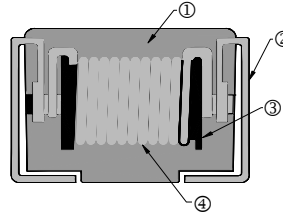


Wire Wound Chip Inductor (Ferrite) – NL Series

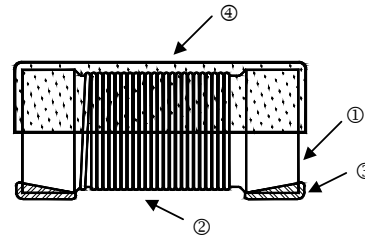
Construction

Molding Type



① Molded resin	③ Ferrite core
② Electrode (Ag)	④ Magnet wire

Open Type



① Ferrite core	③ Electrode (Ag/Pd+Ni+Sn)
② Magnet wire	④ UV Glue

1. These revolutionary, highly reliable wound chip inductors for automatic mounting, have been developed in response to the trend toward high density in electronic equipment.
2. With metal terminals and a body of heat resistant resin, these inductors offer many superior features.

Features

- Very strong solderability by flow soldering, soldering iron or wave soldering
- Highly accurate dimensions, can be mounted automatically
- Terminals are highly resistant to pull forces
- Highly resistant to mechanical shocks and pressure
- Highly reliable in environments of sudden temperature change and humidity. Super Q characteristics

Part Numbering

NL	05	K	T	C	1R0
Product Type	Dimensions	Inductance Tolerance	Packaging Code	Current	Inductance
	03: 0603 05: 0805 08: 1008 10: 1210 12: 1812 20: 2220	J: ±5% K: ±10% M: ±20%	T: Taping Reel	: Standard C: Large Current L: Low Profile	R12: 120nH R27: 270nH 2R7: 2700nH 100: 10µH

Applications

- Micro Televisions, Liquid Crystal Televisions, Video Cameras, Portable VCRs, Car Radios, Car Stereos, Thin Tape Radios, Television Tuners, Mobile Telephones, Radio and Other Electronic Devices

■ Dimensions

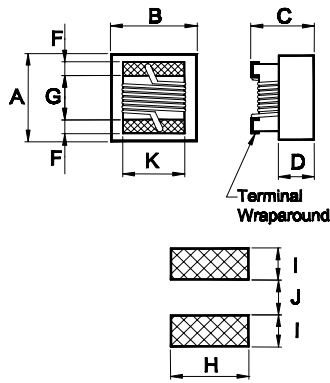


Figure 1

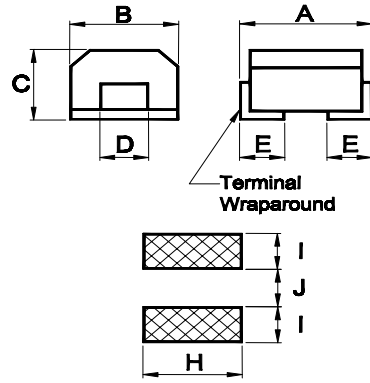


Figure 2

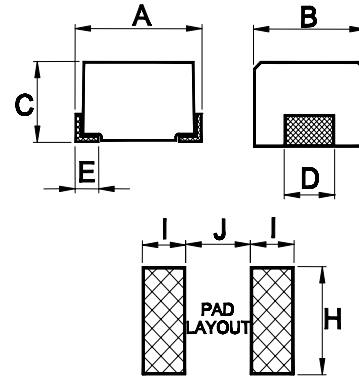


Figure 3

Unit: mm

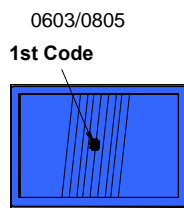
Type	Size (Inch)	Figure	A max.	B max.	C max.	D Ref.	E	F	G	H	I	J	K	Weight (g) (1000pcs)
NL03	0603	1	1.80	1.20	1.00	0.45	-	0.33	0.95	1.02	1.64	0.64	1.05	9.6
NL05	0805	1	2.40	1.71	1.45	0.65	-	0.44	1.02	1.78	1.02	0.76	1.27	14
NL08	1008	1	2.92	2.79	2.10	1.20	-	0.45	1.52	2.54	1.02	1.27	2.03	30
NL10	1210	2	3.50	2.80	2.50	1.60	0.8	-	-	2.00	1.20	1.60	-	40
NL12	1812	2	4.80	3.50	3.50	1.80	1.1	-	-	2.80	1.50	3.00	-	160
NL20	2220	3	5.90	5.20	4.30	4±0.2	0.7±0.2	-	-	4.50	2.00	4.00	-	300
NL05 (L)	0805	1	2.29	1.73	1.00	0.51	-	0.44	1.02	1.78	1.02	0.76	1.27	14
NL03 (C)	0603	1	1.80	1.20	1.10	0.45	-	0.33	0.95	1.02	1.64	0.64	1.05	9.6
NL05 (C)	0805	1	2.40	1.71	1.45	0.65	-	0.44	1.02	1.78	1.02	0.76	1.27	14
NL08 (C)	1008	1	2.92	2.79	2.10	1.30	-	0.45	1.52	2.54	1.02	1.27	2.03	30
NL12 (C)	1812	2	4.80	3.50	3.50	1.40	1.1	-	-	2.80	1.50	3.00	-	160
NL20 (C)	2220	3	5.90	5.20	4.30	4±0.2	0.7±0.2	-	-	4.50	2.00	4.00	-	300

■ Color Coding

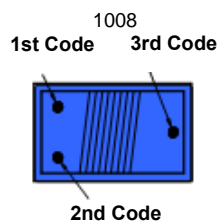
0603 / 0805 / 1008 Type

Because of small sizes, these parts are marked with a single color dot.

