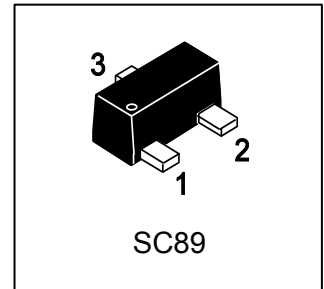


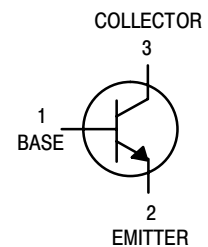
## 1. FEATURES

- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.



## 2. DEVICE MARKING AND RESISTOR VALUES

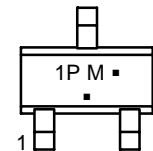
| Device       | Marking | Shipping        |
|--------------|---------|-----------------|
| MBT2222ATT1G | 1P      | 3000/Tape&Reel  |
| MBT2222ATT3G | 1P      | 10000/Tape&Reel |



## 3. MAXIMUM RATINGS(Ta = 25°C)

| Parameter                      | Symbol           | Limits | Unit |
|--------------------------------|------------------|--------|------|
| Collector–Emitter Voltage      | V <sub>CEO</sub> | 40     | V    |
| Collector–Base Voltage         | V <sub>CBO</sub> | 75     | V    |
| Emitter–Base Voltage           | V <sub>EBO</sub> | 6      | V    |
| Collector Current — Continuous | I <sub>C</sub>   | 600    | mA   |

### MARKING DIAGRAM



- 1P = Specific Device Code
- M = Date Code
- = Pb–Free Package

## 4. THERMAL CHARACTERISTICS

| Parameter   | Symbol                           | Limits   | Unit |
|---|----------------------------------|----------|------|
| Total Device Dissipation,<br>(Note 1) @ TA = 25°C | PD                               | 150      | mW   |
| Thermal Resistance,<br>Junction–to–Ambient        | R <sub>θJA</sub>                 | 833      | °C/W |
| Operating and Storage Junction Temperature Range  | T <sub>J</sub> ,T <sub>stg</sub> | -55~+150 | °C   |

1. Device mounted on FR4 glass epoxy printed circuit board using the minimum recommended footprint.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%.

## 5. ELECTRICAL CHARACTERISTICS (Ta= 25°C )

### OFF CHARACTERISTICS

| Characteristic   | Symbol   | Min. | Typ. | Max. | Unit |
|--|----------|------|------|------|------|
| Collector–Emitter Breakdown Voltage(Note 1)<br>(IC = 1.0 mA, IB = 0) | V(BR)CEO | 40   | -    | -    | V    |
| Collector–Base Breakdown Voltage<br>(IC = 10 μA, IE = 0)             | V(BR)CBO | 75   | -    | -    | V    |
| Emitter–Base Breakdown Voltage<br>(IE = 10 μA, IC = 0)               | V(BR)EBO | 6    | -    | -    | V    |
| Base Cutoff Current<br>(VCE = 60 V, VEB = 3.0 V)                     | IBL      | -    | -    | 20   | nA   |
| Collector Cutoff Current<br>(VCE = 60 V, VEB = 3.0 V)                | ICEX     | -    | -    | 100  | nA   |
| Collector Cutoff Current<br>(VCB = 60 V, IE = 0)                     | ICBO     | -    | -    | 100  | nA   |
| Emitter Cutoff Current<br>(VEB = 3.0 V, IC = 0)                      | IEBO     | -    | -    | 100  | nA   |

### ON CHARACTERISTICS

|   |          |                             |                       |                       |   |
|---|----------|-----------------------------|-----------------------|-----------------------|---|
| DC Current Gain<br>(IC = 0.1 mA, VCE = 10 V)<br>(IC = 1.0 mA, VCE = 10 V)<br>(IC = 10 mA, VCE = 10 V)<br>(IC = 150 mA, VCE = 10 V)<br>(IC = 500 mA, VCE = 10 V) | HFE      | 35<br>50<br>75<br>100<br>40 | -<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>- |   |
| Collector–Emitter Saturation Voltage<br>(IC = 150 mA, IB = 15 mA)<br>(IC = 500 mA, IB = 50 mA)  | VCE(sat) | -<br>-                      | -<br>-                | 0.3<br>1              | V |
| Base–Emitter Saturation Voltage<br>(IC = 150 mA, IB = 15 mA)<br>(IC = 500 mA, IB = 50 mA)   | VBE(sat) | 0.6<br>-                    | -<br>-                | 1.2<br>2              | V |

