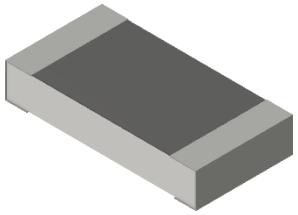
Features:

- Small standard sizes down to 0201
- High frequency up to 70 GHz for 0201
- High frequency up to 50 GHz for 0402 and 0603
- High purity alumina substrate
- RoHS compliant, REACH compliant, lead free, and halogen free

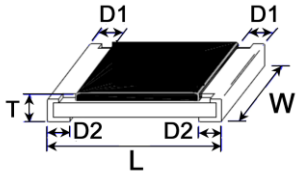


Electrical Specifications - Precision

Type/Code	Power Rating (W) @ 70ºC	Max Working Voltage (V)	Max Overload Voltage (V)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance			
					0.1%	0.25%	0.5%	1%
RNCQ0201	0.03	15	30	± 25	20 - 500			
				± 50				
RNCQ0402	0.05	30	60	± 25	10 - 1K			
				± 50				
RNCQ0603	0.125	50	100	± 25	10 - 1K			
				± 50				
RNCQ0805	0.2	50	100	± 25	10 - 1K			
				± 50				
RNCQ1206	0.33	75	150	± 25	10 - 1K			
				± 50				

Working voltage = √(P*R) or max. operating voltage listed above, whichever is lower.
Overload voltage = 2.5*√(P*R) or max. overload voltage listed above, whichever is lower.

Mechanical Specifications



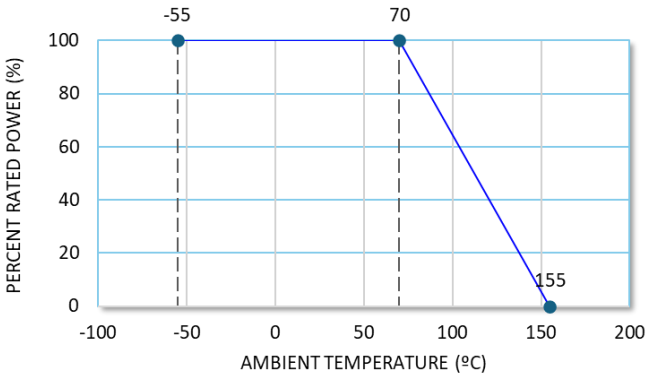
Type/Code	Typical Unit Weight (mg)	L	W	T	D1	D2	Unit
RNCQ0201	0.12	0.023 ± 0.002 0.58 ± 0.05	0.012 ± 0.002 0.30 ± 0.05	0.008 ± 0.003 0.21 ± 0.07	-	0.006 ± 0.004 0.15 ± 0.10	inches mm
RNCQ0402	0.73	0.039 ± 0.003 1.00 ± 0.07	0.020 ± 0.003 0.50 ± 0.07	0.015 ± 0.006 0.38 ± 0.15	0.008 ± 0.006 0.20 ± 0.15	0.008 ± 0.006 0.20 ± 0.15	inches mm
RNCQ0603	2.1	0.061 ± 0.004 1.55 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.006 0.45 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	inches mm
RNCQ0805	4.2	0.079 ± 0.006 2.00 ± 0.15	0.049 ± 0.006 1.25 ± 0.15	0.018 ± 0.006 0.45 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	0.014 ± 0.008 0.35 ± 0.20	inches mm
RNCQ1206	7.6	0.120 ± 0.008 3.05 ± 0.20	0.061 ± 0.008 1.55 ± 0.20	0.018 ± 0.006 0.45 ± 0.15	0.018 ± 0.008 0.45 ± 0.20	0.014 ± 0.010 0.35 ± 0.25	inches mm

