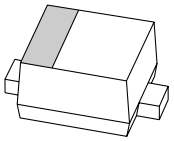


BAS521

Single high-voltage switching diode

Rev. 2 — 5 November 2010 Product data sheet

1. Product profile

1.1 General description

Single high-voltage switching diode, fabricated in planar technology, and encapsulated in a SOD523 (SC-79) ultra small Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- High switching speed: $t_{rr} \leq 50$ ns
- High reverse voltage: $V_R \leq 300$ V
- Repetitive peak forward current: $I_{FRM} \leq 1$ A
- Ultra small SMD plastic package
- AEC-Q101 qualified

1.3 Applications

- High-speed switching
- High-voltage switching

1.4 Quick reference data

Table 1. Quick reference data

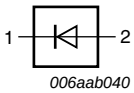
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq 90$ °C	[1]	-	-	250	mA
V_R	reverse voltage			-	-	300	V
t_{rr}	reverse recovery time		[2]	-	16	50	ns

[1] T_{sp} is the solder point temperature at the soldering point of the cathode tab.

[2] 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 2. Pinning

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

006aab040

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS521	SC-79	plastic surface-mounted package; 2 leads	SOD523

4. Marking

Table 4. Marking codes

Type number	Marking code
BAS521	L4

5. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage			-	300	V
V_{RRM}	repetitive peak reverse voltage			-	300	V
I_F	forward current	$T_{sp} \leq 90$ °C	[1]		250	mA
I_{FRM}	repetitive peak forward current	$t_p = 1$ ms; $\delta = 0.25$		-	1	A
I_{FSM}	non-repetitive peak forward current	square wave; $t_p = 1$ µs	[2]	-	4.5	A
P_{tot}	total power dissipation	$T_{sp} \leq 90$ °C	[1][3]	-	500	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−65	+150	°C
T_{stg}	storage temperature			−65	+150	°C

[1] T_{sp} is the solder point temperature at the soldering point of the cathode tab.

[2] $T_j = 25$ °C prior to surge.

[3] Reflow soldering is the only recommended soldering method.

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][2]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	120	K/W

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

[2] Reflow soldering is the only recommended soldering method.

[3] Soldering point of cathode tab.

7. Characteristics

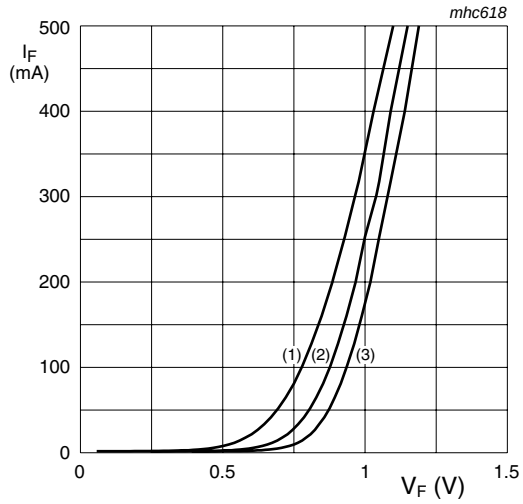
Table 7. Characteristics

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{BR}	breakdown voltage	I_R = 100 μA		300	340	-	V
V_F	forward voltage	I_F = 100 mA	[1]	-	0.95	1.1	V
I_R	reverse current	V_R = 250 V		-	30	150	nA
		V_R = 250 V; T_{amb} = 150 °C		-	40	100	μA
C_d	diode capacitance	f = 1 MHz; V_R = 0 V		-	0.4	5	pF
t_{rr}	reverse recovery time		[2]	-	16	50	ns

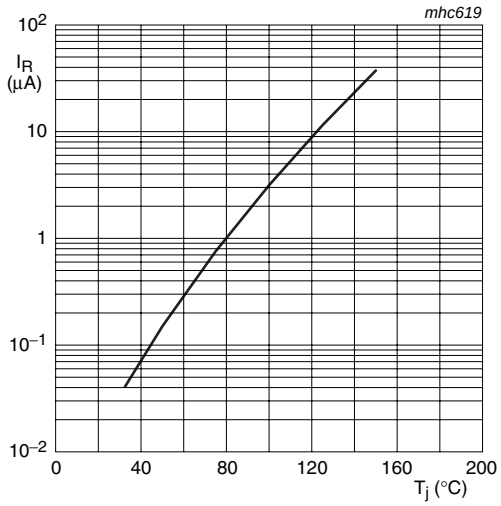
[1] Pulse test: t_p = 300 μs; δ = 0.02.

