

BAP50-02

General purpose PIN diode

Rev. 02 — 3 January 2008

Product data sheet

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NXP Semiconductors

General purpose PIN diode

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FEATURES

- Low diode capacitance
- Low diode forward resistance.

APPLICATIONS

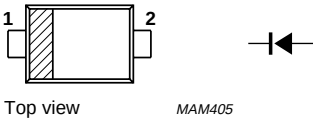
- General RF applications.

DESCRIPTION

General purpose PIN diode in a SOD523 small SMD plastic package.

PINNING

PIN	DESCRIPTION
1	cathode
2	anode



Top view

MAM405

Marking code: K4.

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		–	50	V
I _F	continuous forward current		–	50	mA
P _{tot}	total power dissipation	T _s = 90 °C	–	715	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–65	+150	°C

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ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 50\text{ mA}$	–	0.95	1.1	V
V_R	reverse voltage	$I_R = 10\text{ }\mu\text{A}$	50	–	–	V
I_R	reverse current	$V_R = 50\text{ V}$	–	–	100	nA
C_d	diode capacitance	$V_R = 0$; $f = 1\text{ MHz}$	–	0.4	–	pF
		$V_R = 1\text{ V}$; $f = 1\text{ MHz}$	–	0.3	0.55	pF
		$V_R = 5\text{ V}$; $f = 1\text{ MHz}$	–	0.22	0.35	pF
r_D	diode forward resistance	$I_F = 0.5\text{ mA}$; $f = 100\text{ MHz}$; note 1	–	25	40	Ω
		$I_F = 1\text{ mA}$; $f = 100\text{ MHz}$; note 1	–	14	25	Ω
		$I_F = 10\text{ mA}$; $f = 100\text{ MHz}$; note 1	–	3	5	Ω
$ S_{21} ^2$	isolation	$V_R = 0$; $f = 900\text{ MHz}$	–	20.4	–	dB
		$V_R = 0$; $f = 1800\text{ MHz}$	–	17.3	–	dB
		$V_R = 0$; $f = 2450\text{ MHz}$	–	15.5	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 0.5\text{ mA}$; $f = 900\text{ MHz}$	–	1.74	–	dB
		$I_F = 0.5\text{ mA}$; $f = 1800\text{ MHz}$	–	1.79	–	dB
		$I_F = 0.5\text{ mA}$; $f = 2450\text{ MHz}$	–	1.88	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 1\text{ mA}$; $f = 900\text{ MHz}$	–	1.03	–	dB
		$I_F = 1\text{ mA}$; $f = 1800\text{ MHz}$	–	1.09	–	dB
		$I_F = 1\text{ mA}$; $f = 2450\text{ MHz}$	–	1.15	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 10\text{ mA}$; $f = 900\text{ MHz}$	–	0.26	–	dB
		$I_F = 10\text{ mA}$; $f = 1800\text{ MHz}$	–	0.32	–	dB
		$I_F = 10\text{ mA}$; $f = 2450\text{ MHz}$	–	0.34	–	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 $I_R = 3\text{ mA}$	–	1.05	–	μs
L_S	series inductance	$I_F = 100\text{ mA}$; $f = 100\text{ MHz}$	–	0.6	–	nH

