

**Features:**

- Precision tolerances to  $\pm 0.01\%$
- TCR down to  $\pm 2\text{ppm}/^\circ\text{C}$
- Wide R-value range
- Lower values may be available
- Consult factory for tighter tolerances
- Qualified to AEC-Q200
- RoHS compliant and halogen-free



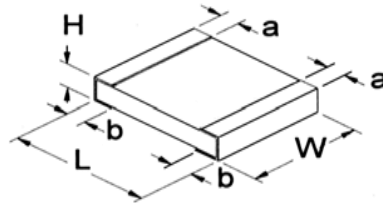
| Electrical Specifications |                             |  |                                    |                                    |  |             |                          |                        |      |           |
|---------------------------|-----------------------------|--|------------------------------------|------------------------------------|--|-------------|--------------------------|------------------------|------|-----------|
| Type / Code               | Power Rating (Watts) @ 70°C | Maximum Working Voltage <sup>(1)</sup> | Maximum Overload Voltage           | Resistance Temperature Coefficient | Ohmic Range ( $\Omega$ ) and Tolerance |             |                          |                        |      |           |
|                           |                             |  |                                    |                                    | 0.01%                                  | 0.05%       | 0.1%                     | 0.25%                  | 0.5% | 1%        |
| RNCF0201                  | 0.032W                      | 15V                                    | 30V                                | $\pm 25\text{ ppm}/^\circ\text{C}$ | -                                      |             | 49.9 - 4.99K             |                        |      |           |
|                           |                             |  |                                    | $\pm 50\text{ ppm}/^\circ\text{C}$ | -                                      |             | 49.9 - 33K               |                        |      |           |
| RNCF0402                  | 0.063W                      | 25V                                    | 50V                                | $\pm 2\text{ ppm}/^\circ\text{C}$  | 49.9 - 4.99K                           |             |                          | -                      |      |           |
|                           |                             |  |                                    | $\pm 5\text{ ppm}/^\circ\text{C}$  | 49.9 - 20K                             |             |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 10\text{ ppm}/^\circ\text{C}$ | 49.9 - 20K                             |             | 49.9 - 100K              |                        |      |           |
|                           |                             |  |                                    | $\pm 15\text{ ppm}/^\circ\text{C}$ | 49.9 - 20K                             |             | 49.9 - 69.8K             |                        |      |           |
|                           |                             |  |                                    | $\pm 25\text{ ppm}/^\circ\text{C}$ | -                                      | 49.9 - 12K  | 10 - 511K                | 4.7 - 511K             |      |           |
|                           |                             |  |                                    | $\pm 50\text{ ppm}/^\circ\text{C}$ | -                                      | 49.9 - 12K  | 10 - 511K                | 4.7 - 511K             |      |           |
| RNCF0603                  | 0.063W                      | 50V                                    | 100V                               | $\pm 5\text{ ppm}/^\circ\text{C}$  | 15.2K - 60K                            |             |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 10\text{ ppm}/^\circ\text{C}$ | -                                      | 336K - 511K |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 15\text{ ppm}/^\circ\text{C}$ | -                                      | 336K - 511K |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 25\text{ ppm}/^\circ\text{C}$ | -                                      |             |                          | 1 - 4.64               |      |           |
|                           |                             |  |                                    | $\pm 50\text{ ppm}/^\circ\text{C}$ | -                                      |             |                          | 1 - 4.64               |      |           |
|                           | 0.1W                        | 75V                                    | 150V                               | $\pm 2\text{ ppm}/^\circ\text{C}$  | 24.9 - 15K                             |             | -                        |                        |      |           |
|                           |                             |  |                                    | $\pm 5\text{ ppm}/^\circ\text{C}$  | 24.9 - 15K                             |             |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 10\text{ ppm}/^\circ\text{C}$ | 24.9 - 100K                            | 4.7 - 332K  |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 15\text{ ppm}/^\circ\text{C}$ | 24.9 - 100K                            | 4.7 - 332K  |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 25\text{ ppm}/^\circ\text{C}$ | 24.9 - 100K                            | 4.7 - 9.88  | 4.7 - 9.88 and 336K - 1M |                        |      |           |
| 0.166W                    | 100V                        | 150V                                   | $\pm 25\text{ ppm}/^\circ\text{C}$ | -                                  | 10 - 332K                              |             |                          |                        |      |           |
|                           |                             |  | $\pm 50\text{ ppm}/^\circ\text{C}$ | -                                  | 10 - 332K                              |             |                          |                        |      |           |
| RNCF0805                  | 0.1W                        | 100V                                   | 200V                               | $\pm 5\text{ ppm}/^\circ\text{C}$  | 30.5K - 150K                           |             |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 10\text{ ppm}/^\circ\text{C}$ | -                                      | 517K - 1M   |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 15\text{ ppm}/^\circ\text{C}$ | -                                      | 517K - 1M   | -                        |                        |      |           |
|                           |                             |  |                                    | $\pm 25\text{ ppm}/^\circ\text{C}$ | -                                      | 517K - 1M   | 1.01M - 2M               |                        |      |           |
|                           |                             |  |                                    | $\pm 50\text{ ppm}/^\circ\text{C}$ | -                                      | 517K - 1M   | 1.01M - 2M               |                        |      |           |
|                           | 0.125W                      | 150V                                   | 300V                               | $\pm 2\text{ ppm}/^\circ\text{C}$  | 24.9 - 30K                             |             | -                        |                        |      |           |
|                           |                             |  |                                    | $\pm 5\text{ ppm}/^\circ\text{C}$  | 24.9 - 30K                             |             |                          |                        |      |           |
|                           |                             |  |                                    | $\pm 10\text{ ppm}/^\circ\text{C}$ | 24.9 - 200K                            | 4.7 - 511K  | 4.7 - 511K               |                        |      |           |
|                           |                             |  |                                    | $\pm 15\text{ ppm}/^\circ\text{C}$ | 24.9 - 200K                            | 4.7 - 511K  | 4.7 - 1M                 |                        |      |           |
|                           |                             |  |                                    | $\pm 25\text{ ppm}/^\circ\text{C}$ | 24.9 - 200K                            | 4.7 - 9.88  | 4.7 - 9.88 and 505K - 1M | 1 - 9.88 and 505K - 1M |      |           |
|                           |                             |  |                                    | $\pm 50\text{ ppm}/^\circ\text{C}$ | 24.9 - 200K                            | 4.7 - 9.88  | 4.7 - 9.88 and 505K - 1M | 1 - 9.88 and 505K - 1M |      |           |
|                           | 0.25W                       | 150V                                   | 300V                               | $\pm 25\text{ ppm}/^\circ\text{C}$ | -                                      |             |                          |                        |      | 10 - 499K |
|                           |                             |  |                                    | $\pm 50\text{ ppm}/^\circ\text{C}$ | -                                      |             |                          |                        |      | 10 - 499K |

