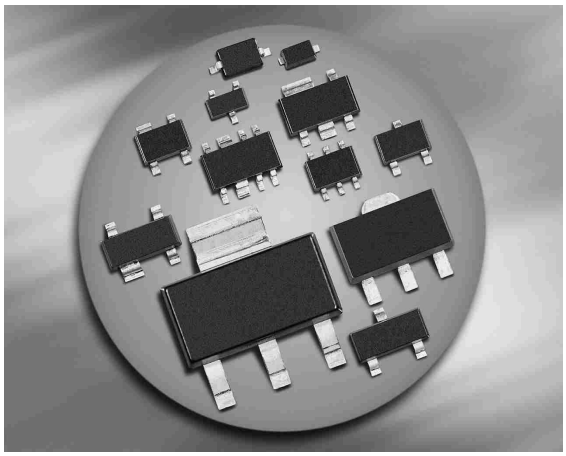
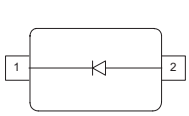
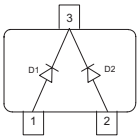
Silicon PIN Diodes

- Current-controlled RF resistor
  for switching and attenuating applications
- Frequency range above 10 MHz up to 6 GHz
- Especially useful as antenna switch
  in mobile communication
- Very low capacitance at zero volt reverse bias
  at freuencies above 1 GHz (typ. 0.15 pF)
- Low forward resitance
- Very low harmonics



BAR50-02L **BAR50-05**
BAR50-02V
BAR50-03W





Type	Package	Configuration	L_S(nH)	Marking
BAR50-02L*	TSLP-2-1	single,leadless	0.4	AB
BAR50-02V	SC79	single	0.6	a
BAR50-03W	SOD323	single	1.4	blue A
BAR50-05*	SOT23	common cathode	1.8	OCs

* Preliminary

Maximum Ratings at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
Diode reverse voltage	V_R	50	V
Forward current	I_F	100	mA
Total power dissipation	P_{tot}		mW
BAR50-02L, $T_S \leq 130$°C		250	
BAR50-02V, $T_S \leq 120$°C		250	
BAR50-03W, $T_S \leq 116$°C		250	
BAR50-05, $T_S \leq 60$°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}		K/W
BAR50-02L		≤ 80	
BAR50-02V		≤ 120	
BAR50-03W		≤ 135	
BAR50-05		≤ 360	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Reverse current V_R = 50 V	I_R	-	-	50	nA
Forward voltage I_F = 50 mA	V_F	-	0.95	1.1	V

