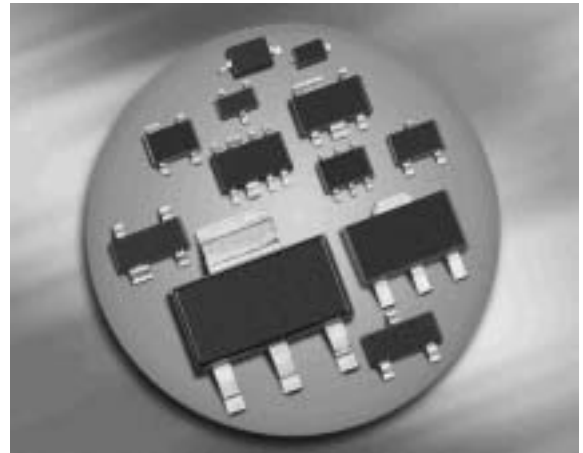
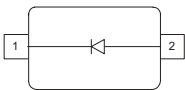


Silicon PIN Diodes

- 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 harmonics
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101


BAR50-02L
BAR50-02V


Type	Package	Configuration	L_S (nH)	Marking
BAR50-02L	TSLP-2-1	single, leadless	0.4	AB
BAR50-02V	SC79	single	0.6	a

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	P_{tot}		mW
BAR50-02L, $T_S \leq 130^\circ\text{C}$		250	
BAR50-02V, $T_S \leq 120^\circ\text{C}$		250	
Junction temperature	T_j	150	°C
Operating temperature range	T_{op}	-55 ... 125	
Storage temperature	T_{stg}	-55 ... 150	

¹Pb-containing package may be available upon special request

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}		K/W
BAR50-02L		≤ 80	
BAR50-02V		≤ 120	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC Characteristics

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

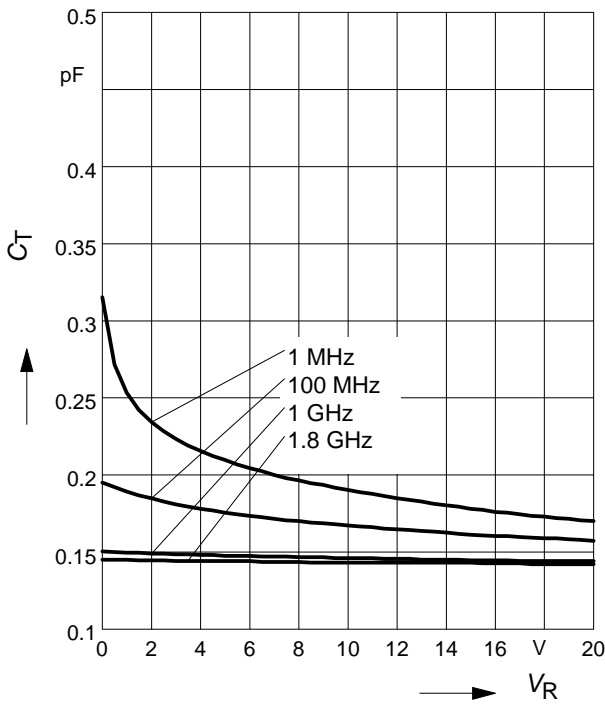
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

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⁾	l_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⁾	l_{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, $Z = 50\ \Omega$

