DESCRIPTION

The MMBT2222W & MMBT2222AW are available in SOT-323 package.

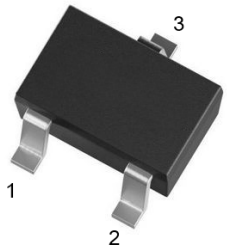
APPLICATION

For Switching and amplifier applications

ORDERING INFORMATION

Package Type	Part Number
SOT-323	MMBT2222W
	MMBT2222AW
SPQ	3,000pcs/Reel
AiT provides all RoHS Compliant Products	

PIN DESCRIPTION



SOT-323

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	MMBT2222W	60V
	MMBT2222AW	75V
V_{CEO}, Collector Emitter Voltage	MMBT2222W	30V
	MMBT2222AW	40V
V_{EBO}, Emitter Base Voltage	MMBT2222W	5V
	MMBT2222AW	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
$R_{\theta JA}$, 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℃ 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

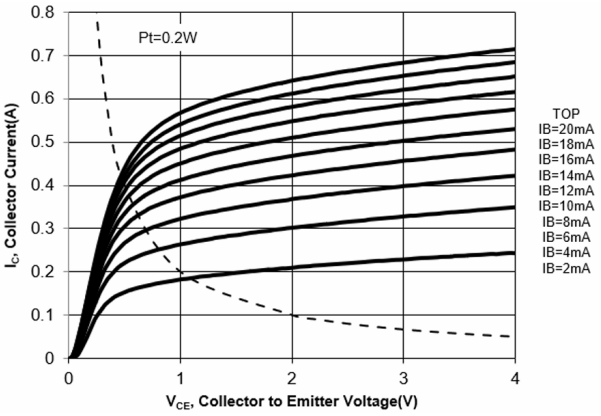


