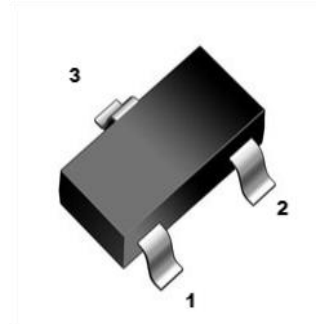




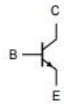
### 1. Features

- Complementary To MMBT3906T.
- Small Package

SOT-523



- 1 base
- 2 emitter
- 3 collector



### 2. Mechanical Data

- Case:Molded Plastic,SOT-523 .
- Epoxy:UL 94V-0 rate flame retardant.
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: 1N
- Mounting Position : Any.

### 3. Maximum Ratings

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current	$I_C$	200	mA
Power Dissipation	$P_{tot}$	150	mW
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
Collector Base Breakdown Voltage	$BV_{CBO}$	$I_C=10\mu\text{A}$	60	-	-	V
Collector Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=1\text{mA}$	40	-	-	V
Emitter Base Breakdown Voltage	$BV_{EBO}$	$I_E=10\mu\text{A}$	6	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB}=60\text{V}$	-	-	100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=5\text{V}$	-	-	100	nA
DC current gain	$h_{FE}$	$V_{CE}=1\text{V}, I_C=10\text{mA}$	100	-	300	-
		$V_{CE}=1\text{V}, I_C=50\text{mA}$	60	-	-	-
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$	-	-	300	mV
Base -emitter saturation voltage	$V_{BE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$	-	-	950	mV
Transition frequency	$f_T$	$V_{CE}=20\text{Vdc}, I_C=10\text{mA}, f=100\text{MHz}$	300	-	-	MHz
Delay Time	$t_d$	$V_{CC}=3\text{V}, V_{BE}=-0.5\text{V}$	-	-	35	nS
Rise Time	$t_r$	$I_C=10\text{mA}, I_{B1}=-I_{B2}=1.0\text{mA}$	-	-	35	nS
Storage Time	$t_s$	$V_{CC}=3\text{V}, I_C=10\text{mA}$	-	-	200	nS
Fall Time	$t_f$	$I_{B1}=-I_{B2}=1.0\text{mA}$	-	-	50	nS



