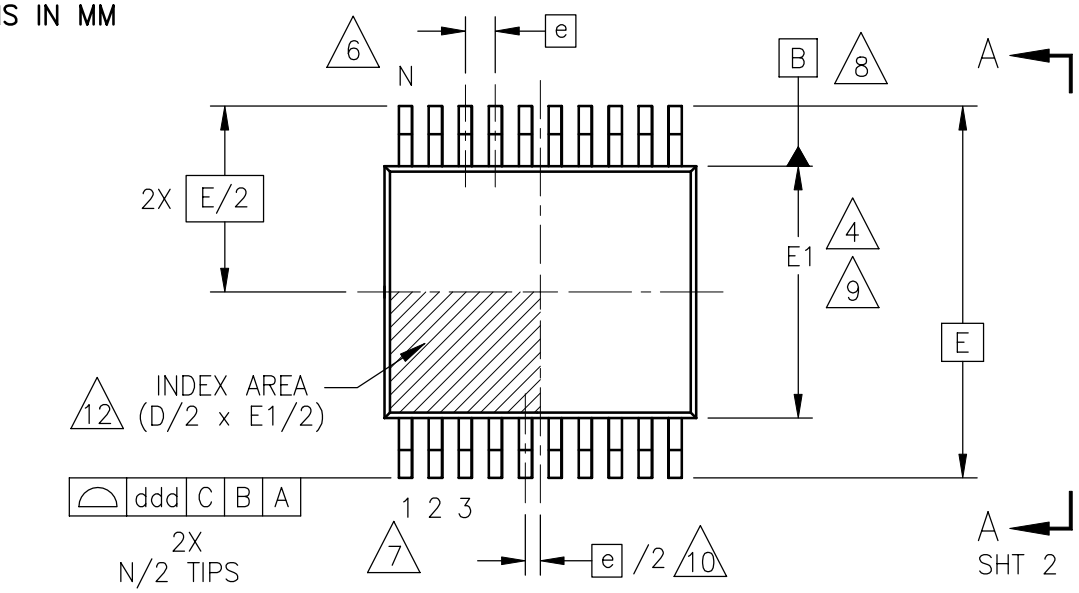
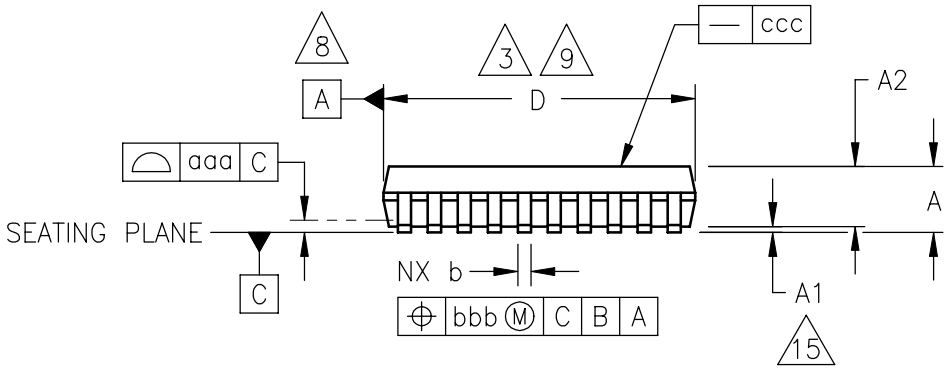
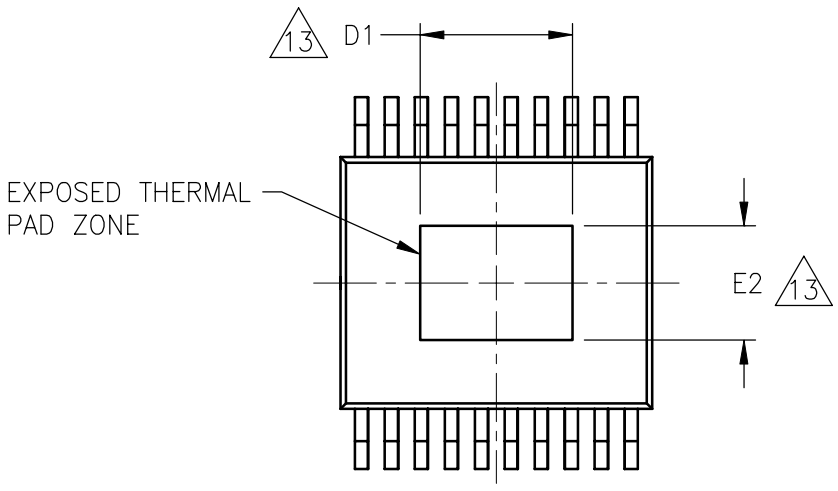
DIMENSIONS IN MM



