

# BAV102; BAV103

Single general-purpose switching diodes

Rev. 03 — 16 August 2007

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

- 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


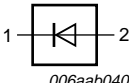
[1] Pulse test:  $t_p \leq 300$   $\mu$ s;  $\delta \leq 0.02$ .

[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	Symbol
1	cathode <sup>[1]</sup>		
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 <sup>[1]</sup>
BAV102	marking band
BAV103	

[1] green: made in Philippines

## 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	<sup>[1][2]</sup>	-	250	mA
$I_{FRM}$	repetitive peak forward current		-	625	mA

**Table 6. Limiting values ...continued**

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

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

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

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

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

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

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

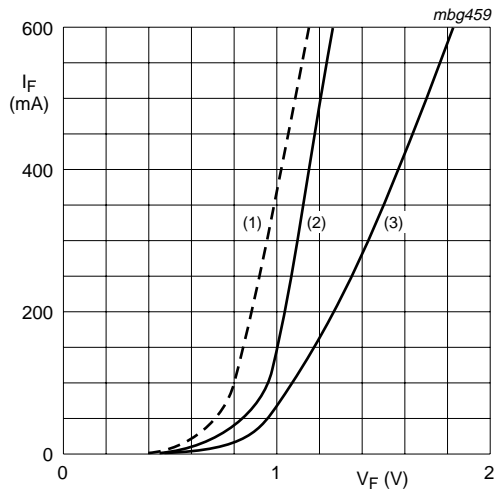
**Table 8. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$V_F$	forward voltage		[1]				
		$I_F = 100 \text{ mA}$	-	-	1.0	V	
		$I_F = 200 \text{ mA}$	-	-	1.25	V	
$I_R$	reverse current	BAV102	$V_R = 150 \text{ V}$	-	-	100	nA
			$V_R = 150 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	-	100	$\mu\text{A}$
		BAV103	$V_R = 200 \text{ V}$	-	-	100	nA
			$V_R = 200 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	-	100	$\mu\text{A}$
				-	-	5	pF
$t_{rr}$	reverse recovery time	$f = 1 \text{ MHz}; V_R = 0 \text{ V}$	[2]	-	50	ns	

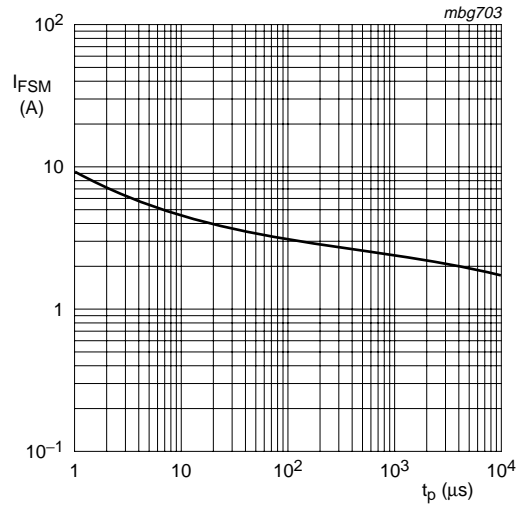
[1] Pulse test:  $t_p \leq 300 \mu s$ ;  $\delta \leq 0.02$ .

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



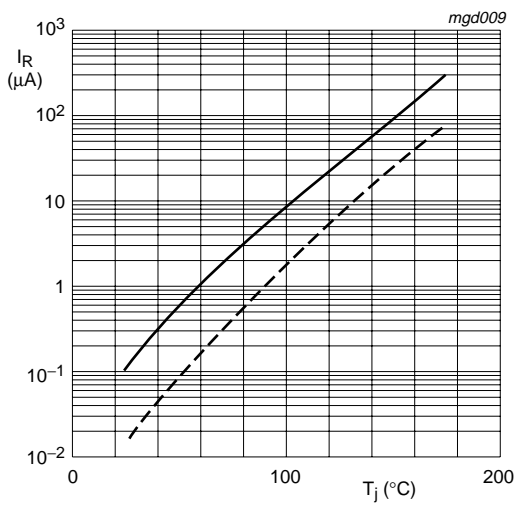
- (1)  $T_{amb} = 150\text{ °C}$ ; typical values
- (2)  $T_{amb} = 25\text{ °C}$ ; typical values
- (3)  $T_{amb} = 25\text{ °C}$ ; maximum values

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



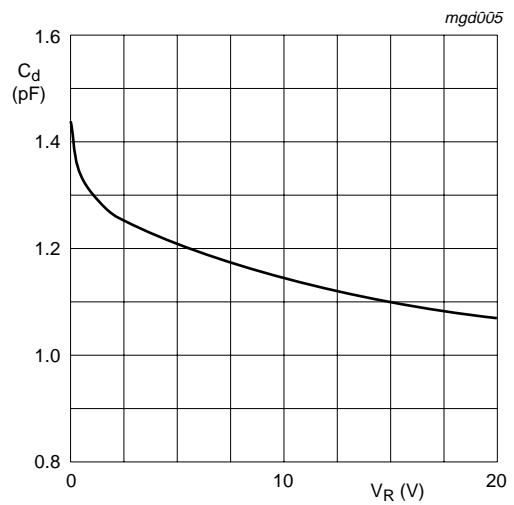
Based on square wave currents.  
 $T_j = 25\text{ °C}$ ; prior to surge

