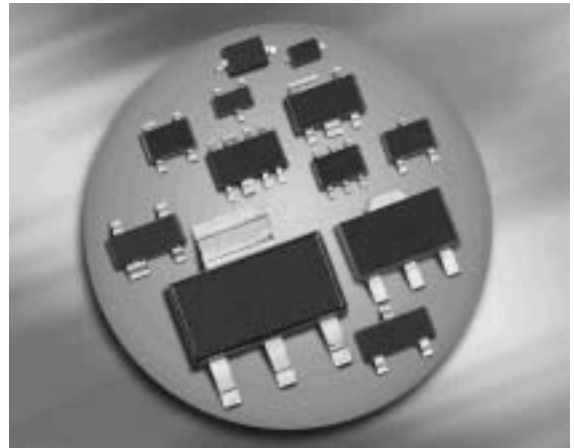
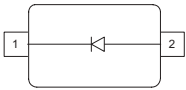
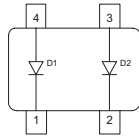
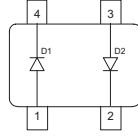
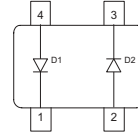


**Silicon Deep Trench PIN Diodes**

- Optimized for low bias current antenna switches in hand held applications
- Very low capacitance at zero volt reverse bias at frequencies above 1GHz (typ. 0.19pF)
- Low forward resistance (typ. 1.3Ω @  $I_F = 3\text{mA}$ )
- Improved ON / OFF mode harmonic distortion balance


**BAR90-02L**  
**BAR90-02LRH**

**BAR90-07L4**  
**BAR90-07LRH**

**BAR90-098L4**  
**BAR90-098LRH**

**BAR90-099L4**  
**BAR90-099LRH**


Type	Package	Configuration	$L_S$ (nH)	Marking
BAR90-02L*	TSLP-2-1	single, leadless	0.4	RT
BAR90-02LRH*	TSLP-2-7	single, leadless	0.4	R9
BAR90-07L4*	TSLP-4-4	parallel pair, leadless	0.4	RT
BAR90-07LRH*	TSLP-4-7	parallel pair, leadless	0.4	T
BAR90-098L4*	TSLP-4-4	anti-parallel pair, leadless	0.4	TT
BAR90-098LRH*	TSLP-4-7	anti-parallel pair, leadless	0.4	T9
BAR90-099L4*	TSLP-4-4	anti-parallel pair, leadless	0.4	TR
BAR90-099LRH*	TSLP-4-7	anti-parallel pair, leadless	0.4	99

\* Preliminary data

**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>	$R_{thJS}$	$\leq 65$	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

Breakdown voltage $I_{(BR)} = 5 \mu\text{A}$	$V_{(BR)}$	80	-	-	V
Reverse current $V_R = 60 \text{ V}$	$I_R$	-	-	50	nA
Forward voltage $I_F = 3 \text{ mA}$ $I_F = 100 \text{ mA}$	$V_F$	0.75 -	0.81 0.9	0.87 1	V

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

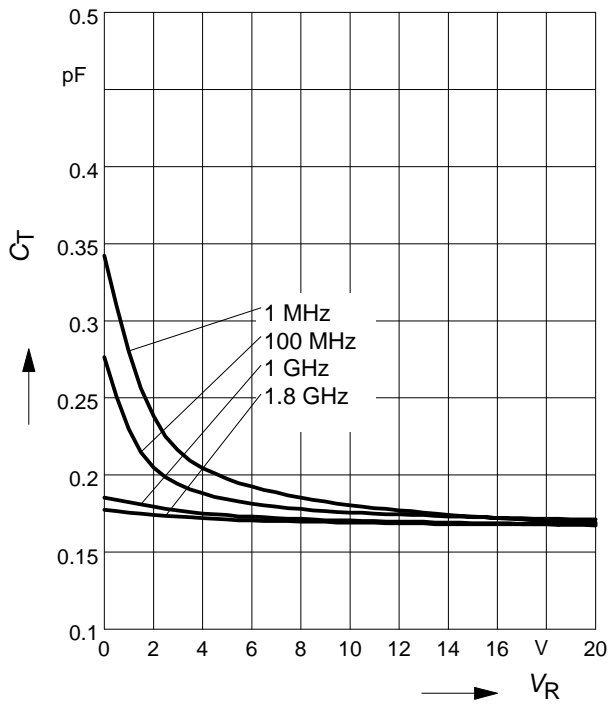
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<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 0.3 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 4	- - -	k $\Omega$
Forward resistance $I_F = 1\text{ mA}, f = 100\text{ MHz}$ $I_F = 3\text{ mA}, f = 100\text{ MHz}$ $I_F = 10\text{ mA}, f = 100\text{ MHz}$	$r_f$	-	2 1.3 0.8	- 2.3 -	$\Omega$
Charge carrier life time $I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ , $R_L = 100\ \Omega$	$\tau_{rr}$	-	750	-	ns
I-region width	$W_I$	-	20	-	$\mu\text{m}$
Insertion loss <sup>1)</sup> $I_F = 1\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 3\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}, f = 1.8\text{ GHz}$	$ S_{21} ^2$	-	-0.16 -0.11 -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$	-	-18.5 -13.5 -11.5	- - -	

