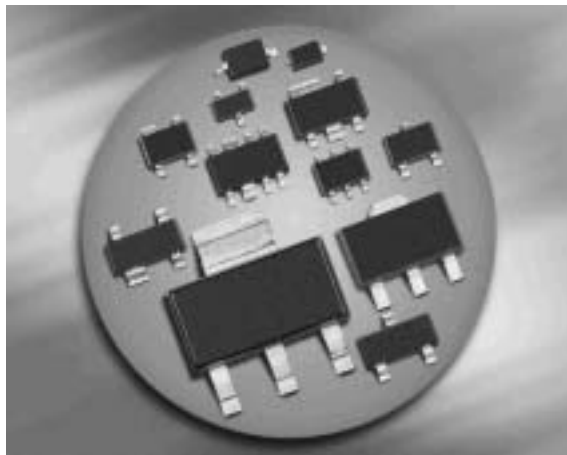
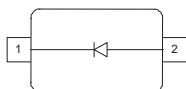


## Silicon PIN Diode

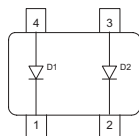
- Optimized for low current antenna switches in hand held applications
- Very low forward resistance  
(typ.  $1.5 \Omega$  @  $I_F = 1 \text{ mA}$ )
- Low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.28 pF)
- Very low signal distortion
- Pb-free (RoHS compliant) package<sup>1)</sup>
- Qualified according AEC Q101



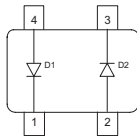
**BAR88-02LRH**  
**BAR88-02V**



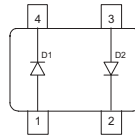
**BAR88-07LRH**



**BAR88-099LRH**



**BAR88-098LRH**



| Type         | Package  | Configuration           | $L_S(\text{nH})$ | Marking |
|--------------|----------|-------------------------|------------------|---------|
| BAR88-02LRH  | TSLP-2-7 | single, leadless        | 0.4              | U8      |
| BAR88-02V    | SC79     | single                  | 0.6              | U       |
| BAR88-07LRH  | TSLP-4-7 | parallel pair, leadless | 0.4              | T8      |
| BAR88-098LRH | TSLP-4-7 | anti-parallel, leadless | 0.4              | 98      |
| BAR88-099LRH | TSLP-4-7 | anti parallel, leadless | 0.4              | S8      |

<sup>1</sup>Pb-containing package may be available upon special request

**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>BAR88-02LRH, -07LRH $T_S \leq 133^\circ\text{C}$<br>BAR88-02V, $T_S \leq 123^\circ\text{C}$<br>BAR88-098LRH, -099LRH $T_S \leq 133^\circ\text{C}$ | $P_{\text{tot}}$ | 250<br>250<br>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><br>BAR88-02LRH, -07LRH<br>BAR88-02V<br>BAR88-098LRH, -099LRH | $R_{\text{thJS}}$ | $\leq 65$<br>$\leq 105$<br>$\leq 65$ | K/W  |

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

| Parameter                                                                           | Symbol            | Values |              |            | Unit |
|-------------------------------------------------------------------------------------|-------------------|--------|--------------|------------|------|
|                                                                                     |                   | min.   | typ.         | max.       |      |
| DC Characteristics                                                                  |                   |        |              |            |      |
| Breakdown voltage<br>$I_{(\text{BR})} = 5 \mu\text{A}$                              | $V_{(\text{BR})}$ | 80     | -            | -          | V    |
| Reverse current<br>$V_{\text{R}} = 60 \text{ V}$                                    | $I_{\text{R}}$    | -      | -            | 50         | nA   |
| Forward voltage<br>$I_{\text{F}} = 1 \text{ mA}$<br>$I_{\text{F}} = 100 \text{ mA}$ | $V_{\text{F}}$    | -<br>- | 0.75<br>0.95 | 0.9<br>1.2 | V    |

