

# EMI Common Mode Choke



## BWCU Series



### Overview

An EMI common mode choke (CMC) for power lines is a passive component specifically designed to suppress electromagnetic interference (EMI) in power supply circuits. A full series of common mode choke is designed for excellent noise attenuation with compact sizing for use in wide range of applications. Both standard series and custom designs are available.

### Benefits

1. EMI/RFI Suppression
2. Improved Signal Integrity
3. Effectively suppresses noise over a wide frequency spectrum, including low-frequency and high-frequency EMI.
4. Common mode chokes are compact and suitable for applications where space is limited.

### Applications

1. USB line for personal computers and peripheral
2. IEEE 1394 line for personal computers, DVC, STB
3. LVDS, panel line for liquid display panels, graph card, etc

### Product Information

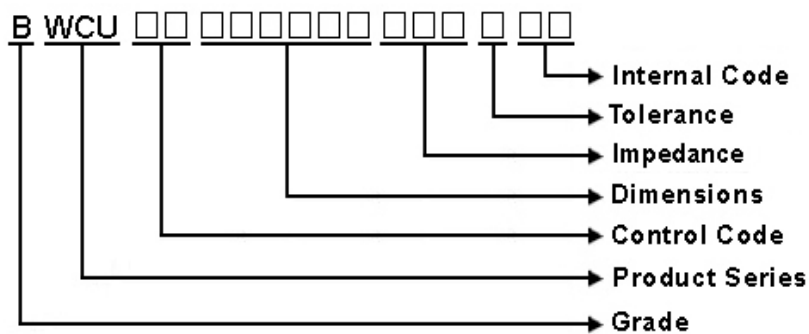
| Series | Size Code (JIS/EIA) | Impedance ( $\Omega$ ) |
|--------|---------------------|------------------------|
| BWCU   | 1608/0603           | 22 ~ 2200              |
|        | 2012/0805           |                        |
|        | 1210/0504           |                        |
|        | 3216/1206           |                        |
|        | 2520/1008           |                        |
|        | 3225/1210           |                        |



## BWCU00321619 Series Specification

**1 Scope:** This specification applies to BWCU Wire Wound Common Mode Choke Coil

**2 Part Numbering:**



**3 Rating:**

Operating Temperature: - 40°C ~ 105°C  
(Including self - temperature rise)

Storage Temperature: - 40°C ~ 105°C  
(The storage temperature range is for after the assembly)

**4 Marking:**

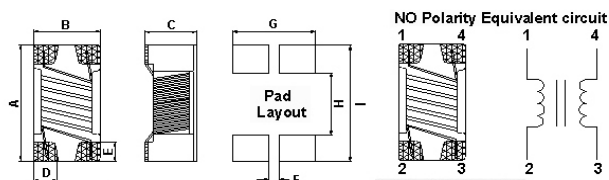
No Marking

**5 Standard Testing Condition**

|             | Unless otherwise specified       | In case of doubt |
|-------------|----------------------------------|------------------|
| Temperature | Ordinary Temperature(15 to 35°C) | 20 to 30°C       |
| Humidity    | Ordinary Humidity(25 to 85% RH)  | 50 to 80 %RH     |

## BWCU00321619 Series Specification

### 6 Configuration and Dimensions and Unit Weight:



Dimensions in mm

| TYPE   | A       | B       | C       | D   | E   | F   | G   | H   | I   |
|--------|---------|---------|---------|-----|-----|-----|-----|-----|-----|
| 321619 | 3.2±0.2 | 1.6±0.2 | 1.9±0.2 | 0.5 | 0.6 | 0.4 | 1.6 | 1.6 | 3.7 |

Net Weight (grms)

| SIZE CODE | Net Weight (grms) |
|-----------|-------------------|
| 261619    | 0.039 (typ.)      |

