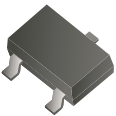


MMBT589-HF (PNP)

RoHS Device

Halogen Free



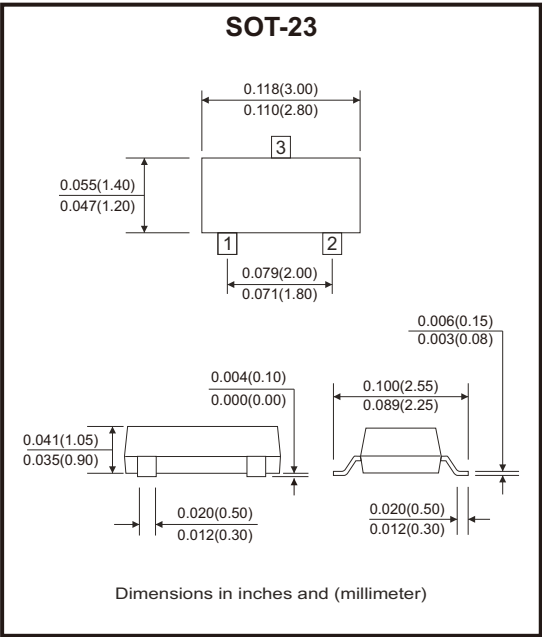
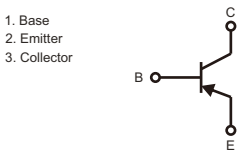
Features

- High current surface mount PNP silicon switching transistor for load management in portable applications.

Mechanical data

- Case: SOT-23, molded plastic.
- Mounting position: Any.

Circuit Diagram



Maximum Ratings (at TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V _{CBO}	-50	V
Collector-emitter voltage	V _{CEO}	-30	V
Emitter-base voltage	V _{EBO}	-5	V
Collector current-continuous	I _C	-1	A
Collector power dissipation	P _C	310	mW
Thermal resistance, junction to ambient	R _{θJA}	403	°C/W
Operation junction and storage temperature range	T _J , T _{STG}	-55 to +150	°C

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

Parameter	Symbol	Conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -100\mu\text{A}$, $I_E = 0$	-50		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10\text{mA}$, $I_B = 0$	-30		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -100\mu\text{A}$, $I_C = 0$	-5		V
Collector cut-off current	I_{CBO}	$V_{CB} = -30\text{V}$, $I_E = 0$		-0.1	μA
Collector-emitter cut-off current	I_{CES}	$V_{CES} = -30\text{V}$		-0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -4\text{V}$, $I_C = 0$		-0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = -2\text{V}$, $I_C = -1\text{mA}$	100		
	$h_{FE(2)}$	$V_{CE} = -2\text{V}$, $I_C = -500\text{mA}$	100	300	
	$h_{FE(3)}$	$V_{CE} = -2\text{V}$, $I_C = -1\text{A}$	80		
	$h_{FE(4)}$	$V_{CE} = -2\text{V}$, $I_C = -2\text{A}$	40		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = -500\text{mA}$, $I_B = -50\text{mA}$		-0.25	V
	$V_{CE(sat)2}$	$I_C = -1\text{A}$, $I_B = -100\text{mA}$		-0.3	
	$V_{CE(sat)3}$	$I_C = -2\text{A}$, $I_B = -200\text{mA}$		-0.65	
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = -1\text{A}$, $I_B = -100\text{mA}$		-1.2	V
Base-emitter turn-on voltage	$V_{BE(on)}$	$V_{CE} = -2\text{V}$, $I_C = -1\text{A}$		-1.1	V
Transition frequency	f_T	$V_{CE} = -5\text{V}$, $I_C = -100\text{mA}$, $f = 100\text{MHz}$	100		MHz
Collector output capacitance	C_{ob}	$f = 1\text{MHz}$		15	pF

Rating and Characteristic Curves (MMBT589-HF)

