

RF Inductor

Automotive Grade

AWLS 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)
AWLS	1.0x0.6/0402	18 ~ 39000
	1.6x1.1/0603	
	2.4x1.7/0805	
	3.0x2.5/1008	

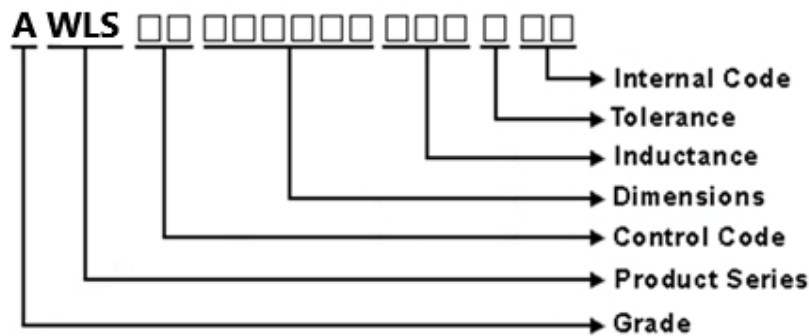


AWLS00161109 Series Specification

AEC-Q200

1 Scope: This specification applies to Wire Wound Ferrite Chip Inductors

2 Part numbering:



3 Rating:

Operating Temperature: $-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$
(Including self - temperature rise)

Storage Temperature: $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$
(The storage temperature range is for after the assembly)

4 Marking:

No Marking

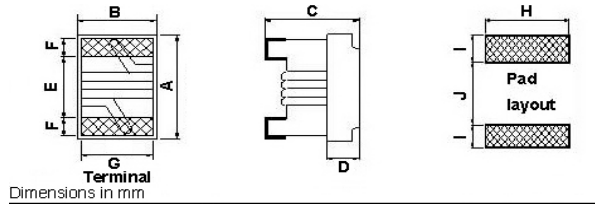
5 Standard Testing Condition

	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

AWLS00161109 Series Specification

AEC-Q200

6 Configuration and Dimensions and Unit Weight:



Terminal
Dimensions in mm

TYPE	A	B	C	D	E	F	G	H	I	J
161109	1.6 ^{+0.2} _{-0.1}	1.1 ^{+0.1} _{-0.1}	0.9 ^{+0.2} _{-0.1}	0.38	0.86	0.33	0.76	1.02	0.64	0.64

Net Weight (grms)

SIZE CODE	Net Weight (grms)
161109	0.005 (typ.)

7 Electrical Characteristics:

Part No.	Inductance (μ H)	L/Q Test Freq. (MHz)	Q Typ.	SRF (MHz)Min.	RDC (Ω)Max.	IDC (mA)	Tolerance ($\pm$ %)
AWLS0016110947N□00	0.047	7.9/7.9	17	1700	0.075	1500	5,10
AWLS0016110972N□00	0.072	7.9/7.9	17	1700	0.12	1500	5,10
AWLS00161109R10□00	0.1	7.9/7.9	17	1650	0.13	1500	5,10
AWLS00161109R12□00	0.12	7.9/7.9	17	1350	0.15	1500	5,10
AWLS00161109R15□00	0.15	7.9/7.9	17	1350	0.15	1450	5,10
AWLS00161109R18□00	0.18	7.9/7.9	17	1150	0.15	1400	5,10
AWLS00161109R22□00	0.22	7.9/7.9	17	1050	0.16	1350	5,10
AWLS00161109R24□00	0.24	7.9/7.9	17	1050	0.19	1300	5,10
AWLS00161109R27□00	0.27	7.9/7.9	17	1050	0.3	1050	5,10
AWLS00161109R33□00	0.33	7.9/7.9	17	850	0.46	1200	5,10
AWLS00161109R39□00	0.39	7.9/7.9	17	810	0.51	1200	5,10
AWLS00161109R47□00	0.47	7.9/7.9	17	720	0.62	1050	5,11
AWLS00161109R56□00	0.56	7.9/7.9	17	600	0.44	850	5,10
AWLS00161109R68□00	0.68	7.9/7.9	17	600	0.52	850	5,10
AWLS00161109R78□00	0.78	7.9/7.9	17	460	0.83	850	5,10
AWLS00161109R82□00	0.82	7.9/7.9	17	480	0.69	750	5,10
AWLS00161109R91□00	0.91	7.9/7.9	17	330	0.76	670	5,10
AWLS001611091R0□00	1	7.9/7.9	18	310	0.81	600	5,10
AWLS001611091R2□00	1.2	7.9/7.9	17	270	0.87	550	5,10
AWLS001611091R5□00	1.5	7.9/7.9	17	270	1.06	540	5,10
AWLS001611091R8□00	1.8	7.9/7.9	17	230	1.1	520	5,10
AWLS001611092R2□00	2.2	7.9/7.9	17	140	1.2	500	5,10
AWLS001611092R7□00	2.7	7.9/7.9	17	105	1.5	480	5,10
AWLS001611093R3□00	3.3	7.9/7.9	17	84	1.5	440	5,10
AWLS001611093R9□00	3.9	7.9/7.9	17	80	1.6	430	5,10

