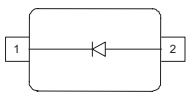


Silicon PIN Diode

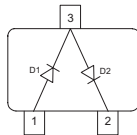
- High voltage current controlled RF resistor for RF attenuator and switches
- Frequency range above 1 MHz up to 6 GHz
- Very low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.17 pF)
- Low forward resistance (typ. 2.1 Ω @ 10 mA)
- Very low signal distortion



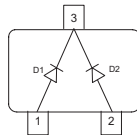
BAR64-02L
BAR64-02V
BAR64-03W



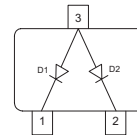
BAR64-04
BAR64-04T
BAR64-04W



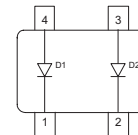
BAR64-05
BAR64-05W



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

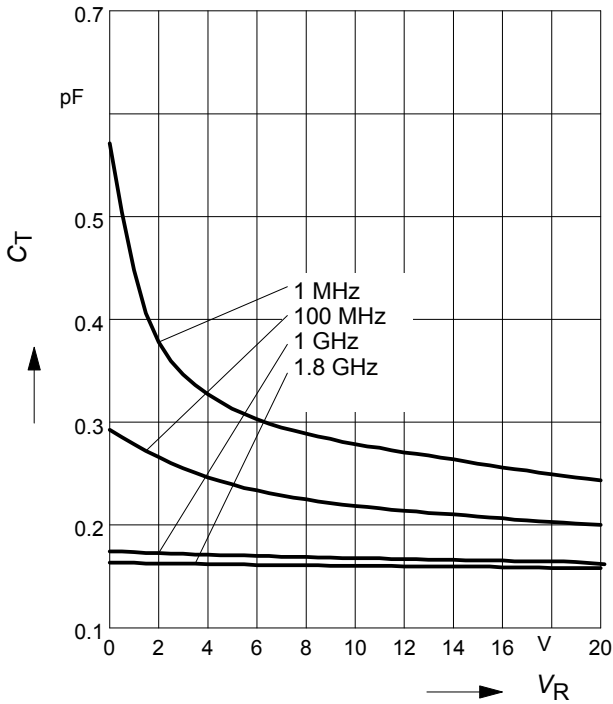
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|--|--------------|------------------|-----------------------------|---------------------|---------------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Diode capacitance $V_R = 20\text{ V}$, $f = 1\text{ MHz}$ $V_R = 0\text{ V}$, $f = 100\text{ MHz}$ $V_R = 0\text{ V}$, $f = 1\dots 1.8\text{ GHz}$, BAR64-02L $V_R = 0\text{ V}$, $f = 1\dots 1.8\text{ GHz}$, 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 $I_F = 10\text{ mA}$, $I_R = 6\text{ mA}$, 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, $Z = 50\ \Omega$

