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 2009. 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.
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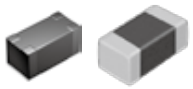
WOUND CHIP INDUCTORS (LB SERIES)



REFLOW

FEATURES

Wound Chip Inductors cover customers' wide range module designs by wide-line-up shape, standard, low Rdc, and high electric current series.

- LB/LBR Series : Super low Rdc and high Idc characteristics.
- LB3218 Series : This series is downsized from 3225 size. Land pattern can be used by 3225 size.
- LBMF1608
  The best efficiency design is achieved by adopting bottom-surface electrode structure. Because of 1608 shape, it can be high-density mounting.

APPLICATIONS

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

ORDERING CODE

L B △ 2 0 1 2 T 1 0 0 △ △ △ △ △

❶Type

LB	Wound chip inductor

❷Shape

△	Standard products
C	High current
R	Low Rdc
MF	Bottom-surface electrode

❸External Dimensions (mm)

1608(0603)	1.6×0.8
2012(0805)	2.0×1.25
2016(0806)	2.0×1.6
2518(1007)	2.5×1.8
3218(1207)	3.2×1.8
3225(1210)	3.2×1.5

❹Packaging

T	Tape & Reel

❺Nominal Inductance(μH)

example	
1R0	1
100	10
101	100

※R=decimal point

❻Inductance Tolerances (%)

K	±10
M	±20

❼Special code

△	Standard products
R	Low Rdc type

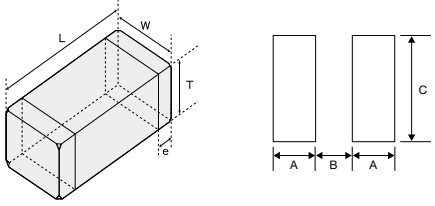
❽Internal code

△△△	Standard Products

△=Blank space

EXTERNAL DIMENSIONS/STANDARD QUANTITY

EXTERNAL DIMENSIONS



Unit : mm

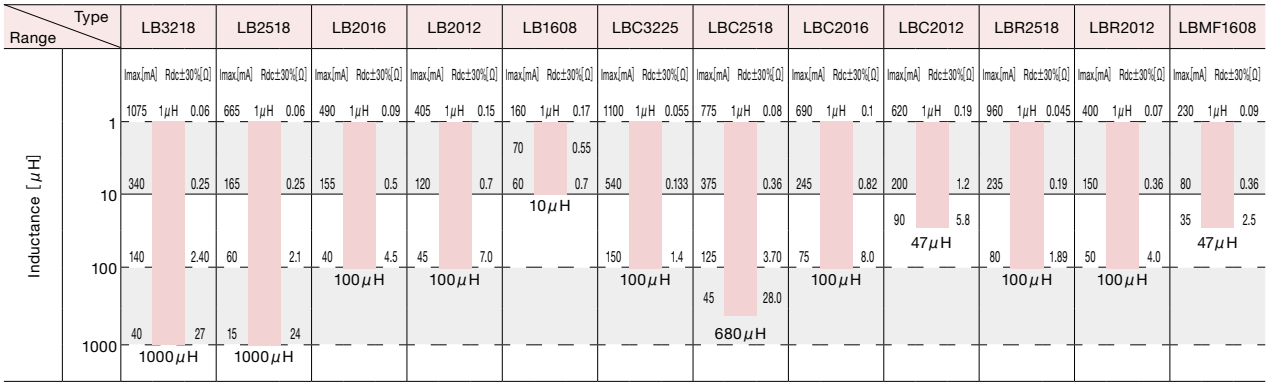
TYPE	A	B	C
1608	0.55	0.7	1.0
MF1608	0.55	0.8	0.9
2012	0.7	0.8	1.45
2016	0.7	0.8	1.8
2518	0.8	1.2	2.0
3218	1.0	1.6	2.0
3225	1.0	1.6	2.0

Surface Mounting
- Mounting and soldering conditions should be checked beforehand.
- Applicable soldering process to those products is reflow soldering only.
- Recommended Land Patterns

