



BAS316-Q

High-speed switching diode

16 June 2021

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: $t_{rr} \leq 4$ ns
- Low capacitance
- Low leakage current
- Reverse voltage: $V_R \leq 100$ V
- Repetitive peak reverse voltage: $V_{RRM} \leq 100$ 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


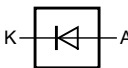
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_R	reverse voltage		-	-	100	V
I_R	reverse current	$V_R = 80$ V; $T_{amb} = 25$ °C	-	-	0.5	μ A
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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 SOD323	 006aab040
2	A	anode		

6. Ordering information

Table 3. Ordering information

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

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 forward current	$t_p = 1 \mu\text{s}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	4	A
		$t_p = 1 \text{ ms}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	1	A
		$t_p = 1 \text{ s}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 0.5 \text{ ms}$; $\delta = 0.25$		-	500	mA
P_{tot}	total power dissipation	$T_{\text{sp}} \leq 90 \text{ }^\circ\text{C}$	[1] [2]	-	400	mW
T_j	junction temperature			-	150	$^\circ\text{C}$
T_{amb}	ambient temperature			-65	150	$^\circ\text{C}$
T_{stg}	storage temperature			-65	150	$^\circ\text{C}$

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

[2] Soldering point of cathode tab.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{\text{th}(j\text{-sp})}$	thermal resistance from junction to solder point	in free air	[1]	-	-	150	K/W

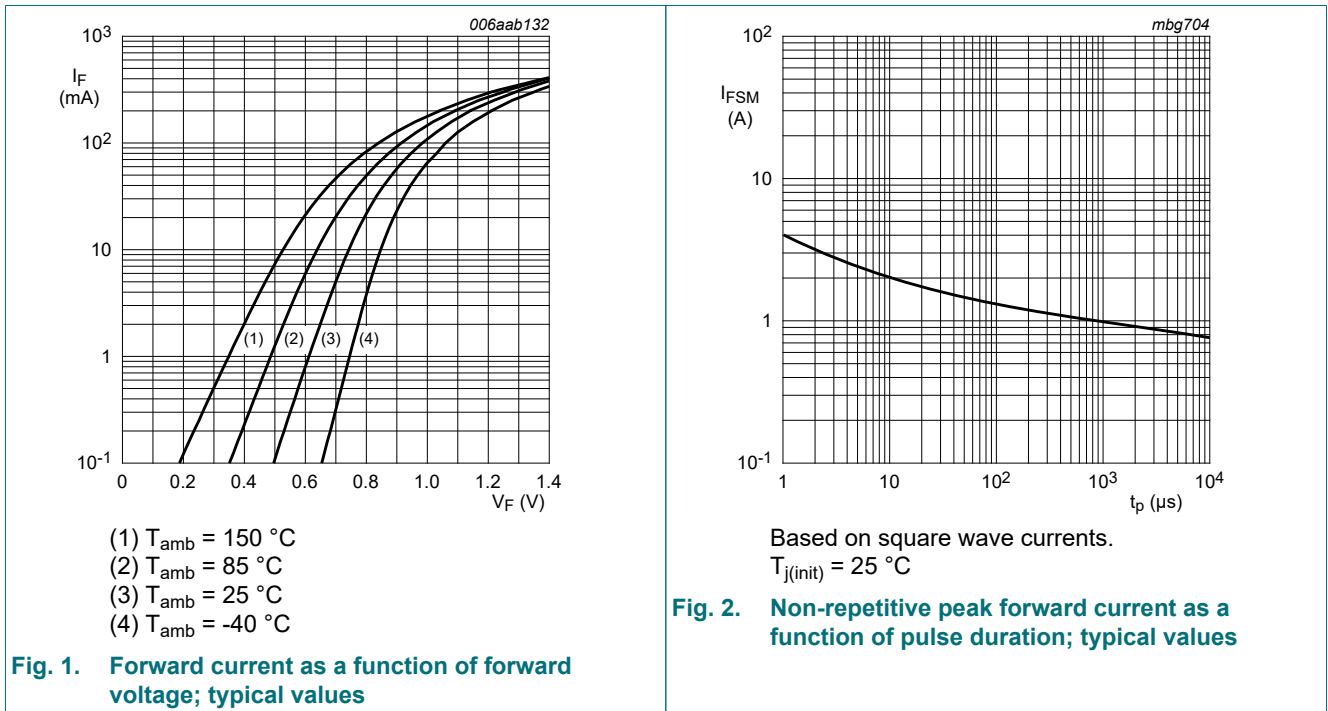
[1] Soldering point of cathode tab.

