# RF Inductor

## BWCS Series

### Overview

Wire-wound RF inductors are electronic components designed to store energy in a magnetic field when electrical current passes through them. They are constructed by winding a conductive wire (usually copper or gold-plated) around a core material such as air, ceramic, or ferrite.
This configuration allows them to provide high inductance values with minimal power loss, especially at high frequencies.

### Benefits

1. High Q-Factor (Quality Factor)
2. Ceramic body and wire wound construction provide high SRFs
3. Low DC resistance design
4. High Current Handling
5. Can maintain excellent thermal stability at different temperatures

### Applications

1. Industrial and Medical Equipmen: RFID systems and medical imaging equipment.
2. Data Centers
3. Networking
4. Base Station
5. Consumer Electronics
6. Security system

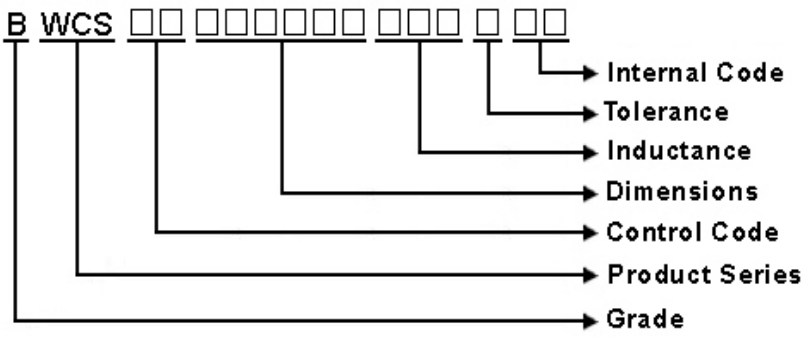
### Product Information

| Series | Size Code (JIS/EIA) | Inductance (nH) |
|---|---|---|
| BWCS | 0603/0201<br>1005/0402<br>1608/0603<br>2012/0805<br>2520/1008<br>4938/1812 | 1 ~ 470 |

# BWCS00161008 Series Specification

## 1 Scope:
This specification applies to Wire Wound Ceramic Chip Inductors

## 2 Part Numbering:

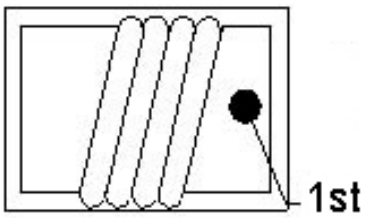



## 3 Rating:

Operating Temperature: - 40℃ ~ 125℃
(Including self - temperature rise)

Storage Temperature: - 40℃ ~ 125℃
(The storage temperature range is for after the assembly)

## 4 Marking:



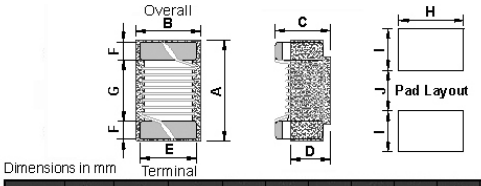

**EX:BWCS001610086N8J00**
**Marking:1st→RED**

## 5 Standard Testing Condition

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

# BWCS00161008 Series Specification

## 6 Configuration and Dimensions and Unit Weight:




Dimensions in mm

| TYPE | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 161008 | $1.6^{+0.2}_{-0.1}$ | 1.02±0.1 | $0.82^{+0.2}_{-0.1}$ | 0.51 | 0.76 | 0.33 | 0.86 | 1.02 | 0.64 | 0.64 |

Net Weight (grms)

| SIZE CODE | Net Weight (grms) |
|---|---|
| 161008 | 0.00335 (typ.) |

## 7 Electrical Characteristics:

| Part No. | Inductance (nH) | L/Q Test Freq. (MHz) | Q Min. | SRF (MHz)Min. | RDC (Ω)Max. | Irms (mA)Max. | Tolerance | Color Code 1st |
|---|---|---|---|---|---|---|---|---|
| BWCS001610081N6□00 | 1.6 | 250/250 | 24 | 12500 | 0.03 | 700 | K,J,B | RED |
| BWCS001610081N8□00 | 1.8 | 250/250 | 16 | 12500 | 0.045 | 700 | K,J,B | BLK |
| BWCS001610082N2□00 | 2.2 | 250/250 | 13 | 12500 | 0.25 | 700 | K,J,B | YEL |
| BWCS001610083N3□00 | 3.3 | 250/250 | 35 | 5900 | 0.045 | 700 | K,J,H,G | BLU |
| BWCS001610083N6□00 | 3.6 | 250/250 | 22 | 5900 | 0.063 | 700 | K,J,H,G | RED |
| BWCS001610083N9□00 | 3.9 | 250/250 | 22 | 6900 | 0.08 | 700 | K,J,H,G | BRN |
| BWCS001610084N3□00 | 4.3 | 250/250 | 22 | 5900 | 0.063 | 700 | K,J,H,G | ORN |
| BWCS001610084N7□00 | 4.7 | 250/250 | 20 | 5800 | 0.116 | 700 | K,J,H,G | VIO |
| BWCS001610085N1□00 | 5.1 | 250/250 | 20 | 5700 | 0.14 | 700 | K,J,H,G | GRN |
| BWCS001610085N6□00 | 5.6 | 250/250 | 20 | 5800 | 0.17 | 700 | K,J,H,G | YEL |
| BWCS001610086N3□00 | 6.3 | 250/250 | 20 | 5700 | 0.14 | 700 | K,J,H,G | WHT |
| BWCS001610086N8□00 | 6.8 | 250/250 | 27 | 5800 | 0.11 | 700 | K,J,H,G | RED |
| BWCS001610087N5□00 | 7.5 | 250/250 | 28 | 4800 | 0.106 | 700 | K,J,H,G | BRN |
| BWCS001610088N2□00 | 8.2 | 250/250 | 28 | 4700 | 0.109 | 700 | K,J,H,G | WHT |
| BWCS001610088N7□00 | 8.7 | 250/250 | 28 | 4600 | 0.109 | 700 | K,J,H,G | YEL |
| BWCS001610089N1□00 | 9.1 | 250/250 | 28 | 4800 | 0.12 | 700 | K,J,H,G | VIO |
| BWCS001610089N5□00 | 9.5 | 250/250 | 28 | 5400 | 0.135 | 700 | K,J,H,G | BLU |
| BWCS0016100810N□00 | 10 | 250/250 | 31 | 4800 | 0.13 | 700 | K,J,H,G | ORN |
| BWCS0016100811N□00 | 11 | 250/250 | 33 | 4000 | 0.086 | 700 | K,J,H,G | GRY |
| BWCS0016100812N□00 | 12 | 250/250 | 35 | 4000 | 0.13 | 700 | K,J,H,G | YEL |
| BWCS0016100813N□00 | 13 | 250/250 | 30 | 4000 | 0.16 | 700 | K,J,H,G | BLK |
| BWCS0016100815N□00 | 15 | 250/250 | 35 | 4000 | 0.17 | 700 | K,J,H,G | GRN |
| BWCS0016100816N□00 | 16 | 250/250 | 34 | 3300 | 0.104 | 700 | K,J,H,G | WHT |
| BWCS0016100818N□00 | 18 | 250/250 | 35 | 3100 | 0.17 | 700 | K,J,H,G | BLU |
| BWCS0016100820N□00 | 20 | 250/250 | 38 | 3000 | 0.19 | 700 | K,J,H,G | RED |

**NOTE: □-tolerance B=±0.1nH / G=±2% / H=±3% / J=±5% / K=±10%**

1.Operating temperature range -40℃~125℃(Including self - temperature rise)

2.Irms for a 15℃ temperature rise from 25℃ ambient.

3.L/Q Test OSC @200mV.

