Power Supplies for every application

**NXT-400M**
- Universal (85-264Vac) Input
- Low Power (25-100 Watt)
- Up to 4 Outputs
- Medical & Industrial Applications

**SRP SERIES**
- SRP-25
  - 25 Watt
  - Multi Output
- SRP-40A
  - 40 Watt
  - Multi Output
- SRW-100
  - 100 Watt
  - Multi Output

**GRN SERIES**
- GRN-60
  - 60 Watt
  - Single Output
- GRN-80
  - 80 Watt
  - Single Output
- GRN-110
  - 110 Watt
  - Single Output
- GRN-200
  - 200 Watt
  - Multi Output

**REL SERIES**
- REL-70
  - 70 Watt
  - Multi Output
- REL-110
  - 110 Watt
  - Multi Output
- REL-150
  - 150 Watt
  - Multi Output
- REL-185
  - 185 Watt
  - Multi Output

**CE SERIES**
- CE-150
  - 150 Watt
  - Multi Output
- CE-225
  - 225 Watt
  - Multi Output

**NXT SERIES**
- NXT-100
  - 100 Watt
  - Single Output
- NXT-175
  - 175 Watt
  - Single Output
- NXT-225
  - 225 Watt
  - Single Output
- NXT-325
  - 350 Watt
  - Single Output
- NXT-400
  - 400 Watt
  - Single Output

**DC2 SERIES**
- DC2-70
  - 70 Watt
  - Multi Output
- DC2-110
  - 110 Watt
  - Multi Output
- DC2-150
  - 150 Watt
  - Multi Output
- DC2-185
  - 185 Watt
  - Multi Output

**DC4 SERIES**
- DC4-70
  - 70 Watt
  - Multi Output
- DC4-110
  - 110 Watt
  - Multi Output
- DC4-150
  - 150 Watt
  - Multi Output
- DC4-185
  - 185 Watt
  - Multi Output
25 WATTS
SINGLE/MULTI OUTPUT AC-DC

FEATURES:
- Compact 2.25" x 4.00" x .96" Size
- 2 Year Warranty
- Universal 85-264V Input
- Single, Dual or Triple Outputs
- 0-70°C Operating Temperature
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN5511/32
- RoHS Compliant
- Optional Chassis/Cover

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRP-25-3001</td>
<td>+5V/3A</td>
<td>+12V/1.5A</td>
<td>-12V/0.5A</td>
</tr>
<tr>
<td>SRP-25-3002</td>
<td>+5V/3A</td>
<td>+12V/1.5A</td>
<td>-12V/0.5A</td>
</tr>
<tr>
<td>SRP-25-3003</td>
<td>3.3V/2.5A</td>
<td>6V/2A</td>
<td>5V/1A</td>
</tr>
<tr>
<td>SRP-25-2001</td>
<td>+5V/3A</td>
<td>+24V/1A</td>
<td></td>
</tr>
<tr>
<td>SRP-25-2002</td>
<td>+5V/3A</td>
<td>+12V/1.5A</td>
<td>-12V/1.5A</td>
</tr>
<tr>
<td>SRP-25-2003</td>
<td>+5V/3A</td>
<td>-5V/2A</td>
<td></td>
</tr>
<tr>
<td>SRP-25-2004</td>
<td>+12V/1.5A</td>
<td>-12V/1.5A</td>
<td></td>
</tr>
<tr>
<td>SRP-25-2005</td>
<td>+15V/1.5A</td>
<td>-15V/1.5A</td>
<td></td>
</tr>
<tr>
<td>SRP-25-1001</td>
<td>3.3V/0A</td>
<td>5V/5A</td>
<td></td>
</tr>
<tr>
<td>SRP-25-1002</td>
<td>12V/2.08A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRP-25-1003</td>
<td>15V/1.67A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRP-25-1004</td>
<td>24V/0.40A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRP-25-1005</td>
<td>48V/0.32A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CH - Chassis
CO - Cover
I/O - Isolated Outputs
TS - Terminal Strip

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1/A2:2013, 2nd Edition
AAMI/ANSI ES60601-1:2005(R) 2012

UL Recognition
Mark for Canada
File E137708/E140259
CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60601-1-2014

TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1-2006/A1:2013

Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

EN 60601-1:2006/A1:2013
IEC 60950-1 2nd ed. ITE Certification
IEC 60601-1 3rd ed. Medical Cert.
Class B Emissions per EN5511/32
Return Self-Certification
Class B Emissions per EN5511/32

MODEL NO. OUTPUT 1 OUTPUT 2 OUTPUT 3
SRP-25-1001 3.3V/3A 5V/5A 10V/1A
SRP-25-1002 12V/2.08A 15V/1.67A 24V/0A
SRP-25-1003 48V/0.32A

INPUT SPECIFICATIONS

Source Voltage 85 – 264 Volts AC
Frequency Range 47 – 63 Hz
Source Current 3A
Peak Inrush 30 A
Efficiency 0.65 – 0.72 (Varies by model)


Electrostatic Discharge EN 61000-4-2
Radiated Electromagnetic Field EN 61000-4-3
80MHz-2.7GHz, 10/10m, 80% AM
Electrical Fast Transients/Bursts EN 61000-4-4
±2 KV, 50Hz/100kHz
Surge Immunity EN 61000-4-5
±2 KV line to earth / ±1 KV line to line
Conducted Immunity EN 61000-4-6
0.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity EN 61000-4-8
30A/m, 60 Hz
Voltage Dips EN 61000-4-11
0% Ur, 0.5 cycles, 0-315° 100/240V A/B
0% Ur, 1 cycles, 0° 100/240V A/B
40% Ur, 10/12 cycles, 0° 100/240V A/B
70% Ur, 25/30 cycles, 0° 100/240V A/B
Voltage Interruptions EN 61000-4-11
0% Ur, 300 cycles, 0° 100/240V A/B
Radiated Emissions EN 55011/32 Class B
Conducted Emissions EN 55011/32 Class B
Harmonic Current Emissions EN 61000-3-2 Class A
Voltage Fluctuations/Flicker EN 61000-3-3 Compliant

All specifications are maximum at 25°C/25V unless otherwise stated, may vary by model and are subject to change without notice.
SRP-25 SERIES MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION
1. Each output can deliver its rated current but Total Output Power must not exceed 25W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This product has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

CONNECTOR SPECIFICATIONS

P1 AC Input 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.

P2 DC Output 0.156 friction lock header mates with Molex 09-50-3061 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.

G Ground 0.187’’ quick disconnect terminal.
40 WATTS
SINGLE/MULTI OUTPUT AC-DC

FEATURES:
- Compact 2.5" x 4.25" x 1.2" Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover

SAFETY SPECIFICATIONS
- Underwriters Laboratories File E13707/E14029
  UL 60950-1/2013, 2nd Edition

IEC/EN 61010-1 2nd Edition

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRP-40A-2001</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2002</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2003</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2004</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2005</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2006</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2007</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
<tr>
<td>SRP-40A-2008</td>
<td>+3.3V/5A</td>
<td>+5V/5A</td>
<td>+12V/0.7A</td>
<td>-12V/0.7A</td>
</tr>
</tbody>
</table>

CHASSIS/COVER
- Open Frame

Model 40A-4001
40W (33W, 1001)
(See Derating Chart)

CHASSIS/COVER
- Open Frame

SRP-40A-1001 3.3V/10A
CO – Cover
I/O – Isolated Outputs
TS – Terminal Strip

MODEL NO. OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4
SRP-40A-1002 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A
SRP-40A-1003 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A
SRP-40A-1004 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A
SRP-40A-1005 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A
SRP-40A-1006 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A
SRP-40A-1007 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A
SRP-40A-1008 +5V/5A +12V/0.7A -12V/0.7A +1V/2.5A

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating Output 2.
Specify DC Input when ordering SRP-40A-3003 only.
Please specify the following optional features when ordering:
CH – Chassis
I/O – Isolated Outputs
CO – Cover
TS – Terminal Strip

INTEGRATED
POWER DESIGNS
300 Stewart Road Wilkes-Barre, PA 18706 Phone: (570) 824-4666 Fax: (570) 824-4843 Email: sales@ipdpower.com Web: www.ipdpower.com
SRP-40A SERIES MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION
1. Each output can deliver its rated current but total Output Power must not exceed 40W (33W, 1001).
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method, 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary to ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV, depending on model. The use of a twisted pair, decoupling capacitors, and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum Ambient Temperature is reduced to 40°C with optional Chassis and Cover. See chart below.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

CONNECTOR SPECIFICATIONS
<table>
<thead>
<tr>
<th>Connector</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 AC Input</td>
<td>0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3 DC Output (Single)</td>
<td>0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3 DC Output (Multiple)</td>
<td>0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P4,P5 Sense</td>
<td>0.100 friction lock header mates with Molex 22-01-2027 or equivalent crimp terminal housing with Molex 08-50-0114 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>G Ground</td>
<td>0.187 quick disconnect terminal.</td>
</tr>
</tbody>
</table>
100 WATTS
SINGLE/MULTI OUTPUT AC-DC

FEATURES:
- Compact 3.3” x 5” x 1.5” Size
- 2 Year Warranty
- Universal 85-264V Input
- 1-4 Tightly-Regulated Outputs
- 0-70°C Operating Temperature
- RoHS Compliant

CHASSIS/Cover
OPEN CHASSIS

SAFETY SPECIFICATIONS
Underwriters Laboratories
UL 60550-1:2007, 2nd Edition
AAMI/ANSI ES60601-1:2005(R) 2012

IEC 60950-1/A2:2013, 2nd Edition
File E137708/E140258
Mark for Canada
File E137708/E140259

TUV
UL Recognition
Mark for Canada
EN 60950-1:A2:2013, 2nd Edition
EN 60601-1:2006/A1:2013

Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING
MODEL NO. OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4
SRW-100-4001 +3.3V/10A, -12V/1A  +12V/2A, -12V/1A
SRW-100-4002 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4003 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4004 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4005 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4006 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4007 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4008 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4009 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4010 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4011 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4012 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3001 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3002 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3003 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3004 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3005 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3006 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3007 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-3008 +5V/10A, -12V/1A  +24V/2A, -12V/1A
SRW-100-4001 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4002 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4003 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4004 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4005 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4006 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4007 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4008 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4009 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4010 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4011 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-4012 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3001 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3002 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3003 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3004 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3005 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3006 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3007 +5V/12A, -12V/1A  +24V/3A, -12V/1A
SRW-100-3008 +5V/12A, -12V/1A  +24V/3A, -12V/1A

SRP-100-100

OUTPut SPECIFICATIONS
Total Output Power at 50°C(1)
(See Derating Chart)
Output Voltage Centering
Output Voltage Adjust Range
(All outputs at 50% load)
Output Voltage Centering
Output Voltage Adjust Range
(All outputs at 50% load)
Load Regulation
Output Overvoltage Protection
Output Overtemperature Protection
Hold Up Time
2 Year Warranty
Optional Perforated Cover
Optional Power Fail Warning
1.05 Lbs.  w/Cover
Weight 1.00 Lbs.  Open Frame
Mean-Time Between Failures  150,000 Hours min., MIL-HDBK(10)

ENVIRONMENTAL SPECIFICATIONS
Environmental Temperature Range
Temperature Derating: See Power Rating Chart
Ambient Storage Temp. Range
Temperature Coefficient
Outputs 1 - 4: 0.02%/°C

MEANS OF PROTECTION
Means of Protection
Primary to Secondary
Secondary to Ground
Means of Patient Protection
Means of Patient Protection
Means of Patient Protection
Means of Patient Protection

DEIECTIC STRENGTH
Reinforced Insulation
Basic Insulation
Operational Insulation
Consult factory for 1MOOP or 1MOPP

4565 VDC
2121 VDC
5656 VDC

POWER FAIL SIGNAL
Logic low with input power failure 2ms

Remote Sense/single
Output Models only)(10

Power Fail Power
Source 30A at 85V Input

WEIGHT
1.00 Lbs.  Open Frame
1.05 Lbs.  w/Cover

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.

CO - Cover
PF - Power Fail
OVP - Overvoltage Protection

All specifications are maximum at 25°C/100W unless otherwise stated, may vary by model and are subject to change without notice.

INTEGRATED POWER DESIGNS
300 Stewart Road ♦ Wilkes-Barre, PA 18706 ♦ Phone: (570) 824-4666 ♦ Fax: (570) 824-4843 ♦ Email: sales@ipdpower.com ♦ Web: www.ipdpower.com

- **Electrostatic Discharge** EN 61000-4-2 ±8kV contact / ±15kV air discharge A
- **Radiated Electromagnetic Field** EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM A
- **Electrical Fast Transients/Bursts** EN 61000-4-4 ±2 kV, 5kHz/100kHz A
- **Surge Immunity** EN 61000-4-5 ±1 kV line to earth / ±2 kV line to line A
- **Conducted Immunity** EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM A
- **Magnetic Field Immunity** EN 61000-4-8 30A/m, 60 Hz. A
- **Voltage Dips** EN 61000-4-11 0% Un, 0.5 cycles, 0-315° 100/240V (+/-) A
- **Voltage Interruptions** EN 61000-4-11 0% Un, 0.5 cycles, 0-315° 100/240V (+/-) A
- **Voltage Fluctuations/Flicker** EN 61000-4-11 Class B

**SRW/SRP-100 SERIES MECHANICAL SPECIFICATIONS**

**APPLICATIONS INFORMATION**

1. Each output can deliver its rated current but Total Output Power must not exceed 70, 85 or 100W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 80°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory for additional information.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into chassis mounting holes is 0.125 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector output connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
15. Forced-Air cooling rating of 100W requires an air speed of 200LFM flowing past a point one inch above the main isolation transformer.
16. Baseplate cooling rating of 85W requires a one-square-foot 0.09"-thick aluminum area attached to bottom four mounting holes.
17. Rated 8A maximum when convection cooled only.
18. Rated 1A maximum when convection cooled only.
19. Rated 50W maximum output power when convection cooled; 70W when baseplate or forced-air cooled.

**MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE**

**MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE**

**CONNECTOR SPECIFICATIONS**

- **P1** AC Input (Single) Terminal block with 4-40 inch screws on 0.325 inch centers with #4 spade terminals.
- **P1** AC Input (Multiple) 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal.
- **P2** DC Output (Single) 6-32 screw down terminal mates with #20 ring tongue terminal. 10 in-lb max.
- **P2** DC Output (Multiple) 0.156 friction lock header mates with Molex 08-50-0189 or equivalent crimp terminal.
- **G** Ground 0.187 quick disconnect terminal.
- **P3** Option/Sense (Single) 0.100 friction lock header mates with Molex 22-01-2047 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
- **P3** Option (Multiple) 0.100 friction lock header mates with Molex 22-01-2027 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

**INTEGRATED POWER DESIGNS**

300 Stewart Road Wilkes-Barre, PA 18706 Phone: (570) 824-4666 Fax: (570) 824-4843 Email: sales@ipdpower.com Web: www.ipdpower.com
### FEATURES:
- Compact 2.5" x 4.25" x 1.0" Size
- 3 Year Warranty
- Universal 85-264V Input
- Dual, Triple, or Quad Outputs
- 86% Peak Efficiency
- 85% Average Efficiency
- <1W No Load Input Power
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover

### GENERAL SPECIFICATIONS
- **Output Power at 50°C (C1):** 45W
  - 85-264V Vav
- **Protection Class:** I
- **Classification:** Category II, Safety Extra Low Voltage (SELV), Limited Power Source (LPS)
- **Mean-Time Between Failures:** >400,000 hours, MIL-HDBK-217F, 25°C, C, GB
- **Switching Frequency:** 100 KHz
- **Weight:** 0.48 lbs. / 0.62 lbs. Chassis and cover

### EN SPECIFICATIONS (IEC 60950-1/2-2014, 3rd ed.; IEC 61000-6-2:2005)

#### ELECTRICAL SPECIFICATIONS
- **Earth Leakage:** <300µA NC, <1000µA SFC
- **Touch Current:** <100µA NC, <500µA SFC
- **Switching Between Failures:** >400,000 hours, MIL-HDBK-217F, 25°C, C, GB
- **Weight:** 0.48 lbs. / 0.62 lbs. Chassis and cover

#### ELECTRICAL SPECIFICATIONS
- **Electromagnetic Discharge:** EN 61000-4-2 8KV contact / 15KV air discharge
- **Radiated Electromagnetic Field (EMS):** EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM
- **Electrical Fast Transients/Bursts:** EN 61000-4-4 ±2KV, ±5KV/100KHz
- **Surge Immunity:** EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line
- **Conducted Immunity:** EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM
- **Magnetic Field Immunity:** EN 61000-4-8 30A/m, 60 Hz.
- **Voltage Dips:** EN 61000-4-11 0% Un, 0.5 cycles, 0-315° 100/240V A/A
- **Voltage Interruptions:** EN 61000-4-11 0% Un, 0.3 cycles, 0-100/240V A/B
- **Radiated Emissions:** EN 55011/1 3A
- **Conducted Emissions:** EN 55011/2 3A
- **Harmonic Current Emissions:** EN 55011/3 3A
- **Voltage Fluctuations/Flicker:** EN 55011/3 3A

### SAFETY SPECIFICATIONS
- **Underwriters Laboratories:** File E137708/E140259
- **UL Recognition:** UL 60950-1/A2:2013, 2nd Edition
- **IEC Recognition:** IEC 60601-1:2006/A1:2013

### MODEL LISTING

<table>
<thead>
<tr>
<th>Model</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Output 3</th>
<th>Output 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-45-4001</td>
<td>+3.3V/5.0A</td>
<td>+5.0V/5.0A</td>
<td>+12V/1.0A</td>
<td>-12V/1.0A</td>
</tr>
<tr>
<td>GRN-45-4002</td>
<td>+5.0V/5.0A</td>
<td>-5.0V/5.0A</td>
<td>+12V/1.0A</td>
<td>-12V/1.0A</td>
</tr>
<tr>
<td>GRN-45-4003</td>
<td>+5.0V/5.0A</td>
<td>+24V/1.0A</td>
<td>+12V/1.0A</td>
<td>-12V/1.0A</td>
</tr>
<tr>
<td>GRN-45-4004</td>
<td>+5.0V/5.0A</td>
<td>+24V/1.0A</td>
<td>+15V/1.0A</td>
<td>-15V/1.0A</td>
</tr>
<tr>
<td>GRN-45-5001</td>
<td>+5.0V/5.0A</td>
<td>+12V/1.0A</td>
<td>-12V/1.0A</td>
<td>-12V/1.0A</td>
</tr>
<tr>
<td>GRN-45-5002</td>
<td>+5.0V/5.0A</td>
<td>+12V/1.0A</td>
<td>-12V/1.0A</td>
<td>-12V/1.0A</td>
</tr>
<tr>
<td>GRN-45-4005</td>
<td>+12V/2.0A</td>
<td>-12V/2.0A</td>
<td>-12V/2.0A</td>
<td>-12V/2.0A</td>
</tr>
<tr>
<td>GRN-45-4006</td>
<td>+15V/2.0A</td>
<td>-15V/2.0A</td>
<td>-15V/2.0A</td>
<td>-15V/2.0A</td>
</tr>
</tbody>
</table>

### ORDERING INFORMATION
- Consult factory for alternate output configurations.
- Consult factory for positive, negative or floating outputs (14).
- Please specify the following optional features when ordering:
  - CH - Chassis: OVP - Over-voltage Protection
  - CO - Cover: I/O - Isolated Outputs (consult factory)

### ENVIRONMENTAL SPECIFICATIONS
- **INTEGRATE**
  - TUV
  - Low Voltage Directive
  - EN 55011/32 Class B
  - 86% Average Efficiency
  - 86% Peak Efficiency
  - 0-70°C Operating Temperature
  - No Load Input Power <1W, 115/230 V
  - Voltage Fluctuations/Flicker EN 61000-3-3 Compliant
  - Harmonic Current Emissions EN 61000-3-2 Class A
  - Voltage Adjustments EN 61000-4-11 0% UT, 300 cycles, 0° 100/240V B/B
  - Voltage Dips EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM
  - Magnetic Field Immunity EN 61000-4-8 30A/m, 60 Hz.
  - Surge Protection EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line
  - Radiated Electromagnetic Field EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM

### MODEL OUTPUT AC-DC

**POWER DESIGNS**

- **Compact 2.5" x 4.25" x 1.0" Size**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **IEC 60601-1-2 4th ed. EMC**
- **Class B Emissions per EN55011/32**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**

**GRN-45 OUTPUT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Output Power at 50°C C1</th>
<th>45W</th>
<th>85-264V Vav</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Centering</td>
<td>Output 1: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td></td>
<td>Output 2 - 4: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Voltage Adjust Range</td>
<td>Output 1: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td></td>
<td>Output 2 - 4: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>Output 1: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td></td>
<td>Output 2 - 4: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Source Regulation</td>
<td>Output 1 - 4: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td></td>
<td>Output 2 - 4: ±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Ripple &amp; Noise</td>
<td>Output 1 - 4: 1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Turn On Overshoot</td>
<td>Output recovers to within 1% of initial set point due to a 50% step load change. 500µs maximum, 4% maximum deviation.</td>
<td></td>
</tr>
<tr>
<td>Overvoltage Protection</td>
<td>Latching, Output 1 between 110% and 150% of rated output voltage (optional)</td>
<td></td>
</tr>
<tr>
<td>Overcurrent Protection</td>
<td>110% - 150% rated Pmax, cycle off, auto recovery</td>
<td></td>
</tr>
<tr>
<td>Hold-Up Time</td>
<td>10ms typical, full power, 115V input</td>
<td></td>
</tr>
<tr>
<td>Start-Up Time</td>
<td>1 sec, ±15/230V input</td>
<td></td>
</tr>
<tr>
<td>Output Rise Time</td>
<td>25ms typical</td>
<td></td>
</tr>
<tr>
<td>Minimum Load (A)</td>
<td>No minimum load required</td>
<td></td>
</tr>
</tbody>
</table>

**INPUT SPECIFICATIONS**

- **Protection Class:** I
- **Source Voltage:** 85–264V VAC (see derating chart)
- **Frequency Range:** 47 – 63 Hz
- **Input Protection:** Internal 2A time delay fuse, 1500A breaking capacity
- **Peak Inrush Current:** 50A max. at 230 V
- **Peak Efficiency:** 86% |
- **Average Efficiency:** 85% (Avg. of 25%, 50%, 75%, and 100% rated load)
- **Light Load Efficiency:** 85%, ±15/230 VAC, 33% power
- **No Load Input Power:** <1W, ±115/230 VAC, no load
GRN-45 MULTI MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 45W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. Minimum load is not required for reliable operation; however, a 10% load may be required on Output 1 when loading Outputs 2, 3 or 4.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. In consideration of clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 1ST Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to operating instructions for additional information.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Optional Output Configuration (consult factory). - V2 can be configured positive, negative or floating with respect to V1. - V3 can be configured positive or floating with respect to V1 and must share a common return to V4. - V4 can be configured negative or floating with respect to V1 and must share a common return with V3.

