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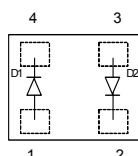
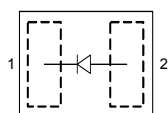
BAR90...

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 Ω @ I_F = 3 mA)
- Improved ON / OFF mode harmonic distortion balance
- Pb-free (RoHS compliant) package



BAR90-02LRH BAR90-098LRH
BAR90-02LS



Type	Package	Configuration	L _S (nH)	Marking
BAR90-02LRH	TSLP-2-7	single, leadless	0.4	R9
BAR90-02LS	TSSLP-2-1	single, leadless	0.2	J
BAR90-098LRH	TSLP-4-7	anti-parallel pair, leadless	0.4	T9

Maximum Ratings at T_A = 25°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 ≤ 137 °C, BAR90-02LS		150	
T _S ≤ 133°C, all others		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
BAR90-02LS		≤ 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

¹⁾For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)


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

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

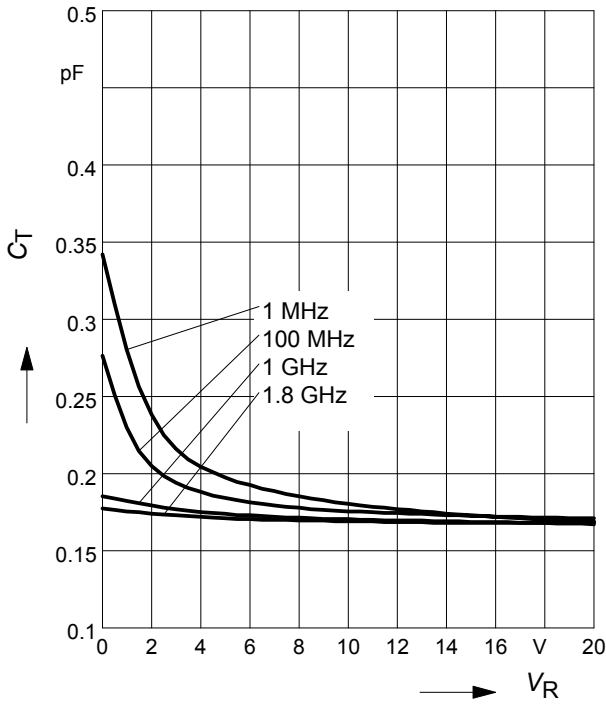
¹⁾BAR90-02LRH in series configuration, $Z = 50\ \Omega$



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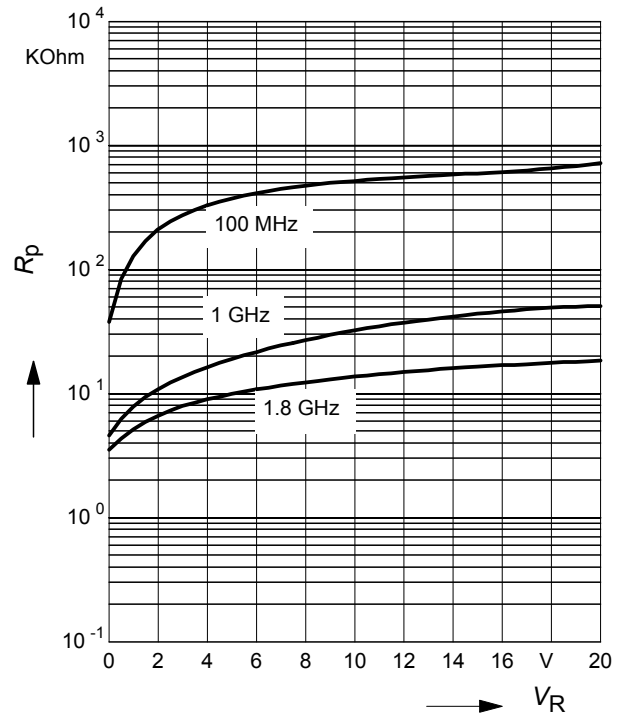
Diode capacitance $C_T = f(V_R)$

