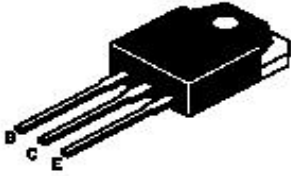


SILICON PLANAR DARLINGTON POWER TRANSISTORS

**TIP140, 141, 142 NPN
TIP145, 146, 147 PNP**



**TO- 3PN Non Isolated
Plastic Package**

Designed for General Purpose Amplifier and Low Frequency Switching Applications

ABSOLUTE MAXIMUM RATINGS

| DESCRIPTION | SYMBOL | TIP140 TIP145 | TIP141 TIP146 | TIP142 TIP147 | UNIT |
|---|----------------|------------------|------------------|------------------|------------------|
| Collector Base Voltage | V_{CBO} | 60 | 80 | 100 | V |
| Collector Emitter Voltage | V_{CEO} | 60 | 80 | 100 | V |
| Emitter Base Voltage | V_{EBO} | 5.0 | | | V |
| Collector Current Continuous | I_C | 10 | | | A |
| Collector Current Peak | $*I_{CM}$ | 15 | | | A |
| Base Current Continuous | I_B | 0.5 | | | A |
| Total Power Dissipation at $T_c = 25^\circ\text{C}$ | P_D | 125 | | | W |
| Operating and Storage Junction Temperature Range | T_j, T_{stg} | - 65 to +150 | | | $^\circ\text{C}$ |

*5ms \leq 10% Duty Cycle

THERMAL RESISTANCE

| | | | |
|--------------------------------------|---------------|------|--------------------|
| From Junction to case | $R_{th(j-c)}$ | 1.0 | $^\circ\text{C/W}$ |
| From Junction to Ambient in free air | $R_{th(j-a)}$ | 35.7 | $^\circ\text{C/W}$ |

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

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|--------------------------------------|-------------------|---|-----------------|-----|------------|-------------|
| Collector Emitter Sustaining Voltage | ** $V_{CEO(sus)}$ | $I_C = 30\text{mA}, I_B = 0$ TIP140/145 TIP141/146 TIP142/147 | 60 80 100 | | | V V V |
| Collector Cutoff Current | I_{CEO} | $V_{CE} = 1/2 \text{ rated } V_{CEO}, I_B = 0$ | | | 2.0 | mA |
| Collector Cutoff Current | I_{CBO} | $V_{CB} = \text{Rated } V_{CBO}, I_E = 0$ | | | 1.0 | mA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 5.0 \text{ V}, I_C = 0$ | | | 2.0 | mA |
| DC Current Gain | ** h_{FE} | $I_C = 5\text{A}, V_{CE} = 4\text{V}$ $I_C = 10\text{A}, V_{CE} = 4 \text{ V}$ | 1000 500 | | | |
| Collector Emitter Saturation Voltage | ** $V_{CE(sat)}$ | $I_C = 5\text{A}, I_B = 10\text{mA}$ $I_C = 10\text{A}, I_B = 40\text{mA}$ | | | 2.0 3.0 | V V |
| Base Emitter Saturation Voltage | ** $V_{BE(sat)}$ | $I_C = 10\text{A}, I_B = 40\text{mA}$ | | | 3.5 | V |
| Base Emitter On Voltage | ** $V_{BE(on)}$ | $I_C = 10\text{A}, V_{CE} = 4 \text{ V}$ | | | 3.0 | V |

