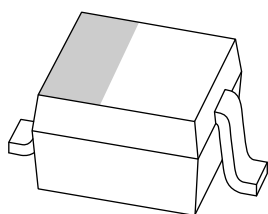


# DATA SHEET



## **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

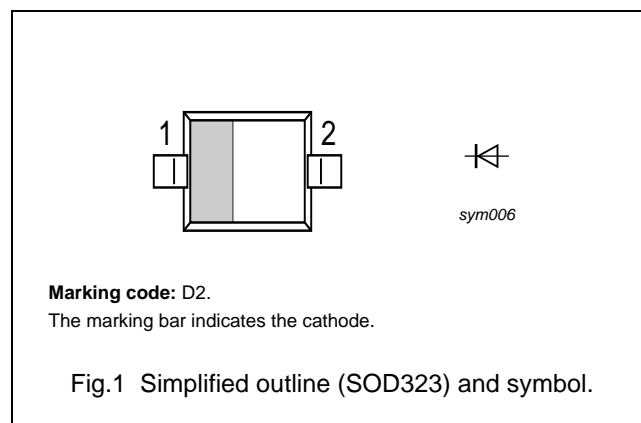
- RF attenuators and switches.

## 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

## BAP63-03

**ELECTRICAL CHARACTERISTICS**T<sub>j</sub> = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 50 mA	0.95	1.1	V
I <sub>R</sub>	reverse leakage current	V <sub>R</sub> = 35 V	–	10	nA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0; f = 1 MHz	0.4	–	pF
		V <sub>R</sub> = 1 V; f = 1 MHz	0.35	–	pF
		V <sub>R</sub> = 20 V; f = 1 MHz	0.27	0.32	pF
r <sub>D</sub>	diode forward resistance	I <sub>F</sub> = 0.5 mA; f = 100 MHz; note 1	2.5	3.5	Ω
		I <sub>F</sub> = 1 mA; f = 100 MHz; note 1	1.95	3	Ω
		I <sub>F</sub> = 10 mA; f = 100 MHz; note 1	1.17	1.8	Ω
		I <sub>F</sub> = 100 mA; f = 100 MHz; note 1	0.9	1.5	Ω
s <sub>21</sub>   <sup>2</sup>	isolation	V <sub>R</sub> = 0; f = 900 MHz	15.4	–	dB
		V <sub>R</sub> = 0; f = 1800 MHz	10.1	–	dB
		V <sub>R</sub> = 0; f = 2450 MHz	7.8	–	dB
s <sub>21</sub>   <sup>2</sup>	insertion loss	I <sub>F</sub> = 0.5 mA; f = 900 MHz	0.21	–	dB
		I <sub>F</sub> = 0.5 mA; f = 1800 MHz	0.28	–	dB
		I <sub>F</sub> = 0.5 mA; f = 2450 MHz	0.38	–	dB
s <sub>21</sub>   <sup>2</sup>	insertion loss	I <sub>F</sub> = 1 mA; f = 900 MHz	0.18	–	dB
		I <sub>F</sub> = 1 mA; f = 1800 MHz	0.26	–	dB
		I <sub>F</sub> = 1 mA; f = 2450 MHz	0.35	–	dB
s <sub>21</sub>   <sup>2</sup>	insertion loss	I <sub>F</sub> = 10 mA; f = 900 MHz	0.13	–	dB
		I <sub>F</sub> = 10 mA; f = 1800 MHz	0.20	–	dB
		I <sub>F</sub> = 10 mA; f = 2450 MHz	0.30	–	dB
s <sub>21</sub>   <sup>2</sup>	insertion loss	I <sub>F</sub> = 100 mA; f = 900 MHz	0.10	–	dB
		I <sub>F</sub> = 100 mA; f = 1800 MHz	0.18	–	dB
		I <sub>F</sub> = 100 mA; f = 2450 MHz	0.28	–	dB
τ <sub>L</sub>	charge carrier life time	when switched from I <sub>F</sub> = 10 mA to I <sub>R</sub> = 6 mA; R <sub>L</sub> = 100 Ω; measured at I <sub>R</sub> = 3 mA	310	–	ns
L <sub>S</sub>	series inductance		1.5	–	nH

