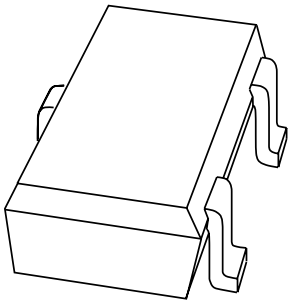
DATA SHEET



BAP63-05W
Silicon PIN diode

Product specification
Supersedes data of 2001 Apr 04

2001 May 18

Philips
Semiconductors

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Silicon PIN diode BAP63-05W

FEATURES

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

APPLICATIONS

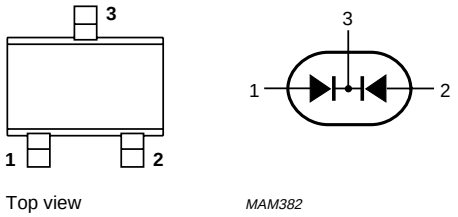
- RF attenuators and switches.

DESCRIPTION

Two planar PIN diodes in common cathode configuration in a SOT323 small SMD plastic package.

PINNING

PIN	DESCRIPTION
1	anode (a1)
2	anode (a2)
3	common cathode



Marking code: W9-.

Fig.1 Simplified outline (SOT323) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current		–	100	mA
P_{tot}	total power dissipation	$T_s \leq 90$ °C	–	240	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
Per diode					
V_F	forward voltage	I_F = 50 mA	0.95	1.1	V
I_R	reverse current	V_R = 35 V	–	10	nA
C_d	diode capacitance	V_R = 0; f = 1 MHz	0.4	–	pF
		V_R = 1 V; f = 1 MHz	0.35	–	pF
		V_R = 20 V; f = 1 MHz	0.3	0.35	pF
r_D	diode forward resistance	I_F = 0.5 mA; f = 100 MHz; note 1	2.5	3.5	Ω
		I_F = 1 mA; f = 100 MHz; note 1	1.95	3	Ω
		I_F = 10 mA; f = 100 MHz; note 1	1.17	1.8	Ω
		I_F = 100 mA; f = 100 MHz; note 1	0.9	1.5	Ω
$\|s_{21}\|^2$	isolation	V_R = 0; f = 900 MHz	14.5	–	dB
		V_R = 0; f = 1800 MHz	9.5	–	dB
		V_R = 0; f = 2450 MHz	7.0	–	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	0.19	–	dB
		I_F = 1 mA; f = 1800 MHz	0.24	–	dB
		I_F = 1 mA; f = 2450 MHz	0.30	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 10 mA; f = 900 MHz	0.14	–	dB
		I_F = 10 mA; f = 1800 MHz	0.19	–	dB
		I_F = 10 mA; f = 2450 MHz	0.25	–	dB
$\|s_{21}\|^2$	insertion loss	I_F = 100 mA; f = 900 MHz	0.11	–	dB
		I_F = 100 mA; f = 1800 MHz	0.17	–	dB
		I_F = 100 mA; f = 2450 MHz	0.23	–	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	310	–	ns
L_S	series inductance	I_F = 100 mA; f = 100 MHz	1.5	–	nH

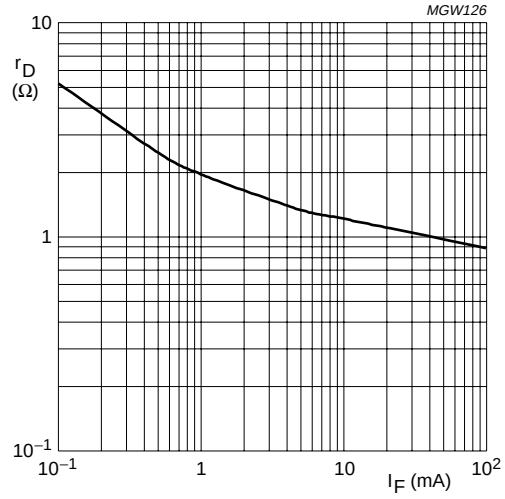
Note

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

THERMAL CHARACTERISTICS

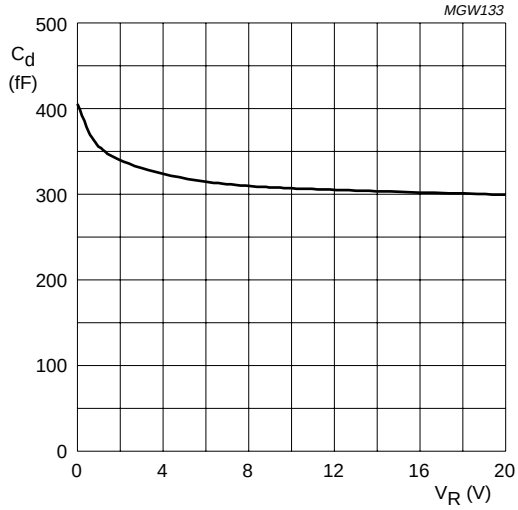
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	250	K/W

GRAPHICAL DATA



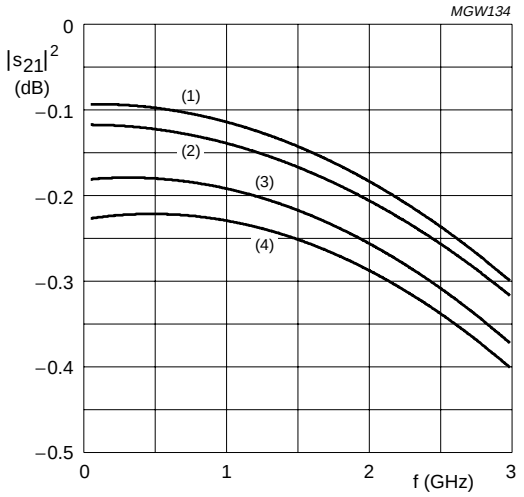
f = 100 MHz; T_j = 25 °C.

