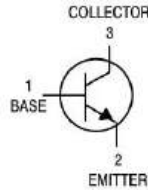


NPN General Purpose Amplifier

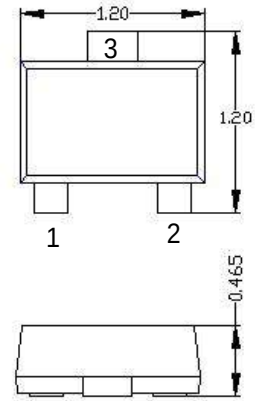
- ◇ Epitaxial planar die construction
- ◇ Operating and Storage Junction Temperatures: -55°C to 150°C
- ◇ Small Outline Surface Mount Package
- ◇ RoHS compliant / Green EMC

Device Marking Code	
MMBT2222AM	1P

Circuit Diagram



SOT-723



Maximum Ratings ($T_a = 25^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6.0	V
I_C	Collector Current-Continuous	600	mA
P_D	Total Device Dissipation	265	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	470	$^{\circ}\text{C}/\text{W}$
T_j, T_{stg}	Junction and Storage Temperature	-55 to $+150$	$^{\circ}\text{C}$

Off Electrical Characteristics $T_a=25^{\circ}\text{C}$

Symbol	Parameter	Test Conditions	Min	Max	Units
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C=10.0\text{mA}, I_B=0$	40	—	V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C=10\mu\text{A}, I_E=0$	75	—	V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=10\mu\text{A}, I_C=0$	6.0	—	V
I_{CBO}	Collector Cutoff Current	$V_{CB}=60\text{V}, I_E=0$		10	nA
I_{CEX}	Collector Cutoff Current	$V_{CE}=60\text{V}, V_{EB(off)}=3.0\text{V}$		0.01	μA
I_{EBO}	Emitter cut-off current	$V_{EB}=3\text{V}, I_C=0$		0.1	μA
I_{BL}	Base Cutoff Current	$V_{CE}=60\text{V}, V_{EB(off)}=3.0\text{V}$		20	nA

On Electrical Characteristics Ta=25°C

Symbol	Parameter	Test Conditions	Min	Max	Units
h_{FE}	DC Current Gain	$I_C=0.1mA, V_{CE}=10V$	35	–	–
		$I_C=1.0mA, V_{CE}=10V$	50	–	
		$I_C=10mA, V_{CE}=10V$	75	–	
		$I_C=150mA, V_{CE}=10V$ (Note 1)	100	300	
		$I_C=150mA, V_{CE}=1.0V$ (Note 1)	50	–	
		$I_C=500mA, V_{CE}=10V$ (Note 1)	40	–	
$V_{CE(Sat)}$	Collector–Emitter Saturation Voltage (Note 1)	$(I_C=150mA, I_B=15mA)$	–	0.3	V
		$(I_C=500mA, I_B=50mA)$	–	1.0	
$V_{BE(Sat)}$	Base–Emitter Saturation Voltage (Note 1)	$I_C=150mA, I_B=15mA$	0.6	1.2	V
		$I_C=500mA, I_B=50mA$	–	2.0	

Small-Signal Characteristics

Symbol	Parameter	Test Conditions	Min	Max	Units
f_T	Current–Gain – Bandwidth Product (Note 2)	$I_C=20mA, V_{CE}=20V, f=100MHz$	300	–	MHz
Cobo	Output Capacitance	$V_{CB}=10V, I_E=0, f=1.0MHz$	–	8.0	pF
Cibo	Input Capacitance	$V_{EB}=0.5V, I_C=0, f=1.0MHz$	–	25	pF