$f =$ Parameter



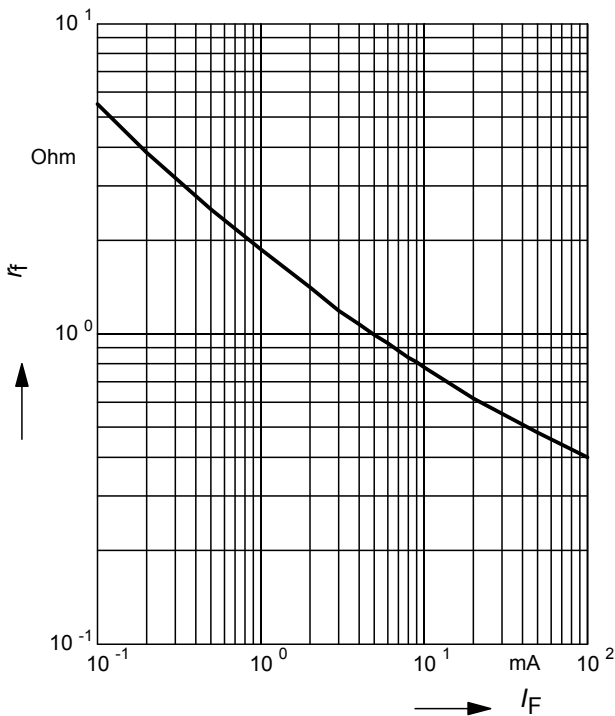
Reverse parallel resistance $R_P = f(V_R)$