CONNECTOR SPECIFICATIONS

P1
- Neutral Line
- AC Input:
  - 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.

P2
- DC Output:
  - 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

Ground: 0.187 quick disconnect terminal

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-45-3001 Efficiency shown)

MAX P_OUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

Derating requirements:
- Derate from 100% load at 50°C to 50% load at 70°C.
- Derate from 100% load at 90V/90 to 90% load at 85V/85.
60 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
- Compact 2.0" x 3.0" x 1.0" Size
- 3 Year Warranty
- Universal 85-264V Input
- Single Output
- 90% Peak Efficiency
- 87% Average Efficiency
- <300mW No Load Input Power
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN50011/32
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1:2007, 2nd Edition
IEC 60601-1-2:2013, 2nd Edition

UL Recognition
Mark for Canada
File E137708/E140259
UL 60601-1-2005/1:2012

TUV
EN 60950-1/2:2013, 2nd Edition
EN 60601-1:2014

Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT</th>
<th>P_OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-60-1001</td>
<td>3.3V/9.0A</td>
<td>30W</td>
</tr>
<tr>
<td>GRN-60-1002</td>
<td>5.0V/9.0A</td>
<td>45W</td>
</tr>
<tr>
<td>GRN-60-1003</td>
<td>12V/5.0A</td>
<td>60W</td>
</tr>
<tr>
<td>GRN-60-1004</td>
<td>15V/4.0A</td>
<td>60W</td>
</tr>
<tr>
<td>GRN-60-1005</td>
<td>24V/2.5A</td>
<td>60W</td>
</tr>
<tr>
<td>GRN-60-1006</td>
<td>28V/2.2A</td>
<td>60W</td>
</tr>
<tr>
<td>GRN-60-1007</td>
<td>48V/1.3A</td>
<td>60W</td>
</tr>
<tr>
<td>GRN-60-1008</td>
<td>19V/3.1A</td>
<td>60W</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:

CH - Chassis OVP - Overvoltage Protection
CO - Cover DF - Dual Fuse

CHASSIS/COVER OPEN FRAME

OUTPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Output Power at 50°C(1)</th>
<th>60W</th>
<th>85-264 V AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Centering</td>
<td>±0.5%</td>
<td>(Output at 50% load)</td>
</tr>
<tr>
<td>Voltage Adjust Range</td>
<td>95-105%</td>
<td></td>
</tr>
<tr>
<td>Load Regulation</td>
<td>±0.5%</td>
<td>(0-100% load change)</td>
</tr>
<tr>
<td>Source Regulation</td>
<td>0.5%</td>
<td>&lt;150mV (1001,1002)</td>
</tr>
<tr>
<td>Ripple &amp; Noise</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Overvoltage Protection</td>
<td>Latching, between 110% and 150% of rated output voltage (optional).</td>
<td></td>
</tr>
<tr>
<td>Overpower Protection</td>
<td>110-160% rated P, min., cycle on/off, auto recovery</td>
<td></td>
</tr>
<tr>
<td>Hold-Up Time</td>
<td>10ms typical, full power, 115V input</td>
<td></td>
</tr>
<tr>
<td>Start-Up Time</td>
<td>1 sec., 115/230V input</td>
<td></td>
</tr>
<tr>
<td>Output Rise Time</td>
<td>27ms typical</td>
<td></td>
</tr>
<tr>
<td>Minimum Load</td>
<td>No minimum load required</td>
<td></td>
</tr>
</tbody>
</table>

INPUT SPECIFICATIONS

Protection Class I
Source Voltage 65 – 264VAC (see derating chart)
Frequency Range 47 – 63 Hz
Input Protection Uin Internal 2A time-delay fuse, 1500A breaking capacity
Peak Inrush Current 50A max. at 230 V
Peak Efficiency 90%
Average Efficiency 87% (1003-1008), 85% (1002), 80% (1001)
Light Load Efficiency 85%, 115/230V, 33% power, 81% (1001), 84% (1002)
No Load Input Power ≤0.3W, 115/230 V, no load

ENVIRONMENTAL SPECIFICATIONS

Cooling Free air convection
Ambient Operating 0° to +70°C
Ambient Storage Temp. Range -40° to +85°C
Operating Relative Humidity Range 20-90% non-condensing
Altitude 10,000 ft. ASL Operating 40,000 ft. ASL Non-operating
Temperature Coefficient 0.02%/°F
Vibration 2.5g swept sine, 7-2000Hz, 1 octave/min, 3 axis, 1 hour each.
Shock 20g, 11ms, 3 axis, 3 each direction.

GENERAL SPECIFICATIONS

Means of Protection
Primary to Secondary 2MOPP (Means of Patient Protection)
Primary to Ground 1MOP (Means of Patient Protection)
Secondary to Ground Operational Insulation Consult factory for 1MOOP or 1MOPP

Dielectric Strength
Reinforced Insulation 5656 VDC, Primary to Secondary
Basic Insulation 2121 VDC, Primary to Ground
Operational Insulation 707 VDC, Secondary to Ground

Leakage Current
Earth Leakage <300µA NC, <100µA SFC
Touch Current <100µA NC, <500µA SFC

Switching Frequency 65 kHz
Remote Sense(Vin) 400 mV compensation of output cable losses
Mean-Time Between Failures >250,000 hours, MIL-HDBK-217F, 25°C, GB
Weight 0.24 lbs. Open frame/0.34 lbs. Chassis and cover


<table>
<thead>
<tr>
<th>Electrostatic Discharge</th>
<th>EN 61000-4-2</th>
<th>±16KV contact / ±1KV air discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiated Electromagnetic Field</td>
<td>EN 61000-4-3</td>
<td>80MHz-2.7GHz, 10V/m, 80% AM</td>
</tr>
<tr>
<td>Electrical Fast Transients/Bursts</td>
<td>EN 61000-4-4</td>
<td>±2KV, 5kHz/100kHz</td>
</tr>
<tr>
<td>Surge Immunity</td>
<td>EN 61000-4-5</td>
<td>±2KV line to earth / ±1KV line to line</td>
</tr>
<tr>
<td>Conducted Immunity</td>
<td>EN 61000-4-6</td>
<td>0.15 to 80MHz, 10V, 80% AM</td>
</tr>
<tr>
<td>Magnetic Field Immunity</td>
<td>EN 61000-4-8</td>
<td>30A/m, 60 Hz,</td>
</tr>
<tr>
<td>Voltage Dips</td>
<td>EN 61000-4-11</td>
<td>0% UT, 0.5 cycles, 0-315°</td>
</tr>
<tr>
<td>Voltage Interruptions</td>
<td>EN 61000-4-11</td>
<td>0% UT, 0.5 cycles, 0-315°</td>
</tr>
<tr>
<td>Radiated Emissions</td>
<td>EN 55011/32</td>
<td>Class B</td>
</tr>
<tr>
<td>Conducted Emissions</td>
<td>EN 55011/32</td>
<td>Class B</td>
</tr>
<tr>
<td>Harmonic Current Emissions</td>
<td>EN 61000-3-2</td>
<td>Class A</td>
</tr>
<tr>
<td>Voltage Fluctuations/Flicker</td>
<td>EN 61000-3-3</td>
<td>Compliant</td>
</tr>
</tbody>
</table>

All specifications are maximum at 25°C/60W unless otherwise stated, may vary by model and are subject to change without notice.
GRN-60 SINGLE MECHANICAL SPECIFICATIONS

CONNECTOR SPECIFICATIONS

- **P1**
  - **LINE**
  - **NEUTRAL**
  - **AC Input**: 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.

- **P2**
  - 1) **OUTPUT**
  - 2) **OUTPUT**
  - 3) **OUTPUT**
  - 4) **OUTPUT**
  - **DC Output**: 0.156 friction lock header mates with Tyco 770849-4 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

- **P3**
  - 1) **OUTPUT**
  - 2) **SENS**
  - 3) **SENS**
  - 4) **SENS**
  - **DC Sense**: 0.100 breakaway header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

- **Ground**: 0.187 quick disconnect terminal

APPLICATIONS INFORMATION

1. Continuous Output Power must not exceed 60W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 50°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. Standard models include only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product. Models with the suffix DF include a fuse in the line and neutral leads.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1-2005. In consideration of clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-60-1004 efficiency shown)

MAX P_OUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

(Derating requirements - Denote from 100% load at 50°C to 50% load at 70°C.)
80 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
- Compact 2.5” x 4.25” x 1.0” Size
- 3 Year Warranty
- Universal 85-264V Input
- Single Output
- 89% Peak Efficiency
- 87% Average Efficiency
- <300mW No Load Input Power
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1/A2:2013, 2nd Edition
AM/ANSI ES60601-1-2:2005(R) 2012

CB Reports/Certificates (including all National and Group Deviations)
IEC 60950-1/A2;2013, 2nd Edition

UL Recognition
Mark for Canada
File E137708/E140259
CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60601-1:2014

TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1:2005/A1:2013

Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT</th>
<th>Pout</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-80-1001</td>
<td>3.3V/16A</td>
<td>53W</td>
</tr>
<tr>
<td>GRN-80-1002</td>
<td>5.0V/16A</td>
<td>80W</td>
</tr>
<tr>
<td>GRN-80-1003</td>
<td>12V/8.7A</td>
<td>80W</td>
</tr>
<tr>
<td>GRN-80-1004</td>
<td>15V/3.3A</td>
<td>80W</td>
</tr>
<tr>
<td>GRN-80-1005</td>
<td>24V/3.3A</td>
<td>80W</td>
</tr>
<tr>
<td>GRN-80-1006</td>
<td>28V/2.9A</td>
<td>80W</td>
</tr>
<tr>
<td>GRN-80-1007</td>
<td>48V/1.7A</td>
<td>80W</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:

CH - Chassis
CO - Cover

OVP - Overvoltage Protection

EMC SPECIFICATIONS


Electrostatic Discharge
EN 61010-1

Radiated Electromagnetic Field
EN 61000-4-3

Electrical Fast Transients/Blurs
EN 61000-4-4

Surge Immunity
EN 61000-4-5

Conducted Immunity
EN 61000-4-6

Magnetic Field Immunity
EN 61000-4-8

Voltage Dips
EN 61000-4-11

Voltage Interruptions
EN 61000-4-11

Radiated Emissions
EN 55011/32

Conducted Emissions
EN 55011/32

Harmonic Current Emissions
EN 61000-3-2

Voltage Fluctuations/Flicker
EN 61000-3-3

All specifications are maximum at 25°C/80V unless otherwise stated, may vary by model and are subject to change without notice.
**APPLICATIONS INFORMATION**

1. Continuous Output Power must not exceed 80W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. In consideration of clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 11th Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

**TYPICAL EFFICIENCY vs. LOAD**

(Model GRN-80-1004 Efficiency shown)

<table>
<thead>
<tr>
<th>Load (%)</th>
<th>Efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>95</td>
</tr>
<tr>
<td>20</td>
<td>90</td>
</tr>
<tr>
<td>30</td>
<td>85</td>
</tr>
<tr>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>70</td>
<td>65</td>
</tr>
<tr>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>90</td>
<td>55</td>
</tr>
<tr>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

Input Voltage (V) vs. Ambient Temperature (°C)

- Derate from 100% load at 50°C to 50% load at 70°C.
- Derate from 100% load at 90V to 90% load at 85V.
- Derate 10% with chassis and cover.

**CONNECTOR SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>NEUTRAL LINE AC Input 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>(+) OUTPUT DC Output 6-32 screw down terminal mates with #6 ring tongue terminal (10in-lb Max.)</td>
</tr>
<tr>
<td>P3</td>
<td>(-) SENSE 4 (-) OUTPUT Remote Sense 0.100 breakaway header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71651 or equivalent crimp terminal.</td>
</tr>
<tr>
<td></td>
<td>(-) OUTPUT 3 (+) OUTPUT Ground 0.187 quick disconnect terminal</td>
</tr>
</tbody>
</table>
80 WATTS
MULTI OUTPUT AC-DC

FEATURES:
- Compact 3.0” x 5.0” x 1.0” Size
- 3 Year Warranty
- Universal 85-264V Input
- Dual, Triple or Quad Outputs
- 87% Peak Efficiency
- 85% Average Efficiency
- <1W No Load Input Power
- IEC 60950-1 2nd ed. ITC Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- 6-70°C Operating Temperature
- Optional Chassis/Cover

CHASSIS/Cover
OPEN FRAME

SAFETY SPECIFICATIONS
Underwriters Laboratories
File E137708/E140259
UL 60950-1:2007, 2nd Edition
AAMI/ANSI ES60950-1-2005(R) 2012
CB Reports/Certificates (including all National and Group Deviations)
TUV
IEC 60950-1/A2:2013, 2nd Edition
UL Recognition
Mark for Canada
File E137708/E140259
CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60601-1-2012
TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1-2006/A1:2012
Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-80-4001</td>
<td>+3.3V/8.0A</td>
<td>+5.0V/6.0A</td>
<td>+12V/1.5A</td>
<td>-12V/1.5A</td>
</tr>
<tr>
<td>GRN-80-4002</td>
<td>+5.0V/8.0A</td>
<td>-5.0V/5.0A</td>
<td>+12V/1.5A</td>
<td>-12V/1.5A</td>
</tr>
<tr>
<td>GRN-80-4003</td>
<td>+5.0V/8.0A</td>
<td>+24V/1.0A</td>
<td>+12V/1.5A</td>
<td>-12V/1.5A</td>
</tr>
<tr>
<td>GRN-80-4004</td>
<td>+5.0V/8.0A</td>
<td>+24V/1.0A</td>
<td>+15V/1.5A</td>
<td>-15V/1.5A</td>
</tr>
<tr>
<td>GRN-80-3001</td>
<td>+5.0V/8.0A</td>
<td>+12V/2.0A</td>
<td>+12V/2.0A</td>
<td>-12V/2.0A</td>
</tr>
<tr>
<td>GRN-80-3002</td>
<td>+5.0V/8.0A</td>
<td>+12V/2.0A</td>
<td>+15V/2.0A</td>
<td>-15V/2.0A</td>
</tr>
<tr>
<td>GRN-80-2001</td>
<td>+5.0V/8.0A</td>
<td>+24V/2.0A</td>
<td>-12V/4.0A</td>
<td>-12V/4.0A</td>
</tr>
<tr>
<td>GRN-80-2002</td>
<td>+5.0V/8.0A</td>
<td>+24V/2.0A</td>
<td>+15V/3.0A</td>
<td>-15V/3.0A</td>
</tr>
<tr>
<td>GRN-80-2003</td>
<td>+12V/4.0A</td>
<td>-12V/4.0A</td>
<td>+15V/3.0A</td>
<td>-15V/3.0A</td>
</tr>
<tr>
<td>GRN-80-2004</td>
<td>+15V/3.0A</td>
<td>-12V/4.0A</td>
<td>+12V/2.0A</td>
<td>-12V/2.0A</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.

Please specify the following optional features when ordering:

CH - Chassis
CO - Cover
OVP - Overvoltage Protection
I/O - Isolated outputs

EMC SPECIFICATIONS (IEC 60601-1-2-2014, 4th ed./IEC 61000-6-2-2005)

- Electromagnetic Discharge: EN 61000-4-2
- Radiated Electromagnetic Field: EN 61000-4-3
- Electrical Fast Transients/Bursts: EN 61000-4-4
- Surge Immunity: EN 61000-4-5
- Conducted Immunity: EN 61000-4-6
- Magnetic Field Immunity: EN 61000-4-8
- Voltage Dips: EN 61000-4-11
- Voltage Interruptions: EN 61000-4-11
- Radiated Emissions: EN 55011/32
- Conducted Emissions: EN 55011/32
- Harmonic Current Emissions: EN 61000-3-2
- Voltage Fluctuations/Flicker: EN 61000-3-3

All specifications are maximum at 25°C/80W unless otherwise stated, may vary by model and are subject to change without notice.

80 WATTS
OUTPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Output Power at 50°C (C1)</th>
<th>80W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Centering</td>
<td>85-264 Vrms</td>
</tr>
<tr>
<td>Voltage Adjust Range</td>
<td>0.5%</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>0%</td>
</tr>
<tr>
<td>Source Regulation</td>
<td>0.5%</td>
</tr>
<tr>
<td>Ripple &amp; Noise</td>
<td>0.5%</td>
</tr>
<tr>
<td>Turn-On Overshoot</td>
<td>0%</td>
</tr>
<tr>
<td>Overvoltage Protection</td>
<td>50%</td>
</tr>
<tr>
<td>Overpower Protection</td>
<td>50%</td>
</tr>
<tr>
<td>Hold-Up Time</td>
<td>50ms</td>
</tr>
<tr>
<td>Start-Up Time</td>
<td>1 sec</td>
</tr>
<tr>
<td>Output Rise Time</td>
<td>5ms</td>
</tr>
</tbody>
</table>

Minimum Load:
No minimum load required.

INPUT SPECIFICATIONS

- Protection Class: I
- Source Voltage: 85 – 264 VAC (see derating chart)
- Frequency Range: 47 – 63 Hz
- Input Protection: Internal 3A time delay fuse, 1500A breaking capacity
- Peak Inrush Current: 50A max. at 230 V
- Peak Efficiency: 87%
- Average Efficiency: 85% (Avg. of 25%, 50%, 75% and 100% rated load)
- Light Load Efficiency: 83%, 115/230 Vac, 33% power

ENVIRONMENTAL SPECIFICATIONS

- Cooling: Free air convection
- Ambient Operating Temperature: 0°C to + 70°C
- Temperature Range: see power rating chart
- Ambient Storage Temp. Range: -40°C to + 85°C
- Operating Relative Humidity Range: 20-90% non-condensing
- Altitude: 10,000 ft. ASL Operating, 40,000 ft. ASL Non-operating
- Temperature Coefficient: 0.02%/°C
- Vibration: 2.5G sweept sine, 7-2000Hz, 1 octave/min, 3 axis, 1 hour each.
- Shock: 20G, 11ms, 3 axis, 3 each direction.

GENERAL SPECIFICATIONS

- Means of Protection:
  - Primary to Secondary: 2MOPP (Means of Patient Protection)
  - Primary to Ground: 1MOPP (Means of Patient Protection)
  - Secondary to Ground: Operational Insulation/Consult factory for 1MOOP or 1MOPP)
- Dielectric Strengths:
  - Reinforced Insulation: 5656 VDC, Primary to Secondary
  - Basic Insulation: 2121 VDC, Primary to Ground
  - Operational Insulation: 707 VDC, Secondary to Ground
- Leakage Current:
  - Earth Leakage: <300μA NC, <1100μA SFC
  - Touch Current: <100μA NC, <500μA SFC
- Switching Frequency: 100 KHz
- Mean-Time Between Failures: >300,000 hours, MIL-HDBK-217F, 25°C, CB
- Weight: 0.63 lbs Open frame / 0.80 lbs. Chassis and cover

All specifications are maximum at 25°C/80W unless otherwise stated, may vary by model and are subject to change without notice.

300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 624-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com
GRN-80 MULTI MECHANICAL SPECIFICATIONS

Applications Information

1. Each output can deliver its rated current but Total Output Power must not exceed 80W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. Minimum load is not required for reliable operation; however, a 10% load may be required on Output 1 when loading Outputs 2, 3 or 4.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1-1:2005. In consideration of clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not over-stress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
13. Optional Output Configuration (consult factory).
   - V2 can be configured positive, negative or floating with respect to V1.
   - V3 can be configured positive or floating with respect to V1.
   - V4 can be configured positive, negative or floating with respect to V1.

