



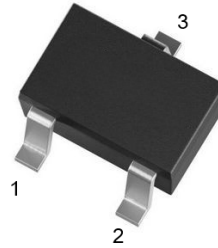
DESCRIPTION

The MMBT222W & MMBT222AW are available in SOT-323 package.

APPLICATION

For Switching and amplifier applications

PIN DESCRIPTION



SOT-323

ORDERING INFORMATION

Package Type	Part Number
SOT-323	MMBT222W
	MMBT222AW
SPQ	3,000pcs/Reel
AiT provides all RoHS Compliant Products	

PIN#	DESCRIPTION
1	Base
2	Emitter
3	Collector

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise specified.

Parameter	Value	
V _{CBO} , Collector Base Voltage	MMBT222W	60V
	MMBT222AW	75V
V _{CEO} , Collector Emitter Voltage	MMBT222W	30V
	MMBT222AW	40V
V _{EBO} , Emitter Base Voltage	MMBT222W	5V
	MMBT222AW	6V
I _C , Collector Current	600mA	
P _{tot} , Total Power Dissipation	(1)	460mW
	(2)	200mW
T _J , Junction Temperature	150°C	
T _{stg} , Storage Temperature Range	-55°C ~ +150°C	
R _{θJA} , Thermal Resistance from Junction to Ambient ⁽¹⁾	(1)	270°C/W
	(2)	625°C/W

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

- (1) Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
- (2) Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.



ELECTRICAL CHARACTERISTICS

T_A=25°C unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Max.	Unit	
DC Current Gain	h _{FE}	V _{CE} = 10V, I _C = 0.1 mA	35	-	-	
		V _{CE} = 10V, I _C = 1 mA	50	-		
		V _{CE} = 10V, I _C = 10 mA	75	-		
		V _{CE} = 1V, I _C = 150 mA	50	-		
		V _{CE} = 10V, I _C = 150mA	100	300		
		V _{CE} = 10V, I _C = 500mA	MMBT2222W	30		-
		MMBT2222AW	40	-		
Collector Base Voltage	-V _{(BR)CBO}	I _C = 10 μA	MMBT2222W	60	-	V
			MMBT2222AW	75	-	
Collector Emitter Voltage	-V _{(BR)CEO}	I _C = 10 mA	MMBT2222W	30	-	V
			MMBT2222AW	40	-	
Emitter Base Voltage	-V _{(BR)EBO}	I _E = 1 μA	MMBT2222W	5	-	V
			MMBT2222AW	6	-	
Collector Base Cutoff Current	I _{CBO}	V _{CB} = 50 V	MMBT2222W	-	100	nA
		V _{CB} = 60 V	MMBT2222AW	-	100	
Emitter Base Cutoff Current	I _{EBO}	V _{EB} = 3 V	-	100	nA	
Collector Emitter Saturation Voltage	-V _{CE(sat)}	I _C = 150mA, I _B = 15mA	MMBT2222W	-	0.40	V
			MMBT2222AW	-	0.30	
		I _C = 500mA, I _B = 50mA	MMBT2222W	-	1.60	
			MMBT2222AW	-	1	
Base Emitter Voltage	-V _{BE(sat)}	I _C = 150mA, I _B = 15mA	MMBT2222W	-	1.30	V
			MMBT2222AW	0.60	1.20	
		I _C = 500mA, I _B = 50mA	MMBT2222W	-	2.60	
			MMBT2222AW	-	2	
Transition Frequency	f _T	V _{CE} = 20V, -I _E = 10 mA, f = 100 MHz	300	-	MHz	
Collector Output Capacitance	C _{ob}	V _{CB} = 10 V, f = 1 KHz	-	8	pF	
Emitter Input Capacitance	C _{ib}	V _{EB} = 0.5V, f = 1 KHz	-	25	pF	
Delay Time	t _d	V _{CC} =30V, V _{BE(OFF)} =0.5V, I _C = 150mA, I _{B1} =15mA	-	10	ns	
Rise Time	t _r	V _{CC} =30V, V _{BE(OFF)} =0.5V, I _C = 150mA, I _{B1} =15mA	-	25	ns	
Storage Time	t _{stg}	V _{CC} =30V, I _C = 150mA, I _{B1} =-I _{B2} =15mA	-	225	ns	
Fall Time	t _f	V _{CC} =30V, I _C = 150mA, I _{B1} =-I _{B2} =15mA	-	60	ns	



