



# BAS116-Q

## Low-leakage diode

17 February 2025

Product data sheet

## 1. General description

Epitaxial medium-speed switching diode with a low leakage current in a small SOT23 plastic SMD package.

## 2. Features and benefits

- Plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8  $\mu$ s
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Low leakage current applications in surface mounted circuits

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$	-	-	215	mA
$I_R$	reverse current	$V_R = 75 \text{ V}$ ; pulsed; $T_j = 25^\circ\text{C}$	-	0.003	5	nA
$t_{rr}$	reverse recovery time	$I_F = 10 \text{ mA}$ ; $I_R = 10 \text{ mA}$ ; $R_L = 100 \Omega$ ; $I_{R(\text{meas})} = 1 \text{ mA}$ ; $T_j = 25^\circ\text{C}$	-	0.8	3	$\mu\text{s}$
$V_{RRM}$	repetitive peak reverse voltage	$T_j = 25^\circ\text{C}$	-	-	85	V
$V_F$	forward voltage	$I_F = 50 \text{ mA}$ ; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_j = 25^\circ\text{C}$	-	-	1.1	V

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode	 SOT23	 006aaa764
2	n.c.	not connected		
3	K	cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS116-Q	SOT23	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]
BAS116-Q	JV%

[1] % = placeholder for manufacturing site code

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V <sub>RRM</sub>	repetitive peak reverse voltage	T <sub>j</sub> = 25 °C		-	85	V
V <sub>R</sub>	reverse voltage			-	75	V
I <sub>F</sub>	forward current	t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>amb</sub> = 25 °C		-	215	mA
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 1 μs; square wave; T <sub>j(init)</sub> = 25 °C		-	4	A
		t <sub>p</sub> = 1 ms; square wave; T <sub>j(init)</sub> = 25 °C		-	1	A
		t <sub>p</sub> = 1 s; square wave; T <sub>j(init)</sub> = 25 °C		-	0.5	A
I <sub>FRM</sub>	repetitive peak forward current			-	500	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[1]	-	250	mW
Per device, one diode loaded						
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

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

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	In free air	[1]	-	-	500	K/W
R <sub>th(j-sp)</sub>	thermal resistance from junction to solder point		[2]	-	-	330	K/W

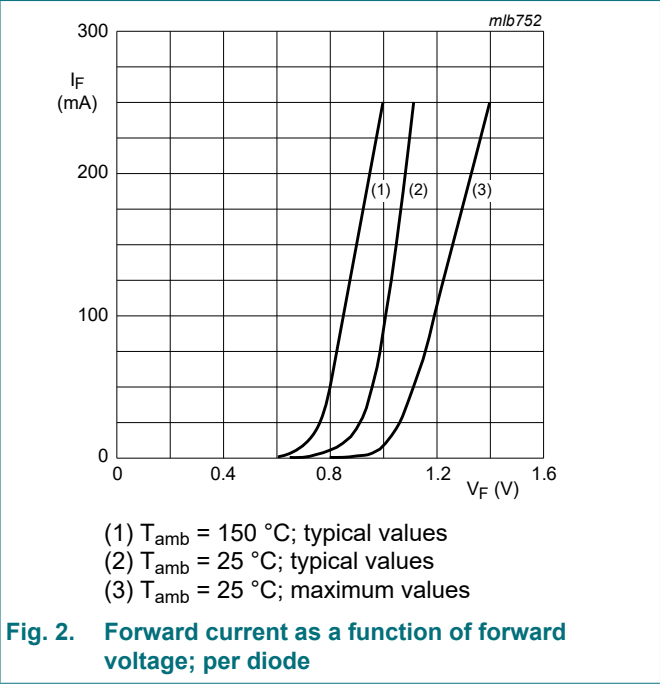
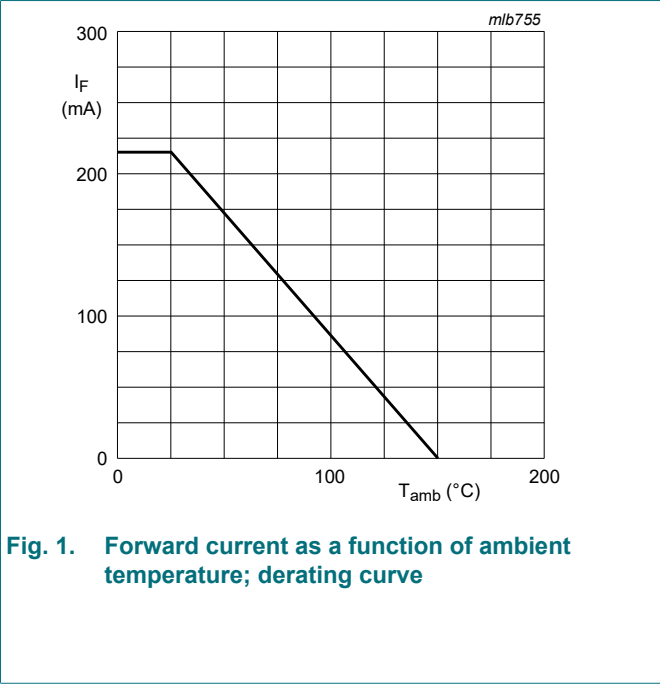
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

