

# Silicon PIN diode

## FEATURES

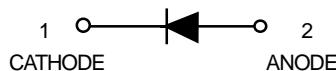
- High voltage, current controlled
- RF resistor for RF switches
- Low diode capacitance
- Low diode forward resistance (low loss)
- Very low series inductance.

## APPLICATIONS

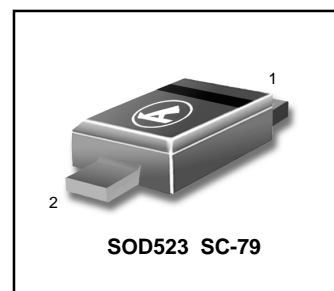
- RF attenuators and switches
- Bandswitch for TV tuners
- Series diode for mobile communication transmit/receive switch.

## DESCRIPTION

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



## BAP65 – 02



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC60134).

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	$T_s \leq 90^\circ\text{C}$	–	715	mW
$T_{stg}$	storage temperature		-65	+150	$^\circ\text{C}$
$T_j$	junction temperature		-65	+150	$^\circ\text{C}$

## 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 current	$V_R = 20\text{ V}$	–	20	nA
$C_d$	diode capacitance	$V_R = 0; f = 1\text{ MHz}$	0.65	–	pF
		$V_R = 1\text{ V}; f = 1\text{ MHz}$	0.55	0.9	pF
		$V_R = 3\text{ V}; f = 1\text{ MHz}$	0.5	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	–	$\Omega$
		$I_F = 5\text{ mA}; f = 100\text{ MHz};$ note 1	0.65	0.95	$\Omega$
		$I_F = 10\text{ mA}; f = 100\text{ MHz};$ note 1	0.56	0.9	$\Omega$
		$I_F = 100\text{ mA}; f = 100\text{ MHz};$	0.35	–	$\Omega$
$ s_{21} ^2$	isolation	$V_R = 0; f = 900\text{ MHz}$	10	–	dB
		$V_R = 0; f = 1800\text{ MHz}$	5.8	–	dB
		$V_R = 0; f = 2450\text{ MHz}$	4.4	–	dB
$ s_{21} ^2$	insertion loss	$I_F = 1\text{ mA}; f = 900\text{ MHz}$	0.11	–	dB
		$I_F = 1\text{ mA}; f = 1800\text{ MHz}$	0.13	–	dB
		$I_F = 1\text{ mA}; f = 2450\text{ MHz}$	0.16	–	dB
$ s_{21} ^2$	insertion loss	$I_F = 5\text{ mA}; f = 900\text{ MHz}$	0.08	–	dB
		$I_F = 5\text{ mA}; f = 1800\text{ MHz}$	0.11	–	dB
		$I_F = 5\text{ mA}; f = 2450\text{ MHz}$	0.13	–	dB
$ s_{21} ^2$	insertion loss	$I_F = 10\text{ mA}; f = 900\text{ MHz}$	0.07	–	dB
		$I_F = 10\text{ mA}; f = 1800\text{ MHz}$	0.1	–	dB
		$I_F = 10\text{ mA}; f = 2450\text{ MHz}$	0.13	–	dB
$ s_{21} ^2$	insertion loss	$I_F = 100\text{ mA}; f = 900\text{ MHz}$	0.07	–	dB
		$I_F = 100\text{ mA}; f = 1800\text{ MHz}$	0.1	–	dB
		$I_F = 100\text{ mA}; f = 2450\text{ MHz}$	0.128	–	dB

**BAP65-02**

**ELECTRICAL CHARACTERISTICS**  $T_j = 25^\circ\text{C}$  unless otherwise specified. (Continue)

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$\tau_L$	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	$I_F = 10\text{ mA}$ ; $f = 100\text{ MHz}$	0.6	—	nH

