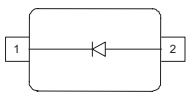


Silicon PIN Diode

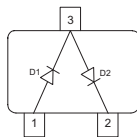
- High voltage current controlled RF resistor for RF attenuator and switches
- Frequency range above 1 MHz up to 6 GHz
- Very low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.17 pF)
- Low forward resistance (typ. 2.1 Ω @ 10 mA)
- Very low signal distortion



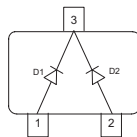
BAR64-02L
BAR64-02V
BAR64-03W



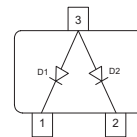
BAR64-04
BAR64-04T
BAR64-04W



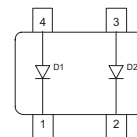
BAR64-05
BAR64-05W



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_{tot}	250 250 250 250 250 250	mW
Junction temperature	T_j	150	°C
Operating temperature range	T_{op}	-55 ... 125	
Storage temperature	T_{stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾ BAR64-02L BAR64-02V, -04W, -05W, -06W BAR64-03W BAR64-04, -05, -06 BAR64-04T BAR64-07	R_{thJS}	≤ 60 ≤ 140 ≤ 370 ≤ 340 ≤ 165 ≤ 290	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
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	

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

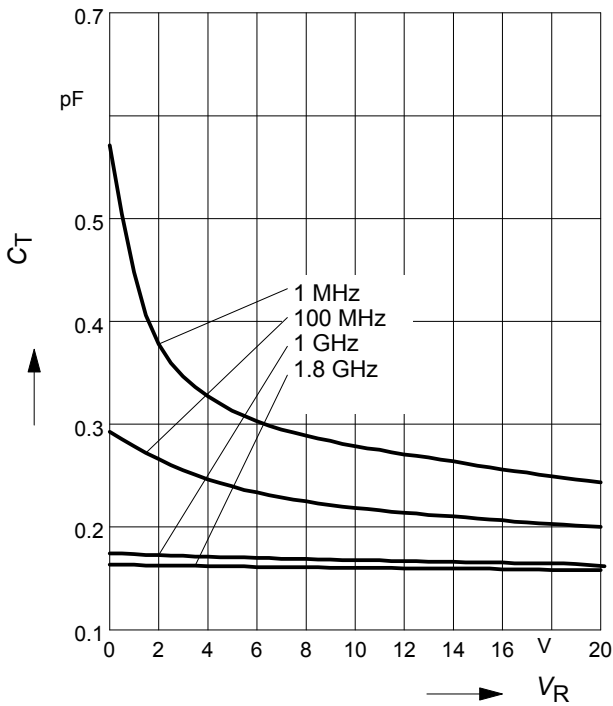
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
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 Ω
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	Ω
Charge carrier life time $I_F = 10\text{ mA}, I_R = 6\text{ mA}, \text{measured at } I_R = 3\text{ mA}, R_L = 100\ \Omega$	τ_{rr}	-	1550	-	ns
I-region width	W_I	-	50	-	μm
Insertion loss ¹⁾ $I_F = 3\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 5\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}, f = 1.8\text{ GHz}$	$ S_{21} ^2$	- - -	-0.32 -0.23 -0.16	- - -	dB
Isolation ¹⁾ $V_R = 0\text{ V}, f = 0.9\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$ $V_R = 0\text{ V}, f = 2.45\text{ GHz}$ $V_R = 0\text{ V}, f = 5.6\text{ GHz}$	$ S_{21} ^2$	- - - -	-22 -17 -14.5 -8.5	- - - -	

