Series 3699
7.5 – 20 Watt Hybrid
For CUBESATS and MINIATURIZED SATELLITES

Features
- Rad Hard: TID > 100kRad(Si)
- 2:1 margin: Operates beyond 200kRad TID
- 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
- No external filter caps required
- Fully isolated design
- “Inhibit-not” function
- Power on soft start
- 200 kHz operation for low ripple and fast response time
- Built-in EMI input filter
- Short circuit and overvoltage protection
- Capability of external sync for switching frequencies

Specifications

INPUT:
- 12 VDC nominal
- Range: 6 to 16 VDC continuous

ISOLATION:
- Input to case: 500 VDC
- Input to output: 500 VDC
- Output to case: 100 VDC

ENVIRONMENT:
- Storage temperature: -55°C to +150°C
- Shock: 50 G’s
- Acceleration: 50 G’s
- Vibration: 30 G’s

Grades EU, R & S:
- Full Power Output at Tcase = +85°C
- Lineally derates to zero at Tcase = +115°C
- Grades RE & SE:
- Full Power Output at Tcase = +125°C
- Lineally derates to zero at Tcase = +135°C

WEIGHT:
- 60 grams typical

TOLERANCES: ALL DIMENSIONS ±0.01 EXCEPT F= MAX. C = +0.01/-0.02; DRAWINGS IN INCHES.

<table>
<thead>
<tr>
<th>Case Style</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tbody>
<tr>
<td>2</td>
<td>2.200</td>
<td>55.880</td>
<td>1.350</td>
<td>34.290</td>
<td>0.495</td>
<td>12.573</td>
<td>1.000</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>2.200</td>
<td>55.880</td>
<td>1.350</td>
<td>34.290</td>
<td>0.495</td>
<td>12.573</td>
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<tr>
<td>5</td>
<td>I</td>
<td>2.225</td>
<td>56.515</td>
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<td>12.573</td>
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<td>0.495</td>
<td>12.573</td>
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<tr>
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<td>12</td>
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## PROTON RAD HARD 100K+™ SERIES 3699

### Magneticley Isolated

#### 6 – 16 VDC

### DC – DC Converters

#### PROTON RAD HARD 100K+™ SERIES 3699

<table>
<thead>
<tr>
<th>DUAL OUTPUT DEVICES</th>
<th>3699-D03S (11.6W)</th>
<th>3699-D05S (20W)</th>
<th>3699-D12 (20W)</th>
<th>3699-D15S (20W)</th>
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</thead>
<tbody>
<tr>
<td><strong>PARAMETER</strong></td>
<td><strong>CONDITION</strong></td>
<td><strong>MIN</strong></td>
<td><strong>TYP</strong></td>
<td><strong>MAX</strong></td>
</tr>
<tr>
<td>Output voltage</td>
<td></td>
<td>+3.2</td>
<td>+3.3</td>
<td>+3.4</td>
</tr>
<tr>
<td>Output current*</td>
<td></td>
<td>200mA</td>
<td>2A</td>
<td>±190mA</td>
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<tr>
<td>Efficiency</td>
<td></td>
<td>62%</td>
<td>65%</td>
<td>±150mA</td>
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<tr>
<td>Line regulation</td>
<td></td>
<td>70%</td>
<td>74%</td>
<td>±10mV</td>
</tr>
<tr>
<td>Load regulation†</td>
<td></td>
<td>76%</td>
<td>80%</td>
<td>±10mV</td>
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<tr>
<td>Output ripple</td>
<td></td>
<td>±30mV</td>
<td>±50mV</td>
<td>±20mV</td>
</tr>
</tbody>
</table>

### Notes:

*Up to 90% full power available from either output if rated output power is not exceeded; †balanced load conditions.

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**CASE STYLE 6**

**CASE STYLE 8**

**CASE STYLE 10**

**CASE STYLE 12**

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**3699-SXX output < 24VDC**

- Pin 1: N/C
- Pin 2: Inhibit Not
- Pin 3: Soft Start
- Pin 4: Sync
- Pin 5: N/C
- Pin 6: Input Ret

**3699-SXX output ≥ 24VDC**

- Pin 1: N/C
- Pin 2: Main Output
- Pin 3: Main Output Ret
- Pin 4: Sync
- Pin 5: Adjust
- Pin 6: Input Ret

**3699-DXX**

- Pin 1: N/C
- Pin 2: +Input
- Pin 3: +Input
- Pin 4: +Input
- Pin 5: Adjust
- Pin 6: Main Output Ret

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Please specify **GRADE LEVEL** for your application. EU grade units will be shipped if no option is specified.

- **EU Engineering Units**
  - RE 100 K+™, +125°C military/aerospace
  - R 100 K+™, +85°C military/aerospace
- **SE 100 K+™, +125°C space**
- **S 100 K+™, +85°C space**

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