NOTE: □-tolerance J=±5% / K=±10%

- Operating temperature range —55°C ~ 125°C (Including self - temperature rise)
- L/Q Test OSC @200mV.
- IDC for Inductance drop 10% from its value without current.

AWLS00161109 Series Specification

AEC-Q200

Part No.	Inductance (uH)	L/Q Test Freq. (MHz)	Q Typ.	SRF (MHz)Min.	RDC (Ω)Max.	IDC (mA)	Tolerance (±%)
AWLS001611094R7□00	4.7	7.9/7.9	18	69	2.1	420	5,10
AWLS001611095R6□00	5.6	7.9/7.9	18	65	2.6	400	5,10
AWLS001611096R8□00	6.8	7.9/7.9	19	55	3.1	400	5,10
AWLS001611097R8□00	7.8	7.9/7.9	17	47	3.5	400	5,10
AWLS001611098R2□00	8.2	7.9/7.9	17	42	3.8	400	5,10
AWLS00161109100□00	10	7.9/7.9	19	40	4.8	300	5,10

NOTE: □-tolerance J=±5% / K=±10%

1. Operating temperature range —55°C ~ 125°C (Including self - temperature rise)

2. L/Q Test OSC @200mV.

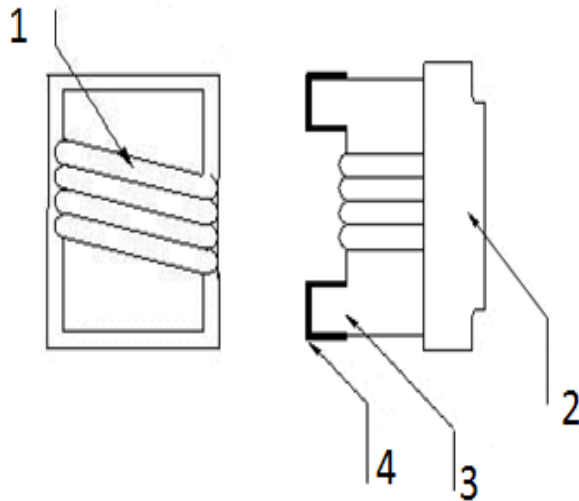
3. IDC for Inductance drop 10% from its value without current.

