

# Notice for TAIYO YUDEN products

Please read this notice before using the TAIYO YUDEN products.

## ⚠️ REMINDERS

### ■ Product Information in this Catalog

Product information in this catalog is as of October 2019. All of the contents specified herein and production status of the products listed in this catalog are subject to change without notice due to technical improvement of our products, etc. Therefore, please check for the latest information carefully before practical application or use of our products.

Please note that TAIYO YUDEN shall not be in any way responsible for any damages and defects in products or equipment incorporating our products, which are caused under the conditions other than those specified in this catalog or individual product specification sheets.

### ■ Approval of Product Specifications

Please contact TAIYO YUDEN for further details of product specifications as the individual product specification sheets are available. When using our products, please be sure to approve our product specifications or make a written agreement on the product specification with TAIYO YUDEN in advance.

### ■ Pre-Evaluation in the Actual Equipment and Conditions

Please conduct validation and verification of our products in actual conditions of mounting and operating environment before using our products.

### ■ Limited Application

#### 1. Equipment Intended for Use

The products listed in this catalog are intended for general-purpose and standard use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and other equipment specified in this catalog or the individual product specification sheets.

TAIYO YUDEN has the line-up of the products intended for use in automotive electronic equipment, telecommunications infrastructure and industrial equipment, or medical devices classified as GHTF Classes A to C (Japan Classes I to III). Therefore, when using our products for these equipment, please check available applications specified in this catalog or the individual product specification sheets and use the corresponding products.

#### 2. Equipment Requiring Inquiry

Please be sure to contact TAIYO YUDEN for further information before using the products listed in this catalog for the following equipment (excluding intended equipment as specified in this catalog or the individual product specification sheets) which may cause loss of human life, bodily injury, serious property damage and/or serious public impact due to a failure or defect of the products and/or malfunction attributed thereto.

- (1) Transportation equipment (automotive powertrain control system, train control system, and ship control system, etc.)
- (2) Traffic signal equipment
- (3) Disaster prevention equipment, crime prevention equipment
- (4) Medical devices classified as GHTF Class C (Japan Class III)
- (5) Highly public information network equipment, data-processing equipment (telephone exchange, and base station, etc.)
- (6) Any other equipment requiring high levels of quality and/or reliability equal to the equipment listed above

#### 3. Equipment Prohibited for Use

Please do not incorporate our products into the following equipment requiring extremely high levels of safety and/or reliability.

- (1) Aerospace equipment (artificial satellite, rocket, etc.)
- (2) Aviation equipment \*<sup>1</sup>
- (3) Medical devices classified as GHTF Class D (Japan Class IV), implantable medical devices \*<sup>2</sup>

- (4) Power generation control equipment (nuclear power, hydroelectric power, thermal power plant control system, etc.)
- (5) Undersea equipment (submarine repeating equipment, underwater work equipment, etc.)
- (6) Military equipment
- (7) Any other equipment requiring extremely high levels of safety and/or reliability equal to the equipment listed above

\*Notes:

1. There is a possibility that our products can be used only for aviation equipment that does not directly affect the safe operation of aircraft (e.g., in-flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified separately by TAIYO YUDEN. Please be sure to contact TAIYO YUDEN for further information before using our products for such aviation equipment.
2. Implantable medical devices contain not only internal unit which is implanted in a body, but also external unit which is connected to the internal unit.

#### 4. Limitation of Liability

Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this catalog for any equipment that is not intended for use by TAIYO YUDEN, or any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

### ■ Safety Design

When using our products for high safety and/or reliability-required equipment or circuits, please fully perform safety and/or reliability evaluation. In addition, please install (i) systems equipped with a protection circuit and a protection device and/or (ii) systems equipped with a redundant circuit or other system to prevent an unsafe status in the event of a single fault for a failsafe design to ensure safety.

### ■ Intellectual Property Rights

Information contained in this catalog is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of TAIYO YUDEN or any third parties nor grant any license under such rights.

### ■ Limited Warranty

Please note that the scope of warranty for our products is limited to the delivered our products themselves and TAIYO YUDEN shall not be in any way responsible for any damages resulting from a failure or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by TAIYO YUDEN and your company, TAIYO YUDEN will warrant our products in accordance with such agreement.

### ■ TAIYO YUDEN's Official Sales Channel

The contents of this catalog are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter "TAIYO YUDEN's official sales channel"). Please note that the contents of this catalog are not applicable to our products purchased from any seller other than TAIYO YUDEN's official sales channel.

### ■ Caution for Export

Some of our products listed in this catalog may require specific procedures for export according to "U.S. Export Administration Regulations", "Foreign Exchange and Foreign Trade Control Law" of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

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



REFLOW

■ PARTS NUMBER

\* Operating Temp.: -25~+120°C (NRS40/50/60/80: -25~+125°C) (Including self-generated heat)

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

△=Blank space

① Series name

| Code | Series name                 |
|------|-----------------------------|
| NR△  | Coating resin specification |
| NRH  |                             |
| NRS  |                             |
| NRV  |                             |

② Dimensions (L×W×H)

| Code | Dimensions (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 Packaging

| Code | Packaging |
|------|-----------|
| T△   | Taping    |

④ Nominal inductance

| Code (example) | Nominal inductance [μH] |
|----------------|-------------------------|
| 2R2            | 2.2                     |
| 100            | 10                      |
| 101            | 100                     |

※R=Decimal point

⑤ Inductance tolerance

| Code | Inductance tolerance |
|------|----------------------|
| M    | ±20%                 |
| N    | ±30%                 |

⑥ Internal code

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STANDARD EXTERNAL DIMENSIONS / STANDARD QUANTITY



| Type                      | A    | B    | C   |
|---------------------------|------|------|-----|
| NRV2010                   | 0.65 | 1.35 | 2.0 |
| NRS2012, NRV2012          |      |      |     |
| NRH2410                   | 0.7  | 1.45 | 2.0 |
| NRH2412                   |      |      |     |
| NR 3010, NRH3010          | 0.8  | 2.2  | 2.7 |
| NR 3012, NRH3012, NRV3012 |      |      |     |
| NR 3015, NRS3015          |      |      |     |
| NR 4010, NRS4010          | 1.2  | 2.8  | 3.7 |
| NR 4012, NRS4012          |      |      |     |
| NR 4018, NRS4018          |      |      |     |
| NRS8030                   | 1.8  | 5.6  | 7.5 |
| NR 8040, NRS8040          |      |      |     |

Unit: mm

| Type                          | L                        | W                        | H  | e                         | f                         | Standard quantity<br>[pcs] Taping |
|-------------------------------|--------------------------|--------------------------|--|---------------------------|---------------------------|-----------------------------------|
| NRV2010                       | 2.0±0.1<br>(0.079±0.004) | 2.0±0.1<br>(0.079±0.004) | 1.0 max<br>(0.039 max)                                   | 0.5±0.2<br>(0.020±0.008)  | 1.25±0.2<br>(0.050±0.008) | 2500                              |
| NRS2012<br>NRV2012            | 2.0±0.1<br>(0.079±0.004) | 2.0±0.1<br>(0.079±0.004) | 1.2 max<br>(0.047 max)                                   | 0.5±0.2<br>(0.020±0.008)  | 1.25±0.2<br>(0.050±0.008) | 2500                              |
| NRH2410                       | 2.4±0.1<br>(0.095±0.004) | 2.4±0.1<br>(0.095±0.004) | 1.0 max<br>(0.039 max)                                   | 0.6±0.2<br>(0.024±0.008)  | 1.45±0.2<br>(0.057±0.008) | 2500                              |
| NRH2412                       | 2.4±0.1<br>(0.095±0.004) | 2.4±0.1<br>(0.095±0.004) | 1.2 max<br>(0.047 max)                                   | 0.6±0.2<br>(0.024±0.008)  | 1.45±0.2<br>(0.057±0.008) | 2500                              |
| NR 3010<br>NRH3010            | 3.0±0.1<br>(0.118±0.004) | 3.0±0.1<br>(0.118±0.004) | 1.0 max<br>(0.039 max)                                   | 0.9±0.2<br>(0.035±0.008)  | 1.9±0.2<br>(0.075±0.008)  | 2000                              |
| NR 3012<br>NRH3012<br>NRV3012 | 3.0±0.1<br>(0.118±0.004) | 3.0±0.1<br>(0.118±0.004) | 1.2 max<br>(0.047 max)                                   | 0.9±0.2<br>(0.035±0.008)  | 1.9±0.2<br>(0.075±0.008)  | 2000                              |
| NR 3015<br>NRS3015            | 3.0±0.1<br>(0.118±0.004) | 3.0±0.1<br>(0.118±0.004) | 1.5 max<br>(0.059 max)                                   | 0.9±0.2<br>(0.035±0.008)  | 1.9±0.2<br>(0.075±0.008)  | 2000                              |
| NR 4010<br>NRS4010            | 4.0±0.2<br>(0.158±0.008) | 4.0±0.2<br>(0.158±0.008) | 1.0 max<br>(0.039 max)                                   | 1.1±0.2<br>(0.043±0.008)  | 2.5±0.2<br>(0.098±0.008)  | 5000                              |
| NR 4012<br>NRS4012            | 4.0±0.2<br>(0.158±0.008) | 4.0±0.2<br>(0.158±0.008) | 1.2 max<br>(0.047 max)                                   | 1.1±0.2<br>(0.043±0.008)  | 2.5±0.2<br>(0.098±0.008)  | 4500                              |
| NR 4018<br>NRS4018            | 4.0±0.2<br>(0.158±0.008) | 4.0±0.2<br>(0.158±0.008) | 1.8 max<br>(0.071 max)                                   | 1.1±0.2<br>(0.043±0.008)  | 2.5±0.2<br>(0.098±0.008)  | 3500                              |
| NRS8030                       | 8.0±0.2<br>(0.315±0.008) | 8.0±0.2<br>(0.315±0.008) | 3.0 max<br>(0.118 max)                                   | 1.60±0.3<br>(0.063±0.012) | 5.6±0.3<br>(0.22±0.012)   | 1000                              |
| NR 8040<br>NRS8040            | 8.0±0.2<br>(0.315±0.008) | 8.0±0.2<br>(0.315±0.008) | *1) 4.2 max<br>(0.165 max)<br>*2) 4.0 max<br>(0.158 max) | 1.60±0.3<br>(0.063±0.012) | 5.6±0.3<br>(0.22±0.012)   | 1000                              |

\*1) 0R9~6R8 type, \*2) 100~221 type

Unit: mm (inch)

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Recommended Land Patterns



| Type             | A   | B   | C   |
|------------------|-----|-----|-----|
| NRS5010          | 1.5 | 3.6 | 4.0 |
| NRS5012          |     |     |     |
| NRS5014          |     |     |     |
| NRS5020          |     |     |     |
| NRS5024          |     |     |     |
| NRS5030          |     |     |     |
| NR 5040, NRS5040 | 1.6 | 4.7 | 5.7 |
| NRS6010          |     |     |     |
| NR 6012, NRS6012 |     |     |     |
| NRS6014          |     |     |     |
| NR 6020, NRS6020 |     |     |     |
| NR 6028, NRS6028 |     |     |     |
| NR 6045, NRS6045 |     |     |     |

Unit: mm

| Type               | L                        | W                        | H  | e                         | f                        | ΔI                   | Standard quantity<br>[pcs] Taping |
|--------------------|--------------------------|--------------------------|--|---------------------------|--------------------------|----------------------|-----------------------------------|
| NRS5010            | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | 1.0 max<br>(0.039 max)                                   | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 1000                              |
| NRS5012            | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | 1.2 max<br>(0.047 max)                                   | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 1000                              |
| NRS5014            | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | 1.4 max<br>(0.055 max)                                   | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 1000                              |
| NRS5020            | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | 2.0 max<br>(0.079 max)                                   | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 800                               |
| NRS5024            | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | *3) 2.5 max<br>(0.098 max)<br>*4) 2.4 max<br>(0.095 max) | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 2500                              |
| NRS5030            | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | *5) 3.1 max<br>(0.122 max)<br>*6) 3.0 max<br>(0.118 max) | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 500                               |
| NR 5040<br>NRS5040 | 4.9±0.2<br>(0.193±0.008) | 4.9±0.2<br>(0.193±0.008) | *7) 4.1 max<br>(0.161 max)<br>*8) 4.0 max<br>(0.158 max) | 1.2±0.2<br>(0.047±0.008)  | 3.3±0.2<br>(0.130±0.008) | 1.3typ<br>(0.051typ) | 1500                              |
| NRS6010            | 6.0±0.2<br>(0.236±0.008) | 6.0±0.2<br>(0.236±0.008) | 1.0 max<br>(0.039 max)                                   | 1.35±0.2<br>(0.053±0.008) | 4.0±0.2<br>(0.158±0.008) | 2.3typ<br>(0.091typ) | 1000                              |
| NR 6012<br>NRS6012 | 6.0±0.2<br>(0.236±0.008) | 6.0±0.2<br>(0.236±0.008) | 1.2 max<br>(0.047 max)                                   | 1.35±0.2<br>(0.053±0.008) | 4.0±0.2<br>(0.158±0.008) | 2.3typ<br>(0.091typ) | 1000                              |
| NRS6014            | 6.0±0.2<br>(0.236±0.008) | 6.0±0.2<br>(0.236±0.008) | 1.4 max<br>(0.055 max)                                   | 1.35±0.2<br>(0.053±0.008) | 4.0±0.2<br>(0.158±0.008) | 2.3typ<br>(0.091typ) | 1000                              |
| NR 6020<br>NRS6020 | 6.0±0.2<br>(0.236±0.008) | 6.0±0.2<br>(0.236±0.008) | 2.0 max<br>(0.079 max)                                   | 1.35±0.2<br>(0.053±0.008) | 4.0±0.2<br>(0.158±0.008) | 2.3typ<br>(0.091typ) | 2500                              |
| NR 6028<br>NRS6028 | 6.0±0.2<br>(0.236±0.008) | 6.0±0.2<br>(0.236±0.008) | 2.8 max<br>(0.110 max)                                   | 1.35±0.2<br>(0.053±0.008) | 4.0±0.2<br>(0.158±0.008) | 2.3typ<br>(0.091typ) | 2000                              |
| NR 6045<br>NRS6045 | 6.0±0.2<br>(0.236±0.008) | 6.0±0.2<br>(0.236±0.008) | 4.5 max<br>(0.177 max)                                   | 1.35±0.2<br>(0.053±0.008) | 4.0±0.2<br>(0.158±0.008) | 2.3typ<br>(0.091typ) | 1500                              |

