

# RF Inductor



## BWHQ 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

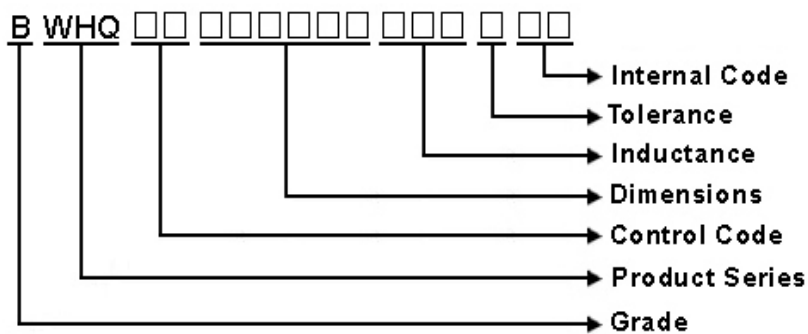
Series	Size Code (JIS/EIA)	Inductance (nH)
BWHQ	2012/0805 2520/1008 4938/1812	2.5 ~ 390



## BWHQ00302821 Series Specification

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

**2 Part Numbering:**

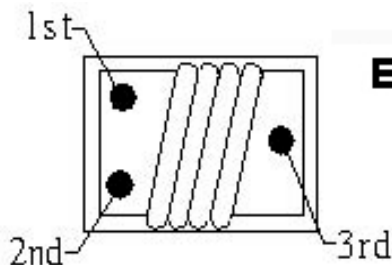


**3 Rating:**

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

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

**4 Marking:**



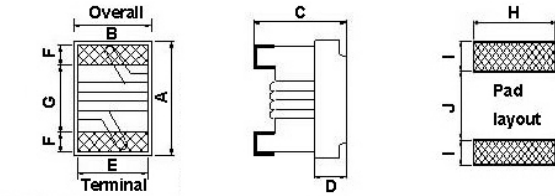
**Ex Marking: 1st → Brown**  
**2nd → Red**  
**3rd → Black**

**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

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### 6 Configuration and Dimensions and Unit Weight:



Dimensions in mm

TYPE	A	B	C	D	E	F	G	H	I	J
302821	2.96Max.	2.79Max.	2.10Max.	0.70	2.03	0.51	1.52	2.54	1.02	1.27

Net Weight (grms)

SIZE CODE	Net Weight (grms)
302821	0.0299 (typ.)

### 7 Electrical Characteristics:

Part No.	Inductance (nH)	L/Q Test Freq. (MHz)	Q Min.	SRF (MHz)Min.	RDC ( $\Omega$ )Max.	I <sub>rms</sub> (mA)Max.	Tolerance ( $\pm$ %)	Color Code		
								1st	2nd	3rd
BWHQ003028214N1□00	4.1	50/1500	75	6000	0.05	1600	10,5	BLK	YEL	BLK
BWHQ003028218N2□00	8.2	50/500	60	3600	0.06	1600	10,5	GRY	RED	WHT
BWHQ0030282110N□00	10	50/500	60	3600	0.06	1600	10,5	BRN	BLK	BLK
BWHQ0030282112N□00	12	50/500	70	2800	0.06	1500	10,5,2	BRN	RED	BLK
BWHQ0030282118N□00	18	50/350	62	2700	0.07	1400	10,5,2	BRN	GRY	BLK
BWHQ0030282122N□00	22	50/350	62	2050	0.07	1400	10,5,2	RED	RED	BLK
BWHQ0030282133N□00	33	50/350	75	1700	0.09	1300	10,5,2	ORN	ORN	BLK
BWHQ0030282139N□00	39	50/350	75	1300	0.09	1300	10,5,2	ORN	WHT	BLK
BWHQ0030282147N□00	47	50/350	75	1450	0.12	1200	10,5,2	YEL	VIO	BLK
BWHQ0030282156N□00	56	50/350	75	1230	0.12	1200	10,5,2	GRN	BLU	BLK
BWHQ0030282168N□00	68	50/350	80	1150	0.13	1100	10,5,2	BLU	GRY	BLK
BWHQ0030282182N□00	82	50/350	80	1060	0.16	1100	10,5,2	GRY	RED	BLK
BWHQ00302821R10□00	100	50/350	62	1000	0.16	1000	10,5,2	BRN	BLK	BRN
BWHQ00302821R12□00	120	25/100	50	950	0.2	1000	10,5,2	BRN	RED	BRN
BWHQ00302821R15□00	150	25/100	48	820	0.23	1000	10,5,2	BRN	GRN	BRN
BWHQ00302821R22□00	220	25/100	48	730	0.45	1000	10,5,2	RED	RED	BRN
BWHQ00302821R27□00	270	25/100	48	650	0.5	900	10,5,2	RED	VIO	BRN
BWHQ00302821R33□00	330	25/100	48	570	0.65	900	10,5,2	ORN	ORN	BRN
BWHQ00302821R39□00	390	25/100	48	530	0.7	900	10,5,2	ORN	WHT	BRN

