

# BAS32L

## High-speed switching diode

Rev. 05 — 3 January 2008

Product data sheet

## 1. Product profile

### 1.1 General description

Single high-speed switching diode, fabricated in planar technology, and encapsulated in a small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) package.

### 1.2 Features

- High switching speed:  $t_{rr} \leq 4$  ns
- Reverse voltage:  $V_R \leq 75$  V
- Repetitive peak reverse voltage:  $V_{RRM} \leq 100$  V
- Repetitive peak forward current:  $I_{FRM} \leq 450$  mA
- Small hermetically sealed glass SMD package

### 1.3 Applications

- High-speed switching
- Reverse polarity protection

### 1.4 Quick reference data

Table 1. Quick reference data


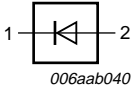
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		[1]	-	200	mA
$I_{FRM}$	repetitive peak forward current		-	-	450	mA
$V_R$	reverse voltage		-	-	75	V
$V_F$	forward voltage	$I_F = 100$ mA	-	-	1000	mV
$t_{rr}$	reverse recovery time		[2]	-	4	ns

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

[2] When switched from  $I_F = 10$  mA to  $I_R = 10$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 1$  mA.

## 2. Pinning information

**Table 2. Pinning**

Pin	Description	Simplified outline	Symbol
1	cathode		
2	anode		

[1] The marking band indicates the cathode.

## 3. Ordering information

**Table 3. Ordering information**

Type number	Package		Version
	Name	Description	
BAS32L	-	hermetically sealed glass surface-mounted package; 2 connectors	SOD80C

## 4. Marking

**Table 4. Marking codes**

Type number	Marking code <sup>[1]</sup>
BAS32L	marking band

[1] black: made in Philippines  
brown: made in China

## 5. Limiting values

**Table 5. Limiting values**

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

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{RRM}$	repetitive peak reverse voltage		-	100	V
$V_R$	reverse voltage		-	75	V
$I_F$	forward current		[1]	200	mA
$I_{FRM}$	repetitive peak forward current		-	450	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	[2]		
		$t_p = 1 \mu s$	-	4	A
		$t_p = 1 ms$	-	1	A
		$t_p = 1 s$	-	0.5	A
$P_{tot}$	total power dissipation	$T_{amb} = 25 \text{ }^\circ\text{C}$	[1]	500	mW

**Table 5. Limiting values ...continued***In accordance with the Absolute Maximum Rating System (IEC 60134).*

Symbol	Parameter	Conditions	Min	Max	Unit
$T_j$	junction temperature		-	200	°C
$T_{amb}$	ambient temperature		-65	+200	°C
$T_{stg}$	storage temperature		-65	+200	°C

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

[2]  $T_j = 25$  °C prior to surge.

## 6. 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]	-	350	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	300	K/W

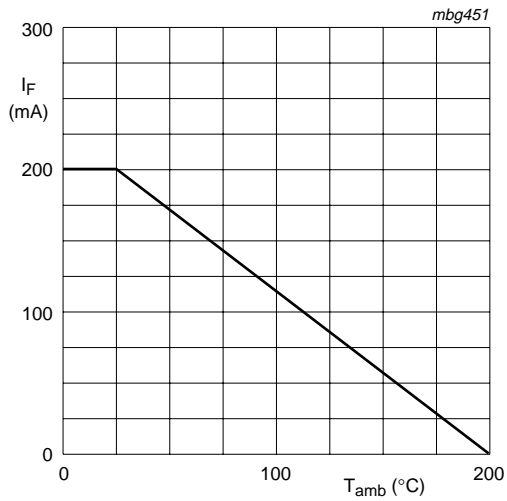
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 7. Characteristics

**Table 7. Characteristics** *$T_{amb} = 25$  °C unless otherwise specified.*

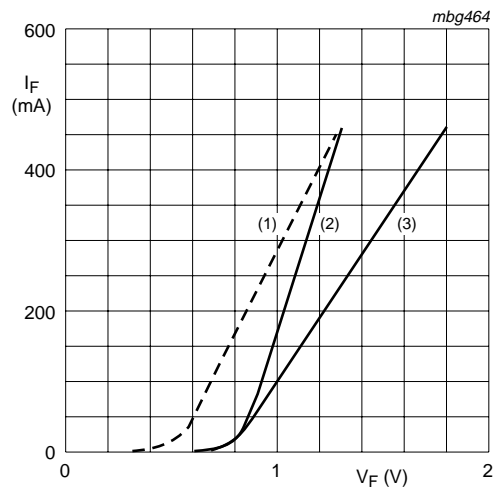
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 5$ mA	620	-	750	mV
		$I_F = 100$ mA	-	-	1000	mV
		$I_F = 100$ mA; $T_j = 100$ °C	-	-	930	mV
$I_R$	reverse current	$V_R = 20$ V	-	-	25	nA
		$V_R = 75$ V	-	-	5	μA
		$V_R = 20$ V; $T_j = 150$ °C	-	-	50	μA
		$V_R = 75$ V; $T_j = 150$ °C	-	-	100	μA
$C_d$	diode capacitance	$V_R = 0$ V; $f = 1$ MHz	-	-	2	pF
$t_{rr}$	reverse recovery time		[1]	-	4	ns
$V_{FR}$	forward recovery voltage		[2]	-	2.5	V

