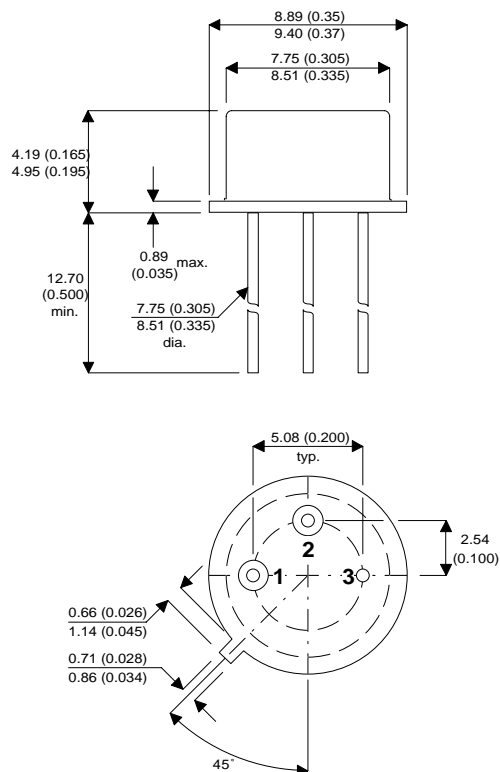


**MECHANICAL DATA**

Dimensions in mm (inches)



**TO39 METAL PACKAGE**

**Underside View**

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

**HIGH SPEED  
MEDIUM POWER  
PNP SWITCHING TRANSISTOR**

**FEATURES**

- SILICON PLANAR EPITAXIAL PNP 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	-60V
$V_{CEO}$	Collector - Emitter Voltage	-60V
$V_{EBO}$	Emitter - Base Voltage	-5V
$I_C$	Collector Current Continuous	600mA
$P_D$	Total Device Dissipation @ $T_A = 25^\circ\text{C}$	600mW
	Derate above $25^\circ\text{C}$	3.43mW / $^\circ\text{C}$
$P_D$	Total Device Dissipation @ $T_C = 25^\circ\text{C}$	3W
	Derate above $25^\circ\text{C}$	17.2mW / $^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-65 to +200 $^\circ\text{C}$

**THERMAL CHARACTERISTICS**

$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	292 $^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	58 $^\circ\text{C}/\text{w}$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>					
$V_{(BR)CEO}^1$	Collector – Emitter Breakdown Voltage	$I_C = -10\text{mA}$ $I_B = 0$	-60		V
$V_{(BR)CBO}$	Collector – Base Breakdown Voltage	$I_C = -10\mu\text{A}$ $I_E = 0$	-60		V
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage	$I_E = -10\mu\text{A}$ $I_C = 0$	-5		V
$I_{CEX}$	Collector Cut-off Current	$V_{CE} = -30\text{V}$ $V_{BE} = -0.5\text{V}$		-50	nA
$I_{CBO}$	Collector Cut-off Current	$I_E = 0$ $V_{CB} = -50\text{V}$ $T_A = 150^\circ\text{C}$		-0.01 -10	$\mu\text{A}$
$I_B$	Base Current	$V_{CE} = -30\text{V}$ $V_{BE} = -0.5\text{V}$		-50	nA
<b>ON CHARACTERISTICS</b>					
$V_{CE(sat)}^1$	Collector – Emitter Saturation Voltage	$I_C = -150\text{mA}$ $I_B = -15\text{mA}$ $I_C = -500\text{mA}$ $I_B = -50\text{mA}$		-0.4 -1.6	V
$V_{BE(sat)}$	Base – Emitter Saturation Voltage	$I_C = -150\text{mA}$ $I_B = -15\text{mA}$ $I_C = -500\text{mA}$ $I_C = -50\text{mA}$		-1.3 -2.6	V
$h_{FE}$	DC Current Gain	$I_C = -0.1\text{mA}$ $V_{CE} = -10\text{V}$ $I_C = -1\text{mA}$ $V_{CE} = -10\text{V}$ $I_C = -10\text{mA}$ $V_{CE} = -10\text{V}$ $I_C = -150\text{mA}$ $V_{CE} = -10\text{V}^1$ $I_C = -500\text{mA}$ $V_{CE} = -10\text{V}^1$	75 100 100 100 50		—   300
<b>SMALL SIGNAL CHARACTERISTICS</b>					
$f_T$	Transition Frequency <sup>2</sup>	$I_C = -50\text{mA}$ $V_{CE} = -20\text{V}$ $f = 100\text{MHz}$	200		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$		8	pF
$C_{ib}$	Input Capacitance	$V_{BE} = -2\text{V}$ $I_C = 0$ $f = 1.0\text{MHz}$		30	pF
<b>SWITCHING CHARACTERISTICS</b>					
$t_{on}$	Turn-On Time	$V_{CC} = -30\text{V}$		26	45
$t_d$	Delay Time	$I_C = -150\text{mA}$		6	10
$t_r$	Rise Time	$I_{B1} = -15\text{mA}$		20	40
$t_{off}$	Turn-Off Time	$V_{CC} = -6\text{V}$		70	100
$t_s$	Storage Time	$I_C = -150\text{mA}$		50	80
$t_f$	Fall Time	$I_{B1} = I_{B2} = -15\text{mA}$		20	30

**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.