

# BAV102; BAV103

Single general-purpose switching diodes

Rev. 4 — 6 August 2010

Product data sheet

## 1. Product profile

### 1.1 General description

Single general-purpose switching diodes, fabricated in planar technology, and encapsulated in small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) packages.

Table 1. Product overview

Type number	Package		Configuration
	NXP	JEITA	
BAV102	SOD80C	-	single
BAV103			

### 1.2 Features and benefits

- High switching speed:  $t_{rr} \leq 50$  ns
- Low leakage current
- Low capacitance:  $C_d \leq 5$  pF
- Small hermetically sealed glass SMD package

### 1.3 Applications

- High-speed switching
- General-purpose switching
- Voltage clamping
- Reverse polarity protection

### 1.4 Quick reference data

Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	[1][2]	-	-	250	mA
$V_R$	reverse voltage					
	BAV102		-	-	150	V
	BAV103		-	-	200	V
$t_{rr}$	reverse recovery time	[3]	-	-	50	ns

[1] Pulse test:  $t_p \leq 300$   $\mu$ s;  $\delta \leq 0.02$ .

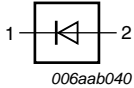

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[3] When switched from  $I_F = 30$  mA to  $I_R = 30$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 3$  mA.



## 2. Pinning information

**Table 3. Pinning**

Pin	Description	Simplified outline	Graphic symbol
1	cathode	[1]	
2	anode		

[1] The marking band indicates the cathode.

## 3. Ordering information

**Table 4. Ordering information**

Type number	Package		
	Name	Description	Version
BAV102	-	hermetically sealed glass surface-mounted package;	SOD80C
BAV103	-	2 connectors	

## 4. Marking

**Table 5. Marking codes**

Type number	Marking code
BAV102	marking band
BAV103	marking band

## 5. Limiting values

**Table 6. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage				
		BAV102	-	200	V
		BAV103	-	250	V
$V_R$	reverse voltage				
		BAV102	-	150	V
		BAV103	-	200	V
$I_F$	forward current	[1][2]	-	250	mA
$I_{FRM}$	repetitive peak forward current		-	625	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	[3]		
		$t_p = 1 \mu s$	-	9	A
		$t_p = 100 \mu s$	-	3	A
		$t_p = 1 s$	-	1	A

**Table 6. Limiting values ...continued***In accordance with the Absolute Maximum Rating System (IEC 60134).*

Symbol	Parameter	Conditions	Min	Max	Unit
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25 \text{ }^{\circ}\text{C}$	[2] -	400	mW
$T_{\text{j}}$	junction temperature		-	175	$^{\circ}\text{C}$
$T_{\text{amb}}$	ambient temperature		-65	+175	$^{\circ}\text{C}$
$T_{\text{stg}}$	storage temperature		-65	+175	$^{\circ}\text{C}$

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

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

[3]  $T_{\text{j}} = 25 \text{ }^{\circ}\text{C}$  prior to surge.

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{\text{th(j-a)}}$	thermal resistance from junction to ambient	in free air	[1] -	-	375	K/W
$R_{\text{th(j-t)}}$	thermal resistance from junction to tie-point		-	-	300	K/W

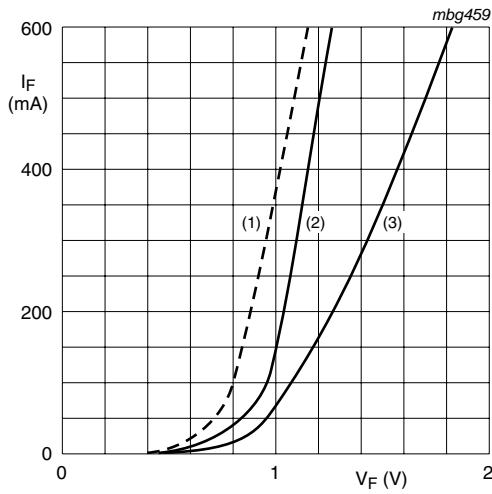
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 7. Characteristics

