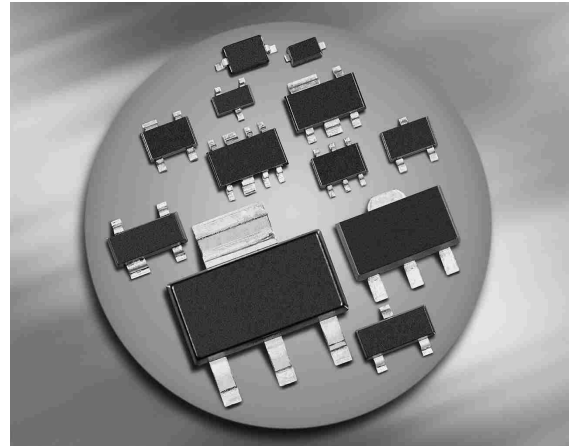
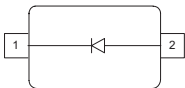


**Silicon PIN Diode**

- 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.  $0.8\Omega @ I_F = 10\text{mA}$ )
- Very low signal distortion


**BAR89-02L**


Type	Package	Configuration	$L_S$ (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 $T_S \leq 133^\circ\text{C}$	$P_{\text{tot}}$	250	mW
Junction temperature	$T_j$	150	°C
Operating temperature range	$T_{\text{op}}$	-55 ... 125	
Storage temperature	$T_{\text{stg}}$	-55 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup> , BAR89-02L	$R_{\text{thJS}}$	$\leq 65$	K/W

<sup>1</sup>For calculation of  $R_{\text{thJA}}$  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.	
<b>DC Characteristics</b>					
Breakdown voltage $I_{(BR)} = 5 \mu\text{A}$	$V_{(BR)}$	80	-	-	V
Reverse current $V_R = 60 \text{ V}$	$I_R$	-	-	50	nA
Forward voltage $I_F = 10 \text{ mA}$ $I_F = 100 \text{ mA}$	$V_F$	- -	0.83 0.95	0.9 1.1	V

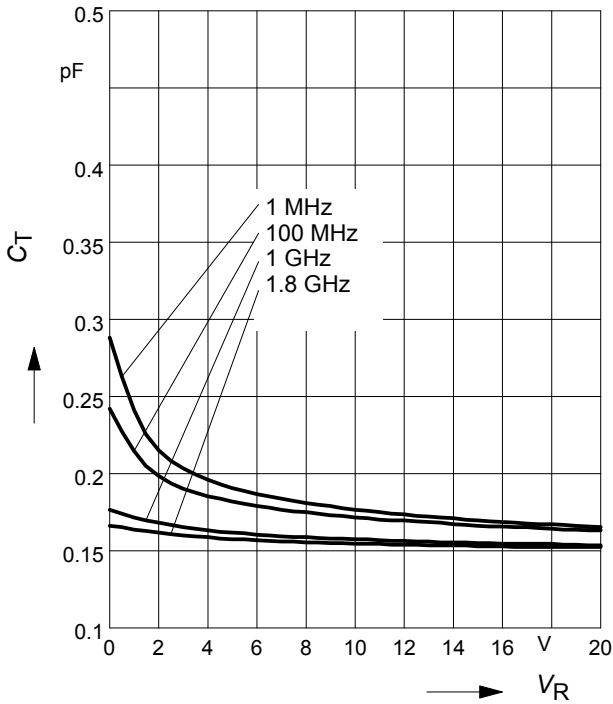
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
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	- - -	k $\Omega$
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	$\Omega$
Charge carrier life time $I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ , $R_L = 100\ \Omega$	$\tau_{rr}$	-	800	-	ns
I-region width	$W_I$	-	19	-	$\mu\text{m}$
Insertion loss <sup>1)</sup> $I_F = 1\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 5\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}, f = 1.8\text{ GHz}$	$ S_{21} ^2$	- - -	-0.23 -0.1 -0.08	- - -	dB
Isolation <sup>1)</sup> $V_R = 0\text{ V}, f = 0.9\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$ $V_R = 0\text{ V}, f = 2.45\text{ GHz}$	$ S_{21} ^2$	- - -	-19 -14 -11	- - -	