AWLS00161109 Series Specification

AEC-Q200

8 AWLS00161109 Series

8.1 Construction:

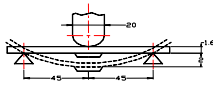


8.2 Material List:

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

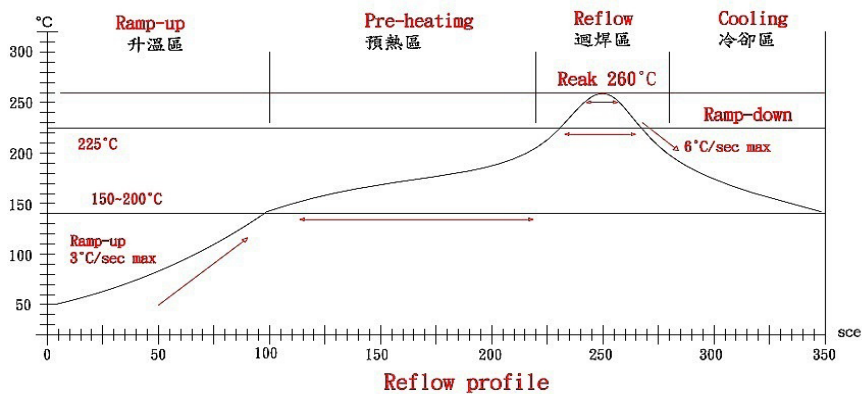
9 Reliability Of Ferrite Wire Wound Chip Inductor/FERRITE SERIES

1-1.Mechanical Performance

No	Item	Specification	Test Method
1-1-1	Board Flex	The forces applied on the right 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 right 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: 0.764386octave/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-45 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: -55±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 : -55 to +125 ℃ Soak Mode Condition : 30 minutes Measured after exposure in the room condition for 24hrs
1-2-5	Operational Life		Temperature: 125±2℃ Applied 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.



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	5~10 sec	-
實際時間 Time result	-	75 ~ 100 sec	90 ~ 120 sec	10 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

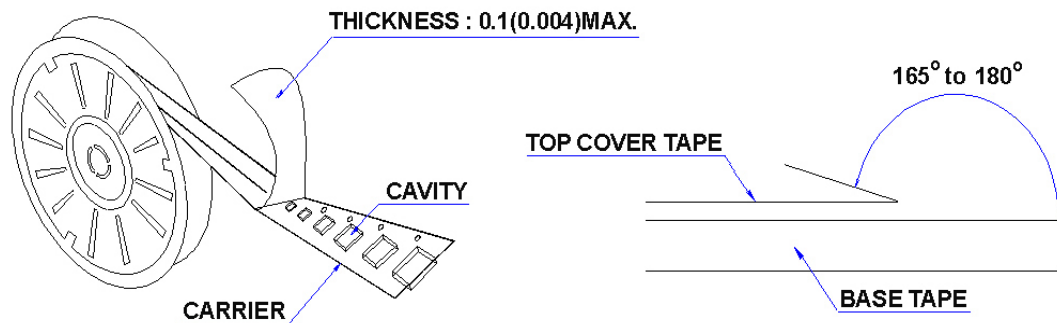
AWLS00161109 Series Specification

AEC-Q200

10 Packaging:

10.1 Packaging -Cover Tape

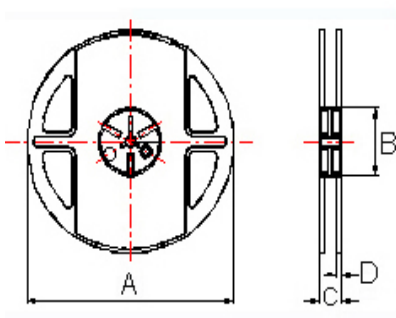
The force for tearing off cover tape is 10 to 100 grams in the arrow direction.



