



Modular Devices, Inc.

Power Conversion for Military/Commercial Space/Aerospace

HYBRID DC - DC CONVERTERS



ISO 9001:2008

SOLUTIONS FOR INNOVATIVE POWER TECHNOLOGY AND PACKAGING

**High-reliability DC-DC converters
with built-in EMI filtering**

**Space proven proton rad hard
100K+® technology**

**Wide selection of input
bus voltages**

**Standard, semi-custom
and full custom packages**

**Optimum technology in the
most efficient packages for the
most demanding applications**

*Modular Devices, Inc. is proud
to support many of the
world's most important programs*

B2
F16
F22
JDAM
LAIRCM
Small Diameter Bomb
Stryker MGS
Aquarius/SAC-D
Astrosat
COSMO
GPS
Hermes® 450/900
ISS/AMS
KOMPSAT-3

Modular Devices, Inc. (MDI) designs and produces an exceptionally wide range of power supplies for military, aerospace, and commercial space applications. From single converters to robust converter assemblies, MDI's high-reliability hybrid DC-DC converters with built-in EMI filtering offer optimum technology in the smallest, lightest packages for the most demanding specifications.

MDI can produce unique power electronic functions quickly and efficiently with its in-house thick film hybrid facility and magnetics capability. Furthermore, the company's extensive inventory of proven designs and automated design techniques drive MDI's realistic development costs—and lead time.

As a USA-based, ISO 9001:2008 registered company, Modular Devices Inc. offers the accessibility, resources and experience to accommodate your diverse and most challenging requirements.

MDI – STANDARD Hybrid DC-DC Converters feature:

- Built-in EMI filters that meet MIL-STD-461 requirements CE01, CE03, CS01, CS02 and CS06
- Inhibit-Not Function
- Fully Isolated Design
- Power On Soft Start
- External Sync Capability for switching frequencies

Hybrid, discrete and surface mount configurations available.

MDI's designs have been proven in military, commercial space and aerospace applications worldwide. These heritage designs reduce the risk associated with new designs while significantly shortening the planning phase of each project. Modules are efficiently adapted to your specifications for power technologies, packaging and output voltages to fulfill your unique power requirements.

MDI – RUGGEDIZED Hybrid DC-DC Converters form versatile building blocks for innovative solutions at both the individual converter and assembly level

MDI combines standard and modified converters into high-density assemblies in NC milled housings. VME, SEM E or custom packaging formats are available. By implementing the power converter function with assemblies of hybrid converters, the same functions can be achieved at different input voltages (e.g. 28 VDC and 120 VDC, or 28 VDC and 270 VDC) by simply changing out the hybrid modules. Sequencing, redundant outputs, programmable outputs and other functions are also readily available. Superior system integration is realized more effectively with MDI's assembly packaging.

MDI – 100K+® TECHNOLOGY Space proven for critical missions

The Proton Rad Hard series of converters feature MDI's patented 100K+® Technology for low, medium and high power applications. This includes the 5000 Series (28 VDC input), 7000 Series (50 VDC input), 8000 Series (70 VDC input) and 9000 Series (100 VDC input).

- Rad Hard: TID > 100kRad (Si)
- No SEE: LET > 82MeV*cm²/mg
- Neutron Fluence to 1E14/cm²
- Resistant to Prompt Dose

- 2:1 Margin: Operates beyond 200kRad TID
- Proton Resistance: No optocouplers used
- Proton Fluence to 1E12/cm²
- Resistant to Low Dose Rates (ELDRS)

MDI's space proven Proton Rad Hard Series has been successfully deployed to provide electrical power, attitude control, data management and communication link capabilities for international satellite and spacecraft programs for more than 15 years.

