

# BAS32L

## High-speed switching diode

Rev. 7 — 20 January 2011

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 and benefits

- 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

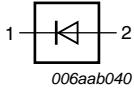

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

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

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## 2. Pinning information

Table 2. Pinning

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

[1] The marking band indicates the cathode.

## 3. Ordering information

Table 3. Ordering information

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

## 4. Marking

Table 4. Marking codes

Type number	Marking code
BAS32L	marking band

## 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]		
		$t_p = 1 \mu\text{s}$	-	4	A
		$t_p = 1 \text{ms}$	-	1	A
		$t_p = 1 \text{s}$	-	0.5	A

**Table 5. 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	$T_{\text{amb}} = 25\text{ °C}$	[1] -	500	mW
$T_j$	junction temperature		-	200	°C
$T_{\text{amb}}$	ambient temperature		-65	+200	°C
$T_{\text{stg}}$	storage temperature		-65	+200	°C

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

[2]  $T_j = 25\text{ °C}$  prior to surge.

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{\text{th(j-a)}}$	thermal resistance from junction to ambient	in free air	[1] -	-	350	K/W
$R_{\text{th(j-sp)}}$	thermal resistance from junction to solder point		-	-	300	K/W

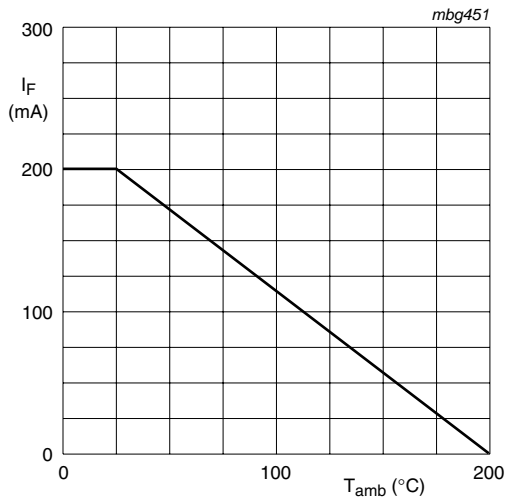
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 7. Characteristics

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

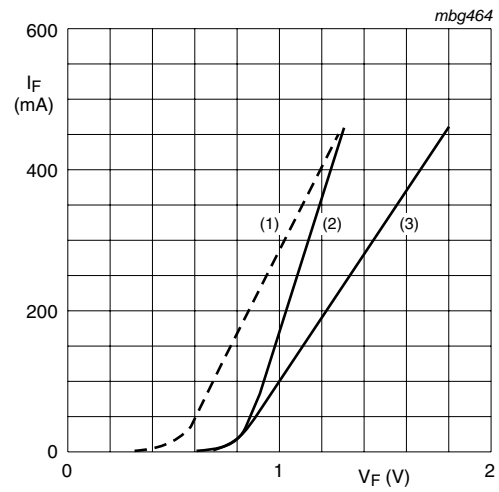
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 5\text{ mA}$	620	-	750	mV
		$I_F = 100\text{ mA}$	-	-	1000	mV
		$I_F = 100\text{ mA}; T_j = 100\text{ °C}$	-	-	930	mV
$I_R$	reverse current	$V_R = 20\text{ V}$	-	-	25	nA
		$V_R = 75\text{ V}$	-	-	5	μA
		$V_R = 20\text{ V}; T_j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

