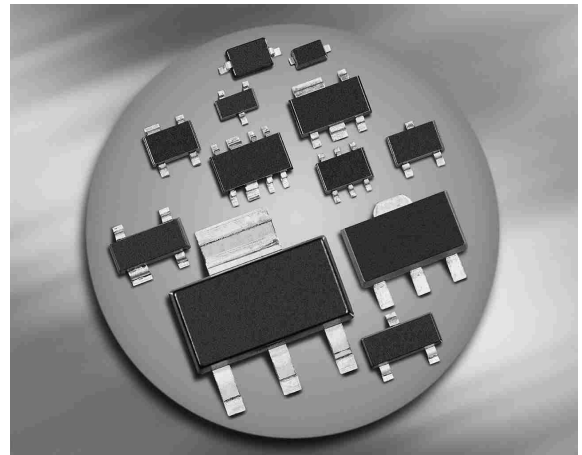


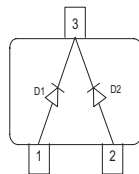
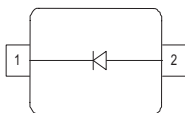
## Silicon Tuning Diode

- High Q hyperabrupt tuning diode
- Designed for low tuning voltage operation
- For VCO's in mobile communications equipment
- Pb-free (RoHS compliant) package



**BBY51-02L**  
**BBY51-02V**  
**BBY51-02W**  
**BBY51-03W**

**BBY51**



| Type       | Package  | Configuration    | Marking |
|------------|----------|------------------|---------|
| BBY51      | SOT23    | common cathode   | S3s     |
| BBY51-02L  | TSLP-2-1 | single, leadless | II      |
| BBY51-02V  | SC79     | single           | f       |
| BBY51-02W* | SCD80    | single           | II      |
| BBY51-03W  | SOD323   | single           | white H |

\* Not for new design

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

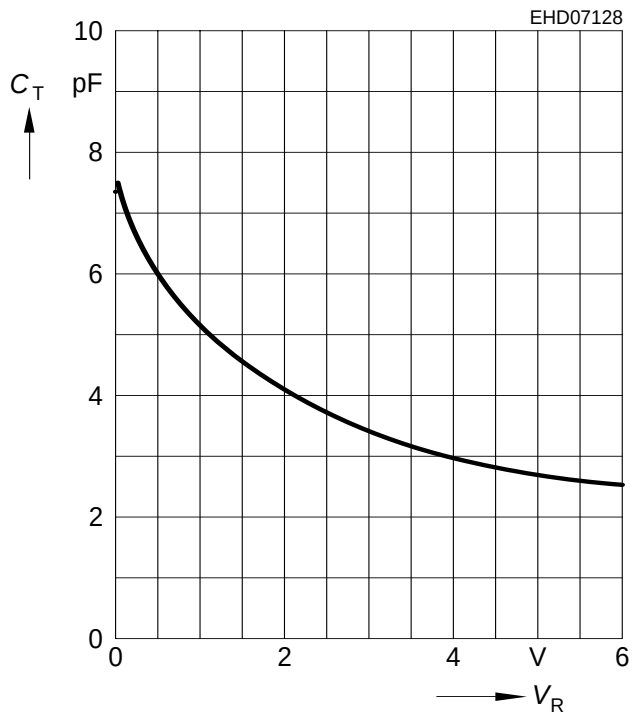
| Parameter                   | Symbol    | Value       | Unit               |
|-----------------------------|-----------|-------------|--------------------|
| Diode reverse voltage       | $V_R$     | 7           | V                  |
| Forward current             | $I_F$     | 20          | mA                 |
| Operating temperature range | $T_{op}$  | -55 ... 125 | $^{\circ}\text{C}$ |
| Storage temperature         | $T_{stg}$ | -55 ... 150 |                    |

