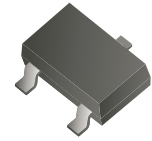


MMBTA42-HF (NPN)

RoHS Device
Halogen Free



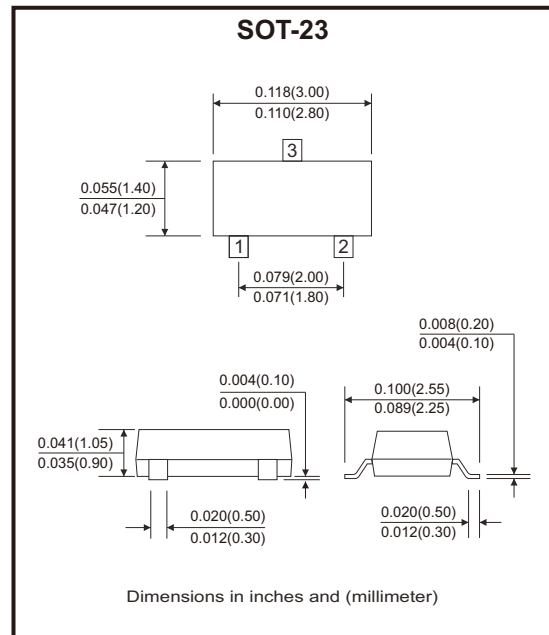
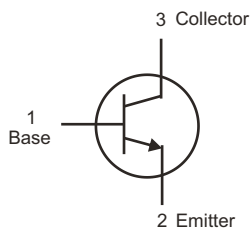
Features

- Epoxy meets UL-94 V-0 flammability rating.
- Moisture sensitivity Level 1.
- High conductance.
- Surface mount package ideally suited for automatic insertion.

Mechanical data

- Case: SOT-23, molded plastic.
- Terminals: Tin plated leads, solderable per J-STD-002 and JESD22-B102.

Circuit Diagram



Maximum Ratings (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	300	V
Collector-emitter voltage	V_{CEO}	300	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	500	mA
Collector power dissipation	P_C	350	mW
Operation junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal resistance from junction to ambient	$R_{\theta JA}$	357	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

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

Rating and Characteristic Curves (MMBTA42-HF)

Fig.1 - Static Characteristic

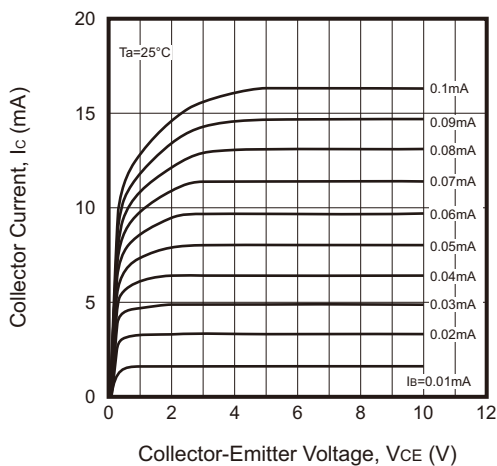
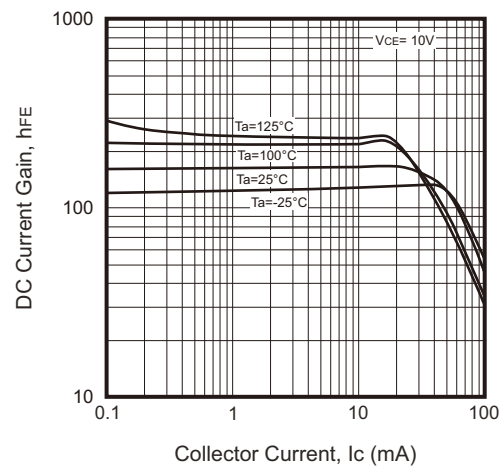


Fig.2 - DC Current Gain



Rating and Characteristic Curves (MMBTA42-HF)

