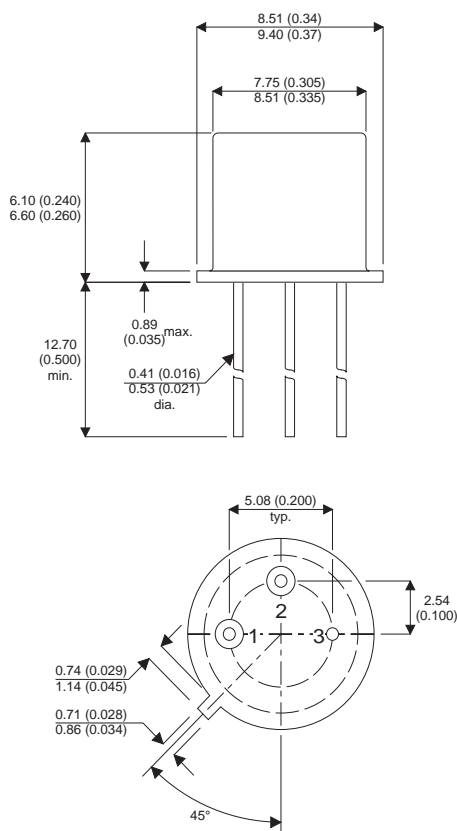




**MECHANICAL DATA**

Dimensions in mm (inches)



**TO-39 (TO-205AD) PACKAGE**  
Underside View

**NPN EPITAXIAL PLANAR BIPOLAR TRANSISTOR**

**FEATURES**

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- CECC SCREENING OPTIONS
- JAN LEVEL SCREENING OPTIONS

**APPLICATIONS:**

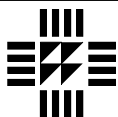
- General Purpose Amplifier
- High Voltage

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

**ABSOLUTE MAXIMUM RATINGS** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )	300V
$V_{CBO}$	Collector – Base Voltage ( $I_E = 0$ )	300V
$V_{EBO}$	Emitter – Base Voltage ( $I_C = 0$ )	7V
$I_C$	Collector Current	150mA
$P_D$	Total Device Dissipation @ $T_A = 25^{\circ}C$	1.0W
	Derate above $25^{\circ}C$	6.67mW / $^{\circ}C$
$P_D$	Total Device Dissipation @ $T_C = 25^{\circ}C$	5.0W
	Derate above $25^{\circ}C$	33.3mW / $^{\circ}C$
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-65 to +200 $^{\circ}C$

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO}^*$ Collector – Emitter Breakdown Voltage	$I_C = 30\text{mA}$ $I_B = 0$	300			V
$V_{(BR)CBO}$ Collector – Base Breakdown Voltage	$I_C = 100\mu\text{A}$ $I_E = 0$	300			
$V_{(BR)EBO}$ Emitter – Base Breakdown Voltage	$I_E = 100\mu\text{A}$ $I_C = 0$	7.0			
$I_{CBO}$ Collector Cut-off Current	$V_{CB} = 100\text{V}$ $I_E = 0$			0.05	$\mu\text{A}$
	$T_A = +125^\circ\text{C}$			20	
$I_{EBO}$ Emitter Cut-off Current	$V_{BE} = 5\text{V}$ $I_C = 0$			10	nA
$V_{CE(sat)}^*$ Collector – Emitter Saturation Voltage	$I_C = 30\text{mA}$ $I_B = 3\text{mA}$			1.0	V
$V_{BE(sat)}^*$ Base – Emitter Saturation Voltage	$I_C = 30\text{mA}$ $I_B = 3\text{mA}$			0.85	
$V_{BE(on)}^*$ Base – Emitter On Voltage	$I_C = 30\text{mA}$ $V_{CE} = 25\text{V}$			0.82	
$h_{FE}^*$ DC Current Gain	$I_C = 5\text{mA}$ $V_{CE} = 25\text{V}$	10			—
	$I_C = 30\text{mA}$ $V_{CE} = 25\text{V}$	35		150	
	$T_A = -55^\circ\text{C}$	10			
	$I_C = 100\text{mA}$ $V_{CE} = 25\text{V}$	35			

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$f_t$ Transistion Frequency <sup>1</sup>	$V_{CE} = 25\text{V}$ $I_C = 10\text{mA}$ $f = 20\text{MHz}$	30		160	MHz
$C_{ob}$ Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 1\text{MHz}$			10	$\text{pF}$
$C_{ib}$ Input Capacitance	$V_{BE} = 0.5\text{V}$ $I_C = 0$ $f = 1\text{MHz}$			75	

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

Parameter	Min.	Typ.	Max.	Unit
$R_{\theta JC}$ Thermal Resistance Junction To Case			30	$^\circ\text{C} / \text{W}$
$R_{\theta JA}$ Thermal Resistance Junction To Ambient			150	

\* Pulse Test:  $t_p \leq 300\text{ms}$ ,  $d \leq 2\%$ .

1)  $f_t$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.