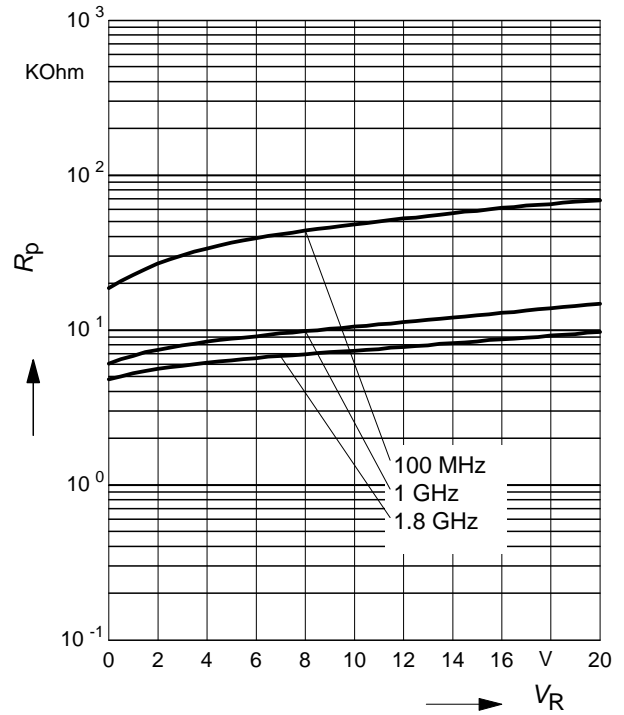
Diode capacitance $C_T = f(V_R)$

$f =$ Parameter



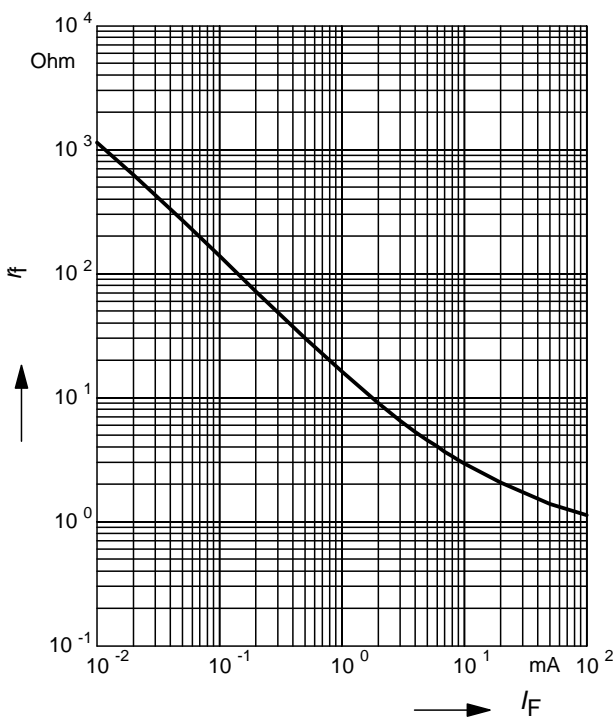
Reverse parallel resistance $R_p = f(V_R)$

