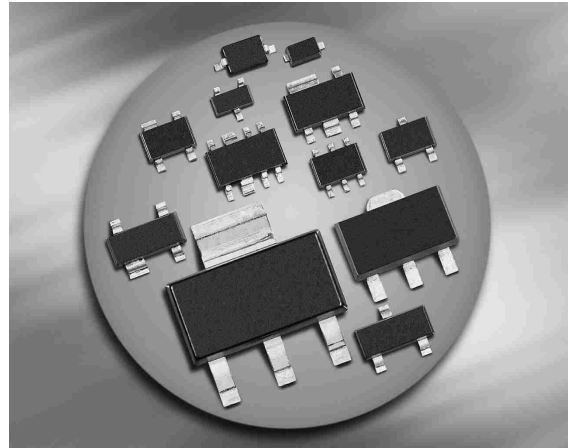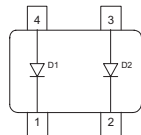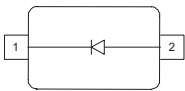**Silicon PIN Diode**

- 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 mA)

- Low capacitance (typ. 0.5 pF @ 0V)

- Fast switching applications

**BAR65-02L**  **BAR65-07**
**BAR65-02V**
**BAR65-03W**

| 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°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, $T_S \leq 128$°C | | 250 | |
| BAR65-02V, $T_S \leq 118$°C | | 250 | |
| BAR65-03W, $T_S \leq 113$°C | | 250 | |
| BAR65-07, $T_S \leq 57$°C | | 250 | |
| Junction temperature | $T_j$ | 150 | °C |
| Operating temperature range | $T_{op}$ | -55 ... 125 | |
| Storage temperature | $T_{stg}$ | -55 ... 150 | |

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## Thermal Resistance

| Parameter | Symbol | Value | Unit |
|---|---|:---:|---|
| Junction - soldering point[1] | $R_{thJS}$ | | K/W |
| BAR65-02L | | $\leq 90$ | |
| BAR65-02V | | $\leq 130$ | |
| BAR65-03W | | $\leq 145$ | |
| BAR65-07 | | $\leq 370$ | |

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

| Parameter | Symbol | Values | | | Unit |
|---|---|:---:|:---:|:---:|---|
| | | min. | typ. | max. | |
| **DC Characteristics** | | | | | |
| Reverse current $V_R$ = 20 V | $I_R$ | - | - | 20 | nA |
| Forward voltage $I_F$ = 100 mA | $V_F$ | - | 0.93 | 1 | V |

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

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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 |
| $V_R$ = 1 V, $f$ = 1 MHz | | - | 0.45 | 0.9 | |
| $V_R$ = 3 V, $f$ = 1 MHz | | - | 0.4 | 0.8 | |
| $V_R$ = 0 V, $f$ = 100 MHz ... 1.8 GHz | | - | 0.5 | - | |
| Reverse parallel resistance | $R_P$ | | | | kΩ |
| $V_R$ = 0 V, $f$ = 100 MHz | | - | 700 | - | |
| $V_R$ = 0 V, $f$ = 1 GHz | | - | 10 | - | |
| $V_R$ = 0 V, $f$ = 1.8 GHz | | - | 5 | - | |
| Forward resistance | $r_f$ | | | | Ω |
| $I_F$ = 1 mA, $f$ = 100 MHz | | - | 1 | - | |
| $I_F$ = 5 mA, $f$ = 100 MHz | | - | 0.65 | 0.95 | |
| $I_F$ = 10 mA, $f$ = 100 MHz | | - | 0.56 | 0.9 | |
| Charge carrier life time | $\tau_{rr}$ | - | 80 | - | ns |
| $I_F$ = 10 mA, $I_R$ = 6 mA, measured at $I_R$ = 3 mA, $R_L$ = 100 Ω | | | | | |
| I-region width | $W_I$ | - | 3.5 | - | µm |
| Insertion loss[1] | $|S_{21}|^2$ | | | | dB |
| $I_F$ = 1 mA, $f$ = 1.8 GHz | | - | -0.08 | - | |
| $I_F$ = 5 mA, $f$ = 1.8 GHz | | - | -0.06 | - | |
| $I_F$ = 10 mA, $f$ = 1.8 GHz | | - | -0.05 | - | |
| Isolation[1] | $|S_{21}|^2$ | | | | |
| $V_R$ = 0 V, $f$ = 0.9 GHz | | - | -12 | - | |
| $V_R$ = 0 V, $f$ = 1.8 GHz | | - | -7 | - | |
| $V_R$ = 0 V, $f$ = 2.45 GHz | | - | -5 | - | |

