FMBT589

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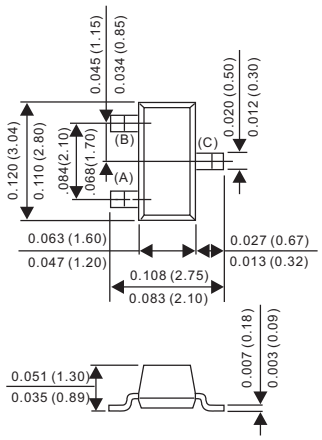
High Current PNP Silicon Transistor

Features

- High current surface mount PNP silicon switching transistor for Load management in portable applications.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" dinicates Halogen-free part, ex.FMBT589-H.

Package outline

SOT-23



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Maximum ratings (AT T_A=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}	-5.0	V
Collector current -continuous	I_C	-1	A
Collector power dissipation	P_D	310	mW
Thermal resistance junction to ambient	$R_{\theta JA}$	403	°C/W
Operating junction temperature range	T_J	-55 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

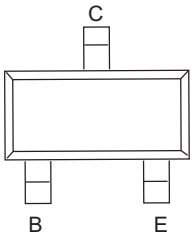
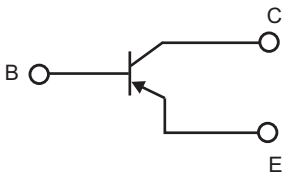
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Electrical characteristics (AT T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	UNIT
Collector-base breakdown voltage	I_c = -100uA, I_E = 0	$V_{(BR)CBO}$	-50			V
Collector-emitter breakdown voltage	I_c = -10mA, I_B = 0	$V_{(BR)CEO}$	-30			V
Emitter-base breakdown voltage	I_E = -100uA, I_C = 0	$V_{(BR)EBO}$	-5.0			V
Collector cut-off current	V_{CB} = -30V, I_E = 0	I_{CBO}			-0.1	μA
Collector-emitter cut-off current	V_{CES} = -30V	I_{CES}			-0.1	μA
Emitter cut-off current	V_{EB} = -4V, I_C = 0	I_{EBO}			-0.1	μA
DC current gain	I_c = -1.0mA, V_{CE} = -2.0V	h_{FE}	100			
	I_c = -500mA, V_{CE} = -2.0V		100		300	
	I_c = -1.0A, V_{CE} = -2.0V		80			
	I_c = -2.0A, V_{CE} = -2.0V		40			
Collector-emitter saturation voltage	I_c = -500mA, I_B = -50mA	$V_{CE(sat)}$			-0.25	V
	I_c = -1.0A, I_B = -100mA				-0.3	V
	I_c = -2.0A, I_B = -200mA				-0.65	V
Base-emitter saturation voltage	I_c = -1.0A, I_B = -100mA	$V_{BE(sat)}$			-1.2	V
Base-emitter Turn-on voltage	I_c = -1.0A, V_{CE} = -2.0V	$V_{BE(on)}$			-1.1	V
Transition frequency	I_C = -100mA, V_{CE} = -5.0V, f = 100MHz	f_T	100			MHz
Collector Output Capacitance	f = 1.0MHz	C_{ob}			15	pF

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Pinning information

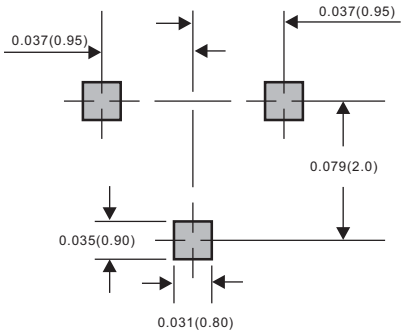
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
FMBT589	589

