Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

⚠ REMINDERS

- Product information in this catalog is as of October 2011. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or usage of the Products.

  Please note that Taiyo Yuden Co., Ltd. shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this catalog or individual specification.

- Please contact Taiyo Yuden Co., Ltd. for further details of product specifications as the individual specification is available.

- Please conduct validation and verification of products in actual condition of mounting and operating environment before commercial shipment of the equipment.

- All electronic components or functional modules listed in this catalog are developed, designed and intended for use in general electronics equipment.(for AV, office automation, household, office supply, information service, telecommunications, (such as mobile phone or PC) etc.). Before incorporating the components or devices into any equipment in the field such as transportation,(automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network (telephone exchange, base station) etc. which may have direct influence to harm or injure a human body, please contact Taiyo Yuden Co., Ltd. for more detail in advance.
  Do not incorporate the products into any equipment in fields such as aerospace, aviation, nuclear control, submarine system, military, etc. where higher safety and reliability are especially required.

  In addition, even electronic components or functional modules that are used for the general electronic equipment, if the equipment or the electric circuit require high safety or reliability function or performances, a sufficient reliability evaluation check for safety shall be performed before commercial shipment and moreover, due consideration to install a protective circuit is strongly recommended at customer's design stage.

- The contents of this catalog are applicable to the products which are purchased from our sales offices or distributors (so called "TAIYO YUDEN's official sales channel").
  It is only applicable to the products purchased from any of TAIYO YUDEN's official sales channel.

- Please note that Taiyo Yuden Co., Ltd. shall have no responsibility for any controversies or disputes that may occur in connection with a third party's intellectual property rights and other related rights arising from your usage of products in this catalog. Taiyo Yuden Co., Ltd. grants no license for such rights.

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

SMD POWER INDUCTORS (NR SERIES/NR SERIES H TYPE/S TYPE/V TYPE)

REFLOW

FEATURES

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

APPLICATIONS

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

OPERATING TEMP.

- NR/NRS20/NRV20/NRH24/NRH30/NRV3012 : −25℃~120℃ (Including self-generated heat)
- NRS40/50/60/80 : −25℃~125℃ (Including self-generated heat)

ORDERING CODE

N R △ 4 0 1 8 T △ 1 0 0 M △

❶Type	
NR△ NRH NRS NRV	Coating resin specification

△=Blank Space

❸Packaging	
T△	Tape & Reel

△=Blank Space

❹Nominal inductance (μH)	
example	
2R2	2.2
100	10
101	100

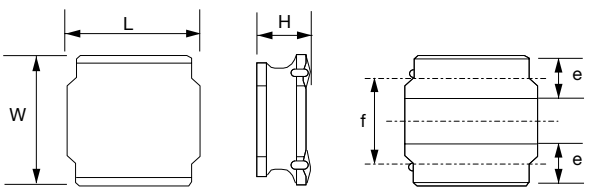
※R=decimal point

❺Inductance tolerance	
M	±20%
N	±30%

❻Internal code

❷External dimensions (W×L×H)			
2012	2.0×2.0×1.2 mm	5020	4.9×4.9×2.0 mm
2410	2.4×2.4×1.0 mm	5024	4.9×4.9×2.4 mm
2412	2.4×2.4×1.2 mm	5040	4.9×4.9×4.0 mm
3010	3.0×3.0×1.0 mm	6010	6.0×6.0×1.0 mm
3012	3.0×3.0×1.2 mm	6012	6.0×6.0×1.2 mm
4010	4.0×4.0×1.0 mm	6014	6.0×6.0×1.4 mm
4012	4.0×4.0×1.2 mm	6020	6.0×6.0×2.0 mm
4018	4.0×4.0×1.8 mm	6028	6.0×6.0×2.8 mm
5010	4.9×4.9×1.0 mm	6045	6.0×6.0×4.5 mm
5012	4.9×4.9×1.2 mm	8030	8.0×8.0×3.0 mm
5014	4.9×4.9×1.4 mm	8040	8.0×8.0×4.0 mm

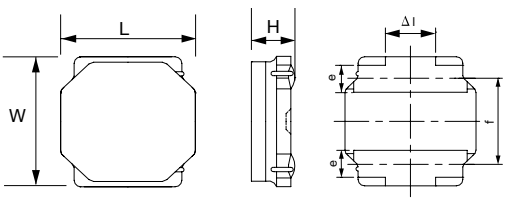
EXTERNAL DIMENSIONS/STANDARD QUANTITY



Type	L	W	H	e	f	Standard Quantity [pcs] Tape & Reel
NRS2012 NRV2012	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 (0.020±0.008)	1.25±0.2 (0.050±0.008)	2500
NRH2410 NRH2412	2.4±0.1 (0.095±0.004)	2.4±0.1 (0.095±0.004)	1.0 max (0.039 max) 1.2 max (0.047 max)	0.6±0.2 (0.024±0.008)	1.45±0.2 (0.057±0.008)	2500
NR 3010 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
NR3012 NRH3012 NRV3012			1.2 max (0.047 max)			2000
NR 3015			1.5 max (0.059 max)			2000
NR 4010 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
NR 4012 NRS4012			1.2 max (0.047 max)			4500
NR 4018 NRS4018			1.8 max (0.071 max)			3500
NRS8030	8.0±0.2 (0.315±0.008)	8.0±0.2 (0.315±0.008)	3.0max (0.118max)	1.60±0.3 (0.063±0.012)	5.6±0.3 (0.22±0.012)	1000
NR 8040 NRS8040			*1) 4.2max (0.165max) *2) 4.0max (0.157max)			1000

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

Unit : mm (inch)



Type	L	W	H	e	f	ΔI	Standard Quantity [pcs] Tape & Reel
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			1.2 max (0.047 max)				1000
NRS5014			1.4 max (0.055 max)				1000
NRS5020			2.0 max (0.079 max)				800
NRS5024			2.4 max (0.094 max)				2500
NR 5040 NRS5040			*3) 4.1max (0.161max) *4) 4.0max (0.157max)				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
NR 6012 NRS6012			1.2 max (0.047 max)				1000
NRS6014			1.4 max (0.055 max)				1000
NR 6020 NRS6020			2.0 max (0.079 max)				2500
NR 6028 NRS6028			2.8 max (0.110 max)				2000
NR 6045 NRS6045			4.5 max (0.177 max)				1500

*3) 1R5~100Type
*4) 150~470Type

Unit : mm (inch)

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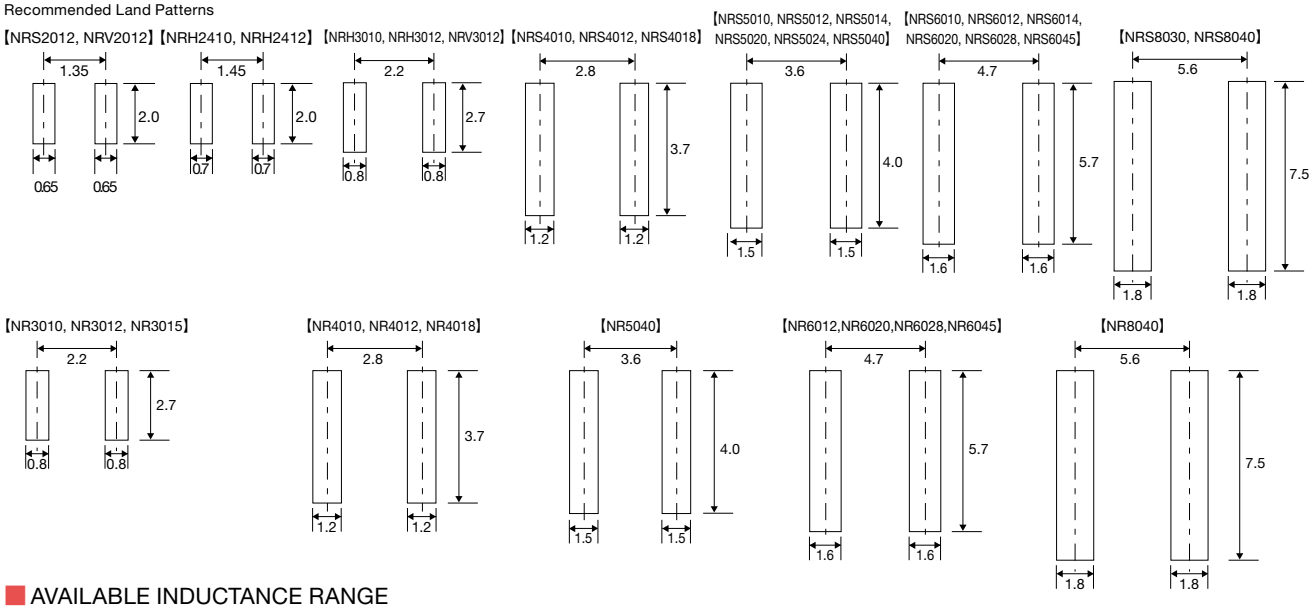
Recommended Land Patterns



