

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 2011. 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.

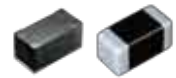
- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.
- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.
- All electronic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

WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES)



REFLOW

FEATURES

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

- CBC series has large rated current. They contribute to the miniaturization of the power supply circuit.
- CBL series has low profile characteristic. They contribute to the lowering of the equipments.
- CBMF 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

C B \triangle 2 0 1 2 T 1 0 0 \triangle \triangle \triangle \triangle \triangle

1 Type

CB	Wound chip power inductor
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2 Characteristic Spec

\triangle	Standard
C	High current
L	Low profile
MF	Low loss

3 External 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
3225 (1210)	3.2×2.5

4 Packaging

T	Tape & Reel
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5 Nominal Inductance (μH)

example	
1R0	1
100	10
101	100

※R=decimal point

6 Inductance Tolerances (%)

K	±10
M	±20

7 Special code

\triangle	Standard products
R	Low Rdc type

8 Internal code

EXTERNAL DIMENSIONS/STANDARD QUANTITY

Type	L	W	T	e
CBMF1608	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)
CBL2012	2.0±0.2 (0.079±0.008)	1.25±0.2 (0.049±0.008)	0.9±0.1 (0.035±0.004)	0.5±0.2 (0.020±0.008)
CB2012	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)
CB2016	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)
CBC2518	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)
CBC2518	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)
CBC3225	3.2±0.2 (0.126±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)

TYPE	Unit : mm			Standard Quantity [pcs]
	A	B	C	
MF1608	0.55	0.7	1.0	Paper Tape
2012	0.60	1.0	1.45	
2016	0.60	1.0	1.8	Embossed Tape
2518	0.60	1.5	2.0	
3218	0.85	1.7	2.0	3000
3225	0.85	1.7	2.7	

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 (inch)

AVAILABLE INDUCTANCE RANGE

Range	Type	CBMF1608		CBL2012		CB2012		CBC2012		CB2016		CBC2016		CB2518		CBC2518		CBC3225	
		I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]	I _{max} (mA)	Rdc±30% [Ω]
Inductance [μH]	1	290	1μH 0.09	620	1μH 0.15	500	1μH 0.15	700	1μH 0.19	600	1μH 0.09	1100	1μH 0.1	1200	1μH 0.06	1000	1μH 0.08	1440	1μH 0.055
	2.2	190	0.17	440	0.39	410	0.23	530	0.33	510	0.13	720	0.2	510	0.09	890	0.13	1130	0.08
	10	115	0.36	205	1.0	190	0.7	240	1.2	250	0.5	350	0.82	250	0.25	480	0.36	900	0.133
	47	50	2.5	100	4.2	90	3.7	120	5.8	110	2.4	150	4.3	110	0.95	240	1.90	390	0.67
	100	47μH	47μH	47μH	47μH	60	7	70	4.5	110	8	60	2.1	160	3.7	270	1.4		
1000														25	24	680μH	100	13	

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PART NUMBERS

1608(0603)TYPE

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CBMF1608T1R0M	RoHS	1.0	±20%	100	0.09	290	770	7.96
CBMF1608T2R2M	RoHS	2.2		80	0.17	190	560	
CBMF1608T3R3M	RoHS	3.3		60	0.22	170	500	
CBMF1608T4R7M	RoHS	4.7		45	0.24	145	470	
CBMF1608T100□	RoHS	10	±10% ±20%	32	0.36	115	380	2.52
CBMF1608T220□	RoHS	22		16	1.0	70	230	
CBMF1608T470□	RoHS	47		11	2.5	50	140	

□Please specify the Inductance tolerance code(Kor M)

