**Features**

- Specifically designed for redundant or individual military or aerospace applications
- Completely self contained Thick Film Hybrid DC-DC Converter
- No external filter caps required
- Fully isolated design
- "Inhibit-not" function
- Power on soft start
- 300 kHz operation for low ripple and fast response time
- Built-in EMI input filter meets MIL-STD-461C requirements CE01, CE03, CS01, CS02 and CS06
- Short circuit and overvoltage protection
- Capability of external sync for switching frequencies
- Built-in test capability

**Specifications**

**INPUT:** 28 VDC nominal

**Range:** 16 to 50 VDC continuous

18 to 50 VDC full power

Survives 80 V transients/MIL-STD-704A

**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: 500 G’s

Vibration: 30 G’s

Grade M:

- Full Power Output at Tcase = +85°C
- Linearily derates to zero at Tcase = +115°C

Grade E:

- Full Power Output at Tcase = +125°C
- Linearily derates to zero at Tcase = +135°C

**WEIGHT:** 50 grams typical

**Note**

Series 6690 is recommended over 2890 for new designs ("Inhibit not" function yields a higher level of noise immunity).

---

### SINGLE OUTPUT DEVICES

**PARAMETER** | **CONDITION** | **6690-S03.3 (6.5W)** | **6690-S05 (6.5W)** | **6690-S05.2 (6.5W)** | **6690-S12 (6.5W)**
--- | --- | --- | --- | --- | ---
Output voltage | — | +3.2 | +3.3 | +3.4 | +4.9 | +5.0 | +5.1 | +5.1 | +5.2 | +5.3 | +11.9 | +12.0 | +12.1
Output current | — | — | — | 1.97A | — | — | 1.3A | — | — | 1.25A | — | — | 54mA
Efficiency | — | 65% | 68% | — | 70% | 73% | — | 70% | 73% | — | 77% | 81% | —
Line regulation | — | — | — | 10mV | 30mV | — | 10mV | 50mV | — | 10mV | 50mV | — | 20mV | 100mA
Load regulation | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
Output ripple | FL BW 2 MHz | 30 | 85 | 85 | 60 | 150 | 85 | 85 | 60 | 150 | 85 | 85 | 60 | 150

---

### SINGLE OUTPUT DEVICES

**PARAMETER** | **CONDITION** | **6690-S15 (6.5W)** | **6690-S28 (6.5W)**
--- | --- | --- | ---
Output voltage | — | +14.9 | +15.0 | +15.1 | +27.8 | +28.0 | +28.2
Output current | — | — | — | 433mA | — | — | 232mA
Efficiency | — | 78% | 82% | — | 77% | 81% | —
Line regulation | — | — | — | 25mV | 125mV | — | 50mV | 250mV
Load regulation | — | — | — | — | — | — | — | — |
Output ripple | FL BW 2 MHz | 75 | 180 | 150 | 350

---

### Case Dimensions

<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>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.130</td>
<td>54.102</td>
<td>1.120</td>
<td>28.448</td>
<td>0.375</td>
<td>9.525</td>
<td>—</td>
</tr>
<tr>
<td>3F</td>
<td>2.130</td>
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<td>28.448</td>
<td>0.375</td>
<td>9.525</td>
<td>—</td>
</tr>
<tr>
<td>8UF</td>
<td>2.160</td>
<td>54.864</td>
<td>1.510</td>
<td>38.354</td>
<td>0.495</td>
<td>12.573</td>
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</tr>
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</table>
### DC-DC Converters