<sup>1</sup>BAR89-02L in series configuration,  $Z = 50\ \Omega$

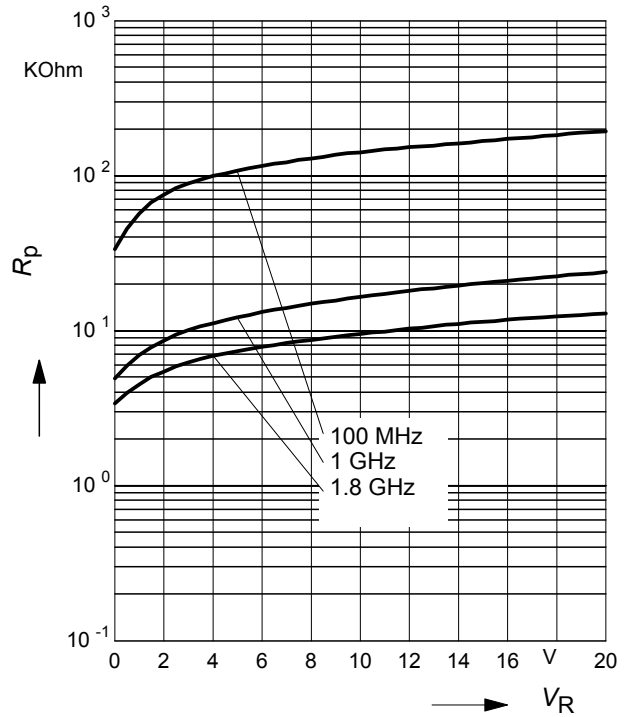
**Diode capacitance  $C_T = f(V_R)$**

$f =$  Parameter



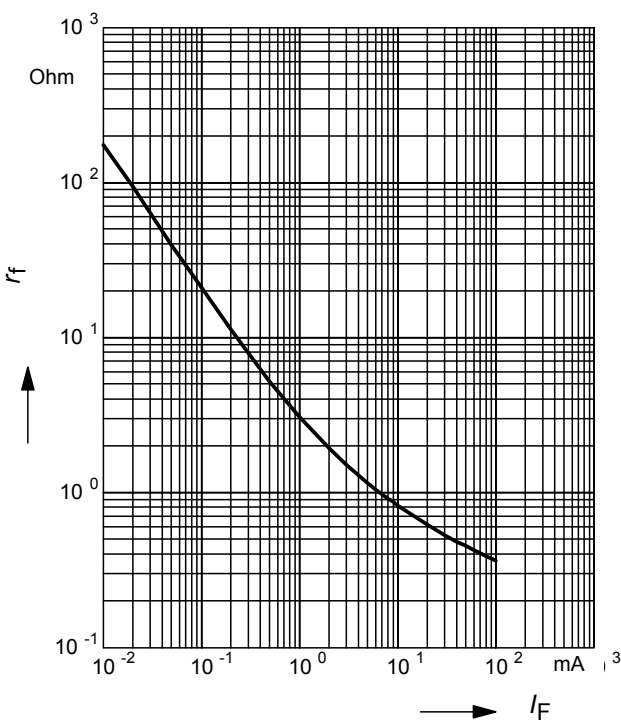
**Reverse parallel resistance  $R_P = f(V_R)$**

