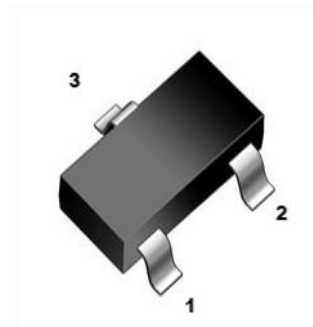




### 1. Features

- Collector Current.( $I_C=0.6A$ ) .
- Complementary To MMBT4403.
- Collector Dissipation:  $P_C=0.3W$  ( $T_C=25^{\circ}C$ ).
- General purpose,medium current.
- For linear amplification and switching.
- Available in lead free version.

SOT-23



1 base  
2 emitter  
3 collector

### 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:2X
- Mounting Position : Any.

### 3. Maximum Ratings

Electrical Characteristics Rating at  $25^{\circ}C$  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	$I_C$	0.6	A
Collector Power Dissipation	$P_C$	0.3	W
Junction Temperature	$T_j$	$-55 \sim +150$	$^{\circ}C$
Storage Temperature	$T_{stg}$	$-55 \sim +150$	$^{\circ}C$

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

Characteristics	Symbol	Condition	Min	TYP	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=100\mu A, I_E=0$	60	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1mA, I_B=0$	40	-	-	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=100\mu A, I_C=0$	6	-	-	V
Collector cut-off current	$I_{CBO}$	$V_{CB}=50V, I_E=0$	-	-	0.1	$\mu A$
Collector cut-off current	$I_{CEO}$	$V_{CE}=30V, I_E=0$	-	-	0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=5V, I_C=0$	-	-	0.1	$\mu A$
DC current gain	$h_{FE}$	$V_{CE}=1V, I_C=150mA$	100	-	300	-
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=150mA, I_B=15mA$	-	-	0.4	V
Base -emitter saturation voltage	$V_{BE(sat)}$	$I_C=150mA, I_B=15mA$	-	-	0.95	V
Transition frequency	$f_T$	$V_{CE}=10V, I_C=20mA, f=100MHz$	250	-	-	MHz



