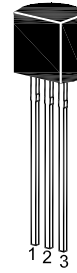


# 2N4400 / 2N4401

## NPN Silicon Epitaxial Planar Transistor

### Features

- On special request, these transistors can be manufactured in different pin configurations.
- Low Collector Emitter Saturation Voltage



1. Emitter 2. Base 3. Collector  
TO-92 Plastic Package

### Applications

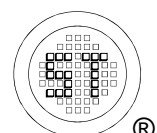
- Switching and AF Amplifier

### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	60	V
Collector Emitter Voltage	$V_{CEO}$	40	V
Emitter Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	600	mA
Power Dissipation	$P_{tot}$	625	mW
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 55 to + 150	$^\circ\text{C}$

### Thermal Characteristics

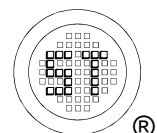
Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	200	$^\circ\text{C/W}$



# 2N4400 / 2N4401

## Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain				
at $V_{CE} = 1\text{ V}$ , $I_C = 0.1\text{ mA}$	2N4401 $h_{FE}$	20	-	-
at $V_{CE} = 1\text{ V}$ , $I_C = 1\text{ mA}$	2N4400 $h_{FE}$	20	-	-
	2N4401 $h_{FE}$	40	-	-
at $V_{CE} = 1\text{ V}$ , $I_C = 10\text{ mA}$	2N4400 $h_{FE}$	40	-	-
	2N4401 $h_{FE}$	58	-	-
at $V_{CE} = 1\text{ V}$ , $I_C = 150\text{ mA}$	2N4400 $h_{FE}$	50	150	-
	2N4401 $h_{FE}$	100	300	-
at $V_{CE} = 2\text{ V}$ , $I_C = 500\text{ mA}$	2N4400 $h_{FE}$	20	-	-
	2N4401 $h_{FE}$	40	-	-
Collector Base Cutoff Current at $V_{CB} = 35\text{ V}$	$I_{CBO}$	-	100	nA
Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$	$I_{EBO}$	-	100	nA
Collector Base Breakdown Voltage at $I_C = 100\text{ }\mu\text{A}$	$V_{(BR)CBO}$	60	-	V
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at $I_E = 100\text{ }\mu\text{A}$	$V_{(BR)EBO}$	6	-	V
Collector Emitter Saturation Voltage at $I_C = 150\text{ mA}$ , $I_B = 15\text{ mA}$ at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{CE(sat)}$	- -	0.4 0.75	V
Base Emitter Saturation Voltage at $I_C = 150\text{ mA}$ , $I_B = 15\text{ mA}$ at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{BE(sat)}$	0.75 -	0.95 1.2	V
Gain Bandwidth Product at $V_{CE} = 10\text{ V}$ , $I_C = 20\text{ mA}$ , $f = 100\text{ MHz}$	$f_T$	200	-	MHz
Collector Output Capacitance at $V_{CB} = 5\text{ V}$ , $f = 100\text{ MHz}$	$C_{ob}$	-	12	pF
Turn On Time at $V_{CC} = 30\text{ V}$ , $V_{BE} = 2\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = 15\text{ mA}$	$t_{on}$	-	35	ns
Turn Off Time at $V_{CC} = 30\text{ V}$ , $I_C = 150\text{ mA}$ , $I_{B1} = I_{B2} = 15\text{ mA}$	$t_{off}$	-	255	ns



