

Silicon PIN Diodes

- PIN diode for high speed switching of RF signals
- Very low forward resistance (low insertion loss)
- Very low capacitance (high isolation)
- For frequencies up to 3GHz
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101¹⁾


BAR63-02..
BAR63-03W

BAR63-04
BAR63-04W

BAR63-05
BAR63-05W

BAR63-06
BAR63-06W


| Type | Package | Configuration | L_s (nH) | Marking |
|------------|----------|------------------|------------|---------|
| BAR63-02L* | TSLP-2-1 | single, leadless | 0.4 | G |
| BAR63-02V | SC79 | single | 0.6 | G |
| BAR63-02W | SCD80 | single | 0.6 | GG |
| BAR63-03W | SOD323 | single | 1.8 | white G |
| BAR63-04 | SOT23 | series | 1.8 | G4s |
| BAR63-04W | SOT323 | series | 1.4 | G4s |
| BAR63-05 | SOT23 | common cathode | 1.8 | G5s |
| BAR63-05W | SOT323 | common cathode | 1.4 | G5s |
| BAR63-06 | SOT23 | common anode | 1.8 | G6s |
| BAR63-06W | SOT323 | common anode | 1.4 | G6s |

¹⁾BAR63-02L is not qualified according AEC Q101

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

| Parameter | Symbol | Value | Unit |
|--|------------------|---------------------------------|------|
| Diode reverse voltage | V_R | 50 | V |
| Forward current | I_F | 100 | mA |
| Total power dissipation BAR63-02L, $T_S \leq 118^\circ\text{C}$ BAR63-02V, -02W, BAR63-03W, $T_S \leq 115^\circ\text{C}$ BAR63-04...BAR63-06, $T_S \leq 55^\circ\text{C}$ BAR63-04S, $T_S \leq 115^\circ\text{C}$ BAR63-04W...BAR63-06W, $T_S \leq 105^\circ\text{C}$ | P_{tot} | 250 250 250 250 250 | 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⁾ BAR63-02L BAR63-02V, BAR63-02W BAR63-03W BAR63-04...BAR63-06 BAR63-04S BAR63-04W...BAR63-06W | R_{thJS} | ≤ 125 ≤ 140 ≤ 155 ≤ 380 ≤ 180 ≤ 180 | 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 $I_{(\text{BR})} = 5 \mu\text{A}$ | $V_{(\text{BR})}$ | 50 | - | - | V |
| Reverse current $V_R = 35 \text{ V}$ | I_R | - | - | 10 | nA |
| Forward voltage $I_F = 100 \text{ mA}$ | V_F | - | 0.95 | 1.2 | V |

