MMDT3904TB6

DUAL NPN GENERAL PURPOSE SWITCHING TRANSISTOR

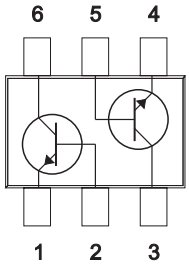
VOLTAGE 40 Volt **POWER** 225 mWatt

FEATURES

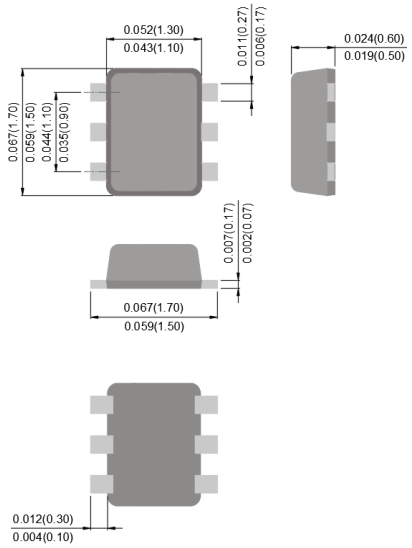
- NPN epitaxial silicon, planar design
- Collector-emitter voltage VCE = 40V
- Collector current IC = 200mA
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

MECHANICAL DATA

- Case : SOT-563, Plastic
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0026 grams.
- Marking : TX



SOT-563 Dimension Unit: inch(mm)



ABSOLUTE RATINGS

Parameter	Symbol	Value	Units
Collector - Emitter Voltage	V_{CEO}	40	V
Collector - Base Voltage	V_{CBO}	60	V
Emitter - Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous	I_C	200	mA

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Units
Max Power Dissipation (Note 1)	P_{TOT}	225	mW
Thermal Resistance , Junction to Ambient	$R_{\theta JA}$	625	^{O}C/W
Junction Temperature	T_J	-55 to 150	^{O}C
Storage Temperature	T_{STG}	-55 to 150	^{O}C

Note 1: Transistor mounted on FR-5 board 1.0 x 0.75 x 0.062 in.

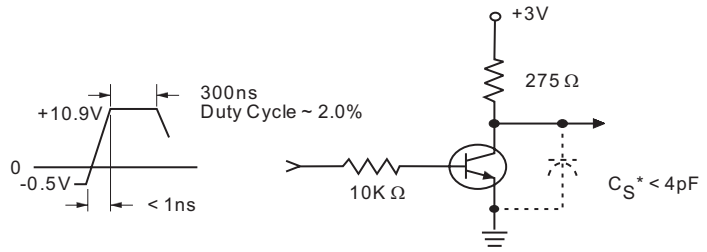
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ELECTRICAL CHARACTERISTICS

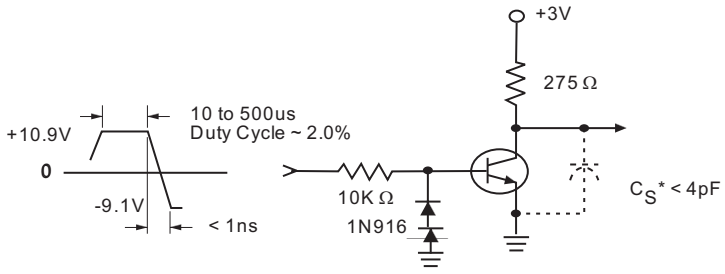
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Collector - Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=1.0mA, I_B=0	40	-	-	V
Collector - Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=10uA, I_E=0	60	-	-	V
Emitter - Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=10uA, I_C=0	6.0	-	-	V
Base Cutoff Current	I_{BI}	V_{CE}=30V, V_{EB}=3.0V	-	-	50	nA
Collector Cutoff Current	I_{CEX}	V_{CE}=30V, V_{EB}=3.0V	-	-	50	nA
DC Current Gain (Note 2)	h_{FE}	I_C=0.1mA, V_{CE}=1.0V I_C=1.0mA, V_{CE}=1.0V I_C=10mA, V_{CE}=1.0V I_C=50mA, V_{CE}=1.0V I_C=100mA, V_{CE}=1.0V	40 70 100 60 30	- - - - -	- - 300 - -	-
Collector - Emitter Saturation Voltage (Note 2)	$V_{CE(SAT)}$	I_C=10mA, I_B=1.0mA I_C=50mA, I_B=5.0mA	-	-	0.2 0.3	V
Base - Emitter Saturation Voltage (Note 2)	$V_{BE(SAT)}$	I_C=10mA, I_B=1.0mA I_C=50mA, I_B=5.0mA	0.65 -	- -	0.85 0.95	V
Collector - Base Capacitance	C_{CBO}	V_{CB}=5V, I_E=0, f=1MHz	-	-	4.0	pF
Emitter - Base Capacitance	C_{EBO}	V_{CB}=0.5V, I_C=0, f=1MHz	-	-	8.0	pF
Delay Time	td	V_{CC}=3V,V_{BE}=0.5V, I_C=10mA,I_B=1.0mA	-	-	35	ns
Rise Time	tr	V_{CC}=3V,V_{BE}=0.5V, I_C=10mA,I_B=1.0mA	-	-	35	ns
Storage Time	ts	V_{CC}=3V,I_C=10mA I_B1=I_B2=1.0mA	-	-	200	ns
Fall Time	tf	V_{CC}=3V,I_C=10mA I_B1=I_B2=1.0mA	-	-	50	ns