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

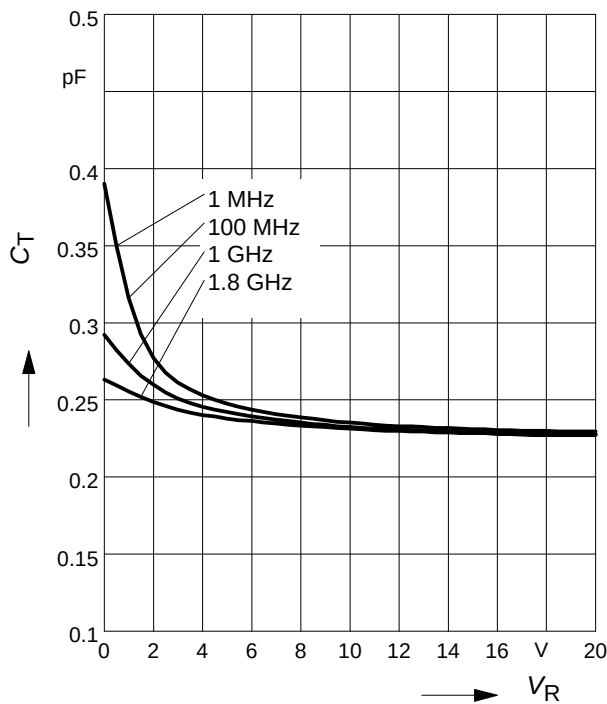
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                                                                                                             | Symbol      | Values           |                            |                    | Unit |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|----------------------------|--------------------|------|
|                                                                                                                                                                                       |             | min.             | typ.                       | max.               |      |
| AC Characteristics                                                                                                                                                                    |             |                  |                            |                    |      |
| Diode capacitance<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>- | 0.3<br>0.4<br>0.28<br>0.25 | 0.4<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>-      | 65<br>2.5<br>1.5           | -<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>-      | 1.5<br>0.8<br>0.6          | 2.5<br>-<br>-      | Ω    |
| Charge carrier life time<br>$I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ ,<br>$R_L = 100\text{ }\Omega$                                                  | $\tau_{rr}$ | -                | 500                        | -                  | ns   |
| I-region width                                                                                                                                                                        | $W_I$       | -                | 13                         | -                  | 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>-      | 0.11<br>0.07<br>0.06       | -<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>-      | 15<br>11<br>9              | -<br>-<br>-        |      |

