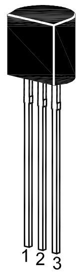
2N4402 / 2N4403

PNP 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℃)

Parameter	Symbol	Value	Unit
Collector Base Voltage	$-V_{CBO}$	40	V
Collector Emitter Voltage	$-V_{CEO}$	40	V
Emitter Base Voltage	$-V_{EBO}$	5	V
Collector Current	$-I_C$	600	mA
Power Dissipation	P_{tot}	625	mW
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	- 55 to + 150	℃

Characteristics at T_a = 25℃

Parameter		Symbol	Min.	Max.	Unit
DC Current Gain					
at $-V_{CE}$ = 1 V, $-I_C$ = 0.1 mA	2N4403	h_{FE}	30	-	-
at $-V_{CE}$ = 1 V, $-I_C$ = 1 mA	2N4402	h_{FE}	30	-	-
	2N4403	h_{FE}	60	-	-
at $-V_{CE}$ = 1 V, $-I_C$ = 10 mA	2N4402	h_{FE}	50	-	-
	2N4403	h_{FE}	100	-	-
at $-V_{CE}$ = 1 V, $-I_C$ = 150 mA	2N4402	h_{FE}	50	150	-
	2N4403	h_{FE}	100	300	-
at $-V_{CE}$ = 2 V, $-I_C$ = 500 mA		h_{FE}	20	-	-
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		$-V_{(BR)CBO}$	40	-	V
Collector Emitter Breakdown Voltage at $-I_C$ = 1 mA		$-V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at $-I_E$ = 100 µA		$-V_{(BR)EBO}$	5	-	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 1.3	V
Gain Bandwidth Product at $-V_{CE}$ = 10 V, $-I_C$ = 20 mA, f = 100 MHz	2N4402 2N4403	f_T	150 200	- -	MHz
Collector Output Capacitance at $-V_{CB}$ = 10 V, f = 140 MHz		C_{ob}	-	8.5	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

