

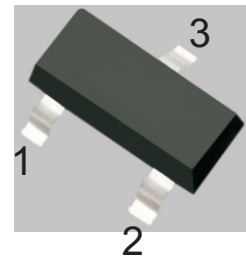


**MMBT4401**  
**NPN TRANSISTOR**

**FEATURES**

- Switching Transistor

**SOT-23**



- 1.BASE  
2.EMITTER  
3.COLLECTOR

**MAXIMUM RATINGS (Ta=25°C unless otherwise noted)**

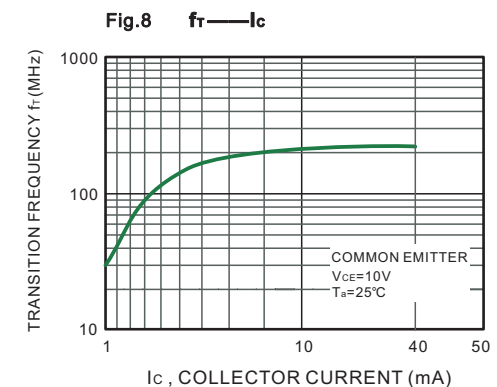
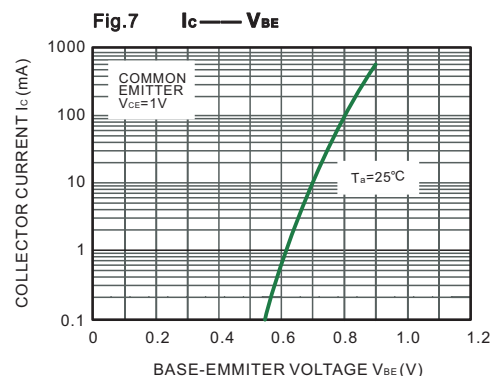
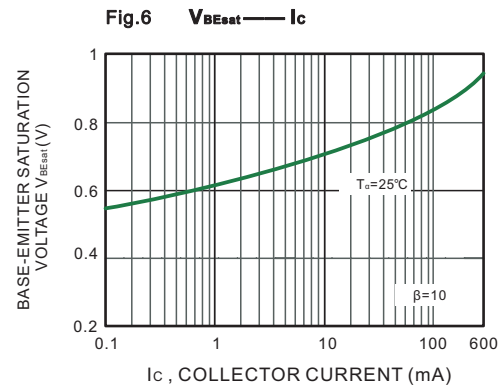
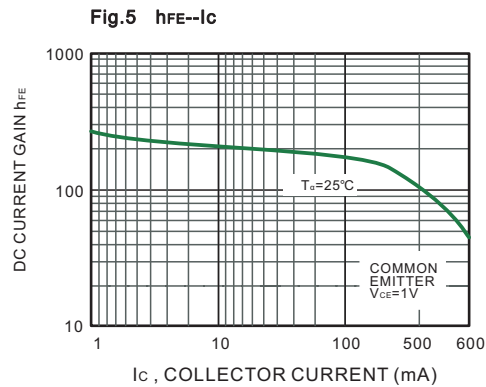
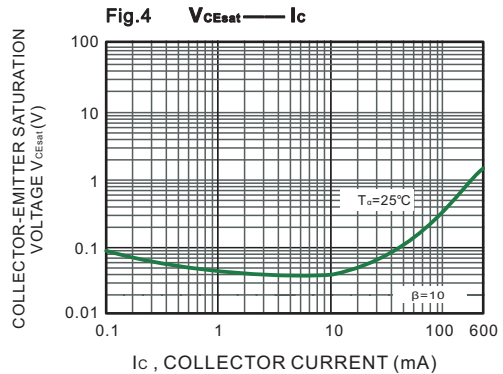
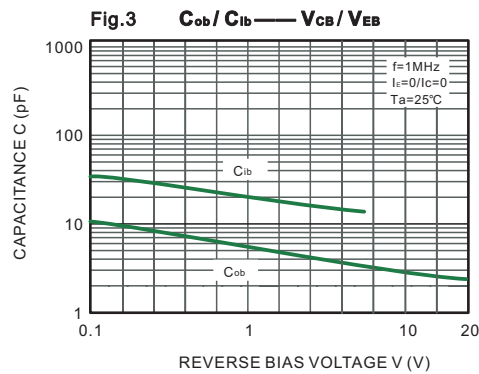
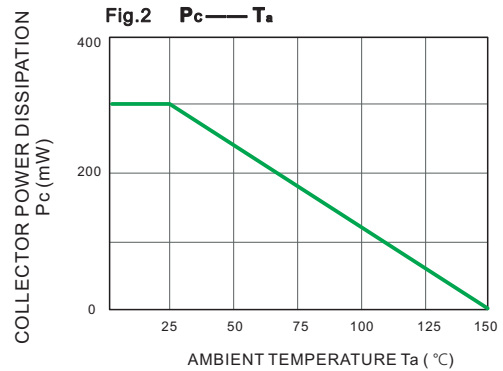
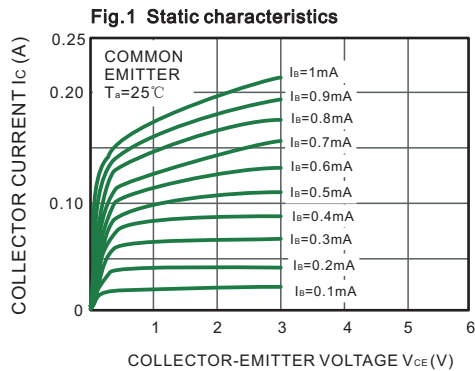
Parameter	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB0}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current — Continuous	$I_C$	600	mA
Collector Power Dissipation	$P_C$	300	mW
Thermal Resistance From Junction To Ambient	$R_{thJA}$	417	°C/W
Operation Junction and Storage Temperature Range	$T_J, T_{stg}$	-55~+150	°C

**ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted.)**

Parameter	Symbol	Test conditions	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	$V_{(BR)CEO}$	$I_C = 1\text{ mA}, I_B = 0$	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	$I_{CEX}$	$V_{CE} = 35V, V_{EB} = 0.4V$			0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5V, I_C = 0$			0.1	$\mu A$
DC current gain	$h_{FE1}$	$V_{CE} = 1V, I_C = 0.1\text{ mA}$	20			
	$h_{FE2}$	$V_{CE} = 1V, I_C = 1\text{ mA}$	40			
	$h_{FE3}$	$V_{CE} = 1V, I_C = 10\text{ mA}$	80			
	$h_{FE4}$	$V_{CE} = 1V, I_C = 150\text{ mA}$	100		300	
	$h_{FE5}$	$V_{CE} = 2V, I_C = 500\text{ mA}$	40			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$			0.4	V
		$I_C = 500\text{ mA}, I_B = 50\text{ mA}$			0.75	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 150\text{ mA}, I_B = 15\text{ mA}$			0.95	V
		$I_C = 500\text{ mA}, I_B = 50\text{ mA}$			1.2	V
Transition frequency	$f_T$	$V_{CE} = 10V, I_C = 20\text{ mA}, f = 100\text{ MHz}$	250			MHz
Delay time	$t_d$	$V_{CC} = 30V, V_{BE(off)} = -2V, I_C = 150\text{ mA}, I_{B1} = 15\text{ mA}$			15	ns
Rise time	$t_r$				20	ns
Storage time	$t_s$	$V_{CC} = 30V, I_C = 150\text{ mA}, I_{B1} = I_{B2} = 15\text{ mA}$			225	ns
Fall time	$t_f$				60	ns

