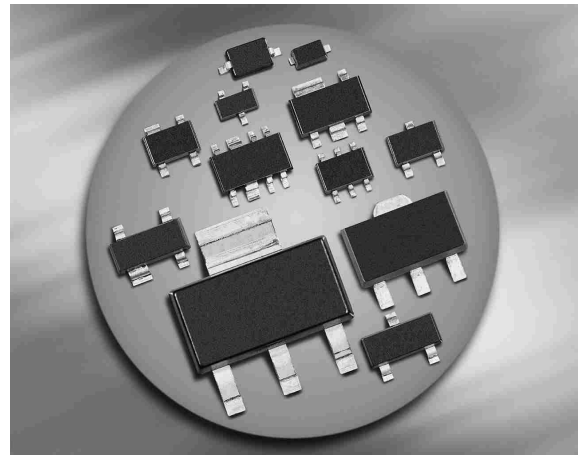


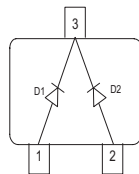
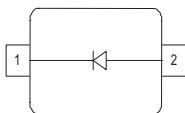
## Silicon Tuning Diode

- 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 $T_A = 25\text{ °C}$ , unless otherwise specified

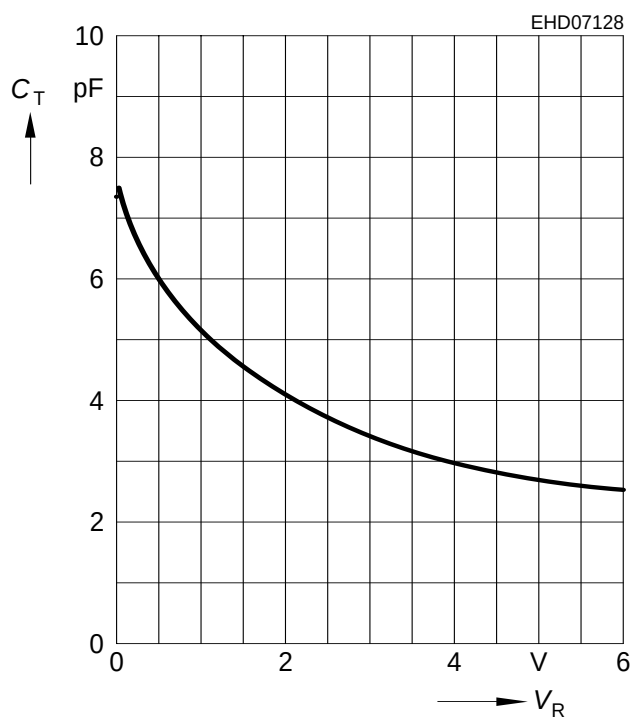
| Parameter                   | Symbol    | Value       | Unit |
|-----------------------------|-----------|-------------|------|
| Diode reverse voltage       | $V_R$     | 7           | V    |
| Forward current             | $I_F$     | 20          | mA   |
| Operating temperature range | $T_{op}$  | -55 ... 125 | °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<br>$V_R = 6\text{ V}$<br>$V_R = 6\text{ V}, T_A = 85\text{ }^{\circ}\text{C}$                                                                                     | $I_R$           | -<br>-                    | -<br>-                   | 10<br>200                 | nA       |
| AC Characteristics                                                                                                                                                                |                 |                           |                          |                           |          |
| Diode capacitance<br>$V_R = 1\text{ V}, f = 1\text{ MHz}$<br>$V_R = 2\text{ V}, f = 1\text{ MHz}$<br>$V_R = 3\text{ V}, f = 1\text{ MHz}$<br>$V_R = 4\text{ V}, f = 1\text{ MHz}$ | $C_T$           | 5.05<br>3.4<br>2.7<br>2.5 | 5.4<br>4.2<br>3.5<br>3.1 | 5.75<br>5.2<br>4.6<br>3.7 | pF       |
| Capacitance ratio<br>$V_R = 1\text{ V}, V_R = 4\text{ V}, f = 1\text{ MHz}$                                                                                                       | $C_{T1}/C_{T4}$ | 1.55                      | 1.75                     | 2.2                       |          |
| Capacitance difference<br>$V_R = 1\text{ V}, V_R = 3\text{ V}, f = 1\text{ MHz}$                                                                                                  | $C_{1V}-C_{3V}$ | 1.4                       | 1.78                     | 2.2                       | pF       |
| Capacitance difference<br>$V_R = 3\text{ V}, V_R = 4\text{ V}, f = 1\text{ MHz}$                                                                                                  | $C_{3V}-C_{4V}$ | 0.3                       | 0.5                      | 0.7                       |          |
| Series resistance<br>$V_R = 1\text{ V}, f = 1\text{ GHz}$                                                                                                                         | $r_S$           | -                         | 0.37                     | -                         | $\Omega$ |

