



● Features

- I The miniature chip inductors is wound on a special ferrite core
- II VLH322515/322520/453226 are low DC resistance.
- III 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

- I Pagers, Cordless Phone.
- II High Frequency Communication Products
- III Personal Computers.
- IV Disk Drives And Computer Peripherals
- V DC Power Supply Circuits

● Characteristics for 252010E/ 252012E/252510/322515C

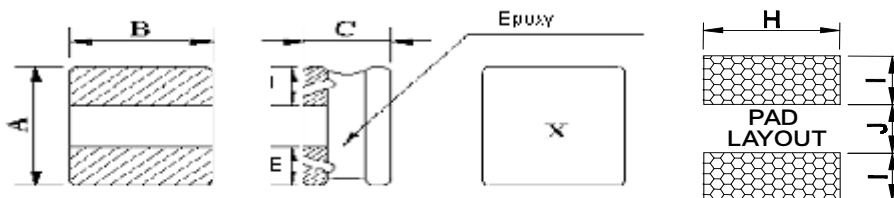
- I Rated DC Current(I sat): The current when the inductance becomes 30% typical its initial value (Ta=25°C)
- II Temperature Rise Current(I rms): The actual current when the temperature of coil becomes $\Delta T 40^{\circ}\text{C}$.. (Ta=25°C)
- III Operating temperature range: -4~105°C

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

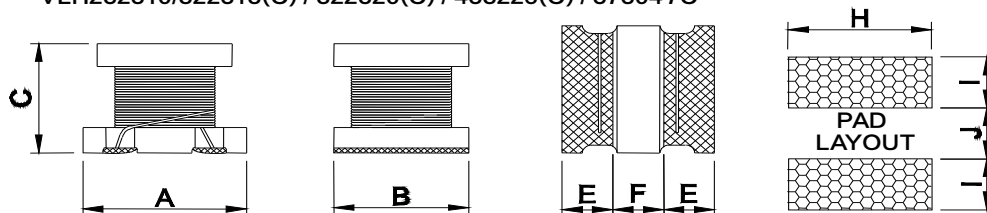
- I Rated DC Current: The current when the inductance becomes 10% lower than its initial value or the current when the temperature of coil increases $\Delta T 20^{\circ}\text{C}$. The smaller one is defined as Rated DC Current. (Ta=25° C)
- II Operating temperature range: -40 ~ 105° C

● Dimensions

VLH252010E / 252012E



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



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

● Reference Standards

JISC 5201-1

Ordering Information

Example:

VLH	453226	C	-	101	K
(1)	(2)	(3)	(4)	(5)	(6)
Series Name	Dimensions (AxBxC)	Use	Appearance	Inductance	Inductance Tolerance

(1)Type: VLH SERIES

(2)Dimensions(AxBxC) : 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

(3)Use: C: Choke Use: General Use

(4)Appearance: - : Standard ,E: Epoxy

(5)Inductance : 1R0= 1.0 μ H,470= 47 μ H,101= 100 μ H

(6)InductanceToleranceJ: \pm 5%,K: \pm 10%,M: \pm 20%,N: \pm 30%

Inductance and rated current ranges

VLH252010E	1.00 ~22 μ H	2.20~ 0.50A
VLH252012E	1.00 ~22 μ H	2.80~ 0.55A
VLH252510	1.00 ~22 μ H	2.30~ 0.51A
VLH322515	1.00 ~100 μ H	1.00 ~ 0.1A
VLH322520	1.00 ~560 μ H	0.445~0.04A
VLH453226	1.00 ~2200 μ H	0.50~ 0.03A
VLH322515C	0.47~120 μ H	3.40 ~0.17A
VLH322520C	1.00~ 560 μ H	1.00 ~0.06A
VLH453226C	1.00~ 470 μ H	1.08 ~0.09A
VLH575047C	0.12 ~10000 μ H	6.00 ~0.05A
Test equipment: L&Q: HP4285A Precision LCR meter ,DCR: Milli-ohm meter		
Electrical specifications at 25° C		

Electrical Characteristics

VLH252010E Type

Codes	L (μ H)	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 (μ H)	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 (μ H)	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

VLH322515- Type

Codes	L (μ H)	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 (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

VLH453226- Type

Codes	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

VLH322515C- Type

Codes	L (μ H)	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 (μ H)	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

