FMBT493

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FMBT493

Medium power NPN Silicon Transistor

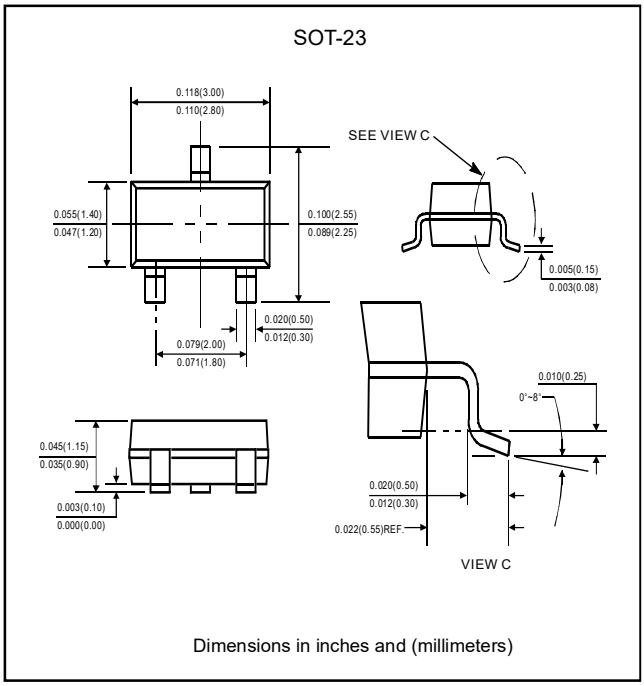
Features

- For switching and AF amplifier applications.
- Lead-free parts meet RoHS requirments
- Suffix "-H" dinicates Halogen-free part, ex.FMBT493-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
- Weight : Approximated 0.008 gram

Package outline



Dimensions in inches and (millimeters)

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

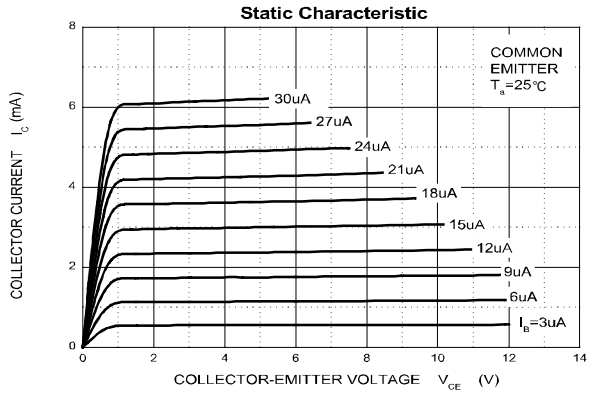
Parameter	Symbol	Value	Unit
Collector to base voltage	V_{CBO}	120	V
Collector to Emitter Voltage	V_{CEO}	100	V
Emitter to base voltage	V_{EBO}	5	V
Collector current	I_C	1	A
Total power dissipation	P_D	250	mW
Junction temperature	T_j	+150	℃
Storage temperature range	T_{STG}	-55 ~ +150	℃

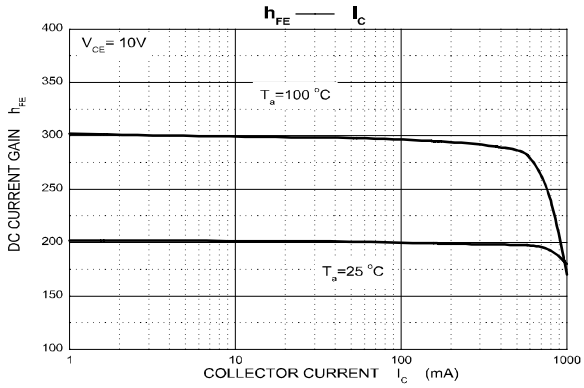
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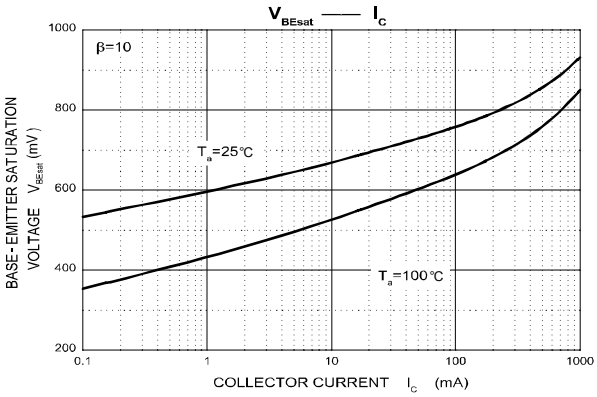
Electrical characteristics (At T_A=25°C unless otherwise noted)

