19.5-40 Watt Hybrid

**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" function
- Power on soft start
- 200 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 Gs
- Acceleration: 500 Gs
- Vibration: 30 Gs

**Grade M:**
- Full Power Output at Tcase = +85°C
- Linearly derates to zero at Tcase = +115°C

**Grade E:**
- Full Power Output at Tcase = +125°C
- Linearly derates to zero at Tcase = +135°C

**Weight:** 90 grams typical

**Model No.**
- 3193-S03 (28.4W)
- 3193-S05 (40W)
- 3193-S05.2 (40W)
- 3193-S12 (40W)

### TABLE OF PARAMETERS

<table>
<thead>
<tr>
<th>SINGLE OUTPUT DEVICES</th>
<th>3193-S03.3 (28.4W)</th>
<th>3193-S05 (40W)</th>
<th>3193-S05.2 (40W)</th>
<th>3193-S12 (40W)</th>
</tr>
</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>+3.3</td>
<td>+3.3</td>
<td>+3.4</td>
</tr>
<tr>
<td>Output current V_{in} - V_{out}</td>
<td>—</td>
<td>—</td>
<td>8A</td>
<td>—</td>
</tr>
<tr>
<td>Efficiency P_{out} = max rated load</td>
<td>67%</td>
<td>70%</td>
<td>72%</td>
<td>75%</td>
</tr>
<tr>
<td>Line regulation</td>
<td>V_{in} - V_{out}</td>
<td>10mV</td>
<td>30mV</td>
<td>—</td>
</tr>
<tr>
<td>Load regulation P_{out} = 10% to FL</td>
<td>—</td>
<td>10mV</td>
<td>30mV</td>
<td>—</td>
</tr>
<tr>
<td>Output ripple FL BW 2 MHz</td>
<td>mV</td>
<td>30</td>
<td>65</td>
<td>—</td>
</tr>
</tbody>
</table>

**Table of 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>2.200</td>
<td>55.880</td>
<td>1.750</td>
<td>44.450</td>
<td>0.495</td>
<td>12.573</td>
<td>1.400</td>
</tr>
<tr>
<td>3</td>
<td>2.200</td>
<td>55.880</td>
<td>1.750</td>
<td>44.450</td>
<td>0.495</td>
<td>12.573</td>
<td>1.400</td>
</tr>
<tr>
<td>5</td>
<td>2.225</td>
<td>56.515</td>
<td>1.750</td>
<td>44.450</td>
<td>0.495</td>
<td>12.573</td>
<td>1.400</td>
</tr>
<tr>
<td>6</td>
<td>2.225</td>
<td>56.515</td>
<td>1.750</td>
<td>44.450</td>
<td>0.495</td>
<td>12.573</td>
<td>1.400</td>
</tr>
<tr>
<td>8</td>
<td>2.225</td>
<td>56.515</td>
<td>2.100</td>
<td>53.340</td>
<td>0.495</td>
<td>12.573</td>
<td>—</td>
</tr>
<tr>
<td>10</td>
<td>2.225</td>
<td>56.515</td>
<td>1.750</td>
<td>44.450</td>
<td>0.495</td>
<td>12.573</td>
<td>1.400</td>
</tr>
</tbody>
</table>

**Tolerances:**
- All dimensions ±0.01 except F = Max, C = ±0.01-0.02; Drawings in inches.

Modular Devices, Inc • One Roned Road • Shirley, New York 11967 • www.mdipower.com • Fax 631.345.3106 • Tel 631.345.3100
DC-DC CONVERTERS

FULL FEATURE SERIES 3193

DUAL OUTPUT DEVICES

3193-D05 (40W) 3193-D12 (40W) 3193-D15 (40W)

PARAMETER | CONDITION | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Output voltage | \( V_{in} \) | +1.67A | +150mA | +4A | +14.9 | +150mA | +15.1 | +14.9 | +150mA | +15.1
| \( V_{out} \) | | +150mA | +4A | +14.9 | +150mA | +15.1 | +14.9 | +150mA | +15.1
Output current | | ≤12mA | ≤12mA | ≤12mA | ≤12mA | ≤12mA | ≤12mA | ≤12mA | ≤12mA
LINE REGULATION | \( P_{out} = \) max rated load | | | | | | | | | |
Load regulation | \( P_{out} = \) 10% to FL | | | | | | | | | |
Output ripple | F.L.BW 2 MHz | | | | | | | | | |

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

TRIPLE OUTPUT DEVICES

3193-T3.3/5 (17.7W) 3193-T3.3/12 (24W) 3193-T3.3/15 (25.2W) 3193-T05 (19.5W) 3193-T12 (25.8W) 3193-T15 (27W)

PARAMETER | CONDITION | MIN | TYP | MAX | MIN | TYP | MAX | MIN | TYP | MAX
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Output voltage | \( V_{in} \) | +3.2 | +3.3 | +3.4 | +3.2 | +3.3 | +3.4 | +3.2 | +3.3 | +3.4
| \( V_{out} \) | | 90mA | 3A | 90mA | 3A | 90mA | 3A | 90mA | 3A
Output current | | 90mA | 3A | 90mA | 3A | 90mA | 3A | 90mA | 3A
Efficiency | \( P_{out} = \) max rated load | 67% | 70% | 70% | 67% | 70% | 70% | 67% | 70% | 70%
Line regulation | \( P_{out} = \) max rated load | | | | | | | | | |
Load regulation | \( P_{out} = \) 10% to FL | | | | | | | | | |
Output ripple | F.L.BW 2 MHz | | | | | | | | | |

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

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