

Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.



REMINDERS

- Product information in this catalog is as of October 2008. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or usage of the Products.

Please note that Taiyo Yuden Co., Ltd. shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this catalog or individual specification.

- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.
- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,(automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance.

Do not incorporate the products into any equipment in fields such as aerospace, aviation, nuclear control, submarine system, military, etc. where higher safety and reliability are especially required.

In addition, even electronic components or functional modules that are used for the general electronic equipment, if the equipment or the electric circuit require high safety or reliability function or performances, a sufficient reliability evaluation check for safety shall be performed before commercial shipment and moreover, due consideration to install a protective circuit is strongly recommended at customer's design stage.

- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN' s official sales channel").
It is only applicable to the products purchased from any of TAIYO YUDEN' s official sales channel.
- Please note that Taiyo Yuden Co., Ltd. shall have no responsibility for any controversies or disputes that may occur in connection with a third party's intellectual property rights and other related rights arising from your usage of products in this catalog. Taiyo Yuden Co., Ltd. grants no license for such rights.
- Caution for export
Certain items in this catalog may require specific procedures for export according to "Foreign Exchange and Foreign Trade Control Law" of Japan, "U.S. Export Administration Regulations," and other applicable regulations. Should you have any question or inquiry on this matter, please contact our sales staff.
Should you have any question or inquiry on this matter, please contact our sales staff.

信号系巻線チップインダクタ

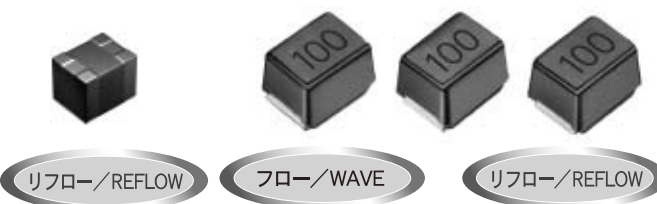
WOUND CHIP INDUCTORS

FOR SIGNAL LINE

LB SERIES M TYPE

LE SERIES M TYPE

OPERATING TEMP.	LBM2016 TYPE	-25~+105°C (製品自己発熱含む) (Including self-generated heat)
	LEM2520 TYPE	-40~+85°C



特長 FEATURES

LBM2016

- ・下面電極構造を採用により、高いQ化および狭公差化を実現しました。信号系用途の回路設計に適した巻線チップインダクタです。

LEM2520

- ・アキシア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

LBM2016 Series

- ・ High Q and narrow tolerance are achieved by adopting bottom-surface electrode structure. Wound Chip Inductors that are suit for module design of signal line uses.

LEM2520 Series

- ・ 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.

用途 APPLICATIONS

- ・ DSC / DVC / HDD、液晶、携帯電話、ゲーム機器、各種映像機器、各種通信機器など

- ・ DSC/DVC/HDD, LCD, portable telephones, game equipments. Various audio-visual equipments, various communication equipments, etc.

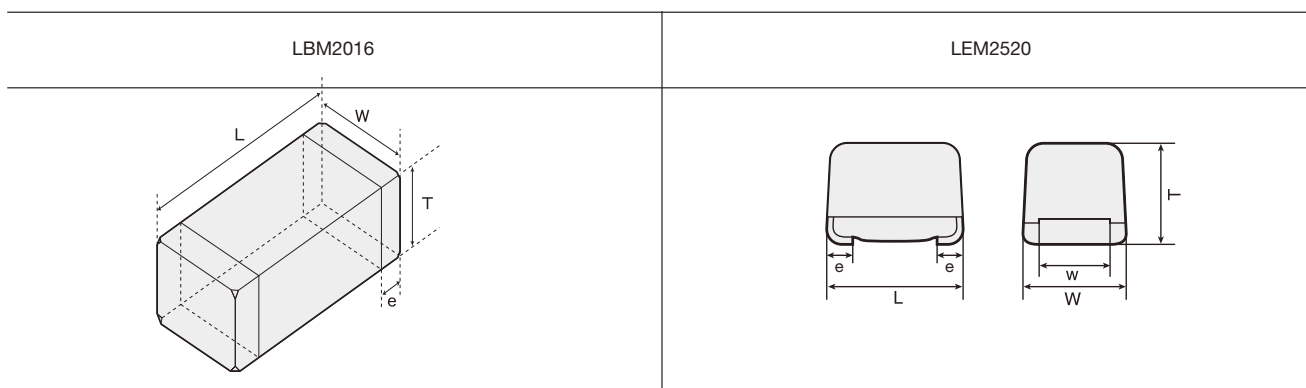
形名表記法 ORDERING CODE

1 形式 LBM 信号系巻線チップインダクタ LEM 信号系巻線チップインダクタ	3 梱包 T テーピング	4 公称インダクタンス [μH] 例 R12 0.12 1R0 1.00 100 10.0	5 インダクタンス許容差 J ±5% K ±10%
2 外形寸法 [mm] 2016 2.0×1.6 2520 2.5×2.0	6 当社管理記号 △ 標準品 △=スペース		

