

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 2010. 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.

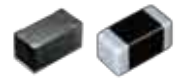
- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.
- All electronic 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.

WOUND CHIP INDUCTORS (LB SERIES)



REFLOW

FEATURES

LB-series are Wound Chip Inductors having wide line-up, which are suitable for any circuit designs.

- LBC series has large rated current. They contribute to the miniaturization of the power supply circuit.
- LBR series has low DC resistance. They contribute to the miniaturization of the power supply circuit.
- LBMF series has a low loss characteristic.

APPLICATIONS

- They are suitable for an anti-noise measure on the power supply circuit of DSC, DVC, HDD, LCD-TV, mobile phones, PC, game equipments, various communication equipments and etc..

OPERATING TEMP.

- -40 ~ 105°C (Including-self-generated heat)

ORDERING CODE

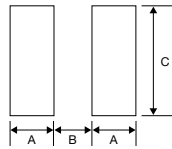
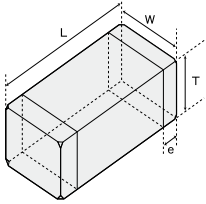
LB \triangle 2 0 1 2 T 1 0 0 \triangle \triangle \triangle \triangle \triangle

1 2 3 4 5 6 7 8

1 Type		3 External Dimensions (mm)		4 Packaging		5 Nominal Inductance (μ H)		6 Inductance Tolerances (%)		7 Special code		8 Internal code	
LB	Wound chip inductor	1608 (0603)	1.6×0.8	T	Tape & Reel	example		K	±10	\triangle	Standard products	\triangle \triangle \triangle	Standard Products
2 Shape		2012 (0805)	2.0×1.25			1R0	1	M	±20	R	Low Rdc type	\triangle =Blank space	
\triangle	Standard products	2016 (0806)	2.0×1.6			100	10						
C	High current	2518 (1007)	2.5×1.8			101	100						
R	Low Rdc	3218 (1207)	3.2×1.8			*R=decimal point							
MF	Low loss	3225 (1210)	3.2×2.5										

EXTERNAL DIMENSIONS/STANDARD QUANTITY

EXTERNAL DIMENSIONS



Unit : mm

TYPE	A	B	C
1608	0.55	0.7	0.9
MF1608	0.55	0.7	1.0
2012	0.60	1.0	1.45
2016	0.60	1.0	1.8
2518	0.60	1.5	2.0
3218	0.85	1.7	2.0
3225	0.85	1.7	2.7

- 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
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
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)	—	3000
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
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
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
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

Unit : mm (inch)

AVAILABLE INDUCTANCE RANGE

Type	LB1608	LBMF1608	LB2012	LBC2012	LBR2012	LB2016	LBC2016	LB2518	LBC2518	LBR2518	LB3218	LBC3225	
Range													
Inductance [μ H]	1	160 1 μ H 0.17	230 1 μ H 0.09	405 1 μ H 0.15	620 1 μ H 0.19	400 1 μ H 0.07	490 1 μ H 0.09	690 1 μ H 0.1	665 1 μ H 0.06	775 1 μ H 0.08	960 1 μ H 0.045	1075 1 μ H 0.06	1100 1 μ H 0.055
	10	70 0.55	80 0.36	120 0.7	200 1.2	150 0.36	155 0.5	245 0.82	165 0.25	375 0.36	235 0.19	340 0.25	540 0.133
	100	60 0.7	35 2.5	45 7.0	90 5.8	50 4.0	40 4.5	75 8.0	60 2.1	125 3.70	80 1.89	140 2.40	150 1.4
	1000	10 μ H	47 μ H	100 μ H	47 μ H	100 μ H	100 μ H	100 μ H	1000 μ H	45 28.0	100 μ H	1000 μ H	100 μ H

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PART NUMBERS

●1608(0603) TYPE

Ordering code	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) ($\pm 30\%$)	Rated current (mA) max.	Measuring frequency (MHz)
LB 1608T1R0M	1.0	$\pm 20\%$	100	0.17	160	7.96
LB 1608T2R2M	2.2		80	0.33	115	
LB 1608T4R7M	4.7		45	0.55	70	
LB 1608T8R2M	8.2		32	0.70	60	
LB 1608T100M	10		32	0.70	60	2.52

