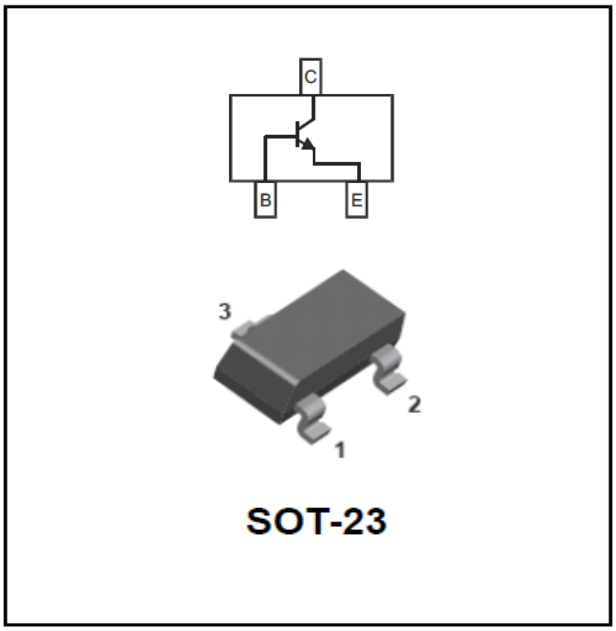
NPN Transistor



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
Junction Temperature	Tj	℃	150
Storage Temperature	T_{stg}	℃	-55 to +150

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

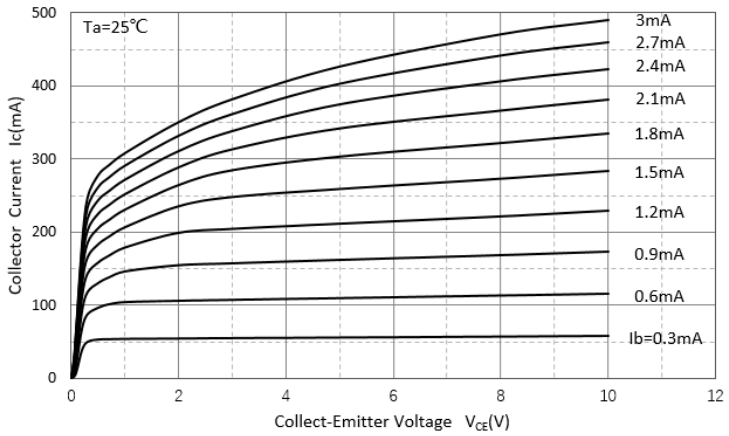
Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V_{CBO}	V	IC=10uA,IE=0	75		
Collector-emitter breakdown voltage	V_{CEO*}	V	IC =10mA,IB=0	40		
Emitter-base breakdown voltage	V_{EBO}	V	IE=10μA,IC=0	6		
Collector-emitter cut-off current	I_{CEX}	nA	VCE=60V, VEB=3V			10
Collector-base 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	35		
	h_{FE}		VCE=10V,IC=1mA	50		
	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

■ Ordering Information (Example)

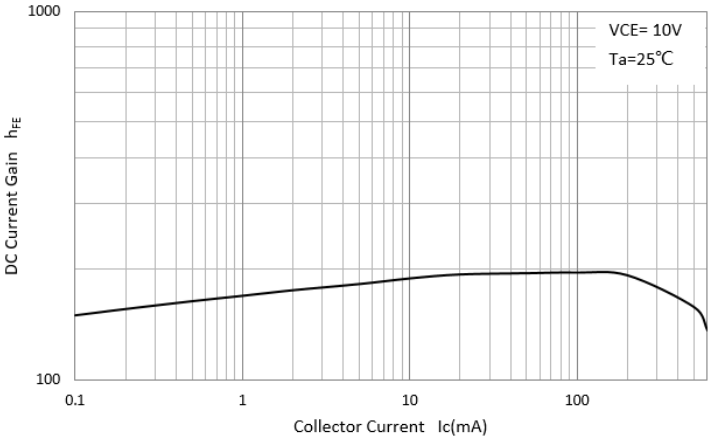
PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMBT2222A	F2	Approximate 0.008	3000	30000	120000	7” reel
MMBT2222A	F4	Approximate 0.008	10000	/	210000	13” reel

