

High Reliability Power Conversion Products

For Military and Avionics Applications



VPT®

Power Your Critical Mission Today

www.vptpower.com

Military and Commercial Avionics Power Solutions



When your program needs true military grade high-reliability DC-DC converters, EMI filters and other power accessories qualified to MIL-PRF-38534 Class H and Class K, count on the proven products from VPT's DV Series.

Save board space, weight, heat, and cost when you create an efficient power system using our isolated DC-DC converters plus our family of non-isolated, synchronous, buck regulated point of load DC-DC converters.

DV Series

[DC-DC CONVERTERS]

Isolated, thick-film hybrid converters for flight-critical applications. -55 °C to +125 °C.

Power Level (W)	Model Series	Outputs	DLA SMD Family #
1.5	DVCH2800S/D	Single and Dual	5962-09242 5962-09243
6	DVSA2800S/D	Single and Dual	5962-03241 5962-03242
12.5	DVSB2800D	Dual	5962-08207
12.5	DVGF+2800T	Triple	5962-08205
15	DVHV2800S/D	Single and Dual	5962-11226 5962-11227
15	DVAB2800D	Dual	5962-14232
15	DVHF+2800T	Triple	5962-08206
20	DVHF2800S/D	Single and Dual	5962-03243 5962-03244
25	DVWR2800T	Triple	5962-16203
30	DVTR2800T	Triple	5962-16202
40	DVTR2800S/D	Single and Dual	5962-11224 5962-11225
120	DVFL2800S/D	Single and Dual	5962-07243 5962-07244

[DC-DC CONVERTERS WITH EMI FILTERS]

Isolated, hybrid DC-DC power converters with integral EMI filtering capability. -55 °C to +125 °C.

Power Level (W)	Model Series	Outputs	EMI Filter	DLA SMD Family #
10	DVEHF2800T	Triple	Included	In process
40	DVETR2800S	Single	Included	5962-15208
40	DVETR2800D	Dual	Included	5962-15209

[HIGH EFFICIENCY DC-DC CONVERTERS]

Isolated, thick-film hybrid converters that deliver extremely efficient performance. -55 °C to +125 °C.

Power Level (W)	Model Series	Outputs	EMI Filter	DLA SMD Family #
50	DVHE2800S	Single	DVMC28	5962-15230

[POINT OF LOAD DC-DC CONVERTERS]

Combine an isolated DC-DC converter with any of these POL converters for reduced system size, weight, heat and cost. -55 °C to +125 °C, 5Vin nominal.

Power Level (W)	Model Series	Outputs	DLA SMD Family #
10	DVPL0503S	Single	5962-13243
16	DVPL0505S	Single	5962-09241
33	DVPL0510S	Single	5962-13219
66	DVPL0520S	Single	In process

[EMI FILTERS]

Further reduce noise with EMI filters and transient suppression modules. -55 °C to +125 °C.

Output Current (A)	Model Series	Outputs	DLA SMD Family #
0.8	DVMSA28	Single	11016
1	DVMA28	Single	06004
2	DVMH28	Single	06005
2	DV704A	Single	In process
4	DVMC28	Single	06023
7	DVMD28	Single	06024
15	DVME28	Single	07004

[INRUSH CURRENT LIMITER]

Control the inrush current of your DC-DC converters, EMI filters and discrete input capacitors. -55 °C to +125 °C.

Output Power (W)	Model Series	Outputs	DLA SMD Family #
200	DVCL28	Single	5962-13240

[THERMAL PADS]

Ensure low thermal resistance, fill air gaps and provide excellent thermal performance.

Output Power	Model Series	Outputs	DLA SMD Family #
N/A	TP-001 to 011	N/A	N/A

For complete data, see datasheets at www.vptpower.com.