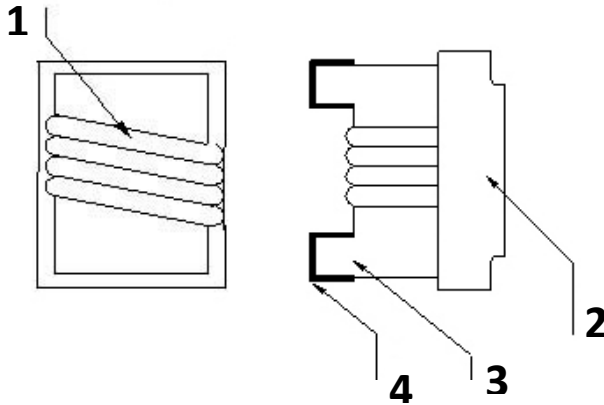
**NOTE:** □-tolerance J= $\pm$ 5%

- Operating temperature range - 4 0 °C ~ 1 2 5 °C(Including self - temperature rise)
- I<sub>rms</sub> for a 15°C temperature rise from 25°C ambient.
- L/Q Test OSC @200mV.

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#### 8.1 Construction:



#### 8.2 Material List:

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

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

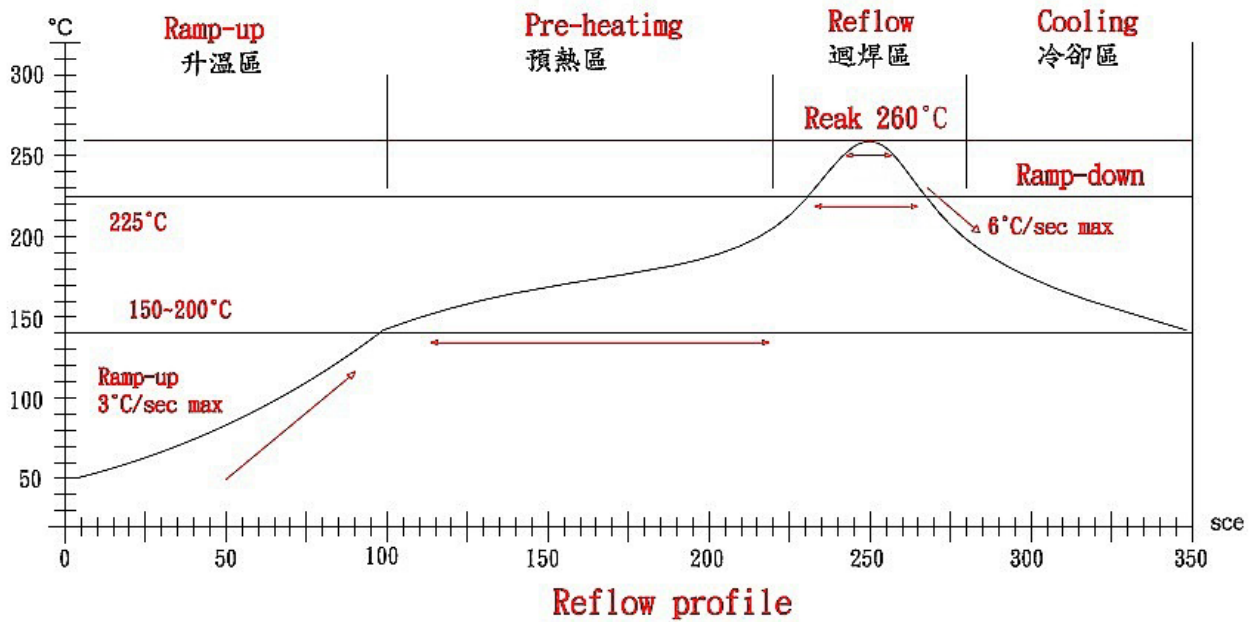
#### 1-1.Environmental Performance

No	Item	Specification	Test Method		
1-1-1	Temperature Cycle	Appearance: No Damage Inductance: within $\pm 10\%$ of initial value Q change: within $\pm 30\%$ of initial value	One cycle:		
			Step	Temperature ( $^{\circ}\text{C}$ )	Time (min)
			1	-40 $\pm$ 3	30
			2	25 $\pm$ 2	15
			3	125 $\pm$ 3	30
4	25 $\pm$ 2	15			
			Total: 5 cycles Measured After Exposure in The Room Condition For 1hrs		
1-1-2	High Temperature Resistance		Temperature: 125 $\pm$ 3 $^{\circ}\text{C}$ Time: 1000Hrs Measured After Exposure In The Room Condition For 1Hrs		
1-1-3	Low Temperature Resistance		Temperature: -40 $\pm$ 3 $^{\circ}\text{C}$ Time: 1000Hrs 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 $\pm$ 2 $^{\circ}\text{C}$ Relative Humidity: 90~95% Load: Allowed DC Current Time: 96Hrs		

#### 1-2.Mechanical Performance

No	Item	Specification	Test Method
