

# 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.

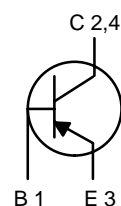
- High Collector–Emitter Sustaining Voltage –  
 $V_{CEO(sus)} = 300 \text{ Vdc @ } I_C$   
 $= 1.0 \text{ mAdc}$
- Excellent DC Current Gain –  
 $h_{FE} = 30\text{--}240 @ I_C$   
 $= 50 \text{ mAdc}$
- Epoxy Meets UL94, V-0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B; > 8000 V  
Machine Model,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



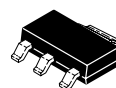
**ON Semiconductor®**

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

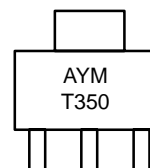


Schematic

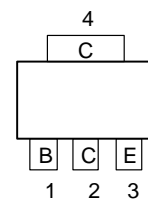


SOT-223  
CASE 318E  
Style 1

#### 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

# MMJT350T1

## MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ 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 – Peak	$I_C$	0.5 0.75	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ Total $P_D$ @ $T_A = 25^\circ\text{C}$ mounted on 1" sq. (645 sq. mm) Collector pad on FR–4 bd material Total $P_D$ @ $T_A = 25^\circ\text{C}$ mounted on 0.012" sq. (7.6 sq. mm) Collector pad on FR–4 bd material	$P_D$	2.75 22 1.40 0.65	W mW/ $^\circ\text{C}$ W W
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	–55 to +150	$^\circ\text{C}$

## THERMAL CHARACTERISTICS

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

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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Sustaining Voltage ( $I_C = 1.0$ mAdc, $I_B = 0$ Adc)	$V_{CEO(SUS)}$	300	–	Vdc
Collector–Base Current ( $V_{CB} = \text{Rated } V_{CBO}, V_{EB} = 0$ )	$I_{CBO}$	–	100	$\mu\text{Adc}$
Emitter Cut–off Current ( $V_{BE} = 5.0$ Vdc)	$I_{EBO}$	–	100	$\mu\text{Adc}$

### ON CHARACTERISTICS (Note )

DC Current Gain ( $I_C = 50$ mAdc, $V_{CE} = 10$ Vdc) ( $I_C = 100$ mAdc, $V_{CE} = 10$ Vdc)	$h_{FE}$	30 20	240 –	–
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# MMJT350T1

