

APPROVAL SHEET

WL1608series

MULTILAYER INDUCTOR

High Frequency Application Purpose

Size 0603(1608)

Customer : _____

Approval No : _____

Issue Date : 2001.03.20

Customer Approval :

WALSIN Technology Corp.

Authorized By : _____



DESCRIPTION

Walsin High frequency chip inductors are designed to suppress EMI noises. The wide operating range make Walsin High frequency chip inductors suitable for numerous applications on EMI filters. The Walsin High frequency chip inductors are manufactured by Multilayer fabrication technology providing excellent electrical performance.

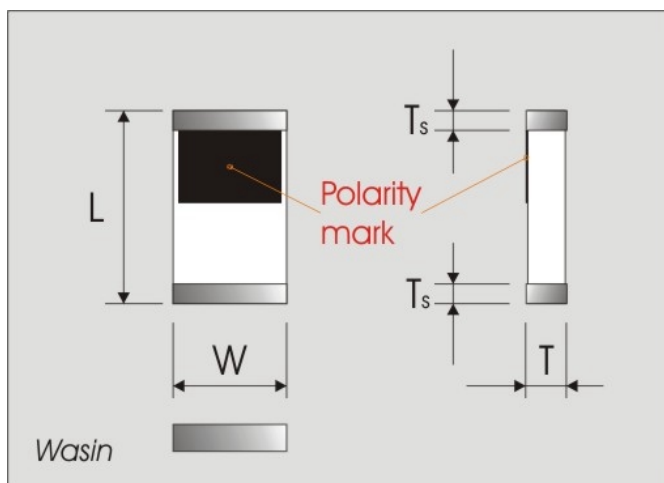
FEATURES

- 1. Ceramic structure provides high reliability 、 high productivity
- 2. Addresses inductor needs for applications above 100 MHz
- 3. Excellent Q and SRF characteristics
- 4. Design for applications

APPLICATIONS

- 1. Cellular phones
- 2. Data transmission lines
- 3. LANs, modems
- 4. Personal computer,...etc.

DIMENSIONS



CHIP SIZE	WL1608 Series
L	1.60 ± 0.15 mm
W	0.80 ± 0.15 mm
T	0.80 ± 0.15 mm
Ts	0.40 ± 0.20 mm

MARKING

Polarity mark

ORDERING CODE

WL100505 G 4N7K N T

PRODUCT SYMBOL
 WB : Walsin's Beads
 WL : Walsin's Inductors

SIZE CODE
 Chip sizes
 Code is a*b
 1005=1.0*0.5mm

THICKNESS
 Chip thickness Code
 05=0.5mm

MATERIAL
 A,B,C,D,F,G,H

PACKING CODE
 No code=packed in bulk
 T=Reeled

SPECIFICATION
 N=Normal

TOLERANCE
 S= 0.3 nH
 J= 5 %
 K= 10 %
 M= 20 %
 Q= 25 %

INDUCTANCE
 Two significant digits followed
 by no. of zero s
 4N7=4.7nH when < 10 nH
 R = decimal point
 N= nH = 0.001 μH

**RATING**

Part number	Inductance (nH)	Q. (Min.)	L.Q. Test Frequency (MHz)	Self Resonance Frequency (MHz)	Max. DC Resistance (Ω)	Max. Rated Current (mA)
WL160808G1N0SNT03	1.0±0.3 nH	8	100	10000	0.10	300
WL160808G1N2SNT03	1.2±0.3 nH	8	100	10000	0.10	300
WL160808G1N5SNT03	1.5±0.3 nH	8	100	6000	0.10	300
WL160808G1N8SNT03	1.8±0.3 nH	8	100	6000	0.10	300
WL160808G2N2SNT03	2.2±0.3 nH	8	100	6000	0.10	300
WL160808G2N7SNT03	2.7±0.3 nH	8	100	6000	0.10	300
WL160808G3N3 NT03	3.3±10% or 0.3 nH	10	100	6000	0.12	300
WL160808G3N9 NT03	3.9±10% or 0.3 nH	10	100	4000	0.14	300
WL160808G4N7 NT03	4.7±10% or 0.3 nH	10	100	4000	0.16	300
WL160808G5N6 NT03	5.6±10% or 0.3 nH	10	100	4000	0.18	300
WL160808G6N8 NT03	6.8±10% or 5%	10	100	4000	0.22	250
WL160808G8N2 NT03	8.2±10% or 5%	10	100	3500	0.24	250
WL160808G10N NT03	10.0±10% or 5%	12	100	3400	0.26	250
WL160808G12N NT03	12.0±10% or 5%	12	100	2600	0.28	250
WL160808G15N NT03	15.0±10% or 5%	12	100	2300	0.32	250
WL160808G18N NT02	18.0±10% or 5%	12	100	2000	0.35	200
WL160808G22N NT02	22.0±10% or 5%	12	100	1600	0.40	200
WL160808G27N NT02	27.0±10% or 5%	12	100	1400	0.45	200
WL160808G33N NT02	33.0±10% or 5%	12	100	1200	0.55	200
WL160808G39N NT02	39.0±10% or 5%	12	100	1100	0.60	150
WL160808G47N NT02	47.0±10% or 5%	12	100	900	0.70	150
WL160808G56N NT02	56.0±10% or 5%	12	100	900	0.75	150
WL160808G68N NT02	68.0±10% or 5%	12	100	700	0.85	150
WL160808G82N NT01	82.0±10% or 5%	12	100	600	0.95	100



