



# THE DATASHEET OF MMBTA56-AU\_R1\_000A1



# MMBTA05-AU / MMBTA06-AU / MMBTA55-AU / MMBTA56-AU

## NPN AND PNP HIGH VOLTAGE TRANSISTOR

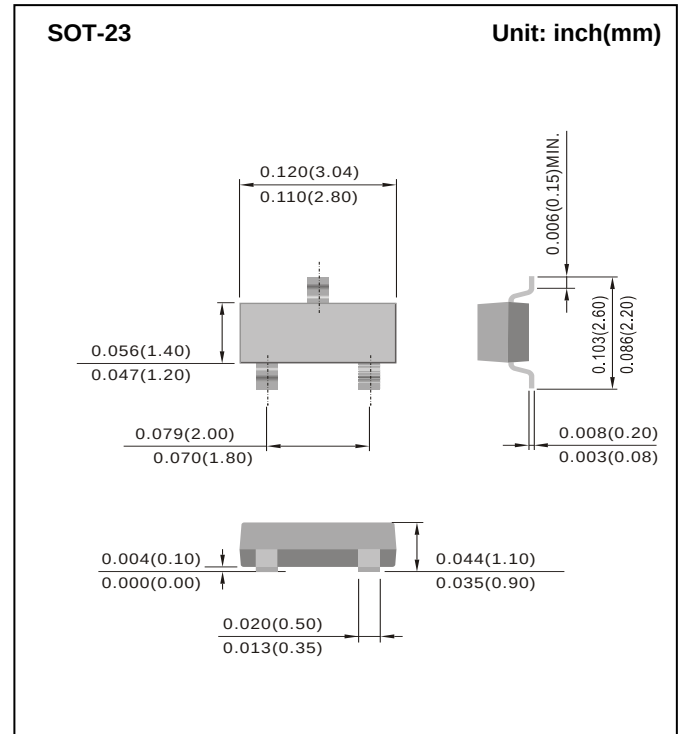
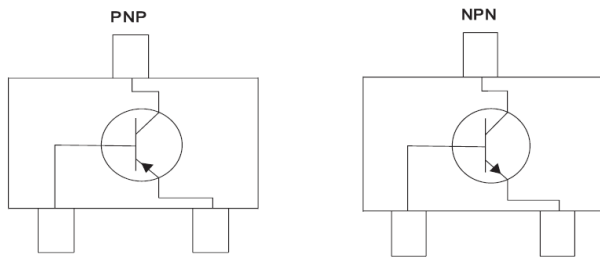
|                |               |              |              |
|----------------|---------------|--------------|--------------|
| <b>Voltage</b> | <b>60~80V</b> | <b>Power</b> | <b>225mW</b> |
|----------------|---------------|--------------|--------------|

### Features

- NPN and PNP silicon, planar design
- Collector current  $I_C = 500\text{mA}$
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams



## Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER                    | SYMBOL           | MMBTA05-AU | MMBTA55-AU | MMBTA06-AU | MMBTA56-AU | UNITS |
|------------------------------|------------------|------------|------------|------------|------------|-------|
| Marking                      |                  | B05        | B55        | B06        | B56        |       |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | 60         |            | 80         |            | V     |
| Collector-Base Voltage       | V <sub>CBO</sub> | 60         |            | 80         |            | V     |
| Emitter-Base Voltage         | V <sub>EBO</sub> | 4          |            |            |            | V     |
| Collector Current-Continuous | I <sub>C</sub>   | 500        |            |            |            | mA    |
| Circuit Figure               |                  | NPN        | PNP        | NPN        | PNP        |       |

## Maximum Ratings and Thermal Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| CHARACTERISTIC                                                             | SYMBOL          | MAX.       | UNITS                |
|----------------------------------------------------------------------------|-----------------|------------|----------------------|
| Total device dissipation FR-4 board (Note 1) $T_A=25^\circ\text{C}$        | $P_D$           | 225        | mW                   |
| derate above $25^\circ\text{C}$                                            |                 | 1.8        | mW/ $^\circ\text{C}$ |
| Typical thermal resistance                                                 | $R_{\theta JA}$ | 556        | $^\circ\text{C/W}$   |
| Total device dissipation alumina substrate (Note 2) $T_A=25^\circ\text{C}$ | $P_D$           | 300        | mW                   |
| derate above $25^\circ\text{C}$                                            |                 | 2.4        | mW/ $^\circ\text{C}$ |
| Typical thermal resistance                                                 | $R_{\theta JA}$ | 417        | $^\circ\text{C/W}$   |
| Operating junction and storage temperature range                           | $T_J, T_{STG}$  | -55 to 150 | $^\circ\text{C}$     |

Note : 1. FR-4=70 x 60 x 1mm.

