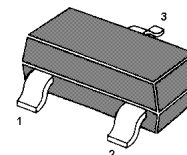


MMBT5089 NPN General Purpose Amplifier

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



1.Base 2.Emitter 3.Collector
SOT-23 Plastic Package

MARKING:1R

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

Parameter	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}	300 2.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Operating and Storage Junction Temperature Range	T_J, T_S	-55 to +150	$^\circ\text{C}$

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

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

Typical Characteristics

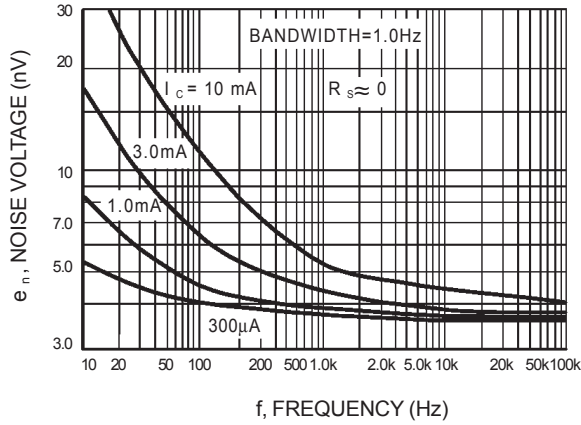


Fig 2. Effects of Frequency

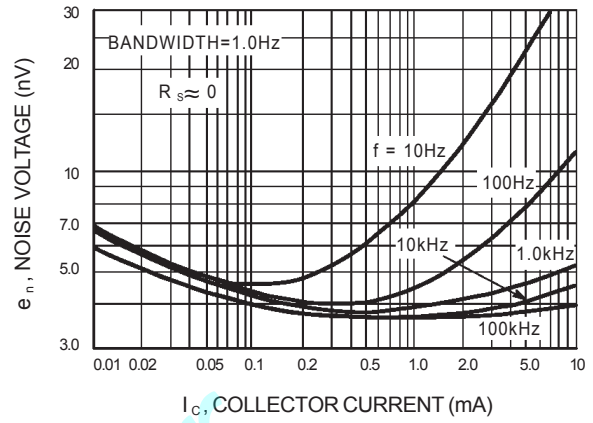


Fig 3. Effects of Collector Current

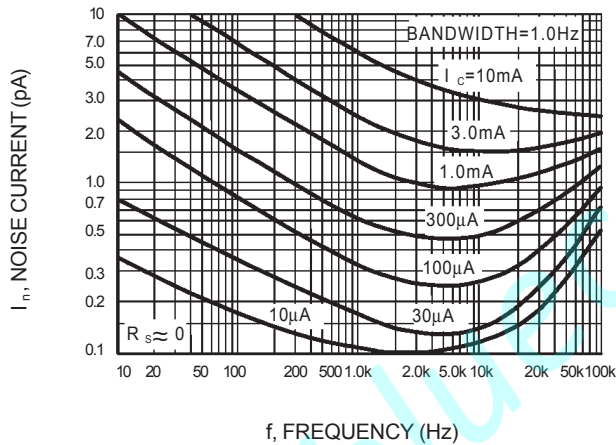


Fig 4. Noise Current

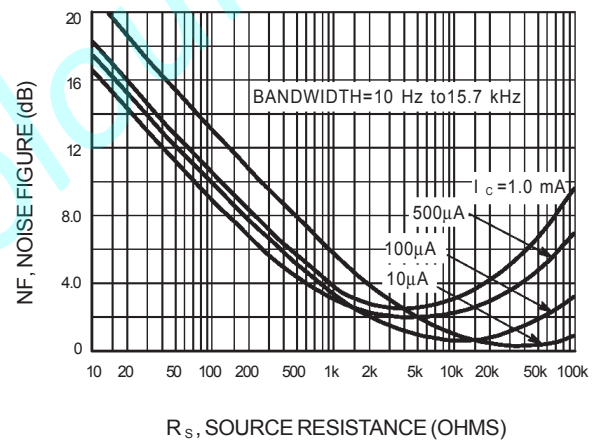


Fig 5. Wideband Noise Figure

100 Hz NOISE DATA

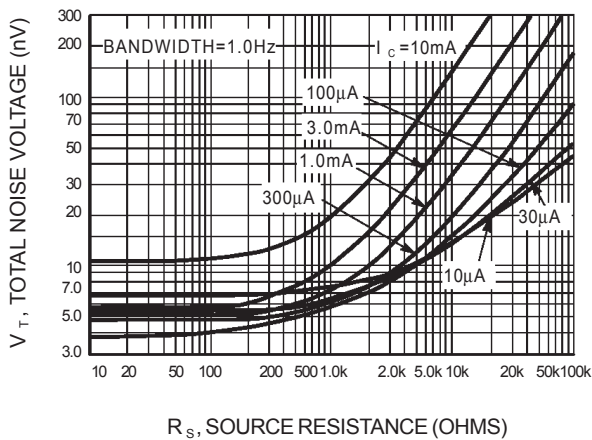


Fig 6. Total Noise Voltage

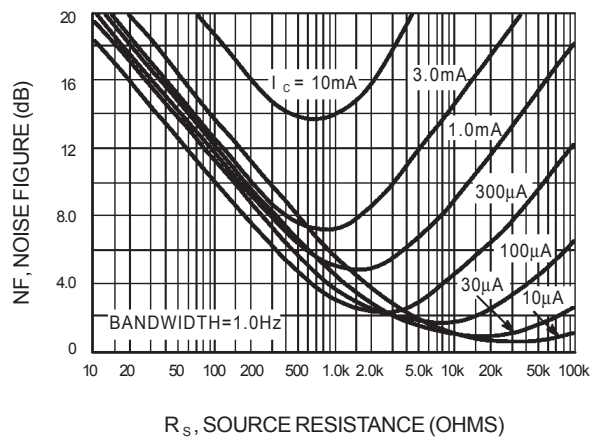


Fig 7. Noise Figure