(1) Lesser of  $\sqrt{P \cdot R}$  or maximum working voltage.

| Electrical Specifications (cont.) |                             |  |                          |                                    |                               |               |                            |          |           |    |  |         |  |
|-----------------------------------|-----------------------------|--|--------------------------|------------------------------------|-------------------------------|---------------|----------------------------|----------|-----------|----|--|---------|--|
| Type / Code                       | Power Rating (Watts) @ 70°C | Maximum Working Voltage <sup>(1)</sup> | Maximum Overload Voltage | Resistance Temperature Coefficient | Ohmic Range (Ω) and Tolerance |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          |                                    | 0.01%                         | 0.05%         | 0.1%                       | 0.25%    | 0.5%      | 1% |  |         |  |
| RNCF1206                          | 0.125W                      | 150V                                   | 300V                     | ±5 ppm/°C                          | 50.5K - 300K                  |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±10 ppm/°C                         | -                             | 1.01M - 1.5M  |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±15 ppm/°C                         | -                             | 1.01M - 1.5M  |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | -                             | 1.01M - 2.49M | 1 - 4.64 and 1.01M - 2.49M |          |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | -                             | 1.01M - 2.49M | 1 - 4.64 and 1.01M - 2.49M |          |           |    |  |         |  |
|                                   | 0.25W                       | 200V                                   | 400V                     | ±2 ppm/°C                          | 24.9 - 49.9K                  |               |                            | -        |           |    |  |         |  |
|                                   |                             |  |                          | ±5 ppm/°C                          | 24.9 - 49.9K                  |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±10 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±15 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | 24.9 - 499K                   | 4.7 - 9.88    |                            |          |           |    |  |         |  |
|                                   | 0.33W                       | 200V                                   | 400V                     | ±25 ppm/°C                         | -                             | 10 - 1M       |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | -                             | 10 - 1M       |                            |          |           |    |  |         |  |
| RNCF1210                          | 0.25W                       | 150V                                   | 300V                     | ±5 ppm/°C                          | 50.5K - 300K                  |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | -                             | 1.01M - 2.49M | 1 - 4.64 and 1.01M - 2.49M |          |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | -                             | 1.01M - 2.49M | 1 - 4.64 and 1.01M - 2.49M |          |           |    |  |         |  |
|                                   | 0.33W                       | 200V                                   | 400V                     | ±2 ppm/°C                          | 24.9 - 49.9K                  |               |                            | -        |           |    |  |         |  |
|                                   |                             |  |                          | ±5 ppm/°C                          | 24.9 - 49.9K                  |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±10 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±15 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
| ±50 ppm/°C                        | 24.9 - 499K                 | 4.7 - 1M                               |                          |                                    |                               |               |                            |          |           |    |  |         |  |
| RNCF2010                          | 0.25W                       | 150V                                   | 300V                     | ±2 ppm/°C                          | 50.5K - 100K                  |               |                            | -        |           |    |  |         |  |
|                                   |                             |  |                          | ±5 ppm/°C                          | 50.5K - 300K                  |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | -                             | 1.01M - 3M    | 1 - 4.64 and 1.01M - 3M    |          |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | -                             | 1.01M - 3M    | 1 - 4.64 and 1.01M - 3M    |          |           |    |  |         |  |
|                                   | 0.33W                       | 200V                                   | 400V                     | ±2 ppm/°C                          | 24.9 - 49.9K                  |               |                            | -        |           |    |  |         |  |
|                                   |                             |  |                          | ±5 ppm/°C                          | 24.9 - 49.9K                  |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±10 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±15 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | 24.9 - 499K                   | 4.7 - 1M      |                            |          |           |    |  |         |  |
| RNCF2512                          | 0.5W                        | 150V                                   | 300V                     | ±2 ppm/°C                          | 24.9 - 100K                   |               |                            | -        |           |    |  |         |  |
|                                   |                             |  |                          | ±5 ppm/°C                          | 24.9 - 300K                   |               |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±10 ppm/°C                         | -                             | 2.03K - 1M    |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±15 ppm/°C                         | -                             | 2.03K - 1M    |                            |          |           |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | -                             | 2.03K - 1M    | 2.03K - 3M                 |          |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | -                             | 2.03K - 1M    | 2.03K - 3M                 |          |           |    |  |         |  |
|                                   | 0.75W                       | 200V                                   | 400V                     | ±10 ppm/°C                         | 24.9 - 2K                     | 4.7 - 2K      |                            |          | 1 - 2K    |    |  |         |  |
|                                   |                             |  |                          | ±15 ppm/°C                         | 24.9 - 2K                     | 4.7 - 2K      |                            |          | 1 - 2K    |    |  |         |  |
|                                   |                             |  |                          | ±25 ppm/°C                         | 24.9 - 2K                     | 4.7 - 2K      | 101 - 2K                   | 101 - 2K |           |    |  |         |  |
|                                   |                             |  |                          | ±50 ppm/°C                         | 24.9 - 2K                     | 4.7 - 2K      | 101 - 2K                   | 101 - 2K |           |    |  |         |  |
|                                   |                             |  |                          | 1W                                 | 200V                          | 400V          | ±25 ppm/°C                 | -        | 4.7 - 100 |    |  | 1 - 100 |  |
|                                   |                             |  |                          |                                    |                               |               | ±50 ppm/°C                 | -        | 4.7 - 100 |    |  | 1 - 100 |  |

