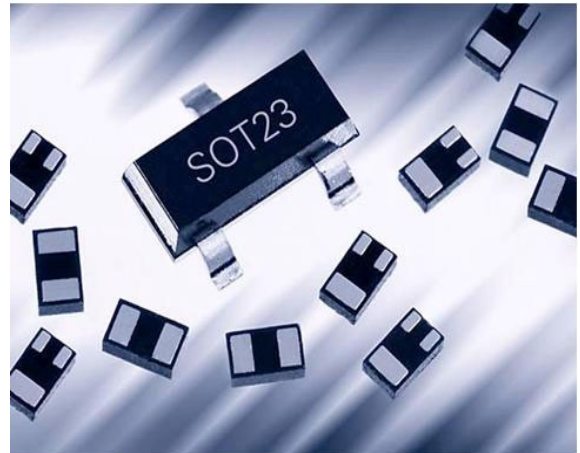
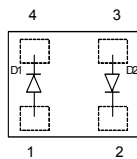
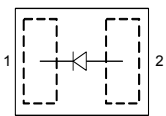


**Silicon Deep Trench PIN Diodes**

- Optimized for low bias current antenna switches in hand held applications
- Very low capacitance at zero volt reverse bias at frequencies above 1GHz (typ. 0.19 pF)
- Low forward resistance (typ.  $1.3 \Omega$  @  $I_F = 3 \text{ mA}$ )
- Improved ON / OFF mode harmonic distortion balance
- Pb-free (RoHS compliant) package


**BAR90-02EL**  
**BAR90-02ELS**
**BAR90-098LRH**


Type	Package	Configuration	$L_S$ (nH)	Marking
BAR90-02ELS	TSSLP-2-3	single, leadless	0.2	J*
BAR90-02EL	TSLP-2-19	single, leadless	0.4	X
BAR90-098LRH	TSLP-4-7	anti-parallel pair, leadless	0.4	T9

\* Marking of TSSLP-2-3 with underline

**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	$P_{tot}$		mW
$T_S \leq 137^\circ\text{C}$ , BAR90-02ELS		150	
$T_S \leq 133^\circ\text{C}$ , all others		250	
Junction temperature	$T_j$	150	$^\circ\text{C}$
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
BAR90-02ELS		≤ 90	
All others		≤ 65	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

Breakdown voltage $I_{(BR)} = 5 \mu\text{A}$	$V_{(BR)}$	80	-	-	V
Reverse current $V_R = 60 \text{ V}$	$I_R$	-	-	50	nA
Forward voltage $I_F = 3 \text{ mA}$ $I_F = 100 \text{ mA}$	$V_F$	0.75 -	0.81 0.9	0.87 1	V

