

WW3AFT47R0 Datasheet

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| | |
|------------------------------|---|
| DiGi Electronics Part Number | WW3AFT47R0-DG |
| Manufacturer | Stackpole Electronics Inc |
| Manufacturer Product Number | WW3AFT47R0 |
| Description | RES 47 OHM 1% 3W AXIAL |
| Detailed Description | 47 Ohms ±1% 3W Through Hole Resistor Axial Moisture Resistant Wirewound |

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Purchase and inquiry

Manufacturer Product Number:

WW3AFT47R0

Series:

WW

Resistance:

47 Ohms

Power (Watts):

3W

Features:

Moisture Resistant

Operating Temperature:

-55°C ~ 350°C

Supplier Device Package:

Axial

Height - Seated (Max):

-

Failure Rate:

-

Manufacturer:

Stackpole Electronics Inc

Product Status:

Active

Tolerance:

±1%

Composition:

Wirewound

Temperature Coefficient:

±20ppm/°C

Package / Case:

Axial

Size / Dimension:

0.187" Dia x 0.560" L (4.75mm x 14.22mm)

Number of Terminations:

2

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8533.21.0080

Moisture Sensitivity Level (MSL):

Not Applicable

ECCN:

EAR99

WW / MWW / NWW / WWS Series
 General Purpose and Precision Wirewound Resistor

Stackpole Electronics, Inc.
 Resistive Product Solutions

Features:

- WWS offers miniature size at higher power rating
- High performance for low cost
- High power to size ratio
- High temperature silicone coating
- 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
- Higher operating temperatures available
- "B" packaging code denotes bulk packaging - contact Stackpole for package quantities
- WW/NWW/WWS meet UL94V-0
- RoHS compliant, REACH compliant, halogen free, and lead free without exemption



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

(*) Other resistance values available - contact Stackpole for details.
 Max Voltage Rating is $\sqrt{P \cdot R}$

| Electrical Specifications – Non-Inductive Styles | | | | | |
|--|---------------|----------------------|--------|--|--|
| Type/Code | MIL-R-26 Ref. | Power Rating (Watts) | | TCR (ppm/°C) | Ohmic Range (Ω) and Tolerance ^(*) |
| | | @ 125°C | @ 70°C | | 1% and 5% |
| NWW12 | - | 0.4 | 0.5 | < 1Ω = ± 90 ppm/°C 1Ω to 10Ω = ± 50 ppm/°C > 10Ω = ± 20 ppm/°C | 10 - 1K |
| NWW1 | - | 1 | 1.1 | | 2 - 1.5K |
| NWW1A | RW-70 | 1 | 1.3 | | 1 - 2.5K |
| NWW2 | RW-69 | 1.5 | 2.1 | | 1 - 5K |
| NWWS2 | - | 2.5 | 2.6 | | 1 - 5K |
| NWW2A | - | 2.5 | 2.6 | | 1 - 5K |
| NWW3 | RW-79 | 3 | 3.2 | | 1 - 11K |
| NWWS3 | - | 3 | 3.2 | | 3 - 5K |
| NWW3A | - | 3 | 3.4 | | 1 - 15K |
| NWW4 | - | 4 | 4.3 | | 1 - 20K |
| NWWS4 | RW-79 | 4 | 4.3 | | 1 - 11K |
| NWW5 | RW-67, RW-74 | 5 | 5.1 | | 1 - 25K |
| NWWS5 | - | 5 | 5.1 | | 1 - 20K |
| NWW7 | - | 6.5 | 7.2 | | 1 - 35K |
| NWWS7 | RW-67, RW-74 | 6.5 | 7.2 | 1 - 25K | |
| NWW7B | - | 7 | 7.7 | 1 - 35K | |
| NWW10 | RW-78 | 10 | 11 | 1 - 50K | |
| NWWS10 | - | 10 | 11 | 1 - 35K | |
| NMWW1 | RW-70 | 1 | 1.3 | 5 - 1K | |
| NMWW3 | RW-79 | 3 | 3.2 | 3 - 10K | |
| NMWW5 | RW-67, RW-74 | 5 | 5.5 | 2 - 20K | |
| NMWW10 | RW-68, RW-74 | 10 | 11 | 2 - 40K | |

