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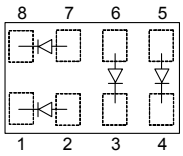
Silicon Trench PIN Diode Array

- 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
- Very small form factor: 1.34 x 0.74 x 0.31 mm³
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101

AEC Qualified RoHS

BAR90-081LS



Type	Package	Configuration	L_S(nH)	Marking
BAR90-081LS	TSSLP-8-1	quad array	0.2	WM

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 $T_S \leq$ 137 °C	P_{tot}	150	mW
Junction temperature	T_j	150	°C
Operating temperature range	T_{op}	-55 ... 125	
Storage temperature	T_{stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	≤ 90	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Breakdown voltage $I_{(BR)}$ = 5 µA	$V_{(BR)}$	80	-	-	V
Reverse current V_R = 60 V	I_R	-	-	50	nA
Forward voltage I_F = 3 mA I_F = 100 mA	V_F	 0.75 -	 0.81 0.9	 0.87 1	V

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

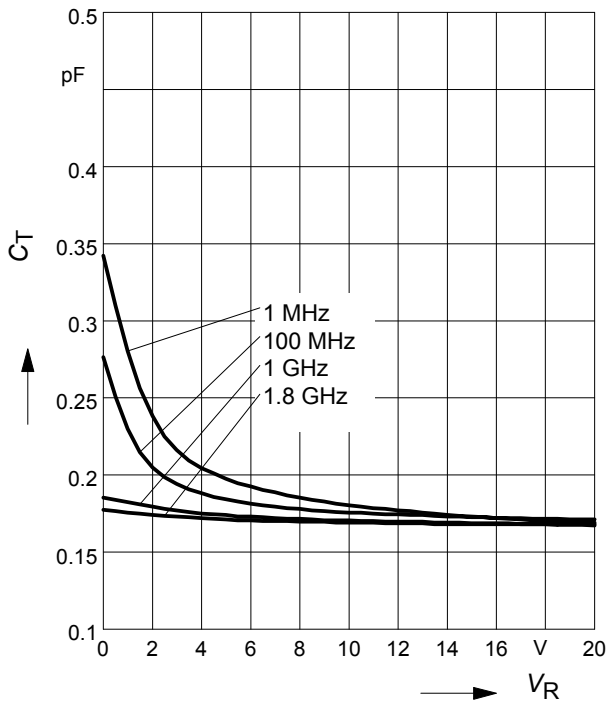
Electrical Characteristics at T_A = 25°C, unless otherwise specified

