

# MMBT2907AW

## PNP GENERAL PURPOSE SWITCHING TRANSISTOR

|                |                 |              |               |
|----------------|-----------------|--------------|---------------|
| <b>VOLTAGE</b> | <b>60 Volts</b> | <b>POWER</b> | <b>225 mW</b> |
|----------------|-----------------|--------------|---------------|

**SOT-323** Unit: inch (mm)

### FEATURES

PNP epitaxial silicon, planar design  
Collector-emitter voltage  $V_{CE} = -60V$   
Collector current  $I_C = -600mA$   
Lead free in compliance with EU RoHS2.0 (2011/65/EU & 2015/865/EU directive)  
Green molding compound as per IEC61249 Std. . (Halogen Free)

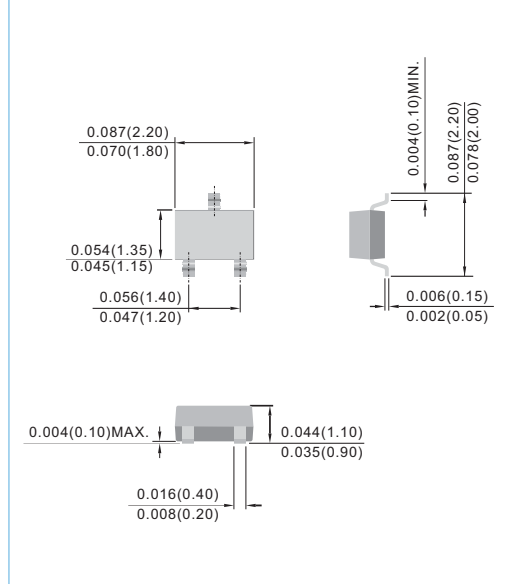
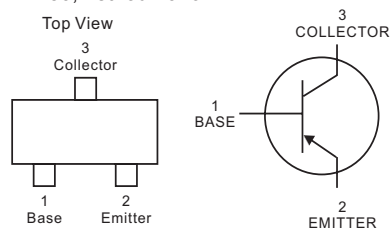
### MECHANICAL DATA

Case: SOT-323

Terminals : Solderable per MIL-STD-750,Method 2026

Approx Weight: 0.0048 gram

Device Marking : M7A



### ABSOLUTE MAXIMUM RATINGS

| Parameter                    | Symbol    | Value | Units |
|------------------------------|-----------|-------|-------|
| Collector-Emitter Voltage    | $V_{CEO}$ | -60   | V     |
| Collector-Base Voltage       | $V_{CBO}$ | -60   | V     |
| Emitter-Base Voltage         | $V_{EBO}$ | -5.0  | V     |
| Collector Current-Continuous | $I_C$     | -600  | mA    |

### THERMAL CHARACTERISTICS

| Parameter                               | Symbol          | Value      | Units  |
|-----------------------------------------|-----------------|------------|--------|
| Max Power Dissipation (Note 1)          | $P_{TOT}$       | 225        | mW     |
| Storage Temperature                     | $T_{STG}$       | -55 to 150 | °C     |
| Junction Temperature                    | $T_J$           | -55 to 150 | °C     |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 556        | °C / W |

Note 1 : Transistor mounted on FR-5 board 1.0 x 0.75 x 0.062 in.

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## ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise noted)

