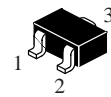
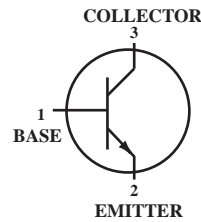


Plastic-Encapsulate Transistors

NPN Silicon

 Lead(Pb)-Free



SOT-523(SC-75)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CBO}	75	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current-Continuous	I_C	600	mAdc

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board ⁽¹⁾ $T_A=25^\circ\text{C}$	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Junction and Storage, Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

DEVICE MARKING

MMBT2222AT=1P

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C=10\text{ mAdc}, I_B=0$) ⁽²⁾	$V_{(BR)CEO}$	40	-	Vdc
Collector-Base Breakdown Voltage ($I_C=10\text{ }\mu\text{Adc}, I_E=0$)	$V_{(BR)CBO}$	75	-	Vdc
Emitter-Base Breakdown Voltage ($I_E=-10\text{ }\mu\text{Adc}, I_C=0$)	$V_{(BR)EBO}$	6.0	-	Vdc
Collector Cutoff Current ($V_{CB}=70\text{ Vdc}, I_E=0$)	I_{CBO}	-	0.1	nAdc
Emitter Cutoff Current ($V_{EB}=3\text{ Vdc}, I_C=0$)	I_{EBO}	-	0.1	nAdc

1.FR-5=1.0 x 0.75 x 0.062 in

2. Pulse Test:Pulse Width=300 us, Duty Cycle $\leq 2.0\%$

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise noted) (Continued)

Characteristics	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS⁽¹⁾

DC Current Gain (I _C = 0.1 mA _{dc} , V _{CE} = 10 V _{dc})	hFE	35	-	-	
(I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc})		50	-	-	
(I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc})		75	-	-	
(I _C = 150 mA _{dc} , V _{CE} = 10 V _{dc})		100	-	-	
(I _C = 500 mA _{dc} , V _{CE} = 10 V _{dc})		40	-	-	
Collector-Emitter Saturation Voltage ⁽³⁾ (I _C = 150 mA _{dc} , I _B = 15 mA _{dc}) (I _C = 500 mA _{dc} , I _B = 50 mA _{dc})	V _{CE(sat)}	-	-	0.3 1	V _{dc}
Base-Emitter Saturation Voltage ⁽³⁾ (I _C = 150 mA _{dc} , I _B = 15 mA _{dc}) (I _C = 500 mA _{dc} , I _B = 50 mA _{dc})	V _{BE(sat)}	-	-	1.2 2	V _{dc}

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product ⁽¹⁾ (I _C = 20 mA _{dc} , V _{CE} = 20 V _{dc} , f = 100 MHz)	f _T	300	-	-	MHz
Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz)	C _{ob}	-	-	8	pF

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise noted) (Continued)

Characteristics	Symbol	Min	Max	Unit
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SWITCHING CHARACTERISTICS

Delay Time	(V _{CC} = 30 V _{dc} , I _C = 150 mA _{dc} , I _{B1} = 15 mA _{dc})	t _d	-	10	ns
Rise Time		t _r	-	25	
Storage Time	(V _{CC} = 30 V _{dc} , I _C = 150 mA _{dc} , I _{B1} = I _{B2} = 15 mA _{dc})	t _s	-	225	
Fall Time		t _f	-	60	

