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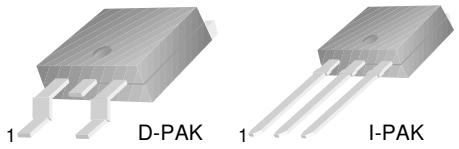
# MJD117

## D-PAK for Surface Mount Applications

- High DC Current Gain
- Built-in a Damper Diode at E-C
- Lead Formed for Surface Mount Applications (No Suffix)
- Straight Lead (I-PAK, " - I " Suffix)
- Electrically Similar to Popular TIP117



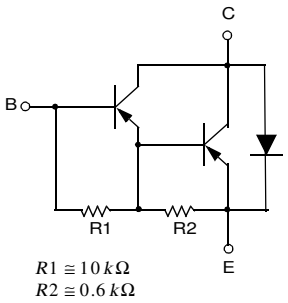

1.Base 2.Collector 3.Emitter

# PNP Silicon Darlington Transistor

## Absolute Maximum Ratings $T_C$=25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | - 100 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | - 100 | V |
| $V_{EBO}$ | Emitter-Base Voltage | - 5 | V |
| $I_C$ | Collector Current (DC) | - 2 | A |
| $I_{CP}$ | Collector Current (Pulse) | - 4 | A |
| $I_B$ | Base Current | - 50 | mA |
| $P_C$ | Collector Dissipation ($T_C$=25°C) | 20 | W |
| | Collector Dissipation ($T_a$=25°C) | 1.75 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | - 65 ~ 150 | °C |

Equivalent Circuit




## Electrical Characteristics $T_C$=25°C unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| $V_{CEO}$ (sus) | *Collector-Emitter Sustaining Voltage | $I_C$ = - 30mA, $I_B$ = 0 | - 100 | | V |
| $I_{CEO}$ | Collector Cut-off Current | $V_{CE}$ = - 50V, $I_B$ = 0 | | - 20 | μA |
| $I_{CBO}$ | Collector Cut-off Current | $V_{CB}$ = - 100V, $I_E$ = 0 | | - 20 | μA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$ = - 5V, $I_C$ = 0 | | - 2 | mA |
| $h_{FE}$ | *DC Current Gain | $V_{CE}$ = - 3V, $V_{EB}$ = - 0.5A<br>$V_{CE}$ = - 3V, $V_{EB}$ = - 2A<br>$V_{CE}$ = - 3V, $I_C$ = - 4A | 500<br>1000<br>200 | 12K | |
| $V_{CE}$(sat) | *Collector-Emitter Saturation Voltage | $I_C$ = -2A, $I_B$ = - 8mA<br>$I_C$ = - 4A, $I_B$ = - 40mA | | - 2<br>- 3 | V<br>V |
| $V_{BE}$(sat) | *Base-Emitter Saturation Voltage | $I_C$ = - 4A, $I_B$ = - 40mA | | - 4 | V |
| $V_{BE}$(on) | *Base-Emitter ON Voltage | $V_{CE}$ = - 3A, $I_C$ = - 2A | | - 2.8 | V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = -10V, $I_C$ = - 0.75A | 25 | | MHz |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = - 10V, $I_E$ = 0<br>f= 0.1MHz | | 200 | pF |

