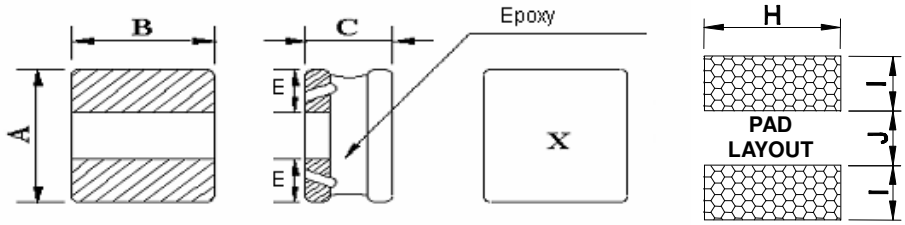
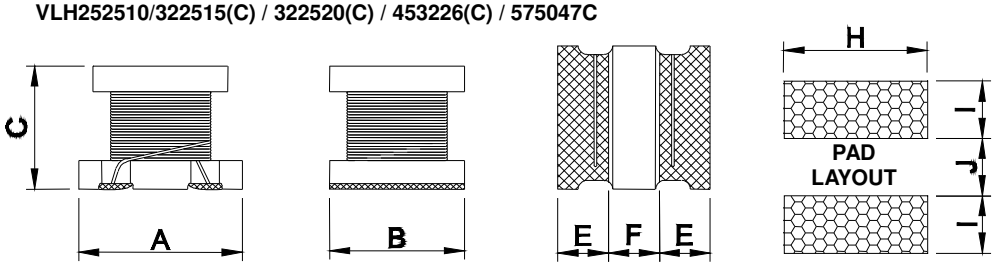
SMD Power Inductor

VLH252010E / 252012E



VLH252510/322515(C) / 322520(C) / 453226(C) / 575047C



■Dimensions

Unit: mm

Type	A	B	C	E	F	H	I	J
252010E	2.5±0.2	2.0±0.2	1.02 max	0.8 ref	-	2.0	0.85	0.8
252012E	2.5±0.2	2.0±0.2	1.20 max	0.8 ref	-	2.0	0.85	0.8
252510	2.5±0.2	2.5±0.2	1.05 max	0.9 ref	0.7 ref	2.5	1.2	0.8
322515(C)	3.2±0.3	2.5±0.2	1.55±0.3	1.05±0.3	1.05±0.3	2.0	1.5	1.0
322520(C)	3.2±0.3	2.5±0.2	2.0±0.3	0.7min.	0.7min.	2.0	1.5	1.0
453226(C)	4.5±0.3	3.2±0.2	2.6±0.4	1.0min.	1.0min.	3.0	2.0	1.2
575047C	5.7±0.3	5.0±0.3	4.7±0.3	1.3min.	1.7min.	5.0	2.0	2.0

■Features

- The miniature chip inductors is wound on a special ferrite core.
- VLH322515/322520/453226 are low DC resistance.
- VLH322520C/453226C/565047C 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.

■Applications

- Pagers, Cordless Phone
- High Frequency Communication Products
- Personal Computers
- Disk Drives And Computer Peripherals
- DC Power Supply Circuits

■Characteristics for252010E/ 252012E/252510/322515C

- Rated DC Current(I sat): The current when the inductance becomes 30% typical its initial value (Ta=25℃)
- Temperature Rise Current(I rms): The actual current when the temperature of coil becomes Δ T40℃.. (Ta=25℃)
- Operating temperature range: -40～105℃

■Inductance and rated current ranges

VLH252010E	1.00～22μH	2.20～0.50A
VLH252012E	1.00～22μH	2.80～0.55A
VLH252510	1.00～22μH	2.30～0.51A
VLH322515	1.00～100μH	1.00～0.1A
VLH322520	1.00～560μH	0.445～0.04A
VLH453226	1.00～2200μH	0.50～0.03A
VLH322515C	0.47～120μH	3.40～0.17A
VLH322520C	1.00～560μH	1.00～0.06A
VLH453226C	1.00～470μH	1.08～0.09A
VLH575047C	0.12～10000μH	6.00～0.05A

- Test equipment:
  L&Q: HP4285A Precision LCR meter
  DCR: Milli-ohm meter
- Electrical specifications at 25℃

■Characteristics except 252010E/252012E/252510/322515C

- Rated DC Current: The current when the inductance becomes 10% lower than its initial value or the current when the temperature of coil increases Δ T20℃. The smaller one is defined as Rated DC Current. (Ta=25℃)
- Operating temperature range: -40～105℃

■Product Identification

VLH	453226	C	-	101	K
Product Type	Dimensions (AxBxC)	Use	Appearance	Inductance	Inductance Tolerance
	252010: 2.5x2.0x1.02 252012: 2.5x2.0x1.2 252510: 2.5x2.5x1.05 322515: 3.2x2.5x1.55 322520: 3.2x2.5x2.0 453226: 4.5x3.2x2.6 575047: 5.7x5.0x4.7	C: Choke Use : General Use	- : Standard E: Epoxy	1R0: 1.0μH 470: 47μH 101: 100μH	J: ±5% K: ±10% M: ±20% N: ±30%