The inductance value represented by the dot is shown on the data page for each type.



Color Coding



Color Coding

Standard Electrical Specifications

NL03 Wire Wound Chip Inductors (Ferrite) / Standard Type

Codes	Inductance (μH)	Tolerance	Test Freq. (MHz)	Q typ.	SRF (MHz) typ.	DCR (Ω) max.	IDC (mA) max.	Color Code
1R0	1.0	±10, ±20%	7.96	16	390	0.416	860	Black
1R5	1.5	±10, ±20%	7.96	16	160	0.520	720	Brown
1R8	1.8	±10, ±20%	7.96	16	121	0.559	640	Red
2R2	2.2	±10, ±20%	7.96	16	103	0.728	600	Orange
2R7	2.7	±10, ±20%	7.96	16	72	0.806	540	Yellow
3R3	3.3	±10, ±20%	7.96	16	66	0.910	500	Green
3R9	3.9	±10, ±20%	7.96	16	61	1.079	460	Blue
4R7	4.7	±10, ±20%	7.96	16	51	1.261	400	Violet
5R6	5.6	±10, ±20%	7.96	16	47	1.430	380	Gray
6R8	6.8	±10, ±20%	7.96	16	43	1.950	340	White
8R2	8.2	±10, ±20%	7.96	16	40	2.184	300	Black
100	10	±10, ±20%	2.52	14	36	2.405	280	Brown
120	12	±10, ±20%	2.52	14	32	2.964	260	Red
150	15	±10, ±20%	2.52	14	29	3.380	240	Orange
180	18	±10, ±20%	2.52	14	28	3.770	220	Yellow
220	22	±10, ±20%	2.52	14	24	4.693	200	Green
270	27	±10, ±20%	2.52	14	20	6.760	140	Blue
330	33	±10, ±20%	2.52	14	15	8.580	120	Violet

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL05 Wire Wound Chip Inductors (Ferrite) / Standard Type

Codes	Inductance (μH)	Tolerance	Test Freq. (MHz)	Q min.	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.	Color Code
R11	0.11	±10%	25.2	25	1200	0.05	2000	White
R12	0.12	±5, ±10%	25.2	20	700	0.18	1100	Violet
R15	0.15	±5, ±10%	25.2	20	900	0.18	1100	Gray
R18	0.18	±5, ±10%	25.2	20	600	0.20	800	Black
R22	0.22	±5, ±10%	25.2	20	550	0.25	700	Brown
R27	0.27	±5, ±10%	25.2	20	550	0.38	700	Red
R33	0.33	±5, ±10%	25.2	20	550	0.35	650	Orange
R39	0.39	±5, ±10%	25.2	20	420	0.35	600	Yellow
R47	0.47	±5, ±10%	25.2	20	350	0.45	600	Green
R56	0.56	±5, ±10%	25.2	20	300	0.45	550	Blue
R62	0.62	±5, ±10%	25.2	30	640	0.45	980	Brown
R68	0.68	±5, ±10%	25.2	20	300	0.60	500	Violet
R82	0.82	±5, ±10%	25.2	20	300	0.55	500	Gray
R91	0.91	±5, ±10%	25.2	30	500	0.55	900	Yellow
1R0	1.0	±5, ±10%	7.96	15	280	0.80	450	White
1R2	1.2	±5, ±10%	7.96	15	280	0.90	400	Black
1R5	1.5	±5, ±10%	7.96	15	250	1.05	350	Brown
1R8	1.8	±5, ±10%	7.96	15	120	1.00	350	Red
2R2	2.2	±5, ±10%	7.96	15	110	1.10	320	Orange
2R7	2.7	±5, ±10%	7.96	15	70	1.20	320	Yellow
3R3	3.3	±5, ±10%	7.96	15	60	1.50	300	Green
3R9	3.9	±5, ±10%	7.96	15	55	1.75	300	Blue
4R7	4.7	±5, ±10%	7.96	15	45	2.10	200	Violet
5R6	5.6	±5, ±10%	7.96	15	40	2.30	250	Gray
6R8	6.8	±5, ±10%	7.96	15	36	2.70	200	White
8R2	8.2	±5, ±10%	7.96	15	33	3.30	180	Black
100	10	±5, ±10%	2.52	10	30	4.50	180	Brown
120	12	±5, ±10%	2.52	16	37	2.80	220	Red
150	15	±5, ±10%	2.52	16	30	3.80	200	Orange
180	18	±5, ±10%	2.52	16	23	4.48	180	Yellow
220	22	±5, ±10%	2.52	16	20	6.30	160	Green
270	27	±5, ±10%	2.52	16	19	6.85	140	Blue
330	33	±5, ±10%	2.52	16	18	7.60	120	Violet
390	39	±5, ±10%	2.52	15	16	8.20	100	Gray