[1]BAR65-02L in series configuration, $Z$ = 50Ω

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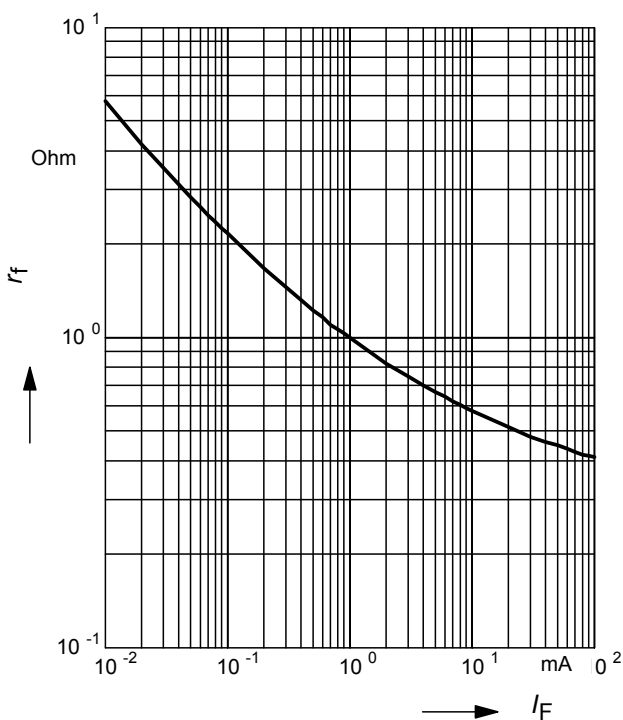
**Diode capacitance** $C_T = f\ (V_R)$

