

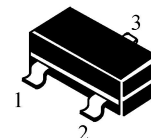
**SOT-23 Bipolar Transistor 双极型三极管**

■ **Features 特点**

**NPN Switching 开关**

**SOT-23**

- 1. BASE
- 2. EMITTER
- 3. COLLECTOR



■ **Absolute Maximum Ratings 最大额定值**

Characteristic 特性参数	Symbol 符号	MMBT2222	MMBT2222A	Unit 单位
Collector-Base Voltage 集电极基极电压	$V_{CBO}$	75	75	V
Collector-Emitter Voltage 集电极发射极电压	$V_{CEO}$	30	40	V
Emitter-Base Voltage 发射极基极电压	$V_{EBO}$	6	6	V
Collector Current 集电极电流	$I_C$	600	600	mA
Power dissipation 耗散功率	$P_C(T_a=25^\circ\text{C})$	250	300	mW
Thermal Resistance Junction-Ambient 热阻	$R_{\theta JA}$	500	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature 结温和储藏温度	$T_J, T_{stg}$	-55to+150 $^\circ\text{C}$		

■ **Device Marking 产品打标**

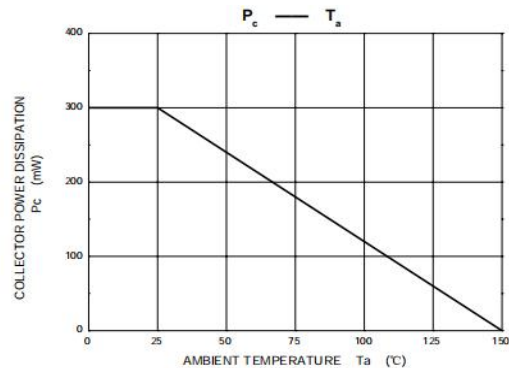
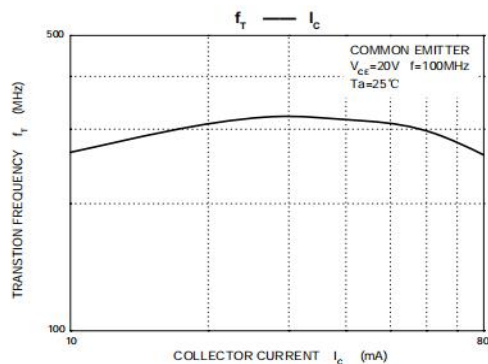
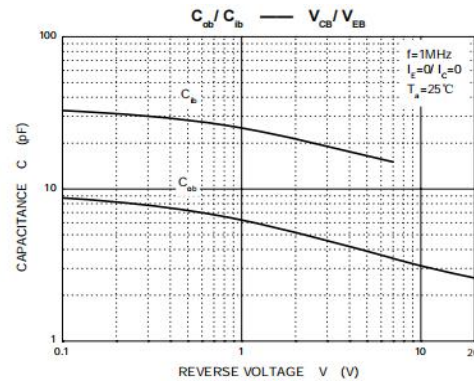
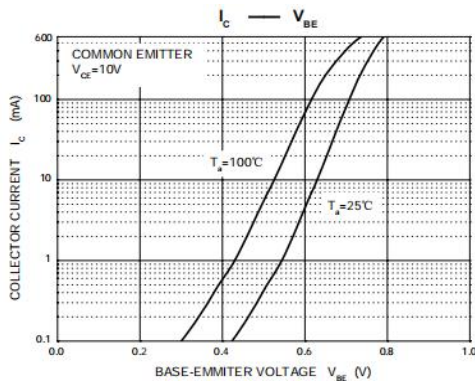
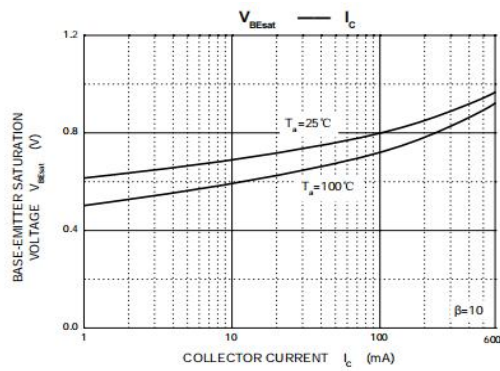
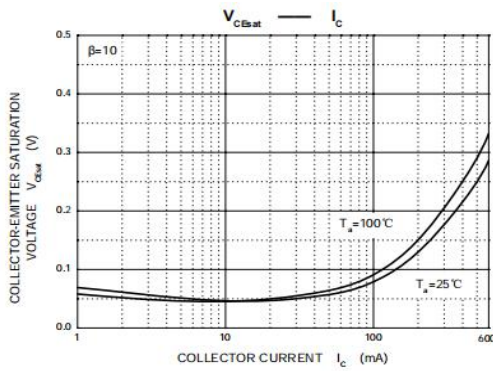
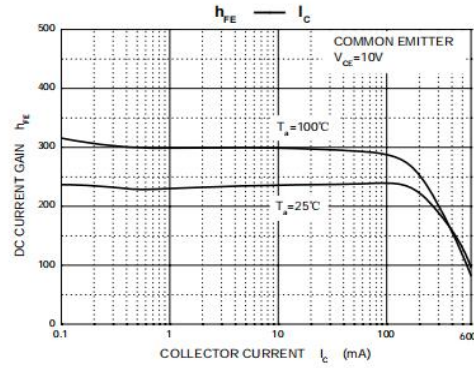
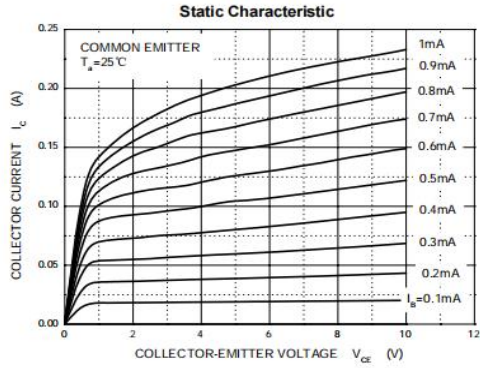
MMBT2222=M1B  
MMBT2222A=1P