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL08 Wire Wound Chip Inductors (Ferrite) / Standard Type

Codes	Inductance (μH)	Tolerance	Test Freq. (MHz)	Q typ.	SRF (MHz) typ.	DCR (Ω) max.	IDC (mA) max.	Color Code		
R12	0.12	±5, ±10%	25.2	26	800	0.30	1000	Brown	Red	Brown
R18	0.18	±5, ±10%	25.2	30	600	0.30	960	Red	Gray	Brown
R20	0.20	±5, ±10%	25.2	30	735	0.30	960	Red	Black	Brown
R22	0.22	±5, ±10%	25.2	27	600	0.40	880	Red	Red	Brown
R27	0.27	±5, ±10%	25.2	29	425	0.42	900	Red	Violet	Brown
R33	0.33	±5, ±10%	25.2	30	400	0.42	900	Orange	Orange	Brown
R39	0.39	±5, ±10%	25.2	30	375	0.45	700	Orange	White	Brown
R47	0.47	±5, ±10%	25.2	30	350	0.50	900	Yellow	Violet	Brown
R56	0.56	±5, ±10%	25.2	30	325	0.55	850	Green	Blue	Brown
R62	0.62	±5, ±10%	25.2	30	460	0.55	900	Blue	Red	Brown
R68	0.68	±5, ±10%	25.2	30	300	0.55	800	Blue	Gray	Brown
R75	0.75	±5, ±10%	25.2	30	420	0.65	880	Violet	Green	Brown
R82	0.82	±5, ±10%	25.2	30	260	0.65	700	Gray	Red	Brown
R91	0.91	±5, ±10%	25.2	30	400	0.65	840	White	Brown	Brown
1R0	1.0	±5, ±10%	7.96	25	245	0.60	600	Brown	Black	Red
1R2	1.2	±5, ±10%	7.96	25	230	0.74	600	Brown	Red	Red
1R5	1.5	±5, ±10%	7.96	25	182	0.85	550	Brown	Green	Red
1R8	1.8	±5, ±10%	7.96	25	135	0.92	500	Brown	Gray	Red
2R2	2.2	±5, ±10%	7.96	25	105	1.10	500	Red	Red	Red
2R7	2.7	±5, ±10%	7.96	25	70	1.22	350	Red	Violet	Red
3R3	3.3	±5, ±10%	7.96	25	55	1.37	350	Orange	Orange	Red
3R9	3.9	±5, ±10%	7.96	25	48	1.66	310	Orange	White	Red
4R7	4.7	±5, ±10%	7.96	25	43	1.68	300	Yellow	Violet	Red
5R6	5.6	±5, ±10%	7.96	25	42	1.75	300	Green	Blue	Red
6R8	6.8	±5, ±10%	7.96	25	39	1.85	300	Blue	Gray	Red
8R2	8.2	±5, ±10%	7.96	25	36	2.00	250	Gray	Red	Red
100	10	±5, ±10%	2.52	20	33	2.32	250	Brown	Black	Orange
120	12	±5, ±10%	2.52	15	28	2.99	200	Brown	Red	Orange
150	15	±5, ±10%	2.52	15	24	3.42	200	Brown	Green	Orange
180	18	±5, ±10%	2.52	15	20	4.65	180	Brown	Gray	Orange
220	22	±5, ±10%	2.52	15	18	5.12	180	Red	Red	Orange
270	27	±5, ±10%	2.52	15	17	5.76	160	Red	Violet	Orange
330	33	±5, ±10%	2.52	15	16	6.44	120	Orange	Orange	Orange
390	39	±5, ±10%	2.52	15	15	6.85	120	Orange	White	Orange
470	47	±5, ±10%	2.52	14	13	9.94	110	Yellow	Violet	Orange
560	56	±5, ±10%	2.52	14	10	10.7	90	Green	Blue	Orange
680	68	±5, ±10%	2.52	14	8	12.8	90	Blue	Gray	Orange
820	82	±5, ±10%	2.52	14	8	18.3	80	Gray	Red	Orange
101	100	±5, ±10%	1	8	7	19.6	120	Brown	Black	Orange

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL10 Wire Wound Chip Inductors (Ferrite) / Standard Type