The newest additions to the MDI product line include:

3090 Series Quiet Converters meet MIL-STD-461 D, E, and F. No external filtering required.

Cubesat/Nanosat Converters:
3693,3967,3699,53080

- Rad Hard: TID > 100kRad(Si)
- No SEE: LET > 82MeV*cm²/mg
- Proton Resistant: No optocouplers used
- Single and dual outputs for 6 - 16V powerbus of cubesats and scalable miniaturized satellites
- Completely self contained Thick Film Hybrid DC-DC Converter
- Built-in EMI input filter
No external filter caps required
- Short circuit and overvoltage protection
- Capability of external sync

Industrial Grade Converters (+85°C):
1607,1631,1680,1690,1693,16080

- For demanding industrial applications not requiring military specifications
- Hermetic packaging protects against harsh environments
- Built-in EMI filter limits conducted emissions and reduces transient susceptibility
- Short circuit proof – inherent dual mode overcurrent protection
- Fixed frequency operation offers low ripple and fast load transient response
- User programmable soft start for Vout ramp
- Sync input
- Power on/off – ground INH to shut output: low quiescent current
- Precision RF feedback – no optical devices used
- Parallelable – for higher output prime or redundant power applications

MDI Standard DC - DC Converters

Maximum Power Output Input Description	2.5 Watts	5 Watts	6.5 Watts	10 Watts	20 Watts	30 Watts	40 Watts	80 Watts
5 VDC Low Input Voltage Range					Series 3650			
8-40 VDC Low Input Voltage Range		Series 3061	Series 3062		Series 3113	Series 3378		Series 3114
5 and 12 VDC Input Point-of-Load Non-Isolated Proton Rad Hard					Series 5080 5085	Series 5082 5087		
28 VDC Input Standard		Series 3080			Series 3011	Series 3001 3138		
28 VDC Input Full Feature			Series 2690 6690		Series 3107 6107	Series 2680 6680	Series 3193 6193	Series 3031 6031
28 VDC Input Spacecraft Bus Low Power / High Efficiency Proton Rad Hard		Series 4690						
28 VDC Input Spacecraft Bus Proton Rad Hard			Series 5690		Series 5107	Series 5680	Series 5193	Series 5031
50 VDC Input Spacecraft Bus Proton Rad Hard			Series 7690		Series 7107	Series 7680	Series 7193	Series 7031
70 VDC Input Spacecraft Bus Proton Rad Hard			Series 8690		Series 8107	Series 8680	Series 8193	Series 8031
100 VDC Input Spacecraft Bus Proton Rad Hard			Series 9690		Series 9107	Series 9680	Series 9193	Series 9031
120 VDC Input Space Station		Series 3325	Series 3070		Series 3108	Series 3060	Series 3326	Series 3051
270 VDC Input Advanced Aircraft			Series 3020		Series 3109	Series 3000	Series 3327	Series 3041

Join the worldwide community that relies on MDI to be receptive to tomorrow's challenges - today.

We support unique requirements while maintaining an established track record of program support for military, aerospace and commercial space applications.

All MDI converters are screened in accordance with military/aerospace methods.

(*) Available in 28, 50, 70, 100 Volt Inputs

Modular Devices, Inc. (MDI) is an ISO 9001 : 2008 registered company that is privately owned and operated in the U.S.A. MDI specializes in the rapid design, development and manufacture of robust, state-of-the-art DC - DC converters, power supplies, power controllers, and power distribution products for the military, commercial space, and aerospace communities, worldwide.

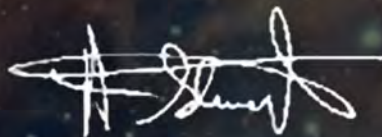
MDI's unusually comprehensive range of in-house engineering and production capabilities allow the company to be exceptionally responsive to its customers diverse requirements. These same facilities and experience mean that MDI can efficiently modify and quickly produce new devices from the company's huge catalog of heritage designs.

The professional staff at MDI is organized for optimal performance to military and space level quality assurance requirements - from work statements, technical design and analysis, materials selection and control to documentation management, precision manufacture and screening and testing of complex parts - to assure the success of each customer's programs. Modular Devices, Inc. is uniquely capable of coordinating its advanced power conversion technology with professional management to meet or exceed your most challenging specifications.

We, the people at Modular Devices, Inc., are proud of our long record of accomplishment and customer satisfaction. We remain highly responsive to all of our customers while we continue to:

- Provide cutting edge technology with low-risk options,
- Maintain rigorous space-quality standards and quality control,
- Create lasting relationships built on commitment, communication, and trust.

Henry F. Striegl, Jr.
Vice President and General Manager



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