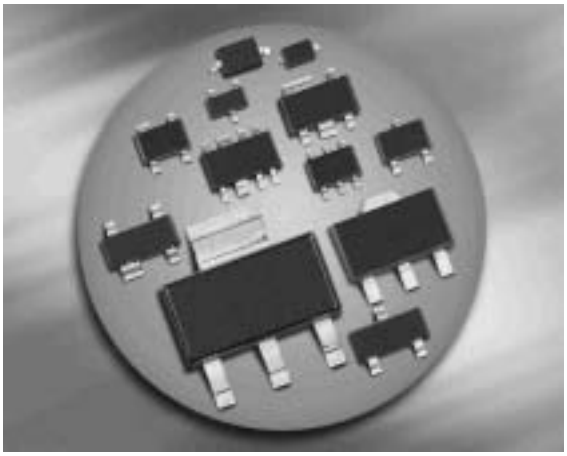
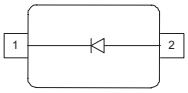
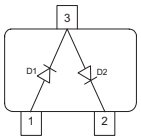
**Silicon PIN Diode**

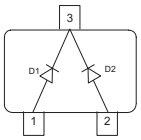
- High voltage current controlled RF resistor for RF attenuator and switches
- Frequency range above 1 MHz up to 6 GHz
- Very low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.17 pF)
- Low forward resistance (typ. 2.1 Ω @ 10 mA)
- Very low signal distortion

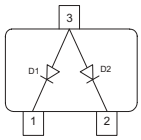


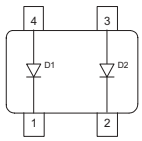
**BAR64-02L** **BAR64-04** **BAR64-05** **BAR64-06** **BAR64-07**
**BAR64-02LRH** **BAR64-04W** **BAR64-05W** **BAR64-06W**
**BAR64-02V**
**BAR64-03W**




| Type | Package | Configuration | $L_S$(nH) | Marking |
|---|---|---|---|---|
| BAR64-02L | TSLP-2-1 | single, leadless | 0.4 | MM |
| BAR64-02LRH* | TSLP-2-7 | single, leadless | 0.4 | O |
| BAR64-02V | SC79 | single | 0.6 | O |
| BAR64-03W | SOD323 | single | 1.8 | 2 blue |
| BAR64-04 | SOT23 | series | 1.8 | 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, BAR64-02LRH, $T_S \leq 135$ °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 | |
| BAR64-04W, -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, BAR64-02LRH | | ≤ 60 | |
| BAR64-02V, -04W, -05W, -06W | | ≤ 140 | |
| BAR64-03W | | ≤ 370 | |
| BAR64-04, -05, -06 | | ≤ 340 | |
| BAR64-07 | | ≤ 290 | |

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

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

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

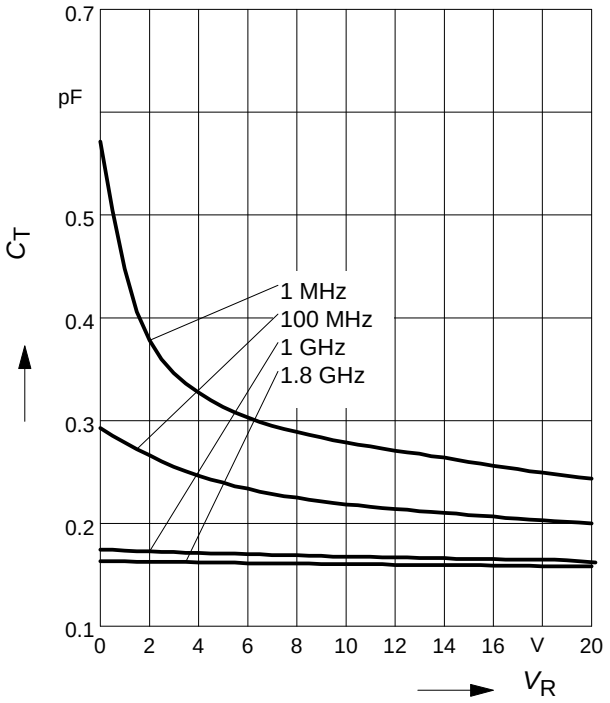
**Electrical Characteristics** at $T_A$ = 25°C, unless otherwise specified

| 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/ -02LRH | | - | 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 | $\tau_{rr}$ | - | 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

