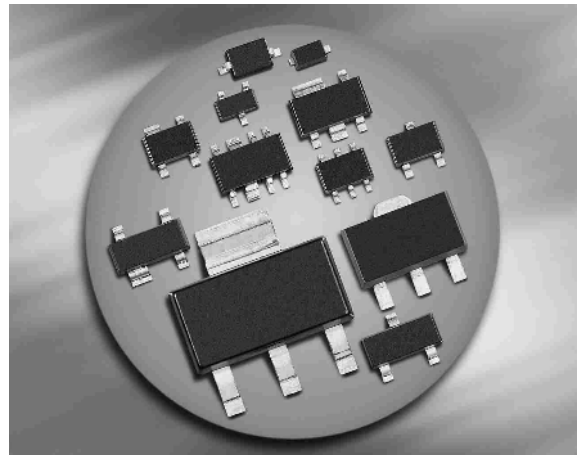
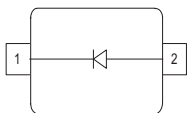


Silicon Variable Capacitance Diodes

- For tuning of extended frequency band in VHF TV / VTR tuners
- High capacitance ratio
- Low series inductance
- Low series resistance
- Excellent uniformity and matching due to "in-line" matching assembly procedure
- Pb-free (RoHS compliant) package



BB639
BB659



| Type | Package | Configuration | L_S (nH) | Marking |
|-------|---------|---------------|------------|----------|
| BB639 | SOD323 | single | 1.8 | yellow S |
| BB659 | SCD80 | single | 0.6 | DE |

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

| Parameter | Symbol | Value | Unit |
|--|-----------|-------------|------|
| Diode reverse voltage | V_R | 30 | V |
| Peak reverse voltage ($R \geq 5\text{k}\Omega$) | V_{RM} | 35 | |
| Forward current | I_F | 20 | mA |
| Operating temperature range | T_{op} | -55 ... 150 | °C |
| Storage temperature | T_{stg} | -55 ... 150 | |

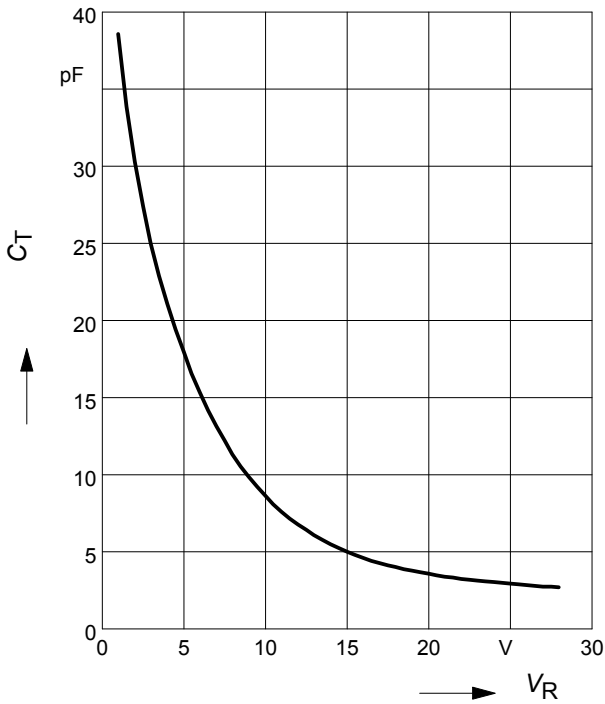
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

| Parameter | Symbol | Values | | | Unit |
|---|------------------|--------------------------|------------------------------|--------------------------|----------|
| | | min. | typ. | max. | |
| DC Characteristics | | | | | |
| Reverse current $V_R = 30\text{ V}$ $V_R = 30\text{ V}, T_A = 85^\circ\text{C}$ | I_R | - - | - - | 10 200 | nA |
| AC Characteristics | | | | | |
| Diode capacitance $V_R = 1\text{ V}, f = 1\text{ MHz}$ $V_R = 2\text{ V}, f = 1\text{ MHz}$ $V_R = 25\text{ V}, f = 1\text{ MHz}$ $V_R = 28\text{ V}, f = 1\text{ MHz}$ | C_T | 36 27.7 2.5 2.4 | 38.3 29.75 2.85 2.6 | 40 31.8 3.2 2.9 | pF |
| Capacitance ratio $V_R = 1\text{ V}, V_R = 28\text{ V}, f = 1\text{ MHz}$ | C_{T1}/C_{T28} | 13.5 | 14.7 | - | |
| Capacitance ratio $V_R = 2\text{ V}, V_R = 25\text{ V}, f = 1\text{ MHz}$ | C_{T2}/C_{T25} | 9.8 | 10.4 | - | |
| Capacitance matching ¹⁾ $V_R = 1\text{ V}, V_R = 28\text{ V}, f = 1\text{ MHz}$, 7 diode sequence BB639 $V_R = 1\text{ V}, V_R = 28\text{ V}, f = 1\text{ MHz}$, 4 diode sequence BB659 $V_R = 1\text{ V}, V_R = 28\text{ V}, f = 1\text{ MHz}$, 7 diode sequence BB659 | $\Delta C_T/C_T$ | - - - | - 0.3 0.4 | 2.5 1 2 | % |
| Series resistance $V_R = 5\text{ V}, f = 470\text{ MHz}$ | r_S | - | 0.65 | 0.7 | Ω |

