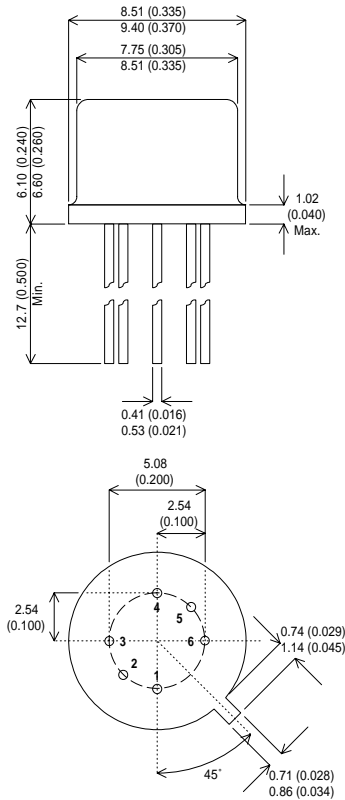


MECHANICAL DATA

Dimensions in mm (inches)



**DUAL NPN
PLANAR TRANSISTORS IN
TO77 PACKAGE**

TO-77 PACKAGE

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

ABSOLUTE MAXIMUM RATINGS

($T_{amb} = 25^{\circ}C$ unless otherwise stated)

			EACH SIDE	TOTAL DEVICE
V_{CBO}	Collector – Base Voltage		60V	
V_{CEO}	Collector – Emitter Voltage ¹		60V	
V_{EBO}	Emitter – Base Voltage		6V	
I_C	Continuous Collector Current		30	
P_D	Total Device Dissipation	$T_{AMB} = 25^{\circ}C$	300mW	500mW
		Derate above $25^{\circ}C$	1.72mW / $^{\circ}C$	2.86W / $^{\circ}C$
P_D	Total Device Dissipation	$T_C = 25^{\circ}C$	750mW	1.5W
		Derate above $25^{\circ}C$	4.3mW / $^{\circ}C$	8.6mW / $^{\circ}C$
T_{STG}	Storage Temperature Range		-65 to $200^{\circ}C$	
T_L	Lead temperature (Soldering, 10 sec.)		300 $^{\circ}C$	

NOTES

1. Base – Emitter Diode Open Circuited.

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

Parameter	Test Conditions ¹	Min.	Typ.	Max.	Unit	
INDIVIDUAL TRANSISTOR CHARACTERISTICS						
$V_{(BR)CBO}$	Collector – Base Breakdown Voltage	$I_C = 10\mu\text{A}$	$I_E = 0$	60	V	
$V_{(BR)CEO}^*$	Collector – Emitter Breakdown Voltage	$I_C = 10\text{mA}$	$I_B = 0$	60		
$V_{(BR)EBO}$	Emitter – Base Breakdown Voltage	$I_E = 10\mu\text{A}$	$I_C = 0$	6		
I_{CBO}	Collector Cut-off Current	$V_{CB} = 45\text{V}$	$I_E = 0$		2	nA
			$T_A = 150^{\circ}\text{C}$			10
I_{CEO}	Collector Cut-off Current	$V_{CE} = 5\text{V}$	$I_B = 0$		2	nA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 5\text{V}$	$I_C = 0$		2	nA
h_{FE}	DC Current Gain	$V_{CE} = 5\text{V}$	$I_C = 10\mu\text{A}$	150	600	—
			$T_A = -55^{\circ}\text{C}$	40		
			$I_C = 100\mu\text{A}$	225		
		$V_{CE} = 5\text{V}$	$I_C = 1\text{mA}$	300		
V_{BE}	Base – Emitter Voltage	$V_{CE} = 5\text{V}$	$I_C = 100\mu\text{A}$		0.70	V
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage	$I_B = 100\mu\text{A}$	$I_C = 1\text{mA}$		0.35	
h_{ib}	Small Signal Common – Base Input Impedance	$V_{CB} = 5\text{V}$	$I_C = 1\text{mA}$	25	32	Ω
		$f = 1\text{kHz}$				
h_{ob}	Small Signal Common – Base Output Admittance	$V_{CB} = 5\text{V}$	$I_C = 1\text{mA}$		1	μmho
		$f = 1\text{kHz}$				
$ h_{fe} $	Small Signal Common – Base Current Gain	$V_{CE} = 5\text{V}$	$I_C = 500\mu\text{A}$	3		—
		$f = 20\text{MHz}$				
C_{obo}	Common – Base Open Circuit Output Capacitance	$V_{CB} = 5\text{V}$	$I_E = 0$		6	pF
		$f = 140\text{kHz to } 1\text{MHz}$				

* Pulse Test: $t_p = 300\mu\text{s}$, $\delta \leq 1\%$.

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
TRANSISTOR MATCHING CHARACTERISTICS						
h_{FE1}	Static Forward Current Gain	$V_{CE} = 5\text{V}$	$I_C = 100\mu\text{A}$	0.9	1	—
h_{FE2}	Balance Ratio	See Note 2.				
$ V_{BE1} - V_{BE2} $	Base – Emitter Voltage Differential	$V_{CE} = 5\text{V}$	$I_C = 100\mu\text{A}$		3	mV
		$V_{CE} = 5\text{V}$	$I_C = 10\mu\text{A to } 1\text{mA}$		5	
$ \Delta(V_{BE1} - V_{BE2})\Delta T_A $	Base – Emitter Voltage Differential Change With Temperature	$V_{CE} = 5\text{V}$	$I_C = 100\mu\text{A}$		0.8	mV
		$T_{A1} = 25^{\circ}\text{C}$	$T_{A2} = -55^{\circ}\text{C}$			
		$V_{CE} = 5\text{V}$	$I_C = 100\mu\text{A}$		1	
		$T_{A1} = 25^{\circ}\text{C}$	$T_{A2} = 125^{\circ}\text{C}$			

NOTES

- 1) Terminals not under test are open circuited under all test conditions.
- 2) The lower of the two readings is taken as h_{FE1} .