

Project Summary:

Design Review of Uninterruptible Power Supply

DfR Solutions was asked to complete a thorough design review of a new uninterruptible power supply. At this stage of product development, the power supply did not have very well-defined customer expectations, typical use environments, or reliability goals. DfR Solutions recommended component stress analysis, step stress analysis, virtual qualification, and failure analysis on field returns. Accelerated life testing was also encouraged, to include duty cycling, temperature-humidity bias, mixed flowing gas, and high temperature operating life testing. Overall, the manufacturer could implement several additional tests to ensure the reliability of the new power supply.

Keywords: design review, UPS, uninterruptible power supply, AC, DC, backup power, current, operating environment, lifetime, warranty, thermal measurement, component stress analysis, actives, switches, relays, capacitors, resistors, diodes, step stress testing, virtual qualification, cyclic stress, acceleration factor, accelerated life testing, duty cycling, temperature-humidity bias, THB, mixed flowing gas, MFG, high temperature operating life, HTOL, continuous power on, root cause analysis, conformal coating, physical contaminants