

BAP1321-02

Silicon PIN diode

Rev. 02 — 3 January 2008 Product data sheet

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Silicon PIN diode BAP1321-02

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

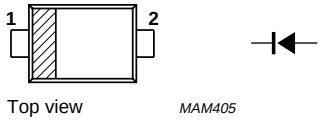
- RF attenuators and switches.

DESCRIPTION

Planar PIN diode in a SOD523 ultra small SMD plastic package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



Marking code: K7.

Fig.1 Simplified outline (SOD523) 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	$T_s \leq 90$ °C	–	715	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

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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	–	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	16.3	–	dB
		V_R = 0; f = 1800 MHz	11.4	–	dB
		V_R = 0; f = 2450 MHz	9.2	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 0.5 mA; f = 900 MHz	0.23	–	dB
		I_F = 0.5 mA; f = 1800 MHz	0.27	–	dB
		I_F = 0.5 mA; f = 2450 MHz	0.33	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 1 mA; f = 900 MHz	0.18	–	dB
		I_F = 1 mA; f = 1800 MHz	0.22	–	dB
		I_F = 1 mA; f = 2450 MHz	0.27	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 10 mA; f = 900 MHz	0.10	–	dB
		I_F = 10 mA; f = 1800 MHz	0.16	–	dB
		I_F = 10 mA; f = 2450 MHz	0.20	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 100 mA; f = 900 MHz	0.08	–	dB
		I_F = 100 mA; f = 1800 MHz	0.13	–	dB
		I_F = 100 mA; f = 2450 MHz	0.18	–	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

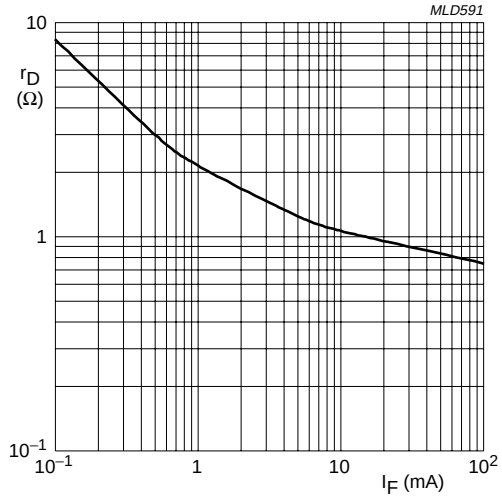
1. Guaranteed on AQL basis: inspection level S4, AQL 1.0.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	85	K/W

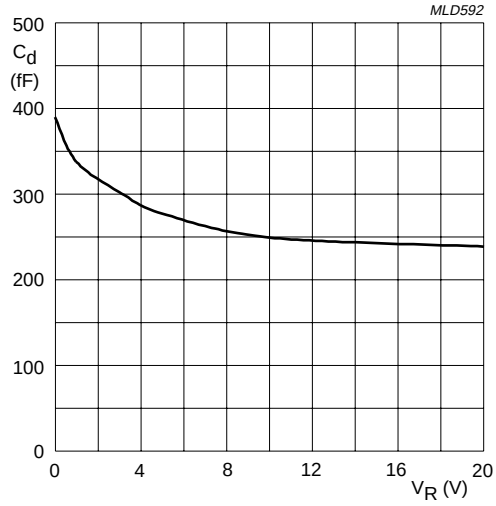
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GRAPHICAL DATA



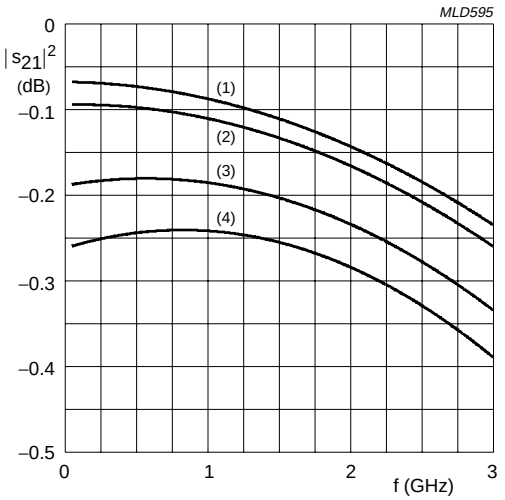
f = 100 MHz; T_j = 25 °C.

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



f = 1 MHz; T_j = 25 °C.

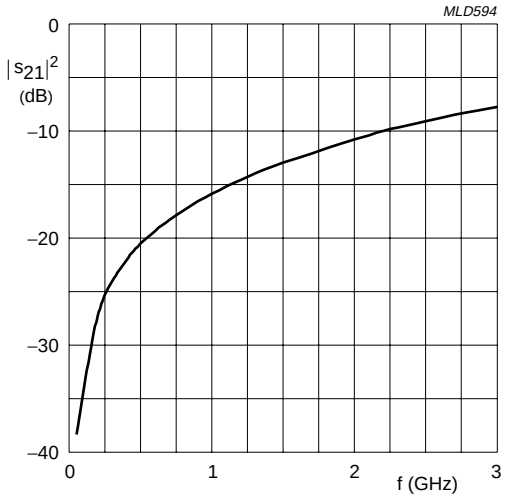
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



(1) I_F = 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.



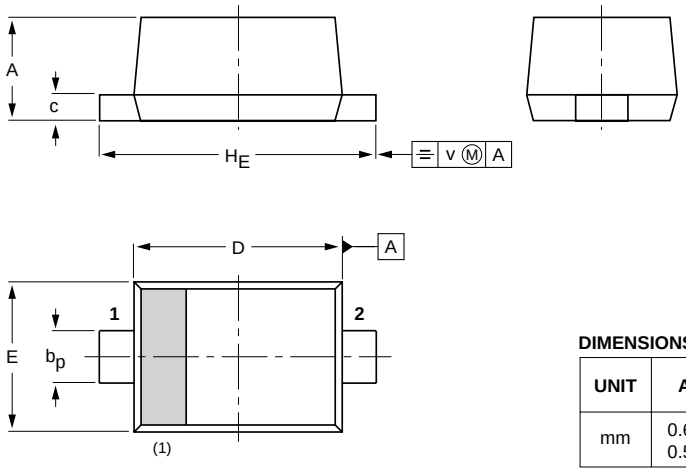
Diode zero biased and inserted in series with a 50 Ω stripline circuit.
T_{amb} = 25 °C.

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

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PACKAGE OUTLINE

Plastic surface-mounted package; 2 leads **SOD523**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	H_E	v
mm	0.65 0.58	0.34 0.26	0.17 0.11	1.25 1.15	0.85 0.75	1.65 1.55	0.1

Note

1. The marking bar indicates the cathode.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD523			SC-79			~~02-12-13~~ 06-03-16

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Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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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".

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Revision history

Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP1321-02_N_2	20080103	Product data sheet	-	BAP1321-02_1
Modifications:	• Package outline drawing on page 5 changed			
BAP1321-02_1 (9397 750 08131)	20010417	Product specification	-	-

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