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

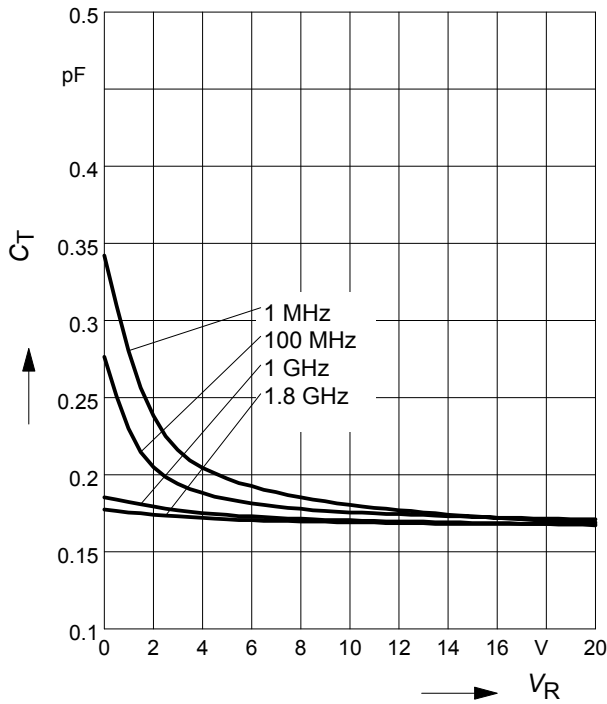
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Diode capacitance $V_R = 1\text{ V}, f = 1\text{ MHz}$ $V_R = 0\text{ V}, f = 100\text{ MHz}$ $V_R = 0\text{ V}, f = 1\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$	$C_T$	-	0.25 0.3 0.19 0.18	0.35 - - -	pF
Reverse parallel resistance $V_R = 0\text{ V}, f = 100\text{ MHz}$ $V_R = 0\text{ V}, f = 1\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$	$R_P$	-	35 5 4	- - -	k $\Omega$
Forward resistance $I_F = 1\text{ mA}, f = 100\text{ MHz}$ $I_F = 3\text{ mA}, f = 100\text{ MHz}$ $I_F = 10\text{ mA}, f = 100\text{ MHz}$	$r_f$	-	2 1.3 0.8	- 2.3 -	$\Omega$
Charge carrier life time $I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ , $R_L = 100\ \Omega$	$\tau_{rr}$	-	750	-	ns
I-region width	$W_I$	-	20	-	$\mu\text{m}$
Insertion loss <sup>1)</sup> $I_F = 1\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 3\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}, f = 1.8\text{ GHz}$	$I_L$	-	0.16 0.11 0.08	- - -	dB
Isolation <sup>1)</sup> $V_R = 0\text{ V}, f = 0.9\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$ $V_R = 0\text{ V}, f = 2.45\text{ GHz}$	$I_{SO}$	-	18.5 13.5 11.5	- - -	

