Silicon PIN Diodes

- PIN diode for high speed
  switching of RF signals

- Very low forward resistance (low insertion loss)

- Very low capacitance (high isolation)

- For frequencies up to 3GHz
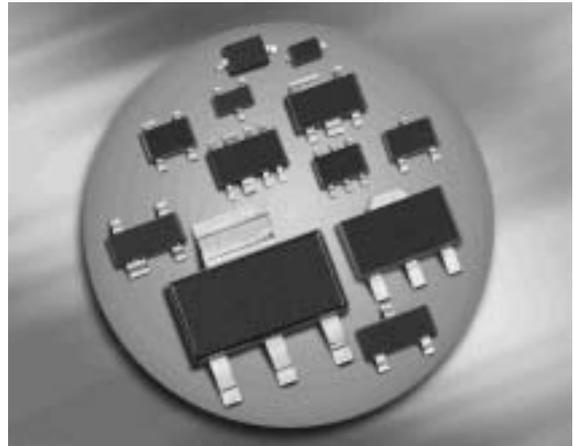
BAR63-02..	BAR63-04	BAR63-05	BAR63-06	BAR63-07L4
BAR63-03W	BAR63-04W	BAR63-05W	BAR63-06W	
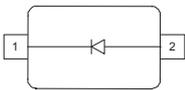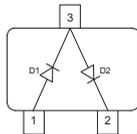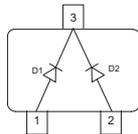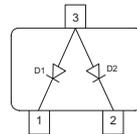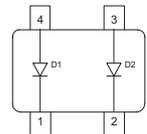
Type	Package	Configuration	L_S(nH)	Marking
BAR63-02L	TSLP-2-1	single, leadless	0.4	G
BAR63-02V	SC79	single	0.6	G
BAR63-02W	SCD80	single	0.6	GG
BAR63-03W	SOD323	single	1.8	G
BAR63-04	SOT23	series	1.8	G4s
BAR63-04W	SOT323	series	1.4	G4s
BAR63-05	SOT23	common cathode	1.8	G5s
BAR63-05W	SOT323	common cathode	1.4	G5s
BAR63-06	SOT23	common anode	1.8	G6s
BAR63-06W	SOT323	common anode	1.4	G6s
BAR63-07L4*	TSLP-4-4	parallel pair, leadless	0.4	P3s

* preliminary data

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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
BAR63-02L, $T_S \leq 118$°C		250	
BAR63-02V, -02W, BAR63-03W, $T_S \leq 115$°C		250	
BAR63-04...BAR63-06, $T_S \leq 55$°C		250	
BAR63-04S, $T_S \leq 115$°C		250	
BAR63-04W...BAR63-06W, $T_S \leq 105$°C		250	
BAR63-07L4, $T_S \leq$ tbd		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
BAR63-02L		≤ 125	
BAR63-02V, BAR63-02W		≤ 140	
BAR63-03W		≤ 155	
BAR63-04...BAR63-06		≤ 380	
BAR63-04S		≤ 180	
BAR63-04W...BAR63-06W		≤ 180	
BAR63-07L4		$\leq$ tbd	

[1]For calculation of R_{thJA} please refer to the Technical Information

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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	$V_{(BR)}$	50	-	-	V
Reverse current V_R = 35 V	I_R	-	-	10	nA
Forward voltage I_F = 100 mA	V_F	-	0.95	1.2	V

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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 = 5 V, f = 1 MHz		-	0.21	0.3	
V_R = 0 V, 100 MHz ... 1.8 GHz		-	0.3	-	
Reverse parallel resistance	R_P				kΩ
V_R = 0 V, f = 100 MHz		-	500	-	
V_R = 0 V, f = 1 GHz		-	15	-	
V_R = 0 V, f = 1.8 GHz		-	5	-	
Forward resistance	r_f				Ω
I_F = 5 mA, f = 100 MHz		-	1.2	2	
I_F = 10 mA, f = 100 MHz		-	1	-	
Charge carrier life time	τ_{rr}	-	75	-	ns
I_F = 10 mA, I_R = 6 mA, measured at I_R = 3 mA, R_L = 100 Ω					
I-region width	W_I	-	4.5	-	µm
Insertion loss[1]	$|S_{21}|^2$				dB
I_F = 1 mA, f = 1.8 GHz		-	-0.15	-	
I_F = 5 mA, f = 1.8 GHz		-	-0.11	-	
I_F = 10 mA, f = 1.8 GHz		-	-0.1	-	
Isolation[1]	$|S_{21}|^2$				
V_R = 0 V, f = 0.9 GHz		-	-17.9	-	
V_R = 0 V, f = 1.8 GHz		-	-12.3	-	
V_R = 0 V, f = 2.45 GHz		-	-10	-	