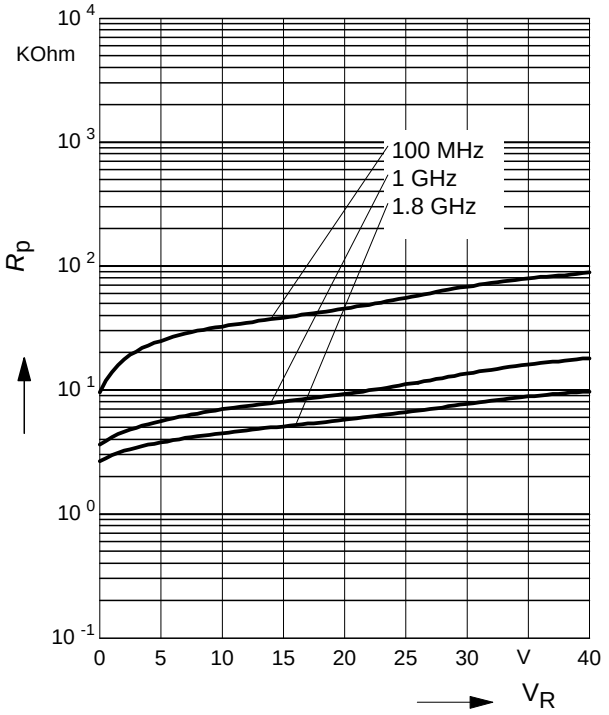
**Diode capacitance** $C_T = f\ (V_R)$

$f$ = Parameter



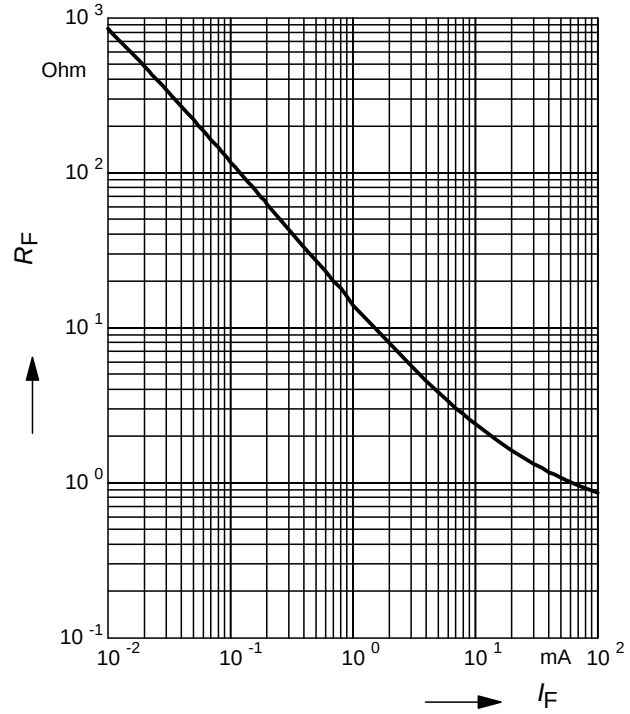

**Reverse parallel resistance** $R_P = f(V_R)$

$f$ = Parameter



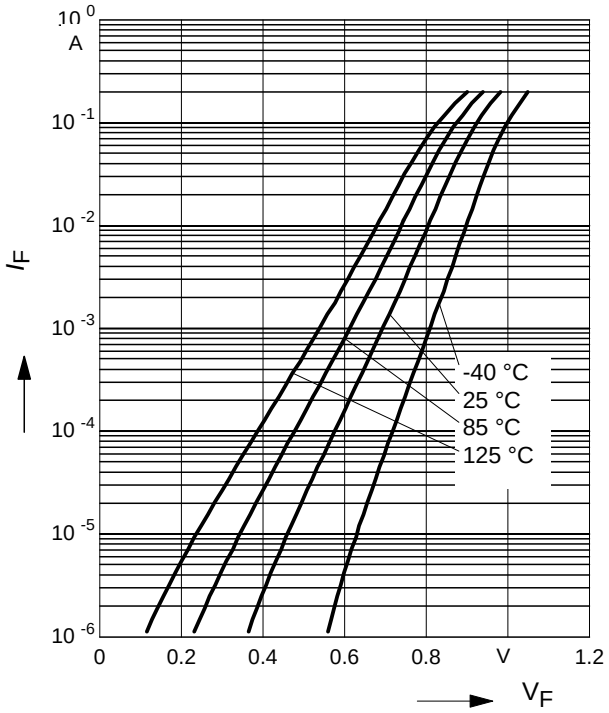

**Forward resistance** $r_f = f\ (I_F)$

$f$ = 100MHz



