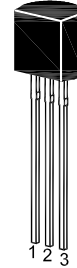


2N4400 / 2N4401

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	$^\circ\text{C}$

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	- -
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

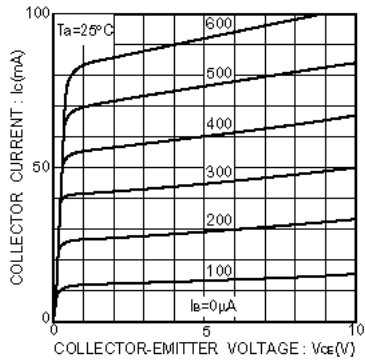


Fig.1 Grounded emitter output characteristics

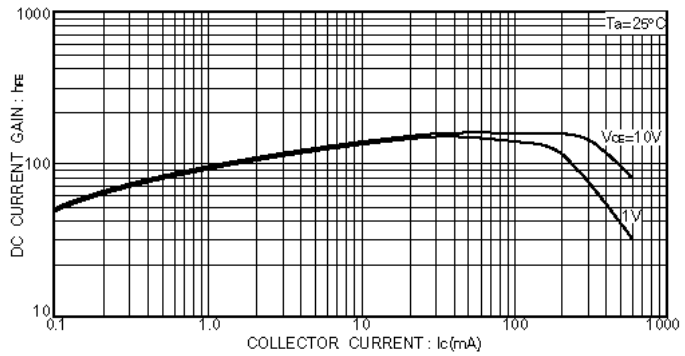


Fig.3 DC current gain vs. collector current(I)

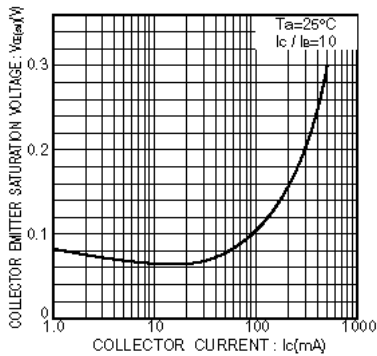


Fig.2 Collector-emitter saturation voltage vs. collector current

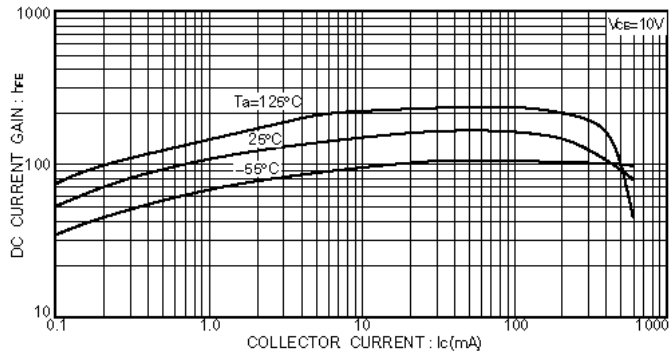


Fig.4 DC current gain vs. collector current(II)

