

MMBT2131T1

General Purpose Transistors

PNP Bipolar Junction Transistor

(Complementary NPN Device: MMBT2132T1/T3)

NOTE: Voltage and Current are negative for the PNP Transistor.

Features

- Pb-Free Package is Available

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Emitter Voltage | V _{CEO} | 30 | V |
| Collector-Base Voltage | V _{CBO} | 40 | V |
| Emitter-Base Voltage | V _{EBO} | 5.0 | V |
| Collector Current | I _C | 700 | mA |
| Base Current | I _B | 350 | mA |
| Total Power Dissipation @ T _C = 25°C | P _D | 342 | mW |
| Total Power Dissipation @ T _C = 85°C | P _D | 178 | mW |
| Thermal Resistance, Junction-to-Ambient (Note 1) | R _{θJA} | 366 | °C/W |
| Total Power Dissipation @ T _C = 25°C | P _D | 665 | mW |
| Total Power Dissipation @ T _C = 85°C | P _D | 346 | mW |
| Thermal Resistance, Junction-to-Ambient (Note 2) | R _{θJA} | 188 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{stg} | -55 to +150 | °C |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

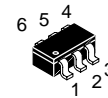
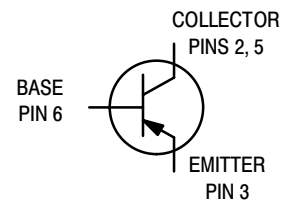
- Minimum FR-4 or G-10 PCB, Operating to Steady State.
- Mounted onto a 2" square FR-4 Board (1" sq. 2 oz Cu 0.06" thick single sided), Operating to Steady State.



ON Semiconductor®

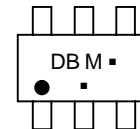
http://onsemi.com

0.7 AMPERES
30 VOLTS – V_{(BR)CEO}
342 mW



SC-74
CASE 318F
STYLE 2

MARKING DIAGRAM



DB = Device Code
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)
*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|--------------------|------------------|
| MMBT2131T1 | SC-74 | 3000/Tape & Reel |
| MMBT2131T1G | SC-74 (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 Specification Brochure, BRD8011/D.

MMBT2131T1

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---------------|-----|-----|-----------|---------------|
| OFF CHARACTERISTICS | | | | | |
| Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{A}$) | $V_{(BR)CBO}$ | 40 | - | - | V |
| Collector-Emitter Breakdown Voltage ($I_C = 10 \text{ mA}$) | $V_{(BR)CEO}$ | 30 | - | - | V |
| Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{A}$) | $V_{(BR)EBO}$ | 5.0 | - | - | V |
| Collector Cutoff Current ($V_{CB} = 25 \text{ V}, I_E = 0 \text{ A}$) ($V_{CB} = 25 \text{ V}, I_E = 0 \text{ A}, T_A = 125^\circ\text{C}$) | I_{CBO} | - | - | 1.0 10 | μA |
| Emitter Cutoff Current ($V_{EB} = 5.0 \text{ V}, I_C = 0 \text{ A}$) | I_{EBO} | - | - | 10 | μA |
| ON CHARACTERISTICS | | | | | |
| DC Current Gain ($V_{CE} = 3.0 \text{ V}, I_C = 100 \text{ mA}$) | h_{FE} | 150 | - | - | V |
| Collector-Emitter Saturation Voltage ($I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$) | $V_{CE(sat)}$ | - | - | 0.25 | V |
| Collector-Emitter Saturation Voltage ($I_C = 700 \text{ mA}, I_B = 70 \text{ mA}$) | $V_{CE(sat)}$ | - | - | 0.4 | V |
| Base-Emitter Saturation Voltage ($I_C = 700 \text{ mA}, I_B = 70 \text{ mA}$) | $V_{BE(sat)}$ | - | - | 1.1 | V |
| Collector-Emitter Saturation Voltage ($I_C = 700 \text{ mA}, V_{CE} = 1.0 \text{ V}$) | $V_{BE(on)}$ | - | - | 1.0 | V |

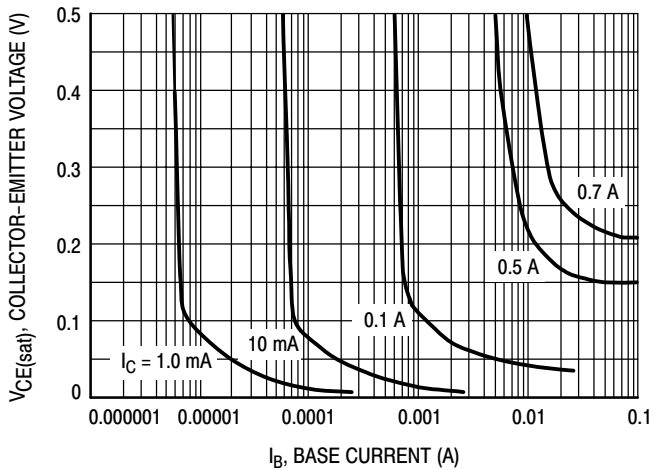


Figure 1. Collector Saturation Region

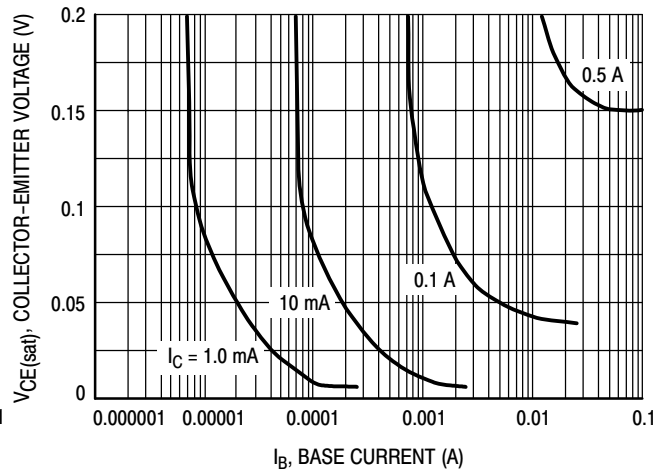


Figure 2. Collector Saturation Region

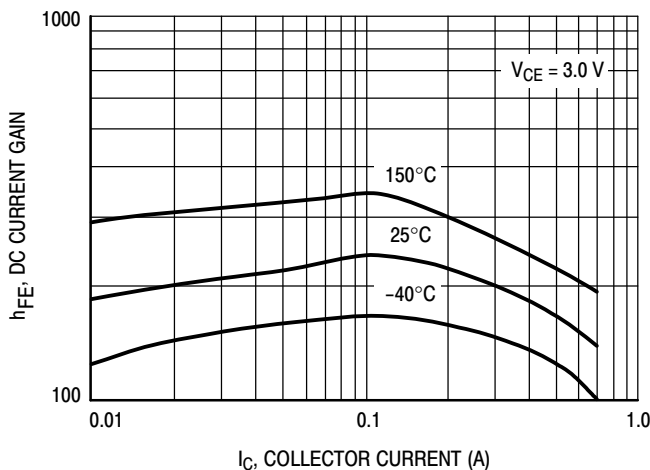


Figure 3. DC Current Gain

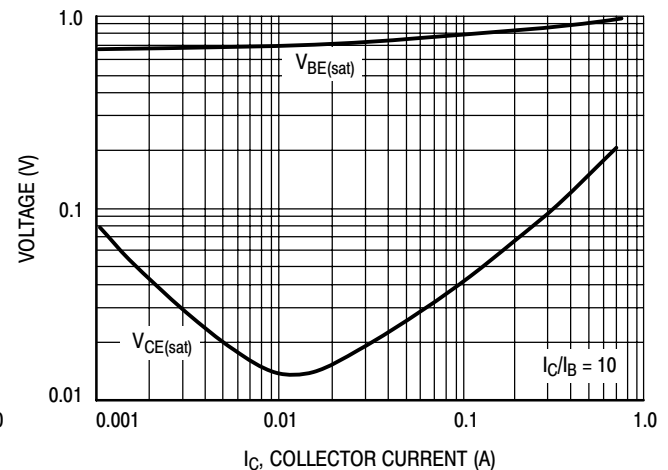


Figure 4. "ON" Voltages

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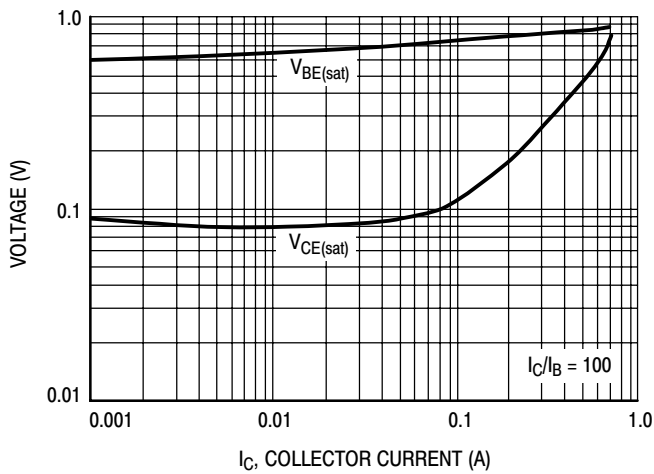


Figure 5. "ON" Voltages

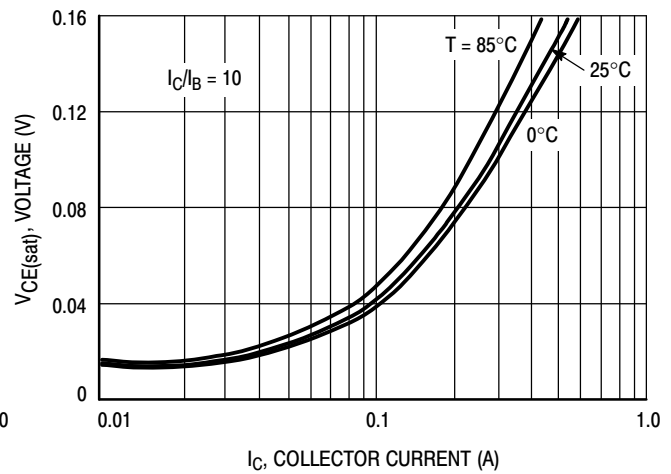


Figure 6. Collector-Emitter Saturation Voltage

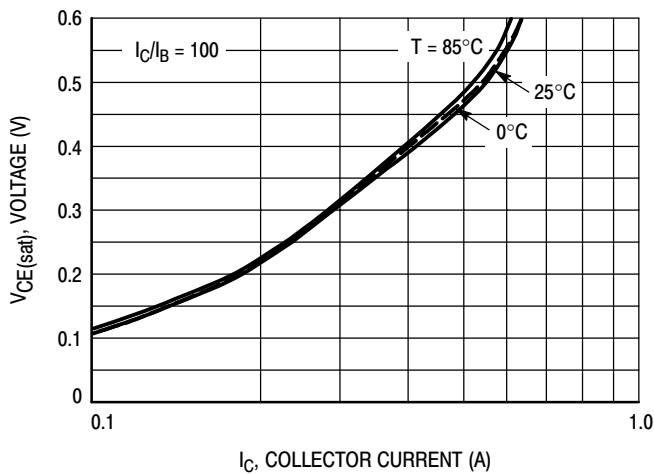


Figure 7. Collector-Emitter Saturation Voltage

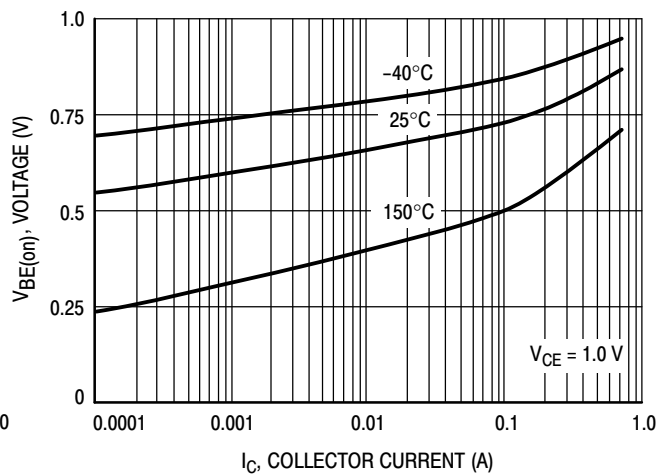


Figure 8. $V_{BE(on)}$ Voltage

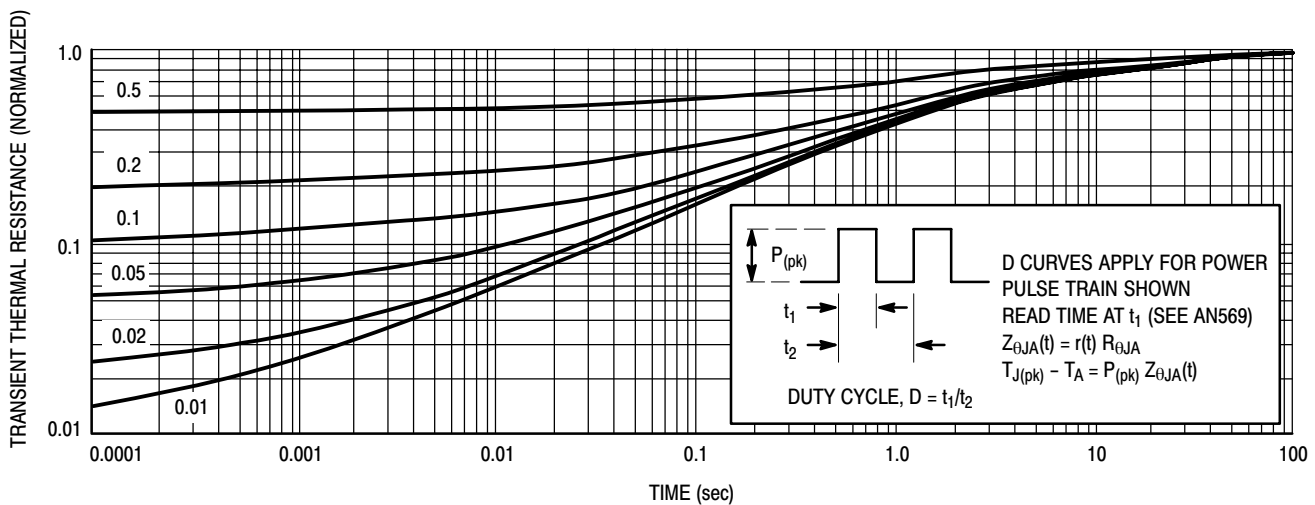
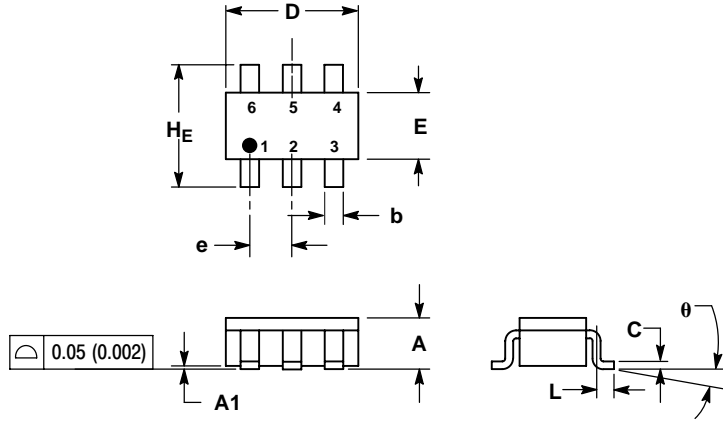


Figure 9. Thermal Response Curve

MMBT2131T1

PACKAGE DIMENSIONS

SC-74
CASE 318F-05
ISSUE L



NOTES:

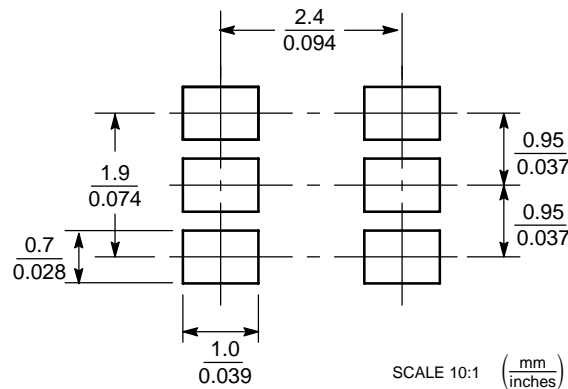
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F-01, -02, -03 OBSOLETE. NEW STANDARD 318F-04.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.90 | 1.00 | 1.10 | 0.035 | 0.039 | 0.043 |
| A1 | 0.01 | 0.06 | 0.10 | 0.001 | 0.002 | 0.004 |
| b | 0.25 | 0.37 | 0.50 | 0.010 | 0.015 | 0.020 |
| c | 0.10 | 0.18 | 0.26 | 0.004 | 0.007 | 0.010 |
| D | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |
| E | 1.30 | 1.50 | 1.70 | 0.051 | 0.059 | 0.067 |
| e | 0.85 | 0.95 | 1.05 | 0.034 | 0.037 | 0.041 |
| L | 0.20 | 0.40 | 0.60 | 0.008 | 0.016 | 0.024 |
| HE | 2.50 | 2.75 | 3.00 | 0.099 | 0.108 | 0.118 |
| θ | 0° | - | 10° | 0° | - | 10° |

STYLE 2:

- PIN 1. NO CONNECTION
2. COLLECTOR
3. EMITTER
4. NO CONNECTION
5. COLLECTOR
6. BASE

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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