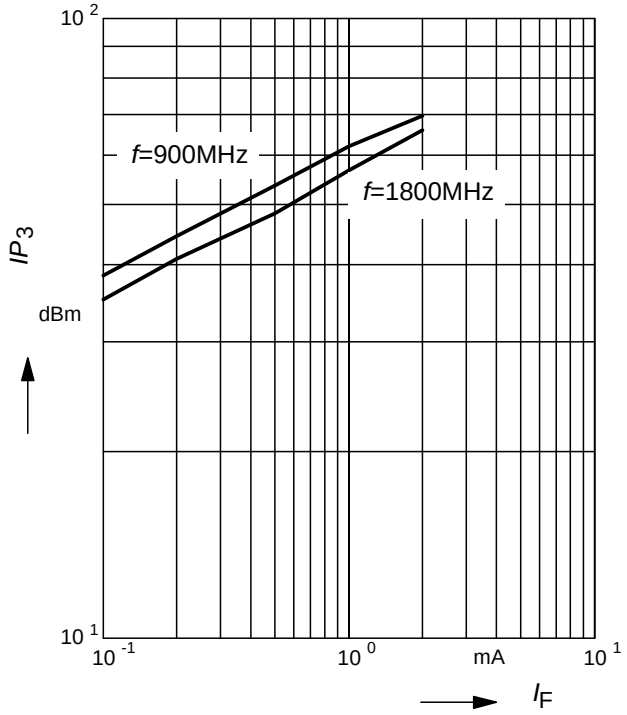

**Forward current** $I_F = f\ (V_F)$

$T_A$ = Parameter



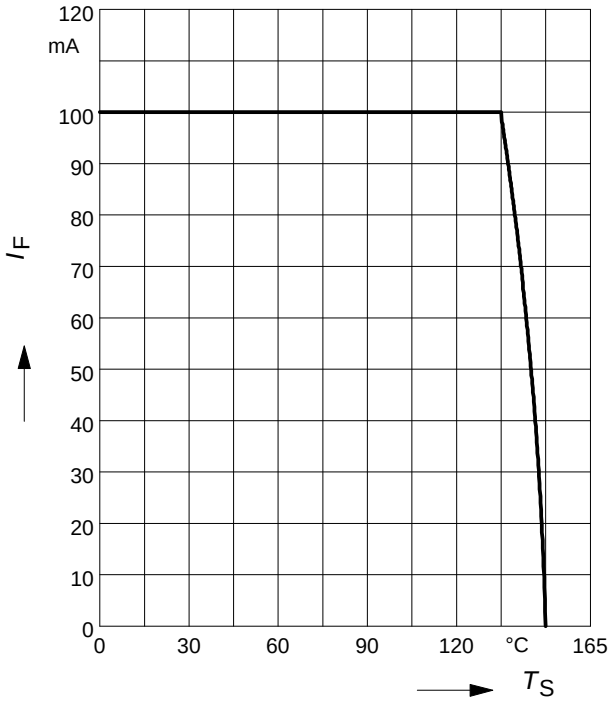
**Intermodulation intercept point**

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



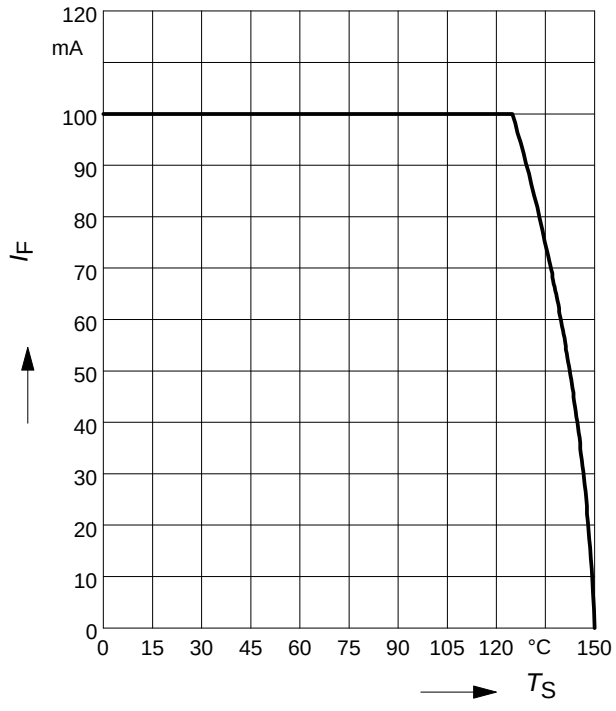

**Forward current** $I_F = f(T_S)$

BAR64-02L, BAR64-02LRH



