

MMBT2369L, MMBT2369AL

Switching Transistors

NPN Silicon

Features

- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	15	Vdc
Collector-Emitter Voltage	V_{CES}	40	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4.5	Vdc
Collector Current - Continuous	I_C	200	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

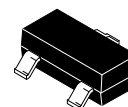
1. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

2. Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.

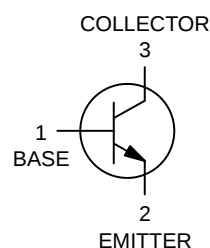


ON Semiconductor®

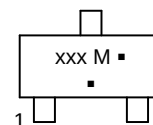
<http://onsemi.com>



SOT-23
CASE 318
STYLE 6



MARKING DIAGRAM



xxx = M1J or 1JA
M = Date Code*
▪ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
MMBT2369LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
SMMBT2369LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
MMBT2369ALT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
SMMBT2369ALT1G	SOT-23 (Pb-Free)	3,000 / 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.

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage (Note 3) (I _C = 10 mAdc, I _B = 0)	V _{(BR)CEO}	15	–	–	Vdc
Collector – Emitter Breakdown Voltage (I _C = 10 µAdc, V _{BE} = 0)	V _{(BR)CES}	40	–	–	Vdc
Collector – Base Breakdown Voltage (I _C = 10 µAdc, I _E = 0)	V _{(BR)CBO}	40	–	–	Vdc
Emitter – Base Breakdown Voltage (I _E = 10 µAdc, I _C = 0)	V _{(BR)EBO}	4.5	–	–	Vdc
Collector Cutoff Current (V _{CB} = 20 Vdc, I _E = 0) (V _{CB} = 20 Vdc, I _E = 0, T _A = 150°C)	I _{CBO}	– –	– –	0.4 30	µAdc
Collector Cutoff Current MMBT2369A (V _{CE} = 20 Vdc, V _{BE} = 0)	I _{CES}	–	–	0.4	µAdc

ON CHARACTERISTICS

DC Current Gain (Note 3) MMBT2369 (I _C = 10 mAdc, V _{CE} = 1.0 Vdc) MMBT2369A (I _C = 10 mAdc, V _{CE} = 1.0 Vdc) MMBT2369A (I _C = 10 mAdc, V _{CE} = 0.35 Vdc) MMBT2369A (I _C = 10 mAdc, V _{CE} = 0.35 Vdc, T _A = –55°C) MMBT2369A (I _C = 30 mAdc, V _{CE} = 0.4 Vdc) MMBT2369 (I _C = 100 mAdc, V _{CE} = 2.0 Vdc) MMBT2369A (I _C = 100 mAdc, V _{CE} = 1.0 Vdc)	h _{FE}	40 – 40 20 30 20 20	– – – – – – –	120 120 – – – – –	–
Collector – Emitter Saturation Voltage (Note 3) MMBT2369 (I _C = 10 mAdc, I _B = 1.0 mAdc) MMBT2369A (I _C = 10 mAdc, I _B = 1.0 mAdc) MMBT2369A (I _C = 10 mAdc, I _B = 1.0 mAdc, T _A = +125°C) MMBT2369A (I _C = 30 mAdc, I _B = 3.0 mAdc) MMBT2369A (I _C = 100 mAdc, I _B = 10 mAdc)	V _{CE(sat)}	– – – – –	– – – – –	0.25 0.20 0.30 0.25 0.50	Vdc
Base – Emitter Saturation Voltage (Note 3) MMBT2369/A (I _C = 10 mAdc, I _B = 1.0 mAdc) MMBT2369A (I _C = 10 mAdc, I _B = 1.0 mAdc, T _A = –55°C) MMBT2369A (I _C = 30 mAdc, I _B = 3.0 mAdc) MMBT2369A (I _C = 100 mAdc, I _B = 10 mAdc)	V _{BE(sat)}	0.7 – – –	– – – –	0.85 1.02 1.15 1.60	Vdc

