

信号系巻線チップインダクタ

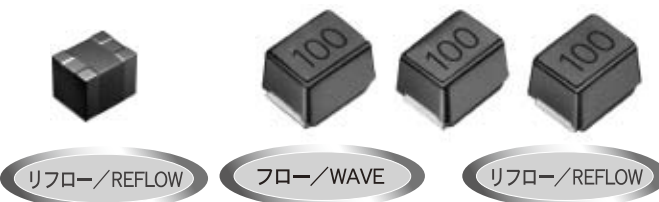
WOUND CHIP INDUCTORS

FOR SIGNAL LINE

LB SERIES M TYPE

LE SERIES M TYPE

OPERATING TEMP.	LBM2016 TYPE	-25~+120°C (製品自己発熱含む) -25~+120°C (Inducting 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。

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

- ・ 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

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

2

外形寸法 [mm]

2016	2.0×1.6
2520	2.5×2.0

3

梱包

T	テーピング
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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%

6

当社管理記号

△	標準品
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△=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

2

External Dimensions [mm]	
2016	2.0×1.6
2520	2.5×2.0

3

Packaging	
T	Tape & Reel

4

Nominal Inductance[μH]	
example	
R12	0.12
1R0	1.00
100	10.0

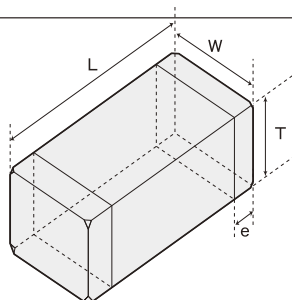
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Inductance Tolerances	
J	±5%
K	±10%

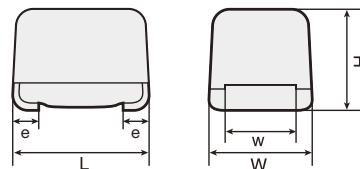
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Internal code	
△	Standard Products
△=Blank space	

LBM2016



LEM2520



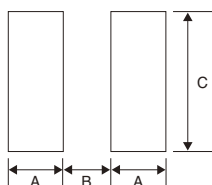
Type	L	W	T	e	w
LBM2016	2.0±0.2 (0.08±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.02±0.004)	
LEM2520	2.5±0.2 (0.098±0.008)	2.0±0.2 (0.079±0.008)	1.8±0.2 (0.071±0.008)	0.45 (0.018)	1.4±0.1 (0.055±0.004)

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す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です。
(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		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]
Ordering code									
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	
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	
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	14		3.9	120		
LB M2016T470J		RoHS	47	20		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	0.796	

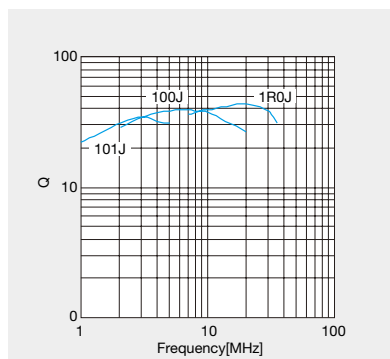
LEM2520 TYPE

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			10	19.00	65	
LEM 2520 T101J		RoHS	100		15	9	21.00	60	0.796

特性図 ELECTRICAL CHARACTERISTICS

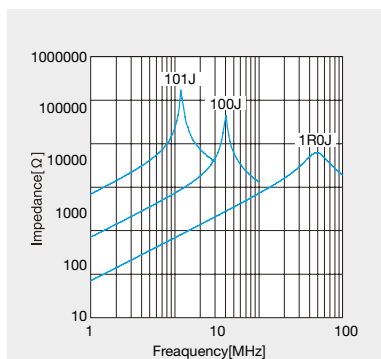
●LBM2016

Q-周波数特性 Q-Characteristics

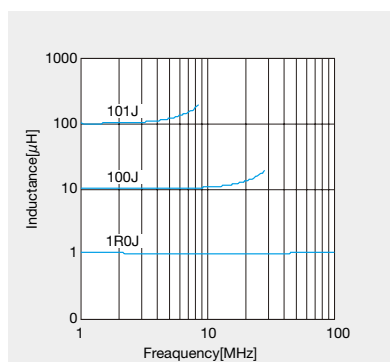


インピーダンス周波数特性

Impedance-vs-Frequency characteristics



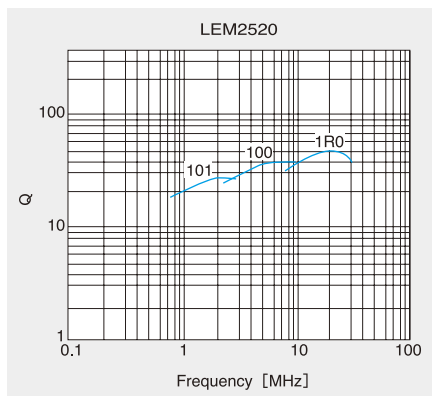
インダクタンス周波数特性 Inductance-vs-Frequency characteristics