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

Unit: mm (inch)

■ PARTS NUMBER

● NRS2012 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS2012T 1R0N GJ | RoHS | 1.0                        | ±30%                 | —  | 0.070                       | 1,900                    | 2,050 | 1,700                          | 1,850 | 100                          |
| NRS2012T 1R5N GJ | RoHS | 1.5                        | ±30%                 | —  | 0.090                       | 1,650                    | 1,800 | 1,500                          | 1,650 | 100                          |
| NRS2012T 2R2M GJ | RoHS | 2.2                        | ±20%                 | —  | 0.107                       | 1,350                    | 1,500 | 1,370                          | 1,500 | 100                          |
| NRS2012T 3R3M GJ | RoHS | 3.3                        | ±20%                 | —  | 0.190                       | 1,000                    | 1,150 | 1,020                          | 1,100 | 100                          |
| NRS2012T 4R7M GJ | RoHS | 4.7                        | ±20%                 | —  | 0.241                       | 900                      | 1,050 | 910                            | 1,000 | 100                          |

● NRV2010 type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRV2010T R47N GF | RoHS | 0.47                       | ±30%                 | —  | 0.052                       | 2,100                    | 2,250 | 2,000                          | 2,300 | 100                          |
| NRV2010T R68N GF | RoHS | 0.68                       | ±30%                 | —  | 0.060                       | 1,850                    | 2,000 | 1,850                          | 2,100 | 100                          |
| NRV2010T 1R0N GF | RoHS | 1.0                        | ±30%                 | —  | 0.080                       | 1,550                    | 1,700 | 1,600                          | 1,850 | 100                          |
| NRV2010T 1R5M GF | RoHS | 1.5                        | ±20%                 | —  | 0.100                       | 1,350                    | 1,450 | 1,450                          | 1,650 | 100                          |
| NRV2010T 2R2M GF | RoHS | 2.2                        | ±20%                 | —  | 0.175                       | 1,100                    | 1,200 | 1,100                          | 1,200 | 100                          |
| NRV2010T 3R3M GF | RoHS | 3.3                        | ±20%                 | —  | 0.250                       | 890                      | 950   | 1,000                          | 1,100 | 100                          |
| NRV2010T 4R7M GF | RoHS | 4.7                        | ±20%                 | —  | 0.320                       | 760                      | 810   | 820                            | 930   | 100                          |

● NRV2012 type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRV2012T 1R0N GF | RoHS | 1.0                        | ±30%                 | —  | 0.073                       | 2,200                    | 2,350 | 1,650                          | 1,830 | 100                          |
| NRV2012T 1R5N GF | RoHS | 1.5                        | ±30%                 | —  | 0.100                       | 1,800                    | 1,950 | 1,400                          | 1,550 | 100                          |
| NRV2012T 2R2M GF | RoHS | 2.2                        | ±20%                 | —  | 0.129                       | 1,600                    | 1,700 | 1,200                          | 1,350 | 100                          |
| NRV2012T 3R3M GF | RoHS | 3.3                        | ±20%                 | —  | 0.227                       | 1,250                    | 1,350 | 900                            | 1,040 | 100                          |
| NRV2012T 4R7M GF | RoHS | 4.7                        | ±20%                 | —  | 0.325                       | 1,100                    | 1,150 | 750                            | 850   | 100                          |

● NRH2410 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRH2410T R68NN 4 | RoHS | 0.68                       | ±30%                 | 120  | 0.060                       | 2,200                    | 2,300 | 1,570                          | 1,810 | 100                          |
| NRH2410T 1R0NN 4 | RoHS | 1.0                        | ±30%                 | 106  | 0.070                       | 1,800                    | 1,950 | 1,410                          | 1,640 | 100                          |
| NRH2410T 1R5MN   | RoHS | 1.5                        | ±20%                 | 94   | 0.110                       | 1,550                    | 1,640 | 1,160                          | 1,320 | 100                          |
| NRH2410T 2R2MN   | RoHS | 2.2                        | ±20%                 | 77   | 0.150                       | 1,290                    | 1,340 | 970                            | 1,110 | 100                          |
| NRH2410T 3R3MN   | RoHS | 3.3                        | ±20%                 | 56   | 0.220                       | 1,000                    | 1,140 | 770                            | 890   | 100                          |
| NRH2410T 4R7MN   | RoHS | 4.7                        | ±20%                 | 50   | 0.290                       | 880                      | 930   | 670                            | 780   | 100                          |
| NRH2410T 6R8MN   | RoHS | 6.8                        | ±20%                 | 43   | 0.410                       | 750                      | 765   | 570                            | 650   | 100                          |
| NRH2410T 100MN   | RoHS | 10                         | ±20%                 | 32   | 0.690                       | 550                      | 605   | 450                            | 520   | 100                          |
| NRH2410T 150MN   | RoHS | 15                         | ±20%                 | 27   | 1.02                        | 470                      | 520   | 370                            | 430   | 100                          |
| NRH2410T 220MN   | RoHS | 22                         | ±20%                 | 22   | 1.47                        | 390                      | 405   | 300                            | 340   | 100                          |

● NRH2412 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRH2412T R47NNGJ | RoHS | 0.47                       | ±30%                 | 180  | 0.050                       | 2,900                    | 3,690 | 2,100                          | 2,300 | 100                          |
| NRH2412T 1R0NNGH | RoHS | 1.0                        | ±30%                 | 101  | 0.077                       | 2,350                    | 2,610 | 1,300                          | 1,540 | 100                          |
| NRH2412T 1R5NNGH | RoHS | 1.5                        | ±30%                 | 89   | 0.100                       | 2,100                    | 2,290 | 1,150                          | 1,390 | 100                          |
| NRH2412T 2R2MNGH | RoHS | 2.2                        | ±20%                 | 72   | 0.140                       | 1,700                    | 1,940 | 1,000                          | 1,190 | 100                          |
| NRH2412T 3R3MNGH | RoHS | 3.3                        | ±20%                 | 56   | 0.225                       | 1,400                    | 1,600 | 750                            | 890   | 100                          |
| NRH2412T 4R7MNGH | RoHS | 4.7                        | ±20%                 | 45   | 0.300                       | 1,150                    | 1,280 | 650                            | 770   | 100                          |
| NRH2412T 6R8MNGH | RoHS | 6.8                        | ±20%                 | 34   | 0.420                       | 950                      | 1,100 | 550                            | 635   | 100                          |
| NRH2412T 100MNGH | RoHS | 10                         | ±20%                 | 29   | 0.600                       | 810                      | 900   | 450                            | 510   | 100                          |

● NRH3010 Shielded type

| Parts number   | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|----------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRH3010T 1R2NN | RoHS | 1.2                        | ±30%                 | 120  | 0.065                       | 1,700                    | 1,740 | 1,480                          | 1,850 | 100                          |
| NRH3010T 1R5NN | RoHS | 1.5                        | ±30%                 | 99   | 0.075                       | 1,440                    | 1,500 | 1,370                          | 1,680 | 100                          |
| NRH3010T 2R2MN | RoHS | 2.2                        | ±20%                 | 86   | 0.083                       | 1,300                    | 1,400 | 1,300                          | 1,550 | 100                          |
| NRH3010T 3R3MN | RoHS | 3.3                        | ±20%                 | 64   | 0.130                       | 1,000                    | 1,020 | 1,030                          | 1,220 | 100                          |
| NRH3010T 4R7MN | RoHS | 4.7                        | ±20%                 | 50   | 0.170                       | 850                      | 930   | 900                            | 1,090 | 100                          |
| NRH3010T 6R8MN | RoHS | 6.8                        | ±20%                 | 44   | 0.250                       | 700                      | 750   | 745                            | 920   | 100                          |
| NRH3010T 100MN | RoHS | 10                         | ±20%                 | 34   | 0.350                       | 600                      | 650   | 620                            | 780   | 100                          |
| NRH3010T 150MN | RoHS | 15                         | ±20%                 | 25   | 0.550                       | 450                      | 520   | 480                            | 600   | 100                          |
| NRH3010T 220MN | RoHS | 22                         | ±20%                 | 22   | 0.770                       | 380                      | 440   | 410                            | 510   | 100                          |
| NRH3010T 330MN | RoHS | 33                         | ±20%                 | 20   | 1.250                       | 290                      | 360   | 350                            | 440   | 100                          |
| NRH3010T 470MN | RoHS | 47                         | ±20%                 | 17   | 2.050                       | 250                      | 300   | 285                            | 320   | 100                          |

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

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

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

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PARTS NUMBER

NRH3012 Shielded type

| Parts number   | EHS  | Nominal 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 |       |                           |
|                |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRH3012T R47NN | RoHS | 0.47                    | ±30%                 | 160                                  | 0.033                    | 2,600                    | 3,200 | 1,900                          | 2,280 | 100                       |
| NRH3012T 1R0NN | RoHS | 1.0                     | ±30%                 | 111                                  | 0.048                    | 2,200                    | 2,500 | 1,710                          | 1,970 | 100                       |
| NRH3012T 1R5NN | RoHS | 1.5                     | ±30%                 | 95                                   | 0.055                    | 1,700                    | 1,900 | 1,600                          | 1,750 | 100                       |
| NRH3012T 2R2MN | RoHS | 2.2                     | ±20%                 | 78                                   | 0.075                    | 1,500                    | 1,750 | 1,370                          | 1,600 | 100                       |
| NRH3012T 3R3MN | RoHS | 3.3                     | ±20%                 | 61                                   | 0.100                    | 1,200                    | 1,500 | 1,210                          | 1,480 | 100                       |
| NRH3012T 4R7MN | RoHS | 4.7                     | ±20%                 | 50                                   | 0.130                    | 1,000                    | 1,200 | 1,060                          | 1,280 | 100                       |
| NRH3012T 6R8MN | RoHS | 6.8                     | ±20%                 | 43                                   | 0.190                    | 850                      | 910   | 890                            | 1,000 | 100                       |
| NRH3012T 100MN | RoHS | 10                      | ±20%                 | 32                                   | 0.270                    | 730                      | 780   | 720                            | 850   | 100                       |
| NRH3012T 150MN | RoHS | 15                      | ±20%                 | 26                                   | 0.450                    | 530                      | 650   | 570                            | 680   | 100                       |
| NRH3012T 220MN | RoHS | 22                      | ±20%                 | 22                                   | 0.630                    | 500                      | 550   | 500                            | 590   | 100                       |
| NRH3012T 330MN | RoHS | 33                      | ±20%                 | 18                                   | 0.960                    | 360                      | 430   | 450                            | 510   | 100                       |
| NRH3012T 470MN | RoHS | 47                      | ±20%                 | 16                                   | 1.340                    | 280                      | 380   | 380                            | 430   | 100                       |

NRV3012 Shielded type

| Parts number  | EHS  | Nominal 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 |       |                           |
|               |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRV3012T 1R0N | RoHS | 1.0                     | ±30%                 | 110                                  | 0.065                    | 2,500                    | 3,000 | 1,600                          | 1,970 | 100                       |
| NRV3012T 1R5N | RoHS | 1.5                     | ±30%                 | 92                                   | 0.075                    | 2,100                    | 2,500 | 1,400                          | 1,610 | 100                       |
| NRV3012T 2R2M | RoHS | 2.2                     | ±20%                 | 70                                   | 0.120                    | 1,800                    | 2,100 | 1,100                          | 1,330 | 100                       |
| NRV3012T 3R3M | RoHS | 3.3                     | ±20%                 | 55                                   | 0.150                    | 1,600                    | 1,900 | 1,000                          | 1,260 | 100                       |
| NRV3012T 4R7M | RoHS | 4.7                     | ±20%                 | 48                                   | 0.190                    | 1,250                    | 1,500 | 850                            | 1,040 | 100                       |
| NRV3012T 6R8M | RoHS | 6.8                     | ±20%                 | 40                                   | 0.300                    | 950                      | 1,200 | 650                            | 800   | 100                       |
| NRV3012T 100M | RoHS | 10                      | ±20%                 | 32                                   | 0.470                    | 800                      | 990   | 550                            | 640   | 100                       |