Codes	Inductance (μH)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.
R18	0.18	±20%	25.2	30	400	0.28	450
R22	0.22	±20%	25.2	30	350	0.32	450
R27	0.27	±20%	25.2	30	320	0.36	450
R33	0.33	±20%	25.2	30	300	0.40	450
R39	0.39	±20%	25.2	30	250	0.45	450
R47	0.47	±20%	25.2	30	220	0.50	450
R56	0.56	±20%	25.2	30	180	0.55	450
R68	0.68	±20%	25.2	30	160	0.60	450
R82	0.82	±20%	25.2	30	140	0.65	450
1R0	1.0	±10%	7.96	30	120	0.70	400
1R2	1.2	±10%	7.96	30	100	0.75	390
1R5	1.5	±10%	7.96	30	85	0.85	370
1R8	1.8	±10%	7.96	30	80	0.90	350
2R2	2.2	±10%	7.96	30	75	1.00	320
2R7	2.7	±10%	7.96	30	70	1.10	290
3R3	3.3	±10%	7.96	30	60	1.20	260
3R9	3.9	±10%	7.96	30	55	1.30	250
4R7	4.7	±10%	7.96	30	50	1.50	220
5R6	5.6	±10%	7.96	30	45	1.60	200
6R8	6.8	±10%	7.96	30	40	1.80	180
8R2	8.2	±10%	7.96	30	35	2.00	170
100	10	±10%	2.52	30	30	2.10	150
120	12	±10%	2.52	30	20	2.50	140
150	15	±10%	2.52	30	20	2.80	130
180	18	±10%	2.52	30	20	3.30	120
220	22	±10%	2.52	30	20	3.70	110
270	27	±10%	2.52	30	20	5.00	80
330	33	±10%	2.52	30	17	5.60	70
390	39	±10%	2.52	30	16	6.40	65
470	47	±10%	2.52	30	15	7.00	60
560	56	±10%	2.52	30	13	8.00	55
680	68	±10%	2.52	30	12	9.00	50
820	82	±10%	2.52	30	11	10.00	45
101	100	±10%	0.796	20	10	10.00	40
121	120	±10%	0.796	20	10	11.00	70
151	150	±10%	0.796	20	8	15.00	65
181	180	±10%	0.796	20	7	17.00	60
221	220	±10%	0.796	20	7	21.00	50

- L, Q: HP4291 for 0.18μH~82μH; HP4284 for 100μH~220μH
- SRF: HP4291
- RDC: Agilent 34401A

NL12 Wire Wound Chip Inductors (Ferrite) / Standard Type

Codes	Inductance (μH)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.
R18	0.18	±20%	25.2	30	220	0.24	700
R22	0.22	±20%	25.2	30	200	0.25	665
R27	0.27	±20%	25.2	30	180	0.26	635
R33	0.33	±20%	25.2	30	165	0.28	605
R39	0.39	±20%	25.2	30	150	0.30	575
R47	0.47	±20%	25.2	30	145	0.32	545
R56	0.56	±20%	25.2	30	140	0.36	520
R68	0.68	±20%	25.2	30	135	0.40	500
R82	0.82	±20%	25.2	30	130	0.45	475
1R0	1.0	±10%	7.96	50	100	0.50	450
1R2	1.2	±10%	7.96	50	80	0.55	430
1R5	1.5	±10%	7.96	50	70	0.60	410
1R8	1.8	±10%	7.96	50	60	0.65	390
2R2	2.2	±10%	7.96	50	55	0.70	380
2R7	2.7	±10%	7.96	50	50	0.75	370
3R3	3.3	±10%	7.96	50	45	0.80	355
3R9	3.9	±10%	7.96	50	40	0.90	330
4R7	4.7	±10%	7.96	50	35	1.00	315
5R6	5.6	±10%	7.96	50	33	1.10	300
6R8	6.8	±10%	7.96	50	27	1.20	285
8R2	8.2	±10%	7.96	50	25	1.40	270
100	10	±10%	2.52	50	20	1.60	250
120	12	±10%	2.52	50	18	2.00	225
150	15	±10%	2.52	50	17	2.50	200
180	18	±10%	2.52	50	15	2.80	190
220	22	±10%	2.52	50	13	3.20	180
270	27	±10%	2.52	50	12	3.60	170
330	33	±10%	2.52	50	11	4.00	160
390	39	±10%	2.52	50	10	4.50	150
470	47	±10%	2.52	50	10	5.00	140
560	56	±10%	2.52	50	9	5.50	135
680	68	±10%	2.52	50	9	6.00	130
820	82	±10%	2.52	50	8	7.00	120
101	100	±10%	0.796	40	8	8.00	110
121	120	±10%	0.796	40	6	8.00	110
151	150	±10%	0.796	40	5	9.00	105
181	180	±10%	0.796	40	5	9.50	102
221	220	±10%	0.796	40	4	10.0	100
271	270	±10%	0.796	30	4	15.0	92
331	330	±10%	0.796	30	3.5	15.0	85
391	390	±10%	0.796	30	3	18.0	80
471	470	±10%	0.796	30	3	26.0	62
561	560	±10%	0.796	30	3	30.0	50
681	680	±10%	0.796	30	3	30.0	50
821	820	±10%	0.796	30	2.5	43.0	30

- L, Q: HP4291 for 0.18μH–82μH; HP4284 for 100μH–820μH
- SRF: HP4291
- RDC: Agilent 34401A

NL20 Wire Wound Chip Inductors (Ferrite) / Standard Type

Codes	Inductance (mH)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.
122	1.2	$\pm 5, \pm 10\%$	0.252	20	1.5	17	75
152	1.5	$\pm 5, \pm 10\%$	0.252	20	1.4	20	70
182	1.8	$\pm 5, \pm 10\%$	0.252	20	1.3	30	60
222	2.2	$\pm 5, \pm 10\%$	0.252	20	1.2	35	55
272	2.7	$\pm 5, \pm 10\%$	0.252	20	1.1	55	45
332	3.3	$\pm 5, \pm 10\%$	0.252	20	1.0	60	40
392	3.9	$\pm 5, \pm 10\%$	0.252	20	1.0	70	38
472	4.7	$\pm 5, \pm 10\%$	0.252	20	0.9	78	36
562	5.6	$\pm 5, \pm 10\%$	0.252	20	0.8	85	33
682	6.8	$\pm 5, \pm 10\%$	0.252	20	0.7	110	30
822	8.2	$\pm 5, \pm 10\%$	0.252	20	0.6	125	28
103	10	$\pm 5, \pm 10\%$	0.0796	15	0.5	150	25