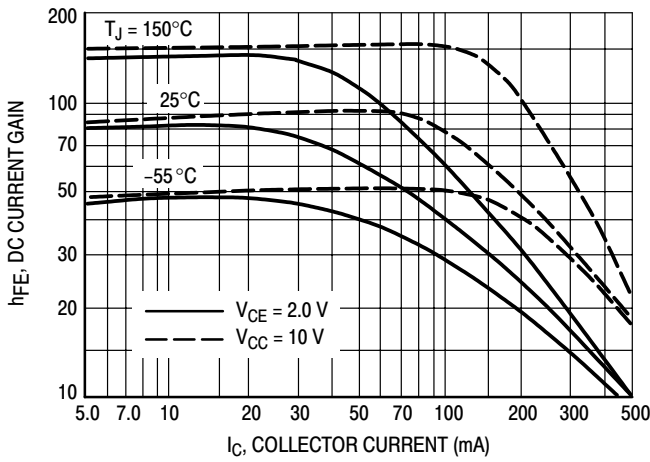


Figure 1. DC Current Gain

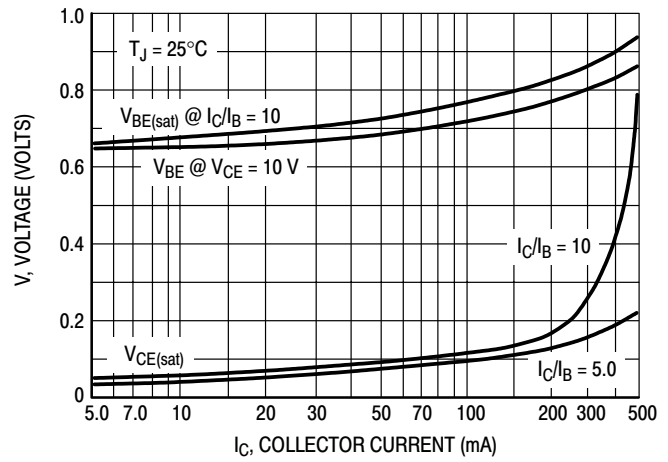


Figure 2. "On" Voltages

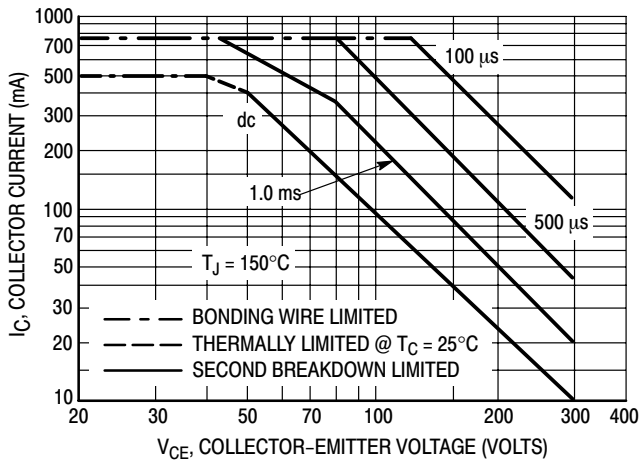


Figure 3. Active-Region Safe Operating Area

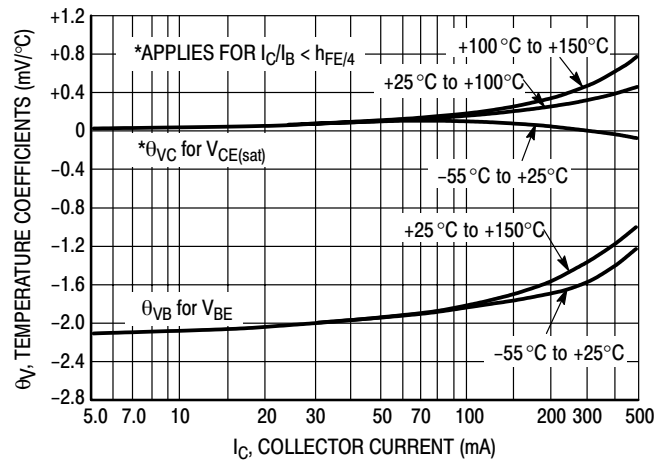


Figure 4. Temperature Coefficients

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

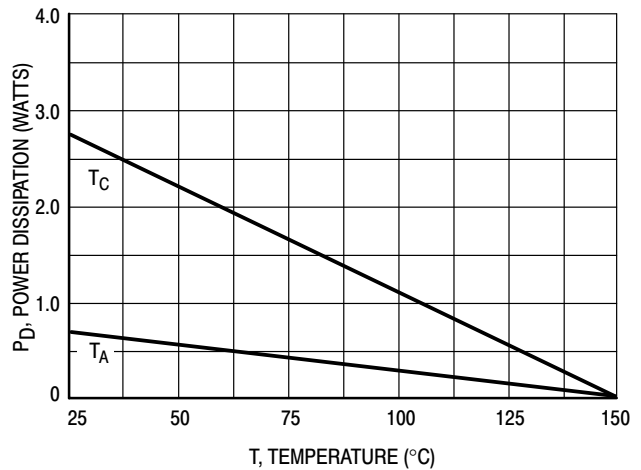
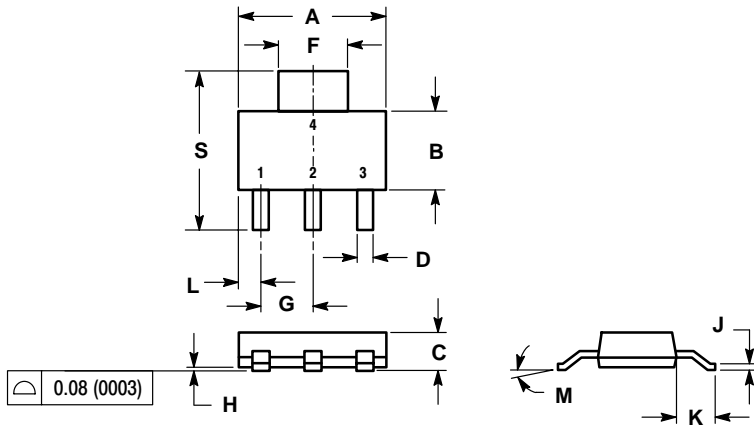


Figure 5. Power Derating

# 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.

DIM	INCHES		MILLIMETERS	
	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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