$f =$ Parameter



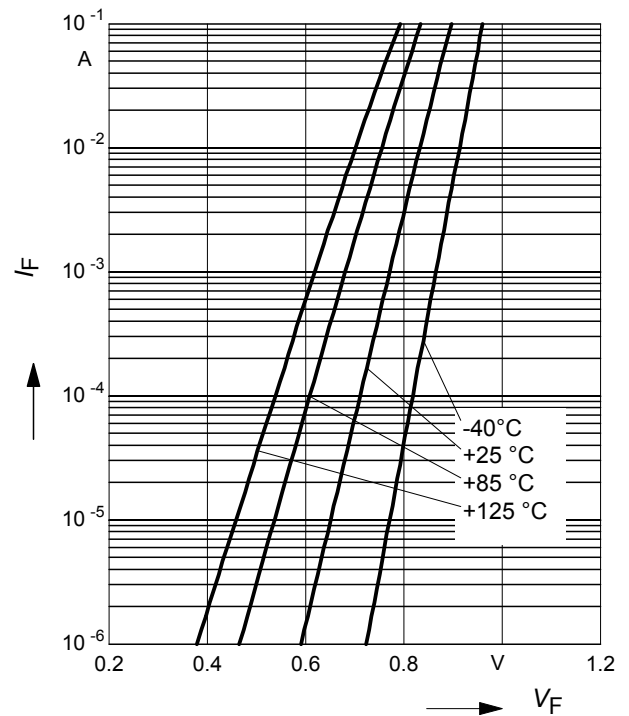
Forward resistance $r_f = f(I_F)$

$f = 100$ MHz



Forward current $I_F = f(V_F)$

$T_A =$ Parameter

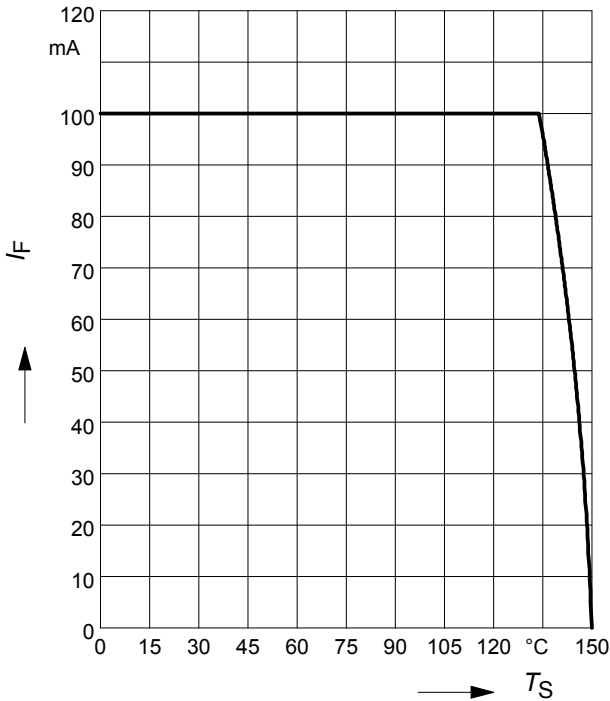




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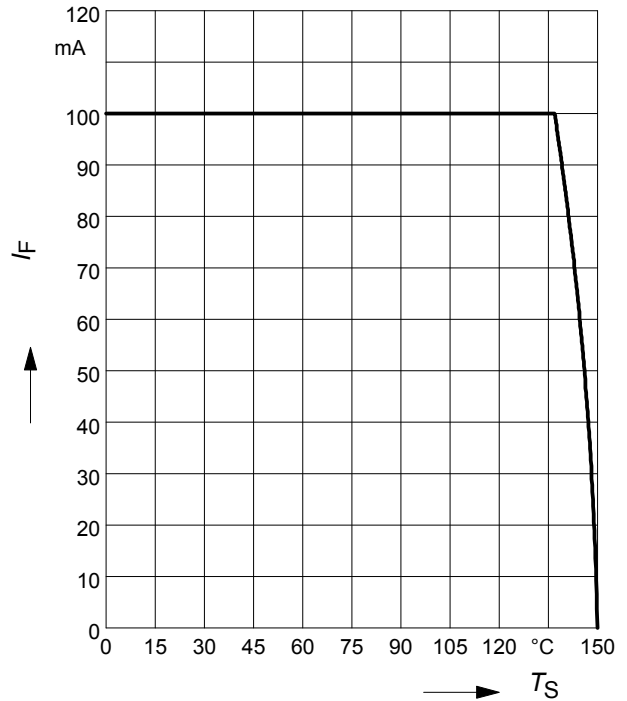
Forward current $I_F = f(T_S)$

