MAX ECHO 鈺鎧科技股份有限公司規格標準書

COMPONENT SPECIFICATION

版次：第4.0版

MAX ECHO

NAME	MULTILAYER CHIP INDUCTORS	COMPOSITE SPECIFICATION		1/9
	EBLS-321611	SPEC#	EBLS3216-Series	

1. SCOPE
   This specification applies to the EBLS-3216 series Multilayer Chip Inductors
2. STANDARD ATMOSPHERIC CONDITIONS
   Unless otherwise specified the standard range of atmospheric conditions for making measurements and tests is as follows:
   Ambient temperature : 20±15℃
   Relative humidity : 30~70%
   If there may be any doubt on the results, measurements shall be made within the following limits :
   Ambient temperature : 25±5℃
   Relative humidity : 30~70%
3. RATINGS

PART NO.	Q	INDUCTANCE	Test Frequency/Voltage L,Q	SELF-RESONANT FREQUENCY	DC RESISTANCE	RATED CURRENT
	MIN	Tolerance	(MHz)/(MV)	min(MHz)	(Ω) Max	(mA)max
EBLS3216-47NM	20	0.047 μH ±20%	50/250	320	0.15	300
EBLS3216-68NM	20	0.068 μH ±20%	50/250	280	0.25	300
EBLS3216-82NM	20	0.082 μH ±20%	50/250	255	0.25	300
EBLS3216-R10K,M	20	0.10 μH ±10%,±20%	25/250	235	0.25	250
EBLS3216-R12K,M	20	0.12 μH ±10%,±20%	25/250	220	0.30	250
EBLS3216-R15K,M	20	0.15 μH ±10%,±20%	25/250	200	0.30	250
EBLS3216-R18K,M	20	0.18 μH ±10%,±20%	25/250	185	0.40	250
EBLS3216-R22K,M	20	0.22 μH ±10%,±20%	25/250	170	0.40	250
EBLS3216-R27K,M	20	0.27 μH ±10%,±20%	25/250	150	0.50	250
EBLS3216-R33K,M	20	0.33 μH ±10%,±20%	25/250	145	0.60	250
EBLS3216-R39K,M	25	0.39 μH ±10%,±20%	25/250	135	0.50	250
EBLS3216-R47K,M	25	0.47 μH ±10%,±20%	25/250	125	0.60	200
EBLS3216-R56K,M	25	0.56 μH ±10%,±20%	25/250	115	0.70	200
EBLS3216-R68K,M	25	0.68 μH ±10%,±20%	25/250	105	0.80	150
EBLS3216-R82K,M	25	0.82 μH ±10%,±20%	25/250	100	0.90	150
EBLS3216-1R0K,M	45	1.0 μH ±10%,±20%	10/250	75	0.40	100
EBLS3216-1R2K,M	45	1.2 μH ±10%,±20%	10/250	65	0.50	100
EBLS3216-1R5K,M	45	1.5 μH ±10%,±20%	10/250	60	0.50	50
EBLS3216-1R8K,M	45	1.8 μH ±10%,±20%	10/250	55	0.50	50
EBLS3216-2R2K,M	45	2.2 μH ±10%,±20%	10/250	50	0.60	50
EBLS3216-2R7K,M	45	2.7 μH ±10%,±20%	10/250	45	0.60	50
EBLS3216-3R3K,M	45	3.3 μH ±10%,±20%	10/250	41	0.70	50
EBLS3216-3R9K,M	45	3.9 μH ±10%,±20%	10/250	38	0.80	50
EBLS3216-4R7K,M	45	4.7 μH ±10%,±20%	10/250	35	0.90	50
EBLS3216-5R6K,M	50	5.6 μH ±10%,±20%	4/250	32	0.70	25
EBLS3216-6R8K,M	50	6.8 μH ±10%,±20%	4/250	29	0.80	25
EBLS3216-8R2K,M	50	8.2 μH ±10%,±20%	4/250	26	0.90	25
EBLS3216-100K,M	50	10 μH ±10%,±20%	2/200	24	1.00	25
EBLS3216-120K,M	50	12 μH ±10%,±20%	2/200	22	1.05	15
EBLS3216-150K,M	35	15 μH ±10%,±20%	1/100	19	0.70	5
EBLS3216-180K,M	35	18 μH ±10%,±20%	1/100	18	0.70	5
EBLS3216-220K,M	35	22 μH ±10%,±20%	1/100	16	0.90	5
EBLS3216-270K,M	35	27 μH ±10%,±20%	1/100	14	0.90	5
EBLS3216-330K,M	35	33 μH ±10%,±20%	1/100	13	1.05	5
EBLS3216-390K,M	40	39 μH ±10%,±20%	1/100	11	3.00	10
EBLS3216-470K,M	40	47 μH ±10%,±20%	1/100	10	3.40	10

