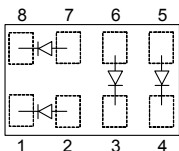


Silicon Trench PIN Diode Array

- 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. 1.3Ω @ $I_F = 3 \text{ mA}$)
- Improved ON / OFF mode harmonic distortion balance
- Very small form factor: $1.34 \times 0.74 \times 0.31 \text{ mm}^3$
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101


BAR90-081LS


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

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

| Parameter | Symbol | Value | Unit |
|---|------------------|-------------|------|
| Diode reverse voltage | V_R | 80 | V |
| Forward current | I_F | 100 | mA |
| Total power dissipation $T_S \leq 137^\circ\text{C}$ | 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 $T_A = 25^\circ\text{C}$, 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 Thermal Resistance

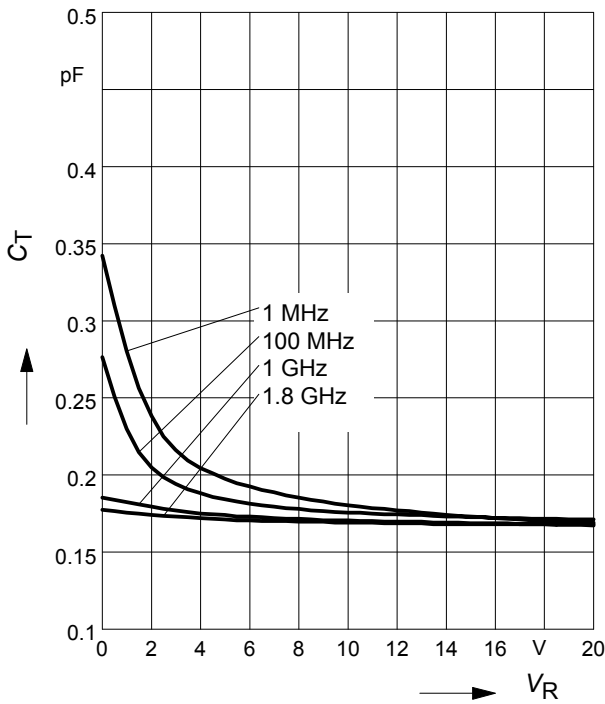
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|-------------|------------------|-----------------------------|---------------------|---------------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Diode capacitance $V_R = 1\text{ V}, f = 1\text{ MHz}$ $V_R = 0\text{ V}, f = 100\text{ MHz}$ $V_R = 0\text{ V}, f = 1\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$ | 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 Ω |
| 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 - | Ω |
| Charge carrier life time $I_F = 10\text{ mA}$, measured at $I_R = 3\text{ mA}$, $I_R = 6\text{ mA}$, $R_L = 100\ \Omega$ | τ_{rr} | - | 750 | - | ns |
| I-region width | W_I | - | 20 | - | μm |
| Insertion loss ¹⁾ $I_F = 1\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 3\text{ mA}, f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}, f = 1.8\text{ GHz}$ | I_L | - - - | 0.16 0.11 0.08 | - - - | dB |
| Isolation ¹⁾ $V_R = 0\text{ V}, f = 0.9\text{ GHz}$ $V_R = 0\text{ V}, f = 1.8\text{ GHz}$ $V_R = 0\text{ V}, f = 2.45\text{ GHz}$ | I_{SO} | - - - | 18.5 13.5 11.5 | - - - | |

