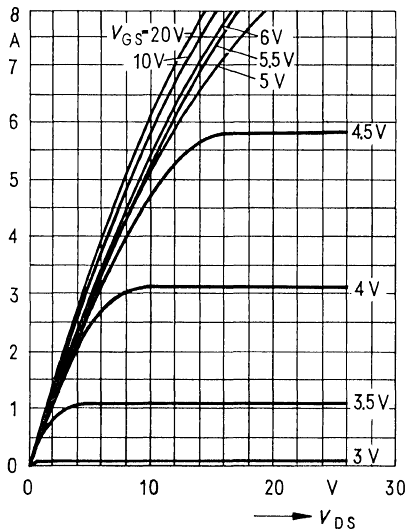
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 6,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 18 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,5 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 25 | – | µC | |

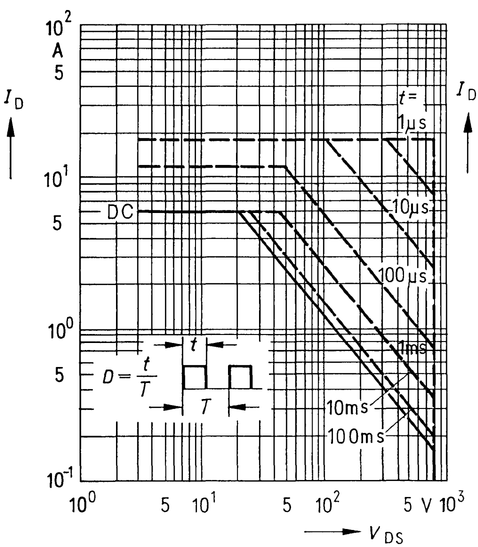
**Power dissipation** $P_D = f(T_{case})$



