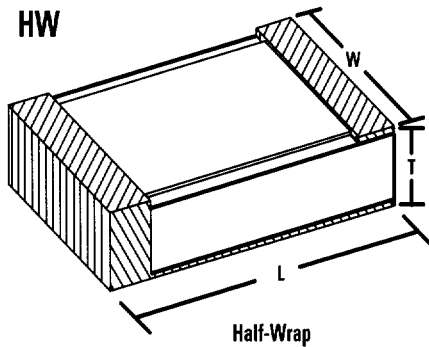
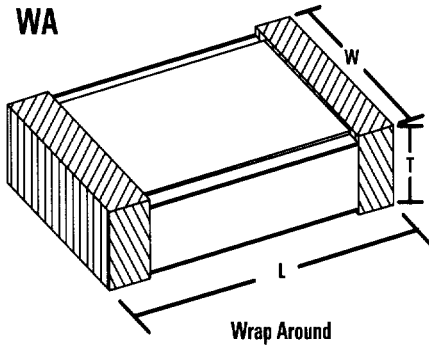


WA SERIES SURFACE MOUNT RESISTORS

DESCRIPTION

Surface mount thick film resistors, printed and fired on 96% alumina with a five sided wraparound termination, and a top conductor pad are offered in a variety of styles to fit a wide range of hybrid microelectronic and surface mount applications. Advanced processing techniques, and Hi-Rel construction assure optimum performance where TCR, VCR and operating power are critical factors. WA styles meet and exceed the qualification requirements of MIL-PRF-55342.



| STYLE & TYPE | CASE SIZE | LENGTH | | WIDTH | | THICKNESS Max | | VOLTAGE RATING | POWER RATING |
|--------------|-----------|--------|--------|-------|--------|---------------|-------|----------------|--------------|
| | | (in) | (mm) | (in) | (mm) | (in) | (mm) | | |
| WA20 | 0402 | 0.040 | 1.020 | 0.020 | 0.508 | 0.017 | 0.330 | 40V | 0.040W |
| WA56 | 0503 | 0.050 | 1.140 | 0.030 | 0.762 | 0.017 | 0.432 | 80V | 0.125W |
| WA81 | 0502 | 0.055 | 1.400 | 0.025 | 0.635 | 0.017 | 0.432 | 50V | 0.100W |
| WA19 | 0504 | 0.055 | 1.270 | 0.040 | 1.020 | 0.017 | 0.432 | 68V | 0.100W |
| WA82 | 0505 | 0.055 | 1.400 | 0.050 | 1.270 | 0.017 | 0.432 | 80V | 0.125W |
| WA61 | 0604 | 0.065 | 1.520 | 0.040 | 1.020 | 0.022 | 0.559 | 65V | 0.125W |
| WA86 | 0805 | 0.080 | 2.030 | 0.050 | 1.270 | 0.022 | 0.559 | 122V | 0.200W |
| WA62 | 0805 | 0.085 | 2.160 | 0.050 | 1.270 | 0.022 | 0.559 | 122V | 0.200W |
| WA5 | 1002 | 0.105 | 2.540 | 0.025 | 0.635 | 0.017 | 0.432 | 172V | 0.100W |
| WA83 | 1005 | 0.105 | 2.670 | 0.050 | 1.270 | 0.022 | 0.559 | 177V | 0.250W |
| WA90 | 1010 | 0.105 | 2.670 | 0.100 | 2.540 | 0.022 | 0.559 | 156V | 0.500W |
| WA57 | 1206 | 0.125 | 3.050 | 0.060 | 1.520 | 0.022 | 0.559 | 200V | 0.750W |
| WA87 | 1206 | 0.126 | 3.200 | 0.063 | 1.600 | 0.022 | 0.559 | 188V | 0.250W |
| WA80 | 1505 | 0.155 | 3.940 | 0.050 | 1.270 | 0.022 | 0.559 | 302V | 0.300W |
| WA88 | 2010 | 0.209 | 5.310 | 0.098 | 2.490 | 0.022 | 0.559 | 352V | 0.800W |
| WA85 | 2307 | 0.230 | 5.840 | 0.072 | 1.830 | 0.022 | 0.559 | 380V | 0.500W |
| WA17 | 2412 | 0.245 | 6.170 | 0.125 | 3.180 | 0.035 | 0.889 | 476V | 2W |
| WA89 | 2512 | 0.259 | 6.580 | 0.124 | 3.150 | 0.035 | 0.889 | 476V | 2W |
| WA30 | 5024 | 0.500 | 12.550 | 0.243 | 6.170 | 0.035 | 0.889 | 998V | 4W |
| WA28 | 6632 | 0.666 | 16.920 | 0.326 | 8.280 | 0.035 | 0.889 | 1440V | 8W |
| WA26 | 6645 | 0.666 | 16.920 | 0.495 | 12.570 | 0.035 | 0.889 | 1440V | 8W |

