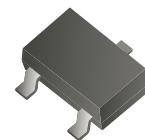


MMBTA42-HF (NPN)

RoHS Device
Halogen Free



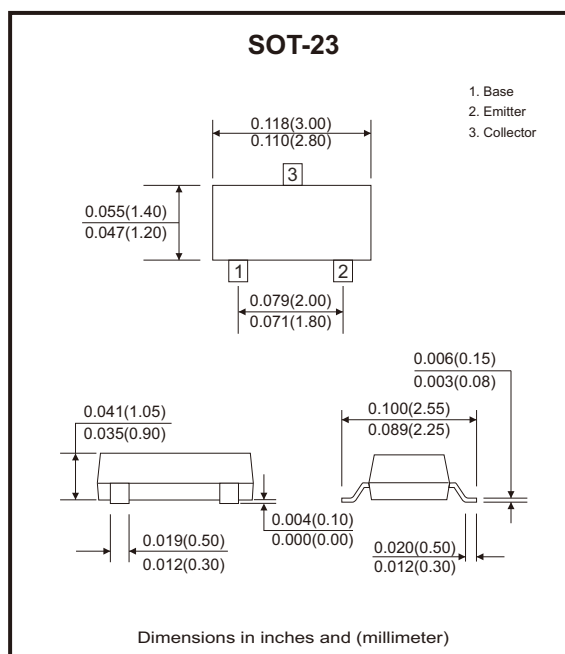
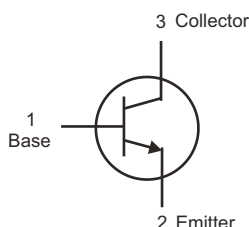
Features

- Power dissipation of 350mW.
- High stability and high reliability.

Mechanical data

- Case: SOT-23, molded plastic.
- Epoxy : UL 94V-0.
- Mounting position: Any.

Circuit Diagram



Maximum Ratings (at TA=25°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 _{EB0}	5	V
Collector current-continuous	I _C	300	mA
Collector power dissipation	P _C	350	mW
Junction temperature	T _J	150	°C
Storage temperature range	T _{STG}	-55 to +150	°C
Thermal resistance, junction to ambient	R _{θJA}	357	°C/W

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

Parameter	Conditions	Symbol	Min	Max	Unit
Collector-base breakdown voltage	$I_C=100\mu\text{A}$, $I_E=0$	$V_{(BR)CBO}$	300		V
Collector-emitter breakdown voltage	$I_C=1\text{mA}$, $I_B=0$	$V_{(BR)CEO}$	300		V
Emitter-base breakdown voltage	$I_E=10\mu\text{A}$, $I_C=0$	$V_{(BR)EBO}$	5		V
Collector cut-off current	$V_{CE}=200\text{V}$, $I_E=0$	I_{CBO}		250	nA
Emitter cut-off current	$V_{EB}=5\text{V}$, $I_C=0$	I_{EBO}		100	nA
DC current gain (Note 1)	$V_{CE}=10\text{V}$, $I_C=1\text{mA}$	$h_{FE(1)}$	60		
	$V_{CE}=10\text{V}$, $I_C=10\text{mA}$	$h_{FE(2)}$	100	200	
	$V_{CE}=10\text{V}$, $I_C=30\text{mA}$	$h_{FE(3)}$	65		
Collector-emitter saturation voltage (Note 1)	$I_C=20\text{mA}$, $I_B=2\text{mA}$	$V_{CE(sat)}$		0.2	V
Base-emitter saturation voltage (Note 1)	$I_C=20\text{mA}$, $I_B=2\text{mA}$	$V_{BE(sat)}$		0.9	V
Transition frequency	$V_{CE}=20\text{V}$, $I_C=100\text{mA}$, $f=30\text{MHz}$	f_T	50		MHz

Note: 1. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2.0\%$.

