

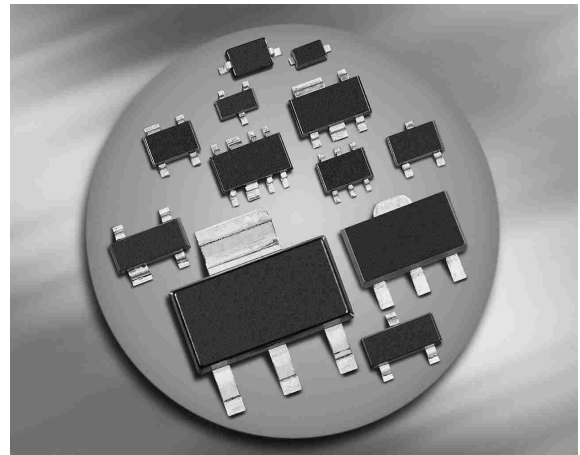


**THE DATASHEET OF  
BAR50-03WE6327**

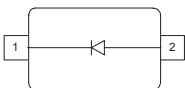


**Silicon PIN Diodes**

- 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 Q101<sup>1)</sup>



**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

<sup>1)</sup>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, $T_S \leq 115^\circ\text{C}$	$P_{\text{tot}}$	250 250 250	mW
Junction temperature	$T_j$	150	°C
Operating temperature range	$T_{\text{op}}$	-55 ... 125	
Storage temperature	$T_{\text{stg}}$	-55 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup> BAR50-02L BAR50-02V BAR50-03W	$R_{\text{thJS}}$	$\leq 80$ $\leq 120$ $\leq 140$	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

<sup>1)</sup>For calculation of  $R_{\text{thJA}}$  please refer to Application Note Thermal Resistance

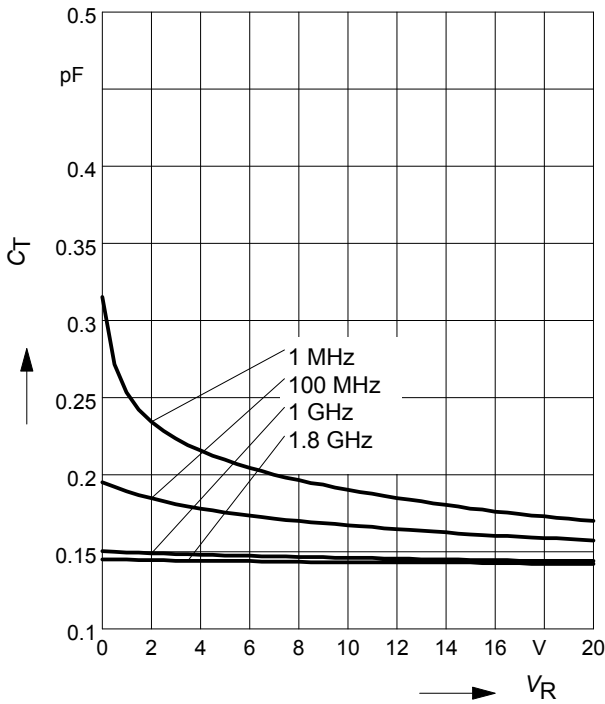
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
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 $\Omega$
$V_R = 0\text{ V}, f = 100\text{ MHz}$		-	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	$\Omega$
$I_F = 0.5\text{ mA}, f = 100\text{ MHz}$		-	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	$\tau_{rr}$	-	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	-	$\mu\text{m}$
Insertion loss <sup>1)</sup>	$I_L$	-	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 <sup>1)</sup>	$I_{SO}$	-	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	-	
$V_R = 0\text{ V}, f = 5.6\text{ GHz}$		-	-	-	

