Solving SWaP-C power challenges for MIL-COTS applications

Modular solutions for your power system

VICOR

On the forefront of power architectures

Solving the toughest aerospace and defense power delivery challenges

Vicor continues to raise the bar by delivering technologically advanced MIL-COTS power solutions that meet demanding SWaP-C requirements with all the robustness and reliability you would expect from a 30 year veteran of the aerospace and defense industry. Vicor has a portfolio of highly reliable modular components that enable military equipment designers to create SWaP-C optimized solutions. A good example is our DCM™ family DC-DC converters. When compared to the next-best solutions in brick packages, our innovative ChiP and VIA packages enable solutions with upwards of 2.5X improvement in power density by volume, and over 3X the power density by weight.

Tethered inspection UAV

Light, compact power supply increases UAV payload and supports a backup battery.

Man portable digital radio

The DCM fixed switching frequency (750 kHz) enables a compact EMI filter to meet stringent conducted noise specifications.

Airborne equipment

Scalable modular DCM based design, enables high power, regulated outputs with up to 200mF of bulk capacitance.

Autonomous underwater vehicle

A wide-input voltage range allows full utilization of the battery, which extended the range of the UAVs.

Direct infrared countermeasures

Direct infrared countermeasure's optical circuitry runs cooler while meeting stringent EMI specs.

Helicopter gearbox

MIL-STD power components withstand mechanical stresses caused by vibration and acceleration in helicopter gearboxes.

MIL-COTS DCM™ isolated-regulated DC-DC converter modules

Rugged high power converters for 28V and 270V line inputs

The DCM is an isolated, regulated DC-DC converter, operating from an unregulated, wide range input to generate an isolated output. With its high frequency zero-voltage switching (ZVS) topology, the DCM converter delivers high efficiency across its specified input line range. Modular DCM converters used independently or with downstream point-of-load (PoL) products support efficient power distribution, providing superior power system performance and connectivity from a variety of unregulated power sources to the point of load. The DCM VIA module provides a higher level of functionality with integrated EMI filtering, tight output voltage regulation and a secondary-referenced PMBus control interface. The DCM is able to meet MIL-STD-810, MIL-STD-704, MIL-STD-1275, and DO-160 when used in conjunction with the MIL-COTS MFM filter.

Features and benefits

- Up to 500W, 17.86A continuous
- Up to 93% peak efficiency
- Up to 1,032W/in³ power density
- OV, OC, UV, short circuit & thermal protection

Input voltage range:
9.0 – 50.0V
16.0 – 50.0V
160.0 – 420.0V

Output voltage range:
2.97 – 3.63V
3.5 – 5.5V
4.0 – 5.5V
7.2 – 13.2V
9.0 – 16.5V
14.4 – 26.4V
16.8 – 30.8V
22.0 – 30.8V
28.8 – 52.8V

Power:
2322 ChiP: Up to 60W
3623 ChiP: Up to 320W
4623 ChiP: Up to 500W
3414 VIA: Up to 320W
3714 VIA: Up to 500W

Dimensions:
2322 ChiP: 24.8 x 22.8 x 7.2mm
3623 ChiP: 38.7 x 22.8 x 7.2mm
4623 ChiP: 47.9 x 22.8 x 7.2mm
3414 VIA: 85.9 x 35.5 x 9.4mm
3714 VIA: 95.1 x 35.5 x 9.4mm

A complete list of MIL-COTS DCMs are available at **vicorpower.com/mil-cots-dcm**

MIL-COTS BCM® isolated fixed-ratio DC-DC bus converter modules

High-voltage bidirectional bus converters

The MIL-COTS Bus Converter Module (BCM) is a high efficiency (up to 98.7%), fixed ratio module operating from a 270V input voltage and delivering an isolated 28V or 48V nominal output voltage. The low weight, high efficiency and high power density enable our customers to meet their increasing SWaP-C requirements. The BCMs wide input range help achieve MIL-STD-704 E/F ranges without the need for external clamping. Low noise, high-frequency operation minimizes the size of the filter needed for MIL-STD compliance. The BCM enables system design flexibility and can be paralleled to create multi-kW arrays.

