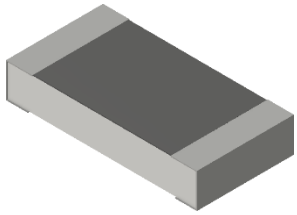
Features:



- Special passivation for moisture sensitive applications
- E192 value is built to order with no part marking
- Test proven performance under humidity and moisture
- Test proven immunity to sulfur per ASTM-B-809-95
- Cost effective option for tantalum nitride resistor
- RoHS compliant, REACH compliant, lead free, and halogen free
- AEC-Q200 qualified

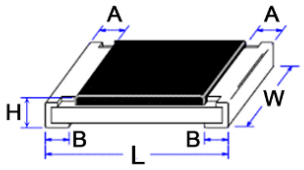
The RNCS series employs a special manufacturing process to ensure high precision, ultra-stable performance, and long life in the harshest environments. In moisture comparison testing, the RNCS series outperformed Nichrome Chip Resistors and demonstrated the anti-corrosive claims characterized by Tantalum Nitride resistor products. The "-AS" version adds anti-sulfur performance.

Electrical Specifications

Type/Code	Power Rating (W) @ 70ºC	Maximum Working Voltage (V)[1]	Maximum Overload Voltage (V)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance				
					±0.05%	±0.1%	±0.25%	±0.5%	±1%
RNCS0402-AS	0.063	50	100	± 10	49.9 - 12K	49.9 - 69.8K			
				± 15					
				± 25	10 - 221K				
				± 50					
RNCS0603-AS	0.1	75	150	± 10	10 - 49.9K	10 - 332K			
				± 15					
				± 25		10 - 680K			
				± 50					
RNCS0805-AS	0.125	150	300	± 10	10 - 100K	10 - 1M			
				± 15					
				± 25					
				± 50					
RNCS1206-AS	0.25	200	400	± 10	10 - 200K	10 - 1M			
				± 15					
				± 25		10 - 1.5M			
				± 50					
RNCS1210-AS	0.33	200	400	± 10	10 - 499K	10 - 1M			
				± 15					
				± 25					
				± 50					
RNCS2010-AS	0.33	200	400	± 10	10 - 499K	10 - 1M			
				± 15					
				± 25					
				± 50					
RNCS2512-AS	0.5	150	300	± 10	10 - 499K	10 - 1M			
				± 15					
				± 25					
				± 50					

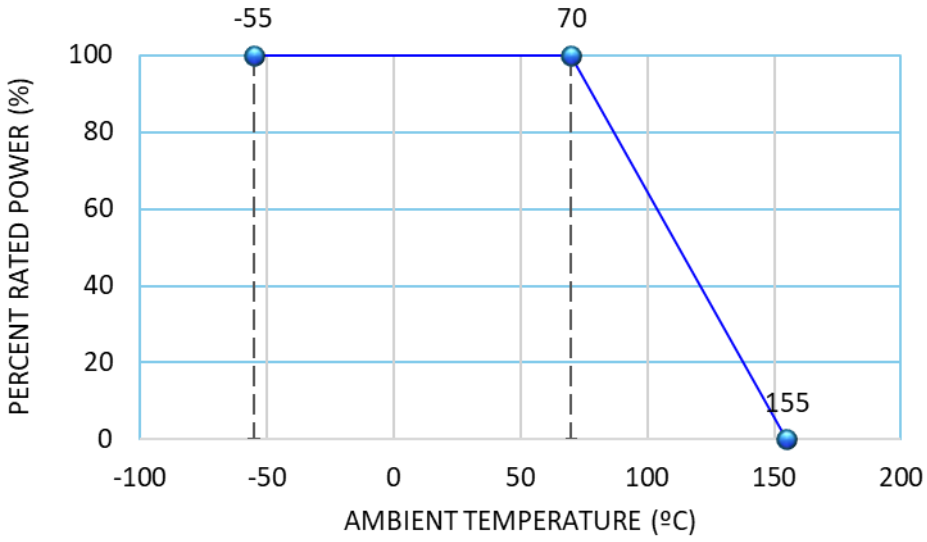
(1) Lesser of √(P*R) or maximum working voltage.