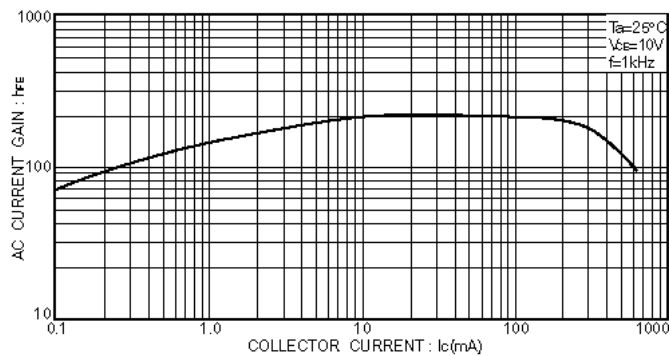


Fig.5 AC current gain vs. collector current

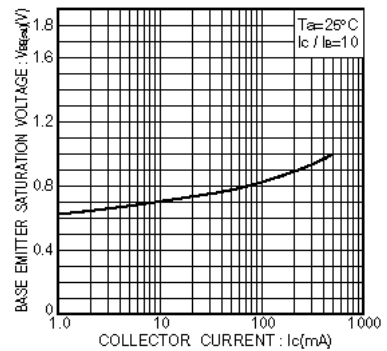


Fig.6 Base-emitter saturation voltage vs. collector current

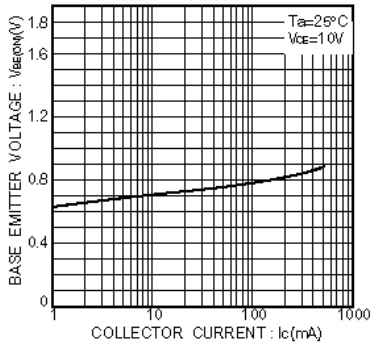


Fig. 7 Grounded emitter propagation characteristics

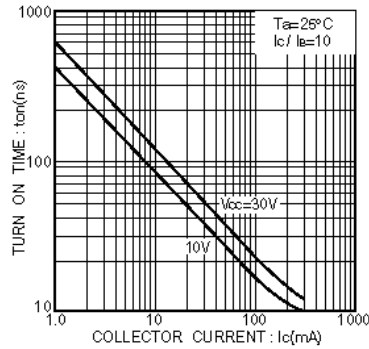


Fig. 8 Turn-on time vs. collector current

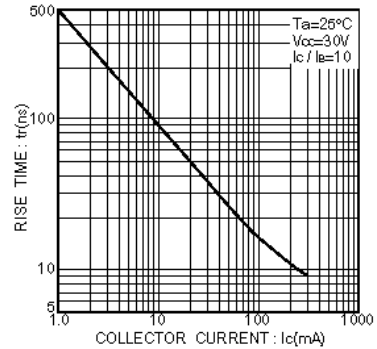


Fig. 9 Rise time vs. collector current

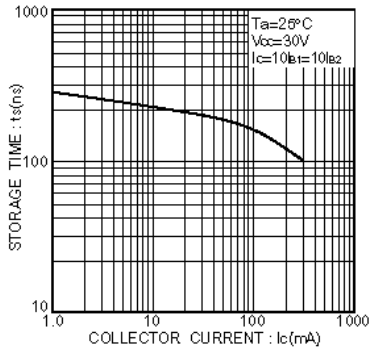


Fig. 10 Storage time vs. collector current

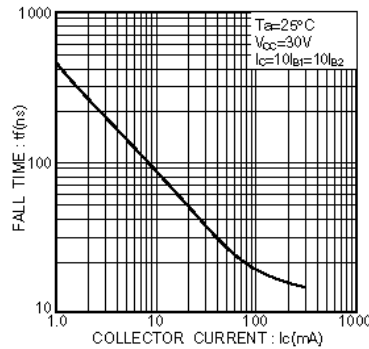


Fig. 11 Fall time vs. collector current

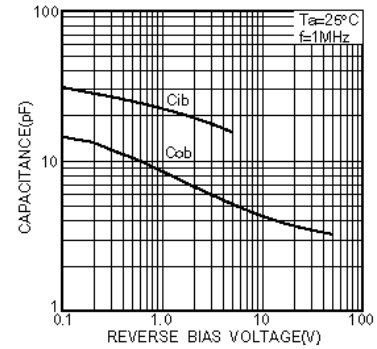


Fig. 12 Input / output capacitance vs. voltage

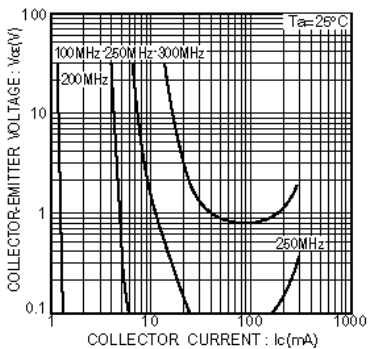


Fig. 13 Gain bandwidth product

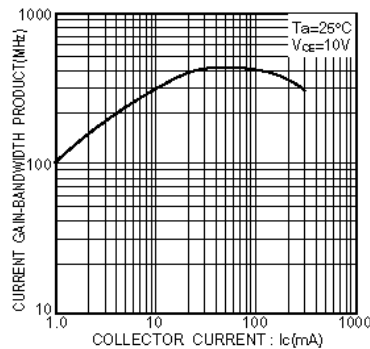


Fig. 14 Gain bandwidth product vs. collector current