

MMBT2222AM

NPN Plastic-
Encapsulate Transistor

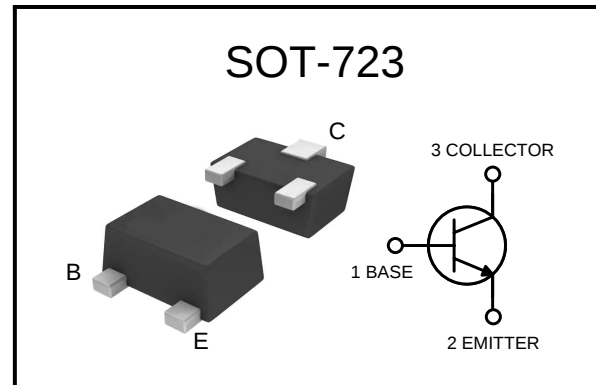
Features

- $V_{CE}=40V$
- $I_C=0.6A$
- $f_T=300MHz$ @ $V_{CE}=20V$, $I_C=20mA$, $f=100MHz$

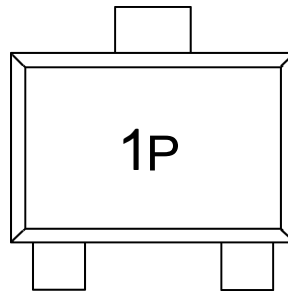
Description

- Epitaxial planar die construction
- RoHS compliant
- SOT-723 Plastic Package.

Package



Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
MMBT2222AM	SOT-723	1P	8K	Tape and reel

Absolute Maximum Ratings @ $T_A=25^{\circ}C$ unless otherwise noted

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	0.6	A
P_D	Collector Power Dissipation	265	mW
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	470	$^{\circ}C/W$
T_J	Junction Temperature Range	-55 to +150	$^{\circ}C$
T_{stg}	Storage Temperature Range	-55 to +150	$^{\circ}C$



MMBT2222AM

NPN Plastic-
Encapsulate Transistor

Electrical Characteristics ($T_A=+25^{\circ}\text{C}$, unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C=10\mu\text{A}, I_E=0$	75	—	—	V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C=10\text{mA}, I_B=0$	40	—	—	
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E=10\mu\text{A}, I_C=0$	6	—	—	
I_{CBO}	Collector cut-off current	$V_{CB}=60\text{V}, I_E=0$	—	—	0.01	uA
I_{CEX}	Collector cut-off current	$V_{CE}=60\text{V}, V_{EB(off)}=3\text{V}$	—	—	0.01	
I_{EBO}	Emitter cut-off current	$V_{EB}=3\text{V}, I_C=0\text{mA}$	—	—	0.1	
I_{BL}	Base cut-off current	$V_{CE}=60\text{V}, V_{EB(off)}=3\text{V}$	—	—	20	nA
$h_{FE(1)}$	DC current gain	$V_{CE}=10\text{V}, I_C=0.1\text{mA}$	35	—	—	—
$h_{FE(2)}$		$V_{CE}=10\text{V}, I_C=1\text{mA}$	50	—	—	
$h_{FE(3)}$		$V_{CE}=10\text{V}, I_C=10\text{mA}$	75	—	—	
$h_{FE(4)}$		$V_{CE}=10\text{V}, I_C=150\text{mA}^1$	100	—	300	
$h_{FE(5)}$		$V_{CE}=1.0\text{V}, I_C=150\text{mA}^1$	50	—	—	
$h_{FE(6)}$		$V_{CE}=10\text{V}, I_C=500\text{mA}^1$	40	—	—	
$V_{CE(sat)}$	Collector-emitter saturation voltage	$I_C=500\text{mA}, I_B=50\text{mA}$	—	—	1	V
		$I_C=150\text{mA}, I_B=15\text{mA}$	—	—	0.3	
$V_{BE(sat)}$	Base-emitter saturation voltage	$I_C=500\text{mA}, I_B=50\text{mA}$	—	—	2.0	
		$I_C=150\text{mA}, I_B=15\text{mA}$	—	—	1.2	
t_d	Delay time	$V_{CC}=30\text{V}, V_{BE(off)}=-0.5\text{V},$ $I_C=150\text{mA}, I_{B1}=15\text{mA}$	—	—	10	nS
t_r	Rise time		—	—	25	
t_s	Storage time	$V_{CC}=30\text{V}, I_C=150\text{mA},$ $I_{B1}=-I_{B2}=15\text{mA}$	—	—	225	
t_f	Fall time		—	—	60	
f_T	Transition frequency	$V_{CE}=20\text{V}, I_C=20\text{mA}, f=100\text{MHZ}$	300	—	—	MHZ
C_{obo}	Output Capacitance	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHZ}$	—	—	8	pF
C_{ibo}	Input Capacitance	$V_{EB}=0.5\text{V}, I_C=0, f=1\text{MHZ}$	—	—	25	pF