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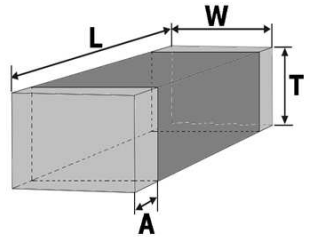
	EBLS-321611	SPEC#	EBLS3216-Series	

4. DIMENSION



OPERATING TEMP. RANGE : -40℃ ~ +85℃
STORAGE TEMP. RANGE : -10℃ ~ +40℃

TYPE	L	W	T	A
EBLS-3216	3.2±0.2 (.126±.008)	1.6±0.2 (.063±.008)	1.1±0.3 (.043±.012)	0.4~1.0

5. The place of origin :
Taichung, Taiwan

HISTORY	DATE	REVISION	SIGN.	SIGN.
PLANNED BY	CHECKED BY	APPROVED BY		
LUN	TINA	Chi Chi Huang	鈺鎧文件中心 發行章	

NAME	MULTILAYER CHIP INDUCTORS	COMPOSITE SPECIFICATION	3/9
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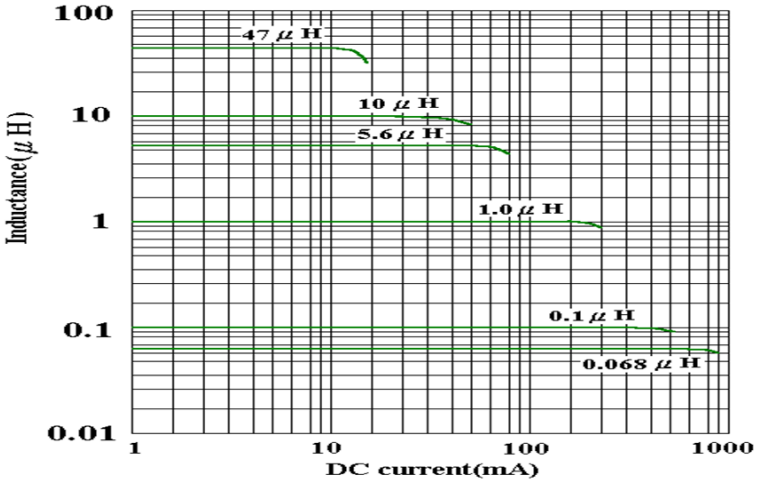
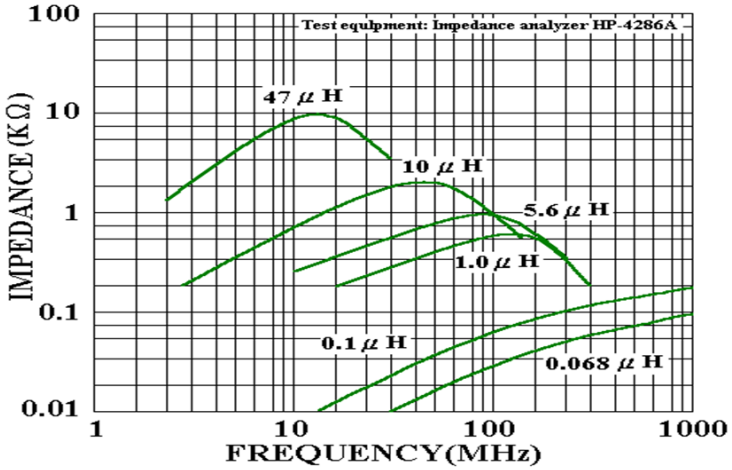
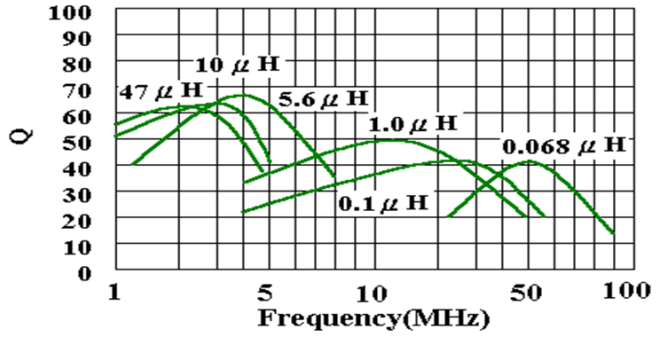
INDUCTANCE VS DC SUPERPOSITION CHARACTERISTICS