(1) Lesser of  $\sqrt{P \cdot R}$  or maximum working voltage.

**Mechanical Specifications**



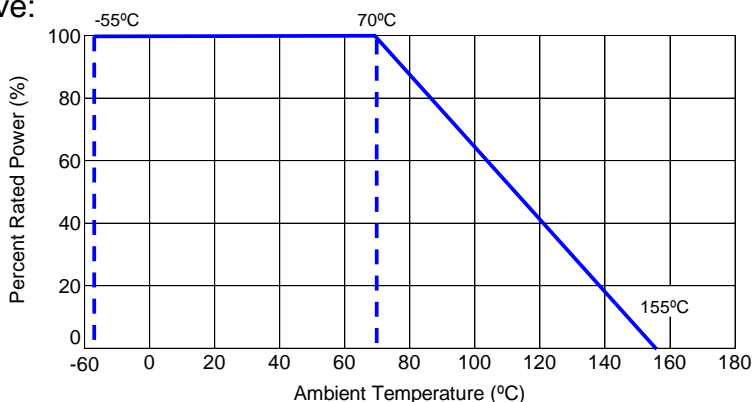
| Type / Code | Weight (g)<br>(1000 pc.) | L<br>Body Length | W<br>Body Width | H<br>Body Height | a<br>Top Termination | b<br>Bottom Termination | Unit   |
|-------------|--------------------------|------------------|-----------------|------------------|----------------------|-------------------------|--------|
| RNCF0201    | 0.14                     | 0.023 ± 0.002    | 0.011 ± 0.002   | 0.009 ± 0.002    | 0.005 ± 0.002        | 0.006 ± 0.002           | inches |
|             |                          | 0.58 ± 0.05      | 0.29 ± 0.05     | 0.23 ± 0.05      | 0.12 ± 0.05          | 0.15 ± 0.05             | mm     |
| RNCF0402    | 0.54                     | 0.039 ± 0.002    | 0.020 ± 0.002   | 0.012 ± 0.002    | 0.008 ± 0.004        | 0.008 ± 0.004           | inches |
|             |                          | 1.00 ± 0.05      | 0.50 ± 0.05     | 0.30 ± 0.05      | 0.20 ± 0.10          | 0.20 ± 0.10             | mm     |
| RNCF0603    | 1.83                     | 0.061 ± 0.004    | 0.031 ± 0.004   | 0.018 ± 0.004    | 0.012 ± 0.008        | 0.012 ± 0.008           | inches |
|             |                          | 1.55 ± 0.10      | 0.80 ± 0.10     | 0.45 ± 0.10      | 0.30 ± 0.20          | 0.30 ± 0.20             | mm     |
| RNCF0805    | 4.71                     | 0.079 ± 0.006    | 0.049 ± 0.006   | 0.022 ± 0.004    | 0.012 ± 0.008        | 0.016 ± 0.008           | inches |
|             |                          | 2.00 ± 0.15      | 1.25 ± 0.15     | 0.55 ± 0.10      | 0.30 ± 0.20          | 0.40 ± 0.20             | mm     |
| RNCF1206    | 9.02                     | 0.120 ± 0.006    | 0.061 ± 0.006   | 0.022 ± 0.004    | 0.017 ± 0.008        | 0.014 ± 0.010           | inches |
|             |                          | 3.05 ± 0.15      | 1.55 ± 0.15     | 0.55 ± 0.10      | 0.42 ± 0.20          | 0.35 ± 0.25             | mm     |
| RNCF1210    | 10                       | 0.122 ± 0.006    | 0.094 ± 0.006   | 0.022 ± 0.004    | 0.016 ± 0.008        | 0.022 ± 0.010           | inches |
|             |                          | 3.10 ± 0.15      | 2.40 ± 0.15     | 0.55 ± 0.10      | 0.40 ± 0.20          | 0.55 ± 0.25             | mm     |
| RNCF2010    | 23.61                    | 0.193 ± 0.006    | 0.094 ± 0.006   | 0.022 ± 0.004    | 0.024 ± 0.012        | 0.020 ± 0.010           | inches |
|             |                          | 4.90 ± 0.15      | 2.40 ± 0.15     | 0.55 ± 0.10      | 0.60 ± 0.30          | 0.50 ± 0.25             | mm     |
| RNCF2512    | 38.6                     | 0.248 ± 0.006    | 0.122 ± 0.006   | 0.022 ± 0.004    | 0.024 ± 0.012        | 0.020 ± 0.010           | inches |
|             |                          | 6.30 ± 0.15      | 3.10 ± 0.15     | 0.55 ± 0.10      | 0.60 ± 0.30          | 0.50 ± 0.25             | mm     |

