

WH/WN Series

Miniature Molded Wirewound



AXIAL
LEAD



FEATURES

- WH precision series
- WN Aryton Perry winding Non-Inductive series: Inductance <1nH at 1MHZ test,
- Designed to meet MIL-R-26F, MIL-STD-202 standard requirements
- Manufacturing process -Wire winding/ Spot Welding- by Computer Numerical Control (CNC) machine tools to ensure consistency of product quality.
- Encapsulated by epoxy molding compound
- Advanced IC encapsulation mold/die technologies

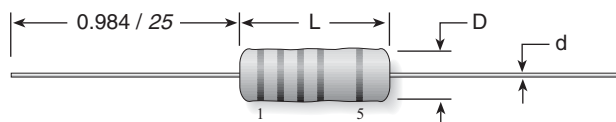
SERIES SPECIFICATIONS

| Type | Power Rating (watts) | Resistance Range (Ω) | Weight (g/1000pc) |
|------|----------------------|-------------------------------|-------------------|
| WHA | 0.5 | 0.100 - 1.0K | 216 |
| WNA | | 0.100 - 250 | |
| WHB | 1 | 0.100 - 4.0K | 296 |
| WNB | | 0.100 - 1.0K | |
| WHC | 2 | 0.10 - 8.0K | 712 |
| WNC | | 0.10 - 2.0K | |
| WHD | 3 | 0.10 - 25K | 1160 |
| WND | | 0.10 - 5.0K | |
| WHE | 5 | 0.10 - 50K | 2920 |
| WNE | | 0.10 - 10K | |

CHARACTERISTICS

| | |
|---|--|
| Ceramic Core | CeramTec Rubalit® 85% alumina |
| End Caps | Stainless steel, precision formed |
| Leads | Copper wire, 100% Sn (lead free) coated |
| Resistance Wire | ISAOHM® wire TC ± 20 ppm/ $^{\circ}$ C |
| Encapsulation | SUMICON 1100/1200 Epoxy molding compound for IC encapsulation |
| Standard Tolerance | D (0.5%), F (1.0%), J (5.0%) |
| Temperature Coefficient (ppm/$^{\circ}$C) | ± 90 for 0.100 Ω -0.99 Ω , ± 50 for 1.00 Ω -10.00 Ω , ± 20 for >10.00 Ω |
| Maximum Working Voltage | (P \times R) ^{1/2} |
| Derating | Linearly from 100% @ +70 $^{\circ}$ C to 0% @ +150 $^{\circ}$ C. |
| Operating Temp | -55 $^{\circ}$ C to +150 $^{\circ}$ C |

DIMENSIONS



| Type | Wattage | L | D | d |
|-------|---------|---------------|--------------|--------------|
| WH/NA | 0.5 | 5.08 / 0.200 | 2.54 / 0.100 | 0.60 / 0.024 |
| WH/NB | 1 | 7.00 / 0.276 | 3.30 / 0.130 | 0.60 / 0.024 |
| WH/NC | 2 | 11.4 / 0.450 | 4.57 / 0.180 | 0.80 / 0.031 |
| WH/ND | 3 | 13.54 / 0.530 | 5.50 / 0.216 | 0.80 / 0.031 |
| WH/NE | 5 | 20.00 / 0.790 | 7.50 / 0.295 | 1.00 / 0.039 |

Packaging

| Tape Width | Pitch | Reel Diam. | Pc/reel |
|------------|-------------|-------------|---------|
| 64 / 2.520 | 5.0 / 0.197 | 290 / 11.41 | 1000 |
| 64 / 2.520 | 5.0 / 0.197 | 290 / 11.41 | 1000 |
| 64 / 2.520 | 10 / 0.393 | 290 / 11.41 | 1000 |
| 84 / 3.307 | 10 / 0.393 | 290 / 11.41 | 500 |
| 84 / 3.307 | 10 / 0.393 | 290 / 11.41 | 500 |

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PERFORMANCE CHARACTERISTICS

| Test | Conditions of Test | Performance |
|--|---|---|
| Thermal shock | Environmental chamber, -55°C +0°C, -3°C to 150°C +3°C, -0°C, 5 cycles, minimum 15 min. at each extreme | ±(1.0% + 0.5mΩ)ΔR |
| Short-time overload | Overload voltage 5x rated wattage for 5 sec. | ±(0.5% + 0.5mΩ)ΔR |
| Solderability | Bath temp. 260°C ±5°, immersion time 5 sec. ±0.5, JIS C 5201 4.18 | >90% of contact face covered new solder |
| Resistance to solder heat | Bath temp. 260°C ±5°, immersion time 5 sec. ±0.5, JIS C 5201 4.18 | ±(0.5% + 0.5mΩ)ΔR |
| Dielectric withstanding voltage | Magnitude of test voltage >500 volts rms.; duration 1 min. | Pass |
| Insulation resistance | Magnitude of test voltage 500 volts rms. ±10%; duration 1 min. | >10 ⁹ Ω |
| High Temperature Exposure | Exposed to an ambient temperature of 175°C +5°/-0° for 250 ±8 hours | ±(1.0% + 0.5mΩ)ΔR |
| Low Temperature Storage | At a temperature of -65°C ±2° for a period of 24 hours ±4 | ±(0.5% + 0.5mΩ)ΔR |
| Life | Test temp. at 70°C ±2°, rated DC continuous working voltage applied, 1.5 hours on and 0.5 hours off, 1000 hours | ±(2.0% + 0.5mΩ)ΔR |