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

[1]Single BAR90 diode in series configuration, Z = 50 Ω

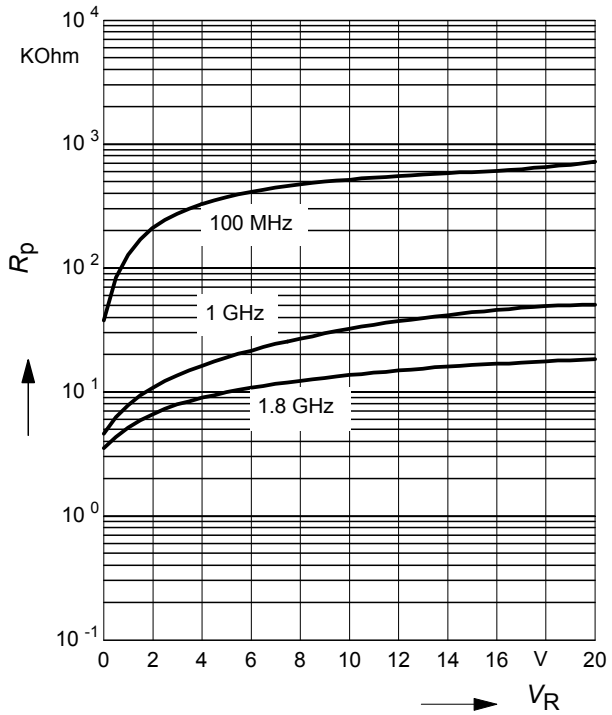
Diode capacitance $C_T = f\ (V_R)$

f = Parameter



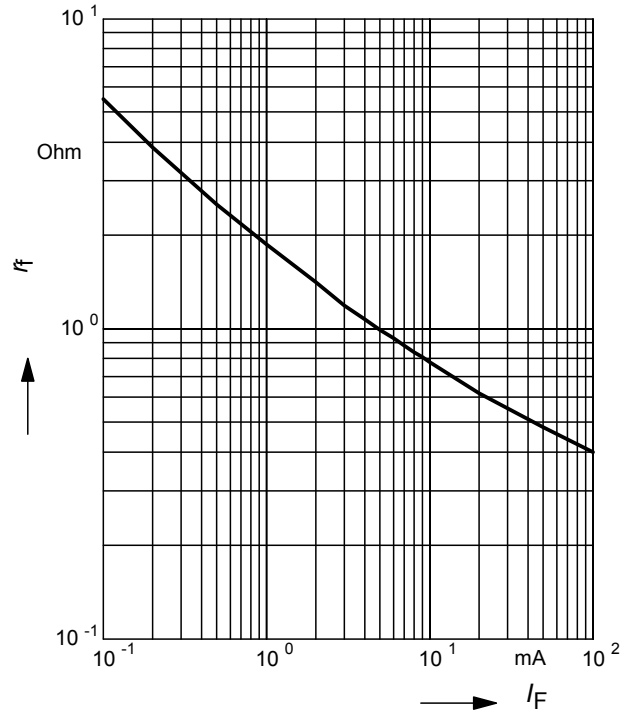
Reverse parallel resistance $R_P = f(V_R)$

