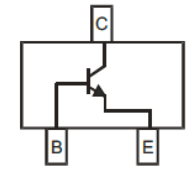
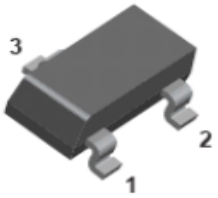
NPN Transistor





SOT-23

Features

- Epoxy meets UL-94 V-0 flammability rating
- Halogen free available upon request by adding suffix "HF"
- Moisure 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℃ unless otherwise noted)

Item	Symbol	Unit	Value
Collector-Base Voltage	V_{CBO}	V	75
Collector-Emitter Voltage	V_{CEO}	V	40
Emitter-Base Voltage	V_{EBO}	V	6
Collector Current	I_C	mA	600
Collector Power Dissipation	Pc	mW	300
Thermal Resistance From Junction To Ambient	$R_{\theta JA}$	℃/W	417
Junction Temperature	Tj	℃	150
Storage Temperature	T_{stg}	℃	-55 to +150

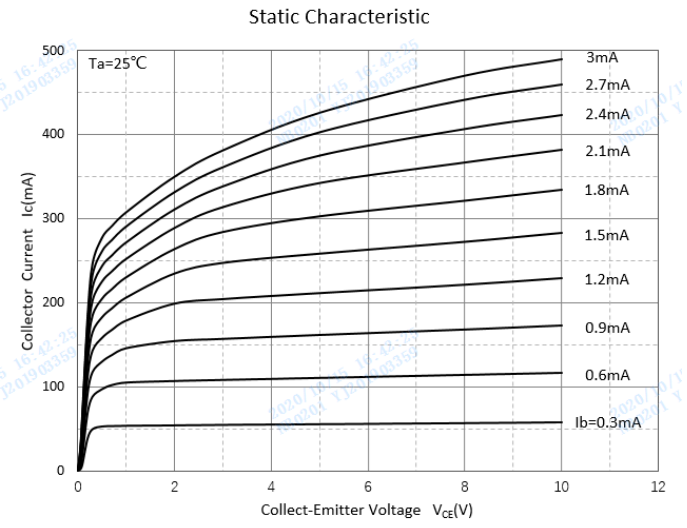
■ Ordering Information (Example)

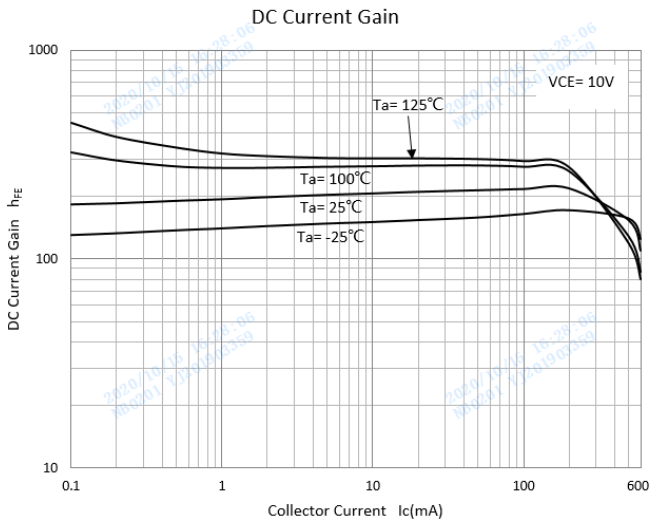
PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMBT2222A	F2	Approximate 0.008	3000	30000	120000	7" reel

■ Electrical Characteristics (Ta=25℃ unless otherwise noted)

