



# THE DATASHEET OF NRS8030T2R2NJGJ

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# 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

## ①Series name

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

## ②Dimensions (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             |

## ③Packaging

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

## ④Nominal inductance

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

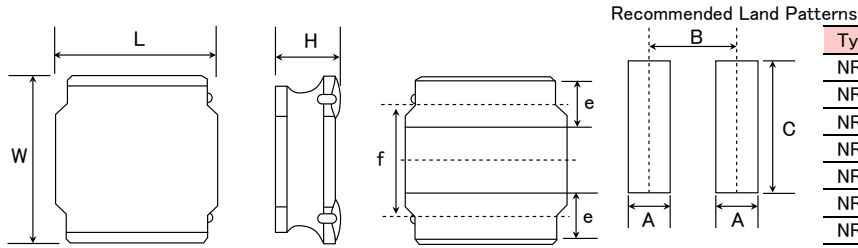
※R=Decimal point

## ⑤Inductance tolerance

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

## ⑥Internal code

► 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/>).



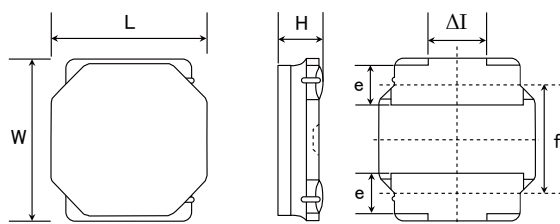
| Type                      | A    | B    | C   |
|---------------------------|------|------|-----|
| NRV2010                   | 0.65 | 1.35 | 2.0 |
| NRS2012, NRV2012          |      |      |     |
| NRH2410                   | 0.7  | 1.45 | 2.0 |
| NRH2412                   |      |      |     |
| 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

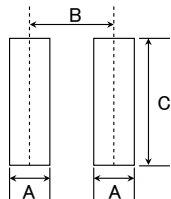
| Type                          | L                        | W                        | H                                                        | e                         | f                         | Standard quantity<br>[pcs] Taping |
|-------------------------------|--------------------------|--------------------------|----------------------------------------------------------|---------------------------|---------------------------|-----------------------------------|
| 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)



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                              |

Unit: mm (inch)

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

## 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>[ $\mu$ 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.                     | Typ.  | Max.                           | Typ.  |                             |
| NRV2010T R47N GF | RoHS | 0.47                             | $\pm 30\%$           | —                                          | 0.052                                        | 2,100                    | 2,250 | 2,000                          | 2,300 | 100                         |
| NRV2010T R68N GF | RoHS | 0.68                             | $\pm 30\%$           | —                                          | 0.060                                        | 1,850                    | 2,000 | 1,850                          | 2,100 | 100                         |
| NRV2010T 1R0N GF | RoHS | 1.0                              | $\pm 30\%$           | —                                          | 0.080                                        | 1,550                    | 1,700 | 1,600                          | 1,850 | 100                         |
| NRV2010T 1R5M GF | RoHS | 1.5                              | $\pm 20\%$           | —                                          | 0.100                                        | 1,350                    | 1,450 | 1,450                          | 1,650 | 100                         |
| NRV2010T 2R2M GF | RoHS | 2.2                              | $\pm 20\%$           | —                                          | 0.175                                        | 1,100                    | 1,200 | 1,100                          | 1,200 | 100                         |
| NRV2010T 3R3M GF | RoHS | 3.3                              | $\pm 20\%$           | —                                          | 0.250                                        | 880                      | 950   | 1,000                          | 1,100 | 100                         |
| NRV2010T 4R7M GF | RoHS | 4.7                              | $\pm 20\%$           | —                                          | 0.320                                        | 760                      | 810   | 820                            | 930   | 100                         |

## ● NRV2012 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.                     | Typ.  | Max.                           | Typ.  |                              |
| NRV2012T 1R0N GF | RoHS | 1.0                              | $\pm 30\%$           | —                                          | 0.073                                        | 2,200                    | 2,350 | 1,650                          | 1,830 | 100                          |
| NRV2012T 1R5N GF | RoHS | 1.5                              | $\pm 30\%$           | —                                          | 0.100                                        | 1,800                    | 1,950 | 1,400                          | 1,550 | 100                          |
| NRV2012T 2R2M GF | RoHS | 2.2                              | $\pm 20\%$           | —                                          | 0.129                                        | 1,600                    | 1,700 | 1,200                          | 1,350 | 100                          |
| NRV2012T 3R3M GF | RoHS | 3.3                              | $\pm 20\%$           | —                                          | 0.227                                        | 1,250                    | 1,350 | 900                            | 1,040 | 100                          |
| NRV2012T 4R7M GF | RoHS | 4.7                              | $\pm 20\%$           | —                                          | 0.325                                        | 1,100                    | 1,150 | 750                            | 850   | 100                          |

## ● NRH2410 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.                     | Typ.  | Max.                           | Typ.  |                             |
| NRH2410T R68NN 4 | RoHS | 0.68                             | $\pm 30\%$           | 120                                        | 0.060                                        | 2,200                    | 2,300 | 1,570                          | 1,810 | 100                         |
| NRH2410T 1R0NN 4 | RoHS | 1.0                              | $\pm 30\%$           | 106                                        | 0.070                                        | 1,800                    | 1,950 | 1,410                          | 1,640 | 100                         |
| NRH2410T 1R5MN   | RoHS | 1.5                              | $\pm 20\%$           | 94                                         | 0.110                                        | 1,550                    | 1,640 | 1,160                          | 1,320 | 100                         |
| NRH2410T 2R2MN   | RoHS | 2.2                              | $\pm 20\%$           | 77                                         | 0.150                                        | 1,290                    | 1,340 | 970                            | 1,110 | 100                         |
| NRH2410T 3R3MN   | RoHS | 3.3                              | $\pm 20\%$           | 56                                         | 0.220                                        | 1,000                    | 1,140 | 770                            | 890   | 100                         |
| NRH2410T 4R7MN   | RoHS | 4.7                              | $\pm 20\%$           | 50                                         | 0.290                                        | 880                      | 930   | 670                            | 780   | 100                         |
| NRH2410T 6R8MN   | RoHS | 6.8                              | $\pm 20\%$           | 43                                         | 0.410                                        | 750                      | 765   | 570                            | 650   | 100                         |
| NRH2410T 100MN   | RoHS | 10                               | $\pm 20\%$           | 32                                         | 0.690                                        | 550                      | 605   | 450                            | 520   | 100                         |
| NRH2410T 150MN   | RoHS | 15                               | $\pm 20\%$           | 27                                         | 1.02                                         | 470                      | 520   | 370                            | 430   | 100                         |
| NRH2410T 220MN   | RoHS | 22                               | $\pm 20\%$           | 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>[ $\mu$ 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.                     | Typ.  | Max.                           | Typ.  |                             |
| NRH3010T 1R2NN | RoHS | 1.2                              | $\pm 30\%$           | 120                                        | 0.065                                        | 1,700                    | 1,740 | 1,480                          | 1,850 | 100                         |
| NRH3010T 1R5NN | RoHS | 1.5                              | $\pm 30\%$           | 99                                         | 0.075                                        | 1,440                    | 1,500 | 1,370                          | 1,680 | 100                         |
| NRH3010T 2R2MN | RoHS | 2.2                              | $\pm 20\%$           | 86                                         | 0.083                                        | 1,300                    | 1,400 | 1,300                          | 1,550 | 100                         |
| NRH3010T 3R3MN | RoHS | 3.3                              | $\pm 20\%$           | 64                                         | 0.130                                        | 1,000                    | 1,020 | 1,030                          | 1,220 | 100                         |
| NRH3010T 4R7MN | RoHS | 4.7                              | $\pm 20\%$           | 50                                         | 0.170                                        | 850                      | 930   | 900                            | 1,090 | 100                         |
| NRH3010T 6R8MN | RoHS | 6.8                              | $\pm 20\%$           | 44                                         | 0.250                                        | 700                      | 750   | 745                            | 920   | 100                         |
| NRH3010T 100MN | RoHS | 10                               | $\pm 20\%$           | 34                                         | 0.350                                        | 600                      | 650   | 620                            | 780   | 100                         |
| NRH3010T 150MN | RoHS | 15                               | $\pm 20\%$           | 25                                         | 0.550                                        | 450                      | 520   | 480                            | 600   | 100                         |
| NRH3010T 220MN | RoHS | 22                               | $\pm 20\%$           | 22                                         | 0.770                                        | 380                      | 440   | 410                            | 510   | 100                         |
| NRH3010T 470MN | RoHS | 47                               | $\pm 20\%$           | 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.

