

# MMBT2132T3

## General Purpose Transistors

### NPN Bipolar Junction 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	$^\circ\text{C/W}$
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	$^\circ\text{C/W}$
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.

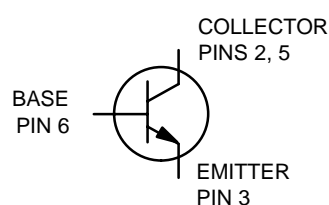
- Minimum FR-4 or G-10 PCB, Operating to Steady State.
- Mounted onto a 2" square FR-4 Board (1" sq 2 oz Cu 0.06" thick single sided), Operating to Steady State.



ON Semiconductor®

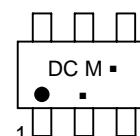
<http://onsemi.com>

**0.7 AMPS**  
**30 VOLTS –  $V_{(BR)CEO}$**   
**342 mW**



**TSOP-6/SC-74**  
**CASE 318F**  
**STYLE 2**

#### MARKING DIAGRAM



DC = Specific 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†
MMBT2132T3	TSOP-6	10,000/Tape & Reel
MMBT2132T3G	TSOP-6 (Pb-Free)	10,000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# MMBT2132T3

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

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

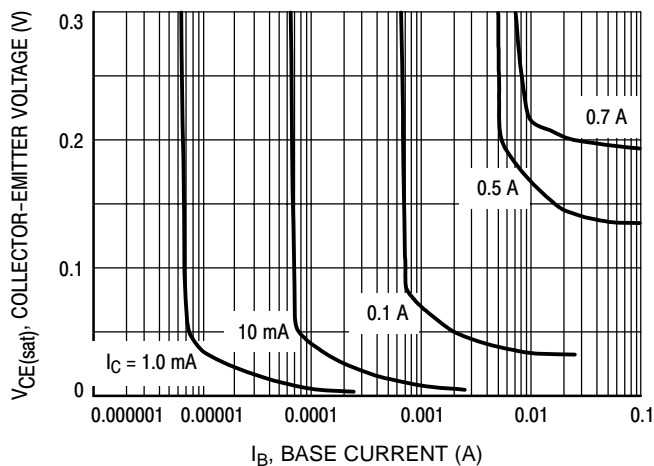


Figure 1. Collector Saturation Region

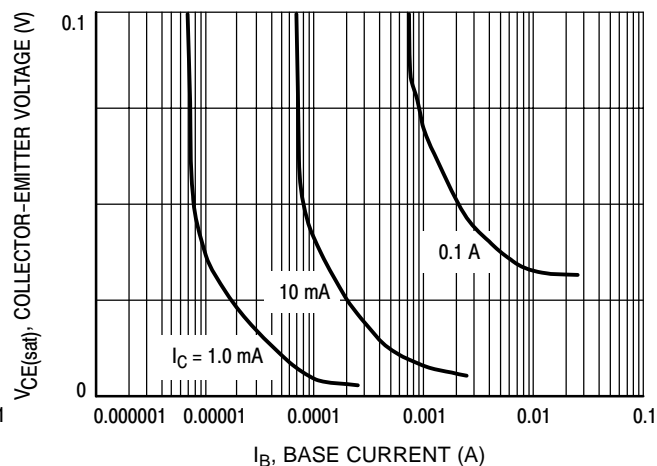


Figure 2. Collector Saturation Region

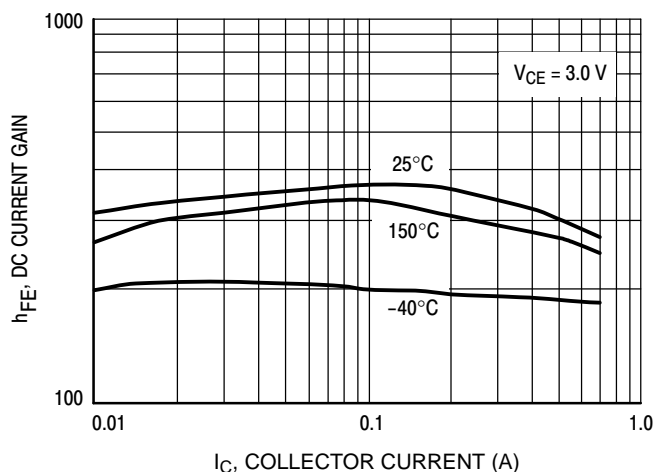


Figure 3. DC Current Gain

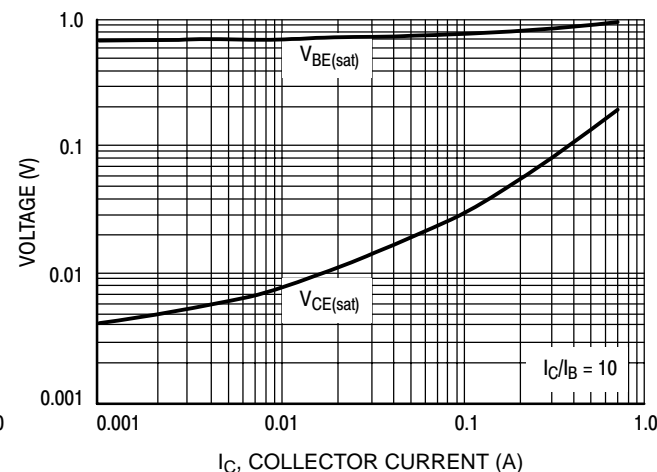