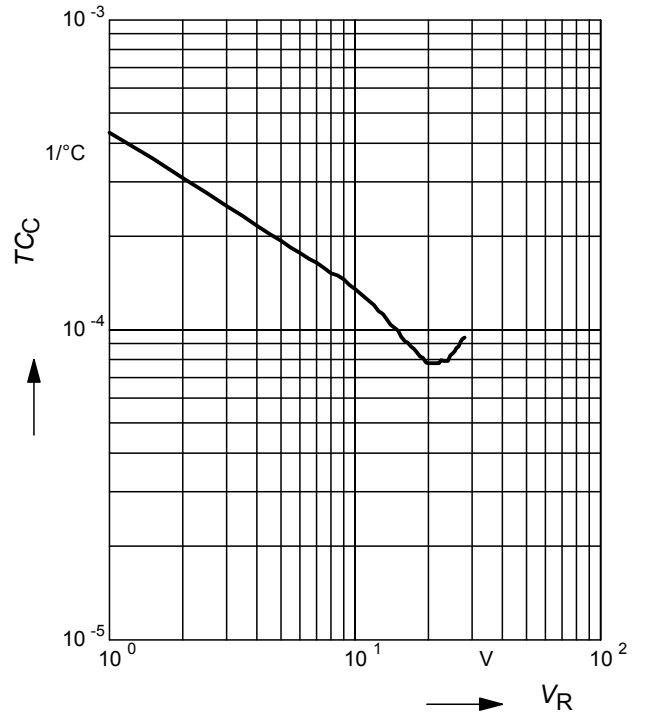
¹For details please refer to Application Note 047.