Fig.3 - Collector-Emitter Saturation Voltage

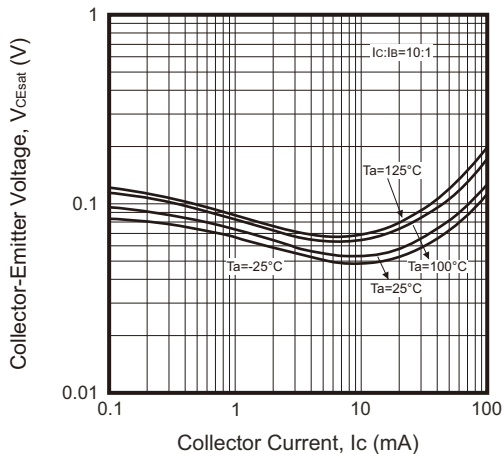


Fig.4 - Base-Emitter Saturation Voltage

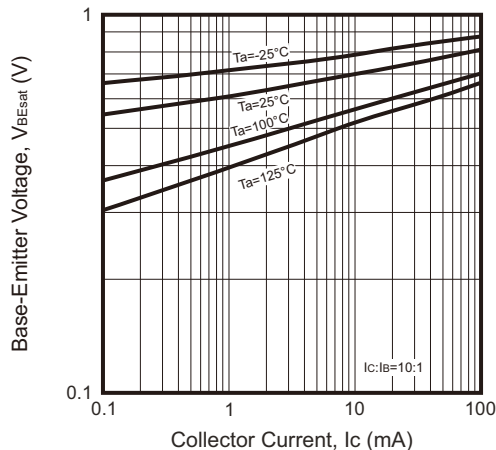


Fig.5 - Base-Emitter on Voltage

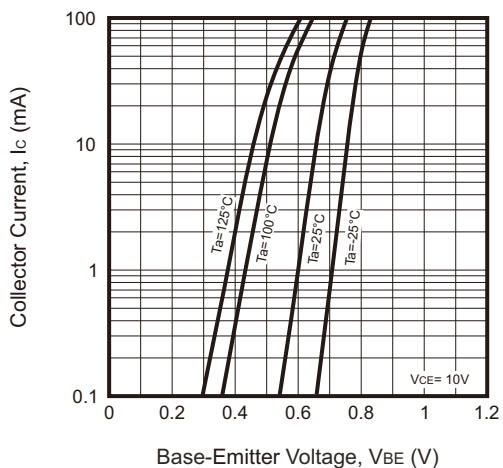


Fig.6 - $C_{ob}/C_{ib} - V_{CB}/V_{EB}$

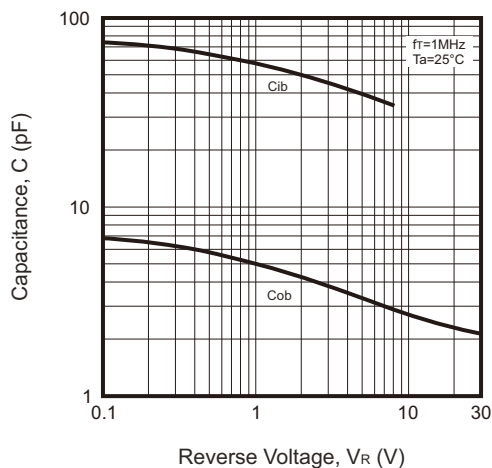
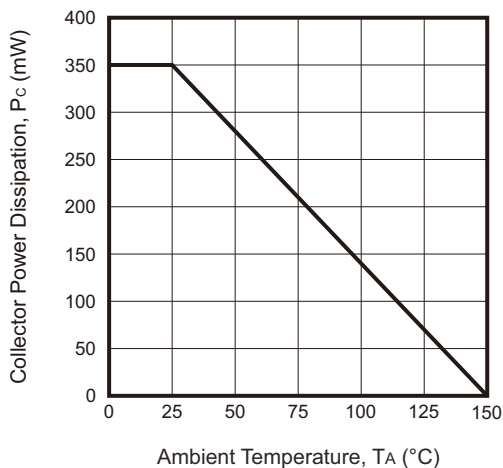
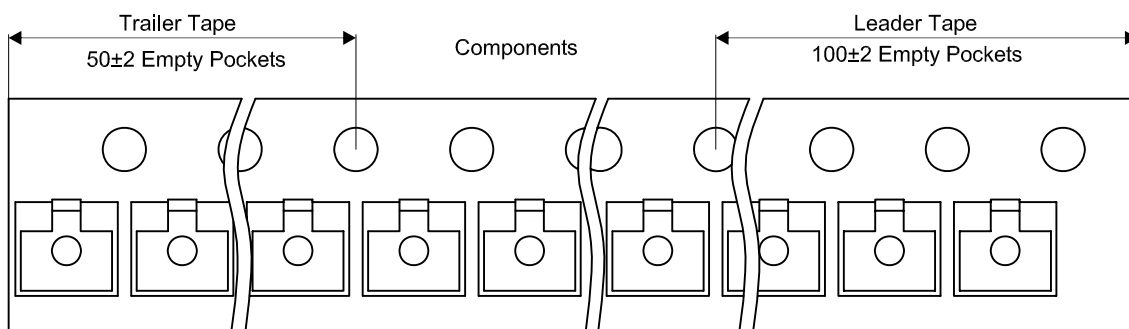
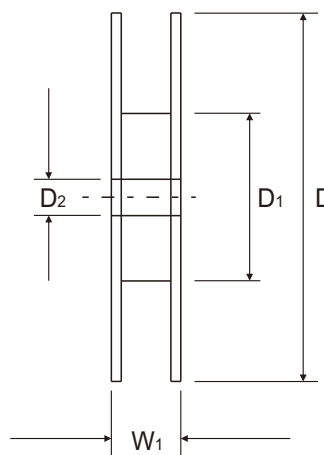
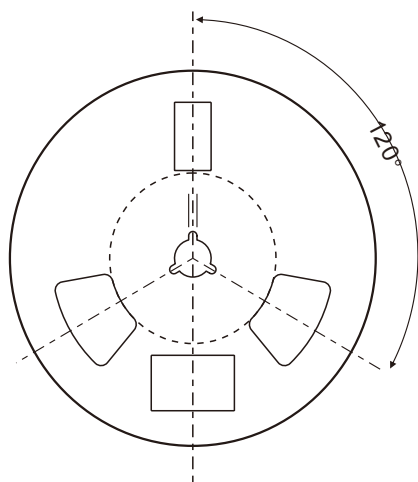
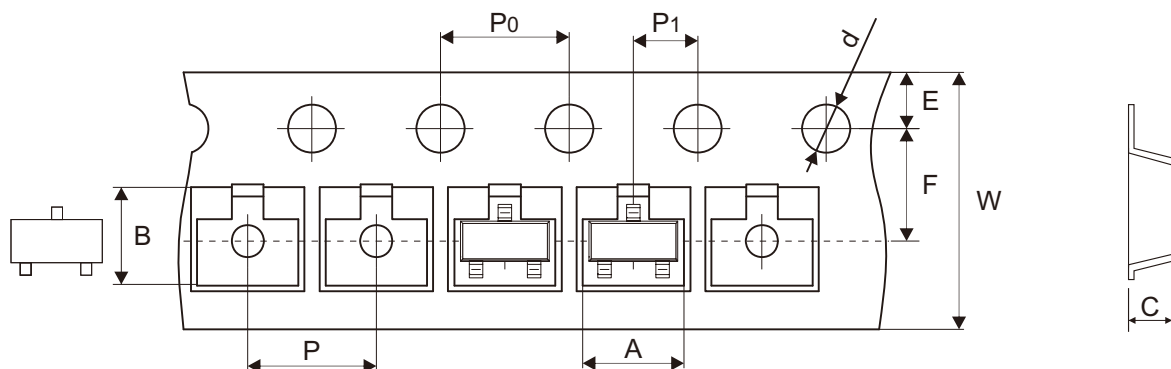


Fig.7 - Collector Power Derating Curve



Reel Taping Specification

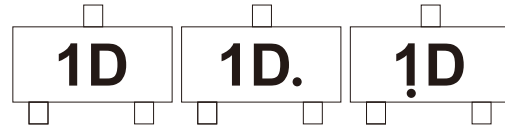


SOT-23	SYMBOL	A	B	C	d	D	D ₁	D ₂
