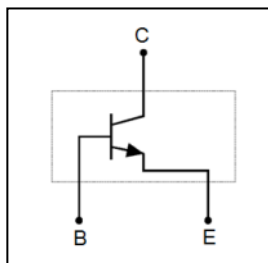


NPN General Purpose Amplifier

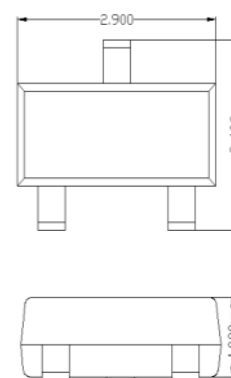
- ◇ Complementary PNP Type Available (MMBT3906)
- ◇ Epoxy Meets UL 94 V-0 Flammability Rating
- ◇ Surface Mount SOT-23 Package
- ◇ Rohs Compliant / Green EMC

Device Marking Code	
MMBT3904	1AM●

Equivalent Circuit



SOT23



Maximum Ratings (Ta=25°C Unless Otherwise Noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	200	mA
P_C	Collector Power Dissipation*	225	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	556	°C/W
T_j	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55~+150	°C

*Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

2025-12/03
REV:F

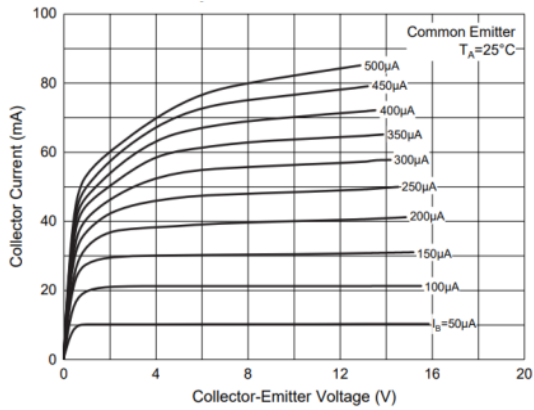
Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Test Conditions	Min	Max	Units
$V_{(BR)CEO}$	Collector–Emitter Breakdown Voltage	$I_C=1.0mA, I_E=0$	40		V
$V_{(BR)CBO}$	Collector–Base Breakdown Voltage	$I_C=10\mu A, I_E=0$	60		V
$V_{(BR)EBO}$	Emitter–Base Breakdown Voltage	$I_E=10\mu A, I_C=0$	6.0		V
I_{CBO}	Collector Cutoff Current	$V_{CB}=30V, I_E=0$		50	nA
I_{CEX}	Collector Cutoff Current	$V_{CE}=30V, V_{BE}=3.0V$		50	nA
h_{FE}	DC Current Gain	$I_C=0.1mA, V_{CE}=1.0V$	40		
		$I_C=1.0mA, V_{CE}=1.0V$	70		
		$I_C=10mA, V_{CE}=1.0V$	100	300	
		$I_C=50mA, V_{CE}=1.0V$	60		
		$I_C=100mA, V_{CE}=1.0V$	30		
$V_{CE(sat)}$	Collector–Emitter Saturation Voltage	$I_C=10mA, I_B=1.0mA$		0.2	V
		$I_C=50mA, I_B=5.0mA$		0.3	
$V_{BE(sat)}$	Base–Emitter Saturation Voltage	$I_C=10mA, I_B=1.0mA$	0.65	0.85	V
		$I_C=50mA, I_B=5.0mA$		0.95	
f_T	Transition Frequency	$I_C=10mA, V_{CE}=20V, f=100MHz$	300		MHZ
C_{obo}	Output Capacitance	$V_{CB}=5.0V, I_E=0, f=1.0MHz$		4.0	PF
C_{ibo}	Input Capacitance	$V_{BE}=0.5V, I_C=0, f=1.0MHz$		8.0	PF
NF	Noise Figure	$I_C=100\mu A, V_{CE}=5.0V, R_S=1.0k\Omega, f=10Hz$ to 15.7kHz		5.0	dB

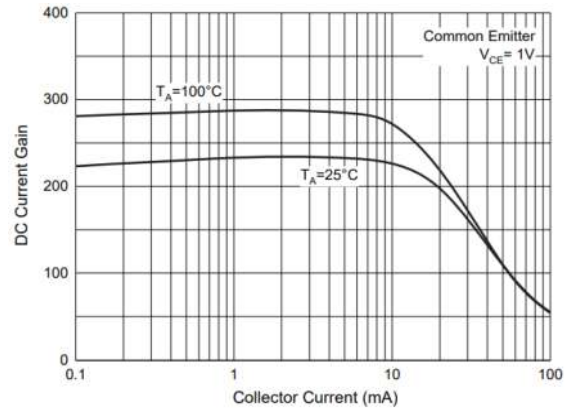
Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Max	Units
td	Delay Time	$V_{CC}=3.0V, V_{BE}=0.5V$ $I_C=10mA, I_{B1}=1.0mA$		35	ns
tr	Rise Time			35	ns
ts	Storage Time	$V_{CC}=3.0V, I_C=10mA$ $I_{B1}=I_{B2}=1.0mA$		200	ns
tf	Fall Time			50	ns

