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

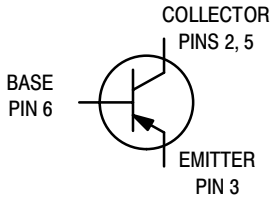
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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

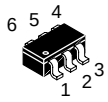
1. Minimum FR−4 or G−10 PCB, Operating to Steady State.
2. Mounted onto a 2″ square FR−4 Board (1″ sq. 2 oz Cu 0.06″ thick single sided), Operating to Steady State.

ON Semiconductor®

http://onsemi.com

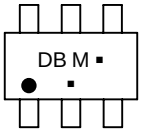
0.7 AMPERES
30 VOLTS − $V_{(BR)CEO}$
342 mW





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.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

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

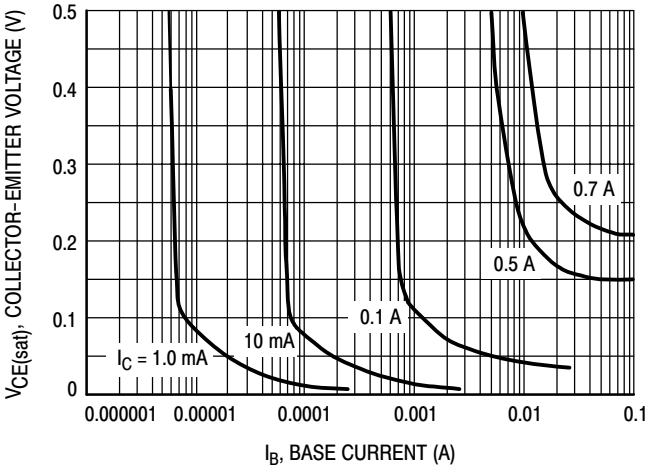


Figure 1. Collector Saturation Region

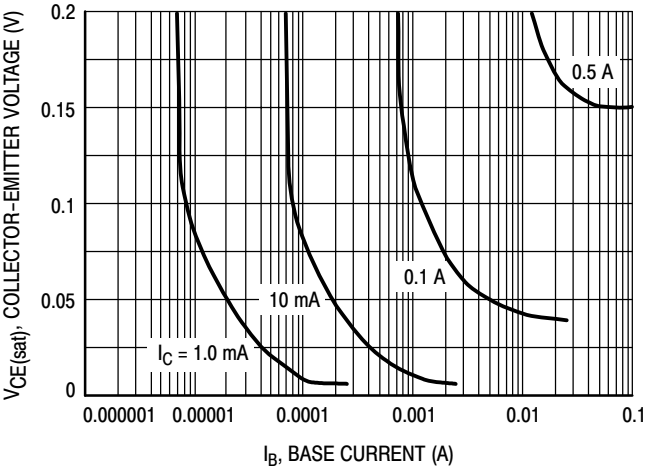


Figure 2. Collector Saturation Region

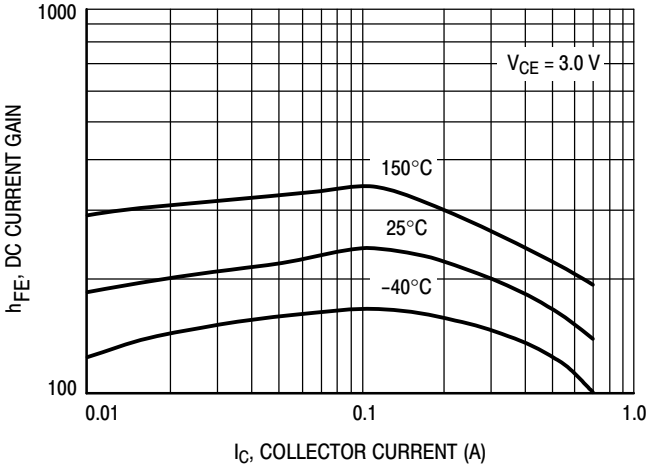


Figure 3. DC Current Gain

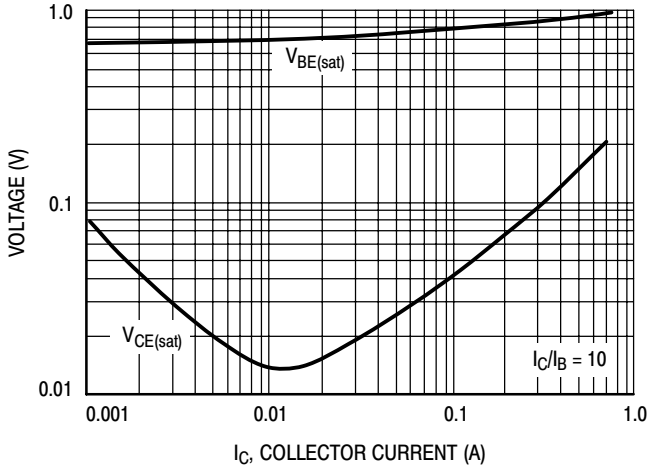


Figure 4. “ON” Voltages

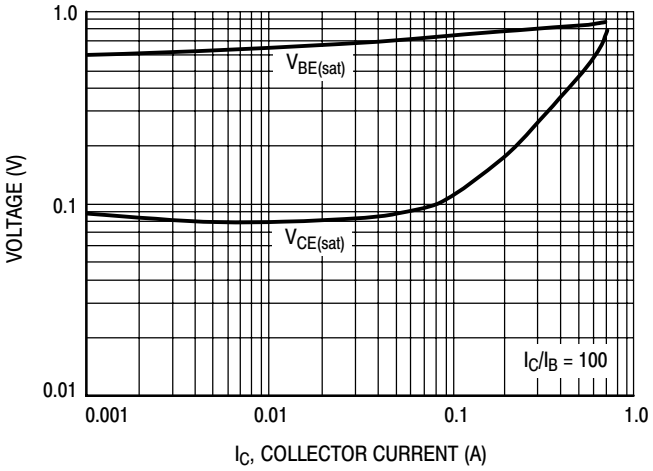


Figure 5. “ON” Voltages

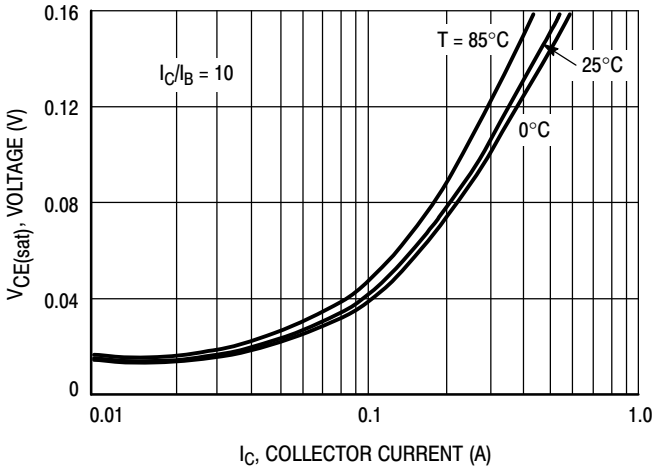


Figure 6. Collector−Emitter Saturation Voltage

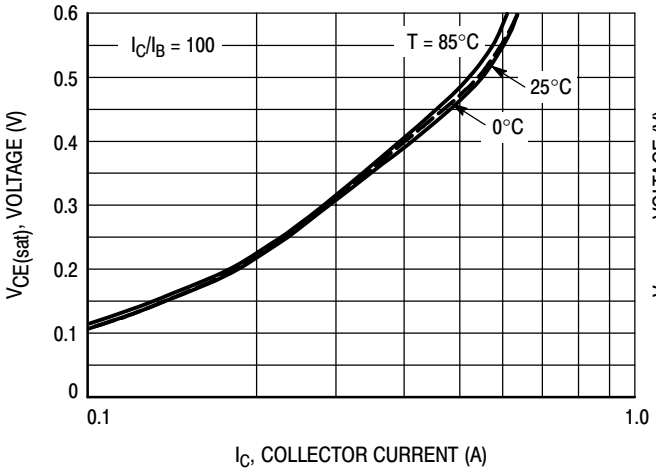


Figure 7. Collector−Emitter Saturation Voltage

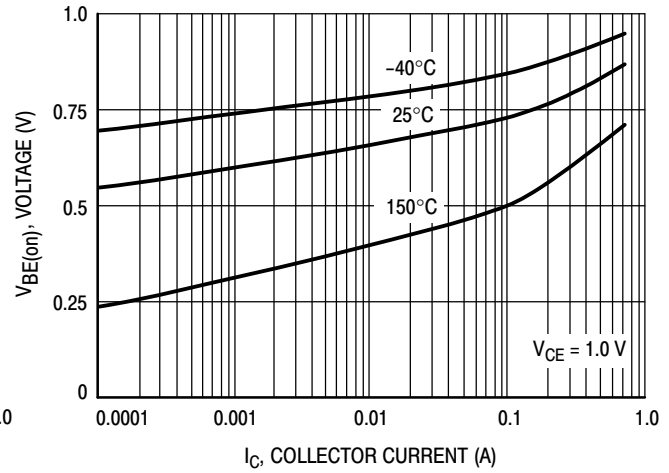