TYPICAL CHARACTERISTICS

Fig 1. Output Characteristics Curve

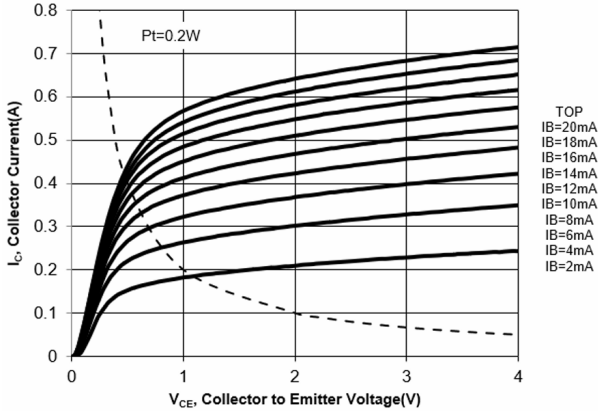


Fig 2. Output Characteristics Curve

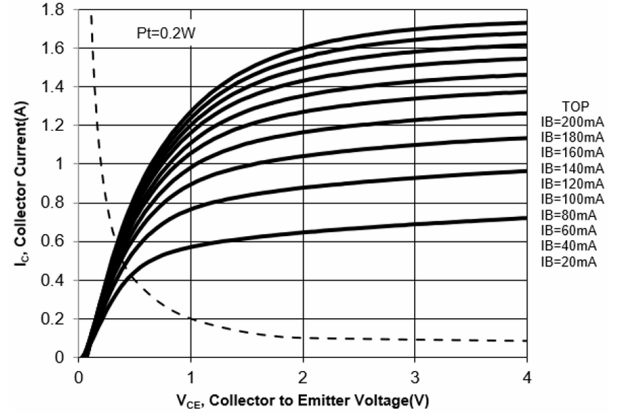


Fig 3. Collector Current vs. Base to Emitter Voltage

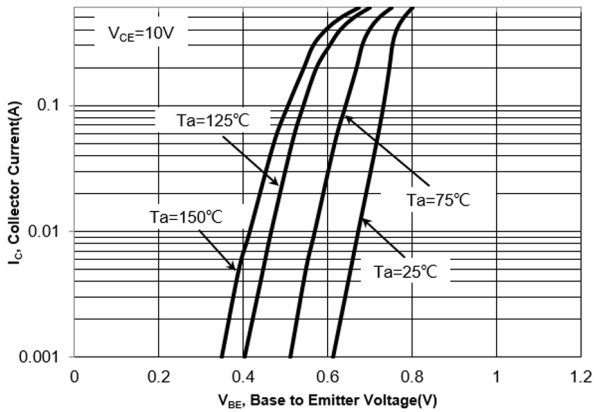


Fig 4. h_{FE} , DC Current Gain vs. Collector Current

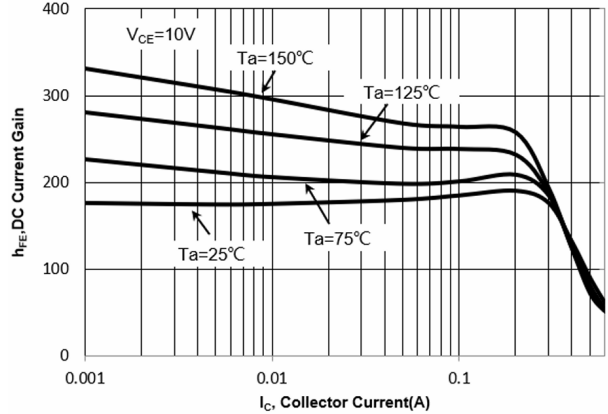


Fig 5. $V_{BE(sat)}$ vs. Collector Current

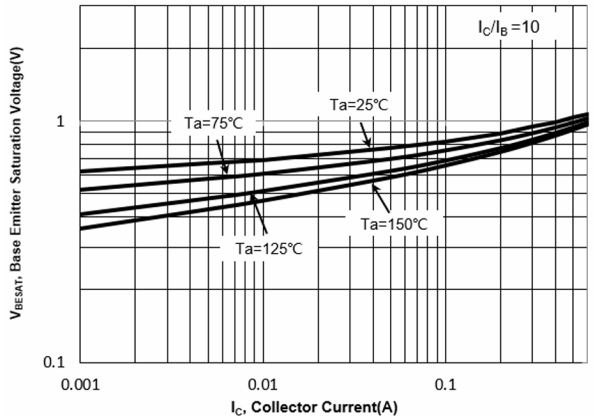


Fig 6. $V_{CE(sat)}$ vs. Collector Current

