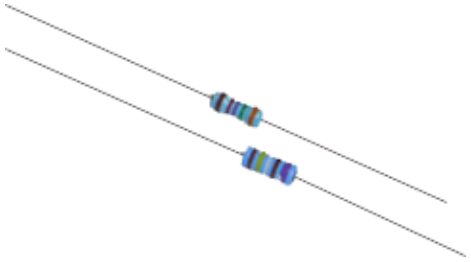
Features:



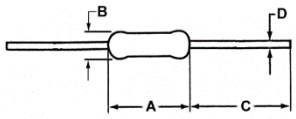
- Precision metal film
- Superior electrical, TCR performances
- Flame-retardant coatings are standard
- Panasert available (selected sizes: contact factory)
- RNMF (mini) an ideal choice where size constraints apply
- RNF 5% replaces MP series
- Lower or higher resistance values may be possible (contact factory)
- RoHS compliant, lead free and halogen free

Electrical Specifications

Type / Code	Mil Ref	Power Rating (W)	Maximum Working Voltage	Maximum Overload Voltage	TCR	Ohmic Range (Ω) and Tolerance						
						0.05%	0.1%	0.25%	0.5%	1%	2%	5%
RNF18	RN 50	0.125	200	400	± 10 ppm/ºC ± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	100 - 100 K	100 - 100 K 51.1 - 100 K	100 - 100 K	100 - 100 K 30.1 - 499 K 10 - 1 M	100 - 100 K 49.9 - 499 K 1 - 1M 1 - 10 M	- 1 - 22 M	
RNMF14	-	0.25	200	400	± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	-	100 - 100 K		30.1 - 499 K 10 - 1 M	30.1 - 499 K 1 - 1 M 1 - 2.15 M	- 1 - 2.2 M	
RNF14	RN 55	0.25	250	500	± 10 ppm/ºC ± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	100 - 100 K	100 - 100 K 1 - 2.2 M	-		10 - 1 M 1 - 5.11 M 1 - 10 M	- 5.6 - 10 M	- 1.1 M - 10 M 1 - 10 M
RNMF12	RL 07	0.5	350	600	± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	-	30.1 - 294 K 30.1 - 1 M		49.9 - 1 M 10 - 1 M	1 - 1M 1 - 10 M	- 1 - 10 M	
RNF12	RN 60	0.5	350	700	± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	100 - 100 K			49.9 - 499 K 10 - 1 M	1 - 4.99 M 1 - 10 M	- 1 - 10 M	
RNF1	RN 65	1	350	700	± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	-			- 10 - 1 M	10 - 470 K 1 - 1 M	-	- 10 - 470 K 1 - 1 M
RNF2	-	2	350	800	± 25 ppm/ºC ± 50 ppm/ºC ± 100 ppm/ºC	-				- 10 - 1 M	-	- 10 - 1 M