<sup>1)</sup>BAR88-02LRH in series configuration,  $Z = 50\ \Omega$

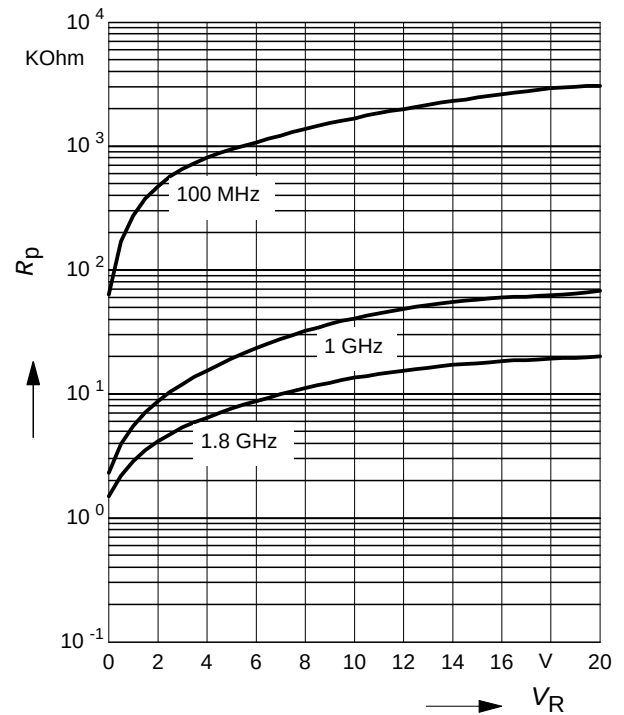
### Diode capacitance $C_T = f(V_R)$

$f$  = Parameter



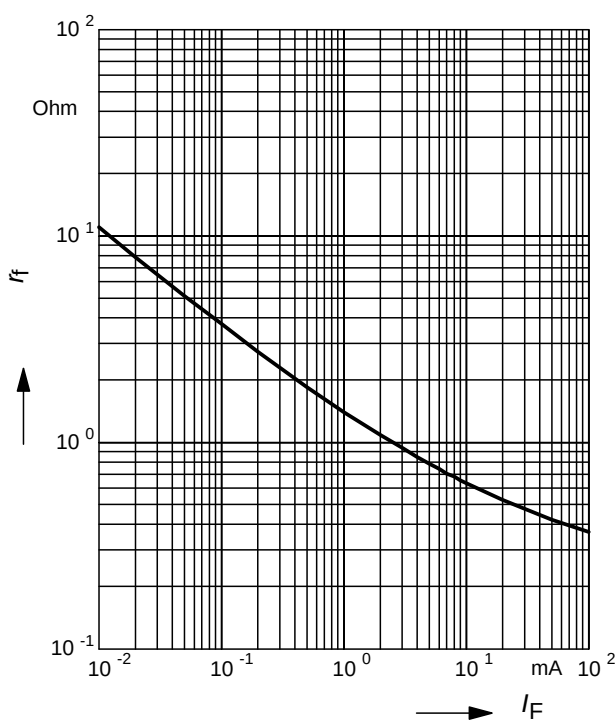
### Reverse parallel resistance $R_P = f(V_R)$