BAR90-02LRH / -098LRH



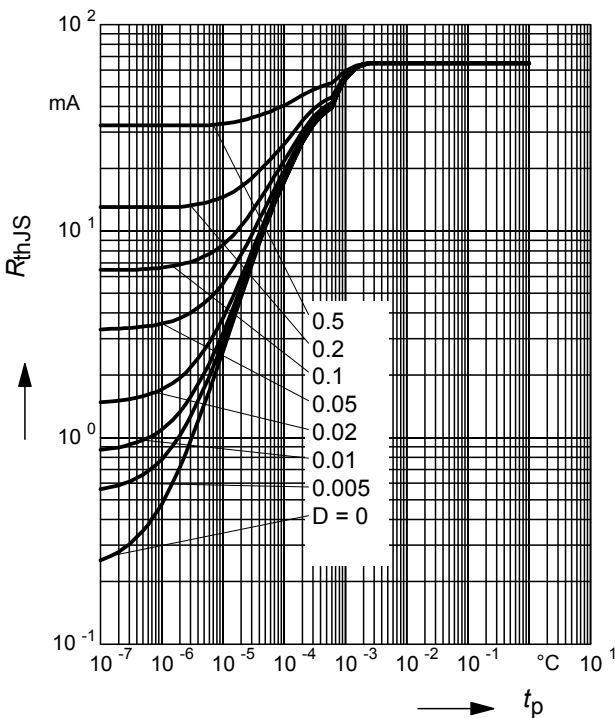
Forward current $I_F = f(T_S)$

BAR90-02LS



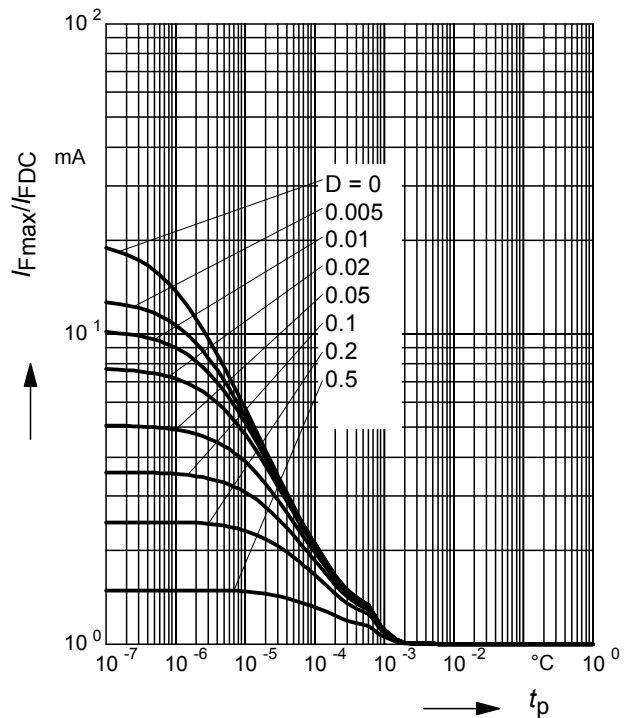
Permissible Puls Load $R_{thJS} = f(t_p)$

BAR90-02LRH / -098LRH



Permissible Pulse Load

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

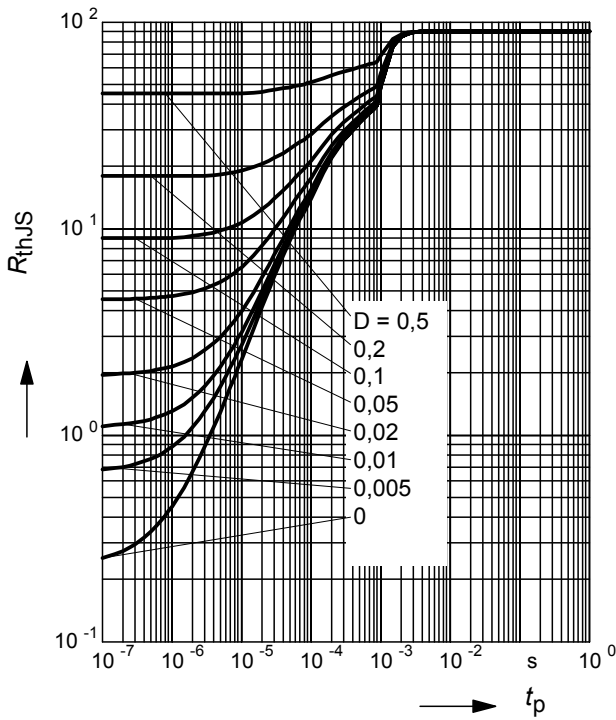




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Permissible Puls Load $R_{thJS} = f(t_p)$

