

- Features:**
- Wirewound of ferrite core miniature chip inductor
 - VLH322515/322520/453226 are high Q value at high frequency and low DC resistance
 - VLH322520C/453226C are low DC resistance, high current capacity and high impedance characteristics. They are excellent for using as a choke coil in DC power supply circuits
 - RoHS compliant – lead free



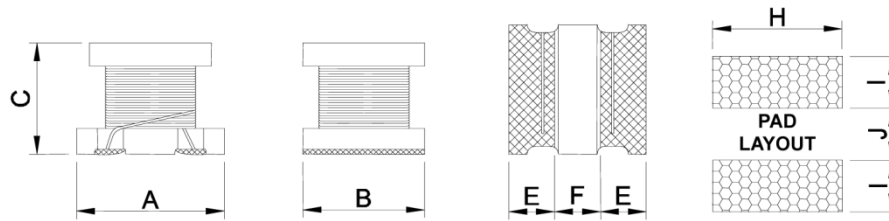
- Applications:**
- Pagers, cordless phones
 - High frequency communication products
 - Personal computers
 - Disk drives and computer peripherals
 - DC power supply circuits

Inductance and Current Ranges		
Type	Inductance (μH)	Current Range (A)
VLH252010	1.00 ~ 22	2.20 ~ 0.50
VLH252012	1.00 ~ 22	2.80 ~ 0.55
VLH252510	1.00 ~ 22	2.30 ~ 0.51
VLH322515	1.00 ~ 100	1.00 ~ 0.10
VLH322520	1.00 ~ 560	0.445 ~ 0.04
VLH453226	1.00 ~ 2200	0.50 ~ 0.03
VLH322515C	0.47 ~ 120	3.40 ~ 0.17
VLH322520C	1.00 ~ 560	1.00 ~ 0.06
VLH453226C	1.00 ~ 470	1.08 ~ 0.09
VLH575047C	0.12 ~ 10000	6.00 ~ 0.05

Electrical specifications at 25°C

How to Order

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
V	L	H	4	5	3	2	2	6	C	-	1	0	1	K
Product Series		Code		Dimension		Special		Special		Inductance		Tolerance		
VLH	SMD Choke Chip	252010	2.5x2.0x1.02	Code	Description	Code	Description	Code	Inductance	Code	Tol			
		252012	2.5x2.0x1.2	Blank	General Use	-	Standard	R12	0.12μH	J	± 5%			
		252510	2.5x2.5x1.05	C	Choke Use	S	Shielded	120	12μH	K	± 10%			
		322515(C)	3.2x2.5x1.55					101	100μH	M	± 20%			
		322520(C)	3.2x2.5x2.0					102	1000μH	N	± 30%			
		453226(C)	4.5x3.2x2.6											
		575047(C)	5.7x5.0x4.7											



Mechanical Specifications									
Type / Code	A	B	C	E	F	H	I	J	Unit
252010	0.098 ± 0.008 2.50 ± 0.20	0.079 ± 0.008 2.00 ± 0.20	0.040 max. 1.02 max.	0.031 ref. 0.80 ref.	-	0.079 2.00	0.033 0.85	0.031 0.80	inches mm
252012	0.098 ± 0.008 2.50 ± 0.20	0.079 ± 0.008 2.00 ± 0.20	0.047 max. 1.20 max.	0.031 ref. 0.80 ref.	-	0.079 2.00	0.033 0.85	0.031 0.80	inches mm
252510	0.098 ± 0.008 2.50 ± 0.20	0.098 ± 0.008 2.50 ± 0.20	0.041 max. 1.05 max.	0.035 ref. 0.90 ref.	0.028 ref. 0.70 ref.	0.098 2.50	0.047 1.20	0.031 0.80	inches mm
322515(C)	0.126 ± 0.012 3.20 ± 0.30	0.098 ± 0.008 2.50 ± 0.20	0.061 ± 0.012 1.55 ± 0.30	0.041 ± 0.012 1.05 ± 0.30	0.041 ± 0.012 1.05 ± 0.30	0.079 2.00	0.059 1.50	0.039 1.00	inches mm
322520(C)	0.126 ± 0.012 3.20 ± 0.30	0.098 ± 0.008 2.50 ± 0.20	0.079 ± 0.012 2.00 ± 0.30	0.028 min. 0.70 min.	0.028 min. 0.70 min.	0.079 2.00	0.059 1.50	0.039 1.00	inches mm
453226(C)	0.177 ± 0.012 4.50 ± 0.30	0.126 ± 0.008 3.20 ± 0.20	0.102 ± 0.016 2.60 ± 0.40	0.039 min. 1.00 min.	0.039 min. 1.00 min.	0.118 3.00	0.079 2.00	0.047 1.20	inches mm
575047(C)	0.224 ± 0.012 5.70 ± 0.30	0.197 ± 0.012 5.00 ± 0.30	0.185 ± 0.012 4.70 ± 0.30	0.051 min. 1.30 min.	0.067 min. 1.70 min.	0.197 5.00	0.079 2.00	0.079 2.00	inches mm