$f$  = Parameter



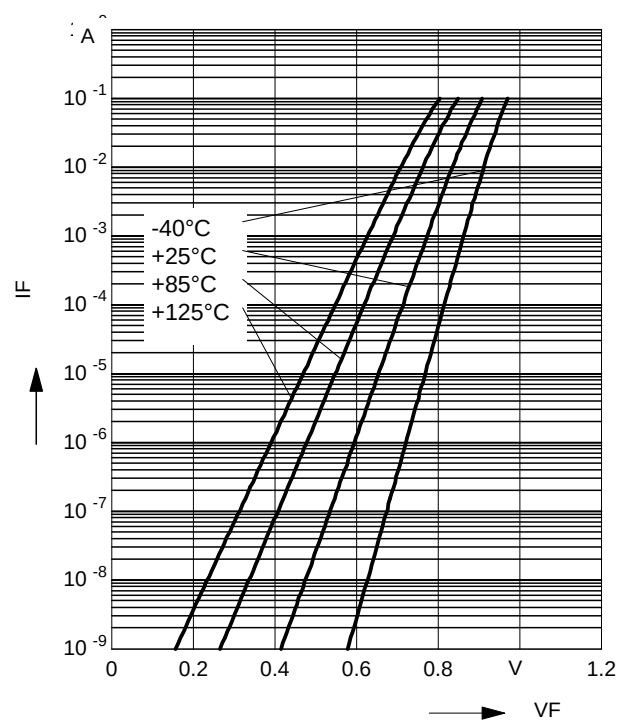
### Forward resistance $r_f = f(I_F)$

$f$  = 100MHz



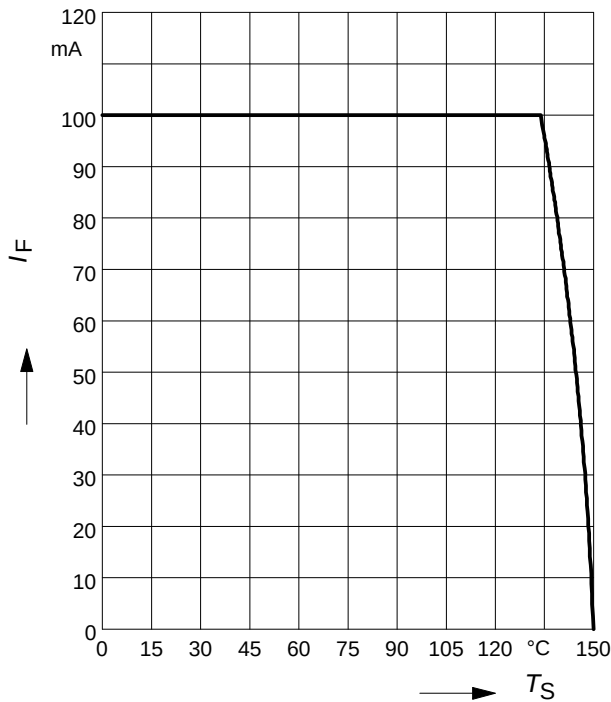
### Forward current $I_F = f(V_F)$

$T_A$  = Parameter

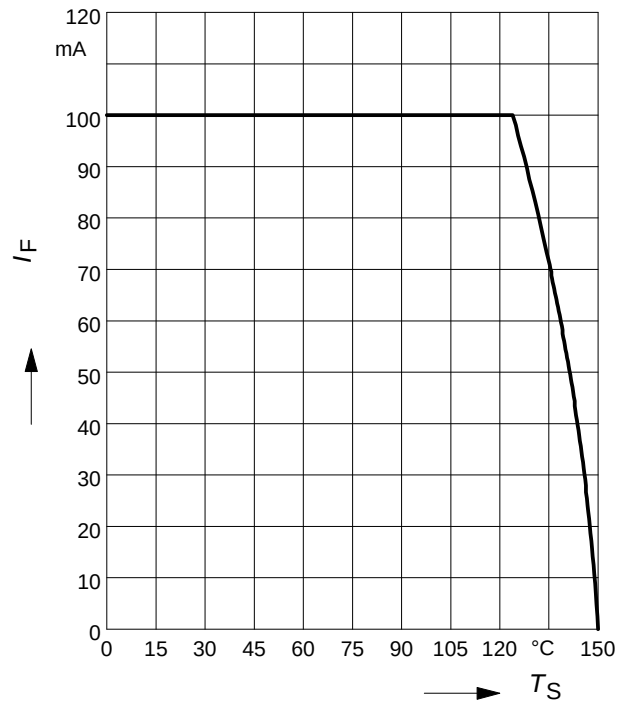


**Forward current  $I_F = f(T_S)$** 

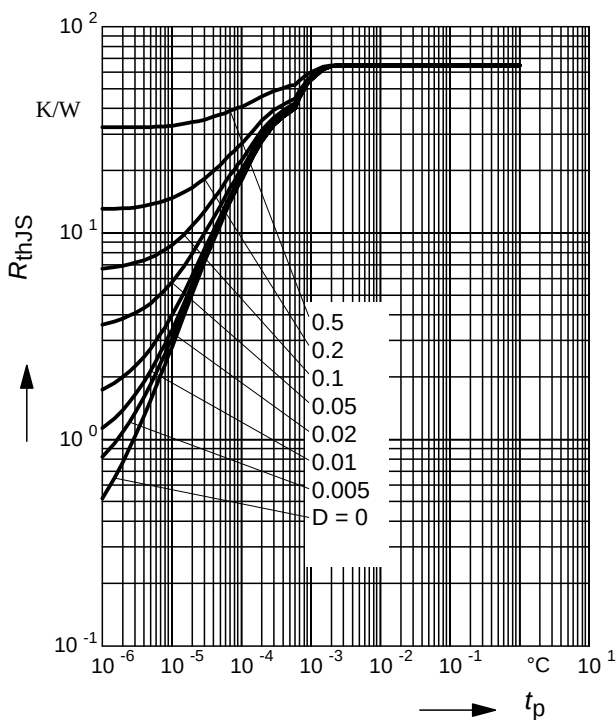
BAR88-02LRH, -07LRH,  
-098LRH, -099LRH


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

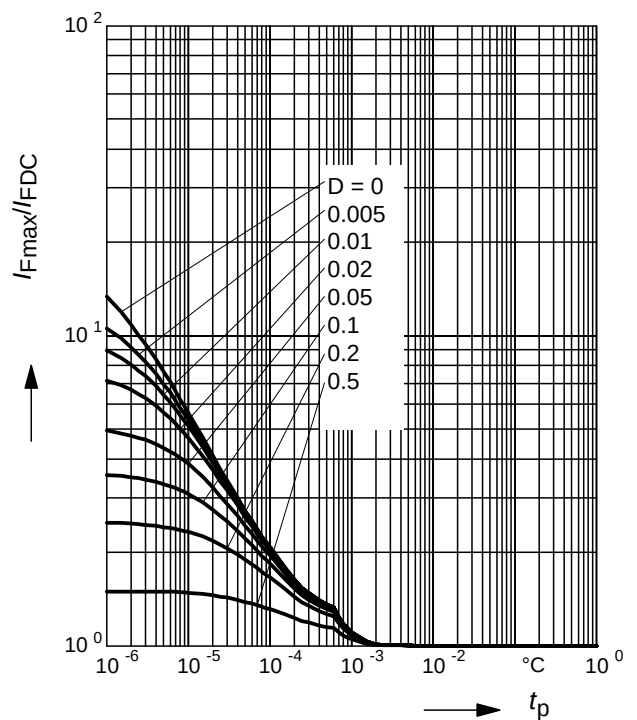
BAR88-02V


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

BAR88-02LRH, -07LRH  