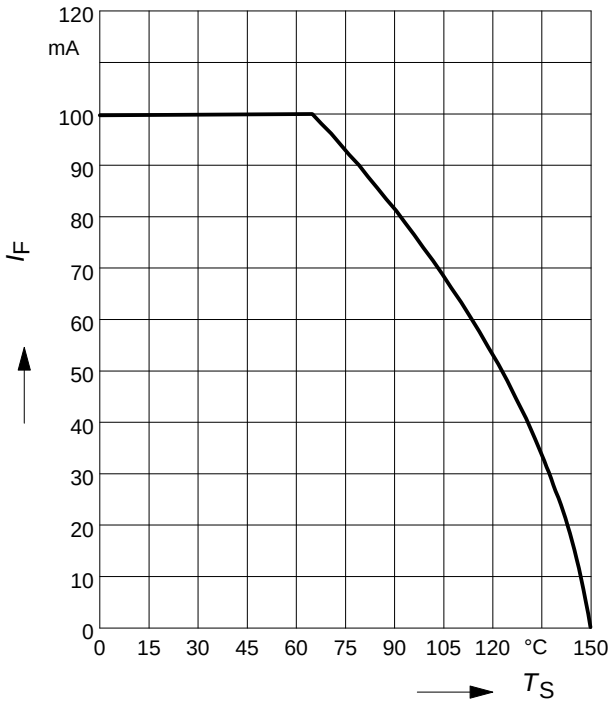

**Forward current** $I_F = f(T_S)$

BAR64-02V



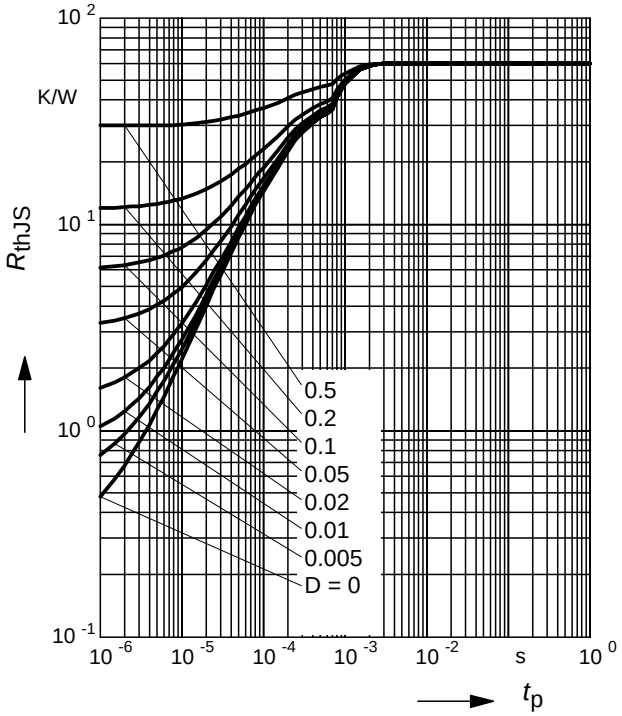

**Forward current** $I_F = f(T_S)$

BAR64-04, BAR64-06



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

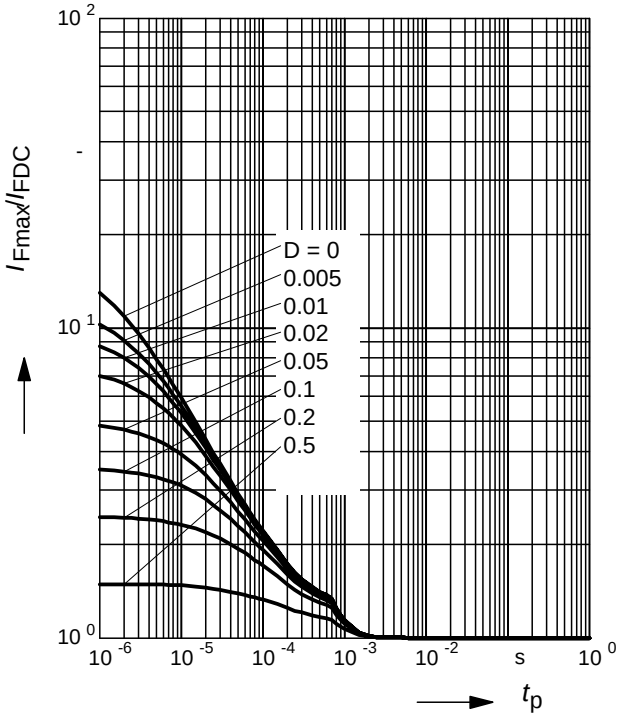
