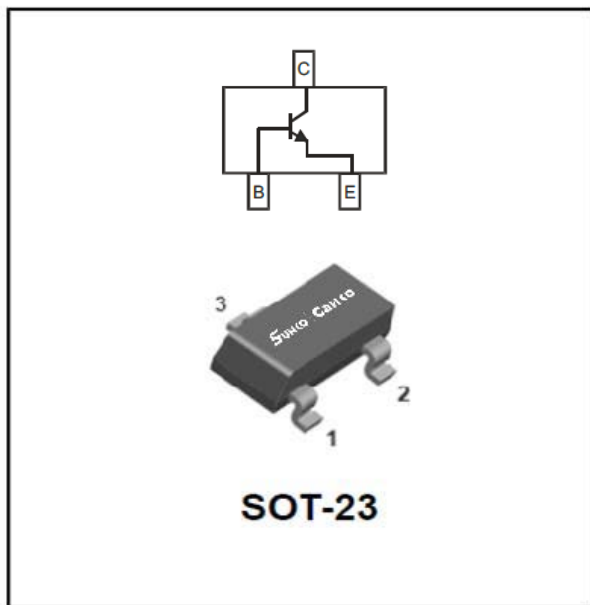


NPN Transistor



Features

- Epoxy meets UL-94 V-0 flammability rating
- Halogen free available upon request by adding suffix "HF"
- 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, -compliant, halogen-free
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** 1D

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

Item	Symbol	Unit	Value
Collector-Base Voltage	V_{CBO}	V	300
Collector-Emitter Voltage	V_{CEO}	V	300
Emitter-Base Voltage	V_{EBO}	V	5
Collector Current	I_C	mA	500
Collector Power Dissipation	P_C	mW	350
Thermal Resistance From Junction To Ambient	$R_{\theta JA}$	°C/W	357
Operation Junction Temperature	T_J	°C	150
Storage Temperature	T_{stg}	°C	-55 to +150

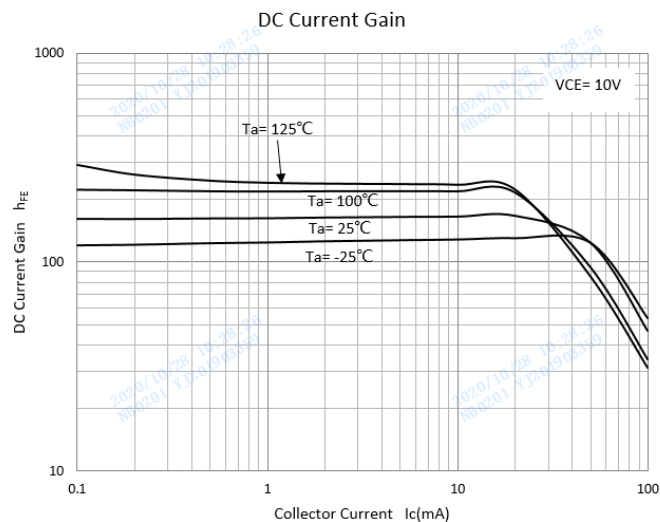
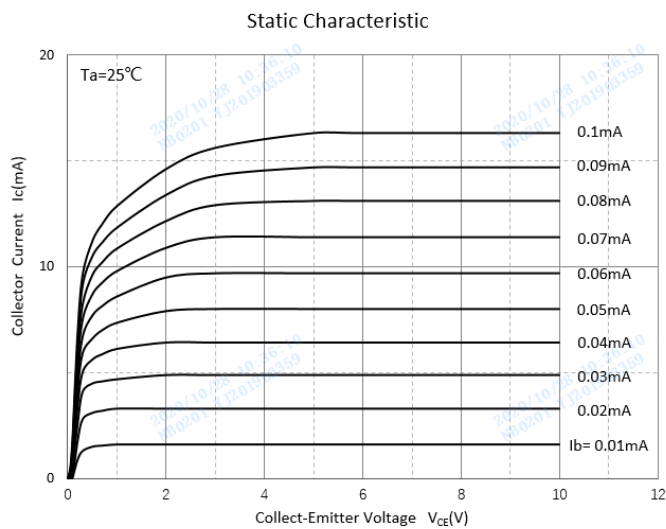
■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMBTA42	F2	Approximate 0.008	3000	30000	120000	7" reel

