

Miniature Surface Mount Chip Inductors / NLH TYPE

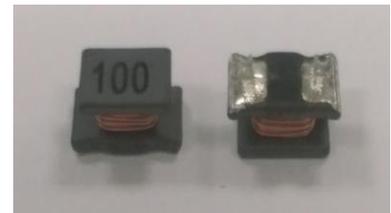
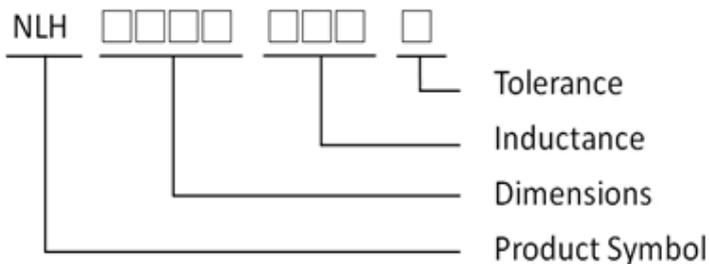
Features:

1. RoHS compliant
2. Miniature chip inductors wound on a special ferrite core
3. High Q value at high frequencies and low DC resistance
4. Wide inductance range
5. Excellent solder heat resistance
6. Both flow and reflow soldering methods can be employed

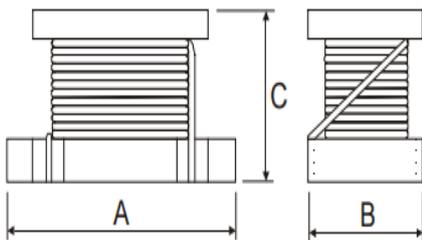
Applications:

1. Personal, cordless phone
2. High Freq. communication products
3. GPS
4. Personal computers

Product Identification :



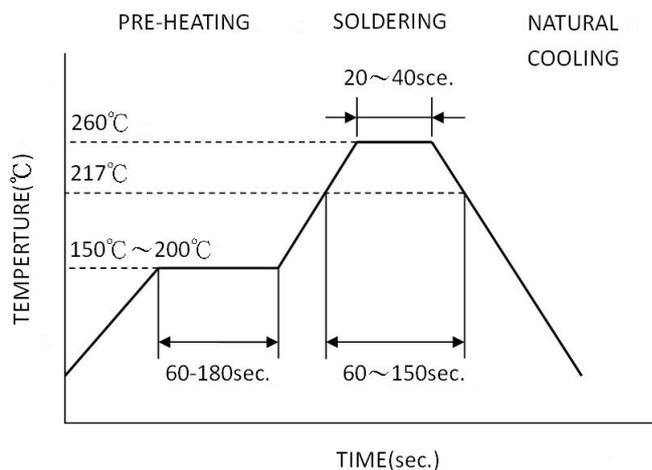
Shape and Dimension



Dimensions in mm

TYPE	A(mm)	B(mm)	C(mm)
NLH322520	3.2±0.3	2.5±0.2	2.0±0.2
NLH453226	4.5±0.3	3.2±0.2	2.6±0.2

Recommended Reflow Soldering Conditions (For Lead Free)



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Electrical Characteristics (NLH32250 TYPE)

