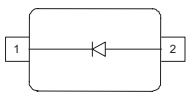


**Silicon PIN Diode**

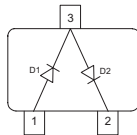
- High voltage current controlled RF resistor for RF attenuator and switches
- Frequency range above 1 MHz up to 6 GHz
- Very low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.17 pF)
- Low forward resistance (typ. 2.1  $\Omega$  @ 10 mA)
- Very low signal distortion



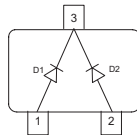
**BAR64-02L**  
**BAR64-02V**  
**BAR64-03W**



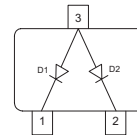
**BAR64-04**  
**BAR64-04T**  
**BAR64-04W**



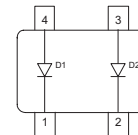
**BAR64-05**  
**BAR64-05W**



**BAR64-06**  
**BAR64-06W**



**BAR64-07**



Type	Package	Configuration	$L_s$ (nH)	Marking
BAR64-02L *	TSLP-2-1	single, leadless	0.4	MM
BAR64-02V	SC79	single	0.6	O
BAR64-03W	SOD323	single	1.8	2 blue
BAR64-04	SOT23	series	1.8	PPs
BAR64-04T	SC75	series	1.2	PPs
BAR64-04W	SOT323	series	1.4	PPs
BAR64-05	SOT23	common cathode	1.8	PRs
BAR64-05W	SOT323	common cathode	1.4	PRs
BAR64-06	SOT23	common anode	1.8	PSs
BAR64-06W	SOD323	common anode	1.4	PSs
BAR64-07	SOT143	parallel pair	2	PTs

\* Preliminary Data

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

Parameter	Symbol	Value	Unit
Diode reverse voltage	$V_R$	150	V
Forward current	$I_F$	100	mA
Total power dissipation BAR64-02L, $T_S \leq 135^\circ\text{C}$ BAR64-02V, $T_S \leq 125^\circ\text{C}$ BAR64-03W, BAR64-07, $T_S \leq 25^\circ\text{C}$ BAR64-04, -05, -06, $T_S \leq 65^\circ\text{C}$ BAR64-04T, $T_S \leq 109^\circ\text{C}$ BAR64-04W, -05W, -06W, $T_S \leq 115^\circ\text{C}$	$P_{\text{tot}}$	250 250 250 250 250 250	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> BAR64-02L BAR64-02V, -04W, -05W, -06W BAR64-03W BAR64-04, -05, -06 BAR64-04T BAR64-07	$R_{\text{thJS}}$	$\leq 60$ $\leq 140$ $\leq 370$ $\leq 340$ $\leq 165$ $\leq 290$	

**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 $I_{(\text{BR})} = 5 \mu\text{A}$	$V_{(\text{BR})}$	150	-	-	V
Forward voltage $I_F = 50 \text{ mA}$	$V_F$	-	-	1.1	

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

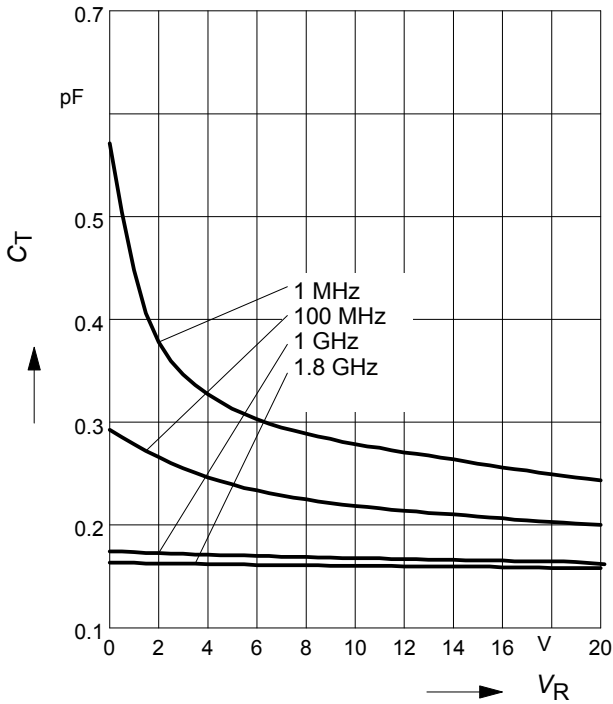
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Diode capacitance $V_R = 20\text{ V}, f = 1\text{ MHz}$ $V_R = 0\text{ V}, f = 100\text{ MHz}$ $V_R = 0\text{ V}, f = 1\dots 1.8\text{ GHz}, \text{BAR64-02L}$ $V_R = 0\text{ V}, f = 1\dots 1.8\text{ GHz}, \text{all other}$	$C_T$	- - - -	0.23 0.3 0.13 0.17	0.35 - - -	pF
Reverse parallel resistance $V_R = 0\text{ V}, f = 100\text{ MHz}$ $V_R = 0\text{ V}, f = 1\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$	$R_P$	- - -	10 4 3	- - -	k $\Omega$
Forward resistance $I_F = 1\text{ mA}, f = 100\text{ MHz}$ $I_F = 10\text{ mA}, f = 100\text{ MHz}$ $I_F = 100\text{ mA}, f = 100\text{ MHz}$	$r_f$	- - -	12.5 2.1 0.85	20 2.8 1.35	$\Omega$
Charge carrier life time $I_F = 10\text{ mA}, I_R = 6\text{ mA}, \text{measured at } I_R = 3\text{ mA}, R_L = 100\ \Omega$	$\tau_{rr}$	-	1550	-	ns
I-region width	$W_I$	-	50	-	$\mu\text{m}$
Insertion loss <sup>1)</sup> $I_F = 3\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 5\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}, f = 1.8\text{ GHz}$	$ S_{21} ^2$	- - -	-0.32 -0.23 -0.16	- - -	dB
Isolation <sup>1)</sup> $V_R = 0\text{ V}, f = 0.9\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$ $V_R = 0\text{ V}, f = 2.45\text{ GHz}$ $V_R = 0\text{ V}, f = 5.6\text{ GHz}$	$ S_{21} ^2$	- - - -	-22 -17 -14.5 -8.5	- - - -	

