



| SYMBOL               | VARIATIONS |          |      |      |      |          |       |
|----------------------|------------|----------|------|------|------|----------|-------|
|                      | AA         |          |      | NOTE | AB   |          | NOTE  |
|                      | MIN.       | NOM.     | MAX. |      | MIN. | NOM.     | MAX.  |
| D                    | .940       | .960     | .980 |      | .990 | 1.010    | 1.030 |
| D1                   |            | .800 BSC |      |      |      | .850 BSC |       |
| E                    | .940       | .960     | .980 |      | .990 | 1.010    | 1.030 |
| E1                   |            | .800 BSC |      |      |      | .850 BSC |       |
| M                    | —          | 17       | —    | 3    | —    | 18       | —     |
| N                    | —          | —        | 288  | 4    | —    | —        | 323   |
| S                    |            | .000 BSC |      | 14   |      | .025 BSC | 14    |
| NOTE 1, 2, 5, 11, 16 |            |          |      |      |      |          |       |
| REF 10-324           |            |          |      |      |      |          |       |
| ISSUE A              |            |          |      |      |      |          |       |

|                      | AC    |          |       | NOTE | AD    |          |       | NOTE |
|----------------------|-------|----------|-------|------|-------|----------|-------|------|
|                      | MIN   | NOM      | MAX   |      | MIN   | NOM      | MAX   |      |
| D                    | 1.040 | 1.060    | 1.080 |      | 1.090 | 1.110    | 1.130 |      |
| D1                   |       | .900 BSC |       |      |       | .950 BSC |       |      |
| E                    | 1.040 | 1.060    | 1.080 |      | 1.090 | 1.110    | 1.130 |      |
| E1                   |       | .900 BSC |       |      |       | .950 BSC |       |      |
| M                    | —     | 19       | —     | 3    | —     | 20       | —     | 3    |
| N                    | —     | —        | 360   | 4    | —     | —        | 399   | 4    |
| S                    |       | .000 BSC |       | 14   |       | .025 BSC |       | 14   |
| NOTE 1, 2, 5, 11, 16 |       |          |       |      |       |          |       |      |
| REF 10-324           |       |          |       |      |       |          |       |      |
| ISSUE A              |       |          |       |      |       |          |       |      |

|                      | AE    |           |       | NOTE | AF    |           |       | NOTE |
|----------------------|-------|-----------|-------|------|-------|-----------|-------|------|
|                      | MIN   | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
| D                    | 1.140 | 1.160     | 1.180 |      | 1.190 | 1.210     | 1.230 |      |
| D1                   |       | 1.000 BSC |       |      |       | 1.050 BSC |       |      |
| E                    | 1.140 | 1.160     | 1.180 |      | 1.190 | 1.210     | 1.230 |      |
| E1                   |       | 1.000 BSC |       |      |       | 1.050 BSC |       |      |
| M                    | —     | 21        | —     | 3    | —     | 22        | —     | 3    |
| N                    | —     | —         | 440   | 4    | —     | —         | 483   | 4    |
| S                    |       | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE 1, 2, 5, 11, 16 |       |           |       |      |       |           |       |      |
| REF 10-324           |       |           |       |      |       |           |       |      |
| ISSUE A              |       |           |       |      |       |           |       |      |

| SYMBOL | VARIATIONS      |           |       |      |       |           |       |      |
|--------|-----------------|-----------|-------|------|-------|-----------|-------|------|
|        | AG              |           |       | NOTE | AH    |           |       | NOTE |
|        | MIN.            | NOM.      | MAX.  |      | MIN.  | NOM.      | MAX.  |      |
| D      | 1.240           | 1.260     | 1.280 |      | 1.290 | 1.310     | 1.330 |      |
| D1     |                 | 1.100 BSC |       |      |       | 1.150 BSC |       |      |
| E      | 1.240           | 1.260     | 1.280 |      | 1.290 | 1.310     | 1.330 |      |
| E1     |                 | 1.100 BSC |       |      |       | 1.150 BSC |       |      |
| M      | —               | 23        | —     | 3    | —     | 24        | —     | 3    |
| N      | —               | —         | 528   | 4    | —     | —         | 575   | 4    |
| S      |                 | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE   | 1, 2, 5, 11, 16 |           |       |      |       |           |       |      |
| REF    | 10-324          |           |       |      |       |           |       |      |
| ISSUE  | A               |           |       |      |       |           |       |      |