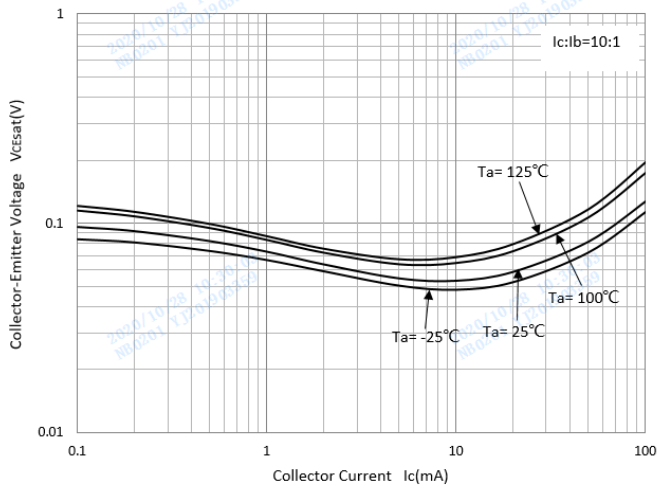
■ Electrical Characteristics (Ta=25°C unless otherwise noted)

Item	Symbol	Unit	Conditions	Min	Typ	Max
Collector-base breakdown voltage	V_{CBO}	V	$I_C = 100\mu A, I_E = 0$	300		
Collector-emitter breakdown voltage	V_{CEO}	V	$I_C = 1mA, I_B = 0$	300		
Emitter-base breakdown voltage	V_{EBO}	V	$I_E = 100\mu A, I_C = 0$	5		
Collector-base cut-off current	I_{CBO}	μA	$V_{CB} = 200V, I_E = 0$			0.5
Emitter-base cut-off current	I_{EBO}	μA	$V_{EB} = 5V, I_C = 0$			0.5
DC current gain	$h_{FE(1)}$		$V_{CE} = 10V, I_C = 1mA$	25		
	$h_{FE(2)}$		$V_{CE} = 10V, I_C = 10mA$	40		300
	$h_{FE(3)}$		$V_{CE} = 10V, I_C = 30mA$	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = 20mA, I_B = 2mA$			0.5
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C = 20mA, I_B = 2mA$			1.0
Transition frequency	f_T	MHz	$V_{CE} = 20V, I_C = 10mA, f = 30MHz$	50		

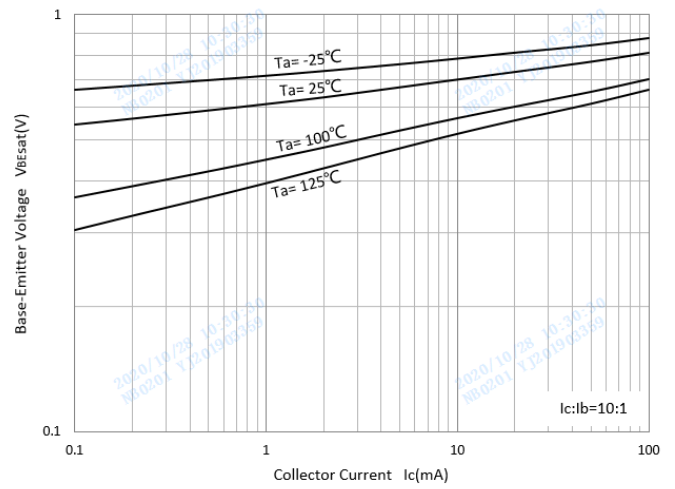
■ Characteristics (Typical)