Type	L	W	T	e	Standard Quantity [pcs] Paper Tape	Embossed Tape
LBC3225	3.2±0.2 (0.128±0.008)	2.5±0.2 (0.098±0.008)	2.5±0.2 (0.098±0.008)	0.6±0.3 (0.024±0.012)	—	1000
LB3218	3.2±0.2 (0.128±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.6±0.2 (0.024±0.008)	—	2000
LB2518 LBC2518 LBR2518	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.5±0.2 (0.020±0.008)	—	2000
LB2016 LBC2016	2.0±0.2 (0.079±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.020±0.008)	—	2000
LB2012 LBC2012 LBR2012	2.0±0.2 (0.079±0.008)	1.25±0.2 (0.049±0.008)	1.25±0.2 (0.049±0.008)	0.5±0.2 (0.020±0.008)	—	2000
LB1608	1.6±0.1 (0.063±0.004)	0.8±0.1 (0.031±0.004)	0.8±0.1 (0.031±0.004)	0.35±0.15 (0.014±0.006)	4000	—
LBMF1608	1.6±0.2 (0.063±0.008)	0.8±0.2 (0.031±0.008)	0.8±0.2 (0.031±0.008)	0.45±0.15 (0.016±0.006)	—	3000

Unit : mm(inch)

AVAILABLE CAPACITANCE RANGE



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PART NUMBERS

LB1608 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB 1608T1R0M		RoHS	1.0	±20%	100	0.17	160	7.96
LB 1608T2R2M		RoHS	2.2		80	0.33	115	
LB 1608T4R7M		RoHS	4.7		45	0.55	70	
LB 1608T8R2M		RoHS	8.2		32	0.70	60	2.52
LB 1608T100M		RoHS	10		32	0.70	60	

LB2012 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB 2012T1R0M		RoHS	1.0	±20%	100	0.15	405	7.96
LB 2012T2R2M		RoHS	2.2		80	0.23	260	
LB 2012T3R3M		RoHS	3.3		55	0.30	235	
LB 2012T4R7M		RoHS	4.7		45	0.40	190	
LB 2012T6R8M		RoHS	6.8		38	0.47	135	
LB 2012T100□		RoHS	10	±10% ±20%	32	0.70	120	2.52
LB 2012T100□R		RoHS	10		32	0.50	120	
LB 2012T150□		RoHS	15		28	1.3	100	
LB 2012T220□		RoHS	22		16	1.7	80	
LB 2012T470□		RoHS	47		11	3.7	60	
LB 2012T680□		RoHS	68		10	6.0	50	
LB 2012T101□		RoHS	100		8	7.0	45	0.796

LB2016 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB 2016T1R0M		RoHS	1.0	±20%	100	0.09	490	7.96
LB 2016T1R5M		RoHS	1.5		80	0.11	380	
LB 2016T2R2M		RoHS	2.2		70	0.13	375	
LB 2016T3R3M		RoHS	3.3		55	0.20	285	
LB 2016T4R7M		RoHS	4.7		45	0.25	225	
LB 2016T6R8M		RoHS	6.8		38	0.35	200	
LB 2016T100□		RoHS	10	±10% ±20%	32	0.50	155	2.52
LB 2016T150□		RoHS	15		28	0.70	130	
LB 2016T220□		RoHS	22		16	1.0	105	
LB 2016T330□		RoHS	33		14	1.7	85	
LB 2016T470□		RoHS	47		11	2.4	70	
LB 2016T680□		RoHS	68		10	3.0	55	
LB 2016T101□		RoHS	100		8	4.5	40	0.796

LB2518 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB 2518T1R0M		RoHS	1.0	±20%	100	0.06	665	7.96
LB 2518T1R5M		RoHS	1.5		80	0.07	405	
LB 2518T2R2M		RoHS	2.2		68	0.09	340	
LB 2518T3R3M		RoHS	3.3		54	0.11	280	
LB 2518T4R7M		RoHS	4.7		46	0.13	240	
LB 2518T4R7MR		RoHS	4.7		46	0.10	235	
LB 2518T6R8M		RoHS	6.8		38	0.15	195	
LB 2518T100□		RoHS	10	±10% ±20%	30	0.25	165	2.52
LB 2518T150□		RoHS	15		23	0.32	145	
LB 2518T220□		RoHS	22		19	0.50	115	
LB 2518T330□		RoHS	33		15	0.70	95	
LB 2518T470□		RoHS	47		12	0.95	85	
LB 2518T680□		RoHS	68		9.5	1.5	70	
LB 2518T101□		RoHS	100		9.0	2.1	60	0.796
LB 2518T151□		RoHS	150		7.0	3.2	45	
LB 2518T221□		RoHS	220		5.5	4.5	40	
LB 2518T331□		RoHS	330		4.5	7.0	30	
LB 2518T471□		RoHS	470		3.5	10	25	
LB 2518T681□		RoHS	680		3.0	17	20	
LB 2518T102□		RoHS	1000		2.4	24	15	0.252

