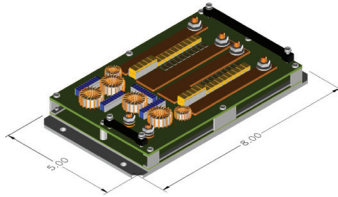


# \* 3696 500 Watt Proton Rad Hard 100K +<sup>®</sup> Space Power Supply

## High Power DC - DC Converter



Model	Nominal Vin	Vin Range	Applications
53696	28	20-40	28VDC Satellite Bus
73696	50	35-70	50VDC Satellite Bus
83696	70	65-90	70VDC Satellite Bus
93696	100	85-120	100VDC Satellite Bus
33696	120	86-158	ISS/Orion Space Vehicle Bus

The \*3696 DC-DC converters are a family of 500 watt rated modules that provide high reliability power for critical space environment applications needing higher power than full hybrid DC-DC converters can offer.

The circuit topology of the \*3696 provides superior SEU and 100K+ TID performance.

Five different ranges of input voltage are offered, each tailored to popular satellite bus voltages. A range of popular single and dual output voltages is available, and custom output voltages are also available.

The units include an input EMI filter and active reverse polarity protection. User specified under voltage lockout is included. Outputs include high attenuation ripple and common mode spike filtering.

The \*3696 converters are constructed with an optimum mixture of hermetic hybrid control circuits and high reliability surface mount components, offering a construction that is suitable for the most demanding space applications, while providing reliable conduction cooled thermal paths for all components.

### Specifications

#### Single Outputs:

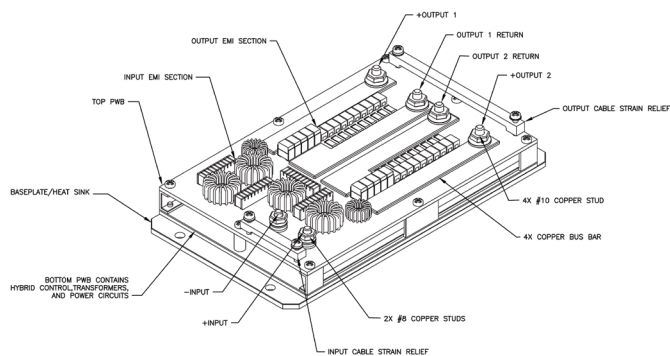
Output Voltage V	12	15	28
Output Current A	42	33	18
Efficiency %	84	86	86
Line/Load Regulation %	2	2	2
Output Ripple mVpp	120	150	200

#### Dual Outputs:

Output Voltage V	12/12	15/15
Output Current A	21/21	16/16
Efficiency %	84	86
Line/Load Regulation %	2	2
Output Ripple mVpp	120/120	150/150

#### Environment:

Operating Temperature Range -55°C to +100°C baseplate  
Non-operating Storage Temperature Range -65°C to +150°C ambient



#### Notes:

Data for 25°C operating baseplate temps.  
Output Voltage: Nominal shown. Factory setpoint within ±1% at nominal input and full rated load.  
Output Current: Max. shown at nominal input voltage.  
Efficiency: Min. shown at nominal input and full rated load.

Line/Load Regulation: Max. Combined over Input Voltage and Load ranges listed.  
Output Ripple: Full load resistive, 20 MHz bandwidth.  
Specifications subject to change without notice.

### Features

#### Electrical Design Features:

##### MDI Proton RadHard 100K+@ Technology:

Proton resistant RF I/O Isolation: no optical devices used.  
Over 100kRad Si TID, 200kRad tested.  
SEE/SEU Immune: LET>82MeV\*cm<sup>2</sup>/mg tested.

**Ultra-Low Vf Input Reverse Polarity Protection:** Protects against input misconnections or unanticipated polarity reversal of any duration. Clamless design eliminates need for external diodes or fuses.

**Input Undervoltage Lockout:** User programmable UV lock with hysteresis to shut operation at line inputs under selected limit.

**Sync Input:** Synchronizes up to user programmed frequency.

**Inhibit Not Input:** Shut operation by grounding Inh Not port; very low quiescent current (µA).

**Remote Sense:** Auto adjusts output voltage for load lead losses.

**Output Adjust:** User programmable to increase/decrease output voltage setpoint.

**Output Soft Start:** User programmable output turn-on delay/ramp.

**Full Load Range Voltage Regulation:** Regulates down to zero applied load.

**Dual Mode Overcurrent/Short Circuit Protection:** Current mode control pulse by pulse and cyclic mode overcurrent protection.

**Internal Overvoltage Protection:** Overvoltage protected for internal (open control loop) fault.

**Built-In EMI filters:** Input filter for 461C CE03, output filtering smooths ripple and attenuates noise spikes.

#### Mechanical Design Features:

**All Conduction Cooled Design:** Efficient thermal management in vacuum environments.

**Hybrid and SMT Componentry:** Space heritage hybrid and SMT component selection for reliability.

**Integral I/O bus rails interface:** Reliable low loss input and output power connections.

**Compact size, light weight:** 5x8x1.5 LWH Inches including connecting rails and thermal interface heatsink. Less than 3.5 lbs.



**Modular Devices, Inc.**

Power Conversion for Space and Military/Aerospace

**Modular Devices, Inc.**

One Roned Road  
Shirley, New York 11967

Tel: 631.345.3100 Fax: 631.345.3106 E-mail: sales@mdipower.com