## ●NRH3012 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.  |                             |
| 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                         |

## ●NRV3012 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.  |                              |
| 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<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.  |                             |
| 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<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.  |                             |
| 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<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.  |                             |
| 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.

## 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>[ $\mu$ 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.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5010T 1R0NMGF | RoHS | 1.0                              | $\pm 30\%$           | 95                                         | 0.070                                        | 2,350                    | 2,510 | 1,750                          | 2,000 | 100                          |
| NRS5010T 2R2NMGF | RoHS | 2.2                              | $\pm 30\%$           | 65                                         | 0.105                                        | 1,500                    | 1,710 | 1,400                          | 1,600 | 100                          |
| NRS5010T 3R3MMGF | RoHS | 3.3                              | $\pm 20\%$           | 42                                         | 0.125                                        | 1,400                    | 1,530 | 1,250                          | 1,520 | 100                          |
| NRS5010T 4R7MMGF | RoHS | 4.7                              | $\pm 20\%$           | 37                                         | 0.145                                        | 1,200                    | 1,340 | 1,150                          | 1,390 | 100                          |
| NRS5010T 6R8MMGF | RoHS | 6.8                              | $\pm 20\%$           | 33                                         | 0.185                                        | 1,000                    | 1,120 | 1,000                          | 1,210 | 100                          |
| NRS5010T 100MMGF | RoHS | 10                               | $\pm 20\%$           | 23                                         | 0.250                                        | 850                      | 970   | 900                            | 950   | 100                          |
| NRS5010T 150MMGF | RoHS | 15                               | $\pm 20\%$           | 19                                         | 0.400                                        | 680                      | 740   | 650                            | 700   | 100                          |
| NRS5010T 220MMGF | RoHS | 22                               | $\pm 20\%$           | 15                                         | 0.600                                        | 550                      | 620   | 450                            | 560   | 100                          |

## ● NRS5012 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.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5012T 1R0NMGF | RoHS | 1.0                              | $\pm 30\%$           | 100                                        | 0.053                                        | 4,500                    | 4,670 | 2,300                          | 2,750 | 100                          |
| NRS5012T 1R5NMGF | RoHS | 1.5                              | $\pm 30\%$           | 86                                         | 0.070                                        | 3,800                    | 3,970 | 2,200                          | 2,470 | 100                          |
| NRS5012T 2R2MMGF | RoHS | 2.2                              | $\pm 20\%$           | 70                                         | 0.085                                        | 3,100                    | 3,510 | 2,000                          | 2,300 | 100                          |
| NRS5012T 3R3MMGF | RoHS | 3.3                              | $\pm 20\%$           | 48                                         | 0.160                                        | 2,400                    | 2,580 | 1,450                          | 1,650 | 100                          |
| NRS5012T 4R7MMGF | RoHS | 4.7                              | $\pm 20\%$           | 40                                         | 0.180                                        | 2,200                    | 2,320 | 1,400                          | 1,560 | 100                          |
| NRS5012T 6R8MMGF | RoHS | 6.8                              | $\pm 20\%$           | 36                                         | 0.260                                        | 1,700                    | 1,950 | 1,100                          | 1,260 | 100                          |
| NRS5012T 100MMGF | RoHS | 10                               | $\pm 20\%$           | 26                                         | 0.420                                        | 1,400                    | 1,550 | 850                            | 1,000 | 100                          |
| NRS5012T 150MMGF | RoHS | 15                               | $\pm 20\%$           | 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>[ $\mu$ 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.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS5020T R47NMGGJ | RoHS | 0.47                             | $\pm 30\%$           | 230                                        | 0.012                                        | 6,100                    | 6,900 | 5,000                          | 5,800 | 100                          |
| NRS5020T 1R0NMGGJ | RoHS | 1.0                              | $\pm 30\%$           | 81                                         | 0.021                                        | 4,000                    | 4,500 | 3,600                          | 3,710 | 100                          |
| NRS5020T 1R5NMGGJ | RoHS | 1.5                              | $\pm 30\%$           | 68                                         | 0.026                                        | 3,350                    | 3,800 | 3,200                          | 3,540 | 100                          |
| NRS5020T 2R2NMGGJ | RoHS | 2.2                              | $\pm 30\%$           | 57                                         | 0.035                                        | 2,900                    | 3,200 | 2,900                          | 3,200 | 100                          |
| NRS5020T 3R3NMGGJ | RoHS | 3.3                              | $\pm 30\%$           | 46                                         | 0.048                                        | 2,400                    | 2,700 | 2,400                          | 3,080 | 100                          |
| NRS5020T 4R7MMGGJ | RoHS | 4.7                              | $\pm 20\%$           | 37                                         | 0.060                                        | 2,000                    | 2,270 | 2,000                          | 2,370 | 100                          |
| NRS5020T 6R8MMGGJ | RoHS | 6.8                              | $\pm 20\%$           | 30                                         | 0.090                                        | 1,600                    | 1,850 | 1,650                          | 2,200 | 100                          |
| NRS5020T 100MMGGJ | RoHS | 10                               | $\pm 20\%$           | 24                                         | 0.120                                        | 1,300                    | 1,480 | 1,450                          | 1,850 | 100                          |
| NRS5020T 150MMGGJ | RoHS | 15                               | $\pm 20\%$           | 20                                         | 0.165                                        | 1,100                    | 1,260 | 1,200                          | 1,480 | 100                          |
| NRS5020T 220MMGGJ | RoHS | 22                               | $\pm 20\%$           | 17                                         | 0.260                                        | 900                      | 1,100 | 1,000                          | 1,230 | 100                          |
| NRS5020T 470MMGGJ | RoHS | 47                               | $\pm 20\%$           | 12                                         | 0.435                                        | 630                      | 750   | 560                            | 610   | 100                          |
| NRS5020T 101MMGGJ | RoHS | 100                              | $\pm 20\%$           | 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.

