RF Inductor
Automotive Grade
AWCS 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. Wide Frequency Range
3. Low Signal Loss
4. High Current Handling
5. Can maintain excellent thermal stability at different temperatures

Applications

1. Automotive Electronics: infotainment systems, ADAS, and car keyless entry systems.
2. Industrial and Medical Equipmen: RFID systems and medical imaging equipment.
3. Data Centers and Networking
4. Consumer Electronics

Product Information

Series	Size Code (JIS/EIA)	Inductance (nH)
AWCS	1005/0402 1608/0603 2012/0805 2520/1008 3025/1210	1 ~ 4700

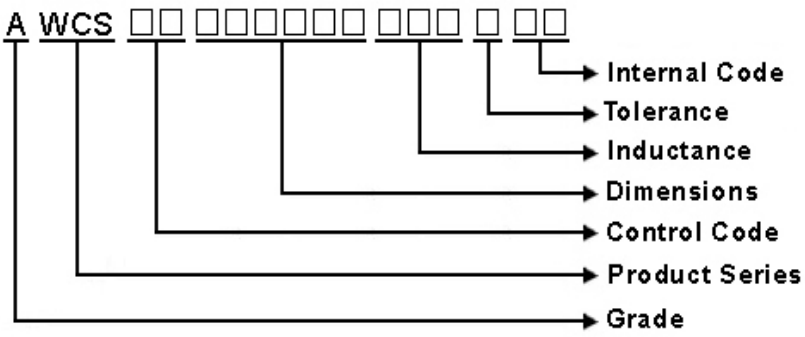
AWCS00372822 Series Specification

AEC-Q200

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:

No Marking

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

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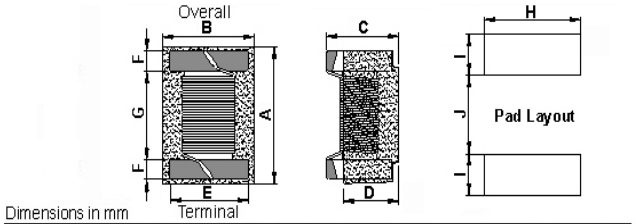
6 Configuration and Dimensions:



TYPE	A	B	C	D	E	F	G	H	I	J
372822	3.7 Max.	2.8 Max.	2.2 Max.	0.9	2.3	0.51	2.18	2.7	1.0	2.0

7 Electrical Characteristics:

Part No.	Inductance (nH)	L/Q Test Freq. (MHz)	Q Min.	SRF (MHZ)Min.	RDC (Ω)Max.	Irms (mA)Max.	Tolerance (±%)
AWCS003728223N3□00	3.3	100/300	30	6200	0.05	1000	10,5
AWCS003728226N8□00	6.8	100/300	30	5500	0.07	1000	10,5
AWCS0037282210N□00	10	100/300	40	4000	0.08	1000	10,5,2
AWCS0037282212N□00	12	100/300	40	3200	0.08	1000	10,5,2
AWCS0037282215N□00	15	100/300	40	3200	0.1	1000	10,5,2
AWCS0037282218N□00	18	100/300	50	2800	0.1	1000	10,5,2
AWCS0037282222N□00	22	100/300	50	2200	0.1	1000	10,5,2
AWCS0037282227N□00	27	100/300	50	1800	0.11	1000	10,5,2
AWCS0037282233N□00	33	100/300	55	1800	0.11	1000	10,5,2
AWCS0037282239N□00	39	100/300	55	1800	0.12	1000	10,5,2
AWCS0037282247N□00	47	100/300	55	1500	0.13	1000	10,5,2
AWCS0037282256N□00	56	100/300	55	1450	0.14	1000	10,5,2
AWCS0037282268N□00	68	100/300	55	1200	0.26	900	10,5,2
AWCS0037282282N□00	82	100/300	55	1200	0.21	900	10,5,2
AWCS00372822R10□00	100	100/300	55	1100	0.26	850	10,5,2
AWCS00372822R12□00	120	100/300	60	1100	0.26	800	10,5,2
AWCS00372822R15□00	150	100/300	60	950	0.31	750	10,5,2
AWCS00372822R18□00	180	50/300	60	900	0.43	700	10,5,2
AWCS00372822R22□00	220	50/300	60	760	0.5	670	10,5,2
AWCS00372822R27□00	270	50/300	55	730	0.56	630	10,5,2
AWCS00372822R29□00	290	50/300	55	700	0.6	615	5
AWCS00372822R33□00	330	50/150	45	650	0.62	590	10,5,2
AWCS00372822R39□00	390	50/150	45	600	0.75	530	10,5,2
AWCS00372822R47□00	470	50/150	45	550	1.3	490	10,5,2
AWCS00372822R56□00	560	35/150	45	470	1.34	460	10,5,2
AWCS00372822R62□00	620	35/150	45	470	1.58	460	10,5,2

NOTE: □-tolerance G=±2% / J=±5% / K=±10%

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

2.Irms for 15℃ rise above 25℃ ambient.

3.L/Q Test OSC @200mV.

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Part No.	Inductance (nH)	L/Q Test Freq. (MHz)	Q Min.	SRF (MHZ)Min.	RDC (Ω)Max.	Irms (mA)Max.	Tolerance (±%)
AWCS00372822R68□00	680	35/150	45	450	1.58	430	10,5,2
AWCS00372822R75□00	750	35/150	45	440	2.25	320	10,5,2
AWCS00372822R82□00	820	35/150	45	420	1.82	400	10,5,2
AWCS00372822R91□00	910	35/150	45	410	2.95	310	10,5,2
AWCS003728221R0□00	1000	35/150	45	400	2.8	320	10,5,2
AWCS003728221R2□00	1200	35/150	45	380	3.2	300	10,5,2

NOTE: □-tolerance G=±2% / J=±5% / K=±10%

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

2.Irms for 15℃ rise above 25℃ ambient.

3.L/Q Test OSC @200mV.

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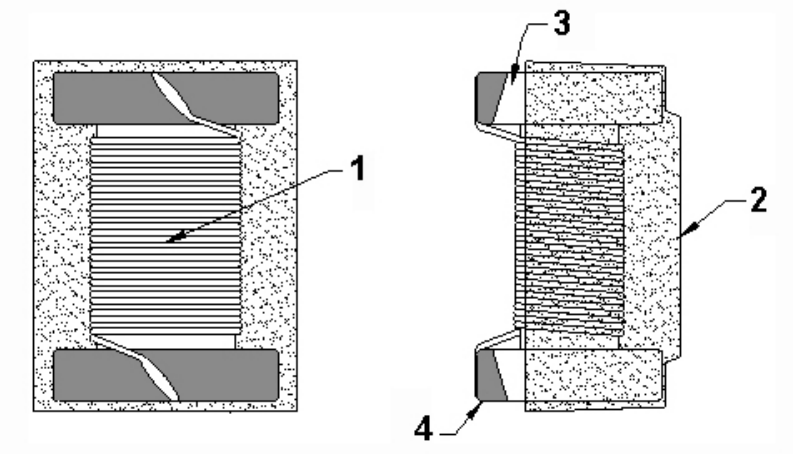
8.1 CONSTRUCTION:

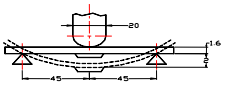


8.2 MATERIAL LIST:

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

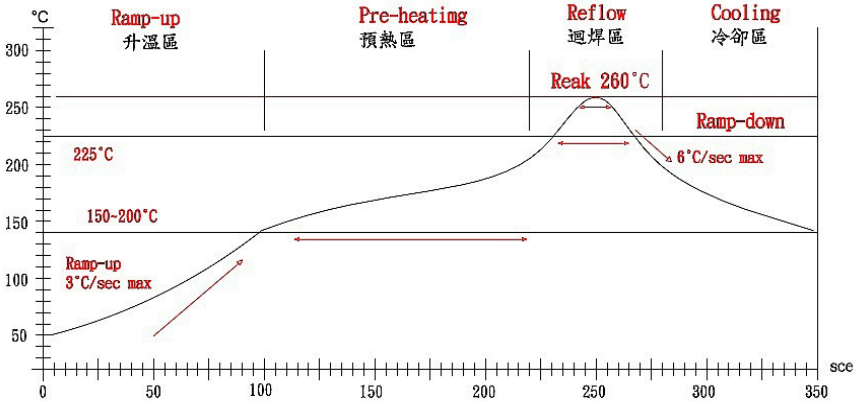
9 Reliability Of Ceramic Wire Wound Chip Inductor/CERAMIC SERIES