AVAILABLE INDUCTANCE RANGE

Range \ Type	NRS2012		NRV2012		NRH2410		NRH2412		NRH3010		NRH3012		NRV3012		NRS4010	
Inductance [μH]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]
0.68	1700	0.070	1650	0.073	1570	0.060	1300	0.077	1480	0.065	1710	0.048	1600	0.065	1900	0.056
1.0																
4.7	910	0.241	750	0.325			650	0.300								
10					450	0.690	450	0.600	600	0.350	720	0.270	550	0.470	620	0.300
22					300	1.47			380	0.770	500	0.630			450	0.570
100																

Range \ Type	NRS4012		NRS4018		NRS5010		NRS5012		NRS5014		NRS5020		NRS5024		NRS5040	
Inductance [μH]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]
0.68	2200	0.042	3200	0.027	1750	0.070	2300	0.053	2800	0.045	3600	0.021	4400	0.016	4500	0.017
1.0																
4.7	800	0.170	1200	0.150	850	0.250	850	0.420	1050	0.200	1300	0.120	1200	0.125	2100	0.056
10							640	0.670								
22	500	0.400	550	0.460	450	0.600					900	0.260	630	0.370	900	0.31
100																

Range \ Type	NRS6010		NRS6012		NRS6014		NRS6020		NRS6028		NRS6045		NRS8030		NRS8040	
Inductance [μH]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±20% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]	Imax [mA]	Rdc±30% [Ω]
1.0	1900	0.090	1800	0.090	2750	0.042	4100	0.020	4600	0.013	4500	0.014			7800	0.006
4.7													6200	0.009		
10	1000	0.270	1000	0.200	1800	0.140	1500	0.125	1900	0.065	2400	0.046	2400	0.033	3100	0.034
22	700	0.580			950	0.300	950	0.290					1100	0.170	2200	0.066
100			320	1.670					650	0.600	750	0.466				

Range \ Type	NR 3010		NR 3012		NR 3015		NR 4010		NR 4012		NR 4018		NR 5040		NR 6012		NR 6020		NR 6028		NR 6045		NR 8040	
Inductance [μH]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±30% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±20% [Ω]	IMAX [mA]	Rdc±30% [Ω]	IMAX [mA]	Rdc±30% [Ω]	IMAX [mA]	Rdc±30% [Ω]
0.8																	3800	0.020					7800	0.006
1.0	1300	0.065	1490	0.05	2100	0.030	1050	0.100	1500	0.060	1830	0.030							4600	0.013	4200	0.014		
3.3													3600	0.020	1730	0.090								
10	500	0.450	540	0.290	700	0.230	560	0.380	740	0.240	840	0.180	2100	0.056	1000	0.235	1400	0.125	1900	0.065	2500	0.047	3100	0.034
47	220	2.05	250	1.45	300	1.34	240	1.81	350	1.00			900	0.310			950	0.290						
100															320	2.18			620	0.600	700	0.500	1000	0.290
220											170	4.00												

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PART NUMBERS

●NRS2012 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRS2012T 1R0N GJ		RoHS	1.0	±30%	0.070	1,900	1,700	100
NRS2012T 1R5N GJ		RoHS	1.5		0.090	1,650	1,500	
NRS2012T 2R2M GJ		RoHS	2.2	±20%	0.107	1,350	1,370	
NRS2012T 3R3M GJ		RoHS	3.3		0.190	1,000	1,020	
NRS2012T 4R7M GJ		RoHS	4.7		0.241	900	910	

●NRV2012 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
						Saturation current Idc1	Temperature rise current Idc2	
NRV2012T 1R0N GF		RoHS	1.0	±30%	0.073	2,200	1,650	100
NRV2012T 1R5N GF		RoHS	1.5		0.100	1,800	1,400	
NRV2012T 2R2M GF		RoHS	2.2	±20%	0.129	1,600	1,200	
NRV2012T 3R3M GF		RoHS	3.3		0.227	1,250	900	
NRV2012T 4R7M GF		RoHS	4.7		0.325	1,100	750	

●NRH2410 Shielded type

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

●NRH2412 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRH2412T 1R0NNGH		RoHS	1.0	±30%	101	0.077	2,350	1,300	100
NRH2412T 1R5NNGH		RoHS	1.5		89	0.100	2,100	1,150	
NRH2412T 2R2MNGH		RoHS	2.2	±20%	72	0.140	1,700	1,000	
NRH2412T 3R3MNGH		RoHS	3.3		56	0.225	1,400	750	
NRH2412T 4R7MNGH		RoHS	4.7		45	0.300	1,150	650	
NRH2412T 6R8MNGH		RoHS	6.8		34	0.420	950	550	
NRH2412T 100MNGH		RoHS	10		29	0.600	810	450	

●NRH3010 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRH3010T 1R2NN		RoHS	1.2	±30%	120	0.065	1,700	1,480	100
NRH3010T 1R5NN		RoHS	1.5		99	0.075	1,440	1,370	
NRH3010T 2R2MN		RoHS	2.2	±20%	86	0.083	1,300	1,300	
NRH3010T 3R3MN		RoHS	3.3		64	0.130	1,000	1,030	
NRH3010T 4R7MN		RoHS	4.7		50	0.170	850	900	
NRH3010T 6R8MN		RoHS	6.8		44	0.250	700	745	
NRH3010T 100MN		RoHS	10		34	0.350	600	620	
NRH3010T 150MN		RoHS	15		25	0.550	450	480	
NRH3010T 220MN		RoHS	22		22	0.770	380	410	

●NRH3012 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRH3012T 1R0NN		RoHS	1.0	±30%	111	0.048	2,200	1,710	100
NRH3012T 1R5NN		RoHS	1.5		95	0.055	1,700	1,600	
NRH3012T 2R2MN		RoHS	2.2	±20%	78	0.075	1,500	1,370	
NRH3012T 3R3MN		RoHS	3.3		61	0.100	1,200	1,210	
NRH3012T 4R7MN		RoHS	4.7		50	0.130	1,000	1,060	
NRH3012T 6R8MN		RoHS	6.8		43	0.190	850	890	
NRH3012T 100MN		RoHS	10		32	0.270	730	720	
NRH3012T 150MN		RoHS	15		26	0.450	530	570	
NRH3012T 220MN		RoHS	22		22	0.630	500	500	

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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PART NUMBERS

NRV3012 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRV3012T 1R0N		RoHS	1.0	±30%	110	0.065	2,500	1,600	100
NRV3012T 1R5N		RoHS	1.5		92	0.075	2,100	1,400	
NRV3012T 2R2M		RoHS	2.2	±20%	70	0.120	1,800	1,100	
NRV3012T 3R3M		RoHS	3.3		55	0.150	1,600	1,000	
NRV3012T 4R7M		RoHS	4.7		48	0.190	1,250	850	
NRV3012T 6R8M		RoHS	6.8		40	0.300	950	650	
NRV3012T 100M		RoHS	10		32	0.470	800	550	