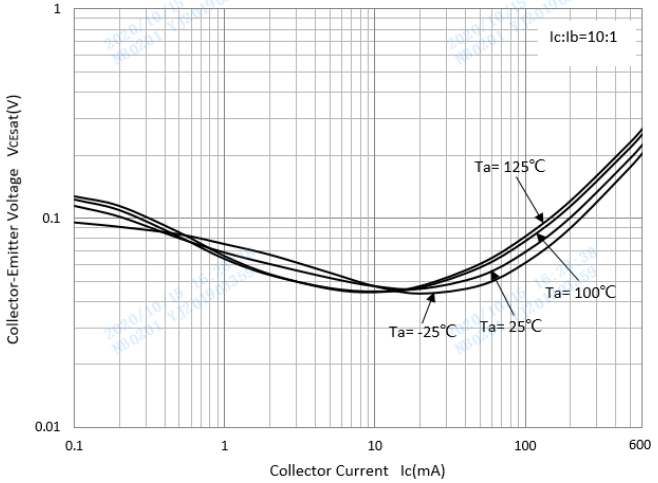
Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V_{CBO}	V	IC=10uA,IE=0	75		
Collector-emitter breakdown voltage	V_{CEO}	V	IC =10mA,IB=0	40		
Emitter-base breakdown voltage	V_{EBO}	V	IE=10μA,IC=0	6		
Collector-emitter cut-off current	I_{CEX}	nA	VCE=60V, VEB=3V			10
Collector-base cut-off current	I_{CBO}	nA	VCB=60V, IE =0			100
Emitter-base cut-off current	I_{EBO}	nA	VEB=3 V, IC =0			100
DC current gain	h_{FE}		VCE=10V,IC=0.1mA	20		
	h_{FE}		VCE=10V,IC=1mA	40		
	h_{FE}		VCE=10V,IC=10mA	80		
	h_{FE}		VCE=10V,IC=150mA	100		300
	h_{FE}		VCE=1V,IC=150mA	50		
	h_{FE}		VCE=10V,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	VCE=20V,IC=20mA,f=100MHz	300		
Delay time	td	ns	VCC=30V, VBE(off)=-0.5V IC=150mA,IB1=15mA			15
Rise time	tr	ns				25
Storage time	ts	ns	VCC=30V,IC=150mA,IB1=IB2=15mA			225
Fall time	tf	ns				60

■ Characteristics (Typical)

