

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 ($T_C = 25^\circ\text{C}$ 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 @ $T_C = 25^\circ\text{C}$	P_D	342	mW
Total Power Dissipation @ $T_C = 85^\circ\text{C}$	P_D	178	mW
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	366	$^\circ\text{C}/\text{W}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	P_D	665	mW
Total Power Dissipation @ $T_C = 85^\circ\text{C}$	P_D	346	mW
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	188	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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.

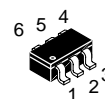
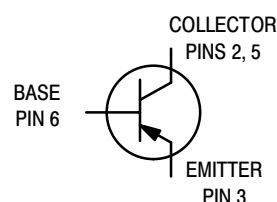
- Minimum FR-4 or G-10 PCB, Operating to Steady State.
- Mounted onto a 2" square FR-4 Board (1" sq. 2 oz Cu 0.06" thick single sided), Operating to Steady State.



ON Semiconductor®

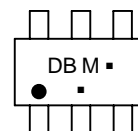
<http://onsemi.com>

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

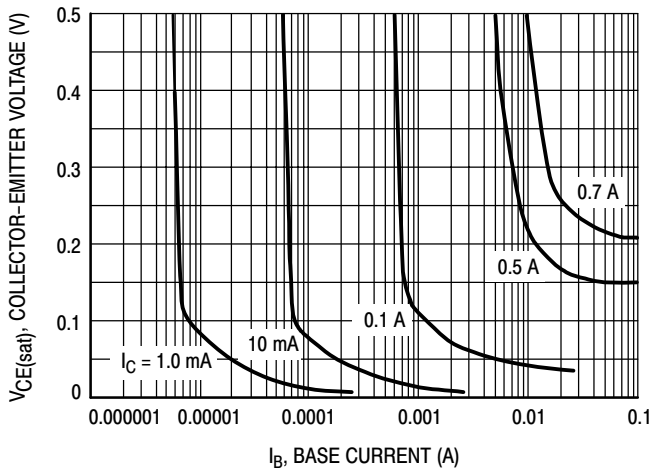


Figure 1. Collector Saturation Region

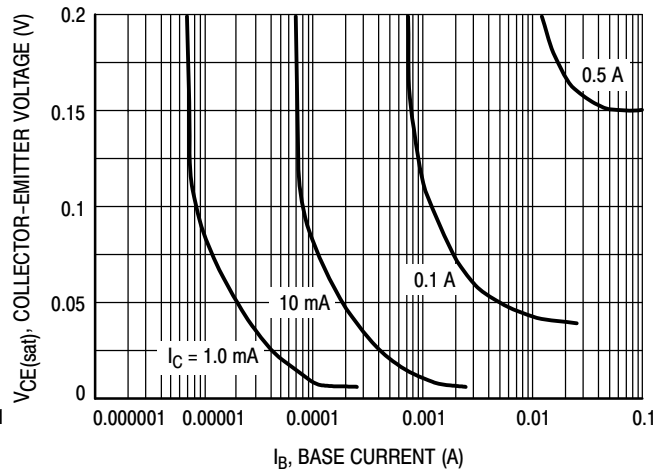


Figure 2. Collector Saturation Region

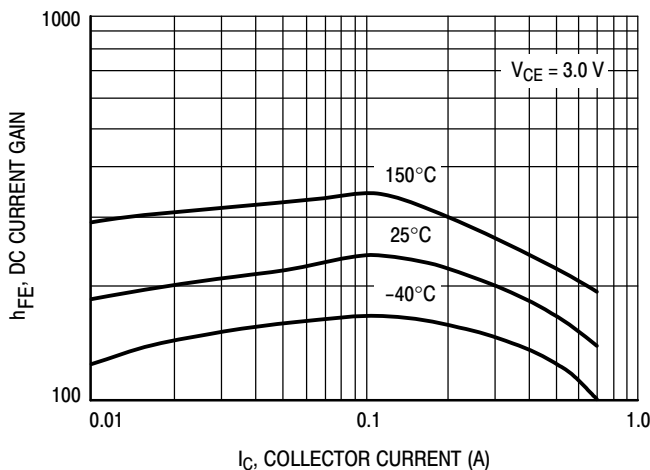


Figure 3. DC Current Gain

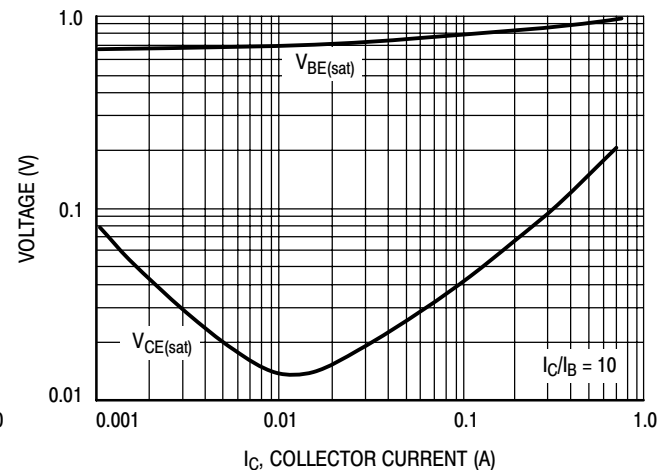


Figure 4. "ON" Voltages

MMBT2131T1

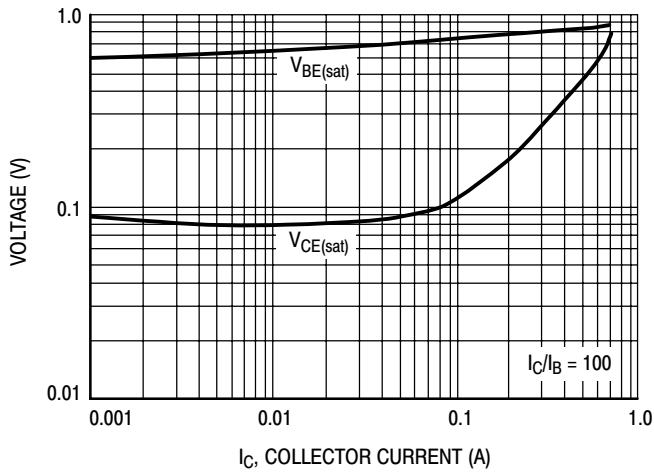


Figure 5. "ON" Voltages

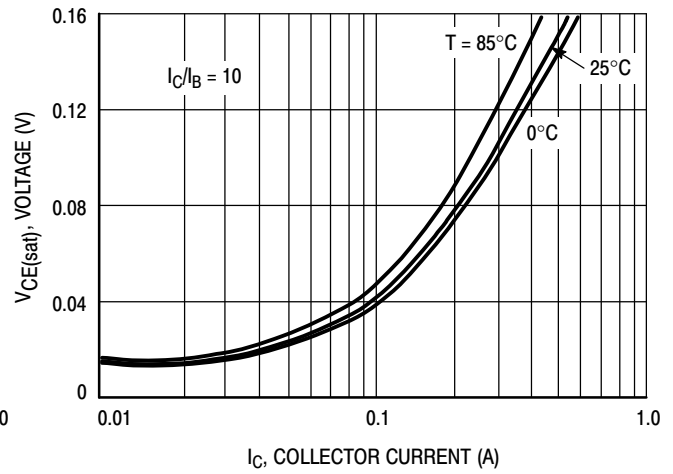


