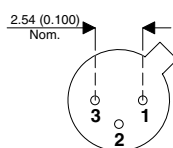
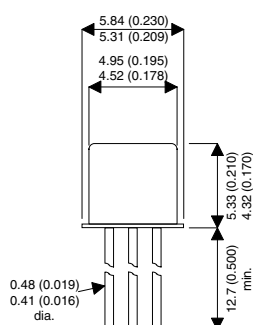


NPN SILICON AMPLIFIER TRANSISTOR

MECHANICAL DATA

Dimensions in mm (inches)



TO18

FEATURES

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR

PIN 1 = Emitter PIN 2 = Base PIN 3 = Collector

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	6V
I_C	Collector Current Continuous	50mA
P_D	Total Device Dissipation @ $T_A = 25^\circ\text{C}$	360mW
	Derate above 25°C	2.06mW / $^\circ\text{C}$
P_D	Total Device Dissipation @ $T_C = 25^\circ\text{C}$	1.2W
	Derate above 25°C	6.85mW / $^\circ\text{C}$
T_{STG}, T_J	Operating and Storage Temperature Range	-65 to +200 $^\circ\text{C}$

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
OFF CHARACTERISTICS							
V _{(BR)CBO} *	Collector – Base Breakdown Voltage	I _C = 10μA	I _B = 0	60			V
V _{(BR)CEO}	Collector – Emitter Breakdown Voltage	I _C = 10mA	I _E = 0	60			
V _{(BR)EBO}	Emitter – Base Breakdown Voltage	I _E = 10μA	I _C = 0	6			
I _{CBO}	Collector Cut-off Current	V _{CB} = 45V	I _E = 0			10	nA
			TA = 150°C			10	μA
I _{EBO}	Emitter Cut-off Current	V _{BE} = 5V	I _C = 0			10	nA
ON CHARACTERISTICS							
V _{CE(sat)}	Collector – Emitter Saturation Voltage	I _C = 1mA	I _B = 0.1mA		0.25	0.35	V
V _{BE(on)}	Base – Emitter On Voltage	I _C = 0.1mA	V _{CE} = 5V	0.5	0.65	0.7	V
h _{FE}	DC Current Gain	I _C = 1μA	V _{CE} = 5V	30	190		—
		I _C = 10μA	V _{CE} = 5V	100	250	500	
			TA = 55°C	20	40		
		I _C = 100μA	V _{CE} = 5V	175	275		
		I _C = 500μA	V _{CE} = 5V	200	300		
		I _C = 1mA	V _{CE} = 5V	250	350		
		I _C = 10mA	V _{CE} = 5V		400	800	
SMALL SIGNAL CHARACTERISTICS							
f _T	Current Gain Bandwidth Product	I _C = 0.05mA f = 5MHz	V _{CE} = 5V	15	50		MHz
		I _C = 0.05mA f = 30MHz	V _{CE} = 5V	60	100		
C _{obo}	Output Capacitance	V _{CB} = 5V	I _E = 0		3	6	pF
C _{ibo}	Input Capacitance	f = 140KHz	I _C = 0.5mA		4	6	
h _{ie}	Input Impedance	I _C = 1.0mA f = 1.0KHz	V _{CE} = 5V	3.5		24	kΩ
h _{re}	Voltage Feedback Ratio					800	x 10 ⁻⁶
h _{fe}	Small Signal Current Gain			150		900	—
h _{oe}	Small Signal Current Gain						40

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
SMALL SIGNAL CHARACTERISTICS					
N_F Noise Figure	$I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$ $R_S = 10\text{K}\Omega$ $f = 100\text{Hz}$ $BW = 20\text{Hz}$		8.0	10	dB
	$I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$ $R_S = 10\text{K}\Omega$ $f = 1.0\text{kHz}$ $BW = 200\text{Hz}$			3.0	
	$I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$ $R_S = 10\text{K}\Omega$ $f = 10\text{kHz}$ $BW = 2.0\text{kHz}$			2.0	
	$I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$ $R_S = 10\text{K}\Omega$ $f = 10\text{Hz to } 15.7\text{kHz}$ $BW = 15.7\text{kHz}$			3.0	

THERMAL CHARACTERISTICS

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$R_{\theta JC}$ Thermal Resistance, Junction to Case				146	$^\circ\text{C/W}$
$R_{\theta JA(1)}$ Thermal Resistance, Junction to Case				485	
T_L Lead Temperature 1/16 from Case for 10 seconds				300	$^\circ\text{C}$

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