Product data sheet

1. General description

High-speed switching diode, encapsulated in a small SOD323 (SC-76) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- High switching speed: t_{rr} ≤ 4 ns
- Low capacitance
- · Low leakage current
- Reverse voltage: V_R ≤ 100 V
- Repetitive peak reverse voltage: V_{RRM} ≤ 100 V
- · Small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

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 _R	reverse voltage		-	-	100	V
I _R	reverse current	V _R = 80 V; T _{amb} = 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



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5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	1 2	. [4] .
2	Α	anode		K K A
			SOD323	006aab040

6. Ordering information

Table 3. Ordering information

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Type number	Package				
	Name	Description	Version		
BAS316-Q	SOD323	plastic, surface-mounted package; 2 leads; 1.3 mm pitch; 1.7 mm x 1.25 mm x 0.95 mm body	SOD323		

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS316-Q	A6

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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			-	100	V
V_R	reverse voltage			-	100	V
I _F	forward current		[1]	-	250	mA
I _{FSM}	non-repetitive peak	t _p = 1 μs; square wave; T _{j(init)} = 25 °C		-	4	Α
	forward current	t _p = 1 ms; square wave; T _{j(init)} = 25 °C		-	1	Α
		t _p = 1 s; square wave; T _{j(init)} = 25 °C		-	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 _{sp} ≤ 90 °C	[1] [2]	-	400	mW
Tj	junction temperature			-	150	°C
T _{amb}	ambient temperature			-65	150	°C
T _{stg}	storage temperature			-65	150	°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
$R_{th(j-sp)}$	thermal resistance from junction to solder point	in free air	[1]	-	-	150	K/W

^[1] Soldering point of cathode tab.

^[2] Soldering point of cathode tab.

High-speed switching diode

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
V _F	forward voltage	I _F = 1 mA; T _{amb} = 25 °C	[1]	-	-	715	mV
		I _F = 10 mA; T _{amb} = 25 °C	[1]	-	-	855	mV
		I _F = 50 mA; T _{amb} = 25 °C	[1]	-	-	1	V
		I _F = 150 mA; T _{amb} = 25 °C	[1]	-	-	1.25	V
I _R	reverse current	V _R = 25 V; T _{amb} = 25 °C		-	-	30	nA
		V _R = 80 V; T _{amb} = 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 V; f = 1 MHz; T _{amb} = 25 °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	$I_F = 10 \text{ mA}; t_r = 20 \text{ ns}; T_{amb} = 25 \text{ °C}$		-	-	1.75	V

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

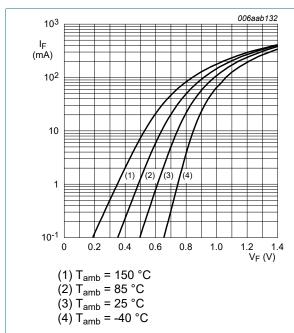
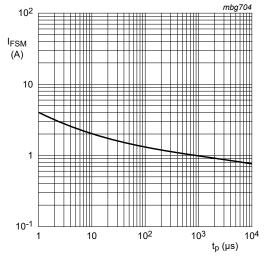


Fig. 1. Forward current as a function of forward voltage; typical values



Based on square wave currents. $T_{j(init)} = 25 \text{ °C}$

Fig. 2. Non-repetitive peak forward current as a function of pulse duration; typical values

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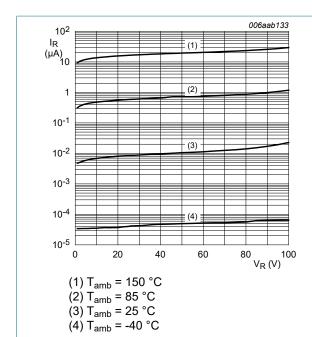


Fig. 3. Reverse current as a function of reverse voltage; typical values

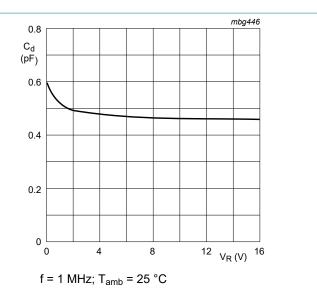
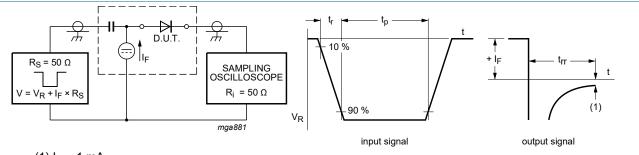


Fig. 4. Diode capacitance as a function of reverse voltage; typical values

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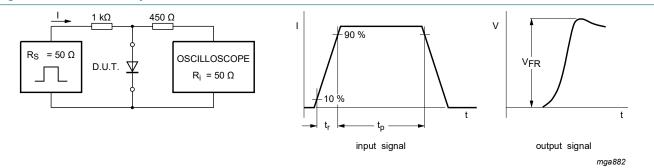
11. Test information



(1) $I_R = 1 \text{ mA}$

Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty cycle δ = 0.05 Oscilloscope: rise time t_r = 0.35 ns

Fig. 5. Reverse recovery time test circuit and waveforms



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

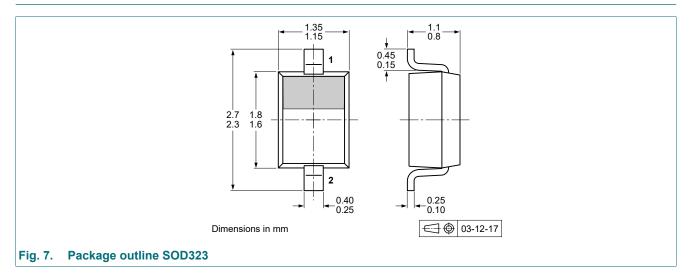
Fig. 6. Forward recovery voltage test circuit and waveforms

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.

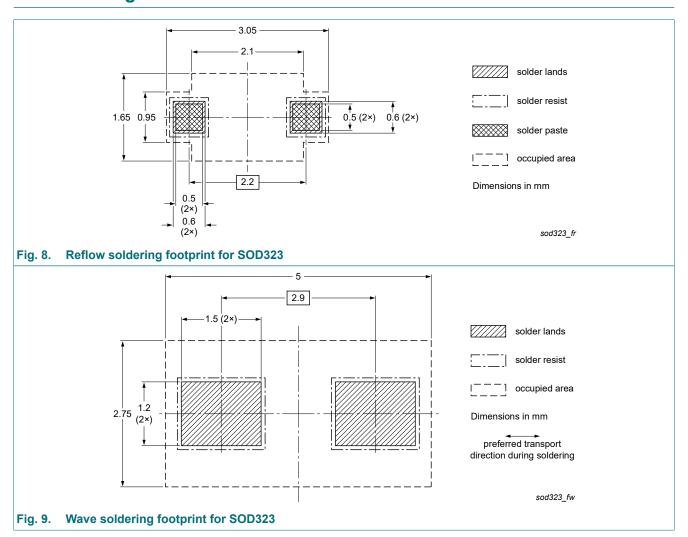
High-speed switching diode

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
BAS316-Q v.1	20210616	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.

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BAS316-Q

High-speed switching diode

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