Note1:pulse test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycles $\leq 2.0\%$.



MMBT2222AM

NPN Plastic-
Encapsulate Transistor

Typical Performance Characteristics($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 1 : Static Characteristic

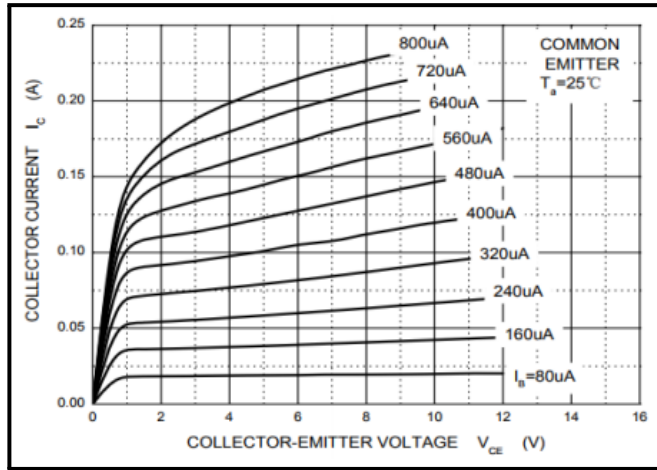


Figure 2 : $h_{FE} \sim I_C$

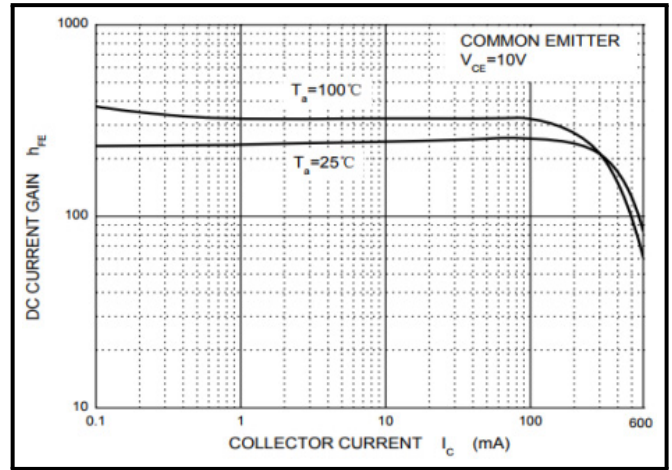


Figure 3 : $V_{CE(sat)} \sim I_C$

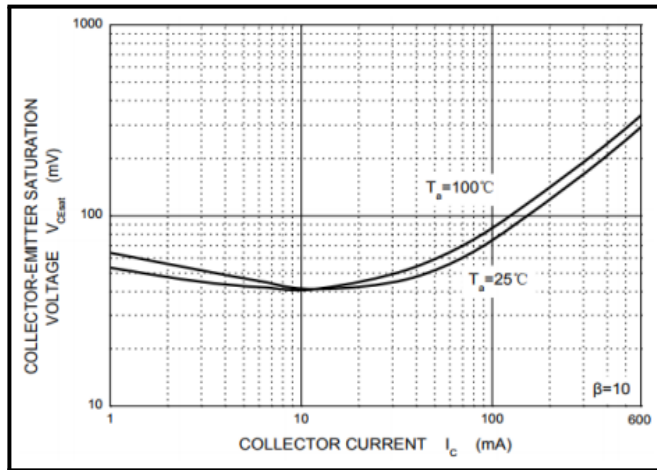