(1) Lesser of √PR or maximum working voltage

Mechanical Specifications

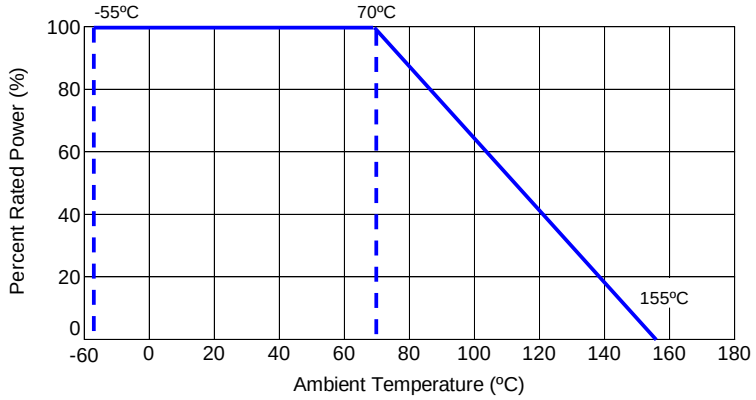


Type / Code	A Body Length	B Body Diameter	C Lead Length (Bulk)	D Lead Diameter	Unit
RNF18	0.130 ± 0.012 3.30 ± 0.30	0.071 ± 0.012 1.80 ± 0.30	1.102 ± 0.118 28.00 ± 3.00	0.018 ± 0.003 0.45 ± 0.07	inches mm
RNMF14	0.130 ± 0.012 3.30 ± 0.30	0.070 ± 0.003 1.78 ± 0.08	1.102 ± 0.118 28.00 ± 3.00	0.017 ± 0.002 0.44 ± 0.05	inches mm
RNF14	0.250 ± 0.026 6.35 ± 0.65	0.093 ± 0.010 2.35 ± 0.25	1.102 ± 0.118 28.00 ± 3.00	0.022 ± 0.003 0.56 ± 0.08	inches mm
RNMF12	0.250 ± 0.026 6.35 ± 0.65	0.093 ± 0.010 2.35 ± 0.25	1.102 ± 0.118 28.00 ± 3.00	0.022 ± 0.003 0.56 ± 0.08	inches mm
RNF12	0.344 ± 0.030 8.75 ± 0.75	0.108 ± 0.039 2.75 ± 1.00	1.102 ± 0.197 28.00 ± 5.00	0.026 ± 0.004 0.65 ± 0.10	inches mm
RNF1 (< 10 Ω)	0.453 ± 0.039 11.50 ± 1.00	0.177 ± 0.020 4.50 ± 0.50	1.378 ± 0.079 35.00 ± 2.00	0.031 ± 0.001 0.78 ± 0.03	inches mm
RNF1 (≥ 10 Ω)	0.433 ± 0.039 11.00 ± 1.00	0.177 ± 0.020 4.50 ± 0.50	1.181 ± 0.118 30.00 ± 3.00	0.030 ± 0.002 0.75 ± 0.05	inches mm
RNF2	0.591 ± 0.039 15.00 ± 1.00	0.197 ± 0.020 5.00 ± 0.50	1.339 ± 0.157 34.00 ± 4.00	0.028 ± 0.004 0.70 ± 0.10	inches mm

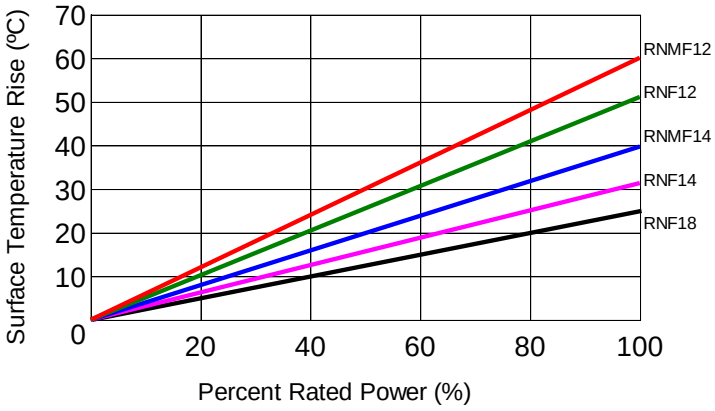
Performance Characteristics			
Test	Test Method	Typical Results	Test Limits
Insulation Resistance	JIS C5201-1, IEC60115-1, 4.6	≥ 1000 MΩ	≥ 1000 MΩ
Voltage Proof / DWV		RNF16 / RNMF14: 300 RNF14 / RNMF12: 500 RNF12 / RNF1: 700	≤ ± (0.5% + 0.05 Ω) No mechanical damage
Short Time Overload	JIS C5201-1, IEC60115-1, 4.13	< ± 0.1%	≤ ± (0.25% + 0.05 Ω)
Resistance to Solder Heat	JIS C5201-1, IEC60115-1, 4.18	< ± 0.1%	≤ ± (0.3% + 0.05 Ω)
Rapid Change of Temperature	JIS C5201-1, IEC60115-1, 4.19	< ± 0.05%	≤ ± (0.35% + 0.05 Ω)
Endurance at 70 °C	JIS C5201-1, IEC60115-1, 4.25.1	< ± 0.15%	≤± (1.0% + 0.05 Ω)
Robustness of Terminations	JIS C5201-1, IEC60115-1, 4.16	< ± 0.10%	≤ ± (0.2% + 0.05 Ω)
Damp Heat (Steady state)	JIS C5201-1, IEC60115-1, 4.24	< ± 0.10%	≤ ± (1.5% + 0.05 Ω)

Operating Temperature Range: -55 ºC to +155 ºC

Power Derating Curve:



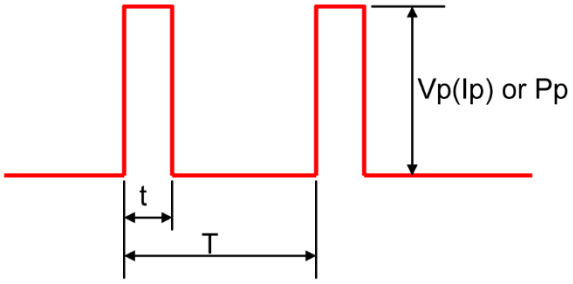
Surface Temperature Rise:



Repetitive Pulse Information:

If repetitive pulses are applied to resistors, pulse wave form must be less than "pulse limiting voltage", "pulse limiting current" or "pulse limiting wattage" calculated by the formula below.

