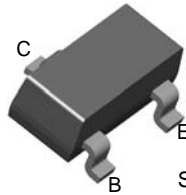


MMBT2369 / PN2369 NPN Switching Transistor

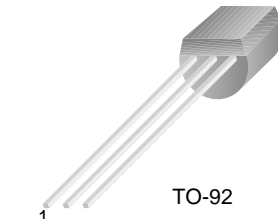
- This device is designed for high speed saturated switching at collector currents of 10mA to 100mA.
- Sourced from process 21.

MMBT2369



SOT-23
Mark: 1J

PN2369



TO-92
1. Emitter 2. Base 3. Collector

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 300ms, 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°C	350 2.8	mW mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	$^\circ\text{C}/\text{W}$

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

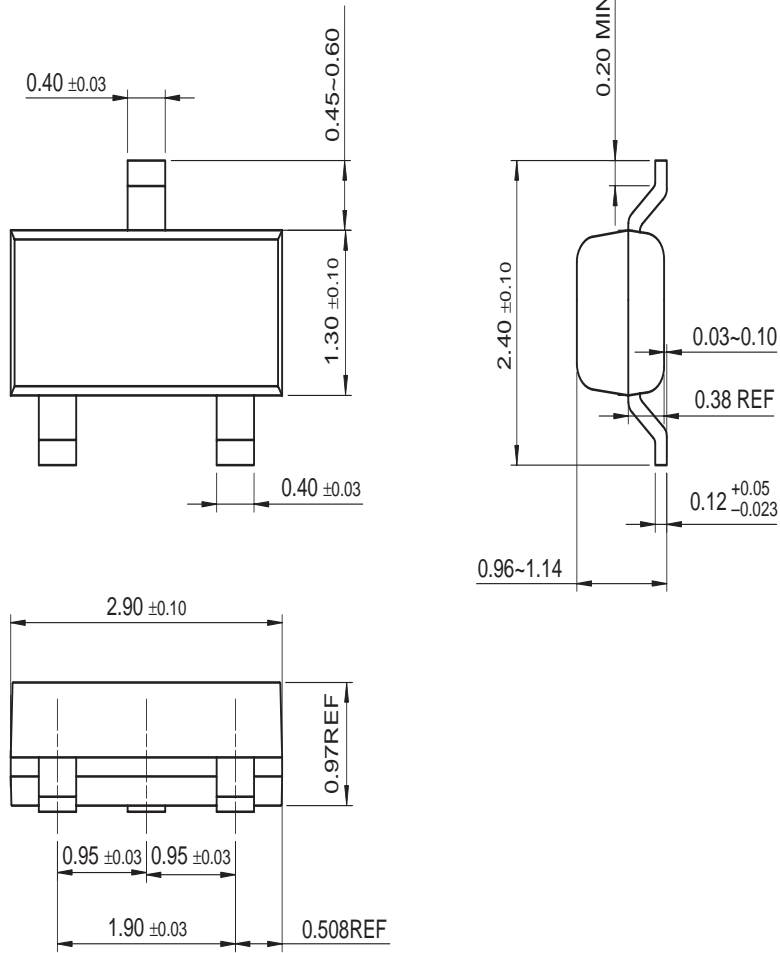
Electrical Characteristics T_a = 25°C unless otherwise noted

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

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

Package Dimensions

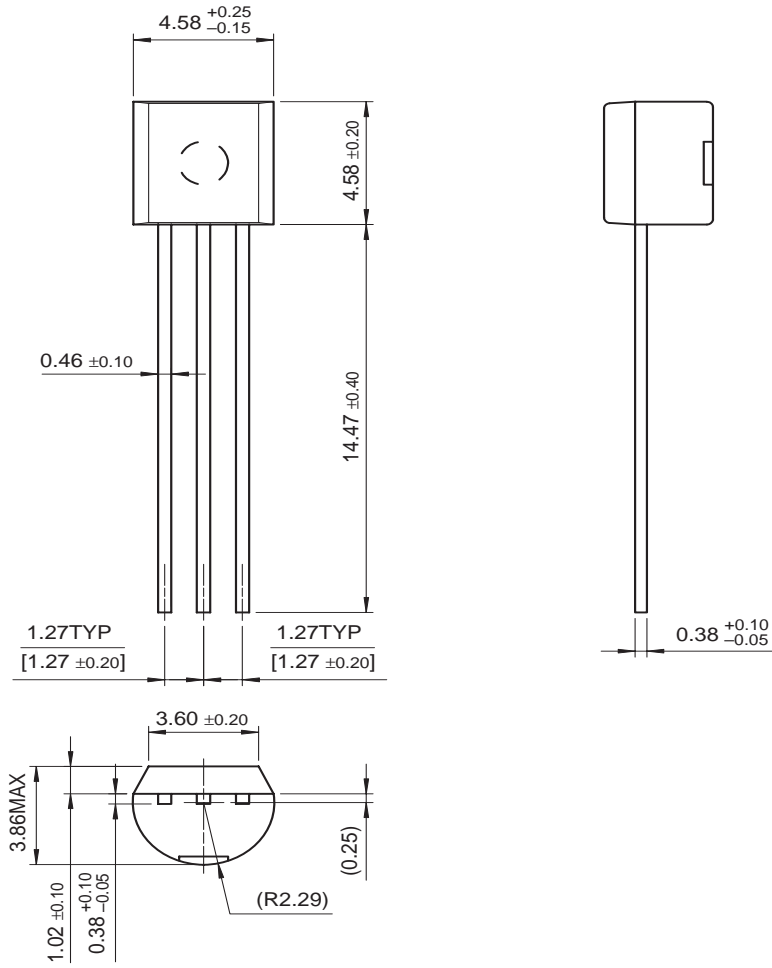
SOT-23



Dimensions in Millimeters

Package Dimensions (Continued)

TO-92




Dimensions in Millimeters



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