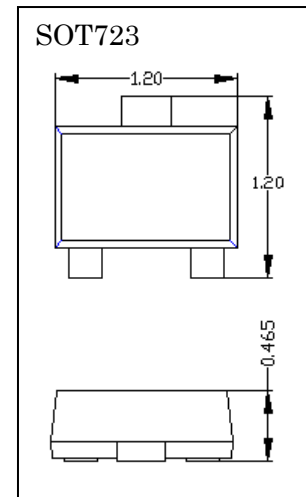
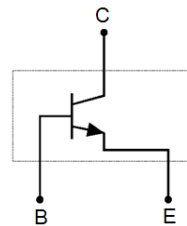


MMBT3904M

- ◇ Capable of 200 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

Circuit Diagram



MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CB0}	Collector-Base Voltage	60	V
V_{CE0}	Collector-Emitter Voltage	40	V
V_{EB0}	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_{CE0}	Collector-Emitter Breakdown Voltage	$I_c=1.0\text{mA}$, $I_B=0$	40		V
V_{CB0}	Collector-Base Breakdown Voltage	$I_c=10\mu\text{A}$, $I_E=0$	60		V
V_{EB0}	Emitter-Base Breakdown Voltage	$I_E=10\mu\text{A}$, $I_c=0$	6		V

I_{CB0}	Collector Cutoff Current	$V_{CB}=30V, I_E=0$		100	nA
I_{CEX}	Collector Cutoff Current	$V_{CE}=30V, V_{EB(OFF)}=3.0V$		50	nA
I_{EB0}	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

PACKAGE DIMENSIONS