L B M 2 0 1 6 T 1 0 0 J △

1 2 3 4 5 6

1 Type LBM Wound chip inductor for signal line LEM Wound chip inductor for signal line	3 Packaging T Tape & Reel	4 Nominal Inductance [μH] example R12 0.12 1R0 1.00 100 10.0	5 Inductance Tolerances J ±5% K ±10%
2 External Dimensions [mm] 2016 2.0×1.6 2520 2.5×2.0	6 Internal code △ Standard Products △=Blank space		



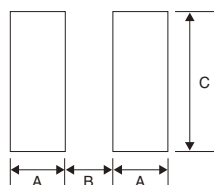
Type	L	W	T	e	w
LBM2016	2.0±0.2 (0.08±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.02±0.008)	
LEM2520	2.5±0.2 (0.098±0.008)	2.0±0.2 (0.079±0.008)	1.8±0.2 (0.071±0.008)	0.45 (0.018)	1.4±0.1 (0.055±0.004)

Unit : mm (inch)

推奨ランドパターン Recommended Land Patterns

実装上の注意

- ・実装状態を確認の上ご使用下さいませようお願いいたします。
- ・本製品のはんだ付けは、リフローはんだ工法に限りませう。
- (LBのみの適用)
- ・推奨ランドパターン



TYPE	A	B	C
LBM2016	0.7	0.8	1.8
LEM2520	0.9	1.5	1.5

Surface Mounting

- ・Mounting and soldering conditions should be checked beforehand.
- ・Applicable soldering process to this products is reflow soldering only. (LB only)
- ・Recommended Land Patterns

概略バリエーション AVAILABLE INDUCTANCE RANGE

Range		Type	LBM2016		LEM2520	
一般タイプ Ordinary type	Inductance (μH)	0.12	Idc[mA] 610	Rdc±30%[Ω] 0.13	Idc[mA] 520	Rdc max 0.37
		1.0	385	0.38	245	1.10
		10	215	1.20	155	3.50
		100	80	8.00	60	21.00
			100 μH		100 μH	

代表値 Examples	Inductance	Idc [mA]		Rdc [Ω]	
		LBM2016 (max.)	LEM2520 (max.)	LBM2016 (±30%)	LEM2520 (max.)
	0.12 μH	610	520	0.13	0.37
	1.00 μH	385	245	0.38	1.10
	10.0 μH	215	155	1.20	3.50
	100 μH	80	60	8.00	21.0

セレクションガイド
Selection Guide

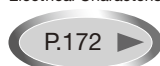
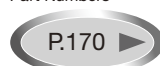
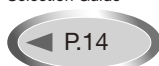
アイテム一覧
Part Numbers