・□Please specify the Inductance tolerance code (K or M)

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PART NUMBERS

LB3218 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB 3218T1R0M		RoHS	1.0	±20%	100	0.06	1075	7.96
LB 3218T1R5M		RoHS	1.5		80	0.07	860	
LB 3218T2R2M		RoHS	2.2		68	0.09	775	
LB 3218T3R3M		RoHS	3.3		54	0.11	560	
LB 3218T4R7M		RoHS	4.7		41	0.13	550	
LB 3218T6R8M		RoHS	6.8		40	0.17	380	
LB 3218T100□		RoHS	10	±10% ±20%	30	0.25	340	2.52
LB 3218T150□		RoHS	15		25	0.32	300	
LB 3218T220□		RoHS	22		19	0.49	255	
LB 3218T330□		RoHS	33		15	0.75	215	
LB 3218T470□		RoHS	47		12	0.92	205	
LB 3218T680□		RoHS	68		11	1.49	145	
LB 3218T101□		RoHS	100		8.0	2.4	140	0.796
LB 3218T151□		RoHS	150		7.0	3.2	105	
LB 3218T221□		RoHS	220		5.0	5.4	80	
LB 3218T331□		RoHS	330		4.0	7.0	65	
LB 3218T471□		RoHS	470		3.5	14	54	
LB 3218T681□		RoHS	680		3.0	17	45	
LB 3218T102□		RoHS	1000		2.4	27	39	0.252

LBMF1608 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LBMF1608T1R0M		RoHS	1.0	±20%	100	0.09	230	7.96
LBMF1608T2R2M		RoHS	2.2		80	0.17	160	
LBMF1608T3R3M		RoHS	3.3		60	0.22	130	
LBMF1608T4R7M		RoHS	4.7		45	0.24	110	
LBMF1608T100□		RoHS	10	±10% ±20%	32	0.36	80	2.52
LBMF1608T220□		RoHS	22		16	1.0	50	
LBMF1608T470□		RoHS	47		11	2.5	35	

LBC3225 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB C3225T1R0MR		RoHS	1.0	±20%	250	0.055	1100	0.1
LB C3225T1R5MR		RoHS	1.5		220	0.060	1000	
LB C3225T2R2MR		RoHS	2.2		190	0.080	930	
LB C3225T3R3MR		RoHS	3.3		160	0.095	820	
LB C3225T4R7MR		RoHS	4.7		70	0.100	680	
LB C3225T6R8MR		RoHS	6.8		50	0.120	620	
LB C3225T100□R		RoHS	10	±10% ±20%	23	0.133	540	
LB C3225T150□R		RoHS	15		20	0.195	420	
LB C3225T220□R		RoHS	22		17	0.270	330	
LB C3225T330□R		RoHS	33		13	0.410	300	
LB C3225T470□R		RoHS	47		10	0.670	220	
LB C3225T680□R		RoHS	68		8	1.00	190	
LB C3225T101□R		RoHS	100		6	1.40	150	

LBC2518 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB C2518T1R0M		RoHS	1.0	±20%	100	0.08	775	7.96
LB C2518T1R0MR		RoHS	1.0		100	0.065	890	
LB C2518T1R5M		RoHS	1.5		80	0.11	730	
LB C2518T2R2M		RoHS	2.2		68	0.13	630	
LB C2518T3R3M		RoHS	3.3		54	0.16	560	
LB C2518T4R7M		RoHS	4.7		41	0.20	510	
LB C2518T6R8M		RoHS	6.8		38	0.30	420	
LB C2518T100□		RoHS	10	±10% ±20%	30	0.36	375	2.52
LB C2518T150□		RoHS	15		23	0.65	285	
LB C2518T220□		RoHS	22		19	0.77	250	
LB C2518T330□		RoHS	33		15	1.5	185	
LB C2518T470□		RoHS	47		12	1.9	165	
LB C2518T680□		RoHS	68		9.5	2.8	140	
LB C2518T101□		RoHS	100		9.0	3.7	125	0.796
LB C2518T151□		RoHS	150		7.0	6.1	95	
LB C2518T221□		RoHS	220		5.5	8.4	80	
LB C2518T331□		RoHS	330		4.5	12.3	65	
LB C2518T471□		RoHS	470		4.5	22	50	
LB C2518T681□		RoHS	680		3.0	28	45	