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

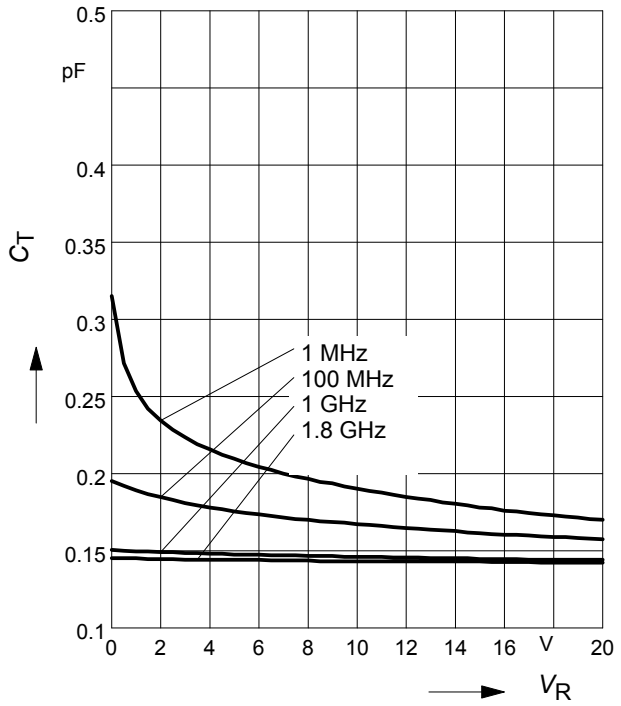
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Diode capacitance	C_T				pF
V_R = 1 V, f = 1 MHz		-	0.24	0.5	
V_R = 5 V, f = 1 MHz		-	0.2	0.4	
V_R = 0 V, f = 100 MHz		-	0.2	-	
V_R = 0 V, f = 1...1.8 GHz, BAR50-02L		-	0.1	-	
V_R = 0 V, f = 1...1.8 GHz, all other		-	0.15	-	
Reverse parallel resistance	R_P				kΩ
V_R = 0 V, f = 100 MHz		-	25	-	
V_R = 0 V, f = 1 GHz		-	6	-	
V_R = 0 V, f = 1.8 GHz		-	5	-	
Forward resistance	r_f				Ω
I_F = 0.5 mA, f = 100 MHz		-	25	40	
I_F = 1 mA, f = 100 MHz		-	16.5	25	
I_F = 10 mA, f = 100 MHz		-	3	4.5	
Charge carrier life time	τ_{rr}	-	1100	-	ns
I_F = 10 mA, I_R = 6 mA, measured at I_R = 3 mA, R_L = 100 Ω					
I-region width	W_I	-	56	-	µm
Insertion loss[1)]	$\|S_{21}\|^2$				dB
I_F = 3 mA, f = 1.8 GHz		-	-0.56	-	
I_F = 5 mA, f = 1.8 GHz		-	-0.4	-	
I_F = 10 mA, f = 1.8 GHz		-	-0.27	-	
Isolation[1)]	$\|S_{21}\|^2$				
V_R = 0 V, f = 0.9 GHz		-	-24.5	-	
V_R = 0 V, f = 1.8 GHz		-	-20	-	
V_R = 0 V, f = 2.45 GHz		-	-18	-	
V_R = 0 V, f = 5.6 GHz		-	-12	-	