2012(0805)TYPE

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB 2012T1R0M	RoHS	1.0	±20%	100	0.15	500	900	7.96
CB 2012T2R2M	RoHS	2.2		80	0.23	410	770	
CB 2012T3R3M	RoHS	3.3		55	0.30	330	650	
CB 2012T4R7M	RoHS	4.7		45	0.40	300	580	
CB 2012T6R8M	RoHS	6.8		38	0.47	250	540	
CB 2012T100□	RoHS	10	±10% ±20%	32	0.70	190	440	2.52
CB 2012T100□R	RoHS	10		32	0.50	200	520	
CB 2012T150□	RoHS	15		28	1.3	170	320	
CB 2012T220□	RoHS	22		16	1.7	135	280	
CB 2012T470□	RoHS	47		11	3.7	90	190	
CB 2012T680□	RoHS	68		10	6.0	70	140	
CB 2012T101□	RoHS	100		8	7.0	60	130	

□Please specify the Inductance tolerance code(Kor M)

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB C2012T1R0M	RoHS	1.0	±20%	100	0.19	700	840	7.96
CB C2012T2R2M	RoHS	2.2		70	0.33	530	640	
CB C2012T4R7M	RoHS	4.7		45	0.50	360	520	
CB C2012T100□	RoHS	10		40	1.2	240	340	
CB C2012T220□	RoHS	22	±10% ±20%	16	3.7	170	190	2.52
CB C2012T470□	RoHS	47		11	5.8	120	150	

□Please specify the Inductance tolerance code(Kor M)

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB L2012T1R0M	RoHS	1.0	±20%	100	0.15	620	950	0.1
CB L2012T2R2M	RoHS	2.2		80	0.39	440	590	
CB L2012T4R7M	RoHS	4.7		45	0.66	275	490	
CB L2012T100M	RoHS	10		32	1.0	205	370	
CB L2012T220M	RoHS	22		23	2.1	150	250	
CB L2012T470M	RoHS	47		11	4.2	100	140	

□Please specify the Inductance tolerance code(Kor M)

2016(0806)TYPE

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB 2016T1R0M	RoHS	1.0	±20%	100	0.09	600	1100	7.96
CB 2016T1R5M	RoHS	1.5		80	0.11	550	1000	
CB 2016T2R2M	RoHS	2.2		70	0.13	510	1000	
CB 2016T3R3M	RoHS	3.3		55	0.20	400	800	
CB 2016T4R7M	RoHS	4.7		45	0.25	340	740	
CB 2016T6R8M	RoHS	6.8		38	0.35	300	600	
CB 2016T100□	RoHS	10	±10% ±20%	32	0.50	250	520	2.52
CB 2016T150□	RoHS	15		28	0.70	210	440	
CB 2016T220□	RoHS	22		16	1.0	165	370	
CB 2016T330□	RoHS	33		14	1.7	130	270	
CB 2016T470□	RoHS	47		11	2.4	110	240	
CB 2016T680□	RoHS	68		10	3.0	90	210	
CB 2016T101□	RoHS	100		8	4.5	70	170	

□Please specify the Inductance tolerance code(Kor M)

※) The saturation current value(Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)
 ※) The temperature rise current value(Idc2) is the DC current value having temperature increase up to 40°C. (at 20°C)

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Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB C2016T1R0M	RoHS	1.0	±20%	100	0.10	1100	1100	7.96
CB C2016T1R5M	RoHS	1.5		80	0.15	1000	1000	
CB C2016T2R2M	RoHS	2.2		70	0.20	750	720	
CB C2016T3R3M	RoHS	3.3		55	0.27	600	610	
CB C2016T4R7M	RoHS	4.7		45	0.37	550	530	
CB C2016T6R8M	RoHS	6.8		38	0.59	450	450	
CB C2016T100□	RoHS	10	±10% ±20%	32	0.82	380	350	2.52
CB C2016T150□	RoHS	15		28	1.2	300	300	
CB C2016T220□	RoHS	22		16	1.8	250	240	
CB C2016T330□	RoHS	33		14	2.8	220	220	
CB C2016T470□	RoHS	47		11	4.3	150	150	
CB C2016T680□	RoHS	68		10	7.0	130	130	
CB C2016T101□	RoHS	100	8	8.0	110	110	0.796	

□ Please specify the Inductance tolerance code (Kor M)