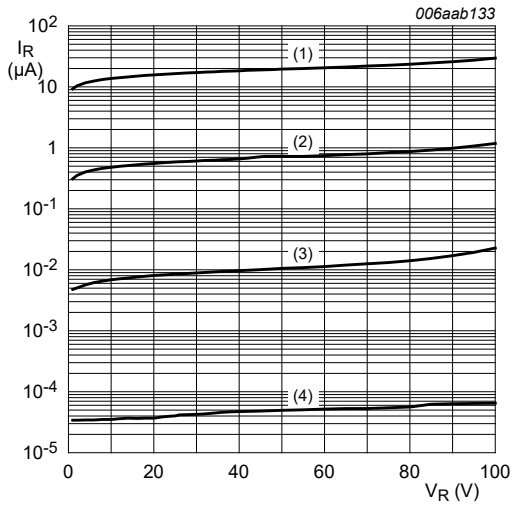
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	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	μA
		V _R = 25 V; T _j = 150 °C		-	-	30	μA
		V _R = 80 V; T _j = 150 °C		-	-	50	μA
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; T _{amb} = 25 °C	-	-	4	ns	
V _{FRM}	peak forward recovery voltage	I _F = 10 mA; t _r = 20 ns; T _{amb} = 25 °C	-	-	1.75	V	

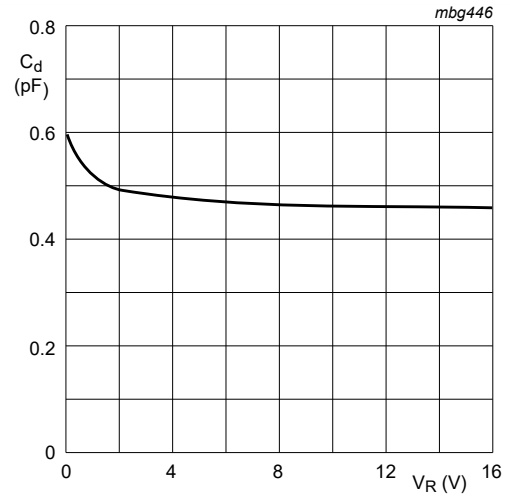
[1] Pulsed test: t_p ≤ 300 μs; δ ≤ 0.02





- (1) $T_{amb} = 150\text{ }^{\circ}\text{C}$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}$