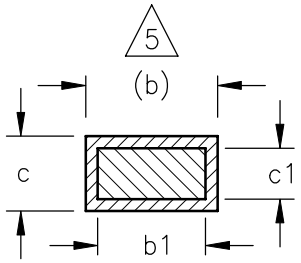



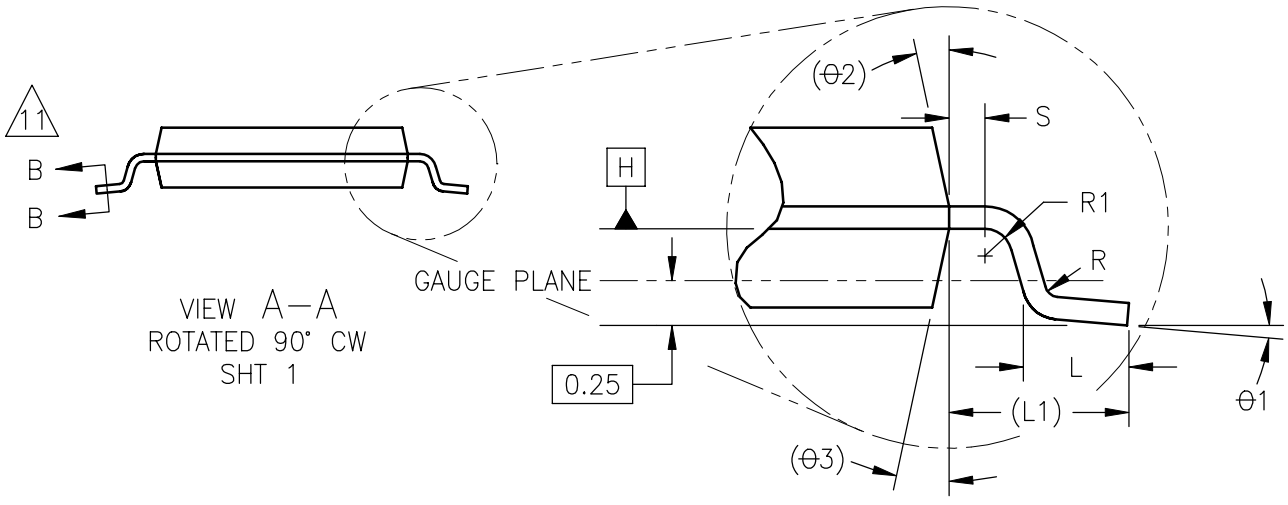

BOTTOM VIEW
(THERMALLY ENHANCED VARIATIONS ONLY)

| | |
|---|---|
| JEDEC SOLID STATE PRODUCT OUTLINES | THIS ***REGISTERED OUTLINE*** HAS BEEN PREPARED BY THE JEDEC JC–11 COMMITTEE AND REFLECTS A PRODUCT WITH ANTICIPATED USAGE IN THE ELECTRONICS INDUSTRY; CHANGES ARE LIKELY TO OCCUR. |

| TITLE | PACKAGE DESIGNATOR | ISSUE | DATE | | SHEET |
|---|---|---|---|---|---|
| PLASTIC THIN SHRINK SMALL OUTLINE PACKAGE 0.40 MM LEAD PITCH | R–PDSO–G/TSSOP/HTSSOP | B | 10/97 | MO–194 | 1 OF 6 |




SECTION B–B




| JEDEC SOLID STATE PRODUCT OUTLINES | TITLE: PLASTIC THIN SHRINK SMALL OUTLINE PACKAGE 0.40 MM LEAD PITCH | ISSUE: B | DATE: 10/97 | MO–194 | SHEET: 2 OF 6 |
|---|---|---|---|---|---|

| SUMMARY TABLE – VARIATIONS | | | |
|---|---|---|---|
| BODY WIDTH | LEAD COUNT | VARIATION | |
| | | STANDARD (TSSOP) | THERMALLY ENHANCED (HTSSOP) |
| 4.40 | 14 | AA | AAT |
| | 16 | AB | ABT |
| | 20 | AC | ACT |
| | 24 | VARIATION MOVED TO MO–153 VARIATION CA/CAT (11–492) | |
| | 48 | VARIATION MOVED TO MO–153 VARIATION CD/CDT (11–492) | |
| | 56 | AF | AFT |
| 6.10 | 80 | VARIATION MOVED TO MO–153 VARIATION FF/FFT (11–492) | |
| | 100 | BB | BBT |

