

Features:

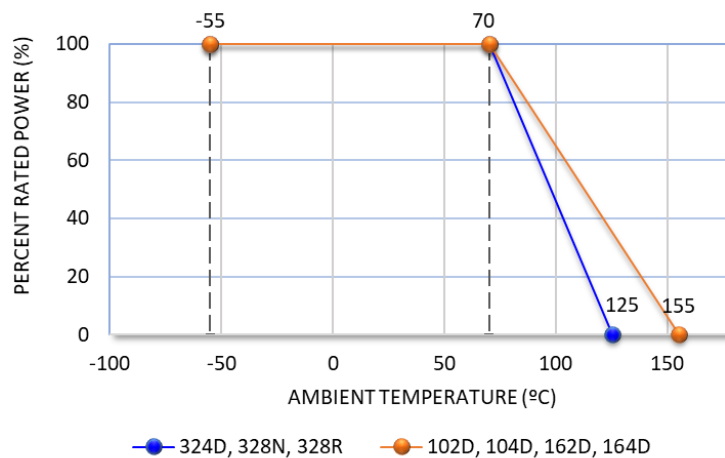
- Square corner construction standard
- RAVF 324D is standard with scalloped corner
- RoHS compliant, REACH compliant and halogen free
- Sizes 102D, 104D and 164D are AEC-Q200 compliant



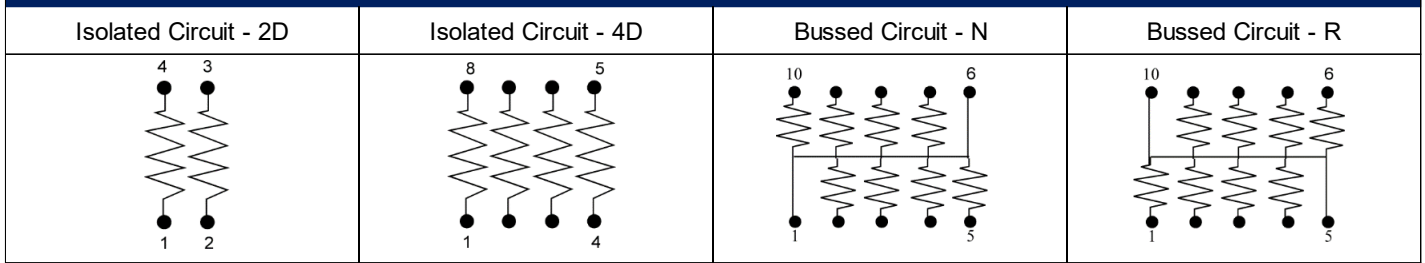
Electrical Specifications						
Type/Code, # of Elements, Circuit Type	Power Rating (W) (per element) @ 70°C	Maximum Working Voltage (V) ⁽¹⁾	Maximum Overload Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
					1%	2%, 5%
RAVF102D	0.063	25	50	± 400	-	1 - 9.1
	Jumper: 1A			± 200	10 - 1M	
RAVF104D	0.063	25	50	± 400	-	1 - 9.1
	Jumper: 1A			± 200	10 - 1M	
RAVF162D	0.063	50	100	± 200	10 - 1M	1 - 1M
	Jumper: 1A			-	-	0.05 max
RAVF164D	0.1	50	100	± 400	-	1 - 9.1
	Jumper: 1A			± 200	10 - 1M	10 - 1M
RAVF324D	0.125	200	400	± 200	22 - 1M	10 - 1M
RAVF328N	0.063	25	50	± 200	-	22 - 1M
RAVF328R	0.063	25	50	± 200	-	22 - 1M

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

Power Derating Curve:

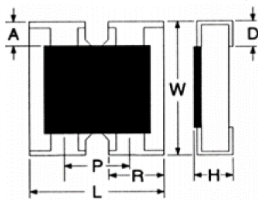


Schematics

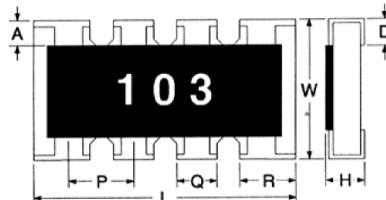


Terminations

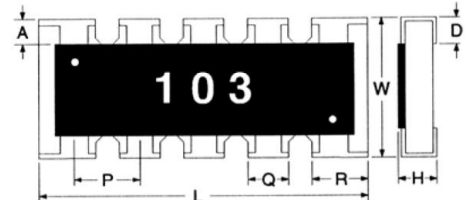
RAVF - 2 Resistors / 4 Terminations (D)



