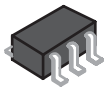
Elektronische Bauelemente

MMDT2227

NPN-PNP Silicon Multi-Chip Transistor

RoHS Compliant Product

* Features



Power dissipation

P_{CM} : 0.2 W (Tamp.= 25°C)

Collector current

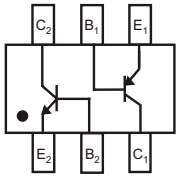
I_{CM} : 0.2/-0.2 A

Collector-base voltage

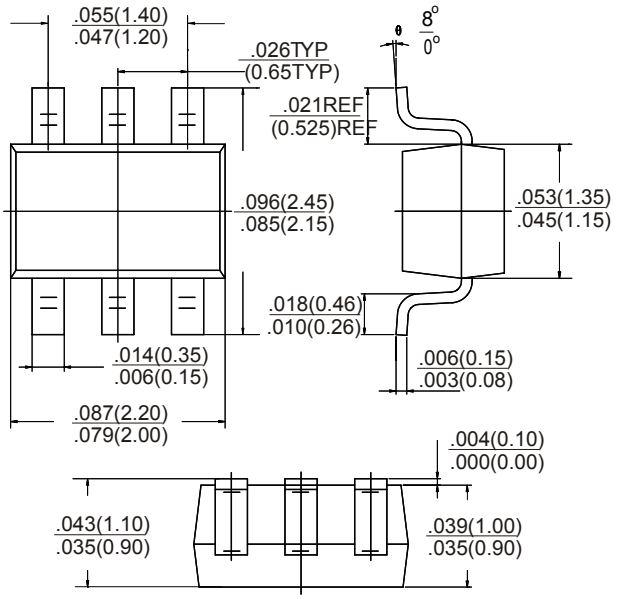
$V_{(BR)CBO}$: 75/-60 V

Operating & Storage junction Temperature

T_j, T_{stg} : -55°C~ +150°C



SOT-363



Dimensions in inches and (millimeters)

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

NPN2222A ELECTRICAL CHARACTERISTICS（Tamb=25℃ unless otherwise specified）

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	Ic=10μA,I_E=0	75			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	Ic=10mA,I_B=0	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=10μA,I_C=0	6			V
Collector cut-off current	I_{CBO}	V_{CB}=60V,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			0.3	V
	$V_{CE(sat)2}$	I_C=500mA,I_B=50mA			1	V
Base -emitter saturation voltage	$V_{BE(sat)1}$	I_C=150mA,I_B=15mA			1.2	V
	$V_{BE(sat)2}$	I_C=500mA,I_B=50mA			2	V
Transition frequency	f_T	V_{CE}=20V,I_C=20mA,f=100MHz	300			MHz
Collector output capacitance	C_{ob}	V_{CB}=10V,I_E=0,f=1MHz			8	pF
Noise Figure	NF	V_{CE}=10V,I_c=0.1mA, f=1KHZ,Rs=1KΩ			4	dB

PNP2907A ELECTRICAL CHARACTERISTICS（Tamb=25℃ unless otherwise specified）

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	Ic=-10μA,I_E=0	-60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	Ic=-10mA,I_B=0	-60			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=-10μA,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

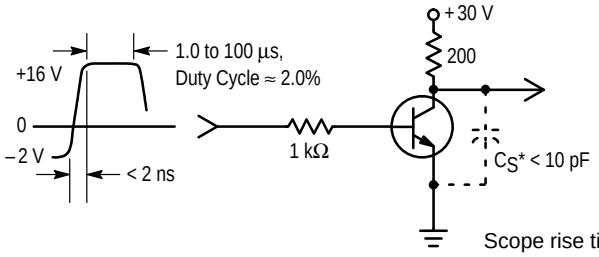


Figure 1. Turn–On Time

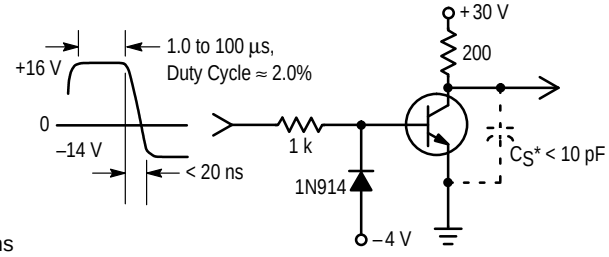


Figure 2. Turn–Off Time

Scope rise time < 4 ns
*Total shunt capacitance of test jig, connectors, and oscilloscope.

