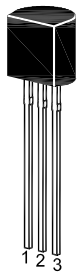
2N4400 / 2N4401

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 °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	°C
Storage Temperature Range	T_{stg}	- 55 to + 150	°C

Characteristics at T_a = 25 °C

Parameter		Symbol	Min.	Max.	Unit
DC Current Gain					
at V_{CE} = 1 V, I_C = 0.1 mA	2N4401	h_{FE}	20	-	-
at V_{CE} = 1 V, I_C = 1 mA	2N4400	h_{FE}	20	-	-
	2N4401	h_{FE}	40	-	-
at V_{CE} = 1 V, I_C = 10 mA	2N4400	h_{FE}	40	-	-
	2N4401	h_{FE}	58	-	-
at V_{CE} = 1 V, I_C = 150 mA	2N4400	h_{FE}	50	150	-
	2N4401	h_{FE}	100	300	-
at V_{CE} = 2 V, I_C = 500 mA	2N4400	h_{FE}	20	-	-
	2N4401	h_{FE}	40	-	-
Collector Base Cutoff Current at V_{CB} = 35 V		I_{CBO}	-	100	nA
Emitter Base Cutoff Current at V_{EB} = 5 V		I_{EBO}	-	100	nA
Collector Base Breakdown Voltage at I_C = 100 µA		$V_{(BR)CBO}$	60	-	V
Collector Emitter Breakdown Voltage at I_C = 1 mA		$V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at I_E = 100 µA		$V_{(BR)EBO}$	6	-	V
Collector Emitter Saturation Voltage at I_C = 150 mA, I_B = 15 mA at I_C = 500 mA, I_B = 50 mA		$V_{CE(sat)}$	- -	0.4 0.75	V
Base Emitter Saturation Voltage at I_C = 150 mA, I_B = 15 mA at I_C = 500 mA, I_B = 50 mA		$V_{BE(sat)}$	0.75 -	0.95 1.2	V
Gain Bandwidth Product at V_{CE} = 10 V, I_C = 20 mA, f = 100 MHz	2N4400 2N4401	f_T	200 250	- -	MHz
Collector Output Capacitance at V_{CB} = 5 V, f = 100 MHz		C_{ob}	-	12	pF
Turn On Time at V_{CC} = 30 V, V_{BE} = 2 V, I_C = 150 mA, I_{B1} = 15 mA		t_{on}	-	35	ns
Turn Off Time at V_{CC} = 30 V, I_C = 150 mA, I_{B1} = I_{B2} =15 mA		t_{off}	-	255	ns

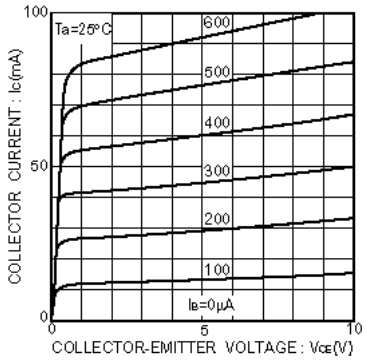


Fig.1 Grounded emitter output characteristics

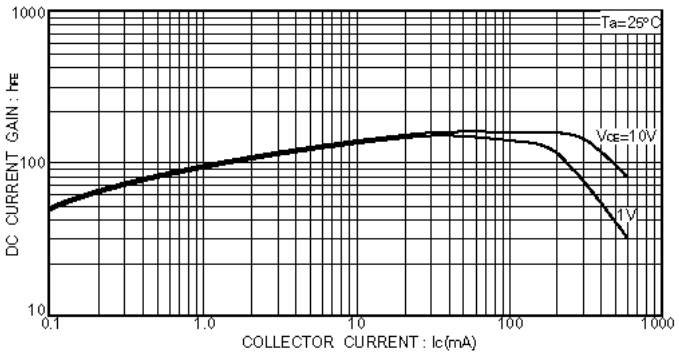


Fig.3 DC current gain vs. collector current(I)

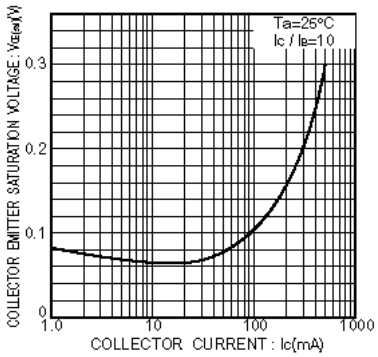


Fig.2 Collector-emitter saturation voltage vs. collector current

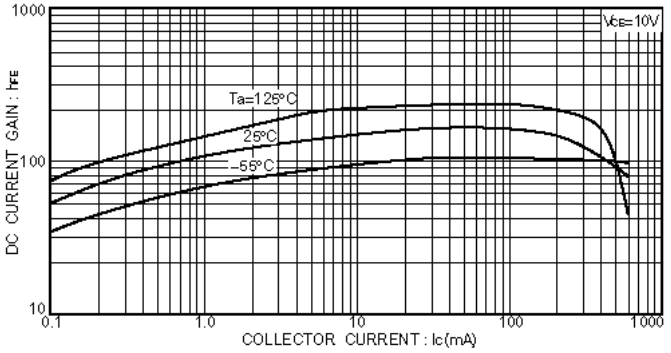


Fig.4 DC current gain vs. collector current(II)