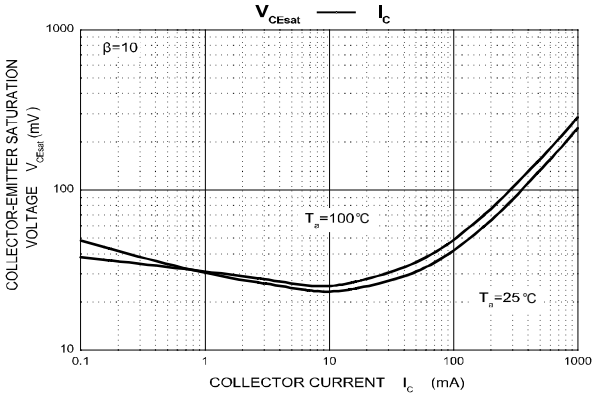
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector base cut off current	V_{CB} = 100V	I_{CBO}			0.1	μA
Collector base cut off current	V_{CE} = 100V	I_{CES}			0.1	μA
Emitter base cut-off current	V_{EB} = 4V	I_{EBO}			0.1	μA
Collector base breakdown voltage	I_C = 100μA	$V_{(BR)CBO}$	120			V
Collector emitter breakdown voltage	I_C = 10mA	$V_{(BR)CEO}$	100			V
Emitter base breakdown voltage	I_E = 100μA	$V_{(BR)EBO}$	5			V
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} = 5V, I_C = 1mA	h_{FE}	100			
	V_{CE} = 5V, I_C= 250mA		100		300	
	V_{CE} = 5V, I_C = 500mA		60			
	V_{CE} = 5V, 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

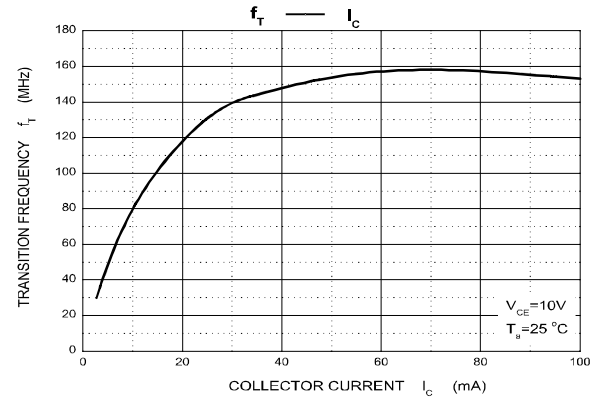
Rating and characteristic curves (FMBT493)

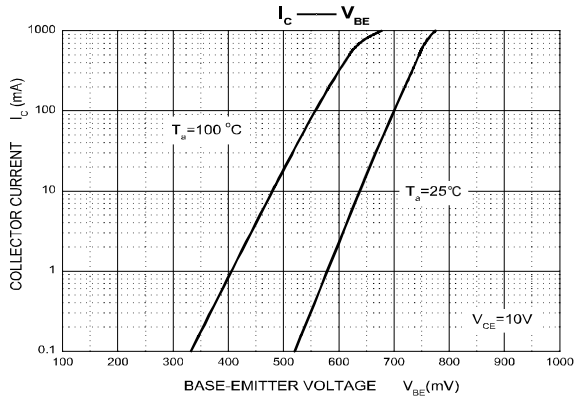


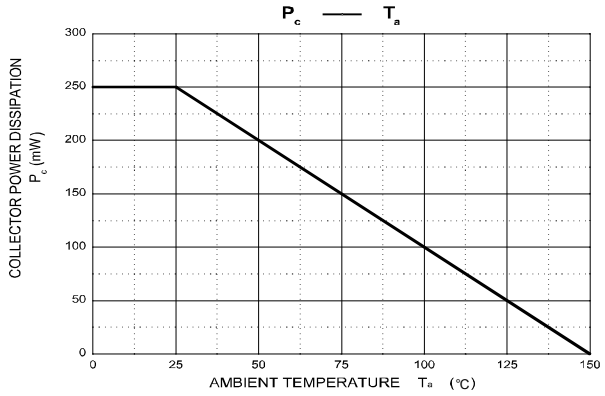






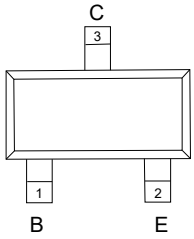
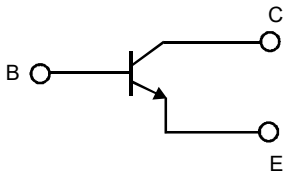