Performance Characteristics

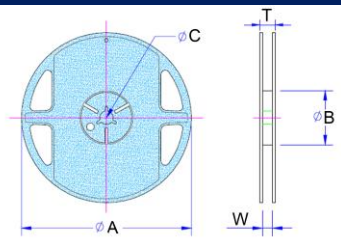
Test	Test Method	Test Specification	Test Condition
Temperature coefficient of Resistance (T.C.R.)	MIL-STD-202 Method 304	As specified.	+25 / -55 / +25 / +125 / +25°C
Short Time Overload	JIS-C-5201-1 4.13	ΔR ± 0.2%	RCWV * 2.5 or Max. overload voltage whichever is lower for 5 seconds
Insulation Resistance	MIL-STD-202 Method 302	> 9999MΩ	Apply 100 V_{DC} for 1 minute
Endurance	MIL-STD-202 Method 108	ΔR ± 0.5%	70 ± 2°C, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Damp Heat with Load	MIL-STD-202 Method 103	ΔR ± 0.5%	40 ± 2°C, 90 ~ 95% R.H. RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Bending Strength	JIS-C-5201-1 4.33	ΔR ± 0.1%	Bending amplitude 3 mm for 60 seconds
Solderability	MIL-STD-202 Method 208	95% min. coverage (except 0201)	245 ± 5°C for 3 seconds
Resistance to Soldering Heat	MIL-STD-202 Method 210	ΔR ± 0.1% (except 0201)	260 ± 5°C for 10 seconds
Dielectric Withstand Voltage	MIL-STD-202 Method 301	by type	Max. overload voltage for 1 minute
Low Temperature Exposure	JIS-C-5201-1 4.36	ΔR ± 0.2%	1 hour, -65°C, followed by 45 minutes of RCWV
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.
Recommended storage conditions is 15~28°C. Humidity < 80% R.H.
Shelf life is 2 years from production date.

Power Derating Curve:

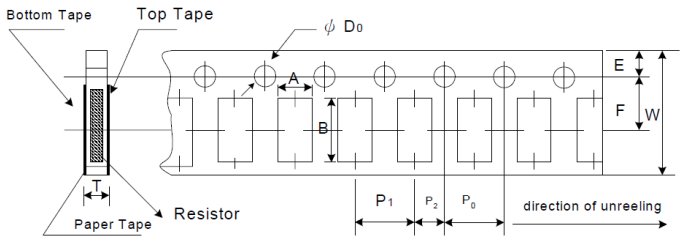


Reel Specifications



Type/Code	A	B	C	W	T	Unit
RNCQ0201	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
RNCQ0402	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
RNCQ0603	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
RNCQ0805	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
RNCQ1206	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

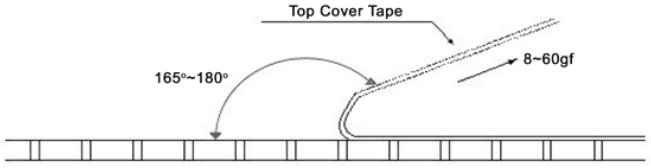
Taping Specifications - Paper Tape



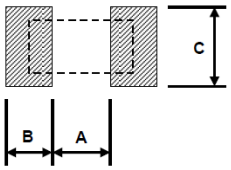
Type/Code	A	B	W	E	F	Unit
RNCQ0201	0.016 ± 0.002 0.40 ± 0.05	0.028 ± 0.002 0.70 ± 0.05	0.315 ± 0.004 8.00 ± 0.10	0.069 ± 0.002 1.75 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	inches mm
RNCQ0402	0.026 ± 0.002 0.66 ± 0.06	0.046 ± 0.002 1.18 ± 0.06	0.315 ± 0.008 8.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	inches mm
RNCQ0603	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
RNCQ0805	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
RNCQ1206	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
Type/Code	P0	P1	P2	D0	T	Unit
RNCQ0201	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 ± 0.001 1.55 ± 0.03	0.017 ± 0.001 0.42 ± 0.02	inches mm
RNCQ0402	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	0.024 ± 0.001 0.60 ± 0.03	inches mm
RNCQ0603	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
RNCQ0805	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
RNCQ1206	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

Peel Force of Top Cover Tape - Paper Tape

The peel speed shall be about 300 mm/minute ± 5%
The peel force of top cover tape shall be between 8 to 60 gf

