

Silicon PIN diode

FEATURES

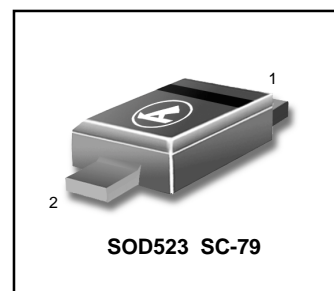
- High voltage, current controlled
- RF resistor for RF switches
- Low diode capacitance
- Low diode forward resistance (low loss)
- Very low series inductance.

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.


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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	–	Ω
		$I_F = 5\text{ mA}; f = 100\text{ MHz};$ note 1	0.65	0.95	Ω
		$I_F = 10\text{ mA}; f = 100\text{ MHz};$ note 1	0.56	0.9	Ω
		$I_F = 100\text{ mA}; f = 100\text{ MHz};$	0.35	–	Ω
$ 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

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
τ_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	—	μs
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

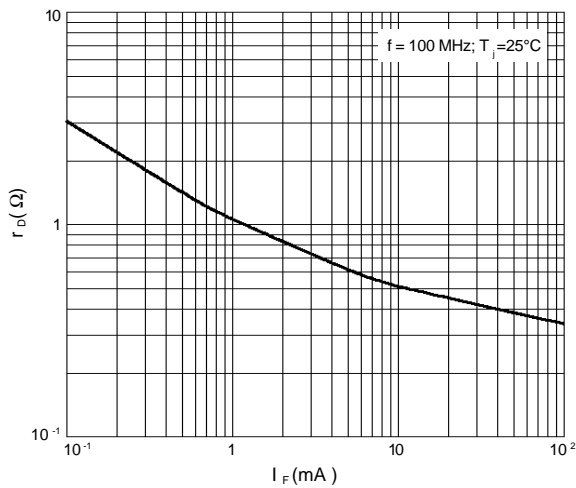


Fig.1 Forward resistance as a function of forward current; typical values.

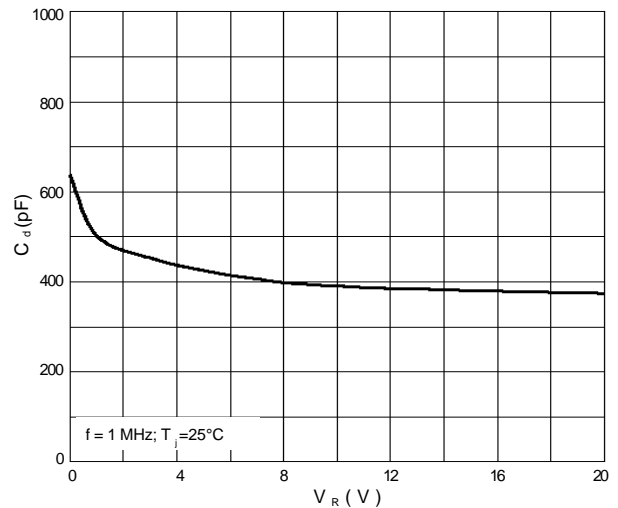


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

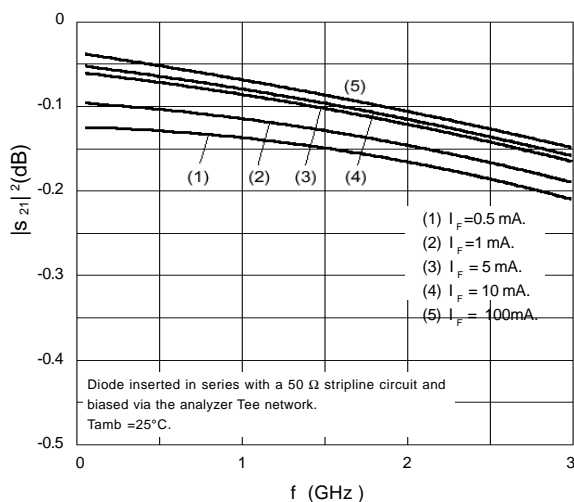


Fig.3 Insertion loss ($|s_{21}|^2$) of the diode in on-state as a function of frequency; typical values.

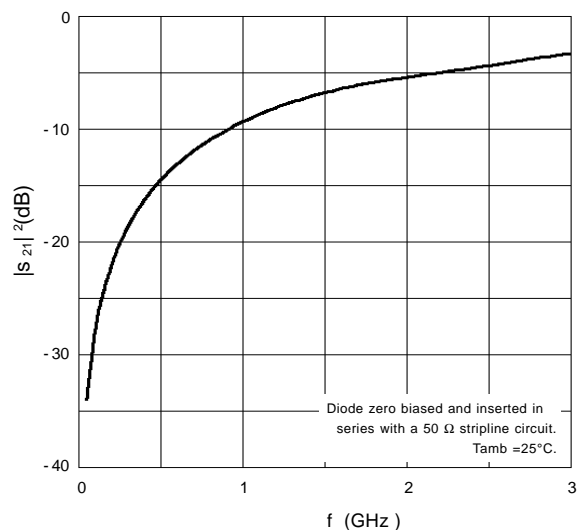


Fig.4 Isolation ($|s_{21}|^2$) of the diode in off-state as a function of frequency; typical values.