1-1.Mechanical Performance

	Item	Specification	Test Method
1-1-1	Board Flex	The forces applied on the righ conditions must not damage the terminal electrode and the ferrite.	Test device shall be soldered on the substrate Substrate Dimension: 100x40x1.6mm Deflection: 2.0mm Keeping Time: 60 sec 
1-1-2	Terminal Strength	The chip must not damage the terminal electrode and the ferrite.	Refer to AEC-Q200-006 Test device shall be soldered on the substrate Force 0.5lbs for 60±1 seconds for 0201 series Force 1lbs for 60±1 seconds for 0402 series Force 2lbs for 60±1 seconds for 0603 series Force 1.8Kg for 60±1 seconds for the other series.
1-1-3	Solderability	The electrodes shall be at least 95% covered with new solder coating.	Pre-heating: 150℃, 1min Solder Composition: Sn/3.0Ag/0.5Cu Solder Temperature: 245±5℃ Immersion Time: 4±1sec
1-1-4	Resistance to Soldering Heat	Appearance:No damage Inductance change shall be within ±10%. Q change:within±30% of initial value	Pre-heating: 150℃, 1min Solder Composition: Sn/Ag3.0/Cu0.5 Solder Temperature: 260±5℃ Immersion Time: 10±1sec
1-1-5	Resistance to Solvents	There must be no change in appearance or obliteration of marking.	Inductors must withstand 6 minutes of alcohol or water.
1-1-6	Mechanical Shock	The forces applied on the righ conditions must not damage the terminal electrode and the ferrite.	Pulse shape：Half-sine waveform Impact acceleration：100 g Pulse duration：6 ms Number of shocks：18 shocks (3 shocks for each face) Orientation：Bottom, top, left, right, front and rear faces
1-1-7	Vibration	Appearance:No damage Inductance change shall be within ±10%. Q change:within±30% of initial value	Vibration waveform: Sine waveform Vibration frequency: 10Hz~2000Hz Vibration acceleration: 5g Sweep rate: 0.764386otcave/minute Duration of test: 12 cycles each of 3 orientations 20 minutes for each cycle Vibration axes: X, Y & Z

1-2.Environmental Performance

No	Item	Specification	Test Method
1-2-1	High Temperature Exposure (Storage)	Appearance:No damage (for microscope of CASTOR MZ-4 20X)Inductance change shall be within ±10%. Q change:within±30% of initial value	Temperature: 125±3℃ Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-2	Low Temperature Exposure (Storage)		Temperature: -40±3℃ Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-3	Biased Humidity		Temperature: 85±2℃ Relative Humidity: 85% Time: 1000hrs Measured after exposure in the room condition for 24hrs
1-2-4	Temperature Cycling		Total cycles: 1000 cycles Temperature Cycling Test Conditions : -40 to +125 ℃ Soak Mode Condition： 30 minutes Measured after exposure in the room condition for 24hrs
1-2-5	Operational Life	Appearance:No damage Inductance change shall be within ±10%.	Temperature: 125±2℃ Appliend Current : Rated Current Time: 1000± 24 hrs Measured after exposure in the room condition for 24hrs
1-2-6	ESD		Test mode：Contact Discharge Discharge level：±6KV, Discharge interval：1 second Polarity of the output voltage：Positive and negative Number of discharge：Discharge +/- for 1 time for the 2 test points.
			Test Mode：Air Discharge Discharge level：±12KV, ±16KV, ±25KV Discharge interval：＜5 seconds Polarity of the output voltage：Positive and negative Number of discharge：Discharge +/- for 1 time for the 1~2 test points.



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	-

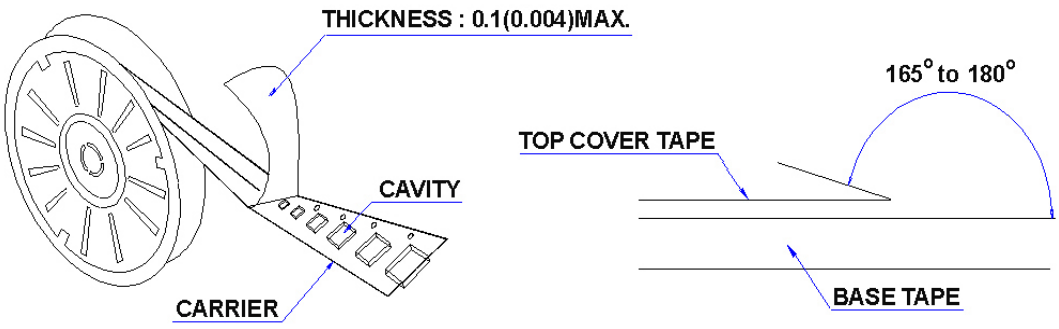
NOTE:

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

10 Packaging:

10.1 Packaging -Cover Tape

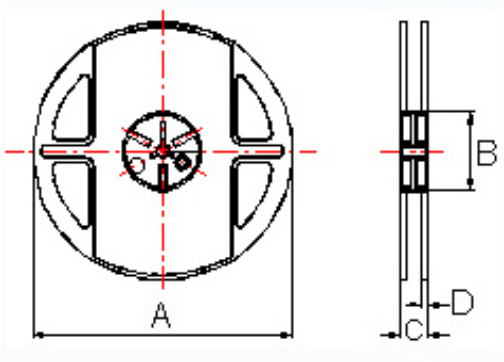
The force for tearing off cover tape is 10 to 130 grams in the arrow direction.



10.2 Packaging Quantity

TYPE	PCS/REEL
372822	2000

10.3 Reel Dimensions



Dimensions in mm

TYPE	A	B	C	D
372822	178±1	60±0.5	12±0.5	1.4±0.5

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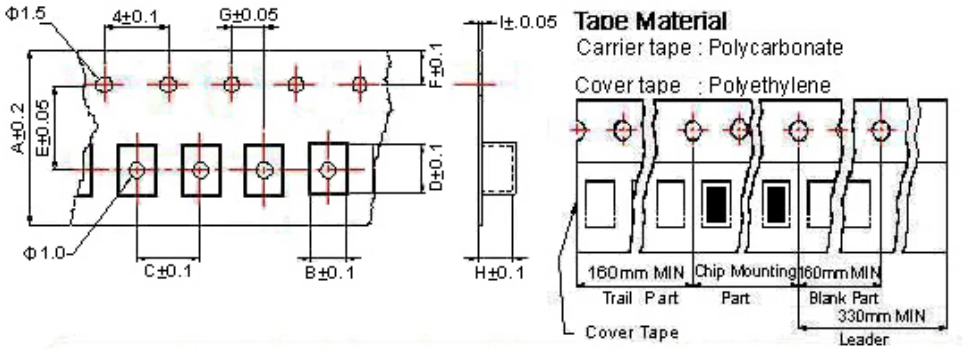
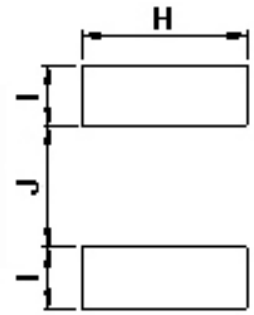
10 Packaging:

10.4 Tape Dimensions in mm



TYPE	A	B	C	D	E	F	G	H	I
372822	12	2.85	4	3.58	5.5	1.75	2	2.55	0.26

11 Recommended Land Pattern:



Dimensions in mm

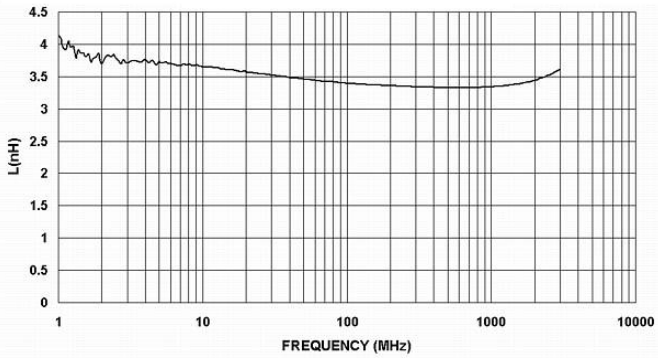
TYPE	I(In/mm)	J(In/mm)	H(In/mm)
372822	0.039/1.00	0.079/2.00	0.106/2.70

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.

