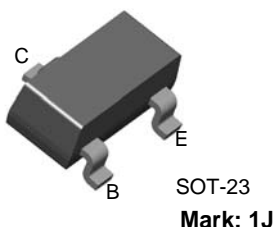


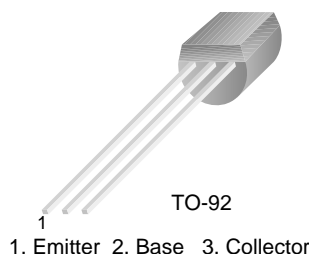
# MMBT2369 / PN2369 NPN Switching Transistor

- This device is designed for high speed saturated switching at collector currents of 10mA to 100mA.
- Sourced from process 21.

MMBT2369



PN2369



## Absolute Maximum Ratings \* $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Ratings	Units
$V_{CEO}$	Collector-Emitter Voltage	15	V
$V_{CBO}$	Collector-Base Voltage	40	V
$V_{EBO}$	Emitter-Base Voltage	4.5	V
$I_C$	Collector Current - Continuous	200	mA
$I_{CP}$	**Collector Current (Pulse)	400	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 ~ 150	$^\circ\text{C}$

\* This ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

\*\* Pulse Test: Pulse Width  $\leq 300\text{ms}$ , Duty Cycle  $\leq 2.0\%$

### NOTES:

- 1) These rating are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

## Thermal Characteristics $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max.	Units
$P_D$	Total Device Dissipation Derate above $25^\circ\text{C}$	350 2.8	mW mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^\circ\text{C/W}$

\* Device mounted on FR-4PCB 1.6"  $\times$  1.6"  $\times$  0.06".

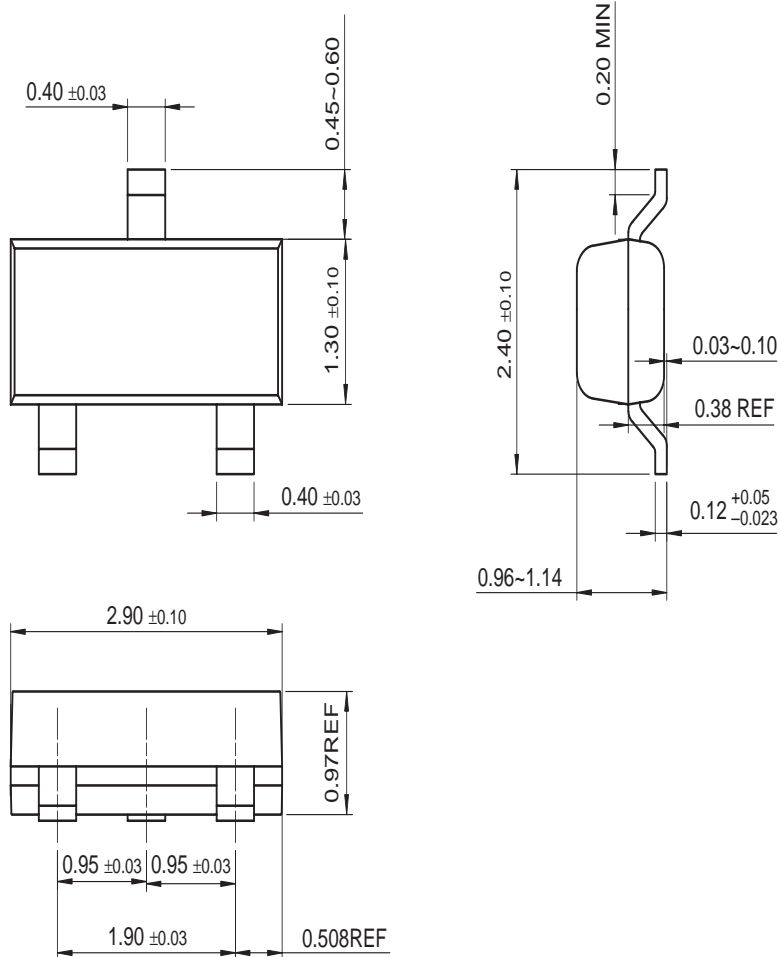
# Electrical Characteristics T<sub>a</sub> = 25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage *	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0	15		V
V <sub>(BR)CES</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 10μA, V <sub>BE</sub> = 0	40		V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	40		V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0	4.5		V
I <sub>CBO</sub>	Collector Cutoff Current	V <sub>CB</sub> = 20V, I <sub>E</sub> = 0 V <sub>CB</sub> = 20V, I <sub>E</sub> = 0, T <sub>a</sub> = 125°C		0.4 30	μA μA
<b>On Characteristics</b>					
h <sub>FE</sub>	DC Current Gain *	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 1.0V I <sub>C</sub> = 100mA, V <sub>CE</sub> = 2.0V	40 20	120	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage *	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1.0mA		0.25	V
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1.0mA	0.7	0.85	V
<b>Small Signal Characteristics</b>					
C <sub>obo</sub>	Output Capacitance	V <sub>CB</sub> = 5.0V, I <sub>E</sub> = 0, f = 1.0MHz		4.0	pF
C <sub>ibo</sub>	Input Capacitance	V <sub>EB</sub> = 0.5V, I <sub>C</sub> = 0, f = 1.0MHz		5.0	pF
h <sub>fe</sub>	Small -Signal Current Gain	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V, R <sub>G</sub> = 2.0kΩ, f = 100MHz	5.0		
<b>Switching Characteristics</b>					
t <sub>s</sub>	Storage Time	I <sub>B1</sub> = I <sub>B2</sub> = I <sub>C</sub> = 10mA		13	ns
t <sub>on</sub>	Turn-On Time	V <sub>CC</sub> = 3.0V, I <sub>C</sub> = 10mA, I <sub>B1</sub> = 3.0mA		12	ns
t <sub>off</sub>	Turn-Off Time	V <sub>CC</sub> = 3.0V, I <sub>C</sub> = 10mA, I <sub>B1</sub> = 3.0mA, I <sub>B2</sub> = 1.5mA		18	ns