Note

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

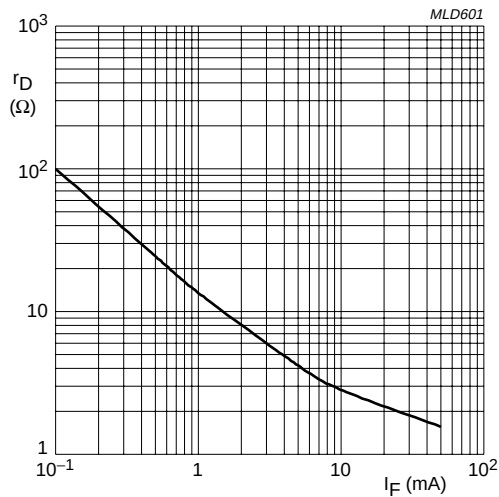
THERMAL CHARACTERISTICS

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

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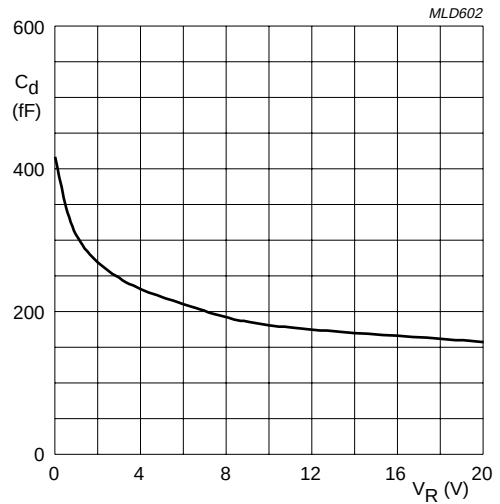
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GRAPHICAL DATA



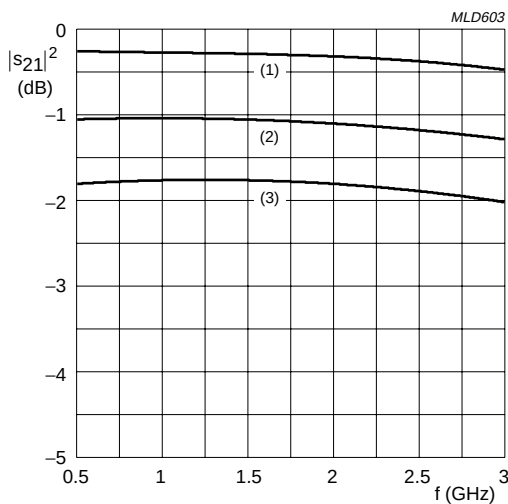
$f = 100 \text{ MHz}$; $T_j = 25^\circ\text{C}$.

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



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

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

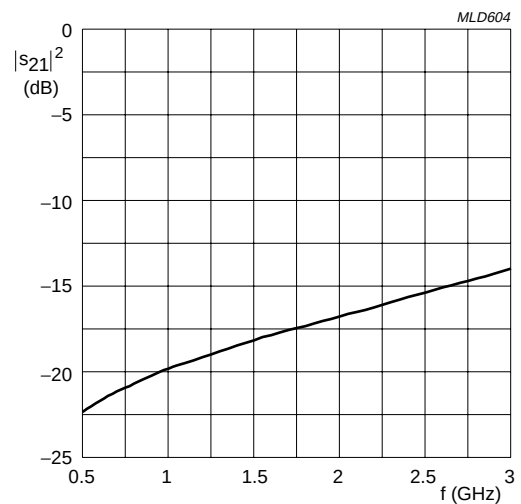


(1) $I_F = 10 \text{ mA}$. (2) $I_F = 1 \text{ mA}$. (3) $I_F = 0.5 \text{ mA}$.

Diode inserted in series with a 50Ω 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 50Ω 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.

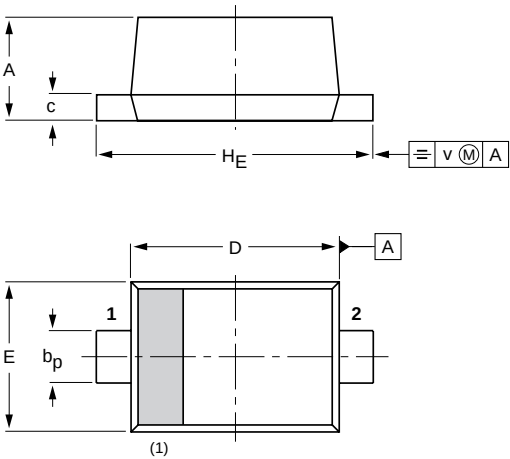
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PACKAGE OUTLINE

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

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
BAP50-02_N_2	20080103	Product data sheet	-	BAP50-02_1
Modifications:		Package outline drawing on page 5 changed		
BAP50-02_1 (9397 750 08113)	20010417	Product specification	-	-

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