[2] When switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA.



(1) T_{amb} = 150 °C
(2) T_{amb} = 75 °C
(3) T_{amb} = 25 °C

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



$V_R = V_{Rmax}$

Fig 2. Reverse current as a function of junction temperature; typical values

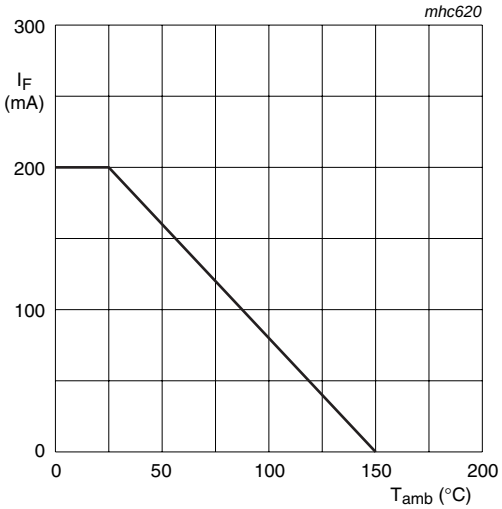
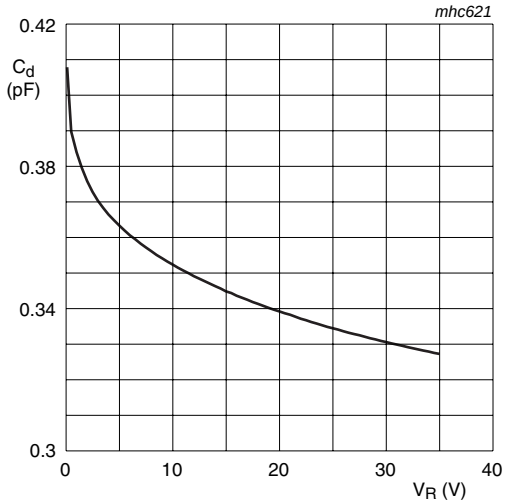
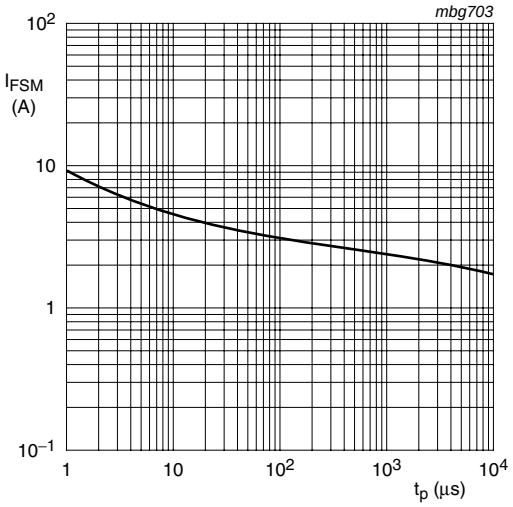