¹BAR64-02L in series configuration, $Z = 50\ \Omega$

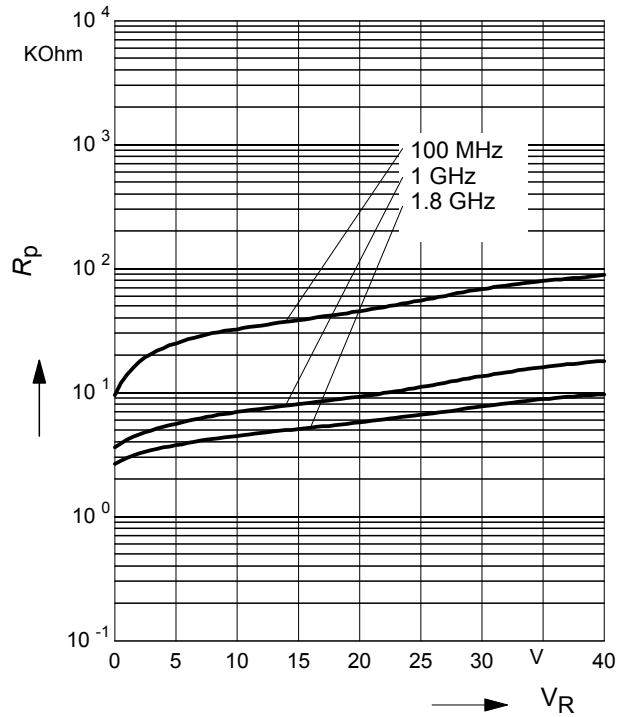
Diode capacitance $C_T = f(V_R)$

$f = \text{Parameter}$



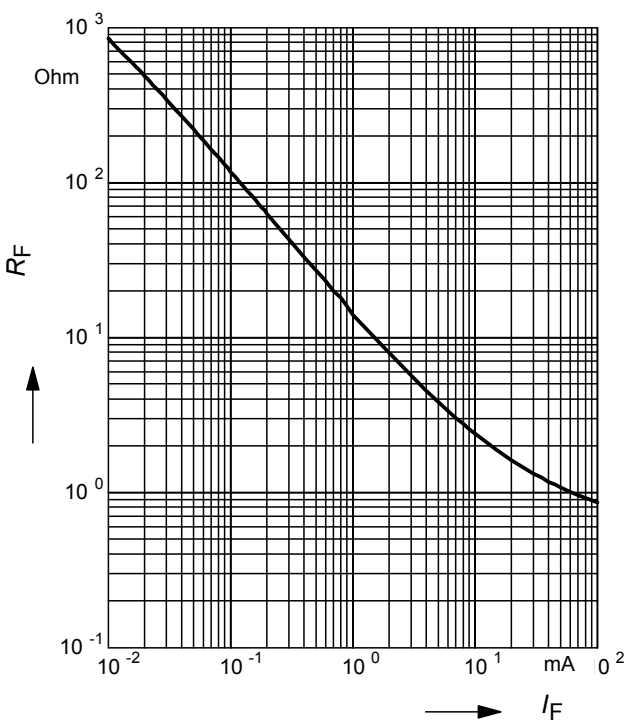
Reverse parallel resistance $R_p = f(V_R)$

