



BAS16H

High-speed switching diode

1 October 2022

Product data sheet

1. General description

High-speed switching diode, encapsulated in a small and flat lead SOD123F 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

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			-	-	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		
2	A	anode		 006aab040

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS16H	SOD123F	plastic, surface-mounted package; 2 leads; 2.6 mm x 1.6 mm x 1.1 mm body	SOD123F

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS16H	A1

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			-	100	V
V_R	reverse voltage			-	100	V
I_F	forward current		[1]	-	215	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1 \mu s$; square wave; $T_{j(init)} = 25^\circ C$		-	4	A
		$t_p = 1 ms$; square wave; $T_{j(init)} = 25^\circ C$		-	1	A
		$t_p = 1 s$; square wave; $T_{j(init)} = 25^\circ C$		-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 0.5 ms$; $\delta \leq 0.25$		-	500	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ C$	[1]	-	380	mW
			[2]	-	830	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 PCB with 60 μm copper strip line.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	330	K/W
			[2]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	70	K/W

[1] Device mounted on an FR4 PCB with 60 μm copper strip line.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1cm^2 .

[3] Soldering point of cathode tab.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	$I_F = 1 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25^\circ\text{C}$		-	-	715	mV
		$I_F = 10 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25^\circ\text{C}$		-	-	855	mV
		$I_F = 50 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25^\circ\text{C}$		-	-	1	V
		$I_F = 150 \text{ mA}; t_p \leq 300 \mu\text{s}; \delta \leq 0.02;$ pulsed; $T_{amb} = 25^\circ\text{C}$		-	-	1.25	V
I_R	reverse current	$V_R = 25 \text{ V}; T_{amb} = 25^\circ\text{C}$		-	-	30	nA
		$V_R = 80 \text{ V}; T_{amb} = 25^\circ\text{C}$		-	-	0.5	μA
		$V_R = 25 \text{ V}; T_j = 150^\circ\text{C}$		-	-	30	μA
		$V_R = 80 \text{ V}; T_j = 150^\circ\text{C}$		-	-	50	μA
C_d	diode capacitance	$V_R = 0 \text{ V}; f = 1 \text{ MHz}; T_{amb} = 25^\circ\text{C}$		-	-	1.5	pF
t_{rr}	reverse recovery time	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; R_L = 100 \Omega;$ $I_{R(meas)} = 1 \text{ mA}; T_{amb} = 25^\circ\text{C}$		-	-	4	ns
V_{FRM}	peak forward recovery voltage	$I_F = 10 \text{ mA}; t_r = 20 \text{ ns}; T_{amb} = 25^\circ\text{C}$		-	-	1.75	V