<sup>1)</sup>BAR90-02EL in series configuration,  $Z = 50\ \Omega$

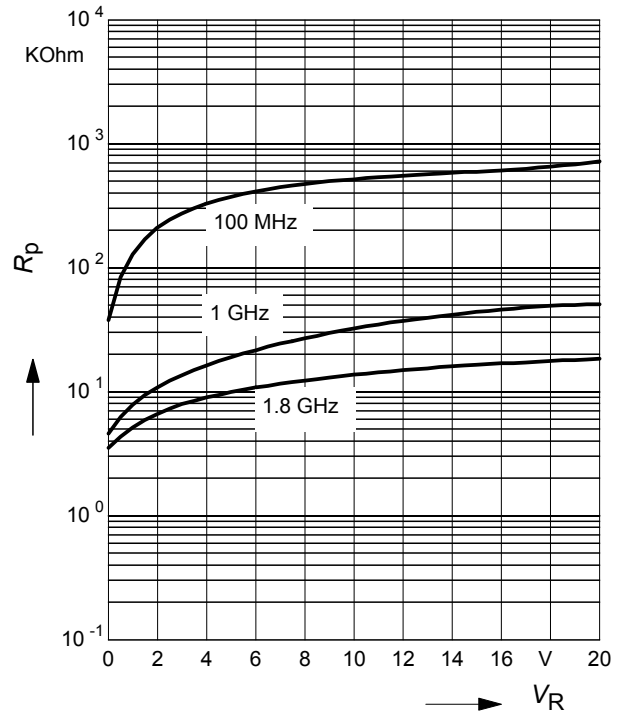
**Diode capacitance  $C_T = f(V_R)$**

$f =$  Parameter



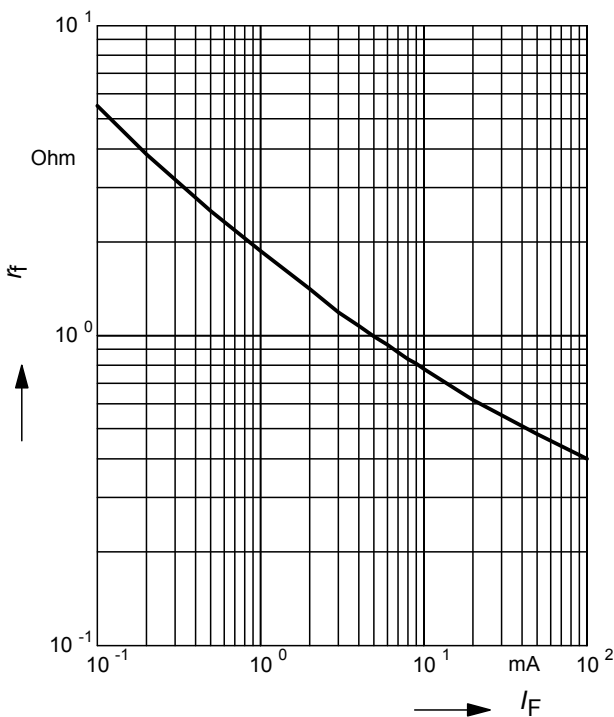
**Reverse parallel resistance  $R_P = f(V_R)$**