# BWCS00161008 Series Specification

| Part No. | Inductance (nH) | L/Q Test Freq. (MHz) | Q Min. | SRF (MHz)Min. | RDC (Ω)Max. | Irms (mA)Max. | Tolerance | Color Code 1st |
|---|---|---|---|---|---|---|---|---|
| BWCS0016100822N□00 | 22 | 250/250 | 38 | 3000 | 0.19 | 700 | K,J,H,G | VIO |
| BWCS0016100823N□00 | 23 | 250/250 | 38 | 2850 | 0.19 | 700 | K,J,H,G | ORN |
| BWCS0016100824N□00 | 24 | 250/250 | 37 | 2650 | 0.135 | 700 | K,J,H,G | BLK |
| BWCS0016100827N□00 | 27 | 250/250 | 40 | 2800 | 0.22 | 600 | K,J,H,G | GRY |
| BWCS0016100830N□00 | 30 | 250/250 | 37 | 2250 | 0.144 | 600 | K,J,H,G | BRN |
| BWCS0016100833N□00 | 33 | 250/250 | 40 | 2300 | 0.22 | 600 | K,J,H,G | WHT |
| BWCS0016100836N□00 | 36 | 250/250 | 38 | 2080 | 0.25 | 600 | K,J,H,G | RED |
| BWCS0016100839N□00 | 39 | 250/250 | 40 | 2200 | 0.25 | 600 | K,J,H,G | BLK |
| BWCS0016100843N□00 | 43 | 250/250 | 39 | 2000 | 0.28 | 600 | K,J,H,G | ORN |
| BWCS0016100847N□00 | 47 | 200/200 | 38 | 2000 | 0.28 | 600 | K,J,H,G | BRN |
| BWCS0016100851N□00 | 51 | 200/200 | 38 | 1900 | 0.31 | 600 | K,J,H,G | BRN |
| BWCS0016100856N□00 | 56 | 200/200 | 38 | 1900 | 0.31 | 600 | K,J,H,G | RED |
| BWCS0016100868N□00 | 68 | 200/200 | 37 | 1700 | 0.34 | 600 | K,J,H,G | ORN |
| BWCS0016100872N□00 | 72 | 150/150 | 34 | 1700 | 0.49 | 400 | K,J,H,G | YEL |
| BWCS0016100882N□00 | 82 | 150/150 | 34 | 1700 | 0.54 | 400 | K,J,H,G | GRN |
| BWCS0016100891N□00 | 91 | 150/150 | 34 | 1400 | 0.58 | 400 | K,J,H,G | BLK |
| BWCS00161008R10□00 | 100 | 150/150 | 34 | 1400 | 0.58 | 400 | K,J,H,G | BLU |
| BWCS00161008R11□00 | 110 | 150/150 | 32 | 1350 | 0.61 | 300 | K,J,H,G | VIO |
| BWCS00161008R12□00 | 120 | 150/150 | 32 | 1300 | 0.75 | 300 | K,J,H,G | GRY |
| BWCS00161008R15□00 | 150 | 150/150 | 28 | 990 | 0.92 | 280 | K,J,H,G | WHT |
| BWCS00161008R16□00 | 160 | 100/100 | 25 | 990 | 1.25 | 240 | K,J,H,G | YEL |
| BWCS00161008R18□00 | 180 | 100/100 | 25 | 990 | 1.25 | 240 | K,J,H,G | BLK |
| BWCS00161008R20□00 | 200 | 100/100 | 25 | 900 | 2.1 | 200 | K,J,H,G | RED |
| BWCS00161008R21□00 | 210 | 100/100 | 27 | 895 | 2.06 | 200 | K,J,H,G | GRY |
| BWCS00161008R22□00 | 220 | 100/100 | 25 | 900 | 2.1 | 200 | K,J,H,G | BRN |
| BWCS00161008R24□00 | 240 | 100/100 | 25 | 900 | 2.2 | 200 | K,J,H,G | GRN |
| BWCS00161008R25□00 | 250 | 100/100 | 25 | 822 | 3.55 | 120 | K,J,H,G | VIO |
| BWCS00161008R27□00 | 270 | 100/100 | 24 | 900 | 2.8 | 170 | K,J,H,G | RED |
| BWCS00161008R33□00 | 330 | 100/100 | 25 | 900 | 3.89 | 100 | K,J,H,G | ORN |
| BWCS00161008R39□00 | 390 | 100/100 | 25 | 900 | 4.35 | 100 | K,J,H,G | YEL |
| BWCS00161008R47□00 | 470 | 100/100 | 25 | 500 | 4.5 | 100 | K,J,H,G | GRN |
| BWCS00161008R56□00 | 560 | 100/100 | 23 | 460 | 4.7 | 90 | K,J,H,G | BLU |

**NOTE: □-tolerance B=±0.1nH / G=±2% / H=±3% / J=±5% / K=±10%**

1.Operating temperature range -40℃~125℃(Including self - temperature rise)

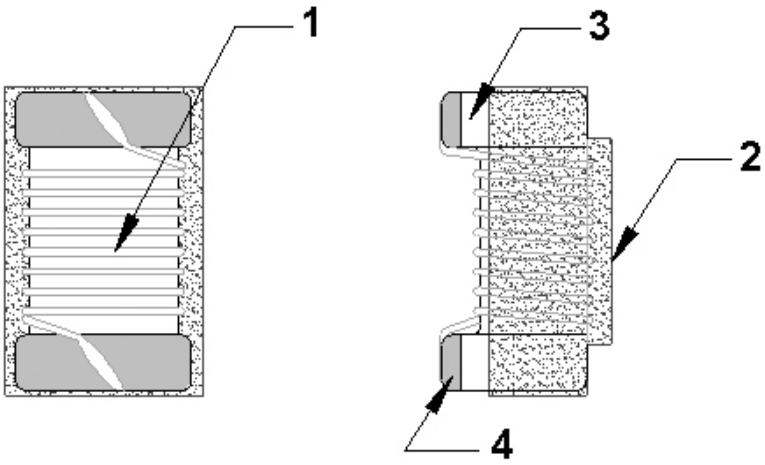
2.Irms for a 15℃ temperature rise from 25℃ ambient.

3.L/Q Test OSC @200mV.

# BWCS00161008 Series Specification

## 8 BWCS00161008 Series

### 8.1 Construction:




### 8.2 Material List:

| NO | PART | MATERIAL |
|---|---|---|
| 1 | WIRE | COPPER 180 |
| 2 | EPOXY | UV GLUE |
| 3 | CORE | CERAMIC |
| 4 | TERMINAL | Ag/Cu/Ni/Sn |

# BWCS00161008 Series Specification

## 9 Reliability Of Ceramic Wire Wound Chip Inductor/CERAMIC SERIES

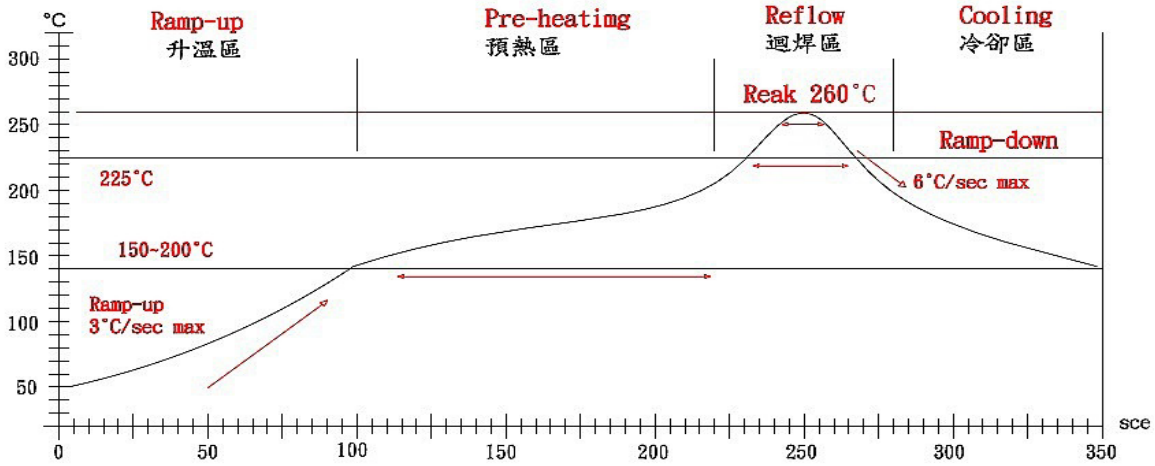
### 1-1.Environmental Performance

<table>
<tr><th>No</th><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>1-1-1</td><td>Temperature Cycle</td><td rowspan="3">Appearance: No Damage<br>Inductance:within±10% of initial value<br>Q change:within±30% of initial value</td><td>One cycle:<br><table><tr><th>Step</th><th>Temperature (℃)</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>15</td></tr><tr><td>3</td><td>125±3</td><td>30</td></tr><tr><td>4</td><td>25±2</td><td>15</td></tr></table>Total: 5 cycles<br>Measured After Exposure in The Room Condition For 1hrs</td></tr>
<tr><td>1-1-2</td><td>High Temperature Resistance</td><td>Temperature: 125±3℃<br>Time: 1000Hrs<br>Measured After Exposure In The Room Condition For 1Hrs</td></tr>
<tr><td>1-1-3</td><td>Low Temperature Resistance</td><td>Temperature: -40±3℃<br>Time: 1000Hrs<br>Measured After Exposure In The Room Condition For 1Hrs</td></tr>
<tr><td>1-1-4</td><td>Humidity Load Life</td><td>There should be no evidence of short or open circle</td><td>Temperature: 40±2℃<br>Relative Humidity: 90~95%<br>Load: Allowed DC Current<br>Time: 96Hrs</td></tr>
</table>

