



MMBT5401

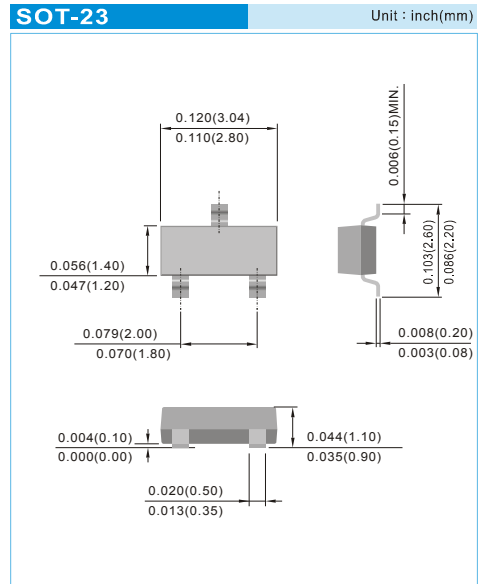
HIGH VOLTAGE TRANSISTOR PNP Silicon

FEATURES

- Lead free in compliance with EU RoHS2.0 (2011/65/EU & 2015/865/EU directive)
- Green molding compound as per IEC61249 Std. . (Halogen Free)

MECHANICAL DATA

- Case : SOT-23 plastic case.
- Terminals : Solderable per MIL-STD-750, Method 2026
- Standard packaging : 8mm tape
- Approx. Weight : 0.0003 ounces, 0.008 grams
- Marking : M5A



MAXIMUM RATINGS

RATING	SYMBOL	VALUE	UNITS
Collector-Emitter Voltage	V_{CE0}	-150	Vdc
Collector-Base Voltage	V_{CB0}	-160	Vdc
Emitter-Base Voltage	V_{EB0}	-5.0	Vdc
Collector Current-Continuous	I_C	-500	mAdc

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operational is not implied, damage may occur and reliability may be affected.

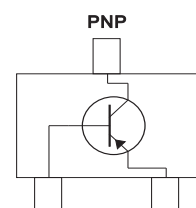


Fig.35



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THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX	UNITS
Total Device Dissipation FR-4 Board (Note 1) T _A =25°C Derate Above 25°C	P _D	225	mW
Thermal Resistance, Junction-to-Ambient	R _{θJA}	1.8	mW/°C
Total Device Dissipation Alumina Substrate (Note 2) T _A =25°C Derate Above 25°C	P _D	300	mW
Thermal Resistance Junction-to-Ambient	R _{θJA}	2.4	mW/°C
Junction and Storage Temperature	T _J , T _{STG}	-55 to +150	°C

1.FR-4 = 70 X 60 X 1mm

2.Alumina = 0.4 X 0.3 X 0.024 in 99.5% alumina

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

CHARACTERISTIC	SYMBOL	MIN	MAX	UNITS
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (I _C =-1.0mA _{dc} , I _B =0)	V _{(BR)CEO}	-150	-	V _{dc}
Collector-Base Breakdown Voltage (I _C =-100μA _{dc} , I _E =0)	V _{(BR)CBO}	-160	-	V _{dc}
Emitter-Base Breakdown Voltage (I _E =-10μA _{dc} , I _C =0)	V _{(BR)EBO}	-5.0	-	V _{dc}
Collector Cutoff Current (V _{CB} =-120V _{dc} , I _E =0) (V _{CB} =-120V _{dc} , I _E =0, T _A =100°C)	I _{CES}	-	-50 -50	nA _{dc} μA _{dc}
ON CHARACTERISTICS				
DC Current Gain (I _C =-1.0mA _{dc} , V _{CE} =-5.0V _{dc}) (I _C =-10mA _{dc} , V _{CE} =-5.0V _{dc}) (I _C =-50mA _{dc} , V _{CE} =-5.0V _{dc})	h _{FE}	50 60 50	- 240 -	-
Collector-Emitter Saturation Voltage (I _C =-10mA _{dc} , I _B =-1.0mA _{dc}) (I _C =-50mA _{dc} , I _B =-5.0mA _{dc})	V _{CE(SAT)}	- -	-0.2 -0.5	V _{dc}
Base-Emitter Saturation Voltage (I _C =-10mA _{dc} , I _B =-1.0mA _{dc}) (I _C =-50mA _{dc} , I _B =-5.0mA _{dc})	V _{BE(SAT)}	- -	-1.0 -1.0	V _{dc}
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain-Bandwidth Product (I _C =-10mA _{dc} , V _{CE} =-10V _{dc} , f=100MHz)	f _r	100	300	MHz
Output Capacitance (V _{CB} =-10V _{dc} , I _E =0, f=1.0MHz)	C _{OB0}	-	6.0	pF
Small Signal Current Gain (I _C =-1.0mA _{dc} , V _{CE} =-10V _{dc} , f=1.0kHz)	h _{FE}	40	200	-
Noise Figure (I _C =-200μA _{dc} , V _{CE} =-5.0V _{dc} , R _s =10Ω, f=1.0kHz)	NF	-	8.0	dB



