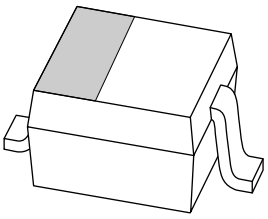
DATA SHEET



BAP1321-03
Silicon PIN diode

Product specification
Supersedes data of 2001 May 11

2004 Feb 17

Philips
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Silicon PIN diode BAP1321-03

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

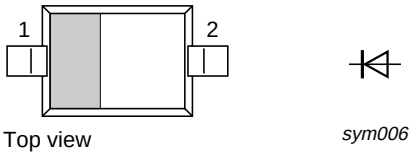
- RF attenuators and switches.

DESCRIPTION

Planar PIN diode in a SOD323 (SC-76) ultra small SMD plastic package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



Marking code: V8.
The marking bar indicates the cathode.

Fig.1 Simplified outline (SOD323; SC-76) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BAP1321-03	–	plastic surface mounted package; 2 leads	SOD323

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	$T_s \leq 90$ °C	–	500	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

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	–	100	nA
C_d	diode capacitance	V_R = 0; f = 1 MHz	0.4	–	pF
		V_R = 1 V; f = 1 MHz	0.35	0.45	pF
		V_R = 20 V; f = 1 MHz	0.25	0.32	pF
r_D	diode forward resistance	f = 100 MHz; note 1			
		I_F = 0.5 mA	3.4	5.0	Ω
		I_F = 1 mA	2.4	3.6	Ω
		I_F = 10 mA	1.2	1.8	Ω
		I_F = 100 mA	0.85	1.3	Ω
$\|s_{21}\|^2$	isolation	V_R = 0; f = 900 MHz	16.6	–	dB
		V_R = 0; f = 1800 MHz	11.6	–	dB
		V_R = 0; f = 2450 MHz	9.2	–	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	0.35	–	dB
		I_F = 0.5 mA; f = 2450 MHz	0.44	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 1 mA; f = 900 MHz	0.20	–	dB
		I_F = 1 mA; f = 1800 MHz	0.29	–	dB
		I_F = 1 mA; f = 2450 MHz	0.38	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 10 mA; f = 900 MHz	0.13	–	dB
		I_F = 10 mA; f = 1800 MHz	0.22	–	dB
		I_F = 10 mA; f = 2450 MHz	0.32	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 100 mA; f = 900 MHz	0.10	–	dB
		I_F = 100 mA; f = 1800 MHz	0.20	–	dB
		I_F = 100 mA; f = 2450 MHz	0.29	–	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	1.5	–	nH

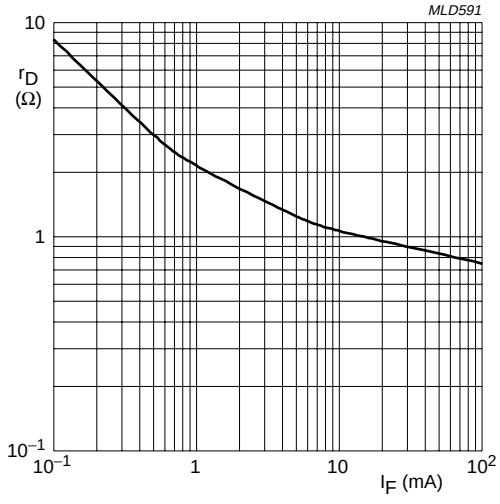
Note

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

THERMAL CHARACTERISTICS

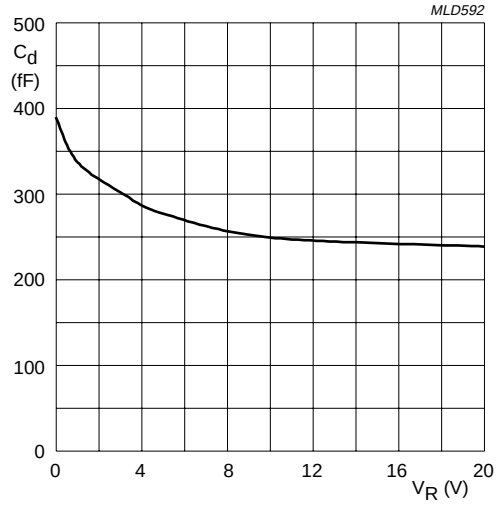
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th(j-s)}$	thermal resistance from junction to soldering point	120	K/W

GRAPHICAL DATA



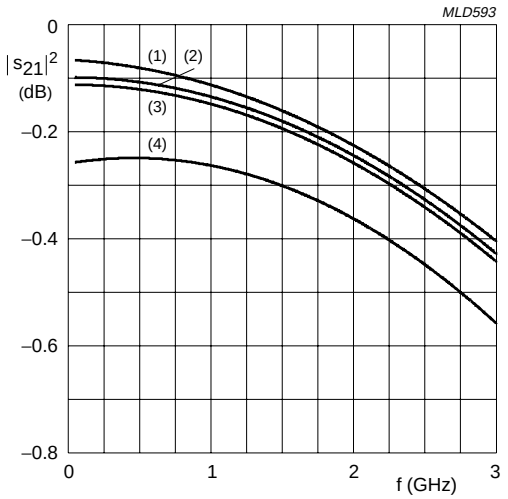
T_j = 25 °C; f = 100 MHz.