$f =$ Parameter



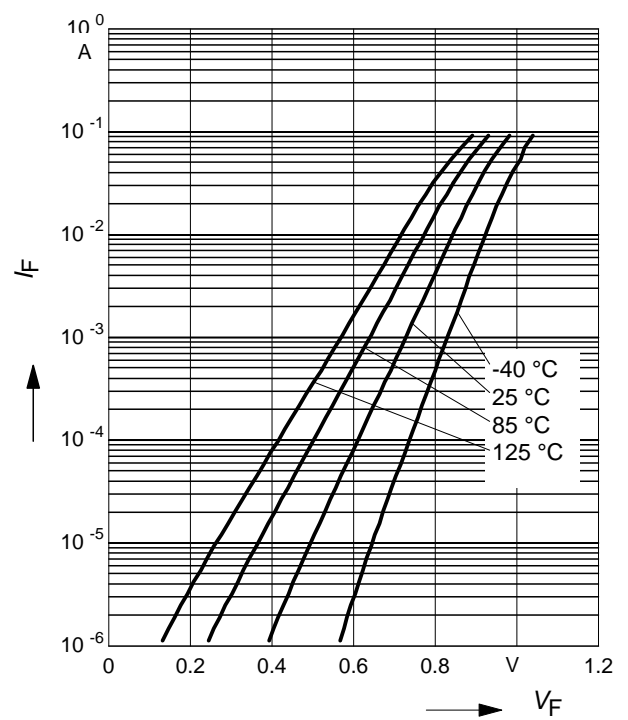
Forward resistance $r_f = f(I_F)$

$f = 100$ MHz



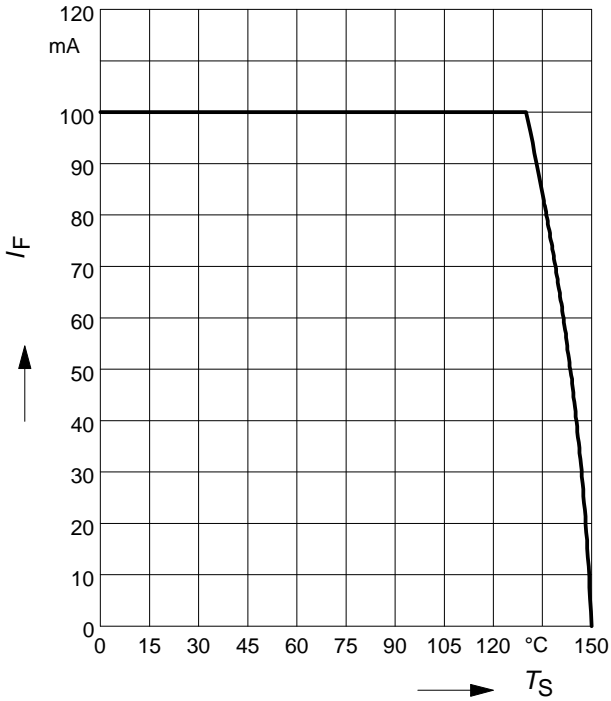
Forward current $I_F = f(V_F)$

$T_A =$ Parameter



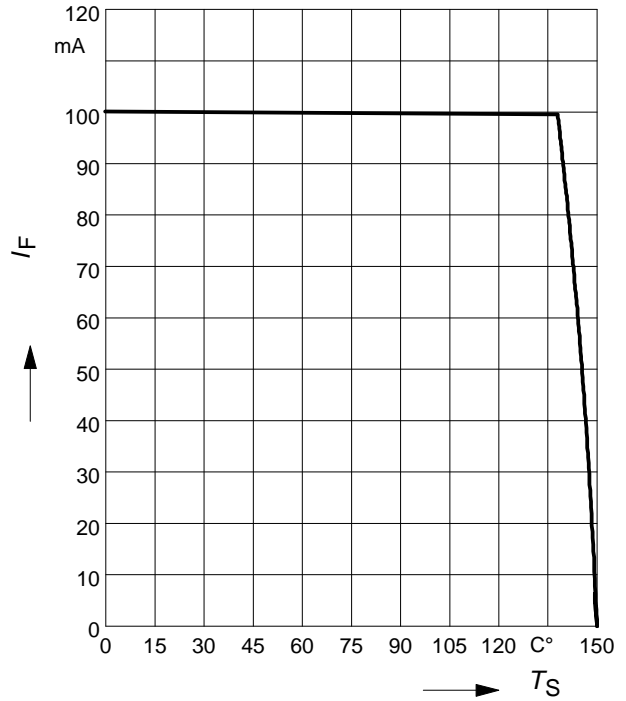
Forward current $I_F = f(T_S)$

BAR50-02L



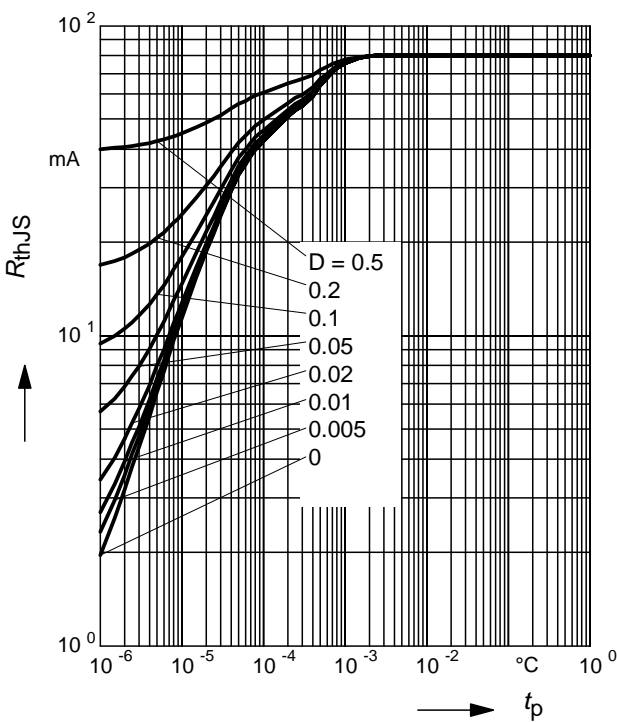