$f$ = Parameter
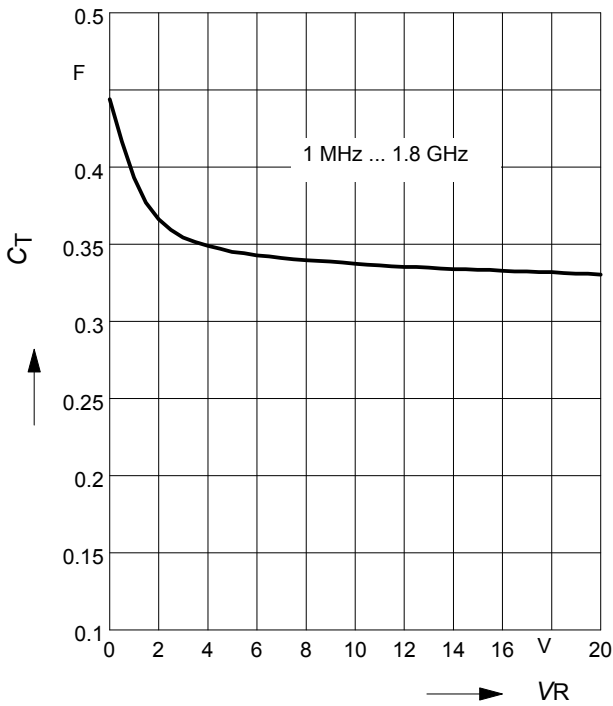


**Reverse parallel resistance** $R_P = f(V_R)$

$f$ = Parameter
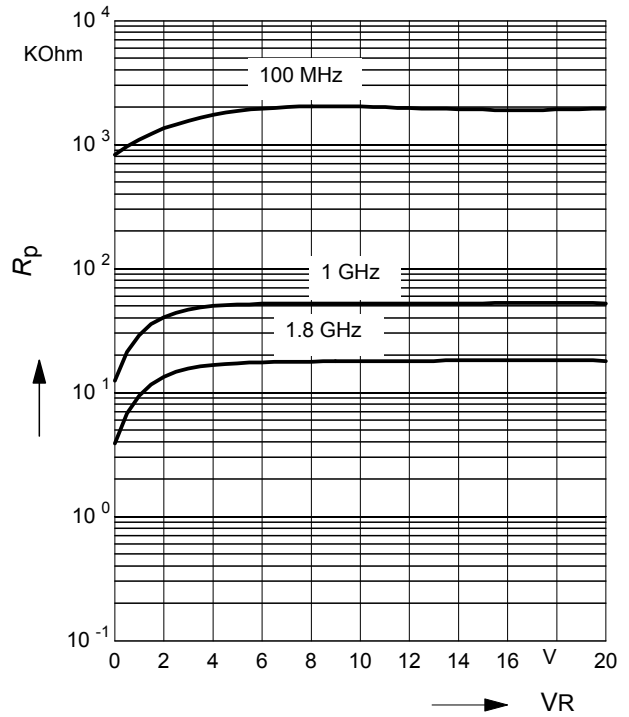


**Forward resistance** $r_f = f\ (I_F)$

$f$ = 100MHz



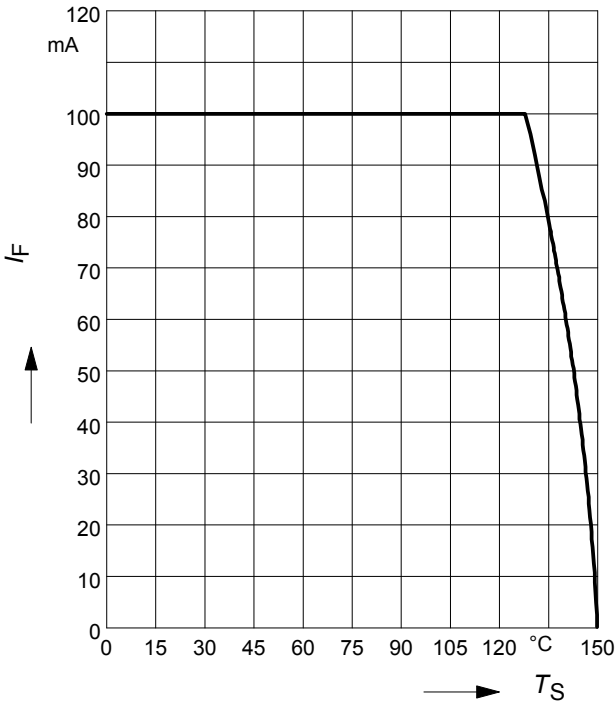**Forward current** $I_F = f\ (V_F)$

