



BAS316

High-speed switching diode

1 July 2022

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

3. Applications

- High-speed switching
- General-purpose switching

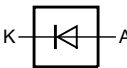
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_R	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$	-	-	100	V
I_R	reverse current	$V_R = 80 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	0.5	μA
t_{rr}	reverse recovery time	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; R_L = 100 \text{ }\Omega;$ $I_{R(\text{meas})} = 1 \text{ mA}; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	-	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	SOD323	plastic, surface-mounted package; 2 leads; 1.3 mm pitch; 1.7 mm x 1.25 mm x 0.95 mm body	SOD323
BAS316/DG	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	A6
BAS316/DG	KN

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	$T_j = 25\text{ °C}$		-	100	V
V_R	reverse voltage			-	100	V
I_F	forward current		[1]	-	250	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1\text{ }\mu\text{s}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	4	A
		$t_p = 1\text{ ms}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	1	A
		$t_p = 1\text{ s}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	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	$T_{sp} \leq 90\text{ °C}$	[1] [2]	-	400	mW
T_j	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.

[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

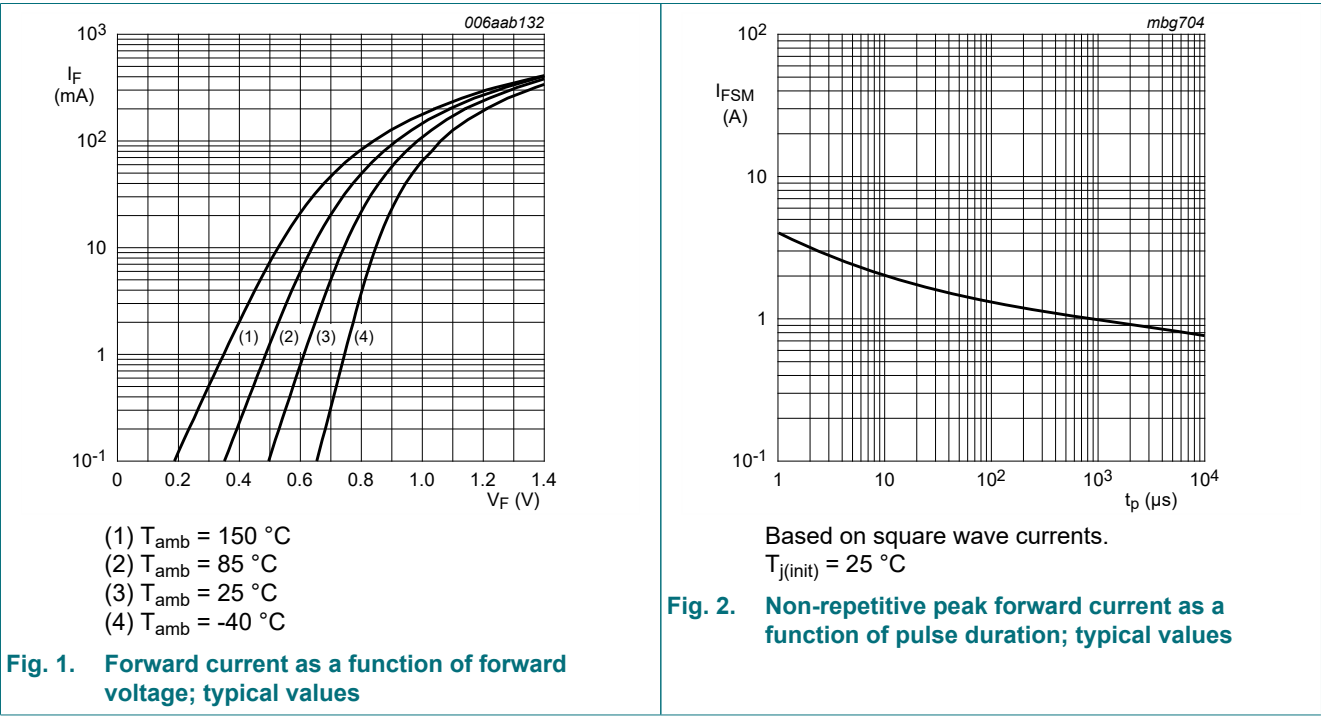
[1] Soldering point of cathode tab.