Rating and Characteristic Curves (MMBTA42-HF)

Fig.1 - $I_C - V_{CE}$

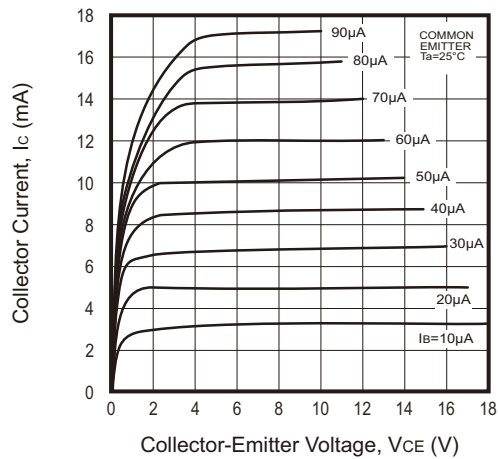


Fig.2 - $h_{FE} - I_C$

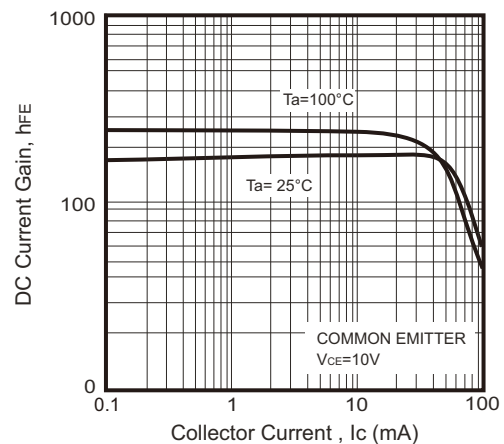


Fig.3 - $V_{CEsat} - I_C$

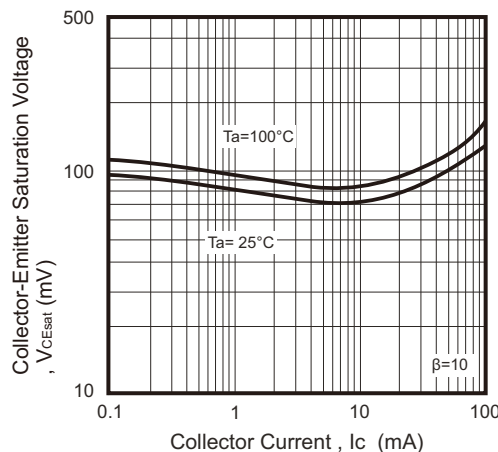
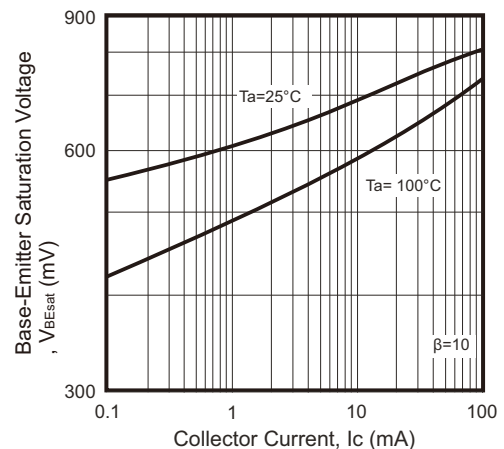


Fig.4 - $V_{BEsat} - I_C$



Company reserves the right to improve product design, functions and reliability without notice.

Rating and Characteristic Curves (MMBTA42-HF)

