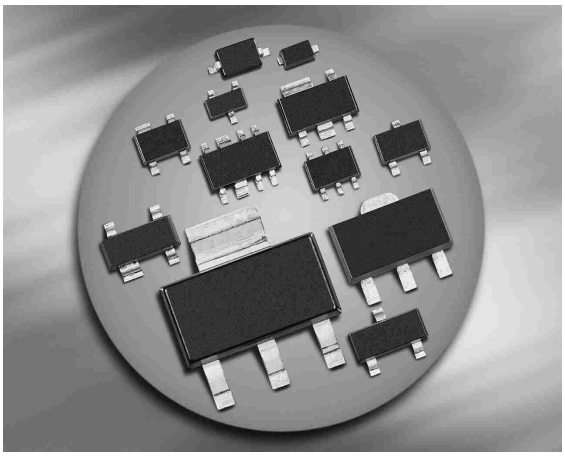
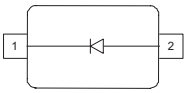
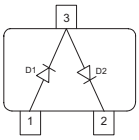
Silicon PIN Diode

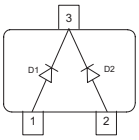
- High voltage current controlled RF resistor for RF attenuator and switches
- Frequency range above 1 MHz up to 6 GHz
- Very low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.17 pF)
- Low forward resistance (typ. 2.1 Ω @ 10 mA)
- Very low signal distortion

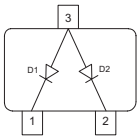


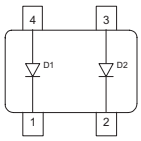
BAR64-02L **BAR64-04** **BAR64-05** **BAR64-06** **BAR64-07**
BAR64-02V **BAR64-04T** **BAR64-05W** **BAR64-06W**
BAR64-03W **BAR64-04W**











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°C, unless otherwise specified

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

Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Breakdown voltage $I_{(BR)}$ = 5 µA	$V_{(BR)}$	150	-	-	V
Forward voltage I_F = 50 mA	V_F	-	-	1.1	

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

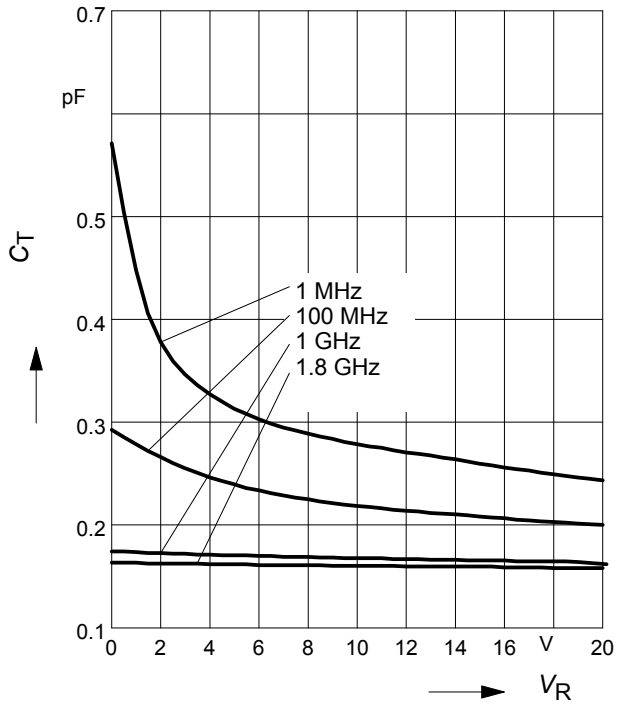
Electrical Characteristics at T_A = 25°C, unless otherwise specified