# 2N4400 / 2N4401

## Electrical Characteristics Curves

Fig. 1 Power Derating Curve

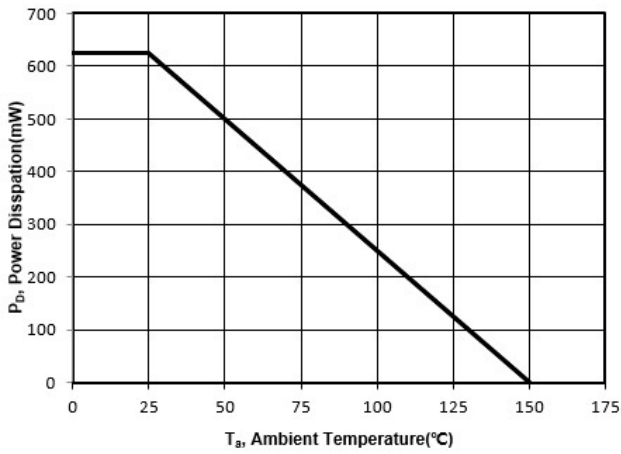


Fig. 2 Output Characteristics Curve

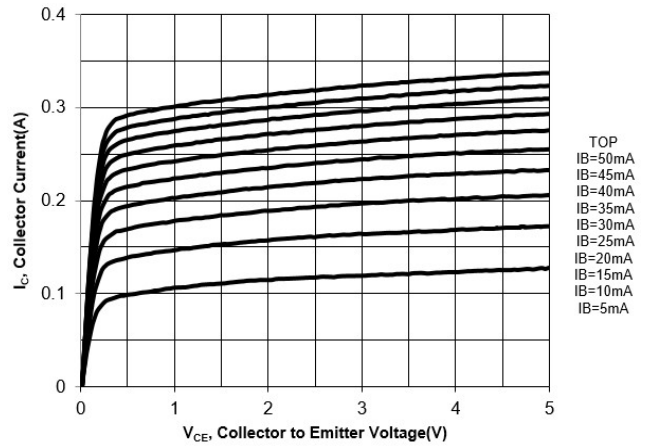


Fig. 3  $h_{FE,DC}$  Current Gain vs. Collector Current

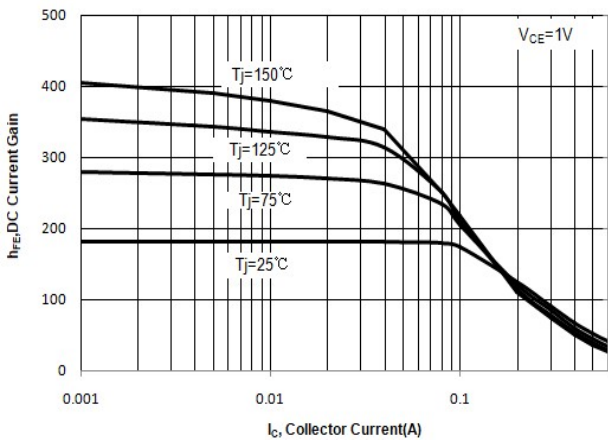


Fig. 4  $V_{BE(SAT)}$  vs. Collector Current

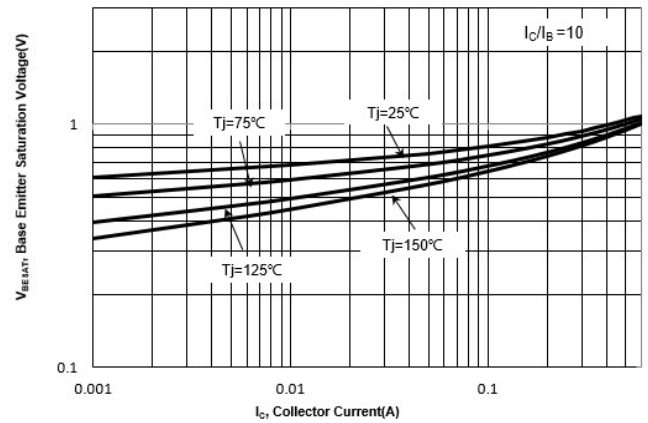


Fig. 5  $V_{CE(SAT)}$  vs. Collector Current

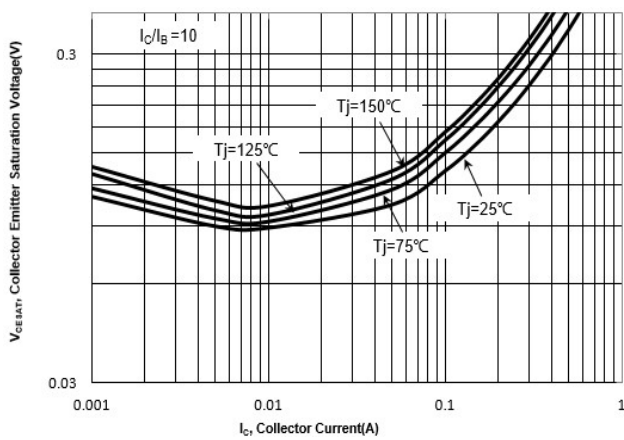