[1]BAR63-02L in series configuration, Z = 50Ω

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

f = 1MHz - 1.8GHz
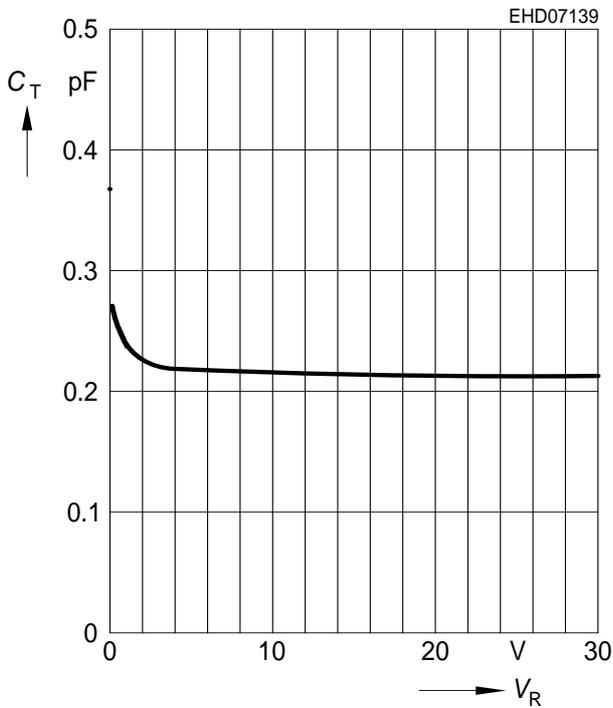
Reverse parallel resistance $R_P = f(V_R)$

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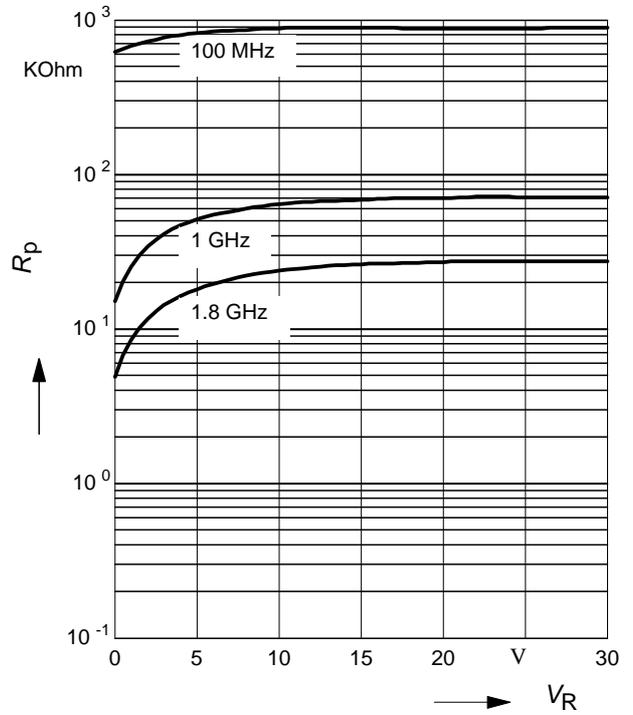
Forward resistance $r_f = f(I_F)$