[1] When switched from  $I_F = 10$  mA to  $I_R = 10$  mA;  $R_L = 100$  Ω; measured at  $I_R = 1$  mA.[2] When switched from  $I_F = 50$  mA;  $t_r = 20$  ns.



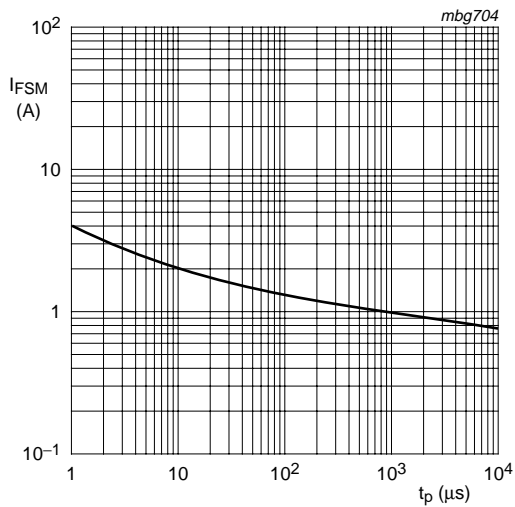
FR4 PCB, standard footprint

**Fig 1. Forward current as a function of ambient temperature; derating curve**



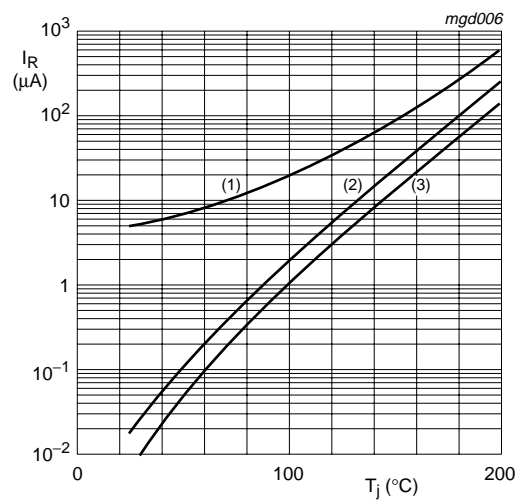
- (1)  $T_j = 175\text{ }^\circ\text{C}$ ; typical values
- (2)  $T_j = 25\text{ }^\circ\text{C}$ ; typical values
- (3)  $T_j = 25\text{ }^\circ\text{C}$ ; maximum values

**Fig 2. Forward current as a function of forward voltage**



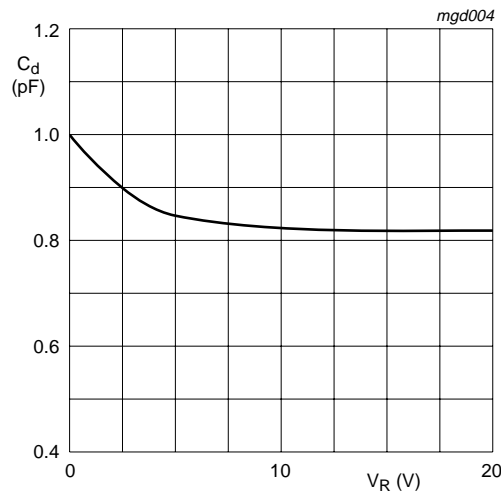
Based on square wave currents.  
 $T_j = 25\text{ }^\circ\text{C}$  prior to surge

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



- (1)  $V_R = 75\text{ V}$ ; maximum values
- (2)  $V_R = 75\text{ V}$ ; typical values
- (3)  $V_R = 20\text{ V}$ ; typical values