Fig.1 - Static Characteristic

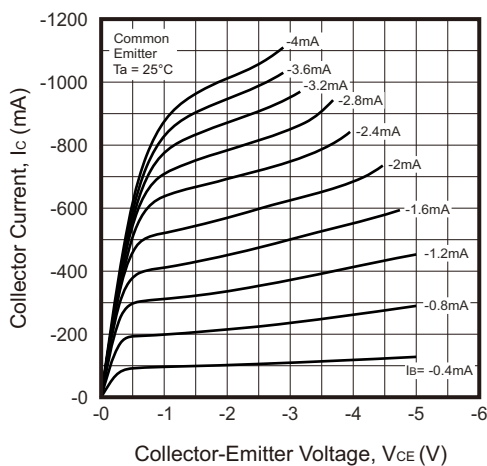
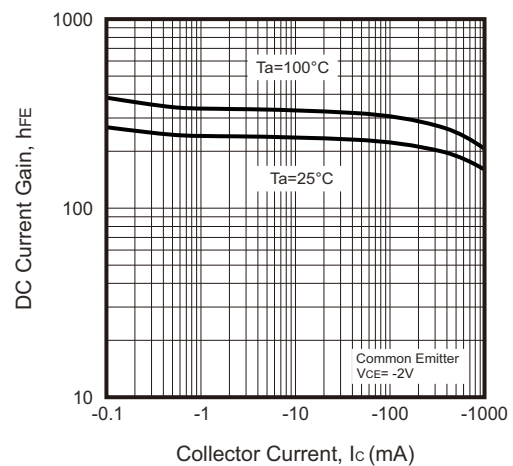


Fig.2 - $h_{FE} - I_C$



Rating and Characteristic Curves (MMBT589-HF)