$f = \text{Parameter}$



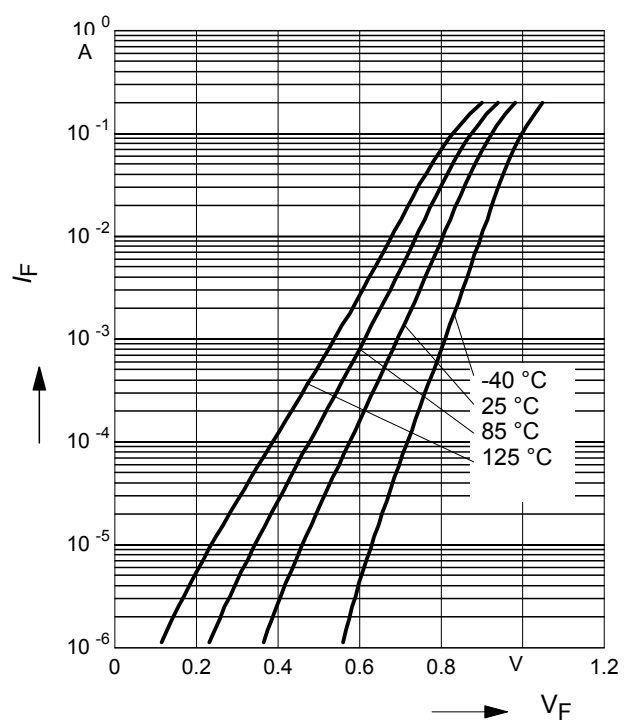
Forward resistance $r_f = f(I_F)$

$f = 100\text{MHz}$



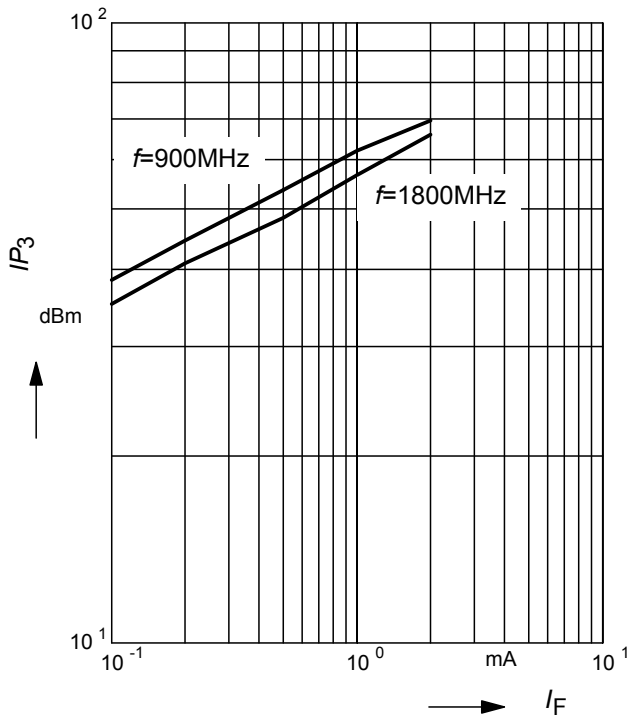
Forward current $I_F = f(V_F)$

$T_A = \text{Parameter}$



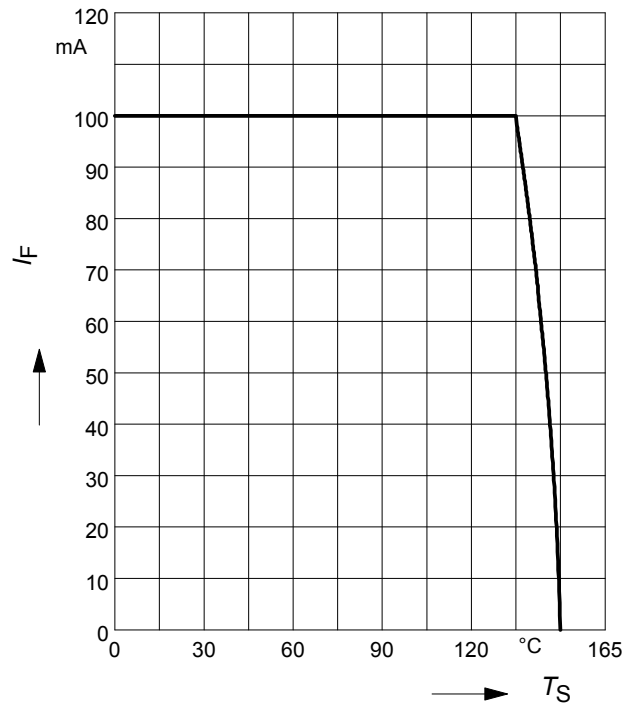
Intermodulation intercept point