### 5. Rating And Characteristic Curves

Fig.1 Typical Capacitance

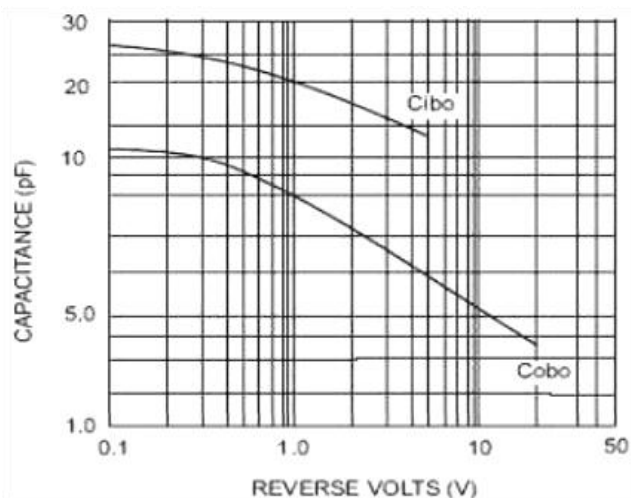


Fig.2 Typical Collector Saturation Region

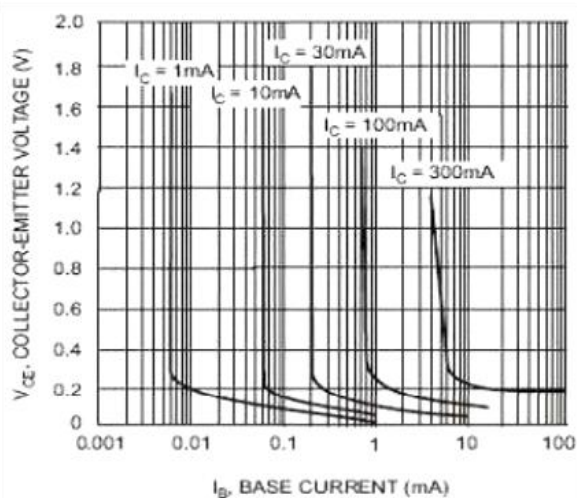


Fig.3 Collector Emitter Saturation Voltage vs. Collector Current

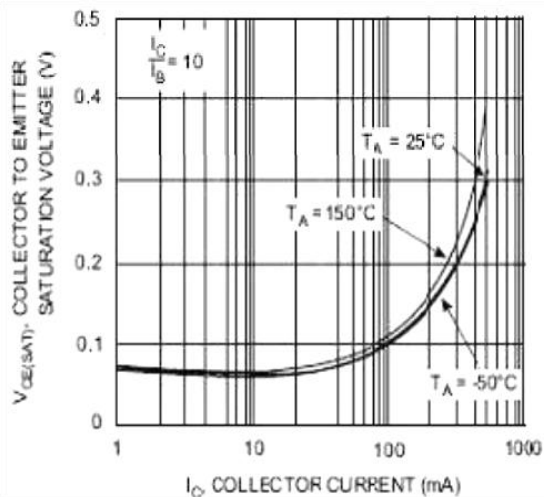


Fig.4 Base-Emitter Voltage vs. Collector Current

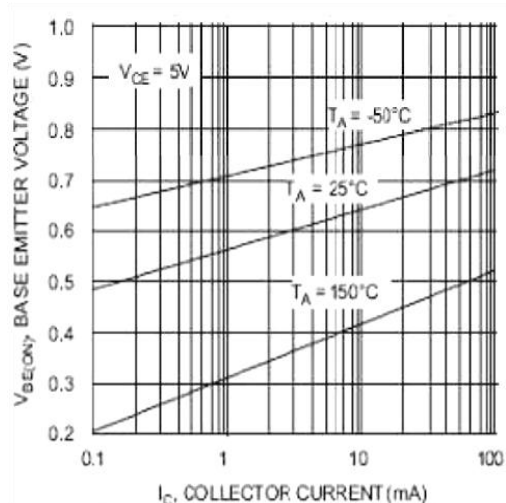


Fig.5 DC Current Gain vs. Collector Current

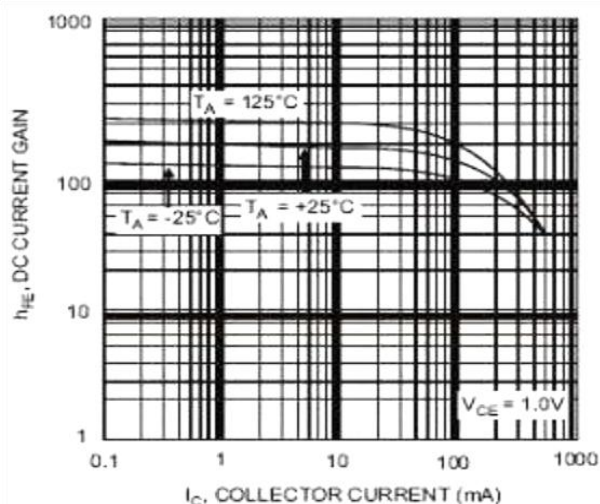
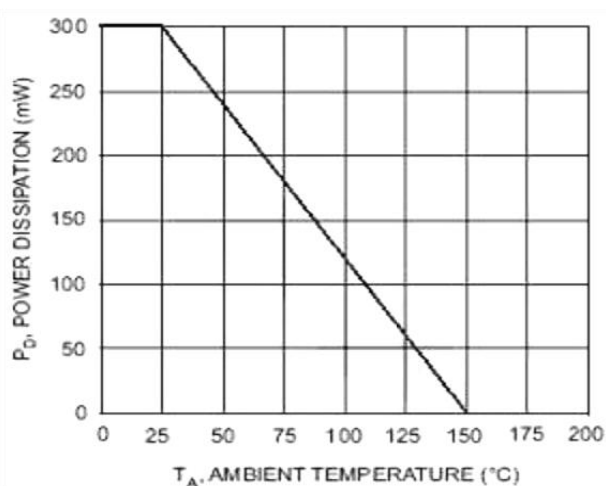
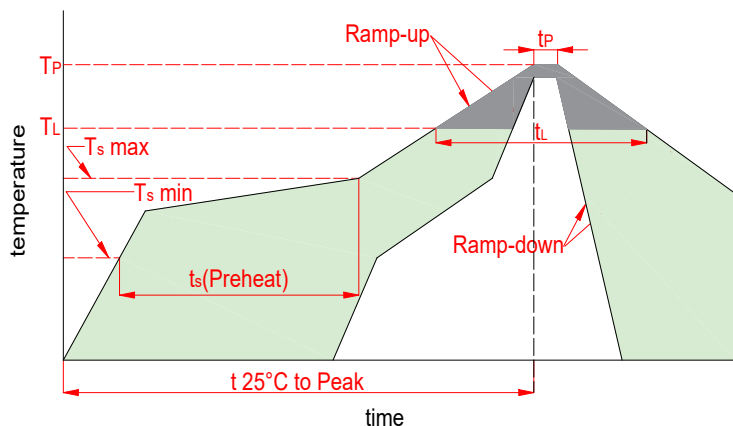