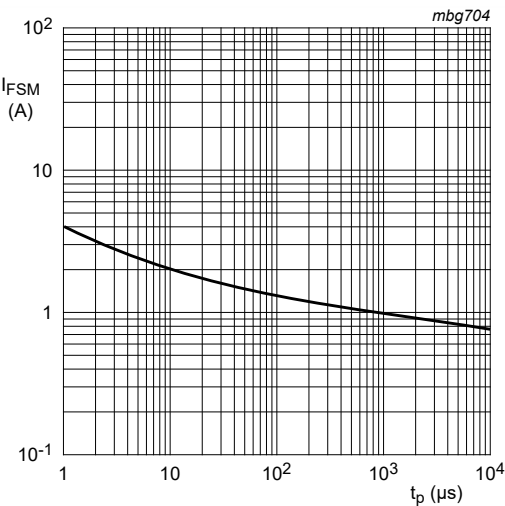
[2] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

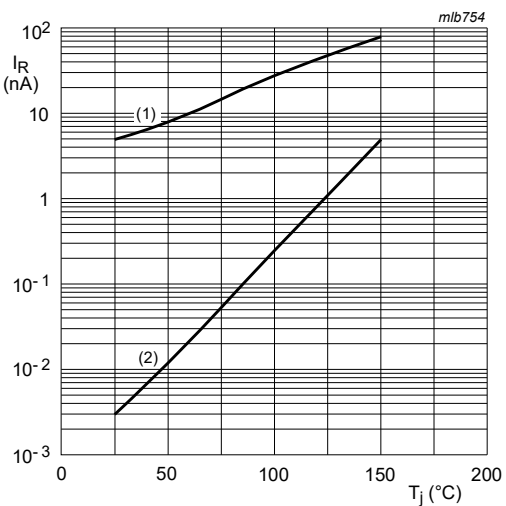
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 1 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	0.9	V
		I <sub>F</sub> = 10 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	1	V
		I <sub>F</sub> = 50 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	1.1	V
		I <sub>F</sub> = 150 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 75 V; pulsed; T <sub>j</sub> = 25 °C	-	0.003	5	nA
		V <sub>R</sub> = 75 V; pulsed; T <sub>j</sub> = 150 °C	-	3	80	nA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz; T <sub>j</sub> = 25 °C	-	2	-	pF
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 10 mA; I <sub>R</sub> = 10 mA; R <sub>L</sub> = 100 Ω; I <sub>R(meas)</sub> = 1 mA; T <sub>j</sub> = 25 °C	-	0.8	3	μs





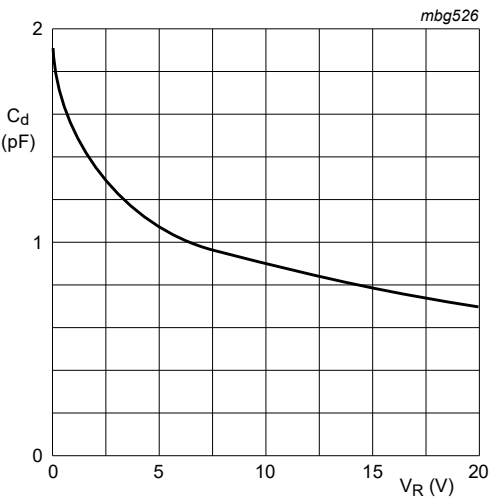
Based on square wave currents.  
 $T_{j(init)} = 25\text{ }^{\circ}\text{C}$

