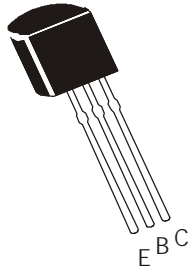


**NPN SILICON PLANAR EPITAXIAL TRANSISTORS**

**MPSA44  
MPSA45**



**TO-92  
Plastic Package**

**High Voltage Transistors**

Complementary of MPSA44 is MPSA94

**ABSOLUTE MAXIMUM RATINGS**

| DESCRIPTION                                      | SYMBOL         | MPSA44       | MPSA45 | UNITS                |
|--|----------------|--------------|--------|----------------------|
| Collector Base Voltage                           | $V_{CBO}$      | 500          | 400    | V                    |
| Collector Emitter Voltage                        | $V_{CEO}$      | 400          | 350    | V                    |
| Emitter Base Voltage                             | $V_{EBO}$      | 6.0          |        | V                    |
| Collector Current                                | $I_C$          | 300          |        | mA                   |
| Power Dissipation @ $T_a=25^\circ\text{C}$       | $P_D$          | 625          |        | mW                   |
| Derate Above $25^\circ\text{C}$                  |                | 5.0          |        | mW/ $^\circ\text{C}$ |
| Power Dissipation @ $T_c=25^\circ\text{C}$       | $P_D$          | 1.5          |        | W                    |
| Derate Above $25^\circ\text{C}$                  |                | 12           |        | mW/ $^\circ\text{C}$ |
| Operating And Storage Junction Temperature Range | $T_j, T_{stg}$ | - 55 to +150 |        | $^\circ\text{C}$     |

**THERMAL CHARACTERISTICS**

|                                 |               |      |                  |
|---------------------------------|---------------|------|------------------|
| Junction to Case                | $R_{th(j-c)}$ | 83.3 | $^\circ\text{C}$ |
| Junction to Ambient in free air | $R_{th(j-a)}$ | 200  | $^\circ\text{C}$ |

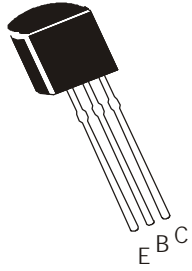
**ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$  unless specified otherwise)**

| DESCRIPTION               | SYMBOL    | TEST CONDITION                  | MIN           | MAX | UNITS |
|---------------------------|-----------|---------------------------------|---------------|-----|-------|
| Collector Emitter Voltage | $V_{CEO}$ | $I_C=1\text{mA}, I_B=0$         | <b>MPSA44</b> | 400 | V     |
|                           |           |                                 | <b>MPSA45</b> | 350 | V     |
| Collector Emitter Voltage | $V_{CES}$ | $I_C=100\mu\text{A}, V_{BE}=0$  | <b>MPSA44</b> | 500 | V     |
|                           |           |                                 | <b>MPSA45</b> | 400 | V     |
| Collector Base Voltage    | $V_{CBO}$ | $I_C=100\mu\text{A}, I_E=0$     | <b>MPSA44</b> | 500 | V     |
|                           |           |                                 | <b>MPSA45</b> | 400 | V     |
| Emitter Base Voltage      | $V_{EBO}$ | $I_E=10\mu\text{A}, I_C=0$      | 6             |     | V     |
| Collector Cut Of Current  | $I_{CBO}$ | $V_{CB}=400\text{V}, I_E=0,$    | <b>MPSA44</b> | 100 | nA    |
|                           |           | $V_{CB}=320\text{V}, I_E=0,$    | <b>MPSA45</b> | 100 | nA    |
| Collector Cut Off Current | $I_{CES}$ | $V_{CE}=400\text{V}, V_{BE}=0,$ | <b>MPSA44</b> | 500 | nA    |
|                           |           | $V_{CE}=320\text{V}, V_{BE}=0,$ | <b>MPSA45</b> | 500 | nA    |
| Emitter Cut off Current   | $I_{EBO}$ | $V_{EB}=4\text{V}, I_C=0$       |               | 100 | nA    |