NRS4010 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS4010T 1R0NDGG		RoHS	1.0	±30%	116	0.056	2,000	1,900	100
NRS4010T 2R2MDGG		RoHS	2.2	±20%	73	0.085	1,200	1,500	
NRS4010T 3R3MDGG		RoHS	3.3		58	0.100	1,100	1,400	
NRS4010T 4R7MDGG		RoHS	4.7		47	0.140	950	1,200	
NRS4010T 6R8MDGG		RoHS	6.8		38	0.200	800	1,000	
NRS4010T 100MDGG		RoHS	10		31	0.300	620	750	
NRS4010T 150MDGG		RoHS	15		24	0.430	540	600	
NRS4010T 220MDGG		RoHS	22		19	0.570	450	500	

NRS4012 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS4012T 1R0NDGG		RoHS	1.0	±30%	100	0.042	2,800	2,200	100
NRS4012T 2R2MDGJ		RoHS	2.2	±20%	70	0.060	1,650	1,900	
NRS4012T 3R3MDGJ		RoHS	3.3		60	0.070	1,400	1,700	
NRS4012T 4R7MDGJ		RoHS	4.7		45	0.095	1,200	1,500	
NRS4012T 6R8MDGJ		RoHS	6.8		35	0.125	900	1,300	
NRS4012T 100MDGJ		RoHS	10		30	0.170	800	1,100	
NRS4012T 150MDGJ		RoHS	15		24	0.260	650	750	
NRS4012T 220MDGJ		RoHS	22		18	0.400	500	620	

NRS4018 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS4018T 1R0NDGJ		RoHS	1.0	±30%	90	0.027	4,000	3,200	100
NRS4018T 2R2MDGJ		RoHS	2.2	±20%	60	0.042	3,000	2,200	
NRS4018T 3R3MDGJ		RoHS	3.3		45	0.055	2,300	2,000	
NRS4018T 4R7MDGJ		RoHS	4.7		35	0.070	2,000	1,700	
NRS4018T 6R8MDGJ		RoHS	6.8		30	0.098	1,600	1,450	
NRS4018T 100MDGJ		RoHS	10		25	0.150	1,300	1,200	
NRS4018T 150MDGJ		RoHS	15		18	0.210	1100	850	
NRS4018T 220MDGJ		RoHS	22		15	0.290	900	720	
NRS4018T 330MDGJ		RoHS	33		12	0.460	700	550	

NRS5010 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS5010T 1R0NMGF		RoHS	1.0	±30%	95	0.070	2,350	1,750	100
NRS5010T 2R2NMGF		RoHS	2.2		65	0.105	1,500	1,400	
NRS5010T 3R3MMGF		RoHS	3.3	±20%	42	0.125	1,400	1,250	
NRS5010T 4R7MMGF		RoHS	4.7		37	0.145	1,200	1,150	
NRS5010T 6R8MMGF		RoHS	6.8		33	0.185	1,000	1,000	
NRS5010T 100MMGF		RoHS	10		23	0.250	850	900	
NRS5010T 150MMGF		RoHS	15		19	0.400	680	650	
NRS5010T 220MMGF		RoHS	22		15	0.600	550	450	

NRS5012 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS5012T 1R0NMGF		RoHS	1.0	±30%	100	0.053	4,500	2,300	100
NRS5012T 1R5NMGF		RoHS	1.5		86	0.070	3,800	2,200	
NRS5012T 2R2MMGF		RoHS	2.2	±20%	70	0.085	3,100	2,000	
NRS5012T 3R3MMGF		RoHS	3.3		48	0.160	2,400	1,450	
NRS5012T 4R7MMGF		RoHS	4.7		40	0.180	2,200	1,400	
NRS5012T 6R8MMGF		RoHS	6.8		36	0.260	1,700	1,100	
NRS5012T 100MMGF		RoHS	10		26	0.420	1,400	850	
NRS5012T 150MMGF		RoHS	15		22	0.670	1,200	640	

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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●NRS5014 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS5014T 1R2NMGG		RoHS	1.2	±30%	86	0.045	3,800	2,400	100
NRS5014T 2R2NMGG		RoHS	2.2		56	0.065	2,800	2,000	
NRS5014T 3R3NMGG		RoHS	3.3		48	0.080	2,350	1,700	
NRS5014T 4R7NMGG		RoHS	4.7		41	0.100	2,050	1,400	
NRS5014T 6R8MMGG		RoHS	6.8	±20	33	0.150	1600	1,200	
NRS5014T 100MMGG		RoHS	10		27	0.200	1400	1,050	

●NRS5020 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS5020T 1R0NMGJ		RoHS	1.0	±30%	81	0.021	4,000	3,600	100
NRS5020T 1R5NMGJ		RoHS	1.5		68	0.026	3,350	3,200	
NRS5020T 2R2NMGJ		RoHS	2.2		57	0.035	2,900	2,900	
NRS5020T 3R3NMGJ		RoHS	3.3		46	0.048	2,400	2,400	
NRS5020T 4R7MMGJ		RoHS	4.7	±20%	37	0.060	2,000	2,000	
NRS5020T 6R8MMGJ		RoHS	6.8		30	0.090	1,600	1,650	
NRS5020T 100MMGJ		RoHS	10		24	0.120	1,300	1,450	
NRS5020T 150MMGJ		RoHS	15		20	0.165	1,100	1,200	
NRS5020T 220MMGJ		RoHS	22		17	0.260	900	1,000	

●NRS5024 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS5024T 1R0NMGJ		RoHS	1.0	±30%	85	0.016	5,800	4,400	100
NRS5024T 1R5NMGJ		RoHS	1.5		67	0.022	5,200	3,600	
NRS5024T 2R2NMGJ		RoHS	2.2		51	0.029	4,100	3,100	
NRS5024T 3R3NMGJ		RoHS	3.3		41	0.043	3,100	2,400	
NRS5024T 4R7MMGJ		RoHS	4.7	±20%	37	0.055	2,700	2,000	
NRS5024T 6R8MMGJ		RoHS	6.8		28	0.080	2,200	1,600	
NRS5024T 100MMGJ		RoHS	10		21	0.125	1,700	1,200	
NRS5024T 150MMGJ		RoHS	15		18	0.170	1,400	1,000	
NRS5024T 220MMGJ		RoHS	22		15	0.230	1,200	820	
NRS5024T 330MMGJ		RoHS	33		11	0.370	1,000	630	

●NRS5040 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS5040T 1R5NMGJ		RoHS	1.5	±30%	60	0.017	6,400	4,500	100
NRS5040T 2R2NMGJ		RoHS	2.2		42	0.022	5,000	3,700	
NRS5040T 3R3NMGJ		RoHS	3.3		32	0.027	4,000	3,300	
NRS5040T 4R7NMGK		RoHS	4.7		28	0.029	3,300	3,100	
NRS5040T 6R8MMGJ		RoHS	6.8	±20%	21	0.049	2,800	2,400	
NRS5040T 100MMGJ		RoHS	10		18	0.056	2,300	2,100	
NRS5040T 150MMGJ		RoHS	15		13	0.080	2,000	1,800	
NRS5040T 220MMGK		RoHS	22		9	0.126	1,500	1,400	
NRS5040T 330MMGJ		RoHS	33		7	0.180	1,300	1,200	
NRS5040T 470MMGJ		RoHS	47		6	0.310	1,100	900	

