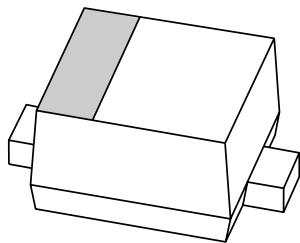


DATA SHEET



BAP1321-01 Silicon PIN diode

Preliminary specification

2001 Nov 01

Silicon PIN diode**BAP1321-01****FEATURES**

- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 3 GHz.

APPLICATIONS

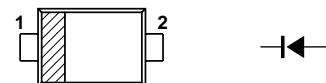
- RF attenuators and switches.

DESCRIPTION

Planar PIN diode in a SOD723A ultra small plastic SMD package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



Top view MAM405

Marking code: K7

Fig.1 Simplified outline (SOD723A) and symbol.

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	60	V
I_F	continuous forward current		–	100	mA
P_{tot}	total power dissipation	$T_s = 90^\circ\text{C}$	–	315	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–65	+150	$^\circ\text{C}$

Silicon PIN diode

BAP1321-01

ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 50 \text{ mA}$	0.95	1.1	V
I_R	reverse leakage current	$V_R = 60 \text{ V}$	—	0.1	μA
		$V_R = 20 \text{ V}$	—	tbd	μA
C_d	diode capacitance	$V_R = 0; f = 1 \text{ MHz}$	0.32	—	pF
		$V_R = 1 \text{ V}; f = 1 \text{ MHz}$	0.28	—	pF
		$V_R = 20 \text{ V}; f = 1 \text{ MHz}$	0.22	0.32	pF
r_D	diode forward resistance	$f = 100 \text{ MHz}$; note 1			
		$I_F = 0.5 \text{ mA}$	3.2	5.0	Ω
		$I_F = 1 \text{ mA}$	2.3	3.6	Ω
		$I_F = 10 \text{ mA}$	1.1	1.8	Ω
$ s_{21} ^2$	isolation	$I_F = 100 \text{ mA}$	0.8	1.3	Ω
		$V_R = 0; f = 900 \text{ MHz}$	15.7	—	dB
		$V_R = 0; f = 1800 \text{ MHz}$	10.8	—	dB
$ s_{21} ^2$	insertion loss	$V_R = 0; f = 2450 \text{ MHz}$	8.7	—	dB
		$I_F = 0.5 \text{ mA}; f = 900 \text{ MHz}$	0.26	—	dB
		$I_F = 0.5 \text{ mA}; f = 1800 \text{ MHz}$	0.28	—	dB
$ s_{21} ^2$	insertion loss	$I_F = 0.5 \text{ mA}; f = 2450 \text{ MHz}$	0.31	—	dB
		$I_F = 1 \text{ mA}; f = 900 \text{ MHz}$	0.20	—	dB
		$I_F = 1 \text{ mA}; f = 1800 \text{ MHz}$	0.23	—	dB
$ s_{21} ^2$	insertion loss	$I_F = 1 \text{ mA}; f = 2450 \text{ MHz}$	0.25	—	dB
		$I_F = 10 \text{ mA}; f = 900 \text{ MHz}$	0.15	—	dB
		$I_F = 10 \text{ mA}; f = 1800 \text{ MHz}$	0.18	—	dB
$ s_{21} ^2$	insertion loss	$I_F = 10 \text{ mA}; f = 2450 \text{ MHz}$	0.21	—	dB
		$I_F = 100 \text{ mA}; f = 900 \text{ MHz}$	0.10	—	dB
		$I_F = 100 \text{ mA}; f = 1800 \text{ MHz}$	0.13	—	dB
$ s_{21} ^2$	insertion loss	$I_F = 100 \text{ mA}; f = 2450 \text{ MHz}$	0.16	—	dB
τ_L	charge carrier life time	when switched from $I_F = 10 \text{ mA}$ to $I_R = 6 \text{ mA}; R_L = 100 \Omega$; measured at $I_R = 3 \text{ mA}$	0.5	—	μs
L_S	series inductance	$I_F = 100 \text{ mA}; f = 100 \text{ MHz}$	0.6	—	nH

Note

- Guaranteed on AQL basis: inspection level S4, AQL 1.0.

