有关敝公司产品的注意事项 【高度安全性，可靠性的应用设备(汽车室内 / 产业机器)】

请务必在使用敝司产品之前阅读。

⚠ 注 意

- 本产品目录中所记载的内容为2017年10月之内容。因改良等原因，可能会不经预告而变更记载内容，所以请务必在使用前先确认最新的产品信息。未按照本产品目录中所记载的内容或交货规格说明书使用敝公司产品的，即便其致使使用设备发生损害、瑕疵等时，敝公司也不承担任何责任，敬请悉知。

- 就规格相关的详细内容，敝公司备有交货规格说明书，详情请向敝公司咨询。

- 使用敝公司产品时，请务必事先安装到设备之后，在实际使用的环境下进行评估和确认。

- 本产品目录中所记载的产品可使用于一般电子设备（音像设备、办公自动化设备、家电产品、办公设备、信息/通讯设备）、医疗设备（国际（IMDRF）第一类，第二类）、产业机器、室内电灯等。若考虑将本产品目录中所记载的产品使用于可能会直接危及生命或身体的设备［运输用设备（汽车驱动控制设备、火车控制设备、船舶控制设备等）、交通用信号设备、医疗设备（国际（IMDRF）第三类）］等的，请务必事先向敝公司咨询。

  另外，请勿将敝公司产品使用于对安全性和可靠性要求较高的设备（航天设备、航空设备※、医疗设备（国际（IMDRF）第四类）、原子能控制设备、海底设备、军事设备等）。

  ※ 注释：仅限于对航空设备的安全运行不产生直接干扰的设备[机内娱乐设备、机内照明设备、电动座椅、餐饮设备等]，在满足敝公司另行指定的相关条件时，亦可将敝公司产品用于以上用途。在贵公司考虑将敝公司的产品用于以上用途时，请务必事先向敝公司咨询相关的信息。

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- 出口相关注意事项

  本产品目录中所记载的部分产品在出口时须事先确认《外汇和对外贸易法》以及美国出口管理的相关法规，并办理相关手续。如有不明之处，请向敝公司咨询。

SMD 功率电感器(NR系列 H型 / S型 / V型)

回流焊
AEC-Q200

■型号标示法

*使用温度范围 : -40～125℃ (包括本身发热)

N	R	△	4	0	1	8	T	△	1	0	0	M	△	V
①			②				③		④			⑤	⑥	⑦

△=空格

①类型

代码	类型
NRH	外装树脂规格
NRS	
NRV	

②尺寸 (L×W×H)

代码	尺寸 (L×W×H) [mm]
2010	2.0×2.0×1.0
2012	2.0×2.0×1.2
2410	2.4×2.4×1.0
2412	2.4×2.4×1.2
3010	3.0×3.0×1.0
3012	3.0×3.0×1.2
3015	3.0×3.0×1.5
4010	4.0×4.0×1.0
4012	4.0×4.0×1.2
4018	4.0×4.0×1.8
5010	4.9×4.9×1.0
5012	4.9×4.9×1.2
5014	4.9×4.9×1.4
5020	4.9×4.9×2.0
5024	4.9×4.9×2.4
5030	4.9×4.9×3.0
5040	4.9×4.9×4.0
6010	6.0×6.0×1.0
6012	6.0×6.0×1.2
6014	6.0×6.0×1.4
6020	6.0×6.0×2.0
6028	6.0×6.0×2.8
6045	6.0×6.0×4.5
8030	8.0×8.0×3.0
8040	8.0×8.0×4.0

③包装

代码	包装
T△	卷盘带装

④标称电感值

代码 (例)	标称电感值 [μH]
2R2	2.2
100	10
101	100

※R=小数点

⑤电感量公差

代码	电感量公差
M	±20%
N	±30%

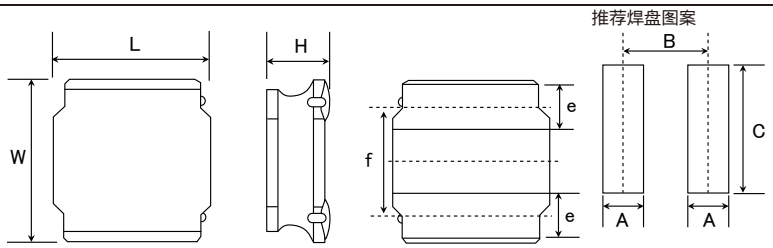
⑥个别规格

代码	个别规格
△	标准

⑦本公司管理记号

代码	本公司管理记号
V	产业机器/车内用途

■标准外型尺寸 / 标准数量



Type	A	B	C
NRV2010	0.65	1.35	2.0
NRV2012, NRS2012			
NRH2410	0.7	1.45	2.0
NRH2412			
NRH3010	0.8	2.2	2.7
NRH3012, NRV3012			
NRS3015			
NRS4010	1.2	2.8	3.7
NRS4012			
NRS4018			
NRS8030	1.8	5.6	7.5
NRS8040			

单位: mm

Type	L	W	H	e	f	标准数量 [pcs] 卷盘带装
NRV2010	2.0±0.1 (0.079±0.004)	2.0±0.1 (0.079±0.004)	1.0 max (0.039 max)	0.5±0.2 (0.024±0.008)	1.25±0.2 (0.050±0.008)	2500
NRV2012 NRS2012	2.0±0.1 (0.079±0.004)	2.0±0.1 (0.079±0.004)	1.2 max (0.047 max)	0.5±0.2 (0.024±0.008)	1.25±0.2 (0.050±0.008)	2500
NRH2410	2.4±0.1 (0.095±0.00)	2.4±0.1 (0.095±0.004)	1.0 max (0.039 max)	0.6±0.2 (0.024±0.008)	1.45±0.2 (0.057±0.008)	2500
NRH2412	2.4±0.1 (0.095±0.004)	2.4±0.1 (0.095±0.004)	1.2 max (0.047 max)	0.6±0.2 (0.024±0.008)	1.45±0.2 (0.057±0.008)	2500

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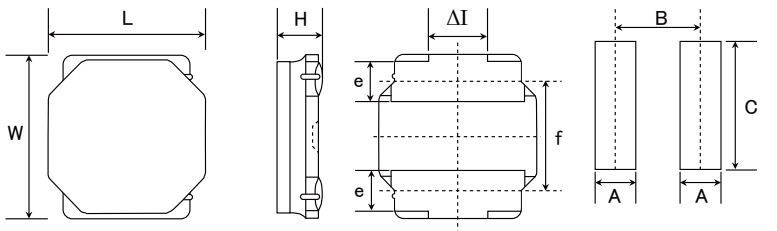
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

NRH3010	3.0±0.1 (0.118±0.004)	3.0±0.1 (0.118±0.004)	1.0 max (0.039 max)	0.9±0.2 (0.035±0.008)	1.9±0.2 (0.075±0.008)	2000
NRH3012 NRV3012	3.0±0.1 (0.118±0.004)	3.0±0.1 (0.118±0.004)	1.2 max (0.047 max)	0.9±0.2 (0.035±0.008)	1.9±0.2 (0.075±0.008)	2000
NRS3015	3.0±0.1 (0.118±0.004)	3.0±0.1 (0.118±0.004)	1.5 max (0.059 max)	0.9±0.2 (0.035±0.008)	1.9±0.2 (0.075±0.008)	2000
NRS4010	4.0±0.2 (0.157±0.008)	4.0±0.2 (0.157±0.008)	1.0 max (0.039 max)	1.1±0.2 (0.043±0.008)	2.5±0.2 (0.098±0.008)	5000
NRS4012	4.0±0.2 (0.157±0.008)	4.0±0.2 (0.157±0.008)	1.2 max (0.047 max)	1.1±0.2 (0.043±0.008)	2.5±0.2 (0.098±0.008)	4500
NRS4018	4.0±0.2 (0.157±0.008)	4.0±0.2 (0.157±0.008)	1.8 max (0.071 max)	1.1±0.2 (0.043±0.008)	2.5±0.2 (0.098±0.008)	3500
NRS8030	8.0±0.2 (0.315±0.008)	8.0±0.2 (0.315±0.008)	3.0 max (0.118 max)	1.60±0.3 (0.063±0.012)	5.6±0.3 (0.22±0.012)	1000
NRS8040	8.0±0.2 (0.315±0.008)	8.0±0.2 (0.315±0.008)	*1) 4.2 max (0.165 max) *2) 4.0 max (0.157 max)	1.60±0.3 (0.063±0.012)	5.6±0.3 (0.22±0.012)	1000

*1) 0R9～6R8 型 *2) 100～101 型

单位: mm (inch)

推荐焊盘图案



Type	A	B	C
NRS5010	1.5	3.6	4.0
NRS5012			
NRS5014			
NRS5020			
NRS5024			
NRS5030			
NRS5040			
NRS6010	1.6	4.7	5.7
NRS6012			
NRS6014			
NRS6020			
NRS6028			
NRS6045			

单位: mm

Type	L	W	H	e	f	ΔI	标准数量 [pcs] 卷盘带装
NRS5010	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	1.0 max (0.039 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	1000
NRS5012	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	1.2 max (0.047 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	1000
NRS5014	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	1.4 max (0.055 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	1000
NRS5020	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	2.0 max (0.079 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	800
NRS5024	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	*3) 2.5 max (0.098 max) *4) 2.4 max (0.094 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	2500
NRS5030	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	*5) 3.1 max (0.122 max) *6) 3.0 max (0.118 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	500
NRS5040	4.9±0.2 (0.193±0.008)	4.9±0.2 (0.193±0.008)	*7) 4.1 max (0.161 max) *8) 4.0 max (0.157 max)	1.2±0.2 (0.047±0.008)	3.3±0.2 (0.130±0.008)	1.3typ (0.051typ)	1500
NRS6010	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	1.0 max (0.039 max)	1.35±0.2 (0.053±0.008)	4.0±0.2 (0.157±0.008)	2.3typ (0.091typ)	1000
NRS6012	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)	4.0±0.2 (0.157±0.008)	2.3typ (0.091typ)	1000
NRS6014	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	1.4 max (0.055 max)	1.35±0.2 (0.053±0.008)	4.0±0.2 (0.157±0.008)	2.3typ (0.091typ)	1000
NRS6020	6.0±0.2 (0.236±0.008)	6.0±0.2 (0.236±0.008)	2.0 max (0.079 max)	1.35±0.2 (0.053±0.008)	4.0±0.2 (0.157±0.008)	2.3typ (0.091typ)	2500
NRS6028	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)	4.0±0.2 (0.157±0.008)	2.3typ (0.091typ)	2000
NRS6045	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)	4.0±0.2 (0.157±0.008)	2.3typ (0.091typ)	1500

*3) 1R0～1R5 型 *4) 2R2～330 型
*5) R47～100 型 *6) 150～470 型
*7) 1R5～100 型 *8) 150～470 型

单位: mm (inch)

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■型号一览

・产品目录中的SMD功率电感器全部属于RoHS对应品。

注）
・根据使用电路和机器，需要按照相应规格处理。请务必咨询正规销售渠道。

・*1：面向汽车室内用途（AEC-Q200 Qualified）的产品。
＜ AEC-Q200 ：AEC-Q200 qualified＞
*1标志的SMD功率电感器，已实施代表项目的AEC-Q200对应评价试验。
关于本产品的详细规格和评估测试结果等信息，请咨询官方销售渠道。
此外，订购时请索取产品规格书。
・*2：面向工业设备、医疗设备的产品。

●NRV2010

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRV2010T R47N GFV	0.47	±30%	–	0.052	2,100	2,000	100	*1, *2
NRV2010T R68N GFV	0.68	±30%	–	0.060	1,850	1,850	100	*1, *2
NRV2010T 1R0N GFV	1.0	±30%	–	0.080	1,550	1,600	100	*1, *2
NRV2010T 1R5M GFV	1.5	±20%	–	0.100	1,350	1,450	100	*1, *2
NRV2010T 2R2M GFV	2.2	±20%	–	0.175	1,100	1,100	100	*1, *2
NRV2010T 3R3M GFV	3.3	±20%	–	0.250	880	1,000	100	*1, *2
NRV2010T 4R7M GFV	4.7	±20%	–	0.320	760	820	100	*1, *2

●NRV2012

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRV2012T 1R0N GFV	1.0	±30%	–	0.073	2,200	1,650	100	*1, *2
NRV2012T 1R5N GFV	1.5	±30%	–	0.100	1,800	1,400	100	*1, *2
NRV2012T 2R2M GFV	2.2	±20%	–	0.129	1,600	1,200	100	*1, *2
NRV2012T 3R3M GFV	3.3	±20%	–	0.227	1,250	900	100	*1, *2
NRV2012T 4R7M GFV	4.7	±20%	–	0.325	1,100	750	100	*1, *2

●NRS2012 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS2012T 1R0N GJV	1.0	±30%	–	0.070	1,900	1,700	100	*1, *2
NRS2012T 1R5N GJV	1.5	±30%	–	0.090	1,650	1,500	100	*1, *2
NRS2012T 2R2M GJV	2.2	±20%	–	0.107	1,350	1,370	100	*1, *2
NRS2012T 3R3M GJV	3.3	±20%	–	0.190	1,000	1,020	100	*1, *2
NRS2012T 4R7M GJV	4.7	±20%	–	0.241	900	910	100	*1, *2

●NRH2410 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRH2410T R68NN 4V	0.68	±30%	120	0.060	2,200	1,570	100	*1, *2
NRH2410T 1R0NN 4V	1.0	±30%	106	0.070	1,800	1,410	100	*1, *2
NRH2410T 1R5MN V	1.5	±20%	94	0.110	1,550	1,160	100	*1, *2
NRH2410T 2R2MN V	2.2	±20%	77	0.150	1,290	970	100	*1, *2
NRH2410T 3R3MN V	3.3	±20%	56	0.220	1,000	770	100	*1, *2
NRH2410T 4R7MN V	4.7	±20%	50	0.290	880	670	100	*1, *2
NRH2410T 6R8MN V	6.8	±20%	43	0.410	750	570	100	*1, *2
NRH2410T 100MN V	10	±20%	32	0.690	550	450	100	*1, *2
NRH2410T 150MN V	15	±20%	27	1.02	470	370	100	*1, *2
NRH2410T 220MN V	22	±20%	22	1.47	390	300	100	*1, *2

●NRH2412 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRH2412T R47NNGJV	0.47	±30%	180	0.050	2,900	2,100	100	*1, *2
NRH2412T 1R0NNGHV	1.0	±30%	101	0.077	2,350	1,300	100	*1, *2
NRH2412T 1R5NNGHV	1.5	±30%	89	0.100	2,100	1,150	100	*1, *2
NRH2412T 2R2MNGHV	2.2	±20%	72	0.140	1,700	1,000	100	*1, *2
NRH2412T 3R3MNGHV	3.3	±20%	56	0.225	1,400	750	100	*1, *2
NRH2412T 4R7MNGHV	4.7	±20%	45	0.300	1,150	650	100	*1, *2
NRH2412T 6R8MNGHV	6.8	±20%	34	0.420	950	550	100	*1, *2
NRH2412T 100MNGHV	10	±20%	29	0.600	810	450	100	*1, *2

※) 直流重叠允许电流 (Idc1)为直流重叠带来的电感值下降，范围在 30%以内的直流电感值(at 20℃)
※) 温度上升允许电流 (Idc2)为温度上升到 40℃时的直流电感值 (at 20℃)
※) 最大额定电流为能够满足直流重叠允许电流和温度上升允许电流的直流电流值

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■型号一览

●NRH3010 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRH3010T 1R2NN V	1.2	±30%	120	0.065	1,700	1,480	100	*1, *2
NRH3010T 1R5NN V	1.5	±30%	99	0.075	1,440	1,370	100	*1, *2
NRH3010T 2R2MN V	2.2	±20%	86	0.083	1,300	1,300	100	*1, *2
NRH3010T 3R3MN V	3.3	±20%	64	0.130	1,000	1,030	100	*1, *2
NRH3010T 4R7MN V	4.7	±20%	50	0.170	850	900	100	*1, *2
NRH3010T 6R8MN V	6.8	±20%	44	0.250	700	745	100	*1, *2
NRH3010T 100MN V	10	±20%	34	0.350	600	620	100	*1, *2
NRH3010T 150MN V	15	±20%	25	0.550	450	480	100	*1, *2
NRH3010T 220MN V	22	±20%	22	0.770	380	410	100	*1, *2
NRH3010T 470MN V	47	±20%	17	2.05	250	285	100	*1, *2