-098LRH, -099LRH

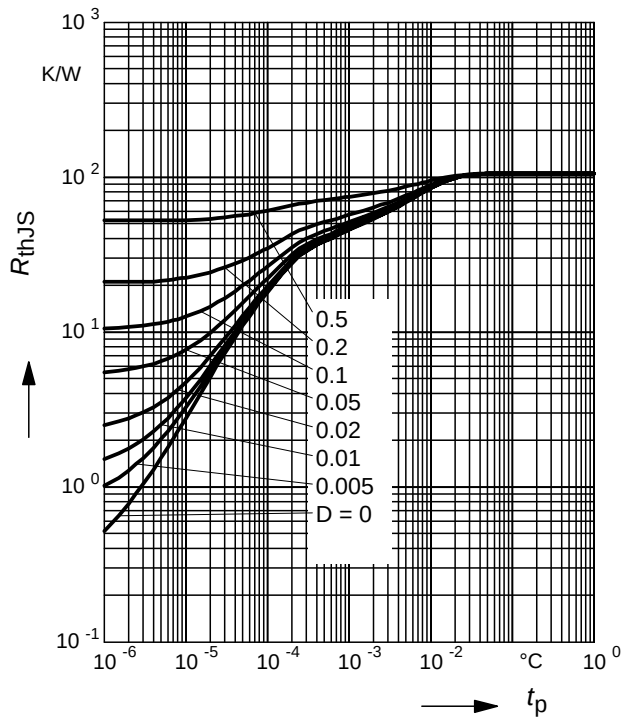

**Permissible Pulse Load**

$I_{Fmax}/I_{FDC} = f(t_p)$ , BAR88-02LRH  
-07LRH, -098LRH, -099LRH



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

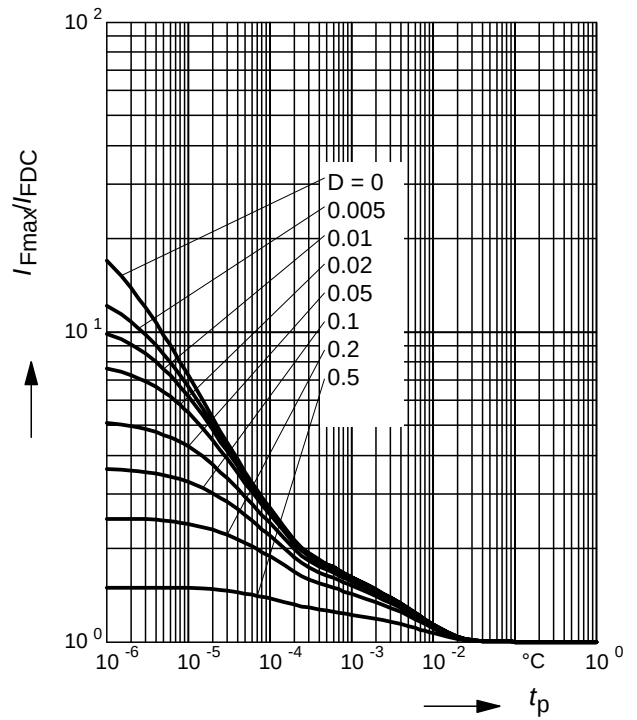
BAR88-02V



### Permissible Pulse Load

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

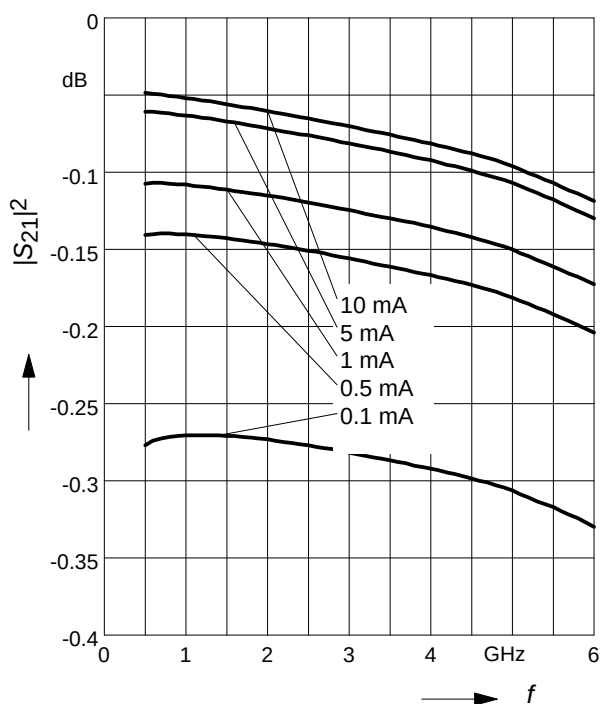
BAR88-02V



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

$I_F$  = Parameter

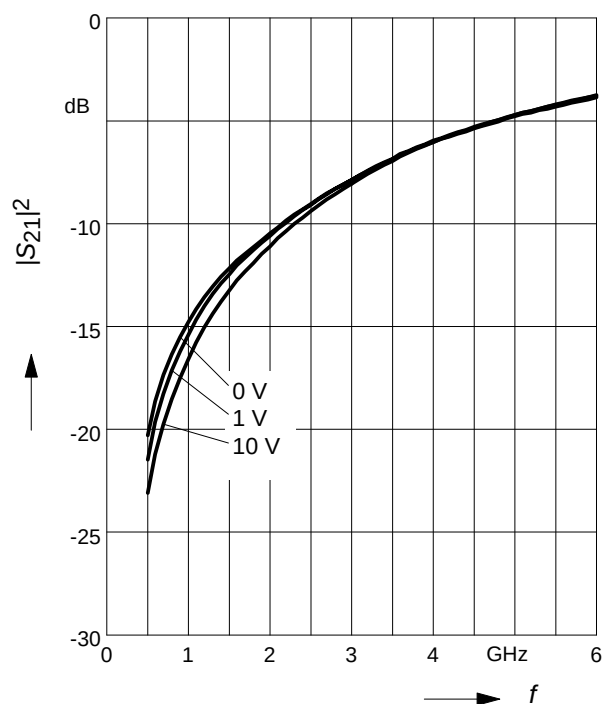
BAR88-02LRH in series configuration,  $Z = 50\Omega$