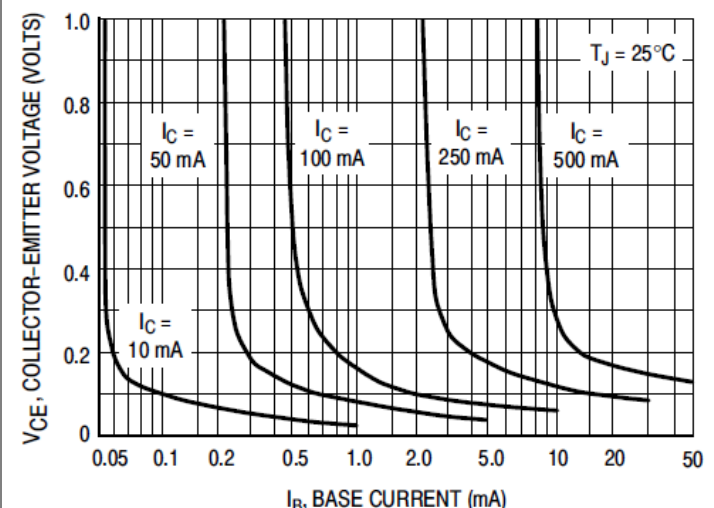
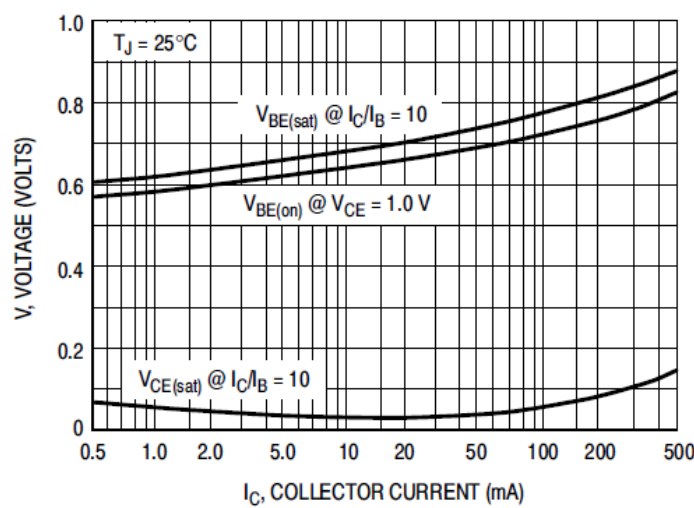
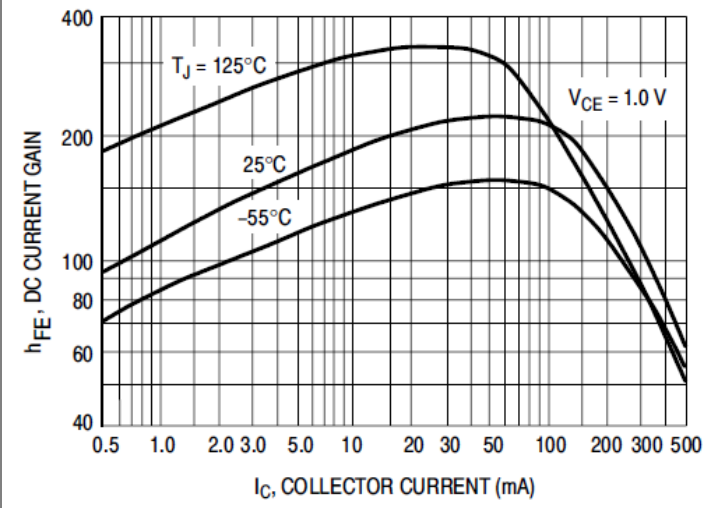
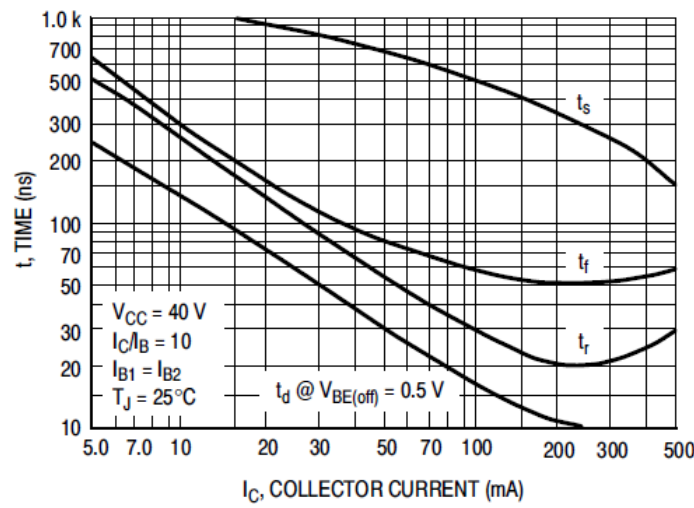
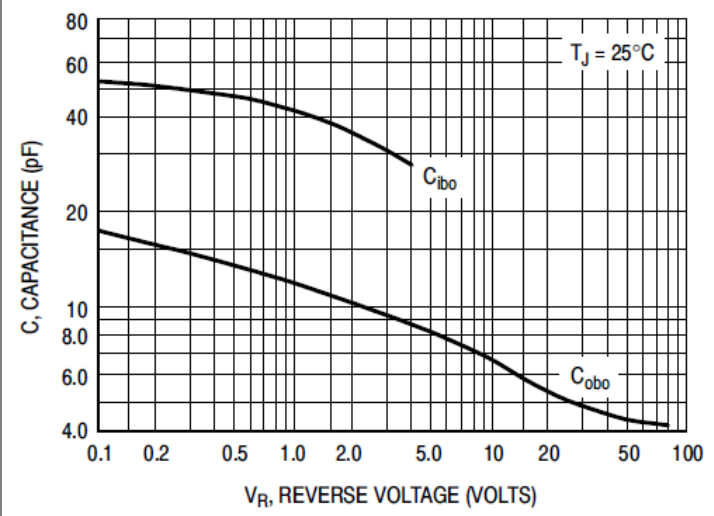
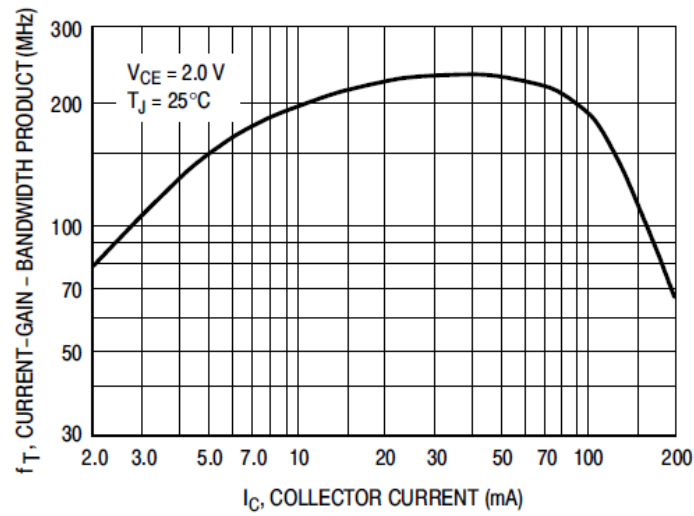
2. Alumina=0.4 x 0.3 x 0.024 in. 99.5 alumina.