13 Graph:

AWCS003728223N3□00



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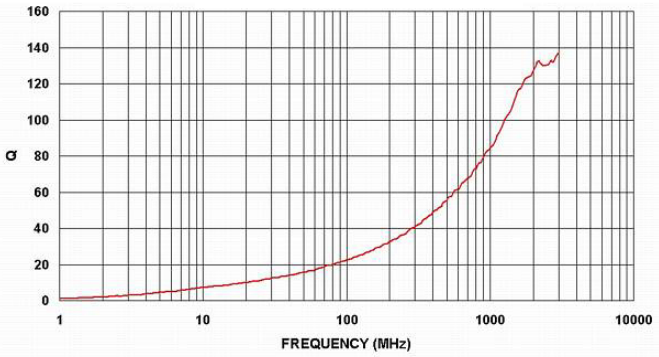

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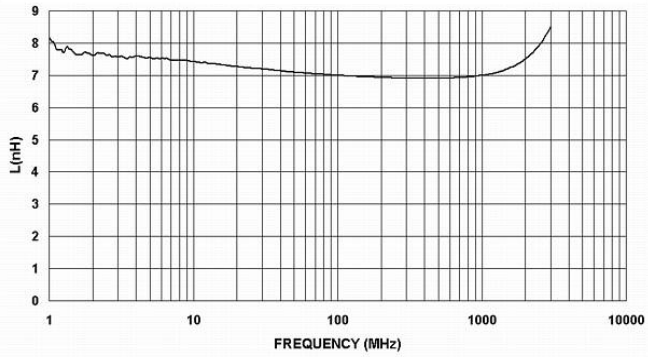

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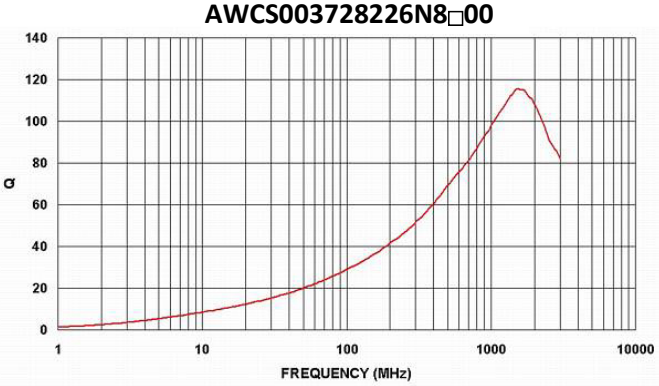

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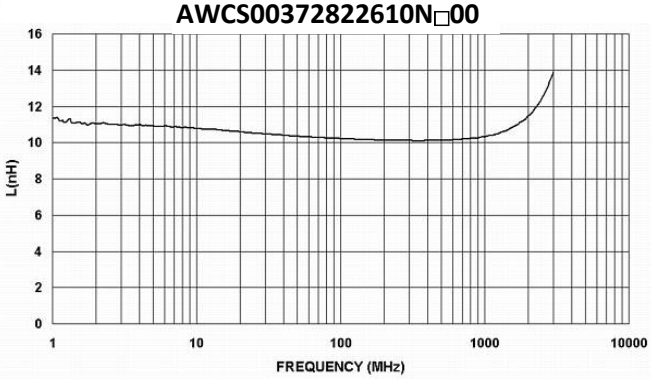

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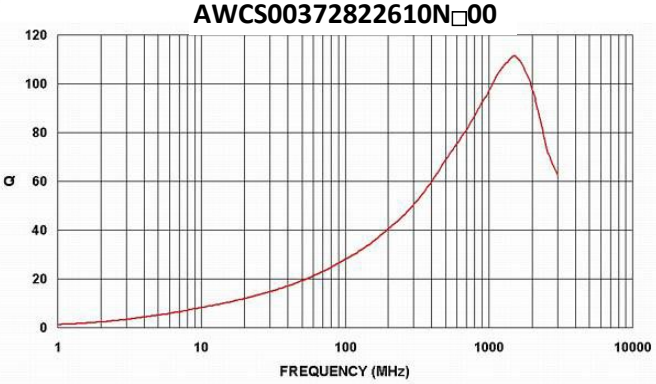

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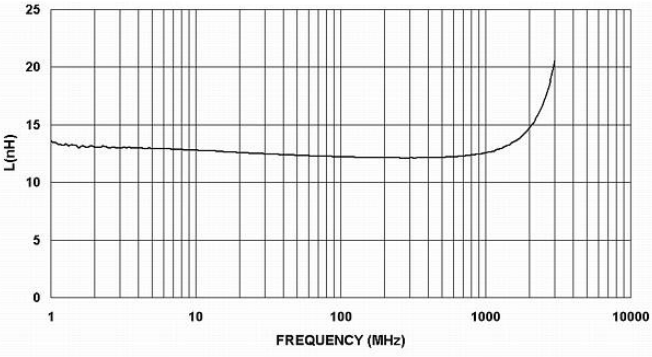

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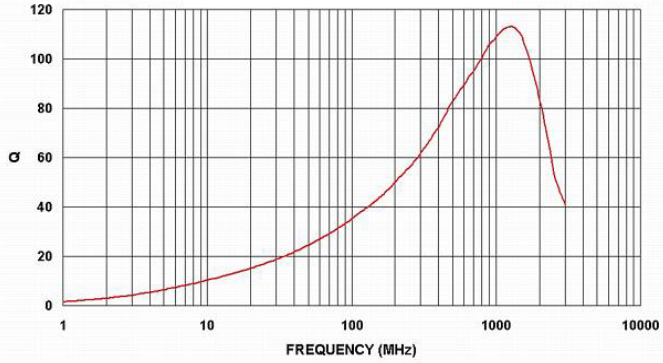

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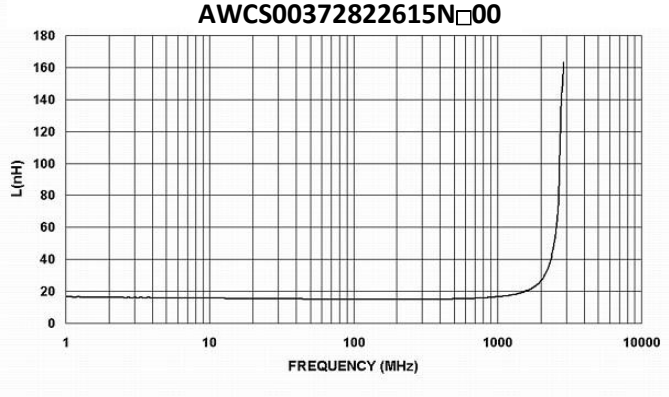

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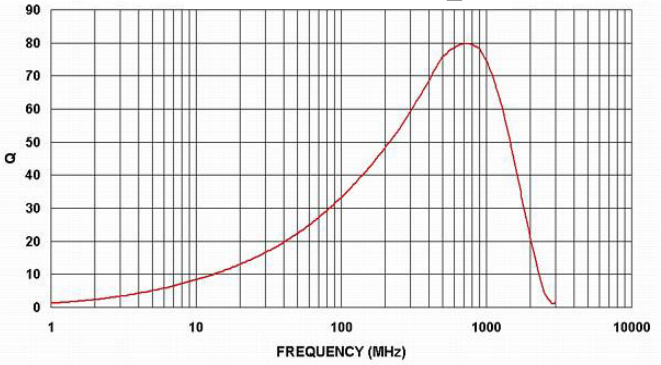

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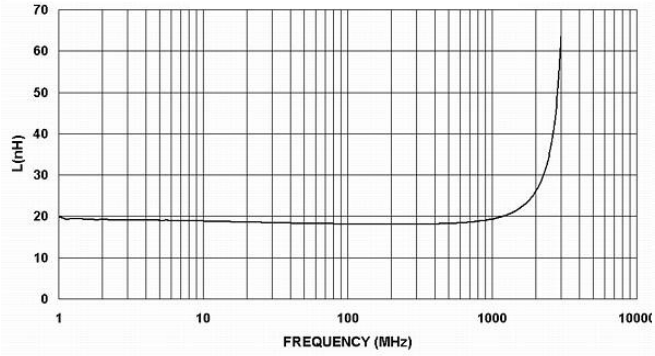

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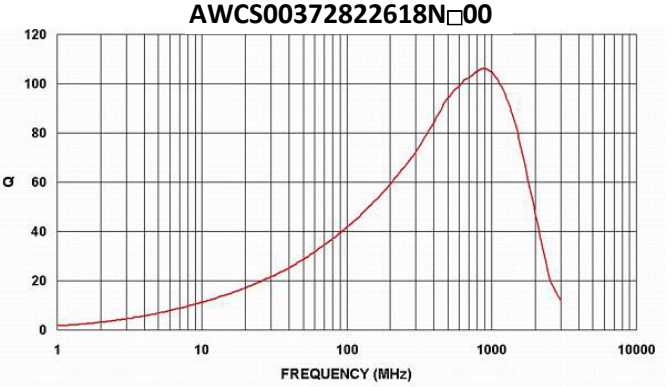

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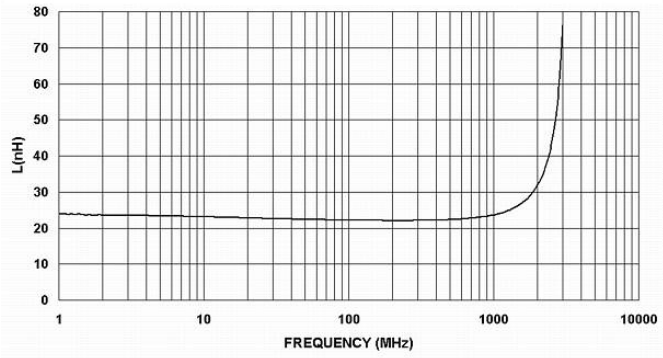