●NRH3012 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRH3012T R47NN V	0.47	±30%	160	0.033	2,600	1,900	100	*1, *2
NRH3012T 1R0NN V	1.0	±30%	111	0.048	2,200	1,710	100	*1, *2
NRH3012T 1R5NN V	1.5	±30%	95	0.055	1,700	1,600	100	*1, *2
NRH3012T 2R2MN V	2.2	±20%	78	0.075	1,500	1,370	100	*1, *2
NRH3012T 3R3MN V	3.3	±20%	61	0.100	1,200	1,210	100	*1, *2
NRH3012T 4R7MN V	4.7	±20%	50	0.130	1,000	1,060	100	*1, *2
NRH3012T 6R8MN V	6.8	±20%	43	0.190	850	890	100	*1, *2
NRH3012T 100MN V	10	±20%	32	0.270	730	720	100	*1, *2
NRH3012T 150MN V	15	±20%	26	0.450	530	570	100	*1, *2
NRH3012T 220MN V	22	±20%	22	0.630	500	500	100	*1, *2

●NRV3012 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRV3012T 1R0N V	1.0	±30%	110	0.065	2,500	1,600	100	*1, *2
NRV3012T 1R5N V	1.5	±30%	92	0.075	2,100	1,400	100	*1, *2
NRV3012T 2R2M V	2.2	±20%	70	0.120	1,800	1,100	100	*1, *2
NRV3012T 3R3M V	3.3	±20%	55	0.150	1,600	1,000	100	*1, *2
NRV3012T 4R7M V	4.7	±20%	48	0.190	1,250	850	100	*1, *2
NRV3012T 6R8M V	6.8	±20%	40	0.300	950	650	100	*1, *2
NRV3012T 100M V	10	±20%	32	0.470	800	550	100	*1, *2

●NRS3015 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS3015T 1R0NNGHV	1.0	±30%	100	0.030	2,100	2,100	100	*1, *2
NRS3015T 1R5NNGHV	1.5	±30%	87	0.038	1,800	1,820	100	*1, *2
NRS3015T 2R2MNGHV	2.2	±20%	64	0.058	1,480	1,500	100	*1, *2
NRS3015T 3R3MNGHV	3.3	±20%	49	0.078	1,210	1,230	100	*1, *2
NRS3015T 4R7MNGHV	4.7	±20%	40	0.120	1,020	1,040	100	*1, *2
NRS3015T 6R8MNGHV	6.8	±20%	36	0.160	870	880	100	*1, *2
NRS3015T 100MNGHV	10	±20%	28	0.220	700	710	100	*1, *2
NRS3015T 220MNGHV	22	±20%	20	0.520	470	470	100	*1, *2

●NRS4010 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS4010T 1R0NDGGV	1.0	±30%	116	0.056	2,000	1,900	100	*1, *2
NRS4010T 2R2MDGGV	2.2	±20%	73	0.085	1,200	1,500	100	*1, *2
NRS4010T 3R3MDGGV	3.3	±20%	58	0.100	1,100	1,400	100	*1, *2
NRS4010T 4R7MDGGV	4.7	±20%	47	0.140	950	1,200	100	*1, *2
NRS4010T 6R8MDGGV	6.8	±20%	38	0.200	800	1,000	100	*1, *2
NRS4010T 100MDGGV	10	±20%	31	0.300	620	750	100	*1, *2
NRS4010T 150MDGGV	15	±20%	24	0.430	540	600	100	*1, *2
NRS4010T 220MDGGV	22	±20%	19	0.570	450	500	100	*1, *2

●NRS4012 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS4012T 1R0NDGGV	1.0	±30%	100	0.042	2,800	2,200	100	*1, *2
NRS4012T 2R2MDGJV	2.2	±20%	70	0.060	1,650	1,900	100	*1, *2
NRS4012T 3R3MDGJV	3.3	±20%	60	0.070	1,400	1,700	100	*1, *2
NRS4012T 4R7MDGJV	4.7	±20%	45	0.095	1,200	1,500	100	*1, *2
NRS4012T 6R8MDGJV	6.8	±20%	35	0.125	900	1,300	100	*1, *2
NRS4012T 100MDGJV	10	±20%	30	0.170	800	1,100	100	*1, *2
NRS4012T 150MDGJV	15	±20%	24	0.260	650	750	100	*1, *2
NRS4012T 220MDGJV	22	±20%	18	0.400	500	620	100	*1, *2

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 最大额定电流值为能够满足直流重叠允许电流和温度上升允许电流的直流电流值

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■型号一览

●NRS4018 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS4018T 1R0NDGJV	1.0	±30%	90	0.027	4,000	3,200	100	*1, *2
NRS4018T 1R5NDGJV	1.5	±30%	75	0.037	3,300	2,400	100	*1, *2
NRS4018T 2R2MDGJV	2.2	±20%	60	0.042	3,000	2,200	100	*1, *2
NRS4018T 3R3MDGJV	3.3	±20%	45	0.055	2,300	2,000	100	*1, *2
NRS4018T 4R7MDGJV	4.7	±20%	35	0.070	2,000	1,700	100	*1, *2
NRS4018T 6R8MDGJV	6.8	±20%	30	0.098	1,600	1,450	100	*1, *2
NRS4018T 100MDGJV	10	±20%	25	0.150	1,300	1,200	100	*1, *2
NRS4018T 150MDGJV	15	±20%	18	0.210	1,100	850	100	*1, *2
NRS4018T 220MDGJV	22	±20%	15	0.290	900	720	100	*1, *2
NRS4018T 330MDGJV	33	±20%	12	0.460	700	550	100	*1, *2
NRS4018T 470MDGJV	47	±20%	10	0.650	600	440	100	*1, *2
NRS4018T 680MDGJV	68	±20%	8.3	1.00	520	320	100	*1, *2
NRS4018T 101MDGJV	100	±20%	6.5	1.45	420	280	100	*1, *2
NRS4018T 151MDGJV	150	±20%	5.5	2.30	340	220	100	*1, *2
NRS4018T 221MDGJV	220	±20%	4.0	3.80	275	170	100	*1, *2

●NRS5010

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5010T 1R0NMGFV	1.0	±30%	95	0.070	2,350	1,750	100	*1, *2
NRS5010T 2R2NMGFV	2.2	±30%	65	0.105	1,500	1,400	100	*1, *2
NRS5010T 3R3MMGFV	3.3	±20%	42	0.125	1,400	1,250	100	*1, *2
NRS5010T 4R7MMGFV	4.7	±20%	37	0.145	1,200	1,150	100	*1, *2
NRS5010T 6R8MMGFV	6.8	±20%	33	0.185	1,000	1,000	100	*1, *2
NRS5010T 100MMGFV	10	±20%	23	0.250	850	900	100	*1, *2
NRS5010T 150MMGFV	15	±20%	19	0.400	680	650	100	*1, *2
NRS5010T 220MMGFV	22	±20%	15	0.600	550	450	100	*1, *2

●NRS5012

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5012T 1R0NMGFV	1.0	±30%	100	0.053	4,500	2,300	100	*1, *2
NRS5012T 1R5NMGFV	1.5	±30%	86	0.070	3,800	2,200	100	*1, *2
NRS5012T 2R2MMGFV	2.2	±20%	70	0.085	3,100	2,000	100	*1, *2
NRS5012T 3R3MMGFV	3.3	±20%	48	0.160	2,400	1,450	100	*1, *2
NRS5012T 4R7MMGFV	4.7	±20%	40	0.180	2,200	1,400	100	*1, *2
NRS5012T 6R8MMGFV	6.8	±20%	36	0.260	1,700	1,100	100	*1, *2
NRS5012T 100MMGFV	10	±20%	26	0.420	1,400	850	100	*1, *2
NRS5012T 150MMGFV	15	±20%	22	0.670	1,200	640	100	*1, *2

●NRS5014 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5014T R47NMGGV	0.47	±30%	185	0.025	5,800	3,300	100	*1, *2
NRS5014T 1R2NMGGV	1.2	±30%	86	0.045	3,800	2,400	100	*1, *2
NRS5014T 2R2NMGGV	2.2	±30%	56	0.065	2,800	2,000	100	*1, *2
NRS5014T 3R3NMGGV	3.3	±30%	48	0.080	2,350	1,700	100	*1, *2
NRS5014T 4R7NMGGV	4.7	±30%	41	0.100	2,050	1,400	100	*1, *2
NRS5014T 6R8MMGGV	6.8	±20%	33	0.150	1,600	1,200	100	*1, *2
NRS5014T 100MMGGV	10	±20%	27	0.200	1,400	1,050	100	*1, *2
NRS5014T 150MMGGV	15	±20%	20	0.320	1,100	650	100	*1, *2
NRS5014T 220MMGGV	22	±20%	16	0.450	900	550	100	*1, *2

●NRS5020 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5020T R47NMGJV	0.47	±30%	230	0.012	6,100	5,000	100	*1, *2
NRS5020T 1R0NMGJV	1.0	±30%	81	0.021	4,000	3,600	100	*1, *2
NRS5020T 1R5NMGJV	1.5	±30%	68	0.026	3,350	3,200	100	*1, *2
NRS5020T 2R2NMGJV	2.2	±30%	57	0.035	2,900	2,900	100	*1, *2
NRS5020T 3R3NMGJV	3.3	±30%	46	0.048	2,400	2,400	100	*1, *2
NRS5020T 4R7MMGJV	4.7	±20%	37	0.060	2,000	2,000	100	*1, *2
NRS5020T 6R8MMGJV	6.8	±20%	30	0.090	1,600	1,650	100	*1, *2
NRS5020T 100MMGJV	10	±20%	24	0.120	1,300	1,450	100	*1, *2
NRS5020T 150MMGJV	15	±20%	20	0.165	1,100	1,200	100	*1, *2
NRS5020T 220MMGJV	22	±20%	17	0.260	900	1,000	100	*1, *2
NRS5020T 470MMGJV	47	±20%	12	0.435	630	560	100	*1, *2
NRS5020T 101MMGJV	100	±20%	7	0.850	420	400	100	*1, *2

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 最大额定电流值为能够满足直流重叠允许电流和温度上升允许电流的直流电流值

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■型号一览

●NRS5024 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5024T 1R0NMGJV	1.0	±30%	85	0.016	5,800	4,400	100	*1, *2
NRS5024T 1R5NMGJV	1.5	±30%	67	0.022	5,200	3,600	100	*1, *2
NRS5024T 2R2NMGJV	2.2	±30%	51	0.029	4,100	3,100	100	*1, *2
NRS5024T 3R3NMGJV	3.3	±30%	41	0.043	3,100	2,400	100	*1, *2
NRS5024T 4R7MMGJV	4.7	±20%	37	0.055	2,700	2,000	100	*1, *2
NRS5024T 6R8MMGJV	6.8	±20%	28	0.080	2,200	1,600	100	*1, *2
NRS5024T 100MMGJV	10	±20%	21	0.125	1,700	1,200	100	*1, *2
NRS5024T 150MMGJV	15	±20%	18	0.170	1,400	1,000	100	*1, *2
NRS5024T 220MMGJV	22	±20%	15	0.230	1,200	820	100	*1, *2
NRS5024T 330MMGJV	33	±20%	11	0.370	1,000	630	100	*1, *2

●NRS5030 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5030T R47NMGJV	0.47	±30%	185	0.010	9,000	5,000	100	*1, *2
NRS5030T 1R0NMGJV	1.0	±30%	110	0.015	6,600	4,000	100	*1, *2
NRS5030T 2R2NMGJV	2.2	±30%	46	0.023	4,200	3,500	100	*1, *2
NRS5030T 3R3MMGJV	3.3	±20%	36	0.030	3,600	3,000	100	*1, *2
NRS5030T 4R7MMGJV	4.7	±20%	31	0.035	3,100	2,600	100	*1, *2
NRS5030T 6R8MMGJV	6.8	±20%	22	0.052	2,500	2,300	100	*1, *2
NRS5030T 100MMGJV	10	±20%	20	0.070	2,100	1,700	100	*1, *2
NRS5030T 150MMGJV	15	±20%	14	0.125	1,600	1,400	100	*1, *2
NRS5030T 220MMGJV	22	±20%	13	0.180	1,400	1,050	100	*1, *2
NRS5030T 330MMGJV	33	±20%	10	0.225	1,150	800	100	*1, *2
NRS5030T 470MMGJV	47	±20%	9	0.325	950	700	100	*1, *2

●NRS5040 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS5040T 1R5NMGJV	1.5	±30%	60	0.017	6,400	4,500	100	*1, *2
NRS5040T 2R2NMGJV	2.2	±30%	42	0.022	5,000	3,700	100	*1, *2
NRS5040T 3R3NMGJV	3.3	±30%	32	0.027	4,000	3,300	100	*1, *2
NRS5040T 4R7NMGKV	4.7	±30%	28	0.029	3,300	3,100	100	*1, *2
NRS5040T 6R8MMGJV	6.8	±20%	21	0.049	2,800	2,400	100	*1, *2
NRS5040T 100MMGJV	10	±20%	18	0.056	2,300	2,100	100	*1, *2
NRS5040T 150MMGJV	15	±20%	13	0.080	2,000	1,800	100	*1, *2
NRS5040T 220MMGKV	22	±20%	9	0.126	1,500	1,400	100	*1, *2
NRS5040T 330MMGJV	33	±20%	7	0.180	1,300	1,200	100	*1, *2
NRS5040T 470MMGJV	47	±20%	6	0.310	1,100	900	100	*1, *2

●NRS6010

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS6010T 1R5MMGFV	1.5	±20%	77	0.090	2,400	1,900	100	*1, *2
NRS6010T 2R2MMGFV	2.2	±20%	56	0.110	1,900	1,700	100	*1, *2
NRS6010T 3R3MMGFV	3.3	±20%	42	0.135	1,600	1,500	100	*1, *2
NRS6010T 4R7MMGFV	4.7	±20%	36	0.165	1,300	1,400	100	*1, *2
NRS6010T 6R8MMGFV	6.8	±20%	30	0.220	1,200	1,200	100	*1, *2
NRS6010T 100MMGFV	10	±20%	25	0.270	1,000	1,100	100	*1, *2
NRS6010T 220MMGFV	22	±20%	12	0.580	650	700	100	*1, *2

●NRS6012 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS6012T 1R0NMGJV	1.0	±30%	95	0.050	3,000	2,400	100	*1, *2
NRS6012T 1R5NMGGV	1.5	±30%	69	0.067	2,600	2,100	100	*1, *2
NRS6012T 2R5NMGGV	2.5	±30%	45	0.090	2,100	1,800	100	*1, *2
NRS6012T 3R3NMGGV	3.3	±30%	42	0.105	1,800	1,700	100	*1, *2
NRS6012T 4R7MMGGV	4.7	±20%	36	0.125	1,600	1,550	100	*1, *2
NRS6012T 5R3MMGJV	5.3	±20%	34	0.125	1,500	1,550	100	*1, *2
NRS6012T 6R8MMGJV	6.8	±20%	30	0.165	1,300	1,350	100	*1, *2
NRS6012T 100MMGJV	10	±20%	22	0.200	1,000	1,200	100	*1, *2
NRS6012T 150MMGJV	15	±20%	18	0.295	800	800	100	*1, *2
NRS6012T 220MMGJV	22	±20%	12	0.465	760	650	100	*1, *2
NRS6012T 330MMGJV	33	±20%	8	0.580	590	550	100	*1, *2
NRS6012T 470MMGJV	47	±20%	6	0.965	520	460	100	*1, *2
NRS6012T 680MMGJV	68	±20%	3	1.16	440	410	100	*1, *2
NRS6012T 101MMGJV	100	±20%	1	1.67	350	320	100	*1, *2

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 最大额定电流值为能够满足直流重叠允许电流和温度上升允许电流的直流电流值

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■型号一览

●NRS6014 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS6014T 1R2NMGGV	1.2	±30%	77	0.042	4,000	2,750	100	*1, *2
NRS6014T 2R2NMGGV	2.2	±30%	61	0.055	3,000	2,300	100	*1, *2
NRS6014T 3R3NMGGV	3.3	±30%	41	0.075	2,500	2,000	100	*1, *2
NRS6014T 4R7MMGGV	4.7	±20%	36	0.090	2,000	1,900	100	*1, *2
NRS6014T 6R8MMGGV	6.8	±20%	30	0.115	1,700	1,650	100	*1, *2
NRS6014T 100MMGGV	10	±20%	24	0.140	1,400	1,400	100	*1, *2
NRS6014T 150MMGGV	15	±20%	20	0.210	1,150	1,200	100	*1, *2
NRS6014T 220MMGGV	22	±20%	16	0.300	950	1,000	100	*1, *2

●NRS6020 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±20%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS6020T 0R8NMGGV	0.8	±30%	110	0.020	6,400	4,100	100	*1, *2
NRS6020T 1R5NMGJV	1.5	±30%	93	0.026	4,300	3,600	100	*1, *2
NRS6020T 2R2NMGJV	2.2	±30%	73	0.034	3,200	2,900	100	*1, *2
NRS6020T 3R3NMGJV	3.3	±30%	55	0.040	2,800	2,750	100	*1, *2
NRS6020T 4R7NMGJV	4.7	±30%	43	0.058	2,400	2,150	100	*1, *2
NRS6020T 6R8NMGJV	6.8	±30%	30	0.085	2,000	1,800	100	*1, *2
NRS6020T 100MMGGV	10	±20%	18	0.125	1,900	1,500	100	*1, *2
NRS6020T 220MMGGV	22	±20%	11	0.290	1,250	950	100	*1, *2

