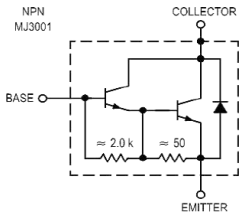
# NPN Silicon Darlington Medium Power Transistor

**$V_{CEO}$ 80V, $I_C$ 10A, 150W, TO-3**

RoHS Compliant




## Features

1. High DC Current Gain - $h_{FE}$ = 4000 (Typ.) @ $I_C$=25A DC
   $h_{FE}$ = 400 (Min) @ Ic= 5 Adc
2. Monolithic Construction with Built-In Base-Emitter Shunt Resistor

**APPLICATIONS:** For use as output devices in complementary general purpose amplifier applications.

**ABSOLUTE MAXIMUM RATINGS** ($T_a$ = 25°C)

| Rating | Symbol | Max | Units |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 80 | V DC |
| Collector-Base Voltage | $V_{CB}$ | 80 | V DC |
| Emitter Base Voltage | $V_{EB}$ | 5 | V DC |
| Collector Current | $I_C$ | 10 | $A_{DC}$ |
| Base Current | $I_B$ | 0.2 | $A_{DC}$ |
| Total Device Dissipation @ TC 25°C<br>Derate above 25°C | $P_D$ | 150<br>0.857 | Watts<br>W/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | -55°C to +200°C | °C |

## Thermal Characteristics

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Thermal Resistance, Junction to case | JC | 1.17 | °C/W |

## Electrical Characteristics at $T_A$ = 25°C unless otherwise specified)

| Description | Symbol | Min | Max | Units |
|---|---|---|---|---|
| **Off Characteristics** | | | | |
| Collector-Emitter Breakdown Voltage (1)<br>($I_C$ = 100mADC, $I_B$ = 0) | $V_{(BR)CEO}$ | 80 | - | V DC |
| Collector-Emitter Leakage Current<br>($V_{CE}$ = 80V DC, $R_{BE}$ = 1k Ω<br>($V_{CE}$ = 80V DC, $R_{BE}$ = 1k Ω, $T_C$ = 150°C) | $I_{CER}$ | -<br>- | 1<br>5 | mA DC |
| Emitter Cut Off Current ($V_{BE}$ = 5V DC, $I_C$ = 0) | $I_{EBO}$ | - | 5 | mA DC |
| Collector-Emitter Leakage Current ($V_{CE}$ = 40V DC, $I_B$ = 0) | $I_{CEO}$ | - | 1 | mA DC |
| **On Characteristics (1)** | | | | |
| DC Current Gain ($I_C$ = 5A DC, $V_{CE}$ = 3 $V_{DC}$ | $h_{FE}$ | 1000 | - | - |
| Collector-Emitter Saturation Voltage<br>($I_C$ = 5A DC, $I_B$ = 20 $mA_{DC}$<br>($I_C$ = 10A DC, $I_B$ = 50 $mA_{DC}$ | $V_{CE(sat)}$ | -<br>- | 2<br>4 | V DC |
| Base-Emitter Voltage<br>($I_C$ = 5A DC, $V_{CE}$ = 3 $V_{DC}$ | $V_{BE(on)}$ | - | 3 | V DC |