1-2-1	Vibration Test (Low Frequency)	1.Appearance: No Damage 2.Inductance: within $\pm 10\%$ of initial value 3.Q change: within $\pm 30\%$ of initial value	1. Test device shall be soldered on the substrate. 2. Oscillation frequency: 10 to 55 to 10Hz for 1min. 3. Amplitude: 1.5mm 4. Time: 2hrs for each axis(X, Y & Z), total 6hrs
1-2-2	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) 2. Solder Composition: Sn/Ag3.0/Cu0.5 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 $^{\circ}\text{C}$ , 1min. 2. Solder Composition: Sn/Ag3.0/Cu0.5 3. Solder Temperature: 245 $\pm$ 5 $^{\circ}\text{C}$ . 4. Immersion Time: 4 $\pm$ 1 sec.
1-2-4	Component Adhesion (Push Test)	1 Lbs. For 0402 2 Lbs. For 0603 4 Lbs. For The Rest	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. The device must withstand a minimum force of 2 or 4 pounds without a failure of the termination attached to component

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Lead-Free(LF)標準溫度分析範圍

Refer to J-STD-020C

管制項目 Item.	升温區 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°C	150°C ~ 200°C	Above 217°C	260±5°C	Peak Temp.~150°C
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 :**

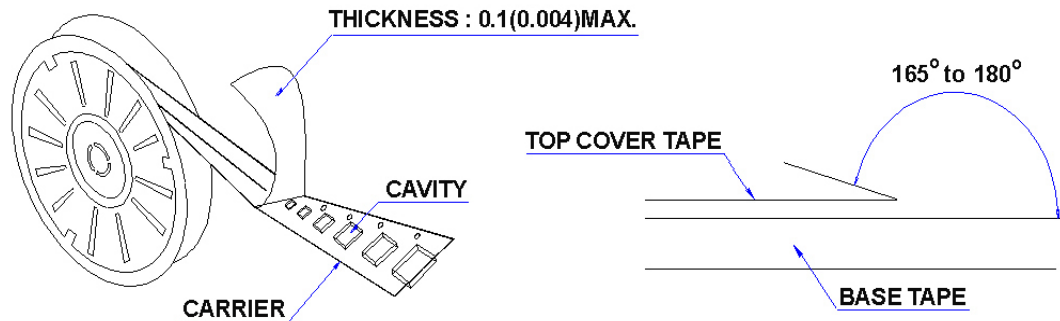
1. Re-flow possible times : within 2 times
2. Nitrogen adopted is recommended while in re-flow
3. Products can only be soldered with reflow