## MMBTA05-AU / MMBTA06-AU / MMBTA55-AU / MMBTA56-AU

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

| PARAMETER                                                                               | SYMBOL               | MIN. | MAX. | UNITS |
|-----------------------------------------------------------------------------------------|----------------------|------|------|-------|
| OFF Characteristics                                                                     |                      |      |      |       |
| Collector-Emitter Breakdown Voltage<br>(I <sub>C</sub> =1.0mA, I <sub>B</sub> =0)       | V <sub>(BR)CEO</sub> | 60   | -    | V     |
| MMBTA05-AU, MMBTA55-AU<br>MMBAT06-AU, MMBTA56-AU                                        |                      | 80   | -    |       |
| Emitter-Base Breakdown Voltage<br>(I <sub>E</sub> =100μA, I <sub>C</sub> =0)            | V <sub>(BR)EBO</sub> | 4    | -    | V     |
| Collector Cutoff Current<br>(V <sub>CE</sub> =60V, I <sub>B</sub> =0)                   | I <sub>CES</sub>     | -    | 0.1  | μA    |
| Collector Cutoff Current<br>(V <sub>CB</sub> =60V, I <sub>E</sub> =0)                   | I <sub>CBO</sub>     | -    | 0.1  | μA    |
| MMBTA05-AU, MMBTA55-AU<br>MMBAT06-AU, MMBTA56-AU                                        |                      | -    | 0.1  |       |
| ON characteristics                                                                      |                      |      |      |       |
| DC Current Gain<br>(I <sub>C</sub> =10mA, V <sub>CE</sub> =1V)                          | h <sub>FE</sub>      | 100  | -    | -     |
| (I <sub>C</sub> =100mA, V <sub>CE</sub> =1V)                                            |                      | 100  | -    |       |
| Collector-Emitter Saturation Voltage<br>(I <sub>C</sub> =100mA, I <sub>B</sub> =10mA)   | V <sub>CE(SAT)</sub> | -    | 0.25 | V     |
| Base-Emitter On Voltage<br>(I <sub>C</sub> =100mA, V <sub>CE</sub> =1V)                 | V <sub>BE(ON)</sub>  | -    | 1.2  | V     |
| Small-signal characteristics                                                            |                      |      |      |       |
| Current-Gain-Bandwidth Product<br>(I <sub>C</sub> =10mA, V <sub>CE</sub> =2V, f=100MHz) | f <sub>T</sub>       | 100  | -    | MHz   |

