

2N4400
2N4401

SILICON
NPN TRANSISTORS



TO-92 CASE



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DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N4400 and 2N4401 are silicon NPN transistors designed for general purpose amplifier and switching applications. PNP complementary types are 2N4402 and 2N4403.

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		UNITS
V_{CBO}	60	V
V_{CEO}	40	V
V_{EBO}	6.0	V
I_C	600	mA
P_D	625	mW
T_J, T_{stg}	-65 to +150	$^\circ\text{C}$

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

SYMBOL	TEST CONDITIONS	2N4400		2N4401		UNITS
		MIN	MAX	MIN	MAX	
I_{CEV}	$V_{CE}=35\text{V}, V_{EB}=0.4\text{V}$	-	100	-	100	nA
BV_{CBO}	$I_C=0.1\text{mA}$	60	-	60	-	V
BV_{CEO}	$I_C=1.0\text{mA}$	40	-	40	-	V
BV_{EBO}	$I_E=0.1\text{mA}$	6.0	-	6.0	-	V
$V_{CE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$	-	0.40	-	0.40	V
$V_{CE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$	-	0.75	-	0.75	V
$V_{BE(SAT)}$	$I_C=150\text{mA}, I_B=15\text{mA}$	0.75	0.95	0.75	0.95	V
$V_{BE(SAT)}$	$I_C=500\text{mA}, I_B=50\text{mA}$	-	1.2	-	1.2	V
h_{FE}	$V_{CE}=1.0\text{V}, I_C=0.1\text{mA}$	-	-	20	-	
h_{FE}	$V_{CE}=1.0\text{V}, I_C=1.0\text{mA}$	20	-	40	-	
h_{FE}	$V_{CE}=1.0\text{V}, I_C=10\text{mA}$	40	-	80	-	
h_{FE}	$V_{CE}=1.0\text{V}, I_C=150\text{mA}$	50	150	100	300	
h_{FE}	$V_{CE}=2.0\text{V}, I_C=500\text{mA}$	20	-	40	-	
h_{fe}	$V_{CE}=10\text{V}, I_C=1.0\text{mA}, f=1.0\text{kHz}$	20	250	40	500	
f_T	$V_{CE}=10\text{V}, I_C=20\text{mA}, f=100\text{MHz}$	200	-	250	-	MHz
C_{ob}	$V_{CB}=5.0\text{V}, I_E=0, f=100\text{kHz}$	-	6.5	-	6.5	pF
C_{ib}	$V_{BE}=0.5\text{V}, I_C=0, f=100\text{kHz}$	-	30	-	30	pF
t_{on}	$V_{CC}=30\text{V}, V_{EB(OFF)}=2.0\text{V}, I_C=150\text{mA}, I_{B1}=15\text{mA}$	-	35	-	35	ns
t_{off}	$V_{CC}=30\text{V}, I_C=150\text{mA}, I_{B1}=I_{B2}=15\text{mA}$	-	255	-	255	ns

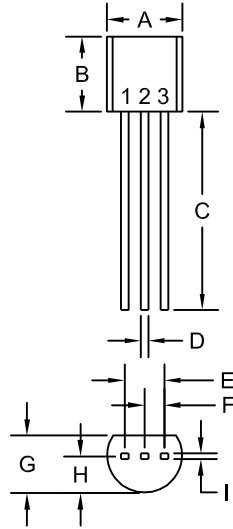
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TO-92 CASE - MECHANICAL OUTLINE



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

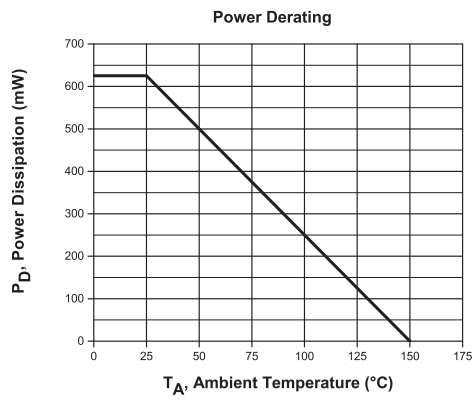
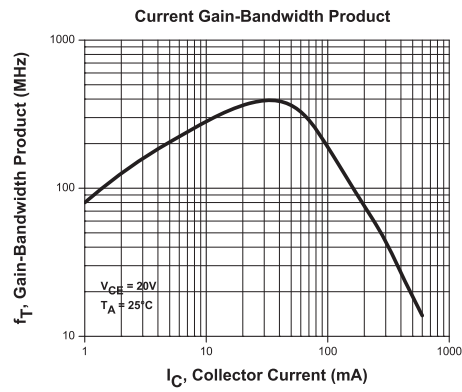
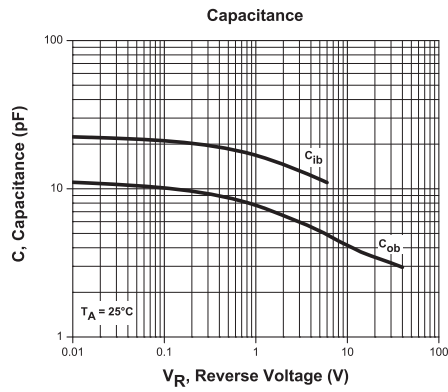
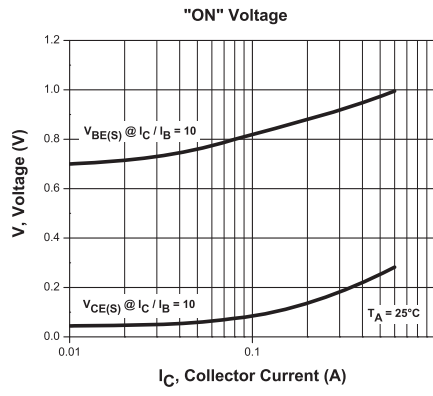
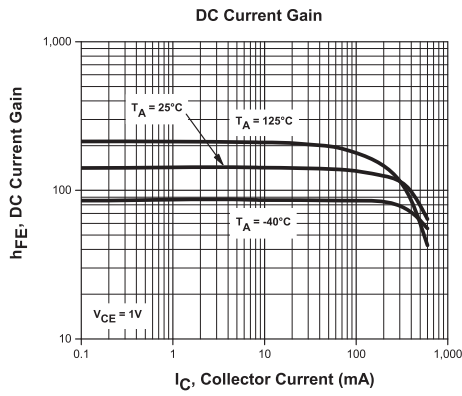
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TYPICAL ELECTRICAL CHARACTERISTICS



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