\* Pulse Test: Pulse Width ≤ 300ms, Duty Cycle ≤ 2.0%

## Package Dimensions

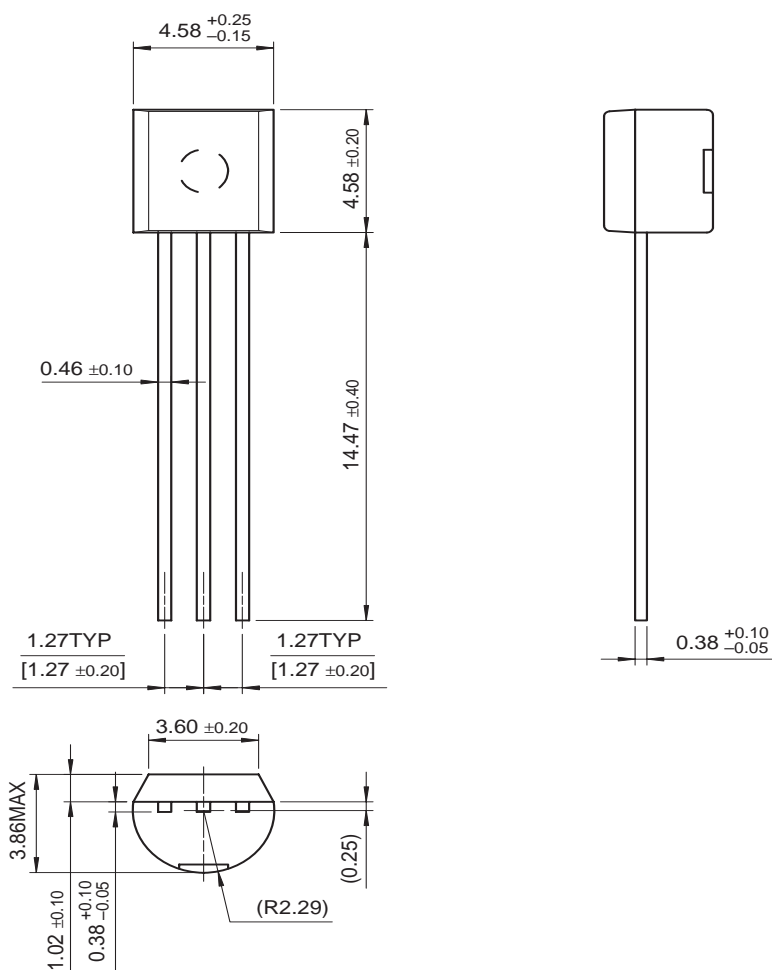
## SOT-23



Dimensions in Millimeters

## Package Dimensions (Continued)

TO-92






Dimensions in Millimeters



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