| SYMBOL | COMMON DIMENSIONS | | | NOTE |
|---|---|---|---|---|
| | MIN | NOM | MAX | |
| A | – | – | 1.20 | |
| A2 | 0.80 | 1.00 | 1.05 | |
| b | 0.13 | – | 0.23 | 5 |
| b1 | 0.13 | 0.16 | 0.19 | |
| c | 0.09 | – | 0.20 | |
| c1 | 0.09 | – | 0.16 | |
| e | 0.40 BSC | | | |
| L | 0.45 | 0.60 | 0.75 | |
| L1 | 1.00 REF | | | |
| R | 0.09 | – | – | |
| R1 | 0.09 | – | – | |
| S | 0.20 | – | – | |
| θ1 | 0 | – | 8 | |
| θ2 | 12 REF | | | |
| θ3 | 12 REF | | | |
| aaa | 0.08 | | | |
| bbb | 0.07 | | | |
| ccc | 0.05 | | | |
| ddd | 0.20 | | | |
| | | | | |
| | | | | |
| NOTE | 1,2 | | | |
| REF | 11–465 | | | |
| ISSUE | A | | | |

| SYMBOL | STANDARD VARIATIONS (TSSOP) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AA | | | NOTE | AB | | | NOTE | AC | | | NOTE |
| | MIN | NOM | MAX | | MIN | NOM | MAX | | MIN | NOM | MAX | |
| A1 | 0.05 | – | 0.15 | | 0.05 | – | 0.15 | | 0.05 | – | 0.15 | |
| D | 3.50 | 3.60 | 3.70 | 3,9 | 3.50 | 3.60 | 3.70 | 3,9 | 4.90 | 5.00 | 5.10 | 3,9 |
| E | 6.40 BSC | | | | 6.40 BSC | | | | 6.40 BSC | | | |
| E1 | 4.30 | 4.40 | 4.50 | 4,9 | 4.30 | 4.40 | 4.50 | 4,9 | 4.30 | 4.40 | 4.50 | 4,9 |
| e | 0.40 BSC | | | | 0.40 BSC | | | | 0.40 BSC | | | |
| N | 14 | | | 7 | 16 | | | 6,7 | 20 | | | 7 |
| REF | 11–465 | | | | 11–465 | | | | 11–465 | | | |
| ISSUE | A | | | | A | | | | A | | | |

| SYMBOL | STANDARD VARIATIONS (TSSOP) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AF | | | NOTE | BB | | | NOTE | | | | NOTE |
| | MIN | NOM | MAX | | MIN | NOM | MAX | | MIN | NOM | MAX | |
| A1 | 0.05 | – | 0.15 | | 0.05 | – | 0.15 | | | | | |
| D | 11.20 | 11.30 | 11.40 | 3,9 | 20.70 | 20.80 | 20.90 | 3,9 | | | | |
| E | 6.40 BSC | | | | 8.10 BSC | | | | | | | |
| E1 | 4.30 | 4.40 | 4.50 | 4,9 | 6.00 | 6.10 | 6.20 | 4,9 | | | | |
| e | 0.40 BSC | | | | 0.40 BSC | | | | | | | |
| N | 56 | | | 6,7 | 100 | | | 6,7 | | | | |
| REF | 11–465 | | | | 11–465 | | | | | | | |
| ISSUE | A | | | | A | | | | | | | |

| JEDEC SOLID STATE PRODUCT OUTLINES | TITLE | PLASTIC THIN SHRINK SMALL OUTLINE PACKAGE 0.40 MM LEAD PITCH | ISSUE | DATE | MO–194 | SHEET |
|---|---|---|---|---|---|---|
| | | | B | 10/97 | | 4 OF 6 |

| SYMBOL | THERMALLY ENHANCED VARIATIONS (HTSSOP) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AAT | | | NOTE | ABT | | | NOTE | ACT | | | NOTE |
| | MIN | NOM | MAX | | MIN | NOM | MAX | | MIN | NOM | MAX | |
| A1 | 0.00 | – | 0.15 | 15 | 0.00 | – | 0.15 | 15 | 0.00 | – | 0.15 | 15 |
| D | 3.50 | 3.60 | 3.70 | 3,9 | 3.50 | 3.60 | 3.70 | 3,9 | 4.90 | 5.00 | 5.10 | 3,9 |
| D1 | 1.20 | – | – | 13 | 1.20 | – | – | 13 | 1.70 | – | – | 13 |
| E | 6.40 BSC | | | | 6.40 BSC | | | | 6.40 BSC | | | |
| E1 | 4.30 | 4.40 | 4.50 | 4,9 | 4.30 | 4.40 | 4.50 | 4,9 | 4.30 | 4.40 | 4.50 | 4,9 |
| E2 | 1.50 | – | – | 13 | 1.50 | – | – | 13 | 1.50 | – | – | 13 |
| e | 0.40 BSC | | | | 0.40 BSC | | | | 0.40 BSC | | | |
| N | 14 | | | 7 | 16 | | | 6,7 | 20 | | | 7 |
| REF | 11–465 | | | | 11–465 | | | | 11–465 | | | |
| ISSUE | A | | | | A | | | | A | | | |