Ordering code	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) ($\pm 30\%$)	Rated current (mA) max.	Measuring frequency (MHz)
LBMF1608T1R0M	1.0	$\pm 20\%$	100	0.09	230	7.96
LBMF1608T2R2M	2.2		80	0.17	160	
LBMF1608T3R3M	3.3		60	0.22	130	
LBMF1608T4R7M	4.7		45	0.24	110	
LBMF1608T100□	10	$\pm 10\%$ $\pm 20\%$	32	0.36	80	2.52
LBMF1608T220□	22		16	1.00	50	
LBMF1608T470□	47		11	2.50	35	

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

●2012(0805) TYPE

Ordering code	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) ($\pm 30\%$)	Rated current (mA) max.	Measuring frequency (MHz)
LB 2012T1R0M	1.0	$\pm 20\%$	100	0.15	405	7.96
LB 2012T2R2M	2.2		80	0.23	260	
LB 2012T3R3M	3.3		55	0.30	235	
LB 2012T4R7M	4.7		45	0.40	190	
LB 2012T6R8M	6.8		38	0.47	135	
LB 2012T100□	10	$\pm 10\%$ $\pm 20\%$	32	0.7	120	2.52
LB 2012T100□R	10		32	0.5	120	
LB 2012T150□	15		28	1.3	100	
LB 2012T220□	22		16	1.7	80	
LB 2012T470□	47		11	3.7	60	
LB 2012T680□	68		10	6.0	50	
LB 2012T101□	100		8	7.0	45	0.796

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

Ordering code	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) ($\pm 30\%$)	Rated current (mA) max.	Measuring frequency (MHz)
LB C2012T1R0M	1.0	$\pm 20\%$	100	0.19	620	7.96
LB C2012T2R2M	2.2		70	0.33	430	
LB C2012T4R7M	4.7		45	0.5	295	
LB C2012T100□	10	$\pm 10\%$ $\pm 20\%$	40	1.2	200	2.52
LB C2012T220□	22		16	3.7	130	
LB C2012T470□	47		11	5.8	90	

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

Ordering code	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) ($\pm 30\%$)	Rated current (mA) max.	Measuring frequency (MHz)
LB R2012T1R0M	1.0	$\pm 20\%$	100	0.07	400	7.96
LB R2012T2R2M	2.2		80	0.13	260	
LB R2012T4R7M	4.7		45	0.24	200	
LB R2012T100□	10	$\pm 10\%$ $\pm 20\%$	32	0.36	150	2.52
LB R2012T220□	22		16	1	100	
LB R2012T470□	47		11	1.7	75	
LB R2012T101□	100		8	4	50	

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

●2016(0806) TYPE

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

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

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PART NUMBERS

Ordering code	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB C2016T1R0M	1.0	±20%	100	0.1	690	7.96
LB C2016T1R5M	1.5		80	0.15	600	
LB C2016T2R2M	2.2		70	0.2	520	
LB C2016T3R3M	3.3		55	0.27	410	
LB C2016T4R7M	4.7		45	0.37	355	
LB C2016T6R8M	6.8		38	0.59	290	
LB C2016T100□	10	±10% ±20%	32	0.82	245	2.52
LB C2016T150□	15		28	1.2	200	
LB C2016T220□	22		16	1.8	165	
LB C2016T330□	33		14	2.8	135	
LB C2016T470□	47		11	4.3	110	
LB C2016T680□	68		10	7	95	
LB C2016T101□	100		8	8	75	