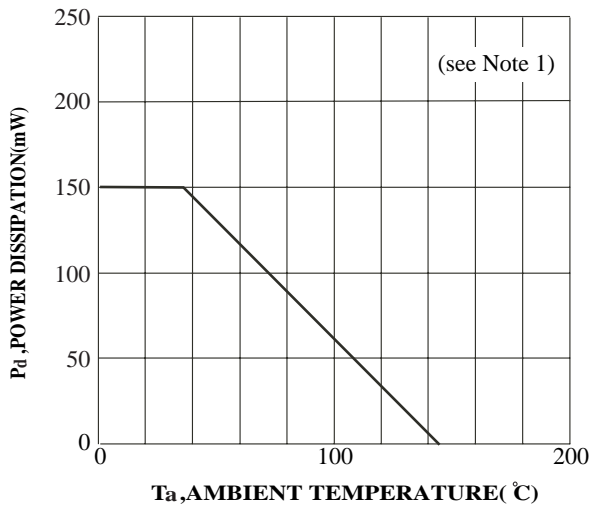


FIG.1 Power Derating Curve

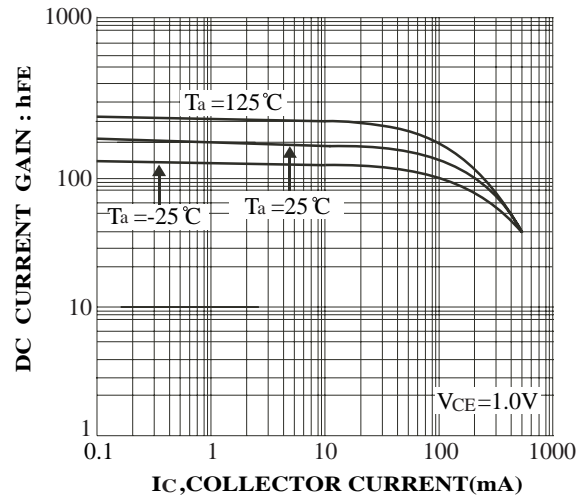


FIG.2 Typical DC Current Gain vs Collector Current

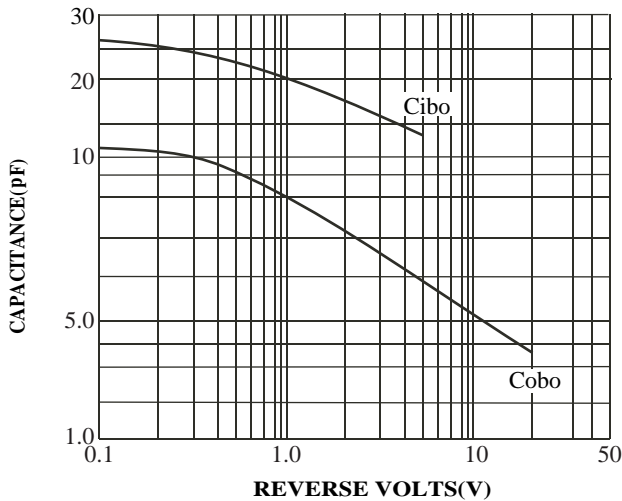


FIG.3 Typical Capacitance

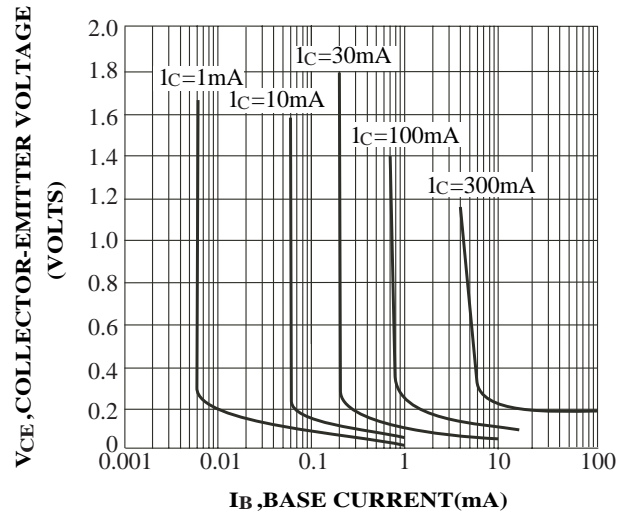


FIG.4 Typical Collector Saturation Region

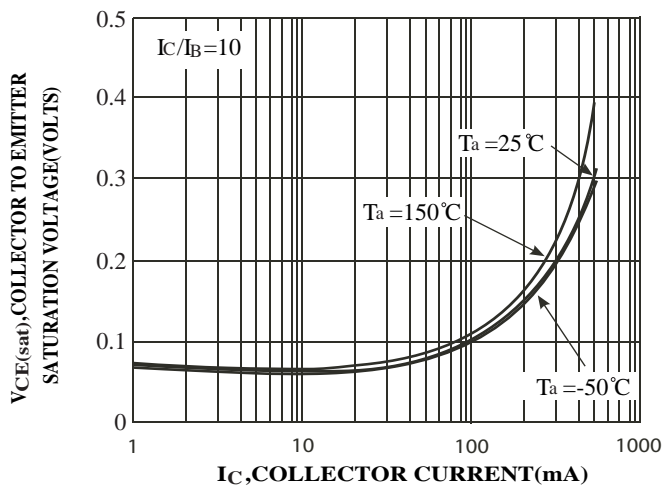


FIG.5 Collector Emitter Saturation Voltage vs. Collector Current

