Features:

- Special passivation for moisture sensitive applications
- Absolute TCR's to ±10 ppm/ºC
- E192 value is built to order with no part marking
- Test proven immunity to humidity and moisture corrosion
- Test proven immunity to sulfur per ASTM-B-809-95
- Absolute tolerances to 0.05%
- Ideal replacement for costly Tantalum Nitride resistors
- 100% RoHS compliant and lead free without exemption
- Halogen free
- REACH compliant
- Qualified to AEC-Q200



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

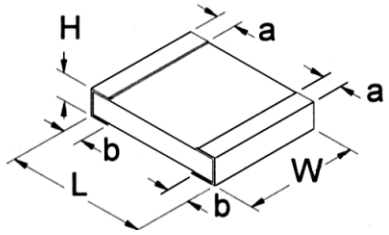
Type/Code	Power Rating (W) @ 70ºC	Maximum Working Voltage (V)(1)	Maximum Overload Voltage (V)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance				
					±0.05%	±0.1%	±0.25%	±0.5%	±1%
RNCS0402_-AS	0.063	25	50	± 10 ± 15 ± 25 ± 50	49.9 - 10K	49.9 - 10K 49.9 - 69.8K 49.9 - 100K			
RNCS0603_-AS	0.1	75	150	± 10 ± 15 ± 25 ± 50	10 - 49.9K	10 - 332K			
RNCS0805_-AS	0.125	150	300	± 10 ± 15 ± 25 ± 50	10 - 100K	10 - 511K 10 - 1M			
RNCS1206_-AS	0.25	200	400	± 10 ± 15 ± 25 ± 50	10 - 200K	10 - 1M			
RNCS1210_-AS	0.33	200	400	± 10 ± 15 ± 25 ± 50	10 - 499K	10 - 1M			
RNCS2010_-AS	0.33	200	400	± 10 ± 15 ± 25 ± 50	10 - 499K	10 - 1M			
RNCS2512_-AS	0.5	150	300	± 10 ± 15 ± 25 ± 50	10 - 499K	10 - 1M			

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

This specification may be changed at any time without prior notice

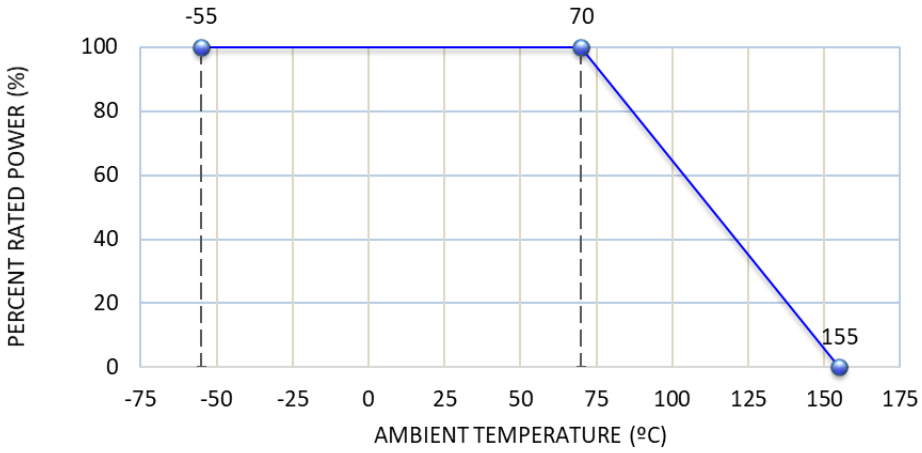
Please confirm technical specifications before you order and/or use.

Mechanical Specifications



Type/Code	Weight (g) (1000 pc)	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	1.83	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	4.71	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	9.02	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	0.122 ± 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	23.61	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	38.06	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:



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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 -55ºC ± 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%		≤ ± 0.02%
Insulation resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6 Apply 100V_{DC} for 1 minute	> 1000MΩ		
Operational Life	MIL-STD-202 Method 108 Condition D Steady State T_A=125ºC at derated power Measurement at 24 ± 4 hours after test conclusion	ΔR ± 0.05%	ΔR ± 0.2%	
		>7kΩ ΔR ± 0.2% ΔR ± 0.5% for 0603 to 2010		
Biased humidity	MIL-STD-202 Method 103 1000 hours 85ºC/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 -55ºC 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: 2mm; other sizes: 3mm	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%
Terminal strength	AEC-Q200-006 Force of 1.8kg for 60 seconds	No breakage		
Mechanical shock	MIL-STD-202 Method 213 Wave form: tolerance for half sine shock pulse Peak value is 100g'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: 0.2KV 0805, 1206: 1KV 2010, 2512: 2KV	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) = $\sqrt{P*R}$ or max. operating voltage, whichever is lower
Storage temperature: 15~28ºC. Humidity < 80%RH
Operating temperature range is -55°C to +155°C

