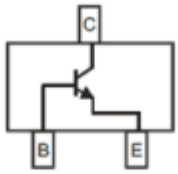
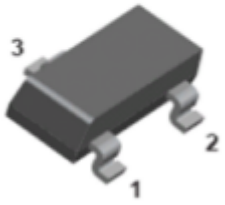
# MMBTA44

## NPN Transistor




SOT-23

### Features

- Moisture sensitivity level 1
- Halogen free and RoHS compliant
- Surface mount package ideally suited for automatic insertion

### Application

- Signal amplification
- Switching circuit

### Mechanical data

- **Package**: SOT-23
- **Terminals**: Tin plated leads, solderable per J-STD-002 and JESD22-B102

■ **Maximum Ratings** ($T_a$=25℃ Unless otherwise specified)

| Item | Symbol | Unit | Conditions | Value |
|---|---|---|---|---|
| Device marking code | | | | 3D |
| Collector-base voltage | $V_{CBO}$ | V | $I_C$=100μA,$I_E$=0 | 400 |
| Collector-emitter voltage | $V_{CEO}$ | V | $I_C$ =1mA,$I_B$=0 | 400 |
| Emitter-base voltage | $V_{EBO}$ | V | $I_E$=10μA,$I_C$=0 | 6 |
| Collector current | $I_C$ | mA | | 200 |
| Power dissipation | $P_D$ | mW | | 350 |
| Junction temperature | $T_J$ | ℃ | | -55 to +150 |
| Storage temperature | $T_{STG}$ | ℃ | | -55 to +150 |

## ■ Electrical Characteristics (Ta=25℃ Unless otherwise specified)

| Item | Symbol | Unit | Conditions | Min | Typ | Max |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | V | $I_C$=100μA,$I_E$=0 | 400 | | |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | V | $I_C$ =1mA,$I_B$=0 | 400 | | |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | V | $I_E$=10μA,$I_C$=0 | 6 | | |
| Collector-base cut-off current | $I_{CBO}$ | nA | $V_{CB}$=400V | | | 100 |
| Emitter-base cut-off current | $I_{EBO}$ | nA | $V_{EB}$=4V | | | 100 |
| DC current gain | $h_{FE1}$ | | $V_{CE}$=10V,$I_C$=1mA | 40 | | |
| | $h_{FE2}$ | | $V_{CE}$=10V,$I_C$=10mA | 50 | | 200 |
| | $h_{FE3}$ | | $V_{CE}$=10V,$I_C$=50mA | 45 | | |
| | $h_{FE4}$ | | $V_{CE}$=10V,$I_C$=100mA | 40 | | |
| Collector-emitter saturation voltage | $V_{CE(sat)1}$ | V | $I_C$=10mA,$I_B$=1mA | | | 0.5 |
| | $V_{CE(sat)2}$ | V | $I_C$=50mA,$I_B$=5mA | | | 0.75 |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | V | $I_C$=10mA,$I_B$=1mA | | | 0.75 |

## ■ Thermal Characteristics

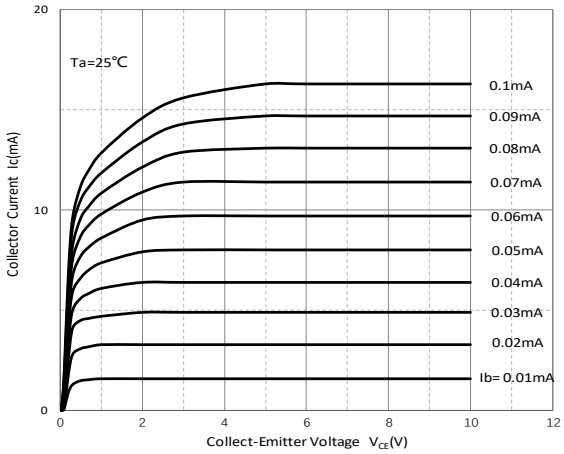
| Parameter | Symbol | Unit | Value |
|---|---|---|---|
| Thermal resistance, junction-to-ambient | $R_{\theta J-A}$(1) | ℃/W | 357 |
| Thermal resistance, junction-to-case | $R_{\theta J-C}$(1) | ℃/W | 286 |

Note:

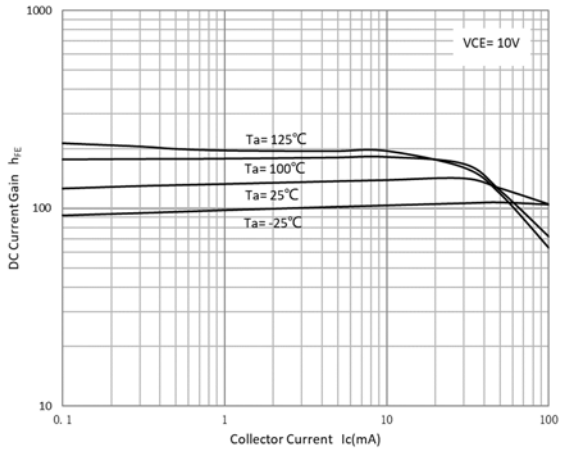
（1）Device mounted on PCB, single-sided copper，with standard footprint