Fig.5 - I_C — V_{BE}

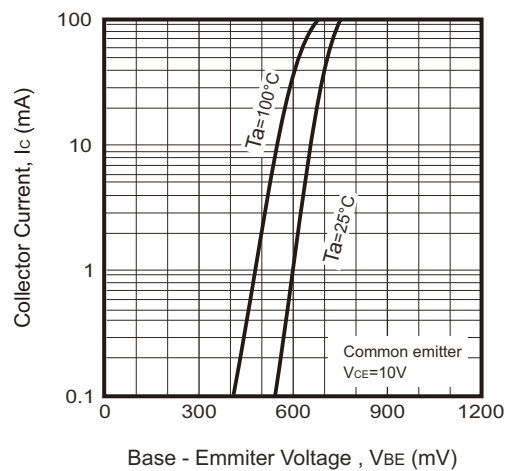


Fig.6 - f_T — I_C

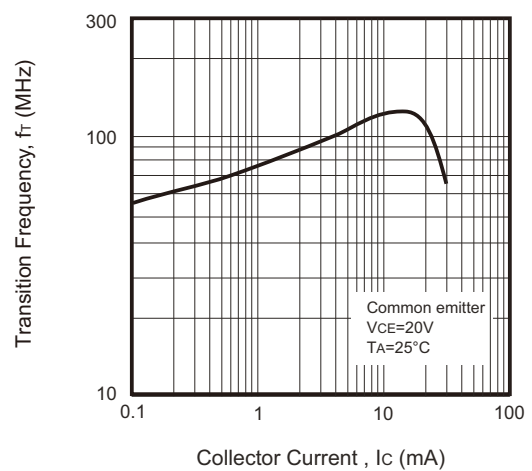


Fig. 7 - C_{ob}/C_{ib} — V_{CB}/V_{EB}

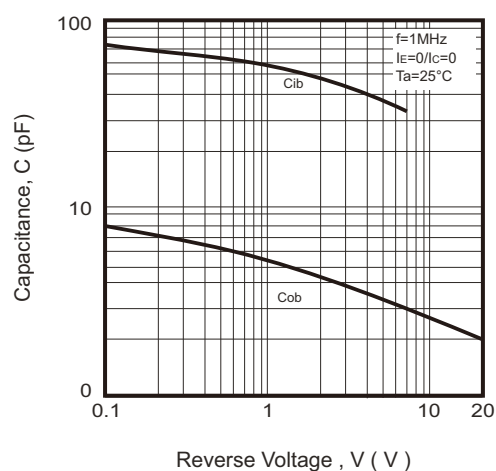
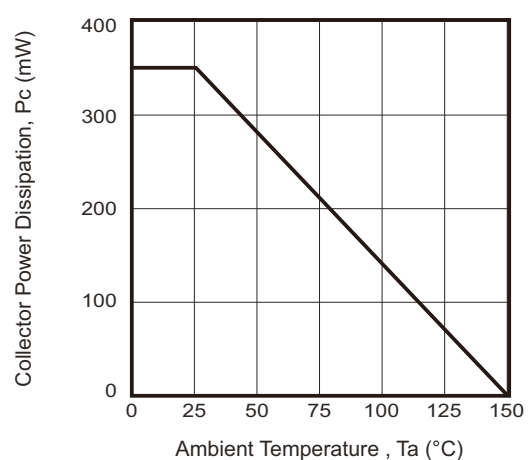
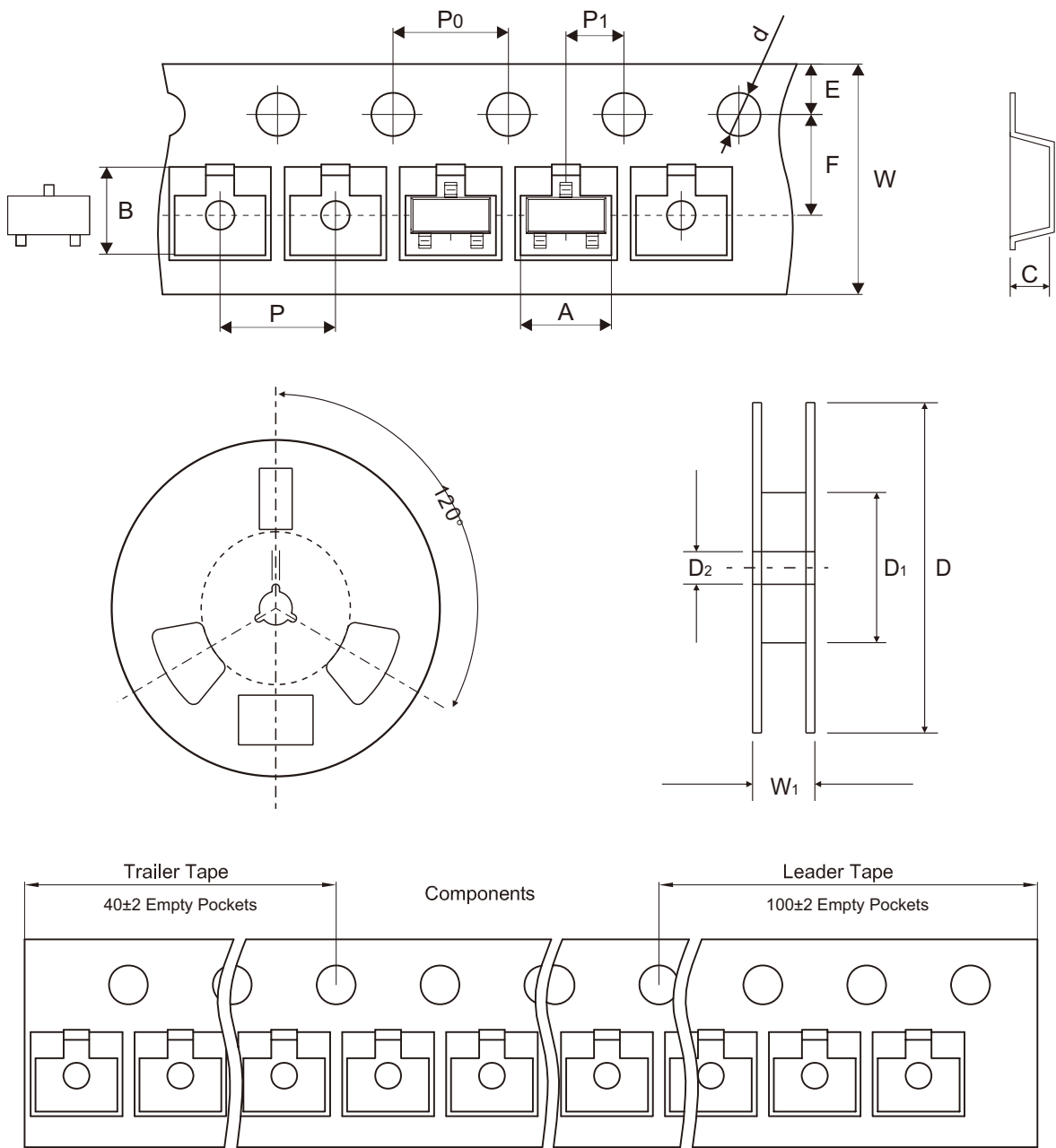


Fig.8 - P_C — T_a



Reel Taping Specification

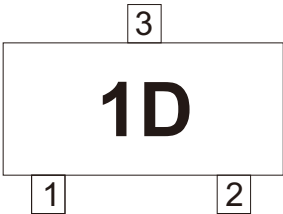


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.00 ± 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 ± 0.004	0.472 ± 0.039

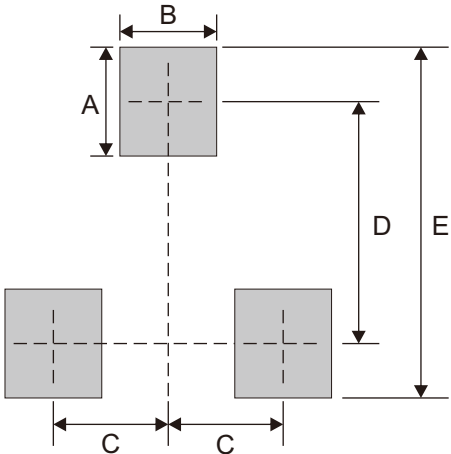
Marking Code

Part Number	Marking Code
MMBTA42-HF	1D



Suggested 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