

NPN General Purpose Amplifier

MMBT2222A

FEATURES

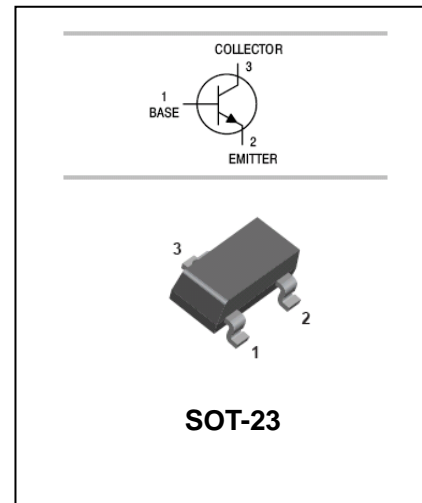
- Epitaxial planar die construction.
- Complementary PNP type available MMBT2907A.
- Ultra-small surface mount package.



Lead-free

APPLICATIONS

- Use as a medium power amplifier.
- Switching requiring collector currents up to 500mA.



ORDERING INFORMATION

Type No.	Marking	Package Code
MMBT2222A	1P	SOT-23

MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	600	mA
P_C	Collector Dissipation	300	mW
$R_{\theta JA}$	Thermal resistance junction to ambient	417	°C/W
T_j, T_{stg}	Junction and Storage Temperature	-55 to +150	°C



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ESD RATING

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

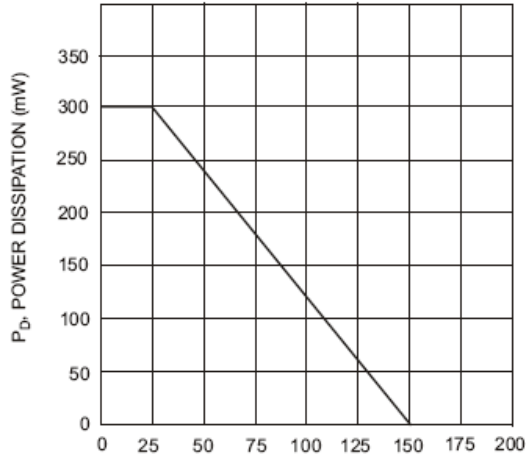
Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu A, I_E=0$	75			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10mA, I_B=0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu A, I_C=0$	6			V
Collector cut-off current	I_{CBO}	$V_{CB}=60V, I_E=0$			0.01	μA
Collector cut-off current	I_{CEX}	$V_{CE}=60V, V_{BE}=-3.0V$			0.01	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=3V, I_C=0$			0.01	μA
DC current gain	h_{FE}	$V_{CE}=10V, I_C=150mA$	100		300	
		$V_{CE}=10V, I_C=0.1mA$	35			
		$V_{CE}=10V, I_C=1.0mA$	50			
		$V_{CE}=10V, I_C=10mA$	75			
		$V_{CE}=10V, I_C=500mA$	40			
		$V_{CE}=1V, I_C=150mA$	50			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=500mA, I_B=50mA$ $I_C=150mA, I_B=15mA$			1.0 0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=500mA, I_B=50mA$ $I_C=150mA, I_B=15mA$		0.6	2.0 1.2	V
Transition frequency	f_T	$V_{CE}=20V, I_C=20mA$ $f=100MHz$	300			MHz
Output capacitance	C_{obo}	$V_{CB}=10V, I_E=0, f=1.0MHz$		8.0		pF
Input capacitance	C_{ibo}	$V_{EB}=0.5V, I_C=0,$ $f=1.0MHz$		25		pF
Delay time	t_d	$V_{CC}=30V, V_{BE(off)}=-0.5V$ $I_C=150mA, I_{B1}=15mA$			10	ns
Rise time	t_r				25	ns
Storage time	t_s	$V_{CC}=30V, I_C=150mA$ $I_{B1}=-I_{B2}=15mA$			225	ns
Fall time	t_f				60	ns