Typical Efficiency vs. Load

(Model GRN-80-3001 Efficiency shown)

Max Pout vs. Ambient Temperature/Input Voltage

Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C.
- Derate from 100% load at 90V to 90% load at 85V.
110 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
• Compact 3.0” x 5.0” x 1.25” Size
• 3 Year Warranty
• Universal 85-264V Input
• Single Output
• 90% Peak Efficiency
• 87% Average Efficiency
• <300mW No Load Input Power
• IEC 60601-1 3rd ed. Medical Cert.
• IEC 60950-1 2nd ed. ITE Certification
• IEC 60601-1-2 4th ed. EMC
• Class B Emissions per EN501132
• 0-70°C Operating Temperature
• RoHS Compliant
• Optional Chassis/Cover

SAFETY SPECIFICATIONS

CHASSIS/COVER OPEN FRAME

GRN-110-1001 3.0V/22A 73W
GRN-110-1002 5.0V/22A 110W
GRN-110-1003 12V/8.2A 110W
GRN-110-1004 15V/7.3A 110W
GRN-110-1005 24V/4.6A 110W
GRN-110-1006 28V/3.9A 110W
GRN-110-1007 48V/2.3A 110W

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:

CH - Chassis
CO - Cover
OVP - Overvoltage Protection


Electrostatic Discharge
EN 61000-4-2 ±8kV contact / ±15kV air discharge A

Radiated Electromagnetic Field
EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM A

Electrical Fast Transients/Bursts
EN 61000-4-4 ±2kV, 50kHz/100kHz A

Surge Immunity
EN 61000-4-5 ±2kV line to earth / ±1kV line to line A

Conducted Immunity
EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM A

Magnetic Field Immunity
EN 61000-4-8 30A/m, 60Hz A

Voltage Dips
EN 61000-4-11 0%, 5 cycles, 0-315° 100/240V A/A

Voltage Interruptions
EN 61000-4-11 0%, 300 cycles, 0° 100/240V B/B

Overvoltage Protection
Latching, Between 110% and 150% of rated output voltage (optional)

Overpower Protection
110% rated POUT min, cycle on/off, auto recovery

Hold-Up Time
16ms typical, full power, 115V input

Start-Up Time
1 sec, 115/230V Input

Output Rise Time
50ms typical

Minimum Load
No minimum load required

INPUT SPECIFICATIONS

Protection Class I

Source Voltage
85–264 VAC (see derating chart)

Frequency Range
47–63Hz

Input Protection
Internal 4A time delay fuse, 1500A breaking capacity

Peak Inrush Current
50A max. at 230 V

Peak Efficiency
90%

Average Efficiency
87% (1003-1007), 86% (1002), 82% (1001)

Light Load Efficiency
85%, 115/230V, 33% power (1001 >81%)

No Load Input Power
<0.3W, 115/230V IN, no load (1001 <0.3W)

ENVIRONMENTAL SPECIFICATIONS

Cooling
Free air convection

Ambient Operating
0°C to +70°C

Temperature Range
Derating: see derating chart

Ambient Storage Temp. Range
-40°C to +85°C

Operating Relative Humidity Range
20-90% non-condensing

Altitude
10,000 ft. ASL Operating
40,000 ft. ASL Non-operating

Temperature Coefficient
0.02%/°C

Vibration
2.5G swept sine, 7-2000Hz, 1 octave/min, 3 axis, 1 hour each.

Shock
20G 111 ms, 3 axis, 3 each direction.

GENERAL SPECIFICATIONS

Means of Protection
Primary to Secondary 2MOPP (Means of Patient Protection)
Primary to Ground 1MOPP (Means of Patient Protection)
Secondary to Ground Operation

Mean-Time Between Failures
>250,000 hours, MIL-HDBK

Remote Sense
400 mV compensation of output cable losses

Mean-Time Between Failures
>250,000 hours, MIL-HDBK-217F, 25°C, GB

Weight
0.65 lbs. Open frame / 0.85 lbs. Chassis and cover

All specifications are maximum at 25°C unless otherwise stated, may vary by model and are subject to change without notice.
GRN-110 SINGLE MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION

1. Continuous Output Power must not exceed 110W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retracted tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. In consideration of clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1.1ST Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote Sense terminals may be used to compensate for cable losses up to 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-110-1004 Efficiency shown)

MAX P_OUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

Derating requirements - Derate from 100% load at 50°C to 50% load at 70°C.
- Derate from 100% load at 90V_IN to 90% load at 85V_IN.
- Derate 10% with chassis and cover.
110 WATTS
MULTI OUTPUT AC-DC

FEATURES:
- Compact 3.0” x 5.0” x 1.25” Size
- 3 Year Warranty
- Universal 85-264V Input
- Dual, Triple or Quad Outputs
- 87% Peak Efficiency
- 85% Average Efficiency
- <1W No Load Input Power
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover

SAFETY SPECIFICATIONS
Am/Can/NSI ES6061-01:2005(R) 2012
CB Reports/Certificates (including all National and Group Deviations)
Mark for Canada

MODEL LISTING
<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRN-110-4001</td>
<td>+3.3V/10A</td>
<td>+5V/5A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>GRN-110-4002</td>
<td>+5V/10A</td>
<td>-5V/5A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>GRN-110-4003</td>
<td>+5V/10A</td>
<td>+24V/2A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>GRN-110-4004</td>
<td>+5V/10A</td>
<td>+24V/2A</td>
<td>+15V/2A</td>
<td>-15V/2A</td>
</tr>
<tr>
<td>GRN-110-5001</td>
<td>+5V/12A</td>
<td>+12V/2A</td>
<td>+12V/3A</td>
<td>-12V/3A</td>
</tr>
<tr>
<td>GRN-110-3002</td>
<td>+5V/12A</td>
<td>+15V/2A</td>
<td>+15V/2A</td>
<td>-15V/2A</td>
</tr>
<tr>
<td>GRN-110-2001</td>
<td>+5V/12A</td>
<td>+24V/3A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>GRN-110-2002</td>
<td>+5V/12A</td>
<td>+12V/5A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>GRN-110-2003</td>
<td>+12V/5A</td>
<td>+12V/5A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>GRN-110-2004</td>
<td>+15V/4A</td>
<td>+15V/4A</td>
<td>+15V/2A</td>
<td>-15V/2A</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.(13)
Please specify the following optional features when ordering:
CH - Chassis
OVP - Overvoltage Protection
CO - Cover
I/O - Isolated Outputs

GRN-110-110W

OUTPUT SPECIFICATIONS
<table>
<thead>
<tr>
<th>Output Power at 50°C(1)</th>
<th>110W</th>
</tr>
</thead>
<tbody>
<tr>
<td>(See Derating Chart)</td>
<td>85-264 V Vin</td>
</tr>
</tbody>
</table>

Voltage Centering
Output 1: ±0.5% (All outputs at 50% load)
Output 2 - 4: ±0.5%

Voltage Adjust Range
Output 1: ±0.5% to ±5.0%
Output 2 - 4: ±0.5% to ±10.0%

Load Regulation
Output 1: ±0.5%
Output 2 - 4: ±0.5%

Source Regulation
Outputs 1 - 4: 0.5%

Hold-Up Time
16ms typical, full power, 115V input

Minimum Load(5)
No minimum load required

INPUT SPECIFICATIONS
Protection Class
1

Voltage Source
65 – 264VAC (see derating chart)

Frequency Range
47 – 63 Hz

Input Protection(6)
Internal 4A time delay fuse, 1500A breaking capacity

Peak Inrush Current
40A max at 230V

Peak Efficiency
87%

Average Efficiency
85% (Avg. of 25%, 50%, 75% and 100% rated load)

Light Load Efficiency
85%, 115/230 Vac, 33% power

No Load Input Power
<1W, 115/230 V, no load

ENVIRONMENTAL SPECIFICATIONS
Cooling
Free air convection

Ambient Operating
0°C to +70°C

Temperature Range
Derating: see power rating chart

Ambient Storage Temp. Range
-40°C to +85°C

Relative Humidity Range
20-90% non-condensing

Operating Relative Humidity Range
20-90% non-condensing

Altiitude
10,000 ft. ASL Operating
40,000 ft. ASL Non-operating

Temperature Coefficient
0.02%/°C

Vibration
2.5G swept sine, 7-2000Hz, 1 octave/min, 3 axis, 1 hour each.

Shock
20g, 11 ms, 3 axis.

GENERAL SPECIFICATIONS
Means of Protection
Primary to Secondary 2MOPP (Means of Patient Protection)
Primary to Ground 1MOPP (Means of Patient Protection)
Secondary to Ground Operational Insulation (consult factory for 1MOPP or 1MOPP)

Dielectric Strengths(7)
Reinforced Insulation 5656 VDC, Primary to Secondary
Basic Insulation 2121 VDC, Primary to Ground
Operational Insulation 707 VDC, Secondary to Ground

Leakage Current
Earth Leakage <300µA NC, <100µA SFC
Touch Current <100µA NC, <500µA SFC

Switching Frequency
100 KHz

Mean-Time Between Failures
>250,000 hours, MIL-HDBK-217F, 25°C, 60Hz

Weight
0.19 lbs. Open frame / 1.00 lbs. Chassis and cover


Electromagnetic Discharge
Radiated Electromagnetic Field
EN 61000-4-3
80MHz-2.7GHz, 10V/m, 80% AM

Electrical Fast Transients/Bursts
EN 61000-4-4
±2KV, 50Hz/100kHz

Surge Immunity
EN 61000-4-5
±2KV line to earth / ±1KV line to line

Conducted Immunity
EN 61000-4-6
0.15 to 80MHz, 10V, 80% AM

Magnetic Field Immunity
EN 61000-4-8
30A/m, 60 Hz.

Voltage Dips
EN 61000-4-11
0% Un., 0.5 cycles, 0-315°
100/240V A/A
0% Un., 1 cycles, 0°
100/240V A/A
40% Un., 10/12 cycles, 0°
100/240V B/A
70% Un., 25/30 cycles, 0°
100/240V B/A

Voltage Interruptions
EN 61000-4-11
0% Un., 300 cycles, 0°
100/240V B/B

Radiated Emissions
EN 55011/32
Class B

Conducted Emissions
EN 55011/32
Class B

Harmonic Current Emissions
EN 61000-3-2
Class A (<1000W Pnom)

Voltage Fluctuations/Flicker
EN 61000-3-3
Compliant

INTEGRATED POWER DESIGNS
300 Stewart Road Wilkes-Barre, PA 18706
Phone: (570) 624-4666 Fax: (570) 824-4843
Email: sales@ipdpower.com Web: www.ipdpower.com

(1) For operating points outside of the above specifications, please consult factory.

(2) For models with isolated outputs, consult factory.

(3) For models with isolated outputs, consult factory.

(4) For models with isolated outputs, consult factory.

(5) For models with isolated outputs, consult factory.

(6) For models with isolated outputs, consult factory.

(7) For models with isolated outputs, consult factory.

(8) For models with isolated outputs, consult factory.

(9) For models with isolated outputs, consult factory.

(10) For models with isolated outputs, consult factory.

(11) For models with isolated outputs, consult factory.

(12) For models with isolated outputs, consult factory.

(13) For models with isolated outputs, consult factory.
GRN-110 MULTI MECHANICAL SPECIFICATIONS

CONNECTOR SPECIFICATIONS

P1
- NEUTRAL
- LINE

0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.

P2
- 1 (OUTPUT 4)
- 2 (OUTPUT 4)
- 3 (INPUT 3)
- 4 (INPUT 3)
- 5 (OUTPUT 2)
- 6 (OUTPUT 2)
- 7 (OUTPUT 1)
- 8 (OUTPUT 1)
- 9 (OUTPUT 1)
- 10 (OUTPUT 1)

0.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

Ground 0.187 quick disconnect terminal

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 110W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. Minimum load is not required for reliable operation; however, a 10% load may be required on Output 1 when loading Outputs 2, 3 or 4.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. In consideration of clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type-test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 1ST Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric stress test. Please consult factory before performing an AC dielectric stress test.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
13. Optional Output Configuration (consult factory).
   - V2 can be configured positive, negative or floating with respect to V1.
   - V3 can be configured positive or floating with respect to V1.
   - V4 can be configured positive, negative or floating with respect to V1.

TYPICAL EFFICIENCY vs. LOAD

(Model GRN-110-3001 Efficiency shown)

MAX P_OUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

Derating requirements:
- Derate from 100% load at 50°C to 50% load at 70°C.
- Derate from 100% load at 90V\text{IN} to 90% load at 85V\text{IN}.
- Derate 10% with Chassis/Cover option.
200 WATTS
MULTI OUTPUT AC-DC

FEATURES:
- Compact 3.0" x 5.0" x 1.3" Size
- 3 Year Warranty
- Universal 85-264V Input
- Dual, Triple or Quad Outputs
- 90% Peak Efficiency
- 86% Average Efficiency
- <300mW No Load Input Power
- RoHS Compliant

CHASSIS/Cover

GRN-200

SAFETY SPECIFICATIONS

Underwriters Laboratories File E137708/E140259
UL 60950-1:2007, 2nd Edition (amendment 3)
UL 62368-1:2014, 2nd Edition
UL 60601-1-2:2012
IEC 60601-1-2:2014
TUV EN 62368-1:2014, 2nd Edition
IEC 60950-1/A2:2013, 2nd Edition
CB Reports/Certificates File E137708/E140259 CAN/CS
Graded Safety Level 2
User's Manual Includes Safety Instructions

MODEL LISTING

MODEL OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4
GRN-200-4001 +3.3V/30A +5V/8A +12V/2A -12V/2A
GRN-200-4002 +5V/30A +3.3V/8A +12V/2A -12V/2A
GRN-200-4003 +5V/30A +24V/3A +12V/2A -12V/2A
GRN-200-4004 +5V/30A +24V/3A +15V/2A -15V/2A
GRN-200-4005 +24V/6A +5V/8A +12V/2A -12V/2A
GRN-200-3001 +5V/30A +12V/6A -12V/2A
GRN-200-3002 +5V/30A +15V/5A -15V/2A
GRN-200-3003 +5V/30A +24V/1.5A -24V/1.5A
GRN-200-2001 +5V/30A +24V/3A
GRN-200-2002 +5V/30A +12V/6A
GRN-200-2003 +12V/12A +12V/6A
GRN-200-2004 +15V/10A -15V/5A

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:
CH - Chassis
PF - Power Fail Warning
CO - Cover
IO - Isolated Outputs
BF - Type BF

All specifications are maximum at 25°C, 200W unless otherwise stated, may vary by model and are subject to change without notice.

SAFETY SPECIFICATIONS

Underwriters Laboratories File E137708/E140259
UL 60950-1:2007, 2nd Edition (amendment 3)
UL 62368-1:2014, 2nd Edition
UL 60601-1-2:2012
IEC 60601-1-2:2014
TUV EN 62368-1:2014, 2nd Edition
IEC 60950-1/A2:2013, 2nd Edition
CB Reports/Certificates File E137708/E140259 CAN/CS
Graded Safety Level 2
User's Manual Includes Safety Instructions

MODEL LISTING

MODEL OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4
GRN-200-4001 +3.3V/30A +5V/8A +12V/2A -12V/2A
GRN-200-4002 +5V/30A +3.3V/8A +12V/2A -12V/2A
GRN-200-4003 +5V/30A +24V/3A +12V/2A -12V/2A
GRN-200-4004 +5V/30A +24V/3A +15V/2A -15V/2A
GRN-200-4005 +24V/6A +5V/8A +12V/2A -12V/2A
GRN-200-3001 +5V/30A +12V/6A -12V/2A
GRN-200-3002 +5V/30A +15V/5A -15V/2A
GRN-200-3003 +5V/30A +24V/1.5A -24V/1.5A
GRN-200-2001 +5V/30A +24V/3A
GRN-200-2002 +5V/30A +12V/6A
GRN-200-2003 +12V/12A +12V/6A
GRN-200-2004 +15V/10A -15V/5A

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:
CH - Chassis
PF - Power Fail Warning
CO - Cover
IO - Isolated Outputs
BF - Type BF

All specifications are maximum at 25°C, 200W unless otherwise stated, may vary by model and are subject to change without notice.
GRN-200 SERIES MECHANICAL SPECIFICATIONS

CONNECTOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1:</td>
<td>0.156 friction lock header mates with Molex 09-50-3531 or equivalent crimp terminal housing with Molex 09-50-0189 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2:</td>
<td>6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)</td>
</tr>
<tr>
<td>P3:</td>
<td>5566 Mini-Fit Jr. header mates with 5557 Mini-Fit Jr. or equivalent crimp housing with 5566 Mini-Fit Jr. or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P4:</td>
<td>0.100 friction lock header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 200W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. Minimum load is not required for reliable operation; however, a 10% load may be required on Output 1 when loading Outputs 2, 3 or 4.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1 Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a AC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 400mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RC shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
13. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 9-15ms prior to loss of output from AC failure.
14. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
15. A 3% increase above nominal voltage of Output 1 is required to meet ±5% centering of Output 2 or 4002 only.

**MAX P_{out} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE**

---

**DERATING REQUIREMENTS**

- Derate Output 1 (3.3-5V) current rating 33% when convection cooled.
- Derate Outputs 2-4 (12-24V) current rating 25% when convection cooled.
- Derate Total Output Power linearly from 100% load at 50°C to 50% load at 70°C.
- Derate Total Output Power linearly from 100% load at 90V to 90% load at 85V.
- Derate Total Output Power 10% when convection cooled using Chassis or Chassis/Cover.
- Derate Total Output Power 10% when forced-air cooled using Chassis or Chassis/Cover.

---

**Ambient Temperature (°C)**

0 10 20 30 40 50 60 70

**Input Voltage (V)**

0 20 40 60 80 100 120 140 160 180 200

**Output Power (Watts)**

OPEN FRAME

CHASSIS/COVER

FORCED AIR COOLED

CONVENTION COOLED

---

**Contact Information**

Integrated Power Designs
300 Stewart Road • Wilkes-Barre, PA 18706 • Phone: (570) 824-4666 • Fax: (570) 824-4843 • Email: sales@ipdpower.com • Web: www.ipdpower.com
FEATUERS:

- Compact 2.5 x 4.5” x 1.2” Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- High Efficiency
- 0-70°C Operating Temperature
- IEC 60950-1 2nd ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN50011/32
- RoHS Compliant
- Optional Chassis/Cover

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1 2-07, 2nd Edition
AMMI/ANSI ES60601-1:2005(R) 2012
CB Reports/Certificates (including all National and Group Deviations)
IEC 60601-2-1:2013

UL Recognition
Mark for Canada
CAN/CSA C22.2 No. 60950-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60601-1:2014

TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1:2006/A1:2013
AMMI/ANSI ES60601-1:2005/(R) 2012

Low Voltage Directive

ENVIRONMENTAL SPECIFICATIONS

Operating Temperatures:
0°C to +70°C

Total Output Power at 50°C(1) 50W
Convection Cooled (16)(18)
70W 300LFM Forced-Cooled (15)(17)(19)

电气和环境条件


<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-70-4001</td>
<td>+3.3V/6A</td>
<td>+5V/6A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>REL-70-4002</td>
<td>+5V/6A</td>
<td>+3.3V/5A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>REL-70-4003</td>
<td>+5V/6A</td>
<td>+3.3V/5A</td>
<td>+15V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>REL-70-4004</td>
<td>+5V/6A</td>
<td>-5V/5A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>REL-70-4005</td>
<td>+5V/6A</td>
<td>-5V/5A</td>
<td>+15V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>REL-70-4006</td>
<td>+5V/6A</td>
<td>+24/2A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
</tr>
<tr>
<td>REL-70-4007</td>
<td>+5V/6A</td>
<td>+24/2A</td>
<td>+24/2A</td>
<td>-15V/2A</td>
</tr>
<tr>
<td>REL-70-4008</td>
<td>6.7V/5A</td>
<td>5V/4A</td>
<td>+15V/2A</td>
<td>-15V/2A</td>
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<tr>
<td>REL-70-3001</td>
<td>+5V/6A</td>
<td>+12V/2A</td>
<td>-12V/2A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3002</td>
<td>+5V/6A</td>
<td>+15V/2A</td>
<td>-15V/2A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3003</td>
<td>+5V/6A</td>
<td>+7.5V/2A</td>
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<tr>
<td>REL-70-3004</td>
<td>+3.3V/6A</td>
<td>+7V/5A</td>
<td>+12V/2A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3005</td>
<td>+3.3V/6A</td>
<td>+12V/3A</td>
<td>-12V/3A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3006</td>
<td>+5V/6A</td>
<td>+15V/3A</td>
<td>-15V/2A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3007</td>
<td>+5V/6A</td>
<td>+5V/6A</td>
<td>+3.3V/6A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3008</td>
<td>2.5V/14A(2)</td>
<td>3.5V/14A(3)</td>
<td>5V/14A(5)</td>
<td>12V/5.8A</td>
</tr>
<tr>
<td>REL-70-3009</td>
<td>12V/5.8A</td>
<td>15V/4.7A</td>
<td>24V/2.9A</td>
<td></td>
</tr>
<tr>
<td>REL-70-3010</td>
<td>28V/2.5A</td>
<td>48V/1.3A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

- CH - Chassis
- CO - Cover
- I/O - Isolated Outputs
- TS - Terminal Strip

All specifications are maximum at 25°C/70W unless otherwise stated, may vary by model and are subject to change without notice.
POWER DESIGNS INTEGRATE REL-70 MECHANICAL SPECIFICATIONS

