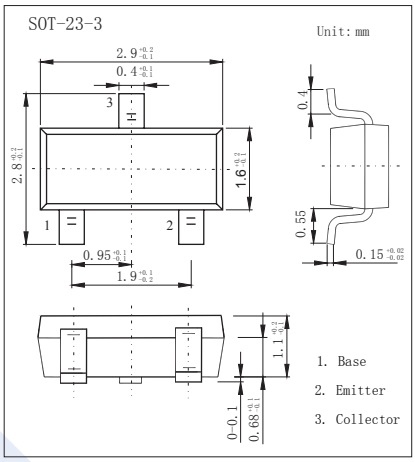
NPN Transistors

2SC2223



■ Features

- Collector Current Capability I_C=20mA
- Collector Emitter Voltage V_{CEO}=20V

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	30	V
Collector - Emitter Voltage	V_{CEO}	20	
Emitter - Base Voltage	V_{EBO}	4	
Collector Current - Continuous	I_C	20	mA
Collector Power Dissipation	P_C	150	mW
Junction Temperature	T_J	125	℃
Storage Temperature Range	T_{stg}	-55 to 125	

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 100 μA, I_E= 0	30			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA, I_B= 0	20			
Emitter - base breakdown voltage	V_{EBO}	I_E= 100 μ A, I_C= 0	4			
Collector-base cut-off current	I_{CBO}	V_{CB}= 25 V , I_E= 0			100	nA
Emitter cut-off current	I_{EBO}	V_{EB}= 3V , I_C=0			100	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=10 mA, I_B=1mA			0.3	V
Base - emitter saturation voltage	$V_{BE(sat)}$	I_C=10 mA, I_B=1mA			1.2	
Base - emitter voltage	V_{BE}	V_{CE}= 6V, I_C= 1mA		0.72		
DC current gain	h_{FE}	V_{CE}= 6V, I_C= 1mA	40		180	
Noise Figure	NF	V_{CE}= 6V, I_E= -1mA,R_G=50Ω,f=100MHz		3		dB
Collector output capacitance	C_{ob}	V_{CB}= 6V, I_E= 0,f=1MHz		1		pF
Collector to base time constant	$C_{crb'b}$	V_{CE}= 6V, I_E= -1mA,f=31.9MHz		12		pS
Transition frequency	f_T	V_{CE}= 6V, I_E= -1mA	400	600		MHz

■ Classification of h_{fe}

Type	2SC2223-F12	2SC2223-F13	2SC2223-F14
Range	40-80	60-120	90-180
Marking	F12	F13	F14

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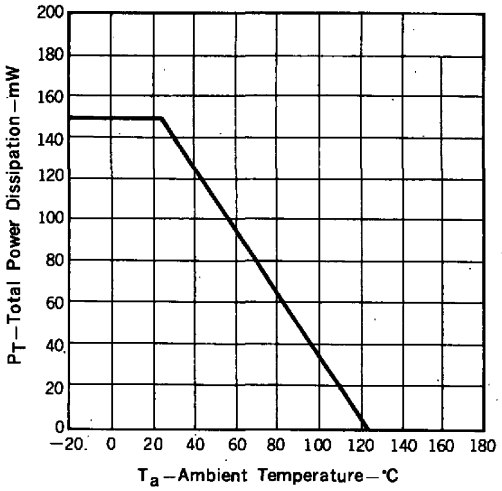
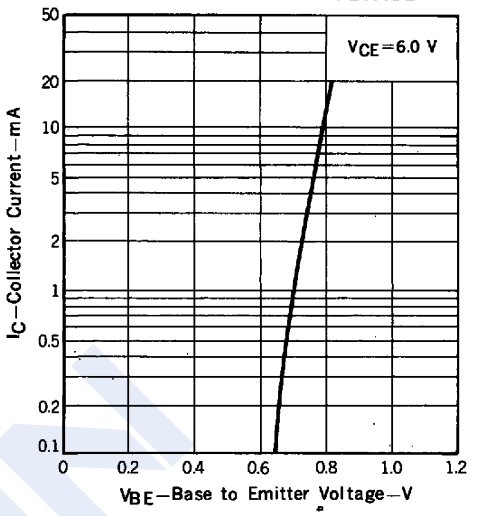
■ Typical Characterisitics

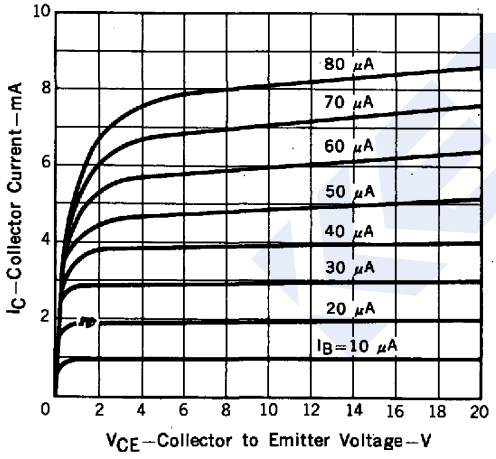
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



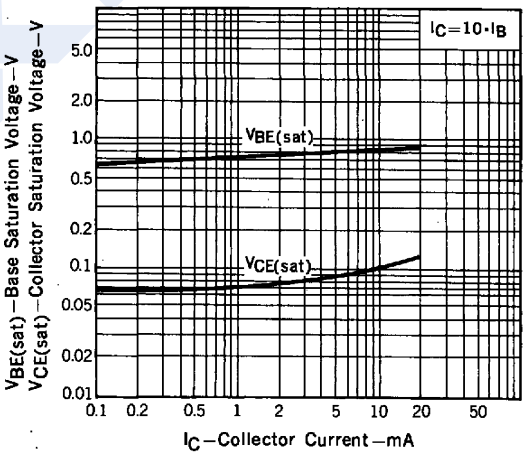
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