2518(1007) TYPE

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB 2518T1R0M	RoHS	1.0	±20%	100	0.06	1200	1500	7.96
CB 2518T1R5M	RoHS	1.5		80	0.07	650	1400	
CB 2518T2R2M	RoHS	2.2		68	0.09	510	1300	
CB 2518T3R3M	RoHS	3.3		54	0.11	440	1200	
CB 2518T4R7MR	RoHS	4.7		46	0.10	310	1200	
CB 2518T4R7M	RoHS	4.7		46	0.13	340	1100	
CB 2518T6R8M	RoHS	6.8	38	0.15	270	930	2.52	
CB 2518T100□	RoHS	10	±10% ±20%	30	0.25	250		820
CB 2518T150□	RoHS	15		23	0.32	180		650
CB 2518T220□	RoHS	22		19	0.50	165		580
CB 2518T330□	RoHS	33		15	0.70	130		460
CB 2518T470□	RoHS	47		12	0.95	110		420
CB 2518T680□	RoHS	68		9.5	1.5	70	310	0.796
CB 2518T101□	RoHS	100	9.0	2.1	60	260		
CB 2518T151□	RoHS	150	7.0	3.2	55	210		
CB 2518T221□	RoHS	220	5.5	4.5	50	180		
CB 2518T331□	RoHS	330	4.5	7.0	40	140		
CB 2518T471□	RoHS	470	3.5	10	35	120		
CB 2518T681□	RoHS	680	3.0	17	30	90	0.252	
CB 2518T102□	RoHS	1000	2.4	24	25	75		

□ Please specify the Inductance tolerance code (Kor M)

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] (±30%)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB C2518T1R0M	RoHS	1.0	±20%	100	0.08	1000	1200	7.96
CB C2518T1R5M	RoHS	1.5		80	0.11	950	1190	
CB C2518T2R2M	RoHS	2.2		68	0.13	890	1100	
CB C2518T3R3M	RoHS	3.3		54	0.16	730	1020	
CB C2518T4R7M	RoHS	4.7		41	0.20	680	920	
CB C2518T6R8M	RoHS	6.8		38	0.30	550	740	
CB C2518T100□	RoHS	10	±10% ±20%	30	0.36	480	680	2.52
CB C2518T150□	RoHS	15		23	0.65	350	500	
CB C2518T220□	RoHS	22		19	0.77	320	460	
CB C2518T330□	RoHS	33		15	1.5	270	320	
CB C2518T470□	RoHS	47		12	1.9	240	290	
CB C2518T680□	RoHS	68		9.5	2.8	200	200	
CB C2518T101□	RoHS	100	9.0	3.7	160	170		
CB C2518T151□	RoHS	150	7.0	6.1	140	130		
CB C2518T221□	RoHS	220	5.5	8.4	115	110		
CB C2518T331□	RoHS	330	4.5	12.3	100	90		
CB C2518T471□	RoHS	470	3.5	22	80	70		
CB C2518T681□	RoHS	680	3.0	28	65	60		

□ Please specify the Inductance tolerance code (Kor M)

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)

※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40°C. (at 20°C)

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PART NUMBERS

3225(1210) TYPE

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] min.	Resistance DC [Ω] ($\pm 30\%$)	Rated current [mA]		Measuring frequency [MHz]
						Saturation current Idc1	Temperature rise current Idc2	
CB C3225T1R0MR	RoHS	1.0	$\pm 20\%$	250	0.055	2000	1440	0.1
CB C3225T1R5MR	RoHS	1.5		220	0.060	2000	1310	
CB C3225T2R2MR	RoHS	2.2		190	0.080	2000	1130	
CB C3225T3R3MR	RoHS	3.3		160	0.095	2000	1040	
CB C3225T4R7MR	RoHS	4.7		70	0.100	1250	1010	
CB C3225T6R8MR	RoHS	6.8	50	0.120	950	940		
CB C3225T100□R	RoHS	10	$\pm 10\%$ $\pm 20\%$	23	0.133	900	900	
CB C3225T150□R	RoHS	15		20	0.195	730	850	
CB C3225T220□R	RoHS	22		17	0.27	620	780	
CB C3225T330□R	RoHS	33		13	0.41	500	570	
CB C3225T470□R	RoHS	47		10	0.67	390	480	
CB C3225T680□R	RoHS	68		8	1.0	320	410	
CB C3225T101□R	RoHS	100		6	1.4	270	340	
CB C3225T221□R	RoHS	220		3	2.5	190	190	
CB C3225T821□R	RoHS	820		1.8	12	110	110	
CB C3225T102□R	RoHS	1000		1.6	13	100	100	

