

HARSH ENVIRONMENTS

Power supplies are used in a wide range of new applications exposing them to harsh environmental conditions. Pioneer Magnetics is committed to meeting the industry's need whatever the challenge. Harsh environments for power supplies can include corrosive atmospheres/conductive dust, temperature extremes, high vibration, and unreliable AC sources.

Corrosive Atmosphere/Conductive Dust

Depending on the severity of the corrosive environment and life expectancy Pioneer Magnetics can offer two types of solutions. The first one consists of conformal coating the circuit boards, which will further protect and enhance the life of the power supply. The second is a longer-term solution and consists of installing the power supply in a Heat Exchanger.

The conformal coating solution consists of applying a layer of Acrylic coating (HumiSeal part number 1B73) to all the PC boards and to apply a layer of epoxy coating to all of the Hybrids (Hysol part number PC17M). The reason for different coatings is due to the materials used in the Hybrids (silver traces). The epoxy coating has been proven to provide additional protection to the silver in the event that the power supply is exposed to sulfur vapors.

Temperature Extremes

Semiconductors typically have temperature ratings from 0-50C but most are available in wide temperature versions from -40 to +70C. Pioneer can integrate these wide temperature components in the supply and extend the operating range far beyond the typical 0-50C.

Vibration Immunity

Vibration causes problems for all electronics but large power supplies with heavier through-hole mounted components are especially vulnerable. Such parts pose unique challenges to designers in terms of placement and mounting to withstand mechanical stresses and to ensure long-term reliability. Pioneer Magnetics has supplied vibration resistant power supplies in applications requiring this increased immunity to shock.

Unreliable AC Sources

MOVs (metal oxide varistors) can be used along with gas discharge tubes to protect the power supply from surges in AC line voltage, one of the most common sources of power supply failure. These components may be mounted inside the power supply enclosure or on an external board. Another common source of power supply problems is exposure to an AC input line, either below or above the rated voltage level of the supply. Pioneer has a standard line sensor board that senses whether the AC line voltage is within the specified rating of the power supply and can be used in conjunction with a system level contactor to connect the line to the power supply only when it is within the band of specified voltages.