<sup>1</sup>BAR64-02L in series configuration,  $Z = 50\ \Omega$

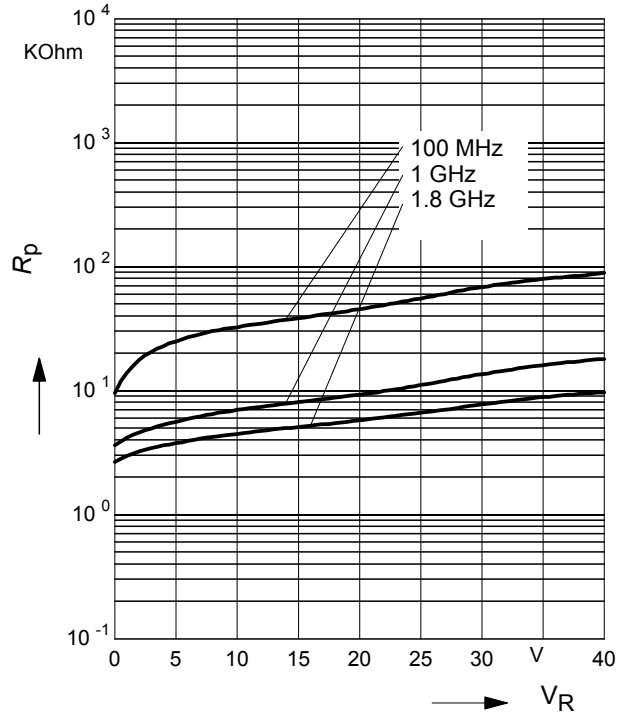
**Diode capacitance  $C_T = f(V_R)$**

$f = \text{Parameter}$



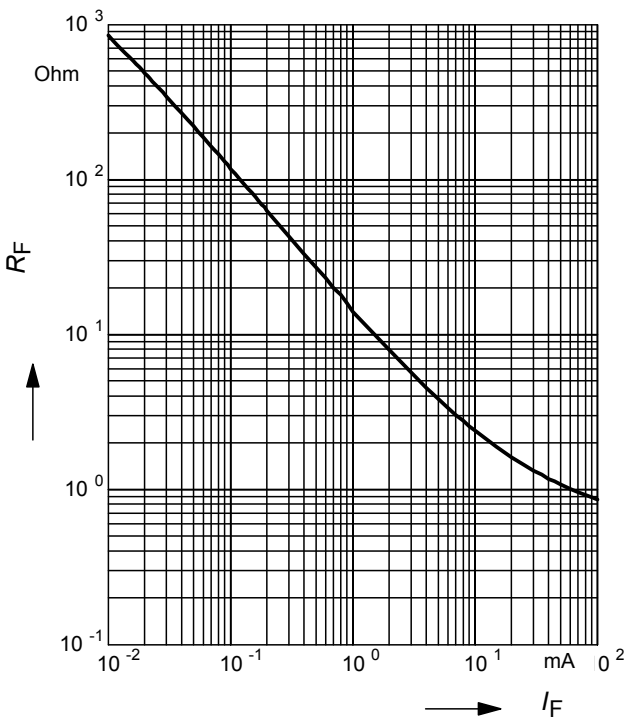
**Reverse parallel resistance  $R_p = f(V_R)$**

