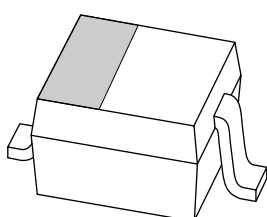


DATA SHEET



BAP63-03 Silicon PIN diode

Product specification
Supersedes data of 2001 May 18

2004 Feb 11

Silicon PIN diode

BAP63-03

FEATURES

- High speed switching for RF signals
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 3 GHz.

APPLICATIONS

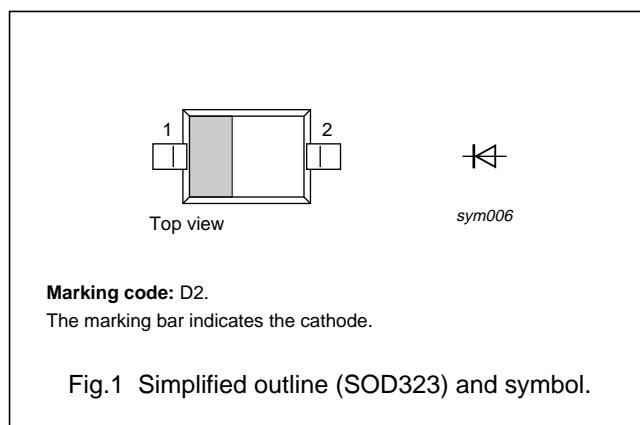
- RF attenuators and switches.

DESCRIPTION

Planar PIN diode in a SOD323 small SMD plastic package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BAP63-03	–	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		–	50	V
I_F	continuous forward current		–	100	mA
P_{tot}	total power dissipation	$T_s \leq 90\text{ °C}$	–	500	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

Silicon PIN diode

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ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ 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	$V_R = 35\text{ V}$	–	10	nA
C_d	diode capacitance	$V_R = 0$; $f = 1\text{ MHz}$	0.4	–	pF
		$V_R = 1\text{ V}$; $f = 1\text{ MHz}$	0.35	–	pF
		$V_R = 20\text{ V}$; $f = 1\text{ MHz}$	0.27	0.32	pF
r_D	diode forward resistance	$I_F = 0.5\text{ mA}$; $f = 100\text{ MHz}$; note 1	2.5	3.5	Ω
		$I_F = 1\text{ mA}$; $f = 100\text{ MHz}$; note 1	1.95	3	Ω
		$I_F = 10\text{ mA}$; $f = 100\text{ MHz}$; note 1	1.17	1.8	Ω
		$I_F = 100\text{ mA}$; $f = 100\text{ MHz}$; note 1	0.9	1.5	Ω
$ S_{21} ^2$	isolation	$V_R = 0$; $f = 900\text{ MHz}$	15.4	–	dB
		$V_R = 0$; $f = 1800\text{ MHz}$	10.1	–	dB
		$V_R = 0$; $f = 2450\text{ MHz}$	7.8	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 0.5\text{ mA}$; $f = 900\text{ MHz}$	0.21	–	dB
		$I_F = 0.5\text{ mA}$; $f = 1800\text{ MHz}$	0.28	–	dB
		$I_F = 0.5\text{ mA}$; $f = 2450\text{ MHz}$	0.38	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 1\text{ mA}$; $f = 900\text{ MHz}$	0.18	–	dB
		$I_F = 1\text{ mA}$; $f = 1800\text{ MHz}$	0.26	–	dB
		$I_F = 1\text{ mA}$; $f = 2450\text{ MHz}$	0.35	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 10\text{ mA}$; $f = 900\text{ MHz}$	0.13	–	dB
		$I_F = 10\text{ mA}$; $f = 1800\text{ MHz}$	0.20	–	dB
		$I_F = 10\text{ mA}$; $f = 2450\text{ MHz}$	0.30	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 100\text{ mA}$; $f = 900\text{ MHz}$	0.10	–	dB
		$I_F = 100\text{ mA}$; $f = 1800\text{ MHz}$	0.18	–	dB
		$I_F = 100\text{ mA}$; $f = 2450\text{ MHz}$	0.28	–	dB
τ_L	charge carrier life time	when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$; $R_L = 100\text{ }\Omega$; measured at $I_R = 3\text{ mA}$	310	–	ns
L_S	series inductance		1.5	–	nH