**Performance Characteristics**

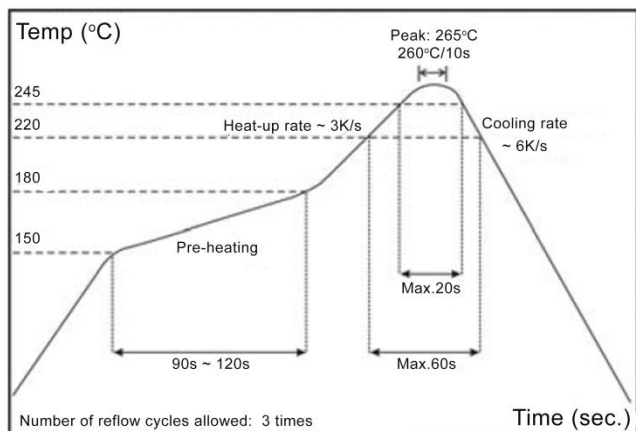
| Test   | Test Method             | Test Specification                       |              | Test Condition  |
|--|-------------------------|--|--------------|---|
|  |                         | Tol. ≤ 0.05%                             | Tol. > 0.05% |   |
| Temperature coefficient of Resistance (T.C.R.) | MIL-STD-202 Method 304  | As specified.                            |              | +25/-55/+25/+125/+25°C  |
| Short Time Overload                            | JIS-C-5201-1 4.13       | ΔR±0.05%                                 | ΔR±0.2%      | RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds                |
|  |                         | ΔR±0.2% for high power rating            |              |   |
| Insulation Resistance                          | MIL-STD-202 Method 302  | >9999 MΩ                                 |              | Apply 100 V <sub>DC</sub> for 1 minute  |
| Endurance                                      | MIL-STD-202 Method 108A | ΔR±0.05%                                 | ΔR±0.2%      | 70±2°C, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"                |
|  |                         | ΔR±0.5% for high power rating            |              |   |
|  |                         | 0201 ≤7kΩ: ΔR±0.2%<br>0201 >7kΩ: ΔR±0.5% |              |   |
| Damp Heat with Load                            | MIL-STD-202 Method 103B | ΔR±0.05%                                 | ΔR±0.3%      | 40±2°C, 90~95% R.H. RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"    |
|  |                         | ΔR±0.5% for high power rating            |              |   |
| Bending Strength                               | JIS-C-5201-1 4.33       | ΔR±0.05%                                 | ΔR±0.1%      | Bending amplitude for 10 seconds.<br>2010 and 2512 sizes: 2mm<br>Other sizes: 3mm |
| Solderability                                  | MIL-STD-202 Method 208H | 95% min. coverage                        |              | 245±5°C for 3 seconds   |
| Resistance to Soldering Heat                   | MIL-STD-202 Method 210E | ΔR±0.05%                                 | ΔR±0.1%      | 260±5°C for 10 seconds  |
| Dielectric Withstand Voltage                   | MIL-STD-202 Method 301  | by type                                  |              | Max. overload voltage for 1 minute  |
| Thermal Shock                                  | MIL-STD-202 Method 107G | ΔR±0.05%                                 | ΔR±0.2%      | -55~150°C, 100 cycles   |
| Low Temperature Operation                      | JIS-C-5201-1 4.36       | ΔR±0.05%                                 | ΔR±0.2%      | 1 hour, -65°C, followed by 45 minutes of RCWV                                     |
|  |                         | ΔR±0.5% for high power rating            |              |   |
| High Temperature Exposure                      | MIL-STD-202 Method 108  | ΔR±0.5%                                  |              | +155°C for 1000 hours   |

