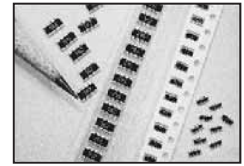


### FEATURES

- SUPER MINIATURE SIZE AND LOW PROFILE
- HIGH DENSITY PACKAGING OFFERS SIGNIFICANT SPACE SAVINGS
- LOWER PRODUCTION COSTS WITH LESS PLACEMENT (UP TO 8 RESISTORS IN ONE PACKAGE)
- STANDARD FOOTPRINTS MAKE CONVERSIONS EASY
- BOTH FLOW AND REFLOW SOLDERING APPLICABLE

**RoHS**  
**Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



### SPECIFICATIONS

| Type                              | NRSNØ4I2                          |                            | NRSNA4I2                   |                            | NRSNA6I2                   | NRSNØ4I4                   | NRSNA4I4                   | NRSNØ6I4                 | NRSNA6I4 |
|-----------------------------------|-----------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|--------------------------|----------|
| Termination Type                  | Concave                           |                            | Convex                     |                            | Convex                     | Concave                    | Convex                     | Concave                  | Convex   |
| Size W x L (mm)                   | 1.0 x 1.0                         |                            | 1.0 x 1.0                  |                            | 1.6 x 1.6                  | 1.0 x 2.0                  | 1.0 x 2.0                  | 1.6 x 3.2                |          |
| No. of Resistors & Circuit        | 2R Isolated                       |                            | 2R Isolated                |                            | 2R Isolated                | 4R Isolated                | 4R Isolated                | 4R Isolated              |          |
| Power Rating per Resistor @ +70°C | 1/16 (.0625W)                     |                            | 1/16 (.0625W)              |                            | 1/16 (.0625W)              | 1/16 (.0625W)              | 1/16 (.0625W)              | 1/16 (.0625W)            |          |
| Resistance Tolerance              | J(±5%)<br>G(±2%)<br>F(±1%)        | J(±5%)<br>G(±2%)<br>F(±1%) | J(±5%)<br>G(±2%)<br>F(±1%) | J(±5%)<br>G(±2%)<br>F(±1%) | J(±5%)<br>G(±2%)<br>F(±1%) | J(±5%)<br>G(±2%)<br>F(±1%) | J(±5%)<br>G(±2%)<br>F(±1%) | J(5%)<br>G(2%)<br>F(±1%) |          |
| Resistance Range                  | 1Ω ~ 9.1Ω                         | 10Ω ~ 1MΩ                  | 1Ω ~ 9.1Ω                  | 10Ω ~ 1MΩ                  | 10Ω ~ 1MΩ                  | 1Ω ~ 1MΩ                   | 10Ω ~ 1MΩ                  | 1Ω ~ 1MΩ                 |          |
| Temperature Coefficient           | ±650ppm                           | ±250ppm                    | ±650ppm                    | ±250ppm                    | ±200ppm                    | ±200ppm                    | ±200ppm                    | ±200ppm                  |          |
| Maximum Working Voltage*          | 25V                               |                            |                            |                            | 50V                        | 25V                        |                            | 50V                      |          |
| Maximum Overload Voltage          | 50V                               |                            |                            |                            | 100V                       | 50V                        |                            | 100V                     |          |
| Operating Temperature Range       | -55°C ~ +125°C (derated as shown) |                            |                            |                            |                            |                            |                            |                          |          |

| Type                              | NRSNØ6C<br>NRSNØ6D                | NRSN12I4    |           |
|-----------------------------------|-----------------------------------|-------------|-----------|
| Termination Type                  | Concave                           | Concave     |           |
| Size W x L (mm)                   | 3.1 x 6.4                         | 3.0 x 5.1   |           |
| No. of Resistors & Circuit        | 8R Common                         | 4R Isolated |           |
| Power Rating per Resistor @ +70°C | 1/8<br>(0.125W)                   |             |           |
| Resistance Tolerance              | J (5%)                            | J (5%)      | G (2%)    |
| Resistance Range                  | 100Ω ~ 470KΩ                      | 10Ω ~ 1MΩ   | 47Ω ~ 1MΩ |
| Temperature Coefficient           | ±200ppm                           | ±200ppm     | ±200ppm   |
| Maximum Working Voltage*          | 50V                               | 75V         |           |
| Maximum Overload Voltage          | 100V                              | 125V        |           |
| Operating Temperature Range       | -55°C ~ +125°C (derated as shown) |             |           |

