

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.

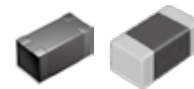
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- Caution for export

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

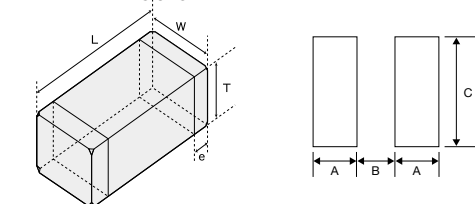
- DSC/DVC/HDD, LCD, portable telephones, game equipments.
Various audio-visual equipments, various communication equipments, etc.

ORDERING CODE

L	B	△	2	0	1	2	T	1	0	0	△	△	△	△	△
1	2	3	4	5	6	7	8								
1 Type LB Wound chip inductor		2 Shape △ Standard products C High current R Low Rdc MF Bottom-surface electrode		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 3218 (1207) 3.2×1.8 3225 (1210) 3.2×1.5		4 Packaging T Tape & Reel		5 Nominal Inductance (μH) example 1R0 1 100 10 101 100 ※R=decimal point		6 Inductance Tolerances (%) K ±10 M ±20		7 Special code △ Standard products R Low Rdc type		8 Internal 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

Type Range	LB3218	LB2518	LB2016	LB2012	LB1608	LBC3225	LBC2518	LBC2016	LBC2012	LBR2518	LBR2012	LBMF1608
Inductance [μH]	Imax [mA] Rdc±30% [Ω] 1075 1μH 0.06 340 0.25 140 2.40 40 1000μH	Imax [mA] Rdc±30% [Ω] 665 1μH 0.06 165 0.25 60 2.1 15 1000μH	Imax [mA] Rdc±30% [Ω] 490 1μH 0.09 155 0.5 40 4.5 45 100μH	Imax [mA] Rdc±30% [Ω] 405 1μH 0.15 120 0.7 45 7.0 100μH	Imax [mA] Rdc±30% [Ω] 160 1μH 0.17 70 0.55 60 0.7 10μH	Imax [mA] Rdc±30% [Ω] 1100 1μH 0.055 540 0.133 150 1.4 100μH	Imax [mA] Rdc±30% [Ω] 775 1μH 0.08 375 0.36 125 3.70 45 28.0 680μH	Imax [mA] Rdc±30% [Ω] 690 1μH 0.1 245 0.82 75 8.0 100μH	Imax [mA] Rdc±30% [Ω] 620 1μH 0.19 200 1.2 90 5.8 47μH	Imax [mA] Rdc±30% [Ω] 960 1μH 0.045 235 0.19 80 1.89 100μH	Imax [mA] Rdc±30% [Ω] 400 1μH 0.07 150 0.36 50 4.0 100μH	Imax [mA] Rdc±30% [Ω] 230 1μH 0.09 80 0.36 35 2.5 47μH

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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	±10% ±20%	38	0.35	200	2.52
LB 2016T100□		RoHS	10		32	0.50	155	
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	±10% ±20%	46	0.10	235	2.52
LB 2518T6R8M		RoHS	6.8		38	0.15	195	
LB 2518T100□		RoHS	10		30	0.25	165	
LB 2518T150□		RoHS	15		23	0.32	145	
LB 2518T220□		RoHS	22		19	0.50	115	
LB 2518T330□		RoHS	33		15	0.70	95	0.796
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	
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	±10% ±20%	40	0.17	380	2.52
LB 3218T100□		RoHS	10		30	0.25	340	
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	0.796
LB 3218T680□		RoHS	68		11	1.49	145	
LB 3218T101□		RoHS	100		8.0	2.4	140	
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	0.796
LB C2518T101□		RoHS	100		9.0	3.7	125	
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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● 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

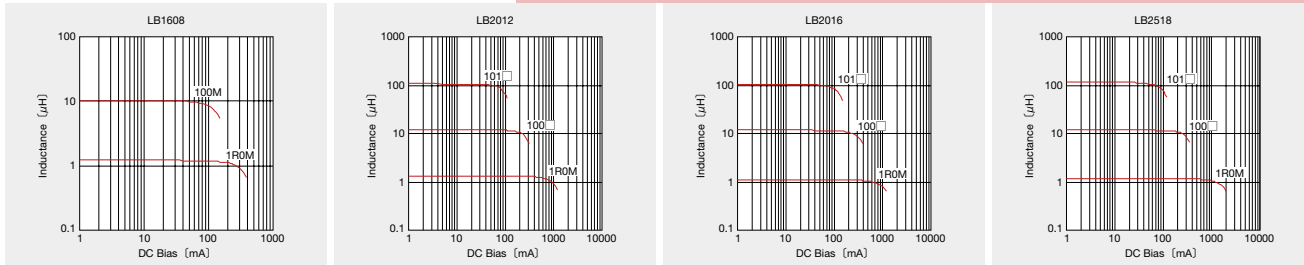
● LBR2012 TYPE

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

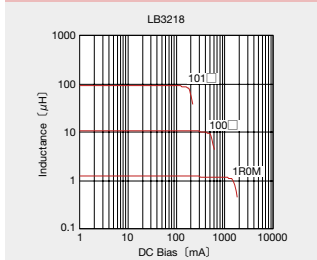
□ Please specify the Inductance tolerance code (K or M)

DC Bias characteristics (Measured by HP4285A+42841A)

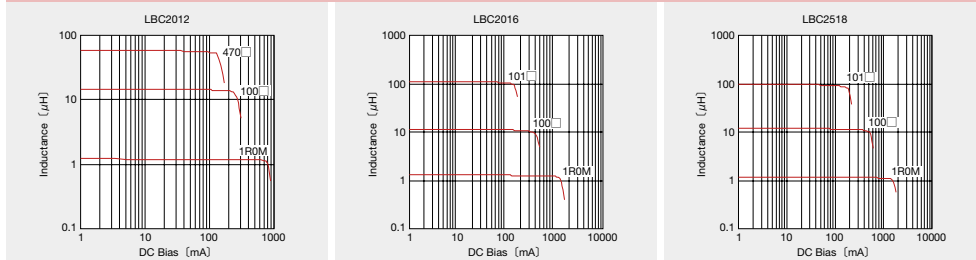
Standard Type



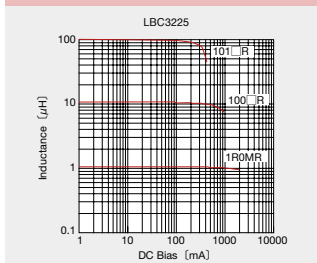
Standard Type



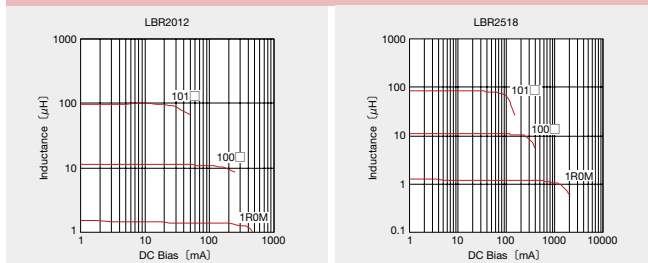
High Current Type



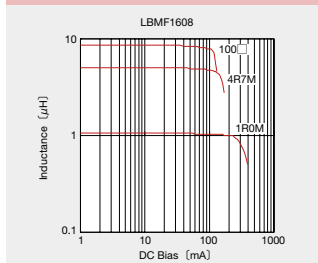
High Current Type



Low Rdc Type

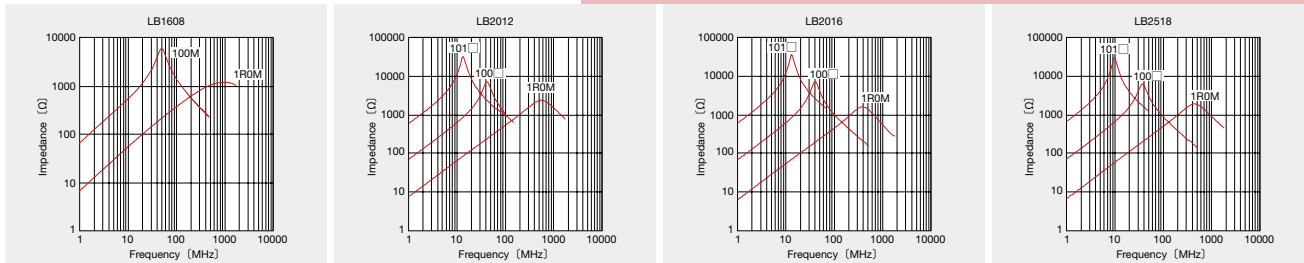


Bottom-surface electrode Type

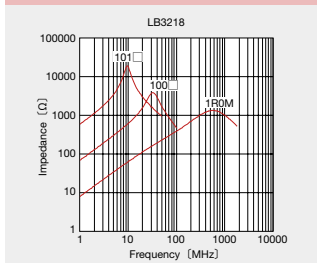


Impedance-vs-Frequency characteristics (Measured by HP4291A)

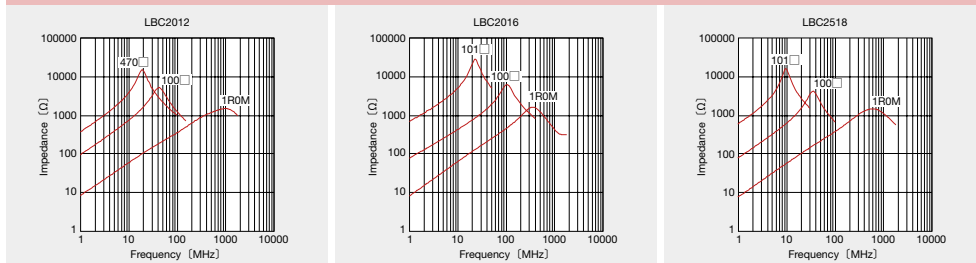
Standard Type



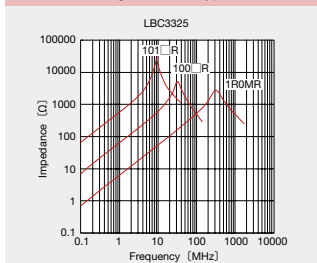
Standard Type



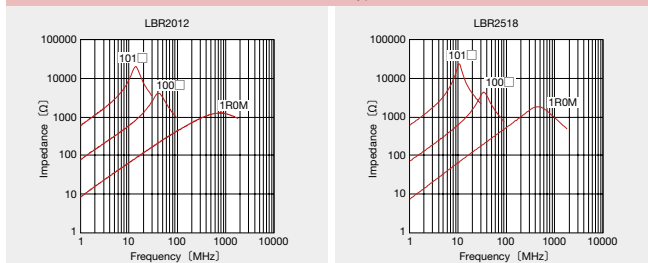
High Current Type



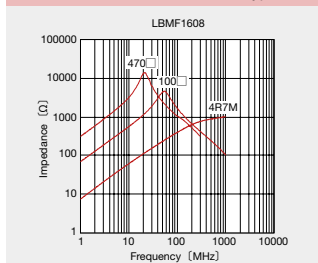
High Current Type



Low Rdc Type



Bottom-surface electrode Type



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WOUND CHIP POWER INDUCTORS (CB SERIES)



REFLOW

FEATURES

- This series corresponds to high electric current compared with LB/LBC series.
Wound Chip Inductors that can be used for small DC/DC converters and are suitable for choke uses.
- CBMF 1608 Series
The best efficiency design is achieved by adopting bottom-surface electrode structure.
Wound Chip Inductors that are suitable for module design which needs high electric current like DC/DC converters.

APPLICATIONS

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

ORDERING CODE

C	B	△	2	0	1	2	T	1	0	0	△	△	△	△	△
①Type		③External Dimensions (mm)			④Packaging		⑤Nominal Inductance (μH)		⑥Inductance Tolerances (%)		⑦Special code		⑧Internal code		
CB	Wound chip power inductor	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			T Tape & Reel		example 1R0 1 100 10 101 100		K ±10 M ±20		△ Standard products R Low Rdc type		△△△ Standard Products △=Blank space		
②Characteristic Spec															
△	Low Rdc														
C	High current														
L	Low profile														
MF	Bottom-surface electrode														

EXTERNAL DIMENSIONS/STANDARD QUANTITY

Unit : mm

Recommended Land Patterns

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
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
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)	—	1000
CB2518 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)	—	2000
CB2016 CBC2016	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
CB2012 CBC2012	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
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)	4000	—
CBMF1608	1.6±0.2 (0.063±0.2)	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)

Unit : mm (inch)

AVAILABLE CAPACITANCE RANGE

Range	Type	CB2518	CB2016	CB2012	CBC3225	CBC2518	CBC2016	CBC2012	CBC2012	CBMF1608
Inductance [μH]	1	1200 1μH 0.06	600 1μH 0.09	500 1μH 0.15	1440 1μH 0.055	1000 1μH 0.08	1100 1μH 0.1	700 1μH 0.19	620 1μH 0.15	350 1μH 0.09
	22	510 0.09	510 0.13	410 0.23	1130 0.08	890 0.13	750 0.2	530 0.33	530 0.33	230 0.17
	10	250 2.40	250 0.5	200 0.5	900 0.133	480 0.36	380 0.82	240 1.2	440 1.0	115 0.36
	47	110 0.95	110 2.4	90 3.7	390 0.67	240 1.90	150 4.3	120 5.8	100 4.2	50 2.5
	100	60 2.1	70 4.5	60 7	270 1.4	160 3.7	110 8	47μH	47μH	47μH
1000		25 1000μH				65 28				

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PART NUMBERS

CB2012 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	
									0.796

CB2016 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	±10% ±20%	38	0.35	300	600	2.52
CB 2016T100□		RoHS	10		32	0.50	250	520	
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	
									0.796

