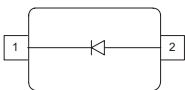


Silicon PIN Diodes

- Current-controlled RF resistor for switching and attenuating applications
- Frequency range above 10 MHz up to 6 GHz
- Especially useful as antenna switch in mobile communication
- Very low capacitance at zero volt reverse bias at frequencies above 1 GHz (typ. 0.15 pF)
- Low forward resistance
- Very low harmonic distortion
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101¹⁾



BAR50-02L
BAR50-02V
BAR50-03W



Type	Package	Configuration	L_S (nH)	Marking
BAR50-02L*	TSLP-2-1	single, leadless	0.4	AB
BAR50-02V	SC79	single	0.6	a
BAR50-03W	SOD323	single	1.8	blue A

¹⁾BAR50-02L 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 BAR50-02L, $T_S \leq 130^\circ\text{C}$ BAR50-02V, $T_S \leq 120^\circ\text{C}$ BAR50-03W, $T_S \leq 115^\circ\text{C}$	P_{tot}	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⁾ BAR50-02L BAR50-02V BAR50-03W	R_{thJS}	≤ 80 ≤ 120 ≤ 140	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Reverse current $V_R = 50\text{ V}$	I_R	-	-	50	nA
Forward voltage $I_F = 50\text{ mA}$	V_F	-	0.95	1.1	V

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

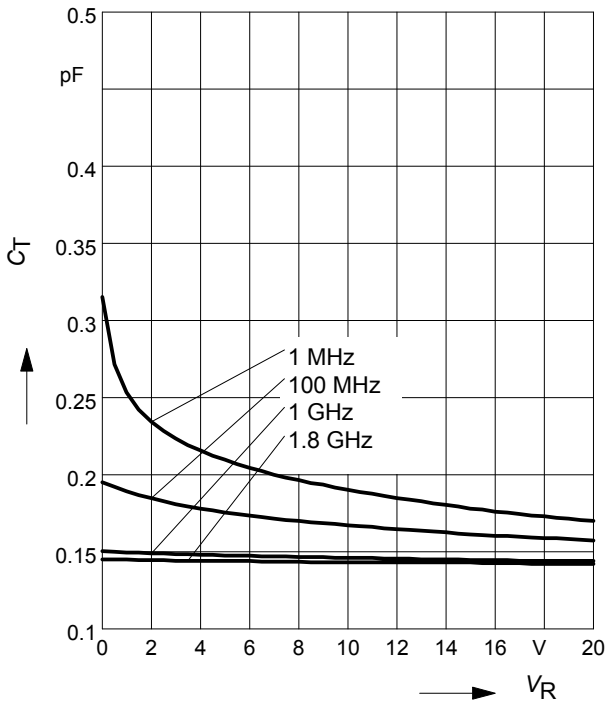
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Diode capacitance	C_T	-	0.24	0.5	pF
$V_R = 1\text{ V}, f = 1\text{ MHz}$		-	0.2	0.4	
$V_R = 5\text{ V}, f = 1\text{ MHz}$		-	0.2	-	
$V_R = 0\text{ V}, f = 100\text{ MHz}$		-	0.1	-	
$V_R = 0\text{ V}, f = 1\dots 1.8\text{ GHz}, \text{BAR50-02L}$		-	0.15	-	
$V_R = 0\text{ V}, f = 1\dots 1.8\text{ GHz}, \text{all other}$					
Reverse parallel resistance	R_p	-	25	-	k Ω
$V_R = 0\text{ V}, f = 100\text{ MHz}$		-	6	-	
$V_R = 0\text{ V}, f = 1\text{ GHz}$		-	5	-	
$V_R = 0\text{ V}, f = 1.8\text{ GHz}$					
Forward resistance	r_f	-	25	40	Ω
$I_F = 0.5\text{ mA}, f = 100\text{ MHz}$		-	16.5	25	
$I_F = 1\text{ mA}, f = 100\text{ MHz}$		-	3	4.5	
$I_F = 10\text{ mA}, f = 100\text{ MHz}$					
Charge carrier life time	τ_{rr}	-	1100	-	ns
$I_F = 10\text{ mA}, I_R = 6\text{ mA}, \text{measured at } I_R = 3\text{ mA}, R_L = 100\ \Omega$					
I-region width	W_I	-	56	-	μm
Insertion loss ¹⁾	I_L	-	0.56	-	dB
$I_F = 3\text{ mA}, f = 1.8\text{ GHz}$		-	0.4	-	
$I_F = 5\text{ mA}, f = 1.8\text{ GHz}$		-	0.27	-	
$I_F = 10\text{ mA}, f = 1.8\text{ GHz}$					
Isolation ¹⁾	I_{SO}	-	24.5	-	
$V_R = 0\text{ V}, f = 0.9\text{ GHz}$		-	20	-	
$V_R = 0\text{ V}, f = 1.8\text{ GHz}$		-	18	-	
$V_R = 0\text{ V}, f = 2.45\text{ GHz}$		-	12	-	
$V_R = 0\text{ V}, f = 5.6\text{ GHz}$					