### 1-2.Mechanical Performance

| No | Item | Specification | Test Method |
|---|---|---|---|
| 1-2-1 | Vibration Test<br>(Low Frequency) | 1.Appearance: No Damage<br>2.Inductance:within±10% of initial value<br>3.Q change:within±30% of initial value | 1. Test device shall be soldered on the substrate.<br>2. Oscillation frequency: 10 to 55 to 10Hz for 1min.<br>3. Amplitude: 1.5mm<br>4. Time: 2hrs for each axis(X, Y & Z),total 6hrs |
| 1-2-2 | Resistance TO<br>Soldering Heat | Appearance: No Damage | 1. The device should be reflow soldered on PCB<br>(peak 260℃±5℃ for 10 seconds)<br>2. Solder Composition: Sn/Ag3.0/Cu0.5<br>3. Test time: 6 minutes |
| 1-2-3 | Solder ability | The electrodes shall be at least 95% covered with new solder coating | 1. Pre-Heating: 150℃,1min.<br>2. Solder Composition: Sn/Ag3.0/Cu0.5<br>3. Solder Temperature: 245±5℃.<br>4. Immersion Time: 4±1 sec. |
| 1-2-4 | Component<br>Adhesion<br>(Push Test) | 1 Lbs. For 0402<br>2 Lbs. For 0603<br>4 Lbs. For The Rest | The device should be reflow soldered (245±5℃ 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 or 4 pounds without a failure of the termination attached to component |

# BWCS00161008 Series Specification




Reflow profile

Lead-Free(LF)標準溫度分析範圍 Refer to J-STD-020C

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

NOTE:

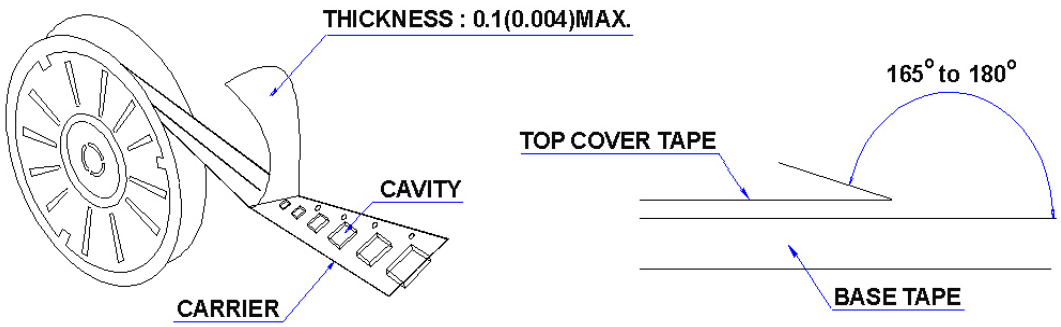
1.Re-flow possible times : within 3 times
2.Nitrogen adopted is recommendes while in re-flow
3.Products can only be soldered with reflow

# BWCS00161008 Series Specification

## 10 Packaging:

### 10.1 Packaging -Cover Tape

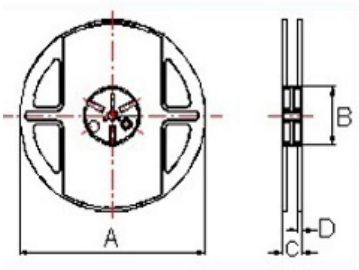
The force for tearing off cover tape is 10 to 100 grams in the arrow direction.




### 10.2 Packaging Quantity

| TYPE | PCS/REEL |
|---|---|
| 161008 | 4000 |

### 10.3 Reel Dimensions



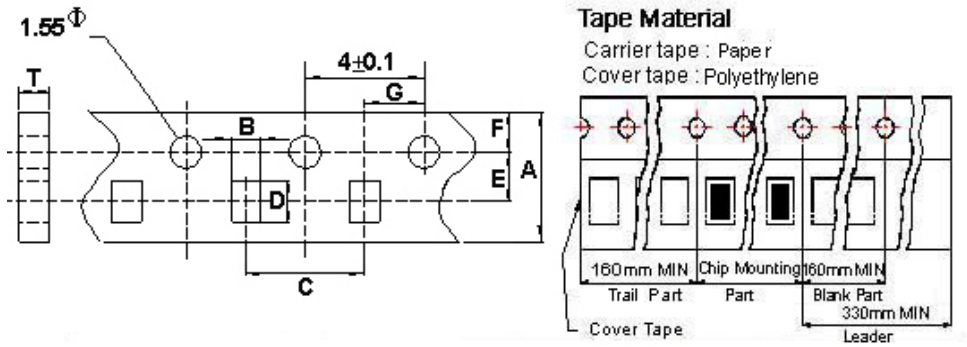

Dimensions in mm

| TYPE | A | B | C | D |
|---|---|---|---|---|
| 161008 | 178±1 | 60±0.5 | 12±0.5 | 1.5±0.5 |

# BWCS00161008 Series Specification

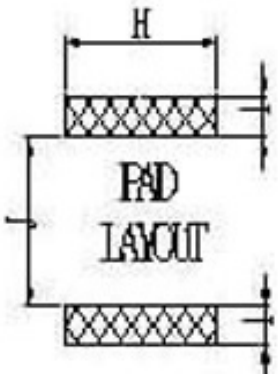
## 10 Packaging:

### 10.4 Tape Dimensions in mm




| TYPE | A | B | C | D | E | F | G | T |
|---|---|---|---|---|---|---|---|---|
| 161008 | 8.0 | 1.25 | 4 | 1.90 | 3.5 | 1.75 | 2 | 1.05 |

## 11 Recommended Land Pattern:




Dimensions in mm

| TYPE | H(In/mm) | I(In/mm) | J(In/mm) |
|---|---|---|---|
| 161008 | 0.04/1.02 | 0.025/0.64 | 0.025/0.64 |

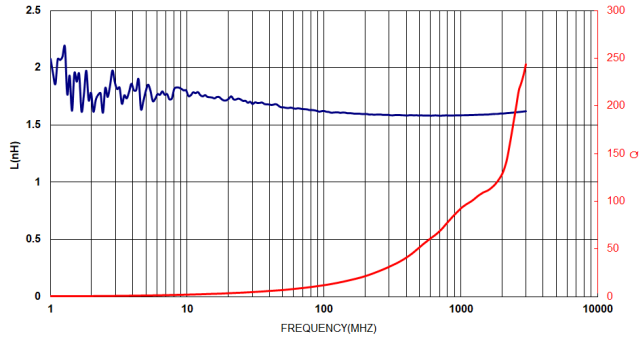
## 12 Note:

1. Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
2. Do not knock nor drop.
3. 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.
4. The storage period is less than 12 months. Be sure to follow the storage conditions (Temperature: 5 to 40°C, Humidity: 10 to 75% RHor less).
   If the storage period elapses, the soldering of the terminal electrodes may deteriorate.
5. Do not use or store in locations where there are conditions such as gas corrosion (salt, acid, alkali, etc.).
6. The moisture sensitivity level (MSL) of products is classified as level 1.