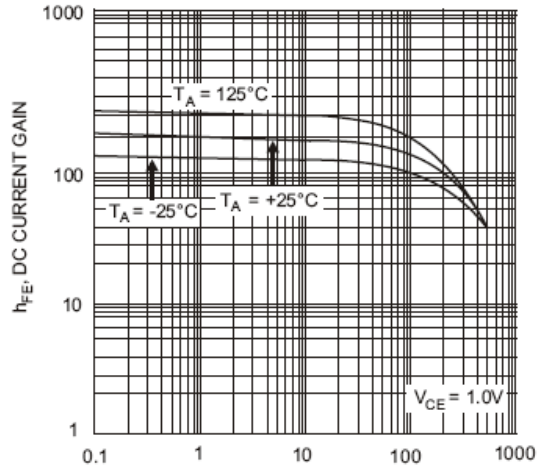
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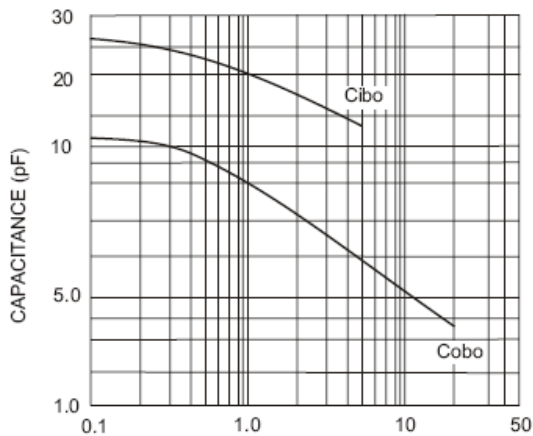
TYPICAL CHARACTERISTICS @ $T_a=25^\circ\text{C}$ unless otherwise specified



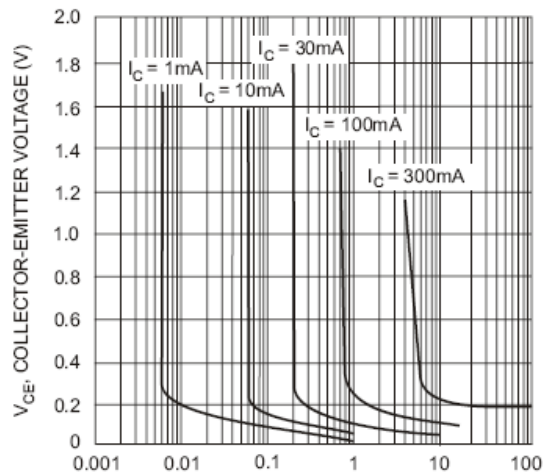
T_A , AMBIENT TEMPERATURE ($^\circ\text{C}$)
Fig. 1 Max Power Dissipation vs Ambient Temperature



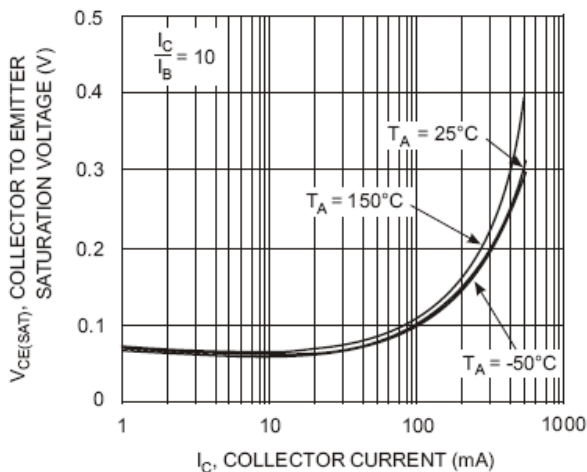
I_C , COLLECTOR CURRENT (mA)
Fig. 2 Typical DC Current Gain vs Collector Current



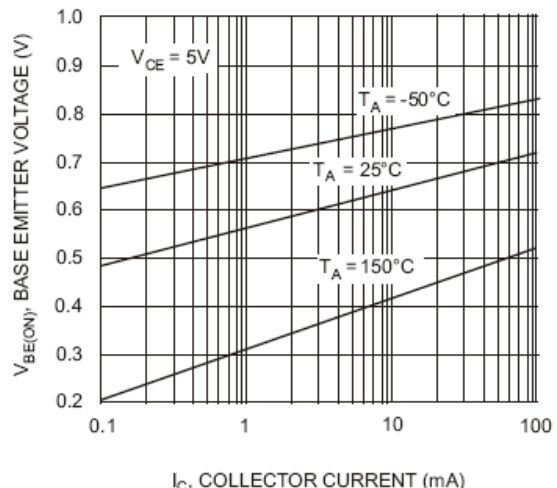
REVERSE VOLTS (V)
Fig. 3 Typical Capacitance