NPN2222

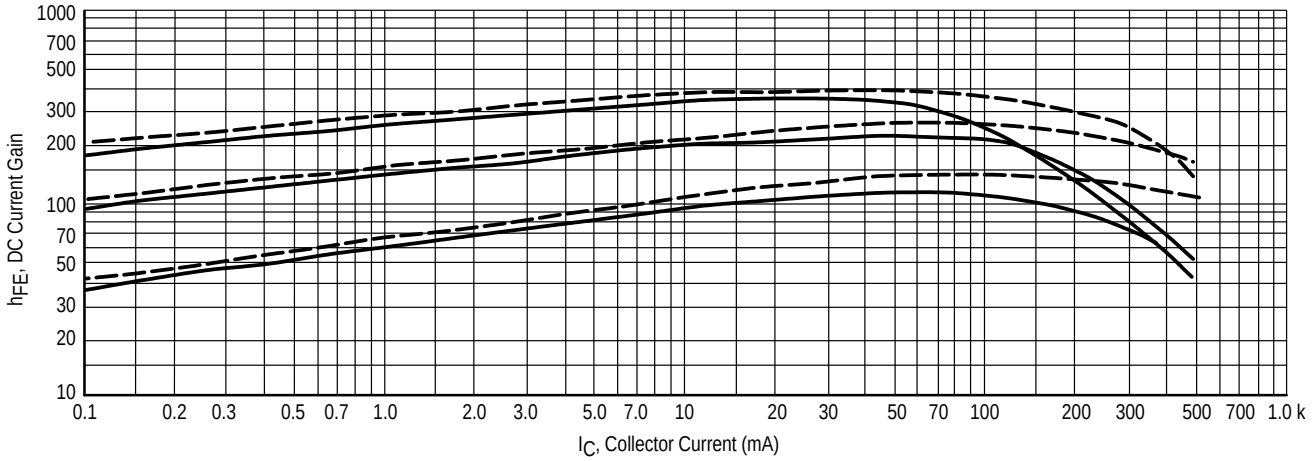


Figure 3. DC Current Gain

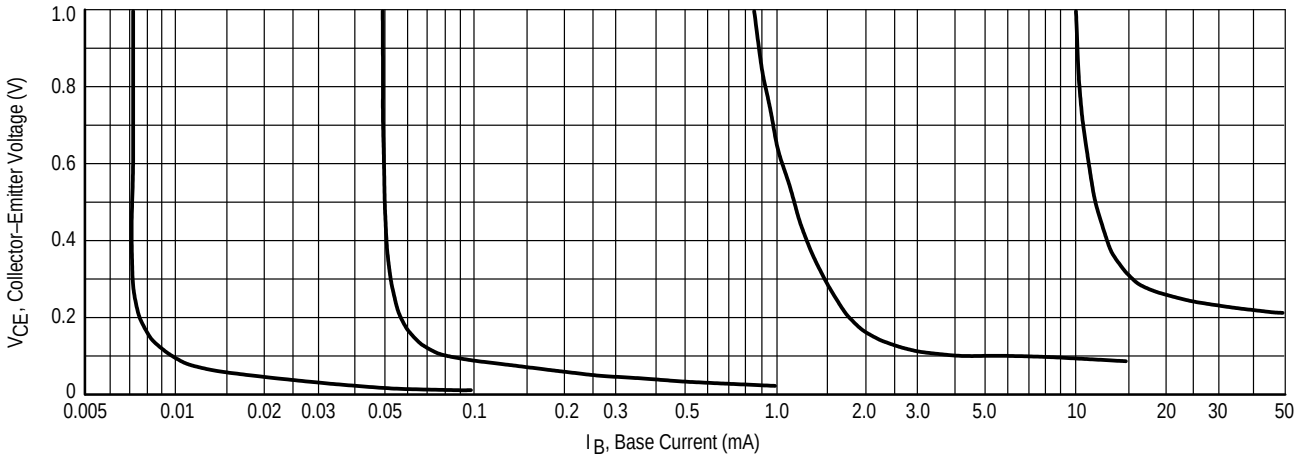


Figure 4. Collector Saturation Region

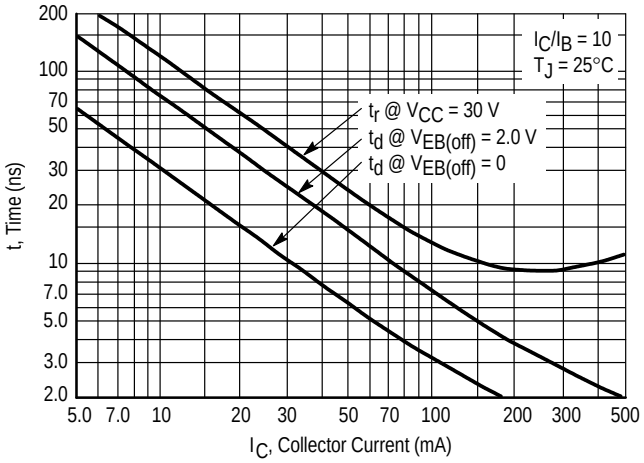


Figure 5. Turn – On Time

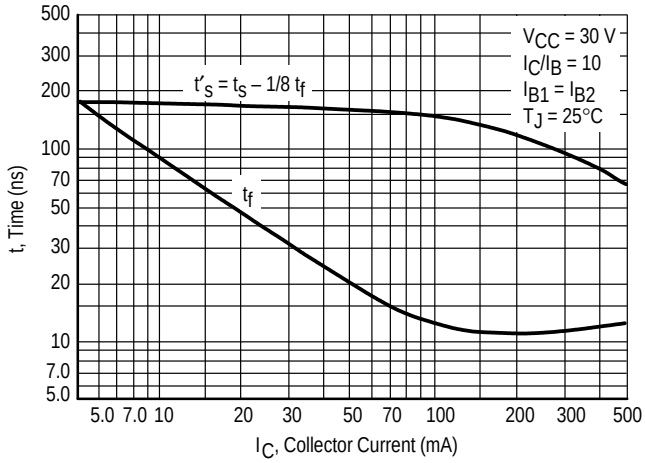


