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 2008. 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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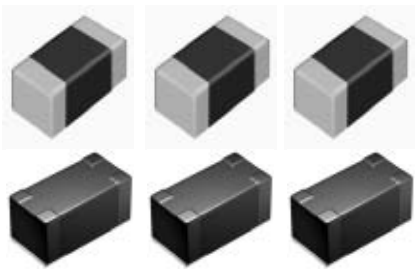
■ Caution for export
Certain items in this catalog may require specific procedures for export according to “Foreign Exchange and Foreign Trade Control Law” of Japan, “U.S. Export Administration Regulations,” and other applicable regulations. Should you have any question or inquiry on this matter, please contact our sales staff.
Should you have any question or inquiry on this matter, please contact our sales staff.

巻線チップインダクタ
WOUND CHIP INDUCTORS
LB SERIES



OPERATING TEMP.	−25〜+105℃（製品自己発熱含む） （Including self-generated heat）

リフロー／REFLOW

特長　FEATURES

豊富なラインアップ形状と標準、低Rdc、大電流シリーズでお客様の広範囲な回路設計に対応する、巻線チップインダクタです。
・LB/LBRシリーズ：超低Rdc特性で且つ高Idc特性です。
・LBCシリーズ：超高Idc特性で且つ低Rdc特性です。
・LB3218シリーズ：3225サイズからのダウンサイジング対応品です。
　ランドパターンは3225サイズのままでご使用できます。
・LBMF1608
　下面電極構造採用により、最大効率設計を実現。1608形状により高密度実装化が可能となります。

Wound Chip Inductors that cover customers' wide range module design by wide-line-up shape, standard, low Rdc, and high electric current series.
・LB/LBR Series
　Super low Rdc and high Idc characteristics.
・LBC Series
　Super high Idc and low Rdc characteristics.
・LB3218 Series
　This series are down sized from 3225 size. Land pattern can be used by 3225 size.
・LBMF1608 Series
　The best efficiency design is achieved by adopting bottom-surface electrode structure. Because of 1608 shape, it can be high-density mount.

用途　APPLICATIONS

・DSC / DVC / HDD、液晶、携帯電話、ゲーム機器、各種映像機器、各種通信機器など

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

形名表記法　ORDERING CODE

① 形式

LB	巻線チップインダクタ

② 特性仕様

△	標準品
C	大電流
R	低Rdc
MF	下面電極

③ 外形寸法〔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

④ 包装

T	テーピング

⑤ 公称インダクタンス〔μH〕

例	
1R0	1
100	10
101	100

※R＝小数点

⑥ インダクタンス許容差〔%〕

K	±10
M	±20

⑦ 個別仕様

△	標準品
R	低 Rdc 品

⑧ 当社管理記号

△△△	標準品

△＝スペース

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

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

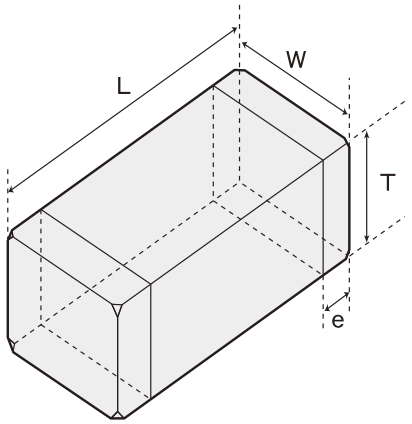
△	Standard products
R	Low Rdc type

⑧ Internal code

△△△	Standard Products

△= Blank space

外形寸法　EXTERNAL DIMENSIONS



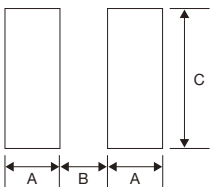
Type	L	W	T	e
LB3218	3.2±0.2 (0.128±0.008)	1.8±0.2 (0.072±0.008)	1.8±0.2 (0.072±0.008)	0.6±0.2 (0.024±0.008)
LB2518／LBC2518／LBR2518	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.5±0.2 (0.020±0.008)
LB2016／LBC2016	2.0±0.2 (0.079±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.020±0.008)
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)
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)
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)

Unit : mm (inch)

推奨ランドパターン　Recommended Land Patterns

実装上の注意
- 実装状態を確認の上ご使用下さいますようお願いいたします。
- 本製品のはんだ付けはリフローはんだ工法に限ります。
- 推奨ランドパターン

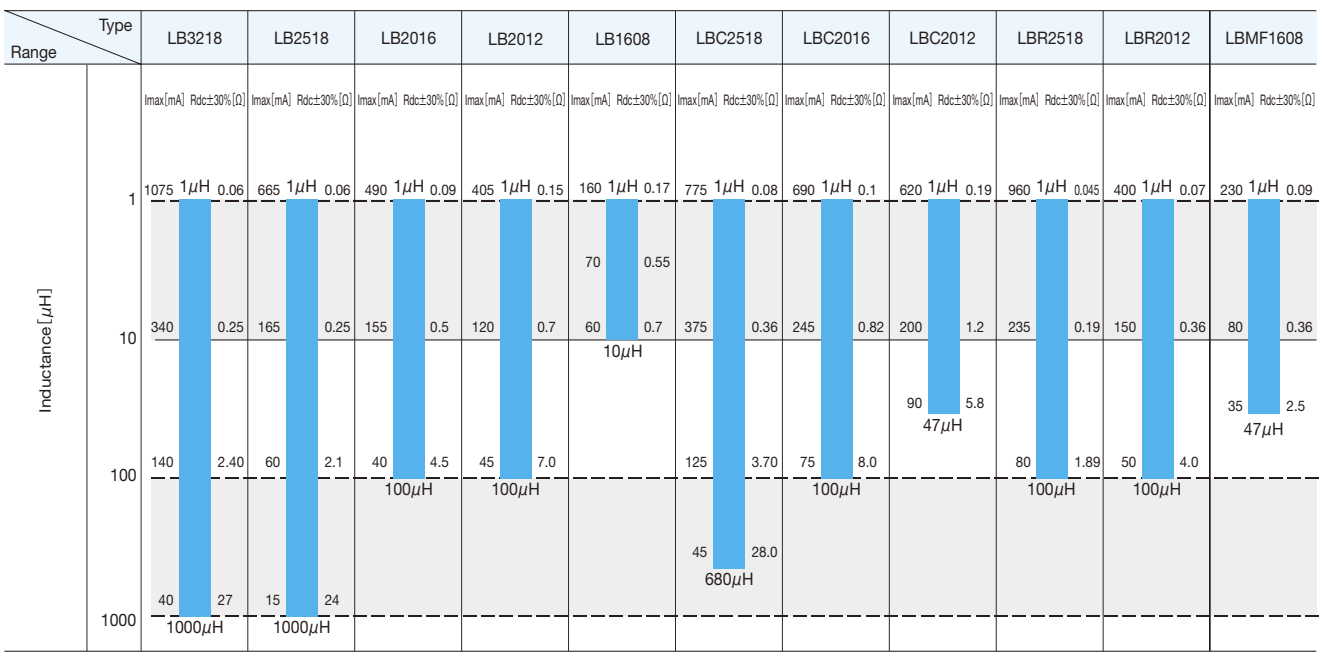
Surface Mounting
- Mounting and soldering conditions should be checked beforehand.
- Applicable soldering process to this products is reflow soldering only.
- Recommended Land Patterns



Unit : mm

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

概略バリエーション　AVAILABLE INDUCTANCE RANGE



	Inductance	LB3218 Imax [mA]	LB3218 Rdc±30% [Ω]	LB2518 Imax [mA]	LB2518 Rdc±30% [Ω]	LB2016 Imax [mA]	LB2016 Rdc±30% [Ω]	LB2012 Imax [mA]	LB2012 Rdc±30% [Ω]	LB1608 Imax [mA]	LB1608 Rdc±30% [Ω]	LBC2518 Imax [mA]	LBC2518 Rdc±30% [Ω]	LBC2016 Imax [mA]	LBC2016 Rdc±30% [Ω]	LBC2012 Imax [mA]	LBC2012 Rdc±30% [Ω]	LBR2518 Imax [mA]	LBR2518 Rdc±30% [Ω]	LBR2012 Imax [mA]	LBR2012 Rdc±30% [Ω]	LBMF1608 Imax [mA]	LBMF1608 Rdc±30% [Ω]
代表値 Examples	1μH	1075	0.06	665	0.06	490	0.09	405	0.15	160	0.17	775	0.08	690	0.1	620	0.19	960	0.045	400	0.07	230	0.09
	10μH	340	0.25	165	0.25	155	0.5	120	0.7	60	0.70	375	0.36	245	0.82	200	1.2	235	0.19	150	0.36	80	0.36
	100μH	140	2.40	60	2.1	40	4.5	45	7.0	–	–	125	3.70	75	8.0	90(47μH)	5.8(47μH)	80	1.89	50	4.0	35(47μH)	2.5(47μH)
	1000μH	40	27	15	24	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

セレクションガイド Selection Guide P.14
アイテム一覧 Part Numbers P.154
特性図 Electrical Characteristics P.158
梱包 Packaging P.173
信頼性 Reliability Data P.174
使用上の注意 Precautions P.184
etc

LB1608 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 Rated current 〔mA〕 max.	測　定 周波数 Measuring frequency 〔MHz〕
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

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 Rated current 〔mA〕 max.	測　定 周波数 Measuring frequency 〔MHz〕
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

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 Rated current 〔mA〕 max.	測　定 周波数 Measuring frequency 〔MHz〕
LB　2016T1R0M		RoHS	1.0	±20%	100	0.09	490	7.96
LB　2016T1R5M		RoHS	1.5		80	0.11	380	
LB　2016T2R2M		RoHS	2.2		70	0.13	375	
LB　2016T3R3M		RoHS	3.3		55	0.20	285	
LB　2016T4R7M		RoHS	4.7		45	0.25	225	
LB　2016T6R8M		RoHS	6.8		38	0.35	200	
LB　2016T100□		RoHS	10	±10% ±20%	32	0.50	155	2.52
LB　2016T150□		RoHS	15		28	0.70	130	
LB　2016T220□		RoHS	22		16	1.0	105	
LB　2016T330□		RoHS	33		14	1.7	85	
LB　2016T470□		RoHS	47		11	2.4	70	
LB　2016T680□		RoHS	68		10	3.0	55	
LB　2016T101□		RoHS	100		8	4.5	40	0.796

LB2518 TYPE

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

(注)形名の□にはインダクタンス許容差記号（MまたはK）が入ります。
・□Please specify the Inductance tolerance code (K or M)

LB3218 TYPE

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

LBMF1608 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 Rated current 〔mA〕 max.	測　定 周波数 Measuring frequency 〔MHz〕
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	

LBC2518 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 Rated current 〔mA〕 max.	測　定 周波数 Measuring frequency 〔MHz〕
LB　C2518T1R0M		RoHS	1.0	±20%	100	0.08	775	7.96
LB　C2518T1R0MR		RoHS	1.0		100	0.065	890	
LB　C2518T1R5M		RoHS	1.5		80	0.11	730	
LB　C2518T2R2M		RoHS	2.2		68	0.13	630	
LB　C2518T3R3M		RoHS	3.3		54	0.16	560	
LB　C2518T4R7M		RoHS	4.7		41	0.20	510	
LB　C2518T6R8M		RoHS	6.8		38	0.30	420	
LB　C2518T100□		RoHS	10	±10% ±20%	30	0.36	375	2.52
LB　C2518T150□		RoHS	15		23	0.65	285	
LB　C2518T220□		RoHS	22		19	0.77	250	
LB　C2518T330□		RoHS	33		15	1.5	185	
LB　C2518T470□		RoHS	47		12	1.9	165	
LB　C2518T680□		RoHS	68		9.5	2.8	140	
LB　C2518T101□		RoHS	100		9.0	3.7	125	0.796
LB　C2518T151□		RoHS	150		7.0	6.1	95	
LB　C2518T221□		RoHS	220		5.5	8.4	80	
LB　C2518T331□		RoHS	330		4.5	12.3	65	
LB　C2518T471□		RoHS	470		3.5	22	50	
LB　C2518T681□		RoHS	680		3.0	28	45	

(注)形名の□にはインダクタンス許容差記号（MまたはK）が入ります。
・□Please　specify　the　Inductance　tolerance　code（K or M）

LBC2016 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 Rated current〔mA〕max.	測定周波数 Measuring frequency〔MHz〕
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

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 Rated current〔mA〕max.	測定周波数 Measuring frequency〔MHz〕
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

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 Rated current〔mA〕max.	測定周波数 Measuring frequency〔MHz〕
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

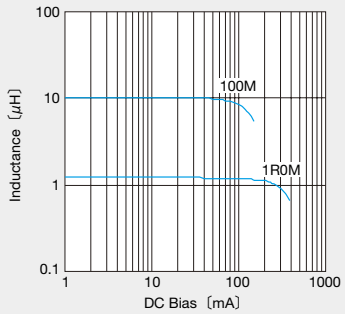
形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 Rated current〔mA〕max.	測定周波数 Measuring frequency〔MHz〕
LB R2012T1R0M		RoHS	1.0	±20%	100	0.07	400	7.96
LB R2012T2R2M		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

(注) 形名の□にはインダクタンス許容差記号（MまたはK）が入ります。
・□ Please specify the Inductance tolerance code (K or M)

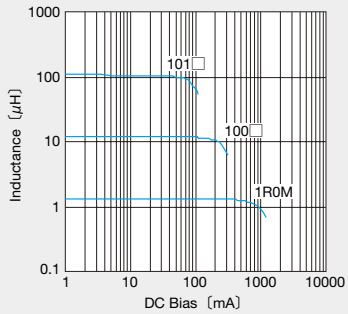
直流重畳特性例 DC Bias characteristics（Measured by HP4285A＋42841A）

○標準品 Standard Type

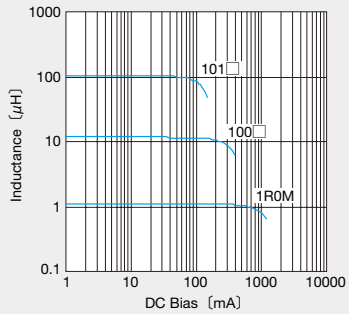
LB1608



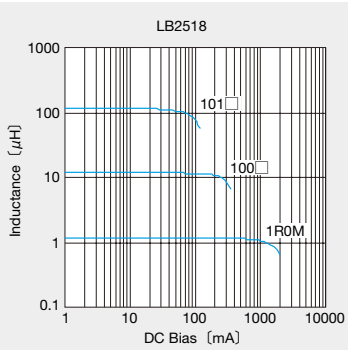
LB2012



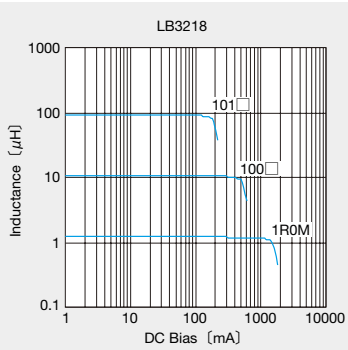
LB2016



LB2518

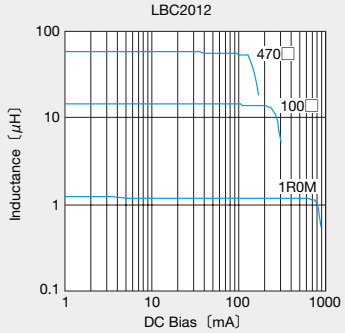


LB3218

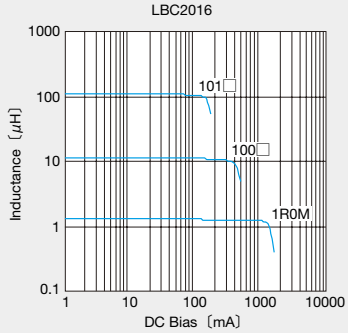


○大電流品 High Current Type

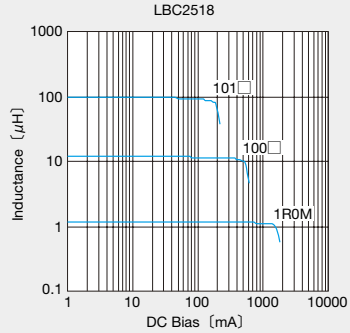
LBC2012



LBC2016

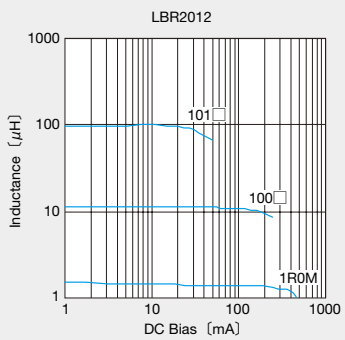


LBC2518

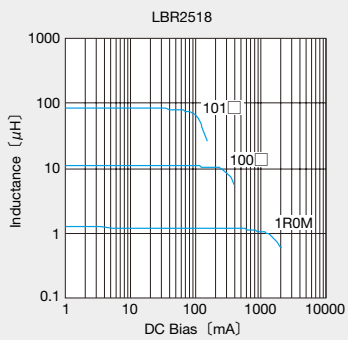


○低抵抗品 Low Rdc Type

LBR2012

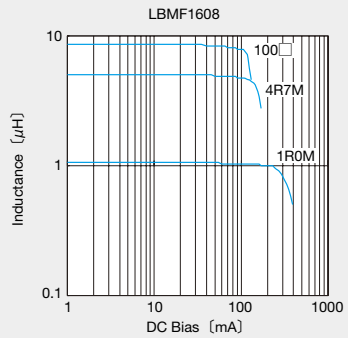


LBR2518



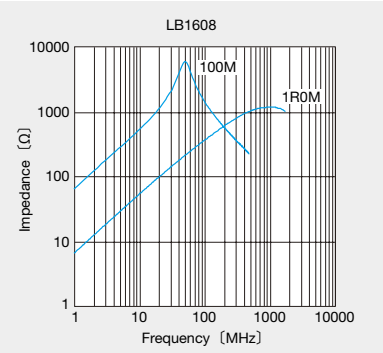
○下面電極品 Bottom-surface electrode Type

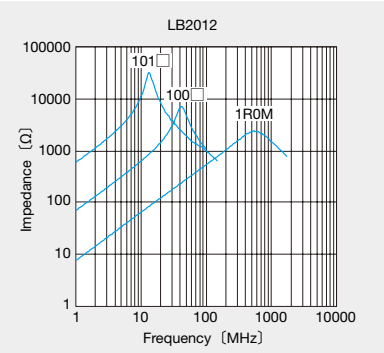
LBMF1608

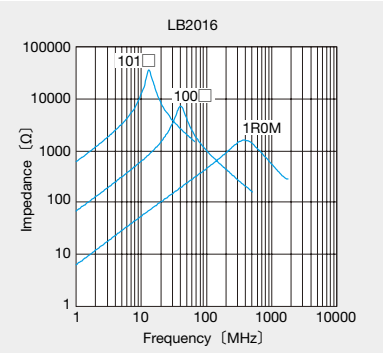


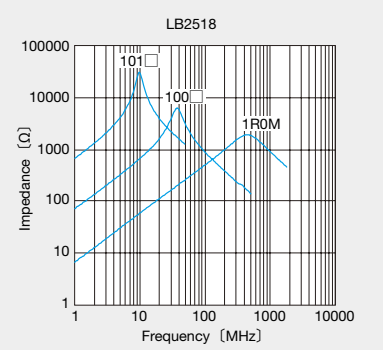
インピーダンス周波数 Impedance-vs-Frequency characteristics（Measured by HP4291A）

