

RMAN Series

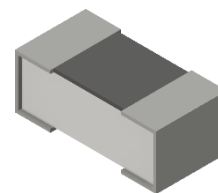
Thick Film High Power Aluminum Nitride Substrate
Chip Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

Features:

- Thick film technology on aluminum nitride substrate
- High power ratings
- High stability
- RoHS compliant, REACH compliant, and halogen free

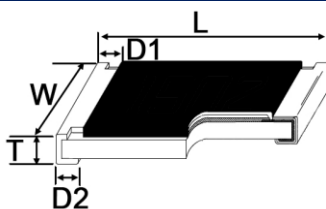


Electrical Specifications

Type/Code	Power Rating (W) @ 70°C	Max. Working Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
				1%	5%
RMAN0603	1.5	$\sqrt{P \cdot R}$	± 150	18, 50, 100 ^(*)	
RMAN1206	2.4	$\sqrt{P \cdot R}$	± 150	10 - 2K	
RMAN2512	3.5	$\sqrt{P \cdot R}$	± 150	3 - 2K	

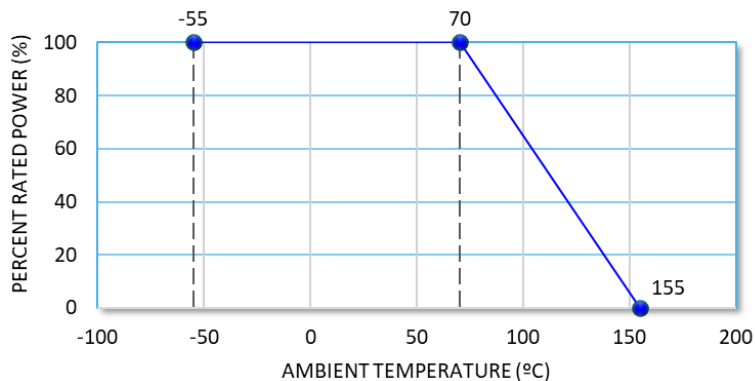
(*) Other values under development. Contact Stackpole for more information.

Mechanical Specifications



Type/Code	L Body Length	W Body Width	T Body Height	D1 Top Termination	D2 Bottom Termination	Unit
RMAN0603	0.063 ± 0.005 1.60 ± 0.13	0.031 ± 0.005 0.80 ± 0.13	0.018 ± 0.005 0.45 ± 0.13	0.012 ± 0.005 0.30 ± 0.13	0.023 ± 0.005 0.58 ± 0.13	inches mm
RMAN1206	0.122 ± 0.005 3.10 ± 0.13	0.060 ± 0.005 1.52 ± 0.13	0.020 ± 0.005 0.51 ± 0.13	0.015 ± 0.005 0.38 ± 0.13	0.048 ± 0.005 1.22 ± 0.13	inches mm
RMAN2512	0.250 ± 0.005 6.35 ± 0.13	0.124 ± 0.005 3.15 ± 0.13	0.020 ± 0.005 0.51 ± 0.13	0.024 ± 0.010 0.60 ± 0.25	0.106 ± 0.004 2.70 ± 0.10	inches mm

Power Derating Curve:

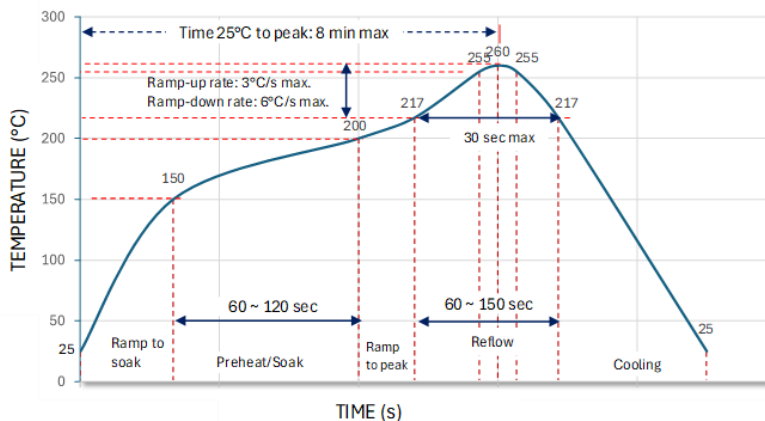


Performance Characteristics

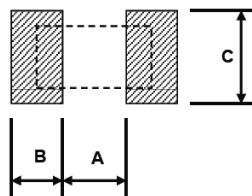
Test	Test Specifications	Typical	Test Method
Temperature Coefficient of Resistance (TCR)	As per specification	$\pm 120 \text{ ppm/}^\circ\text{C}$	JIS-C-5201-1 4.8, IEC-60115-1 4.8 At $25^\circ\text{C} / -55^\circ\text{C}$ and $25^\circ\text{C} / +125^\circ\text{C}$, 25°C is the reference temperature
Short Time Overload	$\pm 0.5\%$	$\pm 0.1\%$	0603: 4.4 W applied for 5 seconds 1206: 4.7 W applied for 5 seconds 2512: 7.7 W applied for 5 seconds
Endurance	$\pm 0.5\%$	$\pm 0.2\%$	JIS-C-5201-1 4.25, IEC-60115-1 4.25.1 $70 \pm 2^\circ\text{C}$, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
High Temperature Exposure	$\pm 0.5\%$	$\pm 0.1\%$	MIL-STD-202 Method 108 $+150^\circ\text{C}$ for 100 hours
Solderability	95% min. coverage	95% min. coverage	JIS-C-5201-1 4.17, IEC-60115-1 4.17 $245 \pm 5^\circ\text{C}$ for 3 seconds
Terminal Strength	No evidence of mechanical damage	No evidence of mechanical damage	0603 and 1206: 2 kg force applied 2512: 3 kg force applied
Moisture Resistance	$\pm 0.5\%$	$\pm 0.15\%$	$\geq 80\%$ R.H., 240 hours
Resistance to Soldering Heat	0603 = $\pm 0.2\%$ 1206, 2512 = $\pm 0.5\%$	$\pm 0.2\%$	MIL-STD-202 Method 210 $260 \pm 5^\circ\text{C}$ for 10 seconds

Operating temperature range is -55 to $+155^\circ\text{C}$

Recommended Resistor Reflow Profile



Recommended Solder Pad



Type/Code	A	B	C	Unit
RMAN0603	0.018 0.45	0.043 1.10	0.037 0.94	inches mm
RMAN1206	0.018 0.46	0.068 1.73	0.066 1.68	inches mm
RMAN2512	0.024 0.61	0.134 3.40	0.130 3.30	inches mm

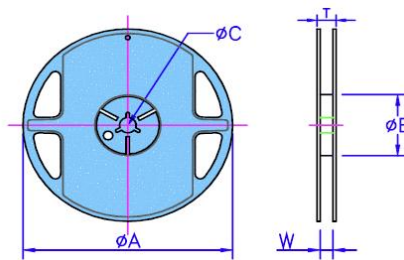
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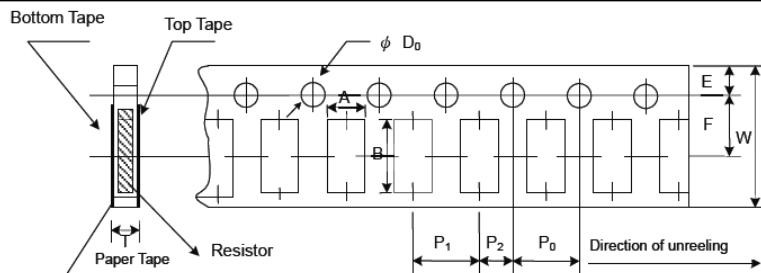
Resistive Product Solutions

