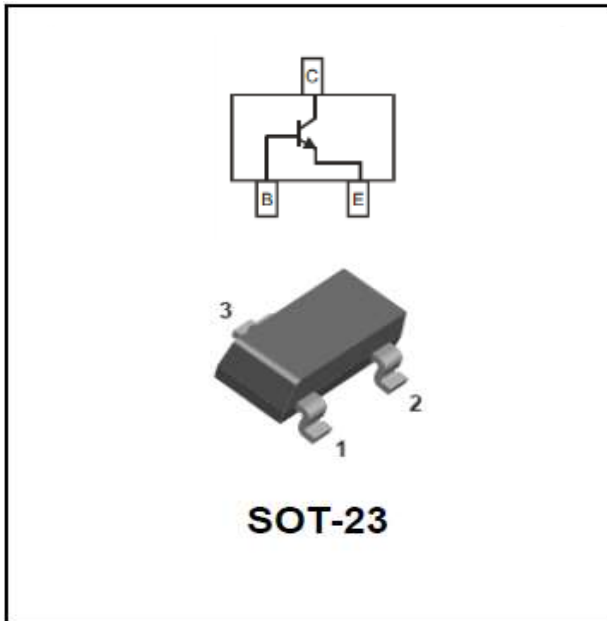


NPN Transistor



Features

- Epoxy meets UL-94 V-0 flammability rating
- Moisture Sensitivity Level 1
- High Conductance
- Surface mount package ideally Suited for Automatic Insertion

Mechanical Data

- **Package:** SOT-23
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** 1P



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

Item	Symbol	Unit	Value
Collector-Base Voltage	VCBO	V	60
Collector-Emitter Voltage	VCEO	V	40
Emitter-Base Voltage	VEBO	V	6
Collector Current -Continuous	IC	mA	600
Total Device Dissipation	PD	mW	300
Junction Temperature	Tj	°C	150
Storage Temperature	TSTG	°C	-55 to +150

■ Electrical Characteristics (Ta=25°C unless otherwise noted)