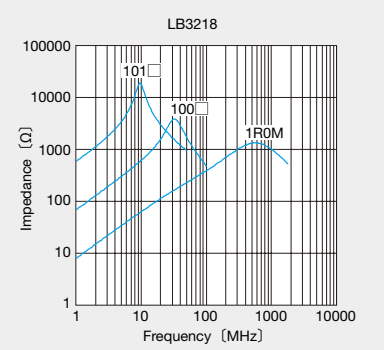
○標準品 Standard Type



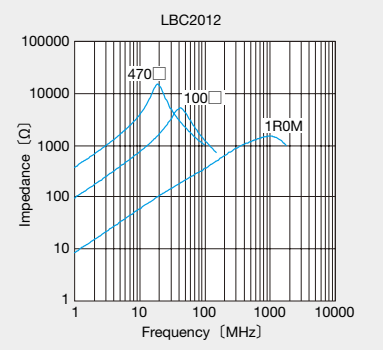


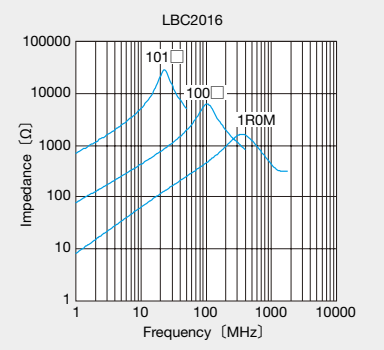


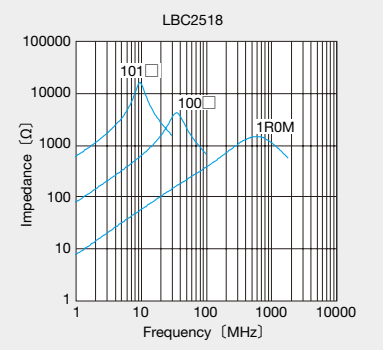




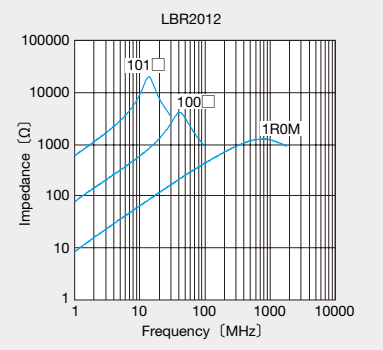
○大電流品 High Current Type

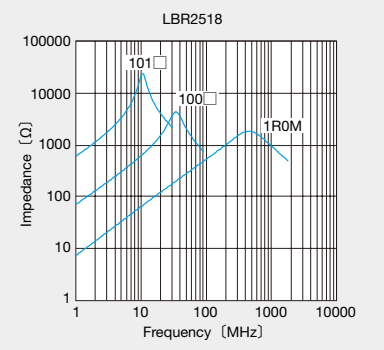




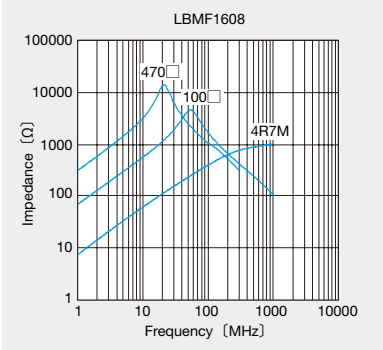


○低抵抗品　Low Rdc Type

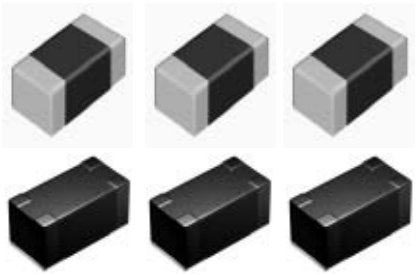




○下面電極品　Bottom-surface electrode Type



巻線チップパワーインダクタ
WOUND CHIP POWER INDUCTORS
CB SERIES



OPERATING TEMP.	−25〜＋105℃（製品自己発熱含む） (Including self-generated heat)

リフロー／REFLOW

特長　FEATURES

・LB / LBC シリーズに対し大電流化に対応しています。小型のDC/DCコンバータに使用する、チョーク用途に適した巻線チップインダクタです。

・CBMF 1608
一面電極構造採用により、最大効率設計を実現。DC/DCコンバータなど大電流を必要とする回路設計に適したチップインダクタです。

This series correspond to high electric current compared with LB/LBC series.
Wound Chip Inductors that can be used for small DC/DC converters and are suit for choke uses.

・CBMF1608 Series
The best efficiency design is achieved by adopting bottom-surface electrode structure.
Wound Chip Inductors that are suit for module design which needs high electric current like DC/DC converters.

用途　APPLICATIONS

・DSC / DVC / HDD、液晶、携帯電話、ゲーム機器、各種映像機器、各種通信機器など

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

形名表記法　ORDERING CODE

1 形式

CB	巻線チップパワーインダクタ

2 特性仕様

△	低Rdc
C	大電流
L	低背
MF	下面電極

3 外形寸法〔mm〕

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

4 包装

T	テーピング

5 公称インダクタンス〔μH〕

例	
1R0	1
100	10
101	100

※R＝小数点

6 インダクタンス許容差〔%〕

K	±10
M	±20

7 個別仕様

△	標準品
R	低Rdc品

8 当社管理記号

△△△	標準品

△＝スペース

C B △ 2 0 1 2 T 1 0 0 △ △ △ △ △

1 2 3 4 5 6 7 8

1 Type

CB	Wound chip power inductor

2 Characteristic Spec

△	Low Rdc
C	High current
L	Low profile
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
3225（1210）	3.2×2.5

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

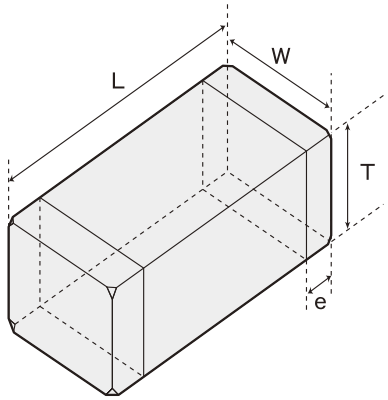
△	Standard products
R	Low Rdc type

8 Internal code

△△△	Standard Products

△= Blank space

外形寸法　EXTERNAL DIMENSIONS



Type	L	W	T	e
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)
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)
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)
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)
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)
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 (0.015±0.006)

Unit : mm (inch)

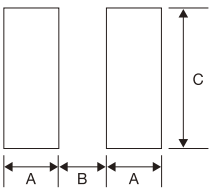
推奨ランドパターン　Recommended Land Patterns

実装上の注意

・実装状態を確認の上ご使用下さいますようお願いいたします。
・本製品のはんだ付けはリフローはんだ工法に限ります。
・推奨ランドパターン

Surface Mounting

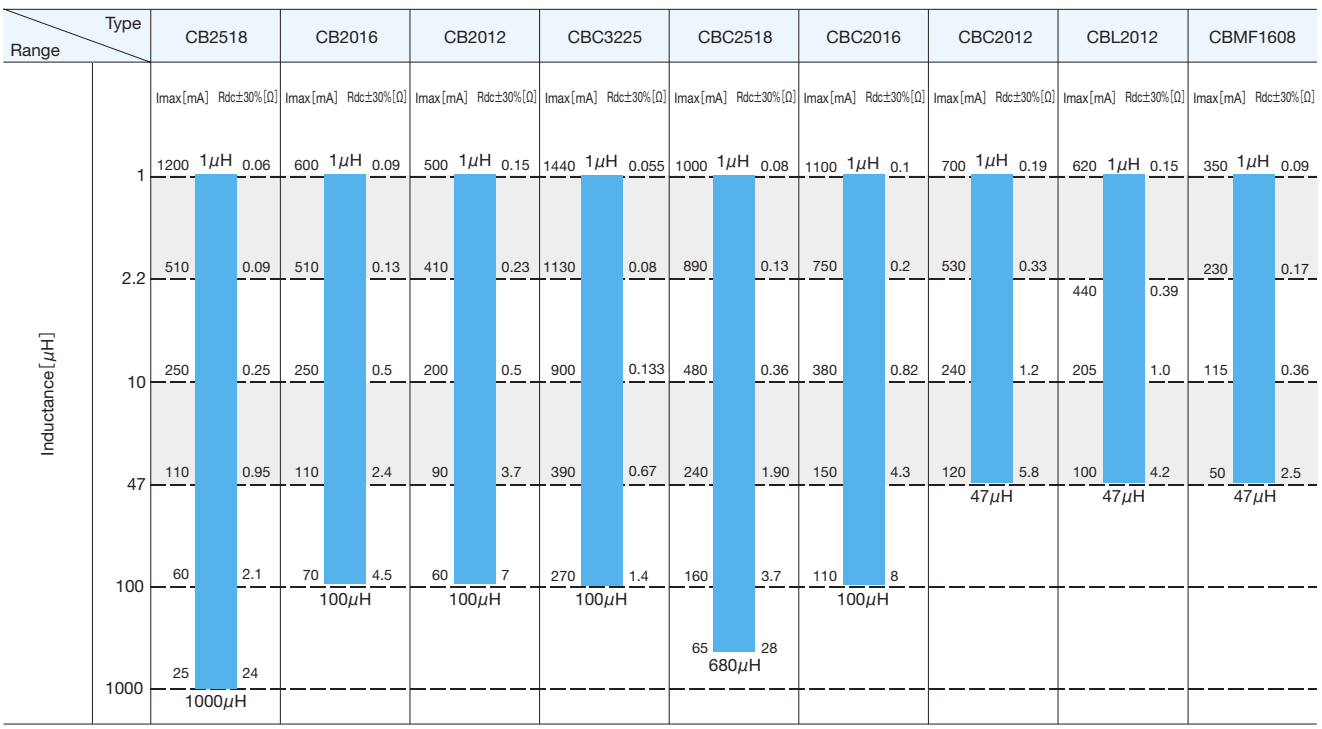
・Mounting and soldering conditions should be checked beforehand.
・Applicable soldering process to this products is reflow soldering only.
・Recommended Land Patterns



Unit : mm

TYPE	A	B	C
1608	0.55	0.7	1.0
MF1608	0.55	0.8	1.0
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	2.7

概略バリエーション　AVAILABLE INDUCTANCE RANGE



	Inductance	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]
代表値 Examples	1μH	1200	0.06	600	0.09	500	0.15	1440	0.055	1000	0.08	1100	0.1	700	0.19	620	0.15	350	0.09
	2.2μH	510	0.09	510	0.13	410	0.23	1130	0.08	890	0.13	750	0.2	530	0.33	440	0.39	230	0.17
	10μH	250	0.25	250	0.5	200	0.5	900	0.133	480	0.36	380	0.82	240	1.2	205	1.0	115	0.36
	47μH	110	0.95	110	2.4	90	3.7	390	0.67	240	1.9	150	4.3	120	5.8	100	4.2	50	2.5
	100μH	60	2.1	70	4.5	60	7	270	1.4	160	3.7	110	8	—	—	—	—	—	—

セレクションガイド Selection Guide P.14
アイテム一覧 Part Numbers P.162
特性図 Electrical Characteristics P.166
梱包 Packaging P.173
信頼性 Reliability Data P.174
使用上の注意 Precautions P.184
etc

CB2012 TYPE

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 ※) Rated current〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定周波数 Measuring frequency〔MHz〕
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		35	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

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 ※) Rated current〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定周波数 Measuring frequency〔MHz〕
CB 2016T1R0M		RoHS	1.0	±20%	100	0.09	600	1100	7.96
CB 2016T1R5M		RoHS	1.5		80	0.11	550	1000	
CB 2016T2R2M		RoHS	2.2		70	0.13	510	1000	
CB 2016T3R3M		RoHS	3.3		55	0.20	400	800	
CB 2016T4R7M		RoHS	4.7		45	0.25	340	740	
CB 2016T6R8M		RoHS	6.8		38	0.35	300	600	
CB 2016T100□		RoHS	10	±10% ±20%	32	0.50	250	520	2.52
CB 2016T150□		RoHS	15		28	0.70	210	440	
CB 2016T220□		RoHS	22		16	1.0	165	370	
CB 2016T330□		RoHS	33		14	1.7	130	270	
CB 2016T470□		RoHS	47		11	2.4	110	240	
CB 2016T680□		RoHS	68		10	3.0	90	210	
CB 2016T101□		RoHS	100		8	4.5	70	170	0.796

CB2518 TYPE

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency〔MHz〕min.	直流抵抗 DC Resistance〔Ω〕(±30%)	定格電流 ※) Rated current〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定周波数 Measuring frequency〔MHz〕
CB 2518T1R0M		RoHS	1.0	±20%	100	0.06	1200	1500	7.96
CB 2518T1R5M		RoHS	1.5		80	0.07	650	1400	
CB 2518T2R2M		RoHS	2.2		68	0.09	510	1300	
CB 2518T3R3M		RoHS	3.3		54	0.11	440	1200	
CB 2518T4R7MR		RoHS	4.7		46	0.10	310	1200	
CB 2518T4R7M		RoHS	4.7		46	0.13	340	1100	
CB 2518T6R8M		RoHS	6.8		38	0.15	270	930	
CB 2518T100□		RoHS	10	±10% ±20%	30	0.25	250	820	2.52
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	0.796
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

(注)形名の□にはインダクタンス許容差記号(MまたはK)が入ります。
·□Please specify the Inductance tolerance code(Kor M)

※)直流重畳許容電流 (Idc1)は、直流重畳によるインダクタンス低下が30%以内となる直流電流値 (at 20℃)
The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)

※)温度上昇許容電流 (Idc2)は、温度上昇が40℃となる直流電流値 (at 20℃)
The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)

※)最大定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
The maximum rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

CBC2012 TYPE

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance 〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定周波数 Measuring frequency 〔MHz〕
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	

CBC2016 TYPE

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance 〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定周波数 Measuring frequency 〔MHz〕
CB C2016T1R0M		RoHS	1.0	±20%	100	0.10	1100	1100	7.96
CB C2016T1R5M		RoHS	1.5		80	0.15	1000	1000	
CB C2016T2R2M		RoHS	2.2		70	0.20	750	720	
CB C2016T3R3M		RoHS	3.3		55	0.27	600	610	
CB C2016T4R7M		RoHS	4.7		45	0.37	550	530	
CB C2016T6R8M		RoHS	6.8		38	0.59	450	450	
CB C2016T100□		RoHS	10	±10% ±20%	32	0.82	380	350	2.52
CB C2016T150□		RoHS	15		28	1.2	300	300	
CB C2016T220□		RoHS	22		16	1.8	250	240	
CB C2016T330□		RoHS	33		14	2.8	220	220	
CB C2016T470□		RoHS	47		11	4.3	150	150	
CB C2016T680□		RoHS	68		10	7.0	130	130	
CB C2016T101□		RoHS	100		8	8.0	110	110	0.796

CBC2518 TYPE

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance 〔μH〕	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定周波数 Measuring frequency 〔MHz〕
CB C2518T1R0M		RoHS	1.0	±20%	100	0.08	1000	1200	7.96
CB C2518T1R5M		RoHS	1.5		80	0.11	950	1190	
CB C2518T2R2M		RoHS	2.2		68	0.13	890	1100	
CB C2518T3R3M		RoHS	3.3		54	0.16	730	1020	
CB C2518T4R7M		RoHS	4.7		41	0.20	680	920	
CB C2518T6R8M		RoHS	6.8		38	0.30	550	740	
CB C2518T100□		RoHS	10	±10% ±20%	30	0.36	480	680	2.52
CB C2518T150□		RoHS	15		23	0.65	350	500	
CB C2518T220□		RoHS	22		19	0.77	320	460	
CB C2518T330□		RoHS	33		15	1.5	270	320	
CB C2518T470□		RoHS	47		12	1.9	240	290	
CB C2518T680□		RoHS	68		9.5	2.8	200	200	
CB C2518T101□		RoHS	100		9.0	3.7	160	170	0.796
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	

(注)形名の□にはインダクタンス許容差記号(MまたはK)が入ります。
・□Please specify the Inductance tolerance code(Kor M)

※)直流重畳許容電流 (Idc1)は、直流重畳によるインダクタンス低下が30%以内となる直流電流値 (at 20℃)
The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)

※)温度上昇許容電流 (Idc2)は、温度上昇が40℃となる直流電流値 (at 20℃)
The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)

※)最大定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
The maximum rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

CBC3225 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測　定 周波数 Measuring frequency 〔MHz〕
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		50	0.12	930	940	
CB　C3225T100□R		RoHS	10	±10% ±20%	23	0.133	900	900	
CB　C3225T150□R		RoHS	15		20	0.195	730	850	
CB　C3225T220□R		RoHS	22		17	0.27	620	780	
CB　C3225T330□R		RoHS	33		13	0.41	500	570	
CB　C3225T470□R		RoHS	47		10	0.67	390	480	
CB　C3225T680□R		RoHS	68		8	1.0	320	410	
CB　C3225T101□R		RoHS	100		6	1.4	270	340	

CBL2012 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測　定 周波数 Measuring frequency 〔MHz〕
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	

CBMF1608 TYPE

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測　定 周波数 Measuring frequency 〔MHz〕
CB　MF1608T1R0M		RoHS	1.0	±20%	100	0.09	290	770	7.96
CB　MF1608T2R2M		RoHS	2.2		80	0.17	190	560	
CB　MF1608T3R3M		RoHS	3.3		60	0.22	170	500	
CB　MF1608T4R7M		RoHS	4.7		45	0.24	145	470	
CB　MF1608T100□		RoHS	10.0	±10% ±20%	32	0.36	115	380	2.52
CB　MF1608T220□		RoHS	22		16	1.0	70	230	
CB　MF1608T470□		RoHS	47		11	2.5	50	140	

(注)形名の□にはインダクタンス許容差記号(MまたはK)が入ります。
・□Please specify the Inductance tolerance code(Kor M)

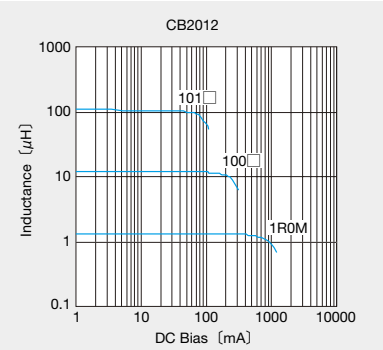
※)直流重畳許容電流 (Idc1)は、直流重畳によるインダクタンス低下が30%以内となる直流電流値 (at 20℃)
The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)

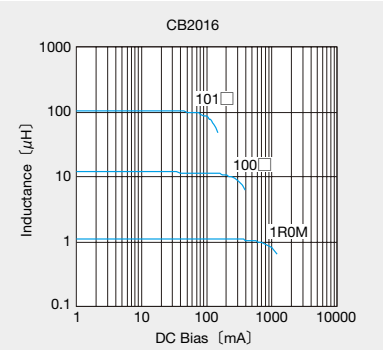
※)温度上昇許容電流 (Idc2)は、温度上昇が40℃となる直流電流値 (at 20℃)
The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)

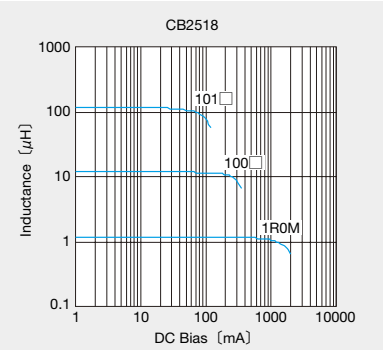
※)最大定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
The maximum rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