Forward current $I_F = f(T_S)$

BAR50-02V



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

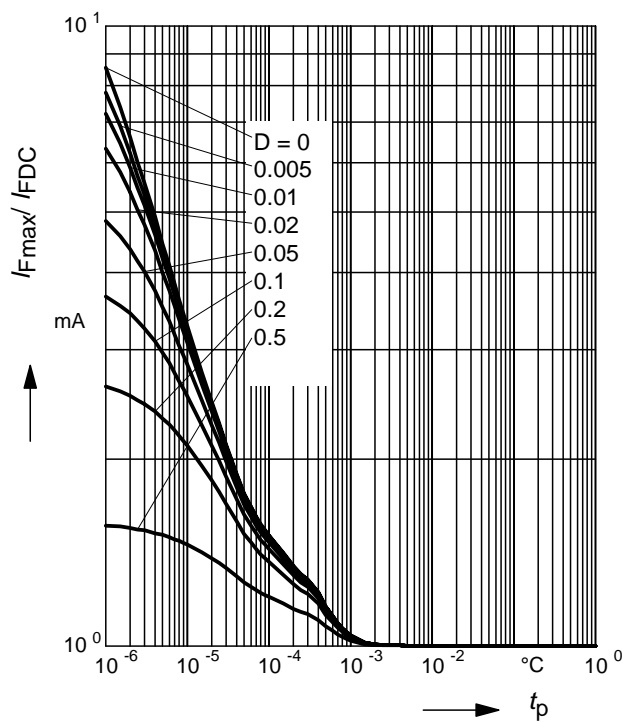
BAR50-02L



Permissible Pulse Load

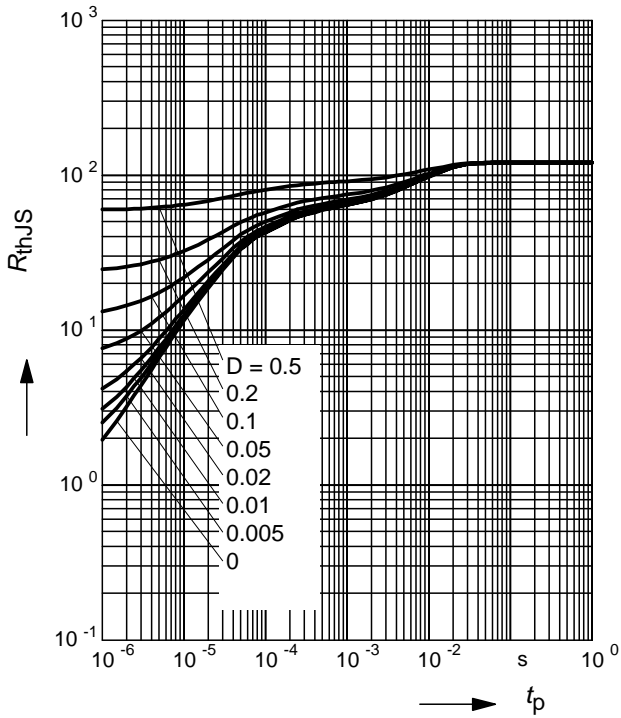
$I_{Fmax} / I_{FDC} = f(t_p)$

BAR50-02L



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