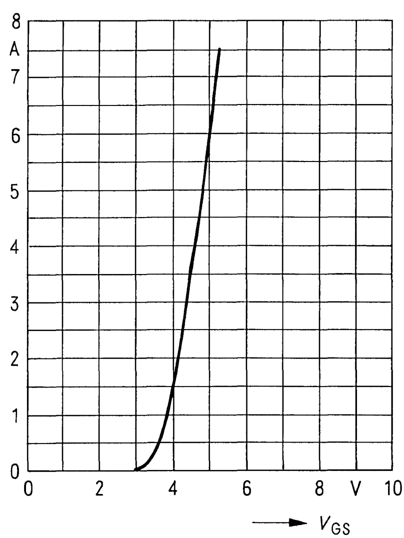

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



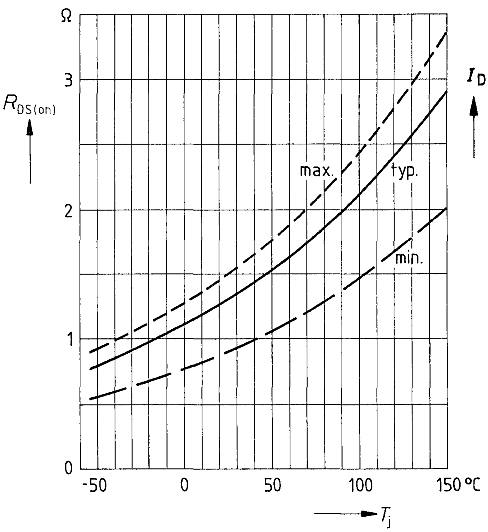

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



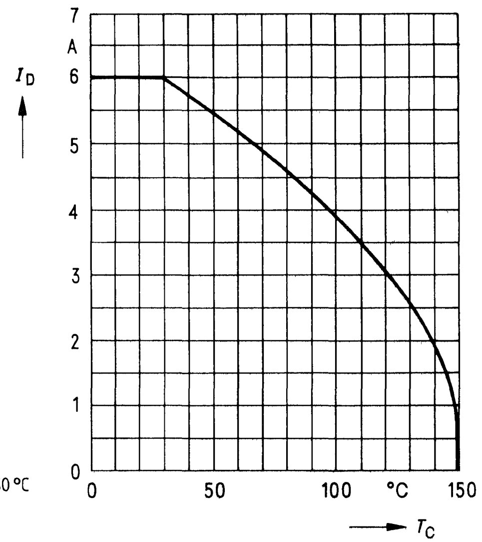

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25\,V$, $T_j = 25\,°C$



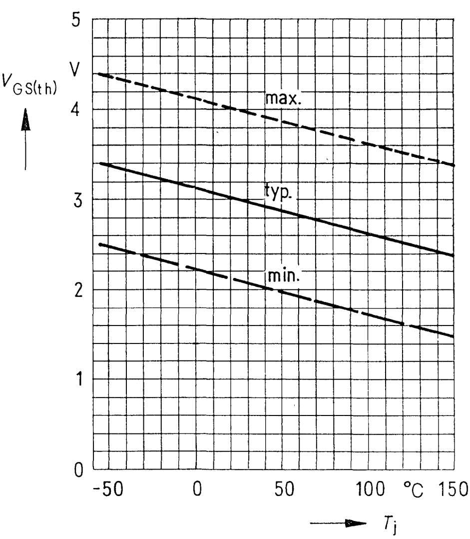
**Drain-source on-state resistance**
$R_{DS\,(on)} = f(T_j)$
(spread)



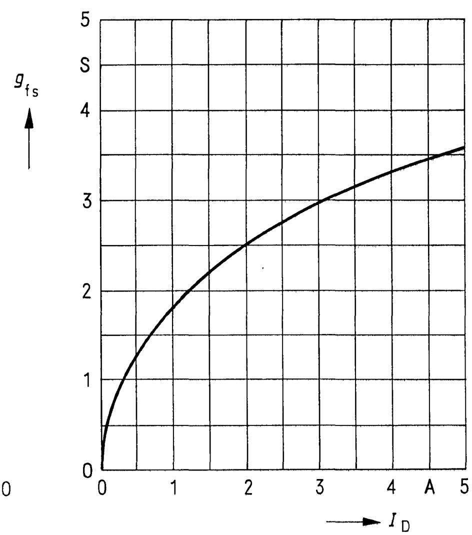

**Continuous drain current** $I_D = f(T_{case})$



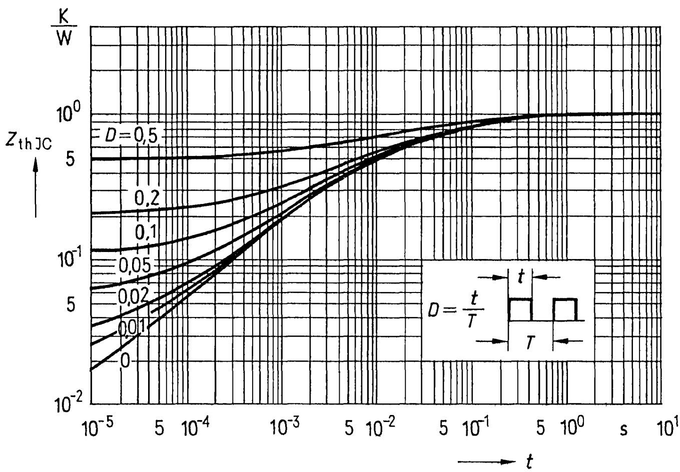

**Gate threshold voltage** $V_{GS(th)} = f(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D = 10$ mA




**Typical transconductance** $g_{fs} = f(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



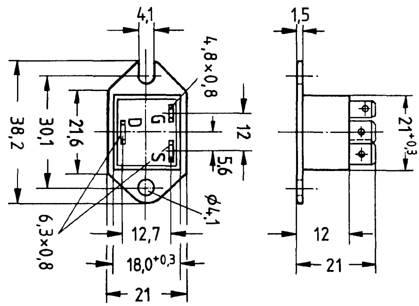
**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode

**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 88 | C67078-A1609-A2 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS} = 20\ k\Omega$ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case} = 25\ °C$ | $I_D$ | 4,3A |
| Pulsed drain current, $T_{case} = 25\ °C$ | $I_{Dpuls}$ | 12A |
| Gate-source voltage | $V_{GS}$ | $\pm$20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | $-40\ °C \ldots +150\ °C$ |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 3500Vdc[1]) |

**Thermal resistance**

| | | |
|---|---|---|
| | $R_{th\ JA}$ | – |
| | $R_{th\ JC}$ | $\leq$1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

# Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

## Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 2,0 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 3A |