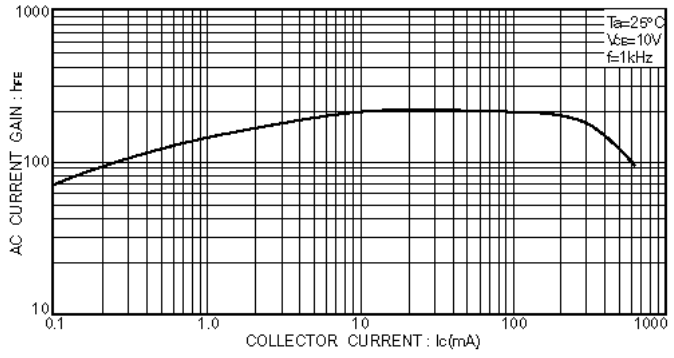


Fig.5 AC current gain vs. collector current

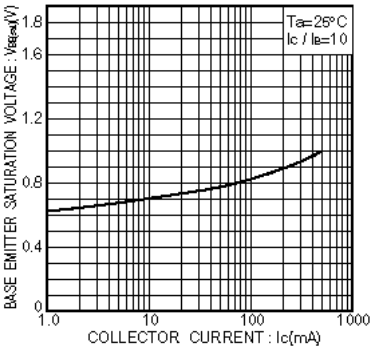


Fig.6 Base-emitter saturation voltage vs. collector current

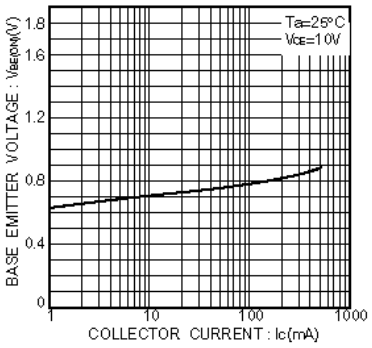


Fig.7 Grounded emitter propagation characteristics

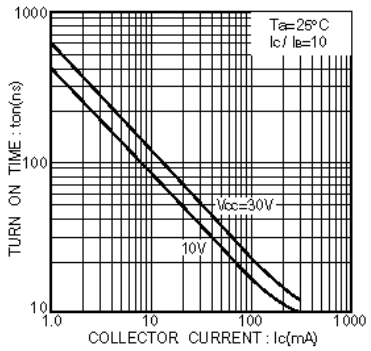


Fig.8 Turn-on time vs. collector current

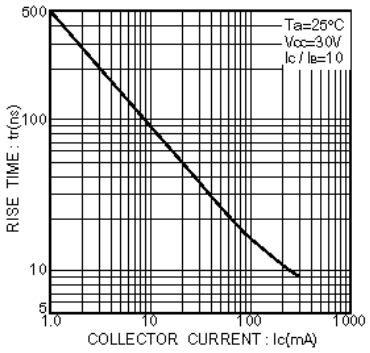


Fig.9 Rise time vs. collector current

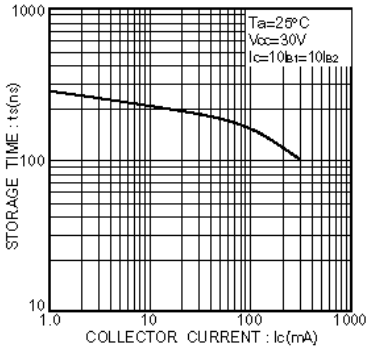


Fig.10 Storage time vs. collector current

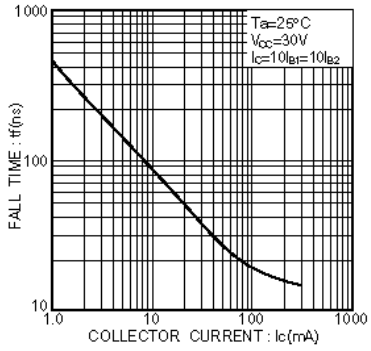


Fig.11 Fall time vs. collector current

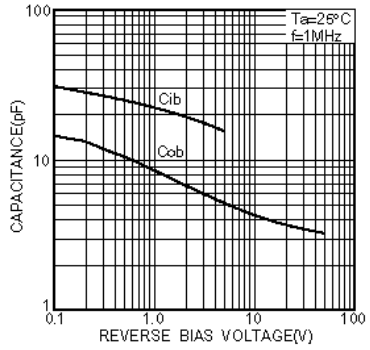


Fig.12 Input / output capacitance vs. voltage

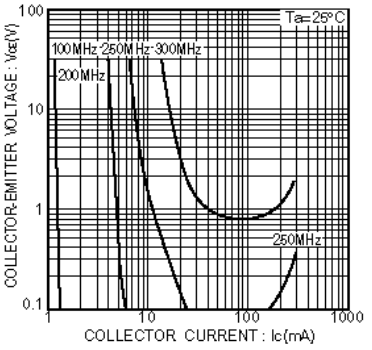


Fig.13 Gain bandwidth product

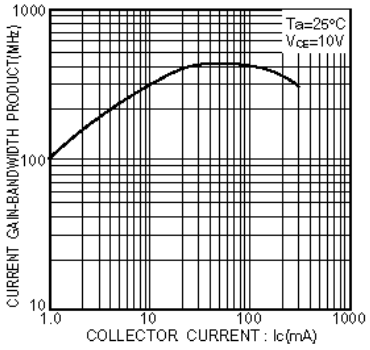


Fig.14 Gain bandwidth product vs. collector current