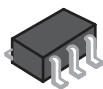


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* Features



Power dissipation

$P_{CM} : 0.2 \text{ W (Tamp.} = 25^{\circ}\text{C)}$

Collector current

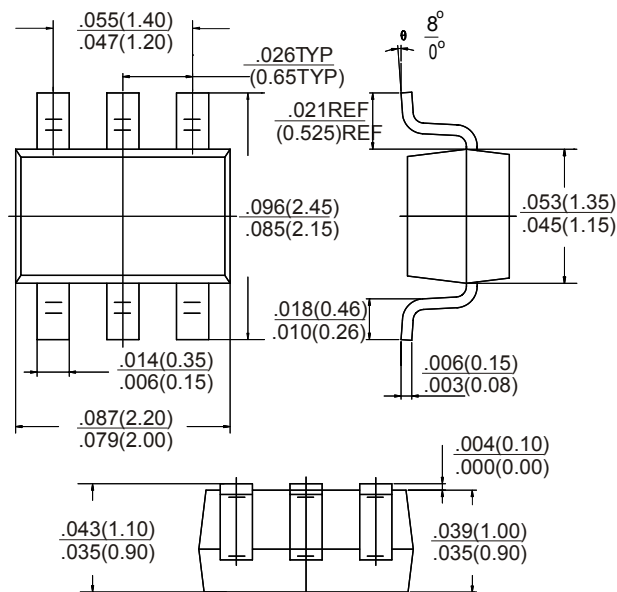
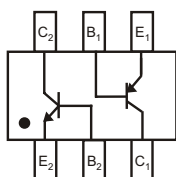
$I_{CM} : 0.2/0.2 \text{ A}$

Collector-base voltage

$V_{(BR)CBO} : 75/60 \text{ V}$

Operating & Storage junction Temperature

$T_j, T_{stg} : -55^{\circ}\text{C} \sim +150^{\circ}\text{C}$



Dimensions in inches and (millimeters)

Electrical Characteristics(Tamb=25°C unless otherwise specified)

NPN222A ELECTRICAL CHARACTERISTICS (Tamb=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10 \mu\text{A}, I_E=0$	75			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10\text{mA}, I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10 \mu\text{A}, I_C=0$	6			V
Collector cut-off current	I_{CBO}	$V_{CB}=60\text{V}, I_E=0$			10	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=3\text{V}, I_C=0$			10	nA
DC current gain	h_{FE}	$V_{CE}=10\text{V}, I_C=150\text{mA}$	100		300	
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=150\text{mA}, I_B=15\text{mA}$			0.3	V
	$V_{CE(sat)2}$	$I_C=500\text{mA}, I_B=50\text{mA}$			1	V
Base -emitter saturation voltage	$V_{BE(sat)1}$	$I_C=150\text{mA}, I_B=15\text{mA}$			1.2	V
	$V_{BE(sat)2}$	$I_C=500\text{mA}, I_B=50\text{mA}$			2	V
Transition frequency	f_T	$V_{CE}=20\text{V}, I_C=20\text{mA}, f=100\text{MHz}$	300			MHz
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$			8	pF
Noise Figure	NF	$V_{CE}=10\text{V}, I_C=0.1\text{mA}, f=1\text{KHz}, R_s=1\text{K}\Omega$			4	dB

PNP2907A ELECTRICAL CHARACTERISTICS (T_{amb}=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10 \mu A, I_E = 0$	-60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10 mA, I_B = 0$	-60			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10 \mu A, I_C = 0$	-5			V
Collector cut-off current	I_{CBO}	$V_{CB} = -50V, I_E = 0$			-10	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -3V, I_C = 0$			-10	nA
DC current gain	h_{FE}	$V_{CE} = -10V, I_C = -150mA$	100		300	
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = -150mA, I_B = -15mA$			-0.4	V
	$V_{CE(sat)2}$	$I_C = -500mA, I_B = -50mA$			-1.6	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = -150mA, I_B = -15mA$			-1.3	V
	$V_{BE(sat)2}$	$I_C = -500mA, I_B = -50mA$			-2.6	V
Transition frequency	f_T	$V_{CE} = -20V, I_C = -50mA, f = 100MHz$	200			MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10V, I_E = 0, f = 1MHz$			8	pF