BAR64-02L, BAR64-02LRH




**Permissible Pulse Load**

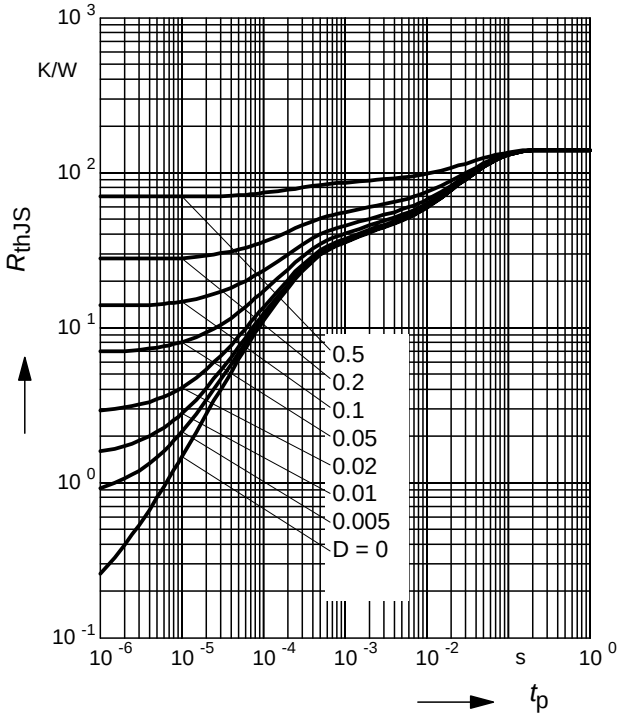
$I_{Fmax}/I_{FDC} = f(t_p)$

BAR64-02L, BAR64-02LRH




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

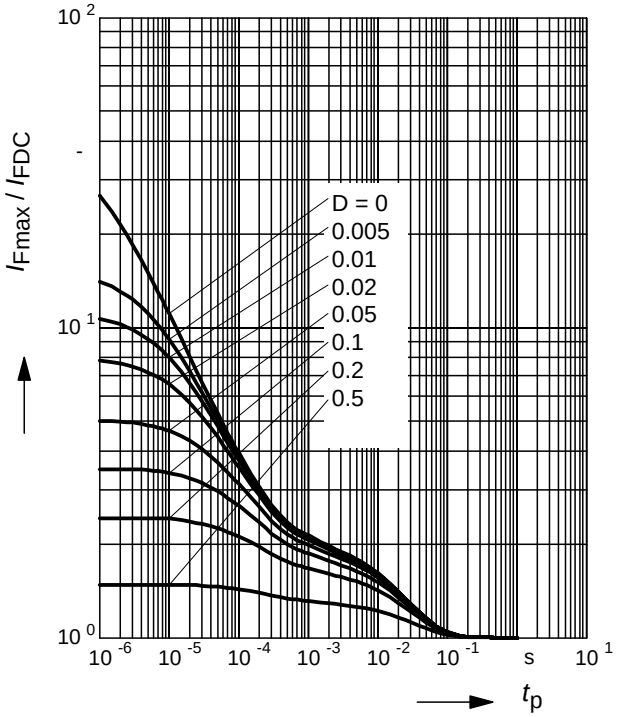
BAR64-02V




**Permissible Pulse Load**

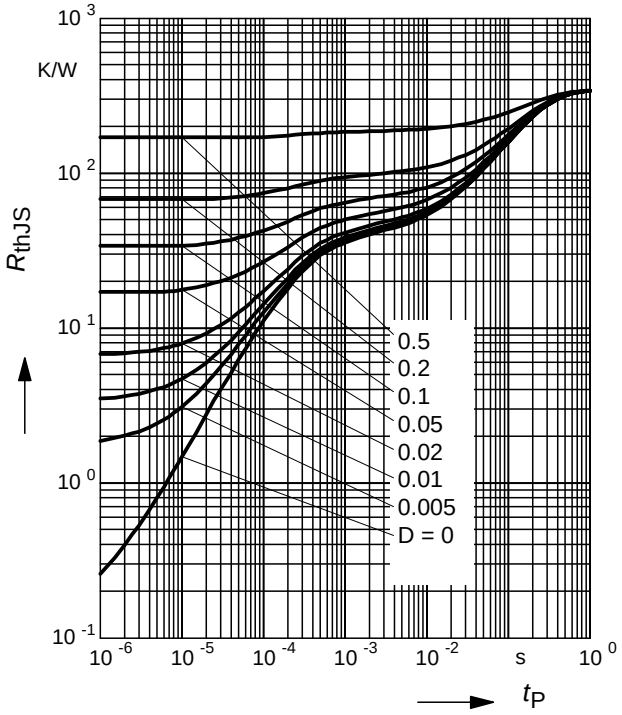