10.2 Packaging Quantity

TYPE	PCS/REEL
161109	4000

10.3 Reel Dimensions



Dimensions in mm

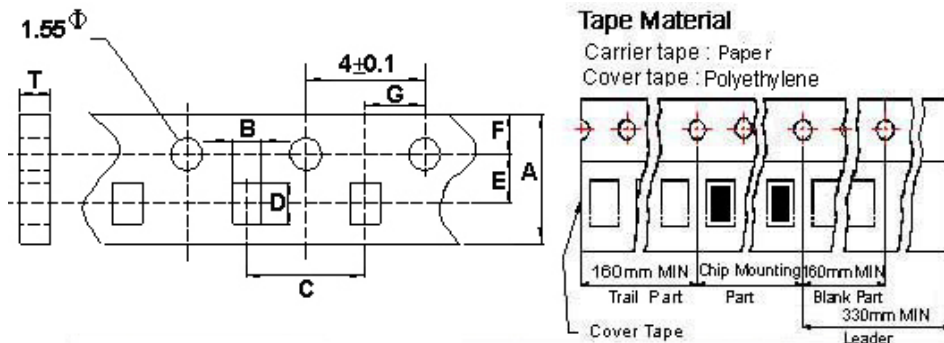
TYPE	A	B	C	D
161109	178±1	60±0.5	12±0.5	1.5±0.5

AWLS00161109 Series Specification

AEC-Q200

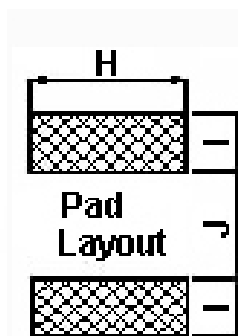
10 Packaging:

10.4 Tape Dimensions in mm



TYPE	A	B	C	D	E	F	G	T
161109	8.0	1.25	4	1.9	3.5	1.75	2	1.05

11 Recommended Land Pattern:



Dimensions in mm

TYPE	H(In/mm)	I(In/mm)	J(In/mm)
161109	0.04/1.02	0.025/0.64	0.025/0.64

12 Note:

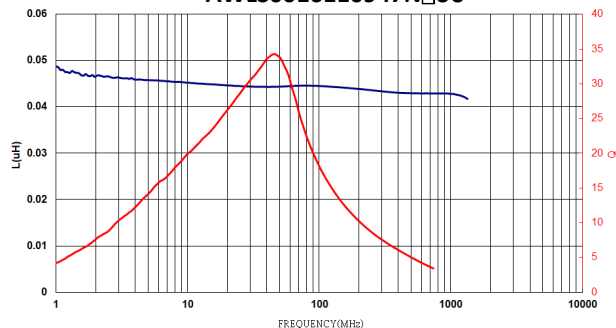
- Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.
- Do not knock nor drop.
- All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, 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.

