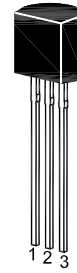


# 2N4400 / 2N4401

## NPN Epitaxial Silicon Transistor

General purpose transistor

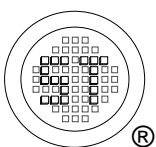
On special request, these transistors can be manufactured in different pin configurations.



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

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



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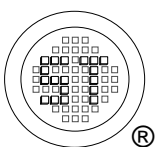


Dated : 12/08/2016 Rev: 01

# 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 $V_{CE} = 10\text{ V}$ , $I_C = 20\text{ mA}$ , $f = 100\text{ MHz}$	2N4400 2N4401	$f_T$	200 250	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



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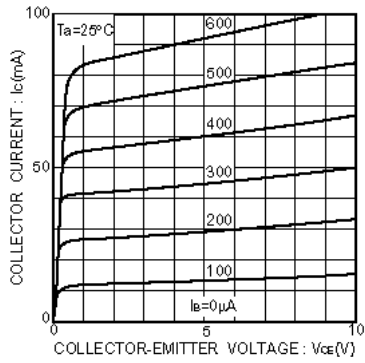


Fig.1 Grounded emitter output characteristics

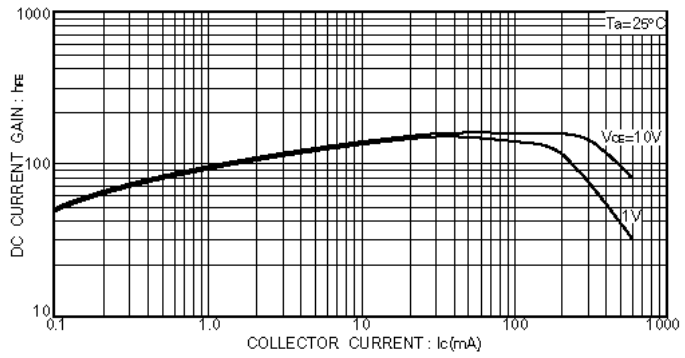


Fig.3 DC current gain vs. collector current(I)

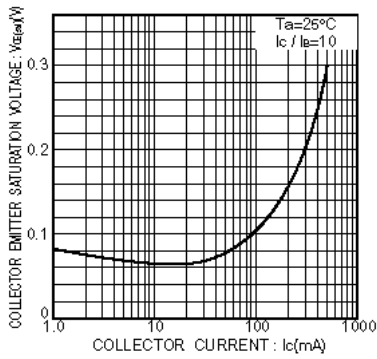


Fig.2 Collector-emitter saturation voltage vs. collector current

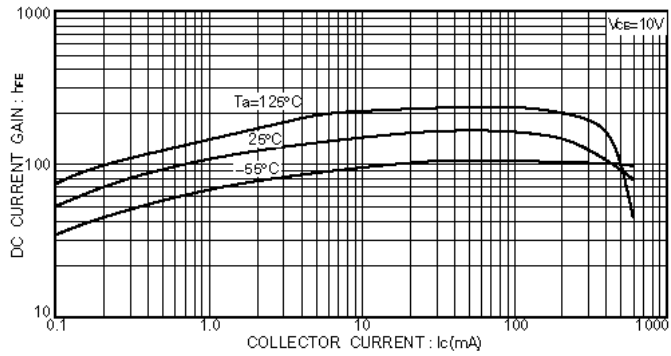


Fig.4 DC current gain vs. collector current(II)

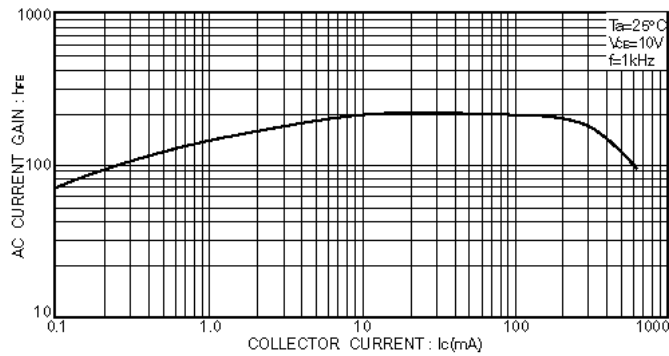


Fig.5 AC current gain vs. collector current

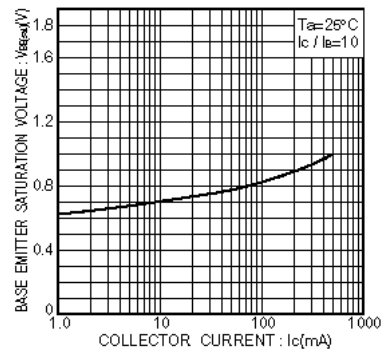
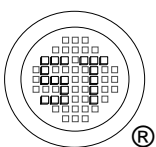