$f = \text{Parameter}$



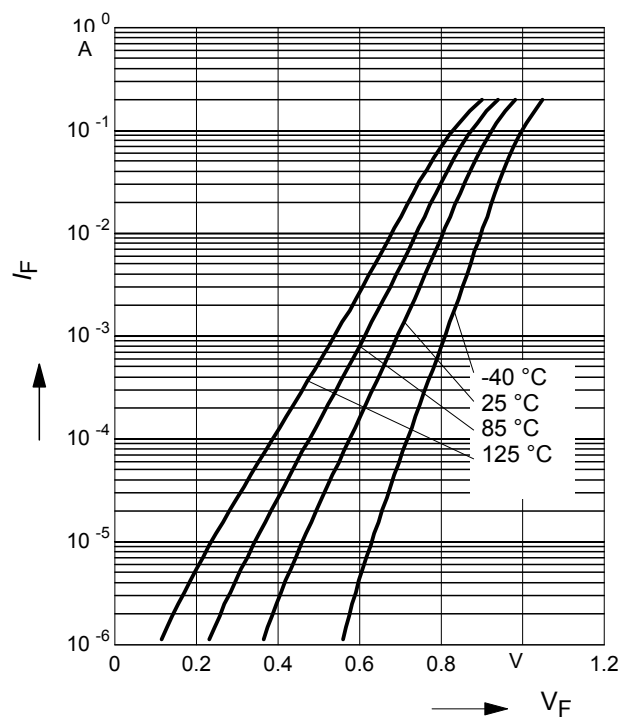
**Forward resistance  $r_f = f(I_F)$**

$f = 100\text{MHz}$



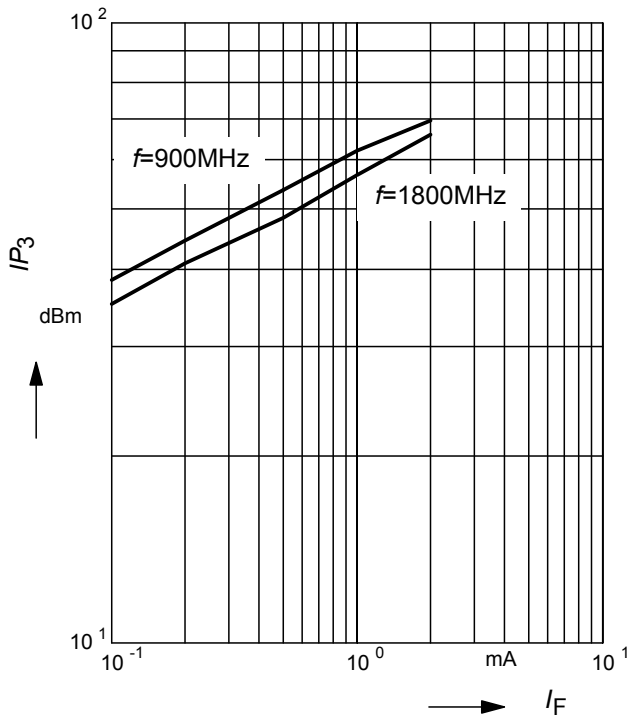
**Forward current  $I_F = f(V_F)$**

$T_A = \text{Parameter}$



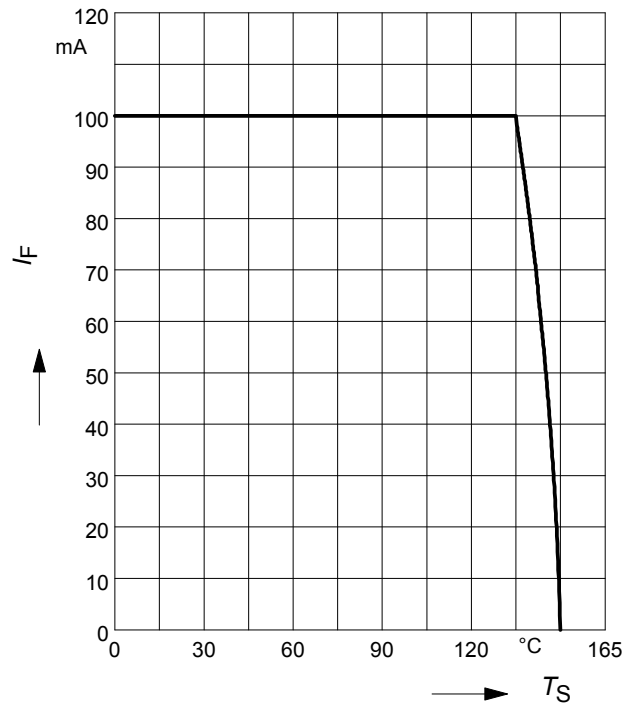
