



# MMDT4401

## DUAL NPN GENERAL PURPOSE SWITCHING TRANSISTOR

**VOLTAGE** 40 Volt **POWER** 225 mWatt

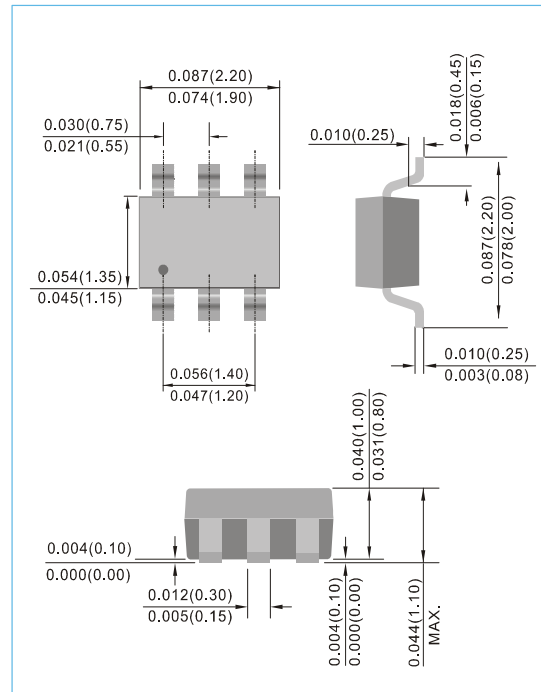
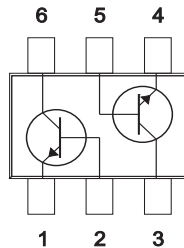
**SOT-363** Unit : inch(mm)

### FEATURES

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

### MECHANICAL DATA

- Case: SOT-363, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0002 ounces, 0.006 grams
- Marking: M4A



### ABSOLUTE RATINGS ( $T_A=25^\circ C$ unless otherwise noted)

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	$I_C$	600	mA

### THERMAL CHARACTERISTICS ( $T_A=25^\circ C$ unless otherwise noted)

PARAMETER	Symbol	Value	Units
Max Power Dissipation (Note1)	$P_{TOT}$	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	625	$^\circ C/W$
Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$

Note 1: Transistor mounted on FR-4 board 1.0X0.85X0.062 in.