| Parameter                            | Symbol                | Test Condition                                                                                | Min. | Typ. | Max. | Units |
|--------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------|------|------|------|-------|
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)</sub> CEO | I <sub>C</sub> =-10mA, I <sub>B</sub> =0                                                      | -60  | -    | -    | V     |
| Collector-Base Breakdown Voltage     | V <sub>(BR)</sub> CBO | I <sub>C</sub> =-10μA, I <sub>E</sub> =0                                                      | -60  | -    | -    | V     |
| Emitter-Base Breakdown Voltage       | V <sub>(BR)</sub> EBO | I <sub>E</sub> =-10μA, I <sub>C</sub> =0                                                      | -5.0 | -    | -    | V     |
| Base Cutoff Current                  | I <sub>BL</sub>       | V <sub>CE</sub> =-30V, V <sub>EB</sub> =-0.5V                                                 | -    | -    | -50  | nA    |
| Collector Cutoff Current             | I <sub>CEX</sub>      | V <sub>CE</sub> =-30V, V <sub>EB</sub> =-0.5V                                                 | -    | -    | -50  | nA    |
|                                      | I <sub>CBO</sub>      | V <sub>CE</sub> =-50V, I <sub>E</sub> =0                                                      | -    | -    | -10  | nA    |
|                                      |                       | V <sub>CE</sub> =-50V, I <sub>E</sub> =0                                                      | -    | -    | -10  | μA    |
|                                      |                       | T <sub>J</sub> =125°C                                                                         | -    | -    | -10  | μA    |
| DC Current Gain                      | h <sub>FE</sub>       | 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   | -    | -    |       |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub>  | 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 |       |
| Base-Emitter Saturation Voltage      | V <sub>BE(SAT)</sub>  | 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 |       |
| Collector-Base Capacitance           | C <sub>CBO</sub>      | V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=1MHz                                              | -    | -    | 8.0  | pF    |
| Emitter-Base Capacitance             | C <sub>EBO</sub>      | V <sub>CB</sub> =-2V, I <sub>C</sub> =0, f=1MHz                                               | -    | -    | 30   | pF    |
| Current Gain-Bandwidth Product       | F <sub>T</sub>        | I <sub>C</sub> =-50mA, V <sub>CE</sub> =-20V, f=100MHz                                        | 200  | -    | -    | MHz   |
| Turn-On Time                         | t <sub>on</sub>       | V <sub>CC</sub> =-30V, V <sub>BE</sub> =-0.5V, I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA  | -    | -    | 45   | ns    |
| Delay Time                           | t <sub>d</sub>        | V <sub>CC</sub> =-30V, V <sub>BE</sub> =-0.5V, I <sub>C</sub> =-150mA, I <sub>B</sub> =-15mA  | -    | -    | 10   | ns    |
| Rise Time                            | t <sub>r</sub>        | V <sub>CC</sub> =-30V, V <sub>BE</sub> =-0.5V, I <sub>C</sub> =-150mA, I <sub>B1</sub> =-15mA | -    | -    | 40   | ns    |
| Turn-Off Time                        | t <sub>off</sub>      | V <sub>CC</sub> =-6V, I <sub>C</sub> =-150mA, I <sub>B1</sub> =I <sub>B2</sub> =-15mA         | -    | -    | 100  | ns    |
| Storage Time                         | t <sub>s</sub>        | V <sub>CC</sub> =-6V, I <sub>C</sub> =-150mA, I <sub>B1</sub> =I <sub>B2</sub> =-15mA         | -    | -    | 80   | ns    |
| Fall Time                            | t <sub>f</sub>        | V <sub>CC</sub> =-6V, I <sub>C</sub> =-150mA, I <sub>B1</sub> =I <sub>B2</sub> =-15mA         | -    | -    | 30   | ns    |

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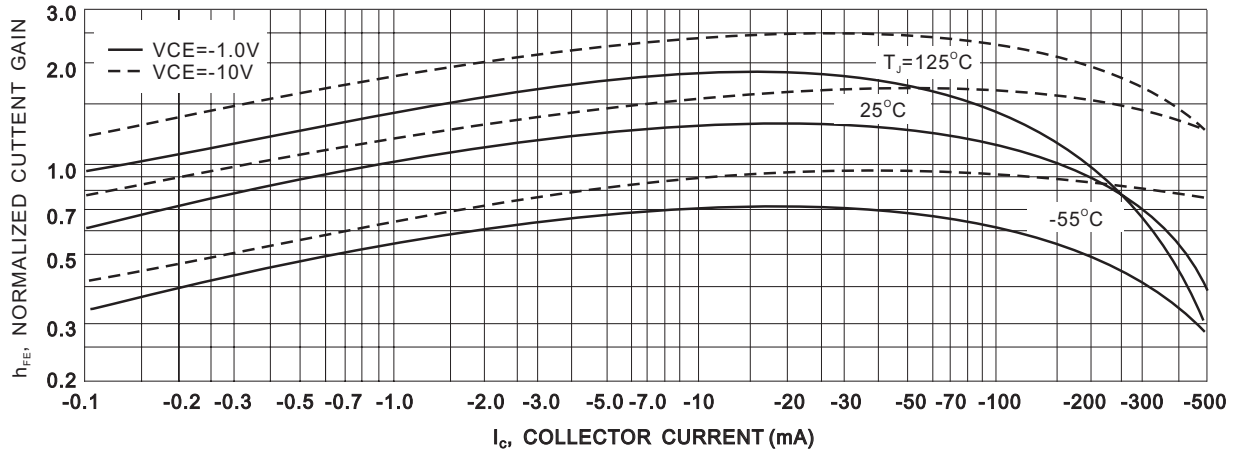


