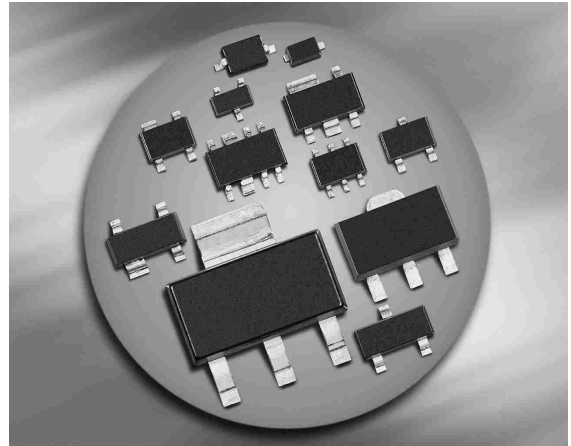


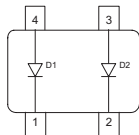
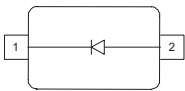
**Silicon PIN Diode**

- Series diode for mobile communication in low loss transmit-receiver switches
- Band switch for TV-tuners
- Very low forward resistance (typ.  $0.65 \Omega @ 5 \text{ mA}$ )
- Low capacitance (typ.  $0.5 \text{ pF} @ 0\text{V}$ )
- Fast switching applications



**BAR65-02L**  
**BAR65-02V**  
**BAR65-03W**

**BAR65-07**



| Type        | Package  | Configuration    | $L_S$ (nH) | Marking |
|-------------|----------|------------------|------------|---------|
| BAR65-02L * | TSLP-2-1 | single, leadless | 0.4        | NN      |
| BAR65-02V   | SC79     | single           | 0.6        | N       |
| BAR65-03W   | SOD323   | single           | 1.8        | M/blue  |
| BAR65-07    | SOT143   | parallel pair    | 2          | Ms      |

\* Preliminary Data

**Maximum Ratings** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                               | Symbol    | Value       | Unit |
|-----------------------------------------|-----------|-------------|------|
| Diode reverse voltage                   | $V_R$     | 30          | V    |
| Forward current                         | $I_F$     | 100         | mA   |
| Total power dissipation                 | $P_{tot}$ |             | mW   |
| BAR65-02L, $T_S \leq 128^\circ\text{C}$ |           | 250         |      |
| BAR65-02V, $T_S \leq 118^\circ\text{C}$ |           | 250         |      |
| BAR65-03W, $T_S \leq 113^\circ\text{C}$ |           | 250         |      |
| BAR65-07, $T_S \leq 57^\circ\text{C}$   |           | 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 <sup>1)</sup> | $R_{thJS}$ |       | K/W  |
| BAR65-02L                                |            | ≤ 90  |      |
| BAR65-02V                                |            | ≤ 130 |      |
| BAR65-03W                                |            | ≤ 145 |      |
| BAR65-07                                 |            | ≤ 370 |      |

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

| Parameter | Symbol | Values |      |      | Unit |
|-----------|--------|--------|------|------|------|
|           |        | min.   | typ. | max. |      |

**DC Characteristics**

|                                          |       |   |      |    |    |
|------------------------------------------|-------|---|------|----|----|
| Reverse current<br>$V_R = 20\text{ V}$   | $I_R$ | - | -    | 20 | nA |
| Forward voltage<br>$I_F = 100\text{ mA}$ | $V_F$ | - | 0.93 | 1  | V  |