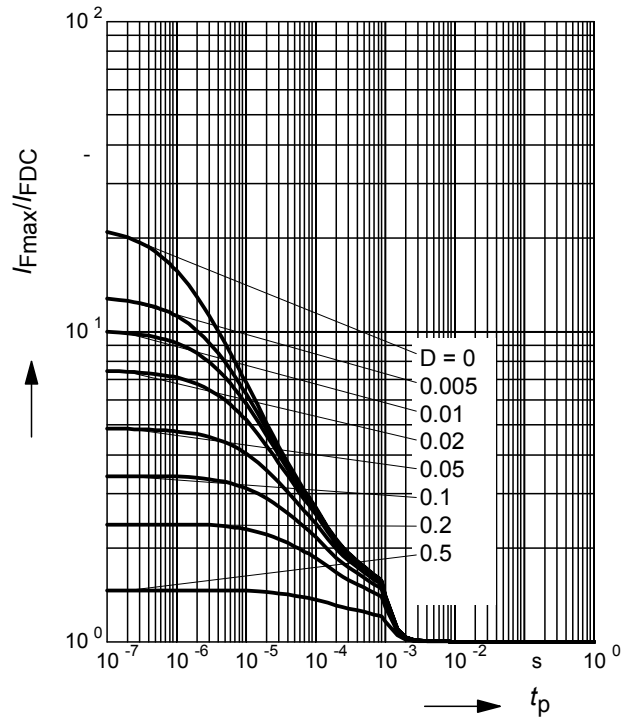
BAR90-02LS



Permissible Pulse Load

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

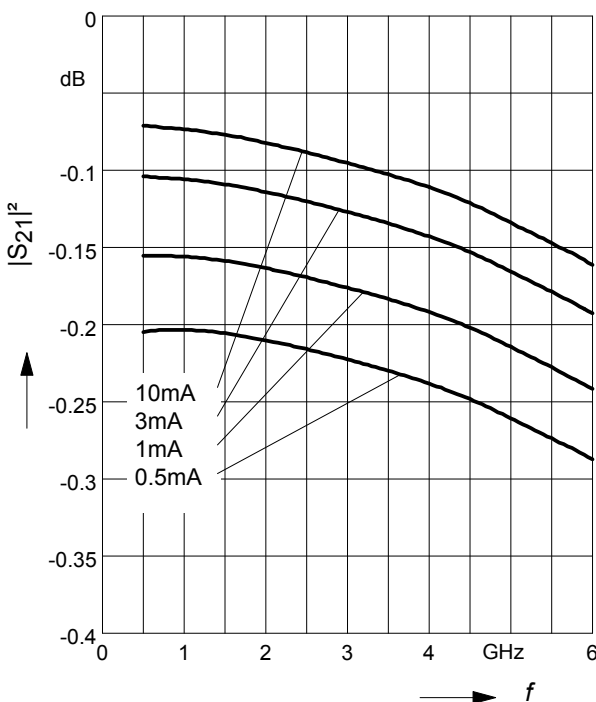
BAR90-02LS



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

I_F = Parameter

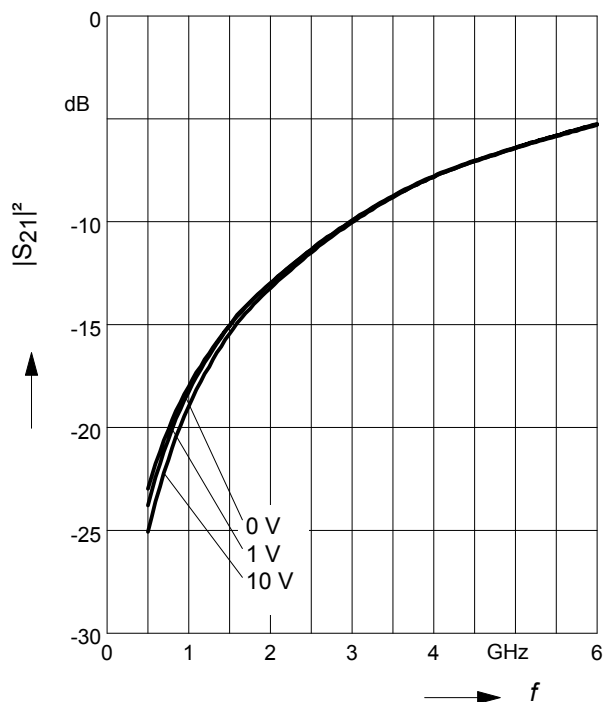
BAR90-02LRH in series configuration, $Z = 50\Omega$