### 7 Electrical Characteristics:

| Part No.           | Z<br>(Ω) | RDC<br>(Ω)Max. | IDC<br>(mA) | Rated<br>Voltage<br>(Vdc) | Withstanding<br>Voltage<br>(Vdc) | Insulation<br>Resistance<br>(MΩ)(min) | Tolerance<br>(±%) | Test Freq.<br>(MHz) |
|--------------------|----------|----------------|-------------|---------------------------|----------------------------------|---------------------------------------|-------------------|---------------------|
| BWCU00321619900□02 | 90       | 0.3            | 370         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619121□02 | 120      | 0.3            | 370         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619161□02 | 160      | 0.4            | 340         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619171□02 | 170      | 0.4            | 330         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619221□02 | 220      | 0.4            | 320         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619261□02 | 260      | 0.5            | 310         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619401□02 | 400      | 0.5            | 300         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619501□02 | 500      | 0.6            | 280         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619601□02 | 600      | 0.8            | 260         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619102□02 | 1000     | 1              | 230         | 50                        | 125                              | 10                                    | 20,25             | 100                 |
| BWCU00321619222□02 | 2200     | 1.2            | 200         | 50                        | 125                              | 10                                    | 20,25             | 100                 |

**NOTE:** □-tolerance M=±20% / Y=±25%

1.Operating temperature range - 4 0 °C ~ 1 0 5 °C(Including self - temperature rise)

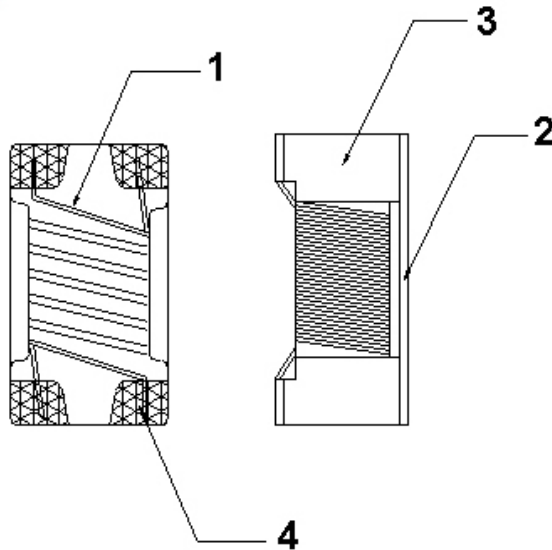
2.RDC: SINGLE WIRE TEST VALUE

3.IDC for Inductance drop 10% from its value without current.

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#### 8.1 Construction:



#### 8.2 Material List:

| NO | PART        | MATERIAL     |
|----|-------------|--------------|
| 1  | WIRE        | Grade 180    |
| 2  | COVER SHEET | FERRITE CORE |
| 3  | CORE        | FERRITE CORE |
| 4  | TERMINAL    | Ag/Cu/Ni/Sn  |

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### 9 Common Mode Choke / RELIABILITY TEST