・□Please specify the Inductance tolerance code (K or M)

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PART NUMBERS

●LBC2016 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB C2016T1R0M		RoHS	1.0	±20%	100	0.10	690	7.96
LB C2016T1R5M		RoHS	1.5		80	0.15	600	
LB C2016T2R2M		RoHS	2.2		70	0.20	520	
LB C2016T3R3M		RoHS	3.3		55	0.27	410	
LB C2016T4R7M		RoHS	4.7		45	0.37	355	
LB C2016T6R8M		RoHS	6.8		38	0.59	290	
LB C2016T100□		RoHS	10	±10% ±20%	32	0.82	245	2.52
LB C2016T150□		RoHS	15		28	1.2	200	
LB C2016T220□		RoHS	22		16	1.8	165	
LB C2016T330□		RoHS	33		14	2.8	135	
LB C2016T470□		RoHS	47		11	4.3	110	
LB C2016T680□		RoHS	68		10	7.0	95	
LB C2016T101□		RoHS	100		8	8.0	75	0.796

●LBC2012 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB C2012T1R0M		RoHS	1.0	±20%	100	0.19	620	7.96
LB C2012T2R2M		RoHS	2.2		70	0.33	430	
LB C2012T4R7M		RoHS	4.7		45	0.50	295	
LB C2012T100□		RoHS	10	±10% ±20%	40	1.2	200	2.52
LB C2012T220□		RoHS	22		16	3.7	130	
LB C2012T470□		RoHS	47		11	5.8	90	

●LBR2518 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB R2518T1R0M		RoHS	1.0	±20%	100	0.045	960	7.96
LB R2518T2R2M		RoHS	2.2		68	0.07	480	
LB R2518T4R7M		RoHS	4.7		45	0.10	345	
LB R2518T100□		RoHS	10	±10% ±20%	30	0.19	235	2.52
LB R2518T220□		RoHS	22		19	0.44	175	
LB R2518T470□		RoHS	47		11	0.84	120	
LB R2518T101□		RoHS	100		9	1.89	80	0.796

●LBR2012 TYPE

Ordering code		EHS (Environmental Hazardous Substances)	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB R2012T1R0M		RoHS	1.0	±20%	100	0.07	400	7.96
LB R2012T2R2M		RoHS	2.2		80	0.13	260	
LB R2012T4R7M		RoHS	4.7		45	0.24	200	
LB R2012T100□		RoHS	10	±10% ±20%	32	0.36	150	2.52
LB R2012T220□		RoHS	22		16	1.0	100	
LB R2012T470□		RoHS	47		11	1.7	75	
LB R2012T101□		RoHS	100		8	4.0	50	0.796

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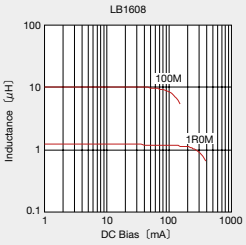
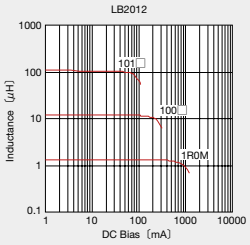
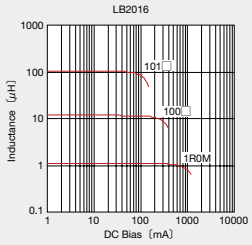
ELECTRICAL CHARACTERISTICS

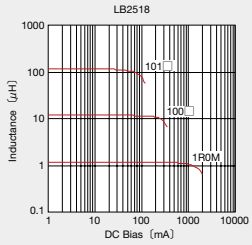
DC Bias characteristics (Measured by HP4285A+42841A)