RCWV (Rated Continuous Working Voltage) = √(P\*R) or Max. Operating Voltage, whichever is lower.  
Storage Temperature: 60~82°F. Humidity < 80% R.H.

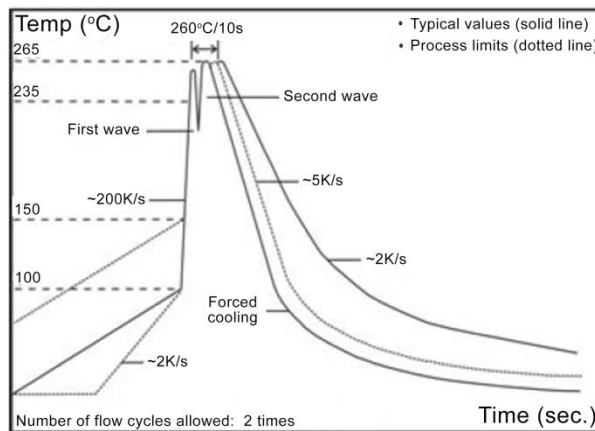
**Power Derating Curve:**



**Soldering Condition:**



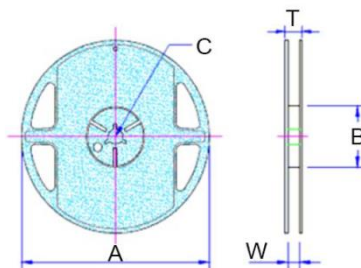
IR Reflow Soldering



Wave Soldering (Flow Soldering)

- (1) Time of IR reflow soldering at maximum temperature point 260°C : 10s
- (2) Time of wave soldering at maximum temperature point 260°C : 10s
- (3) Time of soldering iron at maximum temperature 410°C : 5s

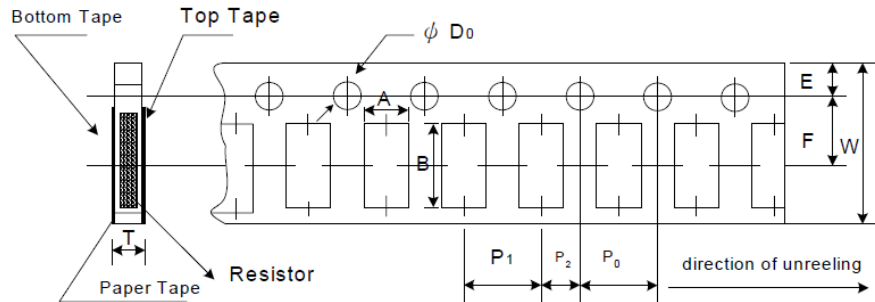
**Reel Specifications**



| Type / Code | A             | B             | C             | W             | T             | Unit   |
|-------------|---------------|---------------|---------------|---------------|---------------|--------|
| RNCF0201    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.374 ± 0.039 | 0.453 ± 0.039 | inches |
|             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 9.50 ± 1.00   | 11.50 ± 1.00  | mm     |
| RNCF0402    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.374 ± 0.039 | 0.453 ± 0.039 | inches |
|             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 9.50 ± 1.00   | 11.50 ± 1.00  | mm     |
| RNCF0603    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.374 ± 0.039 | 0.453 ± 0.039 | inches |
|             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 9.50 ± 1.00   | 11.50 ± 1.00  | mm     |