<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

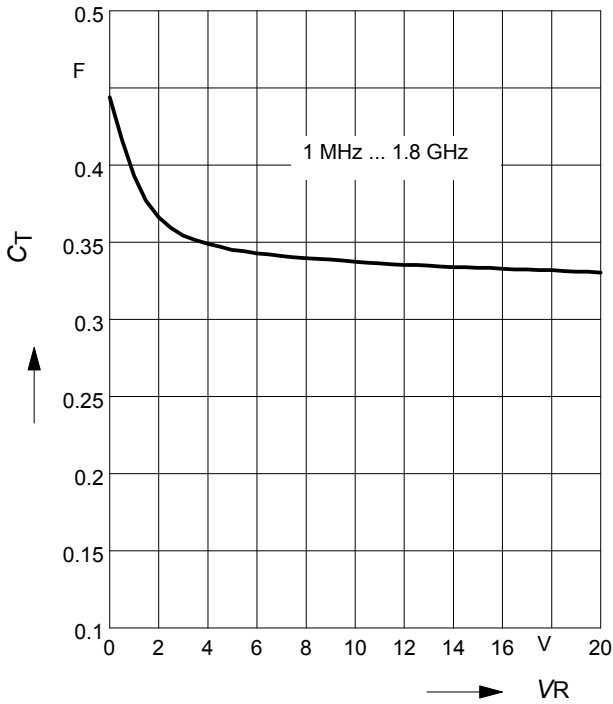
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| Parameter                                                                                                                                                        | Symbol       | Values      |                         |                  | Unit          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|-------------------------|------------------|---------------|
|                                                                                                                                                                  |              | min.        | typ.                    | max.             |               |
| <b>AC Characteristics</b>                                                                                                                                        |              |             |                         |                  |               |
| Diode capacitance<br>$V_R = 1\text{ V}, f = 1\text{ MHz}$<br>$V_R = 3\text{ V}, f = 1\text{ MHz}$<br>$V_R = 0\text{ V}, f = 100\text{ MHz} \dots 1.8\text{ GHz}$ | $C_T$        | -<br>-<br>- | 0.45<br>0.4<br>0.5      | 0.9<br>0.8<br>-  | pF            |
| Reverse parallel resistance<br>$V_R = 0\text{ V}, f = 100\text{ MHz}$<br>$V_R = 0\text{ V}, f = 1\text{ GHz}$<br>$V_R = 0\text{ V}, f = 1.8\text{ GHz}$          | $R_P$        | -<br>-<br>- | 700<br>10<br>5          | -<br>-<br>-      | k $\Omega$    |
| Forward resistance<br>$I_F = 1\text{ mA}, f = 100\text{ MHz}$<br>$I_F = 5\text{ mA}, f = 100\text{ MHz}$<br>$I_F = 10\text{ mA}, f = 100\text{ MHz}$             | $r_f$        | -<br>-<br>- | 1<br>0.65<br>0.56       | -<br>0.95<br>0.9 | $\Omega$      |
| Charge carrier life time<br>$I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ ,<br>$R_L = 100\ \Omega$                                   | $\tau_{rr}$  | -           | 80                      | -                | ns            |
| I-region width                                                                                                                                                   | $W_I$        | -           | 3.5                     | -                | $\mu\text{m}$ |
| Insertion loss <sup>1)</sup><br>$I_F = 1\text{ mA}, f = 1.8\text{ GHz}$<br>$I_F = 5\text{ mA}, f = 1.8\text{ GHz}$<br>$I_F = 10\text{ mA}, f = 1.8\text{ GHz}$   | $ S_{21} ^2$ | -<br>-<br>- | -0.08<br>-0.06<br>-0.05 | -<br>-<br>-      | dB            |
| Isolation <sup>1)</sup><br>$V_R = 0\text{ V}, f = 0.9\text{ GHz}$<br>$V_R = 0\text{ V}, f = 1.8\text{ GHz}$<br>$V_R = 0\text{ V}, f = 2.45\text{ GHz}$           | $ S_{21} ^2$ | -<br>-<br>- | -12<br>-7<br>-5         | -<br>-<br>-      |               |