Figure 6. Turn – Off Time

NPN2222

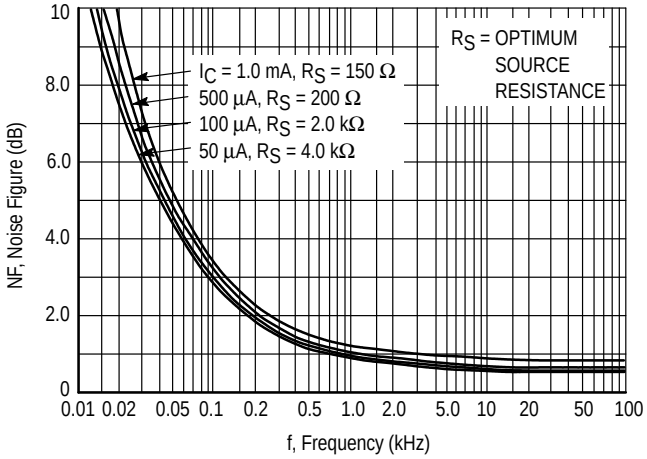


Figure 7. Frequency Effects

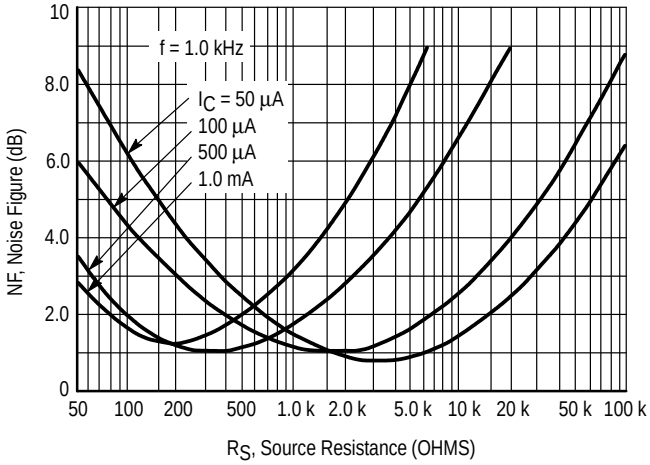


Figure 8. Source Resistance Effects

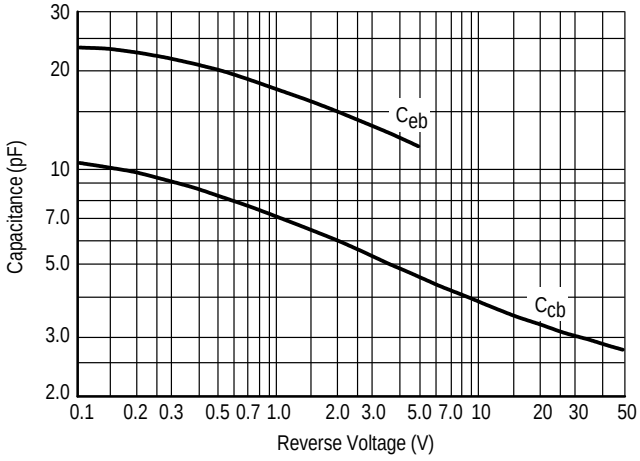


Figure 9. Capacitances