## ● NRS5024 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.  |                             |
| 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<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.  |                             |
| 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<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.  |                             |
| 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<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.  |                             |
| 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<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.  |                             |
| 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 4R7MMGJ | 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>[ $\mu$ 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.                     | Typ.  | Max.                           | Typ.  |                              |
| NRS6014T 1R2NMGG | RoHS | 1.2                              | $\pm 30\%$           | 77                                         | 0.042                                        | 4,000                    | 4,400 | 2,750                          | 3,200 | 100                          |
| NRS6014T 2R2NMGG | RoHS | 2.2                              | $\pm 30\%$           | 61                                         | 0.055                                        | 3,000                    | 3,500 | 2,300                          | 2,600 | 100                          |
| NRS6014T 3R3NMGG | RoHS | 3.3                              | $\pm 30\%$           | 41                                         | 0.075                                        | 2,500                    | 2,600 | 2,000                          | 2,200 | 100                          |
| NRS6014T 4R7MMGG | RoHS | 4.7                              | $\pm 20\%$           | 36                                         | 0.090                                        | 2,000                    | 2,170 | 1,900                          | 1,950 | 100                          |
| NRS6014T 6R8MMGG | RoHS | 6.8                              | $\pm 20\%$           | 30                                         | 0.115                                        | 1,700                    | 1,880 | 1,650                          | 1,700 | 100                          |
| NRS6014T 100MMGG | RoHS | 10                               | $\pm 20\%$           | 24                                         | 0.140                                        | 1,400                    | 1,540 | 1,400                          | 1,500 | 100                          |
| NRS6014T 150MMGG | RoHS | 15                               | $\pm 20\%$           | 20                                         | 0.210                                        | 1,150                    | 1,300 | 1,200                          | 1,280 | 100                          |
| NRS6014T 220MMGG | RoHS | 22                               | $\pm 20\%$           | 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 0R8NMGG | RoHS | 0.8                        | ±30%                 | 110                                        | 0.020                       | 6,400                    | 7,400 | 4,100                          | 4,800 | 100                          |
| NRS6020T 1R5NMGG | RoHS | 1.5                        | ±30%                 | 93                                         | 0.026                       | 4,300                    | 5,300 | 3,600                          | 4,200 | 100                          |
| NRS6020T 2R2NMGG | RoHS | 2.2                        | ±30%                 | 73                                         | 0.034                       | 3,200                    | 4,000 | 2,900                          | 3,400 | 100                          |
| NRS6020T 3R3NMGG | RoHS | 3.3                        | ±30%                 | 55                                         | 0.040                       | 2,800                    | 3,400 | 2,750                          | 3,100 | 100                          |
| NRS6020T 4R7NMGG | RoHS | 4.7                        | ±30%                 | 43                                         | 0.058                       | 2,400                    | 2,800 | 2,150                          | 2,500 | 100                          |
| NRS6020T 6R8NMGG | RoHS | 6.8                        | ±30%                 | 30                                         | 0.085                       | 2,000                    | 2,600 | 1,800                          | 2,100 | 100                          |
| NRS6020T 100MMGG | RoHS | 10                         | ±20%                 | 18                                         | 0.125                       | 1,900                    | 2,240 | 1,500                          | 1,700 | 100                          |
| NRS6020T 220MMGG | 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 0R9NMGJ | RoHS | 0.9                        | ±30%                 | 90                                         | 0.013                       | 6,700                    | 7,900 | 4,600                          | 5,200 | 100                         |
| NRS6028T 1R5NMGJ | RoHS | 1.5                        | ±30%                 | 78                                         | 0.016                       | 5,100                    | 6,100 | 4,200                          | 4,700 | 100                         |
| NRS6028T 2R2NMGJ | RoHS | 2.2                        | ±30%                 | 68                                         | 0.020                       | 4,200                    | 5,100 | 3,700                          | 4,200 | 100                         |
| NRS6028T 3R0NMGJ | RoHS | 3.0                        | ±30%                 | 55                                         | 0.023                       | 3,600                    | 4,300 | 3,400                          | 3,900 | 100                         |
| NRS6028T 4R7MMGK | RoHS | 4.7                        | ±20%                 | 39                                         | 0.031                       | 2,700                    | 3,300 | 3,000                          | 3,400 | 100                         |
| NRS6028T 6R8MMGJ | RoHS | 6.8                        | ±20%                 | 25                                         | 0.043                       | 2,600                    | 3,000 | 2,500                          | 2,900 | 100                         |
| NRS6028T 100MMGK | RoHS | 10                         | ±20%                 | 20                                         | 0.065                       | 1,900                    | 2,200 | 1,900                          | 2,200 | 100                         |
| NRS6028T 150MMGJ | RoHS | 15                         | ±20%                 | 17                                         | 0.095                       | 1,600                    | 1,900 | 1,800                          | 1,900 | 100                         |
| NRS6028T 220MMGJ | RoHS | 22                         | ±20%                 | 12                                         | 0.135                       | 1,300                    | 1,600 | 1,400                          | 1,600 | 100                         |
| NRS6028T 330MMGJ | RoHS | 33                         | ±20%                 | 10                                         | 0.220                       | 1,100                    | 1,300 | 1,100                          | 1,250 | 100                         |
| NRS6028T 470MMGJ | RoHS | 47                         | ±20%                 | 8                                          | 0.300                       | 1,000                    | 1,150 | 920                            | 1,050 | 100                         |
| NRS6028T 680MMGJ | RoHS | 68                         | ±20%                 | 5                                          | 0.420                       | 800                      | 950   | 770                            | 880   | 100                         |
| NRS6028T 101MMGJ | RoHS | 100                        | ±20%                 | 3                                          | 0.600                       | 650                      | 750   | 660                            | 750   | 100                         |

## ● NRS6045 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.  |                             |
| NRS6045T 1R0NMGK | RoHS | 1.0                              | $\pm 30\%$           | 110                                        | 0.014                                        | 9,800                    | 11,000 | 4,500                          | 5,200 | 100                         |
| NRS6045T 1R3NMGK | RoHS | 1.3                              | $\pm 30\%$           | 95                                         | 0.016                                        | 8,200                    | 9,300  | 4,200                          | 4,800 | 100                         |
| NRS6045T 1R5NMGK | RoHS | 1.5                              | $\pm 30\%$           | 95                                         | 0.016                                        | 8,200                    | 9,300  | 4,200                          | 4,800 | 100                         |
| NRS6045T 1R8NMGK | RoHS | 1.8                              | $\pm 30\%$           | 80                                         | 0.019                                        | 7,200                    | 8,100  | 3,900                          | 4,400 | 100                         |
| NRS6045T 2R2NMGK | RoHS | 2.2                              | $\pm 30\%$           | 60                                         | 0.022                                        | 6,400                    | 7,300  | 3,600                          | 4,100 | 100                         |
| NRS6045T 2R3NMGK | RoHS | 2.3                              | $\pm 30\%$           | 60                                         | 0.022                                        | 6,400                    | 7,300  | 3,600                          | 4,100 | 100                         |
| NRS6045T 3R0NMGK | RoHS | 3.0                              | $\pm 30\%$           | 45                                         | 0.024                                        | 5,600                    | 6,500  | 3,300                          | 4,000 | 100                         |
| NRS6045T 3R3NMGK | RoHS | 3.3                              | $\pm 30\%$           | 45                                         | 0.024                                        | 5,600                    | 6,500  | 3,300                          | 4,000 | 100                         |
| NRS6045T 4R5MMGK | RoHS | 4.5                              | $\pm 20\%$           | 25                                         | 0.030                                        | 4,400                    | 5,400  | 3,100                          | 3,600 | 100                         |
| NRS6045T 4R7NMGK | RoHS | 4.7                              | $\pm 30\%$           | 25                                         | 0.030                                        | 4,400                    | 5,400  | 3,100                          | 3,600 | 100                         |
| NRS6045T 6R3MMGK | RoHS | 6.3                              | $\pm 20\%$           | 15                                         | 0.036                                        | 3,600                    | 4,300  | 3,000                          | 3,300 | 100                         |
| NRS6045T 6R8MMGK | RoHS | 6.8                              | $\pm 20\%$           | 15                                         | 0.036                                        | 3,600                    | 4,300  | 3,000                          | 3,300 | 100                         |
| NRS6045T 100MMGK | RoHS | 10                               | $\pm 20\%$           | 12                                         | 0.046                                        | 3,100                    | 3,600  | 2,400                          | 2,800 | 100                         |
| NRS6045T 150MMGK | RoHS | 15                               | $\pm 20\%$           | 10                                         | 0.070                                        | 2,500                    | 3,000  | 1,900                          | 2,300 | 100                         |
| NRS6045T 220MMGK | RoHS | 22                               | $\pm 20\%$           | 7                                          | 0.107                                        | 2,000                    | 2,400  | 1,600                          | 1,900 | 100                         |
| NRS6045T 330MMGK | RoHS | 33                               | $\pm 20\%$           | 6                                          | 0.141                                        | 1,650                    | 2,000  | 1,400                          | 1,600 | 100                         |
| NRS6045T 470MMGK | RoHS | 47                               | $\pm 20\%$           | 5                                          | 0.211                                        | 1,400                    | 1,600  | 1,150                          | 1,350 | 100                         |
| NRS6045T 680MMGK | RoHS | 68                               | $\pm 20\%$           | 4                                          | 0.304                                        | 1,100                    | 1,300  | 950                            | 1,100 | 100                         |
| NRS6045T 101MMGK | RoHS | 100                              | $\pm 20\%$           | 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.

## ● NRS8030 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.  |                             |
| NRS8030T 1R0NJGJ | RoHS | 1.0                        | ±30%                 | 120                                        | 0.009                       | 7,800                    | 9,300 | 6,200                          | 7,600 | 100                         |
| NRS8030T 1R5NJGJ | RoHS | 1.5                        | ±30%                 | 80                                         | 0.012                       | 6,200                    | 7,800 | 5,300                          | 6,400 | 100                         |
| NRS8030T 2R2NJGJ | RoHS | 2.2                        | ±30%                 | 60                                         | 0.015                       | 4,900                    | 6,100 | 4,800                          | 5,600 | 100                         |
| NRS8030T 3R3MJGJ | RoHS | 3.3                        | ±20%                 | 50                                         | 0.019                       | 4,200                    | 5,200 | 4,300                          | 5,100 | 100                         |
| NRS8030T 4R7MJGJ | RoHS | 4.7                        | ±20%                 | 40                                         | 0.022                       | 3,600                    | 4,400 | 4,000                          | 4,700 | 100                         |
| NRS8030T 6R8MJGJ | RoHS | 6.8                        | ±20%                 | 32                                         | 0.029                       | 3,000                    | 3,600 | 3,400                          | 4,000 | 100                         |
| NRS8030T 100MJGJ | RoHS | 10                         | ±20%                 | 27                                         | 0.033                       | 2,400                    | 2,900 | 3,000                          | 3,600 | 100                         |
| NRS8030T 150MJGJ | RoHS | 15                         | ±20%                 | 20                                         | 0.060                       | 2,000                    | 2,300 | 2,200                          | 2,600 | 100                         |
| NRS8030T 220MJGJ | RoHS | 22                         | ±20%                 | 16                                         | 0.070                       | 1,750                    | 2,200 | 1,900                          | 2,300 | 100                         |
| NRS8030T 330MJGJ | RoHS | 33                         | ±20%                 | 13                                         | 0.120                       | 1,300                    | 1,600 | 1,500                          | 1,800 | 100                         |
| NRS8030T 470MJGJ | RoHS | 47                         | ±20%                 | 11                                         | 0.170                       | 1,100                    | 1,400 | 1,300                          | 1,500 | 100                         |

