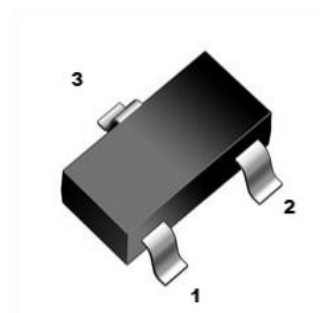




1. Features

- High Voltage Application.
- Telephone Application.
- Complementary to MMBTA43.

SOT-23



2. Mechanical Data

- Case:Molded Plastic,SOT-23 .
- Epoxy:UL 94V-0 rate flame retardant.
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: 2D.
- Mounting Position : Any.

1 base
2 emitter
3 collector

3. Maximum Ratings

Electrical Characteristics Rating at 25°C ambient temperature unless otherwise specified.

Characteristic	Symbol	Value	Unit
CollectorBase Voltage	V_{CBO}	-200	V
CollectorEmitter Voltage	V_{CEO}	-200	V
EmitterBase Voltage	V_{EBO}	-5	V
Collector Current	I_C	-500	mA
Collector Power Dissipation	P_D	350	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	°C/W
Junction Temperature	T_j	-55 ~ +150	°C
Storage Temperature	T_{stg}	-55 ~ +150	°C

4. Electrical Characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

Characteristics	Symbol	Condition	Min	TYP	Max	Unit
Collectorbase breakdown voltage	$V_{(BR)CBO}$	$I_C=-100\mu A, I_E=0$	-200			V
Collectoremitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	-200			V
Emitterbase breakdown voltage	$V_{(BR)EBO}$	$I_E=-100\mu A, I_C=0$	-5			V
Collector cutoff current	I_{CBO}	$V_{CB}=-200V, I_E=0$			-0.25	uA
Collector cut-off current	I_{CEO}	$V_{CB}=-200V, I_E=1$			-0.25	uA
Collector cut-off current	I_{EBO}	$V_{CE}=-5V, I_C=-1mA$			-0.1	uA'
DC current gain	h_{FE1}	$V_{CE}=-10V, I_C=-10mA$	40			
	h_{FE2}	$V_{CE}=-10V, I_C=-1mA$	25			
	h_{FE3}	$V_{CE}=-10V, I_C=-30mA$	25			
Collectoremitter saturation voltage	$V_{CE(sat)}$	$I_C=-20mA, I_B=-2mA$			-0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=-20mA, I_B=-2mA$			-0.9	V
Transition frequency	f_T	$V_{CE}=-20V, I_C=-10mA$ $f=100MHz$	50			MHz
Collector output capacitance	C_{ob}	$V_{CB}=-20V, I_E=0, f=1MHz$			8	pF