HOW TO ORDER

H = Inductive
N = Non Inductive

RoHS compliant

WHA10RFE - T

Series: W, H, A, 1, 0, R, F, E, - T

Power: A = 0.5, B = 1, C = 2, D = 3, E = 5

Ohms: 1, 2, 5, 10, 15, 25, 51, 75, 100, 150, 200, 250, 330, 470, 560, 750, 1K, 2.5K, 5K, 10K, 25K

Tolerance: F = 1%, J = 5%, D = 0.5%

Package: T = Tape, blank = 25pc pack

Part marking:
0.50, 1.0, 2.0 watt parts marked with 5-band color code, 3.0 and 5.0 watt parts marked with part number stamping

Standard part numbers

| Wattage: | 0.5 | 0.5 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 3.0 | 5.0 | 5.0 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Series: | WHA | WNA | WHB | WNB | WHC | WNC | WHD | WND | WHE | WNE |
| Ohms | | | | | | | | | | |
| 0.1 | WHAR10FE | WNAR10FE | WHBR10FE | WNBR10FE | WHCR10FE | WNCR10FE | WHDR10FE | WNDR10FE | WHER10FE | WNER10FE |
| 0.25 | WHAR25FE | WNAR25FE | WHBR25FE | WNBR25FE | WHCR25FE | WNCR25FE | | | | |
| 0.5 | WHAR50FE | WNAR50FE | WHBR50FE | WNBR50FE | WHCR50FE | WNCR50FE | WHDR50FE | WNDR50FE | WHER50FE | WNER50FE |
| 0.75 | WHAR75FE | WNAR75FE | WHBR75FE | WNBR75FE | WHCR75FE | WNCR75FE | | | | |
| 1 | WHA1R0FE | WNA1R0FE | WHB1R0FE | WNB1R0FE | WHC1R0FE | WNC1R0FE | WHD1R0FE | WND1R0FE | WHE1R0FE | WNE1R0FE |
| 2 | WHA2R0FE | WNA2R0FE | WHB2R0FE | WNB2R0FE | WHC2R0FE | WNC2R0FE | | | | |
| 4 | WHA4R0FE | WNA4R0FE | WHB4R0FE | WNB4R0FE | WHC4R0FE | WNC4R0FE | | | | |
| 5 | WHA5R0FE | WNA5R0FE | WHB5R0FE | WNB5R0FE | WHC5R0FE | WNC5R0FE | WHD5R0FE | WND5R0FE | WHE5R0FE | WNE5R0FE |
| 10 | WHA10RFE | WNA10RFE | WHB10RFE | WNB10RFE | WHC10RFE | WNC10RFE | WHD10RFE | WND10RFE | WHE10RFE | WNE10RFE |
| 15 | WHA15RFE | WNA15RFE | WHB15RFE | WNB15RFE | WHC15RFE | WNC15RFE | WHD15RFE | WND15RFE | WHE15RFE | WNE15RFE |
| 25 | WHA25RFE | WNA25RFE | WHB25RFE | WNB25RFE | WHC25RFE | WNC25RFE | | | | |
| 51 | WHA51RFE | WNA51RFE | WHB51RFE | WNB51RFE | WHC51RFE | WNC51RFE | | | | |
| 75 | WHA75RFE | WNA75RFE | WHB75RFE | WNB75RFE | WHC75RFE | WNC75RFE | | | | |
| 100 | WHA100FE | WNA100FE | WHB100FE | WNB100FE | WHC100FE | WNC100FE | WHD100FE | WND100FE | WHE100FE | WNE100FE |
| 150 | WHA150FE | WNA150FE | WHB150FE | WNB150FE | WHC150FE | WNC150FE | | | | |
| 200 | WHA200FE | WNA200FE | WHB200FE | WNB200FE | WHC200FE | WNC200FE | | | | |
| 250 | WHA250FE | WNA250FE | WHB250FE | WNB250FE | WHC250FE | WNC250FE | WHD250FE | WND250FE | WHE250FE | WNE250FE |
| 330 | WHA330FE | | WHB330FE | WNB330FE | WHC330FE | WNC330FE | | | | |
| 470 | WHA470FE | | WHB470FE | WNB470FE | WHC470FE | WNC470FE | | | | |
| 560 | WHA560FE | | WHB560FE | WNB560FE | WHC560FE | WNC560FE | WHD560FE | WND560FE | WHE560FE | WNE560FE |
| 750 | WHA750FE | | WHB750FE | WNB750FE | WHC750FE | WNC750FE | | | | |
| 1K | WHA1K0FE | | WHB1K0FE | WNB1K0FE | WHC1K0FE | WNC1K0FE | WHD1K0FE | WND1K0FE | WHE1K0FE | WNE1K0FE |
| 2.5K | | | WHB2K5FE | | WHC2K5FE | | | WND2K5FE | | |
| 5K | | | | | | | WHD5K0FE | | WHE5K0FE | WNE5K0FE |
| 10K | | | | | | | WHD10KFE | | WHE10KFE | WNE10KFE |
| 25K | | | | | | | | | WHE25KFE | |