直流重畳特性例 DC Bias characteristics（Measured by HP4285A＋42841A）

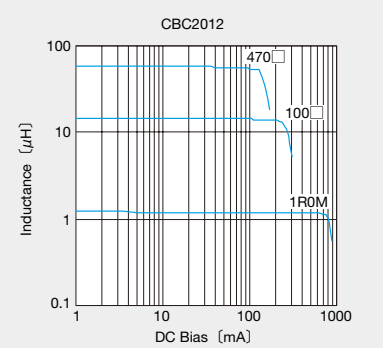
○低抵抗品　Low Rdc Type

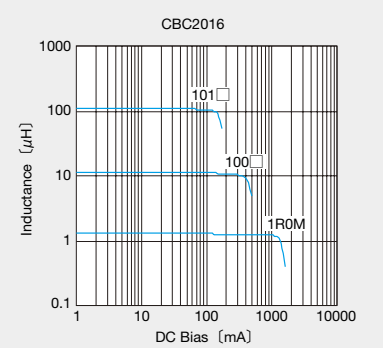


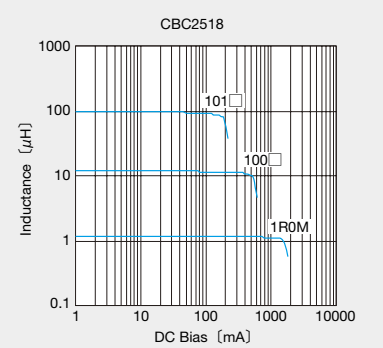


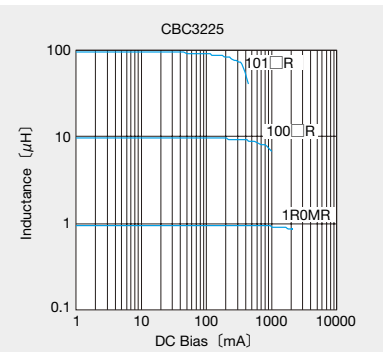


○大電流品 High Current Type

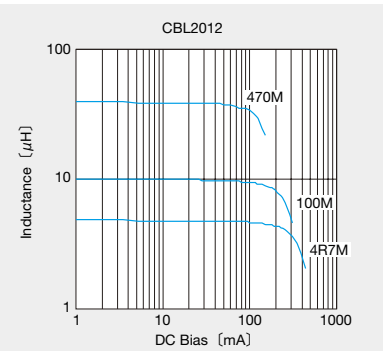




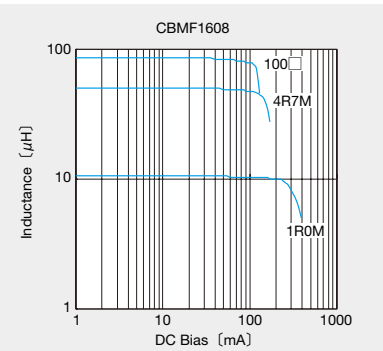




○低背品　Low Profile Type

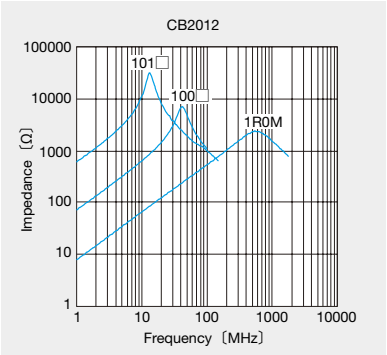


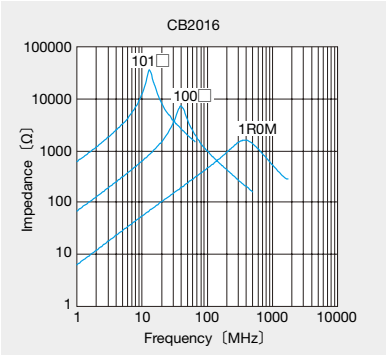
○下面電極品　Bottom-surface electrode Type

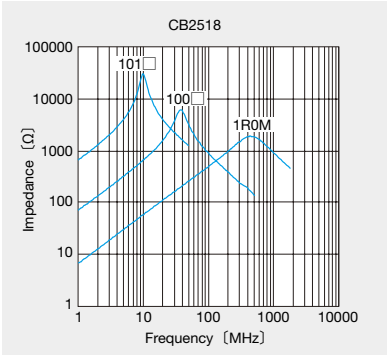


インピーダンス周波数 Impedance-vs-Frequency characteristics (Measured by HP4291A)

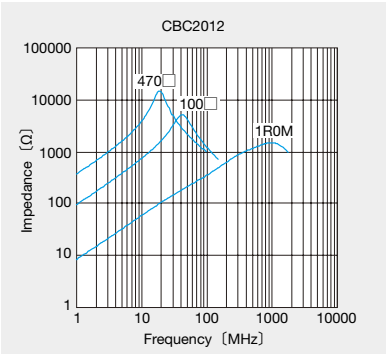
○低抵抗品　Low Rdc Type

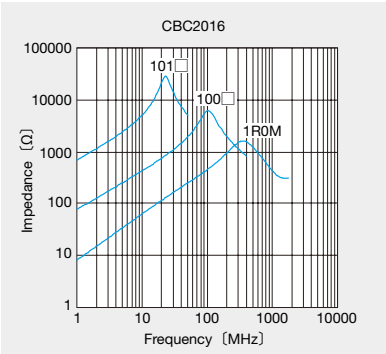


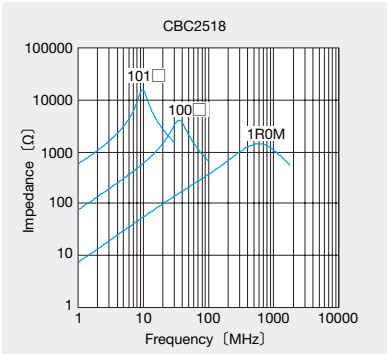


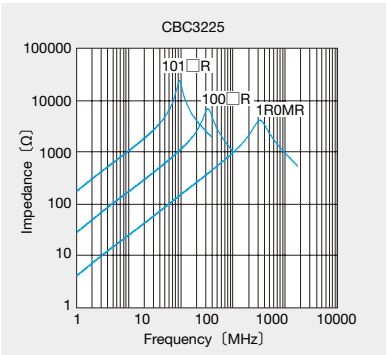


○大電流品 High Current Type

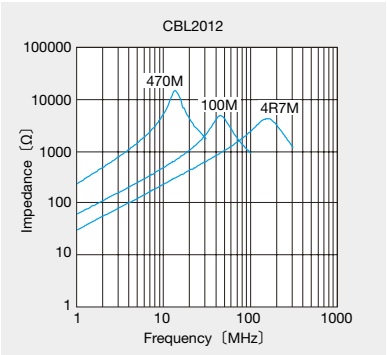




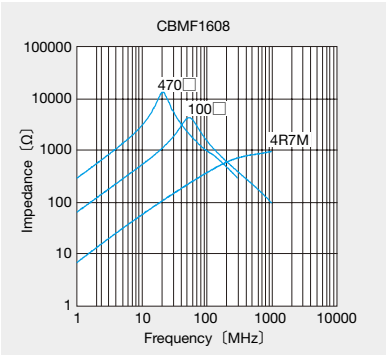




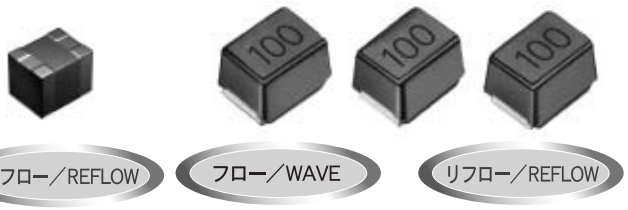
○低背品　Low Profile Type



○下面電極品　Bottom-surface electrode Type



信号系巻線チップインダクタ
WOUND CHIP INDUCTORS FOR SIGNAL LINE
LB SERIES M TYPE
LE SERIES M TYPE



OPERATING TEMP.	LBM2016 TYPE	−25〜+105℃ (製品自己発熱含む) (Including self-generated heat)
	LEM2520 TYPE	−40〜+85℃

特長　FEATURES

LBM2016
・下面電極構造を採用により、高いQ化および狭公差化を実現しました。
信号系用途の回路設計に適した巻線チップインダクタです。

LEM2520
・アキシャルリード形インダクタの製造工程・基本構造を継承した量産性に優れた高品質のインダクタ

LBM2016 Series
・High Q and narrow tolerance are achieved by adopting bottom-surface electrode structure.Wound Chip Inductors that are suit for module design of signal line uses.

LEM2520 Series
・A high-quality inductor that is simple to mass-produce and conforms to the same production process and basic construction as an axial lead type inductor.

用途　APPLICATIONS

・DSC / DVC / HDD、液晶、携帯電話、ゲーム機器、各種映像機器、各種通信機器など

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

形名表記法　ORDERING CODE

1 形式

LBM	信号系巻線チップインダクタ
LEM	信号系巻線チップインダクタ

2 外形寸法〔mm〕

2016	2.0×1.6
2520	2.5×2.0

3 梱包

T	テーピング

4 公称インダクタンス〔μH〕

例	
R12	0.12
1R0	1.00
100	10.0

5 インダクタンス許容差

J	±5%
K	±10%

6 当社管理記号

△	標準品

△＝スペース

L B M 2 0 1 6 T 1 0 0 J △
1 2 3 4 5 6

1 Type

LBM	Wound chip inductor for signal line
LEM	Wound chip inductor for signal line

2 External Dimensions〔mm〕

2016	2.0×1.6
2520	2.5×2.0

3 Packaging

T	Tape & Reel

4 Nominal Inductance〔μH〕

example	
R12	0.12
1R0	1.00
100	10.0

5 Inductance Tolerances

J	±5%
K	±10%

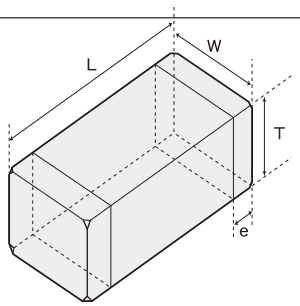
6 Internal code

△	Standard Products

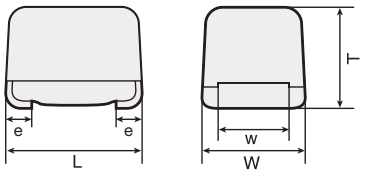
△=Blank space

外形寸法　EXTERNAL DIMENSIONS

LBM2016



LEM2520

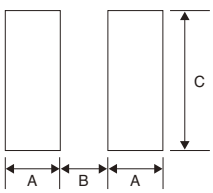


Type	L	W	T	e	w
LBM2016	2.0±0.2 (0.08±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.02±0.008)	
LEM2520	2.5±0.2 (0.098±0.008)	2.0±0.2 (0.079±0.008)	1.8±0.2 (0.071±0.008)	0.45 (0.018)	1.4±0.1 (0.055±0.004)

Unit：mm (inch)

推奨ランドパターン　Recommended Land Patterns

実装上の注意
- 実装状態を確認の上ご使用下さいますようお願いいたします。
- 本製品のはんだ付けは、リフローはんだ工法に限ります。（LBのみの適用）
- 推奨ランドパターン

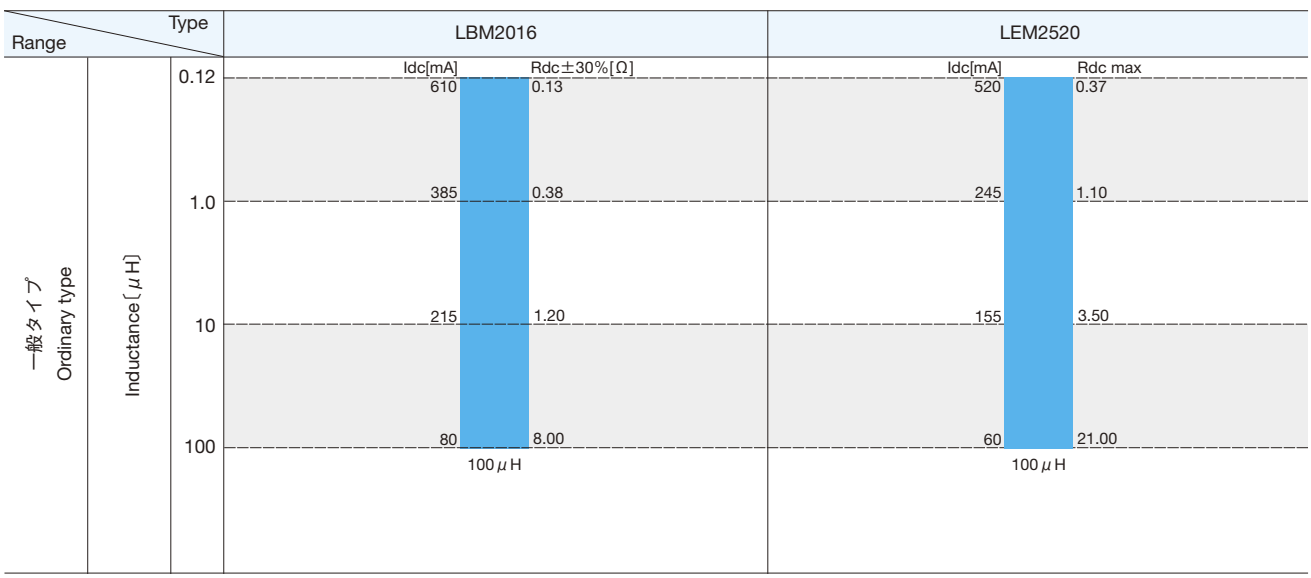


Unit：mm

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

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

概略バリエーション　AVAILABLE INDUCTANCE RANGE



代表値 Examples	Inductance	Idc〔mA〕		Rdc〔Ω〕	
		LBM2016 (max.)	LEM2520 (max.)	LBM2016 (±30%)	LEM2520 (max.)
	0.12μH	610	520	0.13	0.37
	1.00μH	385	245	0.38	1.10
	10.0μH	215	155	1.20	3.50
	100μH	80	60	8.00	21.0

セレクションガイド Selection Guide P.14
アイテム一覧 Part Numbers P.170
特性図 Electrical Characteristics P.172
梱包 Packaging P.173
信頼性 Reliability Data P.174
使用上の注意 Precautions P.184
etc

LBM2016 TYPE

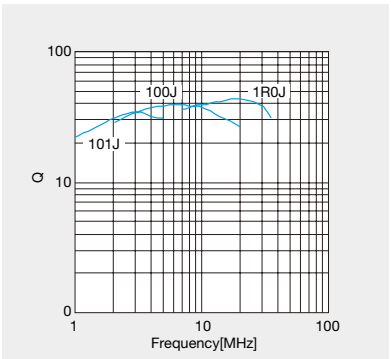
形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	Q値 Q VALUE (min.)	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 ±30%	定格電流 Rated current 〔mA〕 (max.)	測　定 周波数 Measuring frequency 〔MHz〕
LB M2016TR12J		RoHS	0.12			600	0.13	610	
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	25.2
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		30	250	0.34	390	
LB M2016T1R0J		RoHS	1.0			220	0.38	385	
LB M2016T1R2J		RoHS	1.2	±5%		180	0.41	370	
LB M2016T1R5J		RoHS	1.5			135	0.47	350	
LB M2016T1R8J		RoHS	1.8			100	0.48	345	
LB M2016T2R2J		RoHS	2.2			75	0.54	340	
LB M2016T2R7J		RoHS	2.7			55	0.59	310	7.96
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			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		25	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	2.52
LB M2016T330J		RoHS	33			15	3.6	125	
LB M2016T390J		RoHS	39			14	3.9	120	
LB M2016T470J		RoHS	47			13	4.1	115	
LB M2016T560J		RoHS	56		20	12	5.9	95	
LB M2016T680J		RoHS	68			11	7.0	90	
LB M2016T820J		RoHS	82			10	7.7	85	
LB M2016T101J		RoHS	100		15	9.0	8.0	80	0.796

LEM2520 TYPE

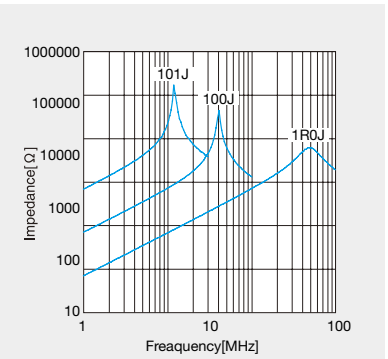
形　名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	Q min.	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 min.	直流抵抗 DC Resistance 〔Ω〕 max.	定格電流 Rated current 〔mA〕 max.	測　定 周波数 Measuring frequency 〔MHz〕
LEM 2520 TR12K		RoHS	0.12	±10%	30	600	0.37	520	25.2
LEM 2520 TR15K		RoHS	0.15			550	0.42	480	
LEM 2520 TR18K		RoHS	0.18			500	0.46	460	
LEM 2520 TR22K		RoHS	0.22			450	0.52	430	
LEM 2520 TR27K		RoHS	0.27			425	0.56	420	
LEM 2520 TR33K		RoHS	0.33			400	0.60	400	
LEM 2520 TR39K		RoHS	0.39			375	0.65	375	
LEM 2520 TR47K		RoHS	0.47			350	0.68	350	
LEM 2520 TR56K		RoHS	0.56			300	0.75	325	
LEM 2520 TR68K		RoHS	0.68			270	0.85	300	
LEM 2520 TR82K		RoHS	0.82			250	1.00	260	
LEM 2520 T1R0J		RoHS	1.0	±5%	30	220	1.10	245	7.96
LEM 2520 T1R2J		RoHS	1.2			180	1.20	230	
LEM 2520 T1R5J		RoHS	1.5			135	1.30	220	
LEM 2520 T1R8J		RoHS	1.8			100	1.45	210	
LEM 2520 T2R2J		RoHS	2.2			75	1.55	200	
LEM 2520 T2R7J		RoHS	2.7			55	1.70	195	
LEM 2520 T3R3J		RoHS	3.3			48	1.90	185	
LEM 2520 T3R9J		RoHS	3.9			43	2.10	180	
LEM 2520 T4R7J		RoHS	4.7			40	2.30	175	
LEM 2520 T5R6J		RoHS	5.6		25	36	2.50	170	
LEM 2520 T6R8J		RoHS	6.8			33	2.70	165	
LEM 2520 T8R2J		RoHS	8.2			30	3.05	160	
LEM 2520 T100J		RoHS	10			27	3.50	155	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		20	14	9.50	90	
LEM 2520 T470J		RoHS	47			13	11.10	80	
LEM 2520 T560J		RoHS	56			12	12.10	75	
LEM 2520 T680J		RoHS	68			11	16.60	70	
LEM 2520 T820J		RoHS	82			10	19.00	65	
LEM 2520 T101J		RoHS	100		15	9	21.00	60	0.796

●LBM2016

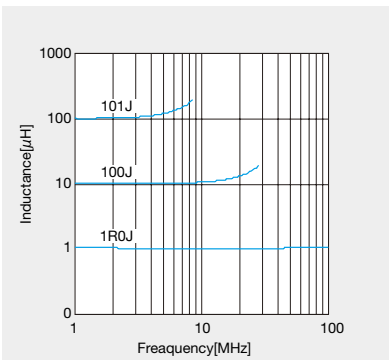
Q-周波数特性　Q-Characteristics



インピーダンス周波数特性
Impedance-vs-Frequency characteristics

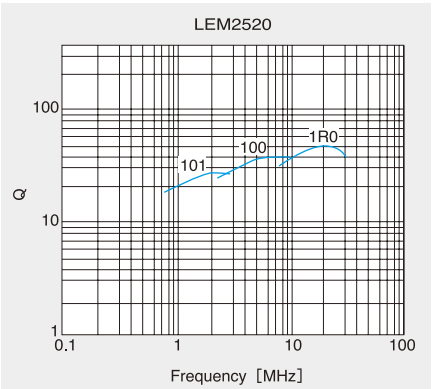


インダクタンス周波数特性　Inductance-vs-Frequency characteristics

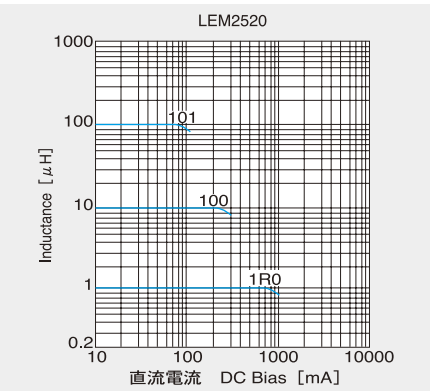


●LEM2520

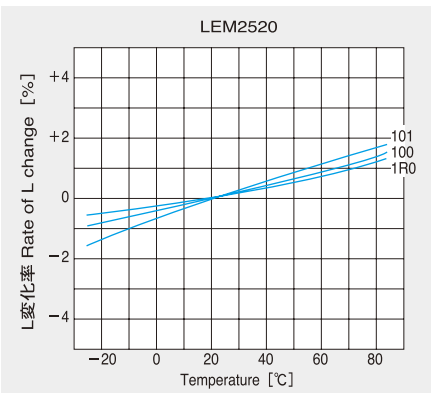
Q-周波数特性例　Q-Characteristics
一般タイプ　Ordinary type（Measured by HP4285A＋42851A）



直流重量特性例　DC Bias characteristics（Measured by HP4285A＋42841A）



温度特性例　Temperature characteristics（Measured by HP4285A＋42851A）

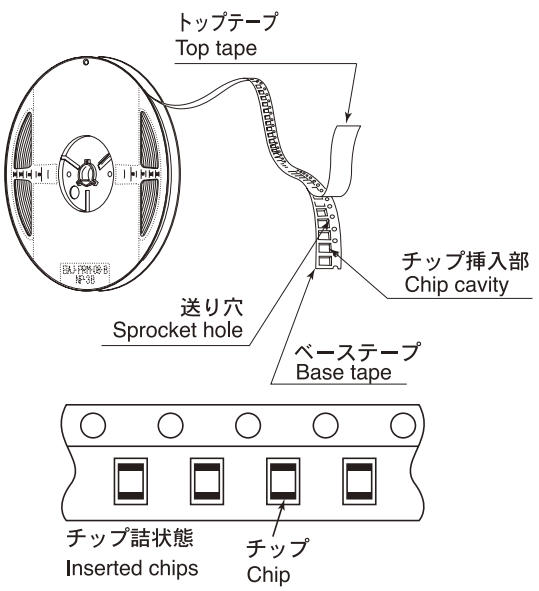


①最小受注単位数　Minimum Quantity

形　式 Type	標準数量 Standard Quantity [pcs]	
	紙テーピング Papar Tape	エンボステーピング Embossed Tape
CBC3225	—	1000
LB3218	—	2000
LBR2518/LBC2518/LB2518 /CB2518/CBC2518/LEM2520	—	2000
LBM2016/LBC2016/LB2016 /CB2016/CBC2016	—	2000
LB2012/LBC2012/LBR202 /CB2012/CBC2012	—	3000
CBL2012	4000	—
LB1608	4000	—
LBMF1608/CBMF1608	—	3000