CB2518 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	±10% ±20%	46	0.13	340	1100	2.52
CB 2518T6R8M		RoHS	6.8		38	0.15	270	930	
CB 2518T100□		RoHS	10		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	
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	
CB 2518T102□		RoHS	1000		2.4	24	25	75	0.252

CBC2012 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 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	±10% ±20%	40	1.2	240	340	2.52
CB C2012T220□		RoHS	22		16	3.7	170	190	
CB C2012T470□		RoHS	47		11	5.8	120	150	

□ 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)

※) The maximum rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

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PART NUMBERS

●CBC2016 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 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	±10% ±20%	38	0.59	450	450	2.52
CB C2016T100□		RoHS	10		32	0.82	380	350	
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

●CBC2518 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 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	±10% ±20%	38	0.30	550	740	2.52
CB C2518T100□		RoHS	10		30	0.36	480	680	
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	0.796

●CBC3225 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 C3225T1R0MR		RoHS	1.0	±20%	250	0.055	2000	1440	0.1
CB C3225T1R5MR		RoHS	1.5		220	0.06	2000	1310	
CB C3225T2R2MR		RoHS	2.2		190	0.08	2000	1130	
CB C3225T3R3MR		RoHS	3.3		160	0.095	2000	1040	
CB C3225T4R7MR		RoHS	4.7		70	0.10	1250	1010	
CB C3225T6R8MR		RoHS	6.8	±10% ±20%	50	0.12	950	940	
CB C3225T100□R		RoHS	10		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	

●CBL2012 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 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 (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)

※) The maximum rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

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PART NUMBERS

CBMF1608 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	
CBMF1608T1R0M		RoHS	1.0	$\pm 20\%$	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	10.0	$\pm 10\%$ $\pm 20\%$	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 (K or M)

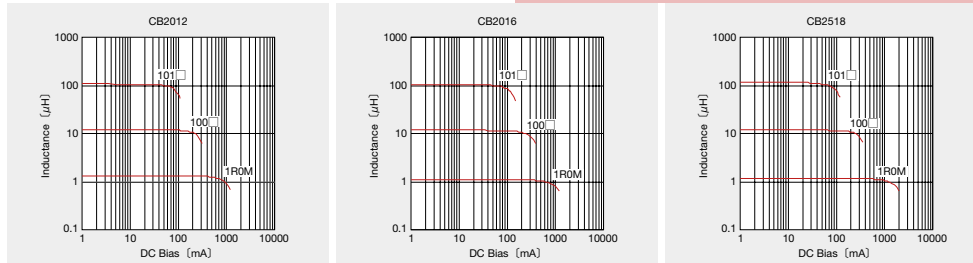
※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)

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

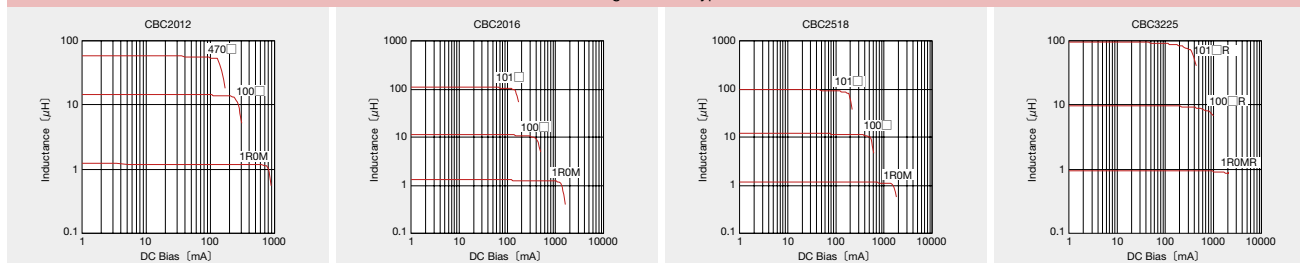
※) The maximum rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

DC Bias characteristics Measured by HP4285A+42841A

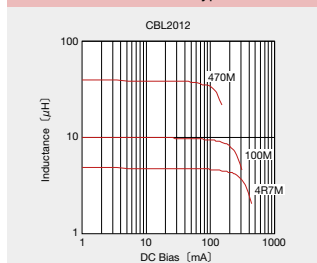
Low Rdc Type



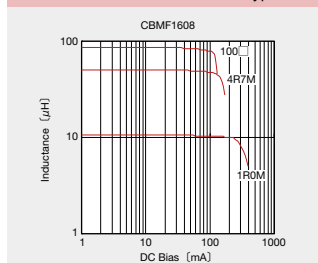
High Current Type



Low Profile Type

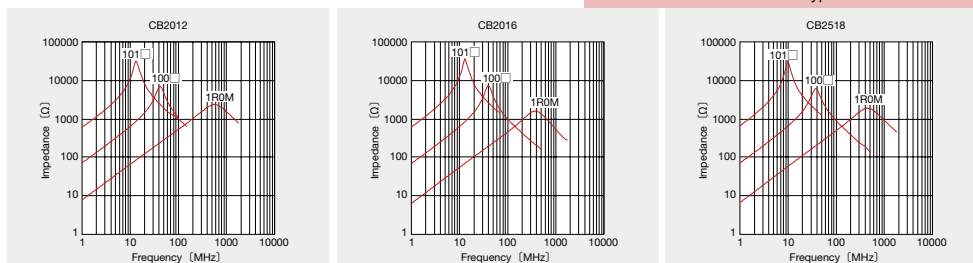


Bottom-surface electrode Type

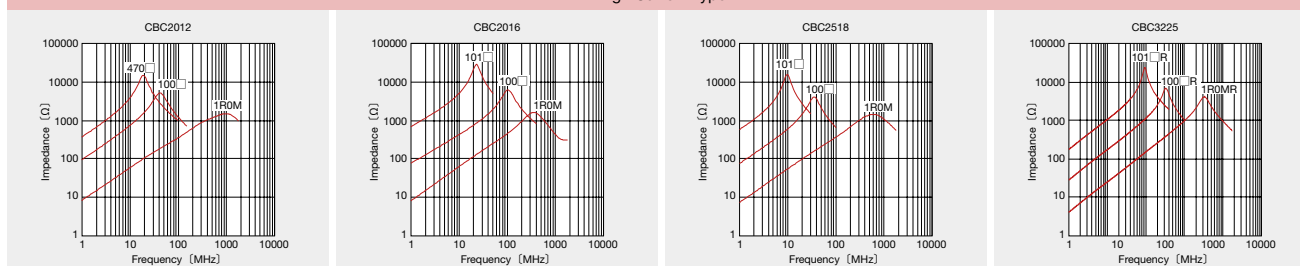


Impedance-vs-Frequency characteristics Measured by HP4291A

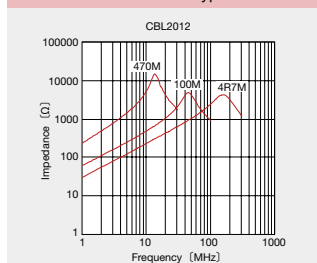
Low Rdc Type



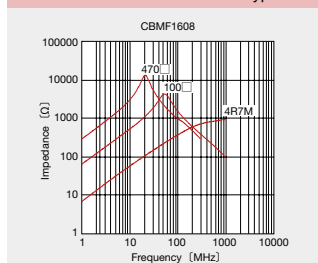
High Current Type



Low Profile Type



Bottom-surface electrode Type



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WOUND CHIP INDUCTORS FOR SIGNAL LINE (LB/LE SERIES M TYPE)



LB: REFLOW LE: WAVE REFLOW

FEATURES

- **LBM2016 Series**
High Q and narrow tolerance are achieved by adopting bottom-surface electrode structure. Wound Chip Inductors that are suitable for module design of signal line uses.
- **LEM2520 Series**
A high-quality inductor that is simple to mass-produce and conforms to the same production process and basic construction as an axial lead type inductor.

APPLICATIONS

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

ORDERING CODE

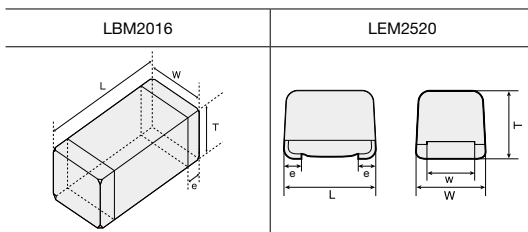
L	B	M	2	0	1	6	T	1	0	0	J	△
①Type			②External Dimensions (mm)		③Packaging		④Nominal Inductance (μH)		⑤Inductance Tolerances		⑥Internal code	
LBM	Wound chip inductor for signal line		2016	2.0×1.6	T	Tape & Reel		example		J	±5%	△
LEM	Wound chip inductor for signal line		2520	2.5×2.0				R12	0.12	K	±10%	
								1R0	1.00			
								100	10.0			

※R=decimal point

△=Blank space

※R=decimal point

EXTERNAL DIMENSIONS/STANDARD QUANTITY



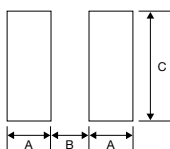
Type	L	W	T	e	W	Standard Quantity [pcs]
LBM2016	2.0±0.2 (0.08±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.02±0.008)		
LEM2520	2.5±0.2 (0.098±0.008)	2.0±0.2 (0.079±0.008)	1.8±0.2 (0.071±0.008)	0.45 (0.018)	1.4±0.1 (0.055±0.004)	

Unit : mm (inch)

Recommended Land Patterns

Surface Mounting

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



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

Unit : mm

AVAILABLE CAPACITANCE RANGE

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

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● LBM2016 TYPE

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

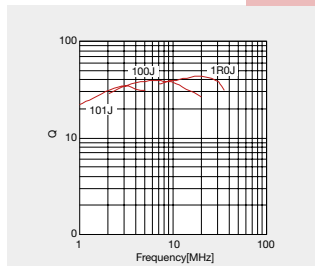
● LEM2520 TYPE

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

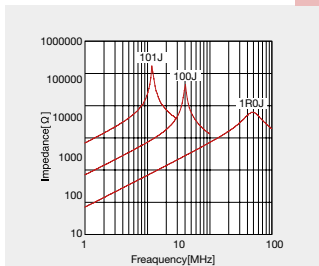
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● LBM2016

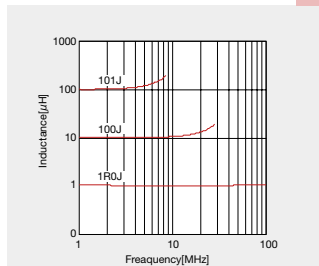
■ Q-vs-Frequency characteristics



■ Impedance-vs-Frequency characteristics

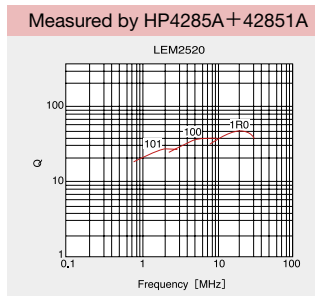


■ Inductance-vs-Frequency characteristics

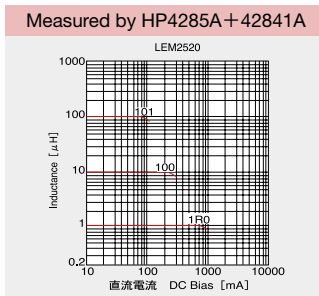


● LEM2520

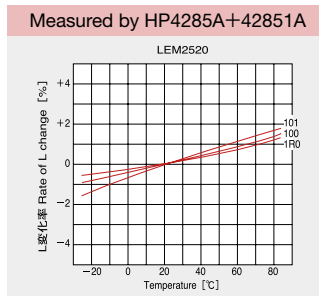
■ Q-vs-Frequency characteristics



■ DC Bias characteristics



■ Temperature characteristics



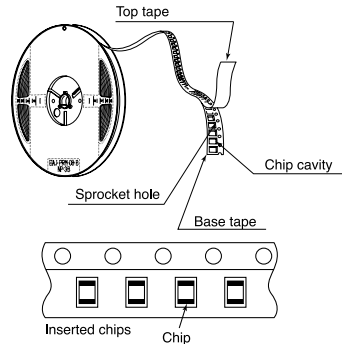
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① Minimum Quantity

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

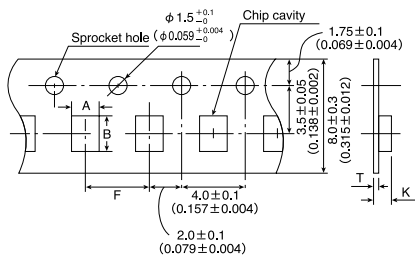
② Tape material

- Embossed tape



③ Taping Dimensions

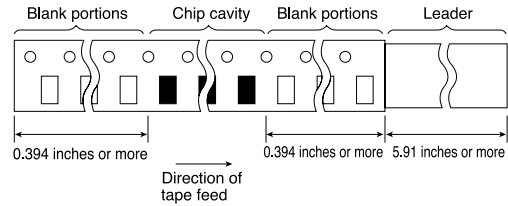
- Embossed Tape (0.315 inches wide)
- Card board carrier tape (0.315 inches wide)



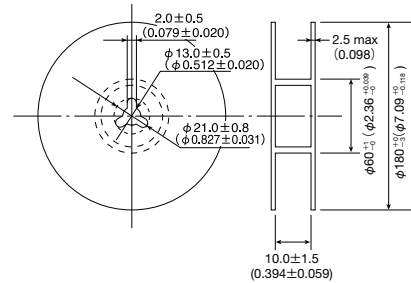
Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		T	K
LBM 2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.074)
LEM 2520	2.3±0.1 (0.091±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.1±0.1 (0.083±0.004)
LBC3225/ 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

