ultrohm plus
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GENERAL RESISTOR SPECIFICATIONS

July 10, 2001

Available resistor styles:

Cylindrical body, axial leads as of this date.

Available resistor sizes:

.125 diameter X .250 length to .500 diameter X 2.000 length are standard, with seven other sizes available between these extremes. Other sizes and styles are available on special order at the determination of ultrohm plus.

Standard resistance values:

0.1Ω to 10 MΩ. Maximum value for each size is different, and based on the use of .0005 wire.

Standard temperature coefficients:

.1Ω to 1Ω 0±50 ppm/degree C
>1Ω to 10Ω 0±10 ppm/degree C
>10Ω0±3ppm/degreeC,butapproximately 60% of units will be 0±1 ppm/degree C
0±1 ppm/degree C is available in all values, but below 1Ω will require a 4 terminal resistor,available on special order.

Standard long term stability:

Shelf, 0±5 ppm/year
Operating, full power @ 125 degree C, 0±10 ppm/year

Short term stability, 50 thermal shocks, -65 degrees C to 125 degrees C:

12 ppm max, 8 ppm average

Initial tolerances:

0±10 ppm through 0±1% are standard. Other tolerances available on request.

Positive TCR temperature sensors:

Any TCR from 0 through 5500 ppm/degree C is available. We do not differentiate individual wire alloys and their TCR's and tolerances as other manufacturers do. Our resistor design allows greater flexibility, so we are not limited in our capabilities for intermediate TCR's.

Construction:

Proprietary design and manufacturing procedures allow us greater freedom in build and greater reliability in the end product. Our materials are chosen for use, purposely not matched, as other manufacturers claim. They compare apples and oranges to show that they're matched--we know they can't, so we purposely mismatch. Our design is welded, else it can't get through the process--theirs is a mechanical joint which will pass all testing in the plant, then fail in the field. If our part isn't welded, it can't leave the manufacturing area. The design is self-inspecting. An open crossed-wire weld system, the joint can be inspected visually

and electrically, and if it's not made, the part is scrapped. It's strictly a go-no go process. Not so with the competition--they make a mechanical joint first, then pretend to weld, and let the mechanical component take over. That is the reason for MIL -STD-202, power conditioning, and thermal shock testing. It's really shocking the number of non-welded parts, just mechanically fastened that pass these tests. If they show large shifts in resistance value (ΔR's), then the manufacturer's answer is to elevate the bake temperature, bake them for a longer time, etc. to stabilize the wire. In fact, the wire is already 1,000 times more stable than the resistor unless it's been wildly mistreated. The error is in the connection of the resistance wire to the lead.

This fact has been proven by ultrohm plus. Our "stabilization bake" requires 8 hours @ 150 degrees C. It does not remove stresses from the wire. Instead, we try to stress the wire above what the customer will ever use it. The upper operating limit of use is 145 degrees C. Once we've stressed the wire over the limit, the user can't touch it and his operating stability is guaranteed. For those customers operating over the full MIL range, we'll cycle a part 5 times through the thermal shock cycle, and once prestressed, again it won't fail. The design has been tested and refined over a period of 15 years, and is in use in numerous units in the field. It has been tested by a major user of resistors in jet engine fuel controls, and found to be superior.

Power conditioning (burn-in) is redundant testing in our parts--a waste of time. They're either good or they're not. Final inspection of plain old DCR will tell you immediately--no further testing required.

MRC/mhc