

# MMBT4403

## PNP SILICON TRANSISTOR

### DESCRIPTION

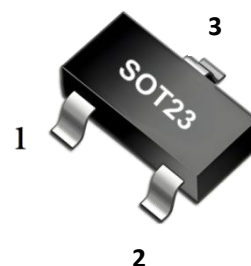
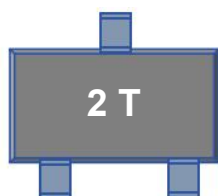
The MMBT4403 is designed for use as a general purpose amplifier and switch requiring collector currents up to 500mA.

### FEATURES

\*Switching Transistor

### MARKING

Type Code: Marking: 2 T



- |              |
|--------------|
| 1. BASE      |
| 2. EMITTER   |
| 3. COLLECTOR |

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

SYMBOL	PARAMETER	VALUE	UNIT
V <sub>CBO</sub>	Collector-base voltage	-40	V
V <sub>CEO</sub>	Collector-emitter voltage	-40	V
V <sub>EB0</sub>	Emitter-base voltage	-5	V
I <sub>c</sub>	Collector current	-0.6	A
P <sub>c</sub>	Collector Power Dissipation	0.3	W
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-60~150	°C
R <sub>θJA</sub>	Thermal Resistance From Junction To Ambient	417	°C/W

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-100\mu A, I_E=0$	-40		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-1mA, I_B=0$	-40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-100\mu A, I_C=0$	-5		V
Collector cutoff current	$I_{CBO}$	$V_{CB}=-35V, I_E=0$		-0.1	$\mu A$
Collector cut-off current	$I_{CEX}$	$V_{CE}=-35V, V_{BE}=-0.4V$		-0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-4V, I_C=0$		-0.1	$\mu A$
DC Current Gain	$h_{FE1}$	$V_{CE}=-1V, I_C=-0.1mA$	30		
	$h_{FE2}$	$V_{CE}=-1V, I_C=-1mA$	60		
	$h_{FE3}$	$V_{CE}=-1V, I_C=-10mA$	100		
	$h_{FE4}$	$V_{CE}=-2V, I_C=-150mA$	100	300	
	$h_{FE5}$	$V_{CE}=-2V, I_C=-500mA$	20		
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=-150mA, I_B=-15mA$		-0.4	V
		$I_C=-500mA, I_B=-50mA$		-0.75	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=-150mA, I_B=-15mA$		-0.95	V
		$I_C=-500mA, I_B=-50mA$		-1.3	V
Transition frequency	$f_T$	$V_{CE}=-10V, I_C=-20mA, f=100MHz$	200		MHz
Delay time	$t_d$	$V_{CC}=-30V, V_{BE(off)}=-0.5V$		15	ns
Rise time	$t_r$	$I_C=-150mA, I_{B1}=-15mA$		20	ns
Storage time	$t_s$	$V_{CC}=-30V, I_C=-150mA$		225	ns
Fall time	$t_f$	$I_{B1}=I_{B2}=-15mA$		60	ns