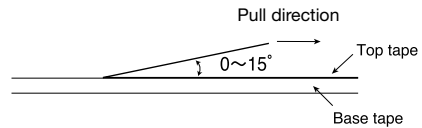


⑤ Reel Size



⑥ Top Tape Strength

The top tape requires a peel-off force 0.1 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	Within the specified tolerance	
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							
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						
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				Within the specified tolerance
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 $\pm 5\%$
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change: Within $\pm 15\%$ LBMF1608・LB3218 Inductance change: Within $\pm 20\%$
LBC3225	LBC2518	LBC2016	LBC2012			LBC3225・LBC2518・LBC2016 Inductance change: Within $\pm 20\%$ LBC2012 Inductance change: Within $\pm 30\%$
LBR2518	LBR2012					Inductance change: Within $\pm 15\%$
CB2518	CB2016	CB2012				Inductance change: Within $\pm 15\%$
CBC3225	CBC2518	CBC2016	CBC2012			CBC3225・CBC2518・CBC2016 Inductance change: Within $\pm 20\%$ CBC2012 Inductance change: Within $\pm 30\%$
CBL2012						Inductance change: Within $\pm 15\%$
CBMF1608						Inductance change: Within $\pm 20\%$
LBM2016						Inductance change: Within $\pm 5\%$

[Test Methods and Remarks]

Change of maximum inductance deviation in step 1-5

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

9. Resistance to Flexure of Substrate

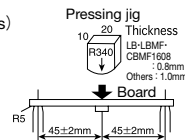
LEM2520						
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				No damage.
CBC3225	CBC2518	CBC2016	CBC2012			
CBL2012						
CBMF1608						
LBM2016						

[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						
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					
CB2518	CB2016	CB2012				No damage.
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 Frequency

LEM2520						
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	Inductance change : Within—10%
LBC3225	LBC2518	LBC2016	LBC2012			
LBR2518	LBR2012					Inductance change : Within—20%
CB2518	CB2016	CB2012				
CBC3225	CBC2518	CBC2016	CBC2012			Inductance change : Within—30%
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 $\pm 5\%$	No significant abnormality in appearance.
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608		
LBC3225	LBC2518	LBC2016	LBC2012				
LBR2518	LBR2012						
CB2518	CB2016	CB2012				Inductance change: Within $\pm 10\%$	No significant abnormality in appearance.
CBC3225	CBC2518	CBC2016	CBC2012				
CBL2012							
CBMF1608							
LBM2016						Inductance change: Within $\pm 5\%$	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 $\pm 5\%$	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 $\times$ 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 $\pm$ 5 $^{\circ}$ C
 Duration : 5 $\pm$ 0.5sec.
 Flux : Methanol solution with 25% of colophony

LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF :
 Solder temperature : 245 $\pm$ 5 $^{\circ}$ C
 Duration : 5 $\pm$ 0.5sec
 Flux : Methanol solution with 25% of colophony

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RELIABILITY DATA

16. Resistance to soldering heat

LEM2520						No significant abnormality in appearance.			
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608	LB3218, LB2518, LB2016, LB2012, LB1608 Inductance change:Within±10% LBMF1608 Inductance change:Within±20%	No significant abnormality in appearance. 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 $220 \pm 5^\circ\text{C}$ for 40sec. MAX, With Peak temperature at $240 \pm 5^\circ\text{C}$ for 5 sec. MAX. (Refer to a Profile of chart below.)

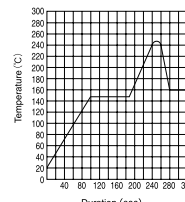
Flow condition

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

Duration : 10 ± 1 sec. Once

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

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



17. Resistance 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 · CBF)

Cleaning conditions : 90s. Immersion and cleaning.

(LEM2520 · LB · LBC · LBR · CB · CBC · CBL · LBM · LBMF · CBF)

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 1 cycle

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 · CBF : $-40 \sim +85^\circ\text{C}$, 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.

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

Humidity : $90 \sim 95\%$ 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
LBC3225	LBC2518	LBC2016	LBC2012		
LBR2518	LBR2012				
CB2518	CB2016	CB2012			
CBC3225	CBC2518	CBC2016	CBC2012		
CBL2012					
CBMF1608					
LBM2016					
Inductance change:Within±10% No significant abnormality in appearance.					
【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			
CBC3225	CBC2518	CBC2016	CBC2012		
CBL2012					
CBMF1608					
LBM2016					
Inductance change:Within±10% No significant abnormality in appearance.					
【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
LBC3225	LBC2518	LBC2016	LBC2012		
LBR2518	LBR2012				
CB2518	CB2016	CB2012			
CBC3225	CBC2518	CBC2016	CBC2012		
CBL2012					
CBMF1608					
LBM2016					
Inductance change:Within±10% No significant abnormality in appearance.					
【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 $\pm 10\%$ Q $\rightarrow$ 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			
CBC3225	CBC2518	CBC2016	CBC2012		
CBL2012					
CBMF1608					
LBM2016					
Inductance change: Within $\pm 10\%$ No significant abnormality in appearance.					
[Test Methods and Remarks] LEM · LB · LBC · LBR · CB · CBC · CBL · LBM · LBMF · CBF 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.					

24. Standard condition

LEM2520	Standard test conditions				
LB3218	LB2518	LB2016	LB2012	LB1608	LBMF1608
LBC3225	LBC2518	LBC2016	LBC2012		
LBR2518	LBR2012				
CB2518	CB2016	CB2012			
CBC3225	CBC2518	CBC2016	CBC2012		
CBL2012					
CBMF1608					
LBM2016					
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.					

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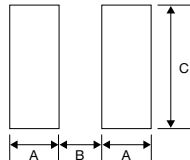
PRECAUTIONS

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.
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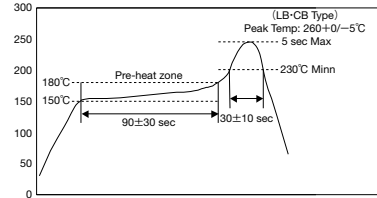
2. PCB Design

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.																																			
	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																																			
Technical considerations																																				
	<table><tr><th>TYPE</th><th>A</th><th>B</th><th>C</th></tr><tr><td>1608</td><td>0.55</td><td>0.7</td><td>1.0</td></tr><tr><td>MF1608</td><td>0.55</td><td>0.8</td><td>0.9</td></tr><tr><td>2012</td><td>0.7</td><td>0.8</td><td>1.45</td></tr><tr><td>2016</td><td>0.7</td><td>0.8</td><td>1.8</td></tr><tr><td>2518</td><td>0.8</td><td>1.2</td><td>2.0</td></tr><tr><td>LEM2520</td><td>0.9</td><td>1.5</td><td>1.5</td></tr><tr><td>3218</td><td>1.0</td><td>1.6</td><td>2.0</td></tr><tr><td>3225</td><td>1.0</td><td>1.6</td><td>2.7</td></tr></table> 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
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 specified conditions in our catalog or the relevant specifications. ◆Reflow soldering (LB and CB Types) 1. For reflow soldering with either leaded or lead-free solder, the profile specified in "point for controlling" is recommended. ◆Reflow soldering (LEM) 1. For reflow soldering, please apply conditions meeting the range of the specified conditions in our catalog or the relevant specifications. ◆Recommended conditions for using a soldering iron 1. Put the soldering iron on the land-pattern. Soldering iron's temperature-Below 350°C Duration-3 seconds or less. The soldering iron should not 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°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.
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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SMD INDUCTORS LOW PROFILE TYPE



REFLOW

FEATURES

- Small and Low profile inductor.
- It corresponds to High current.
- Simple and original magnetic shield structure.
- Durable structure against dropping impact.

APPLICATIONS

- For small DC/DC converter (cellular Phone, HDD, DVC, DSC, PDA, LCD display etc).

ORDERING CODE

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①Type

NR△, NRG

Coating resin specification

△=Blank Space

②External dimensions (W×L×H)

example		4026	4.0×4.0×2.6mm
3010	3.0×3.0×1.0mm	5040	5.0×5.0×4.0mm
3012	3.0×3.0×1.2mm	6012	6.0×6.0×1.2mm
3015	3.0×3.0×1.5mm	6020	6.0×6.0×2.0mm
4010	4.0×4.0×1.0mm	6028	6.0×6.0×2.8mm
4012	4.0×4.0×1.2mm	6045	6.0×6.0×4.5mm
4018	4.0×4.0×1.8mm	8040	8.0×8.0×4.0mm

③Packaging

T△

Tape & Reel

△=Blank Space

④Nominal inductance (μH)

example	
2R2	2.2
100	10
101	100

※R=decimal point

⑤Inductance tolerance

M	±20%
N	±30%

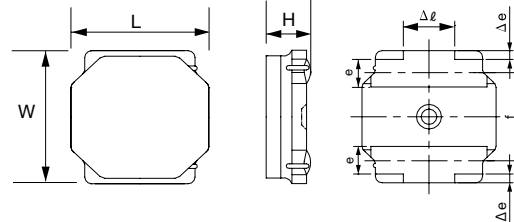
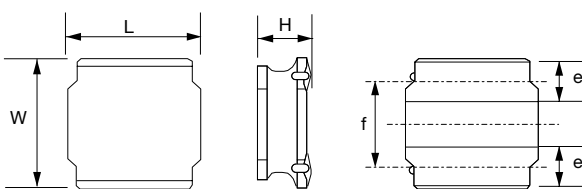
⑥Internal code

△

Standard product

△=Blank Space

EXTERNAL DIMENSIONS/STANDARD QUANTITY



Type	L	W	H	e	f	Standard Quantity [pcs] Tape & Reel
NR3010	3.0±0.1 (0.118±0.004)	3.0±0.1 (0.118±0.004)	1.0 max (0.039 max)	0.9±0.2 (0.035±0.008)	1.9±0.2 (0.075±0.008)	2000
NR3012			1.2 max (0.047 max)			2000
NR3015			1.5 max (0.059 max)			2000
NR4010	4.0±0.2 (0.157±0.008)	4.0±0.2 (0.157±0.008)	1.0 max (0.039 max)	1.1±0.2 (0.043±0.008)	2.5±0.2 (0.098±0.008)	5000
NR4012			1.2 max (0.047 max)			4500
NR4018			1.8 max (0.071 max)			3500
NRG4026			2.6 max (0.102 max)			2000
NR8040	8.0±0.2 (0.315±0.008)	8.0±0.2 (0.315±0.008)	⁺¹⁾ 4.2max (0.165max) ⁺²⁾ 4.0max (0.157max)	1.6±0.3 (0.063±0.012)	5.6±0.3 (0.220±0.012)	1000

*1) 0R9~6R8 Type
*2) 100~101 Type

Unit : mm (inch)

Type	L	W	H	e	Δe	f	Δℓ	Standard Quantity [pcs] Tape & Reel
NR5040	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	⁺³⁾ 4.1max (0.161max) ⁺⁴⁾ 4.0max (0.157max)	1.2±0.2 (0.047±0.008)	0.3±0.2 (0.011±0.008)	3.3±0.2 (0.130±0.008)	1.3±0.3 (0.051±0.011)	1500
NR6012 (E Type)	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	1.2 max (0.047 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)	2.3±0.3 (0.091±0.011)	1000
NR6020	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	2.0 max (0.078 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)		2500
NR6028	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	2.8 max (0.110 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)		2000
NR6045	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	4.5 max (0.177 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)		1500

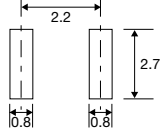
*3) 1R5~100 Type

*4) 150~470 Type

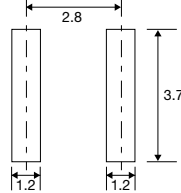
Unit : mm (inch)

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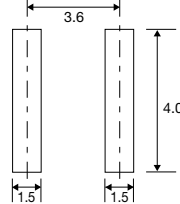
[NR3010, NR3012, NR3015]



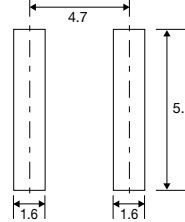
[NR4010, NR4012, NR4018, NRG4026]



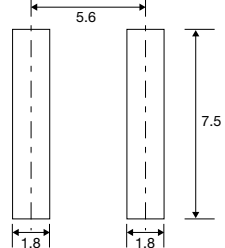
[NR5040]



[NR6012, NR6020, NR6028, NR6045]



[NR8040]



Unit : mm

AVAILABLE INDUCTANCE RANGE

Range	Type	NR 3010	NR 3012	NR 3015	NR 4010	NR 4012	NR 4018	NR 5040	NR 6012	NR 6020	NR 6028	NR 6045	NR 8040	NRG 4026
0.8	IMAX [mA]	1300	0.065	1490	0.05	2100	0.030	1050	0.100	1500	0.060	1830	0.030	3600
1.0	Rdc±20% [Ω]	500	0.450	540	0.290	700	0.230	560	0.380	740	0.240	840	0.180	2100
3.3	IMAX [mA]	500	0.450	540	0.290	700	0.230	560	0.380	740	0.240	840	0.180	2100
10	Rdc±20% [Ω]	220	2.05	250	1.45	300	1.34	240	1.81	350	1.00	170	4.00	320
47	IMAX [mA]	220	2.05	250	1.45	300	1.34	240	1.81	350	1.00	170	4.00	320
100	Rdc±20% [Ω]	220	2.05	250	1.45	300	1.34	240	1.81	350	1.00	170	4.00	320
220	IMAX [mA]	220	2.05	250	1.45	300	1.34	240	1.81	350	1.00	170	4.00	320

PART NUMBERS

NR 3010 Shielded type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NR 3010T 1R0N	RoHS	1.0	±30%	126	0.065	1,300	1,400	100
NR 3010T 1R5N	RoHS	1.5		98	0.080	1,200	1,300	
NR 3010T 2R2M	RoHS	2.2		82	0.095	1,100	1,100	
NR 3010T 3R3M	RoHS	3.3	±20%	63	0.140	870	940	
NR 3010T 4R7M	RoHS	4.7		56	0.190	750	780	
NR 3010T 6R8M	RoHS	6.8		46	0.300	610	630	
NR 3010T 100M	RoHS	10		35	0.450	500	510	
NR 3010T 150M	RoHS	15		30	0.740	400	400	
NR 3010T 220M	RoHS	22		25	1.03	350	350	
NR 3010T 330M	RoHS	33		20	1.55	260	275	
NR 3010T 470M	RoHS	47		17	2.05	220	235	