Figure 4. "ON" Voltages

# MMBT2132T3

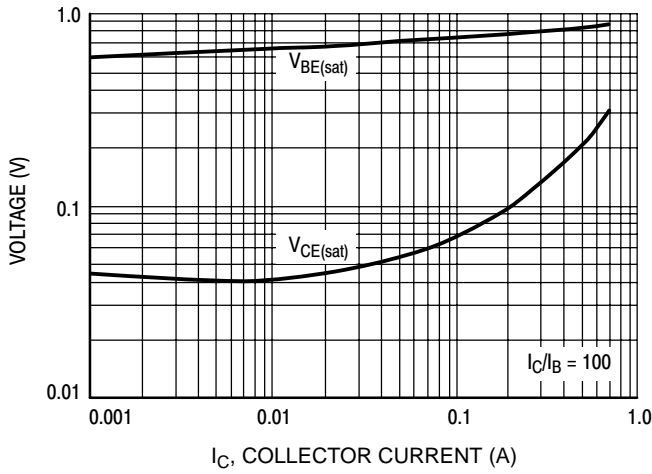


Figure 5. "ON" Voltages

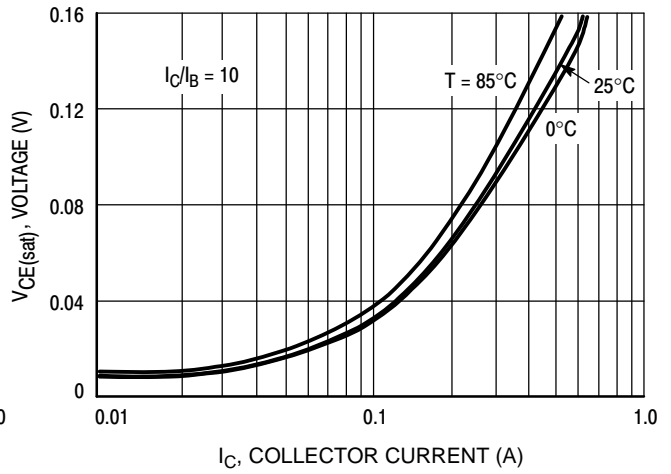


Figure 6. Collector-Emitter Saturation Voltage

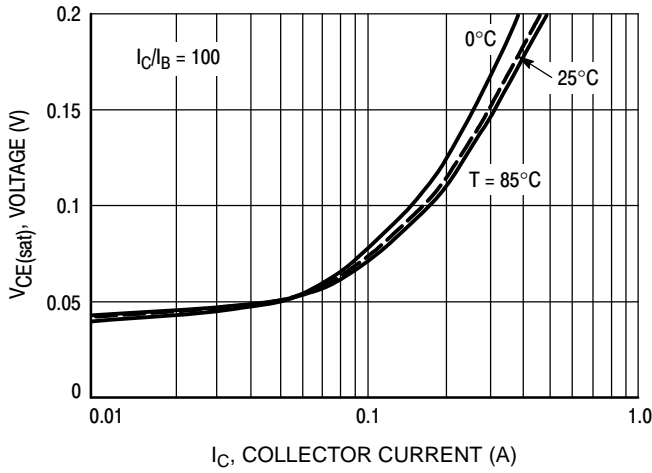


Figure 7. Collector-Emitter Saturation Voltage

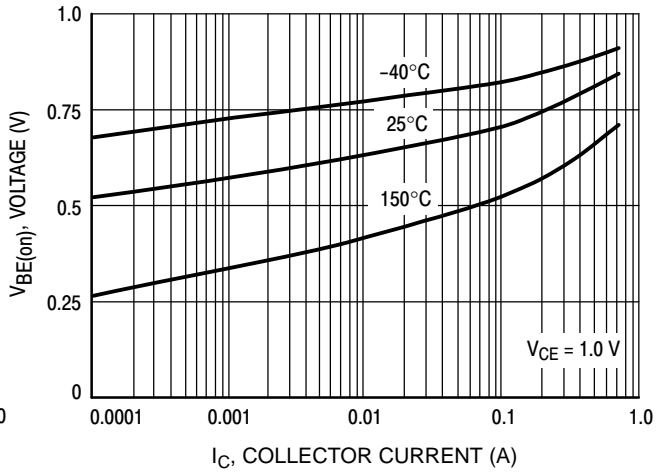


Figure 8.  $V_{BE(on)}$  Voltage

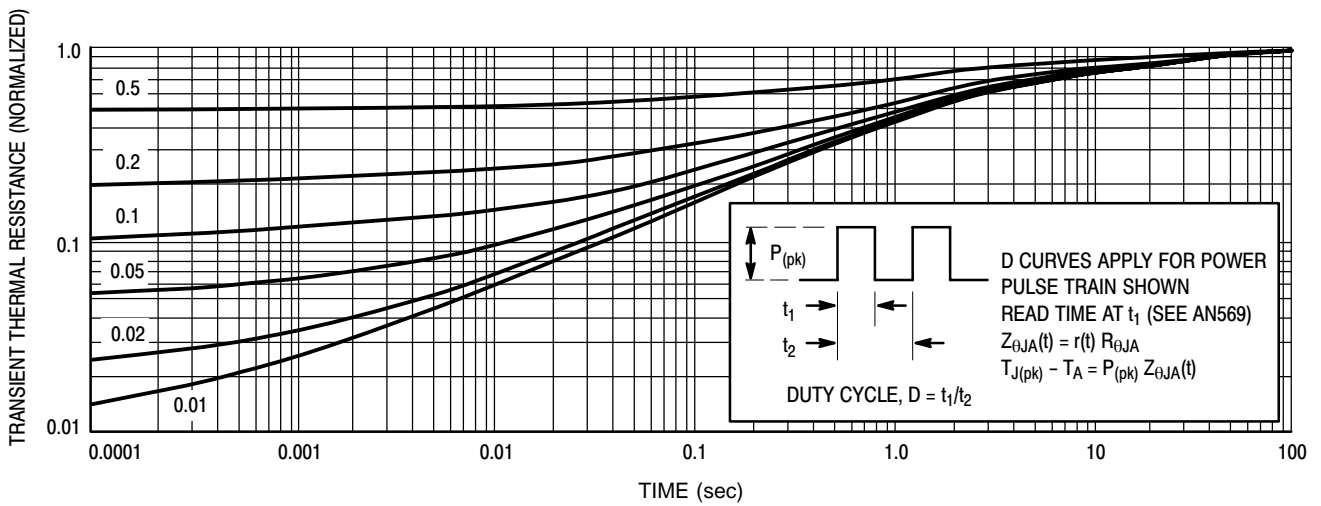


Figure 9. Thermal Response Curve

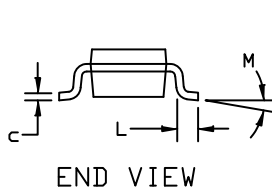
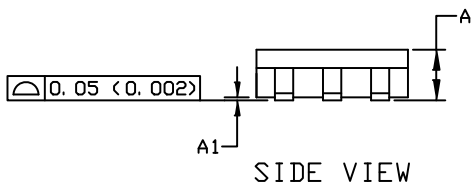
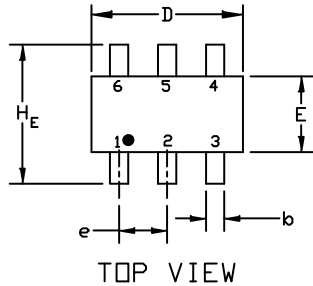
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