**Table 8. Characteristics** *$T_{\text{amb}} = 25 \text{ }^{\circ}\text{C}$  unless otherwise specified.*

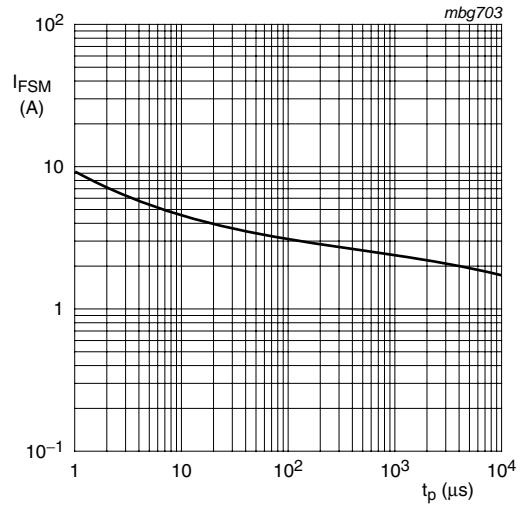
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$V_{\text{F}}$	forward voltage		[1]				
		$I_{\text{F}} = 100 \text{ mA}$	-	-	1.0	V	
		$I_{\text{F}} = 200 \text{ mA}$	-	-	1.25	V	
$I_{\text{R}}$	reverse current						
		BAV102	$V_{\text{R}} = 150 \text{ V}$	-	-	100	nA
			$V_{\text{R}} = 150 \text{ V}; T_{\text{j}} = 150 \text{ }^{\circ}\text{C}$	-	-	100	$\mu\text{A}$
		BAV103	$V_{\text{R}} = 200 \text{ V}$	-	-	100	nA
			$V_{\text{R}} = 200 \text{ V}; T_{\text{j}} = 150 \text{ }^{\circ}\text{C}$	-	-	100	$\mu\text{A}$
$C_{\text{d}}$	diode capacitance	$f = 1 \text{ MHz}; V_{\text{R}} = 0 \text{ V}$	-	-	5	pF	
$t_{\text{rr}}$	reverse recovery time		[2] -	-	50	ns	

[1] Pulse test:  $t_p \leq 300 \text{ } \mu\text{s}$ ;  $\delta \leq 0.02$ .[2] When switched from  $I_{\text{F}} = 30 \text{ mA}$  to  $I_{\text{R}} = 30 \text{ mA}$ ;  $R_{\text{L}} = 100 \text{ } \Omega$ ; measured at  $I_{\text{R}} = 3 \text{ mA}$ .



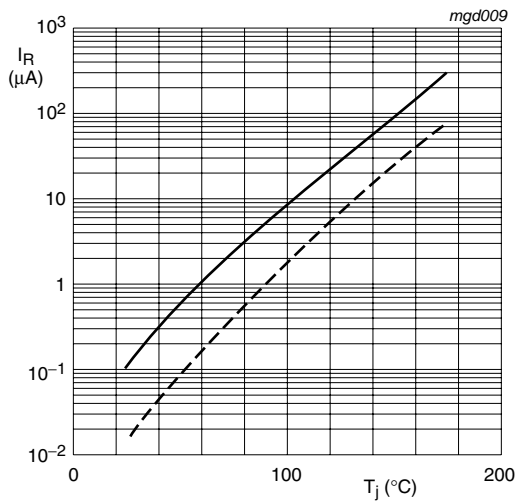
- (1)  $T_{amb} = 150\text{ °C}$ ; typical values
- (2)  $T_{amb} = 25\text{ °C}$ ; typical values
- (3)  $T_{amb} = 25\text{ °C}$ ; maximum values

**Fig 1. Forward current as a function of forward voltage**



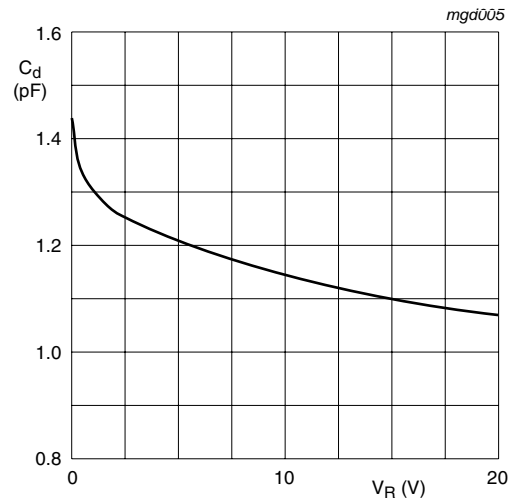
Based on square wave currents.  
 $T_j = 25\text{ °C}$ ; prior to surge