SWITCHING TIME EQUIVALENT TEST CIRCUITS

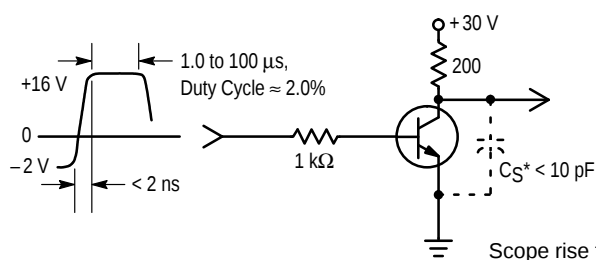


Figure 1. Turn-On Time

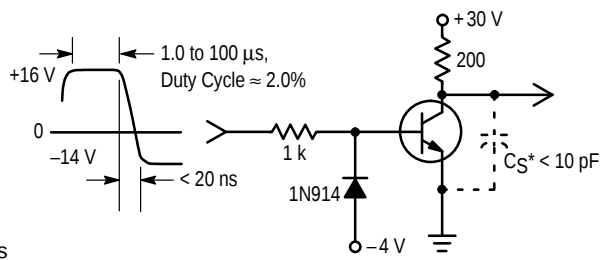


Figure 2. Turn-Off Time

NPN2222

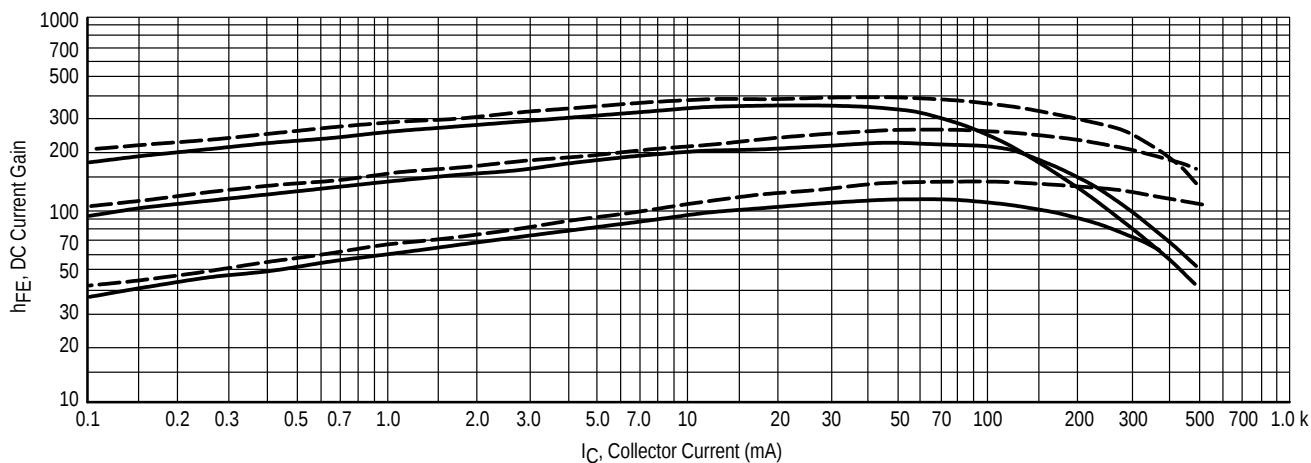


Figure 3. DC Current Gain

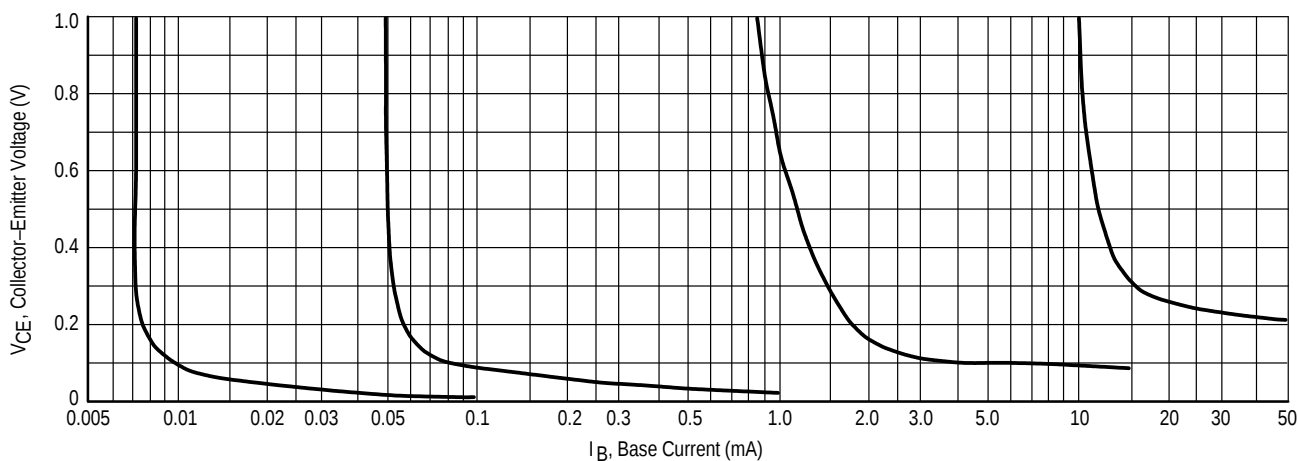


