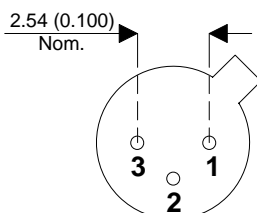
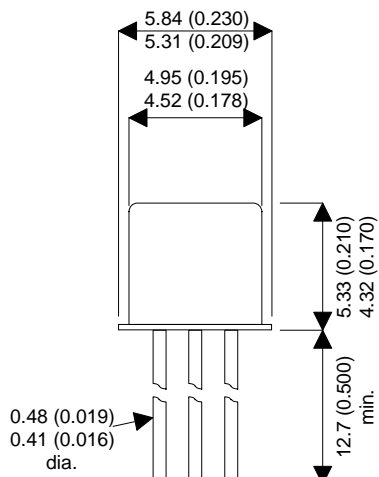


**MECHANICAL DATA**

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 $25^\circ\text{C}$	2.28mW / $^\circ\text{C}$
$P_D$	Total Device Dissipation @ $T_C = 25^\circ\text{C}$	1.2W
	Derate above $25^\circ\text{C}$	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
<b>OFF CHARACTERISTICS</b>					
$V_{(BR)CEO}$	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	$\mu\text{A}$
$I_{EBO}$	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
<b>ON CHARACTERISTICS</b>					
$V_{CE(sat)}^1$	Collector – Emitter Saturation Voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$ $I_C = 500\text{mA}$ $I_B = 50\text{mA}$		0.3 1	V
$V_{BE(sat)}^1$	Base – Emitter Saturation Voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$ $I_C = 500\text{mA}$ $I_C = 50\text{mA}$	0.6	1.2 2	V
$h_{FE}$	DC Current Gain	$I_C = 0.1\text{mA}$ $V_{CE} = 10\text{V}$ $I_C = 1\text{mA}$ $V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$ $T_A = -55^\circ\text{C}$ $I_C = 150\text{mA}$ $V_{CE} = 10\text{V}^1$ $I_C = 150\text{mA}$ $V_{CE} = 1\text{V}^1$ $I_C = 500\text{mA}$ $V_{CE} = 10\text{V}^1$	35 50 75 35 100 50 40		— 300
<b>SMALL SIGNAL CHARACTERISTICS</b>					
$f_T$	Transition Frequency <sup>2</sup>	$I_C = 20\text{mA}$ $V_{CE} = 20\text{V}$ $f = 100\text{MHz}$	300		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 100\text{kHz}$		8	pF
$C_{ib}$	Input Capacitance	$V_{EB} = 0.5\text{V}$ $I_C = 0$ $f = 100\text{kHz}$		25	pF
$h_{fe}$	Small Signal Current Gain	$I_C = 1\text{mA}$ $V_{CE} = 10\text{V}$ $f = 1\text{kHz}$ $I_C = 10\text{mA}$ $V_{CE} = 10\text{V}$ $f = 1\text{kHz}$	50 75	300 375	—
<b>SWITCHING CHARACTERISTICS</b>					
$t_d$	Delay Time	$V_{CC} = 30\text{V}$ $V_{BE(off)} = 0.5\text{V}$		10	ns
$t_r$	Rise Time	$I_C = 150\text{mA}$ $I_{B1} = 15\text{mA}$		25	ns
$t_s$	Storage Time	$V_{CC} = 30\text{V}$ $I_C = 150\text{mA}$		225	ns
$t_f$	Fall Time	$I_{B1} = I_{B2} = 15\text{mA}$		60	ns

**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.