$f =$  Parameter



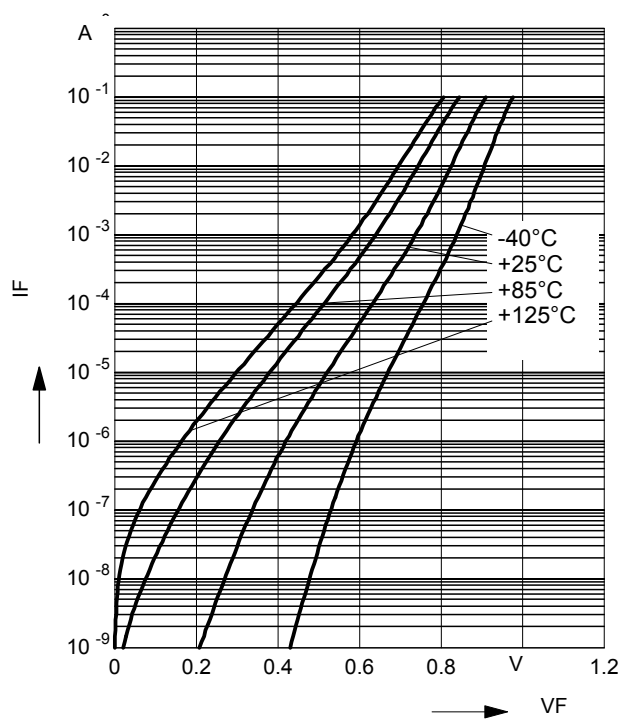
**Forward resistance  $r_f = f(I_F)$**

$f = 100\text{MHz}$



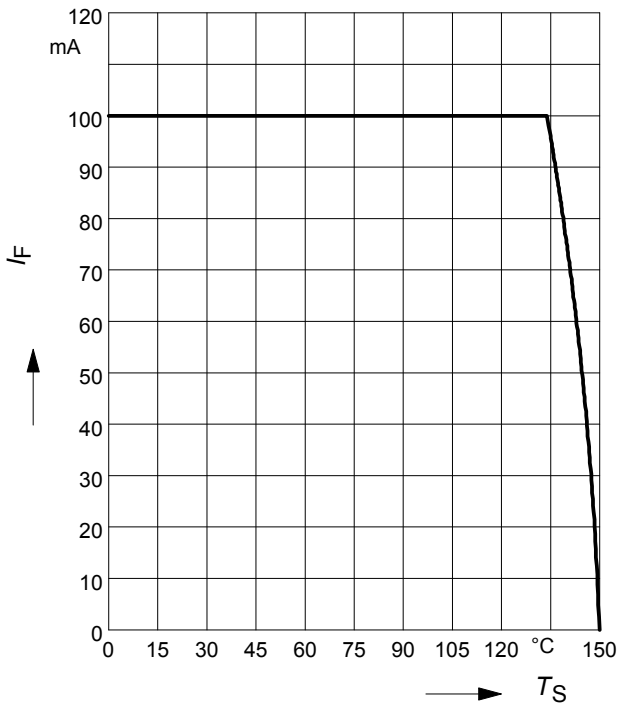
**Forward current  $I_F = f(V_F)$**

$T_A =$  Parameter



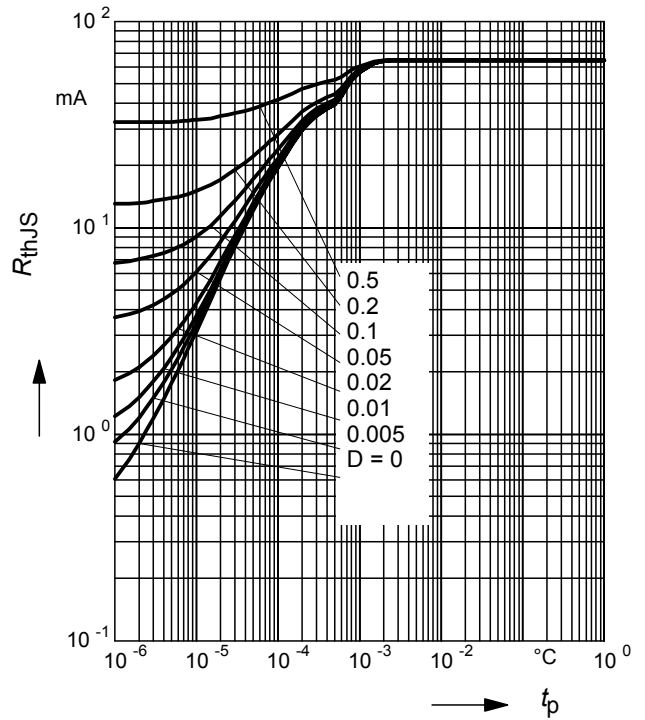
**Forward current  $I_F = f(T_S)$**

BAR89-02L