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



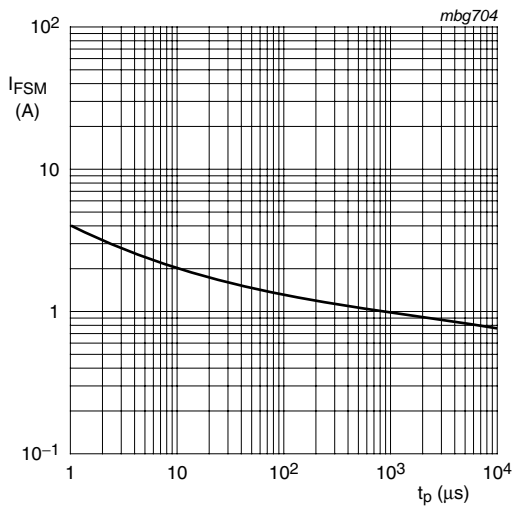
FR4 PCB, standard footprint

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



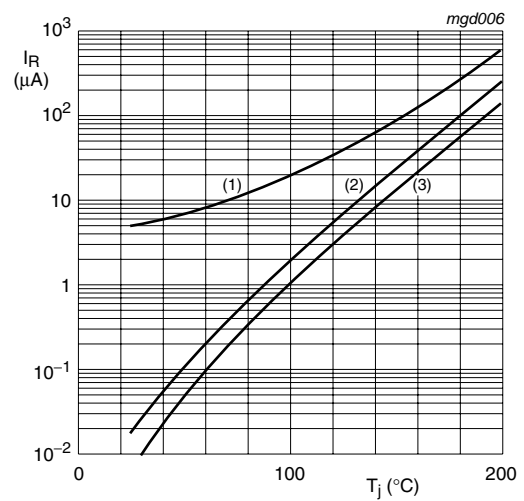
- (1)  $T_j = 175\text{ °C}$ ; typical values
- (2)  $T_j = 25\text{ °C}$ ; typical values
- (3)  $T_j = 25\text{ °C}$ ; maximum values

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



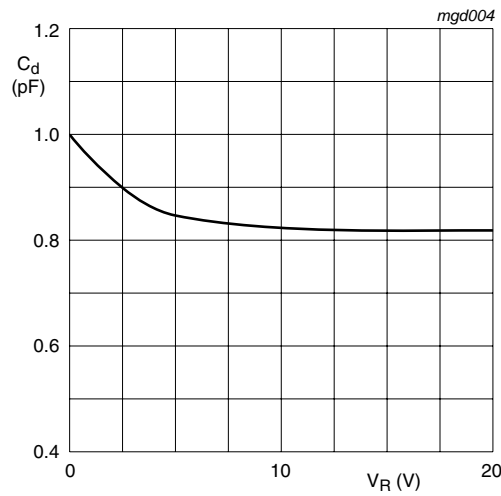
Based on square wave currents.  
 $T_j = 25\text{ °C}$  prior to surge

**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

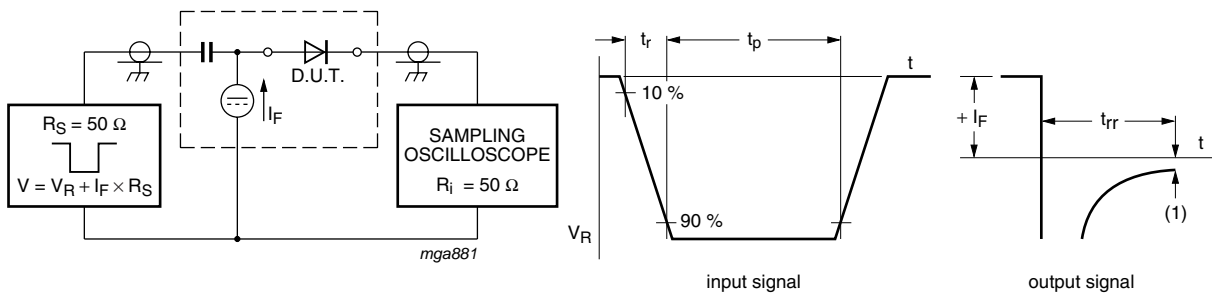
**Fig 4. Reverse current as a function of junction temperature**