### SMALL–SIGNAL CHARACTERISTICS

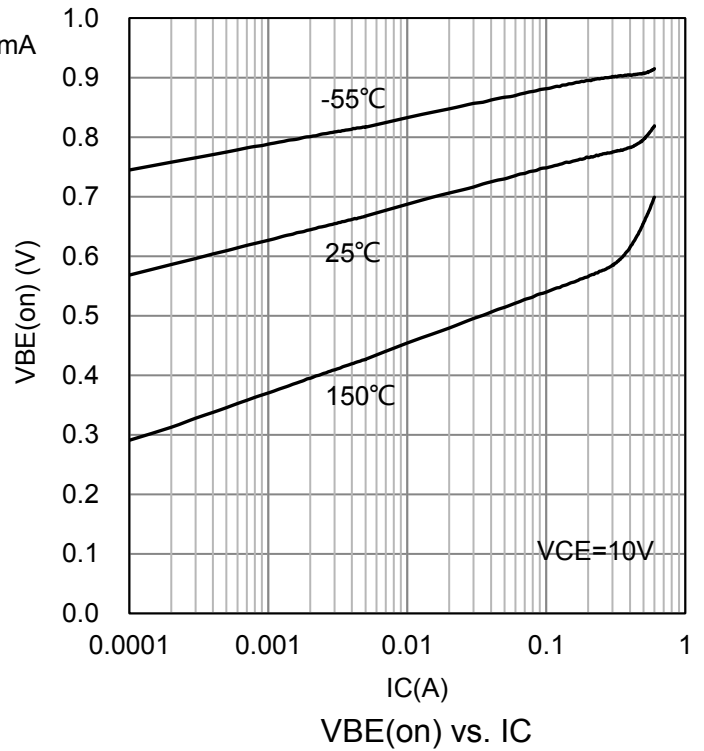
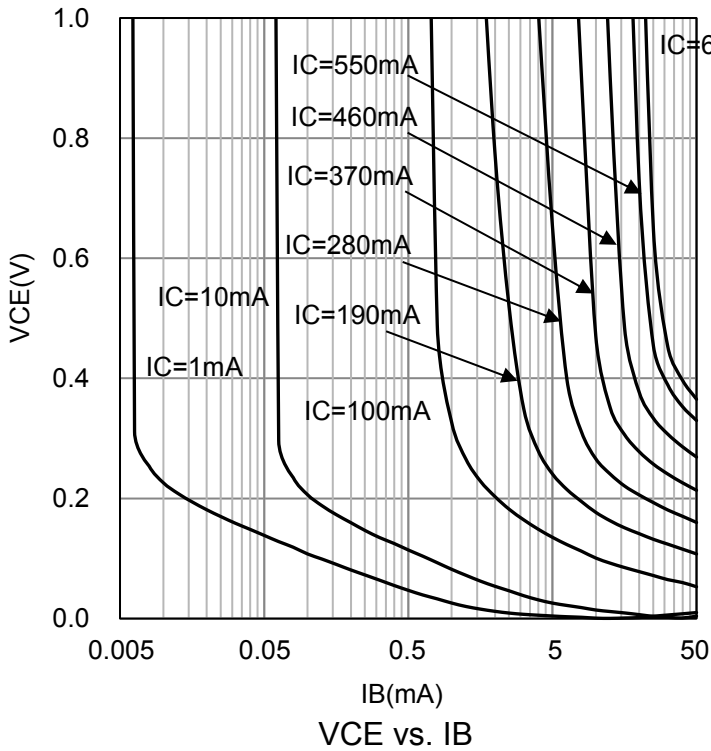
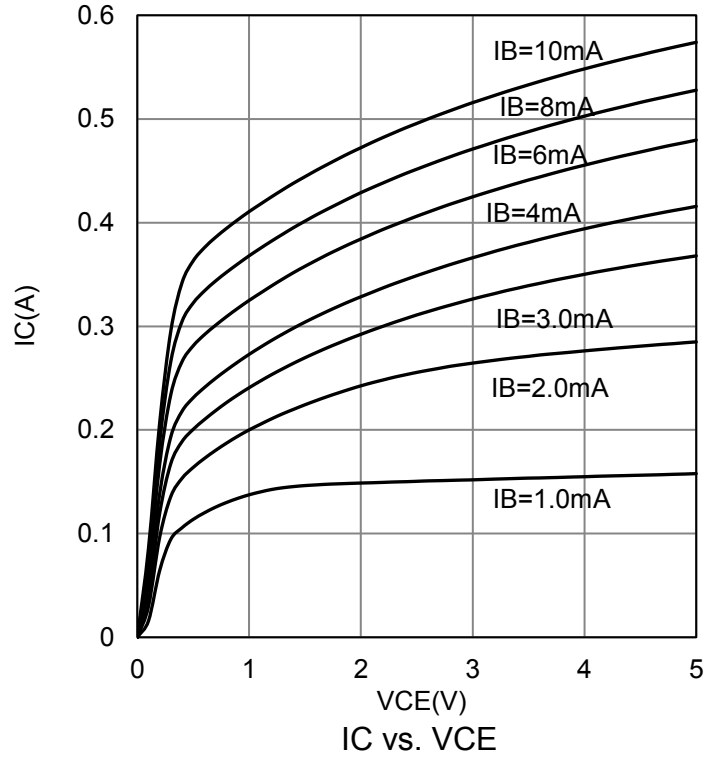
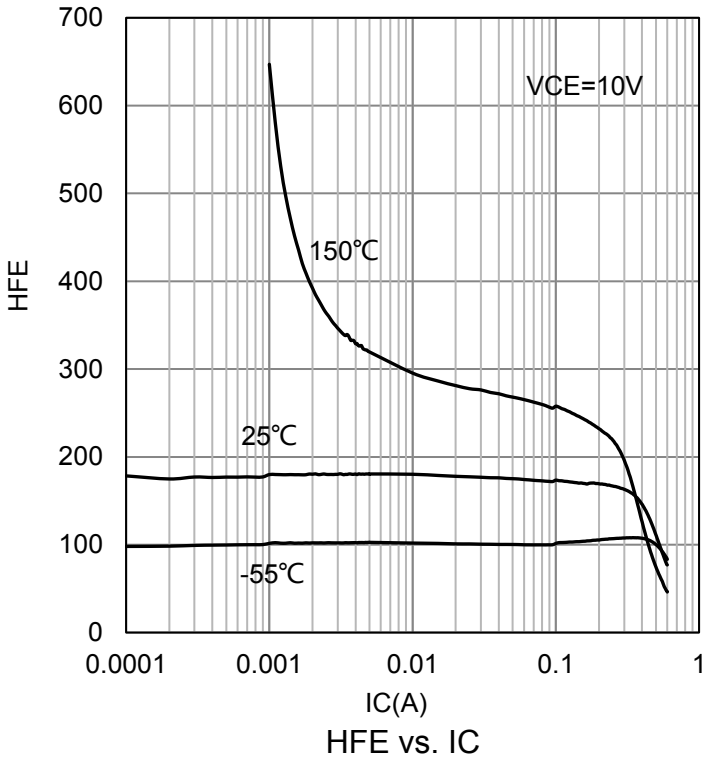
|   |      |      |   |      |                   |
|---|------|------|---|------|-------------------|
| Current–Gain – Bandwidth Product<br>(IC = 20 mA, VCE = 20 V, f = 100 MHz) | fT   | 250  | - | -    | MHz               |
| Output Capacitance<br>(VCB = 10 V, IE = 0, f = 1.0 MHz)                   | Cobo | -    | - | 8    | pF                |
| Input Capacitance<br>(VEB = 0.5 V, IC = 0, f = 1.0 MHz)                   | Cibo | -    | - | 30   | pF                |
| Input Impedance<br>(VCE = 10 V, IC = 10 mA, f = 1.0 kHz)                  | hie  | 0.25 | - | 1.25 | kΩ                |
| Voltage Feedback Ratio<br>(VCE = 10 V, IC = 10 mA, f = 1.0 kHz)           | hre  | -    | - | 4    | X10 <sup>-4</sup> |
| Small–Signal Current Gain<br>(VCE = 10 V, IC = 10 mA, f = 1.0 kHz)        | hfe  | 75   | - | 375  | -                 |
| Output Admittance<br>(VCE = 10 V, IC = 10 mA, f = 1.0 kHz)                | hoe  | 25   | - | 200  | μmhos             |
| Noise Figure<br>(VCE=10 V, IC=100μA, RS=1kΩ, f = 1 kHz)                   | NF   | -    | - | 4    | dB                |

