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 %: 86, 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
- Shock: 20 G’s
- Vibration: 12 G’s

**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·cm²/kg tested.

- **Ultra-Low Vf Input Reverse Polarity Protection:**
  Protects against input misconnections or unanticipated polarity reversal of any duration.
  Clumpless 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, output filtering smooths ripple and attenuates noise spikes.

- **Mechanical Design Features:**

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

- **Hybrid and SMT Componetry:**
  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:**
  6.50” x 4.95” x 1.05” LWH Inches including connecting rails and thermal interface heatsink. Less that 2.5 lbs.
**3696 500 Watt Proton Rad Hard 100K +®**  
Space Power Supply  
High Power DC - DC Converter

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### P1 CONNECTOR

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<thead>
<tr>
<th>PIN</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>Sync</td>
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<tr>
<td>2</td>
<td>Inhibit Not</td>
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<tr>
<td>3</td>
<td>N/C</td>
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<tr>
<td>4</td>
<td>N/C</td>
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<td>- Remote Sense</td>
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<tr>
<td>A1</td>
<td>N/C</td>
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<tr>
<td>A2</td>
<td>Input Return</td>
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<tr>
<td>A3</td>
<td>+VDC Input</td>
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### J1 CONNECTOR

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<th>DESCRIPTION</th>
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<tr>
<td>A2</td>
<td>N/C</td>
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<td>A3</td>
<td>Output Return</td>
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*Model Number: 3696*  
*Power Conversion: 500 Watts*  
*Input/Output: DC - DC*  
*Operating Temperature: -40°C to 85°C*  
*Compliance: Space Qualified*  
*Manufacturer: Modular Devices, Inc.*

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Modular Devices, Inc.  
Power Conversion for Space and Military/Aerospace

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