AWLS00161109 Series Specification

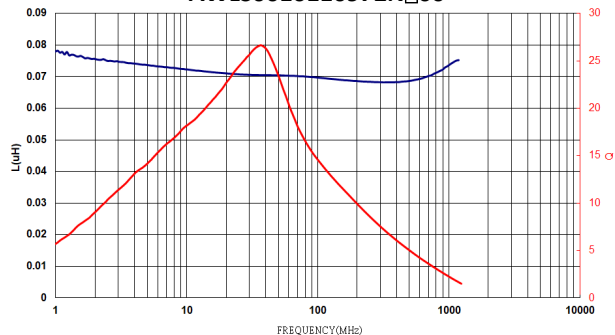
AEC-Q200

13 Graph:

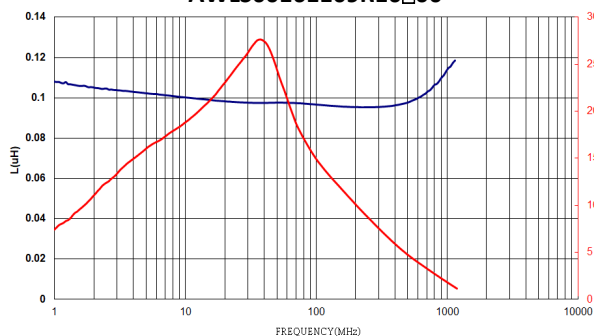
AWLS0016110947N□00



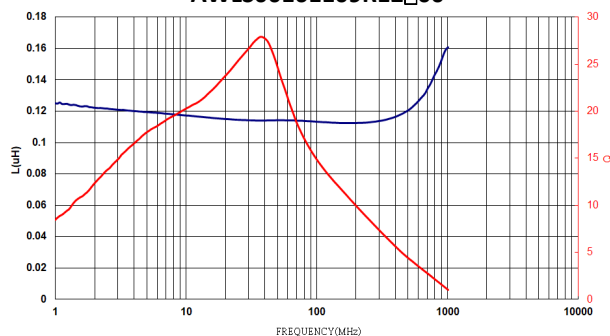
AWLS0016110972N□00



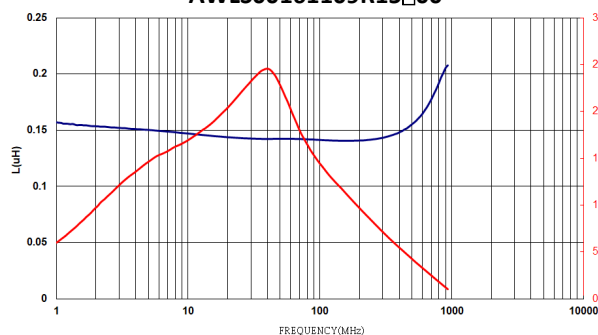
AWLS00161109R10□00



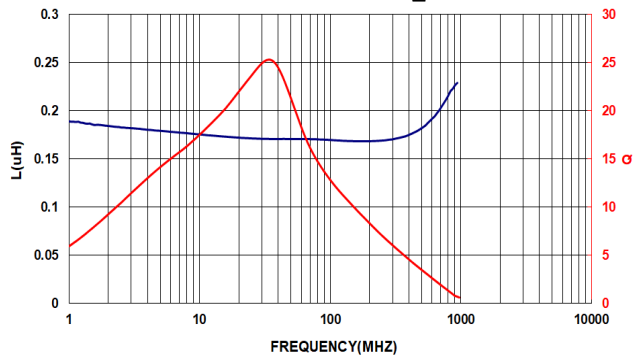
AWLS00161109R12□00



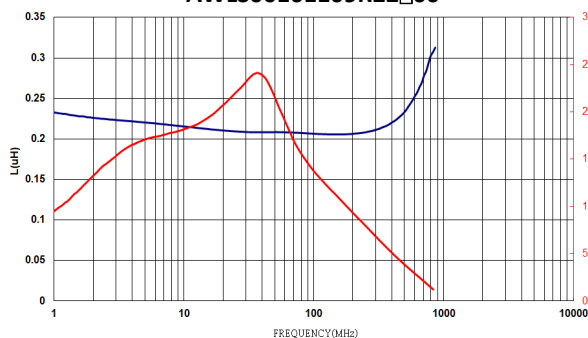
AWLS00161109R15□00



