PCDM | Small Size, Low Profile | Scalable | High Efficiency

Scientific Instrumentation

Simple, Hassle-Free Power Design

The Customer's Challenge

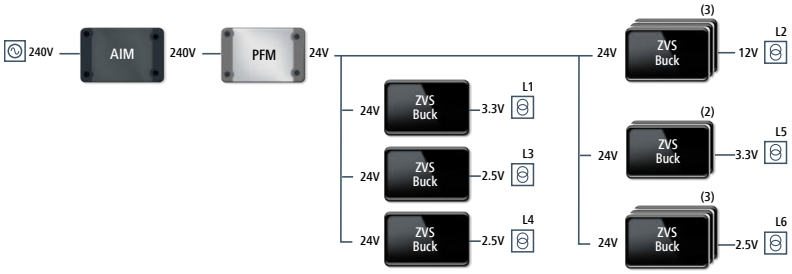
This instrumentation system manufacturer recognized the opportunities that existed in leveraging recent advances in sensor technology when targeted at the new and expanding market for DNA analysis. During system development the specification changed to accommodate an increased number of measurement channels, nearly doubling the power system requirements. Without impacting the size of the equipment, hence the space available for the power supply remained the same as before.

A further design goal was that the cost of the power supply should scale with power, ensuring that the system remained competitive even in its original, lower power, configuration.

The Solution

Vicor applications engineers proposed a solution based on the PFM isolated AC-DC converter that was capable of providing the 400W required by the full system, but that was small enough to fit in the reduced space available for the fully configured system. The sensor and processor supplies were based on ZVS Buck regulators, and these low profile and high efficiency regulators could be easily paralleled to meet the requirements of the higher power system configurations. Using the Vicor Power System Designer the customer was able to review the various configurations of the power supply recommended and understand the cooling requirements, size and cost implications for each solution.

Link to Whiteboard »



The Results

A one-vendor solution for the complete power chain allowed the development of the system to proceed quickly, with no surprises. And the ease of paralleling the ZVS Buck regulators ensures future scalability of the output power without major redesigns.

Product Family Key Specifications	
AIM™ AC Input Front-End Module	
Input Voltages	85 – 264V_{AC}
Output Voltages	Rectified AC line voltage (non-isolated)
Output Power	Up to 450W
Efficiency	Up to 98%
Dimensions	1714 VIA : 44.6 x 35.5 x 9.3mm
PFM™ Isolated AC-DC Converters with PFC	
Input Voltages	Universal rectified: 85 – 264V_{RMS}
Output Voltages	24V and 48V isolated and regulated outputs
Output Power	400W
Efficiency	Up to 92%
Dimensions	PFM 4414: 111 x 36 x 9.4mm PFM 4914: 125 x 36 x 9.4mm
Cool-Power® ZVS Buck Regulator Module	
Input Voltages	12V, 24V, 48V (Nominal)
Output Voltage	Wide output range (1 – 16V)
Output Current	8A, 9A, 10A, and 15A versions
Efficiency	Up to 96.5% Light load and full load High efficiency performance
Dimensions	LGA SiP: 10 x 14 x 2.56mm LGA SiP: 10 x 10 x 2.56mm