



Armored Multi-Purpose Vehicle

Ultra-Low Profile 9 kW High Power Array



High Power



Battery Charging



Rugged



Wide Input Range

The Customer's Challenge

Today's soldiers require a wide variety of portable critical electronic equipment to be easily accessible when in the battlefield. We worked with a customer to develop a power solution to enable them to move the charging station for this portable equipment from the relative protection of the inside of armored vehicles to the outside.

While enhancing readiness, the harsh environmental conditions the electronics needed to survive meant that moving the charging station to the outside of the vehicle created some significant challenges. Especially when minimizing size and weight was also critical to the operation of the vehicle.

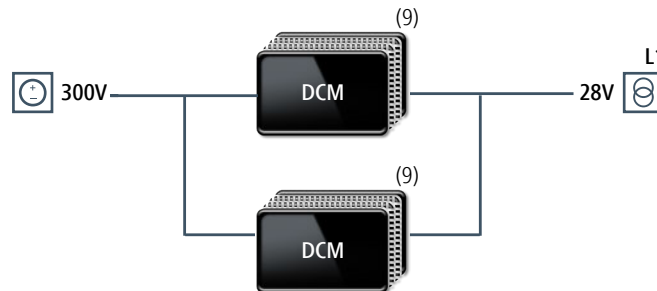
Additional challenges for the power solution was the very high power level that was needed to charge multiple items simultaneously (9 kW) in the space available. In addition, the rectified three phase input from the vehicle generator required the charger to accept a wide range input voltage.



The Solution

18 DCM DC-DC Converters in the thermally-adept ChiP packaging were paralleled to provide the 9 kW high output power requirements, and the wide input range of 160 – 420V met the input voltage needs of this challenging application.

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The Results

DCMs have a unique design, allowing the devices to be connected in parallel simply, acting like a single high output current DCM, and with no need to derate the outputs. With a footprint area for each DCM of just 10.9 cm² and a weight of 29.2g the high power requirements were met in the small and lightweight package necessary for this vehicle-based application.

With its high frequency zero-voltage switching (ZVS) topology, the DCM converter consistently delivers high efficiency across the input line range. Flexible thermal management options, with very low top and bottom side thermal impedances, meant keeping them cool in extreme environments was greatly simplified. Robust construction ensured extensive environmental qualifications (MIL-STD-810, etc) were met.

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 3714 VIA: Up to 600W 3414 VIA: 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 3714 VIA: 95.3 x 35.6 x 9.4 mm 3414 VIA: 85.9 x 35.6 x 9.4 mm