<sup>1</sup>BAR90-02L in series configuration,  $Z = 50\ \Omega$

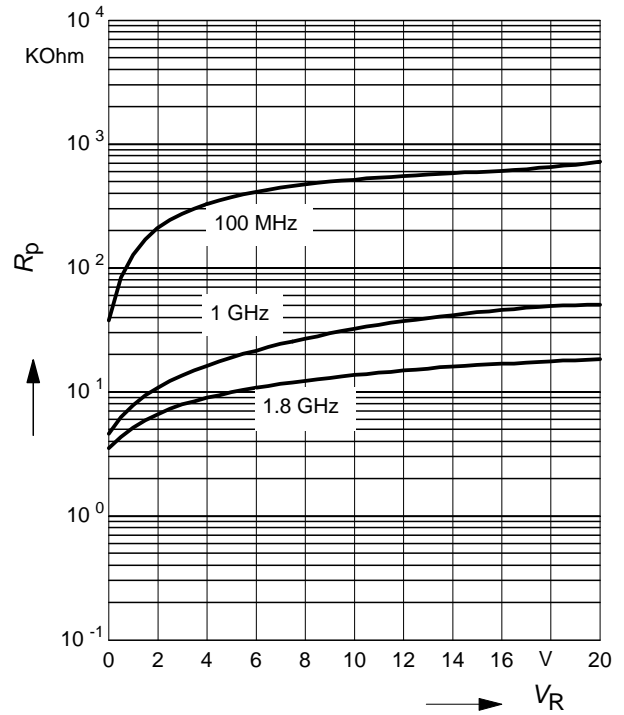
**Diode capacitance  $C_T = f(V_R)$**

$f =$  Parameter



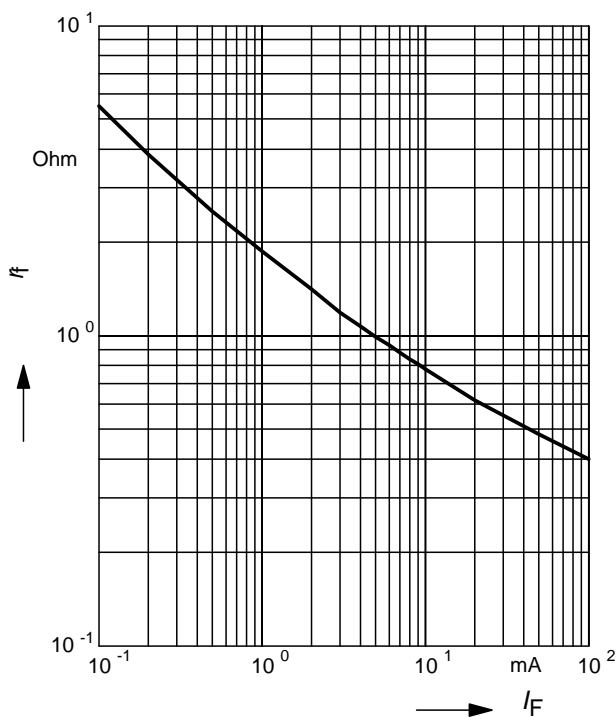
**Reverse parallel resistance  $R_p = f(V_R)$**