IMPEDANCE VS FREQUENCY CHARACTERISTICS



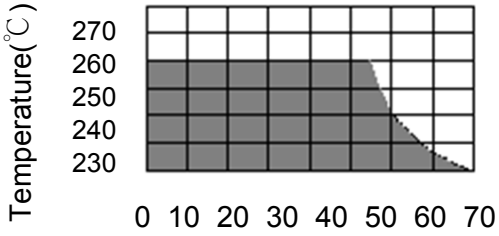
Q VS FREQUENCY CHARACTERISTICS



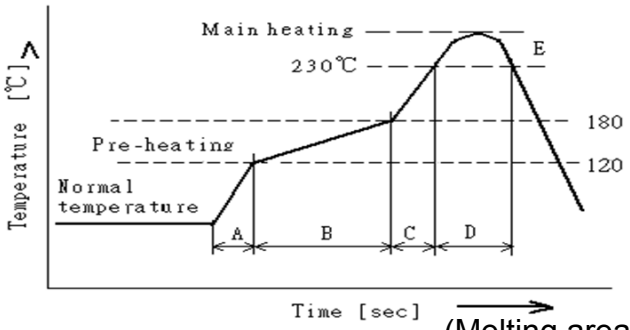
Name	Multilayer Chip Inductors EBLS-321611	COMPOSITE SPECIFICATION	4/9
		SPEC# EBLS3216-Series	

6. Reflow soldering conditions

- Pre－heating should be in such a way that the temperature difference between solder and ferrite surface is limited to 150℃ max. Also cooling into solvent after soldering should be in such a way that the temperature difference is limited to 100℃ max.
  Insufficient pre－heating may cause cracks on the ferrite, resulting in the deterioration of product quality.
- Products should be soldered within the following allowable range indicated by the slanted line.
  The excessive soldering conditions may cause the corrosion of the electrode, when soldering is repeated, allowable time is the accumulated time.



Temperature Profile



(Melting area of solder)

A	Slope of temp. rise	※ 1 to 5	※ ℃/sec
B	Heat time	50 to 150	※ sec
	Heat temperature	120 to 180	※ ℃
C	Slope of temp. rise	1 to 5	※ ℃/sec
D	Time over 230℃	90~120	※ sec
E	Peak temperature	255~260	※ ℃
	Peak hold time	10 max.	※ sec
No. of mounting		3	※ times

6-1 Reworking with soldering iron

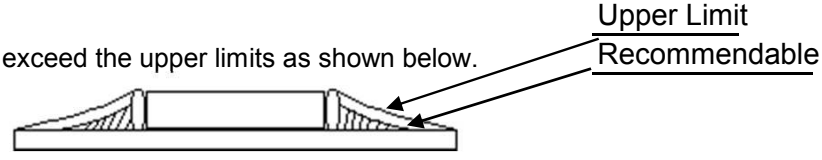
Preheating	150℃, 1 minute
Tip temperature	280℃ max.
Soldering time	3 seconds max.
Soldering iron output	30w max.
End of soldering iron	ϕ3mm max.

- Reworking should be limited to only one time.

Note：Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the ferrite material due to the thermal shock.

6-2 Solder Volume

Solder shall be used not to be exceed the upper limits as shown below.



Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance.

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7. Equipment

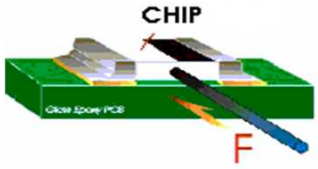
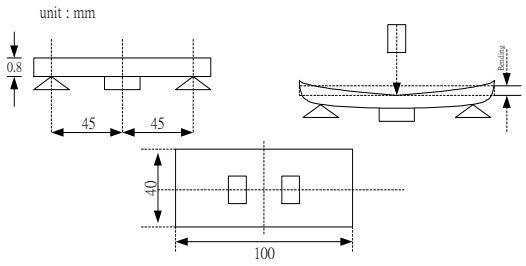
7-1 Inductance

Inductance shall be measured with HP－4286A impedance analyzer or equivalent system

7-2 DC RESISTANCE

DC resistance shall be measured using HP 4338 digital mili－ohm meter with 4 terminal method.