[1]BAR50-02L in series configuration, Z = 50 Ω

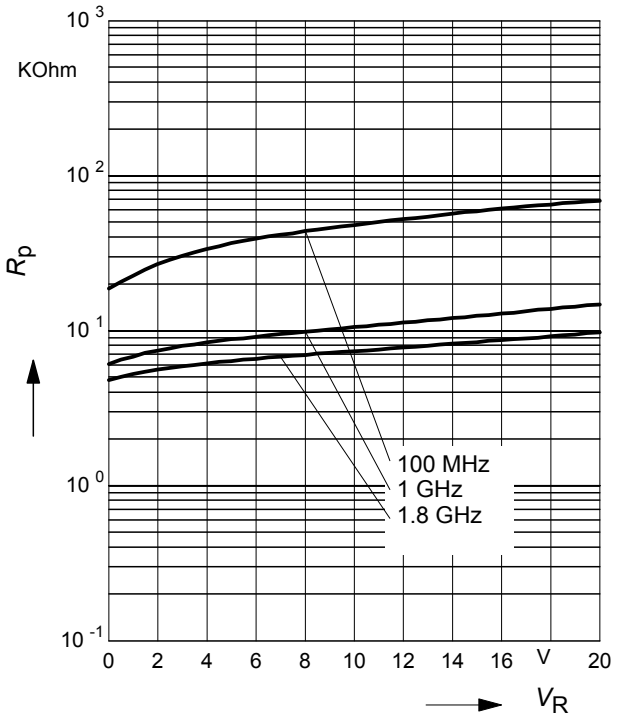
Diode capacitance $C_T = f(V_R)$

f = Parameter



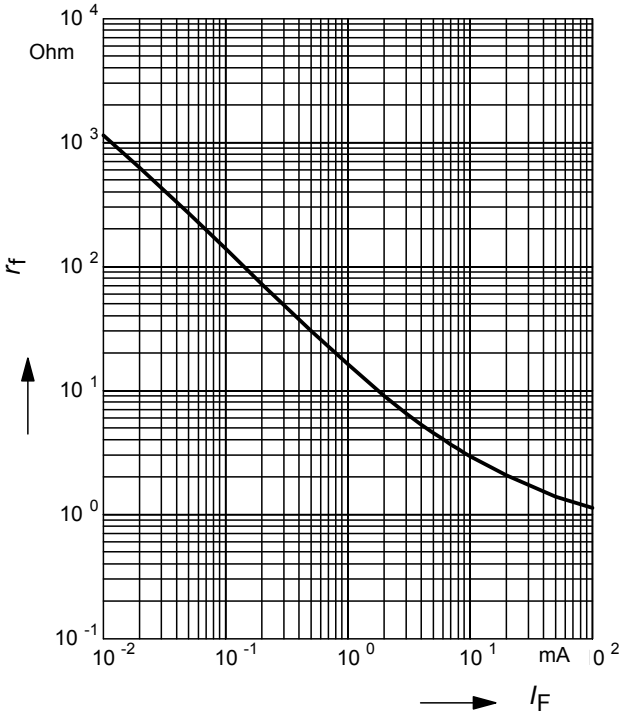
Reverse parallel resistance $R_P = f(V_R)$