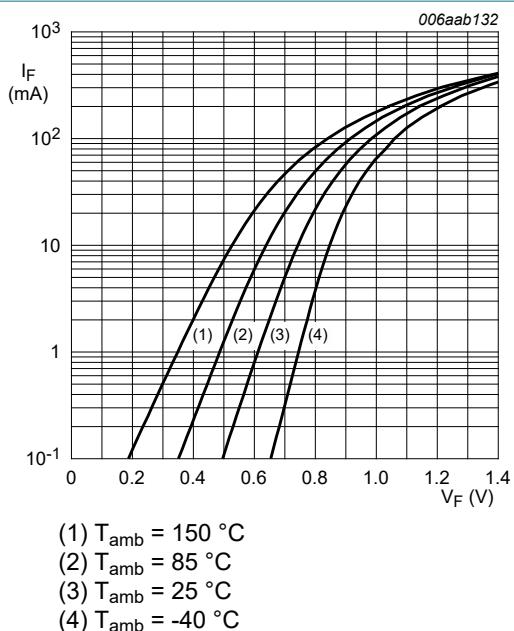


Fig. 1. Forward current as a function of forward voltage; typical values

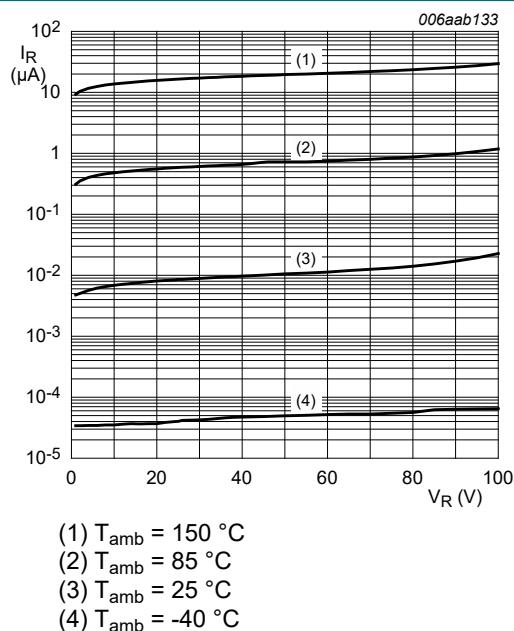
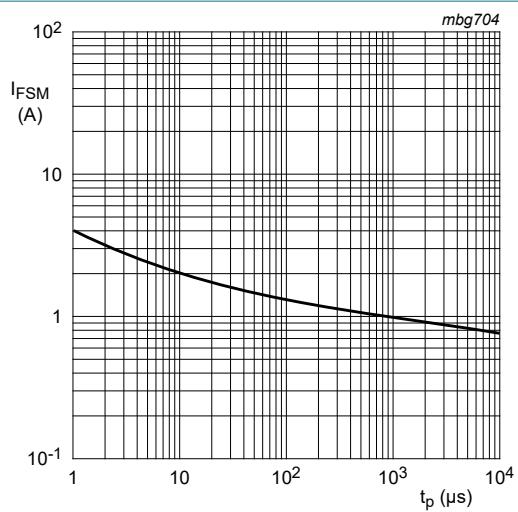
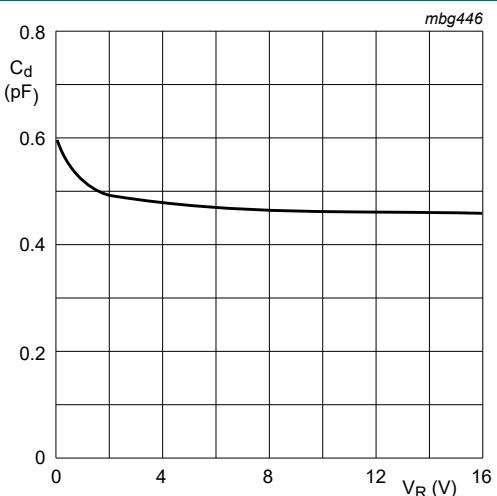