f = Parameter



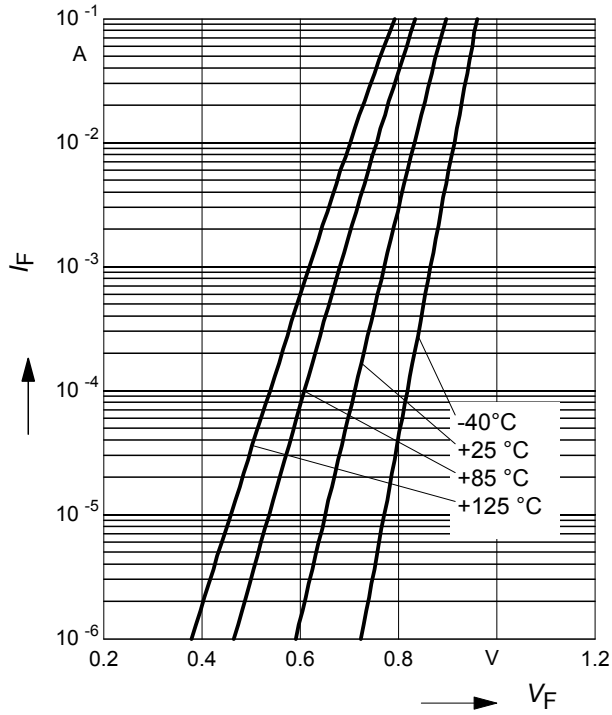
Forward resistance $r_f = f\ (I_F)$

f = 100 MHz

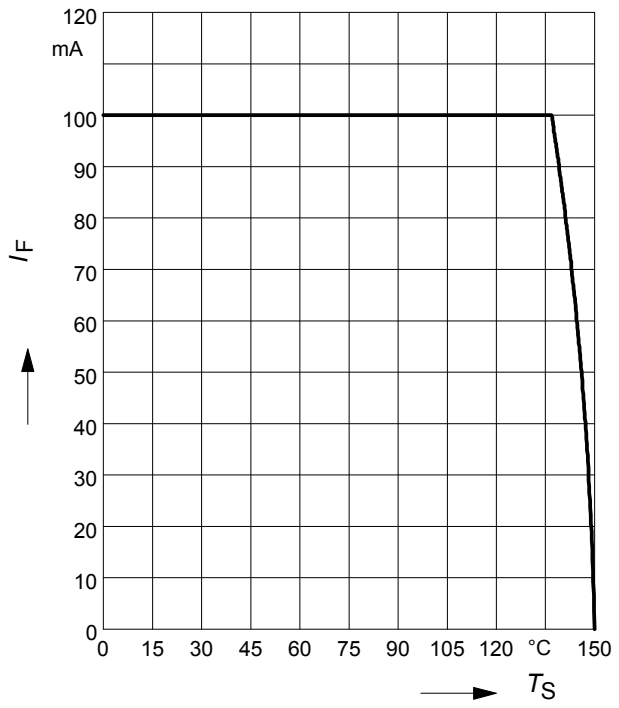


Forward current $I_F = f\ (V_F)$

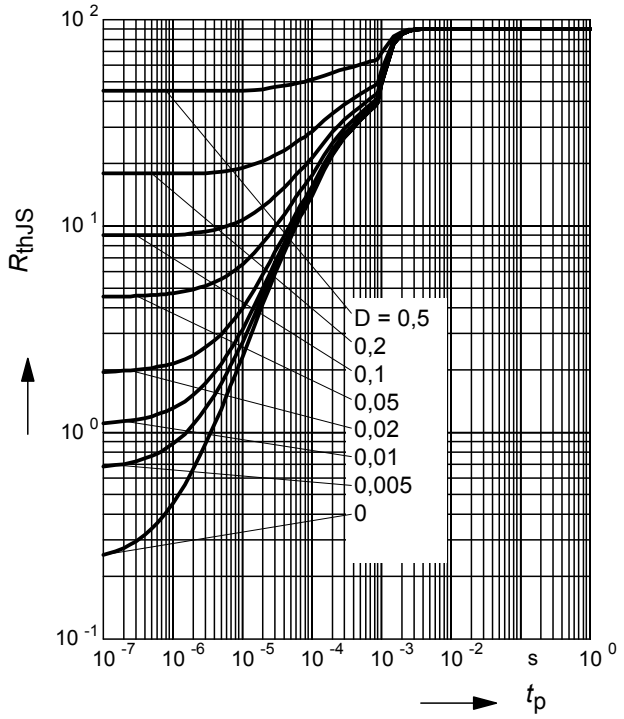
T_A = Parameter



Forward current $I_F = f\ (T_S)$

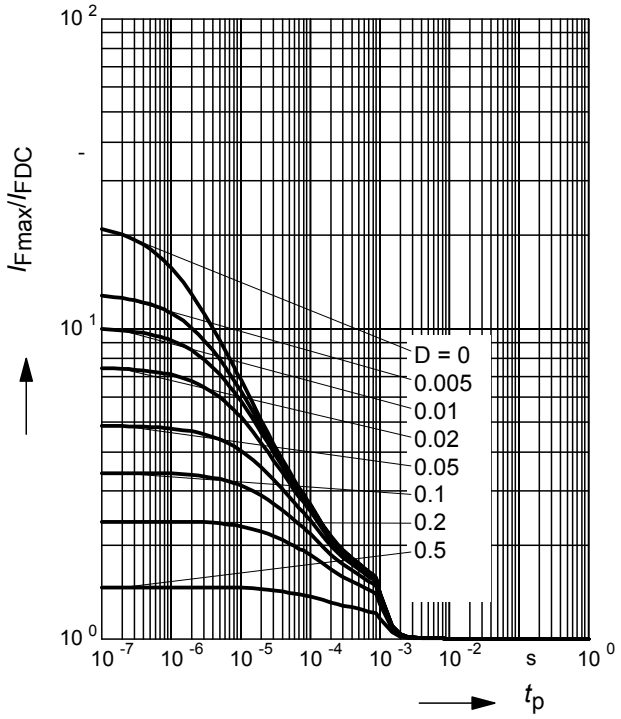


