

**303A-011A**  
**CMOS/BIPOLAR P/T ADAPTER**

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*V11.1 Device List*



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## DEVICE LIST

Following is a complete listing of the devices currently programmable with the 303A-011A. The devices are organized by manufacturer, and are listed in numerical order. References in the Notes column are explained following the list.

### CAUTION

*Be sure you enter the proper family and pinout codes for the device you want to program. If you enter an incorrect family and pinout code, you may damage your device. Be aware that although you may enter an independently valid family code and an independently valid pinout code, when combined, these may produce an invalid (illegal) combination. The correct combination for your device is published in this table. All family/pinout combinations not contained in this table are considered "illegal". Data I/O assumes no responsibility or liability for results produced by entry of "illegal" family/pinout combinations.*

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RAL™ is a trademark of Lattice Semiconductor Corporation.

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### Data I/O Device Support Policy/Liability

1. Data I/O strives to achieve more device support approvals from semiconductor manufacturers than any other programmer manufacturer.
2. Every effort is made to program an adequate number of samples according to the manufacturer supplied specification, and verify waveforms as per that specification prior to release of support. Manufacturers' approvals are to be sought in parallel with this process.
3. Data I/O's objective is to seek and obtain approvals on all devices.
4. Data I/O has made every attempt to ensure that the device information (as provided by the device manufacturer) contained in our programmers, software and documentation is accurate and complete. However, Data I/O assumes no liability for errors, or for any damages, whether direct, indirect, consequential or incidental, that result from use of documents provided with equipment or from the equipment or software which it accompanies, regardless of whether or not Data I/O has been advised of the possibility of such loss or damage.

## Entering 3-Digit Codes

### CAUTION

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*To prevent damage to the device if your machine is a 29B, V6.0, or later, family/pinout codes must be entered using one of the following two methods.*

1. When entering family/pinout codes, all codes must be entered as three-digit codes. If the family/pinout code is given as two digits for the family code and two digits for the pinout code, leading zeroes must be inserted for both family and pinout codes. For example, a 16L8 with a family/pinout code of 22/26 must be entered as 022/026.
2. Family codes and pinout codes can be entered as two-digit codes when applicable, provided that the family code entry and the pinout code entry are separated by a START keystroke. Again, using the 16L8 example, the 22/26 code would be entered as 22 START, 26 START.

## Key To Device List Headings

An explanation of each of the column headings is given below.

|                     |   |
|---------------------|---|
| Device Part Number: | The number assigned by the device manufacturer  |
| Pins:               | The number of pins on the device package.   |
| Part Type:          | The type of part, such as GAL, EPLD, or PAL.  |
| Footnote:           | Numbers which correspond to footnotes described at the end of the device list. The footnotes provide additional information about a device. Each footnote number corresponds to a numbered description at the end of the device list. |
| Adapter Version:    | A number that specifies the earliest version of the P/T Adapter firmware that will program the device to the manufacturer's latest specifications.  |
| Family Code:        | A 2- or 3-digit hexadecimal number that designates the programming algorithm (family).  |
| Pinout Code:        | A 2- or 3-digit hexadecimal number used to differentiate device types based on pin assignment and array size (pinout).  |

## LOGIC

| Device<br>Part Number             | Pins | Part<br>Type | Notes | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------------------|------|--------------|-------|--------------------|----------------|----------------|
| <b>Altera</b>                     |      |              |       |                    |                |                |
| 300                               | 20   | EPLD         |       | V02                | 26             | 50             |
| 310                               | 20   | EPLD         |       | V02                | 44             | 50             |
| 320                               | 20   | EPLD         |       | V02                | 44             | 95             |
| 600                               | 24   | EPLD         |       | V02                | 26             | 59             |
| 610                               | 24   | EPLD         | 5,11  | V06                | 26             | 59             |
| <b>Advanced Micro Devices/MMI</b> |      |              |       |                    |                |                |
| 10H8/-2                           | 20   | PAL          |       | V01                | 22             | 18             |
| 10L8/-2                           | 20   | PAL          |       | V01                | 22             | 13             |
| 12H6/-2                           | 20   | PAL          |       | V01                | 22             | 19             |
| 12L10                             | 24   | PAL          |       | V01                | 22             | 01             |
| 12L6/-2                           | 20   | PAL          |       | V01                | 22             | 14             |
| 14H4/-2                           | 20   | PAL          |       | V01                | 22             | 20             |
| 14L4/-2                           | 20   | PAL          |       | V01                | 22             | 15             |
| 14L8                              | 24   | PAL          |       | V01                | 22             | 02             |
| 14R21/A                           | 24   | PMS          | 5     | V10                | 22             | 58             |
| 16A4                              | 20   | PAL          |       | V01                | 22             | 24             |
| 16C1/-2                           | 20   | PAL          |       | V01                | 22             | 21             |
| 16H2/-2                           | 20   | PAL          |       | V01                | 22             | 22             |
| 16H8                              | 20   | AmPAL        |       | V01                | 97             | 25             |
| 16HD8                             | 20   | AmPAL        |       | V01                | 97             | 25             |
| 16L2/-2                           | 20   | PAL          |       | V01                | 22             | 16             |
| 16L6                              | 24   | PAL          |       | V01                | 22             | 03             |
| 16L8-7                            | 20   | PAL          |       | V05                | 20             | 17             |
| 16L8/A/A-2/A-4                    | 20   | PAL          |       | V01                | 22             | 17             |
| 16L8/A/B                          | 20   | AmPAL        |       | V05                | 97             | 17             |
| 16L8B                             | 20   | PAL          |       | V01                | 30             | 17             |
| 16L8B-2/B-4                       | 20   | PAL          |       | V01                | 22             | 17             |
| 16L8D                             | 20   | AmPAL        |       | V05                | 20             | 17             |
| 16L8D                             | 20   | PAL          |       | V09                | 30             | 17             |
| 16L8H-10                          | 20   | PAL          |       | V11                | 20             | 17             |
| 16L8H-15                          | 20   | PAL          |       | V03                | 30             | 17             |
| 16LD8                             | 20   | AmPAL        |       | V01                | 97             | 17             |
| 16P8A                             | 20   | PAL          |       | V01                | 22             | 30             |
| 16R4-7                            | 20   | PAL          | 1     | V05                | 20             | 81             |
| 16R4/A/A-2/A-4                    | 20   | PAL          |       | V01                | 22             | 24             |
| 16R4/A/B                          | 20   | AmPAL        | 1     | V05                | 97             | 81             |
| 16R4B                             | 20   | PAL          |       | V01                | 30             | 24             |
| 16R4B-2/B-4                       | 20   | PAL          |       | V01                | 22             | 24             |
| 16R4D                             | 20   | AmPAL        | 1,4   | V05                | 20             | 24             |
| 16R4D                             | 20   | PAL          |       | V09                | 30             | 24             |
| 16R4H-10                          | 20   | PAL          | 1     | V11                | 20             | 81             |
| 16R4H-15                          | 20   | PAL          | 1     | V03                | 30             | 67             |
| 16R6-7                            | 20   | PAL          | 1     | V05                | 20             | 80             |
| 16R6/A/A-2/A-4                    | 20   | PAL          |       | V01                | 22             | 24             |
| 16R6/A/B                          | 20   | AmPAL        | 1     | V05                | 97             | 80             |
| 16R6B                             | 20   | PAL          |       | V01                | 30             | 24             |