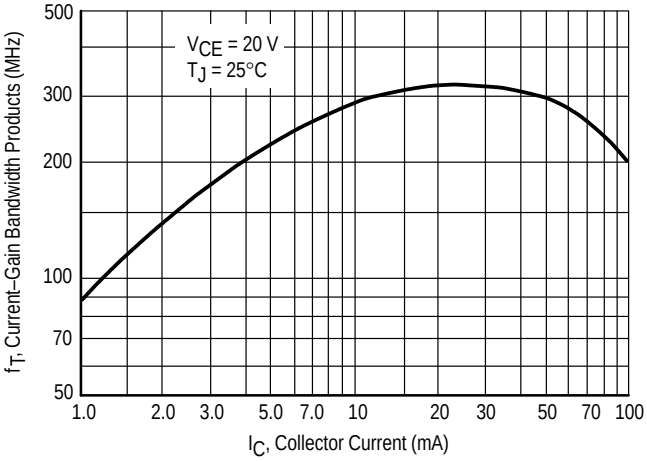


Figure 10. Current–Gain Bandwidth Product

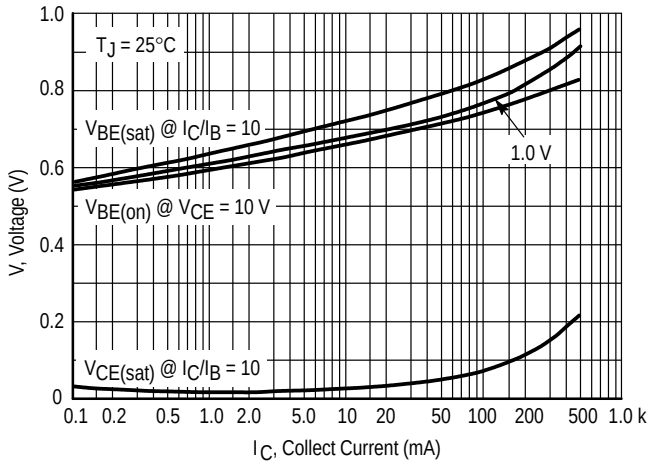


Figure 11. "On" Voltages

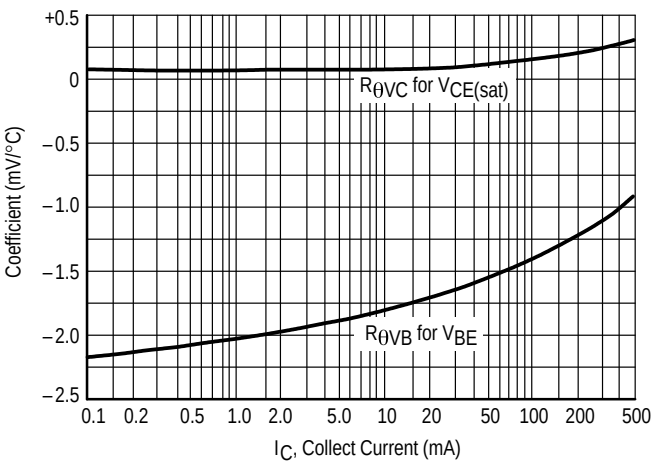


Figure 12. Temperature Coefficients

PNP2907

TYPICAL CHARACTERISTICS