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



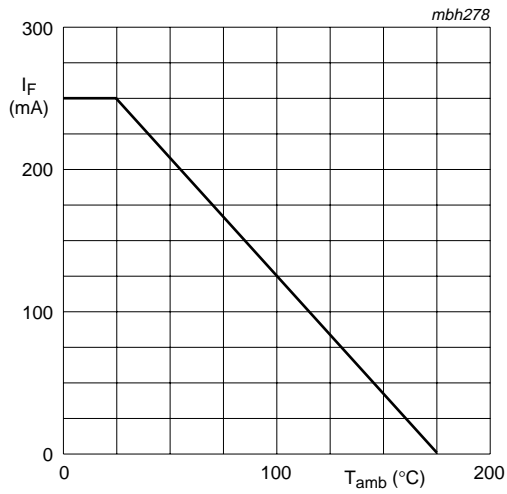
$V_R = V_{Rmax}$   
 Solid line: maximum values  
 Dotted line: typical values

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



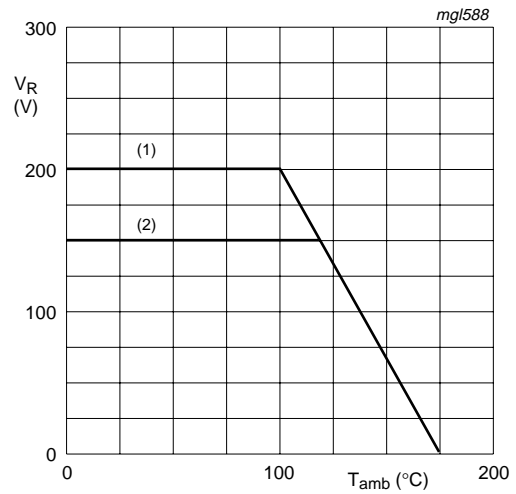
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ °C}$