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle = 2%

## Typical Characteristics Curves

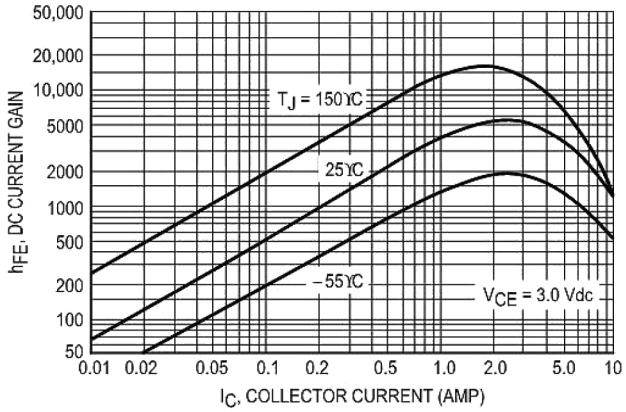



**Figure 2. DC Current Gain**

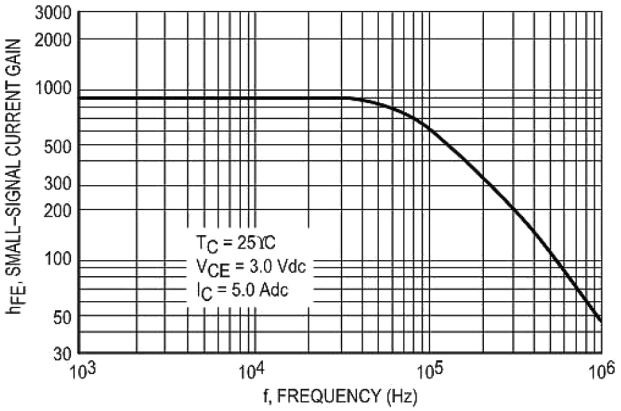



**Figure 3. Small–Signal Current Gain**

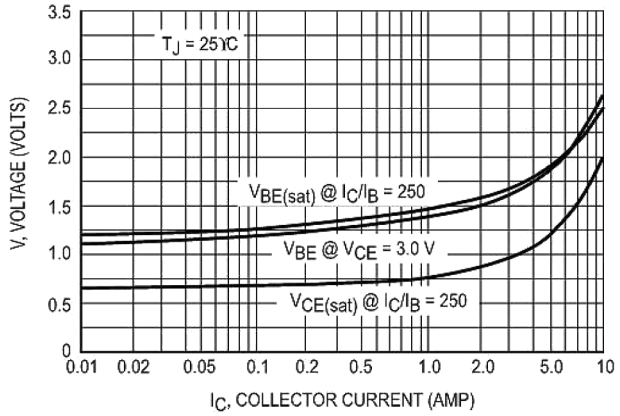



**Figure 4. "On" Voltages**

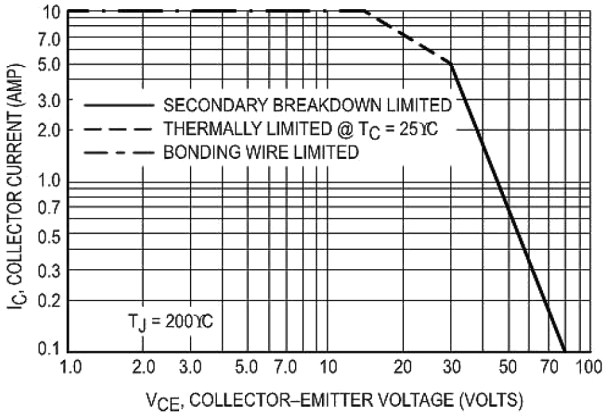
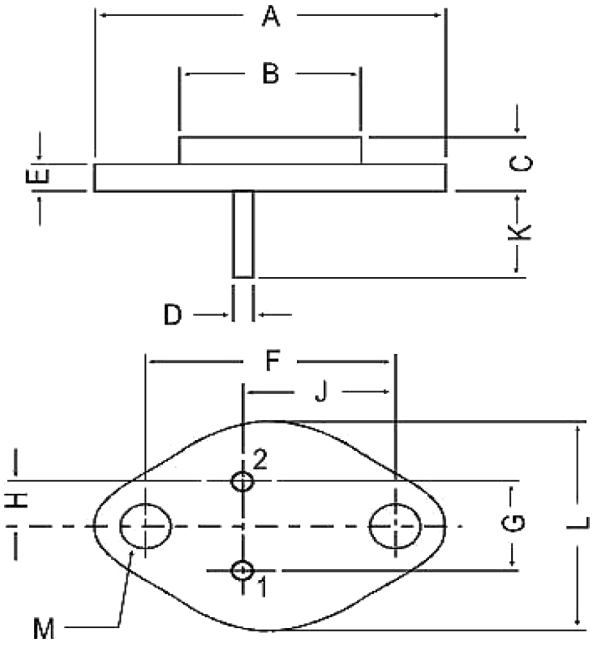
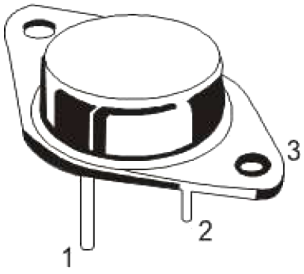



**Figure 5. DC Safe Operating Area**

## Package Details




Dimensions : Millimetres




PIN CONFIGURATION
1. BASE
2. EMITTER
3. COLLECTOR

| Dim | Min. | Max. |
|---|---|---|
| A | - | 39.37 |
| B | - | 22.22 |
| C | 6.35 | 8.5 |
| D | 0.96 | 1.09 |
| E | - | 1.77 |
| F | 29.9 | 30.4 |
| G | 10.69 | 11.18 |
| H | 5.2 | 5.72 |
| J | 16.64 | 17.15 |
| K | 11.15 | 12.25 |
| L | - | 26.67 |
| M | 3.84 | 4.19 |

## Part Number Table

| Description | Part Number |
|---|---|
| Silicon Darlington Medium Power Transistor, NPN 80V, 10A, TO-3 | MJ3001 |