Low Voltage Case Study

Fast MultiMode Power Supply for Plasma-Based Glass Coating Equipment

Challenge

A nanotechnology innovator in the food and beverage packaging industry is developing a new system using plasma-aided deposition for a new generation of environmentally friendly packaging. The system required an AC/DC power supply to drive the RF generator that then powered the plasma injector. To achieve best performance, the power supply needed to be able to support a wide output range and high peak power with very fast control but still be small enough to fit within a compact power system cabinet.

Solution

Advanced Energy's CoolX1800 was the only product in the market that could provide the needed 110 VDC at 15 A in a 1U compact enclosure. The 15 A current was achieved by paralleling three CmQ modules. The 110 V was achieved by paralleling two such stacks of paralleled CmQ modules. Overall, a total of six CmQ modules met the requirements with sufficient margin for future expansion.

Working closely with the customer and utilizing the modularity of the CoolX platform, the Advanced Energy team was able to customize the internal control circuit to match the required fast control and dynamic range, eliminating the time and resources needed to develop a fully custom supply.

The CmQ modules are specially adapted to allow for rapid changes to output voltage, typically within 10 ms from one extreme to the other. Additional benefits included:

- PMBus for additional control and monitoring capabilities by enabling/disabling multiple power supplies simultaneously
- High isolation across all barriers provides enhanced protection to power supply from potential HV arcing over from load end
- High Aux power output ensures system front panel can operate without a dedicated power supply

Results

Given Advanced Energy's modular customization ability and exceptional applications support, the customer was able to incorporate highly tailored features easily, leading to a fast time to market and reduced development costs.

The CoolX1800 gave the power system the level of performance required while meeting budget expectations. The solution offered high reliability and a history of strong performance leading to a lower cost of ownership at the system level. Despite the heavy industrial operating environment, the built-in MIL 810 compliance and conformal coating features helps to achieve long product life. The CoolX1800 meets the requirements of future IEC 62368, ensuring no major investments will be needed to reassess power system when the standard comes into effect in late 2020.

Conclusions

With the advanced features of CoolX product line, Advanced Energy can support isolated DC power requirements of a wide variety of applications in industrial, Medical and military systems with little or no customization, thereby enabling a fast time to market huge savings in engineering, qualification and certification costs.

Learn more about the CoolX1800.