- L, Q: HP4284
- SRF: HP4291
- RDC: Agilent 34401A

Low Profile Electrical Specifications

NL05 Wire Wound Chip Inductors (Ferrite) / **Low Profile Type**

Codes	Inductance (μ H)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.
1R0	1.0	$\pm 5, \pm 10\%$	15	L: 7.96 / Q: 25.2	115	0.90	450
3R3	3.3	$\pm 5, \pm 10\%$	13	7.96	70	1.40	450
4R7	4.7	$\pm 5, \pm 10\%$	15	7.96	65	1.90	400
6R8	6.8	$\pm 5, \pm 10\%$	15	7.96	41	2.40	400
100	10	$\pm 5, \pm 10\%$	14	7.96	31	2.70	400
150	15	$\pm 5, \pm 10\%$	12	7.96	28	5.00	300
220	22	$\pm 5, \pm 10\%$	10	7.96	25	6.00	250

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

Large Current Electrical Specifications

NL03 Wound Chip Inductors (Ferrite) / **Large Current Type**

Codes	Inductance (μH)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.	Color Code
47N	0.047	±10%	12	7.96	2000	0.075	1800	White
51N	0.051	±10%	12	7.96	1500	0.075	1800	Violet
68N	0.068	±10%	12	7.96	1500	0.12	1800	Gray
72N	0.072	±10%	12	7.96	1500	0.12	1800	Brown
R10	0.10	±10%	12	7.96	1150	0.13	1700	Black
R12	0.12	±5, ±10%	12	7.96	1100	0.15	1700	Orange
R15	0.15	±5, ±10%	15	7.96	1050	0.15	1600	Brown
R18	0.18	±5, ±10%	15	7.96	950	0.15	1500	Green
R22	0.22	±5, ±10%	15	7.96	900	0.30	1200	Red
R24	0.24	±5, ±10%	15	7.96	850	0.16	1460	Green
R27	0.27	±5, ±10%	15	7.96	835	0.30	1460	Yellow
R33	0.33	±5, ±10%	15	7.96	725	0.40	1420	Orange
R39	0.39	±5, ±10%	15	7.96	680	0.41	1400	Blue
R47	0.47	±5, ±10%	15	7.96	640	0.43	1400	Black
R56	0.56	±5, ±10%	15	7.96	630	0.44	1400	Brown
R68	0.68	±5, ±10%	15	7.96	510	0.52	1340	Red
R78	0.78	±5, ±10%	15	7.96	465	0.63	1300	Orange
R82	0.82	±5, ±10%	15	7.96	460	0.69	1200	Yellow
1R0	1.0	±5, ±10%	15	7.96	320	0.81	1100	Green
1R2	1.2	±5, ±10%	15	7.96	270	0.87	1000	Blue
1R5	1.5	±5, ±10%	15	7.96	230	0.96	920	Violet
1R8	1.8	±5, ±10%	15	7.96	210	1.10	900	Gray
2R2	2.2	±5, ±10%	15	7.96	115	1.20	740	White
2R7	2.7	±5, ±10%	15	7.96	100	1.38	700	Black
3R3	3.3	±5, ±10%	15	7.96	84	1.50	680	Brown
3R9	3.9	±5, ±10%	15	7.96	75	1.50	600	Red
4R7	4.7	±5, ±10%	15	7.96	67	2.10	580	Orange
5R6	5.6	±5, ±10%	15	7.96	55	2.37	540	Yellow
6R8	6.8	±5, ±10%	15	7.96	48	3.10	500	Green
7R8	7.8	±5, ±10%	15	7.96	40	3.35	460	Blue
8R2	8.2	±5, ±10%	15	7.96	38	3.50	440	Violet
100	10	±5, ±10%	15	7.96	32	4.46	400	Gray

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL05 Wire Wound Chip Inductors (Ferrite) / **Large Current Type**