Typical Characteristics

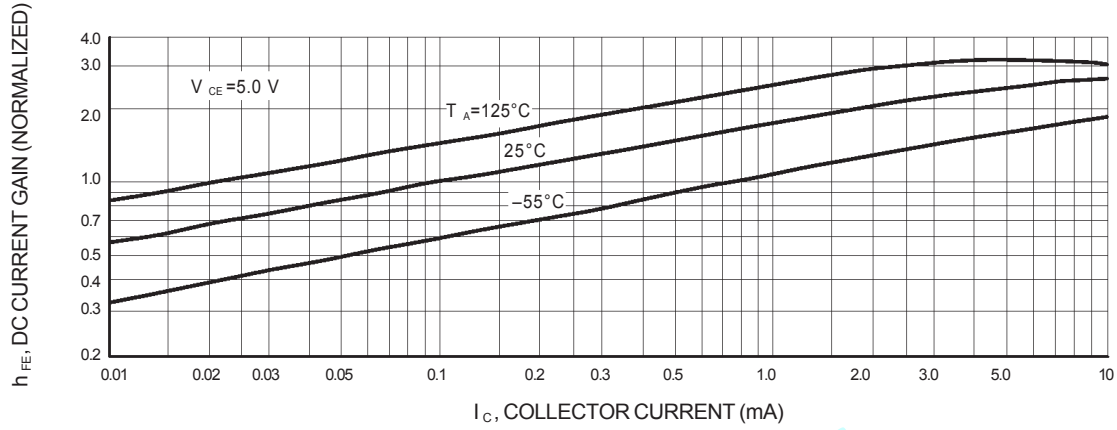


Fig 8. DC Current Gain

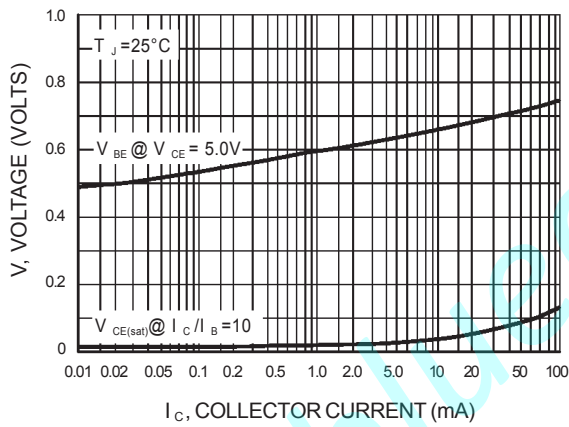


Fig 9. "On" Voltages

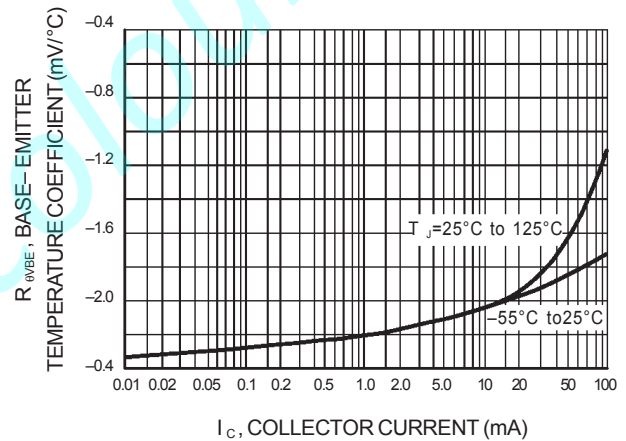


Fig 10. Temperature Coefficients

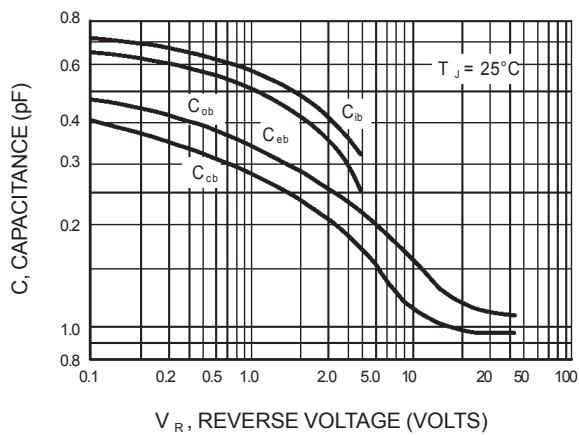


Fig 11. Capacitance

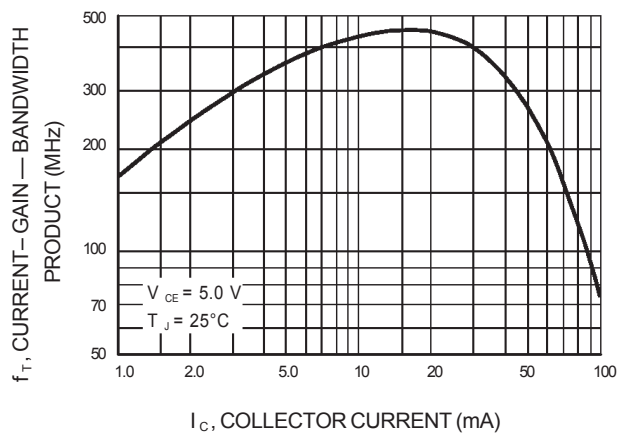
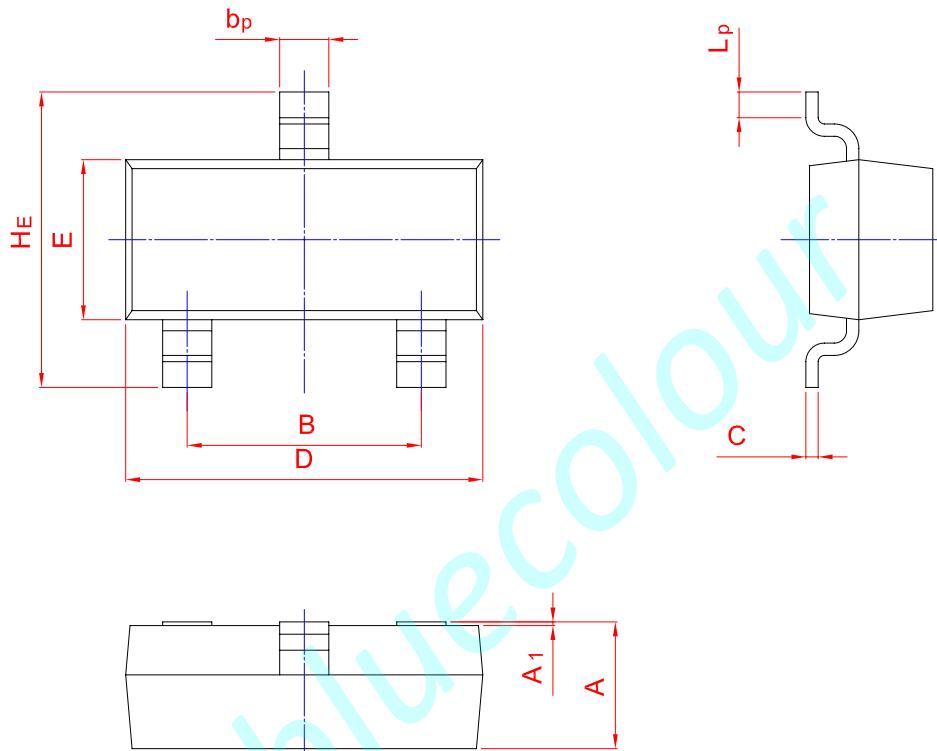
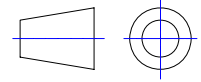


Fig 12. Current-Gain - Bandwidth Product

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20