●NRS6028 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS6028T 0R9NMGJV	0.9	±30%	90	0.013	6,700	4,600	100	*1, *2
NRS6028T 1R5NMGJV	1.5	±30%	78	0.016	5,100	4,200	100	*1, *2
NRS6028T 2R2NMGJV	2.2	±30%	68	0.020	4,200	3,700	100	*1, *2
NRS6028T 3R0NMGJV	3.0	±30%	55	0.023	3,600	3,400	100	*1, *2
NRS6028T 4R7MMGKV	4.7	±20%	39	0.031	2,700	3,000	100	*1, *2
NRS6028T 6R8MMGJV	6.8	±20%	25	0.043	2,600	2,500	100	*1, *2
NRS6028T 100MMGKV	10	±20%	20	0.065	1,900	1,900	100	*1, *2
NRS6028T 150MMGJV	15	±20%	17	0.095	1,600	1,800	100	*1, *2
NRS6028T 220MMGJV	22	±20%	12	0.135	1,300	1,400	100	*1, *2
NRS6028T 330MMGJV	33	±20%	10	0.220	1,100	1,100	100	*1, *2
NRS6028T 470MMGJV	47	±20%	8	0.300	1,000	920	100	*1, *2
NRS6028T 680MMGJV	68	±20%	5	0.420	800	770	100	*1, *2
NRS6028T 101MMGJV	100	±20%	3	0.600	650	660	100	*1, *2

●NRS6045 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS6045T 1R0NMGKV	1.0	±30%	110	0.014	9,800	4,500	100	*1, *2
NRS6045T 1R3NMGKV	1.3	±30%	95	0.016	8,200	4,200	100	*1, *2
NRS6045T 1R8NMGKV	1.8	±30%	80	0.019	7,200	3,900	100	*1, *2
NRS6045T 2R3NMGKV	2.3	±30%	60	0.022	6,400	3,600	100	*1, *2
NRS6045T 3R0NMGKV	3.0	±30%	45	0.024	5,600	3,300	100	*1, *2
NRS6045T 4R5MMGKV	4.5	±20%	25	0.030	4,400	3,100	100	*1, *2
NRS6045T 6R3MMGKV	6.3	±20%	15	0.036	3,600	3,000	100	*1, *2
NRS6045T 100MMGKV	10	±20%	12	0.046	3,100	2,400	100	*1, *2
NRS6045T 150MMGKV	15	±20%	10	0.070	2,500	1,900	100	*1, *2
NRS6045T 220MMGKV	22	±20%	7	0.107	2,000	1,600	100	*1, *2
NRS6045T 330MMGKV	33	±20%	6	0.141	1,650	1,400	100	*1, *2
NRS6045T 470MMGKV	47	±20%	5	0.211	1,400	1,150	100	*1, *2
NRS6045T 680MMGKV	68	±20%	4	0.304	1,100	950	100	*1, *2
NRS6045T 101MMGKV	100	±20%	3	0.466	900	750	100	*1, *2

●NRS8030 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS8030T 1R0NJGJV	1.0	±30%	120	0.009	7,800	6,200	100	*1, *2
NRS8030T 1R5NJGJV	1.5	±30%	80	0.012	6,200	5,300	100	*1, *2
NRS8030T 2R2NJGJV	2.2	±30%	60	0.015	4,900	4,800	100	*1, *2
NRS8030T 3R3MJGJV	3.3	±20%	50	0.019	4,200	4,300	100	*1, *2
NRS8030T 4R7MJGJV	4.7	±20%	40	0.022	3,600	4,000	100	*1, *2
NRS8030T 6R8MJGJV	6.8	±20%	32	0.029	3,000	3,400	100	*1, *2
NRS8030T 100MJGJV	10	±20%	27	0.033	2,400	3,000	100	*1, *2
NRS8030T 150MJGJV	15	±20%	20	0.060	2,000	2,200	100	*1, *2
NRS8030T 220MJGJV	22	±20%	16	0.070	1,750	1,900	100	*1, *2
NRS8030T 330MJGJV	33	±20%	13	0.120	1,300	1,500	100	*1, *2
NRS8030T 470MJGJV	47	±20%	11	0.170	1,100	1,300	100	*1, *2

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 最大额定电流值为能够满足直流重叠允许电流和温度上升允许电流的直流电流值

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■型号一览

●NRS8040 屏蔽型

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [kHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NRS8040T 0R9NJGJV	0.9	±30%	85	0.006	13,000	7,800	100	*1, *2
NRS8040T 1R4NJGJV	1.4	±30%	63	0.007	10,000	7,000	100	*1, *2
NRS8040T 2R0NJGJV	2.0	±30%	50	0.009	8,100	6,300	100	*1, *2
NRS8040T 3R6NJGJV	3.6	±30%	34	0.015	6,400	4,900	100	*1, *2
NRS8040T 4R7NJGJV	4.7	±30%	30	0.018	5,400	4,100	100	*1, *2
NRS8040T 6R8NJGJV	6.8	±30%	24	0.025	4,400	3,700	100	*1, *2
NRS8040T 100MJGJV	10	±20%	22	0.034	3,800	3,100	100	*1, *2
NRS8040T 150MJGJV	15	±20%	16	0.050	2,900	2,400	100	*1, *2
NRS8040T 220MJGJV	22	±20%	13	0.066	2,400	2,200	100	*1, *2
NRS8040T 330MJGKV	33	±20%	12	0.100	2,000	1,700	100	*1, *2
NRS8040T 470MJGKV	47	±20%	8	0.140	1,500	1,500	100	*1, *2
NRS8040T 101MJGKV	100	±20%	6	0.280	1,100	1,000	100	*1, *2

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 最大额定电流值为能够满足直流重叠允许电流和温度上升允许电流的直流电流值

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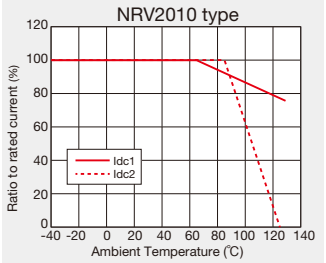
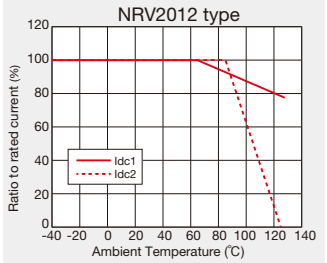
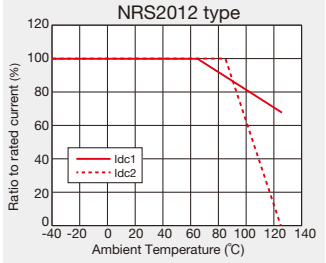
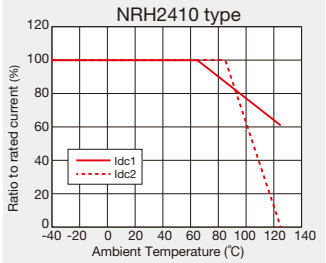
■降低额定电流值

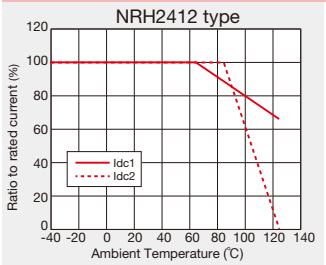
●NR系列 H型 / S型 / V型
NR系列 H 型 / S 型 / V 型需要根据周围温度降低额定电流值。
请参照下图降低使用电流的额定值。

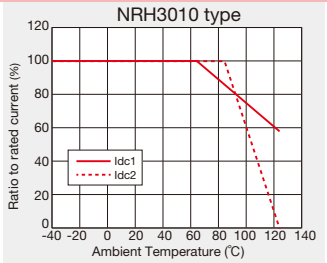


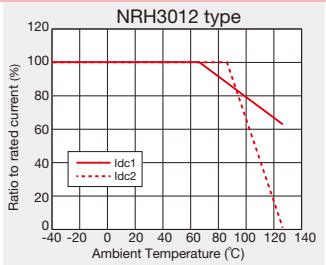


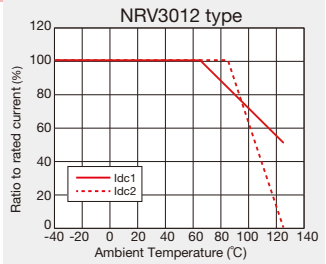


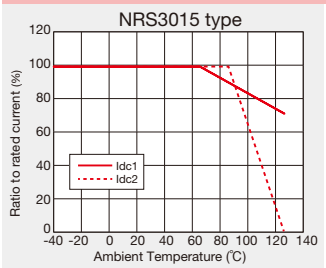


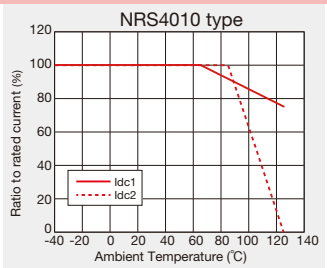


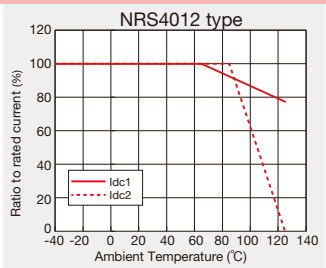


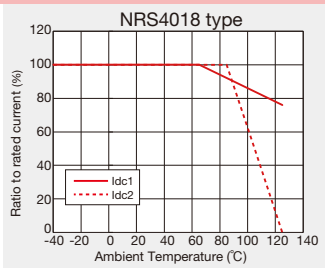


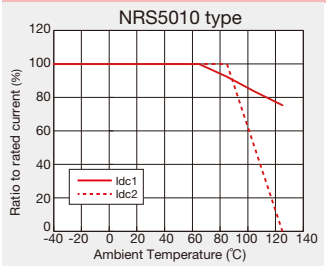


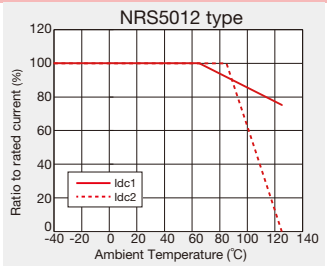


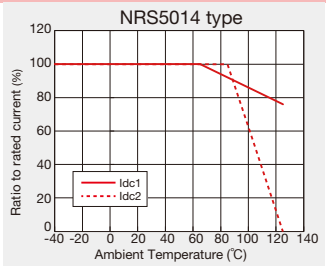


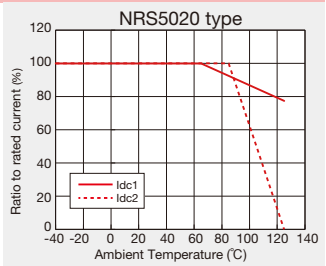


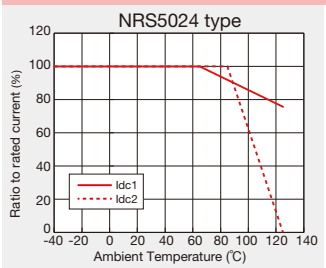


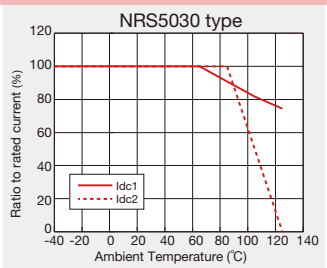


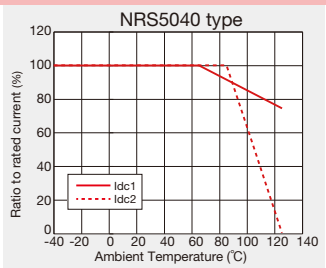


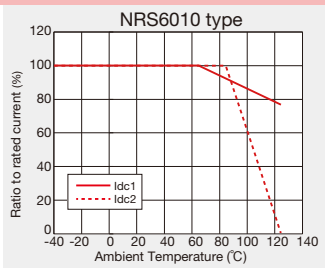












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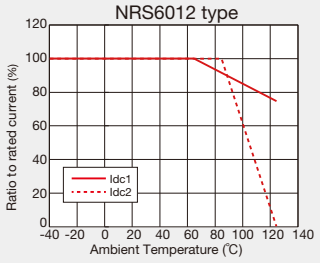
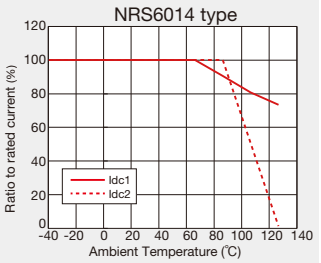
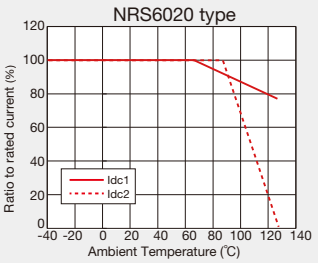
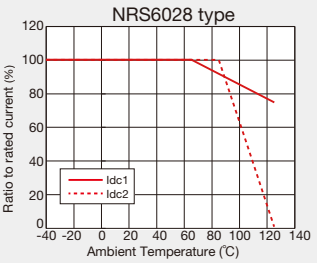
■降低额定电流值

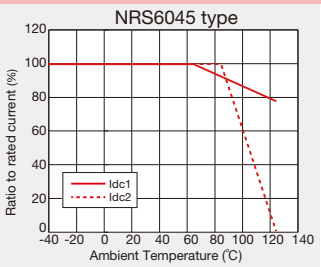
●NR系列 H型 / S型 / V型
NR系列 H 型 / S 型 / V 型需要根据周围温度降低额定电流值。
请参照下图降低使用电流的额定值。

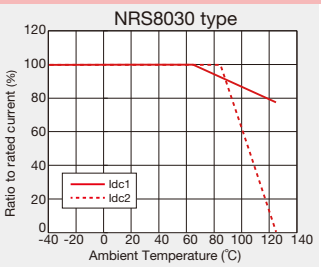


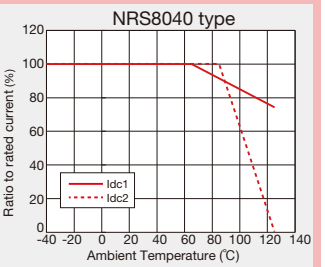












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■PACKAGING

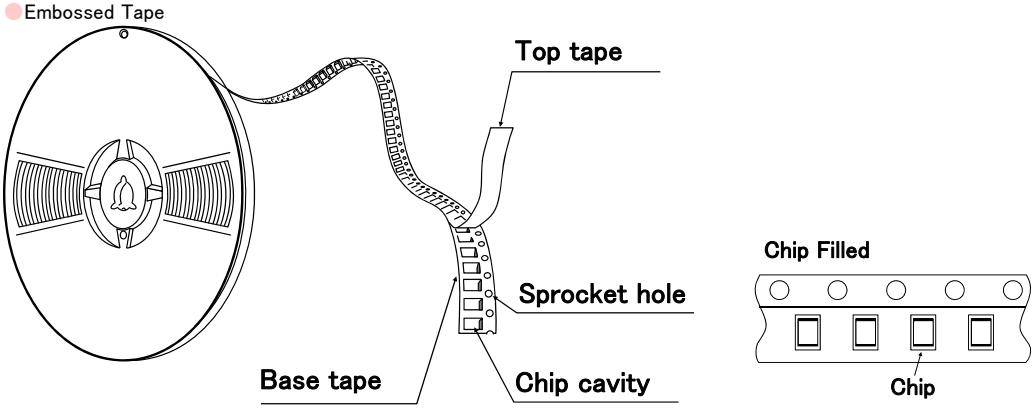
①Minimum Quantity

Type	Standard Quantity [pcs]
	Tape & Reel
NRV2010	2500
NRS2012 NRV2012	2500
NRH2410	2500
NRH2412	2500
NR 3010 NRH3010	2000
NR 3012 NRH3012 NRV3012	2000
NR 3015 NRS3015	2000
NR 4010 NRS4010	5000
NR 4012 NRS4012	4500
NR 4018 NRS4018	3500

Type	Standard Quantity [pcs]
	Tape & Reel
NRS5010	1000
NRS5012	1000
NRS5014	1000
NRS5020	800
NRS5024	2500
NRS5030	500
NR 5040 NRS5040	1500
NRS6010	1000
NR 6012 NRS6012	1000
NRS6014	1000
NR 6020 NRS6020	2500
NR 6028 NRS6028	2000
NR 6045 NRS6045	1500
NRS8030	1000
NR 8040 NRS8040	1000

