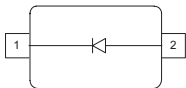


Silicon PIN Diode

- Optimized for antenna switches in hand held applications
- Very low capacitance at zero volts reverse bias at frequencies above 1GHz (typ. 0.19 pF)
- Low forward resistance (typ. 0.8Ω @ $I_F = 10\text{mA}$)
- Very low signal distortion



BAR89-02L



Type	Package	Configuration	$L_S(\text{nH})$	Marking
BAR89-02L	TSLP-2-1	single, leadless	0.4	RS

Maximum Ratings at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Diode reverse voltage	V_R	80	V
Forward current	I_F	100	mA
Total power dissipation $T_S \leq 133^\circ\text{C}$	P_{tot}	250	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Operating temperature range	T_{op}	-55 ... 125	
Storage temperature	T_{stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾ , BAR89-02L	R_{thJS}	≤ 65	K/W

¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Breakdown voltage $I_{(BR)} = 5 \mu A$	$V_{(BR)}$	80	-	-	V
Reverse current $V_R = 60 V$	I_R	-	-	50	nA
Forward voltage $I_F = 10 mA$ $I_F = 100 mA$	V_F	- -	0.83 0.95	0.9 1.1	V

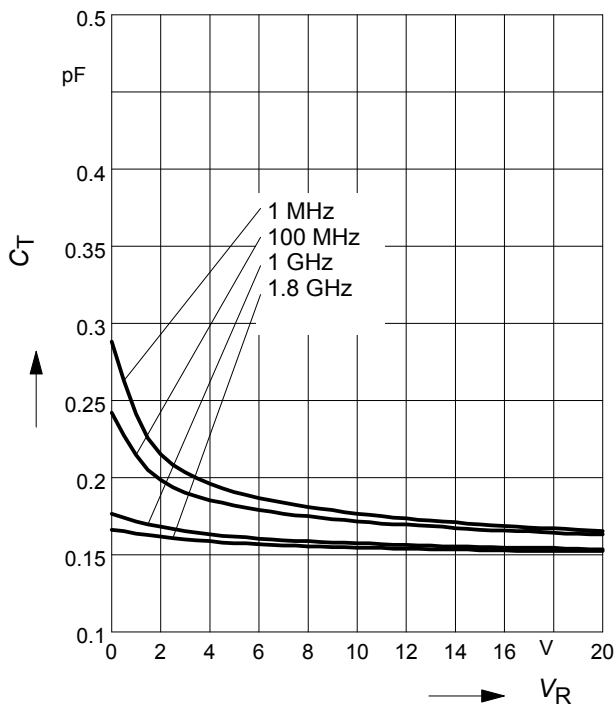
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Diode capacitance $V_R = 1\text{ V}$, $f = 1\text{ MHz}$ $V_R = 0\text{ V}$, $f = 100\text{ MHz}$ $V_R = 0\text{ V}$, $f = 1\text{ GHz}$ $V_R = 0\text{ V}$, $f = 1.8\text{ GHz}$	C_T	- - - -	0.25 0.25 0.19 0.18	0.35 - - -	pF
Reverse parallel resistance $V_R = 0\text{ V}$, $f = 100\text{ MHz}$ $V_R = 0\text{ V}$, $f = 1\text{ GHz}$ $V_R = 0\text{ V}$, $f = 1.8\text{ GHz}$	R_P	- - -	35 5 3.5	- - -	kΩ
Forward resistance $I_F = 1\text{ mA}$, $f = 100\text{ MHz}$ $I_F = 5\text{ mA}$, $f = 100\text{ MHz}$ $I_F = 10\text{ mA}$, $f = 100\text{ MHz}$	r_f	- - -	3 1.2 0.8	- - 1.5	Ω
Charge carrier life time $I_F = 10\text{ mA}$, $I_R = 6\text{ mA}$, measured at $I_R = 3\text{ mA}$, $R_L = 100\text{ Ω}$	τ_{rr}	-	800	-	ns
I-region width	W_I	-	19	-	μm
Insertion loss ¹⁾ $I_F = 1\text{ mA}$, $f = 1.8\text{ GHz}$ $I_F = 5\text{ mA}$, $f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}$, $f = 1.8\text{ GHz}$	$ S_{21} ^2$	- - -	-0.23 -0.1 -0.08	- - -	dB
Isolation ¹⁾ $V_R = 0\text{ V}$, $f = 0.9\text{ GHz}$ $V_R = 0\text{ V}$, $f = 1.8\text{ GHz}$ $V_R = 0\text{ V}$, $f = 2.45\text{ GHz}$	$ S_{21} ^2$	- - -	-19 -14 -11	- - -	