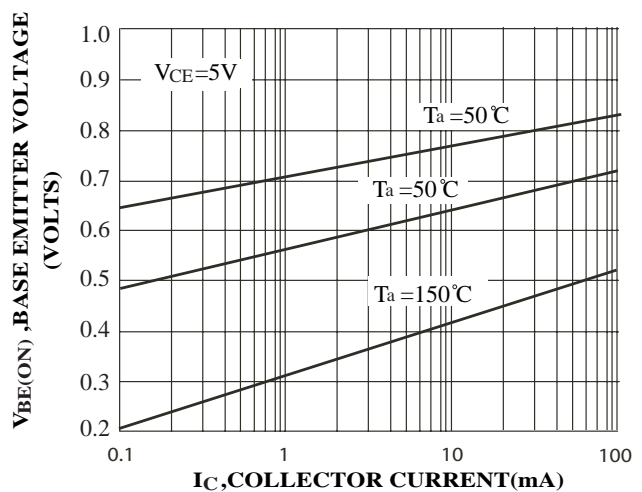
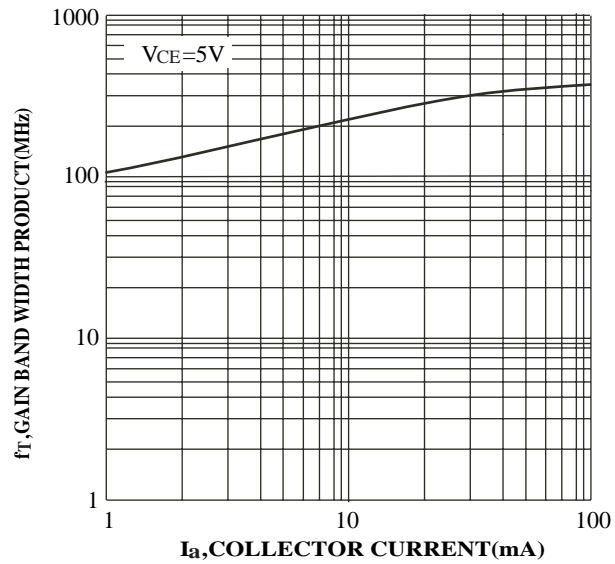


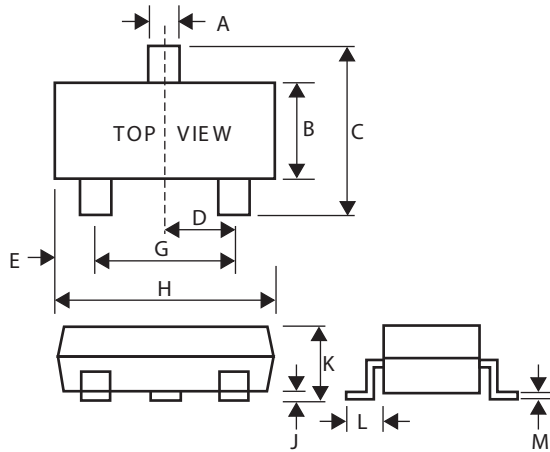
FIG.6 Base Emitter Voltage vs. Collector Current



**FIG.7 Gain Bandwidth Product
vs. Collector Current**

SOT-523 Outline Dimensions (SC-75)

Unit:mm



SC-75		
Dim	Min	Max
A	0.30	0.50
B	0.70	0.90
C	1.45	1.75
D	-	0.50
E	0.15	0.40
G	0.80	1.00
H	1.40	1.80
J	0.00	0.10
K	0.70	1.00
L	0.37	0.48
M	0.10	0.25