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



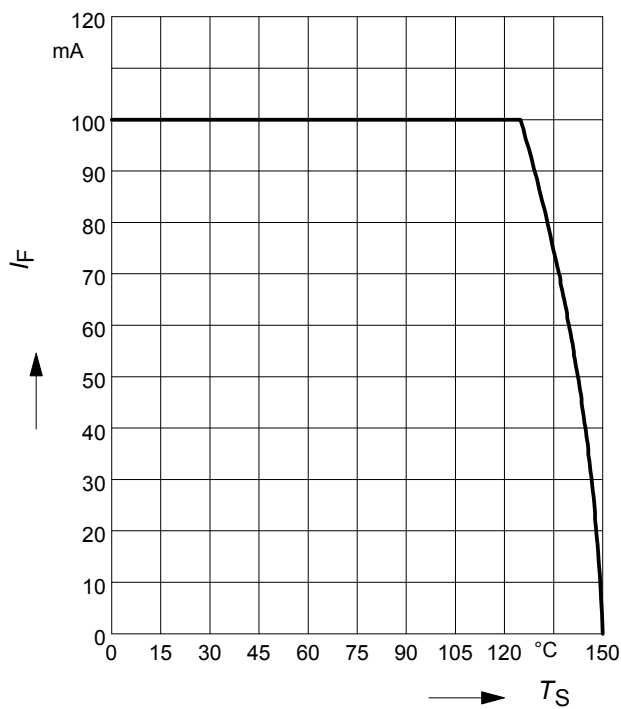
Forward current $I_F = f(T_S)$

BAR64-02L



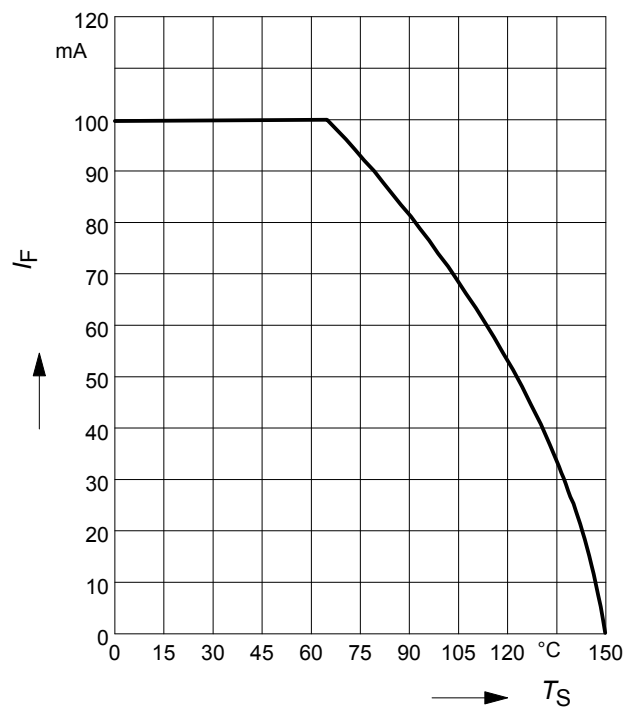
Forward current $I_F = f(T_S)$

BAR64-02V



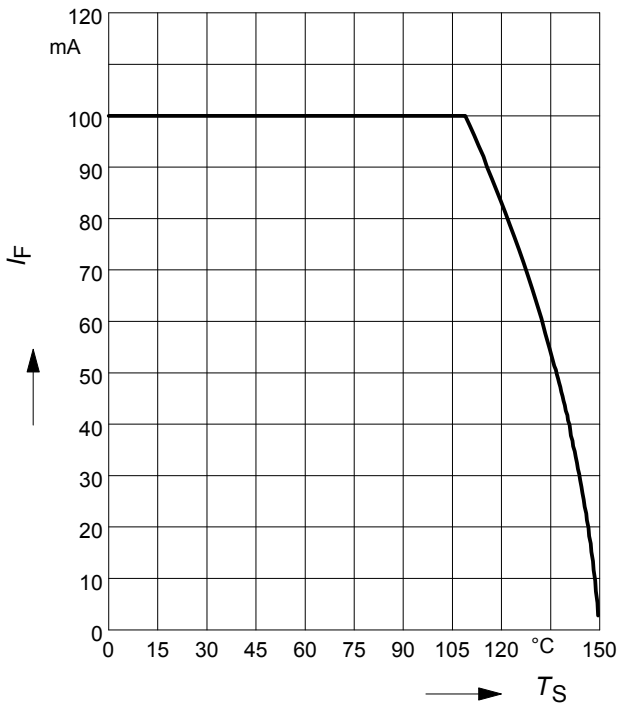