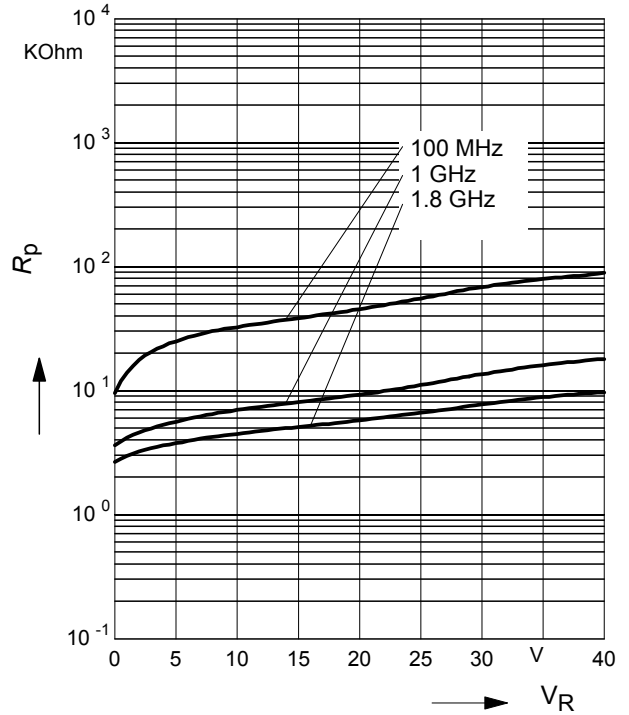
Diode capacitance $C_T = f(V_R)$

$f = \text{Parameter}$



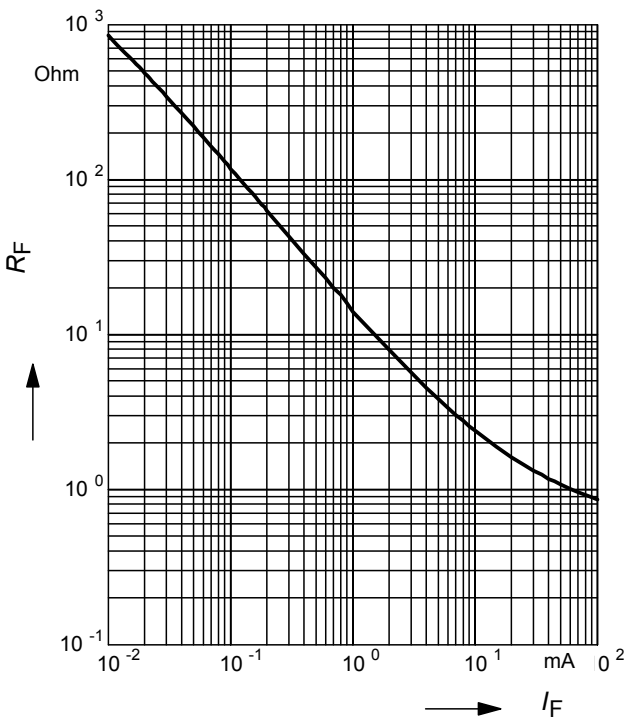
Reverse parallel resistance $R_p = f(V_R)$