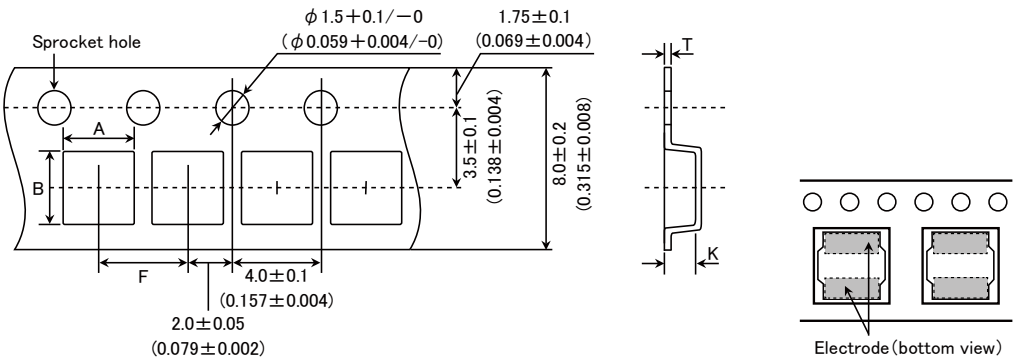
②Tape Material

Embossed Tape



③Taping dimensions

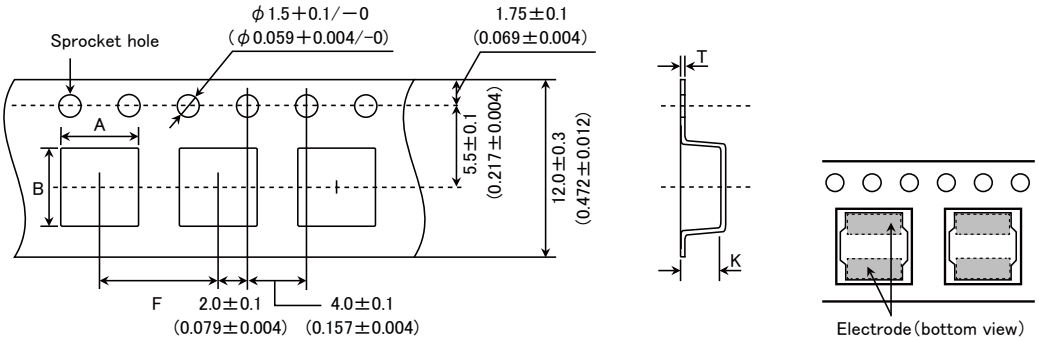
Embossed tape 8mm wide (0.315 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NRV2010	2.2±0.1 (0.102±0.004)	2.2±0.1 (0.102±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.009±0.002)	1.3±0.1 (0.051±0.004)
NRS2012 NRV2012					
NRH2410	2.6±0.1 (0.087±0.004)	2.6±0.1 (0.102±0.004)		0.25±0.05 (0.009±0.002)	1.3±0.1 (0.051±0.004)
NRH2412					
NR 3010 NRH3010	3.2±0.1 (0.126±0.004)	3.2±0.1 (0.126±0.004)		0.3±0.05 (0.012±0.002)	1.4±0.1 (0.055±0.004)
NR 3012 NRH3012 NRV3012					1.6±0.1 (0.063±0.004)
NR 3015 NRS3015					1.9±0.1 (0.075±0.004)

Unit:mm(inch)

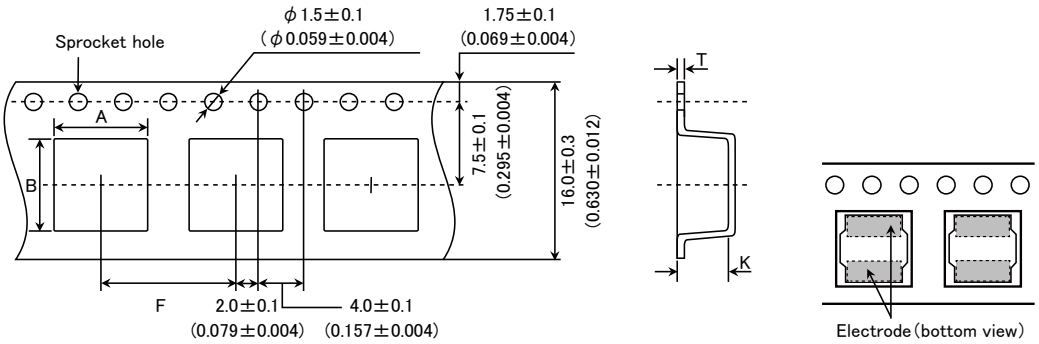
Embossed tape 12mm wide (0.47 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NR 4010 NRS4010	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±0.1 (0.012±0.004)	1.4±0.1 (0.055±0.004)
NR 4012 NRS4012					1.6±0.1 (0.063±0.004)
NR 4018 NRS4018					2.1±0.1 (0.083±0.004)
NRS5010	5.25±0.1 (0.207±0.004)	5.25±0.1 (0.207±0.004)			1.4±0.1 (0.055±0.004)
NRS5012					1.4±0.1 (0.055±0.004)
NRS5014					1.6±0.1 (0.063±0.004)
NRS5020					2.3±0.1 (0.091±0.004)
NRS5024					2.7±0.1 (0.106±0.004)
NRS5030	5.15±0.1 (0.203±0.004)	5.15±0.1 (0.203±0.004)		0.4±0.1 (0.016±0.004)	3.2±0.1 (0.126±0.004)
NR 5040 NRS5040	5.15±0.1 (0.203±0.004)	5.15±0.1 (0.203±0.004)			4.2±0.1 (0.165±0.004)
NRS6010	6.3±0.1 (0.248±0.004)	6.3±0.1 (0.248±0.004)			1.4±0.1 (0.055±0.004)
NR 6012 NRS6012					1.6±0.1 (0.063±0.004)
NRS6014					1.6±0.1 (0.063±0.004)
NR 6020 NRS6020					2.3±0.1 (0.090±0.004)
NR 6028 NRS6028					3.1±0.1 (0.122±0.004)
NR 6045 NRS6045					4.7±0.1 (0.185±0.004)

Unit:mm(inch)

Embossed tape 16mm wide (0.63 inches wide)

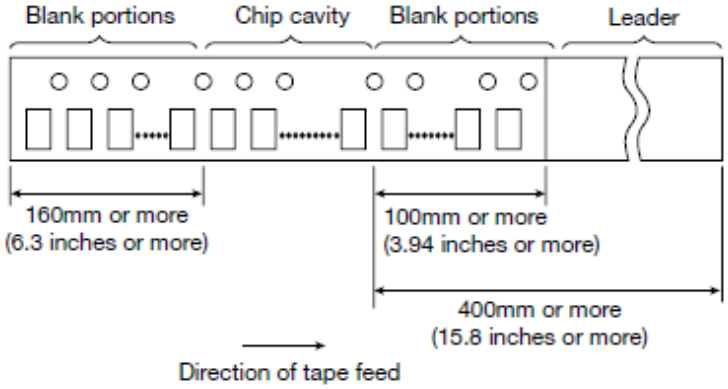


Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NRS8030	8.3±0.1 (0.327±0.004)	8.3±0.1 (0.327±0.004)	12.0±0.1 (0.472±0.004)	0.5±0.1 (0.020±0.004)	3.4±0.1 (0.134±0.004)
NR 8040 NRS8040					4.5±0.1 (0.177±0.004)

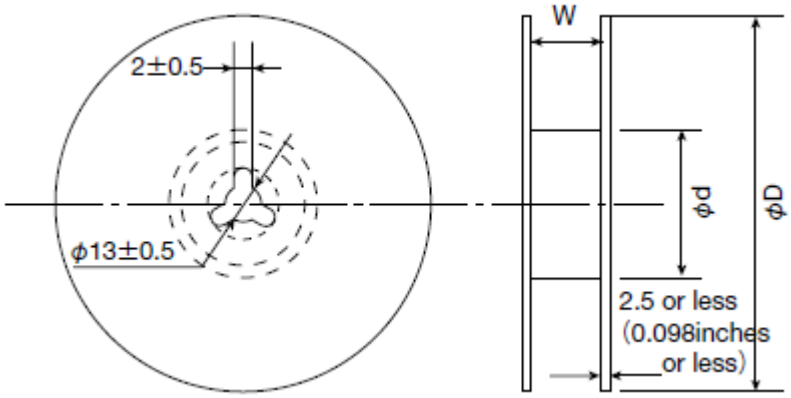
Unit : mm (inch)

④Leader and Blank portion

NR, NRH, NRS, NRV



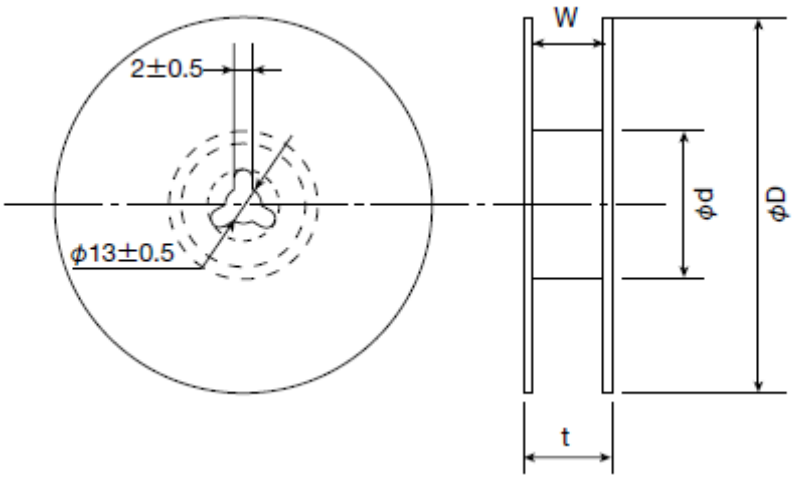
⑤Reel size



Type	Reel size (Reference values)		
	φD	φd	W
NRV2010	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)
NRS2012 NRV2012			
NRH2410			
NRH2412			
NR 3010 NRH3010			
NR 3012 NRH3012 NRV3012			
NR 3015 NRS3015			

NRS5010	180±3.0 (7.087±0.118)	60±2.0 (2.36±0.08)	14.0±1.5 (0.551±0.059)
NRS5012			
NRS5014			
NRS5020			
NRS5030			
NRS6010			
NR 6012 NRS6012			
NRS6014			

Unit : mm (inch)

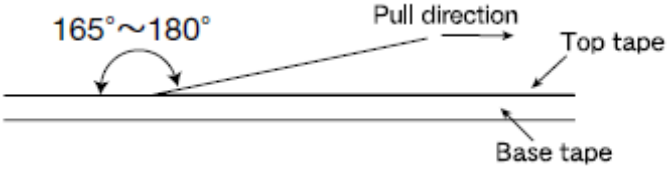


Type	Reel size (Reference values)			
	ϕD	ϕd	t (max.)	W
NR 4010 NRS4010	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	18.5 (0.72)	13.5±1.0 (0.531±0.04)
NR 4012 NRS4012				
NR 4018 NRS4018				
NRS5024				
NR 5040 NRS5040				
NR 6020 NRS6020				
NR 6028 NRS6028				
NR 6045 NRS6045				
NRS8030			22.5 (0.89)	17.5±1.0 (0.689±0.04)
NR 8040 NRS8040				

Unit : mm (inch)

⑥Top Tape Strength

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



■RELIABILITY DATA

1. Operating Temperature Range		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	−40～＋125℃(Including self-generated heat)
Test Methods and Remarks	Including self-generated heat	

2. Storage Temperature Range		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	−40～＋85℃
Test Methods and Remarks	−5 to 40℃ for the product with taping.	

3. Rated current		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Within the specified tolerance

4. Inductance		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : LCR Meter (HP 4285A or equivalent) Measuring frequency : 100kHz, 1V	

5. DC Resistance		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : DC ohmmeter (HIOKI 3227 or equivalent)	

6. Self resonance frequency		
Specified Value	NRV30Type,NRH24/30Type NRS30/40/50/60/80Type	Within the specified tolerance
	NRV20,NRS20	−
Test Methods and Remarks	NRV30,NRH24/30,NRS30/40/50/60/80Type Measuring equipment : Impedance analyzer/material analyzer(HP4291A or equivalent HP4191A, 4192A or equivalent)	

7. Temperature characteristic		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±20%
Test Methods and Remarks	NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type, : Measurement of inductance shall be taken at temperature range within −40℃～＋85℃. With reference to inductance value at ＋20℃., change rate shall be calculated.	

Change of maximum inductance deviation in step 1 to 5

Step	Temperature(℃)
1	20
2	Minimum operating temperature
3	20 (Standard temperature)
4	Maximum operating temperature
5	20

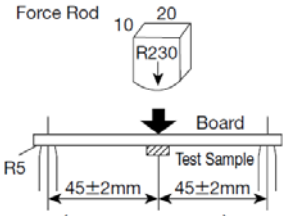
8. Resistance to flexure of substrate

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	No damage

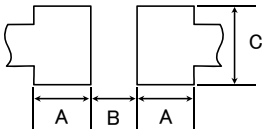
Test Methods and Remarks

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 : 0.10mm (NRS20/30, NRH24/30, NRV20/30Type)
: 0.15mm (NRS40/50/60/80Type)



Land dimension



Type	A	B	C
NRS20, NRV20	0.65	0.7	2.0
NRH24	0.7	0.75	2.0
NRV30,NRH30,NRS30	0.8	1.4	2.7
NRS40	1.2	1.6	3.7
NRS50	1.5	2.1	4.0
NRS60	1.6	3.1	5.7
NRS80	1.8	3.8	7.5

9. Insulation resistance : between wires

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	—

10. Insulation resistance : between wire and core

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	—

11. Withstanding voltage : between wire and core

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	—

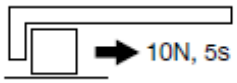
12. Adhesion of terminal electrode

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Shall not come off PC board

Test Methods and Remarks

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

Applied force : 10N to X and Y directions.
Duration : 5s.
Solder cream thickness : 0.10mm(NRV20/30Type,NRH24/30type,NRS20/30Type)
: 0.15mm(NRS40/50/60/80Type)



13. Resistance to vibration

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.

Test Methods and Remarks

The test samples shall be soldered to the test board by the reflow.
Then it shall be submitted to below test conditions.

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

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

14. Solderability

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	At least 90% of surface of terminal electrode is covered by new solder.
Test Methods and Remarks	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%.	

Solder Temperature	245±5℃
Time	5±1.0 sec.

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

15. Resistance to soldering heat

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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. Test board material : glass epoxy-resin Test board thickness : 1.0mm	

16. Thermal shock

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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 1000 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

17. Damp heat

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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	1000+24/−0 hour

18. Loading under damp heat

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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	1000+24/−0 hour

19. Low temperature life test

Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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±2℃
Time	1000+24/−0 hour

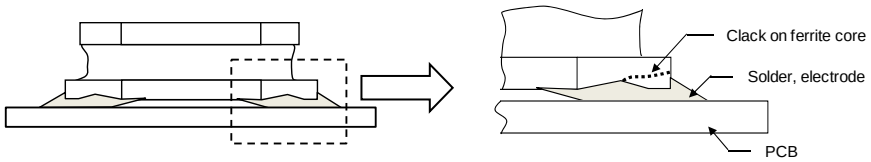
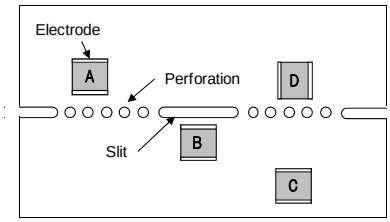
20. High temperature life test		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	—

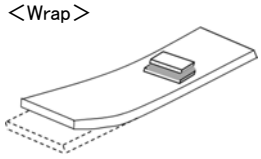
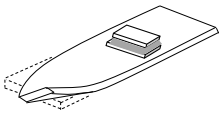
21. Loading at high temperature life test		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	The test samples shall be soldered to the test board by the reflow soldering. Temperature: 85±2℃ Applied current: Rated current Time: 1000+24/−0 hour	

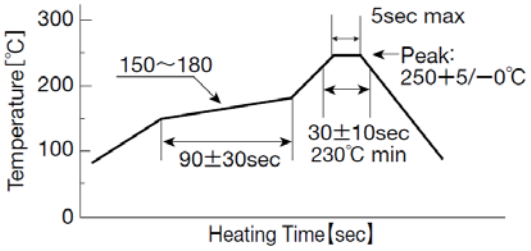
22. Standard condition		
Specified Value	NRV20/30Type,NRH24/30Type NRS20/30/40/50/60/80Type	Standard test condition : Unless otherwise specified, temperature is 20±15℃ and 65±20%of relative humidity. When there is any question concerning measurement result: In order to provide correlation data, the test shall be condition of 20±2℃ of temperature, 65±5% relative humidity. Inductance is in accordance with our measured value.

■PRECAUTIONS

1. Circuit Design	
Precautions	◆Operating environment 1. The products listed in this catalogue are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment), general medical equipment, industrial equipment, and automotive interior applications, etc. Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., specially controlled medical equipment, transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment). Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment, nuclear control equipment, undersea equipment, military equipment, etc.).