Standard Type

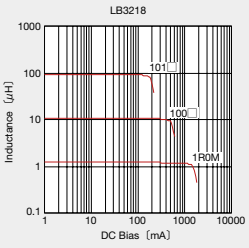




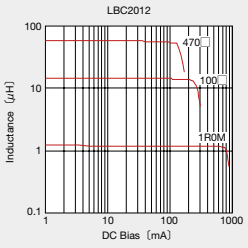


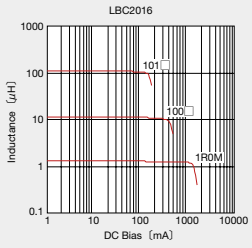


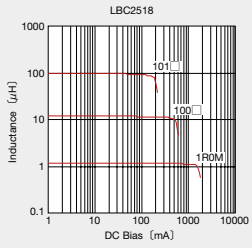
Standard Type



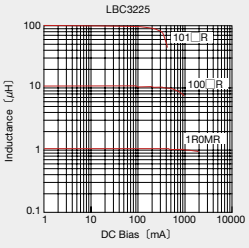
High Current Type



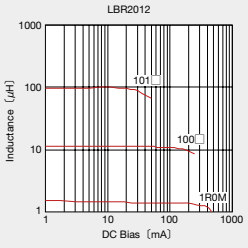


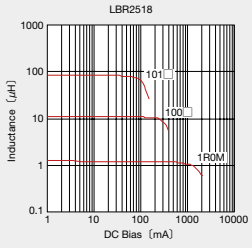


High Current Type

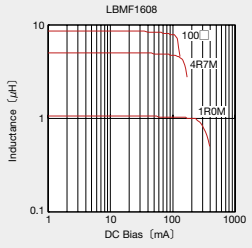


Low Rdc Type



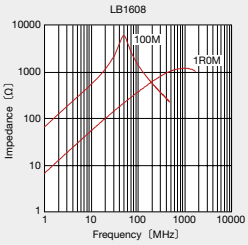


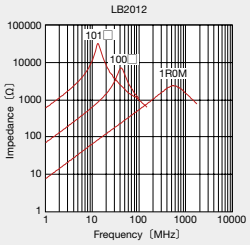
Bottom-surface electrode Type

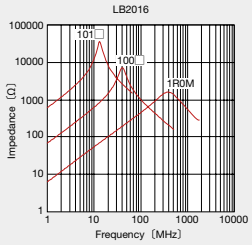


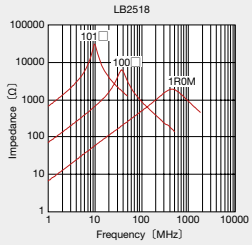
Impedance-vs-Frequency characteristics (Measured by HP4291A)

Standard Type

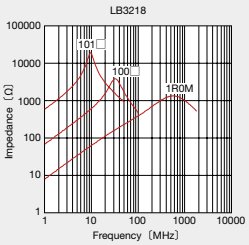




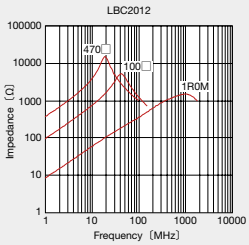


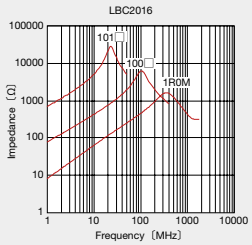


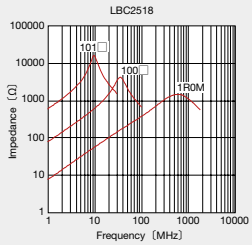
Standard Type



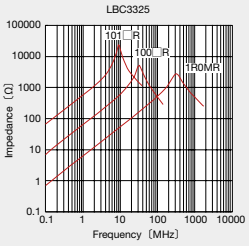
High Current Type



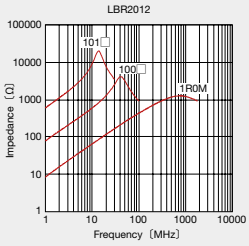


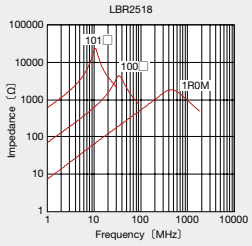


High Current Type

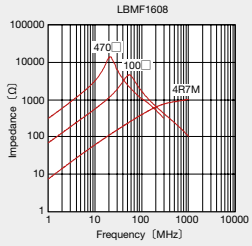


Low Rdc Type





Bottom-surface electrode Type



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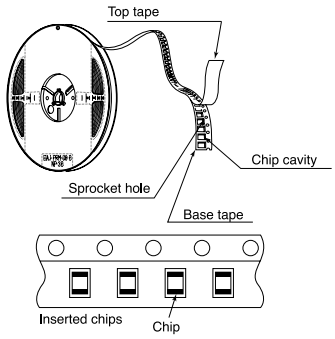
PACKAGING

①Minimum Quantity

Type	Standard Quantity [pcs]	
	Papar Tape	Embossed Tape
LBC3225/CBC3225	—	1000
LB3218	—	2000
LBR2518/LBC2518/LB251 /CB2518/CBC2518/LEM2520	—	2000
LBM2016/LBC2016/ LB2016/CB2016/CBC2016	—	2000
LB2012/LBC2012/LBR202 /CB2012/CBC2012	—	3000
CBL2012	4000	—
LB1608	4000	—
LBMF1608/CBMF1608	—	3000