$I_{Fmax}/I_{FDC} = f(t_p)$

BAR64-02V



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

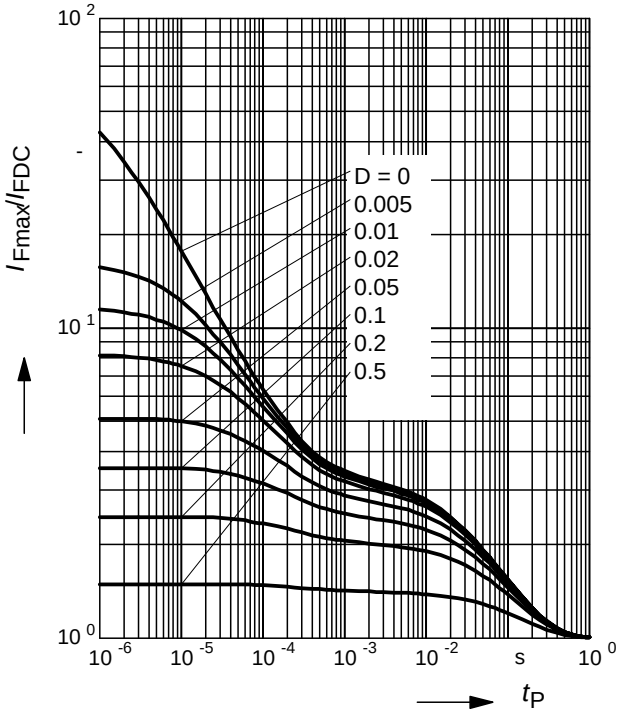
BAR64-04, BAR64-06




**Permissible Pulse Load**

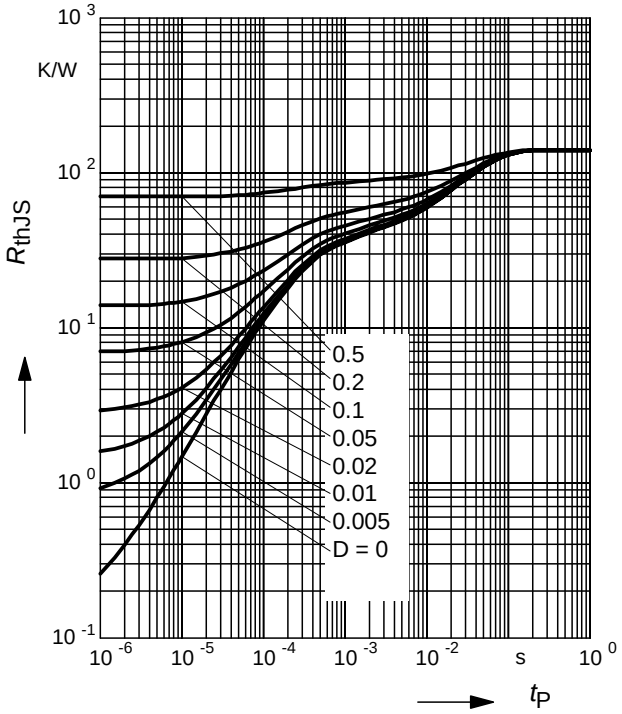
$I_{Fmax}/ I_{FDC} = f(t_p)$

BAR64-04, BAR64-06