<sup>1</sup>BAR50-02L in series configuration,  $Z = 50\ \Omega$

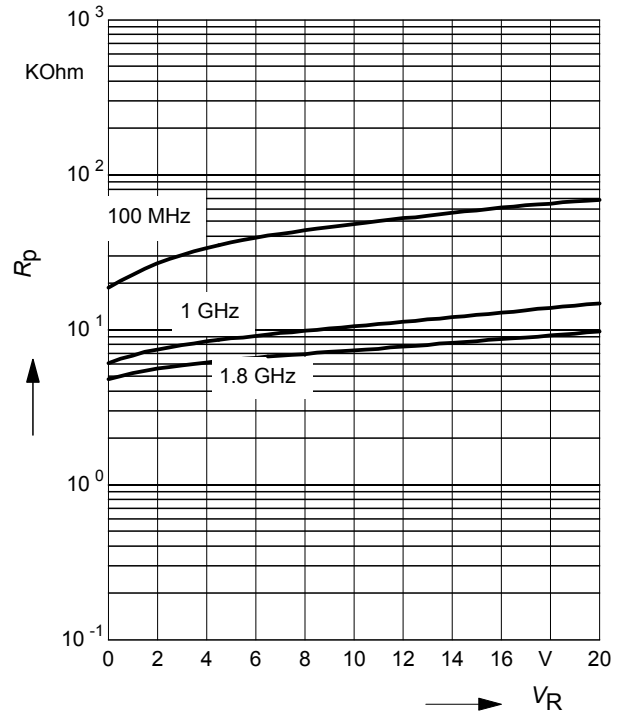
**Diode capacitance  $C_T = f(V_R)$**

$f =$  Parameter



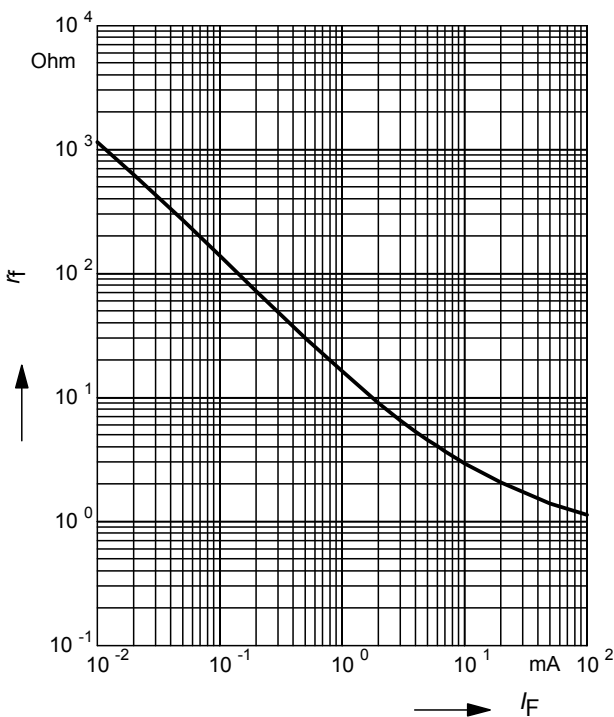
**Reverse parallel resistance  $R_P = f(V_R)$**