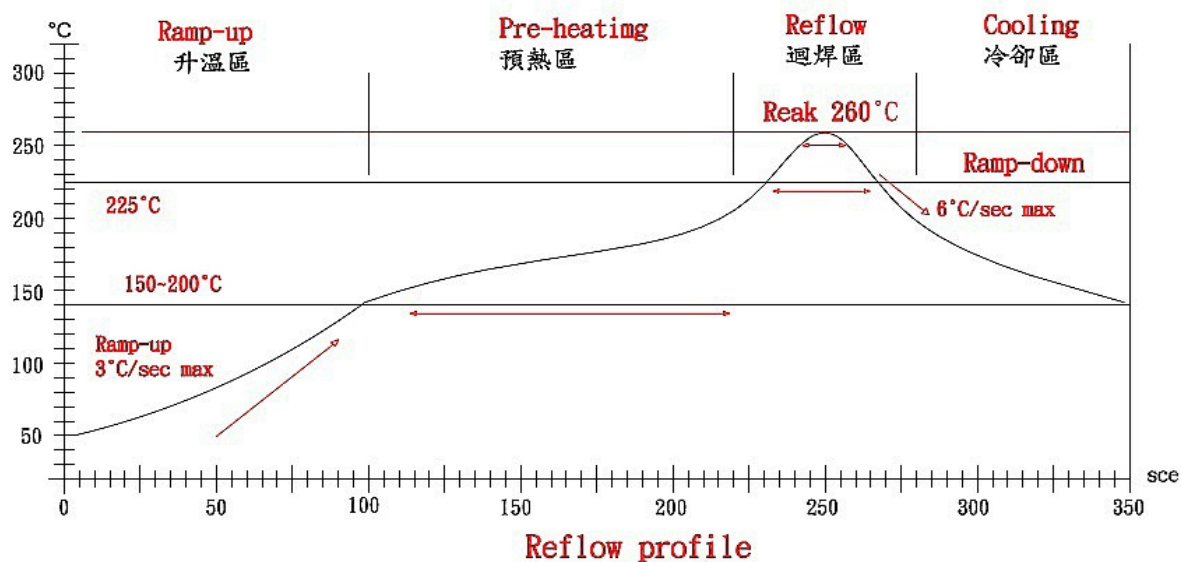
#### 1-1.Environmental Performance

| No    | Item                        | Specification                                                                                   | Test Method                                                                                                                                                                                                                                                              |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
|-------|-----------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|------------|---|-------|----|---|------|---|---|-------|----|---|------|---|
| 1-1-1 | Temperature Cycle           | Appearance: No Damage<br>Impedance: within±20% of initial value                                 | One cycle: <table><tr><th>Step</th><th>Temperature (°C)</th><th>Time (min)</th></tr><tr><td>1</td><td>-40±3</td><td>30</td></tr><tr><td>2</td><td>25±2</td><td>3</td></tr><tr><td>3</td><td>105±3</td><td>30</td></tr><tr><td>4</td><td>25±2</td><td>3</td></tr></table> | Step | Temperature (°C) | Time (min) | 1 | -40±3 | 30 | 2 | 25±2 | 3 | 3 | 105±3 | 30 | 4 | 25±2 | 3 |
| Step  | Temperature (°C)            |                                                                                                 | Time (min)                                                                                                                                                                                                                                                               |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 1     | -40±3                       |                                                                                                 | 30                                                                                                                                                                                                                                                                       |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 2     | 25±2                        |                                                                                                 | 3                                                                                                                                                                                                                                                                        |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 3     | 105±3                       |                                                                                                 | 30                                                                                                                                                                                                                                                                       |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 4     | 25±2                        | 3                                                                                               |                                                                                                                                                                                                                                                                          |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 1-1-2 | High Temperature Resistance | Total: 5 cycles<br>Measured After Exposure in The Room Condition For 1hrs                       |                                                                                                                                                                                                                                                                          |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 1-1-3 | Low Temperature Resistance  | Temperature: 105±3°C<br>Time: 1000Hrs<br>Measured After Exposure In The Room Condition For 1Hrs |                                                                                                                                                                                                                                                                          |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 1-1-4 | Humidity Load Life          | Temperature: -40±3°C<br>Time: 1000Hrs<br>Measured After Exposure In The Room Condition For 1Hrs |                                                                                                                                                                                                                                                                          |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |
| 1-1-4 | Humidity Load Life          | There should be no evidence of short or open circle                                             | Temperature: 40±2°C<br>Relative Humidity: 90~95%<br>Load: Allowed DC Current<br>Time: 96Hrs                                                                                                                                                                              |      |                  |            |   |       |    |   |      |   |   |       |    |   |      |   |