$f = \text{Parameter}$



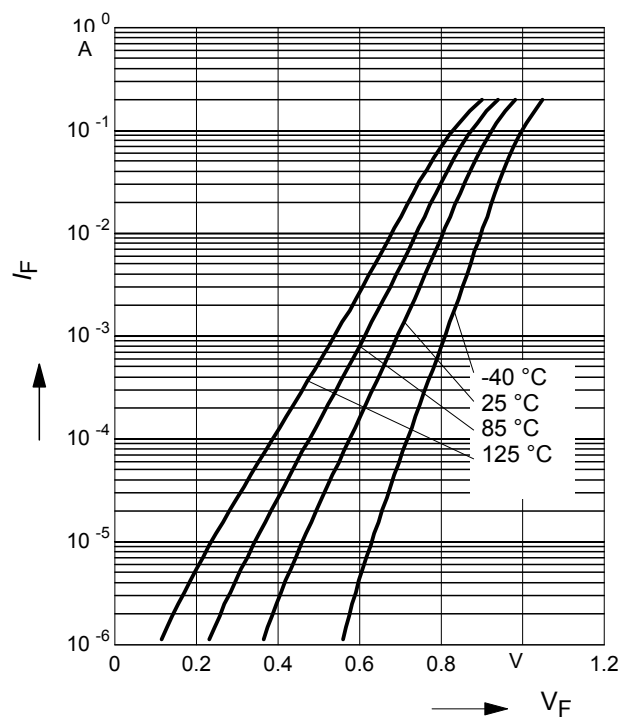
Forward resistance $r_f = f(I_F)$

$f = 100\text{MHz}$



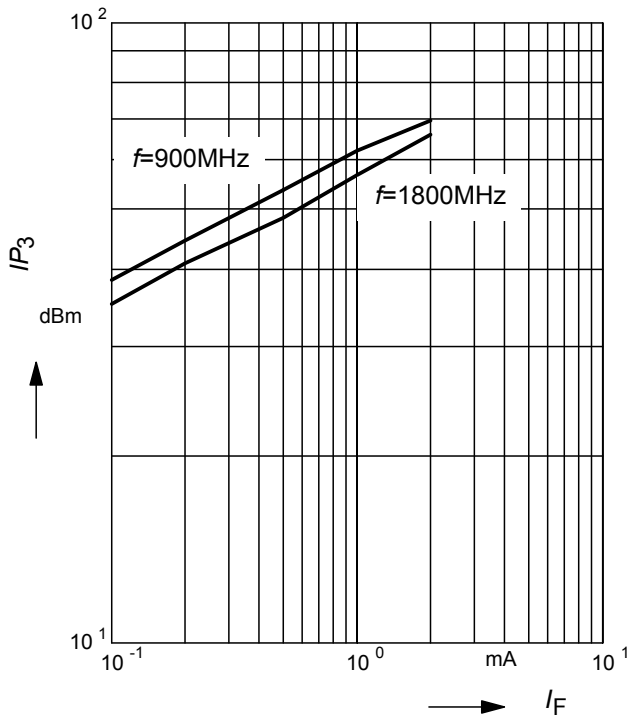
Forward current $I_F = f(V_F)$

$T_A = \text{Parameter}$



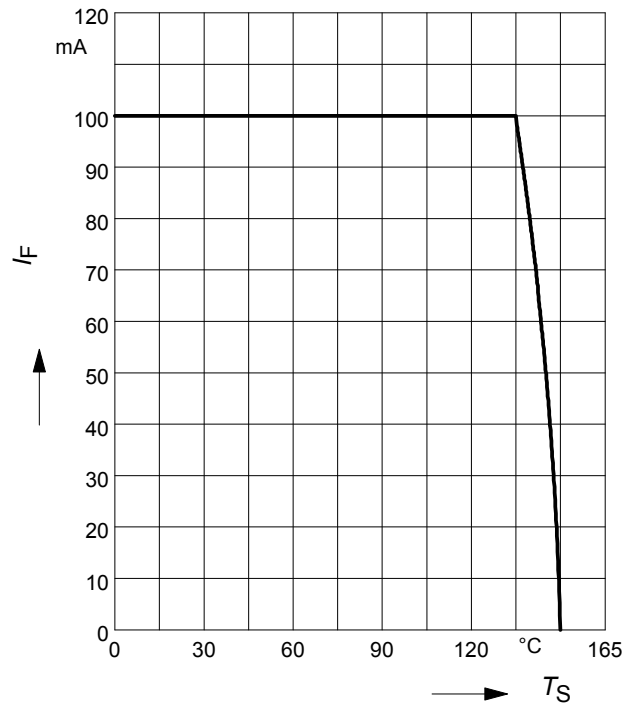
Intermodulation intercept point