f = Parameter



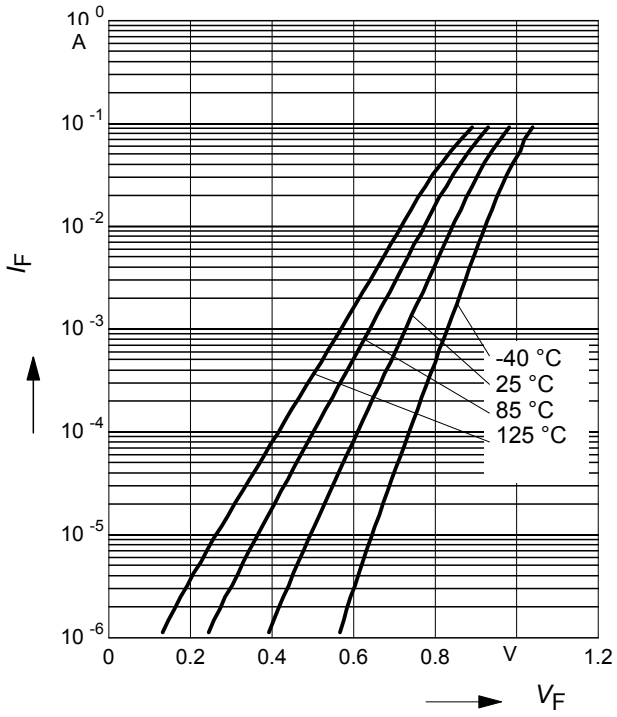
Forward resistance $r_f = f(I_F)$

f = 100 MHz

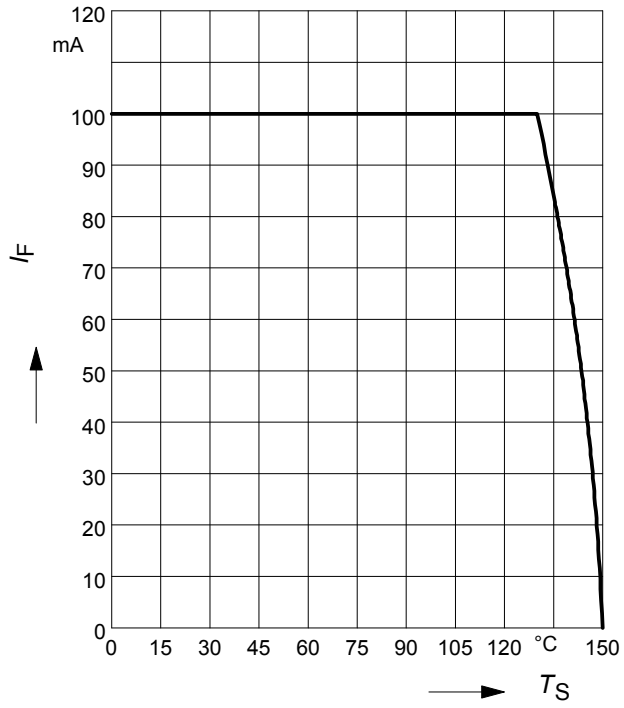


Forward current $I_F = f(V_F)$

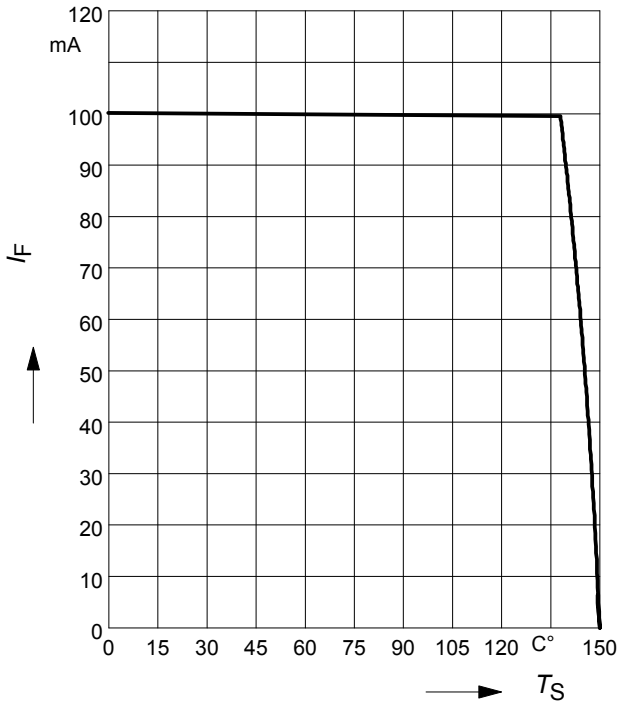
T_A = Parameter



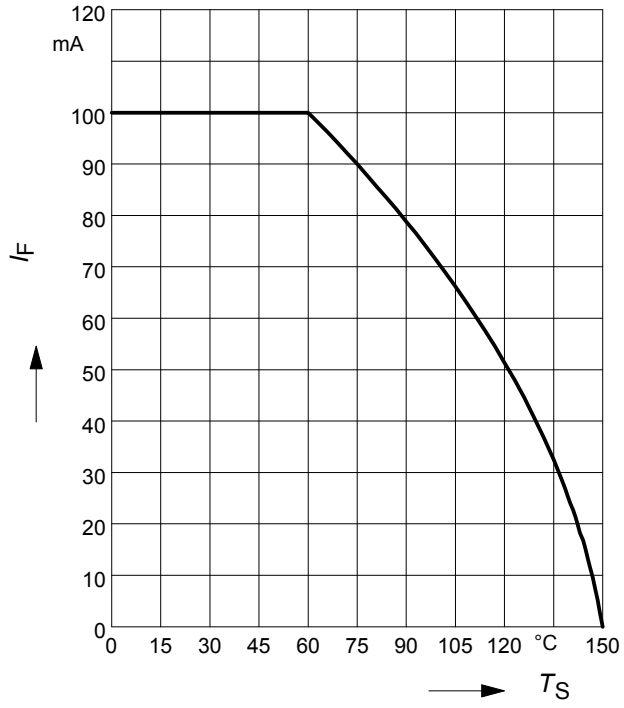
Forward current $I_F = f(T_S)$
BAR50-02L



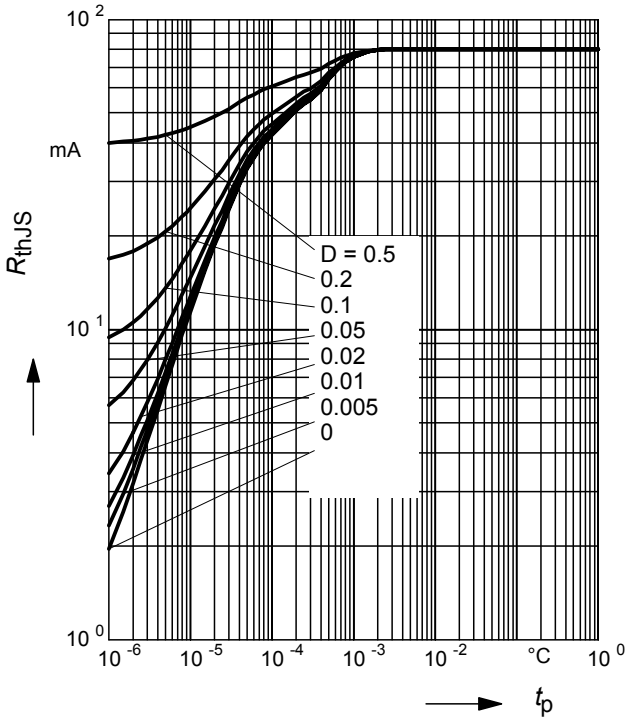
Forward current $I_F = f(T_S)$
BAR50-02V, BAR50-03W