Features and benefits

- MIL-STD-704E/F compliant
- High efficiency up to 98.7%
- Power density >2,342 W/in^3, at 36.58W/gram
- Can be paralleled to create multi-kW arrays

Input voltage range:	
200 – 330V	330 – 365V
200 – 400V	360 – 400V
240 – 330V	400 – 700V
260 – 410V	500 – 800V

Output voltage range:	
8.1 – 12.8V	30.0 – 41.25V
10.3 – 11.4V	31.25 – 50.0V
11.2 – 12.5V	32.5 – 51.3V
11.8 – 13.0V	33.4 - 55.1V
16.3 – 25.6V	41.3 - 45.6V
25.0 – 43.7V	45.0 - 50.0V
25.0 – 50.0V	

Current:
Full Chip: Up to 25.8A
6123 ChiP: Up to 125A
4414 VIA: Up to 125A

Dimensions:
Full Chip: 32.5 x 22.0 x 6.7mm
6123 ChiP: 63.3 x 22.8 x 7.2mm
4414 VIA: 110.6 x 35.5 x 9.4mm

A complete list of BCMs are available at
vicorpower.com/mil-cots-bcm

MIL-COTS VITA-62™

VITA-62 compliant power converters

The VITA 62 power supply is a MIL-COTS power supply that is designed for 3U Open VPX systems. This rugged, conduction-cooled model operates from a nominal 28V or 270V DC input, with predefined output voltages ranging from 3.3V to 12V, delivering up to 600W of power. Customers requiring different output voltages or power levels can request a customized power supply to meet their own specifications. This family of products has been fully tested to meet MIL-461F and MIL-704F. In addition the 28V input version also meets MIL-1275D.

Features and benefits

- 3U open VPX power supply
- Over-current, -voltage & -temp protections
- MIL-STD 704F, 461F, 810G, 1275D
- No electrolytic capacitors

Input voltage range:
18.0 – 50.0V
220.0 – 320.0V

Output voltage:
+12V at 40A
+5V at 30A
+3.3V at 20A
+3.3V at 6A
+12V at 1A
-12V at 1A

Output power:
600W total power

Dimensions:
3U (3.9 x 6.6 x 1.0in)

A complete list of VITA-62 power supplies are available at **vicorpower.com/vita-62**

ZVS buck and buck-boost switching non-isolated DC-DC regulators

Wide range direct to PoL regulators

This series of regulators offer board-level designers maximum power density and flexibility for high-efficiency point-of-load DC-DC regulation. High performance Zero-Voltage Switching (ZVS) topology increases point-of-load performance, providing best-in-class efficiency up to 98%. They are highly integrated with control circuitry, power semiconductors and support components in a high density System in Package (SiP). It can also be configured to operate in constant-current mode with -55°C to +125°C operation.

Features and benefits

- Wide operating range
- Simple to use; fast development
- High efficiency of over 98%
- Flexible and rich feature set

ZVS buck regulators

Input voltage range:		
8.0 – 18.0V	14.0 – 42.0V	30.0 – 60.0V
8.0 – 36.0V	17.4 – 36.0V	36.0 – 60.0V
11.0 – 36.0V	20.4 – 36.0V	
Output voltage range:		
2.2 – 3.0V	3.3 – 6.5V	6.5 – 14.0V
2.2 – 4.0V	4.0 – 5.5V	10.0 – 16.0V
2.3 – 4.1V	4.0 – 6.5V	
2.6 – 3.6V	6.5 – 13.0V	
Current/Dimensions:		
10.0 x 10.0 x 2.5mm LGA SiP: Up to 10A		
10.0 x 14.0 x 2.5mm LGA SiP: Up to 22A		

ZVS buck-boost regulators

Input voltage range:		
8.0 – 60.0V	21.0 – 60.0V	
Output voltage range:		
10.0 – 50.0V	21.0 – 36.0V	36.0 – 54.0V
Power:		
Up to 150W		
Dimensions:		
LGA SiP: 10.0 x 14.0 x 2.5mm		

A complete list of buck and buck-boost regulators are available at **vicorpower.com/buck** and **vicorpower.com/buck-boost**

Vicor custom power systems

Get to market quickly with a top-quality custom power supply

When a deadline is looming and you need to rely on a trusted partner to design an efficient power supply quickly, let Vicor Power Systems design and deliver a complete, cost-effective solution meeting your exacting needs. Using Vicor Power Component Design Methodology and leveraging exceptional Vicor technologies, our custom engineers will work closely with you during the full process from design through manufacturing to ensure you get the most efficient and flexible power supply from source to point-of-load. **vicorpower.com/custom**