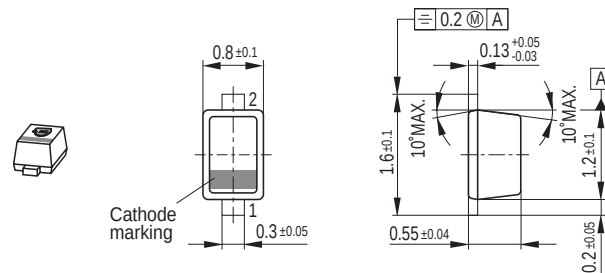
### Isolation $I_{SO} = -|S_{21}|^2 = f(f)$

$V_R$  = Paramter

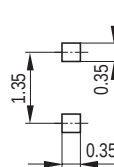
BAR88-02LRH in series configuration,  $Z = 50\Omega$



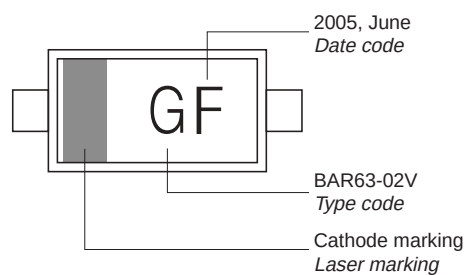
## Package Outline



## Foot Print

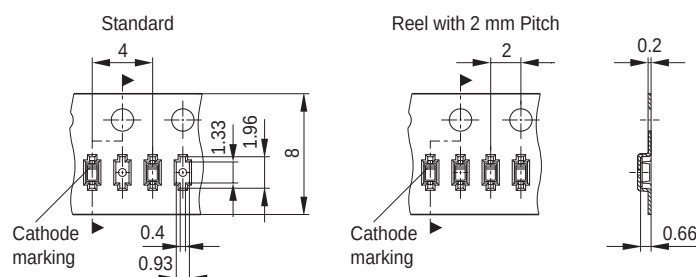


## Marking Layout (Example)



## Standard Packing

Reel  $\varnothing 180$  mm = 3.000 Pieces/Reel  
 Reel  $\varnothing 180$  mm = 8.000 Pieces/Reel (2 mm Pitch)  
 Reel  $\varnothing 330$  mm = 10.000 Pieces/Reel



