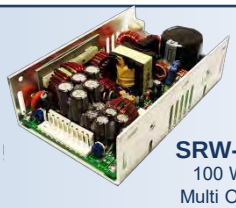
Power Supplies for every application

SRP SERIES

SRP-25
25 Watt
Multi Output

SRP-40A
40 Watt
Multi Output



SRW-100
100 Watt
Multi Output

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

SERIES	PAGE
SRP-25	2
SRP-40A	4
SRW-100	6

GRN SERIES

GRN-60
60 Watt
Single Output

GRN-80
80 Watt
Single Output

GRN-110
110 Watt
Single Output

- Universal (85-264Vac) Input
- Energy Saver Series
- Single Output
- 60-110 W Up to 90% Efficiency
- <0.3W No Load Input Power
- Medical & Industrial Applications

SERIES	PAGE
GRN-60	10
GRN-80	12
GRN-110	16

GRN SERIES

NEW

GRN-45
45 Watt
Multi Output

GRN-80
80 Watt
Multi Output

GRN-110
110 Watt
Multi Output

GRN-200
200 Watt
Multi Output

- Universal (85-264Vac) Input
- Energy Saver Series
- 2-4 Outputs
- 45-200 W Up to 90% Efficiency
- <1W No Load Input Power
- Medical & Industrial Applications

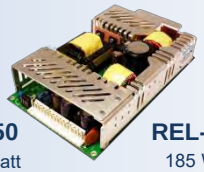
SERIES	PAGE
GRN-45	8
GRN-80	14
GRN-110	18
GRN-200	20

REL SERIES

REL-70
70 Watt
Multi Output

REL-110
110 Watt
Multi Output

REL-150
150 Watt
Multi Output

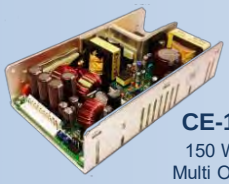


REL-185
185 Watt
Multi Output

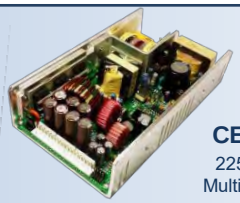
- Universal (85-264Vac) Input
- 1-4 Outputs
- Mid Range Power (70-185 W)
- Medical & Industrial Applications

SERIES	PAGE
REL-70	22
REL-110	24
REL-150	26
REL-185	28

CE SERIES



CE-150
150 Watt
Multi Output



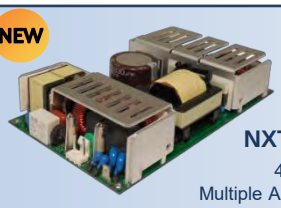
CE-225
225 Watt
Multi Output

- Universal (85-264Vac) Input
- (150-225 Watt)
- 1-4 Tightly Regulated Outputs
- Medical & Industrial Applications

SERIES	PAGE
CE-150	30
CE-225	32

NXT SERIES

NEW



NXT-400M
400 Watt
Multiple Adjustable Outputs

- Universal (85-264Vac) Input
- (400 Watt)
- 2-4 Regulated & Adjustable Outputs
- <0.3W No Load Input Power "Optional"
- Medical & Industrial Applications

SERIES	PAGE
NXT-400M	34

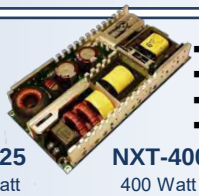
NXT SERIES

NXT-100
100 Watt
Single Output

NXT-175
175 Watt
Single Output

NXT-225
225 Watt
Single Output

NXT-325
350 Watt
Single Output



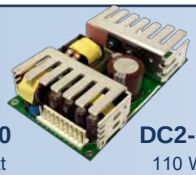
NXT-400
400 Watt
Single Output

- Universal (85-264Vac) Input
- (100-400 Watt)
- Single Output
- Single Wire Load Share
- Medical & Industrial Applications

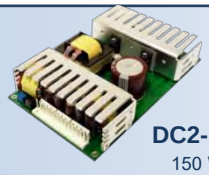
SERIES	PAGE
NXT-100	36
NXT-175	38
NXT-225	40
NXT-325	42
NXT-400	44

DC2 SERIES

DC2-70
70 Watt
Multi Output



DC2-110
110 Watt
Multi Output



DC2-150
150 Watt
Multi Output

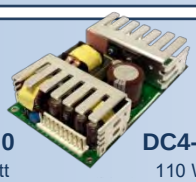
DC2-185
185 Watt
Multi Output

- DC (18-36 VDC) Input
- (70-185) Watt
- 1-4 Outputs
- Reinforced Insulation
- Medical & Industrial Applications

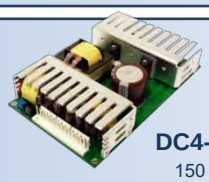
SERIES	PAGE
DC2-70	46
DC2-110	48
DC2-150	50
DC2-185	52

DC4 SERIES

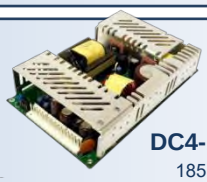
DC4-70
70 Watt
Multi Output



DC4-110
110 Watt
Multi Output



DC4-150
150 Watt
Multi Output



DC4-185
185 Watt
Multi Output

- DC (36-72 VDC) Input
- (70-185) Watt
- 1-4 Outputs
- Reinforced Insulation
- Medical & Industrial Applications

