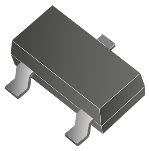
Small Signal Transistor

MMBT2222A-G (NPN)

RoHS Device



Features

-NPN silicon epitaxial planar transistor for switching and amplifier application.

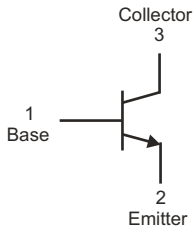
Mechanical data

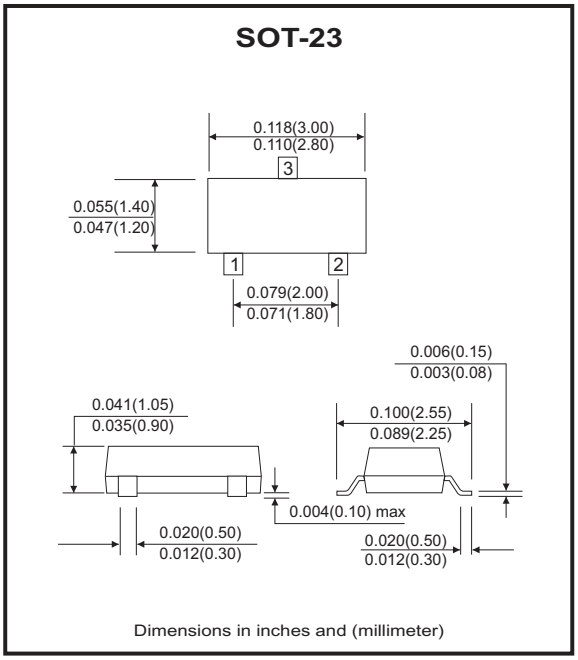
-Case: SOT-23, molded plastic.

-Terminals: solderable per MIL-STD-750, method 2026.

-Approx. weight: 0.008 grams

Diagram:





Maximum Ratings (at Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Units
Collector-Base voltage	V_{CBO}	75	V
Collector-Emitter voltage	V_{CEO}	40	V
Emitter-Base voltage	V_{EBO}	6.0	V
Collector current-continuous	I_C	600	mA
Power dissipation	P_C	300	mW
Thermal resistance, junction to ambient	$R_{\theta JA}$	417	°C/W
Junction temperature	T_J	150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Company reserves the right to improve product design , functions and reliability without notice.

Electrical Characteristics (@TA=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Max.	Units
Collector-Base breakdown voltage	$V_{(BR)CBO}$	I_C=10μA, I_E=0	75		V
Collector-Emitter breakdown voltage	$V_{(BR)CEO}$	I_C=10mA, I_B=0	40		V
Emitter-Base breakdown voltage	$V_{(BR)EBO}$	I_E=10μA, I_C=0	6		V
Collector cut-off current	I_{CBO}	V_{CB}=60V, I_E=0		0.01	μA
Collector cut-off current	I_{CEO}	V_{CE}=30V, $V_{BE(off)}$=3V		0.01	μA
Emitter cut-off current	I_{EBO}	V_{EB}=3V, I_C=0		0.1	μA
DC current gain	$h_{FE(1)}$	V_{CE}=10V, I_C=150mA	100	300	
	$h_{FE(2)}$	V_{CE}=10V, I_C=0.1mA	40		
	$h_{FE(3)}$	V_{CE}=10V, I_C=500mA	42		
Collector-Emitter saturation voltage	$V_{CE(sat)}$	I_C=150mA, I_B=15mA I_C=500mA, I_B=50mA		0.3 1	V
Base-Emitter saturation voltage	$V_{BE(sat)}$	I_C=150mA, I_B=15mA I_C=500mA, I_B=50mA		1.2 2.0	V
Transition frequency	f_T	V_{CE}=20V, I_C=20mA f=100MHz	300		MHz
Delay time (see fig.1)	t_d	V_{CC}=30V, $V_{BE(off)}$=-0.5V I_C=150mA, I_{B1}=15mA		10	nS
Rise time (see fig.1)	t_r			25	nS
Storage time (see fig.2)	t_s	V_{CC}=30V, I_C=150mA I_{B1}=-I_{B2}=15mA		225	nS
Fall time (see fig.2)	t_f			60	nS

Notes:

1. Pulse test: Pulse Width ≤300μs, Duty Cycle ≤ 2.0%.

RATING AND CHARACTERISTIC CURVES (MMBT2222A-G)