¹⁾For calculation of R_{thJA} please refer to the Technical Information

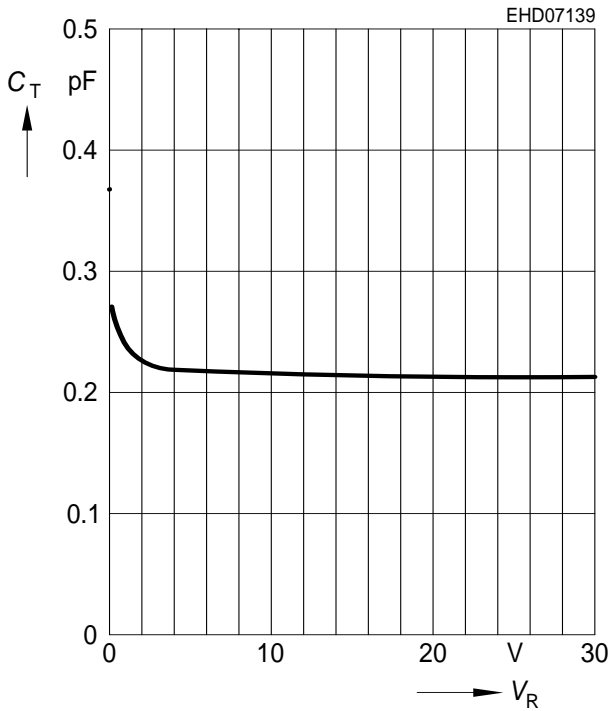
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|-------------|-------------|---------------------|-------------|---------------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Diode capacitance $V_R = 5\text{ V}$, $f = 1\text{ MHz}$ $V_R = 0\text{ V}$, 100 MHz ... 1.8 GHz | C_T | - - | 0.21 0.3 | 0.3 - | 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 | - - - | 500 15 5 | - - - | k Ω |
| Forward resistance $I_F = 5\text{ mA}$, $f = 100\text{ MHz}$ $I_F = 10\text{ mA}$, $f = 100\text{ MHz}$ | r_f | - - | 1.2 1 | 2 - | Ω |
| Charge carrier life time $I_F = 10\text{ mA}$, $I_R = 6\text{ mA}$, measured at $I_R = 3\text{ mA}$, $R_L = 100\ \Omega$ | τ_{rr} | - | 75 | - | ns |
| I-region width | W_I | - | 4.5 | - | μm |
| Insertion loss ¹⁾ $I_F = 1\text{ mA}$, $f = 1.8\text{ GHz}$ $I_F = 5\text{ mA}$, $f = 1.8\text{ GHz}$ $I_F = 10\text{ mA}$, $f = 1.8\text{ GHz}$ | l_L | - - - | 0.15 0.11 0.1 | - - - | dB |
| Isolation ¹⁾ $V_R = 0\text{ V}$, $f = 0.9\text{ GHz}$ $V_R = 0\text{ V}$, $f = 1.8\text{ GHz}$ $V_R = 0\text{ V}$, $f = 2.45\text{ GHz}$ | l_{SO} | - - - | 17.9 12.3 10 | - - - | |
| Series inductance | L_S | - | - | - | |