$f =$  Parameter



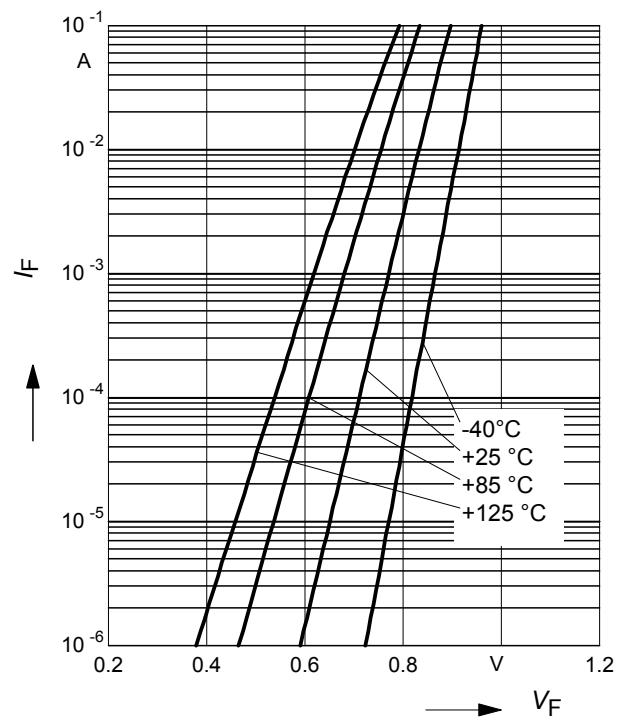
**Forward resistance  $r_f = f(I_F)$**

$f = 100$  MHz



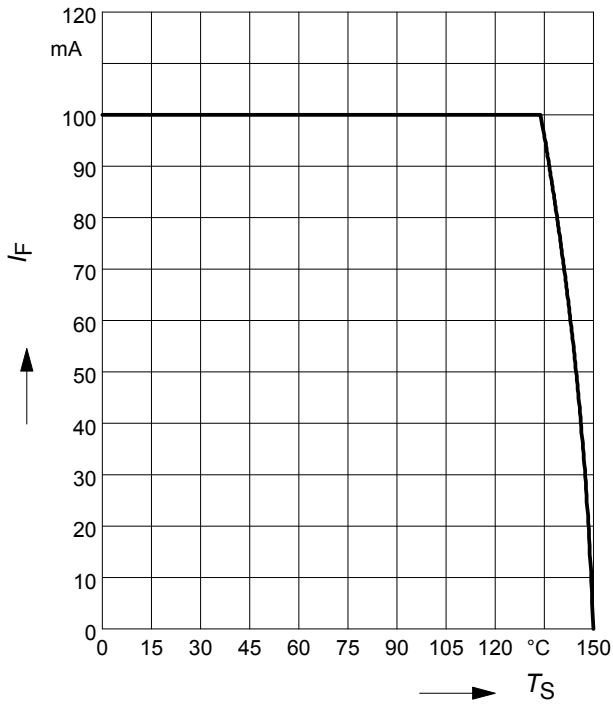
**Forward current  $I_F = f(V_F)$**

$T_A =$  Parameter



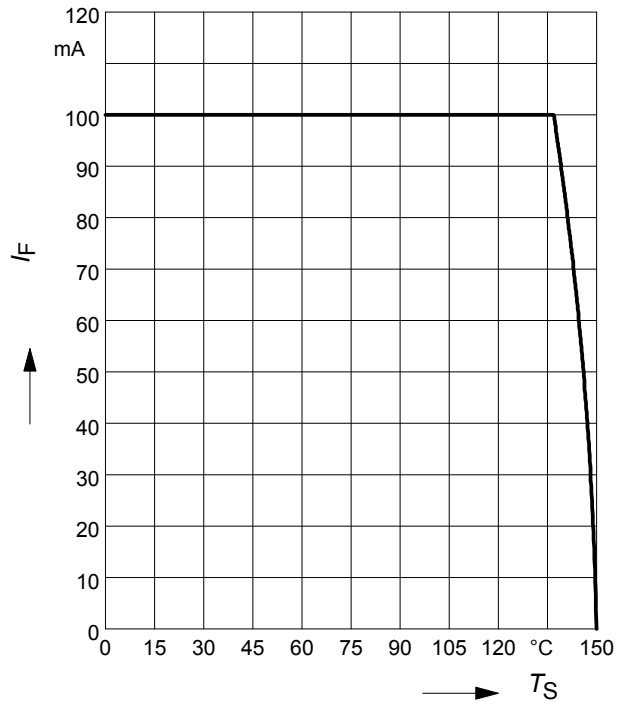
**Forward current  $I_F = f(T_S)$**

BAR90-02EL / -098LRH



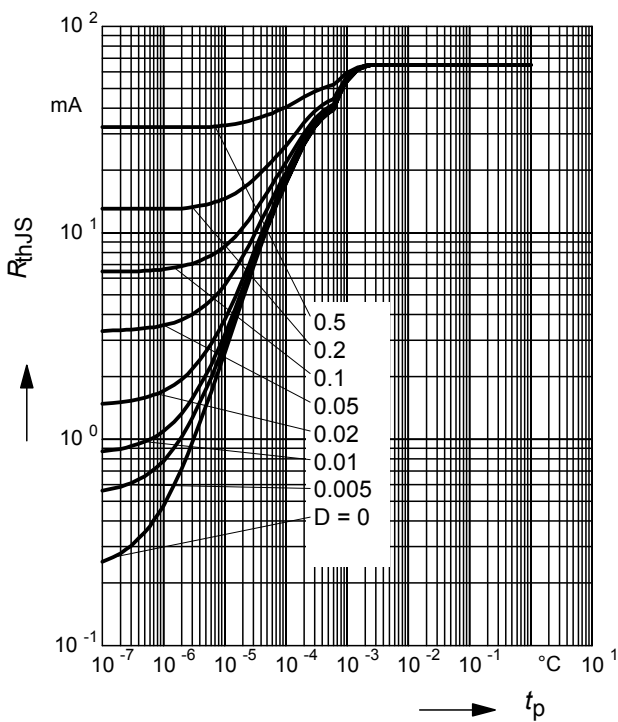
**Forward current  $I_F = f(T_S)$**

BAR90-02ELS



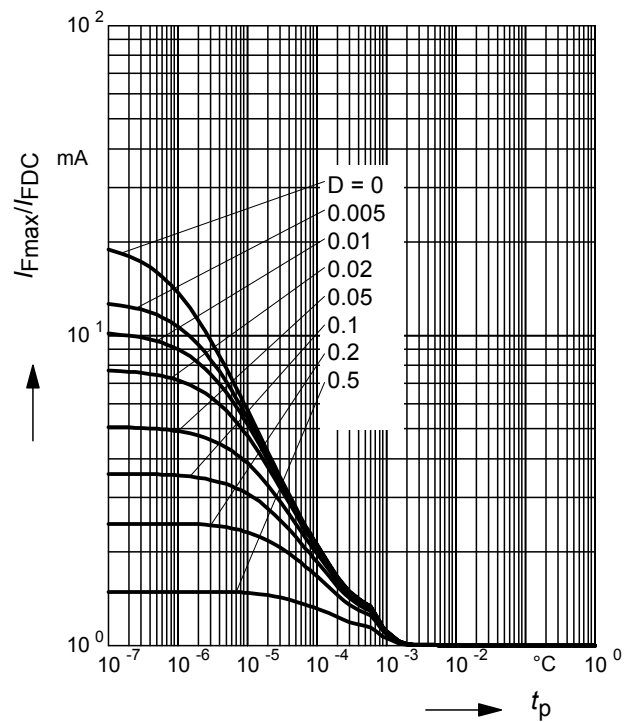
**Permissible Puls Load  $R_{thJS} = f(t_p)$**