¹BAR89-02L in series configuration, $Z = 50\ \Omega$

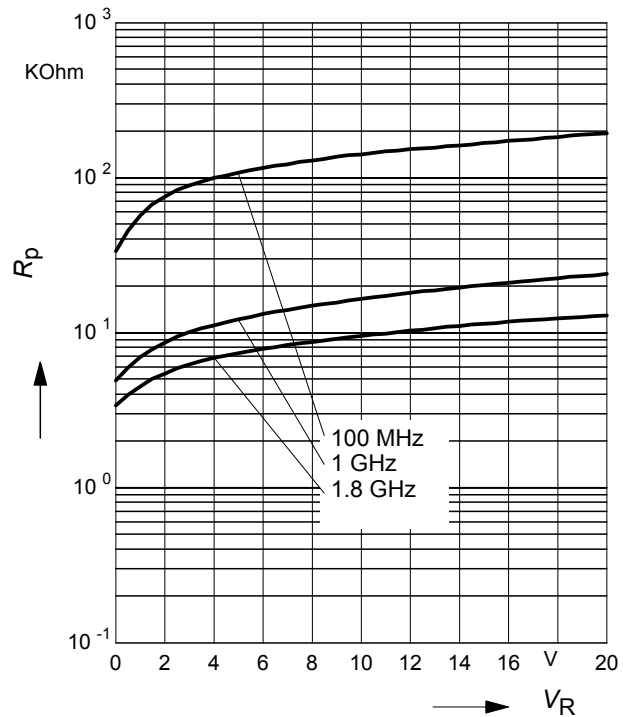
Diode capacitance $C_T = f(V_R)$

f = Parameter



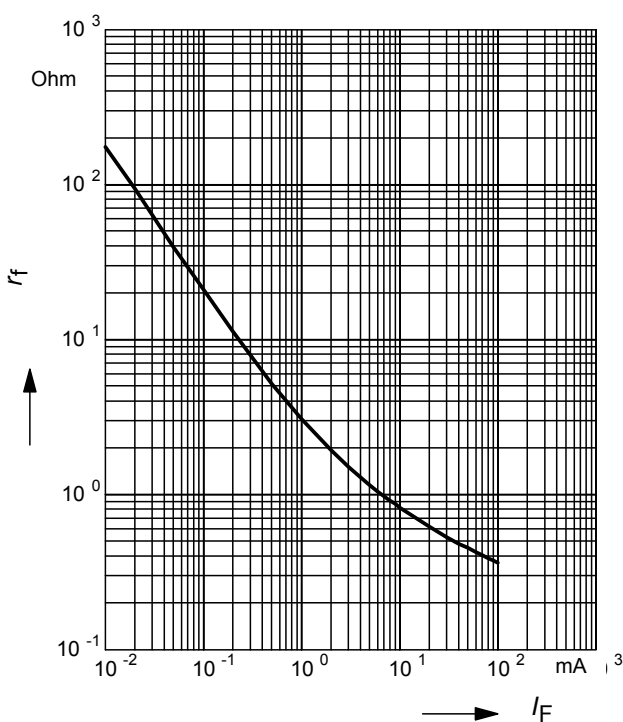
Reverse parallel resistance $R_P = f(V_R)$