#### 1-2.Mechanical Performance

| No    | Item                           | Specification                                                        | Test Method                                                                                                                                                                                                                                                                                       |
|-------|--------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-2-1 | Resistance To Soldering Heat   | Appearance: No Damage                                                | 1. The device should be reflow soldered on PCB (peak $260^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for 10 seconds)<br>2. Solder Composition: Sn/Ag3.0/Cu0.5<br>3. Test time: 6 minutes                                                                                                               |
| 1-2-2 | Solder ability                 | The electrodes shall be at least 95% covered with new solder coating | 1. Pre-Heating: $150^{\circ}\text{C}$ , 1min.<br>2. Solder Composition: Sn/Ag3.0/Cu0.5<br>3. Solder Temperature: $245\pm 5^{\circ}\text{C}$ .<br>4. Immersion Time: $4\pm 1$ sec.                                                                                                                 |
| 1-2-3 | Commpnent Adhesion (Push Test) | 1 Lbs. For 1210 Size<br>2 Lbs. For other                             | The device should be reflow soldered ( $245\pm 5^{\circ}\text{C}$ For 10 seconds) to a tinned copper substrate. A force gauge should be applied to the side of the component.<br>The device must withstand a minimum force of 2 pounds without a failure of the termination attached to component |

## BWCU00321619 Series Specification



Lead-Free(LF)標準溫度分析範圍

Refer to J-STD-020C

| 管制項目<br>Item.       | 升温區<br>Ramp-up | 預熱區<br>Pre-heating | 迴焊區<br>Reflow | Peak Temp   | 冷卻區<br>Cooling   |
|---------------------|----------------|--------------------|---------------|-------------|------------------|
| 溫度範圍<br>Temp.scope  | R.T ~ 150°C    | 150°C ~ 200°C      | Above 217°C   | 260±5°C     | Peak Temp.~150°C |
| 標準時間<br>Time spec.  | -              | 60 ~ 180 sec       | 60 ~ 150 sec  | 20 ~ 40 sec | -                |
| 實際時間<br>Time result | -              | 75 ~ 100 sec       | 90 ~ 120 sec  | 20 ~ 35 sec | -                |

NOTE:

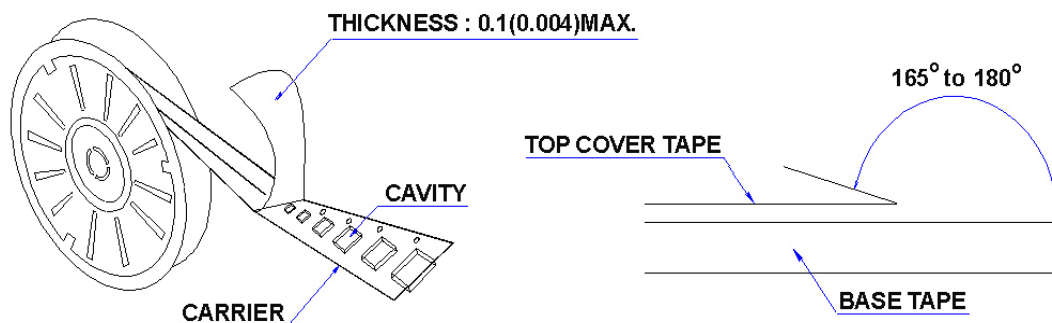
- 1.Re-flow possible times : within 3 times
- 2.Nitrogen adopted is recommends while in re-flow
- 3.Products can only be soldered with reflow

## BWCU00321619 Series Specification

### 10 Packaging:

#### 10.1 Packaging -Cover Tape

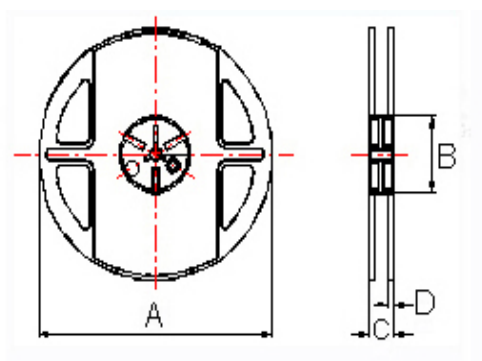
The force for tearing off cover tape is 10 to 100 grams in the arrow direction.