## BWHQ00302821 Series Specification

### 10 Packaging:

#### 10.1 Packaging -Cover Tape

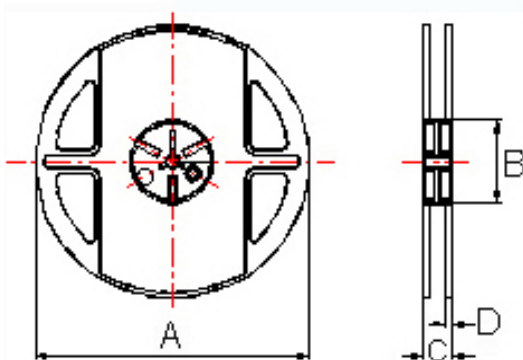
The force for tearing off cover tape is 10 to 100 grams in the arrow direction.



#### 10.2 Packaging Quantity

TYPE	PCS/REEL
302821	2000

#### 10.3 Reel Dimensions



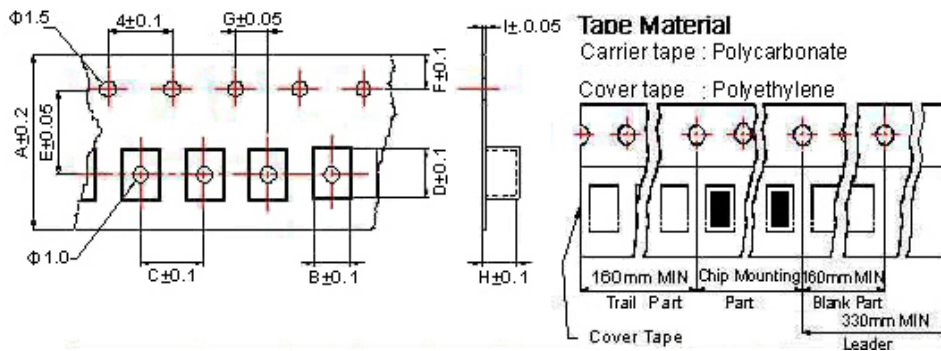
Dimensions in mm

TYPE	A	B	C	D
302821	178±1	60±0.5	12±0.5	1.5±0.5

## BWHQ00302821 Series Specification

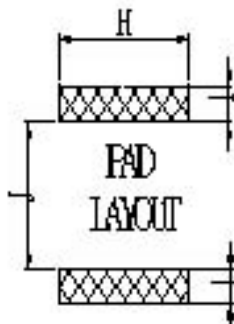
### 10 Packaging:

#### 10.4 Tape Dimensions in mm



TYPE	A	B	C	D	E	F	G	H	I
302821	8	2.80	4	2.95	3.5	1.75	2	2.20	0.23

### 11 Recommended Land Pattern:



Dimensions in mm

TYPE	H(in/mm)	I(in/mm)	J(in/mm)
302821	0.10/2.54	0.04/1.02	0.05/1.27

### 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).

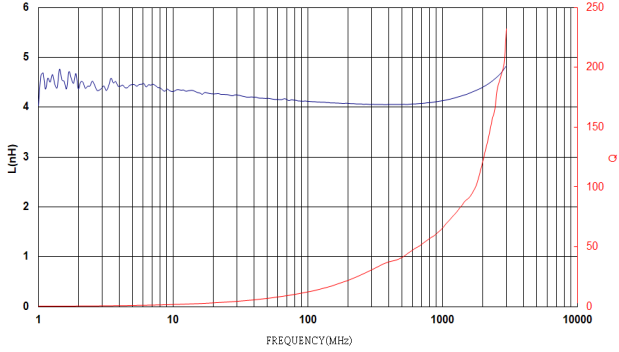
If the storage period elapses, the soldering of the terminal electrodes may deteriorate.