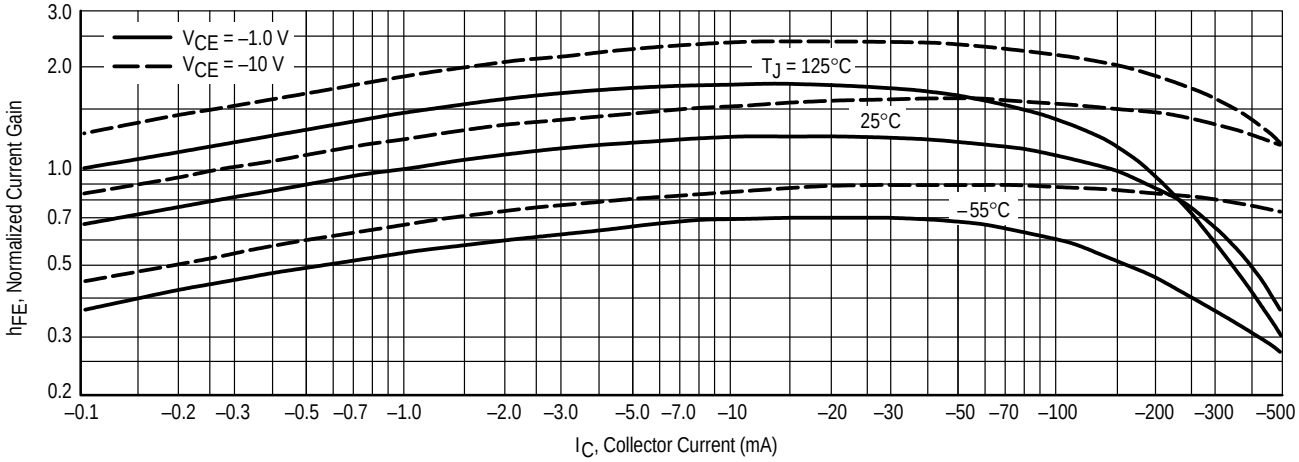


Figure 13. DC Current Gain

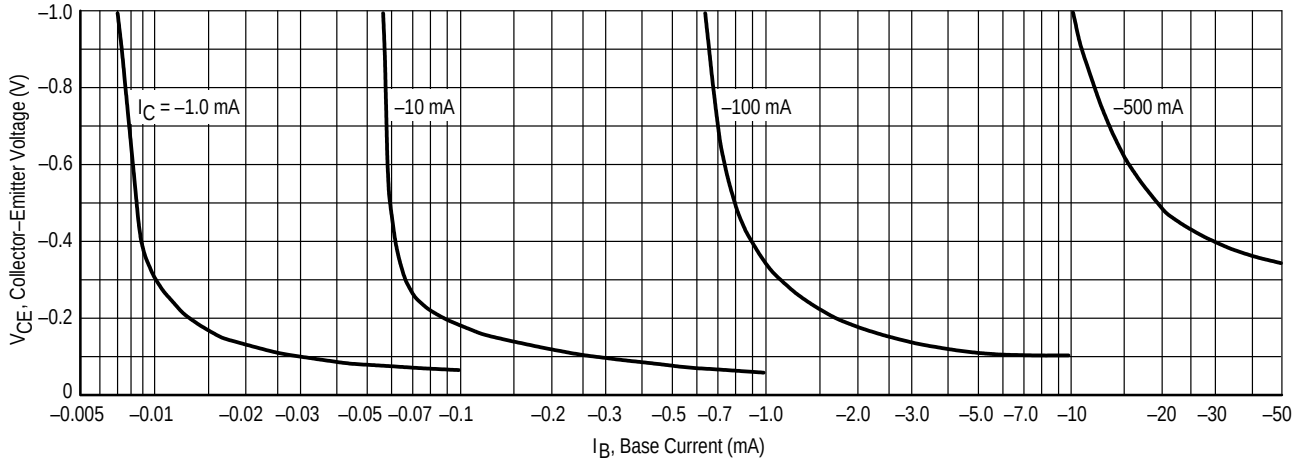


Figure 14. Collector Saturation Region

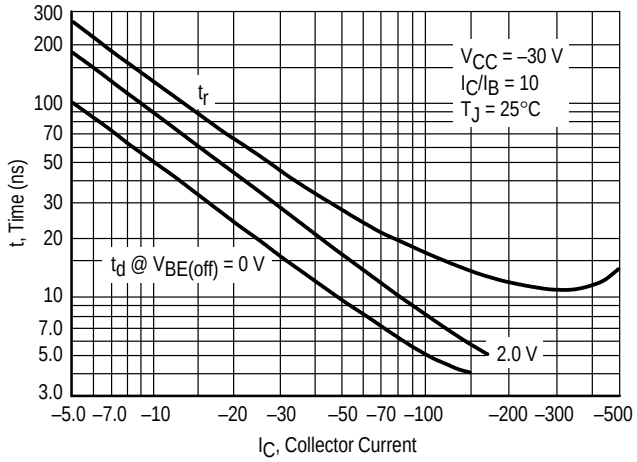


Figure 15. Turn–On Time

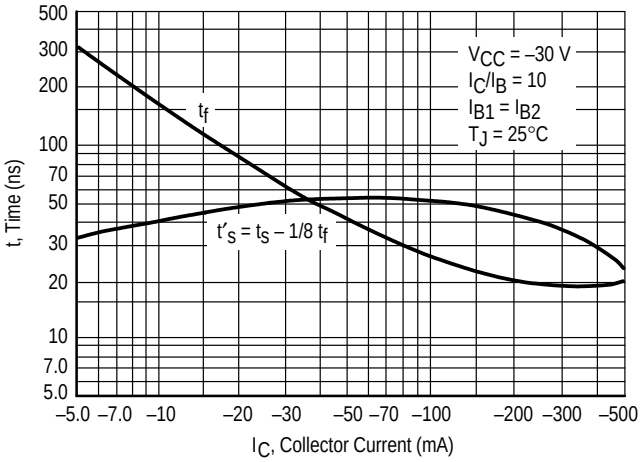


Figure 16. Turn–Off Time

