

# MMDT2222ATB6-AU

## Dual Surface Mount NPN Transistors

**Voltage**

**40V**

**Current**

**600mA**

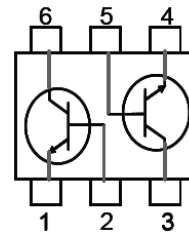
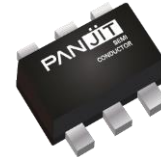
### Features

- Electrically Isolated Dual NPN Switching Transistor
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 Standard

### Mechanical Data

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

SOT-563



## Maximum Ratings and Thermal Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

| PARAMETER   | SYMBOL           | LIMIT   | UNITS |
|---|------------------|---------|-------|
| Collector-Base Voltage                                      | V <sub>CBO</sub> | 75      | V     |
| Collector-Emitter Voltage                                   | V <sub>CEO</sub> | 40      | V     |
| Emitter-Base Voltage  | V <sub>EBO</sub> | 6       | V     |
| Collector Current   | I <sub>c</sub>   | 600     | mA    |
| Total Power Dissipation <sup>(Note 1)</sup>                 | P <sub>D</sub>   | 200     | mW    |
| Operating Junction Temperature Range                        | T <sub>J</sub>   | -55~150 | °C    |
| Storage Temperature Range                                   | T <sub>STG</sub> | -55~150 | °C    |
| THERMAL CHARACTERISTICS                                     |                  |         |       |
| Thermal Resistance, Junction to Ambient <sup>(Note 1)</sup> | R <sub>θJA</sub> | 625     | °C/W  |

NOTE : 1.FR-4 board 70 x 60 x 1mm with minimum recommended pad layout.

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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> = 10mA  | 45   | -    | -    | V     |
| Collector-Base Breakdown Voltage                         | V <sub>(BR)CBO</sub> | I <sub>C</sub> = 10uA  | 75   | -    | -    | V     |
| Emitter-Base Breakdown Voltage                           | V <sub>(BR)EBO</sub> | I <sub>E</sub> = 10uA  | 6    | -    | -    | V     |
| Collector Cutoff Current                                 | I <sub>CEX</sub>     | V <sub>CE</sub> = 60V, V <sub>EB</sub> = 3V                            | -    | -    | 10   | nA    |
| Base Cutoff Current                                      | I <sub>BL</sub>      | V <sub>CE</sub> = 60V, V <sub>EB</sub> = 3V                            | -    | -    | 20   | nA    |
| DC Current Gain <sup>(Note 2)</sup>                      | h <sub>FE</sub>      | I <sub>C</sub> = 0.1mA, V <sub>CE</sub> = 10V                          | 35   | -    | -    | -     |
|  |                      | I <sub>C</sub> = 1mA, V <sub>CE</sub> = 10V                            | 50   | -    | -    |       |
|  |                      | I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V                           | 75   | -    | -    |       |
|  |                      | I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V<br>T <sub>J</sub> =-55 °C | 50   | -    | -    |       |
|  |                      | I <sub>C</sub> = 150mA, V <sub>CE</sub> = 10V                          | 100  | -    | 300  |       |
|  |                      | I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V                          | 40   | -    | -    |       |
|  |                      | I <sub>C</sub> = 150mA, V <sub>CE</sub> = 1V                           | 35   | -    | -    |       |
| Collector-Emitter Saturation Voltage <sup>(Note 2)</sup> | V <sub>CE(SAT)</sub> | I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA                          | -    | -    | 0.3  | V     |
|  |                      | I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA                          | -    | -    | 1    |       |
| Base-Emitter Saturation Voltage <sup>(Note 2)</sup>      | V <sub>BE(SAT)</sub> | I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA                          | 0.6  | -    | 1.2  | V     |
|  |                      | I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA                          | -    | -    | 2    |       |
| Transition Frequency                                     | f <sub>T</sub>       | V <sub>CE</sub> = 20V, I <sub>C</sub> = 20mA<br>f = 100MHz             | 300  | -    | -    | MHz   |
| Collector-Base Capacitance                               | C <sub>CBO</sub>     | V <sub>CB</sub> = 10V, f=1MHz  | -    | -    | 8    | pF    |
| Emitter-Base Capacitance                                 | C <sub>EBO</sub>     | V <sub>EB</sub> = 0.5V, f=1MHz   | -    | -    | 25   | pF    |
| Delay Time   | t <sub>d</sub>       | V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA                          | -    | -    | 10   | ns    |
| Rise Time  | t <sub>r</sub>       | V <sub>BE(off)</sub> = -0.5V<br>I <sub>B1</sub> = 15mA                 | -    | -    | 25   |       |
| Storage Time   | t <sub>s</sub>       | V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA                          | -    | -    | 225  | ns    |
| Fall Time  | t <sub>f</sub>       | I <sub>B1</sub> = I <sub>B2</sub> = 15mA                               | -    | -    | 60   |       |