Permissible Puls Load $R_{thJS} = f\ (t_p)$



Permissible Pulse Load

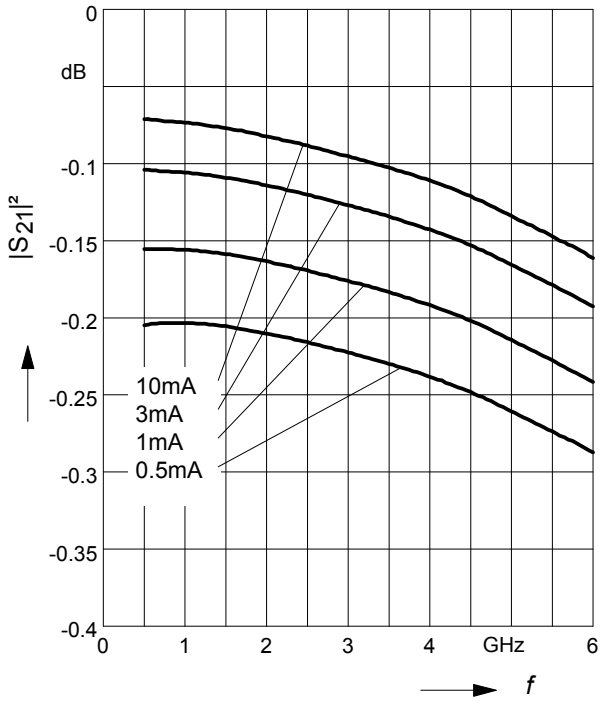
$I_{Fmax}/\ I_{FDC} = f\ (t_p)$



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

I_F = Parameter

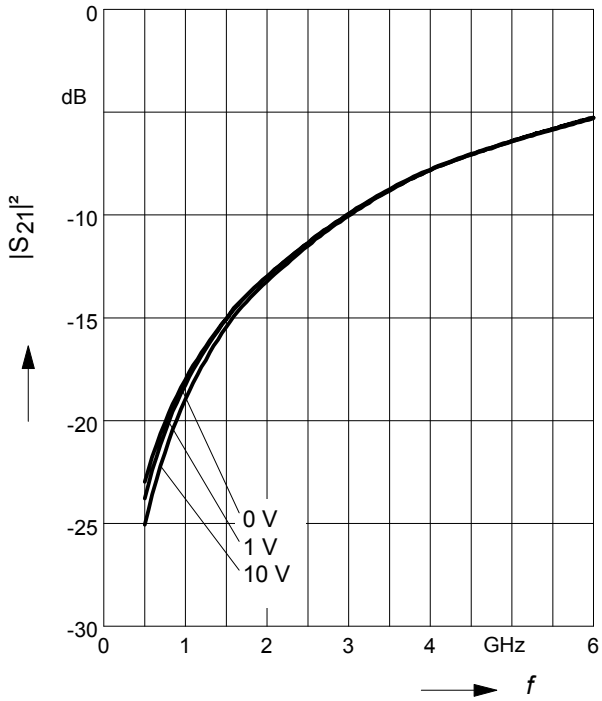
Single BAR90 diode in series configuration, $Z = 50\Omega$