SMALL-SIGNAL CHARACTERISTICS

Output Capacitance (V _{CB} = 5.0 Vdc, I _E = 0, f = 1.0 MHz)	C _{obo}	–	–	4.0	pF
Small Signal Current Gain (I _C = 10 mAdc, V _{CE} = 10 Vdc, f = 100 MHz)	h _{fe}	5.0	–	–	–

SWITCHING CHARACTERISTICS

Storage Time (I _{B1} = I _{B2} = I _C = 10 mAdc)	t _s	–	5.0	13	ns
Turn-On Time (V _{CC} = 3.0 Vdc, I _C = 10 mAdc, I _{B1} = 3.0 mAdc)	t _{on}	–	8.0	12	ns
Turn-Off Time (V _{CC} = 3.0 Vdc, I _C = 10 mAdc, I _{B1} = 3.0 mAdc, I _{B2} = 1.5 mAdc)	t _{off}	–	10	18	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%.

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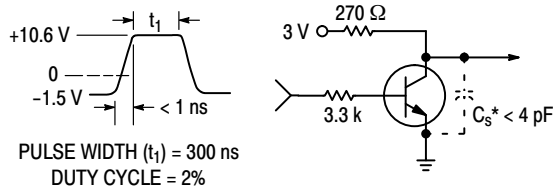


Figure 1. t_{on} Circuit – 10 mA

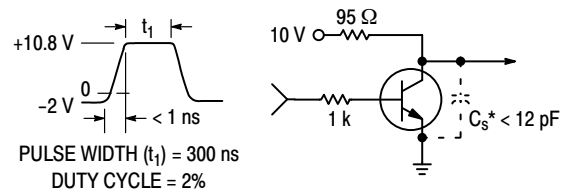


Figure 2. t_{on} Circuit – 100 mA

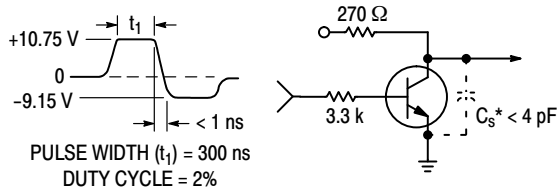


Figure 3. t_{off} Circuit – 10 mA

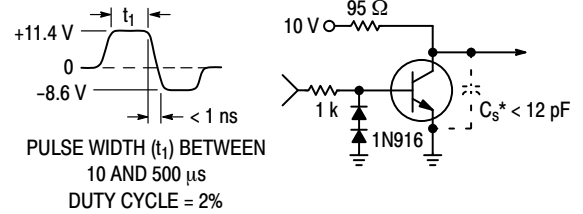


Figure 4. t_{off} Circuit – 100 mA

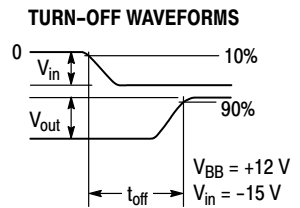
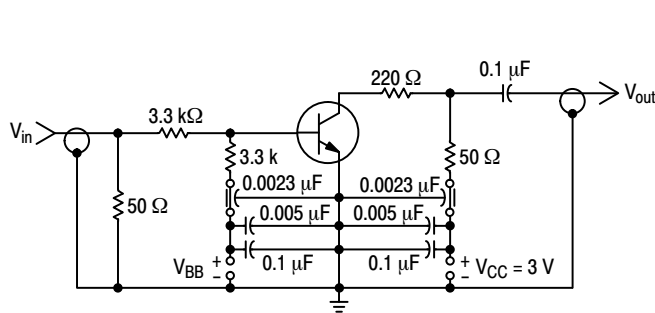
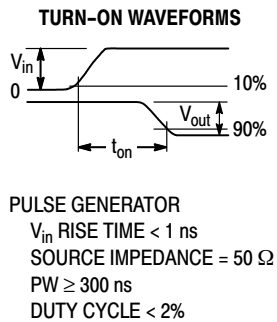