Fig.1-DC Current Gain

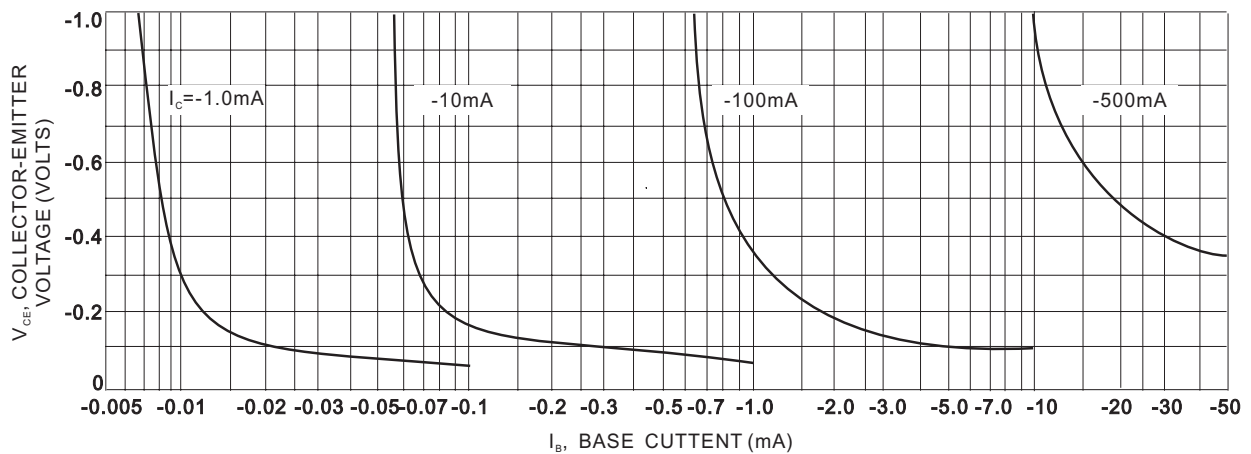


Fig.2-Collector Saturation Region

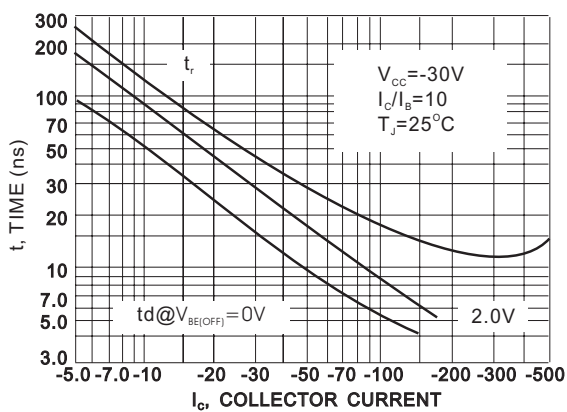


Fig.3-Turn-On Time

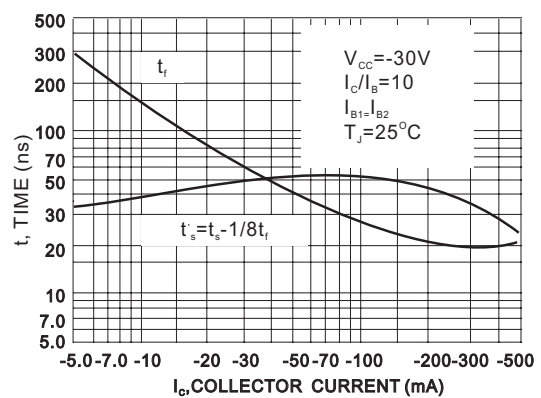
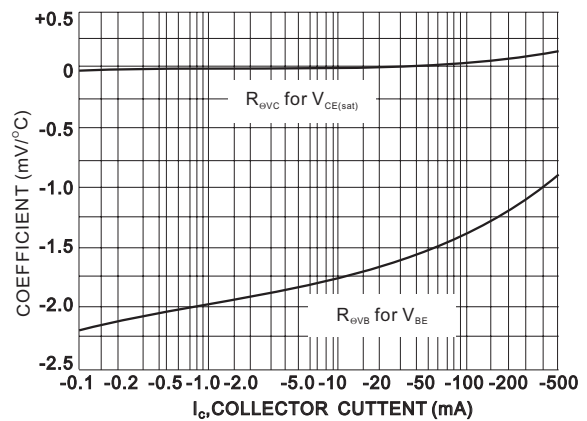