Note 2: Pulse Test: Pulse Width < 300 us, Duty Cycle < 2.0%.

SWITCHING TIME EQUIVALENT TEST CIRCUITS



Delay and Rise Time Equivalent Test Circuit



Storage and Fall Time Equivalent Test Circuit

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ELECTRICAL CHARACTERISTICS CURVE

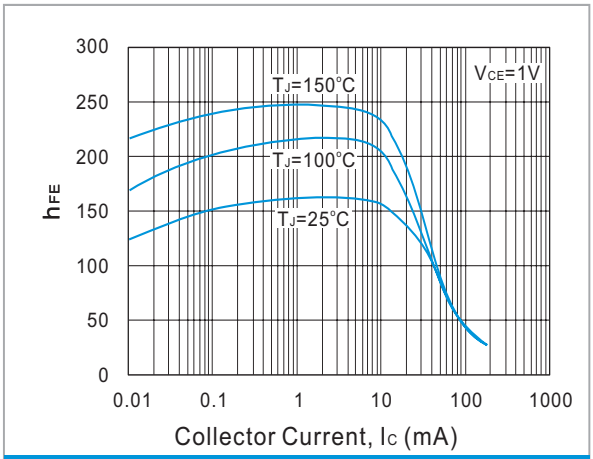


Fig. 1. Typical h_{FE} vs. Collector Current

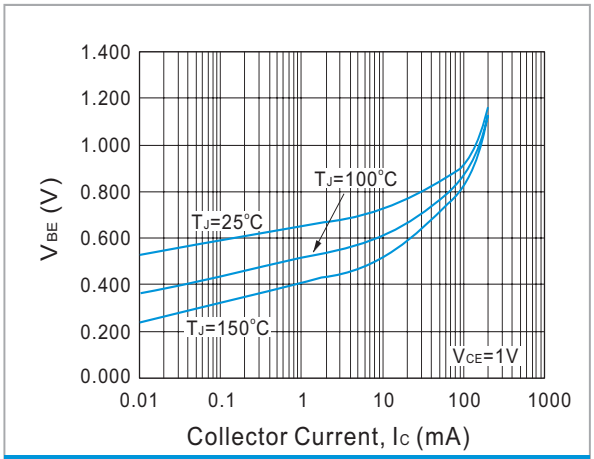


Fig. 2. Typical VBE vs. Collector Current

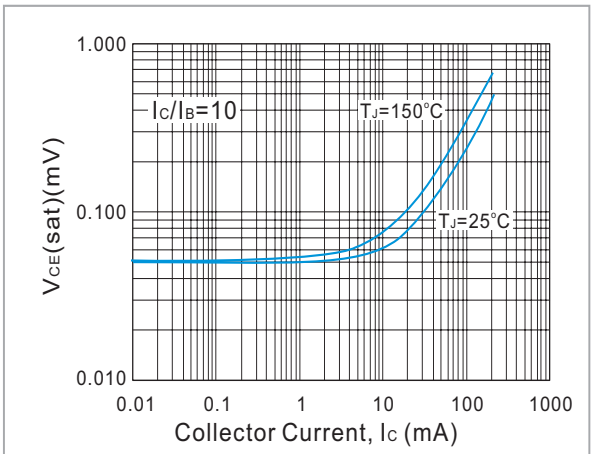


Fig. 3. Typical $V_{CE\,(sat)}$ vs. Collector Current

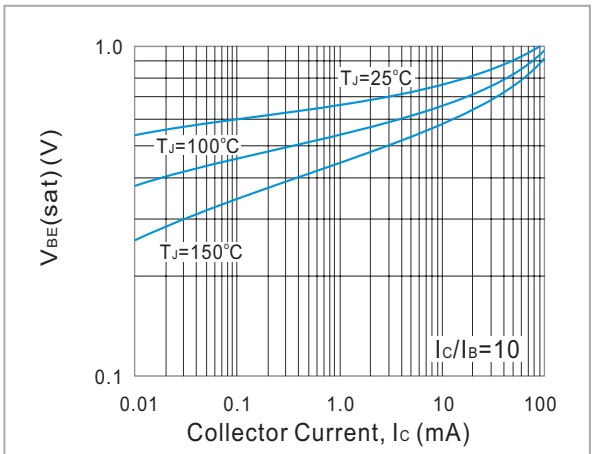


