

# GSTMMBT2907AWF

## PNP General Purpose Transistor

### Product Description

Collector-Emitter Voltage -60V  
Collector Current -600mA

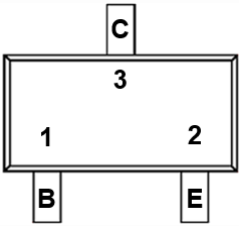
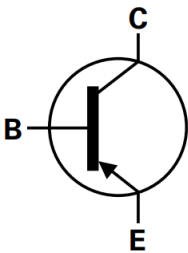
### Features

- Ideal for Low-Power Amplification and Switching
- RoHS Compliant and Halogen Free

### Mechanical Data

- Case : SOT-323 Package
- Epoxy meets UL 94 V-0 Flammability Rating

### Package and Pin Assignment

| SOT-323                                                                                                                                                          | Equivalent Circuit                                                                    |             |   |      |   |         |   |           |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------|---|------|---|---------|---|-----------|--|
|                                                                                |  |             |   |      |   |         |   |           |  |
| <table><tr><th>Pin</th><th>Description</th></tr><tr><td>1</td><td>BASE</td></tr><tr><td>2</td><td>EMITTER</td></tr><tr><td>3</td><td>COLLECTOR</td></tr></table> | Pin                                                                                   | Description | 1 | BASE | 2 | EMITTER | 3 | COLLECTOR |  |
| Pin                                                                                                                                                              | Description                                                                           |             |   |      |   |         |   |           |  |
| 1                                                                                                                                                                | BASE                                                                                  |             |   |      |   |         |   |           |  |
| 2                                                                                                                                                                | EMITTER                                                                               |             |   |      |   |         |   |           |  |
| 3                                                                                                                                                                | COLLECTOR                                                                             |             |   |      |   |         |   |           |  |

### Ordering and Marking Information

| Ordering Information                    |         |                                                                   |               |
|-----------------------------------------|---------|-------------------------------------------------------------------|---------------|
| Part Number                             | Package | Marking Code                                                      | Quantity/Reel |
| GSTMMBT2907AWF                          | SOT-323 | 2F                                                                | 3,000 PCS     |
| <b>GSTMMBT2907AWF</b>                   |         |                                                                   |               |
| <b>- Product Code:</b><br>GSTMMBT2907AW |         | <b>- Green Level:</b><br>F for RoHS Compliant and<br>Halogen Free |               |
| Marking Information                     |         |                                                                   |               |
| <b>2F</b>                               |         |                                                                   |               |
| <b>- Product Code:</b><br>2F            |         |                                                                   |               |

GSTMMBT2907AWF

## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise specified)

| Symbol           | Parameter                                   | Rating   | Unit |
|------------------|---------------------------------------------|----------|------|
| V <sub>CBO</sub> | Collector-Base Voltage                      | -60      | V    |
| V <sub>CEO</sub> | Collector-Emitter Voltage                   | -60      | V    |
| V <sub>EBO</sub> | Emitter-Base Voltage                        | -5       | V    |
| I <sub>C</sub>   | Collector Current                           | -600     | mA   |
| P <sub>C</sub>   | Collector Power Dissipation                 | 200      | mW   |
| R <sub>ΘJA</sub> | Thermal Resistance From Junction To Ambient | 625      | °C/W |
| T <sub>J</sub>   | Junction Temperature                        | -55~+150 | °C   |
| T <sub>STG</sub> | Storage Temperature                         | -55~+150 | °C   |