| Reel Specifications (cont.) |               |               |               |               |               |        |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|--------|
| Type / Code                 | A             | B             | C             | W             | T             | Unit   |
| RNCF0805                    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.374 ± 0.039 | 0.453 ± 0.039 | inches |
|                             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 9.50 ± 1.00   | 11.50 ± 1.00  | mm     |
| RNCF1206                    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.374 ± 0.039 | 0.453 ± 0.039 | inches |
|                             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 9.50 ± 1.00   | 11.50 ± 1.00  | mm     |
| RNCF1210                    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.374 ± 0.039 | 0.453 ± 0.039 | inches |
|                             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 9.50 ± 1.00   | 11.50 ± 1.00  | mm     |
| RNCF2010                    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.531 ± 0.039 | 0.610 ± 0.039 | inches |
|                             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 13.50 ± 1.00  | 15.50 ± 1.00  | mm     |
| RNCF2512                    | 7.008 ± 0.039 | 2.362 ± 0.039 | 0.531 ± 0.028 | 0.531 ± 0.039 | 0.610 ± 0.039 | inches |
|                             | 178.00 ± 1.00 | 60.00 ± 1.00  | 13.50 ± 0.70  | 13.50 ± 1.00  | 15.50 ± 1.00  | mm     |

**Packaging Specifications – Paper Tape**



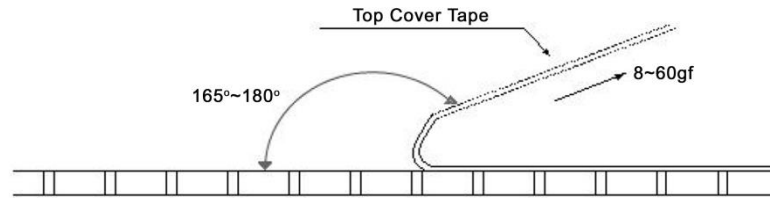
| Type / Code | A             | B             | W             | E             | F             | Unit   |
|-------------|---------------|---------------|---------------|---------------|---------------|--------|
| RNCF0201    | 0.016 ± 0.002 | 0.028 ± 0.002 | 0.315 ± 0.004 | 0.069 ± 0.002 | 0.138 ± 0.002 | inches |
|             | 0.40 ± 0.05   | 0.70 ± 0.05   | 8.00 ± 0.10   | 1.75 ± 0.05   | 3.50 ± 0.05   | mm     |
| RNCF0402    | 0.028 ± 0.002 | 0.046 ± 0.002 | 0.315 ± 0.004 | 0.069 ± 0.002 | 0.138 ± 0.002 | inches |
|             | 0.70 ± 0.05   | 1.16 ± 0.05   | 8.00 ± 0.10   | 1.75 ± 0.05   | 3.50 ± 0.05   | mm     |
| RNCF0603    | 0.043 ± 0.002 | 0.075 ± 0.002 | 0.315 ± 0.004 | 0.069 ± 0.002 | 0.138 ± 0.002 | inches |
|             | 1.10 ± 0.05   | 1.90 ± 0.05   | 8.00 ± 0.10   | 1.75 ± 0.05   | 3.50 ± 0.05   | mm     |
| RNCF0805    | 0.063 ± 0.002 | 0.093 ± 0.002 | 0.315 ± 0.004 | 0.069 ± 0.020 | 0.138 ± 0.002 | inches |
|             | 1.60 ± 0.05   | 2.37 ± 0.05   | 8.00 ± 0.10   | 1.75 ± 0.50   | 3.50 ± 0.05   | mm     |
| RNCF1206    | 0.079 ± 0.002 | 0.140 ± 0.002 | 0.315 ± 0.004 | 0.069 ± 0.002 | 0.138 ± 0.002 | inches |
|             | 2.00 ± 0.05   | 3.55 ± 0.05   | 8.00 ± 0.10   | 1.75 ± 0.05   | 3.50 ± 0.05   | mm     |
| RNCF1210    | 0.108 ± 0.002 | 0.134 ± 0.002 | 0.315 ± 0.004 | 0.069 ± 0.002 | 0.138 ± 0.002 | inches |
|             | 2.75 ± 0.05   | 3.40 ± 0.05   | 8.00 ± 0.10   | 1.75 ± 0.05   | 3.50 ± 0.05   | mm     |