## ■Characteristics

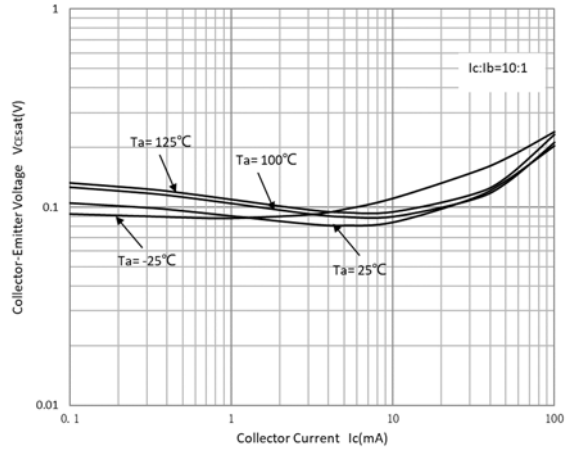
### Fig 1：Static Characteristics



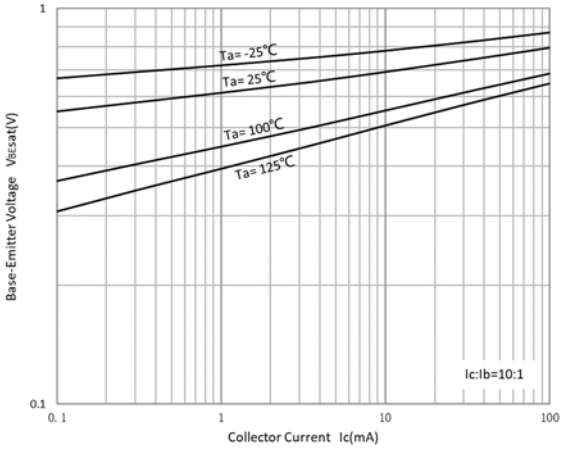

### Fig 2：DC Current Gain



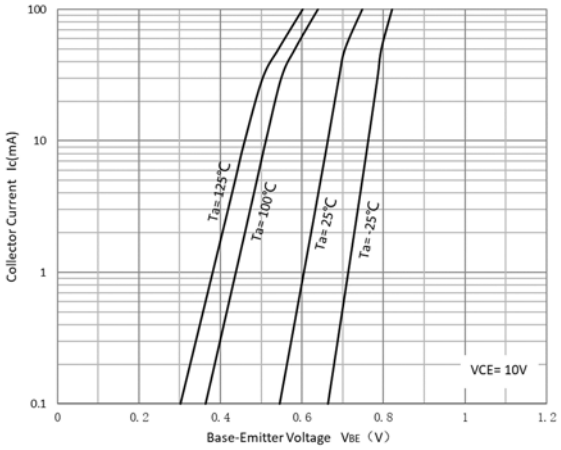

### Fig 3：Collector-Emitter Saturation Voltage




### Fig 4：Base-Emitter Saturation Voltage




### Fig 5：Base-Emitter On Voltage




### Fig 6：Cob/Cib-$V_{CB}$/$V_{EB}$

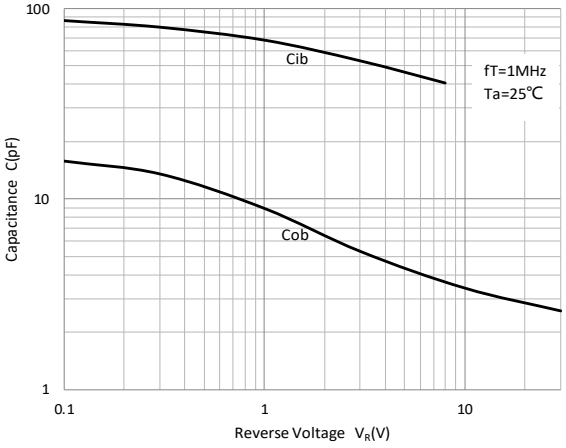
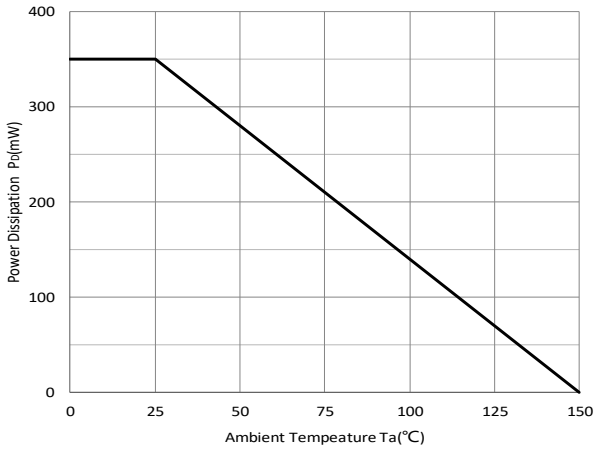