## LOGIC

| Device<br>Part Number | Pins | Part<br>Type | Notes | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|-------|--------------------|----------------|----------------|
| 16R6B-2/B-4           | 20   | PAL          |       | V01                | 22             | 24             |
| 16R6D                 | 20   | AmPAL        | 1,4   | V05                | 20             | 24             |
| 16R6D                 | 20   | PAL          |       | V09                | 30             | 24             |
| 16R6H-10              | 20   | PAL          | 1     | V11                | 20             | 80             |
| 16R6H-15              | 20   | PAL          | 1     | V03                | 30             | 67             |
| 16R8-7                | 20   | PAL          | 1     | V05                | 20             | 82             |
| 16R8/A/A-2/A-4        | 20   | PAL          |       | V01                | 22             | 24             |
| 16R8/A/B              | 20   | AmPAL        | 1     | V05                | 97             | 82             |
| 16R8B                 | 20   | PAL          |       | V01                | 30             | 24             |
| 16R8B-2/B-4           | 20   | PAL          |       | V01                | 22             | 24             |
| 16R8D                 | 20   | AmPAL        | 1,4   | V05                | 20             | 24             |
| 16R8D                 | 20   | PAL          |       | V09                | 30             | 24             |
| 16R8H-10              | 20   | PAL          | 1     | V11                | 20             | 82             |
| 16R8H-15              | 20   | PAL          | 1     | V03                | 30             | 67             |
| 16RA8                 | 20   | PAL          | 1     | V01                | 22             | 31             |
| 16RP4A                | 20   | PAL          | 1     | V01                | 22             | 31             |
| 16RP6A                | 20   | PAL          | 1     | V01                | 22             | 31             |
| 16RP8A                | 20   | PAL          | 1     | V01                | 22             | 31             |
| 16X4                  | 20   | PAL          |       | V01                | 22             | 24             |
| 18L4                  | 24   | PAL          |       | V01                | 22             | 04             |
| 18P8                  | 20   | AmPAL        |       | V01                | 97             | 29             |
| 20C1                  | 24   | PAL          |       | V01                | 22             | 12             |
| 20L10                 | 24   | AmPAL        |       | V02                | 97             | 06             |
| 20L10/A               | 24   | PAL          |       | V09                | 22             | 06             |
| 20L2                  | 24   | PAL          |       | V01                | 22             | 05             |
| 20L8                  | 24   | AmPAL        |       | V02                | 97             | 26             |
| 20L8-10               | 24   | PAL          |       | V11                | 22             | 26             |
| 20L8-7                | 24   | PAL          |       | V11                | 20             | 26             |
| 20L8A/A-2/B/B-2       | 24   | PAL          |       | V01                | 22             | 26             |
| 20R4                  | 24   | AmPAL        | 1,4   | V02                | 97             | 27             |
| 20R4-10               | 24   | PAL          | 1     | V11                | 22             | 68             |
| 20R4-7                | 24   | PAL          | 1     | V11                | 20             | 65             |
| 20R4A/A-2/B/B-2       | 24   | PAL          |       | V01                | 22             | 27             |
| 20R6                  | 24   | AmPAL        | 1,4   | V02                | 97             | 27             |
| 20R6-10               | 24   | PAL          | 1     | V11                | 22             | 68             |
| 20R6-7                | 24   | PAL          | 1     | V11                | 20             | 66             |
| 20R6A/A-2/B/B-2       | 24   | PAL          |       | V01                | 22             | 27             |
| 20R8                  | 24   | AmPAL        | 1,4   | V02                | 97             | 27             |
| 20R8-10               | 24   | PAL          | 1     | V11                | 22             | 68             |
| 20R8-7                | 24   | PAL          | 1     | V11                | 20             | 68             |
| 20R8A/A-2/B/B-2       | 24   | PAL          |       | V01                | 22             | 27             |
| 20RA10                | 24   | PAL          | 5     | V09                | 22             | 45             |
| 20RP10                | 24   | AmPAL        | 1,4   | V02                | 97             | 9F             |
| 20RP4                 | 24   | AmPAL        | 1,4   | V02                | 97             | 9C             |
| 20RP6                 | 24   | AmPAL        | 1,4   | V02                | 97             | 9D             |
| 20RP8                 | 24   | AmPAL        | 1,4   | V02                | 97             | 9E             |
| 20RS10                | 24   | PAL          | 1     | V01                | 22             | 44             |
| 20RS4                 | 24   | PAL          | 1     | V01                | 22             | 46             |

## LOGIC

| Device<br>Part Number | Pins | Part<br>Type | Notes | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|-------|--------------------|----------------|----------------|
| 20RS8                 | 24   | PAL          | 1     | V01                | 22             | 44             |
| 20S10                 | 24   | PAL          |       | V01                | 22             | 43             |
| 20X10                 | 24   | PAL          |       | V09                | 22             | 23             |
| 20X10A                | 24   | PAL          | 1     | V09                | 22             | 36             |
| 20X4                  | 24   | PAL          |       | V09                | 22             | 23             |
| 20X4A                 | 24   | PAL          | 1     | V09                | 22             | 36             |
| 20X8                  | 24   | PAL          |       | V09                | 22             | 23             |
| 20X8A                 | 24   | PAL          | 1     | V09                | 22             | 36             |
| 20XRP10               | 24   | AmPAL        | 1,4   | V02                | 97             | 9F             |
| 20XRP4                | 24   | AmPAL        | 1,4   | V02                | 97             | 9C             |
| 20XRP6                | 24   | AmPAL        | 1,4   | V02                | 97             | 9D             |
| 20XRP8                | 24   | AmPAL        | 1,4   | V02                | 97             | 9E             |
| 22IP6                 | 24   | PAL          |       | V06                | 22             | 6A             |
| 22P10                 | 24   | AmPAL        |       | V02                | 97             | 2B             |
| 22RX8/A               | 24   | PAL          | 1     | V01                | 22             | 78             |
| 22V10/A/B/-15         | 24   | AmPAL        | 1,4   | V01                | 97             | 28             |
| 22XP10                | 24   | AmPAL        |       | V02                | 97             | 2B             |
| 23S8                  | 20   | AmPAL        | 1     | V04                | 97             | 84             |
| 29CPL141              | 28   | FPC          | 2,5   | V08                | 94             | 7C             |
| 29CPL142              | 24   | FPC          | 2,5   | V10                | 94             | 7D             |
| 29CPL144              | 28   | FPC          | 2,5   | V08                | 94             | 7E             |
| 29CPL151              | 28   | FPC          | 2,5   | V08                | 94             | 7C             |
| 29CPL152              | 24   | FPC          | 2,5   | V10                | 94             | 7D             |
| 29CPL154              | 28   | FPC          | 2,5   | V08                | 94             | 7E             |
| 32VX10/A              | 24   | PAL          | 1     | V02                | 22             | 77             |
| 6L16A                 | 24   | PAL          | 5     | V01                | 22             | 48             |
| 8L14A                 | 24   | PAL          | 5     | V01                | 22             | 49             |
| C16L8Q                | 20   | PAL          |       | V04                | DB             | 17             |
| C16L8Z                | 20   | PAL          |       | V07                | 46             | 17             |
| C16R4Q                | 20   | PAL          | 1     | V04                | DB             | 24             |
| C16R4Z                | 20   | PAL          | 1     | V07                | 46             | 24             |
| C16R6Q                | 20   | PAL          | 1     | V04                | DB             | 24             |
| C16R6Z                | 20   | PAL          | 1     | V07                | 46             | 24             |
| C16R8Q                | 20   | PAL          | 1     | V04                | DB             | 24             |
| C16R8Z                | 20   | PAL          | 1     | V07                | 46             | 24             |
| C18U8                 | 20   | PAL          | 1     | V04                | DB             | 2E             |
| C20L8Z                | 24   | PAL          |       | V06                | 46             | 26             |
| C20R4Z                | 24   | PAL          | 1     | V06                | 46             | 27             |
| C20R6Z                | 24   | PAL          | 1     | V06                | 46             | 27             |
| C20R8Z                | 24   | PAL          | 1     | V06                | 46             | 27             |
| C20RA10Z              | 24   | PAL          | 5     | V06                | 46             | 45             |
| C22V10                | 24   | AmPAL        | 1     | V04                | 60             | 28             |
| C22V10                | 24   | PAL          | 1     | V09                | DB             | 28             |
| C22VF10               | 24   | AmPAL        | 1     | V04                | 60             | 4D             |
| CE16V8                | 20   | PAL          | 1,4   | V10                | 80             | 55             |
| CE18U8                | 20   | EPPAL        | 1     | V07                | DE             | 3E             |
| CE20RA10Z             | 24   | PAL          | 5     | V06                | DE             | 45             |
| CE22V10               | 24   | PAL          | 1,4   | V11                | 80             | 28             |