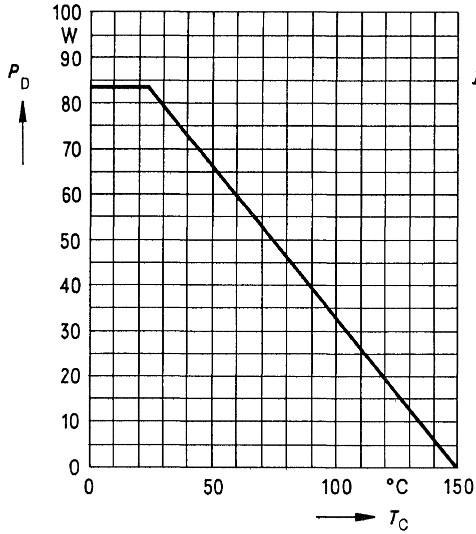
## Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,8 | 3,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 3A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,5A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

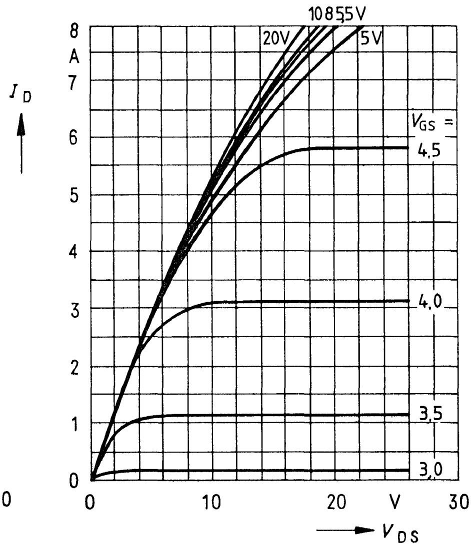
## Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 4,3 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 12 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,4 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/µs |
| Reverse recovery charge | $Q_{rr}$ | – | 25 | – | µC | |

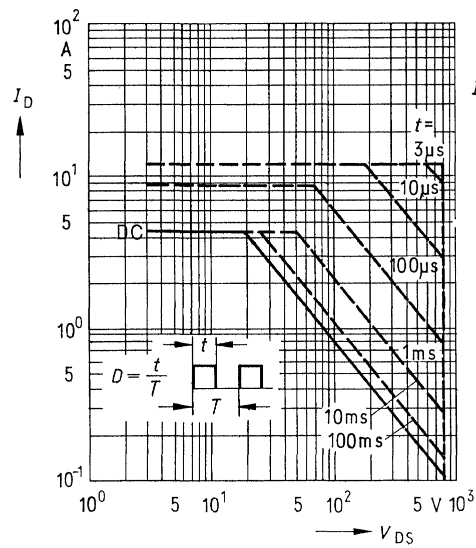
**Power dissipation** $P_D = f(T_{case})$