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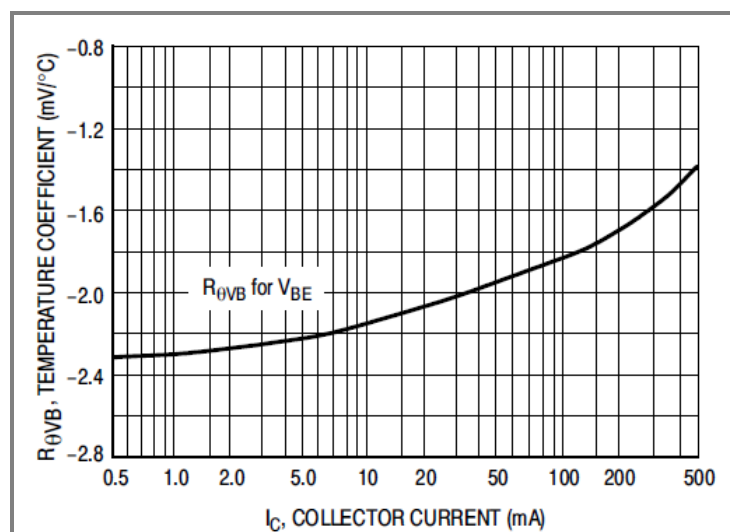


Fig.7 Base-Emitter Temperature Coefficient

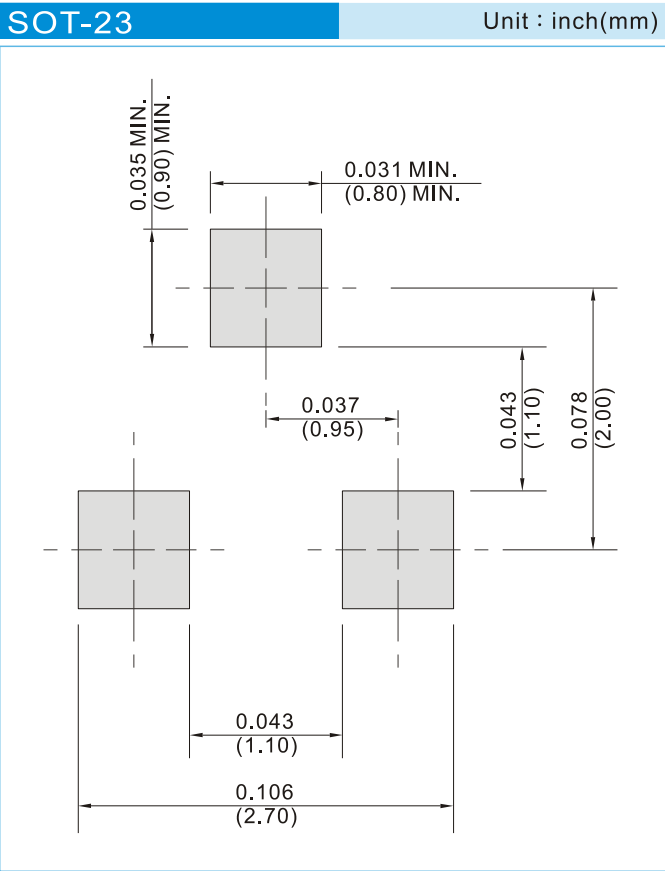


MMBTA05-AU / MMBTA06-AU / MMBTA55-AU / MMBTA56-AU

Part No. Packing Code Version

| Part No. Packing Code | Package Type | Packing Type   | Marking | Version                        |
|-----------------------|--------------|----------------|---------|--------------------------------|
| MMBTA05-AU_R1_000A1   | SOT-23       | 3K / 7" Reel   | B05     | Halogen free<br>RoHS compliant |
| MMBTA05-AU_R2_000A1   | SOT-23       | 12K / 13" Reel | B05     | Halogen free<br>RoHS compliant |

Mounting Pad Layout





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