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Pinning information

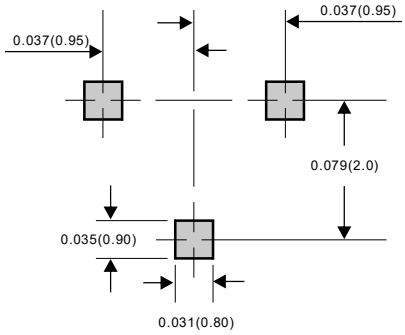
Pin	Simplified outline	Symbol
Pin 1 Base Pin 2 Collector Pin 3 Emitter		

Marking

Type number	Marking code
FMBT493	493

Suggested solder pad layout

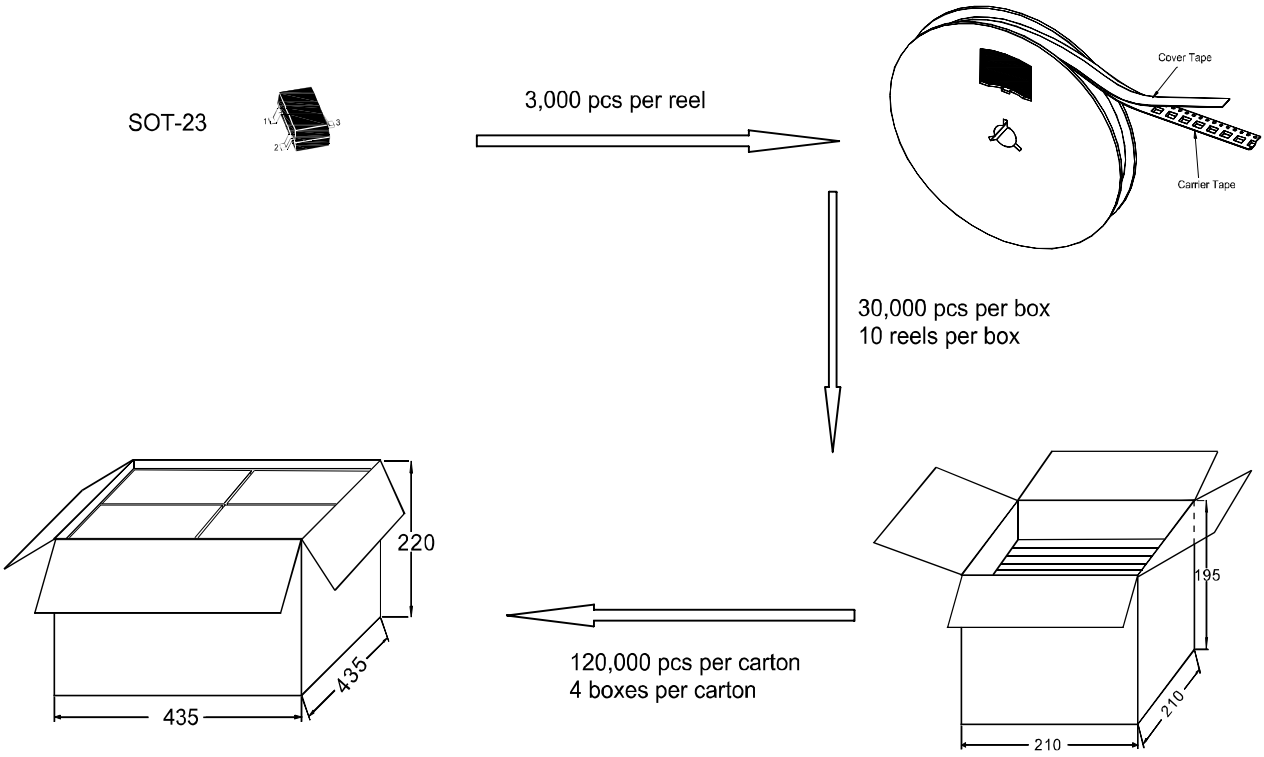
SOT-23



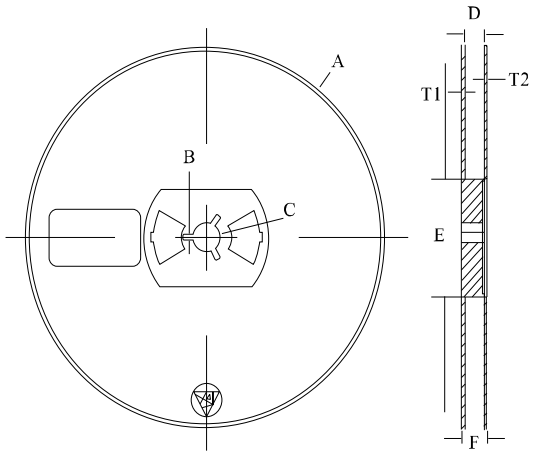
Dimensions in inches and (millimeters)