Suggested solder pad layout

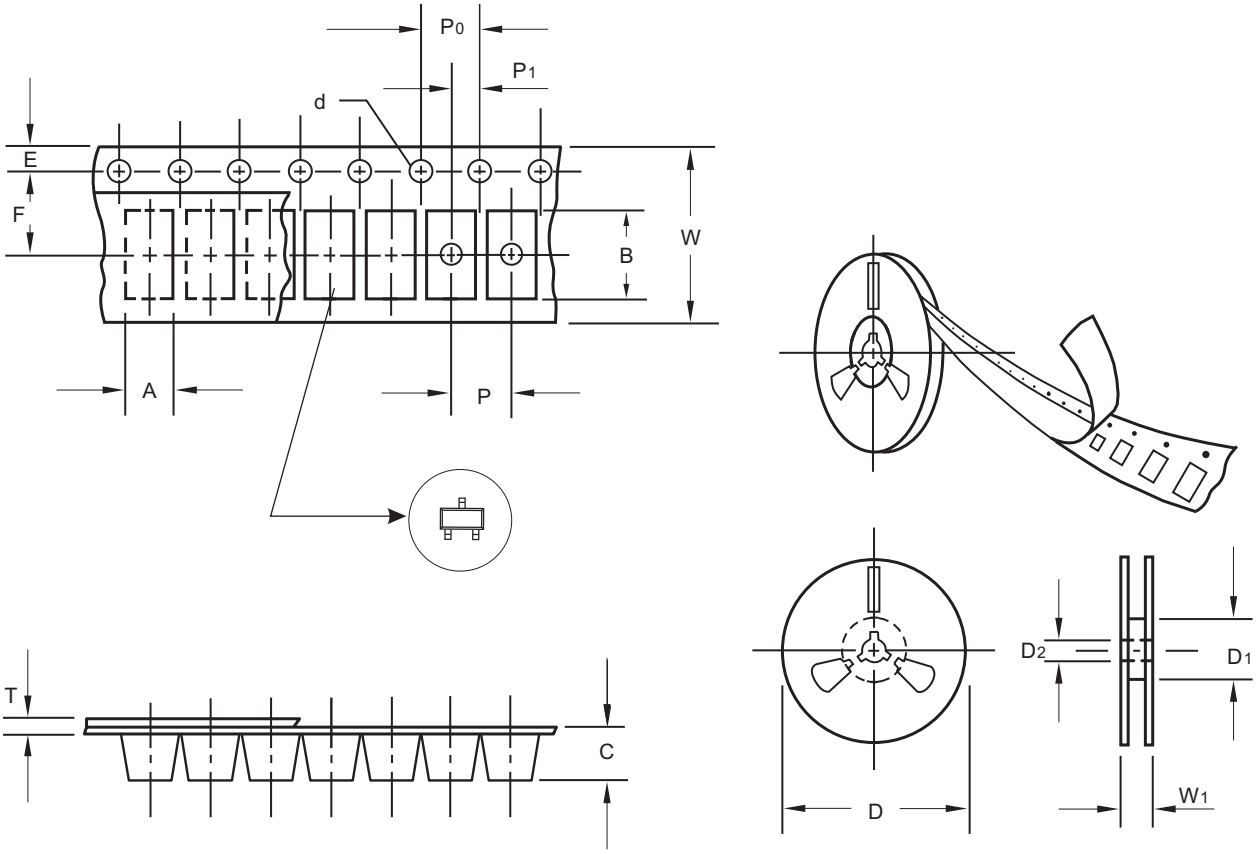
SOT-23



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	55.00
Feed hole diameter	D_2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	12.0

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

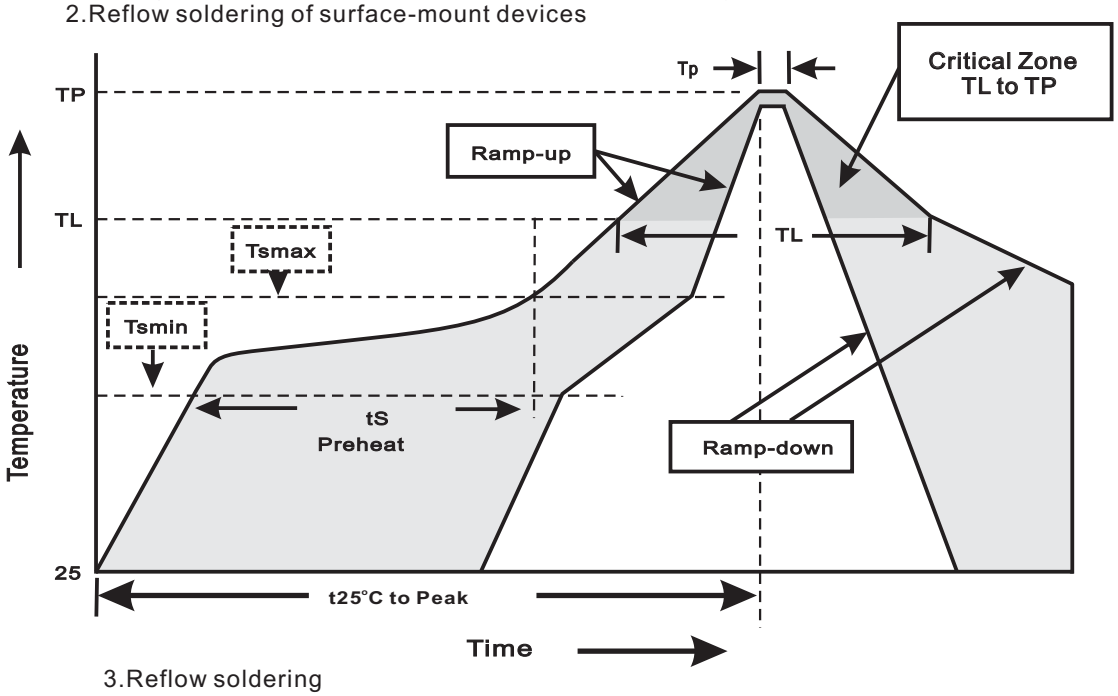
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	11.6

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	 <3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes