# MMJT350T1

## Bipolar Power Transistors

### PNP Silicon

. . . designed for use in line−operated applications such as low power, line−operated series pass and switching regulators requiring PNP capability.

- High Collector−Emitter Sustaining Voltage −
  $V_{CEO(sus)}$ = 300 Vdc @ $I_C$
  = 1.0 mAdc
- Excellent DC Current Gain −
  $h_{FE}$ = 30−240 @ $I_C$
  = 50 mAdc
- Epoxy Meets UL94, V−0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B; > 8000 V
  Machine Model, C; > 400 V

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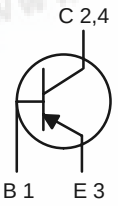
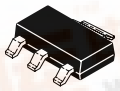
**0.5 AMPERE**
**POWER TRANSISTOR**
**PNP SILICON**
**300 VOLTS**
**2.75 WATTS**

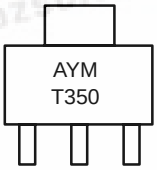



Schematic

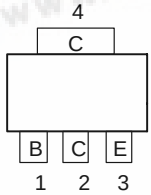


**SOT−223**
**CASE 318E**
*Style 1*

**MARKING DIAGRAM**




| | |
|---|---|
| T350 | = Specific Device Code |
| A | = Assembly Location |
| Y | = Last Digit of Year |
| M | = Month Code |




Top View Pinout

**ORDERING INFORMATION**

| Device | Package | Shipping |
|---|---|---|
| MMJT350T1 | SOT−223 | 1000 / Tape & Reel |

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

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Collector−Emitter Voltage | $V_{CEO}$ | 300 | Vdc |
| Collector−Base Voltage | $V_{CB}$ | 300 | Vdc |
| Emitter−Base Voltage | $V_{EB}$ | 3.0 | Vdc |
| Collector Current − Continuous<br>− Peak | $I_C$ | 0.5<br>0.75 | Adc |
| Total Power Dissipation @ $T_C$ = 25°C<br>Derate above 25°C<br>Total $P_D$ @ $T_A$ = 25°C mounted on 1” sq. (645 sq. mm) Collector pad on FR−4 bd material<br>Total $P_D$ @ $T_A$ = 25°C mounted on 0.012” sq. (7.6 sq. mm) Collector pad on FR−4 bd material | $P_D$ | 2.75<br>22<br>1.40<br>0.65 | W<br>mW/°C<br>W<br>W |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | −55 to +150 | °C |

**THERMAL CHARACTERISTICS**

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance − Junction to Case<br>− Junction−to−Ambient on 1” sq. (645 sq. mm) Collector pad on FR−4 bd material<br>− Junction−to−Ambient on 0.012” sq. (7.6 sq. mm) Collector pad on FR−4 bd material | $R_{\theta JC}$<br>$R_{\theta JA}$<br>$R_{\theta JA}$ | 45<br>85<br>190 | °C/W |
| Maximum Lead Temperature for Soldering Purposes, 1/8” from case for 5 seconds | $T_L$ | 260 | °C |

**ELECTRICAL CHARACTERISTICS** ($T_J$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Collector−Emitter Sustaining Voltage ($I_C$ = 1.0 mAdc, $I_B$ = 0 Adc) | $V_{CEO(SUS)}$ | 300 | − | Vdc |
| Collector−Base Current ($V_{CB}$ = Rated $V_{CBO}$, $V_{EB}$ = 0) | $I_{CBO}$ | − | 100 | μAdc |
| Emitter Cut−off Current ( $V_{BE}$ = 5.0 Vdc) | $I_{EBO}$ | − | 100 | μAdc |
| **ON CHARACTERISTICS** (Note ) | | | | |
| DC Current Gain<br>($I_C$ = 50 mAdc, $V_{CE}$ = 10 Vdc)<br>($I_C$ = 100 mAdc, $V_{CE}$ = 10 Vdc) | $h_{FE}$ | <br>30<br>20 | <br>240<br>− | − |

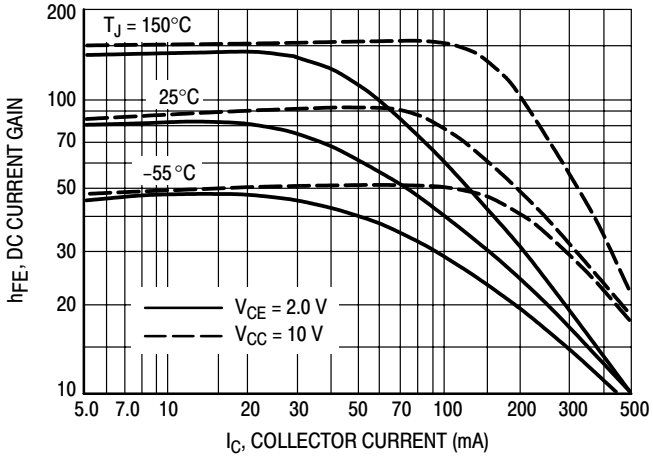



**Figure 1. DC Current Gain**

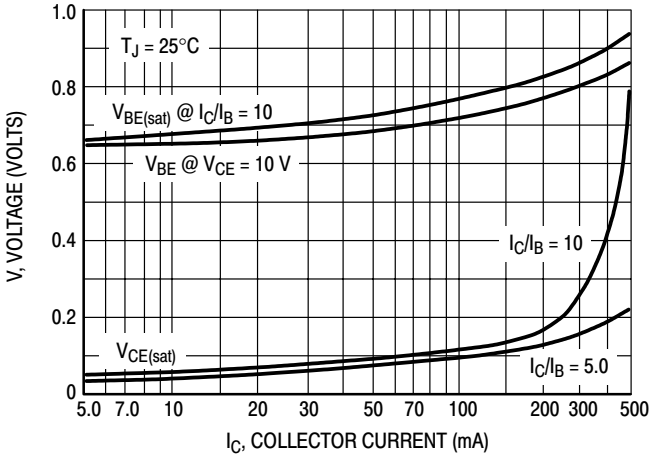



**Figure 2. "On" Voltages**

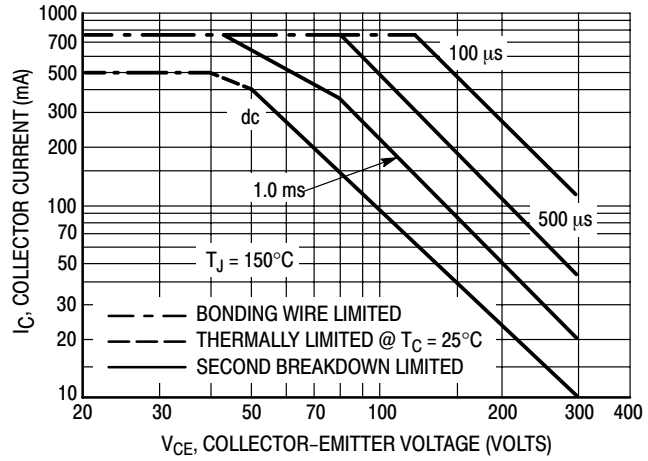



**Figure 3. Active−Region Safe Operating Area**

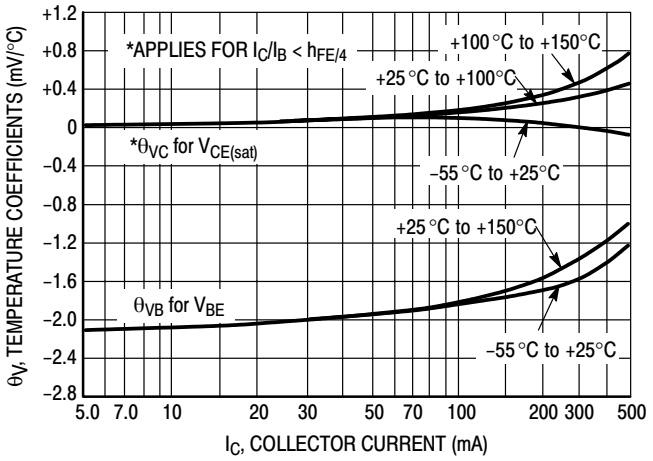



**Figure 4. Temperature Coefficients**

There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown. Safe operating area curves indicate $I_C - V_{CE}$ limits of the transistor that must be observed for reliable operation; i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure 3 is based on $T_{J(pk)}$ = 150°C; $T_C$ is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

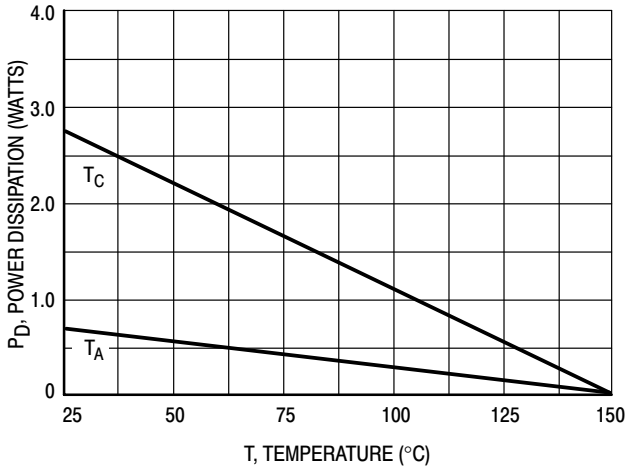
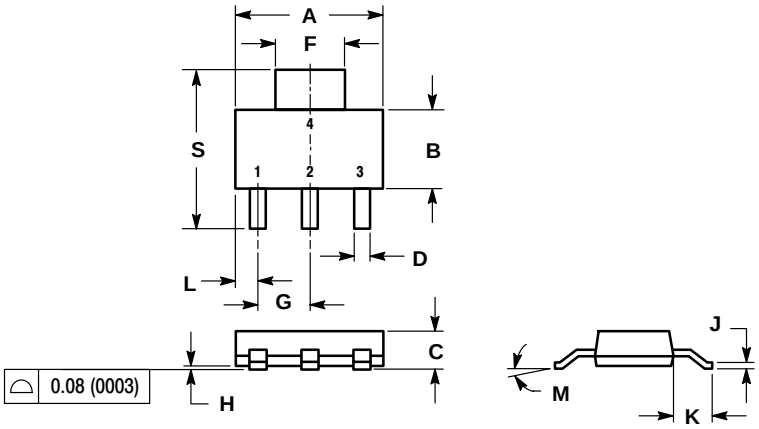



**Figure 5. Power Derating**

# MMJT350T1

## PACKAGE DIMENSIONS

**SOT−223 (TO−261)**
CASE 318E−04
ISSUE K




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.249 | 0.263 | 6.30 | 6.70 |
| B | 0.130 | 0.145 | 3.30 | 3.70 |
| C | 0.060 | 0.068 | 1.50 | 1.75 |
| D | 0.024 | 0.035 | 0.60 | 0.89 |
| F | 0.115 | 0.126 | 2.90 | 3.20 |
| G | 0.087 | 0.094 | 2.20 | 2.40 |
| H | 0.0008 | 0.0040 | 0.020 | 0.100 |
| J | 0.009 | 0.014 | 0.24 | 0.35 |
| K | 0.060 | 0.078 | 1.50 | 2.00 |
| L | 0.033 | 0.041 | 0.85 | 1.05 |
| M | 0 ° | 10 ° | 0 ° | 10 ° |
| S | 0.264 | 0.287 | 6.70 | 7.30 |

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR



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