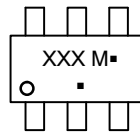
SCALE 2:1

**SC-74**  
CASE 318F  
ISSUE P

DATE 07 OCT 2021



### GENERIC MARKING DIAGRAM\*



XXX = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

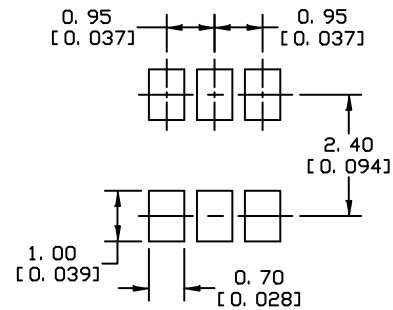
(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994
2. CONTROLLING DIMENSION: INCHES
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF THE BASE MATERIAL.

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
HE	2.50	2.75	3.00	0.099	0.108	0.118
L	0.20	0.40	0.60	0.008	0.016	0.024
M	0*	---	10*	0*	---	10*



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

### SOLDERING FOOTPRINT

- |   |  |   |  |   |   |
|---|--|---|--|---|---|
| <p>STYLE 1:<br/>PIN 1. CATHODE<br/>2. ANODE<br/>3. CATHODE<br/>4. CATHODE<br/>5. ANODE<br/>6. CATHODE</p>     | <p>STYLE 2:<br/>PIN 1. NO CONNECTION<br/>2. COLLECTOR<br/>3. EMITTER<br/>4. NO CONNECTION<br/>5. COLLECTOR<br/>6. BASE</p> | <p>STYLE 3:<br/>PIN 1. EMITTER 1<br/>2. BASE 1<br/>3. COLLECTOR 2<br/>4. EMITTER 2<br/>5. BASE 2<br/>6. COLLECTOR 1</p> | <p>STYLE 4:<br/>PIN 1. COLLECTOR 2<br/>2. EMITTER 1/EMITTER 2<br/>3. COLLECTOR 1<br/>4. EMITTER 3<br/>5. BASE 1/BASE 2/COLLECTOR 3<br/>6. BASE 3</p> | <p>STYLE 5:<br/>PIN 1. CHANNEL 1<br/>2. ANODE<br/>3. CHANNEL 2<br/>4. CHANNEL 3<br/>5. CATHODE<br/>6. CHANNEL 4</p> | <p>STYLE 6:<br/>PIN 1. CATHODE<br/>2. ANODE<br/>3. CATHODE<br/>4. CATHODE<br/>5. CATHODE<br/>6. CATHODE</p> |
| <p>STYLE 7:<br/>PIN 1. SOURCE 1<br/>2. GATE 1<br/>3. DRAIN 2<br/>4. SOURCE 2<br/>5. GATE 2<br/>6. DRAIN 1</p> | <p>STYLE 8:<br/>PIN 1. EMITTER 1<br/>2. BASE 2<br/>3. COLLECTOR 2<br/>4. EMITTER 2<br/>5. BASE 1<br/>6. COLLECTOR 1</p>    | <p>STYLE 9:<br/>PIN 1. EMITTER 2<br/>2. BASE 2<br/>3. COLLECTOR 1<br/>4. EMITTER 1<br/>5. BASE 1<br/>6. COLLECTOR 2</p> | <p>STYLE 10:<br/>PIN 1. ANODE/CATHODE<br/>2. BASE<br/>3. EMITTER<br/>4. COLLECTOR<br/>5. ANODE<br/>6. CATHODE</p>                                    | <p>STYLE 11:<br/>PIN 1. EMITTER<br/>2. BASE<br/>3. ANODE/CATHODE<br/>4. ANODE<br/>5. CATHODE<br/>6. COLLECTOR</p>   |   |

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<b>DESCRIPTION:</b>	<b>SC-74</b>	<b>PAGE 1 OF 1</b>

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