Mechanical Specifications



Type/Code	Weight (mg)	L Body Length	W Body Width	H Body Height	A Top Termination	B Bottom Termination	Unit
RNCS0402-AS	0.54	0.039 ± 0.002 1.00 ± 0.05	0.020 ± 0.002 0.50 ± 0.05	0.012 ± 0.002 0.30 ± 0.05	0.008 ± 0.004 0.20 ± 0.10	0.008 ± 0.004 0.20 ± 0.10	inches mm
RNCS0603-AS	1.8	0.061 ± 0.004 1.55 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	inches mm
RNCS0805-AS	4.7	0.079 ± 0.006 2.00 ± 0.15	0.049 ± 0.006 1.25 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.012 ± 0.008 0.30 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
RNCS1206-AS	9.0	0.120 ± 0.006 3.05 ± 0.15	0.061 ± 0.006 1.55 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.017 ± 0.008 0.42 ± 0.20	0.014 ± 0.010 0.35 ± 0.25	inches mm
RNCS1210-AS	10.0	0.122 ± 0.006 3.10 ± 0.15	0.094 ± 0.006 2.40 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.016 ± 0.008 0.40 ± 0.20	0.022 ± 0.010 0.55 ± 0.25	inches mm
RNCS2010-AS	23.6	0.193 ± 0.006 4.90 ± 0.15	0.094 ± 0.006 2.40 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.012 0.60 ± 0.30	0.020 ± 0.010 0.50 ± 0.25	inches mm
RNCS2512-AS	38.1	0.248 ± 0.006 6.30 ± 0.15	0.122 ± 0.006 3.10 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.012 0.60 ± 0.30	0.020 ± 0.010 0.50 ± 0.25	inches mm

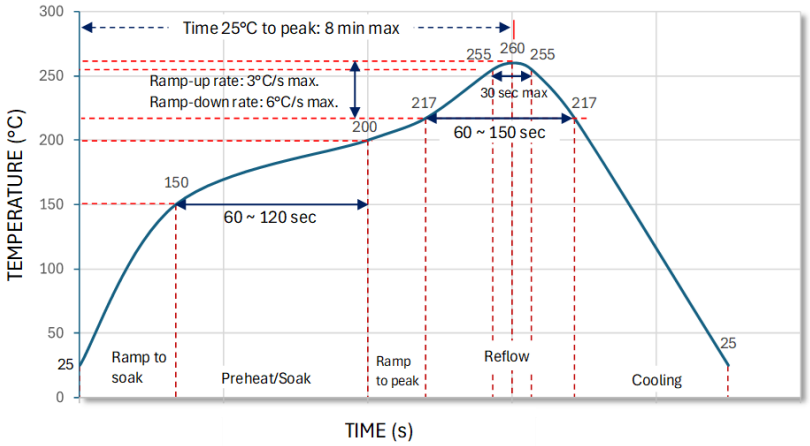
Power Derating Curve:



Performance Characteristics				
Test	Test Method	Test Limits		Typical Performance
		Tol. ≤ 0.05%	Tol. > 0.05%	
Temperature Coefficient of Resistance (TCR)	JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55 ± 125ºC, 25ºC is the reference temperature	As specified		
Short Time Overload	JIS-C-5201-1 4.13 RCWV*2.5 or max. overload voltage whichever is lower for 5 seconds	ΔR ± 0.05% ΔR ± 0.1% for 0603 to 2010		≤ ± 0.02%
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6 Apply 100 V_{DC} for 1 minute	> 1000MΩ		
Operational Life	MIL-STD-202 Method 108 Condition D Steady State TA=125ºC at derated power Measurement at 24 ± 4 hours after test conclusion	>7KΩ: ΔR ± 0.2%; Rest: ΔR ± 0.05%	ΔR ± 0.2%	
Biased Humidity	MIL-STD-202 Method 103 1000 hours 85 °C/85% RH 10% of operating power	ΔR ± 0.1%		
High Temperature Exposure	MIL-STD-202 Method 108 at ±155ºC for 1000 hours	ΔR ± 0.2%		
Temperature Cycling	JESD22 Method JA-104 -55 to +125ºC, 1000 cycles	ΔR ± 0.1%		
Bending Strength (Board Flex)	JIS-C-5201-1 4.33 Bending once for 60 seconds. Bending displacement: 2010 and 2512 sizes: 2 mm; other sizes: 3 mm	ΔR ± 0.1%		
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17 245 ± 5ºC for 3 seconds	95% min. coverage		
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18 260 ± 5ºC for 10 seconds	ΔR±0.05%		≤ ± 0.02%
Termina Strength	AEC-Q200-006 Force of 1.8 Kg for 60 seconds	No breakage		
Mechanical Shock	MIL-STD-202 Method 213 Wave form: tolerance for half sine shock pulse Peak value is 100 g's. Normal duration (D) is 6.	ΔR ± 0.05%	ΔR ± 0.1%	
Vibration	MIL-STD-202 Method 204 5 g's for 20 minutes, 12 cycles each of 3 orientations, 10-2000 Hz	ΔR ± 0.05%	ΔR ± 0.1%	
ESD	AEC-Q200-002 Human body model 0402, 0603: 0.2 KV 0805, 1206: 1 KV 2010, 2512: 2 KV	Δ R±0.5%		
Resistance to Solvents	MIL-STD-202 Method 215 Add aqueous wash chemical - OKEM clean or equivalent. Do not use banned solvents	Marking unsmeared		
Sulfur Test	ASTM-B-809-95 105 ± 2ºC no power rating for 750 hours	ΔR ± 1%		
Flammability	UL-94. V-0 or V-1 are acceptable. Electrical test not required.	No ignition of the tissue paper or scorching of the pinewood board.		

