



MMBT5401

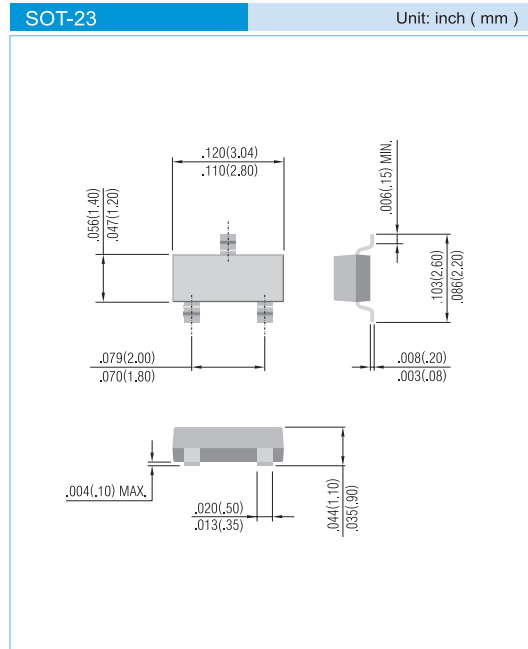
HIGH VOLTAGE TRANSISTOR PNP Silicon

FEATURES

- In compliance with EU RoHS 2002/95/EC directives

MECHANICAL DATA

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



MAXIMUM RATINGS

RATING	SYMBOL	VALUE	UNITS
Collector-Emitter Voltage	V _{CEO}	-150	Vdc
Collector-Base Voltage	V _{CBO}	-160	Vdc
Emitter-Base Voltage	V _{EBO}	-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.

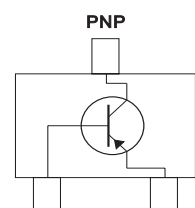


Fig.35



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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	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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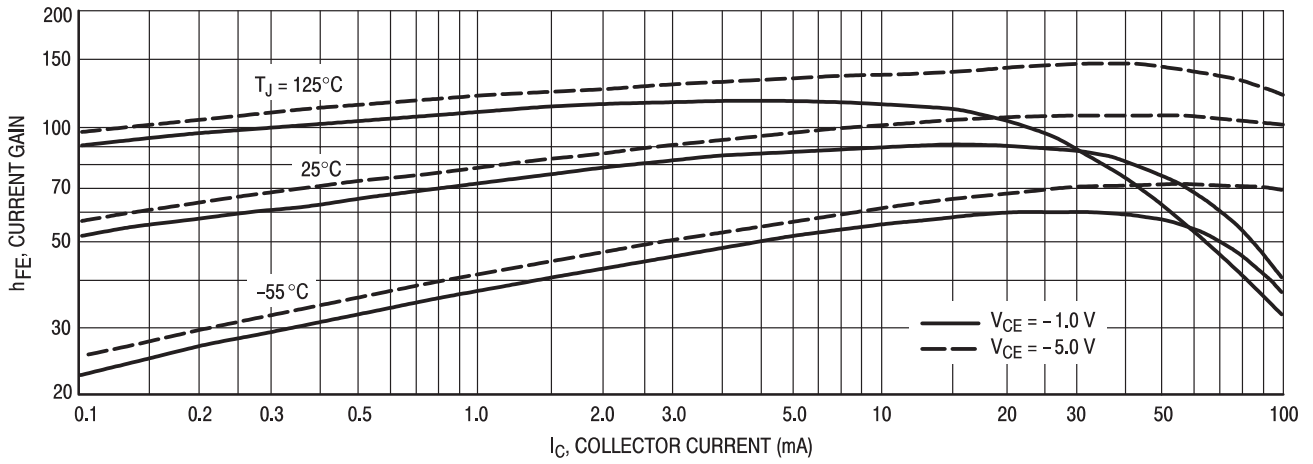