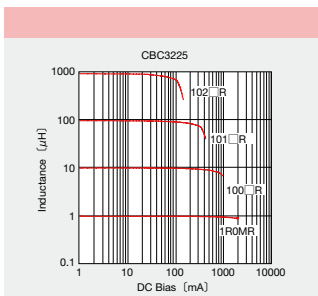
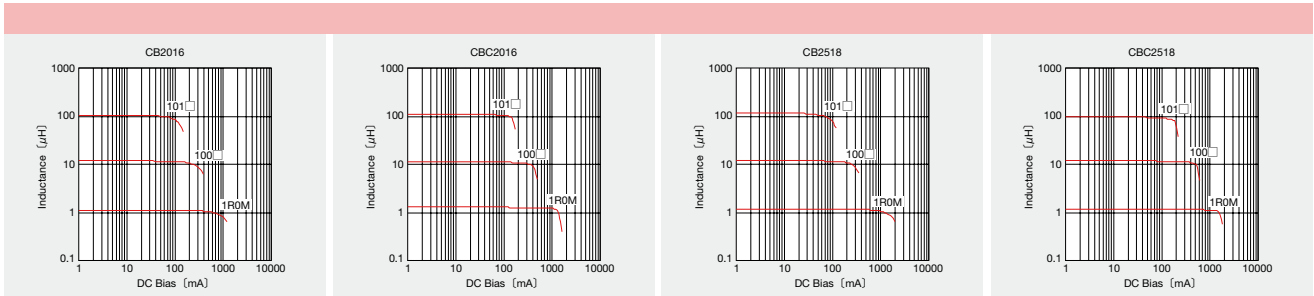
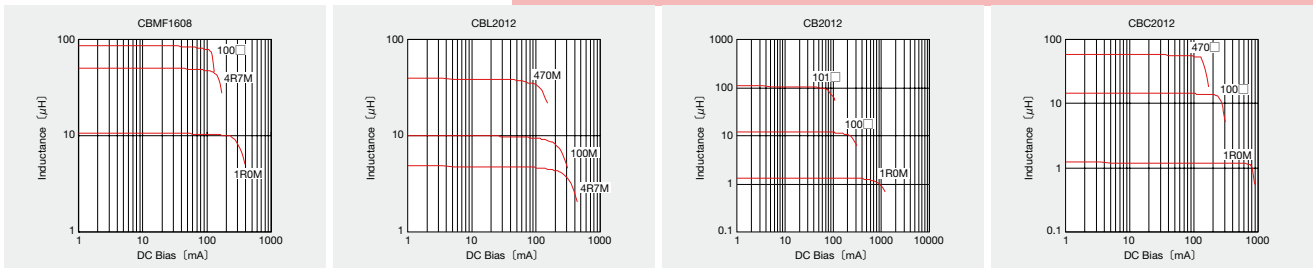
□ Please specify the Inductance tolerance code (K or M)

※ The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)

※ The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40°C. (at 20°C)

ELECTRICAL CHARACTERISTICS

DC Bias characteristics Measured by HP4285A+42841A



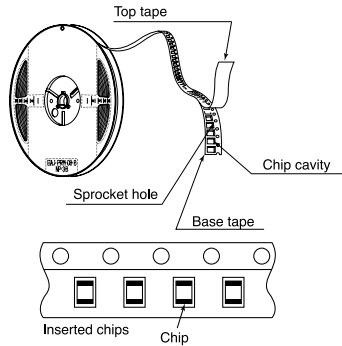
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① Minimum Quantity