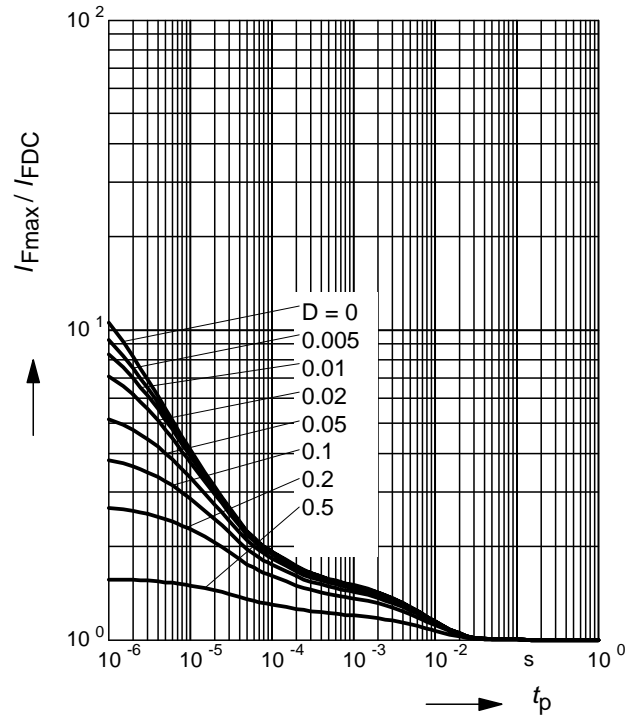
BAR50-02V



Permissible Pulse Load

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

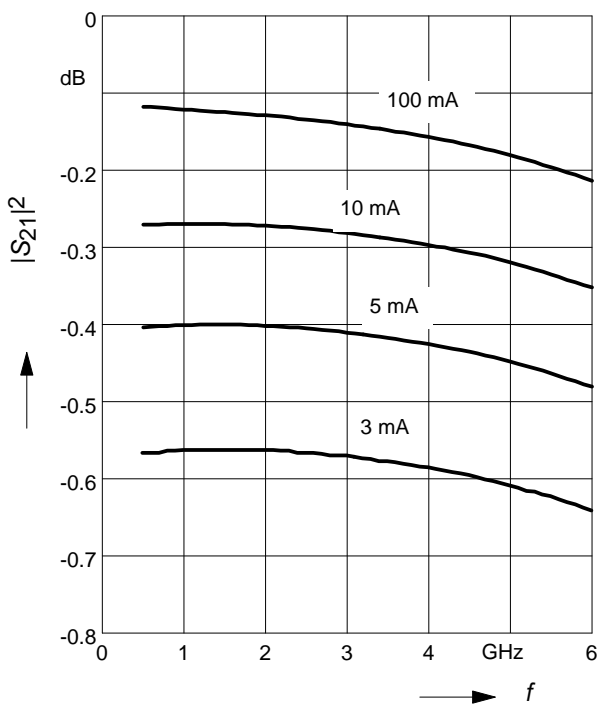
BAR50-02V



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

I_F = Parameter

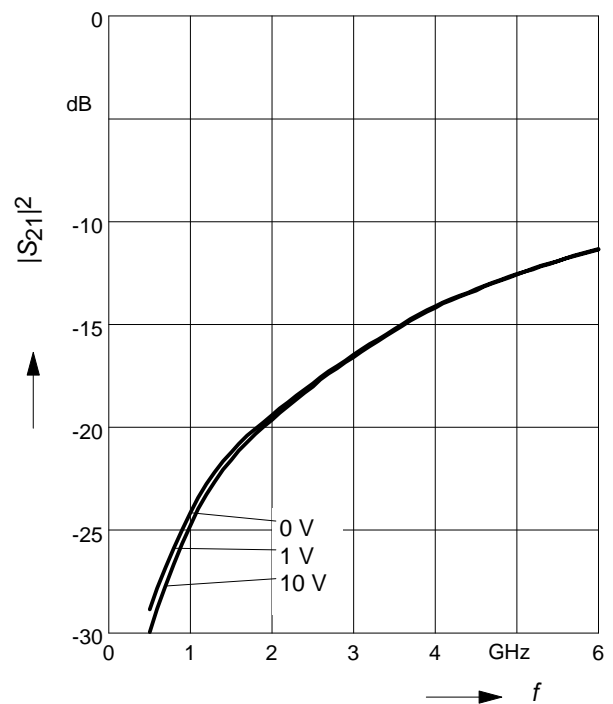
BAR50-02L in series configuration, $Z = 50\Omega$



