

巻線チップインダクタ

WOUND CHIP INDUCTORS(CYLINDRICAL TYPE)

LE SERIES R TYPE

OPERATING TEMP. -25~+85°C



フロー/WAVE

リフロー/REFLOW

015 TYPE

012, 015 TYPE

特長 FEATURES

- ・アキシヤルリード形インダクタの製造工程・基本構造を継承した量産性に優れた高品質のインダクタ
- ・nHタイプと通常品(μ Hタイプ)があり、nHタイプはQが抜群に高く、高周波域での使用に最適
- ・はんだ付けの信頼性が高い金属電極

- ・ A high-quality inductor that is simple to mass-produce and conforms to the same production process and basic construction as an axial lead type inductor.
- ・ Available in two types: nH type and standard type (μ H type). The nH type has a very high Q, and is thus most suitable for high-frequency applications.
- ・ Metal electrode provides good soldering reliability.

用途 APPLICATIONS

チューナ・モジュレータ、移動体通信、カーオーディオその他小型電子機器一般

Tuners, modulators, mobile communications, car audio equipment and other small-sized general electronic appliances.

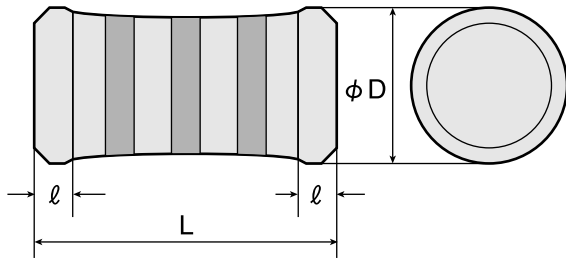
形名表記法 ORDERING CODE

1	2	3	4	5	6	7
形式 LE 巻線チップインダクタ	形状 R 丸形	外径寸法(mm) 012 2.0×1.25 015 3.2×1.6	包装 B△ 単品 T△ テーピング △=スペース	公称インダクタンス(μ H) 例 10N 0.010 R10 0.1 1R0 1 101 100 ※R=小数点 ※N=nHとして的小数点	インダクタンス許容差(%) K ±10 M ±20	当社管理記号 △△△△ 標準品 △=スペース -A nHコア仕様



1	2	3	4	5	6	7
Type LE Wound chip inductor	Shape R Cylindrical Type	External Dimensions (mm) 012 2.0×1.25 015 3.2×1.6	Packaging B△ Bulk T△ Tape & Reel △=Blank Space	Nominal Inductance(μ H) example 10N 0.010 R10 0.1 1R0 1 101 100 *R=decimal point *N=0.0 (nHtype)	Inductance Tolerances (%) K ±10 M ±20	Internal code △△△△ Standard Products △=Blank Space -A nH core type