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

[1]BAR64-02L in series configuration, Z = 50 Ω

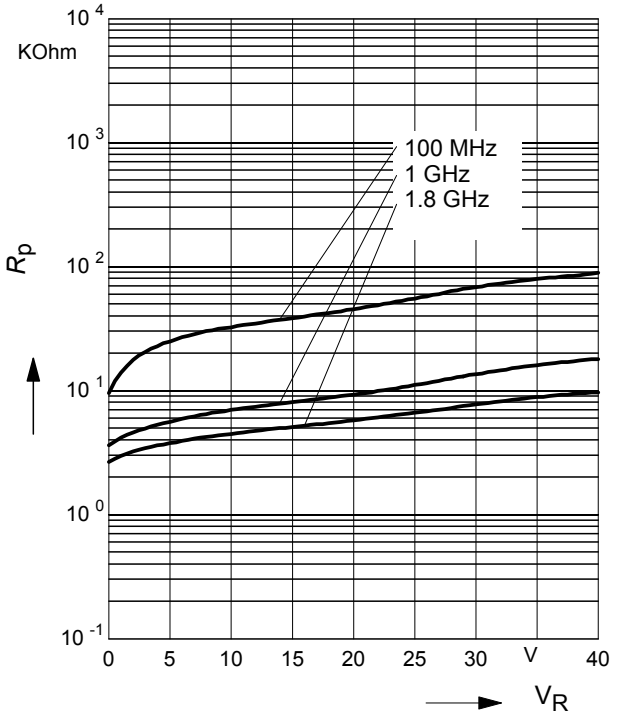
Diode capacitance $C_T = f(V_R)$

f = Parameter



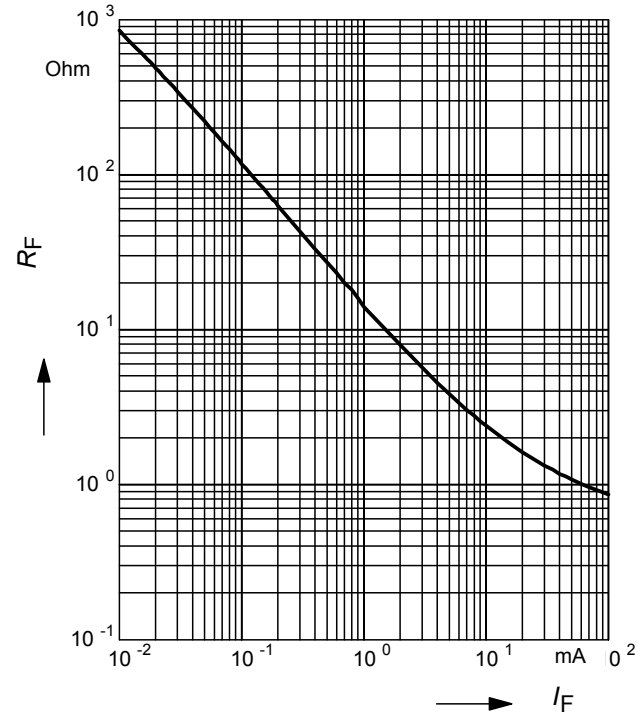
Reverse parallel resistance $R_P = f(V_R)$