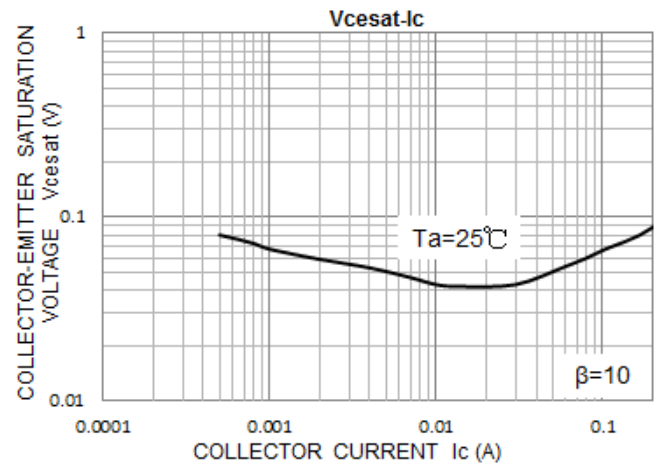
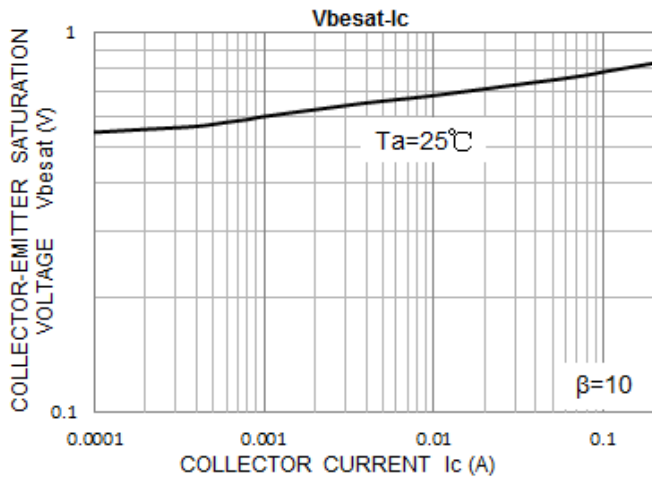
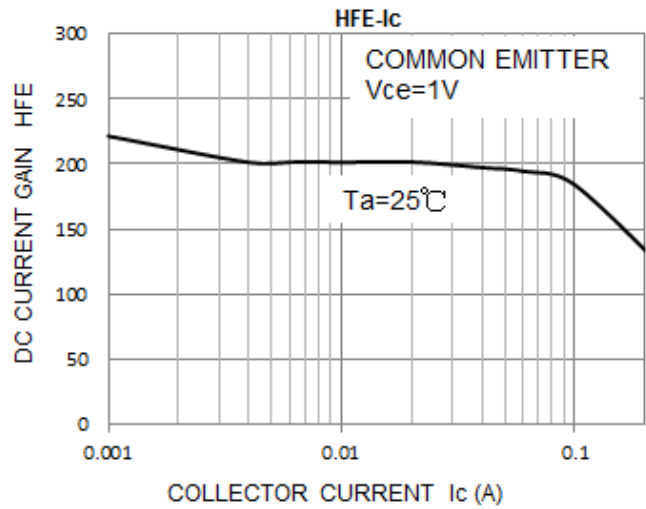
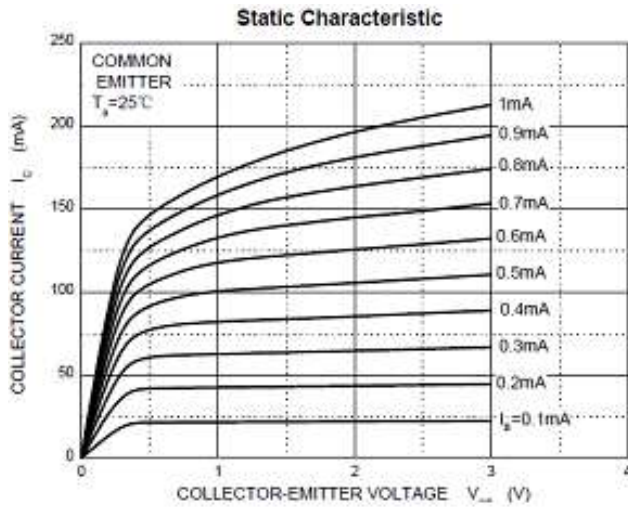
Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	$V_{(BR)CBO}$	V	IC=10mA, IE=0	75		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	V	IC =1mA, IB=0	40		
Emitter-base breakdown voltage	$V_{(BR)EBO}$	V	IE=100µA, IC=0	6		
Collector cut-off current	ICEX	nA	VCB=60V, VBE=3V			10
Base cut-off current	ICBO	nA	VCE=60V, IC =0			100
Emitter cut-off current	IEBO	nA	VEB=3 V, IC =0			100
DC current gain	hFE		VCE=1V, IC=0.1mA	20		
	hFE		VCE=1V, IC=1mA	40		
	hFE		VCE=1V, IC=10mA	80		
	hFE		VCE=1V, IC=150mA	100		300
	hFE		VCE=1V, IC=500mA	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	IC=150mA, IB=15mA			0.3
Base-emitter saturation voltage	$V_{BE(sat)}$	V	IC=150mA, IB=15mA	0.6		1.2