特性図
Electrical Characteristics

梱包
Packaging

信頼性
Reliability Data

使用上の注意
Precautions



etc

LBM2016 TYPE

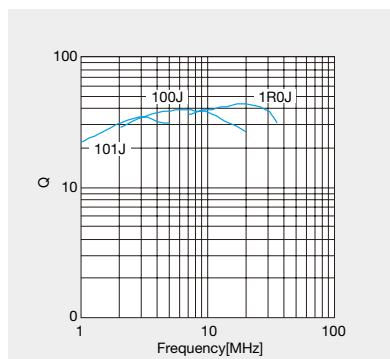
形 名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μ H]	インダクタンス 許容差 Inductance Tolerance	Q値 Q VALUE (min.)	自己共振 周 波 数 Self-resonant frequency [MHz] min.	直流抵抗 DC Resistance [Ω] ±30%	定格電流 Rated current [mA] (max.)	測 定 周波数 Measuring frequency [MHz]
LB M2016TR12J		RoHS	0.12	±5%	30	600	0.13	610	25.2
LB M2016TR15J		RoHS	0.15			550	0.15	570	
LB M2016TR18J		RoHS	0.18			500	0.15	560	
LB M2016TR22J		RoHS	0.22			450	0.20	520	
LB M2016TR27J		RoHS	0.27			425	0.21	510	
LB M2016TR33J		RoHS	0.33			400	0.21	490	
LB M2016TR39J		RoHS	0.39			375	0.26	440	
LB M2016TR47J		RoHS	0.47			350	0.26	430	
LB M2016TR56J		RoHS	0.56			300	0.29	410	
LB M2016TR68J		RoHS	0.68			270	0.32	400	
LB M2016TR82J		RoHS	0.82			250	0.34	390	7.96
LB M2016T1R0J		RoHS	1.0			220	0.38	385	
LB M2016T1R2J		RoHS	1.2			180	0.41	370	
LB M2016T1R5J		RoHS	1.5			135	0.47	350	
LB M2016T1R8J		RoHS	1.8			100	0.48	345	
LB M2016T2R2J		RoHS	2.2			75	0.54	340	
LB M2016T2R7J		RoHS	2.7			55	0.59	310	
LB M2016T3R3J		RoHS	3.3			48	0.68	290	
LB M2016T3R9J		RoHS	3.9			43	0.74	275	
LB M2016T4R7J		RoHS	4.7			40	0.78	270	
LB M2016T5R6J		RoHS	5.6		25	36	0.88	255	2.52
LB M2016T6R8J		RoHS	6.8			33	0.97	240	
LB M2016T8R2J		RoHS	8.2			30	1.10	225	
LB M2016T100J		RoHS	10			27	1.20	215	
LB M2016T120J		RoHS	12			23	1.4	200	
LB M2016T150J		RoHS	15			20	1.5	190	
LB M2016T180J		RoHS	18			18	2.5	150	
LB M2016T220J		RoHS	22			17	2.8	140	
LB M2016T270J		RoHS	27			16	3.2	130	
LB M2016T330J		RoHS	33			15	3.6	125	
LB M2016T390J		RoHS	39		20	14	3.9	120	0.796
LB M2016T470J		RoHS	47			13	4.1	115	
LB M2016T560J		RoHS	56			12	5.9	95	
LB M2016T680J		RoHS	68			11	7.0	90	
LB M2016T820J		RoHS	82	10		7.7	85		
LB M2016T101J		RoHS	100	15		9.0	8.0	80	

LEM2520 TYPE

形 名 Ordering code		EHS (Environmental Hazardous Substances)	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]
LEM 2520 TR12K		RoHS	0.12	±10%	30	600	0.37	520	25.2
LEM 2520 TR15K		RoHS	0.15			550	0.42	480	
LEM 2520 TR18K		RoHS	0.18			500	0.46	460	
LEM 2520 TR22K		RoHS	0.22			450	0.52	430	
LEM 2520 TR27K		RoHS	0.27			425	0.56	420	
LEM 2520 TR33K		RoHS	0.33			400	0.60	400	
LEM 2520 TR39K		RoHS	0.39			375	0.65	375	
LEM 2520 TR47K		RoHS	0.47			350	0.68	350	
LEM 2520 TR56K		RoHS	0.56			300	0.75	325	
LEM 2520 TR68K		RoHS	0.68			270	0.85	300	
LEM 2520 TR82K		RoHS	0.82			250	1.00	260	
LEM 2520 T1R0J		RoHS	1.0	±5%	30	220	1.10	245	7.96
LEM 2520 T1R2J		RoHS	1.2			180	1.20	230	
LEM 2520 T1R5J		RoHS	1.5			135	1.30	220	
LEM 2520 T1R8J		RoHS	1.8			100	1.45	210	
LEM 2520 T2R2J		RoHS	2.2			75	1.55	200	
LEM 2520 T2R7J		RoHS	2.7			55	1.70	195	
LEM 2520 T3R3J		RoHS	3.3			48	1.90	185	
LEM 2520 T3R9J		RoHS	3.9			43	2.10	180	
LEM 2520 T4R7J		RoHS	4.7			40	2.30	175	
LEM 2520 T5R6J		RoHS	5.6		25	36	2.50	170	2.52
LEM 2520 T6R8J		RoHS	6.8			33	2.70	165	
LEM 2520 T8R2J		RoHS	8.2			30	3.05	160	
LEM 2520 T100J		RoHS	10			27	3.50	155	
LEM 2520 T120J		RoHS	12			23	3.80	150	
LEM 2520 T150J		RoHS	15			20	4.40	140	
LEM 2520 T180J		RoHS	18			18	4.80	130	
LEM 2520 T220J		RoHS	22			17	5.50	125	
LEM 2520 T270J		RoHS	27			16	6.30	115	
LEM 2520 T330J		RoHS	33			15	7.10	110	
LEM 2520 T390J		RoHS	39		20	14	9.50	90	
LEM 2520 T470J		RoHS	47			13	11.10	80	
LEM 2520 T560J		RoHS	56			12	12.10	75	
LEM 2520 T680J		RoHS	68			11	16.60	70	
LEM 2520 T820J		RoHS	82		15	10	19.00	65	
LEM 2520 T101J		RoHS	100			9	21.00	60	0.796

