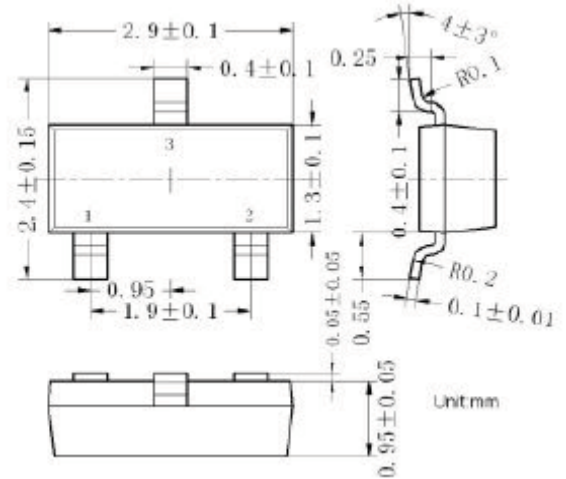


**SOT-23**

**Specification Features:**

- ◆ Complementary Type The NPN Transistor  
MMBT3904 is Recommended
- ◆ Epitaxial Planar Die Construction
- ◆ P/N suffix V means AEC-Q101 qualified, e.g:MMBT3904V
- ◆ Halogen-free
- ◆ Marking :1AM



1.BASE 2.EMITTER 3.COLLECTOR

**Absolute 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
$I_C$	Collector Current	200	mA
$P_C$	Collector Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	625	$^{\circ}\text{C}/\text{W}$
$T_j$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55~+150	$^{\circ}\text{C}$