**Intermodulation intercept point**

$IP_3 = f(I_F)$ ;  $f =$  Parameter



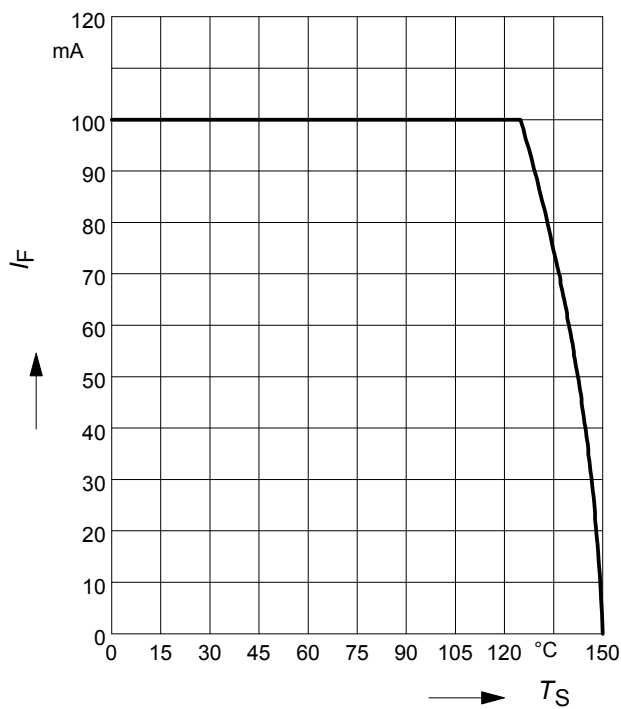
**Forward current  $I_F = f(T_S)$**

BAR64-02L



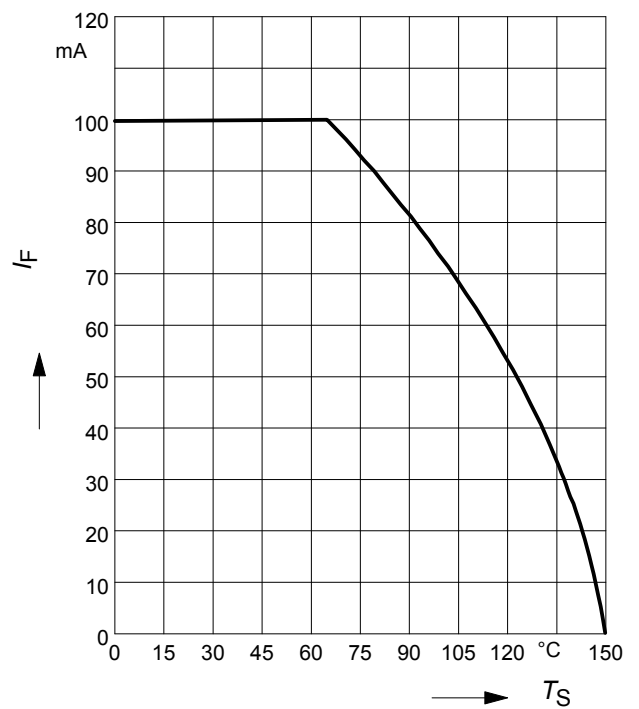
**Forward current  $I_F = f(T_S)$**

BAR64-02V



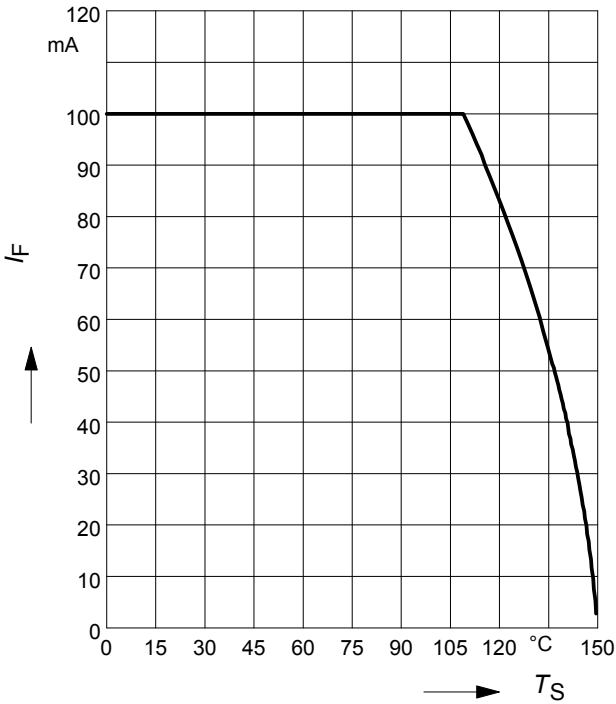