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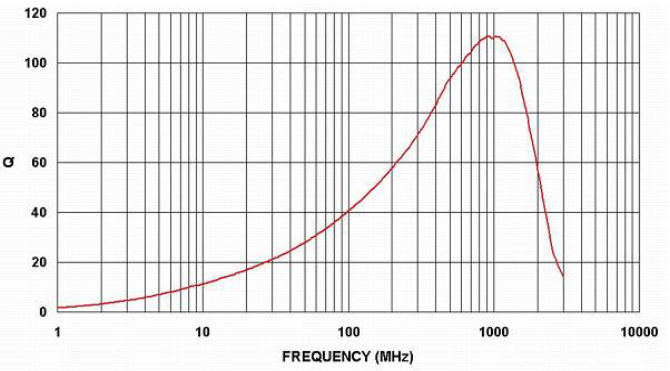

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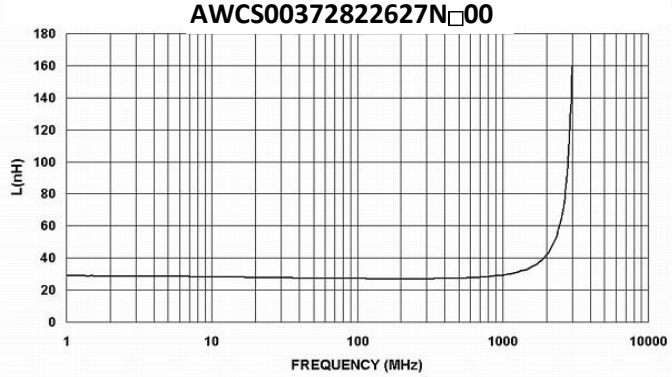

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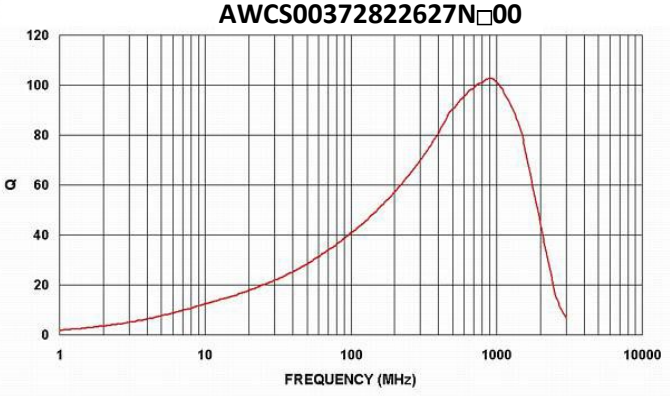

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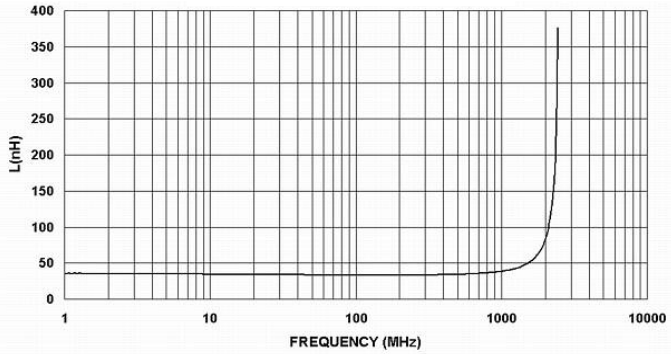

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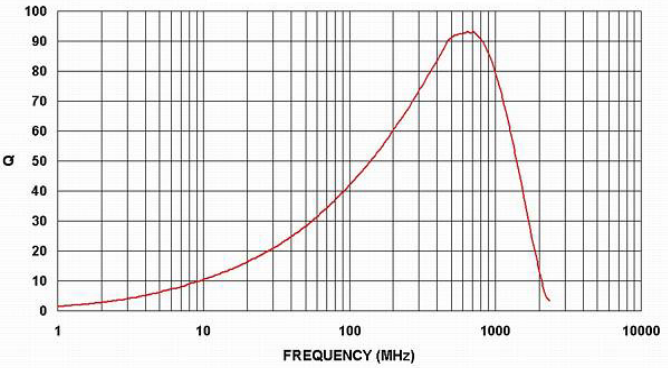

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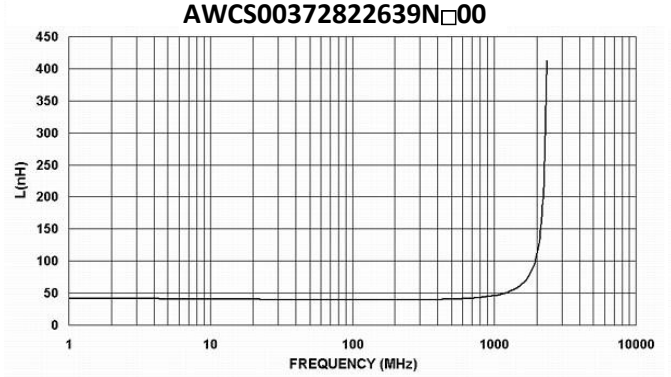

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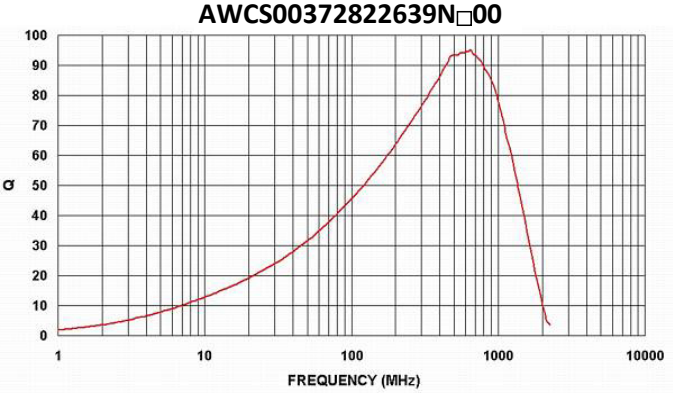

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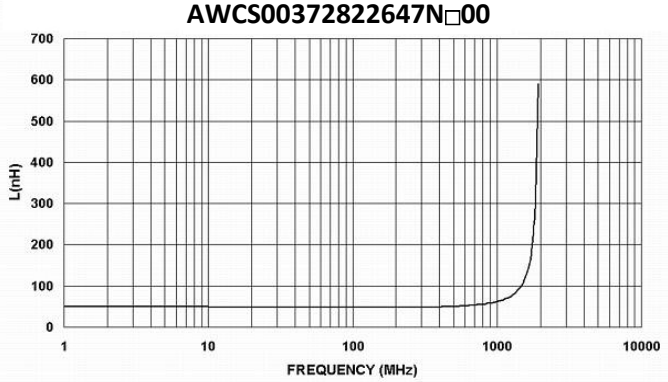

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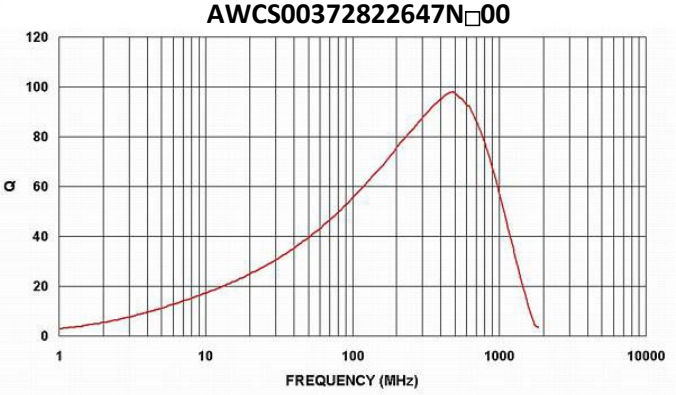

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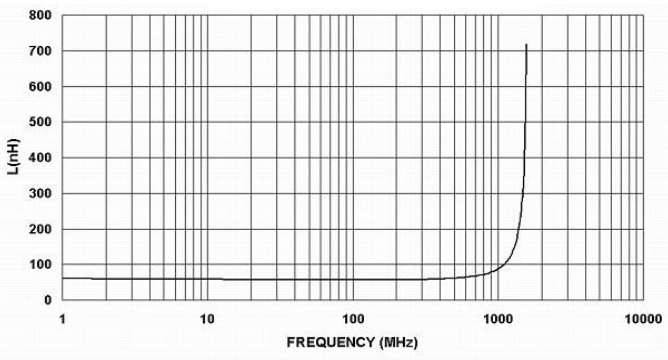