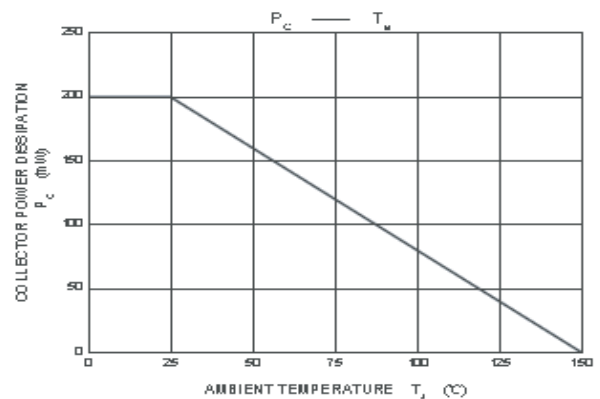
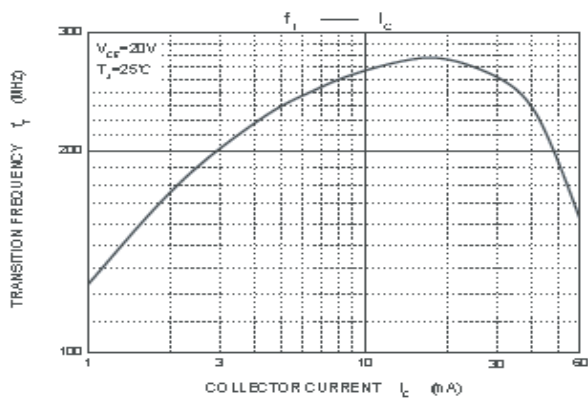
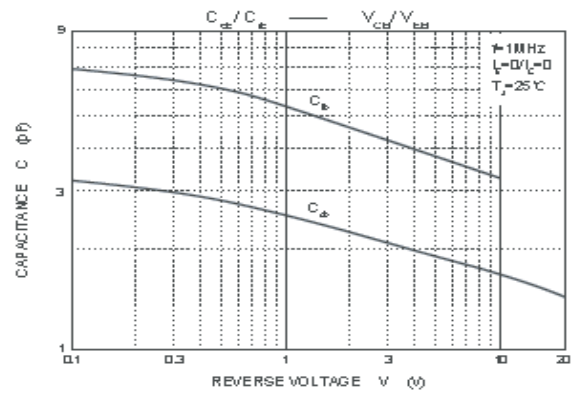
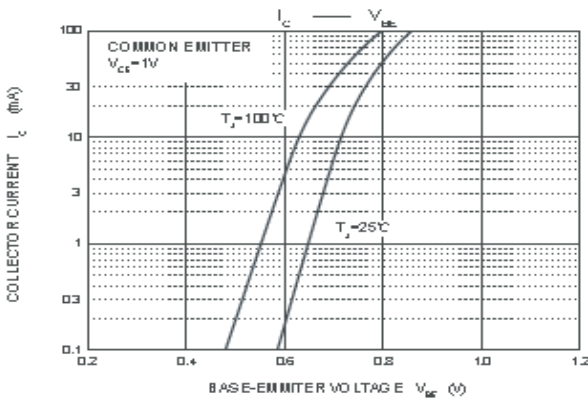
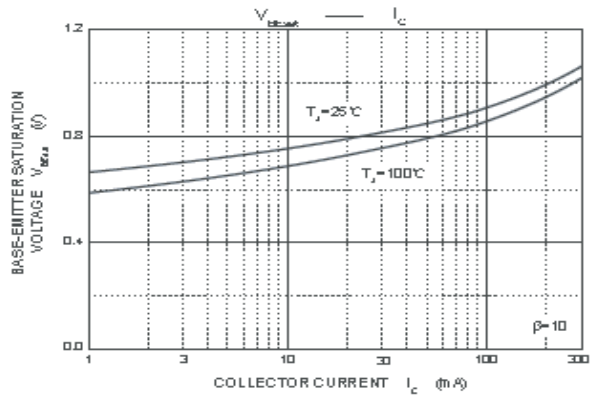
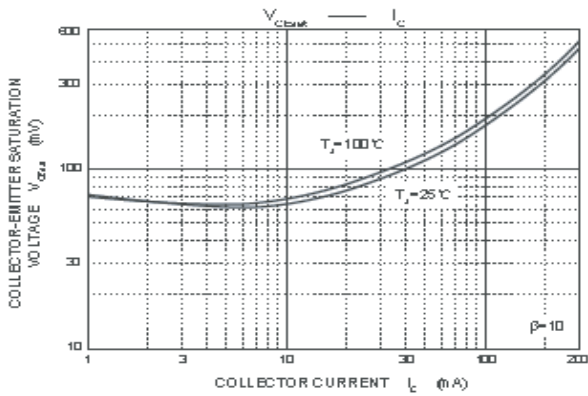
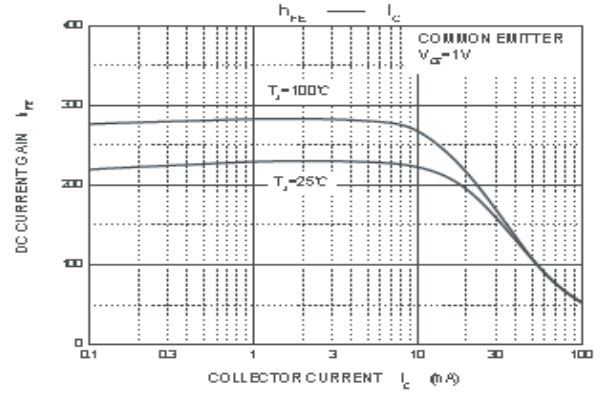
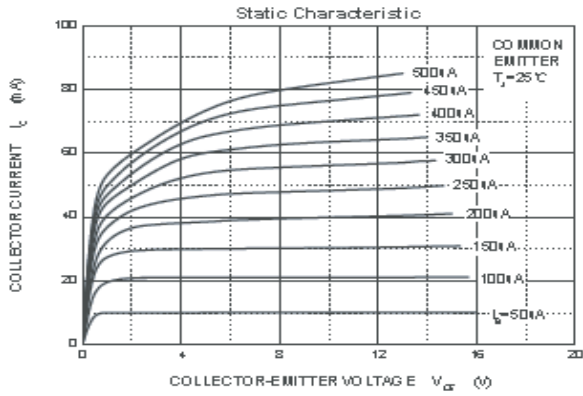
## Electrical Characteristics $T_A=25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage at $I_C=10\text{mA}$ , $I_E=0$	$V_{(BR)CBO}$	60			V
Collector-emitter breakdown voltage at $I_C=1\text{mA}$ , $I_B=0$	$V_{(BR)CEO}$	40			V
Emitter-base breakdown voltage at $I_E=10\mu\text{A}$ , $I_C=0$	$V_{(BR)EBO}$	6			V
Collector cut-off current at $V_{CE}=30\text{V}$ , $V_{EB(off)}=3\text{V}$	$I_{CEX}$			50	nA
Collector cut-off current at $V_{CB}=60\text{V}$ , $I_E=0$	$I_{CBO}$			100	nA
Emitter cut-off current at $V_{EB}=5\text{V}$ , $I_C=0$	$I_{EBO}$			100	nA
DC current gain at $V_{CE}=1\text{V}$ , $I_C=10\text{mA}$ $V_{CE}=1\text{V}$ , $I_C=50\text{mA}$ $V_{CE}=1\text{V}$ , $I_C=100\text{mA}$	$h_{FE(1)}$	100		400	
	$h_{FE(2)}$	60			
	$h_{FE(3)}$	30			
Collector-emitter saturation voltage at $I_C=50\text{mA}$ , $I_B=5\text{mA}$	$V_{CE(sat)}$			0.3	V
base-emitter saturation voltage at $I_C=50\text{mA}$ , $I_B=5\text{mA}$	$V_{BE(sat)}$			0.95	V
Transition frequency at $V_{CE}=20\text{V}$ , $I_C=10\text{mA}$ , $f=100\text{MHZ}$	$f_T$	300			MHZ
Delay time at $V_{CC}=3\text{V}$ , $V_{BE(off)}=-0.5\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=1\text{mA}$	$t_d$			35	ns
Rise time at $V_{CC}=3\text{V}$ , $V_{BE(off)}=-0.5\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=1\text{mA}$	$t_r$			35	ns
Storage time at $V_{CC}=3\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1\text{mA}$	$t_s$			200	ns
Fall time at $V_{CC}=3\text{V}$ , $I_C=10\text{mA}$ , $I_{B1}=I_{B2}=1\text{mA}$	$t_f$			50	ns

### Classification Of $h_{FE(1)}$

RANK	O	Y	G
RANGE	100-200	200-300	300-400

# RATING AND CHARACTERISTICS CURVES (MMBT3904)



# 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	---

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