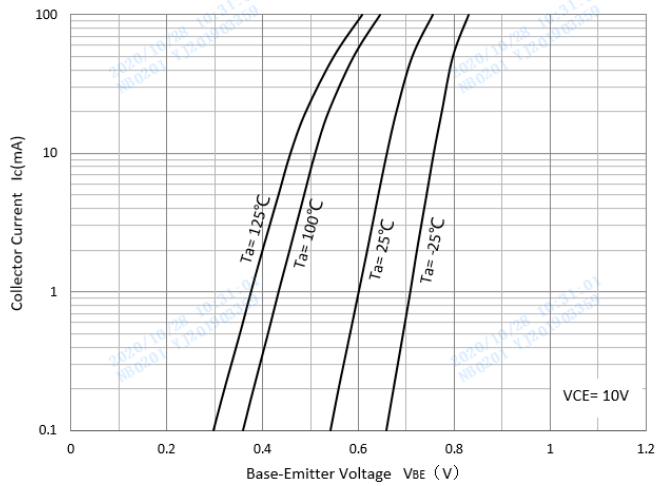
Collector-Emitter Saturation Voltage



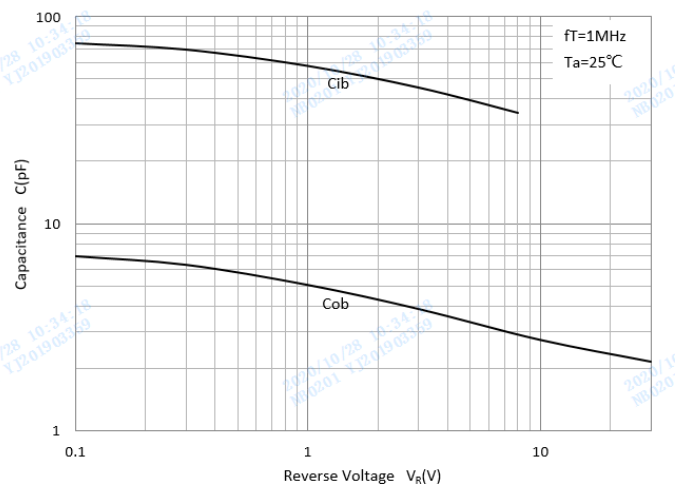
Base-Emitter Saturation Voltage



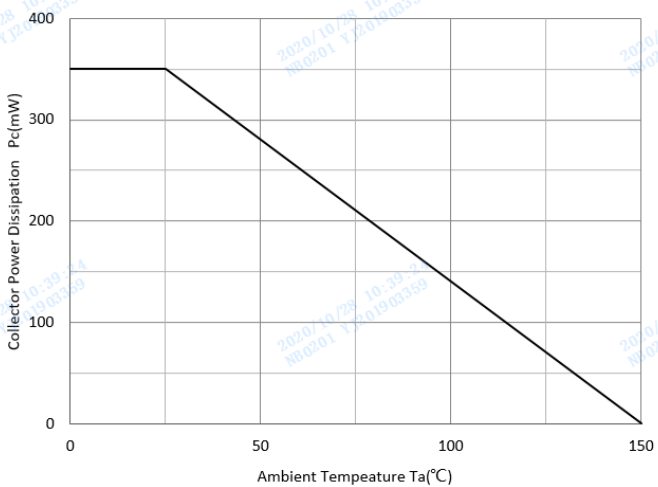
Base-Emitter On Voltage



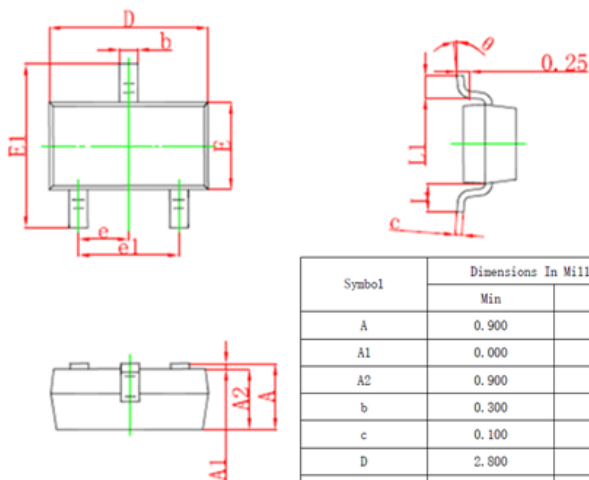
$C_{ob}/C_{ib}-V_{CB}/V_{EB}$



Collector Power Derating Curve

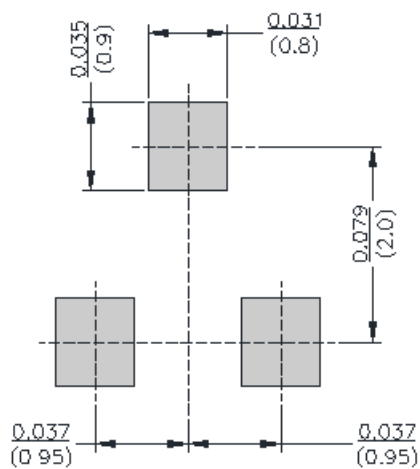


■ SOT-23 Package Outline Dimensions



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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