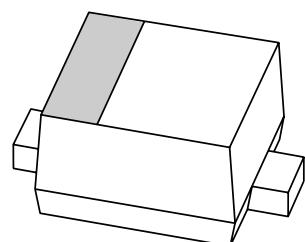


# DATA SHEET



## **BAP65-01** Silicon PIN diode

Preliminary specification

2001 Nov 01

**Silicon PIN diode****BAP65-01****FEATURES**

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

**APPLICATIONS**

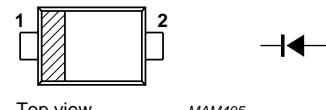
- RF attenuators and switches
- Bandswitch for TV tuners
- Series diode for mobile communication transmit/receive switch.

**DESCRIPTION**

Planar PIN diode in a SOD723A ultra small SMD plastic package.

**PINNING**

PIN	DESCRIPTION
1	cathode
2	anode



Top view

MAM405

Marking code: K6.

Fig.1 Simplified outline (SOD723A) 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		–	30	V
$I_F$	continuous forward current		–	100	mA
$P_{tot}$	total power dissipation	$T_s \leq 90^\circ\text{C}$	–	315	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–65	+150	°C

## Silicon PIN diode

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## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 50 \text{ mA}$	0.9	1.1	V
$I_R$	reverse leakage current	$V_R = 20 \text{ V}$	—	20	nA
$C_d$	diode capacitance	$V_R = 0 \text{ V}; f = 1 \text{ MHz}$	0.61	—	pF
		$V_R = 1 \text{ V}; f = 1 \text{ MHz}$	0.48	0.9	pF
		$V_R = 3 \text{ V}; f = 1 \text{ MHz}$	0.43	0.8	pF
		$V_R = 20 \text{ V}; f = 1 \text{ MHz}$	0.375	—	pF
$r_D$	diode forward resistance	$I_F = 1 \text{ mA}; f = 100 \text{ MHz}$	1.0	—	$\Omega$
		$I_F = 5 \text{ mA}; f = 100 \text{ MHz}; \text{note 1}$	0.6	0.95	$\Omega$
		$I_F = 10 \text{ mA}; f = 100 \text{ MHz}; \text{note 1}$	0.5	0.9	$\Omega$
		$I_F = 100 \text{ mA}; f = 100 \text{ MHz}$	0.3	—	$\Omega$
$ S_{21} ^2$	isolation	$V_R = 0; f = 900 \text{ MHz}$	9.4	—	dB
		$V_R = 0; f = 1800 \text{ MHz}$	5.5	—	dB
		$V_R = 0; f = 2450 \text{ MHz}$	4.1	—	dB
$ S_{21} ^2$	insertion loss	$I_F = 1 \text{ mA}; f = 900 \text{ MHz}$	0.10	—	dB
		$I_F = 1 \text{ mA}; f = 1800 \text{ MHz}$	0.12	—	dB
		$I_F = 1 \text{ mA}; f = 2450 \text{ MHz}$	0.15	—	dB
$ S_{21} ^2$	insertion loss	$I_F = 5 \text{ mA}; f = 900 \text{ MHz}$	0.08	—	dB
		$I_F = 5 \text{ mA}; f = 1800 \text{ MHz}$	0.10	—	dB
		$I_F = 5 \text{ mA}; f = 2450 \text{ MHz}$	0.12	—	dB
$ S_{21} ^2$	insertion loss	$I_F = 10 \text{ mA}; f = 900 \text{ MHz}$	0.06	—	dB
		$I_F = 10 \text{ mA}; f = 1800 \text{ MHz}$	0.09	—	dB
		$I_F = 10 \text{ mA}; f = 2450 \text{ MHz}$	0.11	—	dB
$ S_{21} ^2$	insertion loss	$I_F = 100 \text{ mA}; f = 900 \text{ MHz}$	0.05	—	dB
		$I_F = 100 \text{ mA}; f = 1800 \text{ MHz}$	0.08	—	dB
		$I_F = 100 \text{ mA}; f = 2450 \text{ MHz}$	0.10	—	dB
$\tau_L$	charge carrier life time	when switched from $I_F = 10 \text{ mA}$ to $I_R = 6 \text{ mA}; R_L = 100 \Omega$ ; measured at $I_R = 3 \text{ mA}$	0.17	—	$\mu\text{s}$
$L_S$	series inductance	$I_F = 100 \text{ mA}; f = 100 \text{ MHz}$	0.6	—	nH

## Note

- 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	190	K/W

## Silicon PIN diode

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## GRAPHICAL DATA

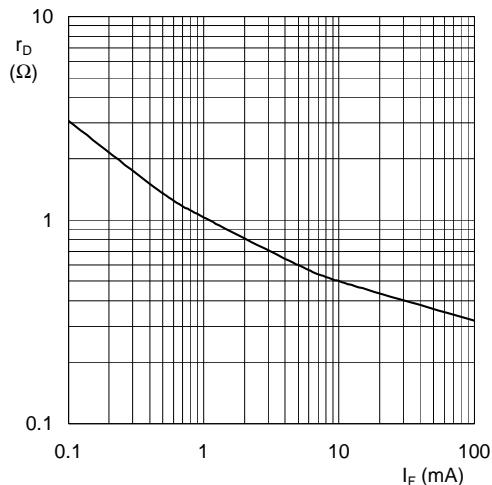
 $f = 100$  MHz;  $T_j = 25$  °C.