Figure 4. Collector Saturation Region

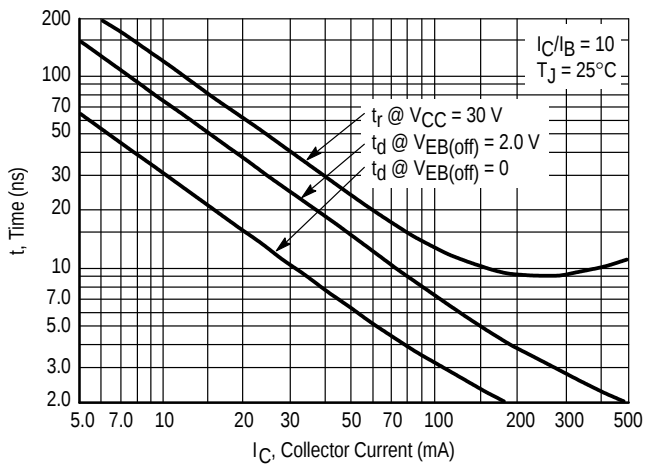


Figure 5. Turn-On Time

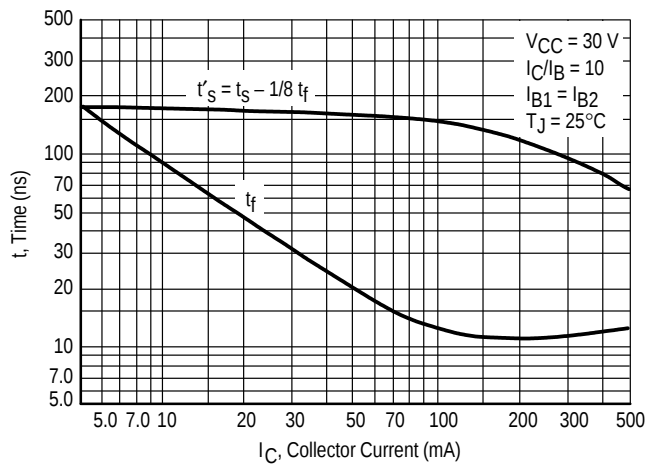


Figure 6. Turn-Off Time

NPN2222

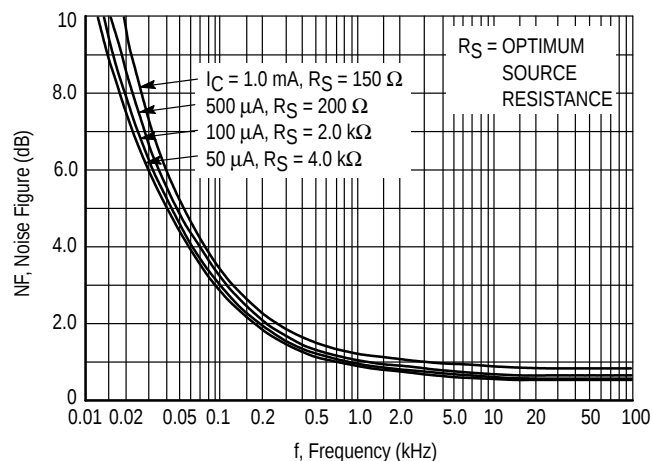


Figure 7. Frequency Effects

