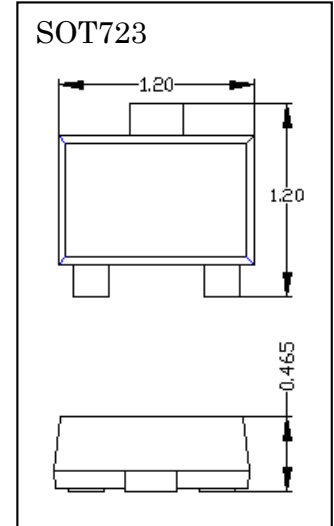
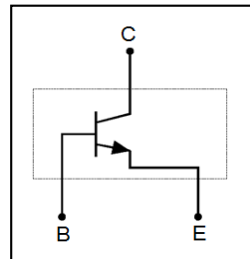


NPN General Purpose Amplifier

- ◇ 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	
MMBT3904M	1N

Equivalent Circuit



Maximum Ratings (T_a=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V _{CB0}	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 _{θJA}	Thermal Resistance From Junction To Ambient	1250	°C/W
T _j	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55~+150	°C

Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Test Conditions	Min	Max	Units
V _{CEO}	Collector – Emitter Breakdown Voltage	I _C = 1.0mA, I _B = 0	40		V
V _{CB0}	Collector – Base Breakdown Voltage	I _C = 10μA, I _E = 0	60		V
V _{EBO}	Emitter – Base Breakdown Voltage	I _E = 10μA, I _C = 0	6		V



MMBT3904M

NPN General Purpose Amplifier

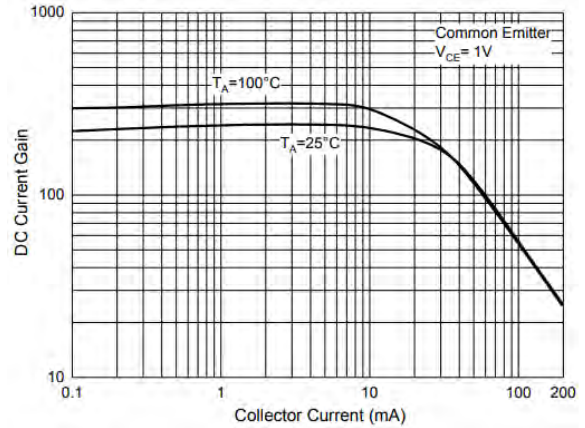
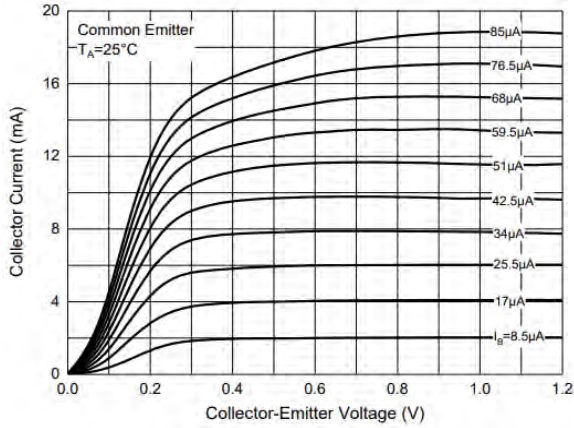
I_{CBO}	Collector – Base Cutoff Current	$V_{CB}=30V, I_E=0$		100	nA
I_{CEX}	Collector – Emitter Cutoff Current	$V_{CE}=30V, V_{EB(OFF)}=3.0V$		50	nA
I_{EBO}	Collector Cutoff Current	$V_{EB}=5V, I_C=0$		100	nA
$h_{FE(1)}$	DC Current Gain	$I_C=0.1mA, V_{CE}=1V$	40		
$h_{FE(2)}$	DC Current Gain	$I_C=1mA, V_{CE}=1V$	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