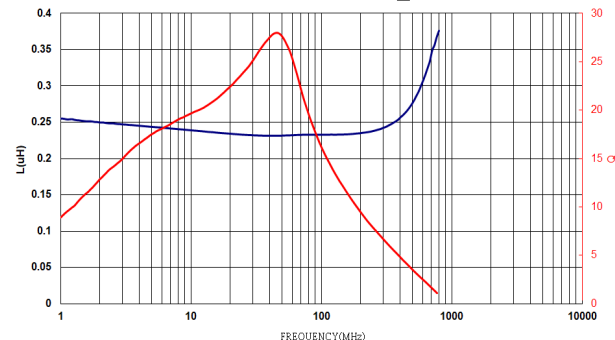
AWLS00161109R18□00



AWLS00161109R22□00



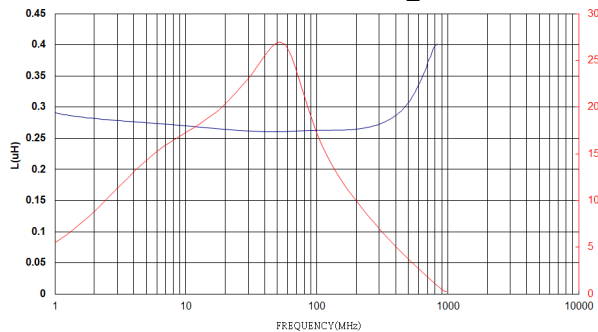
AWLS00161109R24□00



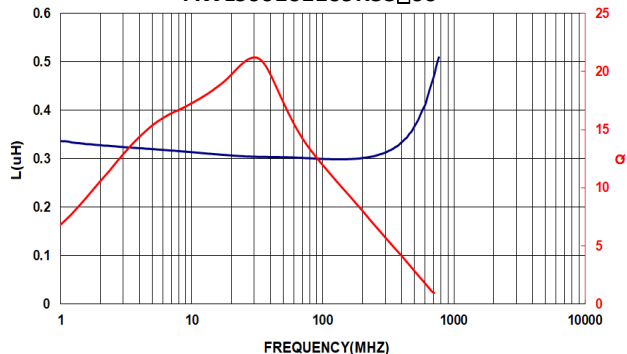
AWLS00161109 Series Specification

AEC-Q200

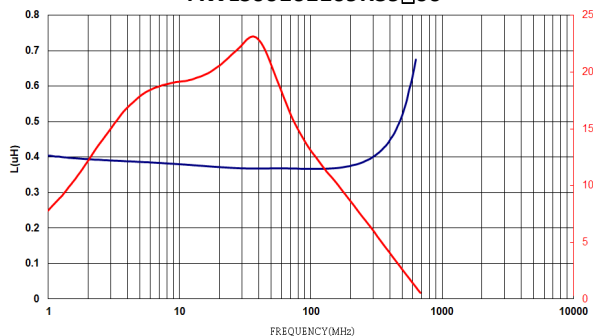
AWLS00161109R27□00



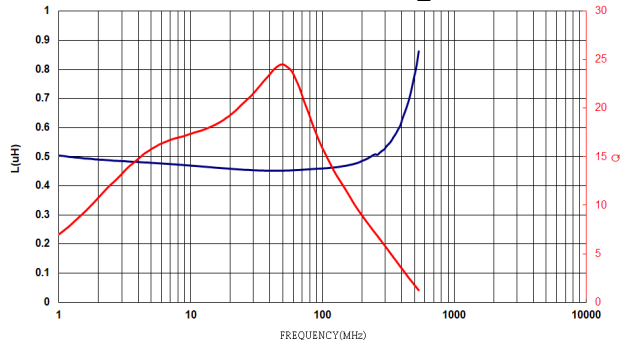
AWLS00161109R33□00



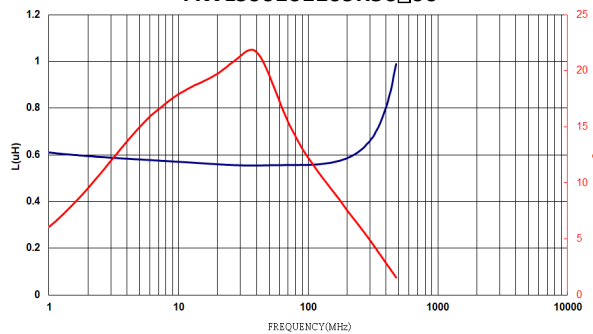
AWLS00161109R39□00



