

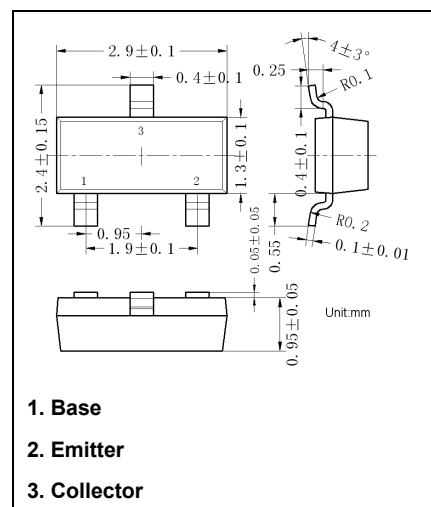
## SOT-23 Plastic-Encapsulate Transistors

### MMBTA44 NPN Transistors

#### Features

- High Collector-Emitter Voltage
- Complement to MMBTA94

Marking: 3D



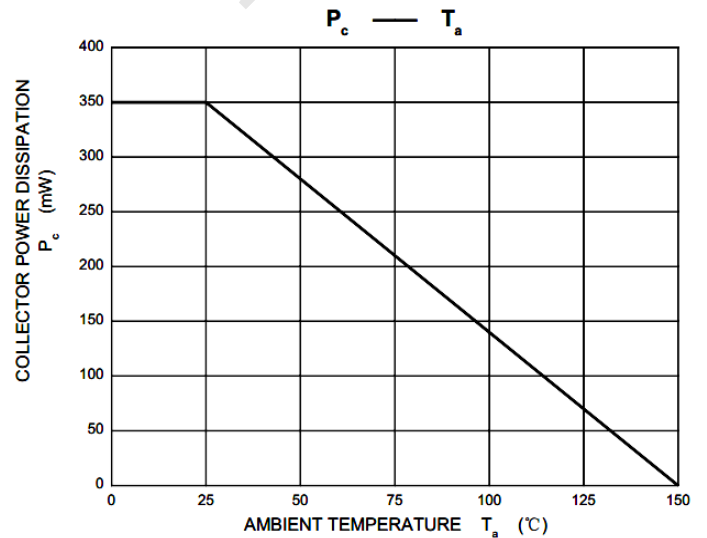
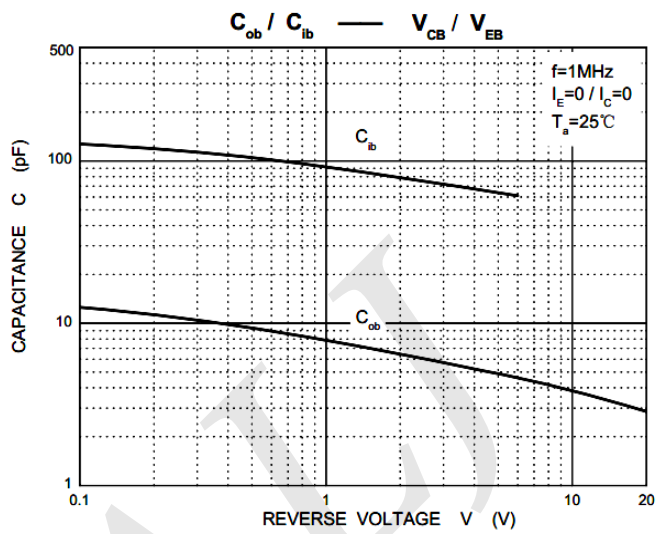
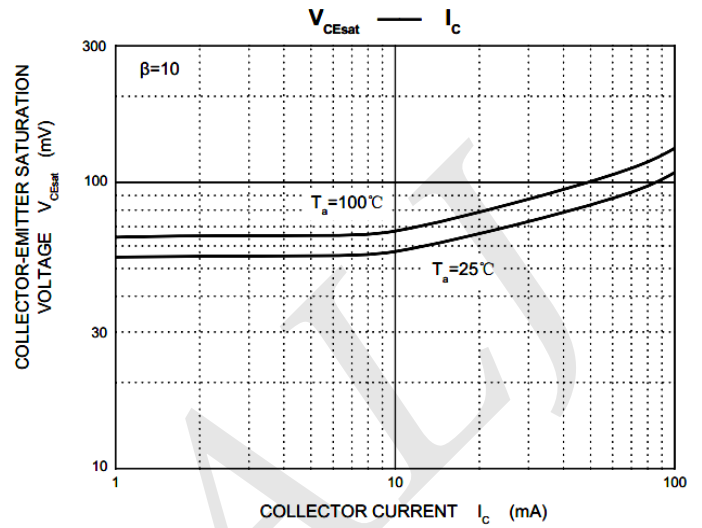
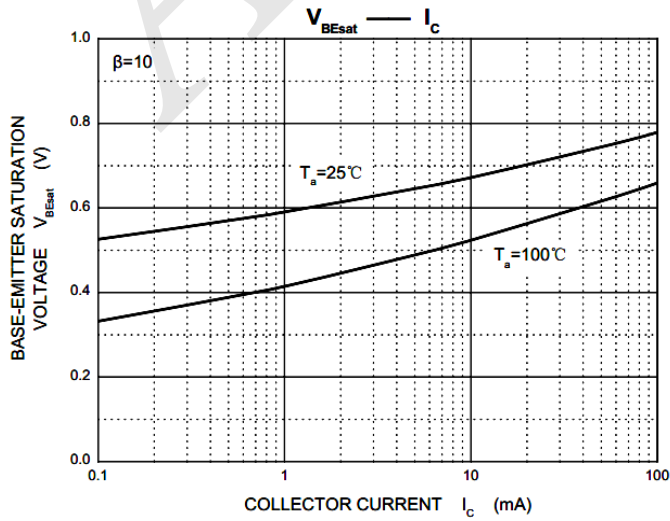
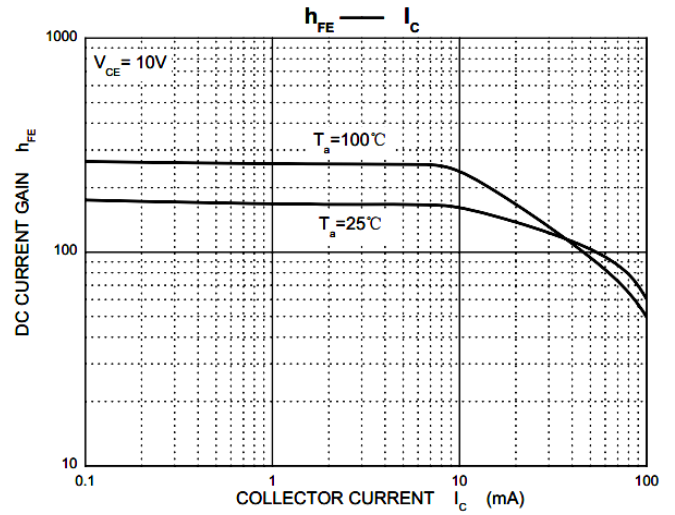
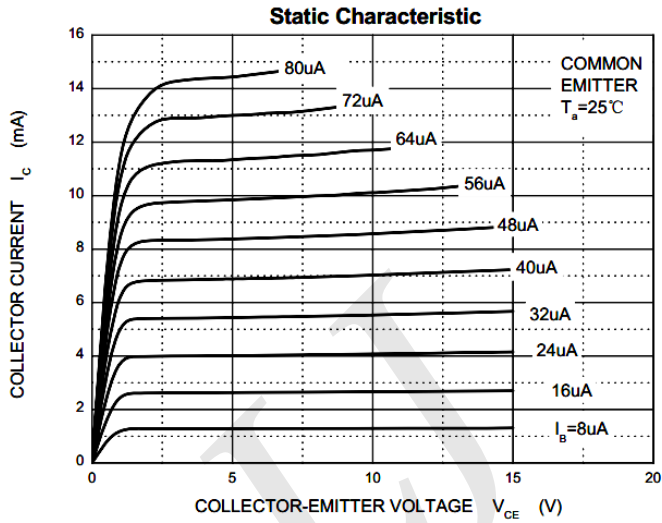
#### Maximum Ratings ( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector Base Voltage	400	V
$V_{CEO}$	Collector Emitter Voltage	400	V
$V_{EBO}$	Emitter Base Voltage	6	V
$I_C$	Collector Current -Continuous	0.2	A
$I_{CM}$	Collector Current-Peak	0.3	A
$P_C$	Collector Power Dissipation	350	mW
$R_{\theta JA}$	Thermal Resistance, junction to Ambient	357	$^{\circ}\text{C}/\text{W}$
$T_j$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	- 55 to +150	$^{\circ}\text{C}$