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



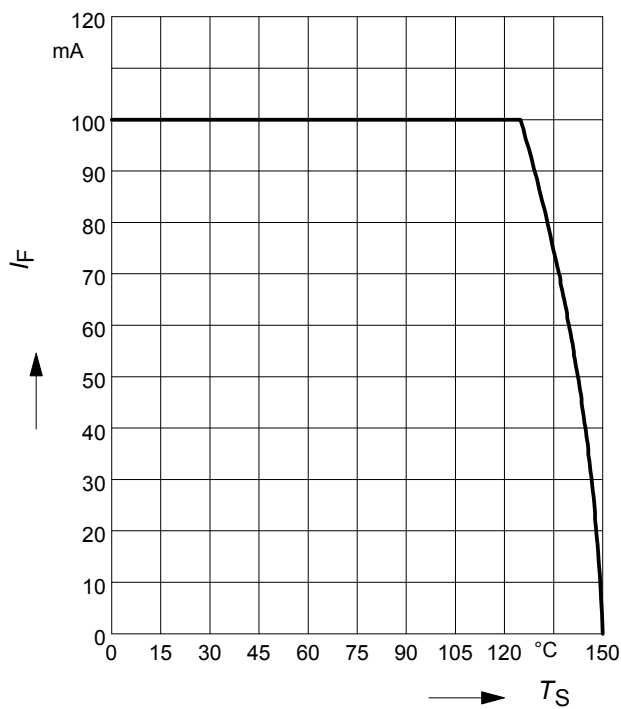
Forward current $I_F = f(T_S)$

BAR64-02L



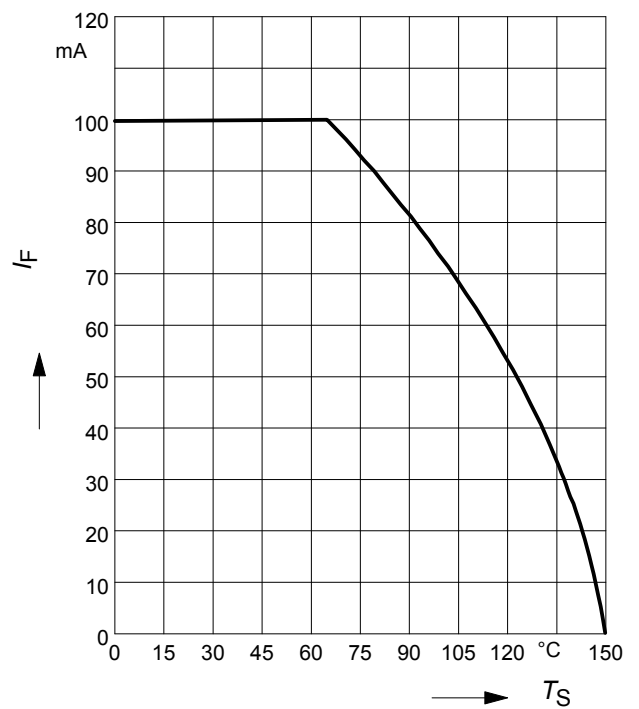
Forward current $I_F = f(T_S)$

BAR64-02V



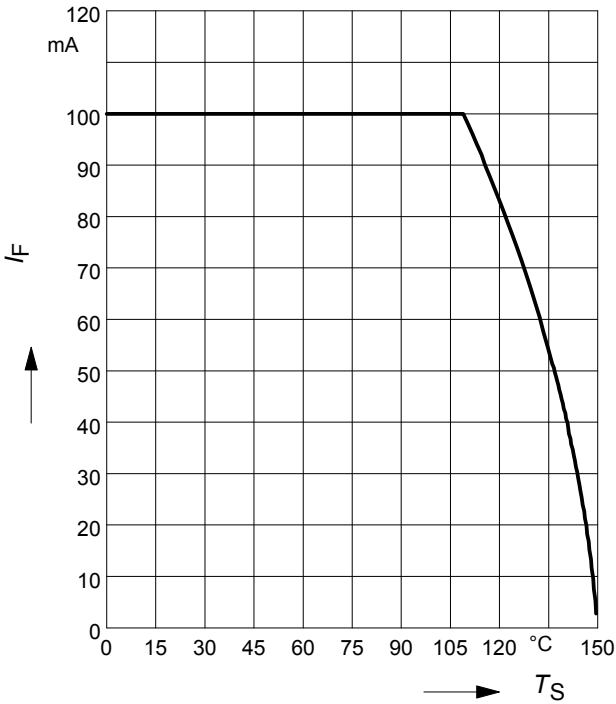