¹⁾Single BAR90 diode in series configuration, $Z = 50\ \Omega$

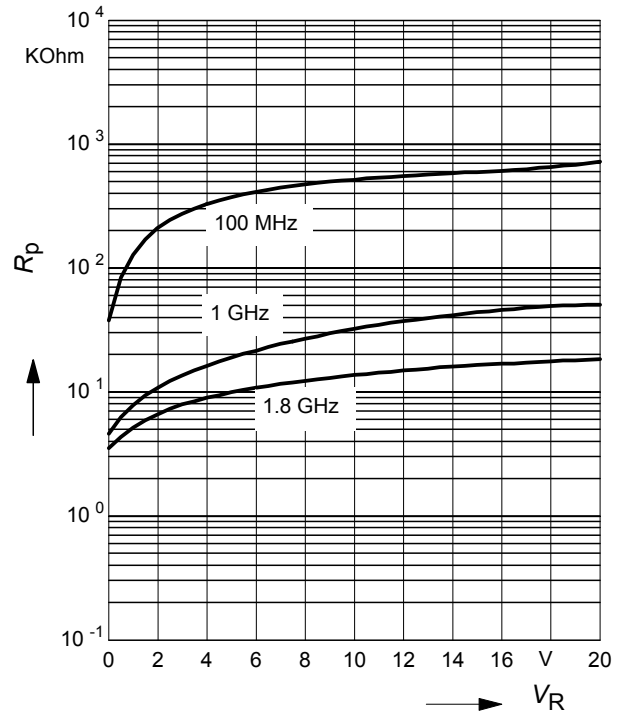
Diode capacitance $C_T = f(V_R)$

$f =$ Parameter



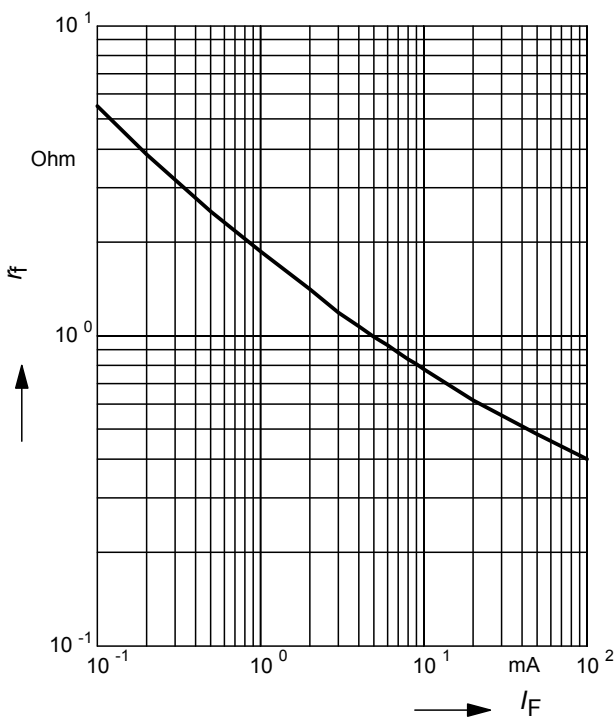
Reverse parallel resistance $R_p = f(V_R)$

