Product data sheet

1. General description

High-speed switching diode, encapsulated in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- High switching speed: t_{rr} ≤ 4 ns
- Low leakage current
- Repetitive peak reverse voltage V_{RRM} ≤ 100 V
- · Low capacitance
- Small SMD plastic package
- High-temperature applications up to 175 °C
- AEC-Q101 qualified

3. Applications

- · High-speed switching
- · General-purpose switching

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
V_{RRM}	repetitive peak reverse voltage	T _j = 25 °C		-	-	100	V
I _F	forward current		[1]	-	-	215	mA
V _R	reverse voltage			-	-	100	V
V _F	forward voltage	I _F = 150 mA	[2]	-	-	1.25	V
I _R	reverse current	V _R = 80 V; T _j = 25 °C		-	-	0.5	μΑ
t _{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; R_L = 100 Ω ; $I_{R(meas)}$ = 1 mA; T_{amb} = 25 °C		-	-	4	ns

- [1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-side copper, tin-plated and standard footprint.
- [2] Pulsed test: $t_p \le 300 \ \mu s$; $\delta \le 0.02$



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5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	А	anode	3	K
2	n.c.	not connected		A n.c.
3	K	cathode		006aaa764
			1 2	
			TO-236AB (SOT23)	

6. Ordering information

Table 3. Ordering information

Table 3. Ordering intori	nation						
Type number	Package	nge .					
	Name	Description	Version				
BAS16TH	TO-236AB	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23				

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAS16TH	SP%

[1] % = placeholder for manufacturing site code

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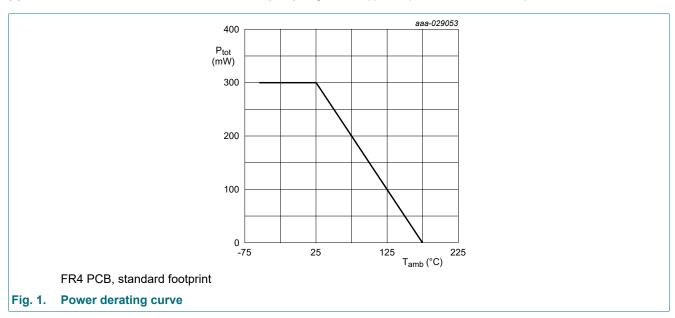
8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{RRM}	repetitive peak reverse voltage	T _j = 25 °C		-	100	V
V _R	reverse voltage			-	100	V
I _F	forward current		[1]	-	215	mA
I _{FSM}	non-repetitive peak	t_p = 1 μ s; $T_{j(init)}$ = 25 °C; square wave		-	4	Α
	forward current	t _p = 1 ms; T _{j(init)} = 25 °C; square wave		-	1	Α
		t_p = 1 s; $T_{j(init)}$ = 25 °C; square wave		-	0.5	Α
I _{FRM}	repetitive peak forward current	$t_p \le 0.5 \text{ ms}; \delta = 0.25$		-	500	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	300	mW
Tj	junction temperature			-	175	°C
T _{amb}	ambient temperature			-55	175	°C
T _{stg}	storage temperature			-65	175	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-side copper, tin-plated and standard footprint.



9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	330	K/W

^[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-side copper, tin-plated and standard footprint.

^[2] Soldering point of cathode tab.

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10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
V _F	forward voltage	I _F = 1 mA	[1]	-	-	715	mV
		I _F = 10 mA	[1]	-	-	855	mV
		I _F = 50 mA	[1]	-	-	1	V
		I _F = 150 mA	[1]	-	-	1.25	V
I _R rev	reverse current	V _R = 25 V; T _j = 25 °C		-	-	30	nA
		V _R = 80 V; T _j = 25 °C		-	-	0.5	μΑ
		V _R = 25 V; T _j = 150 °C		-	-	30	μΑ
		V _R = 80 V; T _j = 150 °C		-	-	50	μΑ
C _d	diode capacitance	$V_R = 0 \text{ V; } f = 1 \text{ MHz; } T_j = 25 ^{\circ}\text{C}$		-	-	1.5	pF
t _{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; R_L = 100 Ω; $I_{R(meas)}$ = 1 mA; I_{Rmb} = 25 °C		-	-	4	ns
V_{FRM}	peak forward recovery voltage	$I_F = 10 \text{ mA}; t_r = 20 \text{ ns}$		-	-	1.75	V