$f =$  Parameter



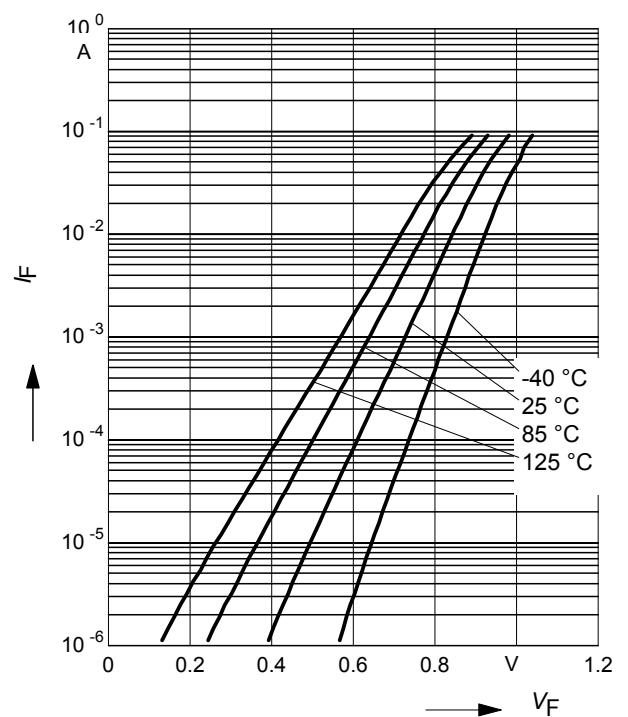
**Forward resistance  $r_f = f(I_F)$**

$f = 100$  MHz



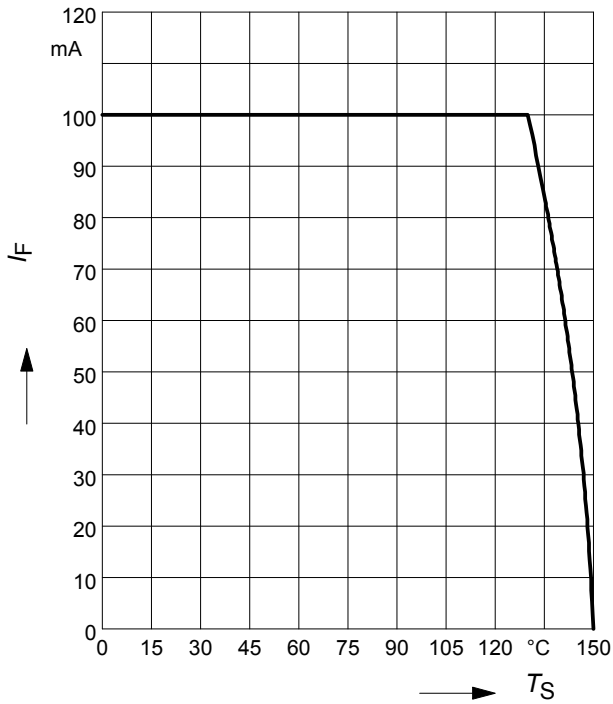
**Forward current  $I_F = f(V_F)$**

$T_A =$  Parameter



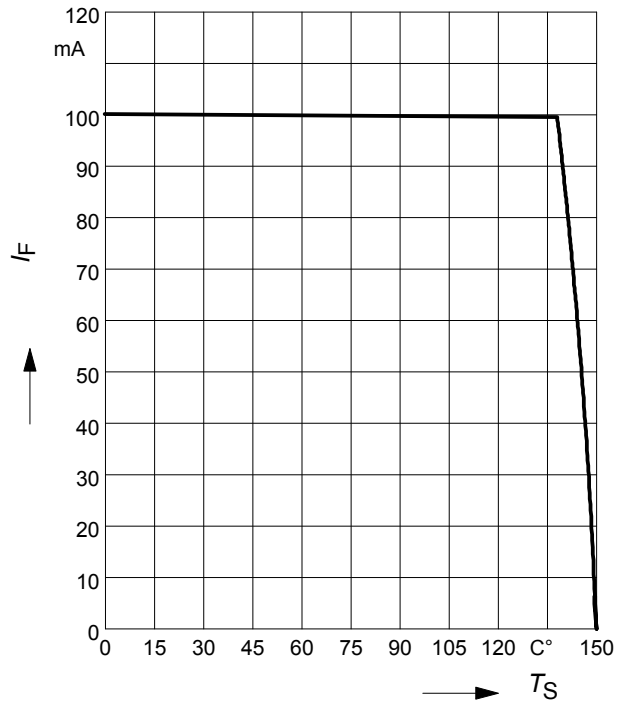
Forward current  $I_F = f(T_S)$

BAR50-02L



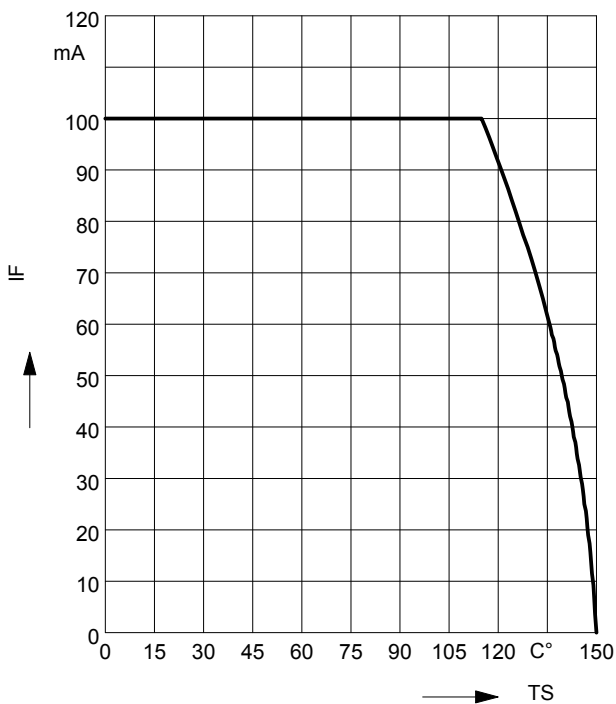
