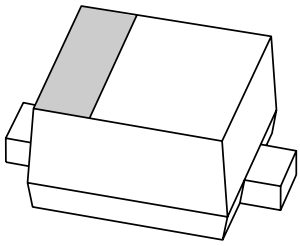
DATA SHEET



BAP1321-01
Silicon PIN diode

Preliminary specification

2001 Nov 01

Philips
Semiconductors

PHILIPS

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

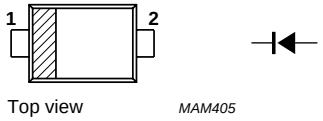
- RF attenuators and switches.

DESCRIPTION

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

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



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 °C	–	315	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

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

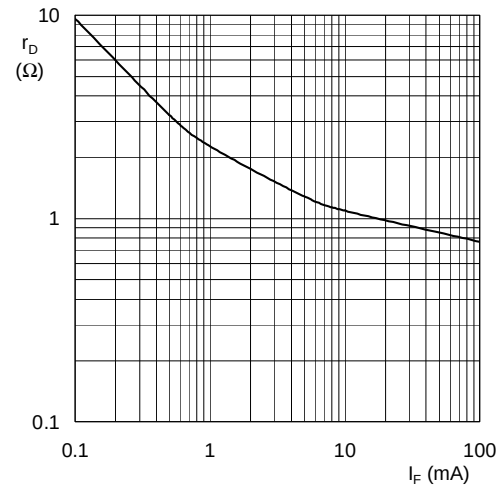
Note

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

THERMAL CHARACTERISTICS

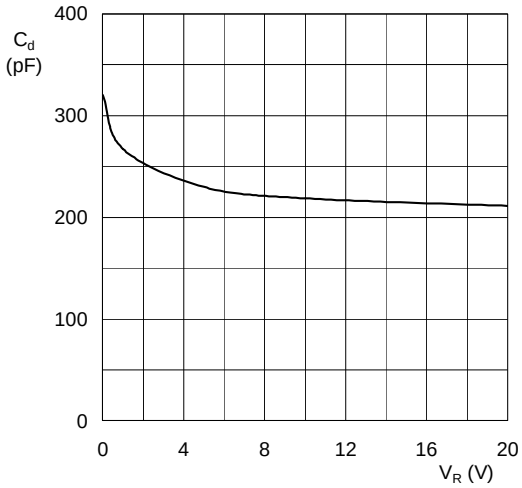
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	190	K/W

GRAPHICAL DATA



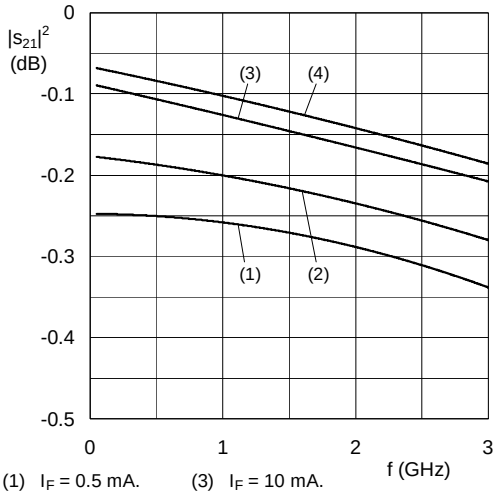
f = 100 MHz; T_j = 25 °C.

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



f = 1 MHz; T_j = 25 °C.

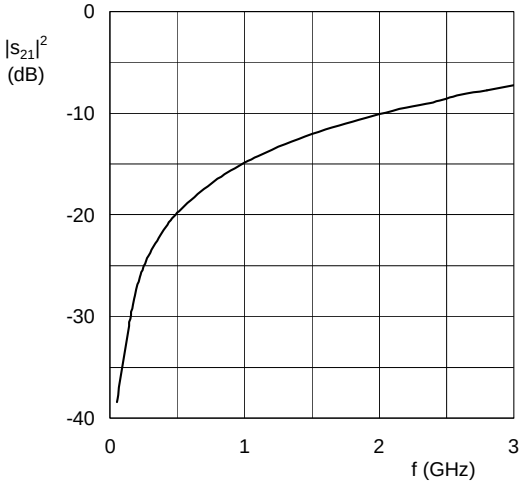
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



(1) I_F = 0.5 mA. (3) I_F = 10 mA.
(2) I_F = 1 mA. (4) I_F = 100 mA.