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

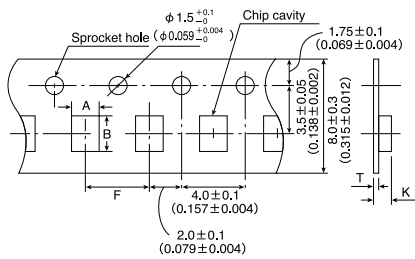
② Tape material

- Embossed tape



③ Taping Dimensions

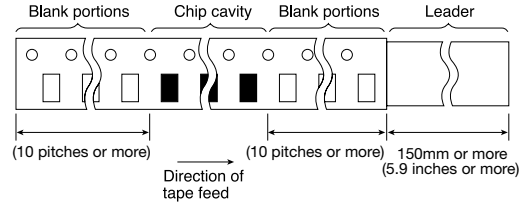
- Embossed Tape (0.315 inches wide)
- Card board carrier tape (0.315 inches wide)



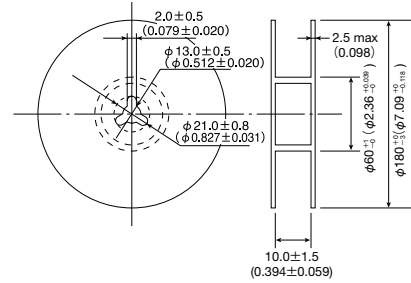
Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		T	K
LBM 2016	1.75 ± 0.1 (0.069±0.004)	2.1 ± 0.1 (0.083±0.004)	4.0 ± 0.1 (0.157±0.004)	0.3 ± 0.05 (0.012±0.002)	1.9max. (0.075max.)
LEM 2520	2.3 ± 0.1 (0.091±0.004)	2.7 ± 0.1 (0.106±0.004)	4.0 ± 0.1 (0.157±0.004)	0.3 ± 0.05 (0.012±0.002)	2.1 ± 0.1 (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. (0.157max.)
LB3218	2.1 ± 0.1 (0.083±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)	2.2max. (0.087max.)
LB2518 / CB2518 LBC2518 / CBC2518 LBR2518	2.15 ± 0.1 (0.085±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)	2.2max. (0.087max.)
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. (0.075max.)
LB2012 / CB2012 LBC2012 / CBC2012 LBR2012	1.45 ± 0.1 (0.057±0.004)	2.25 ± 0.1 (0.089±0.004)	4.0 ± 0.1 (0.157±0.004)	0.25 ± 0.05 (0.010±0.002)	1.45max. (0.057max.)
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. (0.043max.)	1.1max. (0.043max.)
LB1608	1.0 ± 0.1 (0.039±0.004)	1.8 ± 0.1 (0.071±0.004)	4.0 ± 0.1 (0.157±0.004)	1.1max. (0.043max.)	1.1max. (0.043max.)
LBMF1608 / CBMF1608	1.1 ± 0.1 (0.043±0.004)	1.9 ± 0.1 (0.075±0.004)	4.0 ± 0.1 (0.157±0.004)	0.25 ± 0.05 (0.010±0.002)	1.2max. (0.047max.)

Unit : mm (inch)

④ Leader and Blank Portion

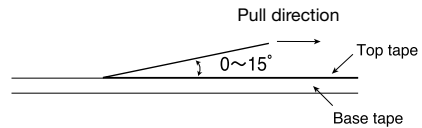


⑤ Reel Size



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 Resisistance	
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 CB2016 LB2518 LBR2518 CB2518 LBC3225 CBC3225	Inductance change: Within ±20%
LBMF1608 CBMF1608 LBC2016 CBC2016 LBC2518 CBC2518 LB3218	Inductance change: Within ±25%
LBC2012 CBC2012	Inductance change: Within ±35%

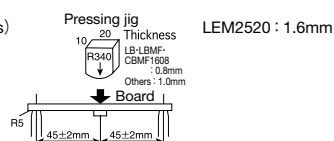
【Test Methods and Remarks】
 Change of maximum inductance deviation in step 1-5

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

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.)