# NPN SILICON PLANAR EPITAXIAL TRANSISTORS

MPSA44

MPSA45



TO-92

Plastic Package

## ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless specified otherwise)

| DESCRIPTION                          | SYMBOL         | TEST CONDITION                        | MIN | MAX  | UNITS |
|--------------------------------------|----------------|---------------------------------------|-----|------|-------|
| DC Current Gain                      | $*h_{FE}$      | $V_{CE}=10\text{V}, I_C=1\text{mA}$   | 40  |      |       |
|                                      |                | $V_{CE}=10\text{V}, I_C=10\text{mA}$  | 50  | 200  |       |
|                                      |                | $V_{CE}=10\text{V}, I_C=50\text{mA}$  | 45  |      |       |
|                                      |                | $V_{CE}=10\text{V}, I_C=100\text{mA}$ | 40  |      |       |
| Collector Emitter Saturation Voltage | $*V_{CE(sat)}$ | $I_C=1\text{mA}, I_B=0.1\text{mA}$    |     | 0.40 | V     |
|                                      |                | $I_C=10\text{mA}, I_B=1\text{mA}$     |     | 0.50 | V     |
|                                      |                | $I_C=50\text{mA}, I_B=5\text{mA}$     |     | 0.75 | V     |
| Base Emitter Saturation Voltage      | $*V_{BE(sat)}$ | $I_C=10\text{mA}, I_B=1\text{mA}$     |     | 0.75 | V     |

## DYNAMIC CHARACTERISTICS

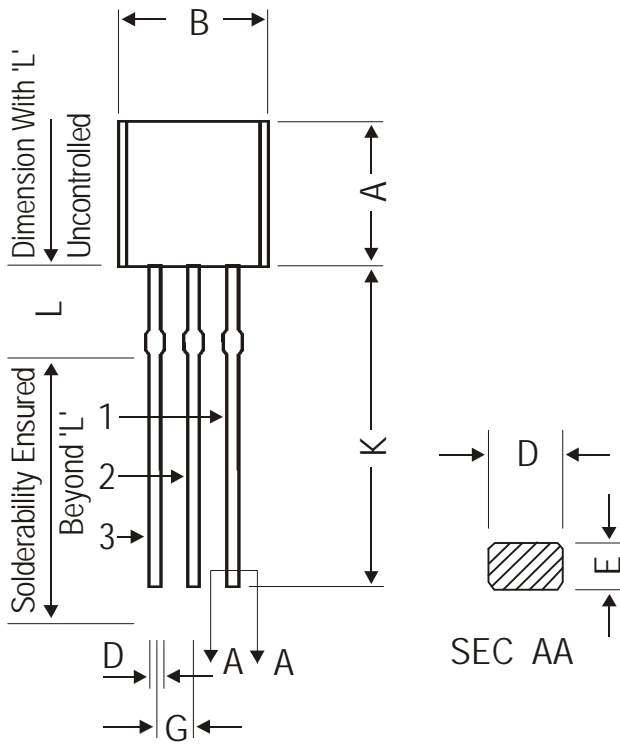
| DESCRIPTION               | SYMBOL    | TEST CONDITION                                       | MIN | MAX | UNITS |
|---------------------------|-----------|--|-----|-----|-------|
| Output Capacitance        | $C_{obo}$ | $V_{CB}=20\text{V}, I_E=0, f=1\text{MHz}$            |     | 7   | pF    |
| Input Capacitance         | $C_{ibo}$ | $V_{EB}=0.5\text{V}, I_C=0, f=1\text{MHz}$           |     | 130 | pF    |
| Small Signal Current Gain | $h_{fe}$  | $I_C=10\text{mA}, V_{CE}=10\text{V}, f=10\text{MHz}$ | 2   |     |       |