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

V_R = Parameter

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

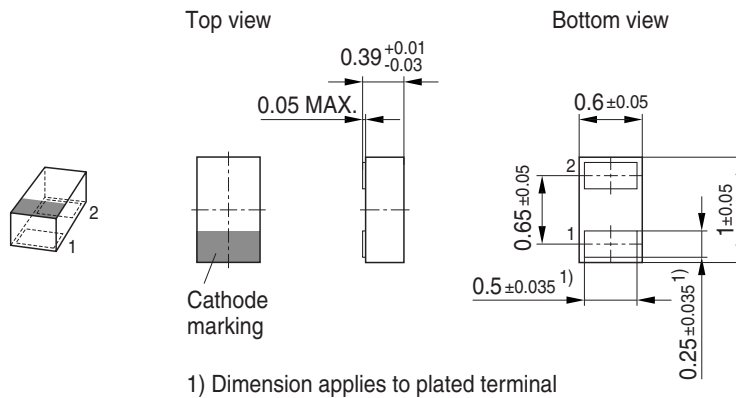




Package TSLP-2-7

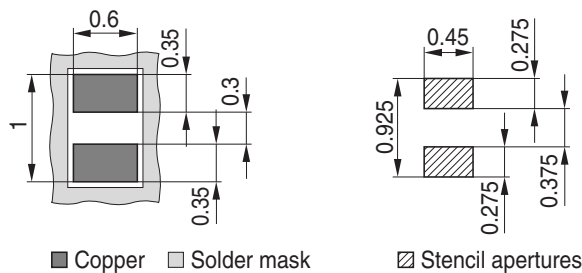
BAR90...

Package Outline

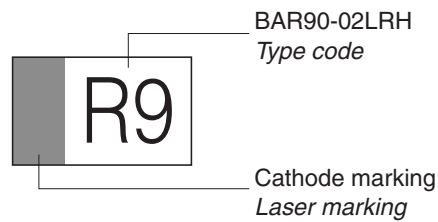


Foot Print

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

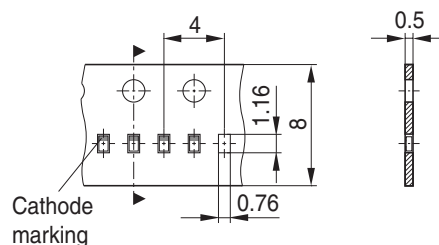


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel
 Reel ø330 mm = 50.000 Pieces/Reel (optional)

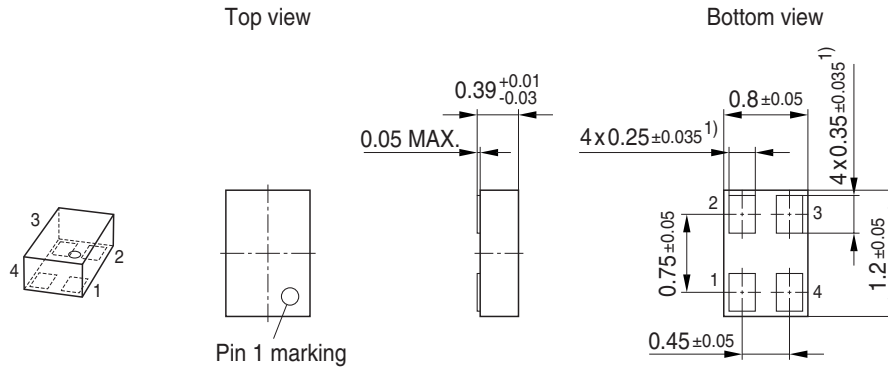




Package TSLP-4-7

BAR90...