300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com

1. Each output can deliver its rated current but total Output Power must not exceed 70W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 80°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV (single output models only). The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power-Fail (AC-Good) feature provides a logic-low warning signal from an open collector output from AC failure, 5V/10mA.
15. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
16. Total power must not exceed 50W with convection cooling on open-frame models.
17. Total power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
18. Total power must not exceed 40W with convection cooling and Chassis/Cover option.
19. Total power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
20. Rated 10A with convection cooling.
21. Rated 1.5A with convection cooling.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

CONNECTOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>AC Input: 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Single): 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Multiple): 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>G</td>
<td>Ground: 0.156 quick disconnect terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>P.F./Sense (Single): 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>Power Fail (Multiple): 0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>
## 110 WATTS
### SINGLE/MULTI OUTPUT AC-DC

#### FEATURES:
- Compact 3” x 5” x 1.3” Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- High Efficiency
- 0-70°C Operating Temperature
- Optional Chassis/Cover

#### SAFETY SPECIFICATIONS

- UL 60950-1/A2:2013, 2nd Edition
- EN 55011/32 Class B
- Magnetic Field Immunity EN 61000-4-8 30A/m, 60 Hz.
- Conducted Immunity EN 61000-4-2
- Radiated Electromagnetic Field EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80%
- Electrostatic Discharge EN 61000-4-2
- Surge Immunity EN 61000-4-5 +2 KV line to earth / ±1 KV line to line
- Conducted Immunity EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM
- Magnetic Field Immunity EN 61000-4-8 30A/m, 60 Hz
- Voltage Dips EN 61000-4-11 0% Un, 0.5 cycles, 0-315° 100/240V A/A
- Voltage Interruptions EN 61000-4-11 0% Un, 0.5 cycles, 0° 100/240V B/B
- Radiated Emissions EN 55011/32 Class B
- Conducted Emissions EN 55011/32 Class B
- Harmonic Current Emissions EN 61000-5-2 Class A

#### ORDERING INFORMATION

Consult factory for alternate output configurations. Consult factory for positive, negative or floating outputs. Specify the following optional features when ordering:

- CH – Chassis
- CO – Cover
- I/O – Isolated Outputs
- TS – Terminal Strip

#### MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-110</td>
<td>+3.3V/10</td>
<td>+5V/10</td>
<td>-3.3V/10</td>
<td>+5V/10</td>
</tr>
<tr>
<td>REL-110</td>
<td>+5V/10</td>
<td>+3.3V/10</td>
<td>+5V/10</td>
<td>-3.3V/10</td>
</tr>
<tr>
<td>REL-110</td>
<td>+5V/10</td>
<td>+3.3V/10</td>
<td>+5V/10</td>
<td>-3.3V/10</td>
</tr>
<tr>
<td>REL-110</td>
<td>+5V/10</td>
<td>+3.3V/10</td>
<td>+5V/10</td>
<td>-3.3V/10</td>
</tr>
<tr>
<td>REL-110</td>
<td>+5V/10</td>
<td>+3.3V/10</td>
<td>+5V/10</td>
<td>-3.3V/10</td>
</tr>
</tbody>
</table>

#### INPUT SPECIFICATIONS

- Voltage Fluctuations/Flicker EN 61000-3-3 Compliant
- Conducted Emissions EN 55011/32 Class B
- Surge Immunity EN 61000-4-5 +2 KV line to earth / ±1 KV line to line
- Conducted Immunity EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM
- Magnetic Field Immunity EN 61000-4-8 30A/m, 60 Hz
- Voltage Dips EN 61000-4-11 0% Un, 0.5 cycles, 0-315° 100/240V A/A
- Voltage Interruptions EN 61000-4-11 0% Un, 0.5 cycles, 0° 100/240V B/B
- Radiated Emissions EN 55011/32 Class B
- Conducted Emissions EN 55011/32 Class B
- Harmonic Current Emissions EN 61000-5-2 Class A
- Voltage Fluctuations/Flicker EN 61000-5-3 Compliant

All specifications are maximum at 25° C, 110W unless otherwise stated, may vary by model and are subject to change without notice.

---

**Compact 3” x 5” x 1.3” Size**

**2 Year Warranty**

**Universal 85-264V Input**

**One to Four Outputs**

**High Efficiency**

**0-70°C Operating Temperature**

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Please specify the following optional features when ordering:

- CH – Chassis
- CO – Cover
- I/O – Isolated Outputs
- TS – Terminal Strip
**APPLICATIONS INFORMATION**

1. Each output can deliver its rated current but Total Output Power must not exceed 110W, as determined by the cooling method.

2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 80°C rise at any specified ambient temperature.

3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.

4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.

5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.

6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.

7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.

8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.

9. This power supply has been safely-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.

10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV (single-output models only). The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.

11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.

12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.

13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

14. Power-Fail (AC-Good) feature provides a logic-low warning signal from an open collector output from AC failure, 5V/10mA.

15. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.

16. Total power must not exceed 80W with convection cooling on open-frame models except where noted.

17. Total power must not exceed 110W with 300LFM forced-air cooling on open-frame models.

18. Total power must not exceed 65W with convection cooling and Chassis/Cover option.

19. Total power must not exceed 110W with 300LFM forced-air cooling and Chassis/Cover option.

20. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.

21. Total current from Outputs 1 & 2 must not exceed 12A with convection cooling.

22. Rated 8A maximum with convection cooling.

23. Rated 16A maximum with convection cooling.

**MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE**

<table>
<thead>
<tr>
<th>Ambient Temperature (°C)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power (Watts)</td>
<td>110</td>
<td>90</td>
<td>70</td>
<td>50</td>
<td>30</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**CONNECTOR SPECIFICATIONS**

- **P1** AC Input
  - 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640708-1 or equivalent crimp terminal.

- **P2** DC Output (Single)
  - 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

- **P2** DC Output (Multiple)
  - 0.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

- **G** Ground
  - 0.187 quick disconnect terminal.

- **P3** P.F./Sense (Single)
  - 0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

- **P3** P.F. (Multiple)
  - 0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
150 WATTS
SINGLE/MULTI OUTPUT AC-DC

FEATURES:
- Compact 3.8” x 6.0” x 1.3” Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- High Efficiency
- 0-70°C Operating Temperature
- All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.

CHASSIS/Cover
OPEN FRAME

SAFETY SPECIFICATIONS
Underwriters Laboratories
UL 60950-1/A2:2007, 2nd Edition
File E137708/E140259

IEC 60601-1/A2:2013, 2nd Edition
File E137708/E140259

TUV
Mark for Canada

Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

MODEL OUTPUT 1 (19) OUTPUT 2 (19) OUTPUT 3 (19) OUTPUT 4 (19)
REL-150-4001 +3.3V/15A (20) +5V/8A +12V/2A -12V/2A
REL-150-4002 +5V/15A (20) +3.3V/8A +12V/2A -12V/2A
REL-150-4003 +5V/15A (20) +3.3V/8A +15V/2A -15V/2A
REL-150-4004 +5V/15A (20) +5V/8A +12V/2A -12V/2A
REL-150-4005 +5V/15A (20) +5V/8A +15V/2A -15V/2A
REL-150-4006 +5V/15A (20) +24V/3A +12V/2A -12V/2A
REL-150-4007 +5V/15A (20) +24V/3A +15V/2A -15V/2A
REL-150-4009 +24V/2.3A +10V/1A +6V/1.6A -6V/3.1A
REL-150-4010 5V/15A (20) 12V/5A 24V/1A 24V/1A
REL-150-3001 +5V/15A (20) +12V/4A +15V/2A -15V/2A
REL-150-3002 +5V/15A (20) +15V/3A +12V/2A -12V/2A
REL-150-3003 +5V/15A (20) -22V/3.5A +22V/3.5A +24V/1A
REL-150-3004 +5V/6A +12V/7A -12V/3A
REL-150-3005 +5.5V/15A (20) +15.5V/3A -15.5V/2A
REL-150-2001 +3.3V/15A (20) +5V/8A +12V/2A -12V/2A
REL-150-2002 +5V/15A (20) +12V/5A +15V/2A -15V/2A
REL-150-2003 +5V/15A (20) +24V/3A +15V/2A -15V/2A
REL-150-2004 +12V/7.5A -12V/5A
REL-150-2005 +15V/5A -15V/5A
REL-150-1001 2.5V/30A (21) 5V/30A (21)
REL-150-1002 3.3V/30A (21)
REL-150-1003 5V/30A (21)
REL-150-1004 12V/12.5A
REL-150-1005 15V/10.0A
REL-150-1006 24V/6.3A
REL-150-1007 28V/5.4A
REL-150-1008 48V/3.1A
REL-150-1009 20/31V/5.4A
REL-150-1010 36V/4.16A

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
REL-150-4010: TUV only.

All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.

ORDERING INFORMATION
Please specify the following optional features when ordering:
CH - Chassis
CO - Cover
TS - Terminal Strip
RE - Remote Inhibit
I/O - Isolated Outputs

INTEGRATED POWER DESIGNS
300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com
1. Each output can deliver its rated current but total Output Power must not exceed 150W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 80°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power-Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure, 5V/10mA.
15. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
16. Total power must not exceed 100W with convection cooling or 150W with forced-air cooling on open frame models except where noted.
17. Total power must not exceed 85W with convection cooling or 150W with forced-air cooling and Chassis/Cover option.
18. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
19. Total current from Outputs 1 & 2 must not exceed 15A with convection cooling.
20. Rated 12A maximum with convection cooling.
21. Rated 20A maximum with convection cooling.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

CONNECTION SPECIFICATIONS

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>AC Input 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Single) 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Multiple) 0.156 friction lock header mates with Molex 09-50-3141 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>G</td>
<td>Ground 0.187 quick disconnect terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>Remote/P.F./Sense (Single) 0.100 friction lock header mates with Molex 50-57-9008 or equivalent crimp terminal housing with Molex type 7185 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>Remote/P.F./Sense (Multiple) 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 7005 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P4</td>
<td>Remote (Multiple) 0.100 breakaway header mates with Molex 50-57-5002 or equivalent crimp terminal housing with Molex type 7155 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>
FEATURES:
- Compact 4.2" x 7.0" x 1.5" Size
- 2 Year Warranty
- Universal 85-264V Input
- One to Four Outputs
- RoHS Compliant
- High Efficiency
- 0-70°C Operating Temperature
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- Output Overvoltage Protection  Output 1:               110% to 150%
- Secondary to Ground Operational  Insulation(Consult factory for 1MOOP or 1MOPP)
- Dielectric Strength(8, 9)
- Power Fail Signal(14)
- Remote Sense(10) 250mV compensation of output cable losses
- Earth Leakage <300µ
- Leakage Current
- Operational Insulation   707 VDC, Secondary to Ground
- Basic Insulation 2121 VDC, Primary to Ground
- Reinforced Insulation 5656 VDC, Primary to Secondary
- Means of Protection
- Primary to Secondary 2MOPP (Means of Patient Protection) (1MOOP- Singles)
- Primary to Ground 1MOPP (Means of Patient Protection) (1MOOP- Singles)
- Secondary to Ground Operational Insulation(Consult factory for 1MOOP or 1MOPP)
- Dielectric Strength(8, 9)
- Reinforced Insulation 5656 VDC, Primary to Secondary
- Basic Insulation 2121 VDC, Primary to Ground
- Operational Insulation 707 VDC, Secondary to Ground
- Leakage Current
- Earth Leakage <300µA NC, <1000µA SFC
- Touch Current <100µA NC, <500µA SFC
- Power Fail Signal(14) Logic low with input power failure 10 ms minimum prior to Output 1 dropping 1%
- Remote Sens(11) 250mV compensation of output cable losses
- Mean-Time Between Failures 100,000 Hours min., MIL-HDBK-217F, 25° C, GB
- Weight 1.70 Lbs. Open Frame/ 2.70 Lbs. Chassis and Cover
- Radiated Magnetic Field EN 61000-4-3 80MHz-2.7GHz, 10V/m, 60% AM
- Electrical Fast Transients/Bursts EN 61000-4-4 ±2 KV, 50Hz/100kHz
- Surge Immunity EN 61000-4-5 ±2 KV line to earth ± 1 KV line to line
- Conducted Immunity EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM
- Magnetic Field Immunity EN 61000-4-8 300µT, 60 Hz.
- Voltage Dips EN 61000-4-11 0% Ur, 0.5 cycles, 0-315° 100/240 V A/A
- Radiated Emissions EN 55011/32 Class B
- Conducted Emissions EN 55011/32 Class B
- Harmonic Current Emissions EN 61000-3-2 Class A
- Voltage Fluctuations/Flicker EN 61000-3-3 Compliant

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>REL-185-4001</td>
<td>+3.3V/20(22)</td>
<td>+5V/10A</td>
<td>+12V/2A</td>
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ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:
CH – Chassis  RE – Remote Inhibit
CO – Cover  I/O – Isolated Outputs
TS – Terminal Strip

All specifications are maximum at 25°C/185W unless otherwise stated, may vary by model and are subject to change without notice.
1. Each output can deliver its rated current but total Output Power must not exceed 180W, as determined by the cooling method.

2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 80°C rise at any specified ambient temperature.

3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.

4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.

5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.

6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.

7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retraction tip (tip-and-barrel method), 20 MHz bandwidth.

8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.

9. This power supply has been type-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.

10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.

11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.

12. To comply with emissions specifications, all four mounting hole ground pads must be electrically connected to a common metal chassis. Chassis/Cover option recommended. Refer to Operating Instructions for additional information.

13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.

14. Power-Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure, 5V/10mA.

15. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.

16. Total power must not exceed 150W with convection cooling on open-frame models except where noted.

17. Total power must not exceed 185W with 300LFM forced-air cooling on open-frame models.

18. Total power must not exceed 110W with convection cooling and Chassis/Cover option.

19. Total power must not exceed 185W with 300LFM forced-air cooling and Chassis/Cover option.

20. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.

21. Total current from Outputs 1 & 2 must not exceed 20A with convection cooling.

22. Rated 15A maximum with convection cooling.

23. Rated 27A maximum with convection cooling.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

CONNECTOR SPECIFICATIONS

- P1 AC Input: 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
- P2 DC Output: 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)
- P2 DC Output: 0.156 friction lock header mates with Molex 09-50-3161 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
- G Ground: 0.187 quick disconnect terminal.
- P3 Option/Sense: 0.100 friction lock header mates with Molex 50-57-9008 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
- P3 Option/Sense: 0.100 breakaway header mates with Molex 22-55-2031 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
FEATURES:
- Compact 4.0" x 7.0" x 1.75" Size
- 2 Year Warranty
- Universal 85-264V Input
- 1-4 Tightly-Regulated Outputs
- High Efficiency
- 0-70°C Operating Temperature
- RoHS Compliant

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1-2007, 2nd Edition
AAMI/ANSI ES60601-1-2005(R) (R) 2012

CB Reports/Certificates (including all National and Group Deviations)
IEC 60950-1/A2:2013, 2nd Edition

UL Recognition
Mark for Canada
File E137708/E140259
CAN/CSA-C22.2 No. 60950-1-07. 2nd Edition
CAN/CSA-C22.2 No. 60601-1-2014

TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1:2006/A1:2013

Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

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<tr>
<th>MODEL NO.</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
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ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CO – Cover
OVP – Overvoltage Protection
PF – Power Fail
I/O – Isolated Outputs
TS – Terminal Strip
RE – Remote Inhibit

150 WATTS
SINGLE/MULTI OUTPUT AC-DC

CHASSIS/COVER
OPEN CHASSIS

INPUT SPECIFICATIONS

Protection Class
I
Source Voltage
85 – 264 Volts AC
Frequency Range
47 – 63 Hz
Source Current
True RMS
3A at 85V Input
Peak Inrush
30A
Peak Repetitive
4.25A at 85V Input
Harmonic Distortion
0.05
Efficiency
0.68-0.90 (varies by model)
Power Factor
0.90 (150 W, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temp. Range
0°C to + 70°C
Temperature Range
Derating: See Power Rating Chart
Ambient Storage Temp. Range
-40°C to + 85°C
Temperature Coefficient
Outputs 1 - 4: 0.02%/°C

GENERAL SPECIFICATIONS

Means of Protection
Primary to Secondary
2MOPP (Means of Patient Protection)
Secondary to Ground
1MOPP (Means of Patient Protection)

Means of Insulation
Primary to Ground
200VAC
Secondary to Ground
150VAC

Dielectric Strength
Reinforced Insulation
5665 VDC, Primary to Secondary
Basic Insulation
2121 VDC, Primary to Ground
Operational Insulation
707 VDC, Secondary to Ground

Leakage Current
Earth Leakage
<300uA NC, <1000uA SFC
Touch Current
<1000uA NC, <500uA SFC

Power Fail Signal
Logic low with input power failure 10 ms

Remote Inhibit (optional)
Contact closure inhibits all outputs

Remote Sense (optional)
250mV compensation of output cable losses

Mean-Time Between Failures
150,000 Hours min., MIL-HDBK-217F, 25°C, GB

Weight
2.0 Lbs.

All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.
Voltage Fluctuations/Flicker: EN 61000-3-3 Compliant
Harmonic Current Emissions: EN 61000-3-2 Class
Conducted Emissions: EN 55011/32 Class B
Voltage Interruptions: EN 61000-4-11 0% U
Voltage Dips: EN 61000-4-11 0% U
Conducted Immunity
Surge Immunity
Electrical Fast Transient:
Electrostatic Discharge: EN 61000-4-2


Voltage Dips
- EN 61000-4-14: ±8kV contact / ±15kV air discharge
- EN 61000-4-12: 80 Hz - 2 MHz, 10 V, 60% AM
- EN 61000-4-15: ±2 kV, 5 kHz - 100 kHz
- EN 61000-4-16: ±1.5 kV line to earth / ±1 kV line to line
- EN 61000-4-17: 0.15 to 80 MHz, 10V, 80% AM
- EN 61000-4-18: ±10% U
- EN 61000-4-19: ±40% U
- EN 61000-4-20: ±70% U

Electrical Fast Transients/Bursts
- EN 61000-4-5: ±1 kV line to line
- EN 61000-4-6: 0.15 to 80 MHz, 10V, 80% AM
- EN 61000-4-7: ±10V/m, ±15kV air discharge
- EN 61000-4-8: ±1 KV line to earth / ±1 kV line to line
- EN 61000-4-9: ±10V/m, ±15kV air discharge
- EN 61000-4-10: ±1.5 kV line to earth / ±1 kV line to line

Surge Immunity
- EN 61000-4-11: 0% U
- EN 61000-4-12: 0% U
- EN 61000-4-13: 0% U
- EN 61000-4-14: ±8kV contact / ±15kV air discharge
- EN 61000-4-15: ±2 kV, 5 kHz - 100 kHz
- EN 61000-4-16: ±1.5 kV line to earth / ±1 kV line to line
- EN 61000-4-17: 0.15 to 80 MHz, 10V, 80% AM
- EN 61000-4-18: ±10% U
- EN 61000-4-19: ±40% U
- EN 61000-4-20: ±70% U

Steady-State Voltage
- EN 61000-4-21: ±8kV contact / ±15kV air discharge
- EN 61000-4-22: 80 Hz - 2 MHz, 10 V, 60% AM
- EN 61000-4-23: ±2 kV, 5 kHz - 100 kHz
- EN 61000-4-24: ±1.5 kV line to earth / ±1 kV line to line
- EN 61000-4-25: 0.15 to 80 MHz, 10V, 80% AM
- EN 61000-4-26: ±10% U
- EN 61000-4-27: ±40% U
- EN 61000-4-28: ±70% U

EMC COMPLIANCE
- EN 61000-6-2:2005
- EN 61000-6-3:2005
- EN 61000-6-3:2007
- EN 61000-6-4:2000
- EN 61000-6-5:2003
- EN 61000-6-6:2003
- EN 61000-6-7:2005

APPLICATIONS INFORMATION
1. Each output can deliver its rated current but total Output Power must not exceed 100, 125 or 150W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 80°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL60601-1-1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure, 5V/10mA.
15. Forced-Air cooling rating of 150W requires an air speed of 300LFM flowing past a point one inch above the main isolation transformer.
16. Free-Air convection cooling, 100W maximum output power.
17. Baseplate-cooled rating of 150W requires a one-square-foot 0.09"-thick aluminum area attached to bottom four mounting holes.
18. Rated 20A maximum when convection cooled only.

Maximum Output Power vs. Ambient Temperature

Connector Specifications
- P1: AC Input 0.150 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.
- P2: DC Output (Single) 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)
- P2: DC Output (Multiple) 0.156 friction lock header mates with Molex 09-50-3121 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.
- G: Ground 0.187 quick disconnect terminal.
- P3: Option/Sense (Single) 0.100 friction lock header mates with Molex 02-01-2067 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
- P3: Option/Sense (Multiple) 0.100 friction lock header mates with Molex 02-01-2047 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
FEATURES:
- Compact 4.75 x 8.0” x 2.0” Size
- 2 Year Warranty
- Universal 85-264V Input
- 1-4 Tightly-Regulated Outputs
- High Efficiency
- 0-70°C Operating Temperature
- RoHS Compliant

Please specify the following optional features when ordering:
- Consult factory for positive, negative or floating outputs.
- Consult factory for alternate output configurations.

