



MMBT4403

PNP GENERAL PURPOSE SWITCHING TRANSISTOR

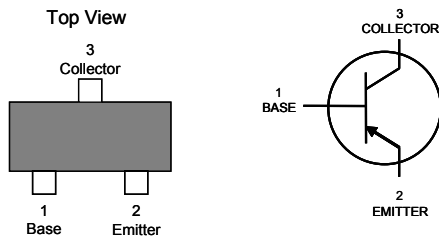
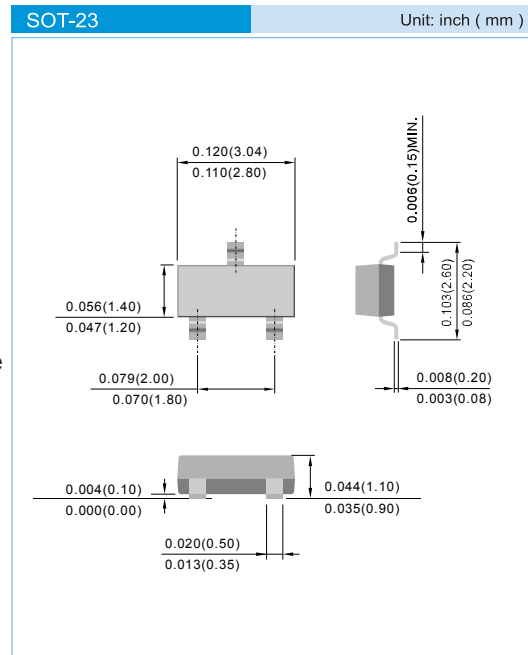
VOLTAGE	40V	POWER	225mW
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FEATURES

- PNP epitaxial silicon, planar design
- Collector-emitter voltage $V_{CE} = -40V$
- Collector current $I_C = -600mA$
- Complimentary (NPN) device: MMBT4401
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. .
- (Halogen Free)

MECHANICAL DATA

- Case: SOT-23
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx Weight: 0.0003 ounces, 0.0084 grams
- Marking: M3A



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Collector - Emitter Voltage	V_{CEO}	-40	V
Collector - Base Voltage	V_{CBO}	-40	V
Emitter - Base Voltage	V_{EBO}	-5.0	V
Collector Current - Continuous	I_C	-600	mA
Max Power Dissipation (Note 1)	P_{TOT}	225	mW
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE	UNIT
Thermal Resistance , Junction to Ambient (Note 1)	$R_{\theta JA}$	556	$^{\circ}C/W$

Note 1: Transistor mounted on FR-4 board 70 x 60 x 1mm. using minimum recommended pad.



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ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	Test Condition	MIN.	TYP.	MAX.	UNIT
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = -1.0\text{mA}$, $I_B = 0$	-40	-	-	V
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = -100\mu\text{A}$, $I_E = 0$	-40	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = -100\mu\text{A}$, $I_C = 0$	-5.0	-	-	V
Base Cutoff Current	I_{BEV}	$V_{CE} = -35\text{V}$, $V_{EB} = -0.4\text{V}$	-	-	-100	nA
Collector Cutoff Current	I_{CEX}	$V_{CE} = -35\text{V}$, $V_{EB} = -0.4\text{V}$	-	-	-100	nA
DC Current Gain	h_{FE}	$I_C = -0.1\text{mA}$, $V_{CE} = -1.0\text{V}$	30	-	-	
		$I_C = -1.0\text{mA}$, $V_{CE} = -1.0\text{V}$	60	-	-	
		$I_C = -10\text{mA}$, $V_{CE} = -1.0\text{V}$	100	-	-	
		$I_C = -150\text{mA}$, $V_{CE} = -2.0\text{V}$	100	-	300	
		$I_C = -500\text{mA}$, $V_{CE} = -2.0\text{V}$	20	-	-	
Collector - Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$ $I_C = -500\text{mA}$, $I_B = -50\text{mA}$	-	-	-0.4 -0.75	V
Base - Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = -150\text{mA}$, $I_B = -15\text{mA}$ $I_C = -500\text{mA}$, $I_B = -50\text{mA}$	-0.75 -	-	-0.95 -1.3	V
Current-Gain – Bandwidth Product	f_T	$I_C = -20\text{mA}$, $V_{CE} = -10\text{V}$, $f = 100\text{MHz}$	200	-	-	MHz
Collector - Base Capacitance	C_{CBO}	$V_{CB} = -5.0\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	-	-	8.5	pF
Emitter - Base Capacitance	C_{EBO}	$V_{CB} = -0.5\text{V}$, $I_C = 0$, $f = 1\text{MHz}$	-	-	30	pF
Delay Time	t_d	$V_{CC} = -30\text{V}$, $V_{BE} = -2.0\text{V}$, $I_C = -150\text{mA}$, $I_{B1} = -15\text{mA}$	-	-	15	ns
Rise Time	t_r	$I_C = -150\text{mA}$, $I_{B1} = -15\text{mA}$	-	-	20	ns
Storage Time	t_s	$V_{CC} = -30\text{V}$, $I_C = -150\text{mA}$, $I_{B1} = I_{B2} = 15\text{mA}$	-	-	225	ns
Fall Time	t_f	$I_{B1} = I_{B2} = 15\text{mA}$	-	-	30	ns

