

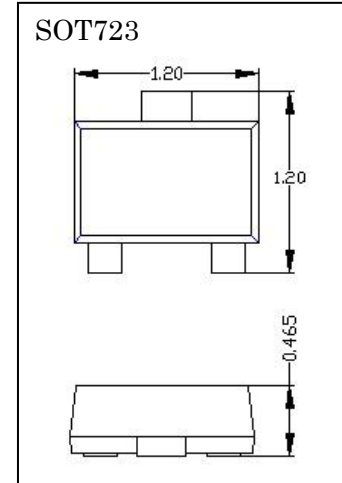
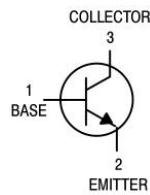
## DATA SHEET

### MMBT2222AM

- ◇ 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



### Maximum Ratings (Ta = 25 °C)

Symbol	Parameter	Value	Unit
V <sub>CB0</sub>	Collector-Base Voltage	75	V
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current-Continuous	600	mA
P <sub>D</sub>	Total Device Dissipation	265	mW
R <sub>θJA</sub>	Thermal Resistance From Junction To Ambient	470	°C/W
T <sub>J</sub> , T <sub>stg</sub>	Junction and Storage Temperature	-55 to +150	°C

### Off Electrical Characteristics Ta=25°C

Symbol	Parameter	Test Conditions	Min	Max	Units
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> =10.0mA, I <sub>B</sub> =0	40	-	V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> =10μA, I <sub>E</sub> =0	75	-	V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> =10μA, I <sub>C</sub> =0	6.0	-	V
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> =60V, I <sub>E</sub> =0		10	nA
I <sub>CEX</sub>	Collector Cutoff Current	V <sub>CE</sub> =60V, V <sub>EB(off)</sub> =3.0V		0.01	uA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =3V, I <sub>C</sub> =0		0.1	uA
I <sub>BL</sub>	Base Cutoff Current	V <sub>CE</sub> =60V, V <sub>EB(off)</sub> =3.0V		20	nA

On Electrical Characteristics Ta=25°C

Symbol	Parameter	Test Conditions	Min	Max	Units
h <sub>FE</sub>	DC Current Gain	I <sub>C</sub> =0.1mA, V <sub>CE</sub> =10V	35	-	-
		I <sub>C</sub> =1.0mA, V <sub>CE</sub> =10V	50	-	
		I <sub>C</sub> =10mA, V <sub>CE</sub> =10V	75	-	
		I <sub>C</sub> =150mA, V <sub>CE</sub> =10V (Note 1)	100	300	
		I <sub>C</sub> =150mA, V <sub>CE</sub> =1.0V (Note 1)	50	-	
		I <sub>C</sub> =500mA, V <sub>CE</sub> =10V (Note 1)	40	-	
V <sub>CE</sub> (Sat)	Collector-Emitter Saturation Voltage (Note 1)	(I <sub>C</sub> =150mA, I <sub>B</sub> =15mA)	-	0.3	V
		(I <sub>C</sub> =500mA, I <sub>B</sub> =50mA)	-	1.0	
V <sub>BE</sub> (Sat)	Base-Emitter Saturation Voltage (Note 1)	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA	0.6	1.2	V
		I <sub>C</sub> =500mA, I <sub>B</sub> =50mA	-	2.0	

Small-Signal Characteristics

Symbol	Parameter	Test Conditions	Min	Max	Units
f <sub>T</sub>	Current-Gain – Bandwidth Product(Note 2)	I <sub>C</sub> =20mA, V <sub>CE</sub> =20V, f=100MHz	300	-	MHz
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1.0MHz	-	8.0	pF
C <sub>ib</sub>	Input Capacitance	V <sub>EB</sub> =0.5V, I <sub>C</sub> =0, f=1.0MHz	-	25	pF

