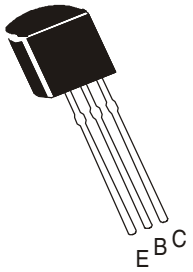
# PNP SILICON PLANAR EPITAXIAL TRANSISTORS

**CP749**




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

**Use in Wide Variety of Industrial and Consumer Applications Including Lamp and Solenoid Drivers and Audio Amplifier**

**Complementary CN649**

**ABSOLUTE MAXIMUM RATINGS**

| DESCRIPTION | SYMBOL | VALUE | UNITS |
|---|---|---|---|
| Collector Base Voltage | $V_{CBO}$ | 35 | V |
| Collector Emitter Voltage | $V_{CEO}$ | 25 | V |
| Emitter Base Voltage | $V_{EBO}$ | 5 | V |
| Peak Pulse Current | $I_{CM}$ | 6 | A |
| Collector Current Continuous | $I_C$ | 2 | A |
| Power Dissipation @ $T_a$=25ºC<br>Derate Above 25ºC | $P_D$ | 0.9<br>7.2 | W<br>mW/ºC |
| Power Dissipation @ $T_a$=25ºC | *$P_D$ | 1.1 | W |
| Power Dissipation @ $T_C$=25ºC | $P_D$ | 2.2 | W |
| Operating and Storage Junction Temperature Range | $T_j$, $T_{stg}$ | - 65 to +150 | ºC |

*** Transistors mounted on printed circuit board. Lead Length 4mm, mounting pad for collector lead min 10mm x 10 mm, copper**

**ELECTRICAL CHARACTERISTICS ($T_a$=25ºC unless specified otherwise)**

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | MAX | UNITS |
|---|---|---|---|---|---|
| Collector Emitter Voltage | $V_{CEO}$ | $I_C$=1mA, $I_B$=0 | 25 | | V |
| Collector Base Voltage | $V_{CBO}$ | $I_C$=100µA, $I_E$=0 | 35 | | V |
| Emitter Base Voltage | $V_{EBO}$ | $I_E$=100µA, $I_C$=0 | 5.0 | | V |
| Collector Cut Off Current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | 100 | nA |
| | | $V_{CB}$=30V, $I_E$=0, $T_a$=100ºC | | 10 | µA |
| Emitter Cut Off Current | $I_{EBO}$ | $V_{EB}$=4V, $I_C$=0 | | 100 | nA |
| Collector Emitter Saturation Voltage | **$V_{CE\ (sat)}$ | $I_C$=1A, $I_B$=100mA | | 0.3 | V |
| | | $I_C$=2A, $I_B$=200mA | | 0.6 | V |
| Base Emitter Saturation Voltage | **$V_{BE\ (sat)}$ | $I_C$=1A, $I_B$=100mA | | 1.25 | V |
| Base Emitter on Voltage | **$V_{BE\ (on)}$ | $I_C$=1A, $V_{CE}$=2V | | 1.0 | V |
| DC Current Gain | **$h_{FE}$ | $I_C$=50mA,$V_{CE}$=2V | 70 | | |
| | | $I_C$=1A, $V_{CE}$=2V | 100 | 300 | |
| | | $I_C$=2A, $V_{CE}$=2V | 75 | | |
| | | $I_C$=6A, $V_{CE}$=2V | 10 | | |

****Pulse Condition: Pulse Width = 300µs, Duty Cycle ≤ 2%.**

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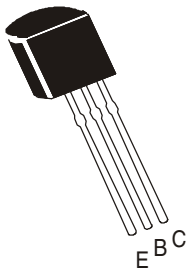


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**ELECTRICAL CHARACTERISTICS ($T_a$=25ºC unless specified otherwise)**

**DYNAMIC CHARACTERISTICS**

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | MAX | UNITS |
|---|---|---|---|---|---|
| **Output Capacitance** | $C_{obo}$ | $V_{CB}$=10V, $I_E$=0, f=1MHz | | 100 | pF |
| **Transition Frequency** | $f_T$ | $V_{CE}$=5V, $I_C$=100mA, f=100MHz | 100 | | MHz |

**SWITCHING TIMES**

| DESCRIPTION | SYMBOL | TEST CONDITION | TYP | UNIT |
|---|---|---|---|---|
| **Turn On Time** | $t_{on}$ | $I_C$=500mA, $I_{B1}$= $I_{B2}$=50mA, $V_{CC}$=10V | 40 | ns |
| **Turn Off Time** | $t_{off}$ | | 500 | ns |