■Electrical Characteristics

VLH252010E Type

Codes	L (μH)	Tolerance	Test Condition	DCR (Ω) max..	I rms(A) max.	I sat(A) max.	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

VLH252012E Type

Codes	L (μH)	Tolerance	Test Condition	DCR (Ω) max.	I rms(A) max.	I sat(A) max.	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

VLH252510- Type

Codes	L (μH)	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 Characteristics

VLH322515- Type

Codes	L (μH)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.	SRF (MHz) min.
1R0	1.0	N	1MHz, 0.1V	0.078	1.000	100
1R5	1.5	N	1MHz, 0.1V	0.068	1.200	100
2R2	2.2	M	1MHz, 0.1V	0.126	0.790	64
3R3	3.3	M	1MHz, 0.1V	0.180	0.700	50
4R7	4.7	M	1MHz, 0.1V	0.195	0.650	43
100	10	K	1MHz, 0.1V	0.420	0.450	26
150	15	K	1MHz, 0.1V	0.750	0.300	22
220	22	K	1MHz, 0.1V	1.000	0.250	19
330	33	K	1MHz, 0.1V	1.400	0.200	17
470	47	K	1MHz, 0.1V	2.200	0.170	13
680	68	K	1MHz, 0.1V	3.200	0.130	9
101	100	K	1MHz, 0.1V	4.500	0.100	8

VLH322520- Type

Codes	L (μH)	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 Characteristics

VLH453226- Type

Codes	L (μH)	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 Characteristics

VLH322515C- Type

Codes	L (μH)	Tolerance	Test Condition	DCR (Ω) ±20%	Isat (A) max.	Irms (A) max.	SRF (MHz) min.
R47	0.47	N	1MHz, 0.1V	0.030	3.40	2.55	100
1R0	1.0	N	1MHz, 0.1V	0.045	2.30	2.05	100
1R5	1.5	N	1MHz, 0.1V	0.057	1.75	1.75	70
2R2	2.2	N	1MHz, 0.1V	0.076	1.55	1.60	70
3R3	3.3	N	1MHz, 0.1V	0.120	1.25	1.20	50
4R7	4.7	N	1MHz, 0.1V	0.180	1.00	1.00	40
6R8	6.8	N	1MHz, 0.1V	0.240	0.85	0.85	40
100	10	M	1MHz, 0.1V	0.380	0.75	0.70	30
150	15	M	1MHz, 0.1V	0.570	0.60	0.52	20
220	22	M	1MHz, 0.1V	0.810	0.50	0.45	20
330	33	M	1MHz, 0.1V	1.150	0.38	0.39	13
470	47	M	1MHz, 0.1V	1.780	0.33	0.31	11
680	68	M	1MHz, 0.1V	2.280	0.28	0.275	11
101	100	M	1MHz, 0.1V	2.700	0.18	0.250	8
121	120	M	1MHz, 0.1V	4.380	0.17	0.200	8

VLH322520C- Type

Codes	L (μH)	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	10.92	0.070
331	330	J, K	1MHz, 0.1V	13.00	0.060
391	390	J, K	1MHz, 0.1V	22.10	0.060
471	470	J, K	1MHz, 0.1V	24.70	0.060
561	560	J, K	1MHz, 0.1V	28.60	0.060