### ■ TEST CIRCUIT

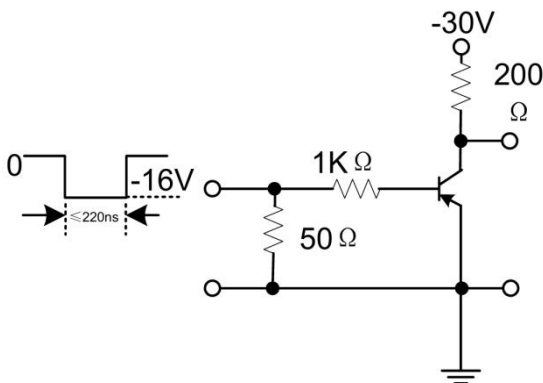


Figure 1. Saturated Turn-On Switching Timer

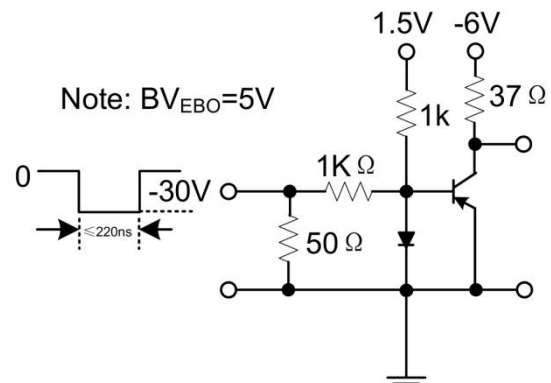


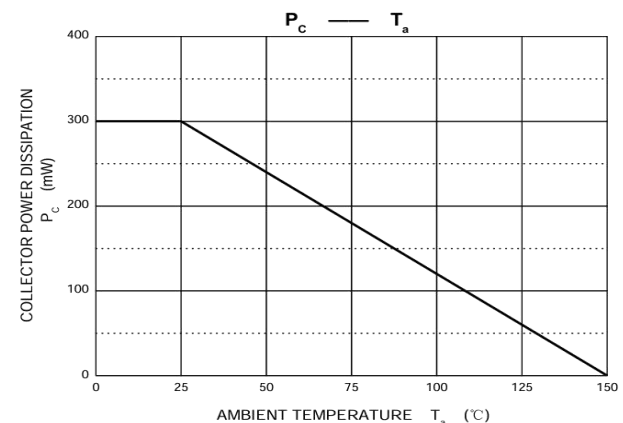
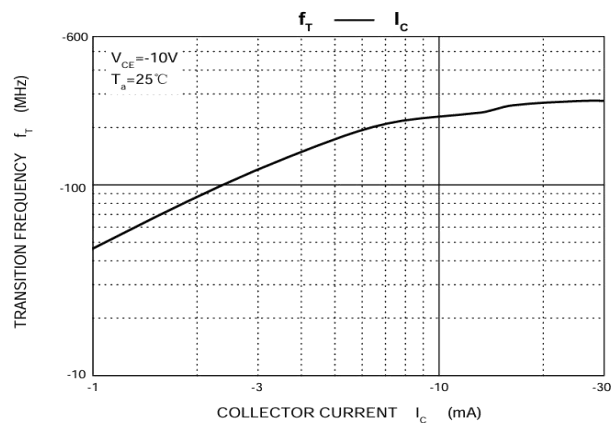
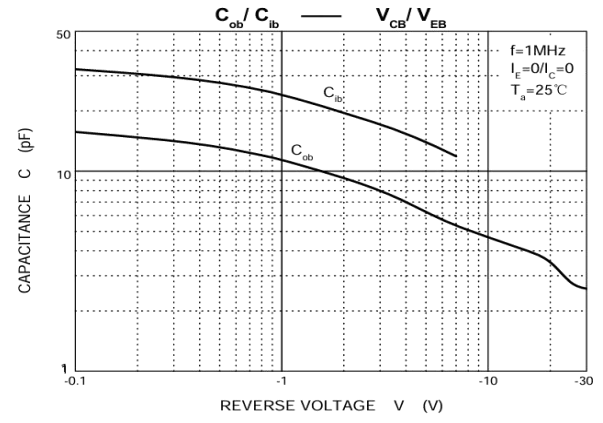
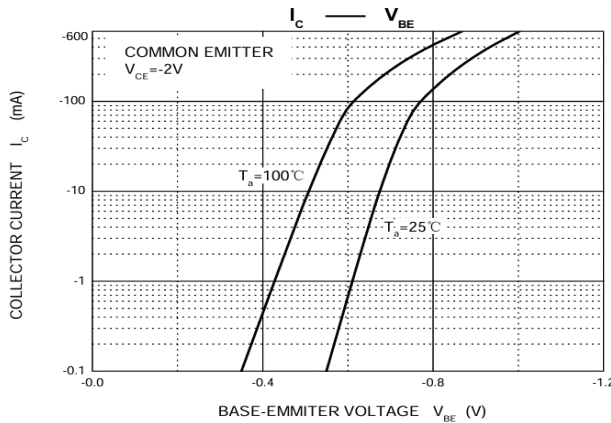
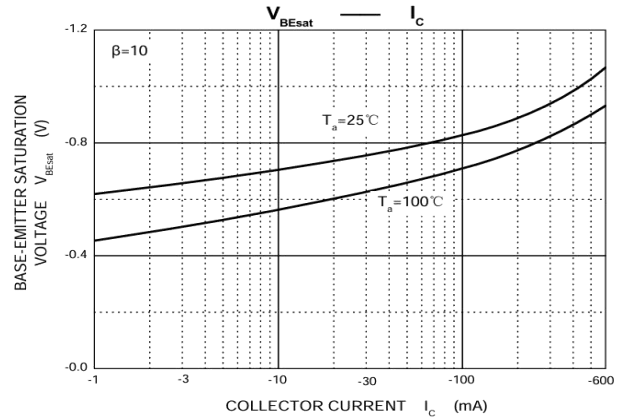
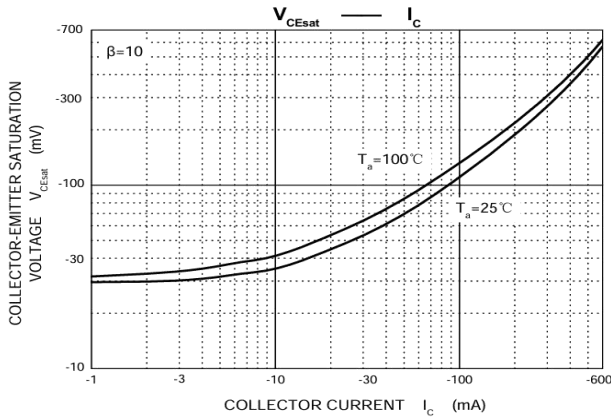
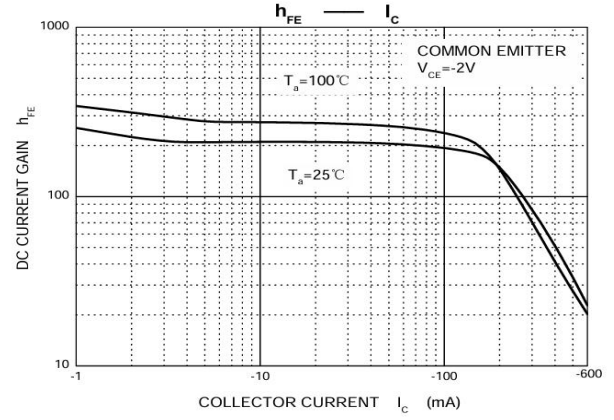
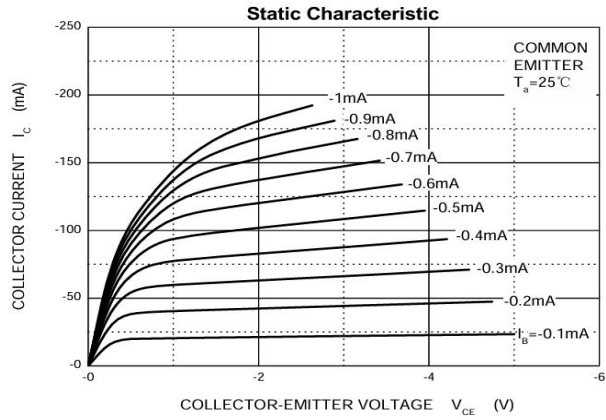
Figure 2. Saturated Turn-Off Switching Timer