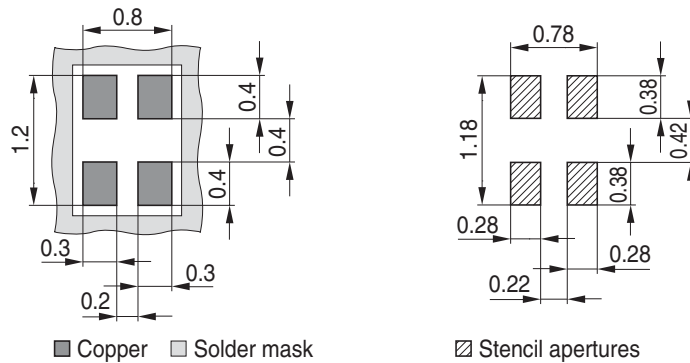
Package Outline



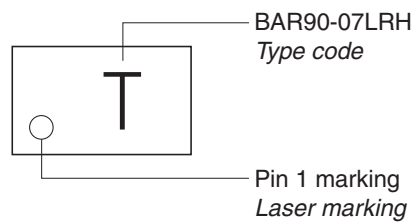
1) Dimension applies to plated terminal

Foot Print

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

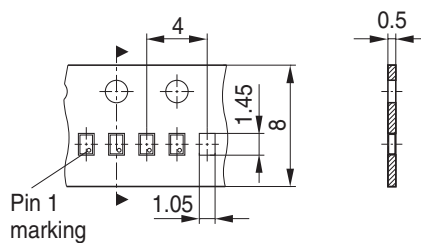


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel

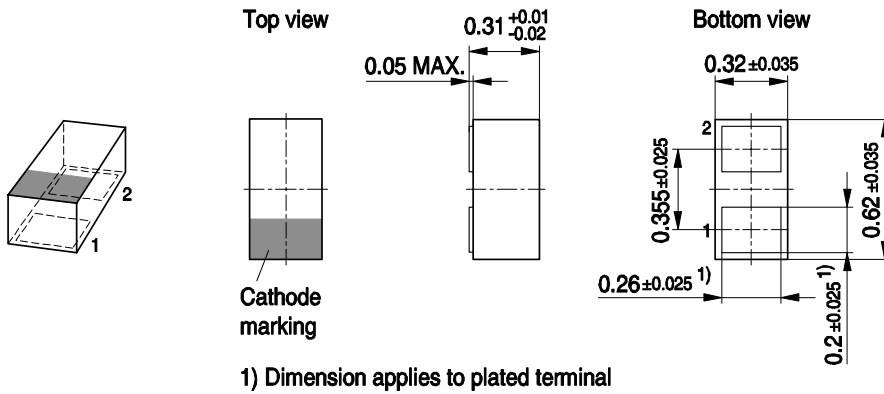




Package TSSLP-2-1

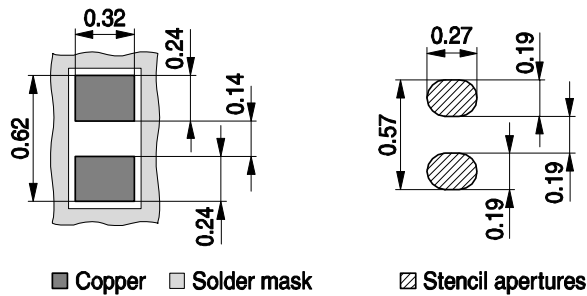
BAR90...

Package Outline

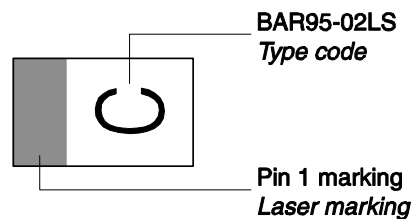


Foot Print

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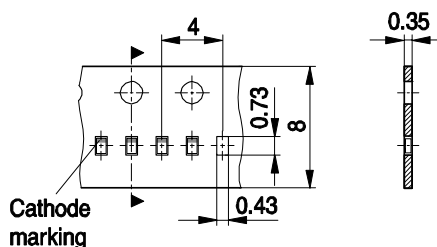


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel





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