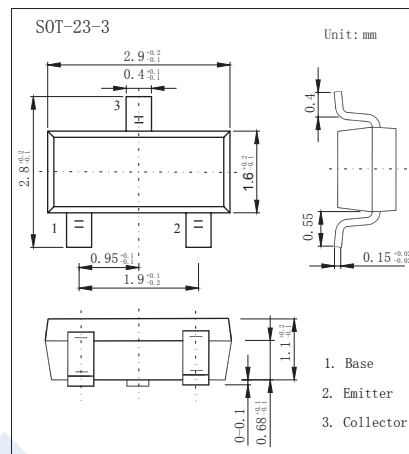


NPN Transistors

2SC2223-HF

■ Features

- Collector Current Capability $I_C=20\text{mA}$
- Collector Emitter Voltage $V_{CE0}=20\text{V}$
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 125	

■ Electrical Characteristics $T_a = 25^\circ\text{C}$

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

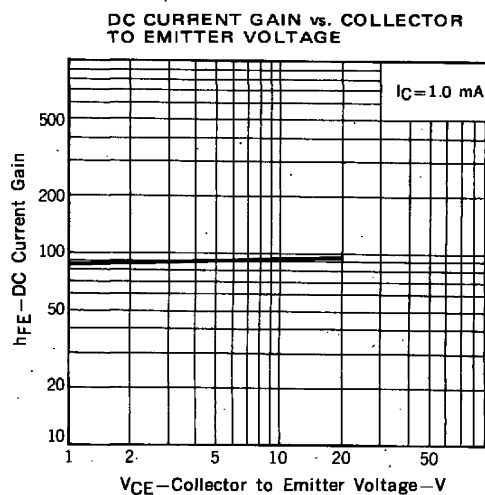
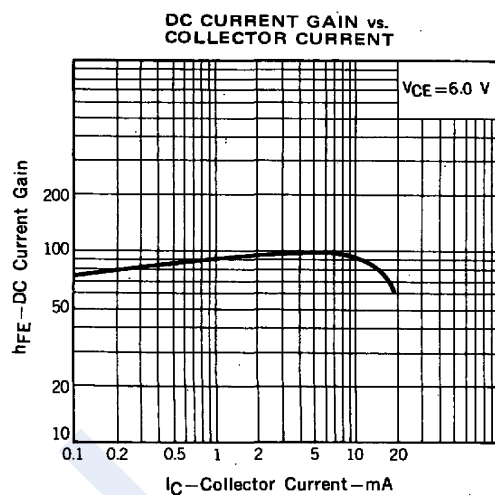
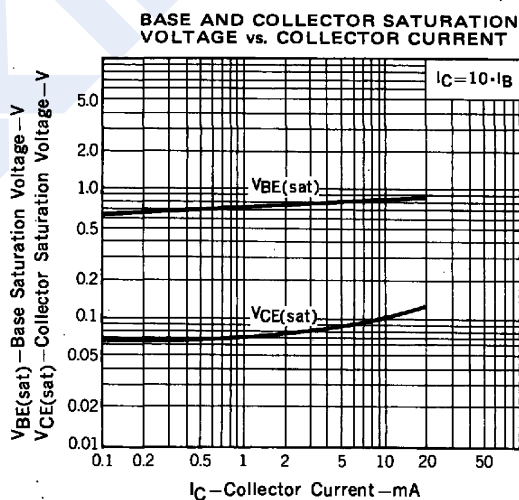
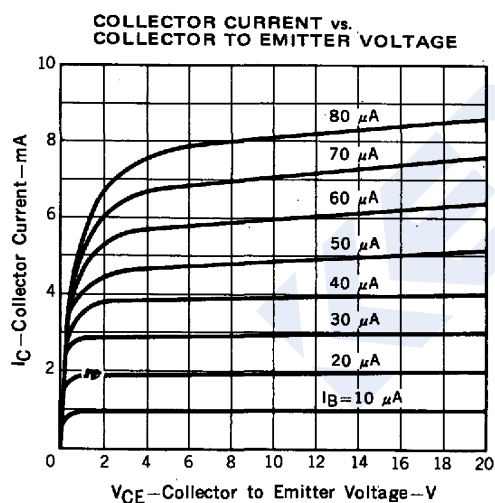
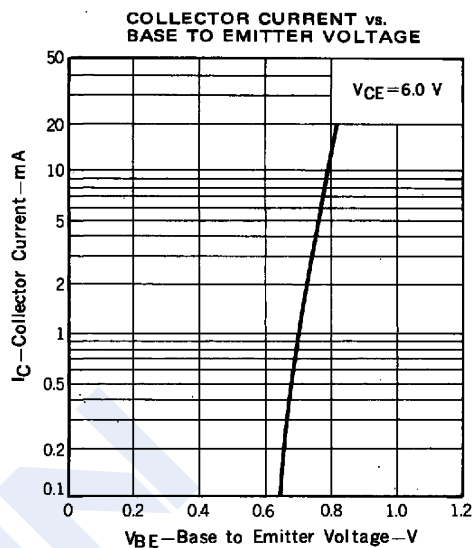
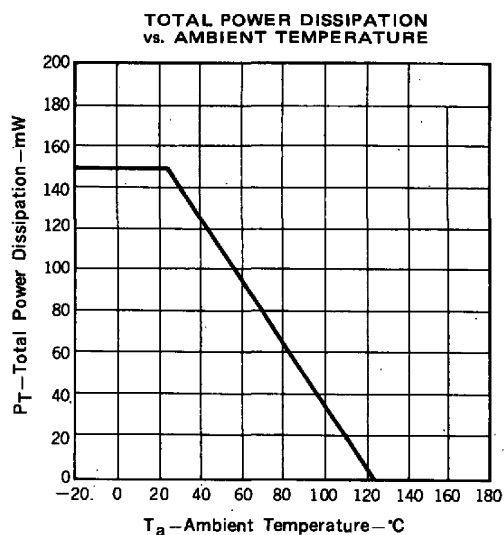
■ Classification of h_{FE}