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

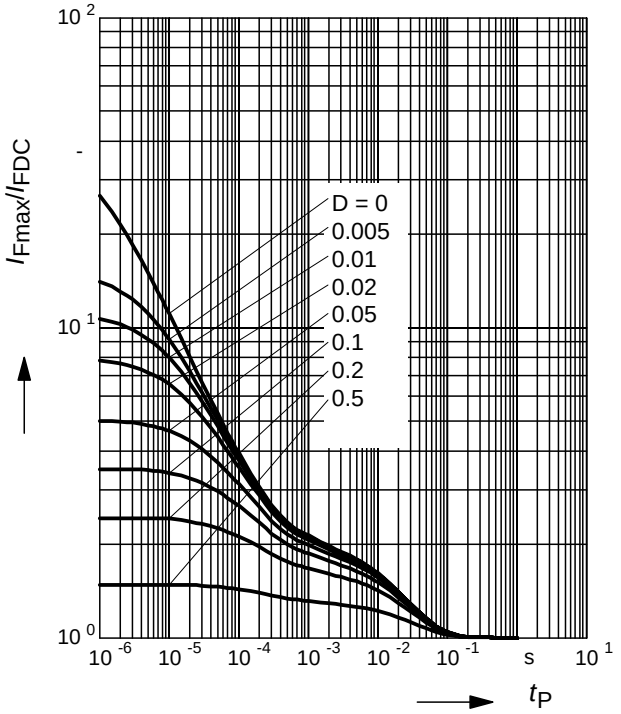
BAR64-04W, BAR64-06W




**Permissible Pulse Load**

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

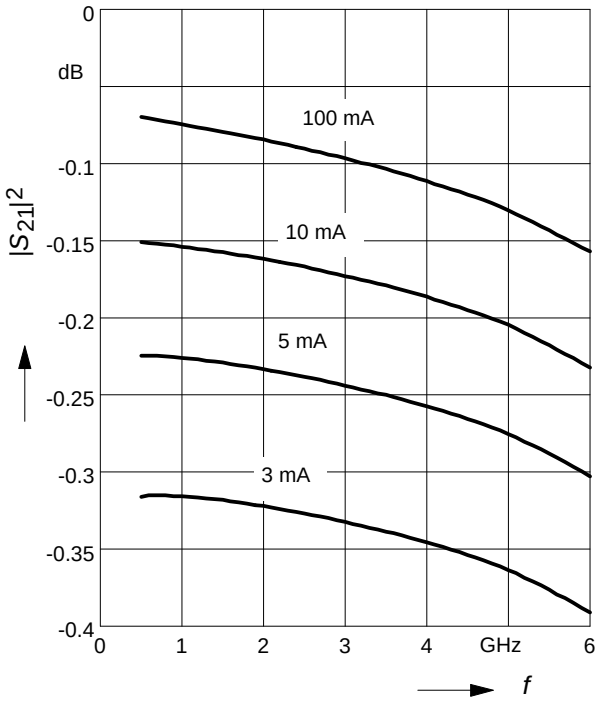
BAR64-04W, BAR64-06W



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