Forward current $I_F = f(T_S)$

BAR64-04, BAR64-06



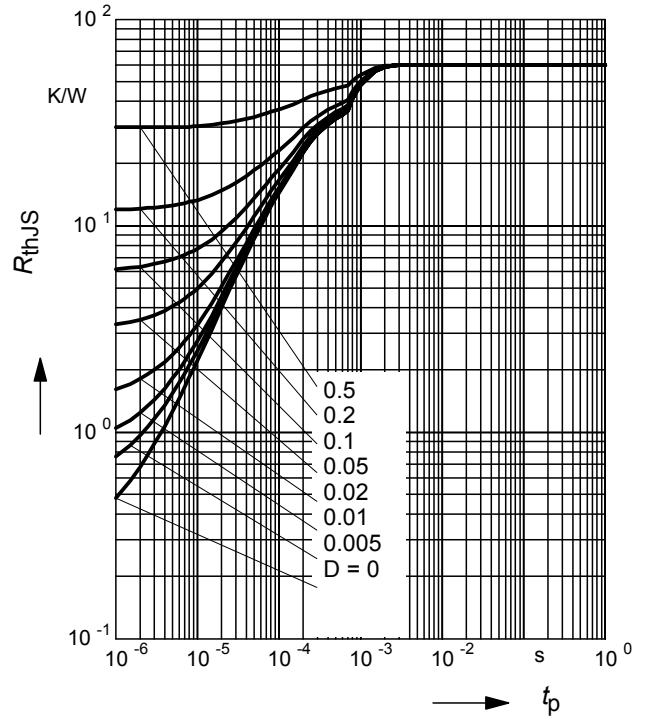
Forward current $I_F = f(T_S)$

BAR64-04T



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

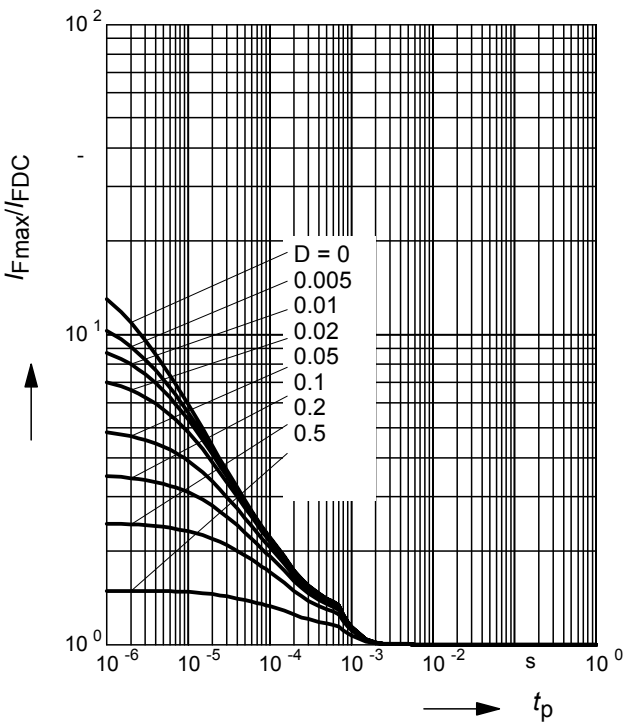
BAR64-02L



Permissible Pulse Load

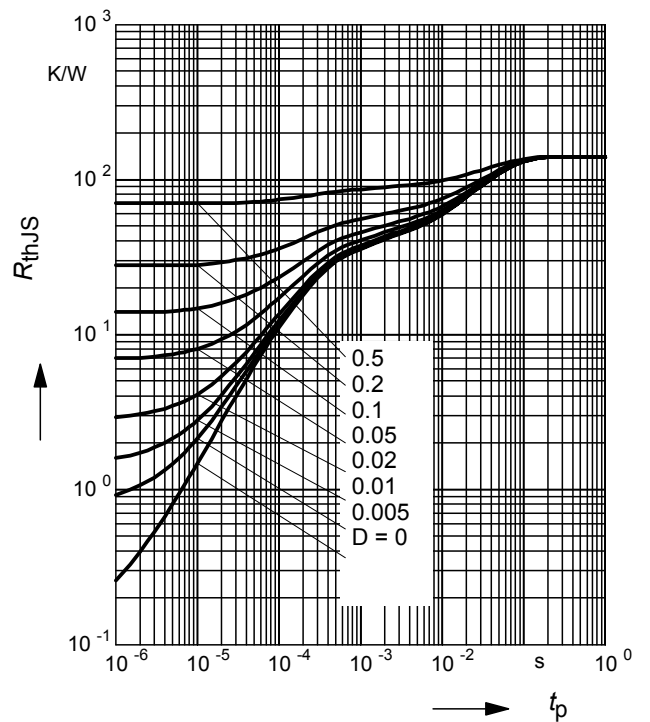
