FMBT493-Q1

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1A 120V NPN Silicon Transistor

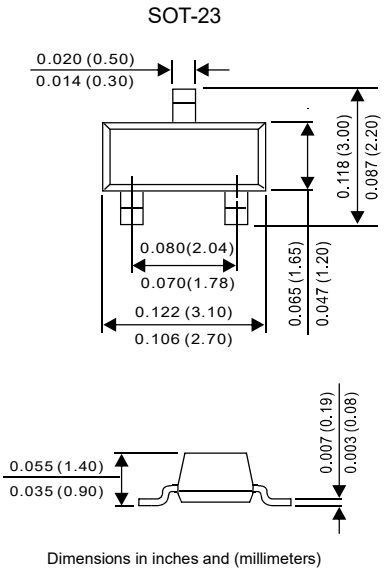
Features

- For switching and AF amplifier applications.
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" dinicates Halogen-free part, ex.FMBT493-Q1-H.

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.

Package outline



Dimensions in inches and (millimeters)

Maximum ratings (At T_A=25°C unless otherwise noted)

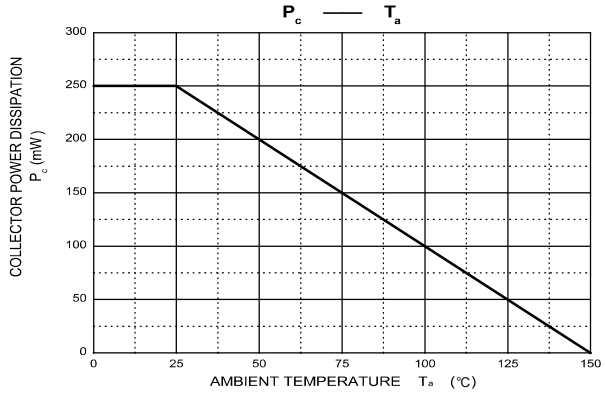
Parameter	Symbol	Value	Unit
Collector to base voltage	V_{CBO}	120	V
Collector to Emitter Voltage	V_{CEO}	100	V
Emitter to base voltage	V_{EBO}	5	V
Collector current	I_C	1	A
Total power dissipation	P_D	250	mW
Junction temperature	T_J	+150	℃
Storage temperature range	T_{STG}	-55 to +150	℃

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

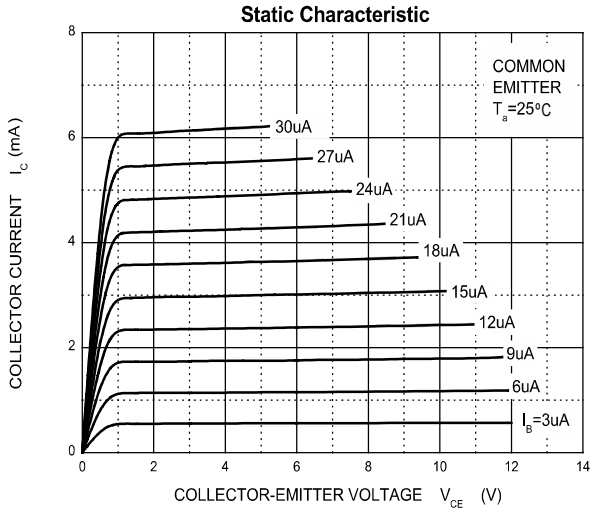
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector base breakdown voltage	I_C = 100μA	$V_{(BR)CBO}$	120			V
Collector emitter breakdown voltage	I_C = 1mA	$V_{(BR)CEO}$	100			V
Emitter base breakdown voltage	I_E = 100μA	$V_{(BR)EBO}$	5			V
Collector base cut off current	V_{CB} = 100V	I_{CBO}			0.1	μA
Collector base cut off current	V_{CE} = 100V	I_{CES}			0.1	μA
Emitter base cut-off current	V_{EB} = 4V	I_{EBO}			0.1	μA
Collector emitter saturation voltage	I_C = 500mA, I_B = 50mA	$V_{CE(sat)}$			0.3	V
	I_C = 1A, I_B = 100mA				0.6	
Base emitter saturation voltage	I_C = 1A, I_B = 100mA	$V_{BE(sat)}$			1.15	V
	V_{CE} = 10V, I_C = 1A	$V_{BE(on)}$			1	
DC current gain	V_{CE} = 10V, I_C = 1mA	h_{FE}	100			
	V_{CE} = 10V, I_C= 250mA		100		300	
	V_{CE} = 10V, I_C = 500mA		60			
	V_{CE} = 10V, I_C = 1A		20			
Transition Frequency	V_{CE} = 10V, I_C = 50mA, f = 100MHz	f_T	150			MHz
Output capacitance	V_{CB} = 10V, I_E = 0, f=1MHz	C_{ob}			10	pF