Forward current  $I_F = f(T_S)$

BAR50-02V



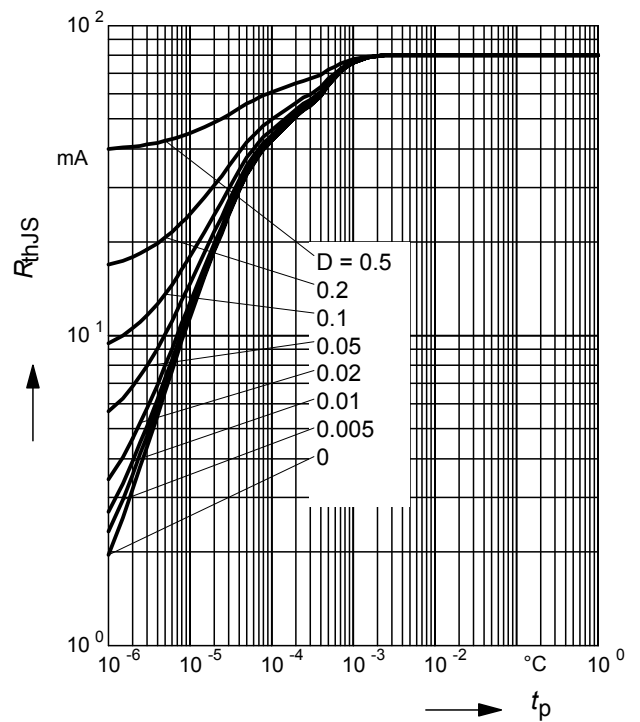
Forward current  $I_F = f(T_S)$

BAR50-03W



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

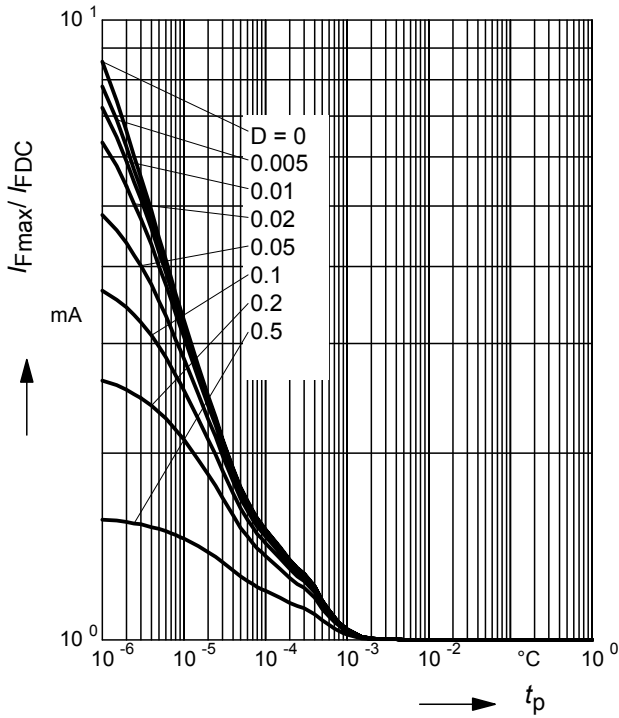
BAR50-02L



**Permissible Pulse Load**

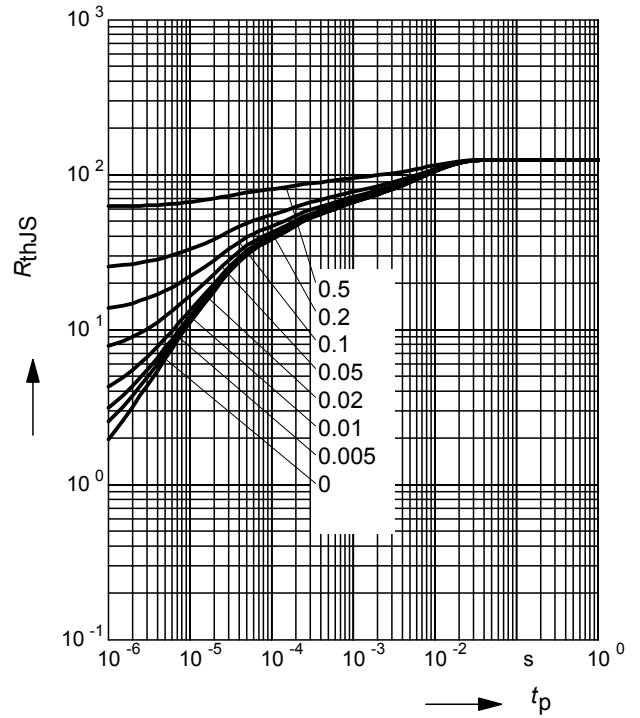
$$I_{Fmax} / I_{FDC} = f(t_p)$$

