

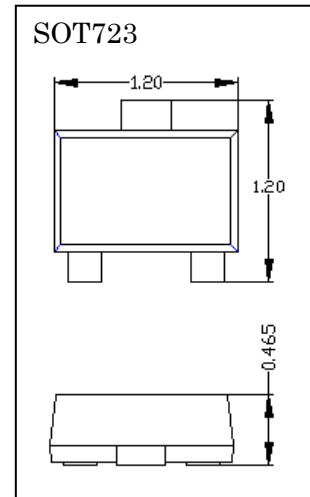
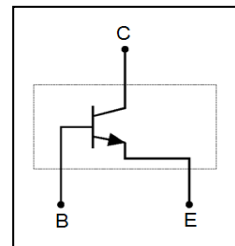
DATA SHEET

MMBT3904M

- ◇ Capable of 100 mWatts of Power Dissipation and 200mA I_c
- ◇ Operating and Storage Junction Temperatures: -55°C to 150°C
- ◇ Small Outline Surface Mount Package
- ◇ RoHS compliant / Green EMC

Device Marking Code	
MMBT3904	1N

Circuit Diagram



Maximum Ratings ($T_a=25^{\circ}\text{C}$ 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	100	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	1250	$^{\circ}\text{C}/\text{W}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical Characteristics @ 25°C Unless Otherwise Specified

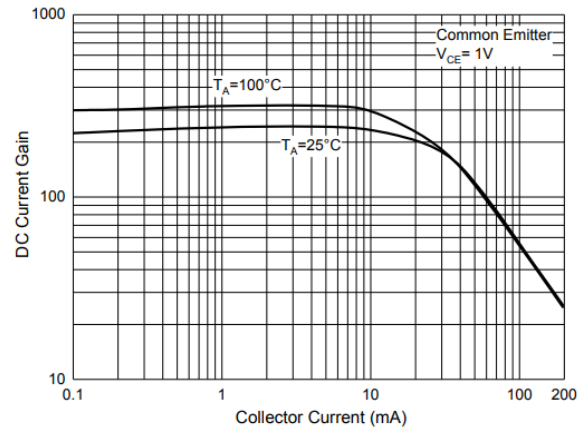
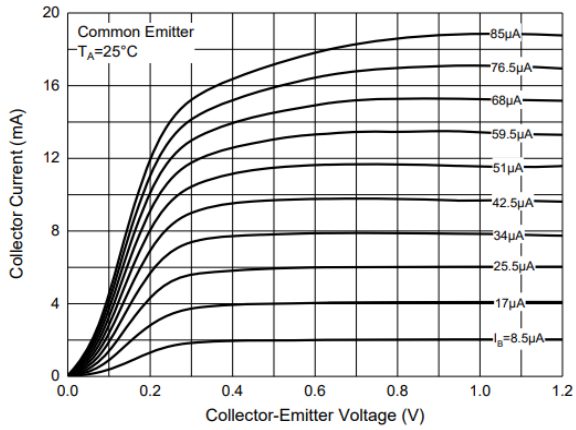
Symbol	Parameter	Test Conditions	Min	Max	Units
V_{CEO}	Collector-Emitter Breakdown Voltage	$I_C=1.0\text{mA}$, $I_B=0$	40		V
V_{CBO}	Collector-Base Breakdown Voltage	$I_C=10\mu\text{A}$, $I_E=0$	60		V
V_{EBO}	Emitter-Base Breakdown Voltage	$I_E=10\mu\text{A}$, $I_C=0$	6		V

I_{CBO}	Collector-Base Cutoff Current	$V_{CB}=30V, I_E=0$		100	nA
I_{CEX}	Collector- Emitter Cutoff Current	$V_{CE}=30V, V_{EB(OFF)}=3.0V$		50	nA
I_{EBO}	Collector Cutoff Current	$V_{EB}=5V, I_C=0$		100	nA
$h_{FE(1)}$	DC Current Gain	$I_C=0.1mA, V_{CE}=1V$	40		
$h_{FE(2)}$	DC Current Gain	$I_C=1mA, V_{CE}=1V$	70		
$h_{FE(3)}$	DC Current Gain	$I_C=10mA, V_{CE}=1V$	100	300	
$h_{FE(4)}$	DC Current Gain	$I_C=50mA, V_{CE}=1V$	60		
$V_{CE(sat)1}$	Collector-Emitter Saturation Voltage	$I_C=10mA, I_B=1mA$		0.2	V
$V_{CE(sat)2}$	Collector-Emitter Saturation Voltage	$I_C=50mA, I_B=5mA$		0.3	V
$V_{BE(sat)1}$	Base-Emitter Saturation Voltage	$I_C=10mA, I_B=1mA$	0.65	0.85	V
$V_{BE(sat)2}$	Base-Emitter Saturation Voltage	$I_C=50mA, I_B=5.0mA$		0.95	V
f_T	Current Gain-Bandwidth Product	$I_C=10mA, V_{CE}=20V, f=100MHz$	300		MHz

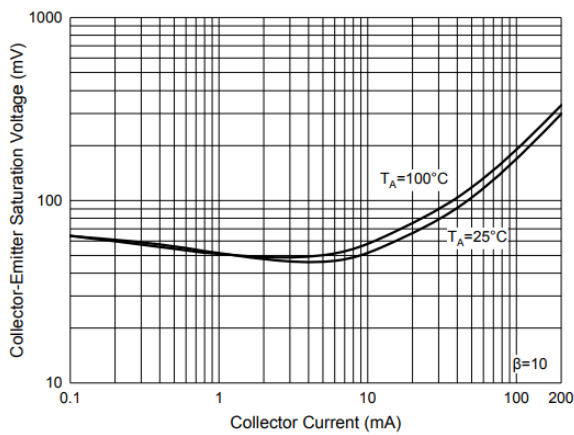
SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Max	Units
t_d	Delay Time	$V_{CC}=3.0V, V_{BE(off)}=-0.5V$		35	ns
t_r	Rise Time	$I_C=10mA, I_{B1}=1.0mA$		35	ns
t_s	Storage Time	$V_{CC}=3.0V, I_C=10mA$		200	ns
t_f	Fall Time	$I_{B1}=I_{B2}=1.0mA$		50	ns