SERIES	PAGE
DC4-70	54
DC4-110	56
DC4-150	58
DC4-185	60

25 WATTS

SINGLE/MULTI OUTPUT AC-DC

SRP-25

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 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**
- **RoHS Compliant**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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
SRP-25-3001	+5V/3A	+12V/1.5A	-12V/0.5A
SRP-25-3002	+5V/3A	+15V/1.5A	-15V/0.5A
SRP-25-3003	3.3V/2.5A	6V/2A	5V/1A
SRP-25-2001	+5V/3A	+24V/1A	
SRP-25-2002	+5V/3A	+12V/1.5A	
SRP-25-2003	+5V/3A	-5V/2A	
SRP-25-2004	+12V/1.5A	-12V/1.5A	
SRP-25-2005	+15V/1.5A	-15V/1.5A	
SRP-25-1001	3.3V/6A		
SRP-25-1002	5V/5A		
SRP-25-1003	12V/2.08A		
SRP-25-1004	15V/1.67A		
SRP-25-1005	24V/1.04A		
SRP-25-1006	48V/0.52A		

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

OUTPUT SPECIFICATIONS

Total Output Power(1) (See Derating Chart)	25W (20W, 1001)		
Output Voltage Centering	Output 1: Output 2: Output 3:	± 0.25% ± 5.0% ± 2.0%	(All outputs at 50% load)
Output Voltage Adjust Range	Output 1:	95 - 105%	
Load Regulation	Output 1: Output 2: Output 2: (2003) Output 3:	0.5% 5.0% 6.0% 1.0%	(0-100% load change) (10-100% load change) (30-100% load change) (0-100% load change)
Source Regulation	Outputs 1 – 3:	0.5%	
Cross Regulation	Output 2: Output 3:	5.0% 2.0%	(Output 1 load varied 50-100%)
Output Noise	Outputs 1-3	1.0%	
Turn on Overshoot	None		
Transient Response Voltage Deviation Recovery Time Load Change	Outputs 1 – 3 5.0% 1ms 50% to 100%		
Output Overvoltage Protection (optional)	Output 1:	110% to 150%	
Output Overcurrent Protection	Output 3:	110% Min.	
Output Overpower Protection	Outputs 1 & 2: Outputs cycle on/off, auto recovery	110% Min.	
Hold Up Time	10ms min., 25W Output, 120V Input		
Start Up Time	1 Second		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Source Current True RMS Peak Inrush	 0.8A at 85V Input 30 A
Efficiency	0.66 - 0.72 (Varies by model)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C Derating: See Power Rating Chart
Ambient Storage Temp. Range	- 40°C to + 85°C
Temperature Coefficient	Outputs 1 – 3: 0.02%/°C

GENERAL SPECIFICATIONS

Means of Protection Primary to Secondary Primary to Ground Secondary to Ground	 2MOPP (Means of Patient Protection) 1MOPP (Means of Patient Protection) (1MOOP-Singles) Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation	 5656 VDC, Primary to Secondary 2121 VDC, Primary to Ground 707 VDC, Secondary to Ground
Leakage Current Earth Leakage Touch Current	 <300µA NC, <1000µA SFC <100µA NC, <500µA SFC
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.30 Lbs. Open Frame 0.62 Lbs. Chassis and Cover

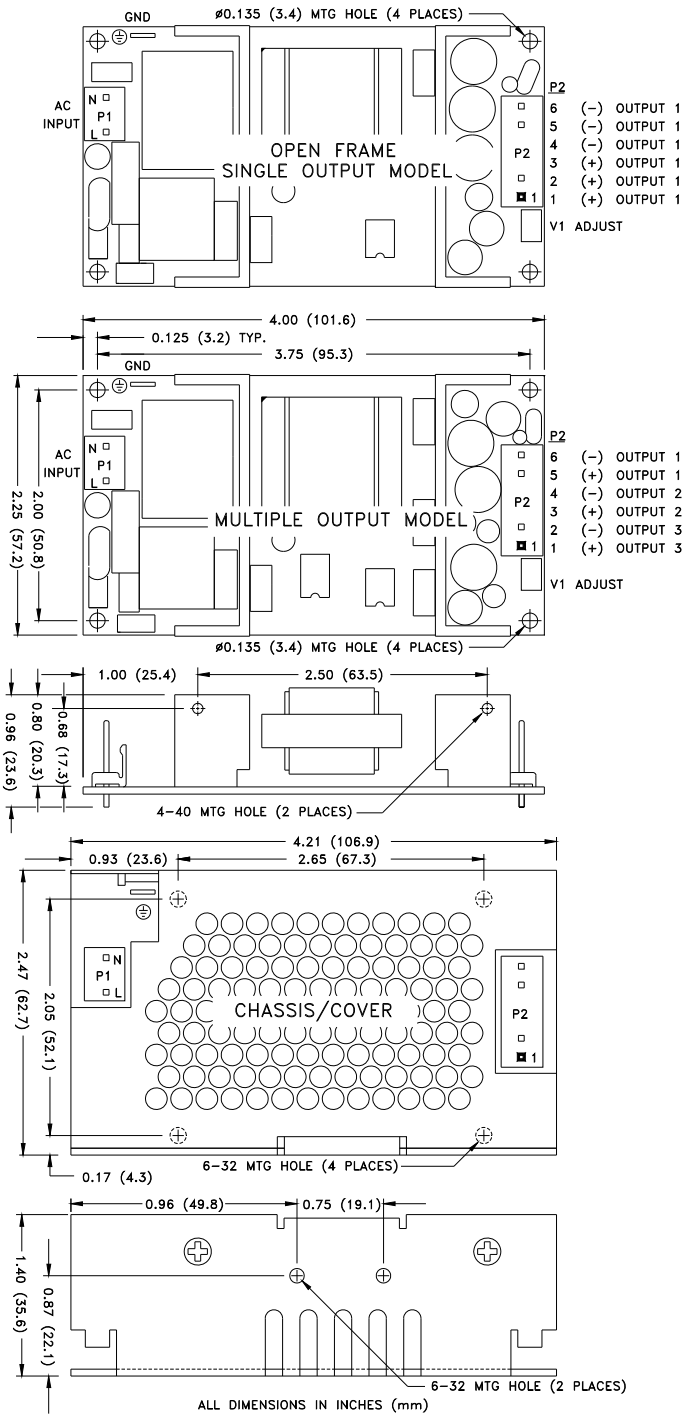
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ed./IEC 61000-6-2:2005)