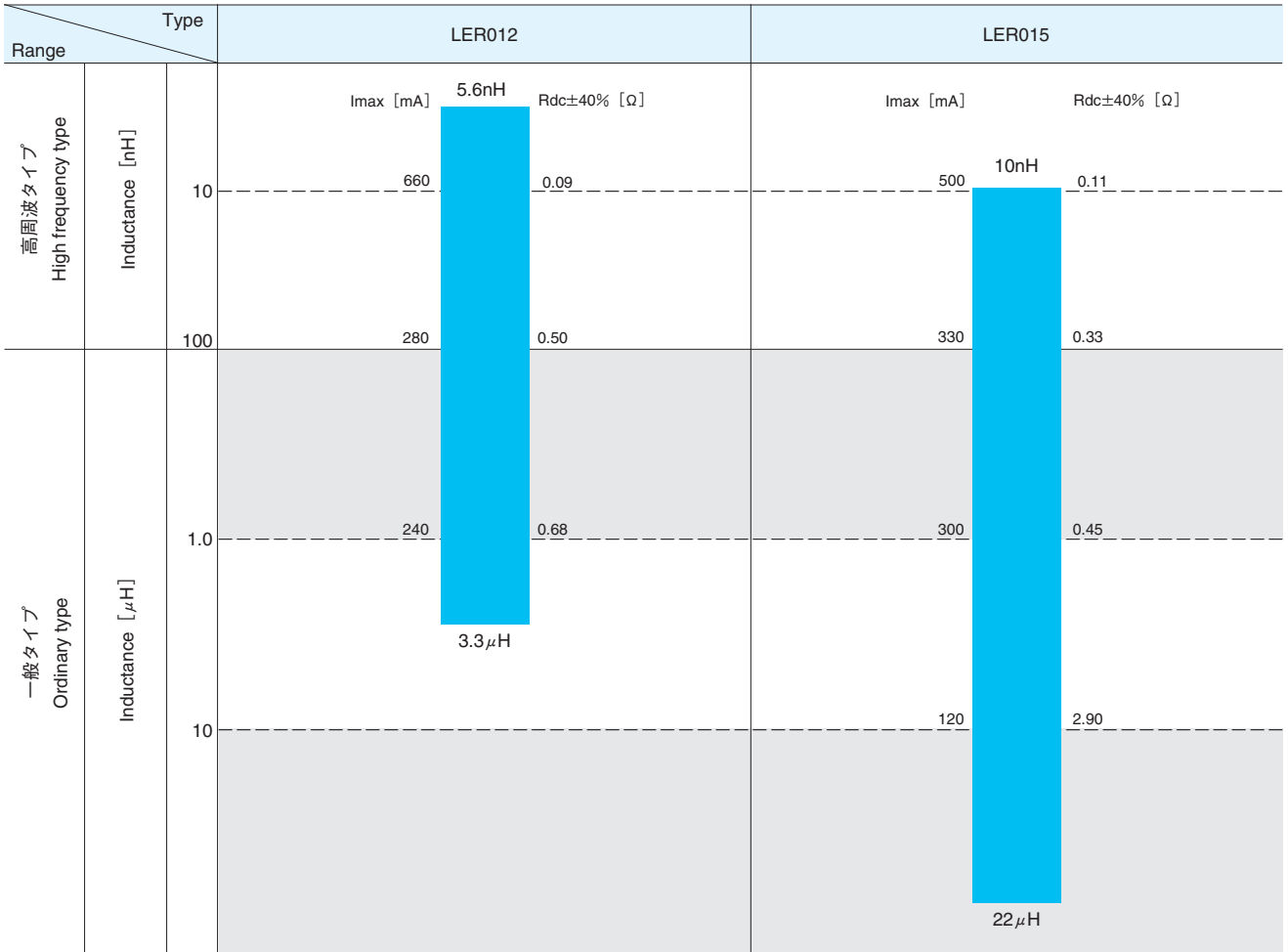
外形寸法 EXTERNAL DIMENSIONS



Type	L	φD	ℓ
LER012	2.0±0.2 (0.079±0.008)	φ1.25±0.2 (φ0.049±0.008)	0.3 (0.012)
LER015	3.4±0.2 (0.134±0.008)	φ1.6max (φ0.063)	0.4 (0.016)

Unit : mm(inch)

概略バリエーション AVAILABLE INDUCTANCE RANGE



代表値 Examples	Inductance	Imax [mA]	Rdc±40% [Ω]	Imax [mA]	Rdc±40% [Ω]
	10nH	660	0.09	500	0.11
	100nH	280	0.50	330	0.33
	1μH	240	0.68	300	0.45
	10μH	—	—	120	2.90

セレクションガイド
Selection Guide

アイテム一覧
Part Numbers

特性図
Electrical Characteristics

梱包
Packaging

信頼性
Reliability Data

使用上の注意
Precautions



etc

LER012

高周波タイプ High frequency type

形名 Ordering code	公称 インダクタンス Inductance [nH]	インダクタンス 許容差 Inductance Tolerance	Q min.	LQ 測定 周波数 Measuring frequency [MHz]	Q Typical 周波数 Frequency [MHz]					自己共振周波数 Self-resonant frequency [MHz]		直流抵抗 DC Resistance [Ω] ±40%	定格電流 Rated current [mA] max.
					100	300	500	800	1000	min.	Typ.		
					100	300	500	800	1000				
LER012□5N6K-A	5.6	±10%	10	100	23	39	49	63	70	3700	7800	0.06	820
LER012□6N8K-A	6.8				24	41	52	66	73	3300	6900	0.07	760
LER012□8N2K-A	8.2				25	43	54	69	76	3000	6200	0.08	710
LER012□10NK-A	10				26	44	58	72	78	2600	5600	0.09	660
LER012□12NK-A	12				26	44	58	72	79	2400	5000	0.10	630
LER012□15NK-A	15				29	48	63	78	84	2200	4400	0.12	600
LER012□18NK-A	18		29	49	63	78	85	2000	3900	0.13	560		
LER012□22NK-A	22		31	51	66	80	85	1800	3500	0.14	530		
LER012□27NK-A	27		32	54	69	83	86	1600	3100	0.16	500		
LER012□33NK-A	33		33	54	69	83	83	1400	2800	0.17	480		
LER012□39NK-A	39		33	54	69	82	81	1300	2500	0.18	460		
LER012□47NK-A	47		33	54	68	79	77	1200	2300	0.20	440		
LER012□56NK-A	56		33	53	67	74	67	1100	2100	0.22	420		
LER012□68NK-A	68		32	52	66	74	65	1000	1900	0.40	310		
LER012□82NK-A	82		32	51	63	68	58	950	1700	0.44	300		
LER012□R10K-A	100		32	48	53	50	38	900	1600	0.50	280		

・注：形名の□には包装記号が入ります。 □ Please specify the packaging code.(T：Tape&Reel, B：Bulk)

一般タイプ Ordinary type

形名 Ordering code	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	Q min.	自己共振 周波数 Self-resonant frequency [MHz] min.	直流抵抗 DC Resistance [Ω] (±40%)	定格電流 Rated current [mA] max.	測定 周波数 Measuring frequency [MHz]		
LER012□R12M	0.12	±20%	25	240	0.14	500	25.2		
LER012□R15M	0.15			220	0.16	490			
LER012□R18M	0.18			200	0.18	460			
LER012□R22M	0.22			180	0.20	450			
LER012□R27M	0.27			160	0.22	420			
LER012□R33M	0.33			140	0.24	400			
LER012□R39M	0.39			120	0.27	380			
LER012□R47M	0.47			110	0.44	285			
LER012□R56M	0.56			100	0.48	265			
LER012□R68M	0.68			80	0.54	255			
LER012□R82M	0.82			70	0.61	245			
LER012□R10M	1.0			60	0.68	240			
LER012□R12M	1.2			20	50	0.98		195	7.96
LER012□R15M	1.5				43	1.10		185	
LER012□R18M	1.8				40	1.20		180	
LER012□R22M	2.2	38	1.70		150				
LER012□R27M	2.7	35	1.90		140				
LER012□R33K	3.3	33	2.10		130				

・注：形名の□には包装記号が入ります。 □ Please specify the packaging code.(T：Tape&Reel, B：Bulk)