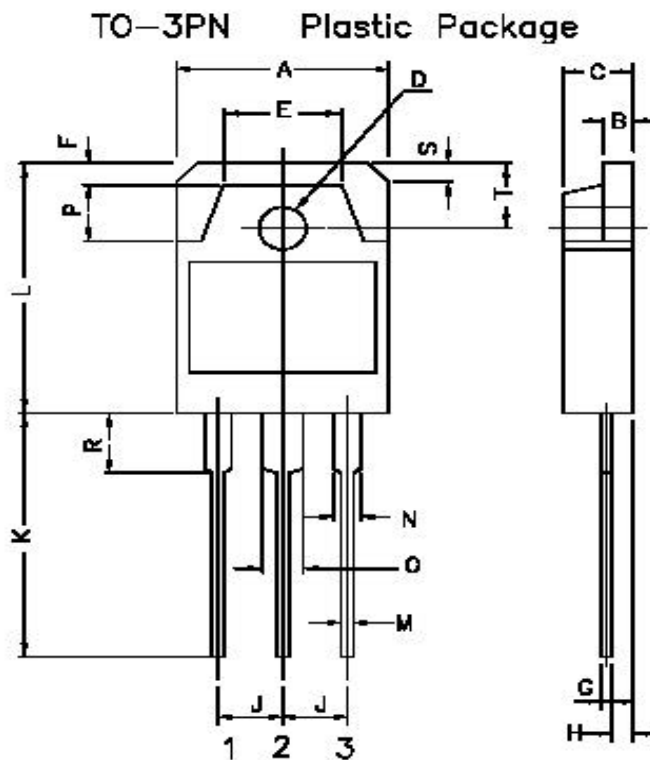
SWITCHING TIME

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|--------------|--------|--|-----|------|-----|---------------|
| Delay Time | t_d | $V_{CC} = 30\text{V}, I_C = 5\text{A}, I_B = 20\text{mA},$ Duty Cycle $\leq 2\%, I_{B1} = I_{B2}, R_C \ \&$ $R_B \text{ varied } T_j = 25^\circ\text{C}$ | | 0.15 | | μs |
| Rise Time | t_r | | | 0.55 | | μs |
| Storage Time | t_s | | | | 2.5 | μs |
| Fall Time | t_f | | | | 2.5 | μs |

**Pulsed test : Pulse width = 300ms, duty cycle $\leq 2\%$

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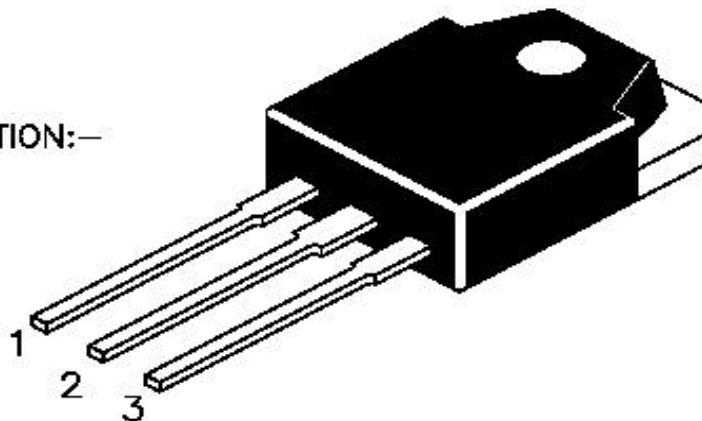


| DIM | MIN | MAX |
|-----|------|------|
| A | 15.2 | 16.0 |
| B | 1.9 | 2.1 |
| C | 4.6 | 5.0 |
| D | 3.1 | 3.3 |
| E | — | 9.6 |
| F | — | 2.0 |
| G | 0.55 | 0.85 |
| H | — | 1.4 |
| J | 5.35 | 5.55 |
| K | 20.0 | — |
| L | 19.6 | 20.2 |
| M | 0.95 | 1.25 |
| N | — | 2.0 |
| O | — | 3.0 |
| P | — | 4.0 |
| R | — | 4.0 |
| S | — | 1.8 |
| T | 4.8 | 5.2 |

ALL DIMENSIONS ARE IN M.M.

PIN CONFIGURATION:—

1. BASE
2. COLLECTOR
3. EMITTER



Packing Detail

| PACKAGE | STANDARD PACK | | INNER CARTON BOX | | OUTER CARTON BOX | | |
|---------|----------------|-----------------|------------------|------|------------------|------|---------|
| | Detail | Net Weight/Qty. | Size | Qty. | Size | Qty. | Gr. Wt. |
| TO-3PN | 100pcs/polybag | 639gm/100pcs | 3"X7.5"X7.5" | 0.3K | 18"X15"X9" | 3K | 21kgs |

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's 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 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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