- 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.

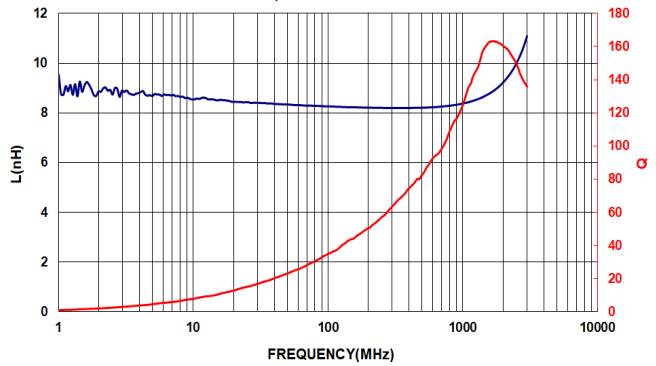
# BWHQ00302821 Series Specification

## 12 Graph:

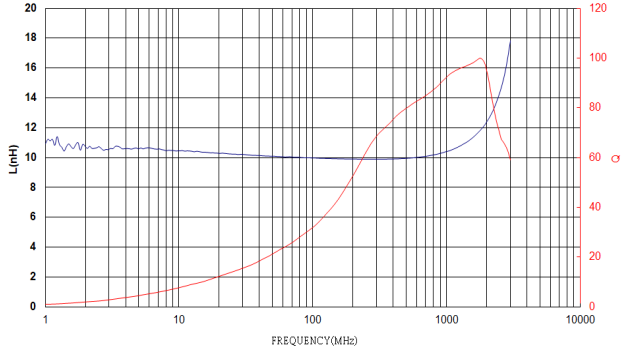
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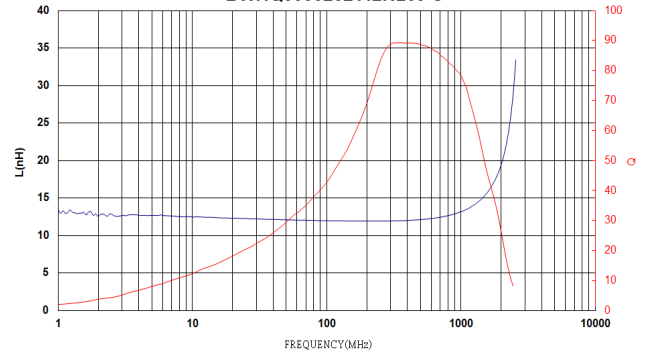
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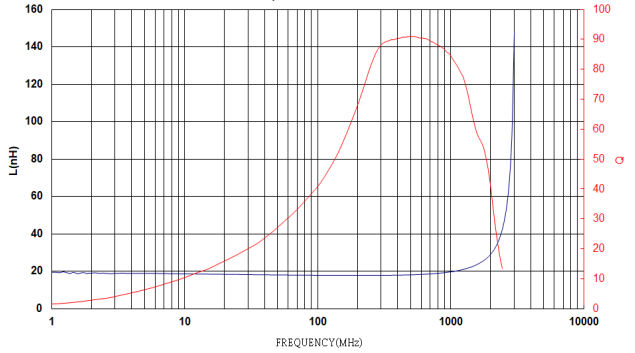