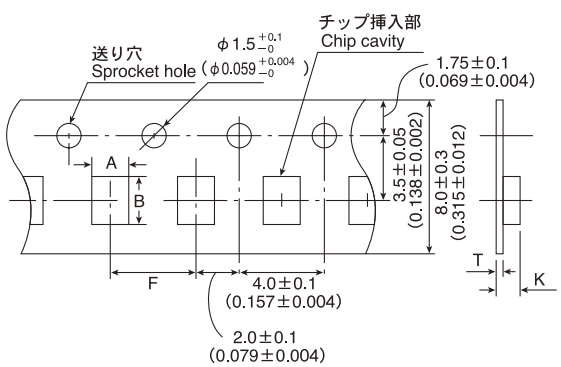
②テーピング材質　Tape material

エンボステープ　Embossed tape



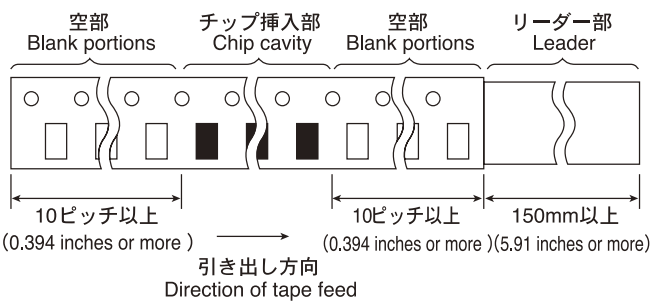
③テーピング寸法　Taping Dimensions

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

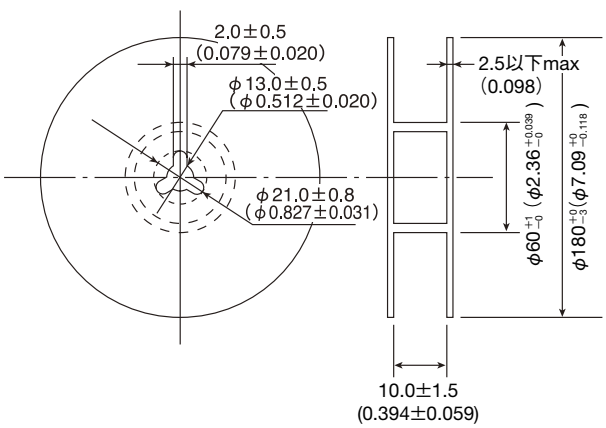


形式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
LBM 2016	1.9±0.2 (0.075±0.008)	2.2±0.2 (0.087±0.008)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.15 (0.085)
LEM 2520	2.3±0.1 (0.091±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.10 (0.083)
CBC3225	2.8±0.1 (0.110±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	0.6max (0.024)	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 (0.012)	2.3max (0.092)
LB2518 / CB2518 LBC2518 / CBC2518 LBR2518	2.15±0.2 (0.085±0.008)	2.7±0.2 (0.107±0.008)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.10 (0.083)
LB2016/ CB2016 LBC2016 / CBC2016	1.9±0.2 (0.075±0.008)	2.2±0.2 (0.087±0.008)	4.0±0.1 (0.157±0.004)	0.3 (0.012)	2.15 (0.085)
LB2012 / CB2012 LBC2012 / CBC2012 LBR2012	1.45±0.2 (0.058±0.008)	2.25±0.2 (0.09±0.008)	4.0±0.1 (0.157±0.004)	0.25 (0.012)	2.0 (0.079)
CBL2012	1.55±0.2 (0.061±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.044)	1.1max (0.044)
LB1608	1.0±0.2 (0.059±0.008)	1.8±0.2 (0.072±0.008)	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)	3.5±0.05 (0.14±0.002)	0.3max (0.012)	1.6max (0.064)

④リーダー部／空部 Leader and Blank Portion

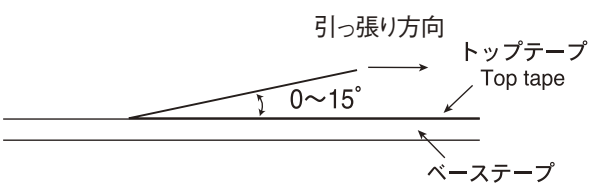


⑤リール寸法　Reel Size

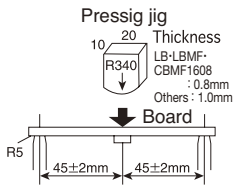


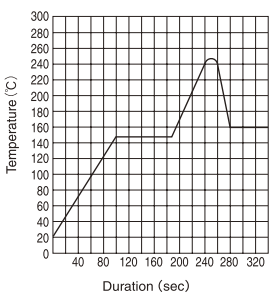
⑥トップテープ強度　Top Tape Strength

トップテープのはがし力は、下図矢印方向にて0.1～0.7Nとなります。
The top tape requires a peel-off force 0.1 to 0.7N in the direction of the arrow as illustrated below.



Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016	
1.Operating temperature Range	−40～+85℃	−25～+105℃ (Including self-generated heat)								
2.Storage	−40～+85℃									
3.Rated Current	Within the specified tolerance									LEM・LB・LBC・LBMF・LBM Series The maximum DC value having inductance decrease within 10% and temperature increase within 20℃ by the application of DC bias. LBR Series The maximum DC value having inductance decrease within 20% and temperature increase within 20℃ by the application of DC bias. CB・CBC・CBL・CBMF Series The maximum DC value having inductance decrease within 30% and temperature increase within 40℃ by the application of DC bias.
4.Inductance	Within the specified tolerance									LEM Series R12～101： Measuring equipment：LCR Meter (HP4285A+42851A or its equivalent) Measuring frequency：Specified frequency LB・LBC・LBR・CB・CBC・CBL・LBMF・CBMF・LBM Series： Measuring equipment：LCR Mater (HP4285A or its equivalent)
5.Q	Within the specified tolerance								Within the specified tolerance	LEM Series R12～101： Measuring equipment：LCR Meter (HP4285A+42851A or its equivalent) Measuring frequency：Specified frequency LBM Series： Measuring equipment：LCR Mater (HP4285A or its equivalent)
6.DC Resisitance	Within the specified tolerance									LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Series： Measuring equipment：DC Ohmmeter (HIOKI 3227 or its equivalent)
7.Self-Resonant Frequency	Within the specified tolerance									LEM2520： Measuring equipment：Impedance analyzer (HP4291A or its equivalent) LB・LBC・LBR・CB・CBC・CBL・LBMF・CBMF Series： Measuring equipment：Impedance analyzer (HP4291A or its equivalent) LBM Series： Measuring equipment：Network analyzer (HP8720B or its equivalent)

Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016	
8.Temperature Characteristic	Inductance change: Within±5%	Inductance change: Within±15% LBMF1608 LB3218 Inductance change: Within±20%	LBC2518 LBC2016 Inductance change: Within±20% LBC2012 Inductance change: Within±30%	Inductance change: Within±15%	Inductance change: Within±15%	CBC3225 CBC2518 CBC2016 Inductance change: Within±20% CBC2012 Inductance change: Within±30%	Inductance change: Within±15%	Inductance change: Within±20%	Inductance change: Within±5%	Change of maximum inductance deviation in step 1−5 Step / Temperture (℃) 1 / 20 2 / −25 3 / 20 (Reference temperature) 4 / +85 (Maximum operating temperature) 5 / 20
9.Rasistance to Flexure of Substrate	No damage.									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	No damage.									LB・LBC・LBR・CB・CBC・CBL・LBM・LEM2520 Applied force : 10N Duration : 10sec. LB1608・LBMF1608・CBMF1608 Applied force : 5N Duration : 10sec.
11.Self Resonant Freguency	Inductance change : Within−10%		Inductance change: Within−20%	Inductance change : Within−30%					Inductance change: Within−10%	Measure inductance with application of rated current using LCR metre to cpmpare it with the initial value.
12.Adhesion of terminal electrode	No abnormality.									LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF・LEM2520 Applied force : 10N to X and Y directions Duration : 5 sec. Test substrate : Printed board
13.Resistance to vibration	Inductance change: Within±5% No significant abnormality in appearance.	Inductance change : Within±10% No significant abnormality in appearance.							Inductance change: Within±5% No significant abnormality in appearance.	LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF : According to JIS C5102 clause 8.2. Vibration type : A Directions : 2 hrs each in X, Y and Z directions. Total : 6 hrs Frequency range : 10 to 55 to 10 Hz (1min.) Amplitude : 1.5mm Mounting method : Soldering onto printed board Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

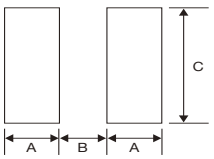
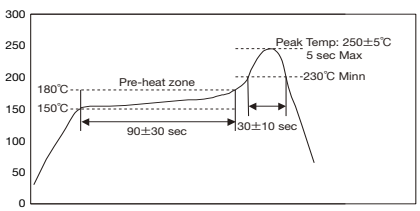
Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016	
14.Drop test	Inductance change : Within±5% No significant abnormality in appearance.									LEM : Acceleration : 980m/sec^2 Duration : 6msec Number of times : 6 sides × 3 times Mounting method : Soldering onto printed board Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
15.Solderability	At least 90% of surface of terminal electrode is covered by new solder.									LEM : Solder temperature : 230±5℃ Duration : 5±0.5sec. Flux : Methanol solution with 25% of colophony LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF : Solder temperature : 245±5℃ Duration : 5±0.5sec Flux : Methanol solution with 25% of colophony
16.Resisitance to soldering heat	Inductance change : Within±10% No significant abnormality in appearance.	LB3218 LB2518 LB2016 LB2012 LB1608 Inductance change : Within±10% No significant abnormality in appearance. LBMF1608 Inductance change : Within±20% No significant abnormality in appearance.	Inductance change : within ±10% No significant abnormality in appearance.					Inductance change : Within±20% No significant abnormality in appearance.	Inductance change : Within±5% No significant abnormality in appearance.	LEM : Reflow condition 3 times of reflow over at 220±5℃ for 40sec. MAX, With Peak temperature at 240±5℃ for 5 sec. MAX. (Refer to a Profile of chart below.)  Flow condition Solder temperature : 260±5℃ Duration : 10±1sec. Once LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF : 3 times of reflow oven at 230℃ MIN for 40sec. with peak temperature at 260$^{+0}_{-5}$℃ for 5sec.
17.Resisitance to solvent	No significant abnormality in appearance									Solvent temperature : Room temperature Type of solvent : Isopropyl alcohol (LEM2520・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF) Cleaning conditions : 90s. Immersion and cleaning. (LEM2520・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF)

<table>
<tr><th rowspan="2">Item</th><th colspan="9">Specified Value</th><th rowspan="2">Test Methods and Remarks</th></tr>
<tr><th>LEM2520</th><th>LB3218
LB2518
LB2016
LB2012
LB1608
LBMF1608</th><th>LBC2518
LBC2016
LBC2012</th><th>LBR2518
LBR2012</th><th>CB2518
CB2016
CB2012</th><th>CBC3225
CBC2518
CBC2016
CBC2012</th><th>CBL2012</th><th>CBMF1608</th><th>LBM2016</th></tr>
<tr><td>18.Thermal shock</td><td>Inductance change :
Within±10%
Q→
R12～4R7：
30min.
5R6～330：
25min.
390～820：
20min.
101：15min.</td><td colspan="8">Inductance change :Within±10%
No significant abnormality in appearance.</td><td>LEM : Conditions for 1cycle
<table><tr><th>Step</th><th>Temperature (℃)</th><th>Duration (min)</th></tr><tr><td>1</td><td>−40</td><td>30</td></tr><tr><td>2</td><td>+85</td><td>30</td></tr></table>Number of cycle：100 cycle
Recovery ： At least 1 hr of recovery the standard condition after the removal from test chamber, followed by measurement within 2 hrs.

LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF：
−40～+85℃, maintain times 30min. ,100 cycle
Recovery ： At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.</td></tr>
<tr><td>19.Damp heat</td><td>Inductance change :
Within±10%
Q→
R12～4R7：
30min.
5R6～330：
25min.
390～820：
20min.
101：15min.</td><td colspan="8">Inductance change :Within±10%
No significant abnormality in appearance.</td><td>Temperature：60±2℃
Humidity：90～95%RH
Duration：1000 hrs
Recovery ： At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.</td></tr>
<tr><td>20.Loading under damp heat</td><td>Inductance change :
Within±10%
Q→
R12～4R7：
30min.
5R6～330：
25min.
390～820：
20min.
101：15min.</td><td colspan="8">Inductance change : Within±10%
No significant abnormality in appearance.</td><td>LEM・LB・LBC・CB・CBC・CBL・LBM・LBMF・CBMF：
Temperature：60±2℃
Humidity：90～95%RH
Duration：1000 hrs
Applied current：Rated current
Recovery ： At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.</td></tr>
<tr><td>21.High temperature life test</td><td>Inductance change :
Within±10%
Q→
R12～4R7：
30min.
5R6～330：
25min.
390～820：
20min.
101：15min.</td><td colspan="4"></td><td colspan="4">Inductance change :Within±10%
No significant abnormality in appearance.</td><td>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.</td></tr>
<tr><td>22.Loading at high temperature</td><td></td><td colspan="4">Inductance change :Within±10%
No significant abnormality in appearance.</td><td colspan="4"></td><td>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.</td></tr>
</table>

Item	Specified Value									Test Methods and Remarks
	LEM2520	LB3218 LB2518 LB2016 LB2012 LB1608 LBMF1608	LBC2518 LBC2016 LBC2012	LBR2518 LBR2012	CB2518 CB2016 CB2012	CBC3225 CBC2518 CBC2016 CBC2012	CBL2012	CBMF1608	LBM2016	
23.Low temperature life test	Inductance change : Within±10% Q→ R12～4R7：30min. 5R6～330：25min. 390～820：20min. 101：15min.	Inductance change :Within±10% No significant abnormality in appearance.								LEM・LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Temperature：−40±2℃ Duration：1000 hrs Recovery ： At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.
24.Standard condition	Standard test condition：Unless otherwise specified,temperature is 20±15℃, and 65±20% of relative humidity.When there are question concerning measurement result ： In order to provide correlation date, the test shall be condition of 20±2℃ of temperature, 65±5% relative humidity. Inductance is in accordance with our measured value.									

LEM Type,LB Type,CB Type

Stages	Precautions	Technical considerations
1.Circuit Design	Operating environment, 1.The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.	
2.PCB Design	Land pattern design 1.Please contact any of our offices for a land pattern, and refer to a recommended land pattern of a right figure or specifications.	PRECAUTIONS 【Recommended Land Patterns】 Surface Mounting ・Mounting and soldering conditions should be checked beforehand. ・Applicable soldering process to this products is reflow soldering only. ・Recommended Land Patterns  Unit : mm TYPE / A / B / C 1608 / 0.55 / 0.7 / 1.0 MF1608 / 0.55 / 0.8 / 1.0 2012 / 0.7 / 0.8 / 1.45 2016 / 0.7 / 0.8 / 1.8 2518 / 0.8 / 1.2 / 2.0 LEM2520 / 0.9 / 1.5 / 1.5 3218 / 1.0 / 1.6 / 2.0 3225 / 1.0 / 1.6 / 2.7
3.Considerations for automatic placement	Adjustment of mounting machine 1.Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2.Mounting and soldering conditions should be checked beforehand.	1. When installing products, care should be taken not to apply distortion stress as it may deform the products.
4.Soldering	Wave soldering (LEM Type only) 1.For wave soldering,please apply conditions meeting the range of the specifed conditions in our catalog or the relevant specifications. Reflow soldering (LB and CB Types) 1.For reflow soldering with either leaded or lead-free solder,the profile specified in "point for controlling" is recommended. Reflow soldering (LEM) 1.For reflow soldering, please apply conditions meeting the range of the specified conditions in our catalog or the relevant specifications. Recommended conditions for using a soldering iron 1.Put the soldering iron on the land-pattern. Soldering iron's temperature-Below 350℃ Duration-3 secons or less The soldering iron shoud not come in contact with inductor directly.	1.Components can be damaged by excessive heat whre soldering conditions exceed the specified range. 1.Reflow profile  1.Components can be damaged by excessive heat whre soldering conditions exceed the specified range.
5.Cleaning	Cleaning conditions LEM Type, LB Type, CB Type 1.Washing by supersonic waves shall be avoided.	LEM Type, LB Type, CB Type 1.If washing by supersonic waves, supersonic waves may cause broken products.
6.Handling	Handling 1.Keep the inductors away from all magnets and magnetic objects. Breakaway PC boards (splitting along perforations) 1.When splitting the PC board after mounting inductors, care should be taken not to give any stresses of deflection or twisting to the board. 2.Board separation should not be done manually, but by using the appropriate devices. Mechanical considerations 1.Please do not give the inductors any excessive mechanical shocks.	1.There is a case that a characteristic varies with magnetic influence. 1.Planning pattern configurations and the position of products should be carefully performed to minimize stress. 1.There is a case to be damaged by a mechanical shock.
7.Storage conditions	Storage 1.To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. ・Recommended conditions Ambient temperature 0～40℃ Humidity Below 70% RH The ambient temperature must be kept below 30℃ Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, LE type inductors should be used within one year from the time of delivery. LB type Please should be used within 6 months from the time of delivery. LE type In case of storage over 6 months, solderability shall be checked before actual usage.	1. Under a high temperature and humidity environment, problems suchas reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.

SMDインダクタ（低背タイプ）
SMD INDUCTORS LOW PROFILE TYPE

OPERATING TEMP	−25〜+120℃（製品自己発熱含む） （Inducting self-generated heat）

リフロー／REFLOW

特長　FEATURES

・小型、低背インダクタ
・大電流に対応
・シンプルで独自な磁気シールド構造
・耐落下衝撃に強い構造

・Small and Low profile inductor.
・It corresponds to High current.
・Simple and original magnetic shield structure.
・Structure strong against a shock-proof.