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

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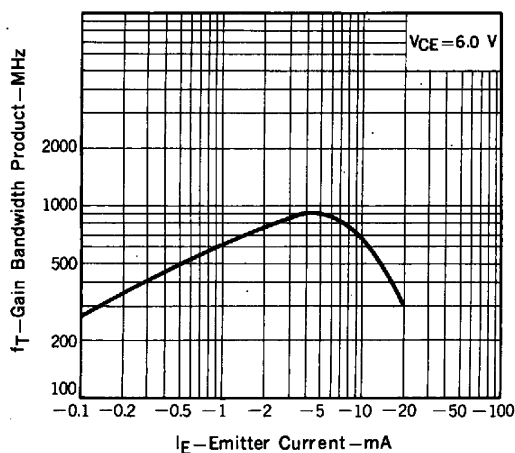
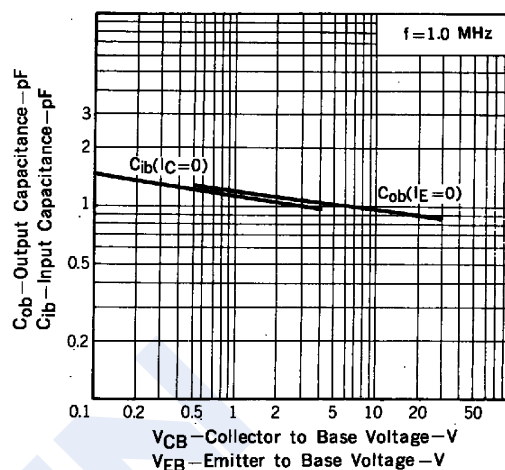
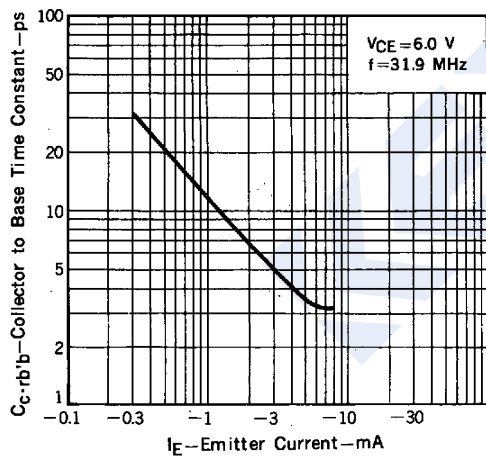
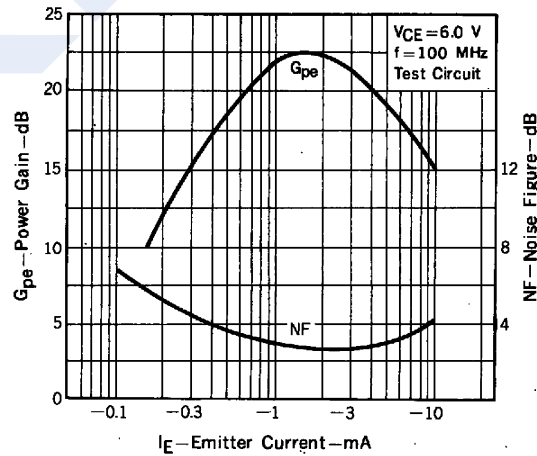
■ Typical Characteristics



NPN Transistors

2SC2223-HF

■ Typical Characteristics

GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENTINPUT CAPACITANCE vs. EMITTER TO
BASE VOLTAGE, OUTPUT CAPACITANCE
vs. COLLECTOR TO BASE VOLTAGECOLLECTOR TO BASE TIME CONSTANT
vs. EMITTER CURRENTPOWER GAIN, NOISE FIGURE
vs. EMITTER CURRENT100 MHz G_{pe} , NF TEST CIRCUIT