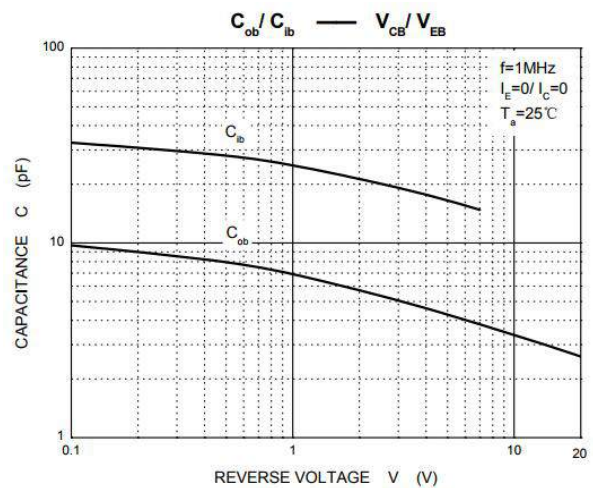
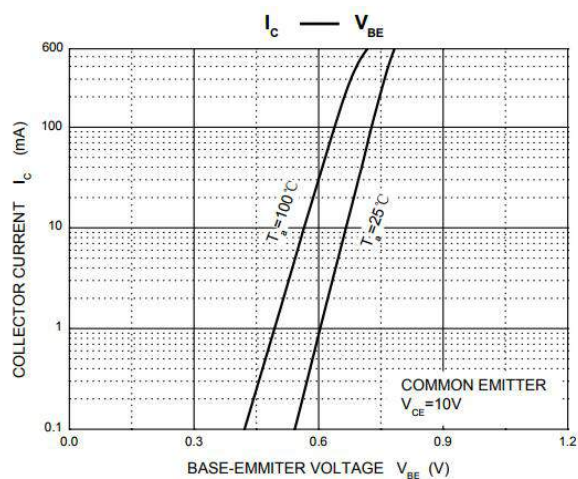
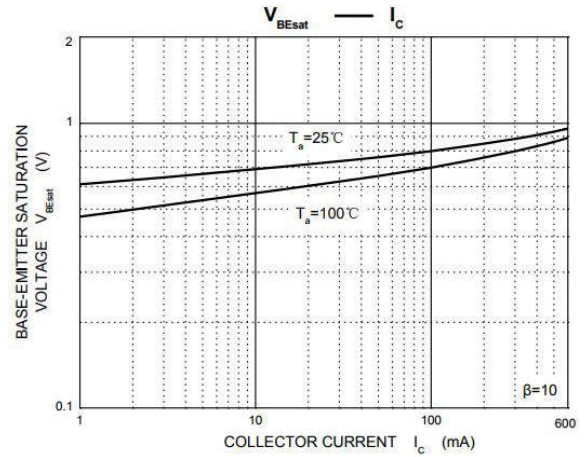
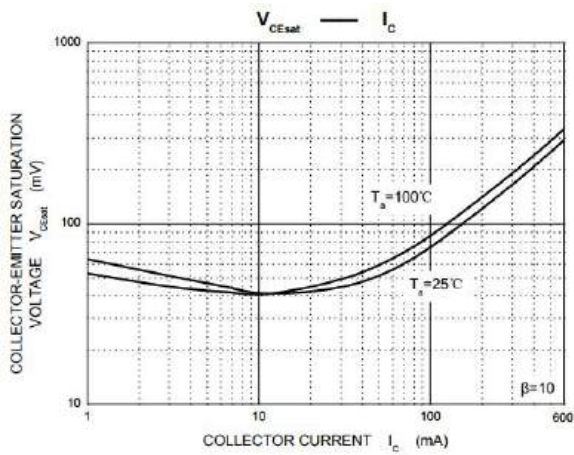
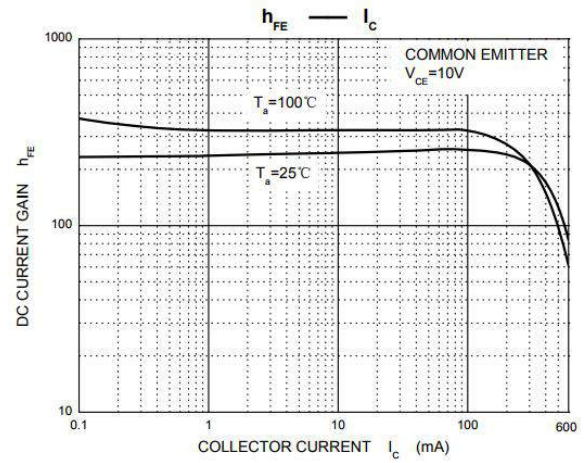
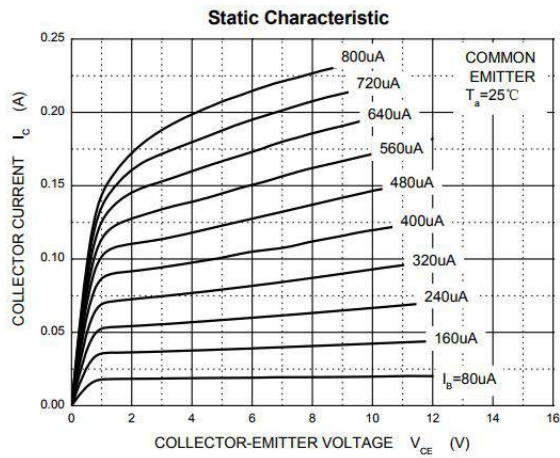
Note 1. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2.0\%$.