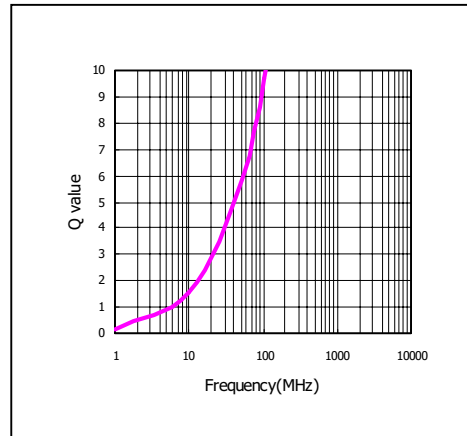
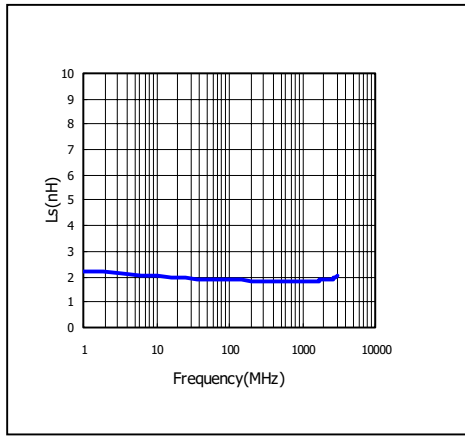
WL160808GR10 NT01	100±10% or 5%	12	100	600	1.00	100
WL160808GR12 NT01	120±10% or 5%	8	100	500	1.20	100
WL160808GR15 NT01	150±10% or 5%	8	100	500	1.30	100
WL160808GR18 NT01	180±10% or 5%	8	100	400	1.40	100
WL160808GR22 NT01	220±10% or 5%	8	100	400	1.50	100



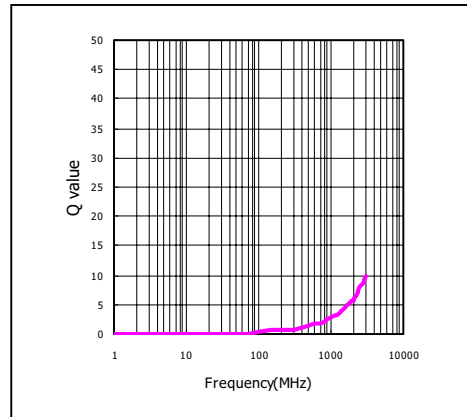
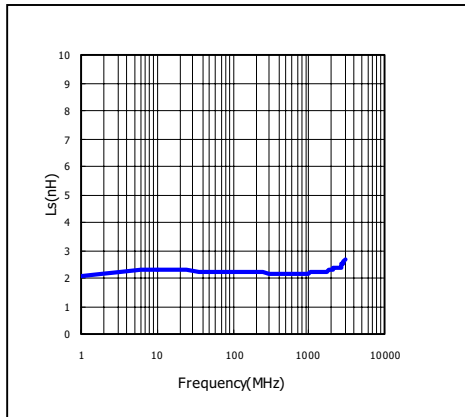
INDUCTANCE & Q vs FREQUENCY CHARACTERISTICS

- measured by HP4287A

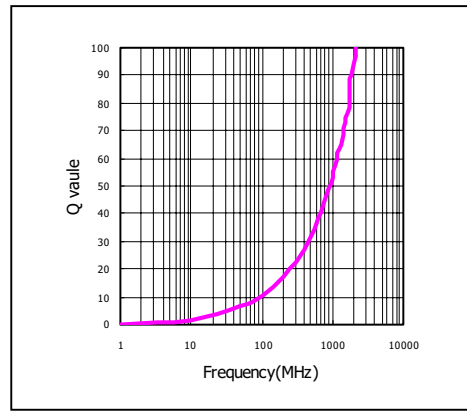
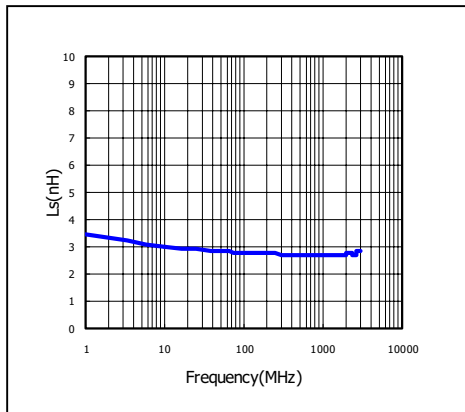
L=1.8nH