¹BAR50-02L in series configuration, $Z = 50\ \Omega$

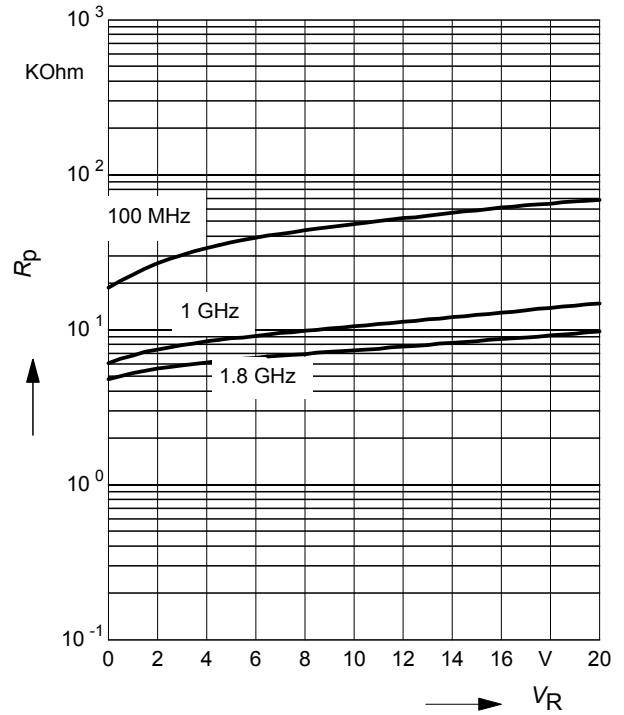
Diode capacitance $C_T = f(V_R)$

$f =$ Parameter



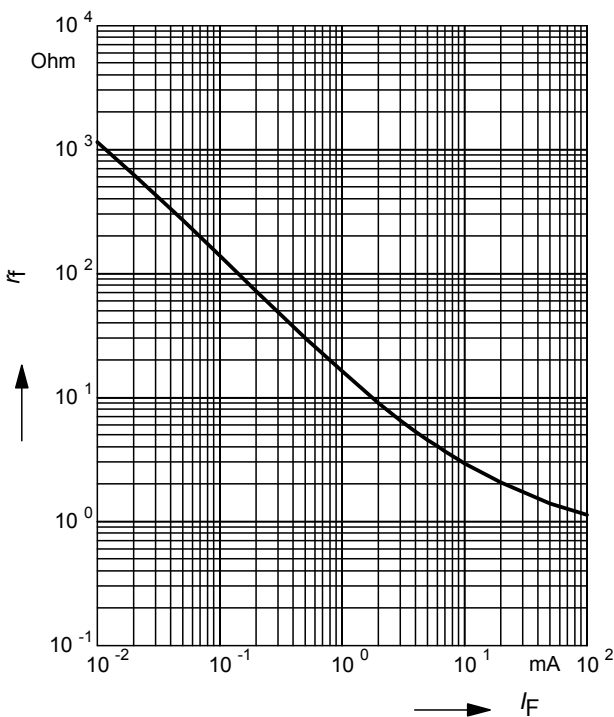
Reverse parallel resistance $R_P = f(V_R)$