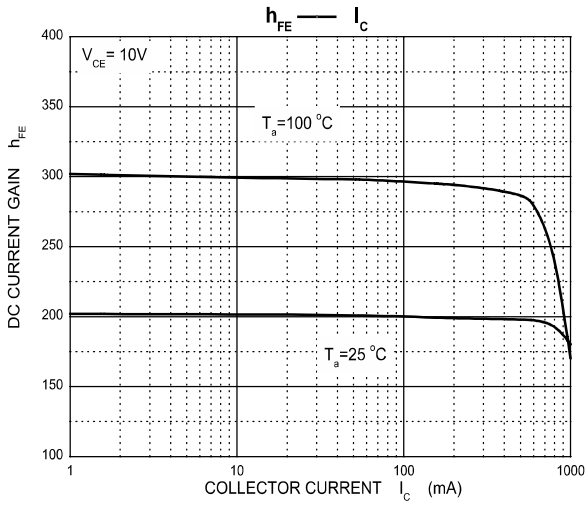
Rating and characteristic curves

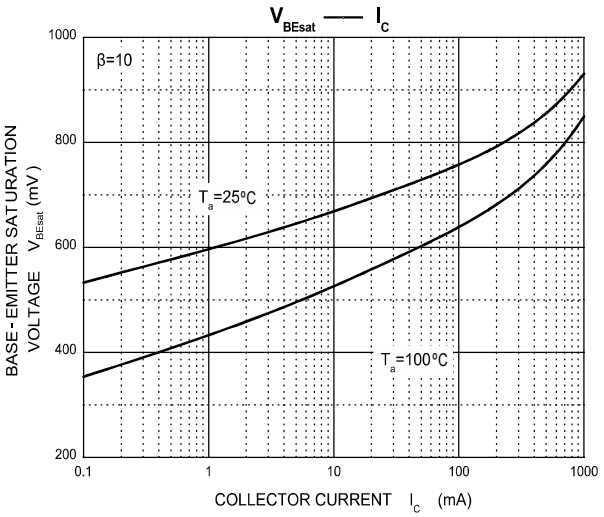


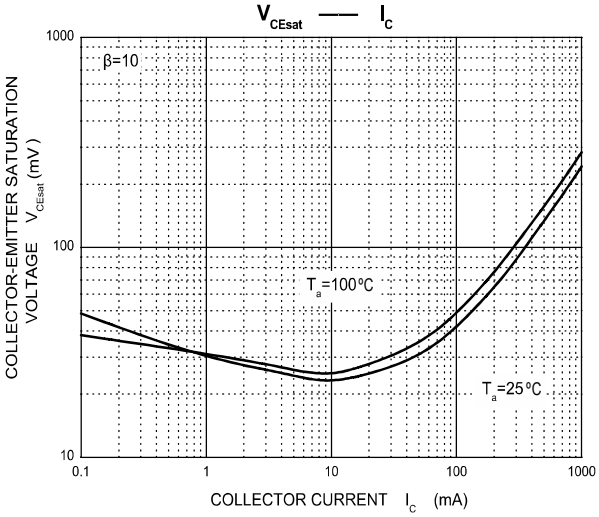
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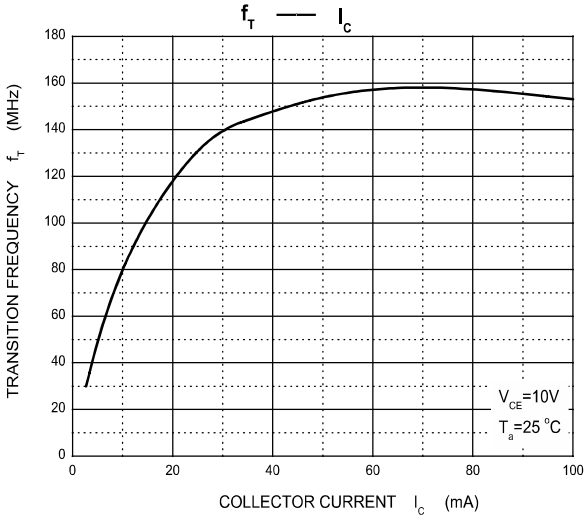
Rating and characteristic curves