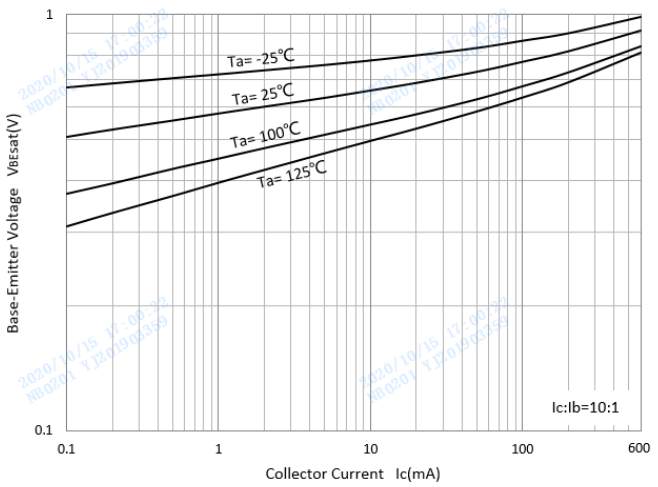




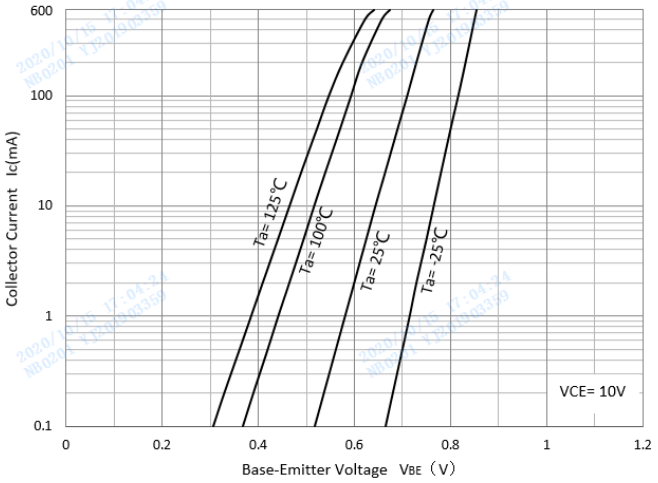
Collector-Emitter Saturation Voltage



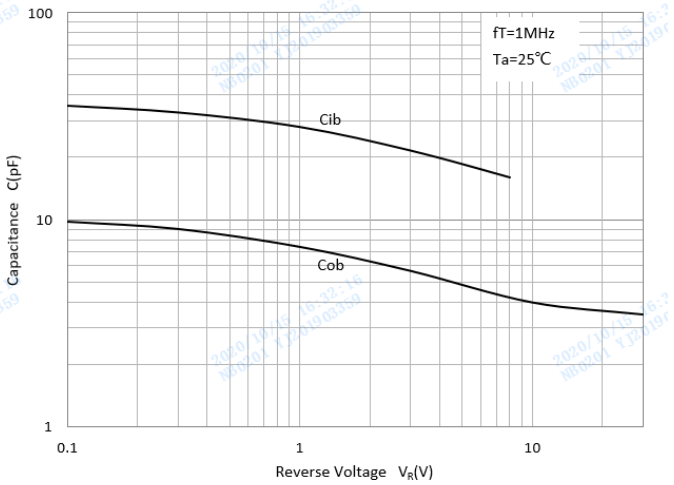
Base-Emitter Saturation Voltage



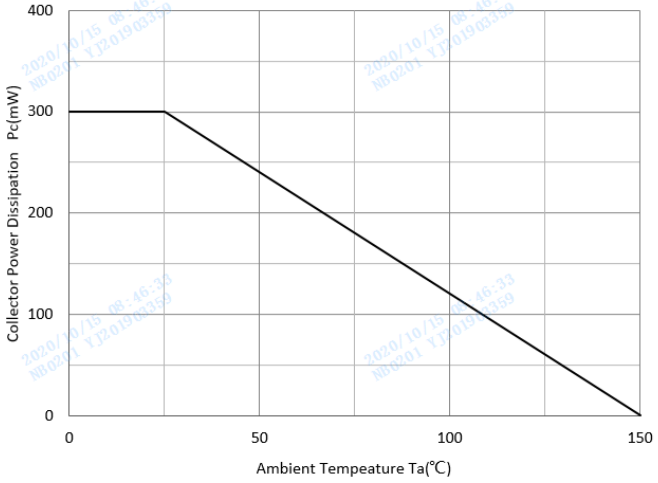
Base-Emitter On Voltage



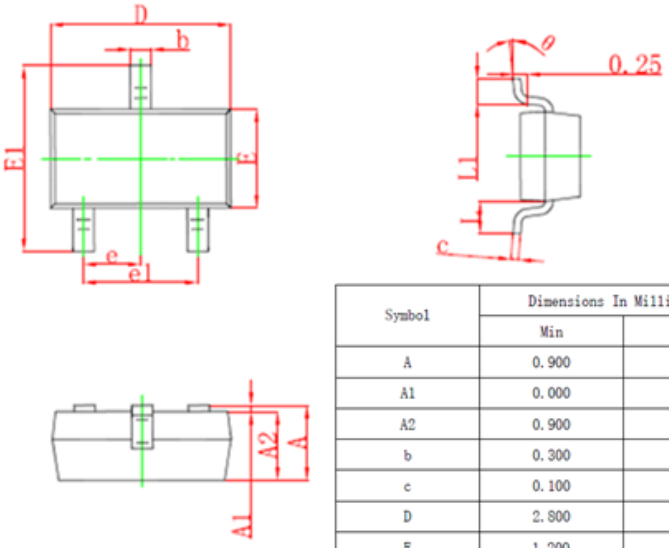
Cob/Cib-V_{CB}/V_{EB}



Collector Power Derating Curve

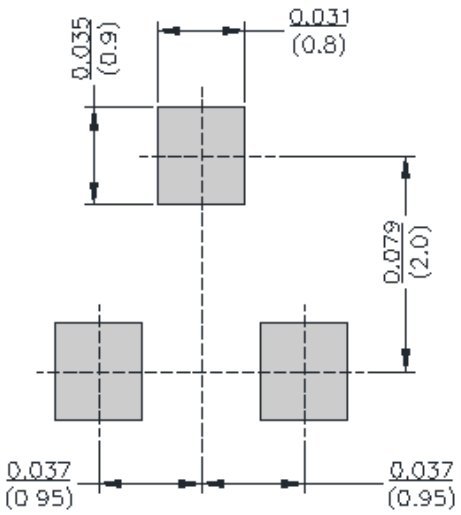


■SOT-23 Package Outline Dimensions



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	0.100	0.200	0.004	0.008
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	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

■SOT-23 Soldering Footprint



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