Fig. 3. Reverse current as a function of reverse voltage; typical values



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

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



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

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

11. Test information

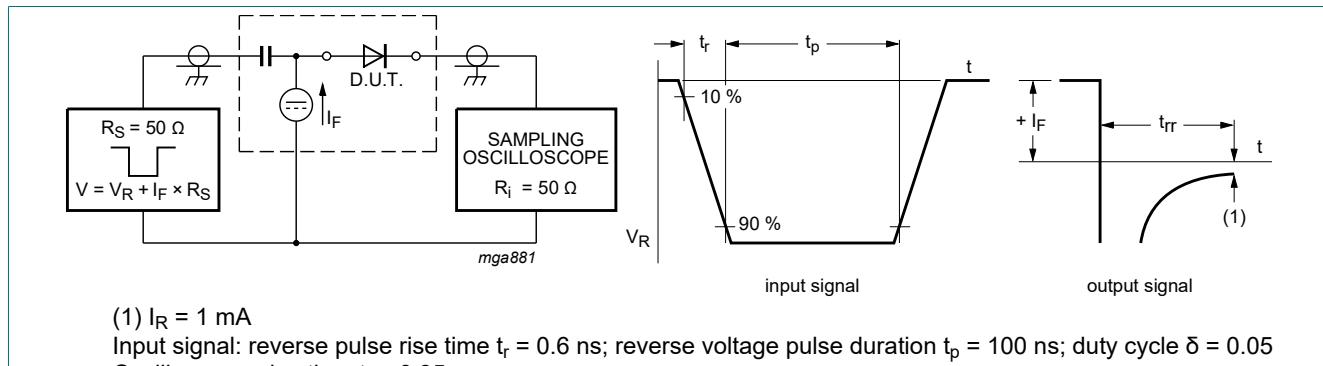


Fig. 5. Reverse recovery time test circuit and waveforms

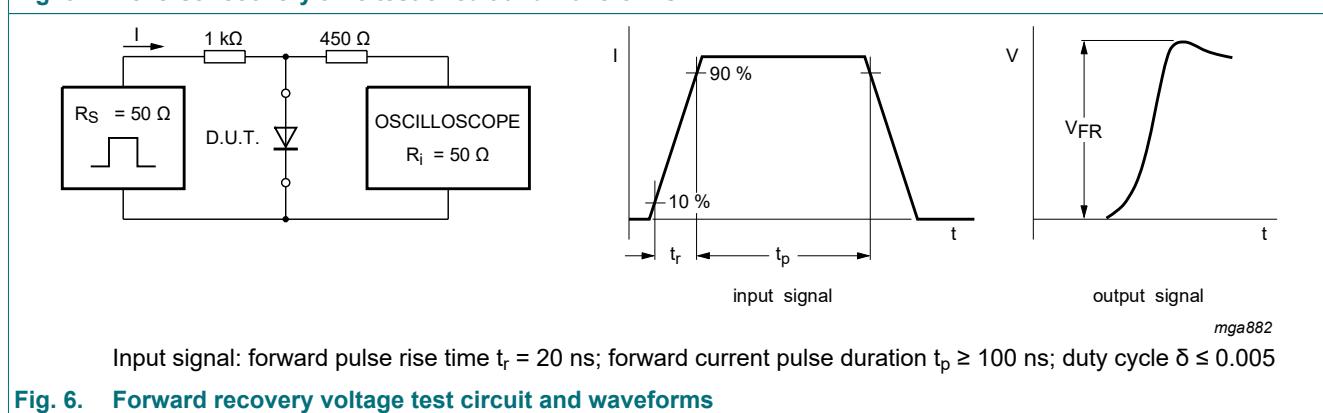


Fig. 6. Forward recovery voltage test circuit and waveforms

12. Package outline

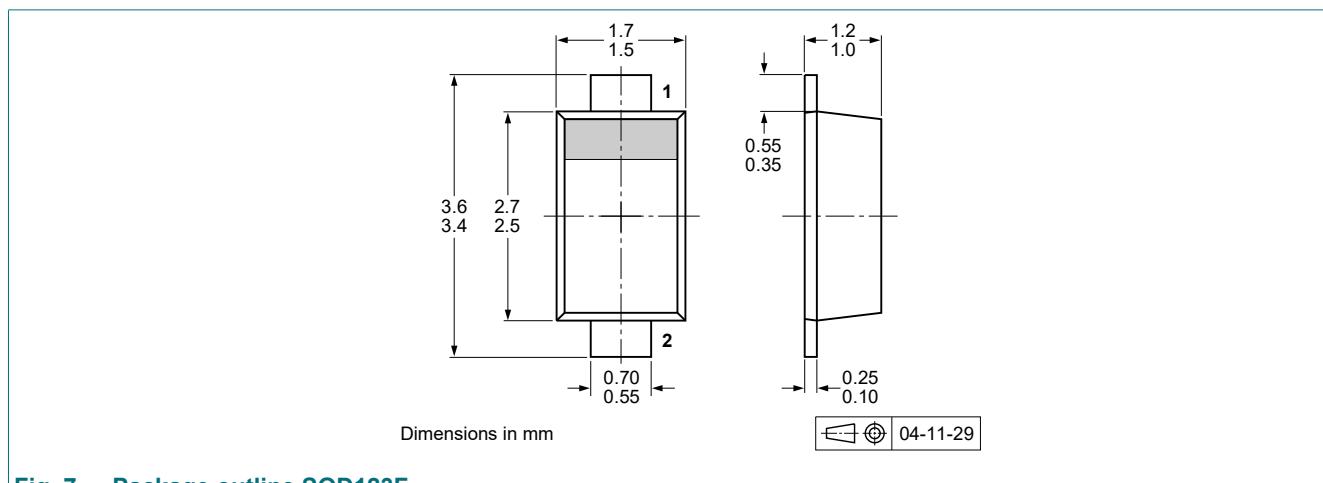
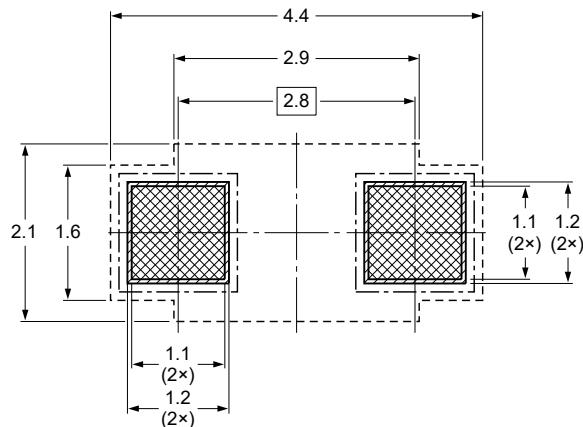


Fig. 7. Package outline SOD123F

13. Soldering

Footprint information for reflow soldering of plastic surface-mounted, 2 leads package

SOD123F



solder land



solder land plus solder paste



solder paste deposit



solder resist

- - - occupied area

Dimensions in mm

sod123f_fr

Fig. 8. Reflow soldering footprint for SOD123F

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16H v.7	20221001	Product data sheet	-	BAS16_SER_6
Modifications:	<ul style="list-style-type: none"> Family data sheet splitted to single type data sheet. Product changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s). 			
BAS16_SER_6	20140924	Product data sheet	-	BAS16_SER_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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