LER015

高周波タイプ High frequency type

形名 Ordering code	公称 インダクタンス Inductance [nH]	インダクタンス 許容差 Inductance Tolerance	Q min.	LQ 測定 周波数 Measuring frequency [MHz]	Q Typical 周波数 Frequency [MHz]					自己共振周波数 Self-resonant frequency [MHz]		直流抵抗 DC Resistance [Ω] ±40%	定格電流 Rated current [mA] max.	
					100	300	500	800	1000	min.	typ.			
					22	37	48	57	60	2600	5400			
LER015□10NK	10	±10%	10	100	22	37	48	57	60	2600	5400	0.11	500	
LER015□12NK	12				23	39	50	59	61	2400	4800	0.12	490	
LER015□15NK	15				26	43	54	62	63	2200	4200	0.14	480	
LER015□18NK	18				28	48	58	66	64	2000	3800	0.16	470	
LER015□22NK	22				29	48	59	67	66	1800	3300	0.18	460	
LER015□27NK	27				31	50	60	66	58	1600	3000	0.20	450	
LER015□33NK	33		15	15	100	34	53	61	63	55	1400	2800	0.22	420
LER015□39NK	39					34	55	64	60	51	1300	2500	0.24	400
LER015□47NK	47					35	55	60	56	41	1200	2300	0.26	390
LER015□56NK	56					36	54	55	47	33	1100	2000	0.28	380
LER015□68NK	68					36	52	51	39	28	1000	1800	0.30	370
LER015□82NK	82					36	49	45	31	18	950	1600	0.31	350
LER015□R10K	100					36	43	34	18	9	850	1400	0.33	330

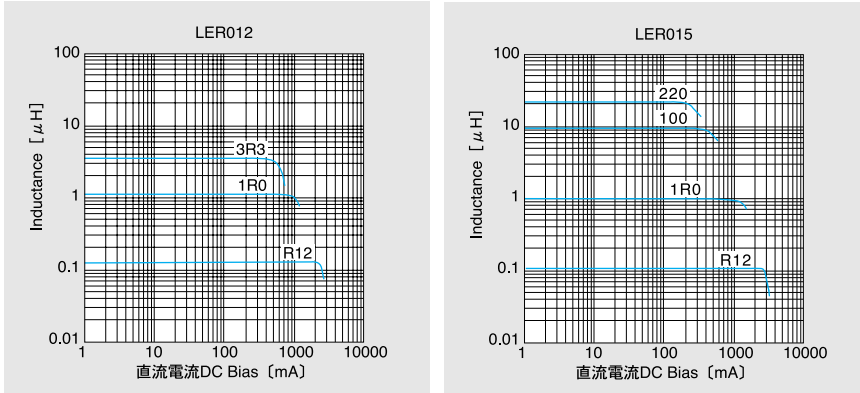
・注：形名の□には包装記号が入ります。 ・□ Please specify the packaging code.(T : Tape&Reel, B : Bulk)

一般タイプ Ordinary type

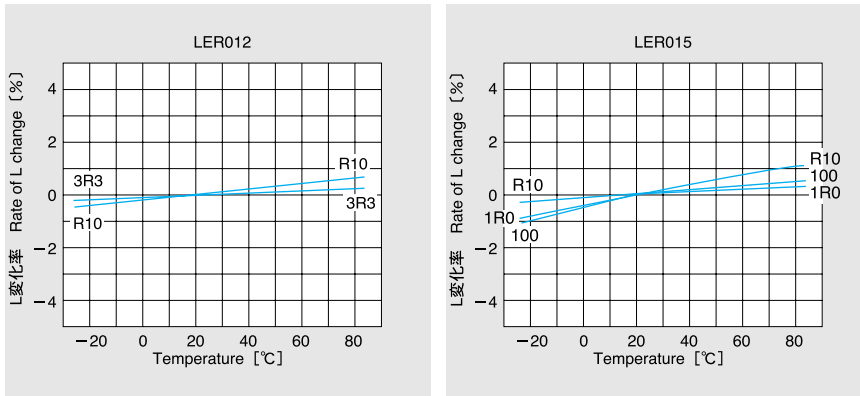
形名 Ordering code	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	Q min.	自己共振 周波数 Self-resonant frequency [MHz] min.	直流抵抗 DC Resistance [Ω] max.	定格電流 Rated current [mA] max.	測定 周波数 Measuring frequency [MHz]
LER015□R12M	0.12	±20%	30	150	0.16	500	25.2
LER015□R15M	0.15			150	0.17	490	
LER015□R18M	0.18			150	0.19	460	
LER015□R22M	0.22			150	0.20	450	
LER015□R27M	0.27			150	0.23	420	
LER015□R33M	0.33			150	0.25	400	
LER015□R39M	0.39			150	0.27	380	
LER015□R47M	0.47			110	0.31	360	
LER015□R56M	0.56			100	0.34	340	
LER015□R68M	0.68			80	0.37	330	
LER015□R82M	0.82			70	0.41	310	
LER015□1R0M	1.0			60	0.45	300	
LER015□1R2M	1.2			50	0.50	280	
LER015□1R5M	1.5			43	0.56	270	
LER015□1R8M	1.8			40	0.62	250	
LER015□2R2M	2.2			38	0.68	240	
LER015□2R7M	2.7	35	0.76	230			
LER015□3R3K	3.3	33	0.86	220			
LER015□3R9K	3.9	30	1.45	170			
LER015□4R7K	4.7	28	1.60	160			
LER015□5R6K	5.6	26	1.75	150			
LER015□6R8K	6.8	24	2.35	130			
LER015□8R2K	8.2	22	2.60	125			
LER015□100K	10	20	2.90	120			
LER015□120K	12	20	18	3.50	105	2.52	
LER015□150K	15		16	3.75	100		
LER015□180K	18		14	5.30	85		
LER015□220K	22		12	6.00	80		

・注：形名の□には包装記号が入ります。 ・□ Please specify the packaging code (T: Tape & reel, B: Bulk)

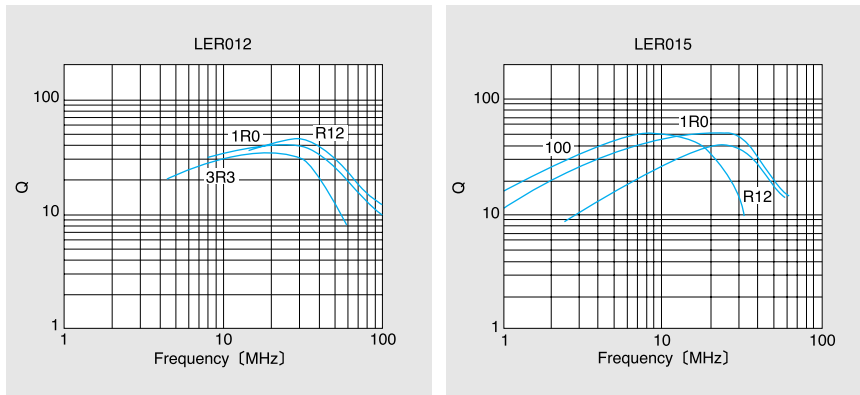
直流重量特性例 DC Bias characteristics(Measured by HP4285A+42841A)