BAR90-02EL / -098LRH



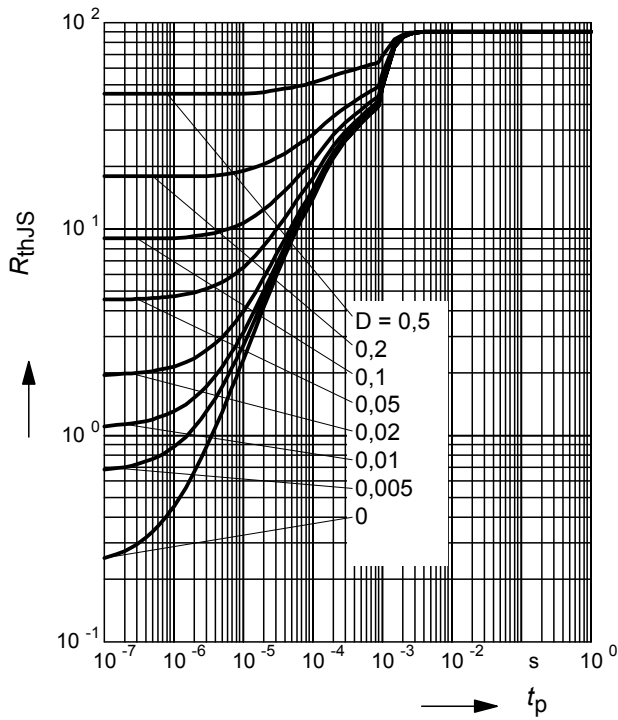
**Permissible Pulse Load**

$I_{Fmax} / I_{FDC} = f(t_p)$  BAR90-02EL / -098LRH



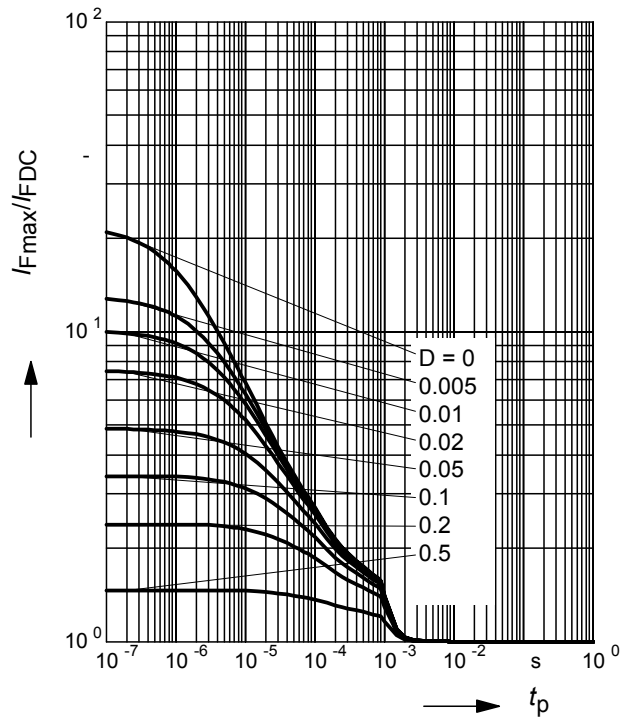
**Permissible Puls Load  $R_{thJS} = f(t_p)$**

