New Type USGS High Voltage, Ultra-Stable, Low TC Selected Resistor Sets

Total Set Resistance up to 500 Megohm with Absolute TC of 5 ppm/°C
Voltage Ratings up to 50 kV DC - Custom Selected Resistor Sets Available

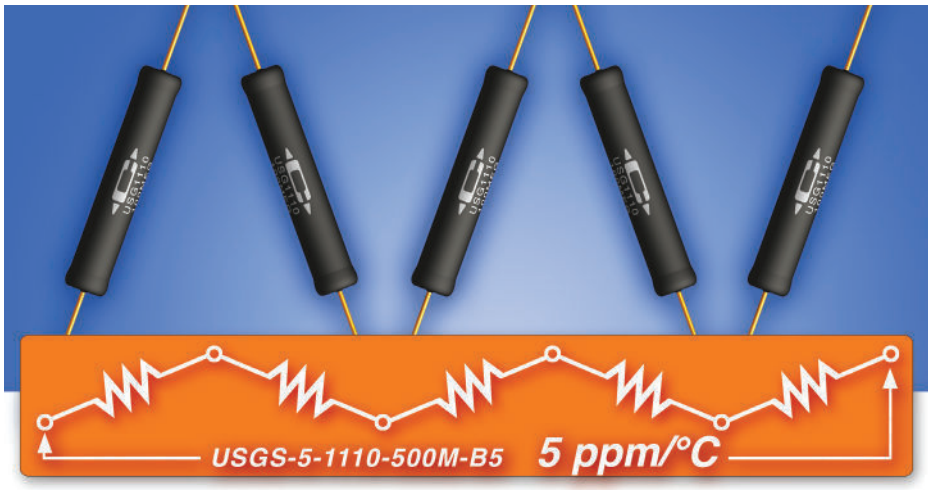
Type USGS - Ultra-Stable Selected Resistor Sets are designed for use in high voltage systems that require excellent temperature stability and long term stability. The resistors used in these Selected Resistor Sets are manufactured with Caddock's Tetrinox® Resistance Film System.

The individual USG Style resistors that form these Ultra-Stable Selected Resistor Sets are individually characterized using automated data acquisition systems, and then selected to form a Set Resistance with an Absolute Temperature Coefficient (TC) of 5 ppm/°C maximum.

The low Voltage Coefficient (VC) of the USG1110 Style resistors used in these selected resistor sets achieves excellent stability over the operating voltage range.

Multiple USGS Selected Resistor Sets can be used in series to form a string of resistors that achieves a higher total resistance and a higher voltage rating with 5 ppm/°C overall temperature coefficient.

For Custom Selected Resistor Sets contact Applications Engineering.



Model Number	① Operating Voltage	② Number of Resistors	③ Set Resistance	④ Set Tolerance	⑤ Set TC	⑥ Set VC	Set Schematic
USGS-3-1110-300M-B5	30 kV DC	3	300 Megohm	0.10%	5 ppm/°C	0.03 ppm/V	Fig. 1A
USGS-5-1110-500M-B5	50 kV DC	5	500 Megohm	0.10%	5 ppm/°C	0.02 ppm/V	Fig. 1B

Specifications for the Selected Resistor Sets:

All specifications are valid for the Set Resistance, which is formed by the series connection of the resistors in the Selected Resistor Set.

①**Operating Voltage:** The maximum continuous operating voltage for the set of resistors connected in series.

②**Number of Resistors:** The number of resistors in each Selected Resistor Set, described by the Caddock Part Number.

③**Set Resistance:** The total resistance of the set of resistors connected in series.

④**Set Tolerance:** The Tolerance of the Set Resistance, measured at low voltage (DC) at +23°C ±2°C.

⑤**Set TC:** The Temperature Coefficient of the Set Resistance, measured at +10°C and +50°C, ref. to +25°C.

⑥**Set VC:** The Voltage Coefficient of the Set Resistance, measured at 10% and 100% of the Operating Voltage.

Storage Temperature Range: -35°C to +85°C.

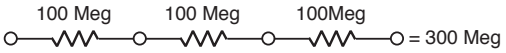


Figure 1A: Schematic of the three 100 Megohm USG1110 Style resistors in a USGS-3-1110-300M-B5 Selected Resistor Set, which are connected in series to form the 300 Megohm Resistance.

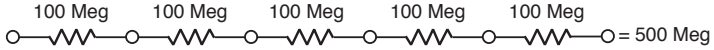
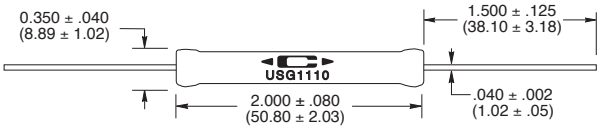


Figure 1B: Schematic of the five 100 Megohm USG1110 Style resistors in a USGS-5-1110-500M-B5 Selected Resistor Set, which are connected in series to form the 500 Megohm Resistance.

Figure 2 and Table: Physical Dimensions and Specifications of the individual USG1110 Style Resistors that form USGS Selected Resistor Sets



Resistor Style	Resistance	Tolerance	TC
USG1110	100 Meg	±0.20%	±20 ppm/°C

High Voltage Design Note: The specifications for these high voltage resistor sets are based upon the proper high voltage field stress management, thermal design, and material selection for the housing which encloses the high voltage resistor set. The design of the housing is the responsibility of the user. These resistors are compatible with many high voltage potting materials, but issues regarding potting material adhesion, bubble free potting, and electrical insulation/isolation are the responsibility of the user.

Dielectric Absorption: The USG resistors are engineered by Caddock to minimize dielectric absorption. The circuit board, potting, or encapsulation materials that are in contact with, or in circuit with the USG resistors, can exhibit dielectric absorption behavior that can affect the performance of the circuit. The user is responsible for the selection of materials and the design so that dielectric absorption and its effects on the performance of the circuit are minimized.

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