## ● NRS8040 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.  |                             |
| NRS8040T 0R9NJGJ | RoHS | 0.9                        | ±30%                 | 85                                         | 0.006                       | 13,000                   | 14,000 | 7,800                          | 9,600 | 100                         |
| NRS8040T 1R0NJGJ | RoHS | 1                          | ±30%                 | 85                                         | 0.006                       | 13,000                   | 14,000 | 7,800                          | 9,600 | 100                         |
| NRS8040T 1R4NJGJ | RoHS | 1.4                        | ±30%                 | 63                                         | 0.007                       | 10,000                   | 11,000 | 7,000                          | 8,400 | 100                         |
| NRS8040T 1R5NJGJ | RoHS | 1.5                        | ±30%                 | 63                                         | 0.007                       | 10,000                   | 11,000 | 7,000                          | 8,400 | 100                         |
| NRS8040T 2R0NJGJ | RoHS | 2.0                        | ±30%                 | 50                                         | 0.009                       | 8,100                    | 9,200  | 6,300                          | 7,600 | 100                         |
| NRS8040T 2R2NJGJ | RoHS | 2.2                        | ±30%                 | 50                                         | 0.009                       | 8,100                    | 9,200  | 6,300                          | 7,600 | 100                         |
| NRS8040T 3R3NJGJ | RoHS | 3.3                        | ±30%                 | 34                                         | 0.015                       | 6,400                    | 6,800  | 4,900                          | 6,000 | 100                         |
| NRS8040T 3R6NJGJ | RoHS | 3.6                        | ±30%                 | 34                                         | 0.015                       | 6,400                    | 6,800  | 4,900                          | 6,000 | 100                         |
| NRS8040T 4R7NJGJ | RoHS | 4.7                        | ±30%                 | 30                                         | 0.018                       | 5,400                    | 5,900  | 4,100                          | 5,200 | 100                         |
| NRS8040T 6R8NJGJ | RoHS | 6.8                        | ±30%                 | 24                                         | 0.025                       | 4,400                    | 4,800  | 3,700                          | 4,400 | 100                         |
| NRS8040T 100MJGJ | RoHS | 10                         | ±20%                 | 22                                         | 0.034                       | 3,800                    | 4,100  | 3,100                          | 3,500 | 100                         |
| NRS8040T 150MJGJ | RoHS | 15                         | ±20%                 | 16                                         | 0.050                       | 2,900                    | 3,200  | 2,400                          | 3,000 | 100                         |
| NRS8040T 220MJGJ | RoHS | 22                         | ±20%                 | 13                                         | 0.066                       | 2,400                    | 2,700  | 2,200                          | 2,600 | 100                         |
| NRS8040T 330MJGK | RoHS | 33                         | ±20%                 | 12                                         | 0.100                       | 2,000                    | 2,300  | 1,700                          | 1,900 | 100                         |
| NRS8040T 470MJGK | RoHS | 47                         | ±20%                 | 8                                          | 0.140                       | 1,500                    | 1,800  | 1,500                          | 1,600 | 100                         |
| NRS8040T 680MJGK | RoHS | 68                         | ±20%                 | 7                                          | 0.210                       | 1,300                    | 1,500  | 1,200                          | 1,300 | 100                         |
| NRS8040T 101MJGK | RoHS | 100                        | ±20%                 | 6                                          | 0.280                       | 1,100                    | 1,300  | 1,000                          | 1,100 | 100                         |
| NRS8040T 151MJGK | RoHS | 150                        | ±20%                 | 5                                          | 0.420                       | 900                      | 980    | 800                            | 890   | 100                         |
| NRS8040T 221MJGK | RoHS | 220                        | ±20%                 | 4                                          | 0.620                       | 700                      | 800    | 670                            | 740   | 100                         |

## ● NR 3010 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<br>Max. | Temperature rise current: Idc2<br>Max. |                             |
| NR 3010T 1R0N | RoHS | 1.0                        | ±30%                 | 126                                        | 0.065                       | 1,300                            | 1,400                                  | 100                         |
| NR 3010T 1R5N | RoHS | 1.5                        | ±30%                 | 98                                         | 0.080                       | 1,200                            | 1,300                                  | 100                         |
| NR 3010T 2R2M | RoHS | 2.2                        | ±20%                 | 82                                         | 0.095                       | 1,100                            | 1,100                                  | 100                         |
| NR 3010T 3R3M | RoHS | 3.3                        | ±20%                 | 63                                         | 0.140                       | 870                              | 940                                    | 100                         |
| NR 3010T 4R7M | RoHS | 4.7                        | ±20%                 | 56                                         | 0.190                       | 750                              | 780                                    | 100                         |
| NR 3010T 6R8M | RoHS | 6.8                        | ±20%                 | 46                                         | 0.300                       | 610                              | 630                                    | 100                         |
| NR 3010T 100M | RoHS | 10                         | ±20%                 | 35                                         | 0.450                       | 500                              | 510                                    | 100                         |
| NR 3010T 150M | RoHS | 15                         | ±20%                 | 30                                         | 0.740                       | 400                              | 400                                    | 100                         |
| NR 3010T 220M | RoHS | 22                         | ±20%                 | 25                                         | 1.03                        | 350                              | 350                                    | 100                         |
| NR 3010T 330M | RoHS | 33                         | ±20%                 | 20                                         | 1.55                        | 260                              | 275                                    | 100                         |
| NR 3010T 470M | RoHS | 47                         | ±20%                 | 17                                         | 2.05                        | 220                              | 235                                    | 100                         |

## ● NR 3012 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<br>Max. | Temperature rise current: Idc2<br>Max. |                             |
| NR 3012T 1R0N | RoHS | 1.0                        | ±30%                 | 110                                        | 0.050                       | 1,500                            | 1,490                                  | 100                         |
| NR 3012T 1R5N | RoHS | 1.5                        | ±30%                 | 92                                         | 0.060                       | 1,360                            | 1,400                                  | 100                         |
| NR 3012T 2R2M | RoHS | 2.2                        | ±20%                 | 70                                         | 0.080                       | 1,100                            | 1,200                                  | 100                         |
| NR 3012T 3R3M | RoHS | 3.3                        | ±20%                 | 55                                         | 0.100                       | 910                              | 1,050                                  | 100                         |
| NR 3012T 4R7M | RoHS | 4.7                        | ±20%                 | 48                                         | 0.130                       | 770                              | 980                                    | 100                         |
| NR 3012T 6R8M | RoHS | 6.8                        | ±20%                 | 40                                         | 0.190                       | 670                              | 740                                    | 100                         |
| NR 3012T 100M | RoHS | 10                         | ±20%                 | 32                                         | 0.290                       | 540                              | 630                                    | 100                         |
| NR 3012T 150M | RoHS | 15                         | ±20%                 | 27                                         | 0.450                       | 440                              | 485                                    | 100                         |
| NR 3012T 220M | RoHS | 22                         | ±20%                 | 22                                         | 0.630                       | 375                              | 420                                    | 100                         |
| NR 3012T 330M | RoHS | 33                         | ±20%                 | 19                                         | 1.03                        | 310                              | 330                                    | 100                         |
| NR 3012T 470M | RoHS | 47                         | ±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 2R2M | 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.