f = 1 MHz; T<sub>j</sub> = 25 °C

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

## 8. Test information

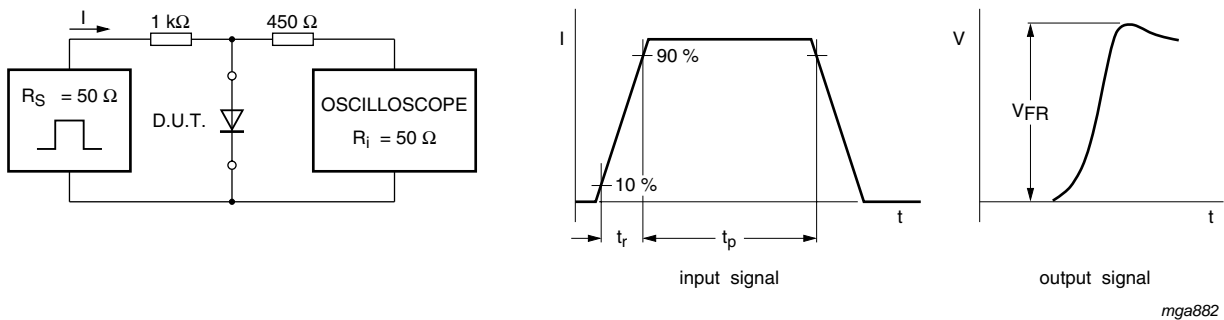


Input signal: Reverse pulse rise time  $t_r = 0.6$  ns; reverse voltage pulse duration  $t_p = 100$  ns; duty factor  $\delta \leq 0.05$

Oscilloscope: Rise time  $t_r = 0.35$  ns

(1)  $I_R = 1$  mA

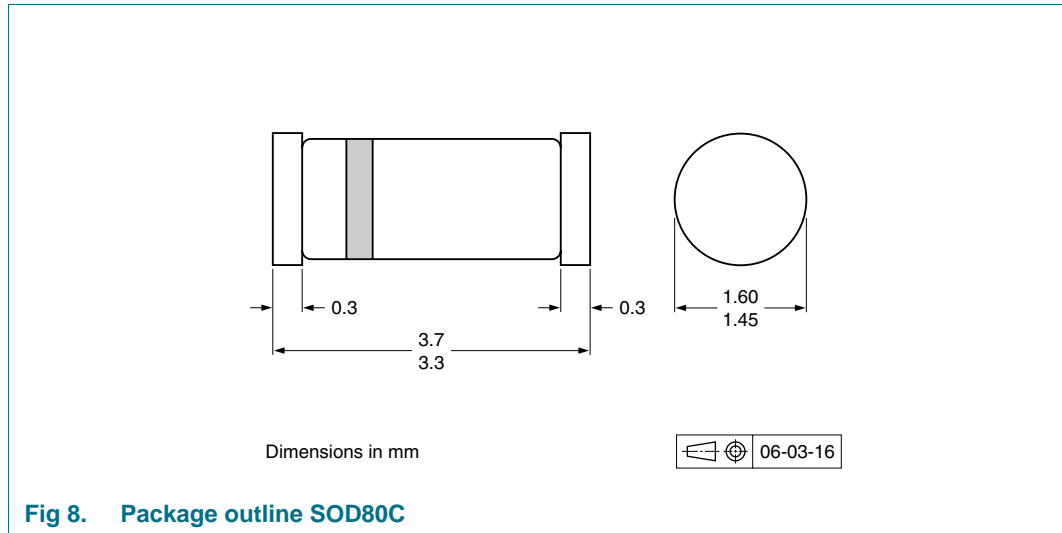
**Fig 6. Reverse recovery time test circuit and waveforms**



