RELIANT LABS

Report Number 2258-B (Abridged)

Power Supply Thermal Stress & Water Exclusion Test Summary

100-Cycle Thermal Stress Test

The power supplies were exposed to 100 temperature cycles from -30℃ to +125℃. The dwell time at each temperature extreme was 55 minutes and the thermal transition rate was set to 6℃ per minute going hot & 8℃ per minute going cold.

At 25, 50, and 75 cycles three samples of each model were removed from the chamber and were analyzed. Analysis consisted of powering each unit at high and low temperature with a full load, checking for proper operation. The units where then cut open, the potting compound removed from the bottom of the printed circuit board, and all solder joints where examined under a 20X microscope for cracks. One or more solder cracks resulted in a failure.

Underwater Thermal Cycle Water Exclusion Test

The power supplies were exposed to 20 temperature cycles from -30℃ to +70℃ while powered, fully loaded and submerged in tubs of water. The dwell time at each temperature extreme was 12 hours and the thermal transition time was 2 hours from hot to cold. After 20 cycles the samples were removed from the chamber and analyzed. If power supplies failed electrically during the test, they were recorded as failed. All power supplies where cut open and inspected for water ingress. Water seen inside the power supply was recorded as a failure.

Test Results

Manufacturer	Underwater Thermal Cycle	Thermal Shock 25 Cycles	Thermal Shock 50 Cycles	Thermal Shock 75 Cycles	Thermal Shock 100 Cycles	Total Thermal Shock
SloanLED 701507-MODW Rev H	**100% pass**	**100% pass**	**100% pass**	**100% pass**	**90% pass**	**95% pass**
SloanLED 701507-MODW Rev F	**100% pass**	**100% pass**	**100% pass**	**100% pass**	**70% pass**	**84% pass**
Competitor "A"	0% pass	33% pass	67% pass	67% pass	60% pass	57% pass
Competitor "B"	100% pass	0% pass	0% pass	0% pass	0% pass	0% pass
Competitor "C"	80% pass	0% pass	0% pass	0% pass	0% pass	0% pass

Summary:

Qualification tests support high reliability performance for solder quality, solder joint strength and water ingress protection. The 701507-MODW power supply is a robust design able to withstand the harsh environments of its stated operational temperature range and weather exposure.

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