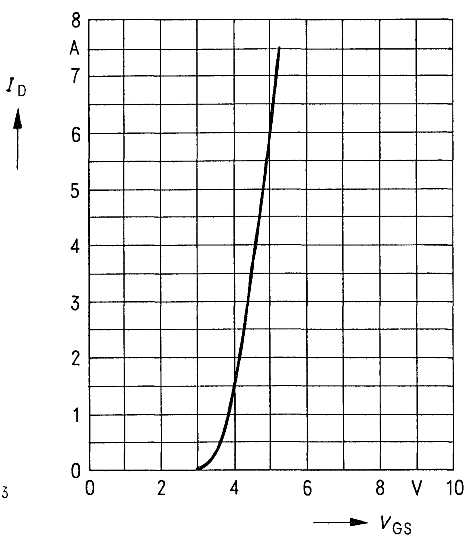

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



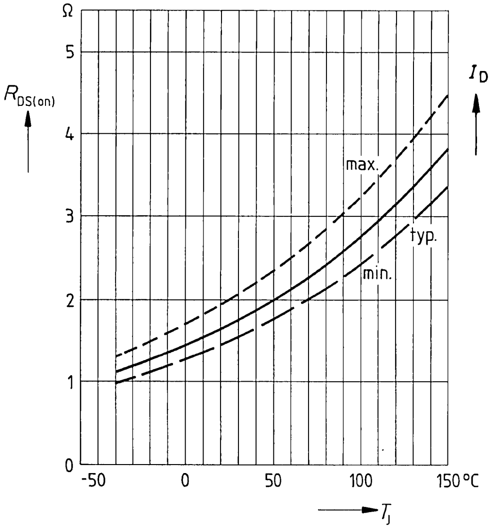

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



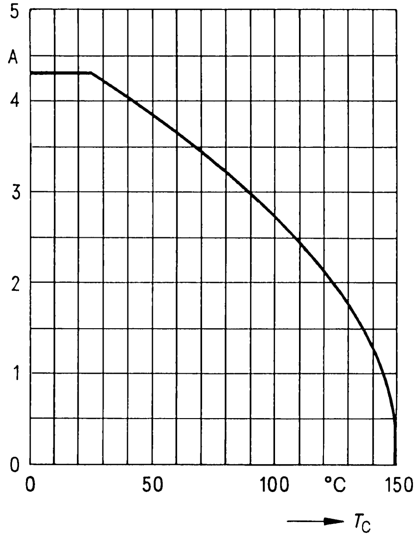

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



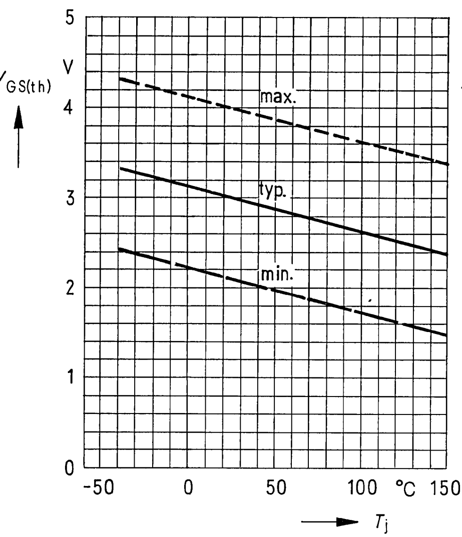
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)



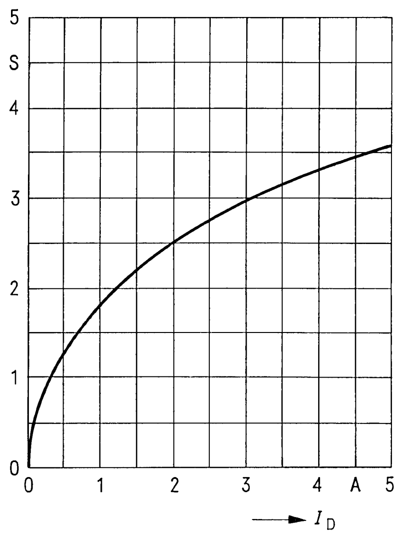

**Continuous drain current** $I_D = f\,(T_{case})$



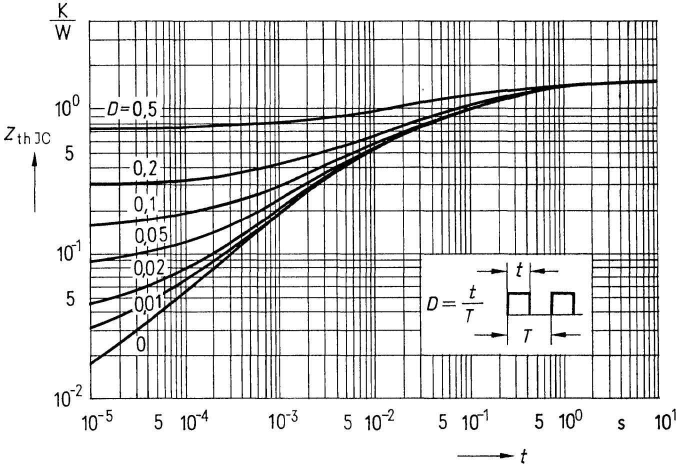

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS,}\ I_D = 10$ mA




**Typical transconductance** $g_{fs} = f\,(I_D)$
parameter: 80 µs pulse test,
$V_{DS} = 25$V, $T_j = 25\,°C$

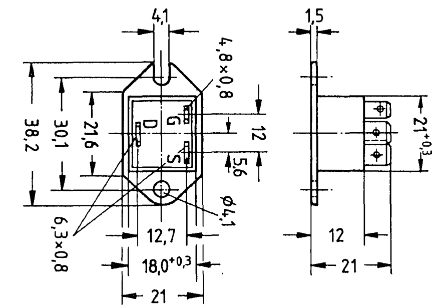


**Transient thermal impedance** $Z_{thJC}$ = f ($t$)
parameter: $D = t/T$



**Description** SIPMOS power FET, N-channel enhancement mode
**Case** Plastic package TO 238 AA with insulated metal base plate in accordance with JEDEC, compatible with TO 3; AMP plug-in connections.
Approx. weight 21 g

