

- Features:
- Precision tolerances to $\pm 0.01\%$
 - TCR down to $\pm 5\text{ppm}/^\circ\text{C}$
 - Wide R-value range
 - Lower values may be available
 - Consult factory for tighter tolerances
 - 2010 and 2512 sizes now available
 - RoHS compliant



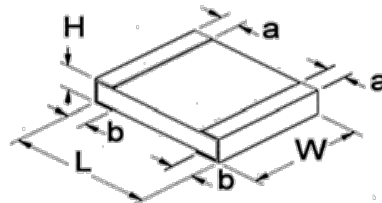
Electrical Specifications											
Type / Code	Power Rating (Watts) @ 70°C	Maximum Working Voltage ⁽¹⁾	Maximum Overload Voltage	Resistance Temperature Coefficient	Ohmic Range (Ω) and Tolerance						
					0.01%	0.05%	0.1%	0.25%	0.5%	1%	
RNCF0201	0.032W	15V	30V	$\pm 25\text{ ppm}/^\circ\text{C}$	-		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

(1) Lesser of $\sqrt{\text{PR}}$ 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	24.9 - 499K	24.9 - 1M				
				±15 ppm/°C	24.9 - 499K	24.9 - 1M				
				±25 ppm/°C	-	24.9 - 1M	24.9 - 3M			
				±50 ppm/°C	-	24.9 - 1M	24.9 - 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	1 - 2K			
				±50 ppm/°C	24.9 - 2K	4.7 - 2K	1 - 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

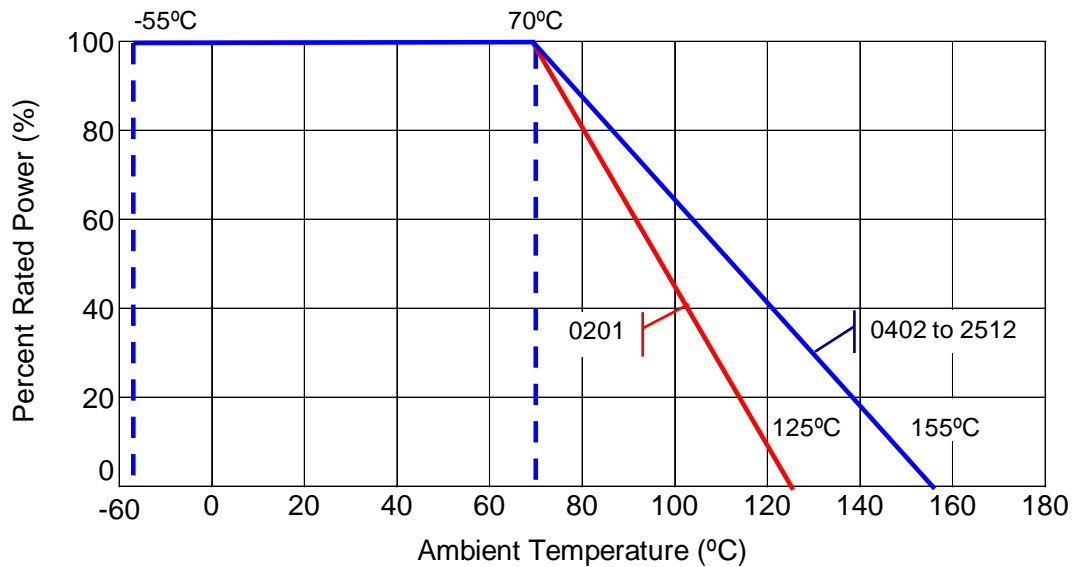


Type / Code	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
RNCF0201	0.024 ± 0.002 0.60 ± 0.05	0.012 ± 0.002 0.30 ± 0.05	0.009 ± 0.001 0.23 ± 0.03	0.005 ± 0.002 0.12 ± 0.05	0.005 ± 0.002 0.12 ± 0.05	inches mm
RNCF0402	0.039 ± 0.002 1.00 ± 0.05	0.020 ± 0.002 0.50 ±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

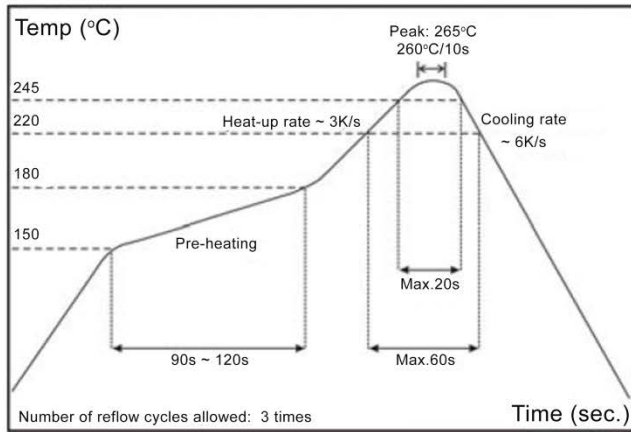
Performance Characteristics					
Test	Specification	Specification for Tolerances = 0.01%	Specification for Tolerances = 0.05%	Typical for Tolerances ≥ 0.1%	Test Method
Moisture Resistance, Thermal Shock	$\Delta R \pm 0.25\%$	$\Delta R \pm 0.01\%$	$\Delta R \pm 0.05\%$	$\leq 0.1\%$	-55°C - 150°C, 100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

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

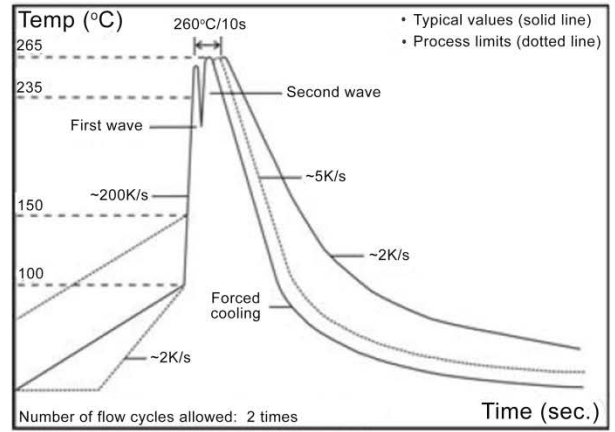
Power Derating Curve:



Soldering Condition:



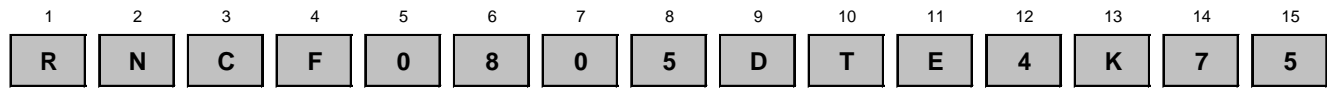
IR Reflow Soldering



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



Product Series		Size	Tolerance		Packaging			TCR		Resistance Value ⁽²⁾				
Code	Description		Code	Tol	Code	Description	Size	Quantity	Code	ppm				
RNCF	Precision Thin Film Chip Resistors	0201	E192, E96, E24	0.01%	T	7" Reel Paper Tape	0201, 0402	10,000	Y	5	Four characters with the multiplier used as the decimal holder. 24.9 ohm = 24R9 10 Kohm = 10K0 1 Mohm = 1M00			
		0603					A	0.05%	1206, 1210	5,000		T	10	
		0805					B	0.1%				2010, 2512	4,000	S
		1206					C	0.25%	E	25				
		1210					D	0.5%	All Sizes	1,000		C	50	
		2010					F	1%				D	100	
		2512												

(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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