NRS3015 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS3015T 1R0NNGH | RoHS | 1.0                     | ±30%                 | 100                                  | 0.030                    | 2,100                    | 2,400 | 2,100                          | 2,350 | 100                       |
| NRS3015T 1R5NNGH | RoHS | 1.5                     | ±30%                 | 87                                   | 0.038                    | 1,800                    | 2,100 | 1,820                          | 2,100 | 100                       |
| NRS3015T 2R2MNGH | RoHS | 2.2                     | ±20%                 | 64                                   | 0.058                    | 1,480                    | 1,700 | 1,500                          | 1,800 | 100                       |
| NRS3015T 3R3MNGH | RoHS | 3.3                     | ±20%                 | 49                                   | 0.078                    | 1,210                    | 1,400 | 1,230                          | 1,500 | 100                       |
| NRS3015T 4R7MNGH | RoHS | 4.7                     | ±20%                 | 40                                   | 0.120                    | 1,020                    | 1,100 | 1,040                          | 1,300 | 100                       |
| NRS3015T 6R8MNGH | RoHS | 6.8                     | ±20%                 | 36                                   | 0.160                    | 870                      | 920   | 880                            | 1,100 | 100                       |
| NRS3015T 100MNGH | RoHS | 10                      | ±20%                 | 28                                   | 0.220                    | 700                      | 750   | 710                            | 840   | 100                       |
| NRS3015T 150MNGH | RoHS | 15                      | ±20%                 | 23                                   | 0.325                    | 580                      | 680   | 680                            | 760   | 100                       |
| NRS3015T 220MNGH | RoHS | 22                      | ±20%                 | 20                                   | 0.520                    | 470                      | 540   | 470                            | 530   | 100                       |
| NRS3015T 330MNGH | RoHS | 33                      | ±20%                 | 18                                   | 0.780                    | 400                      | 440   | 440                            | 490   | 100                       |
| NRS3015T 470MNGH | RoHS | 47                      | ±20%                 | 17                                   | 1.100                    | 325                      | 380   | 350                            | 380   | 100                       |

NRS4010 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS4010T 1R0NDGG | RoHS | 1.0                     | ±30%                 | 116                                  | 0.056                    | 2,000                    | 2,280 | 1,900                          | 2,390 | 100                       |
| NRS4010T 2R2MDGG | RoHS | 2.2                     | ±20%                 | 73                                   | 0.085                    | 1,200                    | 1,610 | 1,500                          | 1,800 | 100                       |
| NRS4010T 3R3MDGG | RoHS | 3.3                     | ±20%                 | 58                                   | 0.100                    | 1,100                    | 1,300 | 1,400                          | 1,700 | 100                       |
| NRS4010T 4R7MDGG | RoHS | 4.7                     | ±20%                 | 47                                   | 0.140                    | 950                      | 1,100 | 1,200                          | 1,450 | 100                       |
| NRS4010T 6R8MDGG | RoHS | 6.8                     | ±20%                 | 38                                   | 0.200                    | 800                      | 890   | 1,000                          | 1,200 | 100                       |
| NRS4010T 100MDGG | RoHS | 10                      | ±20%                 | 31                                   | 0.300                    | 620                      | 760   | 750                            | 860   | 100                       |
| NRS4010T 150MDGG | RoHS | 15                      | ±20%                 | 24                                   | 0.430                    | 540                      | 635   | 600                            | 700   | 100                       |
| NRS4010T 220MDGG | RoHS | 22                      | ±20%                 | 19                                   | 0.570                    | 450                      | 540   | 500                            | 600   | 100                       |
| NRS4010T 330MDGG | RoHS | 33                      | ±20%                 | 15                                   | 0.900                    | 350                      | 440   | 400                            | 460   | 100                       |
| NRS4010T 470MDGG | RoHS | 47                      | ±20%                 | 13                                   | 1.250                    | 300                      | 350   | 350                            | 370   | 100                       |

NRS4012 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS4012T 1R0NDGG | RoHS | 1.0                     | ±30%                 | 100                                  | 0.042                    | 2,800                    | 2,900 | 2,200                          | 2,670 | 100                       |
| NRS4012T 1R5NDGG | RoHS | 1.5                     | ±30%                 | 90                                   | 0.051                    | 2,300                    | 2,500 | 2,000                          | 2,430 | 100                       |
| NRS4012T 2R2MDGJ | RoHS | 2.2                     | ±20%                 | 70                                   | 0.060                    | 1,650                    | 1,950 | 1,900                          | 2,100 | 100                       |
| NRS4012T 3R3MDGJ | RoHS | 3.3                     | ±20%                 | 60                                   | 0.070                    | 1,400                    | 1,700 | 1,700                          | 1,880 | 100                       |
| NRS4012T 4R7MDGJ | RoHS | 4.7                     | ±20%                 | 45                                   | 0.095                    | 1,200                    | 1,320 | 1,500                          | 1,570 | 100                       |
| NRS4012T 6R8MDGJ | RoHS | 6.8                     | ±20%                 | 35                                   | 0.125                    | 900                      | 1,170 | 1,300                          | 1,400 | 100                       |
| NRS4012T 100MDGJ | RoHS | 10                      | ±20%                 | 30                                   | 0.170                    | 800                      | 990   | 1,100                          | 1,200 | 100                       |
| NRS4012T 150MDGJ | RoHS | 15                      | ±20%                 | 24                                   | 0.260                    | 650                      | 820   | 750                            | 840   | 100                       |
| NRS4012T 220MDGJ | RoHS | 22                      | ±20%                 | 18                                   | 0.400                    | 500                      | 620   | 620                            | 650   | 100                       |
| NRS4012T 330MDGJ | RoHS | 33                      | ±20%                 | 15                                   | 0.600                    | 400                      | 500   | 480                            | 530   | 100                       |
| NRS4012T 470MDGJ | RoHS | 47                      | ±20%                 | 12                                   | 0.770                    | 350                      | 430   | 420                            | 470   | 100                       |

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

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

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

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PARTS NUMBER

● NRS4018 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS4018T 1R0NDGJ | RoHS | 1.0                        | ±30%                 | 90   | 0.027                       | 4,000                    | 4,590 | 3,200                          | 3,720 | 100                          |
| NRS4018T 1R5NDGJ | RoHS | 1.5                        | ±30%                 | 75   | 0.037                       | 3,300                    | 3,750 | 2,400                          | 3,000 | 100                          |
| NRS4018T 2R2MDGJ | RoHS | 2.2                        | ±20%                 | 60   | 0.042                       | 3,000                    | 3,110 | 2,200                          | 2,590 | 100                          |
| NRS4018T 3R3MDGJ | RoHS | 3.3                        | ±20%                 | 45   | 0.055                       | 2,300                    | 2,560 | 2,000                          | 2,240 | 100                          |
| NRS4018T 4R7MDGJ | RoHS | 4.7                        | ±20%                 | 35   | 0.070                       | 2,000                    | 2,330 | 1,700                          | 1,880 | 100                          |
| NRS4018T 6R8MDGJ | RoHS | 6.8                        | ±20%                 | 30   | 0.098                       | 1,600                    | 1,820 | 1,450                          | 1,690 | 100                          |
| NRS4018T 100MDGJ | RoHS | 10                         | ±20%                 | 25   | 0.150                       | 1,300                    | 1,440 | 1,200                          | 1,250 | 100                          |
| NRS4018T 150MDGJ | RoHS | 15                         | ±20%                 | 18   | 0.210                       | 1,100                    | 1,150 | 850                            | 915   | 100                          |
| NRS4018T 220MDGJ | RoHS | 22                         | ±20%                 | 15   | 0.290                       | 900                      | 920   | 720                            | 810   | 100                          |
| NRS4018T 330MDGJ | RoHS | 33                         | ±20%                 | 12   | 0.460                       | 700                      | 830   | 550                            | 630   | 100                          |
| NRS4018T 470MDGJ | RoHS | 47                         | ±20%                 | 10   | 0.650                       | 600                      | 700   | 440                            | 520   | 100                          |
| NRS4018T 680MDGJ | RoHS | 68                         | ±20%                 | 8.3  | 1.00                        | 520                      | 600   | 320                            | 400   | 100                          |
| NRS4018T 101MDGJ | RoHS | 100                        | ±20%                 | 6.5  | 1.45                        | 420                      | 490   | 280                            | 330   | 100                          |
| NRS4018T 151MDGJ | RoHS | 150                        | ±20%                 | 5.5  | 2.30                        | 340                      | 390   | 220                            | 280   | 100                          |
| NRS4018T 221MDGJ | RoHS | 220                        | ±20%                 | 4.0  | 3.80                        | 275                      | 310   | 170                            | 210   | 100                          |

● NRS5010 type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5010T 1R0NMGF | RoHS | 1.0                        | ±30%                 | 95   | 0.070                       | 2,350                    | 2,510 | 1,750                          | 2,000 | 100                          |
| NRS5010T 2R2NMGF | RoHS | 2.2                        | ±30%                 | 65   | 0.105                       | 1,500                    | 1,710 | 1,400                          | 1,600 | 100                          |
| NRS5010T 3R3MMGF | RoHS | 3.3                        | ±20%                 | 42   | 0.125                       | 1,400                    | 1,530 | 1,250                          | 1,520 | 100                          |
| NRS5010T 4R7MMGF | RoHS | 4.7                        | ±20%                 | 37   | 0.145                       | 1,200                    | 1,340 | 1,150                          | 1,390 | 100                          |
| NRS5010T 6R8MMGF | RoHS | 6.8                        | ±20%                 | 33   | 0.185                       | 1,000                    | 1,120 | 1,000                          | 1,210 | 100                          |
| NRS5010T 100MMGF | RoHS | 10                         | ±20%                 | 23   | 0.250                       | 850                      | 970   | 900                            | 950   | 100                          |
| NRS5010T 150MMGF | RoHS | 15                         | ±20%                 | 19   | 0.400                       | 680                      | 740   | 650                            | 700   | 100                          |
| NRS5010T 220MMGF | RoHS | 22                         | ±20%                 | 15   | 0.600                       | 550                      | 620   | 450                            | 560   | 100                          |

● NRS5012 type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5012T 1R0NMGF | RoHS | 1.0                        | ±30%                 | 100  | 0.053                       | 4,500                    | 4,670 | 2,300                          | 2,750 | 100                          |
| NRS5012T 1R5NMGF | RoHS | 1.5                        | ±30%                 | 86   | 0.070                       | 3,800                    | 3,970 | 2,200                          | 2,470 | 100                          |
| NRS5012T 2R2MMGF | RoHS | 2.2                        | ±20%                 | 70   | 0.085                       | 3,100                    | 3,510 | 2,000                          | 2,300 | 100                          |
| NRS5012T 3R3MMGF | RoHS | 3.3                        | ±20%                 | 48   | 0.160                       | 2,400                    | 2,580 | 1,450                          | 1,650 | 100                          |
| NRS5012T 4R7MMGF | RoHS | 4.7                        | ±20%                 | 40   | 0.180                       | 2,200                    | 2,320 | 1,400                          | 1,560 | 100                          |
| NRS5012T 6R8MMGF | RoHS | 6.8                        | ±20%                 | 36   | 0.260                       | 1,700                    | 1,950 | 1,100                          | 1,260 | 100                          |
| NRS5012T 100MMGF | RoHS | 10                         | ±20%                 | 26   | 0.420                       | 1,400                    | 1,550 | 850                            | 1,000 | 100                          |
| NRS5012T 150MMGF | RoHS | 15                         | ±20%                 | 22   | 0.670                       | 1,200                    | 1,240 | 640                            | 740   | 100                          |

● NRS5014 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5014T R47NMGG | RoHS | 0.47                       | ±30%                 | 185  | 0.025                       | 5,800                    | 6,400 | 3,300                          | 3,470 | 100                          |
| NRS5014T 1R2NMGG | RoHS | 1.2                        | ±30%                 | 86   | 0.045                       | 3,800                    | 4,200 | 2,400                          | 3,000 | 100                          |
| NRS5014T 2R2NMGG | RoHS | 2.2                        | ±30%                 | 56   | 0.065                       | 2,800                    | 3,100 | 2,000                          | 2,400 | 100                          |
| NRS5014T 3R3NMGG | RoHS | 3.3                        | ±30%                 | 48   | 0.080                       | 2,350                    | 2,650 | 1,700                          | 2,200 | 100                          |
| NRS5014T 4R7NMGG | RoHS | 4.7                        | ±30%                 | 41   | 0.100                       | 2,050                    | 2,400 | 1,400                          | 1,900 | 100                          |
| NRS5014T 6R8MMGG | RoHS | 6.8                        | ±20%                 | 33   | 0.150                       | 1,600                    | 1,850 | 1,200                          | 1,450 | 100                          |
| NRS5014T 100MMGG | RoHS | 10                         | ±20%                 | 27   | 0.200                       | 1,400                    | 1,600 | 1,050                          | 1,250 | 100                          |
| NRS5014T 150MMGG | RoHS | 15                         | ±20%                 | 20   | 0.320                       | 1,100                    | 1,300 | 650                            | 790   | 100                          |
| NRS5014T 220MMGG | RoHS | 22                         | ±20%                 | 16   | 0.450                       | 900                      | 1,000 | 550                            | 660   | 100                          |