BAR90-02ELS



**Permissible Pulse Load  $I_{Fmax}/I_{FDC} = f(t_p)$**

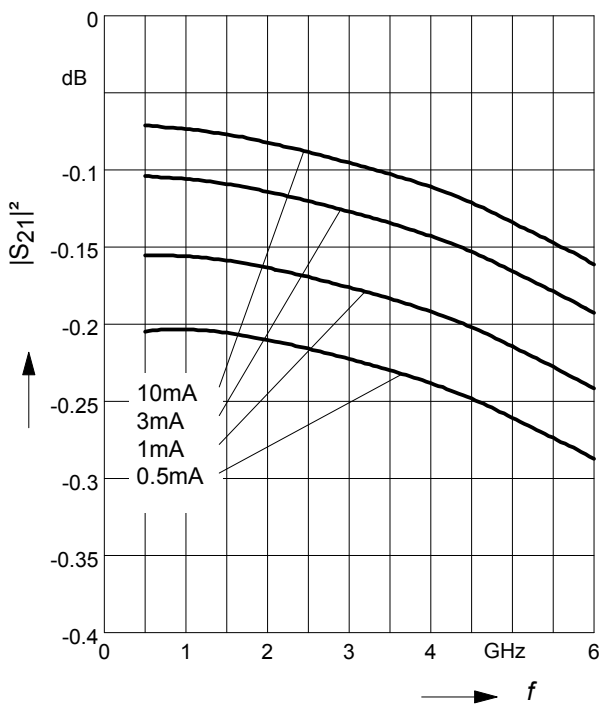
BAR90-02ELS



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

$I_F$  = Parameter

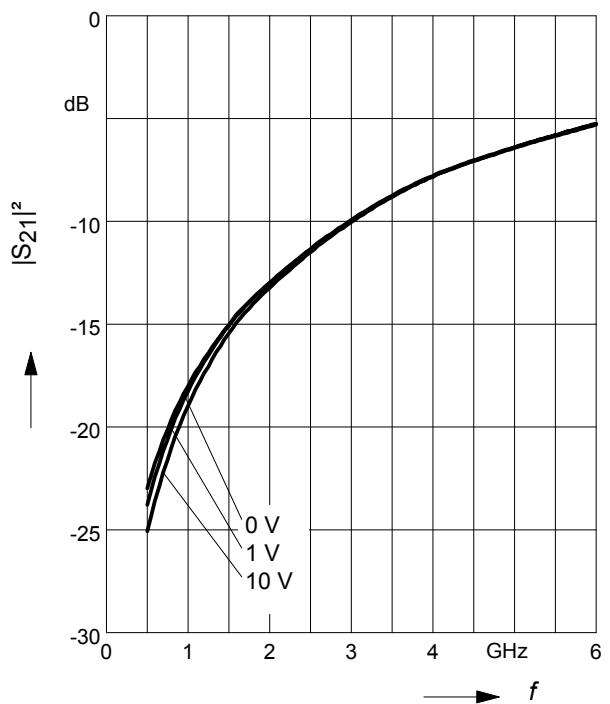
BAR90-02EL in series configuration,  $Z = 50\Omega$



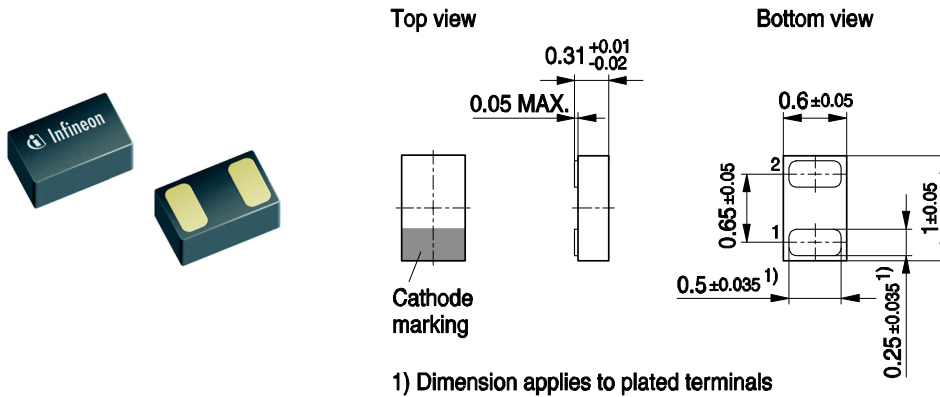
**Isolation  $I_{SO} = -|S_{21}|^2 = f(f)$**