Compliances & Certifications:

- Products available qualified to MIL-PRF-38534 Class H and Class K
- MIL-PRF-38534 Class H and Class K certified manufacturing facility
- MIL-STD-704A input voltage requirements
- DO-160
- ISO-9001
- MIL-STD-883 environmental screening
- MIL-STD-461 C-F when used with a VPT EMI filter
- DLA SMDs available for most modules

Features:

- 100% hermetic
- No optocouplers
- High efficiencies
- 28Vin nominal unless otherwise noted
- Full performance over -55 °C to +125 °C military temperature range, no power derating necessary
- A host of circuit protection features
- Fault-tolerant magnetic feedback circuits
- Thick-film hybrid technology for maximum reliability
- Available in industry standard output voltages including:
 - Single outputs: typically 3.3, 5, 5.2, 12, 15V
 - Dual outputs: typically ±5, ±12, ±15V
 - Triple outputs: typically 5/±12, 5/±15V



Hi-Rel Rugged Power Solutions



Building on proven design heritage, the VXR Series of rugged high-reliability DC-DC converters and EMI filters is optimized for a broad range of applications from military ground vehicles to commercial and military manned and unmanned aircraft that endure harsh environments including severe vibration, shock and temperature cycling.

The VXR Series utilizes a low noise, fixed frequency, wide input voltage range topology with extended high and low input transient capability to simplify overall power system design and compliance. Precision controlled synchronous rectification achieves high efficiency over a wide input range, reducing power dissipation and minimizing external heatsink requirements. Additionally, a proprietary control loop design provides fast transient response without optoisolators.

VPT's patent-pending epoxy encapsulated V-SHIELD™ packaging utilized in the VXR Series of products is highly resistant to chemical, solvent and salt environments – making it fully compatible with high-volume manufacturing processes including wave solder, cleaning solvents, high-pressure sprays and aqueous wash. The epoxy packaging incorporates an integral metalized shield for improved system EMI compatibility. Additionally, the packaging provides dual-sided cooling and reduced power dissipation for simplified thermal design.

Compliances & Reliability Testing:

- MIL-STD-1275 A – E, including starting disturbances
- MIL-STD-1275 A – D voltage spikes, with VXR EMI filter
- RTCA / DO-160 Section 16
- RTCA / DO-160 Section 18 & 21, with VXR EMI filter
- MIL-STD-704 A – F
- MIL-STD-461 C – F, with VXR EMI filter
- J-STD-001, ISO-9001, IPC-A-610 Class 3 manufacturing
- Testing to JESD22, MIL-STD-810, MIL-STD-883

Features:

- 7 to 100 Watt options
- 9 to 60 Volt continuous input
- 6 to 80 Volt transient input
- -55 °C to +105 °C operation
- 2000 V isolation
- Output current limit protection
- Short circuit protection
- Synchronous rectification
- Fixed frequency
- Proprietary control loop design

Advanced Packaging V-SHIELD™ Technology:

- Integral EMI shield
- Dual-sided thermal conduction
- Chemical and solvent resistant
- Compatible with aqueous cleaning processes

VXR Series

[DC-DC CONVERTERS]

Isolated, wide Vin range. 2000 V isolation. -55 °C to +105 °C.

Power Level (W)	Model Series	Output (VDC)
7	VXR7-2800S	Single 3.3, 5, 12, 15
15	VXR15-2800S	Single 3.3, 5, 12, 15
30	VXR30-2800S	Single 3.3, 5, 7, 12, 15
100	VXR100-2800S	Single 3.3, 5, 7, 12, 15, 18

[EMI FILTERS]

Wide Vin range. 2000 V isolation. -55 °C to +105 °C.

Output Current (A)	Model Series	Outputs
2	VXRF2-28	Single
5	VXRF5-28	Single
10	VXRF10-28	Single
20	VXRF20-28	Single

For complete data, see datasheets at www.vptpower.com.



Hi-Rel COTS Power Solutions



VPT's COTS DC-DC converters deliver high reliability at a cost within your program's budget. With electrical designs based on VPT's proven military products, these DC-DC converters, EMI filters and accessory products are designed for the unique requirements of commercial avionics and military applications. VPT never "upscreens" its products from lower-grade solutions.

VPT Series

[DC-DC CONVERTERS]

Metal packaging for extreme temperatures in non-flight critical applications. -55 °C to +100 °C.