I_B , BASE CURRENT (mA)
Fig. 4 Typical Collector Saturation Region



I_C , COLLECTOR CURRENT (mA)
Fig. 5 Collector Emitter Saturation Voltage vs. Collector Current



I_C , COLLECTOR CURRENT (mA)
Fig. 6 Base Emitter Voltage vs. Collector Current



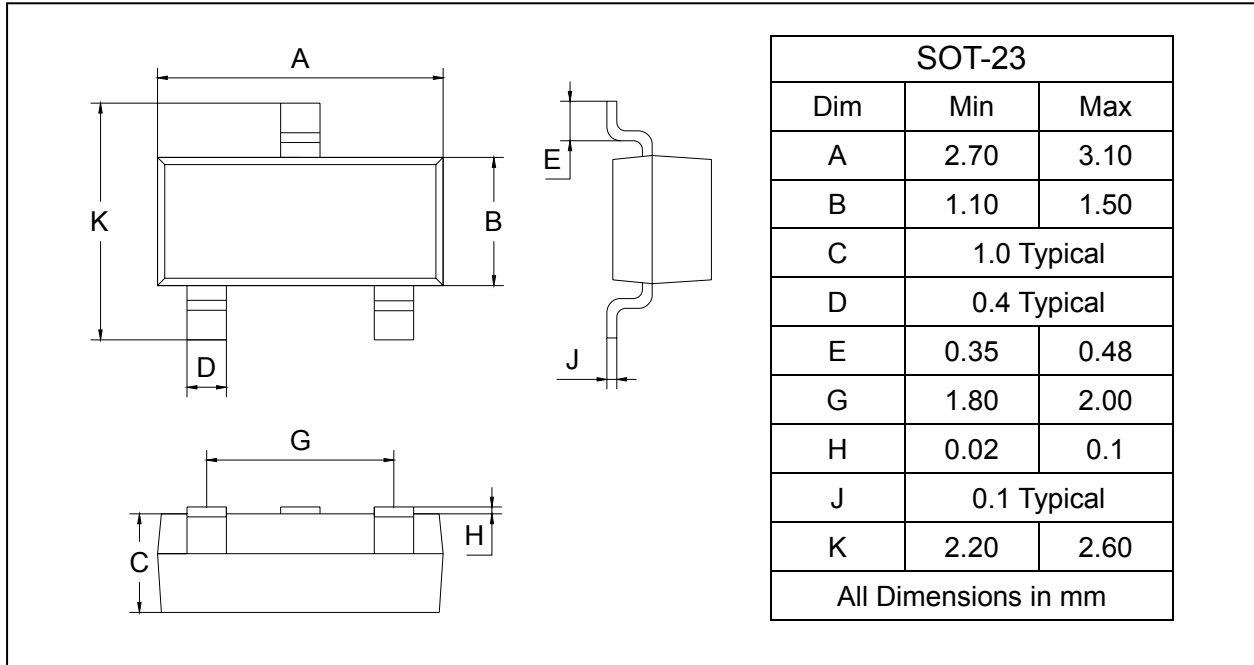
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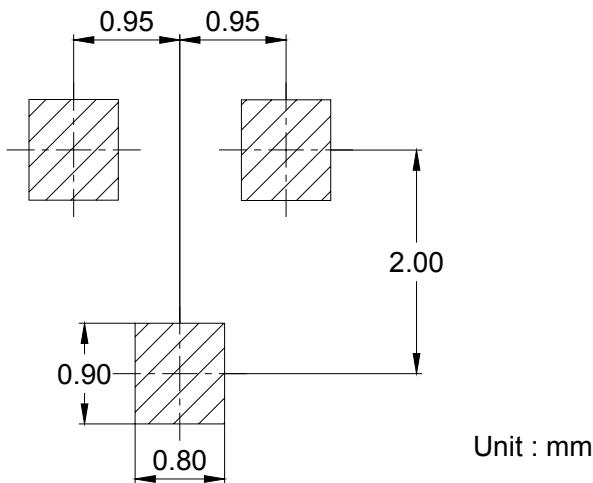
PACKAGE OUTLINE

Plastic surface mounted package

SOT-23



SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
MMBT2222A	SOT-23	3000/Tape&Reel