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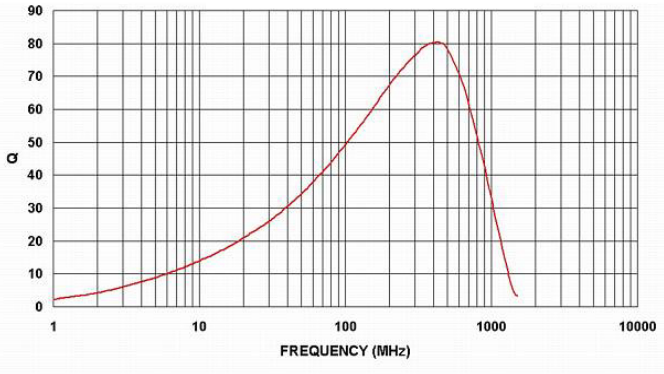

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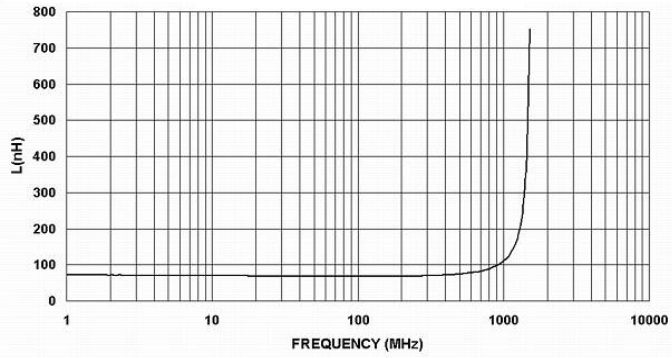

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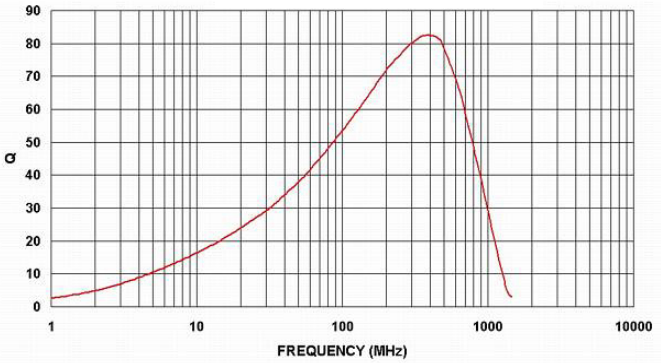

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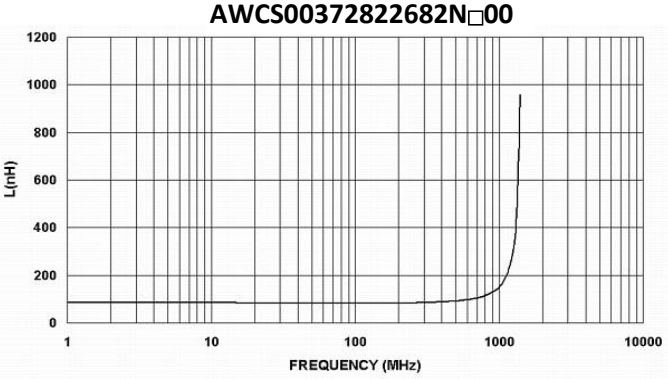

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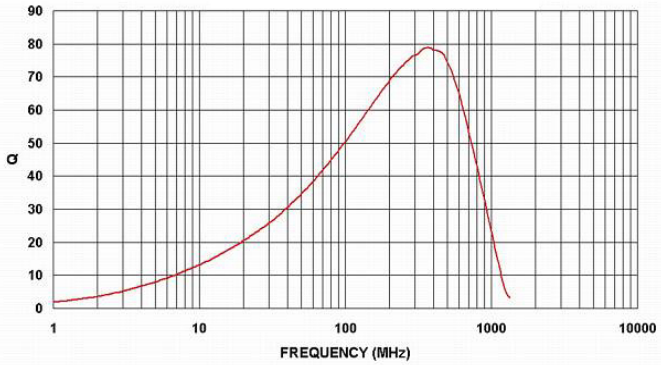

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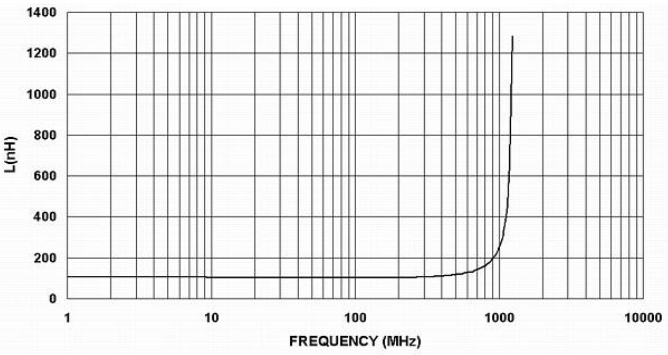

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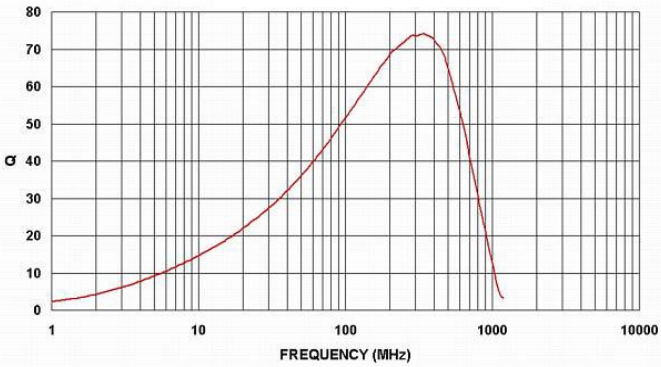

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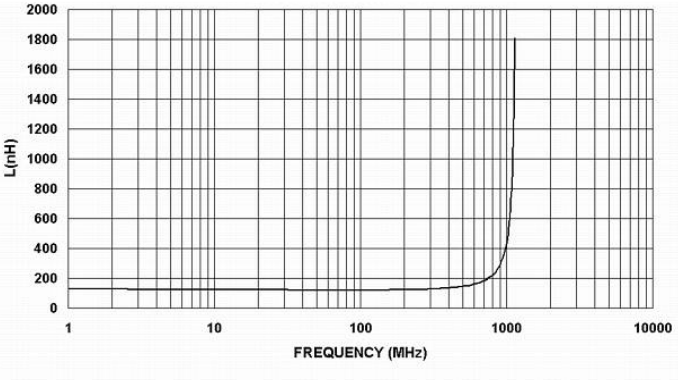

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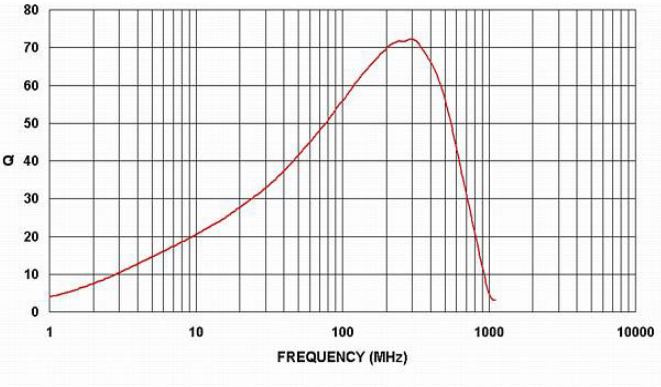

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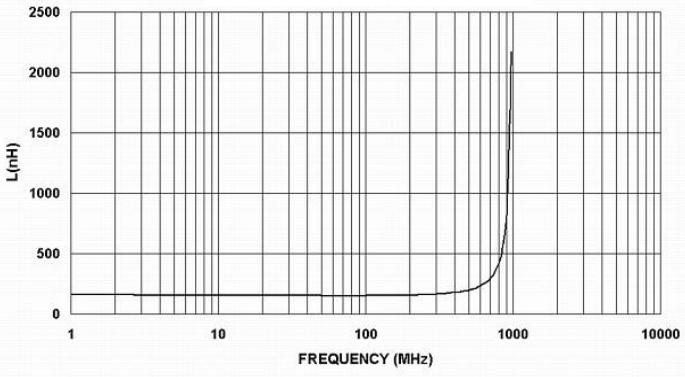