Power Level (W)	Model Series	Outputs
5	VPT5-2800S/D	Single and Dual
15	VPT15-2800S/D	Single and Dual
30	VPT30-2800S/D/T	Single, Dual, Triple
100	VPT100+2800S/D	Single and Dual

Full epoxy encapsulated package with metalized EMI shield. -55 °C to +100 °C.

Power Level (W)	Model Series	Outputs
15	VPT15-2800S/D	Single and Dual
30	VPT30-2800S/D/T	Single, Dual, Triple
250	VPT250-2800S	Single

[ADDITIONAL COTS MODULES]

Metal package with full internal potting for rugged duty. -55 °C to +100 °C. DV200-270 is 270Vin nominal.

Power Level (W)	Model Series	Outputs	EMI Filter
30	DVST2800T	Triple	Included
175	DV200 - 270S/D	Single and Dual	Not included
200	DV200-2800S/D	Single and Dual	Not included

[EMI FILTERS]

Six-sided metal packaging for efficient EMI shielding. -55 °C to +100 °C.

Output Current (A)	Model Series	Outputs
1	VPTF1-28	Single
3	VPTF3-28	Single
10	VPTF10-28	Single
20	VPTF20-28	Single

[EMI FILTERS AND TRANSIENT SUPPRESSION COMBOS]

Protect your system in two ways with a single small module. -55 °C to +100 °C.

Output Current (A)	Model Series	Outputs
10	VPTc10-28	Single
10	VPTi10-28	Single
14	DVMN28	Single

[HI-REL COTS ACCESSORIES]

Power Conditioning Module (VPTPCM) and Bus Converter Module 270V to 28V (VPTHVM). -55 °C to +100 °C.

Output Power (W)	Model Series	Outputs
120	VPTPCM-12	Single
200	VPTHVM-270	Single

[COMPLETE VME POWER SUPPLY]

Single slot 6U, configurable VME power supply.

Power Level (W)	Model Series	Outputs
500	VPTVME-28	Up to 5, configurable

For complete data, see datasheets at www.vptpower.com.

Compliances & Certifications:

- MIL-STD-1275 when used with VPTPCM-12
- MIL-STD-704A input voltage requirements
- MIL-STD-461 C-F when used with an EMI filter
- DO-160
- ISO-9001
- DEF STAN 59-411
- Testing to JESD22, MIL-STD-810, MIL-STD-883
- J-STD-001, ISO 9001, IPC-A-610 manufacturing

Features:

- Technology based on proven military heritage designs
- Cost effective
- High efficiencies
- 28Vin nominal unless otherwise noted
- Full performance over wide military temperature ranges of -55 °C to +100 °C, no power derating necessary
- Host of circuit protection features
- Full military standard input voltage ranges
- Available in industry standard output voltages including:
 - Single outputs: typically 3.3, 5, 12, 15V
 - Dual outputs: typically ± 5 , ± 12 , ± 15 V
 - Triple outputs: typically 5/ ± 12 , 5/ ± 15 V
- Most models available with encapsulated package option for manufacturing processes utilizing cleaning solvents, high pressure sprays and aqueous wash



Innovative Technology. Certified Quality. Proven Heritage.



MIL-PRF-38534
Class H & Class K



Designed and Qualified for Reliability

VPT products are precisely designed for reliability and efficiency. All VPT products undergo rigid quality testing procedures in qualified facilities to ensure optimal performance:

- ▶ MIL-PRF-38534 Class H and Class K Site Certification
- ▶ QML-38534 Qualified Manufacturers List
- ▶ QPD SIS-38534 Qualified Products Database to Class E, H, & K
- ▶ MIL-STD-883 Lab Suitable, MIL-PRF-38534, FSC 5962
- ▶ ISO-9001 Certification
- ▶ DLA Standard Microcircuit Drawings for many military grade products

Screened for Rugged Environments

Each VPT product line offers several grades of environmental screening. Depending on the product series, tests performed may include:

- ▶ Non-destructive bond pull
- ▶ Internal visual
- ▶ Temperature cycling
- ▶ Constant acceleration
- ▶ PIND
- ▶ Stabilization bake
- ▶ Pre burn-in electrical
- ▶ Burn-in
- ▶ 100% final electrical
- ▶ Hermeticity
- ▶ Radiography
- ▶ External visual

Immediate Availability

VPT understands the urgency of many program timelines. There is no need to wait months for your power conversion products because VPT maintains industry-leading stock levels, allowing immediate shipment from stock in most cases.