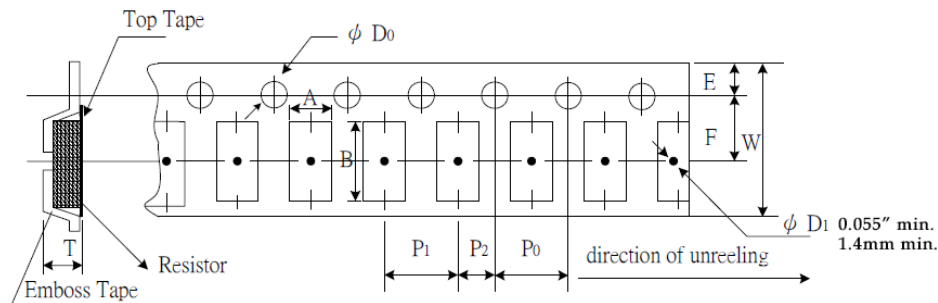
| Type / Code | P0            | P1            | P2            | D0            | T             | Unit   |
|-------------|---------------|---------------|---------------|---------------|---------------|--------|
| RNCF0201    | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.079 ± 0.002 | 0.061 ± 0.001 | 0.017 ± 0.001 | inches |
|             | 4.00 ± 0.10   | 2.00 ± 0.05   | 2.00 ± 0.05   | 1.55 ± 0.03   | 0.42 ± 0.02   | mm     |
| RNCF0402    | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.079 ± 0.002 | 0.061 ± 0.002 | 0.016 ± 0.001 | inches |
|             | 4.00 ± 0.10   | 2.00 ± 0.05   | 2.00 ± 0.05   | 1.55 ± 0.05   | 0.40 ± 0.03   | mm     |
| RNCF0603    | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.061 ± 0.002 | 0.024 ± 0.001 | inches |
|             | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 1.55 ± 0.05   | 0.60 ± 0.03   | mm     |
| RNCF0805    | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.061 ± 0.002 | 0.030 ± 0.002 | inches |
|             | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 1.55 ± 0.05   | 0.75 ± 0.05   | mm     |
| RNCF1206    | 0.157 ± 0.004 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.061 ± 0.002 | 0.030 ± 0.002 | inches |
|             | 4.00 ± 0.10   | 4.00 ± 0.10   | 2.00 ± 0.05   | 1.55 ± 0.05   | 0.75 ± 0.05   | mm     |
| RNCF1210    | 0.157 ± 0.002 | 0.157 ± 0.004 | 0.079 ± 0.002 | 0.063 ± 0.004 | 0.030 ± 0.002 | inches |
|             | 4.00 ± 0.05   | 4.00 ± 0.10   | 2.00 ± 0.05   | 1.60 ± 0.10   | 0.75 ± 0.05   | mm     |

**Peel Force of Top Cover Tape**

The peel speed shall be about 300mm/min  $\pm$  5%  
The peel force of top cover tape shall be between 8gf to 60gf



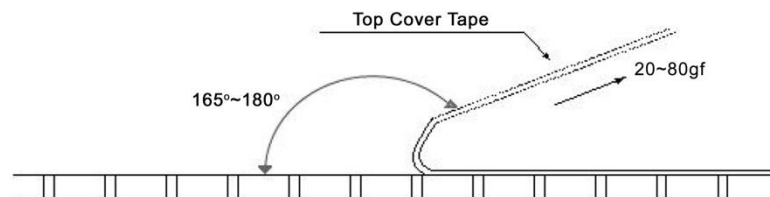
**Packaging Specifications – Embossed Plastic Tape**



| Type / Code | A                 | B                 | W                 | E                 | F                 | Unit   |
|-------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------|
| RNCF2010    | 0.112 $\pm$ 0.004 | 0.215 $\pm$ 0.004 | 0.472 $\pm$ 0.004 | 0.069 $\pm$ 0.004 | 0.217 $\pm$ 0.002 | inches |
|             | 2.85 $\pm$ 0.10   | 5.45 $\pm$ 0.10   | 12.00 $\pm$ 0.10  | 1.75 $\pm$ 0.10   | 5.50 $\pm$ 0.05   | mm     |
| RNCF2512    | 0.134 $\pm$ 0.004 | 0.262 $\pm$ 0.004 | 0.472 $\pm$ 0.004 | 0.069 $\pm$ 0.004 | 0.217 $\pm$ 0.002 | inches |
|             | 3.40 $\pm$ 0.10   | 6.65 $\pm$ 0.10   | 12.00 $\pm$ 0.10  | 1.75 $\pm$ 0.10   | 5.50 $\pm$ 0.05   | mm     |
| Type / Code | P0                | P1                | P2                | D0                | T                 | Unit   |
| RNCF2010    | 0.157 $\pm$ 0.002 | 0.157 $\pm$ 0.004 | 0.079 $\pm$ 0.002 | 0.059 $\pm$ 0.004 | 0.039 $\pm$ 0.008 | inches |
|             | 4.00 $\pm$ 0.05   | 4.00 $\pm$ 0.10   | 2.00 $\pm$ 0.05   | 1.50 $\pm$ 0.10   | 1.00 $\pm$ 0.20   | mm     |
| RNCF2512    | 0.157 $\pm$ 0.002 | 0.157 $\pm$ 0.004 | 0.079 $\pm$ 0.002 | 0.059 $\pm$ 0.004 | 0.039 $\pm$ 0.008 | inches |
|             | 4.00 $\pm$ 0.05   | 4.00 $\pm$ 0.10   | 2.00 $\pm$ 0.05   | 1.50 $\pm$ 0.10   | 1.00 $\pm$ 0.20   | mm     |

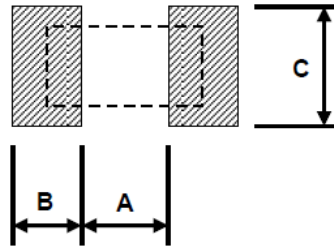
**Peel Force of Top Cover Tape**

The peel speed shall be about 300mm/min  $\pm$  5%  
The peel force of top cover tape shall be between 20gf to 80gf





