

2N3903
2N3904

**SILICON
NPN TRANSISTORS**



TO-92 CASE



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DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N3903 and 2N3904 devices are silicon NPN transistors designed for general purpose amplifier and switching applications. PNP complementary types are 2N3905 and 2N3906.

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
Thermal Resistance

SYMBOL

V_{CBO} 60
 V_{CEO} 40
 V_{EBO} 6.0
 I_C 200
 P_D 625
 T_J, T_{stg} -65 to +150
 Θ_{JA} 200

UNITS

V
V
V
mA
mW
 $^{\circ}\text{C}$
 $^{\circ}\text{C/W}$

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

SYMBOL TEST CONDITIONS

I_{CEV} $V_{CE}=30\text{V}, V_{EB}=3.0\text{V}$
 BV_{CBO} $I_C=10\mu\text{A}$
 BV_{CEO} $I_C=1.0\text{mA}$
 BV_{EBO} $I_E=10\mu\text{A}$
 $V_{CE(SAT)}$ $I_C=10\text{mA}, I_B=1.0\text{mA}$
 $V_{CE(SAT)}$ $I_C=50\text{mA}, I_B=5.0\text{mA}$
 $V_{BE(SAT)}$ $I_C=10\text{mA}, I_B=1.0\text{mA}$
 $V_{BE(SAT)}$ $I_C=50\text{mA}, I_B=5.0\text{mA}$
 h_{FE} $V_{CE}=1.0\text{V}, I_C=0.1\text{mA}$
 h_{FE} $V_{CE}=1.0\text{V}, I_C=1.0\text{mA}$
 h_{FE} $V_{CE}=1.0\text{V}, I_C=10\text{mA}$
 h_{FE} $V_{CE}=1.0\text{V}, I_C=50\text{mA}$
 h_{FE} $V_{CE}=1.0\text{V}, I_C=100\text{mA}$
 h_{fe} $V_{CE}=10\text{V}, I_C=1.0\text{mA}, f=1.0\text{kHz}$
 f_T $V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$
 C_{ob} $V_{CB}=5.0\text{V}, I_E=0, f=100\text{kHz}$
 C_{ib} $V_{EB}=0.5\text{V}, I_C=0, f=100\text{kHz}$
 NF $V_{CE}=5.0\text{V}, I_C=100\mu\text{A}, R_S=1.0\text{k}\Omega$
 $f=10\text{Hz to } 15.7\text{kHz}$
 t_{on} $V_{CC}=3.0\text{V}, V_{BE(OFF)}=0.5\text{V}, I_C=10\text{mA}$
 $I_{B1}=1.0\text{mA}$
 t_{off} $V_{CC}=3.0\text{V}, I_C=10\text{mA}, I_{B1}=I_{B2}=1.0\text{mA}$

2N3903

MIN MAX

- 50
60 -
40 -
6.0 -
- 0.2
- 0.3
0.65 0.85
- 0.95
20 -
35 -
50 200
30 -
15 -
50 200
250 -
- 4.0
- 8.0
- 6.0
- 70
- 225

2N3904

MIN MAX

- 50
60 -
40 -
6.0 -
- 0.2
- 0.3
0.65 0.85
- 0.95
40 -
70 -
100 300
60 -
30 -
100 400
300 -
- 4.0
- 8.0
- 5.0
- 70
- 250

UNITS

nA
V
V
V
V
V
V
V
V
V
V
MHz
pF
pF
dB
ns
ns

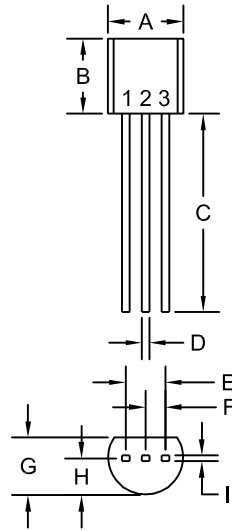
R3 (7-May 2021)

2N3903
2N3904

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TO-92 CASE - MECHANICAL OUTLINE



R1

SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.175	0.205	4.45	5.21
B	0.170	0.210	4.32	5.33
C	0.500	-	12.70	-
D	0.016	0.022	0.41	0.56
E	0.100		2.54	
F	0.050		1.27	
G	0.125	0.165	3.18	4.19
H	0.080	0.105	2.03	2.67
I	0.015		0.38	

TO-92 (REV: R1)

LEAD CODE:

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

MARKING:
FULL PART NUMBER

R3 (7-May 2021)

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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).

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