|       | AJ              |           |       | NOTE | AK    |           |       | NOTE |
|-------|-----------------|-----------|-------|------|-------|-----------|-------|------|
|       | MIN             | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
|       |                 |           |       |      |       |           |       |      |
| D     | 1.340           | 1.360     | 1.380 |      | 1.390 | 1.410     | 1.430 |      |
| D1    |                 | 1.200 BSC |       |      |       | 1.250 BSC |       |      |
| E     | 1.340           | 1.360     | 1.380 |      | 1.390 | 1.410     | 1.430 |      |
| E1    |                 | 1.200 BSC |       |      |       | 1.250 BSC |       |      |
| M     | —               | 25        | —     | 3    | —     | 26        | —     | 3    |
| N     | —               | —         | 624   | 4    | —     | —         | 675   | 4    |
| S     |                 | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE  | 1, 2, 5, 11, 16 |           |       |      |       |           |       |      |
| REF   | 10-324          |           |       |      |       |           |       |      |
| ISSUE | A               |           |       |      |       |           |       |      |

|       | AL              |           |       | NOTE | AM    |           |       | NOTE |
|-------|-----------------|-----------|-------|------|-------|-----------|-------|------|
|       | MIN             | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
|       |                 |           |       |      |       |           |       |      |
| D     | 1.440           | 1.460     | 1.480 |      | 1.490 | 1.510     | 1.530 |      |
| D1    |                 | 1.300 BSC |       |      |       | 1.350 BSC |       |      |
| E     | 1.440           | 1.460     | 1.480 |      | 1.490 | 1.510     | 1.530 |      |
| E1    |                 | 1.300 BSC |       |      |       | 1.350 BSC |       |      |
| M     | —               | 27        | —     | 3    | —     | 28        | —     | 3    |
| N     | —               | —         | 728   | 4    | —     | —         | 783   | 4    |
| S     |                 | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE  | 1, 2, 5, 11, 16 |           |       |      |       |           |       |      |
| REF   | 10-324          |           |       |      |       |           |       |      |
| ISSUE | A               |           |       |      |       |           |       |      |

JEDEC  
Solid State Product  
Outline

S-CPGA-B / SMT PGA  
.050 CENTER CERAMIC  
SURFACE MOUNT  
PIN GRID ARRAY FAMILY  
REGISTRATION

ISSUE  
A

DATE  
JUNE  
1993

MO-145

SHEET  
3/8

| SYMBOL               | VARIATIONS |           |       |      |       |           |       |
|----------------------|------------|-----------|-------|------|-------|-----------|-------|
|                      | AN         |           |       | NOTE | AP    |           | NOTE  |
|                      | MIN.       | NOM.      | MAX.  |      | MIN.  | NOM.      | MAX.  |
| D                    | 1.540      | 1.560     | 1.580 |      | 1.590 | 1.610     | 1.630 |
| D1                   |            | 1.400 BSC |       |      |       | 1.450 BSC |       |
| E                    | 1.540      | 1.560     | 1.580 |      | 1.590 | 1.610     | 1.630 |
| E1                   |            | 1.400 BSC |       |      |       | 1.450 BSC |       |
| M                    | —          | 29        | —     | 3    | —     | 30        | —     |
| N                    | —          | —         | 840   | 4    | —     | —         | 899   |
| S                    |            | .000 BSC  |       | 14   |       | .025 BSC  | 14    |
| NOTE 1, 2, 5, 11, 16 |            |           |       |      |       |           |       |
| REF 10-324           |            |           |       |      |       |           |       |
| ISSUE A              |            |           |       |      |       |           |       |