| Type | Ordering code |
|---|---|
| BUZ 88 A | C67078-A1609-A3 |



Dimensions in mm

**Absolute maximum ratings**

| | | |
|---|---|---|
| Drain-source voltage | $V_{DS}$ | 800V |
| Drain-gate voltage, $R_{GS}$ = 20 kΩ | $V_{DGR}$ | 800V |
| Continuous drain current, $T_{case}$ = 25 °C | $I_D$ | 5,0A |
| Pulsed drain current, $T_{case}$ = 25 °C | $I_{Dpuls}$ | 15A |
| Gate-source voltage | $V_{GS}$ | ±20V |
| Max. power dissipation | $P_D$ | 83,3W |
| Operating and storage temperature range | $T_j$ $T_{stg}$ | −40 °C ... +150 °C |
| Isolation test voltage ($t$ = 1 min) | $V_{is}$ | 3500Vdc[1]) |
| **Thermal resistance** | $R_{th\,JA}$ | – |
| | $R_{th\,JC}$ | ≤1,5K/W |

[1]) Isolation test voltage between drain and heat sink referred to standard climate 23/50 in accordance with DIN 50014.

## Electrical characteristics

at $T_{case}$ = 25 °C (unless otherwise specified)

### Static ratings

| Description | Symbol | Characteristics min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Drain-source breakdown voltage | $V_{(BR)\,DSS}$ | 800 | – | – | V | $V_{GS}$ = 0V<br>$I_D$ = 1mA |
| Gate threshold voltage | $V_{GS\,(th)}$ | 2,1 | 3,0 | 4,0 | | $V_{DS}$ = $V_{GS}$<br>$I_D$ = 10mA |
| Zero gate voltage drain current | $I_{DSS}$ | –<br>– | 0,1<br>0,2 | 1,0<br>4,0 | mA | $T_j$ = 25 °C<br>$T_j$ = 125 °C<br>$V_{DS}$ = 800V<br>$V_{GS}$ = 0V |
| Gate-source leakage current | $I_{GSS}$ | – | 10 | 100 | nA | $V_{GS}$ = 20V<br>$V_{DS}$ = 0V |
| Drain-source on-state resistance | $R_{DS\,(on)}$ | – | – | 1,5 | Ω | $V_{GS}$ = 10V<br>$I_D$ = 3A |

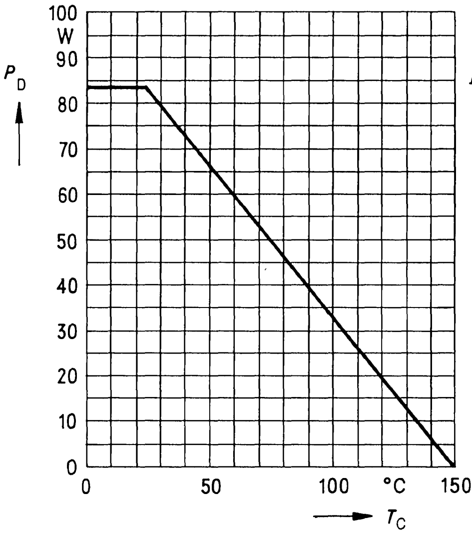
### Dynamic ratings

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Forward transconductance | $g_{fs}$ | 1,8 | 3,0 | – | S | $V_{DS}$ = 25V<br>$I_D$ = 3A |
| Input capacitance | $C_{iss}$ | – | 3500 | – | pF | $V_{GS}$ = 0V<br>$V_{DS}$ = 25V<br>$f$ = 1MHz |
| Output capacitance | $C_{oss}$ | – | 200 | – | | |
| Reverse transfer capacitance | $C_{rss}$ | – | 100 | – | | |
| Turn-on time $t_{on}$ ($t_{on} = t_{d\,(on)} + t_r$) | $t_{d\,(on)}$ | – | 60 | – | ns | $V_{CC}$ = 30V<br>$I_D$ = 2,6A<br>$V_{GS}$ = 10V<br>$R_{GS}$ = 10Ω |
| | $t_r$ | – | 100 | – | | |
| Turn-off time $t_{off}$ ($t_{off} = t_{d\,(off)} + t_f$) | $t_{d\,(off)}$ | – | 500 | – | | |
| | $t_f$ | – | 100 | – | | |