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315° 0% U_T, 1 cycles, 0° 40% U_T, 10/12 cycles, 0° 70% U_T, 25/30 cycles, 0°	100/240V A/A 100/240V A/A 100/240V B/A 100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

All specifications are maximum at 25°C/25W 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

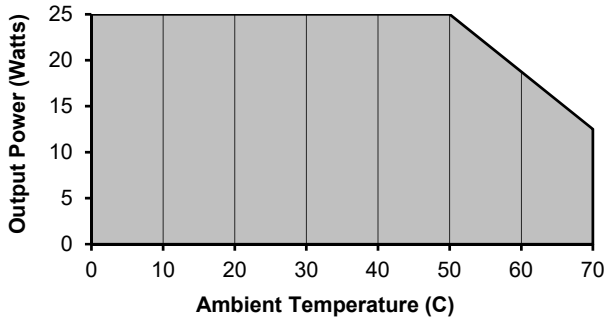
SRP-25 SERIES MECHANICAL SPECIFICATIONS



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 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 0.250 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.

REV. M 2/23/2017

40 WATTS

SINGLE/MULTI OUTPUT AC-DC

SRP-40A

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**
- **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**
- **RoHS Compliant**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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
SRP-40A-4001	+3.3V/5A	+5V/3A	+12V/0.7A	-12V/0.7A
SRP-40A-4002	+5V/5A	+3.3V/3A	+12V/0.7A	-12V/0.7A
SRP-40A-4003	+5V/5A	-5V/3A	+12V/0.7A	-12V/0.7A
SRP-40A-4004	+5V/5A	-5V/3A	+15V/0.7A	-15V/0.7A
SRP-40A-4005	+5V/5A	+24V/1.5A	+12V/0.7A	-12V/0.7A
SRP-40A-4006	+5V/5A	+24V/1.5A	+15V/0.7A	-15V/0.7A
SRP-40A-4007	+3.3V/3.1A	+5V/1.25A	-24V/.27A	-51.6V/.25A
SRP-40A-3001	+5V/5A	+12V/2A	-12V/0.7A	
SRP-40A-3002	+5V/5A	+15V/2A	-15V/0.7A	
SRP-40A-3003	+24V/1.5A		+15V/0.7A	-15V/0.7A
SRP-40A-3004	+14.5V/1.5A	-14.5V/1.5A	+5V/1A	
SRP-40A-3005	+5.1V/5A	+15V/2A	+9V/0.7A	
SRP-40A-2001	+5V/5A	+24V/1.5A		
SRP-40A-2002	+5V/5A	+12V/3A		
SRP-40A-2003	+5V/5A	-5V/4A		
SRP-40A-2004	+12V/3A	-12V/3A		
SRP-40A-2005	+15V/2.5A	-15V/2A		
SRP-40A-2006	+30V/1.2A		-15V/0.7A	
SRP-40A-2007	+3.3V/5A		+5V/0.7A	
SRP-40A-2008	+6V/5A	+9V/1A		
SRP-40A-1001	3.3V/10A			
SRP-40A-1002	5V/8A			
SRP-40A-1003	12V/3.33A			
SRP-40A-1004	15V/2.67A			
SRP-40A-1005	24V/1.67A			
SRP-40A-1006	48V/0.83A			
SRP-40A-1007	9V/4.45A			
SRP-40A-1008	12V/3.33A			

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
CO – Cover
I/O – Isolated Outputs
TS – Terminal Strip