¹⁾BAR63-02L in series configuration, $Z = 50\ \Omega$

Diode capacitance $C_T = f(V_R)$

$f = 1\text{MHz} - 1.8\text{GHz}$



Reverse parallel resistance $R_p = f(V_R)$

$f = \text{Parameter}$



Forward resistance $r_f = f(I_F)$

$f = 100\text{MHz}$



Forward current $I_F = f(V_F)$

$T_A = \text{Parameter}$



Forward current $I_F = f(T_S)$

BAR63-04...BAR63-06



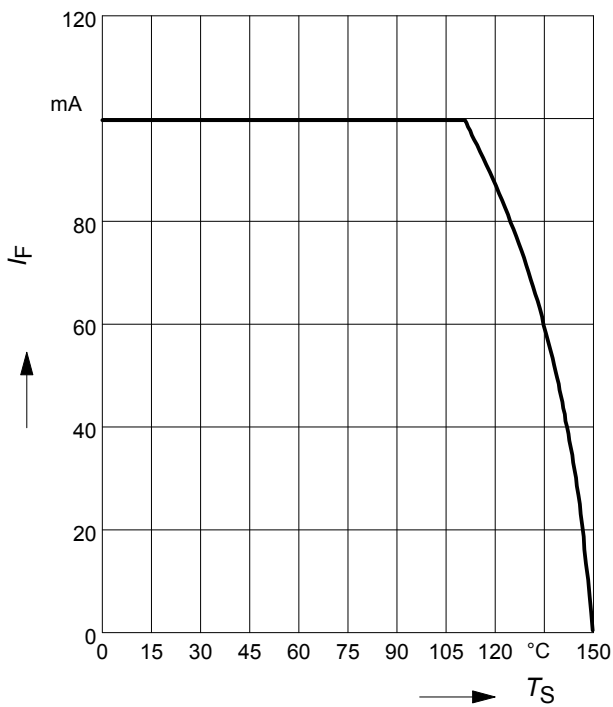
Forward current $I_F = f(T_S)$

BAR63-02V, BAR63-02W



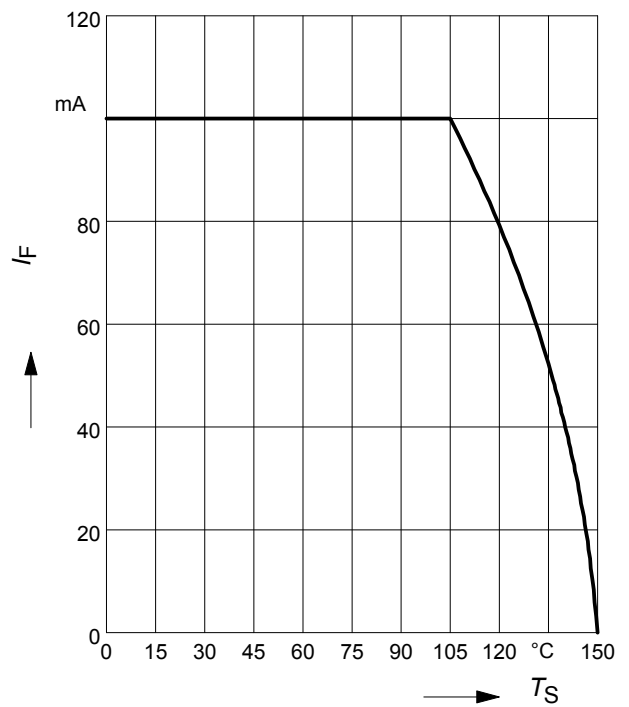
Forward current $I_F = f(T_S)$

BAR63-03W



Forward current $I_F = f(T_S)$

BAR63-04W...BAR63-06W



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

BAR63-04...BAR63-06



Permissible Pulse Load

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

BAR63-04...BAR63-06



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

BAR63-02V, BAR63-02W



Permissible Pulse Load

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

BAR63-02V, BAR63-02W



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

BAR63-03W



Permissible Pulse Load

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

BAR63-03W



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

BAR63-04W...BAR63-06W



Permissible Pulse Load

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

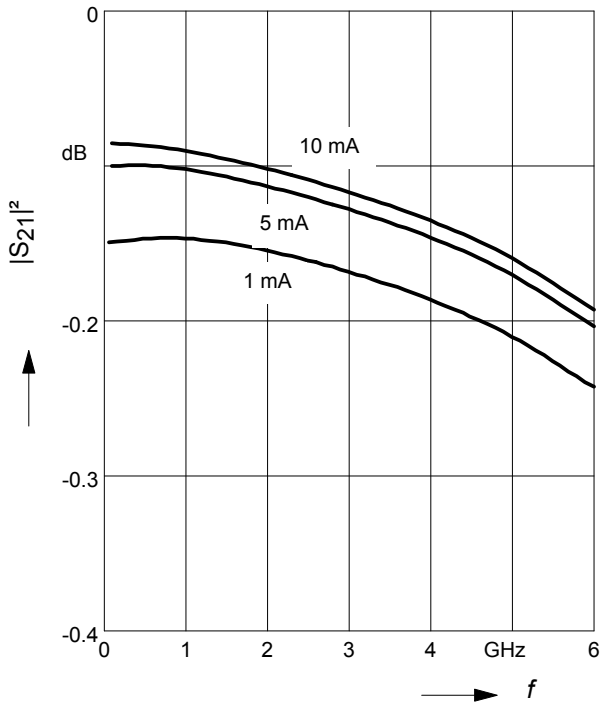
BAR63-04W...BAR63-06W



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

$I_F =$ Parameter

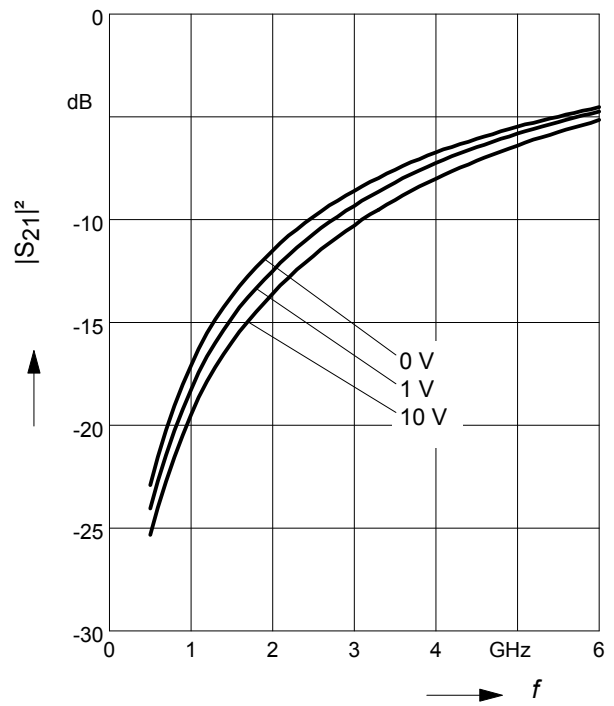
BAR63-02L in series configuration, $Z = 50\Omega$