NR 3012 Shielded type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NR 3012T 1R0N	RoHS	1.0	±30%	110	0.050	1,500	1,490	100
NR 3012T 1R5N	RoHS	1.5		92	0.060	1,360	1,400	
NR 3012T 2R2M	RoHS	2.2		70	0.080	1,100	1,200	
NR 3012T 3R3M	RoHS	3.3	±20%	55	0.100	910	1,050	
NR 3012T 4R7M	RoHS	4.7		48	0.130	770	980	
NR 3012T 6R8M	RoHS	6.8		40	0.190	670	740	
NR 3012T 100M	RoHS	10		32	0.290	540	630	
NR 3012T 150M	RoHS	15		27	0.450	440	485	
NR 3012T 220M	RoHS	22		22	0.630	375	420	
NR 3012T 330M	RoHS	33		19	1.03	310	330	
NR 3012T 470M	RoHS	47		17	1.45	250	280	

NR 3015 Shielded type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NR 3015T 1R0N	RoHS	1.0	±30%	100	0.030	2,100	2,100	100
NR 3015T 1R5N	RoHS	1.5		87	0.040	1,800	1,820	
NR 3015T 2R2M	RoHS	2.2		64	0.060	1,480	1,500	
NR 3015T 3R3M	RoHS	3.3	±20%	49	0.080	1,210	1,230	
NR 3015T 4R7M	RoHS	4.7		40	0.120	1,020	1,040	
NR 3015T 6R8M	RoHS	6.8		36	0.160	870	880	
NR 3015T 100M	RoHS	10		28	0.230	700	710	
NR 3015T 150M	RoHS	15		23	0.360	560	560	
NR 3015T 220M	RoHS	22		20	0.520	470	470	
NR 3015T 330M	RoHS	33		18	0.840	390	370	
NR 3015T 470M	RoHS	47		17	1.34	320	300	

※) 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)

※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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PART NUMBERS

● NR 4010 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 4010T 1R0N		RoHS	1.0	$\pm 30\%$	116	0.100	1,800	1,050	100
NR 4010T 2R2N		RoHS	2.2		73	0.150	1,150	890	
NR 4010T 3R3M		RoHS	3.3		58	0.180	1,100	820	
NR 4010T 4R7M		RoHS	4.7	$\pm 20\%$	47	0.210	900	750	
NR 4010T 6R8M		RoHS	6.8		38	0.300	740	620	
NR 4010T 100M		RoHS	10		31	0.380	560	600	
NR 4010T 150M		RoHS	15		24	0.510	470	510	
NR 4010T 220M		RoHS	22		19	0.870	360	400	
NR 4010T 330M		RoHS	33		15	1.54	280	300	
NR 4010T 470M		RoHS	47		13	1.81	240	280	

● NR 4012 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 4012T 1R0N		RoHS	1.0	$\pm 30\%$	131	0.060	2,500	1,500	100
NR 4012T 2R2M		RoHS	2.2		66	0.090	1,650	1,200	
NR 4012T 3R3M		RoHS	3.3		50	0.130	1,200	980	
NR 4012T 4R7M		RoHS	4.7	$\pm 20\%$	45	0.140	1,050	960	
NR 4012T 6R8M		RoHS	6.8		35	0.180	900	840	
NR 4012T 100M		RoHS	10		28	0.240	740	770	
NR 4012T 150M		RoHS	15		23	0.400	560	600	
NR 4012T 220M		RoHS	22		18	0.480	510	540	
NR 4012T 330M		RoHS	33		15	0.810	400	420	
NR 4012T 470M		RoHS	47		12	1.00	350	370	

● NR 4018 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 4018T 1R0N		RoHS	1.0	$\pm 30\%$	80	0.030	4,000	1,830	100
NR 4018T 2R2M		RoHS	2.2		52	0.060	2,700	1,440	
NR 4018T 3R3M		RoHS	3.3		44	0.070	2,000	1,230	
NR 4018T 4R7M		RoHS	4.7	$\pm 20\%$	34	0.090	1,700	1,200	
NR 4018T 6R8M		RoHS	6.8		29	0.110	1,450	1,060	
NR 4018T 100M		RoHS	10		24	0.180	1,200	840	
NR 4018T 150M		RoHS	15		19	0.250	940	650	
NR 4018T 220M		RoHS	22		16	0.360	800	590	
NR 4018T 330M		RoHS	33		12	0.530	650	490	
NR 4018T 470M		RoHS	47		10	0.650	570	420	
NR 4018T 680M		RoHS	68		8.3	1.00	470	320	
NR 4018T 101M		RoHS	100		6.5	1.50	400	270	
NR 4018T 151M		RoHS	150		5.5	2.50	310	220	
NR 4018T 221M		RoHS	220		4.0	4.00	270	170	

● NR 5040 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 5040T 1R5N		RoHS	1.5	$\pm 30\%$	60	0.020	6,000	3,600	100
NR 5040T 2R2N		RoHS	2.2		42	0.022	4,600	3,500	
NR 5040T 3R3N		RoHS	3.3		32	0.027	3,800	3,300	
NR 5040T 4R7N		RoHS	4.7	$\pm 20\%$	28	0.029	3,300	3,100	
NR 5040T 6R8M		RoHS	6.8		21	0.049	2,600	2,300	
NR 5040T 100M		RoHS	10		18	0.056	2,300	2,100	
NR 5040T 150M		RoHS	15		13	0.080	2,000	1,800	
NR 5040T 220M		RoHS	22		9	0.126	1,600	1,400	
NR 5040T 330M		RoHS	33		7	0.180	1,300	1,200	
NR 5040T 470M		RoHS	47		6	0.310	1,100	900	

● NR 6012 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 6012T 2R5NE		RoHS	2.5	$\pm 30\%$	45	0.090	2,100	1,730	100
NR 6012T 4R0NE		RoHS	4.0		39	0.105	1,800	1,570	
NR 6012T 5R3ME		RoHS	5.3		34	0.125	1,500	1,400	
NR 6012T 6R8ME		RoHS	6.8	$\pm 20\%$	30	0.165	1,300	1,180	
NR 6012T 100ME		RoHS	10		22	0.235	1,000	1,000	
NR 6012T 150ME		RoHS	15		18	0.330	800	790	
NR 6012T 220ME		RoHS	22		12	0.530	760	630	
NR 6012T 330ME		RoHS	33		8	0.700	590	530	
NR 6012T 470ME		RoHS	47		6	1.05	520	460	
NR 6012T 680ME		RoHS	68		3	1.35	440	410	
NR 6012T 101ME		RoHS	100		1	2.18	350	320	

※) 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)

※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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PART NUMBERS

● NR 6020 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 6020T 0R8N		RoHS	0.8	$\pm 30\%$	110	0.020	5,500	3,800	100
NR 6020T 1R5N		RoHS	1.5		93	0.026	4,000	3,200	
NR 6020T 2R2N		RoHS	2.2		73	0.034	3,200	2,700	
NR 6020T 3R3N		RoHS	3.3		55	0.040	2,800	2,600	
NR 6020T 4R7N		RoHS	4.7		43	0.058	2,400	2,000	
NR 6020T 6R8N		RoHS	6.8	$\pm 20\%$	30	0.085	2,000	1,800	
NR 6020T 100M		RoHS	10		18	0.125	1,700	1,400	
NR 6020T 220M		RoHS	22		11	0.290	1,050	950	

● NR 6028 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 6028T 0R9N		RoHS	0.9	$\pm 30\%$	90	0.013	6,600	4,600	100
NR 6028T 1R5N		RoHS	1.5		78	0.016	5,000	4,200	
NR 6028T 2R2N		RoHS	2.2		68	0.020	4,200	3,700	
NR 6028T 3R0N		RoHS	3.0		55	0.023	3,600	3,400	
NR 6028T 4R7M		RoHS	4.7		39	0.031	2,700	3,000	
NR 6028T 6R0M		RoHS	6.0	$\pm 20\%$	30	0.040	2,500	2,500	
NR 6028T 100M		RoHS	10		20	0.065	1,900	1,900	
NR 6028T 150M		RoHS	15		17	0.095	1,600	1,800	
NR 6028T 220M		RoHS	22		12	0.135	1,300	1,400	
NR 6028T 330M		RoHS	33		10	0.220	1,100	1,100	
NR 6028T 470M		RoHS	47		8	0.300	950	920	
NR 6028T 680M		RoHS	68		5	0.420	760	770	
NR 6028T 101M		RoHS	100		3	0.600	620	660	

● NR 6045 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 6045T 1R0N		RoHS	1.0	$\pm 30\%$	110	0.014	8,500	4,200	100
NR 6045T 1R3N		RoHS	1.3		95	0.016	8,000	4,000	
NR 6045T 1R8N		RoHS	1.8		80	0.018	7,000	3,700	
NR 6045T 2R3N		RoHS	2.3		60	0.021	6,000	3,500	
NR 6045T 3R0N		RoHS	3.0		45	0.024	5,000	3,200	
NR 6045T 4R5M		RoHS	4.5	$\pm 20\%$	25	0.031	4,000	3,000	
NR 6045T 6R3M		RoHS	6.3		15	0.038	3,800	2,800	
NR 6045T 100M		RoHS	10		12	0.047	3,000	2,500	
NR 6045T 150M		RoHS	15		10	0.077	2,300	1,900	
NR 6045T 220M		RoHS	22		7	0.115	1,900	1,500	
NR 6045T 330M		RoHS	33		6	0.145	1,500	1,400	
NR 6045T 470M		RoHS	47		5	0.220	1,300	1,100	
NR 6045T 680M		RoHS	68		4	0.330	1,000	900	
NR 6045T 101M		RoHS	100		3	0.500	800	700	

● NR 8040 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NR 8040T 0R9N		RoHS	0.9	$\pm 30\%$	85	0.006	11,000	7,800	100
NR 8040T 1R4N		RoHS	1.4		63	0.007	9,000	7,000	
NR 8040T 2R0N		RoHS	2.0		50	0.009	7,400	6,300	
NR 8040T 3R6N		RoHS	3.6		34	0.015	5,300	4,900	
NR 8040T 4R7N		RoHS	4.7		30	0.018	4,700	4,100	
NR 8040T 6R8N		RoHS	6.8	$\pm 20\%$	24	0.025	4,000	3,700	
NR 8040T 100M		RoHS	10		22	0.034	3,400	3,100	
NR 8040T 150M		RoHS	15		16	0.050	2,700	2,400	
NR 8040T 220M		RoHS	22		13	0.066	2,200	2,200	
NR 8040T 330M		RoHS	33		12	0.100	1,900	1,700	
NR 8040T 470M		RoHS	47		8	0.150	1,500	1,400	
NR 8040T 680M		RoHS	68		7	0.230	1,200	1,100	
NR 8040T 101M		RoHS	100		6	0.290	1,000	1,000	

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● NRG 4026 Shielded type

Ordering code		Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±30%)	Rated current ※) (mA)		Measuring frequency (kHz)
						Saturation current Idc1	Temperature rise current Idc2	
NRG4026 T 1R2N		1.2	±30%	120	0.030	3,100	2,300	100
NRG4026 T 2R3N		2.3		96	0.040	2,100	1,970	
NRG4026 T 3R5M		3.5		58	0.050	1,800	1,700	
NRG4026 T 4R7M		4.7	±20%	46	0.055	1,450	1,600	
NRG4026 T 6R6M		6.6		33	0.065	1,300	1,500	
NRG4026 T 100M		10		26	0.085	1,000	1,300	
NRG4026 T 150M		15		19	0.110	900	1,100	
NRG4026 T 220M		22		13	0.165	610	900	
NRG4026 T 330M		33		9	0.200	540	800	
NRG4026 T 470M		47		6	0.300	410	650	

※) The saturation current (Idc1) is DC current value 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)

※) The rated current is Idc2.

DC Bias characteristics

(Measured by HP4285A)



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SMD INDUCTORS SMALL AND LARGE CURRENT TYPE



REFLOW

FEATURES

- Small and Low profile inductor.
- It corresponds to High current.
- Simple and original magnetic shield structure.
- Durable structure against dropping impact.

APPLICATIONS

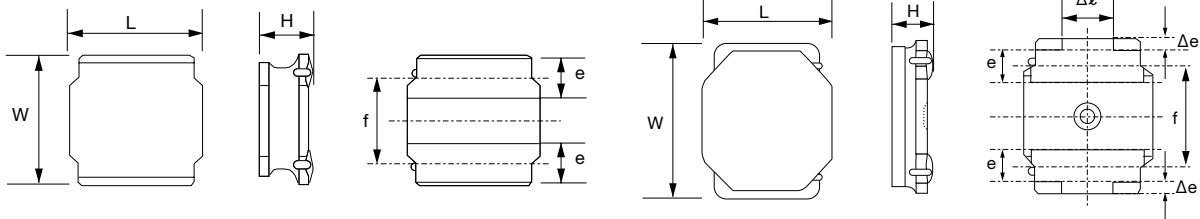
- For small DC/DC converter (cellular Phone, HDD, DVC, DSC, PDA, LCD display etc).