|                      | AR    |           |       | NOTE | AT    |           |       | NOTE |
|----------------------|-------|-----------|-------|------|-------|-----------|-------|------|
|                      | MIN   | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
|                      |       |           |       |      |       |           |       |      |
| D                    | 1.640 | 1.660     | 1.680 |      | 1.690 | 1.710     | 1.730 |      |
| D1                   |       | 1.500 BSC |       |      |       | 1.550 BSC |       |      |
| E                    | 1.640 | 1.660     | 1.680 |      | 1.690 | 1.710     | 1.730 |      |
| E1                   |       | 1.500 BSC |       |      |       | 1.550 BSC |       |      |
| M                    | —     | 31        | —     | 3    | —     | 32        | —     | 3    |
| N                    | —     | —         | 960   | 4    | —     | —         | 1023  | 4    |
| S                    |       | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE 1, 2, 5, 11, 16 |       |           |       |      |       |           |       |      |
| REF 10-324           |       |           |       |      |       |           |       |      |
| ISSUE A              |       |           |       |      |       |           |       |      |

|                      | AU    |           |       | NOTE | AV    |           |       | NOTE |
|----------------------|-------|-----------|-------|------|-------|-----------|-------|------|
|                      | MIN   | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
|                      |       |           |       |      |       |           |       |      |
| D                    | 1.740 | 1.760     | 1.780 |      | 1.790 | 1.810     | 1.830 |      |
| D1                   |       | 1.600 BSC |       |      |       | 1.650 BSC |       |      |
| E                    | 1.740 | 1.760     | 1.780 |      | 1.790 | 1.810     | 1.830 |      |
| E1                   |       | 1.600 BSC |       |      |       | 1.650 BSC |       |      |
| M                    | —     | 33        | —     | 3    | —     | 34        | —     | 3    |
| N                    | —     | —         | 1088  | 4    | —     | —         | 1155  | 4    |
| S                    |       | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE 1, 2, 5, 11, 16 |       |           |       |      |       |           |       |      |
| REF 10-324           |       |           |       |      |       |           |       |      |
| ISSUE A              |       |           |       |      |       |           |       |      |

JEDEC  
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S-CPGA-B / SMTPGA  
.050 CENTER CERAMIC  
SURFACE MOUNT  
PIN GRID ARRAY FAMILY  
REGISTRATION

ISSUE

A

DATE

JUNE  
1993

MO-145

SHEET

4/8

| SYMBOL               | VARIATIONS |           |       |      |       |           |       |      |
|----------------------|------------|-----------|-------|------|-------|-----------|-------|------|
|                      | AW         |           |       | NOTE | AY    |           |       | NOTE |
|                      | MIN.       | NOM.      | MAX.  |      | MIN.  | NOM.      | MAX.  |      |
| D                    | 1.840      | 1.860     | 1.880 |      | 1.890 | 1.910     | 1.930 |      |
| D1                   |            | 1.700 BSC |       |      |       | 1.750 BSC |       |      |
| E                    | 1.840      | 1.860     | 1.880 |      | 1.890 | 1.910     | 1.930 |      |
| E1                   |            | 1.700 BSC |       |      |       | 1.750 BSC |       |      |
| M                    | —          | 35        | —     | 3    | —     | 36        | —     | 3    |
| N                    | —          | —         | 1224  | 4    | —     | —         | 1295  | 4    |
| S                    |            | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE 1, 2, 5, 11, 16 |            |           |       |      |       |           |       |      |
| REF 10-324           |            |           |       |      |       |           |       |      |
| ISSUE A              |            |           |       |      |       |           |       |      |

