

BAP64-02

Silicon PIN diode

Rev. 06 — 9 January 2008

Product data sheet

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NXP Semiconductors

Silicon PIN diode

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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

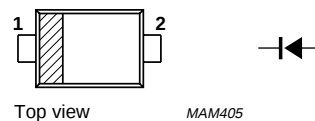
- RF attenuators and switches.

DESCRIPTION

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

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



Marking code: S.

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		–	175	V
I_F	continuous forward current		–	100	mA
P_{tot}	total power dissipation	$T_s = 90\text{ °C}$	–	715	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

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ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ 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	$V_R = 175\text{ V}$	–	10	μA
		$V_R = 20\text{ V}$	–	1	μA
C_d	diode capacitance	$V_R = 0$; $f = 1\text{ MHz}$	0.48	–	pF
		$V_R = 1\text{ V}$; $f = 1\text{ MHz}$	0.35	–	pF
		$V_R = 20\text{ V}$; $f = 1\text{ MHz}$	0.23	0.35	pF
r_D	diode forward resistance	$f = 100\text{ MHz}$; note 1			
		$I_F = 0.5\text{ mA}$	20	40	Ω
		$I_F = 1\text{ mA}$	10	20	Ω
		$I_F = 10\text{ mA}$	2	3.8	Ω
		$I_F = 100\text{ mA}$	0.7	1.35	Ω
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 $I_R = 3\text{ mA}$	1.55	–	μs
L_S	series inductance		0.6	–	nH

Note

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

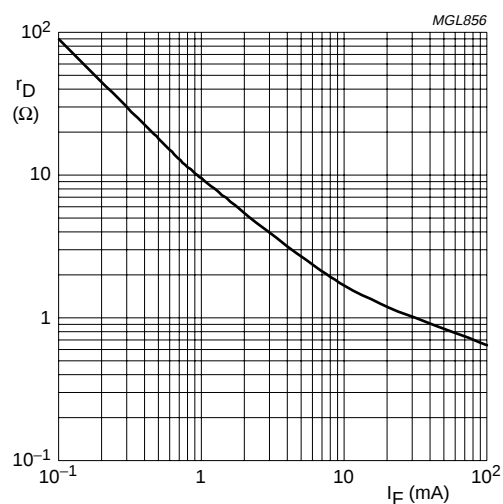
THERMAL CHARACTERISTICS

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

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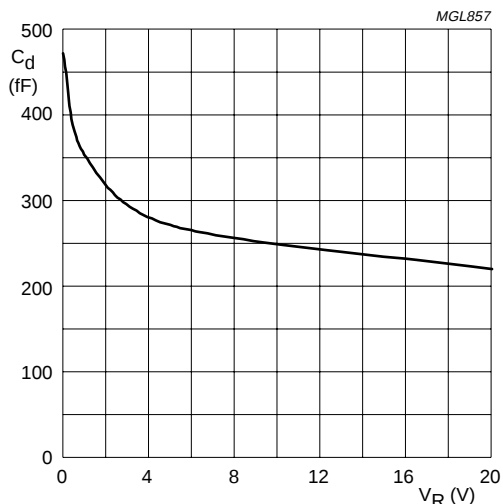
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GRAPHICAL DATA



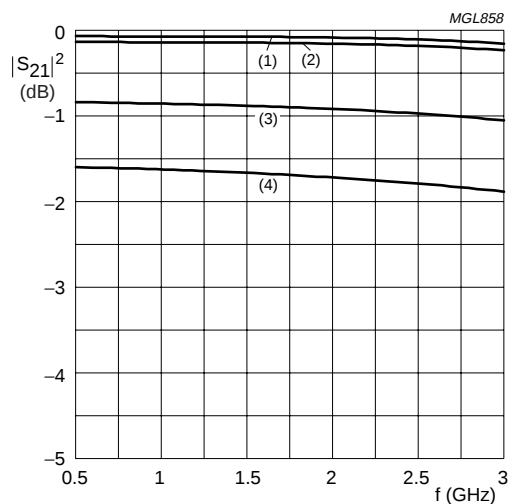
$f = 100$ MHz; $T_j = 25$ °C.

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



$f = 1$ MHz; $T_j = 25$ °C.

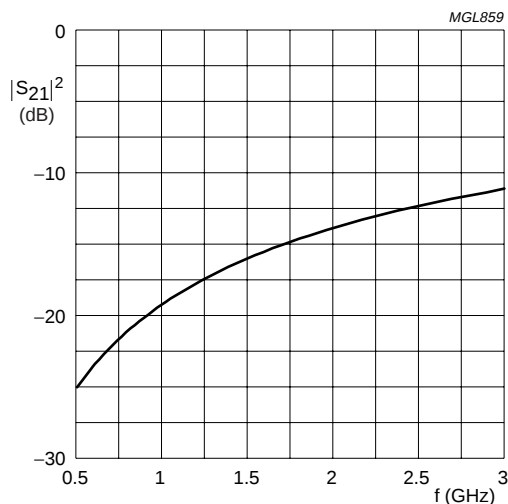
Fig.3 Diode capacitance as a function of reverse voltage; typical values.



- (1) $I_F = 100$ mA. (3) $I_F = 1$ mA.
(2) $I_F = 10$ 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

Top view: Dimensions A (total height), c (lead height), H_E (body height), D (body width), E (lead width), b_p (lead thickness). Marking: v, A, and a marking bar. A scale bar shows 0, 0.5, and 1 mm.

Side view: Shows the profile of the package with dimensions A and c.

Front view: Shows the package with dimensions D, E, b_p, and leads 1 and 2. A marking bar is shown on lead 1.

(1)

DIMENSIONS (mm are the original dimensions)							
UNIT	A	b _p	c	D	E	H _E	v
mm	0.65	0.34	0.17	1.25	0.85	1.65	0.1
	0.58	0.26	0.11	1.15	0.75	1.55	

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

Legal information

Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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
BAP64-02_N_6	20080109	Product data sheet	-	BAP64-02_5
Modifications: Package outline drawing on page 5 changed				
BAP64-02_5 (9397 750 06912)	20000323	Product specification	-	BAP64-02_4
BAP64-02_4 (9397 750 06418)	19990921	Preliminary specification	-	BAP64-02_N_3
BAP64-02_N_3 (9397 750 06086)	19990616	Preliminary specification	-	BAP64-02_2
BAP64-02_2 (9397 750 05556)	19990510	Objective specification	-	BAP64-02_N_1
BAP64-02_N_1 (9397 750 05492)	19981204	Objective specification	-	-

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Date of release: 9 January 2008

Document identifier: BAP64-02_N_6