2. PCB Design	
Precautions	◆Land pattern design 1. Please refer to a recommended land pattern. 2. There is stress, which has been caused by distortion of a PCB, to the inductor. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type) 3. Please consider the arrangement of parts on a PCB. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)
Technical considerations	◆Land pattern design Surface Mounting 1. Mounting and soldering conditions should be checked beforehand. 2. Applicable soldering process to this products is reflow soldering only. 3. Please use the recommended land pattern shown as below. Electrical characteristics and the mounting ability of the product are being considered in the recommended land pattern. If a PCB is designed with other dimensions, defective soldering and stress to a product may occur due to misalignment. The performance of the product may not be brought out. If an adopted land pattern is different from the recommended land pattern, stress to the product will increase. It may cause cracks or defective electrical characteristics of the product. Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type) 4. As coefficients of thermal expansion between an inductor and a PCB differs, cracks may occur on a ferrite core when thermal stress is applied to them after mounting an inductor. (Please refer to the drawings below.) Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)  5. SMD inductors should be located to minimize any possible mechanical stresses from board warp or deflection. When splitting the PC board after mounting inductors and other components, care is required so as not to give any stresses of deflection or twisting to the board. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)  A product tends to undergo stress in order "A>C>B≡D". Please consider the layouts of a product to minimize any stresses.

3. Considerations for automatic placement	
Precautions	◆Adjustment of mounting machine 1. Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2. Mounting and soldering conditions should be checked beforehand.
Technical considerations	◆Adjustment of mounting machine 1. When installing products, care should be taken not to apply distortion stress as it may deform the products. 2. Stress may be applied to a product with a warp or a twist in handling of the product. Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type) <Wrap>  <Twist> 

4. Soldering	
Precautions	◆Reflow soldering 1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified. 2. The product shall be used 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 adhesion, temperature of resistance to soldering heat, soldering etc sufficiently. ◆Recommended conditions for using a soldering iron ・ 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.
Technical considerations	◆Reflow soldering 1. If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products. ・ NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type, NS101/125 Type Recommended reflow condition (Pb free solder) 

5. Cleaning	
Precautions	◆Cleaning conditions 1. Washing by supersonic waves shall be avoided.
Technical considerations	◆Cleaning conditions 1. If washed by supersonic waves, the products might be broken.

6. Handling	
Precautions	◆Handling 1. Keep the product away from all magnets and magnetic objects. ◆Breakaway PC boards (splitting along perforations) 1. When splitting the PC board after mounting product, care should be taken not to give any stresses of deflection or twisting to the board. 2. Board separation should not be done manually, but by using the appropriate devices. ◆Mechanical considerations 1. Please do not give the product any excessive mechanical shocks. 2. Please do not add any shock and power to a product in transportation. ◆Pick-up pressure 1. Please do not push to add any pressure to a winding part. Please do not give any shock and push into a ferrite core exposure part. ◆Packing 1. Please avoid accumulation of a packing box as much as possible.
Technical considerations	◆Handling 1. There is a case that a characteristic varies with magnetic influence. ◆Breakaway PC boards (splitting along perforations) 1. The position of the product on PCBs shall be carefully considered to minimize the stress caused from splitting of the PCBs. ◆Mechanical considerations 1. There is a case to be damaged by a mechanical shock. 2. There is a case to be broken by the handling in transportation. ◆Pick-up pressure 1. Damage and a characteristic can vary with an excessive shock or stress. ◆Packing 1. If packing boxes are accumulated, that could cause a deformation on packing tapes or a damage on the products.

7. Storage conditions	
Precautions	◆Storage 1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. ・ Recommended conditions Ambient temperature : −5～40℃ 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.
Technical considerations	◆Storage 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.

SMD 功率电感器(NS系列)

回流焊
AEC-Q200

■型号标示法

*使用温度范围：-40～125℃（包括本身发热）

N S △	1 0 1 4 5	T △	1 0 0	M	N △	V
①	②	③	④	⑤	⑥	⑦

△＝空格

①类型

代码	类型
NS△	屏蔽规格

②尺寸 (L×W×H)

代码	尺寸 (L×W×H) [mm]
10145	10.1×10.1×4.5
10155	10.1×10.1×5.5
10165	10.1×10.1×6.5
12555	12.5×12.5×5.5
12565	12.5×12.5×6.5
12575	12.5×12.5×7.5

③包装

代码	包装
T△	卷盘带装

④标称电感值

代码 (例)	标称电感值 [μH]
1R0	1.0
100	10
101	100

※R＝小数点

⑤电感量公差

代码	电感量公差
M	±20%
N	±30%

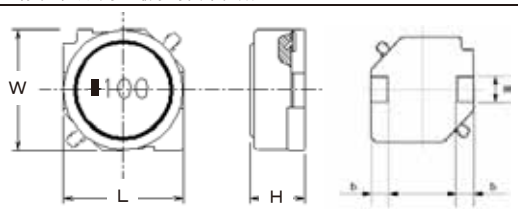
⑥个别规格

代码	个别规格
N△	标准

⑦本公司管理记号

代码	本公司管理记号
V	产业机器/车内用途

■标准外形尺寸 / 最小订货单位数量



Type	L	W	H	a	b	最小订货单位数量 [pcs]
NS 10145	10.1±0.3 (0.398±0.012)	10.1±0.3 (0.398±0.012)	4.5±0.35 (0.177±0.014)	2.8±0.1 (0.110±0.004)	2.0±0.15 (0.079±0.006)	2000
NS 10155	10.1±0.3 (0.398±0.012)	10.1±0.3 (0.398±0.012)	5.5±0.35 (0.217±0.014)	2.8±0.1 (0.110±0.004)	2.0±0.15 (0.079±0.006)	2000
NS 10165	10.1±0.3 (0.398±0.012)	10.1±0.3 (0.398±0.012)	6.5±0.35 (0.256±0.014)	2.8±0.1 (0.110±0.004)	2.0±0.15 (0.079±0.006)	2000
NS 12555	12.5±0.3 (0.492±0.012)	12.5±0.3 (0.492±0.012)	5.5±0.35 (0.217±0.014)	3.0±0.1 (0.118±0.004)	2.0±0.15 (0.079±0.006)	2000
NS 12565	12.5±0.3 (0.492±0.012)	12.5±0.3 (0.492±0.012)	6.5±0.35 (0.256±0.014)	3.0±0.1 (0.118±0.004)	2.0±0.15 (0.079±0.006)	2000
NS 12575	12.5±0.3 (0.492±0.012)	12.5±0.3 (0.492±0.012)	7.5±0.35 (0.295±0.014)	3.0±0.1 (0.118±0.004)	2.0±0.15 (0.079±0.006)	2000

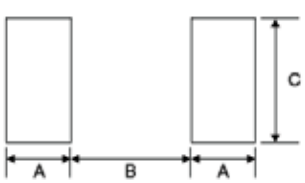
单位: mm (inch)

推荐焊盘图案

实装上的注意

·请确认实装状态后使用。

·本产品焊法限定为回流焊法。



Type	A	B	C
NS 10145	2.5	5.6	3.2
NS 10155	2.5	5.6	3.2
NS 10165	2.5	5.6	3.2
NS 12555	2.5	8.6	3.2
NS 12565	2.5	8.6	3.2
NS 12575	2.5	8.6	3.2

单位: mm

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

■型号一览

・产品目录中的SMD功率电感器全部属于RoHS对应品。

注）
・根据使用电路和机器，需要按照相应规格处理。请务必咨询正规销售渠道。

・*1：面向汽车室内用途（AEC-Q200 Qualified）的产品。
＜ AEC-Q200 ：AEC-Q200 qualified＞
*1标志的SMD功率电感器，已实施代表项目的AEC-Q200对应评价试验。
关于本产品的详细规格和评估测试结果等信息，请咨询官方销售渠道。
此外，订购时请索取产品规格书。
・*2：面向工业设备、医疗设备的产品。

●NS 10145 type

型号	标称电感值 [μH]	电感量公差	直流电阻 [Ω]（±20%）	额定电流 ※）[A]		测试频率 [kHz]	注释
				直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NS 10145T 1R0NN V	1.0	±30%	0.0049	12.54	8.90	100	*1 ,*2
NS 10145T 1R5NN V	1.5	±30%	0.0060	10.34	7.99	100	*1 ,*2
NS 10145T 2R2NN V	2.2	±30%	0.0085	8.91	6.64	100	*1 ,*2
NS 10145T 3R3NN V	3.3	±30%	0.0100	7.33	6.10	100	*1 ,*2
NS 10145T 4R7NN V	4.7	±30%	0.0144	6.69	5.03	100	*1 ,*2
NS 10145T 5R6NN V	5.6	±30%	0.0181	5.85	4.45	100	*1 ,*2
NS 10145T 6R8NN V	6.8	±30%	0.0230	5.05	4.22	100	*1 ,*2
NS 10145T 100MN V	10	±20%	0.0270	4.22	3.10	100	*1 ,*2
NS 10145T 150MN V	15	±20%	0.0381	3.44	3.00	100	*1 ,*2
NS 10145T 220MN V	22	±20%	0.0570	2.87	2.30	100	*1 ,*2
NS 10145T 330MN V	33	±20%	0.0880	2.36	1.90	100	*1 ,*2
NS 10145T 470MN V	47	±20%	0.130	2.00	1.50	100	*1 ,*2
NS 10145T 680MN V	68	±20%	0.150	1.66	1.45	100	*1 ,*2
NS 10145T 101MN V	100	±20%	0.230	1.40	1.10	100	*1 ,*2
NS 10145T 151MN V	150	±20%	0.350	1.11	0.86	100	*1 ,*2
NS 10145T 221MN V	220	±20%	0.510	0.91	0.78	100	*1 ,*2
NS 10145T 331MN V	330	±20%	0.700	0.71	0.64	100	*1 ,*2
NS 10145T 471MN V	470	±20%	1.03	0.61	0.52	100	*1 ,*2
NS 10145T 681MN V	680	±20%	1.57	0.50	0.42	100	*1 ,*2
NS 10145T 102MN V	1000	±20%	2.58	0.41	0.32	100	*1 ,*2
NS 10145T 152MN V	1500	±20%	3.70	0.36	0.27	100	*1 ,*2

●NS 10155 type

型号	标称电感值 [μH]	电感量公差	直流电阻 [Ω]（±20%）	额定电流 ※）[A]		测试频率 [kHz]	注释
				直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NS 10155T 1R5NN V	1.5	±30%	0.0060	11.90	8.39	100	*1 ,*2
NS 10155T 2R2NN V	2.2	±30%	0.0072	10.00	7.61	100	*1 ,*2
NS 10155T 3R3NN V	3.3	±30%	0.0097	8.50	6.49	100	*1 ,*2
NS 10155T 4R7NN V	4.7	±30%	0.0112	7.40	6.01	100	*1 ,*2
NS 10155T 6R8NN V	6.8	±30%	0.0159	6.00	4.98	100	*1 ,*2
NS 10155T 100MN V	10	±20%	0.0200	4.49	4.40	100	*1 ,*2
NS 10155T 150MN V	15	±20%	0.0310	4.03	3.40	100	*1 ,*2
NS 10155T 220MN V	22	±20%	0.0430	3.37	2.80	100	*1 ,*2

●NS 10165 type

型号	标称电感值 [μH]	电感量公差	直流电阻 [Ω]（±20%）	额定电流 ※）[A]		测试频率 [kHz]	注释
				直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NS 10165T 1R5NN V	1.5	±30%	0.0062	13.60	8.04	100	*1 ,*2
NS 10165T 2R2NN V	2.2	±30%	0.0074	10.80	7.32	100	*1 ,*2
NS 10165T 3R3NN V	3.3	±30%	0.0086	9.30	6.76	100	*1 ,*2
NS 10165T 4R7NN V	4.7	±30%	0.0112	7.70	5.88	100	*1 ,*2
NS 10165T 6R8NN V	6.8	±30%	0.0140	6.00	5.22	100	*1 ,*2
NS 10165T 100MN V	10	±20%	0.0174	5.20	4.66	100	*1 ,*2
NS 10165T 150MN V	15	±20%	0.0280	3.60	3.84	100	*1 ,*2
NS 10165T 220MN V	22	±20%	0.0350	3.10	3.41	100	*1 ,*2

※）直流重叠允许电流（Idc1）为直流重叠带来的电感值下降，范围在30%以内的直流电感值（at 20℃）
※）温度上升允许电流（Idc2）为温度上升到40℃时的直流电感值（at 20℃）
※）额定电流值为能同时满足直流重叠许容电流和温度上升许容电流的直流电流值

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息（特性图、可靠性信息、使用时的注意事项等），请参阅弊司网站（http://www.ty-top.com/）。

■型号一览

●NS 12555 type

型号	标称电感值 [μH]	电感量公差	直流电阻 [Ω] (±20%)	额定电流 ※) [A]		测试频率 [kHz]	注释
				直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NS 12555T 6R0NN V	6.0	±30%	0.0140	5.01	5.60	100	*1 ,*2
NS 12555T 100MN V	10	±20%	0.0175	4.73	5.04	100	*1 ,*2
NS 12555T 150MN V	15	±20%	0.0233	3.89	4.18	100	*1 ,*2
NS 12555T 220MN V	22	±20%	0.0297	3.20	3.81	100	*1 ,*2
NS 12555T 330MN V	33	±20%	0.0415	2.64	3.16	100	*1 ,*2
NS 12555T 470MN V	47	±20%	0.0618	2.23	2.70	100	*1 ,*2
NS 12555T 680MN V	68	±20%	0.0832	1.81	2.14	100	*1 ,*2
NS 12555T 101MN V	100	±20%	0.117	1.53	1.86	100	*1 ,*2
NS 12555T 151MN V	150	±20%	0.215	1.10	1.30	100	*1 ,*2
NS 12555T 221MN V	220	±20%	0.270	1.00	1.18	100	*1 ,*2
NS 12555T 331MN V	330	±20%	0.410	0.82	0.96	100	*1 ,*2
NS 12555T 471MN V	470	±20%	0.520	0.68	0.80	100	*1 ,*2
NS 12555T 681MN V	680	±20%	0.870	0.48	0.61	100	*1 ,*2
NS 12555T 102MN V	1000	±20%	1.44	0.41	0.46	100	*1 ,*2
NS 12555T 152MN V	1500	±20%	1.73	0.40	0.44	100	*1 ,*2

●NS 12565 type

型号	标称电感值 [μH]	电感量公差	直流电阻 [Ω] (±20%)	额定电流 ※) [A]		测试频率 [kHz]	注释
				直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NS 12565T 2R0NN V	2.0	±30%	0.0080	13.91	7.60	100	*1 ,*2
NS 12565T 4R2NN V	4.2	±30%	0.0126	9.40	5.91	100	*1 ,*2
NS 12565T 7R0NN V	7.0	±30%	0.0162	7.80	5.21	100	*1 ,*2
NS 12565T 100MN V	10	±20%	0.0199	6.00	4.75	100	*1 ,*2
NS 12565T 150MN V	15	±20%	0.0237	5.60	4.33	100	*1 ,*2
NS 12565T 220MN V	22	±20%	0.0310	4.20	3.91	100	*1 ,*2
NS 12565T 330MN V	33	±20%	0.0390	3.80	3.22	100	*1 ,*2
NS 12565T 470MN V	47	±20%	0.0575	3.34	2.78	100	*1 ,*2
NS 12565T 680MN V	68	±20%	0.0775	2.70	2.30	100	*1 ,*2
NS 12565T 101MN V	100	±20%	0.123	2.23	1.81	100	*1 ,*2
NS 12565T 151MN V	150	±20%	0.173	1.80	1.54	100	*1 ,*2
NS 12565T 221MN V	220	±20%	0.273	1.39	1.18	100	*1 ,*2