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

2518(1007) TYPE

Ordering code	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB 2518T1R0M	1.0	±20%	100	0.06	665	7.96
LB 2518T1R5M	1.5		80	0.07	405	
LB 2518T2R2M	2.2		68	0.09	340	
LB 2518T3R3M	3.3		54	0.11	280	
LB 2518T4R7M	4.7		46	0.13	240	
LB 2518T4R7MR	4.7		46	0.10	235	
LB 2518T6R8M	6.8	38	0.15	195	2.52	
LB 2518T100□	10	±10% ±20%	30	0.25		165
LB 2518T150□	15		23	0.32		145
LB 2518T220□	22		19	0.50		115
LB 2518T330□	33		15	0.70		95
LB 2518T470□	47		12	0.95		85
LB 2518T680□	68		9.5	1.50		70
LB 2518T101□	100		9	2.10		60
LB 2518T151□	150		7	3.20	45	
LB 2518T221□	220		5.5	4.50	40	0.796
LB 2518T331□	330		4.5	7.00	30	
LB 2518T471□	470		3.5	10	25	
LB 2518T681□	680		3	17	20	
LB 2518T102□	1000		2.4	24	15	

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

Ordering code	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)	
LB C2518T1R0M	1.0	±20%	100	0.08	775	7.96	
LB C2518T1R0MR	1.0		100	0.065	890		
LB C2518T1R5M	1.5		80	0.11	730		
LB C2518T2R2M	2.2		68	0.13	630		
LB C2518T3R3M	3.3		54	0.16	560		
LB C2518T4R7M	4.7		41	0.2	510		
LB C2518T6R8M	6.8	38	0.3	420	2.52		
LB C2518T100□	10	±10% ±20%	30	0.36		375	
LB C2518T150□	15		23	0.65		285	
LB C2518T220□	22		19	0.77		250	
LB C2518T330□	33		15	1.5		185	
LB C2518T470□	47		12	1.9		165	
LB C2518T680□	68		9.5	2.8		140	
LB C2518T101□	100		9	3.7		125	
LB C2518T151□	150		7	6.1	95		
LB C2518T221□	220		5.5	8.4	80	0.796	
LB C2518T331□	330		4.5	12.3	65		
LB C2518T471□	470		3.5	22	50		
LB C2518T681□	680		3	28	45		

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

Ordering code	Inductance (μH)	Inductance Tolerance	Self-resonant frequency (MHz) min.	DC Resistance (Ω) (±30%)	Rated current (mA) max.	Measuring frequency (MHz)
LB R2518T1R0M	1.0	±20%	100	0.045	960	7.96
LB R2518T2R2M	2.2		68	0.07	480	
LB R2518T4R7M	4.7		45	0.1	345	
LB R2518T100□	10	±10% ±20%	30	0.19	235	2.52
LB R2518T220□	22		19	0.44	175	
LB R2518T470□	47		11	0.84	120	
LB R2518T101□	100		9	1.89	80	
						0.796

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

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PART NUMBERS

● 3218(1297) TYPE

Ordering code	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] min.	DC Resistance [Ω] ($\pm 30\%$)	Rated current [mA] max.	Measuring frequency [MHz]
LB 3218T1R0M	1.0	$\pm 20\%$	100	0.06	1075	7.96
LB 3218T1R5M	1.5		80	0.07	860	
LB 3218T2R2M	2.2		68	0.09	775	
LB 3218T3R3M	3.3		54	0.11	560	
LB 3218T4R7M	4.7		41	0.13	550	
LB 3218T6R8M	6.8		40	0.17	380	
LB 3218T100□	10	$\pm 10\%$ $\pm 20\%$	30	0.25	340	2.52
LB 3218T150□	15		25	0.32	300	
LB 3218T220□	22		19	0.49	255	
LB 3218T330□	33		15	0.75	215	
LB 3218T470□	47		12	0.92	205	
LB 3218T680□	68		11	1.49	145	
LB 3218T101□	100		8	2.40	140	0.796
LB 3218T151□	150		7	3.20	105	
LB 3218T221□	220		5	5.40	80	
LB 3218T331□	330		4	7.00	65	
LB 3218T471□	470		3.5	14.0	54	
LB 3218T681□	680		3	17.0	45	
LB 3218T102□	1000		2.4	27.0	39	0.252