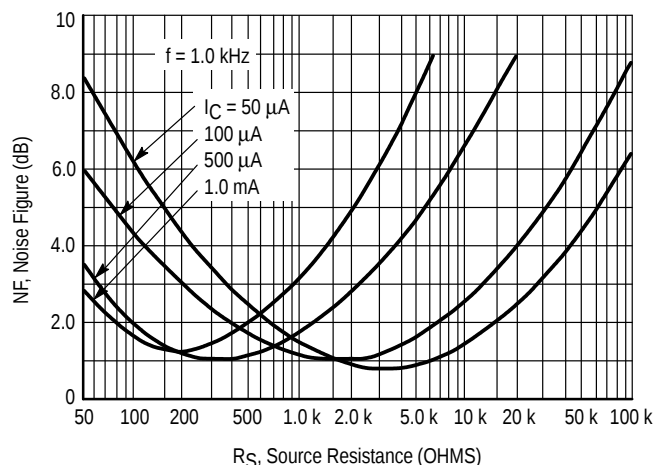


Figure 8. Source Resistance Effects

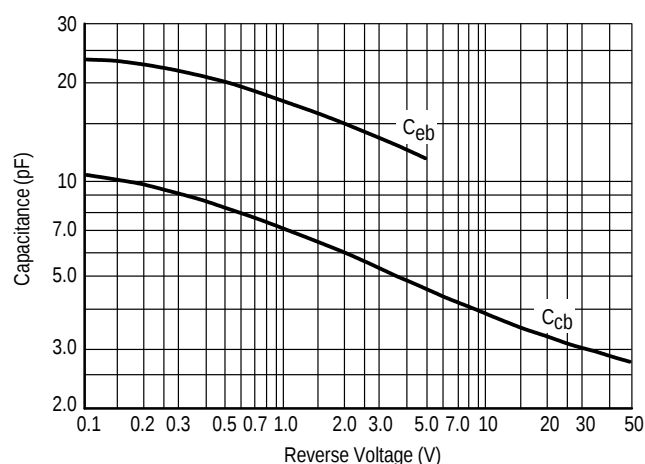


Figure 9. Capacitances

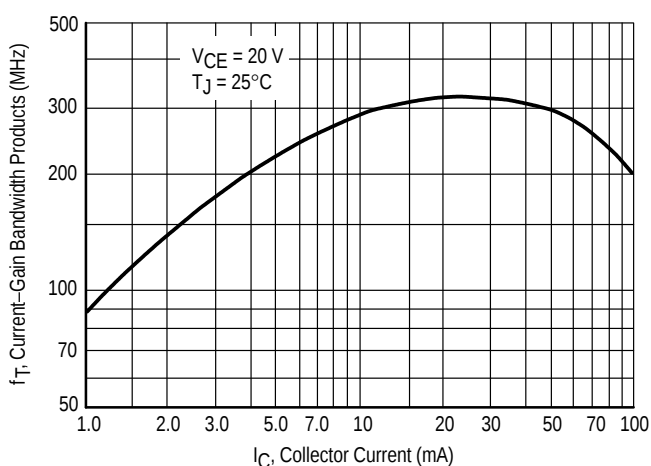


Figure 10. Current-Gain Bandwidth Product

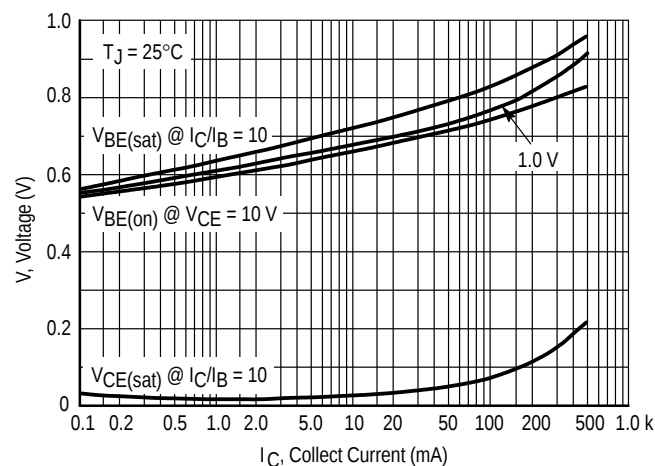


