

UTC MMBT5088 / MMBT5089

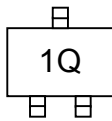
NPN EPITAXIAL SILICON TRANSISTOR

NPN GENERAL PURPOSE AMPLIFIER

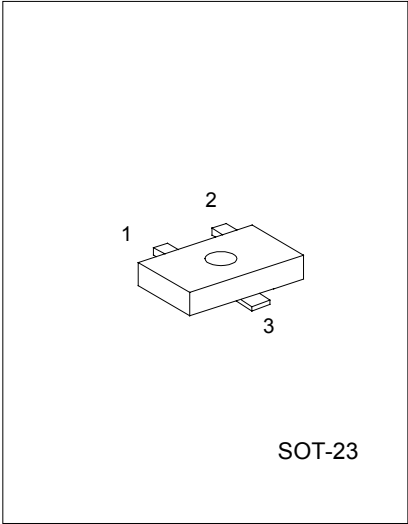
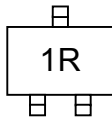
DESCRIPTION

The device is designed for low noise, high gain, general purpose amplifier applications at collector currents from 1 μ A to 50mA.

MARKING(MMBT5088)



MARKING(MMBT5089)



1:EMITTER 2:BASE 3:COLLECTOR

MAXIMUM RATINGS (TA=25°C, unless otherwise noted)

RATING	SYMBOL	MMBT5088	MMBT5089	UNIT
Collector-Emitter voltage	V _{CEO}	30	25	V
Collector-Base voltage	V _{CBO}	35	30	V
Emitter-base voltage	V _{EBO}	4.5		V
Collector current-continuous	I _c	100		mA
Operating and Storage Junction Temperature Range	T _j , T _{stg}	-55 ~ +150		°C

Note 1: These ratings are based on a maximum junction temperature of 150 degrees C.

Note 2: These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

THERMAL CHARACTERISTICS (TA=25°C, unless otherwise noted)

PARAMETER	SYMBOL	MAX	UNIT
Total Device Dissipation	P _D	350	mW
Derate above 25°C		2.8	mW/°C
Thermal Resistance, Junction to Ambient	R _{θJA}	357	°C/W

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ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise noted)

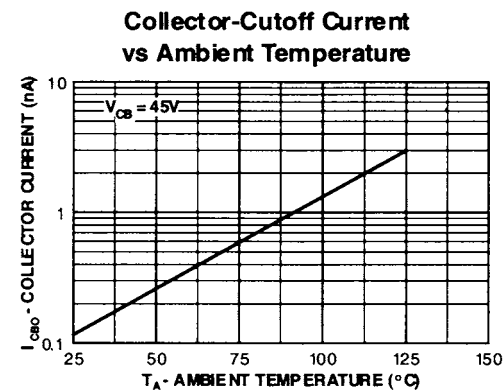
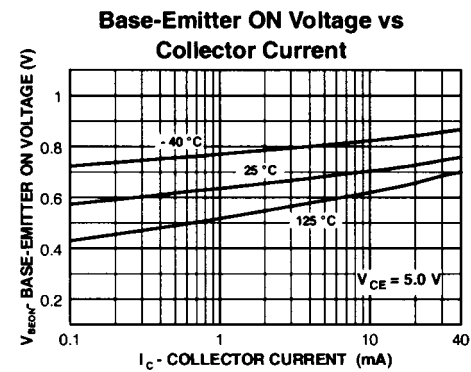
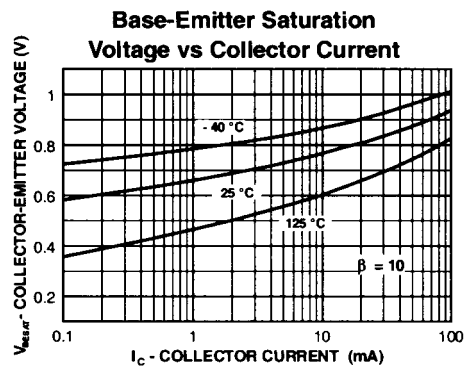
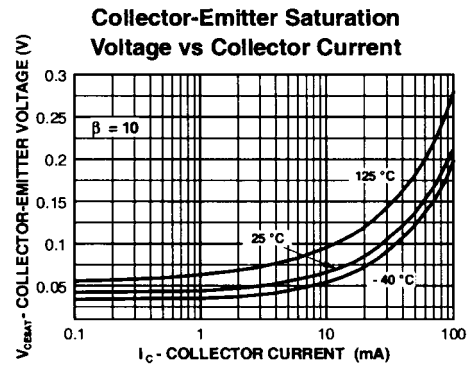
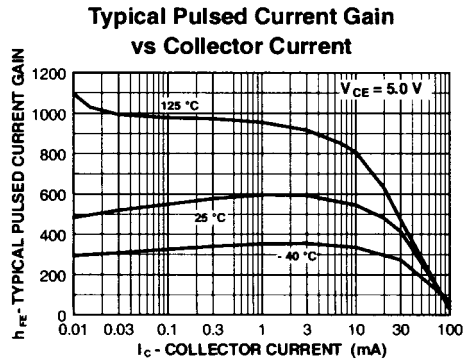
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (note) MMBT5088 MMBT5089	V _{(BR)CEO}	I _C =1.0mA, I _B =0	30 25		V V
Collector-Base Breakdown Voltage MMBT5088 MMBT5089	V _{(BR)CBO}	I _C =100μA, I _E =0	35 30		V V
Collector Cut-Off Current MMBT5088 MMBT5089	I _{CBO}	V _{CB} =20V, I _E =0 V _{CB} =15V, I _E =0		50 50	nA nA
Emitter Cutoff Current	I _{EBO}	V _{EB} =3.0V, I _C =0 V _{EB} =4.5V, I _C =0		50 100	nA nA
ON CHARACTERISTICS					
DC Current Gain	h _{FE}	V _{CE} =5.0V, I _C =100μA MMBT5088 MMBT5089 V _{CE} =5.0V, I _C =1.0mA MMBT5088 MMBT5089 V _{CE} =5.0V, I _C =10mA (note) MMBT5088 MMBT5089	300 400 350 450 300 400	900 1200	
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C =10mA, I _B =1.0mA		0.5	V
Base-Emitter On Voltage	V _{BE(on)}	I _C =10mA, V _{CE} =5.0V		0.8	V
SMALL SIGNAL CHARACTERISTICS					
Current Gain-Bandwidth Product	f _T	V _{CE} =5.0mA, I _C =500μA, f=20MHz	50		MHz
Collector-Base Capacitance	C _{cb}	V _{CB} =5.0V, I _E =0, f=100kHz		4	pF
Emitter-Base Capacitance	C _{eb}	V _{EB} =0.5V, I _C =0, f=100kHz		10	pF
Small-Signal Current Gain MMBT5088 MMBT5089	h _{FE}	V _{CE} =5.0V, I _C =1.0mA, f=1.0kHz	350 450	1400 1800	
Noise Figure MMBT5088 MMBT5089	NF	V _{CE} =5.0V, I _C =100μA, R _s =10kΩ, f=10kHz to 15.7kHz		3.0 2.0	dB dB