### 5. Rating And Characteristic Curves

Fig.1 Static Characteristic

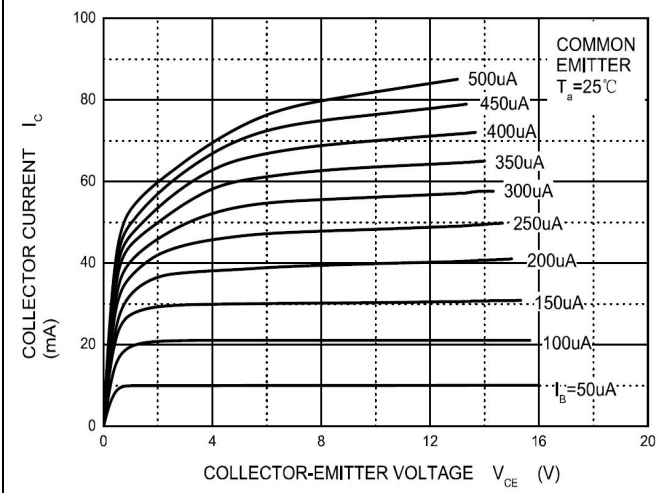


Fig.2  $h_{FE} - I_C$

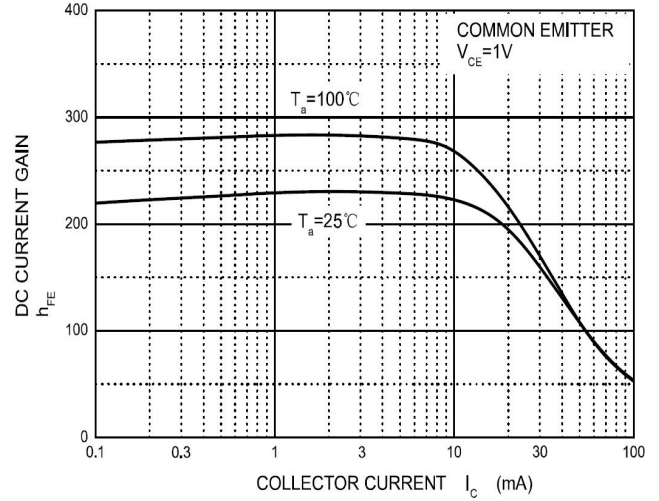


Fig.3  $V_{BE} - I_C$

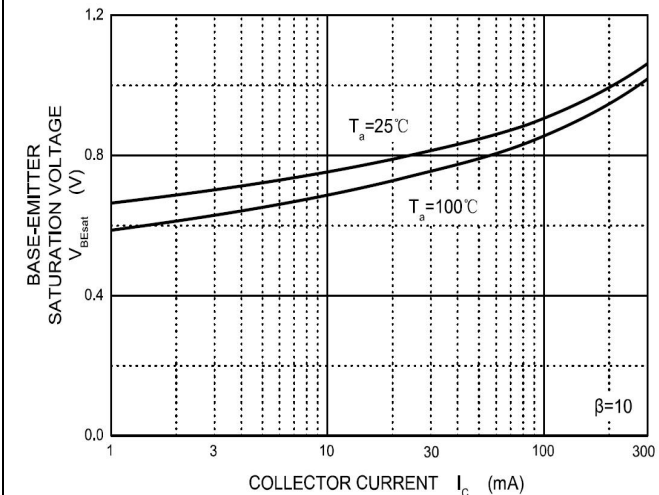


Fig.4  $V_{CE(sat)} - I_C$

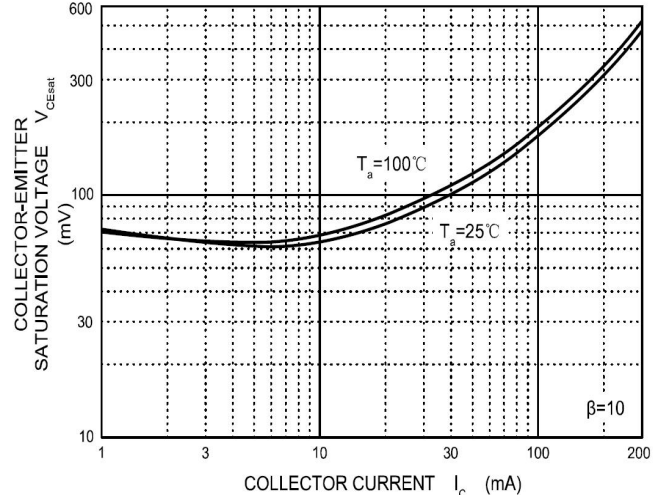


Fig.5  $C_{ob} / C_{ib} - V_{CB} / V_{EB}$

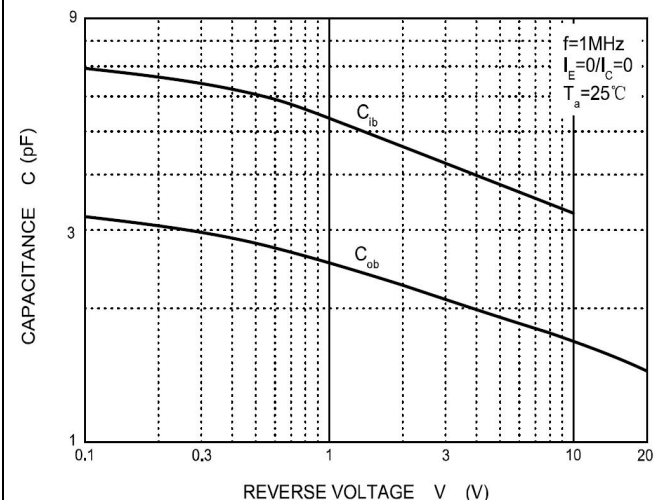
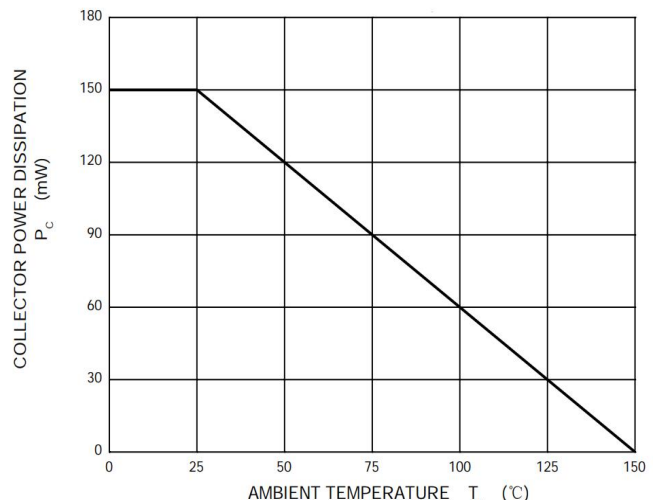
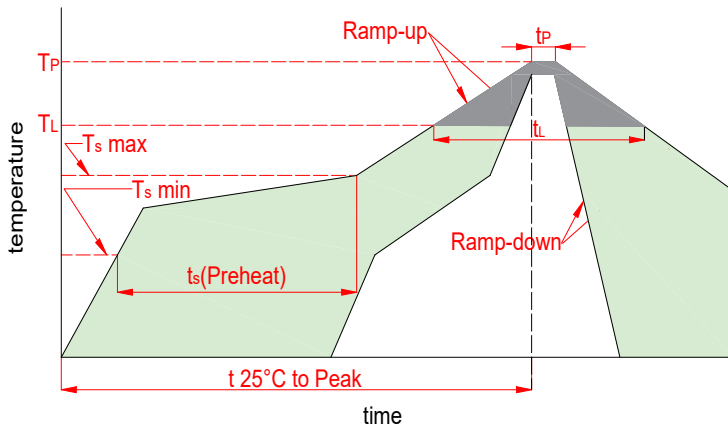


Fig.6  $P_C - T_a$



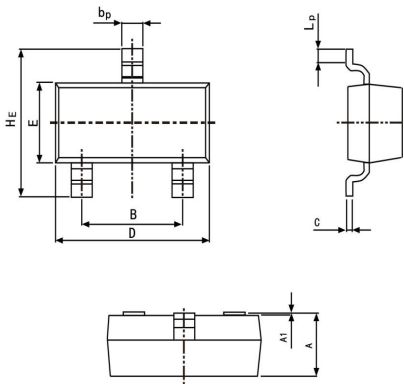


### 6. Soldering Parameters



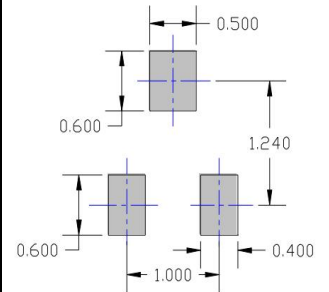
Reflow Condition		Lead-free
Pre Heat	Temp. min( $T_s$ (min))	150°C
	Temp. max( $T_s$ (min))	200°C
	Time(min to max)( $t_s$ )	60~120s
Aver. ramp up rate(Liquidus Temp.)( $T_L$ )to peak		3°C/s max
$T_s$ (max) to $T_L$ -Ramp-up Rate		3°C/s max
Reflow	Temp. ( $T_L$ )(Liquidus)	217°C
	Temp. ( $t_L$ )(Liquidus)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

### 7. Dimensions



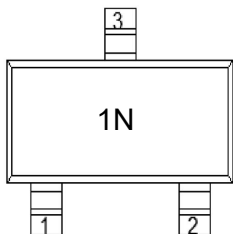
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.028	0.035	0.70	0.90
B	0.035	0.043	0.90	1.10
bp	0.006	0.014	0.15	0.35
C	0.004	0.008	0.10	0.20
D	0.059	0.067	1.50	1.70
E	0.028	0.035	0.70	0.90
HE	0.057	0.069	1.45	1.75
A1	0.000	0.004	0.00	0.10
LP	0.010	0.018	0.26	0.46

Mounting PAD Layout



Unit: mm

### 8. Part Marking System



### 9. Package Information

Package	Part Number	Tape Width(mm)	Quantity(pcs)
SOT-523	MMBT3904T	8	3000



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