$f =$ Parameter



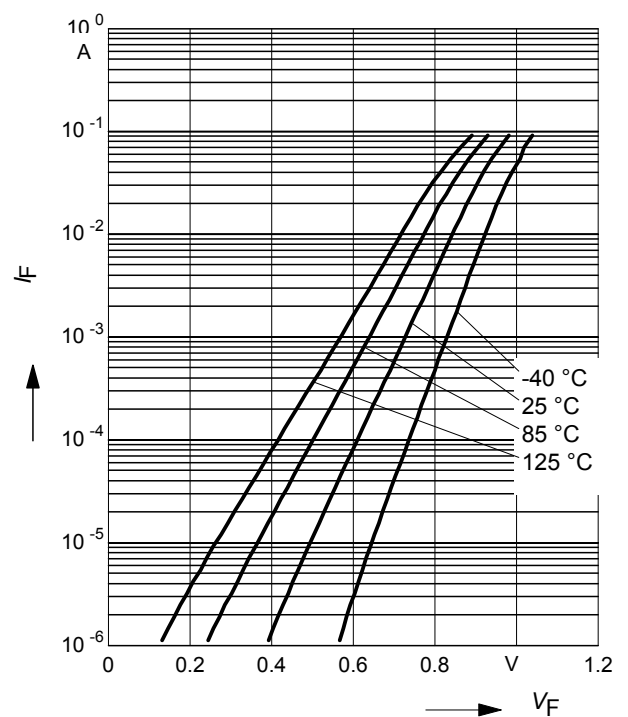
Forward resistance $r_f = f(I_F)$

$f = 100$ MHz



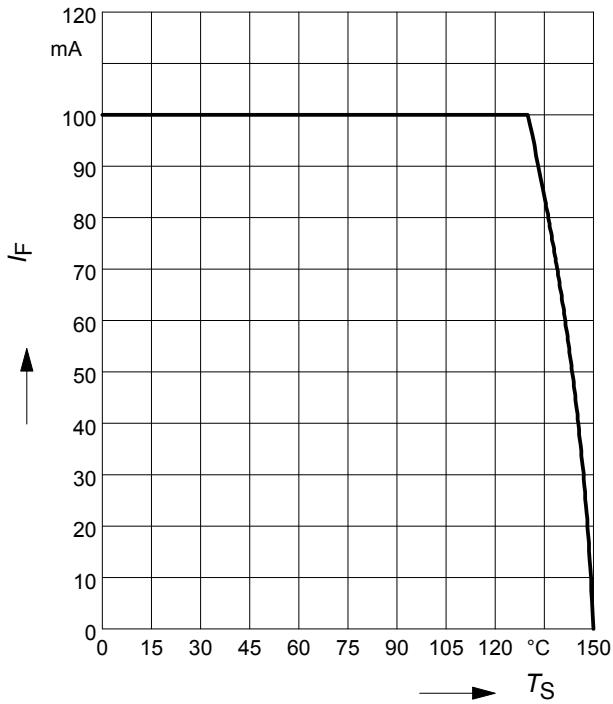
Forward current $I_F = f(V_F)$

$T_A =$ Parameter



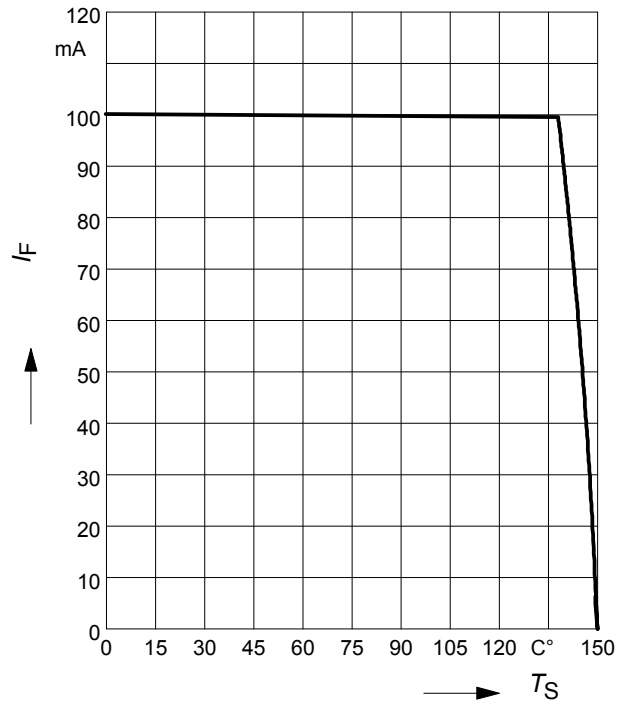
Forward current $I_F = f(T_S)$

BAR50-02L



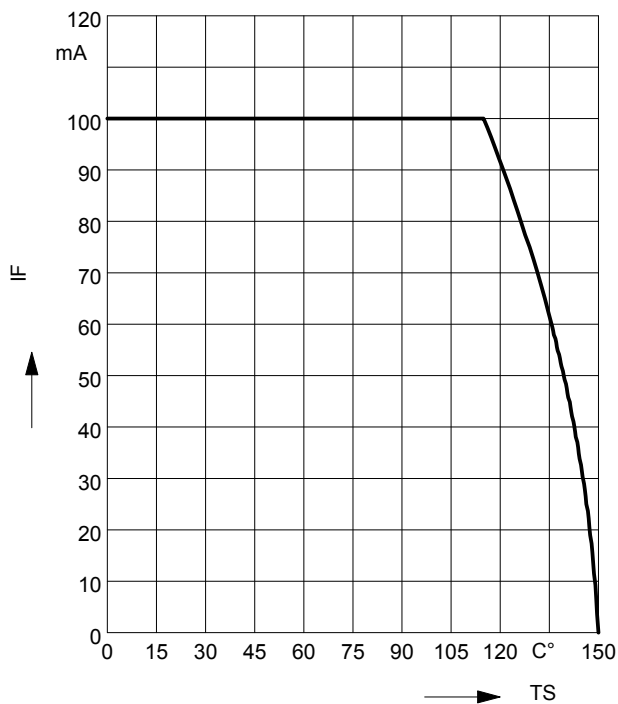