SWITCHING TIME EQUIVALENT TEST CIRCUITS

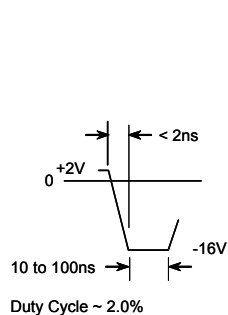


Fig. 1. Turn-On Time

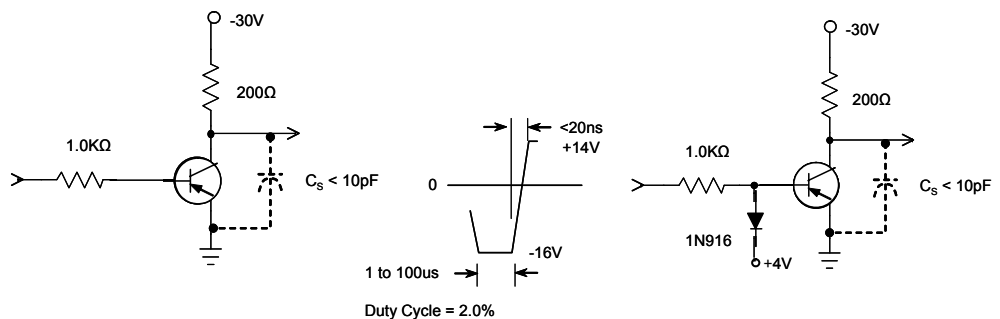


Fig. 2. Turn-Off Time



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ELECTRICAL CHARACTERISTICS CURVES