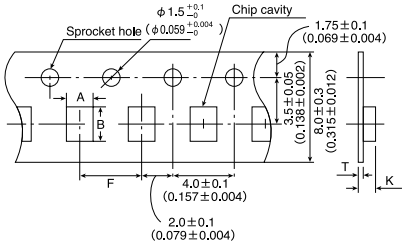
②Tape material

- Embossed tape



③Taping Dimensions

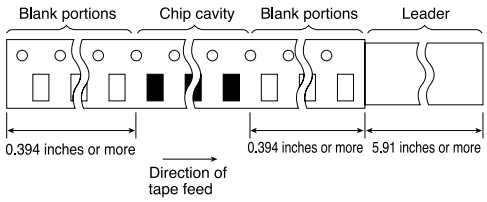
- Embossed Tape（0.315 inches wide）
- Card board carrier tape（0.315 inches wide）



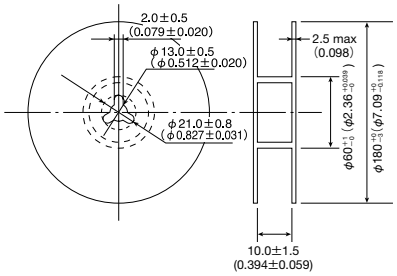
Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
LBM 2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.074)
LEM 2520	2.3±0.1 (0.091±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.1±0.1 (0.083±0.004)
LBC3225/ 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)	0.3±0.05 (0.012±0.002)	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±0.05 (0.012±0.002)	2.2max. (0.086)
LB2518 / CB2518 LBC2518 / CBC2518 LBR2518	2.15±0.1 (0.085±0.004)	2.7±0.1 (0.107±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.2max. (0.086)
LB2016/ CB2016 LBC2016 / CBC2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.074)
LB2012 / CB2012 LBC2012 / CBC2012 LBR2012	1.45±0.1 (0.058±0.004)	2.25±0.1 (0.09±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.010±0.002)	1.45max. (0.057)
CBL2012	1.55±0.1 (0.061±0.004)	2.3±0.1 (0.091±0.004)	4.0±0.1 (0.157±0.004)	1.1max. (0.044)	1.1max. (0.044)
LB1608	1.0±0.1 (0.059±0.004)	1.8±0.1 (0.072±0.004)	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)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.010±0.002)	1.2max. (0.047)

Unit : mm (inch)

④Leader and Blank Portion

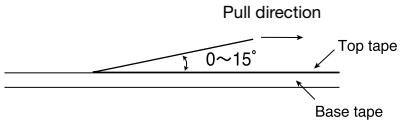


⑤Reel Size



⑥Top Tape Strength

The top tape requires a peel-off force 0.1 to 0.7N in the direction of the arrow as illustrated below.



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RELIABILITY DATA

1.Operating temperature Range						
LEM2520						−40～+85℃
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	−25～+105℃(Including self-generated heat)
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

2.Storage						
LEM2520						−40～+85℃
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

3.Rated Current						
LEM2520						Within the specified tolerance
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
LEM Series The maximum DC value having inductance decrease within 10% and temperature increase within 20℃ by the application of DC bias.

4.Inductance						
LEM2520						Within the specified tolerance
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
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						
LEM2520						Within the specified tolerance
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						Within the specified tolerance

【Test Methods and Remarks】
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 Resisitance						
LEM2520						Within the specified tolerance
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Series Measuring equipment : DC Ohmmeter(HIOKI 3227 or its equivalent)

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RELIABILITY DATA

7.Self-Resonant Frequency

LEM2520						Within the specified tolerance
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】

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)

8.Temperature Characteristic

LEM2520						Inductance change:Within±5%
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change:Within±15% LBMF1608・LB3218 Inductance change:Within±20%
LBC3225	LBC2518	LBC2016	LBC2012			LBC3225・LBC2518・LBC2016 Inductance change:Within±20% LBC2012 Inductance change:Within±30%
LBR2518	LBR2012					Inductance change:Within±15%
CB2518	CB2016	CB2012				Inductance change:Within±15%
CBC3225	CBC2518	CBC2016	CBC2012			CBC3225・CBC2518・CBC2016 Inductance change:Within±20% CBC2012 Inductance change:Within±30%
CBL2012						Inductance change:Within±15%
CBMF1608						Inductance change:Within±20%
LBM2016						Inductance change:Within±5%