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## TYPICAL CHARACTERISTICS



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## SOT23 PACKAGE OUTLINE DIMENSIONS

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.9	1.15	0.035	0.045
A1	0	0.1	0	0.004
A2	0.9	1.05	0.035	0.041
b	0.3	0.5	0.012	0.02
c	0.08	0.15	0.003	0.006
D	2.8	3	0.11	0.118
E	1.2	1.4	0.047	0.055
E1	2.25	2.55	0.089	0.1
e	0.950 TYP		0.037 TYP	
e1	1.8	2	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.25	0.45	0.01	0.02
θ	0°	8°	0°	8°

Note:

- Controlling dimension: in millimeters.
- General tolerance: ±0.05mm.
- The pad layout is for reference purposes only.

## REEL PACKING

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

Embossed carrier tape

Trailer Tape 50±2 Empty Pockets

Components

Leader Tape 100±2 Empty Pockets

Dimensions: A, B, C, P, P0, P1, W, A-A, T1, T2, D, C, E, F, G, M, N, Q, R, S, T, U, V, W, X, Y, Z

Dimensions are in millimeter										
PKG TYPE	A	B	C	d	E	F	Po	P	P1	W
SOT-23	3.17	2.77	1.22	Φ1.55	1.75	3.50	4.00	4.00	2.00	8.00
Reel Option	A	B	C	D	E	F	G	T1	T2	Q.TY PER REEL
7" Dia	Φ177.8	Φ54.5	Φ13.5	2.7	12.3	9.6	9.6	0.9	1.1	3000PCS