Fig. 4. Typical $V_{BE(sat)}$ vs Collector Current

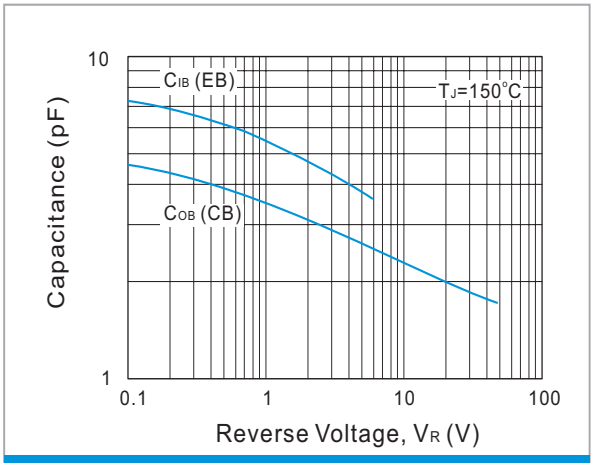


Fig. 5. Typical Capacitances vs. Reverse Voltage

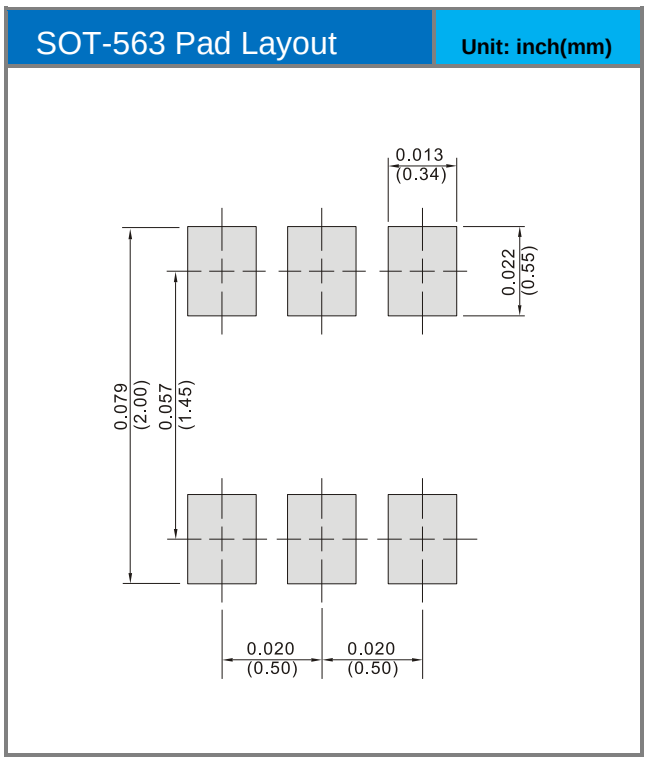
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Product and Packing Information

Part No.	Package Type	Packing Type	Marking
MMDT2222ATB6-AU	SOT-563	4K pcs / 7” reel	TU
MMDT2222ATB6-AU	SOT-563	10K pcs / 13” reel	TU
MMDT2222ATB6-AU	SOT-563	8K pcs / 7” reel	TU
MMDT2222ATB6-AU	SOT-563	20K pcs / 13” reel	TU

Mounting Pad Layout

SOT-563 Pad Layout Unit: inch(mm)



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