## PARTS NUMBER

## ● NR 6012 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 6012T 2R5NE | RoHS | 2.5                              | $\pm 30\%$           | 45                                         | 0.090                                        | 2,100                            | 1,730                                  | 100                         |
| NR 6012T 4R0NE | RoHS | 4.0                              | $\pm 30\%$           | 39                                         | 0.105                                        | 1,800                            | 1,570                                  | 100                         |
| NR 6012T 5R3ME | RoHS | 5.3                              | $\pm 20\%$           | 34                                         | 0.125                                        | 1,500                            | 1,400                                  | 100                         |
| NR 6012T 6R8ME | RoHS | 6.8                              | $\pm 20\%$           | 30                                         | 0.165                                        | 1,300                            | 1,180                                  | 100                         |
| NR 6012T 100ME | RoHS | 10                               | $\pm 20\%$           | 22                                         | 0.235                                        | 1,000                            | 1,000                                  | 100                         |
| NR 6012T 150ME | RoHS | 15                               | $\pm 20\%$           | 18                                         | 0.330                                        | 800                              | 790                                    | 100                         |
| NR 6012T 220ME | RoHS | 22                               | $\pm 20\%$           | 12                                         | 0.530                                        | 760                              | 630                                    | 100                         |
| NR 6012T 330ME | RoHS | 33                               | $\pm 20\%$           | 8                                          | 0.700                                        | 590                              | 530                                    | 100                         |
| NR 6012T 470ME | RoHS | 47                               | $\pm 20\%$           | 6                                          | 1.05                                         | 520                              | 460                                    | 100                         |
| NR 6012T 680ME | RoHS | 68                               | $\pm 20\%$           | 3                                          | 1.35                                         | 440                              | 410                                    | 100                         |
| NR 6012T 101ME | RoHS | 100                              | $\pm 20\%$           | 1                                          | 2.18                                         | 350                              | 320                                    | 100                         |

## ● NR 6020 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 6020T 0R8N | RoHS | 0.8                              | $\pm 30\%$           | 110                                        | 0.020                                        | 5,500                            | 3,800                                  | 100                         |
| NR 6020T 1R5N | RoHS | 1.5                              | $\pm 30\%$           | 93                                         | 0.026                                        | 4,000                            | 3,200                                  | 100                         |
| NR 6020T 2R2N | RoHS | 2.2                              | $\pm 30\%$           | 73                                         | 0.034                                        | 3,200                            | 2,700                                  | 100                         |
| NR 6020T 3R3N | RoHS | 3.3                              | $\pm 30\%$           | 55                                         | 0.040                                        | 2,800                            | 2,600                                  | 100                         |
| NR 6020T 4R7N | RoHS | 4.7                              | $\pm 30\%$           | 43                                         | 0.058                                        | 2,400                            | 2,000                                  | 100                         |
| NR 6020T 6R8N | RoHS | 6.8                              | $\pm 30\%$           | 30                                         | 0.085                                        | 2,000                            | 1,800                                  | 100                         |
| NR 6020T 100M | RoHS | 10                               | $\pm 20\%$           | 18                                         | 0.125                                        | 1,700                            | 1,400                                  | 100                         |
| NR 6020T 220M | RoHS | 22                               | $\pm 20\%$           | 11                                         | 0.290                                        | 1,050                            | 950                                    | 100                         |

## ● NR 6028 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 6028T 0R9N | RoHS | 0.9                              | $\pm 30\%$           | 90                                         | 0.013                                        | 6,600                            | 4,600                                  | 100                         |
| NR 6028T 1R5N | RoHS | 1.5                              | $\pm 30\%$           | 78                                         | 0.016                                        | 5,000                            | 4,200                                  | 100                         |
| NR 6028T 2R2N | RoHS | 2.2                              | $\pm 30\%$           | 68                                         | 0.020                                        | 4,200                            | 3,700                                  | 100                         |
| NR 6028T 3R0N | RoHS | 3.0                              | $\pm 30\%$           | 55                                         | 0.023                                        | 3,600                            | 3,400                                  | 100                         |
| NR 6028T 4R7M | RoHS | 4.7                              | $\pm 20\%$           | 39                                         | 0.031                                        | 2,700                            | 3,000                                  | 100                         |
| NR 6028T 6R0M | RoHS | 6.0                              | $\pm 20\%$           | 30                                         | 0.040                                        | 2,500                            | 2,500                                  | 100                         |
| NR 6028T 100M | RoHS | 10                               | $\pm 20\%$           | 20                                         | 0.065                                        | 1,900                            | 1,900                                  | 100                         |
| NR 6028T 150M | RoHS | 15                               | $\pm 20\%$           | 17                                         | 0.095                                        | 1,600                            | 1,800                                  | 100                         |
| NR 6028T 220M | RoHS | 22                               | $\pm 20\%$           | 12                                         | 0.135                                        | 1,300                            | 1,400                                  | 100                         |
| NR 6028T 330M | RoHS | 33                               | $\pm 20\%$           | 10                                         | 0.220                                        | 1,100                            | 1,100                                  | 100                         |
| NR 6028T 470M | RoHS | 47                               | $\pm 20\%$           | 8                                          | 0.300                                        | 950                              | 920                                    | 100                         |
| NR 6028T 680M | RoHS | 68                               | $\pm 20\%$           | 5                                          | 0.420                                        | 760                              | 770                                    | 100                         |
| NR 6028T 101M | RoHS | 100                              | $\pm 20\%$           | 3                                          | 0.600                                        | 620                              | 660                                    | 100                         |

## ● NR 6045 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 6045T 1R0N | RoHS | 1.0                              | $\pm 30\%$           | 110                                        | 0.014                                        | 8,500                            | 4,200                                  | 100                         |
| NR 6045T 1R3N | RoHS | 1.3                              | $\pm 30\%$           | 95                                         | 0.016                                        | 8,000                            | 4,000                                  | 100                         |
| NR 6045T 1R8N | RoHS | 1.8                              | $\pm 30\%$           | 80                                         | 0.018                                        | 7,000                            | 3,700                                  | 100                         |
| NR 6045T 2R3N | RoHS | 2.3                              | $\pm 30\%$           | 60                                         | 0.021                                        | 6,000                            | 3,500                                  | 100                         |
| NR 6045T 3R0N | RoHS | 3.0                              | $\pm 30\%$           | 45                                         | 0.024                                        | 5,000                            | 3,200                                  | 100                         |
| NR 6045T 4R5M | RoHS | 4.5                              | $\pm 20\%$           | 25                                         | 0.031                                        | 4,000                            | 3,000                                  | 100                         |
| NR 6045T 6R3M | RoHS | 6.3                              | $\pm 20\%$           | 15                                         | 0.038                                        | 3,800                            | 2,800                                  | 100                         |
| NR 6045T 100M | RoHS | 10                               | $\pm 20\%$           | 12                                         | 0.047                                        | 3,000                            | 2,500                                  | 100                         |
| NR 6045T 150M | RoHS | 15                               | $\pm 20\%$           | 10                                         | 0.077                                        | 2,300                            | 1,900                                  | 100                         |
| NR 6045T 220M | RoHS | 22                               | $\pm 20\%$           | 7                                          | 0.115                                        | 1,900                            | 1,500                                  | 100                         |
| NR 6045T 330M | RoHS | 33                               | $\pm 20\%$           | 6                                          | 0.145                                        | 1,500                            | 1,400                                  | 100                         |
| NR 6045T 470M | RoHS | 47                               | $\pm 20\%$           | 5                                          | 0.220                                        | 1,300                            | 1,100                                  | 100                         |
| NR 6045T 680M | RoHS | 68                               | $\pm 20\%$           | 4                                          | 0.330                                        | 1,000                            | 900                                    | 100                         |
| NR 6045T 101M | RoHS | 100                              | $\pm 20\%$           | 3                                          | 0.500                                        | 800                              | 700                                    | 100                         |

## ● NR 8040 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 8040T 0R9N | RoHS | 0.9                              | $\pm 30\%$           | 85                                         | 0.006                                        | 11,000                           | 7,800                                  | 100                         |
| NR 8040T 1R4N | RoHS | 1.4                              | $\pm 30\%$           | 63                                         | 0.007                                        | 9,000                            | 7,000                                  | 100                         |
| NR 8040T 2R0N | RoHS | 2.0                              | $\pm 30\%$           | 50                                         | 0.009                                        | 7,400                            | 6,300                                  | 100                         |
| NR 8040T 3R6N | RoHS | 3.6                              | $\pm 30\%$           | 34                                         | 0.015                                        | 5,300                            | 4,900                                  | 100                         |
| NR 8040T 4R7N | RoHS | 4.7                              | $\pm 30\%$           | 30                                         | 0.018                                        | 4,700                            | 4,100                                  | 100                         |
| NR 8040T 6R8N | RoHS | 6.8                              | $\pm 30\%$           | 24                                         | 0.025                                        | 4,000                            | 3,700                                  | 100                         |
| NR 8040T 100M | RoHS | 10                               | $\pm 20\%$           | 22                                         | 0.034                                        | 3,400                            | 3,100                                  | 100                         |
| NR 8040T 150M | RoHS | 15                               | $\pm 20\%$           | 16                                         | 0.050                                        | 2,700                            | 2,400                                  | 100                         |
| NR 8040T 220M | RoHS | 22                               | $\pm 20\%$           | 13                                         | 0.066                                        | 2,200                            | 2,200                                  | 100                         |
| NR 8040T 330M | RoHS | 33                               | $\pm 20\%$           | 12                                         | 0.100                                        | 1,900                            | 1,700                                  | 100                         |
| NR 8040T 470M | RoHS | 47                               | $\pm 20\%$           | 8                                          | 0.150                                        | 1,500                            | 1,400                                  | 100                         |
| NR 8040T 680M | RoHS | 68                               | $\pm 20\%$           | 7                                          | 0.230                                        | 1,200                            | 1,100                                  | 100                         |
| NR 8040T 101M | RoHS | 100                              | $\pm 20\%$           | 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