\*Pulse test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

**MPSA44**  
**MPSA45**

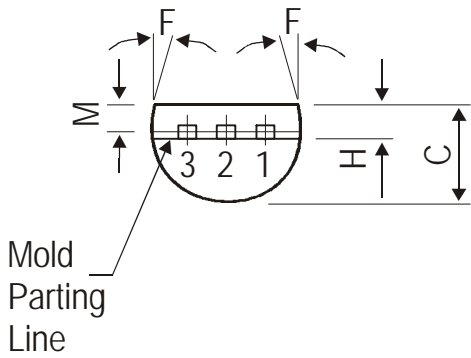
**TO-92**  
**Plastic Package**

**TO-92 Plastic Package**



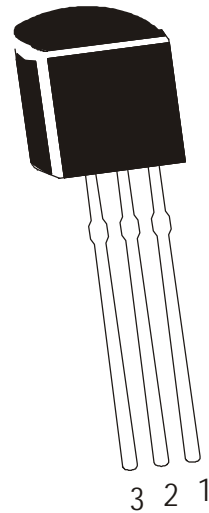
| DIM | MIN.  | MAX.  |
|-----|-------|-------|
| A   | 4.32  | 5.33  |
| B   | 4.45  | 5.20  |
| C   | 3.18  | 4.19  |
| D   | 0.41  | 0.55  |
| E   | 0.35  | 0.50  |
| F   | 5 DEG |       |
| G   | 1.14  | 1.40  |
| H   | 1.20  | 1.40  |
| K   | 12.70 | —     |
| L   | 1.982 | 2.082 |
| M   | 1.03  | 1.20  |

All dimensions are in mm



**PIN CONFIGURATION**

1. COLLECTOR
2. BASE
3. EMITTER



The TO-92 Package, Tape and Ammo Pack Drawings are correct as on the date of issue/revision of this Data Sheet.

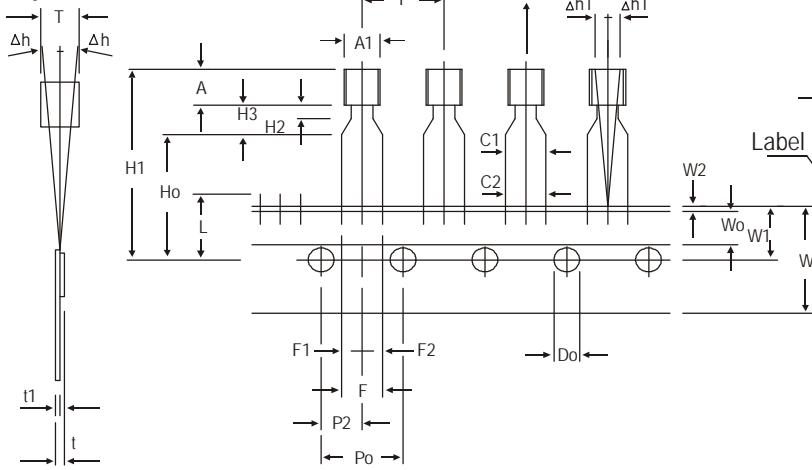
The currently valid dimensions and information, may please be confirmed from the TO-92 Drawing in the Packages and Packing Section of the Product Catalogue.

**Packing Details**

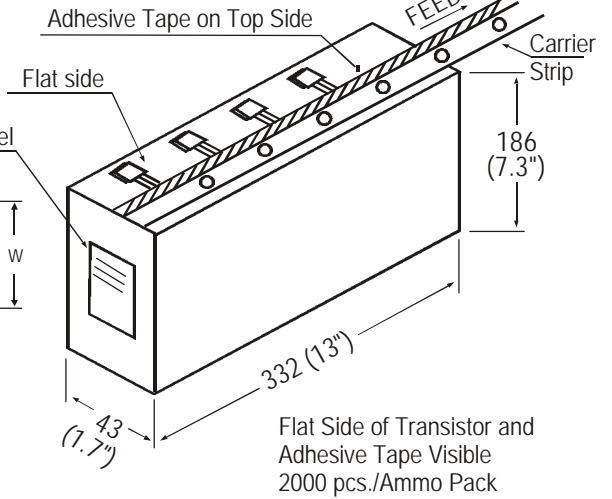
| PACKAGE    | STANDARD PACK |                | INNER CARTON BOX  |     | OUTER CARTON BOX  |     |          |
|------------|---------------|----------------|-------------------|-----|-------------------|-----|----------|
|            | Details       | Net Weight/Qty | Size              | Qty | Size              | Qty | Gr Wt    |
| TO-92 Bulk | 1K/polybag    | 200 gm/1K pcs  | 3" x 7.5" x 7.5"  | 5K  | 17" x 15" x 13.5" | 80K | 23 kgs   |
| TO-92 T&A  | 2K/ammo box   | 645 gm/2K pcs  | 12.5" x 8" x 1.8" | 2K  | 17" x 15" x 13.5" | 32K | 12.5 kgs |

