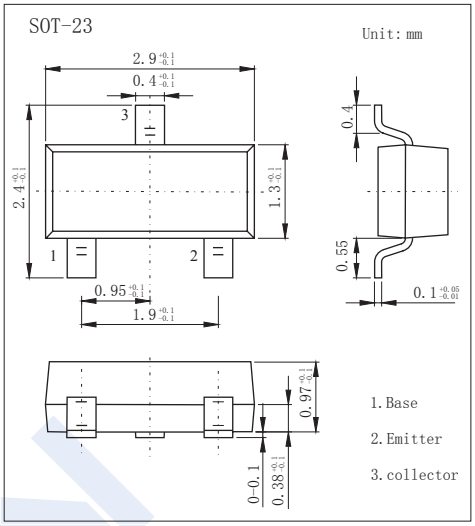
NPN Transistors

MMBT5089 (KMBT5089)



■ Features

- Collector Current Capability I_C=100mA
- Collector Emitter Voltage V_{CEO}=25V

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	30	V
Collector - Emitter Voltage	V_{CEO}	25	
Emitter - Base Voltage	V_{EBO}	4.5	
Collector Current - Continuous	I_C	100	mA
Collector Power Dissipation	P_C	350	mW
Derate above 25°C		2.8	mw/℃
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	

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■ Electrical Characteristics Ta = 25℃

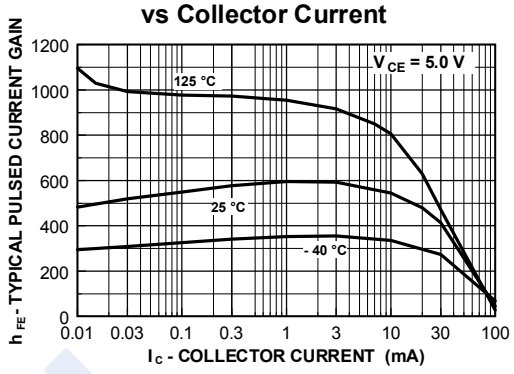
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 100 μA, I_E= 0	30			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA, I_B= 0	25			
Emitter - base breakdown voltage	V_{EBO}	I_E= 100 μ A, I_C= 0	5			
Collector-base cut-off current	I_{CBO}	V_{CB}= 15 V , I_E= 0			50	nA
Emitter cut-off current	I_{EBO}	V_{EB}= 3V , I_C=0			50	
		V_{EB}= 4.5V , I_C=0			100	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=10 mA, I_B=1mA			0.5	V
Base - emitter saturation voltage	$V_{BE(sat)}$	I_C=10 mA, I_B=1mA			1.2	
Base-Emitter On Voltage	$V_{BE(on)}$	V_{CE}= 5V, I_C= 10mA			0.8	
DC current gain	$h_{FE(1)}$	V_{CE}= 5V, I_C= 0.1mA	400		1200	
	$h_{FE(2)}$	V_{CE}= 5V, I_C= 1mA	450			
	$h_{FE(3)}$	V_{CE}= 5V, I_C= 10mA	400			
Small-Signal Current Gain	h_{fe}	I_C = 1mA, V_{CE} = 5V,f = 1kHz	450		1800	
Noise Figure	NF	I_C = 100 μA, V_{CE} = 5.0 V, R_S = 10 kΩ, f = 10 Hz to 15.7 kHz			2	dB
Collector-Base Capacitance	C_{cb}	V_{CB}= 5V, I_E= 0,f=100KHz			4	pF
Emitter-Base Capacitance	C_{eb}	V_{BE}= 0.5V, I_C= 0,f=100KHz			10	
Transition frequency	f_T	V_{CE}= 5V, I_C= 0.5mA,f=20MHz	50			MHz