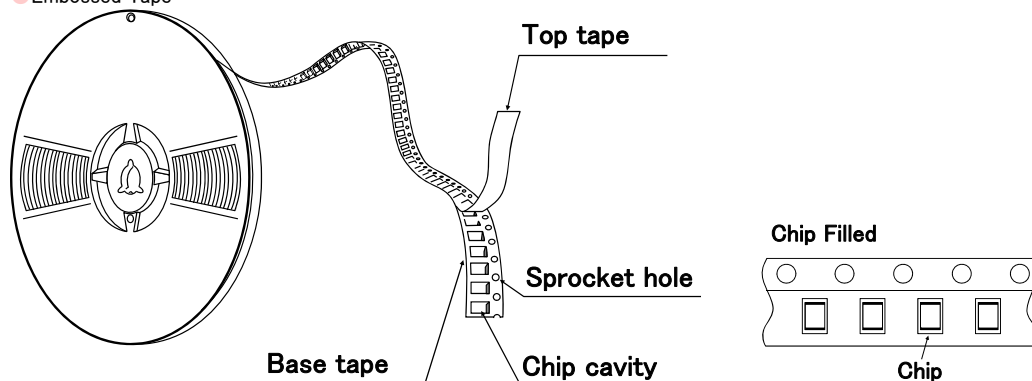
### ① Minimum Quantity

| Type    | Standard Quantity [pcs] |
|---------|-------------------------|
|         | Tape & Reel             |
| NRV2010 | 2500                    |
| NRS2012 | 2500                    |
| 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                    |

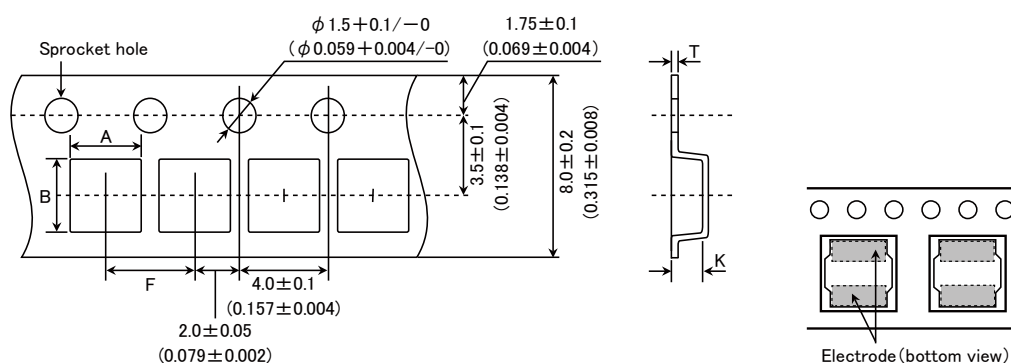
### ② Tape Material

#### ● Embossed Tape



### ③ Taping dimensions

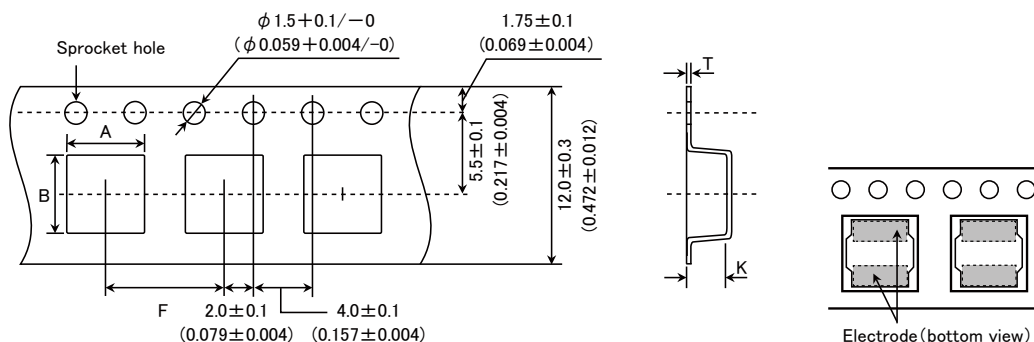
#### ● Embossed tape 8mm wide (0.315 inches wide)



| Type    | Chip cavity              |                          | Insertion pitch          | Tape thickness             |                          |
|---------|--------------------------|--------------------------|--------------------------|----------------------------|--------------------------|
|         | A                        | B                        | F                        | 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 |                          |                          |                          |                            |                          |
| 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 | 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) |
| NRH3010 |                          |                          |                          |                            | 1.6±0.1<br>(0.063±0.004) |
| NR 3012 |                          |                          |                          |                            | 1.9±0.1<br>(0.075±0.004) |
| NRH3012 |                          |                          |                          |                            |                          |
| NRV3012 |                          |                          |                          |                            |                          |
| NR 3015 |                          |                          |                          |                            |                          |
| NRS3015 |                          |                          |                          |                            |                          |

Unit : mm (inch)

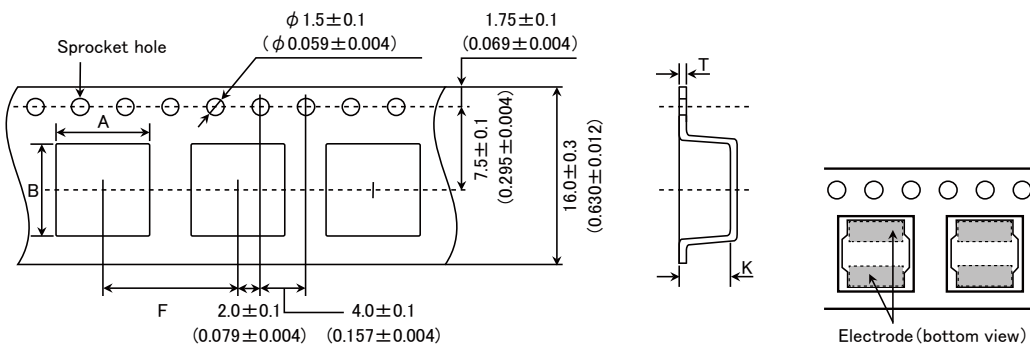
● Embossed tape 12mm wide (0.47 inches wide)



| Type    | Chip cavity               |                           | Insertion pitch          | Tape thickness           |                          |                          |
|---------|---------------------------|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|         | A                         | B                         | F                        | T                        | K                        |                          |
| NR 4010 | 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) |                          |
| NRS4010 |                           |                           |                          |                          | 1.6±0.1<br>(0.063±0.004) |                          |
| NR 4012 |                           |                           |                          |                          | 2.1±0.1<br>(0.083±0.004) |                          |
| NRS4012 |                           |                           |                          |                          | 1.4±0.1<br>(0.055±0.004) |                          |
| NR 4018 | 5.25±0.1<br>(0.207±0.004) | 5.25±0.1<br>(0.207±0.004) |                          |                          | 1.6±0.1<br>(0.063±0.004) |                          |
| NRS4018 |                           |                           |                          |                          | 2.3±0.1<br>(0.091±0.004) |                          |
| NRS5010 |                           |                           |                          |                          | 2.7±0.1<br>(0.106±0.004) |                          |
| NRS5012 |                           |                           |                          |                          | 3.2±0.1<br>(0.126±0.004) |                          |
| NRS5014 | 5.15±0.1<br>(0.203±0.004) | 5.15±0.1<br>(0.203±0.004) |                          | 0.4±0.1<br>(0.016±0.004) | 4.2±0.1<br>(0.165±0.004) |                          |
| NRS5020 |                           |                           |                          |                          | 1.4±0.1<br>(0.055±0.004) |                          |
| NRS5024 |                           |                           |                          |                          | 1.6±0.1<br>(0.063±0.004) |                          |
| NRS5030 |                           |                           |                          |                          | 2.3±0.1<br>(0.090±0.004) |                          |
| NR 5040 | 6.3±0.1<br>(0.248±0.004)  | 6.3±0.1<br>(0.248±0.004)  |                          |                          |                          | 3.1±0.1<br>(0.122±0.004) |
| NRS5040 |                           |                           |                          |                          |                          | 4.7±0.1<br>(0.185±0.004) |
| NRS6010 |                           |                           |                          |                          |                          |                          |
| NR 6012 |                           |                           |                          |                          |                          |                          |
| NRS6012 |                           |                           |                          |                          |                          |                          |
| NRS6014 |                           |                           |                          |                          |                          |                          |
| NR 6020 |                           |                           |                          |                          |                          |                          |
| NRS6020 |                           |                           |                          |                          |                          |                          |
| NR 6028 |                           |                           |                          |                          |                          |                          |
| NRS6028 |                           |                           |                          |                          |                          |                          |
| NR 6045 |                           |                           |                          |                          |                          |                          |
| NRM6045 |                           |                           |                          |                          |                          |                          |
| NRS6045 |                           |                           |                          |                          |                          |                          |