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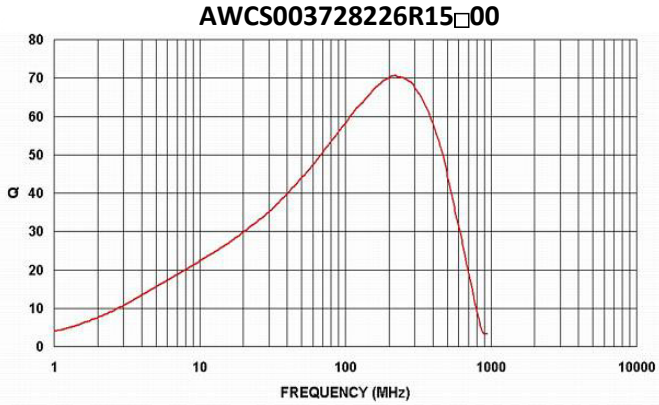

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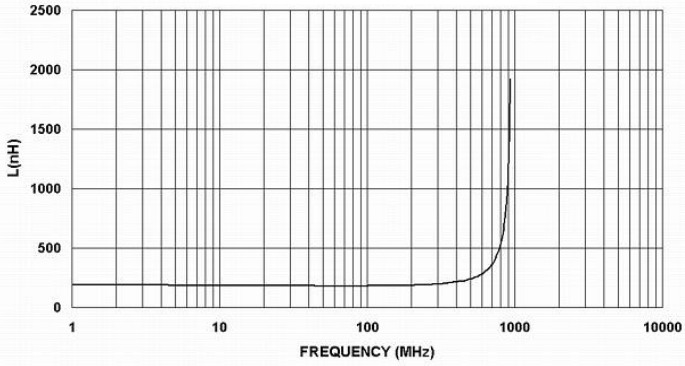

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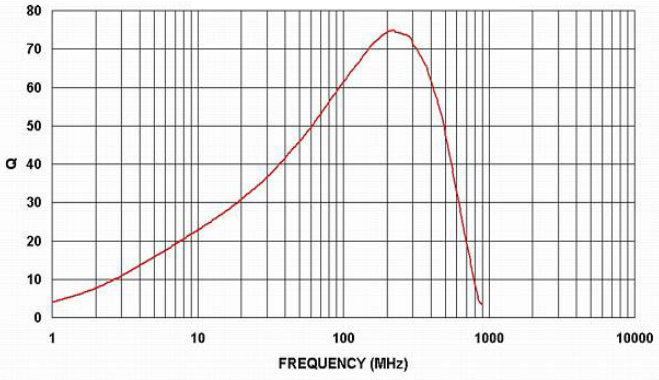

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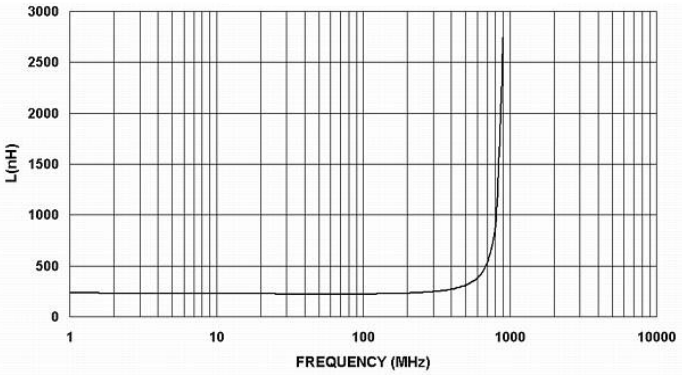

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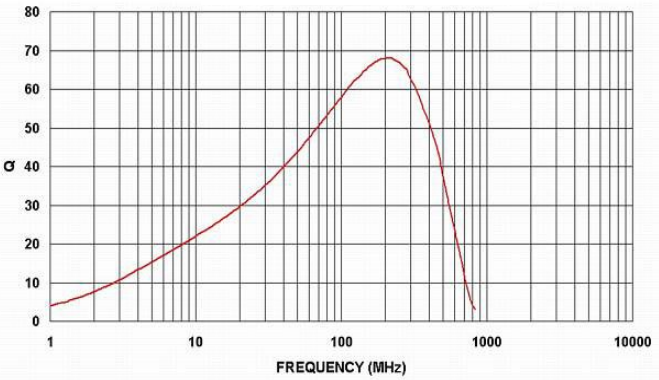

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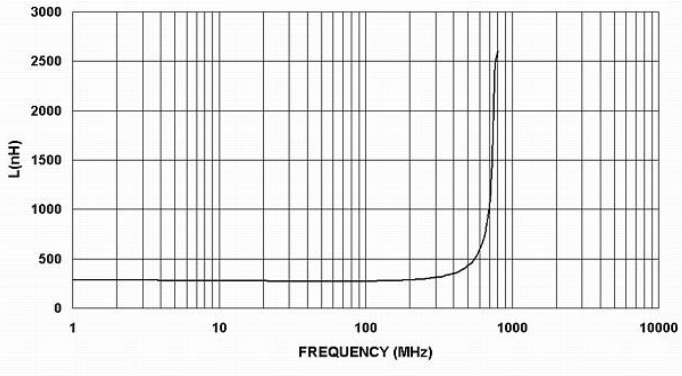

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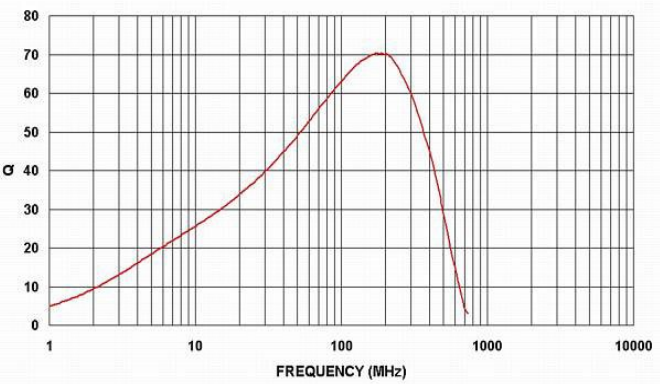

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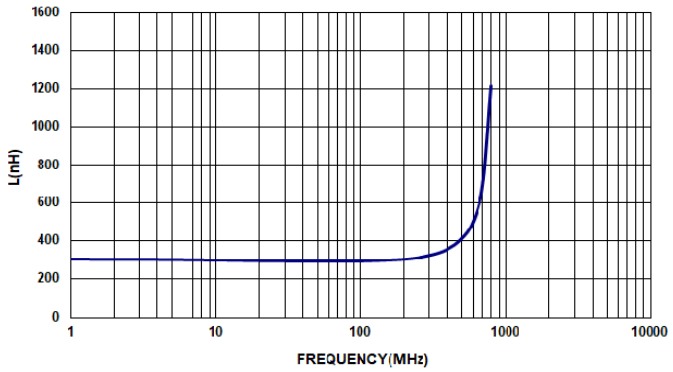

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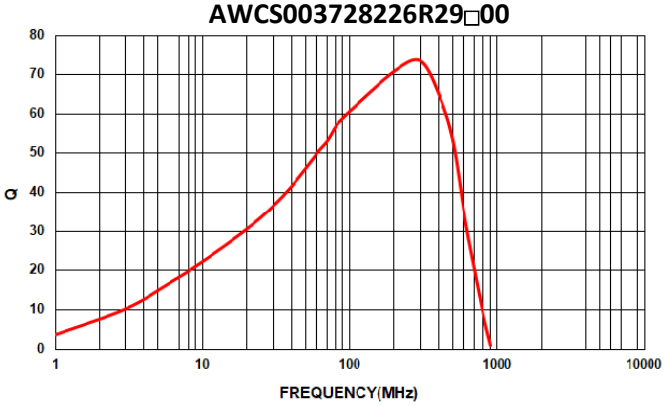

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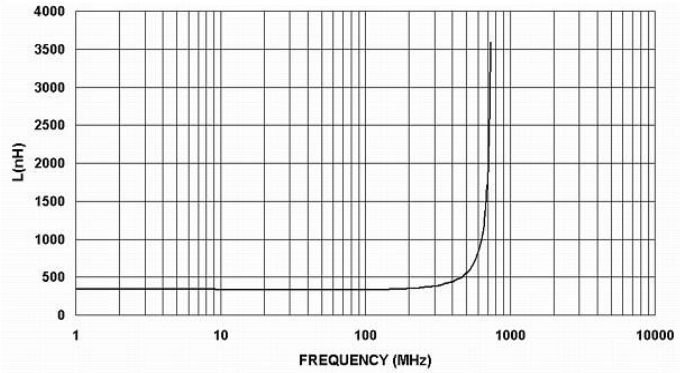