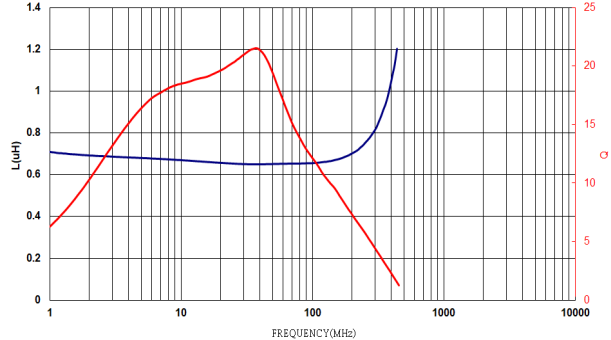
AWLS00161109R47□00



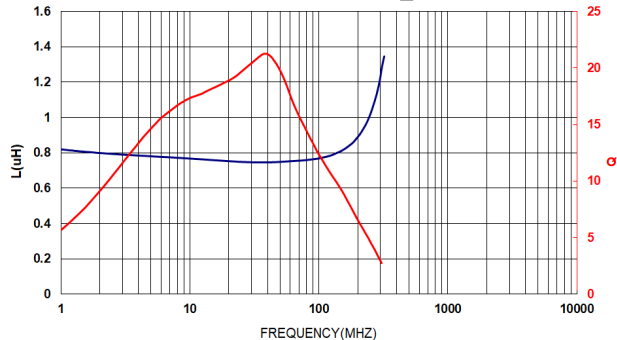
AWLS00161109R56□00



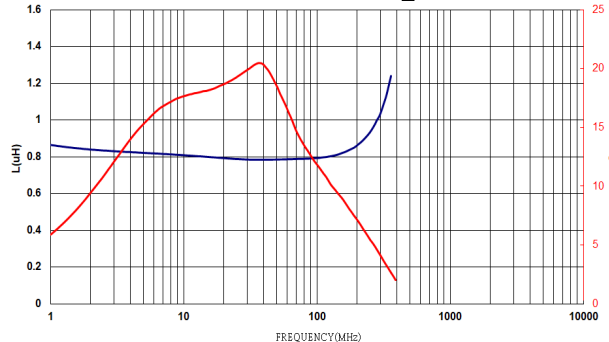
AWLS00161109R68□00



AWLS00161109R78□00



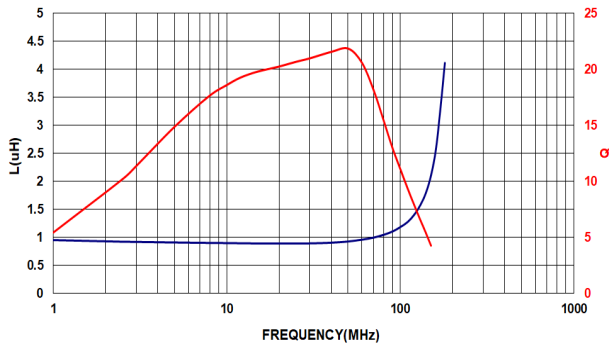
AWLS00161109R82□00



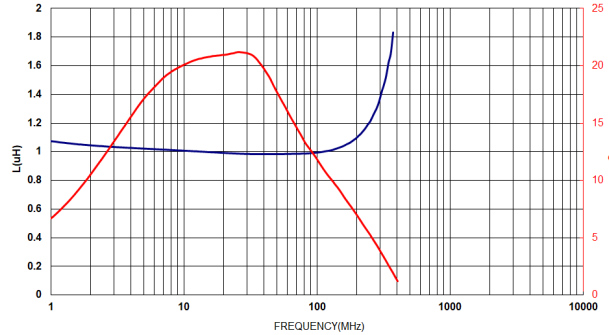
AWLS00161109 Series Specification

AEC-Q200

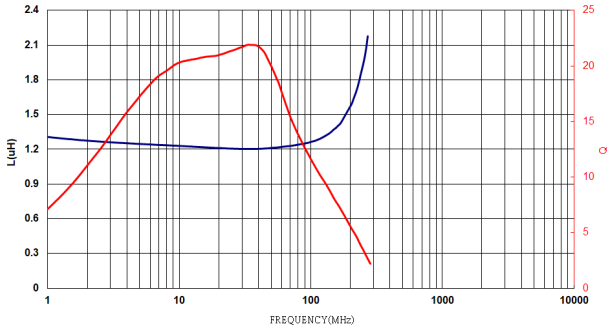