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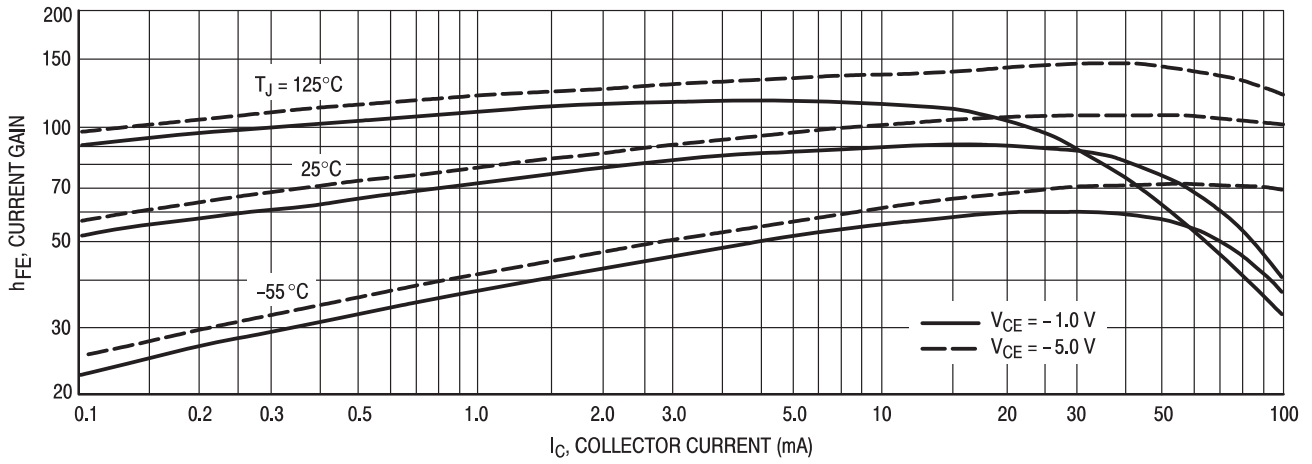