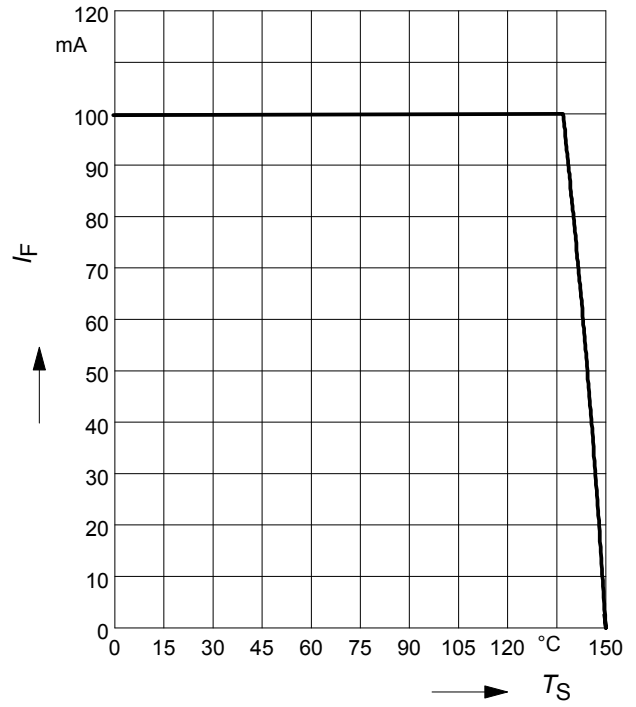$T_A$ = Parameter

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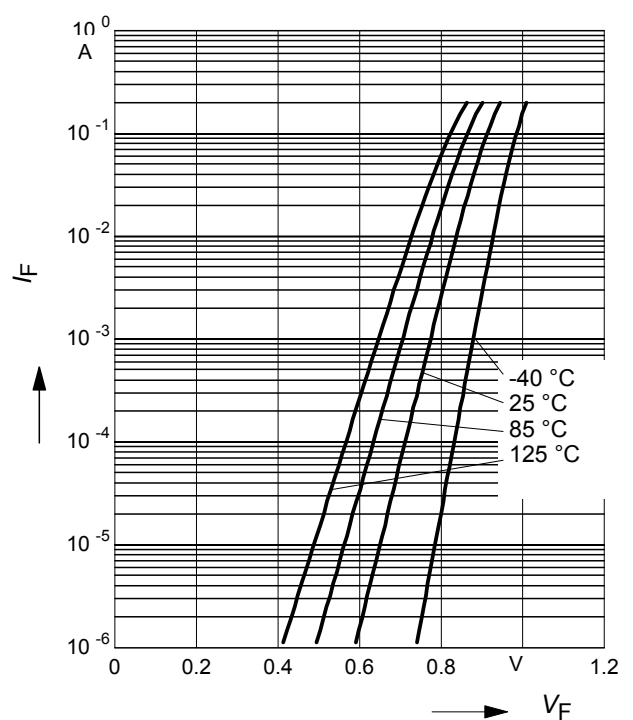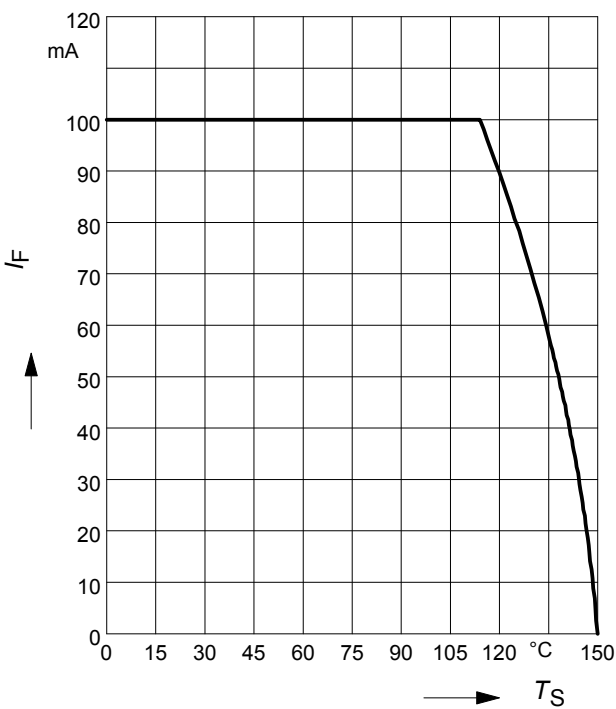
**Forward current** $I_F = f\,(T_S)$