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



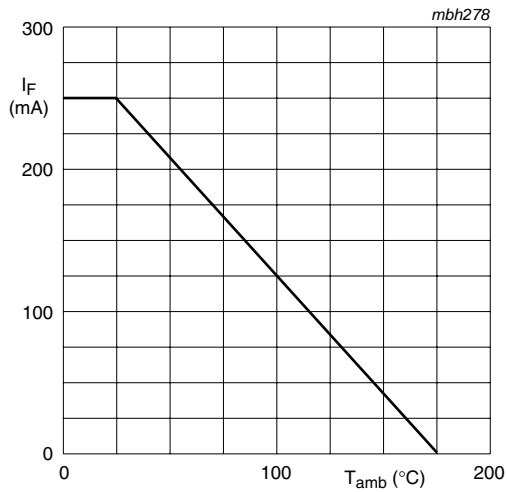
$V_R = V_{Rmax}$   
 Solid line: maximum values  
 Dotted line: typical values

**Fig 3. Reverse current as a function of junction temperature**



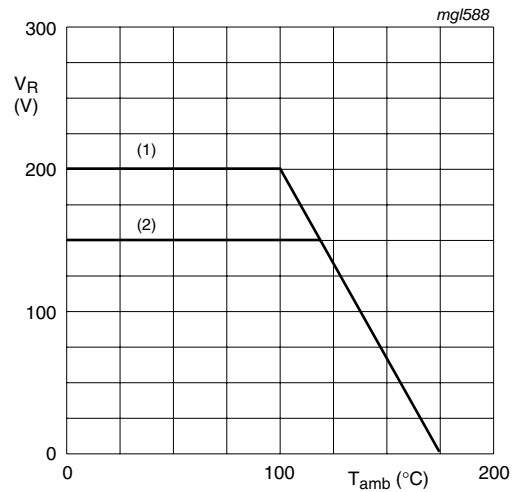
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ °C}$