Part No.	Inductance (μ H)	Tolerance	L/Q Test Freq.	Q Min	RDC (Ω)Max.	Rated (mA)	SRF (MHz) Min.
NLH322520T-1R0□	1	20%	1MHz/1MHz	20	0.5	445	100
NLH322520T-1R2□	1.2	20%	1MHz/1MHz	20	0.6	425	100
NLH322520T-1R5□	1.5	10%/20%	1MHz/1MHz	20	0.6	400	75
NLH322520T-1R8□	1.8	10%/20%	1MHz/1MHz	20	0.7	390	60
NLH322520T-2R2□	2.2	10%/20%	1MHz/1MHz	20	0.8	370	50
NLH322520T-2R7□	2.7	10%/20%	1MHz/1MHz	20	0.9	320	43
NLH322520T-3R3□	3.3	10%/20%	1MHz/1MHz	20	1	300	38
NLH322520T-3R9□	3.9	10%/20%	1MHz/1MHz	20	1.1	290	35
NLH322520T-4R7□	4.7	10%/20%	1MHz/1MHz	20	1.2	270	31
NLH322520T-5R6□	5.6	10%/20%	1MHz/1MHz	20	1.3	250	28
NLH322520T-6R8□	6.8	10%/20%	1MHz/1MHz	20	1.5	240	25
NLH322520T-8R2□	8.2	10%/20%	1MHz/1MHz	20	1.6	225	23
NLH322520T-100□	10	10%/20%	1MHz/1MHz	35	1.8	190	20
NLH322520T-120□	12	10%/20%	1MHz/1MHz	35	2	180	18
NLH322520T-150□	15	10%/20%	1MHz/1MHz	35	2.2	170	16
NLH322520T-180□	18	5%/10%	1MHz/1MHz	35	2.5	165	15
NLH322520T-220□	22	5%/10%/20%	1MHz/1MHz	35	2.8	150	14
NLH322520T-270□	27	10%/20%	1MHz/1MHz	35	3.1	125	13
NLH322520T-330□	33	10%/20%	1MHz/1MHz	40	3.5	115	12
NLH322520T-390□	39	10%/20%	1MHz/1MHz	40	3.9	110	11
NLH322520T-470□	47	10%/20%	1MHz/1MHz	40	4.3	100	11
NLH322520T-560□	56	10%/20%	1MHz/1MHz	40	4.9	85	10
NLH322520T-680□	68	10%/20%	1MHz/1MHz	40	5.5	80	9
NLH322520T-820□	82	5%/10%/20%	1MHz/1MHz	40	6.2	70	8.5
NLH322520T-101□	100	5%/10%/20%	1MHz/796kHz	40	7	80	8
NLH322520T-121□	120	10%/20%	1MHz/796kHz	40	8	75	7.5
NLH322520T-151□	150	10%/20%	1MHz/796kHz	40	9.3	70	7
NLH322520T-181□	180	10%/20%	1MHz/796kHz	40	10.2	65	6
NLH322520T-221□	220	10%/20%	1MHz/796kHz	40	11.8	65	5.5
NLH322520T-271□	270	10%/20%	1MHz/796kHz	40	12.5	65	5
NLH322520T-331□	330	10%/20%	1MHz/796kHz	40	13	65	5
NLH322520T-391□	390	10%/20%	1MHz/796kHz	50	22	50	5
NLH322520T-471□	470	10%/20%	1MHz/796kHz	50	25	45	5
NLH322520T-561□	560	5%/10%/20%	1MHz/796kHz	50	28	40	2

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Electrical Characteristics (NLH453226 TYPE)