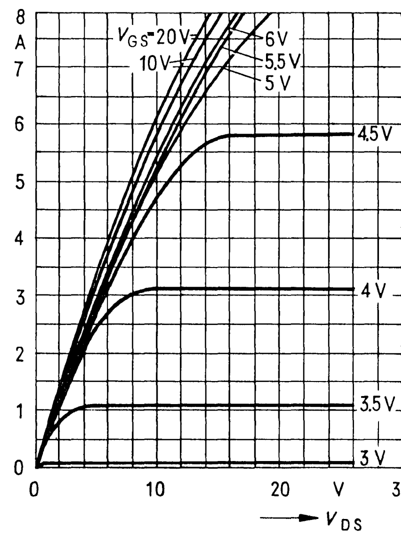
### Reverse diode

| Description | Symbol | min. | typ. | max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Continuous reverse drain current | $I_{DR}$ | – | – | 5,0 | A | $T_C$ = 25 °C |
| Pulsed reverse drain current | $I_{DRM}$ | – | – | 15 | | |
| Diode forward on-voltage | $V_{SD}$ | – | 1,1 | 1,45 | V | $I_F$ = 2× $I_{DR}$<br>$V_{GS}$ = 0V, $T_j$ = 25 °C |
| Reverse recovery time | $t_{rr}$ | – | 1800 | – | ns | $T_j$ = 25 °C<br>$I_F$ = 2× $I_{DR}$<br>$d_{iF/dt}$ = 100A/μs |
| Reverse recovery charge | $Q_{rr}$ | – | 25 | – | μC | |

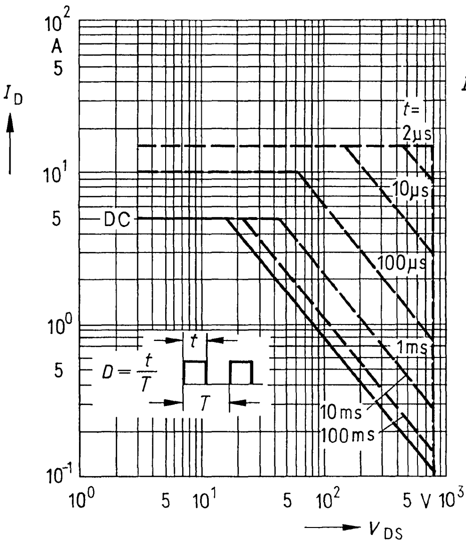
**Power dissipation** $P_D = f(T_{case})$