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

| Symbol               | Description                          | Conditions                                               | Min  | Max  | Unit |
|----------------------|--------------------------------------|----------------------------------------------------------|------|------|------|
| V <sub>CEO</sub>     | Collector-Emitter Breakdown Voltage  | I <sub>C</sub> =-10mA, I <sub>B</sub> =0                 | -60  |      | V    |
| V <sub>CBO</sub>     | Collector-Base Breakdown Voltage     | I <sub>C</sub> =-10μA, I <sub>E</sub> =0                 | -60  |      | V    |
| V <sub>EBO</sub>     | Emitter-Base Breakdown Voltage       | I <sub>E</sub> =-10μA, I <sub>C</sub> =0                 | -5.0 |      | V    |
| I <sub>CBO</sub>     | Collector Cutoff Current             | V <sub>CB</sub> =-50V, I <sub>E</sub> =0V                |      | -100 | nA   |
| I <sub>CEX</sub>     | Collector Cutoff Current             | V <sub>CE</sub> =-30V, V <sub>BE</sub> =-0.5V            |      | -50  | nA   |
| I <sub>BL</sub>      | Base Cutoff Current                  | V <sub>CE</sub> =-30V, V <sub>BE</sub> =-0.5V            |      | -50  | nA   |
| h <sub>FE</sub>      | DC Current Gain                      | I <sub>C</sub> =-0.1mA, V <sub>CE</sub> =-10V            | 75   |      |      |
|                      |                                      | I <sub>C</sub> =-1.0mA, V <sub>CE</sub> =-10V            | 100  |      |      |
|                      |                                      | I <sub>C</sub> =-10mA, V <sub>CE</sub> =-10V             | 100  |      |      |
|                      |                                      | I <sub>C</sub> =-150mA, V <sub>CE</sub> =-10V            | 100  | 300  |      |
|                      |                                      | I <sub>C</sub> =-500mA, V <sub>CE</sub> =-10V            | 50   |      |      |
| V <sub>CE(SAT)</sub> | Collector-Emitter Saturation Voltage | I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA            |      | -0.4 | V    |
|                      |                                      | I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA            |      | -1.6 | V    |
| V <sub>BE(SAT)</sub> | Base-Emitter Saturation Voltage      | I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA            |      | -1.3 | V    |
|                      |                                      | I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA            |      | -2.6 | V    |
| f <sub>T</sub>       | Current Gain-Bandwidth Product       | I <sub>C</sub> =-50mA,<br>V <sub>CE</sub> =-20V,f=100MHz | 200  |      | MHZ  |

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

| Symbol                          | Description  | Conditions                                                                                   | Min | Max | Unit |
|---------------------------------|--------------|----------------------------------------------------------------------------------------------|-----|-----|------|
| <b>Switching Characteristic</b> |              |                                                                                              |     |     |      |
| t <sub>d</sub>                  | Delay Time   | V <sub>CE</sub> = -30V, I <sub>C</sub> = -50mA, I <sub>B1</sub> = -15mA                      |     | 10  | ns   |
| t <sub>r</sub>                  | Rise Time    | V <sub>CE</sub> = -30V, I <sub>C</sub> = -50mA, I <sub>B1</sub> = -15mA                      |     | 40  | ns   |
| t <sub>s</sub>                  | Storage Time | V <sub>CE</sub> = -6.0V, I <sub>C</sub> = -150mA, I <sub>B1</sub> = -I <sub>B2</sub> = -15mA |     | 80  | ns   |
| t <sub>f</sub>                  | Fall Time    | V <sub>CE</sub> = -6.0V, I <sub>C</sub> = -150mA, I <sub>B1</sub> = -I <sub>B2</sub> = -15mA |     | 30  | ns   |

