



Onboard 4G WiFi for Buses

Flexible Solution Reduces System Size



High Efficiency



Wide Input Range



Small Size, Low Profile



High Temp Operation

The Customer's Challenge

Travelers and commuters now expect constant connectivity, and not just through their mobile phones, including on buses and coaches. One manufacturer recognized the opportunity to exploit what was for them a new (and much larger) market by adapting their existing railway WiFi router product to fit the needs of the bus environment.

There were many similarities between the train and bus environment: shock, vibration and extreme temperature ranges required the same rugged components and high efficiency; and security, reliability and speed were equally as important to bus operators as to train companies. However, the manufacturer needed to significantly reduce the product costs to support the more competitive, higher volume market. And to be able to take full advantage of the opportunities that existed the company needed to reduce the size to simplify after-market installation.

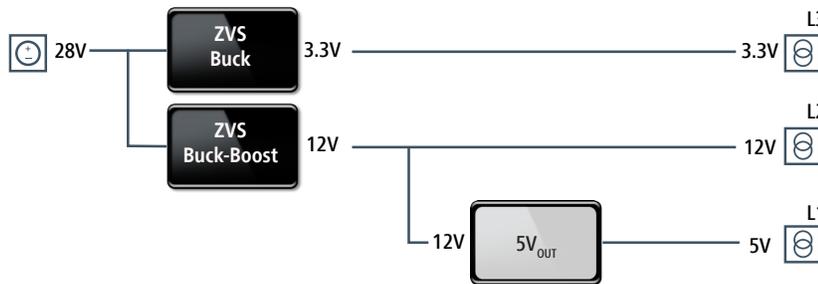
The challenge was further exacerbated by the need for the equipment to work over an 8 – 36V input voltage range to accommodate operation during engine cranking.



The Solution

A ZVS buck-boost regulator provided the regulated 12V output as it can accept input voltages above or below its output set-point voltage. A ZVS buck regulator generated the 3.3V rail. The wide input voltage ranges of the products could deal with the spikes from the battery, particularly significant during engine cranking.

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The Results

Vicor's ZVS regulators are part of a unique product range that delivers more power at higher temperatures, in smaller package sizes. The zero voltage switching topology of the regulators reduces losses from higher input voltages, creating higher conversion efficiency than available anywhere else. These products enabled the company to meet their performance objectives in the a footprint of just 2.8cm². A system efficiency of 91.5% facilitated easy thermal management even when operating at high ambient temperatures with no moving air cooling.

Product Family Key Specifications

Cool-Power® ZVS Buck-Boost Switching Regulators

Input Voltages	16 – 34V, 21 – 60V
Output Voltages	12 – 34V, 21 – 36V, 36 – 54V
Output Power	Up to 240W continuous
Efficiency	Over 98% efficiency at >800kHz FSW
Dimensions	LGA SiP: 10 x 14 x 2.5 mm

Cool-Power® ZVS Buck Regulator Module

Input Voltages	12V, 24V, 48V (Nominal)
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 2.56mm LGA SiP: 10 x 10 x 2.56mm