f = Parameter



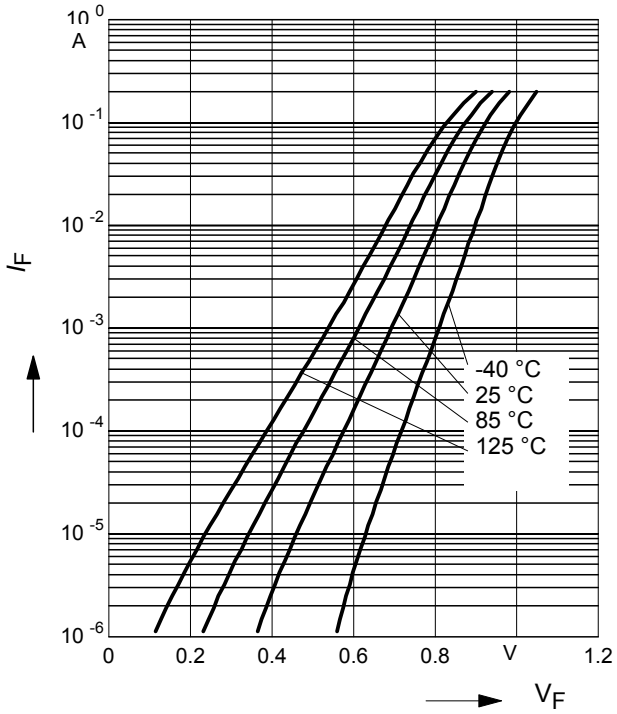
Forward resistance $r_f = f(I_F)$

f = 100MHz



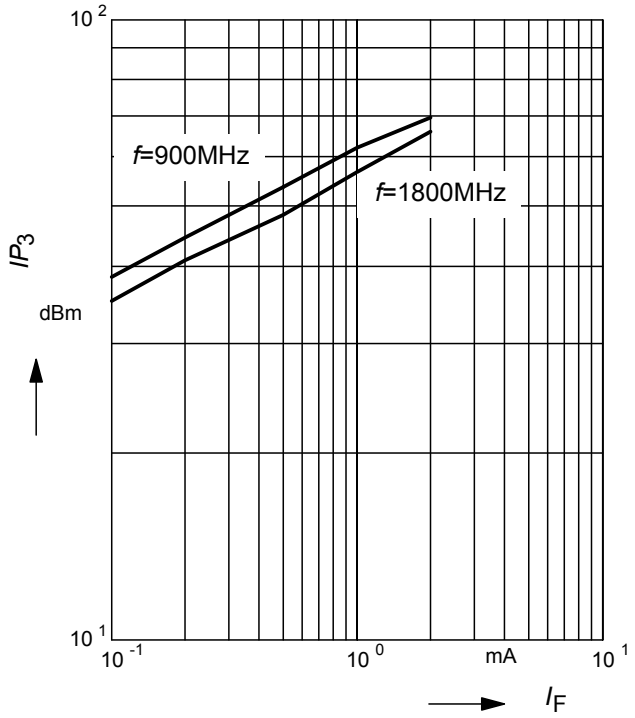
Forward current $I_F = f(V_F)$

T_A = Parameter



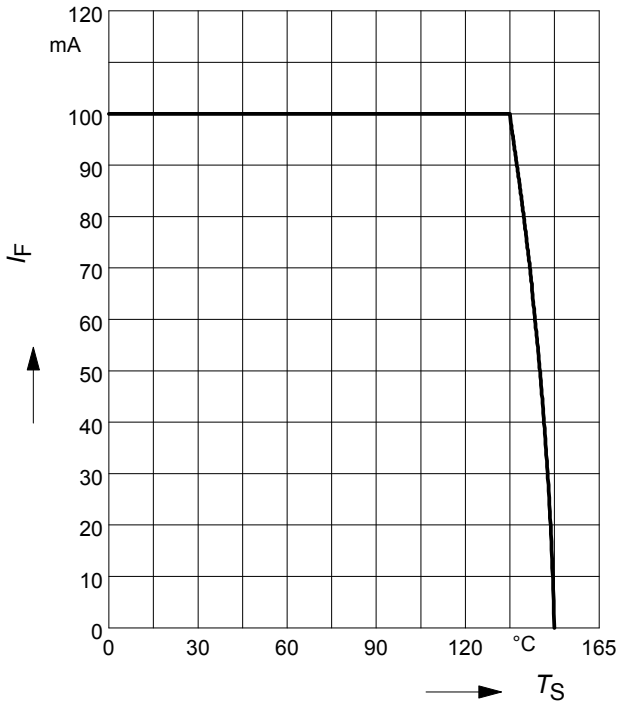
Intermodulation intercept point

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