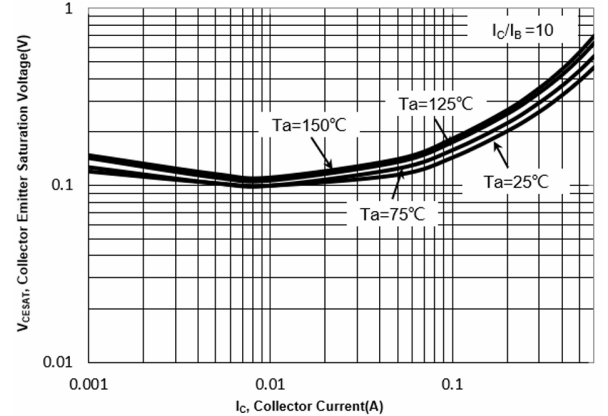




Fig 7. Junction Capacitance

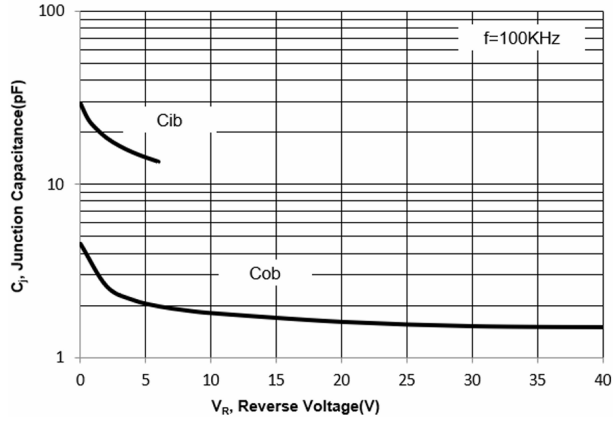
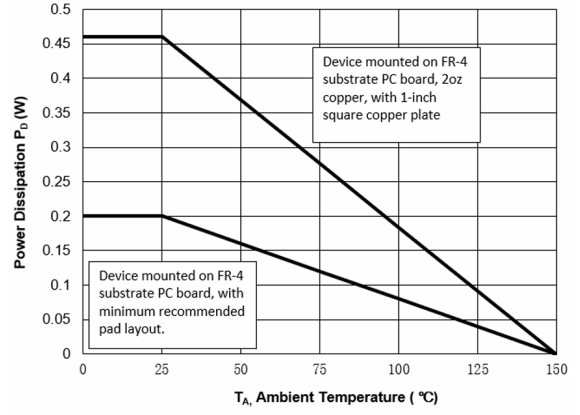


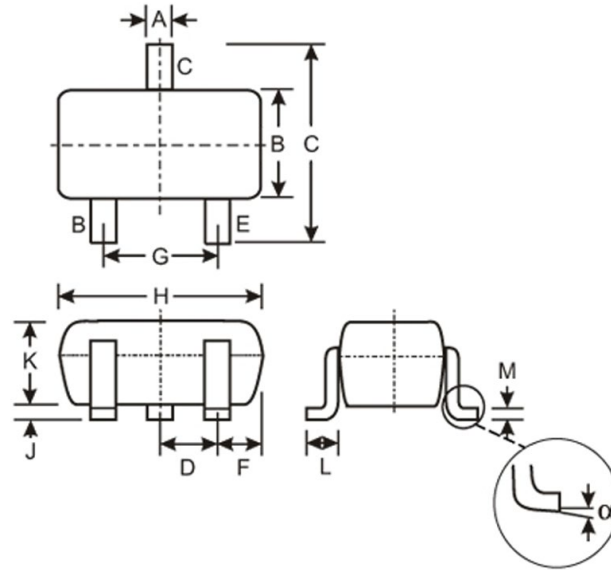
Fig 8. Power Derating Curve





PACKAGE INFORMATION

Dimension in SOT-323 (Unit: mm)



SYMBOL	MILLIMETERS	
	Min.	Max.
A	0.250	0.400
B	1.150	1.350
C	2.000	2.200
D	0.650 TYP.	
E	0.300	0.400
G	1.200	1.400
H	1.800	2.200
J	0.000	0.100
K	0.900	1.000
L	0.250	0.400
M	0.100	0.180
α	0°	8°



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