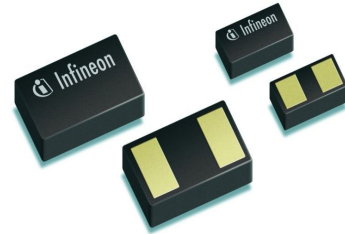
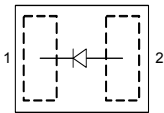


### Silicon PIN Diode

- Optimized for antenna switches in hand held applications
- Very low capacitance at zero volts reverse bias at frequencies above 1GHz (typ. 0.19 pF)
- Low forward resistance (typ.  $0.8\Omega$  @  $I_F = 10\text{mA}$ )
- Very low signal distortion
- Pb-free (RoHS compliant) package



### BAR89-02LRH



| Type        | Package  | Configuration    | $L_S(\text{nH})$ | Marking |
|-------------|----------|------------------|------------------|---------|
| BAR89-02LRH | TSLP-2-7 | single, leadless | 0.4              | R       |

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

| Parameter                                               | Symbol           | Value       | Unit             |
|---------------------------------------------------------|------------------|-------------|------------------|
| Diode reverse voltage                                   | $V_R$            | 80          | V                |
| Forward current                                         | $I_F$            | 100         | mA               |
| Total power dissipation<br>$T_S \leq 133^\circ\text{C}$ | $P_{\text{tot}}$ | 250         | mW               |
| Junction temperature                                    | $T_j$            | 150         | $^\circ\text{C}$ |
| Operating temperature range                             | $T_{\text{op}}$  | -55 ... 125 |                  |
| Storage temperature                                     | $T_{\text{stg}}$ | -55 ... 150 |                  |

### Thermal Resistance

| Parameter                                | Symbol            | Value     | Unit |
|------------------------------------------|-------------------|-----------|------|
| Junction - soldering point <sup>1)</sup> | $R_{\text{thJS}}$ | $\leq 65$ | K/W  |

<sup>1)</sup>For calculation of  $R_{\text{thJA}}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

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

| Parameter                                          | Symbol     | Values |              |            | Unit |
|----------------------------------------------------|------------|--------|--------------|------------|------|
|                                                    |            | min.   | typ.         | max.       |      |
| DC Characteristics                                 |            |        |              |            |      |
| Breakdown voltage<br>$I_{(BR)} = 5 \mu A$          | $V_{(BR)}$ | 80     | -            | -          | V    |
| Reverse current<br>$V_R = 60 V$                    | $I_R$      | -      | -            | 50         | nA   |
| Forward voltage<br>$I_F = 10 mA$<br>$I_F = 100 mA$ | $V_F$      | -<br>- | 0.83<br>0.95 | 0.9<br>1.1 | V    |