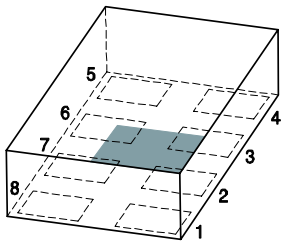
Isolation $|S_{21}|^2 = f(f)$

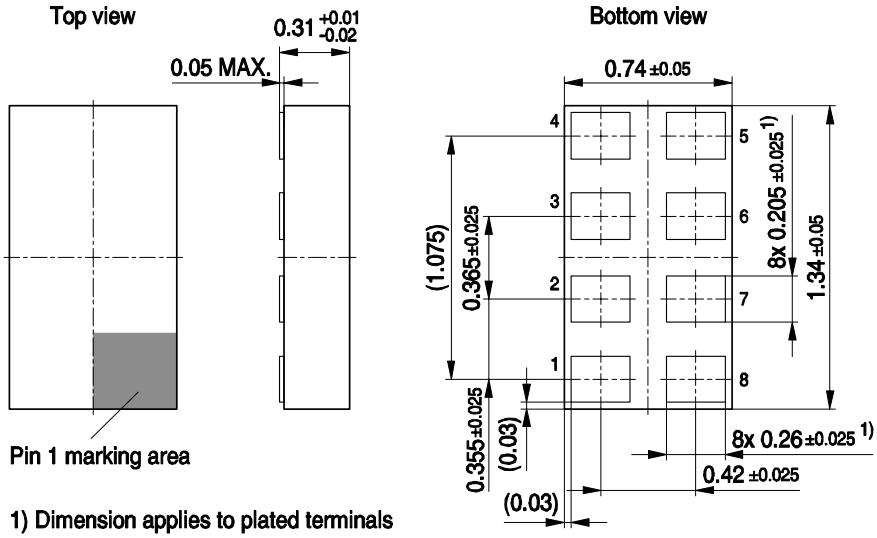
V_R = Parameter

Single BAR90 diode in series configuration, $Z = 50\Omega$



Package Outline

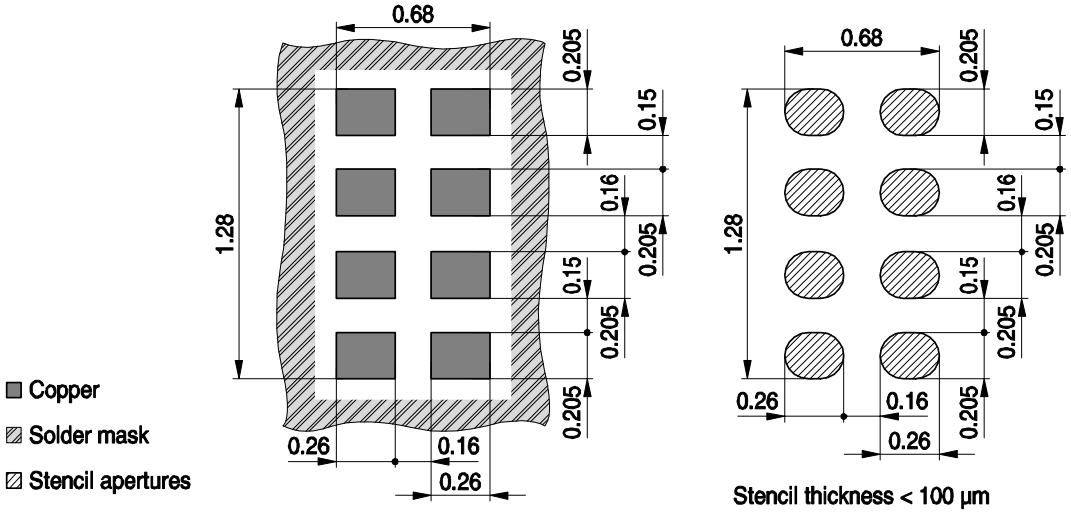




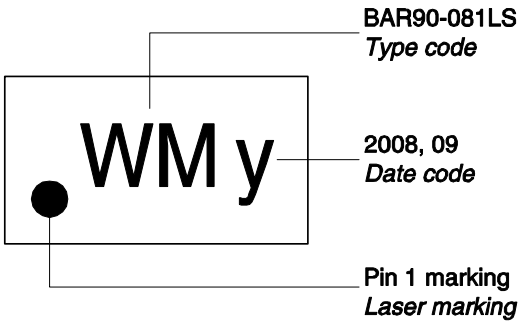
1) Dimension applies to plated terminals

Foot Print

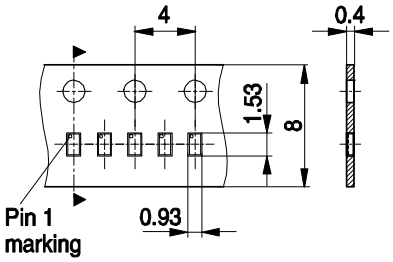
For board assembly information please refer to Infineon website "Packages"



Marking Layout (Example)



Standard Packing



Edition 2006-02-01
Published by
Infineon Technologies AG
81726 München, Germany
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