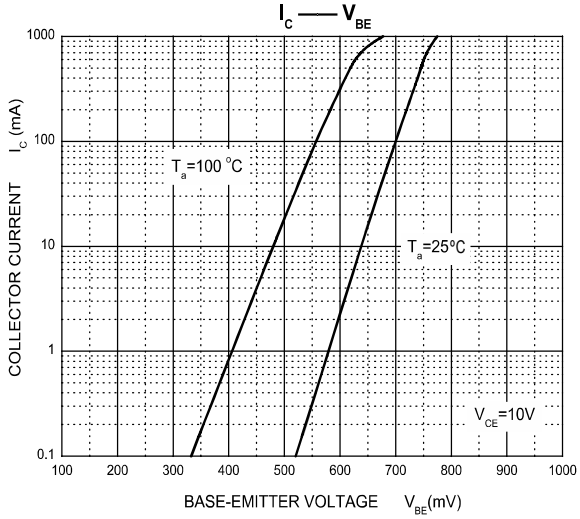






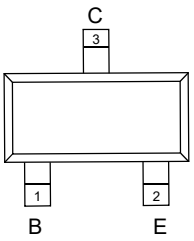
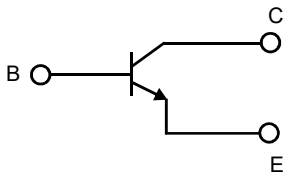






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Pinning information

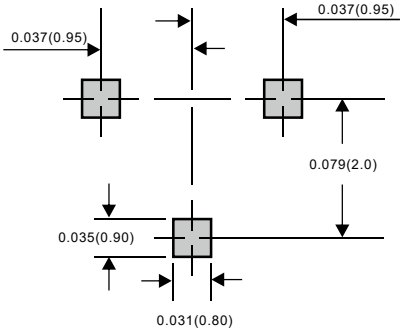
Pin	Simplified outline	Symbol
Pin 1 Base Pin 2 Collector Pin 3 Emitter		