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

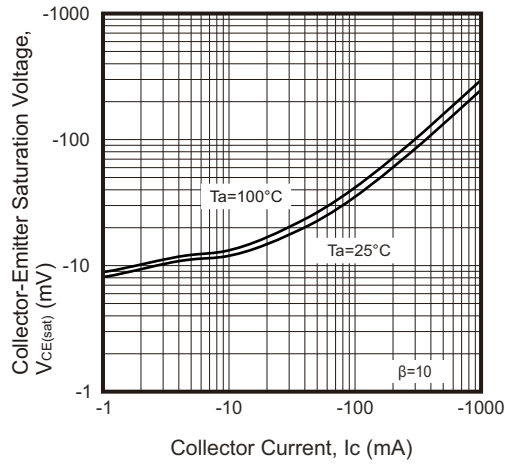


Fig.4 - $V_{BEsat} - I_c$

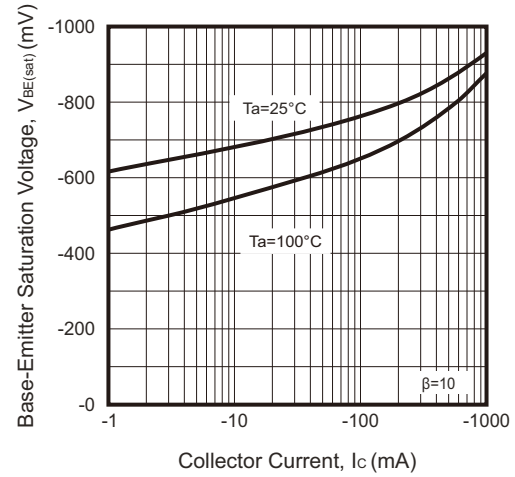


Fig.5 - $I_c - V_{BE}$

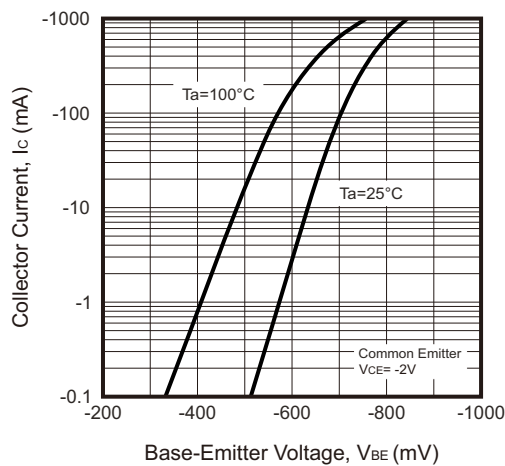


Fig.6 - $f_T - I_c$

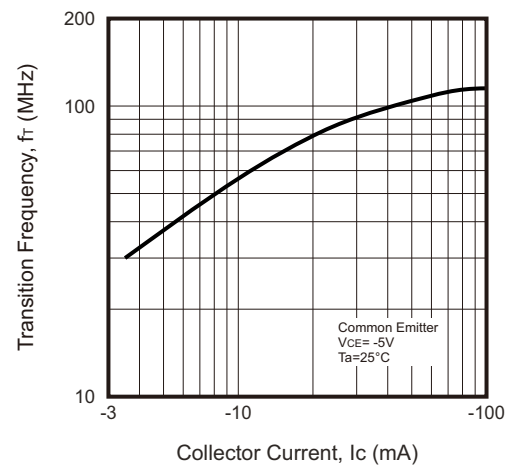


Fig.7 - $C_{ob}/C_{ib} - V_{CB}/V_{EB}$

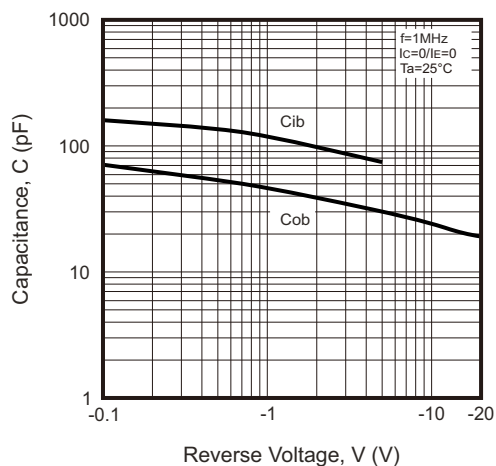
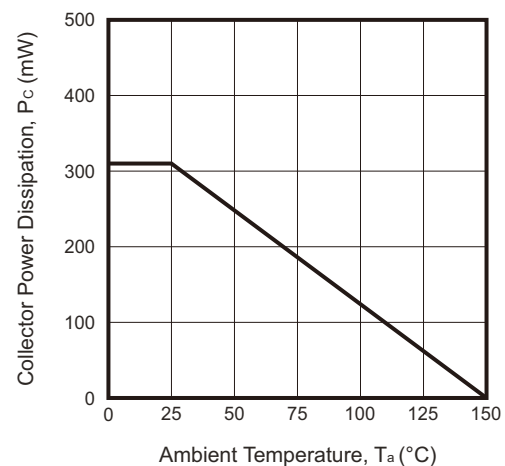
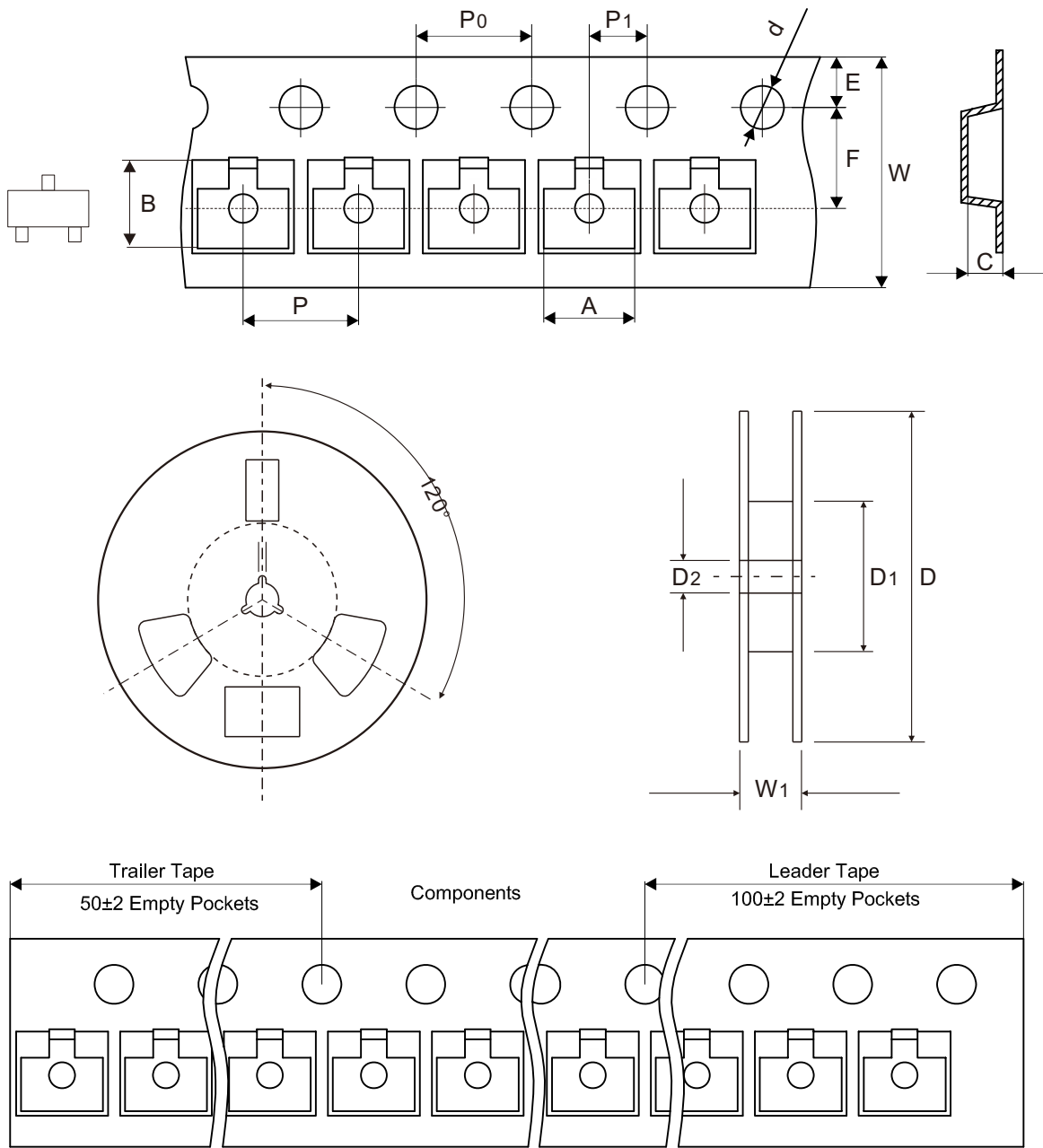


Fig.8 - $P_c - T_a$



Reel Taping Specification

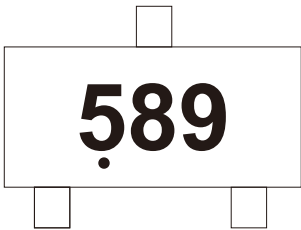


SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

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 + 0.30 - 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 + 0.012 - 0.004	0.484 ± 0.039

Marking Code

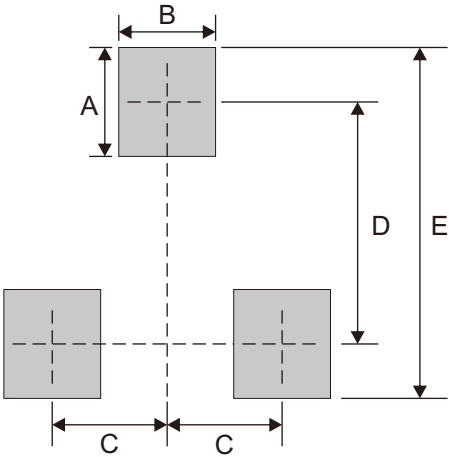
Part Number	Marking Code
MMBT589-HF	589



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