$I_{Fmax}/I_{FDC} = f(t_p)$

BAR64-02L



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

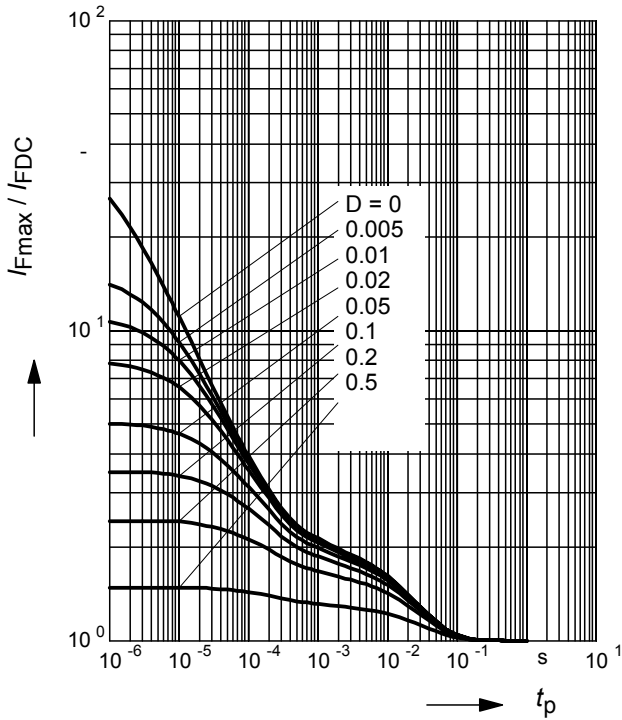
BAR64-02V



Permissible Pulse Load

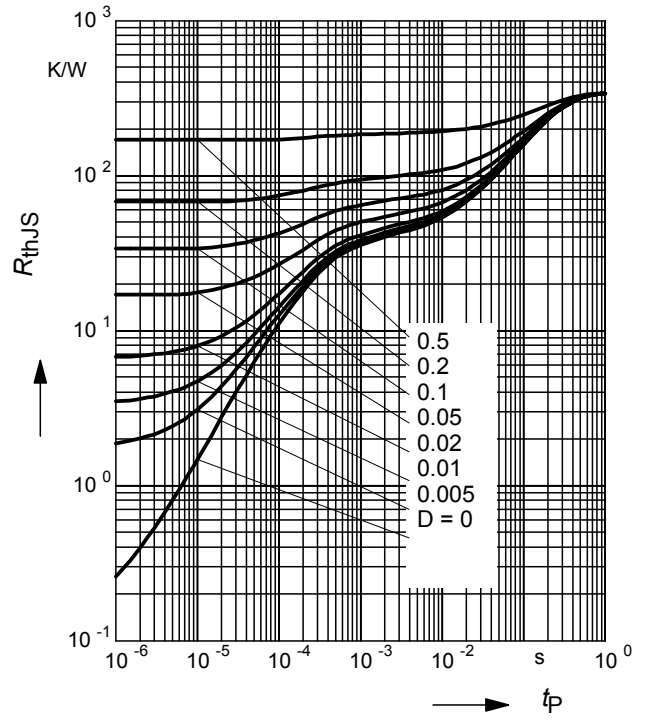
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-02V



