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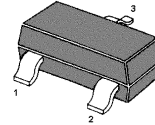
FLAT P, 3/F., EVEREST INDUSTRIAL CENTRE, 396 KWUN TONG ROAD,  
KWUN TONG, KOWLOON, HONG KONG.

TEL: 852-2790 0314 FAX: 852-2790 0206

## MMBT5089

### NPN General Purpose Amplifier

For low noise, high gain, general purpose amplifier applications at collector currents from 1 $\mu$ A to 50mA.

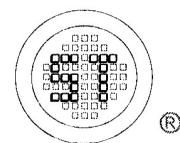


1. Base 2. Emitter 3. Collector

SOT-23 Plastic Package

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

	Symbol	Value	Unit
Collector Emitter Voltage	$V_{CEO}$	25	V
Collector Base Voltage	$V_{CBO}$	30	V
Emitter Base Voltage	$V_{EBO}$	4.5	V
Collector Current - Continuous	$I_C$	100	mA
Total Device Dissipation Derate above 25 $^\circ\text{C}$	$P_{tot}$	200 2.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Operating and Storage Junction Temperature Range	$T_J, T_S$	-55 to +150	$^\circ\text{C}$



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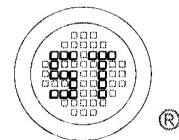
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### Characteristics at $T_{amb}=25\text{ }^{\circ}\text{C}$

	Symbol	Min.	Max.	Unit
DC Current Gain				
at $V_{CE}=5V, I_C=100\mu A$	$h_{FE}$	400	1200	-
at $V_{CE}=5V, I_C=1mA$	$h_{FE}$	450	-	-
at $V_{CE}=5V, I_C=10mA$	$h_{FE}$	400	-	-
Small Signal Current Gain				
at $V_{CE}=5V, I_C=1mA, f=1KHz$	$h_{fe}$	450	1800	-
Collector Base Breakdown Voltage				
at $I_C=100\mu A$	$V_{(BR)CBO}$	30	-	V
Collector Emitter Breakdown Voltage				
at $I_C=1mA$	$V_{(BR)CEO}$	25	-	V
Collector Emitter Saturation Voltage				
at $I_C=10mA, I_B=1mA$	$V_{CEsat}$	-	0.5	V
Base Emitter On Voltage				
at $I_C=10mA, V_{CE}=5V$	$V_{BEon}$	-	0.8	V
Collector Cutoff Current				
at $V_{CB}=15V$	$I_{CBO}$	-	50	nA
Emitter Cutoff Current				
at $V_{EB}=3V$	$I_{EBO}$	-	50	nA
at $V_{EB}=4.5V$	$I_{EBO}$	-	100	nA
Gain Bandwidth Product				
at $V_{CE}=5V, I_C=500\mu A, f=20MHz$	$f_T$	50	-	MHz
Collector Base Capacitance				
at $V_{CB}=5V, f=100KHz$	$C_{cb}$	-	4	pF
Emitter Base Capacitance				
at $V_{BE}=0.5V, f=100KHz$	$C_{eb}$	-	10	pF
Noise Figure				
at $V_{CE}=5V, I_C=100\mu A, R_s=10K\Omega, f=10Hz$ to $15.7KHz$	NF	-	2	dB



