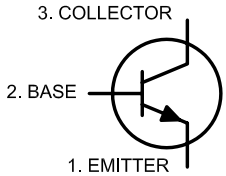
# NPN Silicon Planar Transistor
# 50VCEO

multicomp PRO

TO-39

RoHS Compliant

NPN




## Absolute Maximum Ratings

| Description | Symbol | Value | Unit |
|---|---|---|---|
| Collector Emitter Voltage, $R_{BE} \leq 10\Omega$ | $V_{CER}$ | 50 | V |
| Collector Base Voltage | $V_{CBO}$ | 75 | V |
| Emitter Base Voltage | $V_{EBO}$ | 7 | V |
| Power Dissipation at $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 800<br>4.57 | mW<br>mW/°C |
| Power Dissipation at $T_C$ = 25°C<br>Derate Above 25°C | $P_D$ | 3<br>17.15 | W<br>mW/°C |
| Operating and Storage Junction Temperature Range | Tj, Tstg | - 65 to +200 | °C |

## Electrical Characteristics: ($T_A$ = +25°C Unless otherwise specified)

| Description | Symbol | Test Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| Collector Emitter Voltage | $V_{CER}$ | $I_C$ = 1mA, $R_{BE} \leq 10\Omega$ | 50 | | V |
| Collector Base Voltage | $V_{CBO}$ | $I_C$ = 100µA, $I_E$ = 0 | 75 | | V |
| Emitter Base Voltage | $V_{EBO}$ | $I_E$ = 100µA, $I_C$ = 0 | 7 | | V |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$ = 60V, $I_E$ = 0<br>$V_{CB}$ = 60V, $I_E$ = 0, $T_A$ = 150°C | | 10<br>10 | nA<br>µA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$ =5V, $I_C$ = 0 | | 5 | nA |
| DC Current Gain | $h_{FE}$ | $I_C$ = 0.01mA, $V_{CE}$ = 10V<br>$I_C$ = 0.1mA, $V_{CE}$ =10V<br>$I_C$ = 10mA, $V_{CE}$ =10V<br>$I_C$=10mA, $V_{CE}$=10V, $T_A$= -55°C<br>$I_C$ = 150mA, $V_{CE}$ = 10V<br>$I_C$ = 150mA, $V_{CE}$ = 10V | 20<br>35<br>75<br>35<br>100<br>40 | <br><br><br><br>300<br> | |
| Collector Emitter Saturation Voltage | *$V_{CE(Sat)}$ | $I_C$ = 150mA, $I_B$ = 15mA | | 0.5 | V |
| Base Emitter Saturation Voltage | *$V_{BE(Sat)}$ | $I_C$ = 150mA, $I_B$ = 15mA | | 1.3 | V |

### Small Signal Characteristics

| Description | Symbol | Test Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| Transition Frequency | $f_T$ | Ic=50mA, $V_{CE}$=10V, f=20MHz | 70 | | MHz |
| Output Capacitance | $C_{ob}$ | $V_{CB}$ = 10V, $I_E$ = 0, f = 100kHz | | 25 | pF |
| Input Capacitance | $C_{ib}$ | $V_{EB}$ = 0.5V, $I_C$ = 0, f = 100kHz | | 80 | pF |

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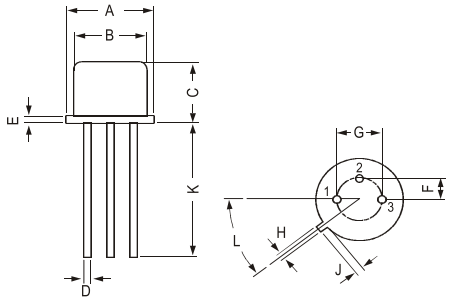
| Description | Symbol | Test Conditions | Min | Max | Unit |
|---|---|---|---|---|---|
| Input Impedance | $h_{ib}$ | $I_C$ = 1mA, $V_{CB}$ = 5V, f = 1kHz<br>$I_C$ = 5mA, $V_{CB}$ = 10V, f = 1kHz | 24<br>4 | 34<br>8 | Ω<br>Ω |
| Voltage Feedback Ratio | $h_{rb}$ | $I_C$ = 1mA, $V_{CB}$ = 5V, f = 1kHz<br>$I_C$ = 5mA, $V_{CB}$ = 10V, f = 1kHz | | 5<br>5 | $x10^{-4}$<br>$x10^{-4}$ |
| Small Signal Current Gain | $h_{fe}$ | $I_C$ = 1mA, $V_{CB}$ = 5V, f = 1kHz<br>$I_C$ = 5mA, $V_{CB}$ = 10V, f = 1kHz | 50<br>70 | 200<br>300 | |
| Output Admittance | $h_{ob}$ | $I_C$ = 1mA, $V_{CB}$ = 5V, f = 1kHz<br>$I_C$ = 5mA, $V_{CB}$ = 10V, f = 1kHz | 0.05<br>0.05 | 0.05<br>0.05 | µmhos<br>µmhos |
| Noise Figure | NF | $I_C$ = 300mA, $V_{CE}$ = 10V, f = 1kHz | | 8 | dB |

*Pulse Test: Pulse Width ≤ 300µs, Duty Cycle < 2%

**TO-39 Metal Can Package**




| Dim. | Min. | Max. |
|---|---|---|
| A | 8.5 | 9.39 |
| B | 7.74 | 8.50 |
| C | 6.09 | 6.60 |
| D | 0.4 | 0.53 |
| E | - | 0.88 |
| F | 2.41 | 2.66 |

| Dim. | Min. | Max. |
|---|---|---|
| G | 4.82 | 5.33 |
| H | 0.71 | 0.86 |
| J | 0.73 | 1.02 |
| K | 12.7 | - |
| L | 42 Deg. | 48 Deg. |

Dimensions : Millimetres

## Part Number Table

| Description | Part Number |
|---|---|
| NPN Silicon Planar Transistor, 50V, TO-39 | MP001165 |