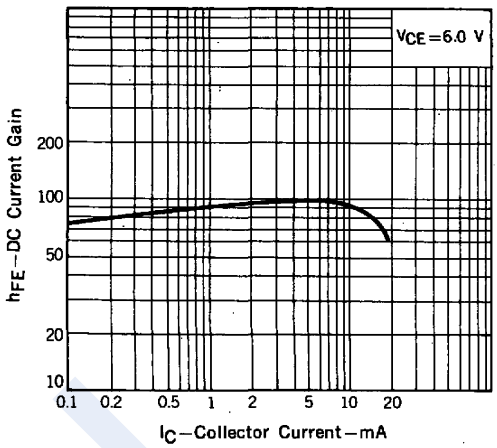
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



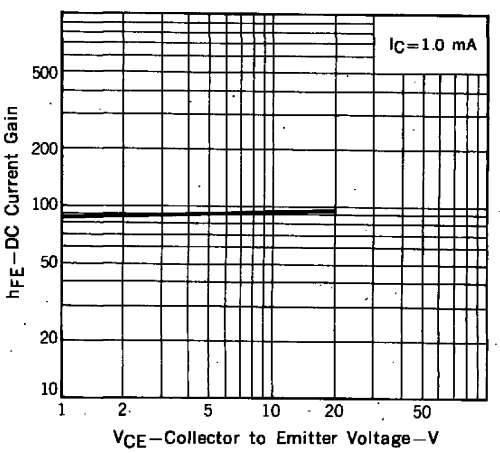
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



DC CURRENT GAIN vs. COLLECTOR CURRENT



DC CURRENT GAIN vs. COLLECTOR TO EMITTER VOLTAGE

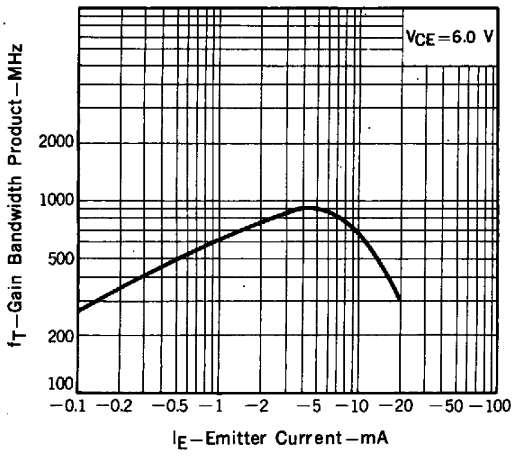


NPN Transistors

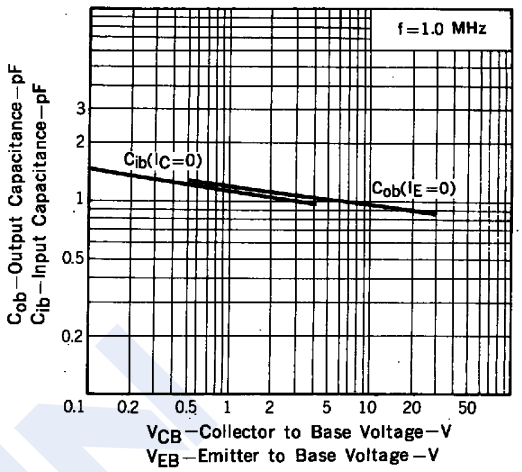
2SC2223

■ Typical Characterisitics

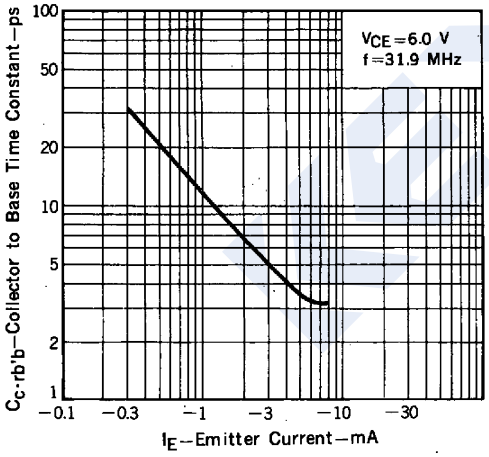
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



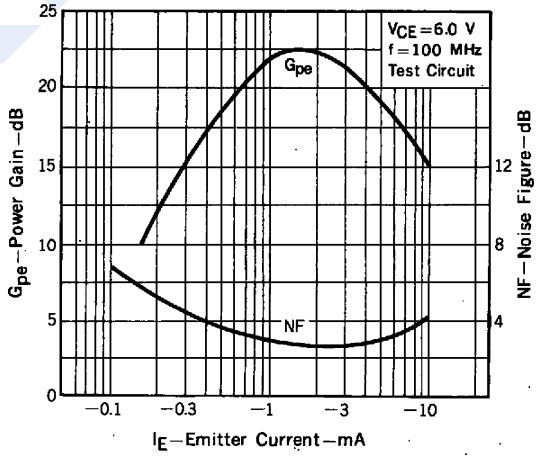
INPUT CAPACITANCE vs. EMITTER TO BASE VOLTAGE, OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



COLLECTOR TO BASE TIME CONSTANT vs. EMITTER CURRENT



POWER GAIN, NOISE FIGURE vs. EMITTER CURRENT



100 MHz G_{pe}, NF TEST CIRCUIT