Forward current $I_F = f(T_S)$
BAR50-05



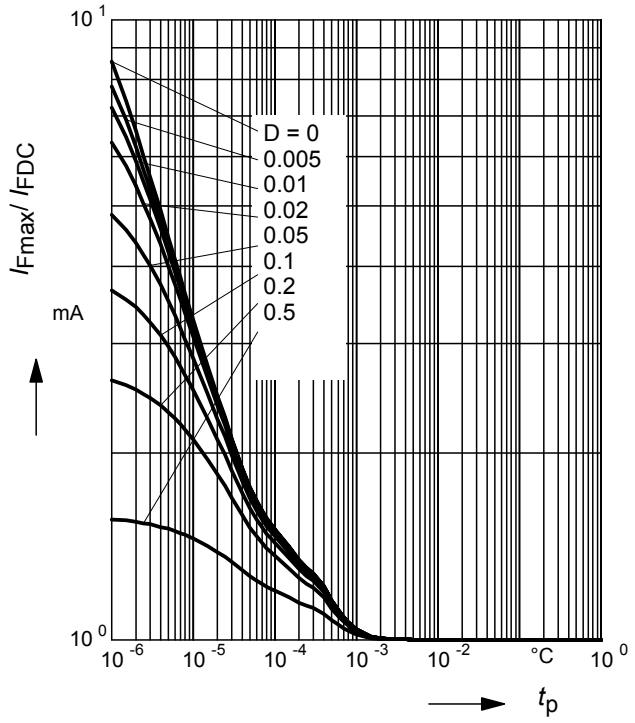
Permissible Puls Load $R_{thJS} = f(t_p)$
BAR50-02L



Permissible Pulse Load

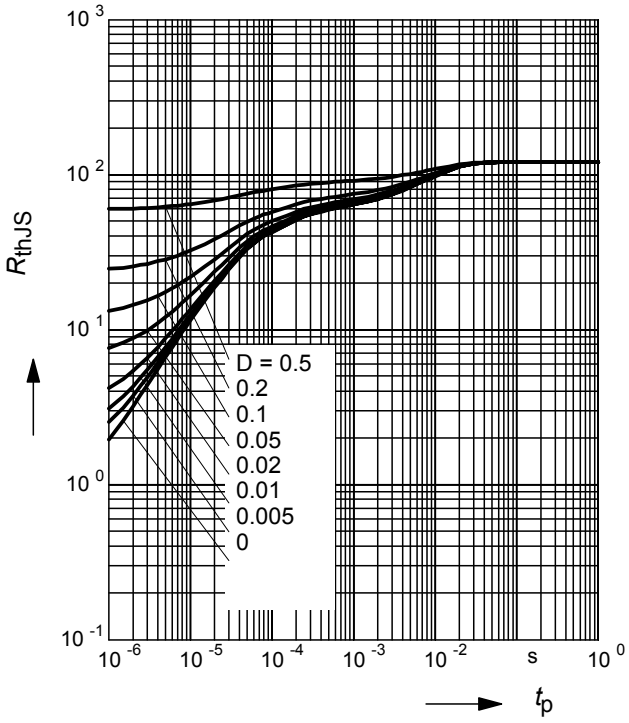
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR50-02L