Fig.6 Max Power Dissipation vs. Ambient Temperature



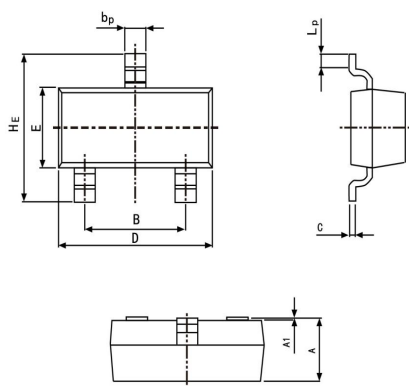


## 6. Soldering Parameters



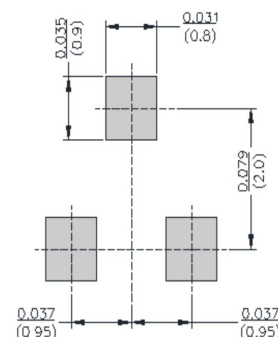
Reflow Condition		Lead-free
Pre Heat	Temp. min( $T_s$ (min))	150°C
	Temp. max( $T_s$ (min))	200°C
	Time(min to max)( $t_s$ )	60~120s
Aver. ramp up rate(Liquidus Temp.)( $T_L$ )to peak		3°C/s max
$T_s$ (max) to $T_L$ -Ramp-up Rate		3°C/s max
Reflow	Temp.( $T_L$ )(Liquidus)	217°C
	Temp.( $t_L$ )(Liquidus)	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

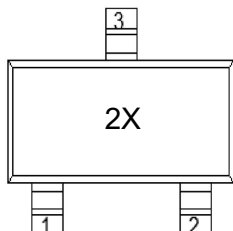


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.035	0.045	0.90	1.15
B	0.070	0.081	1.78	2.05
bp	0.012	0.020	0.30	0.51
C	0.003	0.007	0.08	0.18
D	0.110	0.118	2.80	3.00
E	0.047	0.055	1.20	1.40
HE	0.087	0.110	2.20	2.80
A1	0.000	0.004	0.00	0.10
LP	0.008	0.020	0.20	0.50

Mounting PAD Layout



## 8. Part Marking System



## 9. Package Information

Package	Part Number	Marking Code	Tape Width(mm)	Quantity(pcs)
SOT-23	MMBT4401	2X	8	3000



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