f = 100MHz
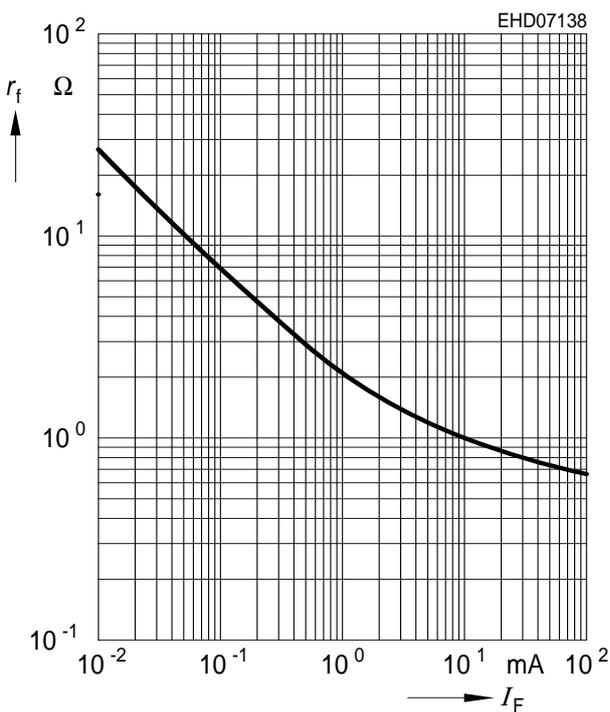
**Forward current** $I_F = f(V_F)$

T_A = Parameter

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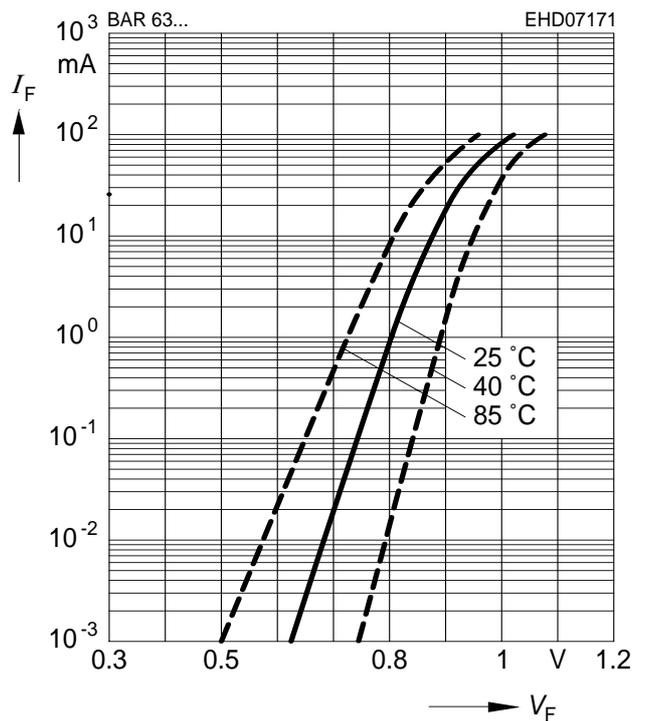
Forward current $I_F = f(T_S)$

BAR63-04...BAR63-06
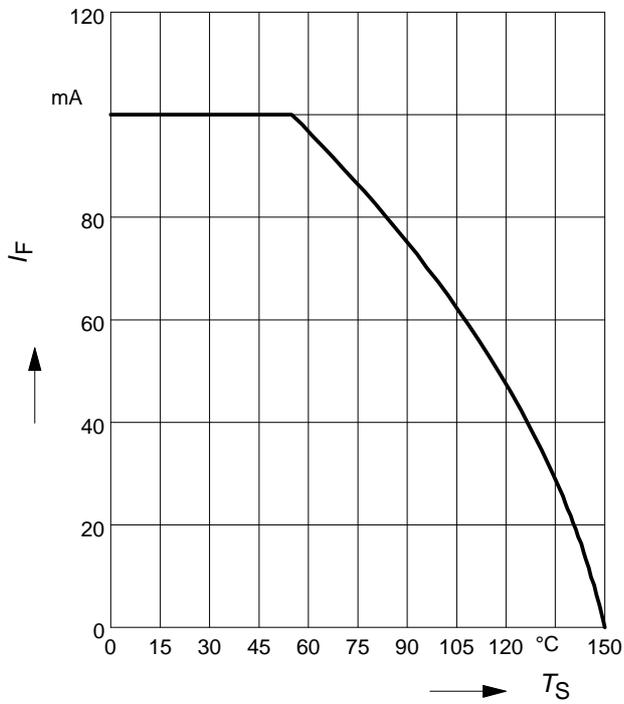
Forward current $I_F = f(T_S)$