**Forward current  $I_F = f(T_S)$**

BAR64-04, BAR64-06



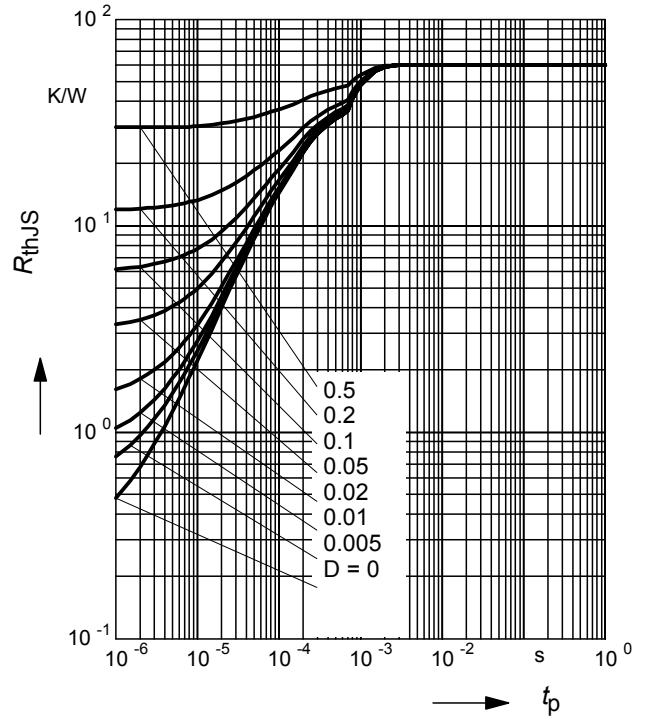
**Forward current  $I_F = f(T_S)$**

BAR64-04T



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

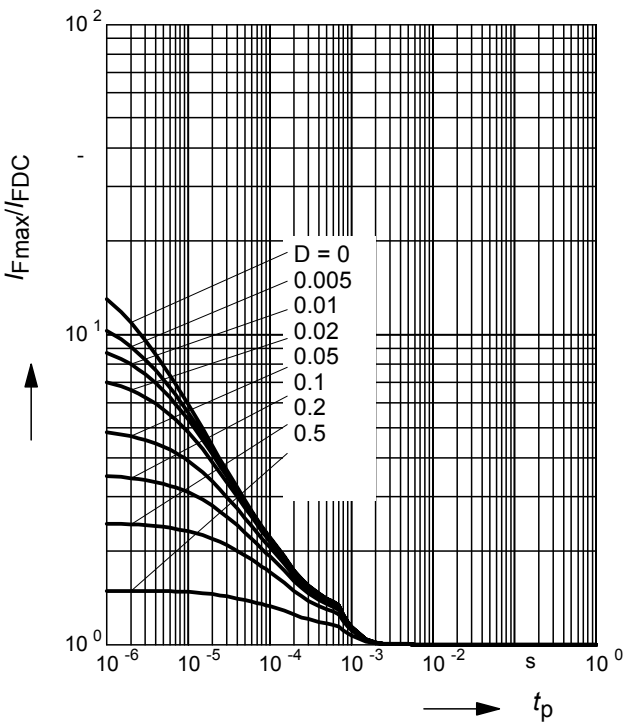
BAR64-02L



**Permissible Pulse Load**

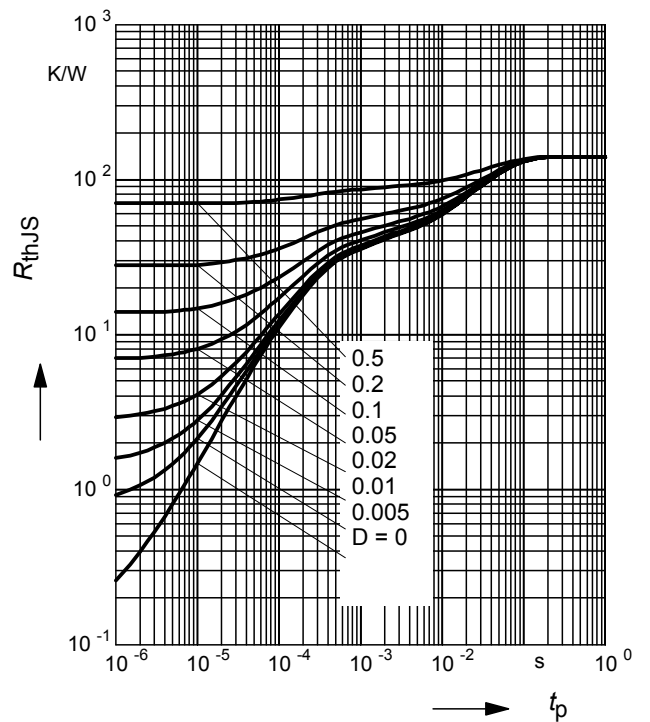