f = Parameter



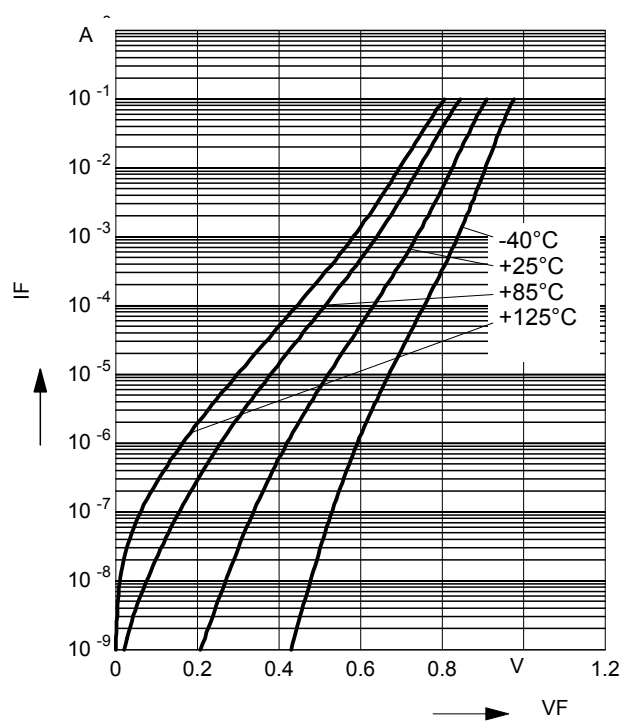
Forward resistance $r_f = f(I_F)$

f = 100MHz



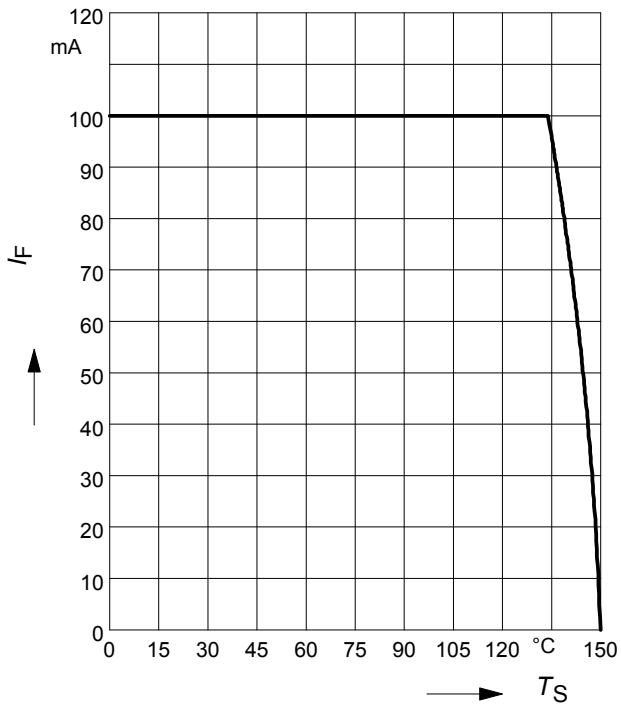
Forward current $I_F = f(V_F)$

T_A = Parameter



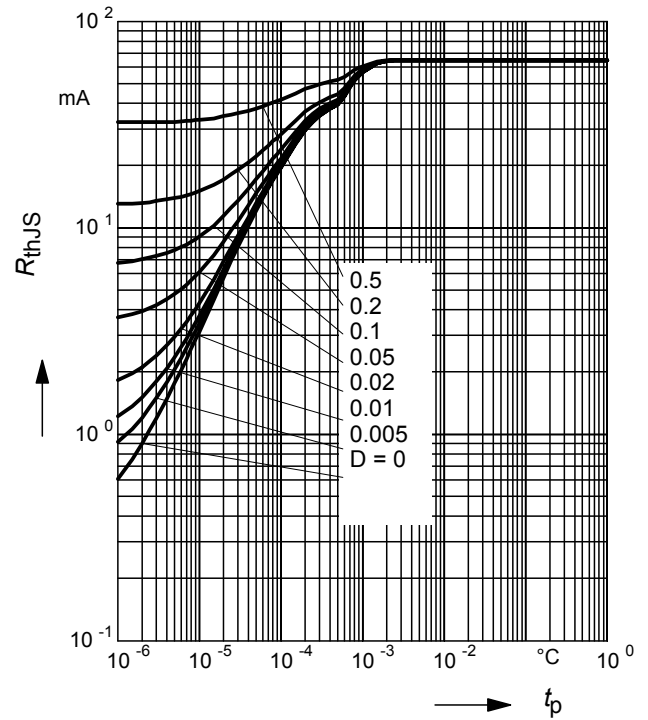
Forward current $I_F = f(T_S)$

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Permissible Puls Load $R_{thJS} = f(t_p)$