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| Device<br>Part Number        | Pins | Part<br>Type | Notes | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|------------------------------|------|--------------|-------|--------------------|----------------|----------------|
| CE26V12                      | 28   | PAL          | 1,4   | V10                | 80             | 4E             |
| CE29M16-25/-35               | 24   | PAL          | 8     | V03                | 60             | 4B             |
| CE29MA16-25/-35              | 24   | PAL          | 8     | V03                | 60             | 4C             |
| PLS105                       | 28   | FPLS         |       | V04                | 2A             | 63             |
| PLS167                       | 24   | FPLS         |       | V04                | 2A             | 60             |
| PLS168                       | 24   | FPLS         |       | V04                | 2A             | 74             |
| <b>ATMEL</b>                 |      |              |       |                    |                |                |
| 22V10                        | 24   | EPLD         | 1     | V04                | 65             | 28             |
| 750                          | 24   | EPLD         | 5,8   | V05                | 65             | 0F             |
| <b>Cypress Semiconductor</b> |      |              |       |                    |                |                |
| 12L10                        | 24   | PAL          |       | V01                | 28             | 01             |
| 14L8                         | 24   | PAL          |       | V01                | 28             | 02             |
| 16L6                         | 24   | PAL          |       | V01                | 28             | 03             |
| 16L8A                        | 20   | PAL          |       | V01                | 28             | 17             |
| 16R4A                        | 20   | PAL          | 1     | V01                | 28             | 24             |
| 16R6A                        | 20   | PAL          | 1     | V01                | 28             | 24             |
| 16R8A                        | 20   | PAL          | 1     | V01                | 28             | 24             |
| 18L4                         | 24   | PAL          |       | V01                | 28             | 04             |
| 20G10                        | 24   | PAL          | 1     | V01                | 28             | 56             |
| 20G10B                       | 24   | PAL          | 1     | V11                | BB             | 56             |
| 20L10                        | 24   | PAL          |       | V01                | 28             | 06             |
| 20L2                         | 24   | PAL          |       | V01                | 28             | 05             |
| 20L8                         | 24   | PAL          |       | V01                | 28             | 26             |
| 20R4                         | 24   | PAL          | 1     | V01                | 28             | 65             |
| 20R6                         | 24   | PAL          | 1     | V01                | 28             | 66             |
| 20R8                         | 24   | PAL          | 1     | V01                | 28             | 27             |
| 22V10                        | 24   | PAL          | 1     | V01                | 28             | 28             |
| 22V10B                       | 24   | EPLD         | 1     | V11                | BB             | 28             |
| 7C330                        | 28   | EPLD         | 8     | V07                | 28             | 1A             |
| 7C331                        | 28   | EPLD         | 1,8   | V11                | 28             | 5C             |
| 7C332                        | 28   | EPLD         |       | V11                | 28             | 8B             |
| <b>EXEL Microelectronics</b> |      |              |       |                    |                |                |
| 78C800                       | 24   | ERASIC       | 1     | V04                | 76             | 2A             |
| <b>Gould Electronics</b>     |      |              |       |                    |                |                |
| 153                          | 20   | PEEL         |       | V09                | 7D             | 65             |
| 173                          | 24   | PEEL         |       | V04                | 7D             | 76             |
| 18CV8                        | 20   | PEEL         |       | V04                | 7D             | 3A             |
| 20CG10                       | 24   | PEEL         | 1     | V10                | 7D             | 56             |
| 22CV10                       | 24   | PEEL         | 1     | V10                | 7D             | 28             |
| 22CV10Z                      | 24   | PEEL         | 1     | V10                | 7D             | A3             |
| 253                          | 20   | PEEL         |       | V09                | 7D             | 85             |
| 273                          | 24   | PEEL         |       | V04                | 7D             | 86             |
| <b>Harris</b>                |      |              |       |                    |                |                |
| 77153/82S153                 | 20   | HPL          |       | V01                | 98             | 65             |



## LOGIC

| Device<br>Part Number                      | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|--|------|--------------|---------|--------------------|----------------|----------------|
| 77209/16L8                                 | 20   | HPL          |         | V01                | 98             | 17             |
| 77210/16R4                                 | 20   | HPL          |         | V01                | 98             | 24             |
| 77211/16R6                                 | 20   | HPL          |         | V01                | 98             | 24             |
| 77212/16R8                                 | 20   | HPL          |         | V01                | 98             | 24             |
| 77215/16H8                                 | 20   | HPL          |         | V01                | 98             | 17             |
| 77216/16P8                                 | 20   | HPL          |         | V01                | 98             | 30             |
| <b>International CMOS Technology, Inc.</b> |      |              |         |                    |                |                |
| 153  | 20   | PEEL         |         | V06                | 8D             | 65             |
| 173  | 24   | PEEL         |         | V04                | 8D             | 76             |
| 18CV8                                      | 20   | PEEL         |         | V04                | 8D             | 3A             |
| 20CG10                                     | 24   | PEEL         | 1       | V10                | 8D             | 56             |
| 22CV10                                     | 24   | PEEL         | 1       | V10                | 8D             | 28             |
| 22CV10Z                                    | 24   | PEEL         | 1       | V10                | 8D             | A3             |
| 253  | 20   | PEEL         |         | V06                | 8D             | 85             |
| 273  | 24   | PEEL         |         | V04                | 8D             | 86             |
| <b>Intel Corporation</b>                   |      |              |         |                    |                |                |
| 5AC312                                     | 24   | EPLD         | 10      | V07                | 55             | 3F             |
| 5C031                                      | 20   | EPLD         |         | V01                | 55             | 50             |
| 5C032                                      | 20   | EPLD         |         | V02                | 55             | 95             |
| 5C060                                      | 24   | EPLD         |         | V01                | 55             | 59             |
| 85C220                                     | 20   | EPLD         | 3       | V10                | 55             | 95             |
| <b>Lattice Semiconductor</b>               |      |              |         |                    |                |                |
| 16V8                                       | 20   | GAL          | 1,6,7,9 | V03                | 36             | 55             |
| 16V8A                                      | 20   | GAL          | 1,6,7,9 | V07                | 36             | 55             |
| 16Z8                                       | 24   | GAL          | 1,5,6,9 | V01                | 36             | 47             |
| 18V10                                      | 20   | GAL          | 6,9     | V11                | 36             | 5F             |
| 20V8                                       | 24   | GAL          | 1,6,7,9 | V03                | 36             | 57             |
| 20V8A                                      | 24   | GAL          | 1,6,7,9 | V07                | 36             | 57             |
| 22V10                                      | 24   | GAL          | 6,9     | V09                | 36             | 28             |
| 22V10UES                                   | 24   | GAL          | 6,9     | V09                | 36             | 7F             |
| 26CV12                                     | 28   | GAL          | 6,9     | V11                | 36             | 4E             |
| 6001                                       | 24   | GAL          | 5,6,9   | V11                | 36             | 4A             |
| <b>National Semiconductor</b>              |      |              |         |                    |                |                |
| 10H8/A/A2                                  | 20   | PAL          |         | V01                | 95             | 18             |
| 10L8/A/A2                                  | 20   | PAL          |         | V01                | 95             | 13             |
| 12H6/A/A2                                  | 20   | PAL          |         | V01                | 95             | 19             |
| 12L10/A                                    | 24   | PAL          |         | V01                | 95             | 01             |
| 12L6/A/A2                                  | 20   | PAL          |         | V01                | 95             | 14             |
| 14H4/A/A2                                  | 20   | PAL          |         | V01                | 95             | 20             |
| 14L4/A/A2                                  | 20   | PAL          |         | V01                | 95             | 15             |
| 14L8/A                                     | 24   | PAL          |         | V01                | 95             | 02             |
| 16C1/A/A2                                  | 20   | PAL          |         | V01                | 95             | 21             |
| 16H2/A/A2                                  | 20   | PAL          |         | V01                | 95             | 22             |
| 16L2/A/A2                                  | 20   | PAL          |         | V01                | 95             | 16             |
| 16L6/A                                     | 24   | PAL          |         | V01                | 95             | 03             |