用途　APPLICATIONS

・携帯電話、HDD、DVC、DSC、PDA、液晶ディスプレイ等の小型DC/DC コンバータ用途

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

形名表記法　ORDERING CODE

1 形式

NR△, NRG	外装樹脂仕様

△＝スペース

2 外径寸法(W×L×H)

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

3 梱包

T△	テーピング

△＝スペース

4 公称インダクタンス〔μH〕

例	
2R2	2.2
100	10
101	100

5 インダクタンス許容差

M	±20%
N	±30%

6 当社管理番号

△	標準品

△＝スペース

N R △ 4 0 1 8 T △ 1 0 0 M △
1 2 3 4 5 6

1 Type

NR△, NRG	Coating resin specification

△＝Blank Space

2 External dimensions(W×L×H)

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

3 Packaging

T△	Tape and Reel

△＝Blank Space

4 Nominal inductance〔μH〕

example	
2R2	2.2
100	10
101	100

5 Inductance tolerance

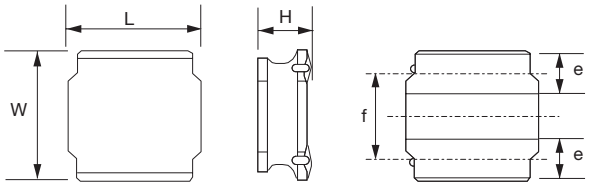
M	±20%
N	±30%

6 Internal code

△	Standard product

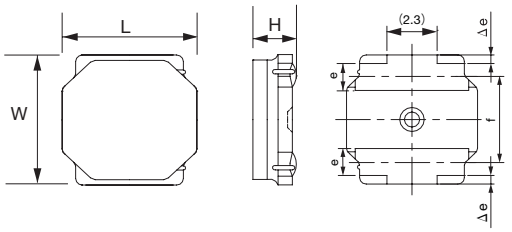
△＝Blank Space

外形寸法　EXTERNAL DIMENSIONS



Type	L	W	H	e	f
NR 3010	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)
NR 3012			1.2 max (0.047 max)		
NR 3015			1.5 max (0.059 max)		
NR 4010	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)	1.1±0.2 (0.043±0.008)
NR 4012			1.2 max (0.047 max)		
NR 4018			1.8 max (0.071 max)		
NRG4026			2.6 max (0.102 max)		
NR 8040	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)

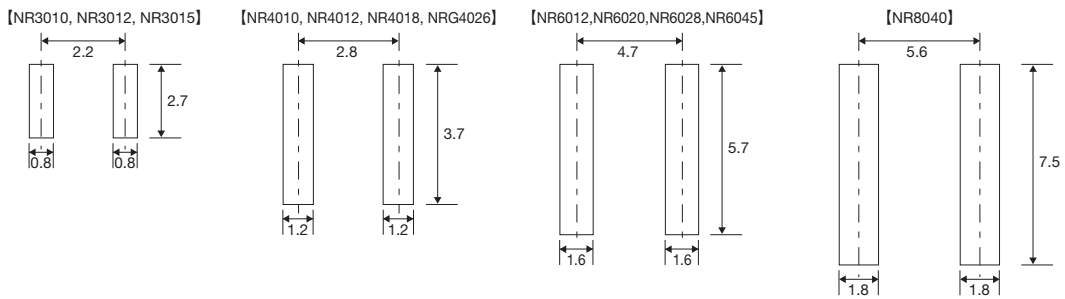
*1) 0R9～6R8タイプ
*2) 100～101タイプ
Unit mm(inch)



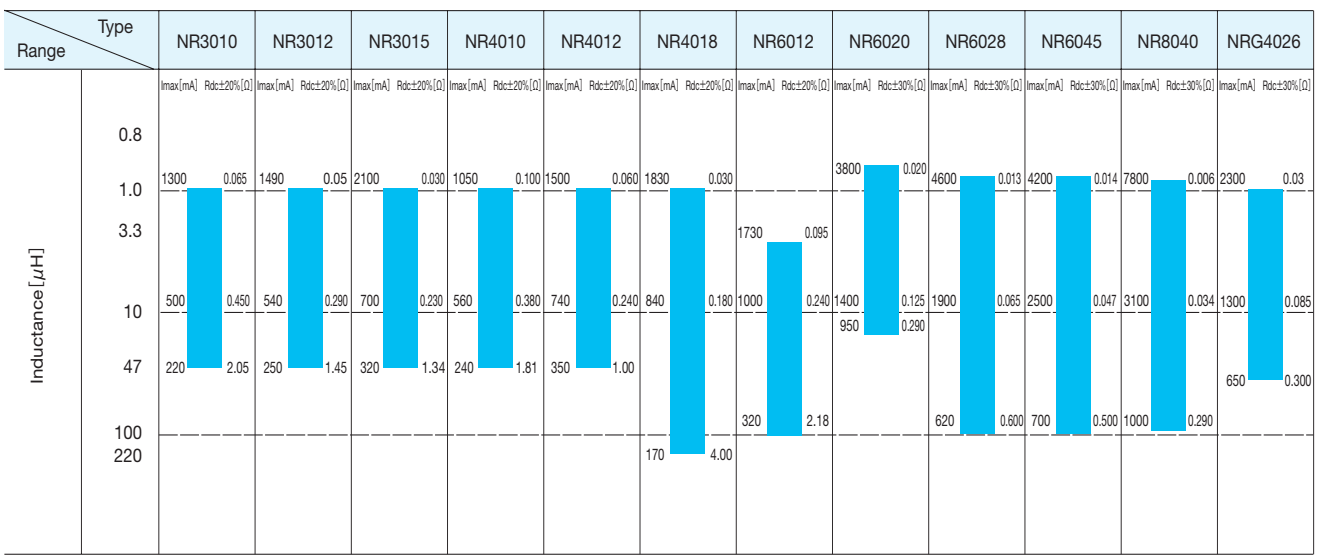
Type	L	W	H	e	Δe	f
NR 6012 (E Type)	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	1.2 max (0.047 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)
NR 6020	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	2.0 max (0.078 max)	1.35±0.2 (0.053±0.008)	0.3±0.2 (0.011±0.008)	4.0±0.2 (0.157±0.008)
NR 6028	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)
NR 6045	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)

Unit mm(inch)

推奨ランド　Recommended Land Patterns



概略バリエーション　AVAILABLE INDUCTANCE RANGE



セレクションガイド Selection Guide P.14
アイテム一覧 Part Numbers P.344
特性図 Electrical Characteristics P.348
梱包 Packaging P.353
信頼性 Reliability Data P.366
使用上の注意 Precautions P.374
etc

NR 3010 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※） Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※） Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
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	±20%	82	0.095	1,100	1,100	
NR 3010T 3R3M		RoHS	3.3		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 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※） Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※） Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
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	±20%	70	0.080	1,100	1,200	
NR 3012T 3R3M		RoHS	3.3		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 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※） Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※） Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
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	±20%	64	0.060	1,480	1,500	
NR 3015T 3R3M		RoHS	3.3		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	

※）直流重畳許容電流（Idc1) は、直流重畳によるインダクタンス低下が 30% 以内となる直流電流値（at 20℃)
※）The saturation current value（Idc1) is the DC current value having inductance decrease down to 30%.（at 20℃)

※）温度上昇許容電流（Idc2) は、温度上昇が 40℃となる直流電流値（at 20℃)
※）The temperature rise current value（Idc2) is the DC current value having temperature increase up to 40℃ .（at 20℃)

※）定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
※）The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

NR 4010 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
NR 4010T 1R0N		RoHS	1.0	±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	±20%	58	0.180	1,100	820	
NR 4010T 4R7M		RoHS	4.7		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 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
NR 4012T 1R0N		RoHS	1.0	±30%	131	0.060	2,500	1,500	100
NR 4012T 2R2M		RoHS	2.2	±20%	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		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 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
NR 4018T 1R0N		RoHS	1.0	±30%	80	0.030	4,000	1,830	100
NR 4018T 2R2M		RoHS	2.2	±20%	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		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	

※）直流重畳許容電流（Idc1) は、直流重畳によるインダクタンス低下が 30% 以内となる直流電流値（at 20℃)
※）The saturation current value（Idc1) is the DC current value having inductance decrease down to 30%.（at 20℃)

※）温度上昇許容電流（Idc2) は、温度上昇が 40℃となる直流電流値（at 20℃)
※）The temperature rise current value（Idc2) is the DC current value having temperature increase up to 40℃ .（at 20℃)

※）定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
※）The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

アイテム一覧　PART NUMBERS

NR 6012 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current Idc1	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current Idc2	測定 周波数 Measuring frequency 〔kHz〕
NR 6012T 2R5NE		RoHS	2.5	±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	±20%	34	0.110	1,500	1,400	
NR 6012T 6R8ME		RoHS	6.8		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	

NR 6020 シールドタイプ　Shielded type

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流 ※) Rated current [mA] 直流重畳飽和電流 Saturation current (Idc1)	定格電流 ※) Rated current [mA] 温度上昇電流 Temperature rise current (Idc2)	測定 周波数 Measuring frequency [kHz]
NR 6020T 0R8N		RoHS	0.8	±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		30	0.085	2,000	1,800	
NR 6020T 100M		RoHS	10	±20%	18	0.125	1,700	1,400	
NR 6020T 220M		RoHS	22		11	0.290	1,050	950	

NR 6028 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕 直流重畳許容電流 Saturation current (⊿L/L≦-30%)	定格電流 ※) Rated current 〔mA〕 温度上昇許容電流 Temperature rise current (⊿T≦40℃)	測定 周波数 Measuring frequency 〔kHz〕
NR 6028T 0R9N		RoHS	0.9	±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	±20%	39	0.031	2,700	3,000	
NR 6028T 6R0M		RoHS	6.0		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	

※）直流重畳許容電流（Idc1) は、直流重畳によるインダクタンス低下が 30% 以内となる直流電流値（at 20℃)
※）The saturation current value（Idc1) is the DC current value having inductance decrease down to 30%.（at 20℃)

※）温度上昇許容電流（Idc2) は、温度上昇が 40℃となる直流電流値（at 20℃)
※）The temperature rise current value（Idc2) is the DC current value having temperature increase up to 40℃ .（at 20℃)

※）定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
※）The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

NR 6045 シールドタイプ　Shielded type

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称インダクタンス Inductance [μH]	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流 ※) Rated current [mA]		測定周波数 Measuring frequency [kHz]
							直流重畳飽和電流 Saturation current (Idc1)	温度上昇電流 Temperature rise current (Idc2)	
NR 6045T 1R0N		RoHS	1.0	±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	±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 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency [MHz] (min.)	直流抵抗 DC Resistance [Ω] (±30%)	定格電流 ※) Rated current [mA]		測定周波数 Measuring frequency [kHz]
							直流重畳許容電流 Saturation current Idc1	温度上昇許容電流 Temperature rise current Idc2	
NR 8040T 0R9N		RoHS	0.9	±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		24	0.025	4,000	3,700	
NR 8040T 100M		RoHS	10	±20%	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	

NRG4026 シールドタイプ　Shielded type

形名 Ordering code		公称インダクタンス Inductance [μH]	インダクタンス許容差 Inductance Tolerance	自己共振周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流 ※) Rated current [mA]		測定周波数 Measuring frequency [kHz]
						直流重畳飽和電流 Saturation current (Idc1)	温度上昇電流 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	±20%	58	0.050	1,800	1,700	
NRG4026 T 4R7M		4.7		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	

※）直流電流許容電流（Idc1) は、直流重畳によるインダクタンス低下が 30% 以内となる直流電流値（at 20℃)
※）The saturation current（Idc1) is DC current value Inductance decrease down to 30%.（at 20℃)

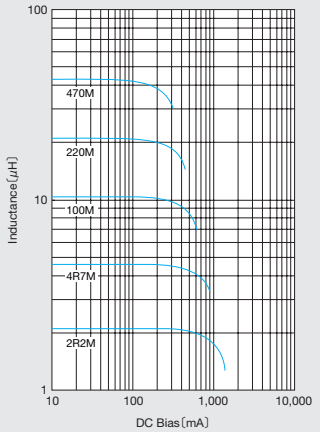
※）温度上昇許容電流（Idc2) は、温度上昇が 40℃となる直流電流値（at 20℃)
※）The temperature rise current value（Idc2) is the DC current value having temperature increase up to 40℃ .（at 20℃)

※）定格電流は Idc2 です。
※）The rated current is Idc2.

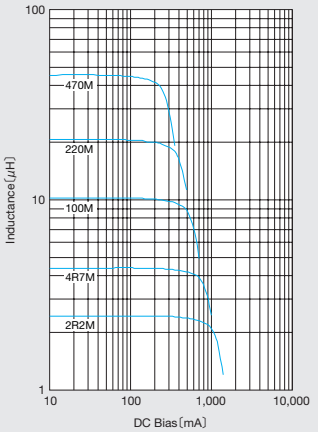
特性図　ELECTRICAL CHARACTERISTICS

直流重畳特性例　DC Bias characteristics（Measured by HP4285A）

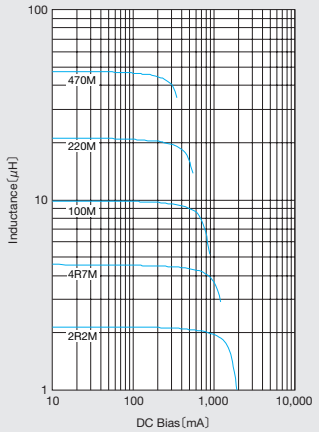
NR 3010



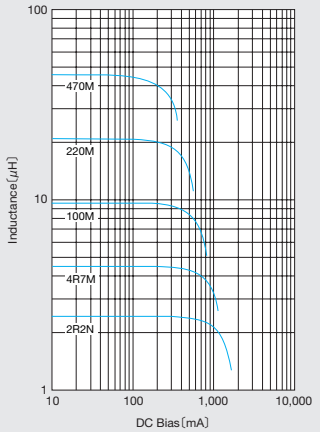
NR 3012



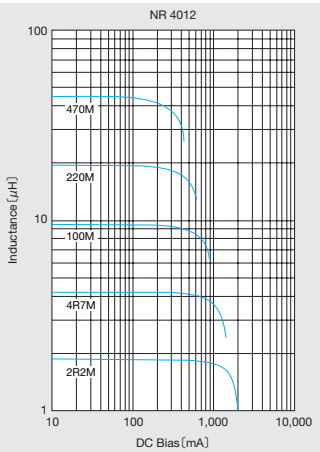
NR 3015



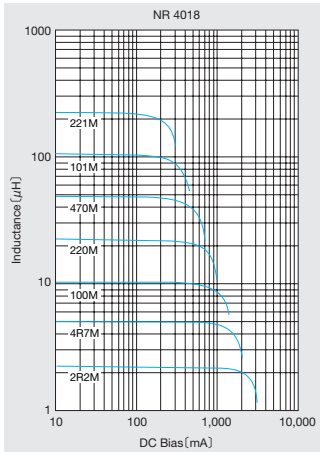
NR 4010



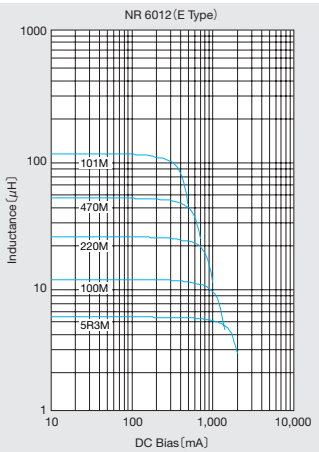
NR 4012



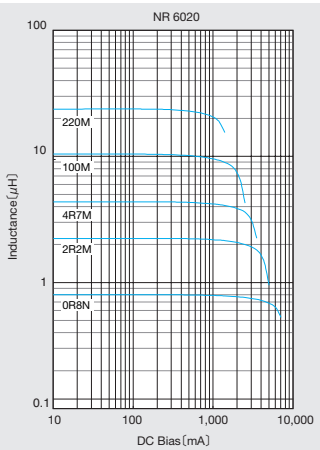
NR 4018



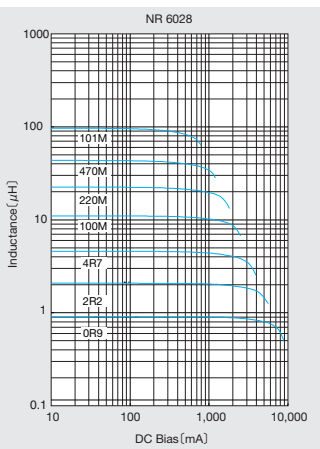
NR 6012 (E Type)



NR 6020



NR 6028



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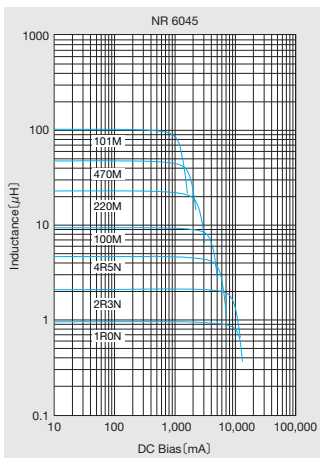

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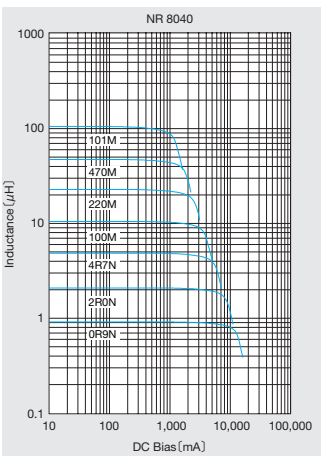
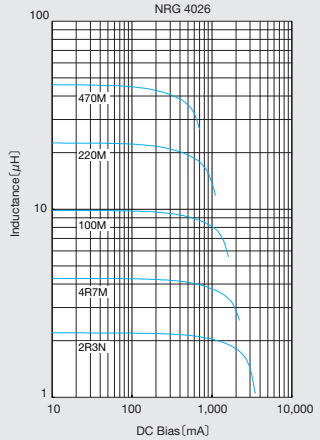


NRG 4026



SMDインダクタ（小型大電流タイプ）
SMD INDUCTORS SMALL AND LARGE CURRENT TYPE

OPERATING TEMP	−25〜+120℃（製品自己発熱含む） （Inducting self-generated heat）

リフロー／REFLOW

特長　FEATURES

・小型、低背インダクタ
・大電流に対応
・シンプルで独自な磁気シールド構造
・耐落下衝撃に強い構造

・Small and Low profile inductor.
・It corresponds to High current.
・Simple and original magnetic shield structure.
・Structure strong against a shock-proof.

用途　APPLICATIONS

・携帯電話、HDD、DVC、DSC、PDA、液晶ディスプレイ等の小型DC/DC コンバータ用途

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

形名表記法　ORDERING CODE

1 形式

NRH	外装樹脂仕様

△＝スペース

2 外径寸法（W×L×H）

例	
2410	2.4×2.4×1.0mm

3 梱包

T△	テーピング

△＝スペース

4 公称インダクタンス〔μH〕

例	
2R2	2.2
100	10
101	100

5 インダクタンス許容差

M	±20%
N	±30%

6 当社管理番号

△	標準品

△＝スペース

N R H 2 4 1 0 T △ 1 0 0 M △

1 2 3 4 5 6

1 Type

NRH	Coating resin specification

△＝Blank Space

2 External dimensions（W×L×H）

example	
2410	2.4×2.4×1.0mm

3 Packaging

T△	Tape and Reel

△＝Blank Space

4 Nominal inductance〔μH〕

example	
2R2	2.2
100	10
101	100

5 Inductance tolerance

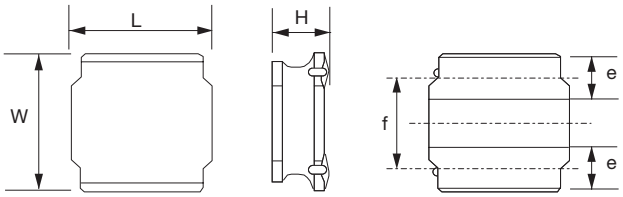
M	±20%
N	±30%

6 Internal code

△	Standard product

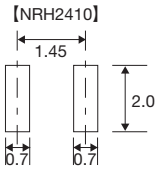
△＝Blank Space

外形寸法　EXTERNAL DIMENSIONS

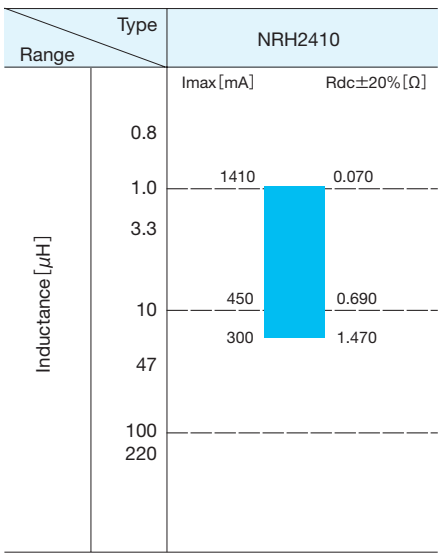


Type	L	W	H	e	f
NRH2410	2.4±0.1 (0.095±0.004)	2.4±0.1 (0.095±0.004)	1.0 max (0.039 max)	0.6±0.2 (0.024±0.008)	1.45±0.2 (0.057±0.008)

推奨ランド　Recommended Land Patterns



概略バリエーション　AVAILABLE INDUCTANCE RANGE



5 FERRITE PRODUCTS

アイテム一覧　PART NUMBERS

NRH 2410 シールドタイプ　Shielded type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±20%)	定格電流 ※) Rated current 〔mA〕		測定 周波数 Measuring frequency 〔kHz〕
							直流重畳許容電流 Saturation current Idc1	温度上昇許容電流 Temperature rise current Idc2	
NRH 2410T 1R0N		RoHS	1	±30%	106	0.070	1,800	1,410	100
NRH 2410T 1R5M		RoHS	1.5		94	0.110	1,550	1,160	
NRH 2410T 2R2M		RoHS	2.2	±20%	77	0.150	1,290	970	
NRH 2410T 3R3M		RoHS	3.3		56	0.220	1,000	770	
NRH 2410T 4R7M		RoHS	4.7		50	0.290	880	670	
NRH 2410T 6R8M		RoHS	6.8		43	0.410	750	570	
NRH 2410T 100M		RoHS	10		32	0.690	550	450	
NRH 2410T 150M		RoHS	15		37	1.02	470	370	
NRH 2410T 220M		RoHS	22		22	1.47	390	300	