**5. ELECTRICAL CHARACTERISTICS (Ta= 25°C )**

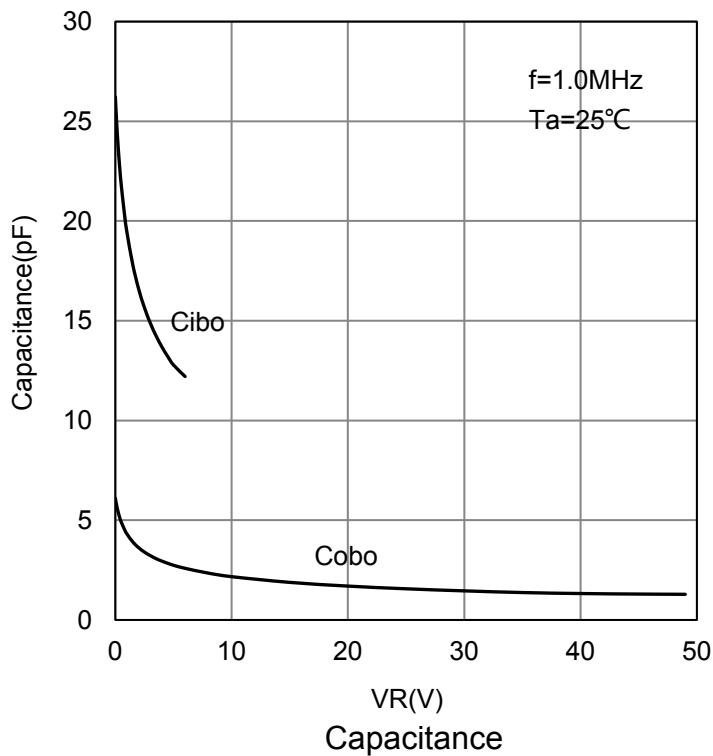
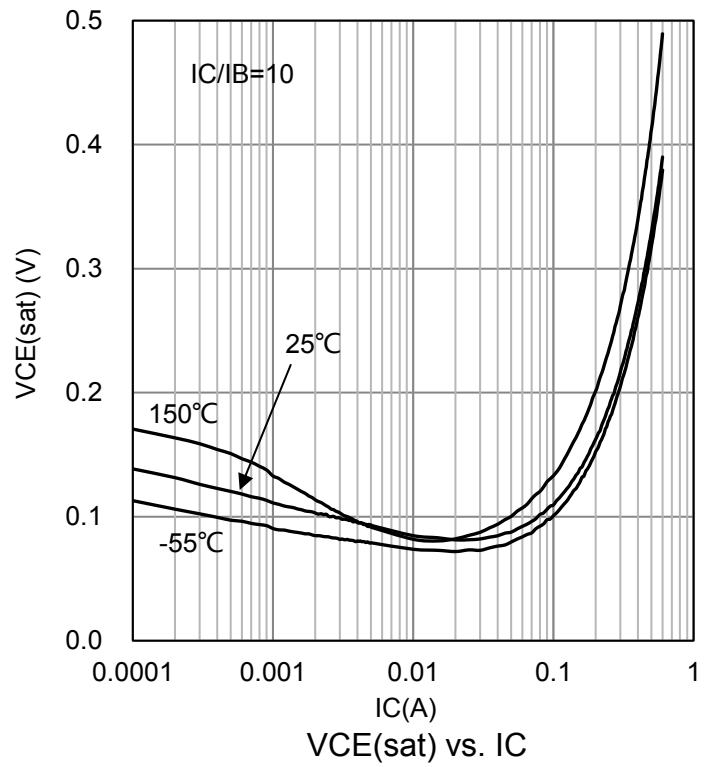
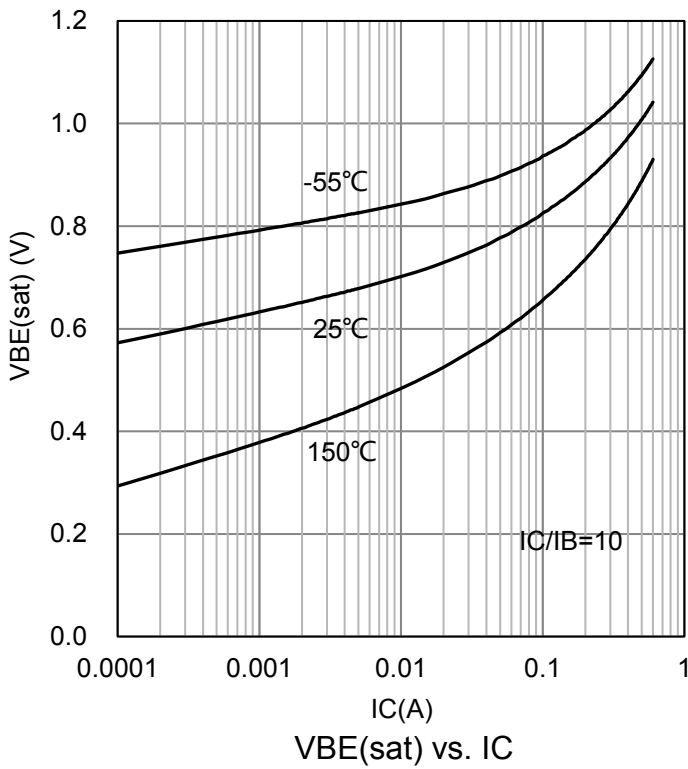
SWITCHING CHARACTERISTICS