Unit : mm (inch)

● Embossed tape 16mm wide (0.63 inches wide)

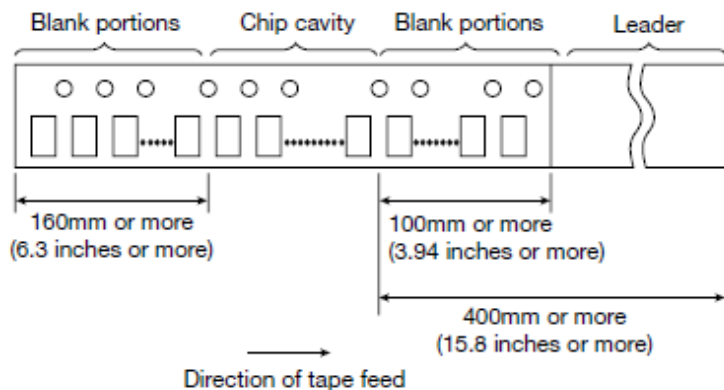


| Type    | Chip cavity                            |                                        | Insertion pitch                         | Tape thickness                         |                                        |
|---------|----------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|
|         | 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 |                                        |                                        |                                         |                                        | $4.5 \pm 0.1$<br>( $0.177 \pm 0.004$ ) |
| NRS8040 |                                        |                                        |                                         |                                        | $4.5 \pm 0.1$<br>( $0.177 \pm 0.004$ ) |

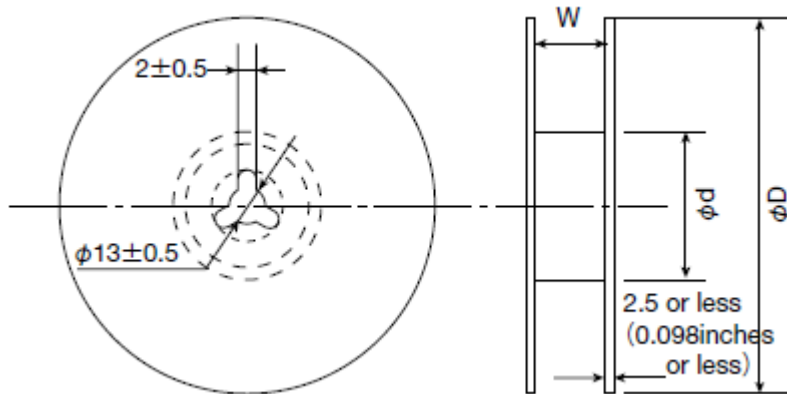
Unit : mm (inch)

#### ④ Leader and Blank portion

● NR, NRH, NRS, NRV



#### ⑤ Reel size

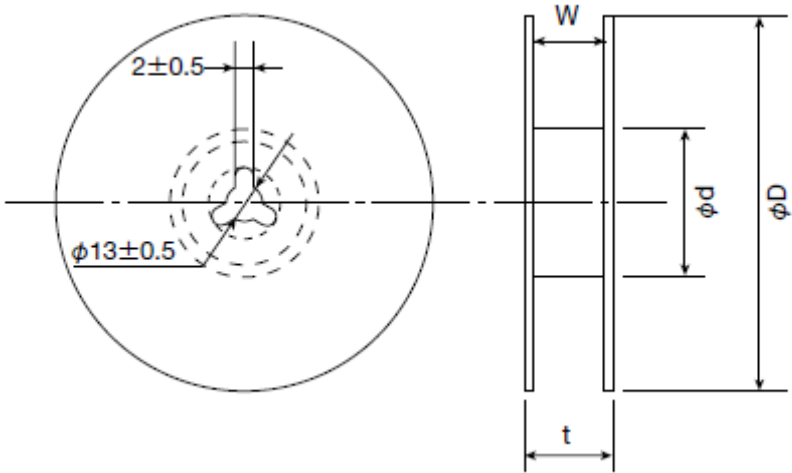


| Type    | Reel size (Reference values)           |                                     |                                         |
|---------|----------------------------------------|-------------------------------------|-----------------------------------------|
|         | $\phi D$                               | $\phi d$                            | 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 |                                        |                                     |                                         |
| NRS3015 |                                        |                                     |                                         |

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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/>) .

|         |                          |                       |                           |
|---------|--------------------------|-----------------------|---------------------------|
| 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)

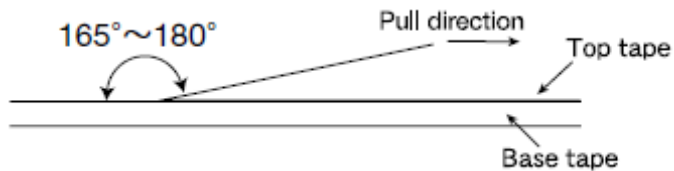


| Type    | Reel size (Reference values) |                        |                |                          |
|---------|------------------------------|------------------------|----------------|--------------------------|
|         | ϕD                           | ϕd                     | t (max.)       | 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.



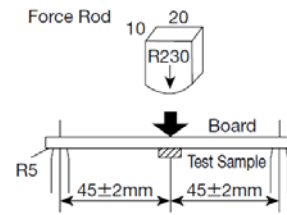
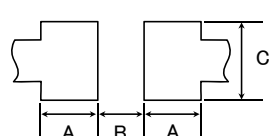
# SMD POWER INDUCTORS (NR□, NS SERIES)

## RELIABILITY DATA

| 1. Operating Temperature Range |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Specified Value                | NR30/40/50/60/80, NRS20, NRV20/30, NRH24/30 Type                                                                                                                                                                                                                                                                                                                                                                        | −25~+120℃                      |
|                                | NRS40/50/60/80 Type                                                                                                                                                                                                                                                                                                                                                                                                     | −25~+125℃                      |
|                                | NR10050 Type                                                                                                                                                                                                                                                                                                                                                                                                            | −25~+105℃                      |
|                                | NS101, NS125 Type                                                                                                                                                                                                                                                                                                                                                                                                       | −40~+125℃                      |
| 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℃                       |
|                                | 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℃ 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)                                                                                                                                                                                                                               |                                |

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

| 7. Temperature characteristic |                                                                                                                                                                                                                                                                                                           |                                       |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Specified Value               | NR30/40/50/60/80, NRV20/30, 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 |                                       |
|                               | 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, 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 :                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       | The test samples shall be soldered to the test board by the reflow. As illustrated below, apply force in the direction of the arrow indicating until deflection of the test board reaches to 2 mm. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       | Test board size                                                                                                                                                                                    | : 100 × 40 × 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       | Test board material                                                                                                                                                                                | : Glass epoxy-resin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       | Solder cream thickness                                                                                                                                                                             | : 0.10mm (NR30, NRS20, NRH24/30, NRV20/30)<br>: 0.15mm(NR40/50/60/80, NRS40/50/60, NS101/125Type)                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       |                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       | Land dimension                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       |                                                                                                                                                                                                    | <table><tr><th>Type</th><th>A</th><th>B</th><th>C</th></tr><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></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    |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
| 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  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
|                                       |                                                                                                                                                                                                    | <table><tr><th>Type</th><th>A</th><th>B</th><th>C</th></tr><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></table>                                                                                                                                                                                                                                                                                                                                                      | Type | A | B | C | NS101        | 2.5  | 5.6 | 3.2 | NS125 | 2.5 | 8.6  | 3.2 |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
| Type                                  | A                                                                                                                                                                                                  | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | C    |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
| NS101                                 | 2.5                                                                                                                                                                                                | 5.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3.2  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |
| NS125                                 | 2.5                                                                                                                                                                                                | 8.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3.2  |   |   |   |              |      |     |     |       |     |      |     |                    |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |             |     |     |     |  |  |