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

● 3225(1210) TYPE

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

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

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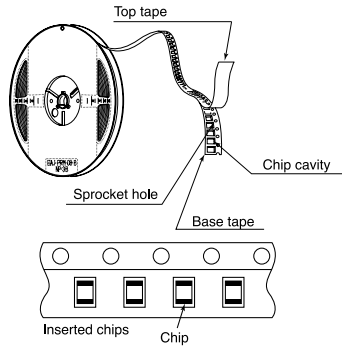
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① Minimum Quantity

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

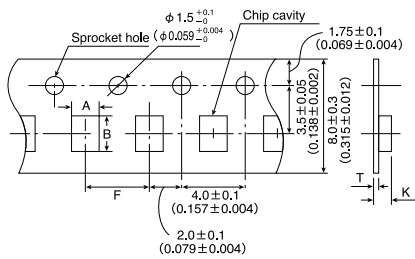
② Tape material

- Embossed tape



③ Taping Dimensions

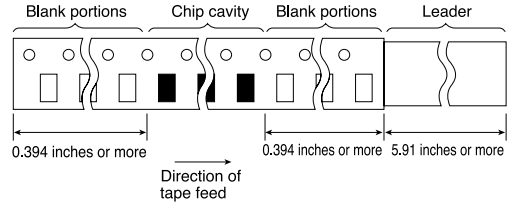
- Embossed Tape (0.315 inches wide)
- Card board carrier tape (0.315 inches wide)



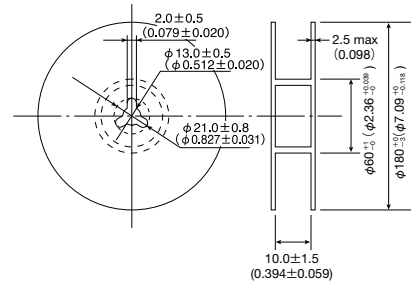
Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		T	K
LBM 2016	1.75 ± 0.1 (0.069 ± 0.004)	2.1 ± 0.1 (0.083 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	1.9max. (0.074)
LEM 2520	2.3 ± 0.1 (0.091 ± 0.004)	2.7 ± 0.1 (0.106 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	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)

④ Leader and Blank Portion

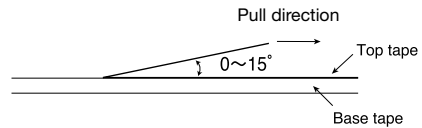


⑤ Reel Size



⑥ Top Tape Strength

The top tape requires a peel-off force 0.2 to 0.7N in the direction of the arrow as illustrated below.



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RELIABILITY DATA

1. Operating temperature Range

LB, LBC, LBR, LBMF Series	-40~+105°C (Including self-generated heat)
CB, CBC, CBL, CBMF Series	
LBM Series	
LEM Series	-40~+85°C

2. Storage

LB, LBC, LBR, LBMF Series	-40~+85°C
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

【Test Methods and Remarks】
Please refer the term of "7. storage conditions" in precautions.

3. Rated Current

LB, LBC, LBR, LBMF Series	Within the specified tolerance
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

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

4. Inductance

LB, LBC, LBR, LBMF Series	Within the specified tolerance
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

【Test Methods and Remarks】
LEM Series 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 Meter (HP4285A or its equivalent)

5. Q

LB, LBC, LBR, LBMF Series	Within the specified tolerance
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

【Test Methods and Remarks】
LEM Series Measuring equipment : LCR Meter (HP4285A+42851A or its equivalent)
Measuring frequency : Specified frequency

LBM Series Measuring equipment : LCR Meter (HP4285A or its equivalent)

6. DC Resisitance

LB, LBC, LBR, LBMF Series	Within the specified tolerance
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

【Test Methods and Remarks】
Measuring equipment : DC Ohmmeter (HIOKI 3227 or its equivalent)

7. Self-Resonant Frequency

LB, LBC, LBR, LBMF Series	Within the specified tolerance
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

【Test Methods and Remarks】
Measuring equipment : Impedance analyzer (HP4291A or its equivalent)