Performance Characteristics	
Type, Code	Maximum
252010, 252012, 252510, 322515(C)	Rated DC Current (I sat): The current when the inductance becomes 30% typical its initial value (Ta=25°C)
	Temperature Rise Current (I rms): The actual current when the temperature of coil becomes ΔT=40°C (Ta=25°C)
	Operating temperature range: -40 ~ 105°C
322520(C), 453226(C), 575047C	Rated DC Current: The current when the inductance becomes 10% lower than its initial value or the current when the temperature of coil increases ΔT20°C. The smaller one is defined as Rated DC Current. (Ta=25°C)
	Operating temperature range: -40 ~ 85°C

Electrical Specifications – VLH252010							
Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) max.	I rms (A) typical	I sat (A) typical	Marking Code
1R0	1.0	M	1MHz, 0.1V	0.121	2.20	2.20	A
1R5	1.5	M	1MHz, 0.1V	0.193	1.80	1.90	B
2R2	2.2	M	1MHz, 0.1V	0.232	1.68	1.60	C
3R3	3.3	M	1MHz, 0.1V	0.372	1.34	1.20	D
4R7	4.7	M	1MHz, 0.1V	0.548	1.00	1.00	E
5R6	5.6	M	1MHz, 0.1V	0.626	0.90	0.90	F
6R8	6.8	M	1MHz, 0.1V	0.778	0.90	0.90	G
100	10	M	1MHz, 0.1V	1.036	0.80	0.70	H
220	22	M	1MHz, 0.1V	2.391	0.50	0.50	I

Electrical Specifications – VLH252012

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) max.	I rms (A) typical	I sat (A) typical	Marking Code
1R0	1.0	M	1MHz, 0.1V	0.137	2.20	2.80	A
1R5	1.5	M	1MHz, 0.1V	0.190	1.86	2.20	B
2R2	2.2	M	1MHz, 0.1V	0.285	1.70	1.80	C
3R3	3.3	M	1MHz, 0.1V	0.454	1.20	1.30	D
4R7	4.7	M	1MHz, 0.1V	0.659	1.04	1.10	E
5R6	5.6	M	1MHz, 0.1V	0.685	1.00	1.10	F
6R8	6.8	M	1MHz, 0.1V	0.988	0.94	0.94	G
100	10	M	1MHz, 0.1V	1.190	0.84	0.82	H
220	22	M	1MHz, 0.1V	2.743	0.54	0.55	I

Electrical Specifications – VLH252510

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) typical	I rms (A) typical	I sat (A) typical
1R0	1.0	M	1MHz, 0.1V	0.085	1.90	2.30
1R5	1.5	M	1MHz, 0.1V	0.115	1.50	1.90
2R2	2.2	M	1MHz, 0.1V	0.168	1.20	1.50
3R3	3.3	M	1MHz, 0.1V	0.239	1.10	1.30
4R7	4.7	M	1MHz, 0.1V	0.316	0.90	1.10
5R6	5.6	M	1MHz, 0.1V	0.420	0.83	0.98
6R8	6.8	M	1MHz, 0.1V	0.487	0.80	0.90
8R2	8.2	M	1MHz, 0.1V	0.548	0.71	0.84
100	10	M	1MHz, 0.1V	0.610	0.68	0.79
220	22	M	1MHz, 0.1V	1.552	0.40	0.51