\* Maximum allowable continuous voltage for all resistors is the lower of the two values: "MAXIMUM WORKING VOLTAGE" as specified, or

$$\sqrt{\text{Power rating (WATTS)} \times \text{Resistance (OHMS)}}$$

### PART NUMBER SYSTEM (E-24 VALUES)

NRSN A 4I2 J 103 TR E

- Series
- Termination Type (A=Convex, Ø=Concave)
- Configuration Designator (See circuit schematics and component diagrams for explanation)
- Tolerance Code: J=5%, G=2%, F=1%
- Resistance Code: First 2 figures are significant, 3rd digit is the multiplier, "R" indicates a decimal point.
- Tape & Reel Packaging
- RoHS compliant

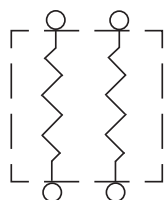
### PART NUMBER SYSTEM (E-96 VALUES)

NRSN A 4I2 F 1002 TR E

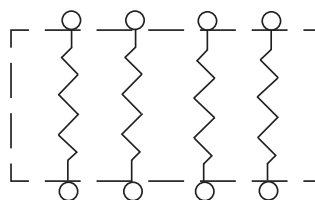
- Series
- Termination Type (A=Convex, Ø=Concave)
- Configuration Designator (See circuit schematics and component diagrams for explanation)
- Tolerance Code: F=1%
- Resistance Code: First 3 figures are significant, 4th digit is the multiplier, "R" indicates a decimal point.
- Tape & Reel Packaging
- RoHS compliant



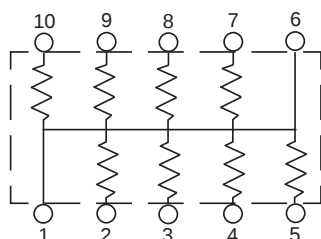
### CIRCUIT SCHEMATICS



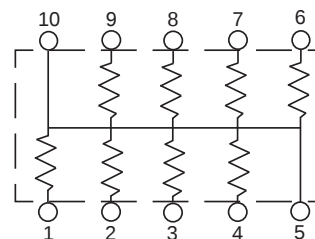
NRSNA4I2/Ø4I2  
NRSNA6I2  
Circuit Type "I"  
Isolated



NRSNA4I4/Ø4I  
NRSNA6I/Ø6I & NRSN12I  
Circuit Type "I"  
Isolated

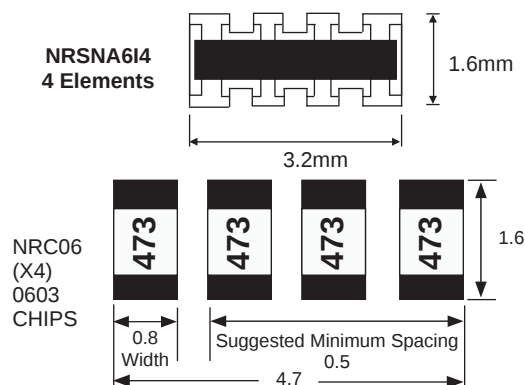
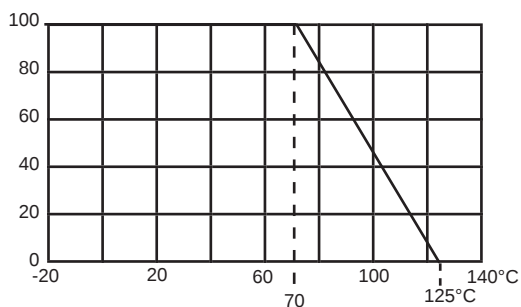