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1) (See Derating Chart)	40W (33W, 1001)		
Output Voltage Centering	Output 1: Output 2: Output 3: Output 4:	± 0.25% ± 5.0% ± 3.0% ± 3.0%	(All outputs at 50% load)
Output Voltage Adjust Range	Output 1:	95 - 105%	
Load Regulation	Output 1: Output 2: (2003,4002) Output 3: Output 4:	0.5% 5.0% 7.0% 0.5% 0.5%	(10-100% load change) (30-100% load change) (30-100% load change) (10-100% load change) (10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Output 2: Output 3: Output 4:	5.0% 0.5% 0.5%	(Output 1 varied 50-100%)
Output Noise	Outputs 1 - 4:	1.0%	
Turn on Overshoot	None		
Transient Response Voltage Deviation Recovery Time Load Change	Outputs 1 – 4 5.0% 2 ms 50% to 100%		
Output Overvoltage Protection	Output 1:	110% to 150%	
Output Overcurrent Protection	Outputs 3 & 4:	110% Min.	
Output Overpower Protection	Outputs 1 & 2: Outputs cycle on/off, auto recovery	110% Min.	
Hold Up Time	10 ms min., 40 W Output, 120V Input		
Start Up Time	1 Second		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Source Current True RMS Peak Inrush	 1A at 85V Input 30 A
Efficiency	0.66 - 0.80 (Varies by model)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0° C to + 70° C 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 Primary to Ground Secondary to Ground	 2MOPP (Means of Patient Protection) 1MOPP (Means of Patient Protection) Operational Insulation (Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9) Reinforced Insulation Basic Insulation Operational Insulation	 5656 VDC, Primary to Secondary 2121 VDC, Primary to Ground 707 VDC, Secondary to Ground
Leakage Current Earth Leakage Touch Current	 <300µA NC, <1000µA SFC <100µA NC, <500µA SFC
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.49 Lbs. Open Frame 0.85 Lbs. Chassis and Cover

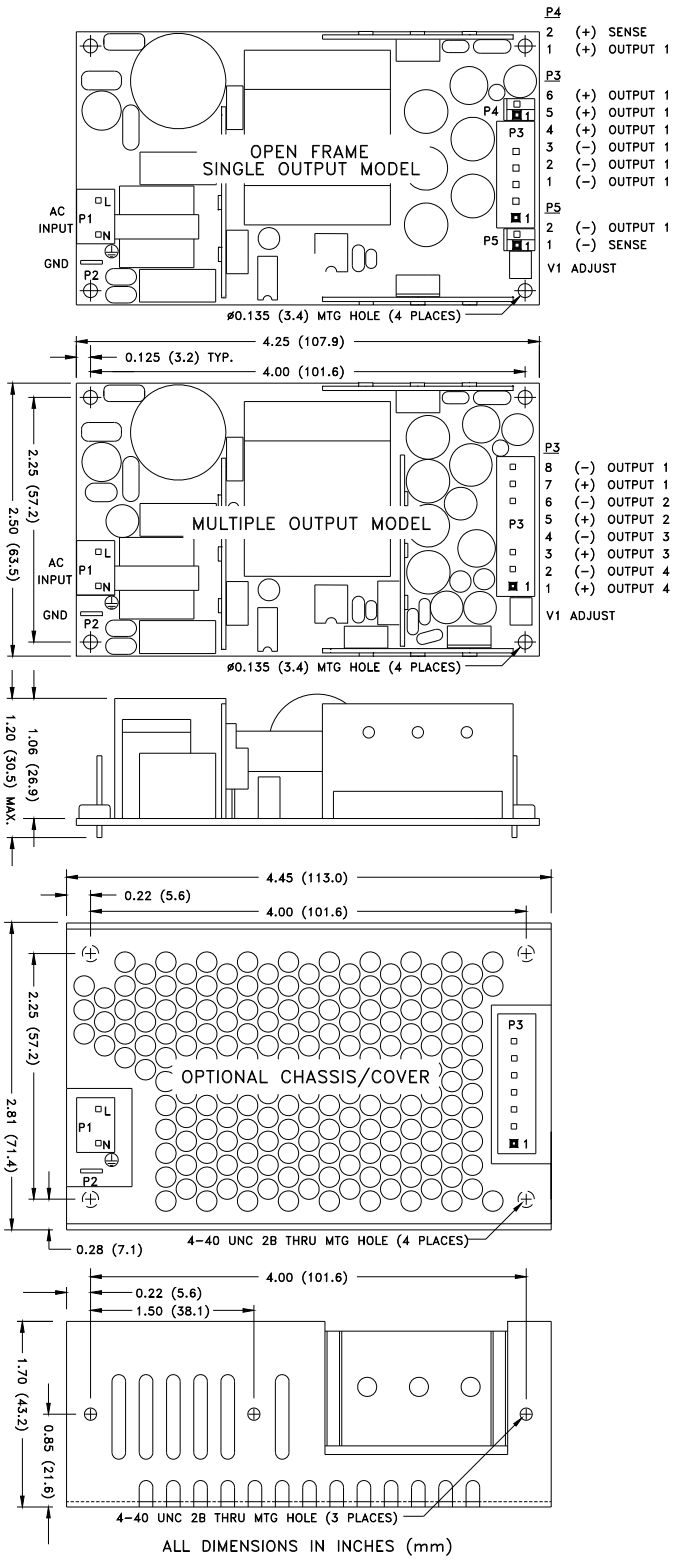
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ED./IEC 61000-6-2:2005)