■ **Characteristics** (Typical)

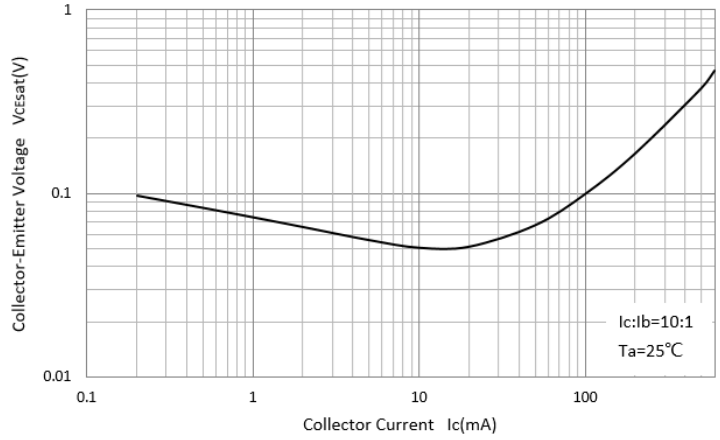
Static Characteristic



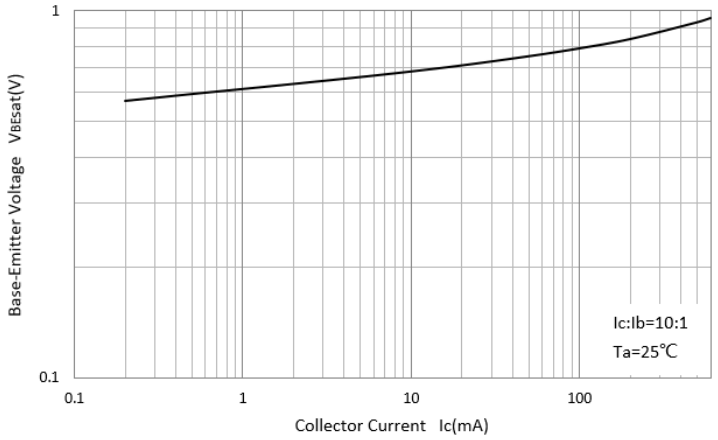
DC Current Gain



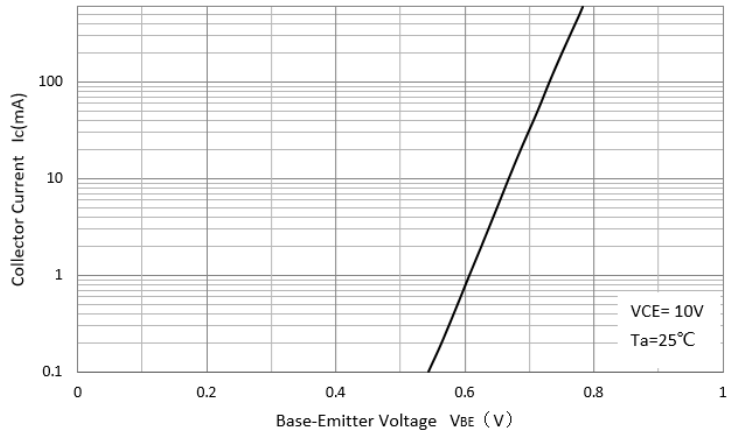
Collector-Emitter Saturation Voltage



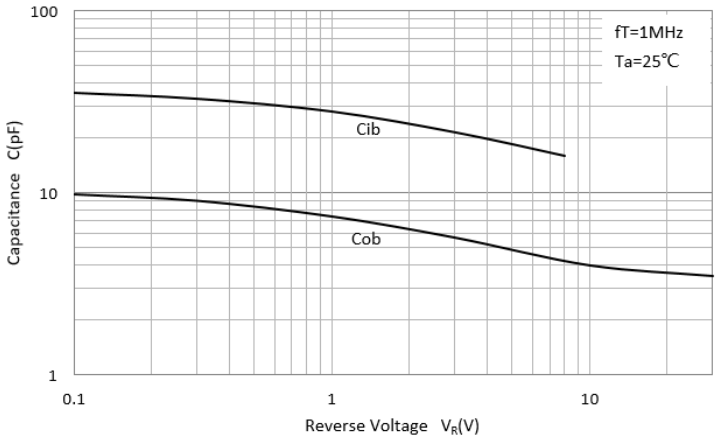
Base-Emitter Saturation Voltage



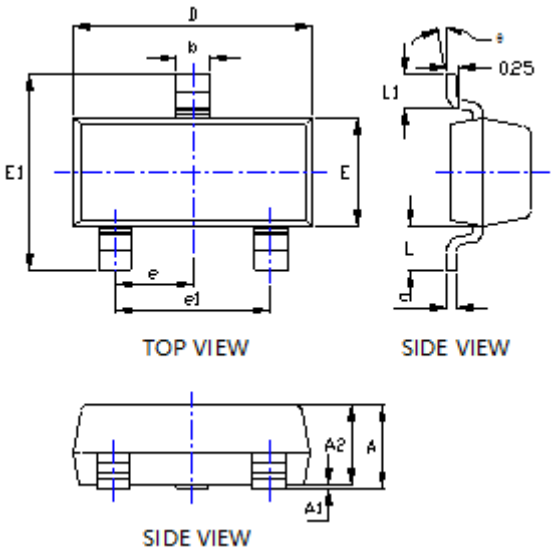
Base-Emitter On Voltage



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



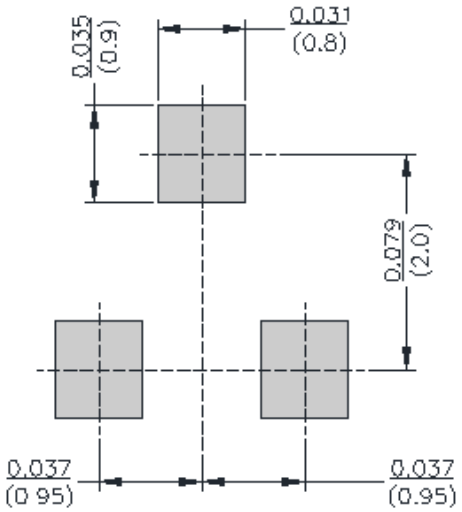
■SOT-23 Package Outline Dimensions



DIMENSIONS				
SYMBOL	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.045	0.900	1.150
A1	0.000	0.004	0.000	0.100
A2	0.035	0.041	0.900	1.050
b	0.012	0.020	0.300	0.500
c	0.004	0.008	0.100	0.200
D	0.110	0.118	2.800	3.000
E	0.047	0.055	1.200	1.400
E1	0.089	0.100	2.250	2.550
e	0.037TYP		0.950TYP	
e1	0.071	0.079	1.800	2.000
L	0.022REF		0.550REF	
L1	0.012	0.020	0.300	0.500
θ	0°	8°	0°	8°

Note:
1. All dimensions are in millimeters (mm) unless otherwise specified.
[所有尺寸均以毫米为单位，除非另有说明]
2. General tolerances: ±0.10mm unless otherwise specified.
[通用公差为±0.10mm，除非另有说明]
3. Dimensions and tolerances per ASME Y14.5M-2018.
[尺寸和公差遵循 ASME Y14.5M-2018 标准]
4.All dimensions shown are exclusive of burrs and gate residues. Burrs and gate vestiges shall not exceed 0.15 mm in maximum.
[所有尺寸均不包括毛刺和浇口残留。毛刺与浇口残留的尺寸最大不得超过 0.15mm]
5.Dimension b does not include dambar protrusion of max 0.100 mm per side.
[尺寸b不包括单边最大0.100 MM的中筋凸出部分]
6.Dimensions D and E are the overall extreme outer dimensions of the mold compound. These dimensions exclude mold flash, lead flash, protrusions and burrs but include the maximum allowable mold mismatch.
[D和E是塑封体的外部极限尺寸，不包括包封溢料、内引线溢料、凸出部分以及胶体毛刺，但是包含了包封错位的最大尺寸]
7.Formed leads shall be planar with respect to one another within a maximum of 0.076 mm relative to the seating plane.
[成型的管脚应为同一平面，共面性最大为0.1mm]

■SOT-23 Soldering Footprint



Notice

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in STARSEA's terms and conditions of sale for such products, STARSEA assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of STARSEA products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.