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

| Parameter                                              | Symbol                 | Values |      |      | Unit     |
|--------------------------------------------------------|------------------------|--------|------|------|----------|
|                                                        |                        | min.   | typ. | max. |          |
| DC Characteristics                                     |                        |        |      |      |          |
| Reverse current                                        | $I_R$                  |        |      |      | nA       |
| $V_R = 6\text{ V}$                                     |                        | -      | -    | 10   |          |
| $V_R = 6\text{ V}, T_A = 85\text{ }^{\circ}\text{C}$   |                        | -      | -    | 200  |          |
| AC Characteristics                                     |                        |        |      |      |          |
| Diode capacitance                                      | $C_T$                  |        |      |      | pF       |
| $V_R = 1\text{ V}, f = 1\text{ MHz}$                   |                        | 5.05   | 5.4  | 5.75 |          |
| $V_R = 2\text{ V}, f = 1\text{ MHz}$                   |                        | 3.4    | 4.2  | 5.2  |          |
| $V_R = 3\text{ V}, f = 1\text{ MHz}$                   |                        | 2.7    | 3.5  | 4.6  |          |
| $V_R = 4\text{ V}, f = 1\text{ MHz}$                   |                        | 2.5    | 3.1  | 3.7  |          |
| Capacitance ratio                                      | $C_{T1}/C_{T4}$        | 1.55   | 1.75 | 2.2  |          |
| $V_R = 1\text{ V}, V_R = 4\text{ V}, f = 1\text{ MHz}$ |                        |        |      |      |          |
| Capacitance difference                                 | $C_{1V}\text{-}C_{3V}$ | 1.4    | 1.78 | 2.2  | pF       |
| $V_R = 1\text{ V}, V_R = 3\text{ V}, f = 1\text{ MHz}$ |                        |        |      |      |          |
| Capacitance difference                                 | $C_{3V}\text{-}C_{4V}$ | 0.3    | 0.5  | 0.7  |          |
| $V_R = 3\text{ V}, V_R = 4\text{ V}, f = 1\text{ MHz}$ |                        |        |      |      |          |
| Series resistance                                      | $r_S$                  | -      | 0.37 | -    | $\Omega$ |
| $V_R = 1\text{ V}, f = 1\text{ GHz}$                   |                        |        |      |      |          |

Diode capacitance  $C_T = f(V_R)$

$f = 1\text{MHz}$



Temperature coefficient of the diode capacitance  $T_{Cc} = f(V_R)$

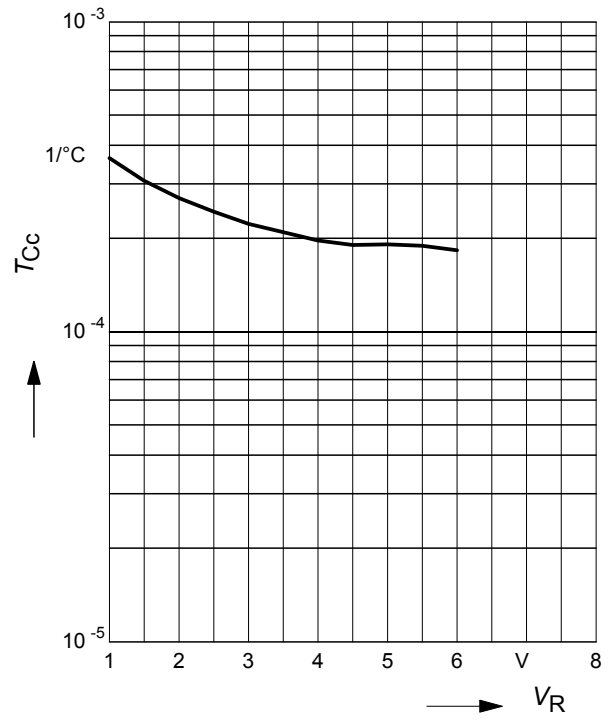


Figure 1: Dimensions of the package. The figure includes a perspective view of the package on the left and two cross-sectional views on the right. The perspective view shows a rectangular package with a circular feature on top. The cross-sectional views show the internal structure and dimensions. Key dimensions include: overall width  $0.8 \pm 0.1$ , top feature width  $0.2$ , top feature height  $0.13^{+0.05}_{-0.03}$ , overall height  $1.6 \pm 0.1$ , bottom feature width  $0.3 \pm 0.05$ , bottom feature height  $0.55 \pm 0.04$ , and a  $10^\circ \text{MAX.}$  angle for the side walls. A cathode marking is indicated on the bottom feature.