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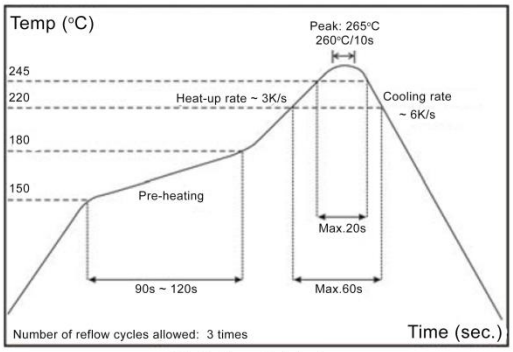
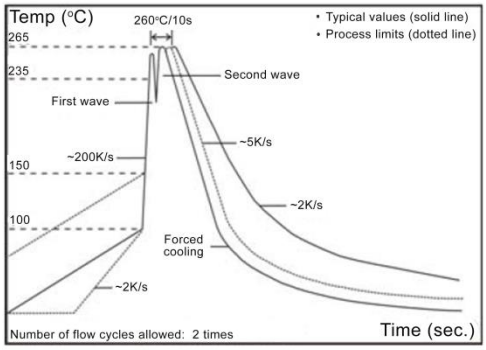
Soldering Condition



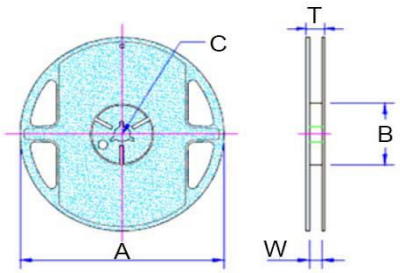
IR Reflow Soldering



Wave Soldering (Flow Soldering)

(1) Time of IR reflow soldering at maximum temperature point 260ºC: 10 seconds
(2) Time of wave soldering at maximum temperature point 260ºC: 10 seconds
(3) Time of soldering iron at maximum temperature point 410ºC: 5 seconds

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

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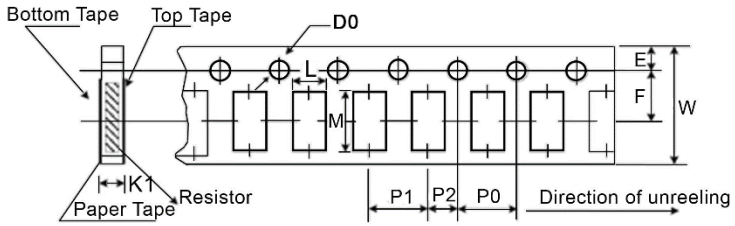
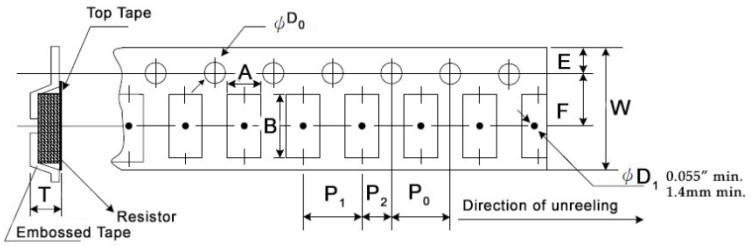
Packaging Specifications – Paper Tape



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

Packaging Specifications – Embossed 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

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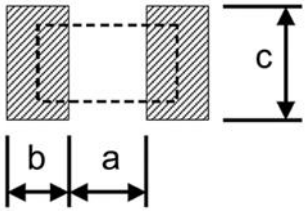
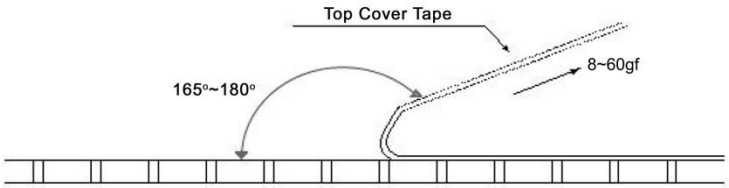
Recommended Pad Layout



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

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.

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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)
RNCS	Anti-Corrosive Tantalum Nitride Replacement 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. 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		16	17
R	**N**	**C**	**S**	**0**	**8**	**0**	**5**	**D**	**T**	**E**	**4**	**K**	**7**	**5**	**-**	**A**	**S**

Product Series

Code	Description
RNCS	Anti-corrosive Tantalum-nitride Replacement

Size

Size	W
0402	0.063
0603	0.1
0805	0.125
1206	0.25
1210	0.33
2010	0.33
2512	0.5

Tolerance

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

Packaging

Code	Description	Size	Quantity
T	Paper Tape	0402	10000
		0603, 0805	5000
		1206, 1210	
	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

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