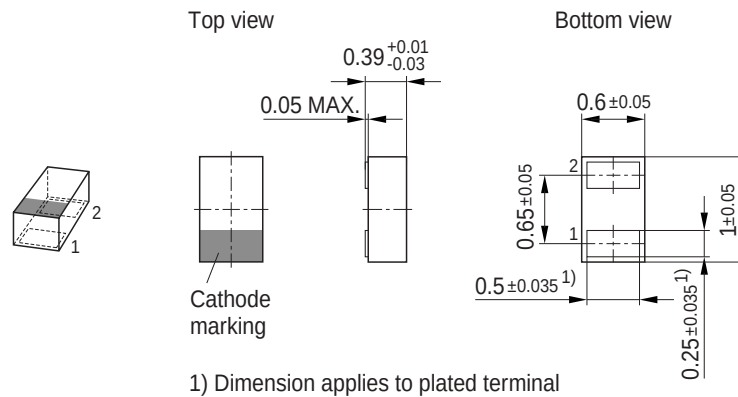
Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

| Month | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 01    | a    | p    | A    | P    | a    | p    | A    | P    | a    | p    | A    | P    |
| 02    | b    | q    | B    | Q    | b    | q    | B    | Q    | b    | q    | B    | Q    |
| 03    | c    | r    | C    | R    | c    | r    | C    | R    | c    | r    | C    | R    |
| 04    | d    | s    | D    | S    | d    | s    | D    | S    | d    | s    | D    | S    |
| 05    | e    | t    | E    | T    | e    | t    | E    | T    | e    | t    | E    | T    |
| 06    | f    | u    | F    | U    | f    | u    | F    | U    | f    | u    | F    | U    |
| 07    | g    | v    | G    | V    | g    | v    | G    | V    | g    | v    | G    | V    |
| 08    | h    | x    | H    | X    | h    | x    | H    | X    | h    | x    | H    | X    |
| 09    | j    | y    | J    | Y    | j    | y    | J    | Y    | j    | y    | J    | Y    |
| 10    | k    | z    | K    | Z    | k    | z    | K    | Z    | k    | z    | K    | Z    |
| 11    | l    | 2    | L    | 4    | l    | 2    | L    | 4    | l    | 2    | L    | 4    |
| 12    | n    | 3    | N    | 5    | n    | 3    | N    | 5    | n    | 3    | N    | 5    |

1) New Marking Layout for SC75, implemented at October 2005.

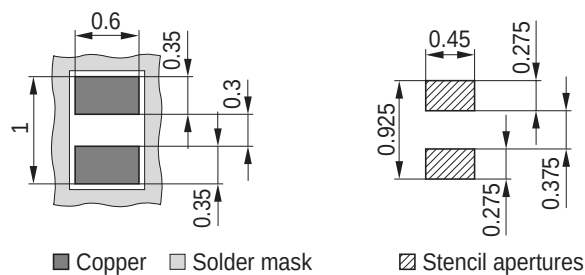


## Package Outline

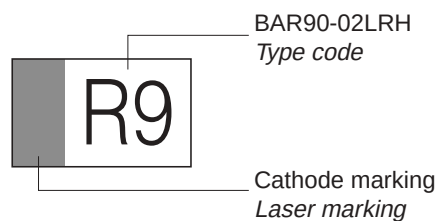


## Foot Print

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



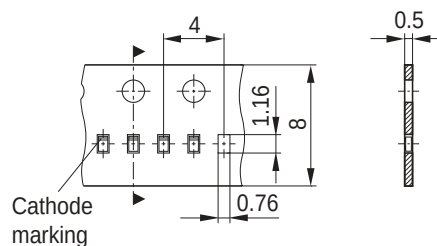
## Marking Layout (Example)



## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel

Reel ø330 mm = 50.000 Pieces/Reel (optional)



Pin 1 marking

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