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

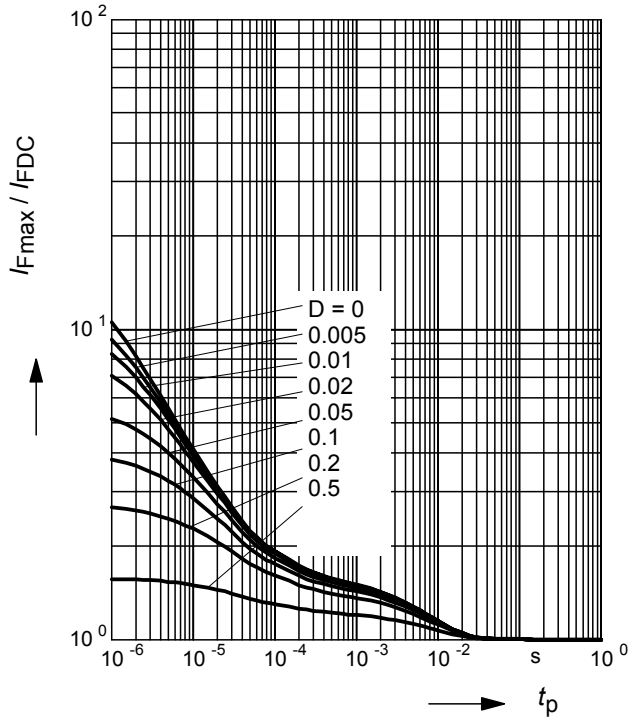
BAR50-02V



Permissible Pulse Load

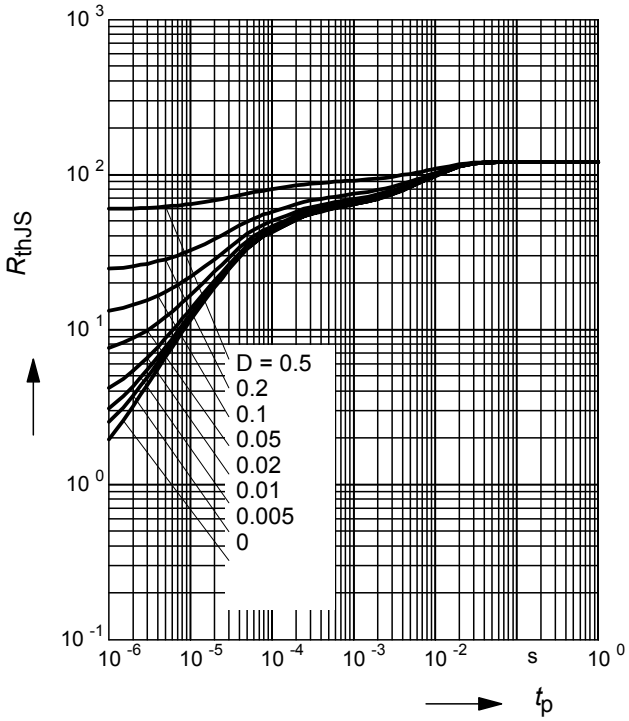
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR50-02V