Electrical Specifications – VLH322515

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	N	1MHz, 0.1V	0.078	1.000
1R5	1.5	N	1MHz, 0.1V	0.068	1.200
2R2	2.2	M	1MHz, 0.1V	0.126	0.790
3R3	3.3	M	1MHz, 0.1V	0.180	0.700
4R7	4.7	K	1MHz, 0.1V	0.195	0.650
100	10	K	1MHz, 0.1V	0.420	0.450
150	15	K	1MHz, 0.1V	0.750	0.300
220	22	K	1MHz, 0.1V	1.000	0.250
330	33	K	1MHz, 0.1V	1.400	0.200
470	47	K	1MHz, 0.1V	2.200	0.170
680	68	K	1MHz, 0.1V	3.200	0.130
101	100	K	1MHz, 0.1V	4.500	0.100

Electrical Specifications – VLH322520

Type / Code	L (μ H)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	M	1MHz, 0.1V	0.50	0.445
1R2	1.2	M	1MHz, 0.1V	0.60	0.425
1R5	1.5	K, M	1MHz, 0.1V	0.60	0.400
1R8	1.8	K, M	1MHz, 0.1V	0.70	0.390
2R2	2.2	K, M	1MHz, 0.1V	0.80	0.370
2R7	2.7	K, M	1MHz, 0.1V	0.90	0.320
3R3	3.3	K, M	1MHz, 0.1V	1.00	0.300
3R9	3.9	K, M	1MHz, 0.1V	1.10	0.290
4R7	4.7	K, M	1MHz, 0.1V	1.20	0.270
5R6	5.6	K, M	1MHz, 0.1V	1.30	0.250
6R8	6.8	K, M	1MHz, 0.1V	1.50	0.240
8R2	8.2	K, M	1MHz, 0.1V	1.60	0.225
100	10	J, K	1MHz, 0.1V	1.80	0.190
120	12	J, K	1MHz, 0.1V	2.00	0.180
150	15	J, K	1MHz, 0.1V	2.20	0.170
180	18	J, K	1MHz, 0.1V	2.50	0.165
220	22	J, K	1MHz, 0.1V	2.80	0.150
270	27	J, K	1MHz, 0.1V	3.10	0.125
330	33	J, K	1MHz, 0.1V	3.50	0.115
390	39	J, K	1MHz, 0.1V	3.90	0.110
470	47	J, K	1MHz, 0.1V	4.30	0.100
560	56	J, K	1MHz, 0.1V	4.90	0.085
680	68	J, K	1MHz, 0.1V	5.50	0.080
820	82	J, K	1MHz, 0.1V	6.20	0.070
101	100	J, K	1MHz, 0.1V	7.00	0.080
121	120	J, K	1MHz, 0.1V	8.00	0.075
151	150	J, K	1MHz, 0.1V	9.30	0.070
181	180	J, K	1MHz, 0.1V	10.20	0.065
221	220	J, K	1MHz, 0.1V	11.80	0.065
271	270	J, K	1MHz, 0.1V	12.50	0.065
331	330	J, K	1MHz, 0.1V	15.00	0.065
391	390	J, K	1MHz, 0.1V	22.00	0.050
471	470	J, K	1KHz, 0.1V	25.00	0.045
561	560	J, K	1KHz, 0.1V	28.00	0.040