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	±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	30A/m, 60 Hz.		A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V	A/A
		0% U_T, 1 cycles, 0°	100/240V	A/A
		40% U_T, 10/12 cycles, 0°	100/240V	B/A
		70% U_T, 25/30 cycles, 0°	100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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		
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant		

All specifications are maximum at 25°C/40W 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

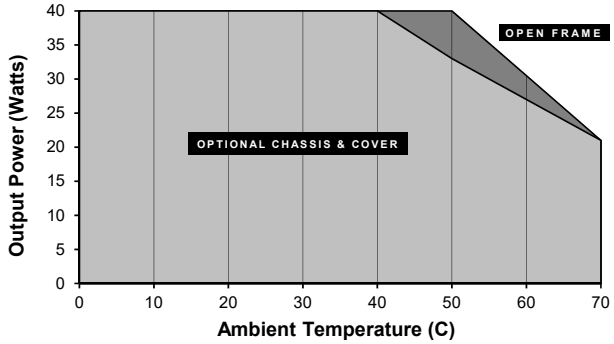
SRP-40A SERIES MECHANICAL SPECIFICATIONS



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 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, 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. Maximum Ambient Temperature is reduced to 40°C with optional Chassis and Cover. See chart below.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



CONNECTOR SPECIFICATIONS

P1	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.
P3	DC Output (Single)	0.156 friction lock header mates with Tyco 770849-6 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.
P3	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.
P4,P5	Sense	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.
G	Ground	0.187 quick disconnect terminal.

REV. P 2/23/2017

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**
- **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 Power Fail Warning**
- **Optional Perforated Cover**

CHASSIS/COVER

OPEN CHASSIS

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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(17)	+5V/4A	+12V/2A(18)	-12V/1A
SRW-100-4002	+5V/10A(17)	+24V/2A	+12V/2A(18)	-12V/1A
SRW-100-4003	+5V/10A(17)	+24V/2A	+15V/2A(18)	-15V/1A
SRW-100-4004	+5V/10A(17)	-5.2V/4A	+12V/2A(18)	-12V/1A
SRW-100-4005	+5V/10A(17)	-5.2V/4A	+15V/2A(18)	-15V/1A
SRW-100-4006	+5V/10A(17)	+3.4V/4A	+9V/1A	24V/.50A
SRW-100-4007	+5V/10A(17)	+15V/3A	+12V/2A	-12V/1A
SRW-100-4008	+5V/10A(17)	+3.3V/4A	+12V/2A	-5V/1A
SRW-100-4009-IT	+3.3V/10A(17)	+5V/4A	+12V/2A	-5V/1A
SRW-100-4010	+5V/5A	+15V/4A	+12V/2A(18)	9V/2.5A
SRW-100-4011	+5V/10A(17)	-15V/2.2A	+15V/2A(18)	12V/1A
SRW-100-4012	+5V/10A(17)	+3.3V/4A	+12V/2A(18)	-12V/1A
SRW-100-3001	+5V/10A(17)	+12V/4A		-12V/1A
SRW-100-3002	+5V/10A(17)	+15V/3A		-15V/1A
SRW-100-3003	+5V/10A(17)	+3.3V/8A		12V/1A
SRW-100-3004	+3.3V/5A	+5.8V/3A		-48V/1A
SRW-100-2001	+12V/5A	-12V/4A		
SRW-100-2002	+15V/5A	-15V/3A		
SRW-100-2003	+12.5V/4A	+16V/2A		
SRW-100-1001	3.3V/20A(19)			
SRW-100-1002	5V/20A			
SRW-100-1003	12V/8.3A			
SRW-100-1004	15V/6.7A			
SRW-100-1005	24V/4.2A			
SRW-100-1006	28V/3.6A			
SRW-100-1007	48V/2.1A			
SRW-100-1008	40V/2.5A			
SRP-100-4001	+5V/12A(17)	+24V/3A	+12V/2A(18)	-12V/1A
SRP-100-4002	+5V/12A(17)	+24V/3A	+15V/2A(18)	-15V/1A
SRP-100-4003	+5V/12A(17)	-5V/4A	+12V/2A(18)	-12V/1A
SRP-100-4004	+5V/12A(17)	-5V/4A	+15V/2A(18)	-15V/1A
SRP-100-4005	+5V/12A(17)	+12V/3A	+8V/2A	-8V/1A
SRP-100-3001	+5V/12A(17)	+12V/4A		-12V/1A
SRP-100-2001	+5V/12A(17)	+24V/3A		