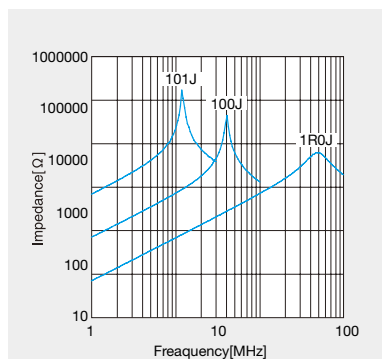
●LBM2016

Q-周波数特性 Q-Characteristics

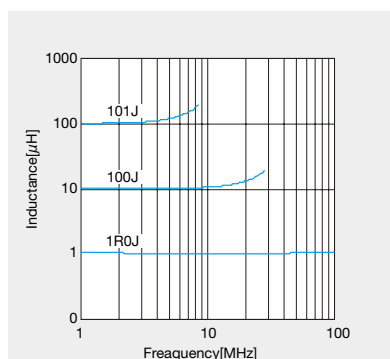


インピーダンス周波数特性

Impedance-vs-Frequency characteristics



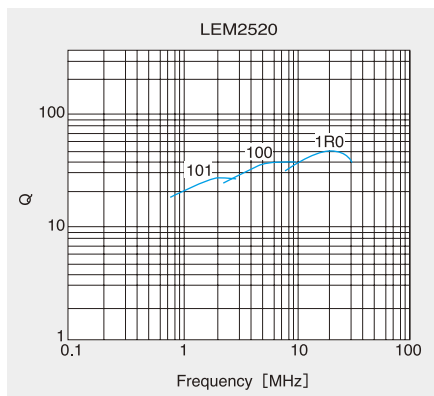
インダクタンス周波数特性 Inductance-vs-Frequency characteristics



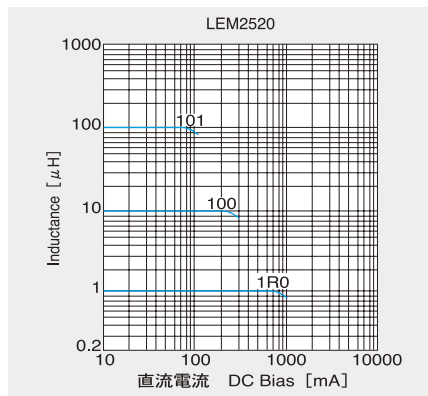
●LEM2520

Q-周波数特性例 Q-Characteristics

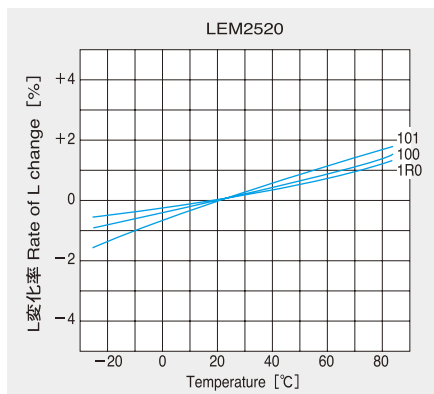
一般タイプ Ordinary type (Measured by HP4285A+42851A)



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)

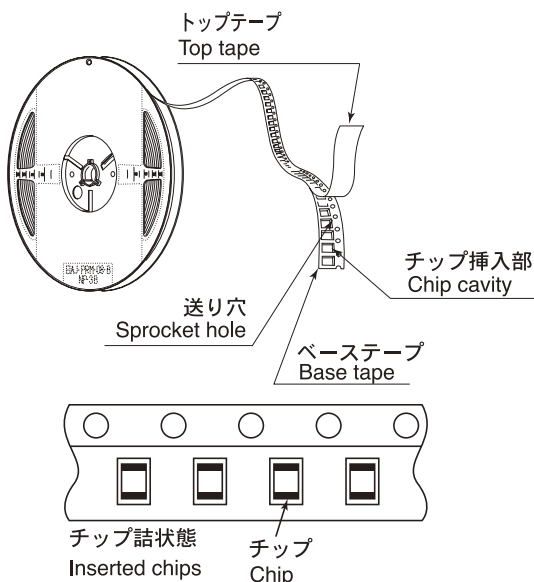


①最小受注単位数 Minimum Quantity

形式 Type	標準数量 Standard Quantity [pcs]	
	紙テーピング Paper Tape	エンボステーピング Embossed Tape
CBC3225	—	1000
LB3218	—	2000
LBR2518/LBC2518/LB2518 /CB2518/CBC2518/LEM2520	—	2000
LBM2016/LBC2016/LB2016 /CB2016/CBC2016	—	2000
LB2012/LBC2012/LBR202 /CB2012/CBC2012	—	3000
CBL2012	4000	—
LB1608	4000	—
LBMF1608/CBMF1608	—	3000

