Features:

- Precision tolerances to ±0.01%
- TCR down to ±5ppm/ºC
- Wide R-value range
- Lower values may be available
- Consult factory for tighter tolerances
- 2010 and 2512 sizes now available
- RoHS compliant


## Electrical Specifications

| Type / Code | Power Rating (Watts) @ 70ºC | Maximum Working Voltage(1) | Maximum Overload Voltage | Resistance Temperature Coefficient | Ohmic Range (Ω) and Tolerance | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.01% | 0.05% | 0.1% | 0.25% | 0.5% | 1% |
| RNCF0201 | 0.032W | 15V | 30V | ±25 ppm/ºC | - | | | | 49.9 - 5K | |
| | | | | ±50 ppm/ºC | - | | | | 49.9 - 33K | |
| RNCF0402 | 0.063W | 25V | 50V | ±5 ppm/ºC | 49.9 - 5K | | | | | |
| | | | | ±10 ppm/ºC | 49.9 - 12K | | | | | |
| | | | | ±15 ppm/ºC | 49.9 - 12K | | 49.9 - 70K | | | |
| | | | | ±25 ppm/ºC | - | 49.9 - 12K | 10 - 255K | | | |
| | | | | ±50 ppm/ºC | - | 49.9 - 12K | 10 - 255K | | 1 - 255K | |
| RNCF0603 | 0.063W | 50V | 100V | ±25 ppm/ºC | - | | | 2 - 4.64 | | |
| | | | | ±50 ppm/ºC | - | | | 1 - 4.64 | | |
| | 0.1W | 75V | 150V | ±5 ppm/ºC | 24.9 - 15K | | | | | |
| | | | | ±10 ppm/ºC | 24.9 - 100K | 4.7 - 332K | 4.7 - 332K | | | |
| | | | | ±15 ppm/ºC | 24.9 - 100K | 4.7 - 332K | 4.7 - 332K | | | |
| | | | | ±25 ppm/ºC | 24.9 - 100K | 4.7 - 332K | 4.7 - 1M | | | |
| | | | | ±50 ppm/ºC | 24.9 - 100K | 4.7 - 332K | 4.7 - 1M | | | |
| RNCF0805 | 0.1W | 100V | 200V | ±25 ppm/ºC | - | | 1.1M - 2M | | | |
| | | | | ±50 ppm/ºC | - | | 1.1M - 2M | | | |
| | 0.125W | 150V | 300V | ±5 ppm/ºC | 24.9 - 30K | | | | | |
| | | | | ±10 ppm/ºC | 24.9 - 200K | 4.7 - 511K | 4.7 - 511K | | | |
| | | | | ±15 ppm/ºC | 24.9 - 200K | 4.7 - 511K | 4.7 - 1M | | | |
| | | | | ±25 ppm/ºC | 24.9 - 200K | 4.7 - 511K | 4.7 - 1M | 1 - 1M | | |
| | | | | ±50 ppm/ºC | 24.9 - 200K | 4.7 - 511K | 4.7 - 1M | 1 - 1M | | |
| RNCF1206 | 0.125W | 150V | 300V | ±25 ppm/ºC | - | | 1.1M - 2.49M | | | |
| | | | | ±50 ppm/ºC | - | | 1.1M - 2.49M | | | |
| | 0.25W | 200V | 400V | ±5 ppm/ºC | 24.9 - 49.9K | | | | | |
| | | | | ±10 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| | | | | ±15 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| | | | | ±25 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| | | | | ±50 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| RNCF1210 | 0.25W | 150V | 300V | ±25 ppm/ºC | - | | 1.1M - 2.49M | | | |
| | | | | ±50 ppm/ºC | - | | 1.1M - 2.49M | | | |
| | 0.33W | 200V | 400V | ±5 ppm/ºC | 24.9 - 49.9K | | | | | |
| | | | | ±10 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| | | | | ±15 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| | | | | ±25 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |
| | | | | ±50 ppm/ºC | 24.9 - 499K | 4.7 - 1M | | | | |

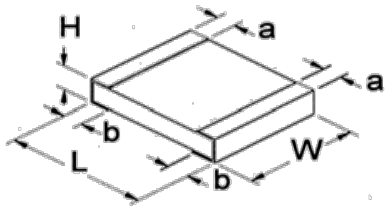
(1) Lesser of √PR or maximum working voltage.