Note: Pulse Test: Pulse Width≤300μs, Duty Cycle≤2.0%.

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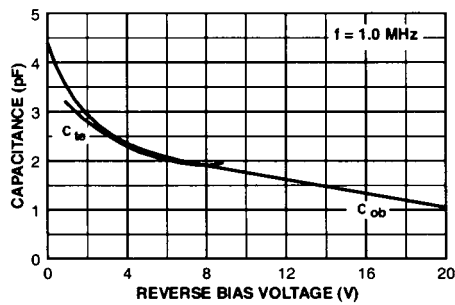
TYPICAL CHARACTERISTICS



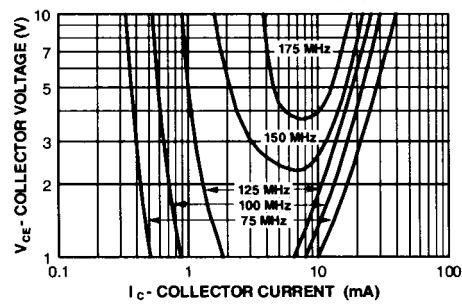
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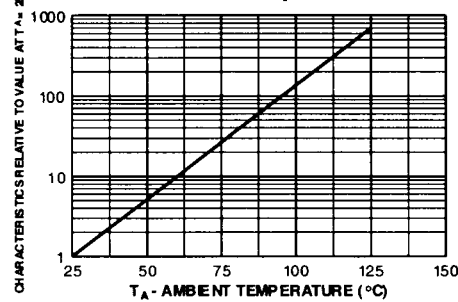
**Input and Output Capacitance
vs Reverse Bias Voltage**



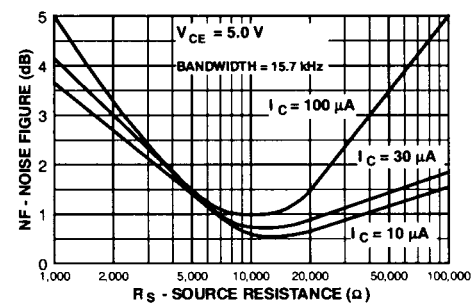
**Contours of Constant Gain
Bandwidth Product (f_T)**



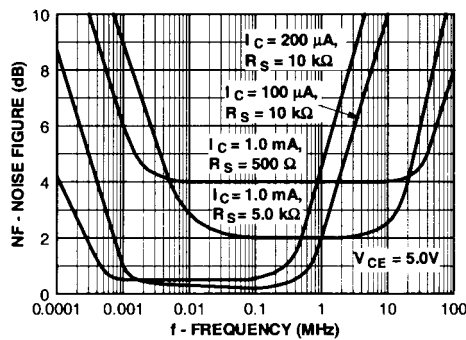
**Normalized Collector-Cutoff Current
vs Ambient Temperature**



