SERIES: PDP1-M | DESCRIPTION: DC-DC CONVERTER

FEATURES
- 1W isolated output
- 1500 Vdc isolation
- compact SMD package
- continuous short circuit protection
- no-load input current as low as 5mA
- wide temperature range: -40°C to +105°C
- high efficiency up to 83%
- UL62368/EN62368/IEC62368 Approval

MODEL

<table>
<thead>
<tr>
<th>MODEL</th>
<th>input voltage</th>
<th>output voltage</th>
<th>output current</th>
<th>output power</th>
<th>ripple and noise</th>
<th>efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>typ (Vdc)</td>
<td>range (Vdc)</td>
<td>min (mA)</td>
<td>max (mA)</td>
<td>max (mVp-p)</td>
<td>typ (%)</td>
</tr>
<tr>
<td>PDP1-S5-S3-M</td>
<td>5</td>
<td>4.5~5.5</td>
<td>30</td>
<td>303</td>
<td>1</td>
<td>75</td>
</tr>
<tr>
<td>PDP1-S5-S5-M</td>
<td>5</td>
<td>4.5~5.5</td>
<td>20</td>
<td>200</td>
<td>1</td>
<td>75</td>
</tr>
<tr>
<td>PDP1-S5-S9-M</td>
<td>5</td>
<td>4.5~5.5</td>
<td>12</td>
<td>111</td>
<td>1</td>
<td>75</td>
</tr>
<tr>
<td>PDP1-S5-S12-M</td>
<td>5</td>
<td>4.5~5.5</td>
<td>9</td>
<td>84</td>
<td>1</td>
<td>75</td>
</tr>
</tbody>
</table>

Notes: 1. Ripple & noise testing condition at nominal input voltage and 10~100% load, 20 MHz bandwidth.

PART NUMBER KEY

PDP1 - S5 - XXX - M

Base Number | Input Voltage | Output S = single | Output Voltage | Packaging Style
-------------|---------------|------------------|----------------|------------------
## INPUT

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>input voltage</td>
<td>for maximum of 1 second</td>
<td>4.5</td>
<td>5</td>
<td>5.5</td>
<td>Vdc</td>
</tr>
<tr>
<td>surge voltage</td>
<td></td>
<td>-0.7</td>
<td>9</td>
<td></td>
<td>Vdc</td>
</tr>
<tr>
<td>filter</td>
<td>capacitance filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>current</td>
<td>full load/no load</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3/5 Vdc input models</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9/12 Vdc input models</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>270/5</td>
<td>286/10</td>
<td>241/12</td>
<td>254/20</td>
</tr>
</tbody>
</table>

## OUTPUT

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>line regulation</td>
<td>Vin change ±1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3 Vdc output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>other outputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.5</td>
<td>1.2</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>load regulation</td>
<td>10% ~ 100% load</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3 Vdc output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Vdc output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 Vdc output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 Vdc output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>20</td>
<td>10</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>15</td>
<td>8</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>10</td>
<td>7</td>
<td>%</td>
</tr>
<tr>
<td>set-point accuracy</td>
<td>see regulation curve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>switching frequency</td>
<td>full load, nominal input</td>
<td></td>
<td></td>
<td></td>
<td>kHz</td>
</tr>
<tr>
<td>temperature coefficient</td>
<td>full load</td>
<td></td>
<td></td>
<td></td>
<td>±0.02</td>
</tr>
</tbody>
</table>

## PROTECTIONS

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>short circuit protection</td>
<td>Continuous, self-recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SAFETY AND COMPLIANCE