●NS 12575 type

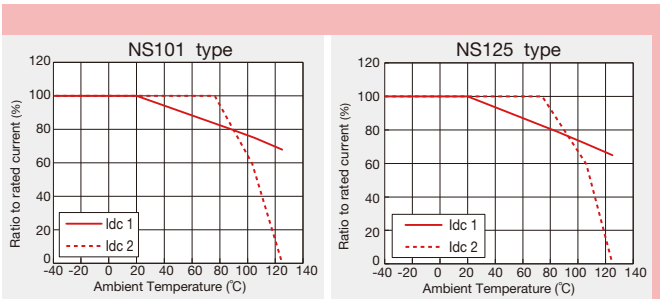
型号	标称电感值 [μH]	电感量公差	直流电阻 [Ω] (±20%)	额定电流 ※) [A]		测试频率 [kHz]	注释
				直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
NS 12575T 1R2NN V	1.2	±30%	0.0058	18.08	9.15	100	*1 ,*2
NS 12575T 2R7NN V	2.7	±30%	0.0085	13.91	7.69	100	*1 ,*2
NS 12575T 3R9NN V	3.9	±30%	0.0099	12.10	7.38	100	*1 ,*2
NS 12575T 5R6NN V	5.6	±30%	0.0116	10.20	6.36	100	*1 ,*2
NS 12575T 6R8NN V	6.8	±30%	0.0131	9.50	5.84	100	*1 ,*2
NS 12575T 100MN V	10	±20%	0.0156	7.65	5.55	100	*1 ,*2
NS 12575T 150MN V	15	±20%	0.0184	6.30	5.22	100	*1 ,*2
NS 12575T 220MN V	22	±20%	0.0260	5.50	4.05	100	*1 ,*2
NS 12575T 330MN V	33	±20%	0.0390	4.30	3.48	100	*1 ,*2
NS 12575T 470MN V	47	±20%	0.0515	3.60	2.95	100	*1 ,*2
NS 12575T 680MN V	68	±20%	0.0900	2.78	2.10	100	*1 ,*2
NS 12575T 101MN V	100	±20%	0.110	2.50	2.01	100	*1 ,*2
NS 12575T 151MN V	150	±20%	0.161	1.90	1.51	100	*1 ,*2
NS 12575T 221MN V	220	±20%	0.300	1.60	1.10	100	*1 ,*2
NS 12575T 102MN V	1000	±20%	1.170	0.72	0.53	100	*1 ,*2

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 额定电流值为能同时满足直流重叠许容电流和温度上升许容电流的直流电流值

▶ 由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

■降低额定电流值

●NS系列
NS系列需要根据周围温度降低额定电流值。
请参照下图降低使用电流的额定值。



▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

SMD POWER INDUCTORS (NS SERIES)

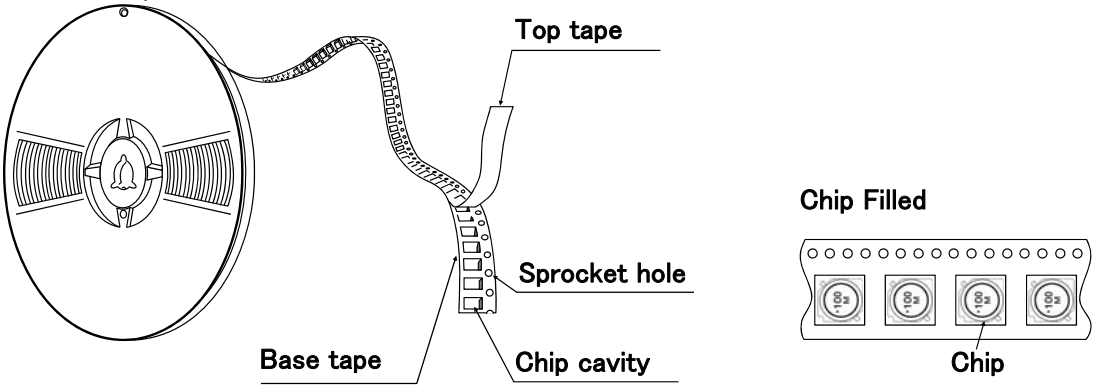
■PACKAGING

①Packing Quantity

Type	Standard Quantity (1reel) [pcs]	Minimum Quantity [pcs]
	Embossed Tape	Embossed Tape
NS10145	500	2000
NS10155	500	2000
NS10165	500	2000
NS12555	500	2000
NS12565	500	2000
NS12575	500	2000

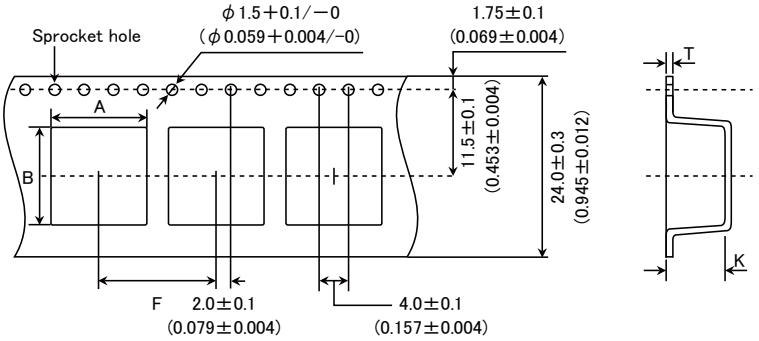
②Tape Material

●Embossed Tape



③Taping dimensions

●Embossed tape 24mm wide (0.945 inches wide)

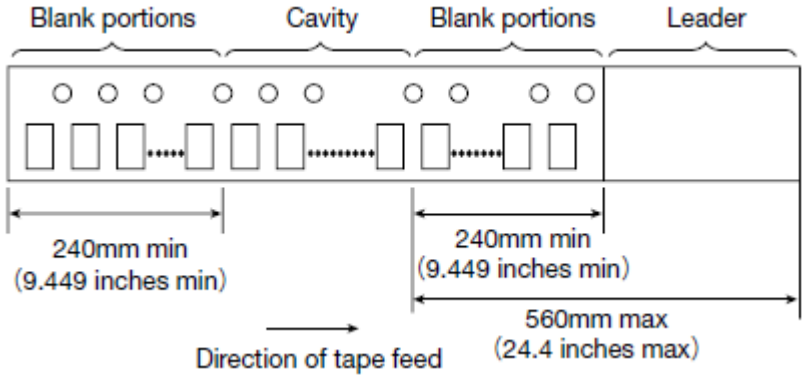


Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NS10145	10.5±0.1 (0.413±0.004)	10.5±0.1 (0.413±0.004)	16.0±0.1 (0.630±0.004)	0.4±0.1 (0.016±0.004)	5.0±0.1 (0.197±0.004)
NS10155	10.5±0.1 (0.413±0.004)	10.5±0.1 (0.413±0.004)	16.0±0.1 (0.630±0.004)	0.4±0.1 (0.016±0.004)	6.0±0.1 (0.236±0.004)
NS10165	10.5±0.1 (0.413±0.004)	10.5±0.1 (0.413±0.004)	16.0±0.1 (0.630±0.004)	0.4±0.1 (0.016±0.004)	7.0±0.1 (0.276±0.004)
NS12555	13.0±0.1 (0.512±0.004)	13.0±0.1 (0.512±0.004)	16.0±0.1 (0.630±0.004)	0.4±0.1 (0.016±0.004)	6.1±0.1 (0.240±0.004)
NS12565	13.0±0.1 (0.512±0.004)	13.0±0.1 (0.512±0.004)	16.0±0.1 (0.630±0.004)	0.4±0.1 (0.016±0.004)	7.1±0.1 (0.280±0.004)
NS12575	13.0±0.1 (0.512±0.004)	13.0±0.1 (0.512±0.004)	16.0±0.1 (0.630±0.004)	0.4±0.1 (0.016±0.004)	8.0±0.1 (0.315±0.004)

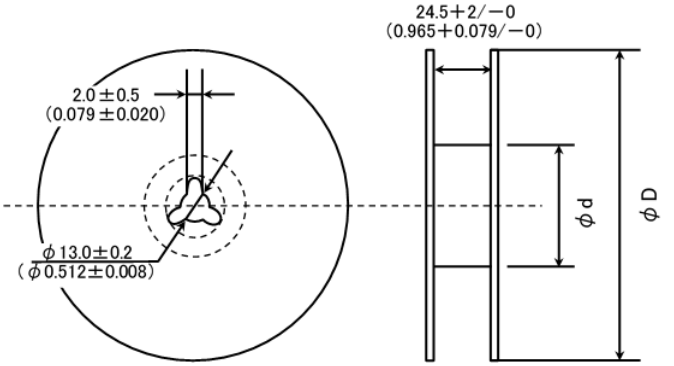
Unit:mm(inch)

▸ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification.
For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (http://www.ty-top.com/) .

④Leader and Blank portion



⑤Reel size

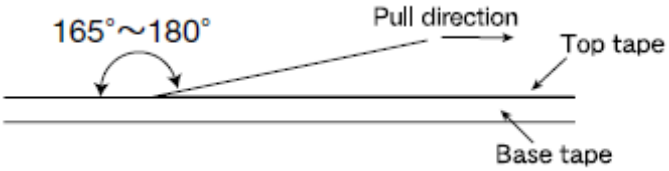


Type	Reel size (Reference values)	
	φD	φd
NS10145	330±2 (12.99±0.079)	100±1 (3.937±0.039)
NS10155		
NS10165		
NS12555		
NS12565		
NS12575		

Unit : mm (inch)

⑥Top Tape Strength

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



SMD POWER INDUCTORS (NS SERIES)

■RELIABILITY DATA

1. Operating Temperature Range		
Specified Value	NS101, NS125 Type	−40～＋125℃(Including self-generated heat)
Test Methods and Remarks	Including self-generated heat	

2. Storage Temperature Range		
Specified Value	NS101, NS125 Type	−40～＋85℃
Test Methods and Remarks	−5 to 40℃ for the product with taping.	

3. Rated current		
Specified Value	NS101, NS125 Type	Within the specified tolerance

4. Inductance		
Specified Value	NS101, NS125 Type	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : LCR Meter (HP 4285A or equivalent) Measuring frequency : 100kHz, 1V	

5. DC Resistance		
Specified Value	NS101, NS125 Type	Within the specified tolerance
Test Methods and Remarks	Measuring equipment : DC ohmmeter (HIOKI 3227 or equivalent)	

6. Self resonance frequency		
Specified Value	NS101, NS125 Type	−

7. Temperature characteristic		
Specified Value	NS101, NS125 Type	Inductance change : Within ±15%

Test Methods and Remarks

NS101, NS125 Type :
Measurement of inductance shall be taken at temperature range within −40℃～＋125℃.
With reference to inductance value at ＋20℃., change rate shall be calculated.
Change of maximum inductance deviation in step 1 to 5

Step	Temperature(℃)
1	20
2	Minimum operating temperature
3	20 (Standard temperature)
4	Maximum operating temperature
5	20

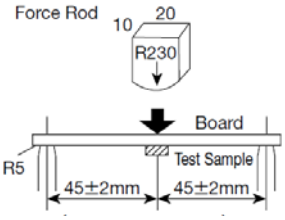
8. Resistance to flexure of substrate

Specified Value	NS101, NS125 Type	No damage

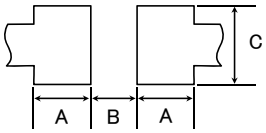
Test Methods and Remarks

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 mm(NS101/125Type)



Land dimension



Type	A	B	C
NS101	2.5	5.6	3.2
NS125	2.5	8.6	3.2

9. Insulation resistance : between wires

Specified Value	NS101, NS125 Type	—

10. Insulation resistance : between wire and core

Specified Value	NS101, NS125 Type	—

11. Withstanding voltage : between wire and core

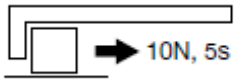
Specified Value	NS101, NS125 Type	—

12. Adhesion of terminal electrode

Specified Value	NS101, NS125 Type	Shall not come off PC board

Test Methods and Remarks

The test samples shall be soldered to the test board by the reflow.
Applied force : 10N to X and Y directions.
Duration : 5s.
Solder cream thickness : 0.15mm(NS101/125Type)



13. Resistance to vibration

Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.

Test Methods and Remarks

The test samples shall be soldered to the test board by the reflow.
Then it shall be submitted to below test conditions.

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

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

14. Solderability

Specified Value	NS101, NS125 Type	At least 90% of surface of terminal electrode is covered by new solder.

Test Methods and Remarks

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%.

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

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

15. Resistance to soldering heat

Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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. Test board material : glass epoxy-resin Test board thickness : 1.0mm Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.	

16. Thermal shock

Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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

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

17. Damp heat

Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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+24/−0 hour

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

18. Loading under damp heat

Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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+24/−0 hour

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

19. Low temperature life test

Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	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±2℃
Time	500+24/−0 hour

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

20. High temperature life test

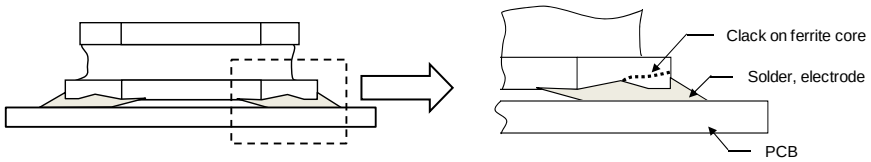
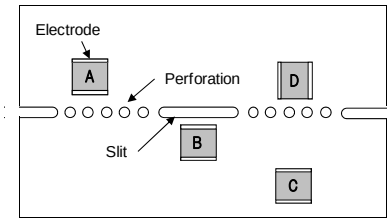
Specified Value	NS101, NS125 Type	—

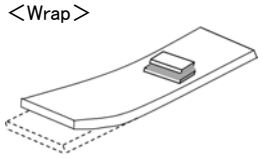
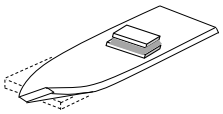
21. Loading at high temperature life test		
Specified Value	NS101, NS125 Type	Inductance change : Within ±10% No significant abnormality in appearance.
Test Methods and Remarks	The test samples shall be soldered to the test board by the reflow soldering. Temperature: 85±2℃ Applied current: Rated current Time: 500+24/−0 hour Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.	

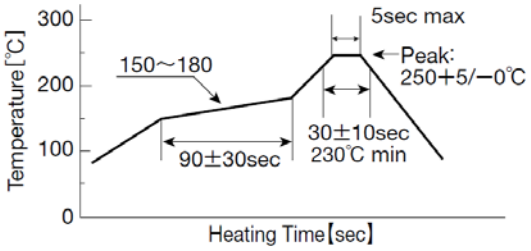
22. Standard condition		
Specified Value	NS101, NS125 Type	Standard test condition : Unless otherwise specified, temperature is 20±15℃ and 65±20%of relative humidity. When there is any question concerning measurement result: In order to provide correlation data, the test shall be condition of 20±2℃ of temperature, 65±5% relative humidity. Inductance is in accordance with our measured value.

■PRECAUTIONS

1. Circuit Design	
Precautions	◆Operating environment 1. The products listed in this catalogue are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment), general medical equipment, industrial equipment, and automotive interior applications, etc. Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., specially controlled medical equipment, transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment). Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment, nuclear control equipment, undersea equipment, military equipment, etc.).

2. PCB Design	
Precautions	◆Land pattern design 1. Please refer to a recommended land pattern. 2. There is stress, which has been caused by distortion of a PCB, to the inductor. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type) 3. Please consider the arrangement of parts on a PCB. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)
Technical considerations	◆Land pattern design Surface Mounting 1. Mounting and soldering conditions should be checked beforehand. 2. Applicable soldering process to this products is reflow soldering only. 3. Please use the recommended land pattern shown as below. Electrical characteristics and the mounting ability of the product are being considered in the recommended land pattern. If a PCB is designed with other dimensions, defective soldering and stress to a product may occur due to misalignment. The performance of the product may not be brought out. If an adopted land pattern is different from the recommended land pattern, stress to the product will increase. It may cause cracks or defective electrical characteristics of the product. Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type) 4. As coefficients of thermal expansion between an inductor and a PCB differs, cracks may occur on a ferrite core when thermal stress is applied to them after mounting an inductor. (Please refer to the drawings below.) Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)  5. SMD inductors should be located to minimize any possible mechanical stresses from board warp or deflection. When splitting the PC board after mounting inductors and other components, care is required so as not to give any stresses of deflection or twisting to the board. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)  A product tends to undergo stress in order "A>C>B≡D". Please consider the layouts of a product to minimize any stresses.

3. Considerations for automatic placement	
Precautions	◆Adjustment of mounting machine 1. Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2. Mounting and soldering conditions should be checked beforehand.
Technical considerations	◆Adjustment of mounting machine 1. When installing products, care should be taken not to apply distortion stress as it may deform the products. 2. Stress may be applied to a product with a warp or a twist in handling of the product. Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility. (NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type) <Wrap>  <Twist> 

4. Soldering	
Precautions	◆Reflow soldering 1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified. 2. The product shall be used 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 adhesion, temperature of resistance to soldering heat, soldering etc sufficiently. ◆Recommended conditions for using a soldering iron ・ 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.
Technical considerations	◆Reflow soldering 1. If products are used beyond the range of the recommended conditions, heat stresses may deform the products, and consequently degrade the reliability of the products. ・ NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type, NS101/125 Type Recommended reflow condition (Pb free solder) 

5. Cleaning	
Precautions	◆Cleaning conditions 1. Washing by supersonic waves shall be avoided.
Technical considerations	◆Cleaning conditions 1. If washed by supersonic waves, the products might be broken.