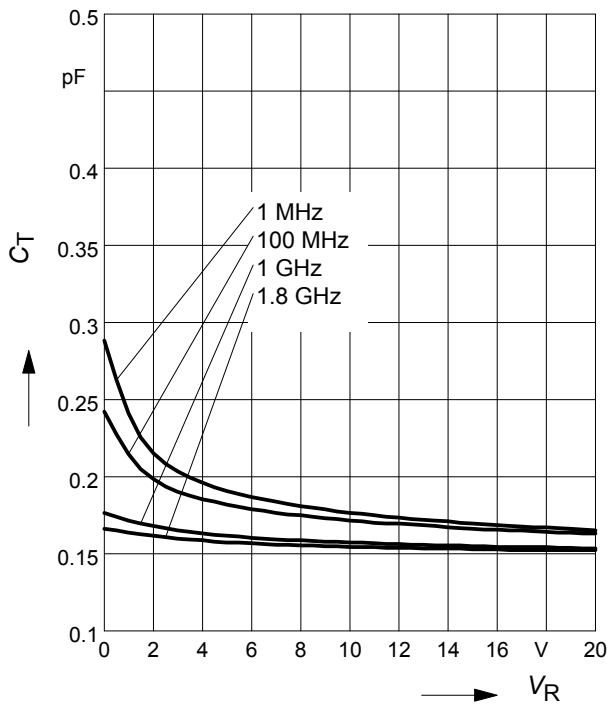
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                                                                                                             | Symbol      | Values           |                              |                     | Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|------------------------------|---------------------|------|
|                                                                                                                                                                                       |             | min.             | typ.                         | max.                |      |
| AC Characteristics                                                                                                                                                                    |             |                  |                              |                     |      |
| Diode capacitance<br>$V_R = 1\text{ V}, f = 1\text{ MHz}$<br>$V_R = 0\text{ V}, f = 100\text{ MHz}$<br>$V_R = 0\text{ V}, f = 1\text{ GHz}$<br>$V_R = 0\text{ V}, f = 1.8\text{ GHz}$ | $C_T$       | -<br>-<br>-<br>- | 0.25<br>0.25<br>0.19<br>0.18 | 0.35<br>-<br>-<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>-      | 35<br>5<br>3.5               | -<br>-<br>-         | kΩ   |
| 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>-      | 3<br>1.2<br>0.8              | -<br>-<br>1.5       | Ω    |
| Charge carrier life time<br>$I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ ,<br>$R_L = 100\text{ }\Omega$                                                  | $\tau_{rr}$ | -                | 800                          | -                   | ns   |
| I-region width                                                                                                                                                                        | $W_I$       | -                | 19                           | -                   | μm   |
| 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>$I_F = 10\text{ mA}, f = 1.8\text{ GHz}$                        | $I_L$       | -<br>-<br>-      | 0.23<br>0.1<br>0.08          | -<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>$V_R = 0\text{ V}, f = 2.45\text{ GHz}$                                | $I_{SO}$    | -<br>-<br>-      | 19<br>14<br>11               | -<br>-<br>-         |      |
|                                                                                                                                                                                       |             |                  |                              |                     |      |
|                                                                                                                                                                                       |             |                  |                              |                     |      |

<sup>1)</sup>BAR89-02LRH in series configuration,  $Z = 50\Omega$

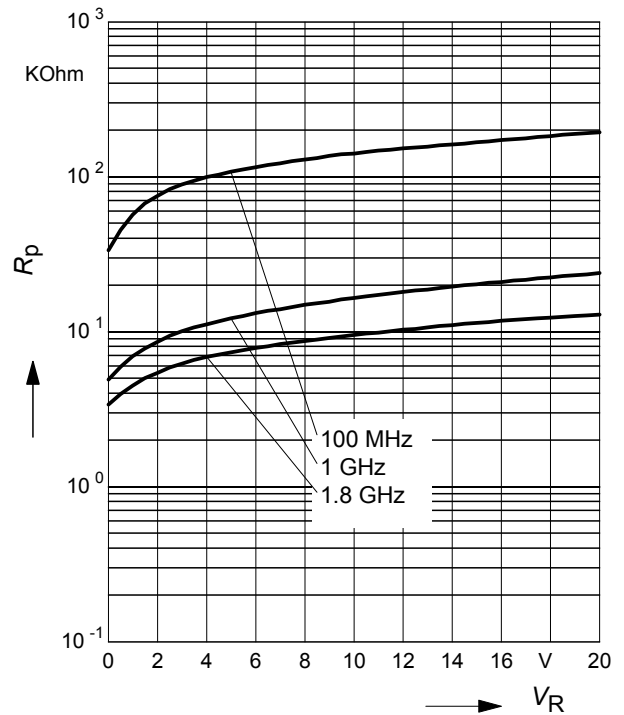
**Diode capacitance  $C_T = f(V_R)$**

$f$  = Parameter



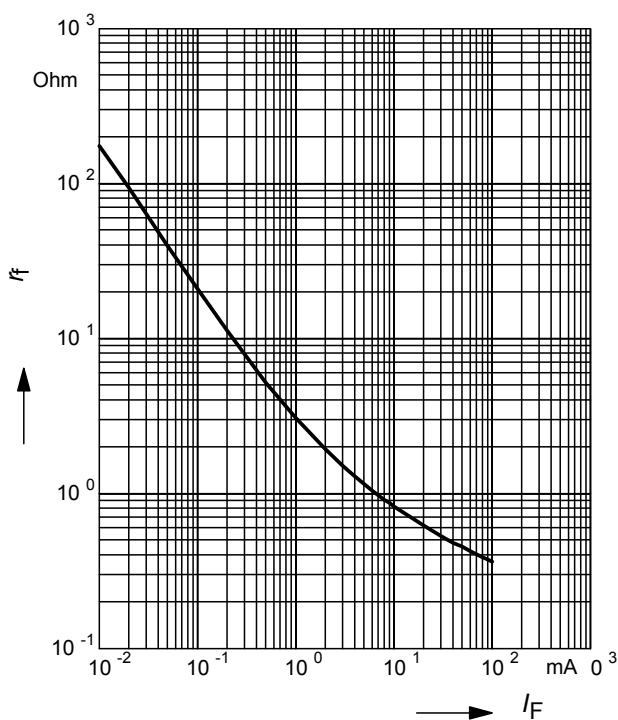
**Reverse parallel resistance  $R_P = f(V_R)$**

