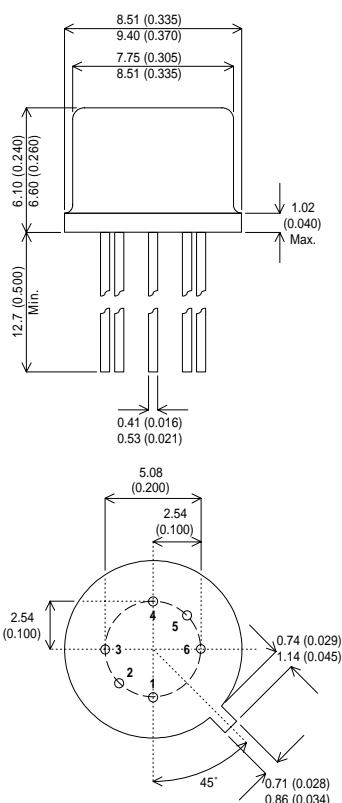


**MECHANICAL DATA**

Dimensions in mm (inches)



**DUAL NPN TRANSISTOR  
IN TO77 HERMETIC PACKAGE**

**FEATURES**

- Silicon Planar Epitaxial NPN Transistor
- High Rel and Screening Options Available.

**TO77 METAL PACKAGE**

- PIN 1 – Collector**                      **PIN 4 – Emitter**  
**PIN 2 – Base**                            **PIN 5 – Base**  
**PIN 3 – Emitter**                        **PIN 6 – Collector**

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

$V_{CEO}$	Collector – Emitter Voltage	60V	
$V_{CER}$	Collector – Emitter Voltage	80V	
$V_{CBO}$	Collector – Base Voltage	100V	
$V_{EBO}$	Emitter – Base Voltage	7V	
$I_C$	Collector Current	500mA	
$T_J, T_{stg}$	Operating and Storage Junction Temperature Range	-65 to +200°C	
		<b>Per Side</b>	<b>Total Device</b>
$P_D$	Total Device Dissipation @ $T_A = 25^{\circ}C$	0.5W	0.6W
	Derate above 25°C	2.86mW/°C	3.43mW/°C
$P_D$	Total Device Dissipation @ $T_C = 25^{\circ}C$	1.6W	3.0W
	Derate above 25°C	9.1mW/°C	11.4mW/°C

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>					
$V_{\text{CER(sus)*}}$ Collector – Emitter Breakdown Voltage	$I_C = 100\text{mA}$ $R_{\text{BE}} \leq 10\Omega$	80			V
$V_{\text{CEO(sus)*}}$ Collector – Emitter Sustaining Voltage	$I_C = 30\text{mA}$ $I_B = 0$	60			V
$V_{(\text{BR})\text{CBO}}$ Collector – Base Breakdown Voltage	$I_C = 100\mu\text{A}$ $I_E = 0$	100			V
$V_{(\text{BR})\text{EBO}}$ Emitter – Base Breakdown Voltage	$I_E = 100\mu\text{A}$ $I_C = 0$	7			V
$I_{\text{CBO}}$ Collector Cut-off Current	$V_{\text{CB}} = 80\text{V}$ $I_E = 0$			0.01	$\mu\text{A}$
				$T_A = 150^\circ\text{C}$	
$I_{\text{EBO}}$ Emitter Cut-off Current	$V_{\text{BE}} = 5\text{V}$ $I_C = 0$			10	nA
<b>ON CHARACTERISTICS</b>					
$h_{\text{FE}}$ DC Current Gain	$I_C = 10\mu\text{A}$ $V_{\text{CE}} = 5\text{V}$	15			—
	$I_C = 100\mu\text{A}$ $V_{\text{CE}} = 5\text{V}$	25		150	
	$I_C = 10\text{mA}$ $V_{\text{CE}} = 5\text{V}$	50		200	
$V_{\text{CE(sat)}}$ Collector – Emitter Saturation Voltage	$I_C = 50\text{mA}$ $I_B = 5\text{mA}$			1.2	V
$V_{\text{BE(sat)}}$ Base – Emitter Saturation Voltage	$I_C = 50\text{mA}$ $I_B = 5\text{mA}$			0.9	
<b>SMALL SIGNAL CHARACTERISTICS</b>					
$f_T$ Current Gain Bandwidth Product	$I_C = 50\text{mA}$ $V_{\text{CE}} = 10\text{V}$ $f = 20\text{MHz}$	50			MHz
$C_{\text{ob}}$ Output Capacitance	$I_E = 0$ $V_{\text{CB}} = 10\text{V}$ $f = 1\text{MHz}$			15	pF
$C_{\text{ib}}$ Input Capacitance	$I_C = 0$ $V_{\text{BE}} = 0.5\text{V}$ $f = 1\text{MHz}$			85	pF
$h_{\text{ib}}$ Input Impedance	$I_C = 1\text{mA}$ $V_{\text{CB}} = 5\text{V}$ $f = 1\text{kHz}$	20		30	$\Omega$
$h_{\text{fe}}$ Small Signal Current Gain	$I_C = 1\text{mA}$ $V_{\text{CE}} = 5\text{V}$ $f = 1\text{kHz}$	40		200	—
$h_{\text{oe}}$ Output Admittance	$f = 1\text{kHz}$			.05	$\mu\text{mhos}$
<b>MATCHING CHARACTERISTICS</b>					
$h_{\text{FE1}}/h_{\text{FE2}}$ DC Current Gain Ratio <sup>1</sup>	$I_C = 100\mu\text{A}$ $V_{\text{CE}} = 5\text{V}$	0.9		1.0	—
$ V_{\text{BE1}} - V_{\text{BE2}} $ Base – Emitter Voltage Differential	$I_C = 100\mu\text{A}$ $V_{\text{CE}} = 5\text{V}$		5.0		mV
$\frac{\Delta(V_{\text{BE1}} - V_{\text{BE2}})}{\Delta T}$ Base – Emitter Voltage Differential Change Due To Temperature	$I_C = 100\mu\text{A}$ $V_{\text{CE}} = 5\text{V}$ $T_A = -55$ to $+125^\circ\text{C}$			25	$\mu\text{V}/^\circ\text{C}$

\* Pulse Test:  $t_p \leq 300\mu\text{s}$ ,  $\delta \leq 2\%$ .

1) The lowest  $h_{\text{FE}}$  reading is taken as  $h_{\text{FE1}}$  for this ratio.