Codes	Inductance (µH)	Tolerance	Test Freq. (MHz)	Q typ.	SRF (MHz) typ.	DCR (Ω) max.	IDC (mA) max.	Color Code
R47	0.47	±10, ±20%	25.2	14	850	0.156	1400	Blue
R68	0.68	±10, ±20%	25.2	14	765	0.195	1200	Gray
1R0	1.00	±10, ±20%	7.96	14	208	0.169	1100	Black
1R2	1.20	±10, ±20%	7.96	14	159	0.208	960	Red
1R5	1.50	±10, ±20%	7.96	14	159	0.221	920	Brown
1R8	1.80	±10, ±20%	7.96	14	112	0.260	860	Orange
2R2	2.20	±10, ±20%	7.96	13	87	0.286	740	Red
2R7	2.70	±10, ±20%	7.96	13	72	0.325	680	Yellow
3R3	3.30	±10, ±20%	7.96	12	70	0.364	620	Orange
3R9	3.90	±10, ±20%	7.96	14	61	0.494	580	Green
4R7	4.70	±10, ±20%	7.96	14	51	0.559	520	Yellow
5R6	5.60	±10, ±20%	7.96	12	47	0.650	480	Blue
6R8	6.80	±10, ±20%	7.96	14	46	0.884	420	Green
8R2	8.20	±10, ±20%	7.96	13	33	0.949	400	Violet
100	10	±5, ±10, ±20%	2.52	14	31	1.105	360	Blue
120	12	±5, ±10, ±20%	2.52	14	30	1.17	340	Gray
150	15	±5, ±10, ±20%	2.52	15	28	1.82	300	Violet
180	18	±5, ±10, ±20%	2.52	15	27	2.01	280	White
220	22	±5, ±10, ±20%	2.52	15	20	2.28	240	Gray
270	27	±5, ±10, ±20%	2.52	15	17	2.60	220	Black
330	33	±5, ±10, ±20%	2.52	15	17	3.05	200	White
470	47	±5, ±10, ±20%	2.52	14	15	4.42	160	Black
560	56	±5, ±10, ±20%	2.52	14	10	5.74	150	Yellow
680	68	±5, ±10, ±20%	2.52	14	10	5.78	140	Brown
820	82	±5, ±10, ±20%	2.52	14	10	9.75	100	Orange
101	100	±5, ±10, ±20%	1	10	9	9.75	100	Red

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL08 Wire Wound Chip Inductors (Ferrite) / Large Current Type

Codes	Inductance (μ H)	Tolerance	Q typ.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.	Color Code		
								1st	2nd	3rd
R22	0.22	$\pm 5, \pm 10\%$	35	25.2	800	0.15	2600	Red	Red	Brown
R47	0.47	$\pm 5, \pm 10\%$	35	25.2	460	0.20	2400	Yellow	Violet	Brown
R68	0.68	$\pm 5, \pm 10\%$	35	25.2	400	0.30	2200	Blue	Gray	Brown
R82	0.82	$\pm 5, \pm 10\%$	35	25.2	360	0.35	1800	Gray	Red	Brown
1R0	1.0	$\pm 5, \pm 10\%$	22	7.96	245	0.35	800	Brown	Black	Red
1R2	1.2	$\pm 5, \pm 10\%$	25	7.96	230	0.40	550	Brown	Red	Red
1R5	1.5	$\pm 5, \pm 10\%$	25	7.96	182	0.45	550	Brown	Green	Red
1R8	1.8	$\pm 5, \pm 10\%$	25	7.96	135	0.55	550	Brown	Gray	Red
2R2	2.2	$\pm 5, \pm 10\%$	22	7.96	105	0.60	500	Red	Red	Red
2R7	2.7	$\pm 5, \pm 10\%$	25	7.96	70	0.70	500	Red	Violet	Red
3R3	3.3	$\pm 5, \pm 10\%$	22	7.96	55	0.75	450	Orange	Orange	Red
3R9	3.9	$\pm 5, \pm 10\%$	25	7.96	50	0.80	450	Orange	White	Red
4R7	4.7	$\pm 5, \pm 10\%$	22	7.96	45	0.90	400	Yellow	Violet	Red
5R6	5.6	$\pm 5, \pm 10\%$	22	7.96	42	1.05	400	Green	Blue	Red
6R8	6.8	$\pm 5, \pm 10\%$	22	7.96	40	1.05	400	Blue	Gray	Red
8R2	8.2	$\pm 5, \pm 10\%$	22	7.96	36	1.30	350	Gray	Red	Red
100	10	$\pm 5, \pm 10\%$	20	2.52	35	1.55	300	Brown	Black	Orange
120	12	$\pm 5, \pm 10\%$	20	2.52	30	2.10	280	Brown	Red	Orange
150	15	$\pm 5, \pm 10\%$	20	2.52	24	2.38	250	Brown	Green	Orange
180	18	$\pm 5, \pm 10\%$	20	2.52	20	2.60	200	Brown	Gray	Orange
220	22	$\pm 5, \pm 10\%$	20	2.52	18	2.92	200	Red	Red	Orange
330	33	$\pm 5, \pm 10\%$	20	2.52	16	4.10	180	Orange	Orange	Orange
470	47	$\pm 5, \pm 10\%$	23	2.52	17	7.80	350	Yellow	Violet	Orange
101	100	$\pm 5, \pm 10\%$	13	1	4	13.2	200	Brown	Black	Yellow
221	220	$\pm 5, \pm 10\%$	13	1	3	26.5	140	Red	Red	Yellow
331	330	$\pm 5, \pm 10\%$	13	1	2	32.5	110	Orange	Orange	Yellow

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL12 Wire Wound Chip Inductors (Ferrite) / **Large Current Type**