SRW/SRP-100

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	70W	Convection Cooled	
(See Derating Chart)	85W	Convection Cooled w/1Sq.ft baseplate(16)	
	100W	200LFM Forced-Air Cooled(15)	
Output Voltage Centering	Output 1:	± 0.25%	(All outputs at 50% load)
	Output 2: (SRW)	± 0.25%	
	(SRP)	± 5.0%	
	Output 3:	± 2.0%	
	Output 4:	± 4.0%	
Output Voltage Adjust Range	Output 1:	95 - 105%	
		85 - 105%	(1001, 4001)
	Output 2:	95 - 105%	(SRW models only)
Load Regulation	Output 1:	0.5%	(10-100% load change)
	Output 2: (SRW)	0.5%	(10-100% load change)
	(SRP)	5.0%	(10-100% load change)
	Output 3:	1.0%	(10-100% load change)
	Output 4:	1.0%	(10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Output 2: (SRW)	0.2%	(Output 1 load varied 50-100%)
	(SRP)	5.0%	
	Output 3:	0.2%	
	Output 4:	0.2%	
Output Noise	Outputs 1 - 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 1 – 4		
Voltage Deviation	5.0%		
Recovery Time	2mS		
Load Change	50% to 100%		
Output Overvoltage Protection (optional)	Output 1:	110% to 150%	
Output Overpower Protection	Outputs 1 & 2:	110W Min.	
	Outputs cycle on/off, auto recovery		
Output Overcurrent Protection	Outputs 3 & 4:	110% Min.	
Hold Up Time	10ms min., 100W Output, 120V Input		
Start Up Time	1 Second		

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
Efficiency	0.68-0.84 (varies by model)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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)
Primary to Ground	1MOPP (Means of Patient Protection)
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	<500µA NC, <1000µA SFC
Touch Current	<100µA NC, <500µA SFC
Power Fail Signal (optional)(14)	Logic low with input power failure 2ms minimum prior to Output 1 dropping 1%
Remote Sense(single Output Models only)(10)	250mV compensation of output cable losses
Mean-Time Between Failures	150,000 Hours min., MIL-HDBK-217F, 25° C, GB
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.
Please specify the following optional features when ordering:

CO - Cover
PF - Power Fail
OVP - Overvoltage Protection
I/O - Isolated Outputs
TS - Terminal Strip

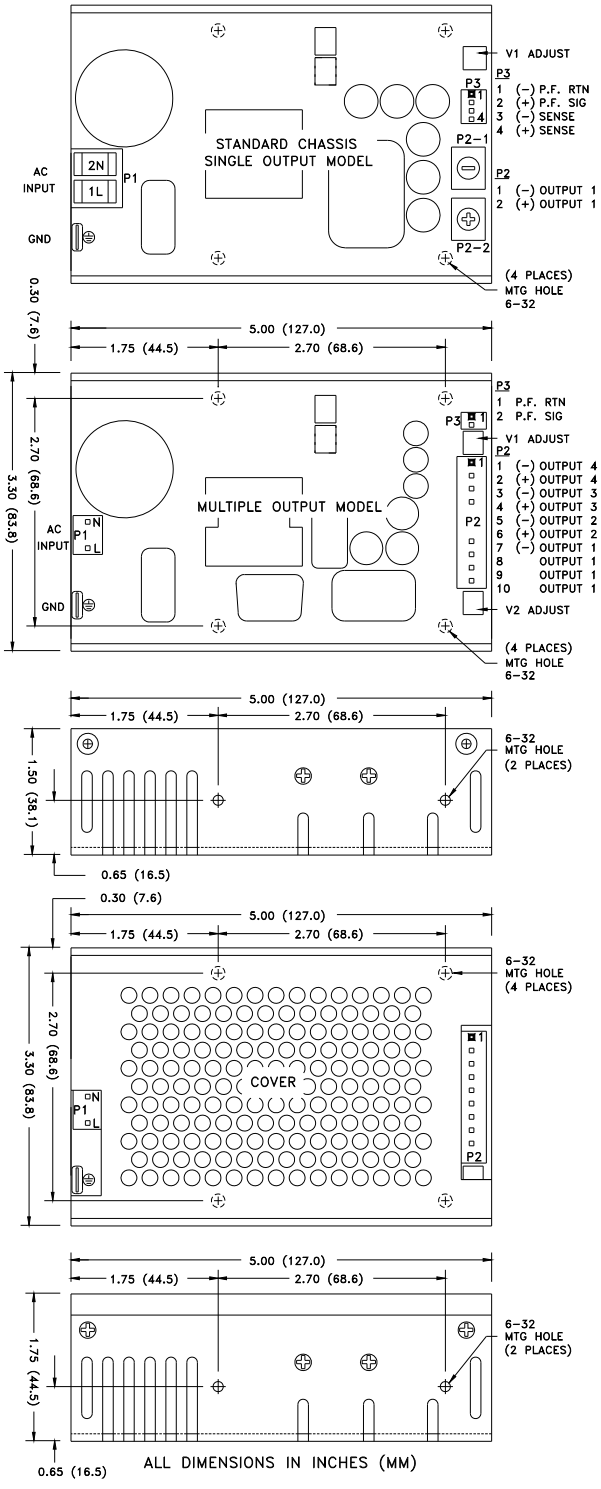
All specifications are maximum at 25°C/100W unless otherwise stated, may vary by model and are subject to change without notice.