Fig. 3. Non-repetitive peak forward current as a function of pulse duration; typical values



$V_R = 75\text{ V}$   
(1) Maximum values  
(2) Typical values

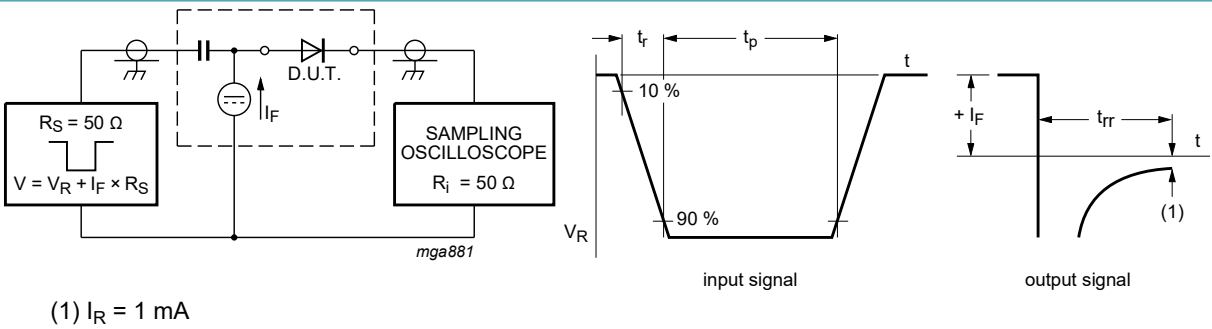
Fig. 4. Reverse current as a function of junction temperature



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

Fig. 5. Diode capacitance as a function of reverse voltage; typical values

11. Test information



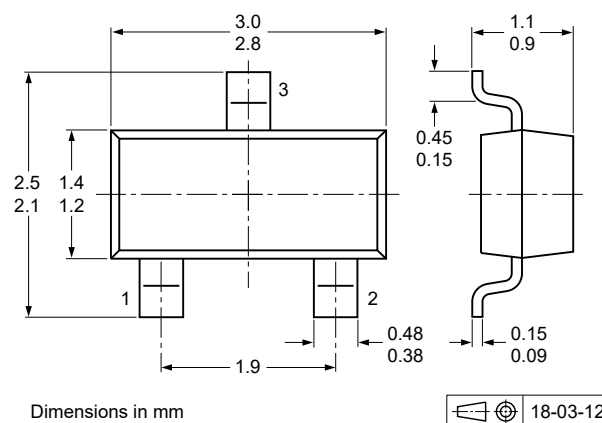
(1)  $I_R = 1\text{ mA}$

Fig. 6. Reverse recovery time test circuit and waveforms

## Quality information

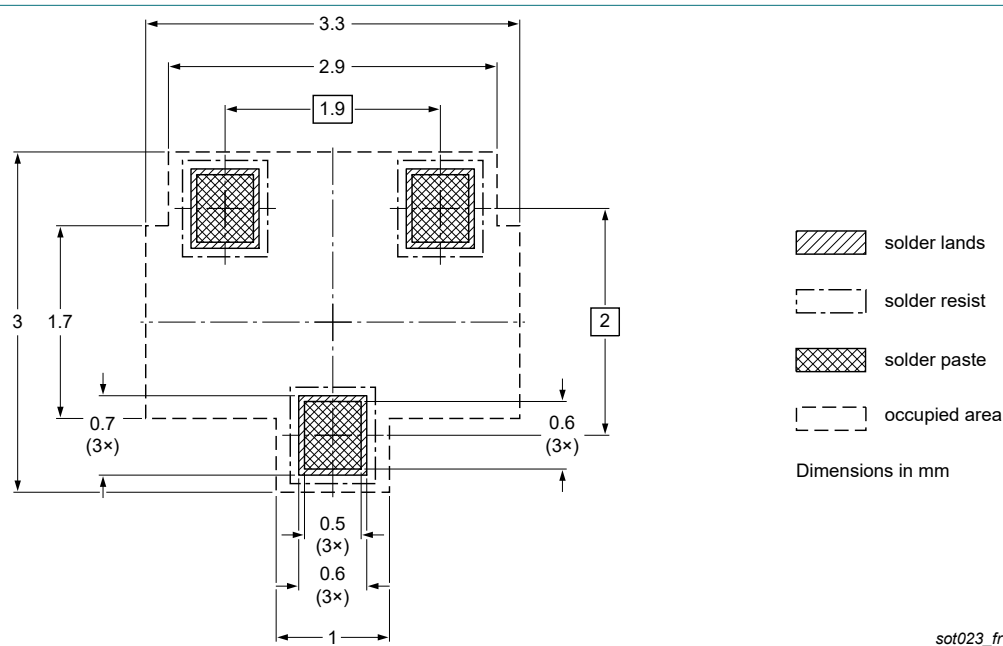
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 12. Package outline