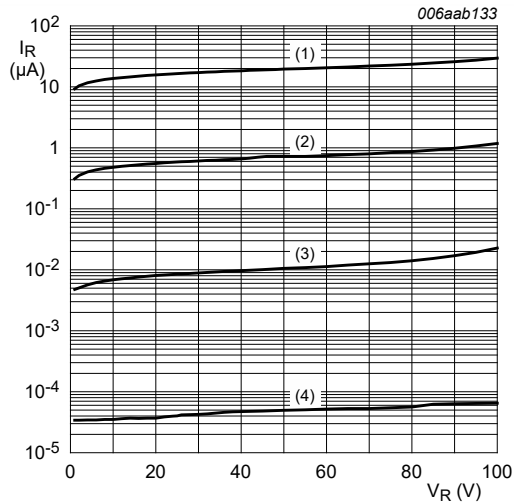
10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 1\text{ mA}$	[1]	-	-	715	mV
		$I_F = 10\text{ mA}$	[1]	-	-	855	mV
		$I_F = 50\text{ mA}$	[1]	-	-	1	V
		$I_F = 150\text{ mA}$	[1]	-	-	1.25	V
I_R	reverse current	$V_R = 25\text{ V}; T_J = 25\text{ }^\circ\text{C}$		-	-	30	nA
		$V_R = 80\text{ V}; T_J = 25\text{ }^\circ\text{C}$		-	-	0.5	μA
		$V_R = 25\text{ V}; T_J = 150\text{ }^\circ\text{C}$		-	-	30	μA
		$V_R = 80\text{ V}; T_J = 150\text{ }^\circ\text{C}$		-	-	50	μA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}; T_J = 25\text{ }^\circ\text{C}$		-	-	1.5	pF
t_{rr}	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; R_L = 100\text{ }\Omega;$ $I_{R(\text{meas})} = 1\text{ mA}; T_{\text{amb}} = 25\text{ }^\circ\text{C}$		-	-	4	ns
V_{FRM}	peak forward recovery voltage	$I_F = 10\text{ mA}; t_r = 20\text{ ns}$		-	-	1.75	V

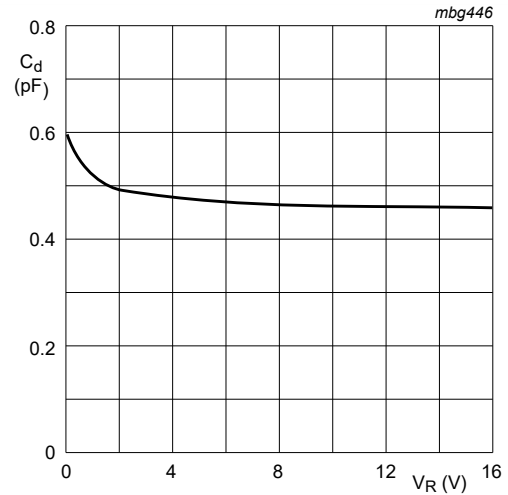
[1] Pulsed test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$





- (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) $T_{amb} = -40\text{ }^{\circ}\text{C}$

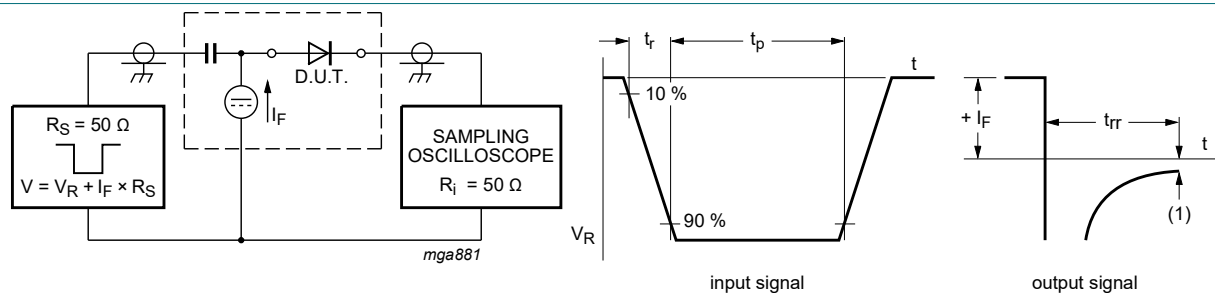
Fig. 3. Reverse current as a function of reverse voltage; typical values