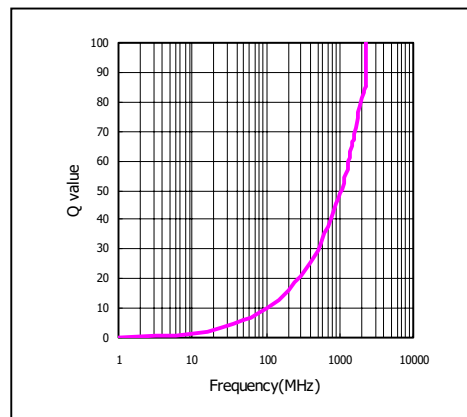
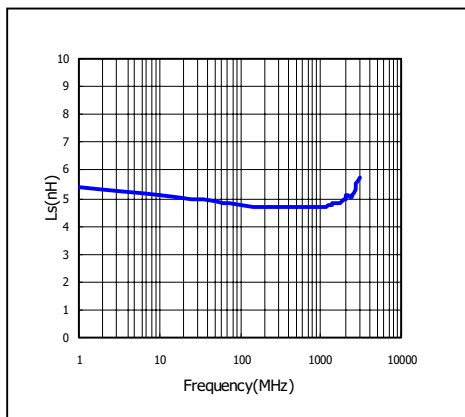
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L=2.7nH

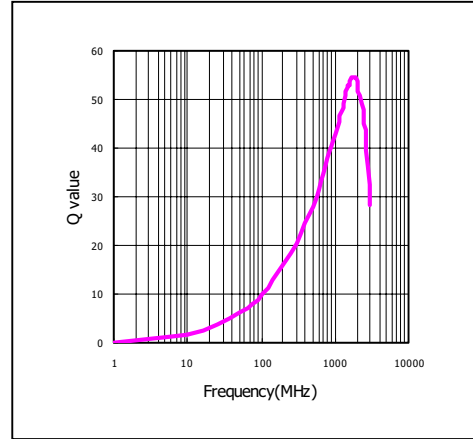
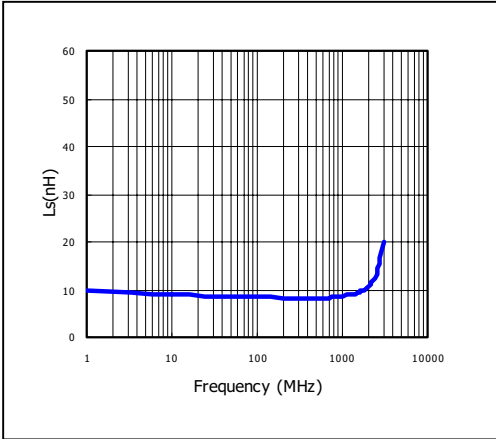


L=4.7nH

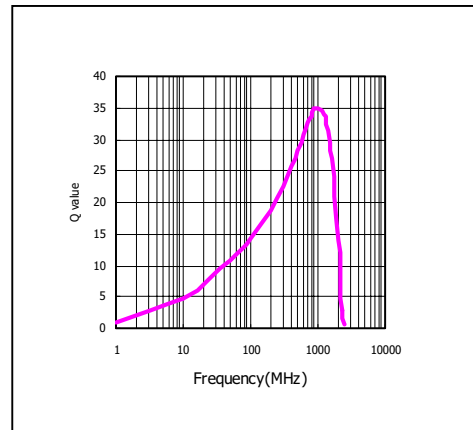
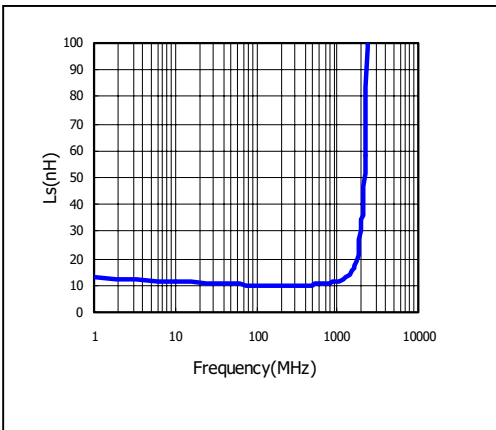




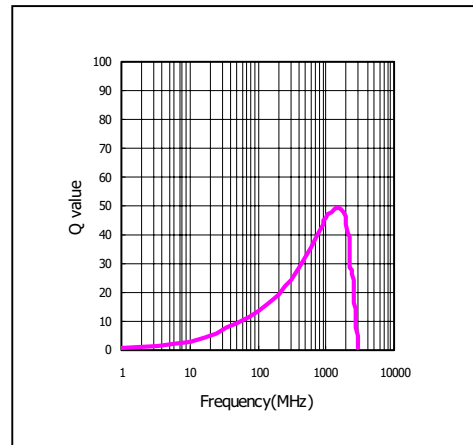
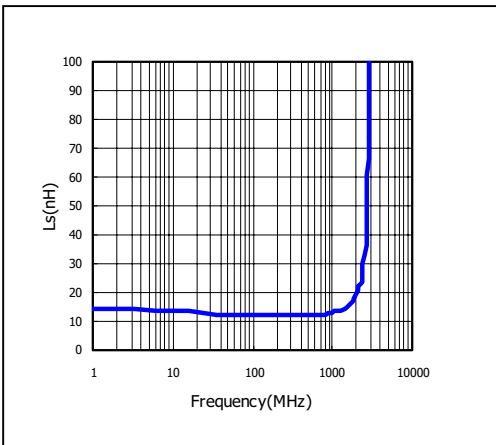
L=8.2nH