## Electrical Specifications (cont.)

| Type / Code | Power Rating (Watts) @ 70°C | Maximum Working Voltage[1] | Maximum Overload Voltage | Resistance Temperature Coefficient | Ohmic Range (Ω) and Tolerance | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.01% | 0.05% | 0.1% | 0.25% | 0.5% | 1% |
| RNCF2010 | 0.25W | 150V | 300V | ±25 ppm/°C | - | | 1.1M - 3M | | | |
| | | | | ±50 ppm/°C | - | | 1.1M - 3M | | | |
| | 0.33W | 200V | 400V | ±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 | ±5 ppm/°C | 24.9 - 100K | | | | | |
| | | | | ±10 ppm/°C | 2.05K - 499K | 2.05K - 1M | | | | |
| | | | | ±15 ppm/°C | 2.05K - 499K | 2.05K - 1M | | | | |
| | | | | ±25 ppm/°C | - | 2.05K - 1M | 2.05K - 3M | | | |
| | | | | ±50 ppm/°C | | 2.05K - 1M | 2.05K - 3M | | | |
| | 0.75W | 200V | 400V | ±10 ppm/°C | 24.9 - 2K | 4.7 - 2K | 102 - 2K | | | |
| | | | | ±15 ppm/°C | 24.9 - 2K | 4.7 - 2K | 102 - 2K | | | |
| | | | | ±25 ppm/°C | 24.9 - 2K | 4.7 - 2K | 102 - 2K | | | |
| | | | | ±50 ppm/°C | 24.9 - 2K | 4.7 - 2K | 102 - 2K | | | |
| | 1W | 200V | 400V | ±25 ppm/°C | - | | 4.7 - 100 | 1 - 100 | | |
| | | | | ±50 ppm/°C | - | | 4.7 - 100 | 1 - 100 | | |

(1) Lesser of √PR or maximum working voltage.

