



# MMBT9013

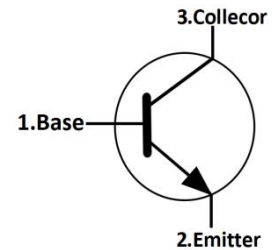
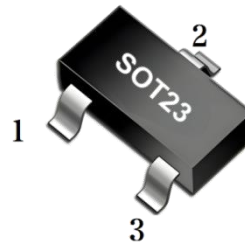
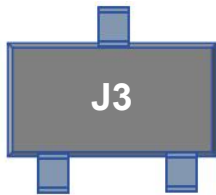
## NPN SILICON TRANSISTOR

### FEATURES

- \* High Collector Current.
- \* Complementary to S9012.
- \* Excellent hFE Linearity.

### MARKING

Type Code: Marking: J3



### ABSOLUTE MAXIMUM RATINGS (Tc=25°C, unless otherwise specified)

SYMBOL	PARAMETER	VALUE	UNIT
V <sub>CB0</sub>	Collector-base voltage	40	V
V <sub>CEO</sub>	Collector-emitter voltage	25	V
V <sub>EBO</sub>	Emitter-base voltage	5	V
I <sub>c</sub>	Collector current	0.5	A
P <sub>c</sub>	Collector Power Dissipation	300	mW
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55~150	°C
ROJA	Thermal Resistance From Junction To Ambient	416	°C/W