Fig.1 - Static Characteristic

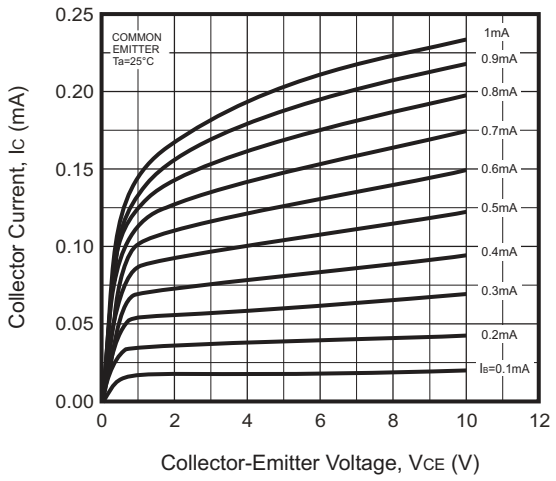


Fig.2 - h_{FE} — I_C

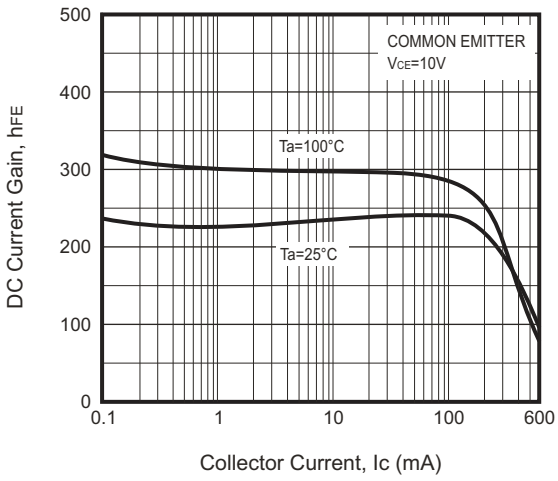


Fig.3 - V_{CEsat} — I_C

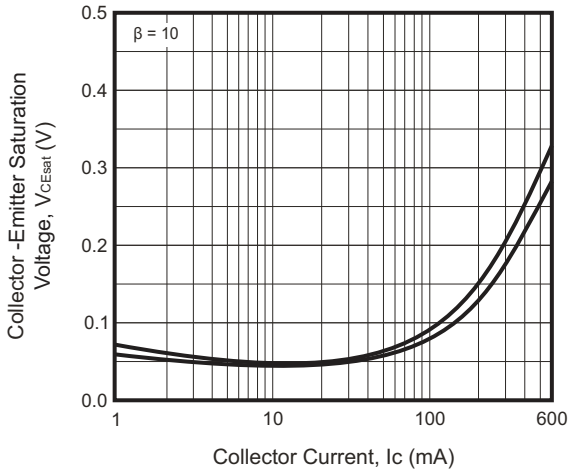


Fig.4 - V_{BEsat} — I_C

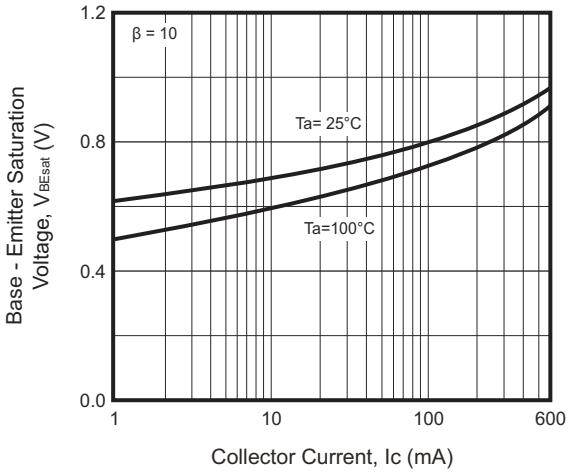


Fig.5 - I_C — V_{BE}

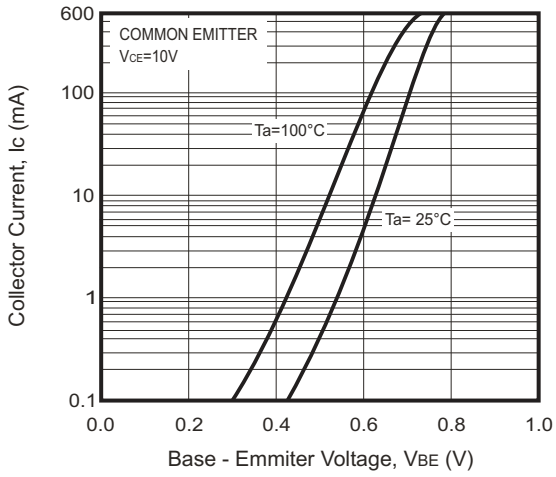