Electrical Specifications – VLH453226

Type / Code	L (μ H)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	M	1MHz, 0.1V	0.20	0.500
1R2	1.2	M	1MHz, 0.1V	0.20	0.500
1R5	1.5	M	1MHz, 0.1V	0.30	0.500
1R8	1.8	M	1MHz, 0.1V	0.30	0.500
2R2	2.2	M	1MHz, 0.1V	0.30	0.500
2R7	2.7	M	1MHz, 0.1V	0.32	0.500
3R3	3.3	M	1MHz, 0.1V	0.35	0.500
3R9	3.9	M	1MHz, 0.1V	0.38	0.500
4R7	4.7	K, M	1MHz, 0.1V	0.40	0.500
5R6	5.6	K, M	1MHz, 0.1V	0.47	0.500
6R8	6.8	K, M	1MHz, 0.1V	0.50	0.450
8R2	8.2	K, M	1MHz, 0.1V	0.56	0.450
100	10	J, K	1MHz, 0.1V	0.56	0.400
120	12	J, K	1MHz, 0.1V	0.62	0.380
150	15	J, K	1MHz, 0.1V	0.73	0.360
180	18	J, K	1MHz, 0.1V	0.82	0.340
220	22	J, K	1MHz, 0.1V	0.94	0.320
270	27	J, K	1MHz, 0.1V	1.10	0.300
330	33	J, K	1MHz, 0.1V	1.20	0.270
390	39	J, K	1MHz, 0.1V	1.40	0.240
470	47	J, K	1MHz, 0.1V	1.50	0.220
560	56	J, K	1MHz, 0.1V	1.70	0.200
680	68	J, K	1MHz, 0.1V	1.90	0.180
820	82	J, K	1MHz, 0.1V	2.20	0.170
101	100	J, K	1MHz, 0.1V	2.50	0.160
121	120	J, K	1MHz, 0.1V	3.00	0.150
151	150	J, K	1MHz, 0.1V	3.70	0.130
181	180	J, K	1MHz, 0.1V	4.50	0.120
221	220	J, K	1MHz, 0.1V	5.40	0.110
271	270	J, K	1MHz, 0.1V	6.80	0.100
331	330	J, K	1MHz, 0.1V	8.20	0.095
391	390	J, K	1MHz, 0.1V	9.70	0.090
471	470	J, K	1KHz, 0.1V	11.80	0.080
561	560	J, K	1KHz, 0.1V	14.50	0.070
681	680	J, K	1KHz, 0.1V	17.00	0.065
821	820	J, K	1KHz, 0.1V	20.50	0.060
102	1000	J, K	1KHz, 0.1V	25.00	0.050
122	1200	J, K	1KHz, 0.1V	30.00	0.045
152	1500	J, K	1KHz, 0.1V	37.00	0.040
182	1800	J, K	1KHz, 0.1V	45.00	0.035
222	2200	J, K	1KHz, 0.1V	50.00	0.030

Electrical Specifications – VLH322515C

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) ±20%	I sat (A) max.	I rms (A) max.
R47	0.47	N	1MHz, 0.1V	0.030	3.40	2.55
1R0	1.0	N	1MHz, 0.1V	0.045	2.30	2.05
1R5	1.5	N	1MHz, 0.1V	0.057	1.75	1.75
2R2	2.2	N	1MHz, 0.1V	0.076	1.55	1.60
3R3	3.3	N	1MHz, 0.1V	0.120	1.25	1.20
4R7	4.7	N	1MHz, 0.1V	0.180	1.00	1.00
6R8	6.8	N	1MHz, 0.1V	0.240	0.85	0.85
100	10	M	1MHz, 0.1V	0.380	0.75	0.70
150	15	M	1MHz, 0.1V	0.570	0.60	0.52
220	22	M	1MHz, 0.1V	0.810	0.50	0.45
330	33	M	1MHz, 0.1V	1.150	0.38	0.39
470	47	M	1MHz, 0.1V	1.780	0.33	0.31
680	68	M	1MHz, 0.1V	2.280	0.28	0.275
101	100	M	1MHz, 0.1V	2.700	0.18	0.25
121	120	M	1MHz, 0.1V	4.380	0.17	0.20

Electrical Specifications – VLH322520C

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	M	1MHz, 0.1V	0.078	1.000
2R2	2.2	M	1MHz, 0.1V	0.126	0.790
3R3	3.3	M	1MHz, 0.1V	0.165	0.500
4R7	4.7	M	1MHz, 0.1V	0.195	0.450
6R8	6.8	M	1MHz, 0.1V	0.330	0.450
100	10	M	1MHz, 0.1V	0.572	0.300
220	22	K, M	1MHz, 0.1V	0.923	0.250
470	47	K, M	1MHz, 0.1V	1.690	0.170
101	100	J, K	1MHz, 0.1V	4.550	0.100
151	150	J, K	1MHz, 0.1V	9.100	0.080
221	220	J, K	1MHz, 0.1V	10.920	0.070
331	330	J, K	1MHz, 0.1V	13.000	0.060
391	390	J, K	1MHz, 0.1V	22.100	0.060
471	470	J, K	1MHz, 0.1V	24.700	0.060
561	560	J, K	1MHz, 0.1V	28.600	0.060