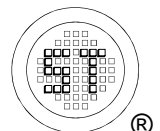
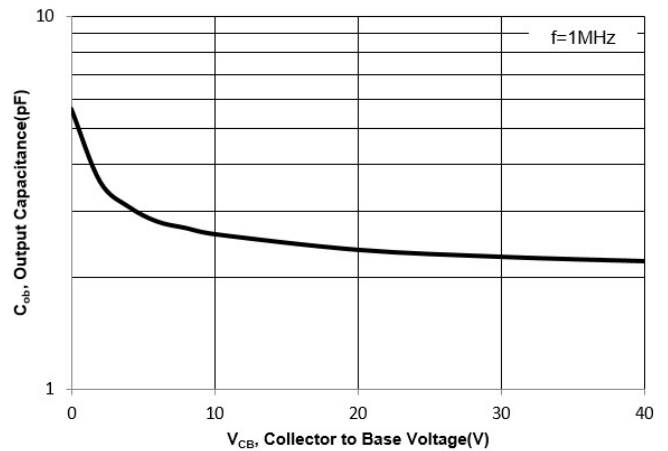
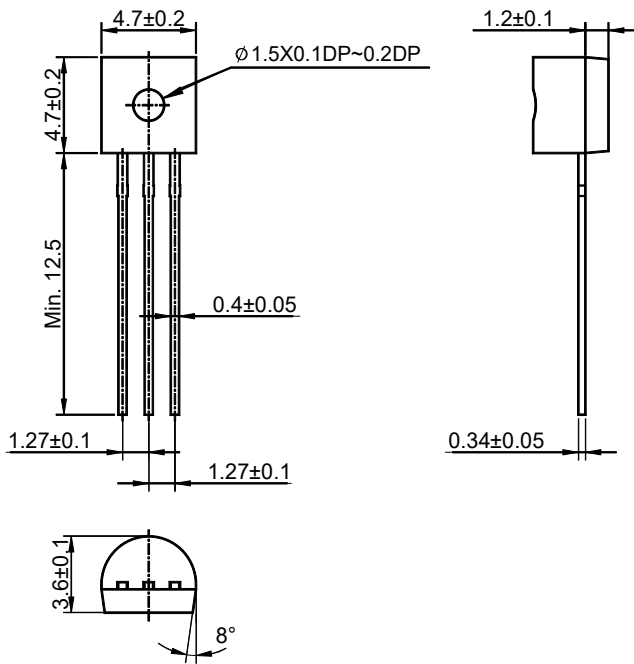


Fig. 6 Output Capacitance

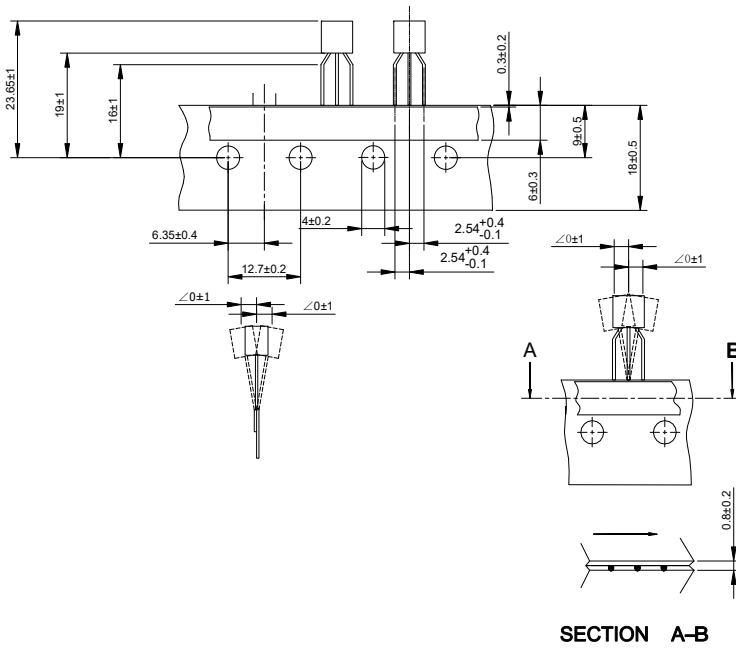


# 2N4400 / 2N4401

## TO-92 Package Outline (Dimensions in millimeters)



## TO-92 Ammo-Pack Outline (Dimensions in millimeters)



### Packing information

Package	Bulk Packing			Ammo-Packing	
	Per Bag Qty	Per Box Qty	Per Carton Qty	Per Box Qty	Per Carton Qty
TO-92	1,000	5,000	50,000	4,000	20,000