Figure 1. DC Current Gain

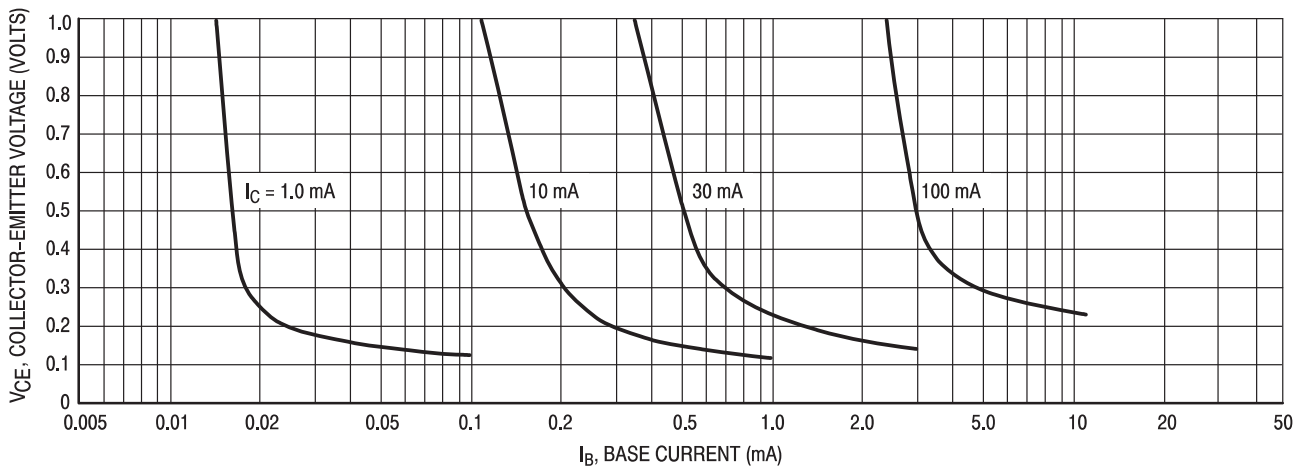


Figure 2. Collector Saturation Region

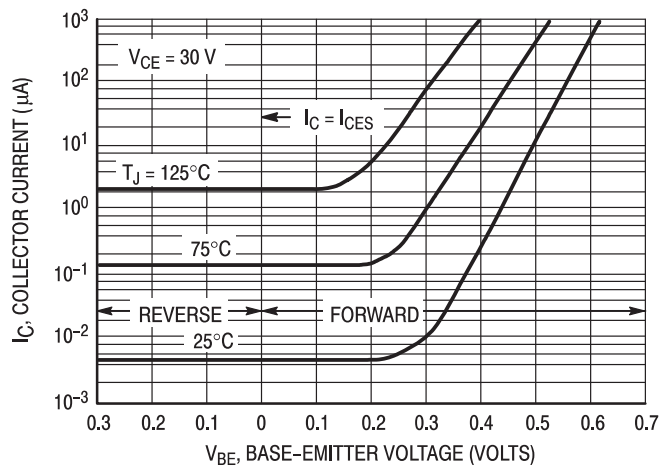


Figure 3. Collector Cut-Off Region



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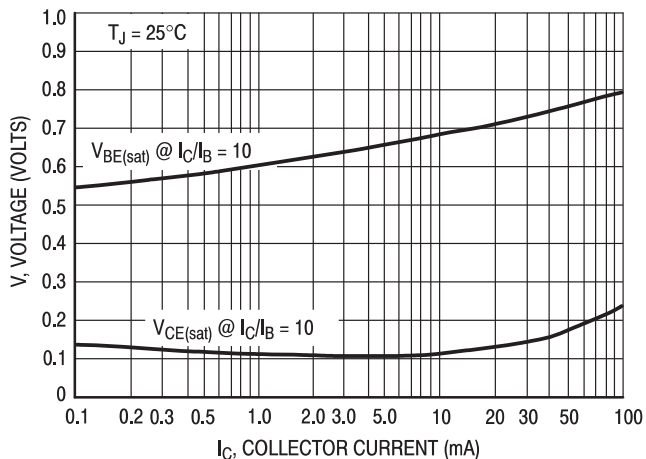


Figure 4. "On" Voltages

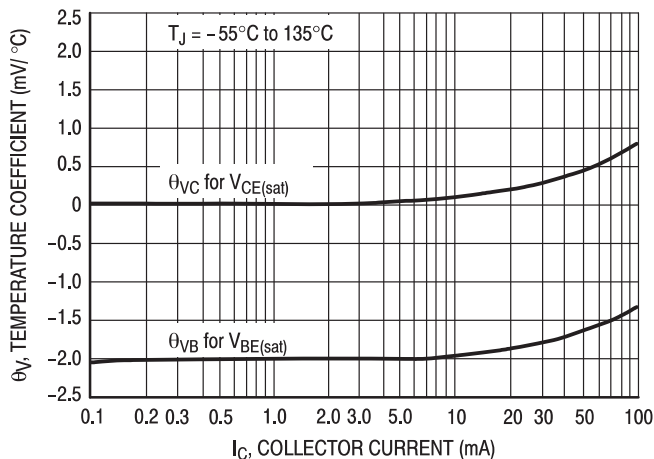
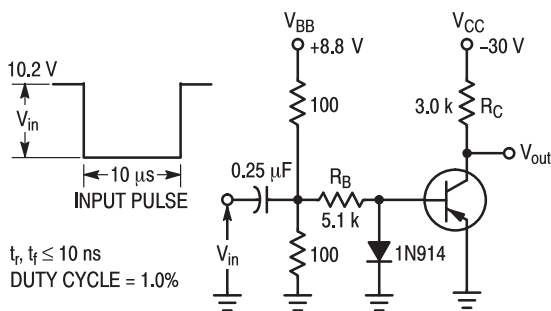