6. Handling	
Precautions	◆Handling 1. Keep the product away from all magnets and magnetic objects. ◆Breakaway PC boards (splitting along perforations) 1. When splitting the PC board after mounting product, care should be taken not to give any stresses of deflection or twisting to the board. 2. Board separation should not be done manually, but by using the appropriate devices. ◆Mechanical considerations 1. Please do not give the product any excessive mechanical shocks. 2. Please do not add any shock and power to a product in transportation. ◆Pick-up pressure 1. Please do not push to add any pressure to a winding part. Please do not give any shock and push into a ferrite core exposure part. ◆Packing 1. Please avoid accumulation of a packing box as much as possible.
Technical considerations	◆Handling 1. There is a case that a characteristic varies with magnetic influence. ◆Breakaway PC boards (splitting along perforations) 1. The position of the product on PCBs shall be carefully considered to minimize the stress caused from splitting of the PCBs. ◆Mechanical considerations 1. There is a case to be damaged by a mechanical shock. 2. There is a case to be broken by the handling in transportation. ◆Pick-up pressure 1. Damage and a characteristic can vary with an excessive shock or stress. ◆Packing 1. If packing boxes are accumulated, that could cause a deformation on packing tapes or a damage on the products.

7. Storage conditions	
Precautions	◆Storage 1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. ・ Recommended conditions Ambient temperature : −5～40℃ 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.
Technical considerations	◆Storage 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.

绕线型片状功率电感器(CB系列)

回流焊

■型号标示法　　*使用温度范围　：-40～105℃（包括本身发热）

C	B	△	△	2	0	1	2	T	1	0	0	M	△	V
①		②		③				④	⑤			⑥	⑦	⑧

△＝空格

①类型

代码	类型
CB	绕线型片状功率电感器

②特性

代码	特性
△△	标准品
△C	大电流

③尺寸（L × W）

代码	外型 (inch)	尺寸 (L×W) [mm]
2012	2012(0805)	2.0×1.25
2016	2016(0806)	2.0×1.6
2518	2518(1007)	2.5×1.8
3225	3225(1210)	3.2×2.5

④包装

代码	包装
T	卷盘带装

⑤标称电感值

代码 (例)	标称电感值 [μH]
1R0	1.0
100	10
101	100

※R＝小数点

⑥电感量公差

代码	电感量公差
K	±10%
M	±20%

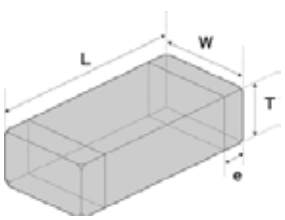
⑦个别规格

代码	个别规格
△	标准品
R	低Rdc 型

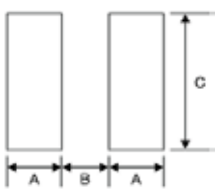
⑧本公司管理记号

代码	本公司管理记号
V	产业机器/车内用途

■标准外型尺寸 / 标准数量



推荐焊盘图案
实装上的注意
·请确认实装状态后使用。
·本产品焊法限定为回流焊法。



Type	A	B	C
2012	0.60	1.0	1.45
2016	0.60	1.0	1.8
2518	0.60	1.5	2.0
3225	0.85	1.7	2.7

单位: mm

Type	L	W	T	e	标准数量[pcs] 纸带	标准数量[pcs] 压纹带
CB 2012 CB C2012	2.0±0.2 (0.079±0.008)	1.25±0.2 (0.049±0.008)	1.25±0.2 (0.049±0.008)	0.5±0.2 (0.020±0.008)	—	3000
CB 2016 CB C2016	2.0±0.2 (0.079±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.020±0.008)	—	2000
CB 2518 CB C2518	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.5±0.2 (0.020±0.008)	—	2000
CB C3225	3.2±0.2 (0.126±0.008)	2.5±0.2 (0.098±0.008)	2.5±0.2 (0.098±0.008)	0.6±0.3 (0.024±0.012)	—	1000

单位: mm (inch)

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另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

■型号一览

・商品目录记载的绕线型片状功率电感器均为RoHS对应产品。

注）
・根据使用电路和机器，需要按照相应规格处理。请务必咨询正规销售渠道。

・*2：面向工业设备、医疗设备的产品。
关于本产品的详细规格和评估测试结果等信息，请咨询官方销售渠道。
此外，订购时请索取产品规格书。
若用于汽车设备时，请务必事先咨询本公司。

●2012(0805)type

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB 2012T1R0M V	1.0	±20%	100	0.15	500	700	7.96	*2
CB 2012T2R2M V	2.2	±20%	80	0.23	410	620	7.96	*2
CB 2012T3R3M V	3.3	±20%	55	0.30	330	550	7.96	*2
CB 2012T4R7M V	4.7	±20%	45	0.40	300	430	7.96	*2
CB 2012T6R8M V	6.8	±20%	38	0.47	250	350	7.96	*2
CB 2012T100□ V	10	±10%, ±20%	32	0.70	190	300	2.52	*2
CB 2012T100□RV	10	±10%, ±20%	32	0.50	200	300	2.52	*2
CB 2012T150□ V	15	±10%, ±20%	28	1.3	170	240	2.52	*2
CB 2012T220□ V	22	±10%, ±20%	16	1.7	135	220	2.52	*2
CB 2012T470□ V	47	±10%, ±20%	11	3.7	90	140	2.52	*2
CB 2012T680□ V	68	±10%, ±20%	10	6.0	70	100	2.52	*2
CB 2012T101□ V	100	±10%, ±20%	8	7.0	60	100	0.796	*2

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB C2012T1R0M V	1.0	±20%	100	0.19	700	640	7.96	*2
CB C2012T2R2M V	2.2	±20%	70	0.33	530	485	7.96	*2
CB C2012T4R7M V	4.7	±20%	45	0.50	360	395	7.96	*2
CB C2012T100□ V	10	±10%, ±20%	40	1.2	240	255	2.52	*2
CB C2012T220□ V	22	±10%, ±20%	16	3.7	170	145	2.52	*2
CB C2012T470□ V	47	±10%, ±20%	11	5.8	120	115	2.52	*2

●2016(0806)type

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB 2016T1R0M V	1.0	±20%	100	0.09	600	720	7.96	*2
CB 2016T1R5M V	1.5	±20%	80	0.11	550	650	7.96	*2
CB 2016T2R2M V	2.2	±20%	70	0.13	510	600	7.96	*2
CB 2016T3R3M V	3.3	±20%	55	0.20	400	440	7.96	*2
CB 2016T4R7M V	4.7	±20%	45	0.25	340	410	7.96	*2
CB 2016T6R8M V	6.8	±20%	38	0.35	300	330	7.96	*2
CB 2016T100□ V	10	±10%, ±20%	32	0.50	250	270	2.52	*2
CB 2016T150□ V	15	±10%, ±20%	28	0.70	210	220	2.52	*2
CB 2016T220□ V	22	±10%, ±20%	16	1.0	165	190	2.52	*2
CB 2016T330□ V	33	±10%, ±20%	14	1.7	130	140	2.52	*2
CB 2016T470□ V	47	±10%, ±20%	11	2.4	110	120	2.52	*2
CB 2016T680□ V	68	±10%, ±20%	10	3.0	90	110	2.52	*2
CB 2016T101□ V	100	±10%, ±20%	8	4.5	70	90	0.796	*2

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB C2016T1R0M V	1.0	±20%	100	0.10	1,100	885	7.96	*2
CB C2016T1R5M V	1.5	±20%	80	0.15	1,000	775	7.96	*2
CB C2016T2R2M V	2.2	±20%	70	0.20	750	625	7.96	*2
CB C2016T3R3M V	3.3	±20%	55	0.27	600	535	7.96	*2
CB C2016T4R7M V	4.7	±20%	45	0.37	550	460	7.96	*2
CB C2016T6R8M V	6.8	±20%	38	0.59	450	360	7.96	*2
CB C2016T100□ V	10	±10%, ±20%	32	0.82	380	305	2.52	*2
CB C2016T150□ V	15	±10%, ±20%	28	1.2	300	255	2.52	*2
CB C2016T220□ V	22	±10%, ±20%	16	1.8	250	205	2.52	*2
CB C2016T330□ V	33	±10%, ±20%	14	2.8	220	165	2.52	*2
CB C2016T470□ V	47	±10%, ±20%	11	4.3	150	130	2.52	*2
CB C2016T680□ V	68	±10%, ±20%	10	7.0	130	105	2.52	*2
CB C2016T101□ V	100	±10%, ±20%	8	8.0	110	95	0.796	*2

(注) 请在型号的[]中指定电感量公差代码 (M或K) 。

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降，范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 额定电流值：Idc1或Idc2中低的一方的直流电流值当作额定电流值。

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■型号一览

●2518(1007)type

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB 2518T1R0M V	1.0	±20%	100	0.06	1,200	1,250	7.96	*2
CB 2518T1R5M V	1.5	±20%	80	0.07	650	1,100	7.96	*2
CB 2518T2R2M V	2.2	±20%	68	0.09	510	1,000	7.96	*2
CB 2518T3R3M V	3.3	±20%	54	0.11	440	900	7.96	*2
CB 2518T4R7MRV	4.7	±20%	46	0.10	310	820	7.96	*2
CB 2518T4R7M V	4.7	±20%	46	0.13	340	820	7.96	*2
CB 2518T6R8M V	6.8	±20%	38	0.15	270	750	7.96	*2
CB 2518T100□ V	10	±10%, ±20%	30	0.25	250	600	2.52	*2
CB 2518T150□ V	15	±10%, ±20%	23	0.32	180	500	2.52	*2
CB 2518T220□ V	22	±10%, ±20%	19	0.50	165	390	2.52	*2
CB 2518T330□ V	33	±10%, ±20%	15	0.70	130	320	2.52	*2
CB 2518T470□ V	47	±10%, ±20%	12	0.95	110	270	2.52	*2
CB 2518T680□ V	68	±10%, ±20%	9.5	1.5	70	210	2.52	*2
CB 2518T101□ V	100	±10%, ±20%	9.0	2.1	60	190	0.796	*2
CB 2518T151□ V	150	±10%, ±20%	7.0	3.2	55	140	0.796	*2
CB 2518T221□ V	220	±10%, ±20%	5.5	4.5	50	110	0.796	*2
CB 2518T331□ V	330	±10%, ±20%	4.5	7.0	40	90	0.796	*2
CB 2518T471□ V	470	±10%, ±20%	3.5	10	35	70	0.796	*2
CB 2518T681□ V	680	±10%, ±20%	3.0	17	30	50	0.796	*2
CB 2518T102□ V	1000	±10%, ±20%	2.4	24	25	45	0.252	*2

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB C2518T1R0M V	1.0	±20%	100	0.08	1,000	775	7.96	*2
CB C2518T1R5M V	1.5	±20%	80	0.11	950	730	7.96	*2
CB C2518T2R2M V	2.2	±20%	68	0.13	890	630	7.96	*2
CB C2518T3R3M V	3.3	±20%	54	0.16	730	560	7.96	*2
CB C2518T4R7M V	4.7	±20%	41	0.20	680	510	7.96	*2
CB C2518T6R8M V	6.8	±20%	38	0.30	550	420	7.96	*2
CB C2518T100□ V	10	±10%, ±20%	30	0.36	480	375	2.52	*2
CB C2518T150□ V	15	±10%, ±20%	23	0.65	350	285	2.52	*2
CB C2518T220□ V	22	±10%, ±20%	19	0.77	320	250	2.52	*2
CB C2518T330□ V	33	±10%, ±20%	15	1.5	270	185	2.52	*2
CB C2518T470□ V	47	±10%, ±20%	12	1.9	240	165	2.52	*2
CB C2518T680□ V	68	±10%, ±20%	9.5	2.8	200	140	2.52	*2
CB C2518T101□ V	100	±10%, ±20%	9.0	3.7	160	125	0.796	*2
CB C2518T151□ V	150	±10%, ±20%	7.0	6.1	140	95	0.796	*2
CB C2518T221□ V	220	±10%, ±20%	5.5	8.4	115	80	0.796	*2
CB C2518T331□ V	330	±10%, ±20%	4.5	12.3	100	65	0.796	*2
CB C2518T471□ V	470	±10%, ±20%	3.5	22	80	50	0.796	*2
CB C2518T681□ V	680	±10%, ±20%	3.0	28	65	45	0.796	*2

●3225(1210)type

型号	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 ※) [mA]		测试频率 [MHz]	注释
					直流重叠允许电流 Idc1	温度上升允许电流 Idc2		
CB C3225T1R0MRV	1.0	±20%	250	0.055	2,000	1,100	0.1	*2
CB C3225T1R5MRV	1.5	±20%	220	0.060	2,000	1,000	0.1	*2
CB C3225T2R2MRV	2.2	±20%	190	0.080	2,000	930	0.1	*2
CB C3225T3R3MRV	3.3	±20%	160	0.095	2,000	850	0.1	*2
CB C3225T4R7MRV	4.7	±20%	70	0.100	1,250	830	0.1	*2
CB C3225T6R8MRV	6.8	±20%	50	0.120	950	760	0.1	*2
CB C3225T100□RV	10	±10%, ±20%	23	0.133	900	720	0.1	*2
CB C3225T150□RV	15	±10%, ±20%	20	0.195	730	590	0.1	*2
CB C3225T220□RV	22	±10%, ±20%	17	0.27	620	500	0.1	*2
CB C3225T330□RV	33	±10%, ±20%	13	0.41	500	400	0.1	*2
CB C3225T470□RV	47	±10%, ±20%	10	0.67	390	320	0.1	*2
CB C3225T680□RV	68	±10%, ±20%	8.0	1.0	320	260	0.1	*2
CB C3225T101□RV	100	±10%, ±20%	6.0	1.4	270	220	0.1	*2
CB C3225T221□RV	220	±10%, ±20%	3.0	2.5	190	170	0.1	*2
CB C3225T821□RV	820	±10%, ±20%	1.8	12	110	80	0.1	*2
CB C3225T102□RV	1000	±10%, ±20%	1.6	13	100	75	0.1	*2

(注) 请在型号的[]中指定电感量公差代码 (M或K) 。

※) 直流重叠允许电流 (Idc1) 为直流重叠带来的电感值下降, 范围在30%以内的直流电感值 (at 20℃)
※) 温度上升允许电流 (Idc2) 为温度上升到40℃时的直流电感值 (at 20℃)
※) 额定电流值: Idc1或Idc2中低的一方的直流电流值当作额定电流值。

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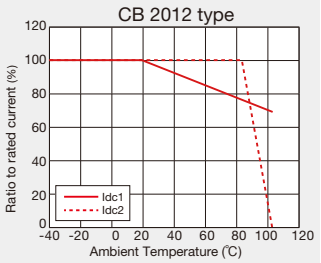
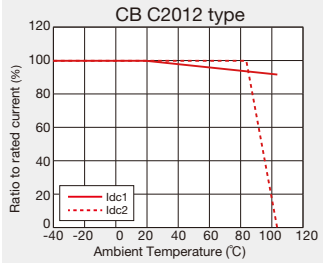
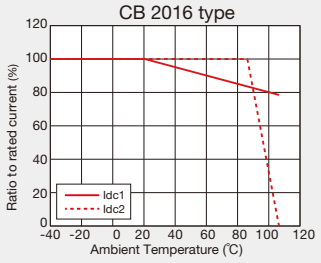
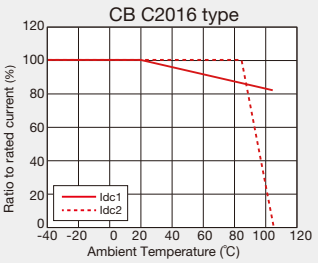
■降低额定电流值

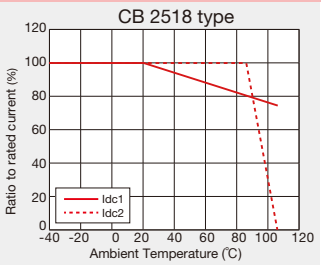
●CB系列
CB 系列需要根据周围温度降低额定电流值。
请参照下图降低使用电流的额定值。

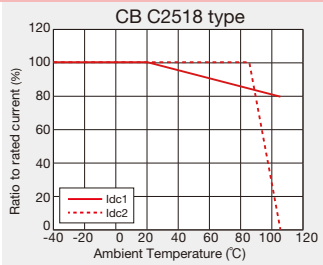


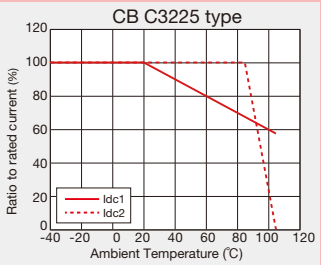












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WIRE-WOUND CHIP INDUCTORS (LB SERIES),
WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES),
WIRE-WOUND CHIP INDUCTORS FOR SIGNAL LINES (LB SERIES M TYPE)