**Note**

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

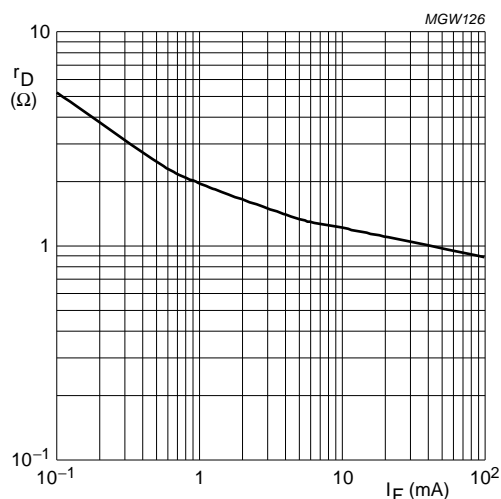
**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	VALUE	UNIT
R <sub>th(j-s)</sub>	thermal resistance from junction to soldering point	120	K/W

## Silicon PIN diode

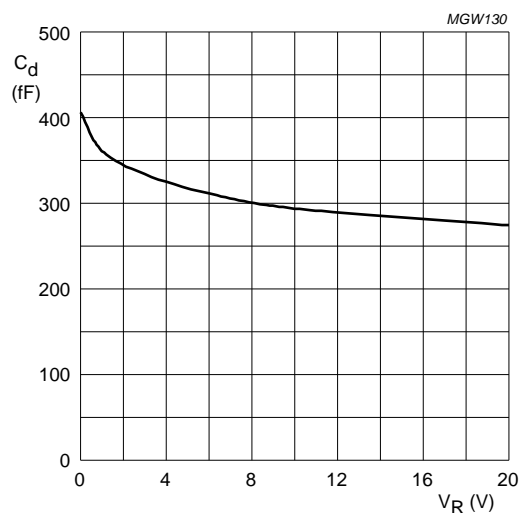
## BAP63-03

## GRAPHICAL DATA



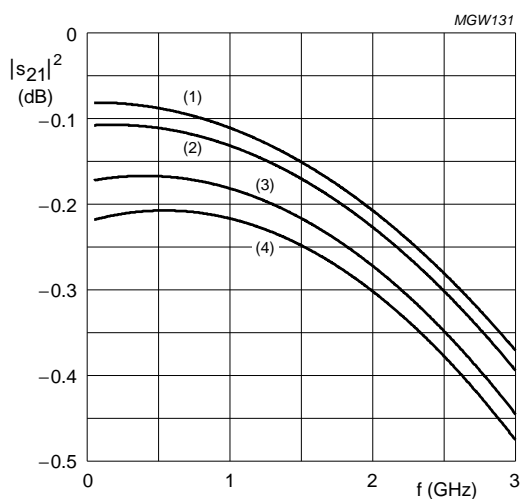
$T_j = 25\text{ }^\circ\text{C}$ ;  $f = 100\text{ MHz}$ .

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



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

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

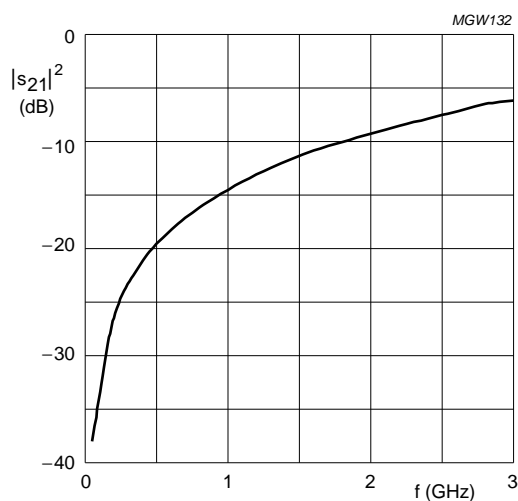


- (1)  $I_F = 100\text{ mA}$ . (3)  $I_F = 1\text{ mA}$ .  
 (2)  $I_F = 10\text{ mA}$ . (4)  $I_F = 0.5\text{ mA}$ .