$f =$ Parameter



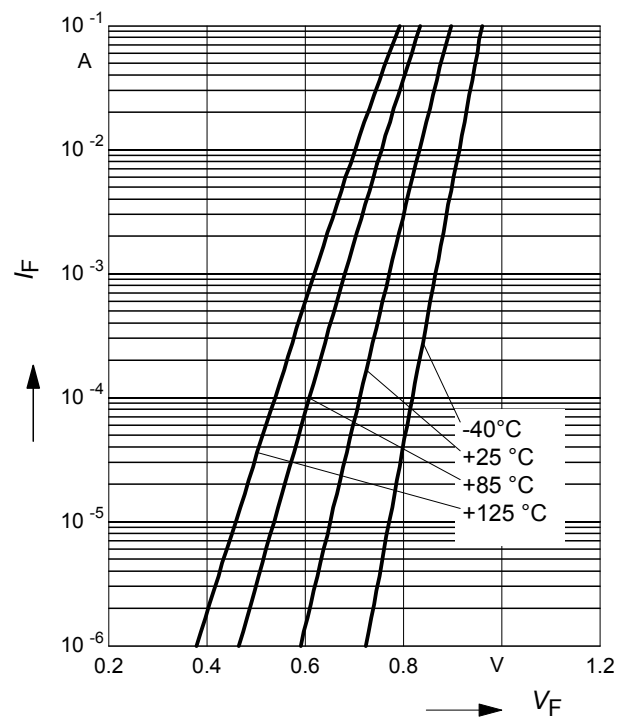
Forward resistance $r_f = f(I_F)$

$f = 100$ MHz

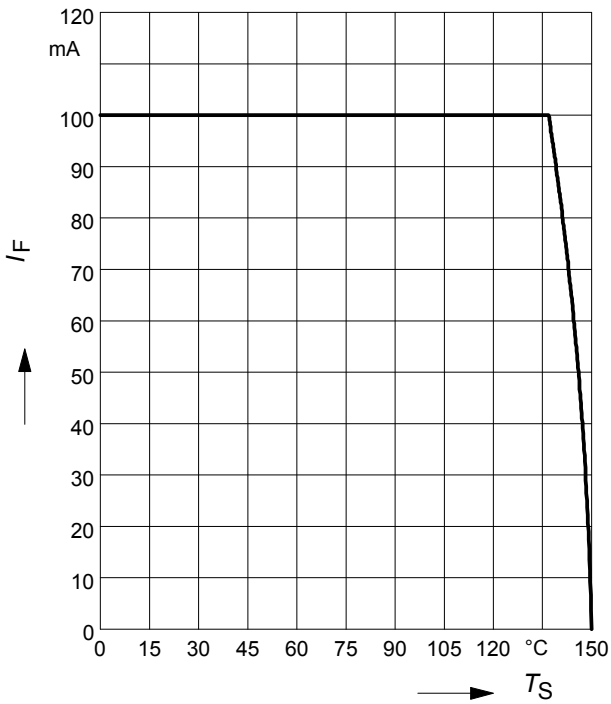


Forward current $I_F = f(V_F)$

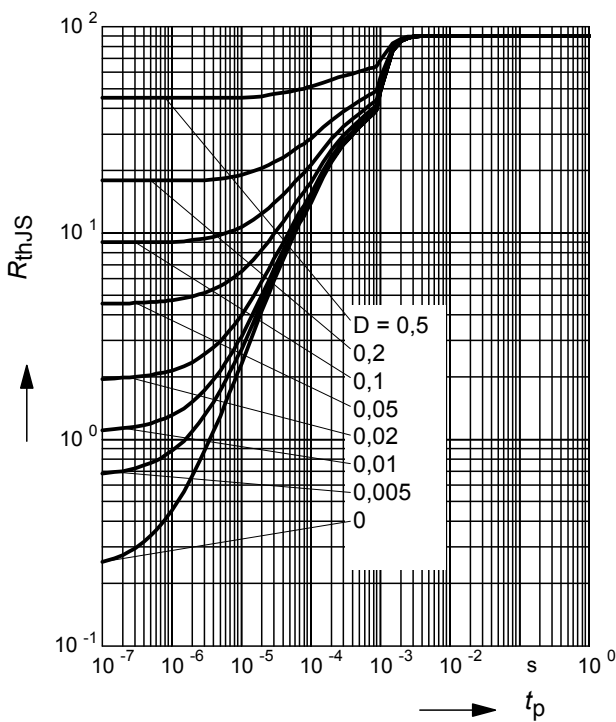
$T_A =$ Parameter



Forward current $I_F = f(T_S)$

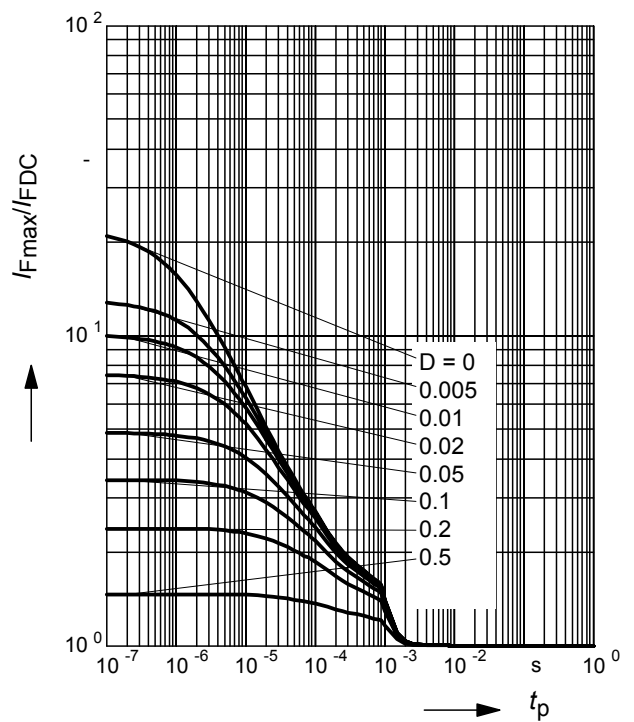