$V_R$  = Parameter

BAR90-02EL in series configuration,  $Z = 50\Omega$



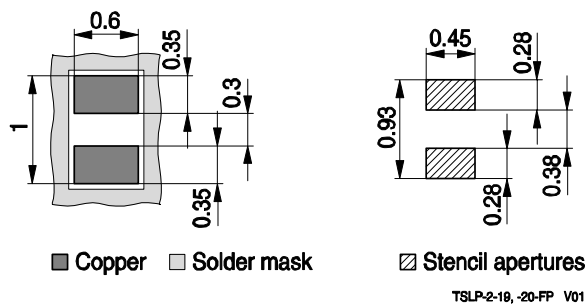
Package Outline



TSLP-2-19, -20-PO V01

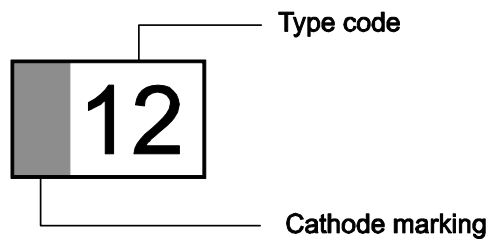
Foot Print

For board assembly information please refer to Infineon website „Packages“



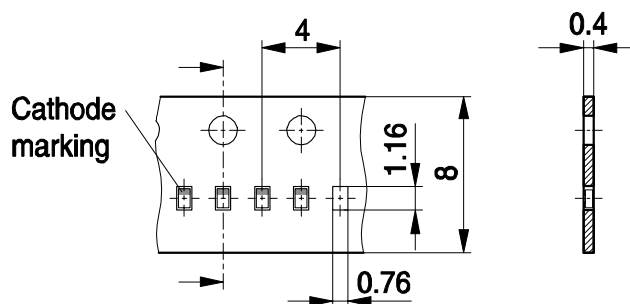
TSLP-2-19, -20-FP V01

Marking layout (Example)



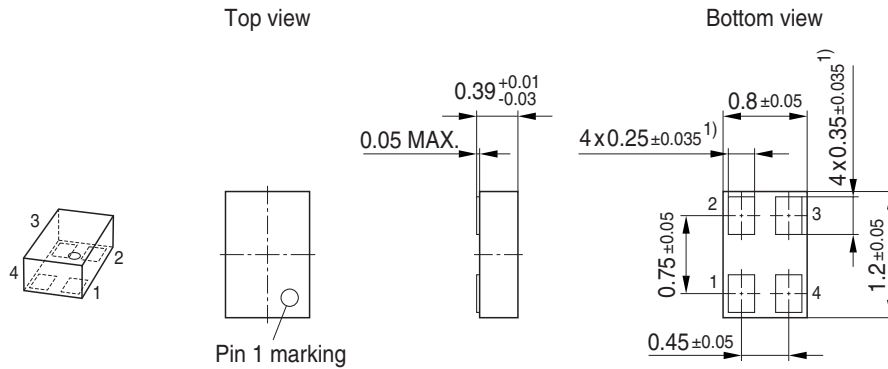
Standard Packing

Reel Ø 180 mm: 15.000 Pieces / Reel  
 Reel Ø 330 mm: 6.000 Pieces / Reel  
 Reel Ø 330 mm: 50.000 Pieces / Reel