8. Temperature Characteristic

LBM2016	LEM2520					Inductance change: Within ±5%
LB1608	LB2012	LBR2012	CB2012	CBL2012	LB2016	Inductance change: Within ±20%
CB2016	LB2518	LBR2518	CB2518	LBC3225	CBC3225	
LBMF1608	CBMF1608	LBC2016	CBC2016	LBC2518		Inductance change: Within ±25%
CBC2518	LB3218					
LBC2012	CBC2012					Inductance change: Within ±35%

【Test Methods and Remarks】
Change of maximum inductance deviation in step 1-5

LB, CB Series	Step	1	2	3	4	5
	Temperature (°C)	20	-40	20 (Reference temperature)	+85 (Maximum operating temperature)	20

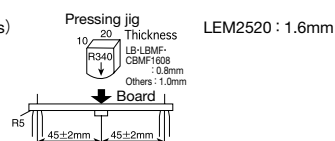
LEM2520	Step	1	2	3	4	5
	Temperature (°C)	20	-25	20 (Reference temperature)	+85 (Maximum operating temperature)	20

9. Resistance to Flexure of Substrate

LB, LBC, LBR, LBMF Series	No damage.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

【Test Methods and Remarks】
Warp : 2mm (LB · LBC · LBR · CB · CBC · CBL · LBM · LBMF · CBMF Series)
3mm (LEM2520)

Test substrate: Board according to JIS C0051



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RELIABILITY DATA

10.Body Strength	
LB, LBC, LBR, LBMF Series	No damage.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	
[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.Adhesion of terminal electrode	
LB, LBC, LBR, LBMF Series	No abnormality.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	
[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
12.Resistance to vibration	
LB, LBC, LBR, LBMF Series	Inductance change:Within±10% No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	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.	
13.Drop test	
LB, LBC, LBR, LBMF Series	Inductance change:Within±5% No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	
LEM Series	
[Test Methods and Remarks]	
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.	
LEM : Recovery	
At least 1 hr of recovery under the standard condition after the test, followed by the measurement within 2 hrs.	
14.Solderability	
LB, LBC, LBR, LBMF Series	At least 90% of surface of terminal electrode is covered by new
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	
[Test Methods and Remarks]	
LEM :	
Solder temperature : 230±5°C	
Duration : 5±0.5sec.	
Flux : Methanol solution with 25% of colophony	
LB·LBC·LBR·CB·CBC·CBL·LBM·LBMF·CBMF :	Solder temperature : 245±5°C
	Duration : 5±0.5sec
	Flux : Methanol solution with 25% of colophony

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RELIABILITY DATA

15. Resistance to soldering	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$
CB, CBC, CBL, CBMF Series	
LEM Series	Inductance change: Within $\pm 5\%$
LEM2520	No significant abnormality in appearance.

[Test Methods and Remarks]

LEM :

Reflow condition 3 times of reflow over at $220 \pm 5^\circ\text{C}$ for 40sec. MAX, With Peak temperature at $240 \pm 5^\circ\text{C}$ for 5 sec. MAX. (Refer to a Profile of chart below.)

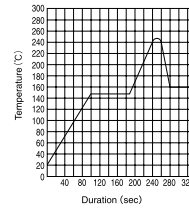
Flow condition

Solder temperature : $260 \pm 5^\circ\text{C}$

Duration : 10 ± 1 sec. Once

LB · LBC · LBR · CB · CBC · CBL · LBM · LBMF · CBMF :

3 times of reflow oven at 230°C MIN for 40sec. with peak temperature at 260°C for 5sec.



16. Resistance to solvent	
LB, LBC, LBR, LBMF Series	No significant abnormality in appearance
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

[Test Methods and Remarks]

Solvent temperature : Room temperature

Type of solvent : Isopropyl alcohol

Cleaning conditions : 90s. Immersion and cleaning.