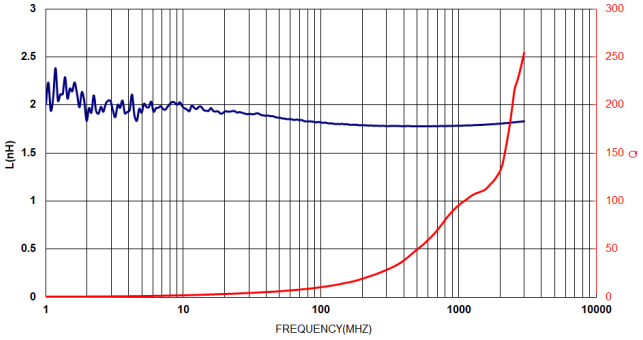
# BWCS00161008 Series Specification

## 13 Graph:

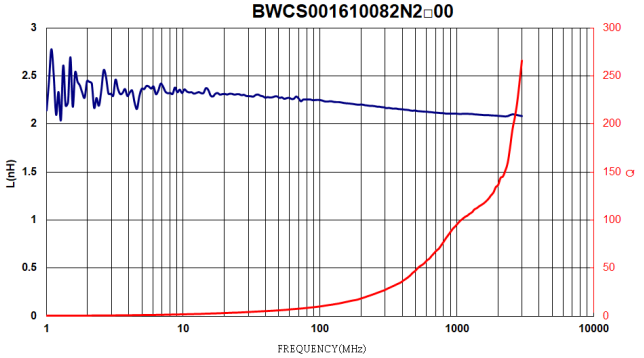
BWCS001610081N6□00



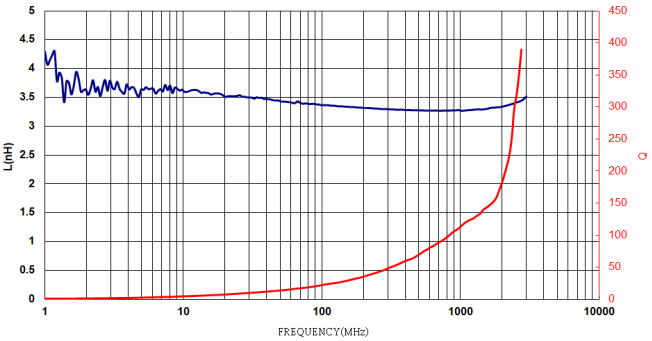

BWCS001610081N8□00



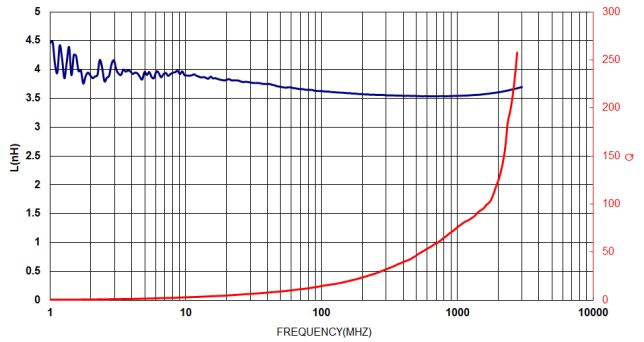

BWCS001610082N2□00



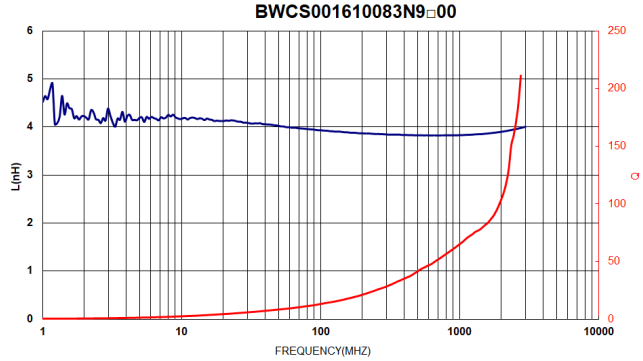

BWCS001610083N3□00



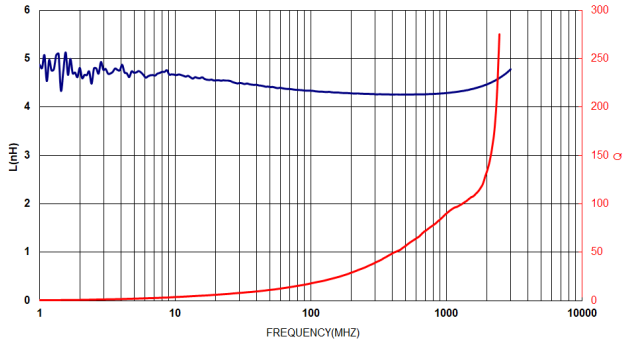

BWCS001610083N6□00



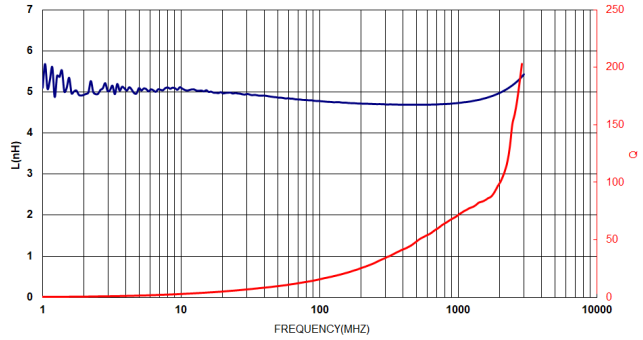

BWCS001610083N9□00




BWCS001610084N3□00

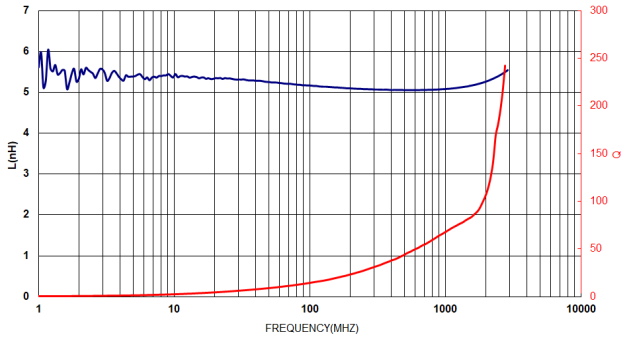



BWCS001610084N7□00

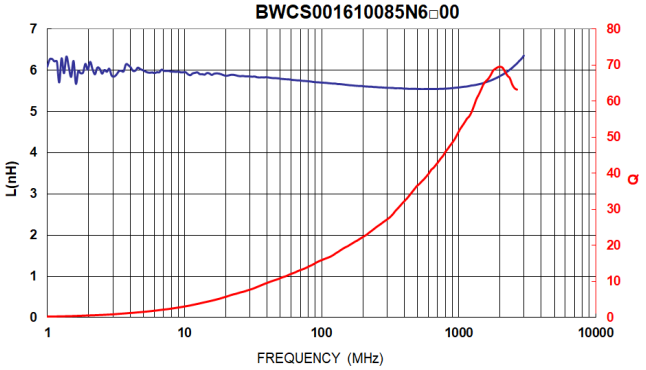


# BWCS00161008 Series Specification

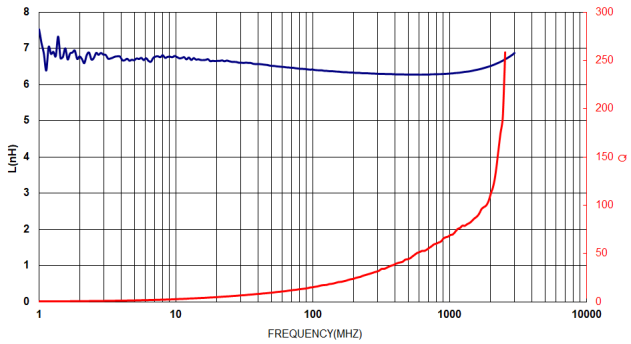
BWCS001610085N1□00



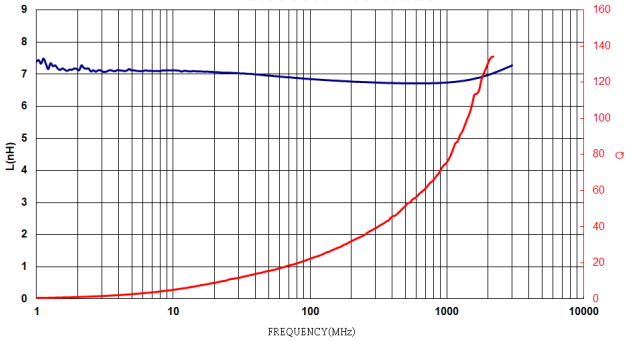

BWCS001610085N6□00




BWCS001610086N3□00




BWCS001610086N8□00

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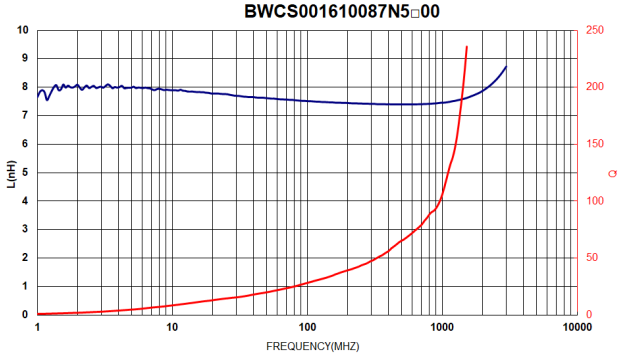