Power rating at 70°C derated linearly to 150°C. ($P = E^2/R$)

Operating temperature range from -55°C to +150°C

ELECTRICAL PERFORMANCE CHARACTERISTICS

MIL-PRF-55342 TEST

MIL-PRF-55342 REQUIREMENT

MSI TYPICAL

| | | |
|---------------------------------|--------|--------|
| Short Term Overload | ±0.25% | ±0.03% |
| High Temperature Exposure | ±0.50% | ±0.05% |
| Thermal Shock | ±0.50% | ±0.07% |
| Low Temperature Operation | ±0.25% | ±0.05% |
| Resistance to Bonding Exposure | ±0.25% | ±0.09% |
| Moisture Resistance | ±0.50% | ±0.06% |
| Stability (Life 70°C 1,000Hrs) | ±0.50% | ±0.04% |
| Stability (Life 70°C 10,000Hrs) | ±2.00% | ±0.07% |

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WA SERIES SURFACE MOUNT RESISTORS

AVAILABLE TCR'S* LISTED BY STYLE AND VALUE

| STYLE & TYPE | RESISTANCE RANGE IN OHMS | | | | | | | | | | | | | |
|--------------|--------------------------|---------|----------|-----------|-----------|------------|--------------|-------------|------------|--------------|---------------|---------------|---------------|-------------|
| | 0.1 to <1 | 1 to <5 | 5 to <10 | 10 to <25 | 25 to <50 | 50 to <50K | 50K to <100K | 100K to <1M | 1M to <10M | 10M to <100M | 100M to <250M | 250M to <500M | 500M to <750M | 750M to <1G |
| WA 20 | 700 | 300 | 200 | 200 | 200 | 150 | 150 | 150 | 200 | 250 | 350 | 350 | 500 | 800 |
| WA 56 | 700 | 350 | 150 | 150 | 150 | 150 | 100 | 200 | 100 | 200 | 300 | 400 | 500 | 800 |
| WA 81 | 500 | 350 | 300 | 200 | 150 | 100 | 100 | 100 | 100 | 200 | 300 | 300 | 400 | 600 |
| WA 19 | 700 | 300 | 150 | 150 | 150 | 100 | 200 | 200 | 300 | 300 | 350 | 400 | 600 | 800 |
| WA 82 | 400 | 300 | 150 | 100 | 100 | 100 | 100 | 100 | 100 | 150 | 350 | 600 | 800 | 1000 |
| WA 61 | 800 | 400 | 200 | 200 | 200 | 100 | 100 | 200 | 200 | 300 | 300 | 400 | 500 | 800 |
| WA 86 | 400 | 200 | 200 | 150 | 150 | 100 | 100 | 100 | 100 | 100 | 300 | 300 | 400 | 600 |
| WA 62 | 800 | 200 | 200 | 200 | 150 | 150 | 150 | 150 | 200 | 200 | 300 | 300 | 400 | 700 |
| WA 5 | 1000 | 500 | 300 | 300 | 300 | 150 | 150 | 150 | 150 | 150 | 150 | 200 | 200 | 200 |
| WA 83 | 600 | 300 | 250 | 200 | 150 | 100 | 100 | 100 | 100 | 200 | 200 | 300 | 400 | 600 |
| WA 90 | 400 | 200 | 200 | 100 | 100 | 100 | 100 | 100 | 150 | 200 | 350 | 500 | 800 | 1000 |
| WA 57 | 600 | 250 | 250 | 250 | 200 | 150 | 150 | 150 | 150 | 200 | 250 | 300 | 300 | 400 |
| WA 87 | 400 | 200 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 150 | 200 | 300 | 500 | 600 |