Forward current $I_F = f(T_S)$

BAR64-04, BAR64-06



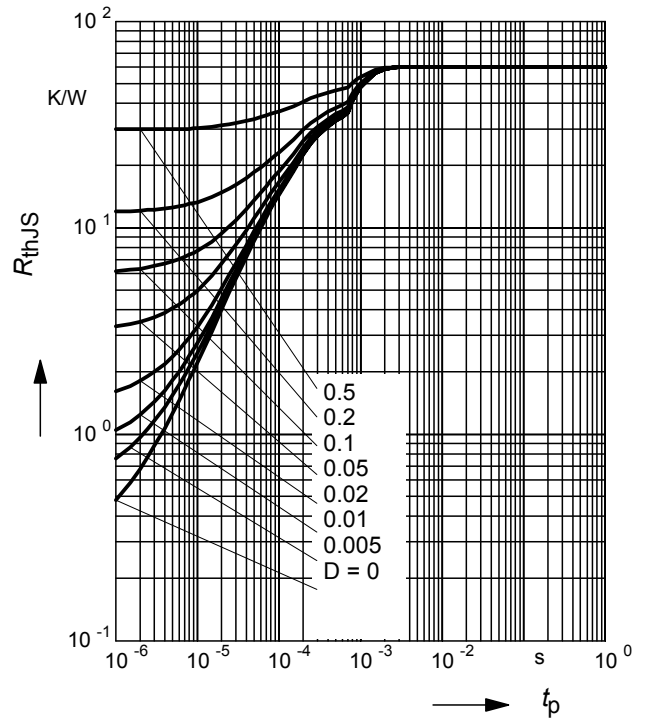
Forward current $I_F = f(T_S)$

BAR64-04T



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

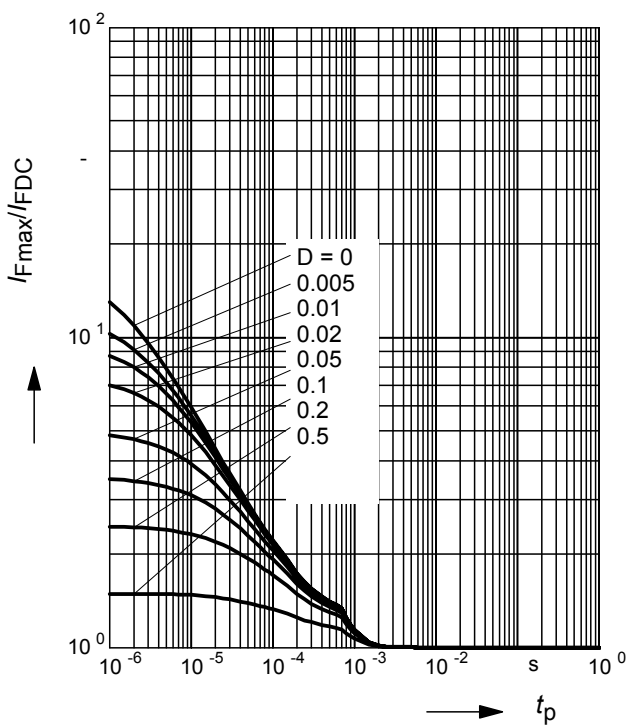
BAR64-02L



Permissible Pulse Load

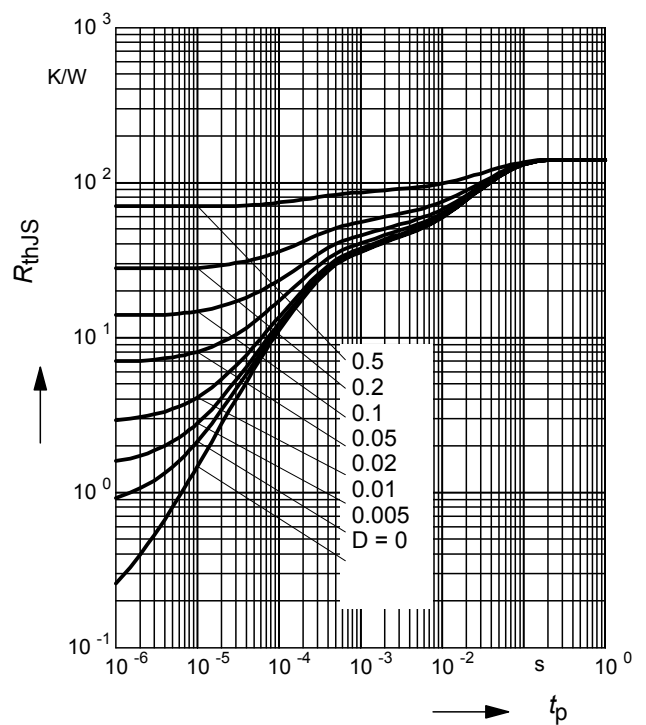