NRSNØ6C8  
Circuit Type "C"  
Bussed/Common



NRSNØ6D8  
Circuit Type "D"  
Bussed/Common

**Power Derating Curve:** For operation above 70°C, power rating must be derated according to the following chart:



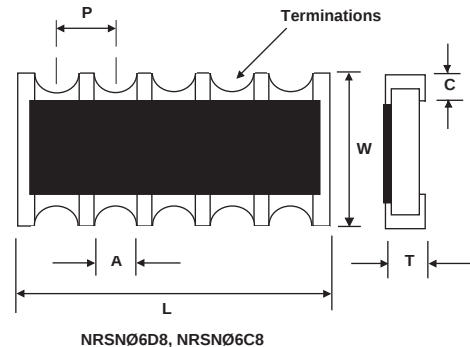
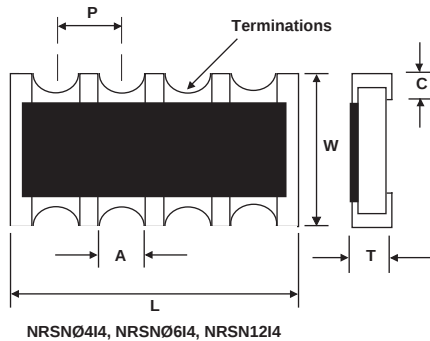
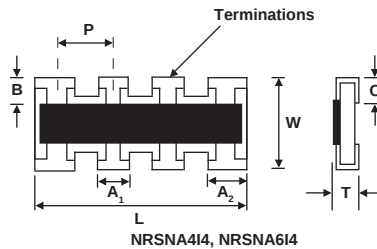
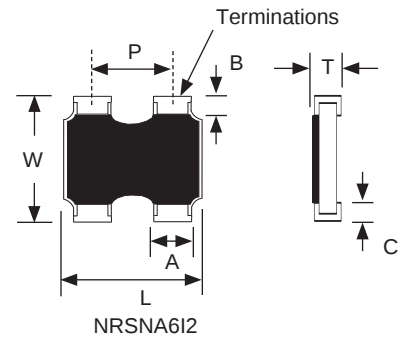
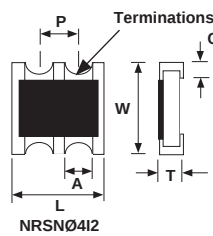
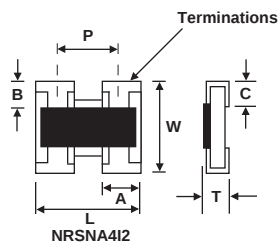
#### Note 1:

Zero ohm versions ( $R < 0.050$  ohms) are available in the following parts:

NRSNØ4I2ZOTRF - 0.5A/element (no markings)  
NRSNA4I2ZOTRF - 0.5A/element (no markings)  
NRSNØ4I4ZOTRF - 0.5A/element (no markings)  
NRSNA4I4ZOTRF - 0.5A/element (marked "000")  
NRSN6I2AZOTRF - 0.5A/element (marked "000")  
NRSNØ6I4ZOTRF - 1.0A/element (marked "000")  
NRSNA6I4ZOTRF - 1.0A/element (marked "000")  
NRSN12I4ZOTRF - 1.5A/element (marked "000")

### PART DIMENSIONS (mm)

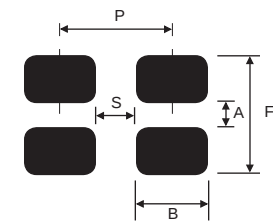
| Type     | W           | L           | P           | T           | A <sub>1</sub> | A <sub>2</sub> | B           | C           |
|----------|-------------|-------------|-------------|-------------|----------------|----------------|-------------|-------------|
| NRSNA4I2 | 1.00 ± 0.20 | 1.00 ± 0.10 | 0.67 nom.   | 0.30 ± 0.05 | 0.33 ± 0.10    | -              | 0.15 ± 0.10 | 0.25 ± 0.10 |
| NRSNØ4I2 | 1.00 ± 0.20 | 1.00 ± 0.10 | 0.50 nom.   | 0.30 ± 0.10 | 0.30 ± 0.10    | -              | 0.20 ± 0.10 | 0.25 ± 0.10 |
| NRSNA6I2 | 1.6 ± 0.15  | 1.6 ± 0.15  | 0.76 nom.   | 0.45 ± 0.10 | 0.46 ± 0.10    | -              | 0.30 ± 0.20 | 0.30 ± 0.10 |
| NRSNA4I4 | 1.00 ± 0.20 | 2.00 ± 0.10 | 0.50 nom.   | 0.40 ± 0.10 | 0.30 ± 0.10    | 0.40 ± 0.10    | 0.20 ± 0.10 | 0.25 ± 0.10 |
| NRSNØ4I4 | 1.00 ± 0.20 | 2.00 ± 0.10 | 0.50 nom.   | 0.40 ± 0.10 | 0.30 ± 0.10    | -              | 0.15 ± 0.10 | 0.25 ± 0.10 |
| NRSNA6I4 | 1.60 ± 0.15 | 3.20 ± 0.20 | 0.80 nom.   | 0.50 ± 0.10 | 0.45 ± 0.10    | 0.60 ± 0.10    | 0.30 ± 0.15 | 0.30 ± 0.15 |
| NRSNØ6I4 | 1.60 ± 0.15 | 3.20 ± 0.20 | 0.80 nom.   | 0.55 ± 0.10 | 0.50 ± 0.10    | -              | 0.35 ± 0.15 | 0.45 ± 0.15 |
| NRSNØ6C8 | 3.10 ± 0.20 | 6.40 ± 0.20 | 1.27 ± 0.20 | 0.60 ± 0.20 | 1.00 ± 0.20    | -              | 0.55 ± 0.20 | 0.50 ± 0.20 |
| NRSNØ6D8 | 3.10 ± 0.20 | 6.40 ± 0.20 | 1.27 ± 0.20 | 0.60 ± 0.20 | 1.00 ± 0.20    | -              | 0.55 ± 0.20 | 0.50 ± 0.20 |
| NRSN12I4 | 3.00 ± 0.20 | 5.08 ± 0.20 | 1.27 ± 0.20 | 0.70 ± 0.20 | 0.80 ± 0.20    | -              | 0.60 ± 0.20 | 0.60 ± 0.20 |