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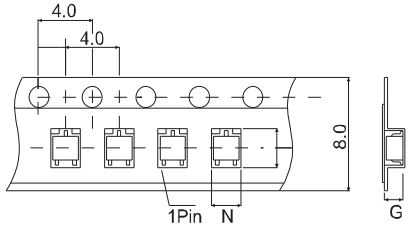
The method of packaging



Embossed tape and reel data



Reel (7")



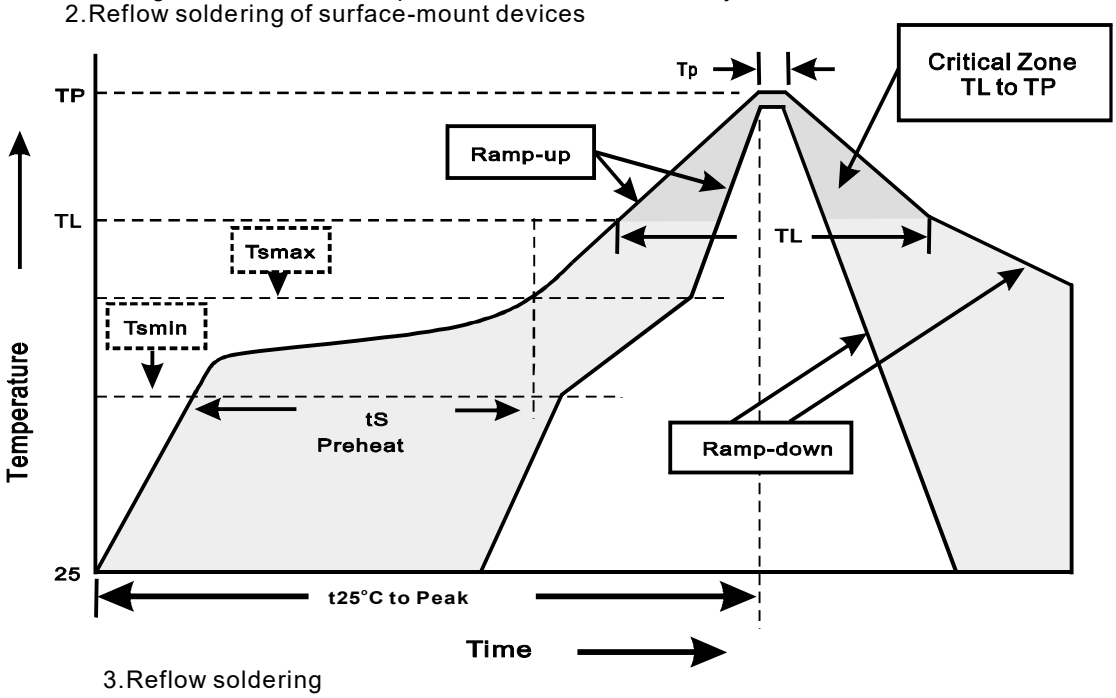
Tape (8mm)

Symbol	Value (unit: mm)
A	Ø 177.8±1
B	2.7±0.2
C	Ø 13.5±0.2
E	Ø 54.5±0.2
F	12.3±0.3
D	9.6+2/-0.3
T1	1.0±0.2
T2	1.2±0.2
N	3.15±0.1
G	1.25±0.1

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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