Fig.6 Base-emitter saturation voltage vs. collector current



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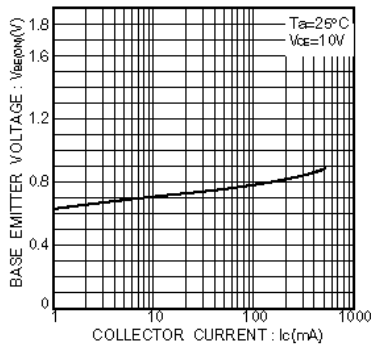


Fig. 7 Grounded emitter propagation characteristics

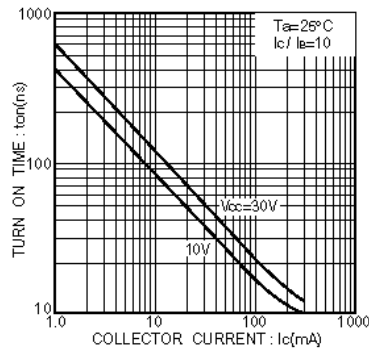


Fig. 8 Turn-on time vs. collector current

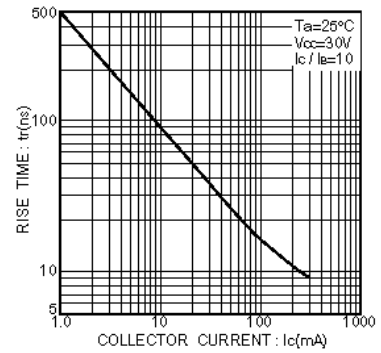


Fig. 9 Rise time vs. collector current

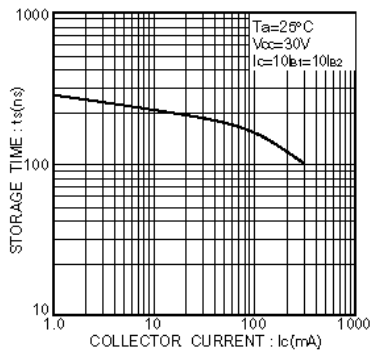


Fig. 10 Storage time vs. collector current

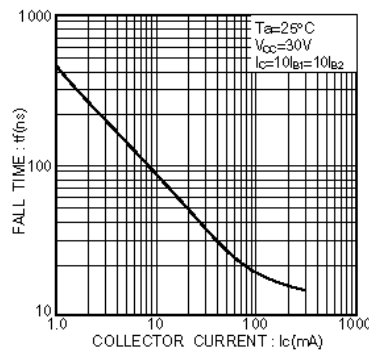


Fig. 11 Fall time vs. collector current

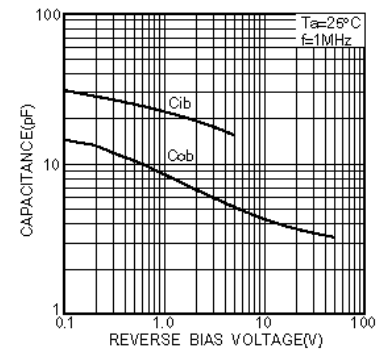


Fig. 12 Input / output capacitance vs. voltage

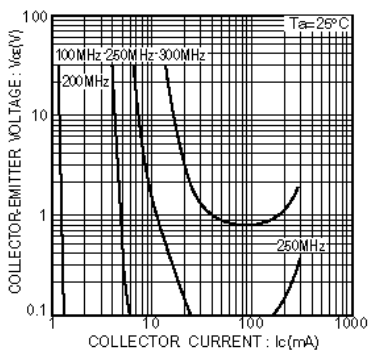


Fig. 13 Gain bandwidth product

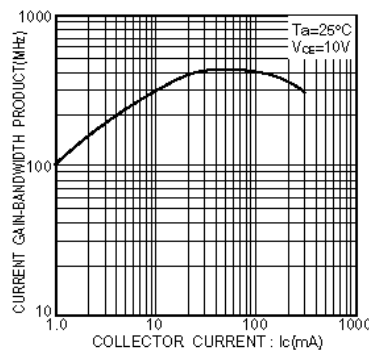
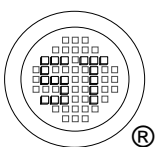


Fig. 14 Gain bandwidth product vs. collector current



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