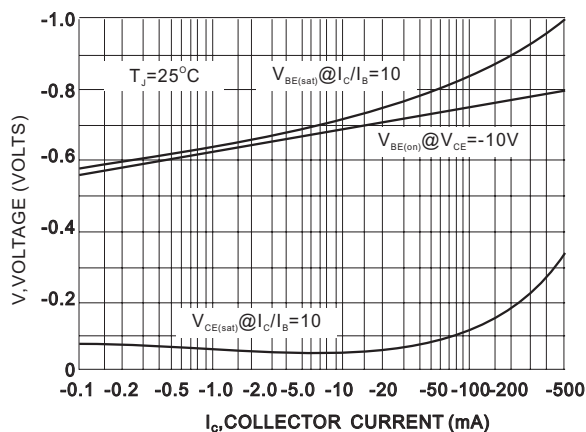
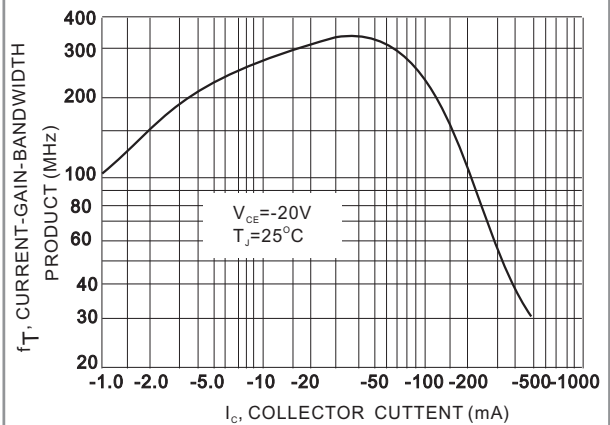
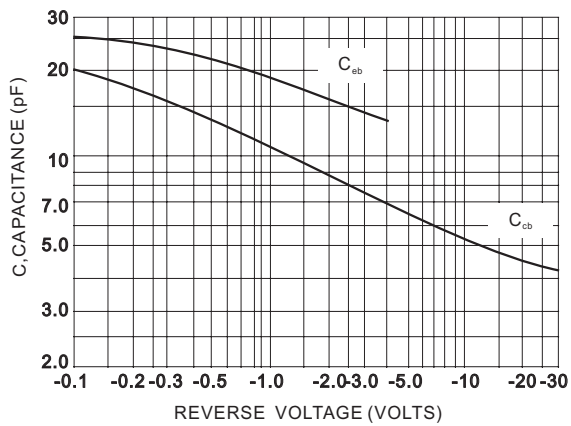
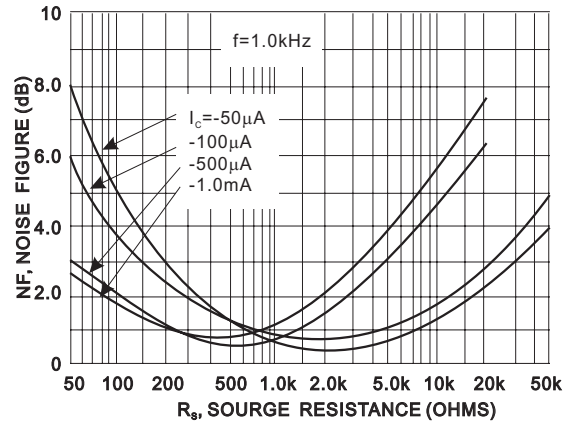
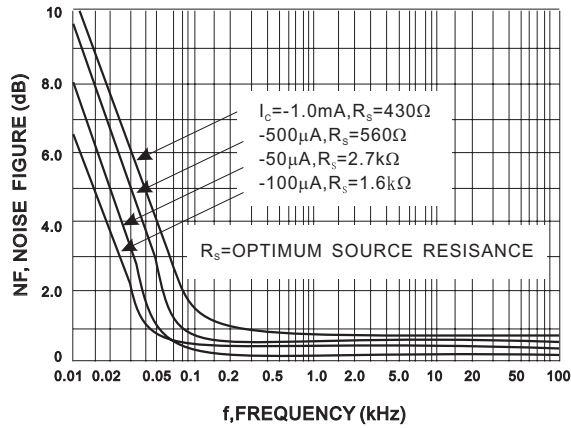