TSLP-2-19, -20-TP V02

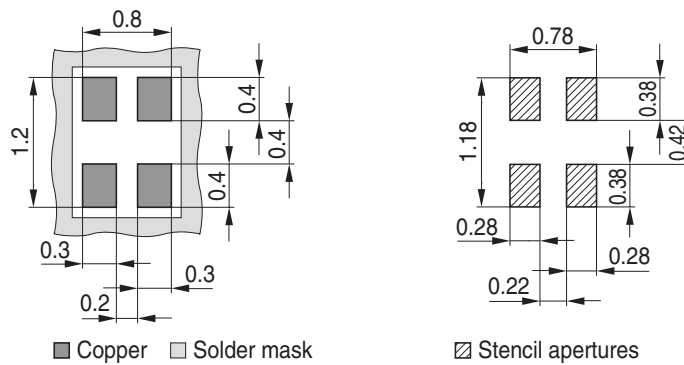
### Package Outline



1) Dimension applies to plated terminal

### Foot Print

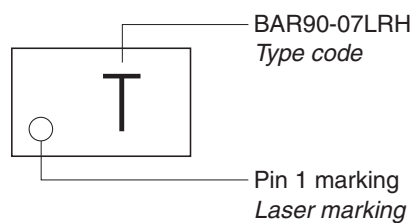
For board assembly information please refer to Infineon website "Packages"



■ Copper □ Solder mask

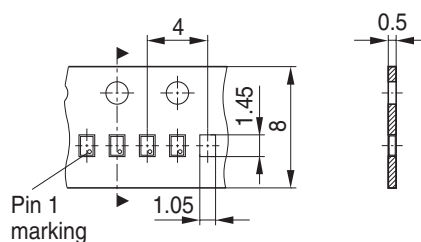
▨ Stencil apertures

### Marking Layout (Example)



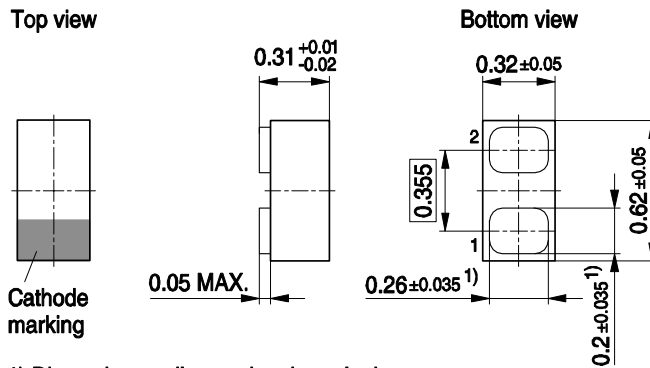
### Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



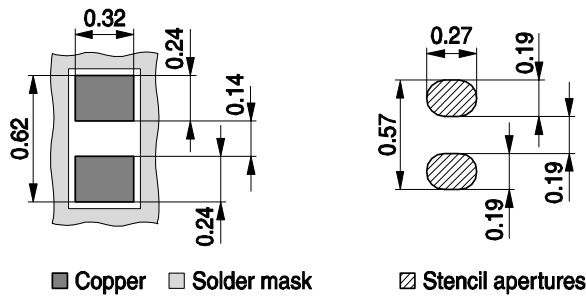


### Package Outline

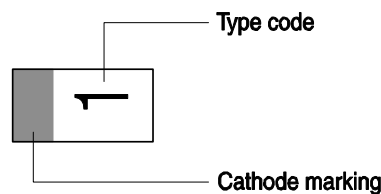


### Foot Print

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

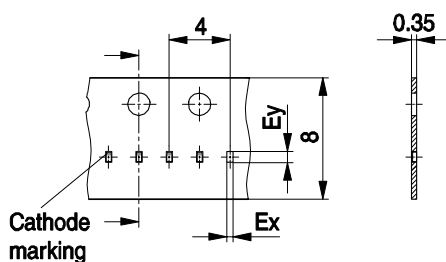


### Marking Layout



### Standard Packing

Reel ø330 mm = 15.000 Pieces/Reel



Tape type	Ex	Ey
Punched Tape	0.43	0.73
Embossed Tape	0.37	0.67

Deliveries can be both tape types (no selection possible).  
Specification allows identical processing (pick & place) by users.

**Edition 2009-11-16**

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

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