【Test Methods and Remarks】

Change of maximum inductance deviation in step 1-5

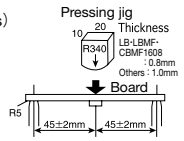
Step	1	2	3	4	5
Temperture(℃)	20	−25	20 (Reference temperature)	+85 (Maximum operating temperature)	20

9.Rasistance to Flexure of Substrate

LEM2520						No damage.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】

Warp : 2mm (LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Series)
3mm (LEM2520)
Test substrate: Printed board
According to JIS C0051



10.Body Strength

LEM2520						No damage.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】

LB・LBC・LBR・CB・CBC・CBL・LBM・LEM2520 Applied force : 10N
Duration : 10sec.
LB1608・LBMF1608・CBMF1608 Applied force : 5N
Duration : 10sec.

11.Self Resonant Freguency

LEM2520						Inductance change : Within−10%
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					Inductance change : Within−20%
CB2518	CB2016	CB2012				Inductance change : Within−30%
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						Inductance change : Within−10%

【Test Methods and Remarks】

Measure inductance with application of rated current using LCR metre to compare it with the initial value.

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RELIABILITY DATA

12.Adhesion of terminal electrode	
LEM2520 LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608 LBC3225 LBC2518 LBC2016 LBC2012 LBR2518 LBR2012 CB2518 CB2016 CB2012 CBC3225 CBC2518 CBC2016 CBC2012 CBL2012 CBMF1608 LBM2016	No abnormality.

【Test Methods and Remarks】

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
LB1608・CBMF1608・LBMF1608	Applied force : 5N to X and Y directions Duration : 5 sec. Test substrate : Printed board

13.Resistance to vibration		
LEM2520	Inductance change:Within±5%	No significant abnormality in appearance.
LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608 LBC3225 LBC2518 LBC2016 LBC2012 LBR2518 LBR2012 CB2518 CB2016 CB2012 CBC3225 CBC2518 CBC2016 CBC2012 CBL2012 CBMF1608	Inductance change:Within±10%	No significant abnormality in appearance.
LBM2016	Inductance change:Within±5%	No significant abnormality in appearance.

【Test Methods and Remarks】
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.
LEM : Recovery
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

14.Drop test		
LEM2520	Inductance change:Within±5%	No significant abnormality in appearance.
LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608 LBC3225 LBC2518 LBC2016 LBC2012 LBR2518 LBR2012 CB2518 CB2016 CB2012 CBC3225 CBC2518 CBC2016 CBC2012 CBL2012 CBMF1608 LBM2016		

【Test Methods and Remarks】
LEM :
Acceleration : 980m/sec2
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.
LEM : Recovery
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

15.Solderability	
LEM2520 LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608 LBC3225 LBC2518 LBC2016 LBC2012 LBR2518 LBR2012 CB2518 CB2016 CB2012 CBC3225 CBC2518 CBC2016 CBC2012 CBL2012 CBMF1608 LBM2016	At least 90% of surface of terminal electrode is covered by new

【Test Methods and Remarks】

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

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RELIABILITY DATA

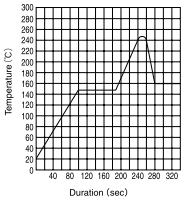
16.Resisitance to soldering heat

LEM2520						No significant abnormality in appearance.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	LB3218, LB2518, LB2016, LB2012, LB1608 Inductance change:Within±10% No significant abnormality in appearance. LBMF1608 Inductance change:Within±20% No significant abnormality in appearance.
LBC3225	LBC2518	LBC2016	LBC2012			Inductance change:Within±10% No significant abnormality in appearance.
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						Inductance change:Within±20% No significant abnormality in appearance.
LBM2016						Inductance change:Within±5% No significant abnormality in appearance.

【Test Methods and Remarks】
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 ℃ for 5sec.



17.Resisitance to solvent

LEM2520						No significant abnormality in appearance
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
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)

18.Thermal shock

LEM2520						Inductance change :Within±10% Q→ R12～4R7 : 30 min. 5R6～330 : 25 min. 390～820 : 20 min. 101 : 15 min.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change:Within±10% No significant abnormality in appearance.
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
LEM : Conditions for 1cycle

Step	Temperature(℃)	Duration(min)
1	−40	30
2	+85	30

Number of cycle : 100 cycle
Recovery : At least 1 hr of recovery under the standard condition after the test, followed by the 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 measurement within 48 hrs.