## LOGIC

| Device<br>Part Number    | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|--------------------------|------|--------------|---------|--------------------|----------------|----------------|
| 16L8/A/A2                | 20   | PAL          |         | V01                | 95             | 17             |
| 16L8B/B2                 | 20   | PAL          |         | V01                | 95             | 17             |
| 16R4/A/A2                | 20   | PAL          |         | V01                | 95             | 24             |
| 16R4B/B2                 | 20   | PAL          |         | V01                | 95             | 24             |
| 16R6/A/A2                | 20   | PAL          |         | V01                | 95             | 24             |
| 16R6B/B2                 | 20   | PAL          |         | V01                | 95             | 24             |
| 16R8/A/A2                | 20   | PAL          |         | V01                | 95             | 24             |
| 16R8B/B2                 | 20   | PAL          |         | V01                | 95             | 24             |
| 16RA8                    | 20   | PAL          |         | V05                | 95             | 31             |
| 16V8                     | 20   | GAL          | 1,6,7,9 | V03                | 0D             | 55             |
| 16V8A                    | 20   | GAL          | 1,6,7,9 | V09                | 0D             | 55             |
| 18L4/A                   | 24   | PAL          |         | V01                | 95             | 04             |
| 20C1                     | 24   | PAL          |         | V01                | 95             | 12             |
| 20L10/A                  | 24   | PAL          |         | V01                | 95             | 06             |
| 20L2/A                   | 24   | PAL          |         | V01                | 95             | 05             |
| 20L8A                    | 24   | PAL          |         | V01                | 95             | 26             |
| 20L8B                    | 24   | PAL          |         | V01                | 95             | 26             |
| 20P8B                    | 24   | PAL          |         | V11                | 95             | 42             |
| 20R4A                    | 24   | PAL          |         | V01                | 95             | 27             |
| 20R4B                    | 24   | PAL          | 1       | V01                | 95             | 27             |
| 20R6A                    | 24   | PAL          |         | V01                | 95             | 27             |
| 20R6B                    | 24   | PAL          | 1       | V01                | 95             | 27             |
| 20R8A                    | 24   | PAL          |         | V01                | 95             | 27             |
| 20R8B                    | 24   | PAL          | 1       | V01                | 95             | 27             |
| 20RA10                   | 24   | PAL          | 5       | V01                | 95             | 45             |
| 20RP4B                   | 24   | PAL          | 1       | V11                | 95             | 97             |
| 20RP6B                   | 24   | PAL          | 1       | V11                | 95             | 97             |
| 20RP8B                   | 24   | PAL          | 1       | V11                | 95             | 97             |
| 20V8                     | 24   | GAL          | 1,6,7,9 | V03                | 0D             | 57             |
| 20V8A                    | 24   | GAL          | 1,6,7,9 | V09                | 0D             | 57             |
| 20X10                    | 24   | PAL          |         | V01                | 95             | 23             |
| 20X10A                   | 24   | PAL          | 1       | V01                | 95             | 36             |
| 20X4                     | 24   | PAL          |         | V01                | 95             | 23             |
| 20X4A                    | 24   | PAL          | 1       | V01                | 95             | 36             |
| 20X8                     | 24   | PAL          |         | V01                | 95             | 23             |
| 20X8A                    | 24   | PAL          | 1       | V01                | 95             | 36             |
| 6001                     | 24   | GAL          | 6,9     | V11                | 0D             | 4A             |
| 87X153B                  | 20   | PLA          |         | V03                | 95             | 65             |
| <b>Ricoh Corporation</b> |      |              |         |                    |                |                |
| 10P8A                    | 20   | EPLD         |         | V01                | 38             | 51             |
| 10P8B                    | 20   | EPLD         |         | V01                | 39             | 51             |
| 12P6A                    | 20   | EPLD         |         | V01                | 38             | 52             |
| 12P6B                    | 20   | EPLD         |         | V01                | 39             | 52             |
| 14P4A                    | 20   | EPLD         |         | V01                | 38             | 53             |
| 14P4B                    | 20   | EPLD         |         | V01                | 39             | 53             |
| 16P2A                    | 20   | EPLD         |         | V01                | 38             | 54             |
| 16P2B                    | 20   | EPLD         |         | V01                | 39             | 54             |

## LOGIC

| Device<br>Part Number                | Pins | Part<br>Type | Notes | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|--------------------------------------|------|--------------|-------|--------------------|----------------|----------------|
| 16P8B                                | 20   | EPLD         |       | V01                | 39             | 30             |
| 16RP4B                               | 20   | EPLD         | 1     | V01                | 39             | 31             |
| 16RP6B                               | 20   | EPLD         | 1     | V01                | 39             | 31             |
| 16RP8B                               | 20   | EPLD         | 1     | V01                | 39             | 31             |
| 241                                  | 24   | EPLD         | 1,8   | V09                | 39             | 5A             |
| <b>Samsung Semiconductor, Inc.</b>   |      |              |       |                    |                |                |
| 16L8                                 | 20   | CPL          | 6     | V04                | 9D             | 17             |
| 16R4                                 | 20   | CPL          | 1,6   | V04                | 9D             | 24             |
| 16R6                                 | 20   | CPL          | 1,6   | V04                | 9D             | 24             |
| 16R8                                 | 20   | CPL          | 1,6   | V04                | 9D             | 24             |
| 20L10                                | 24   | CPL          | 6     | V07                | 9D             | 06             |
| 20L8                                 | 24   | CPL          | 6     | V07                | 9D             | 26             |
| 20R4                                 | 24   | CPL          | 1,6   | V07                | 9D             | 27             |
| 20R6                                 | 24   | CPL          | 1,6   | V07                | 9D             | 27             |
| 20R8                                 | 24   | CPL          | 1,6   | V07                | 9D             | 27             |
| <b>SEEQ Technology, Incorporated</b> |      |              |       |                    |                |                |
| 20RA10Z                              | 24   | EEPAL        | 5     | V04                | 9E             | 45             |
| <b>Signetics</b>                     |      |              |       |                    |                |                |
| CK2605                               | 20   | FPLA         |       | V02                | 96             | 71             |
| PHD16N8                              | 20   | FPLA         |       | V11.1              | 1B             | 8F             |
| PLC153                               | 20   | FPLA         |       | V05                | 86             | 65             |
| PLC16V8                              | 20   | FPLA         |       | V05                | 86             | 3B             |
| PLC18V8Z                             | 20   | EPLD         | 1     | V09                | 86             | 4F             |
| PLC20V8                              | 24   | FPLA         |       | V06                | 86             | 4E             |
| PLC415                               | 28   | FPLA         |       | V10                | 86             | AA             |
| PLC473                               | 24   | FPLA         |       | V02                | 86             | 78             |
| PLHS16L8                             | 20   | FPLA         |       | V09                | 3D             | 17             |
| PLHS18P8                             | 20   | FPLA         |       | V09                | 3D             | 33             |
| PLS104                               | 28   | FPLS         |       | V02                | 96             | 63             |
| PLS105                               | 28   | FPLS         |       | V02                | 96             | 63             |
| PLS150                               | 20   | FPGA         |       | V02                | 96             | 64             |
| PLS151                               | 20   | FPGA         |       | V02                | 96             | 64             |
| PLS152                               | 20   | FPLA         |       | V02                | 96             | 65             |
| PLS153                               | 20   | FPLA         |       | V02                | 96             | 65             |
| PLS154                               | 20   | FPLS         | 1     | V02                | 96             | 67             |
| PLS155                               | 20   | FPLS         | 1     | V02                | 96             | 67             |
| PLS156                               | 20   | FPLS         | 1     | V02                | 96             | 68             |
| PLS157                               | 20   | FPLS         | 1     | V02                | 96             | 68             |
| PLS158                               | 20   | FPLS         | 1     | V02                | 96             | 66             |
| PLS159                               | 20   | FPLS         | 1     | V02                | 96             | 66             |
| PLS159A                              | 20   | FPLS         | 1     | V02                | 64             | 66             |
| PLS161                               | 24   | FPLA         |       | V02                | 96             | 69             |
| PLS166                               | 24   | FPLS         |       | V02                | 96             | 60             |
| PLS167                               | 24   | FPLS         |       | V02                | 96             | 60             |
| PLS168                               | 24   | FPLS         |       | V10                | 96             | 74             |
| PLS173                               | 24   | FPLA         |       | V02                | 96             | 76             |