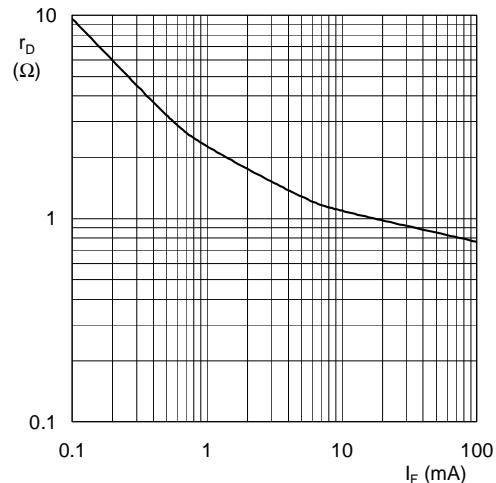
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th,j-s}$	thermal resistance from junction to soldering point	190	K/W

Silicon PIN diode

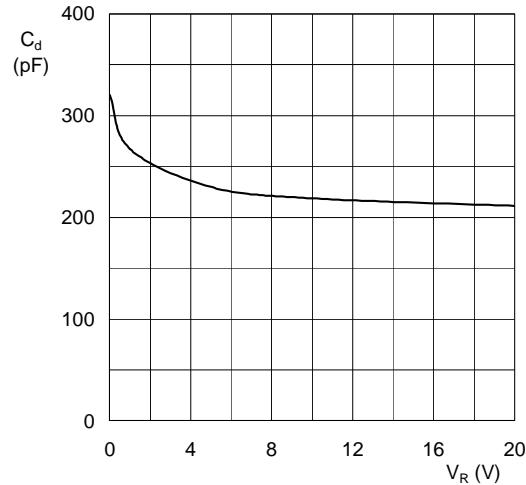
BAP1321-01

GRAPHICAL DATA



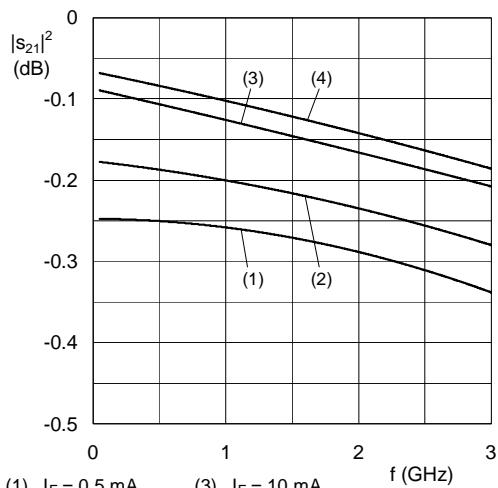
$f = 100 \text{ MHz}; T_j = 25^\circ\text{C}.$

Fig.2 Forward resistance as a function of forward current; typical values.



$f = 1 \text{ MHz}; T_j = 25^\circ\text{C}.$

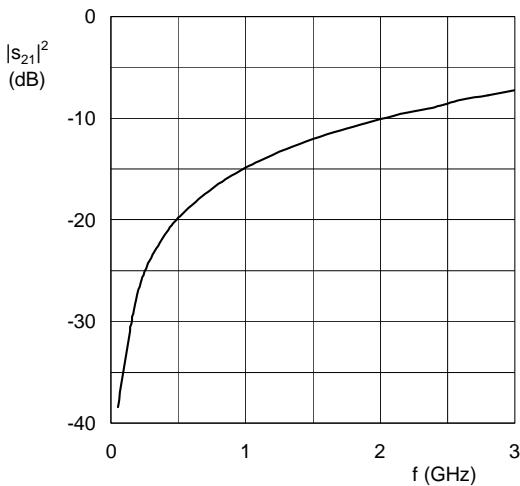
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



(1) $I_F = 0.5 \text{ mA}$. (3) $I_F = 10 \text{ mA}$.
 (2) $I_F = 1 \text{ mA}$. (4) $I_F = 100 \text{ mA}$.