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



f = 1 MHz; T_j = 25 °C.

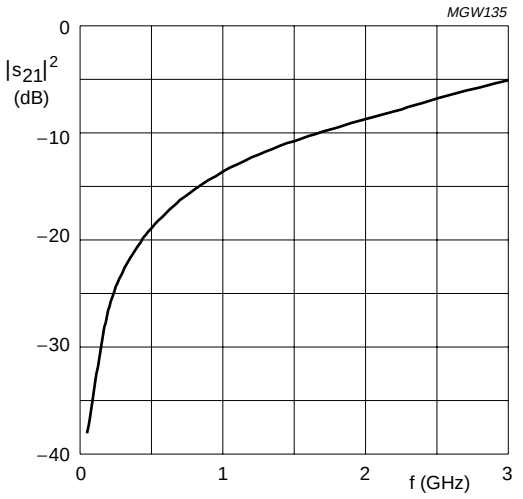
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



(1) I_F = 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 in on-state as a function of frequency; typical values.

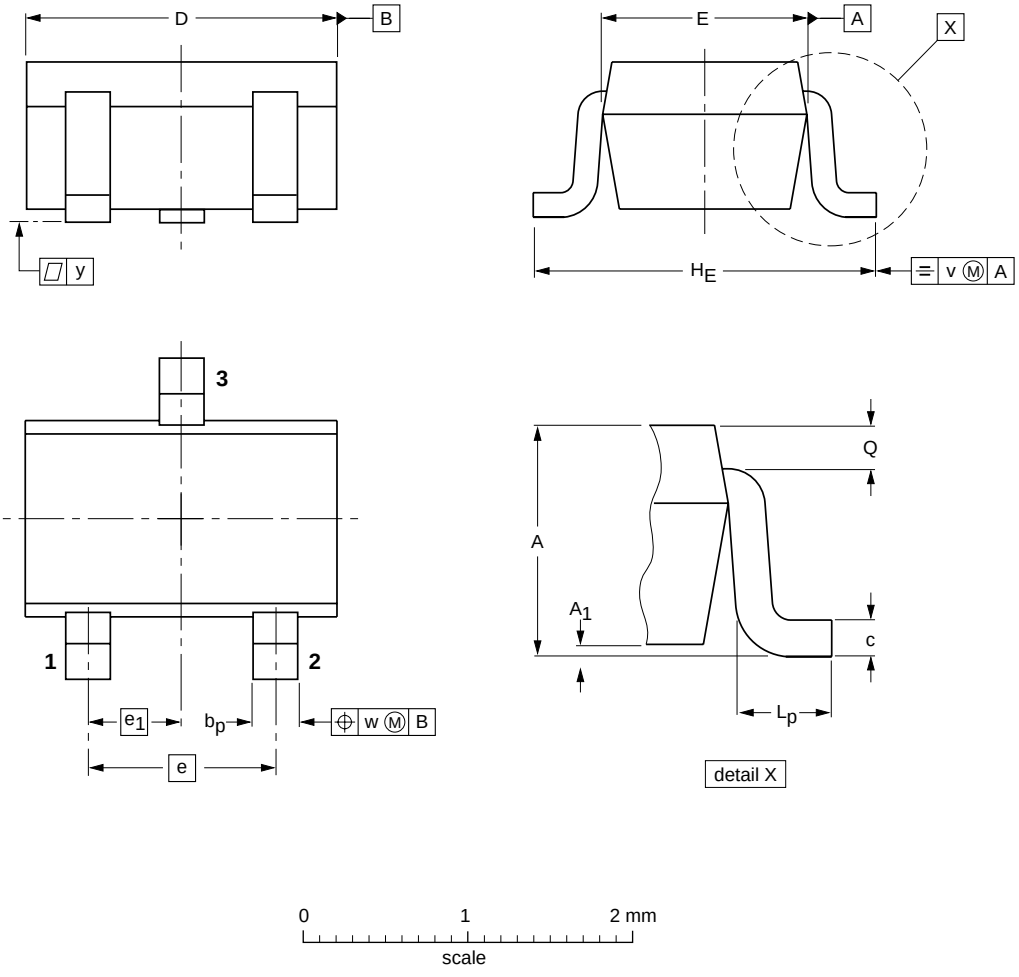


Diode zero biased and inserted in series with a 50 Ω stripline circuit.
T_{amb} = 25 °C.

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

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

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1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

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Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

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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