ORDERING CODE

N R H 2 4 1 0 T △ 1 0 0 M ○ ○ ○

1 Type	2 External dimensions (W×L×H)	3 Packaging	4 Nominal inductance (μH)	5 Inductance tolerance	6 Internal code
NRH NRS NRV	example 2410 2.4×2.4×1.0mm 3010 3.0×3.0×1.0mm 3012 3.0×3.0×1.2mm 5012 5.0×5.0×1.2mm 5014 5.0×5.0×1.4mm 5020 5.0×5.0×2.0mm 6010 6.0×6.0×1.0mm	T△ Tape & Reel △=Blank Space	example 2R2 2.2 100 10 101 100 ※R=decimal point	M ±20% N ±30%	○○○ Standard products ○=Blank Space

EXTERNAL DIMENSIONS/STANDARD QUANTITY



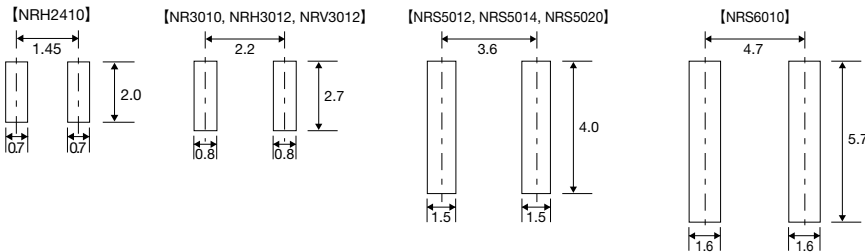
Type	L	W	H	e	f	Standard Quantity [pcs] Tape & Reel
NRH2410	2.4±0.1 (0.095±0.004)	2.4±0.1 (0.095±0.004)	1.0 max (0.039 max)	0.6±0.2 (0.024±0.008)	1.45±0.2 (0.057±0.008)	2500
NRH3010	3.0±0.1 (0.118±0.004)	3.0±0.1 (0.118±0.004)	1.0 max (0.039 max)	0.9±0.2 (0.035±0.008)	1.9±0.2 (0.075±0.008)	2000
NRH3012			1.2 max (0.047 max)			2000

Unit : mm (inch)

Type	L	W	H	e	Δe	f	Δl	Standard Quantity [pcs] Tape & Reel
NRS5012			1.2 max (0.047 max)					1000
NRS5014	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	1.4 max (0.055 max)	1.2±0.2 (0.047±0.008)	0.3±0.2 (0.011±0.008)	3.3±0.2 (0.130±0.008)	1.3±0.3 (0.051±0.011)	1000
NRS5020			2.0 max (0.079 max)					800
NRS6010	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	1.0 max (0.039 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)	2.3±0.3 (0.091±0.011)	1000

Unit : mm (inch)

Recommended Land Patterns



AVAILABLE INDUCTANCE RANGE

Range	Type	NRH2410	NRH3010	NRH3012	NRV3012	NRS5012	NRS5014	NRS5020	NRS6010
		I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]	I _{max} [mA] Rdc±20% [Ω]
1.0		1410	0.070	1480	0.065	1710	0.048	2300	0.053
2.2									
4.7									
10		450	0.690	600	0.350	720	0.270	850	0.420
22		300	1.47	380	0.770				
100									

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PART NUMBERS

●NRH 2410 Shielded type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRH2410T R68NN 4	RoHS	0.68	$\pm 30\%$	120	0.060	2,200	1,570	100
NRH2410T 1R0NN 4	RoHS	1.0		106	0.070	1,800	1,410	
NRH2410T 1R5MN	RoHS	1.5	$\pm 20\%$	94	0.110	1,550	1,160	
NRH2410T 2R2MN	RoHS	2.2		77	0.150	1,290	970	
NRH2410T 3R3MN	RoHS	3.3		56	0.220	1,000	770	
NRH2410T 4R7MN	RoHS	4.7		50	0.290	880	670	
NRH2410T 6R8MN	RoHS	6.8		43	0.410	750	570	
NRH2410T 100MN	RoHS	10		32	0.690	550	450	
NRH2410T 150MN	RoHS	15		27	1.02	470	370	
NRH2410T 220MN	RoHS	22		22	1.47	390	300	

●NRH 3010 Type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRH3010T 1R2N	RoHS	1.2	$\pm 30\%$	120	0.065	1,700	1,480	100
NRH3010T 1R5N	RoHS	1.5		99	0.075	1,440	1,370	
NRH3010T 2R2M	RoHS	2.2	$\pm 20\%$	86	0.083	1,300	1,300	
NRH3010T 3R3M	RoHS	3.3		64	0.130	1,000	1,030	
NRH3010T 4R7M	RoHS	4.7		50	0.170	850	900	
NRH3010T 6R8M	RoHS	6.8		44	0.250	700	745	
NRH3010T 100M	RoHS	10		34	0.350	600	620	
NRH3010T 150M	RoHS	15		25	0.550	450	480	
NRH3010T 220M	RoHS	22		22	0.770	380	410	

●NRH 3012 Type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRH3012T 1R0N	RoHS	1.0	$\pm 30\%$	111	0.048	2,200	1,710	100
NRH3012T 1R5N	RoHS	1.5		95	0.055	1,700	1,600	
NRH3012T 2R2M	RoHS	2.2	$\pm 20\%$	78	0.075	1,500	1,370	
NRH3012T 3R3M	RoHS	3.3		61	0.100	1,200	1,210	
NRH3012T 4R7M	RoHS	4.7		50	0.130	1,000	1,060	
NRH3012T 6R8M	RoHS	6.8		43	0.190	850	890	
NRH3012T 100M	RoHS	10		32	0.270	730	720	
NRH3012T 150M	RoHS	15		26	0.450	530	570	
NRH3012T 220M	RoHS	22		22	0.630	500	500	

●NRV 3012 Type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRV3012T 2R2M	RoHS	2.2	$\pm 20\%$	70	0.120	1,800	1,100	100

●NRS 5012 Type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRS5012T 1R0N	RoHS	1.0	$\pm 30\%$	100	0.053	4,500	2,300	100
NRS5012T 1R5N	RoHS	1.5		86	0.070	3,800	2,200	
NRS5012T 2R2M	RoHS	2.2	$\pm 20\%$	70	0.085	3,100	2,000	
NRS5012T 3R3M	RoHS	3.3		48	0.160	2,400	1,450	
NRS5012T 4R7M	RoHS	4.7		40	0.180	2,200	1,400	
NRS5012T 6R8M	RoHS	6.8		36	0.260	1,700	1,100	
NRS5012T 100M	RoHS	10		26	0.420	1,400	850	

●NRS 5014 Type

Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRS5014T 1R2N	RoHS	1.2	$\pm 30\%$	86	0.045	3,800	2,800	100
NRS5014T 2R2N	RoHS	2.2		56	0.065	2,800	2,300	
NRS5014T 3R3N	RoHS	3.3		48	0.080	2,350	2,100	
NRS5014T 4R7N	RoHS	4.7		41	0.100	2,050	1,800	

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● NRS 5020 Type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS5020T 1R0N		RoHS	1.0	$\pm 30\%$	81	0.021	4,000	3,600	100
NRS5020T 1R5N		RoHS	1.5		68	0.026	3,350	3,200	
NRS5020T 2R2N		RoHS	2.2		57	0.035	2,900	2,900	
NRS5020T 3R3N		RoHS	3.3		46	0.048	2,400	2,400	
NRS5020T 4R7M		RoHS	4.7	$\pm 20\%$	37	0.060	2,000	2,000	
NRS5020T 6R8M		RoHS	6.8		30	0.090	1,600	1,650	
NRS5020T 100M		RoHS	10		24	0.120	1,300	1,450	
NRS5020T 150M		RoHS	15		20	0.165	1,100	1,200	
NRS5020T 220M		RoHS	22		17	0.260	900	1,000	

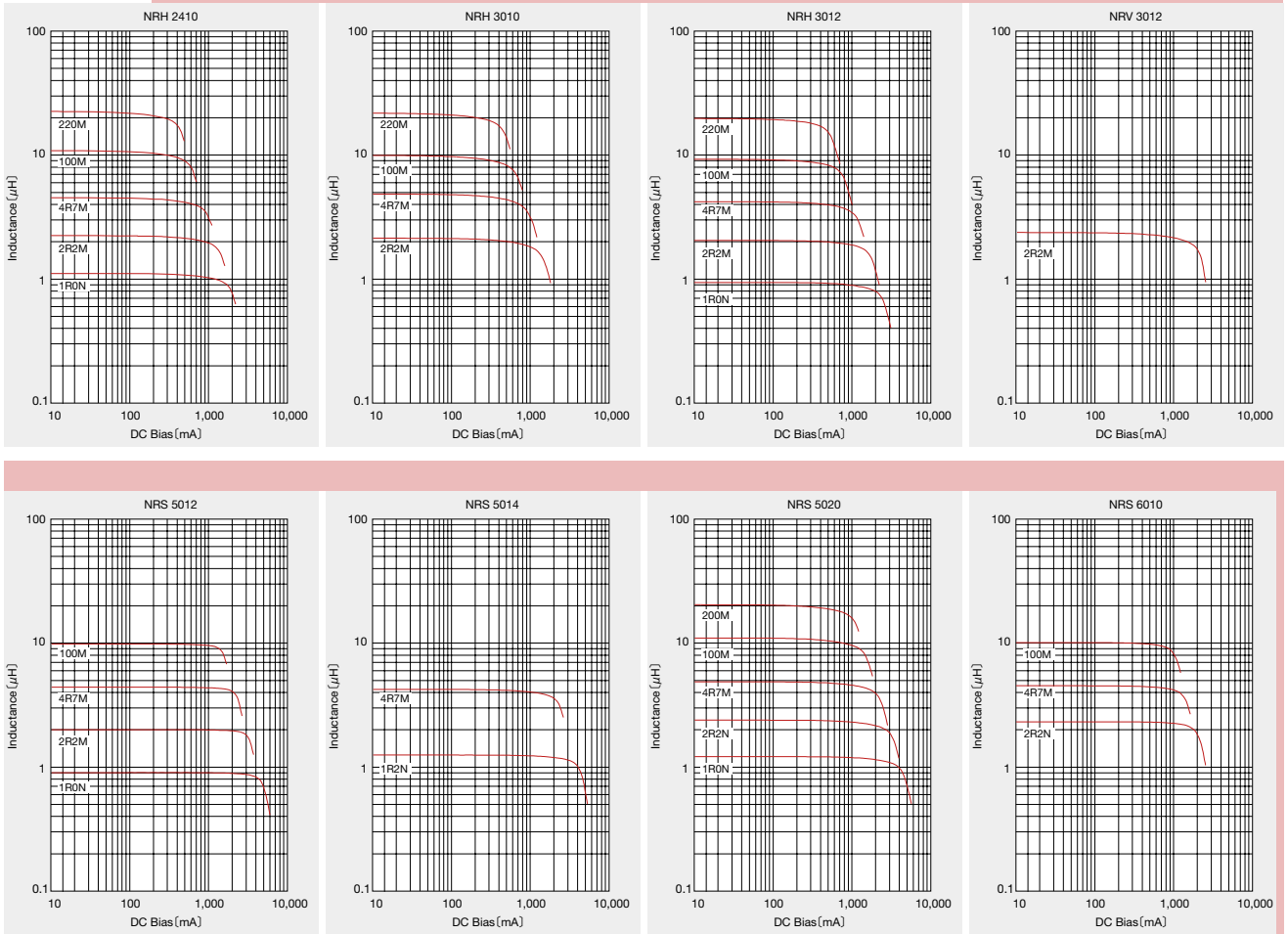
● NRS 6010 Type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 20\%$)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS6010T 1R5N		RoHS	1.5	$\pm 30\%$	90	0.090	2,400	1,900	100
NRS6010T 2R2N		RoHS	2.2		65	0.110	1,900	1,700	
NRS6010T 3R3N		RoHS	3.3		50	0.135	1,600	1,500	
NRS6010T 4R7N		RoHS	4.7		38	0.165	1,300	1,400	
NRS6010T 6R8N		RoHS	6.8		30	0.220	1,200	1,200	
NRS6010T 100M		RoHS	10	$\pm 20\%$	25	0.270	1,000	1,100	

※) 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)

※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

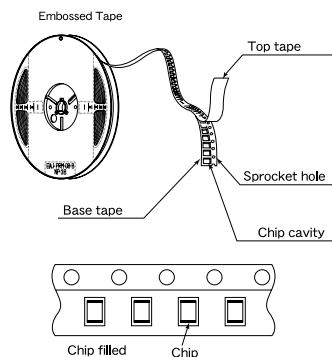


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① Minimum Quantity

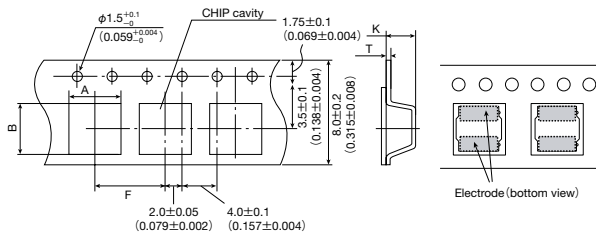
Type	Standard Quantity [pcs]
	Tape & Reel
NRH 2410	2500
NR 3010/NRH 3010	2000
NR 3012/NRH3012/NRV3012	2000
NR 3015	2000
NR 4010	5000
NR 4012	4500
NR 4018	3500
NRG4026	2000
NRS5012	1000
NRS5014	1000
NRS5020	800
NR 5040	1500
NRS6010	1000
NR 6012	1000
NR 6020	2500
NR 6028	2000
NR 6045	1500
NR 8040	1000

② Tape Material



③ Taping dimensions

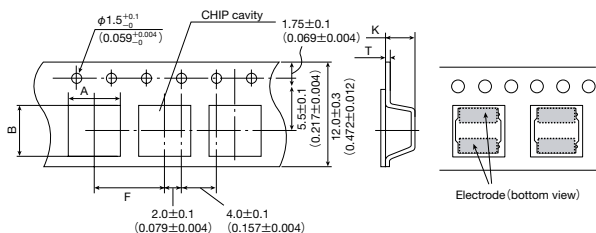
● Embossed tape 8mm wide (0.315 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		F	T
NRH 2410	2.6±0.1 (0.102±0.004)	2.6±0.1 (0.102±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.009±0.002)	1.3±0.1 (0.051±0.004)
NR 3010 NRH 3010	3.2±0.1 (0.126±0.004)	3.2±0.1 (0.126±0.004)		0.3±0.05 (0.012±0.002)	1.4±0.1 (0.055±0.004)
NR 3012 NRH 3012 NRV3012					1.6±0.1 (0.063±0.004)
NR 3015					1.9±0.1 (0.075±0.004)