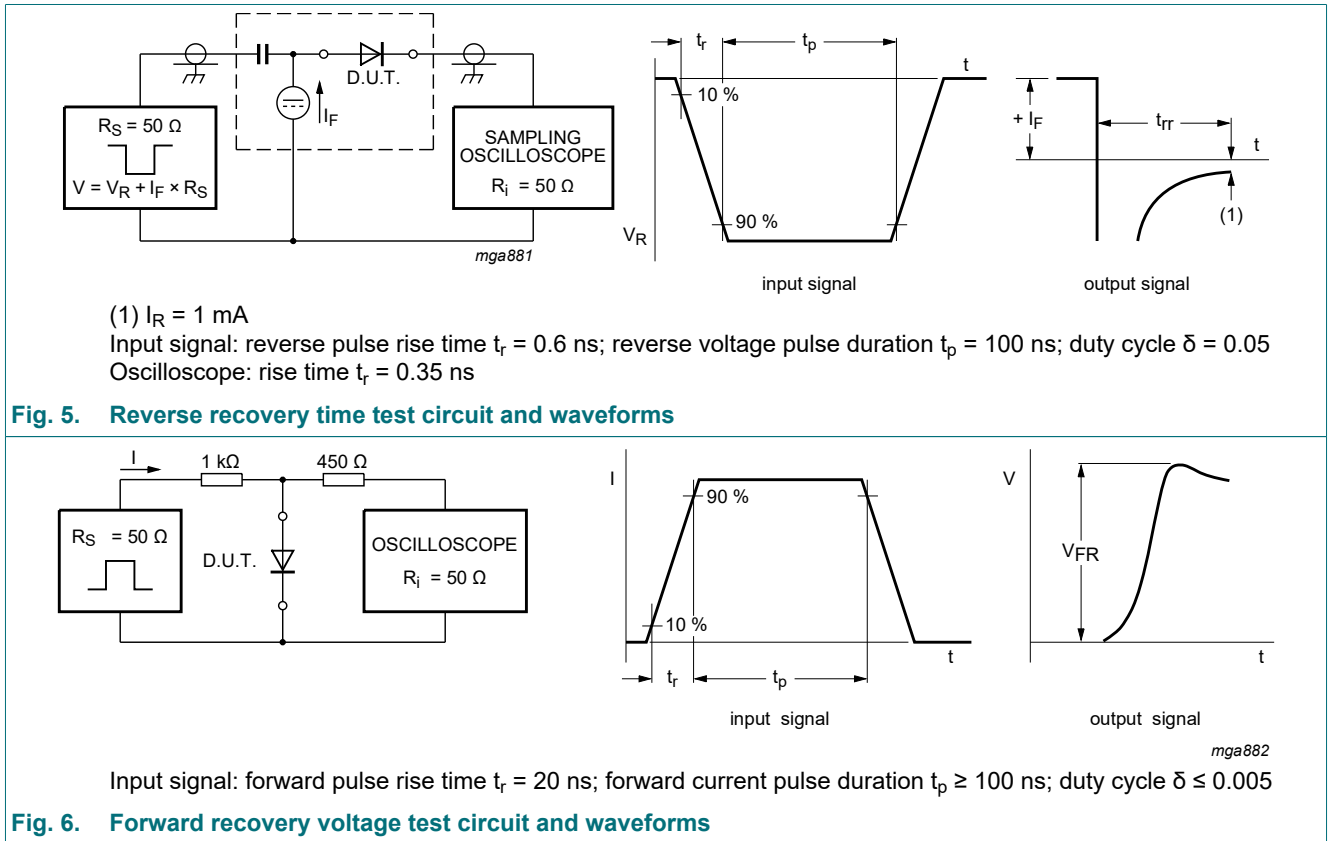
Fig. 3. Reverse current as a function of reverse voltage; typical values



