

Silicon PIN diode

FEATURES

- High speed switching for RF signals
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 3 GHz.

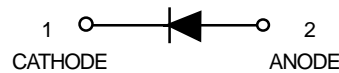
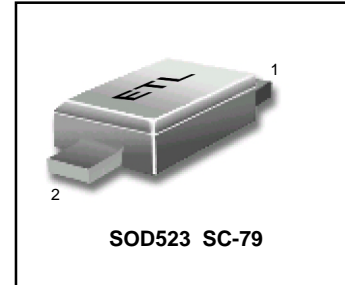
APPLICATIONS

- RF attenuators and switches.

DESCRIPTION

Planar PIN diode in a SOD323 small SMD plastic package.

BAP63 – 03



LIMITING VALUES In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current		–	100	mA
P_{tot}	total power dissipation	$T_s \leq 90^\circ\text{C}$	–	500	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	$I_F = 50\text{ mA}$	0.95	1.1	V
I_R	reverse current	$V_R = 35\text{ V}$	–	10	nA
C_d	diode capacitance	$V_R = 0; f = 1\text{ MHz}$	0.4	–	pF
		$V_R = 1\text{ V}; f = 1\text{ MHz}$	0.35	–	pF
		$V_R = 20\text{ V}; f = 1\text{ MHz}$	0.27	0.32	pF
r_D	diode forward resistance	$I_F = 0.5\text{ mA}; f = 100\text{ MHz}; \text{note 1}$	2.5	3.5	Ω
		$I_F = 1\text{ mA}; f = 100\text{ MHz}; \text{note 1}$	1.95	3	Ω
		$I_F = 10\text{ mA}; f = 100\text{ MHz}; \text{note 1}$	1.17	1.8	Ω
		$I_F = 100\text{ mA}; f = 100\text{ MHz}; \text{note 1}$	0.9	1.5	Ω
$ S_{21} ^2$	isolation	$V_R = 0; f = 900\text{ MHz}$	15.4	–	dB
		$V_R = 0; f = 1800\text{ MHz}$	10.1	–	dB
		$V_R = 0; f = 2450\text{ MHz}$	7.8	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 0.5\text{ mA}; f = 900\text{ MHz}$	0.21	–	dB
		$I_F = 0.5\text{ mA}; f = 1800\text{ MHz}$	0.28	–	dB
		$I_F = 0.5\text{ mA}; f = 2450\text{ MHz}$	0.38	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 1\text{ mA}; f = 900\text{ MHz}$	0.18	–	dB
		$I_F = 1\text{ mA}; f = 1800\text{ MHz}$	0.26	–	dB
		$I_F = 1\text{ mA}; f = 2450\text{ MHz}$	0.35	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 10\text{ mA}; f = 900\text{ MHz}$	0.13	–	dB
		$I_F = 10\text{ mA}; f = 1800\text{ MHz}$	0.20	–	dB
		$I_F = 10\text{ mA}; f = 2450\text{ MHz}$	0.30	–	dB
$ S_{21} ^2$	insertion loss	$I_F = 100\text{ mA}; f = 900\text{ MHz}$	0.10	–	dB
		$I_F = 100\text{ mA}; f = 1800\text{ MHz}$	0.18	–	dB
		$I_F = 100\text{ mA}; f = 2450\text{ MHz}$	0.28	–	dB

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 $I_R = 3\text{ mA}$	310	–	ns
L_s	series inductance		1.5	–	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	120	K/W

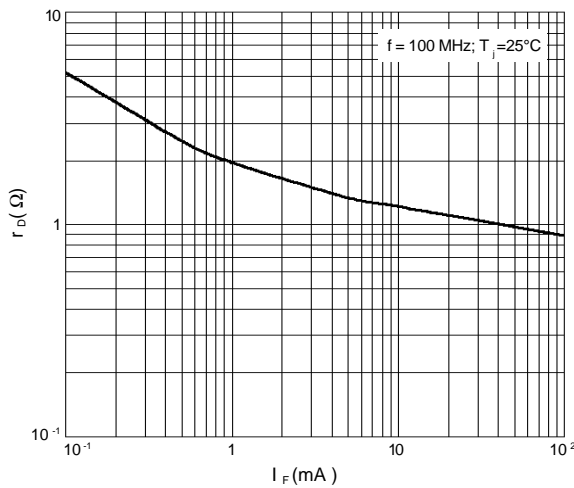


Fig.1 Forward resistance as a function of forward current; typical values.