Part No.	Inductance (μ H)	Tolerance	L/Q Test Freq.	Q Min	RDC (Ω)Max.	Rated (mA)	SRF (MHz) Min.
NLH453226T-1R0□	1	20%	1MHz/1MHz	20	0.2	500	120
NLH453226T-1R2□	1.2	20%	1MHz/1MHz	20	0.2	500	100
NLH453226T-1R5□	1.5	20%	1MHz/1MHz	20	0.3	500	85
NLH453226T-1R8□	1.8	20%	1MHz/1MHz	20	0.3	500	75
NLH453226T-2R2□	2.2	20%	1MHz/1MHz	20	0.3	500	62
NLH453226T-2R7□	2.7	20%	1MHz/1MHz	20	0.32	500	53
NLH453226T-3R3□	3.3	20%	1MHz/1MHz	20	0.35	500	47
NLH453226T-3R9□	3.9	20%	1MHz/1MHz	20	0.38	500	41
NLH453226T-4R7□	4.7	10%/20%	1MHz/1MHz	30	0.4	500	38
NLH453226T-5R6□	5.6	10%/20%	1MHz/1MHz	30	0.47	500	33
NLH453226T-6R8□	6.8	10%/20%	1MHz/1MHz	30	0.5	450	31
NLH453226T-8R2□	8.2	10%/20%	1MHz/1MHz	30	0.56	450	27
NLH453226T-100□	10	5%/10%/20%	1MHz/1MHz	35	0.56	400	23
NLH453226T-120□	12	5%/10%/20%	1MHz/1MHz	35	0.62	380	21
NLH453226T-150□	15	5%/10%/20%	1MHz/1MHz	35	0.73	360	19
NLH453226T-180□	18	5%/10%/20%	1MHz/1MHz	35	0.82	340	17
NLH453226T-220□	22	5%/10%/20%	1MHz/1MHz	35	0.94	320	15
NLH453226T-270□	27	5%/10%/20%	1MHz/1MHz	35	1.1	300	14
NLH453226T-330□	33	5%/10%/20%	1MHz/1MHz	35	1.2	270	12
NLH453226T-390□	39	5%/10%/20%	1MHz/1MHz	35	1.4	240	11
NLH453226T-470□	47	5%/10%/20%	1MHz/1MHz	35	1.5	220	10
NLH453226T-560□	56	5%/10%/20%	1MHz/1MHz	35	1.7	200	9.3
NLH453226T-680□	68	5%/10%/20%	1MHz/1MHz	35	1.9	180	8.4
NLH453226T-820□	82	5%/10%/20%	1MHz/1MHz	35	2.2	170	7.5
NLH453226T-101□	100	5%/10%/20%	1MHz/0.796MHz	40	2.5	160	6.8
NLH453226T-121□	120	5%/10%/20%	1MHz/0.796MHz	40	3	150	6.2
NLH453226T-151□	150	5%/10%/20%	1MHz/0.796MHz	40	3.7	130	5.5
NLH453226T-181□	180	5%/10%/20%	1MHz/0.796MHz	40	4.5	120	5
NLH453226T-221□	220	5%/10%/20%	1MHz/0.796MHz	40	5.4	110	4.5
NLH453226T-271□	270	5%/10%/20%	1MHz/0.796MHz	40	6.8	100	4
NLH453226T-331□	330	5%/10%/20%	1MHz/0.796MHz	40	8.2	95	3.6
NLH453226T-391□	390	5%/10%/20%	1MHz/0.796MHz	40	9.7	90	3.3
NLH453226T-471□	470	5%/10%/20%	1KHz/0.796MHz	40	11.8	80	3
NLH453226T-561□	560	5%/10%/20%	1KHz/0.796MHz	40	14.5	70	2.7
NLH453226T-681□	680	5%/10%/20%	1KHz/0.796MHz	40	17.5	65	2.5
NLH453226T-821□	820	5%/10%/20%	1KHz/0.796MHz	40	20.5	60	2.2
NLH453226T-102□	1000	5%/10%/20%	1KHz/0.252MHz	40	25	50	2
NLH453226T-122□	1200	5%/10%/20%	1KHz/0.252MHz	40	30	45	1.8
NLH453226T-152□	1500	5%/10%/20%	1KHz/0.252MHz	40	37	40	1.6
NLH453226T-182□	1800	5%/10%/20%	1KHz/0.252MHz	40	45	35	1.5
NLH453226T-222□	2200	5%/10%/20%	1KHz/0.252MHz	40	50	30	1.3

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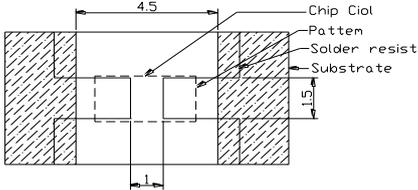
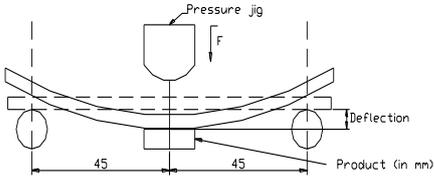
Note:

1. Tolerance : J= $\pm 5\%$, K = $\pm 10\%$, M = $\pm 20\%$
2. Operating temperature range – $40^{\circ}\text{C} \sim 125^{\circ}\text{C}$ (Including self - temperature rise)
3. Rated Current: Self temperature rise shall be limited to 35°C Max. Inductance drop 10% typ.
4. .L/Q Test OSC @1V

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4. Reliability and Test Conditions(可靠性測試條件)