**Full Feature Series 6690**

#### Dual Output Devices

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output voltage</td>
<td>+Vout - -Vout</td>
<td>+4.9</td>
<td>+5.0</td>
<td>+5.1</td>
<td>+11.9</td>
<td>+12.0</td>
<td>+12.1</td>
<td>+14.9</td>
<td>+15.0</td>
<td>+15.1</td>
</tr>
<tr>
<td>Output current*</td>
<td>V&lt;sub&gt;out&lt;/sub&gt; - V&lt;sub&gt;in&lt;/sub&gt;</td>
<td>±35mA</td>
<td>±825mA</td>
<td>±35mA</td>
<td>±270mA</td>
<td>±32mA</td>
<td>±217mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>P&lt;sub&gt;out&lt;/sub&gt;</td>
<td>72%</td>
<td>75%</td>
<td></td>
<td>77%</td>
<td>81%</td>
<td></td>
<td>78%</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>Line regulation</td>
<td>V&lt;sub&gt;out&lt;/sub&gt; - V&lt;sub&gt;in&lt;/sub&gt;</td>
<td>±10mA</td>
<td>±50mA</td>
<td></td>
<td>±20mA</td>
<td>±100mA</td>
<td></td>
<td>±25mA</td>
<td>±125mA</td>
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</tr>
<tr>
<td>Load regulation</td>
<td>P&lt;sub&gt;out&lt;/sub&gt;</td>
<td>10%</td>
<td></td>
<td></td>
<td>±10mA</td>
<td>±50mA</td>
<td></td>
<td>±20mA</td>
<td>±100mA</td>
<td></td>
</tr>
<tr>
<td>Output ripple</td>
<td>F.L. BW 2 MHz</td>
<td>40</td>
<td>85</td>
<td></td>
<td>60</td>
<td>150</td>
<td></td>
<td>75</td>
<td>180</td>
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</tr>
</tbody>
</table>

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

#### Parameters

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<td>+5.0</td>
<td>+5.1</td>
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<td>V&lt;sub&gt;out&lt;/sub&gt; - V&lt;sub&gt;in&lt;/sub&gt;</td>
<td>±20mA</td>
<td>±150mA</td>
<td>±20mA</td>
<td>±105mA</td>
<td>±20mA</td>
<td>±83mA</td>
<td>±20mA</td>
<td>±150mA</td>
<td>±20mA</td>
</tr>
<tr>
<td>Efficiency</td>
<td>P&lt;sub&gt;out&lt;/sub&gt;</td>
<td>65%</td>
<td>66%</td>
<td></td>
<td>65%</td>
<td>68%</td>
<td></td>
<td>70%</td>
<td>73%</td>
<td></td>
</tr>
<tr>
<td>Line regulation</td>
<td>V&lt;sub&gt;out&lt;/sub&gt; - V&lt;sub&gt;in&lt;/sub&gt;</td>
<td>±10mA</td>
<td>±50mA</td>
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<td>30</td>
<td>65</td>
<td></td>
<td>40</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

#### Case Style

- **6690-D05 (6.5W)**
- **6690-D12 (6.5W)**
- **6690-D15 (6.5W)**

**6690-SXX**

- Pin 1 bit
- Pin 7 + input
- Pin 2 inhibit
- Pin 8 main output
- Pin 3 soft start
- Pin 9 main output ret
- Pin 4 sync
- Pin 10 N/C
- Pin 5 N/C
- Pin 6 input ret

**6690-TXX**

- Pin 1 bit
- Pin 7 + input
- Pin 2 inhibit
- Pin 8 main output
- Pin 3 soft start
- Pin 9 N/C
- Pin 4 sync
- Pin 10 + dual output
- Pin 5 N/C
- Pin 6 input ret

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

- **M** +85°C military
- **E** +125°C military

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**28 VDC**

- **6690-T05 (3.75W)**
- **6690-T12 (5W)**
- **6690-T15 (5W)**

**6690-DXX**

- Pin 1 bit
- Pin 7 + input
- Pin 2 inhibit
- Pin 8 main output
- Pin 3 soft start
- Pin 9 N/C
- Pin 4 sync
- Pin 10 + dual output
- Pin 5 N/C
- Pin 6 input ret

**6690-TXX**

- Pin 1 bit
- Pin 7 + input
- Pin 2 inhibit
- Pin 8 main output
- Pin 3 soft start
- Pin 9 N/C
- Pin 4 sync
- Pin 10 + dual output
- Pin 5 N/C
- Pin 6 input ret