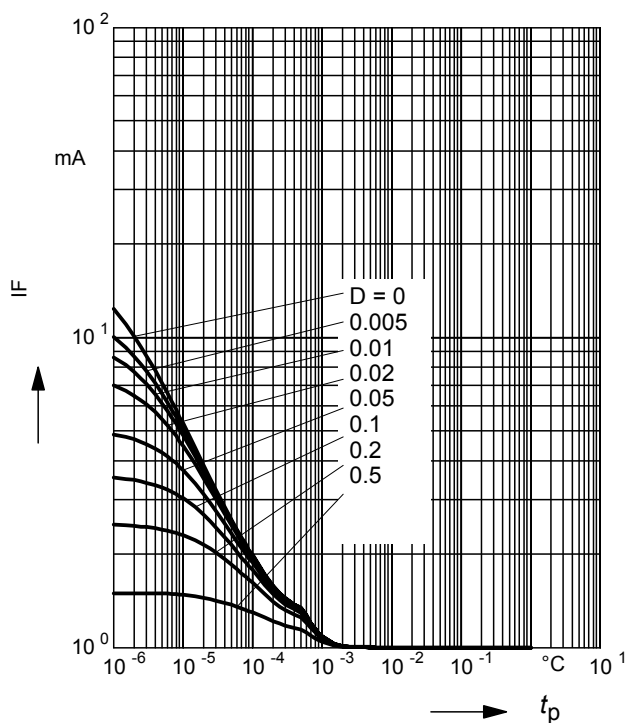
BAR89-02L



Permissible Pulse Load

$$I_{Fmax} / I_{FDC} = f(t_p)$$

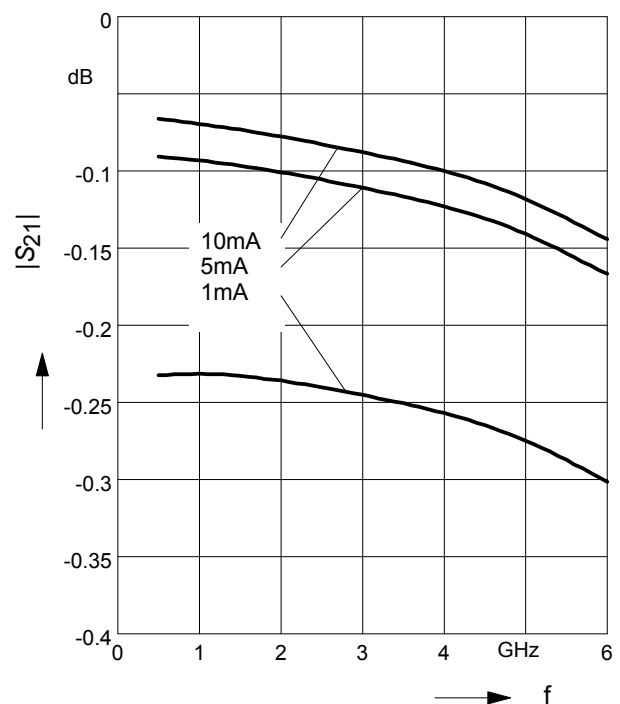
BAR89-02L



Insertion loss $|S_{21}|^2 = f(f)$

I_F = Parameter

BAR89-02L in series configuration, $Z = 50\Omega$



Isolation $|S_{21}|^2 = f(f)$

V_R = Parameter

BAR89-02L in series configuration, $Z = 50\Omega$