|                      | AAA   |           |       | NOTE | AAB   |           |       | NOTE |
|----------------------|-------|-----------|-------|------|-------|-----------|-------|------|
|                      | MIN   | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
| D                    | 1.940 | 1.960     | 1.980 |      | 1.990 | 2.010     | 2.030 |      |
| D1                   |       | 1.800 BSC |       |      |       | 1.850 BSC |       |      |
| E                    | 1.940 | 1.960     | 1.980 |      | 1.990 | 2.010     | 2.030 |      |
| E1                   |       | 1.800 BSC |       |      |       | 1.850 BSC |       |      |
| M                    | —     | 37        | —     | 3    | —     | 38        | —     | 3    |
| N                    | —     | —         | 1368  | 4    | —     | —         | 1443  | 4    |
| S                    |       | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE 1, 2, 5, 11, 16 |       |           |       |      |       |           |       |      |
| REF 10-324           |       |           |       |      |       |           |       |      |
| ISSUE A              |       |           |       |      |       |           |       |      |

|                      | AAC   |           |       | NOTE | AAD   |           |       | NOTE |
|----------------------|-------|-----------|-------|------|-------|-----------|-------|------|
|                      | MIN   | NOM       | MAX   |      | MIN   | NOM       | MAX   |      |
| D                    | 2.040 | 2.060     | 2.080 |      | 2.090 | 2.110     | 2.130 |      |
| D1                   |       | 1.900 BSC |       |      |       | 1.950 BSC |       |      |
| E                    | 2.040 | 2.060     | 2.080 |      | 2.090 | 2.110     | 2.130 |      |
| E1                   |       | 1.900 BSC |       |      |       | 1.950 BSC |       |      |
| M                    | —     | 39        | —     | 3    | —     | 40        | —     | 3    |
| N                    | —     | —         | 1520  | 4    | —     | —         | 1599  | 4    |
| S                    |       | .000 BSC  |       | 14   |       | .025 BSC  |       | 14   |
| NOTE 1, 2, 5, 11, 16 |       |           |       |      |       |           |       |      |
| REF 10-324           |       |           |       |      |       |           |       |      |
| ISSUE A              |       |           |       |      |       |           |       |      |

JEDEC  
Solid State Product  
Outline

S-CPGA-B / SMTPGA  
.050 CENTER CERAMIC  
SURFACE MOUNT  
PIN GRID ARRAY FAMILY  
REGISTRATION

ISSUE  
A

DATE  
JUNE  
1993

MO-145

SHEET  
5/8

# VARIATIONS

| SYMBOL |                 |           |       |      |      |      |      |
|--------|-----------------|-----------|-------|------|------|------|------|
|        | AAE             |           |       | NOTE |      |      | NOTE |
|        | MIN.            | NOM.      | MAX.  |      | MIN. | NOM. | MAX. |
| D      | 2.140           | 2.160     | 2.180 |      |      |      |      |
| D1     |                 | 2.000 BSC |       |      |      |      |      |
| E      | 2.140           | 2.160     | 2.180 |      |      |      |      |
| E1     |                 | 2.000 BSC |       |      |      |      |      |
| M      | —               | 41        | —     | 3    |      |      |      |
| N      | —               | —         | 1680  | 4    |      |      |      |
| S      |                 | .000 BSC  |       | 14   |      |      |      |
| NOTE   | 1, 2, 5, 11, 16 |           |       |      |      |      |      |
| REF    | 10-324          |           |       |      |      |      |      |
| ISSUE  | A               |           |       |      |      |      |      |

JEDEC  
Solid State Product  
Outline

S-CPGA-B / SMTPGA  
.050 CENTER CERAMIC  
SURFACE MOUNT  
PIN GRID ARRAY FAMILY  
REGISTRATION

ISSUE  
A

DATE  
JUNE  
1993

MO-145

SHEET  
6/8

## NOTES:

- 1 DIMENSIONING PER ANSI Y14.5M-1982.
- 2 PIN POSITION DESIGNATION PER JEDEC STANDARD 95-1, SPP-010
- 3 "M" REPRESENTS THE PIN MATRIX SIZE.
- 4 "N" REPRESENTS THE MAXIMUM ALLOWABLE NUMBER OF PINS.
- 5 22 x 22 MATRIX SIZE IS SHOWN FOR ILLUSTRATION ONLY.