Figure 11. "On" Voltages

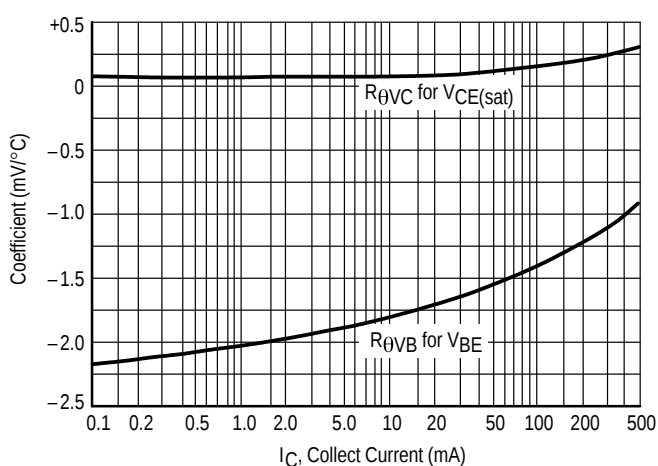


Figure 12. Temperature Coefficients

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TYPICAL CHARACTERISTICS

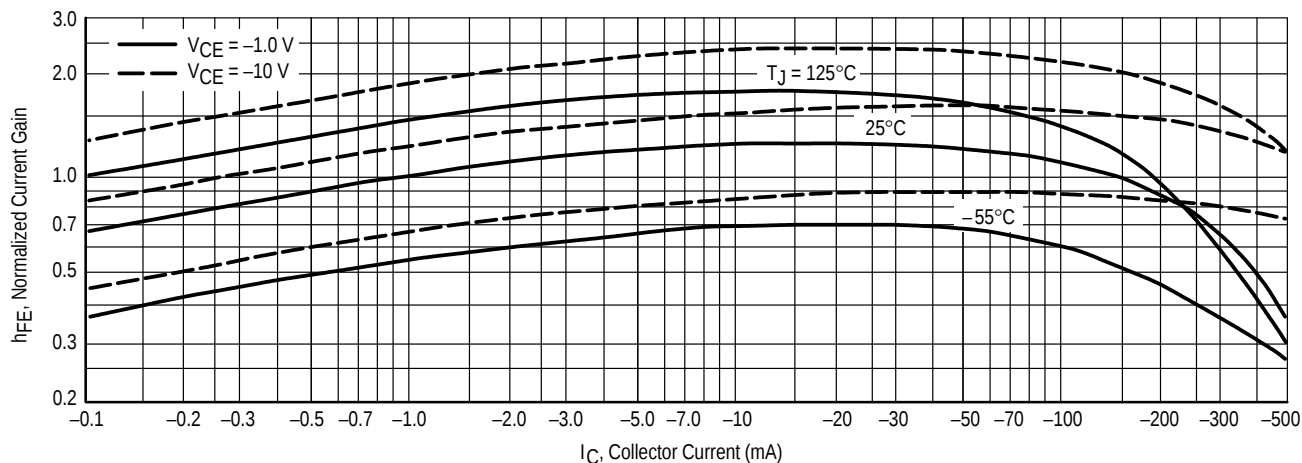


Figure 13. DC Current Gain

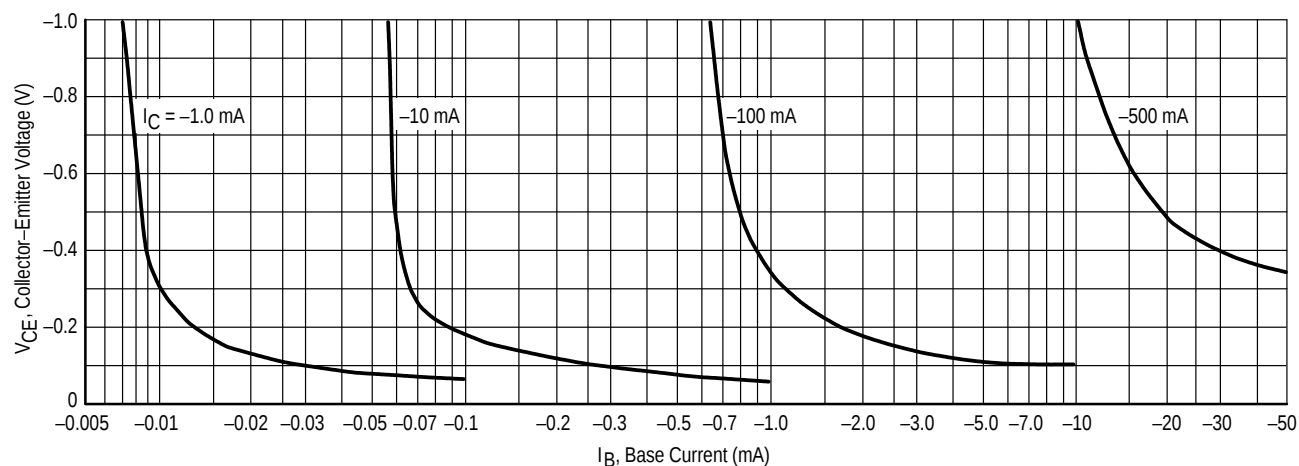