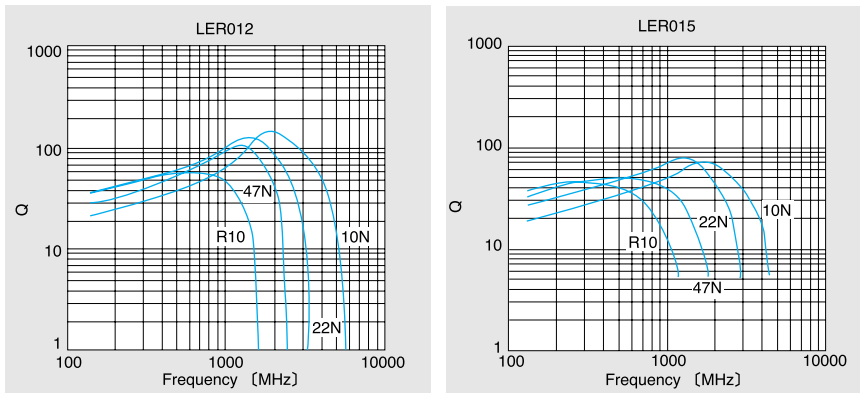
温度特性例 Temperature Characteristics(Measured by HP4285A+42851A)



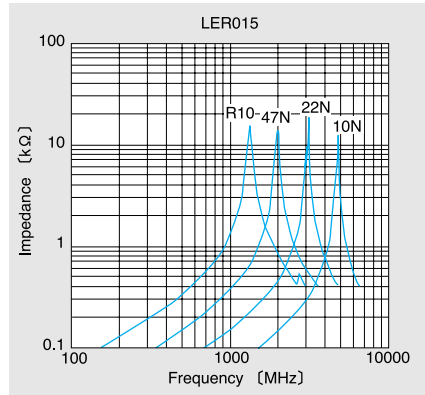
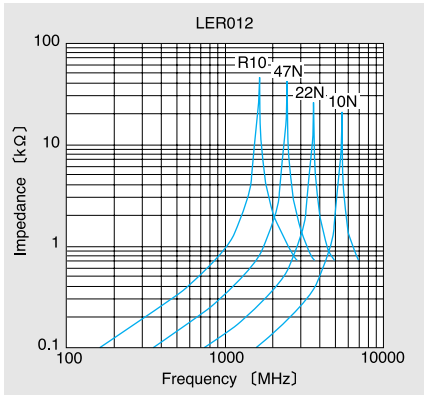
Q-周波数特性例 Q-vs-Frequency Characteristics(Measured by HP4291A)
一般タイプ Ordinary type



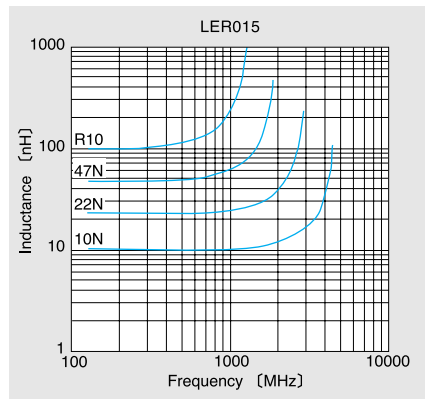
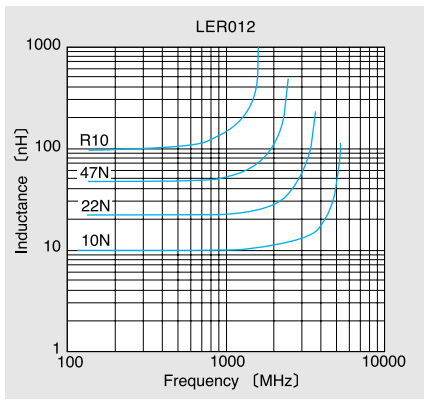
高周波タイプ High Frequency Type(Measured by HP8720B)



インピーダンス周波数特性例 Impedance-vs-Frequency characteristics(Measured by HP8720B)



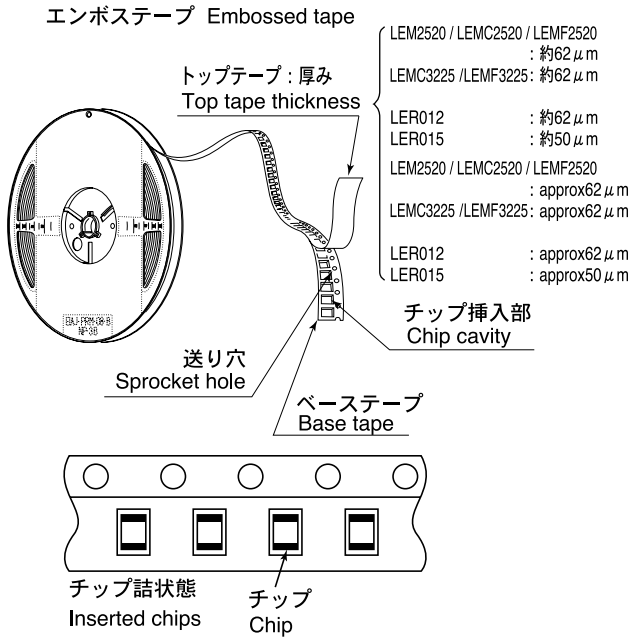
インダクタンス周波数特性例 Inductance-vs-Frequency characteristics(Measured by HP8720B)