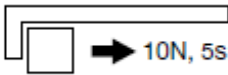
| 9. Insulation resistance : between wires |                                                              |   |
|------------------------------------------|--------------------------------------------------------------|---|
| Specified Value                          | NR30/40/50/60/80, NRV20/30, NRH24/30, 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, NRH24/30, NRS20/40/50/60/80 Type | — |
|                                                   | NR10050 Type                                                 |   |
|                                                   | NS101, NS125 Type                                            |   |

|                                                  |
|--------------------------------------------------|
| 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, 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) |                             |
|                          | <br><br>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, 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><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, 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. |                                                                         |
|                                                                      | Flux : Methanol solution containing rosin 25%.                                                        |                                                                         |
|                                                                      | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type            |                                                                         |
|                                                                      | Solder Temperature                                                                                    | 245±5℃                                                                  |
|                                                                      | Time                                                                                                  | 5±1.0 sec.                                                              |
| ※Immersion depth : All sides of mounting terminal shall be immersed. |                                                                                                       |                                                                         |

| 15. Resistance to soldering heat |                                                                                                                                                                                                                                   |                                                                              |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Specified Value                  | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type                                                                                                                                                                      | Inductance change : Within ±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±5℃ for 40 seconds, with peak temperature at 260±5℃ for 5 seconds, 2 times. |                                                                              |
|                                  | NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80Type, NS101/125 Type<br>Test board material : Glass epoxy-resin<br>Test board thickness : 1.0mm                                                                            |                                                                              |
|                                  | 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, 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. |                  |                                                                                    |
|                                                                                                                             | Conditions of 1 cycle                                                                                                                                                                                                                                                                                                                                         |                  |                                                                                    |
|                                                                                                                             | Step                                                                                                                                                                                                                                                                                                                                                          | Temperature (°C) | Duration (min)                                                                     |
|                                                                                                                             | 1                                                                                                                                                                                                                                                                                                                                                             | -40±3            | 30±3                                                                               |
|                                                                                                                             | 2                                                                                                                                                                                                                                                                                                                                                             | Room temperature | Within 3                                                                           |
|                                                                                                                             | 3                                                                                                                                                                                                                                                                                                                                                             | +85±2            | 30±3                                                                               |
| 4                                                                                                                           | Room temperature                                                                                                                                                                                                                                                                                                                                              | Within 3         |                                                                                    |
| Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs. |                                                                                                                                                                                                                                                                                                                                                               |                  |                                                                                    |

| 17. Damp heat            |                                                                                                                             |  |                                                                                    |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------|
| Specified Value          | NR30/40/50/60/80, NRV20/30, 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 :                                              |  |                                                                                    |
|                          | The test samples shall be soldered to the test board by the reflow.                                                         |  |                                                                                    |
|                          | The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.    |  |                                                                                    |
|                          | Temperature                                                                                                                 |  | 60±2℃                                                                              |
|                          | Humidity                                                                                                                    |  | 90～95%RH                                                                           |
|                          | Time                                                                                                                        |  | 500+24/—0 hour                                                                     |
|                          | Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs. |  |                                                                                    |

| 18. Loading under damp heat |                                                                                                                                                                     |                         |                                                                                    |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------|
| Specified Value             | NR30/40/50/60/80, NRV20/30, 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 :                                                                        |                         |                                                                                    |
|                             | The test samples shall be soldered to the test board by the reflow.                                                                                                 |                         |                                                                                    |
|                             | The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below table. |                         |                                                                                    |
|                             | Temperature                                                                                                                                                         | 60 $\pm$ 2 $^{\circ}$ C |                                                                                    |
|                             | Humidity                                                                                                                                                            | 90 $\sim$ 95%RH         |                                                                                    |
|                             | Applied current                                                                                                                                                     | Rated current           |                                                                                    |
|                             | Time                                                                                                                                                                | 500+24/−0 hour          |                                                                                    |
|                             | Recovery : At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.                                         |                         |                                                                                    |

|                                                                                                                             |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19. Low temperature life test                                                                                               |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                              |
| Specified Value                                                                                                             | NR30/40/50/60/80, NRV20/30, 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, 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, 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, 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
- 1. The products described in this specification are intended for use in general electronic equipment,(office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.

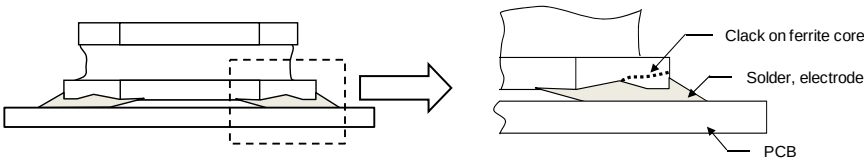
### 2. PCB Design

Precautions

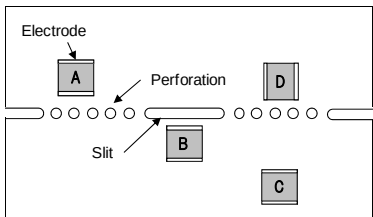
- ◆Land pattern design
- 1. Please refer to a recommended land pattern.
- 2. There is stress, which has been caused by distortion of a PCB, to the inductor.  
(NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)
- 3. Please consider the arrangement of parts on a PCB. (NR30/40/50/60/80, NRV20/30,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

Technical considerations

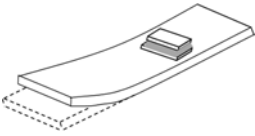
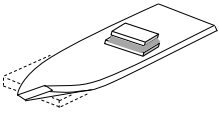
- ◆Land pattern design
- Surface Mounting
- 1. Mounting and soldering conditions should be checked beforehand.
- 2. Applicable soldering process to this products is reflow soldering only.
- 3. Please use the recommended land pattern shown as below. Electrical characteristics and the mounting ability of the product are being considered in the recommended land pattern. If a PCB is designed with other dimensions, defective soldering and stress to a product may occur due to misalignment. The performance of the product may not be brought out. If an adopted land pattern is different from the recommended land pattern, stress to the product will increase. It may cause cracks or defective electrical characteristics of the product. Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility.  
(NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)
- 4. As coefficients of thermal expansion between an inductor and a PCB differs, cracks may occur on a ferrite core when thermal stress is applied to them after mounting an inductor. (Please refer to the drawings below.) Please conduct validation completely before studying adoption of this product and please judge the pros and cons of adoption of this product with taking on responsibility.  
(NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)

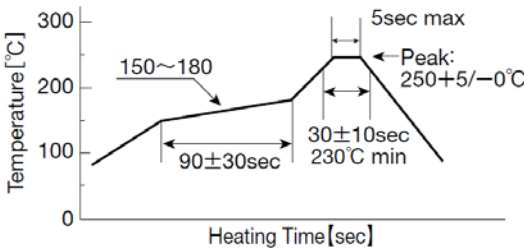


- 5. SMD inductors should be located to minimize any possible mechanical stresses from board warp or deflection. When splitting the PC board after mounting inductors and other components, care is required so as not to give any stresses of deflection or twisting to the board.  
(NR30/40/50/60/80, NRV20/30, 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                               | <p>◆Adjustment of mounting machine</p> <ol style="list-style-type: none"> <li>Excessive impact load should not be imposed on the products when mounting onto the PC boards.</li> <li>Mounting and soldering conditions should be checked beforehand.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Technical considerations                  | <p>◆Adjustment of mounting machine</p> <ol style="list-style-type: none"> <li>When installing products, care should be taken not to apply distortion stress as it may deform the products.</li> <li>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.<br/>(NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/30/40/50/60/80 Type)</li> </ol> <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              | <p>◆Reflow soldering</p> <ol style="list-style-type: none"> <li>Please contact any of our offices for a reflow soldering, and refer to the recommended condition specified.</li> <li>The product shall be used reflow soldering only.</li> <li>Please do not add any stress to a product until it returns in normal temperature after reflow soldering.</li> </ol> <p>◆Lead free soldering</p> <ol style="list-style-type: none"> <li>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> <p>◆Recommended conditions for using a soldering iron (NR10050 Type)</p> <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> |
| Technical considerations | <p>◆Reflow soldering</p> <ol style="list-style-type: none"> <li>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.</li> </ol> <p>•NR30/40/50/60/80, NRV20/30, NRH24/30, NRS20/40/50/60/80 Type, NR10050 Type, NS101/125 Type</p> <p>Recommended reflow condition (Pb free solder)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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

| 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.</li> </ul> </li> </ol> </li> </ul> <p style="margin-left: 40px;">For this reason, product should be used within 6 months from the time of delivery.</p> <p style="margin-left: 40px;">In case of storage over 6 months, solderability shall be checked before actual usage.</p>                                                                                                                                                                                                |
| 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>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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