■ Electrical Characteristics 电特性

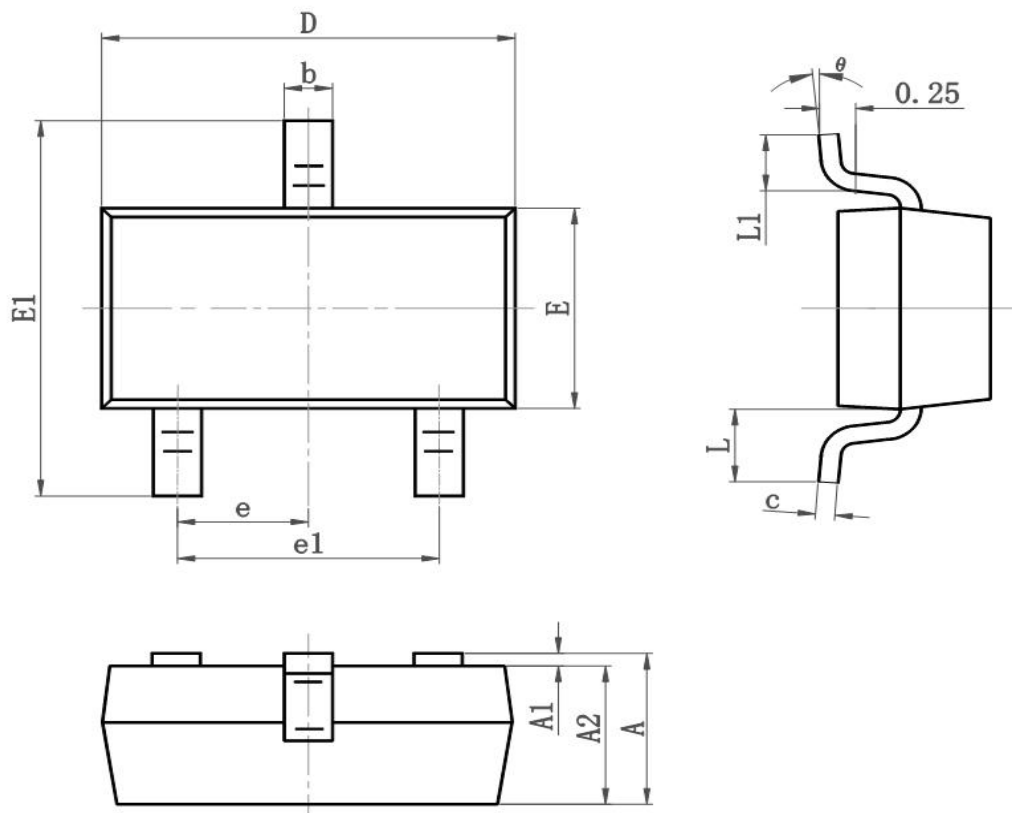
( $T_A=25^{\circ}\text{C}$  unless otherwise noted 如无特殊说明, 温度为  $25^{\circ}\text{C}$ )