**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**

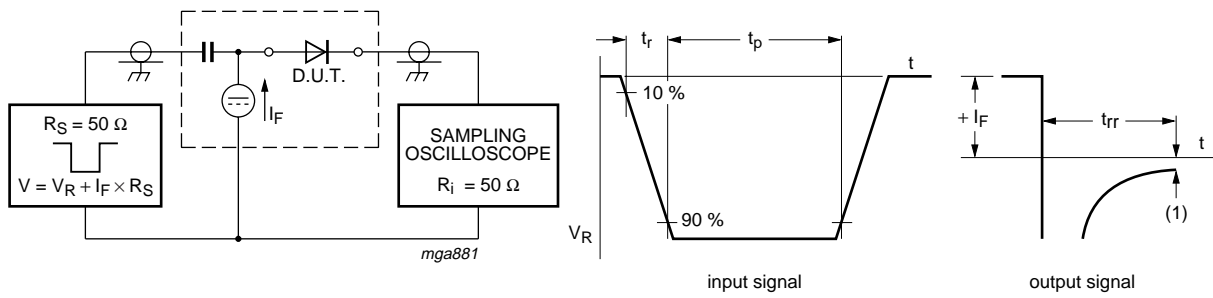


FR4 PCB, standard footprint

- (1) BAV103
- (2) BAV102

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

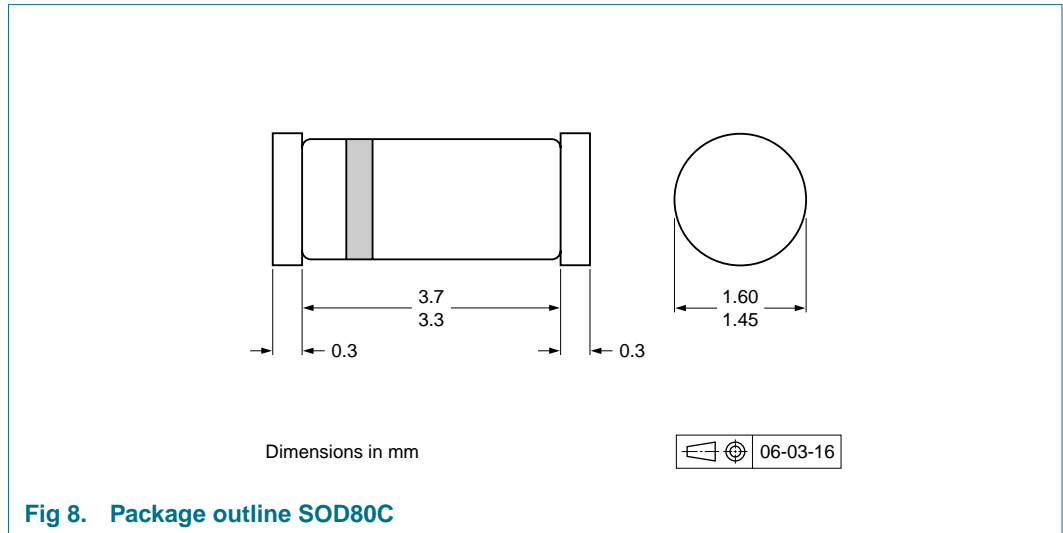
## 8. Test information



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

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

## 9. Package outline



## 10. Packing information

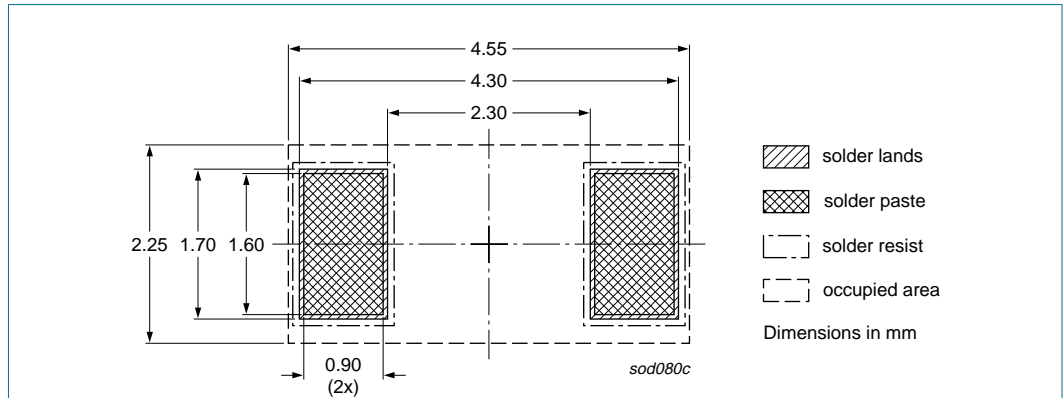
**Table 9. Packing methods**

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

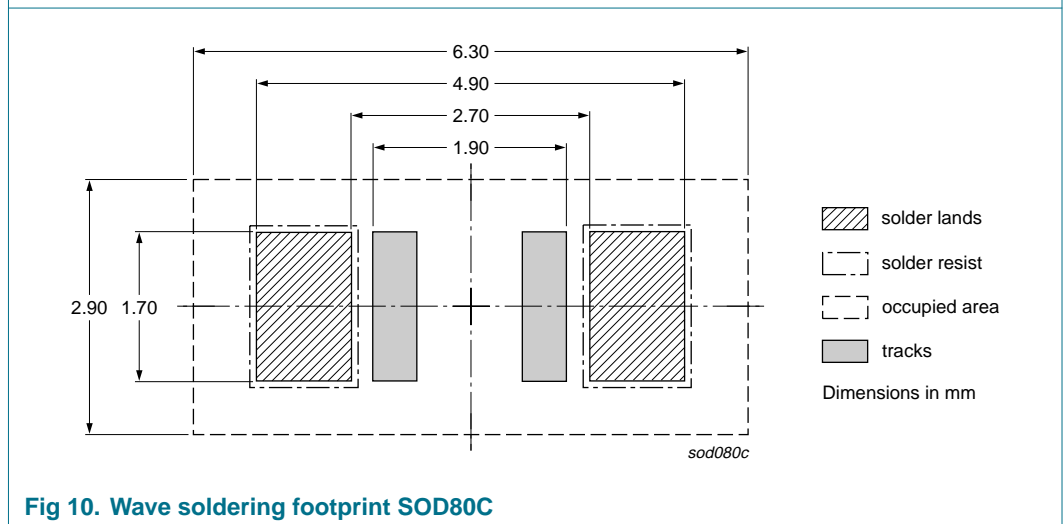
Type number	Package	Description	Packing quantity	
			2500	10000
BAV102	SOD80C	4 mm pitch, 8 mm tape and reel	-115	-135
BAV103				

[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_3	20070816	Product data sheet	-	BAV100_2
Modifications:	<ul style="list-style-type: none"> <li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>• Legal texts have been adapted to the new company name where appropriate.</li> <li>• Type numbers BAV100 and BAV101 have been removed</li> <li>• <a href="#">Section 1.1 “General description”</a>: amended</li> <li>• <a href="#">Table 1 “Product overview”</a>: added</li> <li>• <a href="#">Table 2 “Quick reference data”</a>: added</li> <li>• <a href="#">Section 3 “Ordering information”</a>: added</li> <li>• <a href="#">Figure 7</a>: figure title amended</li> <li>• <a href="#">Figure 8</a>: superseded by minimized package outline drawing</li> <li>• <a href="#">Section 10 “Packing information”</a>: added</li> <li>• <a href="#">Section 11 “Soldering”</a>: added</li> <li>• <a href="#">Section 13 “Legal information”</a>: updated</li> </ul>			
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.

[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 URL <http://www.nxp.com>.

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