●NRS6010 type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±20%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS6010T 1R5MMGF		RoHS	1.5	±20%	77	0.090	2,400	1,900	100
NRS6010T 2R2MMGF		RoHS	2.2		56	0.110	1,900	1,700	
NRS6010T 3R3MMGF		RoHS	3.3		42	0.135	1,600	1,500	
NRS6010T 4R7MMGF		RoHS	4.7		36	0.165	1,300	1,400	
NRS6010T 6R8MMGF		RoHS	6.8		30	0.220	1,200	1,200	
NRS6010T 100MMGF		RoHS	10		25	0.270	1,000	1,100	
NRS6010T 220MMGF		RoHS	22		12	0.580	650	700	

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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NRS6012 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS6012T 2R5NMGG		RoHS	2.5	±30	45	0.090	2,100	1,800	100
NRS6012T 3R3NMGG		RoHS	3.3		42	0.105	1,800	1,700	
NRS6012T 4R7MMGG		RoHS	4.7	±20	36	0.125	1,600	1,550	
NRS6012T 5R3MMGJ		RoHS	5.3		34	0.125	1,500	1,550	
NRS6012T 6R8MMGJ		RoHS	6.8		30	0.165	1,300	1,350	
NRS6012T 100MMGJ		RoHS	10		22	0.200	1,000	1,200	
NRS6012T 150MMGJ		RoHS	15		18	0.295	800	800	
NRS6012T 220MMGJ		RoHS	22		12	0.465	760	650	
NRS6012T 330MMGJ		RoHS	33		8	0.580	590	550	
NRS6012T 470MMGJ		RoHS	47		6	0.965	520	460	
NRS6012T 680MMGJ		RoHS	68		3	1.160	440	410	
NRS6012T 101MMGJ		RoHS	100		1	1.670	350	320	

NRS6014 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS6014T 1R2NMGG		RoHS	1.2	±30%	77	0.042	4,100	2,750	100
NRS6014T 2R2NMGG		RoHS	2.2		61	0.055	3,000	2,300	
NRS6014T 3R3MMGG		RoHS	3.3	±20%	41	0.075	2,500	2,000	
NRS6014T 4R7MMGG		RoHS	4.7		36	0.090	2,000	1,900	
NRS6014T 6R8MMGG		RoHS	6.8		30	0.115	1,700	1,650	
NRS6014T 100MMGG		RoHS	10		24	0.140	1,400	1,400	
NRS6014T 150MMGG		RoHS	15		20	0.210	1,150	1,200	
NRS6014T 220MMGG		RoHS	22		16	0.300	950	1,000	

NRS6020 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±20%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS6020T 0R8NMGG		RoHS	0.8	±30%	110	0.020	6,400	4,100	100
NRS6020T 1R5NMGJ		RoHS	1.5		93	0.026	4,300	3,600	
NRS6020T 2R2NMGJ		RoHS	2.2		73	0.034	3,200	2,900	
NRS6020T 3R3NMGJ		RoHS	3.3		55	0.040	2,800	2,750	
NRS6020T 4R7NMGJ		RoHS	4.7		43	0.058	2,400	2,150	
NRS6020T 6R8NMGJ		RoHS	6.8		30	0.085	2,000	1,800	
NRS6020T 100MMGG		RoHS	10	±20%	18	0.125	1,900	1,500	
NRS6020T 220MMGG		RoHS	22		11	0.290	1,250	950	

NRS6028 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±30%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS6028T 0R9NMGJ		RoHS	0.9	±30%	90	0.013	6,700	4,600	100
NRS6028T 1R5NMGJ		RoHS	1.5		78	0.016	5,100	4,200	
NRS6028T 2R2NMGJ		RoHS	2.2		68	0.020	4,200	3,700	
NRS6028T 3R0NMGJ		RoHS	3.0		55	0.023	3,600	3,400	
NRS6028T 4R7MMGK		RoHS	4.7	±20%	39	0.031	2,700	3,000	
NRS6028T 6R0MMGK		RoHS	6.0		30	0.040	2,500	2,500	
NRS6028T 100MMGK		RoHS	10		20	0.065	1,900	1,900	
NRS6028T 150MMGJ		RoHS	15		17	0.095	1,600	1,800	
NRS6028T 220MMGJ		RoHS	22		12	0.135	1,300	1,400	
NRS6028T 330MMGJ		RoHS	33		10	0.220	1,100	1,100	
NRS6028T 470MMGJ		RoHS	47		8	0.300	1,000	920	
NRS6028T 680MMGJ		RoHS	68		5	0.420	800	770	
NRS6028T 101MMGJ		RoHS	100		3	0.600	650	660	

NRS6045 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency (MHz) (min.)	DC Resistance [Ω] (±30%)	Rated current ※) (mA)		Measuring frequency (kHz)
							Saturation current Idc1	Temperature rise current Idc2	
NRS6045T 1R0NMGK		RoHS	1.0	±30%	110	0.014	9,800	4,500	100
NRS6045T 1R3NMGK		RoHS	1.3		95	0.016	8,200	4,200	
NRS6045T 1R8NMGK		RoHS	1.8		80	0.019	7,200	3,900	
NRS6045T 2R3NMGK		RoHS	2.3		60	0.022	6,400	3,600	
NRS6045T 3R0NMGK		RoHS	3.0		45	0.024	5,600	3,300	
NRS6045T 4R5MMGK		RoHS	4.5	±20%	25	0.030	4,400	3,100	
NRS6045T 6R3MMGK		RoHS	6.3		15	0.036	3,600	3,000	
NRS6045T 100MMGK		RoHS	10		12	0.046	3,100	2,400	
NRS6045T 150MMGK		RoHS	15		10	0.070	2,500	1,900	
NRS6045T 220MMGK		RoHS	22		7	0.107	2,000	1,600	
NRS6045T 330MMGK		RoHS	33		6	0.141	1,650	1,400	
NRS6045T 470MMGK		RoHS	47		5	0.211	1,400	1,150	
NRS6045T 680MMGK		RoHS	68		4	0.304	1,100	950	
NRS6045T 101MMGK		RoHS	100		3	0.466	900	750	

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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NRS8030 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±30%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS8030T 1R0NJGJ		RoHS	1.0	±30%	120	0.009	7,800	6,200	100
NRS8030T 1R5NJGJ		RoHS	1.5		80	0.012	6,200	5,300	
NRS8030T 2R2NJGJ		RoHS	2.2		60	0.015	4,900	4,800	
NRS8030T 3R3MJGJ		RoHS	3.3	±20%	50	0.019	4,200	4,300	
NRS8030T 4R7MJGJ		RoHS	4.7		40	0.022	3,600	4,000	
NRS8030T 6R8MJGJ		RoHS	6.8		32	0.029	3,000	3,400	
NRS8030T 100MJGJ		RoHS	10		27	0.033	2,400	3,000	
NRS8030T 150MJGJ		RoHS	15		20	0.060	2,000	2,200	
NRS8030T 220MJGJ		RoHS	22		16	0.070	1,750	1,900	
NRS8030T 330MJGJ		RoHS	33		13	0.120	1,300	1,500	
NRS8030T 470MJGJ		RoHS	47		11	0.170	1,100	1,300	

NRS8040 Shielded type

Ordering code		EHS (Environmental Hazardous Substances)	Inductance [μH]	Inductance Tolerance	Self-resonant frequency [MHz] (min.)	DC Resistance [Ω] (±30%)	Rated current ※) [mA]		Measuring frequency [kHz]
							Saturation current Idc1	Temperature rise current Idc2	
NRS8040T 0R9NJGJ		RoHS	0.9	±30%	85	0.006	13,000	7,800	100
NRS8040T 1R4NJGJ		RoHS	1.4		63	0.007	10,000	7,000	
NRS8040T 2R0NJGJ		RoHS	2.0		50	0.009	8,100	6,300	
NRS8040T 3R6NJGJ		RoHS	3.6		34	0.015	6,400	4,900	
NRS8040T 4R7NJGJ		RoHS	4.7		30	0.018	5,400	4,100	
NRS8040T 6R8NJGJ		RoHS	6.8		24	0.025	4,400	3,700	
NRS8040T 100MJGJ		RoHS	10	±20%	22	0.034	3,800	3,100	
NRS8040T 150MJGJ		RoHS	15		16	0.050	2,900	2,400	
NRS8040T 220MJGJ		RoHS	22		13	0.066	2,400	2,200	

NR 3010 Shielded type

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

NR 3012 Shielded type

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

NR 3015 Shielded type

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

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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PART NUMBERS

NR 4010 Shielded type

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

NR 4012 Shielded type

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

NR 4018 Shielded type

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

NR 5040 Shielded type

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

NR 6012 Shielded type

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

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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PART NUMBERS

NR 6020 Shielded type

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

NR 6028 Shielded type

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

NR 6045 Shielded type

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

NR 8040 Shielded type

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

※) The saturation current value (Idc1) is the DC current value having inductance decrease down to 30%. (at 20℃)
※) The temperature rise current value (Idc2) is the DC current value having temperature increase up to 40℃. (at 20℃)
※) The rated current is the DC current value that satisfies both of current value saturation current value and temperature rise current value.