Diode capacitance  $C_T = f(V_R)$

$f = 1\text{MHz}$



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

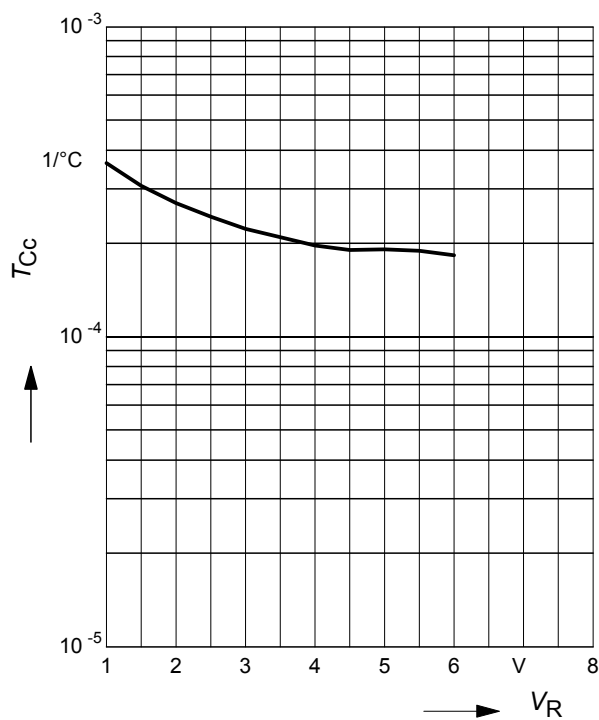


Figure 1: Dimensions of the package. The figure includes a perspective view of the package on the left and two cross-sectional views on the right. The perspective view shows a rectangular package with a circular feature on top. The cross-sectional views show the internal structure and dimensions. Key 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 top feature. A cathode marking is indicated on the bottom feature.

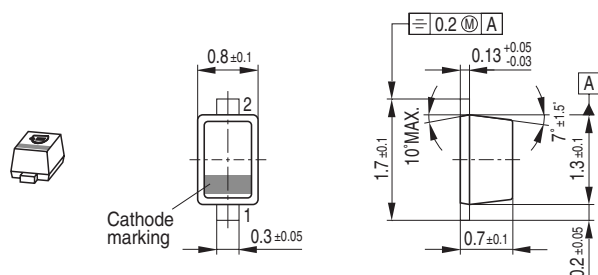
Diagram showing a stepped shaft with a vertical dimension of 1.35 and diameters of 0.35.