<sup>1</sup>BAR65-02L in series configuration,  $Z = 50\ \Omega$

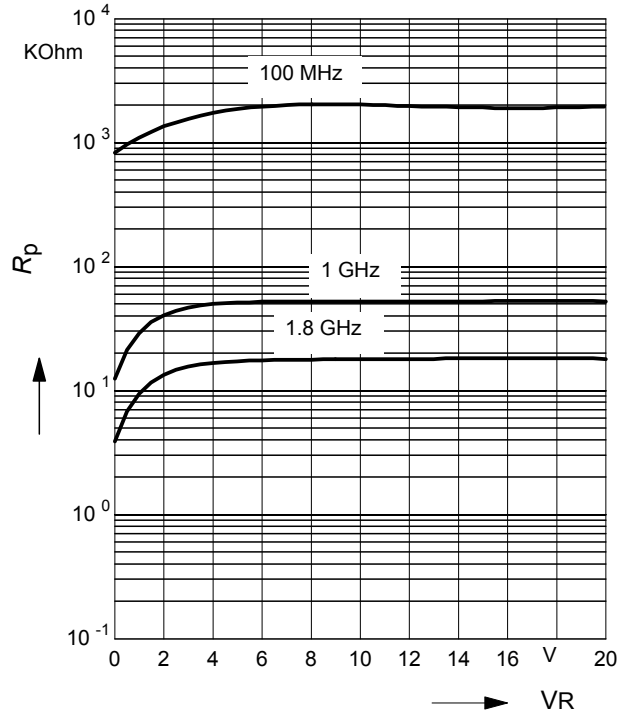
**Diode capacitance  $C_T = f(V_R)$**

$f =$  Parameter



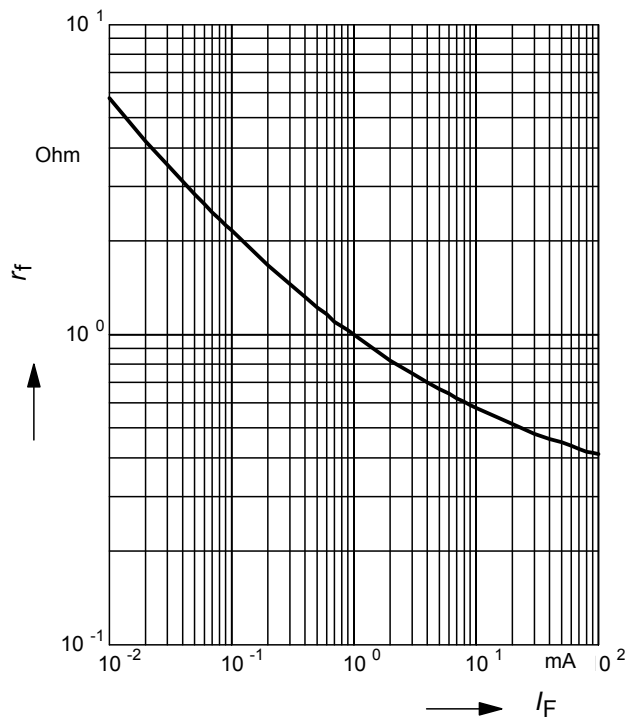
**Reverse parallel resistance  $R_P = f(V_R)$**