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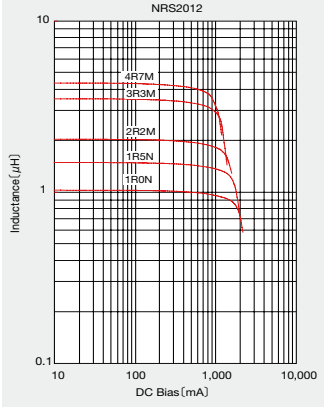
ELECTRICAL CHARACTERISTICS

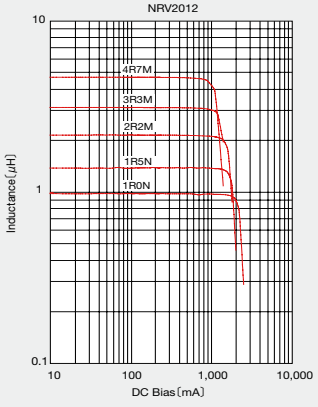
DC Bias characteristics

(Measured by HP4285A)

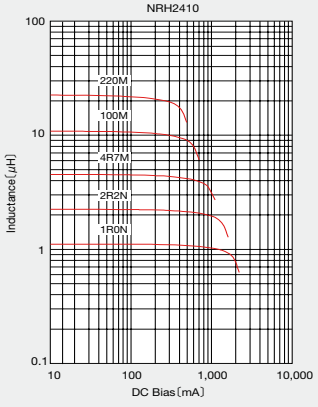
NRS2012



NRV2012



NRH2410



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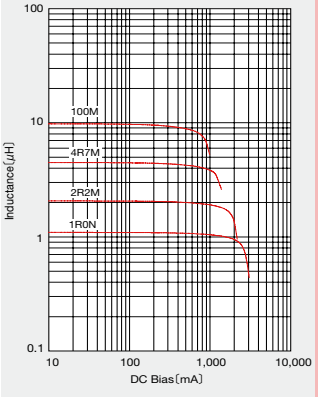
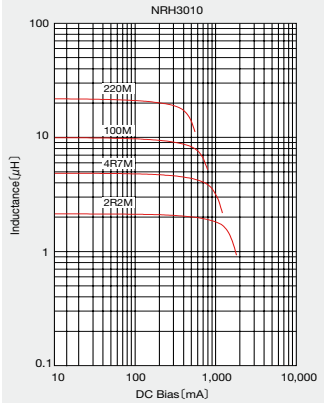


NRH3010



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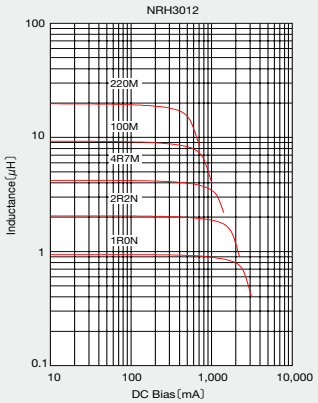

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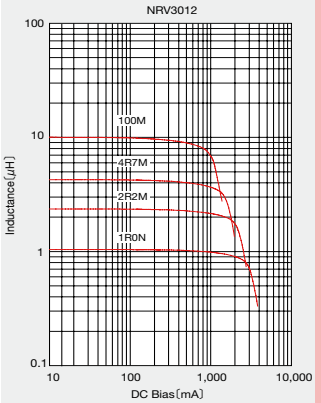
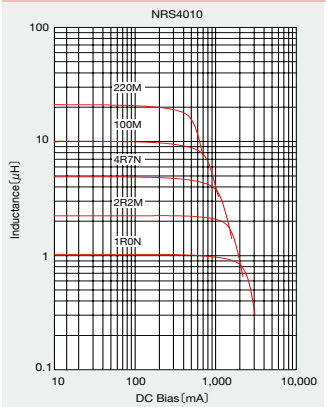


NRS4010



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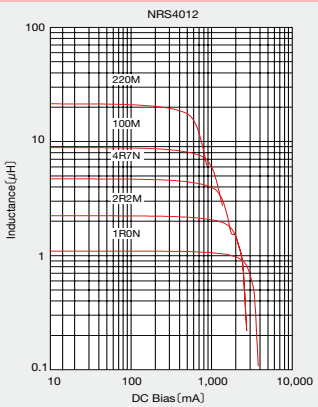
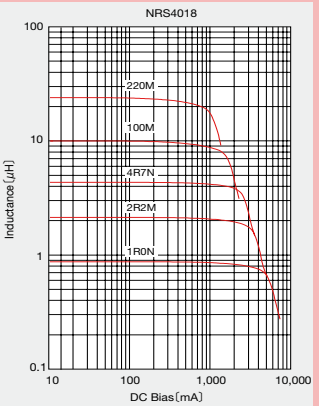
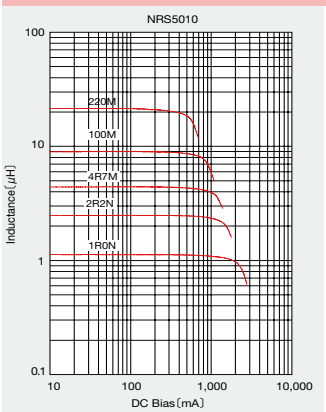


NRS4018



NRS5010



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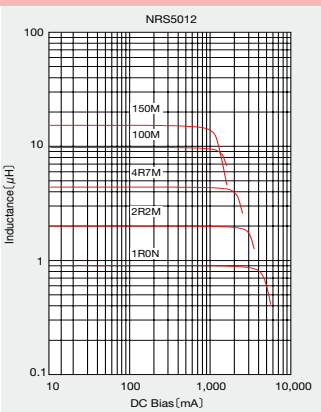

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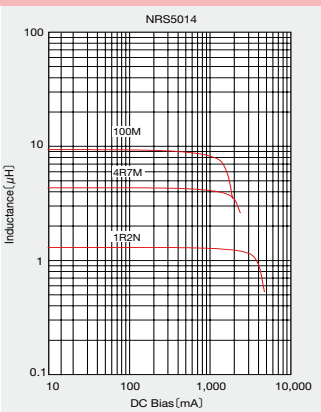
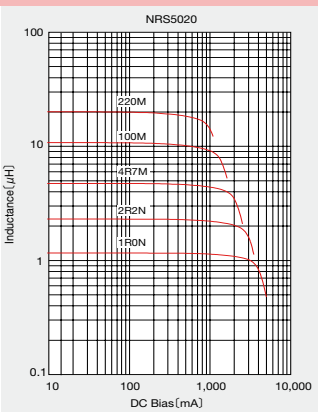