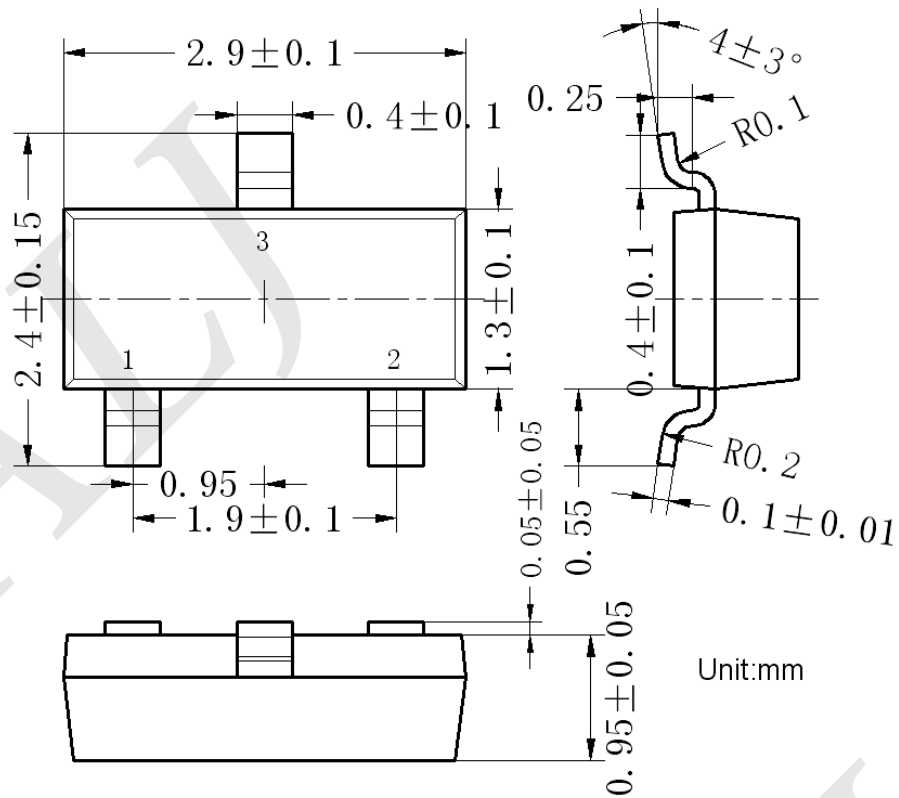
#### Electrical Characteristics ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C = 100\mu\text{A}, I_E = 0$	400			V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C = 1\text{mA}, I_B = 0$	400			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E = 10\mu\text{A}, I_C = 0$	6			V
$I_{CBO}$	Collector cut-off current	$V_{CB} = 400\text{V}, I_E = 0$			100	nA
$I_{EBO}$	Emitter cut-off current	$V_{EB} = 4\text{V}, I_C = 0$			100	nA
$h_{FE(1)}$	DC current gain	$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	50		200	
$h_{FE(2)}$		$V_{CE} = 10\text{V}, I_C = 1\text{mA}$	40			
$h_{FE(3)}$		$V_{CE} = 10\text{V}, I_C = 50\text{mA}$	45			
$h_{FE(4)}$		$V_{CE} = 10\text{V}, I_C = 100\text{mA}$	40			
$V_{CE(sat)}$	Collector-emitter saturation voltage	$I_C = 1\text{mA}, I_B = 0.1\text{mA}$			0.4	V
		$I_C = 10\text{mA}, I_B = 1\text{mA}$			0.5	
		$I_C = 50\text{mA}, I_B = 5\text{mA}$			0.75	
$V_{BE(sat)}$	Base-emitter saturation voltage	$I_C = 10\text{mA}, I_B = 1\text{mA}$			0.75	V
$C_{ob}$	Collector output capacitance	$V_{CB} = 20\text{V}, I_E = 0, f = 1\text{MHz}$			7	pF
$C_{ib}$	Emitter input capacitance	$V_{EB} = 0.5\text{V}, I_C = 0, f = 1\text{MHz}$			130	