Diode capacitance $C_T = f(V_R)$

$f = 1\text{MHz}$

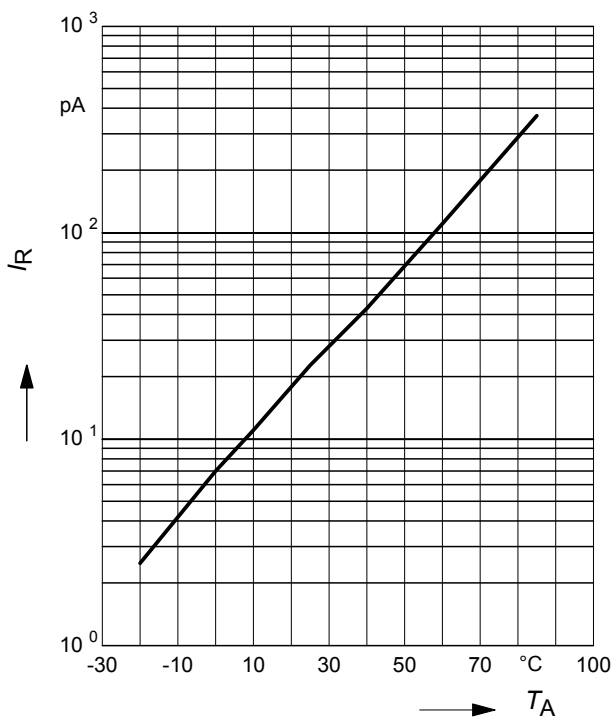


Temperature coefficient of the diode capacitance $T_{CC} = f(V_R)$



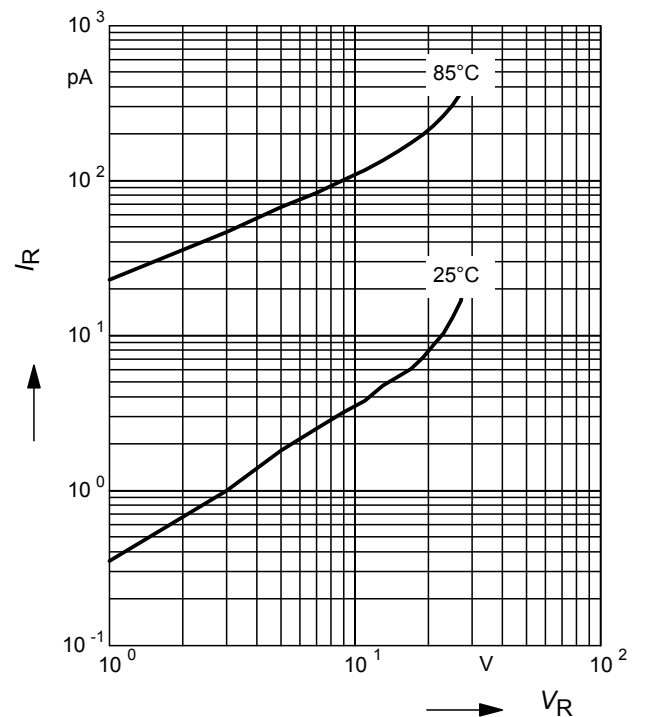
Reverse current $I_R = f(T_A)$

$V_R = 28\text{V}$

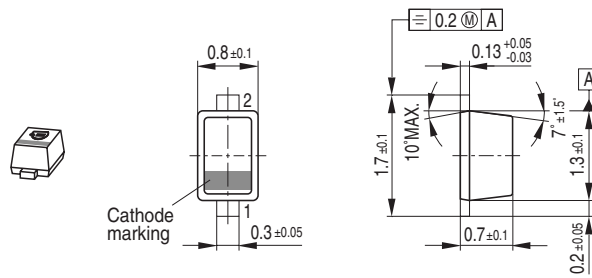


Reverse current $I_R = f(V_R)$

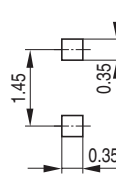
$T_A = \text{Parameter}$



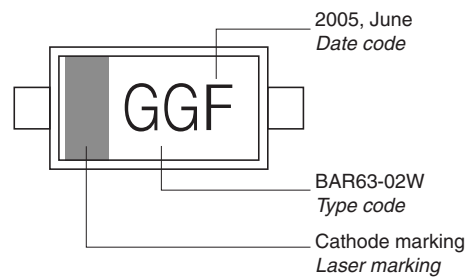
Package Outline



Foot Print

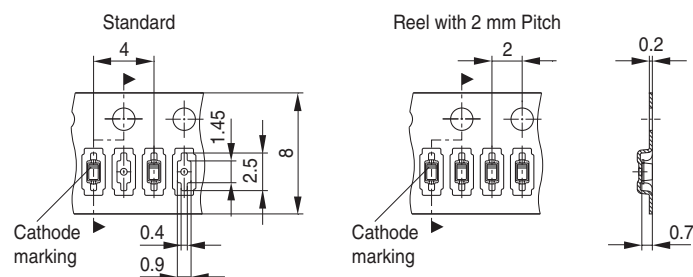


Marking Layout (Example)



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 180 mm = 8.000 Pieces/Reel (2 mm Pitch)
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

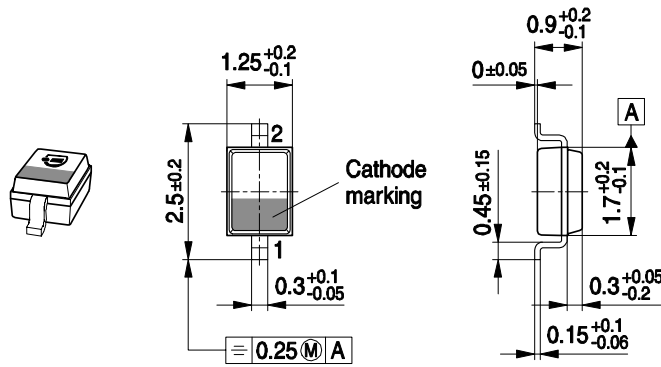


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75¹⁾) CES-Code

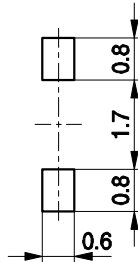
| Month | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 01 | a | p | A | P | a | p | A | P | a | p | A | P |
| 02 | b | q | B | Q | b | q | B | Q | b | q | B | Q |
| 03 | 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.

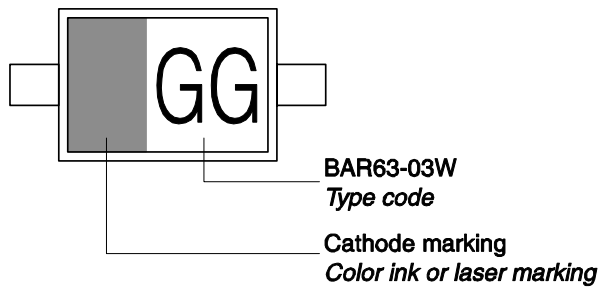
Package Outline



Foot Print

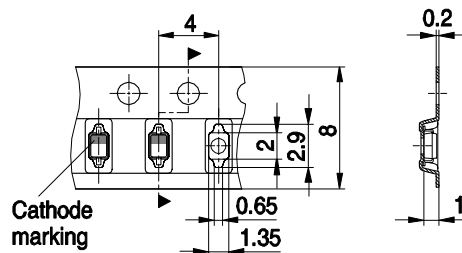


Marking Layout (Example)



Standard Packing

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



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