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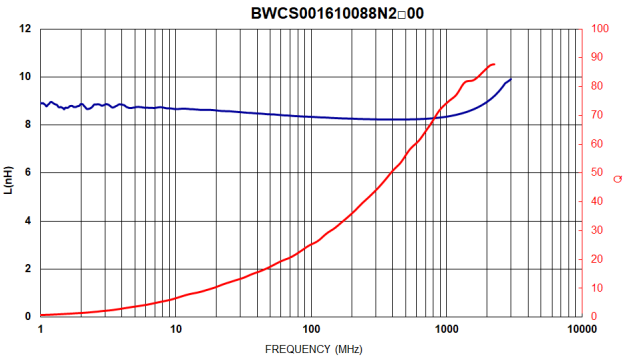


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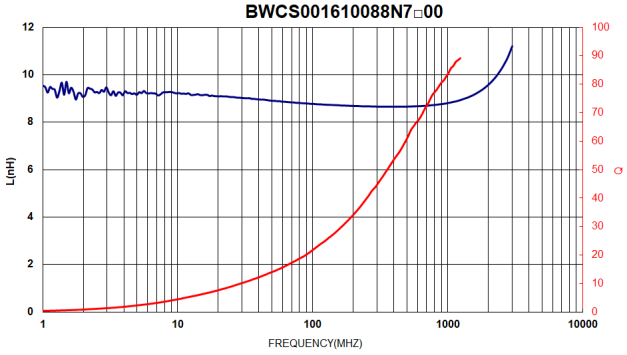


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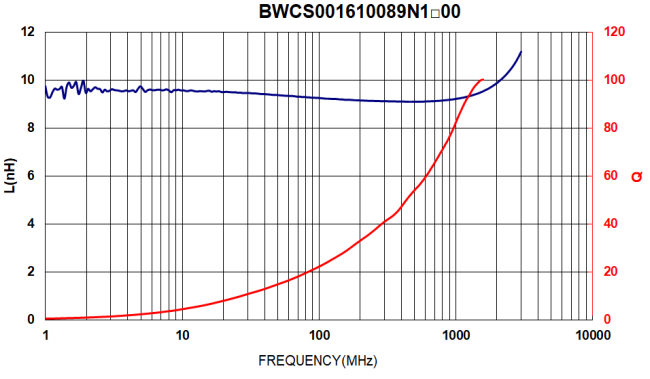

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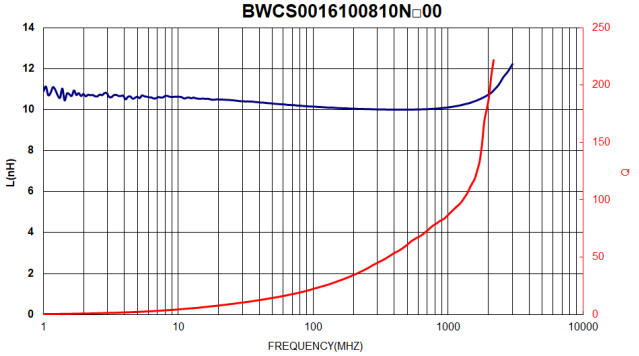


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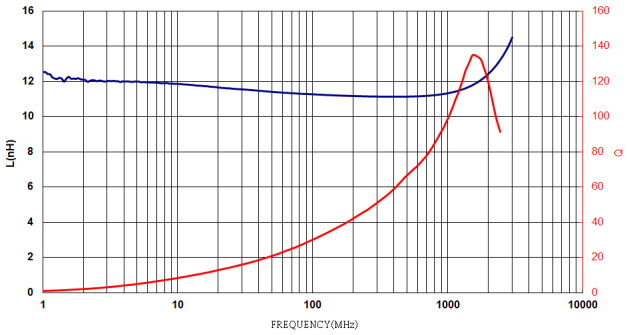


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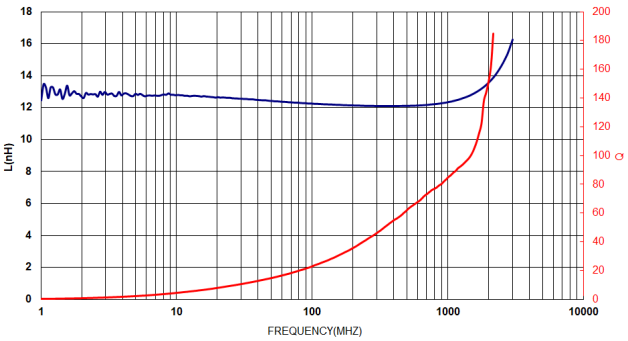


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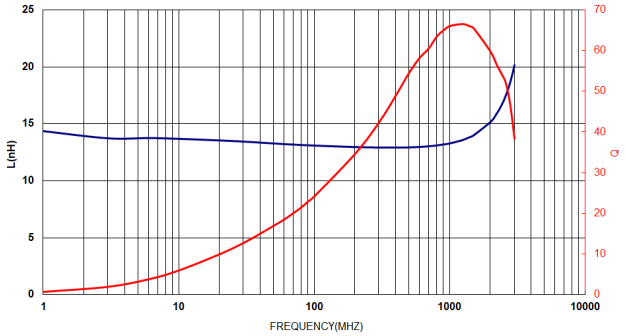


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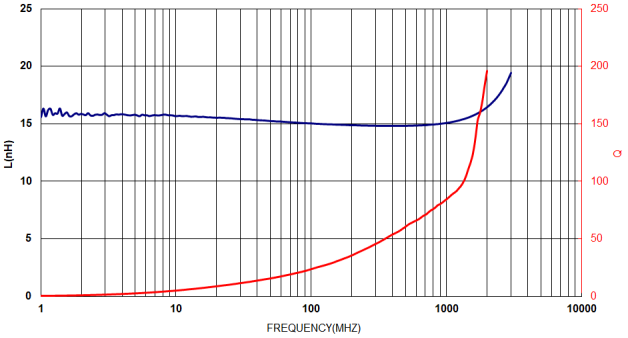


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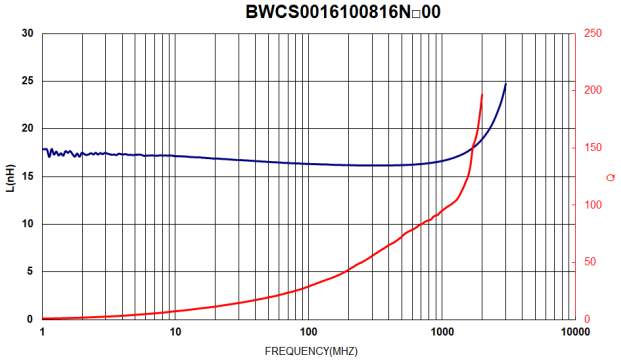


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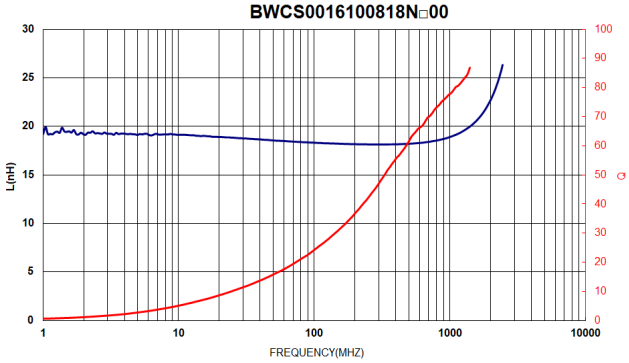

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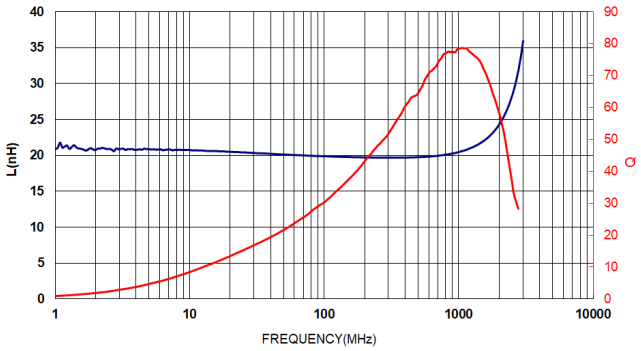