BAR63-02V, BAR63-02W
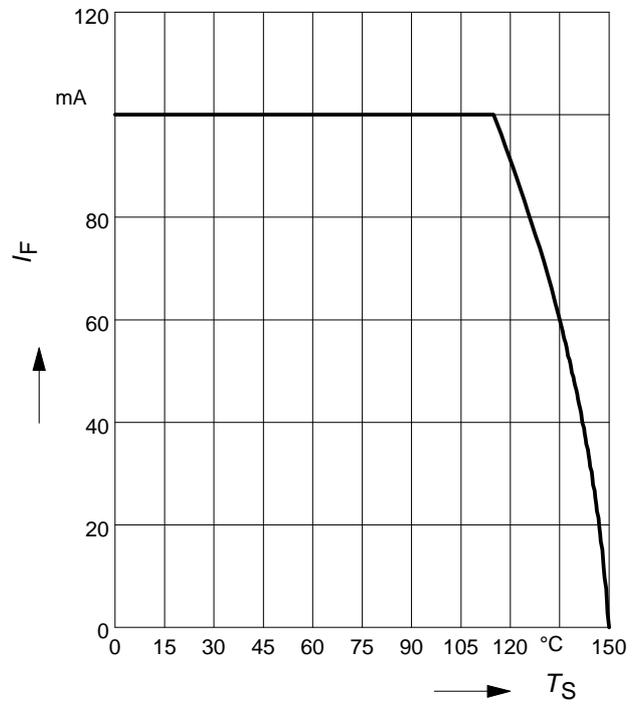
**Forward current** $I_F = f(T_S)$

BAR63-03W
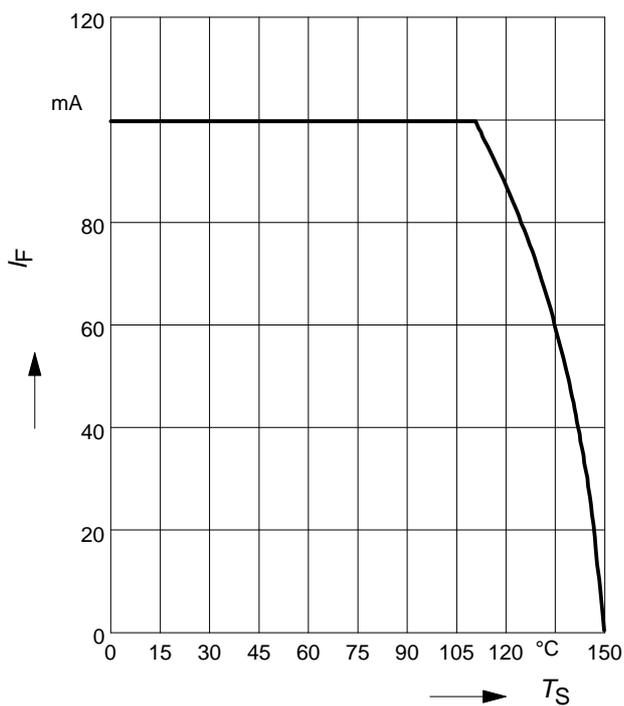
Forward current $I_F = f(T_S)$

BAR63-04W...BAR63-06W

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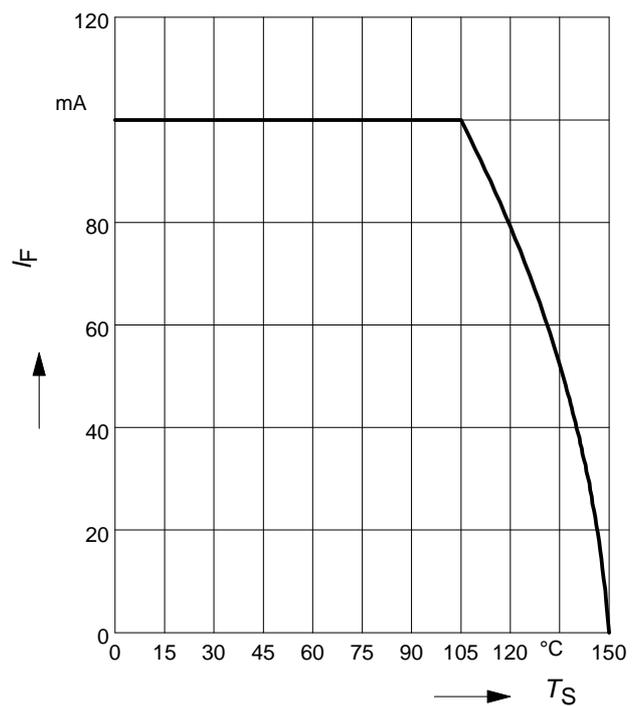
**Permissible Puls Load** $R_{thJS} = f(t_p)$