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| Device<br>Part Number               | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-------------------------------------|------|--------------|---------|--------------------|----------------|----------------|
| PLS179                              | 24   | FPLS         | 1       | V02                | 96             | 77             |
| PLUS105-40                          | 28   | FPLS         |         | V09                | 1B             | 63             |
| PLUS153                             | 20   | FPLA         |         | V11.1              | 1B             | 65             |
| PLUS16L8                            | 20   | FPLA         |         | V08                | 1B             | 17             |
| PLUS16R4                            | 20   | FPLA         |         | V08                | 1B             | 24             |
| PLUS16R6                            | 20   | FPLA         |         | V08                | 1B             | 24             |
| PLUS16R8                            | 20   | FPLA         |         | V08                | 1B             | 24             |
| PLUS173                             | 24   | FPLS         |         | V11.1              | 1B             | 76             |
| PLUS20L8                            | 24   | FPLA         |         | V08                | 1B             | 26             |
| PLUS20R4                            | 24   | FPLA         |         | V08                | 1B             | 27             |
| PLUS20R6                            | 24   | FPLA         |         | V08                | 1B             | 27             |
| PLUS20R8                            | 24   | FPLA         |         | V08                | 1B             | 27             |
| PLUS405                             | 28   | FPLS         |         | V09                | 1B             | 79             |
| <b>Sprague Solid State</b>          |      |              |         |                    |                |                |
| 16LC8                               | 20   | SPL          |         | V01                | 34             | 17             |
| 16RC4                               | 20   | SPL          | 1       | V01                | 34             | 24             |
| 16RC6                               | 20   | SPL          | 1       | V01                | 34             | 24             |
| 16RC8                               | 20   | SPL          | 1       | V01                | 34             | 24             |
| 20LC8                               | 24   | SPL          |         | V01                | 34             | 26             |
| 20XC8                               | 24   | SPL          |         | V01                | 34             | 23             |
| <b>SGS-Thomson Microelectronics</b> |      |              |         |                    |                |                |
| 16V8                                | 20   | GAL          | 1,6,7,9 | V03                | 14             | 55             |
| 16V8A                               | 20   | GAL          | 1,6,7,9 | V10                | 14             | 55             |
| 20V8                                | 24   | GAL          | 1,6,7,9 | V03                | 14             | 57             |
| 20V8A                               | 24   | GAL          | 1,6,7,9 | V10                | 14             | 57             |
| 39V18                               | 24   | GAL          | 6,9     | V11                | 14             | 4A             |
| <b>Texas Instruments</b>            |      |              |         |                    |                |                |
| 16L8-10                             | 20   | BPAL         |         | V05                | A1             | 17             |
| 16L8-12/-15/-25                     | 20   | BPAL         |         | V02                | 9A             | 17             |
| 16L8-7                              | 20   | BPAL         |         | V07                | 0B             | 17             |
| 16L8A/A-2                           | 20   | PAL          |         | V02                | 99             | 17             |
| 16L8H-15                            | 20   | BPAL         |         | V08                | 0B             | 17             |
| 16N8                                | 20   | BPAD         |         | V05                | A1             | 0A             |
| 16R4-10                             | 20   | BPAL         | 1       | V05                | A1             | 24             |
| 16R4-12/-15/-25                     | 20   | BPAL         |         | V02                | 9A             | 24             |
| 16R4-7                              | 20   | BPAL         | 1       | V07                | 0B             | 24             |
| 16R4A/A-2                           | 20   | PAL          |         | V02                | 99             | 24             |
| 16R4H-15                            | 20   | BPAL         | 1       | V08                | 0B             | 24             |
| 16R6-10                             | 20   | BPAL         | 1       | V05                | A1             | 24             |
| 16R6-12/-15/-25                     | 20   | BPAL         |         | V02                | 9A             | 24             |
| 16R6-7                              | 20   | BPAL         | 1       | V07                | 0B             | 24             |
| 16R6A/A-2                           | 20   | PAL          |         | V02                | 99             | 24             |
| 16R6H-15                            | 20   | BPAL         | 1       | V08                | 0B             | 24             |

## LOGIC

| Device<br>Part Number       | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------------|------|--------------|---------|--------------------|----------------|----------------|
| 16R8-10                     | 20   | BPAL         | 1       | V05                | A1             | 24             |
| 16R8-12/-15/-25             | 20   | BPAL         |         | V02                | 9A             | 24             |
| 16R8-7                      | 20   | BPAL         | 1       | V07                | 0B             | 24             |
| 16R8A/A-2                   | 20   | PAL          |         | V02                | 99             | 24             |
| 16R8H-15                    | 20   | BPAL         | 1       | V08                | 0B             | 24             |
| 18N8                        | 20   | BPAD         |         | V08                | A1             | 5E             |
| 20L10                       | 24   | BPAL         |         | V08                | 99             | 06             |
| 20L8-15/-25                 | 24   | BPAL         |         | V02                | A1             | 26             |
| 20L8-7                      | 24   | BPAL         |         | V09                | 0B             | 26             |
| 20L8A                       | 24   | PAL          |         | V02                | 99             | 26             |
| 20R4-15/-25                 | 24   | BPAL         | 1       | V02                | A1             | 27             |
| 20R4-7                      | 24   | BPAL         | 1       | V09                | 0B             | 27             |
| 20R4A                       | 24   | PAL          | 1       | V02                | 99             | 27             |
| 20R6-15/-25                 | 24   | BPAL         | 1       | V02                | A1             | 27             |
| 20R6-7                      | 24   | BPAL         | 1       | V09                | 0B             | 27             |
| 20R6A                       | 24   | PAL          | 1       | V02                | 99             | 27             |
| 20R8-15/-25                 | 24   | BPAL         | 1       | V02                | A1             | 27             |
| 20R8-7                      | 24   | BPAL         | 1       | V09                | 0B             | 27             |
| 20R8A                       | 24   | PAL          | 1       | V02                | 99             | 27             |
| 20X10                       | 24   | BPAL         | 1       | V08                | 99             | 23             |
| 20X4                        | 24   | BPAL         | 1       | V08                | 99             | 23             |
| 20X8                        | 24   | BPAL         | 1       | V08                | 99             | 23             |
| 22V10/A-15                  | 24   | BPAL         | 1       | V02                | 99             | 28             |
| 22VP10                      | 24   | BPAL         | 1       | V04                | 99             | 98             |
| 506                         | 24   | FPLS         | 8       | V09                | 99             | 7A             |
| 507                         | 24   | PSG          |         | V09                | 99             | 7B             |
| 529                         | 20   | FPGA         |         | V02                | 99             | 72             |
| 610                         | 24   | EPLD         | 5,11    | V11                | 26             | 59             |
| 82S105A/B                   | 28   | FPLS         |         | V02                | 99             | 63             |
| 82S167                      | 24   | FPLS         |         | V04                | 99             | 60             |
| 839                         | 24   | FPLA         |         | V04                | 99             | 70             |
| 840                         | 24   | FPLA         |         | V04                | 99             | 70             |
| C16L8                       | 20   | PAL          |         | V03                | 42             | 17             |
| C16R4                       | 20   | PAL          | 1       | V03                | 42             | 24             |
| C16R6                       | 20   | PAL          | 1       | V03                | 42             | 24             |
| C16R8                       | 20   | PAL          | 1       | V03                | 42             | 24             |
| C18V8                       | 20   | PAL          |         | V07                | 42             | 4F             |
| C22V10Z                     | 24   | PAL          |         | V10                | 42             | 28             |
| R19L8                       | 24   | PAL          |         | V02                | 99             | 89             |
| R19R4                       | 24   | PAL          | 1       | V02                | 99             | 91             |
| R19R6                       | 24   | PAL          | 1       | V02                | 99             | 91             |
| R19R8                       | 24   | PAL          | 1       | V02                | 99             | 91             |
| T19L8                       | 24   | PAL          |         | V02                | 99             | 88             |
| T19R4                       | 24   | PAL          | 1       | V02                | 99             | 90             |
| T19R6                       | 24   | PAL          | 1       | V02                | 99             | 90             |
| T19R8                       | 24   | PAL          | 1       | V02                | 99             | 90             |
| <b>VLSI Technology, Inc</b> |      |              |         |                    |                |                |
| 16V8                        | 20   | GAL          | 1,6,7,9 | V01                | 2F             | 55             |