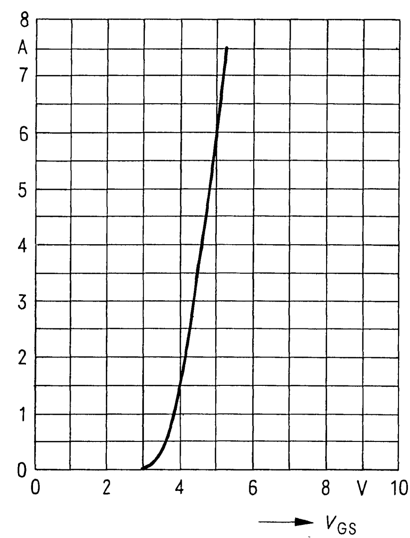

**Typical output characteristics** $I_D = f(V_{DS})$
parameter: 80 µs pulse test,
$T_{case} = 25\,°C$



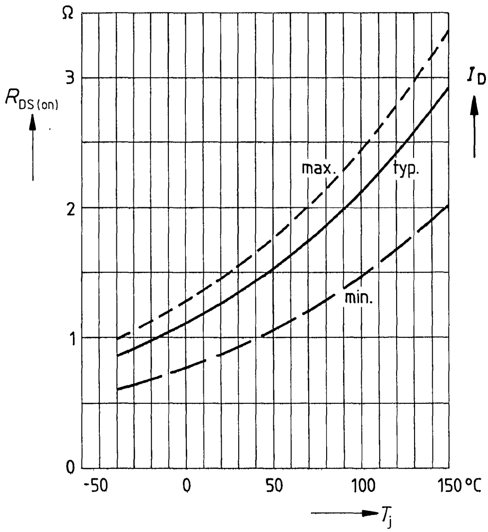

**Safe operating area** $I_D = f(V_{DS})$
parameter: $D = 0.01$, $T_{case} = 25\,°C$



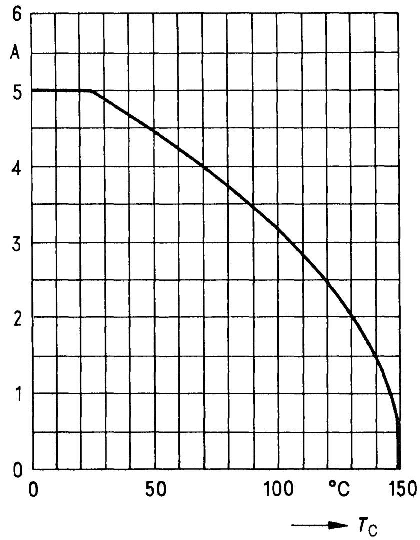

**Typical transfer characteristic** $I_D = f(V_{GS})$
parameter: 80 µs pulse test,
$V_{DS} = 25V$, $T_j = 25\,°C$



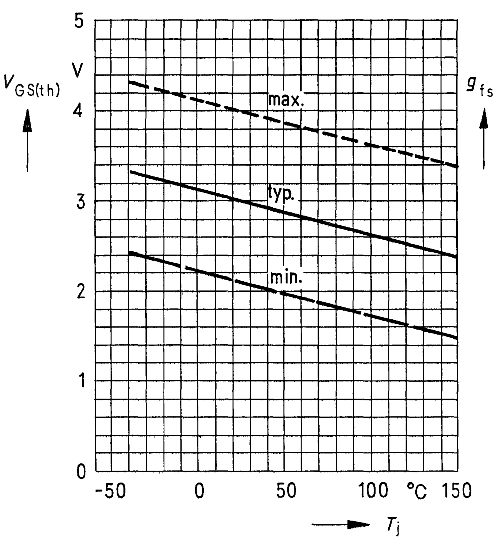
**Drain-source on-state resistance**
$R_{DS\,(on)} = f\,(T_j)$
(spread)



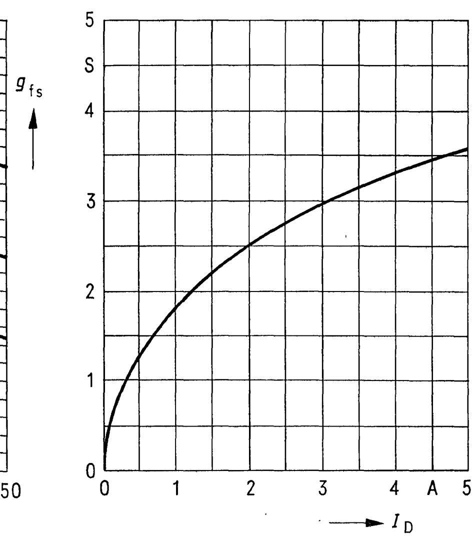

**Continuous drain current** $I_D = f\,(T_{case})$



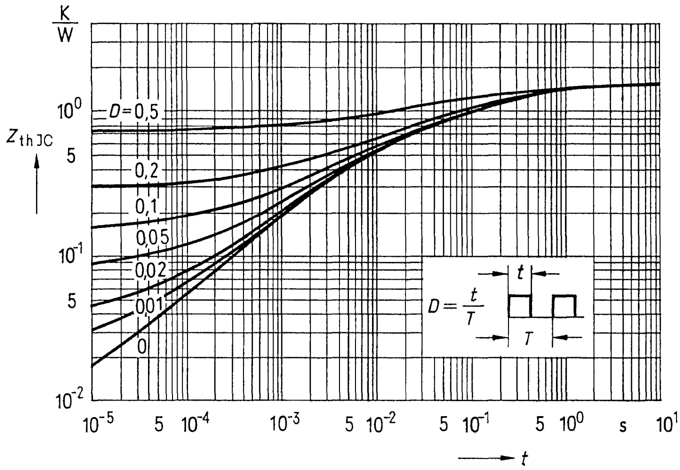

**Gate threshold voltage** $V_{GS(th)} = f\,(T_j)$
parameter: $V_{DS} = V_{GS}$, $I_D$ = 10 mA




**Typical transconductance** $g_{fs} = f\,(I_D)$
parameter: 80 µs pulse test,
$V_{DS}$ = 25V, $T_j$ = 25 °C



**Transient thermal impedance** $Z_{thJC} = f(t)$
parameter: $D = t/T$



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