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

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

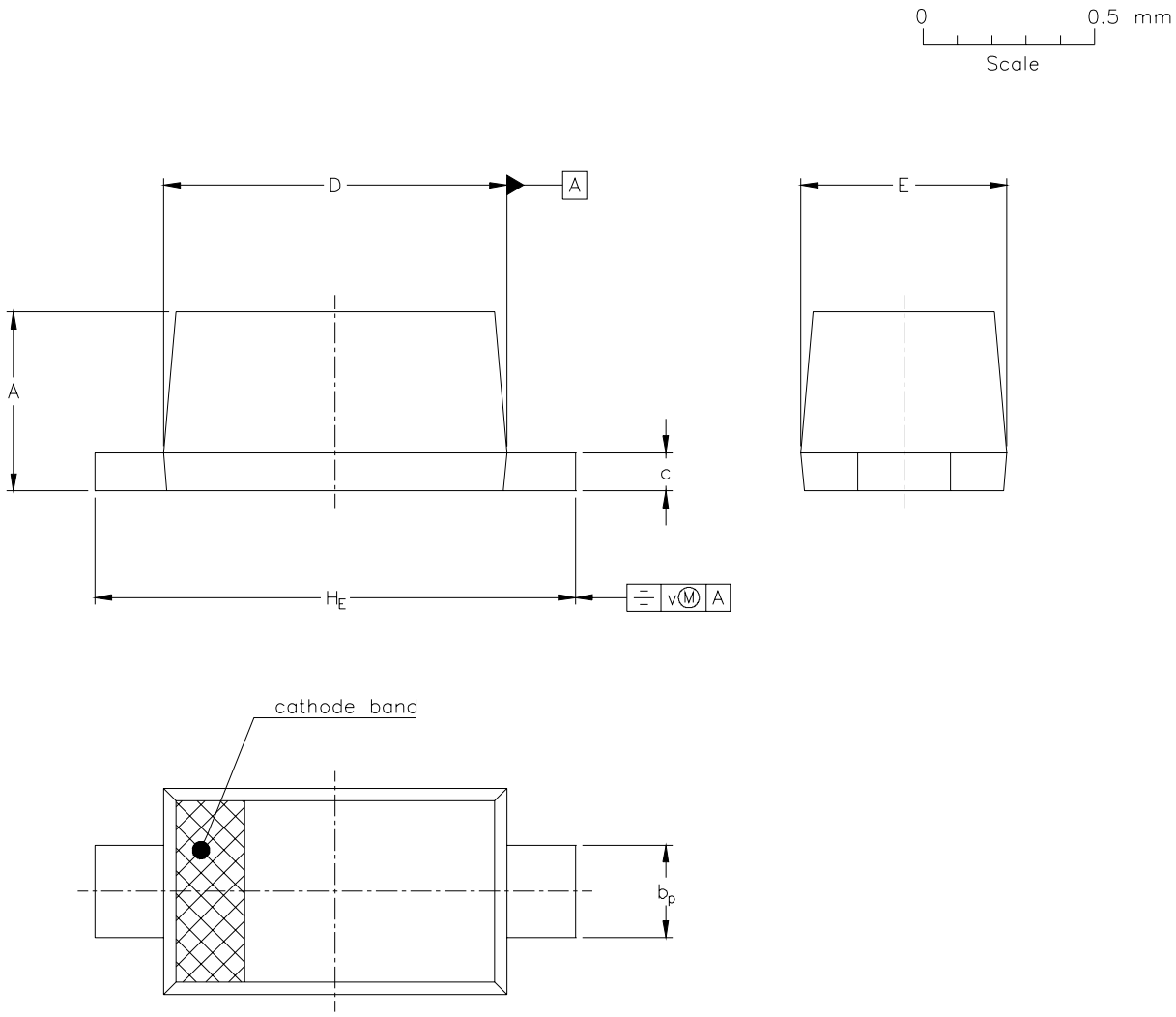


Diode zero biased and inserted in series with a 50 Ω stripline circuit. T_{amb} = 25 °C.

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

PACKAGE OUTLINE **SOD723A**

Plastic surface mounted package; 2 leads



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
	IEC	JEDEC	EIAJ		
SOD723A PUBLICATION DRAWING		UNDER DEVELOPMENT			01-09-06

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**.

SCA73

Printed in The Netherlands 603504/05/pp7 Date of release: 2001 Nov 01 Document order number: 9397 750 08975

Let's make things better.

Philips
Semiconductors

PHILIPS