Marking

Type number	Marking code
FMBT493-Q1	493

Suggested solder pad layout

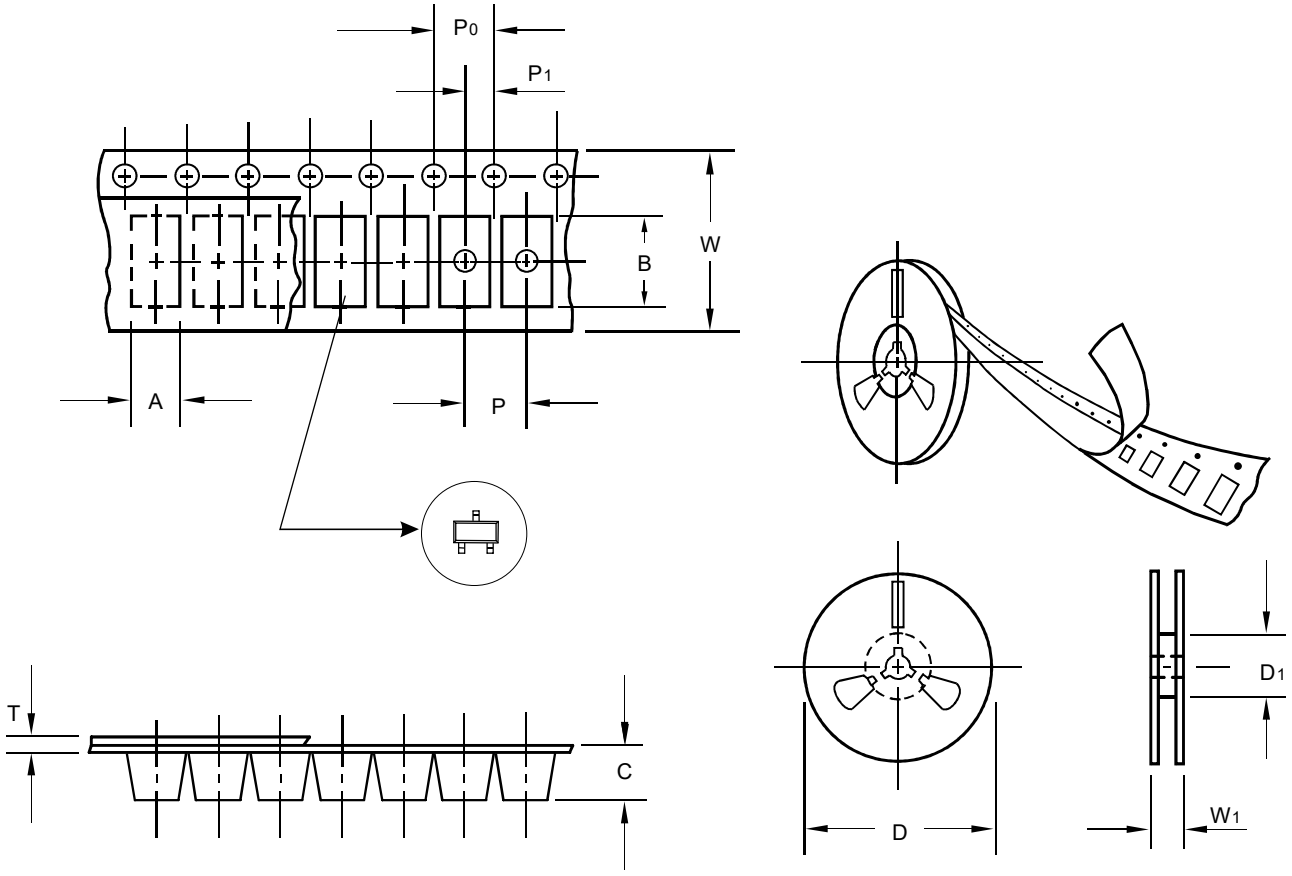
SOT-23



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	1.25
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	0.2	54.50
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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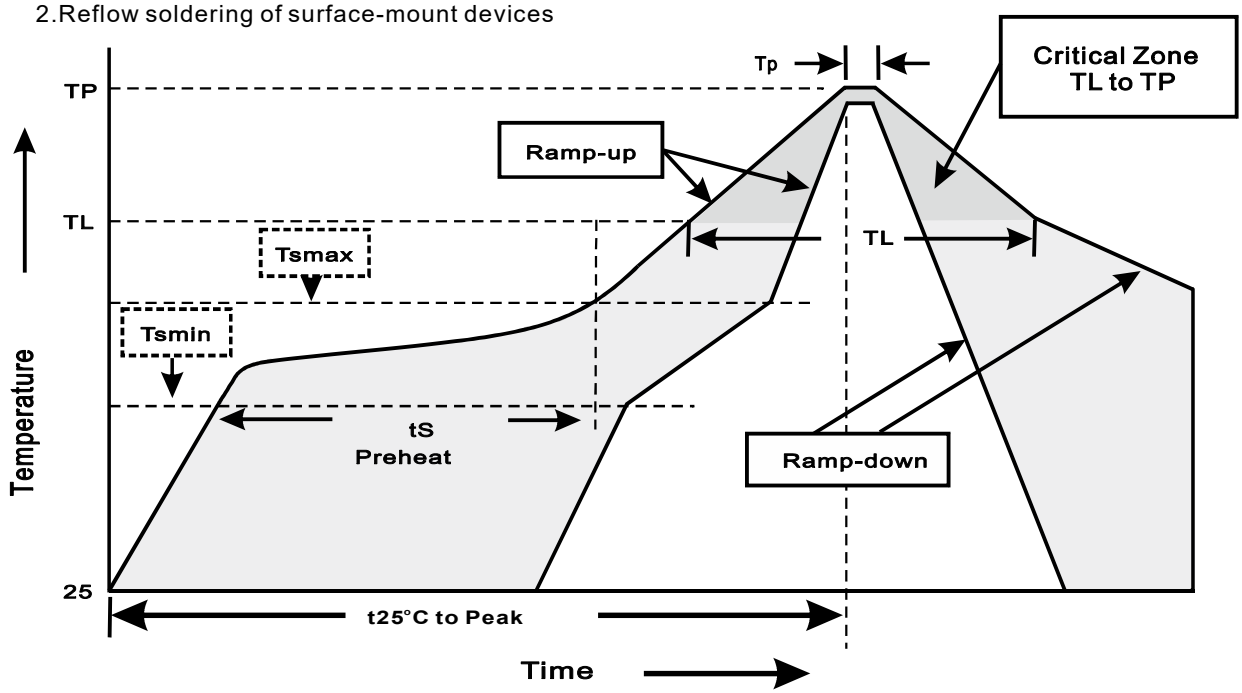
Reel packing

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*123*183	178	382*257*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