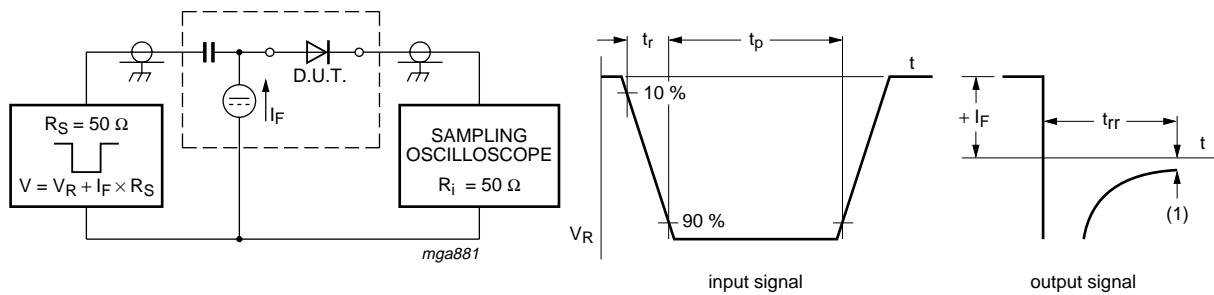
**Fig 4. Reverse current as a function of junction temperature**



f = 1 MHz; Tj = 25 °C

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

## 8. Test information

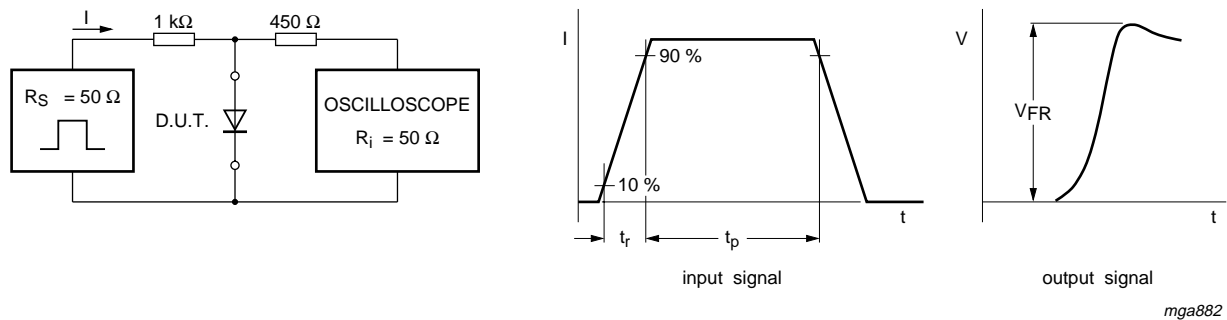


Input signal: Reverse pulse rise time  $t_r = 0.6$  ns; reverse voltage pulse duration  $t_p = 100$  ns; duty factor  $\delta \leq 0.05$

Oscilloscope: Rise time  $t_r = 0.35$  ns

(1)  $I_R = 1$  mA

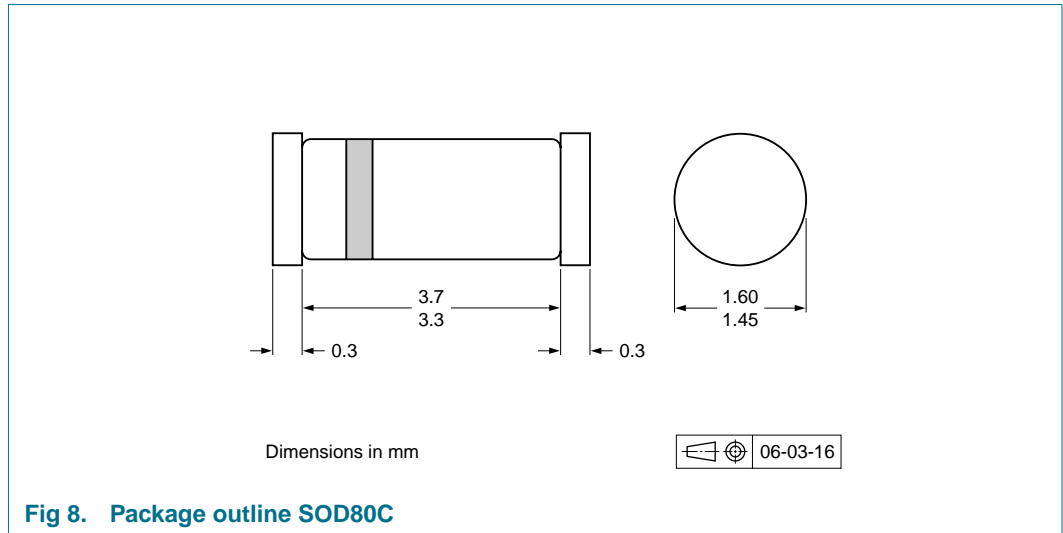
**Fig 6. Reverse recovery time test circuit and waveforms**



