

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		$^\circ\text{C}$
$\theta_{JC}$	146		$^\circ\text{C}/\text{W}$
$\theta_{JA}$	486		$^\circ\text{C}/\text{W}$

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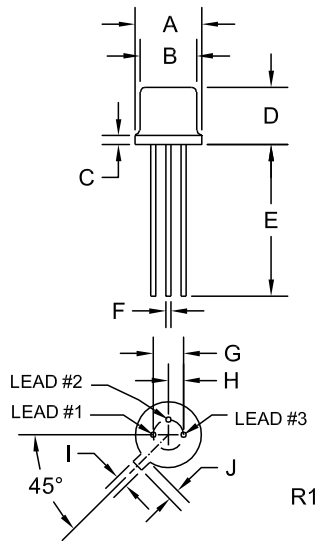
**SILICON  
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**ELECTRICAL CHARACTERISTICS - Continued:** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

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	$\mu\text{S}$
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)

## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix " TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix " PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

#### Corporate Headquarters & Customer Support Team

Central Semiconductor Corp.  
145 Adams Avenue  
Hauppauge, NY 11788 USA  
Main Tel: (631) 435-1110  
Main Fax: (631) 435-1824  
Support Team Fax: (631) 435-3388  
[www.centrasemi.com](http://www.centrasemi.com)

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