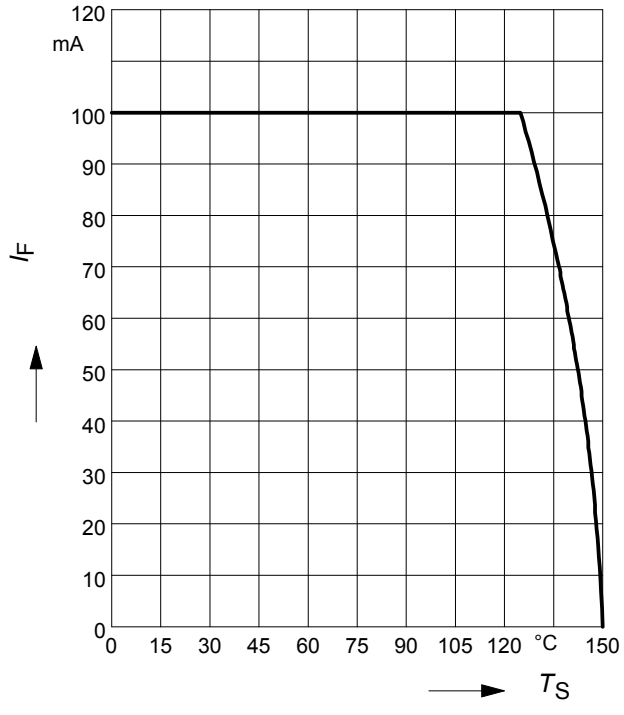
Forward current $I_F = f(T_S)$

BAR64-02L



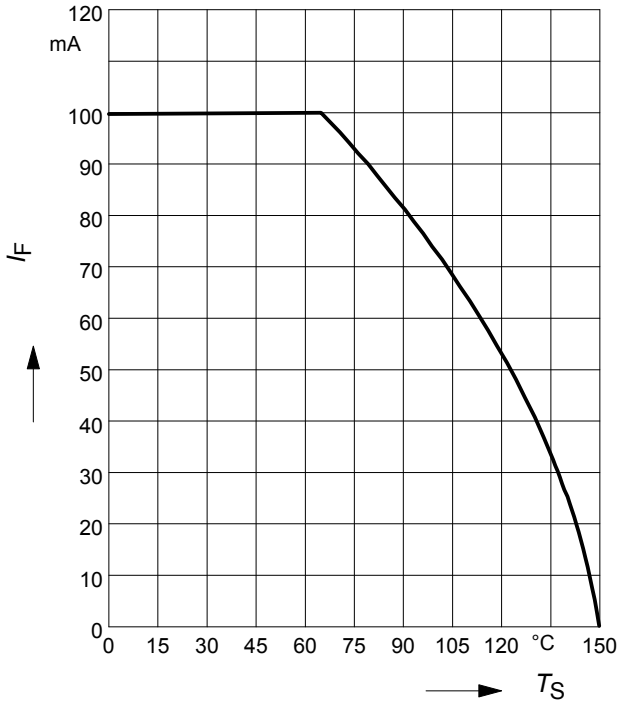
Forward current $I_F = f(T_S)$

BAR64-02V



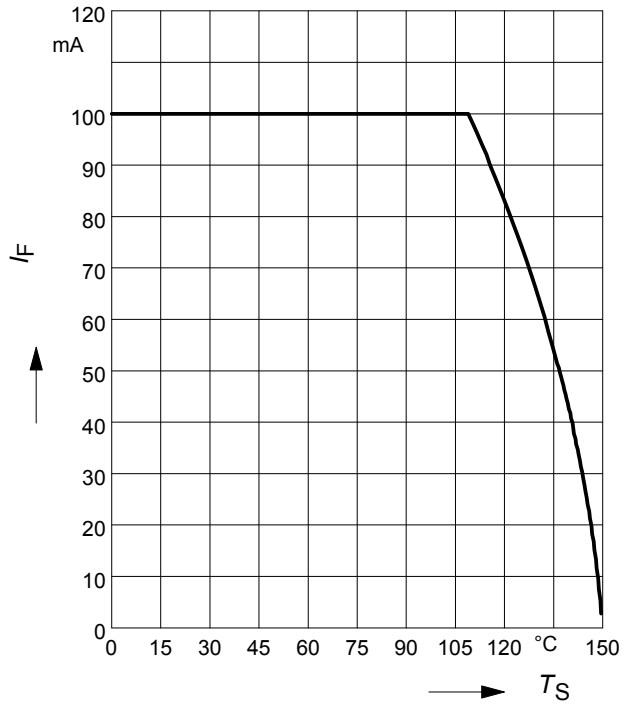
Forward current $I_F = f(T_S)$

BAR64-04, BAR64-06