RAVF - 4 Resistors / 8 Terminations (D)



RAVF - 8 Resistors / 10 Terminations (N/R)



Mechanical Specifications

Type/Code # of Elements Circuit Type	L Body Length	W Body Width	H Body Height	P Element Spacing	Q Termination Width	R Termination Width	D Bottom Termination	A Top Termination	Unit
RAVF102D	0.039 ± 0.004 1.00 ± 0.10	0.039 ± 0.004 1.00 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	0.026 ± 0.039 0.67 ± 1.00	- -	0.013 ± 0.004 0.34 ± 0.10	0.010 ± 0.039 0.25 ± 1.00	0.006 ± 0.004 0.15 ± 0.10	Inches mm
RAVF104D	0.079 ± 0.008 2.00 ± 0.20	0.039 ± 0.006 1.00 ± 0.15	0.014 ± 0.006 0.35 ± 0.15	0.020 ± 0.006 0.50 ± 0.15	0.012 ± 0.004 0.30 ± 0.10	0.017 ± 0.004 0.43 ± 0.10	0.008 ± 0.006/-0.004 0.20 ± 0.15/-0.10	0.008 ± 0.004 0.20 ± 0.10	Inches mm
RAVF162D	0.063 ± 0.006 1.60 ± 0.15	0.063 ± 0.006 1.60 ± 0.15	0.020 ± 0.006 0.50 ± 0.15	0.031 ± 0.002 0.80 ± 0.05	- -	0.024 ± 0.006 0.60 ± 0.15	0.012 ± 0.006 0.30 ± 0.15	0.012 ± 0.006 0.30 ± 0.15	Inches mm
RAVF164D	0.126 ± 0.008 3.20 ± 0.20	0.063 ± 0.008 1.60 ± 0.20	0.020 ± 0.004 0.50 ± 0.10	0.031 ± 0.008 0.80 ± 0.20	0.020 ± 0.006 0.50 ± 0.15	0.024 ± 0.006 0.61 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	Inches mm
RAVF324D	0.201 ± 0.009 5.10 ± 0.22	0.122 ± 0.008 3.10 ± 0.20	0.022 ± 0.006 0.55 ± 0.15	0.051 ± 0.008 1.30 ± 0.20	0.031 ± 0.008 0.80 ± 0.20	0.031 ± 0.008 0.80 ± 0.20	0.022 ± 0.012 0.55 ± 0.30	0.020 ± 0.008 0.50 ± 0.20	Inches mm
RAVF328N	0.126 ± 0.006 3.20 ± 0.15	0.063 ± 0.006 1.60 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.025 ± 0.002 0.64 ± 0.05	0.013 ± 0.006 0.34 ± 0.15	0.019 ± 0.006 0.49 ± 0.15	0.010 ± 0.006 0.25 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	Inches mm
RAVF328R	0.126 ± 0.006 3.20 ± 0.15	0.063 ± 0.006 1.60 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.025 ± 0.002 0.64 ± 0.05	0.013 ± 0.006 0.34 ± 0.15	0.019 ± 0.006 0.49 ± 0.15	0.010 ± 0.006 0.25 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	Inches mm

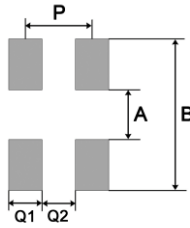
Performance Characteristics

Test	Test Result (JIS C 5202)
Load Life in Moisture	±3%
Temperature cycle	±1%
Load Life	±3%
Resistance to Soldering heat	±1%
Terminal Adhesion	±1%
Short Time Overload	±2%

Operating temperature range is -55 to +155°C, except for RAVF328N and RAVF328R

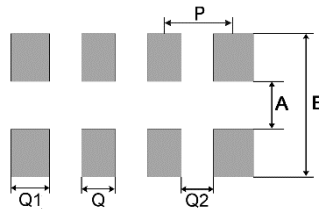
Operating temperature range for RAVF328N and RAVF328R is -55°C to +125°C

Recommended Pad Layout - 102D/162D



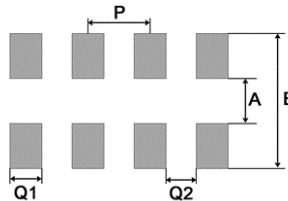
Type/Code	A	B	P	Q1	Q2	Unit
RAVF102D	0.020 0.50	0.079 2.00	0.026 0.67	0.013 0.33	0.013 0.34	Inches mm
RAVF162D	0.039 1.00	0.102 2.60	0.031 0.80	0.016 0.40	0.016 0.40	Inches mm