BAR50-02L



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

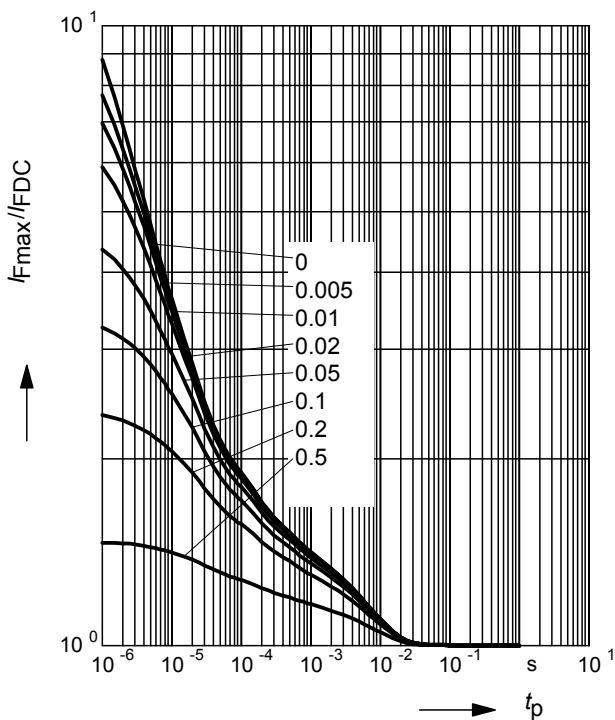
BAR50-02V



**Permissible Pulse Load**

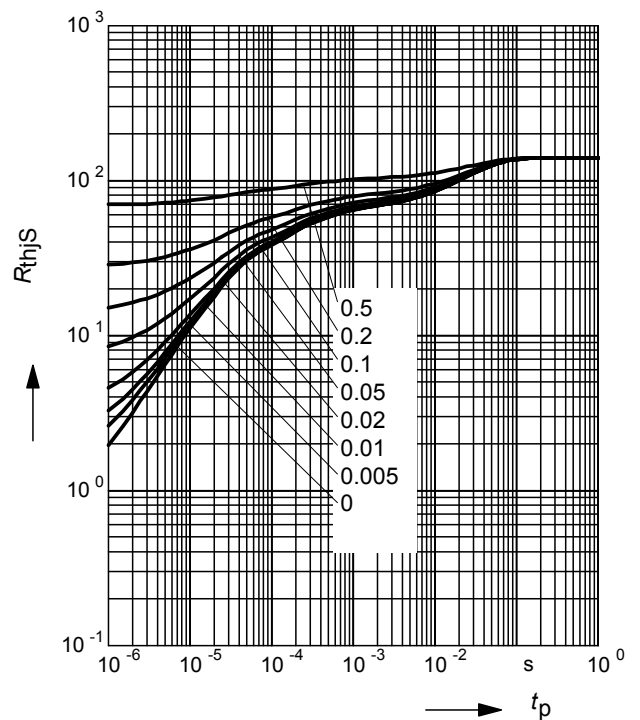
$$I_{Fmax} / I_{FDC} = f(t_p)$$

BAR50-02V



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

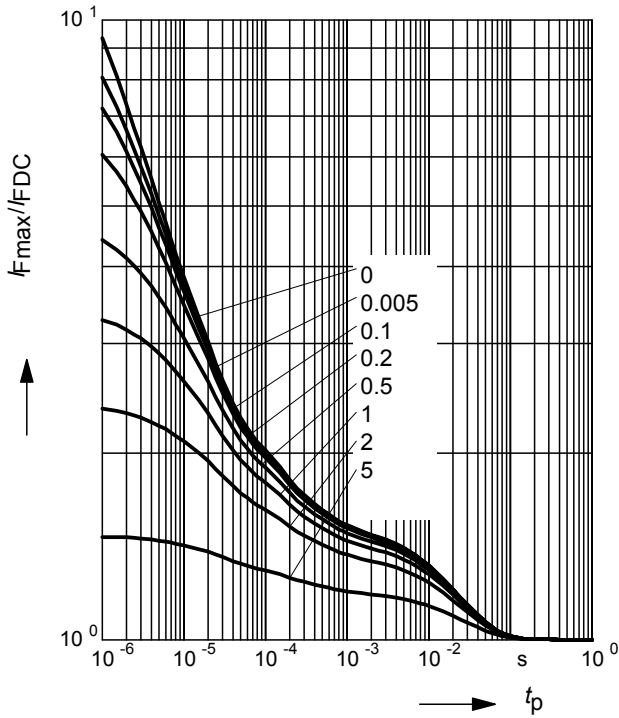