$f =$  Parameter



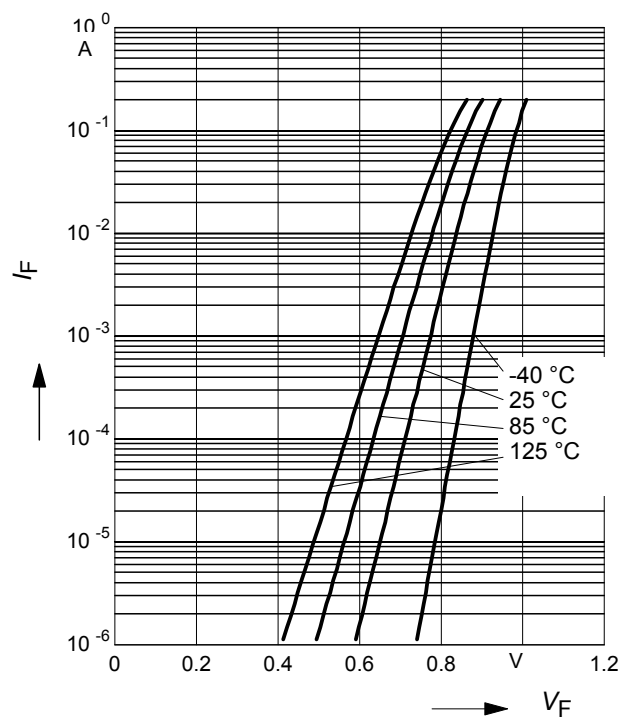
**Forward resistance  $r_f = f(I_F)$**

$f = 100\text{MHz}$



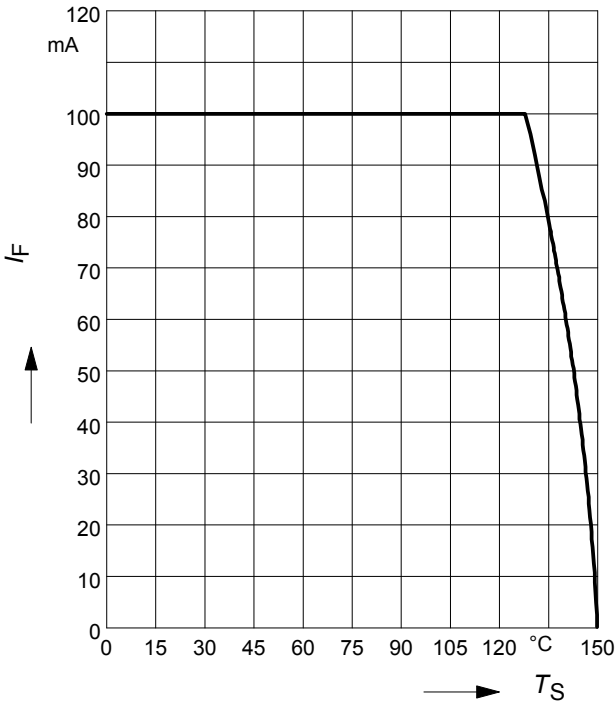
**Forward current  $I_F = f(V_F)$**

$T_A =$  Parameter



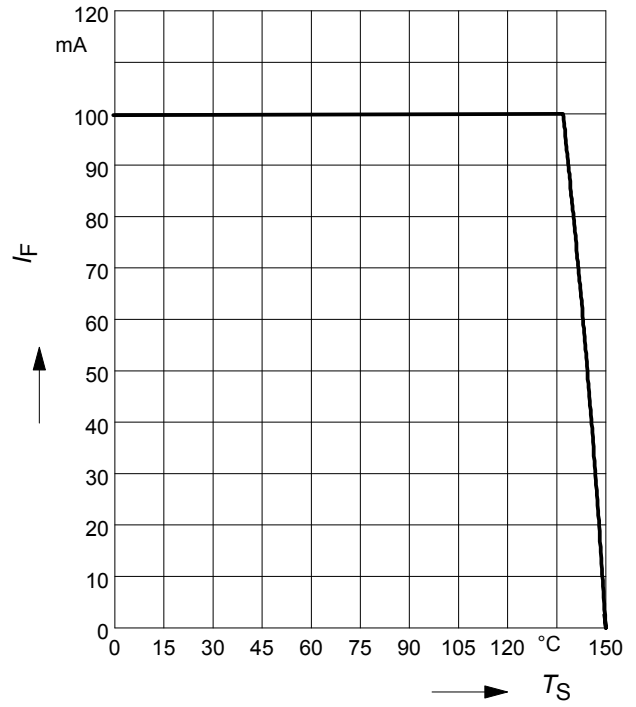