BAR63-04...BAR63-06
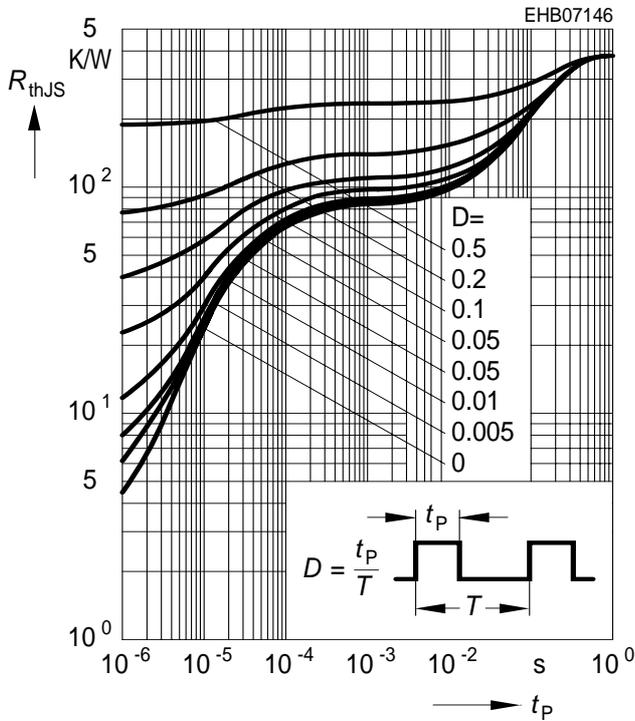
**Permissible Pulse Load**