Figure 5. Turn-On and Turn-Off Time Test Circuit

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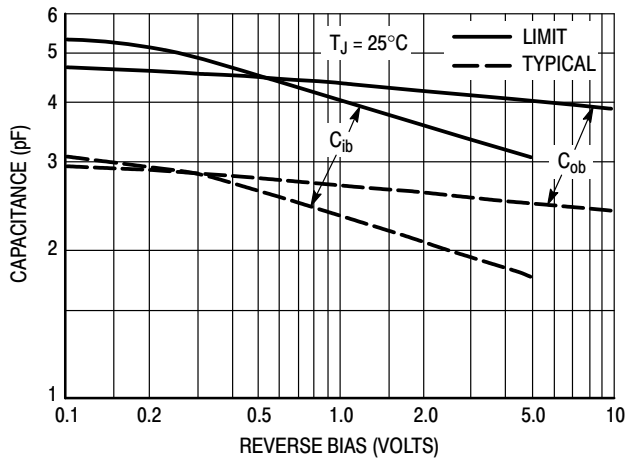


Figure 6. Junction Capacitance Variations

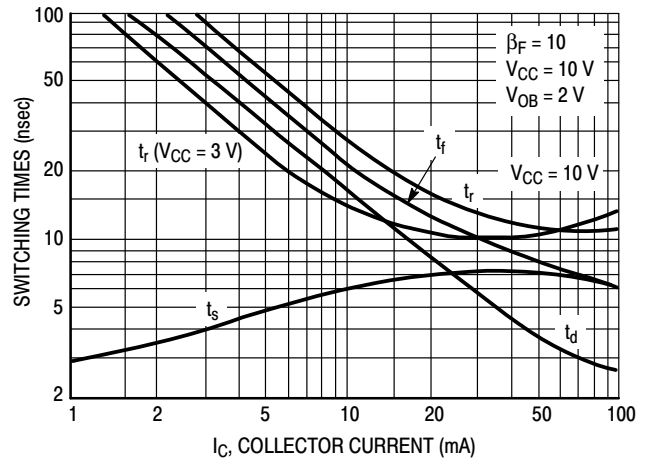


Figure 7. Typical Switching Times

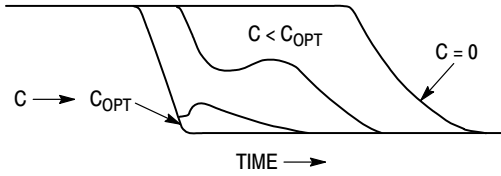


Figure 8. Turn-Off Waveform

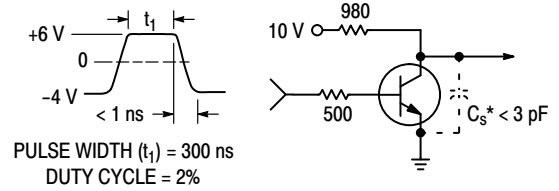


Figure 9. Storage Time Equivalent Test Circuit