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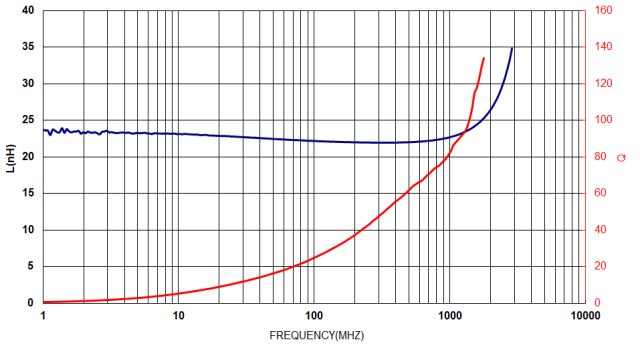


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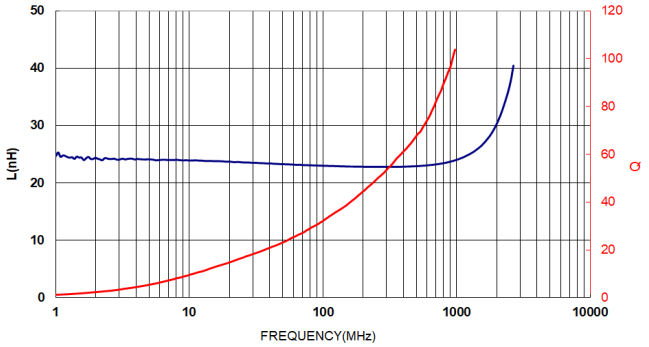


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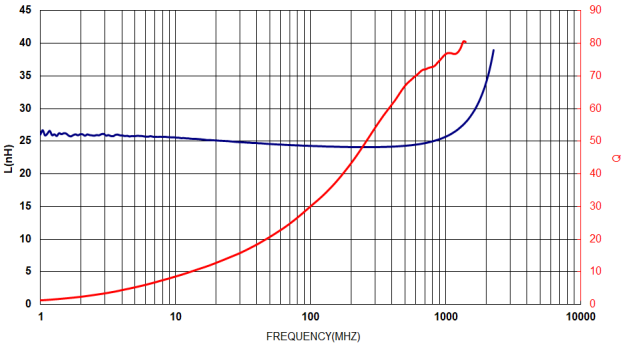


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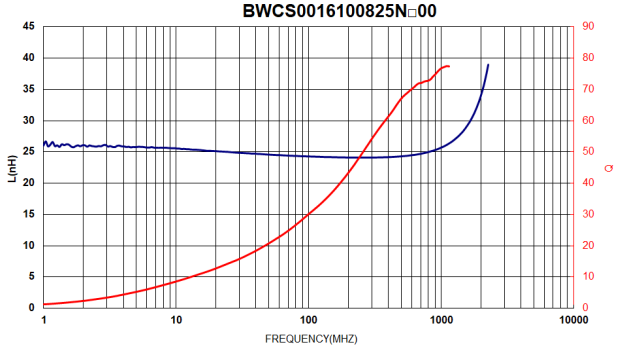


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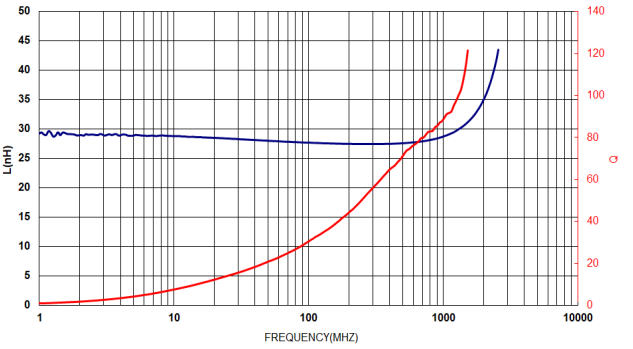


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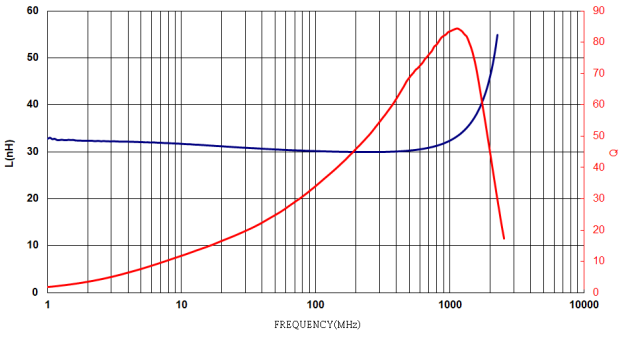


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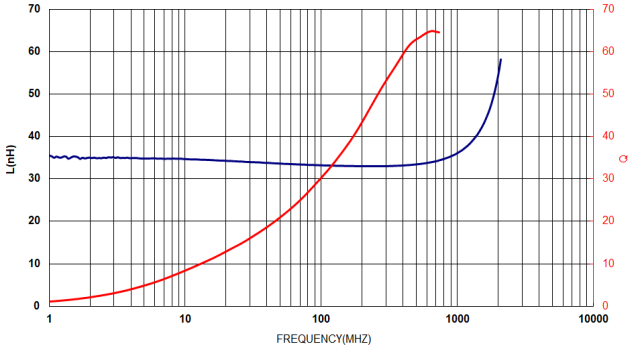

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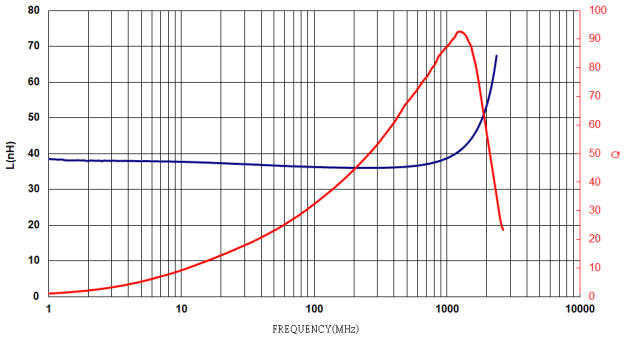


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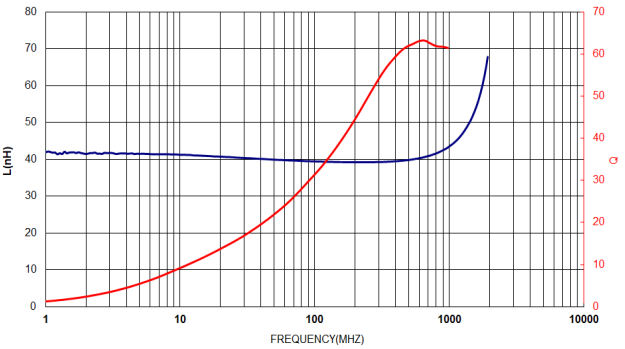


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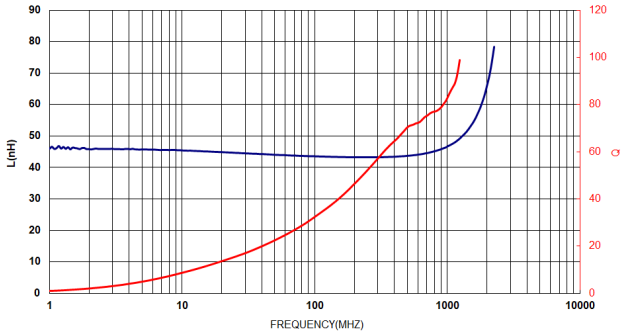


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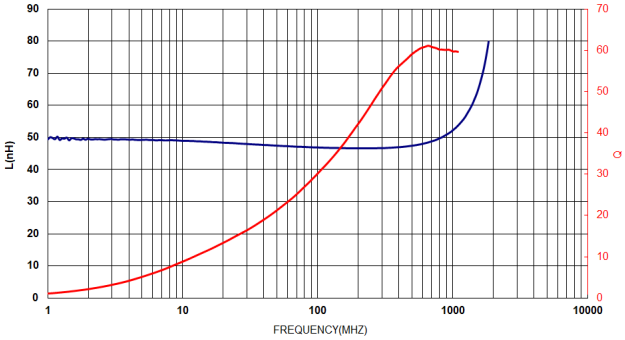