Figure 14. Collector Saturation Region

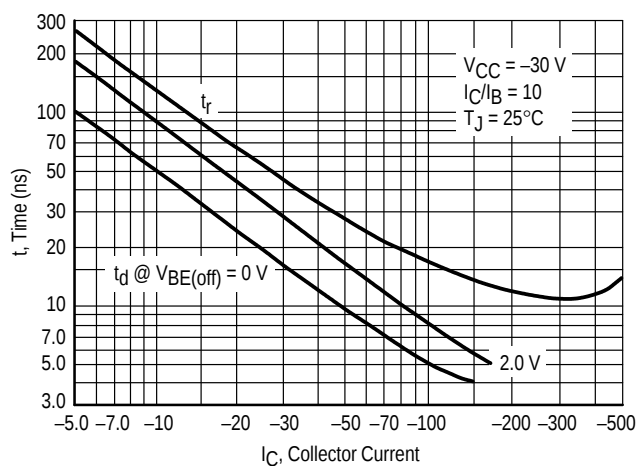


Figure 15. Turn-On Time

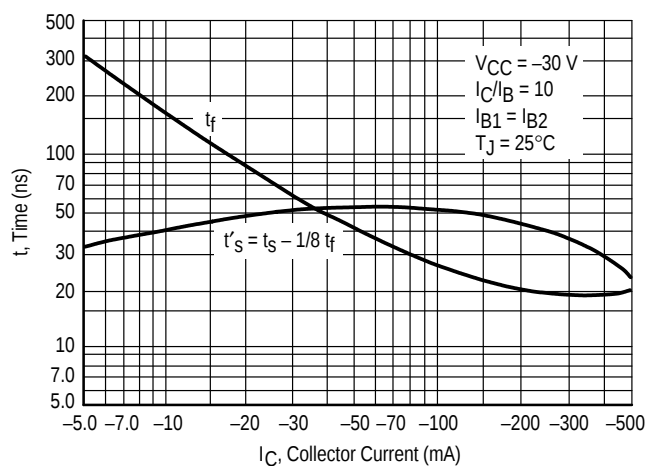


Figure 16. Turn-Off Time

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TYPICAL SMALL-SIGNAL CHARACTERISTICS