NRS5020



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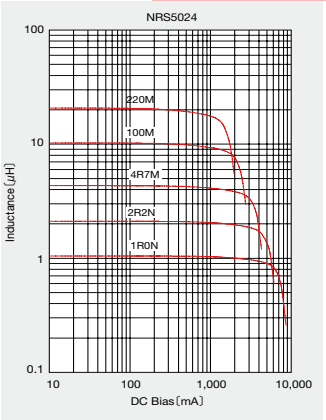
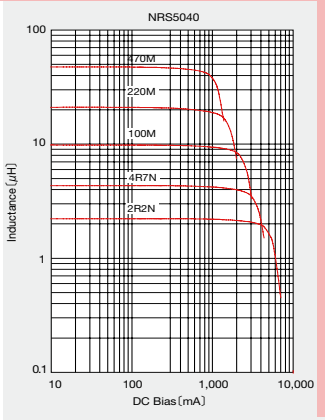
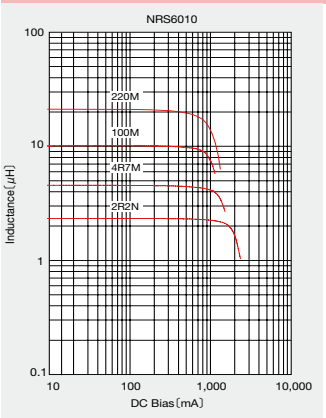
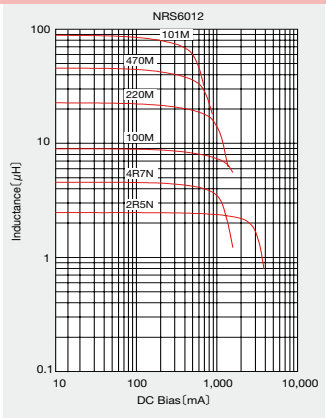
ELECTRICAL CHARACTERISTICS

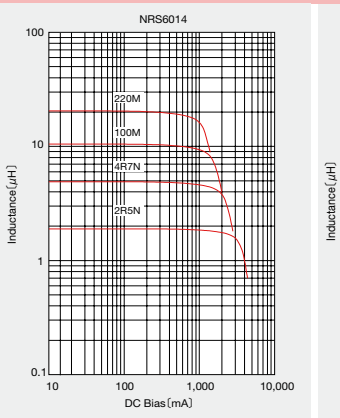
DC Bias characteristics

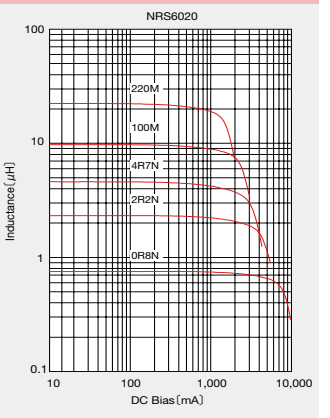


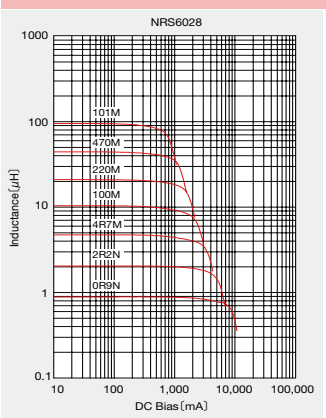


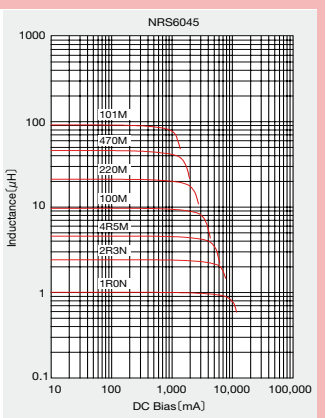


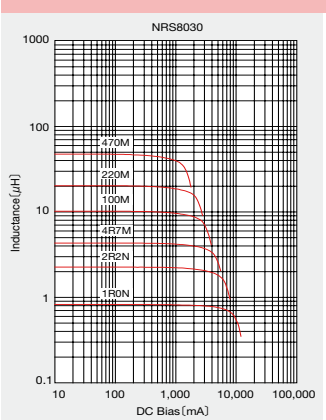


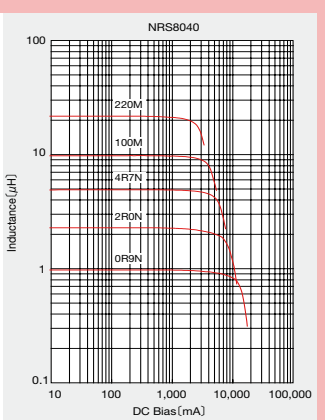












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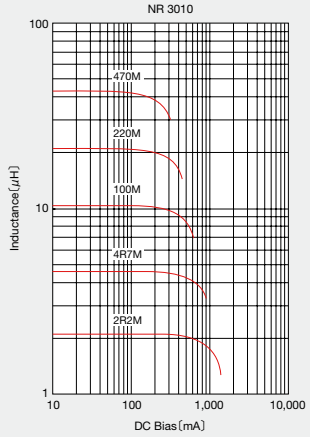
ELECTRICAL CHARACTERISTICS

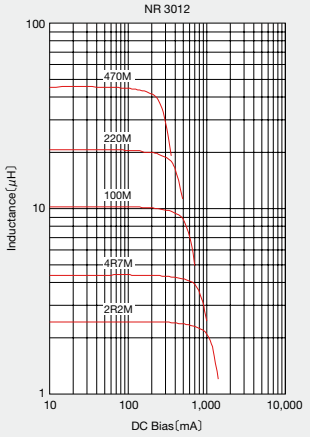
DC Bias characteristics

(Measured by HP4285A)