6 THIS DIMENSION SPECIFIES THE MAXIMUM LID HEIGHT FOR BOTH CAVITY UP AND DOWN CONFIGURATIONS.

7 DIMENSION "A" DOES NOT INCLUDE INTEGRAL HEATSINK OR ATTACHED FEATURES.

8 THE SEATING PLANE IS DEFINED BY THE PIN TIPS FOR BOTH CAVITY UP AND DOWN CONFIGURATIONS.

9 -C- IS THE PLANE OF THE PIN TO PACKAGE INTERFACE FOR BOTH CAVITY UP AND DOWN CONFIGURATIONS (CAVITY DOWN CONFIGURATION SHOWN FOR ILLUSTRATION ONLY).

10 PIN DIAMETER INCLUDES PLATING BUT DOES NOT INCLUDE SOLDER DIP FINISH.

11 A1 CORNER IDENTIFIED BY CHAMFER. ADDITIONAL ID TYPES ARE OPTIONAL AND MAY CONSIST OF METALLIZED MARKINGS OR OTHER FEATURES.

12 THERE MUST BE .010" MINIMUM SPACING BETWEEN ANY TWO METALLIZED FEATURES ON THE PACKAGE.

13 PINS AND BRAZE FILLETS MUST BE POSITIONED ENTIRELY ON THE BRAZE PADS.

14 S IS MEASURED WITH RESPECT TO -A- AND -B- AND DEFINES THE POSITION OF THE CENTER PIN IN THE OUTER ROW, WHEN THERE IS AN ODD NUMBER OF PINS IN THE OUTER ROW, S = .000", WHEN AN EVEN NUMBER IS USED, S = .025". ALL PINS IN A GIVEN ROW MUST BE ON A .050" GRID.

15 SEE APPLICATION NOTES.

16 ALL DIMENSIONS ARE IN INCHES.

|   |   |                |                          |        |                  |
|---|---|----------------|--------------------------|--------|------------------|
| JEDEC<br>Solid State Product<br>Outline | S-CPGA-B / SMT PGA<br>.050 CENTER CERAMIC<br>SURFACE MOUNT<br>PIN GRID ARRAY FAMILY<br>REGISTRATION | ISSUE<br><br>A | DATE<br><br>JUNE<br>1993 | MO-145 | SHEET<br><br>7/8 |
|---|---|----------------|--------------------------|--------|------------------|



# APPLICATION NOTES:

- A FOR SOME SOCKETING APPLICATIONS IN CAVITY UP ORIENTATION AN AREA ON THE TOP SURFACE OF THE PACKAGE EXTENDING IN .150" FROM THE PACKAGE PERIMETER MAY BE USED TO APPLY CONTACT PRESSURE. THIS AREA SHOULD BE FREE OF OBSTRUCTIONS SUCH AS THE LID OR CHIP CAPACITORS.
- B FOR SOME SOCKETING APPLICATIONS A MINIMUM PIN LENGTH OF .055" MAY BE REQUIRED. FOR CAVITY DOWN CONFIGURATIONS THIS DISTANCE IS MEASURED FROM THE LEAD TIP TO THE LID SURFACE.
- C FOR CLEANING OF CIRCUIT BOARDS AFTER COMPONENT MOUNTING IT IS RECOMMENDED THAT A MINIMUM DISTANCE OF .010" FROM THE LEAD TIP TO LID SURFACE IS MAINTAINED.