Forward current  $I_F = f(T_S)$

BAR65-02L



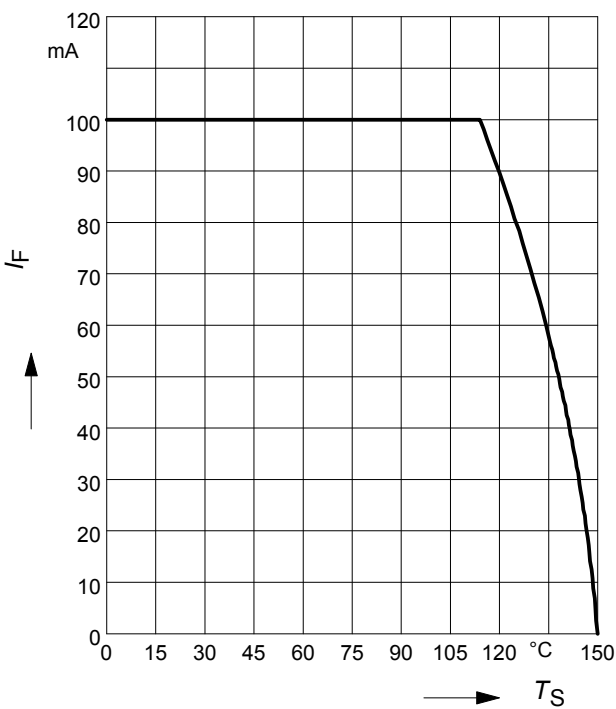
Forward current  $I_F = f(T_S)$

BAR65-02V



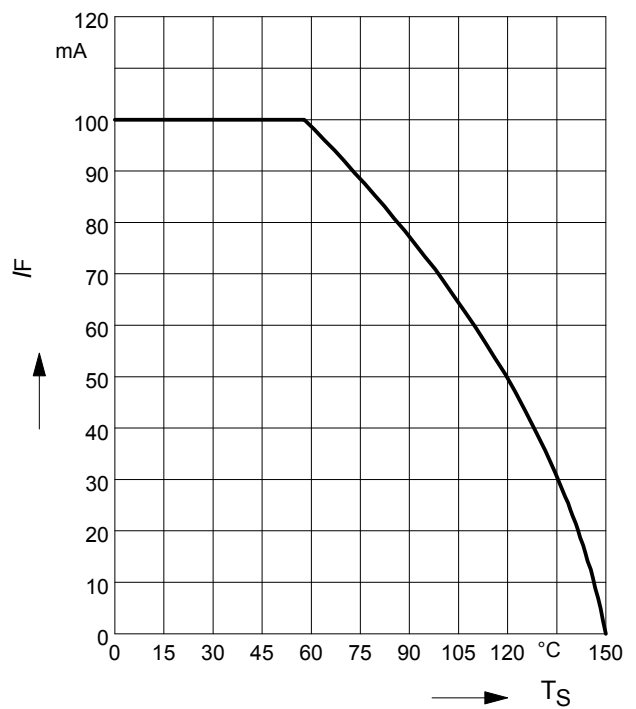
Forward current  $I_F = f(T_S)$

BAR65-03W



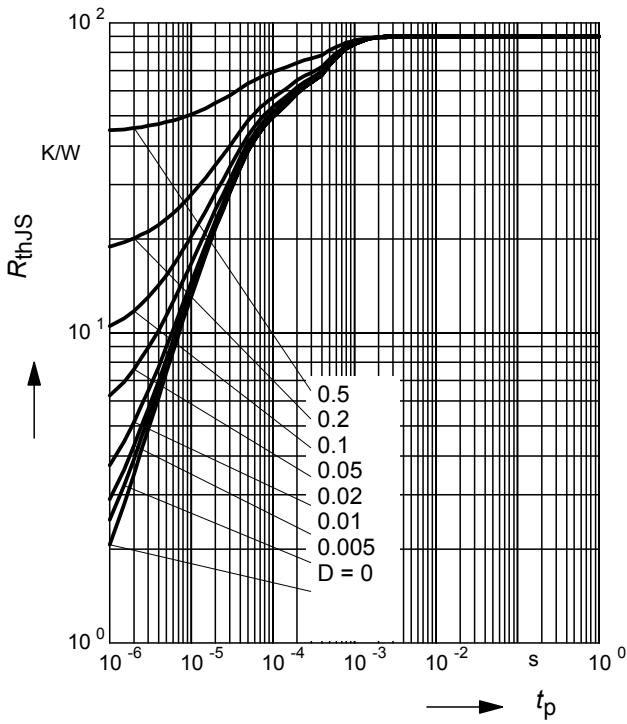