PNP2907

TYPICAL SMALL–SIGNAL CHARACTERISTICS

NOISE FIGURE

V_{CE} = 10 Vdc, T_A = 25°C

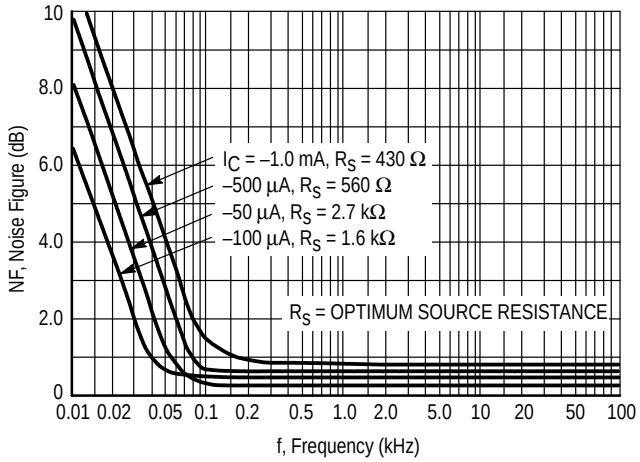


Figure 17. Frequency Effects

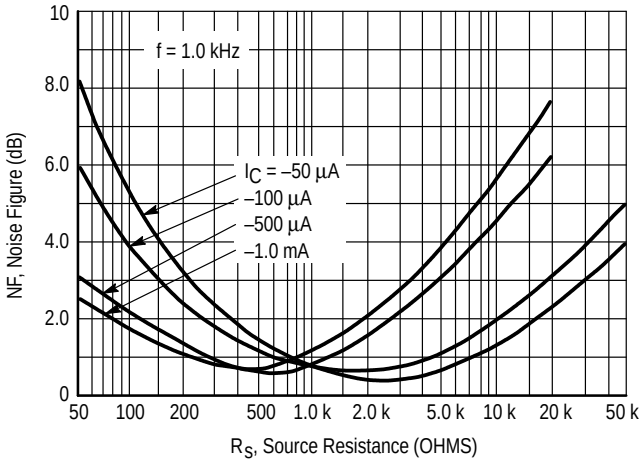


Figure 18. Source Resistance Effects

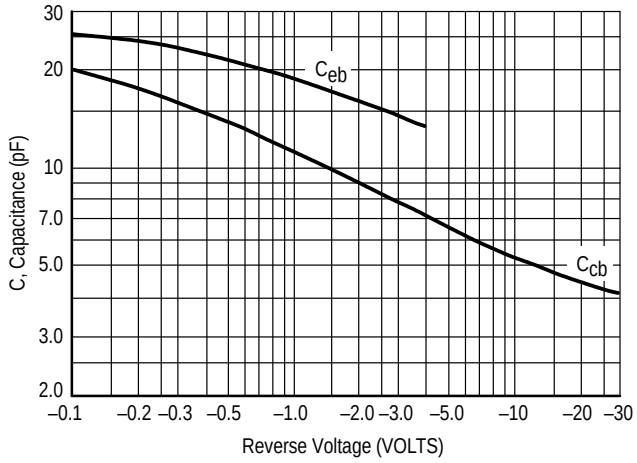


