



BAS516-Q

High-speed switching diode

11 August 2022

Product data sheet

1. General description

High-speed switching diode, encapsulated in a ultra small and flat lead SOD523 (SC-79) 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

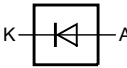
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_R	reverse voltage	$T_{amb} = 25$ °C	-	-	100	V
I_R	reverse current	$V_R = 80$ V; $T_{amb} = 25$ °C	-	-	0.5	µA
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	 SC-79 (SOD523)	 006aab040
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS516-Q	SC-79	plastic, surface-mounted package; 2 leads; 1.2 mm x 0.8 mm x 0.6 mm body	SOD523

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS516-Q	6

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
V_{RRM}	repetitive peak reverse voltage	$T_{amb} = 25\text{ °C}$		-	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; $T_{j(init)} = 25\text{ °C}$		-	4	A
		$t_p = 1\text{ ms}$; square wave; $T_{j(init)} = 25\text{ °C}$		-	1	A
		$t_p = 1\text{ s}$; square wave; $T_{j(init)} = 25\text{ °C}$		-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 0.5\text{ ms}$; $\delta \leq 0.25$		-	500	mA
P_{tot}	total power dissipation	$T_{sp} \leq 90\text{ °C}$	[1] [2]	-	500	mW
Per device						
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-sided copper, tin-plated and standard footprint.

[2] Soldering point of cathode tab.

9. Thermal characteristics

Table 6. Thermal characteristics

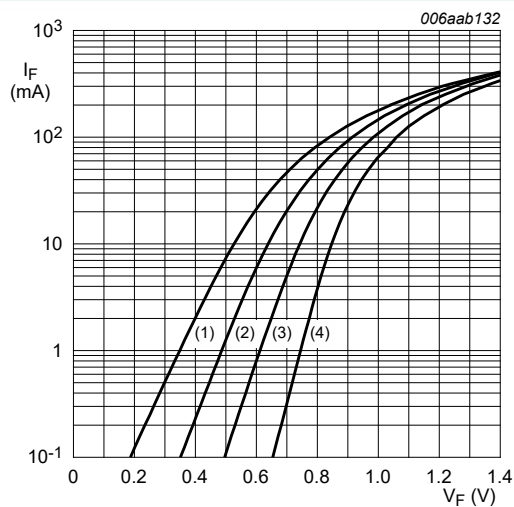
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[1]	-	-	120	K/W

[1] Soldering point of cathode tab.

10. Characteristics

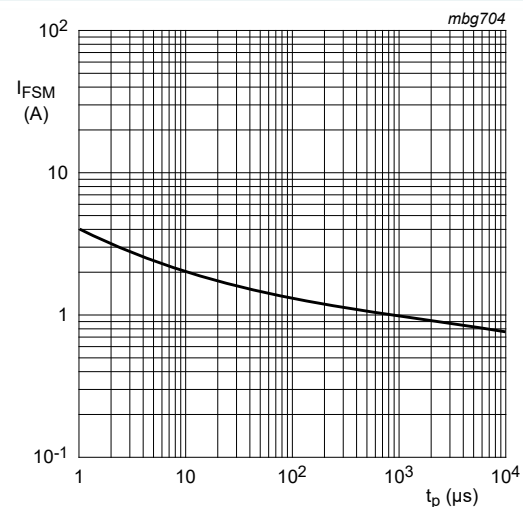
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_F	forward voltage	$I_F = 1 \text{ mA}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	715	mV
		$I_F = 10 \text{ mA}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	855	mV
		$I_F = 50 \text{ mA}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1	V
		$I_F = 150 \text{ mA}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1.25	V
I_R	reverse current	$V_R = 25 \text{ V}$; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	30	nA
		$V_R = 80 \text{ V}$; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	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	$V_R = 0 \text{ V}$; $f = 1 \text{ MHz}$; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1	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	$I_F = 10 \text{ mA}$; $t_r = 20 \text{ ns}$; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1.75	V



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

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



Based on square wave currents.
 $T_{J(\text{init})} = 25 \text{ } ^\circ\text{C}$