Diode inserted in series with a  $50\text{ }\Omega$  stripline circuit and biased via the analyzer Tee network.

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

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  $50\text{ }\Omega$  stripline circuit.

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

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

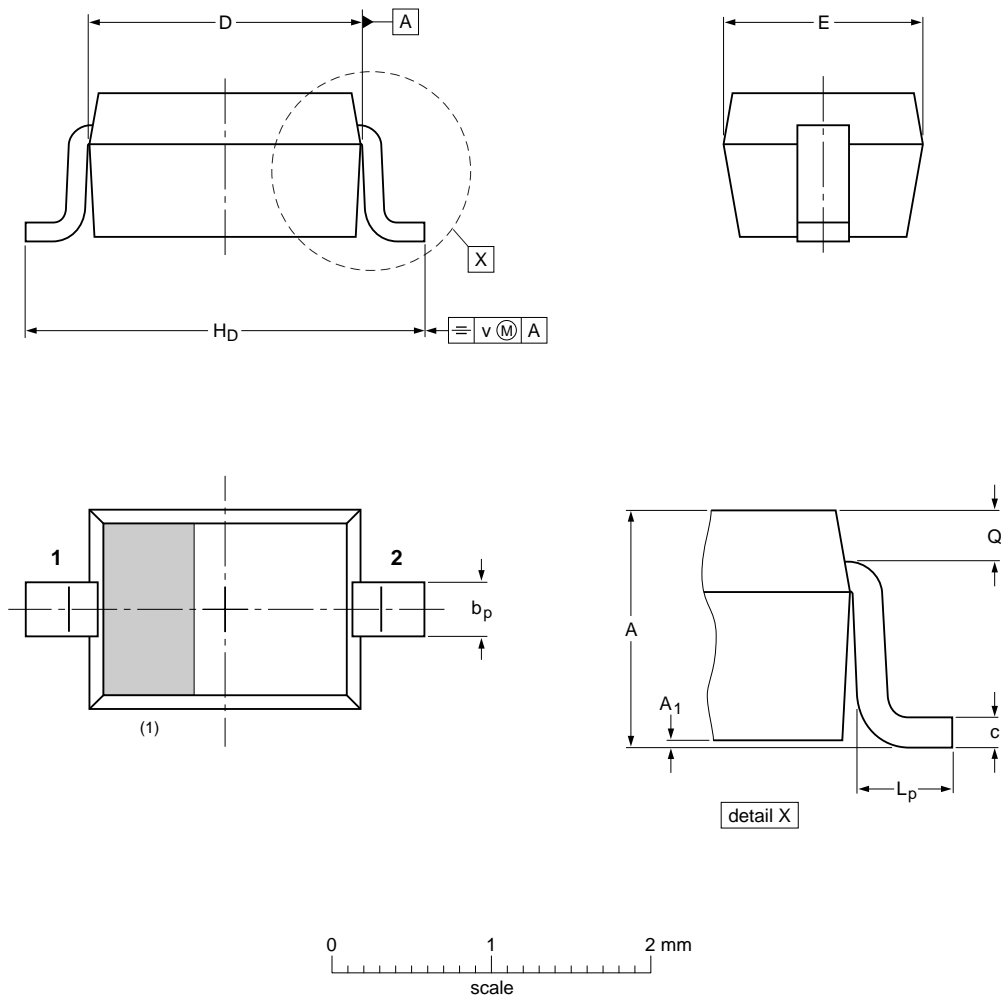
Silicon PIN diode

BAP63-03

PACKAGE OUTLINE

Plastic surface-mounted package; 2 leads

SOD323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	c	D	E	H <sub>D</sub>	L <sub>p</sub>	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			<del>03-12-17</del> 06-03-16

## Silicon PIN diode

BAP63-03

## DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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Printed in The Netherlands

R77/04/pp8

Date of release: 2004 Feb 11