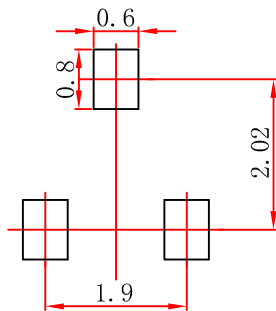
# Typical Characteristics



## SOT-23 Package Outline Dimensions



## SOT-23 Suggested Pad Layout

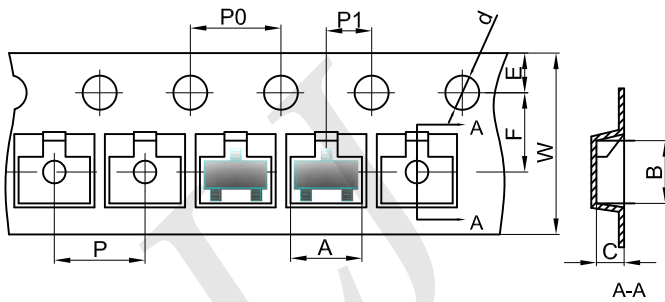


Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.

# SOT-23 Tape and Reel

## SOT-23 Embossed Carrier Tape

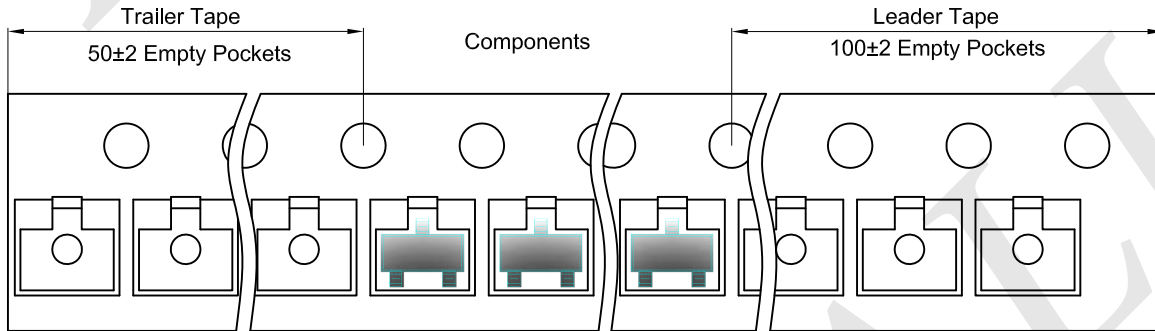


### Packaging Description:

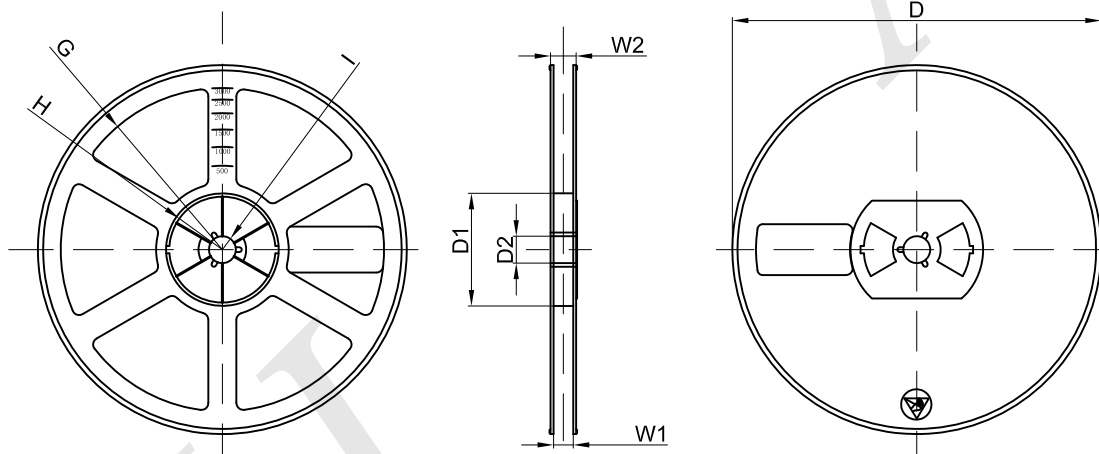
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

## SOT-23 Tape Leader and Trailer



## SOT-23 Reel

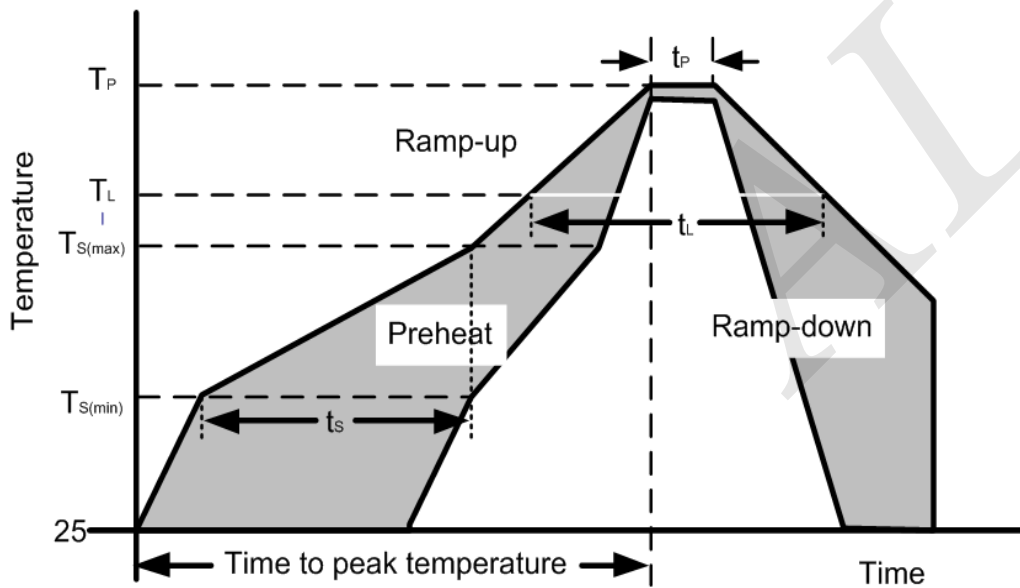


Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	

# Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ( $T_{s(min)}$ )	150°C
	Temperature Max ( $T_{s(max)}$ )	200°C
	Time (min to max) ( $t_s$ )	60 – 190 secs
Average ramp up rate (Liquidus Temp) ( $T_L$ ) to peak		5°C/second max
		5°C/second max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Temperature ( $t_L$ )	60 – 150 seconds
		260+0/-5 °C
Time within actual peak Temperature ( $t_p$ )		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes Max.
Do not exceed		280°C



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