Forward current  $I_F = f(T_S)$

BAR65-07



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

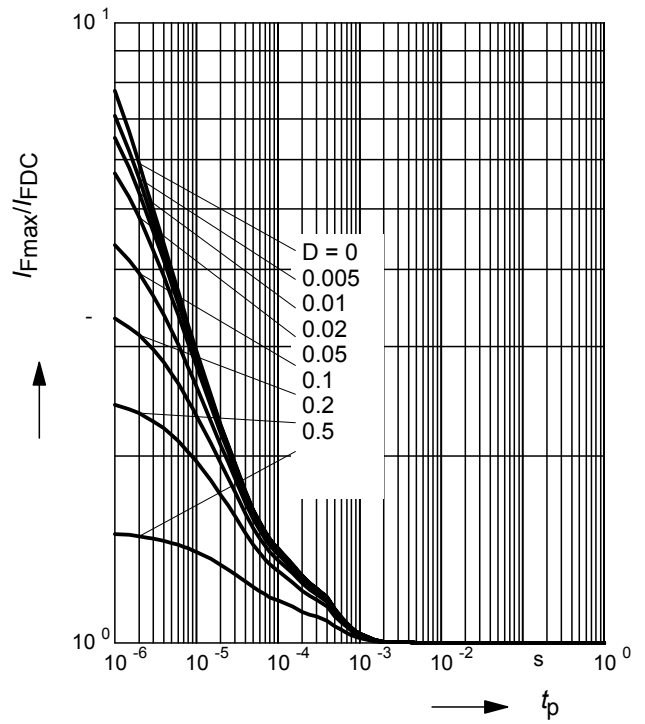
BAR65-02L



**Permissible Pulse Load**

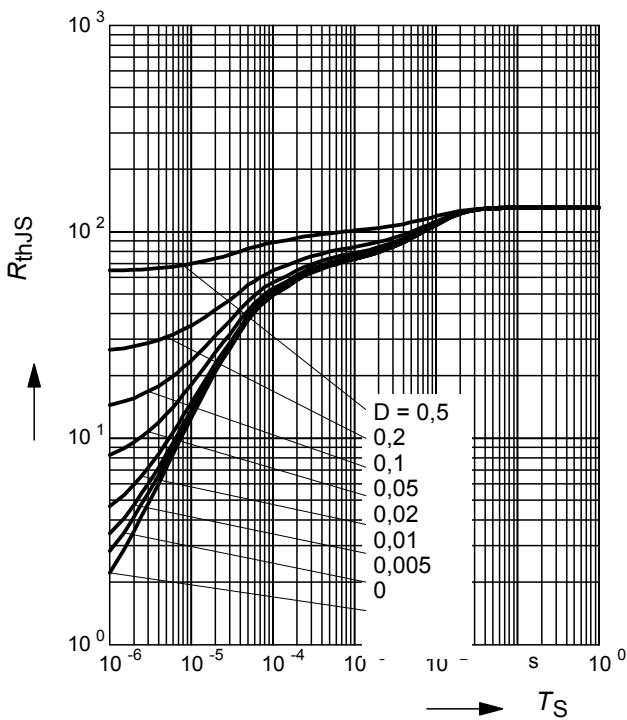
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR65-02L