$I_{Fmax}/I_{FDC} = f(t_p)$

BAR64-02L



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

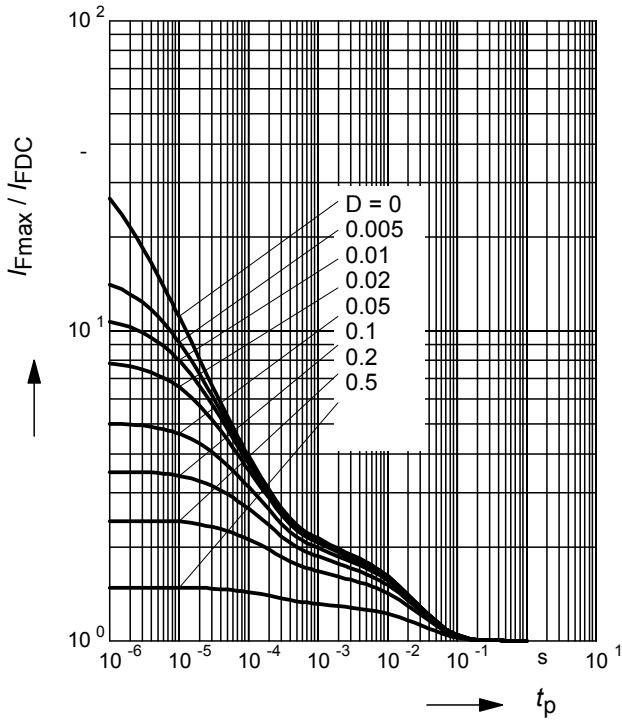
BAR64-02V



Permissible Pulse Load

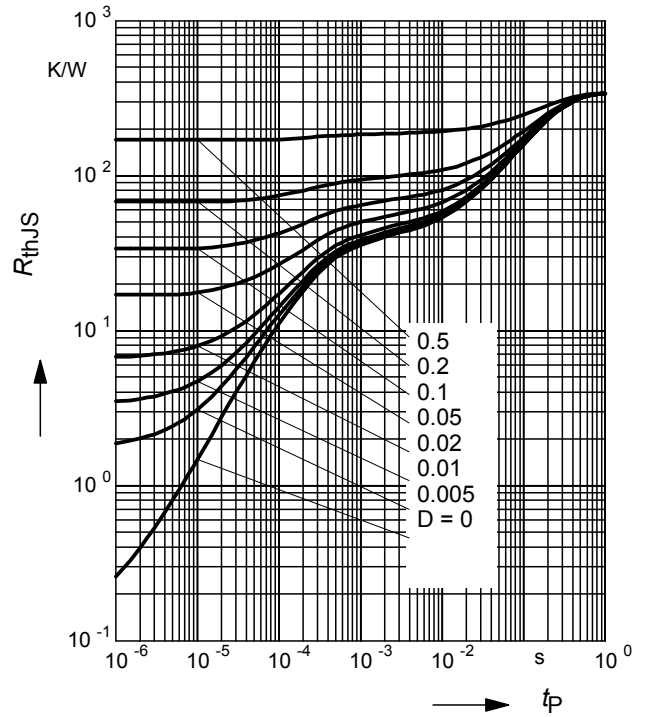
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-02V