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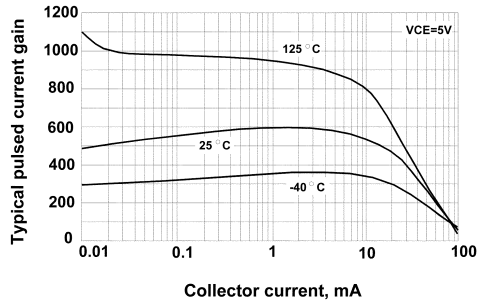
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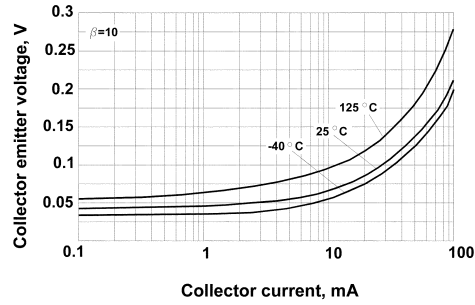
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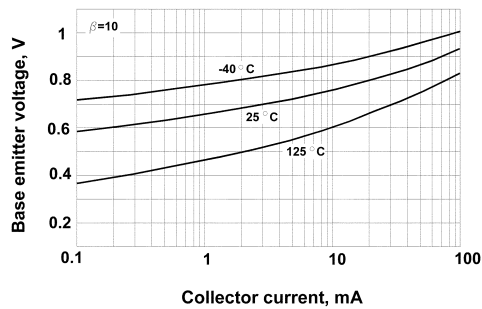
Typical pulsed current gain vs. collector current



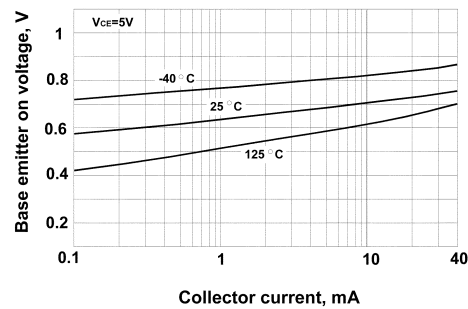
Collector emitter saturation voltage vs. collector current



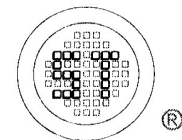
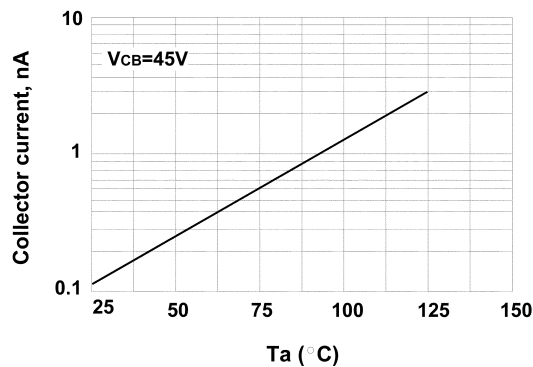
Base emitter saturation voltage vs. collector current



Base emitter on voltage vs. collector current



Collector cutoff current vs. ambient temperature



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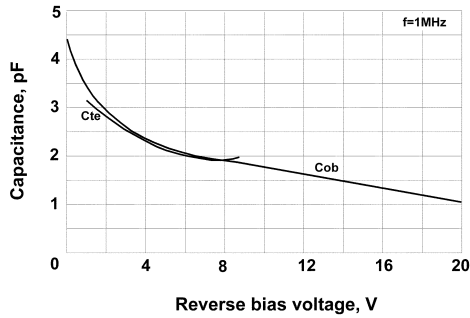
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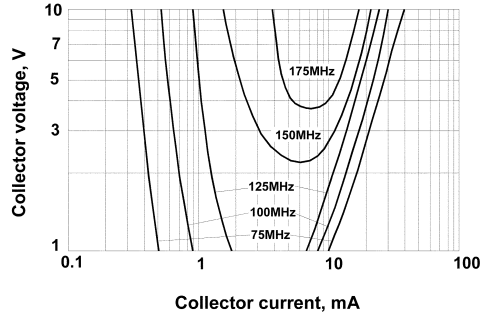
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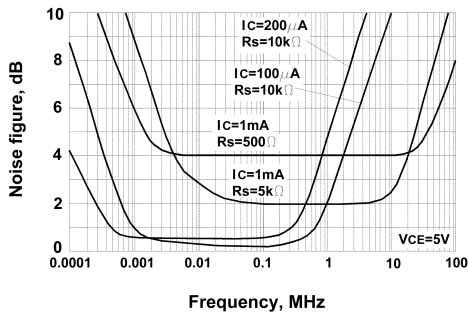
Input and output capacitance vs. reverse bias voltage