Forward current $I_F = f(T_S)$

BAR50-02V



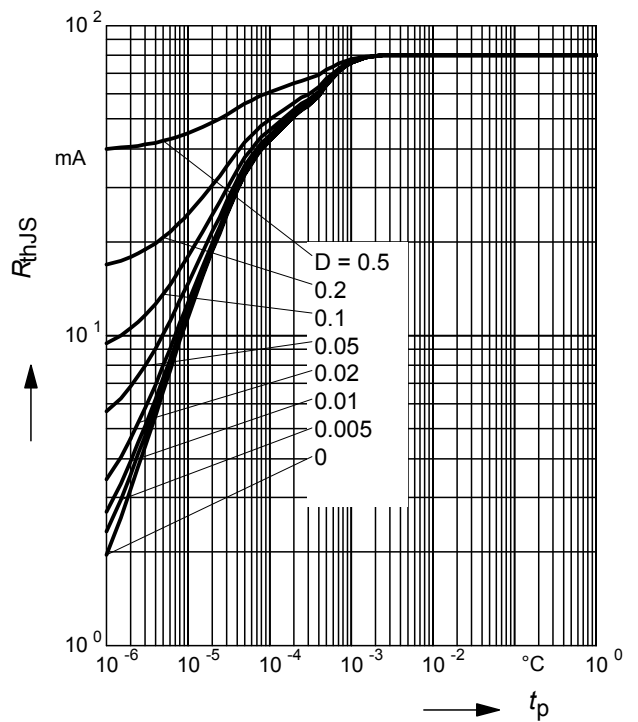
Forward current $I_F = f(T_S)$

BAR50-03W



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

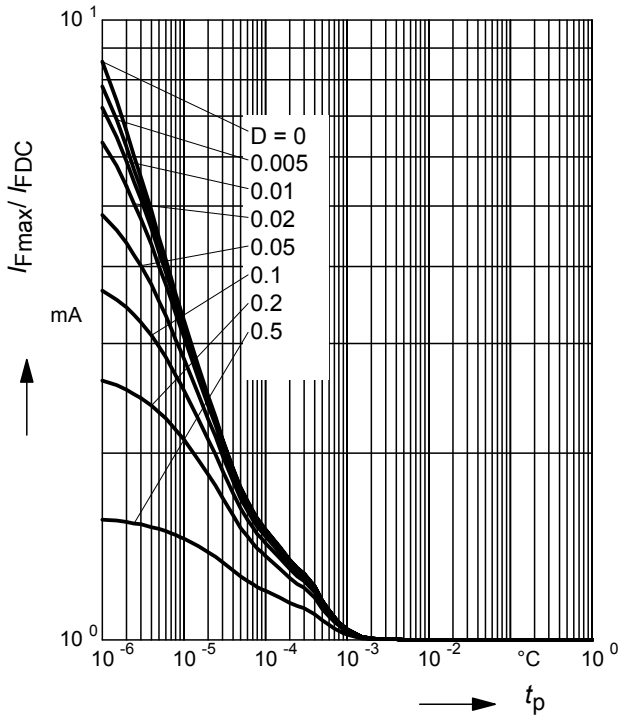
BAR50-02L



Permissible Pulse Load

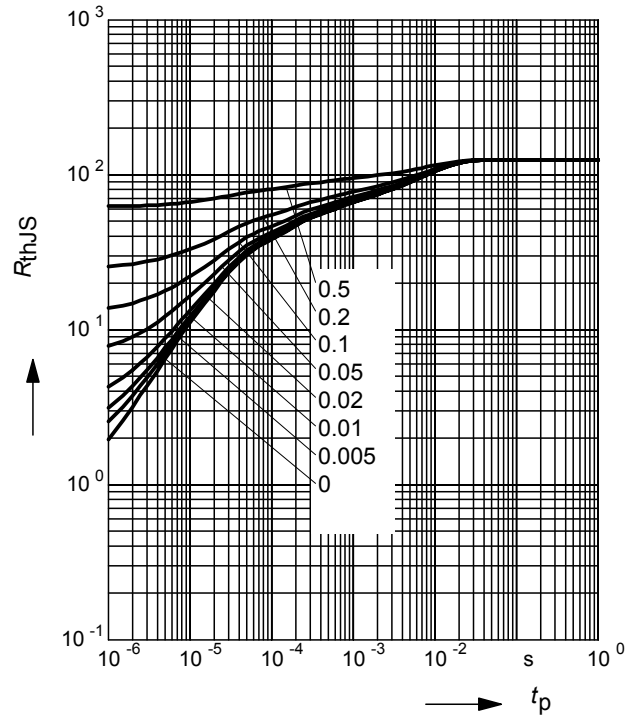