Diode inserted in series with a 50Ω stripline circuit and biased via the analyzer Tee network. $T_{\text{amb}} = 25^\circ\text{C}$.

Fig.4 Insertion loss ($|s_{21}|^2$) of the diode as a function of frequency; typical values.



Diode zero biased and inserted in series with a 50Ω stripline circuit. $T_{\text{amb}} = 25^\circ\text{C}$.

Fig.5 Isolation ($|s_{21}|^2$) of the diode as a function of frequency; typical values.

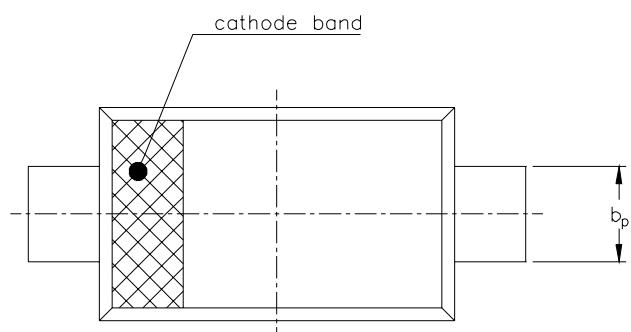
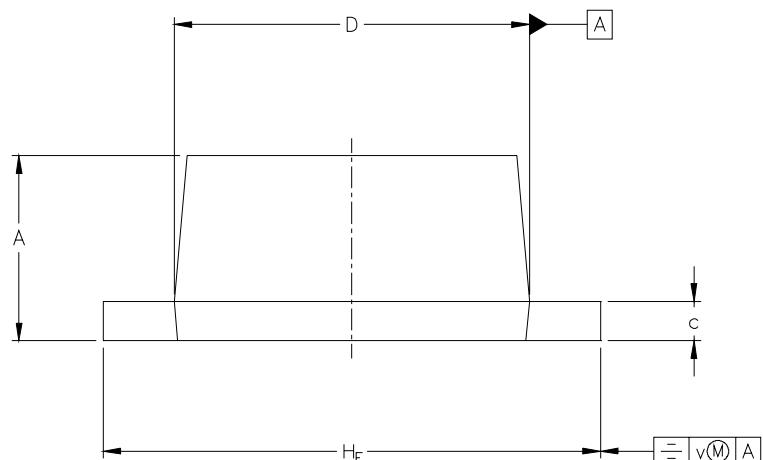
Silicon PIN diode

BAP1321-01

PACKAGE OUTLINE

SOD723A

Plastic surface mounted package; 2 leads


 Scale


UNIT	A	b_p	c	D	E	H_E	v
mm	0.49 0.55	0.25 0.32	0.08 0.15	0.95 1.05	0.55 0.65	1.35 1.45	0.1

PACKAGE OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
SOD723A PUBLICATION DRAWING	IEC	JEDEC	EIAJ		
<i>UNDER DEVELOPMENT</i>					01-09-06

Silicon PIN diode

BAP1321-01

DATA SHEET STATUS

DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITIONS
Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

DISCLAIMERS

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit <http://www.semiconductors.philips.com>. Fax: +31 40 27 24825
For sales offices addresses send e-mail to: sales.addresses@www.semiconductors.philips.com.

© Koninklijke Philips Electronics N.V. 2001

SCA73

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Printed in The Netherlands

603504/05/007

Date of release: 2001 Nov 01

Document order number: 9397 750 08975

Let's make things better.

**Philips
Semiconductors**



PHILIPS