Figure 1. DC Current Gain

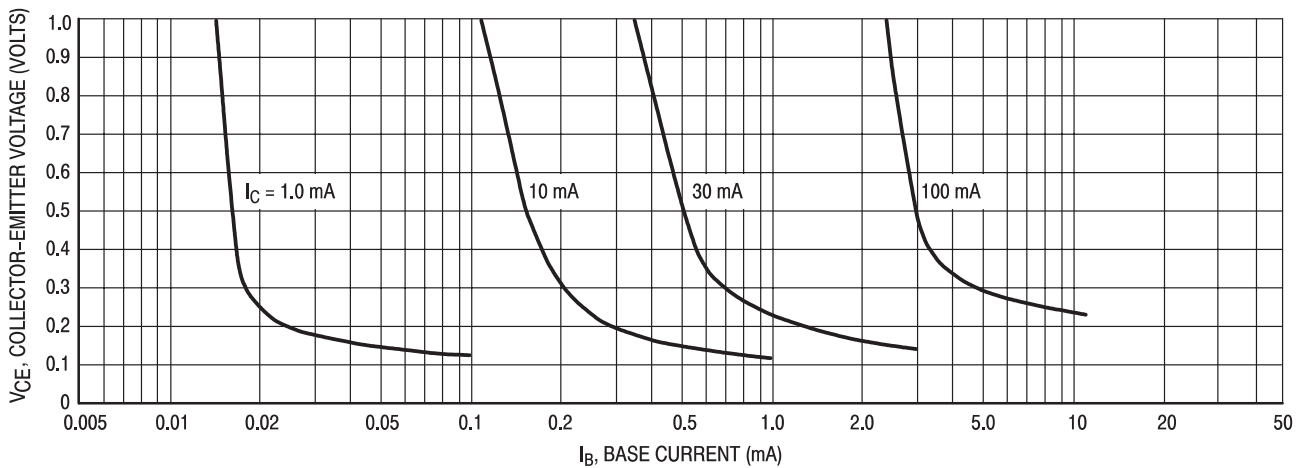


Figure 2. Collector Saturation Region

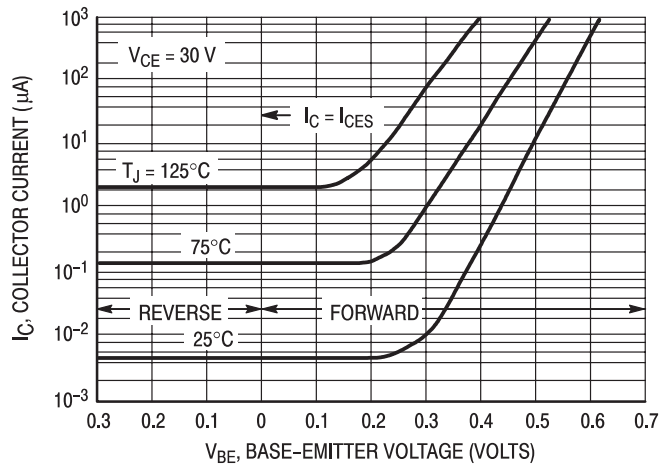


Figure 3. Collector Cut-Off Region



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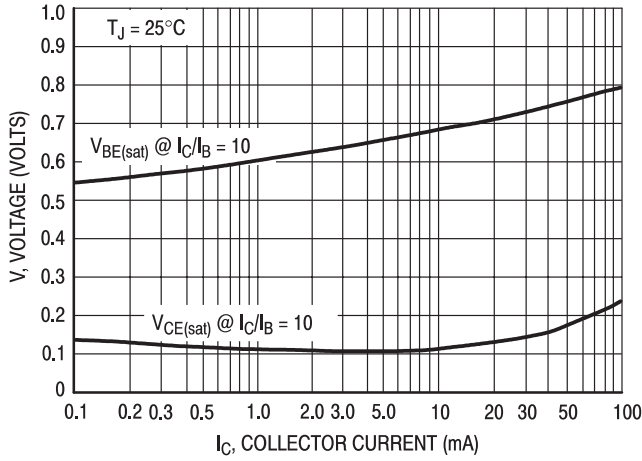


Figure 4. "On" Voltages

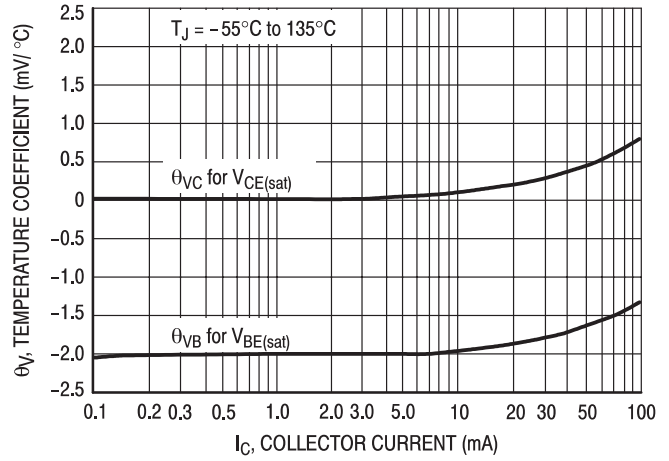
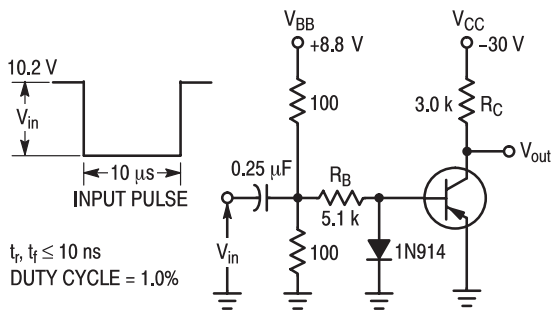