①標準数量 Standard Quantity

形式 Type	標準数量 Standard Quantity [pcs]	
	袋づめ Bulk / Bag	テーピング Tape&Reel
LEM2520/LEMC2520/LEMF2520	2000	2000
LEMC3225/LEMF3225	2000	2000
LER012	3000	3000
LER015	3000	3000

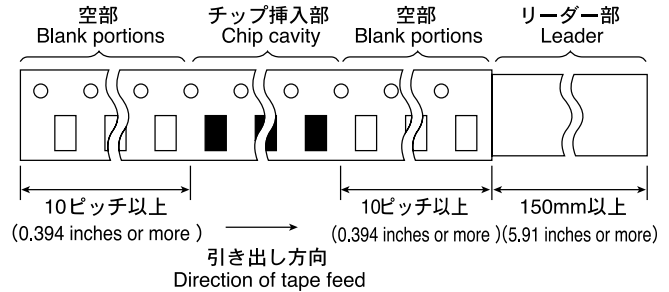
②テーピング材質 Tape material



形式 Type	チップ挿入部 Chip Cavity		挿入ピッチ Insertion Pitch F	テープ厚み Tape Thickness	
	A	B		K	T
LEM2520/ LEMC2520/ LEMF2520	2.3±0.1 (0.091±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	2.1 (0.083)	0.3 (0.012)
				±0.1 (±0.004)	±0.05 (±0.002)
LEMC3225/ LEMF3225	2.8±0.2 (0.110±0.008)	3.55±0.2 (0.140±0.008)	4.0±0.1 (0.157±0.004)	2.45 (0.096)	0.3 (0.012)
				±0.1 (0.004)	±0.05 (0.002)
LER012	1.45±0.2 (0.057±0.008)	2.43±0.2 (0.096±0.008)	4.0±0.1 (0.157±0.004)	2.0 (0.079)	0.3 (0.012)
				max.	max.
LER015	2.0±0.2 (0.079±0.008)	3.6±0.2 (0.142±0.008)	4.0±0.1 (0.157±0.004)	2.0 (0.079)	0.3 (0.012)
				max.	±0.05 (±0.002)

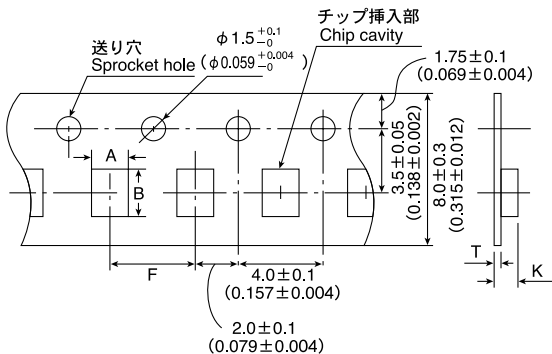
Unit: mm (inch)

④リーダー部/空部 Leader and Blank Portion

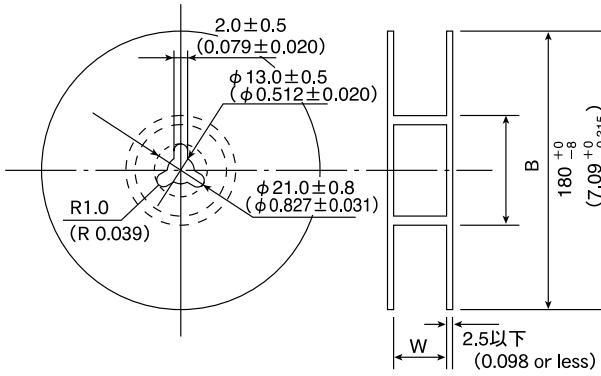


③テーピング寸法 Taping Dimensions

エンボステープ (8mm幅) Embossed Tape (0.315 inches wide)



⑤ リール寸法 Reel Size

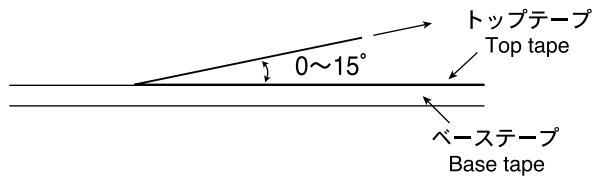


Unit: mm (inch)

形式 Type	W	B
LER012	9±0.8 (0.354±0.031)	60 ⁺¹ / ₋₀ (2.36 ^{+0.039} / ₋₀)
LER015	10.0±1.5 (0.394±0.059)	50±1 (1.97±0.039)
LEM2520 LEMC2520 LEMF2520	9±0.8 (0.354±0.031)	60 ⁺¹ / ₋₀ (2.36 ^{+0.039} / ₋₀)
LEMC3225 LEMF3225	9±0.8 (0.354±0.031)	60 ⁺¹ / ₋₀ (2.36 ^{+0.039} / ₋₀)

⑥ トップテープ強度 Top Tape Strength

トップテープのはがし力は、下図矢印方向にて0.2~0.7Nとなります。
The top tape requires a peel-off force of 0.2 to 0.7N in the direction of the arrow as illustrated below.