**Recommended Pad Layout**



| Type / Code | A     | B     | C             | Unit   |
|-------------|-------|-------|---------------|--------|
| RNCF0201    | 0.010 | 0.012 | 0.016 ± 0.008 | inches |
|             | 0.25  | 0.30  | 0.40 ± 0.20   | mm     |
| RNCF0402    | 0.020 | 0.020 | 0.024 ± 0.008 | inches |
|             | 0.50  | 0.50  | 0.60 ± 0.20   | mm     |
| RNCF0603    | 0.031 | 0.039 | 0.035 ± 0.008 | inches |
|             | 0.80  | 1.00  | 0.90 ± 0.20   | mm     |
| RNCF0805    | 0.039 | 0.039 | 0.053 ± 0.008 | inches |
|             | 1.00  | 1.00  | 1.35 ± 0.20   | mm     |
| RNCF1206    | 0.079 | 0.045 | 0.067 ± 0.008 | inches |
|             | 2.00  | 1.15  | 1.70 ± 0.20   | mm     |
| RNCF1210    | 0.079 | 0.045 | 0.098 ± 0.008 | inches |
|             | 2.00  | 1.15  | 2.50 ± 0.20   | mm     |
| RNCF2010    | 0.142 | 0.055 | 0.098 ± 0.008 | inches |
|             | 3.60  | 1.40  | 2.50 ± 0.20   | mm     |
| RNCF2512    | 0.193 | 0.063 | 0.122 ± 0.008 | inches |
|             | 4.90  | 1.60  | 3.10 ± 0.20   | mm     |

**RoHS Compliance**

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union’s directive regarding “Restrictions on Hazardous Substances” (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

**RoHS Compliance Status**

| Standard Product Series | Description                                     | Package / Termination Type | Standard Series RoHS Compliant | Lead-Free Termination Composition | Lead-Free Mfg. Effective Date (Std Product Series) | Lead-Free Effective Date Code (YY/WW) |
|-------------------------|---|----------------------------|--------------------------------|-----------------------------------|--|---------------------------------------|
| RNCF                    | Precision Thin Film Surface Mount Chip Resistor | SMD                        | YES                            | 100% Matte Sn over Ni             | May-04   | 04/18                                 |

**“Conflict Metals” Commitment**

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the “conflict region” of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

**Compliance to “REACH”**

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, “The Registration, Evaluation, Authorization and Restriction of Chemicals”, otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

**Environmental Policy**

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

**How to Order**

|          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10       | 11       | 12       | 13       | 14       | 15       |
| <b>R</b> | <b>N</b> | <b>C</b> | <b>F</b> | <b>0</b> | <b>8</b> | <b>0</b> | <b>5</b> | <b>D</b> | <b>T</b> | <b>E</b> | <b>4</b> | <b>K</b> | <b>7</b> | <b>5</b> |

| Product Series |                                    | Size | Tolerance |       |                      | Packaging |                    |            |          | TCR  |     | Resistance Value <sup>(2)</sup>   |
|----------------|------------------------------------|------|-----------|-------|----------------------|-----------|--------------------|------------|----------|------|-----|---|
| Code           | Description                        | Code | Code      | Tol   | Value <sup>(1)</sup> | Code      | Description        | Size       | Quantity | Code | ppm | Four characters with the multiplier used as the decimal holder.<br>24.9 ohm = 24R9<br>10 Kohm = 10K0<br>1 Mohm = 1M00 |
| RNCF           | Precision Thin Film Chip Resistors | 0201 | T         | 0.01% | E192, E96, E24       | T         | 7" Reel Paper Tape | 0201, 0402 | 10,000   | W    | 2   |   |
|                |                                    | 0402 | A         | 0.05% |                      |           |                    | 0603, 0805 | 5,000    | Y    | 5   |   |
|                |                                    | 0603 | B         | 0.1%  |                      |           |                    | 1206, 1210 |          | T    | 10  |   |
|                |                                    | 0805 | C         | 0.25% |                      |           |                    |            | S        | 15   |     |   |
|                |                                    | 1206 | D         | 0.5%  |                      |           | E                  | 25         |          |      |     |   |
|                |                                    | 1210 | F         | 1%    | E96, E24             |           | C                  | 50         |          |      |     |   |
|                |                                    | 2010 |           |       |                      |           | D                  | 100        |          |      |     |   |
| 2512           |                                    |      |           |       |                      |           |                    |            |          |      |     |   |
|                |                                    |      |           |       |                      | K         | 7" Reel            | All Sizes  | 1,000    |      |     |   |

(1) E192 values are not marked, and may be subject to 20Kpc MOQ  
 (2) Values below 10 ohm and above 1 Mohm may be subject to 20Kpc MOQ



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