



# MMDT4403

## DUAL PNP GENERAL PURPOSE SWITCHING TRANSISTOR

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

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

### FEATURES

- PNP 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: M3A

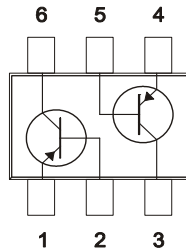
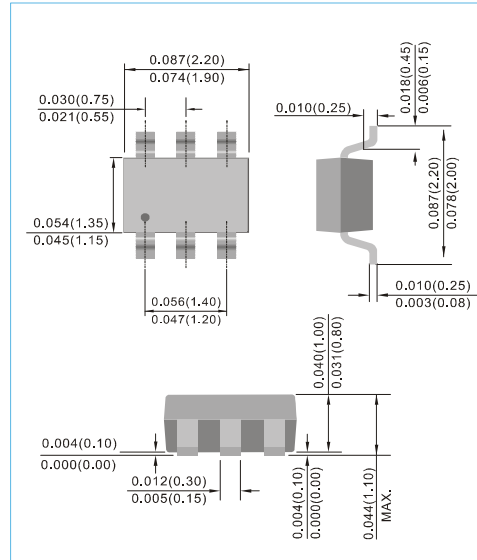


Fig.53



### 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    | 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 70 x 60 x 1mm.



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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  | -40       | -      | -              | V     |
| Emitter - Base Breakdown Voltage                | V <sub>(BR)EBO</sub> | I <sub>E</sub> =-100μA, I <sub>C</sub> =0  | -5.0      | -      | -              | 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   | 30        | -      | -              | -     |
|   |                      | I <sub>C</sub> =-1.0mA, V <sub>CE</sub> =-1.0V   | 60        | -      | -              |       |
|   |                      | I <sub>C</sub> =-10mA, V <sub>CE</sub> =-1.0V  | 100       | -      | -              |       |
|   |                      | I <sub>C</sub> =-150mA, V <sub>CE</sub> =-2.0V   | 100       | -      | 300            |       |
|   |                      | I <sub>C</sub> =-500mA, V <sub>CE</sub> =-2.0V   | 20        | -      | -              |       |
| Collector - Emitter Saturation Voltage (Note 2) | V <sub>CE(SAT)</sub> | I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA<br>I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA   | -         | -      | -0.40<br>-0.75 | V     |
| Base - Emitter Saturation Voltage (Note 2)      | V <sub>BE(SAT)</sub> | I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA<br>I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA   | 0.75<br>- | -<br>- | -0.95<br>-1.30 | 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   | 200       | -      | -              | MHz   |
| Delay Time                                      | t <sub>d</sub>       | V <sub>CC</sub> =-30V, V <sub>BE</sub> =-2.0V,<br>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,<br>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<br>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<br>I <sub>B1</sub> =I <sub>B2</sub> =-15mA         | -         | -      | 30             | ns    |

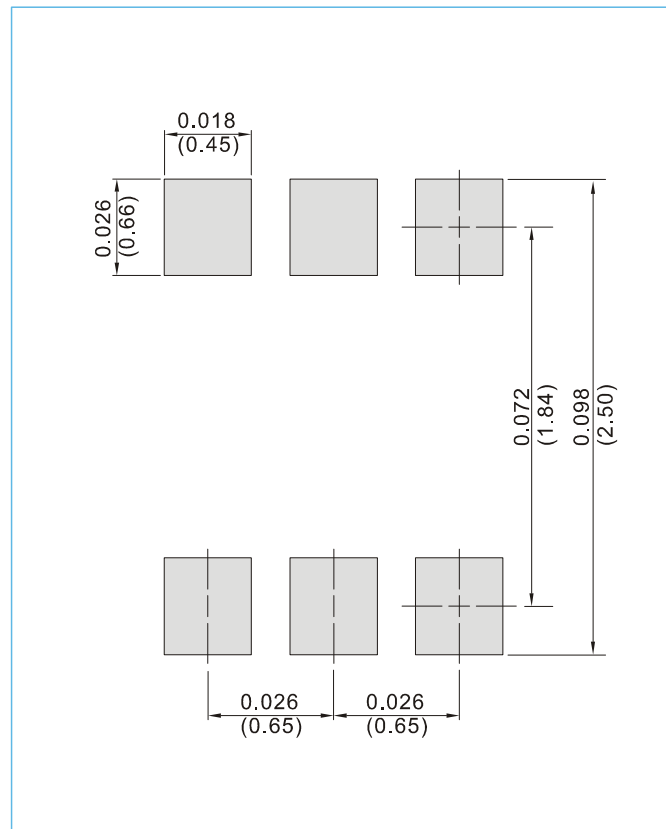


# MMDT4403

## MOUNTING PAD LAYOUT

SOT-363

Unit : inch(mm)



## ORDER INFORMATION

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



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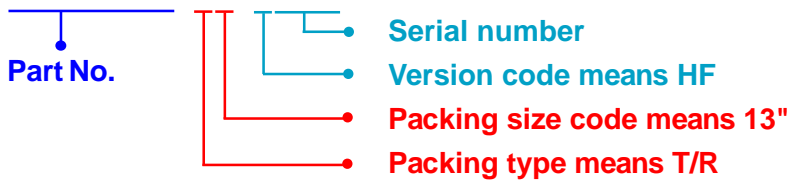
## Part No\_packing code\_Version

MMDT4403\_R1\_00001

MMDT4403\_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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