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

Max Voltage Rating is $\sqrt{P \cdot R}$

Mechanical Specifications



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

| Mechanical Specifications (cont.) | | | | | |
|-----------------------------------|---------------|---------------|---------------|-------------------------|--------|
| Type/Code | A | B | C | D (Bulk) ⁽¹⁾ | Unit |
| 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 | 1.025 ± 0.062 | 0.312 ± 0.031 | 0.036 ± 0.002 | 1.500 typ. | inches |
| | 26.04 ± 1.57 | 7.92 ± 0.79 | 0.91 ± 0.05 | 38.10 typ. | mm |
| WW7B, WWS10 / NWW7B, NWWS10 | 1.225 ± 0.062 | 0.312 ± 0.031 | 0.036 ± 0.002 | 1.500 typ. | inches |
| | 31.12 ± 1.57 | 7.92 ± 0.79 | 0.91 ± 0.05 | 38.10 typ. | mm |
| WW10 / NWW10 ⁽²⁾ | 1.780 ± 0.062 | 0.375 ± 0.031 | 0.040 ± 0.002 | 1.500 typ. | inches |
| | 45.21 ± 1.57 | 9.53 ± 0.79 | 1.02 ± 0.05 | 38.10 typ. | mm |
| MWW1 / NMWW1 | 0.385 ± 0.062 | 0.135 ± 0.031 | 0.032 ± 0.002 | 1.500 typ. | inches |
| | 9.78 ± 1.57 | 3.43 ± 0.79 | 0.81 ± 0.05 | 38.10 typ. | mm |
| MWW3 / NMWW3 | 0.560 ± 0.062 | 0.205 ± 0.031 | 0.032 ± 0.002 | 1.500 typ. | inches |
| | 14.22 ± 1.57 | 5.21 ± 0.79 | 0.81 ± 0.05 | 38.10 typ. | mm |
| MWW5 / NMWW5 | 0.925 ± 0.062 | 0.330 ± 0.031 | 0.036 ± 0.002 | 1.500 typ. | inches |
| | 23.50 ± 1.57 | 8.38 ± 0.79 | 0.91 ± 0.05 | 38.10 typ. | mm |
| MWW10 / NMWW10 | 1.965 ± 0.062 | 0.480 ± 0.031 | 0.040 ± 0.002 | 1.500 typ. | inches |
| | 49.91 ± 1.57 | 12.19 ± 0.79 | 1.02 ± 0.05 | 38.10 typ. | 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" / 0.91 mm.

| 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 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 | 500 V for (N)WW12, 1, 1A and 2S. 1000 V for all others |

Operating Temperature Range is -55 to +350°C

Power Derating Curve:



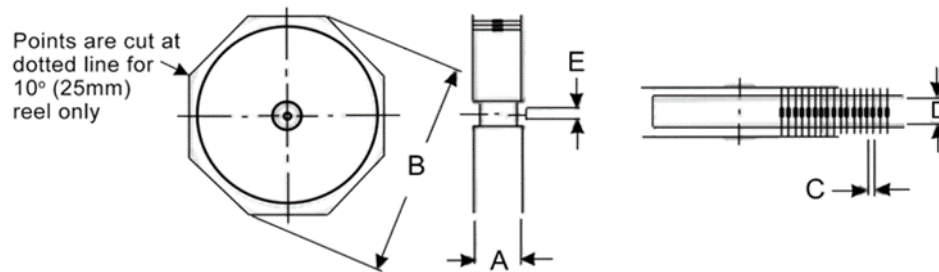
Recommended Soldering Condition

- Flow Soldering:
- Pre-heating: 110°C MAX
 - Peak temperature/duration: 260°C within 10 seconds (1st, 2nd wave total)
 - Temperature profile (see chart on the right)