| WA 80 | 600 | 400 | 300 | 200 | 150 | 100 | 100 | 100 | 100 | 100 | 200 | 300 | 400 | 500 |
| WA 88 | 400 | 200 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 150 | 300 | 300 | 500 | 600 |
| WA 85 | 600 | 400 | 350 | 350 | 200 | 100 | 100 | 100 | 100 | 100 | 200 | 300 | 400 | 500 |
| WA 17 | 600 | 200 | 200 | 200 | 200 | 150 | 100 | 100 | 150 | 200 | 250 | 300 | 500 | 600 |
| WA 89 | 400 | 200 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 150 | 300 | 300 | 500 | 600 |
| WA 30 | 800 | 400 | 300 | 200 | 200 | 200 | 200 | 200 | 200 | 300 | 300 | 300 | 400 | 500 |
| WA 28 | 1000 | 600 | 400 | 300 | 200 | 150 | 150 | 150 | 200 | 200 | 300 | 300 | 500 | 800 |
| WA 26 | 800 | 600 | 400 | 300 | 200 | 150 | 150 | 150 | 200 | 200 | 300 | 300 | 500 | 800 |

*Table indicates optimum TCR values, add 200 for standard values. Units in (\pm ppm/ $^{\circ}$ C)

STANDARD TERMINATION MATERIALS

Untinned: Palladium Silver, Platinum Gold, Gold with no barrier metal and electrolytic Gold plating over Nickel barrier metal.
Solder Tinned: Palladium Silver, Platinum Gold, With or Without Nickel Barrier Metal

Standard Solder Sn62. Other compositions available including high temperature and Indium solders. Consult Factory.

PART NUMBER DESIGNATION

EXAMPLE: WA81PG-1001F-NS62TR: Wraparound (0.055 x 0.025 x 0.017), Pt Gold Term., 1K Ω , 1% Tol., Ni Barrier, Sn62 Solder, Tape & Reel

| WA | 81 | PG | — | 1001 | F | — | N | S62 | TR |
|-----------|-----------------|---|---|------------|---|---|---|---|--|
| MSI STYLE | TYPE NUMBER | BASE METAL | | Value | TOLERANCE | | METAL OPTIONS | SOLDER | SPECIFY OPTION |
| WA HW | See Above Table | PG = Platinum Gold PS = Palladium Silver | | **See Note | E = 0.5% F = 1% G = 2% J = 5% K = 10% M = 20% N = 30% Z = >30% | | B = Back Metal HW Style Only N = Nickel Barrier | S60 = Sn60 S62 = Sn62 S63 = Sn63 S96 = Sn96 I50 = In50 I75 = In75 U = No Solder | X = Special Requirements Code Available from Sales Agent. TL10 = Trimless to 10% TL20 = Trimless to 20% TLXX = Trimless Special TR = Tape and Reel. P = Optimum TCR, otherwise Std. |

** RESISTANCE VALUE IDENTIFIER

Four digits (xxxx) with provisions for five digits (xxxxx) if necessary. The first three digits represent significant figures. The last digit represents the number of zeros to follow. When fractional values of an ohm are required, the letter 'R' is used as a decimal point.

MSI

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