| SYMBOL | THERMALLY ENHANCED VARIATIONS (HTSSOP) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AFT | | | NOTE | BBT | | | NOTE | | | | NOTE |
| | MIN | NOM | MAX | | MIN | NOM | MAX | | MIN | NOM | MAX | |
| A1 | 0.00 | – | 0.15 | 15 | 0.00 | – | 0.15 | 15 | | | | |
| D | 11.20 | 11.30 | 11.40 | 3,9 | 20.70 | 20.80 | 20.90 | 3,9 | | | | |
| D1 | 3.90 | – | – | 13 | 7.20 | – | – | 13 | | | | |
| E | 6.40 BSC | | | | 8.10 BSC | | | | | | | |
| E1 | 4.30 | 4.40 | 4.50 | 4,9 | 6.00 | 6.10 | 6.20 | 4,9 | | | | |
| E2 | 1.50 | – | – | 13 | 2.10 | – | – | 13 | | | | |
| e | 0.40 BSC | | | | 0.40 BSC | | | | | | | |
| N | 56 | | | 6,7 | 100 | | | 6,7 | | | | |
| REF | 11–465 | | | | 11–465 | | | | | | | |
| ISSUE | A | | | | A | | | | | | | |

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M–1994.

3 DIMENSION 'D' DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 PER SIDE.

4 DIMENSION 'E1' DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 PER SIDE.

5 DIMENSION 'b' DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 MM TOTAL IN EXCESS OF THE 'b' DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT. MINIMUM SPACE BETWEEN PROTRUSION AND ADJACENT LEAD IS 0.07 MM.

6. 'N' IS THE MAXIMUM NUMBER OF TERMINAL POSITIONS FOR THE SPECIFIED PACKAGE LENGTH. DEPOPULATION IS ALLOWED, BUT ONLY UNDER THE FOLLOWING CONDITIONS:

   A) DEPOPULATION MAY REDUCE 'N' BY INCREMENTS OF FOUR (4) LEADS ONLY

   B) ONLY END LEADS MAY BE REMOVED

   C) LEADS MUST BE SYMMETRICALLY ARRANGED WITH RESPECT TO DATUM A (SEE NOTE 10) TO AVOID ANY ARRAY SHIFTING.

7 TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.

8 DATUMS A AND B TO BE DETERMINED AT DATUM PLANE H.

9 DIMENSIONS 'D' AND 'E1' TO BE DETERMINED AT DATUM PLANE H.

10 THIS DIMENSION APPLIES ONLY TO VARIATIONS WITH AN EVEN NUMBER OF LEADS PER SIDE. FOR VARIATIONS WITH AN ODD NUMBER OF LEADS PER SIDE, THE "CENTER" LEAD MUST BE COINCIDENT WITH THE PACKAGE CENTERLINE, DATUM A.

11 CROSS SECTION B–B TO BE DETERMINED AT 0.10 TO 0.25 MM FROM THE LEAD TIP.

12 DETAILS OF THE PIN 1 IDENTIFIER ARE OPTIONAL, BUT MUST BE LOCATED WITHIN THE ZONE INDICATED.

13 'D1' AND 'E2' MINIMUM DIMENSIONS OF THERMALLY ENHANCED TYPES ARE VARIABLES DEPENDING ON DEVICE FUNCTION (DIE PADDLE SIZE). 'D1' AND 'E2' MAXIMUM DIMENSIONS CAN BE EQUAL TO 'D/E1' MAXIMUM DIMENSIONS. END USER SHOULD VERIFY ACTUAL SIZE OF EXPOSED THERMAL PAD FOR SPECIFIC DEVICE APPLICATION.

14. THIS PACKAGE FAMILY IS SIMILAR TO MO–153 EXCEPT THE PACKAGE BODY LENGTHS DO NOT CONFORM TO THE MO–153 PROGRESSION.

APPLICATION NOTE:

15 CAUTION SHOULD BE TAKEN DURING DESIGN, ASSEMBLY AND PROCESSING TO PREVENT DEPOSITED BOARD SOLDER FROM HOLDING THE LEADS UP OFF THE BOARD. THIS IS APPLICABLE TO THERMAL ENHANCED VARIATIONS WHERE 'A1' DIMENSION IS ALLOWED TO BE ZERO.