Figure 19. Capacitances

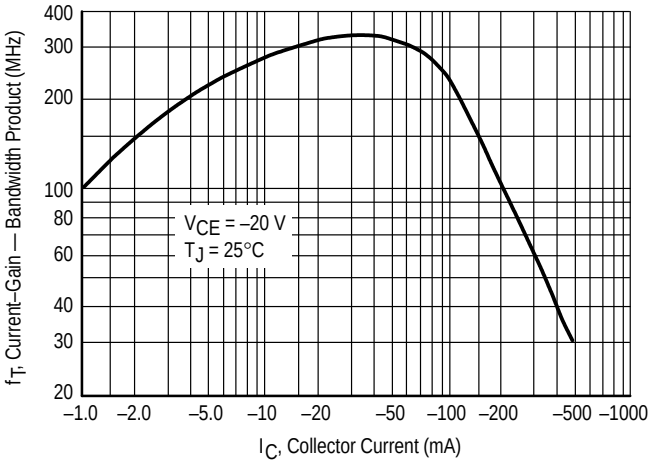


Figure 20. Current–Gain — Bandwidth Product

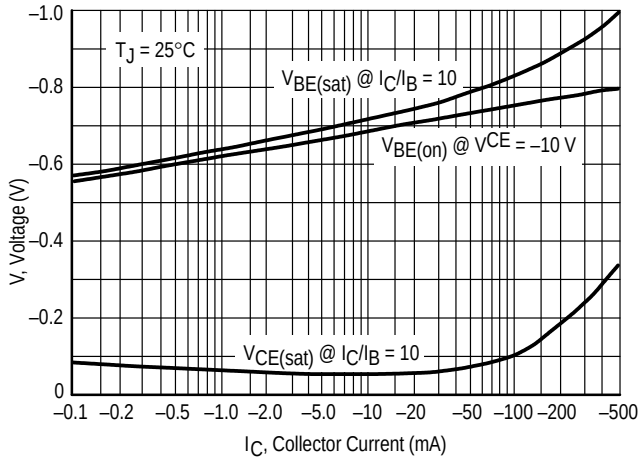


Figure 21. "On" Voltage

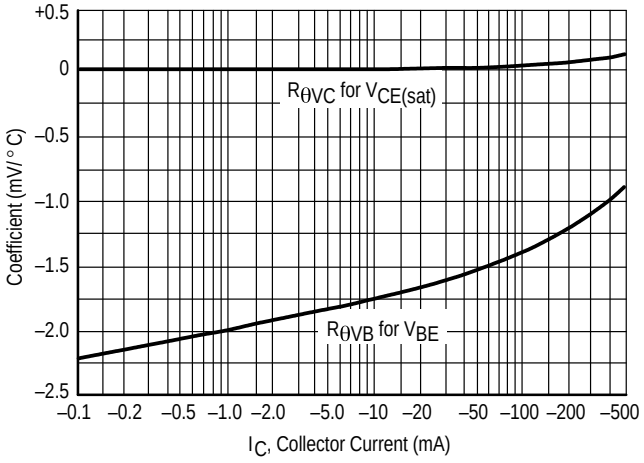


Figure 22. Temperature Coefficients