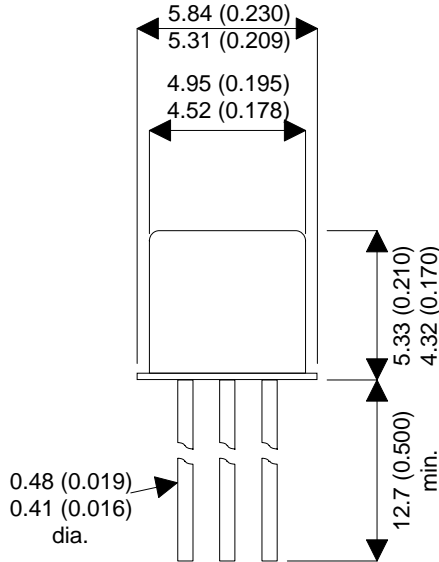


**MECHANICAL DATA**

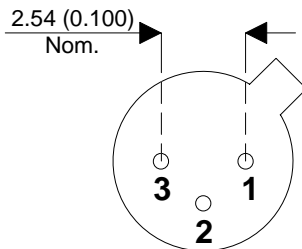
Dimensions in mm (inches)



**GENERAL PURPOSE,  
SMALL SIGNAL, NPN TRANSISTOR**

**FEATURES**

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- CECC SCREENING OPTIONS
- SPACE QUALITY LEVELS OPTIONS
- JAN LEVEL SCREENING OPTIONS



**TO-18 (TO-206AA)**

**Underside View**

Pin 1 – Emitter    PAD 2 – Base    PAD 3 – Collector

**APPLICATIONS:**

Intended for use in audio input stages, driver stages and low noise input applications. The

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

$V_{CEO}$	Collector - Emitter Voltage ( $I_B = 0$ )	45V
$V_{BEO}$	Emitter - Base Voltage ( $I_C = 0$ )	7V
$I_C$	Collector Current	200mA
$P_{TOT}$	Total Power Dissipation @ $T_{amb} \leq 25^{\circ}C$ @ $T_c \leq 45^{\circ}C$	390mW 1W
$T_J, T_{STG}$	Maximum Junction And Storage Temperature	-55°C to 175°C
$R_{\theta JC}$	Thermal Resistance Junction to Case	150°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	385°C/W

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO}^*$ Collector-Emitter Breakdown Voltage	$I_B=0$ $I_C=2mA$	45			V
$V_{(BR)EBO}$ Emitter-Base Breakdown Voltage	$I_C=0$ $I_E=10\mu A$	7			V
$I_{CES}$ Collector Cut-off Current	$V_{CE}=45V$ $V_{BE}=0V$ $T_C=150^{\circ}C$		0.1	10	nA
			0.1	10	$\mu A$
$I_{CEX}$ Collector Cut-off Current ( $T_C=100^{\circ}C$ )	$V_{CE}=45V$ $V_{BE}= -0.2V$			20	$\mu A$
$I_{EBO}$ Emitter Cut-off Current	$I_C=0$ $V_{EB}=5V$			10	nA
$V_{BE(sat)}^*$ Base-Emitter Saturation Voltage	$I_C=10mA$ $I_B=0.25mA$	600	700	850	mV
	$I_C=100mA$ $I_B=2.5mA$	750	900	1200	
$V_{CE(sat)}^*$ Base-Emitter Saturation Voltage	$I_C=10mA$ $I_B=0.25mA$		120	350	mV
	$I_C=100mA$ $I_B=2.5mA$		400	700	
$h_{FE}$ DC Current Gain (BCY59A)	$I_C=2mA$ $V_{CE}=5V$	120		220	—
	$I_C=10mA$ $V_{CE}=1V$	80			
	$I_C=100mA$ $V_{CE}=1V$	40			
DC Current Gain (BCY59B)	$I_C=10\mu A$ $V_{CE}=5V$	20			—
	$I_C=2mA$ $V_{CE}=5V$	180		310	
	$I_C=10mA$ $V_{CE}=1V$	120		400	
	$I_C=100mA$ $V_{CE}=1V$	45			
DC Current Gain (BCY59C)	$I_C=10\mu A$ $V_{CE}=5V$	40			—
	$I_C=2mA$ $V_{CE}=5V$	250		460	
	$I_C=10mA$ $V_{CE}=1V$	160		630	
	$I_C=100mA$ $V_{CE}=1V$	60			
$f_T$ Transition Frequency ( $f=100MHz$ )	$I_C=10mA$ $V_{CE}=5V$		200		MHz
$C_{CBO}$ Collector-Base Capacitance ( $f=1MHz$ )	$I_E=0$ $V_{CB}=10V$		3.5	6	pF
$C_{EBO}$ Emitter-Base Capacitance ( $f=1MHz$ )	$I_C=0$ $V_{EB}=0.5V$		11	15	
NF Noise Figure	$I_C=200\mu A$ $V_{CE}=5V$ $R_S=2K\Omega$ $f=1kHz$		2	6	dB
$t_{on}$ Turn-on Time ( $V_{CC}=10V$ )	$I_C=10mA$ $I_{B1}=1mA$		85	150	ns
	$I_C=100mA$ $I_{B1}=10mA$		55	150	
$t_{off}$ Turn-off Time ( $V_{CC}=10V$ )	$I_C=10mA, I_{B1}= I_{B2}=1mA$		480	800	ns
	$I_C=100mA, I_{B1}= I_{B2}=10mA$		480	800	

\* Pulsed: Pulse Duration = 300 $\mu s$ , duty cycle = 1.5%