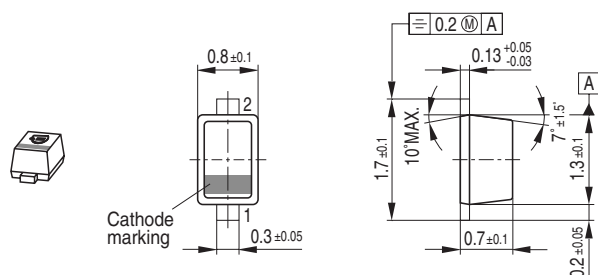
2005, June  
Date code

GF

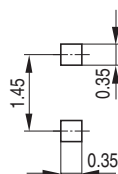
BAR63-02V  
Type code

Cathode marking  
Laser marking

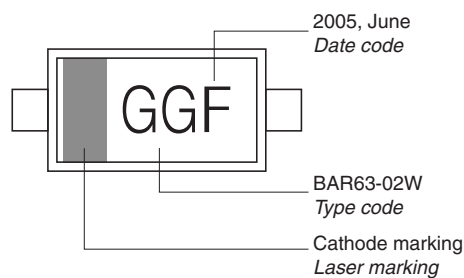
## Package Outline



## Foot Print

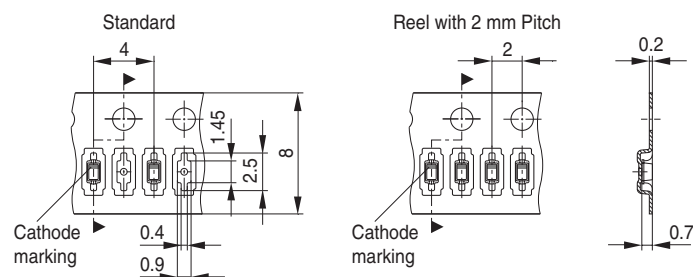


## Marking Layout (Example)



## 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

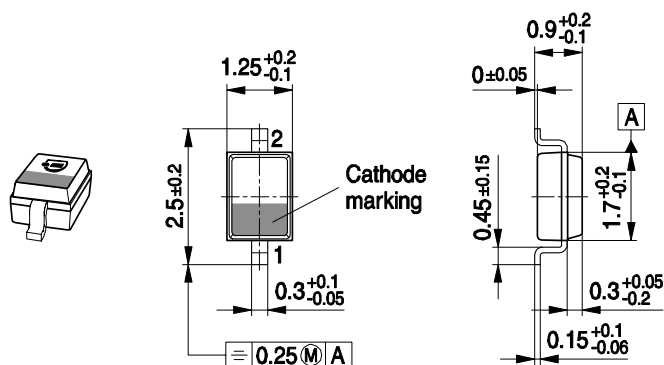


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

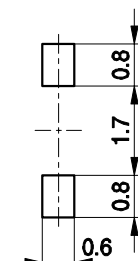
| Month | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 01    | a    | p    | A    | P    | a    | p    | A    | P    | a    | p    | A    | P    |
| 02    | b    | q    | 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.

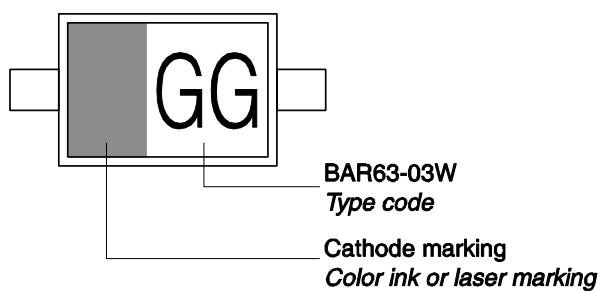
## Package Outline



## Foot Print

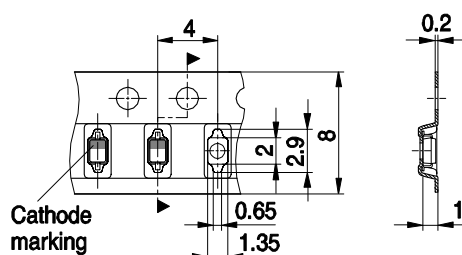


## Marking Layout (Example)

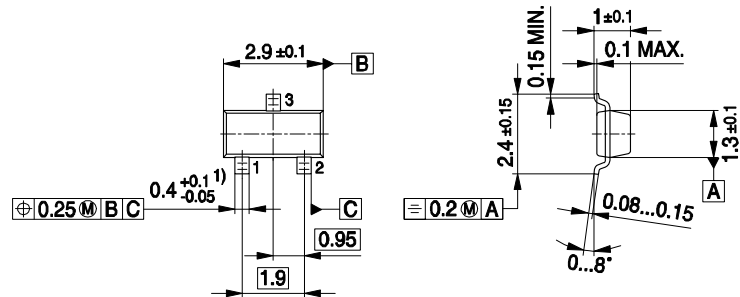
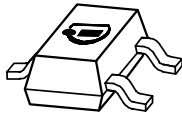