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

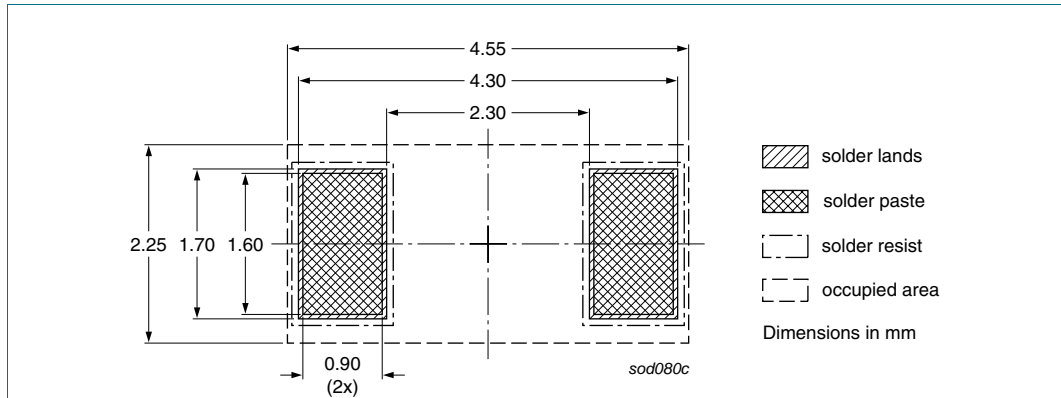
**Table 8. Packing methods**

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

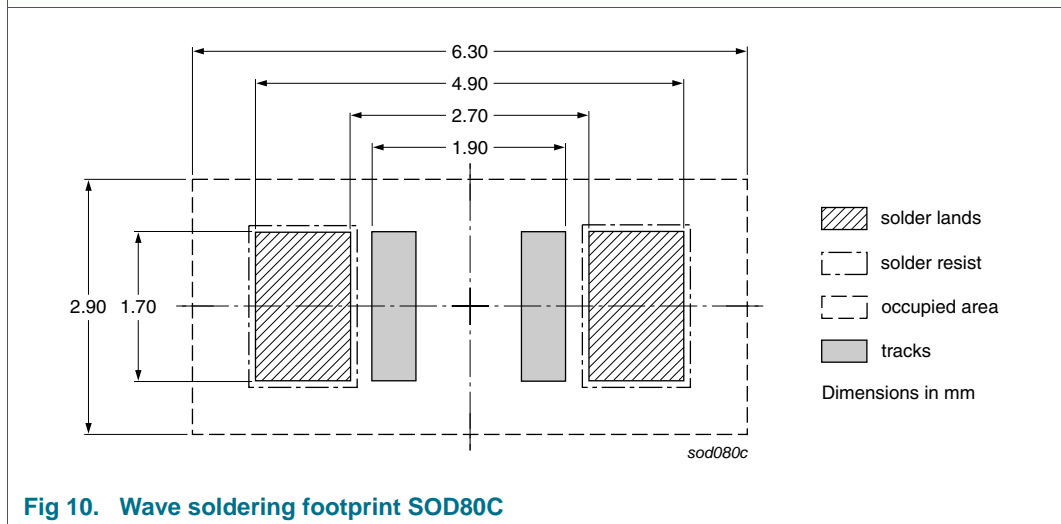
Type number	Package	Description	Packing quantity	
			2500	10000
BAS32L	SOD80C	4 mm pitch, 8 mm tape and reel	-115	-135

[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 v.7	20110120	Product data sheet	-	BAS32L v.6
Modifications:		<ul style="list-style-type: none"><li>• <a href="#">Table 4 “Marking codes”</a>: amended</li><li>• <a href="#">Section 13 “Legal information”</a>: updated</li></ul>		
BAS32L v.6	20081029	Product data sheet	-	BAS32L v.5
BAS32L v.5	20080103	Product data sheet	-	BAS32L v.4
BAS32L v.4	20050322	Product data sheet	-	BAS32L v.3
BAS32L v.3	20020123	Product specification	-	BAS32L v.2
BAS32L v.2	19960910	Product specification	-	BAS32L v.1
BAS32L v.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".

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