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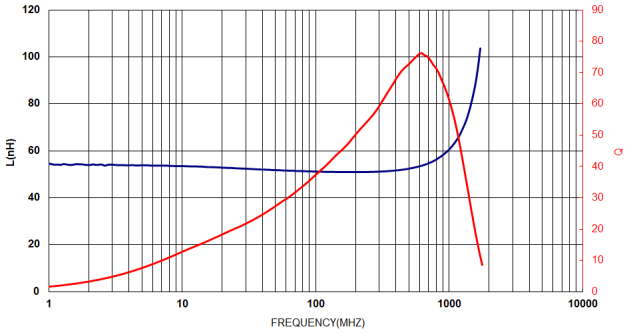


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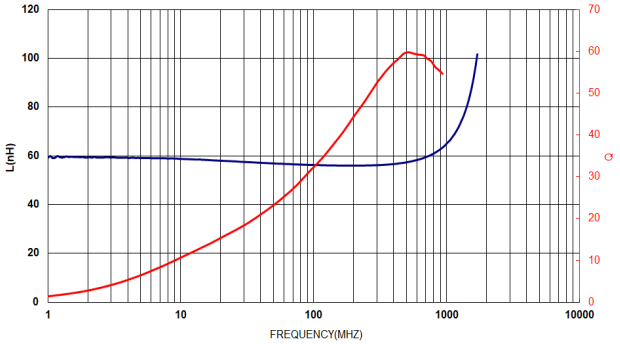


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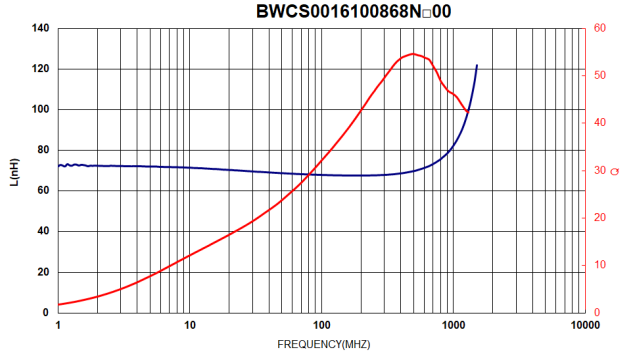


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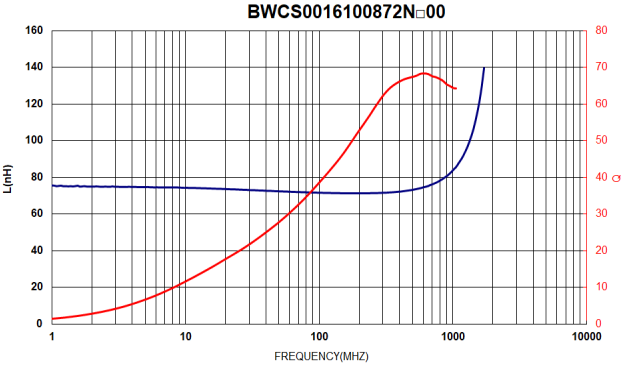

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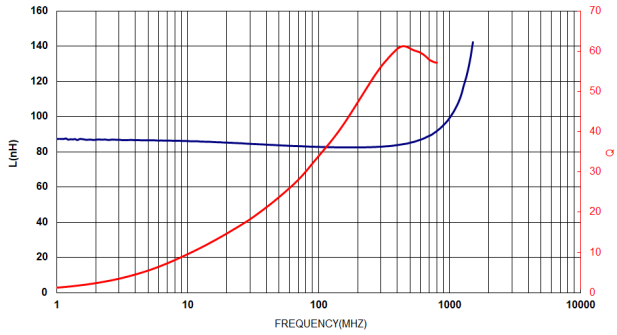


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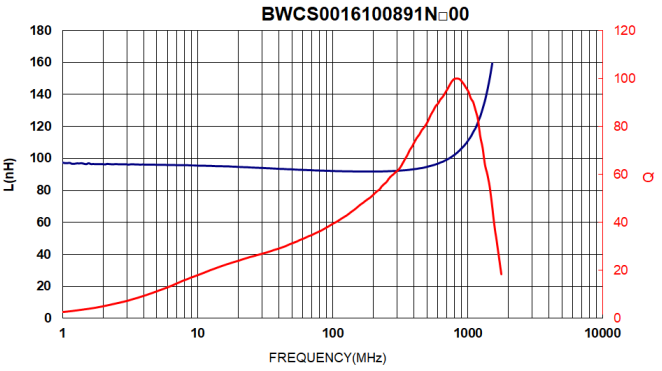


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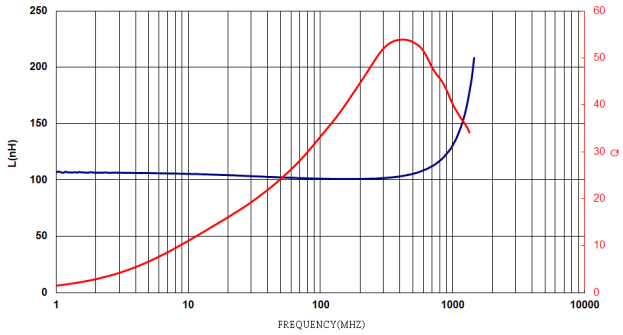


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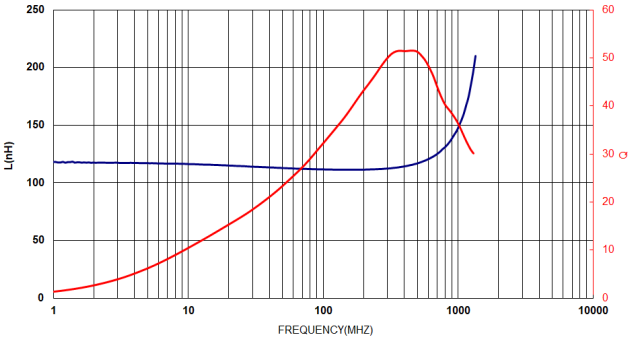


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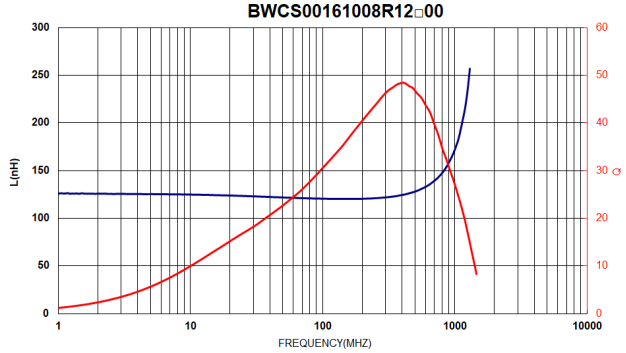


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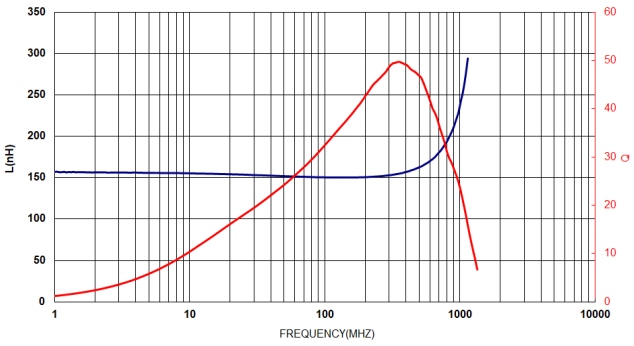


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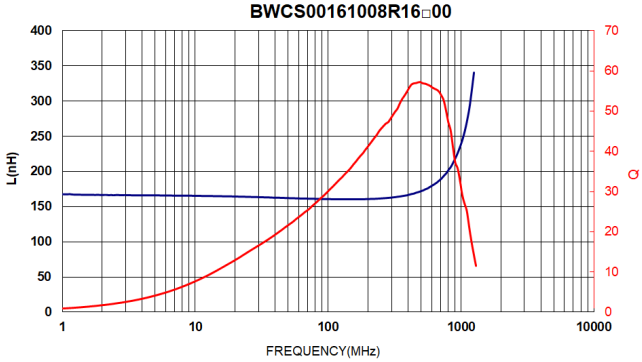