$Vp = K\sqrt{P \times R \times T / t}$
$Ip = K\sqrt{P / R \times T / t}$
$Pp = K^2 \times P \times T / t$

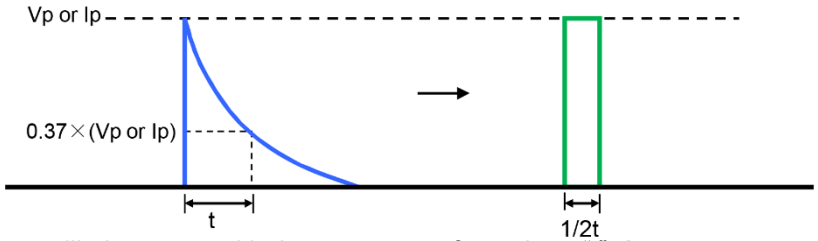


Where: Vp: Pulse limiting voltage (V)
Ip: Pulse limiting current (A)
Pp: Pulse limiting wattage (W)
P: Power rating (W)
R: Nominal resistance (ohm)
T: Repetitive period (sec)
t: Pulse duration (sec)
K: RNF / RNMF Coefficient: 0.7
[Vr: Rated Voltage (V), Ir: Rated Current (A)]

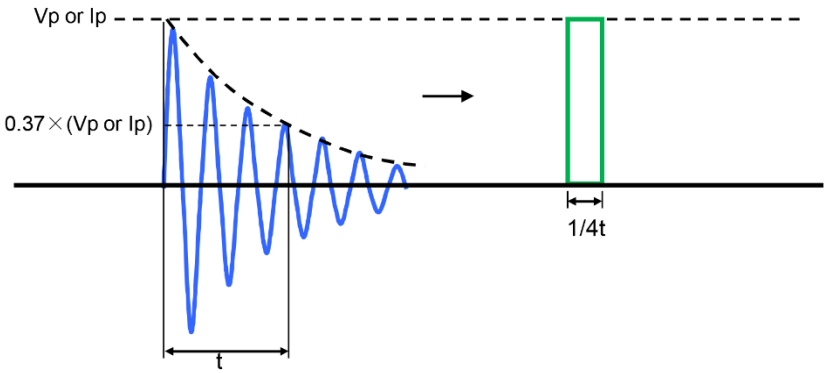
Note 1: If T > 10 → T = 10 (sec), T / t > 1000 → T / t = 1000
Note 2: If T > 10 and T / t > 1000, "Pulse Limiting power (Single pulse) is applied
Note 3: If Vp < Vr (Ip < Ir or Pp < P), Vr (Ir, P) is Vp (Ip, Pp)
Note 4: Pulse limiting voltage (current, wattage) is applied at less than rated ambient temperature. If ambient temperature is more than the rated temperature (70 °C), decrease power rating according to "Power Derating Curve"
Note 5: Assure sufficient margin for use period and conditions for "pulse limiting voltage"
Note 6: If the pulse waveform is not square wave, judge after transform the waveform into square wave according to the "Waveform Transformation to Square Wave".

Waveform Transformation to Square Wave

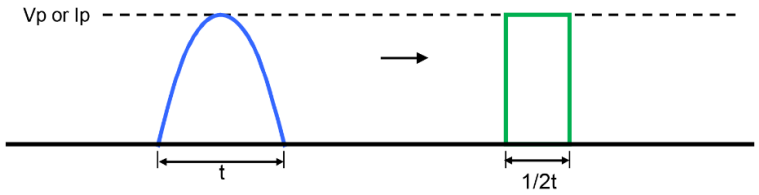
1. Discharge curve wave with time constant "t" → Square wave



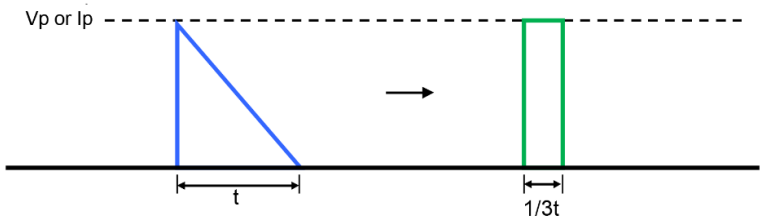
2. Damping oscillation wave with time constant of envelope "t" → Square wave



