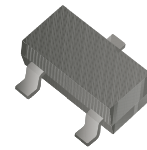


PNP General Purpose Transistors

RoHS Device

Halogen Free



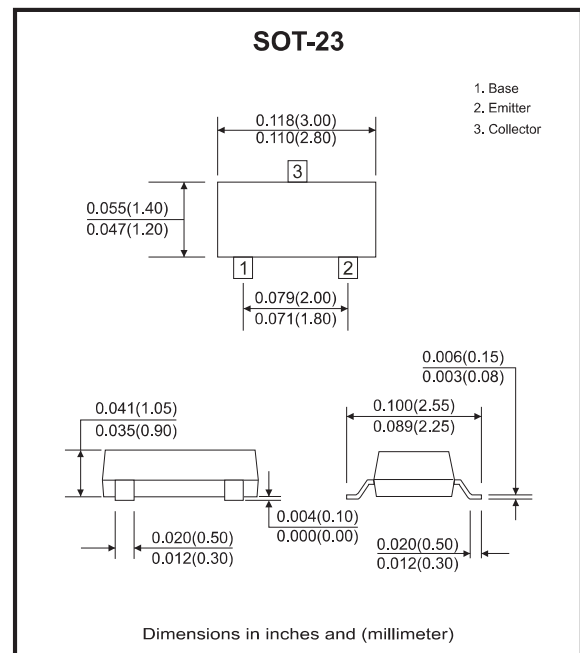
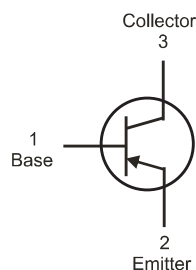
Features

- Power dissipation of 300mW.
- High stability and high reliability.

Mechanical data

- Case: SOT-23, molded plastic.
- Epoxy UL: 94V-0.
- Mounting position: Any.

Circuit Diagram

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

Parameter	Symbol	Value	Unit
Collector-base voltage	V_{CBO}	-160	V
Collector-emitter voltage	V_{CEO}	-150	V
Emitter-base voltage	V_{EBO}	-5	V
Collector current-continuous	I_C	-600	mA
Collector power dissipation	P_C	300	mW
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal resistance from junction to ambient	$R_{\theta JA}$	416	$^{\circ}\text{C/W}$

Electrical Characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -100\mu\text{A}$, $I_E = 0$	-160			V
Collector-emitter breakdown voltage (Note 1)	$V_{(BR)CEO}$	$I_C = -1\text{mA}$, $I_B = 0$	-150			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu\text{A}$, $I_C = 0$	-5			V
Collector cut-off current	I_{CBO}	$V_{CB} = -120\text{V}$, $I_E = 0$			-100	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -4\text{V}$, $I_C = 0$			-100	nA
DC current gain (Note 1)	$h_{FE(1)}$	$V_{CE} = -5\text{V}$, $I_C = -1\text{mA}$	80			
	$h_{FE(2)}$	$V_{CE} = -5\text{V}$, $I_C = -10\text{mA}$	100		300	
	$h_{FE(3)}$	$V_{CE} = -5\text{V}$, $I_C = -50\text{mA}$	30			
Collector-emitter saturation voltage (Note 1)	$V_{CE(sat)}$	$I_C = -10\text{mA}$, $I_B = -1\text{mA}$			-0.2	V
		$I_C = -50\text{mA}$, $I_B = -5\text{mA}$			-0.5	V
Base-emitter saturation voltage (Note 1)	$V_{BE(sat)}$	$I_C = -10\text{mA}$, $I_B = -1\text{mA}$			-1.00	V
		$I_C = -50\text{mA}$, $I_B = -5\text{mA}$			-1.00	V
Transition frequency	f_T	$V_{CE} = -5\text{V}$, $I_C = 10\text{mA}$, $f = 30\text{MHz}$	100			MHz