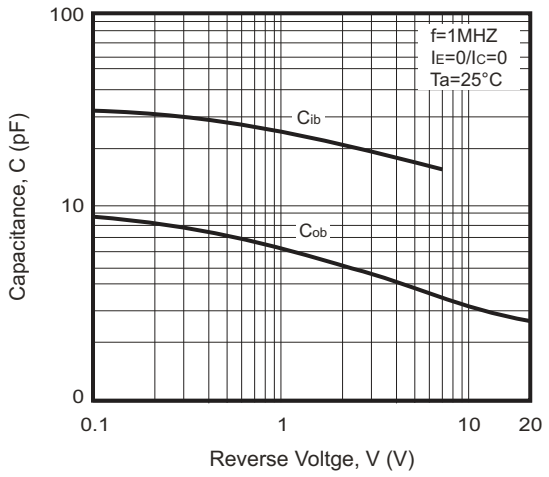


Fig.7 - C_{ob}/C_{ib} — V_{CB}/V_{EB}



RATING AND CHARACTERISTIC CURVES (MMBT2222A-G)

Fig.7 - F_T — I_C

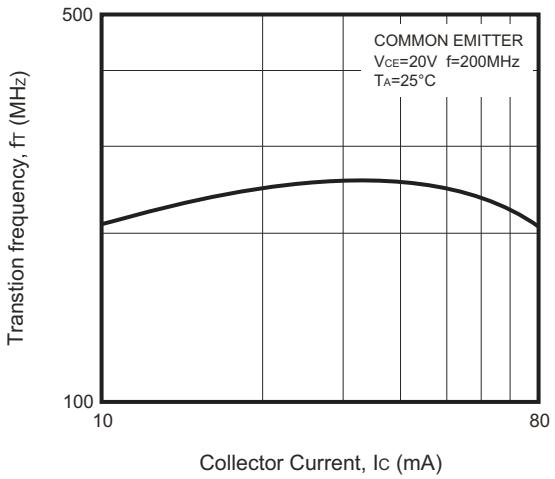
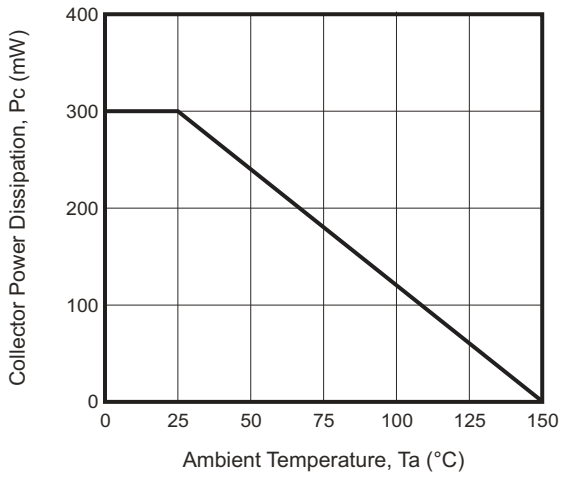
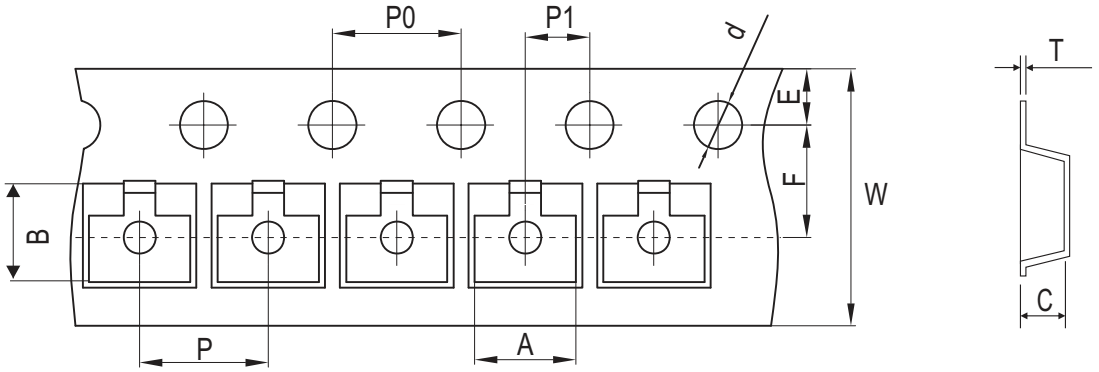
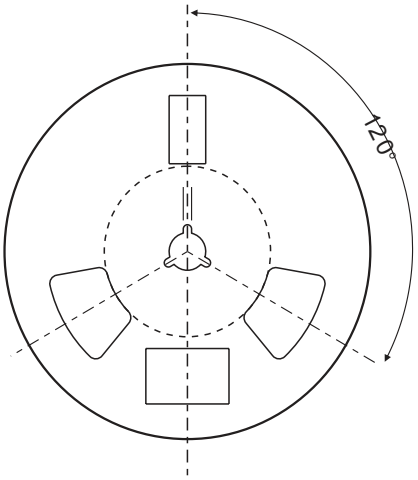