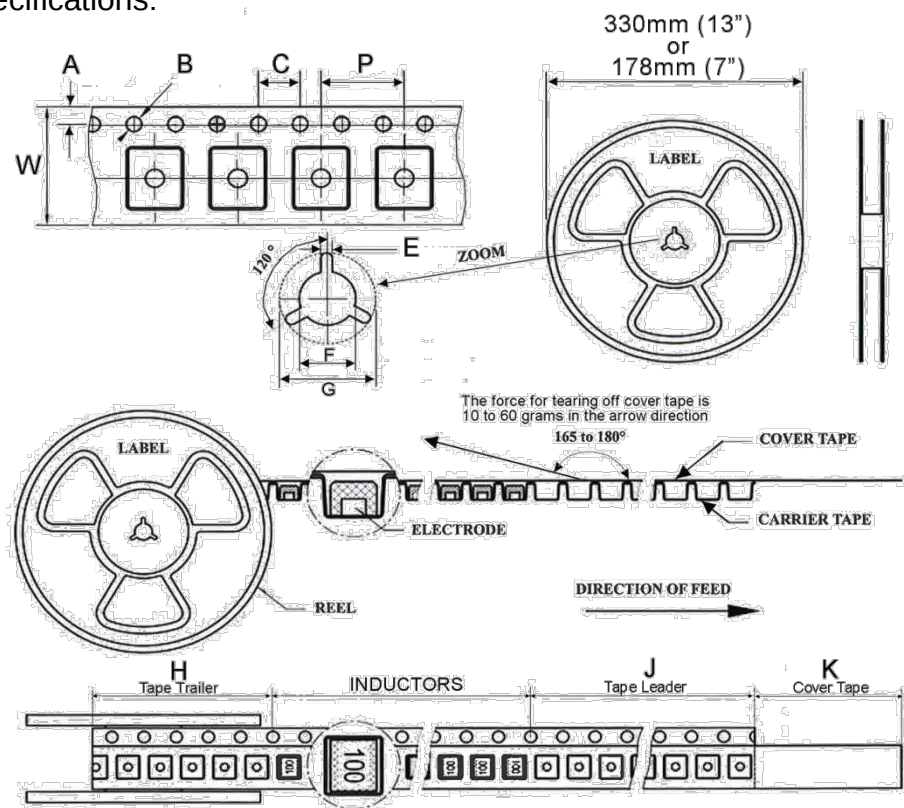
Electrical Specifications – VLH453226C

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	M	1MHz, 0.1V	0.08	1.080
1R5	1.5	M	1MHz, 0.1V	0.09	1.000
2R2	2.2	M	1MHz, 0.1V	0.11	0.900
3R3	3.3	M	1MHz, 0.1V	0.13	0.800
4R7	4.7	K, M	1MHz, 0.1V	0.15	0.750
6R8	6.8	K, M	1MHz, 0.1V	0.20	0.720
100	10	J, K	1MHz, 0.1V	0.24	0.650
150	15	J, K	1MHz, 0.1V	0.32	0.570
220	22	J, K	1MHz, 0.1V	0.60	0.420
330	33	J, K	1MHz, 0.1V	1.00	0.310
470	47	J, K	1MHz, 0.1V	1.10	0.280
680	68	J, K	1MHz, 0.1V	1.70	0.220
101	100	J, K	1MHz, 0.1V	2.20	0.190
151	150	J, K	1MHz, 0.1V	3.50	0.130
221	220	J, K	1MHz, 0.1V	4.00	0.110
331	330	J, K	1MHz, 0.1V	6.80	0.100
471	470	J, K	1KHz, 0.1V	8.50	0.090