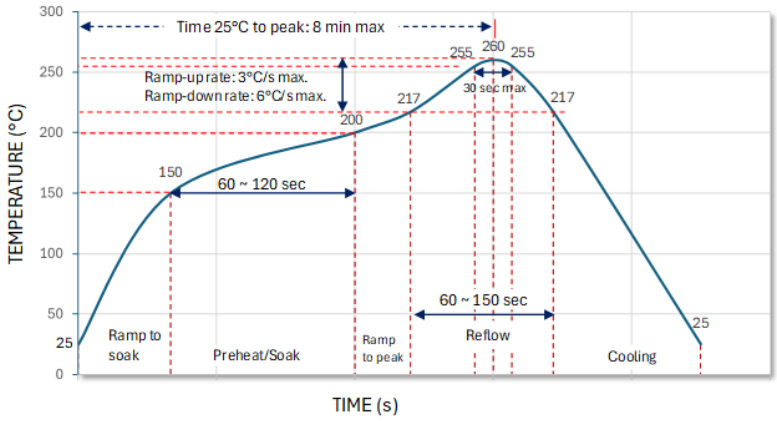


Recommended Solder Pad



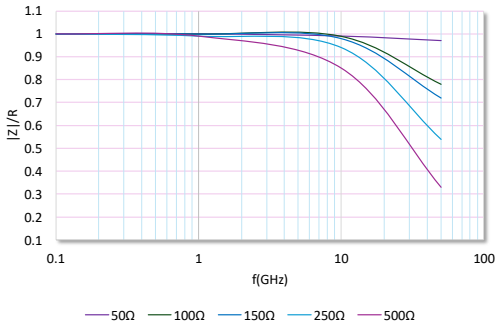
Type/Code	A	B	C	Unit
RNCQ0201	0.010 0.25	0.012 0.30	0.016 ± 0.008 0.40 ± 0.20	inches mm
RNCQ0402	0.020 0.50	0.020 0.50	0.024 ± 0.008 0.60 ± 0.20	inches mm
RNCQ0603	0.031 0.80	0.039 1.00	0.035 ± 0.008 0.90 ± 0.20	inches mm
RNCQ0805	0.039 1.00	0.039 1.00	0.053 ± 0.008 1.35 ± 0.20	inches mm
RNCQ1206	0.079 2.00	0.045 1.15	0.067 ± 0.008 1.70 ± 0.20	inches mm

Recommended Resistor Reflow Profile

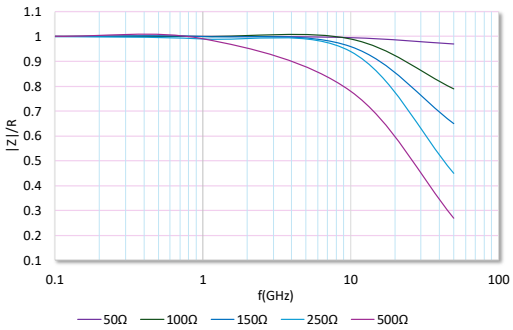


Number of reflow cyles allowed: 3 times

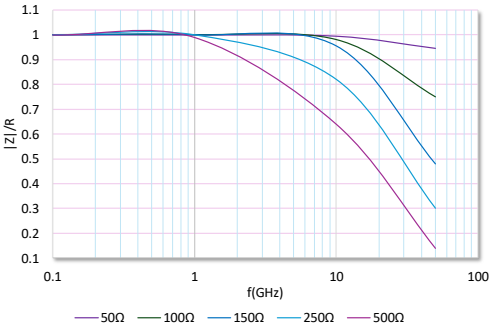
RNCQ0201 Impedance vs. Frequency



RNCQ0402 Impedance vs. Frequency

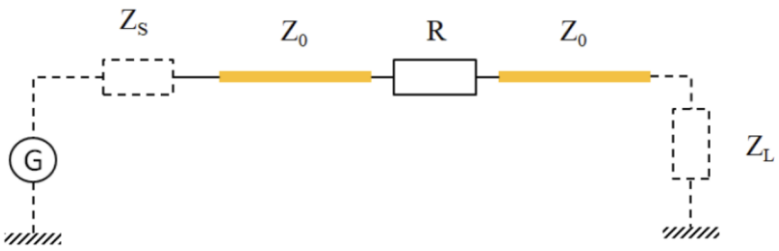


RNCQ0603 Impedance vs. Frequency

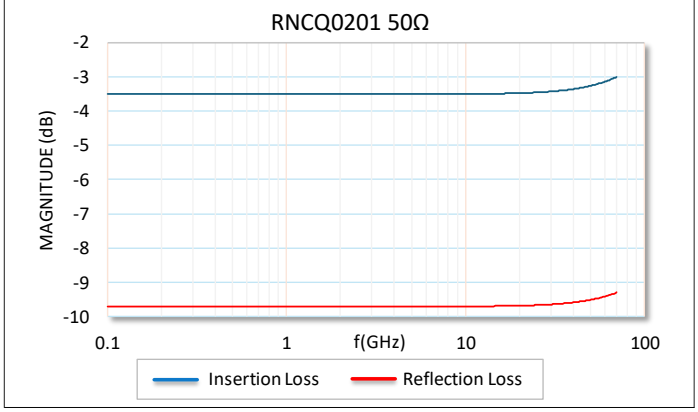


Impedance vs. Frequency information for other sizes and values may be available upon request. Contact Stackpole.