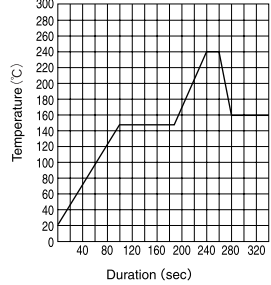


Item	Specified Value											Test Methods and Remarks	
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518		LBH1608
1. Operating temperature Range	-25~+85°C	-40~+85°C					-25~+85°C						
2. Storage	-40~+85°C					-25~+85°C							
3. Rated Voltage	Within the specified tolerance											<p>The maximum DC value having inductance decrease within 10% and temperature increases within 20°C by the application of DC bias.</p> <p>LBH1608 · LEM Series 5N6~R10: The maximum DC value having temperature increases within 20°C by the application of DC bias.</p>	
4. Inductance	Within the specified tolerance											<p>LER · LEM Series 5N6~R10 : Measuring equipment : Impedance analyzer (HP4291A or its equivalent) Measuring frequency : Specified frequency</p> <p>LER · LEM Series R12~221 : Measuring equipment : LCR Meter (HP4285A+42851A or its equivalent) Measuring frequency : Specified frequency</p> <p>LB · LBC Series : Measuring equipment : LCR Meter (HP4285A or its equivalent)</p> <p>LBH1608 Series : Measuring equipment : Impedance analyzer (HP4291A or its equivalent)</p>	
5. Q	Within the specified tolerance										12~18 (at 100MHz) min	<p>LER · LEM Series 5N6~R10 : Measuring equipment : Impedance analyzer (HP4291A or its equivalent) Measuring frequency : Specified frequency</p> <p>LER · LEM Series R12~221 : Measuring equipment : LCR Meter (HP4285A+42851A or its equivalent) Measuring frequency : Specified frequency</p> <p>LB · LBC Series : Measuring equipment : LCR Meter (HP4285A or its equivalent)</p> <p>LBH1608 Series : Measuring equipment : Impedance analyzer (HP4291A or its equivalent)</p>	
6. DC Resistance	Within the specified tolerance											<p>LER · LEM · LB · LBC · LBH Series : Measuring equipment : low ohmmeter (A&D AD5812 or its equivalent)</p>	

Item	Specified Value												Test Methods and Remarks												
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518	LBH1608													
7. Self-Resonant Frequency	Within the specified tolerance												LER・LEM Series 5N6~R10 : Measuring equipment : Network analyzer (HP8720B or its equivalent) LER・LEM Series (Exclude LEM2520) R12~ : Measuring equipment : Impedance analyzer (HP4291A or its equivalent) LEM2520 : Measuring equipment : Network analyzer (Anritsu MS620J or its equivalent) LB・LBC Series : Measuring equipment : Impedance analyzer (HP4291A or its equivalent) LBH1608 Series : Measuring equipment : Network analyzer (HP8720B or its equivalent)												
8. Temperature Characteristic	$\Delta L/L \rightarrow$ Within $\pm 5\%$		$\Delta L/L \rightarrow$ Within $\pm 10\%$	$\Delta L/L \rightarrow$ Within $\pm 5\%$		$\Delta L/L \rightarrow$ Within $\pm 15\%$			$\Delta L/L \rightarrow$ Within $\pm 15\%$			$\Delta L/L \rightarrow$ Within $\pm 5\%$ ※ $\Delta L/L \rightarrow$ Within $\pm 0.5nH$ under 8.2nH	Change of maximum inductance deviation in step 1-5 * Exclude CM03MS series <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>-25</td> </tr> <tr> <td>3</td> <td>20 (Reference temperature)</td> </tr> <tr> <td>4</td> <td>+85 (Maximum operating temperature)</td> </tr> <tr> <td>5</td> <td>20</td> </tr> </tbody> </table>	Step	Temperature (°C)	1	20	2	-25	3	20 (Reference temperature)	4	+85 (Maximum operating temperature)	5	20
Step	Temperature (°C)																								
1	20																								
2	-25																								
3	20 (Reference temperature)																								
4	+85 (Maximum operating temperature)																								
5	20																								
9. Resistance to Flexure of Substrate	No breakdown or damage												Warp: 2mm (LER012, LER015, LBC, LB) : 3mm (LEM2520, LEMC2520, LEMF2520, LEMC3225, LEMF3225) Test substrate: Printed board According to JIS C0051 												
10. Body Strength	No breakdown or damage												LER012・LER015 Applied force : 15N Duration : 5sec. LB・LBC・LBH LEM2520・LEMC2520・LEMF2520・LEMC3225・LEMF3225 Applied force : 10N Duration : 10sec. LB1608 Applied force : 5N Duration : 10sec.												
11. Self Resonant Frequency	$\Delta L/L \rightarrow$ Within -10%												Measure inductance with application of rated current using LCR metre to compare it with the initial value. (* Excluding 5N6~R10)												

Item	Specified Value												Test Methods and Remarks
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518	LBH1608	
12. Adhesion of terminal electrode	Shall not come off PC board.	No detachment of electrode					Shall not come off PC board.						LER012 · LER015 Applied force : 15N Duration : 5 sec. Test substrate : Printed board LB · LBC · LBH LEM2520 · LEMC2520 · LEMF2520 · LEMC3225 · LEMF3225 Applied force : 10N to X and Y directions Duration : 5 sec. Test substrate : Printed board
13. Resistance to vibration	$\Delta L/L \rightarrow$ Within $\pm 5\%$ Q \rightarrow R12~1R0 : 25min. 1R2~3R3 : 20min. $\Delta L/L \rightarrow$ Within $\pm 5\%$ Q \rightarrow R12~100 : 30min. 120~220 : 20min.	$\Delta L/L \rightarrow$ Within $\pm 5\%$ No significant abnormality in appearance.					$\Delta L/L \rightarrow$ Within $\pm 10\%$ No significant abnormality in appearance.						LER · LEM · LB · LBC : According to JIS C5102 clause 8.2. Vibration type : A Directions : 2 hrs each in X, Y and Z directions. Total : 6 hrs Frequency range : 10 to 55 to 10 Hz (1min.) Amplitude : 1.5mm Mounting method : Soldering onto printed board (* Excluding 5N6-R10 LE Series) Recovery : At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