2005, June  
*Date code*

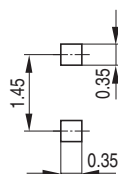
BAR63-02V  
*Type code*

Cathode marking  
*Laser marking*

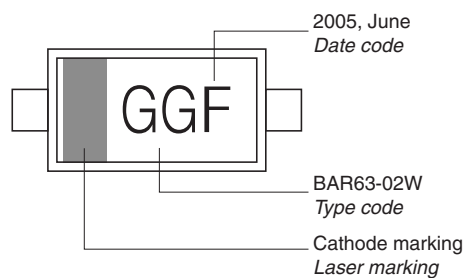
## Package Outline



## Foot Print

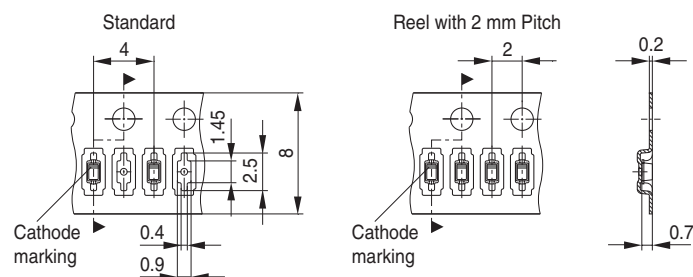


## Marking Layout (Example)



## 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

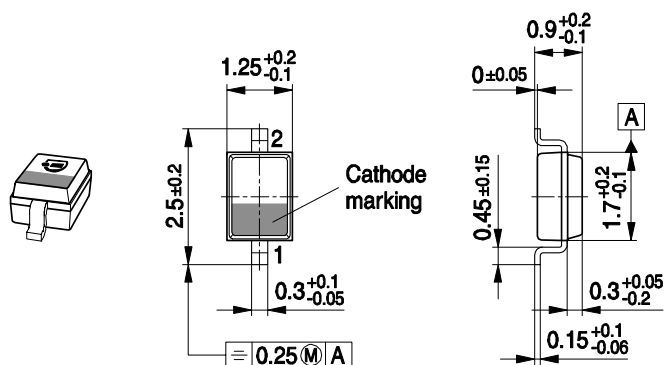


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

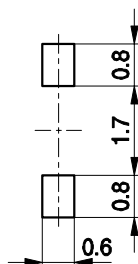
| Month | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 01    | a    | p    | A    | P    | a    | p    | A    | P    | a    | p    | A    | P    |
| 02    | b    | q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

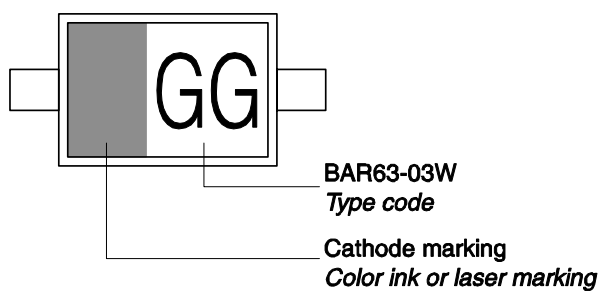
## Package Outline



## Foot Print

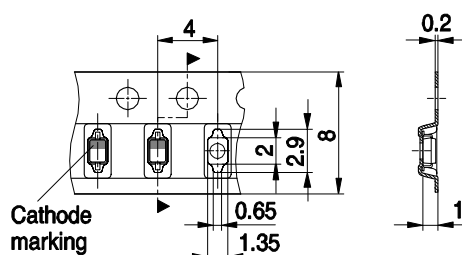


## Marking Layout (Example)

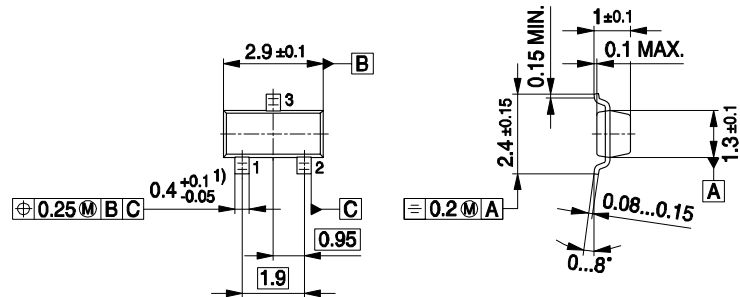
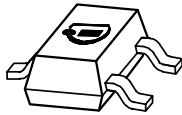