Unit : mm (inch)

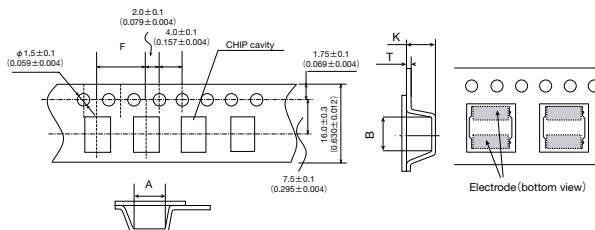
● Embossed tape 12mm wide (0.47 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B		T	K
NR 4010	4.3±0.1 (0.169±0.004)	4.3±0.1 (0.169±0.004)	8.0±0.1 (0.315±0.004)	0.3±0.05 (0.012±0.002)	1.4±0.1 (0.055±0.004)
NR 4012					1.6±0.1 (0.063±0.004)
NR 4018					2.1±0.1 (0.083±0.004)
NRG 4026					3.1±0.1 (0.122±0.004)
NRS 5012	1.4±0.1 (0.055±0.004)				
NRS 5014	5.25±0.1 (0.207±0.004)	5.25±0.1 (0.207±0.004)		0.4±0.1 (0.016±0.004)	1.6±0.1 (0.063±0.004)
NRS 5020					2.3±0.1 (0.091±0.004)
NR 5040	5.15±0.1 (0.203±0.004)	5.15±0.1 (0.203±0.004)			4.2±0.1 (0.165±0.004)
NRS 6010					1.4±0.1 (0.055±0.004)
NR 6012					1.6±0.1 (0.063±0.004)
NR 6020					2.3±0.1 (0.090±0.004)
NR 6028					3.1±0.1 (0.122±0.004)
NR 6045					4.7±0.1 (0.185±0.004)

Unit : mm (inch)

● Embossed tape 16mm wide (0.63 inches wide)

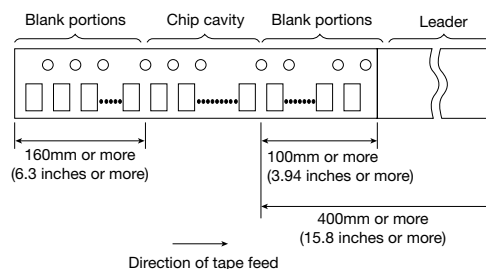


Type	Chip cavity		Insertion pitch F	Tape thickness	
	A	B		T	K
NR 8040	8.3 ± 0.1 (0.327 ± 0.004)	8.3 ± 0.1 (0.327 ± 0.004)	12.0 ± 0.1 (0.472 ± 0.004)	0.5 ± 0.1 (0.020 ± 0.004)	4.5 ± 0.1 (0.177 ± 0.004)

Unit : mm (inch)

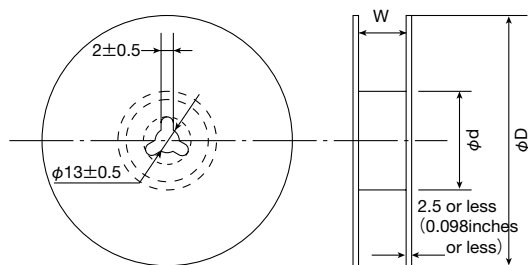
④ Leader and Blank portion

● NR, NRH, NRS, NRG, NRV



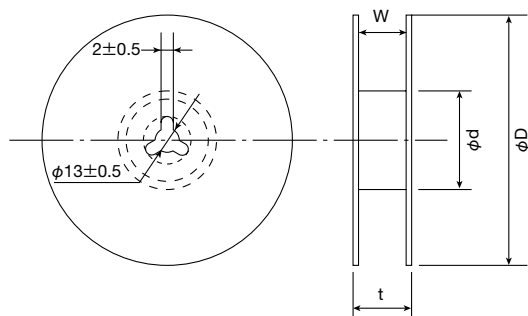
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⑤ Reel size



Type	Reel size (Reference values)		
	φD	φd	W
NRH2410	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)
NR 3010			
NRH 3010			
NR 3012			
NRH 3012			
NRV 3012			
NR 3015	180±3.0 (7.087±0.118)	60±2.0 (2.36±0.08)	14.0±1.5 (0.551±0.059)
NRS 5012			
NRS 5014			
NRS 5020			
NRS 6010			
NR 6012			

Unit : mm (inch)

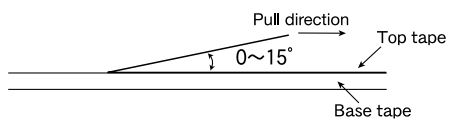


Type	Reel size (Reference values)			
	φD	φd	t (max.)	W
NR 4010	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	18.5 (0.72)	13.5±1.0 (0.531±0.04)
NR 4012				
NR 4018				
NRG 4026				
NR 5040				
NR 6020				
NR 6028				
NR 6045			22.5 (0.89)	17.5±1.0 (0.689±0.04)
NR 8040				

Unit : mm (inch)

⑥ Top Tape Strength

The top tape requires a peel-off force of 0.1 to 1.3N in the direction of the arrow as illustrated below.



SMD INDUCTORS LARGE CURRENT TYPE



FEATURES

- SMD inductor.
- It corresponds to High current.
- Simple and original magnetic shield structure.

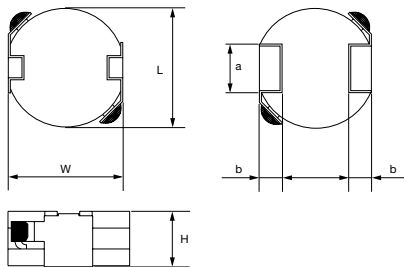
APPLICATIONS

- Power supply circuits / DC-DC converters in a variety of applications such as PDP TV, LCD TV, HDD, PC, etc.

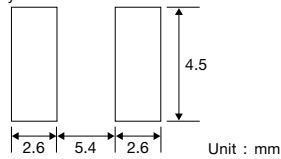
ORDERING CODE

N	R	△	1	0	0	5	0	T	△	1	0	0	M	△
① Type			② External dimensions (W×H)			③ Packaging		④ Nominal inductance (μH)		⑤ Inductance tolerance		⑥ Internal code		
NR△ Coating resin specification △=Blank Space			example 10050 10.0×5.0mm			T△ Tape & Reel △=Blank Space		example 1R3 1.3 100 10 101 100 ※R=decimal point		M ±20% N ±30%		△ Standard product △=Blank Space		

EXTERNAL DIMENSIONS/STANDARD QUANTITY



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



Unit : mm

Type	L	W	H	a	b	Standard Quantity [pcs] Tape & Reel
NR 10050	10.0±0.3 (0.394±0.012)	9.8±0.5 (0.386±0.020)	5.0 max (0.197 max)	4.0 (0.16)	1.75 (0.07)	500

Unit : mm (inch)

AVAILABLE INDUCTANCE RANGE

Range	Type	NR 10050
		I _{max} [A] R _{dc} ±30% [mΩ]
		1.0 9 6.8
		10 4.1 25
		100 1.2 209
		220 0.8 450

PART NUMBERS

● NR 10050 type

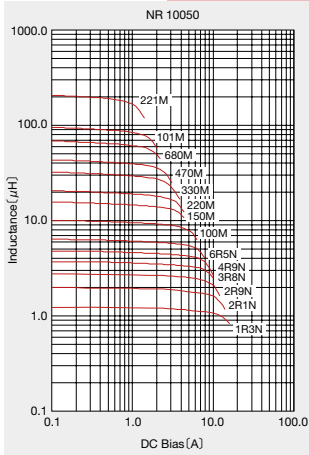
Ordering code	EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±30%)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current I _{dc1}	Temperature rise current I _{dc2}	
NR10050T1R3N	RoHS	1.3	±30%	53	0.0068	11000	9000	100
NR10050T2R1N	RoHS	2.1		37	0.008	10000	8300	
NR10050T2R9N	RoHS	2.9		29	0.0093	8200	7300	
NR10050T3R8N	RoHS	3.8		26	0.013	7300	6800	
NR10050T4R9N	RoHS	4.9		23	0.015	6600	6000	
NR10050T6R5N	RoHS	6.5	±20%	19	0.018	6000	5200	
NR10050T100M	RoHS	10		15	0.025	4700	4100	
NR10050T150M	RoHS	15		11	0.035	3600	3200	
NR10050T220M	RoHS	22		10	0.045	2600	2500	
NR10050T330M	RoHS	33		8.2	0.066	2500	2100	
NR10050T470M	RoHS	47		7.0	0.092	2000	1800	
NR10050T680M	RoHS	68		5.6	0.144	1700	1500	
NR10050T101M	RoHS	100		4.6	0.209	1300	1200	
NR10050T221M	RoHS	220		3.0	0.450	1000	800	

※) The saturation current value (I_{dc1}) is the DC current value having inductance decrease down to 30%. (at 20°C)

※) The temperature rise current value (I_{dc2}) is the DC current value having temperature increase up to 40°C. (at 20°C)

※) The maximum rated current is the DC current value that satisfies both of current value Saturation current value and temperature rise current value. (at 20°C)

DC Bias characteristics (Measured by HP4285A)



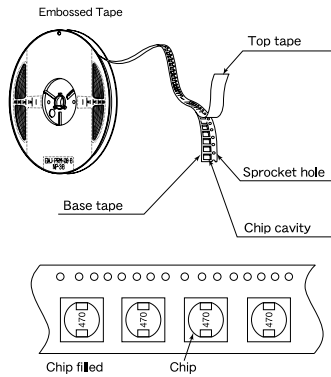
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PACKAGING

① Minimum Quantity

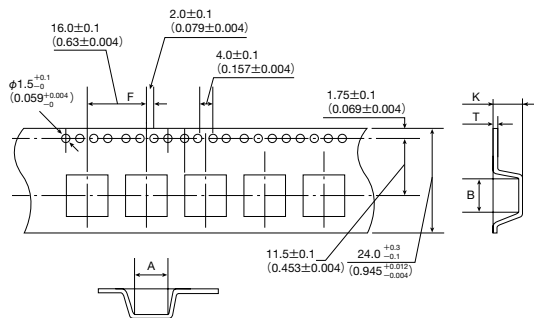
Type	Standard Quantity [pcs]
	Tape & Reel
NR 10050	500

② Tape Material



③ Taping dimensions

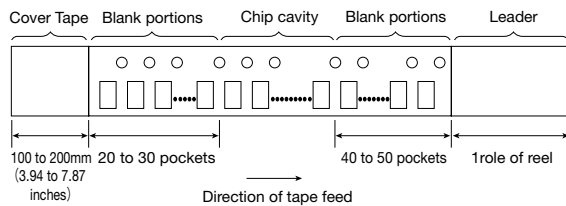
- Embossed tape 24mm wide (0.945 inches wide)



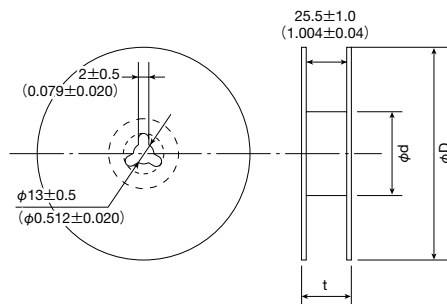
Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NR 10050	10.4±0.1 (0.409±0.004)	9.9±0.1 (0.390±0.004)	16.0±0.1 (0.630±0.004)	0.5±0.05 (0.020±0.002)	5.7±0.1 (0.224±0.004)

Unit : mm (inch)

④ Leader and Blank portion



⑤ Reel size

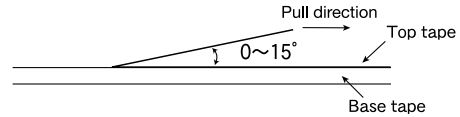


Type	Reel size (Reference values)		
	ϕD	ϕd	t (max.)
NR 10050	330±3 (12.99±0.118)	80±2 (3.15±0.078)	30.5 (1.201)

Unit : mm (inch)

⑥ Top Tape Strength

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



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SMD INDUCTORS COMPACT TYPE



REFLOW

FEATURES

BR C2518/BRFL2518 (NEW PRODUCTS)

The best efficiency design is achieved by adopting bottom-surface electrode structure. Small and low-profile Wound Chip Inductors that are suitable for module design which needs high electric current like DC/DC converters.

APPLICATIONS

For small DC/DC converter
(cellular phone, HDD, DVC, DSC, PDA, LCD display etc).

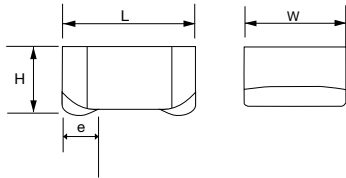
ORDERING CODE

B **R** **△** **2** **5** **1** **8** **T** **2** **R** **2** **M** **△** **△** **△**

1 Type	2 Characteristic Spec	3 External Dimensions (W×L) : mm (inch)	4 Packaging	5 Nominal Inductance [μH]	6 Inductance tolerance
BR SMD Inductors	△ Low Rdc L Low profile C High Current FL Low profile	1608 (0603) 1.6×0.8mm 2012 (0805) 2.0×1.2mm 2016 (0806) 2.0×1.6mm 2518 (1007) 2.5×1.8mm 3225 (1210) 3.2×2.5mm	T Tape & Reel	example R20 0.2 1R0 1.0 2R2 2.2 4R7 4.7 ※R=decimal point	M ±20% K ±10%

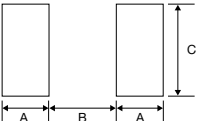
7 Internal code
△△△ Standard product △=Blank Space

EXTERNAL DIMENSIONS/STANDARD QUANTITY



Recommended Land Patterns

Surface Mounting
• Mounting and soldering conditions should be checked beforehand.
• Applicable soldering process to this products is reflow soldering only.