Notes: 1. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

Classification of $h_{FE(2)}$

h_{FE}	100-300	
Rank	L	H
Range	100-200	200-300

Rating and Characteristic Curves

Fig.1 - Static Characteristic

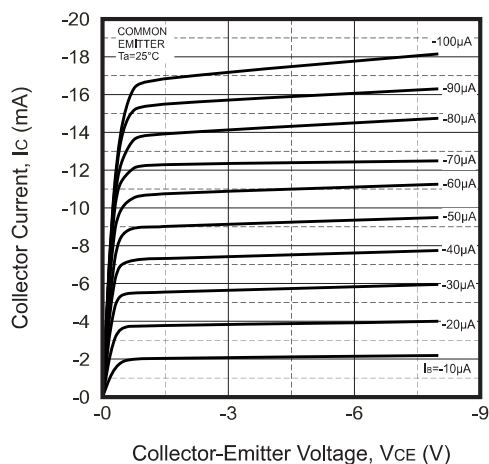
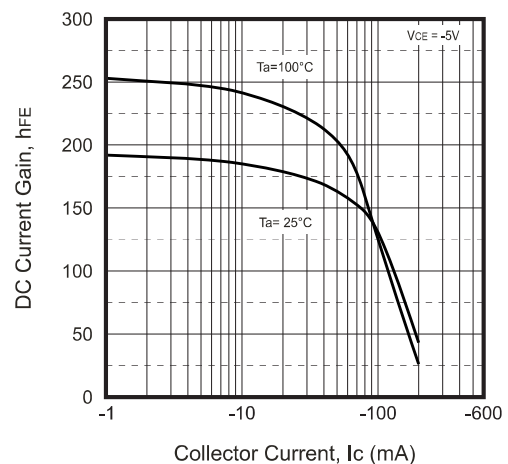