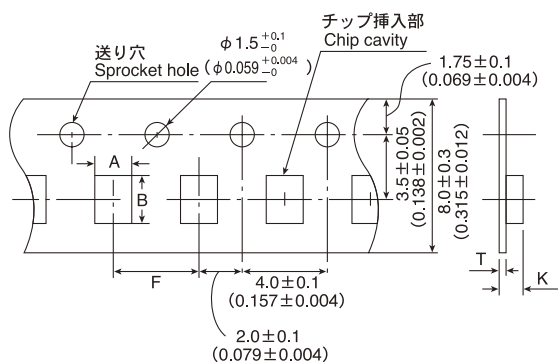
②テーピング材質 Tape material

エンボステープ Embossed tape



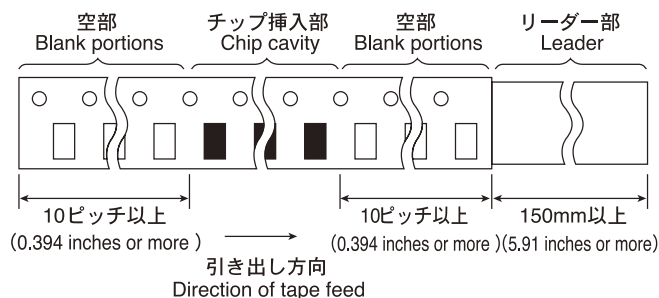
③テーピング寸法 Taping Dimensions

エンボステープ (8mm幅) Embossed Tape (0.315 inches wide)
紙テープ (8mm幅) Card board carrier tape (0.315 inches wide)

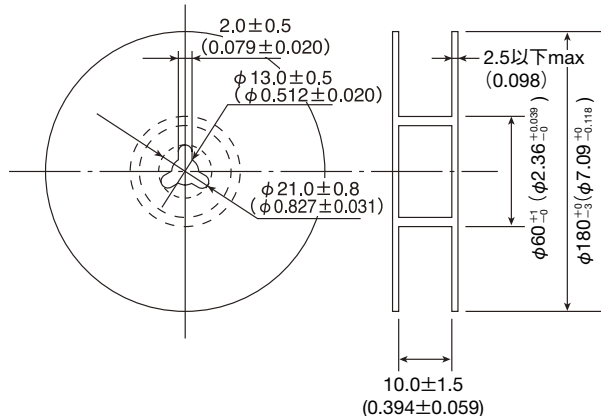


形式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
LBM 2016	1.9±0.2 (0.075±0.008)	2.2±0.2 (0.087±0.008)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.15 (0.085)
LEM 2520	2.3±0.1 (0.091±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.10 (0.083)
CBC3225	2.8±0.1 (0.110±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	0.6max (0.024)	4.0max (0.157)
LB3218	2.1±0.1 (0.084±0.004)	3.5±0.1 (0.014±0.004)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.3max (0.092)
LBR2518 / CB2518 LBC2518 / CBC2518 LBR2518	2.15±0.2 (0.085±0.008)	2.7±0.2 (0.107±0.008)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.10 (0.083)
LB2016 / CB2016 LBC2016 / CBC2016	1.9±0.2 (0.075±0.008)	2.2±0.2 (0.087±0.008)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.15 (0.085)
LB2012 / CB2012 LBC2012 / CBC2012 LBR2012	1.45±0.2 (0.058±0.008)	2.25±0.2 (0.09±0.008)	4.0±0.1 (0.157±0.004)	0.25 (0.012)	2.0 (0.079)
CBL2012	1.55±0.2 (0.061±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.044)	1.1max (0.044)
LB1608	1.0±0.2 (0.059±0.008)	1.8±0.2 (0.072±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.044)	1.1max (0.044)
LBMF1608 / CBMF1608	1.1±0.1 (0.04±0.004)	1.9±0.1 (0.076±0.004)	3.5±0.05 (0.14±0.002)	0.3max (0.012)	1.6max (0.064)