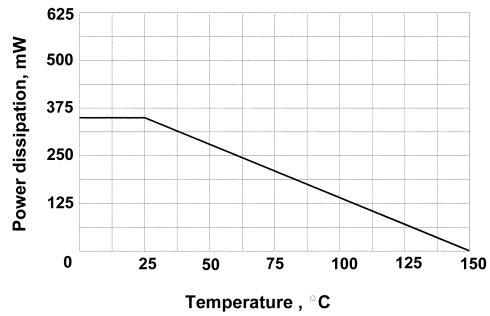
Contours of constant gain bandwidth product



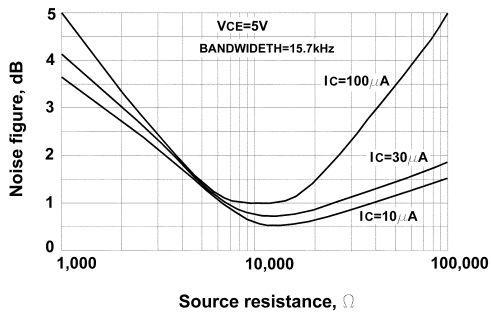
Noise figure vs. frequency



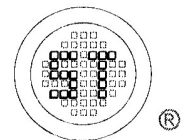
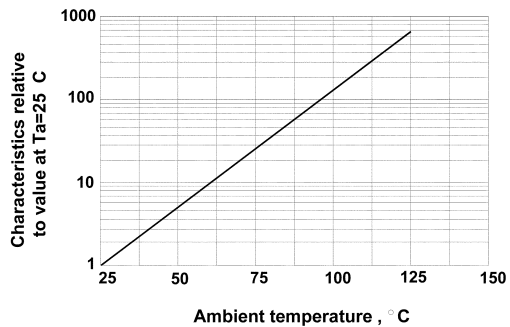
Power dissipation vs. ambient temperature



Wideband noise frequency vs. source resistance



Normalized collector cutoff current vs. ambient temperature



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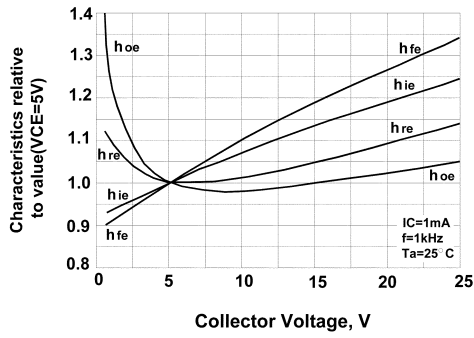
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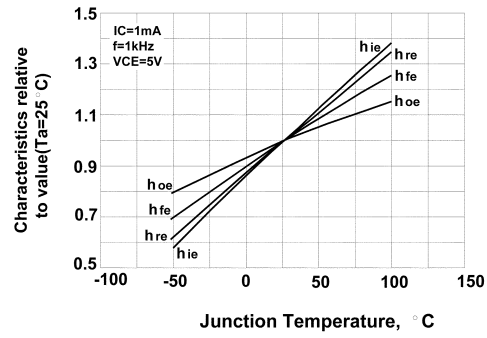
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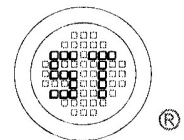
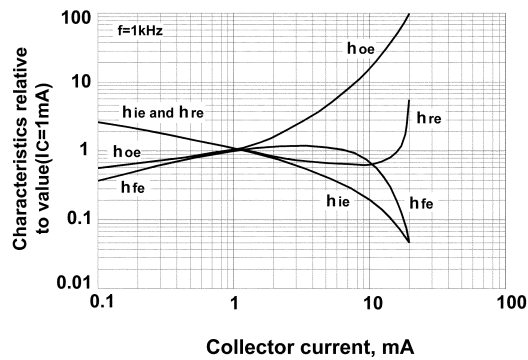
Typical common emitter characteristics



Typical common emitter characteristics



Typical common emitter characteristics



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