$$I_{Fmax} / I_{FDC} = f(t_p)$$

BAR50-02L



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

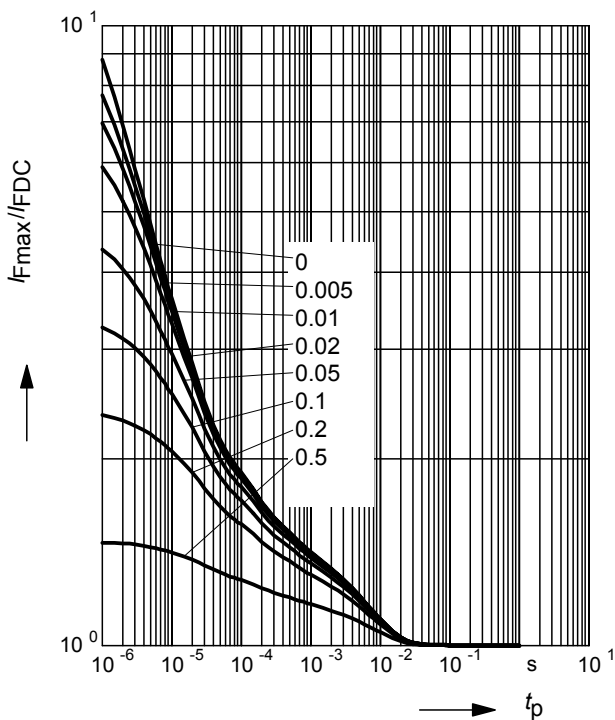
BAR50-02V



Permissible Pulse Load

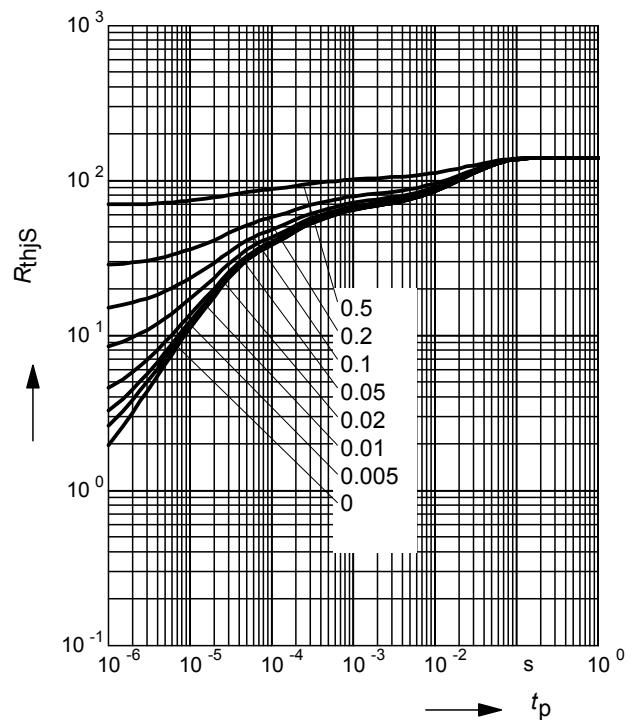
$$I_{Fmax} / I_{FDC} = f(t_p)$$

BAR50-02V



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