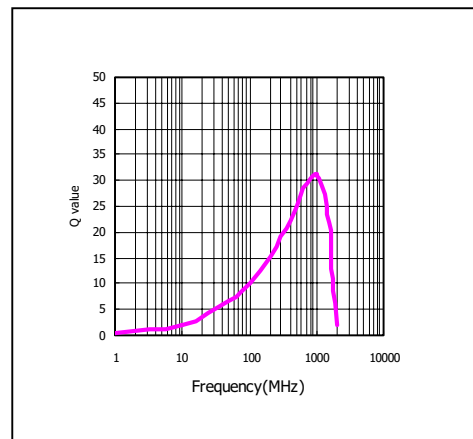
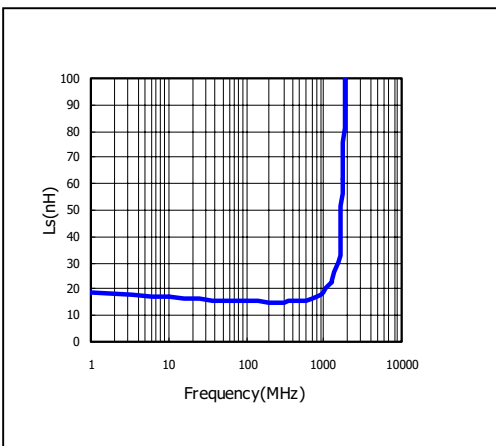
L=10nH



L=12nH

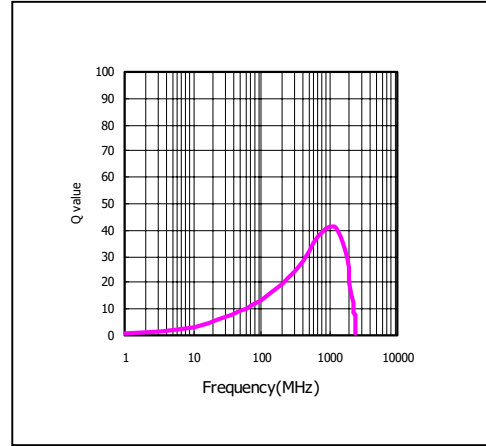
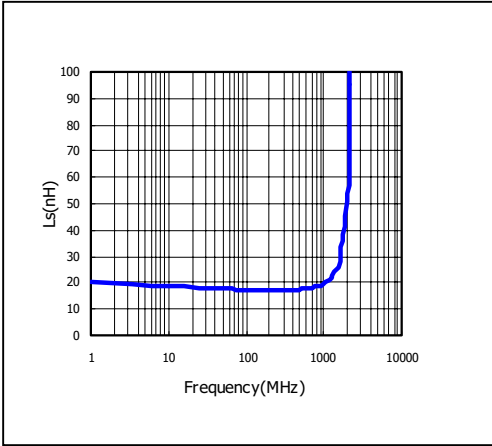


L=15nH

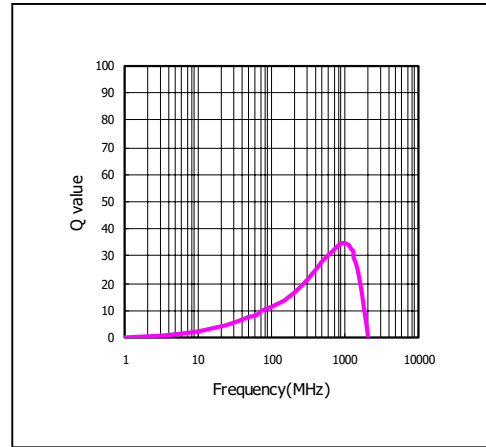
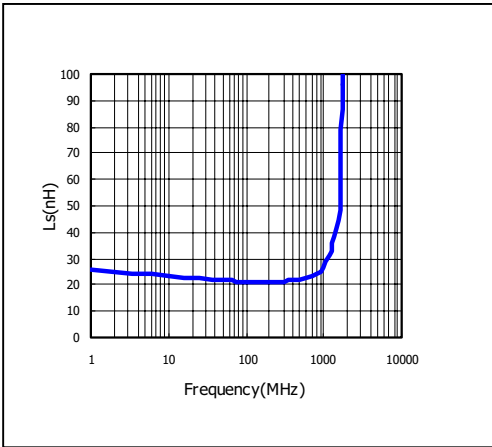




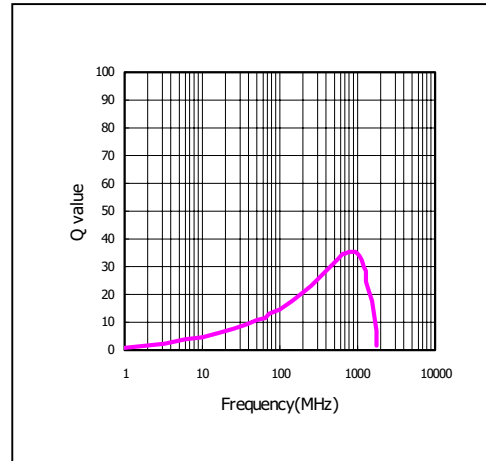
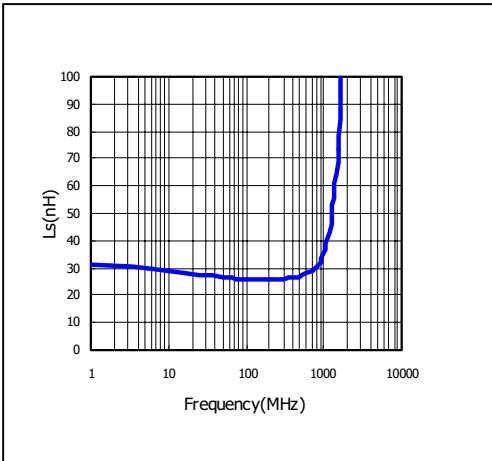
L=18nH