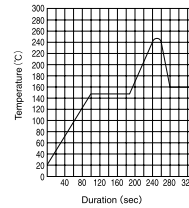
Flow condition

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±10% No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	
LEM Series	Inductance change :Within±10% Q→ R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
[Test Methods and Remarks] Temperature : 85±2°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.	
21.Loading at high temperature life test	
LB, LBC, LBR, LBMF Series	Inductance change:Within±10% No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM, LEM Series	
[Test Methods and Remarks] Temperature : 85±2°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.	
22.Low temperature life test	
LB, LBC, LBR, LBMF Series	Inductance change:Within±10% No significant abnormality in appearance.
CB, CBC, CBL, CBMF Series	
LBM Series	
LEM Series	Inductance change :Within±10% Q→ R12~4R7 : 30 min. 5R6~330 : 25 min. 390~820 : 20 min. 101 : 15 min.
[Test Methods and Remarks] Temperature : -40±2°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.	
23.Standard condition	
LB, LBC, LBR, LBMF Series	Standard test conditions Unless specified, Ambient temperature is 20±15°C 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°C Relative humidity: 65±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	<ul style="list-style-type: none"> ◆Operating environment <ol style="list-style-type: none"> 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.
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2. PCB Design

Precautions	<ul style="list-style-type: none"> ◆Land pattern design <ol style="list-style-type: none"> 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.

3. Considerations for automatic placement

Precautions	<ul style="list-style-type: none"> ◆Adjustment of mounting machine <ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. When installing products, care should be taken not to apply distortion stress as it may deform the products.

4. Soldering

Precautions	<ul style="list-style-type: none"> ◆Wave soldering (LEM Type only) <ol style="list-style-type: none"> 1. For wave soldering, please apply conditions meeting the range of the specified conditions in our catalog or the relevant specifications. ◆Reflow soldering (LB and CB Types) <ol style="list-style-type: none"> 1. For reflow soldering with either leaded or lead-free solder, the profile specified in "point for controlling" is recommended. ◆Reflow soldering (LEM) <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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.
Technical considerations	<ul style="list-style-type: none"> ◆Wave soldering (LEM Type only) <ol style="list-style-type: none"> 1. Components can be damaged by excessive heat where soldering conditions exceed the specified range. ◆Reflow soldering (LB and CB Types) <ol style="list-style-type: none"> 1. Reflow profile <div style="text-align: center;"> <p>Peak Temp: 260+0/-5°C 5 sec Max 230°C Minn 180°C 150°C 90±30 sec 30±10 sec</p> </div> ◆Recommended conditions for using a soldering iron <ol style="list-style-type: none"> 1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.

5. Cleaning

Precautions	<ul style="list-style-type: none"> ◆Cleaning conditions <ol style="list-style-type: none"> 1. Washing by supersonic waves shall be avoided.
Technical considerations	<ul style="list-style-type: none"> ◆Cleaning conditions <ol style="list-style-type: none"> 1. If washed by supersonic waves, the products might be broken.

6. Handling

Precautions	<ul style="list-style-type: none"> ◆Handling <ol style="list-style-type: none"> 1. There is a case that a characteristic varies with magnetic influence. ◆Breakaway PC boards (splitting along perforations) <ol style="list-style-type: none"> 1. Planning pattern configurations and the position of products should be carefully performed to minimize stress. ◆Mechanical considerations <ol style="list-style-type: none"> 1. There is a case to be damaged by a mechanical shock.
Technical considerations	<ul style="list-style-type: none"> ◆Handling <ol style="list-style-type: none"> 1. Keep the inductors away from all magnets and magnetic objects. ◆Breakaway PC boards (splitting along perforations) <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 1. Please do not give the inductors any excessive mechanical shocks.

7. Storage conditions

Precautions	<ul style="list-style-type: none"> ◆Storage <ol style="list-style-type: none"> 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.
Technical considerations	<ul style="list-style-type: none"> ◆Storage <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> · 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 : 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.

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