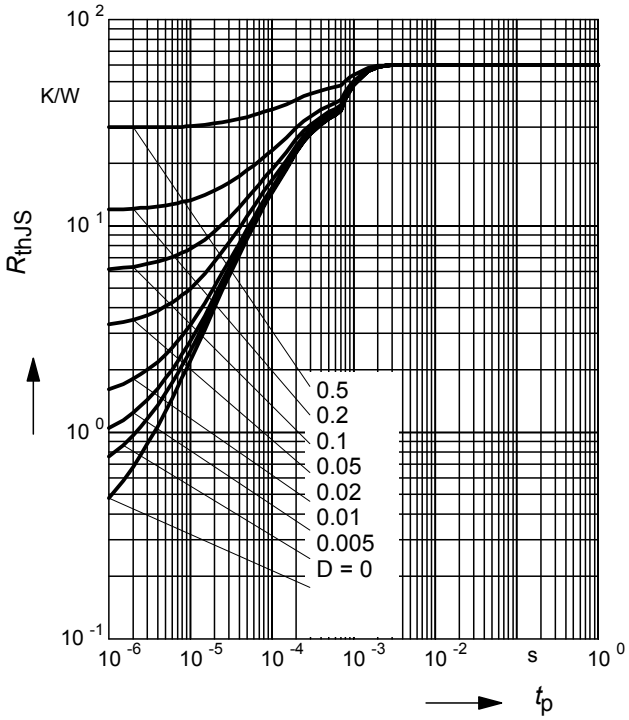
Forward current $I_F = f(T_S)$

BAR64-04T



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

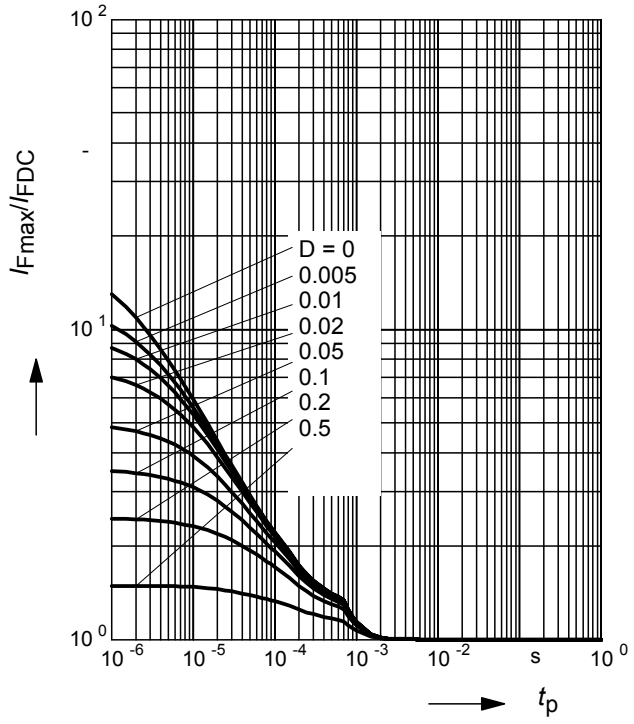
BAR64-02L



Permissible Pulse Load

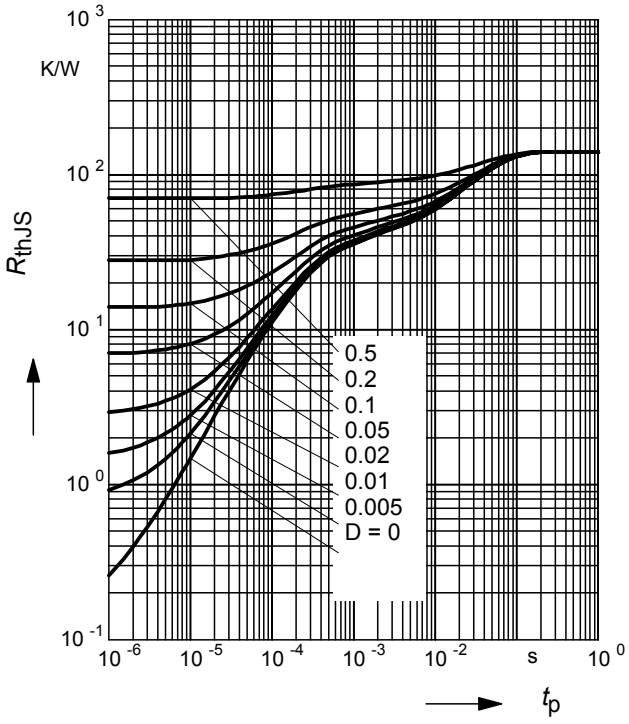
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR64-02L