#### 10.2 Packaging Quantity

| TYPE   | PCS/REEL |
|--------|----------|
| 321619 | 2000     |

#### 10.3 Reel Dimensions



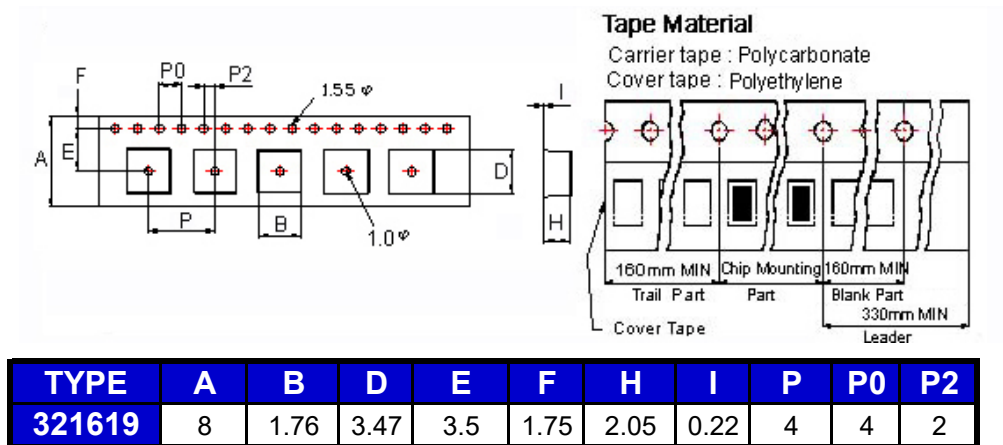
Dimensions in mm

| TYPE   | A   | B  | C  | D   |
|--------|-----|----|----|-----|
| 321619 | 178 | 60 | 12 | 1.5 |

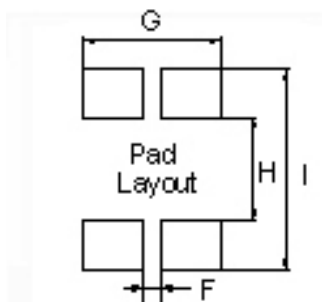
## BWCU00321619 Series Specification

### 10 Packaging:

#### 10.4 Tape Dimensions in mm



### 11 Recommended Land Pattern:



Dimensions in mm