19.Damp heat

LEM2520						Inductance change :Within±10% Q→ R12～4R7 : 30 min. 5R6～330 : 25 min. 390～820 : 20 min. 101 : 15 min.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change:Within±10% No significant abnormality in appearance.
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
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 measurement within 48 hrs.
LEM : Recovery
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

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RELIABILITY DATA

20.Loading under damp heat						
LEM2520						Inductance change :Within±10% Q→ R12～4R7 : 30 min. 5R6～330 : 25 min. 390～820 : 20 min. 101 : 15 min.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change:Within±10% No significant abnormality in appearance.
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
LEM・LB・LBC・LBR・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 measurement within 48 hrs.
LEM : Recovery
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

21.High temperature life test						
LEM2520						Inductance change :Within±10% Q→ R12～4R7 : 30 min. 5R6～330 : 25 min. 390～820 : 20 min. 101 : 15 min.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				Inductance change:Within±10% No significant abnormality in appearance.
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
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 measurement within 48 hrs.
LEM : Recovery
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

22.Loading at high temperature						
LEM2520						
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change:Within±10% No significant abnormality in appearance.
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
LB・LBC・LBR・LBMF : Temperature : 85±2℃
Duration : 1000 hrs
Applied current : Rated current
Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

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RELIABILITY DATA

23.Low temperature life test						
LEM2520						Inductance change :Within±10% Q→ R12～4R7 : 30 min. 5R6～330 : 25 min. 390～820 : 20 min. 101 : 15 min.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change:Within±10% No significant abnormality in appearance.
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

【Test Methods and Remarks】
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 measurement within 48 hrs.
LEM : Recovery
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.

24.Standard condition						
LEM2520						Standard test conditions Unless specified, Ambient temperature is 20±15℃ and the Relative humidity is 65±20%. If there is any doubt about the test results, further measurement shall be had within the following limits: Ambient Temperature: 20±2℃ Relative humidity: 65±5% Inductance value is based on our standard measurement systems.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

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PRECAUTIONS

LEM Type, LB Type, CB Type

1. Circuit Design

Precautions

◆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

Precautions

◆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.

Technical considerations

PRECAUTIONS

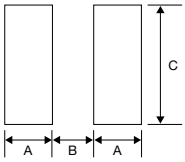
【Recommended Land Patterns】

Surface Mounting

・Mounting and soldering conditions should be checked beforehand.

・Applicable soldering process to those products is reflow soldering only.

・Recommended Land Patterns



Unit : mm

TYPE	A	B	C
1608	0.55	0.7	1.0
MF1608	0.55	0.8	0.9
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

Precautions

◆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.

Technical considerations

1. When installing products, care should be taken not to apply distortion stress as it may deform the products.

4. Soldering

Precautions

◆Wave soldering（LEM Type only）

1. For wave soldering,please apply conditions meeting the range of the specifed 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℃ Duration-3 secons or less. The soldering iron shoud not come in contact with inductor directly.

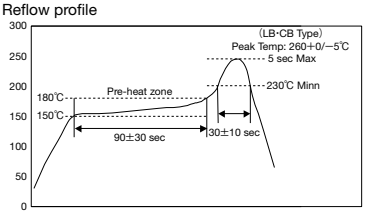
Technical considerations

◆Wave soldering（LEM Type only）

1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.

◆Reflow soldering（LB and CB Types）

1. Reflow profile



◆Recommended conditions for using a soldering iron

1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.

5. Cleaning

Precautions

◆Cleaning conditions

1. LEM Type, LB Type, CB Type
   Washing by supersonic waves shall be avoided.

Technical considerations

◆Cleaning conditions

1. LEM Type, LB Type, CB Type
   If washing by supersonic waves, supersonic waves may cause broken products.

6. Handling

Precautions

◆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.

Technical considerations

◆Handling

1. There is a case that a characteristic varies with magnetic influence.

◆Breakaway PC boards（splitting along perforations）

1. Planning pattern configurations and the position of products should be carefully performed to minimize stress.

◆Mechanical considerations

1. There is a case to be damaged by a mechanical shock.

7. Storage conditions

Precautions

◆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℃ ／ Humidity : Below 70% RH
   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.
   LB type : 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.

Technical considerations

◆Storage

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.

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