CE-225-1007  48V/4.7A
CE-225-1006  28V/8A
CE-225-1005  24V/9.4A
CE-225-1004  15V/15A
CE-225-1003  12V/18.8A
CE-225-1002  3.3V/45A (17)

CE-225-2004  +5.2V/30A (16)  -9V/6A

CE-225-3002  +5V/25A
CE-225-4002  +5V/25A

EN 60950-1/A2:2013, 2nd Edition
File E137708/E140259
Mark for Canada
CB Reports/Certificates (including all Low Voltage Directive
Primary to Secondary 2MOPP (Means of Patient Protection)
Secondary to Ground  Operational Insulation (Consult factory for 1MOOP or 1MOPP))

Dielectric Strength, l
Reinforced Insulation 565 VDC, Primary to Secondary
Dielectric Strength, 9
Reinforced Insulation 565 VDC, Primary to Secondary

Power Factor 0.92 (225 Watts, 230V)

Environmental Specifications
Ambient Operating 0°C to +70°C
Temperature Range Derating See Power Rating Chart
Ambient Storage Temp. Range -40°C to +65°C
Temperature Coefficient Outputs 1 – 4:  0.02%/°C

General Specifications
Means of Protection
Primary to Secondary 2MOPP (Means of Patient Protection)
Primary to Ground 1MOPP (Means of Patient Protection)
Secondary to Ground Operational Insulation (Consult factory for 1MOOP or 1MOPP)

Dissipative Surge
Reinforced Insulation 5656 VDC, Primary to Secondary
Basic Insulation 2121 VDC, Primary to Ground
Operational Insulation 707 VDC, Secondary to Ground

Leakage Current
Earth Leakage <300µA NC, <300µA A SF
Touch Current <100µA NC, <500µA A SF

Power Fail Signal (optional)(14) Logic low with input power failure 10ms
minimum prior to Output 1 dropping 1%

Remote Inhibit (optional) Contact closure inhibits all outputs
Remote Sense(8, 9) 250µm compensation of output cable losses

Mean-Time Between Failures 100,000 Hours min., MIL-HDBK-217F, 25°C, GB
Weight 3.0 Lbs.

All specifications are maximum at 25°C/225W unless otherwise stated, may vary by model and
are subject to change without notice.

- **Voltage Fluctuations/Flicker**: EN 61000-3-3 Compliant
- **Harmonic Current Emissions**: EN 61000-3-2 Class A
- **Conducted Emissions**: EN 55011/32 Class B
- **Radiated Emissions**: EN 55011/32 Class B
- **Voltage Interruptions**: EN 61000-4-11 0% U
- **Voltage Dips**: EN 61000-4-11 0% U
- **Magnetic Field Immunity**: EN 61000-4-8 30A/m, 60 Hz.
- **Surge Immunity**: EN 61000-4-5
- **Radiated Emissions**: EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM
- **Voltage Failures/Bursts**: EN 61000-4-4

GE-225 SERIES MECHANICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>CONNECTOR SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P2</strong> DC Output (Single)**</td>
</tr>
<tr>
<td>6-32 screw down terminal mates with #6 ring tongue terminal.</td>
</tr>
<tr>
<td><strong>P2</strong> DC Output (Multiple)**</td>
</tr>
<tr>
<td>0.156 friction lock header mates with Molex 09-50-3181 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.</td>
</tr>
<tr>
<td><strong>P3</strong> Option/Sense (Single)**</td>
</tr>
<tr>
<td>0.100 friction lock header mates with Molex 22-01-2067 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.</td>
</tr>
<tr>
<td><strong>P3/F4</strong> Option/Sense (Multiple)**</td>
</tr>
<tr>
<td>0.100 friction lock header mates with Molex 22-01-2041 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but total Output Power must not exceed 150 or 225W, as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of Clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during the production/dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector output from AC failure, 5V/10mA.
15. Forced-Air cooling rating of 225W requires an air speed of 300LFM flowing past a point one inch above the main isolation transformer.
16. Derated 20% when convection cooled.
17. Rated 35A maximum when convection cooled only.
18. Free-Air convection cooling, 150W maximum output power.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

CONNECTOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>CONNECTOR SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AC Input</strong> 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONNECTOR SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P2</strong> DC Output (Single)**</td>
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<tr>
<td>6-32 screw down terminal mates with #6 ring tongue terminal.</td>
</tr>
<tr>
<td><strong>P2</strong> DC Output (Multiple)**</td>
</tr>
<tr>
<td>0.156 friction lock header mates with Molex 09-50-3181 or equivalent crimp terminal housing with Molex 08-50-0189 or equivalent crimp terminal.</td>
</tr>
<tr>
<td><strong>G</strong> Ground 0.187 quick disconnect terminal.</td>
</tr>
<tr>
<td><strong>P3</strong> Option/Sense (Single)**</td>
</tr>
<tr>
<td>0.100 friction lock header mates with Molex 22-01-2067 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.</td>
</tr>
<tr>
<td><strong>P3/F4</strong> Option/Sense (Multiple)**</td>
</tr>
<tr>
<td>0.100 friction lock header mates with Molex 22-01-2041 or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>
FEATURES:
- Compact 4.0” x 7.0” x 1.5” Size
- 3 Year Warranty
- Universal 85-264V Input
- 2-4 Regulated & Adjustable Outputs
- 90% Peak/87% Average Efficiency
- <300mW No Load Input Power
- -20 to +70°C Operating Temperature
- RoHS Compliant

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1:2007, 2nd Edition
CB Reports/Certificates (including all
National and Group Deviations)
IEC 60950-1:2007, 2nd Edition
EMC
IEC 62368-1:2014, 2nd Edition
IEC 60601-1-2 4th ed. EMC
IEC 60601-1:2-4th ed. EMC

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTPUT 1</th>
<th>OUTPUT 2</th>
<th>OUTPUT 3</th>
<th>OUTPUT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>NXT-400M-4001</td>
<td>+3.3V/50A</td>
<td>+3.3V/15A</td>
<td>+12-15V/5A</td>
<td>-12-15V/5A</td>
</tr>
<tr>
<td>NXT-400M-4002</td>
<td>+5V/50A</td>
<td>+3.3V/15A</td>
<td>+12-15V/5A</td>
<td>-12-15V/5A</td>
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<tr>
<td>NXT-400M-4003</td>
<td>+5V/50A</td>
<td>+12-15V/5A</td>
<td>+12-15V/5A</td>
<td>-12-15V/5A</td>
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<tr>
<td>NXT-400M-4004</td>
<td>+5V/50A</td>
<td>+24-28V/5A</td>
<td>+24-28V/5A</td>
<td>-12-15V/5A</td>
</tr>
<tr>
<td>NXT-400M-4005</td>
<td>+24V/12.5A</td>
<td>+24-28V/5A</td>
<td>+24-28V/5A</td>
<td>-12-15V/5A</td>
</tr>
<tr>
<td>NXT-400M-3001</td>
<td>+5V/50A</td>
<td>+12-15V/10A</td>
<td>+12-15V/10A</td>
<td>-12-15V/5A</td>
</tr>
<tr>
<td>NXT-400M-2001</td>
<td>+5V/50A</td>
<td>+24-28V/5A</td>
<td>+24-28V/5A</td>
<td>-12-15V/5A</td>
</tr>
<tr>
<td>NXT-400M-2002</td>
<td>+12-15V/10A</td>
<td>+12-15V/10A</td>
<td>+12-15V/10A</td>
<td>-12-15V/10A</td>
</tr>
<tr>
<td>NXT-400M-2003</td>
<td>+12V/25A</td>
<td>+12-15V/10A</td>
<td>+12-15V/10A</td>
<td>-12-15V/10A</td>
</tr>
<tr>
<td>NXT-400M-2004</td>
<td>+15V/20A</td>
<td>+12-15V/10A</td>
<td>+12-15V/10A</td>
<td>-12-15V/10A</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify output voltage set points when ordering.
Please specify the following optional features when ordering:

CH-Chassis I/O-Isoalted Outputs
Co-Cover PF-Power Fail Warning
RE/SE- Remote Inhibit/Standby Output BF-Type BF

All specifications are maximum at 25°C, 400W unless otherwise stated, may vary by model and
are subject to change without notice.
- Derate Total Output Power 10% when forced-air cooled using Chassis/Cover.
- Derate Total Output Power 10% when convection cooled using Chassis or Chassis/Cover.
- Derate Outputs 1 (12-15V) current rating 25% when convection cooled.
- Derate Outputs 2 (3.3-15V) current rating 25% when convection cooled.

MAX P<sub>OUT</sub> vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

- Derate 1 (3.3-5V) current rating 40% when convection cooled.
- Derate Outputs 1 (12-15V) current rating 25% when convection cooled.
- Derate Total Output Power linearly from 100% at 50°C to 50% at 70°C.
- Derate Total Output Power linearly from 100% at 90V<sub>0</sub> to 90% at 85V<sub>0</sub> when forced-air cooled.
- Derate Total Output Power 10% when convection cooled using Chassis or Chassis/Cover.
- Derate Total Output Power 25% when convection cooled using Chassis/Cover (4001, 4002 only).
- Derate Total Output Power 10% when forced-air cooled using Chassis/Cover.

APPLICATIONS INFORMATION
1. Each output can deliver its rated current but Total Output Power must not exceed 400W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. Minimum load is not required for reliable operation; however, a 5% load may be required on Output 1 when loading Outputs 2, 3 or 4 to full rated current.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC60601-1:2005. In consideration of clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength type test on the power supply or the end product. It is highly recommended that the DC test voltage listed in DVB.1, annex DVB of UL60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV, depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.188 inches. Maximum screw penetration into side chassis mounting holes is 0.198 inches.
11. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/cover option is recommended. Refer to Operating Instructions for additional information.
12. Common RF shielding precautions must be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
13. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10-15ms prior to loss of output from AC failure, 5V/10mA (4001:3.3V/10mA).
14. 300LM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
15. Outputs 2, 3 and 4 are adjustable from -10% of lowest voltage rating to +10% of highest voltage rating.
16. RE/SB Option enables all outputs with a P5-4 to P5-2 switch closure, 6V Max./50mA.
17. Output 2, 3 and 4 Inhibit feature shuts down only the output inhibit with a P6-1 to P6-2 switch closure, 45V Max.
100 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
- Compact 2.5” x 4.5” x 1.0” Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- IEC 60950-1 2nd ed., ITE Certification
- IEC 60610-1-2 4th ed. EMC
- Class B Emissions per EN50511/32
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover

SAFETY SPECIFICATIONS
- Underwriters Laboratories
  File E137708/E140259
  UL 60950-1, 2nd Edition
- CE Mark for Canada
- UL Recognition
  CAN/CSA-C22.2 No. 60905-1-07, 2nd Edition
- TUV
  UL 50950-1/A2:2013, 2nd Edition

MARK FOR CANADA
- CAN/CSA-C22.2 No. 60601-1:2014
- IEC 60601-1-2 4th ed. EMC
- EN 61000-6-2:2005

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>300 LFM</th>
<th>CONVECTION COOLED</th>
<th>300 LFM</th>
<th>CONVECTION COOLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>NXT-100-1001</td>
<td>2.5V/20.0A</td>
<td>2.5V/14.0A</td>
<td>2.5V/18.0A</td>
<td>2.5V/12.8A</td>
</tr>
<tr>
<td>NXT-100-1002</td>
<td>3.3V/20.0A</td>
<td>3.3V/14.0A</td>
<td>3.3V/18.0A</td>
<td>3.3V/12.6A</td>
</tr>
<tr>
<td>NXT-100-1003</td>
<td>5V/20.0A</td>
<td>5V/14.0A</td>
<td>5V/18.0A</td>
<td>5V/12.6A</td>
</tr>
<tr>
<td>NXT-100-1004</td>
<td>12V/8.3A</td>
<td>12V/5.8A</td>
<td>12V/7.5A</td>
<td>12V/5.2A</td>
</tr>
<tr>
<td>NXT-100-1005</td>
<td>15V/8.7A</td>
<td>15V/4.7A</td>
<td>15V/6.0A</td>
<td>15V/4.2A</td>
</tr>
<tr>
<td>NXT-100-1006</td>
<td>24V/2.4A</td>
<td>24V/2.9A</td>
<td>24V/3.8A</td>
<td>24V/2.6A</td>
</tr>
<tr>
<td>NXT-100-1007</td>
<td>28V/3.6A</td>
<td>28V/2.5A</td>
<td>28V/3.2A</td>
<td>28V/2.3A</td>
</tr>
<tr>
<td>NXT-100-1008</td>
<td>48V/2.1A</td>
<td>48V/1.5A</td>
<td>48V/1.9A</td>
<td>48V/1.4A</td>
</tr>
</tbody>
</table>

Please refer to Output Power Derating chart.

ORDERING INFORMATION
- Consult factory for alternate output configurations.
- Please specify the following optional features when ordering:
  - CH - Chassis
  - CO - Cover
  - LS - Single Wire Load Sharing
  - LENVB - Load Share Evaluation Board
  - RE - Remote Inhibit

- Electromagnetic Discharge
  - EN 61000-4-2: +8kV contact / +15kV air discharge
  - EN 61000-4-3: 80MHz-2.7GHz, 10V/m, 80% A
  - EN 61000-4-4: ±2 kV, 50Hz/100kHz
  - EN 61000-4-5: ±2 kV line to line / ±1 kV line to earth
  - EN 61000-4-6: 0.15 to 80MHz, 10V, 80% A
  - EN 61000-4-8: 30μA, 60 Hz, A

- Voltage Dips
  - EN 61000-4-11: 0% Un, 0.5 cycles, 0.315
  - EN 61000-4-12: 40% Un, 10 cycles, 0°
  - EN 61000-4-13: 70% Un, 25 cycles, 0°

- Voltage Interruptions
  - EN 61000-4-11: 0% Un, 300 cycles, 0°
  - EN 61000-4-12: 40% Un, 10 cycles, 0°
  - EN 61000-4-13: 70% Un, 25 cycles, 0°

- Radiated Emissions
  - EN 55011/32
  - EN 55011/33

- Conducted Emissions
  - EN 61000-3-2

- Voltage Fluctuations/Flicker
  - EN 61000-3-3

All specifications are maximum at 25°C/100W unless otherwise stated, may vary by model and are subject to change without notice.
### Applications Information

1. Continuous Output Power must not exceed 100W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth.
8. This product is type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1** Edition are not exceeded during a production-line dielectric strength test of the assembled end product.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 400mV depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 15ms prior to loss of output from AC failure.  
15. 300LFM of airflow must be maintained one inch above the top of the heat sinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
16. Low forward-voltage-drop zener diodes must be used in all load-sharing applications in 2.5 through 15V models. Zener diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Zener diode power dissipation must be subtracted from the maximum output-power rating of each model.
17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
18. Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
19. P4-2 Load Share Enable and P4-2 Remote Inhibit will share a common negative return pin P3-1. 
20. Remote Inhibit option will require an outside TTL compatible source.

### Connector Specifications

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>AC Input</td>
<td>0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output</td>
<td>6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)</td>
</tr>
<tr>
<td>P3</td>
<td>Power Fail, Sense</td>
<td>0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or crimp equivalent terminal.</td>
</tr>
<tr>
<td>P4</td>
<td>Inhibit, Load Share</td>
<td>0.100 friction lock header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.</td>
</tr>
<tr>
<td></td>
<td>Ground</td>
<td>0.187 quick disconnect terminal.</td>
</tr>
</tbody>
</table>

### Max P_out vs. Ambient Temperature/Input Voltage

![Graph showing Max P_out vs. Ambient Temperature/Input Voltage](image)

**Derating requirements** – Chart above applies to models 1003 thru 1008 only. 100W 300 LFM forced air, open frame. 70WV convection-cooled open frame. Derate 10% with Chassis and Cover. Derate 1.0W/OUT / VTN below 100Vn and between 100Vn and 85Vn. Use larger of the two deratings when using chassis/cover below 100Vn. Derate output power linearly to 50% between 50°C and 70°C.

### Typical Load Share/Remote Sense Application

![Diagram showing typical load share/remote sense application](image)
175 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
- Compact 3.0“ x 5.0“ x 1.25“ Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- IEC 60601-1-3rd ed. Medical Cert.
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover

SAFETY SPECIFICATIONS

- Underwriters Laboratories File E137708/E140259
- UL 60950-1:2007, 2nd Edition
- AMM/ANSI ES60601-1-2005(R) 2012
- CB Reports/Certificates (including all National and Group Deviations)
- IEC 60950-1/2:2013, 2nd Edition
- IEC 60601-1-2016/01:2012

MODEL LISTING

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OPEN FRAME</th>
<th>CHASSIS/COVER</th>
</tr>
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<td>NX-175-1008</td>
<td>48V/3.6A</td>
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</tr>
</tbody>
</table>

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:
- CH - Chassis
- CO - Cover
- LS - Single Wire Load Sharing
- LSEVB - Load Share Evaluation Board
- RE - Remote Inhibit


Electronic Discharge EN 61000-4-2 +90V contact / ±150V air discharge A
Radiated Electromagnetic Field EN 61000-4-3 80MHz-2GHz, 10mV/m, 80% AM A
Electrical Fast Transients/Bursts EN 61000-4-4 ±2kV, 50kHz/100kHz A
Surge Immunity EN 61000-4-5 ±2kV line to earth / ±1kV line to line A
Conducted Immunity EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM A
Magnetic Field Immunity EN 61000-4-8 30A/m, 80 Hz A
Voltage Dips EN 61000-4-11 0% Ur, 0.5 cycles, 0-315° 100/240V A/A
0% Ur, 1 cycles, 0° 100/240V A/A
Remote SENSE(10) 400mV compensation of output cable losses
Mean-Time Between Failures 100,000 Hours min., MIL-HDBK-217F, 25°C, GB
Weight 0.85 lbs. Open Frame 1.33 lbs. Chassis and Cover

Underwriters Laboratories File E137708/E140259
UL 60950-1:2007, 2nd Edition
AMM/ANSI ES60601-1-2005(R) 2012
CB Reports/Certificates (including all National and Group Deviations)
IEC 60950-1/2:2013, 2nd Edition
IEC 60601-1-2016/01:2012

Low Voltage Directive

MODEL 300 LFM CONVECTION COOLED
CHASSIS/COVER
OPEN FRAME
1. Continuous Output Power must not exceed 175W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltage listed in Table 6 of IEC 60601-1-2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not over-stress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB 1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product.
9. Please consult factory for further information.
10. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
11. Remote-Sense terminals may be used to compensate for cable losses up to 400mV depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
12. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
13. To comply with emissions specifications, all mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
14. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
15. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure.
16. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
17. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
18. Current-carrying conductors in load-sharing applications must be short and symmetrical.
19. A load equal to 5% rated Output Power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

MAX P<sub>OUT</sub> VS. AMBIENT TEMPERATURE/INPUT VOLTAGE

Derating requirements – Chart above applies to models 1003 thru 1008 only. 175W 300LFM forced air; 115W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.0<sub>OUT</sub>/11V<sub>IN</sub> below 100V<sub>N</sub> and between 100V<sub>N</sub> and 85V<sub>N</sub>. Use larger of the two derations when using chassis/cover below 100V<sub>N</sub>. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE APPLICATION

CONNECTOR SPECIFICATIONS

- **P1**: NEUTRAL LINE
- **P2**: OUTPUT 1 (+)
- **P3**: Power Fail, Load Share, Sense
- **P4**: Inhibit, Standby Power
- **Ground**: 0.187 quick disconnect terminal.
**225 WATTS**

**SINGLE OUTPUT AC-DC**

**FEATURES:**
- Compact 3.0” x 5.0” x 1.5” Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN50113/32
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover

### SAFETY SPECIFICATIONS

- **UL** Underwriters Laboratories File E137708/E140259
  UL 60950-1/2007, 2nd Edition
  AAMI/ANSI ES60601-1-2005(R) 2012
- **TUV** EU Recognized Mark for Canada
  CAN/CSA-C22.2 No. 60050-1-07, 2nd Edition
  CAN/CSA-C22.2 No. 60601-1:2014
- **UL** Underwriters Laboratories
  File E137708/E140259
- **EN** 60601-1:2006/A1:2013

**SAFETY SPECIFICATIONS**

- **Mark for Canada**
- **UL** Recognition CAN/CSA-C22.2 No. 60601-1:2014
- **UL** Recognition Mark for Canada
  CAN/CSA-C22.2 No. 60050-1-07, 2nd Edition
- **UL** Recognition Mark for Canada
  CAN/CSA-C22.2 No. 60601-1:2014
- **TUV** EN 60950-1/2013, 2nd Edition
- **TUV** EN 60601-1-2006/A1:2013


**MODEL LISTING**

**MODEL**

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<th>MODEL</th>
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<td>NXT-225-1002</td>
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<td>28V/5.4A</td>
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<td>NXT-225-1008</td>
<td>48V/4.7A</td>
<td>48V/3.1A</td>
<td>48V/4.2A</td>
<td>48V/2.8A</td>
</tr>
</tbody>
</table>