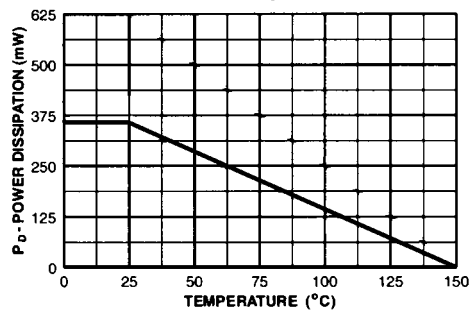
**Wideband Noise Frequency
vs Source Resistance**



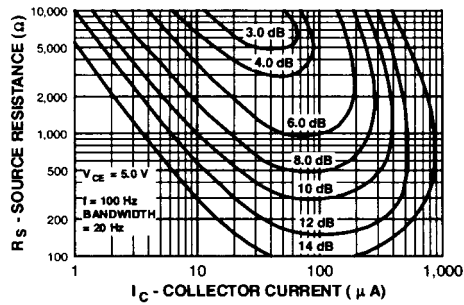
Noise Figure vs Frequency



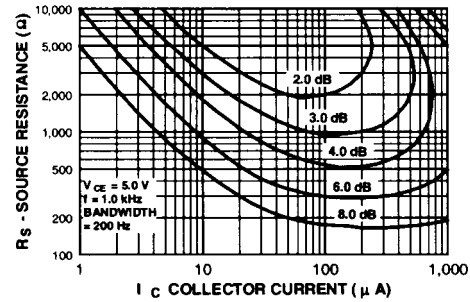
**Power Dissipation vs
Ambient Temperature**



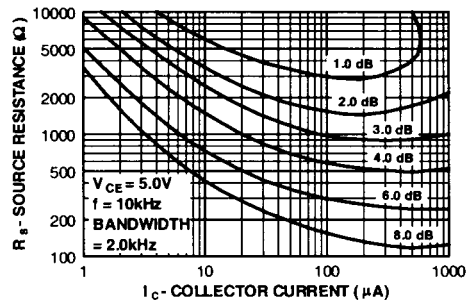
Contours of Constant
Narrow Band Noise Figure



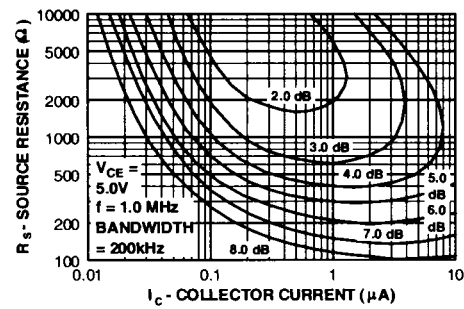
Contours of Constant
Narrow Band Noise Figure



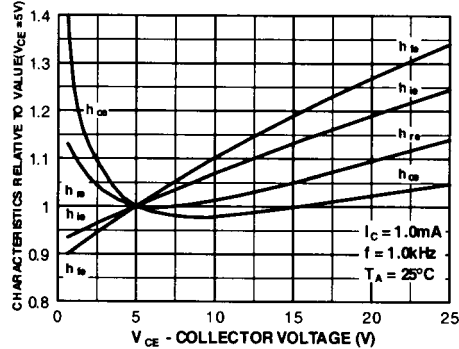
Contours of Constant
Narrow Band Noise Figure



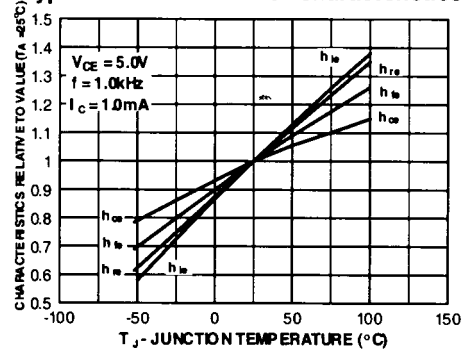
Contours of Constant
Narrow Band Noise Figure



Typical Common Emitter Characteristics

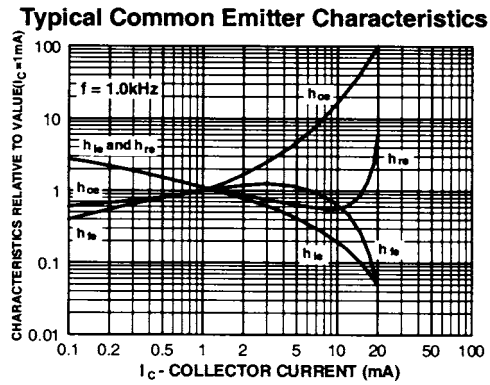


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