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

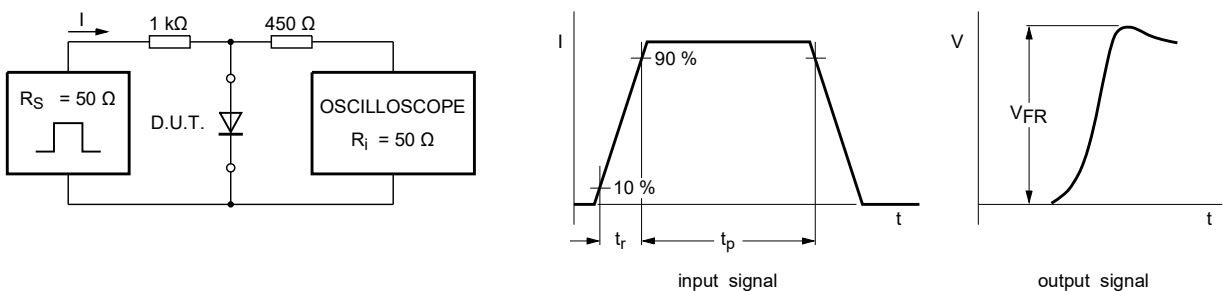
Fig. 4. Diode capacitance as a function of reverse voltage; typical values

11. Test information



- (1) $I_R = 1\text{ mA}$
 Input signal: reverse pulse rise time $t_r = 0.6\text{ ns}$; reverse voltage pulse duration $t_p = 100\text{ ns}$; duty cycle $\delta = 0.05$
 Oscilloscope: rise time $t_r = 0.35\text{ ns}$

Fig. 5. Reverse recovery time test circuit and waveforms



Input signal: forward pulse rise time $t_r = 20\text{ ns}$; forward current pulse duration $t_p \geq 100\text{ ns}$; duty cycle $\delta \leq 0.005$