8. Mechanical Characteristics

ITEM	Specification	Test Conditions
Terminal Strength	Without deformation cases inductance shall be satisfied ± 20% DC resistance shall be satisfied.	Solder chip on PCB and applied 10N (1.02Kgf) for 10 sec 
Substrate Bending Test	Without deformation cases, inductance shall be satisfied ± 20% DC resistance shall be satisfied.	After soldering a chip to a test substrate, bend the substrate by 3mm hold for 10s and then return. Soldering shall be done in accordance with the recommended PC board pattern and reflow soldering. 
Resistance to Solder Heat	No visible damage Electrical characteristics and mechanic characteristics shall be satisfied. **Consult standard MIL-STD-202 METHOD 210**	Solder Temp. : 265±3℃ Immersion time : 6±1 sec Preheating : 100℃ to 150℃, 1 minute. Measurement to be made after keeping at room temp for 24±2 hrs. Solder : Sn-3Ag-0.5Cu
Solderability	95% min. coverage of all metabolised area **Consult standard J-STD-002**	Solder temp. : 240±5℃ Immersion time : 3±1 sec Solder : Sn-3Ag-0.5Cu

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9. RELIABILITY AND TEST CONDITIONS

9-1 HIGH TEMPERATURE RESISTANCE

a. Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1.Temperature: 125℃ ±2℃
2.Testing time：1000±12hrs
3.Measurement：After placing at room ambient temperature for 24 hours minimum

9-2 Biased Humidity RESISTANCE

a.Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1.Humidity: 85 ± 5%RH
2. Temperature: 85℃ ±2℃
3.Testing time: 1000 ± 12 hours
4.Measurement：After placing at room ambient temperature for 24 hours minimum

9-3 TEMPERATURE CYCLE

a.Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1. Low Temperature: - 55℃ ±5℃ kept stabilized for 30 minutes each
2. High Temperature: 125℃ ±5℃kept stabilized for 30 minutes each
2.Cycle：1000 cycles
3.Measurement：After placing for 24hours minimum at room ambient temperature
4. step1. -55℃ temp±3℃ 30±3 minutes
step2. Room temperature 2to5 minutes
step3. +125℃ temp±3℃ 30±3 minutes
step4. room temperature 2to5 minutes

9-4 VIBRATION TEST

a.Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1.Frequency and Amplitude:10-2000-10Hz
2.Direction:X,Y,Z.
3.Test duration:4 hours for each direction,12hours in total.

9-5 Mechanical Shock TEST

a.Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1.peak acceleration ：100 g's
2.Duration of pulse：6 ms
3.Waveform ：Half-sine
4.Velocity change ：12.3 ft/sec
5. Direction：X，Y，Z（3axes/3 times）

9-6 Operational Life

a. Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1.Temperature: 125℃ ±2℃
2.Testing time：1000±12hrs
3.Measurement：After placing at room ambient temperature for 24 hours minimum

9-7 Electrostatic discharge test

a. Performance specification
1.Appearance：no mechanical damage
2.Inductance shall be with ±20% of the initial value

b.Test condition
1.ESD voltage: 15k volts
2.Mode 1:150 pF/330 Ohm
3.Mode 2:150 pF/2000 Ohm

9.1 REMARK
The reliability test customers if there are special requirements in accordance with customer needs

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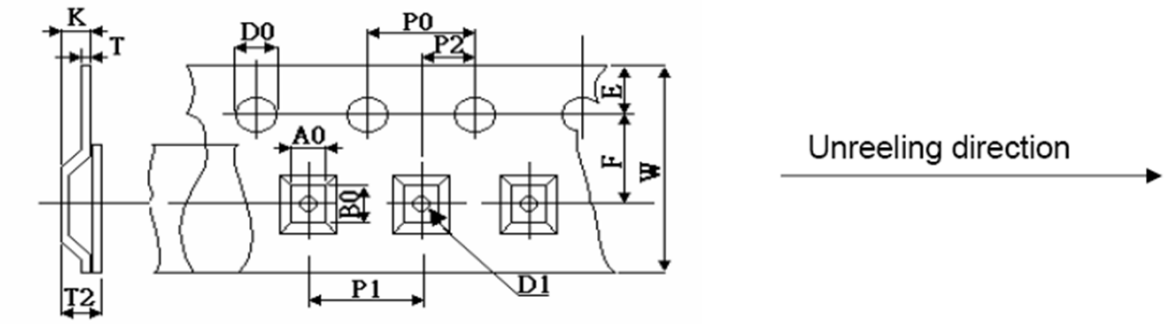
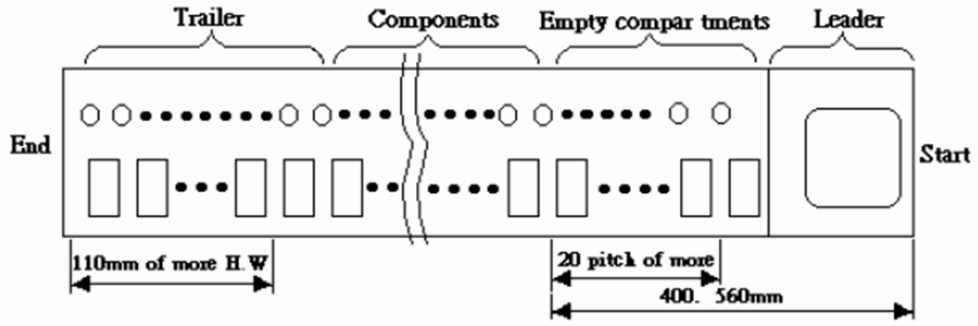
EMBOSSED CARRIER TAPE PACKING