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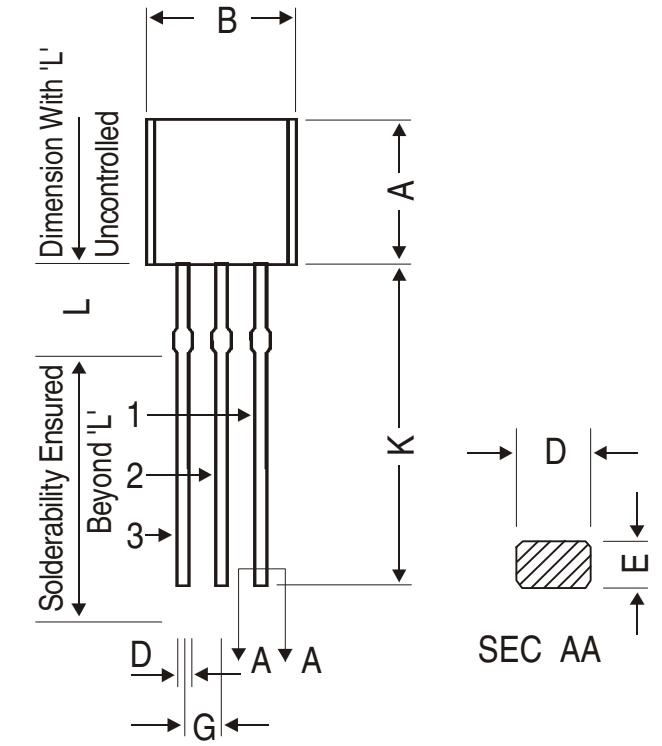
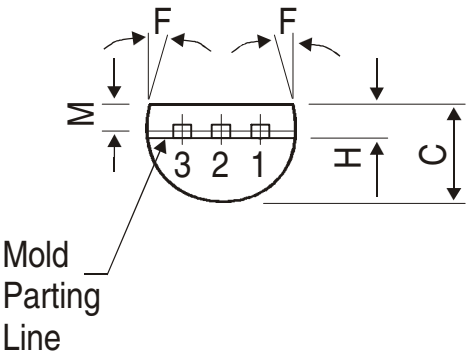
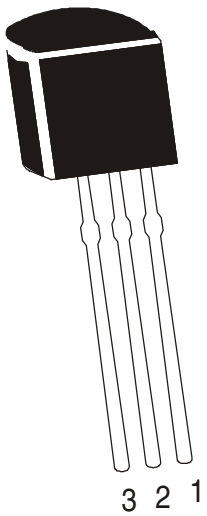
## TO-92 Plastic Package




| 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 |

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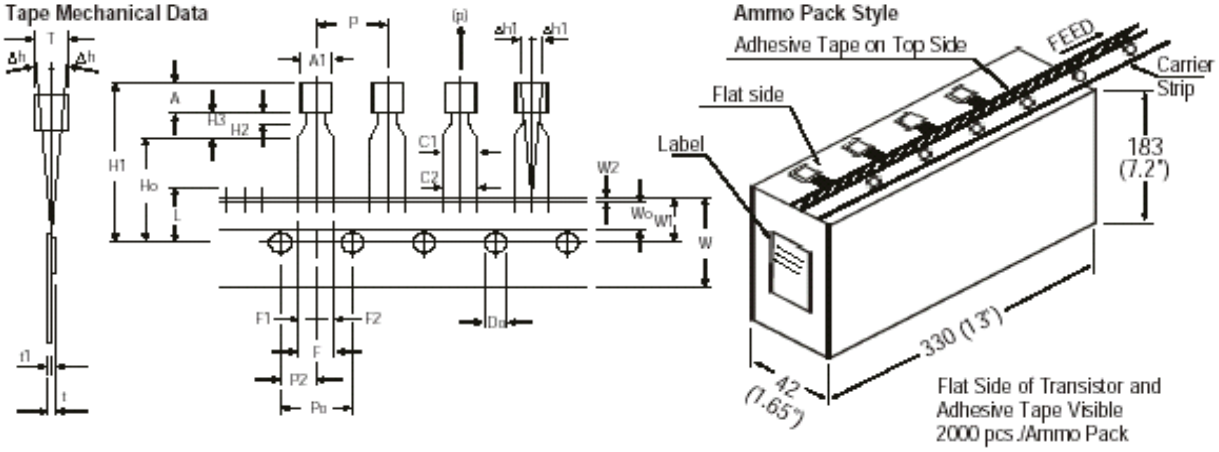
## TO-92 Tape and Ammo Pack




**All dimensions are in mm**

| ITEM | SYMBOL | SPECIFICATION | | | |
|---|---|---|---|---|---|
| | | MIN. | NOM. | MAX. | TOL. |
| BODY WIDTH | A1 | 4.45 | | 5.20 | |
| BODY HEIGHT | A | 4.32 | | 5.33 | |
| BODY THICKNESS | T | 3.18 | | 4.19 | |
| 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 - 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 - 0.5 |
| HOLD-DOWN TAPE POSITION | W2 | 0.0 | | 0.7 | |
| LEAD WIRE CLINCH HEIGHT | Ho | | 16 | | ± 0.5 |
| COMPONENT HEIGHT | H1 | | | 24.0 | |
| 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 | 2.40 | | 2.70 | - 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

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## Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Discrete Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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