## Mechanical Specifications

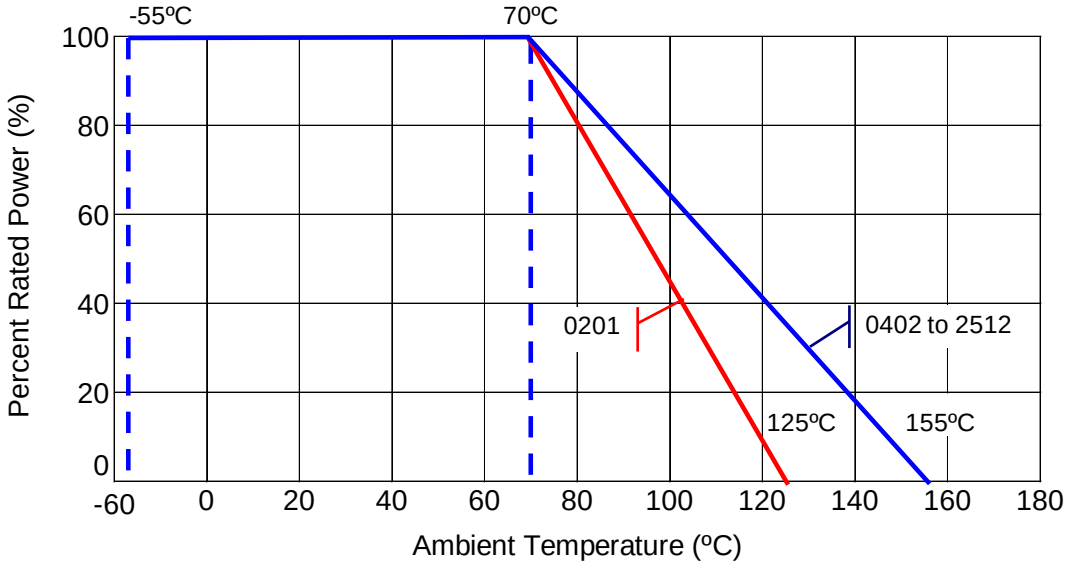



| Type / Code | L Body Length | W Body Width | H Body Height | a Top Termination | b Bottom Termination | Unit |
|---|---|---|---|---|---|---|
| RNCF0201 | 0.024 ± 0.002<br>0.60 ± 0.05 | 0.012 ± 0.002<br>0.30 ± 0.05 | 0.009 ± 0.001<br>0.23 ± 0.03 | 0.005 ± 0.002<br>0.12 ± 0.05 | 0.005 ± 0.002<br>0.12 ± 0.05 | inches<br>mm |
| RNCF0402 | 0.039 ± 0.002<br>1.00 ± 0.05 | 0.020 ± 0.002<br>0.50 ± 0.05 | 0.014 ± 0.002<br>0.35 ± 0.05 | 0.008 ± 0.004<br>0.20 ± 0.10 | 0.010 ± 0.004<br>0.25 ± 0.10 | inches<br>mm |
| RNCF0603 | 0.063 ± 0.008<br>1.60 ± 0.20 | 0.031 ± 0.008<br>0.80 ± 0.20 | 0.016 ± 0.006<br>0.40 ± 0.15 | 0.012 ± 0.008<br>0.30 ± 0.20 | 0.012 ± 0.008<br>0.30 ± 0.20 | inches<br>mm |
| RNCF0805 | 0.079 ± 0.008<br>2.00 ± 0.20 | 0.049 ± 0.008<br>1.25 ± 0.20 | 0.020 ± 0.006<br>0.50 ± 0.15 | 0.016 ± 0.008<br>0.40 ± 0.20 | 0.016 ± 0.008<br>0.40 ± 0.20 | inches<br>mm |
| RNCF1206 | 0.126 ± 0.008<br>3.20 ± 0.20 | 0.063 ± 0.008<br>1.60 ± 0.20 | 0.020 ± 0.006<br>0.50 ± 0.15 | 0.020 ± 0.012<br>0.50 ± 0.30 | 0.016 ± 0.008<br>0.40 ± 0.20 | inches<br>mm |
| RNCF1210 | 0.122 ± 0.008<br>3.10 ± 0.20 | 0.094 ± 0.006<br>2.40 ± 0.15 | 0.024 ± 0.004<br>0.60 ± 0.10 | 0.020 ± 0.012<br>0.50 ± 0.30 | 0.016 ± 0.008<br>0.40 ± 0.20 | inches<br>mm |
| RNCF2010 | 0.193 ± 0.006<br>4.90 ± 0.15 | 0.094 ± 0.006<br>2.40 ± 0.15 | 0.024 ± 0.004<br>0.60 ± 0.10 | 0.024 ± 0.012<br>0.60 ± 0.30 | 0.020 ± 0.010<br>0.50 ± 0.25 | inches<br>mm |
| RNCF2512 | 0.248 ± 0.006<br>6.30 ± 0.15 | 0.122 ± 0.006<br>3.10 ± 0.15 | 0.024 ± 0.004<br>0.60 ± 0.10 | 0.024 ± 0.012<br>0.60 ± 0.30 | 0.020 ± 0.010<br>0.50 ± 0.25 | inches<br>mm |