Characteristic 特性参数	Symbol 符号	Min 最小值	Type 典型值	Max 最大值	Unit 单位
Collector-Base Breakdown Voltage 集电极基极击穿电压( $I_C=10\mu\text{A}$ , $I_E=0$ )	$BV_{CBO}$	75	—	—	V
Collector-Emitter Breakdown Voltage 集电极发射极击穿电压( $I_C=1\text{mA}$ , $I_B=0$ )	$BV_{CEO}$	30(MMBT2222) 40(MMBT2222A)	—	—	V
Emitter-Base Breakdown Voltage 发射极基极击穿电压( $I_E=10\mu\text{A}$ , $I_C=0$ )	$BV_{EBO}$	6	—	—	V
Collector-Base Leakage Current 集电极基极漏电流( $V_{CB}=60\text{V}$ , $I_E=0$ )	$I_{CBO}$	—	—	100	nA
Collector-Emitter Leakage Current 集电极发射极漏电流( $V_{CE}=35\text{V}$ , $V_{BE}=-3\text{V}$ )	$I_{CEX}$	—	—	100	nA
Emitter-Base Leakage Current 发射极基极漏电流( $V_{EB}=5\text{V}$ , $I_C=0$ )	$I_{EBO}$	—	—	100	nA
DC Current Gain( $V_{CE}=10\text{V}$ , $I_C=150\text{mA}$ ) 直流电流增益( $V_{CE}=10\text{V}$ , $I_C=0.1\text{mA}$ ) ( $V_{CE}=10\text{V}$ , $I_C=500\text{mA}$ )	$H_{FE}$	100 40 40	—	300	
Collector-Emitter Saturation Voltage 集电极发射极饱和压降( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ ) ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ )	$V_{CE(sat)}$	—	—	1 0.3	V
Base-Emitter Saturation Voltage 基极发射极饱和压降( $I_C=500\text{mA}$ , $I_B=50\text{mA}$ ) ( $I_C=150\text{mA}$ , $I_B=15\text{mA}$ )	$V_{BE(sat)}$	—	—	2 1.2	V
Transition Frequency 特征频率( $V_{CE}=20\text{V}$ , $I_C=20\text{mA}$ )	$f_T$	300	—	—	MHz
Delay Time 延迟时间 ( $V_{CC}=30\text{V}$ , $V_{BE}=-0.5\text{V}$ , $I_C=150\text{mA}$ , $I_{B1}=15\text{mA}$ )	$t_d$	—	—	10	ns
Rise Time 上升时间 ( $V_{CC}=30\text{V}$ , $V_{BE}=-0.5\text{V}$ , $I_C=150\text{mA}$ , $I_{B1}=15\text{mA}$ )	$t_r$	—	—	25	ns
Storage Time 贮存时间 ( $V_{CC}=30\text{V}$ , $I_C=150\text{mA}$ , $I_{B1}=I_{B2}=15\text{mA}$ )	$t_s$	—	—	225	ns
Fall Time 下降时间 ( $V_{CC}=30\text{V}$ , $I_C=150\text{mA}$ , $I_{B1}=I_{B2}=15\text{mA}$ )	$t_f$	—	—	60	ns

■ Typical Characteristic Curve 典型特性曲线



■Dimension 外形封装尺寸



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.050	0.055
E1	2.250	2.550	0.089	0.100
e	0.900	1.00	0.035	0.039
e1	1.800	2.000	0.071	0.079
L	0.500	0.600	0.020	0.024
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°