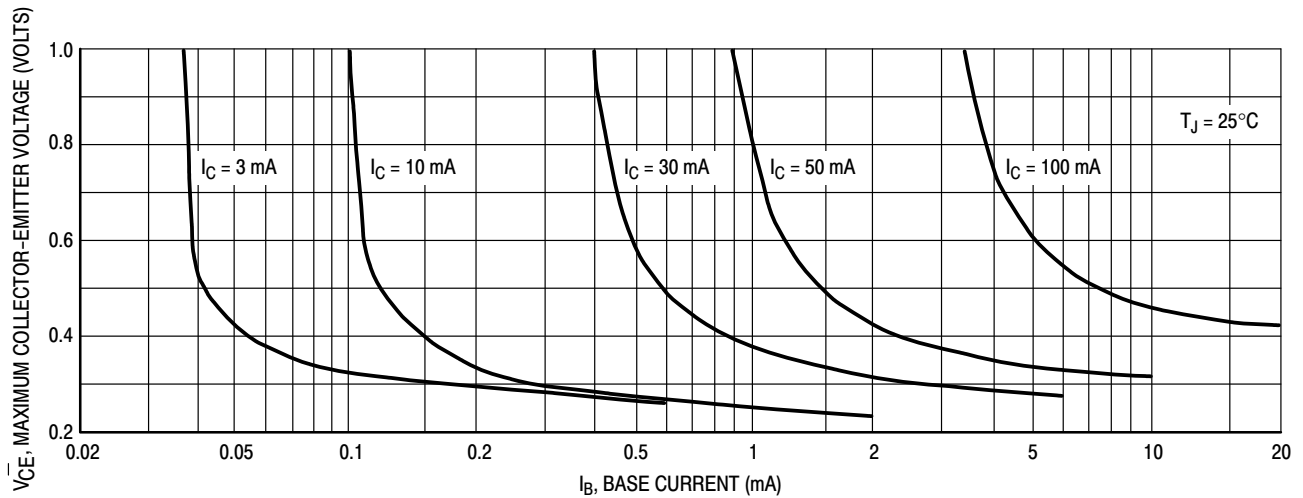


Figure 10. Maximum Collector Saturation Voltage Characteristics

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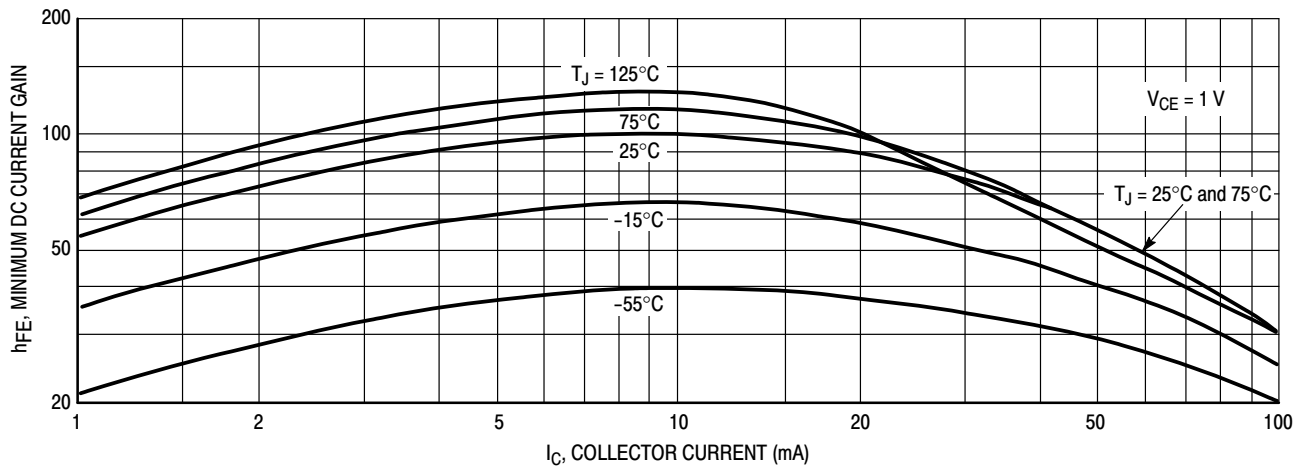


Figure 11. Minimum Current Gain Characteristics

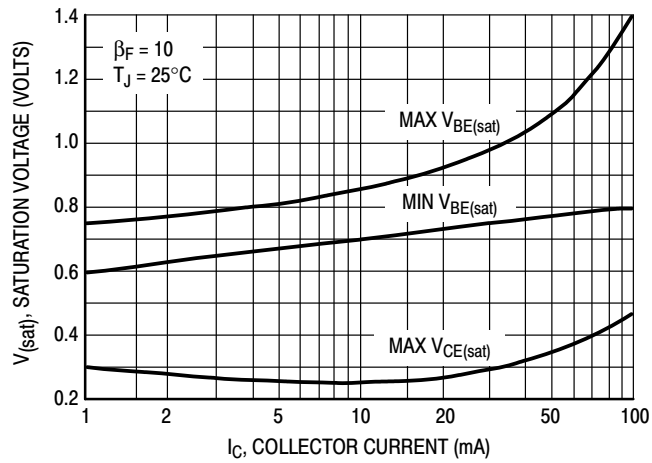


Figure 12. Saturation Voltage Limits

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9