Note

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

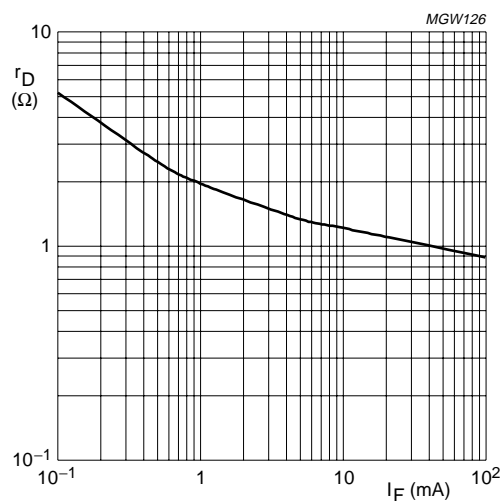
THERMAL CHARACTERISTICS

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

Silicon PIN diode

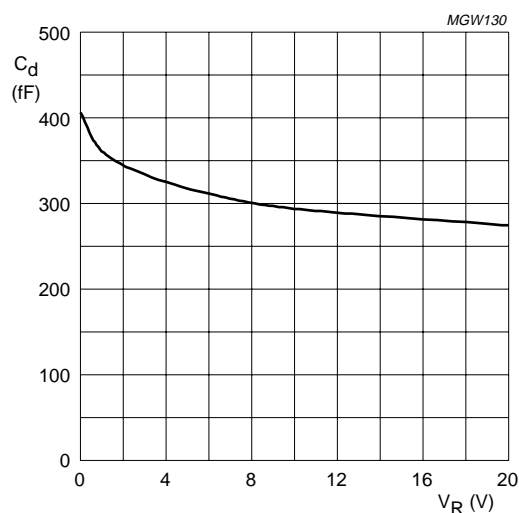
BAP63-03

GRAPHICAL DATA



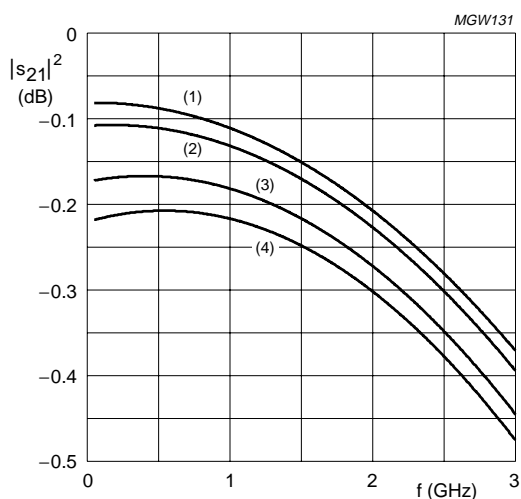
$T_j = 25^\circ\text{C}$; $f = 100\text{ MHz}$.

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



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

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

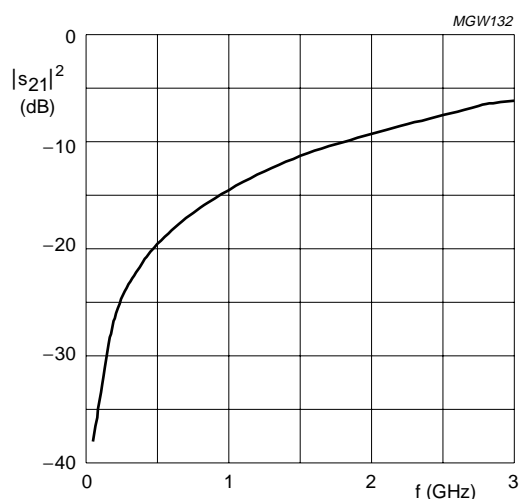


- (1) $I_F = 100\text{ mA}$. (3) $I_F = 1\text{ mA}$.
 (2) $I_F = 10\text{ mA}$. (4) $I_F = 0.5\text{ mA}$.