④リーダー部／空部 Leader and Blank Portion

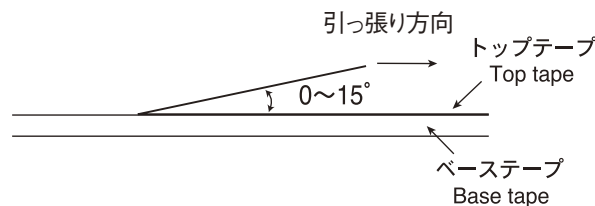


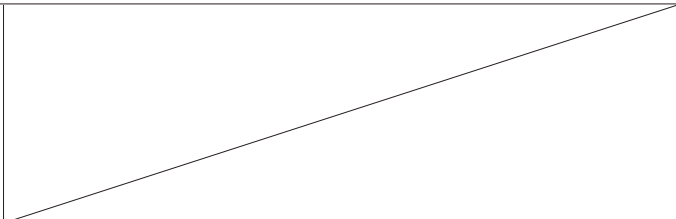
⑤リール寸法 Reel Size

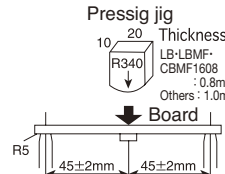


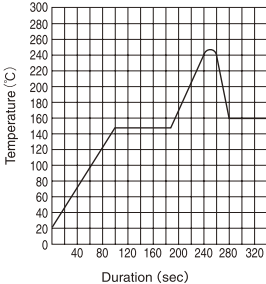
⑥トップテープ強度 Top Tape Strength

トップテープのはがし力は、下図矢印方向にて0.1～0.7Nとなります。
The top tape requires a peel-off force 0.1 to 0.7N in the direction of the arrow as illustrated below.



Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016	
1. Operating temperature Range	-40~+85℃	-25~+105℃ (Including self-generated heat)								
2.Storage	-40~+85℃									
3.Rated Current	Within the specified tolerance									LEM・LB・LBC・LBMF・LBM Series The maximum DC value having inductance decrease within 10% and temperature increase within 20℃ by the application of DC bias. LBR Series The maximum DC value having inductance decrease within 20% and temperature increase within 20℃ by the application of DC bias. CB・CBC・CBL・CBMF Series The maximum DC value having inductance decrease within 30% and temperature increase within 40℃ by the application of DC bias.
4.Inductance	Within the specified tolerance									LEM Series R12~101 : Measuring equipment : LCR Meter (HP4285A+42851A or its equivalent) Measuring frequency : Specified frequency LB・LBC・LBR・CB・CBC・CBL・LBMF・CBMF・LBM Series : Measuring equipment : LCR Mater (HP4285A or its equivalent)
5.Q	Within the specified tolerance							Within the specified tolerance	LEM Series R12~101 : Measuring equipment : LCR Meter (HP4285A+42851A or its equivalent) Measuring frequency : Specified frequency LBM Series : Measuring equipment : LCR Mater (HP4285A or its equivalent)	
6.DC Resistance	Within the specified tolerance									LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Series : Measuring equipment : DC Ohmmeter (HIOKI 3227 or its equivalent)
7.Self-Resonant Frequency	Within the specified tolerance									LEM2520 : Measuring equipment : Impedance analyzer (HP4291A or its equivalent) LB・LBC・LBR・CB・CBC・CBL・LBMF・CBMF Series : Measuring equipment : Impedance analyzer (HP4291A or its equivalent) LBM Series : Measuring equipment : Network analyzer (HP8720B or its equivalent)

