

# MMBTA06WT1

## Driver Transistor

### NPN Silicon

Moisture Sensitivity Level: 1  
ESD Rating: Human Body Model – 4 kV  
Machine Model – 400 V

#### Features

- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

#### MAXIMUM RATINGS

| Rating                         | Symbol    | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector–Emitter Voltage      | $V_{CEO}$ | 80    | Vdc  |
| Collector–Base Voltage         | $V_{CBO}$ | 80    | Vdc  |
| Emitter–Base Voltage           | $V_{EBO}$ | 4.0   | Vdc  |
| Collector Current – Continuous | $I_C$     | 500   | mAdc |

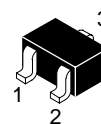
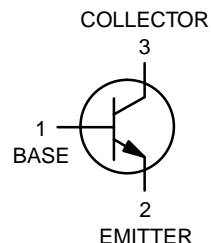
#### THERMAL CHARACTERISTICS

| Characteristic  | Symbol          | Max         | Unit               |
|---|-----------------|-------------|--------------------|
| Total Device Dissipation FR–5 Board<br>$T_A = 25^\circ\text{C}$ | $P_D$           | 150         | mW                 |
| Thermal Resistance,<br>Junction to Ambient                      | $R_{\theta JA}$ | 833         | $^\circ\text{C/W}$ |
| Junction and Storage Temperature                                | $T_J, T_{stg}$  | –55 to +150 | $^\circ\text{C}$   |



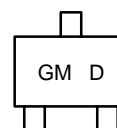
ON Semiconductor®

<http://onsemi.com>



SC-70  
CASE 419  
STYLE 3

#### MARKING DIAGRAM



GM = Specific Device Code  
D = Date Code

#### ORDERING INFORMATION

| Device      | Package            | Shipping†        |
|-------------|--------------------|------------------|
| MMBTA06WT1  | SC-70              | 3000/Tape & Reel |
| MMBTA06WT1G | SC-70<br>(Pb-Free) | 3000/Tape & Reel |

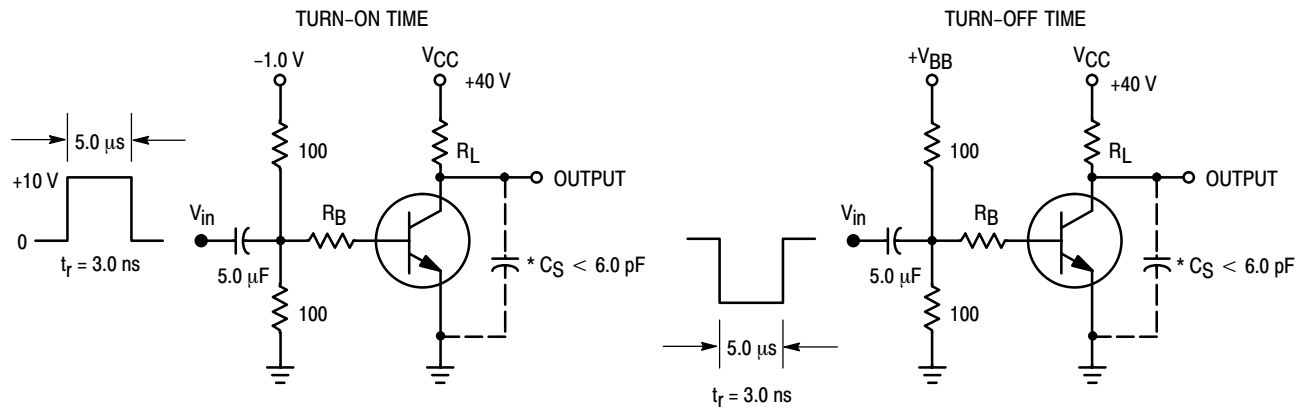
For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic   | Symbol        | Min        | Max    | Unit          |
|--|---------------|------------|--------|---------------|
| <b>OFF CHARACTERISTICS</b>   |               |            |        |               |
| Collector–Emitter Breakdown Voltage (Note 1)<br>( $I_C = 1.0\text{ mA}$ , $I_B = 0$ )  | $V_{(BR)CEO}$ | 80         | –      | Vdc           |
| Emitter–Base Breakdown Voltage<br>( $I_E = 100\text{ }\mu\text{A}$ , $I_C = 0$ )   | $V_{(BR)EBO}$ | 4.0        | –      | Vdc           |
| Collector Cutoff Current<br>( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ )   | $I_{CES}$     | –          | 0.1    | $\mu\text{A}$ |
| Collector Cutoff Current<br>( $V_{CB} = 80\text{ Vdc}$ , $I_E = 0$ )   | $I_{CBO}$     | –          | 0.1    | $\mu\text{A}$ |
| <b>ON CHARACTERISTICS</b>  |               |            |        |               |
| DC Current Gain<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ )<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ ) | $h_{FE}$      | 100<br>100 | –<br>– | –             |
| Collector–Emitter Saturation Voltage<br>( $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$ )   | $V_{CE(sat)}$ | –          | 0.25   | Vdc           |
| Base–Emitter On Voltage<br>( $I_C = 100\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ )   | $V_{BE(on)}$  | –          | 1.2    | Vdc           |
| <b>SMALL–SIGNAL CHARACTERISTICS</b>  |               |            |        |               |
| Current–Gain – Bandwidth Product (Note 2)<br>( $I_C = 10\text{ mA}$ , $V_{CE} = 2.0\text{ V}$ , $f = 100\text{ MHz}$ )           | $f_T$         | 100        | –      | MHz           |

1. Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .
2.  $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.



\*Total Shunt Capacitance of Test Jig and Connectors  
For PNP Test Circuits, Reverse All Voltage Polarities

Figure 1. Switching Time Test Circuits

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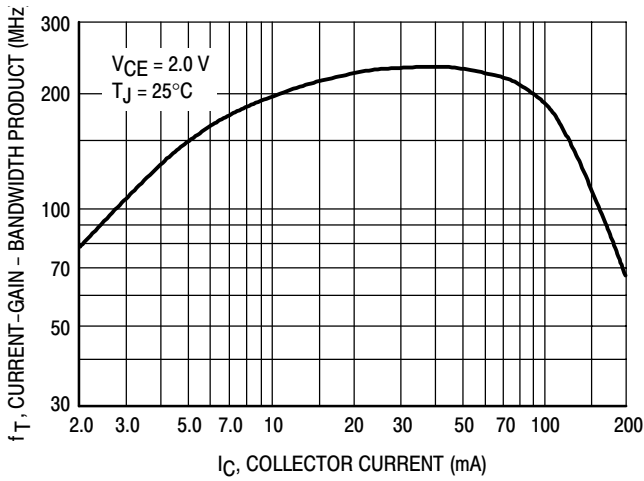


Figure 2. Current-Gain — Bandwidth Product

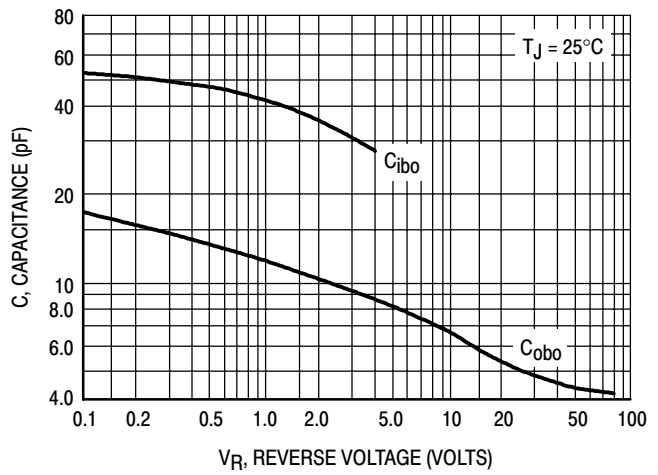


Figure 3. Capacitance

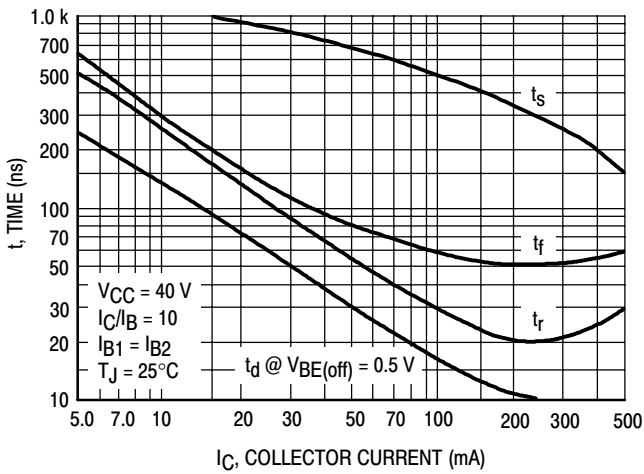


Figure 4. Switching Time

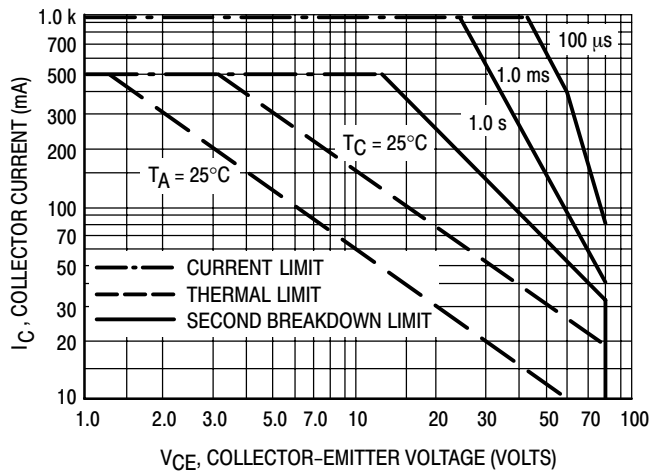


Figure 5. Active-Region Safe Operating Area

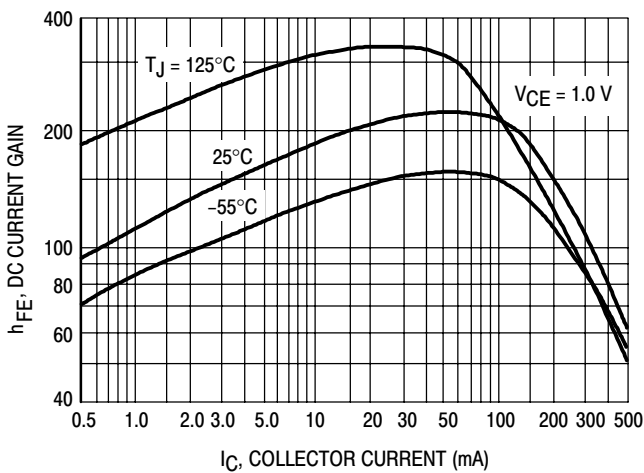


Figure 6. DC Current Gain

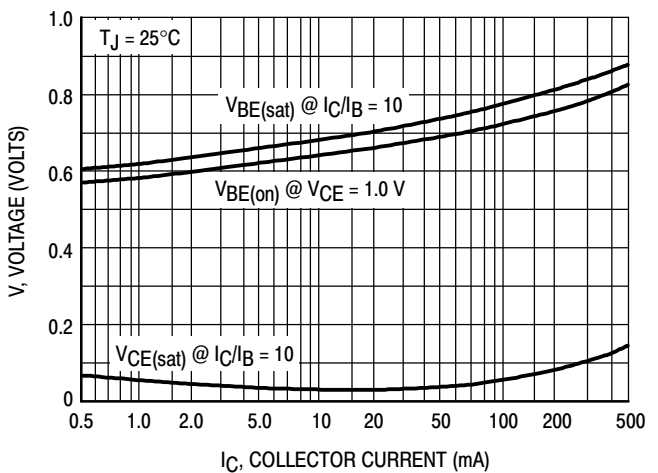


Figure 7. "ON" Voltages

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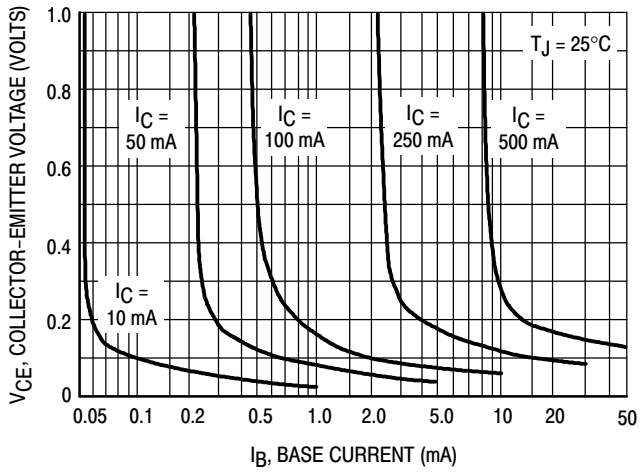


Figure 8. Collector Saturation Region

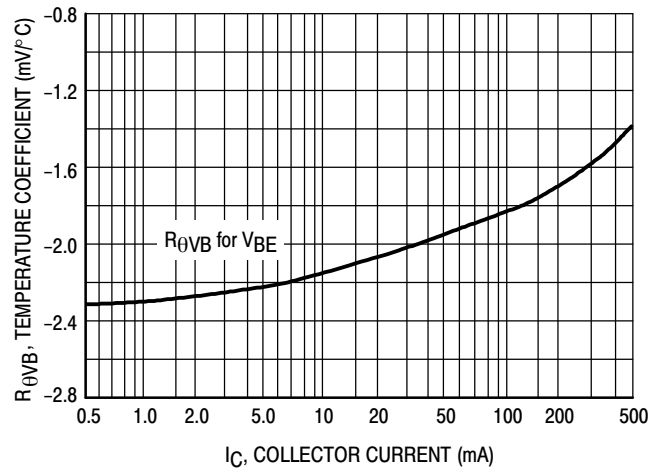


Figure 9. Base-Emitter Temperature Coefficient