## Standard Packing

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



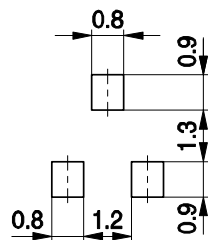
## Package Outline



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

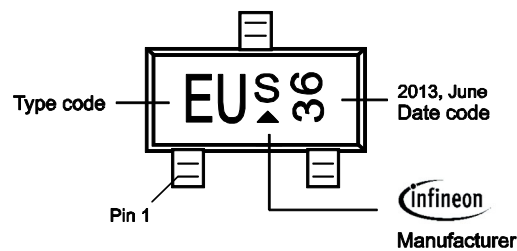
SOT23-PO V08

## Foot Print



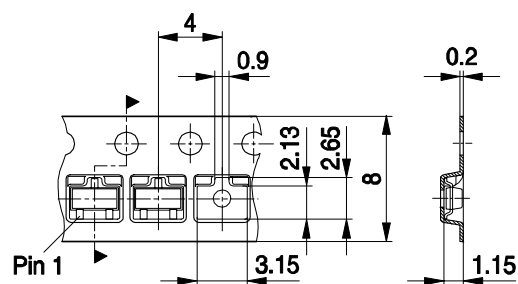
SOT23-FPR V08

## Marking Layout



## Standard Packing

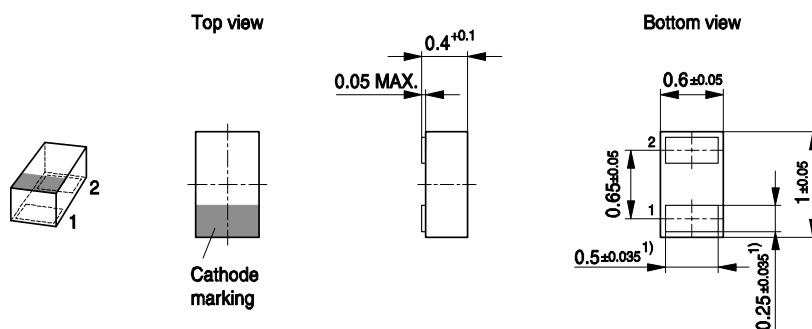
Reel o 180 mm: 3.000 Pieces / Reel  
Reel o 330 mm = 10.000 Pieces / Reel



SOT23-TP V02



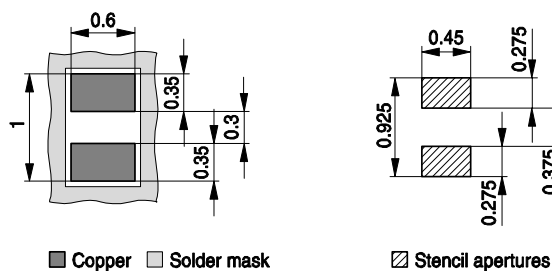
## Package Outline



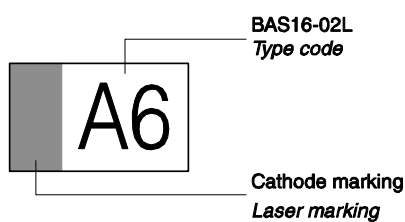
1) Dimension applies to plated terminal

## Foot Print

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



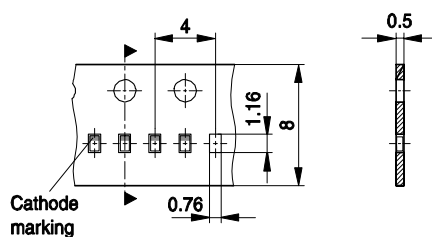
## Marking Layout (Example)



## Standard Packing

Reel  $\varnothing$ 180 mm = 15.000 Pieces/Reel

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



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