SWaP Efficiencies

VPT's continual advancements in power conversion technology deliver many unique advantages across our product lines:

- ▶ Maximum reliability thick-film hybrid technology
- ▶ Innovative rugged hi-rel architecture
- ▶ Proprietary epoxy encapsulation packaging availability
- ▶ Full operation over wide temperature ranges
- ▶ Excellent EMI performance
- ▶ High power densities
- ▶ Light weight



Proven Heritage

A partial list of programs supported by VPT:

Military Avionics

- A330 Tanker
- Apache Helicopter
- ASELPOD ATP
- AWACS Aircraft
- Blackhawk Helicopter
- C-17 Aircraft
- C130J Transport Aircraft
- CP141 Patrol Aircraft
- Euro Hawk UAV
- Eurofighter Typhoon
- F-15/16/18/22/35
- Global Hawk UAV
- Harrier Jet
- Hummingbird UAV
- Lynx Helicopter
- OH-1 Helicopter
- P-1 Aircraft
- Predator UAV
- Tornado Fighter
- Watchkeeper UAV

Ground Vehicles

- Abrams Tank
- Bradley Fighting Vehicle
- Crusader Attack Vehicle
- Gen Main Battle Tank
- Husky Mine Vehicle
- Stryker Tank

Commercial Avionics

- Airbus A350/A380/A400M
- ARJ-21 Jet
- AN-148 Regional Jet
- Bell Helicopter
- Boeing 737/757/777/787
- Dassault Falcon 900
- Embraer Executive Jet
- Gulfstream G250
- Lear Jet
- Mitsubishi Regional Jet
- Sukhoi Superjet 100
- Typolev-154 Tri-Jet

Weapons and Defense Systems

- AAM-5
- AMRAAM
- ATACMS
- ATGM
- ATP, USAF
- IRIS T
- PAC-3/J
- MEADS
- Meteor Missile
- Next MLRS
- Tactical Tomahawk Missile
- THAAD
- Trident

Marine Systems

- ARCI Sub Sonar
- JMMS Ship
- Ohio Class Subs
- PKX Patrol Boat
- Type 23 Frigate
- S-80 Sub
- US-2 Flying Boat
- Virginia Class Sub

Space Solutions

- Atlas V
- Canadian SCISAT
- Delta Rocket
- Dragon Capsule
- Dubai SAT II
- ExoMars
- Falcon 9
- GLONASS
- GPS IIF/IIR-M/III
- International Space Station
- Mercury Messenger
- Orion Spacecraft
- Polar NOx
- Pluto New Horizons
- Venus Express
- Worldview-3

See www.vptpower.com for a comprehensive programs list.



About VPT

VPT, Inc. (VPT®) delivers quality power conversion solutions to customers around the globe with sales representation in more than 30 countries.

Corporate headquarters is located in Blacksburg, Virginia with sales and marketing located in the aerospace hub of Seattle, Washington. VPT's products are manufactured at Delta Electronics, Inc. in Taoyuan, Taiwan.

For over 20 years, VPT's award-winning DC-DC converters, EMI filters, accessory products and engineering services have powered systems for world-class organizations and programs. View our continually expanding list of program heritage on our website.

Long-standing relationships with various partner organizations including Virginia Tech's Center for Power Electronics Systems, Delta Electronics, and parent company HEICO Corporation ensure that VPT leverages its global resources to deliver innovative power conversion products with efficient, cost-effective technology.

VPT is committed to compliance with all aspects of U.S. laws and regulations governing the export of ITAR-controlled defense articles, defense services and technical data.



Visit www.vptpower.com for the latest in:

- New products
- Detailed program experience
- Full product datasheets
- Technical video labs
- Product catalogs
- Application notes
- SMD cross reference

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