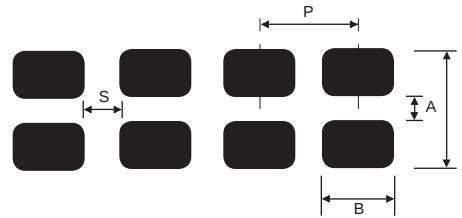
**Terminations (all sizes):**  
100% Sn finish over Ni Barrier

### LAND PATTERN DIMENSIONS (mm)

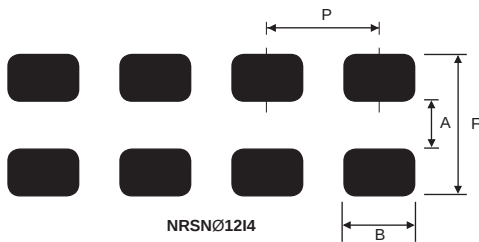
| Type      | Reflow Soldering |       |      |      |      | Flow Soldering |            |      |           |
|-----------|------------------|-------|------|------|------|----------------|------------|------|-----------|
|           | A                | B     | P    | S    | F    | A              | B          | P    | F         |
| NRSNØ4I2  | 0.50             | 0.28  | 0.50 | 0.34 | 2.00 | -              | -          | -    | -         |
| NRSNA4I2  | 0.50             | 0.33  | 0.67 | 0.34 | 2.00 | -              | -          | -    | -         |
| NRSNA6I2  | 0.80             | 0.45  | 0.80 | 0.35 | 2.40 | -              | -          | -    | -         |
| NRSNØ4I4  | 0.50             | 0.28  | 0.50 | 0.22 | 2.00 | -              | -          | -    | -         |
| NRSNA4I4  | 0.50             | 0.28  | 0.50 | 0.22 | 2.00 | -              | -          | -    | -         |
| NRSNØ6I4J | 1.00             | 0.40  | 0.80 | 0.40 | 2.60 | 0.7 ~ 0.9      | 0.3 ~ 0.35 | 0.8  | 4.6 ~ 5.6 |
| NRSNA6I4J | 1.00             | 0.40  | 0.80 | 0.40 | 2.60 | 0.7 ~ 0.9      | 0.3 ~ 0.35 | 0.8  | 4.6 ~ 5.6 |
| NRSNØ6C8  | 2.20             | 0.50  | 1.27 | -    | 4.20 | 1.9 ~ 2.1      | 0.5 ~ 0.55 | 1.27 | 5.6 ~ 6.2 |
| NRSNØ6D8  | 2.20             | 0.50  | 1.27 | -    | 4.20 | 1.9 ~ 2.1      | 0.5 ~ 0.55 | 1.27 | 5.6 ~ 6.2 |
| NRSN12I4  | 2.20             | 0.790 | 1.27 | -    | 4.20 | 1.0 ~ 1.2      | 0.4 ~ 0.45 | 1.27 | 5.6 ~ 6.2 |