1-1.Mechanical Performance

Item	Specification	Test Method
Shear Test	Chip coil shall not be damaged after tested as test method	Substrate: Glass-epoxy substrate  Solder:Sn/Ag3.0/Cu0.5 Applied Direction:  Force : 10N Hold Duration:5s±1s
Bending Test		Substrate:Glass-epoxy substrate(100mm*40mm*1.6mm) speed of Applying Force:1mm/s Deflection:2mm Hold Duration:30s 
Vibration		Oscillation Frequency:10Hz to 55 Hz to 10 hZ for 1 min Total Amplitude:1.5mm Testing Time:A period of 2 hours in each of 3 mutually perpendicular directions(Total 6 hours)
Solderability	The wetting area of the electrode shall be at least 90% covered with new solder coating	Solder:Sn/Ag3.0/Cu0.5 per-Heating:150°C±10°C/1min to 2min solder Temperature:245°C±5°C Immersion Time:4s±1s
Resistance to Soldering Heat	Apperance:No damage	Solder:Sn/Ag3.0/Cu0.5 per-Heating:150°C±10°C/1min to 2min solder Temperature:260°C±5°C Immersion Time:10s±1s
Resistance to solvent	There must be no change in appearance or obliteration of marking.	Inductors must withstand 6 minutes of alcohol or water.

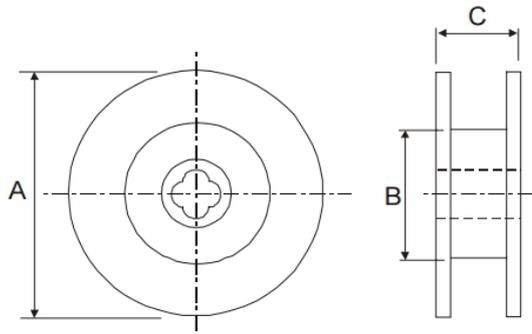
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1-2.Environmental Performance

Item	Specification	Test Method														
Heat Resistance	Appearance: No damage Inductance Change: within $\pm 10\%$ Q change : within $\pm 30\%$	Temperature: $85^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Time: 1000h Then measured after exposure in the room Condition for 24h ± 2 h														
Cold Resistance		Temperature: $-25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Time: 1000h Then measured after exposure in the room Condition for 24h ± 2 h														
Humidity		Temperature: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Humidity: 90%(RH) to 95%(RH) Time: 1000h Then measures after exposure in the room Condition for 24h ± 2 h														
Temperature Cycle		One cycle: <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature ($^{\circ}\text{C}$)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40</td> <td>30</td> </tr> <tr> <td>2</td> <td>25 ± 2</td> <td>3</td> </tr> <tr> <td>3</td> <td>125 ± 3</td> <td>30</td> </tr> <tr> <td>4</td> <td>25 ± 2</td> <td>3</td> </tr> </tbody> </table> Total: 100cycles Measured after exposure in the room condition for 24hrs	Step	Temperature ($^{\circ}\text{C}$)	Time (min)	1	-40	30	2	25 ± 2	3	3	125 ± 3	30	4	25 ± 2
Step	Temperature ($^{\circ}\text{C}$)	Time (min)														
1	-40	30														
2	25 ± 2	3														
3	125 ± 3	30														
4	25 ± 2	3														

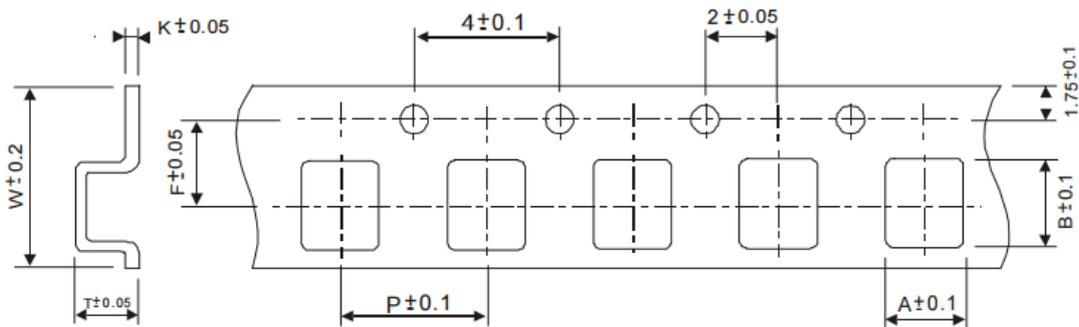
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.Packing Specifications



Dimensions in mm

TYPE	A	B	C
NLH322520	12.0	5.0	8.0
NLH453226	16.0	5.0	8.0



TYPE	Packaging Quantity	Tape and Reel Dimension(mm)						
	Pcs / Reel	A	B	T	W	P	F	K
NLH322520	2000	2.88	3.65	2.5	8	4	3.5	0.22
NLH453226	500	3.31	4.88	3.45	12	8	5.5	0.35

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.Packaging -Cover tape