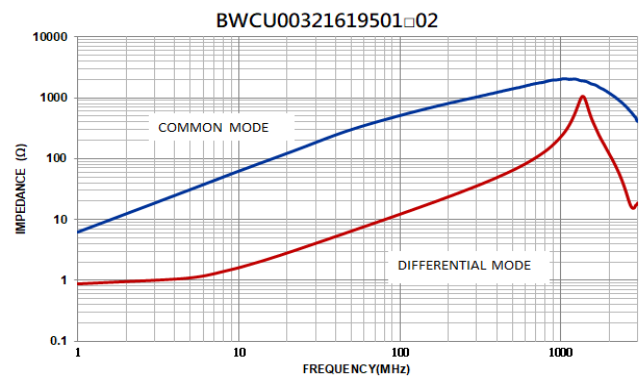
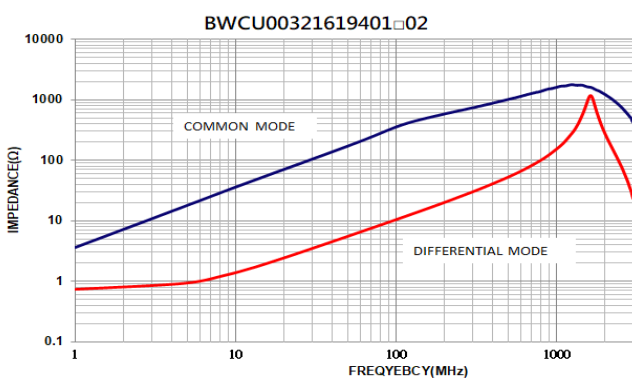
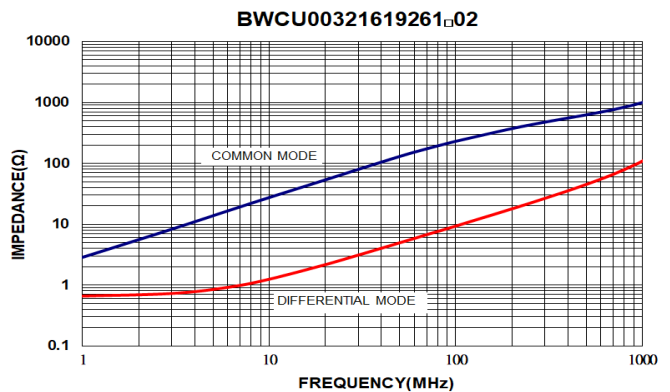
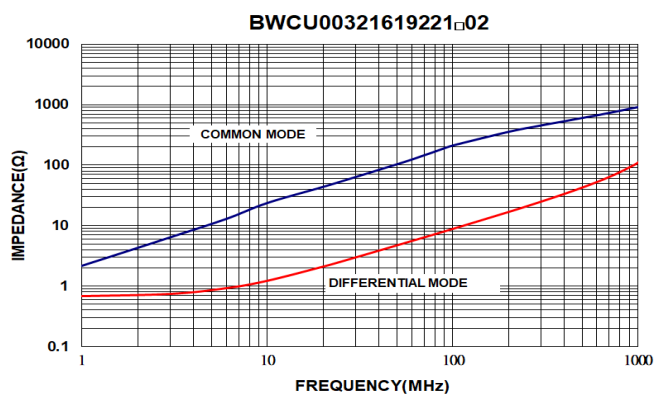
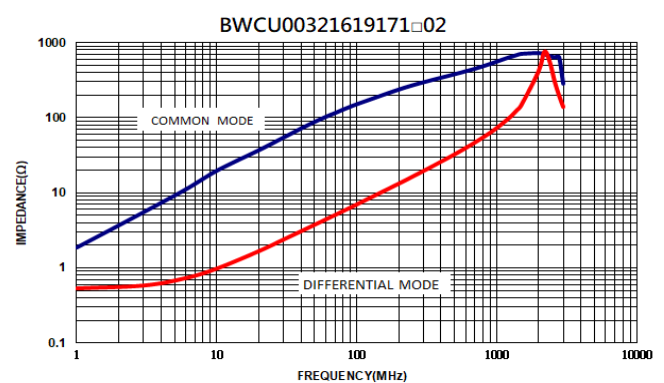
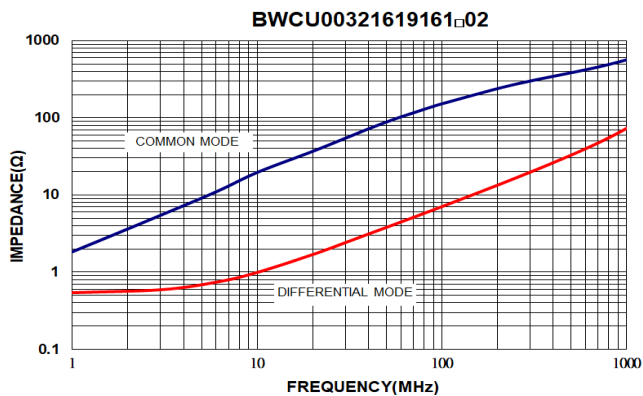
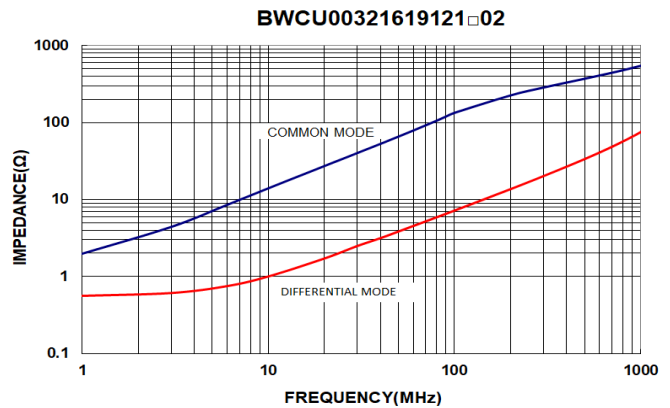
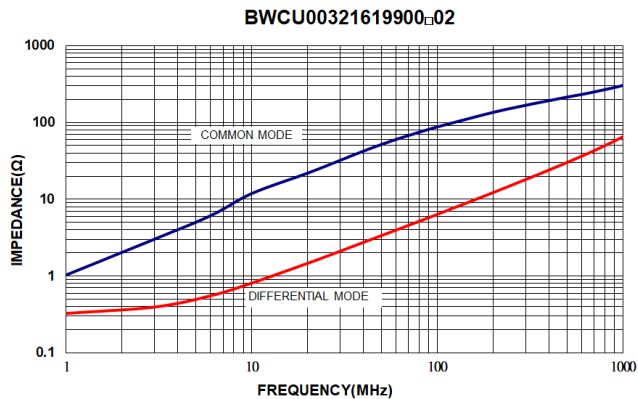
| TYPE   | F(In/mm) | G(In/mm) | H(In/mm) | I(In/mm) |
|--------|----------|----------|----------|----------|
| 321619 | 0.16/0.4 | 0.06/1.6 | 0.06/1.6 | 0.15/3.7 |