5. Rating And Characteristic Curves

Fig.1 Static Characteristic

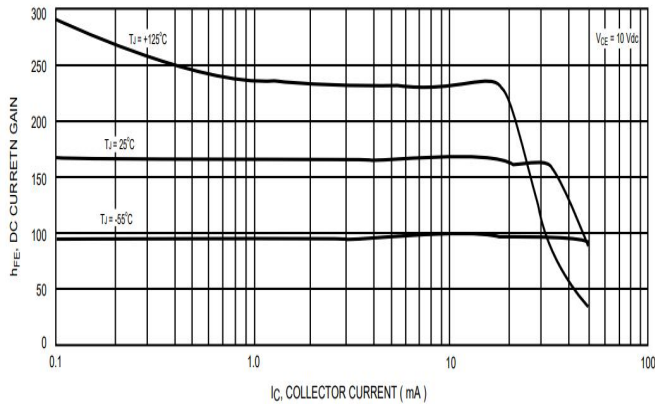


Fig.2 $h_{FE} \text{ --- } I_C$

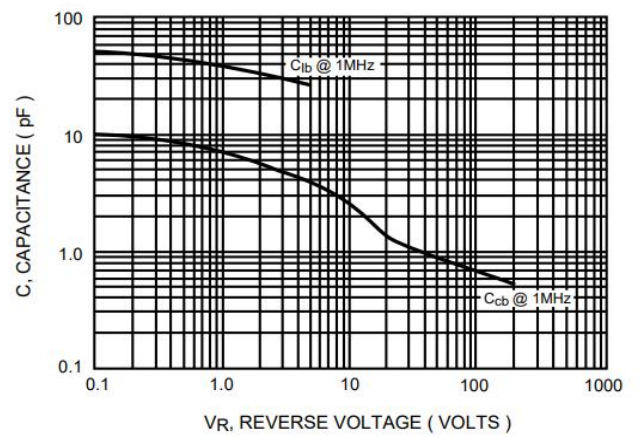


Fig.3 $V_{CEsat} \text{ --- } I_C$

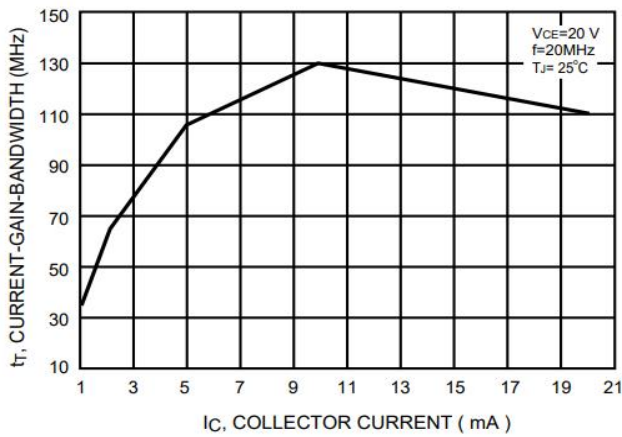
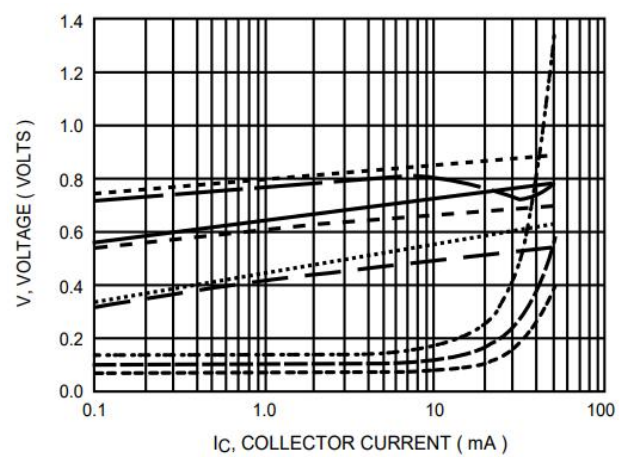
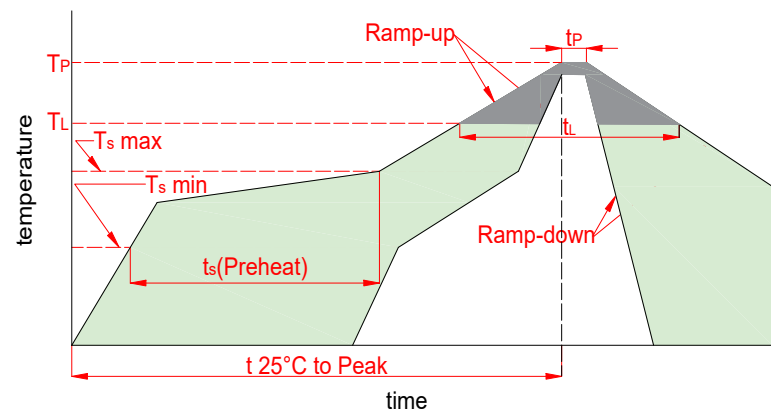


Fig.4 $V_{BEsat} \text{ --- } I_C$



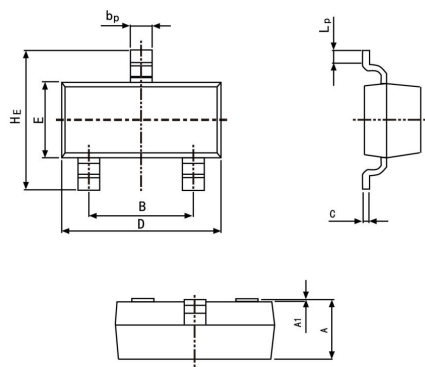


6. Soldering Parameters



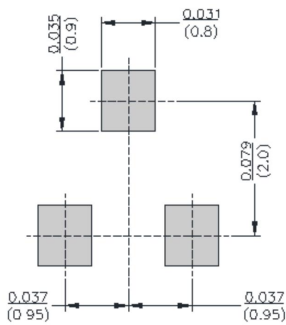
Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s (min))	150℃
	Temp. max(T_s (min))	200℃
	Time(min to max)(t_s)	60~120s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_s (max) to T_L -Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		260 ^{+0/-5} ℃
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6℃/s max
Time 25℃ to peak Tempe.(T_P)		8 minutes max
Do not exceed		260℃

7. Dimensions

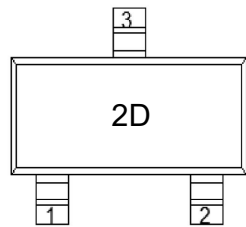


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.035	0.045	0.90	1.15
B	0.070	0.081	1.78	2.05
bp	0.012	0.020	0.30	0.51
C	0.003	0.007	0.08	0.18
D	0.110	0.118	2.80	3.00
E	0.047	0.055	1.20	1.40
HE	0.087	0.110	2.20	2.80
A1	0.000	0.004	0.00	0.10
LP	0.008	0.020	0.20	0.50

Mounting PAD Layout



8. Part Marking System



9. Package Information

Package	Part Number	Tape Width(mm)	Quantity(pcs)
SOT-23	MMBTA93	8	3000



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