**Fig. 7. Package outline SOT23**

## 13. Soldering



**Fig. 8. Reflow soldering footprint for SOT23**

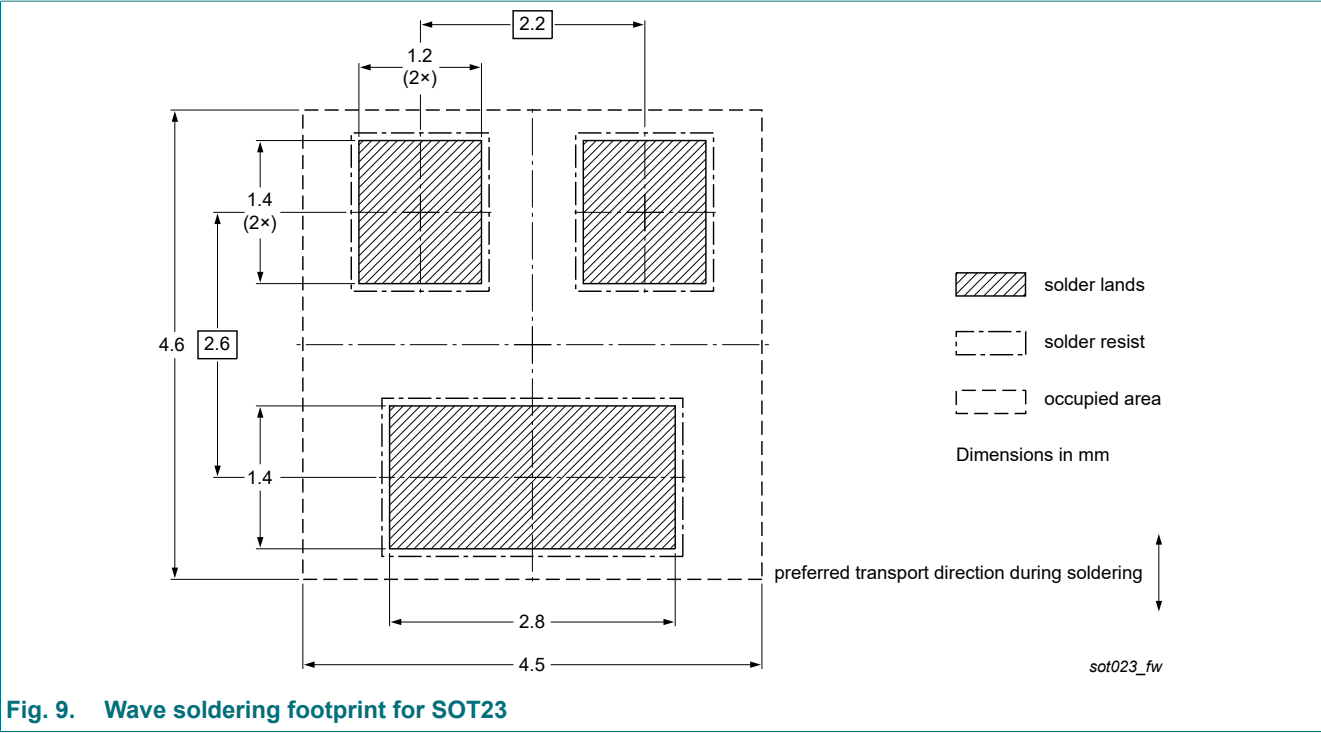


Fig. 9. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS116-Q v.1	20250217	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".
- [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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Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information..... 1

6. Ordering information..... 2

7. Marking..... 2

8. Limiting values..... 2

9. Thermal characteristics..... 2

10. Characteristics..... 3

11. Test information..... 4

12. Package outline..... 5

13. Soldering..... 5

14. Revision history..... 7

15. Legal information..... 8

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