$f$  = Parameter



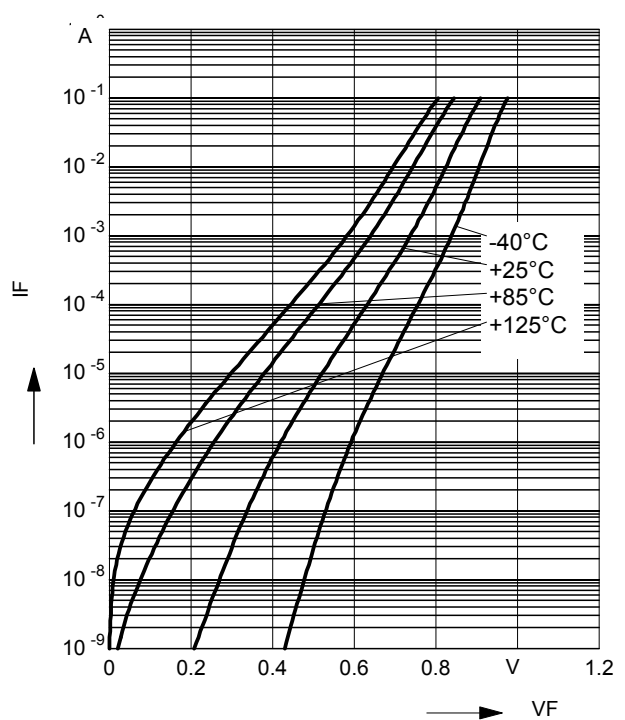
**Forward resistance  $r_f = f(I_F)$**

$f$  = 100MHz



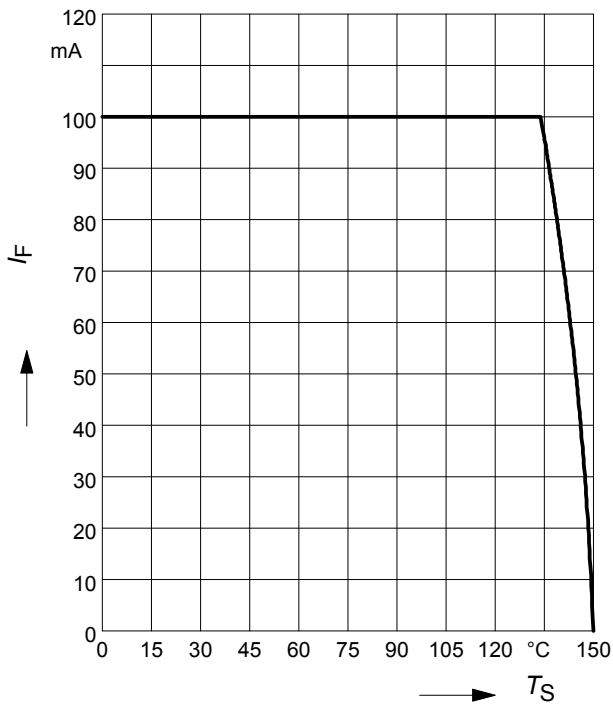
**Forward current  $I_F = f(V_F)$**

$T_A$  = Parameter

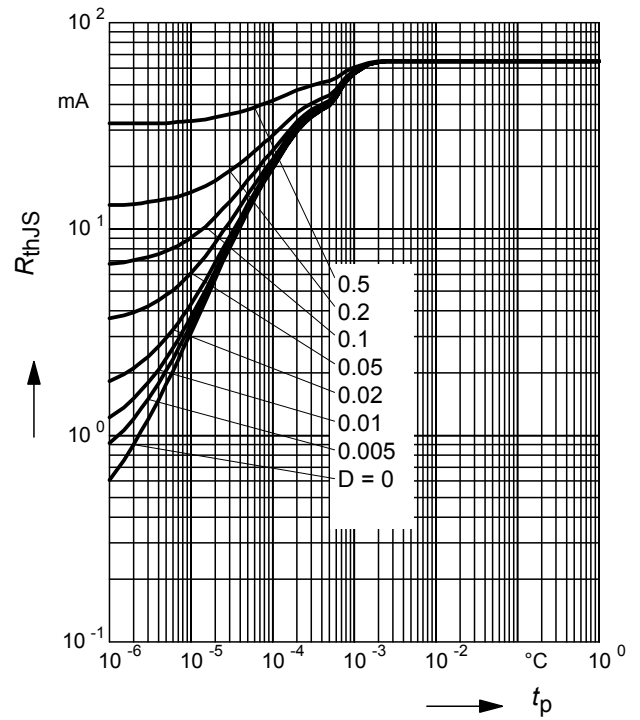


**Forward current  $I_F = f(T_S)$** 

BAR89-02LRH

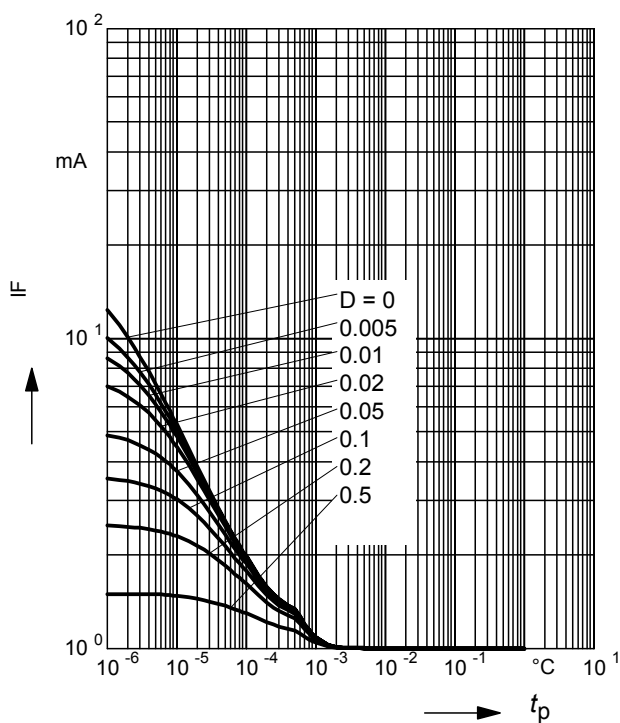

**Permissible Puls Load  $R_{thJS} = f(t_p)$** 

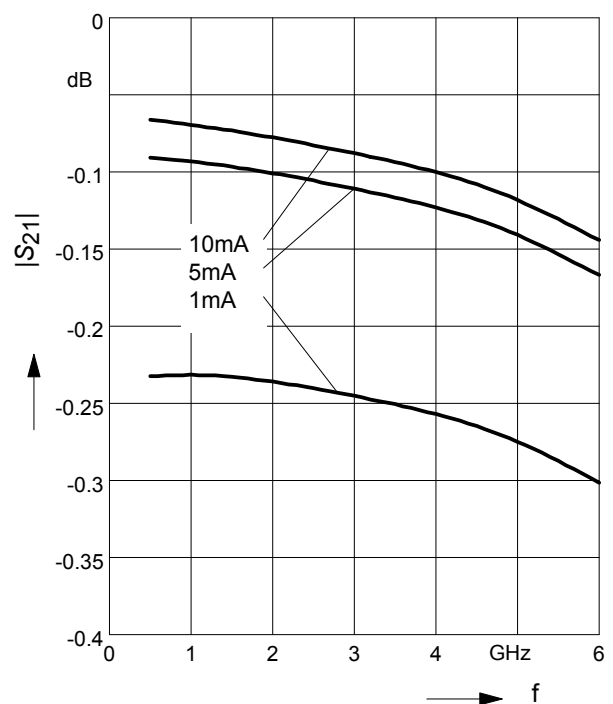
BAR89-02LRH


