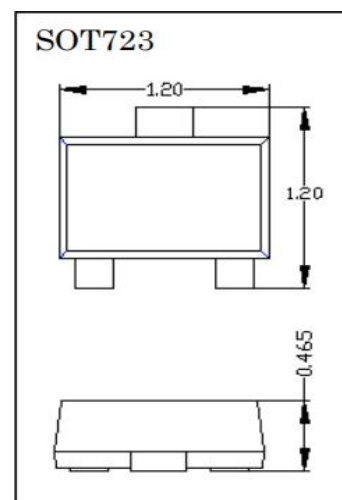
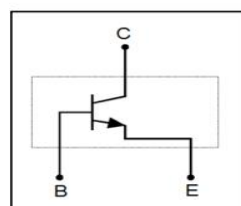


NPN General Purpose Amplifier

- ◇ Capable of 100m Watts 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	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
P_C	Collector Power Dissipation	100	mW
I_C	Collector Current	200	mA
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	-55 to 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	1250	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics ($T_a = 25^{\circ}\text{C}$ Unless Otherwise Specified)

Symbol	Parameter	Test Conditions	Min	Max	Units
V_{CBO}	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}$, $I_E = 0$	60		V
V_{CEO}	Collector-Emitter Breakdown Voltage	$I_C = 1\text{mA}$, $I_B = 0$	40		V
V_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}$, $I_C = 0$	6		V
I_{CBO}	Collector-Base Cutoff Current	$V_{CB} = 30\text{V}$, $I_E = 0$		100	nA
I_{CEX}	Collector-Emitter Cutoff Current	$V_{CE} = 30\text{V}$, $V_{BE} = 3\text{V}$		50	nA
I_{EBO}	Collector Cutoff Current	$V_{EB} = 5\text{V}$, $I_C = 0$		100	nA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{mA}$, $I_B = 1\text{mA}$		0.2	V
		$I_C = 50\text{mA}$, $I_B = 5\text{mA}$		0.3	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{mA}$, $I_B = 1\text{mA}$	0.65	0.85	V
		$I_C = 50\text{mA}$, $I_B = 5\text{mA}$		0.95	

h_{FE}	DC Current Gain	$V_{CE} = 1V, I_C = 0.1mA$	40		
		$V_{CE} = 1V, I_C = 1mA$	70		
		$V_{CE} = 1V, I_C = 10mA$	100	300	
		$V_{CE} = 1V, I_C = 50mA$	60		
f_T	Current Gain-Bandwidth Product	$V_{CE} = 20V, I_C = 10mA, f = 100MHz$	300		MHz

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Max	Units
t_d	Delay Time	$V_{CC} = 3V, I_C = 10mA, V_{BE} = -0.5V, I_{B1} = 1mA$		35	nS
t_r	Rise Time			35	nS
t_s	Storage Time	$V_{CC} = 3V, I_C = 10mA, I_{B1} = I_{B2} = 1mA$		200	nS
t_f	Fall Time			50	nS

Ordering Information

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

Package Dimensions