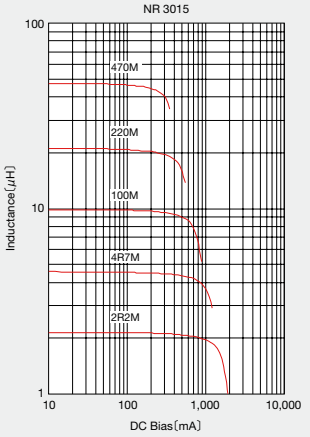
NR 3010



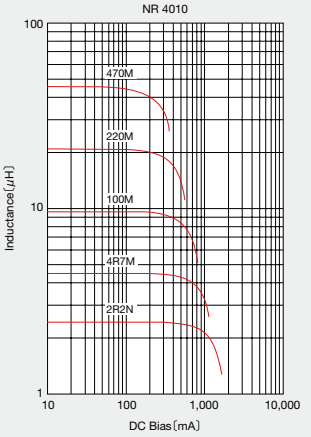
NR 3012



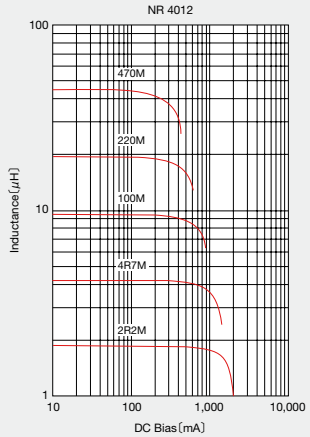
NR 3015



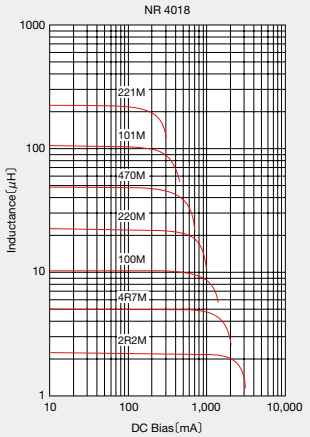
NR 4010



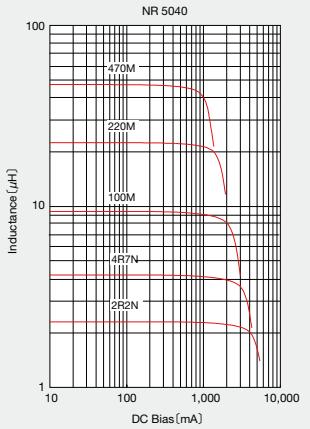
NR 4012



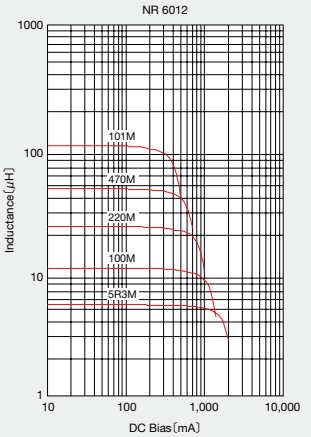
NR 4018



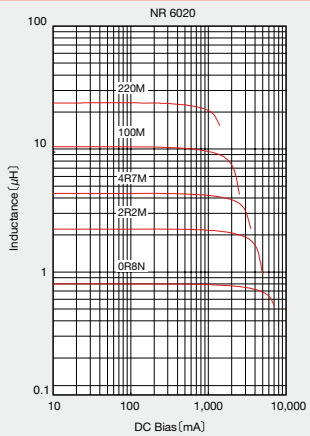
NR 5040



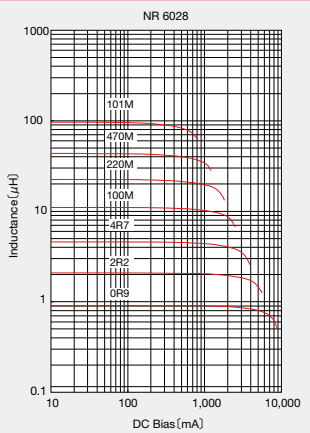
NR 6012



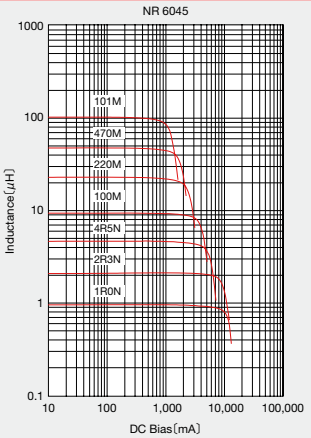
NR 6020



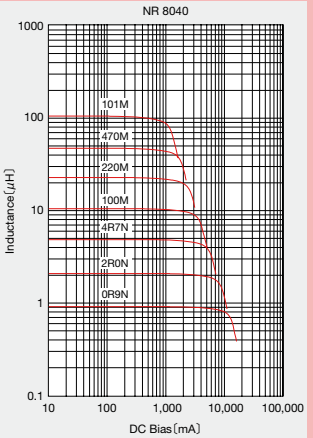
NR 6028



NR 6045



NR 8040



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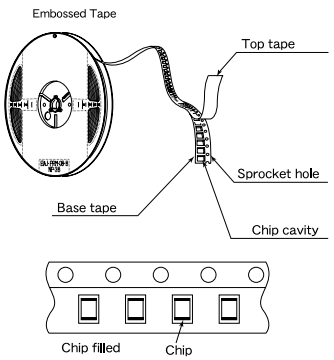
PACKAGING

①Minimum Quantity

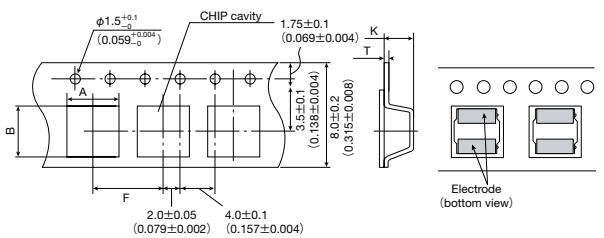
Type	Standard Quantity [pcs]
	Tape & Reel
NRS2012/NRV2012	2500
NRH2410	2500
NRH2412	2500
NR 3010/NRH3010	2000
NR 3012/NRH3012/NRV3012	2000
NR 3015	2000
NR 4010/NRS4010	5000
NR 4012/NRS4012	4500
NR 4018/NRS4018	3500
NRS5010	1000
NRS5012	1000
NRS5014	1000
NRS5020	800
NRS5024	2500
NR 5040/NRS5040	1500
NRS6010	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



③Taping dimensions

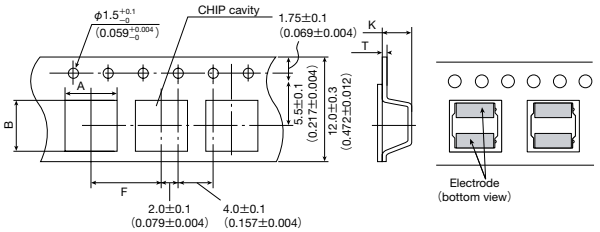
● Embossed tape 8mm wide (0.315 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NRS2012 NRV2012	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)
NRH2410 NRH2412	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)
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					1.9±0.1 (0.075±0.004)

Unit : mm (inch)

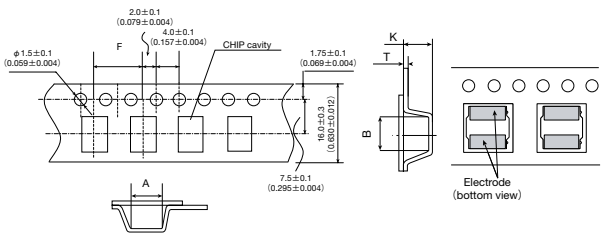
● Embossed tape 12mm wide (0.47 inches wide)



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)
NR 5040 NRS5040	5.15±0.1 (0.203±0.004)	5.15±0.1 (0.203±0.004)		0.4±0.1 (0.016±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)

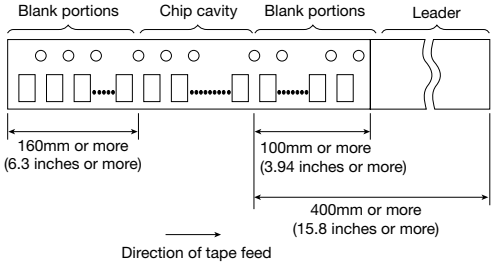


Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
NRS8030	8.3±0.1 (0.327±0.004)	8.3±0.1 (0.327±0.004)	12.0±0.1 (0.472±0.004)	0.5±0.1 (0.020±0.004)	3.4±0.1 (0.134±0.004)
NR 8040 NRS8040					4.5±0.1 (0.177±0.004)

Unit : mm (inch)

④Leader and Blank portion

● NR, NRH, NRS, NRV



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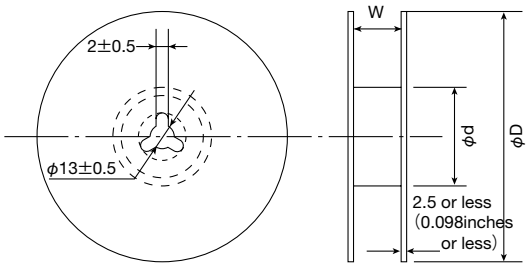
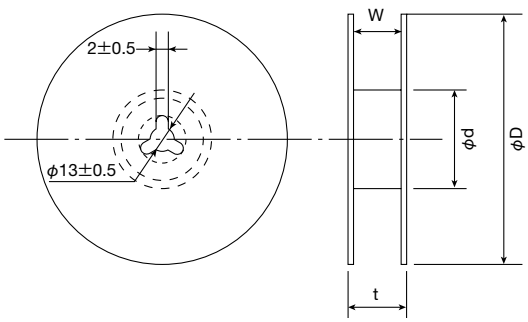
⑤Reel size



Type	Reel size (Reference values)		
	ϕD	ϕd	W
NRS2012 NRV2012	180±0.5 (7.087±0.019)	60±1.0 (2.36±0.04)	10.0±1.5 (0.394±0.059)
NRH2410			
NRH2412			
NR 3010 NRH3010			
NR 3012 NRH3012 NRV3012			
NR 3015			
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			
NRS6010			
NR 6012 NRS6012			
NRS6014			