Type	L	W	H	e	Standard Quantity [pcs]	
					Paper Tape	Embossed Tape
BR C1608	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
BR L2012	2.0±0.2 (0.078±0.008)	1.25±0.2 (0.049±0.008)	1.0 max. (0.040 max.)	0.5±0.2 (0.020±0.008)	—	3000
BR C2016	2.0±0.2 (0.078±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
BR C2518	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
BR L2518	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.2 max. (0.048 max.)	0.5±0.2 (0.020±0.008)	—	3000
BRFL2518	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.0 max. (0.040 max.)	0.5±0.2 (0.020±0.008)	—	3000
BR L3225	3.2±0.2 (0.126±0.008)	2.5±0.2 (0.098±0.008)	1.7 max. (0.068 max.)	0.75±0.2 (0.030±0.008)	—	2000

Unit : mm (inch)

Type	A	B	C
1608	0.55	0.80	0.90
2012	0.65	0.90	1.40
2016	0.70	0.80	1.80
2518	0.65	1.50	1.95
3225	1.00	1.60	2.70

Unit : mm

AVAILABLE INDUCTANCE RANGE

Range	Type	BR L3225	BRFL2518	BR L2518	BR C2518	BR C2016	BR L2012	BR C1608
		I _{max} [mA] R _{dc} ±30% [Ω]	I _{max} [mA] R _{dc} ±30% [Ω]	I _{max} [mA] R _{dc} ±30% [Ω]	I _{max} [mA] R _{dc} ±30% [Ω]	I _{max} [mA] R _{dc} ±30% [Ω]	I _{max} [mA] R _{dc} ±30% [Ω]	I _{max} [mA] R _{dc} ±30% [Ω]
Inductance [μH]		2,200 1μH 0.043	1,200 1μH 0.080 850 1μH 0.135 650 4.7μH 0.330	1,000 1μH 0.080 850 1μH 0.135 470 4.7μH 0.400	1,650 1μH 0.050	1,100 1μH 0.085	1,050 0.47μH 0.090 850 1μH 0.135	980 0.2μH 0.060 520 0.180 280 2.2μH 0.550
1.0								
2.2								
4.7								
10		700 0.350			610 0.350	520 0.400	270 0.850	
22								
47								
100		250 100μH 2.50			190 100μH 3.60	170 100μH 3.40	85 100μH 7.70	
220								

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PART NUMBERS

BR C1608 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BR C1608TR20M		RoHS	0.20	$\pm 20\%$	400	0.060	1,750	980	7.96
BR C1608TR35M		RoHS	0.35		300	0.080	1,400	810	
BR C1608TR45M		RoHS	0.45		200	0.090	1,250	800	
BR C1608TR56M		RoHS	0.56		170	0.095	1,150	760	
BR C1608TR77M		RoHS	0.77		150	0.110	1,000	660	
BR C1608T1R0M		RoHS	1.00		140	0.180	850	520	
BR C1608T1R5M		RoHS	1.50		120	0.300	700	410	
BR C1608T2R2M		RoHS	2.20		100	0.550	550	280	

BR L2012 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BR L2012TR47M		RoHS	0.47	$\pm 20\%$	350	0.090	1,100	1,050	7.96
BR L2012T1R0M		RoHS	1.0		300	0.135	850	850	
BR L2012T1R5M		RoHS	1.5		250	0.180	700	750	
BR L2012T2R2M		RoHS	2.2		200	0.300	600	550	
BR L2012T3R3M		RoHS	3.3		190	0.500	490	440	
BR L2012T4R7M		RoHS	4.7		150	0.550	340	400	
BR L2012T6R8M		RoHS	6.8		60	0.750	290	350	
BR L2012T100M		RoHS	10	$\pm 20\%$	30	0.850	270	330	2.52
BR L2012T150M		RoHS	15		15	1.00	220	300	
BR L2012T220M		RoHS	22		13	1.30	190	270	
BR L2012T330M		RoHS	33		8.0	2.00	150	220	
BR L2012T470M		RoHS	47		7.0	3.50	125	160	
BR L2012T680M		RoHS	68		6.5	5.80	100	110	
BR L2012T101M		RoHS	100		6.0	7.70	85	85	

BR C2016 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BR C2016T1R0M		RoHS	1.0	$\pm 20\%$	450	0.085	1,350	1,100	0.10
BR C2016T1R5M		RoHS	1.5		370	0.150	1,100	820	
BR C2016T2R2M		RoHS	2.2		250	0.180	910	760	
BR C2016T3R3M		RoHS	3.3		140	0.220	740	680	
BR C2016T4R7M		RoHS	4.7		78	0.270	660	610	
BR C2016T6R8M		RoHS	6.8		39	0.330	550	560	
BR C2016T100□		RoHS	10		35	0.400	450	520	
BR C2016T150□		RoHS	15	$\pm 20\%$ $\pm 10\%$	28	0.600	400	410	
BR C2016T220□		RoHS	22		24	1.00	310	310	
BR C2016T330□		RoHS	33		13	1.70	270	240	
BR C2016T470□		RoHS	47		11	2.20	210	210	
BR C2016T680□		RoHS	68		8	2.80	200	190	
BR C2016T101□		RoHS	100		7	3.40	140	170	

BR C2518 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BR C2518T1R0M		RoHS	1.0	$\pm 20\%$	280	0.050	2,550	1,650	1.00
BR C2518T1R5M		RoHS	1.5		230	0.080	2,100	1,300	
BR C2518T2R2M		RoHS	2.2		200	0.120	1,800	1,000	
BR C2518T3R3M		RoHS	3.3		150	0.175	1,450	860	
BR C2518T4R7M		RoHS	4.7		100	0.230	1,250	750	
BR C2518T6R8M		RoHS	6.8		45	0.280	1,050	680	
BR C2518T100□		RoHS	10		20	0.350	890	610	
BR C2518T150□		RoHS	15	$\pm 20\%$ $\pm 10\%$	13	0.43	760	550	
BR C2518T220□		RoHS	22		10	0.56	640	490	
BR C2518T330□		RoHS	33		8	0.85	560	390	
BR C2518T470□		RoHS	47		6.5	1.45	410	300	
BR C2518T680□		RoHS	68		5.5	2.40	340	230	
BR C2518T101□		RoHS	100		4.5	3.60	300	190	

• Please specify the inductance tolerance code. (M or K)

※) 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)

※) The rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

PART NUMBERS

● BR L2518 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BR L2518T1R0M		RoHS	1.0	$\pm 20\%$	130	0.080	1,300	1,000	7.96
BR L2518T1R5M		RoHS	1.5		100	0.100	1,200	920	
BR L2518T2R2M		RoHS	2.2		80	0.135	900	850	
BR L2518T3R3M		RoHS	3.3		70	0.300	750	580	
BR L2518T4R7M		RoHS	4.7		60	0.400	650	470	

● BRFL2518 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BRFL2518T1R0M		RoHS	1.0	$\pm 20\%$	130	0.090	1,200	1,200	1.00
BRFL2518T1R5M		RoHS	1.5		100	0.110	1100	1000	
BRFL2518T2R2M		RoHS	2.2		80	0.130	850	950	
BRFL2518T3R3M		RoHS	3.3		70	0.220	700	700	
BRFL2518T4R7M		RoHS	4.7		60	0.330	650	650	

● BR L3225 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μ H]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] ($\pm 30\%$)	Rated current ※) [mA]		Measuring frequency [MHz]
							Saturation current Idc1	Temperature rise current Idc2	
BR L3225T1R0M		RoHS	1.0	$\pm 20\%$	220	0.043	2,400	2,200	0.10
BR L3225T1R5M		RoHS	1.5		170	0.045	2,200	1,750	
BR L3225T2R2M		RoHS	2.2		150	0.065	1,850	1,600	
BR L3225T3R3M		RoHS	3.3		140	0.120	1,450	1,200	
BR L3225T4R7M		RoHS	4.7		120	0.180	1,300	1,000	
BR L3225T6R8M		RoHS	6.8		90	0.270	1,050	770	
BR L3225T100□		RoHS	10	$\pm 20\%$ $\pm 10\%$	70	0.350	900	700	
BR L3225T150□		RoHS	15		20	0.570	700	530	
BR L3225T220□		RoHS	22		13	0.690	550	470	
BR L3225T330□		RoHS	33		9	0.840	470	420	
BR L3225T470□		RoHS	47		7	1.00	420	390	
BR L3225T680□		RoHS	68		6	1.40	330	300	
BR L3225T101□		RoHS	100		5	2.50	270	250	

・Please specify the inductance tolerance code. (M or K)

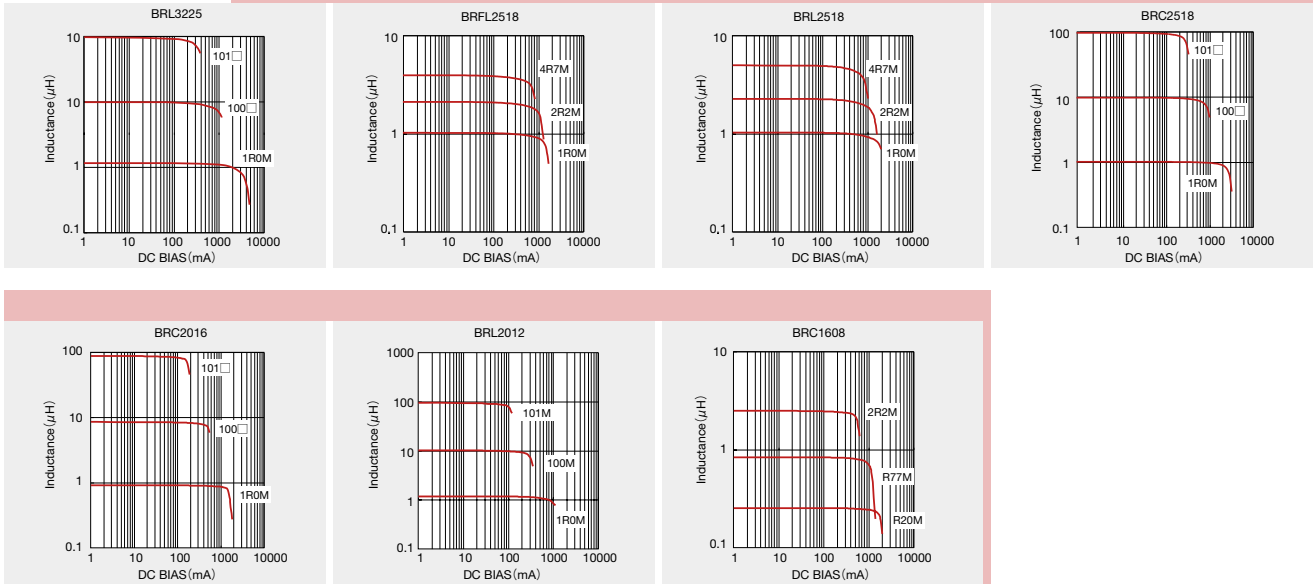
※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20°C)

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

※) The rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

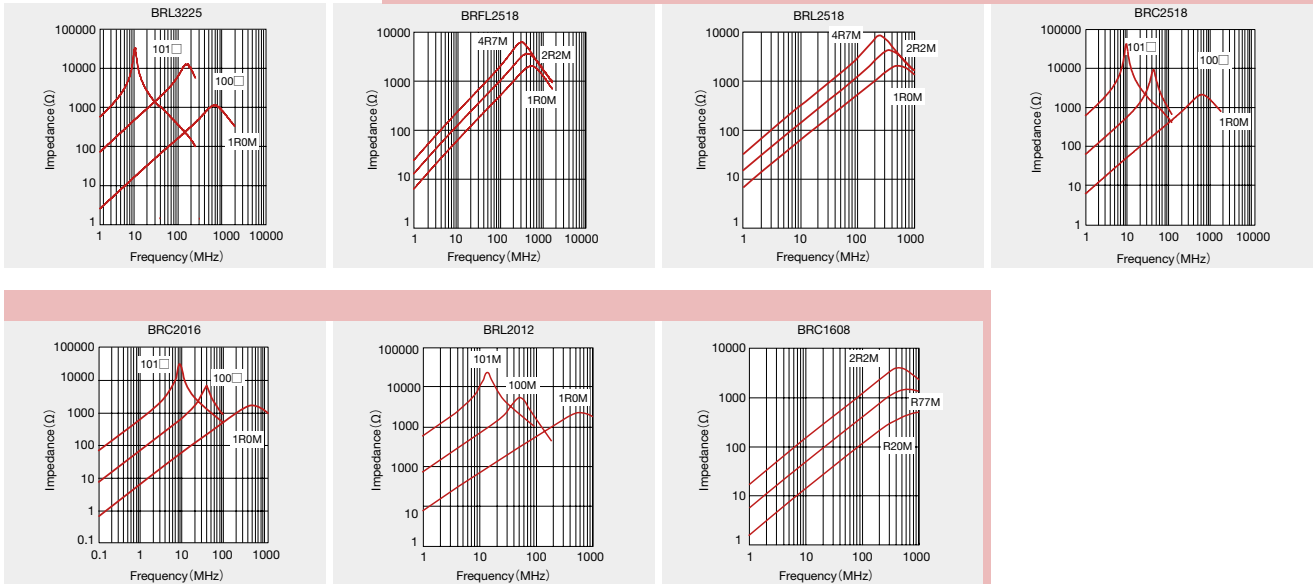
DC Bias characteristics

(Measured by HP4285A)



Impedance-vs-Frequency characteristics

(Measured by HP4291A)



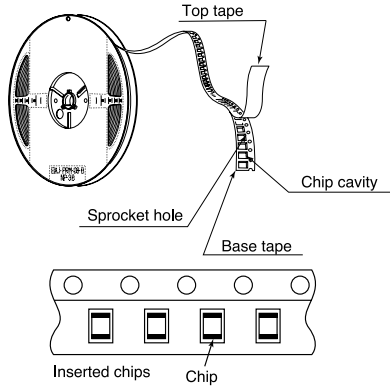
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① Minimum Quantity