TRANSIENT CHARACTERISTICS

25°C 100°C

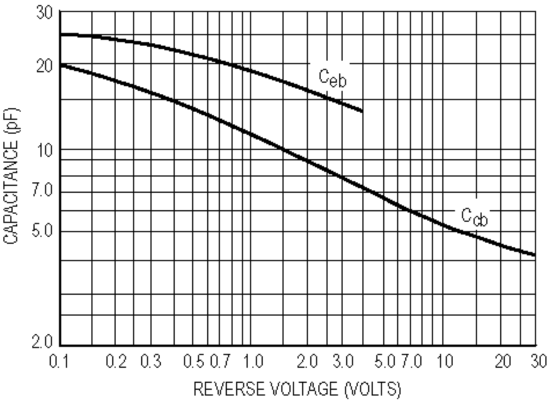


Figure 1. Capacitances

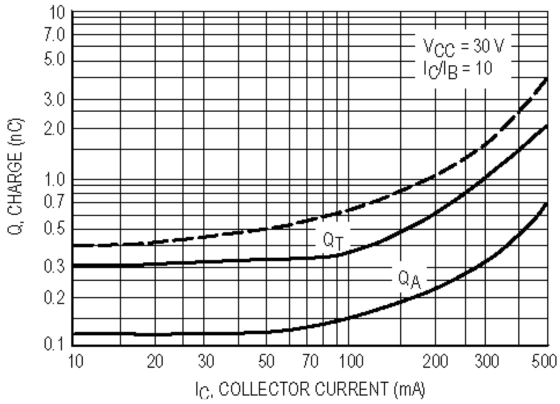


Figure 2. Charge Data

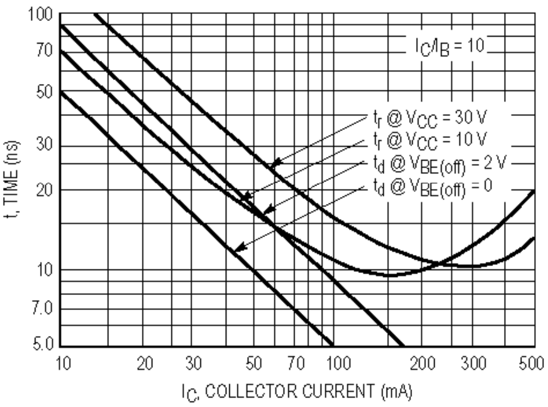


Figure 3. Turn–On Time

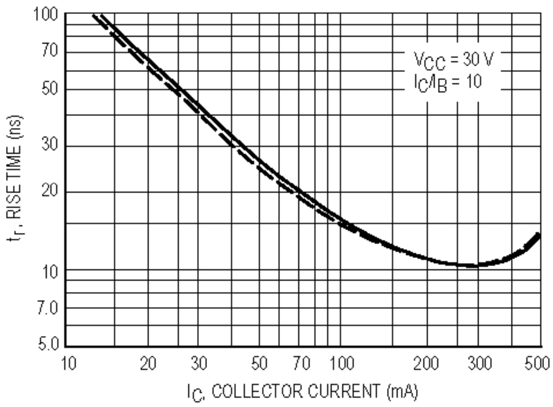


Figure 4. Rise Time

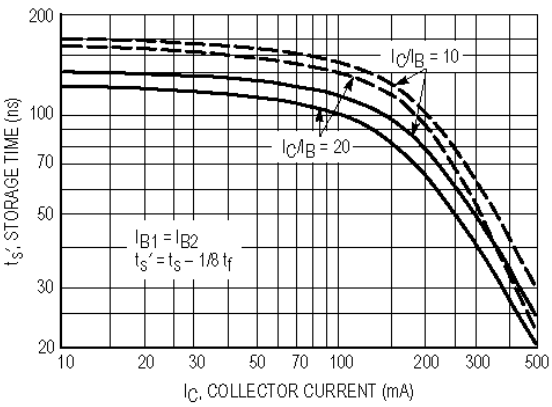


Figure 5. Storage Time

SMALL–SIGNAL CHARACTERISTICS

NOISE FIGURE

V_{CE} = –10 Vdc, T_A = 25°C
Bandwidth = 1.0 Hz

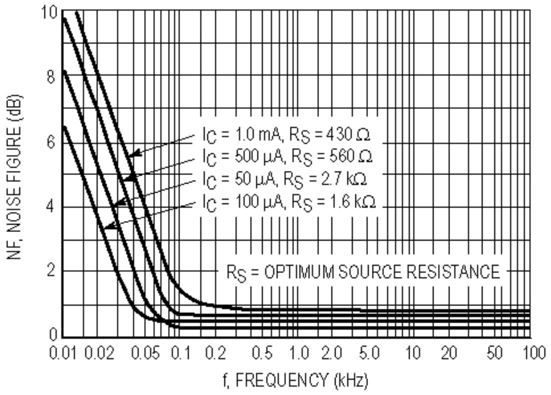


Figure 6. Frequency Effects

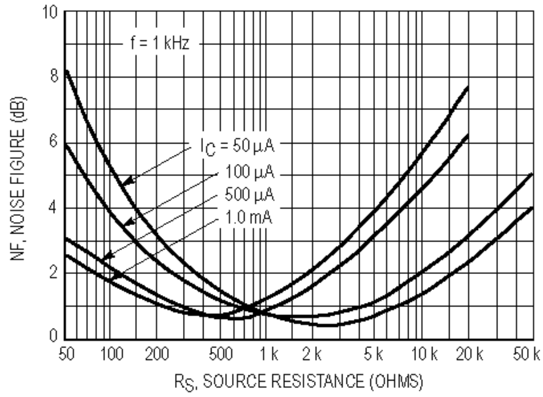


Figure 7. Source Resistance Effects

h PARAMETERS

V_{CE} = –10 Vdc, f = 1.0 kHz, T_A = 25°C

This group of graphs illustrates the relationship between h_{fe} and other "h" parameters for this series of transistors. To obtain these curves, a high–gain and a low–gain unit were selected from both the 2N4402 and 2N4403 lines, and the same units were used to develop the correspondingly–numbered curves on each graph.