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

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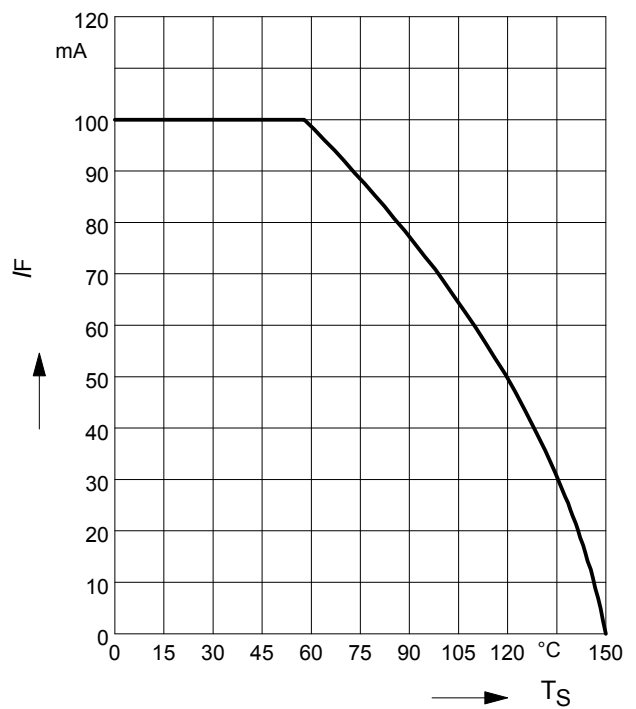
**Permissible Puls Load** $R_{thJS} = f\left(t_p\right)$