- Iron Soldering:
- 380°C, 5 seconds, once/terminal



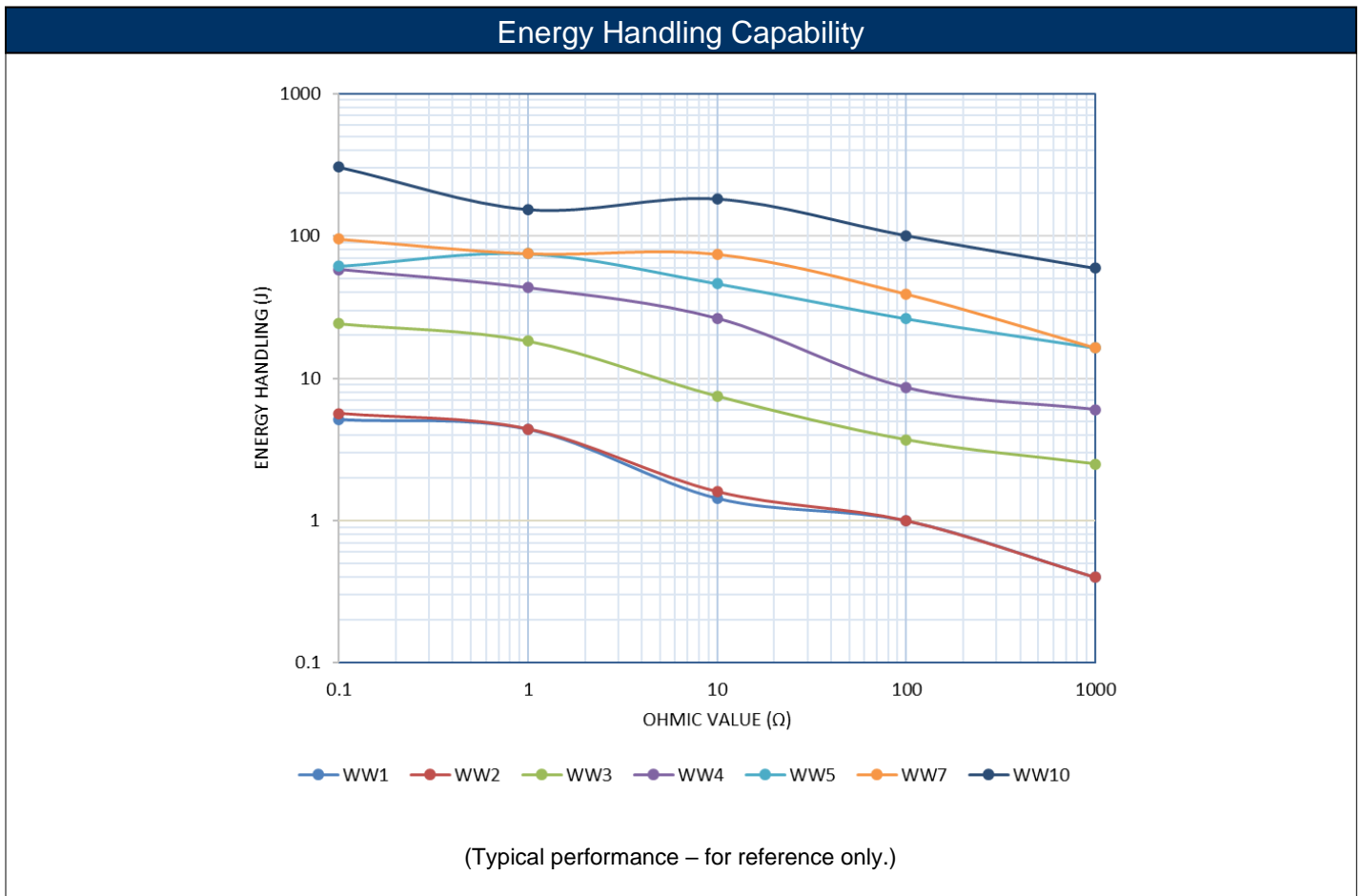
Reel Specifications



| Type/Code | A max ⁽¹⁾ | B max | C | D | Tape | Unit |
|-----------------------------|----------------------|------------------|-------------------------------|-------------------------------|---------------|--------------|
| WW12 | 2.880 73.15 | 11.000 279.40 | 0.197 ± 0.020 5.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW1, WWS2 NWW1, NWS2 | 2.880 73.15 | 11.000 279.40 | 0.197 ± 0.020 5.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW1A, NWW1A | 2.880 73.15 | 11.000 279.40 | 0.197 ± 0.020 5.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW2, WWS3 NWW2, NWS3 | 2.880 73.15 | 11.000 279.40 | 0.197 ± 0.020 5.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW2A, NWW2A | 2.880 73.15 | 11.000 279.40 | 0.197 ± 0.020 5.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW3, WWS4 NWW3, NWS4 | 2.880 73.15 | 11.000 279.40 | 0.197 ± 0.020 5.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW3A, NWW3A | 2.880 73.15 | 11.000 279.40 | 0.394 ± 0.020 10.00 ± 0.50 | 2.063 ± 0.079 52.40 ± 2.00 | 0.250 6.35 | inches mm |
| WW4, WWS5 NWW4, NWS5 | 2.880 73.15 | 11.000 279.40 | 0.394 ± 0.020 10.00 ± 0.50 | 2.500 ± 0.079 63.50 ± 2.00 | 0.250 6.35 | inches mm |