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

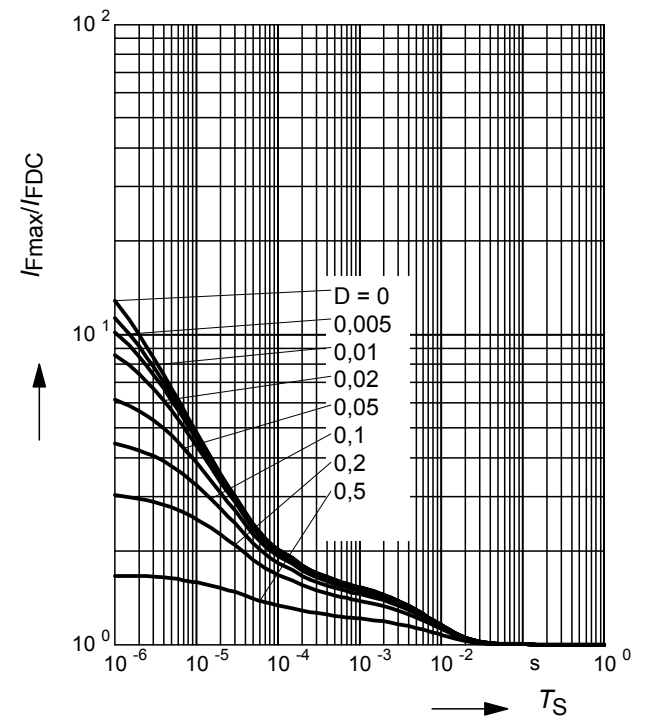
BAR65-02V



**Permissible Pulse Load**

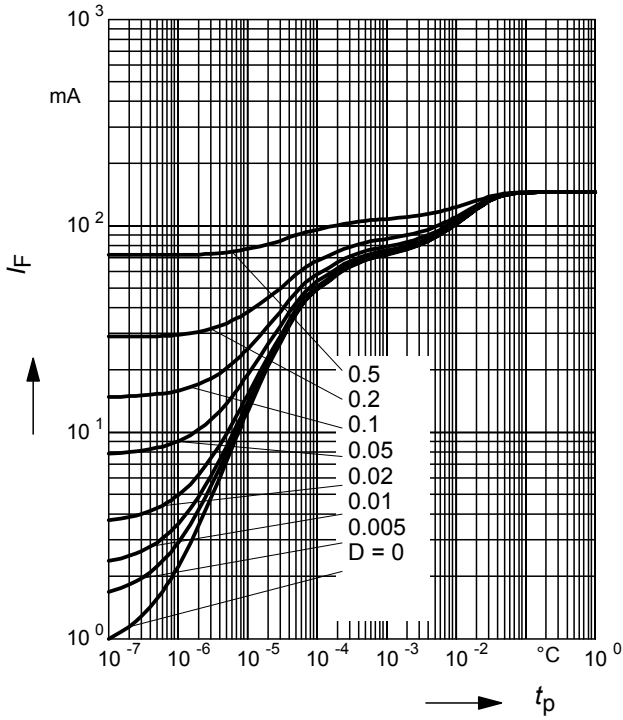
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR65-02V