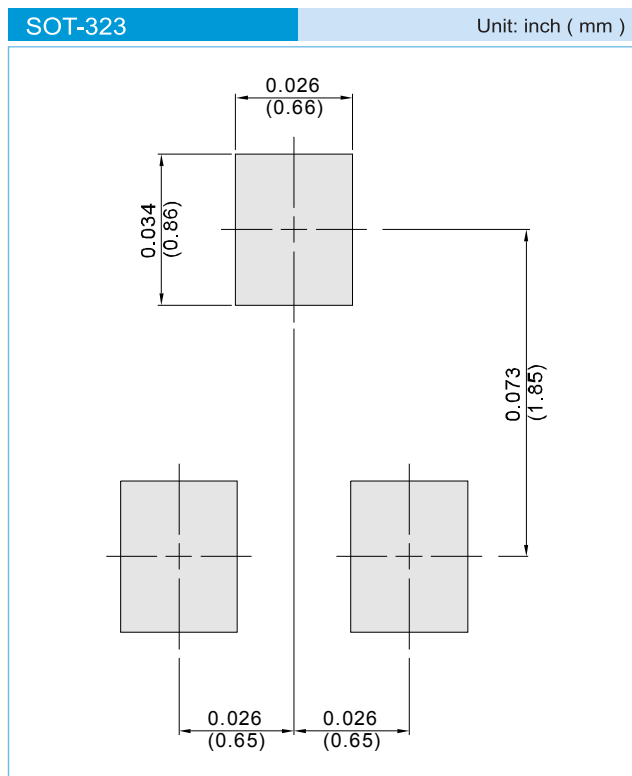
Fig.4-Turn-Off Time

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## MOUNTING PAD LAYOUT



## ORDER INFORMATION

- Packing information

T/R - 12K per 13" plastic Reel

T/R - 3K per 7" plastic Reel

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## Part No\_packing code\_Version

MMBT2907AW\_R1\_00001

MMBT2907AW\_R2\_00001

For example :

**RB500V-40\_R2\_00001**

Part No.

Serial number

Version code means HF

Packing size code means 13"

Packing type means T/R

| Packing Code <b>XX</b>               |                      |                                  |                      | Version Code <b>XXXXX</b> |                      |                                       |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type                         | 1 <sup>st</sup> Code | Packing size code                | 2 <sup>nd</sup> Code | HF or RoHS                | 1 <sup>st</sup> Code | 2 <sup>nd</sup> ~5 <sup>th</sup> Code |
| Tape and Ammunition Box (T/B)        | <b>A</b>             | N/A                              | <b>0</b>             | <b>HF</b>                 | <b>0</b>             | serial number                         |
| Tape and Reel (T/R)                  | <b>R</b>             | 7"                               | <b>1</b>             | <b>RoHS</b>               | <b>1</b>             | serial number                         |
| Bulk Packing (B/P)                   | <b>B</b>             | 13"                              | <b>2</b>             |                           |                      |                                       |
| Tube Packing (T/P)                   | <b>T</b>             | 26mm                             | <b>X</b>             |                           |                      |                                       |
| Tape and Reel (Right Oriented) (TRR) | <b>S</b>             | 52mm                             | <b>Y</b>             |                           |                      |                                       |
| Tape and Reel (Left Oriented) (TRL)  | <b>L</b>             | PANASERT T/B CATHODE UP (PBCU)   | <b>U</b>             |                           |                      |                                       |
| FORMING                              | <b>F</b>             | PANASERT T/B CATHODE DOWN (PBCD) | <b>D</b>             |                           |                      |                                       |



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