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

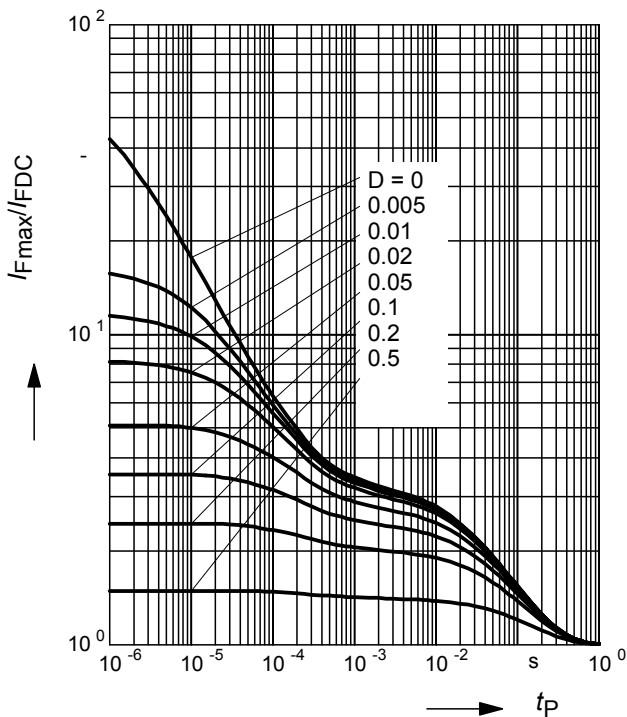
BAR64-04, BAR64-06



Permissible Pulse Load

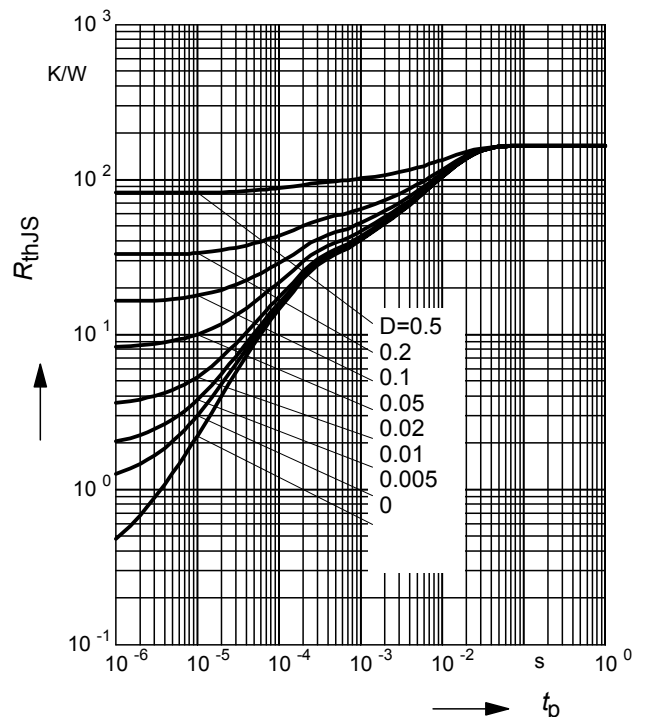
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-04, BAR64-06