NOISE FIGURE
 $V_{CE} = 10 \text{ Vdc}$, $T_A = 25^\circ\text{C}$

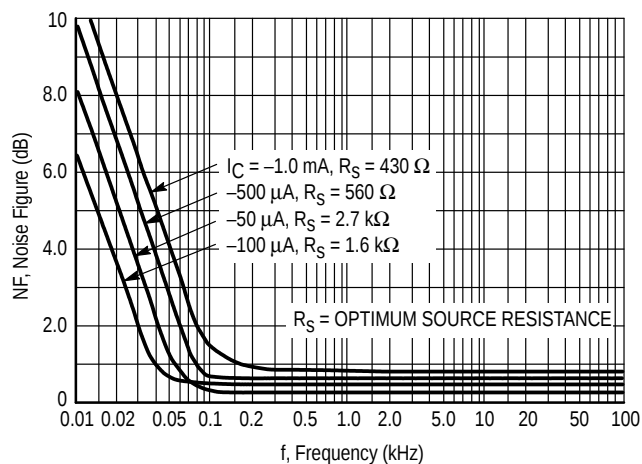


Figure 17. Frequency Effects

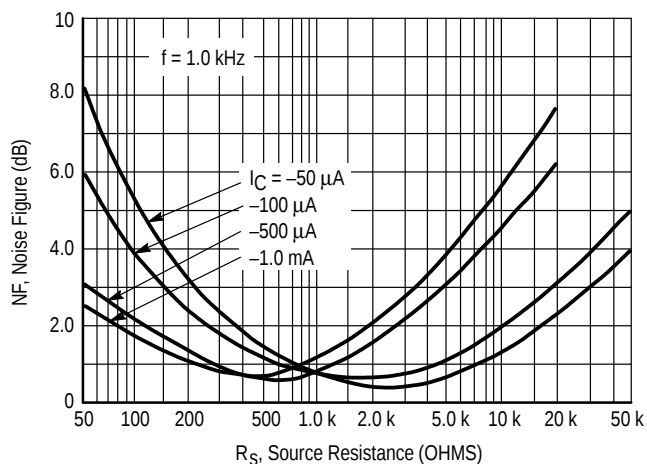


Figure 18. Source Resistance Effects

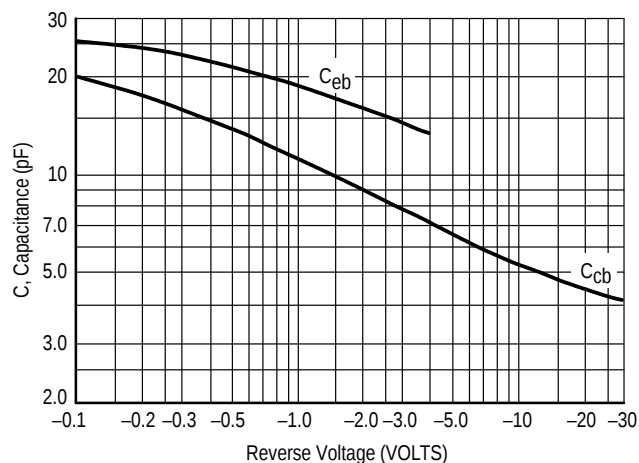