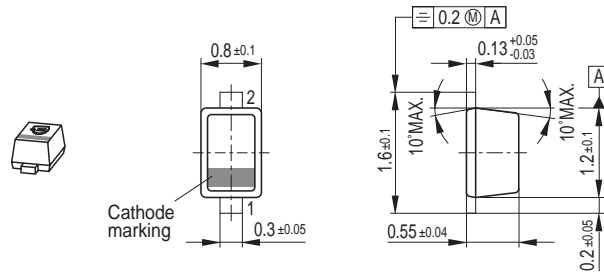
Isolation $I_{SO} = -|S_{21}|^2 = f(f)$

V_R = Parameter

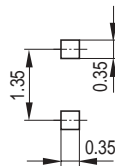
BAR50-02L in series configuration, $Z = 50\Omega$



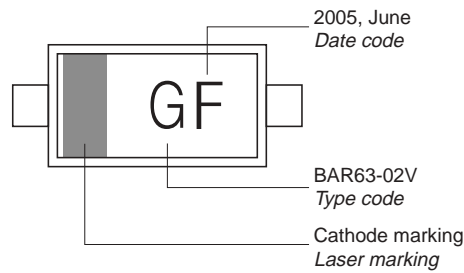
Package Outline



Foot Print

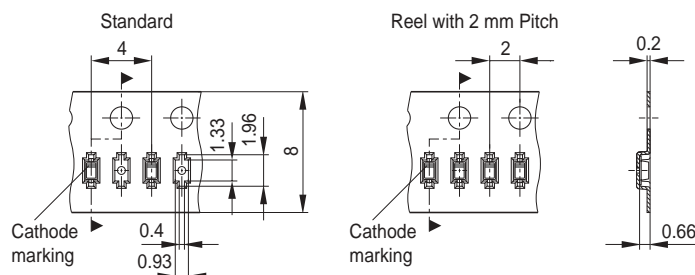


Marking Layout (Example)



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

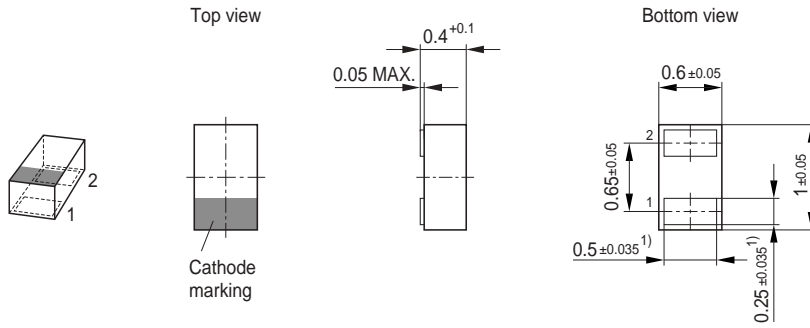


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75¹⁾) CES-Code

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.

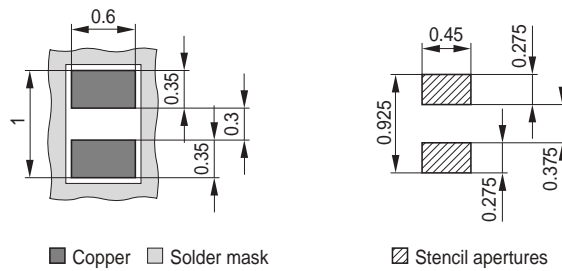
Package Outline



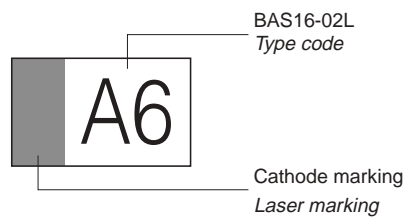
1) Dimension applies to plated terminal

Foot Print

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

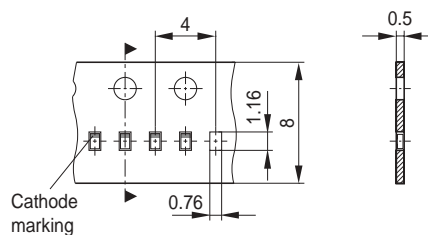


Marking Layout (Example)



Standard Packing

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



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