Recommended Pad Layout - 104D



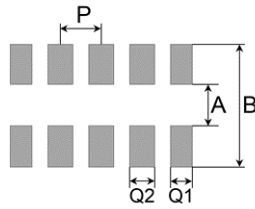
Type/Code	A	B	P	Q	Q1	Q2	Unit
RAVF104D	0.020 0.50	0.079 2.00	0.020 0.50	0.012 0.30	0.016 0.40	0.008 0.20	Inches mm

Recommended Pad Layout - 164D/324D



Type/Code	A	B	P	Q1	Q2	Unit
RAVF164D	0.039 1.00	0.102 2.60	0.031 0.80	0.016 0.40	0.016 0.40	Inches mm
RAVF324D	0.079 2.00	0.187 4.75	0.051 1.30	0.035 0.90	0.015 0.38	Inches mm

Recommended Pad Layout - 328R



Type/Code	A	B	P	Q1	Q2	Unit
RAVF328R	0.031 0.80	0.122 3.10	0.025 0.64	0.013 0.34	0.018 0.45	Inches mm

Recommended Solder Profile

This information is intended as a reference for solder profiles for Stackpole resistive components. These profiles should be compatible with most soldering processes. These are only recommendations. Actual numbers will depend on board density, geometry, packages used, etc., especially those cells labeled with “*”.

100% Matte Tin / RoHS Compliant Terminations

Soldering iron recommended temperatures: 330 to 350°C with minimum duration.
Maximum number of reflow cycles: 3.

Wave Soldering

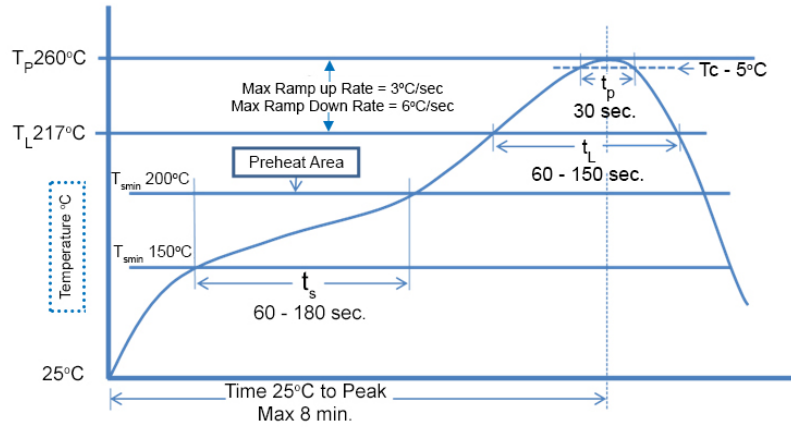
Description	Maximum	Recommended	Minimum
Preheat Time	80 seconds	70 seconds	60 seconds
Temperature Diff.	140°C	120°C	100°C
Solder Temp.	260°C	250°C	240°C
Dwell Time at Max.	10 seconds	5 seconds	*
Ramp DN (°C/sec)	N/A	N/A	N/A

Temperature Diff. = Difference between final preheat stage and soldering stage.

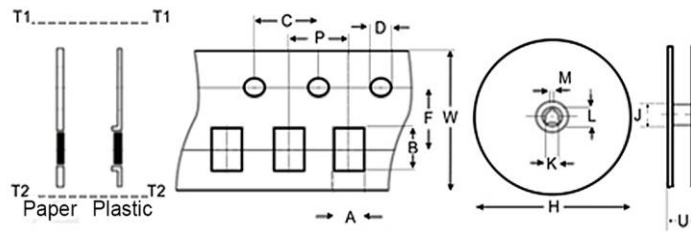
Convection IR Reflow

Description	Maximum	Recommended	Minimum
Ramp Up (°C/sec)	3°C/sec	2°C/sec	*
Dwell Time > 217°C	150 seconds	90 seconds	60 seconds
Solder Temp.	260°C	245°C	*
Dwell Time at Max.	30 seconds	15 seconds	10 seconds
Ramp DN (°C/sec)	6°C/sec	3°C/sec	*

