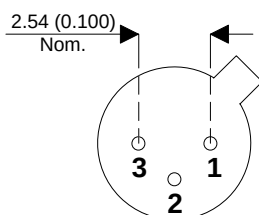
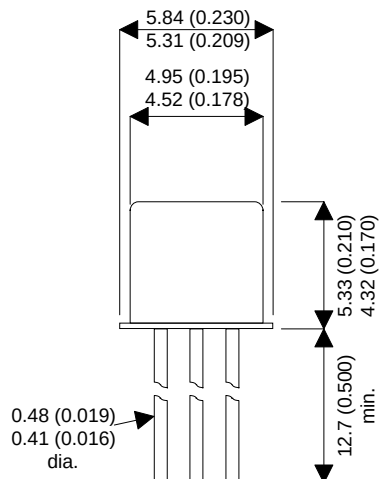


MECHANICAL DATA

Dimensions in mm (inches)



TO-18 METAL PACKAGE

Underside View

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

PNP, LOW NOISE AMPLIFIER TRANSISTOR

FEATURES

- SILICON PLANAR EPITAXIAL PNP TRANSISTOR
- CECC SCREENING OPTIONS
- LOW NOISE AMPLIFIER

APPLICATIONS:

- Low Level Amplifier
- Instrumentation Amplifiers
- General Purpose

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

V_{CBO}	Collector – Base Voltage	–60V
V_{CEO}	Collector – Emitter Voltage ($I_B = 0$)	–60V
V_{EBO}	Emitter – Base Voltage ($I_B = 0$)	–5V
I_C	Collector Current	–50mA
P_D	Total Device Dissipation @ $T_A = 25^{\circ}C$	360mW
	Derate above $25^{\circ}C$	2.06mW / $^{\circ}C$
P_D	Total Device Dissipation @ $T_C = 25^{\circ}C$	1.2W
	Derate above $25^{\circ}C$	6.86mW / $^{\circ}C$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	–65 to +200 $^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	0.49 $^{\circ}C/mW$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.15 $^{\circ}C/mW$

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	$I_C = -10\text{mA}$ $I_B = 0$	-60			V
$V_{(BR)CBO}$ Collector – Base Breakdown Voltage	$I_C = -10\mu\text{A}$ $I_E = 0$	-60			
$V_{(BR)EBO}$ Emitter – Base Breakdown Voltage	$I_E = -10\mu\text{A}$ $I_C = 0$	-5			
I_{CBO} Collector Cut-off Current	$V_{CB} = -50\text{V}$ $I_E = 0$ $T_A = 150^\circ\text{C}$			-0.01 -10	μA
I_{EBO} Emitter Cut-off Current	$V_{EB} = -4\text{V}$ $I_C = 0$			-20	nA
$V_{CE(sat)}$ Collector – Emitter Saturation Voltage	$I_C = -100\mu\text{A}$ $I_B = -10\mu\text{A}$ $I_C = -1\text{mA}$ $I_B = -100\mu\text{A}$			-0.2 -0.25	V
$V_{BE(sat)}$ Base – Emitter Saturation Voltage	$I_C = -100\mu\text{A}$ $I_B = -10\mu\text{A}$ $I_C = -1\text{mA}$ $I_B = -100\mu\text{A}$			-0.7 -0.8	
$V_{BE(on)}$ Base – Emitter On Voltage	$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$			-0.7	V
h_{FE} DC Current Gain ($V_{CE} = -5\text{V}$)	$I_C = -1\mu\text{A}$	75			—
	$I_C = -10\mu\text{A}$	225			
	$I_C = -100\mu\text{A}$	300			
	$I_C = -100\mu\text{A}$ $T_A = -55^\circ\text{C}$	150			
	$I_C = -500\mu\text{A}$	300			
	$I_C = -1\text{mA}$	300			
	$I_C = -10\text{mA}^*$	250			

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

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_t Current Gain Bandwidth Product ¹	$V_{CE} = -5\text{V}$ $I_C = -500\mu\text{A}$ $f = 20\text{MHz}$	30			MHz
	$V_{CE} = -5\text{V}$ $I_C = -1\text{mA}$ $f = 100\text{MHz}$	100		500	
C_{ob} Output Capacitance	$V_{CB} = -5\text{V}$ $I_E = 0$ $f = 1\text{MHz}$			4	pF
C_{ib} Input Capacitance	$V_{EB} = -0.5\text{V}$ $I_C = 0$ $f = 1\text{MHz}$			8	
h_{ie} Input Impedance	$V_{CE} = -10\text{V}$ $I_C = -1\text{mA}$ $f = 1\text{kHz}$	10		40	k Ω
h_{oe} Output Admittance		5		60	μhmos
h_{re} Voltage Feedback Ratio				25	$\times 10^{-4}$
h_{fe} Small Signal Current Gain		300		900	—
N_F Noise Figure	$V_{CE} = -10\text{V}$ $I_C = -100\mu\text{A}$ $R_G = 3\text{k}\Omega$	$f = 100\text{Hz}$ B.W. = 20Hz	2.5	4	dB
		Spot: $f = 1\text{kHz}$ B.W. = 200Hz	0.8	1.5	
		Noise: $f = 10\text{kHz}$ B.W. = 2kHz	1.8	1.5	
		$f = 1\text{kHz}$	1.5	2.5	

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