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

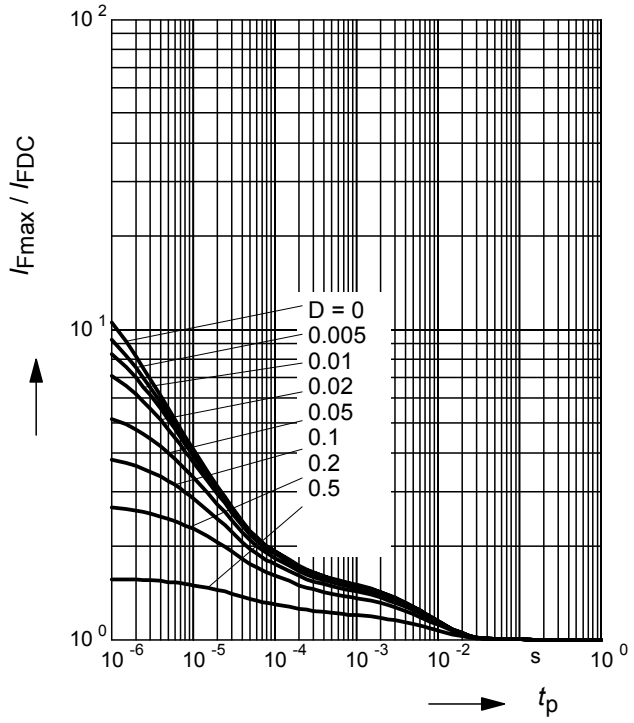
BAR50-02W



Permissible Pulse Load

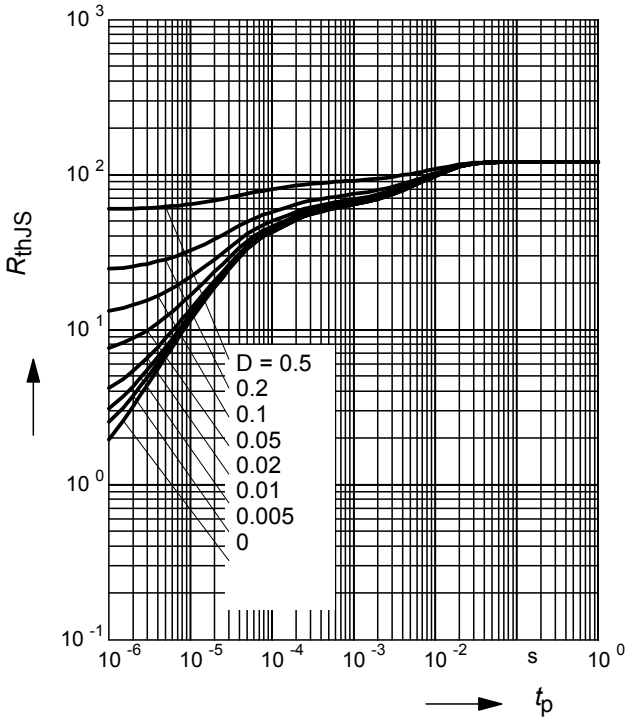
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR50-02W