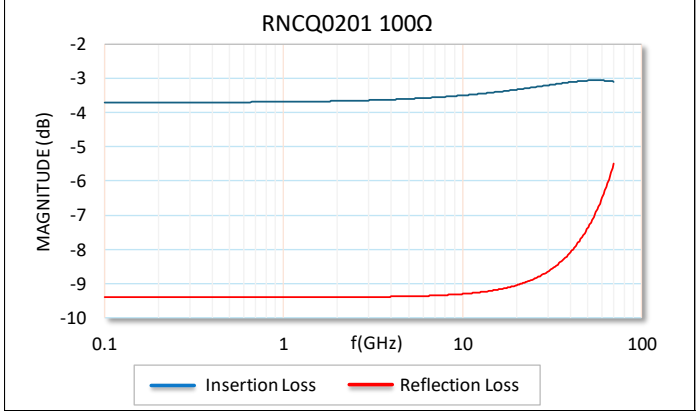
Equivalent Circuit for S-Parameters



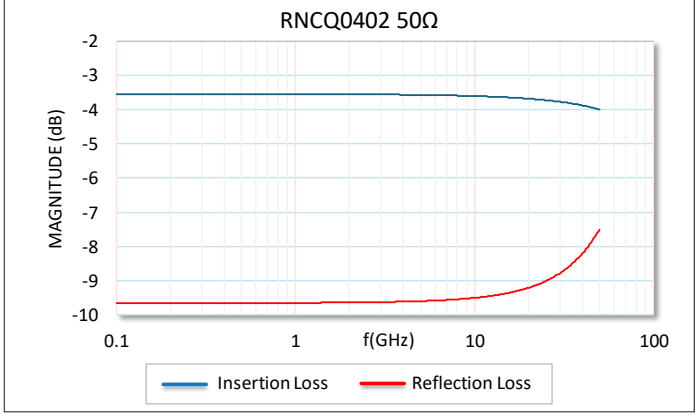
RNCQ0201 50Ω S-Parameter



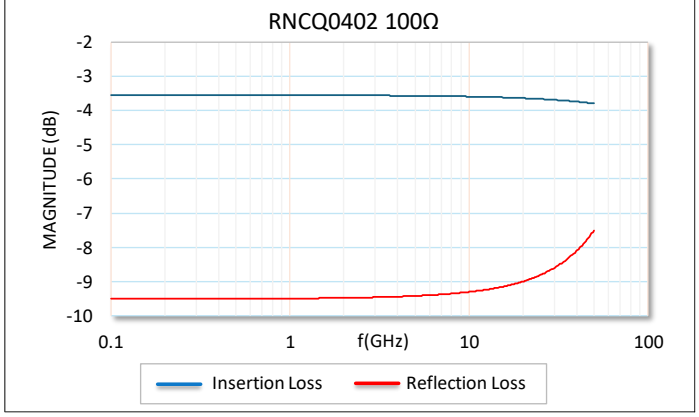
RNCQ0201 100Ω S-Parameter



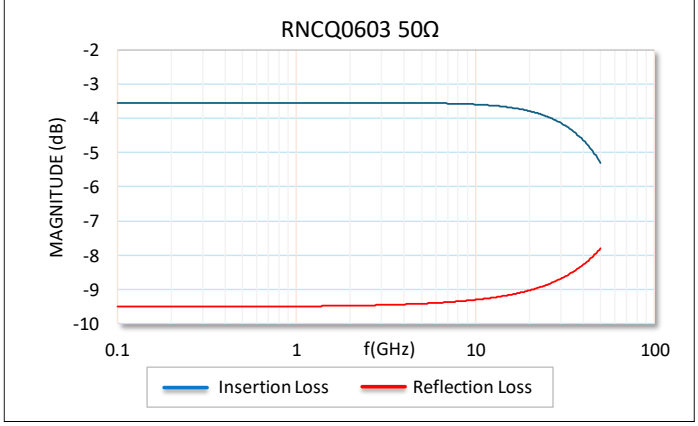
RNCQ0402 50Ω S-Parameter



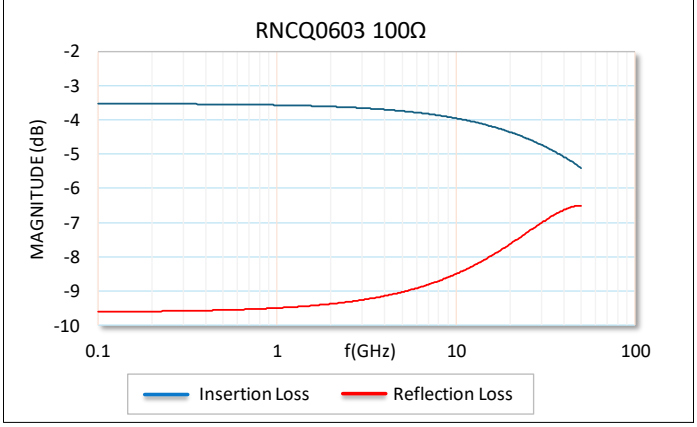
RNCQ0402 100Ω S-Parameter



RNCQ0603 50Ω S-Parameter



RNCQ0603 100Ω S-Parameter



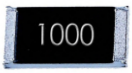
S-parameter information for other sizes and values may be available upon request. Contact Stackpole.