| WW5, WWS7 NWW5, NWS7 | 3.740 95.00 | 11.000 279.40 | 0.394 ± 0.020 10.00 ± 0.50 | 2.874 ± 0.079 73.00 ± 2.00 | 0.250 6.35 | inches mm |
| WW7, NWW7 | 3.740 95.00 | 11.000 279.40 | 0.394 ± 0.020 10.00 ± 0.50 | 2.874 ± 0.079 73.00 ± 2.00 | 0.250 6.35 | inches mm |
| WW7B, WWS10 NWW7B, NWS10 | 3.740 95.00 | 11.000 279.40 | 0.394 ± 0.020 10.00 ± 0.50 | 2.874 ± 0.079 73.00 ± 2.00 | 0.250 6.35 | inches mm |

| Packaging Specifications (cont.) | | | | | | |
|----------------------------------|----------------------|--------|---------------|---------------|-------|--------|
| Type/Code | A max ⁽¹⁾ | B max | C | D | Tape | Unit |
| WW10, NWW10 | 5.100 | 11.000 | 0.394 ± 0.020 | 4.375 ± 0.079 | 0.250 | inches |
| | 129.54 | 279.40 | 10.00 ± 0.50 | 111.13 ± 2.00 | 6.35 | mm |
| MWW1, NMWW1 | 3.311 | 13.504 | 0.197 ± 0.020 | 2.063 ± 0.079 | 0.250 | inches |
| | 84.10 | 343.00 | 5.00 ± 0.50 | 52.40 ± 2.00 | 6.35 | mm |
| MWW3, NMWW3 | 3.484 | 13.504 | 0.394 ± 0.020 | 2.063 ± 0.079 | 0.250 | inches |
| | 88.50 | 343.00 | 10.00 ± 0.50 | 52.40 ± 2.00 | 6.35 | mm |
| MWW5, NMWW5 | 3.850 | 13.504 | 0.394 ± 0.020 | 2.874 ± 0.079 | 0.250 | inches |
| | 97.80 | 343.00 | 10.00 ± 0.50 | 73.00 ± 2.00 | 6.35 | mm |
| MWW10, NMWW10 | 4.764 | 13.504 | 0.600 ± 0.020 | 4.375 ± 0.079 | 0.250 | inches |
| | 121.00 | 343.00 | 15.24 ± 0.50 | 111.13 ± 2.00 | 6.35 | 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.