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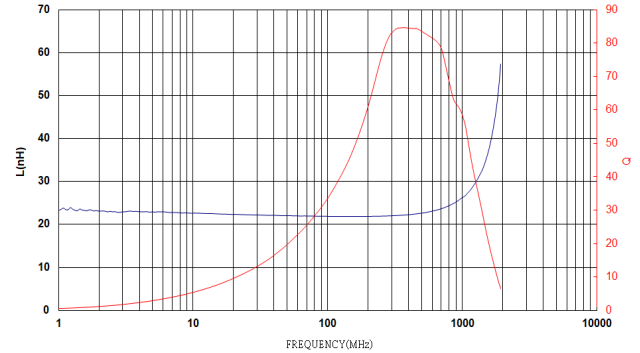
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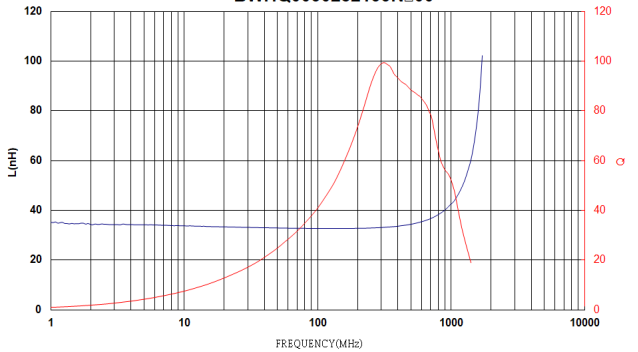
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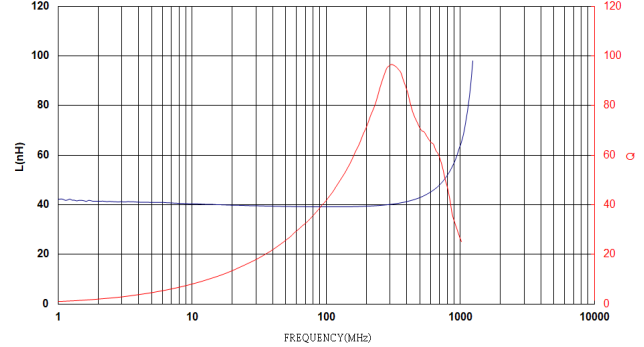
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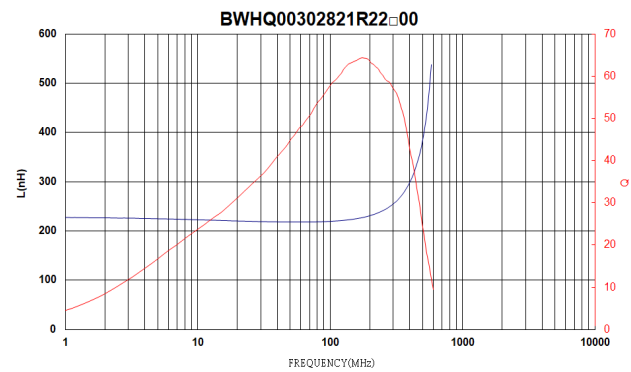
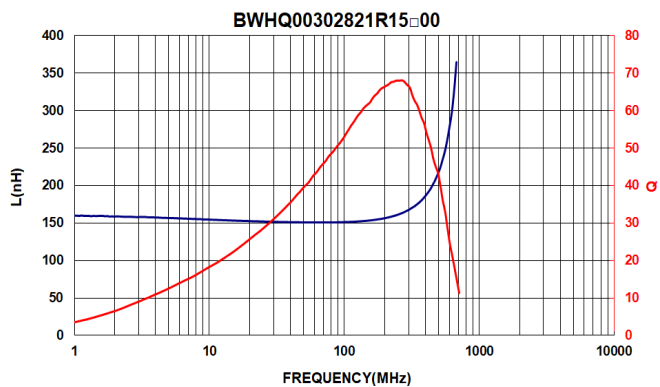