Codes	Inductance (μH)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.
1R0	1.0	±10%	10	7.96	200	0.11	1050
1R2	1.2	±10%	10	7.96	160	0.12	1000
1R5	1.5	±10%	10	7.96	130	0.15	950
1R8	1.8	±10%	10	7.96	100	0.16	900
2R2	2.2	±10%	10	7.96	80	0.18	850
2R7	2.7	±10%	10	7.96	60	0.20	800
3R3	3.3	±10%	10	7.96	45	0.22	750
3R9	3.9	±10%	10	7.96	40	0.24	700
4R7	4.7	±10%	10	7.96	35	0.27	650
5R6	5.6	±10%	10	7.96	30	0.30	650
6R8	6.8	±10%	10	7.96	28	0.35	600
8R2	8.2	±10%	10	7.96	25	0.40	600
100	10	±10%	10	2.52	22	0.50	550
120	12	±10%	10	2.52	21	0.60	500
150	15	±10%	10	2.52	20	0.70	450
180	18	±10%	10	2.52	19	0.80	400
220	22	±10%	10	2.52	18	0.90	370
270	27	±10%	10	2.52	16	1.20	330
330	33	±10%	10	2.52	14	1.40	300
390	39	±10%	10	2.52	12	1.60	280
470	47	±10%	10	2.52	11.5	1.90	260
560	56	±10%	10	2.52	11	2.20	240
680	68	±10%	10	2.52	10	2.60	220
820	82	±10%	10	2.52	9	3.50	200
101	100	±10%	20	0.796	8	4.00	180
121	120	±10%	20	0.796	7.5	4.50	160
151	150	±10%	20	0.796	7	6.50	140
181	180	±10%	20	0.796	6.5	7.50	120
221	220	±10%	20	0.796	5.5	9.00	120
271	270	±10%	20	0.796	5	11.0	100
331	330	±10%	20	0.796	4	13.0	90
391	390	±10%	20	0.796	3.8	23.0	80
471	470	±10%	20	0.796	3.5	26	75
561	560	±10%	20	0.796	2.8	30	70
681	680	±10%	20	0.796	2.6	40	65
821	820	±10%	20	0.796	2.5	45	60

- L, Q: HP4291
- SRF: HP4291
- RDC: Agilent 34401A

NL20 Wire Wound Chip Inductors (Ferrite) / Large Current Type

Codes	Inductance (μH)	Tolerance	Q min.	Test Freq. (MHz)	SRF (MHz) min.	DCR (Ω) max.	IDC (mA) max.
1R0	1.0	±10, ±20%	10	7.96	95	0.03	1800
1R2	1.2	±10, ±20%	10	7.96	70	0.035	1700
1R5	1.5	±10, ±20%	10	7.96	55	0.04	1600
1R8	1.8	±10, ±20%	10	7.96	47	0.05	1400
2R2	2.2	±10, ±20%	10	7.96	42	0.06	1300
2R7	2.7	±10, ±20%	10	7.96	37	0.07	1200
3R3	3.3	±10, ±20%	10	7.96	34	0.08	1120
3R9	3.9	±10, ±20%	10	7.96	32	0.09	1050
4R7	4.7	±10, ±20%	10	7.96	29	0.11	950
5R6	5.6	±10, ±20%	10	7.96	26	0.13	880
6R8	6.8	±10, ±20%	10	7.96	24	0.15	810
8R2	8.2	±10, ±20%	10	7.96	22	0.18	750
100	10	±10, ±20%	10	2.52	19	0.21	690
120	12	±10, ±20%	10	2.52	17	0.25	630
150	15	±10, ±20%	10	2.52	16	0.30	580
180	18	±10, ±20%	10	2.52	14	0.36	530
220	22	±5, ±10%	10	2.52	13	0.43	480
270	27	±5, ±10%	10	2.52	11.5	0.52	440
330	33	±5, ±10%	10	2.52	10.5	0.62	400
390	39	±5, ±10%	10	2.52	9.5	0.72	370
470	47	±5, ±10%	10	2.52	8.5	0.85	340
560	56	±5, ±10%	10	2.52	7.8	1.00	310
680	68	±5, ±10%	10	2.52	7.0	1.2	290
820	82	±5, ±10%	10	2.52	6.4	1.4	270
101	100	±5, ±10%	20	0.796	6.0	1.6	250
121	120	±5, ±10%	20	0.796	5.4	1.9	230
151	150	±5, ±10%	20	0.796	4.8	2.2	210
181	180	±5, ±10%	20	0.796	4.4	2.8	190
221	220	±5, ±10%	20	0.796	3.9	3.4	170
271	270	±5, ±10%	20	0.796	3.6	4.2	155
331	330	±5, ±10%	20	0.796	3.2	4.9	140
391	390	±5, ±10%	20	0.796	2.9	5.8	130
471	470	±5, ±10%	20	0.796	2.6	7.0	120
561	560	±5, ±10%	20	0.796	2.4	8.5	110
681	680	±5, ±10%	20	0.796	2.2	10	100
821	820	±5, ±10%	20	0.796	2.0	13	90
102	1000	±5, ±10%	20	0.252	1.8	15	85

- L, Q: HP4291 for 1.0μH~82μH; HP4284 for 100μH~1000μH
- SRF: HP4291
- RDC: Agilent 34401A

■ Environmental Characteristics

Electrical Performance Test

Item	Requirement	Test Method
Inductance	Refer to standard electrical characteristic spec.	HP4291 or HP4284
Q		HP4291 or HP4284
SRF		HP4291
DC Resistance DCR		Agilent 34401A
Rated Current IDC		Applied the current to coils, The inductance change should be less than 10% to initial value