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



FR4 PCB, standard footprint

**Fig 5. Forward current as a function of ambient temperature; derating curve**

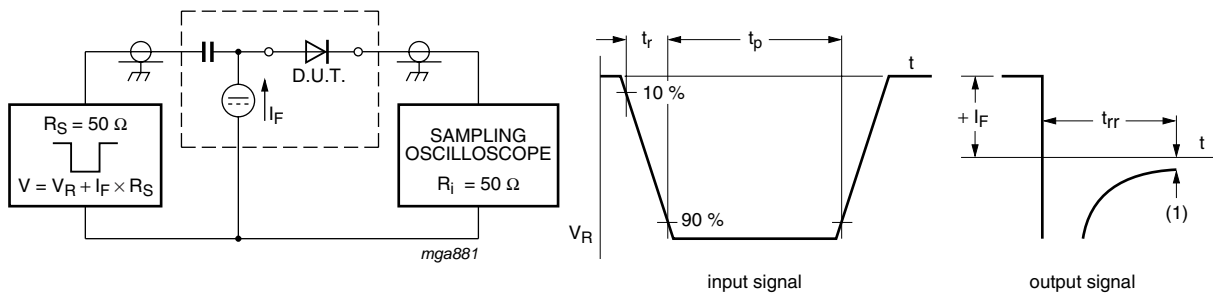


FR4 PCB, standard footprint

- (1) BAV103
- (2) BAV102

**Fig 6. Reverse voltage as a function of ambient temperature; derating curve**

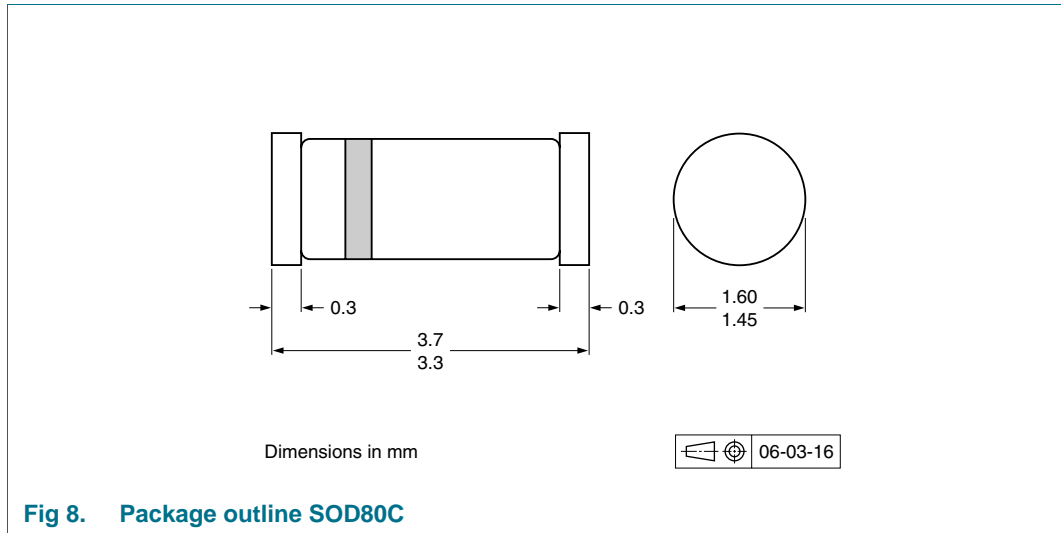
## 8. Test information



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

**Fig 7. Reverse recovery time test circuit and waveforms**

## 9. Package outline



## 10. Packing information

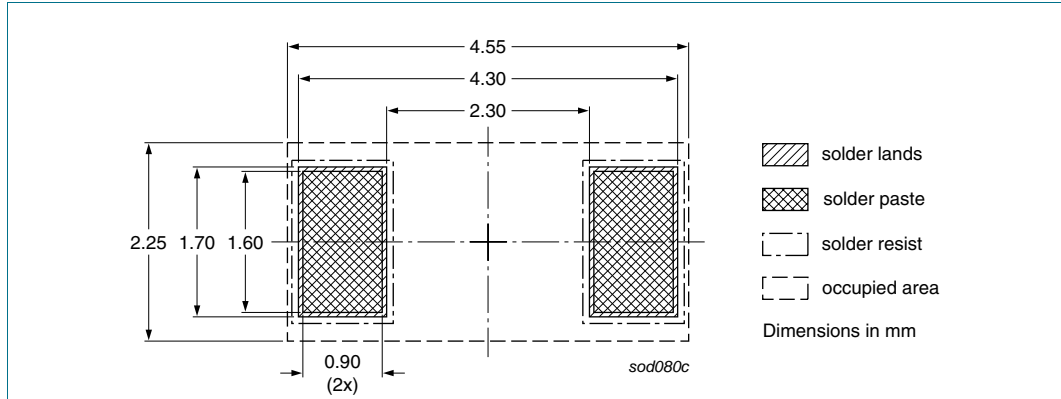
**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

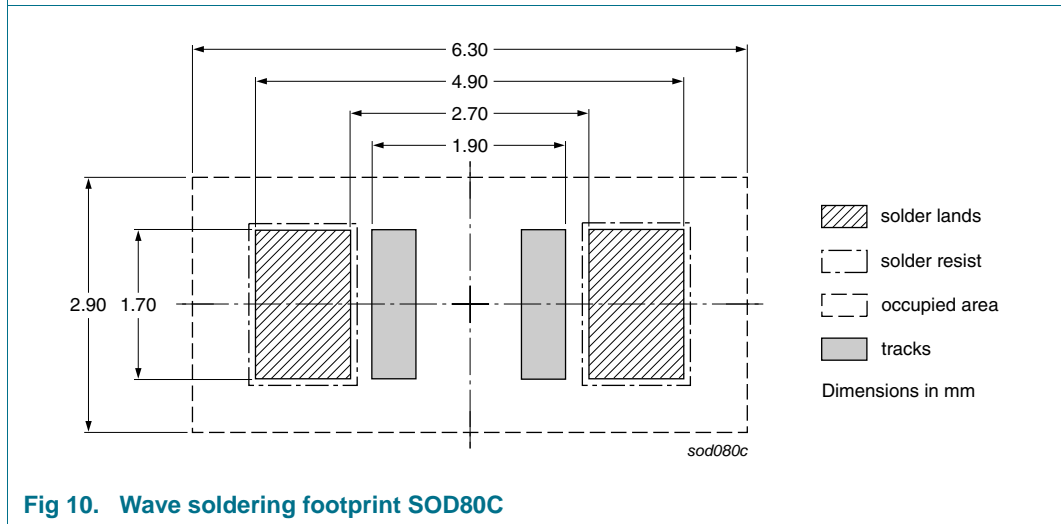
Type number	Package	Description	Packing quantity	
			2500	10000
BAV102	SOD80C	4 mm pitch, 8 mm tape and reel	-115	-135
BAV103				

[1] For further information and the availability of packing methods, see [Section 14](#).

**11. Soldering**



**Fig 9. Reflow soldering footprint SOD80C**



**Fig 10. Wave soldering footprint SOD80C**

## 12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAV102_BAV103 v.4	20100806	Product data sheet	-	BAV102_BAV103_3
Modifications:	<ul style="list-style-type: none"><li>• <a href="#">Section 4 "Marking"</a>: updated</li><li>• <a href="#">Section 13 "Legal information"</a>: updated</li></ul>			
BAV102_BAV103_3	20070816	Product data sheet	-	BAV100_2
BAV100_2	19960917	Product specification	-	BAV100_1
BAV100_1	19960423	Product specification	-	-



## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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