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

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 300 cycles, 0°	100/240V B/B
Radiated Emissions	EN 55011/32	Class B	
Conducted Emissions	EN 55011/32	Class B	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

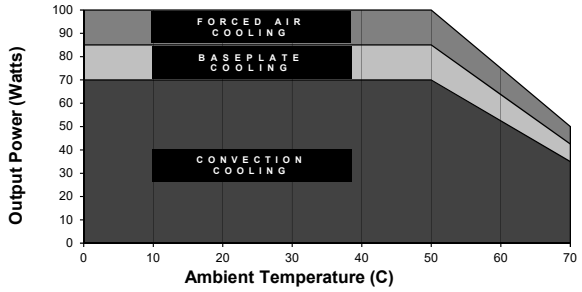
SRW/SRP-100 SERIES MECHANICAL SPECIFICATIONS



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 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. 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, 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 transistor output 2ms prior to loss of output from AC failure.
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



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 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 09-50-3101 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 22-01-2047or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
P3	Option (Multiple)	0.100 friction lock header mates with Molex 22-01-2027or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

REV. N 2/23/2017

45 WATTS

MULTI OUTPUT AC-DC

GRN-45

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-45-4001	+3.3V/5.0A	+5.0V/5.0A	+12V/1.0A	-12V/1.0A
GRN-45-4002	+5.0V/5.0A	-5.0V/5.0A	+12V/1.0A	-12V/1.0A
GRN-45-4003	+5.0V/5.0A	+24V/1.0A	+12V/1.0A	-12V/1.0A
GRN-45-4004	+5.0V/5.0A	+24V/1.0A	+15V/1.0A	-15V/1.0A
GRN-45-3001	+5.0V/5.0A		+12V/1.0A	-12V/1.0A
GRN-45-3002	+5.0V/5.0A		+15V/1.0A	-15V/1.0A
GRN-45-2001	+5.0V/5.0A	+24V/1.0A		
GRN-45-2002	+5.0V/5.0A	+12V/2.0A		
GRN-45-2003	+12V/2.0A	-12V/2.0A		
GRN-45-2004	+15V/2.0A	-15V/2.0A		

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
CO - Cover
OVP - Overvoltage Protection
I/O - Isolated Outputs (consult factory)

All specifications are maximum at 25°C/45W unless otherwise stated, may vary by model and are subject to change without notice.

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	45W	85-264 V_{IN}	
Voltage Centering	Output 1: Outputs 2 - 4:	±0.5% ±5.0%	(All outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%	
Load Regulation	Output 1: Outputs 2 - 4:	±0.5% ±5.0%	(0-100% load change) (10-100% load change)
Source Regulation	Outputs 1 - 4:	0.5%	
Cross Regulation	Outputs 2 - 4:	5.0%	
Ripple & Noise	Outputs 1 - 4	1.0%	
Turn On Overshoot	<1%		
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µS maximum, 4% maximum deviation.		
Overvoltage Protection	Latching, Output 1 between 110% and 150% of rated output voltage (optional)		
Overpower Protection	110%-160% rated P_{OUT}, 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	25ms typical		
Minimum Load(5)	No minimum load required		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 VAC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection(6)	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%, 115/230 V_{IN}, 33% power
No Load Input Power	<1W, 115/230 V_{IN}, no load

ENVIRONMENTAL SPECIFICATIONS

Cooling	Free air convection	
Ambient Operating Temperature Range	0°C to + 70°C 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 40,000 ft. ASL	Operating 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, 3 each direction.	