Unit : mm (inch)

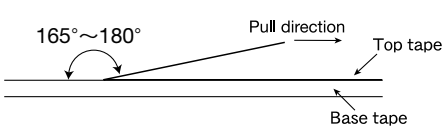


Type	Reel size (Reference values)			
	ϕD	ϕd	t (max.)	W
NR 4010 NRS4010	330±3.0 (12.99±0.118)	80±2.0 (3.15±0.078)	18.5 (0.72)	13.5±1.0 (0.531±0.04)
NR 4012 NRS4012				
NR 4018 NRS4018				
NRS5024				
NR 5040 NRS5040				
NR 6020 NRS6020				
NR 6028 NRS6028				
NR 6045 NRS6045				
NRS8030			22.5 (0.89)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



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RELIABILITY DATA

SMD inductor(NR□, NS series)

1. Operating Temperature Range	
NR30/40/50/60/80, NRS20, NRV20/30, NRH24/30 Type	−25～+120℃
NRS40/50/60/80 Type	−25～+125℃
NR10050 Type	−25～+105℃
NS101, NS125Type	−40～+125℃

【Test Method and Remarks】
Including self-generated heat

2. Storage Temperature Range	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	−40～+85℃
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NR10050 Type, NS101/125 Type : −5 to 40℃ for the product with taping.

3. Rated current	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Within the specified tolerance
NR10050 Type	
NS101, NS125Type	

4. Inductance	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Within the specified tolerance
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
LCR Meter : HP 4285A or equivalent, Measuring frequency : Specified frequency
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NS101/125 Type : LCR Meter : HP 4285A or equivalent, 100kHz, 1V
NR10050 Type : LCR Meter : HP 4263A or equivalent, 100kHz, 1V

5. DC Resistance	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Within the specified tolerance
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
DC ohmmeter : HIOKI 3227 or equivalent

6. Self resonance frequency	
NR30/40/50/60/80, NRV30, NRH24/30, NRS40/50/60/80 Type	Within the specification
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV30, NRH24/30, NRS40/50/60/80Type, NR10050 Type, NS101/125 Type :
Inpedance analyzer/material analyzer : HP4291A or equivalent HP4191A, 4192A or equivalent

7. Temperature characteristic	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±20%
NR10050 Type	
NS101, NS125Type	Inductance change : Within ±15%

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type : Measurement of inductance shall be taken at temperature range within −25℃～+85℃.
With reference to inductance value at +20℃., change rate shall be calculated.

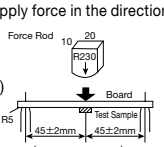
NS101, NS125 Type :
Measurement of inductance shall be taken at temperature range within −40℃～+125℃.
With reference to inductance value at +20℃., change rate shall be calculated.

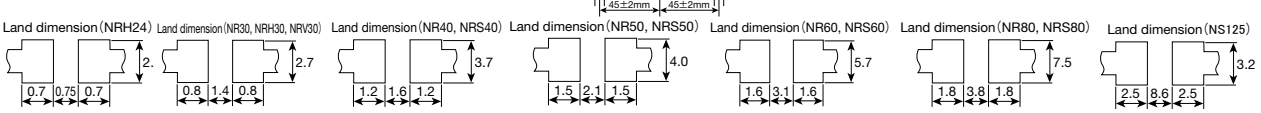
Change of maximum inductance deviation in step 1 to 5

Temperature at step 1	20℃
Temperature at step 2	Minimum operating temperature
Temperature at step 3	20℃ (Standard temperature)
Temperature at step 4	Maximum oparating temperature
Temperature at step 5	20℃

8. Resistance to flexure of substrate	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	No damage
NR10050 Type	
NS101, NS125Type	No damage

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NS101/125Type :
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 : 0.10 (NR30, NRS20, NRH24/30, NRV20/30)
0.15 (NR40/50/60/80, NRS40/50/60, NS101/125Type)





Unit : mm

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RELIABILITY DATA

SMD inductor（NR□, NS series）

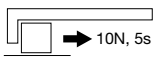
9. Insulation resistance : between wires	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	
NR10050 Type	
NS101, NS125Type	

10. Insulation resistance : between wire and core	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	
NR10050 Type	
NS101, NS125Type	

11. Withstanding voltage : between wire and core	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	
NR10050 Type	
NS101, NS125Type	

12. Adhesion of terminal electrode	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Shall not come off PC board
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NS101/125 Type :
The test samples shall be soldered to the test board by the reflow.
・Applied force : 10N to X and Y directions.
・Duration : 5s.
・Solder cream thickness : 0.15mm.



NR10050 Type :
・Applied force : 5N to X and Y directions.
・Duration : 5s.

13. Resistance to vibration	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NR10050 Type, NS101/125 Type :
The test samples shall be soldered to the test board by the reflow.
Then it shall be submitted to below test conditions.

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

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

14. Solderability	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	At least 90% of surface of terminal electrode is covered by new solder.
NR10050 Type	
NS101, NS125Type	

【Test Method 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%.

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :

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

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

15. Resistance to soldering heat	
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NR10050 Type, NS101/125 Type :
The test sample shall be exposed to reflow oven at 230±5℃ for 40 seconds, with peak temperature at 260±5℃ for 5 seconds, 2 times.

Test board thickness : 1.0mm（NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NS101/125 Type）
1.6mm（NR10050 Type）
Test board material : glass epoxy-resin

RELIABILITY DATA

SMD inductor(NR□, NS series)

16. Thermal shock

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NR10050 Type, NS101/125 Type :
The test samples shall be soldered to the test board by the reflow. The test samples shall be placed at specified temperature for specified time by step 1 to step 4 as shown in below table in sequence. The temperature cycle shall be repeated 100 cycles.

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

17. Damp heat

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	Inductance change : Within ±10% No significant abnormality in appearance.

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NS101/125Type :
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

18. Loading under damp heat

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NR10050 Type, NS101/125Type :
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

19. Low temperature life test

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NR10050 Type, NS101/125Type :
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

20. High temperature life test

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	
NR10050 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NS101, NS125Type	

【Test Method and Remarks】
NR10050 Type :

Temperature	105±3℃
Time	500+24/−0 hour

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

21. Loading at high temperature life test

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type	Inductance change : Within ±10% No significant abnormality in appearance.
NR10050 Type	
NS101, NS125Type	Inductance change : Within ±10% No significant abnormality in appearance.

【Test Method and Remarks】
NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NS101/125 Type :
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

22. Standard condition

NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 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.
NR10050 Type	
NS101, NS125Type	

* 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/) or CD catalogs.

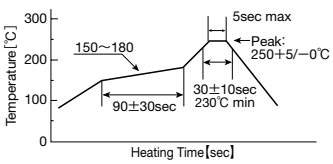
PRECAUTIONS

SMD inductor(NR□, NS series)

1. Circuit Design	
Precautions	◆Operating environment 1. The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.

2. PCB Design	
Precautions	◆Land pattern design 1. Please refer to a recommended land pattern.
Technical consider-ations	◆Land pattern design Surface Mounting ・Mounting and soldering conditions should be checked beforehand. ・Applicable soldering process to this products is reflow soldering only.

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

4. Soldering	
Precautions	◆Reflow soldering 1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified. 2. 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 (NR10050 Type) ・Put the soldering iron on the land-pattern. ・Soldering iron's temperature - Below 350℃ ・Duration - 3 seconds or less ・The soldering iron should not directly touch the inductor.
Technical consider-ations	◆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. ・NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type Recommended reflow condition (Pb free solder) 

5. Cleaning	
Precautions	◆Cleaning conditions 1. Washing by supersonic waves shall be avoided.
Technical consider-ations	◆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 consider-ations	◆Breakaway PC boards (splitting along perforations) 1. The position of the product on PCBs shall be carefully considereed 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 consider-ations	◆Storage 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.

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