

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## FEATURES

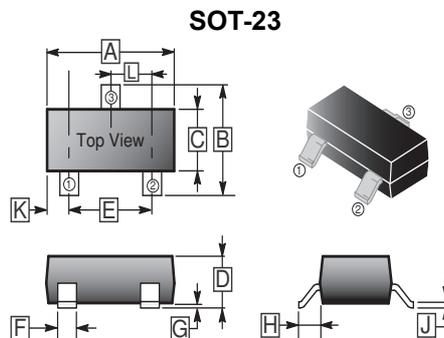
- High Current Gain

## MARKING

**3SS**

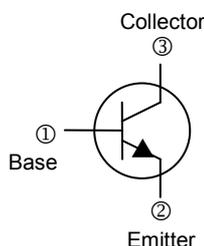
## PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---------|-----|-------------|
| SOT-23  | 3K  | 7 inch      |



## ORDER INFORMATION

| Part Number | Type                            |
|-------------|---------------------------------|
| MMBTA28     | Lead (Pb)-free                  |
| MMBTA28-C   | Lead (Pb)-free and Halogen-free |



| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 2.70       | 3.10 | G    | 0          | 0.18 |
| B    | 2.10       | 2.95 | H    | 0.55       | REF. |
| C    | 1.20       | 1.7  | J    | 0.08       | 0.20 |
| D    | 0.89       | 1.3  | K    | 0.6        | REF. |
| E    | 1.70       | 2.3  | L    | 0.95       | BSC. |
| F    | 0.30       | 0.50 |      |            |      |

## ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise specified)

| Parameter                                | Symbol                            | Ratings      | Unit |
|--|-----------------------------------|--------------|------|
| Collector-Base Voltage                   | V <sub>CBO</sub>                  | 80           | V    |
| Collector-Emitter Voltage                | V <sub>CEO</sub>                  | 80           | V    |
| Emitter-Base Voltage                     | V <sub>EBO</sub>                  | 12           | V    |
| Collector Current                        | I <sub>C</sub>                    | 500          | mA   |
| Collector Power Dissipation              | P <sub>C</sub>                    | 200          | mW   |
| Thermal Resistance From Junction-Ambient | R <sub>θJA</sub>                  | 625          | °C/W |
| Junction, Storage Temperature            | T <sub>J</sub> , T <sub>STG</sub> | 150, -55~150 | °C   |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise specified)

| Parameter   | Symbol                | Min. | Typ. | Max. | Unit | Test Conditions                                     |
|---|-----------------------|------|------|------|------|---|
| Collector-Base Breakdown Voltage                  | V <sub>(BR)CBO</sub>  | 80   | -    | -    | V    | I <sub>C</sub> =100μA, I <sub>E</sub> =0            |
| Collector-Emitter Breakdown Voltage               | V <sub>CEO(sus)</sub> | 80   | -    | -    | V    | I <sub>C</sub> =100μA, I <sub>B</sub> =0            |
| Emitter-Base Breakdown Voltage                    | V <sub>(BR)EBO</sub>  | 12   | -    | -    | V    | I <sub>E</sub> =10μA, I <sub>C</sub> =0             |
| Collector Cut-off Current                         | I <sub>CBO</sub>      | -    | -    | 0.1  | μA   | V <sub>CB</sub> =60V, I <sub>E</sub> =0             |
| Collector Cut-off Current                         | I <sub>CES</sub>      | -    | -    | 0.5  | μA   | V <sub>CE</sub> =60V, V <sub>BE</sub> =0            |
| Emitter Cut-off Current                           | I <sub>EBO</sub>      | -    | -    | 0.1  | μA   | V <sub>EB</sub> =10V, I <sub>C</sub> =0             |
| DC Current Gain <sup>1</sup>                      | h <sub>FE(1)</sub>    | 10   | -    | -    |      | V <sub>CE</sub> =5V, I <sub>C</sub> =10mA           |
|   | h <sub>FE(2)</sub>    | 10   | -    | -    |      | V <sub>CE</sub> =5V, I <sub>C</sub> =100mA          |
| Collector-Emitter Saturation Voltage <sup>1</sup> | V <sub>CE(sat)1</sub> | -    | -    | 1.2  | V    | I <sub>C</sub> =10mA, I <sub>B</sub> =0.01mA        |
|   | V <sub>CE(sat)2</sub> | -    | -    | 1.5  | V    | I <sub>C</sub> =100mA, I <sub>B</sub> =0.1mA        |
| Base-Emitter Voltage <sup>1</sup>                 | V <sub>BE</sub>       | -    | -    | 2    | V    | V <sub>CB</sub> =5V, I <sub>C</sub> =100mA          |
| Collector output capacitance                      | C <sub>ob</sub>       | -    | -    | 8    | pF   | V <sub>CB</sub> =1V, I <sub>E</sub> =0, f=1MHz      |
| Transition Frequency                              | f <sub>T</sub>        | 125  | -    | -    | MHz  | V <sub>CE</sub> =5V, I <sub>C</sub> =10mA, f=100MHz |

Notes:

1. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2.0%.

**CHARACTERISTICS CURVE**

**Static Characteristic**