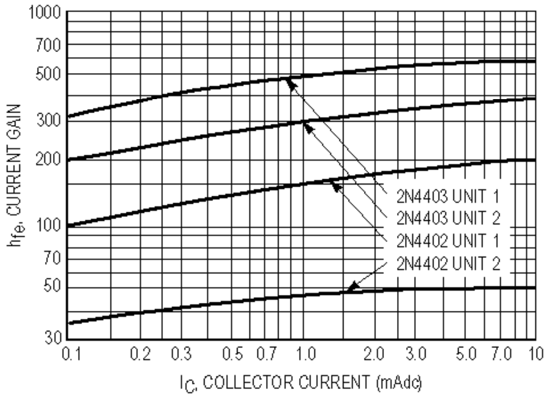


Figure 8. Current Gain

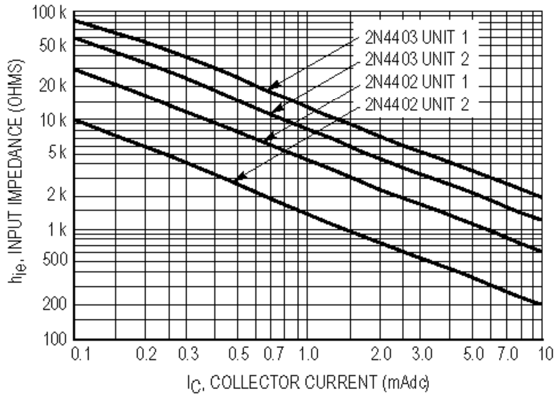


Figure 9. Input Impedance

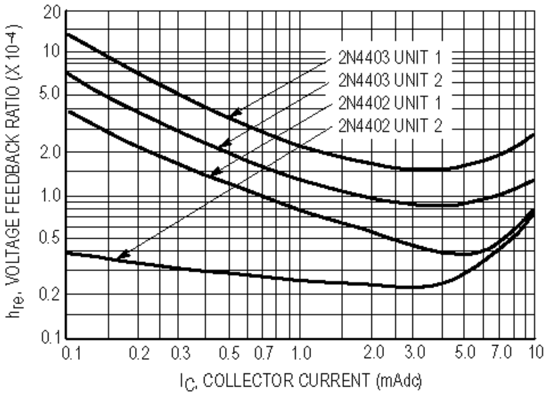


Figure 10. Voltage Feedback Ratio

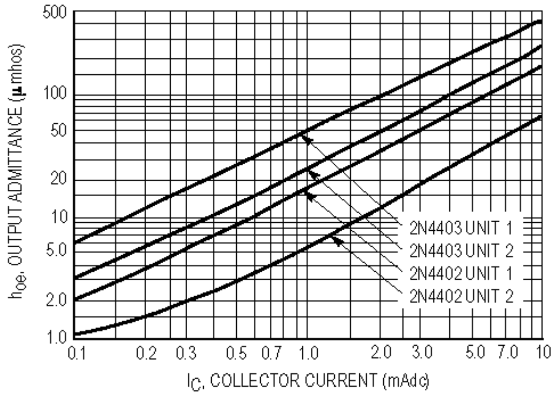


Figure 11. Output Admittance

STATIC CHARACTERISTICS