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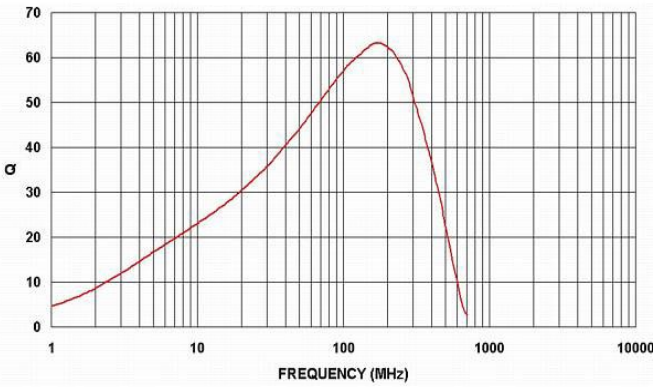

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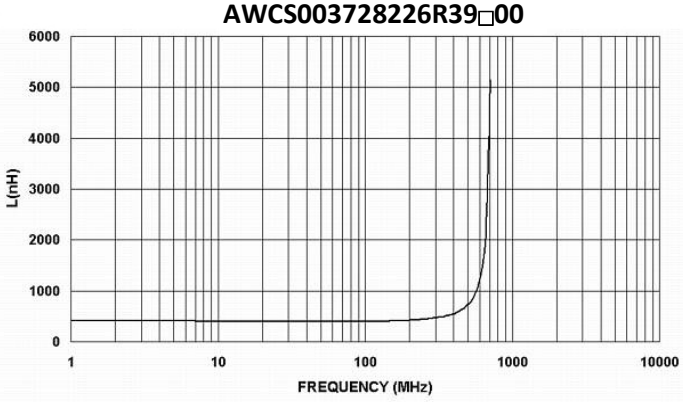

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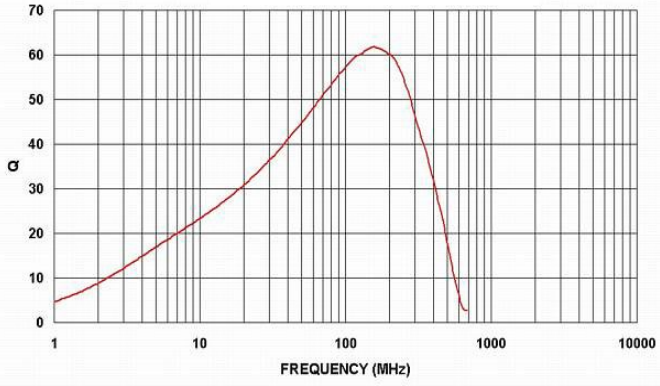

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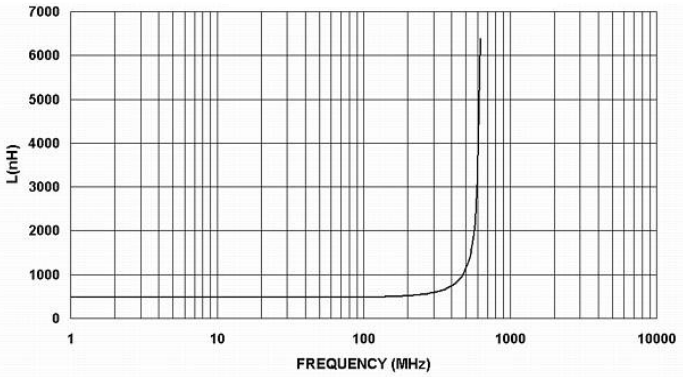

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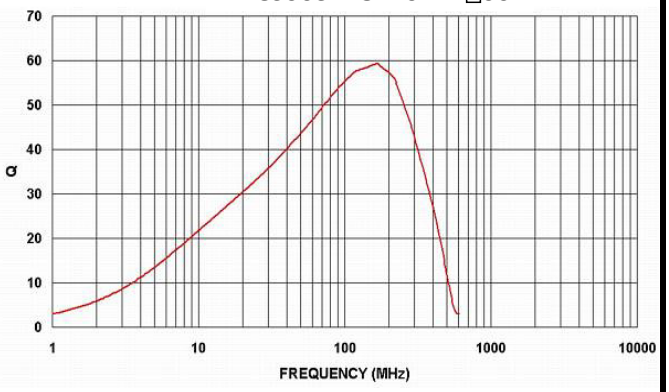

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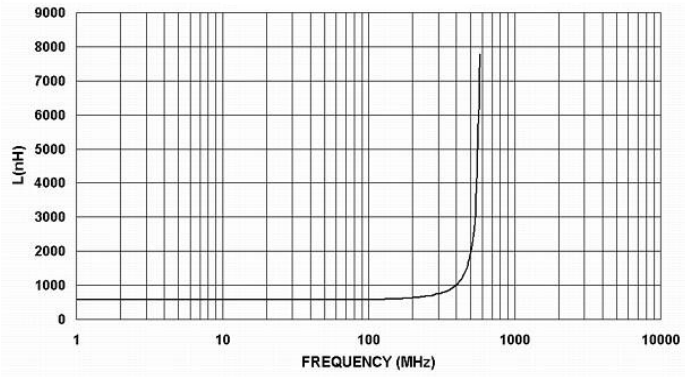

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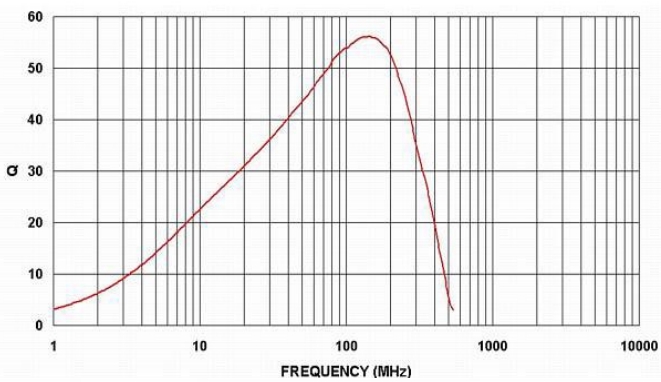

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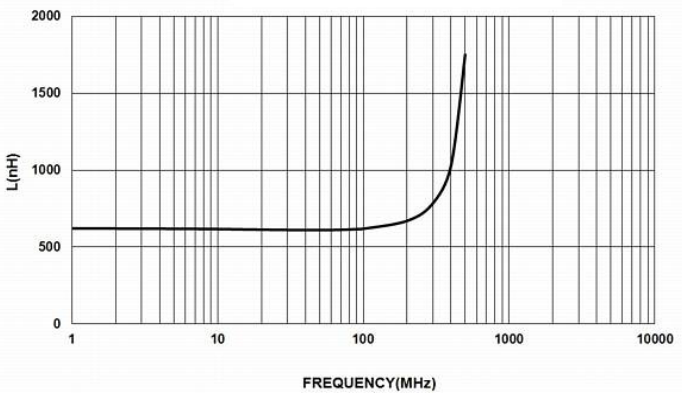

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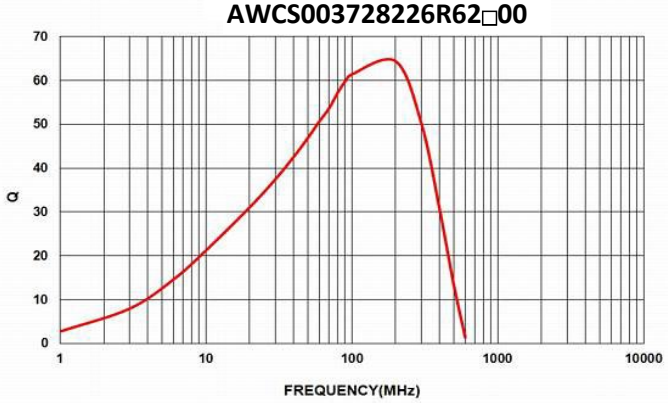

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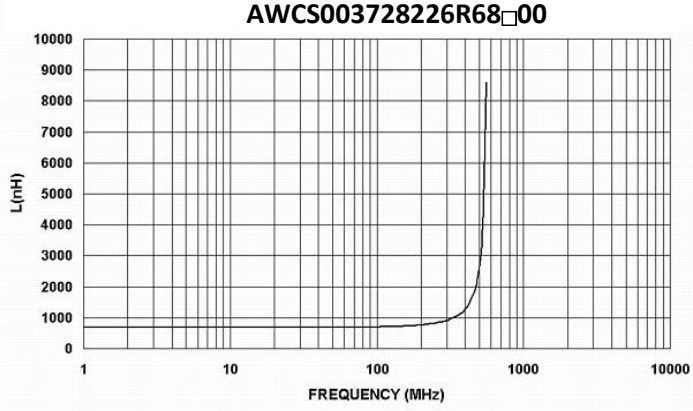