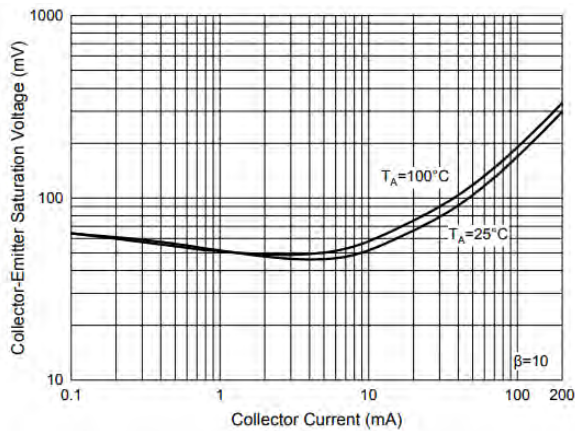
Symbol	Parameter	Test Conditions	Min	Max	Units
t_d	Delay Time	$V_{CC}=3.0V, V_{BE(off)} = -0.5V$		35	ns
t_r	Rise Time	$I_C=10mA, I_{B1}=1.0mA$		35	ns
t_s	Storage Time	$V_{CC}=3.0V, I_C=10mA$		200	ns
t_f	Fall Time	$I_{B1}=I_{B2}=1.0mA$		50	ns

NPN General Purpose Amplifier

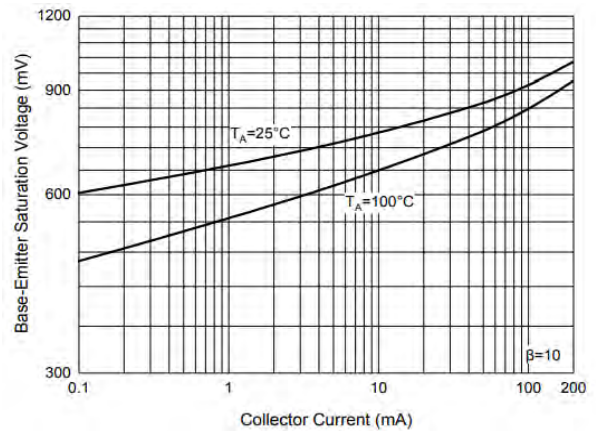
Typical Characteristics



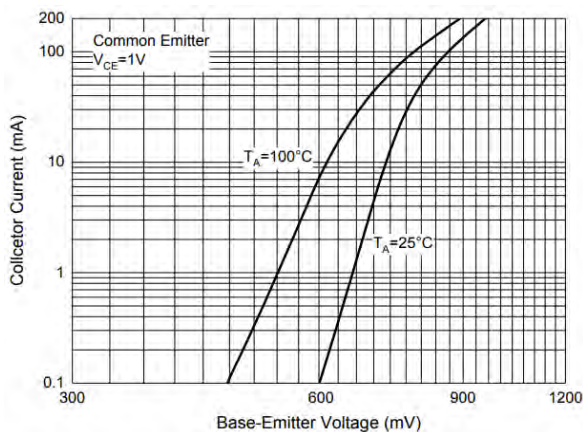
Static Characteristics



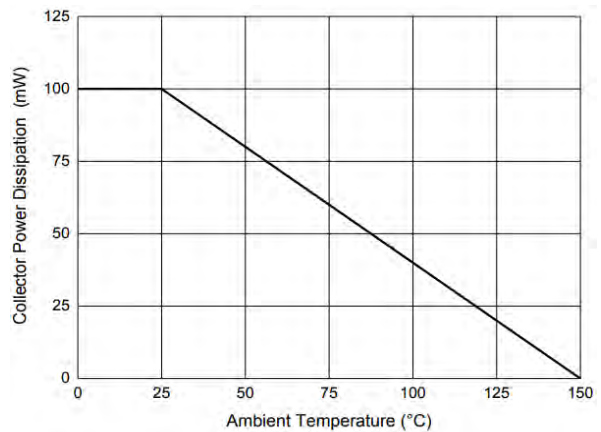
Base-Emitter Saturation Voltage Characteristics



Collector-Emitter Saturation Voltage Characteristics



Base-Emitter Saturation Voltage Characteristics



Base-Emitter Voltage Characteristics

Collector Power Derating Curve

NPN General Purpose Amplifier

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:

- Lead plating: Pb free solder
- Lead thickness includes solder plating
- Lead frame: CAC-5
- Other Tolerance: ±0.05
- Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusion
- Unit: mm