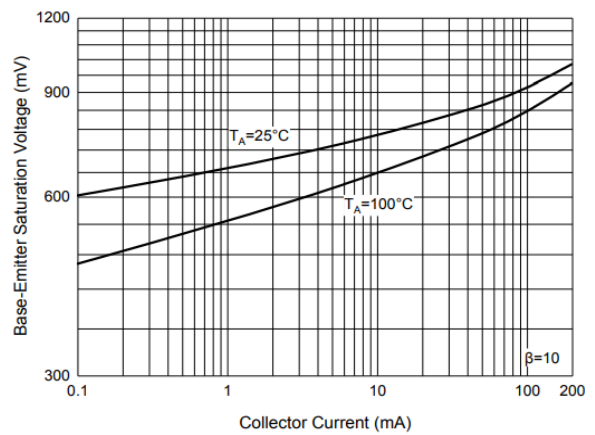
Typical Characteristics



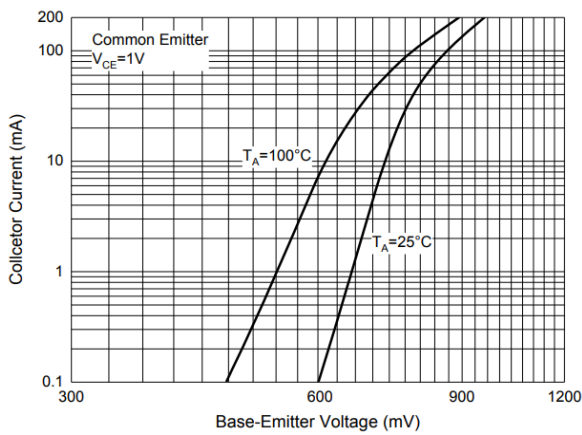
Static Characteristics



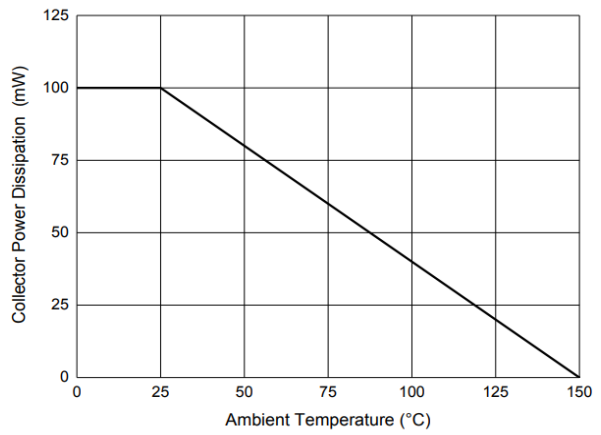
Base-Emitter Saturation Voltage Characteristics



Collector-Emitter Saturation Voltage Characteristics



Base-Emitter Saturation Voltage Characteristics



Base-Emitter Voltage Characteristics

Collector Power Derating Curve

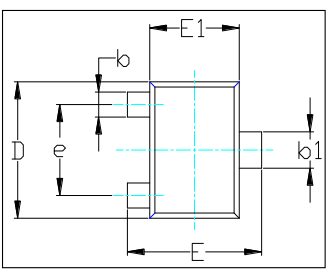
ORDERING INFORMATION

Device	Package	Shipping	Tape wide	Emboss pitch	Tape specification	Notes
MMBT3904M	SOT723	Tape & Reel 8000pcs /7" Reel	8mm	4mm	Conductive	

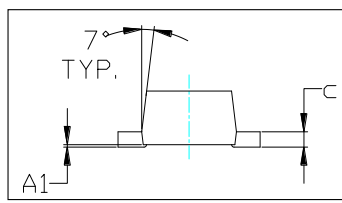
PACKAGE DIMENSIONS

Package outline : SOT723

Top view

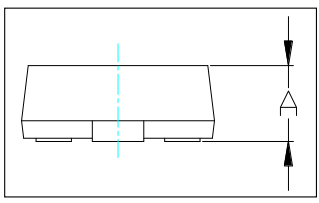


Side view

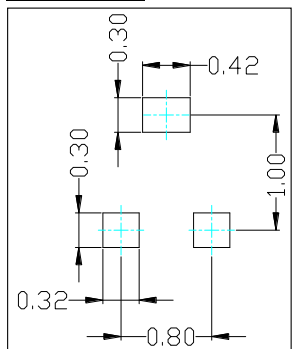


SYMBOL	DIMENSIONS IN MILLIMETER	
	MIN	MAX
A	0.430	0.500
A1	0.000	0.050
b	0.170	0.270
b1	0.270	0.370
c	0.080	0.150
D	1.150	1.250
E	1.150	1.250
E1	0.750	0.850
e	0.800 TYP.	
θ	0°	7°

Front view



Soldering Pattern



Notice:

1. Lead plating: Pb free solder
2. Lead thickness includes solder plating
3. Lead frame: CAC-5
4. Other Tolerance: ± 0.05
5. Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions
6. Unit: mm