

Parallel power supplies and the need for low leakage current

INDUSTRY

Medical Imaging

SOLUTIONArtesyn®
LCC600**EQUIPMENT**

Ultrasound unit

CHALLENGE

This ultrasound medical imaging customer needed an AC-DC power supply on a level of 1200-1500 Watt over a wide range AC input. They wanted to ensure the solution provided a 12 V output and 5 V Standby for their next generation high-end Ultrasound unit, with minimal acoustic noise. Low output ripple voltage was essential for the end application. In addition, there would be a continuous load combined with a pulsed load. Medical safety standards including IEC 60601-1 and -1-2 Medical EMC were essential along with a very low leakage current of $\leq 400\mu\text{A}$, as the customer wanted to sell total power-rack as OEM part A future-proof concept of AC-DC PSU needed, as battery charging and management is planned for this product in the future.

SOLUTION

The solution the AE team provided was two modified Artesyn LCC600, these conduction cooled units eliminates the need for fans, therefore reducing acoustic noise. The AE engineering team worked on lowering the Y-cap values by more than 50% on both units to decrease earth leakage current. To ensure full confidence in the solution proposed by AE, dedicated EMI performance characterization tests were performed with both modified units run in parallel at the max. peak power point given by the customer.



RESULT

Some of the customer's most valued attributes of the LCC Series:

- LCC has no fans, therefore generating no acoustic noise, helping the customer achieve their acoustic noise targets
- Modification still meets class A conducted & radiated EMI with a 6 dB margin AND the leakage current limit requirements
- Proven performance of the LCC600 addressing the high reliability demands of a premium Ultrasound system
- Customer preferred the solution of having 2 units, so they could isolate and drive sub systems individually in the equipment.
- Digital communications and control capability in the LCC600, helps the customer prepare for future battery charging and management needs
- The customer viewed Advanced Energy as a partner in their life science application instead of just a high voltage power supply vendor

CONCLUSION

Advanced Energy's exceptional application support, in conjunction with our flexible engineering adjustments to meet customer needs ensured a successful solution for the end customer. This allowed for reconfirmation of AE's reputation for the highest standards in quality and reliability within the medical industry.



For international contact information, visit advancedenergy.com.

powersales@aei.com

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