● NRS5020 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|------------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                  |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                  |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5020T R47NMGG | RoHS | 0.47                       | ±30%                 | 230  | 0.012                       | 6,100                    | 6,900 | 5,000                          | 5,800 | 100                          |
| NRS5020T 1R0NMGJ | RoHS | 1.0                        | ±30%                 | 81   | 0.021                       | 4,000                    | 4,500 | 3,600                          | 3,710 | 100                          |
| NRS5020T 1R5NMGJ | RoHS | 1.5                        | ±30%                 | 68   | 0.026                       | 3,350                    | 3,800 | 3,200                          | 3,540 | 100                          |
| NRS5020T 2R2NMGG | RoHS | 2.2                        | ±30%                 | 57   | 0.035                       | 2,900                    | 3,200 | 2,900                          | 3,200 | 100                          |
| NRS5020T 3R3NMGG | RoHS | 3.3                        | ±30%                 | 46   | 0.048                       | 2,400                    | 2,700 | 2,400                          | 3,080 | 100                          |
| NRS5020T 4R7MMGG | RoHS | 4.7                        | ±20%                 | 37   | 0.060                       | 2,000                    | 2,270 | 2,000                          | 2,370 | 100                          |
| NRS5020T 6R8MMGG | RoHS | 6.8                        | ±20%                 | 30   | 0.090                       | 1,600                    | 1,850 | 1,650                          | 2,200 | 100                          |
| NRS5020T 100MMGG | RoHS | 10                         | ±20%                 | 24   | 0.120                       | 1,300                    | 1,480 | 1,450                          | 1,850 | 100                          |
| NRS5020T 150MMGG | RoHS | 15                         | ±20%                 | 20   | 0.165                       | 1,100                    | 1,260 | 1,200                          | 1,480 | 100                          |
| NRS5020T 220MMGG | RoHS | 22                         | ±20%                 | 17   | 0.260                       | 900                      | 1,100 | 1,000                          | 1,230 | 100                          |
| NRS5020T 470MMGG | RoHS | 47                         | ±20%                 | 12   | 0.435                       | 630                      | 750   | 560                            | 610   | 100                          |
| NRS5020T 101MMGG | RoHS | 100                        | ±20%                 | 7  | 0.850                       | 420                      | 510   | 400                            | 450   | 100                          |

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

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

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

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



PARTS NUMBER

● NRS5024 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS5024T 1R0NMGJ | RoHS | 1.0                     | ±30%                 | 85                                   | 0.016                    | 5,800                    | 6,800 | 4,400                          | 4,900 | 100                       |
| NRS5024T 1R5NMGJ | RoHS | 1.5                     | ±30%                 | 67                                   | 0.022                    | 5,200                    | 5,800 | 3,600                          | 4,300 | 100                       |
| NRS5024T 2R2NMGJ | RoHS | 2.2                     | ±30%                 | 51                                   | 0.029                    | 4,100                    | 4,800 | 3,100                          | 3,600 | 100                       |
| NRS5024T 3R3NMGJ | RoHS | 3.3                     | ±30%                 | 41                                   | 0.043                    | 3,100                    | 3,700 | 2,400                          | 2,750 | 100                       |
| NRS5024T 4R7MMGJ | RoHS | 4.7                     | ±20%                 | 37                                   | 0.055                    | 2,700                    | 3,400 | 2,000                          | 2,400 | 100                       |
| NRS5024T 6R8MMGJ | RoHS | 6.8                     | ±20%                 | 28                                   | 0.080                    | 2,200                    | 2,750 | 1,600                          | 1,800 | 100                       |
| NRS5024T 100MMGJ | RoHS | 10                      | ±20%                 | 21                                   | 0.125                    | 1,700                    | 2,100 | 1,200                          | 1,460 | 100                       |
| NRS5024T 150MMGJ | RoHS | 15                      | ±20%                 | 18                                   | 0.170                    | 1,400                    | 1,750 | 1,000                          | 1,250 | 100                       |
| NRS5024T 220MMGJ | RoHS | 22                      | ±20%                 | 15                                   | 0.230                    | 1,200                    | 1,450 | 820                            | 900   | 100                       |
| NRS5024T 330MMGJ | RoHS | 33                      | ±20%                 | 11                                   | 0.370                    | 1,000                    | 1,200 | 630                            | 700   | 100                       |

● NRS5030 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS5030T R47NMGJ | RoHS | 0.47                    | ±30%                 | 185                                  | 0.010                    | 9,000                    | 9,400 | 5,000                          | 5,900 | 100                       |
| NRS5030T 1R0NMGJ | RoHS | 1.0                     | ±30%                 | 110                                  | 0.015                    | 6,600                    | 7,400 | 4,000                          | 4,900 | 100                       |
| NRS5030T 2R2NMGJ | RoHS | 2.2                     | ±30%                 | 46                                   | 0.023                    | 4,200                    | 5,000 | 3,500                          | 4,100 | 100                       |
| NRS5030T 3R3MMGJ | RoHS | 3.3                     | ±20%                 | 36                                   | 0.030                    | 3,600                    | 3,900 | 3,000                          | 3,600 | 100                       |
| NRS5030T 4R7MMGJ | RoHS | 4.7                     | ±20%                 | 31                                   | 0.035                    | 3,100                    | 3,500 | 2,600                          | 3,000 | 100                       |
| NRS5030T 6R8MMGJ | RoHS | 6.8                     | ±20%                 | 22                                   | 0.052                    | 2,500                    | 2,800 | 2,300                          | 2,500 | 100                       |
| NRS5030T 100MMGJ | RoHS | 10                      | ±20%                 | 20                                   | 0.070                    | 2,100                    | 2,300 | 1,700                          | 2,000 | 100                       |
| NRS5030T 150MMGJ | RoHS | 15                      | ±20%                 | 14                                   | 0.125                    | 1,600                    | 1,800 | 1,400                          | 1,550 | 100                       |
| NRS5030T 220MMGJ | RoHS | 22                      | ±20%                 | 13                                   | 0.180                    | 1,400                    | 1,500 | 1,050                          | 1,200 | 100                       |
| NRS5030T 330MMGJ | RoHS | 33                      | ±20%                 | 10                                   | 0.225                    | 1,150                    | 1,250 | 800                            | 950   | 100                       |
| NRS5030T 470MMGJ | RoHS | 47                      | ±20%                 | 9                                    | 0.325                    | 950                      | 1,050 | 700                            | 800   | 100                       |

● NRS5040 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS5040T 1R5NMGJ | RoHS | 1.5                     | ±30%                 | 60                                   | 0.017                    | 6,400                    | 6,530 | 4,500                          | 4,730 | 100                       |
| NRS5040T 2R2NMGJ | RoHS | 2.2                     | ±30%                 | 42                                   | 0.022                    | 5,000                    | 5,250 | 3,700                          | 4,080 | 100                       |
| NRS5040T 3R3NMGJ | RoHS | 3.3                     | ±30%                 | 32                                   | 0.027                    | 4,000                    | 4,280 | 3,300                          | 3,770 | 100                       |
| NRS5040T 4R7NMGK | RoHS | 4.7                     | ±30%                 | 28                                   | 0.029                    | 3,300                    | 3,470 | 3,100                          | 3,500 | 100                       |
| NRS5040T 6R8MMGJ | RoHS | 6.8                     | ±20%                 | 21                                   | 0.049                    | 2,800                    | 2,910 | 2,400                          | 2,470 | 100                       |
| NRS5040T 100MMGJ | RoHS | 10                      | ±20%                 | 18                                   | 0.056                    | 2,300                    | 2,470 | 2,100                          | 2,210 | 100                       |
| NRS5040T 150MMGJ | RoHS | 15                      | ±20%                 | 13                                   | 0.080                    | 2,000                    | 2,150 | 1,800                          | 1,920 | 100                       |
| NRS5040T 220MMGK | RoHS | 22                      | ±20%                 | 9                                    | 0.126                    | 1,500                    | 1,580 | 1,400                          | 1,470 | 100                       |
| NRS5040T 330MMGJ | RoHS | 33                      | ±20%                 | 7                                    | 0.180                    | 1,300                    | 1,390 | 1,200                          | 1,270 | 100                       |
| NRS5040T 470MMGJ | RoHS | 47                      | ±20%                 | 6                                    | 0.310                    | 1,100                    | 1,150 | 900                            | 950   | 100                       |

● NRS6010 type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS6010T 1R5MMGF | RoHS | 1.5                     | ±20%                 | 77                                   | 0.090                    | 2,400                    | 2,650 | 1,900                          | 2,150 | 100                       |
| NRS6010T 2R2MMGF | RoHS | 2.2                     | ±20%                 | 56                                   | 0.110                    | 1,900                    | 2,120 | 1,700                          | 1,950 | 100                       |
| NRS6010T 3R3MMGF | RoHS | 3.3                     | ±20%                 | 42                                   | 0.135                    | 1,600                    | 1,750 | 1,500                          | 1,750 | 100                       |
| NRS6010T 4R7MMGF | RoHS | 4.7                     | ±20%                 | 36                                   | 0.165                    | 1,300                    | 1,470 | 1,400                          | 1,600 | 100                       |
| NRS6010T 6R8MMGF | RoHS | 6.8                     | ±20%                 | 30                                   | 0.220                    | 1,200                    | 1,300 | 1,200                          | 1,320 | 100                       |
| NRS6010T 100MMGF | RoHS | 10                      | ±20%                 | 25                                   | 0.270                    | 1,000                    | 1,100 | 1,100                          | 1,200 | 100                       |
| NRS6010T 220MMGF | RoHS | 22                      | ±20%                 | 12                                   | 0.580                    | 650                      | 720   | 700                            | 740   | 100                       |

● NRS6012 Shielded type

| Parts number     | EHS  | Nominal 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 |       |                           |
|                  |      |                         |                      |                                      |                          | Max.                     | Typ.  | Max.                           | Typ.  |                           |
| NRS6012T 1R0NMGJ | RoHS | 1.0                     | ±30%                 | 95                                   | 0.050                    | 3,000                    | 3,900 | 2,400                          | 2,700 | 100                       |
| NRS6012T 1R5NMGJ | RoHS | 1.5                     | ±30%                 | 69                                   | 0.067                    | 2,600                    | 3,500 | 2,100                          | 2,300 | 100                       |
| NRS6012T 2R5NMGJ | RoHS | 2.5                     | ±30%                 | 45                                   | 0.090                    | 2,100                    | 2,900 | 1,800                          | 2,100 | 100                       |
| NRS6012T 3R3NMGJ | RoHS | 3.3                     | ±30%                 | 42                                   | 0.105                    | 1,800                    | 2,500 | 1,700                          | 1,950 | 100                       |
| NRS6012T 4R7MMGG | RoHS | 4.7                     | ±20%                 | 36                                   | 0.125                    | 1,600                    | 2,100 | 1,550                          | 1,750 | 100                       |
| NRS6012T 5R3MMGJ | RoHS | 5.3                     | ±20%                 | 34                                   | 0.125                    | 1,500                    | 1,750 | 1,550                          | 1,750 | 100                       |
| NRS6012T 6R8MMGJ | RoHS | 6.8                     | ±20%                 | 30                                   | 0.165                    | 1,300                    | 1,600 | 1,350                          | 1,600 | 100                       |
| NRS6012T 100MMGJ | RoHS | 10                      | ±20%                 | 22                                   | 0.200                    | 1,000                    | 1,400 | 1,200                          | 1,380 | 100                       |
| NRS6012T 150MMGJ | RoHS | 15                      | ±20%                 | 18                                   | 0.295                    | 800                      | 1,100 | 800                            | 950   | 100                       |
| NRS6012T 220MMGJ | RoHS | 22                      | ±20%                 | 12                                   | 0.465                    | 760                      | 900   | 650                            | 750   | 100                       |
| NRS6012T 330MMGJ | RoHS | 33                      | ±20%                 | 8                                    | 0.580                    | 590                      | 800   | 550                            | 670   | 100                       |
| NRS6012T 470MMGJ | RoHS | 47                      | ±20%                 | 6                                    | 0.965                    | 520                      | 630   | 460                            | 540   | 100                       |
| NRS6012T 680MMGJ | RoHS | 68                      | ±20%                 | 3                                    | 1.16                     | 440                      | 560   | 410                            | 450   | 100                       |
| NRS6012T 101MMGJ | RoHS | 100                     | ±20%                 | 1                                    | 1.67                     | 350                      | 490   | 320                            | 380   | 100                       |

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

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

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



PARTS NUMBER

● NRS6014 Shielded type

| Parts number    | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|-----------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                 |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                 |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS6014T 1R2NMG | RoHS | 1.2                        | ±30%                 | 77   | 0.042                       | 4,000                    | 4,400 | 2,750                          | 3,200 | 100                          |
| NRS6014T 2R2NMG | RoHS | 2.2                        | ±30%                 | 61   | 0.055                       | 3,000                    | 3,500 | 2,300                          | 2,600 | 100                          |
| NRS6014T 3R3NMG | RoHS | 3.3                        | ±30%                 | 41   | 0.075                       | 2,500                    | 2,600 | 2,000                          | 2,200 | 100                          |
| NRS6014T 4R7MMG | RoHS | 4.7                        | ±20%                 | 36   | 0.090                       | 2,000                    | 2,170 | 1,900                          | 1,950 | 100                          |
| NRS6014T 6R8MMG | RoHS | 6.8                        | ±20%                 | 30   | 0.115                       | 1,700                    | 1,880 | 1,650                          | 1,700 | 100                          |
| NRS6014T 100MMG | RoHS | 10                         | ±20%                 | 24   | 0.140                       | 1,400                    | 1,540 | 1,400                          | 1,500 | 100                          |
| NRS6014T 150MMG | RoHS | 15                         | ±20%                 | 20   | 0.210                       | 1,150                    | 1,300 | 1,200                          | 1,280 | 100                          |
| NRS6014T 220MMG | RoHS | 22                         | ±20%                 | 16   | 0.300                       | 950                      | 1,100 | 1,000                          | 1,090 | 100                          |