$I_F$ = Parameter

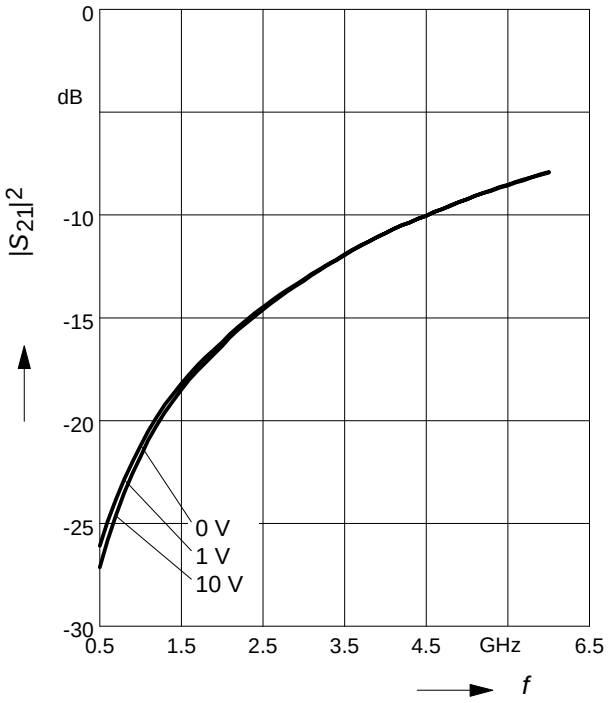
BAR64-02L in series configuration, $Z = 50\Omega$




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

$V_R$ = Parameter

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



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