NOTE : 2. Short duration test pulse used to minimize self-heating

# MMDT2222ATB6-AU

## TYPICAL CHARACTERISTIC CURVES

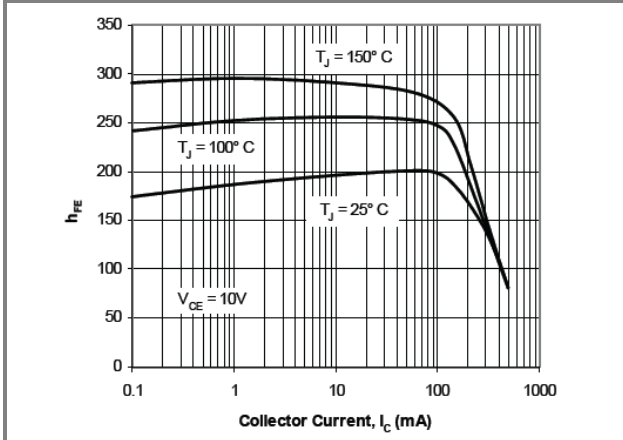


Fig.1 hFE vs. Ic

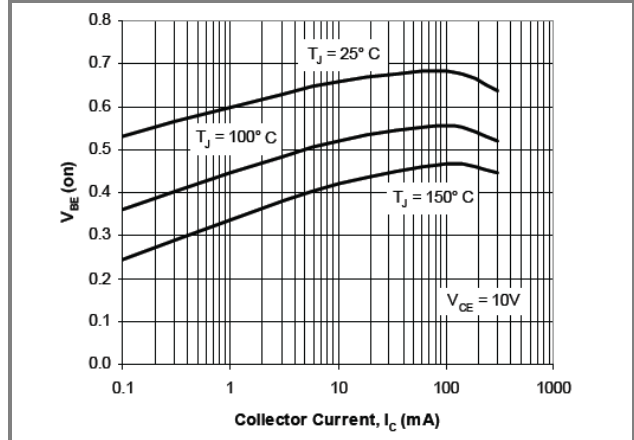


Fig.2 VBE vs. Ic

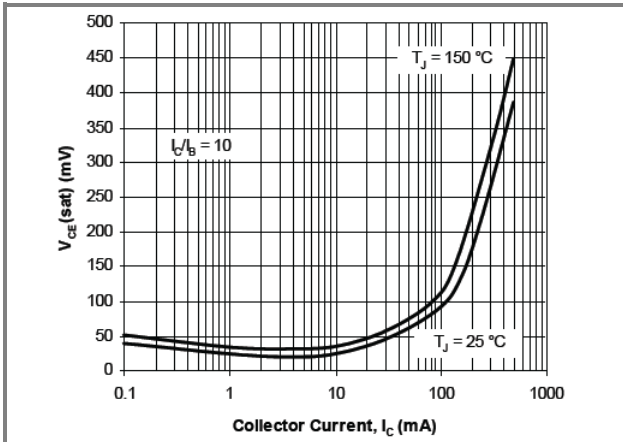


Fig.3 VCE(sat) vs. Ic

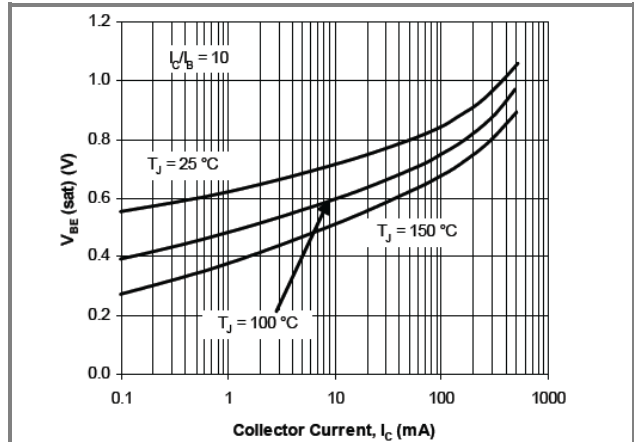


Fig.4 VBE(sat) vs. Ic

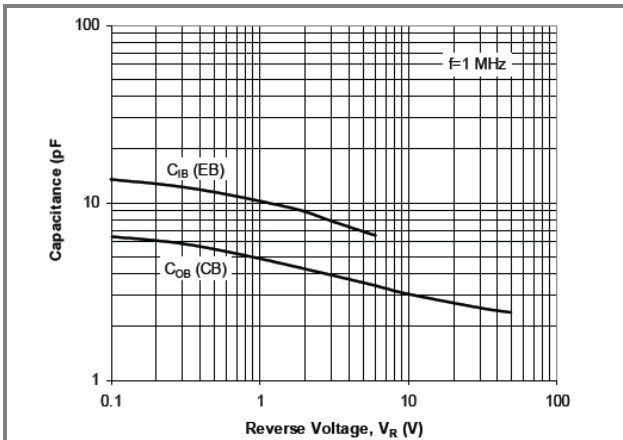