**OUTPUT SPECIFICATIONS**

- **Output Power at 50°C**
  - 150W Convection Cooled, Open Frame
  - 225W 300/600-Volt-Air Cooled
  - 300/600-Volt-Air Cooled
- **Power Derating**
  - 1.5 W/°C (2-10°C)
- **Voltage Centering**
  - ±0.5% (50% load)
- **Voltage Regulator**
  - 90-105%
  - 0.5% (100% load change)
- **Source Regulation**
  - 0.5%
  - 0.5% (100% load change)
- **Noise**
  - 1.0% or 100mV
- **Turn on Overshoot**
  - None
- **Overload Protection**
  - Latching, between 110% and 150% of rated output voltage.
- **Operational Insulation**
  - 707 VDC, Secondary to Ground
- **Basic Insulation**
  - 2121 VDC, Primary to Ground
- **Reinforced Insulation**
  - 5656 VDC, Primary to Secondary
- **Secondary to Ground**
  - 2MOPP (Means of Patient Protection)
- **Means of Protection**
  - 2MOPP (Means of Patient Protection)
  - 1MOPP (Means of Operator Protection)
- **Dielectric Strength**
  - 5666 VDC, Primary to Secondary
  - 2121 VDC, Primary to Ground
  - 707 VDC, Secondary to Ground
- **Leakage Current**
  - <300µA NC, <500µA SFC
- **Leakage Current**
  - <50µA NC, <50µA SFC
- **Power Fail Signal**
  - Logic low with input power failure 10 ms minimum
- **Remote Inhibit (Optional)**
  - Isolated, Contact closure inhibits output.
- **Load Share (Optional)**
  - Single wire current sharing with return via negative sense return. Minimum current share load is 10% of each module’s output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 400 mV for remaining models.
- **Standby Power (Optional)**
  - Isolated 5 Vdc ±10%, 10 mA available only with Remote Inhibit option.
- **Remote Sense (Optional)**
  - 400mV compensation of output cable losses
- **Mean-Time Between Failures**
  - 100,000 Hours min., MIL-HDBK-217F, 25°C, GB
- **Weight**
  - 36 oz, Open Frame 1.50 Lbs, Chassis and Cover

**INPUT SPECIFICATIONS**

- **Protection Class**
  - I
- **Source Voltage**
  - 85 – 264 Volts AC
- **Frequency Range**
  - 47 – 63 Hz
- **Input Protection**
  - Internal 5A Time Delay fuse
- **Peak Intrush Current**
  - 50A (cold)
- **Efficiency**
  - 85% Typical, Full Power varies by model
- **Power Factor**
  - 0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

**GENERAL SPECIFICATIONS**

- **Ambient Operating Temperature**
  - 0°C to + 70°C
- **Temperature Range**
  - Derating: See Power Rating Chart
- **Ambient Storage Temp Range**
  - -40°C to + 85°C
- **Operating Relative Humidity Range**
  - 20-90% non-condensing
- **Altitude**
  - 10,000 ft. ASL Operating, 40,000 ft. ALS Non-Operating
- **Temperature Coefficient**
  - 0.02%/°C
- **Vibration**
  - 2.5g, 10Hz - 2KHz per MIL-STD-810F Method 508.5
- **Shock**
  - 20g per MIL-STD-810F Method 5.6.5

**EMC SPECIFICATIONS**

- **Electrostatic Discharge**
  - EN 61000-4-2
  - ±8KV contact / ±15KV air discharge
- **Radiated Electromagnetic Field**
  - EN 61000-4-3
  - 80MHz-2.7GHz, 10V/m, 80% AM
- **Electrical Fast Transients/Bursts**
  - EN 61000-4-4
  - ±2 KV line to line, ±1 KV line to line
- **Surge Impunity**
  - EN 61000-4-5
  - ±2 KV line to earth / ±1 KV line to line
- **Conducted Immunity**
  - EN 61000-4-6
  - ±2 KV line to earth / ±1 KV line to line
- **Magnetic Field Impunity**
  - EN 61000-4-8
  - 30A/m, 60 Hz
- **Voltage Dips**
  - EN 61000-4-11
  - 0% Ur, 0.5 cycles, 0-315°
  - 100/240V A/A
  - 0% Ur, 1 cycles, 0°
  - 100/240V A/A
  - 40% Ur, 10/12 cycles, 0°
  - 100/240V B/A
  - 70% Ur, 25/30 cycles, 0°
  - 100/240V B/A
- **Voltage Interruptions**
  - EN 61000-4-11
  - 0% Ur, 300 cycles, 0°
  - 100/240V B/A
- **Radiated Emissions**
  - EN 55011-3-2
  - Class A
- **Conducted Emissions**
  - EN 55011-3-2
  - Class B

**ORDERING INFORMATION**

Consult factory for alternate output configurations.

Please specify the following optional features when ordering:

- CH - Chassis
- CO - Cover
- LS - Single Wire Load Sharing

All specifications are maximum at 25°C without exception, stated may vary by model and are subject to change without notice.
1. Continuous Output Power must not exceed 225W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-2:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1-2:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 400mV depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure.
15. 300LPM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and forward of any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 2.4 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
18. Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
19. A load equal to 5% rated Output Power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

**MAX P_OUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE**

Derating requirements – Chart above applies to models 1003 thru 1008 only. 225W 300LPM forced air, open frame. 150W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.5W/°C below 100Vc and between 100Vc and 85Vc. Use larger of the two derating when using chassis/cover below 100Vc. Derate output power linearly to 50% between 50°C and 70°C.

**TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION**
325 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
- Compact 3.9” x 6.0” x 1.5” Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1:2007, 2nd Edition
AAMI/ANSI ES60601-1-2005(R) 2012
CB Reports/Certificates (including all National and Group Deviations)
IEC 60950-1/A2:2013, 2nd Edition
IEC 60601-1:2005/A:2012
UL Recognition
Mark for Canada
File E137708/E140259
UL Recognition
Mark for Canada
C/CSA-C22.2 No. 60050-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60061-1:2004
C/CSA-C22.2 No. 60061-1:2004
TUV
EN 60601-1-2002/1:2012
Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

MODEL                        CONVERSION COOLED 1 300 LFM CONVERSION COOLED 2 300 LFM
NXT-325-1001                2.5V/65.0A             2.5V/40.0A             2.5V/58.5A             2.5V/36.0A
NXT-325-1002                3.3V/65.0A             3.3V/40.0A             3.3V/58.5A             3.3V/36.0A
NXT-325-1003                5V/65.0A              5V/40.0A              5V/58.5A              5V/36.0A
NXT-325-1004                12V/29.2A             12V/18.7A             12V/26.3A             12V/15.0A
NXT-325-1005                15V/23.3A             15V/13.3A             15V/20.9A             15V/12.0A
NXT-325-1006                24V/14.6A             24V/8.3A              24V/13.1A             24V/7.5A
NXT-325-1007                28V/12.5A             28V/7.1A              28V/11.3A             28V/6.4A
NXT-325-1008                48V/7.3A              48V/4.2A              48V/6.6A              48V/3.8A

Please refer to Output Power Derating chart.

SAFETY SPECIFICATIONS

Underwriters Laboratories
File E137708/E140259
UL 60950-1:2007, 2nd Edition
AAMI/ANSI ES60601-1-2005(R) 2012
CB Reports/Certificates (including all National and Group Deviations)
IEC 60950-1/A2:2013, 2nd Edition
IEC 60601-1:2005/A:2012
UL Recognition
Mark for Canada
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CAN/CSA-C22.2 No. 60061-1:2004
C/CSA-C22.2 No. 60061-1:2004
TUV
EN 60601-1-2002/1:2012
Low Voltage Directive
RoHS Directive (Recast)
(2014/35/EU of February 2014)
(2011/65/EU of June 2011)

MODEL LISTING

MODEL                        CONVERSION COOLED 1 300 LFM CONVERSION COOLED 2 300 LFM
NXT-325-1001                2.5V/65.0A             2.5V/40.0A             2.5V/58.5A             2.5V/36.0A
NXT-325-1002                3.3V/65.0A             3.3V/40.0A             3.3V/58.5A             3.3V/36.0A
NXT-325-1003                5V/65.0A              5V/40.0A              5V/58.5A              5V/36.0A
NXT-325-1004                12V/29.2A             12V/18.7A             12V/26.3A             12V/15.0A
NXT-325-1005                15V/23.3A             15V/13.3A             15V/20.9A             15V/12.0A
NXT-325-1006                24V/14.6A             24V/8.3A              24V/13.1A             24V/7.5A
NXT-325-1007                28V/12.5A             28V/7.1A              28V/11.3A             28V/6.4A
NXT-325-1008                48V/7.3A              48V/4.2A              48V/6.6A              48V/3.8A

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:
CH - Chassis
LSEBV - Load Share Evaluation Board
CO - Cover
RE - Remote Inhibit
LS - Single Wire Load Sharing

All specifications are maximum at 25°C/325W unless otherwise stated, may vary by model and are subject to change without notice.
NXT-325 SERIES MECHANICAL SPECIFICATIONS

1. Continuous Output Power must not exceed 350W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1:2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method).
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1-Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 400mV depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure.
15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-sharing applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
18. Refer to Load-Sharing Evaluation Board data sheet (page 58) for additional load-sharing applications information.
19. A load equal to 5% rated output power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

**APPLICATIONS INFORMATION**

**MAX P_OUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE**

Derating requirements – Chart above applies to models 1003 thru 1008 only. 325W 300LFM forced air, open frame. 200W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.5W/out/1V below 100V and between 100V and 85V. Use larger of the two deratings when using chassis/cover below 100V and 85V. Derate output power linearly to 50% between 50° and 70°C.

**TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION**
400 WATTS
SINGLE OUTPUT AC-DC

FEATURES:
- Compact 3.9” x 8.0” x 1.5” Size
- 3 Year Warranty
- Universal 85-264V Input
- Single High Efficiency Output
- Power Fail Warning
- 0-70°C Operating Temperature
- RoHS Compliant
- IEC 60950-1 2nd ed. ITE Certification
- IEC 60601-1-2 4th ed. EMC
- Class B Emissions per EN55011/32
- Optional Single Wire Load Sharing
- Optional Remote Inhibit/Enable
- Optional Chassis/Cover

SAFETY SPECIFICATIONS

CHASSIS/COVER OPEN FRAME

MODEL LISTING

MODELS

MODEL 300 LFM CONVECTION COOLED 300 LFM CONVECTION COOLED
NXT-400-1001 2.5V/80.0A 2.5V/45.0A 2.5V/72.0A 2.5V/40.5A
NXT-400-1002 3.3V/80.0A 3.3V/45.0A 3.3V/72.0A 3.3V/40.5A
NXT-400-1003 5V/80.0A 5V/45.0A 5V/72.0A 5V/40.5A
NXT-400-1004 12V/33.3A 12V/18.8A 12V/29.9A 12V/16.9A
NXT-400-1005 15V/26.7A 15V/15.0A 15V/24.0A 15V/13.5A
NXT-400-1006 24V/16.7A 24V/9.4A 24V/15.0A 24V/8.5A
NXT-400-1007 28V/14.3A 28V/8.0A 28V/12.8A 28V/7.2A
NXT-400-1008 48V/8.3A 48V/4.7A 48V/7.5A 48V/4.2A

Please refer to Output Power Derating chart.

ORDERING INFORMATION

Consult factory for alternate output configurations.
Please specify the following optional features when ordering:
- CH - Chassis
- CO - Cover
- LS - Single Wire Load Sharing

CHASSIS/Cover
- LSEVB - Load Share Evaluation Board
- RE - Remote Inhibit

All specifications are maximum at 25°C/400W unless otherwise stated, may vary by model and are subject to change without notice.

CHASSIS/COVER

MODEL 300 LFM CONVECTION COOLED 300 LFM CONVECTION COOLED
NXT-400-1001 2.5V/80.0A 2.5V/45.0A 2.5V/72.0A 2.5V/40.5A
NXT-400-1002 3.3V/80.0A 3.3V/45.0A 3.3V/72.0A 3.3V/40.5A
NXT-400-1003 5V/80.0A 5V/45.0A 5V/72.0A 5V/40.5A
NXT-400-1004 12V/33.3A 12V/18.8A 12V/29.9A 12V/16.9A
NXT-400-1005 15V/26.7A 15V/15.0A 15V/24.0A 15V/13.5A
NXT-400-1006 24V/16.7A 24V/9.4A 24V/15.0A 24V/8.5A
NXT-400-1007 28V/14.3A 28V/8.0A 28V/12.8A 28V/7.2A
NXT-400-1008 48V/8.3A 48V/4.7A 48V/7.5A 48V/4.2A

Please refer to Output Power Derating chart.

400-400

OUTPUT SPECIFICATIONS

Output Power at 50°C (C1) 225W
(See Derating Chart) 400W
400W
300LFM Forced-Air Cooled(19)
Power Derating 2.5 W out / 1 W in below 100 Wm
Voltage Centering ± 0.5% (50 load)
Voltage Adjust Range 95-105% (0-100% load change)
Load Regulation 0.5%
Source Regulation 0.5%
Noise 1.0% or 100mV Whichever is greater
Turn on Overshoot None
Transient Response Output recovers to within 1% of initial set point due to a 50% step load change, 50uS maximum, 4% maximum deviation.
Overvoltage Protection Latching, between 110% and 150% of rated output voltage.
Overpower Protection 110-120% rated Pout, cycle on/off, auto recovery
Start Up Time 16ms min., Full Power, 85-264V Input
Standby Power (optional)(19) Isolated 5 VDC

INPUT SPECIFICATIONS

Antenna Protection Class I
Source Voltage 85 – 264 Volts AC
Frequency Range 47 – 63 Hz
Input Protection (6) Internal 10
Frequency Range 47 – 63 Hz
Voltage Fluctuations/Flicker EN 61000-3-3 Compliant
Harmonic Current Emissions EN 61000-3-2 Class
Conducted Emissions EN 55011/32 Class B
Voltage Interruptions EN 61000-4-11 0% UT, 300 cycles, 0°         100/240V B/B
Magnetic Field Immunity EN 61000-4-8 30A/m, 60 Hz.
Radiated Electromagnetic Field EN 61000-4-3  80MHz-2.7GHz,  10V/m, 80%
Electrostatic Discharge EN 61000-4-2
Weight 2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover
Mean-Time Between Failures 100,000 Hours min., MIL-HDBK
Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Primary to Ground 1MOOP (Means of Operator Protection)
Primary to Secondary 2MOPP (Means of Patient Protection)
Shock 20g, peak per MIL-STD-810F Method 516.5
Vibration 2.5g, 10Hz.
Operating Relative Humidity Range 20-90% non-condensing
Altitude 10,000 ft. ASL Operating/ 40,000 ft. ASL Non-operating
Temperature Range Derating: See Power Rating Chart

GENERAL SPECIFICATIONS

Input Protection (6) Internal 10
Voltage Centering 0.5% (50 load)
Load Regulation 0.5% (0-100% load change)
Voltage Adjust Range 95-105% (0-100% load change)
Power Fail Signal(14) Logic low with input power failure 10 ms minimum prior to
Power Factor 0.95 (Full Power, 230V), 0.98 (Full Power, 120V)
Efficiency 85% Typical, Full Power varies by model
Power Factor 0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

ENVIRONMENTAL SPECIFICATIONS

Load Share (optional)(14, 17, 18) Single wire current sharing with return via negative sense
Minimum current share load is 10% of each module’s output current rating. Maximum output voltage deviation between modules is 5% for 2.5 through 5 V models and 400 mV/ for remaining models.
Standby Power (optional)(19) Isolated 5 VDC ± 10%, 10mA available with Remote Inhibit
Remote Sense(19) 400mV/ compensation of output cable losses
Mean-Time Between Failures 100,000 Hours min., MIL-HDBK217F, 25°C, GB
Weight 2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover

Electrostatic Discharge EN 61000-4-2 ±8kV contact / ±15KV air discharge A
Radiated Electromagnetic Field EN 61000-4-3 80MHz-2.7GHz, 10V/m, 80% AM A
Electrical Fast Transients/Bursts EN 61000-4-4 ±2 KV, 50kHz/100kHz A
Surge Immunity EN 61000-4-5 ±2 KV line to earth / ±1 KV line to line A
Conducted Immunity EN 61000-4-6 0.15 to 80MHz, 10V, 80% AM A
Magnetic Field Immunity EN 61000-4-8 30μT, 60 Hz A
Voltage Dips EN 61000-4-11 0% Ur, 0.5 cycles, 0-315° 100/240V A/A
0% Ur, 1 cycles, 0 100/240V A/A
10% Ur, 10/12 cycles, 0 100/240V B/A
70% Ur, 25/30 cycles, 0 100/240V B/A
Voltage Interruptions EN 61000-4-11 Latching, between 110% Ur, 3 cycles, 0% 100/240V B/A
Radiated Emissions EN 55011/32 Class B
Conducted Emissions EN 55011/32 Class B
Harmonic Current Emissions EN 61000-3-2 Class A
Voltage Fluctuations/Flicker EN 61000-3-3 Compliant

INTEGRATED POWER DESIGNS
300 Stewart Road  Wilkes-Barre, PA 18706  Phone: (570) 824-4666  Fax: (570) 824-4843  Email: sales@ipdpower.com  Web: www.ipdpower.com
NXT-400 SERIES MECHANICAL SPECIFICATIONS

CONNECTOR SPECIFICATIONS

- **P1**: AC Input
  - Terminal block with 6-32 screws on 0.325 centers mates with #6, spade terminals. (8 in-lb max)

- **P2**: DC Output
  - 10-32 screw down terminal mates with #10 ring tongue terminal. (10 in-lb Max)

- **P3**: Load Share, Sense
  - 0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

- **P4**: Power Fail
  - 0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

- **P5**: Inhibit, Standby
  - 0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

APPLICATIONS INFORMATION

1. Continuous Output Power must not exceed 400W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient air must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. This product includes only one fuse in the input circuit. In consideration of clause 8.11.5 of IEC 60601-1-2005, a second fuse may be required in neutral conductor of the end product.
7. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20MHz bandwidth.
8. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1-2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric stress test.
10. Remote-Sense terminals may be used to compensate for cable losses up to 400mV depending on model. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
11. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
12. To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/Cover option is recommended. Refer to Operating Instructions for additional information.
13. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
14. Power Fail (AC-Good) feature provides a logic-low warning signal from an open collector transistor output 10ms prior to loss of output from AC failure.
15. 300LFM of airflow must be maintained one inch above the top of the heatsinks in any direction in open-frame forced-air applications; and one inch above and toward any of the three perforated sides of the cover in forced-air Chassis/Cover applications.
16. Low forward-voltage-drop oring diodes must be used in all load-sharing applications in 2.5 through 15V models. Oring diodes must be used on 24 through 48V models used in fault-tolerant applications but are optional in power-boosting applications. Oring diode power dissipation must be subtracted from the maximum output-power rating of each model.
17. Current-carrying conductors in load-sharing applications must be short and symmetrical.
18. Refer to Load-Share Evaluation Board data sheet (page 58) for additional load-share applications information.
19. A load equal to 5% of rated output power must be maintained when using Standby Power option. An external electrolytic capacitor across standby power output may be used to improve transient response.