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

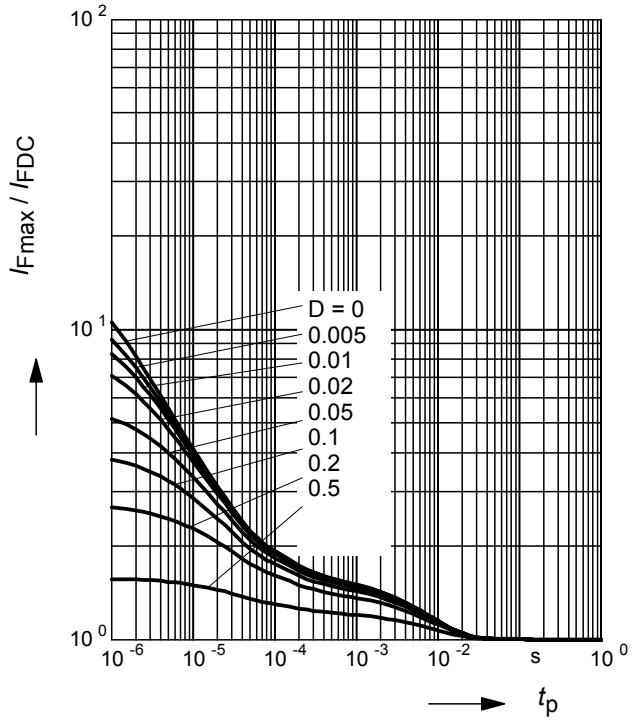
BAR50-03W



Permissible Pulse Load

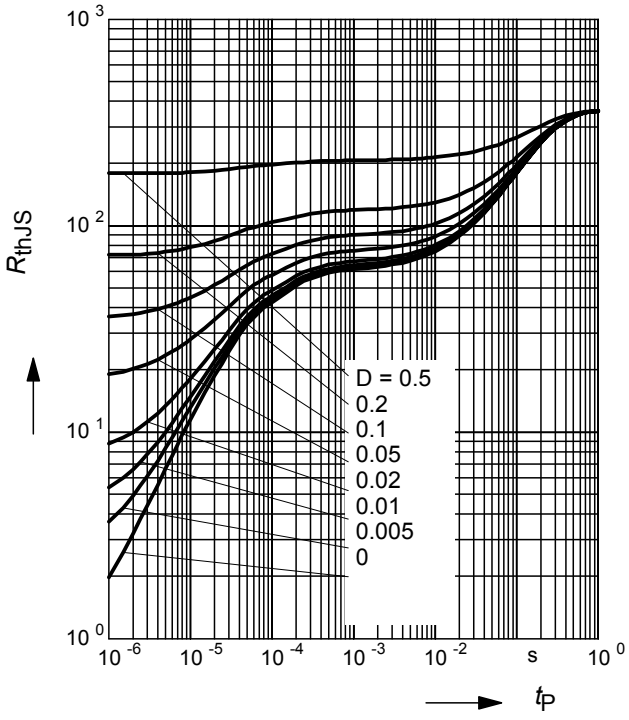
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR50-03W



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

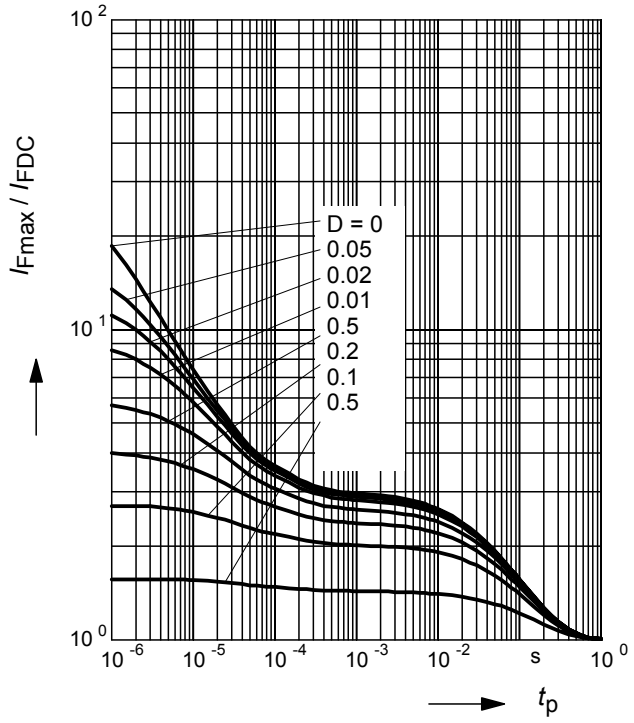
BAR50-05



Permissible Pulse Load

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

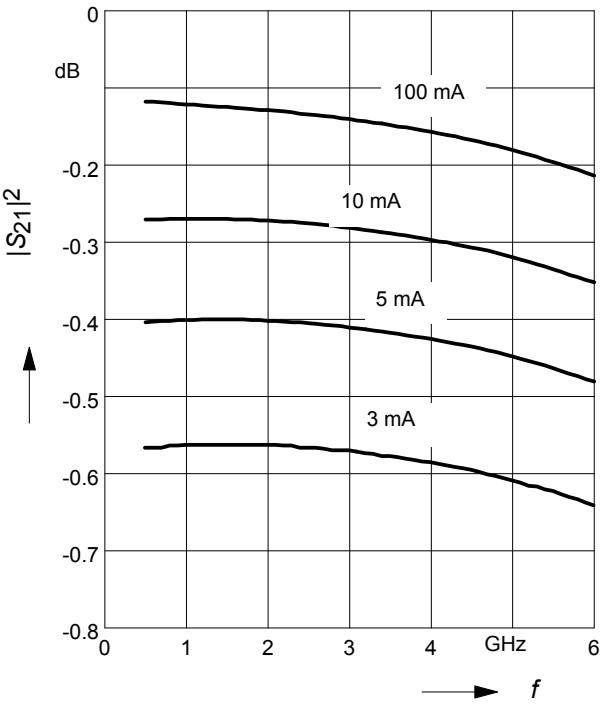
BAR50-05



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

I_F = Parameter

BAR50-02L in series configuration, $Z = 50\Omega$



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

V_R = Parameter

BAR50-02L in series configuration, $Z = 50\Omega$