**Permissible Pulse Load**

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

BAR89-02LRH

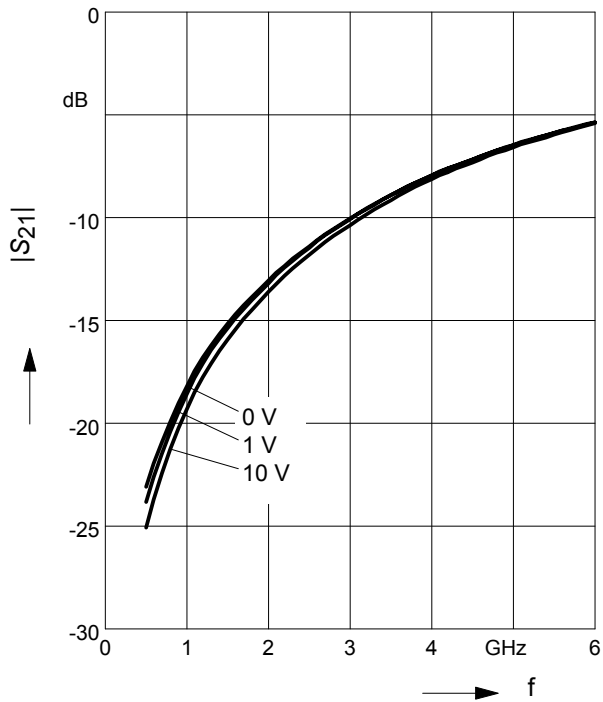

**Insertion loss  $I_L = -|S_{21}|^2 = f(f)$** 
 $I_F$  = Parameter

 BAR89-02LRH in series configuration,  $Z = 50\Omega$ 


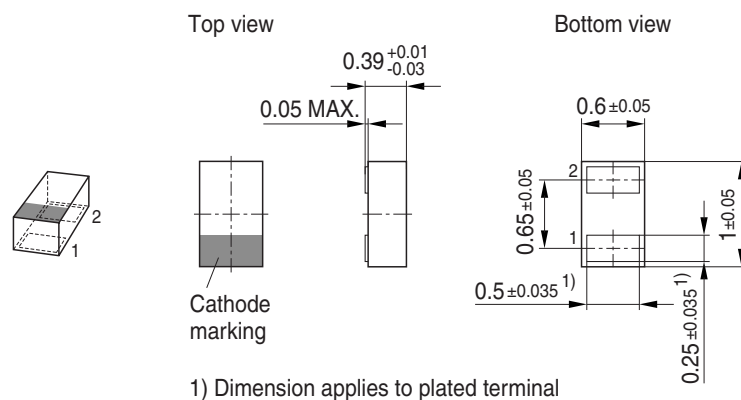
**Isolation**  $I_{SO} = -|S_{21}|^2 = f(f)$

$V_R$  = Parameter

BAR89-02LRH in series configuration,  $Z = 50\Omega$

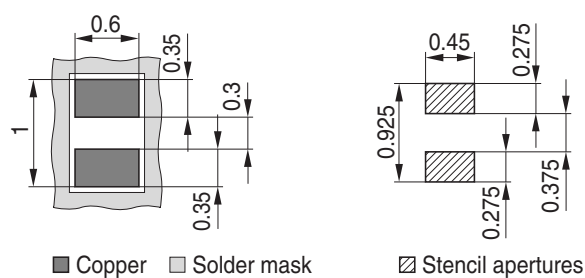


## Package Outline

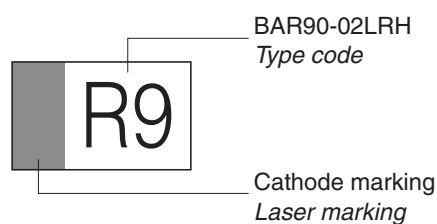


## Foot Print

For board assembly information please refer to Infineon website "Packages"



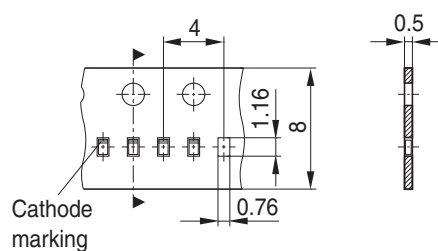
## Marking Layout (Example)



## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel

Reel ø330 mm = 50.000 Pieces/Reel (optional)



**Edition 2009-11-16**

**Published by  
Infineon Technologies AG  
81726 Munich, Germany**

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