Figure 5. Temperature Coefficients



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

Figure 6. Switching Time Test Circuit

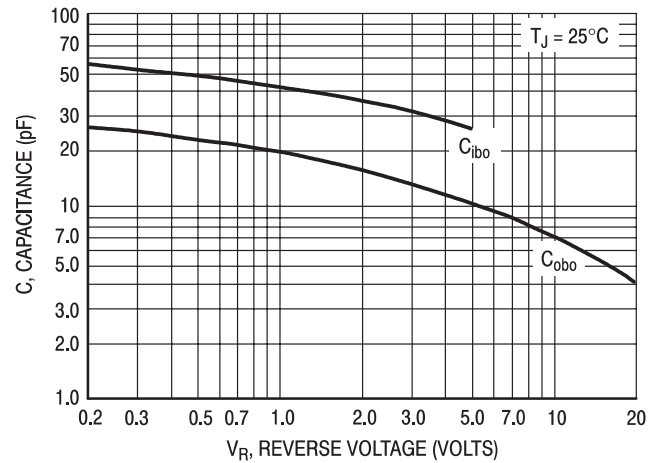


Figure 7. Capacitances

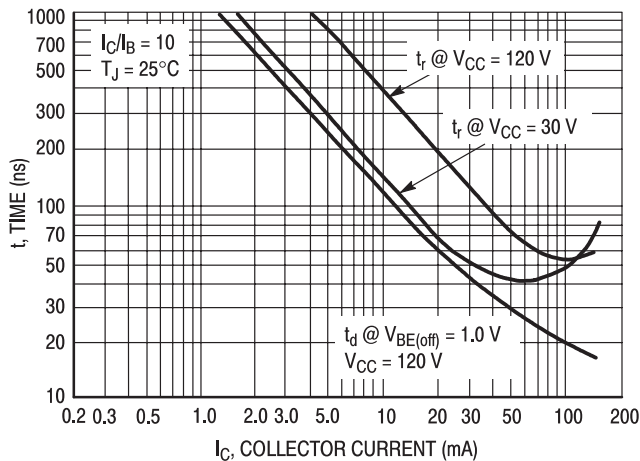


Figure 8. Turn-On Time

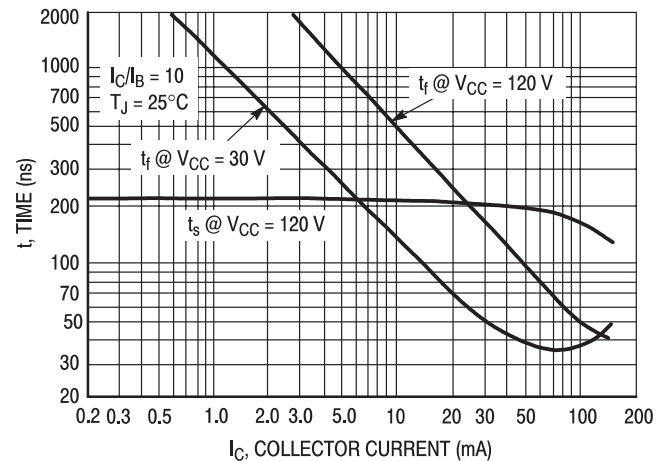
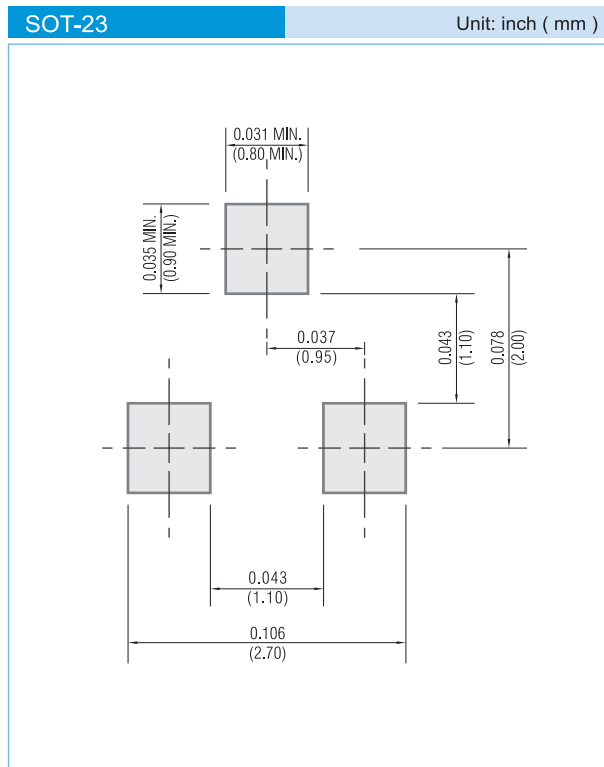


Figure 9. Turn-Off Time



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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

LEGAL STATEMENT

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