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

$V_R =$ Parameter

BAR63-02L in series configuration, $Z = 50\Omega$



Package Outline



Foot Print



Marking Layout (Example)



Standard Packing

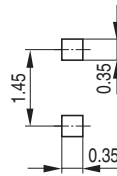
- Reel \varnothing 180 mm = 3.000 Pieces/Reel
- Reel \varnothing 180 mm = 8.000 Pieces/Reel (2 mm Pitch)
- Reel \varnothing 330 mm = 10.000 Pieces/Reel



Package Outline



Foot Print

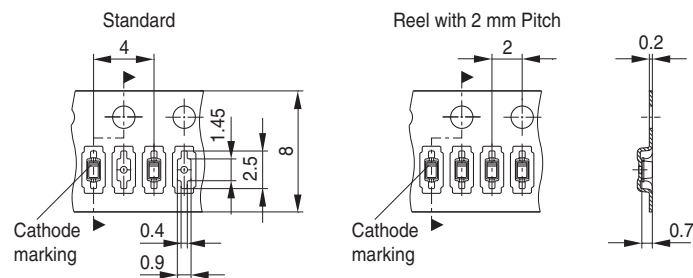


Marking Layout (Example)



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, SC75¹⁾) 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



Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
 Reel ø330 mm = 10.000 Pieces/Reel



Package Outline



1) Lead width can be 0.6 max. in dambar area

Foot Print

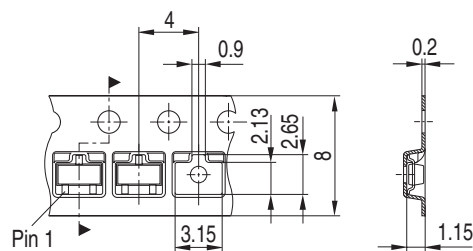


Marking Layout (Example)



Standard Packing

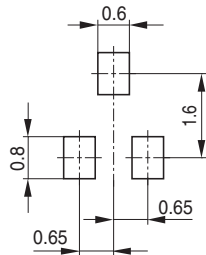
Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel



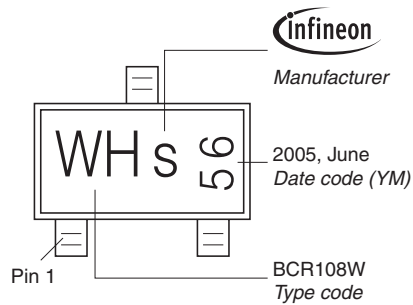
Package Outline



Foot Print



Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
 Reel ø330 mm = 10.000 Pieces/Reel



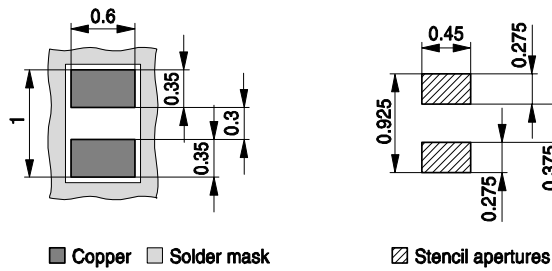
Package Outline



1) Dimension applies to plated terminal

Foot Print

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

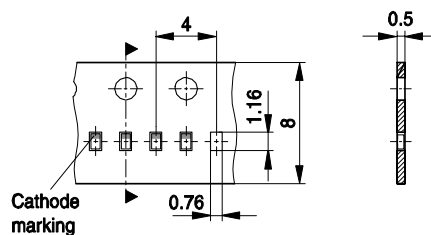


Marking Layout (Example)



Standard Packing

Reel \varnothing 180 mm = 15.000 Pieces/Reel
 Reel \varnothing 330 mm = 50.000 Pieces/Reel (optional)



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