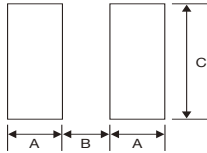
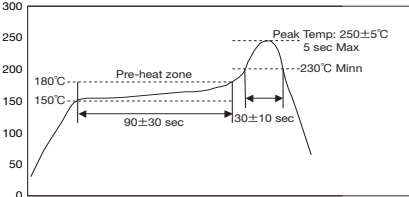
Item	Specified Value									Test Methods and Remarks												
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016													
8.Temperature Characteristic	Inductance change: Within±5%	Inductance change: Within±15% LBMF1608 LB3218 Inductance change: Within±20%	LBC2518 LBC2016 Inductance change: Within±20% LBC2012 Inductance change: Within±30%	Inductance change: Within±15%	Inductance change: Within±15%	CBC3225 CBC2518 CBC2016 Inductance change: Within±20% CBC2012 Inductance change: Within±30%	Inductance change: Within±15%	Inductance change: Within±20%	Inductance change: Within±5%	Change of maximum inductance deviation in step 1—5 <table><tr><th>Step</th><th>Temperature (°C)</th></tr><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></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.Rasistance to Flexure of Substrate	No damage.									Warp: 2mm (LB, LBC, LBR, CB, CBC, CBL, LBM,LBMF, CBF Series) : 3mm (LEM2520) Test substrate: Printed board According to JIS C0051 <div><p>Pressig jig</p></div>												
10.Body Strength	No damage.									LB・LBC・LBR・CB・CBC・CBL・LBM・LEM2520 Applied force : 10N Duration : 10sec. LB1608・LBMF1608・CBMF1608 Applied force : 5N Duration : 10sec.												
11.Self Resonant Frequency	Inductance change : Within—10%			Inductance change: Within—20%	Inductance change : Within—30%			Inductance change: Within—10%	Measure inductance with application of rated current using LCR metre to cmpare it with the initial value.													
12.Adhesion of terminal electrode	No abnormality.									LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF ・CBMF・LEM2520 Applied force : 10N to X and Y directions Duration : 5 sec. Test substrate : Printed board												
13.Resistance to vibration	Inductance change: Within±5% No significant abnormality in appearance.	Inductance change : Within±10% No significant abnormality in appearance.						Inductance change: Within±5% No significant abnormality in appearance.	LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF : 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 Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.													

Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016	
14.Drop test	Inductance change : Within±5% No significant abnormality in appearance.								LEM : Acceleration : 980m/sec ² Duration : 6msec Number of times : 6 sides × 3 times Mounting method : Soldering onto printed board Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	
15.Solderability	At least 90% of surface of terminal electrode is covered by new solder.									LEM : Solder temperature : 230±5℃ Duration : 5±0.5sec. Flux : Methanol solution with 25% of colophony LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF : Solder temperature : 245±5℃ Duration : 5±0.5sec Flux : Methanol solution with 25% of colophony
16.Resistance to soldering heat	Inductance change : Within±10% No significant abnormality in appearance.	LB3218 LB2518 LB2016 LB2012 LB1608 Inductance change : Within±10% No significant abnormality in appearance. LBMF1608 Inductance change : Within±20% No significant abnormality in appearance.	Inductance change : within ±10% No significant abnormality in appearance.			Inductance change : Within±20% No significant abnormality in appearance.	Inductance change : Within±5% No significant abnormality in appearance.	LEM : Reflow condition 3 times of reflow over at 220±5℃ for 40sec. MAX, With Peak temperature at 240±5℃ for 5 sec. MAX. (Refer to a Profile of chart below.)  Flow condition Solder temperature : 260±5℃ Duration : 10±1sec. Once LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF : 3 times of reflow oven at 230℃ MIN for 40sec. with peak temperature at 260 ⁺⁰ ₋₅ ℃ for 5sec.		
17.Resistance to solvent	No significant abnormality in appearance									Solvent temperature : Room temperature Type of solvent : Isopropyl alcohol (LEM2520・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF) Cleaning conditions : 90s. Immersion and cleaning. (LEM2520・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF)

Item	Specified Value									Test Methods and Remarks								
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016									
18.Thermal shock	Inductance change : Within±10% Q→ R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Inductance change :Within±10% No significant abnormality in appearance.							LEM : Conditions for 1cycle <table><tr><td>Step</td><td>Temperature (℃)</td><td>Duration (min)</td></tr><tr><td>1</td><td>－40</td><td>30</td></tr><tr><td>2</td><td>+85</td><td>30</td></tr></table> Number of cycle : 100 cycle Recovery : At least 1 hr of recovery the stan- dard condition after the removal from test chamber, followed by measurement within 2 hrs. LB・LBC・LBR・CB・CBC・CBL・LBM・ LBMF・CBMF : －40～+85℃, maintain times 30min., 100 cycle Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measure- ment within 48 hrs.	Step	Temperature (℃)	Duration (min)	1	－40	30	2	+85	30
Step	Temperature (℃)	Duration (min)																
1	－40	30																
2	+85	30																
19.Damp heat	Inductance change : Within±10% Q→ R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Inductance change :Within±10% No significant abnormality in appearance.							Temperature : 60±2℃ Humidity : 90～95%RH Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measure- ment within 48 hrs.									
20.Loading under damp heat	Inductance change : Within±10% Q→ R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Inductance change : Within±10% No significant abnormality in appearance.							LEM・LB・LBC・CB・CBC・CBL・LBM・ LBMF・CBMF : Temperature : 60±2℃ Humidity : 90～95%RH Duration : 1000 hrs Applied current : Rated current Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measure- ment within 48 hrs.									
21.High temperature life test	Inductance change : Within±10% Q→ R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.					Inductance change :Within±10% No significant abnormality in appearance.			LEM・CB・CBC・CBL・LBM・CBMF : Temperature : 85±2℃ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the mea- surement within 48 hrs.									
22.Loading at high temperature						Inductance change :Within±10% No significant abnormality in appearance.												