BAR65-02L
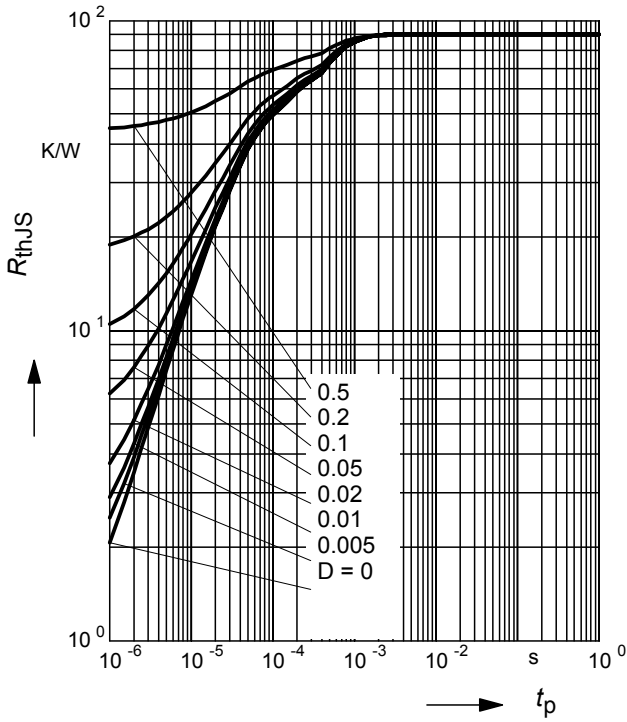


**Permissible Pulse Load**

$I_{Fmax}/\,I_{FDC} = f\left(t_p\right)$

BAR65-02L
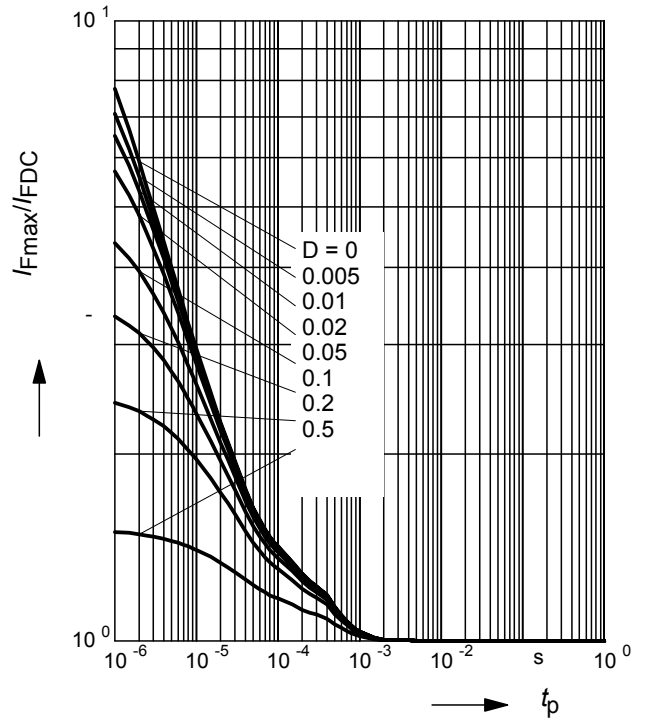


**Permissible Puls Load** $R_{thJS} = f\left(t_p\right)$

BAR65-02V
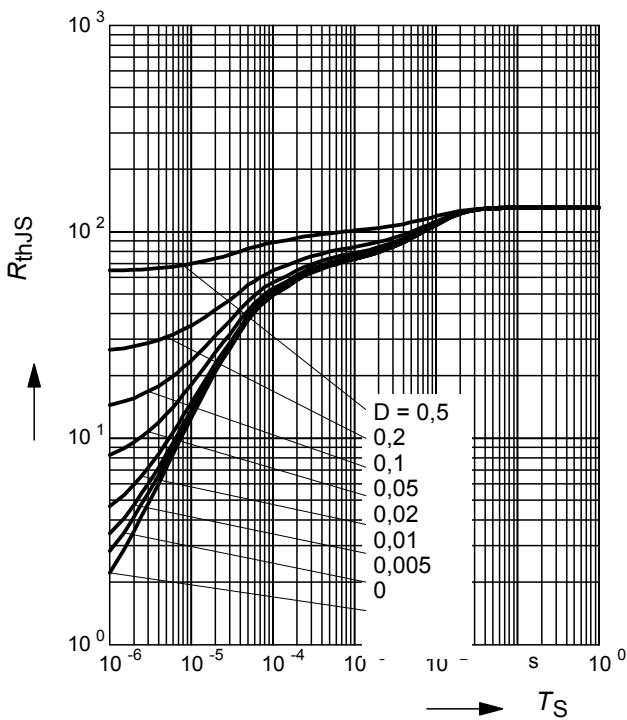