■ Marking

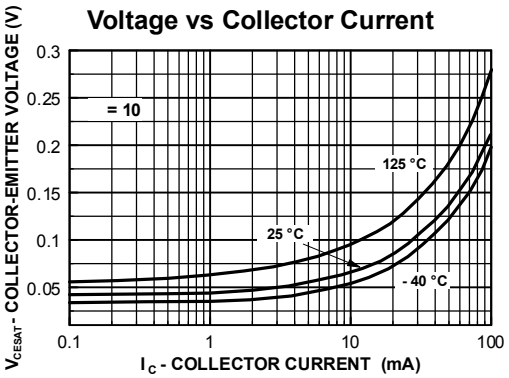
Marking	1R

■ Typical Characterisitics

Typical Pulsed Current Gain vs Collector Current



Collector-Emitter Saturation Voltage vs Collector Current



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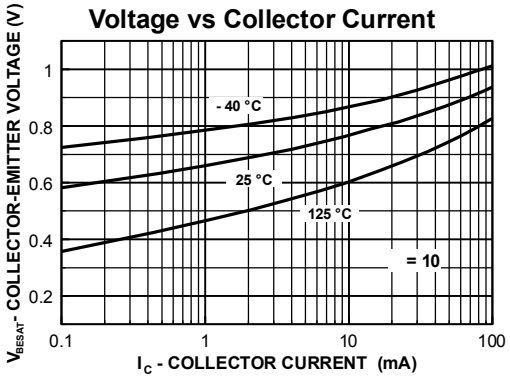
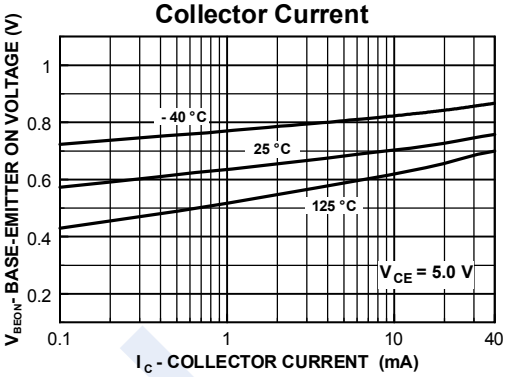
■ Typical Characterisitics

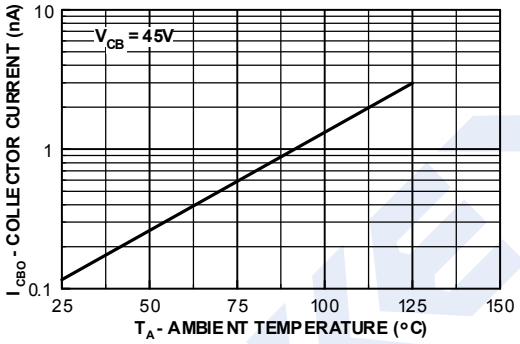
Base-Emitter Saturation Voltage vs Collector Current



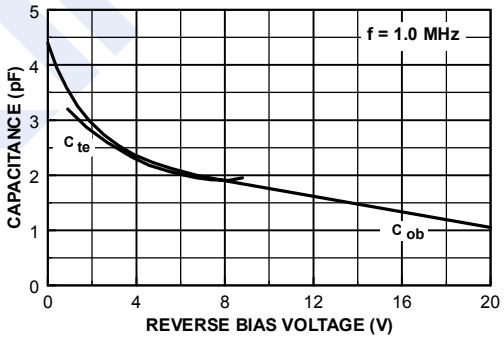
Base-Emitter ON Voltage vs Collector Current



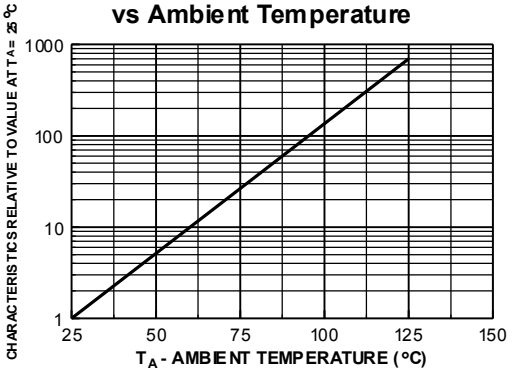
Collector-Cutoff Current vs Ambient Temperature



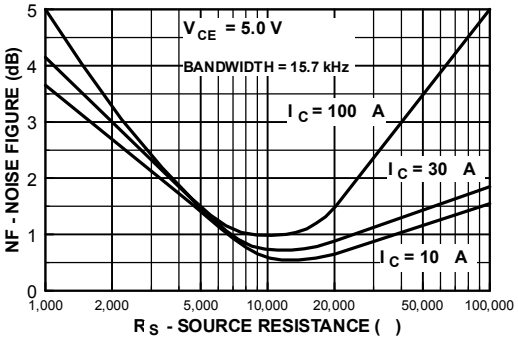
Input and Output Capacitance vs Reverse Bias Voltage



Normalized Collector-Cutoff Current vs Ambient Temperature



Wideband Noise Frequency vs Source Resistance



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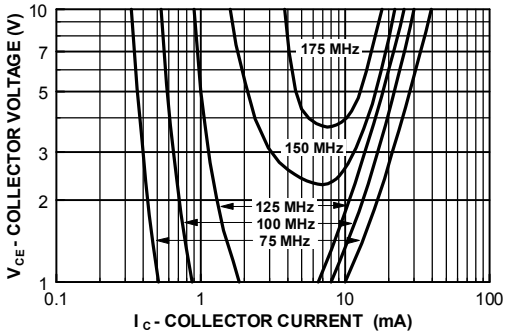
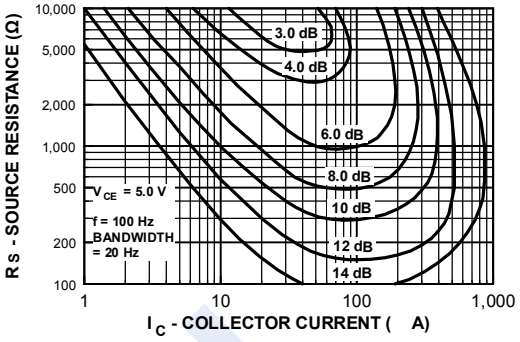
■ Typical Characterisitics