Input signal: Forward pulse rise time  $t_r = 20$  ns; forward current pulse duration  $t_p \geq 100$  ns; duty factor  $\delta \leq 0.005$

**Fig 7. Forward recovery voltage test circuit and waveforms**

## 9. Package outline



## 10. Packing information

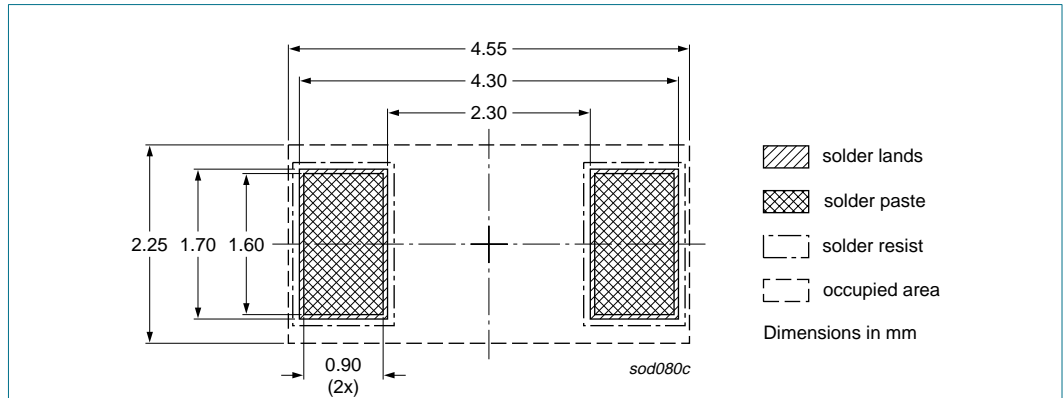
**Table 8. Packing methods**

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

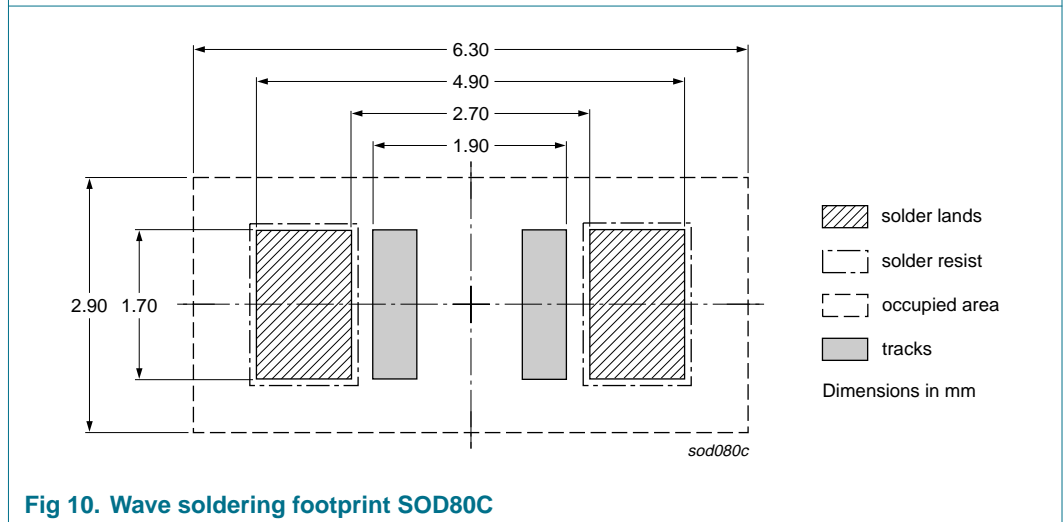
Type number	Package	Description	Packing quantity	
			2500	10000
BAS32L	SOD80C	4 mm pitch, 8 mm tape and reel	-115	-135

[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 9.** Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS32L_5	20080103	Product data sheet	-	BAS32L_4
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>• <a href="#">Section 1.3 “Applications”</a>: amended</li> <li>• <a href="#">Figure 4</a>: axis unit for <math>I_R</math> reverse current amended from mA to <math>\mu</math>A</li> <li>• <a href="#">Figure 9</a> and <a href="#">10</a>: amended</li> <li>• <a href="#">Section 13 “Legal information”</a>: updated</li> </ul>		
BAS32L_4	20050322	Product data sheet	-	BAS32L_3
BAS32L_3	20020123	Product specification	-	BAS32L_2
BAS32L_2	19960910	Product specification	-	BAS32L_1
BAS32L_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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