Figure 4 : $V_{BE(sat)} \sim I_C$

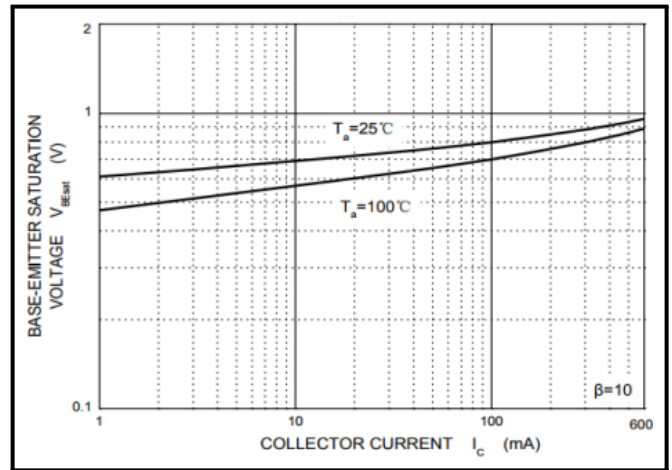


Figure 5 : $I_C \sim V_{BE}$

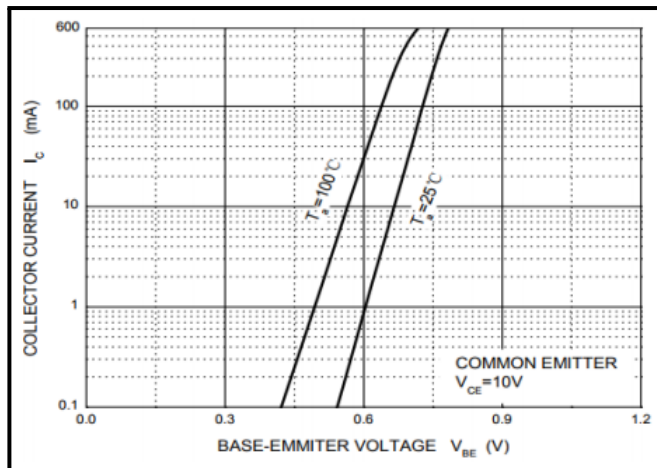
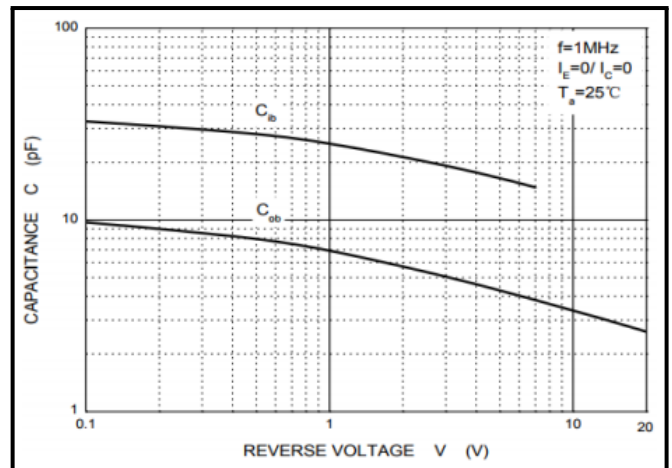


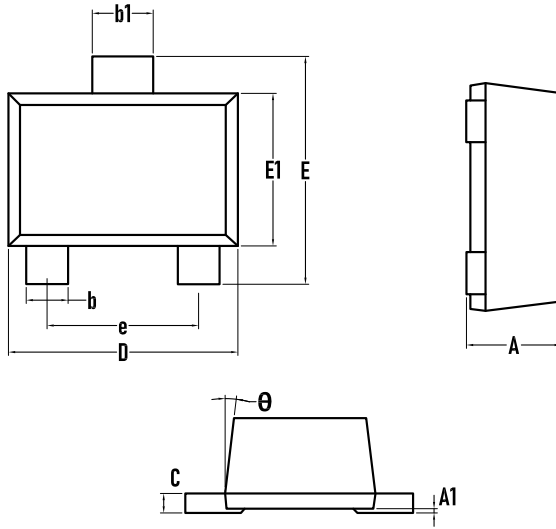
Figure 6 : $C_{ob}/C_{ib} \sim V_{CB}/V_{EB}$



MMBT2222AM

NPN Plastic-
Encapsulate Transistor

Outline Drawing - SOT-723



SYMBOL	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	0.800TYP.	
θ	0°	7°