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

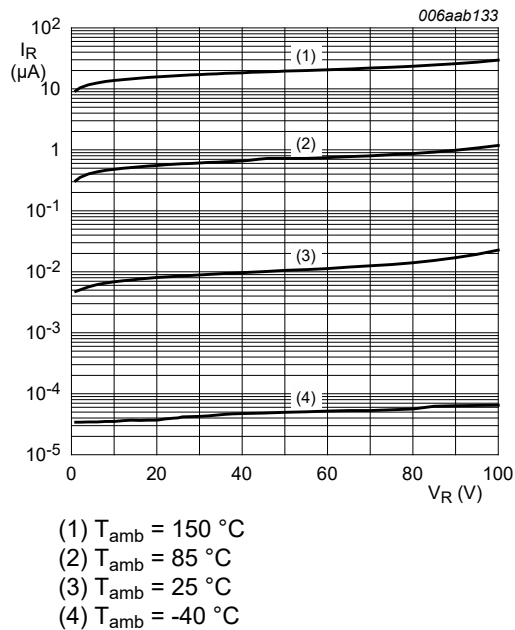


Fig. 3. Reverse current as a function of reverse voltage; typical values

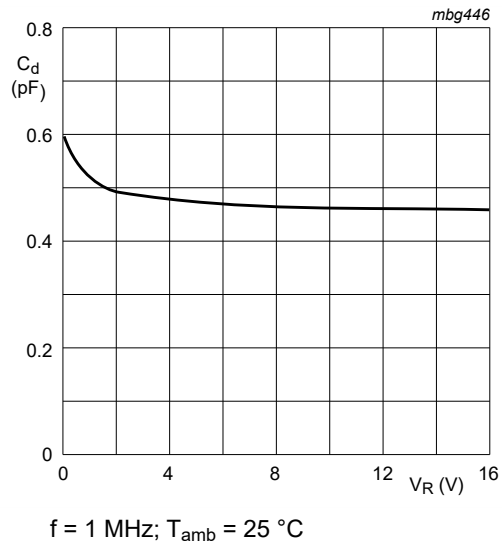
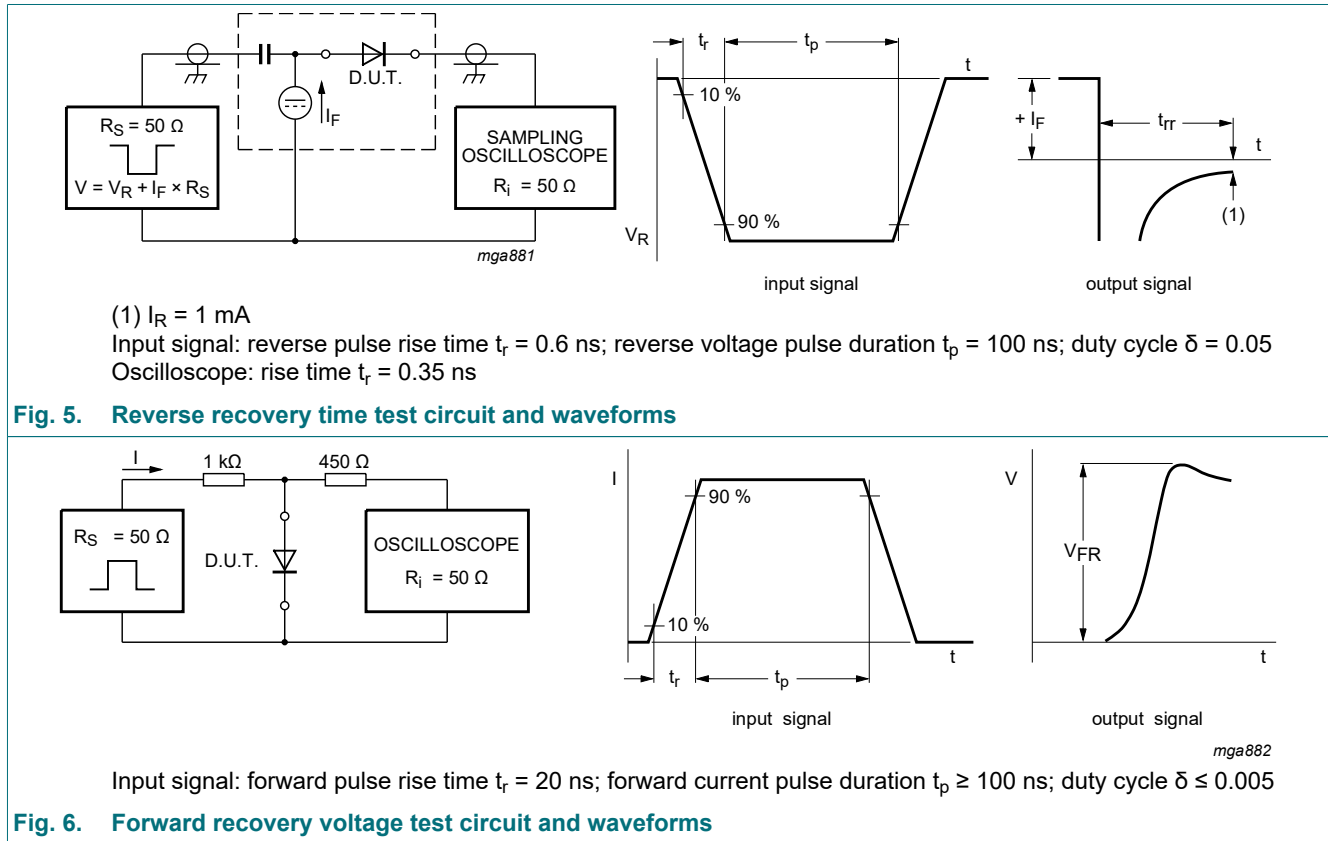