[1] Pulsed test: $t_p \le 300 \mu s$; $\delta \le 0.02$

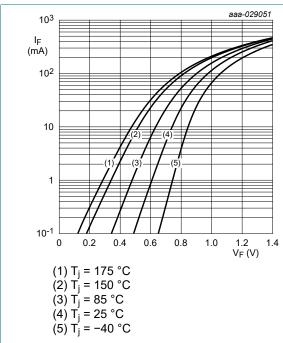


Fig. 2. Forward current as a function of forward voltage; typical values

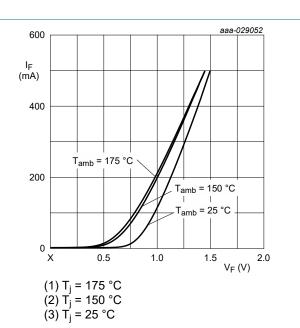


Fig. 3. Forward current as a function of forward voltage; typical values

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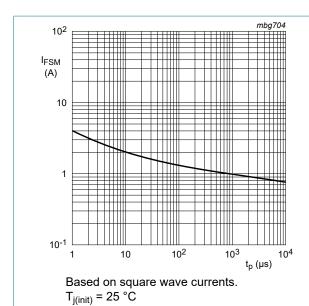


Fig. 4. Non-repetitive peak forward current as a function of pulse duration; typical values

 $f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^{\circ}\text{C}$

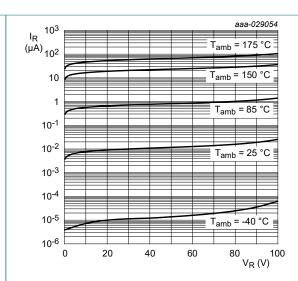


Fig. 5. Reverse current as a function of reverse voltage; typical values

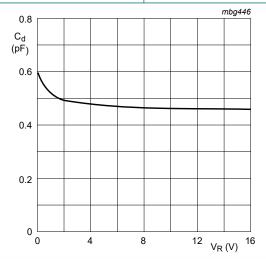


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

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11. Test information

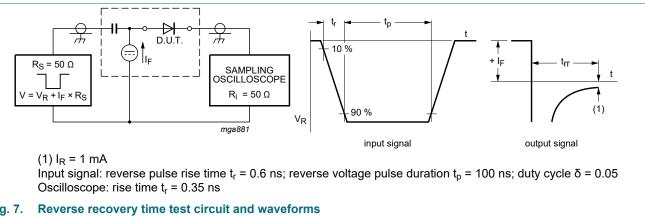
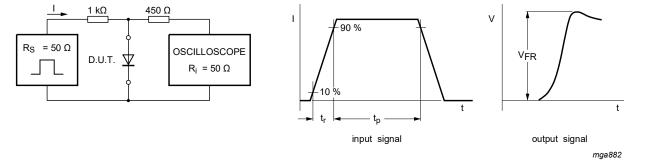


Fig. 7.



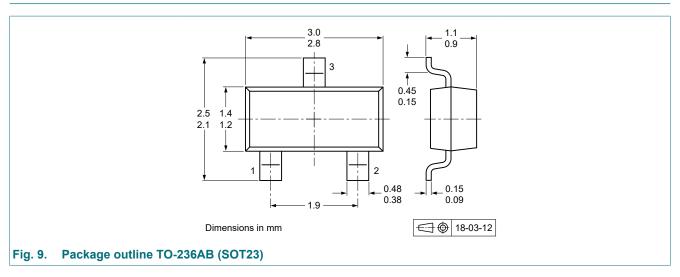
Input signal: forward pulse rise time $t_r = 20$ ns; forward current pulse duration $t_p \ge 100$ ns; duty cycle $\delta \le 0.005$

Forward recovery voltage test circuit and waveforms Fig. 8.

Quality information

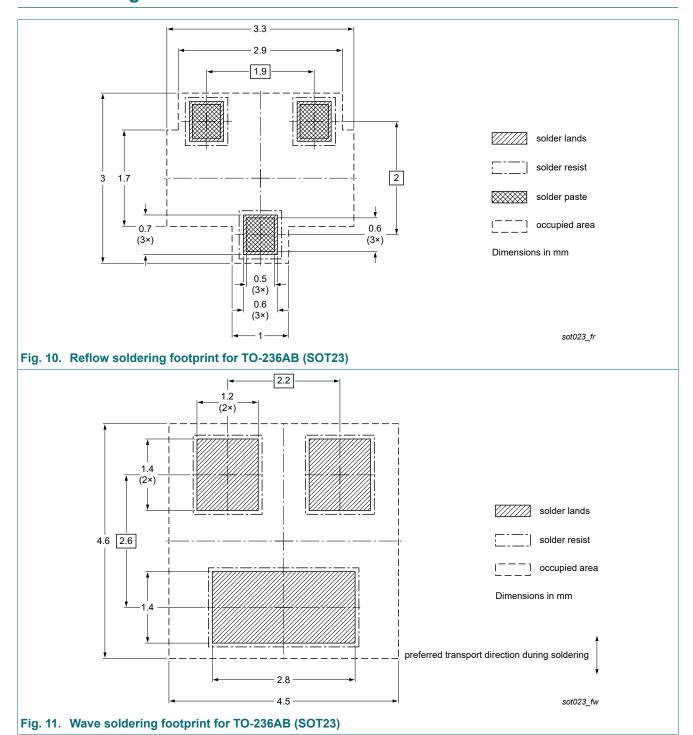
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

12. Package outline



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13. Soldering



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14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16TH v.1	20181207	Product data sheet	-	-

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15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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