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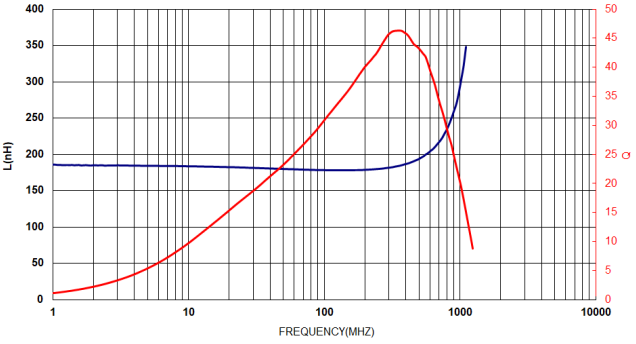

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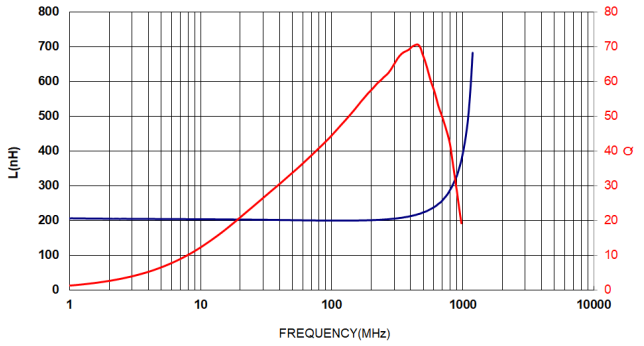


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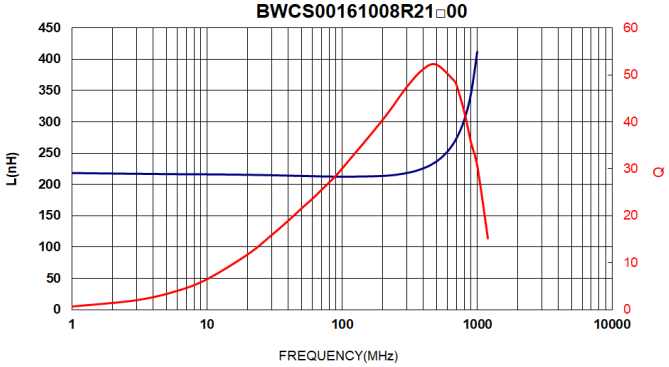


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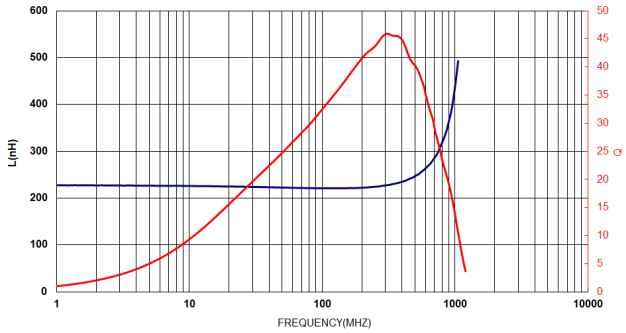


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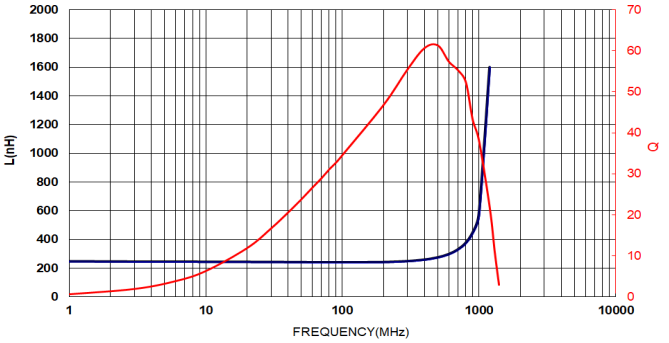


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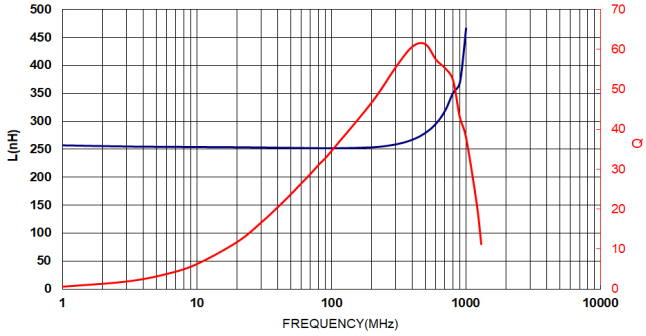


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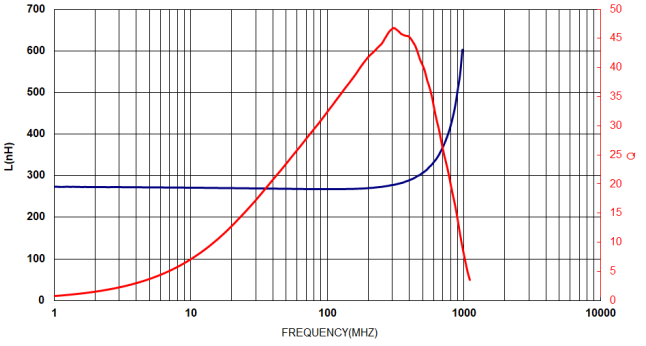


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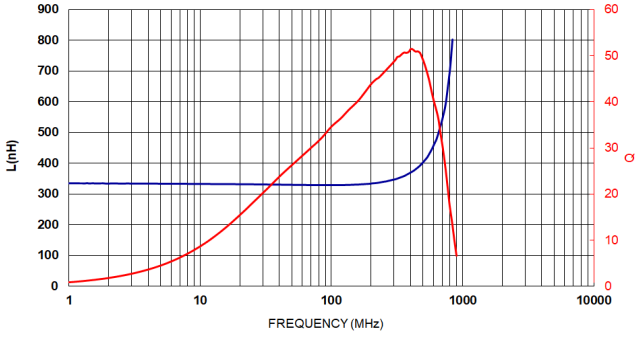


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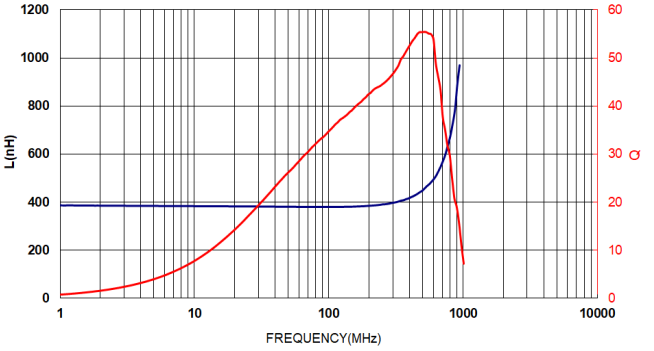
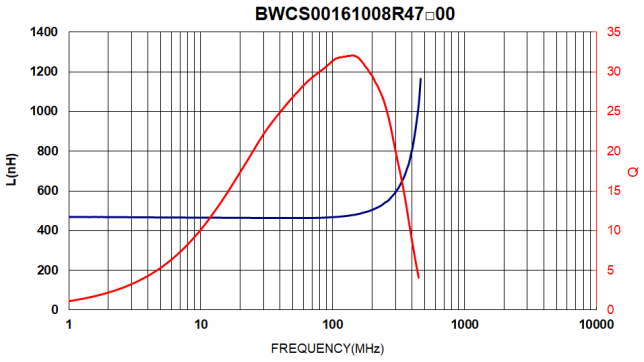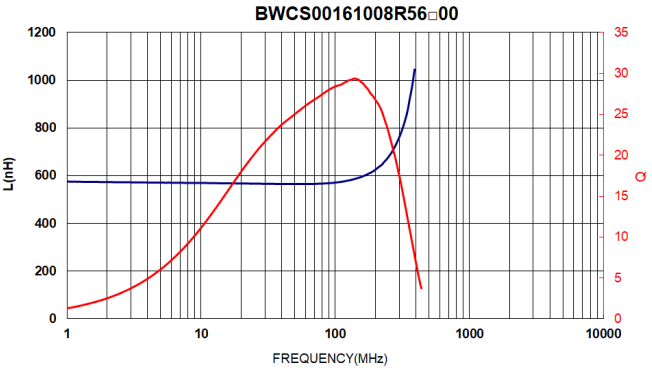
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