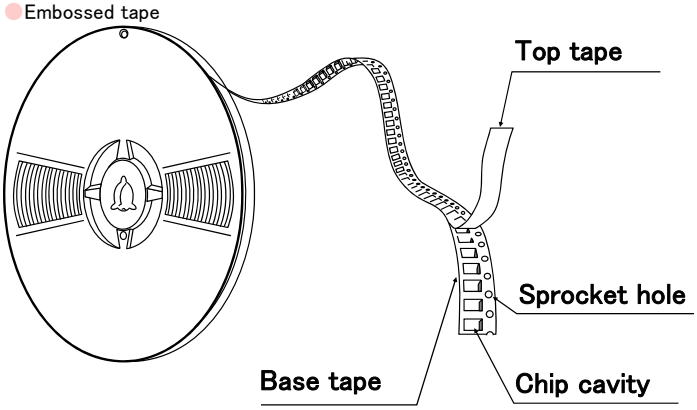
■PACKAGING

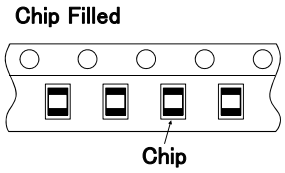
①Minimum Quantity

Type	Standard Quantity [pcs]	
	Paper Tape	Embossed Tape
LB C3225 CB C3225	—	1000
LB 3218	—	2000
LB R2518 LB C2518 LB 2518 CB 2518 CB C2518	—	2000
LBM2016 LB C2016 LB 2016 CB 2016 CB C2016	—	2000
LB 2012 LB C2012 LB R2012 CB 2012 CB C2012	—	3000
CB L2012	4000	—
LB 1608	4000	—
LBMF1608 CBMF1608	—	3000

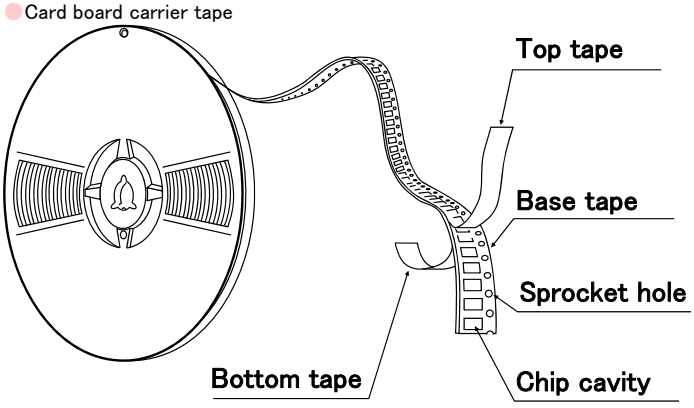
②Tape material

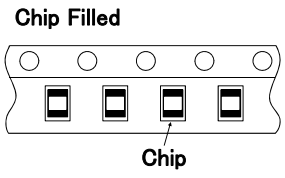
●Embossed tape





●Card board carrier tape

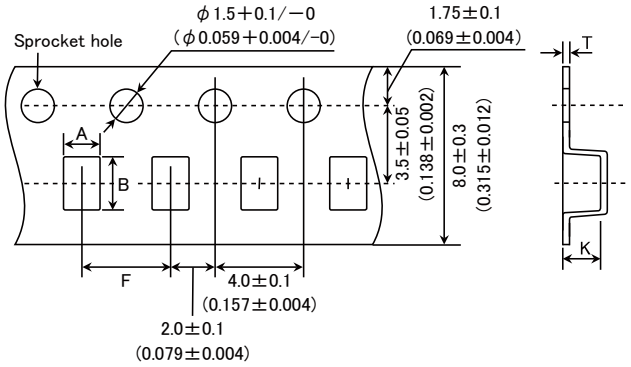




▸ This catalog contains the typical specification only due to the limitation of space. When you consider the purchase of our products, please check our specification.
For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (http://www.ty-top.com/) .

③Taping Dimensions

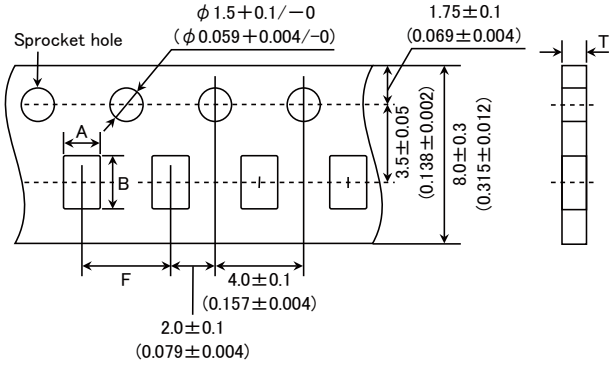
Embossed Tape (0.315 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
LBM2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.075max.)
LB C3225 CB C3225	2.8±0.1 (0.110±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	4.0max. (0.157max.)
LB 3218	2.1±0.1 (0.083±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.2max. (0.087max.)
LB 2518 CB 2518 LB C2518 CB C2518 LB R2518	2.15±0.1 (0.085±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.2max. (0.087max.)
LB 2016 CB 2016 LB C2016 CB C2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.075max.)
LB 2012 CB 2012 LB C2012 CB C2012 LB R2012	1.45±0.1 (0.057±0.004)	2.25±0.1 (0.089±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.010±0.002)	1.45max. (0.057max.)
LBMF1608 CBMF1608	1.1±0.1 (0.043±0.004)	1.9±0.1 (0.075±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.010±0.002)	1.2max. (0.047max.)

Unit : mm (inch)

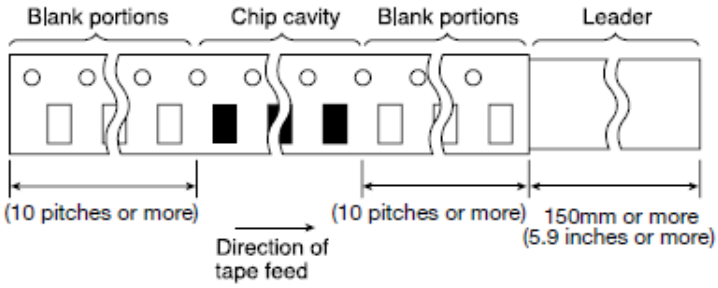
Card board carrier tape (0.315 inches wide)



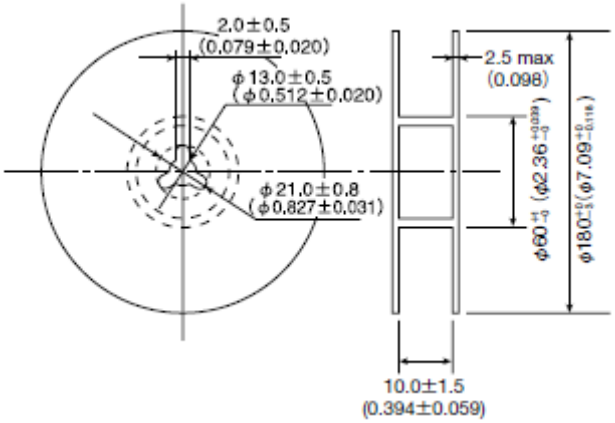
Type	Chip cavity		Insertion pitch	Tape thickness
	A	B	F	T
CB L2012	1.55±0.1 (0.061±0.004)	2.3±0.1 (0.091±0.004)	4.0±0.1 (0.157±0.004)	1.1max. (0.043max.)
LB 1608	1.0±0.1 (0.039±0.004)	1.8±0.1 (0.071±0.004)	4.0±0.1 (0.157±0.004)	1.1max. (0.043max.)

Unit : mm (inch)

④Leader and Blank Portion

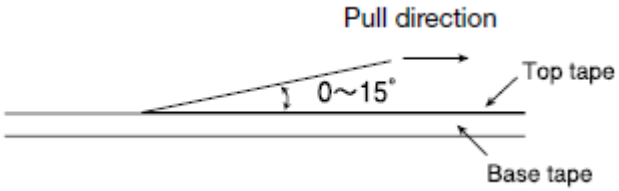


⑤Reel Size



⑥Top Tape Strength

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



WIRE-WOUND CHIP INDUCTORS (LB SERIES),
WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES),
WIRE-WOUND CHIP INDUCTORS FOR SIGNAL LINES (LB SERIES M TYPE)

■RELIABILITY DATA

1.Operating temperature Range		
Specified Value	LB, LBC, LBR Series	−40～＋105℃(Including self-generated heat)
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	Including self-generated heat	

2. Storage Temperature Range(after soldering)		
Specified Value	LB, LBC, LBR Series	−40～＋85℃
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	LB, CB Series: Please refer the term of "7. storage conditions" in precautions.	

3.Rated Current		
Specified Value	LB, LBC, LBR Series	Within the specified tolerance
	CB, CBC Series	
	LBM Series	

4.Inductance		
Specified Value	LB, LBC, LBR Series	Within the specified tolerance
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・LBM Series Measuring equipment : LCR Mater(HP4285A or its equivalent)	

5.Q		
Specified Value	LB, LBC, LBR Series	−
	CB, CBC Series	
	LBM Series	Within the specified tolerance
Test Methods and Remarks	LBM Series Measuring equipment : LCR Mater(HP4285A or its equivalent)	

6.DC Resistance		
Specified Value	LB, LBC, LBR Series	Within the specified tolerance
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	Measuring equipment : DC Ohmmeter (HIOKI 3227 or its equivalent)	

7.Self-Resonant Frequency		
Specified Value	LB, LBC, LBR Series	Within the specified tolerance
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	Measuring equipment : Impedance analyzer (HP4291A or its equivalent)	

8.Temperature Characteristic

Specified Value	LBM2016				Inductance change : Within±10%
	LB2012	LBR2012	CB2012	LB2016	Inductance change : Within±20%
	CB2016	LB2518	LBR2518	CB2518	
	LBC3225	CBC3225			
	LBC2016	CBC2016	LBC2518	CBC2518	Inductance change : Within±25%
	LB3218				
	LBC2012	CBC2012			Inductance change : Within±35%

Test Methods and Remarks

Change of maximum inductance deviation in step 1–5

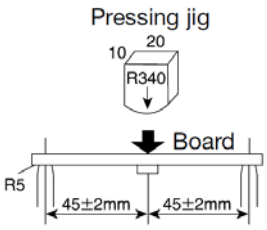
Step	Temperature (℃)
	LB, CB Serie
1	20
2	−40
3	20 (Reference temperature)
4	+85 (Maximum operating temperature)
5	20

9.Rasistance to Flexure of Substrate

Specified Value	LB, LBC, LBR Series	No damage.
	CB, CBC Series	
	LBM Series	

Test Methods and Remarks

Warp : 2mm (LB・LBC・LBR・CB・CBC・LBM Series)
Test substrate : Board according to JIS C0051
Thickness : 1.0mm



10.Body Strength

Specified Value	LB, LBC, LBR Series	No damage.
	CB, CBC Series	
	LBM Series	

Test Methods and Remarks

LB・LBC・LBR・CB・CBC・LBM
Applied force : 10N
Duration : 10sec.

11.Adhesion of terminal electrode

Specified Value	LB, LBC, LBR Series	No abnormality.
	CB, CBC Series	
	LBM Series	

Test Methods and Remarks

LB・LBC・LBR・CB・CBC・CBL・LBM
Applied force : 10N to X and Y directions
Duration : 5 sec.
Test substrate : Printed board

12.Resistance to vibration		
Specified Value	LB, LBC, LBR Series	Inductance change : Within±20% No significant abnormality in appearance.
	CB, CBC Series	
	LBM Series	Inductance change : Within±20% No significant abnormality in appearance.
Test Methods and Remarks	LB・LBR・LBC・CB・CBC・LBM : 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.	

13.Drop test		
Specified Value	LB, LBC, LBR Series	—
	CB, CBC Series	
	LBM Series	

14.Solderability		
Specified Value	LB, LBC, LBR Series	At least 90% of surface of terminal electrode is covered by new
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM: Solder temperature : 245±5℃ Duration : 5±0.5sec Flux : Methanol solution with 25% of colophony	

15.Resistance to soldering		
Specified Value	LB, LBC, LBR Series	Inductance change : Within±20%
	CB, CBC Series	
	LBM Series	Inductance change : Within±20%
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM: 3 times of reflow oven at 230℃ MIN for 40sec. with peak temperature at 260 ℃ for 5sec.	

16.Resisitance to solvent		
Specified Value	LB, LBC, LBR Series	—
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	Solvent temperature : Room temperature Type of solvent : Isopropyl alcohol Cleaning conditions : 90s. Immersion and cleaning.	

17.Thermal shock		
Specified Value	LB, LBC, LBR Series	Inductance change : Within±20% No significant abnormality in appearance.
	CB, CBC Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM:－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.	

18.Damp heat life test		
Specified Value	LB, LBC, LBR Series CB, CBC Series LBM Series	Inductance change : Within±20% No significant abnormality in appearance.
Test Methods and Remarks	Temperature : 60±2℃ Humidity : 90～95%RH Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

19.Loading under damp heat life test		
Specified Value	LB, LBC, LBR Series CB, CBC Series LBM Series	Inductance change : Within±20% No significant abnormality in appearance.
Test Methods and Remarks	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.	

20.High temperature life test		
Specified Value	LB, LBC, LBR Series	—
	CB, CBC Series LBM Series	Inductance change : Within±20% No significant abnormality in appearance.
Test Methods and Remarks	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.	

21.Loading at high temperature life test		
Specified Value	LB, LBC, LBR Series	Inductance change : Within±20% No significant abnormality in appearance.
	CB, CBC Series LBM Series	—
Test Methods and Remarks	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.	

22.Low temperature life test		
Specified Value	LB, LBC, LBR Series CB, CBC Series LBM Series	Inductance change : Within±20% No significant abnormality in appearance.
Test Methods and Remarks	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.	

23.Standard condition		
Specified Value	LB, LBC, LBR Series CB, CBC Series LBM Series	Standard test conditions Unless specified, Ambient temperature is 20±15℃ and the Relative humidity is 65±20%. If there is any doubt about the test results, further measurement shall be had within the following limits: Ambient Temperature: 20±2℃ Relative humidity: 65±5% Inductance value is based on our standard measurement systems.

WIRE-WOUND CHIP INDUCTORS (LB SERIES),
WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES),
WIRE-WOUND CHIP INDUCTORS FOR SIGNAL LINES (LB SERIES M TYPE)

■PRECAUTIONS

1. Circuit Design

Precautions	◆Operating environment 1. The products listed in this catalogue are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment), general medical equipment, industrial equipment, and automotive interior applications, etc. Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., specially controlled medical equipment, transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment). Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment, nuclear control equipment, undersea equipment, military equipment, etc.).

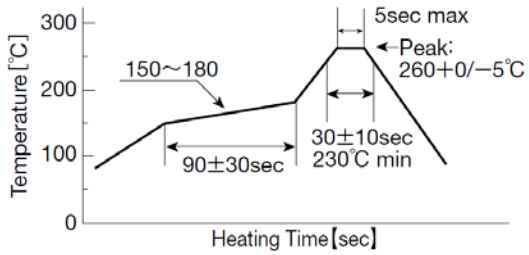
2. PCB Design

Precautions	◆Land pattern design 1. Please contact any of our offices for a land pattern, and refer to a recommended land pattern of a right figure or specifications.
Technical considerations	PRECAUTIONS 【Recommended Land Patterns】 Surface Mounting ・ Mounting and soldering conditions should be checked beforehand. ・ Applicable soldering process to those products is reflow soldering only.

3. Considerations for automatic placement

Precautions	◆Adjustment of mounting machine 1. Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2. Mounting and soldering conditions should be checked beforehand.
Technical considerations	1. When installing products, care should be taken not to apply distortion stress as it may deform the products.

4. Soldering

Precautions	◆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. ◆Recommended conditions for using a soldering iron 1. Put the soldering iron on the land-pattern. Soldering iron's temperature – Below 350℃ Duration-3 seconds or less. The soldering iron should not come in contact with inductor directly.
Technical considerations	◆Reflow soldering(LB and CB Types) 1. Reflow profile  ◆Recommended conditions for using a soldering iron 1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.

5. Cleaning

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

6. Handling	
Precautions	◆Handling 1. Keep the inductors away from all magnets and magnetic objects. ◆Breakaway PC boards (splitting along perforations) 1. When splitting the PC board after mounting inductors, care should be taken not to give any stresses of deflection or twisting to the board. 2. Board separation should not be done manually, but by using the appropriate devices. ◆Mechanical considerations 1. Please do not give the inductors any excessive mechanical shocks.
Technical considerations	◆Handling 1. There is a case that a characteristic varies with magnetic influence. ◆Breakaway PC boards (splitting along perforations) 1. Planning pattern configurations and the position of products should be carefully performed to minimize stress. ◆Mechanical considerations 1. There is a case to be damaged by a mechanical shock.

7. Storage conditions	
Precautions	◆Storage 1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. ・ Recommended conditions Ambient temperature : 0～40℃ / Humidity : Below 70% RH The ambient temperature must be kept below 30℃ even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, These series should be used within 6 months from the time of delivery.
Technical considerations	◆Storage 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.