Fig. 4. Diode capacitance as a function of reverse voltage; typical values

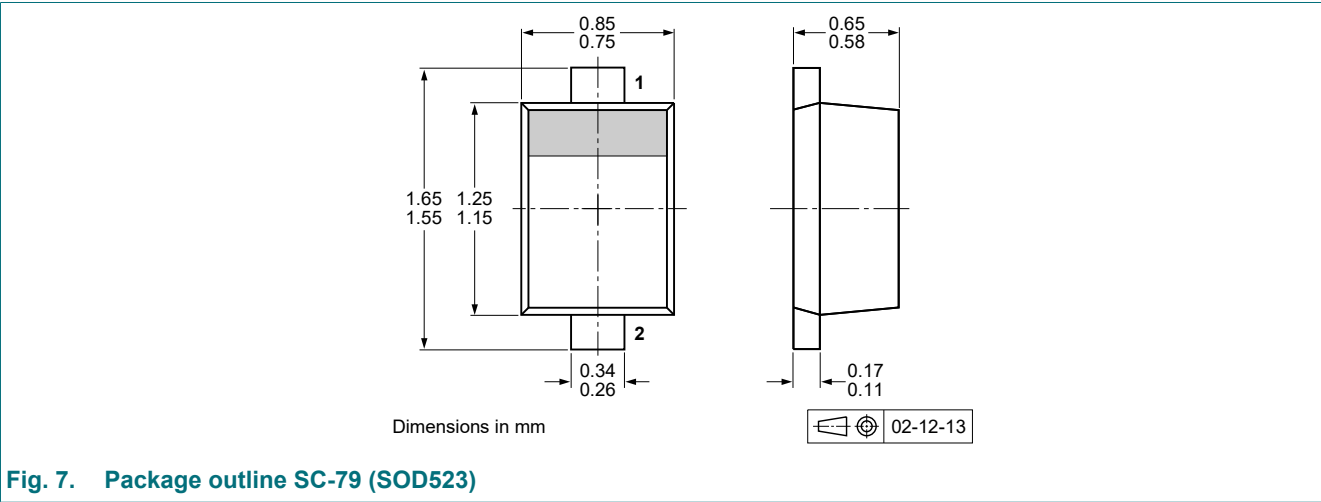
11. Test information



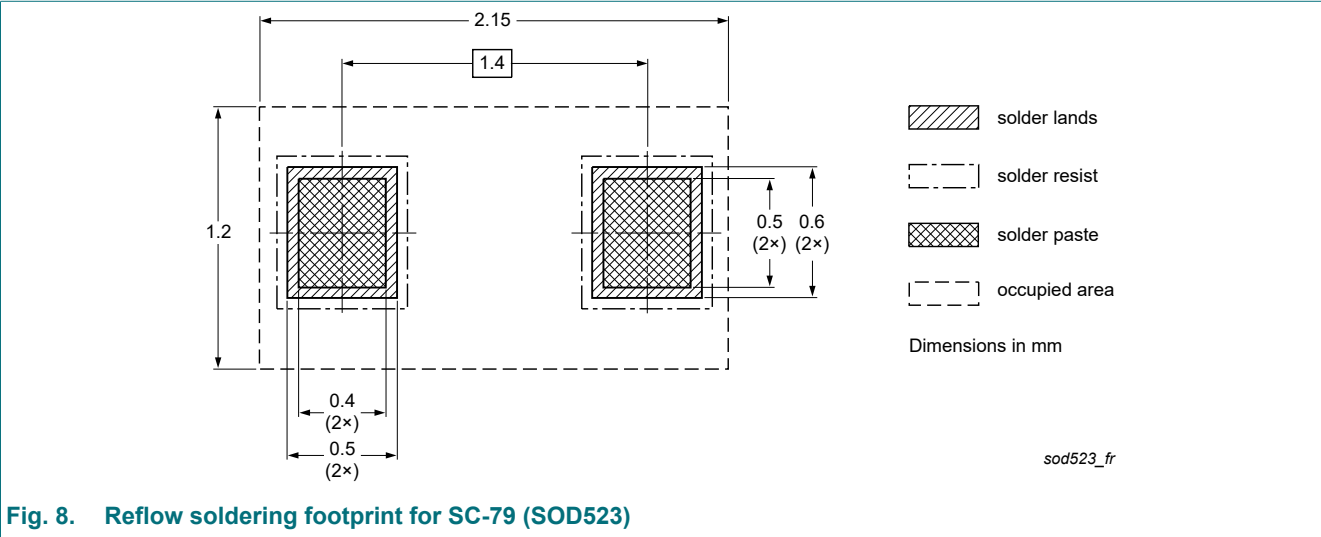
Quality information

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



13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS516-Q v.2	20220811	Product data sheet	-	BAS516-Q v.1
Modifications:	• Section 10 "Characteristics" value $C_d = 1.5$ pF max, typo correction to 1 pF max.			
BAS516-Q v.1	20210917	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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