



Submarine Combat Control Compact Rack Power Supply



Small Size,
Low Profile



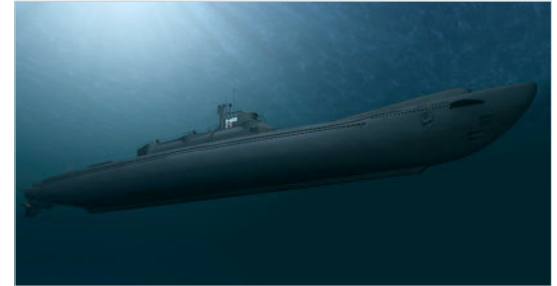
Redundancy /
Power Sharing



Conduction
Cooled

The Customer's Challenge

This customer needed a power supply in a 3U VPX packaging format to address a variety of different power requirements. With the cards mounted vertically in the rack, the width of the supply was a critical design factor. This allowed more space to fit other cards in the rack, thus increasing overall system functionality. Waste heat from the power supply was an issue, and with no space for heat sinking conduction cooling was required. The supply source was a widely fluctuating 220V_{DC} provided by the ship's batteries.

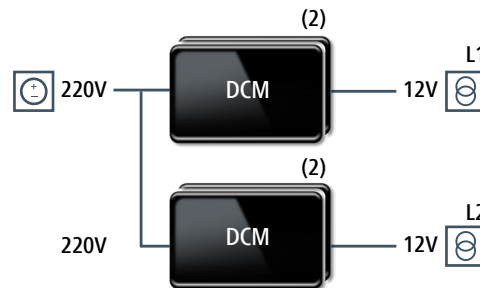


The Solution

The power supply front-end used two DCM DC-DC Converter modules in parallel to provide a high power 1200W, 12V rail. Power sharing between these converters was easy to implement. The low profile of this solution (7.26 mm), facilitated by conduction cooling, contributed to a very narrow power supply case width. This design could be used standalone as a bulk 12V supply. Two separate power supplies could be paralleled in the rack to provide redundancy, when required.

Further variants had additional stages running from the internal 12V bus, providing additional lower voltage rails. Using a PRM Regulator and VTM Current Multipliers allowed the additional outputs to be isolated from each other, and by using ZVS Regulators the lower voltage output rails would share a common return.

[Link to Whiteboard »](#)



The Results

The dual-sided cooling capability of the DCM's ChiP packaging improved the thermal performance of the conduction cooling arrangement. The high efficiency of all of the converters reduced waste heat and allowed a higher system ambient operating temperature. The modularity and scalability of the power component solution used allowed a variety of supply configurations to be supported from a common base design.

Product Family Key Specifications

DCM™ DC-DC Converter Module	
Input Voltages	9 – 50V _{DC} , 16 – 50V _{DC} , 18 – 36V _{DC} , 36 – 75V _{DC} , 120 – 420V _{DC} , 160 – 420V _{DC} , 200 – 420V _{DC}
Output Voltages	5V, 12V, 13.8V, 15V, 24V, 28V, 36V, 48V
Output Power	4623 ChiP: Up to 600W 3623 ChiP: Up to 320W
Efficiency	Up to 93%
Dimensions	4623 ChiP: 47.91 x 22.8 x 7.26 mm 3623 ChiP: 38.72 x 22.8 x 7.26 mm