Item	Specified Value									Test Methods and Remarks	
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016		
23.Low temperature life test	Inductance change : Within±10% Q→ R12~4R7 : 30min. 5R6~330 : 25min. 390~820 : 20min. 101 : 15min.	Inductance change :Within±10% No significant abnormality in appearance.									LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・ LBMF・CBMF Temperature : -40±2℃ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measure- ment within 48 hrs.
24.Standard condition	Standard test condition : Unless otherwise specified,temperature is 20±15℃, and 65±20% of relative humidity.When there are question concerning measurement result : In order to provide correlation date, the test shall be condition of 20±2℃ of temperature, 65±5% relative humidity. Inductance is in accordance with our measured value.										

LEM Type, LB Type, CB 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 a right figure or specifications.</p>	<p>PRECAUTIONS</p> <p>【Recommended Land Patterns】</p> <p>Surface Mounting</p> <p>・ Mounting and soldering conditions should be checked beforehand.</p> <p>・ Applicable soldering process to this products is reflow soldering only. Unit : mm</p> <p>・ Recommended Land Patterns</p> <div><table><tr><th>TYPE</th><th>A</th><th>B</th><th>C</th></tr><tr><td>1608</td><td>0.55</td><td>0.7</td><td>1.0</td></tr><tr><td>MF1608</td><td>0.55</td><td>0.8</td><td>1.0</td></tr><tr><td>2012</td><td>0.7</td><td>0.8</td><td>1.45</td></tr><tr><td>2016</td><td>0.7</td><td>0.8</td><td>1.8</td></tr><tr><td>2518</td><td>0.8</td><td>1.2</td><td>2.0</td></tr><tr><td>LEM2520</td><td>0.9</td><td>1.5</td><td>1.5</td></tr><tr><td>3218</td><td>1.0</td><td>1.6</td><td>2.0</td></tr><tr><td>3225</td><td>1.0</td><td>1.6</td><td>2.7</td></tr></table></div>	TYPE	A	B	C	1608	0.55	0.7	1.0	MF1608	0.55	0.8	1.0	2012	0.7	0.8	1.45	2016	0.7	0.8	1.8	2518	0.8	1.2	2.0	LEM2520	0.9	1.5	1.5	3218	1.0	1.6	2.0	3225	1.0	1.6	2.7
TYPE	A	B	C																																			
1608	0.55	0.7	1.0																																			
MF1608	0.55	0.8	1.0																																			
2012	0.7	0.8	1.45																																			
2016	0.7	0.8	1.8																																			
2518	0.8	1.2	2.0																																			
LEM2520	0.9	1.5	1.5																																			
3218	1.0	1.6	2.0																																			
3225	1.0	1.6	2.7																																			
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 (LEM Type only)</p> <p>1.For wave soldering,please apply conditions meeting the range of the specied conditions in our catalog or the relevant specifications.</p> <p>Reflow soldering (LB and CB Types)</p> <p>1.For reflow soldering with either leaded or lead-free solder,the profile specified in "point for controlling" is recommended.</p> <p>Reflow soldering (LEM)</p> <p>1.For reflow soldering, please apply conditions meeting the range of the specified conditions in our catalog or the relevant specifications.</p> <p>Recommended conditions for using a soldering iron</p> <p>1.Put the soldering iron on the land-pattern.</p> <p>Soldering iron's temperature-Below 350℃ Duration-3 seconds or less</p> <p>The soldering iron should not come in contact with inductor directly.</p>	<p>1.Components can be damaged by excessive heat whre soldering conditions exceed the specified range.</p> <p>1.Reflow profile</p> <div></div> <p>1.Components can be damaged by excessive heat whre soldering conditions exceed the specified range.</p>																																				
5.Cleaning	<p>Cleaning conditions</p> <p>LEM Type, LB Type, CB Type</p> <p>1.Washing by supersonic waves shall be avoided.</p>	<p>LEM Type, LB Type, CB 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℃</p> <p>Humidity Below 70% RH</p> <p>The ambient temperature must be kept below 30℃ 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>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 suchas reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.</p>																																				