

BAP65-02

Silicon PIN diode

Rev. 5 — 28 September 2010 Product data sheet

1. Product profile

1.1 General description

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

1.2 Features and benefits

- High voltage, current controlled
- RF resistor for RF switches
- Low diode capacitance
- Low diode forward resistance (low loss)
- Very low series inductance

1.3 Applications

- RF attenuators and switches
- Bandswitch for TV tuners
- Series diode for mobile communication transmit/receive switch

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode		 sym006
2	anode		

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP65-02	-	plastic surface-mounted package; 2 leads	SOD523

4. Marking

Table 3. Marking codes

Type number	Marking code
BAP65-02	K6

5. Limiting values

Table 4. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_R	continuous reverse voltage		-	30	V
I_F	continuous forward current		-	100	mA
P_{tot}	total power dissipation	$T_s \leq 90$ °C	-	715	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C
T_{amb}	ambient temperature		–40	+85	°C

6. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point		85	K/W

7. Characteristics

Table 6. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 50 mA		-	0.9	1.1	V
I_R	reverse leakage current	V_R = 20 V		-	-	20	nA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	0.65	-	pF
		V_R = 1 V; f = 1 MHz		-	0.55	0.9	pF
		V_R = 3 V; f = 1 MHz		-	0.5	0.8	pF
		V_R = 20 V; f = 1 MHz		-	0.375	-	pF
r_D	diode forward resistance	I_F = 1 mA; f = 100 MHz		-	1	-	Ω
		I_F = 5 mA; f = 100 MHz	[1]	-	0.65	0.95	Ω
		I_F = 10 mA; f = 100 MHz	[1]	-	0.56	0.9	Ω
		I_F = 100 mA; f = 100 MHz		-	0.35	-	Ω
$\lvert s_{21}\rvert^2$	isolation	V_R = 0; f = 900 MHz		-	10	-	dB
		V_R = 0; f = 1800 MHz		-	5.8	-	dB
		V_R = 0; f = 2450 MHz		-	4.4	-	dB
$\lvert s_{21}\rvert^2$	insertion loss	I_F = 1 mA; f = 900 MHz		-	0.11	-	dB
		I_F = 1 mA; f = 1800 MHz		-	0.13	-	dB
		I_F = 1 mA; f = 2450 MHz		-	0.16	-	dB
$\lvert s_{21}\rvert^2$	insertion loss	I_F = 5 mA; f = 900 MHz		-	0.08	-	dB
		I_F = 5 mA; f = 1800 MHz		-	0.11	-	dB
		I_F = 5 mA; f = 2450 MHz		-	0.13	-	dB

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Table 6. Characteristics *...continued*

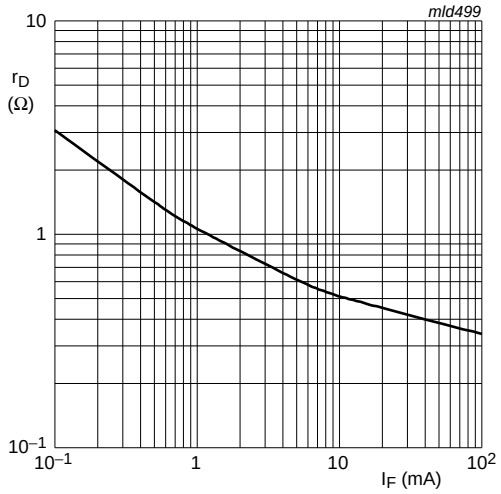
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$\|s_{21}\|^2$	insertion loss	I_F = 10 mA; f = 900 MHz	-	0.07	-	dB
		I_F = 10 mA; f = 1800 MHz	-	0.1	-	dB
		I_F = 10 mA; f = 2450 MHz	-	0.13	-	dB
$\|s_{21}\|^2$	insertion loss	I_F = 100 mA; f = 900 MHz	-	0.07	-	dB
		I_F = 100 mA; f = 1800 MHz	-	0.1	-	dB
		I_F = 100 mA; f = 2450 MHz	-	0.128	-	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	-	0.17	-	µs
L_S	series inductance	I_F = 100 mA; f = 100 MHz	-	0.6	-	nH