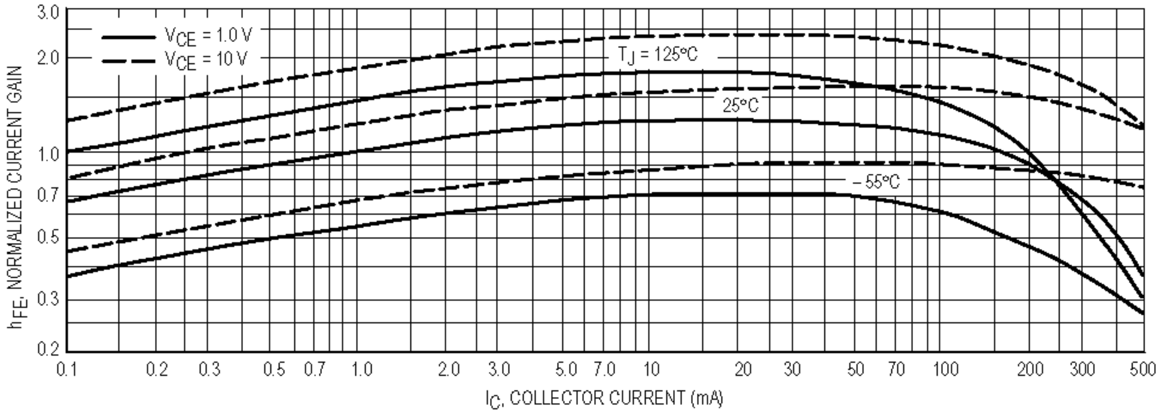


Figure 12. DC Current Gain

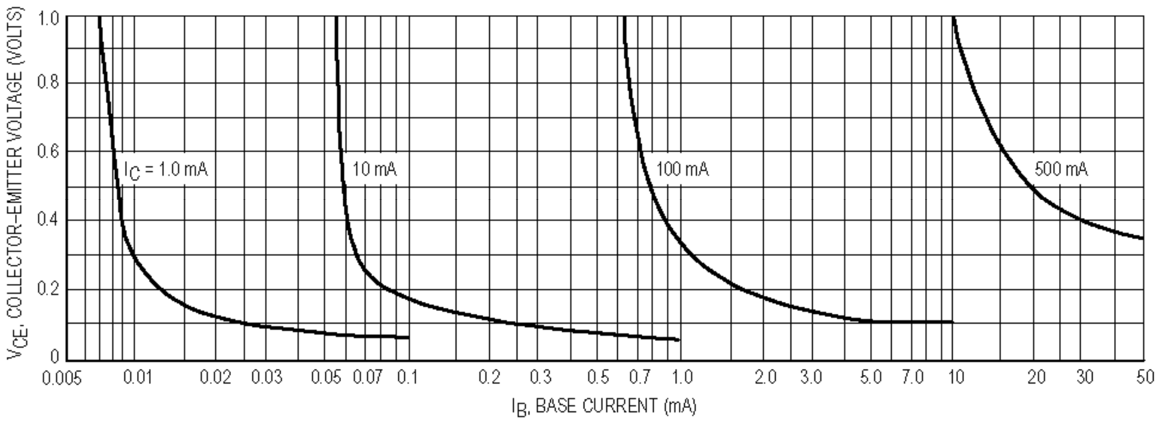


Figure 13. Collector Saturation Region

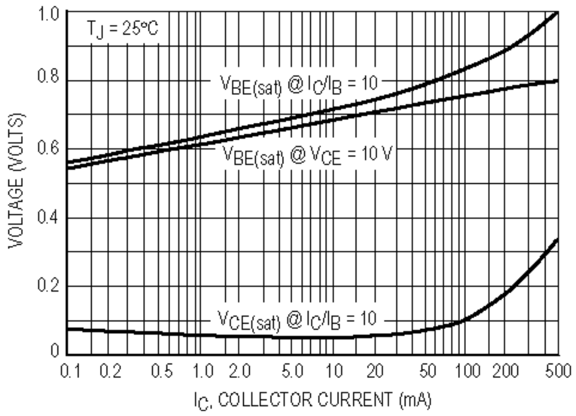


Figure 14. ''On'' Voltages

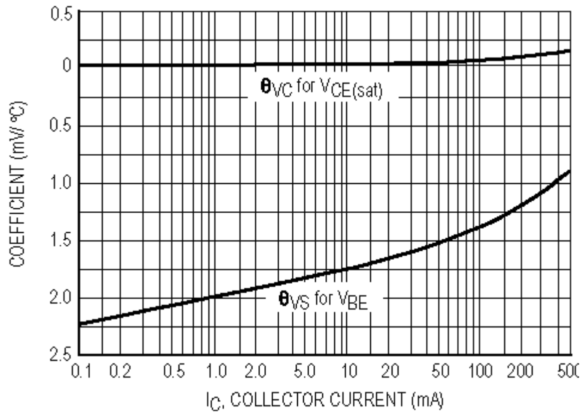


Figure 15. Temperature Coefficients