Figure 19. Capacitances

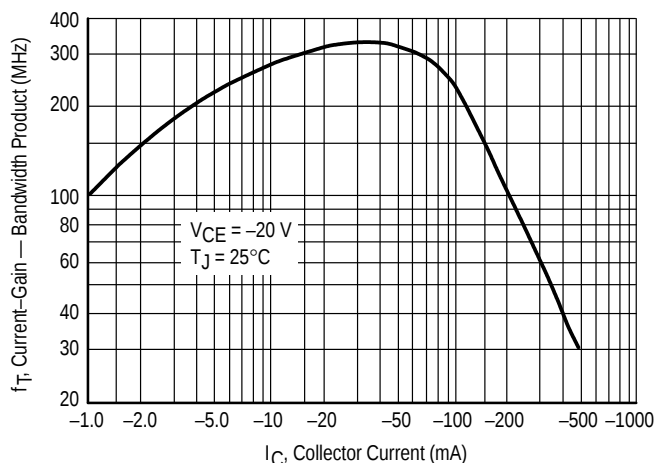


Figure 20. Current-Gain — Bandwidth Product

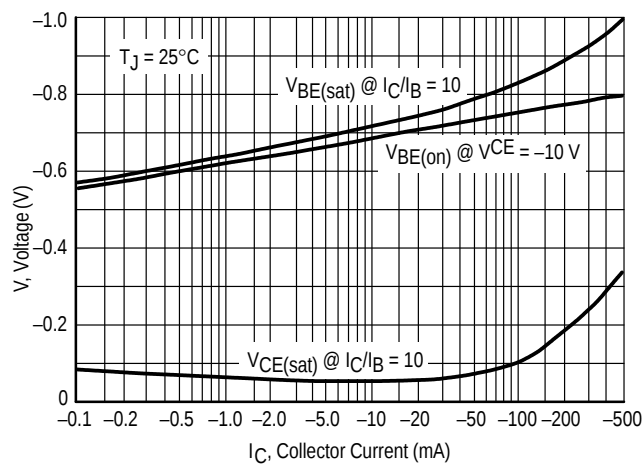


Figure 21. "On" Voltage

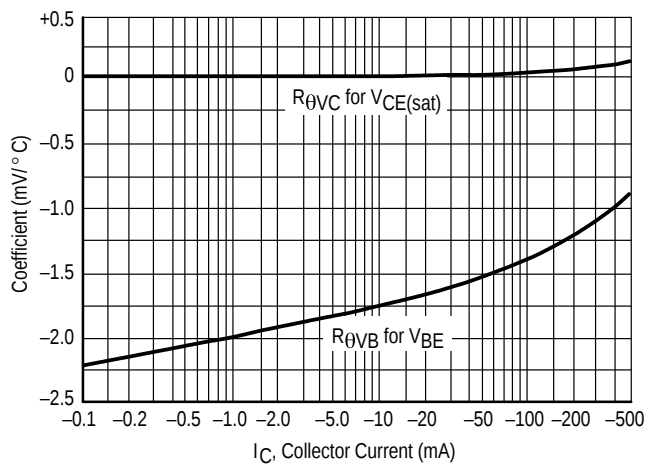


Figure 22. Temperature Coefficients