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

BAR63-04...BAR63-06
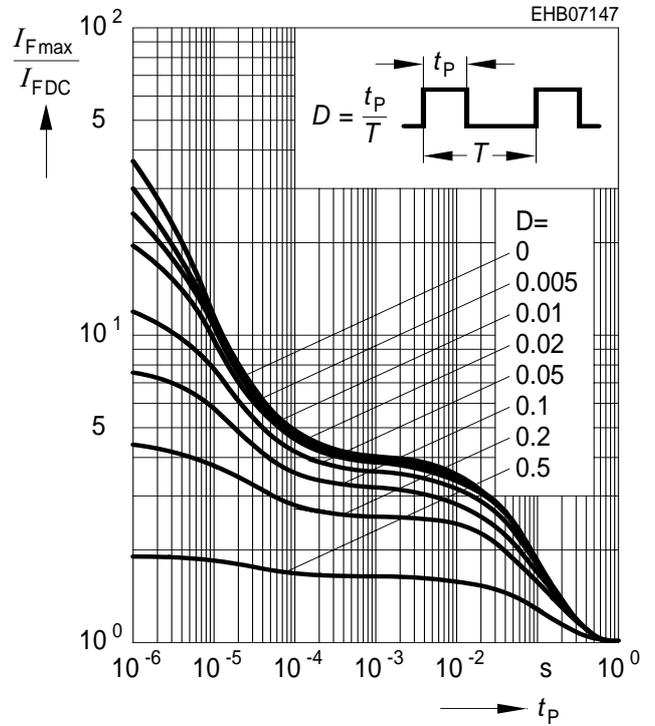

Permissible Puls Load $R_{thJS} = f(t_p)$

BAR63-02V, BAR63-02W
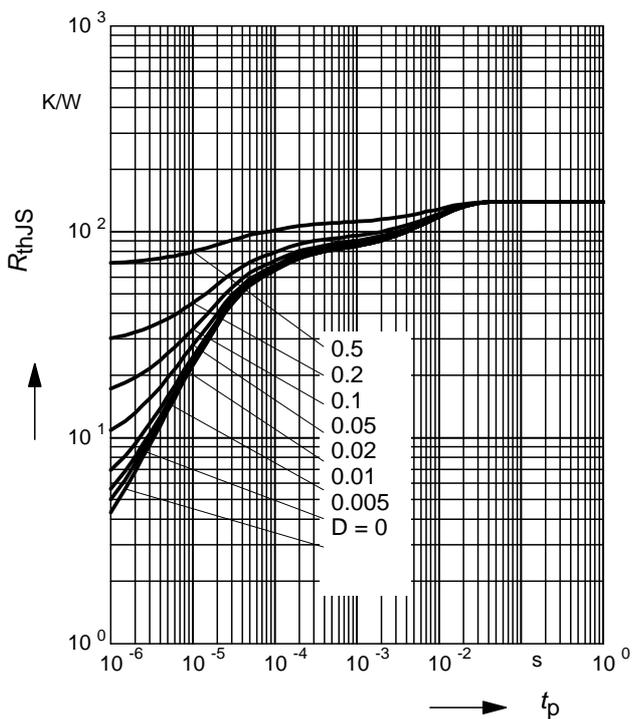
Permissible Pulse Load

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

BAR63-02V, BAR63-02W

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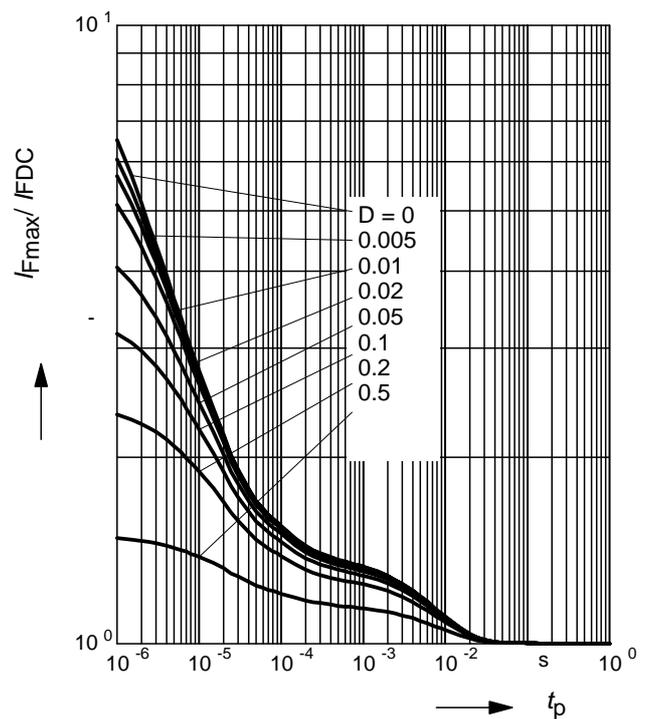
Permissible Puls Load $R_{\text{thJS}} = f(t_p)$