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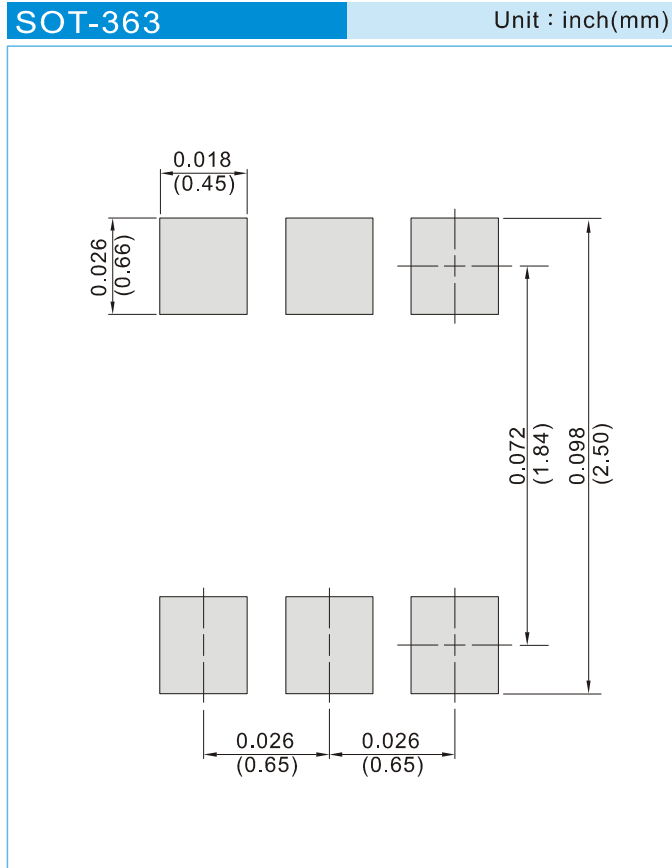
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	Symbol	Test Condition	MIN.	TYP.	MAX.	Units
Collector - Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =1.0mA, I <sub>B</sub> =0	40	-	-	V
Collector - Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =100μA, I <sub>E</sub> =0	60	-	-	V
Emitter - Base Breakdown Voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =100μA, I <sub>C</sub> =0	6.0	-	-	V
Base Cutoff Current	I <sub>BL</sub>	V <sub>CE</sub> =35V, V <sub>EB</sub> =0.4V	-	-	100	nA
Collector Cutoff Current	I <sub>CEX</sub>	V <sub>CE</sub> =35V, V <sub>EB</sub> =0.4V	-	-	100	nA
DC Current Gain (Note 2)	h <sub>FE</sub>	I <sub>C</sub> =0.1mA, V <sub>CE</sub> =1.0V	20	-	-	-
		I <sub>C</sub> =1.0mA, V <sub>CE</sub> =1.0V	40	-	-	
		I <sub>C</sub> =10mA, V <sub>CE</sub> =1.0V	80	-	-	
		I <sub>C</sub> =150mA, V <sub>CE</sub> =1.0V	100	-	300	
		I <sub>C</sub> =500mA, V <sub>CE</sub> =2.0V	40	-	-	
Collector - Emitter Saturation Voltage (Note 2)	V <sub>CE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA I <sub>C</sub> =500mA, I <sub>B</sub> =50mA	-	-	0.40 0.75	V
Base - Emitter Saturation Voltage (Note 2)	V <sub>BE(SAT)</sub>	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA I <sub>C</sub> =500mA, I <sub>B</sub> =50mA	0.75 -	- -	0.95 1.20	V
Collector - Base Capacitance	C <sub>CBO</sub>	V <sub>CB</sub> =5V, I <sub>E</sub> =0, f=1MHz	-	-	6.5	pF
Emitter - Base Capacitance	C <sub>EBO</sub>	V <sub>CB</sub> =0.5V, I <sub>C</sub> =0, f=1MHz	-	-	30	pF
Current Gain - Bandwidth Product	F <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =20mA, f=100MHz	250	-	-	MHz
Delay Time	t <sub>d</sub>	V <sub>CC</sub> =30V, V <sub>BE</sub> =2.0V, I <sub>C</sub> =150mA, I <sub>B1</sub> =15mA	-	-	15	ns
Rise Time	t <sub>r</sub>	V <sub>CC</sub> =30V, V <sub>BE</sub> =2.0V, I <sub>C</sub> =150mA, I <sub>B1</sub> =15mA	-	-	20	ns
Storage Time	t <sub>s</sub>	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA I <sub>B1</sub> =I <sub>B2</sub> =15mA	-	-	225	ns
Fall Time	t <sub>f</sub>	V <sub>CC</sub> =30V, I <sub>C</sub> =150mA I <sub>B1</sub> =I <sub>B2</sub> =15mA	-	-	30	ns



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## MOUNTING PAD LAYOUT



## ORDER INFORMATION

- Packing information  
T/R - 10K per 13" plastic Reel  
T/R - 3K per 7" plastic Reel



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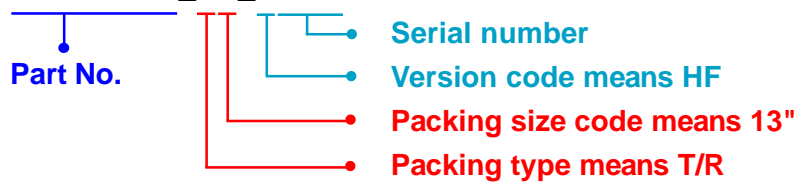
## Part No\_packing code\_Version

MMDT4401\_R1\_00001

MMDT4401\_R2\_00001

For example :

**RB500V-40** **R2** **00001**



Packing Code <b>XX</b>				Version Code <b>XXXXX</b>		
Packing type	1 <sup>st</sup> Code	Packing size code	2 <sup>nd</sup> Code	HF or RoHS	1 <sup>st</sup> Code	2 <sup>nd</sup> ~5 <sup>th</sup> 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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