L=22nH

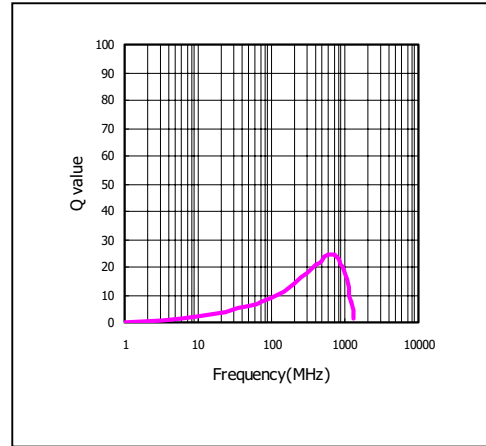
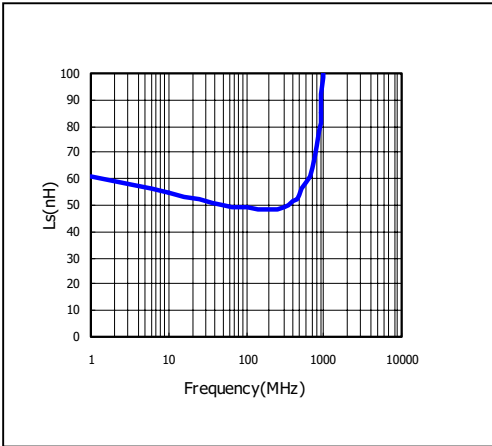


L=27nH

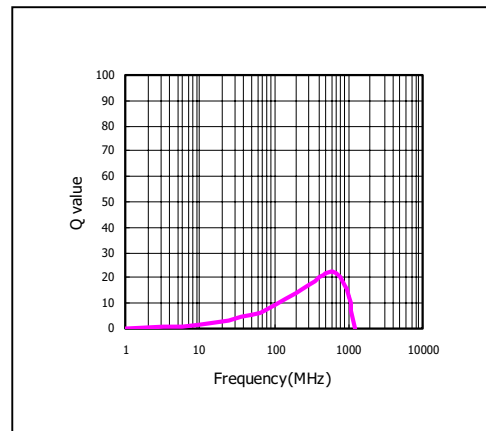
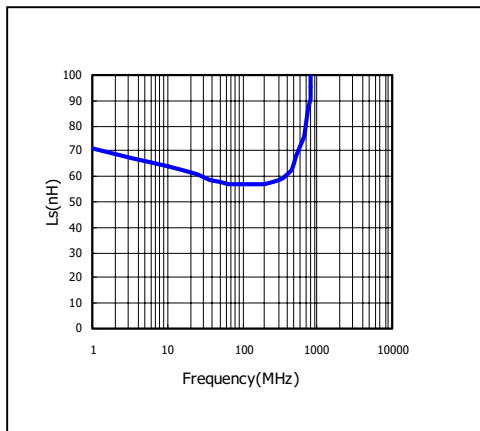




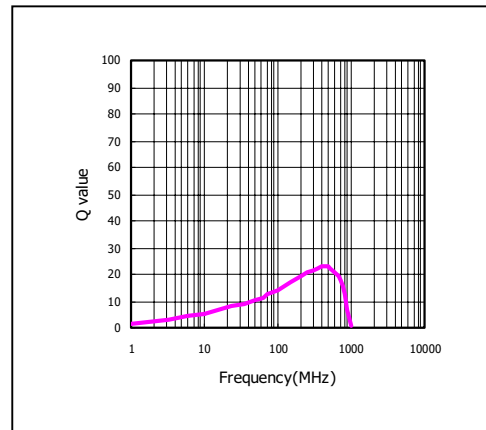
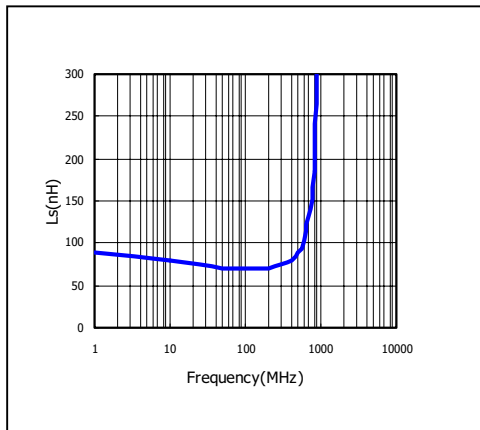
L=47nH