$I_{Fmax}/I_{FDC} = f(t_p)$

BAR64-02L



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

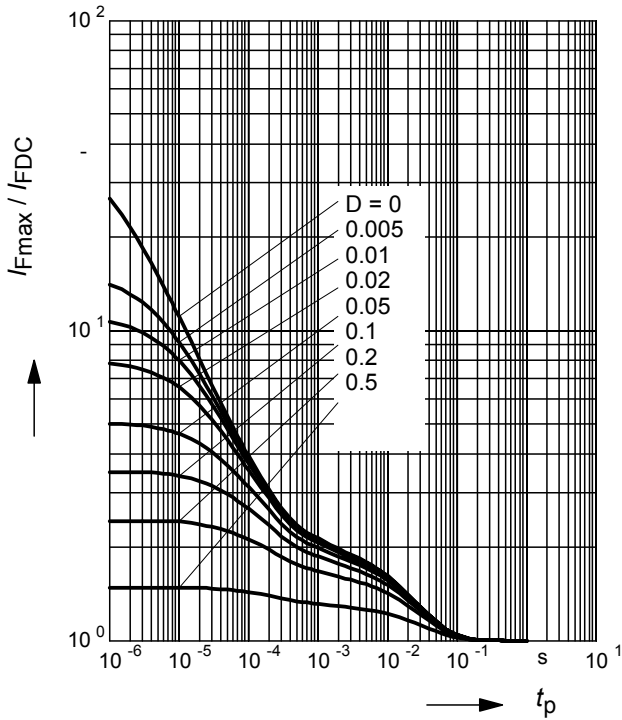
BAR64-02V



**Permissible Pulse Load**

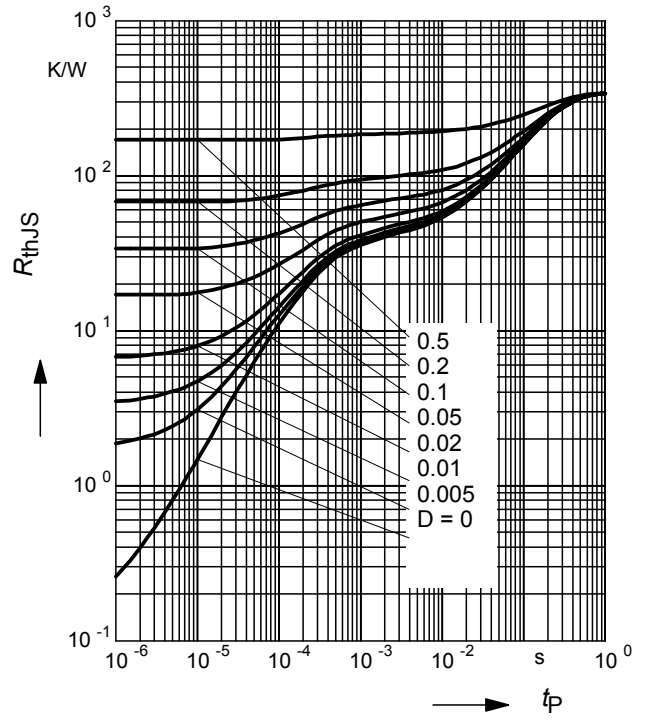
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-02V