BAR50-03W



**Permissible Pulse Load**

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

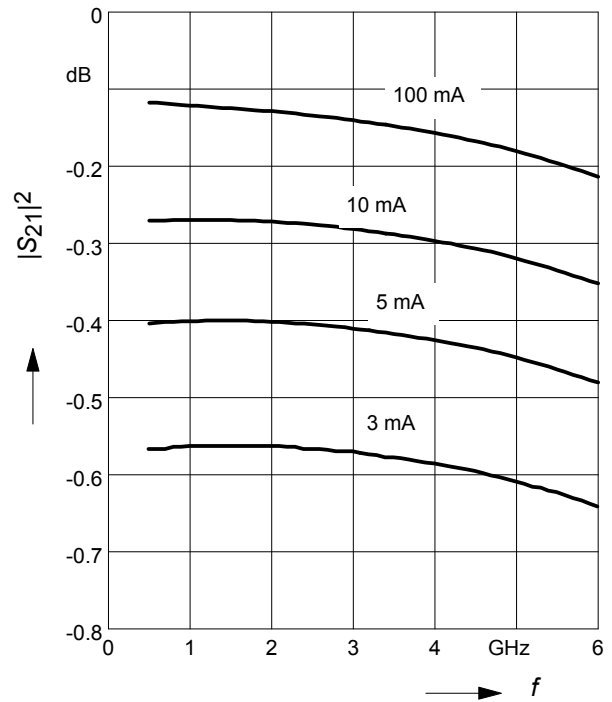
BAR50-03W



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

$I_F$  = Parameter

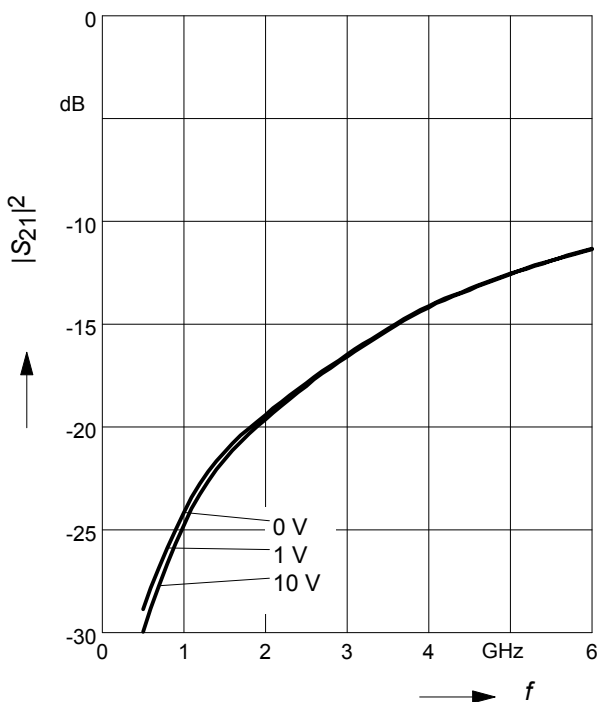
BAR50-02L in series configuration,  $Z = 50\Omega$