### 12 Note:

- Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
- Do not knock nor drop.
- All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.
- The storage period is less than 12 months. Be sure to follow the storage conditions (Temperature: 5 to 40°C, Humidity: 10 to 75% RH or less).  
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
- Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
- The moisture sensitivity level (MSL) of products is classified as level 1.

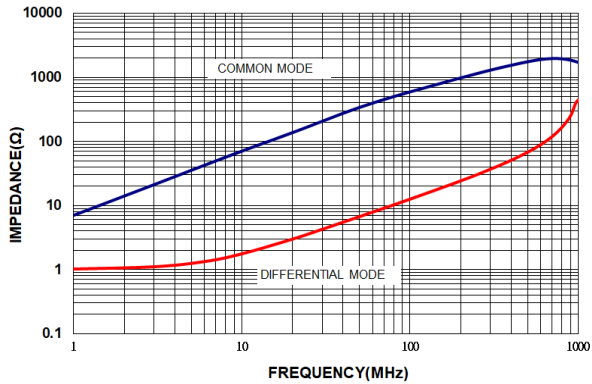
## BWCU00321619 Series Specification

### 13 Graph:

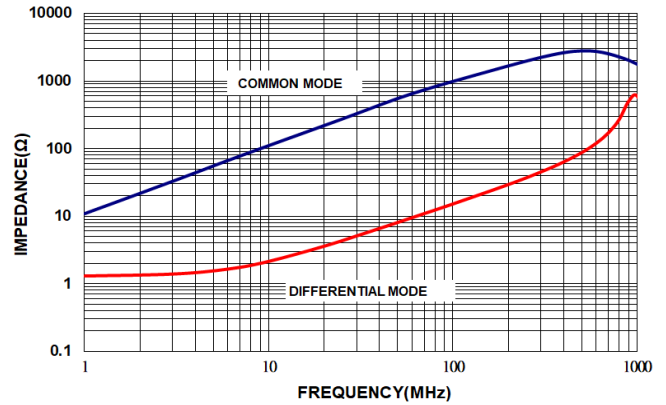


## BWCU00321619 Series Specification

**BWCU00321619601□02**



**BWCU00321619102□02**



**BWCU00321619222□02**