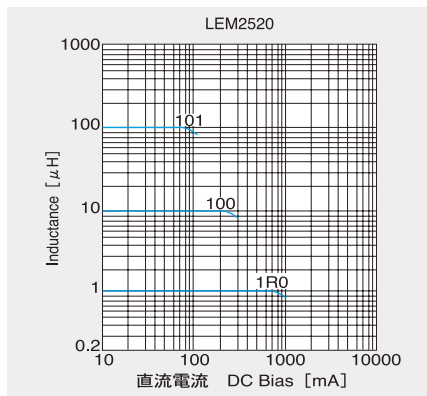
●LEM2520

Q-周波数特性例 Q-Characteristics

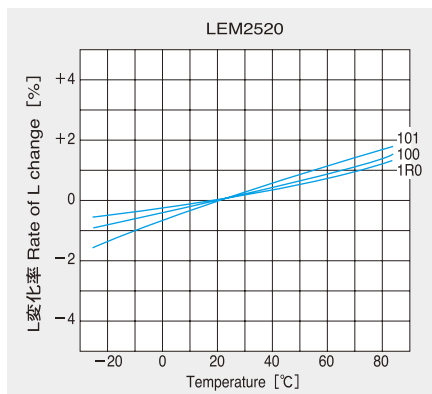
一般タイプ Ordinary type (Measured by HP4285A+42851A)



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)

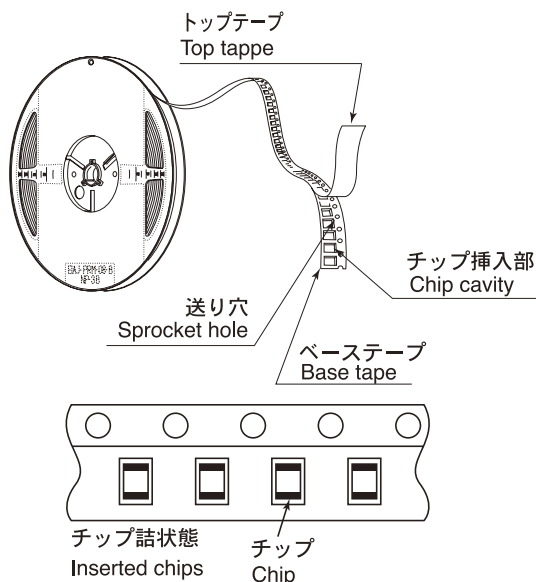


①最小受注単位数 Minimum Quantity

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

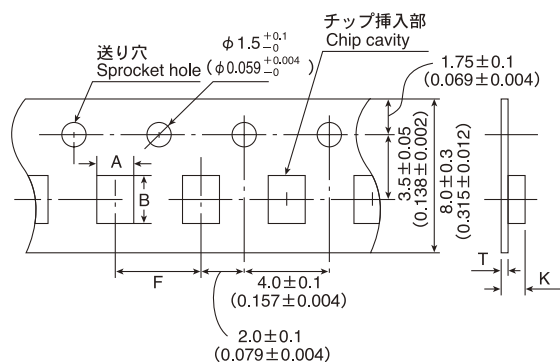
②テーピング材質 Tape material

エンボステープ Embossed tape



③テーピング寸法 Taping Dimensions

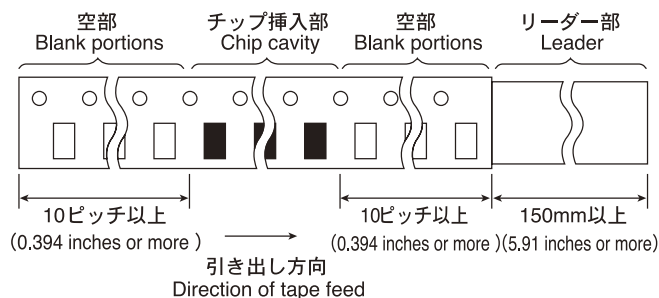
エンボステープ (8mm幅) Embossed Tape (0.315 inches wide)
紙テープ (8mm幅) Card board carrier tape (0.315 inches wide)