AWLS00161109R91□00



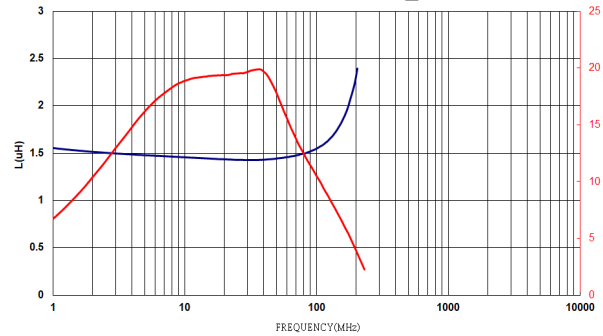
AWLS00161109R0□00



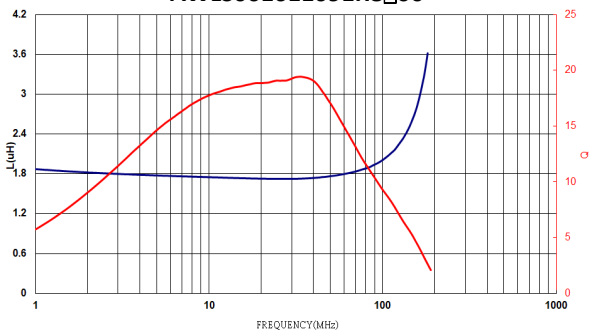
AWLS00161109R2□00



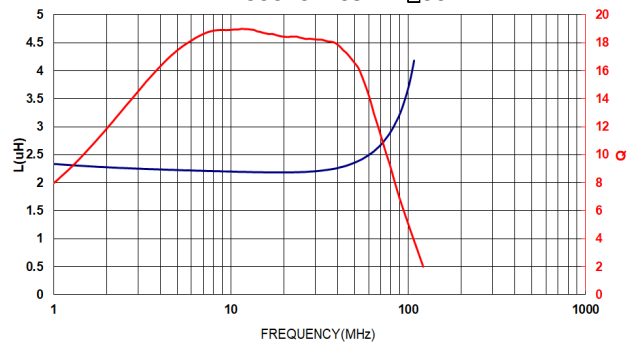
AWLS00161109R5□00



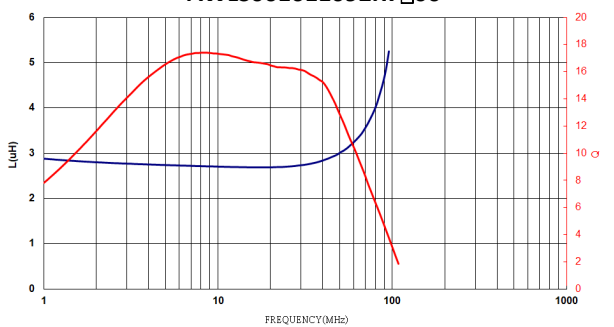
AWLS00161109R8□00



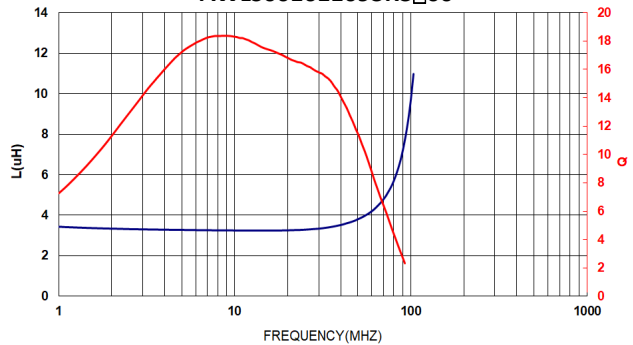
AWLS00161109R2R2□00



AWLS00161109R7□00



AWLS00161109R3R3□00



AWLS00161109 Series Specification

AEC-Q200

