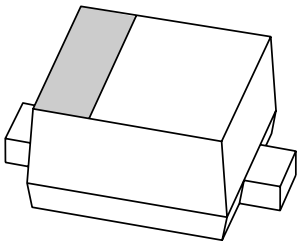
DATA SHEET



BAP27-01
Silicon PIN diode

Preliminary specification

2001 Nov 01

Philips
Semiconductors

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Silicon PIN diode BAP27-01

FEATURES

- High speed switching for RF signals
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 4 GHz.

APPLICATIONS

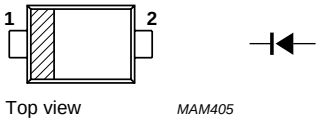
- RF attenuators and switches.

DESCRIPTION

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

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



Marking code: M1

Fig.1 Simplified outline (SOD723A) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	50	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 current	V_R = 20 V	–	20	nA
C_d	diode capacitance	V_R = 0; f = 1 MHz	0.45	–	pF
		V_R = 1 V; f = 1 MHz	0.35	0.45	pF
		V_R = 20 V; f = 1 MHz	0.27	0.32	pF
r_D	diode forward resistance	I_F = 0.5 mA; f = 100 MHz; note 1	1.6	2.5	Ω
		I_F = 1 mA; f = 100 MHz; note 1	1.2	2.0	Ω
		I_F = 5 mA; f = 100 MHz; note 1	0.7	1.2	Ω
		I_F = 10 mA; f = 100 MHz; note 1	0.6	0.95	Ω
$\|s_{21}\|^2$	isolation	V_R = 0; f = 900 MHz	12.3	–	dB
		V_R = 0; f = 1800 MHz	7.7	–	dB
		V_R = 0; f = 2450 MHz	6.0	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 0.5 mA; f = 900 MHz	0.17	–	dB
		I_F = 0.5 mA; f = 1800 MHz	0.19	–	dB
		I_F = 0.5 mA; f = 2450 MHz	0.21	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 1 mA; f = 900 MHz	0.13	–	dB
		I_F = 1 mA; f = 1800 MHz	0.15	–	dB
		I_F = 1 mA; f = 2450 MHz	0.18	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 10 mA; f = 900 MHz	0.08	–	dB
		I_F = 10 mA; f = 1800 MHz	0.11	–	dB
		I_F = 10 mA; f = 2450 MHz	0.14	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 100 mA; f = 900 MHz	0.06	–	dB
		I_F = 100 mA; f = 1800 MHz	0.10	–	dB
		I_F = 100 mA; f = 2450 MHz	0.12	–	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	0.17	–	μs
L_S	series inductance		0.6	–	nH

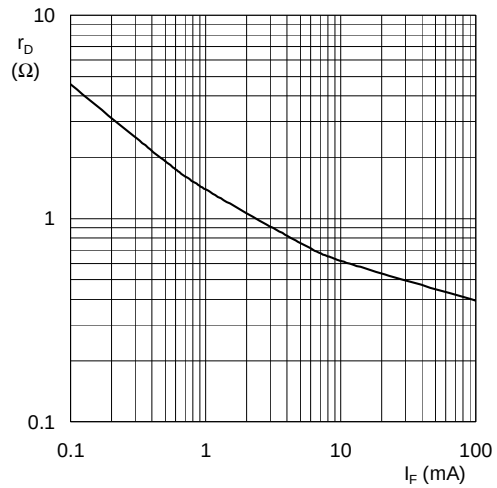
Note

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

THERMAL CHARACTERISTICS

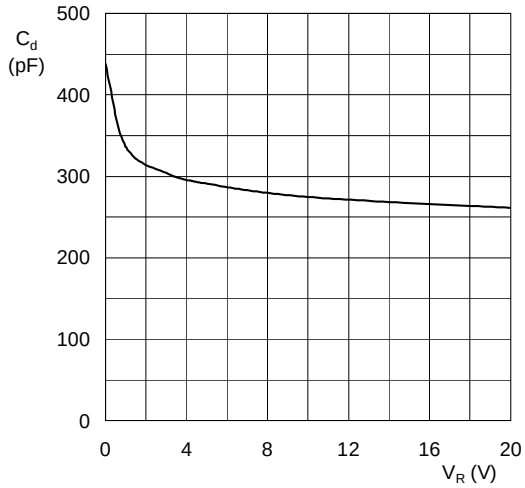
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	190	K/W

GRAPHICAL DATA



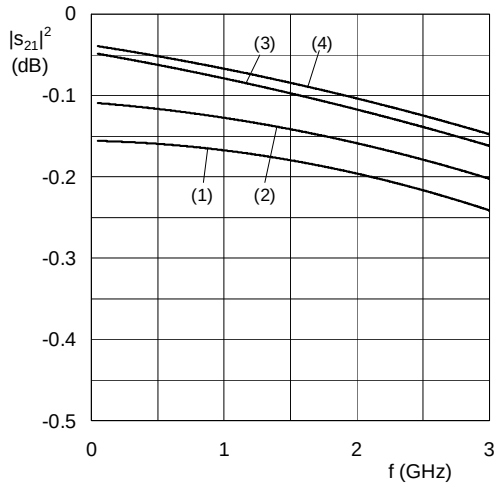
f = 100 MHz; T_j = 25 °C.