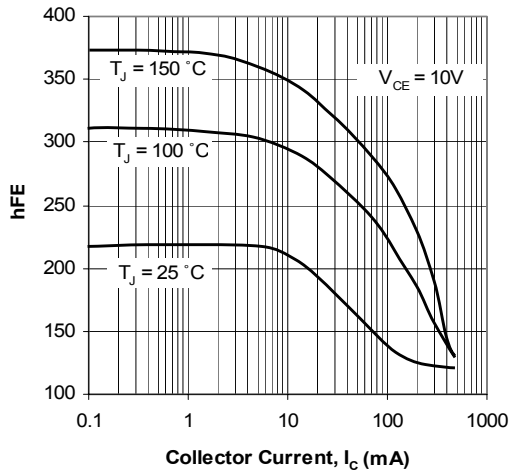


Fig. 3. Typical h_{FE} vs Collector Current

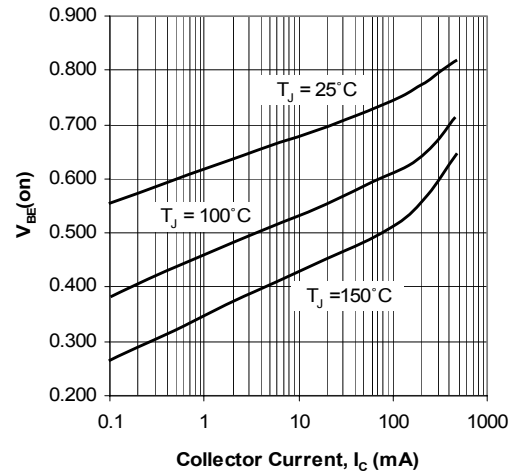


Fig. 4. Typical V_{BE} vs Collector Current

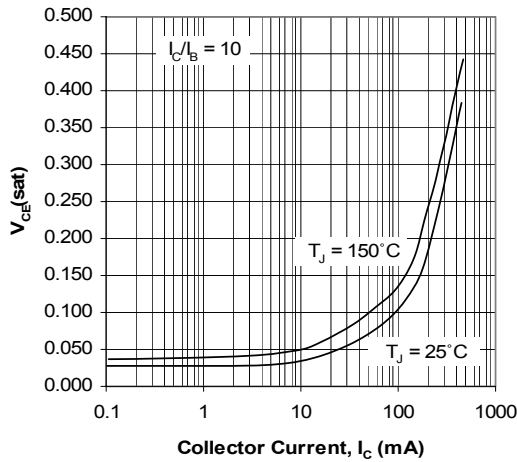


Fig. 5. Typical $V_{CE}(sat)$ vs Collector Current

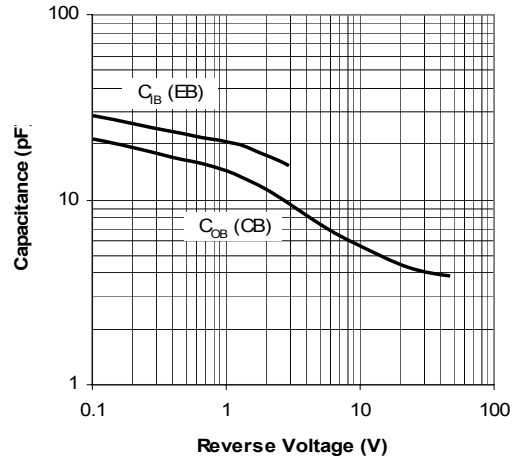
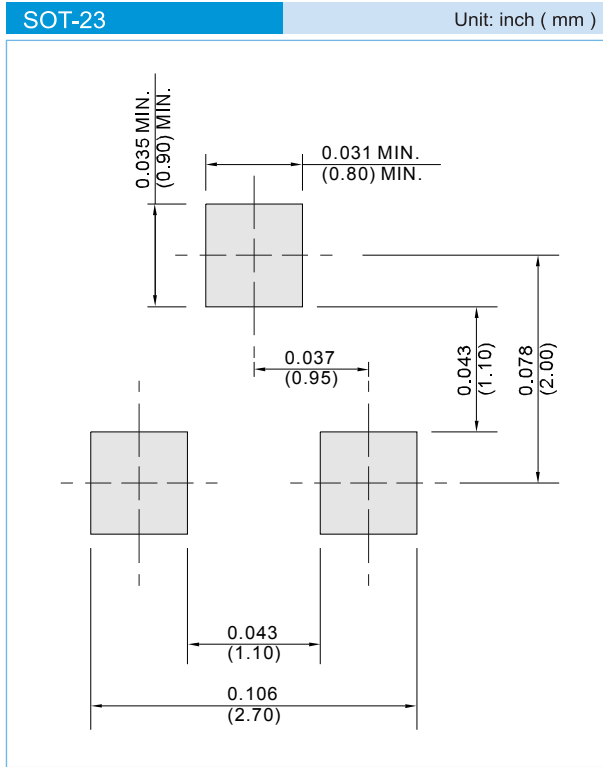


Fig. 6. Typical Capacitances vs Reverse Voltage



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MOUNTING PAD LAYOUT



ORDER INFORMATION

- Packing information
 - T/R - 12K per 13" plastic Reel
 - T/R - 3K per 7" plastic Reel



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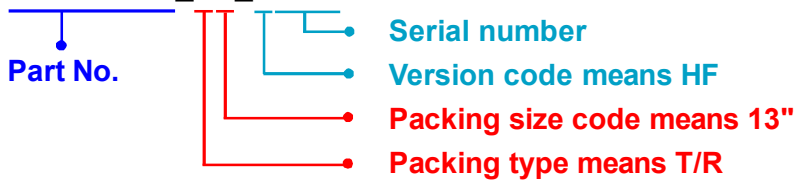
Part No._packing code_Version

MMBT4403_R1_00001

MMBT4403_R2_00001

For example :

RB500V-40_R2_00001



Packing Code XX				Version Code XXXXX		
Packing type	1 st Code	Packing size code	2 nd Code	HF or RoHS	1 st Code	2 nd ~5 th Code
Tape and Ammunition Box (T/B)	A	N/A	0	HF	0	serial number
Tape and Reel (T/R)	R	7"	1	RoHS	1	serial number
Bulk Packing (B/P)	B	13"	2			
Tube Packing (T/P)	T	26mm	X			
Tape and Reel (Right Oriented) (TRR)	S	52mm	Y			
Tape and Reel (Left Oriented) (TRL)	L	PANASERT T/B CATHODE UP (PBCU)	U			
FORMING	F	PANASERT T/B CATHODE DOWN (PBCD)	D			



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