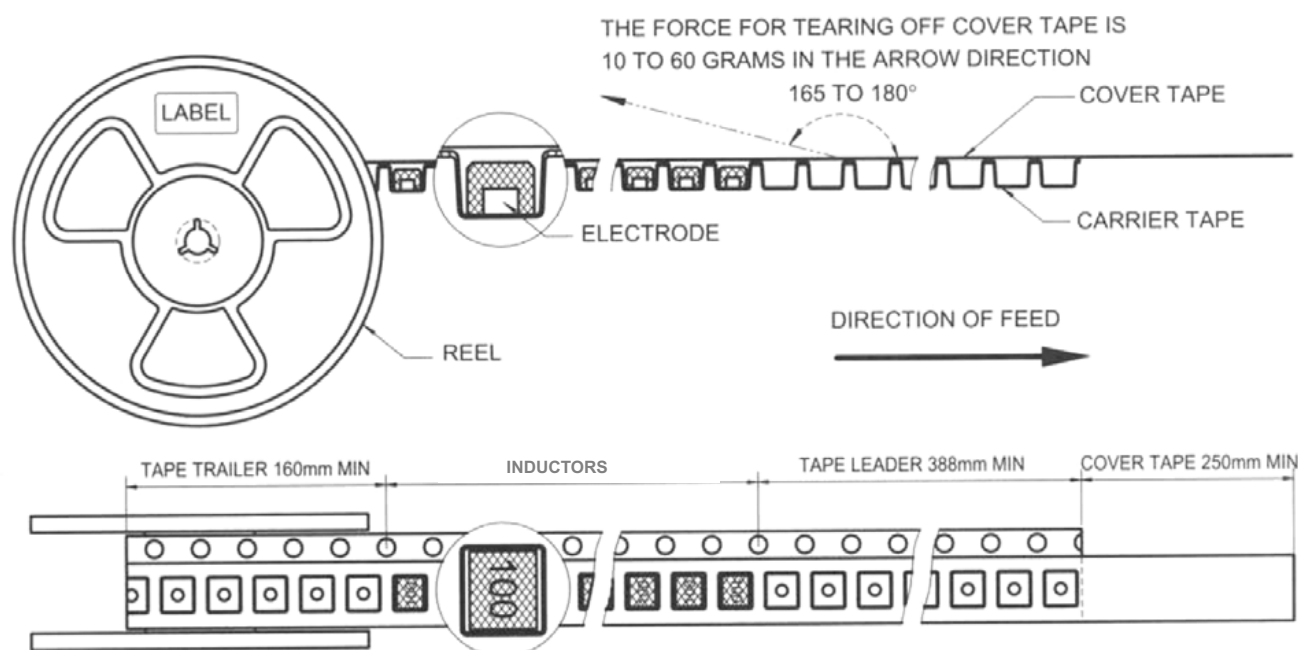
VLH453226C- Type

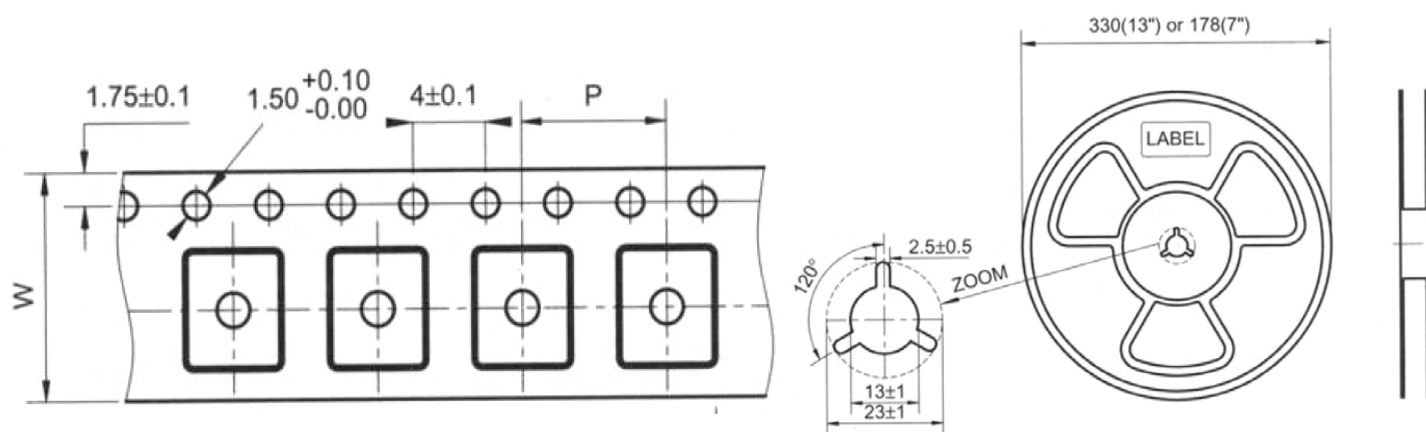
Codes	L (μ H)	Tolerance	Test Condition	DCR (Ω) max.	IDC (A) max.
1R0	1.0	M	1MHz, 0.1V	0.08	1.080
1R5	1.5	M	1MHz, 0.1V	0.09	1.000
2R2	2.2	M	1MHz, 0.1V	0.11	0.900
3R3	3.3	M	1MHz, 0.1V	0.13	0.800
4R7	4.7	K,M	1MHz, 0.1V	0.15	0.750
6R8	6.8	K,M	1MHz, 0.1V	0.20	0.720
100	10	J, K	1MHz, 0.1V	0.24	0.650
150	15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

VLH575047C- Type

Codes	L (μ H)	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





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

● Environmental Specifications of SMT Power Inductor

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	Specifications	Test Conditions / Test Methods
High temperature Storage test	No case deformation or change in appearance. $\Delta L/L \leq 10\%$	Temperature $85 \pm 2^{\circ}\text{C}$, Time: 48 ± 2 hours, Tested after 1 hour at room temperature.
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 30minutes 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	Specifications	Test Conditions / Test Methods
Solderability test	Terminal area must have 90% minimum	Product with Lead-free terminal: Dip pads in flux then dip in solder pot at $245 \pm 5^{\circ}\text{C}$ for 3seconds.
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 $130\sim 150^{\circ}\text{C}$. Immersing to $260 \pm 5^{\circ}\text{C}$ for 10 seconds.
Vibration test	No case deformation or change in appearance.	Apply frequency $10\sim 55\text{Hz}$. 1.5mm amplitude in each of perpendicular direction for 2 hours.
Shock resistance	$\Delta L/L \leq 10\%$	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):