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

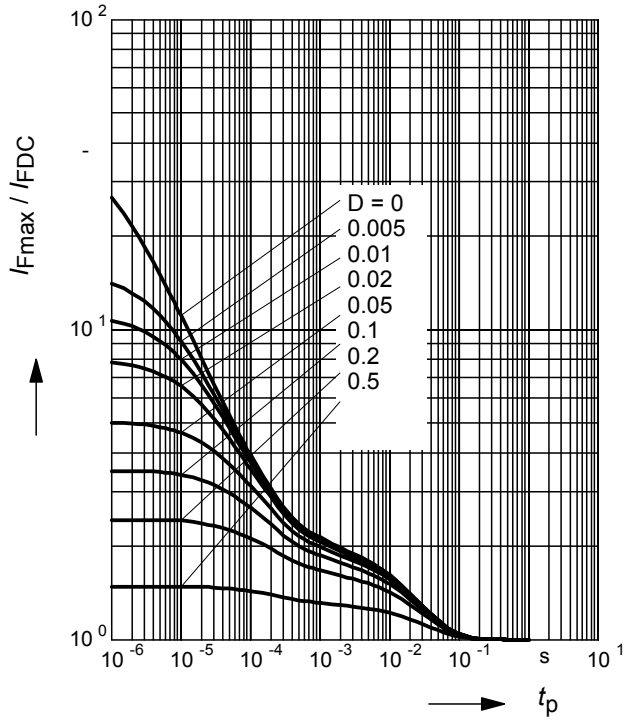
BAR64-02V



Permissible Pulse Load

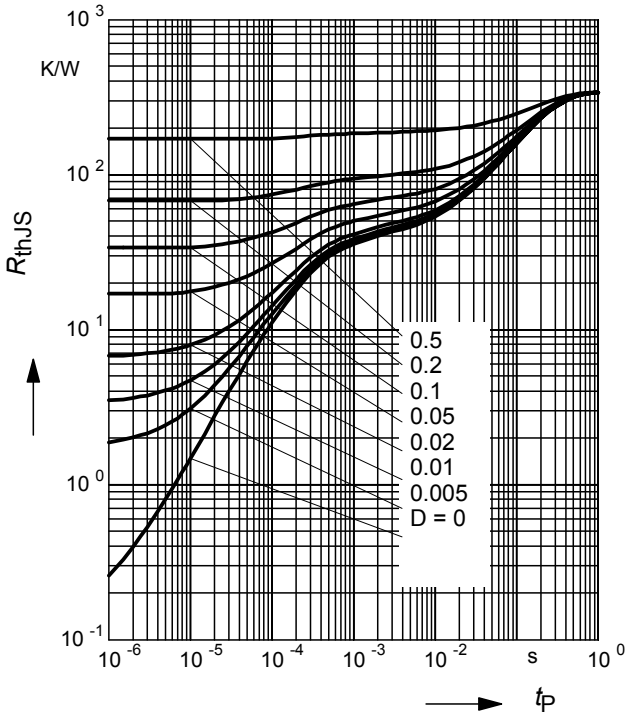
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR64-02V