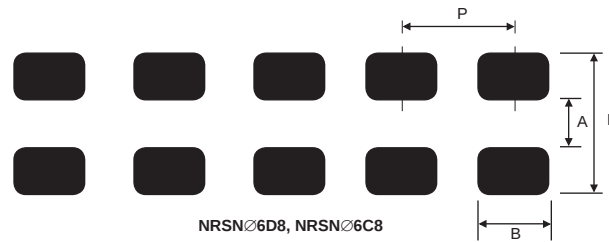
NRSNØI2, NRSNA4I2, NRSNA6I2



NRSNØ4I4, NRSNA4I4, NRSNØ6I4 & NRSNA6I4



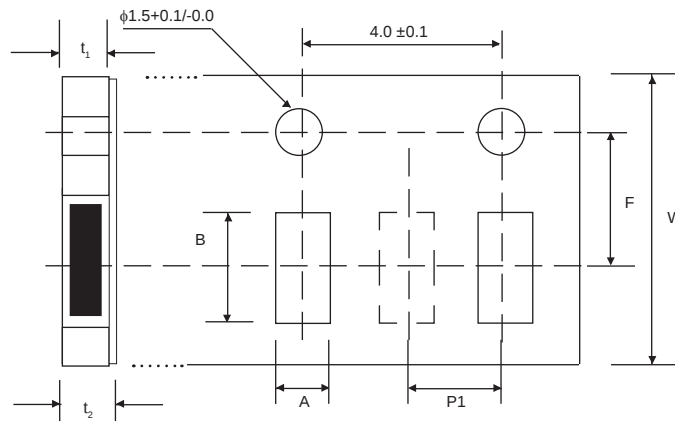
NRSNØ12I4



NRSNØ6D8, NRSNØ6C8

### TAPE DIMENSIONS (mm)

| Type                 | Material | A          | B           | F          | p1        | W          | t <sub>1</sub> | t <sub>2</sub> |
|----------------------|----------|------------|-------------|------------|-----------|------------|----------------|----------------|
| NRSN04I2             | Paper    | 1.20 ± 0.1 | 1.207 ± 0.1 | 3.5 ± 0.05 | 2.0 ± 0.1 | 8.0 ± 0.2  | 0.5 max.       | 1.0 max        |
| NRSNA4I2             |          |            |             |            |           |            |                |                |
| NRSN04I4<br>NRSNA4I4 |          | 1.20 ± 0.1 | 2.20 ± 0.1  |            |           |            |                |                |
| NRSNA6I2             |          | 1.80 ± 0.2 | 1.8 ± 0.2   |            |           |            | 0.64 max.      | 0.94 max.      |
| NRSN06I4<br>NRSNA6I4 |          | 1.90 ± 0.1 | 3.45 ± 0.1  |            | 4.0 ± 0.1 |            |                |                |
| NRSN06C8<br>NRSN06D8 | Plastic  | 3.5 ± 0.1  | 6.75 ± 0.1  | 5.5 ± 0.05 |           | 12.0 ± 0.2 | 1.0 max.       | 1.4 max.       |
| NRSN12I4             |          |            | 5.7 ± 0.1   |            |           |            |                |                |



### REEL DIMENSIONS (mm)

| Type                                         | A                       | B                      | C                        | D                        | E                | W                | Qty/Reel |
|----------------------------------------------|-------------------------|------------------------|--------------------------|--------------------------|------------------|------------------|----------|
| NRSN04I2<br>NRSNA4I2<br>NRSN04I4<br>NRSNA4I4 | $\phi 180$<br>-4.0/+3.0 | $\phi 60$<br>-4.0/+3.0 | $\phi 13.0$<br>$\pm 2.0$ | $\phi 21.0$<br>$\pm 1.0$ | 2.0<br>$\pm 0.5$ | 8.0<br>$\pm 0.2$ | 10,000   |
| NRSNA6I2                                     |                         |                        |                          |                          |                  | 9.0<br>$\pm 1.0$ | 5,000    |
| NRSN06I4<br>NRSNA6I4                         |                         |                        |                          |                          |                  | 10<br>$\pm 1.0$  | 5,000    |
| NRSN06C8<br>NRSN06D8<br>NRSN12I4             |                         |                        |                          |                          |                  | 14<br>$\pm 2.0$  | 4,000    |