Note 2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

Switching Characteristics

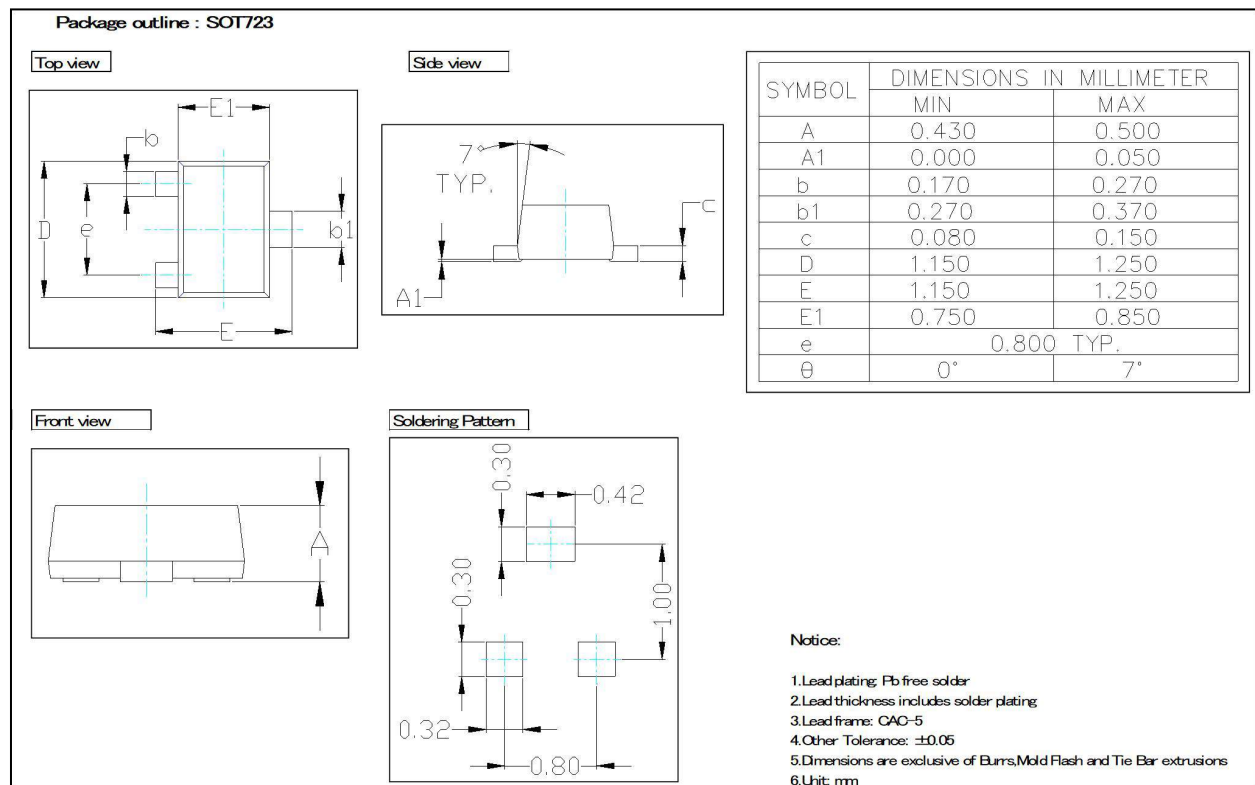
Symbol	Parameter	Test Conditions	Min	Max	Units
t_d	Delay Time	$V_{CC}=30V, I_C=150mA, V_{BE(off)}=-0.5V, I_{B1}=15mA$	–	10	ns
t_r	Rise Time		–	25	
t_s	Storage Time	$(V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA)$	–	225	
t_f	Fall Time		–	60	

RATING AND CHARACTERISTICS CURVES (MMBT2222AM)



Package	Package Code	Shipping	Tape wide	Emboss pitch	Per Carton	Notes
SOT-723	-T	Tape & Reel 8000pcs /7" Reel	8mm	4mm	480000 pcs	

PACKAGE DIMENSIONS



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