**Note**

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

**THERMAL CHARACTERISTICS**

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

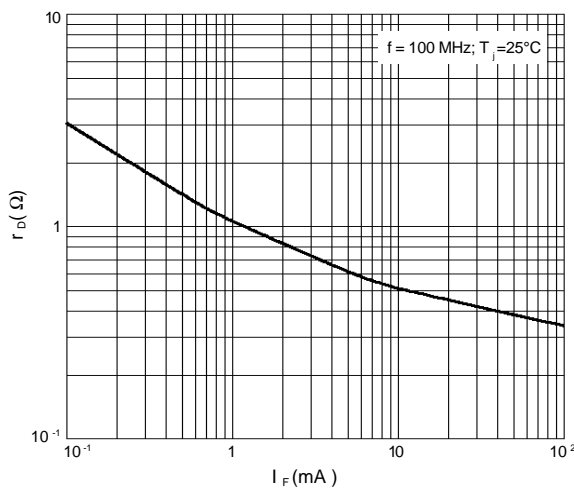


Fig.1 Forward resistance as a function of forward current; typical values.

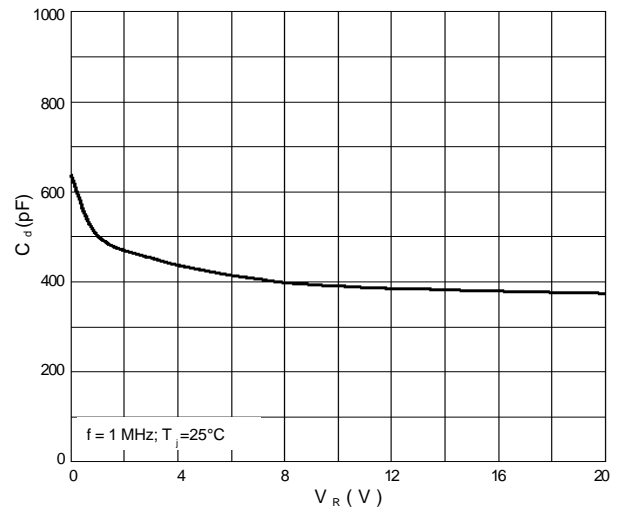


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

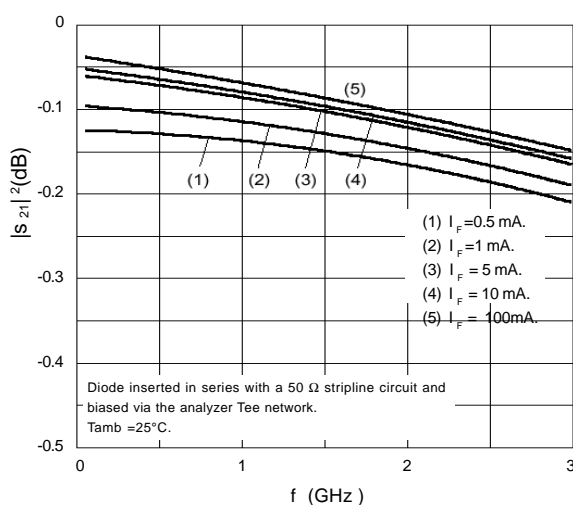


Fig.3 Insertion loss ( $|S_{21}|^2$ ) of the diode in on-state as a function of frequency; typical values.

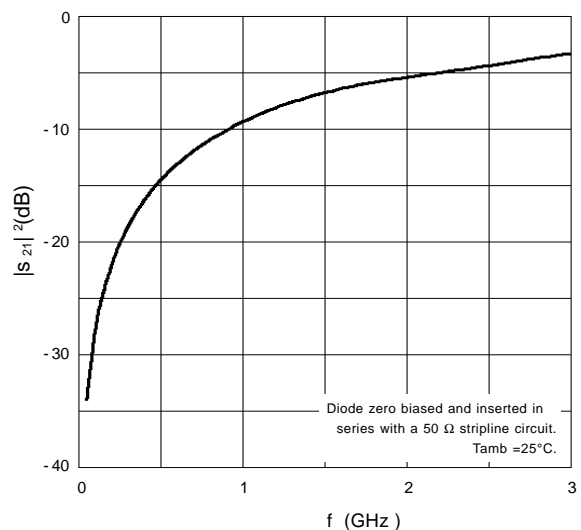


Fig.4 Isolation ( $|S_{21}|^2$ ) of the diode in off-state as a function of frequency; typical values.