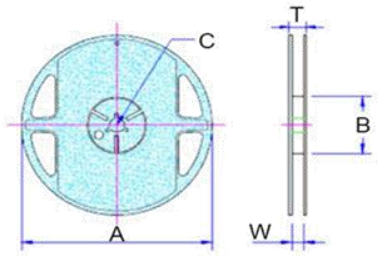
RCWV (Rated continuous working voltage) = √(P*R) or max. operating voltage, whichever is lower.
Suggested recommended storage temperature is 15 ~ 28ºC. Humidity < 80% RH.
Operating temperature range is -55 to +155°C.

Recommended Resistor Reflow Profile



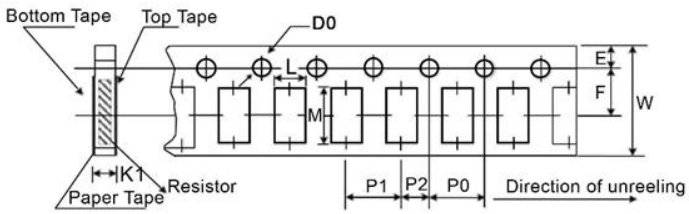
Number of reflow cycles allowed is 3 times.

Reel Specifications



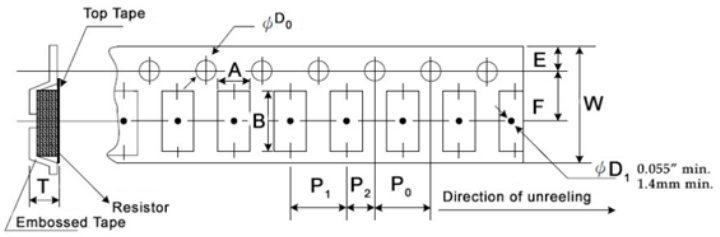
Type/Code	ØA	ØB	ØC	W	T	Unit
RNCS0402-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.374 ± 0.039 9.50 ± 1.00	0.453 ± 0.039 11.50 ± 1.00	inches mm
RNCS0603-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.374 ± 0.039 9.50 ± 1.00	0.453 ± 0.039 11.50 ± 1.00	inches mm
RNCS0805-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.374 ± 0.039 9.50 ± 1.00	0.453 ± 0.039 11.50 ± 1.00	inches mm
RNCS1206-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.374 ± 0.039 9.50 ± 1.00	0.453 ± 0.039 11.50 ± 1.00	inches mm
RNCS1210-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.374 ± 0.039 9.50 ± 1.00	0.453 ± 0.039 11.50 ± 1.00	inches mm
RNCS2010-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.531 ± 0.039 13.50 ± 1.00	0.610 ± 0.039 15.50 ± 1.00	inches mm
RNCS2512-AS	7.008 ± 0.039 178.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.531 ± 0.039 13.50 ± 1.00	0.610 ± 0.039 15.50 ± 1.00	inches mm