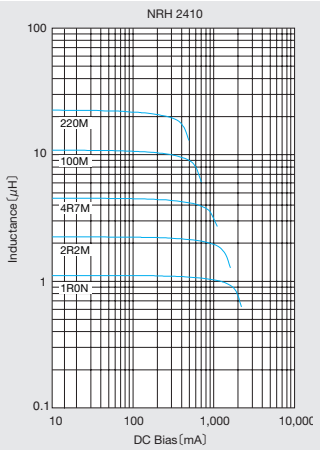
※）直流重畳許容電流（Idc1) は、直流重畳によるインダクタンス低下が 30% 以内となる直流電流値（at 20℃)
※）The saturation current value（Idc1) is the DC current value having inductance decrease down to 30%.（at 20℃)

※）温度上昇許容電流（Idc2) は、温度上昇が 40℃となる直流電流値（at 20℃)
※）The temperature rise current value（Idc2) is the DC current value having temperature increase up to 40℃ .（at 20℃)

※）定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
※）The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

特性図　ELECTRICAL CHARACTERISTICS

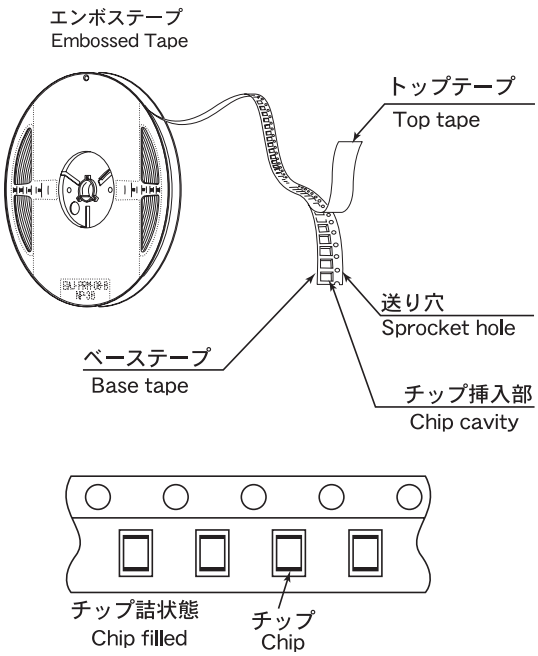
直流重畳特性例　DC Bias characteristics（Measured by HP4285A）



①最小受注単位数 Minimum Quantity

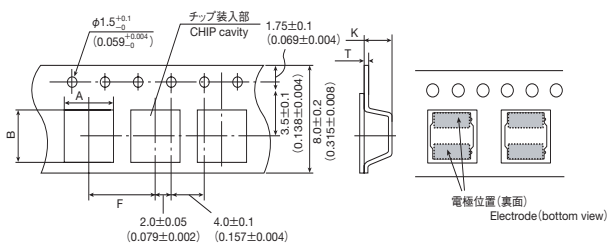
形式 Type	標準数量[個] Standard Quantity [pcs] テーピング Tape & Reel
NR 3012	2000
NR 3015	2000
NR 4010	5000
NR 4012	4500
NR 4018	3500
NR 6012	1000
NR 6020	2500
NR6028	2000
NR 6045	1500
NR 8040	1000

②テーピング材質 Tape Material



③テーピング寸法 Taping dimensions

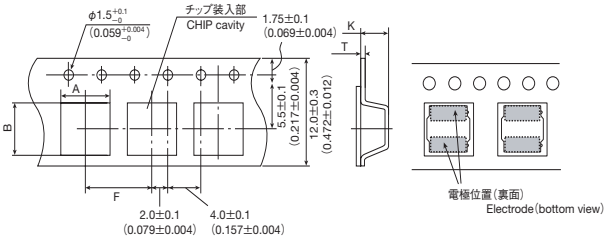
（1）エンボステープ（8mm 幅）Embossed tape（0.315 inches wide）



形　式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
NR 3010	3.2 ± 0.1 (0.126 ± 0.004)	3.2 ± 0.1 (0.126 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	1.4 ± 0.1 (0.055 ± 0.004)
NR 3012	3.2 ± 0.1 (0.126 ± 0.004)	3.2 ± 0.1 (0.126 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	1.6 ± 0.1 (0.063 ± 0.004)
NR 3015	3.2 ± 0.1 (0.126 ± 0.004)	3.2 ± 0.1 (0.126 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	1.9 ± 0.1 (0.075 ± 0.004)

Unit：mm（inch）

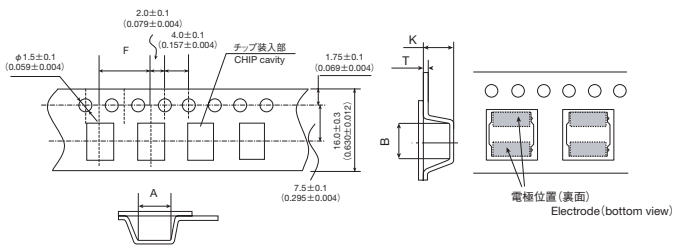
（2）エンボステープ（12mm 幅）Embossed tape（0.47 inches wide）



形式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
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	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)	1.6±0.1 (0.063±0.004)
NR 4018	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)	2.1±0.1 (0.083±0.004)
NRG 4026	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)	3.1±0.1 (0.122±0.004)
NR 6012	6.3±0.1 (0.248±0.004)	6.3±0.1 (0.248±0.004)	8.0±0.1 (0.315±0.004)	0.4±0.1 (0.016±0.004)	1.6±0.1 (0.063±0.004)
NR 6020	6.3±0.1 (0.248±0.004)	6.3±0.1 (0.248±0.004)	8.0±0.1 (0.315±0.004)	0.4±0.1 (0.016±0.004)	2.3±0.1 (0.090±0.004)
NR 6028	6.3±0.1 (0.248±0.004)	6.3±0.1 (0.248±0.004)	8.0±0.1 (0.315±0.004)	0.4±0.1 (0.016±0.004)	3.1±0.1 (0.122±0.004)
NR 6045	6.3±0.1 (0.248±0.004)	6.3±0.1 (0.248±0.004)	8.0±0.1 (0.315±0.004)	0.4±0.1 (0.016±0.004)	4.7±0.1 (0.185±0.004)

Unit：mm（inch）

（3）エンボステープ（16mm 幅）Embossed tape（0.63 inches wide）

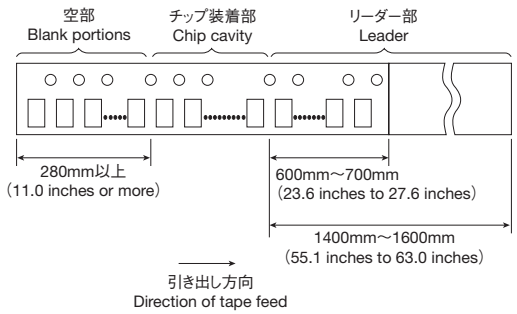


形　式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
NR 8040	8.3 ± 0.1 (0.327 ± 0.004)	8.3 ± 0.1 (0.327 ± 0.004)	12.0 ± 0.1 (0.472 ± 0.004)	0.5 ± 0.1 (0.020 ± 0.004)	4.5 ± 0.1 (0.177 ± 0.004)

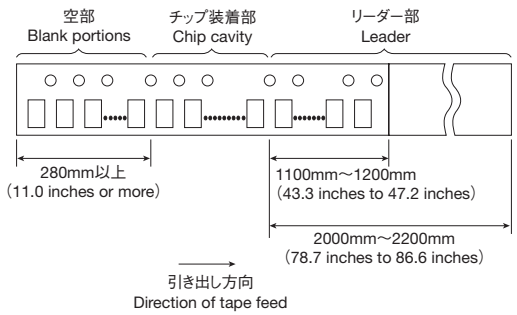
Unit：mm（inch）

④リーダー部・空部　Leader and Blank portion

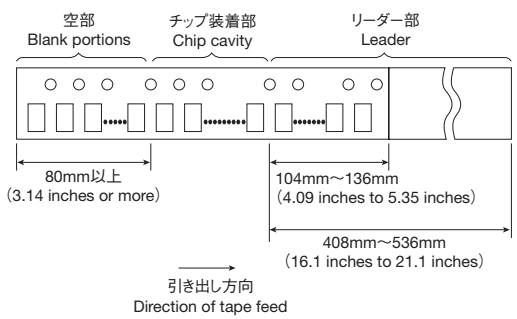
(1) NR 3010, NR 3012, NR 3015



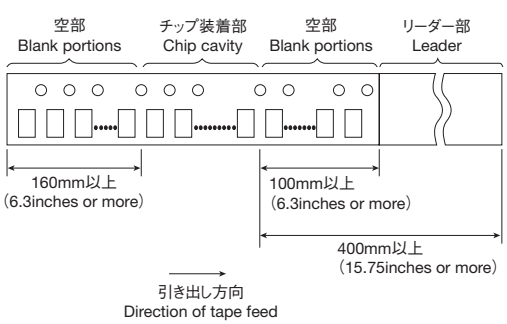
(2) NR 4010, NR 4012, NR 4018



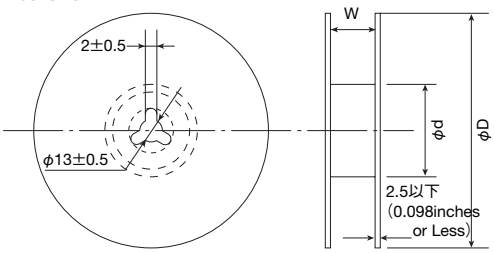
(3) NR 6012



(4) NR 6020, NR 6028, NR 6045, NR 8040

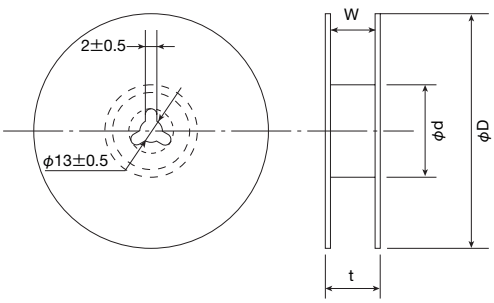


⑤リール寸法　Reel size



形　式 Type	リール寸法 Reel size〔mm〕 (参考値 Reference values)		
	φD	φd	w
NR 3010	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)
NR 3012	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)
NR 3015	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)
NR6012	180±3.0 (7.087±0.019)	60±2.0 (2.36±0.08)	14.0±1.5 (0.551±0.059)

Unit：mm（inch）



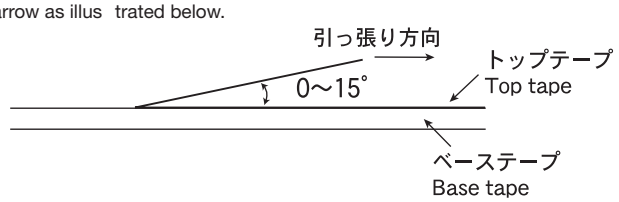
形式 Type	リール寸法　Reel size〔mm〕 (参考値　Reference values)			
	φD	φd	t（max）	w
NR4010	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	18.5 (0.72)	13.5±1.0 (0.531±0.04)
NR4012	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	18.5 (0.72)	13.5±1.0 (0.531±0.04)
NR4018	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	18.5 (0.72)	13.5±1.0 (0.531±0.04)
NRG4026	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)
NR6020	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)
NR6028	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)
NR6045	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)
NR8040	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	22.5 (0.89)	17.5±1.0 (0.689±0.04)

Unit：mm（inch）

⑥トップテープ強度　Top Tape Strength

トップテープのはがし力は、下図矢印方向にて0.1～0.7Nとなります。

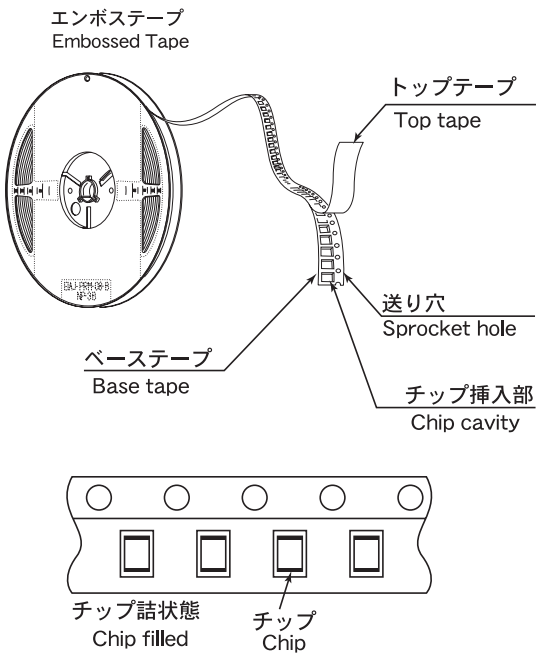
The top tape requires a peel-off force of 0.1 to 0.7N in the direction of the arrow as illus trated below.



①最小受注単位数 Minimum Quantity

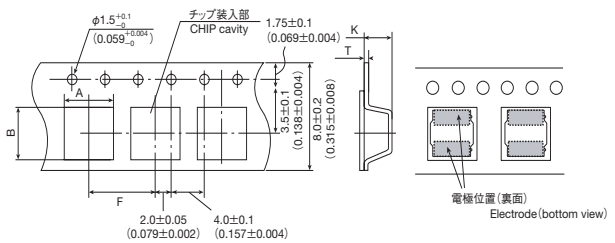
形式 Type	標準数量[個] Standard Quantity [pcs] テーピング Tape & Reel
NRH 2410	2500

②テーピング材質 Tape Material



③テーピング寸法 Taping dimensions

（1）エンボステープ（8mm 幅）Embossed tape（0.315 inches wide）

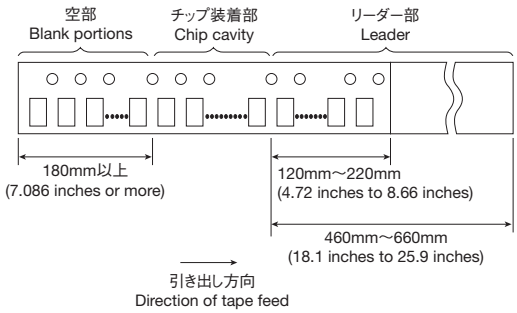


形　式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
NRH2410	2.6 ± 0.1 (0.102 ± 0.004)	2.6 ± 0.1 (0.102 ± 0.004)	4.0 ± 0.1 (0.158 ± 0.004)	0.25 ± 0.05 (0.009 ± 0.002)	1.3 ± 0.1 (0.051 ± 0.004)

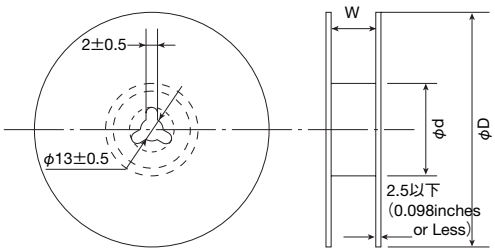
Unit：mm（inch）

④リーダー部・空部 Leader and Blank portion

（1）NRH 2410



⑤リール寸法 Reel size



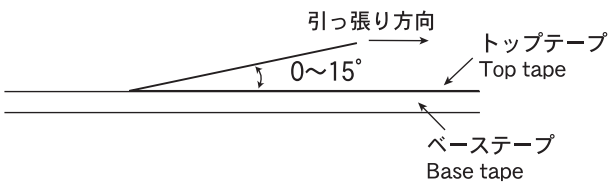
形　式 Type	リール寸法 Reel size〔mm〕（参考値 Reference values）		
	φD	φd	w
NRH2410	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)

Unit：mm（inch）

⑥トップテープ強度　Top Tape Strength

トップテープのはがし力は、下図矢印方向にて0.1～0.7Nとなります。

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



SMDインダクタ（大電流タイプ）
SMD INDUCTORS LARGE CURRENT TYPE

OPERATING TEMP	−25～＋105℃（製品自己発熱含む） −25～＋105℃（Including self-generated heat）

特長　FEATURES

・SMDインダクタ
・大電流に対応
・シンプルで独自な磁気シールド構造

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

用途　APPLICATIONS

PDP TV、LCD TV、HDD、PCなど各種機器の電源回路、DC/DCコンバータ等

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

形名表記法　ORDERING CODE

1 形式

NR△	外装樹脂仕様

△＝スペース

2 形状寸法（W×H）

例	
10050	10.0×5.0mm

3 梱包

T△	テーピング

△＝スペース

4 公称インダクタンス〔μH〕

例	
1R3	1.3
100	10
101	100

5 インダクタンス許容差

M	±20%
N	±30%

6 当社管理番号

△	標準品

△＝スペース

N R △ 1 0 0 5 0 T △ 1 0 0 M △
1 2 3 4 5 6

1 Type

NR△	Coating resin specification

△＝Blank Space

2 External dimensions（W×H）

example	
10050	10.0×5.0mm

3 Packaging

T△	Tape and Reel

△＝Blank Space

4 Nominal inductance〔μH〕

example	
1R3	1.3
100	10
101	100

5 Inductance tolerance

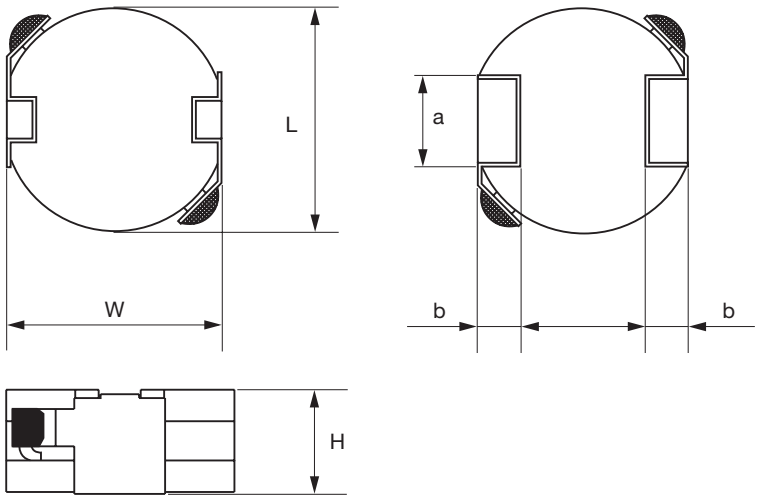
M	±20%
N	±30%

6 Internal code

△	Standard product

△＝Blank Space

外形寸法　EXTERNAL DIMENSIONS



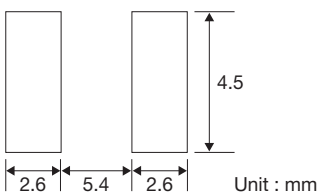
Type	L	W	H	a	b
NR 10050	10.0±0.3 (0.394±0.012)	9.8±0.5 (0.386±0.020)	5.0max (0.197max)	4 (0.16)	1.75 (0.07)

Unit:mm (inch)

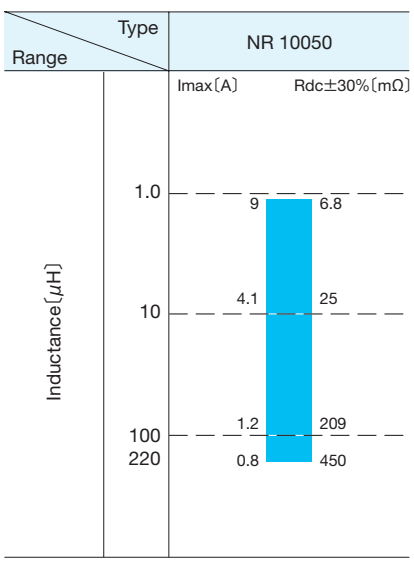
推奨ランドパターン　Recommended Land Patterns

実装上の注意
・実装状態を確認の上ご使用下さいますようお願いいたします。
・本製品のはんだ付けはリフローはんだ工法に限ります。

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



概略バリエーション　AVAILABLE INDUCTANCE RANGE



セレクションガイド Selection Guide P.14
アイテム一覧 Part Numbers P.358
特性図 Electrical Characteristics P.358
梱包 Packaging P.359
信頼性 Reliability Data P.366
使用上の注意 Precautions P.374
etc

