Small Size, Low Profile | Low Weight | Low EMI | Conduction Cooling

Direct Infrared Countermeasures

When Size and Weight Matters

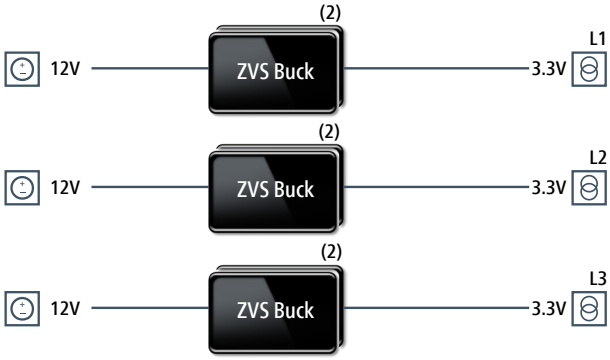
The Customer's Challenge

The survival of aircraft and crew can depend on the reliability of on-board countermeasure systems. The system detects and tracks an incoming weapon and disables that weapon's sensors using a laser beam. The size and weight of the countermeasures system takes up valuable aircraft payload. A customer's power supply for a countermeasure system's optical circuitry also had demanding thermal constraints because of the small space available. In addition, the system needed to meet stringent EMI specifications.

The Solution

The solution comprised three separate arrays of two ZVS Buck Switching Regulators wired in parallel. These products are very low profile (2.56 mm) and are very efficient at 95%, yet can operate at high temperatures. In this application conduction cooling was used and this avoided any power derating or the need for external fans for cooling.

Link to Whiteboard »



The Results

The Vicor applications team was able to recommend an external discrete filter to meet the conducted noise requirements. The low noise of the ZVS switching architecture and the out-of-phase switching configuration of the two paralleled Buck Regulators simplified the design of the input filter. Use of power components meant the system was straightforward to implement, met the overall system thermal demands and provided a flexible, scalable solution.

Product Family Key Specifications	
Cool-Power® ZVS Buck Regulator Module	
Input Voltages	12V Nominal (8 to 18 V_{IN}), 24V Nominal (8 to 36 V_{IN}), 48V Nominal (8 to 60 V_{IN}),
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 2.56 mm