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) |
| WW | General Purpose and Precision Wirewound Resistor (Standard) | Axial | YES | 100% Matte Sn | Jan-06 | 06/01 |
| NWW | General Purpose and Precision Wirewound Resistor (Non-Inductive) | Axial | YES | 100% Matte Sn | Jan-06 | 06/01 |
| WWS | General Purpose and Precision Wirewound Resistor (Mini) | Axial | YES | 100% Matte Sn | Jan-06 | 06/01 |
| NWWS | General Purpose and Precision Wirewound Resistor (Non-Inductive, Mini) | Axial | YES | 100% Matte Sn | Jan-06 | 06/01 |
| MWW | General Purpose and Precision Wirewound Resistor (Molded) | Axial | YES | 100% Matte Sn | Jan-06 | 06/01 |
| NMWW | General Purpose and Precision Wirewound Resistor (Non-Inductive, Molded) | 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.

WW / MWW / NWW / WWS Series
 General Purpose and Precision Wirewound Resistor

Stackpole Electronics, Inc.
 Resistive Product Solutions

How to Order



| Series | Code | Power Rating (W) | | Tolerance | | Packaging | | | | Resistance Value |
|---|------|------------------|--------|-----------|------|----------------|-------------------|---|------|---|
| | | @ 125°C | @ 70°C | Code | Tol | Code | Description | Size | Qty | |
| WW (Standard) NWW (Non-inductive) | 12 | 0.4 | 0.5 | B | 0.1% | T | 11" Tape and Reel | WW12 / NWW12 | 2500 | Four characters with the multiplier used as the decimal holder. 0.5 ohm = R500 1 ohm = 1R00 10 Kohm = 10K0 |
| | 1 | 1 | 1.1 | D | 0.5% | | | WW1 / NWW1 | | |
| | 1A | 1 | 1.3 | F | 1% | | | WWS2 / NWS2 | | |
| | 2 | 1.5 | 2.1 | J | 5% | | | WW1A / NWW1A | | |
| | 2A | 2.5 | 2.6 | | | | | MWW1 / NMWW1 | | |
| | 3 | 3 | 3.2 | | | | | WW2 / NWW2 | 2000 | |
| | 3A | 3 | 3.4 | | | | | WWS3 / NWS3 | | |
| | 4 | 4 | 4.3 | | | | | WW2A / NWW2A | | |
| | 5 | 5 | 5.1 | | | | | WW3 / NWW3 | | |
| | 7 | 6.5 | 7.2 | | | | | WWS4 / NWS4 | | |
| WWS (Mini) NWS (Non-inductive Mini) | 7B | 7 | 7.7 | | | MWW3 / NMWW3 | 500 | | | |
| | 10 | 10 | 11.0 | | | WW3A / NWW3A | | | | |
| | 2 | 2.5 | 2.6 | | | WW4 / NWW4 | | | | |
| | 3 | 3 | 3.2 | | | WWS5 / NWS5 | | | | |
| | 4 | 4 | 4.3 | | | WW5 / NWW5 | | | | |
| MWW (Molded) NMWW (Non-inductive Molded) | 5 | 5 | 5.1 | | | WWS7 / NWS7 | 250 | | | |
| | 7 | 6.5 | 7.2 | | | WW7 / NWW7 | | | | |
| | 10 | 10 | 11.0 | | | WW7B / NWW7B | | | | |
| | 1 | 1 | 1.3 | | | WWS10 / NWS10 | | | | |
| | 3 | 3 | 3.2 | | | MWW5 / NMWW5 | | | | |
| | 5 | 5 | 5.5 | | | WW10 / NWW10 | | | | |
| | 10 | 10 | 11.0 | | | MWW10 / NMWW10 | | | | |
| | | | | | | B | Bulk | Contact Stackpole for package quantities. | | |

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we stricly control the quality of products and services. Welcome your RFQ to

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DiGi is a global authorized distributor of electronic components.