Mechanical Performance Test

Item	Requirement	Test Method
Solderability	The electrodes shall be at least 90% covered with new solder coating	Lead-free inductor: after fluxing(alpha 100 or equiv), inductor shall be dipped in a melted solder bath at 245±5°C, 5±0.5 seconds
Resistance to Soldering Heat	Appearance: No damage	Pre-heating: 150°C, 1min. Solder Temperature: 260±5°C Immersion Time: 10±1 seconds
Vibration	Appearance: No damage L change: within±10% Q change: within±30% DCR: within specification	Test device shall be soldered on the substrate Oscillation Frequency: 10 to 55 to 10Hz for 1 min. Amplitude: 1.5 mm Time: 2 hrs for each axis (X, Y&Z), total 6 hrs

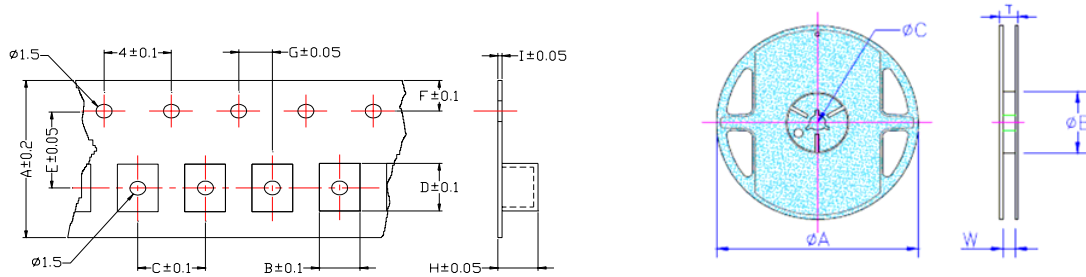
Climatic Test

Item	Requirement	Test Method															
Temperature Cycle	Appearance: No damage L change: within±10% Q change: within±30% DCR: within specification	One cycle: <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25±3</td> <td>30</td> </tr> <tr> <td>2</td> <td>25±2</td> <td>3</td> </tr> <tr> <td>3</td> <td>85±3</td> <td>30</td> </tr> <tr> <td>4</td> <td>25±2</td> <td>3</td> </tr> </tbody> </table> Total: 100 cycles Measured after exposure in the room condition for 24 hrs	Step	Temperature (°C)	Time (min.)	1	-25±3	30	2	25±2	3	3	85±3	30	4	25±2	3
Step		Temperature (°C)	Time (min.)														
1		-25±3	30														
2		25±2	3														
3	85±3	30															
4	25±2	3															
Damp Heat with Load	Temperature: 40±2°C Relative Humidity: 90 ~ 95% Time: 1000 hrs Measured after exposure in the room condition for 24 hrs																
High Temperature Storage	Temperature: 85±3°C Relative Humidity: 20% Applied Current: Rated Current Time: 1000 hrs Measured after exposure in the room condition for 24 hrs																
Low Temperature Storage	Temperature: -25±3°C Relative Humidity: 0% Time: 1000 hrs Measured after exposure in the room condition for 24 hrs																

■ Storage Temperature: 25±3°C; Humidity < 80%RH

■ Packaging

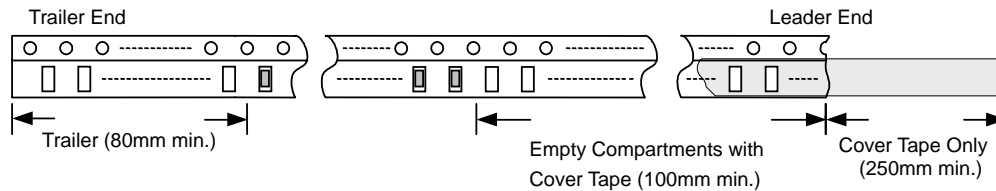
Dimensions



Unit: mm

Type	Tape Dimensions									Reel Dimensions					Quantity /Reel
	A	B	C	D	E	F	G	H	J	ΦA	ΦB	ΦC	W	T	
NL03	8	1.25	4	1.90	3.5	1.75	2	1.00	0.23	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	4,000
NL05	8	1.85	4	2.55	3.5	1.75	2	1.45	0.23	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	2,000
NL08	8	2.80	4	2.95	3.5	1.75	2	2.22	0.23	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	2,000
NL10	8	2.96	4	3.60	3.5	1.75	2	2.40	0.23	178±2.0	60±0.5	13±0.3	9±0.3	12±1.0	2,000
NL12	12	3.30	8	5.00	5.5	1.75	2	3.50	0.30	178±2.0	80±0.5	13±0.3	13.2±0.3	16±1.0	500
NL20	16	5.35	12	6.10	7.5	1.75	2	5.50	0.35	330±2.0	100±0.5	13±0.3	17.4±0.3	22±1.0	1,000

Leader / Trailer Tape



Cover Tape Peel Strength

The force for tearing off cover tape is 0.1~0.6 (N) in the arrow direction at the following conditions:

Temperature: 5~35°C

Humidity: 45~85%

Atmospheric Pressure: 860~1060 hpa