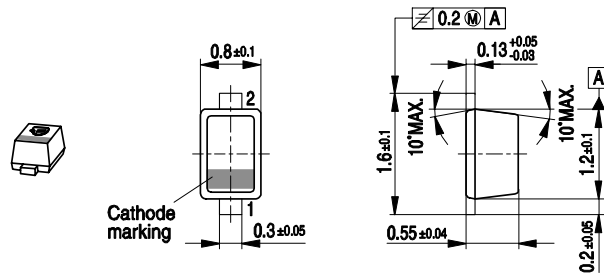
**Isolation  $I_{SO} = -|S_{21}|^2 = f(f)$**

$V_R$  = Parameter

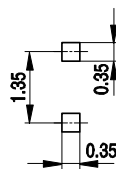
BAR50-02L in series configuration,  $Z = 50\Omega$



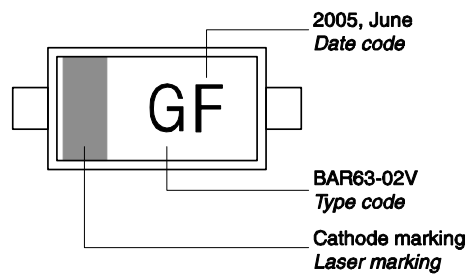
Package Outline



Foot Print

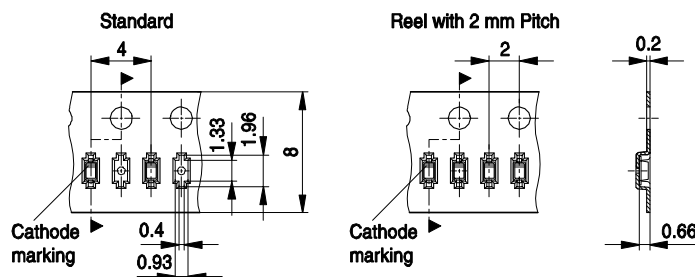


Marking Layout (Example)