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

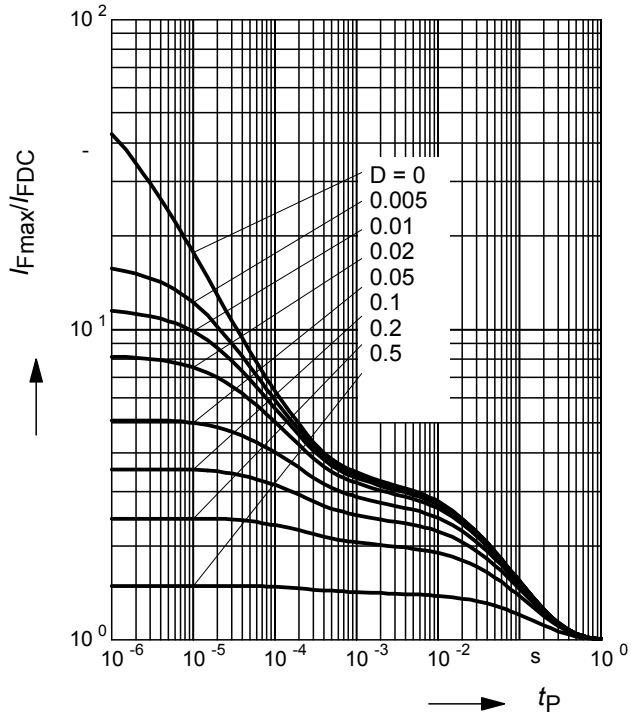
BAR64-04, BAR64-06



Permissible Pulse Load

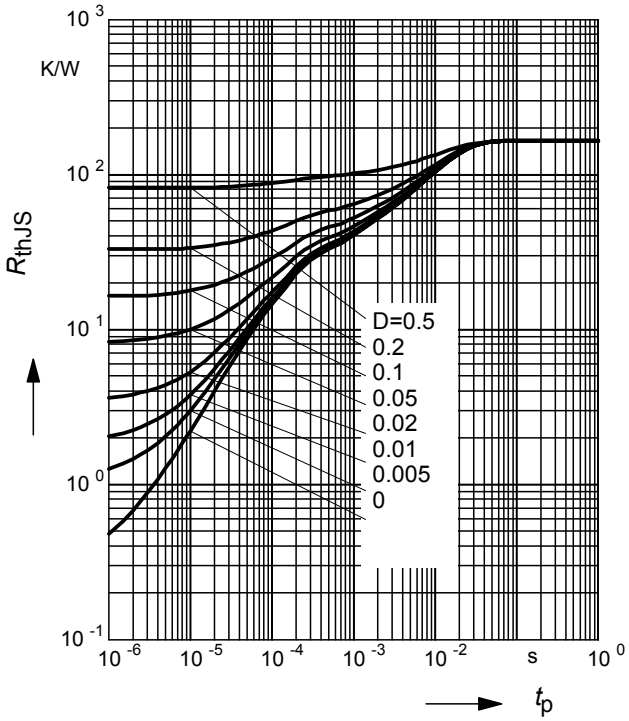
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR64-04, BAR64-06