Permissible Puls Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

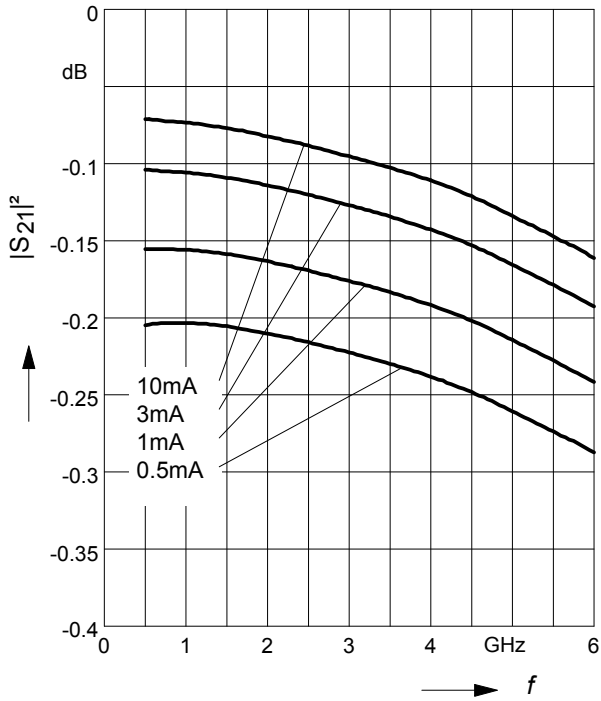
$I_{Fmax} / I_{FDC} = f(t_p)$



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

I_F = Parameter

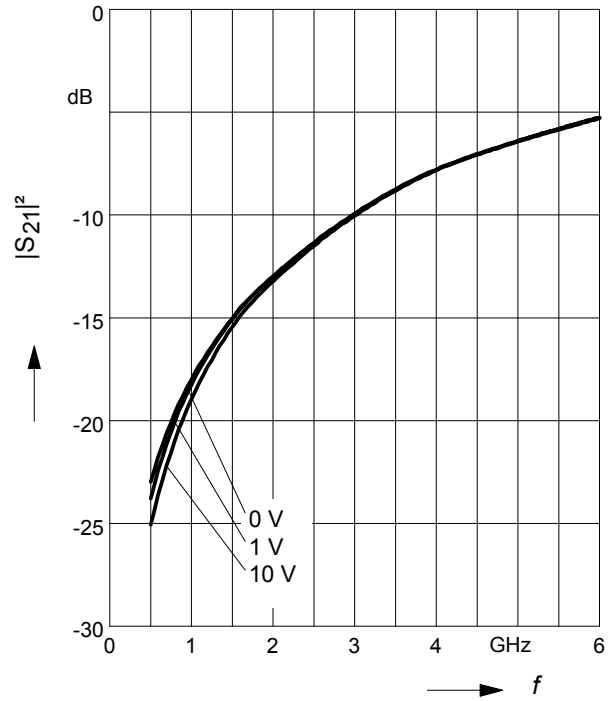
Single BAR90 diode in series configuration, $Z = 50\Omega$