BAR63-03W
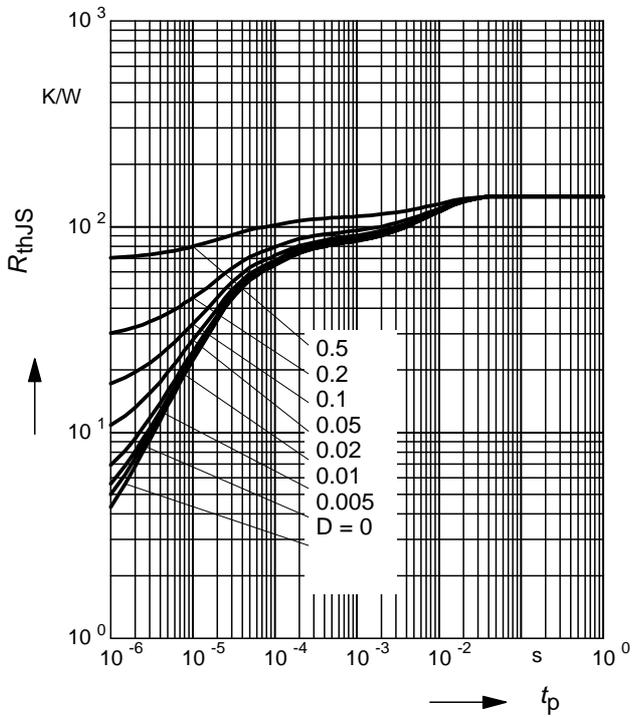
Permissible Pulse Load

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

BAR63-03W
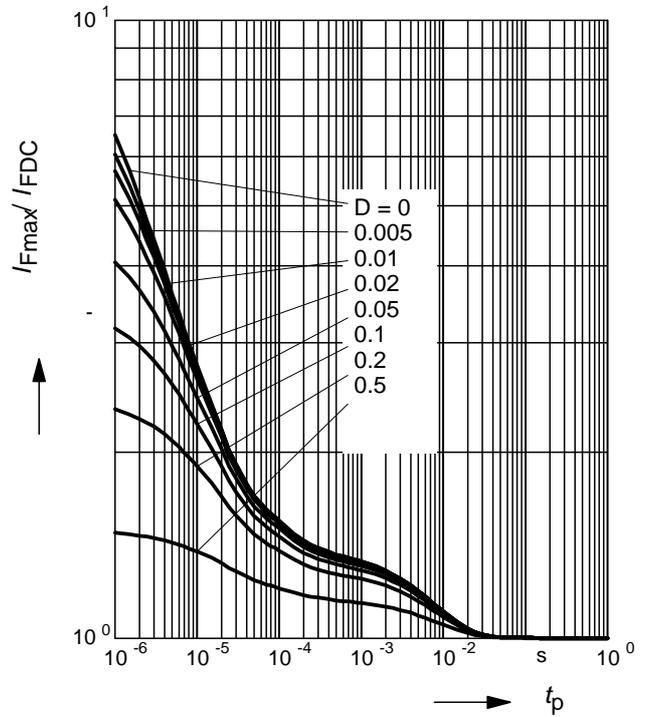
Permissible Puls Load $R_{\text{thJS}} = f(t_p)$

BAR63-04W...BAR63-06W
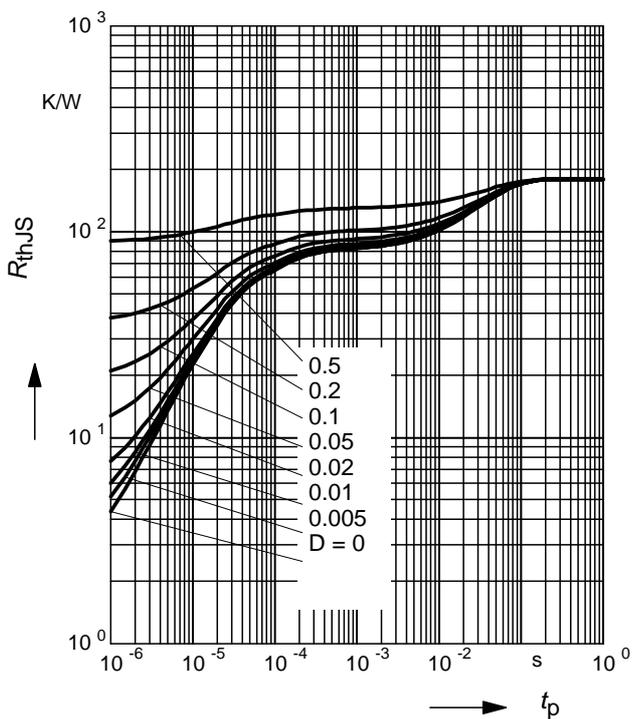
Permissible Pulse Load