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

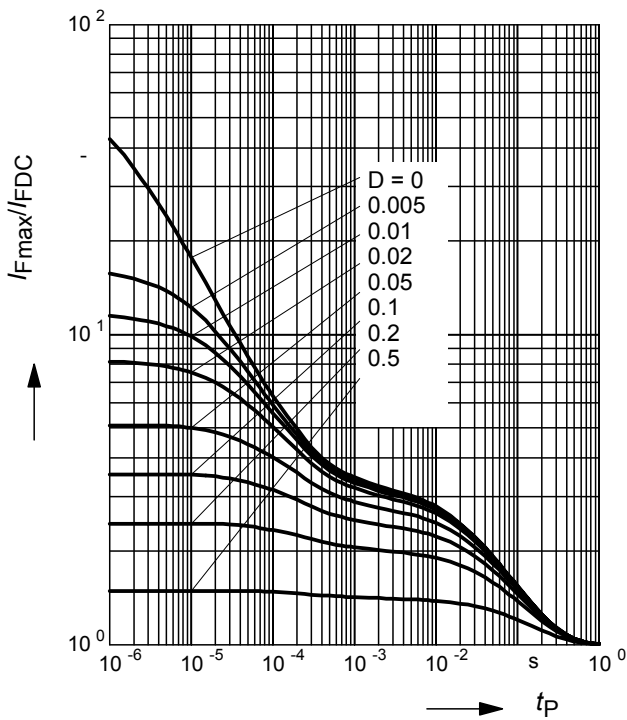
BAR64-04, BAR64-06



Permissible Pulse Load

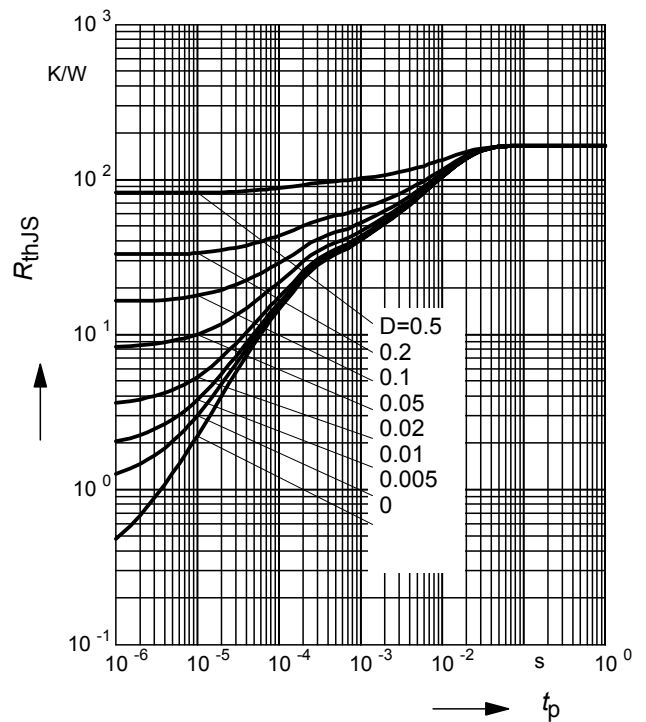
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-04, BAR64-06