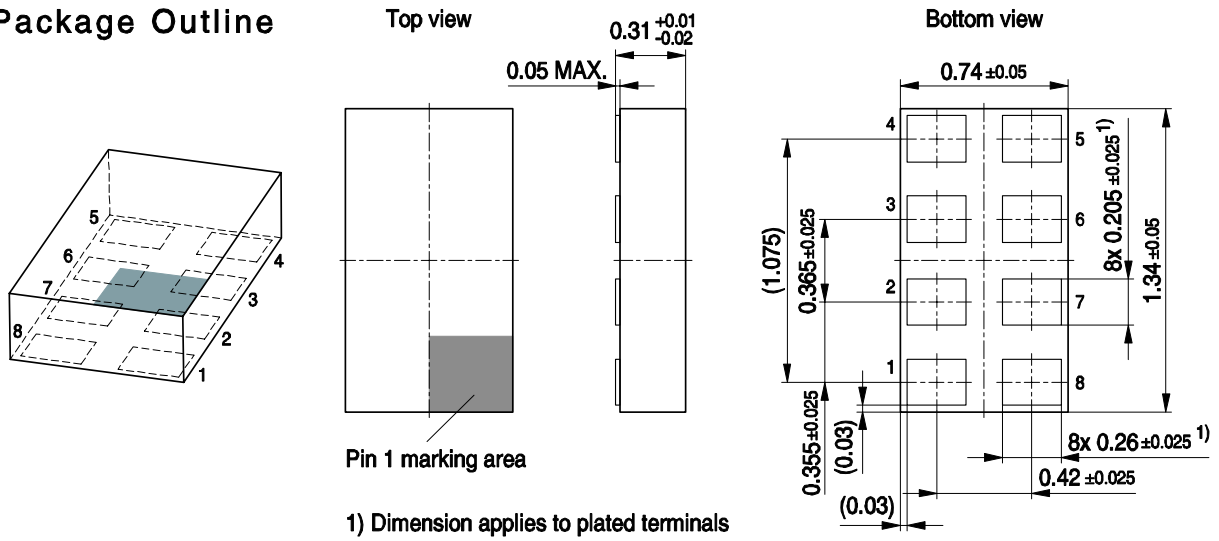
Isolation $|S_{21}|^2 = f(f)$

V_R = Parameter

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

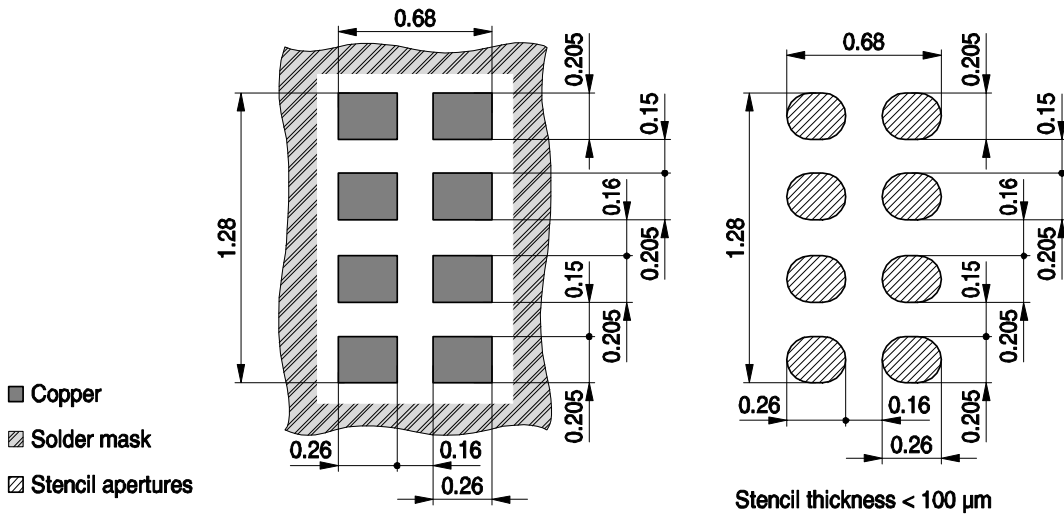


Package Outline

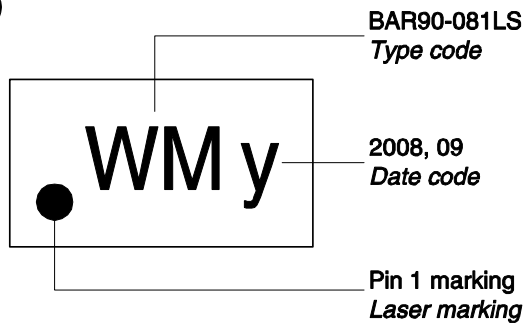


Foot Print

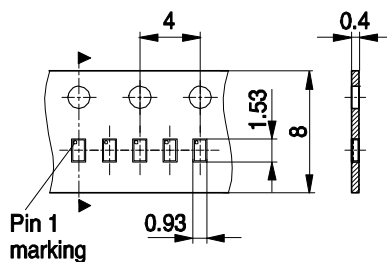
For board assembly information please refer to Infineon website "Packages"



Marking Layout (Example)



Standard Packing



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