MAX P_out vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

Derating requirements – Chart above applies to models 1003 thru 1008 only. 400W 300LFM forced air, open frame. 225W convection cooled open frame. Derate 10% with chassis and cover. Derate 2.5W/15V below 100V and between 100V and 850V. Use larger of the two deratings when using chassis/cover below 100V. Derate output power linearly to 50% between 50°C and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION

![Diagram of load share/remote sense application]

300 Stewart Road, Wilkes-Barre, PA 18706 | Phone: (570) 824-4666 | Fax: (570) 824-8443 | Email: sales@ipdpower.com | Web: www.ipdpower.com
70 WATTS
SINGLE/MULTI OUTPUT DC-DC

FEATURES:
- Compact 2.5” x 4.5” x 1.2” Size
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- Size/Pin Compatible with REL-70 Series

CHASSIS/COVER
- Open Frame

SAFETY SPECIFICATIONS
- Underwriters Laboratories
- File E137708/E140259
- CB Reports/Certificates (including all National and Group Deviations)
- IEC 60950-1:2010, 2nd Edition
- IEC 60601-1:2012
- UL Recognition
- Mark for Canada
- CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
- File E137708/E140259
- TUV
- EN 60950-1/A2:2013, 2nd Edition
- EN 60601-1:2006/A1:2013

PRODUCT LISTING

MODEL OUTPUT 1 OUTPUT 2 OUTPUT 3 OUTPUT 4
DC2-70-4001 +3.3V/6A +5V/5A +12V/2A@<sub>8</sub> -12V/2A@<sub>8</sub>
DC2-70-4002 +5V/6A +3.3V/5A +12V/2A@<sub>8</sub> -12V/2A@<sub>8</sub>
DC2-70-4003 +5V/6A +3.3V/5A +15V/2A@<sub>8</sub> -15V/2A@<sub>8</sub>
DC2-70-4004 +5V/6A +5V/6A +12V/2A@<sub>8</sub> -12V/2A@<sub>8</sub>
DC2-70-4005 +5V/6A -5V/6A +12V/2A@<sub>8</sub> -12V/2A@<sub>8</sub>
DC2-70-4006 +5V/6A +24V/2A +12V/2A@<sub>8</sub> -12V/2A@<sub>8</sub>
DC2-70-4007 +5V/6A +24V/2A +15V/2A@<sub>8</sub> -15V/2A@<sub>8</sub>
DC2-70-3001 +6V/8A +12V/2A -12V/2A
DC2-70-3002 +5V/6A +15V/2A -15V/2A
DC2-70-2001 +3.3V/6A +5V/5A
DC2-70-2002 +5V/6A +12V/4A
DC2-70-2003 +5V/6A +24V/2A
DC2-70-2004 +12V/3A -12V/3A
DC2-70-2005 +15V/3A -15V/2A
DC2-70-1001 2.5V/14A@<sub>17</sub>
DC2-70-1002 3.3V/14A@<sub>17</sub>
DC2-70-1003 5V/14A@<sub>17</sub>
DC2-70-1004 12V/5.8A
DC2-70-1005 15V/4.7A
DC2-70-1006 24V/2.9A
DC2-70-1007 28V/2.5A
DC2-70-1008 48V/1.5A

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CH - Chassis
CO - Cover
BD - Reverse Input Protection
I/O - Isolated Outputs
TS - Terminal Strip

DC2-70

OUTPUT SPECIFICATIONS
- Total Output Power at 50°C/212°F
  - 50W
  - 70W
- Convection Cooled (4, 13)
- 300°F Forced Air Cooled (5, 17, 18)
- Input Voltage Centering
  - Output 1: ±0.5% (All outputs)
  - Output 2: ±5.0% at 50% load
  - Output 3: ±5.0%
  - Output 4: ±5.0%
- Output Voltage Adjust Range
  - Output 1: 95% - 105%
- Load Regulation
  - Output 1: 0.5% (10-100% load change)
  - Output 2: 5.0%
  - Output 3: 5.0%
  - Output 4: 5.0%
- Source Regulation
  - Outputs 1 - 4: 0.5%
- Cross Regulation
  - Outputs 2 - 4: 5.0%
- Turn on Overshoot
  - None
- Transient Response
  - Outputs 1 - 4
- Voltage Deviation
  - 5.0%
- Recovery Time
  - 500µS
- Load Change
  - 50% to 100%
- Overvoltage Protection
  - Output 1: 110% to 150%
- Overpower Protection
  - 110-150% rated Pout, cycle on/oiff, auto recovery
- Start Up Time
  - 4 Seconds
- INPUT SPECIFICATIONS
- Input Voltage Range
  - 18-36 VDC
- Input Under-Voltage Lockout
  - Turn-On Voltage: 14.5-17.5 VDC
  - Turn-Off Voltage: 14.0-17.0 VDC
- Input Overvoltage Shutdown
  - 37.0-43.0 VDC
- Maximum Input Current
  - 5.5 A
- Reflected Ripple Current
  - 5 %
- Efficiency
  - 78% Typ., Full Power, 24VDC, varies by model
- ENVIRONMENTAL SPECIFICATIONS
- Temperature Range
  - 0°C to + 70°C
- Ambient Temp. Range
  - -40°C to + 85°C
- Temperature Coefficient
  - Outputs 1 - 4: -0.03%/°C
- GENERAL SPECIFICATIONS
- Means of Protection
  - Primary to Secondary: 2MOOP (Means of Operator Protection)
  - Primary to Ground: 1MOOP (Means of Operator Protection)
  - Secondary to Ground: Operational Insulation (Consult factory for 1MOOP or 1MOPP)
- Dielectric Strength
  - Reinforced Insulation: 4242 VDC, Primary to Secondary
  - Basic Insulation: 2121 VDC, Primary to Ground
  - Operational Insulation: 707 VDC, Secondary to Ground
- Power Good Signal
  - Logic high with input voltage above Vin min.
- Remote Sense (simplex only)
  - 250mV compensation of output cable losses
- Mean-Time Between Failures
  - 100,000 Hours min., MIL-HDBK-217F, 25°C, CB
- Weight
  - 0.60 Lbs.
  - 1.00 Lbs. Chassis and Cover

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

All specifications are maximum at 25°C/70W unless otherwise stated, may vary by model and are subject to change without notice.
APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 70W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV (single output models only). The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 50W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 40W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 10A maximum with convection cooling.
18. Rated 15A maximum with convection cooling.

CONNECTOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>DC Input 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 5-640706-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Single) 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Multiple) 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>P.G./Sense (Single) 0.100 breakaway header mates with Molex 23-55-2081 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>Power Good (Multiple) 0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>

INTEGRATED POWER DESIGNS 300 Stewart Road Wilkes-Barre, PA 18706 Phone: (570) 824-4666 Fax: (570) 824-4843 Email: sales@ipdpower.com Web: www.ipdpower.com
110 WATTS
SINGLE/MULTI OUTPUT DC-DC

FEATURES:
- Compact 3” x 5” x 1.3” Size
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 424VDC Reinforced Insulation
- Under/Overvoltage Lockout
- Size/Pin Compatible with REL-110 Series

CHASSIS/COVER     OPEN FRAME

SAFETY SPECIFICATIONS
Underwriters Laboratories File E13708/E140259
UL 60950-1:2007, 2nd Edition
AMM/ANSI ES60601-1:2005(R) 2012

IEC 60601
Mark for Canada File E137708/E140259


MODEL LISTING
MODEL OUTPUT 1(20) OUTPUT 2(20) OUTPUT 3(19) OUTPUT 4(19)
DC2-110-4001 +3.3V/10A[18] +5V/6A +12V/2A -12V/2A
DC2-110-4002 +5V/10A[18] +3.3V/6A +12V/2A -12V/2A
DC2-110-4003 +5V/10A[18] +3.3V/6A +15V/2A -15V/2A
DC2-110-4004 +5V/10A[18] -5V/6A +12V/2A -12V/2A
DC2-110-4006 +5V/10A[18] +24V/2A +12V/2A -12V/2A
DC2-110-3001 +5V/10A[18] +12V/3A +12V/3A
DC2-110-3002 +5V/10A[18] +15V/2A
DC2-110-2001 +3.3V/10A[18] +5V/6A +12V/2A
DC2-110-2002 +3.3V/10A[18] +12V/2A
DC2-110-2003 +3.3V/10A[18] +24V/3A
DC2-110-2004 +12V/5A -12V/4A
DC2-110-2005 +15V/4A
DC2-110-1001 2.5V/2A[19] +12V/2A
DC2-110-1002 3.3V/22A[19]
DC2-110-1003 5V/22A[19]
DC2-110-1004 12V/9.2A
DC2-110-1005 15V/7.3A
DC2-110-1006 24V/4.6A
DC2-110-1007 28V/3.9A
DC2-110-1008 48V/2.3A

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:
CH – Chassis I/O – Isolated Outputs
CO – Cover TS – Terminal Strip
BD – Reverse Input Protection

DC2-110
OUTPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Output Power at 50°C[10]</td>
<td>80W</td>
</tr>
<tr>
<td>(See Derating Chart)</td>
<td>110W</td>
</tr>
<tr>
<td>Output Voltage Centering</td>
<td>Output 1: ±0.5% (All outputs)</td>
</tr>
<tr>
<td>Output Voltage Adjust Range</td>
<td>Output 2: ±5.0% at 50% load</td>
</tr>
<tr>
<td>Load Regulation</td>
<td>Output 3: ±5.0%</td>
</tr>
<tr>
<td>Output Noise</td>
<td>Output 4: ±5.0%</td>
</tr>
<tr>
<td>Source Regulation</td>
<td>Output 1 – 4: 0.5%</td>
</tr>
<tr>
<td>Cross Regulation</td>
<td>Output 2 – 4: 5.0%</td>
</tr>
<tr>
<td>Turn on Overshoot</td>
<td>Output 1 – 4: 1.0%</td>
</tr>
<tr>
<td>Output Overvoltage Protection</td>
<td>110% to 150%</td>
</tr>
<tr>
<td>Output Overpower Protection</td>
<td>110-150% rated Pout, cycle on/off, auto recovery</td>
</tr>
<tr>
<td>Start Up Time</td>
<td>5 Seconds</td>
</tr>
</tbody>
</table>

INPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage Range</td>
<td>18-36 VDC</td>
</tr>
<tr>
<td>Input Under-Voltage Lockout</td>
<td>14.5-17.5 VDC</td>
</tr>
<tr>
<td>Turn-On Voltage</td>
<td>14.0-17.0 VDC</td>
</tr>
<tr>
<td>Input Overvoltage Shutdown</td>
<td>37-0-43.0 VDC</td>
</tr>
<tr>
<td>Maximum Input Current</td>
<td>8.5 A</td>
</tr>
<tr>
<td>Reflected Ripple Current</td>
<td>5%</td>
</tr>
<tr>
<td>Efficiency</td>
<td>82% Typ., Full Power, 24V, varies by model</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Operating</td>
<td>0°C to +70°C</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>Derating: See Power Rating Chart</td>
</tr>
<tr>
<td>Ambient Storage Temp. Range</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>Outputs 1 – 4: 0.02%/°C</td>
</tr>
</tbody>
</table>

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of Protection</td>
<td>2MOOP (Means of Operator Protection)</td>
</tr>
<tr>
<td>Primary to Secondary</td>
<td>1MOOP (Means of Operator Protection)</td>
</tr>
<tr>
<td>Primary to Ground</td>
<td>Operational Insulation(Consult factory for 1MOOP or 1MOPP)</td>
</tr>
<tr>
<td>Secondary to Ground</td>
<td>4242 VDC, Primary to Secondary</td>
</tr>
<tr>
<td>Reinforced Insulation</td>
<td>2121 VDC, Primary to Ground</td>
</tr>
<tr>
<td>Basic Insulation</td>
<td>707 VDC, Secondary to Ground</td>
</tr>
<tr>
<td>Operational Insulation</td>
<td>0.02%/°C</td>
</tr>
<tr>
<td>Power Good Signal[13]</td>
<td>Logic high with input voltage above Vin min.</td>
</tr>
<tr>
<td>Remote Sense (simplex only)[13]</td>
<td>250mv compensation of output cable losses</td>
</tr>
<tr>
<td>Mean-Time Between Failures</td>
<td>100,000 Hours min., MIL-STD-217F, 25°C, GB</td>
</tr>
<tr>
<td>Weight</td>
<td>0.65 Lbs. Open Frame</td>
</tr>
<tr>
<td></td>
<td>1.15 Lbs. Chassis and Cover</td>
</tr>
</tbody>
</table>

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

All specifications are maximum at 25°C/110W unless otherwise stated, may vary by model and are subject to change without notice.
1. Each output can deliver its rated current but Total Output Power must not exceed 110W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retraceable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV (single output models only). The use of a twisted-pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 80W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 110W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 65W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 110W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 8A maximum with convection cooling.
18. Rated 16A maximum with convection cooling.
19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
20. Total current from Outputs 1 & 2 must not exceed 12A with convection cooling.

**CONNECTOR SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>DC Input</td>
</tr>
<tr>
<td></td>
<td>0.156 friction lock header mates with Tyco 640250-4 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output</td>
</tr>
<tr>
<td>(Single)</td>
<td>0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output</td>
</tr>
<tr>
<td>(Multiple)</td>
<td>0.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>G</td>
<td>Ground</td>
</tr>
<tr>
<td></td>
<td>0.187 quick disconnect terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>P/G/Sense</td>
</tr>
<tr>
<td>(Single)</td>
<td>0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>P/G.</td>
</tr>
<tr>
<td>(Multiple)</td>
<td>0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>
150 WATTS
SINGLE/MULTI OUTPUT DC-DC

FEATURES:
- Compact 3.8" x 6" x 1.3" Size
- 2 Year Warranty
- 18-36VDC Input
- One to Four Outputs
- 424VDC Reinforced Insulation
- Under/Overvoltage Lockout
- Size/Pin Compatible with REL-150 Series

CHASSIS/Cover OPEN FRAME

SAFETY SPECIFICATIONS

Underwriters Laboratories File E137708/E140259
UL 60950-1:2007, 2nd Edition
AAMI/ANSI ES60601-1:2005(R) 2012

CB Reports/Certificates (including all National and Group Deviations)
IEC 60950-1:2012, 2nd Edition

UL Recognition
Mark for Canada
CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60601-1:2014

TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1:2006/A1:2013

RoHS Directive (Recast)
(2011/65/EU of June 2011)

MODEL LISTING

MODEL OUTPUT 1/2/3/4
DC2-150-4001 +3.3V/15A(2) +5V/8A +12V/2A -12V/2A
DC2-150-4002 +5V/15A(2) +3.3V/8A +12V/2A 0.5%
DC2-150-4003 +5V/15A(2) +3.3V/8A +15V/2A -15V/2A
DC2-150-4004 +5V/15A(2) -5V/8A +12V/2A -12V/2A
DC2-150-4005 +5V/15A(2) -5V/8A 0.5%
DC2-150-4006 +5V/15A(2) +24V/3A +12V/2A -12V/2A
DC2-150-4007 +5V/15A(2) +24V/3A +15V/2A -12V/2A
DC2-150-3001 +5V/15A(2) +12V/6A -12V/3A
DC2-150-3002 +5V/15A(2) +12V/6A -15V/5A
DC2-150-2001 +3.3V/15A(2) +5V/6A 0.5%
DC2-150-2002 +5V/15A(2) +3.3V/6A +12V/3A
DC2-150-2003 +5V/15A(2) +12V/5A
DC2-150-2004 +12V/7.5A -12V/5A
DC2-150-2005 +15V/5A -15V/5A
DC2-150-1001 2.5V/30A(8) 0.5%
DC2-150-1002 3.3V/30A(8)
DC2-150-1003 5V/30A(8)
DC2-150-1004 12V/7.5A
DC2-150-1005 15V/10.0A
DC2-150-1006 24V/6.3A
DC2-150-1007 28V/5.4A
DC2-150-1008 48V/3.1A

ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:
- CH - Chassis
- CO - Cover
- BD – Reverse Input Protection
- I/O - Isolated Outputs
- TS - Terminal Strip

DC2-150

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(CO) 100W
(See Derating Chart) 150W
Convection Cooled
300FLM Forced-Air Cooled

Output Voltage Centering
Output 1: ±0.5% (All outputs at 50% load)
Output 2: ±0.5%
Output 3: ±0.5%
Output 4: ±0.5%

Output Voltage Adjust Range
Output 1: 0% to 105%
Output 2: 0% to 105%
Output 3: 0% to 105%
Output 4: 0% to 105%

Load Regulation
Output 1: 0.5% (10-100% load change)
Output 2: 0.5% (10-100% load change)
Output 3: 0.5% (10-100% load change)
Output 4: 0.5% (10-100% load change)

Source Regulation
Output 1 – 4: 0.5%
Cross Regulation
Output 2 – 4: 0.5%
Output Noise
Output 1 – 4: 1.0%

Turn on Overload
None
Transil Response
Output 1 – 4
Voltage Deviation
5.0%
Recovery Time
500µS
Load Change
50% to 100%

Output Overvoltage Protection
Output 1: 110% to 150%

Output Overpower Protection
110% rated Pout, cycle on/off, auto recovery

Start Up Time
5 Seconds

INPUT SPECIFICATIONS

Input Voltage Range
18-38 VDC

Input Under-Voltage Lockout
Turn-On Voltage
14.5-17.5 VDC
Turn-off Voltage
14.0-17.0 VDC

Input Overvoltage Shutdown
37.0-43.0 VDC

Maximum Input Current
11.5 A

Reflected Ripple Current
5 %

Efficiency
82% Typ., Full Power, 24 VDC, varies by model

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature
0°C to +70°C

Temperature Range Derating: See Power Rating Chart

Ambient Storage Temp. Range
-40°C to +85°C

Temperature Coefficient
0.02%/°C

GENERAL SPECIFICATIONS

Means of Protection
Primary to Secondary 2MOOP (Means of Operator Protection)
Primary to Ground 1MOOP (Means of Operator Protection)
Secondary to Ground Operational Insulation (Consult factory for 1MOOP or 1MOPP)

Dielectric Strength: 1.6
Reinforced Insulation
4242 VDC, Primary to Secondary
Basic Insulation
2121 VDC, Primary to Ground
Operational Insulation
707 VDC, Secondary to Ground

Power Good Signal: Logic high with input voltage above Vin min.
Remote Sense: 250mV compensation of output cable losses
Mean-Time Between Failures
100,000 Hours min., MIL-HDBK-217F, 25°C, 45B

Weight
0.60 Lbs, 2013, 2nd Edition
1.60 Lbs. Chassis and Cover

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.

INTEGRATED POWER DESIGNS
300 Stewart Road ▪ Wilkes-Barre, PA 18706 ▪ Phone: (570) 824-4666 ▪ Fax: (570) 824-4843 ▪ Email: sales@ipdpower.com ▪ Web: www.ipdpower.com
DC2-150 SERIES MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 150W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 100W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 150W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 85W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 150W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 12A maximum with convection cooling.
18. Rated 20A maximum with convection cooling.
19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
20. Total current from Outputs 1 & 2 must not exceed 15A with convection cooling.

CONNECTOR SPECIFICATIONS

P1 DC Input 0.156 friction lock header mates with Molex 09-50-3061 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
P2 DC Output (Single) 6-32 screw down terminal mates with #6 ring tongue terminal (10 in-lb max)
P2 DC Output (Multiple) 0.156 friction lock header mates with Molex 09-50-3141 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
P3 Ground 0.187 quick disconnect terminal.
P3 P.G./Sense (Single) 0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71651 or equivalent crimp terminal.
P3 P.G./Sense (Multiple) 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.

INTEGRATED POWER DESIGNS
300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com
FEATURES:
- Compact 4.2” x 7.0” x 1.5” Size
- 2 Year Warranty
- IEC 60950-1 2nd ed. ITE Certification
- 18-36VDC Input
- 0-70°C Operating Temperature
- One to Four Outputs
- RoHS Compatible
- 4242VDC Reinforced Insulation
- Optional Chassis/Cover
- Under/Overvoltage Lockout
- Power Good Signal
- Size/Pin Compatible with REL-185 Series

SAFETY SPECIFICATIONS

MODEL LISTING

 OUTPUT 1(1)  OUTPUT 2(2)  OUTPUT 3(3)  OUTPUT 4(4)

**DC2-185**

| DC2-185-4001 | +3.3V/20A | +5V/10A | +12V/2A | -12V/2A |
| DC2-185-4002 | +5V/20A(A) | +3.3V/10A | +12V/2A | -12V/2A |
| DC2-185-4003 | +5V/20A(B) | +3.3V/10A | +15V/2A | -15V/2A |
| DC2-185-4004 | +5V/20A(C) | -5V/10A | +12V/2A | -12V/2A |
| DC2-185-4005 | +5V/20A(D) | +24V/3A | +12V/2A | -12V/2A |
| DC2-185-4006 | +5V/20A(E) | +24V/3A | +15V/2A | -15V/2A |
| DC2-185-4007 | +5V/20A(F) | +24V/3A | +24V/3A | -12V/2A |
| DC2-185-3001 | +5V/20A(G) | +12V/6A | -12V/6A | -12V/6A |
| DC2-185-3002 | +5V/20A(H) | +15V/4A | -15V/4A | -15V/4A |
| DC2-185-2001 | +3.3V/20A(I) | +5V/10A | -12V/6A | -12V/6A |
| DC2-185-2002 | +5V/20A(J) | +12V/8A | -15V/5A | -15V/5A |
| DC2-185-2003 | +5V/20A(K) | +24V/4A | -15V/5A | -15V/5A |
| DC2-185-2004 | +12V/10A | -12V/6A | -12V/6A | -12V/6A |
| DC2-185-2005 | +15V/8A | -15V/5A | -15V/5A | -15V/5A |
| DC2-185-1001 | 2.5V/37A(L) | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1002 | 3.3V/37A(M) | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1003 | 5V/37A(N) | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1004 | 12V/15.4A | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1005 | 15V/12.3A | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1006 | 24V/7.7A | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1007 | 28V/6.6A | -12V/3A | -12V/3A | -12V/3A |
| DC2-185-1008 | 48V/3.8A | -12V/3A | -12V/3A | -12V/3A |

Chassis/Cover Open Chassis

CH - Chassis
CO - Cover
BD – Reverse Input Protection

I/O - Isolated Outputs
TS - Terminal Strip

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

DC2-185

<table>
<thead>
<tr>
<th>OUTPUT SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Output Power at 50°C/25°C</td>
</tr>
<tr>
<td>(See Derating Chart)</td>
</tr>
<tr>
<td>Output Voltage Centering</td>
</tr>
<tr>
<td>Output 2: ±5.0% at 50% load</td>
</tr>
<tr>
<td>Output 3: ±5.0%</td>
</tr>
<tr>
<td>Output 4: ±0.5%</td>
</tr>
<tr>
<td>Load Regulation</td>
</tr>
<tr>
<td>Output 2: 5.0% (20-100% load change)</td>
</tr>
<tr>
<td>(4001, 4, 501, 2001)</td>
</tr>
<tr>
<td>Output 3: 10.0%</td>
</tr>
<tr>
<td>Output 4: 15.0%</td>
</tr>
<tr>
<td>Source Regulation</td>
</tr>
<tr>
<td>Cross Regulation</td>
</tr>
<tr>
<td>Output Noise</td>
</tr>
<tr>
<td>Turn on Overshoot</td>
</tr>
<tr>
<td>Transient Response</td>
</tr>
<tr>
<td>Voltage Deviation</td>
</tr>
<tr>
<td>Recovery Time</td>
</tr>
<tr>
<td>Load Change</td>
</tr>
<tr>
<td>Output Overvoltage Protection</td>
</tr>
<tr>
<td>Output Overpower Protection</td>
</tr>
<tr>
<td>Start Up Time</td>
</tr>
</tbody>
</table>

INPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Input Voltage Range</th>
<th>18-36 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Under-Voltage Lockout</td>
<td></td>
</tr>
<tr>
<td>Turn-On Voltage</td>
<td>14.5-17.5 VDC</td>
</tr>
<tr>
<td>Turn-Off Voltage</td>
<td>14.0-17.0 VDC</td>
</tr>
<tr>
<td>Input Overvoltage Shutdown</td>
<td>37-40.0 VDC</td>
</tr>
<tr>
<td>Maximum Input Current</td>
<td>14.0 A</td>
</tr>
<tr>
<td>Reflected Ripple Current</td>
<td>5%</td>
</tr>
<tr>
<td>Efficiency</td>
<td>77% Typ., Full Power, 24VDC, varies by model</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL SPECIFICATIONS

| Ambient Operating Temperature Range | 0°C to +70°C |
| Temperature Range | Derating: See Power Rating Chart |
| Ambient Storage Temp. Range | -40°C to +85°C |
| Temperature Coefficient | Outputs 1 – 4: 0.02%/°C |

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Means of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary to Secondary</td>
</tr>
<tr>
<td>Primary to Ground</td>
</tr>
<tr>
<td>Secondary to Ground</td>
</tr>
</tbody>
</table>

Diode Strength:
- Reinforced Insulation | 4242VDC, Primary to Secondary |
- Basic Insulation | 2121 VDC, Primary to Ground |
- Operational Insulation | 707 VDC, Secondary to Ground |

Power Good Signal:
- Logic high with input voltage above Vin min. |
- Remote Sense (amps only) | 250mV compensation of output cable losses |
- Mean-Time Between Failures | 100,000 Hours min. (MIL-HDBK-217F, 25°C, CB) |
| Weight | 1.26 Lbs. Open Frame |
| | 2.16 Lbs. Chassis and Cover |

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

All specifications are maximum at 25°C/185W unless otherwise stated, may vary by model and are subject to change without notice.
1. Each output can deliver its rated current but Total Output Power must not exceed 185W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Available area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. This is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. Steady-state noise is measured directly at the output terminals of the power supply and is highly recommended that the DC test voltages listed in Table 6 of IEC 60601-1 Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 135W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 185W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 110W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 185W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 15A maximum with convection cooling.
18. Rated 27A maximum with convection cooling.
19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
20. Total current from Outputs 1 & 2 must not exceed 20A with convection cooling.
FEATURES:
- Compact 2.5" x 4.5" x 1.2" Size
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 4242VDC Reinforced Insulation
- Under/Overvoltage Lockout
- Size/Pin Compatible with REL-70 Series
- IEC 60950-1 2nd ed. ITE Certification
- 0-70°C Operating Temperature
- RoHS Compliant
- Optional Chassis/Cover
- Power Good Signal

SAFETY SPECIFICATIONS

CHASSIS/COVER
- Open Frame

MODEL LISTING

MODEL | OUTPUT 1 | OUTPUT 2 | OUTPUT 3 | OUTPUT 4
--- | --- | --- | --- | ---
DC4-70-4001 | +3.3V/6A | +5V/5A | +12V/2A | -12V/2A
DC4-70-4002 | +5V/6A | +3.3V/5A | +15V/2A | -15V/2A
DC4-70-4003 | +5V/6A | +3.3V/5A | +15V/2A | -15V/2A
DC4-70-4004 | +5V/6A | -5V/5A | +12V/2A | -12V/2A
DC4-70-4005 | +5V/6A | -5V/5A | +12V/2A | -12V/2A
DC4-70-4006 | +5V/6A | +24V/2A | +12V/2A | -12V/2A
DC4-70-4007 | +5V/6A | +24V/2A | +15V/2A | -15V/2A
DC4-70-3001 | +5V/6A | +12V/2A | -12V/2A
DC4-70-3002 | +5V/6A | +15V/2A | -15V/2A
DC4-70-2001 | +3.3V/6A | +5V/5A | +12V/2A | -12V/2A
DC4-70-2002 | +5V/6A | +12V/4A | +12V/4A
DC4-70-2003 | +5V/6A | +24V/2A | +24V/2A
DC4-70-2004 | +12V/3A | -12V/3A
DC4-70-2005 | +15V/3A | -15V/2A
DC4-70-1001 | 2.5V/14A | -12V/2A
DC4-70-1002 | 3.3V/14A | -12V/2A
DC4-70-1003 | 5V/14A | -12V/2A
DC4-70-1004 | 12V/5A
DC4-70-1005 | 15V/4.7A
DC4-70-1006 | 24V/2.9A
DC4-70-1007 | 28V/2.5A
DC4-70-1008 | 48V/1.5A

ORDERING INFORMATION

Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

CH – Chassis
CO – Cover
BD – Reverse Input Protection
I/O – Isolated Outputs
TS – Terminal Strip

POWER DESIGNS
300 Stewart Road ▪ Wilkes-Barre, PA 18706 ▪ Phone: (570) 824-4666 ▪ Fax: (570) 824-8483 ▪ Email: sales@ipdpower.com ▪ Web: www.ipdpower.com
1. Each output can deliver its rated current but Total Output Power must not exceed 70W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient air must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250 mV (single output models only). The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 50W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 70W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 40W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 70W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 10A maximum with convection cooling.
18. Rated 1.5A maximum with convection cooling.

CONNECTOR SPECIFICATIONS

P1 DC Input 0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 5-640706-1 or equivalent crimp terminal.

P2 DC Output (Single) 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

P2 DC Output (Multiple) 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.

G Ground 0.187 quick disconnect terminal.

P3 P.G./Sense (Single) 0.100 breakaway header mates with Molex 22-55-2001 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

P3 Power Good (Multiple) 0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
FEATURES:
- Compact 3” x 5” x 1.3” Size
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 424VDC Reinforced Insulation
- Under/Overvoltage Lockout
- Size/Pin Compatible with REL-110 Series

SAFETY SPECIFICATIONS

MODEL LISTING

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:

• CH - Chassis
• CO - Cover
• BD – Reverse Input Protection

All specifications are maximum at 25°C/110W unless otherwise stated, may vary by model and are subject to change without notice.

DC4-110

OUTPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Total Output Power at 50°C/CD</th>
<th>80W</th>
<th>Convection Cooled(13, 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(See Derating Chart)</td>
<td>110W</td>
<td>300LFM Forced-Air Cooled(12, 14, 16)</td>
</tr>
<tr>
<td>Output Voltage Centering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1:</td>
<td>±0.5%</td>
<td>(All outputs)</td>
</tr>
<tr>
<td>Output 2:</td>
<td>±5.0%</td>
<td>at 50% load</td>
</tr>
<tr>
<td>Output 3:</td>
<td>±5.0%</td>
<td></td>
</tr>
<tr>
<td>Output 4:</td>
<td>±5.0%</td>
<td></td>
</tr>
<tr>
<td>Output Voltage Adjust Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1:</td>
<td>0% - 105%</td>
<td></td>
</tr>
<tr>
<td>Load Regulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1:</td>
<td>0.5%</td>
<td>(10-100% load change)</td>
</tr>
<tr>
<td>Output 2:</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>(4001-5 Models)</td>
<td>8.0%</td>
<td></td>
</tr>
<tr>
<td>(2001 Model)</td>
<td>6.0%</td>
<td></td>
</tr>
<tr>
<td>Output 3:</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Output 4:</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Source Regulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs 1 - 4:</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Cross Regulation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs 2 - 4:</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Output Noise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs 1 - 4:</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>Turn on Overshoot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transient Response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs 1 - 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage Deviation</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Recovery Time</td>
<td>500µS</td>
<td></td>
</tr>
<tr>
<td>Load Change</td>
<td>50% to 100%</td>
<td></td>
</tr>
<tr>
<td>Output Overvoltage Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 1:</td>
<td>110% to 150%</td>
<td></td>
</tr>
<tr>
<td>Output Overpower Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110-150% rated Pout, cycle on/off, auto recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Up Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Seconds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

INPUT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Input Voltage Range</th>
<th>36-72 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Under-Voltage Lockout</td>
<td></td>
</tr>
<tr>
<td>Turn-On Voltage</td>
<td>29.0-35.0 VDC</td>
</tr>
<tr>
<td>Turn-Off Voltage</td>
<td>28.0-34.0 VDC</td>
</tr>
<tr>
<td>Input Ovovervoltage Shutdown</td>
<td>77.0-86.0 VDC</td>
</tr>
<tr>
<td>Maximum Input Current</td>
<td>4.2 A</td>
</tr>
<tr>
<td>Reflected Ripple Current</td>
<td>5 %</td>
</tr>
<tr>
<td>Efficiency</td>
<td>82% Typ., Full Power, 48VDC, varies by model</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Ambient Operating Temperature Range</th>
<th>0°C to + 70°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range</td>
<td>-40°C to + 85°C</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>0.02%/°C</td>
</tr>
</tbody>
</table>

GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Means of Protection</th>
<th>Primary to Secondary 2MOOP (Means of Operator Protection)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary to Ground 1MOOP (Means of Operator Protection)</td>
</tr>
<tr>
<td></td>
<td>Secondary to Ground Operational Insulation(Consult factory for 1MOOP or 1MOPP)</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>424VDC, Primary to Secondary</td>
</tr>
<tr>
<td>Reinforced Insulation</td>
<td>2121 VDC, Primary to Ground</td>
</tr>
<tr>
<td>Basic Insulation</td>
<td>707 VDC, Secondary to Ground</td>
</tr>
<tr>
<td>Operational Insulation</td>
<td>100,000 Hours min., MIL-STD-202, 25°C, GB</td>
</tr>
<tr>
<td>Power Good Signal</td>
<td>Logic high with input voltage above Vin min.</td>
</tr>
<tr>
<td>Remote Sense (amps only)</td>
<td>250µm compensation of output cable losses</td>
</tr>
<tr>
<td>Mean-Time Between Failures</td>
<td>100,000 Hours min., MIL-HDBK-217F, 25°C, GB</td>
</tr>
<tr>
<td>Weight</td>
<td>0.65 Lbs. Open Frame</td>
</tr>
<tr>
<td></td>
<td>1.15 Lbs. Chassis and Cover</td>
</tr>
</tbody>
</table>

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

WEB: www.ipdpower.com
1. Each output can deliver its rated current but Total Output Power must not exceed 110W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV (single output models only). The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 80W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 110W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 65W with convection cooling and Chassis/Sense option.
16. Total Power must not exceed 110W with 300LFM forced-air cooling and Chassis/Sense option.
17. Rated 8A maximum with convection cooling.
18. Rated 16A maximum with convection cooling.
19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
20. Total current from Outputs 1 & 2 must not exceed 12A with convection cooling.

**CONNECTOR SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>DC Input 0.156 friction lock header mates with Tyco 640250-4 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Single) 0.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Multiple) 0.156 friction lock header mates with Tyco 1-770849-0 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>G</td>
<td>Ground 0.187 quick disconnect terminal.</td>
</tr>
<tr>
<td>P3.P.G.</td>
<td>Sense (Single) 0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3.P.G.</td>
<td>Multiple 0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>
150 WATTS
SINGLE/MULTI OUTPUT DC-DC

FEATURES:
- Compact 3.8" x 5" x 1.3" Size
- 2 Year Warranty
- 36-72VDC Input
- One to Four Outputs
- 424VDC Reinforced Insulation
- Under/Overvoltage Lockout
- Size/Pin Compatible with REL-150 Series

SAFETY SPECIFICATIONS

CHASSIS/COVER

OPEN FRAME

MODEL LISTING

MODEL

OUTPUT 1 (20)

OUTPUT 2 (20)

OUTPUT 3 (19)

OUTPUT 4 (19)

DC4-150-4001

+3.3V/15A

+5V/8A

+12V/2A

-12V/2A

DC4-150-4002

+3.3V/15A

+3.3V/8A

+12V/2A

-12V/2A

DC4-150-4003

+5V/15A

+3.3V/8A

+15V/2A

-15V/2A

DC4-150-4004

+5V/15A

+5V/8A

+12V/2A

-12V/2A

DC4-150-4005

+5V/15A

-5V/8A

+15V/2A

-15V/2A

DC4-150-4006

+5V/15A

+24V/3A

+12V/2A

-12V/2A

DC4-150-4007

+5V/15A

+24V/3A

+15V/2A

-15V/2A

DC4-150-3001

+5V/15A

+12V/4A

-12V/3A

DC4-150-3002

+5V/15A

+15V/3A

-15V/2A

DC4-150-2001

+3.3V/15A

+12V/2A

-12V/2A

DC4-150-2002

+5V/15A

+12V/5A

-12V/5A

DC4-150-2003

+5V/15A

+24V/3A

-24V/3A

DC4-150-2004

+12V/7.5A

-12V/5A

DC4-150-2005

+15V/5A

-15V/5A

DC4-150-1001

2.5V/30A

DC4-150-1002

3.3V/30A

DC4-150-1003

5V/30A

DC4-150-1004

12V/12.5A

DC4-150-1005

15V/10.0A

DC4-150-1006

24V/6.3A

DC4-150-1007

28V/5.4A

DC4-150-1008

48V/3.1A

MEAN-TIME BETWEEN FAILURES
100,000 Hours min., MIL-HDBK-217F, 25° C, GB

WEIGHT
0.90 lbs. Open Frame
1.60 lbs. Chassis and Cover

POWER GOOD SIGNAL
Optional Chassis/Cover

 zich

0.02%

82% Typ., Full Power, 48 VDC, varies by model

ENVIRONMENTAL SPECIFICATIONS

Ambient Temperature Range - 40°C to + 75°C

Temperature Coefficient ±0.02%/°C

MEANS OF PROTECTION
Primary to Secondary 2MOOP (Means of Operator Protection)
Primary to Ground 1MOOP (Means of Operator Protection)
Secondary to Ground Operational Insulation (Consult factory for 1MOOP or 1MOPP)

REFRACTIVE INDEX (RI)

Reinforced Insulation 1.54242 VDC, Primary to Secondary
Basic Insulation 1.52121 VDC, Primary to Ground
Operational Insulation 1.570 VDC, Secondary to Ground

REMOTE SENSE
250µV compensation of output cable losses

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

FORCED AIR COOLING

CONVECTION COOLING

WITH CHASSIS/COVER

All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.

CH – Chassis
CO – Cover
BD – Reverse Input Protection
I/O – Isolated Outputs
TS – Terminal Strip

INTEGRATED POWER DESIGNS
300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com
DC4-150 SERIES MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 150W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic-high signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
13. Total Power must not exceed 100W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 150W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 85W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 150W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 12A maximum with convection cooling.
18. Rated 20A maximum with convection cooling.
19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
20. Total current from Outputs 1 & 2 must not exceed 15A with convection cooling.

CONNECTOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>DC Input 0.156 friction lock header mates with Molex 09-50-3061 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Single) 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)</td>
</tr>
<tr>
<td>P2</td>
<td>DC Output (Multiple) 0.156 friction lock header mates with Molex 09-50-3141 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>G</td>
<td>Ground 0.187 quick disconnect terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>P.G./Sense (Single) 0.100 breakaway header mates with Molex 50-57-9006 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.</td>
</tr>
<tr>
<td>P3</td>
<td>P.G./Sense (Multiple) 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.</td>
</tr>
</tbody>
</table>

INTEGRATED POWER DESIGNS
300 Stewart Road • Wilkes-Barre, PA 18706 • Phone: (570) 824-4666 • Fax: (570) 824-4843 • Email: sales@ipdpower.com • Web: www.ipdpower.com
185 WATTS
SINGLE/MULTI OUTPUT DC-DC

FEATURES:
- Compact 4.2" x 7.0" x 1.5" Size
- 2 Year Warranty
- IEC 60950-1 2nd ed. ITE Certification
- 36-72VDC Input
- 0-70°C Operating Temperature
- One to Four Outputs
- RoHS Compliant
- 4242VDC Reinforced Insulation
- Optional Chassis/Cover
- Under/Overvoltage Lockout
- Power Good Signal
- Size/Pin Compatible with REL-185 Series

CHASSIS/COVER              OPEN FRAME

SAFETY SPECIFICATIONS
Underwriters Laboratories
UL 60950-1-2007, 2nd Edition
UL 60950-1-2005(R)(2012)
CB Reports/Certificates (including all
National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition

UL Recognition
Mark for Canada
CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition
CAN/CSA-C22.2 No. 60950-1-2005

TUV
EN 60950-1/A2:2013, 2nd Edition
EN 60601-1-2006/A1:2013


MODEL LISTING

MODEL         OUTPUT 1(20) OUTPUT 2(20) OUTPUT 3(19) OUTPUT 4(19)
DC4-185-4001  +3.3V/20A(3) +5V/10A +12V/2A -12V/2A
DC4-185-4002  +5V/20A(3) +3.3V/10A +12V/2A -12V/2A
DC4-185-4003  +5V/20A(3) +3.3V/10A +15V/2A -15V/2A
DC4-185-4004  +5V/20A(3) -5V/10A +12V/2A -12V/2A
DC4-185-4005  +5V/20A(3) -5V/10A +15V/2A -15V/2A
DC4-185-4006  +5V/20A(3) -24V/2A +12V/2A -12V/2A
DC4-185-4007  +5V/20A(3) -24V/2A +15V/2A -15V/2A
DC4-185-3001  +5V/20A(3) +12V/5A +12V/3A
DC4-185-3002  +5V/20A(3) +15V/4A +15V/3A
DC4-185-3003  +5V/20A(3) +12V/2A +12V/2A
DC4-185-3004  +12V/10A +12V/2A +15V/5A
DC4-185-1001  2.5V37A(4) +12V/2A +12V/2A
DC4-185-1002  3.3V37A(4) +12V/2A +12V/2A
DC4-185-1003  5V37A(4) +12V/2A +12V/2A
DC4-185-1004  12V/15.4A +12V/2A +12V/2A
DC4-185-1005  15V/12.3A +12V/2A +12V/2A
DC4-185-1006  24V/7.7A +12V/2A +12V/2A
DC4-185-1007  28V/6.6A +12V/2A +12V/2A
DC4-185-1008  48V/3.8A +12V/2A +12V/2A

ORDERING INFORMATION
Consult factory for alternate output configurations.
Consult factory for positive, negative or floating outputs.
Please specify the following optional features when ordering:
CH – Chassis
CO – Cover
BD – Reverse Input Protection
IO – Isolated Outputs
TS – Terminal Strip

POWER DESIGNS
INTEGRATED
300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com
DC4-185 SERIES MECHANICAL SPECIFICATIONS

APPLICATIONS INFORMATION

1. Each output can deliver its rated current but Total Output Power must not exceed 185W as determined by the cooling method.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
4. This product is intended for use as a professionally-installed component within information technology, industrial, and medical equipment and is not intended for stand-alone operation.
5. A minimum load of 10% is required on Output 1 to ensure proper regulation of remaining outputs.
6. Peak-to-Peak Output Ripple and Noise is measured directly at the output terminals of the power supply, without the use of the probe ground lead or retractable tip (tip-and-barrel method), 20 MHz bandwidth.
7. This product was type-tested and safety-certified using the dielectric strength test voltages listed in Table 6 of IEC 60601-1:2005. In consideration of Clause 8.8.3, care must be taken to ensure that the voltage applied to a reinforced insulation does not overstress different types and levels of insulation. Primary and secondary-to-ground capacitors may need to be disconnected prior to performing a dielectric strength test on the power supply or the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB of UL 60601-1 1st Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
8. This power supply has been safety-approved and final-tested using a DC dielectric strength test. Please consult factory before performing an AC dielectric strength test.
9. Remote-Sense terminals may be used to compensate for cable losses up to 250mV. The use of a twisted pair, decoupling capacitors and an appropriately-rated low-impedance capacitor connected across the load will increase noise immunity.
10. Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.250 inches.
11. Power Good feature provides a logic signal from an open collector transistor when DC input reaches minimum operating voltage.
12. 300LFM minimum of airflow must be maintained one inch above all tops of point components or cover when forced-air cooling is required.
13. Total Power must not exceed 135W with convection cooling on open-frame models except where noted.
14. Total Power must not exceed 185W with 300LFM forced-air cooling on open-frame models.
15. Total Power must not exceed 110W with convection cooling and Chassis/Cover option.
16. Total Power must not exceed 185W with 300LFM forced-air cooling and Chassis/Cover option.
17. Rated 15A maximum with convection cooling.
18. Rated 27A maximum with convection cooling.
19. Total current from Outputs 3 & 4 must not exceed 3A with convection cooling.
20. Total current from Outputs 1 & 2 must not exceed 20A with convection cooling.

CONNECTOR SPECIFICATIONS

P1 DC Input #6 standard (3)position terminal block.
P2 DC Output (Single) 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb max)
P3 DC Output (Multiple) 0.156 friction lock header mates with Molex 09-50-3161 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
P4 Ground 0.187 quick disconnect terminal.
P5 P.G./Sense (Single) 0.100 breakaway header mates with Molex 50-57-9008 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P6 P.G./Sense (Multiple) 0.100 breakaway header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.