### ELECTRICAL CHARACTERISTICS (Tc=25°C, unless otherwise noted)

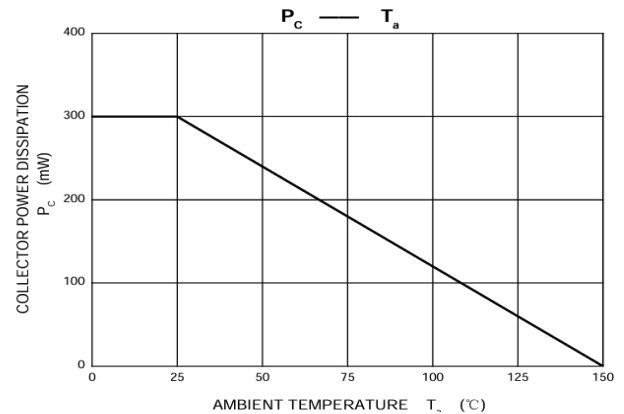
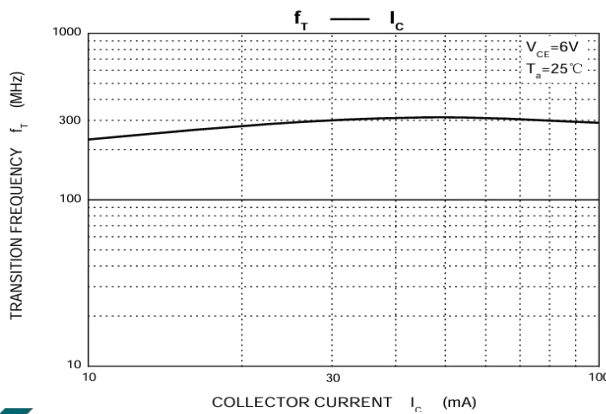
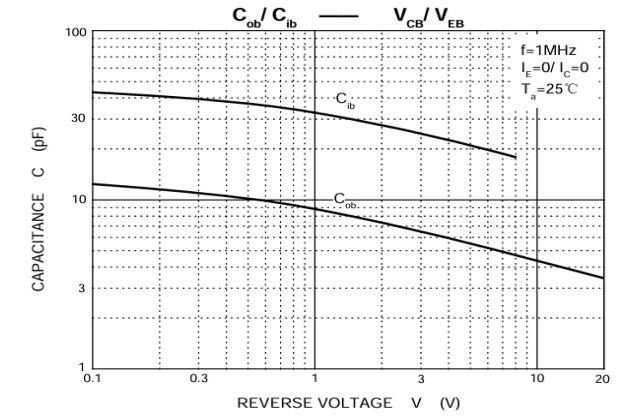
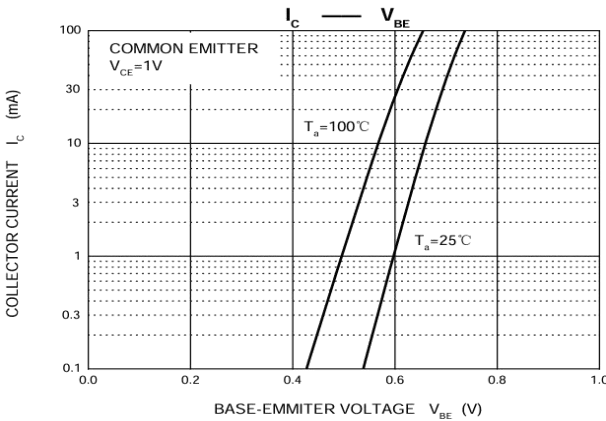
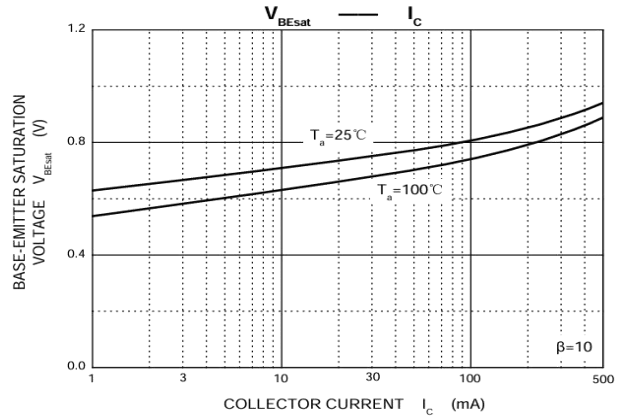
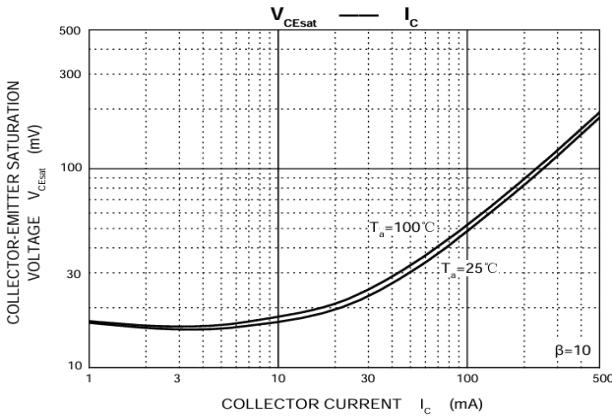
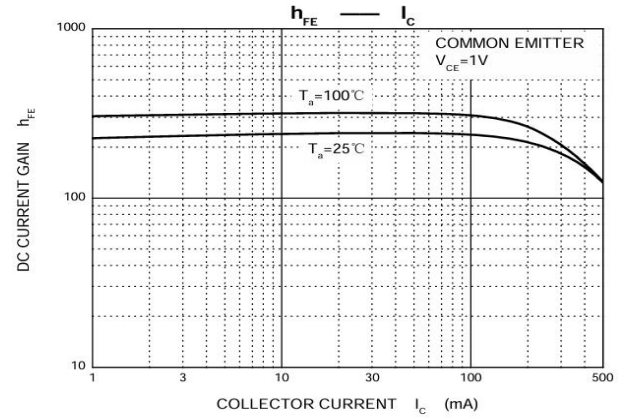
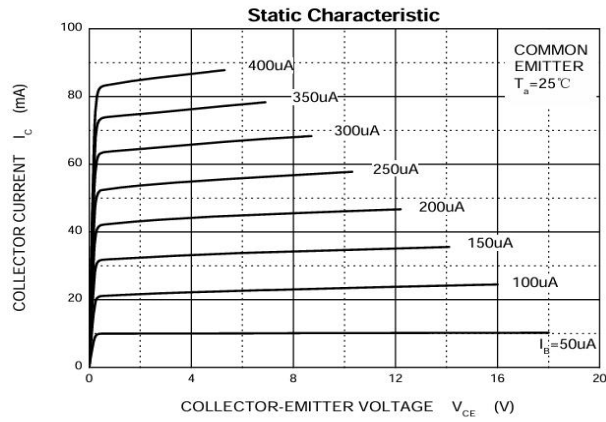
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	40		V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1mA, I <sub>B</sub> =0	25		V
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =100μA, I <sub>C</sub> =0	5		V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> =40V, I <sub>E</sub> =0		0.1	μA
Collector cut-off current	I <sub>CEO</sub>	V <sub>CE</sub> =20V, I <sub>B</sub> =0		0.1	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0		0.1	μA
DC Current Gain (CLASSIFICATION OF h <sub>FE1</sub> )	h <sub>FE1</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =50mA	A	120	200
			B	200	350
			C	300	400
	h <sub>FE2</sub>	V <sub>CE</sub> =1V, I <sub>C</sub> =500mA	40		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA		0.6	V
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA		1.2	V
Base-emitter voltage	V <sub>BE</sub>	V <sub>CB</sub> =1V, I <sub>C</sub> =10mA		0.7	V
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =6V, I <sub>C</sub> =20mA, f=30MHz	150		MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =6V, I <sub>E</sub> =0, f=1MHz		8	pF



# MMBT9013

## NPN SILICON TRANSISTOR

### TYPICAL CHARACTERISTICS





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# NPN SILICON TRANSISTOR

## SOT23 PACKAGE OUTLINE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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

## REEL PACKING

Top cover tape thickness  
0.10 mm (0.004") max. thick

Embossed carrier tape

Trailer Tape  
50±2 Empty Pockets

Components

Leader Tape  
100±2 Empty Pockets

Dimensions are in millimeter										
PKG TYPE	A	B	C	d	E	F	Po	P	P1	W
SOT-23	3.15	2.77	1.22	Φ1.50	1.75	3.50	4.00	4.00	2.00	8.00
Reel Optiom	D	D1	D2	G	H	I	W1	W2	Q.TY PER REEL	
7" Dia	Φ178.0	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30	3000PCS	
13" Dia	φ330.0	/	13.00	/	/	R6.50	9.50	12.30	10000PCS	