* Pulse Test: PW≤300μs, Duty Cycle≤2%

# Typical Characteristics

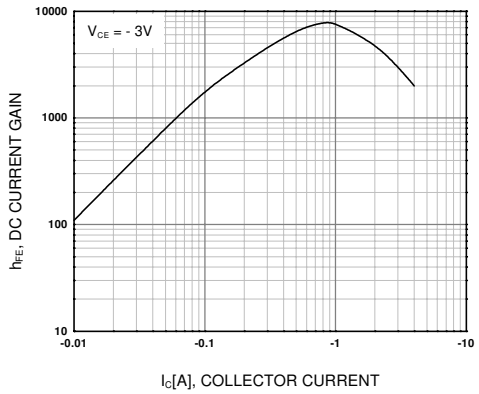



**Figure 1. DC current Gain**

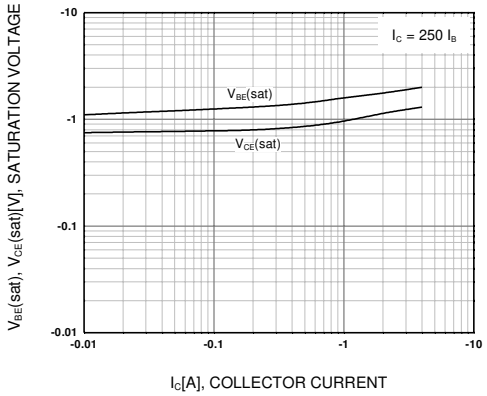



**Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage**

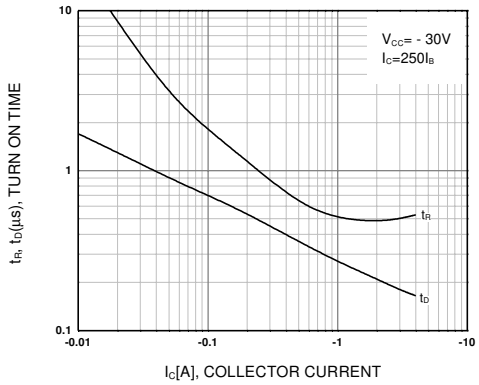



**Figure 3. Collector Output Capacitance**

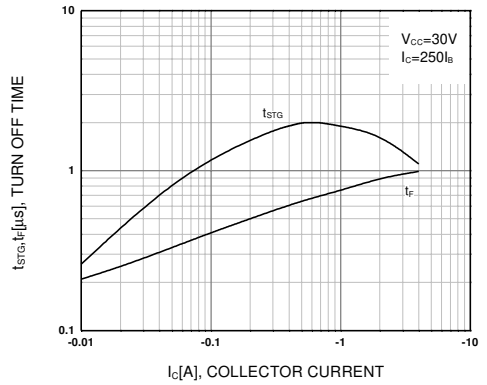



**Figure 4. Turn On Time**

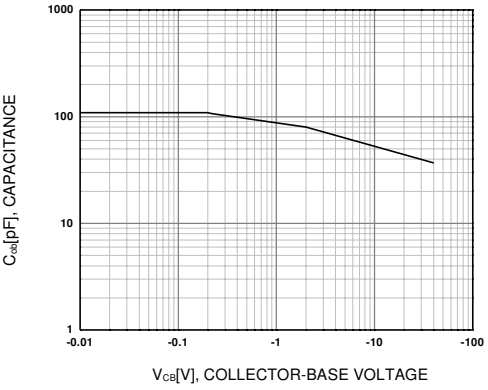



**Figure 5. Turn Off Time**

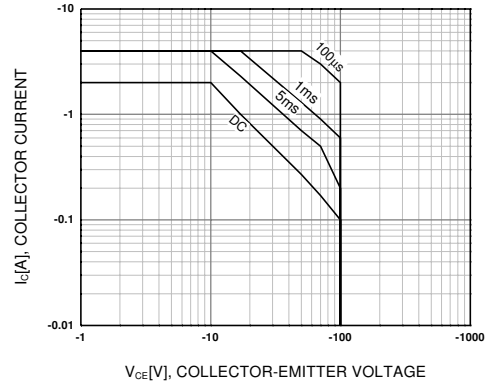



**Figure 6. Safe Operating Area**

## Typical Characteristics (Continued)

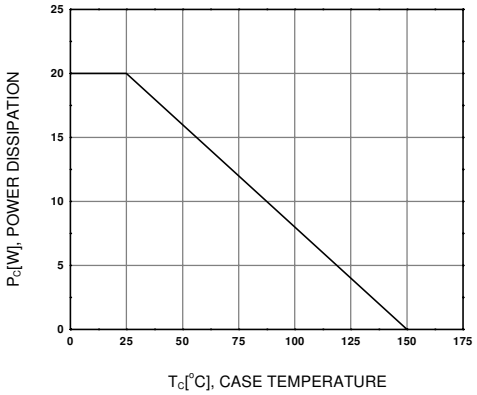
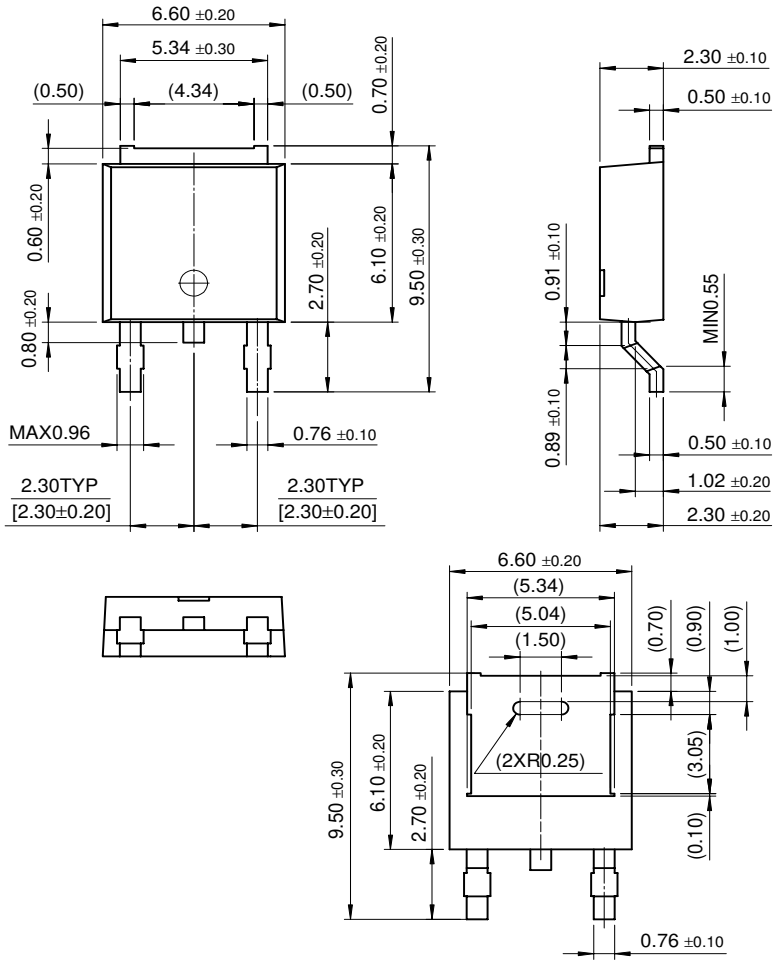



**Figure 7. Power Derating**

## Package Demensions

# D-PAK




Dimensions in Millimeters

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