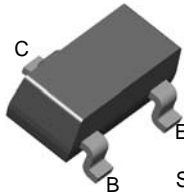


MMBT2369 / PN2369 NPN Switching Transistor

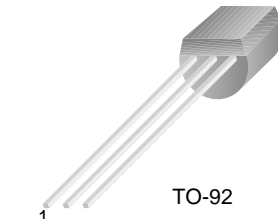
- This device is designed for high speed saturated switching at collector currents of 10mA to 100mA.
- Sourced from process 21.

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_{CE0}	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".

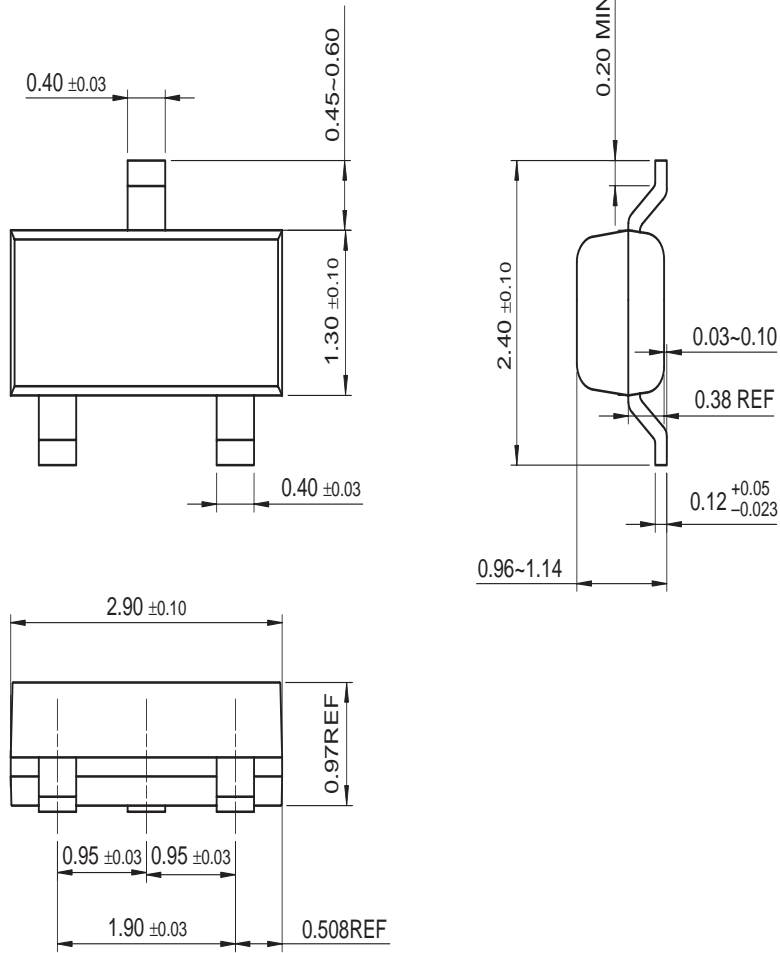
Electrical Characteristics T_a = 25°C unless otherwise noted

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

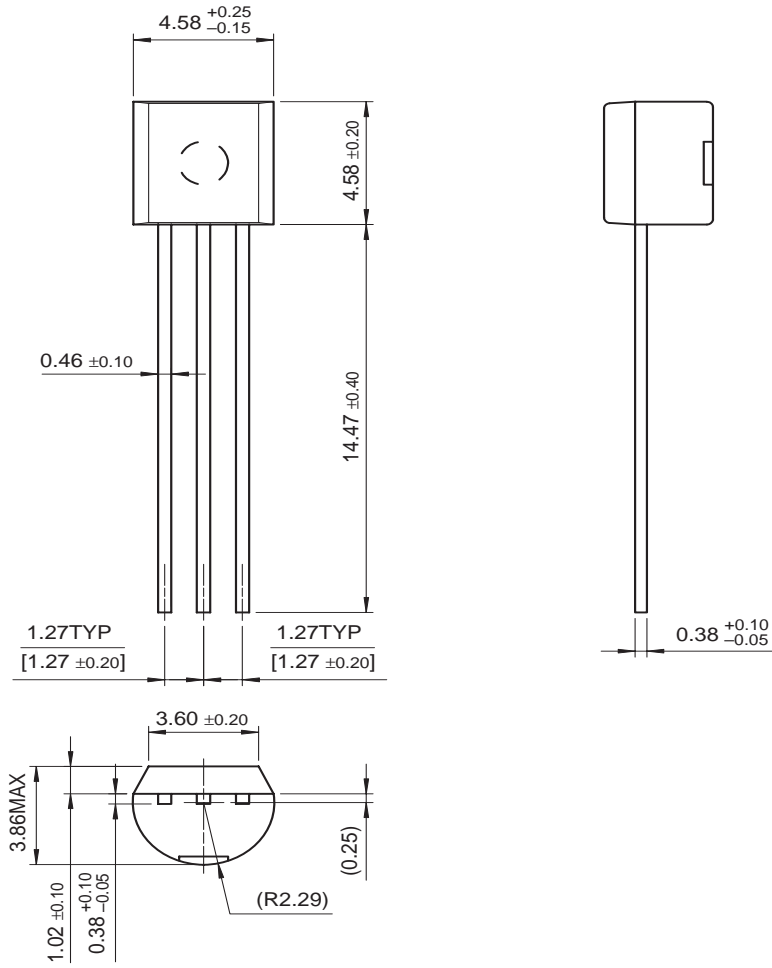
SOT-23



Dimensions in Millimeters

Package Dimensions (Continued)

TO-92




Dimensions in Millimeters



TRADEMARKS

The following are registered and unregistered trademarks and service marks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

- | | | | |
|--------------------------|---|----------------------------|----------------------|
| ACEx® | Green FPS™ | Power247® | SuperSOT™-8 |
| Build it Now™ | Green FPS™ e-Series™ | POWEREDGE® | SyncFET™ |
| CorePLUSTM | GTO™ | Power-SPM™ | The Power Franchise® |
| CROSSVOLT™ | i-Lo™ | PowerTrench® | the power franchise |
| CTL™ | IntelliMAX™ | Programmable Active Droop™ | QFET® |
| Current Transfer Logic™ | ISOPLANAR™ | QS™ | TinyBoost™ |
| EcoSPARK® | MegaBuck™ | QT Optoelectronics™ | TinyBuck™ |
| F ® | MICROCOUPLER™ | Quiet Series™ | TinyLogic® |
| Fairchild® | MicroFET™ | RapidConfigure™ | TINYOPTO™ |
| Fairchild Semiconductor® | MicroPak™ | SMART START™ | TinyPower™ |
| FACT Quiet Series™ | MillerDrive™ | SPM® | TinyPWM™ |
| FACT® | Motion-SPM™ | STEALTH™ | TinyWire™ |
| FAST® | OPTOLOGIC® | SuperFET™ | µSerDes™ |
| FastvCore™ | OPTOPLANAR® | SuperSOT™-3 | UHC® |
| FPS™ |  ® | SuperSOT™-6 | UniFET™ |
| FRFET® | PDP-SPM™ | | VCX™ |
| Global Power ResourceSM | Power220® | | |

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.