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

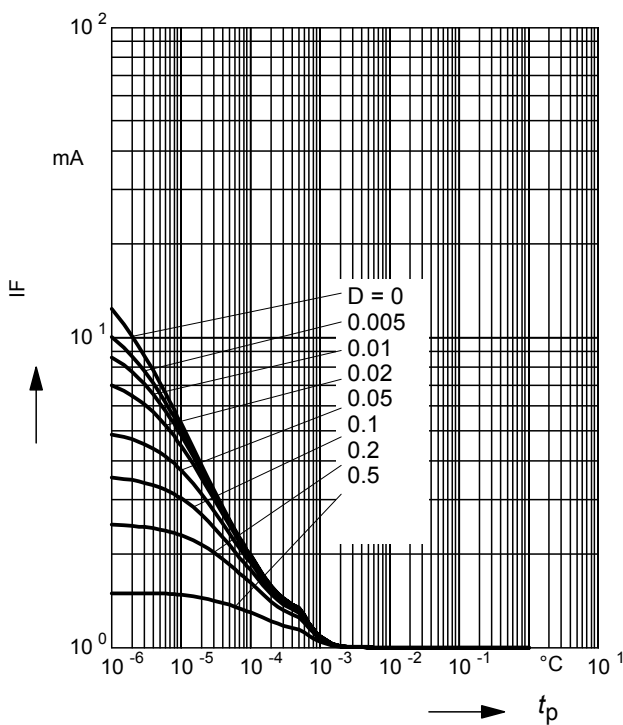
BAR89-02L



**Permissible Pulse Load**

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

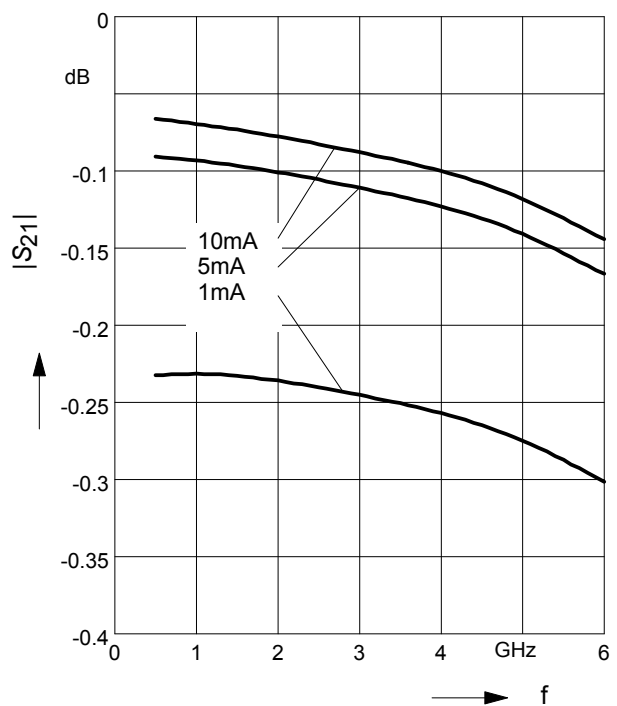
BAR89-02L



**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,  $Z = 50\Omega$