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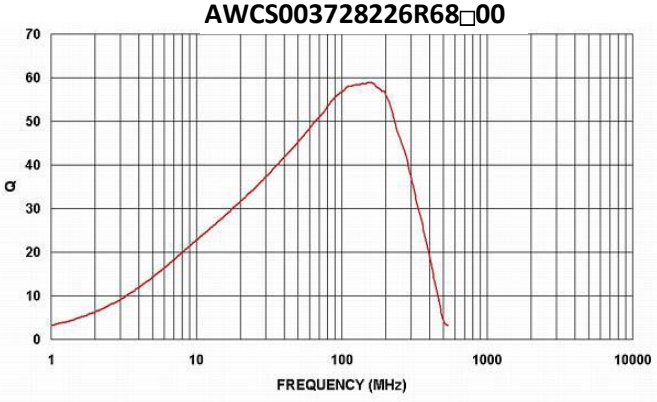

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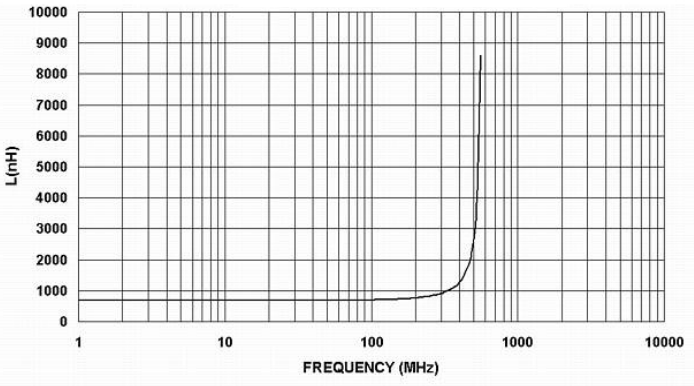

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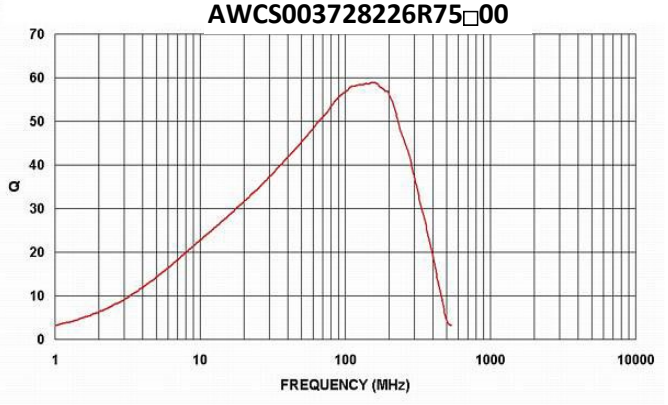

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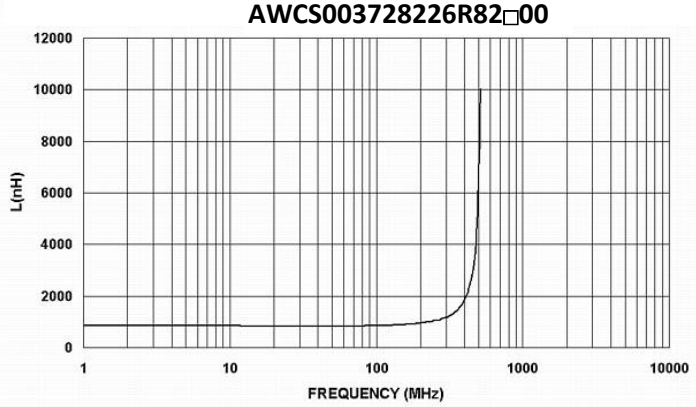

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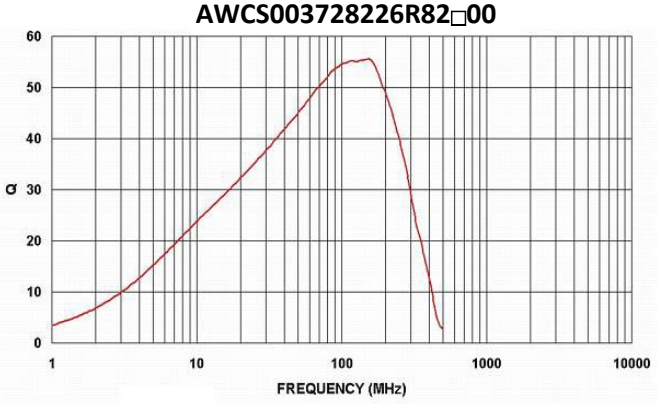

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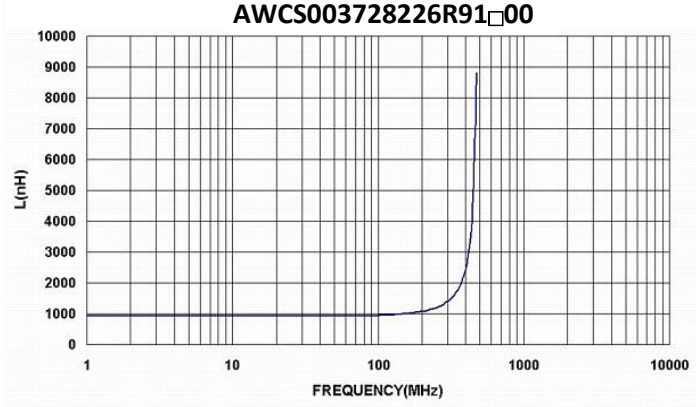

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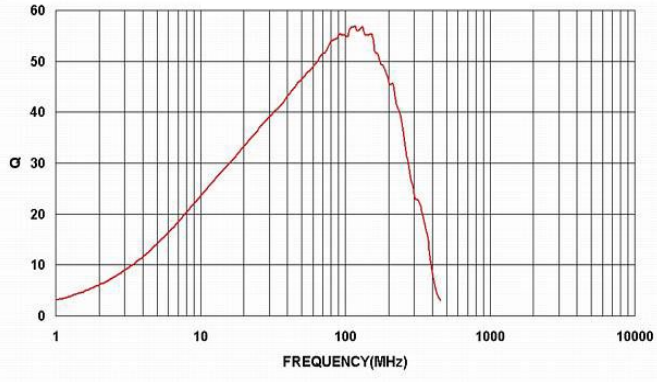

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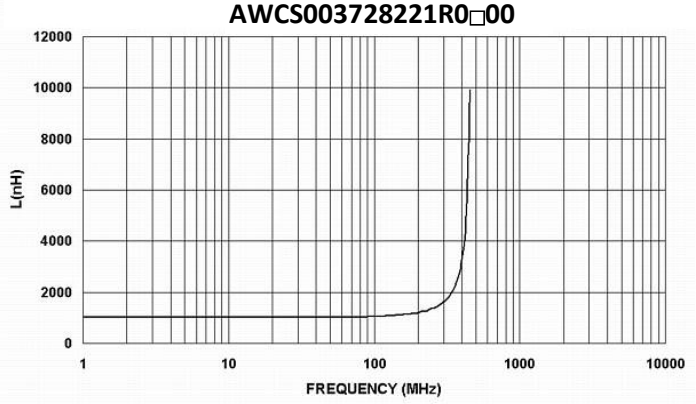

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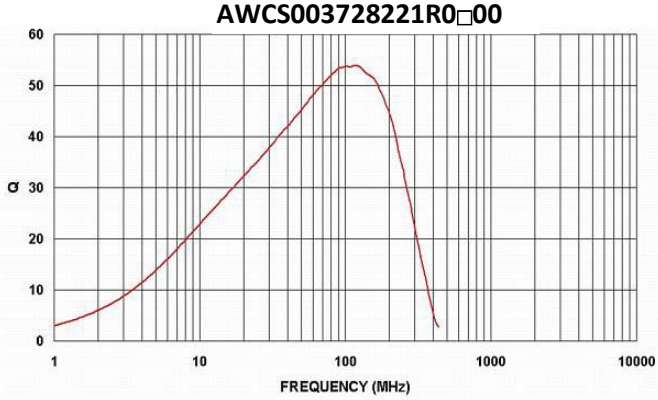

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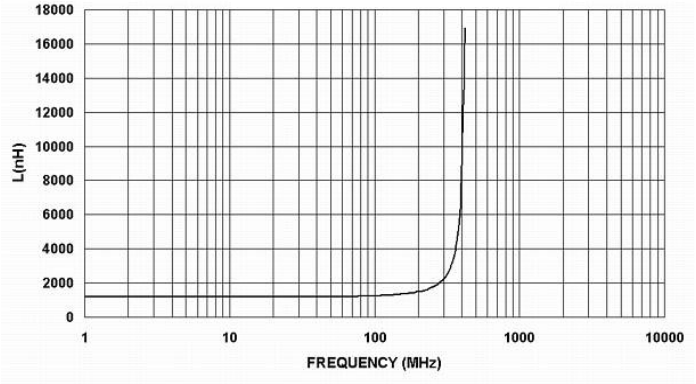

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