

Case study: Unmanned aircraft
for communications



High-efficiency, high-density modules free up space for advanced communications and extend range



Customer's challenge

This class of UAV depends on solar power to meet its long flight time requirements. Solar power systems rely on the use of maximum power-point tracking (MPPT) circuitry to ensure that solar energy is harvested at the optimum voltage before conversion to a voltage suitable for charging a secondary battery, or delivery to the power system's intermediate bus network. The key goals were:

- Efficient high voltage to SELV conversion
- A compact and lightweight solution to keep the drone as light as possible
- A robust and reliable solution



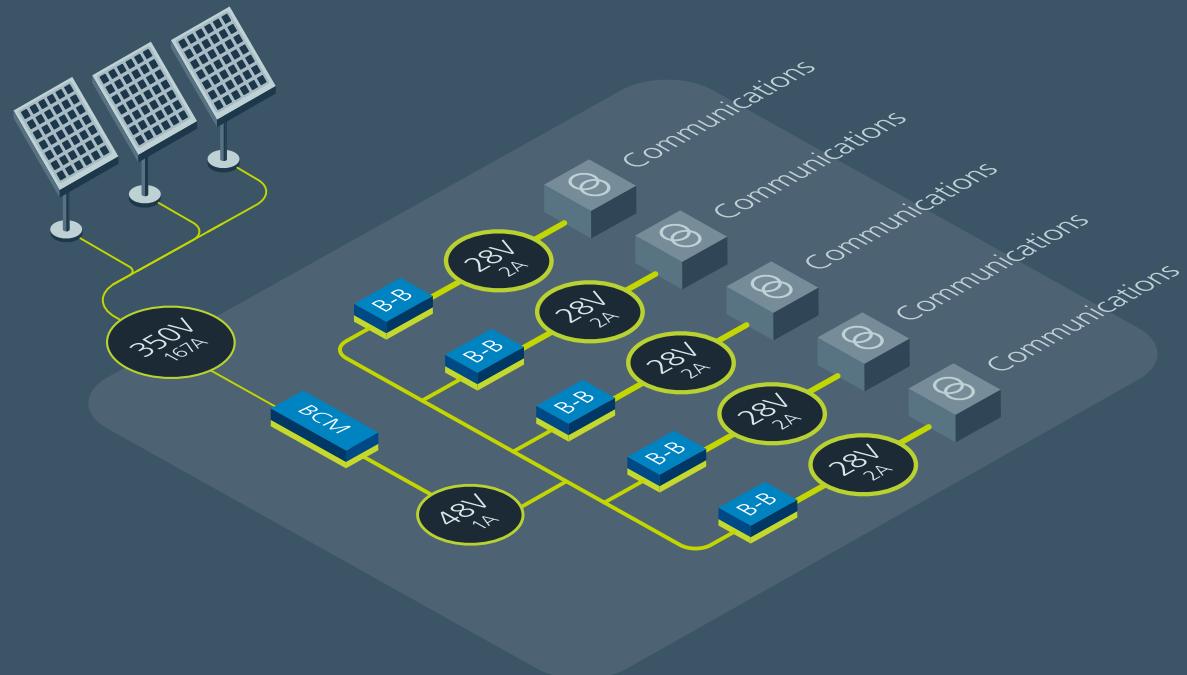
The Vicor solution

As this class of UAVs develops, high-efficiency power-conversion topologies such as Zero-Voltage Switching and Zero-Current Switching (ZVS/ZCS) which are used in Vicor BCMs® are important to enable the widening variety of fuel sources and applications with increasing power challenges. Key benefits were:

- Efficiently convert high voltages to SELV
- Lightweight power delivery network
- Wide input range at point-of-load conversion

The Power Delivery Network

A combination of the BCM6123 providing the isolated conversion of the 350V to a 48V intermediate bus and the PI3741 ZVS Buck-Boost regulator with a very wide range input voltage operating capability provides a tightly regulated 28V output for various UAV loads.



BCM bus converter modules

Input: 800 – 48V
Output: 2.4 – 55.0V
Current: Up to 150A
Efficiency: Up to 98%
As small as 22.0 x 16.5 x 6.7mm

vicorpowers.com/bcm



ZVS buck-boost regulators

Input: 8 – 60V
Output: 10 – 54V
Power: Up to 150W continuous
Efficiency: Over 98%

vicorpowers.com/zvs-buck-boost