17. Thermal shock	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	Inductance change : Within $\pm 10\%$ Q → R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
LEM Series	

[Test Methods and Remarks]

LEM : Conditions for 1cycle

Step	Temperature (°C)	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 : $-40 \sim +85^\circ\text{C}$, 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.

18. Damp heat life test	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	Inductance change : Within $\pm 10\%$ Q → R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
LEM Series	

[Test Methods and Remarks]

Temperature : $60 \pm 2^\circ\text{C}$

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.

19. Loading under damp heat life test	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	Inductance change : Within $\pm 10\%$ Q → R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
LEM Series	

[Test Methods and Remarks]

Temperature : $60 \pm 2^\circ\text{C}$

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.

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RELIABILITY DATA

20. High temperature life test	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	Inductance change : Within $\pm 10\%$ Q \rightarrow R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
LEM Series	
<p>【Test Methods and Remarks】 Temperature : $85 \pm 2^\circ\text{C}$ 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.</p>	
21. Loading at high temperature life test	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	
<p>【Test Methods and Remarks】 Temperature : $85 \pm 2^\circ\text{C}$ 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.</p>	
22. Low temperature life test	
LB, LBC, LBR, LBMF Series	Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	Inductance change : Within $\pm 10\%$ Q \rightarrow R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
LEM Series	
<p>【Test Methods and Remarks】 Temperature : $-40 \pm 2^\circ\text{C}$ 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.</p>	
23. Standard condition	
LB, LBC, LBR, LBMF Series	Standard test conditions Unless specified, Ambient temperature is $20 \pm 15^\circ\text{C}$ and the Relative humidity is $65 \pm 20\%$. If there is any doubt about the test results, further measurement shall be had within the following limits: Ambient Temperature: $20 \pm 2^\circ\text{C}$ Relative humidity: $65 \pm 5\%$ Inductance value is based on our standard measurement systems.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	

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PRECAUTIONS

LEM Type, LB Type, CB Type

1. Circuit Design

Precautions	<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>
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2. PCB Design

Precautions	<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>
Technical considerations	<p>PRECAUTIONS [Recommended Land Patterns]</p> <ul style="list-style-type: none"> · Surface Mounting · Mounting and soldering conditions should be checked beforehand. · Applicable soldering process to those products is reflow soldering only.

3. Considerations for automatic placement

Precautions	<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>
Technical considerations	<p>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</p>

4. Soldering

Precautions	<p>◆Wave soldering (LEM Type only)</p> <p>1. For wave soldering, please apply conditions meeting the range of the specified 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. Soldering iron's temperature - Below 350°C Duration-3 seconds or less. The soldering iron should not come in contact with inductor directly.</p>
Technical considerations	<p>◆Wave soldering (LEM Type only)</p> <p>1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.</p> <p>◆Reflow soldering (LB and CB Types)</p> <p>1. Reflow profile</p> <p>◆Recommended conditions for using a soldering iron</p> <p>1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.</p>

5. Cleaning

Precautions	<p>◆Cleaning conditions</p> <p>Washing by supersonic waves shall be avoided.</p>
Technical considerations	<p>◆Cleaning conditions</p> <p>If washed by supersonic waves, the products might be broken.</p>

6. Handling

Precautions	<p>◆Handling</p> <p>1. There is a case that a characteristic varies with magnetic influence.</p> <p>◆Breakaway PC boards (splitting along perforations)</p> <p>1. Planning pattern configurations and the position of products should be carefully performed to minimize stress.</p> <p>◆Mechanical considerations</p> <p>1. There is a case to be damaged by a mechanical shock.</p>
Technical considerations	<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>

7. Storage conditions

Precautions	<p>◆Storage</p> <p>1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/package materials may take place.</p>
Technical considerations	<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> <ul style="list-style-type: none"> · Recommended conditions · Ambient temperature : 0~40°C / Humidity : Below 70% RH <p>The ambient temperature must be kept below 30°C even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, LE type inductors should be used within one year from the time of delivery.</p> <p>LB type : Should be used within 6 months from the time of delivery.</p> <p>LE type : In case of storage over 6 months, solderability shall be checked before actual usage.</p>

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