Taping Specifications - Paper Tape



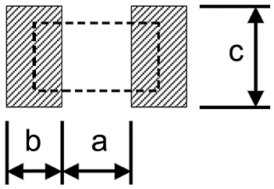
Type/Code	A	B	W	E	F	Unit
RNCS0402-AS	0.028 ± 0.002 0.70 ± 0.05	0.046 ± 0.002 1.16 ± 0.05	0.315 ± 0.004 8.00 ± 0.10	0.069 ± 0.002 1.75 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	inches mm
RNCS0603-AS	0.043 ± 0.002 1.10 ± 0.05	0.075 ± 0.002 1.90 ± 0.05	0.315 ± 0.004 8.00 ± 0.10	0.069 ± 0.002 1.75 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	inches mm
RNCS0805-AS	0.063 ± 0.002 1.60 ± 0.05	0.093 ± 0.002 2.37 ± 0.05	0.315 ± 0.004 8.00 ± 0.10	0.069 ± 0.002 1.75 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	inches mm
RNCS1206-AS	0.079 ± 0.002 2.00 ± 0.05	0.140 ± 0.002 3.55 ± 0.05	0.315 ± 0.004 8.00 ± 0.10	0.069 ± 0.002 1.75 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	inches mm
RNCS1210-AS	0.108 ± 0.002 2.75 ± 0.05	0.134 ± 0.002 3.40 ± 0.05	0.315 ± 0.004 8.00 ± 0.10	0.069 ± 0.002 1.75 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	inches mm
Type/Code	P0	P1	P2	ØD0	T	Unit
RNCS0402-AS	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.002 1.55 ± 0.05	0.016 ± 0.001 0.40 ± 0.03	inches mm
RNCS0603-AS	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.002 1.55 ± 0.05	0.024 ± 0.001 0.60 ± 0.03	inches mm
RNCS0805-AS	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.002 1.55 ± 0.05	0.030 ± 0.002 0.75 ± 0.05	inches mm
RNCS1206-AS	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.002 1.55 ± 0.05	0.030 ± 0.002 0.75 ± 0.05	inches mm
RNCS1210-AS	0.157 ± 0.002 4.00 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.063 ± 0.004 1.60 ± 0.10	0.030 ± 0.002 0.75 ± 0.05	inches mm

Taping Specifications - Plastic Tape



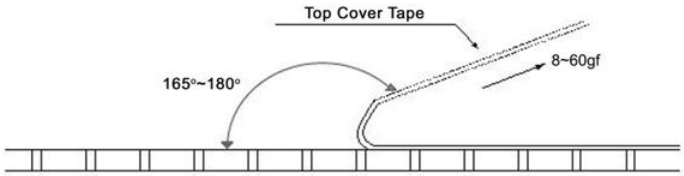
Type/Code	A	B	W	E	F	Unit
RNCS2010-AS	0.112 ± 0.004 2.85 ± 0.10	0.215 ± 0.004 5.45 ± 0.10	0.472 ± 0.004 12.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	inches mm
RNCS2512-AS	0.134 ± 0.004 3.40 ± 0.10	0.262 ± 0.004 6.65 ± 0.10	0.472 ± 0.004 12.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	inches mm
Type/Code	P0	P1	P2	ØD0	T	Unit
RNCS2010-AS	0.157 ± 0.002 4.00 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 ± 0.004 1.50 ± 0.10	0.039 ± 0.008 1.00 ± 0.20	inches mm
RNCS2512-AS	0.157 ± 0.002 4.00 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 ± 0.004 1.50 ± 0.10	0.039 ± 0.008 1.00 ± 0.20	inches mm

Recommended Solder Pad



Type/Code	A	B	C	Unit
RNCS0402-AS	0.020 0.50	0.020 0.50	0.024 ± 0.008 0.60 ± 0.20	inches mm
RNCS0603-AS	0.031 0.80	0.039 1.00	0.035 ± 0.008 0.90 ± 0.20	inches mm
RNCS0805-AS	0.039 1.00	0.039 1.00	0.053 ± 0.008 1.35 ± 0.20	inches mm
RNCS1206-AS	0.079 2.00	0.045 1.15	0.067 ± 0.008 1.70 ± 0.20	inches mm
RNCS1210-AS	0.079 2.00	0.045 1.15	0.098 ± 0.008 2.50 ± 0.20	inches mm
RNCS2010-AS	0.142 3.60	0.055 1.40	0.098 ± 0.008 2.50 ± 0.20	inches mm
RNCS2512-AS	0.193 4.90	0.063 1.60	0.122 ± 0.008 3.10 ± 0.20	inches mm

Peel Force of Top cover Tape



(1) The peel speed shall be about 300 mm/min ± 5%
(2)The peel force of top cover tape shall be between 8 gf to 60 gf

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
RNCS-AS	Moisture Resistant Anti-Sulfur Thin Film Chip Resistor	SMD	YES	100% Matte Sn over Ni

"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. 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

R	N	C	S	0	8	0	5	D	T	E	4	K	7	5	-	A	S

Product Series

Code	Description
RNCS	Moisture Resistant Anti-Sulfur Thin Film

Size

Size
0402
0603
0805
1206
1210
2010
2512

Tolerance

Code	Tol.
A	0.05%
B	0.1%
C	0.25%
D	0.5%
F	1%

Packaging

Code	Description	Size	Quantity
T	7" Reel Paper Tape	0402	10000
		0603, 0805 1206, 1210	5000
	7" Reel Plastic Tape	2010, 2512	4000

TCR

Code	ppm
T	10
S	15
E	25
C	50

Resistance Value

Four characters with the multiplier used as the decimal holder.

24.9 ohm = 24R9
12 Kohm = 12K0
332 Kohm = 332K

Special

Code	Description
-AS	Anti-sulfur