**Permissible Pulse Load**

$I_{Fmax}/\,I_{FDC} = f\left(t_p\right)$

BAR65-02V

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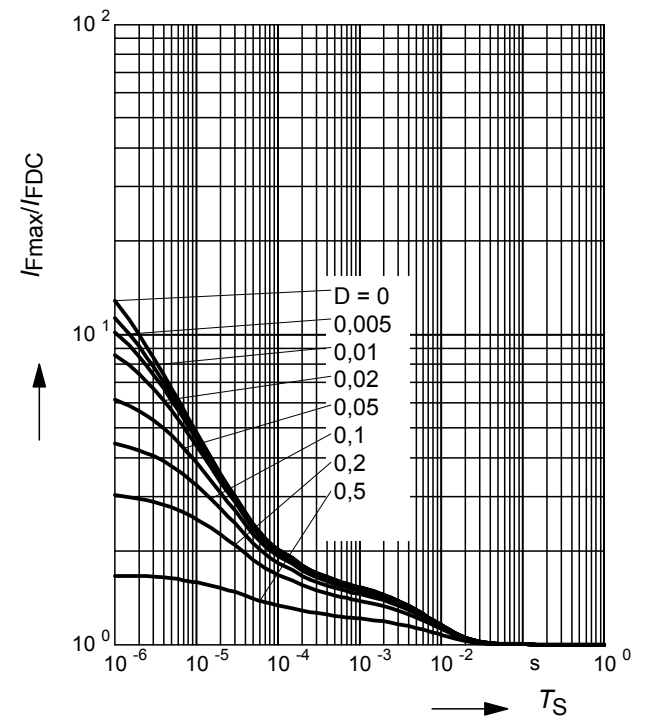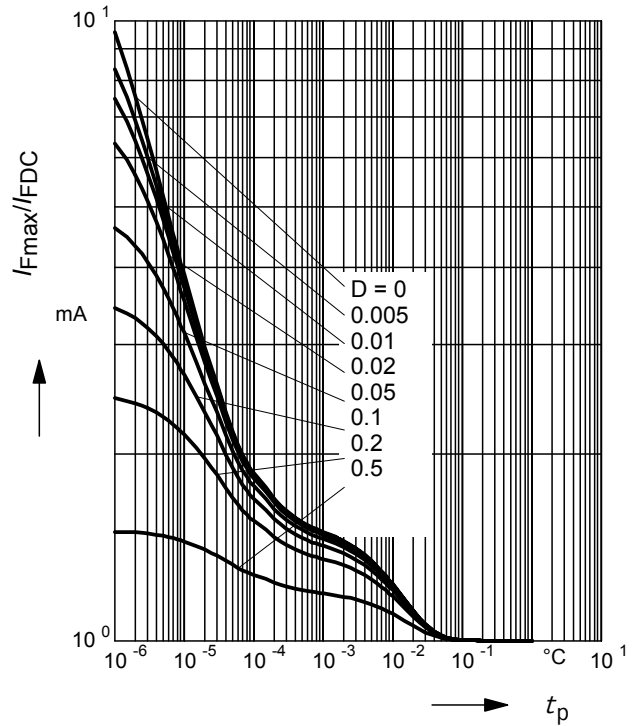
**Permissible Puls Load** $R_{thJS} = f(t_p)$
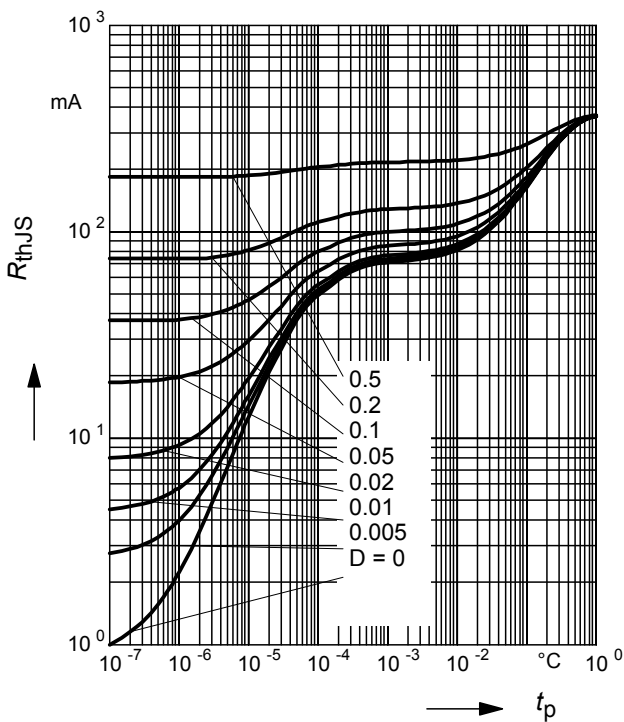
BAR65-03W
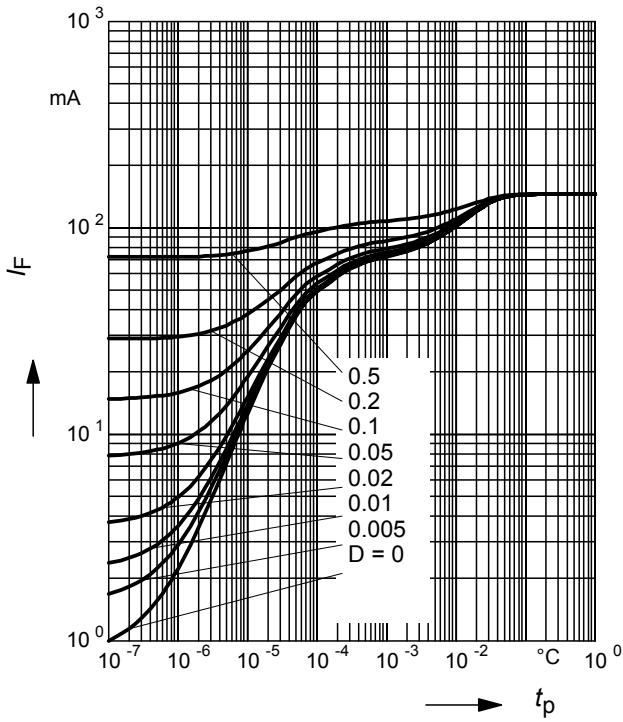