● NRS6020 Shielded type

| Parts number    | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±20%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|-----------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                 |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                 |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS6020T 0R8NMG | RoHS | 0.8                        | ±30%                 | 110  | 0.020                       | 6,400                    | 7,400 | 4,100                          | 4,800 | 100                          |
| NRS6020T 1R5NMG | RoHS | 1.5                        | ±30%                 | 93   | 0.026                       | 4,300                    | 5,300 | 3,600                          | 4,200 | 100                          |
| NRS6020T 2R2NMG | RoHS | 2.2                        | ±30%                 | 73   | 0.034                       | 3,200                    | 4,000 | 2,900                          | 3,400 | 100                          |
| NRS6020T 3R3NMG | RoHS | 3.3                        | ±30%                 | 55   | 0.040                       | 2,800                    | 3,400 | 2,750                          | 3,100 | 100                          |
| NRS6020T 4R7NMG | RoHS | 4.7                        | ±30%                 | 43   | 0.058                       | 2,400                    | 2,800 | 2,150                          | 2,500 | 100                          |
| NRS6020T 6R8NMG | RoHS | 6.8                        | ±30%                 | 30   | 0.085                       | 2,000                    | 2,600 | 1,800                          | 2,100 | 100                          |
| NRS6020T 100MMG | RoHS | 10                         | ±20%                 | 18   | 0.125                       | 1,900                    | 2,240 | 1,500                          | 1,700 | 100                          |
| NRS6020T 220MMG | RoHS | 22                         | ±20%                 | 11   | 0.290                       | 1,250                    | 1,470 | 950                            | 1,100 | 100                          |

● NRS6028 Shielded type

| Parts number    | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±30%) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency [kHz] |
|-----------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|-------|--------------------------------|-------|------------------------------|
|                 |      |                            |                      |  |                             | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                              |
|                 |      |                            |                      |  |                             | Max.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS6028T 0R9NMG | RoHS | 0.9                        | ±30%                 | 90   | 0.013                       | 6,700                    | 7,900 | 4,600                          | 5,200 | 100                          |
| NRS6028T 1R5NMG | RoHS | 1.5                        | ±30%                 | 78   | 0.016                       | 5,100                    | 6,100 | 4,200                          | 4,700 | 100                          |
| NRS6028T 2R2NMG | RoHS | 2.2                        | ±30%                 | 68   | 0.020                       | 4,200                    | 5,100 | 3,700                          | 4,200 | 100                          |
| NRS6028T 3R0NMG | RoHS | 3.0                        | ±30%                 | 55   | 0.023                       | 3,600                    | 4,300 | 3,400                          | 3,900 | 100                          |
| NRS6028T 4R7MMG | RoHS | 4.7                        | ±20%                 | 39   | 0.031                       | 2,700                    | 3,300 | 3,000                          | 3,400 | 100                          |
| NRS6028T 6R8MMG | RoHS | 6.8                        | ±20%                 | 25   | 0.043                       | 2,600                    | 3,000 | 2,500                          | 2,900 | 100                          |
| NRS6028T 100MMG | RoHS | 10                         | ±20%                 | 20   | 0.065                       | 1,900                    | 2,200 | 1,900                          | 2,200 | 100                          |
| NRS6028T 150MMG | RoHS | 15                         | ±20%                 | 17   | 0.095                       | 1,600                    | 1,900 | 1,800                          | 1,900 | 100                          |
| NRS6028T 220MMG | RoHS | 22                         | ±20%                 | 12   | 0.135                       | 1,300                    | 1,600 | 1,400                          | 1,600 | 100                          |
| NRS6028T 330MMG | RoHS | 33                         | ±20%                 | 10   | 0.220                       | 1,100                    | 1,300 | 1,100                          | 1,250 | 100                          |
| NRS6028T 470MMG | RoHS | 47                         | ±20%                 | 8  | 0.300                       | 1,000                    | 1,150 | 920                            | 1,050 | 100                          |
| NRS6028T 680MMG | RoHS | 68                         | ±20%                 | 5  | 0.420                       | 800                      | 950   | 770                            | 880   | 100                          |
| NRS6028T 101MMG | RoHS | 100                        | ±20%                 | 3  | 0.600                       | 650                      | 750   | 660                            | 750   | 100                          |

● NRS6045 Shielded type

| Parts number    | EHS  | Nominal inductance<br>[μH] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[Ω] (±30%) | Rated current ※) [mA]    |        |                                |       | Measuring<br>frequency [kHz] |
|-----------------|------|----------------------------|----------------------|--|-----------------------------|--------------------------|--------|--------------------------------|-------|------------------------------|
|                 |      |                            |                      |  |                             | Saturation current: Idc1 |        | Temperature rise current: Idc2 |       |                              |
|                 |      |                            |                      |  |                             | Max.                     | Typ.   | Max.                           | Typ.  |                              |
| NRS6045T 1R0NMG | RoHS | 1.0                        | ±30%                 | 110  | 0.014                       | 9,800                    | 11,000 | 4,500                          | 5,200 | 100                          |
| NRS6045T 1R3NMG | RoHS | 1.3                        | ±30%                 | 95   | 0.016                       | 8,200                    | 9,300  | 4,200                          | 4,800 | 100                          |
| NRS6045T 1R5NMG | RoHS | 1.5                        | ±30%                 | 95   | 0.016                       | 8,200                    | 9,300  | 4,200                          | 4,800 | 100                          |
| NRS6045T 1R8NMG | RoHS | 1.8                        | ±30%                 | 80   | 0.019                       | 7,200                    | 8,100  | 3,900                          | 4,400 | 100                          |
| NRS6045T 2R2NMG | RoHS | 2.2                        | ±30%                 | 60   | 0.022                       | 6,400                    | 7,300  | 3,600                          | 4,100 | 100                          |
| NRS6045T 2R3NMG | RoHS | 2.3                        | ±30%                 | 60   | 0.022                       | 6,400                    | 7,300  | 3,600                          | 4,100 | 100                          |
| NRS6045T 3R0NMG | RoHS | 3.0                        | ±30%                 | 45   | 0.024                       | 5,600                    | 6,500  | 3,300                          | 4,000 | 100                          |
| NRS6045T 3R3NMG | RoHS | 3.3                        | ±30%                 | 45   | 0.024                       | 5,600                    | 6,500  | 3,300                          | 4,000 | 100                          |
| NRS6045T 4R5MMG | RoHS | 4.5                        | ±20%                 | 25   | 0.030                       | 4,400                    | 5,400  | 3,100                          | 3,600 | 100                          |
| NRS6045T 4R7NMG | RoHS | 4.7                        | ±30%                 | 25   | 0.030                       | 4,400                    | 5,400  | 3,100                          | 3,600 | 100                          |
| NRS6045T 6R3MMG | RoHS | 6.3                        | ±20%                 | 15   | 0.036                       | 3,600                    | 4,300  | 3,000                          | 3,300 | 100                          |
| NRS6045T 6R8MMG | RoHS | 6.8                        | ±20%                 | 15   | 0.036                       | 3,600                    | 4,300  | 3,000                          | 3,300 | 100                          |
| NRS6045T 100MMG | RoHS | 10                         | ±20%                 | 12   | 0.046                       | 3,100                    | 3,600  | 2,400                          | 2,800 | 100                          |
| NRS6045T 150MMG | RoHS | 15                         | ±20%                 | 10   | 0.070                       | 2,500                    | 3,000  | 1,900                          | 2,300 | 100                          |
| NRS6045T 220MMG | RoHS | 22                         | ±20%                 | 7  | 0.107                       | 2,000                    | 2,400  | 1,600                          | 1,900 | 100                          |
| NRS6045T 330MMG | RoHS | 33                         | ±20%                 | 6  | 0.141                       | 1,650                    | 2,000  | 1,400                          | 1,600 | 100                          |
| NRS6045T 470MMG | RoHS | 47                         | ±20%                 | 5  | 0.211                       | 1,400                    | 1,600  | 1,150                          | 1,350 | 100                          |
| NRS6045T 680MMG | RoHS | 68                         | ±20%                 | 4  | 0.304                       | 1,100                    | 1,300  | 950                            | 1,100 | 100                          |
| NRS6045T 101MMG | RoHS | 100                        | ±20%                 | 3  | 0.466                       | 900                      | 1,200  | 750                            | 900   | 100                          |

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

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

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

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

PARTS NUMBER

●NRS8030 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] ( $\pm 30\%$ ) | Rated current ※) [mA]    |       |                                |       | Measuring<br>frequency[kHz] |
|------------------|------|----------------------------------|----------------------|--|--|--------------------------|-------|--------------------------------|-------|-----------------------------|
|                  |      |                                  |                      |  |  | Saturation current: Idc1 |       | Temperature rise current: Idc2 |       |                             |
|                  |      |                                  |                      |  |  | Max.                     | Typ.  | Max.                           | Typ.  |                             |
| NRS8030T 1R0NJGJ | RoHS | 1.0                              | $\pm 30\%$           | 120  | 0.009  | 7,800                    | 9,300 | 6,200                          | 7,600 | 100                         |
| NRS8030T 1R5NJGJ | RoHS | 1.5                              | $\pm 30\%$           | 80   | 0.012  | 6,200                    | 7,800 | 5,300                          | 6,400 | 100                         |
| NRS8030T 2R2NJGJ | RoHS | 2.2                              | $\pm 30\%$           | 60   | 0.015  | 4,900                    | 6,100 | 4,800                          | 5,600 | 100                         |
| NRS8030T 3R3MJGJ | RoHS | 3.3                              | $\pm 20\%$           | 50   | 0.019  | 4,200                    | 5,200 | 4,300                          | 5,100 | 100                         |
| NRS8030T 4R7MJGJ | RoHS | 4.7                              | $\pm 20\%$           | 40   | 0.022  | 3,600                    | 4,400 | 4,000                          | 4,700 | 100                         |
| NRS8030T 6R8MJGJ | RoHS | 6.8                              | $\pm 20\%$           | 32   | 0.029  | 3,000                    | 3,600 | 3,400                          | 4,000 | 100                         |
| NRS8030T 100MJGJ | RoHS | 10                               | $\pm 20\%$           | 27   | 0.033  | 2,400                    | 2,900 | 3,000                          | 3,600 | 100                         |
| NRS8030T 150MJGJ | RoHS | 15                               | $\pm 20\%$           | 20   | 0.060  | 2,000                    | 2,300 | 2,200                          | 2,600 | 100                         |
| NRS8030T 220MJGJ | RoHS | 22                               | $\pm 20\%$           | 16   | 0.070  | 1,750                    | 2,200 | 1,900                          | 2,300 | 100                         |
| NRS8030T 330MJGJ | RoHS | 33                               | $\pm 20\%$           | 13   | 0.120  | 1,300                    | 1,600 | 1,500                          | 1,800 | 100                         |
| NRS8030T 470MJGJ | RoHS | 47                               | $\pm 20\%$           | 11   | 0.170  | 1,100                    | 1,400 | 1,300                          | 1,500 | 100                         |

●NRS8040 Shielded type

| Parts number     | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] ( $\pm 30\%$ ) | Rated current ※) [mA]    |        |                                |       | Measuring<br>frequency[kHz] |
|------------------|------|----------------------------------|----------------------|--|--|--------------------------|--------|--------------------------------|-------|-----------------------------|
|                  |      |                                  |                      |  |  | Saturation current: Idc1 |        | Temperature rise current: Idc2 |       |                             |
|                  |      |                                  |                      |  |  | Max.                     | Typ.   | Max.                           | Typ.  |                             |
| NRS8040T 0R9NJGJ | RoHS | 0.9                              | $\pm 30\%$           | 85   | 0.006  | 13,000                   | 14,000 | 7,800                          | 9,600 | 100                         |
| NRS8040T 1R0NJGJ | RoHS | 1                                | $\pm 30\%$           | 85   | 0.006  | 13,000                   | 14,000 | 7,800                          | 9,600 | 100                         |
| NRS8040T 1R4NJGJ | RoHS | 1.4                              | $\pm 30\%$           | 63   | 0.007  | 10,000                   | 11,000 | 7,000                          | 8,400 | 100                         |
| NRS8040T 1R5NJGJ | RoHS | 1.5                              | $\pm 30\%$           | 63   | 0.007  | 10,000                   | 11,000 | 7,000                          | 8,400 | 100                         |
| NRS8040T 2R0NJGJ | RoHS | 2.0                              | $\pm 30\%$           | 50   | 0.009  | 8,100                    | 9,200  | 6,300                          | 7,600 | 100                         |
| NRS8040T 2R2NJGJ | RoHS | 2.2                              | $\pm 30\%$           | 50   | 0.009  | 8,100                    | 9,200  | 6,300                          | 7,600 | 100                         |
| NRS8040T 3R3NJGJ | RoHS | 3.3                              | $\pm 30\%$           | 34   | 0.015  | 6,400                    | 6,800  | 4,900                          | 6,000 | 100                         |
| NRS8040T 3R6NJGJ | RoHS | 3.6                              | $\pm 30\%$           | 34   | 0.015  | 6,400                    | 6,800  | 4,900                          | 6,000 | 100                         |
| NRS8040T 4R7NJGJ | RoHS | 4.7                              | $\pm 30\%$           | 30   | 0.018  | 5,400                    | 5,900  | 4,100                          | 5,200 | 100                         |
| NRS8040T 6R8NJGJ | RoHS | 6.8                              | $\pm 30\%$           | 24   | 0.025  | 4,400                    | 4,800  | 3,700                          | 4,400 | 100                         |
| NRS8040T 100MJGJ | RoHS | 10                               | $\pm 20\%$           | 22   | 0.034  | 3,800                    | 4,100  | 3,100                          | 3,500 | 100                         |
| NRS8040T 150MJGJ | RoHS | 15                               | $\pm 20\%$           | 16   | 0.050  | 2,900                    | 3,200  | 2,400                          | 3,000 | 100                         |
| NRS8040T 220MJGJ | RoHS | 22                               | $\pm 20\%$           | 13   | 0.066  | 2,400                    | 2,700  | 2,200                          | 2,600 | 100                         |
| NRS8040T 330MJGK | RoHS | 33                               | $\pm 20\%$           | 12   | 0.100  | 2,000                    | 2,300  | 1,700                          | 1,900 | 100                         |
| NRS8040T 470MJGK | RoHS | 47                               | $\pm 20\%$           | 8  | 0.140  | 1,500                    | 1,800  | 1,500                          | 1,600 | 100                         |
| NRS8040T 680MJGK | RoHS | 68                               | $\pm 20\%$           | 7  | 0.210  | 1,300                    | 1,500  | 1,200                          | 1,300 | 100                         |
| NRS8040T 101MJGK | RoHS | 100                              | $\pm 20\%$           | 6  | 0.280  | 1,100                    | 1,300  | 1,000                          | 1,100 | 100                         |
| NRS8040T 151MJGK | RoHS | 150                              | $\pm 20\%$           | 5  | 0.420  | 900                      | 980    | 800                            | 890   | 100                         |
| NRS8040T 221MJGK | RoHS | 220                              | $\pm 20\%$           | 4  | 0.620  | 700                      | 800    | 670                            | 740   | 100                         |

