



## Portable Ground Radar

# Power Averaging for a 64% Reduction in Power Requirements



Pulsed Load



Low Weight



Small Size, Low Profile



Low EMI

### The Customer's Challenge

A manufacturer of ground radar wanted to upgrade the performance of an existing vehicle-mounted system design, increasing both range and resolution.

This was a demanding power application, with 2.5 kW peak output required from the battery-generated 28V input. The space available for the upgrade was fixed and weight reduction was demanded to enable a man-portability capability to extend the available market for the product.

To maximize range the transmit pulse must have minimal distortion. To maximize resolution power supply noise when receiving had to be minimized.



### The Solution

Instead of sizing the power supply for the maximum required power, power averaging is an approach that uses a power supply to provide the average current the load requires, coupled to a large capacitor to deliver the energy in pulses.

Unlike most DC-DC converters, DCMs are designed to deliver power efficiently in pulsed load applications, needing no external circuitry to ensure stability when used with a large amount of capacitance at their outputs to deliver the peaks in current. Additionally, they will not enter current limit conditions that can also cause significant reductions in system reliability.

In this application this enabled the power needs to be met with just three MIL COTS DCM DC-DC Converters configured in a parallel array to provide 900W instead of the peak requirement of 2.5kW.

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### The Results

The use of power averaging reduced the continuous power required by 64% versus the peak requirement, providing significant size, weight and cost savings. In addition, the DCM's high power density, low profile (38.7 x 22.8 x 7.26 mm) and low weight (24g) facilitated the significant size and weight reduction required for enhanced portability, aided by the reduced heat sinking needed because of the products' high efficiency.

The DCMs' high switching frequency simplified EMI filter design.

### Product Family Key Specifications

#### DCM™ DC-DC Converter Module

<b>Input Voltages</b>	9 – 50V <sub>DC</sub> , 16 – 50V <sub>DC</sub> , 18 – 36V <sub>DC</sub> , 36 – 75V <sub>DC</sub> , 120 – 420V <sub>DC</sub> , 160 – 420V <sub>DC</sub> , 200 – 420V <sub>DC</sub>
<b>Output Voltages</b>	5V, 12V, 13.8V, 15V, 24V, 28V, 36V, 48V
<b>Output Power</b>	4623 ChiP: Up to 600W 3623 ChiP: Up to 320W 3714 VIA: Up to 600W 3414 VIA: Up to 320W
<b>Efficiency</b>	Up to 93%
<b>Dimensions</b>	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