## Typical Characteristics

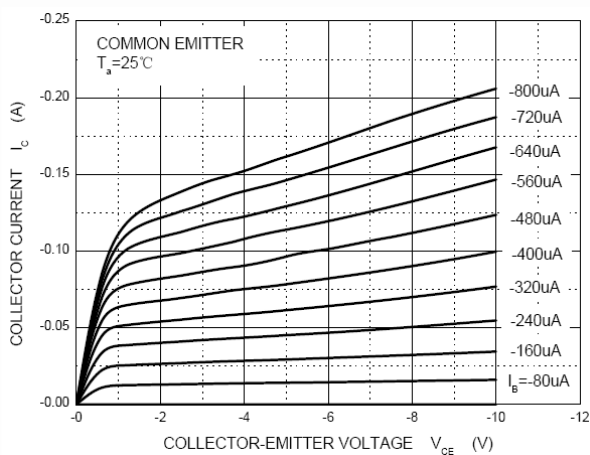


Figure 1. Static Characteristic

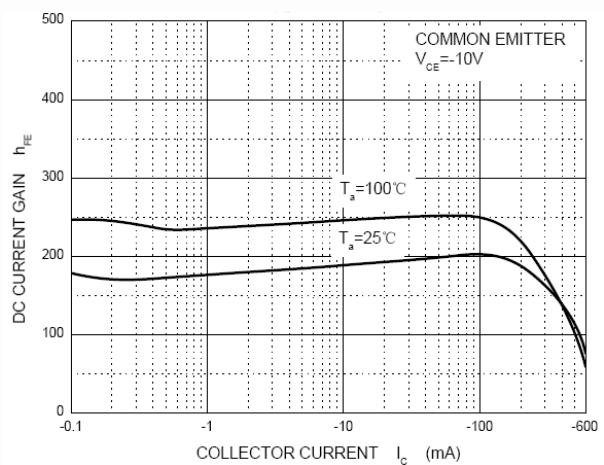


Figure 2. h<sub>FE</sub>---I<sub>C</sub>

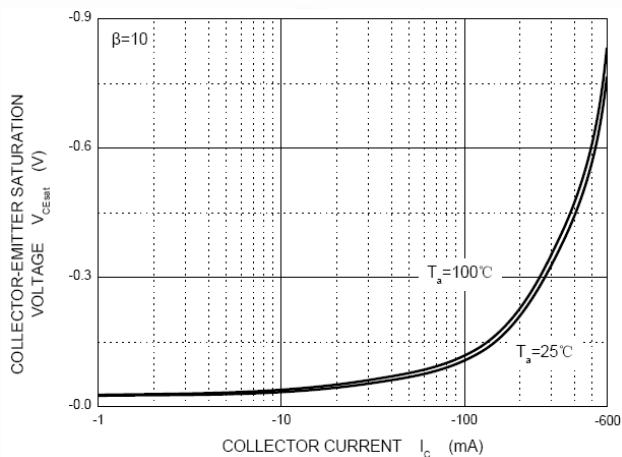


Figure 3. V<sub>CESAT</sub>---I<sub>C</sub>

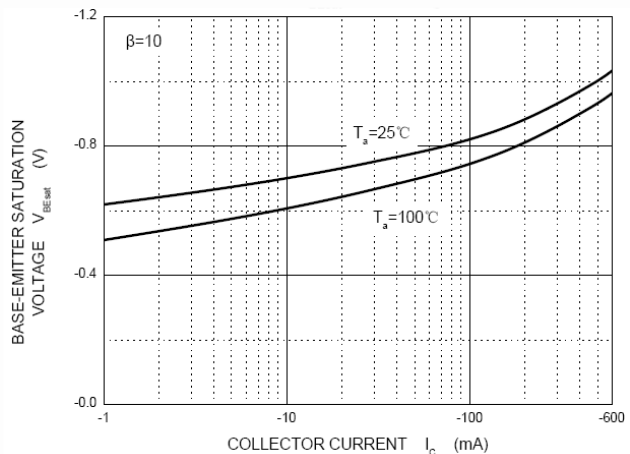


Figure 4. V<sub>BESAT</sub>---I<sub>C</sub>

## Typical Characteristics (Continue)

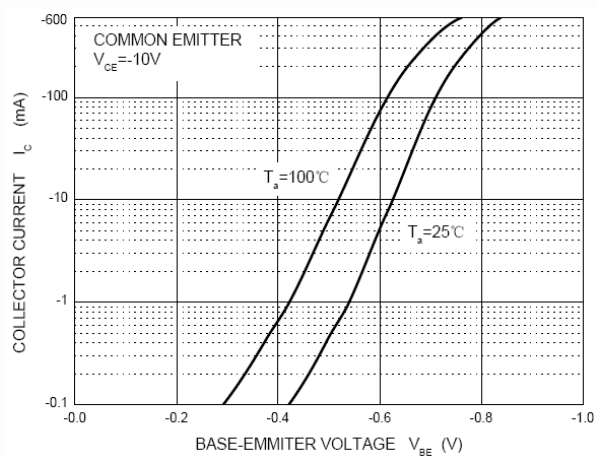


Figure 5.  $I_C$ --- $V_{BE}$

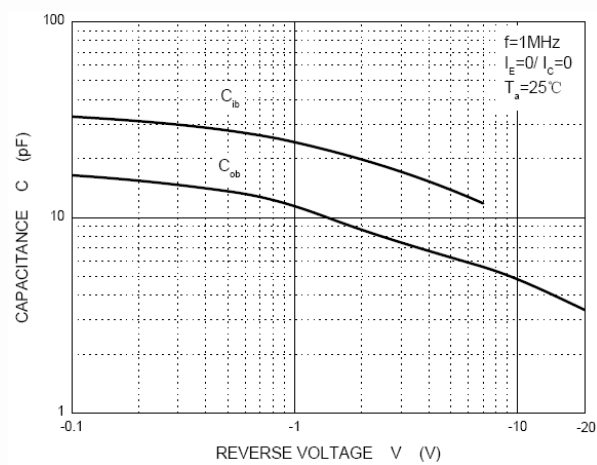
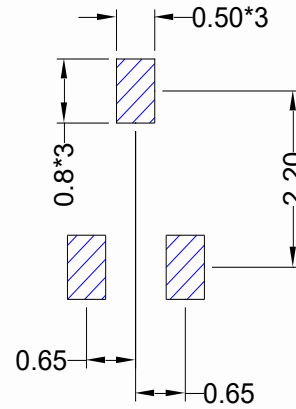
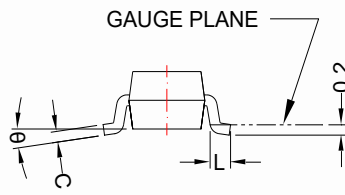
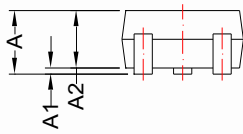
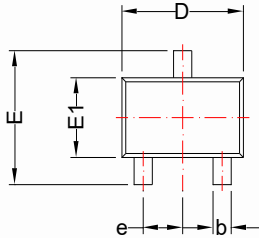


Figure 6.  $C_{ob}/C_{ib}$ --- $V_{CB}/V_{BE}$

# SOT-323

## Package Dimension

## Recommended Land Pattern



(Unit: mm)

| Dimensions |             |      |           |       |
|------------|-------------|------|-----------|-------|
| SYMBOL     | Millimeters |      | Inches    |       |
|            | MIN         | MAX  | MIN       | MAX   |
| A          | 0.80        | 1.10 | 0.031     | 0.043 |
| A1         | 0.00        | 0.10 | 0.000     | 0.004 |
| A2         | 0.80        | 1.00 | 0.031     | 0.039 |
| b          | 0.20        | 0.40 | 0.008     | 0.016 |
| c          | 0.08        | 0.26 | 0.003     | 0.010 |
| D          | 1.80        | 2.20 | 0.071     | 0.087 |
| E          | 1.80        | 2.40 | 0.071     | 0.094 |
| E1         | 1.15        | 1.35 | 0.045     | 0.053 |
| e          | 0.65 BSC    |      | 0.026 BSC |       |
| L          | 0.26        | 0.45 | 0.010     | 0.018 |
| $\theta$   | 0°          | 8°   | 0°        | 8°    |

### NOTE:

Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

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