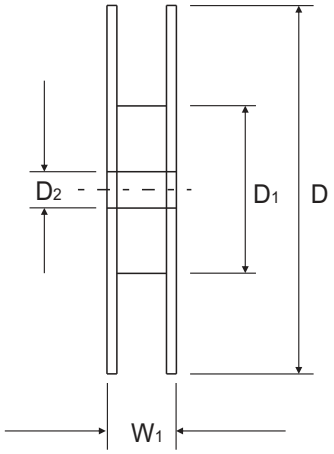
Fig.8 - P_C – Ta

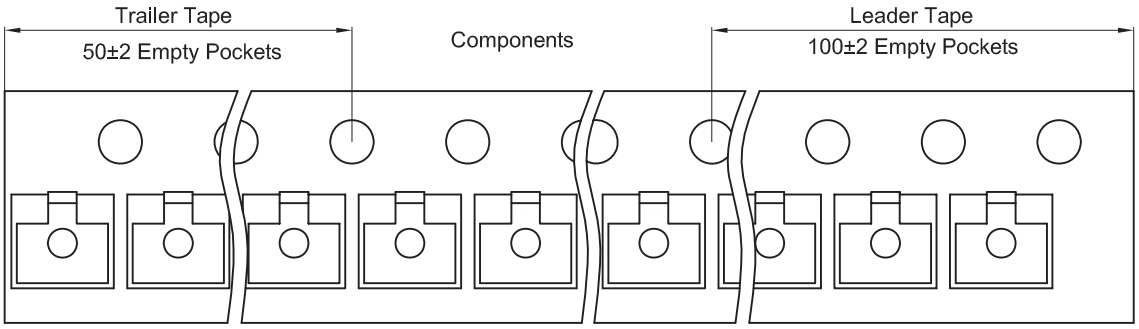


Reel Taping Specification







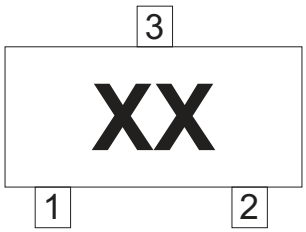


	SYMBOL	A	B	C	d	D	D1	D2
SOT-23	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	Φ1.50 ± 0.10	178 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	Φ0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

	SYMBOL	E	F	P	P0	P1	W	W1
SOT-23	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.00 + 0.30 / - 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 + 0.012 / - 0.004	0.484 ± 0.039

Marking Code

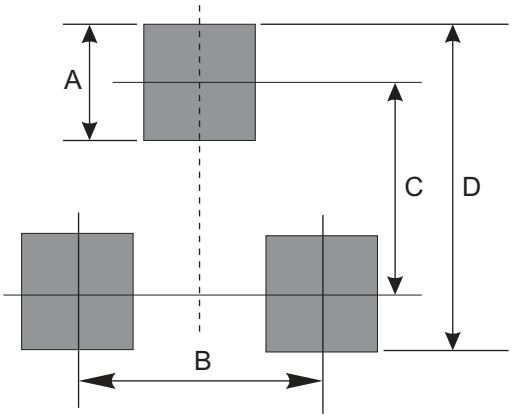
Part Number	Marking Code
MMBT2222A-G	1P



xx = Product type marking code

Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	1.90	0.075
C	2.02	0.080
D	2.82	0.111



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7