Electrical Specifications – VLH575047C

Type / Code	L (uH)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
R12	0.12	M	1MHz, 0.1V	0.0098	6.000
R27	0.27	M	1MHz, 0.1V	0.0140	5.300
R47	0.47	M	1MHz, 0.1V	0.0182	4.800
1R0	1.0	M	1MHz, 0.1V	0.027	4.000
1R5	1.5	M	1MHz, 0.1V	0.031	3.700
2R2	2.2	M	1MHz, 0.1V	0.041	3.200
3R3	3.3	M	1MHz, 0.1V	0.050	2.900
4R7	4.7	M	1MHz, 0.1V	0.574	2.700
6R8	6.8	M	1MHz, 0.1V	0.104	2.000
100	10	K, M	1MHz, 0.1V	0.130	1.700
150	15	K, M	1MHz, 0.1V	0.210	1.400
220	22	K, M	1MHz, 0.1V	0.266	1.200
270	27	K, M	1MHz, 0.1V	0.300	1.000
330	33	K, M	1MHz, 0.1V	0.448	0.900
470	47	K, M	1MHz, 0.1V	0.560	0.800
680	68	K, M	1MHz, 0.1V	0.938	0.640
101	100	K, M	100KHz, 0.1V	1.204	0.560
151	150	K, M	100KHz, 0.1V	2.660	0.420
221	220	K, M	100KHz, 0.1V	3.360	0.320
331	330	K, M	100KHz, 0.1V	6.160	0.270
471	470	K, M	100KHz, 0.1V	7.560	0.240
681	680	K, M	100KHz, 0.1V	11.34	0.190
102	1000	K, M	10KHz, 0.1V	14.42	0.150
222	2200	K, M	10KHz, 0.1V	30.10	0.100
472	4700	K, M	10KHz, 0.1V	61.04	0.070
103	10000	K, M	10KHz, 0.1V	140.00	0.050

Packaging Specifications:



Tape & Reel Specifications

A	B	C	E	F	G	H Tape Trailer	J Tape Leader	K Cover Tape	Unit
0.069 ± 0.004 1.75 ± 0.10	0.059 + 0.004 / -0.000 1.50 + 0.10 / -0.00	0.157 ± 0.004 4.00 ± 0.10	0.098 ± 0.020 2.50 ± 0.50	0.512 ± 0.039 13.00 ± 1.00	0.910 ± 0.040 23.00 ± 1.00	0.910 min. 160.00 min.	0.910 min. 388.00 min.	0.910 min. 250.00 min	inches mm

Type	Packaging		Tape Size		Unit
	7" Reel	13" Reel	W	P	
252010	2,000	-	0.315 8.00	0.157 4.00	inches mm
252012	2,000	-	0.315 8.00	0.157 4.00	inches mm
252510	2,000	-	0.315 8.00	0.157 4.00	inches mm
322515	2,000	-	0.315 8.00	0.157 4.00	inches mm
322520	1,000	-	0.472 12.00	0.315 8.00	inches mm
453226	500	-	0.472 12.00	0.315 8.00	inches mm
575047	-	1000	0.630 16.00	0.472 12.00	inches mm

Environmental Specifications:

General	
Items	Specifications
Shelf Storage Conditions	Temperature range: $25 \pm 3^{\circ}\text{C}$. Humidity <80%, relative humidity Recommended product should be used within six months from the time of delivery.

Environmental Test		
Test Items	Test Conditions / Test Methods	Specifications
High Temperature Storage Test	Temperature: $85 \pm 2^{\circ}\text{C}$ Time: 48 ± 2 hours Tested after 1 hour at room temperature.	No case deformation or change in appearance. $\Delta L/L \leq 10\%$
Low Temperature Storage Test	Temperature: $-25 \pm 2^{\circ}\text{C}$ Time: 48 ± 2 hours Tested after 1 hour at room temperature.	
Humidity Test	Temperature: $40 \pm 2^{\circ}\text{C}$, 90~95% relative humidity Time: 96 ± 2 hours Tested after 1 hour at room temperature.	
Thermal Shock Test	First -25°C 30 minutes then 25°C 10 minutes, last 85°C 30 minutes, as 1 cycle. Go through 5 cycles. Tested after 1 hour at room temperature.	

Mechanical Test		
Test Items	Test Conditions / Test Methods	Specifications
Solderability Test	Product with lead-free terminal: Dip pads in flux then dip in solder pot at $245 \pm 5^{\circ}\text{C}$ for 3 seconds.	Terminal area must have 90% minimum solder coverage.
Resistance to Soldering Heat	Flux should cover the whole of the sample before heating, then be preheated for about 2 minutes over temperature of $130\sim 150^{\circ}\text{C}$ immersing to $260 \pm 5^{\circ}\text{C}$ for 10 seconds.	No case deformation or change in appearance.
Vibration Test	Apply frequency 10~55Hz 1.5mm amplitude in each of perpendicular direction for 2 hours.	No case deformation or change in appearance. $\Delta L/L \leq 10\%$
Shock Resistance	Drop down with 981 m/s ² (100G) shock attitude upon a rubber block method shock testing machine for 1 time in each of three orientations.	

Condition of Reflow:

