

- Features:**
- WWS offers miniature size at higher power rating
 - High performance for low cost
 - High power to size ratio
 - MWW/NMWW – completely molded construction with welded terminations
 - Complete welded terminations
 - Tinned copper leads
 - Available in non-inductive styles
 - Tighter tolerances may be available for non-inductive styles. Contact Stackpole with requirements.
 - High temperature silicone coating
 - RoHS compliant
 - Higher operating temperatures available
 - "B" packaging code denotes bulk packaging - contact Stackpole for package quantities



Electrical Specifications – WW, WWS, MWW								
Type / Code	MIL-R-26 Ref.	Power Rating (W) @ 125°C	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance (*)			
					0.1%	0.5%	1%	5%
WW12	-	0.4 W	0.5 W	$< 1\Omega = \pm 90\text{ppm}/^\circ\text{C}$ $1\Omega \text{ to } 10\Omega = \pm 50\text{ppm}/^\circ\text{C}$ $> 10\Omega = \pm 20\text{ppm}/^\circ\text{C}$	5 - 2K	3 - 2K	5 - 2K	
WW1	-	1 W	1.1 W		2 - 3K			
WW1A	RW-70	1 W	1.3 W		1 - 5K			
WW2	RW-69	1.5 W	2.1 W		1 - 10K	0.5 - 10K		
WWS2	-	2.5 W	2.6 W		1 - 10K	0.5 - 10K		
WW2A	-	2.5 W	2.6 W		1 - 10K	0.5 - 10K		
WW3	RW-79	3 W	3.2 W		1 - 22K	0.5 - 22K		
WWS3	-	3 W	3.2 W		3 - 10K	1 - 10K		
WW3A	-	3 W	3.4 W		1 - 30K	0.5 - 30K		
WW4	-	4 W	4.3 W		1 - 40K	0.5 - 40K		
WWS4	RW-79	4 W	4.3 W		1 - 22K	0.5 - 22K		
WW5	RW-67, RW-74	5 W	5.1 W		1 - 50K	0.5 - 50K		
WWS5	-	5 W	5.1 W		1 - 40K	0.5 - 40K		
WW7	-	6.5 W	7.2 W		1 - 70K	0.5 - 70K		
WWS7	RW-67, RW-74	6.5 W	7.2 W		1 - 50K	0.5 - 50K		
WW7B	-	7 W	7.7 W		1 - 70K	0.5 - 70K		
WW10	RW-78	10 W	11 W		1 - 100K	0.5 - 100K		
WWS10	-	10 W	11 W		1 - 70K	0.5 - 70K		
MWW1	RW-70	1 W	1.3 W			5 - 2K		
MWW3	RW-79	3 W	3.2 W			3 - 20K		
MWW5	RW-67, RW-74	5 W	5.5 W		2 - 40K			
MWW10	RW-68, RW-74	10 W	11 W		2 - 80K			

(*) Other resistance values available - contact factory for details.

Electrical Specifications – Non-Inductive Styles						
Type / Code	MIL-R-26 Ref.	Power Rating (W) @ 125°C	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance (*)	
					1%	5%
NWW12	-	0.4 W	0.5 W	$< 1\Omega = \pm 90\text{ppm}/^\circ\text{C}$ $1\Omega \text{ to } 10\Omega = \pm 50\text{ppm}/^\circ\text{C}$ $> 10\Omega = \pm 20\text{ppm}/^\circ\text{C}$	10 - 1K	
NWW1	-	1 W	1.1 W		2 - 1.5K	
NWW1A	RW-70	1 W	1.3 W		1 - 2.5K	
NWW2	RW-69	1.5 W	2.1 W		1 - 5K	
NWWS2	-	2.5 W	2.6 W		1 - 5K	
NWW2A	-	2.5 W	2.6 W		1 - 5K	
NWW3	RW-79	3 W	3.2 W		1 - 11K	
NWWS3	-	3 W	3.2 W		3 - 5K	
NWW3A	-	3 W	3.4 W		1 - 15K	
NWW4	-	4 W	4.3 W		1 - 20K	
NWWS4	RW-79	4 W	4.3 W		1 - 11K	
NWW5	RW-67, RW-74	5 W	5.1 W		1 - 25K	
NWWS5	-	5 W	5.1 W		1 - 20K	
NWW7	-	6.5 W	7.2 W		1 - 35K	
NWWS7	RW-67, RW-74	6.5 W	7.2 W		1 - 25K	
NWW7B	-	7 W	7.7 W		1 - 35K	

(*) Other resistance values available - contact factory for details.

Electrical Specifications – Non-Inductive Styles (cont.)

Type / Code	MIL-R-26 Ref.	Power Rating (W) @ 125°C	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance (*)	
					1%	5%
NWW10	RW-78	10 W	11 W	< 1Ω = ±90ppm/°C 1Ω to 10Ω = ± 50ppm/°C >10Ω = ±20ppm/°C	1 - 50K	
NWWS10	-	10 W	11 W		1 - 35K	
NMWW1	RW-70	1 W	1.3 W		5 - 1K	
NMWW3	RW-79	3 W	3.2 W		3 - 10K	
NMWW5	RW-67, RW-74	5 W	5.5 W		2 - 20K	
NMWW10	RW-68, RW-74	10 W	11 W		2 - 40K	

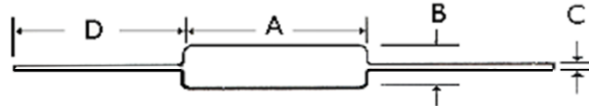
(*) Other resistance values available - contact factory for details.

Performance Characteristics

Test	Test Condition	Test Specification
Moisture Resistance	1000 hours, 95% R.H., 40°C	1% max
Load Life	1000 hours, cycled power 1.5 hours ON, 0.5 hours OFF, 25°C	1%
Temperature Cycling	5 cycles, -55°C to 200°C	0.5%
Short Time Overload	5 times rated power for 5 seconds	1%
Dielectric Withstand Voltage	Resistor leads are grounded and high potential probe is touched to the resistor body	500V for (N)WW12, 1, 1A and 2S. 1000V for all others

Operating Temperature Range: -55°C to +350°C

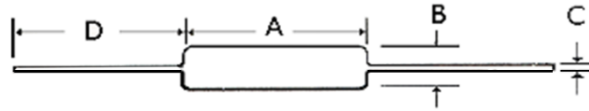
Mechanical Specifications



Type / Code	A	B	C	D (Bulk) ⁽¹⁾	Unit
WW12 / NWW12	0.312 ± 0.062	0.110 ± 0.031	0.025 ± 0.002	1.500 typ.	inches
	7.92 ± 1.57	2.79 ± 0.79	0.64 ± 0.05	38.10 typ.	mm
WW1, WWS2 / NWW1, NWWS2	0.375 ± 0.062	0.110 ± 0.031	0.025 ± 0.002	1.500 typ.	inches
	9.53 ± 1.57	2.79 ± 0.79	0.64 ± 0.05	38.10 typ.	mm
WW1A / NWW1A	0.420 ± 0.062	0.110 ± 0.031	0.025 ± 0.002	1.500 typ.	inches
	10.67 ± 1.57	2.79 ± 0.79	0.64 ± 0.05	38.10 typ.	mm
WW2, WWS3 / NWW2, NWWS3	0.370 ± 0.062	0.156 ± 0.031	0.032 ± 0.002	1.500 typ.	inches
	9.40 ± 1.57	3.96 ± 0.79	0.81 ± 0.05	38.10 typ.	mm
WW2A / NWW2A	0.550 ± 0.062	0.156 ± 0.031	0.032 ± 0.002	1.500 typ.	inches
	13.97 ± 1.57	3.96 ± 0.79	0.81 ± 0.05	38.10 typ.	mm
WW3, WWS4 / NWW3, NWWS4	0.560 ± 0.062	0.187 ± 0.031	0.032 ± 0.002	1.500 typ.	inches
	14.22 ± 1.57	4.75 ± 0.79	0.81 ± 0.05	38.10 typ.	mm
WW3A / NWW3A	0.500 ± 0.062	0.218 ± 0.031	0.032 ± 0.002	1.500 typ.	inches
	12.70 ± 1.57	5.54 ± 0.79	0.81 ± 0.05	38.10 typ.	mm
WW4, WWS5 / NWW4, NWWS5	0.700 ± 0.062	0.270 ± 0.031	0.036 ± 0.002	1.500 typ.	inches
	17.78 ± 1.57	6.86 ± 0.79	0.91 ± 0.05	38.10 typ.	mm
WW5, WWS7 / NWW5, NWWS7	0.875 ± 0.062	0.312 ± 0.031	0.036 ± 0.002	1.500 typ.	inches
	22.23 ± 1.57	7.92 ± 0.79	0.91 ± 0.05	38.10 typ.	mm
WW7 / NWW7	1.000 ± 0.062	0.312 ± 0.031	0.036 ± 0.002	1.500 typ.	inches
	25.40 ± 1.57	7.92 ± 0.79	0.91 ± 0.05	38.10 typ.	mm

(1) See "Resistor Packaging Specification Document" for lead length dimension for tape and reel packaged product.

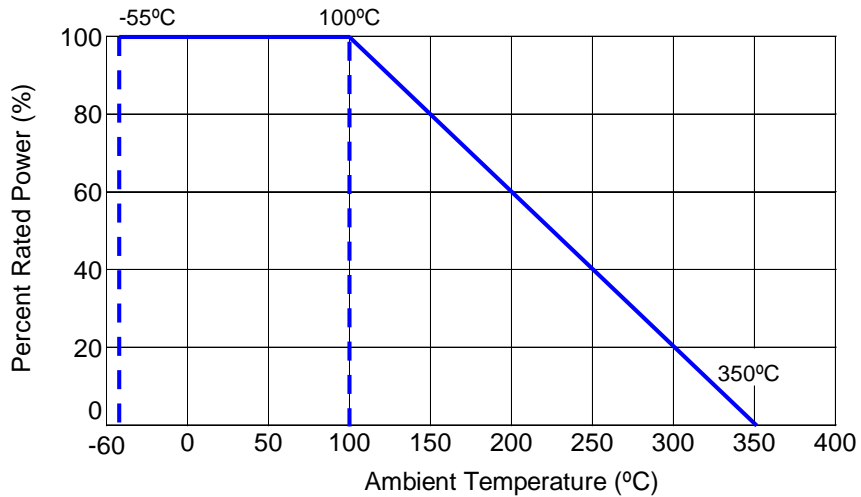
Mechanical Specifications (cont.)



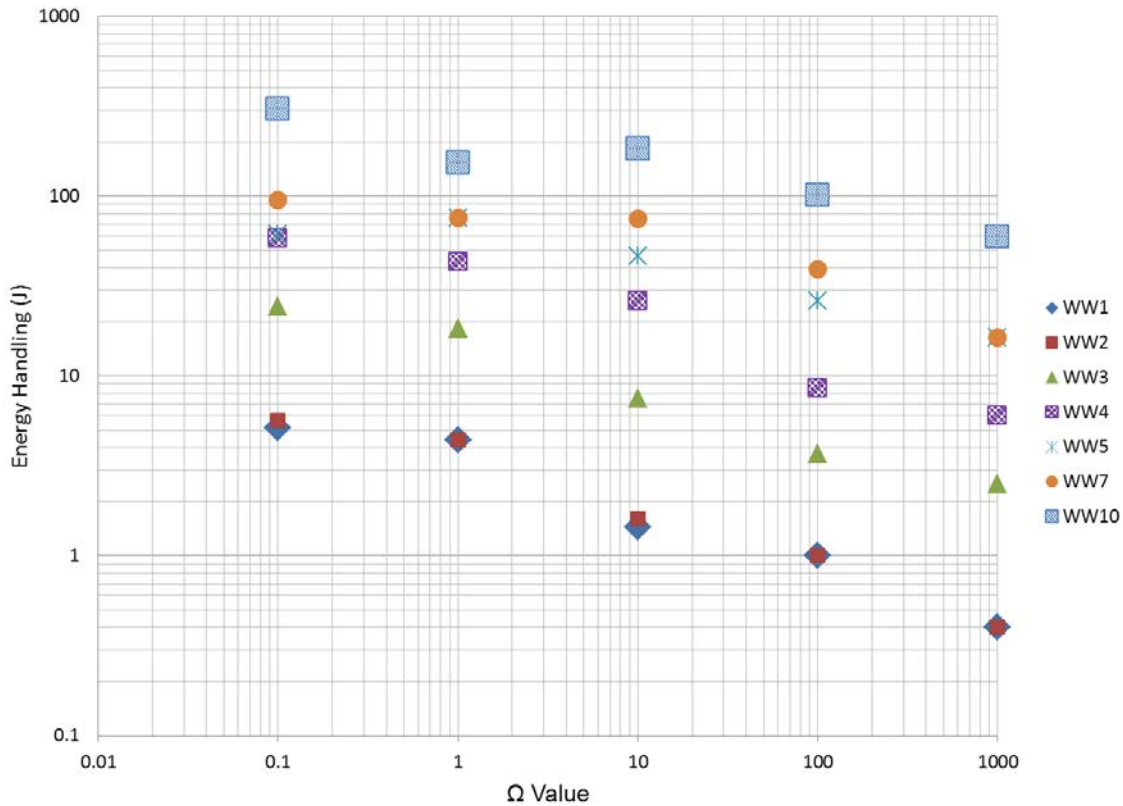
Type / Code	A	B	C	D (Bulk) ⁽¹⁾	Unit
WW7B, WWS10 / NWW7B, NWWS10	1.200 ± 0.062 30.48 ± 1.57	0.312 ± 0.031 7.92 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
WW10 / NWW10 ⁽²⁾	1.780 ± 0.062 45.21 ± 1.57	0.375 ± 0.031 9.53 ± 0.79	0.040 ± 0.002 1.02 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW1 / NMWW1	0.385 ± 0.062 9.78 ± 1.57	0.135 ± 0.031 3.43 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW3 / NMWW3	0.560 ± 0.062 14.22 ± 1.57	0.205 ± 0.031 5.21 ± 0.79	0.032 ± 0.002 0.81 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW5 / NMWW5	0.925 ± 0.062 23.50 ± 1.57	0.330 ± 0.031 8.38 ± 0.79	0.036 ± 0.002 0.91 ± 0.05	1.500 typ. 38.10 typ.	inches mm
MWW10 / NMWW10	1.965 ± 0.062 49.91 ± 1.57	0.480 ± 0.031 12.19 ± 0.79	0.040 ± 0.002 1.02 ± 0.05	1.500 typ. 38.10 typ.	inches mm