|              |   |    |   |   |     |    |
|--------------|---|----|---|---|-----|----|
| Delay Time   | (VCC=3.0 V, VBE=-0.5 V, IC=150 mA, IB1=15 mA) | td | - | - | 10  | ns |
| Rise Time    |   | tr | - | - | 25  |    |
| Storage Time | (VCC=30 V, IC=150mA, IB1=IB2=15mA)            | ts | - | - | 225 |    |
| Fall Time    |   | tf | - | - | 60  |    |

**6.ELECTRICAL CHARACTERISTICS CURVES**



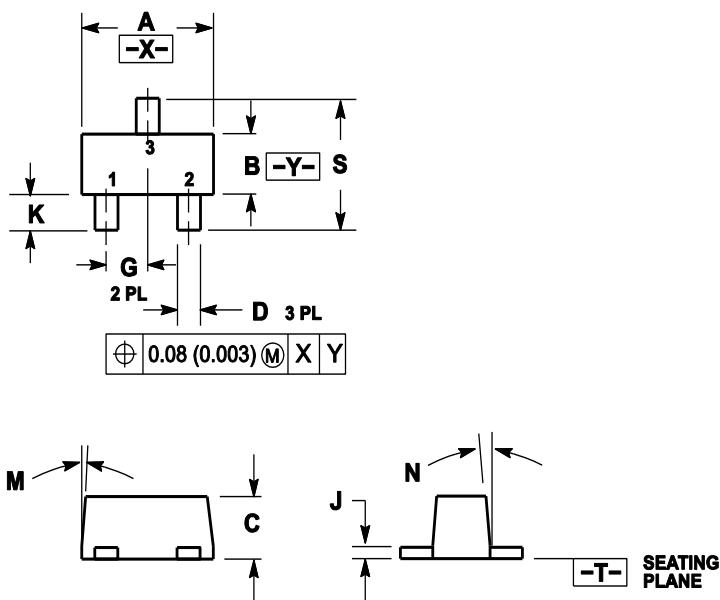
**6.ELECTRICAL CHARACTERISTICS CURVES(Con.)**



**7.OUTLINE AND DIMENSIONS**

Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



| DIM | MILLIMETERS |      |      | INCHES   |       |       |
|-----|-------------|------|------|----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN      | NOM   | MAX   |
| A   | 1.50        | 1.60 | 1.70 | 0.059    | 0.063 | 0.067 |
| B   | 0.75        | 0.85 | 0.95 | 0.030    | 0.034 | 0.040 |
| C   | 0.60        | 0.70 | 0.80 | 0.024    | 0.028 | 0.031 |
| D   | 0.23        | 0.28 | 0.33 | 0.009    | 0.011 | 0.013 |
| G   | 0.50BSC     |      |      | 0.020BSC |       |       |
| H   | 0.53REF     |      |      | 0.021REF |       |       |
| J   | 0.10        | 0.15 | 0.20 | 0.004    | 0.006 | 0.008 |
| K   | 0.30        | 0.40 | 0.50 | 0.012    | 0.016 | 0.02  |
| L   | 1.10REF     |      |      | 0.043REF |       |       |
| M   | ---         | ---  | 10°  | ---      | ---   | 10°   |
| N   | ---         | ---  | 10°  | ---      | ---   | 10°   |
| S   | 1.50        | 1.60 | 1.70 | 0.059    | 0.063 | 0.067 |

**8.SOLDERING FOOTPRINT**