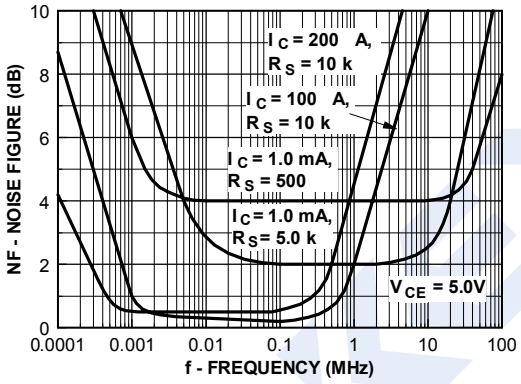
Contours of Constant Gain Bandwidth Product (f_T)



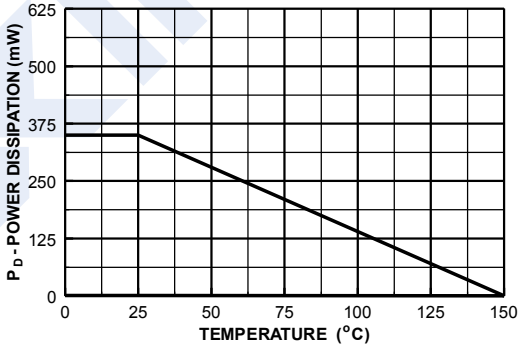
Contours of Constant Narrow Band Noise Figure



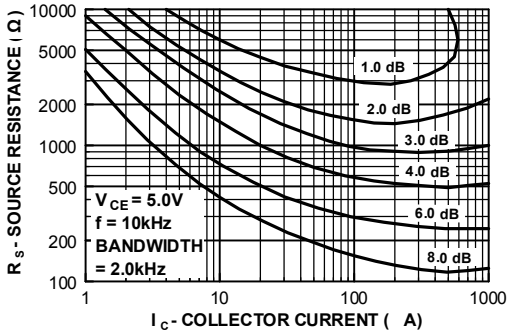
Noise Figure vs Frequency



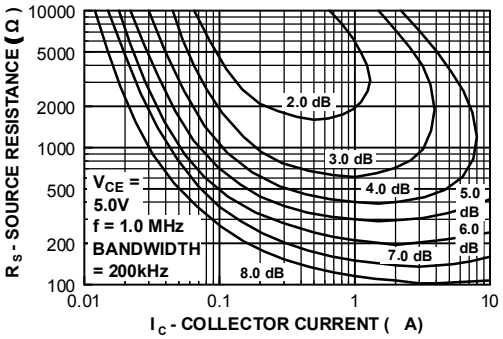
Power Dissipation vs Ambient Temperature



Contours of Constant Narrow Band Noise Figure



Contours of Constant Narrow Band Noise Figure



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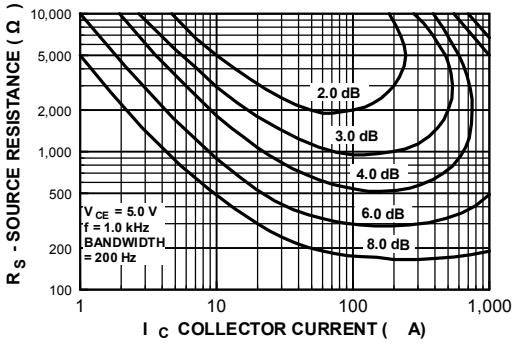
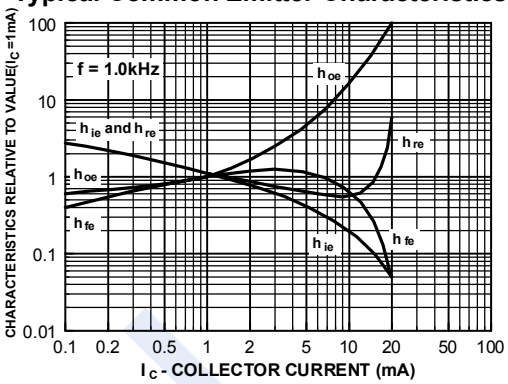
■ Typical Characterisitics

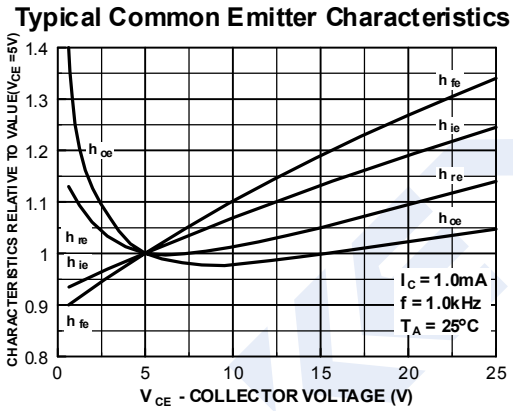
Contours of Constant Narrow Band Noise Figure



Typical Common Emitter Characteristics



Typical Common Emitter Characteristics



Typical Common Emitter Characteristics