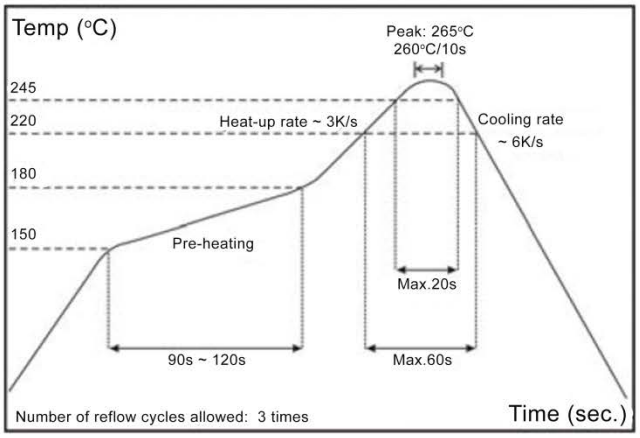
| Performance Characteristics | | | | | |
|---|---|---|---|---|---|
| Test | Specification | Specification for Tolerances = 0.01% | Specification for Tolerances = 0.05% | Typical for Tolerances ≥ 0.1% | Test Method |
| Moisture Resistance, Thermal Shock | ΔR±0.25% | ΔR±0.01% | ΔR±0.05% | ≤0.1% | -55ºC - 150ºC, 100 cycles |
| Load Life | ΔR±0.2% | ΔR±0.01% | ΔR±0.05% | ≤0.2% | 70±2ºC, Maximum working voltage for 1000 hrs with 1.5 hrs ON and 0.5 hrs OFF |
| | >7KΩ ΔR ± 0.5%<br>ΔR±0.5% for high power rating | | | | |
| Load Life in Moisture | ΔR±0.3% | ΔR±0.01% | ΔR±0.05% | ≤0.25% | 40±2ºC, 90-95% RH Maximum working voltage for 1000 hrs with 1.5 hrs ON and 0.5 hrs OFF |
| | ΔR±0.5% for high power rating | | | | |
| Resistance to Soldering Heat | ΔR±0.2% | ΔR±0.01% | ΔR±0.05% | ≤0.05% | 260±5ºC for 10 seconds |
| Solderability | Min 95% coverage | | | ≥95% | 245±5ºC for 3 seconds |
| Bending Strength | ΔR±0.2% | ΔR±0.01% | ΔR±0.05% | ≤0.05% | Bending amplitude 3mm for 10 seconds |
| Dielectric Withstanding Voltage | by type | | | ≤0.05% | Maximum overload voltage for 1 minute |
| Short Time Overload | ΔR±0.2% | ΔR±0.01% | ΔR±0.05% | ≤0.05% | RCWV*2.5 or Maximum overload voltage for 5 seconds |
| Insulation Resistance | >1GΩ | | | ≥1GΩ | Apply 100$V_{DC}$ for 1 minute |
| Low Temperature Operation | ΔR±0.2% | ΔR±0.01% | ΔR±0.05% | | 1 hour, -65ºC, followed by 45 minutes of RCWV |
| | ΔR±0.5% for high power rating | | | | |

Operating Temperature Range: -55ºC to +125ºC (0201); -55ºC to +155ºC (0402 to 2512)
Reference Standards: MIL-STD-202, JIS-C 5201-1

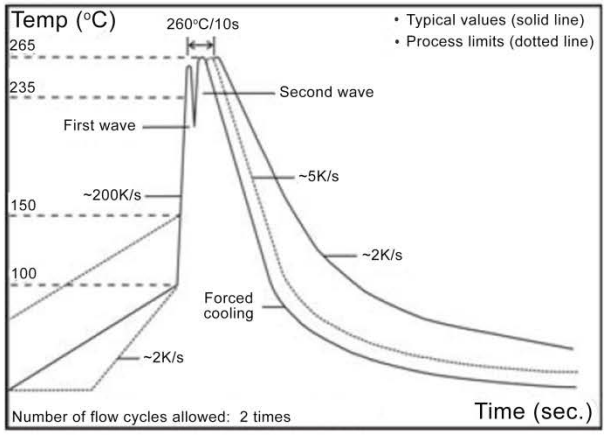
## Power Derating Curve:



## 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 point 410°C : 5s

## How to Order

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

| Product Series | |
|---|---|
| RNCF | Precision Thin Film Chip Resistors |

| Size |
|---|
| 0201 |
| 0402 |
| 0603 |
| 0805 |
| 1206 |
| 1210 |
| 2010 |
| 2512 |

| Tolerance | | |
|---|---|---|
| Code | Tol | Value [1] |
| T | 0.01% | E192, E96, E24 |
| A | 0.05% | |
| B | 0.1% | |
| C | 0.25% | |
| D | 0.5% | |
| F | 1% | E96, E24 |

| Packaging | | | |
|---|---|---|---|
| Code | Description | Size | Quantity |
| T | 7" Reel Paper Tape | 0201, 0402 | 10,000 |
| | | 0603, 0805 1206, 1210 | 5,000 |
| | | 2010, 2512 | 4,000 |
| K | 7" Reel Paper Tape | All Sizes | 1,000 |

| TCR | |
|---|---|
| Code | ppm |
| Y | 5 |
| T | 10 |
| S | 15 |
| E | 25 |
| C | 50 |
| D | 100 |

| Resistance Value [2] |
|---|
| Four characters with the multiplier used as the decimal holder. |
| 24.9 ohm = 24R9<br>10 Kohm = 10K0<br>1 Mohm = 1M00 |

(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