Stackpole Electronics, Inc.
Editor Contact Information
Kory Schroeder
Director of Marketing & Product Engineering
919-875-2495
kschroeder@seielect.com
www.seielect.com

Anti-moisture Thru-hole Resistors

Anti-moisture thru-hole resistors represent an important segment of the resistor market. There are many designs that require resistors to perform in high humidity environments and engineers need the mechanical stability and thermal characteristics of a thru-hole connection. We will examine the most common products for these requirements and discuss the benefits of using each for a given application.

Wirewound Resistors

For high humidity applications requiring power ratings of 1/2W and above, wirewound resistors can be an ideal choice. Wirewound elements have significant material mass to prevent any performance issues caused by oxidation. It would take hundreds of years to develop enough oxidation to shift the resistance tolerance out of specification. As additional protection, some of the metals, such as nickel and chromium, which are regularly used in electrical grade wire alloys, greatly inhibit oxidation of the wire itself.

Wirewounds are available in conformal coated packages such as the WW and WRC series, in ceramic housed versions like the CB series or vertical mount like the VM, as well as other variations. Typically wirewounds are chosen when higher power ratings or pulse handling is required along with robust environmental performance.

MG/MGM Metal Glaze Resistors

Thick film / metal glaze technology is known for superior performance in high humidity environments. Thick film is the terminology used normally for surface mount resistors which are screen printed. Metal glaze is the same thick film material but applied to a cylindrical element, and therefore is the terminology used for axial leaded and MELF type resistors. After application of the material to the ceramic carrier, the material is fired on at high temperature and becomes very smooth and glasslike. This property makes the resistive element impervious to moisture.

Stackpole's MG is available in power ratings from 0.25W up to 3W in resistance values from 1Kohm up to 1Gohm, in 1%, 5%, and 10% tolerances and 100 ppm. The high working voltage ratings of the MG series range from 1600V for the 0.25W size up to 7KV for the larger sizes.

HDM – Moisture Withstanding Carbon Film Resistors

Applications with moisture withstanding requirements were often forced to use metal glaze technology or some other more exotic and expensive technology. Stackpole has developed an inexpensive axial resistor series, the HDM. The HDM is a carbon film resistor that is resistant to high moisture environments. This series utilizes special materials, processes, and process controls to provide a carbon film resistive element with proven corrosion resistance capabilities. Under accelerated humidity testing at 120°C, 2 atmospheres pressure, and 100% relative humidity, the HDM series maintains its resistive value within its specified tolerance, while other carbon film resistors fail. The HDM series performs twice as well as standard carbon film technology under the industry standard humidity test, Mil STD 202, method 106. The HDM is available in standard ¼ watt and ½ watt sizes in tolerances down to 1%. Resistance values range from 1 ohm to 2.2 Meg ohms.

Applications for thru-hole wirewounds, MG, and HDM include testing and monitoring devices and equipment, network power supplies, industrial controls and automation, motor controls, laser controls, medical devices especially portable equipment, audio applications, automotive infotainment, avionics, security and safety equipment, HVAC and heating controls, and robotics.

More information and datasheets available at www.seielect.com
For questions on these and any other Stackpole product please contact Stackpole at: marketing@seielect.com