**LOGIC**

| Device<br>Part Number | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|---------|--------------------|----------------|----------------|
| 20V8                  | 24   | GAL          | 1,6,7,9 | V01                | 2F             | 57             |
| VP10P8                | 20   | EPLD         |         | V01                | 32             | 51             |
| VP12P6                | 20   | EPLD         |         | V01                | 32             | 52             |
| VP14P4                | 20   | EPLD         |         | V01                | 32             | 53             |
| VP16P2                | 20   | EPLD         |         | V01                | 32             | 54             |
| VP16P8                | 20   | EPLD         |         | V01                | 32             | 30             |
| VP16RP4               | 20   | EPLD         | 1       | V01                | 32             | 31             |
| VP16RP6               | 20   | EPLD         | 1       | V01                | 32             | 31             |
| VP16RP8               | 20   | EPLD         | 1       | V01                | 32             | 31             |

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**CROSS-PROGRAMMING**

| Device<br>Part Number             | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------------------|------|--------------|---------|--------------------|----------------|----------------|
| <b>Lattice 16V8/A GAL DIP as:</b> |      |              |         |                    |                |                |
| 10H8                              | 20   | RAL          | 6,7,9   | V03                | 36             | 18             |
| 10H8A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 18             |
| 10L8                              | 20   | RAL          | 6,7,9   | V03                | 36             | 13             |
| 10L8A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 13             |
| 10P8                              | 20   | RAL          | 6,7,9   | V03                | 36             | 32             |
| 10P8A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 32             |
| 12H6                              | 20   | RAL          | 6,7,9   | V03                | 36             | 19             |
| 12H6A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 19             |
| 12L6                              | 20   | RAL          | 6,7,9   | V03                | 36             | 14             |
| 12L6A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 14             |
| 12P6                              | 20   | RAL          | 6,7,9   | V03                | 36             | 33             |
| 12P6A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 33             |
| 14H4                              | 20   | RAL          | 6,7,9   | V03                | 36             | 20             |
| 14H4A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 20             |
| 14L4                              | 20   | RAL          | 6,7,9   | V03                | 36             | 15             |
| 14L4A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 15             |
| 14P4                              | 20   | RAL          | 6,7,9   | V03                | 36             | 34             |
| 14P4A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 34             |
| 16H2                              | 20   | RAL          | 6,7,9   | V03                | 36             | 22             |
| 16H2A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 22             |
| 16H8                              | 20   | RAL          | 6,7,9   | V03                | 36             | 25             |
| 16H8A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 25             |
| 16L2                              | 20   | RAL          | 6,7,9   | V03                | 36             | 16             |
| 16L2A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 16             |
| 16L8                              | 20   | RAL          | 6,7,9   | V03                | 36             | 17             |
| 16L8A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 17             |
| 16P2                              | 20   | RAL          | 6,7,9   | V03                | 36             | 35             |
| 16P2A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 35             |
| 16P8                              | 20   | RAL          | 6,7,9   | V03                | 36             | 30             |
| 16P8A                             | 20   | RAL          | 6,7,9   | V07                | 36             | 30             |
| 16R4                              | 20   | RAL          | 1,6,7,9 | V03                | 36             | 81             |
| 16R4A                             | 20   | RAL          | 1,6,7,9 | V07                | 36             | 81             |
| 16R6                              | 20   | RAL          | 1,6,7,9 | V03                | 36             | 80             |
| 16R6A                             | 20   | RAL          | 1,6,7,9 | V07                | 36             | 80             |
| 16R8                              | 20   | RAL          | 1,6,7,9 | V03                | 36             | 82             |
| 16R8A                             | 20   | RAL          | 1,6,7,9 | V07                | 36             | 82             |
| 16RP4                             | 20   | RAL          | 1,6,7,9 | V03                | 36             | 85             |
| 16RP4A                            | 20   | RAL          | 1,6,7,9 | V07                | 36             | 85             |
| 16RP6                             | 20   | RAL          | 1,6,7,9 | V03                | 36             | 86             |
| 16RP6A                            | 20   | RAL          | 1,6,7,9 | V07                | 36             | 86             |
| 16RP8                             | 20   | RAL          | 1,6,7,9 | V03                | 36             | 87             |
| 16RP8A                            | 20   | RAL          | 1,6,7,9 | V07                | 36             | 87             |
| <b>Lattice 20V8/A GAL DIP as:</b> |      |              |         |                    |                |                |
| 14H8                              | 24   | RAL          | 6,7,9   | V03                | 36             | 08             |
| 14H8A                             | 24   | RAL          | 6,7,9   | V07                | 36             | 08             |
| 14L8                              | 24   | RAL          | 6,7,9   | V03                | 36             | 02             |
| 14L8A                             | 24   | RAL          | 6,7,9   | V07                | 36             | 02             |

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| Device<br>Part Number              | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|------------------------------------|------|--------------|---------|--------------------|----------------|----------------|
| 14P8                               | 24   | RAL          | 6,7,9   | V03                | 36             | 38             |
| 14P8A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 38             |
| 16H6                               | 24   | RAL          | 6,7,9   | V03                | 36             | 09             |
| 16H6A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 09             |
| 16L6                               | 24   | RAL          | 6,7,9   | V03                | 36             | 03             |
| 16L6A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 03             |
| 16P6                               | 24   | RAL          | 6,7,9   | V03                | 36             | 39             |
| 16P6A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 39             |
| 18H4                               | 24   | RAL          | 6,7,9   | V03                | 36             | 10             |
| 18H4A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 10             |
| 18L4                               | 24   | RAL          | 6,7,9   | V03                | 36             | 04             |
| 18L4A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 04             |
| 18P4                               | 24   | RAL          | 6,7,9   | V03                | 36             | 40             |
| 18P4A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 40             |
| 20H2                               | 24   | RAL          | 6,7,9   | V03                | 36             | 11             |
| 20H2A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 11             |
| 20H8                               | 24   | RAL          | 6,7,9   | V03                | 36             | 61             |
| 20H8A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 61             |
| 20L2                               | 24   | RAL          | 6,7,9   | V03                | 36             | 05             |
| 20L2A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 05             |
| 20L8                               | 24   | RAL          | 6,7,9   | V03                | 36             | 26             |
| 20L8A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 26             |
| 20P2                               | 24   | RAL          | 6,7,9   | V03                | 36             | 41             |
| 20P2A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 41             |
| 20P8                               | 24   | RAL          | 6,7,9   | V03                | 36             | 62             |
| 20P8A                              | 24   | RAL          | 6,7,9   | V07                | 36             | 62             |
| 20R4                               | 24   | RAL          | 1,6,7,9 | V03                | 36             | 65             |
| 20R4A                              | 24   | RAL          | 1,6,7,9 | V07                | 36             | 65             |
| 20R6                               | 24   | RAL          | 1,6,7,9 | V03                | 36             | 66             |
| 20R6A                              | 24   | RAL          | 1,6,7,9 | V07                | 36             | 66             |
| 20R8                               | 24   | RAL          | 1,6,7,9 | V03                | 36             | 27             |
| 20R8A                              | 24   | RAL          | 1,6,7,9 | V07                | 36             | 27             |
| 20RP4                              | 24   | RAL          | 1,6,7,9 | V03                | 36             | 46             |
| 20RP4A                             | 24   | RAL          | 1,6,7,9 | V07                | 36             | 46             |
| 20RP6                              | 24   | RAL          | 1,6,7,9 | V03                | 36             | 64             |
| 20RP6A                             | 24   | RAL          | 1,6,7,9 | V07                | 36             | 64             |
| 20RP8                              | 24   | RAL          | 1,6,7,9 | V03                | 36             | 63             |
| 20RP8A                             | 24   | RAL          | 1,6,7,9 | V07                | 36             | 63             |
| <b>National 16V8/A GAL DIP as:</b> |      |              |         |                    |                |                |
| 10H8                               | 20   | RAL          | 6,7,9   | V07                | 0D             | 18             |
| 10H8A                              | 20   | RAL          | 6,7,9   | V09                | 0D             | 18             |
| 10L8                               | 20   | RAL          | 6,7,9   | V07                | 0D             | 13             |
| 10L8A                              | 20   | RAL          | 6,7,9   | V09                | 0D             | 13             |
| 10P8                               | 20   | RAL          | 6,7,9   | V07                | 0D             | 32             |
| 10P8A                              | 20   | RAL          | 6,7,9   | V09                | 0D             | 32             |
| 12H6                               | 20   | RAL          | 6,7,9   | V07                | 0D             | 19             |
| 12H6A                              | 20   | RAL          | 6,7,9   | V09                | 0D             | 19             |