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>isolation voltage</td>
<td>input-output electric strength test for 1 minute</td>
<td>1500</td>
<td></td>
<td></td>
<td>Vdc</td>
</tr>
<tr>
<td>isolation resistance</td>
<td>input-output insulation at 500 Vdc</td>
<td>1000</td>
<td></td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>isolation capacitance</td>
<td>input-output capacitance at 100 KHz / 0.1 V</td>
<td>20</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>safety approvals</td>
<td>UL62368/EN62368/IEC62368</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td>CISPR32/EN55032 Class B (see recommended circuit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD</td>
<td>IEC/EN61000-4-2, Air ±8kV, Contact ±4kV, perf. Criteria B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RoHS</td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MTBF</td>
<td>MIL-HDBK-217F @ 25°C</td>
<td>3500</td>
<td></td>
<td></td>
<td>kHours</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>operating temperature</td>
<td></td>
<td>-40</td>
<td>105</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>storage temperature</td>
<td></td>
<td>-55</td>
<td>125</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>humidity</td>
<td>non-condensing</td>
<td>5</td>
<td>95</td>
<td></td>
<td>%</td>
</tr>
</tbody>
</table>

SOLDERABILITY

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>reflow soldering</td>
<td>60 s max over 217°C</td>
<td></td>
<td></td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

DERATING CURVES

---

Additional Resources:
- Product Page
- 3D Model
- PCB Footprint
MECHANICAL

<table>
<thead>
<tr>
<th>parameter</th>
<th>conditions/description</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>units</th>
</tr>
</thead>
<tbody>
<tr>
<td>dimensions</td>
<td>13.20 x 11.40 x 7.25</td>
<td></td>
<td></td>
<td></td>
<td>mm</td>
</tr>
<tr>
<td>case material</td>
<td>Black plastic; flame-retardant and heat-resistant (UL94 V-0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>weight</td>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
<td>g</td>
</tr>
</tbody>
</table>

MECHANICAL DRAWING

units: inches [mm]
tolerance: ± 0.50 [±0.020]

<table>
<thead>
<tr>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>Vin</td>
</tr>
<tr>
<td>4</td>
<td>0V</td>
</tr>
<tr>
<td>5</td>
<td>+Vo</td>
</tr>
<tr>
<td>3, 6, 7, 8</td>
<td>NC</td>
</tr>
</tbody>
</table>

Note: Grid 2.54*2.54mm
**RECOMMENDED CIRCUITS**

![Diagram of recommended circuits](image)

**RECOMMENDED CIRCUITS**

| recommended input & output capacitor values | | |
|---|---|---|---|
| Vin (Vdc) | Cin (µF) | Vo (Vdc) | Cout (µF) |
| 5 | 4.7 | 3.3/5 | 10 |
| | | 9 | 4.7 |
| | | 12 | 2.2 |

**EMC COMPLIANCE CIRCUITS**

![Diagram of EMC compliance circuits](image)

**EMC COMPLIANCE CIRCUITS**

<table>
<thead>
<tr>
<th>Recommended EMC Filter Values</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Voltage (Vdc)</td>
<td>3.3/5/9</td>
<td>12</td>
</tr>
<tr>
<td>C1/C2</td>
<td>47µF / 25V</td>
<td>47µF / 25V</td>
</tr>
<tr>
<td>CY</td>
<td>- -</td>
<td>1nF/2KVDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HEC C1206X102K202T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JOHANSON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>202R18W102KV4E</td>
</tr>
<tr>
<td>C3</td>
<td>refer to the Cout in table 1</td>
<td></td>
</tr>
<tr>
<td>LDM</td>
<td>6.8µH</td>
<td>6.8µH</td>
</tr>
</tbody>
</table>

Note: To further improve EMI performance, we recommend the use a Y-capacitor CY

---

CUI Inc | SERIES: PDP1-M | DESCRIPTION: DC-DC CONVERTER | date: 03/28/2020 | page: 5 of 6

---

Additional Resources:  [Product Page](#)  |  [3D Model](#)  |  [PCB Footprint](#)
REVISION HISTORY

<table>
<thead>
<tr>
<th>rev.</th>
<th>description</th>
<th>date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>initial release</td>
<td>03/28/2020</td>
</tr>
</tbody>
</table>

The revision history provided is for informational purposes only and is believed to be accurate.