●NR 3010 Shielded type

| Parts number  | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] ( $\pm 20\%$ ) | Rated current ※) [mA]    |                                | Measuring<br>frequency[kHz] |
|---------------|------|----------------------------------|----------------------|--|--|--------------------------|--------------------------------|-----------------------------|
|               |      |                                  |                      |  |  | Saturation current: Idc1 | Temperature rise current: Idc2 |                             |
|               |      |                                  |                      |  |  | Max.                     | Max.                           |                             |
| NR 3010T 1R0N | RoHS | 1.0                              | $\pm 30\%$           | 126  | 0.065  | 1,300                    | 1,400                          | 100                         |
| NR 3010T 1R5N | RoHS | 1.5                              | $\pm 30\%$           | 98   | 0.080  | 1,200                    | 1,300                          | 100                         |
| NR 3010T 2R2M | RoHS | 2.2                              | $\pm 20\%$           | 82   | 0.095  | 1,100                    | 1,100                          | 100                         |
| NR 3010T 3R3M | RoHS | 3.3                              | $\pm 20\%$           | 63   | 0.140  | 870                      | 940                            | 100                         |
| NR 3010T 4R7M | RoHS | 4.7                              | $\pm 20\%$           | 56   | 0.190  | 750                      | 780                            | 100                         |
| NR 3010T 6R8M | RoHS | 6.8                              | $\pm 20\%$           | 46   | 0.300  | 610                      | 630                            | 100                         |
| NR 3010T 100M | RoHS | 10                               | $\pm 20\%$           | 35   | 0.450  | 500                      | 510                            | 100                         |
| NR 3010T 150M | RoHS | 15                               | $\pm 20\%$           | 30   | 0.740  | 400                      | 400                            | 100                         |
| NR 3010T 220M | RoHS | 22                               | $\pm 20\%$           | 25   | 1.03   | 350                      | 350                            | 100                         |
| NR 3010T 330M | RoHS | 33                               | $\pm 20\%$           | 20   | 1.55   | 260                      | 275                            | 100                         |
| NR 3010T 470M | RoHS | 47                               | $\pm 20\%$           | 17   | 2.05   | 220                      | 235                            | 100                         |

●NR 3012 Shielded type

| Parts number  | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] ( $\pm 20\%$ ) | Rated current ※) [mA]    |                                | Measuring<br>frequency[kHz] |
|---------------|------|----------------------------------|----------------------|--|--|--------------------------|--------------------------------|-----------------------------|
|               |      |                                  |                      |  |  | Saturation current: Idc1 | Temperature rise current: Idc2 |                             |
|               |      |                                  |                      |  |  | Max.                     | Max.                           |                             |
| NR 3012T 1R0N | RoHS | 1.0                              | $\pm 30\%$           | 110  | 0.050  | 1,500                    | 1,490                          | 100                         |
| NR 3012T 1R5N | RoHS | 1.5                              | $\pm 30\%$           | 92   | 0.060  | 1,360                    | 1,400                          | 100                         |
| NR 3012T 2R2M | RoHS | 2.2                              | $\pm 20\%$           | 70   | 0.080  | 1,100                    | 1,200                          | 100                         |
| NR 3012T 3R3M | RoHS | 3.3                              | $\pm 20\%$           | 55   | 0.100  | 910                      | 1,050                          | 100                         |
| NR 3012T 4R7M | RoHS | 4.7                              | $\pm 20\%$           | 48   | 0.130  | 770                      | 980                            | 100                         |
| NR 3012T 6R8M | RoHS | 6.8                              | $\pm 20\%$           | 40   | 0.190  | 670                      | 740                            | 100                         |
| NR 3012T 100M | RoHS | 10                               | $\pm 20\%$           | 32   | 0.290  | 540                      | 630                            | 100                         |
| NR 3012T 150M | RoHS | 15                               | $\pm 20\%$           | 27   | 0.450  | 440                      | 485                            | 100                         |
| NR 3012T 220M | RoHS | 22                               | $\pm 20\%$           | 22   | 0.630  | 375                      | 420                            | 100                         |
| NR 3012T 330M | RoHS | 33                               | $\pm 20\%$           | 19   | 1.03   | 310                      | 330                            | 100                         |
| NR 3012T 470M | RoHS | 47                               | $\pm 20\%$           | 17   | 1.45   | 250                      | 280                            | 100                         |

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

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

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

## PARTS NUMBER

## ● NR 3015 Shielded type

| Parts number  | EHS  | Nominal inductance<br>[ $\mu$ H] | Inductance tolerance | Self-resonant<br>frequency<br>[MHz] (min.) | DC Resistance<br>[ $\Omega$ ] ( $\pm 20\%$ ) | Rated current ※) [mA]            |  | Measuring<br>frequency [kHz] |
|---------------|------|----------------------------------|----------------------|--|--|----------------------------------|--|------------------------------|
|               |      |                                  |                      |  |  | Saturation current: Idc1<br>Max. | Temperature rise current: Idc2<br>Max. |                              |
| NR 3015T 1R0N | RoHS | 1.0                              | $\pm 30\%$           | 100  | 0.030  | 2,100                            | 2,100                                  | 100                          |
| NR 3015T 1R5N | RoHS | 1.5                              | $\pm 30\%$           | 87   | 0.040  | 1,800                            | 1,820                                  | 100                          |
| NR 3015T 2R2M | RoHS | 2.2                              | $\pm 20\%$           | 64   | 0.060  | 1,480                            | 1,500                                  | 100                          |
| NR 3015T 3R3M | RoHS | 3.3                              | $\pm 20\%$           | 49   | 0.080  | 1,210                            | 1,230                                  | 100                          |
| NR 3015T 4R7M | RoHS | 4.7                              | $\pm 20\%$           | 40   | 0.120  | 1,020                            | 1,040                                  | 100                          |
| NR 3015T 6R8M | RoHS | 6.8                              | $\pm 20\%$           | 36   | 0.160  | 870                              | 880                                    | 100                          |
| NR 3015T 100M | RoHS | 10                               | $\pm 20\%$           | 28   | 0.230  | 700                              | 710                                    | 100                          |
| NR 3015T 150M | RoHS | 15                               | $\pm 20\%$           | 23   | 0.360  | 560                              | 560                                    | 100                          |
| NR 3015T 220M | RoHS | 22                               | $\pm 20\%$           | 20   | 0.520  | 470                              | 470                                    | 100                          |
| NR 3015T 330M | RoHS | 33                               | $\pm 20\%$           | 18   | 0.840  | 390                              | 370                                    | 100                          |
| NR 3015T 470M | RoHS | 47                               | $\pm 20\%$           | 17   | 1.34   | 320                              | 300                                    | 100                          |

## ● NR 4010 Shielded type

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

## ● NR 4012 Shielded type

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

## ● NR 4018 Shielded type

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

## ● NR 5040 Shielded type

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

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

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

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

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PARTS NUMBER

NR 6012 Shielded type

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

NR 6020 Shielded type

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

NR 6028 Shielded type

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

NR 6045 Shielded type

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

NR 8040 Shielded type

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

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

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

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

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

## PACKAGING

### ① Minimum Quantity

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

| Type    | Standard Quantity [pcs] |
|---------|-------------------------|
|         | Tape & Reel             |
| NRS5010 | 1000                    |
| NRS5012 | 1000                    |
| NRS5014 | 1000                    |
| NRS5020 | 800                     |
| NRS5024 | 2500                    |
| NRS5030 | 500                     |
| NR 5040 | 1500                    |
| NRS5040 | 1500                    |
| NRS6010 | 1000                    |
| NR 6012 | 1000                    |
| NRS6012 | 1000                    |
| NRS6014 | 1000                    |
| NR 6020 | 2500                    |
| NRS6020 | 2500                    |
| NR 6028 | 2000                    |
| NRS6028 | 2000                    |
| NR 6045 | 1500                    |
| NRM6045 | 1500                    |
| NRS6045 | 1500                    |
| NRS8030 | 1000                    |
| NR 8040 | 1000                    |
| NRS8040 | 1000                    |

### ② Tape Material

#### ● Embossed Tape



### ③ Taping dimensions

#### ● Embossed tape 8mm wide (0.315 inches wide)



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

Unit : mm (inch)

● Embossed tape 12mm wide (0.47 inches wide)



| Type                          | Chip cavity               |                           | Insertion pitch          | Tape thickness            |                          |                           |
|-------------------------------|---------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|
|                               | A                         | B                         |                          | T                         | K                        |                           |
| NR 4010<br>NRS4010            | 4.3±0.1<br>(0.169±0.004)  | 4.3±0.1<br>(0.169±0.004)  | 8.0±0.1<br>(0.315±0.004) | 0.3±0.1<br>(0.012±0.004)  | 1.4±0.1<br>(0.055±0.004) |                           |
| NR 4012<br>NRS4012            |                           |                           |                          |                           | 1.6±0.1<br>(0.063±0.004) |                           |
| NR 4018<br>NRS4018            | 2.1±0.1<br>(0.083±0.004)  |                           |                          |                           |                          |                           |
| NRS5010                       | 5.25±0.1<br>(0.207±0.004) | 5.25±0.1<br>(0.207±0.004) |                          |                           | 1.4±0.1<br>(0.055±0.004) |                           |
| NRS5012                       |                           |                           |                          |                           |                          | 1.4±0.1<br>(0.055±0.004)  |
| NRS5014                       |                           |                           |                          |                           |                          | 1.6±0.1<br>(0.063±0.004)  |
| NRS5020                       |                           |                           |                          | 2.3±0.1<br>(0.091±0.004)  |                          |                           |
| NRS5024                       |                           |                           |                          | 2.7±0.1<br>(0.106±0.004)  |                          |                           |
| NRS5030                       |                           |                           |                          | 5.15±0.1<br>(0.203±0.004) |                          | 5.15±0.1<br>(0.203±0.004) |
| NR 5040<br>NRS5040            | 5.15±0.1<br>(0.203±0.004) | 5.15±0.1<br>(0.203±0.004) |                          | 4.2±0.1<br>(0.165±0.004)  |                          |                           |
| NRS6010                       | 6.3±0.1<br>(0.248±0.004)  | 6.3±0.1<br>(0.248±0.004)  |                          | 0.4±0.1<br>(0.016±0.004)  | 1.4±0.1<br>(0.055±0.004) |                           |
| NR 6012<br>NRS6012            |                           |                           |                          |                           | 1.6±0.1<br>(0.063±0.004) |                           |
| NRS6014                       |                           |                           | 1.6±0.1<br>(0.063±0.004) |                           |                          |                           |
| NR 6020<br>NRS6020            |                           |                           | 2.3±0.1<br>(0.090±0.004) |                           |                          |                           |
| NR 6028<br>NRS6028            |                           |                           | 3.1±0.1<br>(0.122±0.004) |                           |                          |                           |
| NR 6045<br>NRM6045<br>NRS6045 |                           |                           | 4.7±0.1<br>(0.185±0.004) |                           |                          |                           |
|                               |                           |                           |                          |                           |                          |                           |
|                               |                           |                           |                          |                           |                          |                           |

Unit : mm (inch)

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● Embossed tape 16mm wide (0.63 inches wide)



| Type               | Chip cavity                            |  | Insertion pitch<br>F                    | Tape thickness                         |  |
|--------------------|--|--|---|--|--|
|                    | A                                      | B                                      |   | T                                      | K                                      |
| NRS8030            | $8.3 \pm 0.1$<br>( $0.327 \pm 0.004$ ) | $8.3 \pm 0.1$<br>( $0.327 \pm 0.004$ ) | $12.0 \pm 0.1$<br>( $0.472 \pm 0.004$ ) | $0.5 \pm 0.1$<br>( $0.020 \pm 0.004$ ) | $3.4 \pm 0.1$<br>( $0.134 \pm 0.004$ ) |
| NR 8040<br>NRS8040 |  |  |   |  | $4.5 \pm 0.1$<br>( $0.177 \pm 0.004$ ) |

Unit: mm (inch)

④ Leader and Blank portion

● NR, NRH, NRS, NRV



⑤ Reel size



| Type    | Reel size (Reference values)           |                                     |   |
|---------|--|-------------------------------------|---|
|         | $\phi D$                               | $\phi d$                            | W                                       |
| NRV2010 | $180 \pm 0.5$<br>( $7.087 \pm 0.019$ ) | $60 \pm 1.0$<br>( $2.36 \pm 0.04$ ) | $10.0 \pm 1.5$<br>( $0.394 \pm 0.059$ ) |
| NRS2012 |  |                                     |   |
| NRV2012 |  |                                     |   |
| NRH2410 |  |                                     |   |
| NRH2412 |  |                                     |   |
| NR 3010 |  |                                     |   |
| NRH3010 |  |                                     |   |
| NR 3012 |  |                                     |   |
| NRH3012 |  |                                     |   |
| NRV3012 |  |                                     |   |
| NR 3015 | $180 \pm 0.5$<br>( $7.087 \pm 0.019$ ) | $60 \pm 1.0$<br>( $2.36 \pm 0.04$ ) | $10.0 \pm 1.5$<br>( $0.394 \pm 0.059$ ) |
| NRS3015 |  |                                     |   |