アイテム一覧　PART NUMBERS

NR 10050 type

形　名 Ordering code		EHS (Environmental Hazardous Substances)	公　称 インダクタンス Inductance 〔μH〕	インダクタンス 許容差 Inductance Tolerance	自己共振 周 波 数 Self-resonant frequency 〔MHz〕 (min.)	直流抵抗 DC Resistance 〔Ω〕 (±30%)	定格電流 ※) Rated current 〔mA〕		測定 周波数 Measuring frequency 〔kHz〕
							直流重畳許容電流 Saturation current Idc1	温度上昇許容電流 Temperature rise current Idc2	
NR 10050T 1R3N		RoHS	1.3	±30%	53	0.0068	11000	9000	100
NR 10050T 2R1N		RoHS	2.1		37	0.008	10000	8300	
NR 10050T 2R9N		RoHS	2.9		29	0.0093	8200	7300	
NR 10050T 3R8N		RoHS	3.8		26	0.013	7300	6800	
NR 10050T 4R9N		RoHS	4.9		23	0.015	6600	6000	
NR 10050T 6R5N		RoHS	6.5		19	0.018	6000	5200	
NR 10050T 100M		RoHS	10	±20%	15	0.025	4700	4100	
NR 10050T 150M		RoHS	15		11	0.035	3600	3200	
NR 10050T 220M		RoHS	22		10	0.045	2600	2500	
NR 10050T 330M		RoHS	33		8.2	0.066	2500	2100	
NR 10050T 470M		RoHS	47		7.0	0.092	2000	1800	
NR 10050T 680M		RoHS	68		5.6	0.144	1700	1500	
NR 10050T 101M		RoHS	100		4.6	0.209	1300	1200	
NR 10050T 221M		RoHS	220		3.0	0.450	1000	800	

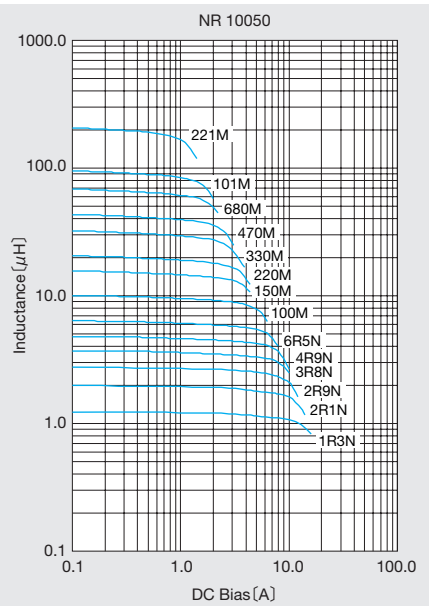
※)直流重畳許容電流(Idc1)は、直流重畳によるインダクタンス低下が30%以内となる直流電流値 (at 20℃)
※)The saturation current value(Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)

※)温度上昇許容電流(Idc2)は、温度上昇が40℃となる直流電流値 (at 20℃)
※)The temperature rise current value(Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)

※)最大定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値 (at 20℃)
※)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℃)

特性図　ELECTRICAL CHARACTERISTICS

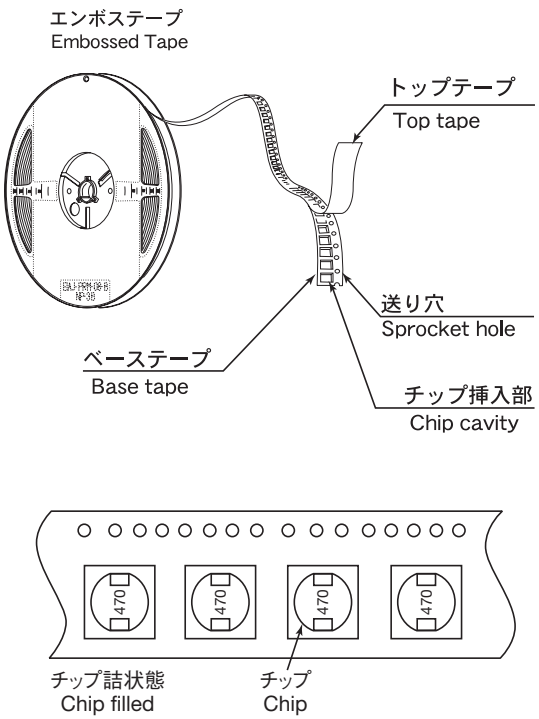
直流重畳特性例　DC Bias characteristics（Measured by HP4285A）



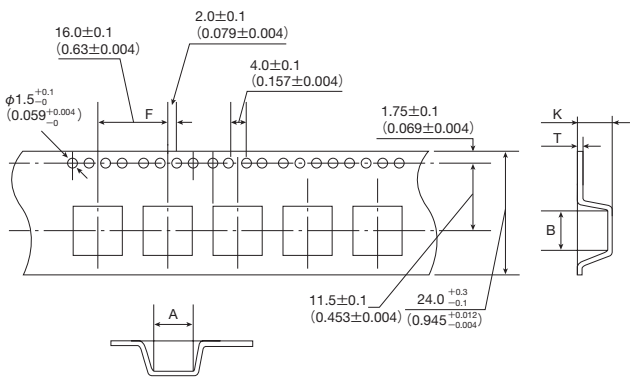
①最小受注単位数　Minimum Quantity

形　式 Type	標準数量 [個] Standard Quantity [pcs]
	テーピング Tape & Reel
NR 10050	500

②テーピング材質　Tape Material



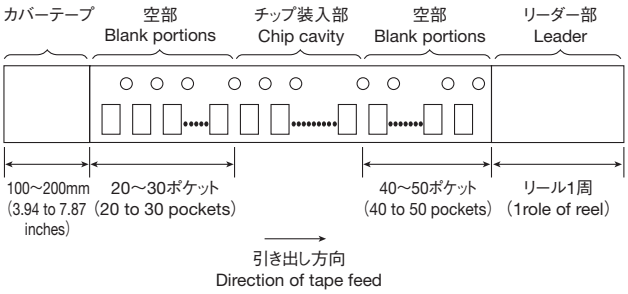
③テーピング寸法　Taping dimensions
エンボステープ（24mm幅）Embossed tape（0.945 inches wide）



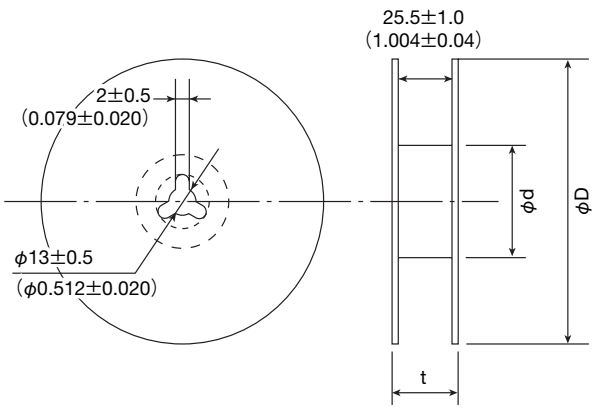
形　式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
NR 10050	10.4±0.1 (0.409±0.004)	9.9±0.1 (0.390±0.004)	16.0±0.1 (0.630±0.004)	0.5±0.05 (0.020±0.002)	5.7±0.1 (0.224±0.004)

Unit：mm（inch）

④リーダー部・空部　Leader and Blank portion



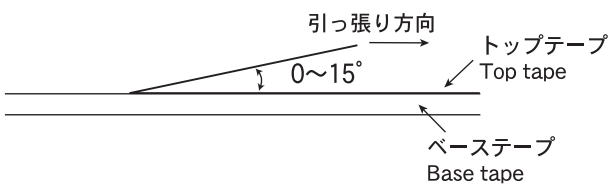
⑤リール寸法　Reel size



形　式 Type	リール寸法 Reel size〔mm〕（参考値 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トップテープ強度　Top Tape Strength
トップテープのはがし力は、下図矢印方向にて0.1～0.7Nとなります。
The top tape requires a peel-off force of 0.1 to 0.7N in the direction of the arrow as illustrated below.



SMD インダクタ（コンパクトタイプ）
SMD INDUCTORS COMPACT TYPE

OPERATING TEMP.	−25〜+105℃（製品自己発熱含む） (Including self-generated heat)

リフロー／REFLOW

特長　FEATURES

・BRC 2016/BRL 3225（新製品）
一面電極構造採用により、最大効率設計を実現しました。
DC/DCコンバータなどの大電流を必要とする、回路設計に適した小型・低背型チップインダクタです。

・BRC 2016/BRL 3225（NEW PRODUCTS）
The best efficiency design is achieved by adopting bottom-surface electrode structure.Small and low-profile Wound Chip Inductors that are suit for module design which needs high electric current like DC/DC converters.

用途　APPLICATIONS

・携帯電話、HDD、DVC、DSC、PDA、液晶ディスプレイ等の小型DC/DCコンバータ用途

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

形名表記法　ORDERING CODE

1

形式	
BR	SMDインダクタ

2

特性仕様	
△	低Rdc
L	低背
C	大電流

3

外形寸法（W×L）：mm(inch)	
1608(0603)	1.6×0.8 mm
2012(0805)	2.0×1.2 mm
2016(0806)	2.0×1.6 mm
2518(1007)	2.5×1.8 mm
3225(1210)	3.2×2.5 mm

4

包装	
T	テーピング

5

公称インダクタンス〔μH〕	
例	
R20	0.2
1R0	1.0
2R2	2.2
4R7	4.7

6

インダクタンス許容差	
M	±20%
K	±10%

7

当社管理番号	
△△△	標準品

△＝スペース

B R △ 2 5 1 8 T 2 R 2 M △ △ △
1 2 3 4 5 6 7

1

Type	
BR	SMD Inductors

2

Characteristic Spec	
L	Low profile
C	High Current

3

外形寸法（W×L）：mm(inch)	
1608(0603)	1.6×0.8 mm
2012(0805)	2.0×1.2 mm
2016(0806)	2.0×1.6 mm
2518(1007)	2.5×1.8 mm
3225(1210)	3.2×2.5 mm

4

Packaging	
T	Tape and Reel

5

Nominal Inductance〔μH〕	
example	
R20	0.2
1R0	1.0
2R2	2.2
4R7	4.7

6

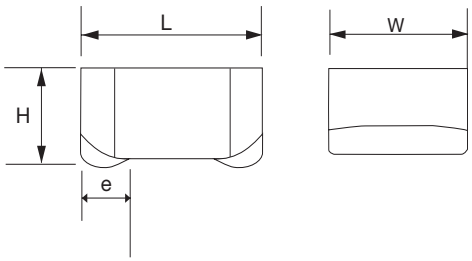
Inductance tolerance	
M	±20%
K	±10%

7

Internal code	
△	Standard product

△=Blank Space

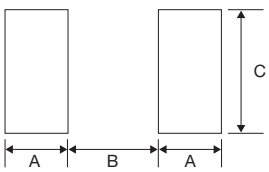
外形寸法　EXTERNAL DIMENSIONS



Unit : mm(inch)

Type	L	W	H	e
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)
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)
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)
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)
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 (0.03±0.008)

推奨ランド　Recommended Land Patterns



Unit : mm

Type	A	B	C
1608	0.55	0.80	1.00
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

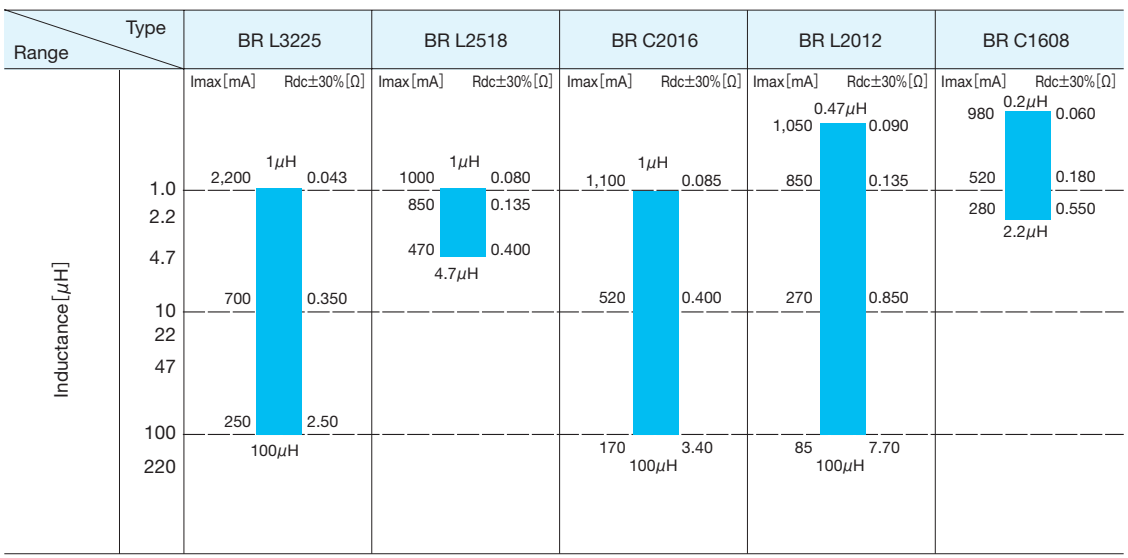
実装上の注意

・実装状態を確認の上ご使用下さいますようお願いいたします。
・本製品のはんだ付けはリフローはんだ工法に限ります。

Surface Mounting

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

概略バリエーション　AVAILABLE INDUCTANCE RANGE



	Inductance	Imax (mA)	Rdc±20% (Ω)	Imax (mA)	Rdc±30% (Ω)	Imax (mA)	Rdc±30% (Ω)	Imax (mA)	Rdc±30% (Ω)	Imax (mA)	Rdc±30% (Ω)
代表値 Examples	1μH	2,200(1.0μH)	0.043(1.0μH)	1,000(1.0μH)	0.080(1.0μH)	1,100(1.0μH)	0.085(1.0μH)	1050(0.47μH)	0.090(0.47μH)	980(0.20μH)	0.060(0.20μH)
	2.2μH	700(10μH)	0.350(10μH)	850(2.2μH)	0.135(2.2μH)	520(10μH)	0.400(10μH)	270(10μH)	0.850(10μH)	520(1.0μH)	0.180(1.0μH)
	4.7μH	250(100μH)	2.50(100μH)	470(4.7μH)	0.400(4.7μH)	170(100μH)	3.40(100μH)	85(100μH)	7.70(100μH)	280(2.2μH)	0.550(2.2μH)

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アイテム一覧 Part Numbers P.362
特性図 Electrical Characteristics P.364
梱包 Packaging P.365
信頼性 Reliability Data P.366
使用上の注意 Precautions P.374
etc

アイテム一覧　PART NUMBERS

BR C1608 type

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流※) Rated current [mA]		測定 周波数 Measuring frequency [MHz]
							直流重畳許容電流 Saturation current Idc1	温度上昇許容 Temperature rise current Idc2	
BR C1608TR20M		RoHS	0.20	±20%	400	0.060	1750	980	7.96
BR C1608TR35M		RoHS	0.35		300	0.080	1400	810	
BR C1608TR45M		RoHS	0.45		200	0.090	1250	800	
BR C1608TR56M		RoHS	0.56		170	0.095	1150	760	
BR C1608TR77M		RoHS	0.77		150	0.110	1000	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

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流※) Rated current [mA]		測定 周波数 Measuring frequency [MHz]
							直流重畳許容電流 Saturation current Idc1	温度上昇許容 Temperature rise current Idc2	
BR L2012TR47M		RoHS	0.47	±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		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	0.796

BR C2016 type

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流※) Rated current [mA]		測定 周波数 Measuring frequency [MHz]
							直流重畳許容電流 Saturation current Idc1	温度上昇許容 Temperature rise current Idc2	
BR C2016T1R0M		RoHS	1.0	±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	±20% ±10%	35	0.400	450	520	
BR C2016T150□		RoHS	15		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	

(注)形名の□にはインダクタンス許容差記号 (MまたはK)が入ります。
・Please specify the inductance tolerance code. (M or K)

※)直流重畳許容電流 (Idc1)は、直流重畳によるインダクタンス低下が−30%以内となる直流電流値 (at 20℃)
The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)

※)温度上昇許容電流 (Idc2)は、温度上昇が40℃となる直流電流値 (at 20℃)
The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)

※)定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
The rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

アイテム一覧　PART NUMBERS

BR L2518 type

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±30%)	定格電流※) Rated current [mA]		測定 周波数 Measuring frequency [MHz]
							直流重畳許容電流 Saturation current Idc1	温度上昇許容 Temperature rise current Idc2	
BR L2518T1R0M		RoHS	1.0	±20%	130	0.080	1600	1000	7.96
BR L2518T1R5M		RoHS	1.5		100	0.100	1200	920	
BR L2518T2R2M		RoHS	2.2		80	0.135	1000	850	
BR L2518T3R3M		RoHS	3.3		70	0.300	800	580	
BR L2518T4R7M		RoHS	4.7		60	0.400	700	470	

BR L3225 type

形名 Ordering code		EHS (Environmental Hazardous Substances)	公称 インダクタンス Inductance [μH]	インダクタンス 許容差 Inductance Tolerance	自己共振 周波数 Self-resonant frequency [MHz] min	直流抵抗 DC Resistance [Ω] (±20%)	定格電流※) Rated current [mA]		測定 周波数 Measuring frequency [MHz]
							直流重畳許容電流 Saturation current Idc1	温度上昇許容 Temperature rise current Idc2	
BR L3225T1R0M		RoHS	1.0	±20%	220	0.043	2,400	2,200	0.10
BR L3225T2R2M		RoHS	2.2		150	0.065	1,850	1,600	
BR L3225T4R7M		RoHS	4.7		120	0.180	1,300	1,000	
BR L3225T100□		RoHS	10	±20% ±10%	70	0.350	900	700	
BR L3225T220□		RoHS	22		50	0.690	550	470	
BR L3225T470□		RoHS	47		40	1.00	420	390	
BR L3225T101□		RoHS	100		30	2.50	270	250	

(注)形名の□にはインダクタンス許容差記号（MまたはK)が入ります。
・Please specify the inductance tolerance code. (M or K)

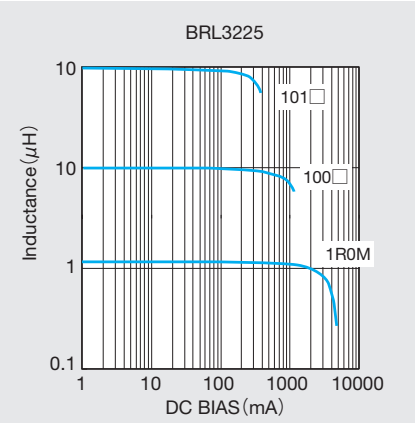
※)直流重畳許容電流（Idc1)は、直流重畳によるインダクタンス低下が−30%以内となる直流電流値（at 20℃）
The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)

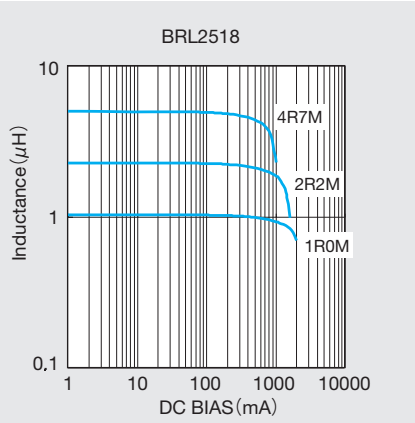
※)温度上昇許容電流（Idc2)は、温度上昇が40℃となる直流電流値（at 20℃）
The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)

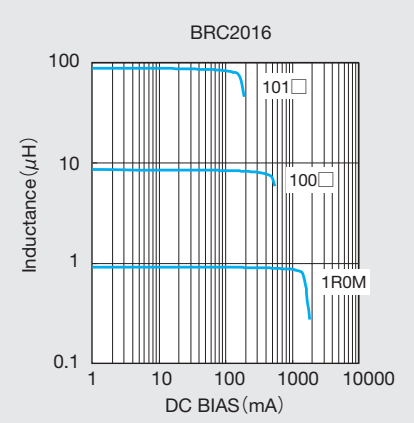
※)定格電流値は直流重畳許容電流、または温度上昇許容電流をいずれも満足する直流電流値
The rated current is the DC current value that satisfies both of DC saturation current value and temperature rise current value.