Figure 6. Collector-Emitter Saturation Voltage

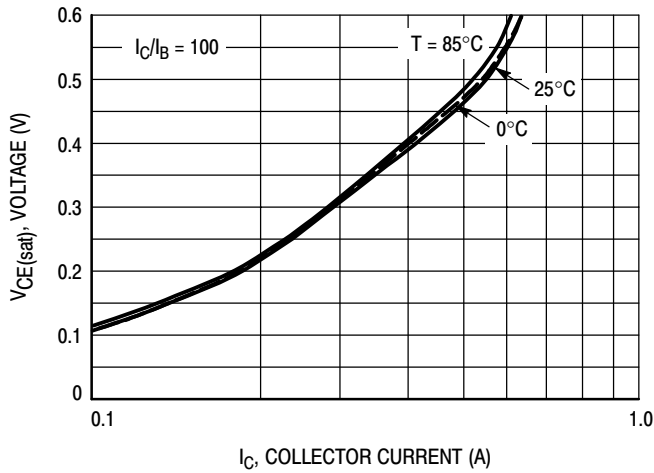


Figure 7. Collector-Emitter Saturation Voltage

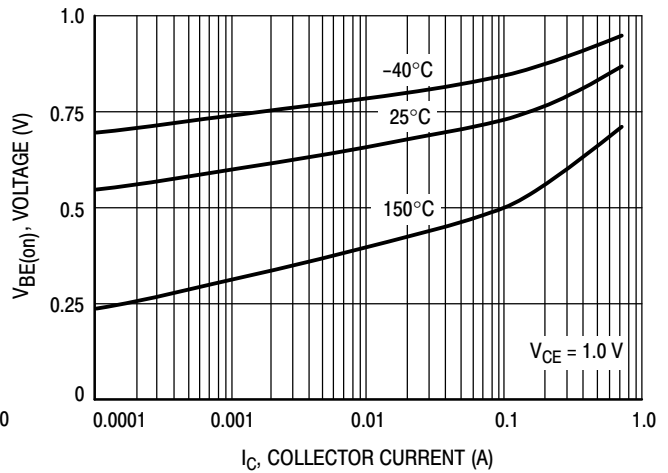


Figure 8. $V_{BE(on)}$ Voltage

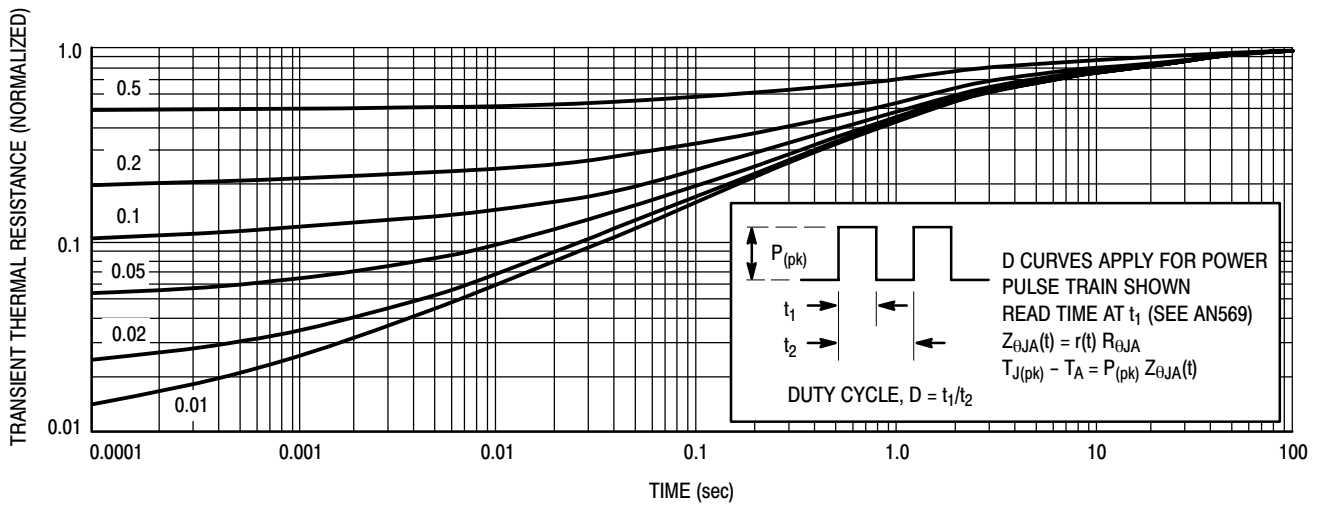
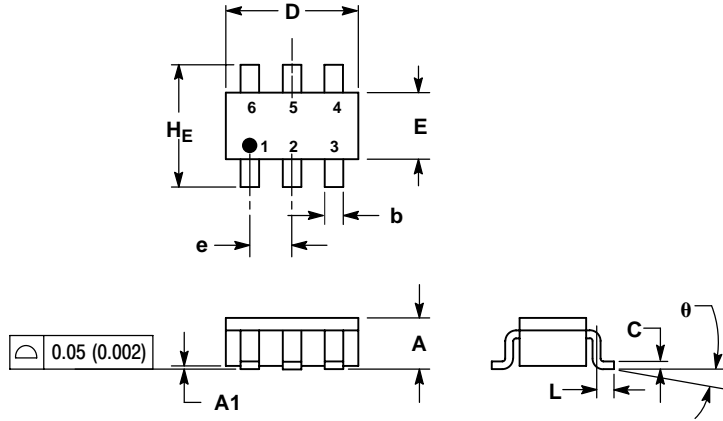


Figure 9. Thermal Response Curve

MMBT2131T1

PACKAGE DIMENSIONS

SC-74
CASE 318F-05
ISSUE L



NOTES:

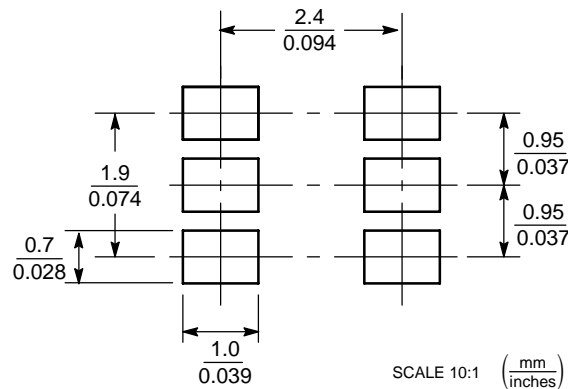
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F-01, -02, -03 OBSOLETE. NEW STANDARD 318F-04.

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
theta	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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MMBT2131T1/D