L=56nH

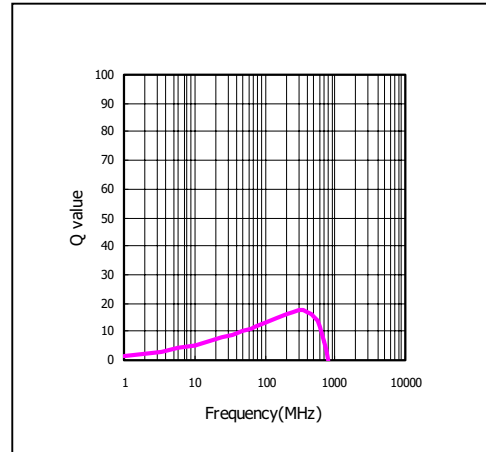
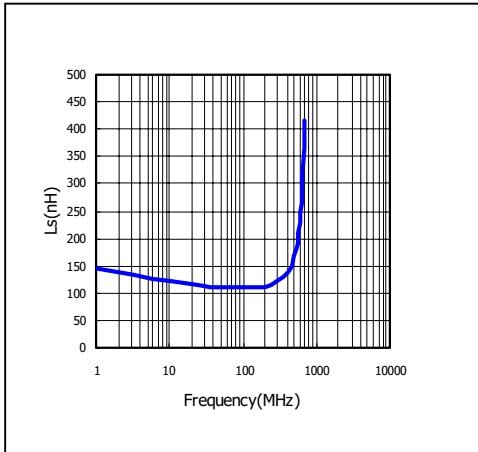


L=68nH

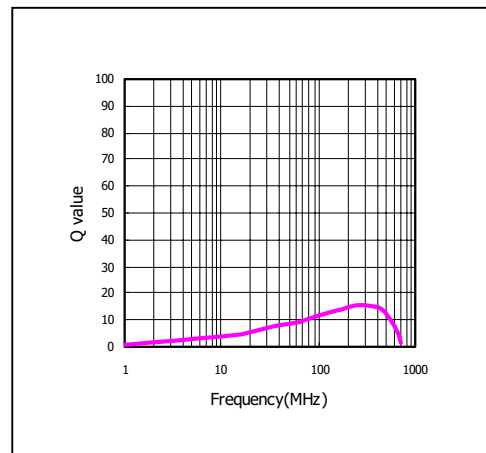
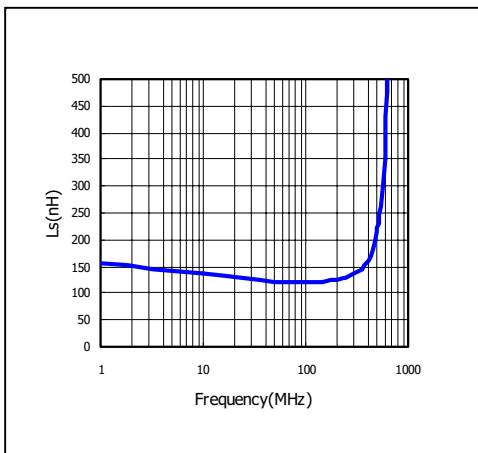




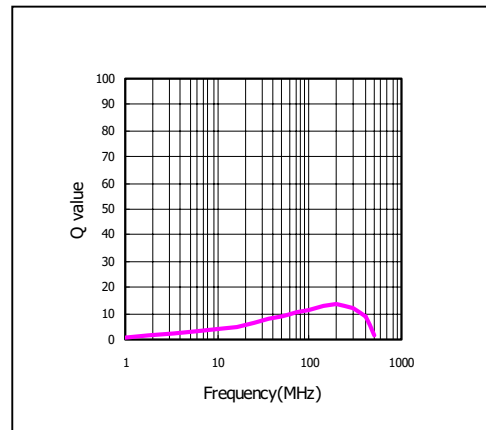
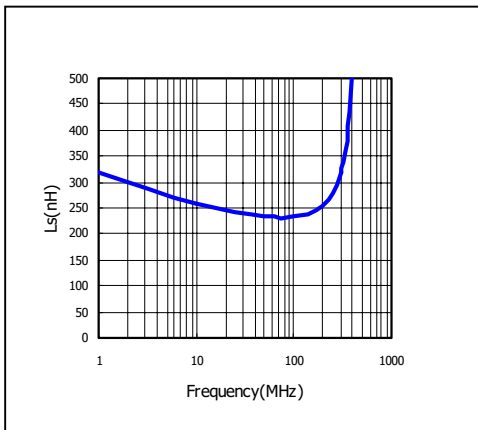
L=100nH



L=120nH



L=220nH



STANDARD TESTING CONDITION

1. Unless otherwise specified
 - Temperature : 15 ~ 35°C
 - Humidity : 25%RH ~ 85%RH
 - Atmospheric pressure : 96kPa ~ 106kPa
2. In case of doubt
 - Temperature : 20±2°C
 - Humidity : 60%RH ~ 70%RH
 - Atmospheric pressure : 86kPa ~ 106kPa