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

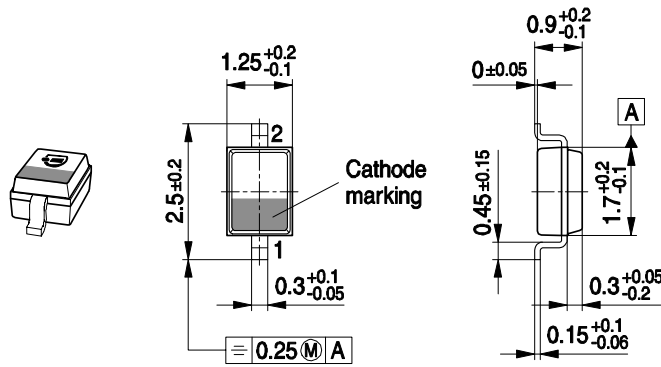


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

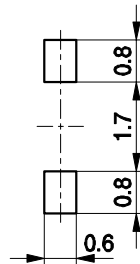
Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
01	a	p	A	P	a	p	A	P	a	p	A	P
02	b	q	B	Q	b	q	B	Q	b	q	B	Q
03	c	r	C	R	c	r	C	R	c	r	C	R
04	d	s	D	S	d	s	D	S	d	s	D	S
05	e	t	E	T	e	t	E	T	e	t	E	T
06	f	u	F	U	f	u	F	U	f	u	F	U
07	g	v	G	V	g	v	G	V	g	v	G	V
08	h	x	H	X	h	x	H	X	h	x	H	X
09	j	y	J	Y	j	y	J	Y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

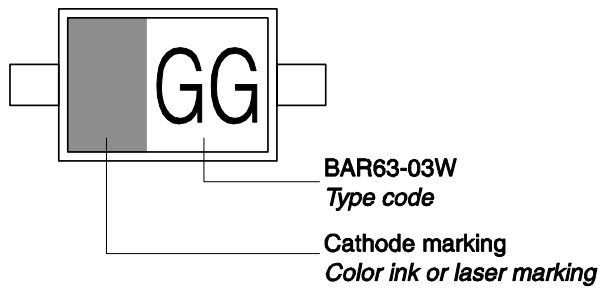
Package Outline



Foot Print

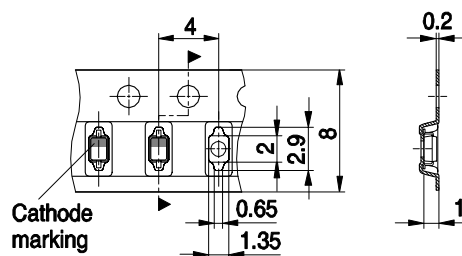


Marking Layout (Example)

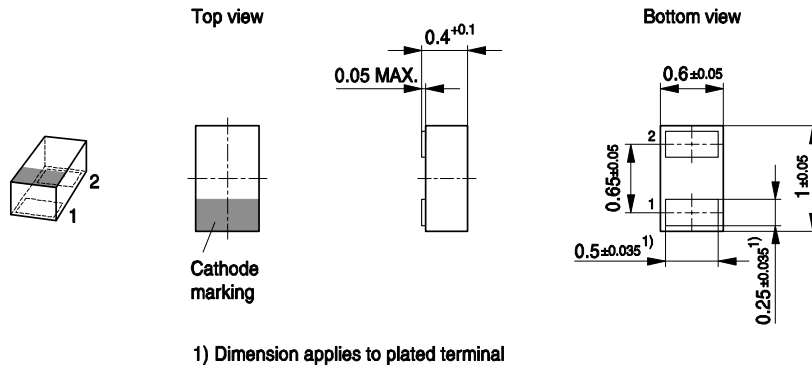


Standard Packing

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

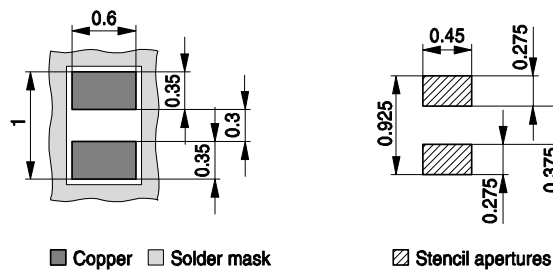


### Package Outline

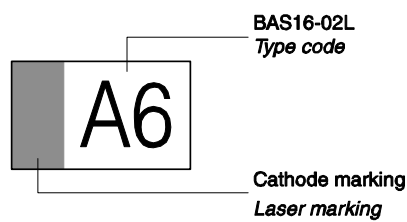


### Foot Print

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

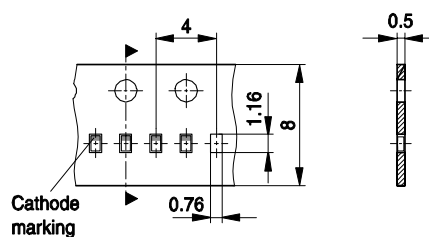


### Marking Layout (Example)



### Standard Packing

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



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