Diode inserted in series with a $50\ \Omega$ 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 in on-state as a function of frequency; typical values.



Diode zero biased and inserted in series with a $50\ \Omega$ stripline circuit.

$T_{\text{amb}} = 25^\circ\text{C}$.

Fig.5 Isolation ($|S_{21}|^2$) of the diode in off-state as a function of frequency; typical values.

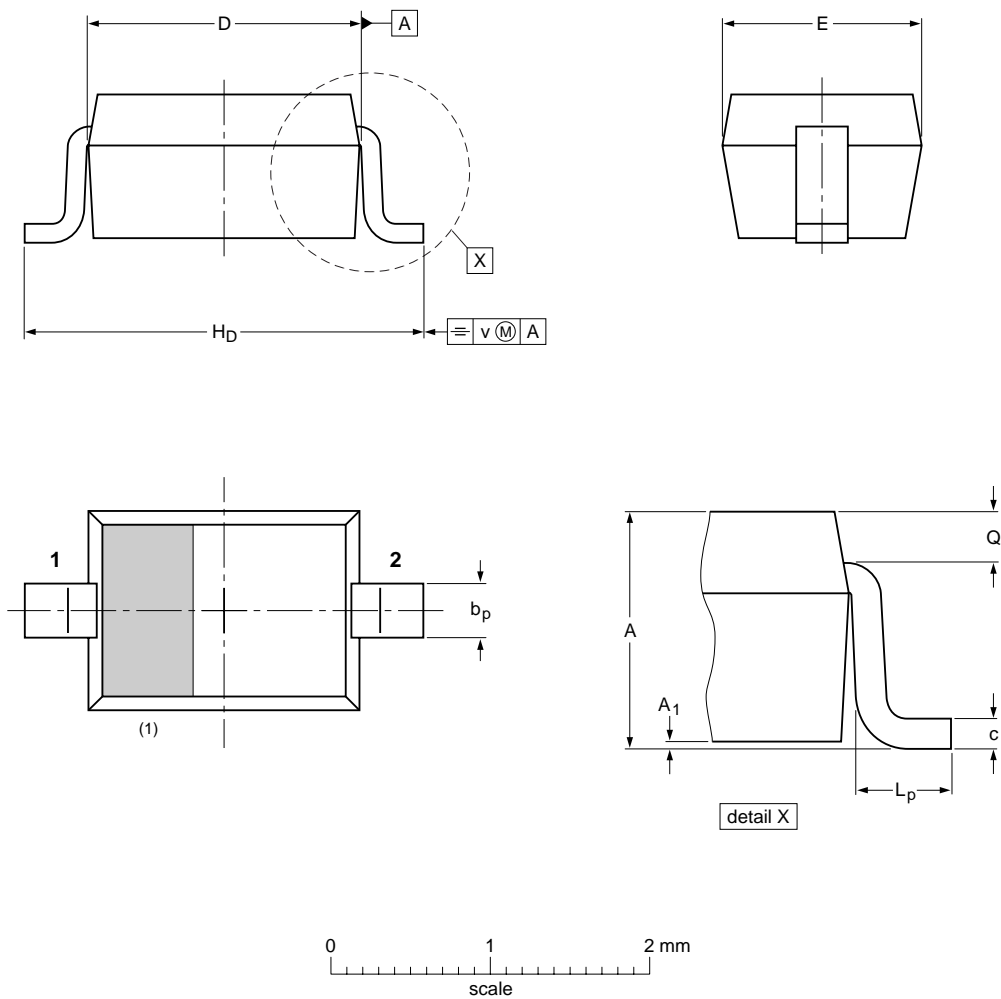
Silicon PIN diode

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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

Silicon PIN diode

BAP63-03

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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