Item	Specified Value											Test Methods and Remarks
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518	
14.Drop test	No significant abnormality in appearance.	$\Delta L/L \rightarrow$ Within $\pm 5\%$ No significant abnormality in appearance.				$\Delta L/L \rightarrow$ Within $\pm 10\%$ No significant abnormality in appearance.						LER・LEM : LER012・LER015 Drop test Impact material : concreta or vinyl tile Height : 1m Total number of drops : 10 times LEM2520・LEMC2520・LEMF2520・ LEMC3225・LEMF3225 Acceleration : 980m/sec ² Duration : 6msec Number of times : 6 sides \times 3 times Mounting method : Soldering onto printed board (* Excluding 10N~R10) Recovery : At least 1 hr of recovery under the standard condition after the
15.Solderability	At least 90% of electrode											test, followed by the measurement within 2 hrs. LER・LEM : Solder temperature : 230 \pm 5 $^{\circ}$ C Duration : 2 \pm 0.5sec. (LER012・LER015) 5 \pm 0.5sec. (LEM2520・ LEMC2520・LEMF2520・ LEMC3225・LEMF3225) Flux : Methanol solution with 25% of colophony LB・LBH : Solder temperature : 230 \pm 5 $^{\circ}$ C Duration : 5 \pm 0.5sec Flux : Methanol solution with 25% of colophony

Item	Specified Value												Test Methods and Remarks
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518	LBH1608	
16. Resistance to soldering heat	No significant abnormality in appearance												Conduct following wave soldering twice. (LER012)  <p>Solder temperature : 260±5°C Duration : 5±0.5sec. Twice (LERO15) 10±1sec. Once (LEM2520 · LEMC2520 · LEMF2520 · LEMC3225 · LEMF3225)</p> <p>LB · LBH : 3 times of reflow oven at 220 ± 5°C for 40sec. with peak temperature at 235± 5°C for 5sec.</p>
17. Resistance to solvent	No significant abnormality in appearance.												Solvent temperature : Room temperature Type of solvent : Chlorocarbon type (LEM2520 · LEMC2520 · LEMC3225) Isopropyl alcohol (LEMF2520 · LEMF3225 · LB · LBC) Cleaning conditions : Output : 20mW/cm ² Frequency : 28kHz Duration : 1 min Conduct ultrasonic cleaning. (LEM2520 · LEMC2520 · LEMC3225) 90s. Immersion and cleaning. (LEMF2520 · LEMF3225 · LB · LBC)

Item	Specified Value											Test Methods and Remarks													
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518		LBH1608												
18.Resisittance to solvent	ΔL/L→	ΔL/L→	ΔL/L→Within±10%									ΔL/L→	Conditions for 1cycle <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature(C)①</th> <th>Temperature(C)②</th> <th>Duration(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25</td> <td>-40</td> <td>30</td> </tr> <tr> <td>2</td> <td>+85</td> <td>+85</td> <td>30</td> </tr> </tbody> </table> Temperature ① for : LER012・LER015 Temperature ② for : LEM2520・LEMC2520・LEMF2520・LEMC3225・LEMF3225 Number of cycle : 100 cycle Recovery : At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs. LB・LBC・LBH : -40~+85°C, miantain times 30min. ,100 cycle Recovery : At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.	Step	Temperature(C)①	Temperature(C)②	Duration(min)	1	-25	-40	30	2	+85	+85	30
	Step	Temperature(C)①	Temperature(C)②	Duration(min)																					
1	-25	-40	30																						
2	+85	+85	30																						
Within±10% Q→ 5N6~18N : 10min. 22N~R10 : 15min. 15min. 39N~R10 : R12~1R0 : 20min. 25min. R12~4R7 : 1R2~3R3 : 30min. 20min. 5R6~330 : 25min. ΔL/L→ Within±10% Q→ 10N~18N : 10min. 22N~R10 : 15min. R12~100 : 30min. 120~220 : 20min.	Within±10% Q→ 10N : 10min. 12N~33N : 15min. 39N~R10 : 15min. R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Within±10% Q→ 10N : 10min. 12N~33N : 15min. 39N~R10 : 15min. R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Within±5% ※ΔL/L→ within±0.5nH under 8.2nH ΔQ/Q→ within±20% ※ΔQ/Q →within ±5 under 8.2nH																						
19.Damp heat	ΔL/L→	ΔL/L→	ΔL/L→Within±10%									ΔL/L→	Temperature : 60±2°C Humidity : 90~95%RH Duration : 1000 hrs Recovery : At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs.												
	Within±10% Q→ 5R6~18N : 10min. 22N~R10 : 15min. 15min. 39N~R10 : R12~1R0 : 20min. 25min. R12~4R7 : 1R2~3R3 : 30min. 20min. 5R6~330 : 25min. ΔL/L→ Within±10% Q→ 10N~18N : 10min. 22N~R10 : 15min. R12~100 : 30min. 120~220 : 20min.	Within±10% Q→ 10N : 10min. 12N~33N : 15min. 39N~R10 : 15min. R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Within±10% Q→ 10N : 10min. 12N~33N : 15min. 39N~R10 : 15min. R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Within±5% ※ΔL/L→ within±0.5nH under 8.2nH ΔQ/Q→ Within±20% ※ΔQ/Q →within ±5 under 8.2nH																					