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

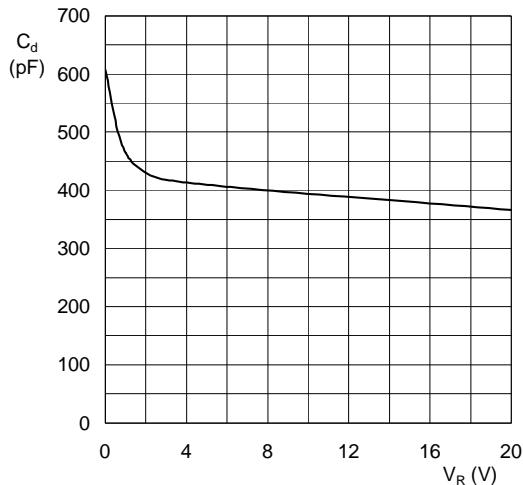
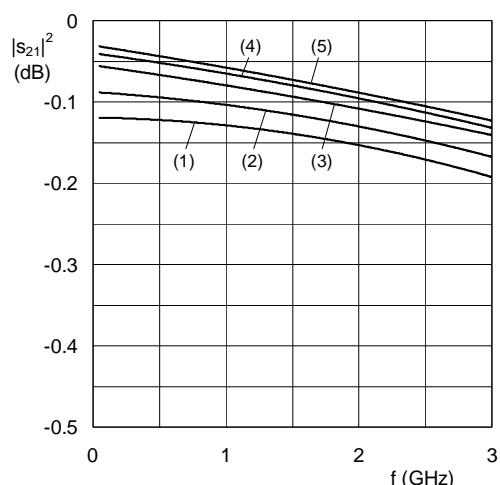
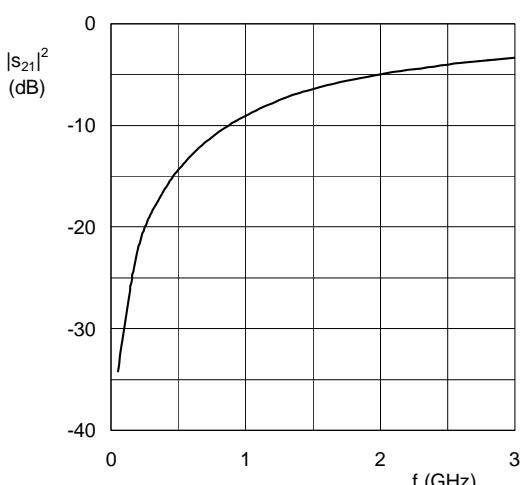
 $f = 1$  MHz;  $T_j = 25$  °C.

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



(1)  $I_F = 0.5$  mA. (4)  $I_F = 10$  mA.  
 (2)  $I_F = 1$  mA. (5)  $I_F = 100$  mA.  
 (3)  $I_F = 5$  mA.

Diode inserted in series with a  $50 \Omega$  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  $50 \Omega$  stripline circuit.  $T_{amb} = 25$  °C.

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

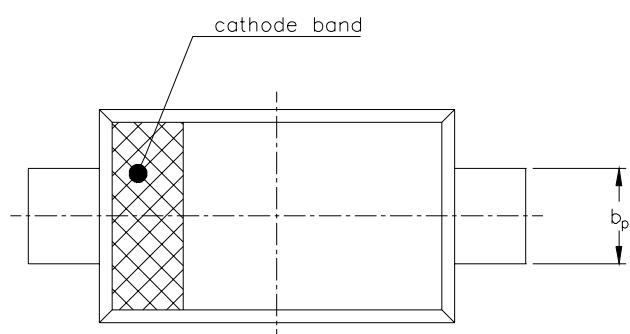
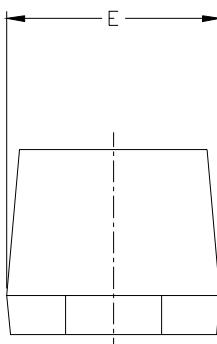
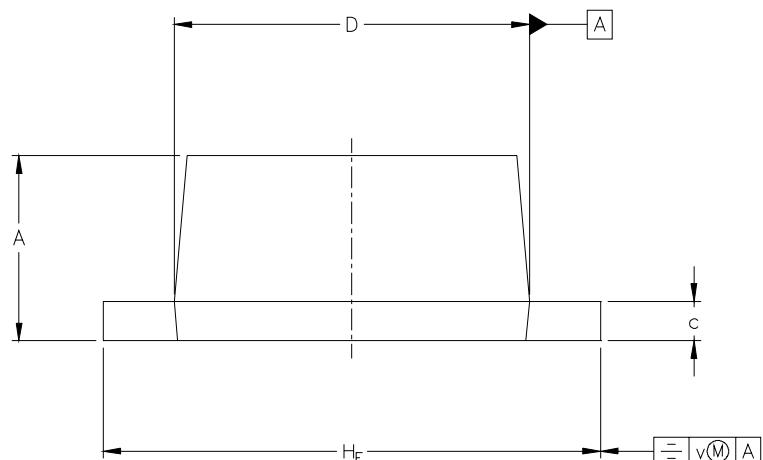
## Silicon PIN diode

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## PACKAGE OUTLINE

SOD723A

Plastic surface mounted package; 2 leads


 0 0.5 mm  
Scale


UNIT	A	$b_p$	c	D	E	$H_E$	v
mm	0.49 0.55	0.25 0.32	0.08 0.15	0.95 1.05	0.55 0.65	1.35 1.45	0.1

PACKAGE OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
SOD723A PUBLICATION DRAWING	IEC	JEDEC	EIAJ		
<i>UNDER DEVELOPMENT</i>					01-09-06

## Silicon PIN diode

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