Figure 8. $V_{BE(on)}$ Voltage

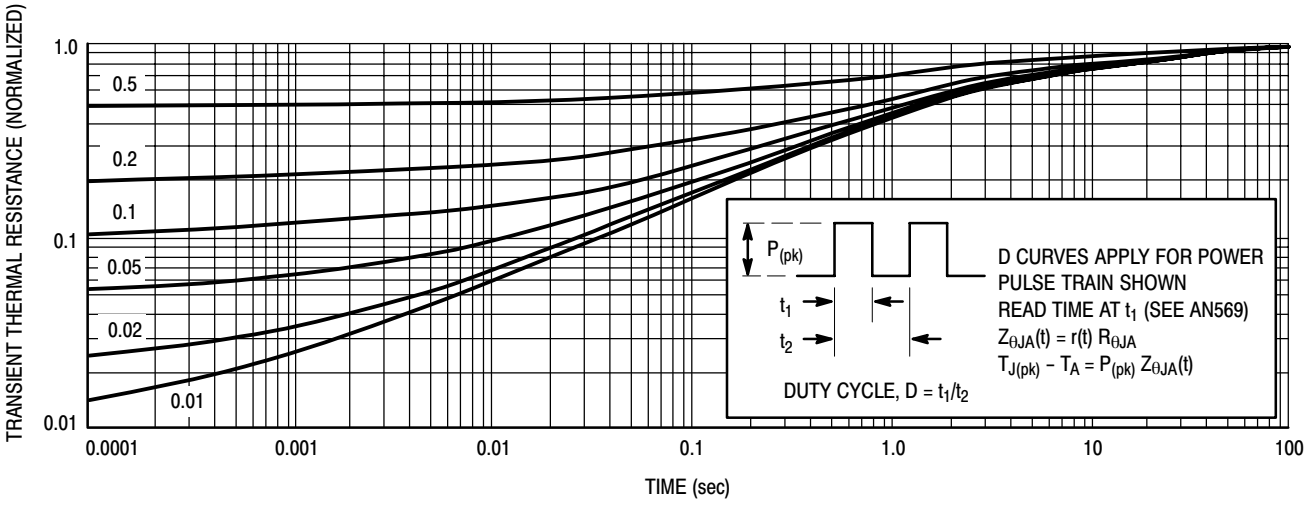
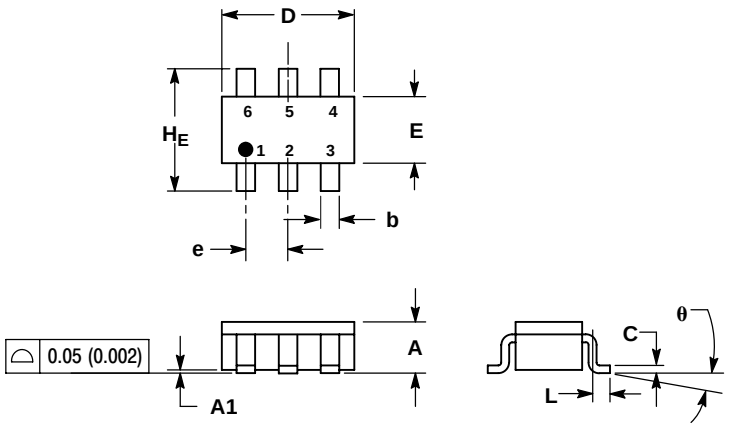


Figure 9. Thermal Response Curve

MMBT2131T1

PACKAGE DIMENSIONS

SC−74
CASE 318F−05
ISSUE L

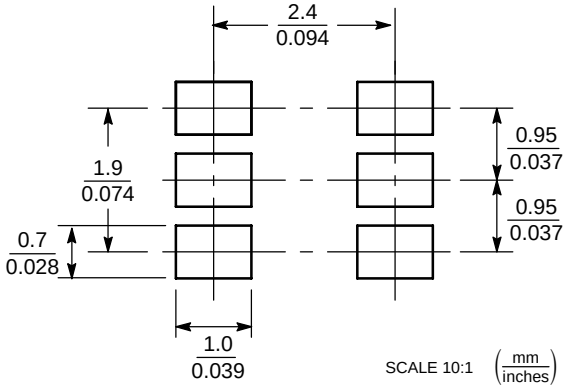


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F−01, −02, −03 OBSOLETE. NEW STANDARD 318F−04.

	MILLIMETERS			INCHES		
DIM	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
H_E	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.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

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2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.