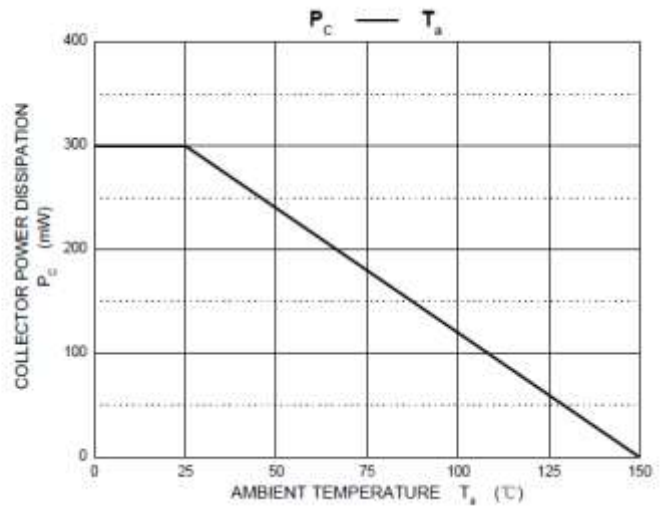
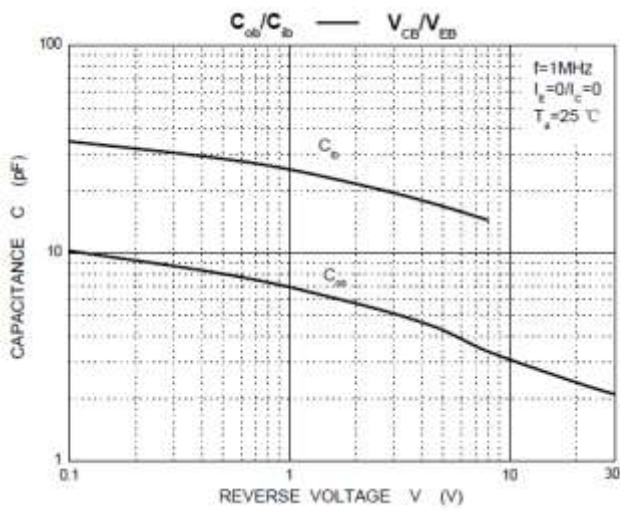
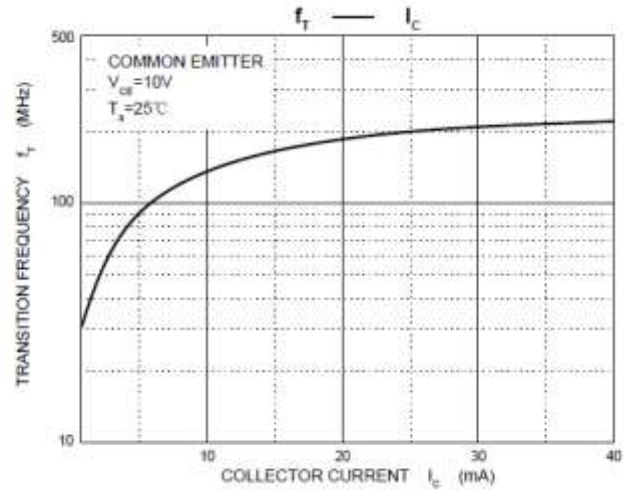
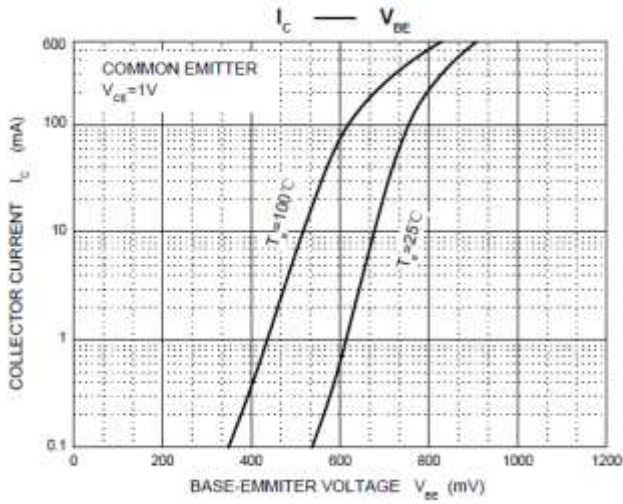
Transition frequency	f_T	MHz	$V_{CE}=20V, I_C=20mA, f=100MHz$	300		
Delay time	t_d	ns	$V_{CC}=30V, V_{BE(off)}=-0.5V$ $I_C=150mA, I_{B1}=15mA$			15
Rise time	t_r	ns				25
Storage time	t_s	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=I_{B2}=15mA$			225
Fall time	t_f	ns				60

■ Ordering Information (Example)

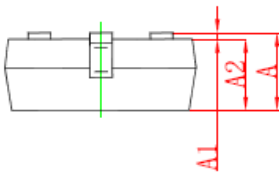
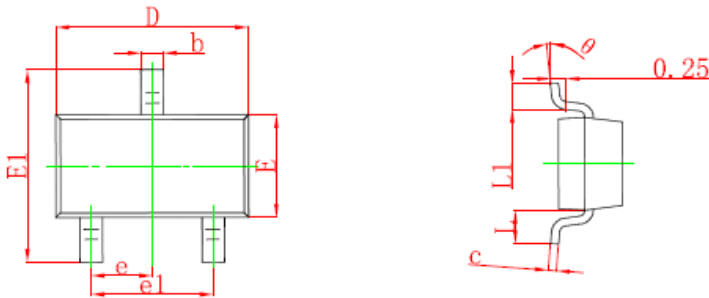
PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMBT2222A	F2	Approximate 0.008	3000	30000	120000	7" reel

■ Characteristics (Typical)



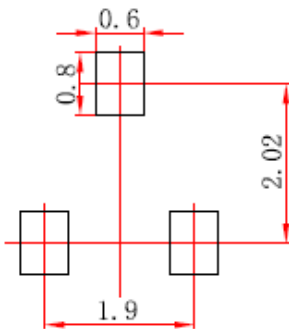


■ SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

■ SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: In millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

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