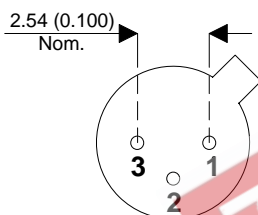
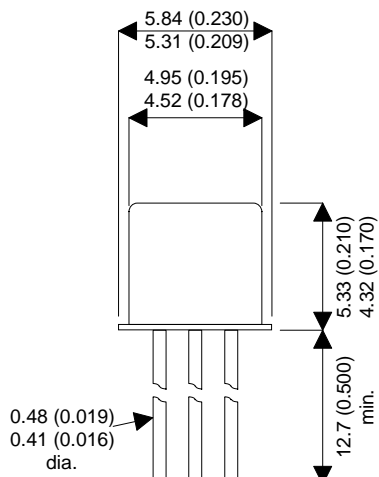


MECHANICAL DATA

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°C	2.28mW / $^\circ\text{C}$
P_D	Total Device Dissipation @ $T_C = 25^\circ\text{C}$	1.2W
	Derate above 25°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	
OFF CHARACTERISTICS						
$V_{(BR)CEO}$	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	μA	
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	
ON CHARACTERISTICS						
$V_{CE(sat)}^1$	Collector – Emitter Saturation Voltage	$I_C = 150\text{mA}$	$I_B = 15\text{mA}$	0.3	V	
		$I_C = 500\text{mA}$	$I_B = 50\text{mA}$	1		
$V_{BE(sat)}^1$	Base – Emitter Saturation Voltage	$I_C = 150\text{mA}$	$I_B = 15\text{mA}$	0.6	V	
		$I_C = 500\text{mA}$	$I_C = 50\text{mA}$	1.2		
				2		
h_{FE}	DC Current Gain	$I_C = 0.1\text{mA}$	$V_{CE} = 10\text{V}$	35	—	
		$I_C = 1\text{mA}$	$V_{CE} = 10\text{V}$	50		
		$I_C = 10\text{mA}$	$V_{CE} = 10\text{V}$	75		
			$T_A = -55^\circ\text{C}$	35		
		$I_C = 150\text{mA}$	$V_{CE} = 10\text{V}^1$	100		
		$I_C = 150\text{mA}$	$V_{CE} = 1\text{V}^1$	50		
		$I_C = 500\text{mA}$	$V_{CE} = 10\text{V}^1$	40		
SMALL SIGNAL CHARACTERISTICS						
f_T	Transition Frequency ²	$I_C = 20\text{mA}$	$V_{CE} = 20\text{V}$	$f = 100\text{MHz}$	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	
h_{fe}	Small Signal Current Gain	$I_C = 1\text{mA}$	$V_{CE} = 10\text{V}$	$f = 1\text{kHz}$	50	—
		$I_C = 10\text{mA}$	$V_{CE} = 10\text{V}$	$f = 1\text{kHz}$	75	
SWITCHING CHARACTERISTICS						
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	
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	

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.