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



T_j = 25 °C; = 1 MHz.

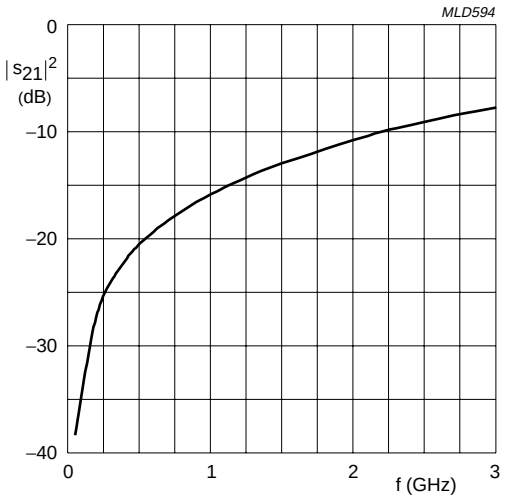
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



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

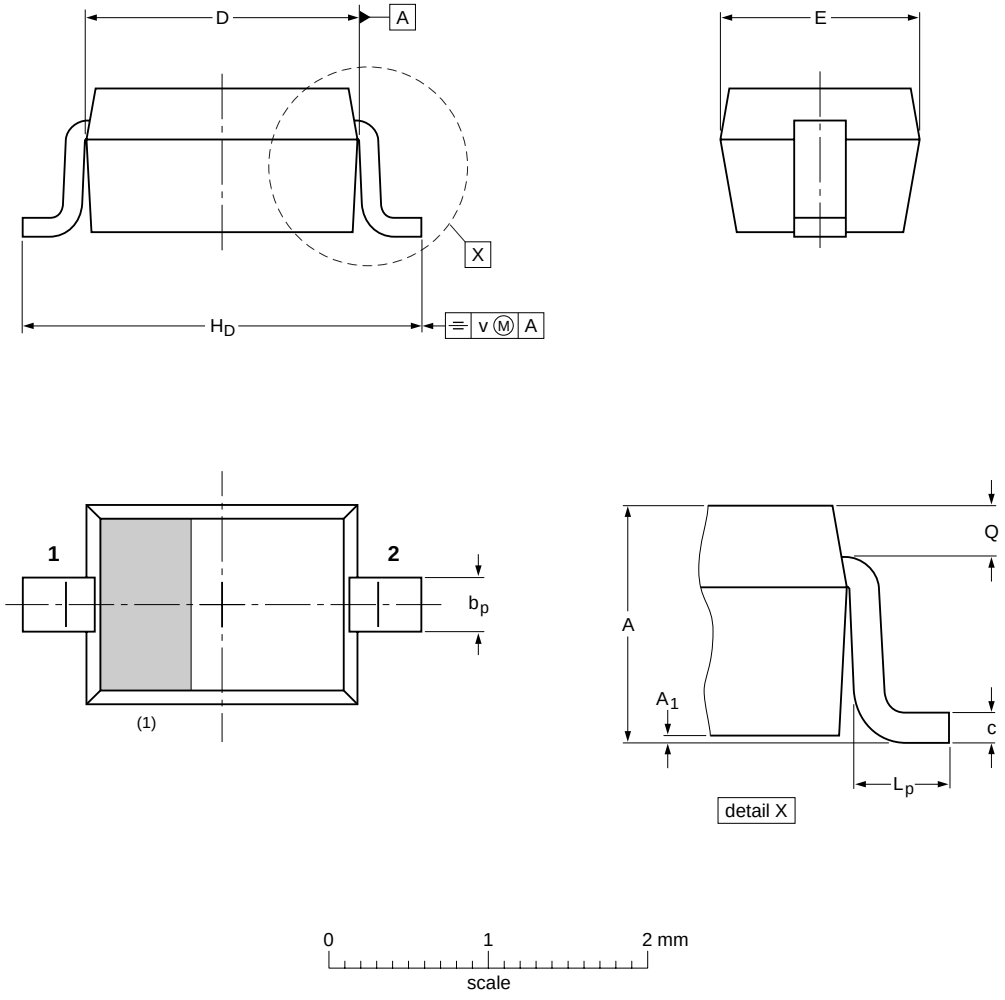


Diode zero biased and inserted in series with a 50 Ω stripline circuit.
T_{amb} = 25 °C.

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

PACKAGE OUTLINE

Plastic surface mounted package; 2 leads **SOD323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	H_D	L_p	Q	v
mm	1.1 0.8	0.05	0.40 0.25	0.25 0.10	1.8 1.6	1.35 1.15	2.7 2.3	0.45 0.15	0.25 0.15	0.2

Note

1. The marking bar indicates the cathode

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD323			SC-76			~~99-09-13~~ 03-12-17

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
I	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.
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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.

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