Type	Standard Quantity [pcs]	
	Paper Tape	Embossed Tape
BR C1608	—	3,000
BR L2012	—	3,000
BR C2016	—	2,000
BR C2518	—	2,000
BR L2518	—	3,000
BRFL2518	—	3,000
BR L3225	—	2,000

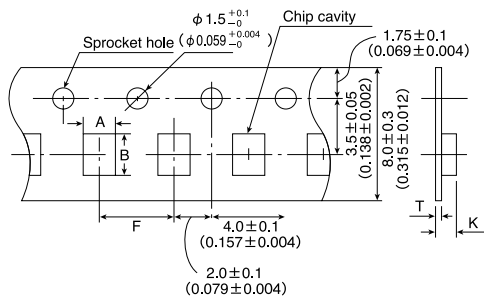
② Tape Material

Embossed tape
Card board carrier tape



③ Taping dimensions

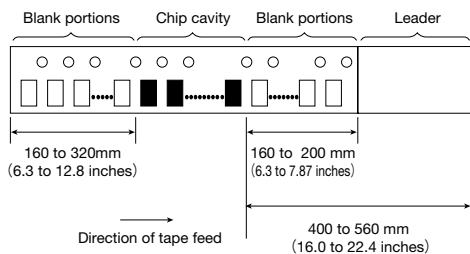
- Embossed Tape 8mm wide (0.315 inches wide)
- Card board carrier tape 8mm wide (0.315 inches wide)



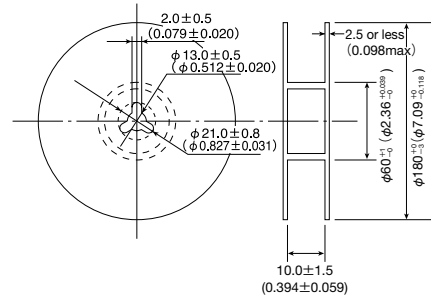
Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
BR C1608	1.0±0.10 (0.04±0.004)	1.9±1.0 (0.076±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.01±0.002)	1.2 max. (0.047)
BR L2012	1.40±0.1 (0.056±0.004)	2.2±0.1 (0.088±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.01±0.002)	1.2 max. (0.048)
BR C2016	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)	1.9 max. (0.074)
BR C2518	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)	2.2 max. (0.086)
BR L2518	2.3±0.1 (0.092±0.004)	2.8±0.1 (0.112±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.45 max. (0.057)
BRFL2518	2.15±0.1 (0.085±0.004)	2.8±0.1 (0.112±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.01±0.002)	1.25 max. (0.049)
BR L3225	2.8±0.1 (0.112±0.004)	3.5±0.1 (0.140±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.01±0.002)	1.9 max. (0.074)

Unit : mm (inch)

④ Leader and Blank portion

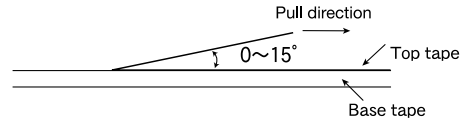


⑤ Reel size



⑥ Top Tape Strength

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



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RELIABILITY DATA

1. Operating Temperature Range	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	-25~+105℃
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	-25~+120℃
NR10050 Type	-25~+105℃
【Test Method and Remarks】 Including self-generated heat	
2. Storage Temperature Range	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	-40~+85℃
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	
【Test Method and Remarks】 BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type : 0 to 40℃ for the product with taping. NR10050 Type : 0~40℃ for the product with taping.	
3. Rated current	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Within the specified tolerance
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	
4. Inductance	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Within the specified tolerance
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	
【Test Method and Remarks】 BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type : LCR Meter : HP 4285A or equivalent, Measuring frequency : Specified frequency NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type : LCR Meter : HP 4285A or equivalent, 100KHz, 1V NR10050 Type : LCR Meter : HP 4263A or equivalent, 100KHz, 1V	
5. DC Resistance	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Within the specified tolerance
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	
【Test Method and Remarks】 DC ohmmeter : HIOKI 3227 or equivalent	
6. Self resonance frequency	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Within the specification
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	
【Test Method and Remarks】 BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type : Impedance analyzer/material analyzer : HP4291A or equivalent HP4191A, 4192A or equivalent	
7. Temperature characteristic	
BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	BRL2012, BRC2016, BRL2518, BRL3225, BRC2518, BRFL2518 Inductance change : Within ±15%
	BRC1608 Inductance change : Within ±20%
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	Inductance change : Within ±20%
NR10050 Type	
【Test Method and Remarks】 BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type : Measurement of inductance shall be taken at temperature range within -25℃~+85℃. With reference to inductance value at +20℃., change rate shall be calculated.	
Change of maximum inductance deviation in step 1 to 5	
Temperature at step 1	20℃
Temperature at step 2	Minimum operating temperature
Temperature at step 3	20℃ (Standard temperature)
Temperature at step 4	Maximum operating temperature
Temperature at step 5	20℃

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8. Resistance to flexure of substrate

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	No damage.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

[Test Method and Remarks]

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type :

The test samples shall be soldered to the test board by the reflow. As illustrated below, apply force in the direction of the arrow indicating until deflection of the test board reaches to 2 mm.

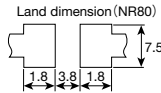
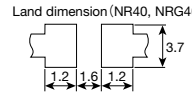
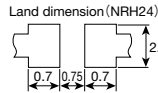
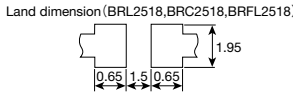
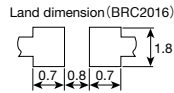
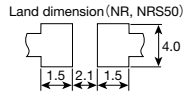
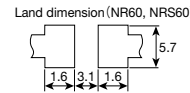
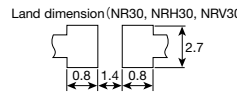
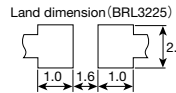
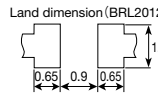
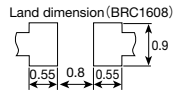
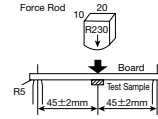
Test board size : 100×40×1.0

Test board material : glass epoxy-resin

Solder cream thickness : 0.12 (BR Series)

0.10 (NR30/40, NRV30, NRH24/30, NRG40)

0.15 (NR50/60/80, NRS50/60)



Printed board thickness : 1.0mm
Unit : mm

9. Insulation resistance : between wires

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

10. Insulation resistance : between wire and core

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

11. Withstanding voltage : between wires and core

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

12. Adhesion of terminal electrode

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Shall not come off PC board.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

[Test Method and Remarks]

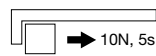
BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type :

The test samples shall be soldered to the test board by the reflow.

•Applied force : 10N to X and Y directions.

•Duration : 5s.

•Solder cream thickness : 0.15mm.



BRC1608, NR10050 Type :

•Applied force : 5N to X and Y directions.

•Duration : 5s.

13. Resistance to vibration

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

[Test Method and Remarks]

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type :

The test samples shall be soldered to the test board by the reflow.

Then it shall be submitted to below test conditions.

Frequency Range	10~55Hz	
Total Amplitude	1.5mm (May not exceed acceleration 196m/s ²)	
Sweeping Method	10Hz to 55Hz to 10Hz for 1min.	
Time	X	For 2 hours on each X, Y, and Z axis.
	Y	
	Z	

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.

RELIABILITY DATA

14. Solderability

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type
NR10050 Type

At least 90% of surface of terminal electrode is covered by new solder.

[Test Method and Remarks]

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type :

The test samples shall be dipped in flux, and then immersed in molten solder as shown in below table.

Flux : Methanol solution containing rosin 25%.

NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type :

Solder Temperature	245±5°C
Time	5±1.0 sec.

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type :

Solder Temperature	245±5°C
Time	5±0.5 sec.

※Immersion depth : All sides of mounting terminal shall be immersed.

15. Resistance to soldering heat

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type
NR10050 Type

Inductance change : Within ±10%
No significant abnormality in appearance.

[Test Method and Remarks]

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type :

3 times of reflow oven at 230°C MIN. for 40sec. with peak temperature at 260⁺⁰₋₅°C for 5sec.

NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type :

The test sample shall be exposed to reflow oven at 230±5°C for 40 seconds, with peak temperature at 260±5°C for 5 seconds, 2 times.

NR6020 Type :

The test sample shall be exposed to reflow oven at 230±5°C for 40 seconds, with peak temperature at 250⁺⁰₋₅°C for 5 seconds, 2 times.

Test board thickness : 1.0mm

Test board material : glass epoxy-resin

16. Thermal shock

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type
NR10050 Type

Inductance change : Within ±10%
No significant abnormality in appearance.

[Test Method and Remarks]

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type, NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type :

The test samples shall be soldered to the test board by the reflow. The test samples shall be placed at specified temperature for specified time by step 1 to step 4 as shown in below table in sequence. The temperature cycle shall be repeated 100 cycles.

Conditions of 1 cycle		
Step	Temperature (°C)	Duration (min)
1	-40±3	30±3
2	Room temperature	Within 3
3	+85±2	30±3
4	Room temperature	Within 3

17. Damp heat

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type
NR10050 Type

Inductance change : Within ±10%
No significant abnormality in appearance.

[Test Method and Remarks]

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type :

Temperature	60±2°C
Humidity	90~95%RH
Time	1000 hours.

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type :

The test samples shall be soldered to the test board by the reflow.

The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.

Temperature	60±2°C
Humidity	90~95%RH
Time	500±24hour

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RELIABILITY DATA

18. Loading under damp heat

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

【Test Method and Remarks】

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type :

Temperature	60 $\pm$ 2℃
Humidity	90~95%RH
Applied current	Rated current
Time	1000hours.

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type :

The test samples shall be soldered to the test board by the reflow.

The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below table.

Temperature	60 $\pm$ 2℃
Humidity	90~95%RH
Applied current	Rated current
Time	500 $\pm$ 2hour

19. Low temperature life test

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

【Test Method and Remarks】

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type :

Temperature	-40 $\pm$ 2℃
Duration	1000hours

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type, NR10050 Type :

The test samples shall be soldered to the test board by the reflow.

After that, the test samples shall be placed at test conditions as shown in below table.

Temperature	-40 $\pm$ 3℃
Time	500 $\pm$ 24hour

20. High temperature life test

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.

【Test Method and Remarks】

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type :

Temperature	85 $\pm$ 2℃
Duration	1000hours

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

NR10050 Type :

Temperature	105 $\pm$ 3℃
Time	500 $\pm$ 24hour

Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

21. Loading at high temperature life test

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Inductance change : Within $\pm 10\%$ No significant abnormality in appearance.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

【Test Method and Remarks】

NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type :

The test samples shall be soldered to the test board by the reflow soldering.

Temperature	85 $\pm$ 2℃
Applied current	Rated current
Time	500 $\pm$ 24hour

22. Standard condition

BRC1608, BRL2012, BRC2016, BRC2518, BRFL2518, BRL2518, BRL3225 Type	Standard test condition : Unless otherwise specified, temperature is 20 $\pm$ 15% and 65 $\pm$ 20% of relative humidity. When there are question concerning measurement result : In order to provide correlation date, the test shall be condition of 20 $\pm$ 2℃ of temperature, 65 $\pm$ 5% relative humidity. Inductance is in accordance with our measured value.
NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type	
NR10050 Type	

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PRECAUTIONS

SMD Inductors

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 refer to a recommended land pattern.
Technical considerations	◆Land pattern design Surface Mounting - Mounting and soldering conditions should be checked beforehand. - Applicable soldering process to this products is reflow soldering only.
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	◆Adjustment of mounting machine 1. When installing products, care should be taken not to apply distortion stress as it may deform the products.
4. Soldering	
Precautions	◆Reflow soldering 1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified. 2. This products is reflow soldering only. 3. Please do not add any stress to a product until it returns in normal temperature after reflow soldering. ◆Lead free soldering 1. When using products with lead free soldering, we request to use them after confirming of adhesion, temperature of resistance to soldering heat, soldering etc sufficiently. ◆Recommended conditions for using a soldering iron (NR10050 Type) - Put the soldering iron on the land-pattern. - Soldering iron's temperature - Below 350°C - Duration - 3 seconds or less - The soldering iron should not directly touch the inductor.
Technical considerations	◆Reflow soldering 1. If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products. •BRC1608, BRL2012, BRL2518, BRC2016, BRL3225 Type BRC2518, BRFL2518 Recommended reflow condition (Pb free solder) •NR30/40/50/60/80, NRV30, NRG40, NRH24/30, NRS50/60 Type Recommended reflow condition (Pb free solder) •NR10050 Type Recommended reflow condition (Pb free solder)
5. Cleaning	
Precautions	◆Cleaning conditions 1. Washing by supersonic waves shall be avoided.
Technical considerations	◆Cleaning conditions 1. If washing by supersonic waves, supersonic waves may cause broken products.
6. Handling	
Precautions	◆Handling 1. Keep the product away from all magnets and magnetic objects. ◆Breakaway PC boards (splitting along perforations) 1. When splitting the PC board after mounting product, 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 product any excessive mechanical shocks. 2. Please do not add any shock and power to a product in transportation. ◆Pick-up pressure 1. Please do not push to add any pressure to a winding part. Please do not give any shock and push into a ferrite core exposure part.. ◆Packing 1. Please avoid accumulation of a packing box as much as possible.
Technical considerations	◆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. 2. There is a case to be broken by the handling in transportation. ◆Pick-up pressure 1. Damage and a characteristic can vary with an excessive shock or stress. ◆Packing 1. There is a case that transformation and a product of tape are damaged by accumulation of a packing box.
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°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, product should be used within 6 months from the time of delivery. 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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