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|         |                          |                       |                           |
|---------|--------------------------|-----------------------|---------------------------|
| NRS5010 | 180±3.0<br>(7.087±0.118) | 60±2.0<br>(2.36±0.08) | 14.0±1.5<br>(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 | 330±3.0<br>(12.99±0.118)     | 80±2.0<br>(3.15±0.078)   | 18.5<br>(0.72) | 13.5±1.0<br>(0.531±0.04) |
| NRS4010 |                              |                          |                |                          |
| NR 4012 |                              |                          |                |                          |
| NRS4012 |                              |                          |                |                          |
| NR 4018 |                              |                          |                |                          |
| NRS4018 |                              |                          |                |                          |
| NRS5024 |                              |                          |                |                          |
| NR 5040 |                              |                          |                |                          |
| NRS5040 |                              |                          |                |                          |
| NR 6020 |                              |                          |                |                          |
| NRS6020 |                              |                          |                |                          |
| NR 6028 |                              |                          |                |                          |
| NRS6028 |                              |                          |                |                          |
| NR 6045 |                              |                          |                |                          |
| NRM6045 |                              |                          |                |                          |
| NRS6045 |                              |                          |                |                          |
| NRS8030 | 22.5<br>(0.89)               | 17.5±1.0<br>(0.689±0.04) |                |                          |
| NR 8040 |                              |                          |                |                          |
| NRS8040 |                              |                          |                |                          |

Unit: mm (inch)

### ⑥ Top Tape Strength

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



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# SMD POWER INDUCTORS (NR□, NS SERIES)

## RELIABILITY DATA

| 1. Operating Temperature Range |   |                                |
|--------------------------------|---|--------------------------------|
| Specified Value                | NR30/40/50/60/80, NRS20, NRV20/30, NRH24/30 Type  | -25~+120°C                     |
|                                | NRS40/50/60/80 Type   | -25~+125°C                     |
|                                | NR10050 Type  | -25~+105°C                     |
|                                | NS101, NS125 Type   | -40~+125°C                     |
| Test Methods and Remarks       | Including self-generated heat   |                                |
| 2. Storage Temperature Range   |   |                                |
| Specified Value                | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type  | -40~+85°C                      |
|                                | NR10050 Type  |                                |
|                                | NS101, NS125 Type   |                                |
| Test Methods and Remarks       | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>-5 to 40°C for the product with taping.   |                                |
| 3. Rated current               |   |                                |
| Specified Value                | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type  | Within the specified tolerance |
|                                | NR10050 Type  |                                |
|                                | NS101, NS125 Type   |                                |
| 4. Inductance                  |   |                                |
| Specified Value                | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type  | Within the specified tolerance |
|                                | NR10050 Type  |                                |
|                                | NS101, NS125 Type   |                                |
| Test Methods and Remarks       | Measuring equipment : LCR Meter (HP 4285A or equivalent)<br>Measuring frequency : Specified frequency<br>NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>Measuring equipment : LCR Meter (HP 4285A or equivalent)<br>Measuring frequency : 100kHz, 1V<br>NR10050 Type :<br>Measuring equipment : LCR Meter (HP 4263A or equivalent)<br>Measuring frequency : 100kHz, 1V |                                |
| 5. DC Resistance               |   |                                |
| Specified Value                | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type  | Within the specified tolerance |
|                                | NR10050 Type  |                                |
|                                | NS101, NS125 Type   |                                |
| Test Methods and Remarks       | Measuring equipment : DC ohmmeter (HIOKI 3227 or equivalent)  |                                |
| 6. Self resonance frequency    |   |                                |
| Specified Value                | NR30/40/50/60/80, NRV30, NRH24/30, NRS40/50/60/80 Type  | Within the specified tolerance |
|                                | NR10050 Type  |                                |
|                                | NS101, NS125 Type   | -                              |
| Test Methods and Remarks       | NR30/40/50/60/80, NRV30, NRH24/30, NRS40/50/60/80 Type, NR10050 Type :<br>Measuring equipment : Impedance analyzer/material analyzer (HP4291A or equivalent HP4191A, 4192A or equivalent)   |                                |

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| 7. Temperature characteristic |  |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
|-------------------------------|--|---------------------------------------|------------------------------------|---|----|---|-------------------------------|---|---------------------------|---|-------------------------------|---|----|--|
| Specified Value               | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | Inductance change : Within $\pm 20\%$ |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | NR10050 Type   |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | NS101, NS125 Type  | Inductance change : Within $\pm 15\%$ |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
| Test Methods and Remarks      | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type :<br>Measurement of inductance shall be taken at temperature range within $-25^{\circ}\text{C}\sim +85^{\circ}\text{C}$ .<br>With reference to inductance value at $+20^{\circ}\text{C}$ ., change rate shall be calculated.  |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | NS101, NS125 Type :<br>Measurement of inductance shall be taken at temperature range within $-40^{\circ}\text{C}\sim +125^{\circ}\text{C}$ .<br>With reference to inductance value at $+20^{\circ}\text{C}$ ., change rate shall be calculated.<br>Change of maximum inductance deviation in step 1 to 5   |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
|                               | <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (<math>^{\circ}\text{C}</math>)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>Minimum operating temperature</td> </tr> <tr> <td>3</td> <td>20 (Standard temperature)</td> </tr> <tr> <td>4</td> <td>Maximum operating temperature</td> </tr> <tr> <td>5</td> <td>20</td> </tr> </tbody> </table> | Step                                  | Temperature ( $^{\circ}\text{C}$ ) | 1 | 20 | 2 | Minimum operating temperature | 3 | 20 (Standard temperature) | 4 | Maximum operating temperature | 5 | 20 |  |
| Step                          | Temperature ( $^{\circ}\text{C}$ )   |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
| 1                             | 20   |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
| 2                             | Minimum operating temperature  |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
| 3                             | 20 (Standard temperature)  |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
| 4                             | Maximum operating temperature  |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |
| 5                             | 20   |                                       |                                    |   |    |   |                               |   |                           |   |                               |   |    |  |

| 8. Resistance to flexure of substrate |  |  |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
|---------------------------------------|--|--|------|---|---|---|--------------|------|-----|-----|-------|-----|------|-----|--------------------|-----|-----|-----|-------------|-----|-----|-----|-------------|-----|-----|-----|-------------|-----|-----|-----|-------------|-----|-----|-----|------|---|---|---|-------|-----|-----|-----|-------|-----|-----|
| Specified Value                       | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | No damage  |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
|                                       | NR10050 Type   | —  |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
|                                       | NS101, NS125 Type  | No damage  |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| Test Methods and Remarks              | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NS101/125 Type :<br>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.<br>Test board size : $100 \times 40 \times 1.0$<br>Test board material : Glass epoxy-resin<br>Solder cream thickness : 0.10mm (NR30, NRS20, NRH24/30, NRV20/30)<br>: 0.15mm (NR40/50/60/80, NRS40/50/60, NS101/125Type) |  |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
|                                       |    |  <table border="1"> <thead> <tr> <th>Type</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>NRS20, NRV20</td> <td>0.65</td> <td>0.7</td> <td>2.0</td> </tr> <tr> <td>NRH24</td> <td>0.7</td> <td>0.75</td> <td>2.0</td> </tr> <tr> <td>NR30, NRV30, NRH30</td> <td>0.8</td> <td>1.4</td> <td>2.7</td> </tr> <tr> <td>NR40, NRS40</td> <td>1.2</td> <td>1.6</td> <td>3.7</td> </tr> <tr> <td>NR50, NRS50</td> <td>1.5</td> <td>2.1</td> <td>4.0</td> </tr> <tr> <td>NR60, NRS60</td> <td>1.6</td> <td>3.1</td> <td>5.7</td> </tr> <tr> <td>NR80, NRS80</td> <td>1.8</td> <td>3.8</td> <td>7.5</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Type</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>NS101</td> <td>2.5</td> <td>5.6</td> <td>3.2</td> </tr> <tr> <td>NS125</td> <td>2.5</td> <td>8.6</td> <td>3.2</td> </tr> </tbody> </table> | Type | A | B | C | NRS20, NRV20 | 0.65 | 0.7 | 2.0 | NRH24 | 0.7 | 0.75 | 2.0 | NR30, NRV30, NRH30 | 0.8 | 1.4 | 2.7 | NR40, NRS40 | 1.2 | 1.6 | 3.7 | NR50, NRS50 | 1.5 | 2.1 | 4.0 | NR60, NRS60 | 1.6 | 3.1 | 5.7 | NR80, NRS80 | 1.8 | 3.8 | 7.5 | Type | A | B | C | NS101 | 2.5 | 5.6 | 3.2 | NS125 | 2.5 | 8.6 |
| Type                                  | A  | B  | C    |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NRS20, NRV20                          | 0.65   | 0.7  | 2.0  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NRH24                                 | 0.7  | 0.75   | 2.0  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NR30, NRV30, NRH30                    | 0.8  | 1.4  | 2.7  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NR40, NRS40                           | 1.2  | 1.6  | 3.7  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NR50, NRS50                           | 1.5  | 2.1  | 4.0  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NR60, NRS60                           | 1.6  | 3.1  | 5.7  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| NR80, NRS80                           | 1.8  | 3.8  | 7.5  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |      |   |   |   |       |     |     |     |       |     |     |
| 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                          | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type | — |
|  | NR10050 Type  |   |
|  | NS101, NS125 Type   |   |

| 10. Insulation resistance : between wire and core |   |   |
|---|---|---|
| Specified Value                                   | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type | — |
|   | NR10050 Type  |   |
|   | NS101, NS125 Type   |   |

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11. Withstanding voltage : between wire and core

|                 |   |   |
|-----------------|---|---|
| Specified Value | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type | - |
|                 | NR10050 Type  |   |
|                 | NS101, NS125 Type   |   |

12. Adhesion of terminal electrode

|                          |  |   |
|--------------------------|--|---|
| Specified Value          | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | Shall not come off PC board   |
|                          | NR10050 Type   |   |
|                          | NS101, NS125 Type  |   |
| Test Methods and Remarks | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NS101/125 Type :<br>The test samples shall be soldered to the test board by the reflow.<br>Applied force : 10N to X and Y directions.<br>Duration : 5s.<br>Solder cream thickness : 0.10mm (NR30, NRS20, NRH24/30, NRV20/30)<br>: 0.15mm (NR40/50/60/80, NRS40/50/60, NS101/125Type) |  |
|                          | NR10050 Type<br>Applied force : 5N to X and Y directions.<br>Duration : 5s.  |   |

13. Resistance to vibration

|                          |   |  |                 |         |  |                 |  |  |                 |                                |  |      |   |                                       |   |   |
|--------------------------|---|--|-----------------|---------|--|-----------------|--|--|-----------------|--------------------------------|--|------|---|---------------------------------------|---|---|
| Specified Value          | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type   | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance.   |                 |         |  |                 |  |  |                 |                                |  |      |   |                                       |   |   |
|                          | NR10050 Type  |  |                 |         |  |                 |  |  |                 |                                |  |      |   |                                       |   |   |
|                          | NS101, NS125 Type   |  |                 |         |  |                 |  |  |                 |                                |  |      |   |                                       |   |   |
| Test Methods and Remarks | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>The test samples shall be soldered to the test board by the reflow.<br>Then it shall be submitted to below test conditions. | <table border="1" data-bbox="295 1164 1133 1344"> <tr> <td>Frequency Range</td> <td colspan="2">10~55Hz</td> </tr> <tr> <td>Total Amplitude</td> <td colspan="2">1.5mm (May not exceed acceleration 196m/s<sup>2</sup>)</td> </tr> <tr> <td>Sweeping Method</td> <td colspan="2">10Hz to 55Hz to 10Hz for 1min.</td> </tr> <tr> <td rowspan="3">Time</td> <td>X</td> <td rowspan="3">For 2 hours on each X, Y, and Z axis.</td> </tr> <tr> <td>Y</td> </tr> <tr> <td>Z</td> </tr> </table> | Frequency Range | 10~55Hz |  | Total Amplitude | 1.5mm (May not exceed acceleration 196m/s <sup>2</sup> ) |  | Sweeping Method | 10Hz to 55Hz to 10Hz for 1min. |  | Time | X | For 2 hours on each X, Y, and Z axis. | Y | Z |
|                          | Frequency Range   |  | 10~55Hz         |         |  |                 |  |  |                 |                                |  |      |   |                                       |   |   |
| Total Amplitude          | 1.5mm (May not exceed acceleration 196m/s <sup>2</sup> )  |  |                 |         |  |                 |  |  |                 |                                |  |      |   |                                       |   |   |
| 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          | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type   | At least 90% of surface of terminal electrode is covered by new solder.  |                          |                          |      |                  |
|                          | NR10050 Type  |  |                          |                          |      |                  |
|                          | NS101, NS125 Type   |  |                          |                          |      |                  |
| Test Methods and Remarks | The test samples shall be dipped in flux, and then immersed in molten solder as shown in below table.<br>Flux : Methanol solution containing rosin 25%.<br>NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type | <table border="1" data-bbox="279 1691 702 1758"> <tr> <td>Solder Temperature</td> <td>245<math>\pm</math>5<math>^{\circ}</math>C</td> </tr> <tr> <td>Time</td> <td>5<math>\pm</math>1.0 sec.</td> </tr> </table> | Solder Temperature       | 245 $\pm$ 5 $^{\circ}$ C | Time | 5 $\pm$ 1.0 sec. |
|                          | Solder Temperature  |  | 245 $\pm$ 5 $^{\circ}$ C |                          |      |                  |
| Time                     | 5 $\pm$ 1.0 sec.  |  |                          |                          |      |                  |
|                          | ※Immersion depth : All sides of mounting terminal shall be immersed.  |  |                          |                          |      |                  |