$f =$  Parameter



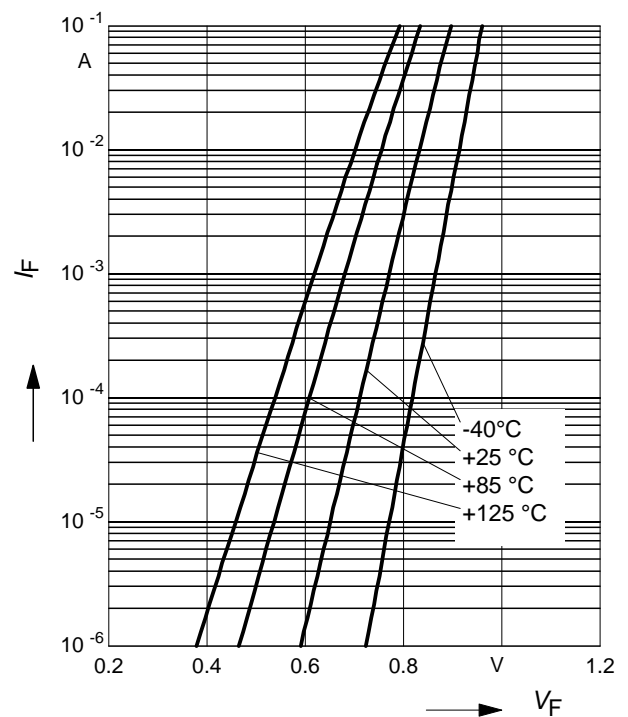
**Forward resistance  $r_f = f(I_F)$**

$f = 100$  MHz

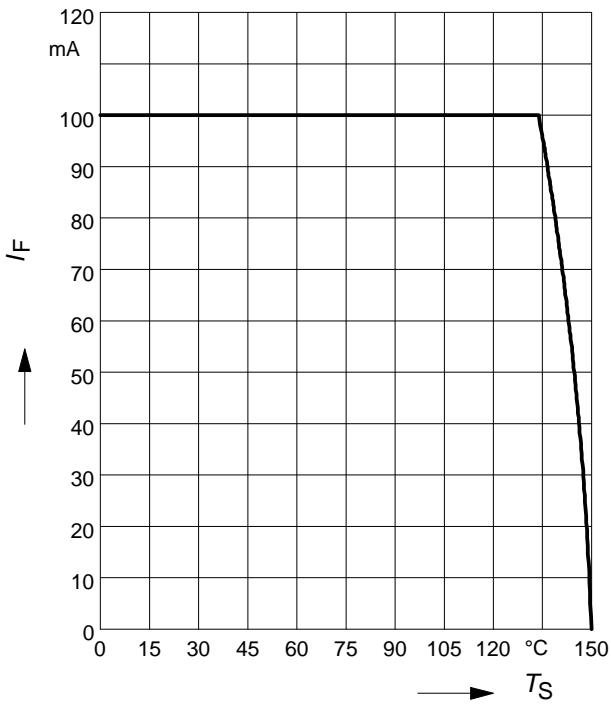


**Forward current  $I_F = f(V_F)$**

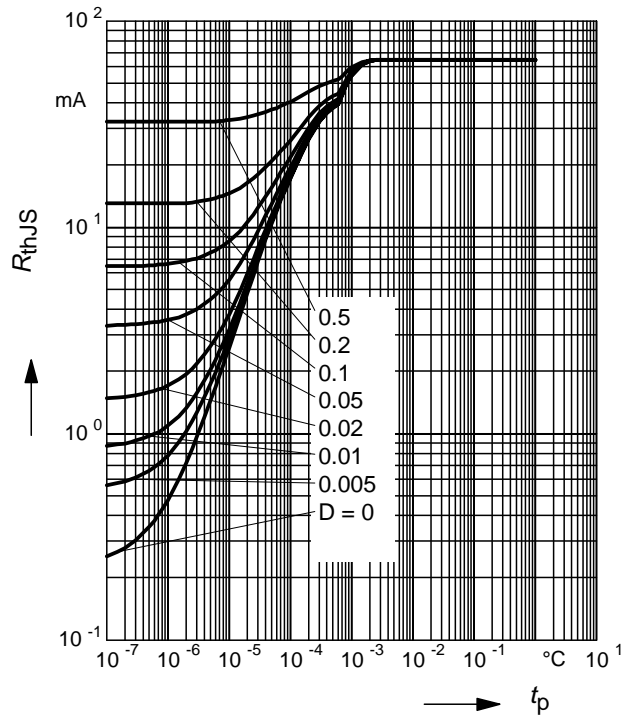
$T_A =$  Parameter



Forward current  $I_F = f(T_S)$

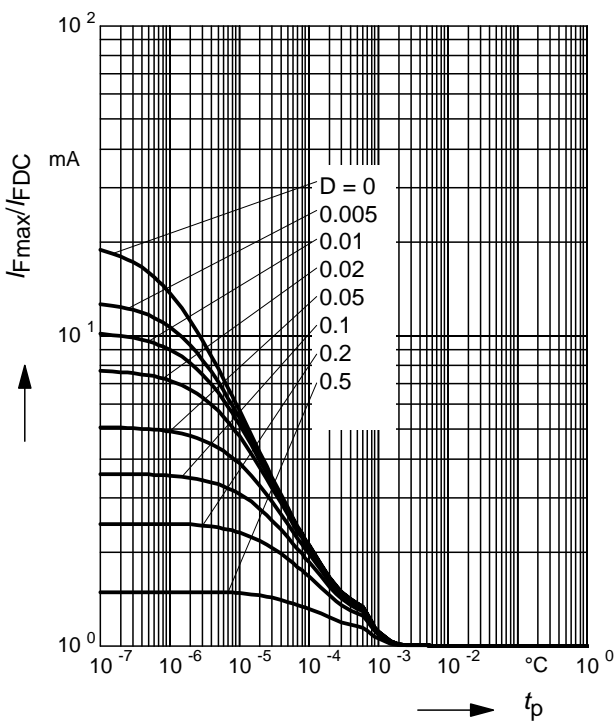


Permissible Puls Load  $R_{thJS} = f(t_p)$



Permissible Pulse Load

