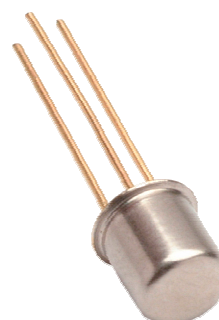


SILICON PNP TRANSISTOR

2N3963

- General Purpose PNP Silicon Transistor
- Low Power Amplifier Applications
- Hermetic TO18 Package
- Screening Options Available



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

V_{CBO}	Collector – Base Voltage	-80V
V_{CEO}	Collector – Emitter Voltage	-80V
V_{EBO}	Emitter – Base Voltage	-6V
I_C	Continuous Collector Current	-200mA
P_D	Total Power Dissipation at $T_A = 25^\circ\text{C}$	0.36W
	Derate Above 25°C	2.06mW/ $^\circ\text{C}$
	$T_C = 25^\circ\text{C}$	1.2W
	Derate Above 25°C	6.86mW/ $^\circ\text{C}$
T_J	Junction Temperature Range	-65 to +200 $^\circ\text{C}$
T_{stg}	Storage Temperature Range	-65 to +200 $^\circ\text{C}$

THERMAL PROPERTIES

Symbols	Parameters	Min.	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance, Junction To Ambient			486	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction To Case			146	$^\circ\text{C/W}$

Semelab Limited 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.

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

Symbols	Parameters	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\mu\text{A}$	-80			V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = -5\text{mA}$	-80			V
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	$I_C = -10\mu\text{A}$	-80			V
$V_{(BR)EBO}$	Emitter - Base Breakdown Voltage	$I_E = -10\mu\text{A}$	-6			V
I_{CBO}	Collector Cut-Off Current	$V_{CB} = -70\text{V}$			-10	nA
I_{CES}	Collector Cut-Off Current	$V_{CE} = -70\text{V}$			-10	
I_{EBO}	Emitter Cut-Off Current	$V_{EB} = -4\text{V}$			-10	
h_{FE}	DC Current Gain	$I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$	100		300	
		-55°C	40			
		$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$	100			
		$I_C = -1.0\text{mA}$ $V_{CE} = -5\text{V}$	100		450	
		100°C			600	
		$I_C = -50\text{mA}^{(1)}$ $V_{CE} = -5\text{V}$	90			
$V_{CE(sat)}^{(1)}$	Collector-Emitter Saturation Voltage	$I_C = -10\text{mA}$ $I_B = -0.5\text{mA}$			-0.25	V
		$I_C = -50\text{mA}$ $I_B = -5.0\text{mA}$			-0.4	
$V_{BE(sat)}^{(1)}$	Base-Emitter Saturation Voltage	$I_C = -10\text{mA}$ $I_B = -0.5\text{mA}$			-0.9	
		$I_C = -50\text{mA}$ $I_B = -5.0\text{mA}$			-0.95	

DYNAMIC CHARACTERISTICS

h_{fe}	Small-Signal Current Gain	$I_C = 1.0\text{mA}$ $V_{CE} = -5.0\text{V}$ $f = 1.0\text{KHz}$	100		550	
$ h_{fe} $	Magnitude of Forward Current Transfer Ratio, Common-Emitter	$I_C = -0.5\text{mA}$ $V_{CE} = -5.0\text{V}$ $f = 20\text{MHz}$	2.0		8.0	
C_{obo}	Output Capacitance	$V_{CB} = -5.0\text{V}$ $f = 1.0\text{MHz}$			6	pF
C_{ibo}	Input Capacitance	$V_{EB} = -0.5\text{V}$ $f = 1.0\text{MHz}$			15	pF

Notes

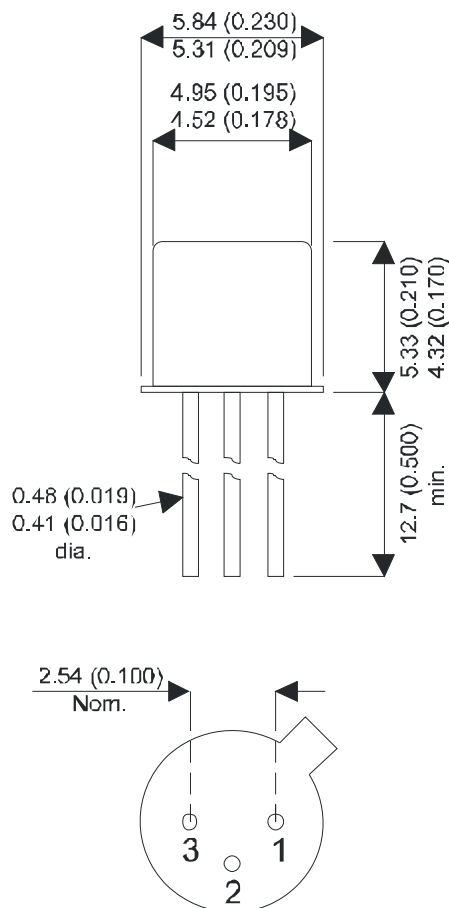
(1) Pulse Width $\leq 300\mu\text{s}$, $\delta \leq 2\%$

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MECHANICAL DATA

Dimensions in mm (inches)



TO18 (TO-206AA) METAL PACKAGE

Underside View

PIN 1 - Emitter

PIN 2 - Base

PIN 3 - Collector