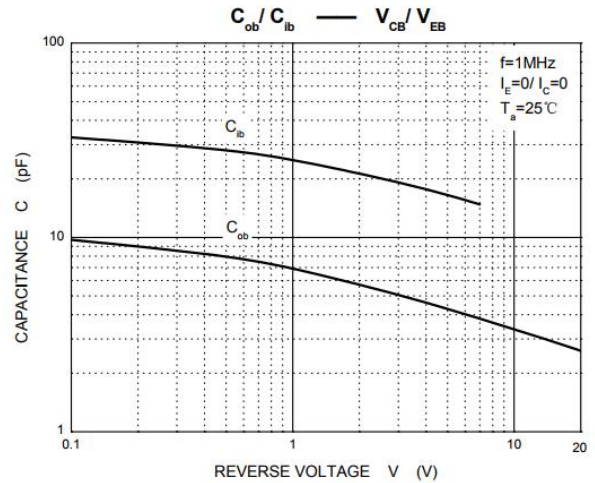
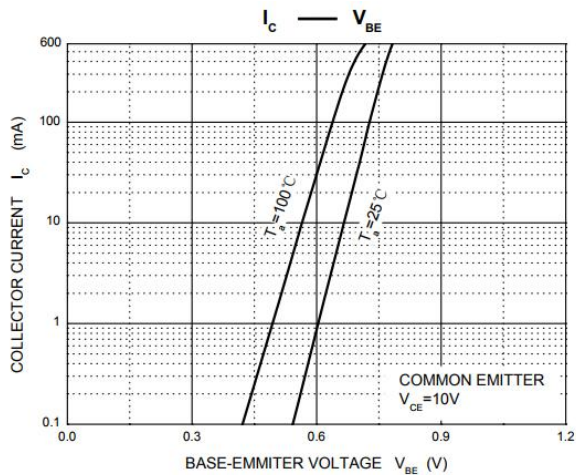
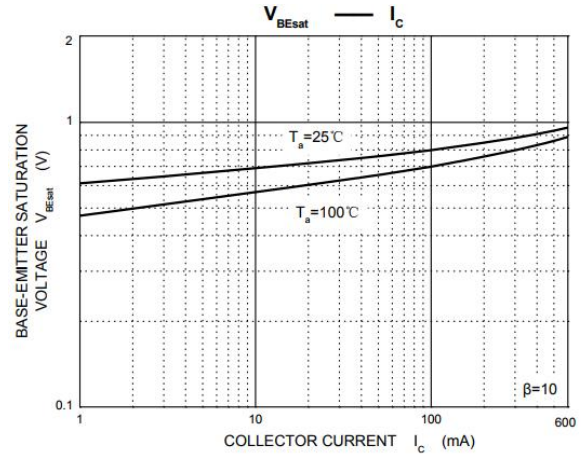
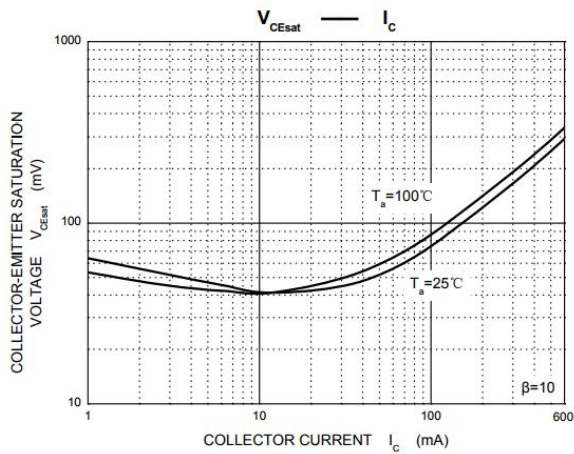
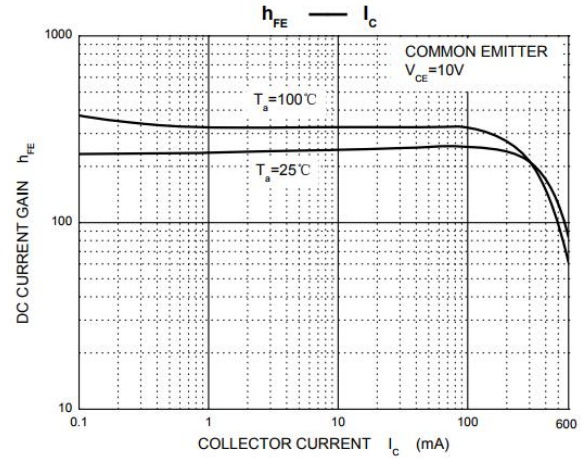
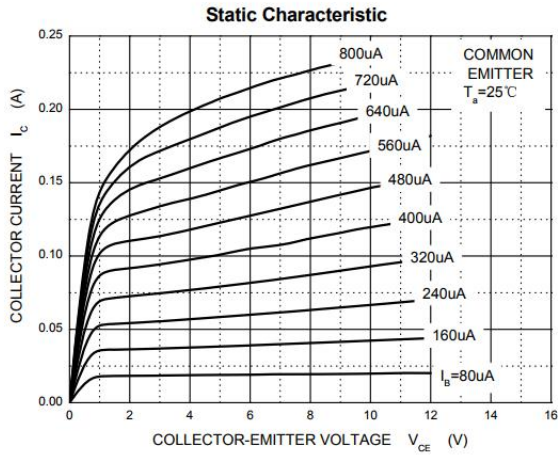
Note 1. Pulse Test: Pulse Width ≤ 300 us, Duty Cycle ≤ 2.0%.

Note 2. f<sub>T</sub> is defined as the frequency at which |h<sub>fe</sub>| extrapolates to unity.

Switching Characteristics

Symbol	Parameter	Test Conditions	Min	Max	Units
t <sub>d</sub>	Delay Time	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, V <sub>BE</sub> (off)=-0.5V, I <sub>B1</sub> =15mA	-	10	ns
t <sub>r</sub>	Rise Time		-	25	
t <sub>s</sub>	Storage Time	(V <sub>CC</sub> =30V, I <sub>C</sub> =150mA, I <sub>B1</sub> =I <sub>B2</sub> =15mA)	-	225	
t <sub>f</sub>	Fall Time		-	60	

### Typical Characteristics



Device	Package	Shipping	Tape wide	Emboss pitch	Tape specification	Notes
MMBT2222AM	SOT723	Tape & Reel 8000pcs /7" Reel	8mm	4mm	Conductive	

## PACKAGE DIMENSIONS