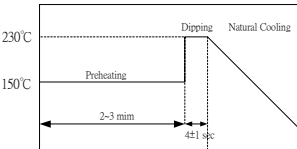
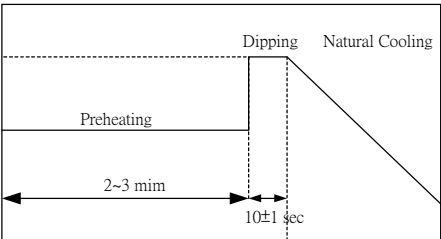
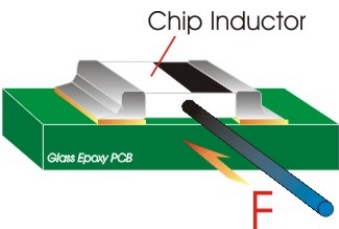
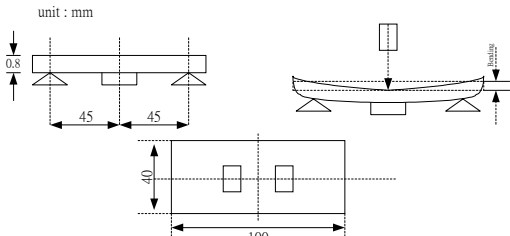
SPECIFICATION

1. Electrical performance test

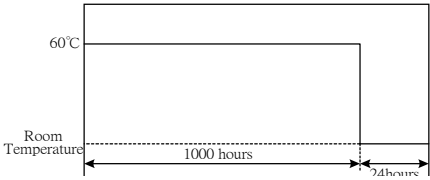
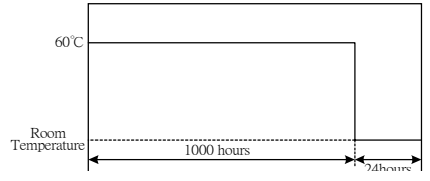
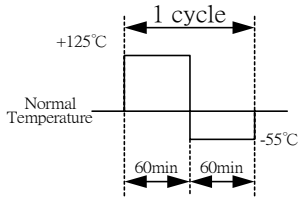
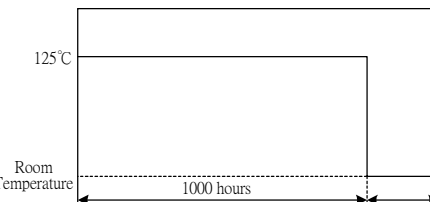
Test item	Test condition / Test method	Specification
D.C. Resistance	DIGITAL MULTIMETER: HP 3478A or HP 4338A or HP4287A	Refer to standard Electrical characteristic list
Inductance	HP4287A & HP16196 or HP 4291A & HP16192 or HP4195A NETWORK ANALYZER	Refer to standard Electrical characteristic list
Q value	HP4287A & HP16196 or HP 4291A & HP16192 or HP4195A NETWORK ANALYZER	Refer to standard Electrical characteristic list
Rated Current	TEST EQUIPMENT: HP4291A & HP6030A Applied the current to coils, The inductance shall be less than 10% initial value	Refer to standard Electrical characteristic list
Self-Resonance Frequency (SRF)	TEST EQUIPMENT: HP4287	Refer to standard Electrical characteristic list



2. Reliability test

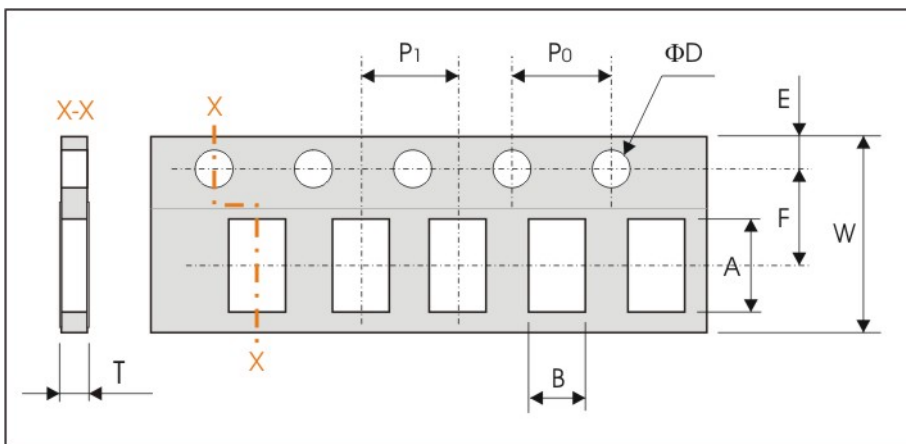
Test item	Test condition / Test method	Specification
Solderability	Solder temp. : 230±5°C Immersion time : 4±1 sec Solder : SN63 	75% min. coverage of all metallized area
Resistance to Soldering Heat	Solder : Sn63 Solder Temp. : 270±5°C Immersion time : 10±0.5 sec Measurement to be made after keeping at room temp. for 24±2 hrs. 	No remarkable damage Remaining terminal electrode : 70% min. ΔL ≤±10% ΔQ ≤±20% At 100 MHz
Temperature Characteristic	Temp. range : -30 ~ 85°C Reference temp. : 20°C	ΔL ≤±10%
Adhesive Strength of Termination	Solder chip on PCB and applied 10N(1Kgf) for 10 sec 	No visible damage
Flexure Strength	After soldering a chip to a test substrate, bend the substrate by 2 mm (0.79 inches) and then return. Soldering shall be done in accordance with the recommended PC board pattern and reflow soldering. 	The terminal electrode and the ferrite must not be damaged by the forces applied on the right conditions.



