

2N4104

NPN SILICON TRANSISTOR



TO-18 CASE



www.centrasemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N4104 type is an NPN silicon transistor designed for Low-Noise amplifier 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
Operating and Storage Junction Temperature

SYMBOL

V_{CB0}

V_{CEO}

V_{EBO}

I_C

P_D

T_J, T_{stg}

60

60

7.5

50

300

-65 to +200

UNITS

V

V

V

mA

mW

$^{\circ}\text{C}$

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

SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
I_{CBO}	$V_{CB}=45\text{V}, I_E=0$		10	nA
I_{CBO}	$V_{CB}=45\text{V}, I_E=0, T_A=150^{\circ}\text{C}$		10	μA
I_{EBO}	$V_{EB}=5.0\text{V}, I_C=0$		10	nA
BV_{CBO}	$I_C=10\mu\text{A}, I_E=0$	60		V
BV_{CEO}	$I_C=10\text{mA}, I_B=0$	60		V
BV_{EBO}	$I_E=10\mu\text{A}, I_C=0$	7.5		V
$V_{CE(SAT)}$	$I_C=1.0\text{mA}, I_B=100\mu\text{A}$		0.3	V
$V_{BE(ON)}$	$V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$		0.7	V
h_{FE}	$V_{CE}=5.0\text{V}, I_C=1.0\mu\text{A}$	150		
h_{FE}	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$	400	800	
h_{FE}	$V_{CE}=5.0\text{V}, I_C=100\mu\text{A}$	450		
h_{FE}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$	500		
h_{ie}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, f=1\text{kHz}$	12	42	k Ω
h_{fe}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, f=1\text{kHz}$	500	1400	
h_{re}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, f=1\text{kHz}$		8×10^{-4}	
h_{oe}	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, f=1\text{kHz}$	8.0	60	umhos
f_T	$V_{CE}=5.0\text{V}, I_C=0.5\text{mA}, f=30\text{MHz}$	90	540	MHz
C_{ob}	$V_{CB}=5.0\text{V}, I_E=0, f=1.0\text{MHz}$		4.5	pF
C_{ib}	$V_{EB}=0.5\text{V}, I_C=0, f=1.0\text{MHz}$		6.0	pF

2N4104

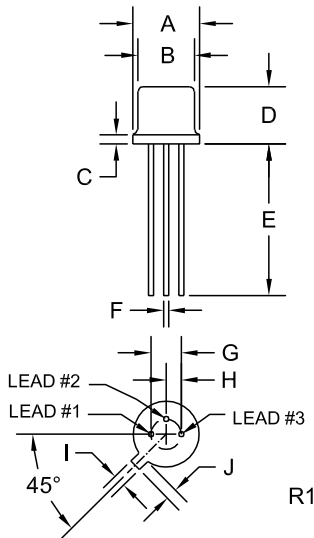
NPN SILICON TRANSISTOR



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

SYMBOL	TEST CONDITIONS	MIN	MAX	UNITS
NF	$V_{CE}=5.0\text{V}$, $I_C=30\mu\text{A}$, $f=10\text{Hz}$, $R_G=10\text{k}\Omega$		15	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=30\mu\text{A}$, $f=100\text{Hz}$, $R_G=10\text{k}\Omega$		4.0	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=5\mu\text{A}$, $f=1\text{kHz}$, $R_G=50\text{k}\Omega$		1.0	dB
NF	$V_{CE}=5.0\text{V}$, $I_C=5\mu\text{A}$, $f=10\text{kHz}$, $R_G=50\text{k}\Omega$		1.0	dB

TO-18 CASE - MECHANICAL OUTLINE



DIMENSIONS				
SYMBOL	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

OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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

DESIGNER SUPPORT/SERVICES

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

- Free quick ship samples (2nd 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

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).

CONTACT US

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