## CROSS-PROGRAMMING

| Device<br>Part Number | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|---------|--------------------|----------------|----------------|
| 12L6                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 14             |
| 12L6A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 14             |
| 12P6                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 33             |
| 12P6A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 33             |
| 14H4                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 20             |
| 14H4A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 20             |
| 14L4                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 15             |
| 14L4A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 15             |
| 14P4                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 34             |
| 14P4A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 34             |
| 16H2                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 22             |
| 16H2A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 22             |
| 16H8                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 25             |
| 16H8A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 25             |
| 16L2                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 16             |
| 16L2A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 16             |
| 16L8                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 17             |
| 16L8A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 17             |
| 16P2                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 35             |
| 16P2A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 35             |
| 16P8                  | 20   | RAL          | 6,7,9   | V07                | 0D             | 30             |
| 16P8A                 | 20   | RAL          | 6,7,9   | V09                | 0D             | 30             |
| 16R4                  | 20   | RAL          | 1,6,7,9 | V07                | 0D             | 81             |
| 16R4A                 | 20   | RAL          | 1,6,7,9 | V09                | 0D             | 81             |
| 16R6                  | 20   | RAL          | 1,6,7,9 | V07                | 0D             | 80             |
| 16R6A                 | 20   | RAL          | 1,6,7,9 | V09                | 0D             | 80             |
| 16R8                  | 20   | RAL          | 1,6,7,9 | V07                | 0D             | 82             |
| 16R8A                 | 20   | RAL          | 1,6,7,9 | V09                | 0D             | 82             |
| 16RP4                 | 20   | RAL          | 1,6,7,9 | V07                | 0D             | 85             |
| 16RP4A                | 20   | RAL          | 1,6,7,9 | V09                | 0D             | 85             |
| 16RP6                 | 20   | RAL          | 1,6,7,9 | V07                | 0D             | 86             |
| 16RP6A                | 20   | RAL          | 1,6,7,9 | V09                | 0D             | 86             |
| 16RP8                 | 20   | RAL          | 1,6,7,9 | V07                | 0D             | 87             |
| 16RP8A                | 20   | RAL          | 1,6,7,9 | V09                | 0D             | 87             |

## National 20V8/A GAL DIP as:

|       |    |     |       |     |    |    |
|-------|----|-----|-------|-----|----|----|
| 14H8  | 24 | RAL | 6,7,9 | V07 | 0D | 08 |
| 14H8A | 24 | RAL | 6,7,9 | V09 | 0D | 08 |
| 14L8  | 24 | RAL | 6,7,9 | V07 | 0D | 02 |
| 14L8A | 24 | RAL | 6,7,9 | V09 | 0D | 02 |
| 14P8  | 24 | RAL | 6,7,9 | V07 | 0D | 38 |
| 14P8A | 24 | RAL | 6,7,9 | V09 | 0D | 38 |
| 16H6  | 24 | RAL | 6,7,9 | V07 | 0D | 09 |
| 16H6A | 24 | RAL | 6,7,9 | V09 | 0D | 09 |
| 16L6  | 24 | RAL | 6,7,9 | V07 | 0D | 03 |
| 16L6A | 24 | RAL | 6,7,9 | V09 | 0D | 03 |
| 16P6  | 24 | RAL | 6,7,9 | V07 | 0D | 39 |
| 16P6A | 24 | RAL | 6,7,9 | V09 | 0D | 39 |

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**CROSS-PROGRAMMING**

| Device<br>Part Number | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|---------|--------------------|----------------|----------------|
| 18H4                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 10             |
| 18H4A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 10             |
| 18L4                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 04             |
| 18L4A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 04             |
| 18P4                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 40             |
| 18P4A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 40             |
| 20H2                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 11             |
| 20H2A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 11             |
| 20H8                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 61             |
| 20H8A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 61             |
| 20L2                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 05             |
| 20L2A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 05             |
| 20L8                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 26             |
| 20L8A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 26             |
| 20P2                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 41             |
| 20P2A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 41             |
| 20P8                  | 24   | RAL          | 6,7,9   | V07                | 0D             | 62             |
| 20P8A                 | 24   | RAL          | 6,7,9   | V09                | 0D             | 62             |
| 20R4                  | 24   | RAL          | 1,6,7,9 | V07                | 0D             | 65             |
| 20R4A                 | 24   | RAL          | 1,6,7,9 | V09                | 0D             | 65             |
| 20R6                  | 24   | RAL          | 1,6,7,9 | V07                | 0D             | 66             |
| 20R6A                 | 24   | RAL          | 1,6,7,9 | V09                | 0D             | 66             |
| 20R8                  | 24   | RAL          | 1,6,7,9 | V07                | 0D             | 27             |
| 20R8A                 | 24   | RAL          | 1,6,7,9 | V09                | 0D             | 27             |
| 20RP4                 | 24   | RAL          | 1,6,7,9 | V07                | 0D             | 46             |
| 20RP4A                | 24   | RAL          | 1,6,7,9 | V09                | 0D             | 46             |
| 20RP6                 | 24   | RAL          | 1,6,7,9 | V07                | 0D             | 64             |
| 20RP6A                | 24   | RAL          | 1,6,7,9 | V09                | 0D             | 64             |
| 20RP8                 | 24   | RAL          | 1,6,7,9 | V07                | 0D             | 63             |
| 20RP8A                | 24   | RAL          | 1,6,7,9 | V09                | 0D             | 63             |

**SGS-Thomson Microelectronics 16V8/A GAL DIP as:**

|       |    |     |       |     |    |    |
|-------|----|-----|-------|-----|----|----|
| 10H8  | 20 | RAL | 6,7,9 | V07 | 14 | 18 |
| 10H8A | 20 | RAL | 6,7,9 | V10 | 14 | 18 |
| 10L8  | 20 | RAL | 6,7,9 | V07 | 14 | 13 |
| 10L8A | 20 | RAL | 6,7,9 | V10 | 14 | 13 |
| 10P8  | 20 | RAL | 6,7,9 | V07 | 14 | 32 |
| 10P8A | 20 | RAL | 6,7,9 | V10 | 14 | 32 |
| 12H6  | 20 | RAL | 6,7,9 | V07 | 14 | 19 |
| 12H6A | 20 | RAL | 6,7,9 | V10 | 14 | 19 |
| 12L6  | 20 | RAL | 6,7,9 | V07 | 14 | 14 |
| 12L6A | 20 | RAL | 6,7,9 | V10 | 14 | 14 |
| 12P6  | 20 | RAL | 6,7,9 | V07 | 14 | 33 |
| 12P6A | 20 | RAL | 6,7,9 | V10 | 14 | 33 |
| 14H4  | 20 | RAL | 6,7,9 | V07 | 14 | 20 |
| 14H4A | 20 | RAL | 6,7,9 | V10 | 14 | 20 |
| 14L4  | 20 | RAL | 6,7,9 | V07 | 14 | 15 |
| 14L4A | 20 | RAL | 6,7,9 | V10 | 14 | 15 |