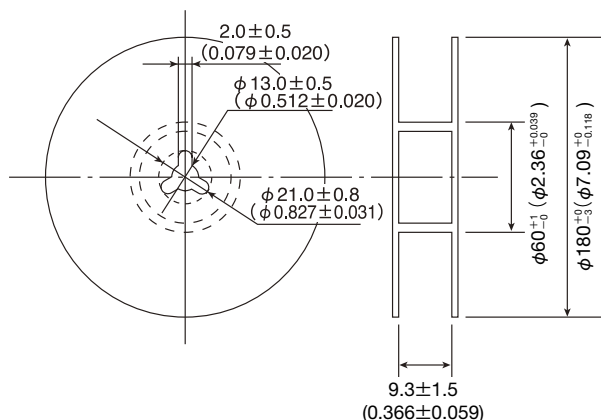
形式 Type	チップ挿入部 Chip Cavity		挿入ピッチ Insertion Pitch	テープ厚み Tape Thickness	
	A	B	F	T	K
LBM 2016	1.9 ± 0.1 (0.075 ± 0.004)	2.2 ± 0.1 (0.087 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 (0.012)	2.15 (0.085)
LEM 2520	2.3 ± 0.1 (0.091 ± 0.004)	2.7 ± 0.1 (0.106 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 (0.012)	2.10 (0.083)

Unit: mm (inch)

④リーダー部／空部 Leader and Blank Portion

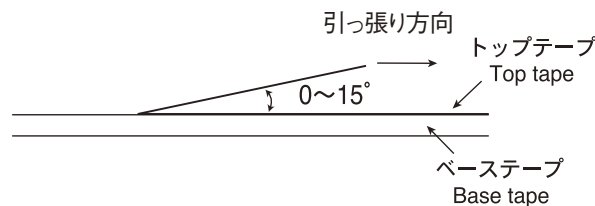


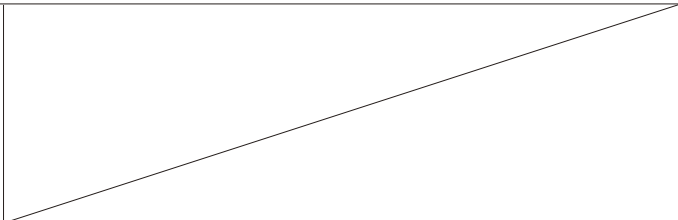
⑤リール寸法 Reel Size

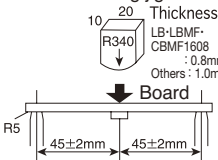


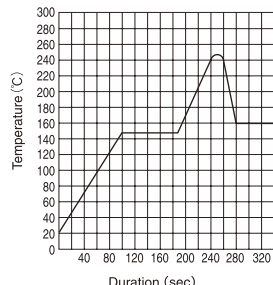
⑥トップテープ強度 Top Tape Strength

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	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	LBMF1608 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 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・LBM・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 Series : Measuring equipment : LCR Meter (HP4285A or its equivalent) LBM Series : Measuring equipment : Impedance analyzer (HP4291A 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 : Impedance analyzer (HP4291A or its equivalent)	
6.DC Resistance	Within the specified tolerance									LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Series : Measuring equipment : low ohmmeter (A&D AD5812,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	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	LBMF1608 CBMF1608	LBM2016													
8.Temperature Characteristic	Inductance change: Within±5%	Inductance change: Within±15% 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.Resistance 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 Pressig jig 												
10.Body Strength	No damage.									LB・LBC・LBR・CB・CBC・CBL・LBM・LEM2520 Applde force : 10N Duration : 10sec. LB1608・LBMF1608・CBMF1608 Applde force : 5N Duration : 10sec.												
11.Self Resonant Frequency	Inductance change : Within—10%			Inductance change: Within—20%	Inductance change : Within—30%		Inductance change: Within—20%	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.									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 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.											