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

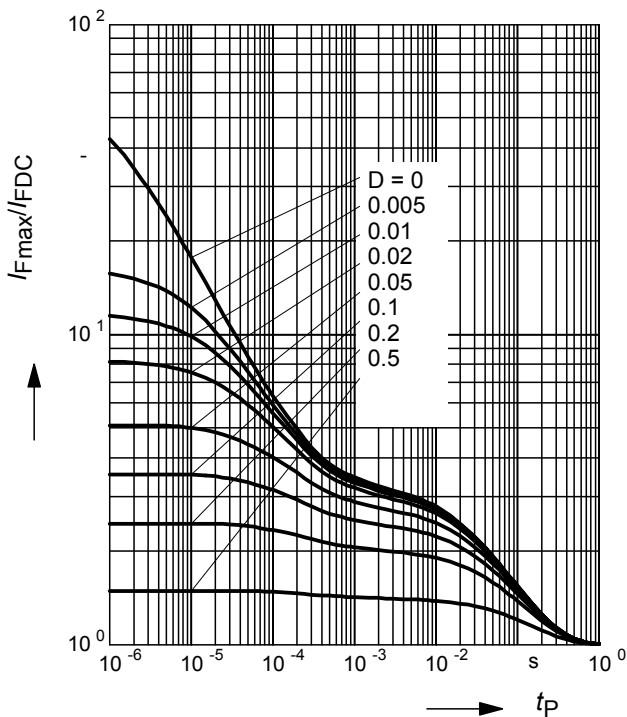
BAR64-04, BAR64-06



**Permissible Pulse Load**

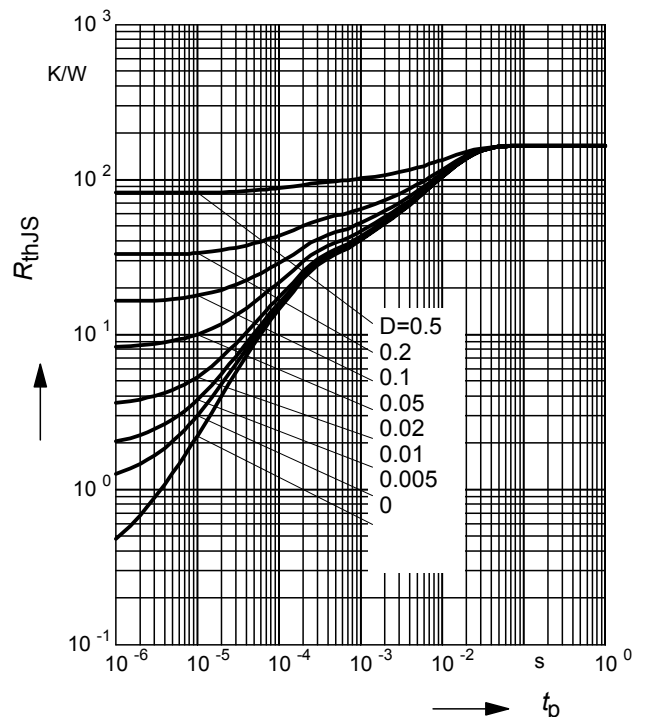
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-04, BAR64-06