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

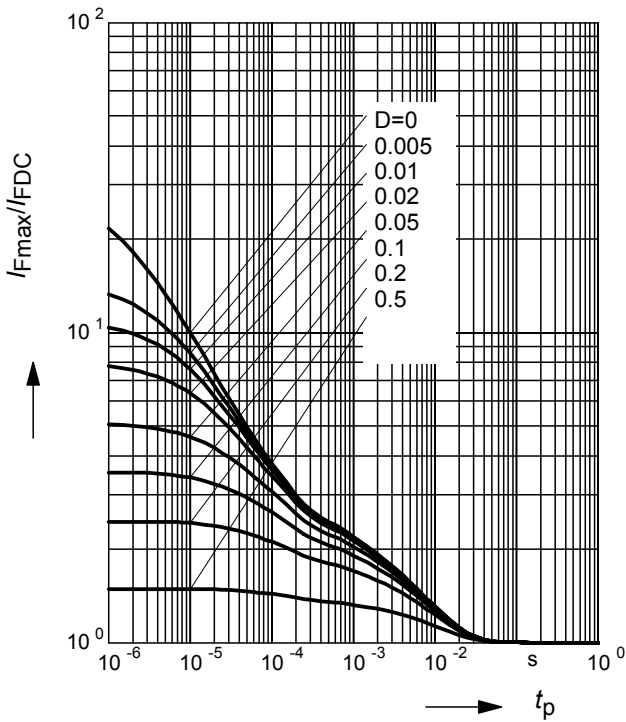
BAR64-04T



Permissible Pulse Load

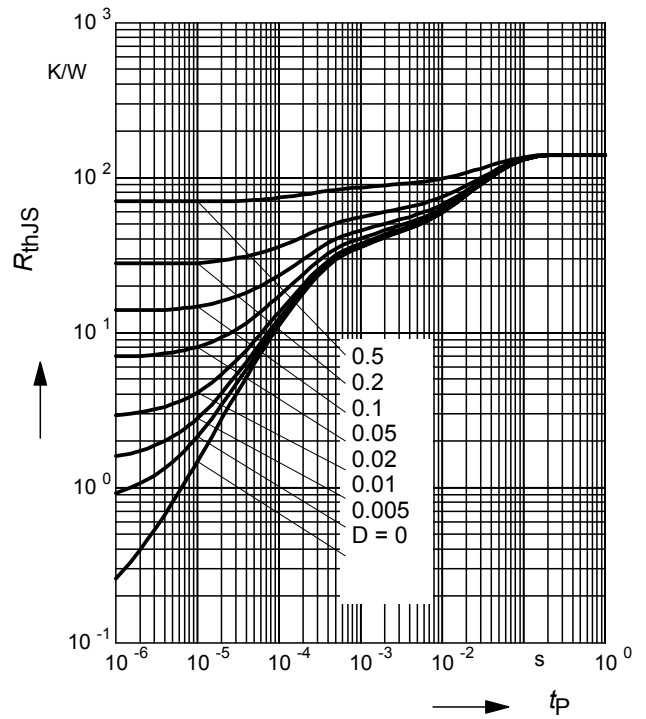
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR64-04T



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

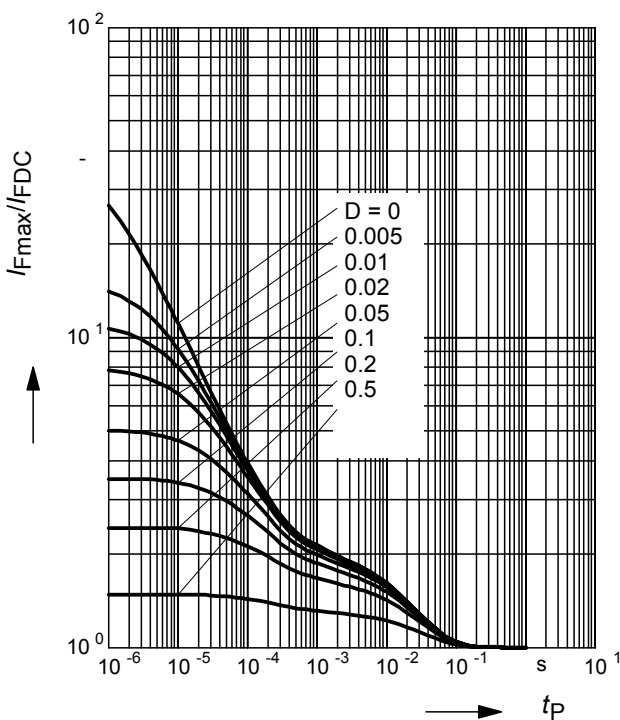
BAR64-04W, BAR64-06W



Permissible Pulse Load

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

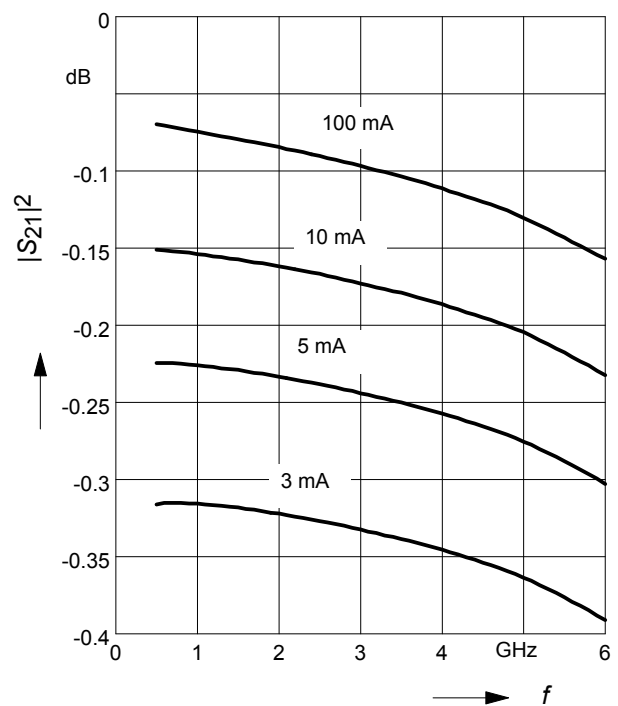
BAR64-04W, BAR64-06W



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, $Z = 50\Omega$

