

2N3963
2N3964

SILICON
PNP TRANSISTORS



TO-18 CASE



www.centrasemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N3963 and 2N3964 are silicon PNP transistors designed for general purpose applications.

MARKING: FULL PART NUMBER

MAXIMUM RATINGS: ($T_A=25^\circ\text{C}$)

Collector-Base Voltage
Collector-Emitter Voltage
Emitter-Base Voltage
Continuous Collector Current
Power Dissipation ($T_C=25^\circ\text{C}$)
Power Dissipation
Operating and Storage Junction Temperature
Thermal Resistance
Thermal Resistance

SYMBOL	2N3963	2N3964	UNITS
V_{CB0}	80	45	V
V_{CEO}	80	45	V
V_{EBO}		6.0	V
I_C	200		mA
P_D	1.2		W
P_D		360	mW
T_J, T_{stg}	-65 to +200		$^\circ\text{C}$
θ_{JC}	146		$^\circ\text{C/W}$
θ_{JA}	486		$^\circ\text{C/W}$

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

SYMBOL	TEST CONDITIONS	2N3963		2N3964		UNITS
		MIN	MAX	MIN	MAX	
I_{CB0}	$V_{CB}=70\text{V}$	-	10	-	-	nA
I_{CB0}	$V_{CB}=40\text{V}$	-	-	-	10	nA
I_{CES}	$V_{CE}=70\text{V}$	-	10	-	-	nA
I_{CES}	$V_{CE}=40\text{V}$	-	-	-	10	nA
I_{EBO}	$V_{EB}=4.0\text{V}$	-	10	-	10	nA
BV_{CB0}	$I_C=10\mu\text{A}$	80	-	45	-	V
BV_{CES}	$I_C=10\mu\text{A}$	80	-	45	-	V
BV_{CEO}	$I_C=5.0\text{mA}$	80	-	45	-	V
BV_{EBO}	$I_E=10\mu\text{A}$	6.0	-	6.0	-	V
$V_{CE(SAT)}$	$I_C=10\text{mA}, I_B=0.5\text{mA}$	-	0.25	-	0.25	V
$V_{CE(SAT)}$	$I_C=50\text{mA}, I_B=5.0\text{mA}$	-	0.40	-	0.40	V
$V_{BE(SAT)}$	$I_C=10\text{mA}, I_B=0.5\text{mA}$	-	0.90	-	0.90	V
$V_{BE(SAT)}$	$I_C=50\text{mA}, I_B=5.0\text{mA}$	-	0.95	-	0.95	V
h_{FE}	$V_{CE}=5.0\text{V}, I_C=1.0\mu\text{A}$	60	-	180	-	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$	100	300	250	500	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, T_A=-55^\circ\text{C}$	40	-	100	-	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$	100	-	250	-	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$	100	450	250	600	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, T_A=100^\circ\text{C}$	-	600	-	800	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=10\text{mA}$	100	-	200	-	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=50\text{mA}$	90	-	180	-	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=50\text{mA}, T_A=-55^\circ\text{C}$	45	-	90	-	

R0 (17-May 2013)

**2N3963
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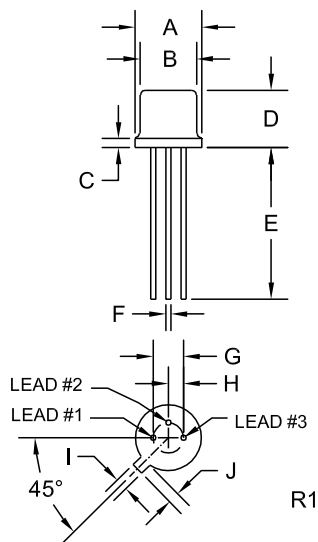
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ELECTRICAL CHARACTERISTICS - Continued: ($T_A=25^\circ\text{C}$ unless otherwise noted)

SYMBOL	TEST CONDITIONS	2N3963		2N3964		UNITS
		MIN	MAX	MIN	MAX	
f_T	$V_{CE}=5.0\text{V}$, $I_C=0.5\text{mA}$, $f=20\text{MHz}$	40	-	50	-	MHz
C_{ob}	$V_{CB}=5.0\text{V}$, $I_E=0$, $f=1.0\text{MHz}$	-	6.0	-	6.0	pF
C_{ib}	$V_{EB}=0.5\text{V}$, $I_C=0$, $f=1.0\text{MHz}$	-	15	-	15	pF
h_{ie}	$V_{CE}=5.0\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$	2.5	17	6.0	20	$k\Omega$
h_{re}	$V_{CE}=5.0\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$	-	10	-	10	10^{-4}
h_{fe}	$V_{CE}=5.0\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$	100	550	250	700	
h_{oe}	$V_{CE}=5.0\text{V}$, $I_C=1.0\text{mA}$, $f=1.0\text{kHz}$	5.0	40	5.0	50	μS
NF	$V_{CE}=5.0\text{V}$, $I_C=20\text{mA}$, $BW=15.7\text{kHz}$	-	3.0	-	2.0	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=20\mu\text{A}$, $BW=1.5\text{kHz}$ $f=10\text{kHz}$, $R_S=10k\Omega$	-	3.0	-	2.0	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=20\mu\text{A}$, $BW=150\text{Hz}$ $f=1.0\text{kHz}$, $R_S=10k\Omega$	-	3.0	-	2.0	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=20\mu\text{A}$, $BW=15\text{Hz}$ $f=100\text{Hz}$, $R_S=10k\Omega$	-	10	-	4.0	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=20\mu\text{A}$, $BW=2.0\text{Hz}$ $f=10\text{Hz}$, $R_S=10k\Omega$	-	-	-	8.0	dB

TO-18 CASE - MECHANICAL OUTLINE



SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.209	0.230	5.31	5.84
B (DIA)	0.178	0.195	4.52	4.95
C	-	0.030	-	0.76
D	0.170	0.210	4.32	5.33
E	0.500	-	12.70	-
F (DIA)	0.016	0.019	0.41	0.48
G (DIA)	0.100		2.54	
H	0.050		1.27	
I	0.036	0.046	0.91	1.17
J	0.028	0.048	0.71	1.22

TO-18 (REV: R1)

LEAD CODE:

- 1) Emitter
- 2) Base
- 3) Collector

MARKING:

FULL PART NUMBER

R0 (17-May 2013)