Figure 5. Temperature Coefficients



Values Shown are for $I_C @ 10 \text{ mA}$

Figure 6. Switching Time Test Circuit

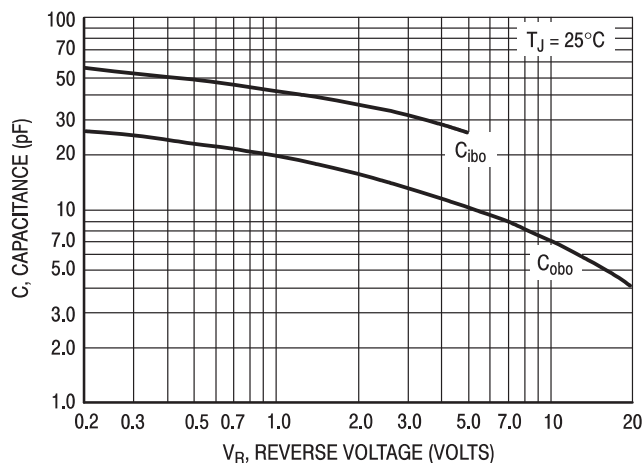


Figure 7. Capacitances

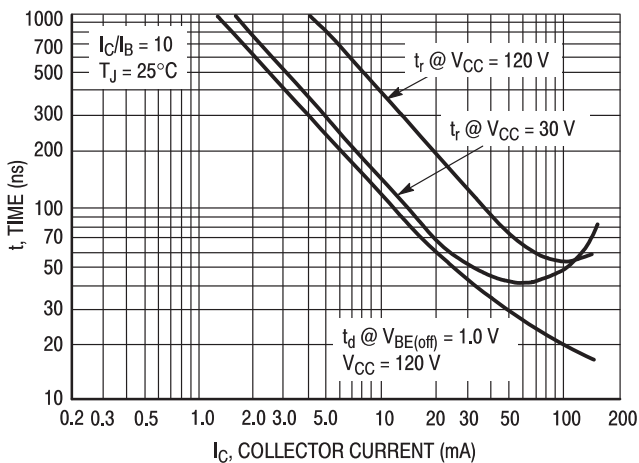


Figure 8. Turn-On Time

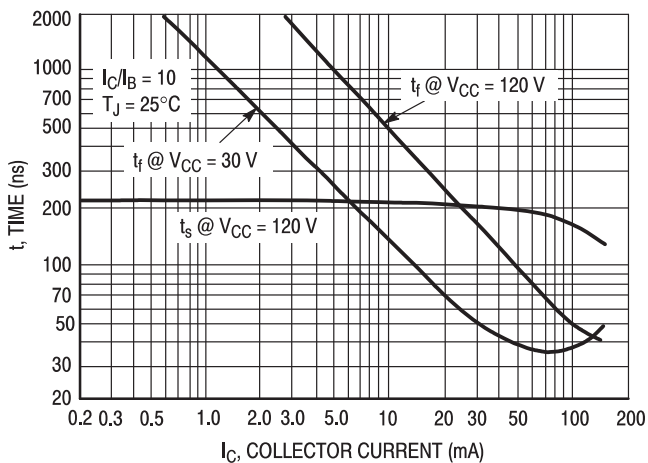
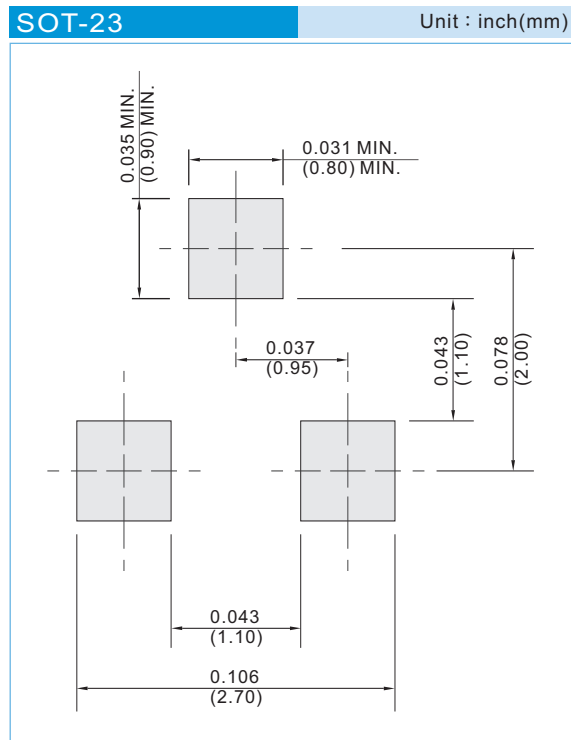


Figure 9. Turn-Off Time



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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

MMBT5401_R1_00001

MMBT5401_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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