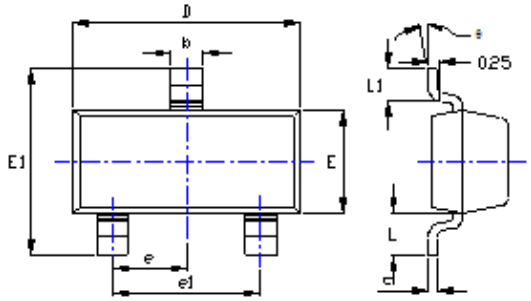
**Fig 7：$P_D$-Ta Curve**

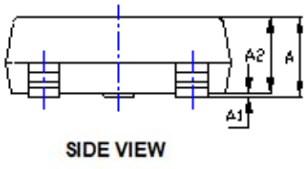



## ■Ordering Information

| Preferred P/N | Packing code | Unit weight(g) | Minimum package(pcs) | Inner box quantity(pcs) | Outer carton quantity(pcs) | Delivery mode |
|---|---|---|---|---|---|---|
| MMBTA44 | F2 | Approximate 0.008 | 3000 | 30000 | 120000 | 7” reel |
| MMBTA44 | F4 | Approximate 0.008 | 10000 | / | 210000 | 13” reel |

## ■ Outline Dimensions

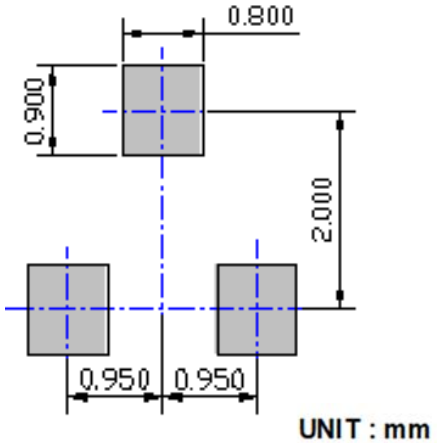



| DIMENSIONS | | | | |
|---|---|---|---|---|
| SYMBOL | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.035 | 0.045 | 0.900 | 1.150 |
| A1 | 0.000 | 0.004 | 0.000 | 0.100 |
| A2 | 0.035 | 0.041 | 0.900 | 1.050 |
| b | 0.012 | 0.020 | 0.300 | 0.500 |
| c | 0.004 | 0.008 | 0.100 | 0.200 |
| D | 0.110 | 0.118 | 2.800 | 3.000 |
| E | 0.047 | 0.055 | 1.200 | 1.400 |
| E1 | 0.089 | 0.100 | 2.250 | 2.550 |
| e | 0.037TYP | | 0.950TYP | |
| e1 | 0.071 | 0.079 | 1.800 | 2.000 |
| L | 0.022REF | | 0.550REF | |
| L1 | 0.012 | 0.020 | 0.300 | 0.500 |
| θ | 0° | 8° | 0° | 8° |

Note:
1. All dimensions are in millimeters (mm) unless otherwise specified.
[所有尺寸均以毫米为单位，除非另有说明]
2. General tolerances: ±0.10mm unless otherwise specified.
[通用公差为±0.10mm，除非另有说明]
3. Dimensions and tolerances per ASME Y14.5M-2018.
[尺寸和公差遵循 ASME Y14.5M-2018 标准]
4.All dimensions shown are exclusive of burrs and gate residues. Burrs and gate vestiges shall not exceed 0.15 mm in maximum.
[所有尺寸均不包括毛刺和浇口残留。毛刺与浇口残留的尺寸最大不得超过 0.15mm]
5.Dimension b does not include dambar protrusion of max 0.100 mm per side.
[尺寸b不包括单边最大0.100 MM的中筋凸出部分]
6.Dimensions D and E are the overall extreme outer dimensions of the mold compound. These dimensions exclude mold flash, lead flash, protrusions and burrs but include the maximum allowable mold mismatch.
[D和E是塑封体的外部极限尺寸，不包括包封溢料、内引线溢料、凸出部分以及胶体毛刺，但是包含了包封错位的最大尺寸]
7.Formed leads shall be planar with respect to one another within a maximum of 0.076 mm relative to the seating plane.
[成型的管脚应为同一平面，共面性最大为0.1mm]

## ■ Suggested Pad Layout



## Notice

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