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 + 0.10 - 0.00	178.00 ± 1.00	54.60 ± 1.00	13.30 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 + 0.004 - 0.000	7.008 ± 0.039	2.150 ± 0.039	0.524 ± 0.039

SOT-23	SYMBOL	E	F	P	P ₀	P ₁	W	W ₁
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 + 0.30 - 0.10	11.10 ± 0.20
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.315 + 0.012 - 0.004	0.437 ± 0.008

Marking Code

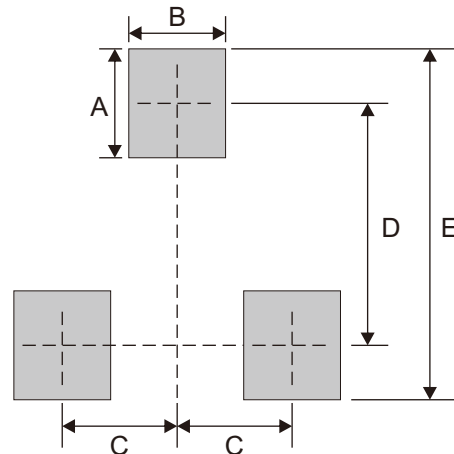
Part Number	Marking Code
MMBTA42-HF	1D



Solid dot = Control code

Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114



Note: 1. The pad layout is for reference purposes only.

Standard Packaging

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