VICOR

Case study: Vehicle-powered portable digital radio



Providing well-regulated 48V at over 1kW

Customer's challenge

A performance upgrade to an existing vehicle-mounted radio providing voice and data communications across the battlefield required 1kw of power – that needed tight regulation – to power upgraded performance features. Key goals were:

- Provide well-regulated 48V with high power
- Use an existing cold wall for thermal dissipation
- Fit in a very small, existing space

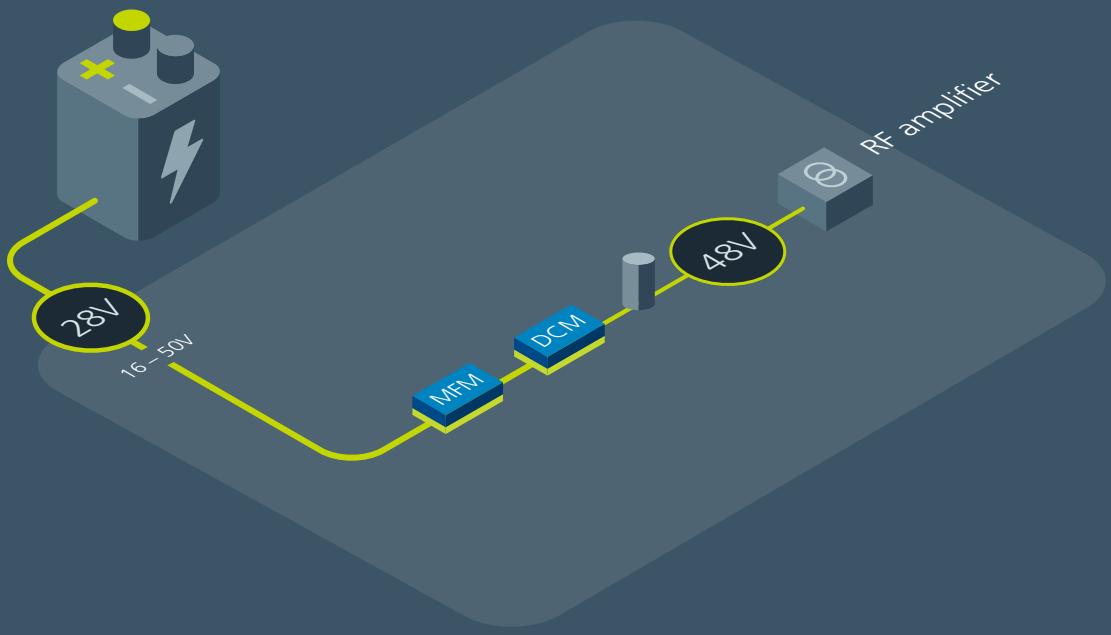
The Vicor solution

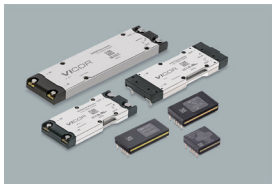
Vicor high-performance power modules provided a lightweight, compact, power-dense solution that both fit within the existing space, but all provided the power necessary. With 800W/in^3 of power density, the MIL-COTS DCM3623 provided the efficiency required to reduce heat and improve reliability critical to vetronics applications. Key benefits were:

- High peak RF output power
- Compact, efficient power delivery
- Low-profile packaging that can utilize the cold wall

The power delivery network

This PDN boosts the MIL-STD-704 28V bus to a regulated 48V using a MIL-COTS DCM3623 DC-DC converter module. The regulated 48V from the DCM™ charges a large capacitor required to deliver the high peak power required by the RF stage. The low profile (7.62mm) of the thermally adept DCM facilitates a cooling solution utilizing an available cold wall, which along with the 800W/in^3 DCM power density, further reduces the footprint of the PDN. The high efficiency of the DCM reduces the waste heat and improves reliability, while its high frequency helps reduce EMI. The MFM™ DCM filter are DC front end modules used in conjunction with DCMs and provide EMI filtering and transient protection to meet MIL standards.





MIL-COTS DCM™ DC-DC converter

- Isolated regulated
- Input: 28, 30, 270V
- Output: 3.3, 5, 12, 15, 24, 28, 48V
- Power: Up to 1300W
- Peak efficiency: 96%
- As small as 0.98 x 0.90 x 0.28in

vicorpower.com/mil-cots-dcm



MIL-COTS MFM™ filter

- Input filter for DCMs
- Input: 28V (16 – 50V), 270V (160 – 420V)
- Current: Up to 22A
- As small as 44.6 x 35.5 x 9.2mm

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