Item	Specified Value											Test Methods and Remarks	
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518		LBH1608
20.Loading under damp heat	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow R12~1R0 : 25min. 1R2~3R3 : 20min. $\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow R12~100 : 30min. 120~220 : 20min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$									$\Delta L/L \rightarrow$ Within $\pm 5\%$ ※ $\Delta L/L \rightarrow$ within $\pm 0.5nH$ under 8.2 n H $\Delta Q/Q \rightarrow$ within $\pm 20\%$ ※ $\Delta Q/Q$ \rightarrow within ± 5 under 8.2 n H	LER · LEM · LB · LBC : Temperature : 60 $\pm 2^\circ C$ (Excluding nH range) Humidity : 90~95%RH Duration : 1000 hrs Applied current : Rated current Recovery : At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs.
21.Hirh temperaturte life test	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow 5R6~18N : 10min. 22N~R10 : 15min. 15min. R12~1R0 : 25min. 1R2~3R3 : 20min. $\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow 10N~18N : 10min. 22N~R10 : 15min. R12~100 : 30min. 120~220 : 20min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow 10N : 10min. 12N~33N : 15min. 39N~R10 : 20min. R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$									LER · LEM : Temperature : 85 $\pm 2^\circ C$ Duration : 1000 hrs Recovery : At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs.	
22.Loading at high temperature	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow R12~1R0 : 25min. 1R2~3R3 : 20min. $\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow R12~100 : 30min. 120~220 : 20min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$					$\Delta L/L \rightarrow$ Within $\pm 10\%$				$\Delta L/L \rightarrow$ Within $\pm 5\%$ ※ $\Delta L/L \rightarrow$ within $\pm 0.5nH$ under 8.2 n H $\Delta Q/Q \rightarrow$ Within $\pm 20\%$ ※ $\Delta Q/Q$ \rightarrow within ± 0.5 under 8.2 n H	LER · LB · LBC : Temperature : 85 $\pm 2^\circ C$ (Excluding nH range) Duration : 1000 hrs Applied current : Rated current Recovery : At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs.	

Item	Specified Value											Test Methods and Remarks	
	LER012 LER015	LEM2520	LEMC2520	LEMF2520	LEMC3225	LEMF3225	LB2518	LB2016	LB2012	LB1608	LBC2518		LBH1608
23.Low temperature life test	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow 5R6~18N : 10min. 22N~R10 : 15min. 15min. R12~1R0 : 20min. 25min. 1R2~3R3 : 30min. 20min. $\Delta L/L \rightarrow$ $\pm 10\%$ 以内 Q \rightarrow 10N~18N : 10min. 22N~R10 : 15min. R12~100 : 30min. 120~220 : 20min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$ Q \rightarrow 10N : 10min. 12N~33N : 10min. 15min. 39N~R10 : 15min. R12~4R7 : 20min. 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	$\Delta L/L \rightarrow$ Within $\pm 10\%$									$\Delta L/L \rightarrow$ Within $\pm 5\%$ ※ $\Delta L/L \rightarrow$ within $\pm 0.5nH$ under 8.2 n H $\Delta Q/Q \rightarrow$ Within $\pm 20\%$ ※ $\Delta Q/Q$ \rightarrow within ± 5 under 8.2 n H	LER · LEM · LB · LBC · LBH Temperature : $-40 \pm 2^\circ C$ Duration : 1000 hrs Recovery : At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs.
24.Standard condition	"Standard condition" referred to herein defined as follows : 5 to 35°C of temperature, 45 to 85% relative humidity, and 86 to 106kPa of air pressure. When there are questions concerning measurement results : In order to provide correlation data, the test shall be conducted under condition of $20 \pm 2^\circ C$ of temperature, 45 to 85% to 106kPa of air pressure. Unless otherwise specified all the test are conducted under the "standard condition"					Standard test condition : Unless otherwise specified, Temperature $20 \pm 15^\circ C$ of temperature, $65 \pm 20\%$ of relative humidity. When there are question concerning measurement result : In order to provide correlation date, the test shall be condition of $20 \pm 2^\circ C$ of temperature, $65 \pm 5\%$ relative humidity. Inductance is in accordance with our measured value.							

PRECAUTIONS

LER Type, LEM Type, LB Type

Stages	Precautions	Technical considerations
1.Circuit Design	<p>Operating environment,</p> <p>1.The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.</p>	
2.PCB Design	<p>Land pattern design</p> <p>1.Please contact any of our offices for a land pattern, and refer to a recommended land pattern of specifications.</p>	
3.Considerations for automatic placement	<p>Adjustment of mounting machine</p> <p>1.Excessive impact load should not be imposed on the products when mounting onto the PC boards.</p> <p>2.Mounting and soldering conditions should be checked beforehand.</p>	<p>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</p>
4.Soldering	<p>Wave soldering</p> <p>1.Please refer to the specifications in the catalog for a wave soldering.</p> <p>Reflow soldering</p> <p>1.Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified.</p> <p>2.LER012 Type, LB Type</p> <p>Reflow solderring only.</p> <p>Lead free soldering</p> <p>1.When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to soldering heat, etc. sufficiently.</p> <p>Recommended conditions for using a soldering iron</p> <p>Put the soldering iron on the land-pattern.</p> <p>Soldering iron's temperature - Below 350 °C</p> <p>Duration - 3 seconds or less</p> <p>The soldering iron should not directly touch the inductor.</p>	<p>1.If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products.</p>
5.Cleaning	<p>Cleaning conditions</p> <p>LB Type</p> <p>1.Washing by supersonic waves shall be avoided.</p>	<p>LB Type</p> <p>1.If washing by supersonic waves, supersonic waves may cause broken products.</p>
6.Handling	<p>Handling</p> <p>1.Keep the inductors away from all magnets and magnetic objects.</p> <p>Breakaway PC boards (splitting along perforations)</p> <p>1.When splitting the PC board after mounting inductors, care should be taken not to give any stresses of deflection or twisting to the board.</p> <p>2.Board separation should not be done manually, but by using the appropriate devices.</p> <p>Mechanical considerations</p> <p>1.Please do not give the inductors any excessive mechanical shocks.</p>	<p>1.There is a case that a characteristic varies with magnetic influence.</p> <p>1.Planning pattern configurations and the position of products should be carefully performed to minimize stress.</p> <p>1.There is a case to be damaged by a mechanical shock.</p>
7.Storage conditions	<p>Storage</p> <p>1.To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled.</p> <p>· Recommended conditions</p> <p>Ambient temperature 0~40°C</p> <p>Humidity Below 70% RH</p> <p>The ambient temperature must be kept below 30°C Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, LE type inductors should be used within one year from the time of delivery.</p> <p>LER type, LB type</p> <p>Please should be used within 6 months from the time of delivery.</p> <p>LE type</p> <p>In case of storage over 6 months, solderability shall be checked before actual usage.</p>	<p>1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.</p>