Test item	Test condition / Test method	Specification
Humidity Storage	Humidity:90% to 95% R.H. Temperature:60±2°C Time: 1000±12 hours. Measurement: After placing for 24 hours Minimum. 	Appearance: Ferrite shall not be damaged. $ \Delta L \leq \pm 10\%$ $ \Delta Q \leq \pm 20\%$ At 100 MHz
Humidity Resistance	Humidity:90% to 95% R.H. Tempertaure:60±2°C Applied rated current(maximum value) Time: 1000±12 hours. Measurement: After placing for 24 hours Minimum. 	Appearance: Ferrite shall not be damaged. $ \Delta L \leq \pm 10\%$ $ \Delta Q \leq \pm 20\%$ At 100 MHz
Thermal Shock	Temperature: -55°C · 125°C · kept stabilized for each 60 minutes Cycle : 100 cycles Measurement: After placing for 24 hours minimum. 	Appearance: Cracking, chipping or any other defects harmful to the characteristics shall not be allowed. $ \Delta L \leq \pm 10\%$ $ \Delta Q \leq \pm 20\%$ At 100 MHz
High Temperature Resistance	Temperature: 125±2°C Applied current: Rated current(maximum value) Testing time: 1000±12 hours. Measurement: After placing for 24 hours minimum. 	Appearance: Ferrite shall not be damaged. $ \Delta L \leq \pm 10\%$ $ \Delta Q \leq \pm 20\%$ At 100 MHz

PACKAGING

Paper Tape specifications (unit :mm) and Packing quantity

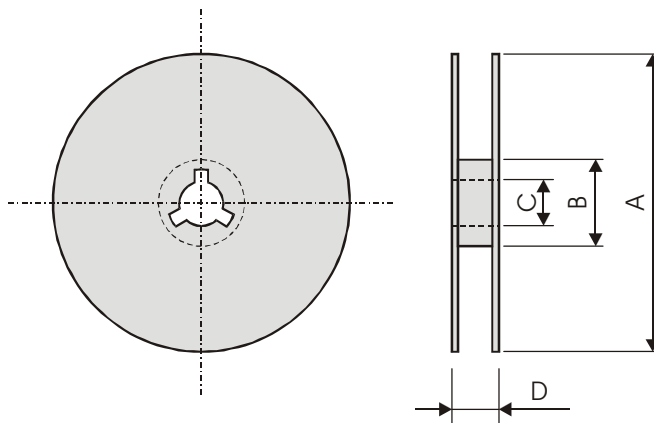


Label	A	B	E	F	ΦD
WL1608 Series	1.85 ± 0.10	1.10 ± 0.10	1.75 ± 0.05	3.50 ± 0.05	1.55 ± 0.05

Label	P0	P1	T	W	Quantity/Reel
WL1608 Series	4.00 ± 0.10	4.00 ± 0.10	<1.00	8.00 ± 0.20	4Kpcs

- Tape Material : Paper tape.

Reel dimensions



Symbol	A	B	C	D
Dimension	Φ178.0±2.0	Φ60.0±1.0	13.0±0.2	10.0±1.5

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 3.

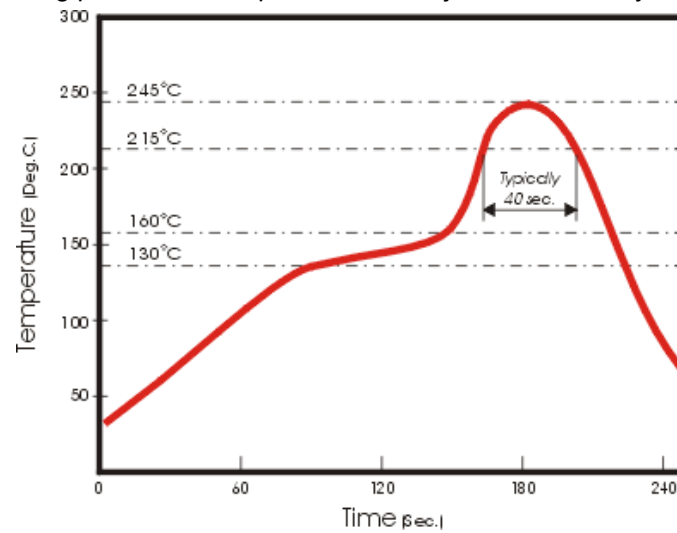


Fig 3. Infrared soldering profile

CAUTION OF HANDLING

Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment
- (2) Aerospace equipment
- (3) Undersea equipment
- (4) Medical equipment
- (5) Disaster prevention / crime prevention equipment
- (6) Traffic signal equipment
- (7) Transportation equipment (vehicles, trains, ships, etc.)
- (8) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

Storage condition

- (1) Products should be used in 6 months from the day of WALSIN outgoing inspection, which can be confirmed.
- (2) Storage environment condition.
 - Products should be storage in the warehouse on the following conditions.
 - Temperature : -10 to +40°C
 - Humidity : 30 to 70% relative humidity
 - Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
 - Products should be storage on the palette for the prevention of the influence from humidity, dust and son on.
 - Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
 - Products should be storage under the airtight packaged condition.