Fig.2 - $h_{FE} - I_C$



Rating and Characteristic Curves

Fig.3 - $V_{BEsat} - I_c$

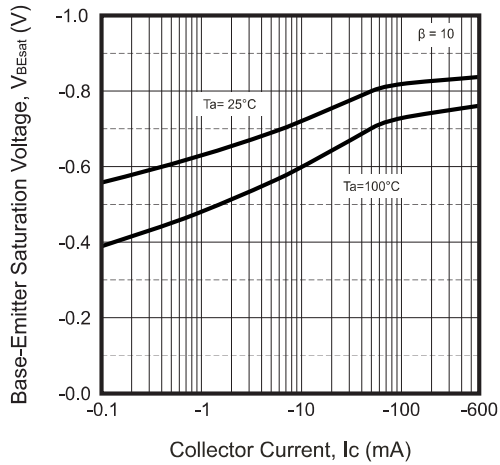


Fig.4 - $V_{CEsat} - I_c$

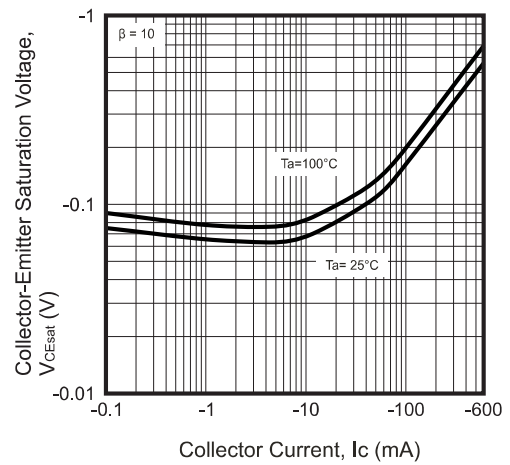


Fig.5 - $I_c - V_{BE}$

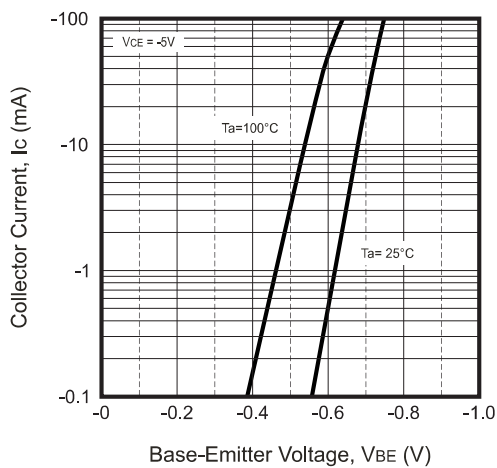


Fig.6 - $C_{ob}/C_{ib} - V_{CB}/V_{EB}$

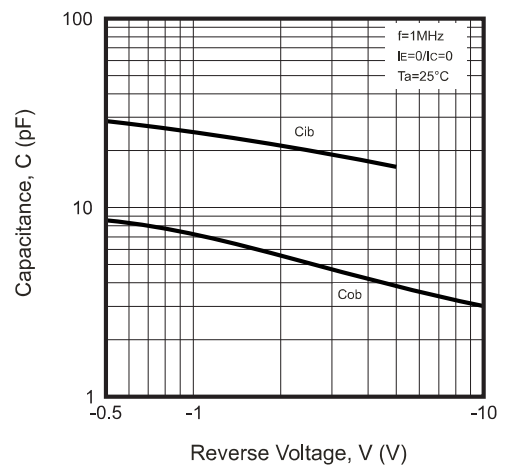


Fig.7 - $f_T - I_c$

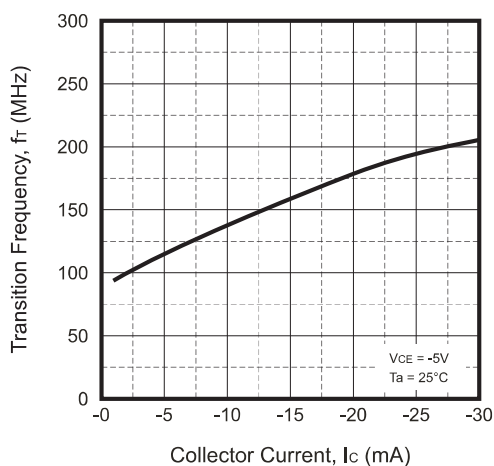
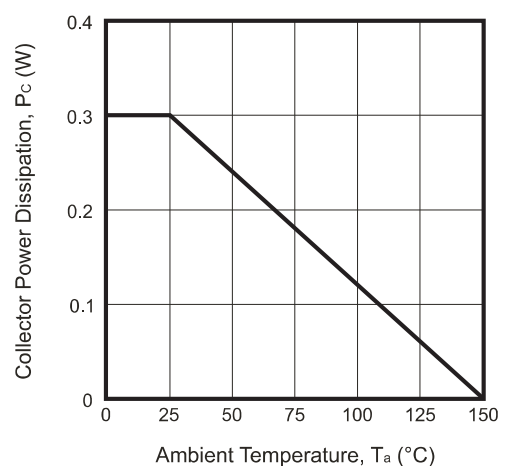