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

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

11. Test information



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

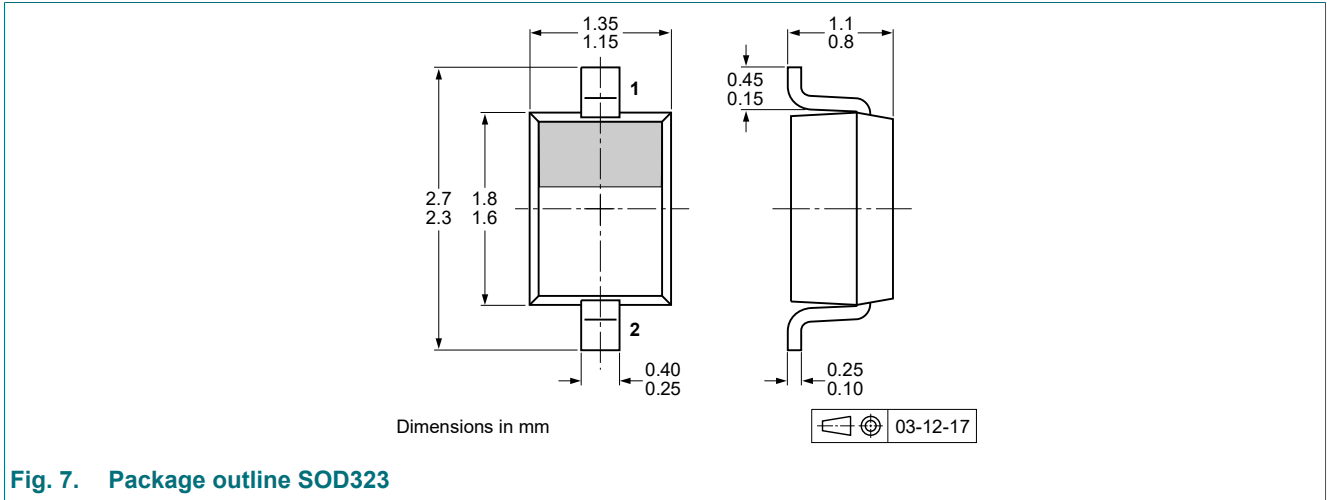


Fig. 7. Package outline SOD323

13. Soldering

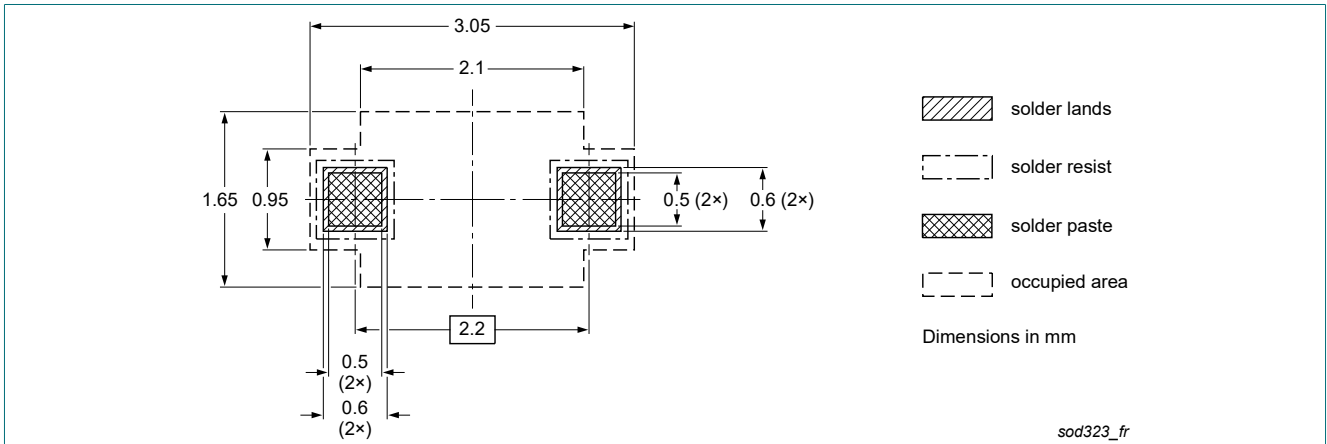


Fig. 8. Reflow soldering footprint for SOD323

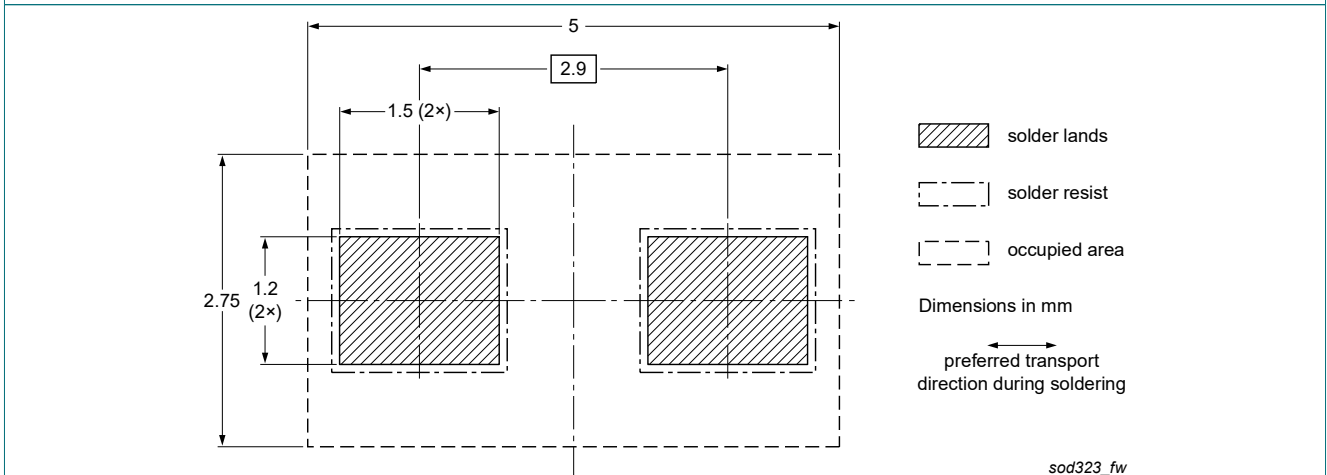


Fig. 9. Wave soldering footprint for SOD323

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	-	-

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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- [2] The term 'short data sheet' is explained in section "Definitions".
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