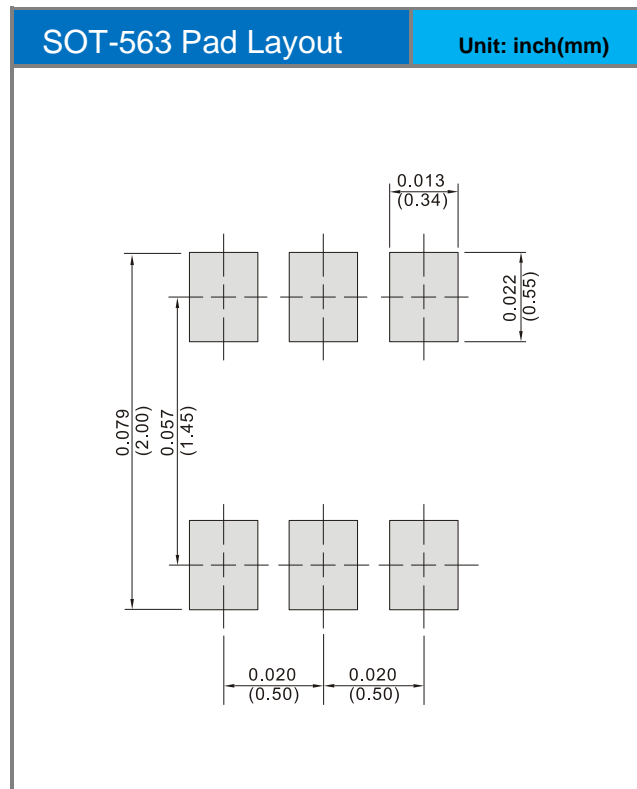
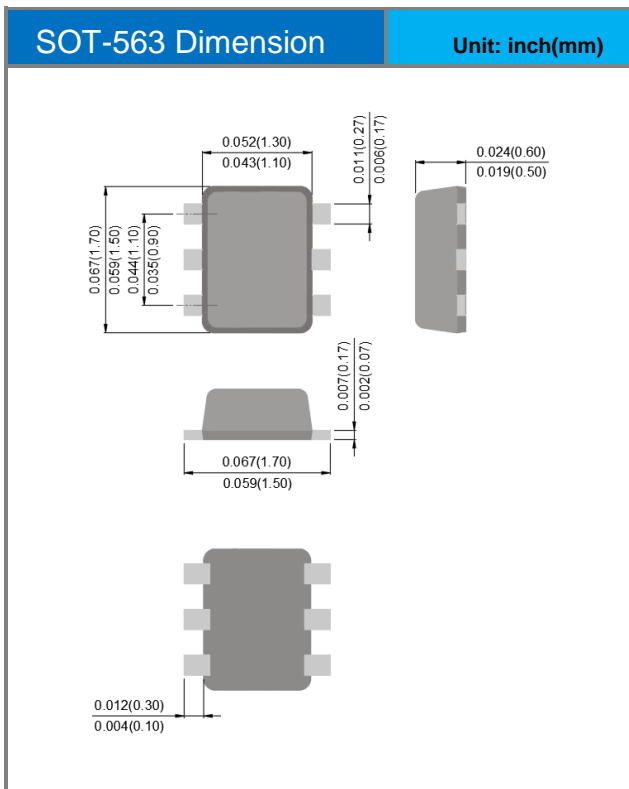
Fig.5 Capacitances

# MMDT2222ATB6-AU

## Product and Packing Information

| Part No.        | Package Type | Packing Type     | Marking |
|-----------------|--------------|------------------|---------|
| MMDT2222ATB6-AU | SOT-563      | 4K pcs / 7" reel | TU      |

## Packaging Information & Mounting Pad Layout



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