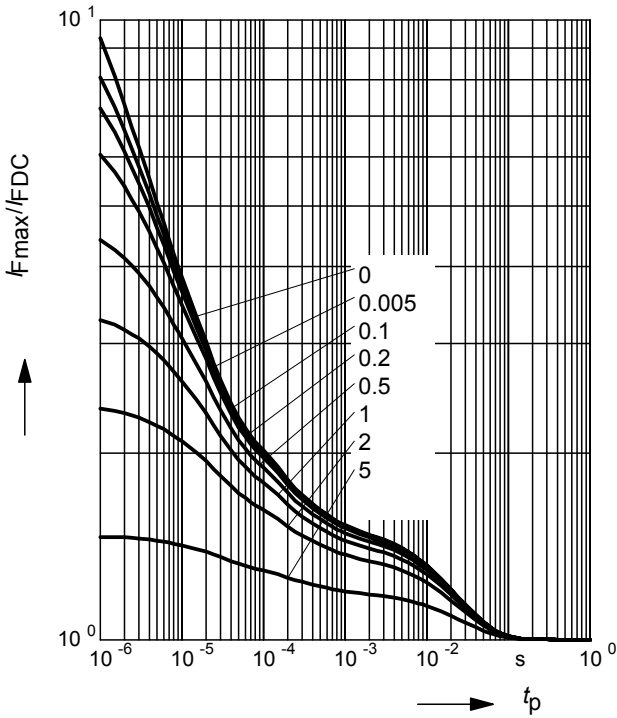
BAR50-03W



Permissible Pulse Load

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

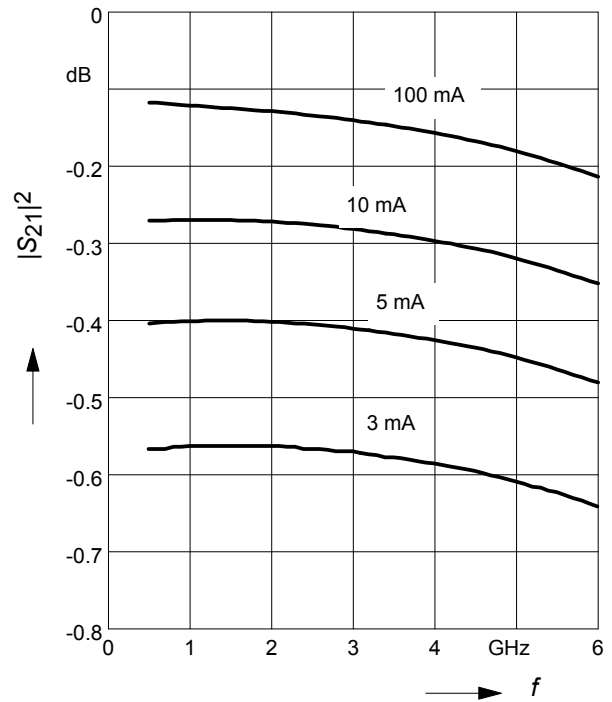
BAR50-03W



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

I_F = Parameter

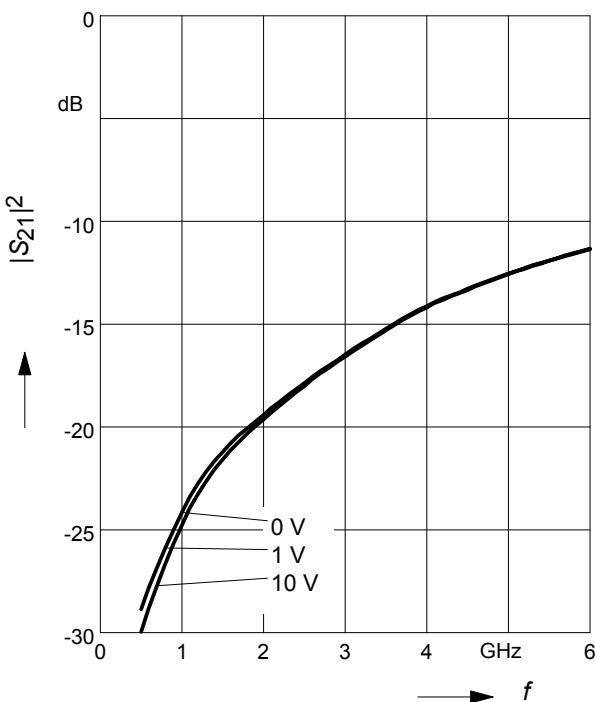
BAR50-02L in series configuration, $Z = 50\Omega$



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

V_R = Parameter

BAR50-02L in series configuration, $Z = 50\Omega$



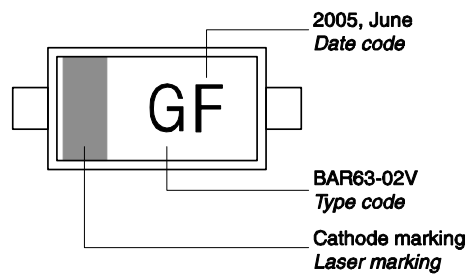
Package Outline



Foot Print

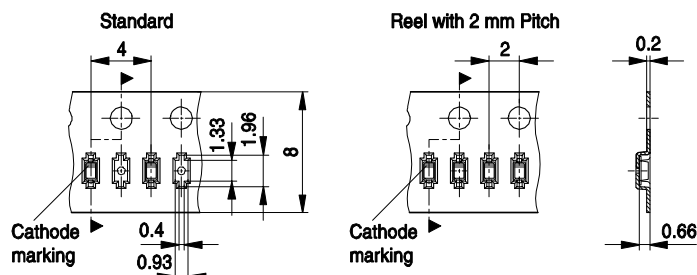


Marking Layout (Example)