TO-92 Tape and Ammo Pack

Tape Mechanical Data



Ammo Pack Style



All dimensions are in mm

| ITEM                                    | SYMBOL  | SPECIFICATION |      |       |                |
|---|---------|---------------|------|-------|----------------|
|   |         | MIN.          | NOM. | MAX.  | TOL.           |
| BODY WIDTH                              | A1      | 4.0           |      | 4.8   |                |
| BODY HEIGHT                             | A       | 4.8           |      | 5.2   |                |
| BODY THICKNESS                          | T       | 3.9           |      | 4.2   |                |
| PITCH OF COMPONENT                      | P       |               | 12.7 |       | ± 1.0          |
| *1 FEED HOLE PITCH                      | Po      |               | 12.7 |       | ± 0.3          |
| *2 FEED HOLE CENTRE TO COMPONENT CENTRE | P2      |               | 6.35 |       | ± 0.4          |
| DISTANCE BETWEEN OUTER LEADS            | F       |               | 5.08 |       | + 0.6<br>- 0.2 |
| *3 COMPONENT ALIGNMENT SIDE VIEW        | Δh      |               | 0    | 1.0   |                |
| *4 COMPONENT ALIGNMENT FRONT VIEW       | Δh1     |               | 0    | 1.3   |                |
| TAPE WIDTH                              | W       |               | 18   |       | ± 0.5          |
| HOLD-DOWN TAPE WIDTH                    | Wo      |               | 6    |       | ± 0.2          |
| HOLE POSITION                           | W1      |               | 9    |       | + 0.7<br>- 0.5 |
| HOLD-DOWN TAPE POSITION                 | W2      |               | 0.5  |       | ± 0.2          |
| LEAD WIRE CLINCH HEIGHT                 | Ho      |               | 16   |       | ± 0.5          |
| COMPONENT HEIGHT                        | H1      |               |      | 23.25 |                |
| LENGTH OF SNIPPED LEADS                 | L       |               |      | 11.0  |                |
| FEED HOLE DIAMETER                      | Do      |               | 4    |       | ± 0.2          |
| *5 TOTAL TAPE THICKNESS                 | t       |               |      | 1.2   |                |
| LEAD - TO - LEAD DISTANCE               | F1, F2  |               | 2.54 |       | + 0.4<br>- 0.1 |
| STAND OFF                               | H2      | 0.45          |      | 1.45  |                |
| CLINCH HEIGHT                           | H3      |               |      | 3.0   |                |
| LEAD PARALLELISM                        | C1 - C2 |               |      | 0.22  |                |
| PULL - OUT FORCE                        | (p)     | 6N            |      |       |                |

NOTES

1. Maximum alignment deviation between leads will not to be greater than 0.2mm.
2. Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
3. Holddown tape will not exceed beyond the edge(s) of carrier tape and there shall be no exposure of adhesive.
4. There will be no more than three (3) consecutive missing components in a tape.
5. A tape trailer, having at least three feed holes are provided after the last component in a tape.
6. Splices should not interfere with the sprocket feed holes.

REMARKS

- \*1 Cumulative pitch error 1.0 mm/20 pitch
- \*2 To be measured at bottom of clinch
- \*3 At top of body
- \*4 At top of body
- \*5 t1 0.3 – 0.6 mm