Components guaranteed to work together

Trusted engineering partner

A full spectrum of in-house testing

Time to market

An experienced, dedicated team

- Specialized engineers with a total of >160 years of experience
- Knowledge, experience and insight from more than 10,000 custom projects over the last 20 years
- Preferred supplier to Raytheon, L3 and Lockheed

Comprehensive environmental and quality testing

- HTOL (High Temperature Operational Life)
- HALT (Highly Accelerated Life Test)
- Environmental stress screening
- Thermal and vibration analysis
- MTBF calculations

Detailed design development

- Conduction-cooled, fan-cooled or natural convection
- Enclosed, open-frame chassis or harsh-environment enclosures
- Mechanical and electrical design
- Program management

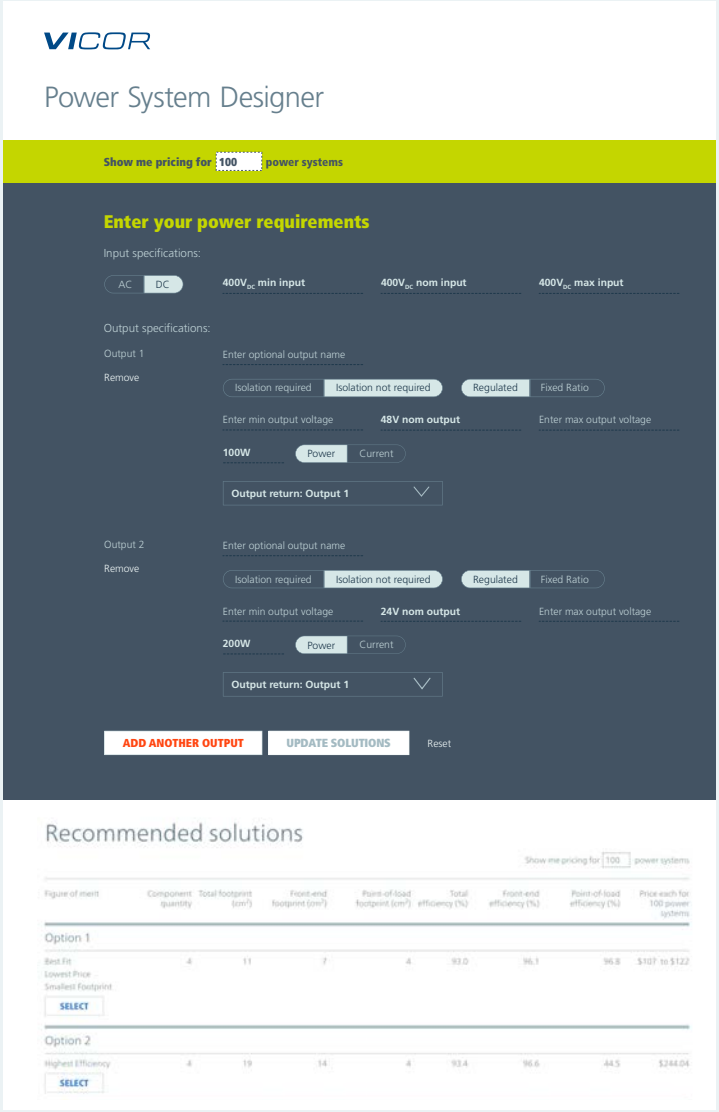
World-class manufacturing facilities

- Technologically-advanced facilities for both low- and high-volume manufacturing
- ISO: AS9100 and ISO 9001 qualified
- Multiple supplier awards from Raytheon SAS, Raytheon IDS, L3 CSW, General Dynamics C4 Systems and Cubic Defense Applications, Inc.

Vicor: Enabling a competitive advantage

High-performance modular power systems achieve higher levels of flexibility and scalability than ground-up custom designs. Our continual advances in power distribution architectures, conversion topologies and packaging technology will keep you ahead in system efficiency and density, converting and managing power from the source to the point-of-load. **www.vicorpower.com/defense-aero**

Generating complete power systems



Just enter a few specs to design your next power system

Designing your power system in a single location — up to 75% faster than traditional methods — is as easy as entering your input and output power as well as your basic system requirements. The Power System Designer is one of the Vicor web-based tools that makes it easy for you to build flexible, efficient and cost-effective power systems that get you to market faster.

- Instant performance analysis for recommended solutions
- Access an infinite number of products and technical specs
- Evaluate power chains electrically and mechanically
- Prioritize solutions by efficiency, component count, cost, footprint and recommended best fit
- Save, export and share a final BOM or power system

Start your next design at www.vicorpower.com/psd

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