Fig 2. Output Characteristics Curve

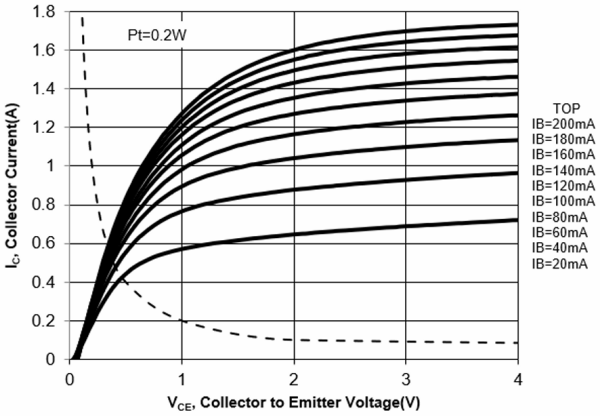


Fig 3. Collector Current vs. Base to Emitter Voltage

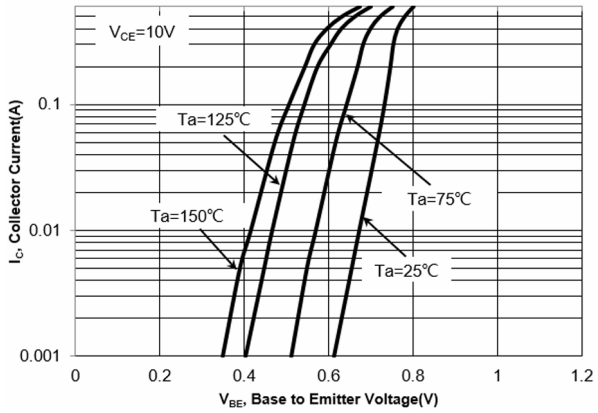


Fig 4. h_{FE}, DC Current Gain vs. Collector Current

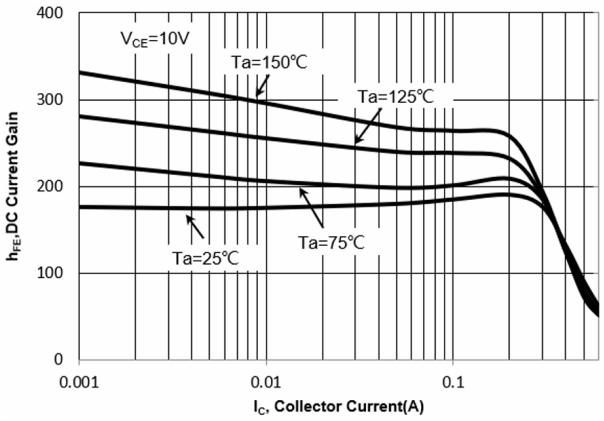


Fig 5. $V_{BE(sat)}$ vs. Collector Current

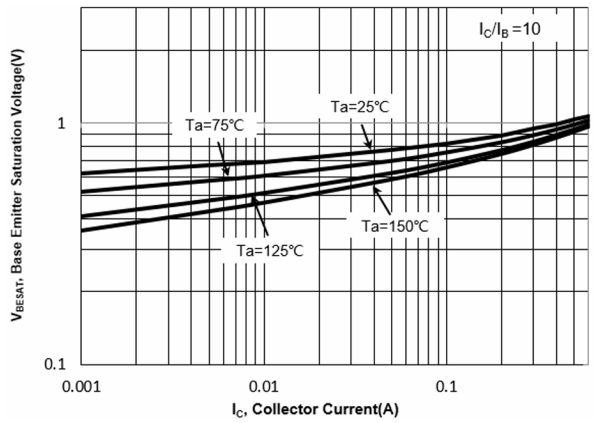


Fig 6. $V_{CE(sat)}$ vs. Collector Current

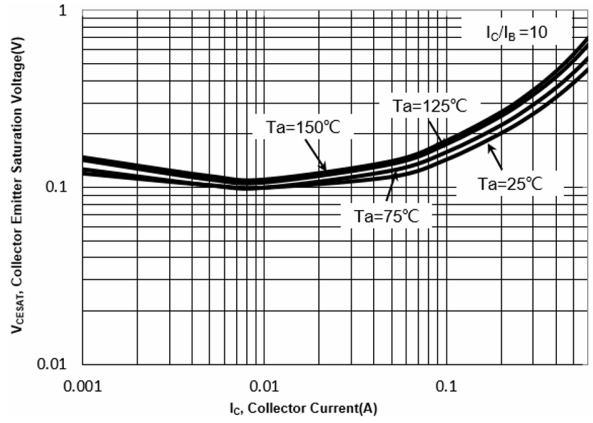


Fig 7. Junction Capacitance

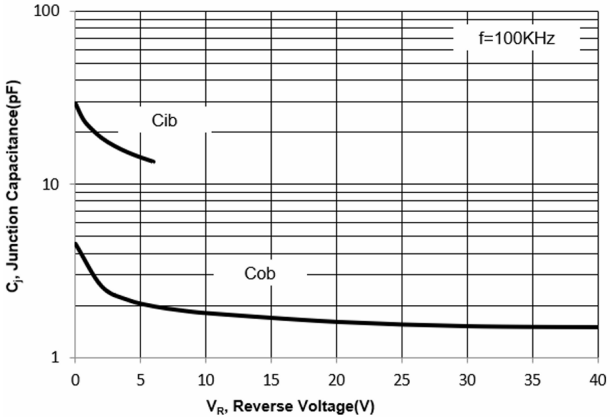
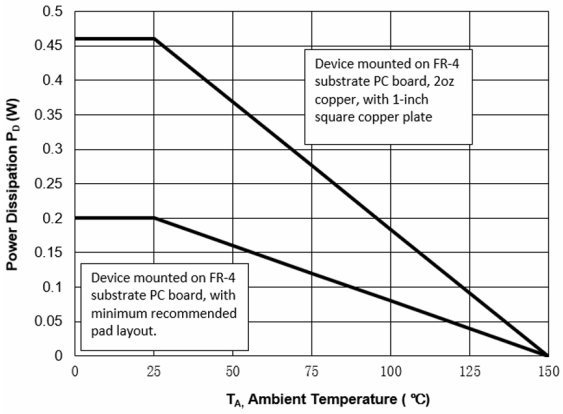
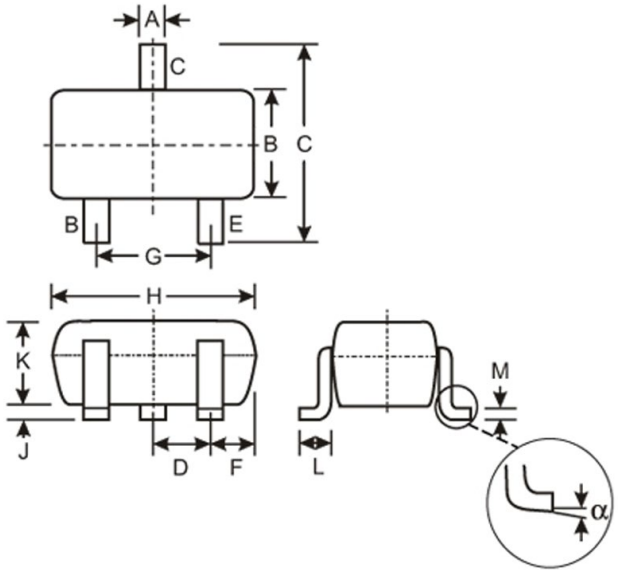


Fig 8. Power Derating Curve



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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