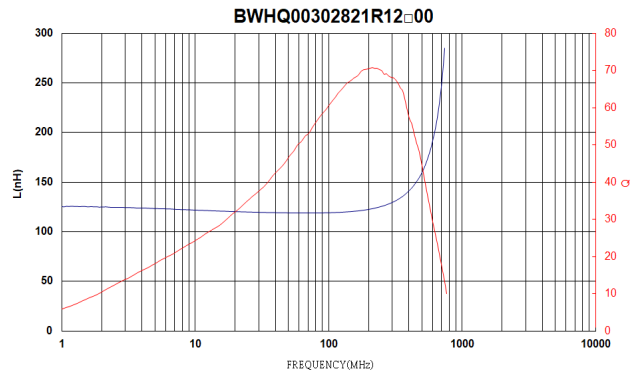
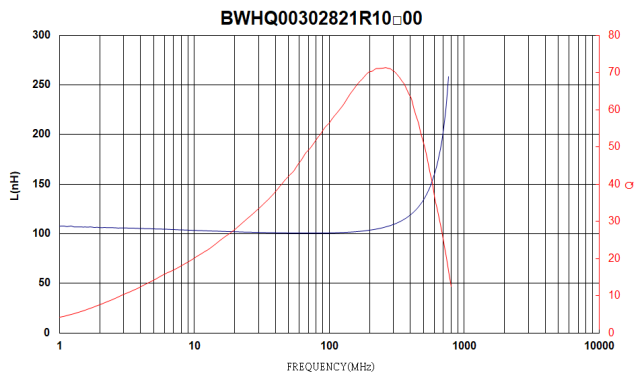
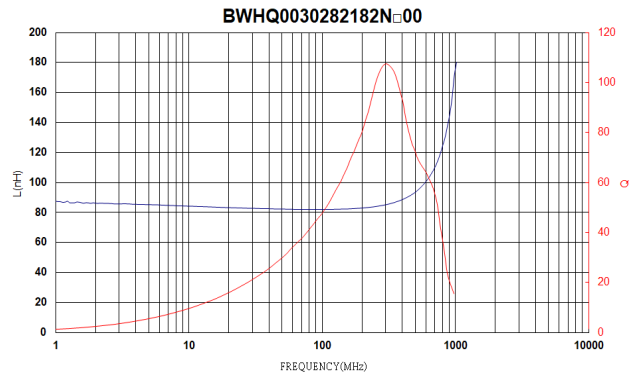
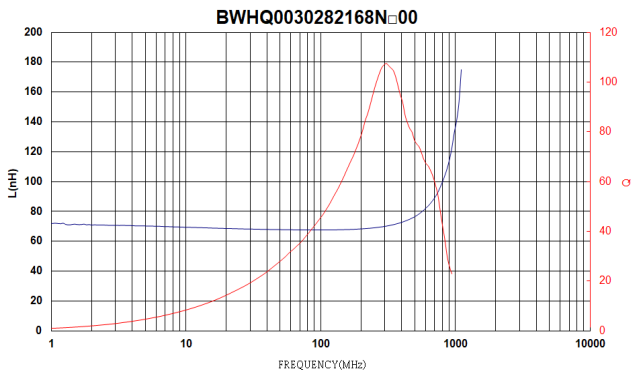
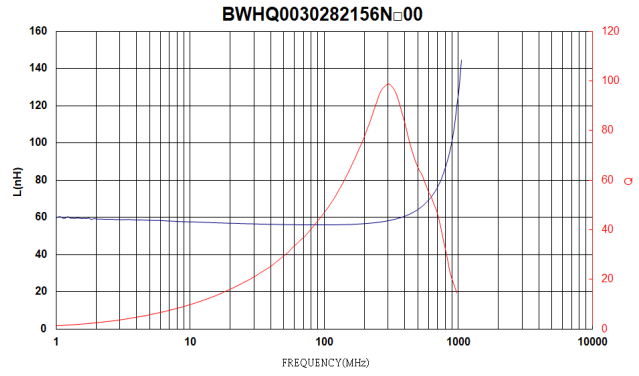
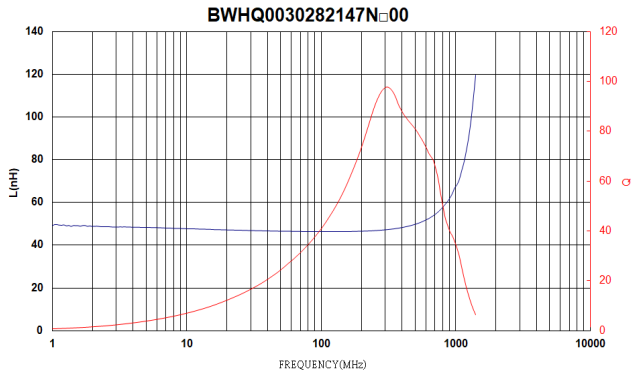
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**BWHQ0030282139N□00**



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