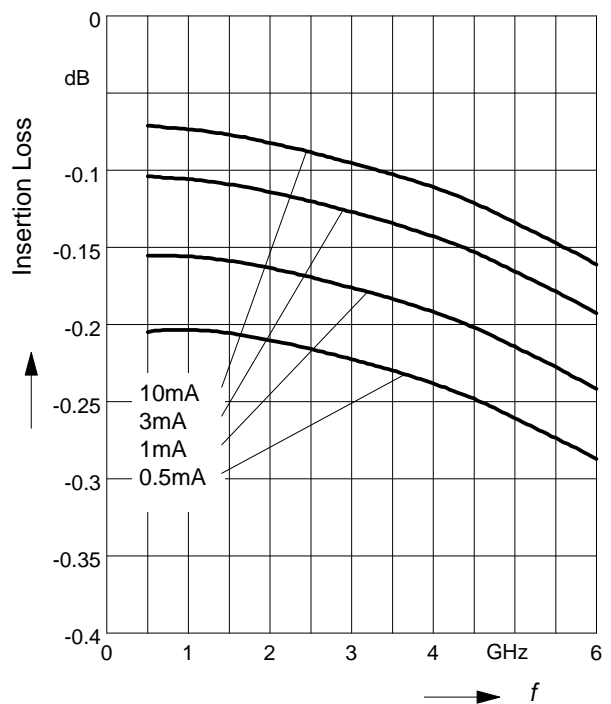
$I_{Fmax} / I_{FDC} = f(t_p)$



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

$I_F$  = Parameter

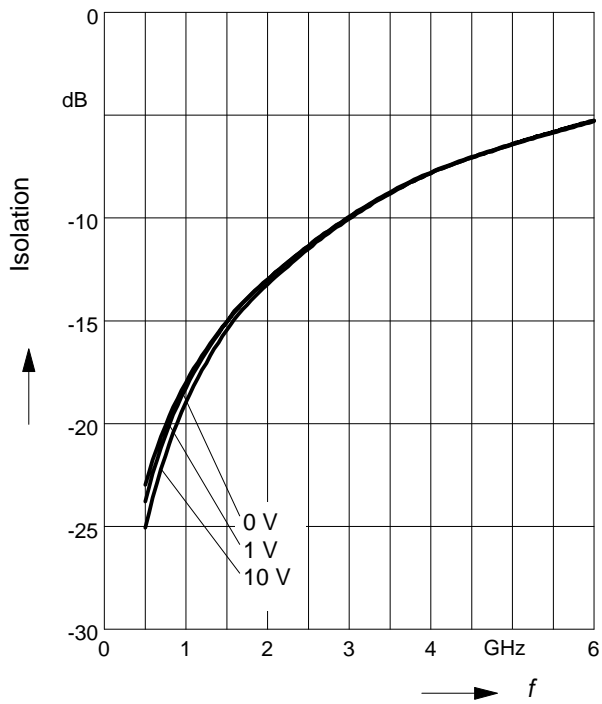
BAR90-02L in series configuration,  $Z = 50\Omega$



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

$V_R =$  Parameter

BAR90-02L in series configuration,  $Z = 50\Omega$



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