## CROSS-PROGRAMMING

| Device<br>Part Number | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|---------|--------------------|----------------|----------------|
| 14P4                  | 20   | RAL          | 6,7,9   | V07                | 14             | 34             |
| 14P4A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 34             |
| 16H2                  | 20   | RAL          | 6,7,9   | V07                | 14             | 22             |
| 16H2A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 22             |
| 16H8                  | 20   | RAL          | 6,7,9   | V07                | 14             | 25             |
| 16H8A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 25             |
| 16L2                  | 20   | RAL          | 6,7,9   | V07                | 14             | 16             |
| 16L2A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 16             |
| 16L8                  | 20   | RAL          | 6,7,9   | V07                | 14             | 17             |
| 16L8A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 17             |
| 16P2                  | 20   | RAL          | 6,7,9   | V07                | 14             | 35             |
| 16P2A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 35             |
| 16P8                  | 20   | RAL          | 6,7,9   | V07                | 14             | 30             |
| 16P8A                 | 20   | RAL          | 6,7,9   | V10                | 14             | 30             |
| 16R4                  | 20   | RAL          | 1,6,7,9 | V07                | 14             | 81             |
| 16R4A                 | 20   | RAL          | 1,6,7,9 | V10                | 14             | 81             |
| 16R6                  | 20   | RAL          | 1,6,7,9 | V07                | 14             | 80             |
| 16R6A                 | 20   | RAL          | 1,6,7,9 | V10                | 14             | 80             |
| 16R8                  | 20   | RAL          | 1,6,7,9 | V07                | 14             | 82             |
| 16R8A                 | 20   | RAL          | 1,6,7,9 | V10                | 14             | 82             |
| 16RP4                 | 20   | RAL          | 1,6,7,9 | V07                | 14             | 85             |
| 16RP4A                | 20   | RAL          | 1,6,7,9 | V10                | 14             | 85             |
| 16RP6                 | 20   | RAL          | 1,6,7,9 | V07                | 14             | 86             |
| 16RP6A                | 20   | RAL          | 1,6,7,9 | V10                | 14             | 86             |
| 16RP8                 | 20   | RAL          | 1,6,7,9 | V07                | 14             | 87             |
| 16RP8A                | 20   | RAL          | 1,6,7,9 | V10                | 14             | 87             |

## SGS-Thomson Microelectronics 20V8/A GAL DIP as:

|       |    |     |       |     |    |    |
|-------|----|-----|-------|-----|----|----|
| 14H8  | 24 | RAL | 6,7,9 | V07 | 14 | 08 |
| 14H8A | 24 | RAL | 6,7,9 | V10 | 14 | 08 |
| 14L8  | 24 | RAL | 6,7,9 | V07 | 14 | 02 |
| 14L8A | 24 | RAL | 6,7,9 | V10 | 14 | 02 |
| 14P8  | 24 | RAL | 6,7,9 | V07 | 14 | 38 |
| 14P8A | 24 | RAL | 6,7,9 | V10 | 14 | 38 |
| 16H6  | 24 | RAL | 6,7,9 | V07 | 14 | 09 |
| 16H6A | 24 | RAL | 6,7,9 | V10 | 14 | 09 |
| 16L6  | 24 | RAL | 6,7,9 | V07 | 14 | 03 |
| 16L6A | 24 | RAL | 6,7,9 | V10 | 14 | 03 |
| 16P6  | 24 | RAL | 6,7,9 | V07 | 14 | 39 |
| 16P6A | 24 | RAL | 6,7,9 | V10 | 14 | 39 |
| 18H4  | 24 | RAL | 6,7,9 | V07 | 14 | 10 |
| 18H4A | 24 | RAL | 6,7,9 | V10 | 14 | 10 |
| 18L4  | 24 | RAL | 6,7,9 | V07 | 14 | 04 |
| 18L4A | 24 | RAL | 6,7,9 | V10 | 14 | 04 |
| 18P4  | 24 | RAL | 6,7,9 | V07 | 14 | 40 |
| 18P4A | 24 | RAL | 6,7,9 | V10 | 14 | 40 |
| 20H2  | 24 | RAL | 6,7,9 | V07 | 14 | 11 |
| 20H2A | 24 | RAL | 6,7,9 | V10 | 14 | 11 |

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**CROSS-PROGRAMMING**

| Device<br>Part Number | Pins | Part<br>Type | Notes   | Adapter<br>Version | Family<br>Code | Pinout<br>Code |
|-----------------------|------|--------------|---------|--------------------|----------------|----------------|
| 20H8                  | 24   | RAL          | 6,7,9   | V07                | 14             | 61             |
| 20H8A                 | 24   | RAL          | 6,7,9   | V10                | 14             | 61             |
| 20L2                  | 24   | RAL          | 6,7,9   | V07                | 14             | 05             |
| 20L2A                 | 24   | RAL          | 6,7,9   | V10                | 14             | 05             |
| 20L8                  | 24   | RAL          | 6,7,9   | V07                | 14             | 26             |
| 20L8A                 | 24   | RAL          | 6,7,9   | V10                | 14             | 26             |
| 20P2                  | 24   | RAL          | 6,7,9   | V07                | 14             | 41             |
| 20P2A                 | 24   | RAL          | 6,7,9   | V10                | 14             | 41             |
| 20P8                  | 24   | RAL          | 6,7,9   | V07                | 14             | 62             |
| 20P8A                 | 24   | RAL          | 6,7,9   | V10                | 14             | 62             |
| 20R4                  | 24   | RAL          | 1,6,7,9 | V07                | 14             | 65             |
| 20R4A                 | 24   | RAL          | 1,6,7,9 | V10                | 14             | 65             |
| 20R6                  | 24   | RAL          | 1,6,7,9 | V07                | 14             | 66             |
| 20R6A                 | 24   | RAL          | 1,6,7,9 | V10                | 14             | 66             |
| 20R8                  | 24   | RAL          | 1,6,7,9 | V07                | 14             | 27             |
| 20R8A                 | 24   | RAL          | 1,6,7,9 | V10                | 14             | 27             |
| 20RP4                 | 24   | RAL          | 1,6,7,9 | V07                | 14             | 46             |
| 20RP4A                | 24   | RAL          | 1,6,7,9 | V10                | 14             | 46             |
| 20RP6                 | 24   | RAL          | 1,6,7,9 | V07                | 14             | 64             |
| 20RP6A                | 24   | RAL          | 1,6,7,9 | V10                | 14             | 64             |
| 20RP8                 | 24   | RAL          | 1,6,7,9 | V07                | 14             | 63             |
| 20RP8A                | 24   | RAL          | 1,6,7,9 | V10                | 14             | 63             |

## FOOTNOTES

1. This device is preloadable. See the section on Adapter-Specific Operating Information for details.
2. This device does not support test vectors.
3. Test vectors do not function properly on this device.
4. Parts are not register preloadable after the security fuse is blown.
5. This device is not supported by Logic Fingerprint testing.
6. The backwards device test is not supported for this device.
7. The number of times a particular GAL/RAL Semiconductor device has been programmed can be read by examining RAM location \$0113 for a 20-pin device or by examining RAM location \$0153 for a 24-pin device from the front panel (refer to the Keyboard Edit Operations section of your programming manual) This counter is updated prior to programming and can only be examined after such an operation is completed.
8. This device has over 10,000 fuses (cells).
9. The continuity test is not supported for this device.
10. Programming support not valid for pre-production devices. Error A2 will result on pre-production devices.
11. Programming this device requires using a special adapter which can be purchased from:  
Emulation Technology  
2344 Walsh Avenue  
Building F  
Santa Clara, CA 95051  
(408) 982-0660

The part number of the adapter is CS-1-024-DIP24-DATA/O.