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

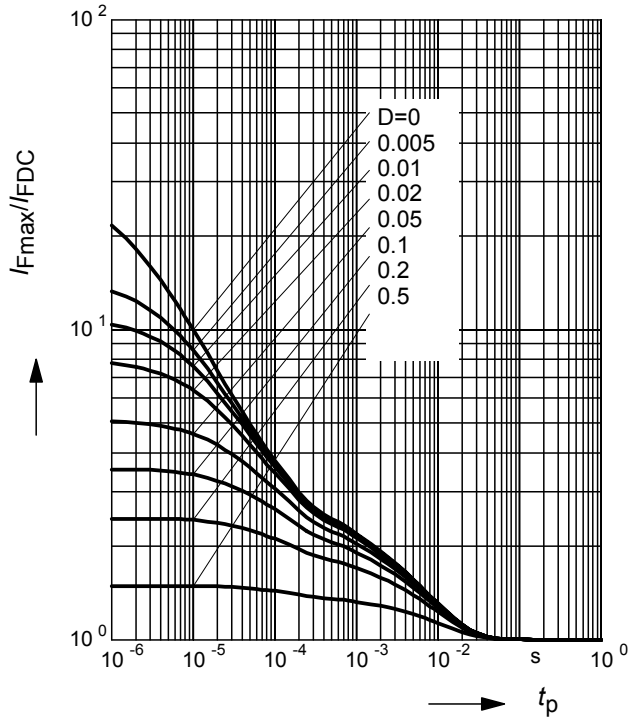
BAR64-04T



Permissible Pulse Load

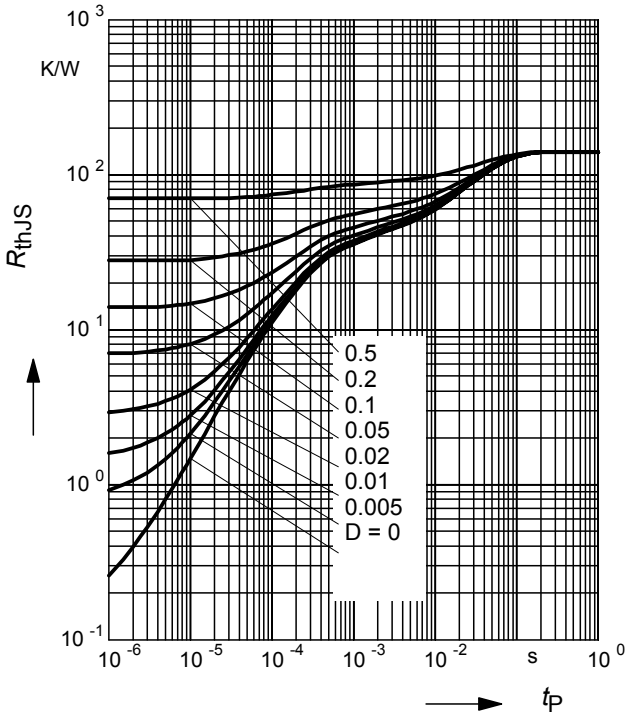
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR64-04T



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

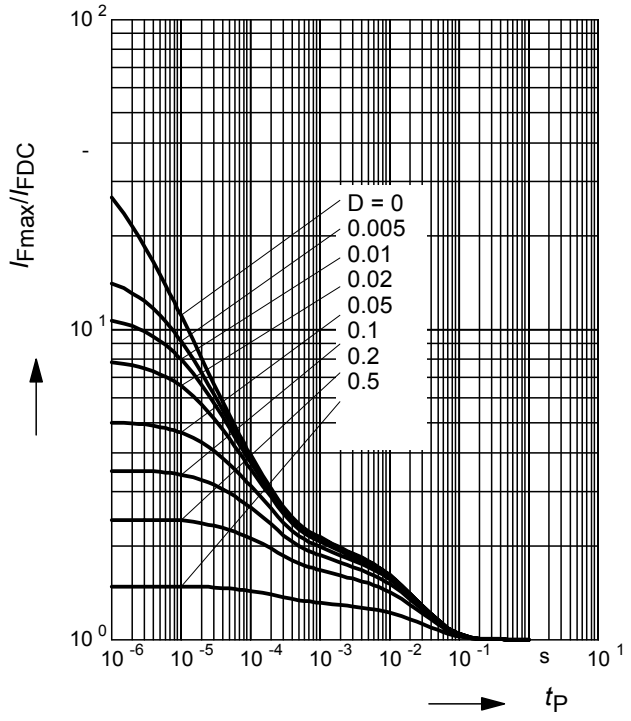
BAR64-04W, BAR64-06W



Permissible Pulse Load

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

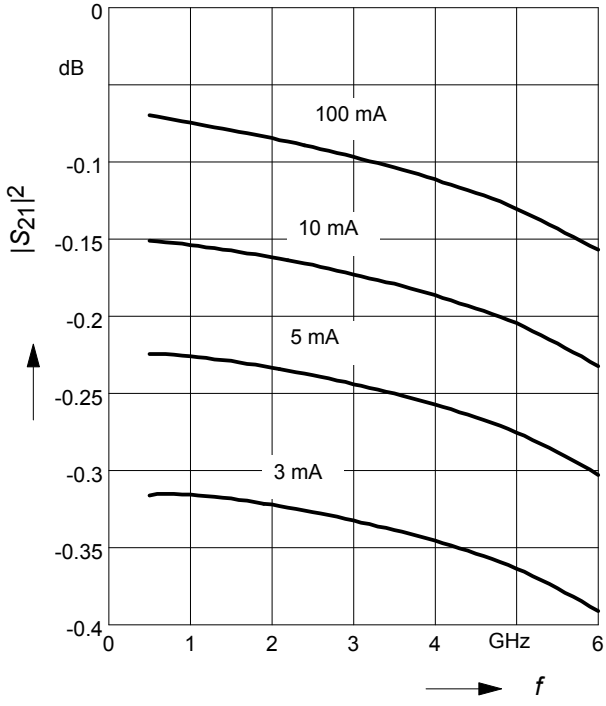
BAR64-04W, BAR64-06W



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, $Z = 50\Omega$