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| 15. Resistance to soldering heat |  |  |
|----------------------------------|--|--|
| Specified Value                  | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance. |
|                                  | NR10050 Type   |  |
|                                  | NS101, NS125 Type  |  |
| Test Methods and Remarks         | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>The test sample shall be exposed to reflow oven at $230 \pm 5^\circ\text{C}$ for 40 seconds, with peak temperature at $260 \pm 5^\circ\text{C}$ for 5 seconds, 2 times.<br><br>NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NS101/125 Type<br>Test board material : Glass epoxy-resin<br>Test board thickness : 1.0mm<br>NR10050 Type<br>Test board material : Glass epoxy-resin<br>Test board thickness : 1.6mm<br>Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs. |  |

| 16. Thermal shock        |   |  |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
|--------------------------|---|--|-----------------------|--|--|------|----------------------------------|----------------|---|-------------|------------|---|------------------|----------|---|-------------|------------|---|------------------|----------|
| Specified Value          | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type   | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance. |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
|                          | NR10050 Type  |  |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
|                          | NS101, NS125 Type   |  |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
| Test Methods and Remarks | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>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.<br><table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="3">Conditions of 1 cycle</th> </tr> <tr> <th>Step</th> <th>Temperature (<math>^\circ\text{C}</math>)</th> <th>Duration (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-40 \pm 3</math></td> <td><math>30 \pm 3</math></td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td><math>+85 \pm 2</math></td> <td><math>30 \pm 3</math></td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>Within 3</td> </tr> </tbody> </table> Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs. |  | Conditions of 1 cycle |  |  | Step | Temperature ( $^\circ\text{C}$ ) | Duration (min) | 1 | $-40 \pm 3$ | $30 \pm 3$ | 2 | Room temperature | Within 3 | 3 | $+85 \pm 2$ | $30 \pm 3$ | 4 | Room temperature | Within 3 |
| Conditions of 1 cycle    |   |  |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
| Step                     | Temperature ( $^\circ\text{C}$ )  | Duration (min)   |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
| 1                        | $-40 \pm 3$   | $30 \pm 3$   |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
| 2                        | Room temperature  | Within 3   |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
| 3                        | $+85 \pm 2$   | $30 \pm 3$   |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |
| 4                        | Room temperature  | Within 3   |                       |  |  |      |                                  |                |   |             |            |   |                  |          |   |             |            |   |                  |          |

| 17. Damp heat            |   |  |             |                          |          |          |      |                |
|--------------------------|---|--|-------------|--------------------------|----------|----------|------|----------------|
| Specified Value          | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type   | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance. |             |                          |          |          |      |                |
|                          | NR10050 Type  |  | —           |                          |          |          |      |                |
|                          | NS101, NS125 Type   | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance. |             |                          |          |          |      |                |
| Test Methods and Remarks | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NS101/125 Type :<br>The test samples shall be soldered to the test board by the reflow.<br>The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.<br><table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>Temperature</td> <td><math>60 \pm 2^\circ\text{C}</math></td> </tr> <tr> <td>Humidity</td> <td>90~95%RH</td> </tr> <tr> <td>Time</td> <td>500+24/-0 hour</td> </tr> </tbody> </table> Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs. |  | Temperature | $60 \pm 2^\circ\text{C}$ | Humidity | 90~95%RH | Time | 500+24/-0 hour |
| Temperature              | $60 \pm 2^\circ\text{C}$  |  |             |                          |          |          |      |                |
| Humidity                 | 90~95%RH  |  |             |                          |          |          |      |                |
| Time                     | 500+24/-0 hour  |  |             |                          |          |          |      |                |

| 18. Loading under damp heat |   |  |             |                          |          |          |                 |               |      |                |
|-----------------------------|---|--|-------------|--------------------------|----------|----------|-----------------|---------------|------|----------------|
| Specified Value             | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type   | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance. |             |                          |          |          |                 |               |      |                |
|                             | NR10050 Type  |  |             |                          |          |          |                 |               |      |                |
|                             | NS101, NS125 Type   |  |             |                          |          |          |                 |               |      |                |
| Test Methods and Remarks    | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>The test samples shall be soldered to the test board by the reflow.<br>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.<br><table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>Temperature</td> <td><math>60 \pm 2^\circ\text{C}</math></td> </tr> <tr> <td>Humidity</td> <td>90~95%RH</td> </tr> <tr> <td>Applied current</td> <td>Rated current</td> </tr> <tr> <td>Time</td> <td>500+24/-0 hour</td> </tr> </tbody> </table> Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs. |  | Temperature | $60 \pm 2^\circ\text{C}$ | Humidity | 90~95%RH | Applied current | Rated current | Time | 500+24/-0 hour |
| Temperature                 | $60 \pm 2^\circ\text{C}$  |  |             |                          |          |          |                 |               |      |                |
| Humidity                    | 90~95%RH  |  |             |                          |          |          |                 |               |      |                |
| Applied current             | Rated current   |  |             |                          |          |          |                 |               |      |                |
| Time                        | 500+24/-0 hour  |  |             |                          |          |          |                 |               |      |                |

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 For details of each product (characteristics graph, reliability information, precautions for use, and so on), see our Web site (<http://www.ty-top.com/>).

| 19. Low temperature life test   |  |  |
|---|--|--|
| Specified Value   | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance.   |
|   | NR10050 Type   |  |
|   | NS101, NS125 Type  |  |
| Test Methods and Remarks  | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type :<br>The test samples shall be soldered to the test board by the reflow. After that, the test samples shall be placed at test conditions as shown in below table. |  |
|   | Temperature  | $-40 \pm 2^{\circ}\text{C}$  |
|   | 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   | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | —  |
|   | NR10050 Type   | —  |
|   | NS101, NS125 Type  | —  |
| Test Methods and Remarks  | NR10050 Type :   |  |
|   | Temperature  | $105 \pm 3^{\circ}\text{C}$  |
|   | 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   |  |  |
| Specified Value   | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance.   |
|   | NR10050 Type   | —  |
|   | NS101, NS125 Type  | Inductance change : Within $\pm 10\%$<br>No significant abnormality in appearance.   |
| Test Methods and Remarks  | NR30/40/50/60/80, NRV30, NRH24/30, NRS40/50/60/80 Type, NS12555, NS12565, NS12575 Type :<br>The test samples shall be soldered to the test board by the reflow soldering.  |  |
|   | Temperature  | $85 \pm 2^{\circ}\text{C}$   |
|   | 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   | NR30/40/50/60/80, NRV20/30,<br>NRH24/30, NRS20/40/50/60/80 Type  | Standard test condition :<br>Unless otherwise specified, temperature is $20 \pm 15^{\circ}\text{C}$ and $65 \pm 20\%$ of relative humidity.<br>When there is any question concerning measurement result: In order to provide correlation data, the test shall be condition of $20 \pm 2^{\circ}\text{C}$ of temperature, $65 \pm 5\%$ relative humidity.<br>Inductance is in accordance with our measured value. |
|   | NR10050 Type   |  |
|   | NS101, NS125 Type  |  |

# SMD POWER INDUCTORS (NR□, NS SERIES)

## PRECAUTIONS

### 1. Circuit Design

#### Precautions

#### ◆ Operating environment

- 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

- Please refer to a recommended land pattern.
- There is stress, which has been caused by distortion of a PCB, to the inductor.  
(NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)
- Please consider the arrangement of parts on a PCB. (NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)

#### Technical considerations

#### ◆ Land pattern design

##### Surface Mounting

- Mounting and soldering conditions should be checked beforehand.
- Applicable soldering process to this products is reflow soldering only.
- 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)
- 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.  
(NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)



- SMD inductors should be located to minimize any possible mechanical stresses from board warp or deflection. When splitting the PCB board after mounting inductors and other components, care is required so as not to give any stresses of deflection or twisting to the board.  
(NR30/40/50/60/80, 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                               | <ul style="list-style-type: none"> <li>◆Adjustment of mounting machine               <ol style="list-style-type: none"> <li>1. Excessive impact load should not be imposed on the products when mounting onto the PC boards.</li> <li>2. Mounting and soldering conditions should be checked beforehand.</li> </ol> </li> </ul>   |
| Technical considerations                  | <ul style="list-style-type: none"> <li>◆Adjustment of mounting machine               <ol style="list-style-type: none"> <li>1. When installing products, care should be taken not to apply distortion stress as it may deform the products.</li> <li>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. (NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)</li> </ol> </li> </ul> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>&lt;Wrap&gt;</p>  </div> <div style="text-align: center;"> <p>&lt;Twist&gt;</p>  </div> </div> |

| 4. Soldering             |  |
|--------------------------|--|
| Precautions              | <ul style="list-style-type: none"> <li>◆Reflow soldering               <ol style="list-style-type: none"> <li>1. Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified.</li> <li>2. The product shall be used reflow soldering only.</li> <li>3. Please do not add any stress to a product until it returns in normal temperature after reflow soldering.</li> </ol> </li> <li>◆Lead free soldering               <ol style="list-style-type: none"> <li>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.</li> </ol> </li> <li>◆Recommended conditions for using a soldering iron (NR10050 Type)               <ul style="list-style-type: none"> <li>• Put the soldering iron on the land-pattern.</li> <li>• Soldering iron's temperature – Below 350°C</li> <li>• Duration – 3 seconds or less</li> <li>• The soldering iron should not directly touch the inductor.</li> </ul> </li> </ul> |
| Technical considerations | <ul style="list-style-type: none"> <li>◆Reflow soldering               <ol style="list-style-type: none"> <li>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.                   <ul style="list-style-type: none"> <li>• NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type</li> </ul> </li> </ol> </li> </ul> <p>Recommended reflow condition (Pb free solder)</p>    |

| 5. Cleaning              |   |
|--------------------------|---|
| Precautions              | <ul style="list-style-type: none"> <li>◆Cleaning conditions               <ol style="list-style-type: none"> <li>1. Washing by supersonic waves shall be avoided.</li> </ol> </li> </ul>                |
| Technical considerations | <ul style="list-style-type: none"> <li>◆Cleaning conditions               <ol style="list-style-type: none"> <li>1. If washed by supersonic waves, the products might be broken.</li> </ol> </li> </ul> |

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| 6. Handling              |  |
|--------------------------|--|
| Precautions              | <ul style="list-style-type: none"> <li>◆ Handling               <ol style="list-style-type: none"> <li>1. Keep the product away from all magnets and magnetic objects.</li> </ol> </li> <li>◆ Breakaway PC boards (splitting along perforations)               <ol style="list-style-type: none"> <li>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.</li> <li>2. Board separation should not be done manually, but by using the appropriate devices.</li> </ol> </li> <li>◆ Mechanical considerations               <ol style="list-style-type: none"> <li>1. Please do not give the product any excessive mechanical shocks.</li> <li>2. Please do not add any shock and power to a product in transportation.</li> </ol> </li> <li>◆ Pick-up pressure               <ol style="list-style-type: none"> <li>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.</li> </ol> </li> <li>◆ Packing               <ol style="list-style-type: none"> <li>1. Please avoid accumulation of a packing box as much as possible.</li> </ol> </li> </ul> |
| Technical considerations | <ul style="list-style-type: none"> <li>◆ Handling               <ol style="list-style-type: none"> <li>1. There is a case that a characteristic varies with magnetic influence.</li> </ol> </li> <li>◆ Breakaway PC boards (splitting along perforations)               <ol style="list-style-type: none"> <li>1. The position of the product on PCBs shall be carefully considered to minimize the stress caused from splitting of the PCBs.</li> </ol> </li> <li>◆ Mechanical considerations               <ol style="list-style-type: none"> <li>1. There is a case to be damaged by a mechanical shock.</li> <li>2. There is a case to be broken by the handling in transportation.</li> </ol> </li> <li>◆ Pick-up pressure               <ol style="list-style-type: none"> <li>1. Damage and a characteristic can vary with an excessive shock or stress.</li> </ol> </li> <li>◆ Packing               <ol style="list-style-type: none"> <li>1. If packing boxes are accumulated, that could cause a deformation on packing tapes or a damage on the products.</li> </ol> </li> </ul>   |
| 7. Storage conditions    |  |
| Precautions              | <ul style="list-style-type: none"> <li>◆ Storage               <ol style="list-style-type: none"> <li>1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled.                   <ul style="list-style-type: none"> <li>▪ Recommended conditions                       <ul style="list-style-type: none"> <li>Ambient temperature : <math>-5\sim 40^{\circ}\text{C}</math></li> <li>Humidity : Below 70% RH</li> </ul> </li> <li>▪ The ambient temperature must be kept below <math>30^{\circ}\text{C}</math>. Even under ideal storage conditions, solderability of products electrodes may decrease as time passes.                           <ul style="list-style-type: none"> <li>For this reason, product should be used within 6 months from the time of delivery.</li> <li>In case of storage over 6 months, solderability shall be checked before actual usage.</li> </ul> </li> </ul> </li> </ol> </li> </ul>  |
| Technical considerations | <ul style="list-style-type: none"> <li>◆ Storage               <ol style="list-style-type: none"> <li>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.</li> </ol> </li> </ul>   |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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