Fig. 6. Forward recovery voltage test circuit and waveforms

12. Package outline

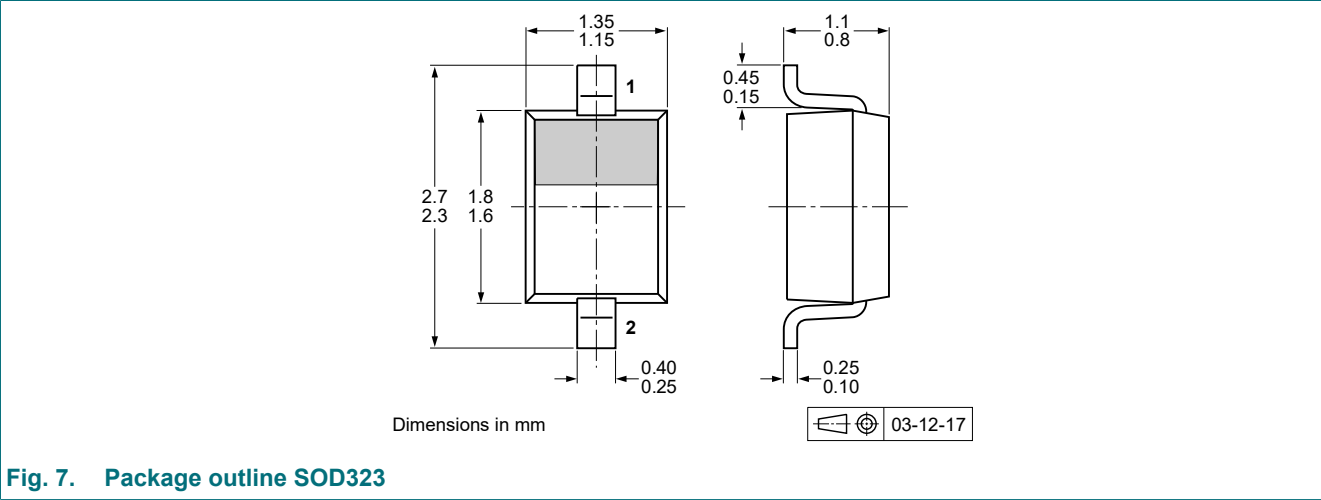


Fig. 7. Package outline SOD323

13. Soldering

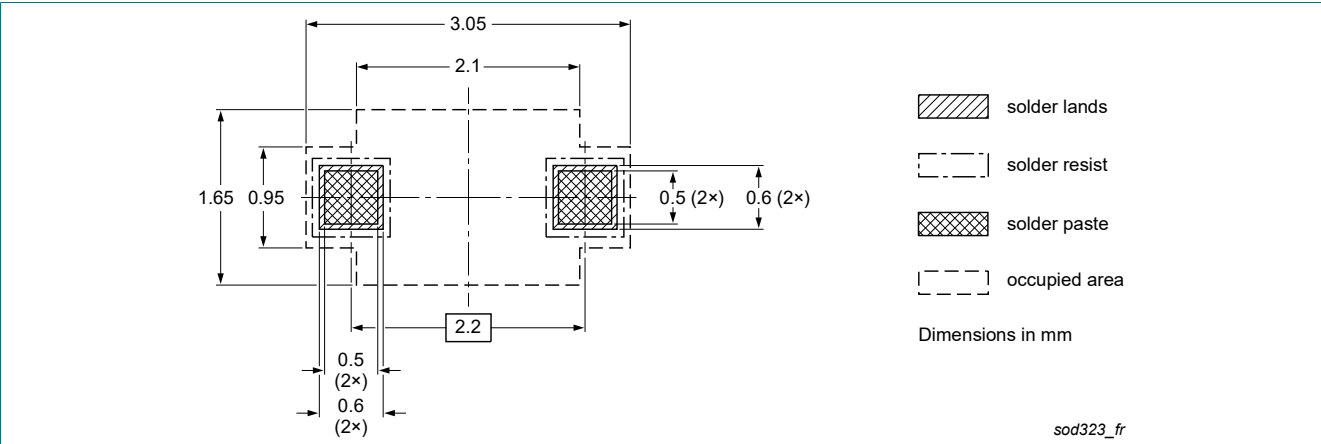


Fig. 8. Reflow soldering footprint for SOD323

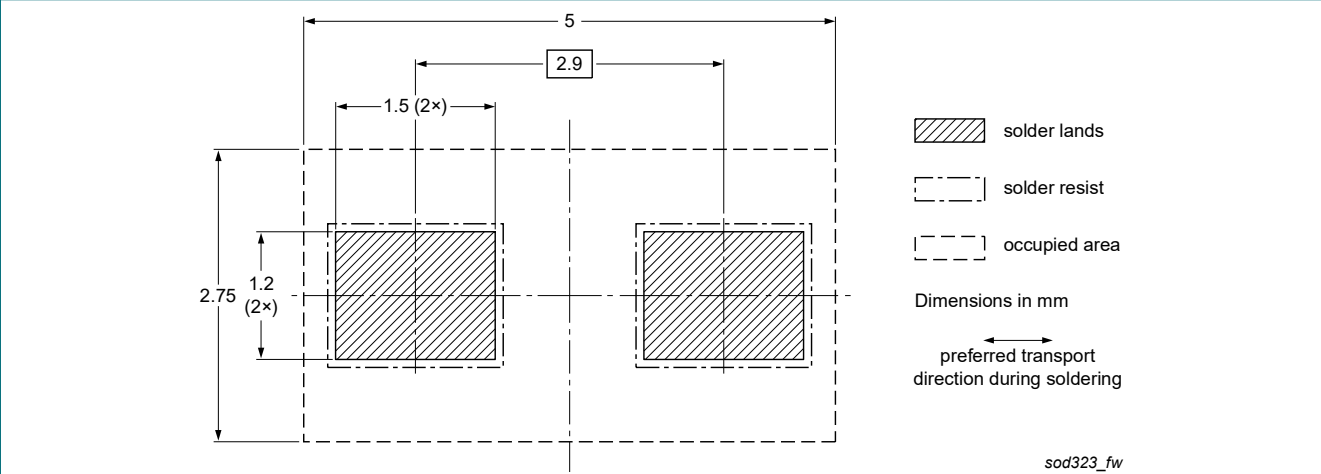


Fig. 9. Wave soldering footprint for SOD323

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS316 v.7	20220701	Product data sheet	-	BAS16_SER v.6
Modifications:	- Family data sheet reduced to single type data sheet. - Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
BAS16_SER v.6	20140924	Product data sheet	-	BAS16_SER v.5
BAS16_SER_5	20080825	Product data sheet	-	BAS16_4 BAS16H_1 BAS16J_1 BAS16L_1 BAS16T_1 BAS16VV_BAS16VY_3 BAS16W_4 BAS316_4 BAS516_1
BAS16_4	20011010	Product specification	-	BAS16_3
BAS16H_1	20050415	Product data sheet	-	-
BAS16J_1	20070308	Product data sheet	-	-
BAS16L_1	20030623	Product specification	-	-
BAS16T_1	19980120	Product specification	-	-
BAS16VV_BAS16VY_3	20070420	Product data sheet	-	BAS16VV_BAS16VY_2
BAS16W_4	19990506	Product specification	-	BAS16W_3
BAS316_4	20040204	Product specification	-	BAS316_3
BAS516_1	19980831	Product specification	-	-

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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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