Reel Specifications



Type/Code	Packaging Quantity	Tape Width	Reel Diameter	A	B	C	W	T	Unit
RMAN0603	Paper Tape 5000 pc	8 mm	7 inches	7.028 ± 0.059 178.50 ± 1.50	2.362 +0.039/-0 60.00 +1.00/-0	0.512 ± 0.008 13.00 ± 0.20	0.354 ± 0.020 9.00 ± 0.50	0.492 ± 0.020 12.50 ± 0.50	inches mm
RMAN1206	Paper Tape 5000 pc	8 mm	7 inches	7.028 ± 0.059 178.50 ± 1.50	2.362 +0.039/-0 60.00 +1.00/-0	0.512 ± 0.008 13.00 ± 0.20	0.354 ± 0.020 9.00 ± 0.50	0.492 ± 0.020 12.50 ± 0.50	inches mm
RMAN2512	Plastic Tape 4000 pc	12 mm	7 inches	7.028 ± 0.059 178.50 ± 1.50	2.362 +0.039/-0 60.00 +1.00/-0	0.512 ± 0.020 13.00 ± 0.50	0.512 ± 0.020 13.00 ± 0.50	0.610 ± 0.020 15.50 ± 0.50	inches mm

Taping Specifications - Paper Tape



Type/Code	A	B	W	E	F	Unit
RMAN0603	0.043 ± 0.004 1.10 ± 0.10	0.075 ± 0.004 1.90 ± 0.10	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
RMAN1206	0.075 ± 0.004 1.90 ± 0.10	0.138 ± 0.008 3.50 ± 0.20	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
Type/Code	P0	P1	P2	D0	T	
RMAN0603	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.002 4.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.039/-0 1.50 +1.00/-0	0.028 ± 0.004 0.70 ± 0.10	inches mm
RMAN1206	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.002 4.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.039/-0 1.50 +1.00/-0	0.033 ± 0.004 0.85 ± 0.10	inches mm

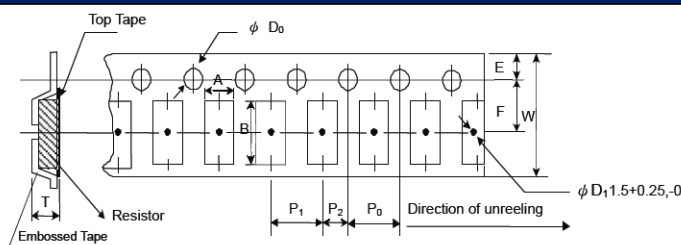
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Taping Specifications - Plastic Tape



Type/Code	A	B	W	E	F	Unit
RMAN2512	0.138 ± 0.004 3.50 ± 0.10	0.264 ± 0.004 6.70 ± 0.10	0.472 ± 0.012 12.00 ± 0.30	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	inches mm
	P0	P1	P2	D0	T	Unit
	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.039/-0 1.50 +1.00/-0	0.047 ⁺⁰ 1.20 ⁺⁰	inches mm

Part Marking Specifications

Part is unmarked.

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
RMAN	Thick Film High Power Aluminum Nitride Substrate	SMD	YES ⁽¹⁾	100% Matte Sn over Ni

Note (1): RoHS compliant by means of exemption 7c-I.

"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.

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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	M	A	N	1	2	0	6	F	T	1	0	R	0
Product Series		Size		Tolerance			Packaging				Resistance Value		
Code		Size	W	Code	Tol	Value	Code	Description	Size	Quantity	Four characters with the multiplier used as the decimal holder.		
RMAN		0603	1.5	F	1%	E96, E24	T	Paper Tape	0603	5000	3 ohm = 3R00		
		1206	2.4	J	5%	E24		Plastic Tape	1206		10 ohm = 10R0		
		2512	3.5						2512	4000	18 ohm = 18R0		
											100 ohm = 100R		
											2 Kohm = 2K00		