Standard Packing

- Reel ø180 mm = 3.000 Pieces/Reel
- Reel ø180 mm = 8.000 Pieces/Reel (2 mm Pitch)
- Reel ø330 mm = 10.000 Pieces/Reel



Date Code marking for discrete packages with one digit (SCD80, SC79, SC75¹⁾) CES-Code

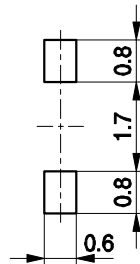
Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
01	a	p	A	P	a	p	A	P	a	p	A	P
02	b	q	B	Q	b	q	B	Q	b	q	B	Q
03	c	r	C	R	c	r	C	R	c	r	C	R
04	d	s	D	S	d	s	D	S	d	s	D	S
05	e	t	E	T	e	t	E	T	e	t	E	T
06	f	u	F	U	f	u	F	U	f	u	F	U
07	g	v	G	V	g	v	G	V	g	v	G	V
08	h	x	H	X	h	x	H	X	h	x	H	X
09	j	y	J	Y	j	y	J	Y	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)

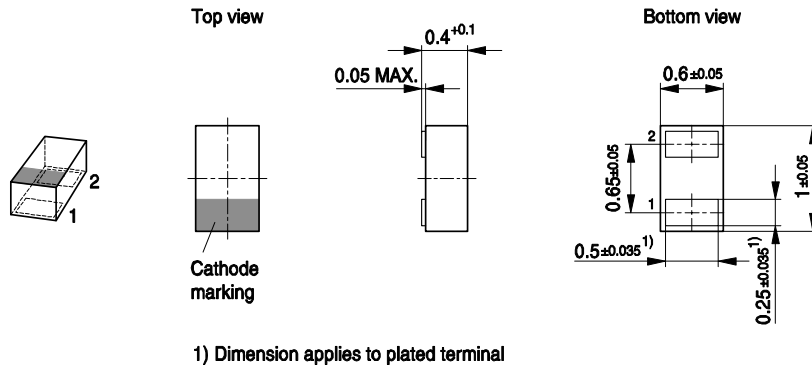


Standard Packing

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

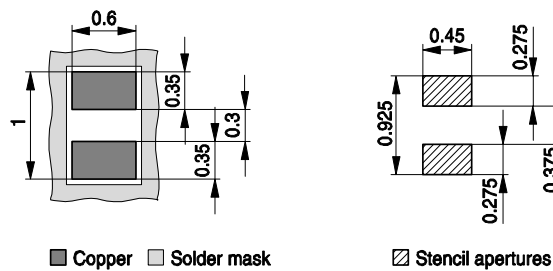


Package Outline

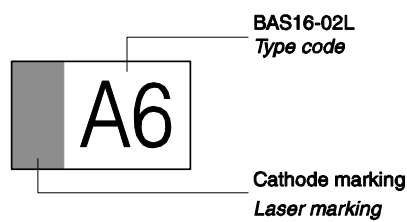


Foot Print

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

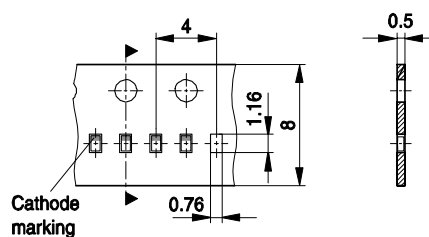


Marking Layout (Example)



Standard Packing

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



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