VLH453226C- Type

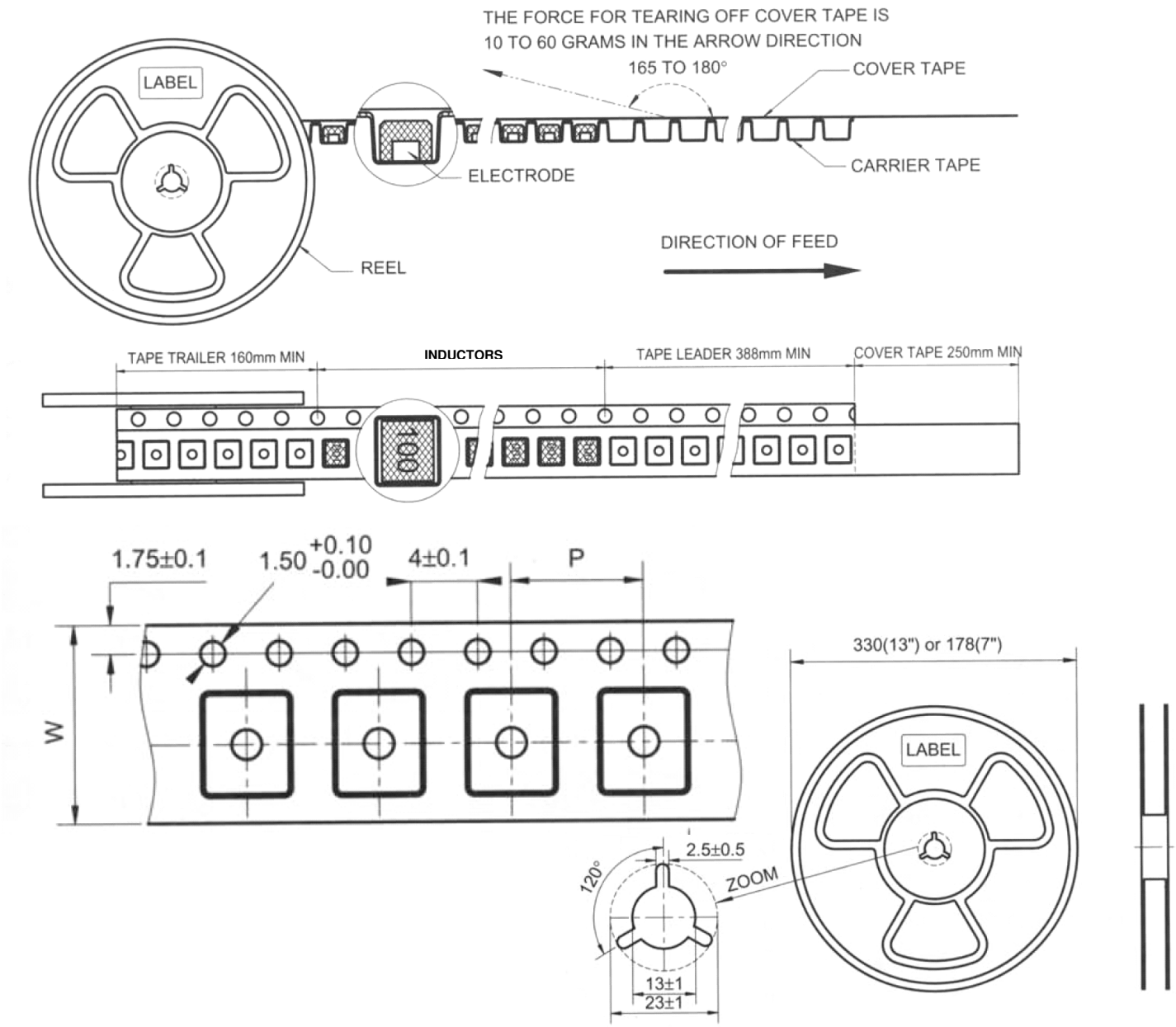
Codes	L (μH)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	M	1MHz, 0.1V	0.08	1.080
1R5	1.5	M	1MHz, 0.1V	0.09	1.000
2R2	2.2	M	1MHz, 0.1V	0.11	0.900
3R3	3.3	M	1MHz, 0.1V	0.13	0.800
4R7	4.7	K, M	1MHz, 0.1V	0.15	0.750
6R8	6.8	K, M	1MHz, 0.1V	0.20	0.720
100	10	J, K	1MHz, 0.1V	0.24	0.650
150	15	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 Characteristics

VLH575047C- Type

Codes	L (μH)	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	0.0270	4.000
1R5	1.5	M	1MHz, 0.1V	0.0310	3.700
2R2	2.2	M	1MHz, 0.1V	0.0410	3.200
3R3	3.3	M	1MHz, 0.1V	0.0500	2.900
4R7	4.7	M	1MHz, 0.1V	0.0574	2.700
6R8	6.8	M	1MHz, 0.1V	0.1040	2.000
100	10	K, M	1MHz, 0.1V	0.1300	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	140.0	0.050

■Tape and Reel specifications



Unit: mm

Type	Tape size		Parts Per Reel	
	W	P	7″	13″
252010E	8	4	2000	-
252012E	8	4	2000	-
252510	8	4	2000	-
322515	8	4	2000	-
322520	12	8	1000	-
453226	12	8	500	-
575047	16	12	-	1000

■SMD Power Inductor Environmental Specifications

General

Items	Specifications
Shelf Storage conditions	Temperature range: 25±3℃; Humidity: <80% relative humidity. Recommended product should be used within six months from the time of delivery.

Environmental test

Test Items	Specifications	Test Conditions / Test Methods
High temperature Storage test	No case deformation or change in appearance. △L/L≦10%	Temperature 85±2℃, Time: 48±2 hours, Tested after 1hour at room temperature.
Low temperature Storage test		Temperature -25±2℃, Time: 48±2 hours, Tested after 1hour at room temperature.
Humidity test		Temperature 40±2℃, 90~95% relative humidity Time: 96±2 hours Tested after 1hour at room temperature.
Thermal shock test		First -25℃ 30minutes then 25℃ 10 minutes last 85℃ 30 minutes, as 1 cycle. Go through 5 cycles. Tested after 1 hour at room temperature.

Mechanical test

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

The condition of reflow (recommendation)