Fig 3. Forward current as a function of ambient temperature; derating curve



f = 1 MHz; T_{amb} = 25 °C

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

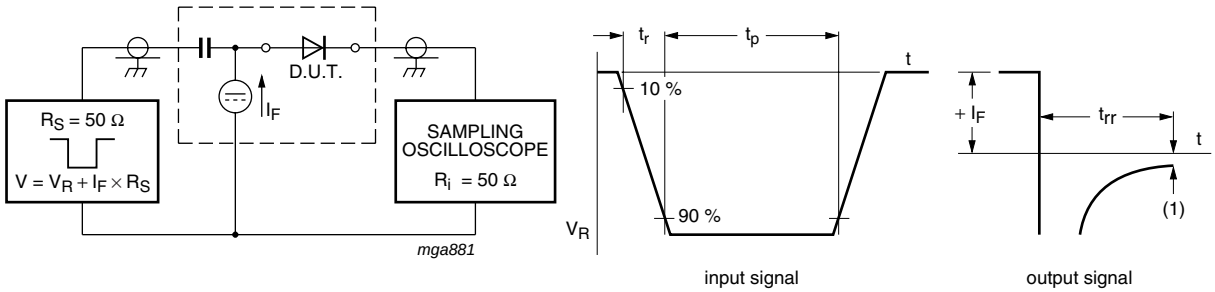


Based on square wave currents.

T_j = 25 °C prior to surge.

Fig 5. Non-repetitive peak forward current as a function of pulse duration; maximum values

8. Test information



(1) I_R = 3 mA

Fig 6. Reverse recovery time test circuit and waveforms

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

9. Package outline

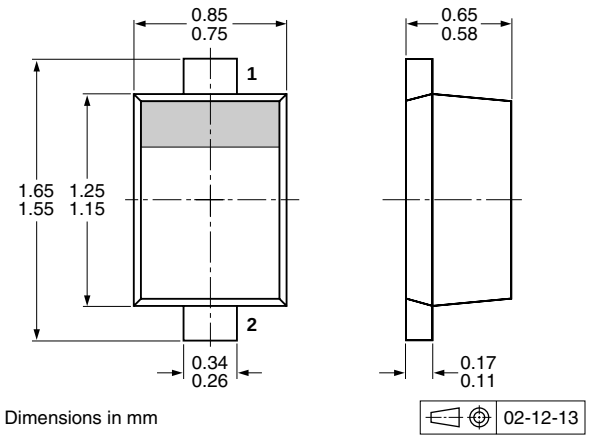


Fig 7. Package outline SOD523 (SC-79)

10. Packing information

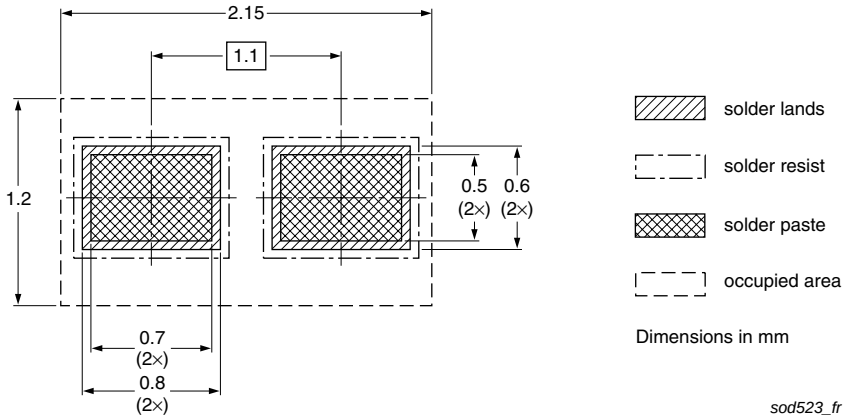
Table 8. Packing methods

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

Type number	Package	Description	Packing quantity		
			3000	8000	10000
BAS521	SOD523	2 mm pitch, 8 mm tape and reel	-	-315	-
		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



Reflow soldering is the only recommended soldering method.

Fig 8. Reflow soldering footprint SOD523 (SC-79)

12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS521 v.2	20101105	Product data sheet	-	BAS521_1
Modifications:	• Section 1.2 “Features and benefits”: amended • Section 8 “Test information”: added • Figure 7: superseded by minimized package outline drawing • Section 10 “Packing information”: added • Section 11 “Soldering”: added • Section 13 “Legal information”: updated			
BAS521_1	20030812	Product data sheet	-	-

13. Legal information

13.1 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 URL http://www.nxp.com.

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