Fig.8 - $P_c - T_a$



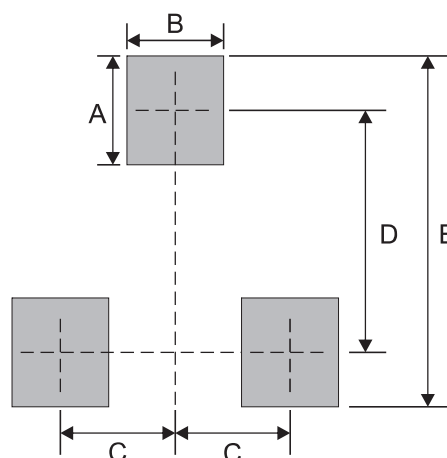
Marking Code

Part Number	Marking Code
MMBT5401	2L



Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114

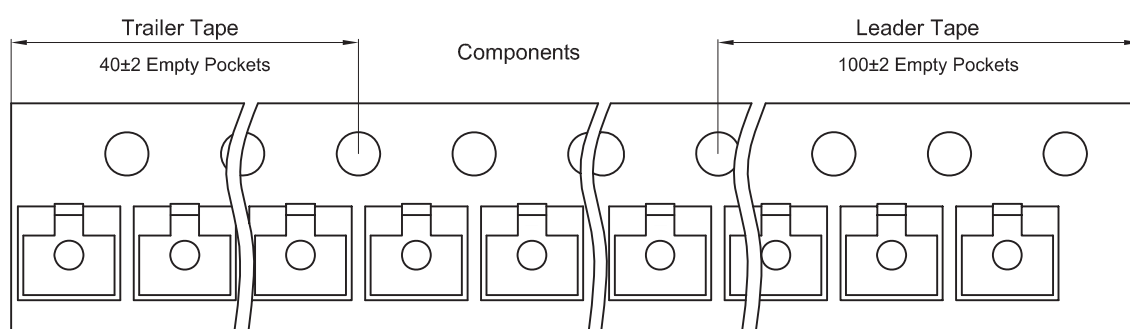
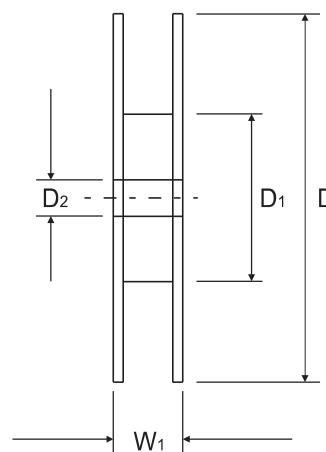
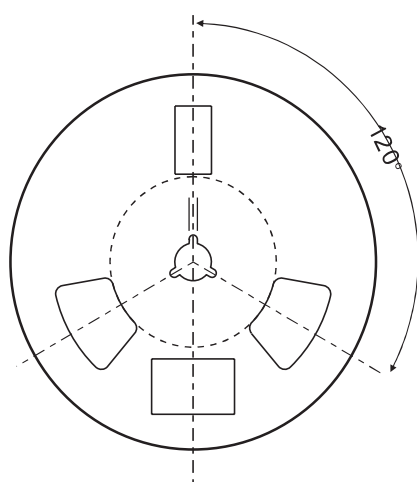
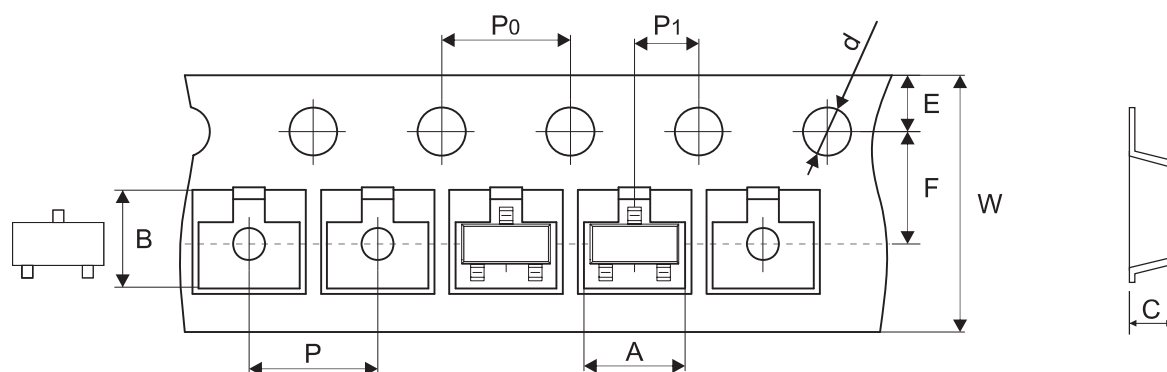


Note: 1. The pad layout is for reference purposes only.

Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7

Reel Taping Specification



SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.00 ± 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 ± 0.004	0.484 ± 0.039