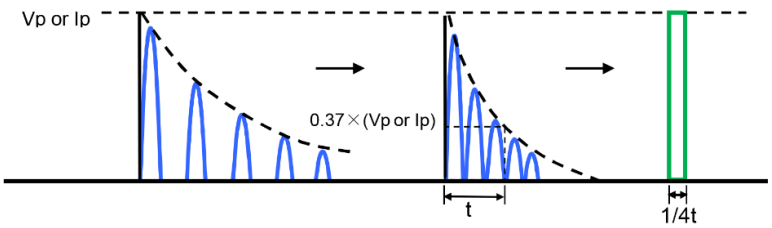
3. Half-wave rectification wave → Square wave



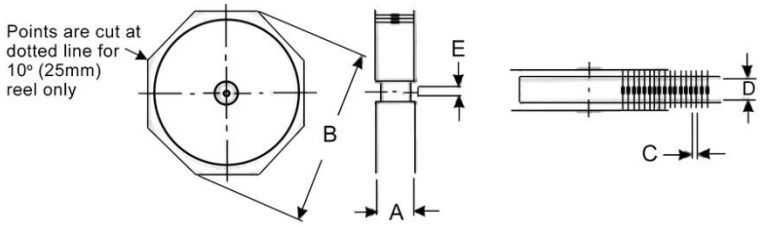
4. Triangular wave → Square wave



5. Special wave → Square wave



Packaging Specifications



Series	A max (1)	B max	C	D (2)	Tape	Unit
RNF18	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm
RNMF14	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm
RNF14	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm
RNMF12	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm
RNF12	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm
RNF1	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm
RNF2	2.756 ± 0.118 70.00 ± 3.00	11.811 ± 0.197 300.00 ± 5.00	0.197 ± 0.020 5.00 ± 0.50	2.047 ± 0.020 52.00 ± 0.50	0.250 6.35	inches mm

Dimension "E": This is a non-critical dimension that does not have a tolerance in the standard.
Range of diameters is from 0.547 inches (13.90 mm) to 1.500 inches (38.10 mm).

(1) Reference value only. The "A" dimension shall be governed by the overall length of the taped component.
The distance between flanges shall be 0.059 inches (1.50 mm) to 0.315 (8.00 mm) greater than the overall component.

(2) The given dimension "D" expresses the standard width spacing. A 26mm narrow spacing is available as option "N" packaging code.

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 2). 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.

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)
RNF	General Purpose Metal Film Leaded Resistor	Axial	YES	99.3/0.7 Sn/Cu 100% Matte Sn	Apr-05 (Japan) Jan-04 (Taiwan, China)	05/14 04/01
RNMF	General Purpose Mini Metal Film Leaded Resistor	Axial	YES	99.3/0.7 Sn/Cu 100% Matte Sn	Apr-05 (Japan) Jan-04 (Taiwan, China)	05/14 04/01

"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

1	2	3	4	5	6	7	8	9	10	11	12
R	N	F	1	4	F	T	D	4	K	7	5

Product Series

Code	Description
RNF	Standard
RNMF	Mini
PRNF	Panasert RoHS

Power Rating

Code	Power
18	0.125 W
14	0.25 W
12	0.5 W
1	1 W
2	2 W

Tolerance

Code	Tol	Value
A	0.05%	E96, E24
B	0.1%	
C	0.25%	
D	0.5%	
F	1%	
G	2%	E24
J	5%	

Packaging

Code	Description	Size	Quantity
T	Tape and Reel	RNF18, RNF14 RNMF14, RNMF12	5000
		RNF12, RNF1	2500
		RNF2	1000
A	Ammo	RNF18, RNF14 RNMF14, RNMF12	5000 (*)
		RNF12	2000
		RNF1, RNF2	1000
B	Bulk	RNF18, RNF14, RNF12, RNF1, RNF2, RNMF12, RNMF14	1000

TCR

Code	ppm
T	10
E	25
C	50
D	100

Resistance Value

Four characters with the multiplier used as the decimal holder.

10 ohm = 10R0
10.2 K ohm = 10K2
1 M ohm = 1M00

(*) Precision metal film resistors with tolerances <1% may be available in smaller quantities. Contact factory for more details.