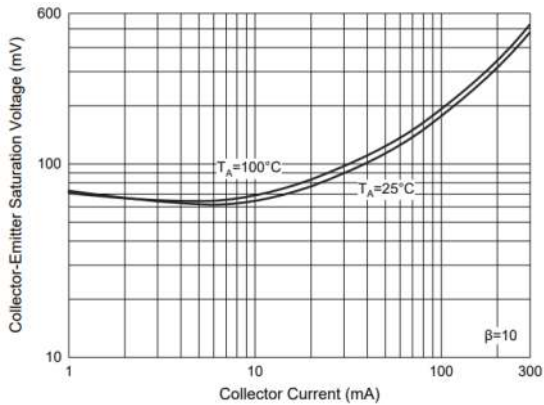
RATING AND CHARACTERISTICS CURVES(MMBT3904)



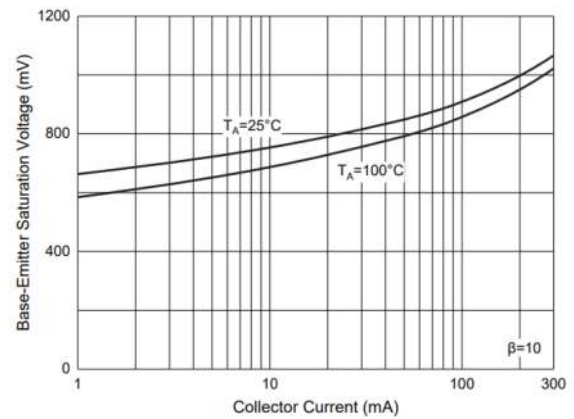
Static Characteristics



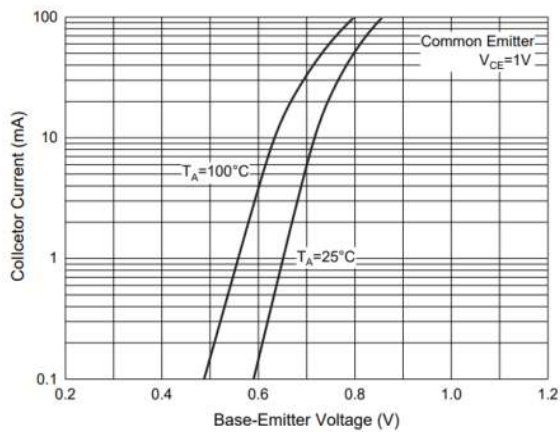
DC Current Gain Characteristics



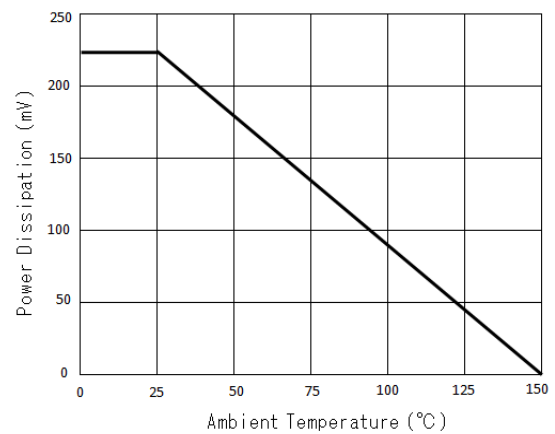
Collector-Emitter Saturation Voltage Characteristics



Base-Emitter Saturation Voltage Characteristics



Base-Emitter Voltage Characteristics



Collector Power Derating Curve

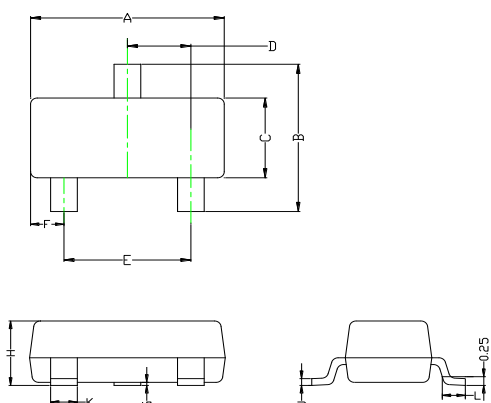
PACKAGING OF DIODE

REEL PACK

PACKAGE	PACKING CODE	REEL (EA)	COMPONENT SPACE(mm)	TAPE SPACE (mm)	REEL DIA (mm)	CARTON SIZE (mm)	EA PER CARTON	GROSS WEIGHT(Kg)
SOT-23/-3L	-T	3,000	---	---	178	438*438*220	180,000	---

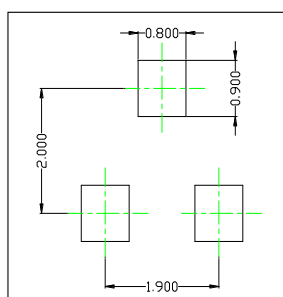
Package Dimensions

Package outline : SOT23



Symbol	Dimensions in mm	
	Min.	Max.
A	2.800	3.040
B	2.100	2.640
C	1.200	1.400
D	0.890	1.030
E	1.780	2.050
F	0.450	0.600
G	0.013	0.100
H	0.900	1.110
J	0.085	0.180
K	0.370	0.510
L	0.300	0.500

SOT23 Package Outline



Land Pattern Recommendation

Notice:

1. Lead plating: Pb free solder
2. Lead thickness includes solder plating
3. Lead frame: CAC-5
4. Other Tolerance: ± 0.05

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