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

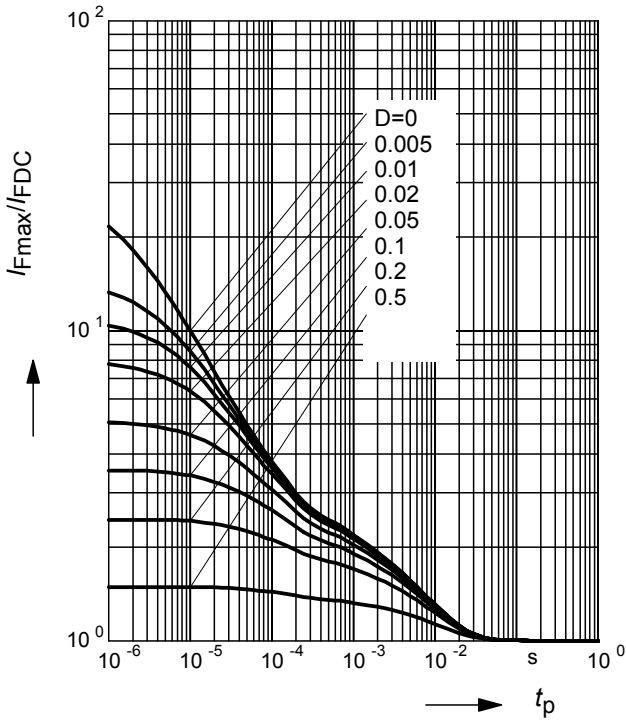
BAR64-04T



Permissible Pulse Load

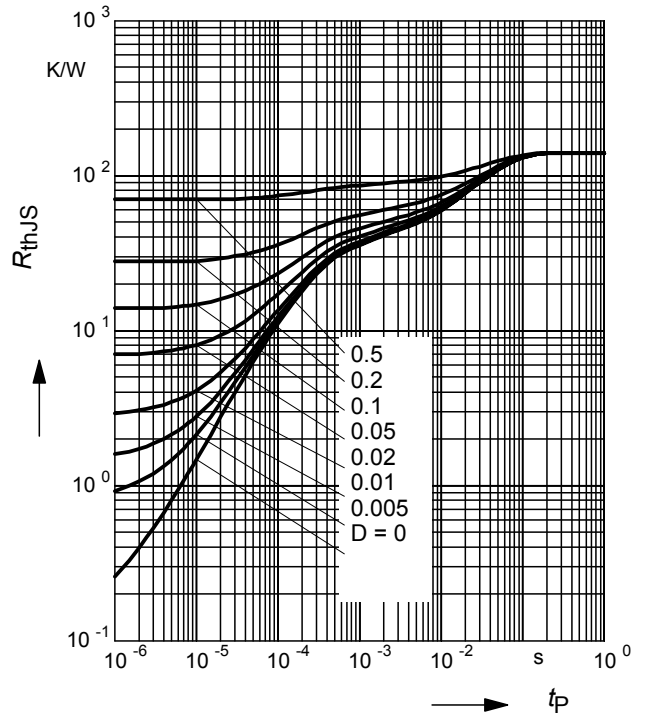
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-04T



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

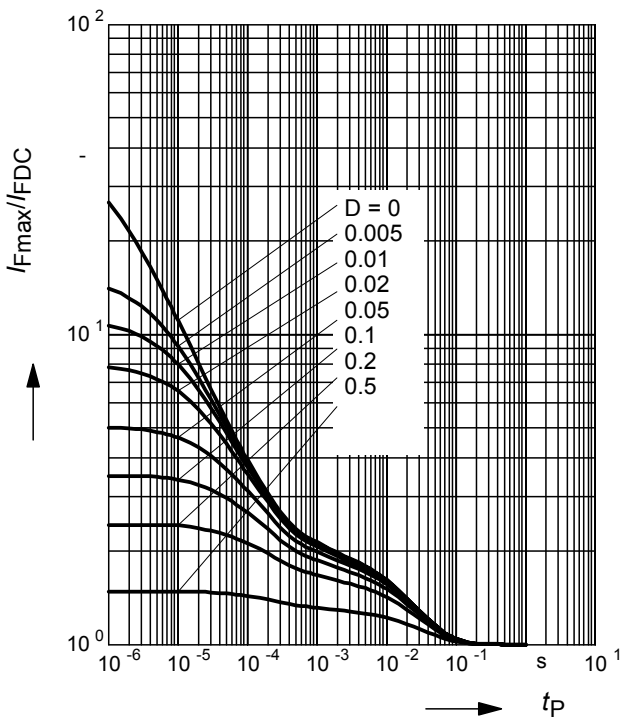
BAR64-04W, BAR64-06W



Permissible Pulse Load

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

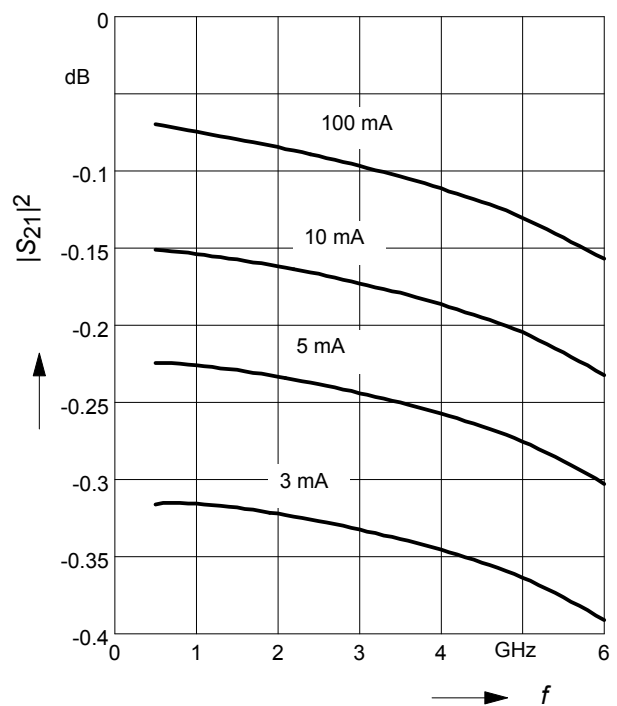
BAR64-04W, BAR64-06W



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, $Z = 50\Omega$