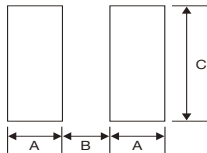
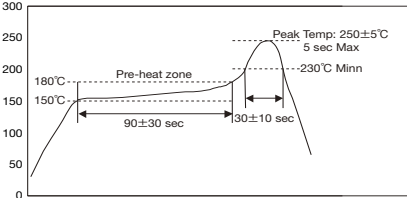
Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	LBMF1608 CBMF1608	LBM2016	
14.Drop test	Inductance change : Within±5% No significant abnormality in appearance.								LEM : Acceleration : 980m/sec ² Duration : 6msec Number of times : 6 sides × 3 times Mounting method : Soldering onto printed board Recovery : At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 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.Resisitance to soldering heat	Inductance chang : within ±10% 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.Resisitance to soolvent	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	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	LBMF1608 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 remova- from test chamber, followed by measurement within 2 hrs. LB・LBC・LBR・CB・CBC・CBL・LBM・ LBMF・CBMF : －40~+85℃, maintian times 30min. ,100 cycle Recovery : At least 2 hr 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 hr 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 hr of recovery under the standard condition after the test, followed by the measure- ment within 48 hrs.									
21.High temperaturte 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 hr 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.				LB・LBC・LBR・LBMF : Temperature : 85±2℃ Duration : 1000 hrs Applied current : Rated current Recovery : At least 2 hr of recovery under the standard condition after the test, followed by the measure- ment within 48 hrs.								

Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	LBMF1608 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 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 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.									

PRECAUTIONS

LEM Type, LB Type, CB Type

Stages	Precautions	Technical considerations																																				
1.Circuit Design	Operating environment, 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.																																					
2.PCB Design	Land pattern design 1.Please contact any of our offices for a land pattern, and refer to a recommended land pattern of a right figure or specifications.	PRECAUTIONS 【Recommended Land Patterns】 Surface Mounting - Mounting and soldering conditions should be checked beforehand. - Applicable soldering process to this products is reflow soldering only. - Recommended Land Patterns <table><thead><tr><th>TYPE</th><th>A</th><th>B</th><th>C</th></tr></thead><tbody><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></tbody></table>	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																																			
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3218	1.0	1.6	2.0																																			
3225	1.0	1.6	2.7																																			
3.Considerations for automatic placement	Adjustment of mounting machine 1.Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2.Mounting and soldering conditions should be checked beforehand.	1. When installing products, care should be taken not to apply distortion stress as it may deform the products.																																				
4.Soldering	Wave soldering (LEM Type only) 1.For wave soldering,please apply conditions meeting the range of the specied conditions in our catalog or the relevant specifications. Reflow soldering (LB and CB Types) 1.For reflow soldering with either leaded or lead-free solder,the profile specified in "point for controlling" is recommended. Reflow soldering (LEM) 1.For reflow soldering, please apply conditions meeting the range of the specified conditions in our catalog or the relevant specifications.. Recommended conditions for using a soldering iron 1.Put the soldering iron on the land-pattern. Soldering iron's temperature-Below 350°C Duration-3 seconds or less The soldering iron should not directly the inductor.	1.Components can be damaged by excessive heat whre soldering conditions exceed the specified range. 1.Reflow profile  1.Components can be damaged by excessive heat whre soldering conditions exceed the specified range.																																				
5.Cleaning	Cleaning conditions LEM Type, LB Type, CB Type 1.Washing by supersonic waves shall be avoided.	LEM Type, LB Type, CB Type 1.If washing by supersonic waves, supersonic waves may cause broken products.																																				
6.Handling	Handling 1.Keep the inductors away from all magnets and magnetic objects. Breakaway PC boards (splitting along perforations) 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. 2.Board separation should not be done manually, but by using the appropriate devices. Mechanical considerations 1.Please do not give the inductors any excessive mechanical shocks.	1.There is a case that a characteristic varies with magnetic influence. 1.Planning pattern configurations and the position of products should be carefully performed to minimize stress. 1.There is a case to be damaged by a mechanical shock.																																				
7.Storage conditions	Storage 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. Recommended conditions Ambient temperature 0~40°C Humidity Below 70% RH 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. LB type Please should be used within 6 months from the time of delivery. LE type In case of storage over 6 months, solderability shall be checked before actual usage.	1. Under a high temperature and humidity environment, problems suchas reduced solderability caused by oxidation of terminal electrodes and deterioration oftaping/packaging materials may take place.																																				