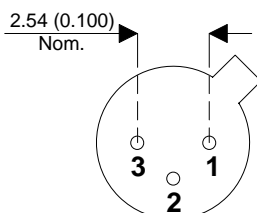
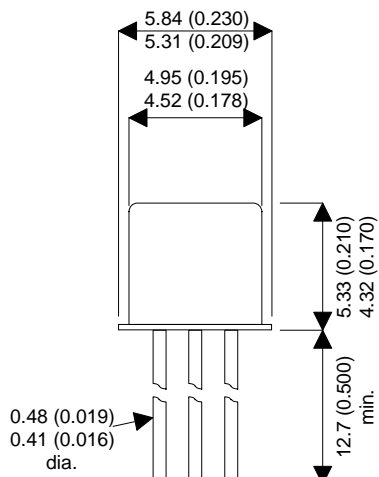


MECHANICAL DATA

Dimensions in mm (inches)



TO-18 METAL PACKAGE

Underside View

PIN 1 – Emitter PIN 2 – Base PIN 3 – Collector

**HIGH SPEED
MEDIUM POWER, NPN
SWITCHING TRANSISTOR**

FEATURES

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- HIGH SPEED SATURATED SWITCHING
- ALSO AVAILABLE IN CERAMIC SURFACE MOUNT PACKAGE

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

| | | |
|----------------|-----------------------------------------------------|------------------------------|
| V_{CBO} | Collector – Base Voltage | 75V |
| V_{CEO} | Collector – Emitter Voltage | 40V |
| V_{EBO} | Emitter – Base Voltage | 6V |
| I_C | Collector Current | 800mA |
| P_D | Total Device Dissipation @ $T_A = 25^\circ\text{C}$ | 0.5mW |
| | Derate above 25°C | 2.28mW / $^\circ\text{C}$ |
| P_D | Total Device Dissipation @ $T_C = 25^\circ\text{C}$ | 1.2W |
| | Derate above 25°C | 6.85mW / $^\circ\text{C}$ |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -65 to +200 $^\circ\text{C}$ |

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

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit | |
|-------------------------------------|----------------------------------------|------------------------|----------------------------------------------------|---------------------|---------------|-----|
| OFF CHARACTERISTICS | | | | | | |
| $V_{(BR)CEO}$ | Collector – Emitter Sustaining Voltage | $I_C = 10\text{mA}$ | $I_B = 0$ | 40 | V | |
| $V_{(BR)CBO}$ | Collector – Base Breakdown Voltage | $I_C = 10\mu\text{A}$ | $I_E = 0$ | 75 | V | |
| $V_{(BR)EBO}$ | Emitter – Base Breakdown Voltage | $I_E = 10\mu\text{A}$ | $I_C = 0$ | 6 | V | |
| I_{CEX} | Collector Cut-off Current | $V_{CE} = 60\text{V}$ | $V_{EB(off)} = 3\text{V}$ | 10 | nA | |
| I_{CBO} | Collector – Base Cut-off Current | $I_E = 0$ | $V_{CB} = 60\text{V}$ $T_A = 150^\circ\text{C}$ | 0.01 10 | μA | |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $I_C = 0$ | $V_{EB} = 3\text{V}$ | 10 | nA | |
| I_{BL} | Base Current | $V_{CE} = 60\text{V}$ | $V_{EB(off)} = 3\text{V}$ | 20 | nA | |
| ON CHARACTERISTICS | | | | | | |
| $V_{CE(sat)}^1$ | Collector – Emitter Saturation Voltage | $I_C = 150\text{mA}$ | $I_B = 15\text{mA}$ | | 0.3 | V |
| | | $I_C = 500\text{mA}$ | $I_B = 50\text{mA}$ | | 1 | |
| $V_{BE(sat)}^1$ | Base – Emitter Saturation Voltage | $I_C = 150\text{mA}$ | $I_B = 15\text{mA}$ | 0.6 | 1.2 | V |
| | | $I_C = 500\text{mA}$ | $I_C = 50\text{mA}$ | | 2 | |
| h_{FE} | DC Current Gain | $I_C = 0.1\text{mA}$ | $V_{CE} = 10\text{V}$ | 35 | | — |
| | | $I_C = 1\text{mA}$ | $V_{CE} = 10\text{V}$ | 50 | | |
| | | $I_C = 10\text{mA}$ | $V_{CE} = 10\text{V}$ | 75 | | |
| | | | $T_A = -55^\circ\text{C}$ | 35 | | |
| | | $I_C = 150\text{mA}$ | $V_{CE} = 10\text{V}^1$ | 100 | 300 | |
| | | $I_C = 150\text{mA}$ | $V_{CE} = 1\text{V}^1$ | 50 | | |
| | | $I_C = 500\text{mA}$ | $V_{CE} = 10\text{V}^1$ | 40 | | |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| f_T | Transition Frequency ² | $I_C = 20\text{mA}$ | $V_{CE} = 20\text{V}$ | $f = 100\text{MHz}$ | 300 | MHz |
| C_{ob} | Output Capacitance | $V_{CB} = 10\text{V}$ | $I_E = 0$ | $f = 100\text{kHz}$ | | 8 |
| C_{ib} | Input Capacitance | $V_{EB} = 0.5\text{V}$ | $I_C = 0$ | $f = 100\text{kHz}$ | | 25 |
| h_{fe} | Small Signal Current Gain | $I_C = 1\text{mA}$ | $V_{CE} = 10\text{V}$ | $f = 1\text{kHz}$ | 50 | 300 |
| | | $I_C = 10\text{mA}$ | $V_{CE} = 10\text{V}$ | $f = 1\text{kHz}$ | 75 | 375 |
| SWITCHING CHARACTERISTICS | | | | | | |
| t_d | Delay Time | $V_{CC} = 30\text{V}$ | $V_{BE(off)} = 0.5\text{V}$ | | | 10 |
| t_r | Rise Time | $I_C = 150\text{mA}$ | $I_{B1} = 15\text{mA}$ | | | 25 |
| t_s | Storage Time | $V_{CC} = 30\text{V}$ | $I_C = 150\text{mA}$ | | | 225 |
| t_f | Fall Time | | $I_{B1} = I_{B2} = 15\text{mA}$ | | | 60 |

NOTES:

- 1) Pulse test: $t_p \leq 300\mu\text{s}$, $\delta \leq 2\%$
- 2) f_T is defined as the frequency at which h_{FE} extrapolates to unity.