Part Marking Specifications

E96 and E24 Values 0805-1206

The nominal resistance is marked on the surface of the overcoating with the use of **four character markings**. Values below 100Ω will use "R" as the decimal holder.

10 Ω

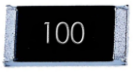


100 Ω

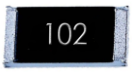
E24 Values 0603

The nominal resistance is marked on the surface of the overcoating with the use of **three character markings**.

Values that are both E24 and E96 follow E96 marking rules.



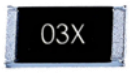
10 Ω



1 KΩ

E96 Values for 0603

A two character number is assigned to each standard R-Value (E96) as shown in the chart below.
This is followed by one alpha character which is used as a multiplier.
Each letter from "Y" - "F" represents a specific multiplier.



10.5 Ω

Alpha Character = Multiplier	
Y = 0.1	C = 1000
X = 1	D = 10000
A = 10	E = 100000
B = 100	F = 1000000

Chip Marking	Value
01B =	10.0 x 100 = 1 KΩ
25C =	17.8 x 1000 = 17.8 KΩ
93D =	90.9 x10000 = 909 KΩ

E96

#	R-Value	#	R-Value	#	R-Value	#	R-Value	#	R-Value	#	R-Value
01	10.0	**17**	14.7	**33**	21.5	**49**	31.6	**65**	46.4	**81**	68.1
02	10.2	**18**	15.0	**34**	22.1	**50**	32.4	**66**	47.5	**82**	69.8
03	10.5	**19**	15.4	**35**	22.6	**51**	33.2	**67**	48.7	**83**	71.5
04	10.7	**20**	15.8	**36**	23.2	**52**	34.0	**68**	49.9	**84**	73.2
05	11.0	**21**	16.2	**37**	23.7	**53**	34.8	**69**	51.1	**85**	75.0
06	11.3	**22**	16.5	**38**	24.3	**54**	35.7	**70**	52.3	**86**	76.8
07	11.5	**23**	16.9	**39**	24.9	**55**	36.5	**71**	53.6	**87**	78.7
08	11.8	**24**	17.4	**40**	25.5	**56**	37.4	**72**	54.9	**88**	80.6
09	12.1	**25**	17.8	**41**	26.1	**57**	38.3	**73**	56.2	**89**	82.5
10	12.4	**26**	18.2	**42**	26.7	**58**	39.2	**74**	57.6	**90**	84.5
11	12.7	**27**	18.7	**43**	27.4	**59**	40.2	**75**	59.0	**91**	86.6
12	13.0	**28**	19.1	**44**	28.0	**60**	41.2	**76**	60.4	**92**	88.7
13	13.3	**29**	19.6	**45**	28.7	**61**	42.2	**77**	61.9	**93**	90.9
14	13.7	**30**	20.0	**46**	29.4	**62**	43.2	**78**	63.4	**94**	93.1
15	14.0	**31**	20.5	**47**	30.1	**63**	44.2	**79**	64.9	**95**	95.3
16	14.3	**32**	21.0	**48**	30.9	**64**	45.3	**80**	66.5	**96**	97.6

Note: 0201 and 0402 resistors are not marked. E192 values that are not shared E96 or E24 values are not marked.

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
RNCQ	High Frequency Thin Film Chip Resistors	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. (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

R	N	C	Q	0	8	0	5	D	T	C	1	0	R	0

Product Series

Code	Description
RNCQ	High Frequency Thin Film Chip Resistor

Size

Code
0201
0402
0603
0805
1206

Tolerance

Code	Tol	Value
B	0.1%	E96, E24
C	0.25%	
D	0.5%	
F	1%	

Packaging

Code	Description	Size	Quantity
T	7" Reel Paper Tape	0201, 0402	10000
		0603, 0805, 1206	5000

TCR

Code	ppm
E	25
C	50

Resistance Value

Four characters with the multiplier used as the decimal holder.

10 ohm = 10R0
100 ohm = 100R
1 Kohm = 1K00