(1) See "Resistor Packaging Specification Document" for lead length dimension for tape and reel packaged product.
 (2) Lead diameter (C) available in 0.036" / 0.91mm.

Power Derating Curve:



Energy Handling Capability:
 (Typical performance - for reference only.)



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)
MWW	General Purpose and Precision Leaded Wirewound Resistor - Molded	Axial	YES	100% Matte Sn	Jan-06	06/01
NWW	General Purpose and Precision Leaded Wirewound Resistor - Conformal Coated - Non-Inductive	Axial	YES	100% Matte Sn	Jan-06	06/01
WW	General Purpose and Precision Leaded Wirewound Resistor - Conformal Coated - Non-Inductive	Axial	YES	100% Matte Sn	Jan-06	06/01

“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.

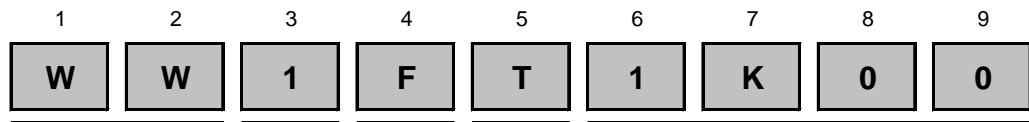
Compliance to “REACH”

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



Product Series		Type/Code	Power Rating		Tolerance		Packaging			Resistance Value		
WW	Standard		@ 125°C	@ 70°C	Code	Tol	Code	Description	Size		Quantity	
WWS	Mini	WW12 / NWW12	0.4W	0.5 W	B	0.1%	T	11" Tape and Reel	WW12 / NWW12	2,500	Four characters with the multiplier used as the decimal holder.	
MWW	Molded	WW1 / NWW1	1W	1.1 W	D	0.5%			WW1 / NWW1			
NWW	Non-Inductive	WW1A / NWW1A	1W	1.3 W	F	1%			WWS2 / NWS2			
NWWS	Mini	WW2 / NWW2	1.5W	2.1 W	J	5%			WW1A / NWW1A			
NWWS	Non-Inductive	WWS2 / NWS2	2.5W	2.6 W					MWW1 / NMWW1			
NMWW	Non-Inductive	WW2A / NWW2A	2.5W	2.6 W					WW2 / NWW2	2,000	500	0.5 ohm = R500 1 ohm = 1R00 10 Kohm = 10K0
	Molded	WW3 / NWW3	3W	3.2 W					WWS3 / NWS3			
		WWS3 / NWS3	3W	3.2 W					WW2A / NWW2A			
		WW3A / NWW3A	3W	3.4 W					WW3 / NWW3			
		WW4 / NWW4	4W	4.3 W					WWS4 / NWS4	250		
		WWS4 / NWS4	4W	4.3 W					MWW3 / NMWW3			
		WW5 / NWW5	5W	5.1 W					WW3A / NWW3A			
		WWS5 / NWS5	5W	5.1 W					WW4 / NWW4			
		WW7 / NWW7	6.5W	7.2 W					WWS5 / NWS5	500		
		WWS7 / NWS7	6.5W	7.2 W					WW5 / NWW5			
		WW7B / NWW7B	7W	7.7 W					WWS7 / NWS7			
		WW10 / NWW10	10W	11.0 W					WW7 / NWW7			
		WWS10 / NWS10	10W	11.0 W					WW7B / NWW7B	250		
		MWW1 / NMWW1	1W	1.3 W					WWS10 / NWS10			
		MWW3 / NMWW3	3W	3.2 W					MWW5 / NMWW5			
		MWW5 / NMWW5	5W	5.5 W			WW10 / NWW10					
		MWW10 / NMWW10	10W	11.0 W			MWW10 / NMWW10					
B	Bulk	Contact Stackpole for package quantities.										

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