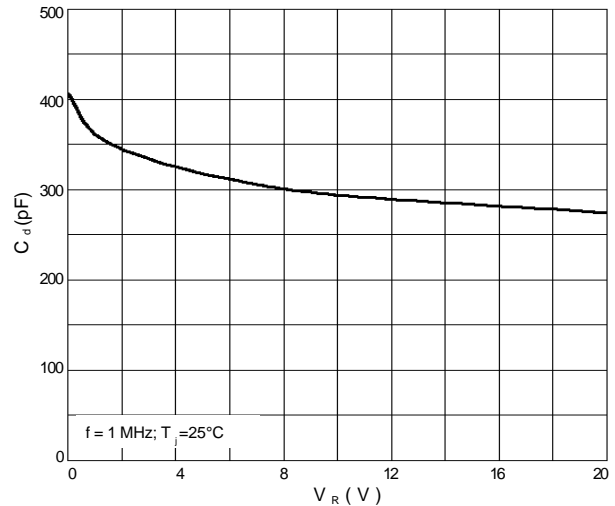


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

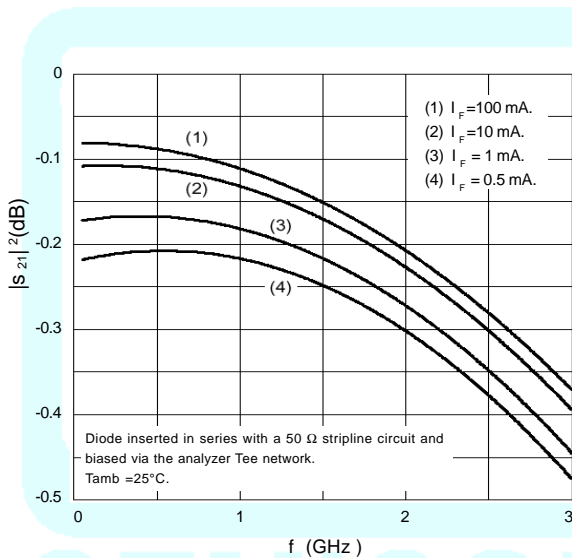


Fig.3 Insertion loss ($|S_{21}|^2$) of the diode in on-state as a function of frequency; typical values.

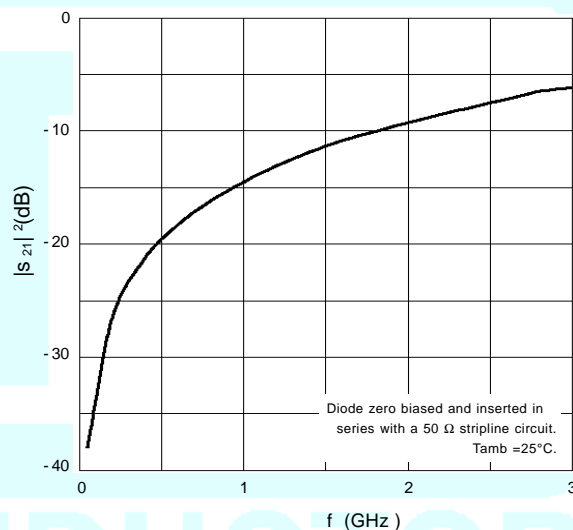


Fig.4 Isolation ($|S_{21}|^2$) of the diode in off-state as a function of frequency; typical values.