## Standard Packing

Reel  $\varnothing 180 \text{ mm}$  = 3.000 Pieces/Reel  
 Reel  $\varnothing 330 \text{ mm}$  = 10.000 Pieces/Reel



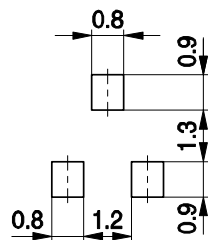
## Package Outline



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

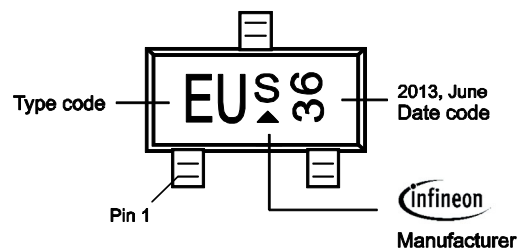
SOT23-PO V08

## Foot Print



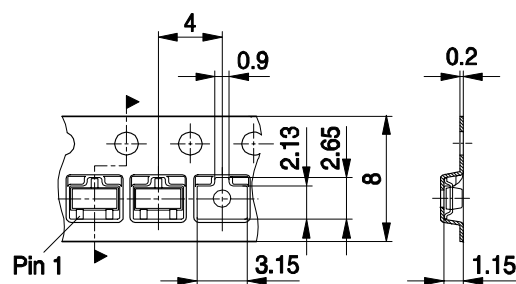
SOT23-FPR V08

## Marking Layout



## Standard Packing

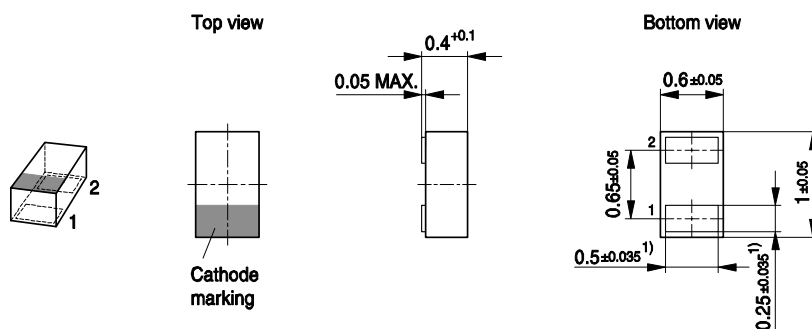
Reel o 180 mm: 3.000 Pieces / Reel  
Reel o 330 mm = 10.000 Pieces / Reel



SOT23-TP V02



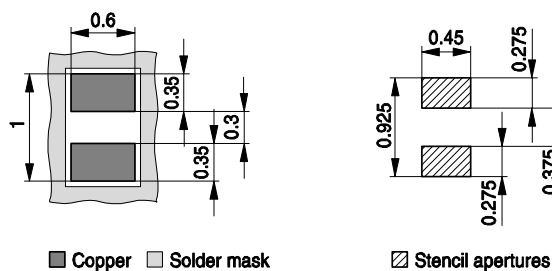
## Package Outline



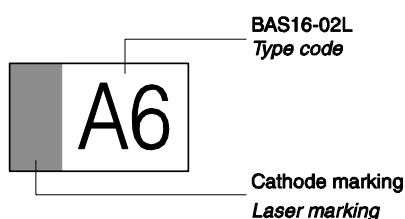
1) Dimension applies to plated terminal

## Foot Print

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



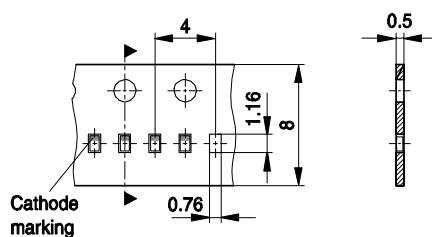
## Marking Layout (Example)



## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel

Reel ø330 mm = 50.000 Pieces/Reel (optional)



**Edition 2009-11-16**

**Published by  
Infineon Technologies AG  
81726 Munich, Germany**

**© 2009 Infineon Technologies AG  
All Rights Reserved.**

## **Legal Disclaimer**

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

## **Information**

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([<www.infineon.com>](http://www.infineon.com)).

## **Warnings**

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.