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

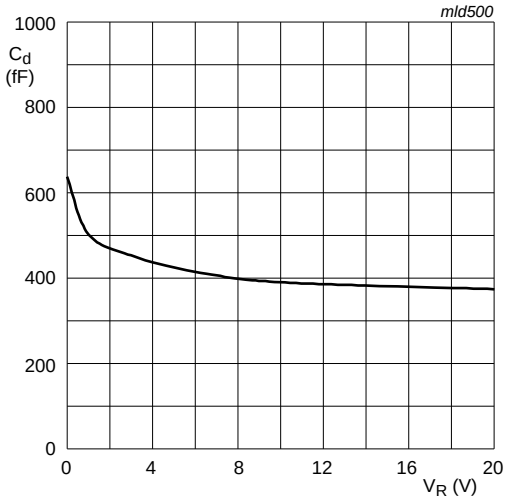
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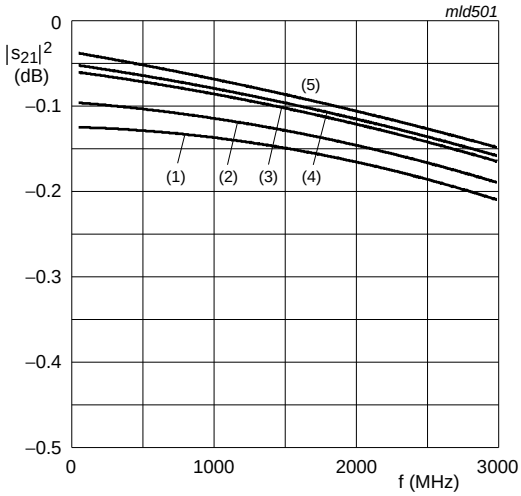
f = 100 MHz; T_j = 25 °C

Fig 1. Forward resistance as a function of forward current; typical values



f = 1 MHz; T_j = 25 °C

Fig 2. Diode capacitance as a function of reverse voltage; typical values



(1) I_F = 0.5 mA

(2) I_F = 1 mA

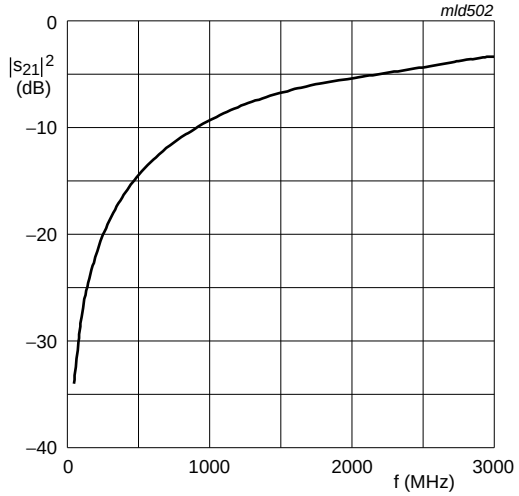
(3) I_F = 5 mA

(4) I_F = 10 mA

(5) I_F = 100 mA

Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network. T_{amb} = 25 °C.

Fig 3. 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.

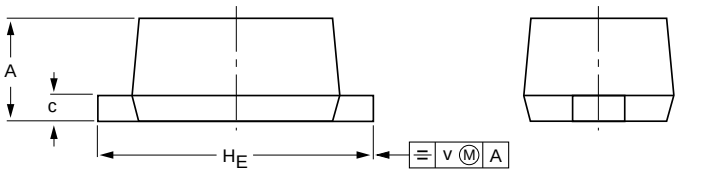
Fig 4. Isolation ($|s_{21}|^2$) of the diode as a function of frequency; typical values

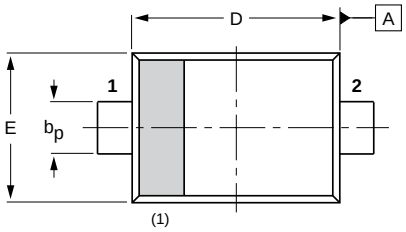
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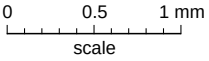
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8. Package outline

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

Fig 5. Package outline SOD523

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9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP65-02 v.5	20100928	Product data sheet	-	BAP65-02_N v.4
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been updated. • Table 4 “Limiting values”: added T_{amb} (ambient temperature).			
BAP65-02_N v.4	20080108	Product data sheet	-	BAP65-02 v.3
BAP65-02 v.3 (9397 750 08364)	20010511	Product specification	-	BAP65-02 v.2
BAP65-02 v.2 (9397 750 08237)	20010507	Product specification	-	BAP65-02 v.1
BAP65-02 v.1 (9397 750 07724)	20001220	Product specification	-	-

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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.

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[2] The term 'short data sheet' is explained in section "Definitions".

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