Recommended Resistor Reflow Profile



Packaging Specifications



Symbol	Description	Paper Tape					Plastic Tape	Unit
		102D	104D	162D	164D	328N/328R	324D	
A	Pocket Width	0.049 ± 0.004 1.25 ± 0.10	0.047 ± 0.004 1.20 ± 0.10	0.075 ± 0.004 1.90 ± 0.10	0.075 ± 0.008 1.90 ± 0.20	0.079 ± 0.008 2.00 ± 0.20	0.134 ± 0.008 3.40 ± 0.20	inches mm
B	Pocket Length	0.049 ± 0.004 1.25 ± 0.10	0.087 ± 0.004 2.20 ± 0.10	0.075 ± 0.004 1.90 ± 0.10	0.138 ± 0.008 3.50 ± 0.20	0.142 ± 0.008 3.60 ± 0.20	0.220 ± 0.008 5.60 ± 0.20	inches mm
C	Pin Spacing	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm
D	Pin Diameter	0.059 ± 0.004 1.50 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	0.061 ± 0.004 1.55 ± 0.10	0.061 ± 0.004 1.55 ± 0.10	inches mm
F	Pin-Pocket C/L	0.138 ± 0.002 3.50 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	0.138 ± 0.002 3.50 ± 0.05	0.217 ± 0.002 5.50 ± 0.05	inches mm
H	Reel Diameter	7.008 ± 0.079 178.00 ± 2.00	7.008 ± 0.079 178.00 ± 2.00	7.008 ± 0.079 178.00 ± 2.00	7.008 ± 0.079 178.00 ± 2.00	7.008 ± 0.079 178.00 ± 2.00	7.008 ± 0.079 178.00 ± 2.00	inches mm
J	Hub Diameter	2.362 ± 0.039 60.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	inches mm
K	Hole Diameter	0.531 ± 0.039 13.50 ± 1.00	0.531 ± 0.039 13.50 ± 1.00	0.531 ± 0.039 13.50 ± 1.00	0.531 ± 0.039 13.50 ± 1.00	0.531 ± 0.039 13.50 ± 1.00	0.531 ± 0.039 13.50 ± 1.00	inches mm
L	Key Diameter	0.827 ± 0.039 21.00 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	inches mm
M	Key Width	0.079 ± 0.039 2.00 ± 1.00	0.079 ± 0.039 2.00 ± 1.00	0.079 ± 0.039 2.00 ± 1.00	0.079 ± 0.039 2.00 ± 1.00	0.079 ± 0.039 2.00 ± 1.00	0.079 ± 0.039 2.00 ± 1.00	inches mm
P	Pocket Spacing	0.079 ± 0.004 2.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm
T1	Strip Thickness	-	-	-	-	-	0.010 ± 0.002 0.25 ± 0.05	inches mm
T2	Total Thickness	0.018 ± 0.004 0.45 ± 0.10	0.024 ± 0.004 0.60 ± 0.10	0.024 ± 0.004 0.61 ± 0.10	0.030 ± 0.004 0.75 ± 0.10	0.055 max 1.40 max	0.039 ± 0.004 1.00 ± 0.10	inches mm
U	Reel Outside Width	0.453 ± 0.079 11.50 ± 2.00	0.453 ± 0.079 11.50 ± 2.00	0.453 ± 0.079 11.50 ± 2.00	0.453 ± 0.079 11.50 ± 2.00	0.453 ± 0.079 11.50 ± 2.00	0.606 ± 0.039 15.40 ± 1.00	inches mm
W	Strip Width	0.315 ± 0.008 8.00 ± 0.20	0.315 ± 0.008 8.00 ± 0.20	0.315 ± 0.008 8.00 ± 0.20	0.315 ± 0.008 8.00 ± 0.20	0.315 ± 0.008 8.00 ± 0.20	0.472 ± 0.008 12.00 ± 0.20	inches mm

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	Lead-Free Mfg. Effective Date (Std Product Series)	Lead-Free Effective Date Code (YY/WW)
RAVF	Convex Termination Thick Film Chip Resistor Array	SMD	YES(1)	100% Matte Sn over Ni	Jan-04 (Japan) Jul-04 (Taiwan)	04/01 04/27

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

"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	A	V	F	1	6	4	D	J	T	1	0	K	0			
Product Series		Size		Tolerance ⁽¹⁾			Packaging				Resistance Value					
Code	Description	Code	W	Code	Tol	Value	Code	Description	Size	Quantity	Four characters with the multiplier used as the decimal holder. 10 ohm = 10R0 10.2 Kohm = 10K2 1 Mohm = 1M00 Zero ohm jumper = 0R00					
RAVF	Convex Termination	102D	0.063	F	1%	E24	T	Paper Tape	102D, 104D	10000						
		104D	0.063	G	2%				162D, 164D	5000						
		162D	0.063	J	5%		Plastic Tape	324D	4000							
		164D	0.1	Z	jumper											
		324D	0.125	Note (1): 1% tolerance is available in E24 values only. E96 values are generally not available. Contact Stackpole for details.												
		328N	0.063													
		328R	0.063													