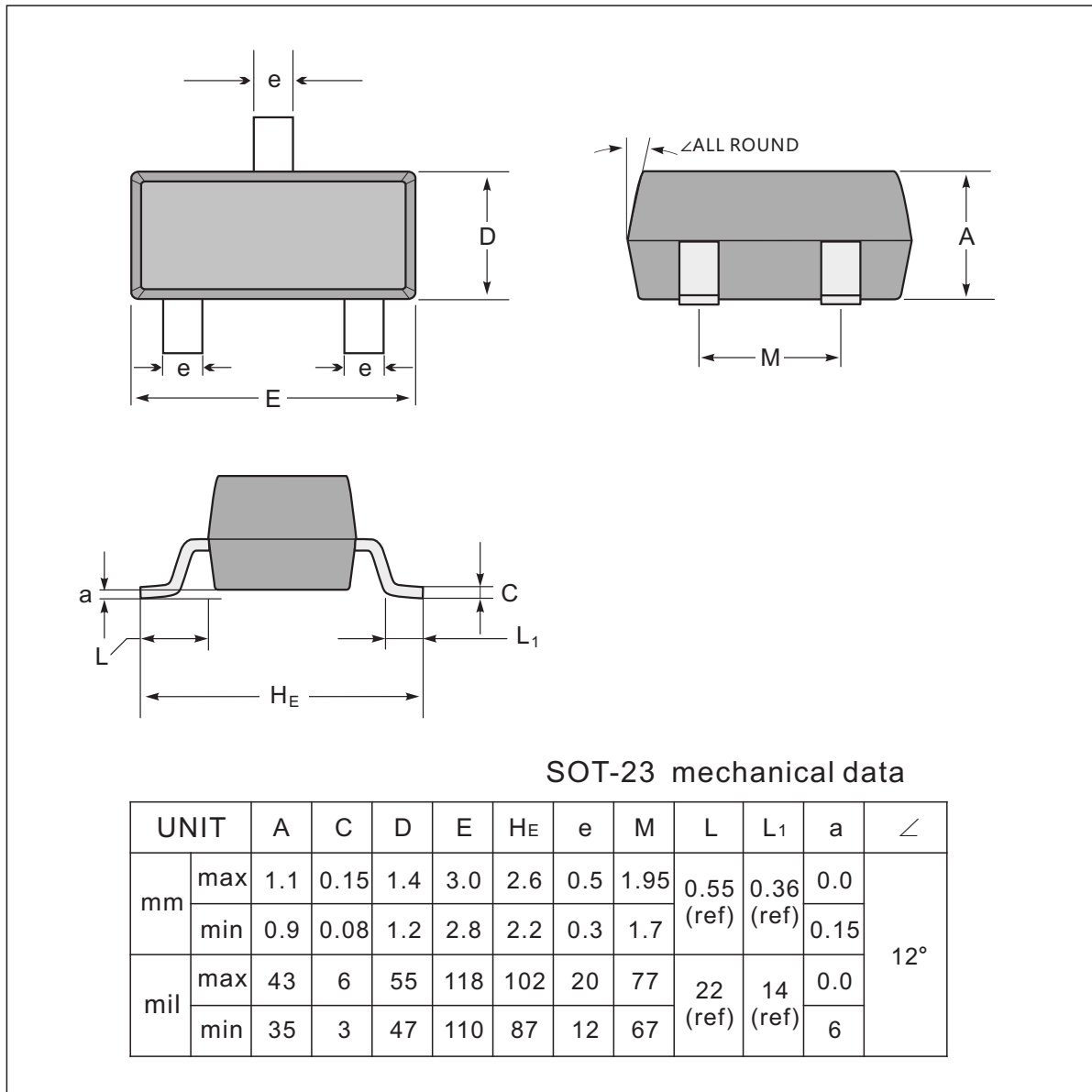


### TYPICAL CHARACTERISTICS

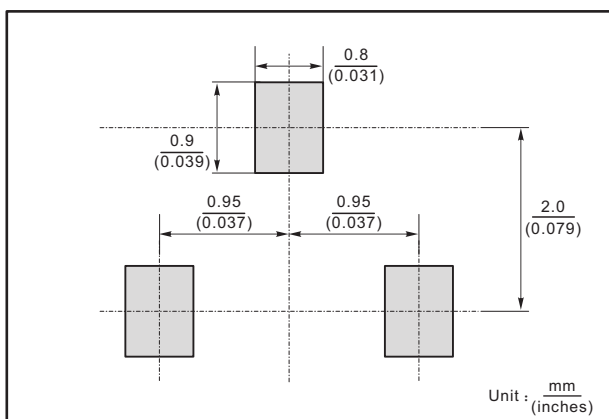




### SOT-23 Package Outline Dimensions



#### The recommended mounting pad size



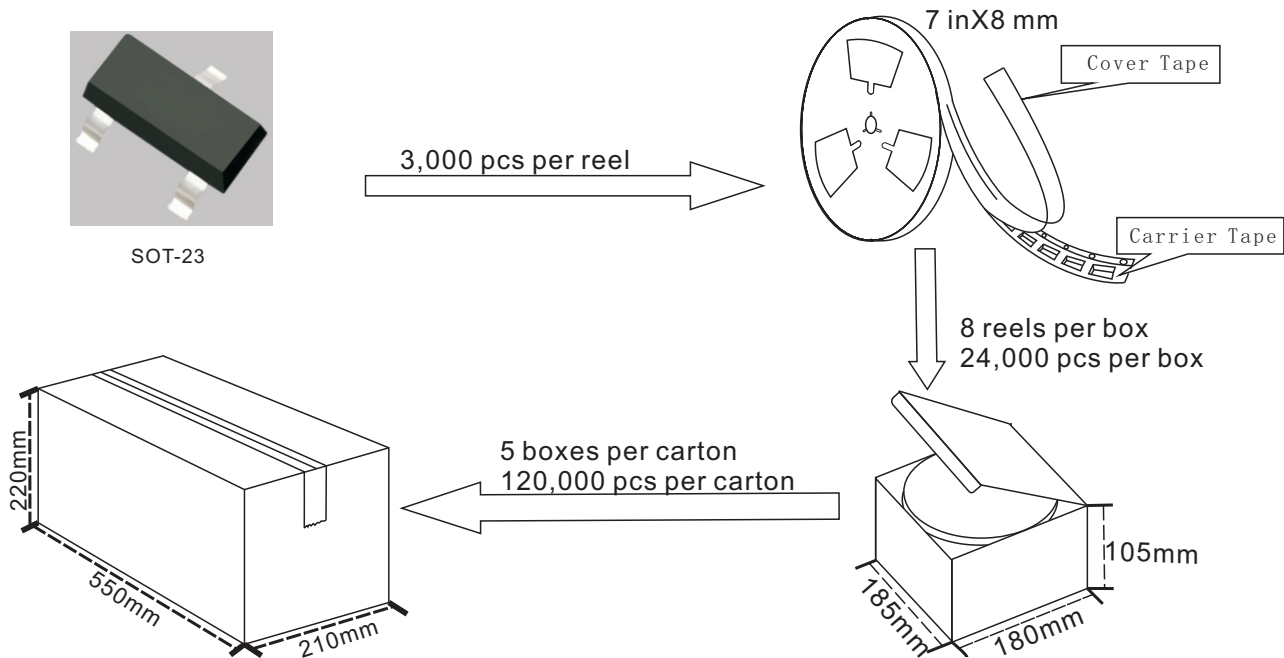
#### Marking

Type number	Marking code
MMBT4401	2X

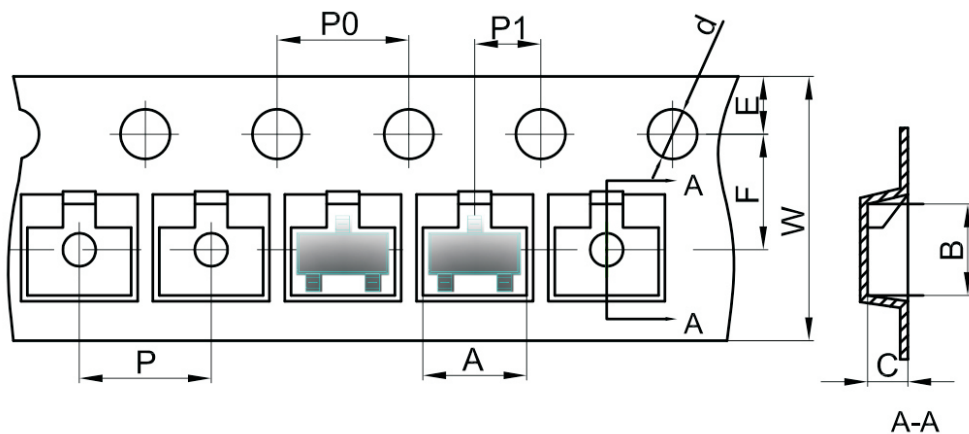


## SOT-23 Packing

1. The method of packaging and dimension are shown as below figure. (Dimension in mm)



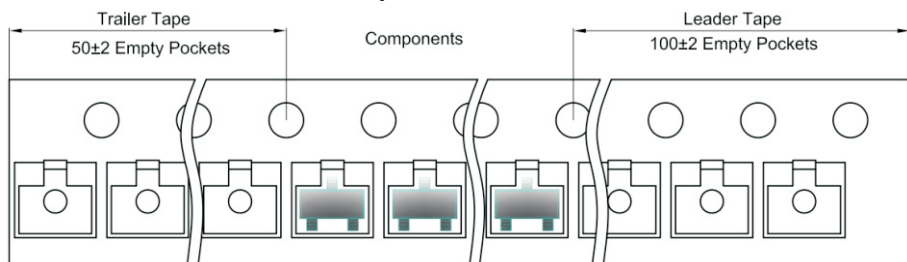
### SOT-23 Embossed Carrier Tape



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



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