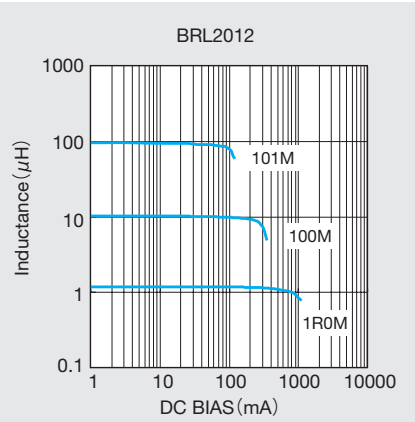
特性図　ELECTRICAL CHARACTERISTICS

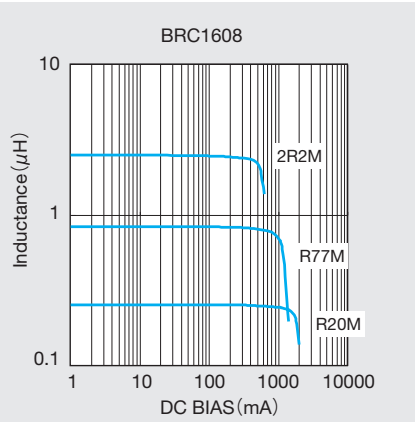
直流重畳特性例　DC Bias characteristics（Measured by HP4285A）



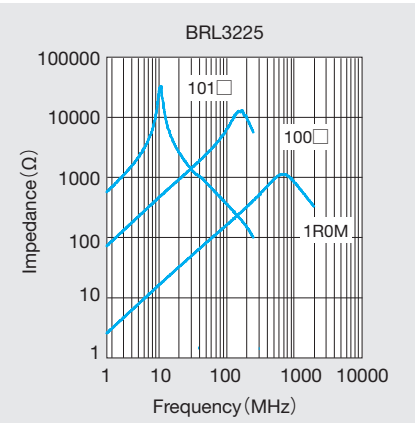


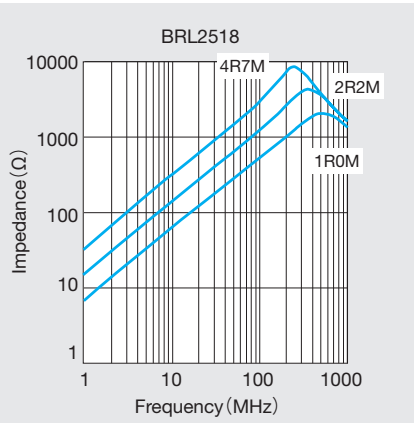


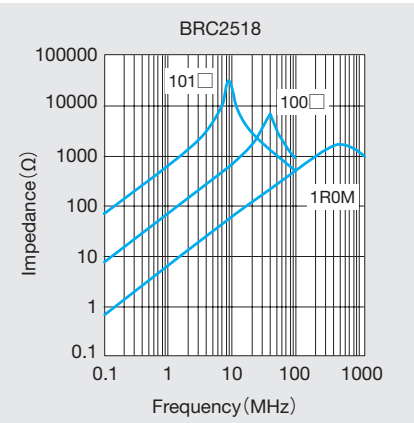


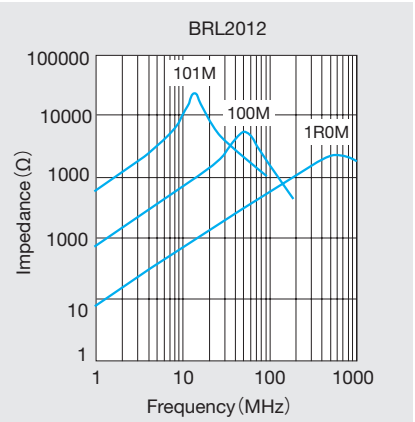


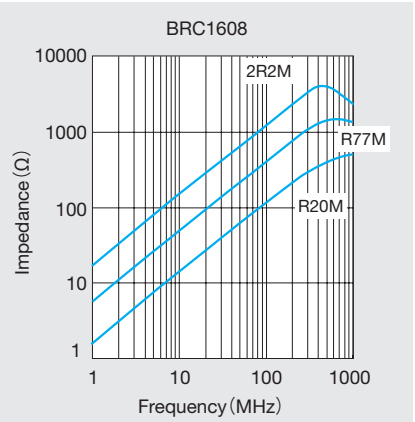
インピーダンス周波数特性　Impedance-vs-Frequency characteristics（Measured by HP4291A）







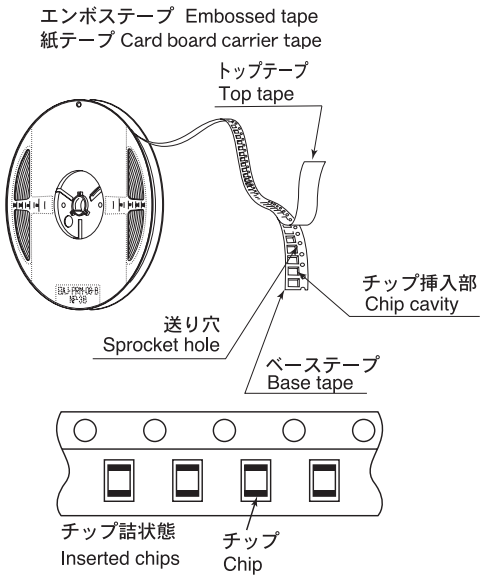




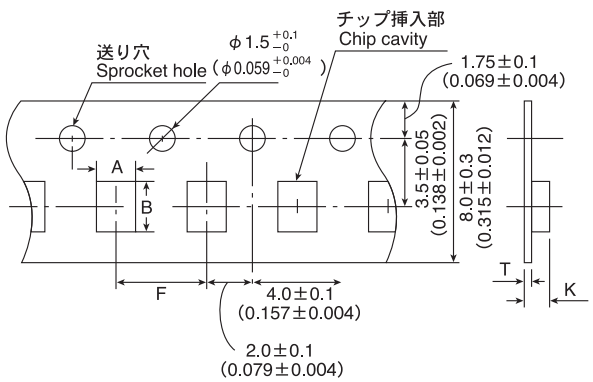
①最小受注単位数　Minimum Quantity

型式 Type	標準数量[個] Standard Quantity [pcs]	
	紙テーピング Paper Tape	エンボステーピング Embossed Tape
BR C1608	—	3000
BR L2012	—	3000
BR C2016	—	2000
BR L2518	—	3000
BR L3225	—	2000

②テーピング材質　Tape Material



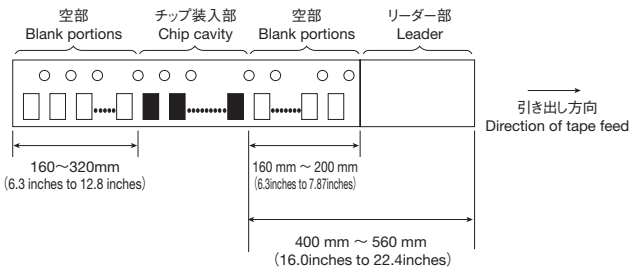
③テーピング寸法　Taping dimensions
エンボステープ（8mm幅）Embossed Tape（0.315 inches wide）
紙テープ（8mm幅）Card board carrier tape（0.315 inches wide）



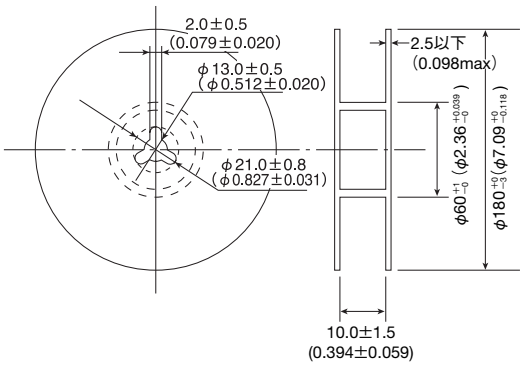
形式 Type	チップ挿入部 Chip cavity		挿入ピッチ Insertion pitch	テープ厚み Tape thickness	
	A	B	F	T	K
BR C1608	1.1±0.5 (0.04±0.002)	1.9±0.5 (0.076±0.002)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.01±0.002)	1.35max (0.054)
BR L2012	1.40±0.1 (0.056±0.004)	2.20±0.1 (0.088±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.01±0.002)	1.2max (0.048)
BR C2016	1.9 ± 0.2 (0.075 ± 0.008)	2.2 ± 0.2 (0.087 ± 0.008)	4.0 ± 0.1 (0.157 ± 0.004)	0.3 ± 0.05 (0.012 ± 0.002)	2.15MAX (0.085MAX)
BR L2518	2.3±0.2 (0.092±0.008)	2.8±0.2 (0.112±0.008)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.5 max (0.060)
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)	1.75 MAX (0.075)

Unit : mm (inch)

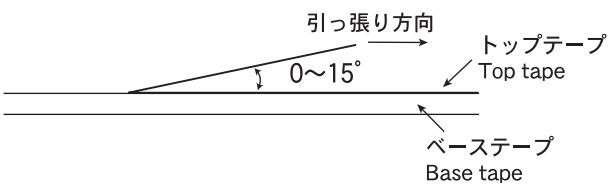
④リーダー部・空部　Leader and Blank portion

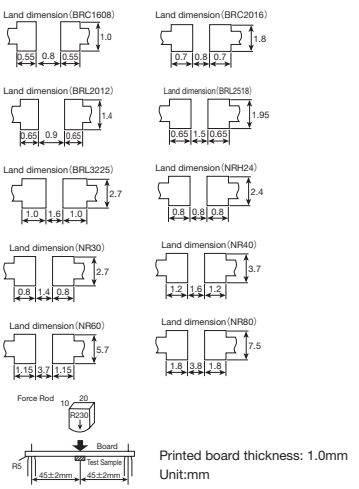


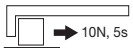
⑤リール寸法　Reel size



⑥トップテープ強度　Top Tape Strength
トップテープのはがし力は、下図矢印方向にて0.2～0.7Nとなります。
The top tape requires a peel-off force of 0.2 to 0.7N in the direction of the arrow as illustrated below.



Item	Specifled Value			Test Method and Remarks
	BRC1608, BRL2012, BRC2016, BRL2518, BRL3225 Type	NRH24, NR30/40/60/80, NRG40 Type	NR10050 Type	
1.Operating Temperature Range	−25℃～+105℃	−25℃～+120℃	−25℃～+105℃	Including self-generated heat
2.Storage Temperature Range	−40℃～+85℃			BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type, NRH24, NR30/40/60/80, NRG4026Type ：0 to 40℃ for the product with taping. NR10050 Type：0 ～40℃ for the product with taping.
3.Rated current	Within the specified tolerance			The maximum DC value having inductance decrease within specified value and temperature increase within 40℃ by the application of DC bias. Inductance decrease BRC1608,BRL2012,BRC2016,BRL2518, BRL3225Type, NRH24, NR30/40/60/80,NRG40Type, NR10050Type: 30%
4.Inductance	Within the specified tolerance			BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type LCR Meter：HP 4285A or equivalent, Measuring frequency:Specified frequency NRH24, NR30/40/60/80, NRG4026Type ： LCR Meter：HP 4285A or equivalent, 100KHz, 1V NR10050Type：LCR Meter：HP 4263A or equivalent, 100KHz, 1V
5.DC Resistance	Within the specified tolerance			DC ohmmeter：HIOKI 3227 or equivalent
6.Self resonance frequency	Within the specification			BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type, NRH24, NR30/40/60/80Type, NR10050Type： Inpedance analyzer/material analyzer：HP4291A or equivalent HP4191A, 4192A or equivalent
7.Temperature characteristic	BRL2012, BRC2016, BRL2518, BRL3225 Inductance change： Within±15% BRC1608 Inductance change： Within±20%	Inductance change： Within±20%		BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type, NRH24, NR30/40/60/80, NRG4026Type ，NR10050Type： 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 oparating temperature Temperature st step 5: 20℃
8.Resistance to flexure of substrate	No damage.			BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type, NRH24, NR30/40/60/80, NRG4026Type ： 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：0.15(BR Series) 0.10(NR Series)  Printed board thickness: 1.0mm Unit:mm
9.Insulation resistance： between wires				
10.Insulation resistance： between wire and core				
11.Withstanding voltage： between wires and core				

Item	Specifled Value			Test Method and Remarks
	BRC1608, BRL2012, BRC2016, BRL2518, BRL3225 Type	NRH24, NR30/40/60/80, NRG40 Type	NR10050 Type	
12.Adhesion of terminal electrode	Shall not come off PC board.			BRC1608,BRL2012,BRC2016,BRL2518, BRL3225Type, NRH24, NR30/40/60/80, NRG40Type： The test samples shall be soldered to the test board by the reflow. pplied force：10N to X and Y directions. Duration：5s. Solder cream thickness：0.15mm.  NR10050Type： Applied force：5N to X and Y directions. Duration：5s.
13.Resistance to vibration	Inductance change：Within±10% No significant abnormality in appearance.			BRC1608,BRL2012,BRC2016,BRL2518, BRL3225Type, NRH24, NR30/40/60/80, NRG40Type, NR10050Type： The test samples shall be soldered to the test board by the reflow. Then it shall be submitted to below test conditions. <table><tr><td>Frequency Range</td><td colspan="2">10～55Hz</td></tr><tr><td>Total Amplitude</td><td colspan="2">1.5mm (May not exceed acceleration 196 m/S^2)</td></tr><tr><td>Sweeping Method</td><td colspan="2">10Hz to 55Hz to 10 Hz for 1 min.</td></tr><tr><td rowspan="3">Time</td><td>X</td><td rowspan="3">For 2 hours on each X, Y, and Z axis.</td></tr><tr><td>Y</td></tr><tr><td>Z</td></tr></table> Recovery：At least 2hrs of recovery under the standard condition sfter the test, followed by the measurement within 48 hrs.
14.Solderability	At least 90%of surface of terminal electrode is covered by new solder.			BRC1608,BRL2012,BRC2016,BRL2518, BRL3225Type, NRH24, NR30/40/60/80, NRG40Type, NR10050Type： 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%. NRH24, NR30/40/60/80Type,NR10050 Type： <table><tr><td>Solder Temperature</td><td>245±5℃</td></tr><tr><td>Time</td><td>5±1.0sec</td></tr></table> BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type： <table><tr><td>Solder Temperature</td><td>245±5℃</td></tr><tr><td>Time</td><td>5±0.5sec</td></tr></table> ※Immersion depth ： All sides of mounting terminal shall be immersed.

<table>
<tr><th rowspan="2">Item</th><th colspan="3">Specifled Value</th><th rowspan="2">Test Method and Remarks</th></tr>
<tr><th>BRC1608, BRL2012, BRC2016, BRL2518, BRL3225 Type</th><th>NRH24, NR30/40/60/80, NRG40 Type</th><th>NR10050 Type</th></tr>
<tr><td>15.Resistance to soldering heat</td><td colspan="3">Inductance change：Within±10%
No significant abnormality in appearance.</td><td>BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type：
3 times of reflow oven at 230℃MIN for 40 sec. with peak temperature at 260 $^{+0}_{-5}$℃ for 5 sec.

NRH24, NR30/40/6012・6028・6045/80,
NRG40Type, NR10050 Type：
The test sample shall be exposed to reflow oven at 230±5℃ for 40 seconds, with peak temperature at 260±5℃ for 5 seconds, 2 times.
NR6020Type：
The test sample shall be exposed to reflow oven at 230±5℃ for 40 seconds, with peak temperature at 250 $^{+5}_{-0}$℃ for 5 seconds, 2 times.
Test board thickness：1.0 mm
Test board material : glass epoxy-resin</td></tr>
<tr><td>16.Thermal shock</td><td colspan="3">Inductance change：Within±10%
No significant abnormality in appearance.</td><td>BRC1608,BRL2012,BRC2016,BRL2518,
BRL3225Type, NRH24, NR30/40/60/80, NRG40Type,
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 (℃) | Duration (min)
1 | −40±3 | 30±3
2 | Room temperature | Within 3
3 | +85±2 | 30±3
4 | Room temperature | Within 3</td></tr>
<tr><td>17.Damp heat</td><td colspan="2">Inductance change：Within±10%
No significant abnormality in appearance.</td><td></td><td>BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type：
Temperature 60±2℃
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.

NRH24, NR30/40/60/80, NRG40Type：
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℃
Humidity 90～95%RH
Time 500±24hour</td></tr>
</table>

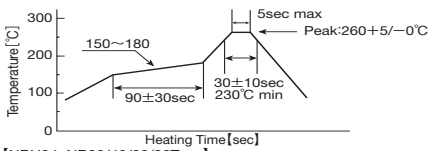
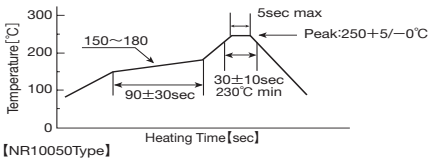
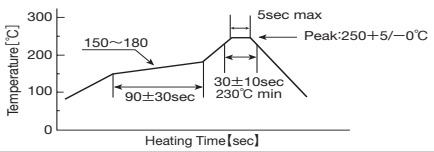
<table>
<tr><th rowspan="2">Item</th><th colspan="3">Specifled Value</th><th rowspan="2">Test Method and Remarks</th></tr>
<tr><th>BRC1608, BRL2012, BRC2016, BRL2518, BRL3225 Type</th><th>NRH24, NR30/40/60/80, NRG40 Type</th><th>NR10050 Type</th></tr>
<tr><td>18.Loading under damp heat</td><td colspan="3">Inductance change：Within±10%
No significant abnormality in appearance.</td><td>BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type：
Temperature 60±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.

NRH24, NR30/40/60/80, NRG40Type, 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±2℃
Humidity 90～95%RH
Applied current Rated current
Time 500±2hour</td></tr>
<tr><td>19.Low temperature life test</td><td colspan="3">Inductance change：Within±10%
No significant abnormality in appearance.</td><td>BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type：
Temperature −40±2℃
Duration 1000hours
Recovery： At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

NRH24, NR30/40/60/80, NRG40Type, 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±3℃
Time 500±24hour</td></tr>
<tr><td>20.High temperature life test</td><td>Inductance change：
Within±10%
No significant abnormality in appearance.</td><td></td><td>Inductance change：
Within±10%
No significant abnormality in appearance.</td><td>BRC1608,BRL2012,BRC2016,BRL2518,BRL3225Type：
Temperature 85±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±3℃
Time 500±24hour
Recovery： At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.</td></tr>
<tr><td>21.Loading at high temperature life test</td><td></td><td>Inductance change：
Within±10%
No significant abnormality in appearance.</td><td></td><td>NRH24, NR30/40/60/80, NRG40Type：
The test samples shall be soldered to the test board by the reflow soldering
Temperature 85±2℃
Applied current Rated current
Time 500±24hour</td></tr>
<tr><td>22.Standard condition</td><td colspan="3">Standard test condition ： Unless otherwise specified, temperature is 20±15% and 65±20%of relative humidity.
When there are question concerning measurement result : In order to provide correlation date, the test shall be condition of 20±2℃ of temperature, 65±5% relative humidity.
Inductance is in accordance with our measured value.</td><td></td></tr>
</table>

SMD Inductors

Stages	Precautions	Technical considerations
1.Circuit Design	Operating environment, 1.The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.	
2.PCB Design	Land pattern design 1.Please refer to a recommended land pattern.	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	Adjustment of mounting machine 1.Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2.Mounting and soldering conditions should be checked beforehand.	1. When installing products, care should be taken not to apply distortion stress as it may deform the products.
4.Soldering	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 ℃ Duration - 3 seconds or less The soldering iron should not directly touch the inductor.	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, BRL3225Type】 Recommended reflow condition（Pb free solder）  【NRH24, NR30/40/60/80Type】 Recommended reflow condition（Pb free solder）  【NR10050Type】 Recommended reflow condition（Pb free solder） 
5.Cleaning	Cleaning conditions 1.Washing by supersonic waves shall be avoided.	1.If washing by supersonic waves, supersonic waves may cause broken products.
6.Handling	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.	1.Planning pattern configurations and the position of products should be carefully performed to minimize stress. 1.There is a case to be damaged by a mechanical shock. 2.There is a case to be broken by the handling in transportation. 1.Damage and a characteristic can vary with an excessive shock or stress. 1.There is a case that transformation and a product of tape are damaged by accumulation of a packing box.
7.Storage conditions	Storage 1.To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. ・Recommended conditions Ambient temperature 0~40℃ Humidity Below 70% RH The ambient temperature must be kept below 30℃. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, 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.	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.