10-1 DIMENSIONS

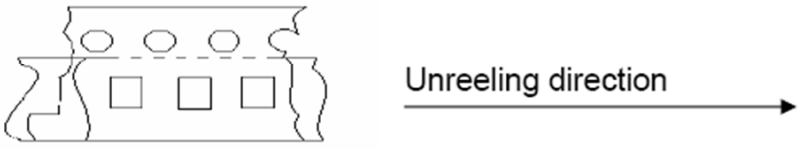


A0	B0	W	F	E	P1	P2	P0	D0	D1	K	T	T2
1.88 ±0.1	3.5 ±0.1	8.0 ±0.2	3.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.00 ±0.05	4.0 ±0.1	1.55 ±0.05	1.00 ±0.1	1.49 ±0.15	0.22 ±0.05	1.49 ±0.25

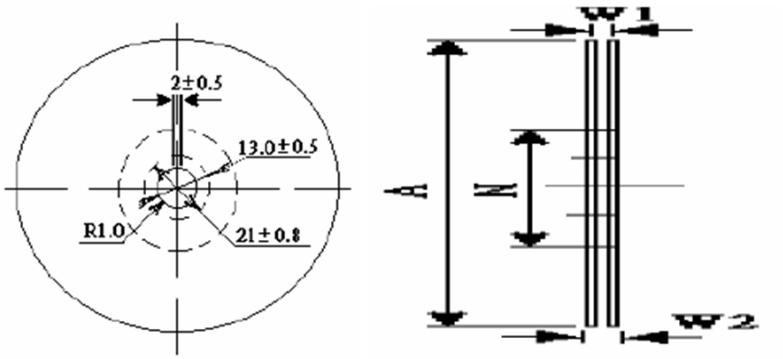
10-2 LEADER AND TRAILER TAPE



10-3 DIRECTION THE DIRECTION SHALL BE SEEN FROM THE TOP OF COVER TAPE



10-4 REELS



UNIT:mm

A	178 ±2.0
N	50 MIN
W1	10 ±1.5
W2	20 MAX

PACKING QTY.
3,000 PCS REEL

Name	Multilayer Chip Inductors EBLS-321611	COMPOSITE SPECIFICATION		8/9
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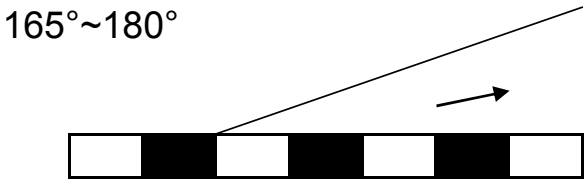
10-5 PEELING STRENGTH OF COVER TAPE

Cover tape	(10g~100g)



Test condition

1. peel angle：165°~180° vs carrier tape
2. peel speed：300mm/min

11. Packaging

1. Tape & Reel packaging in composite specification 6/8
2) Reel and a bag of desiccant shall be packed in Nylon or plastic bag
3) Maximum of 5 reels shall be packaged in a inner box
4) Maximum of 6 inner box shall be packaged in a outer box

12. Reel Label

Producing the goods label needs to indicate (1) Pb Free (2) RoHS Compliant

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13. Storage

13-1The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Packages must be stored at 40℃ or less and 70% RH or less.

13-2 The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust or harmful gas (hydrogen chloride, sulfurous acid gas or hydrogen sulfide).

13-3 Packaging material may be deformed if packages are stored where they are exposed to heat or direct sun－light.

13-4 Minimum packages, such as polyvinyl heat－seal packages shall not be opened until just before they are used. If opened, use the reels as soon as possible.

13-5 Solderability specified in composite specification 4/8 shall be for 6 months from the date of delivery on condition that they are stored at the environment specified clause 13-1 & 13-2. For those parts which passed more than 6 months shall be checked solderability before it is used.

14. Quality System

■ ISO/TS16949
■ IECQ QC 080000