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

BAR63-04W...BAR63-06W

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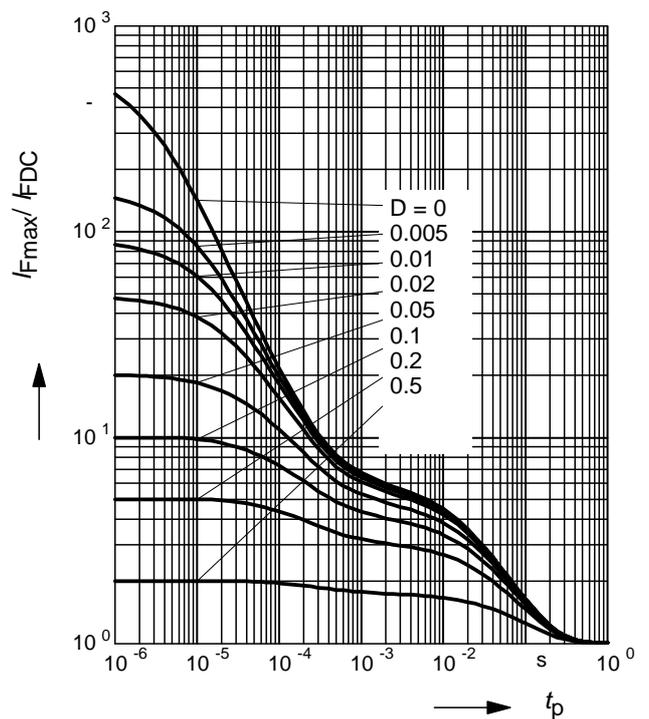
**Insertion loss** $|S_{21}|^2 = f(f)$

I_F = Parameter

BAR63-02L in series configuration, $Z = 50\Omega$
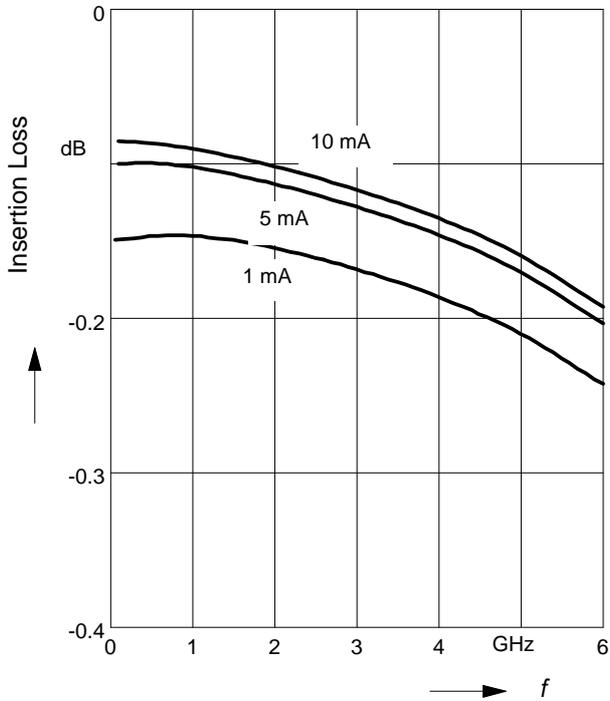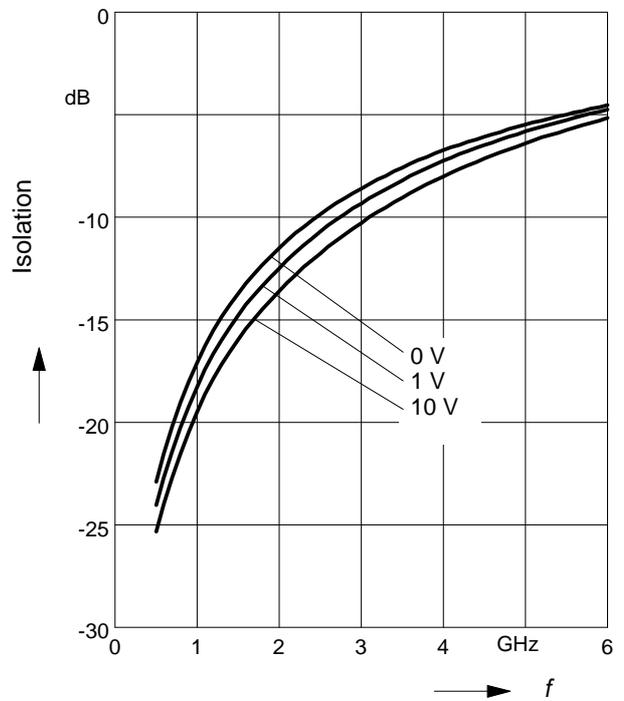
Isolation $|S_{21}|^2 = f(f)$

V_R = Paramter

BAR63-02L in series configuration, $Z = 50\Omega$

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