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

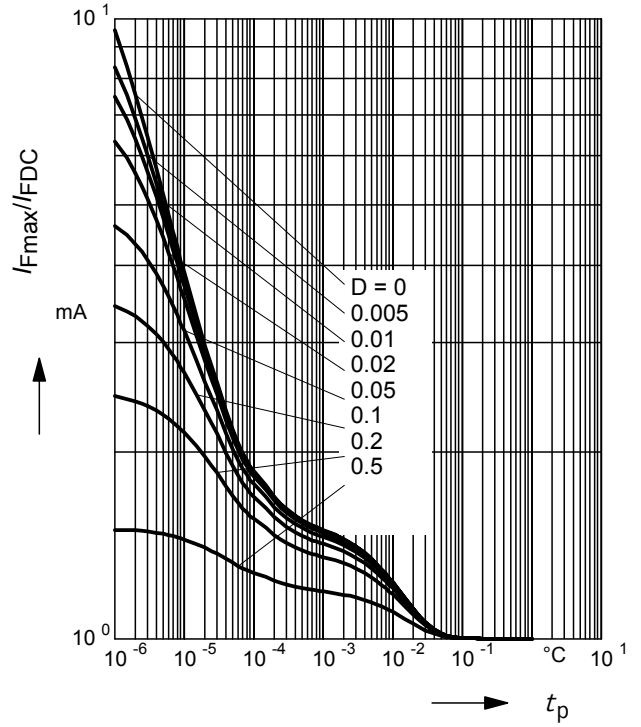
BAR65-03W



**Permissible Pulse Load**

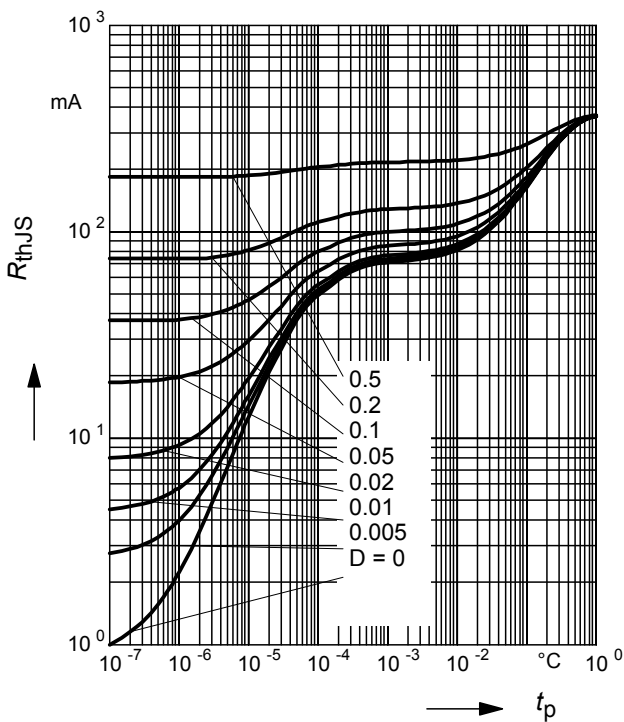
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR65-03W



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

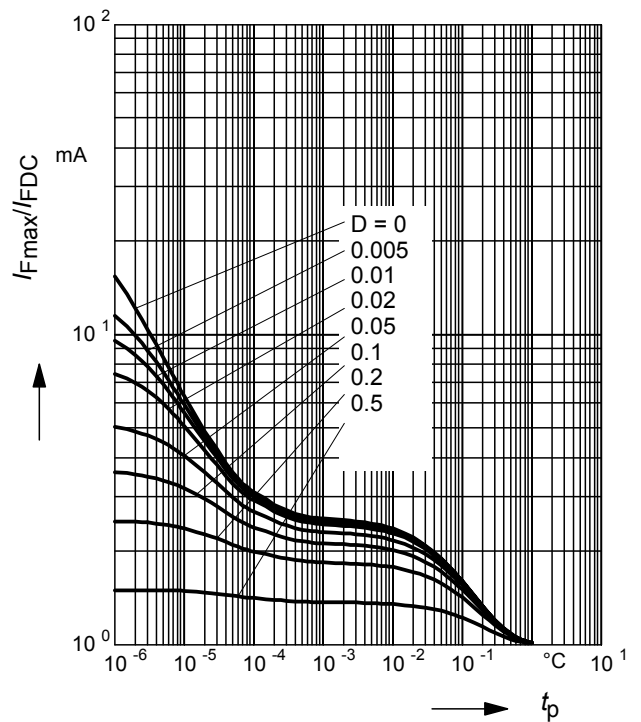
BAR65-07



**Permissible Pulse Load**

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

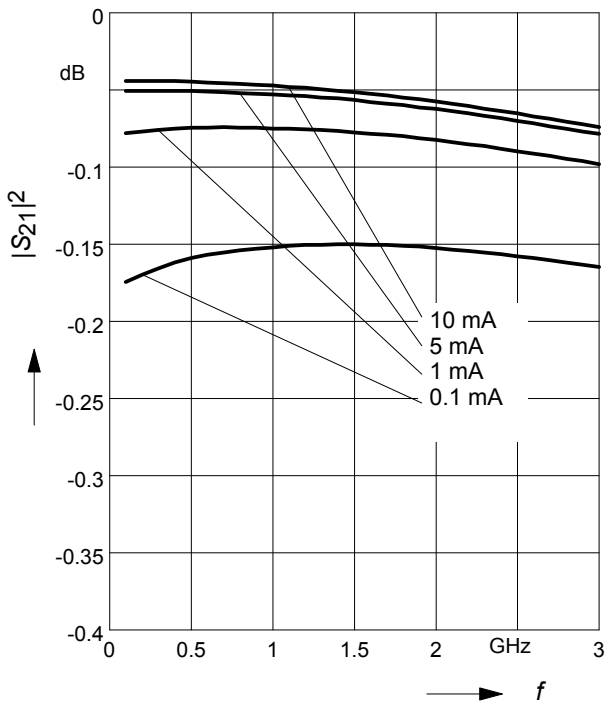
BAR65-07



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

$I_F$  = Parameter

BAR65-02L in series configuration,  $Z = 50\Omega$



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

$V_R$  = Parameter

BAR65-02L in series configuration  $Z = 50\Omega$