**Permissible Pulse Load**

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

BAR65-03W



**Permissible Puls Load** $R_{thJS} = f(t_p)$
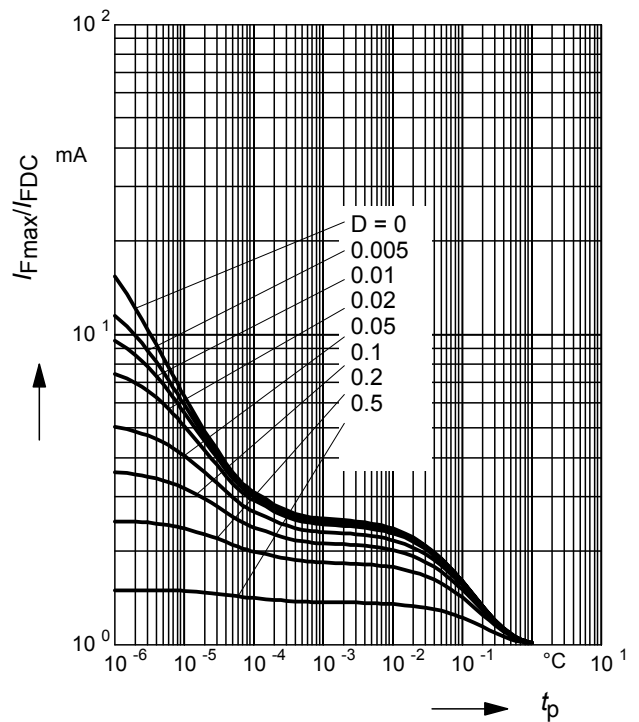
BAR65-07
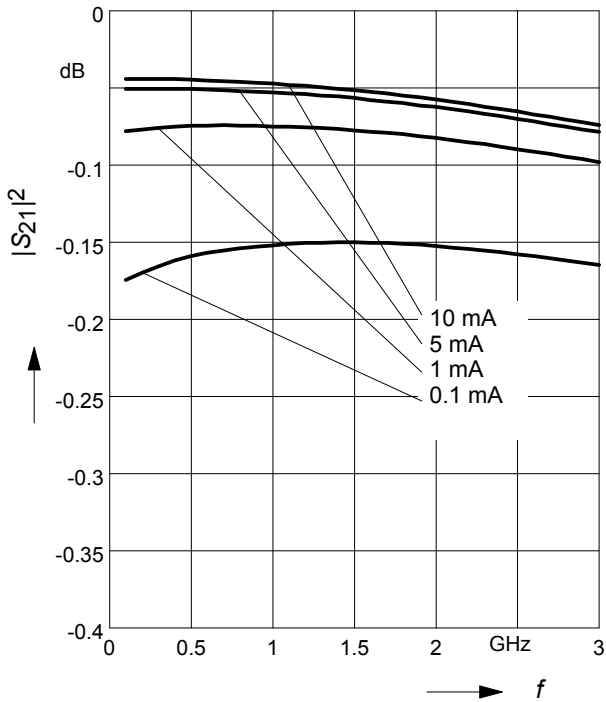


**Permissible Pulse Load**

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

BAR65-07

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**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 $Z = 50\Omega$

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