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

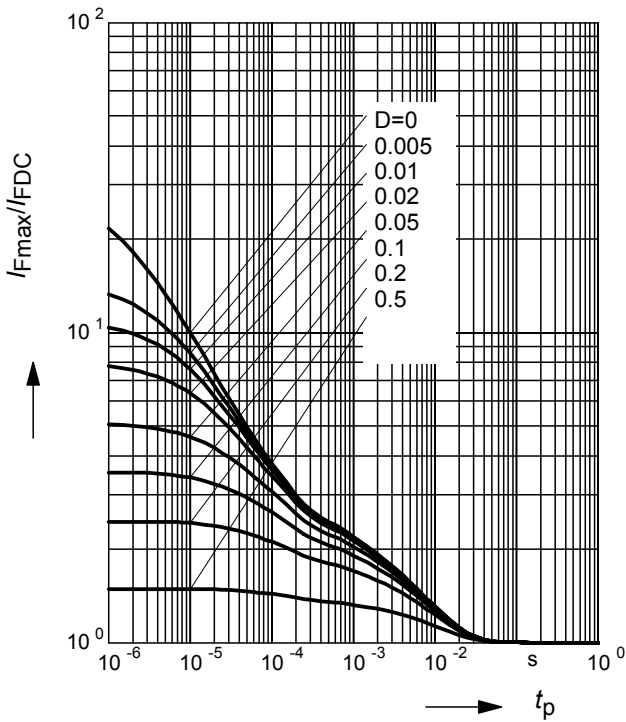
BAR64-04T



**Permissible Pulse Load**

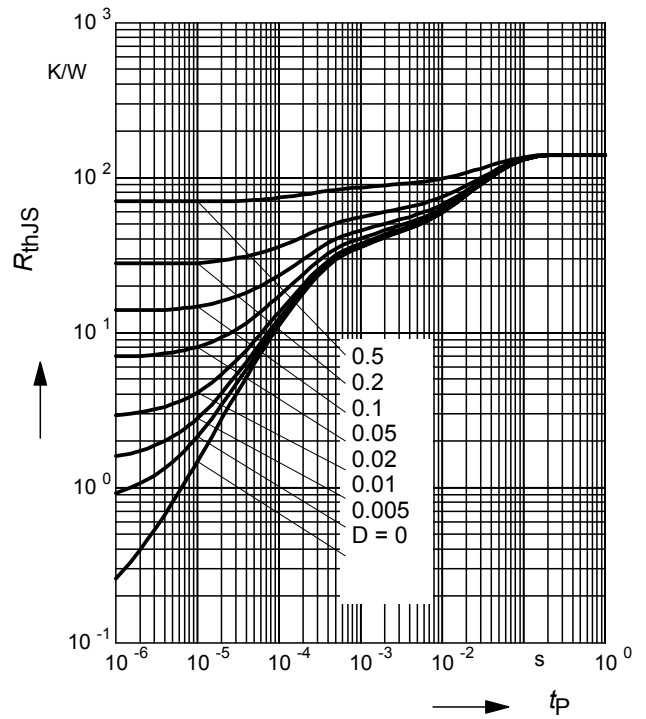
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-04T



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

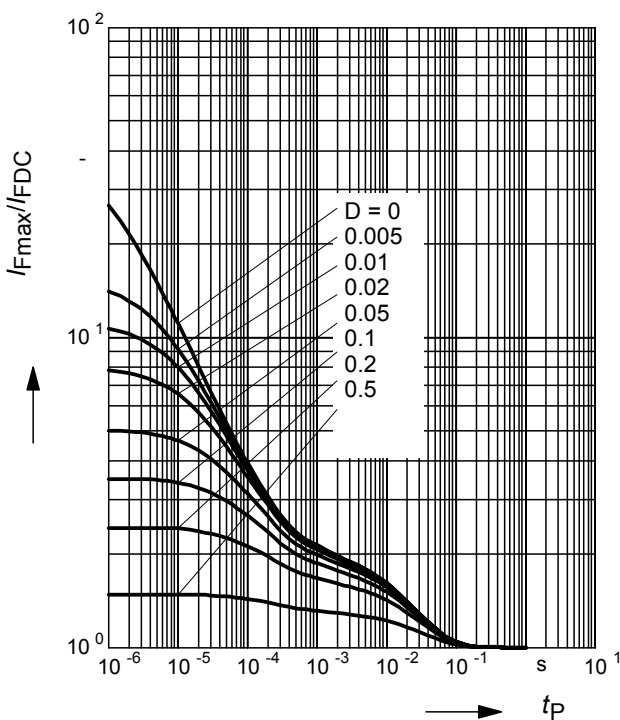
BAR64-04W, BAR64-06W



**Permissible Pulse Load**

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

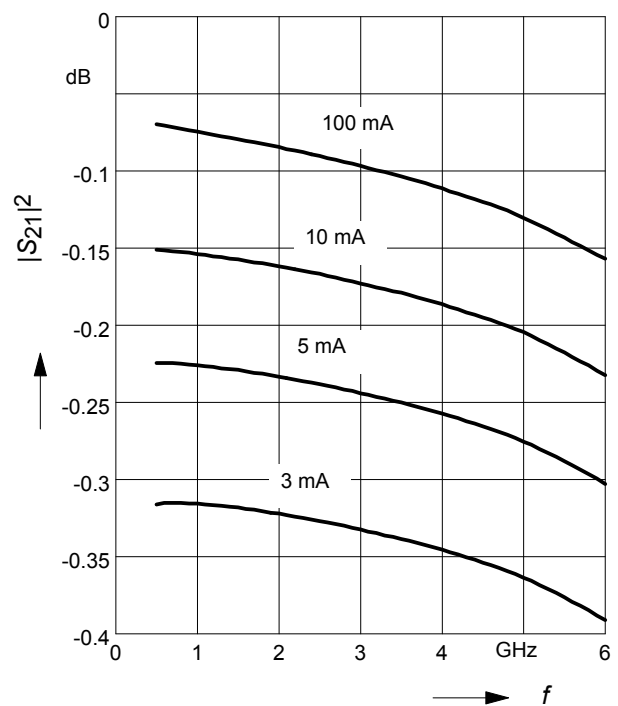
BAR64-04W, BAR64-06W



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

$I_F$  = Parameter

BAR64-02L in series configuration,  $Z = 50\Omega$





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

$V_R =$  Parameter

BAR64-02L in series configuration,  $Z = 50\Omega$