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



f = 1 MHz; T_j = 25 °C.

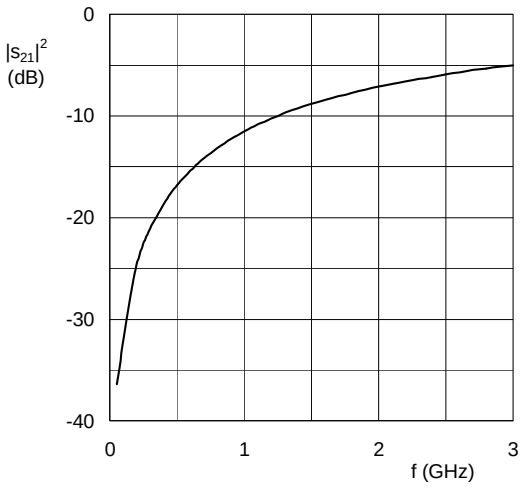
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



(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.

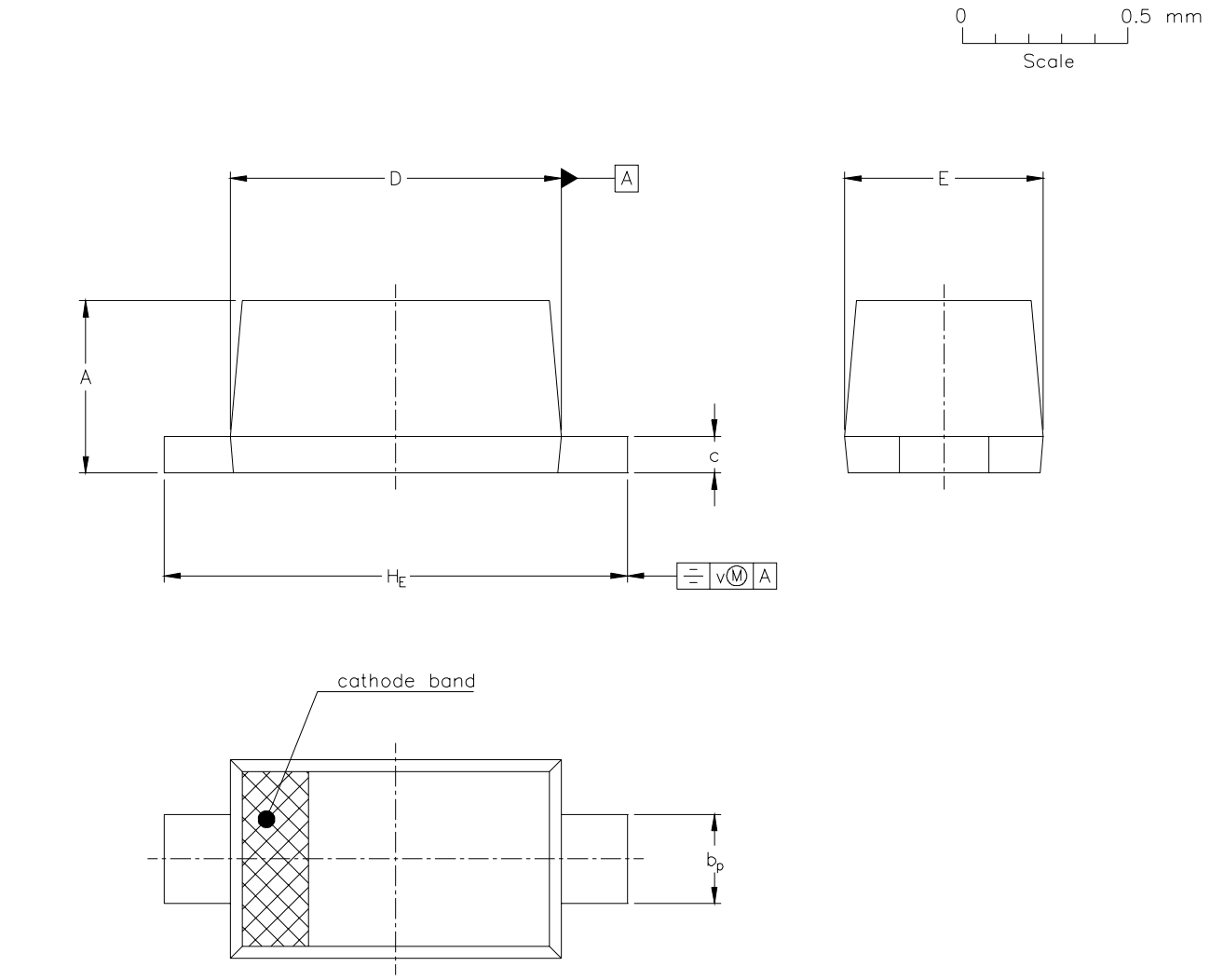


Diode zero biased and inserted in series with a 50 Ω stripline circuit. T_{amb} = 25 °C.

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

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DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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