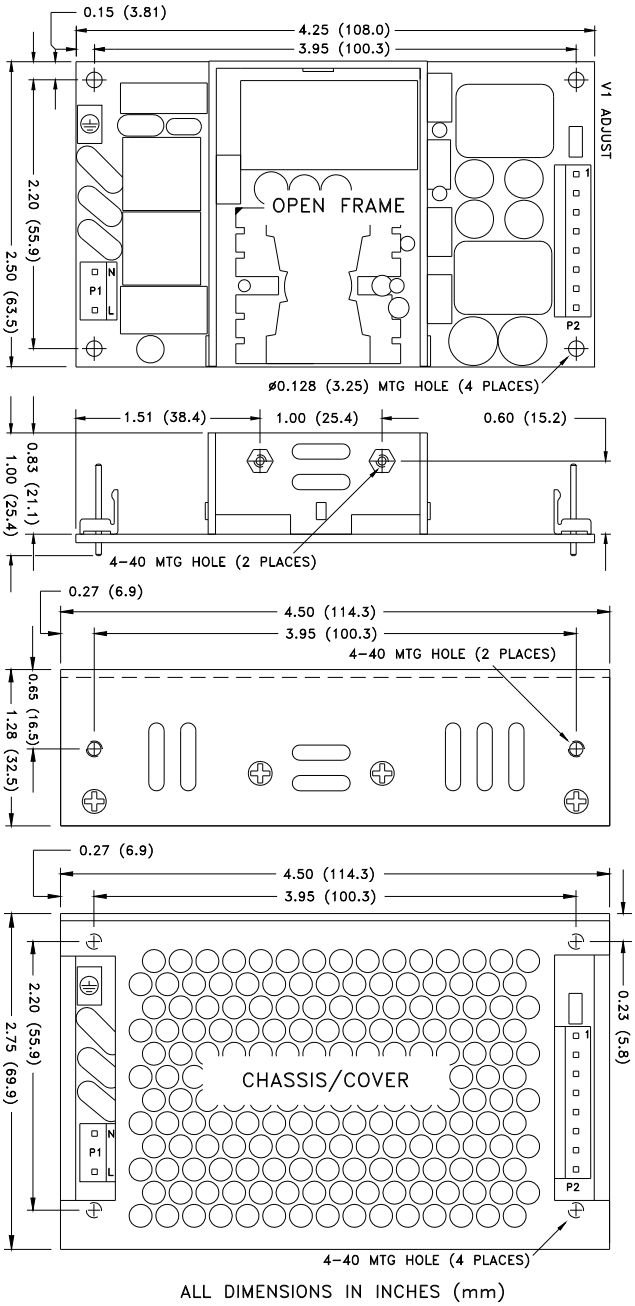
GENERAL SPECIFICATIONS

Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means or Patient Protection)
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
Switching Frequency	100 KHz
Mean-Time Between Failures	>400,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.48 lbs. Open frame / 0.62 lbs. Chassis and cover

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

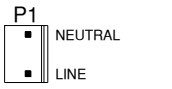
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

GRN-45 MULTI MECHANICAL SPECIFICATIONS



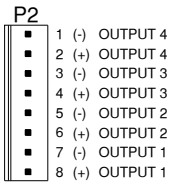
ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS



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.



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

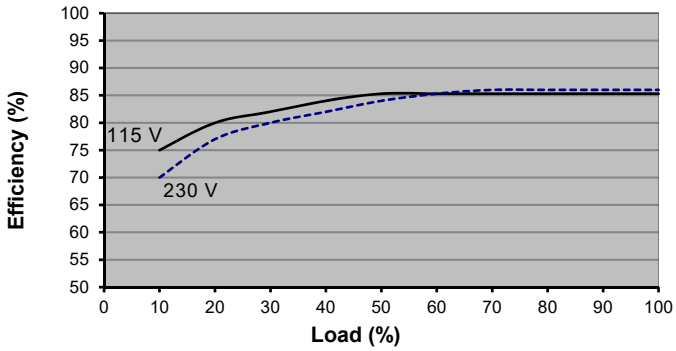
0.187 quick disconnect terminal

APPLICATIONS INFORMATION

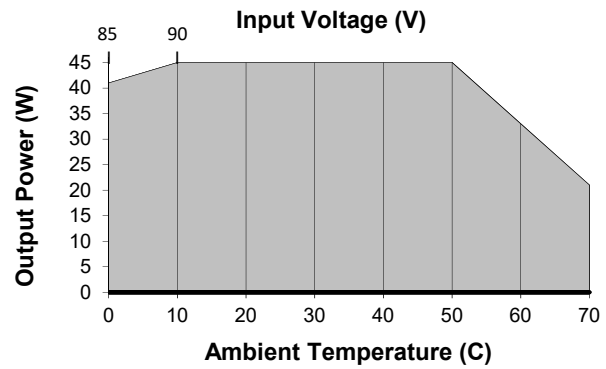
1. Each output can deliver its rated current but Total Output Power must not exceed 45W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area 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 with V4.
    - V4 can be configured negative or floating with respect to V1 and must share a common return with V3.

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 50ºC to 50% load at 70ºC.
- Derate from 100% load at 90V_{IN} to 90% load at 85V_{IN}.

REV. P 2/23/2017

60 WATTS

SINGLE OUTPUT AC-DC

GRN-60

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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
TÜV SÜD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT	POUT
GRN-60-1001	3.3V/9.0A	30W
GRN-60-1002	5.0V/9.0A	45W
GRN-60-1003	12V/5.0A	60W
GRN-60-1004	15V/4.0A	60W
GRN-60-1005	24V/2.5A	60W
GRN-60-1006	28V/2.2A	60W
GRN-60-1007	48V/1.3A	60W
GRN-60-1008	19V/3.1A	60W

ORDERING INFORMATION

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

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	60W	85-264 V_{IN}
Voltage Centering	±0.5%	(Output at 50% load)
Voltage Adjust Range	95-105%	
Load Regulation	±0.5%	(0-100% load change)
Source Regulation	0.5%	
Ripple & Noise	1.0%	<150mV (1001,1002)
Turn-On Overshoot	None	
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µs maximum, 5% maximum deviation (maximum deviation on 1001: 8%, 1002: 6%).	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage (optional).	
Overpower Protection	110-160% rated P_{OUT} min., cycle on/off, auto recovery	
Hold-Up Time	10ms typical, full power, 115V input	
Start-Up Time	1 sec., 115/230V input	
Output Rise Time	27ms typical	
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(5)	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%, 115/230 V_{IN}, 33% power, 81% (1001), 84% (1002)
No Load Input Power	<0.3W, 115/230 V_{IN}, no load

ENVIRONMENTAL SPECIFICATIONS

Cooling	Free air convection	
Ambient Operating Temperature Range	0° to + 70°C Derating: see power rating chart	
Ambient Storage Temp. Range	- 40° to + 85°C	
Operating Relative Humidity Range	20-90% non-condensing	
Altitude	10,000 ft. ASL 40,000 ft. ASL	Operating Non-operating
Temperature Coefficient	0.02%/°C	
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

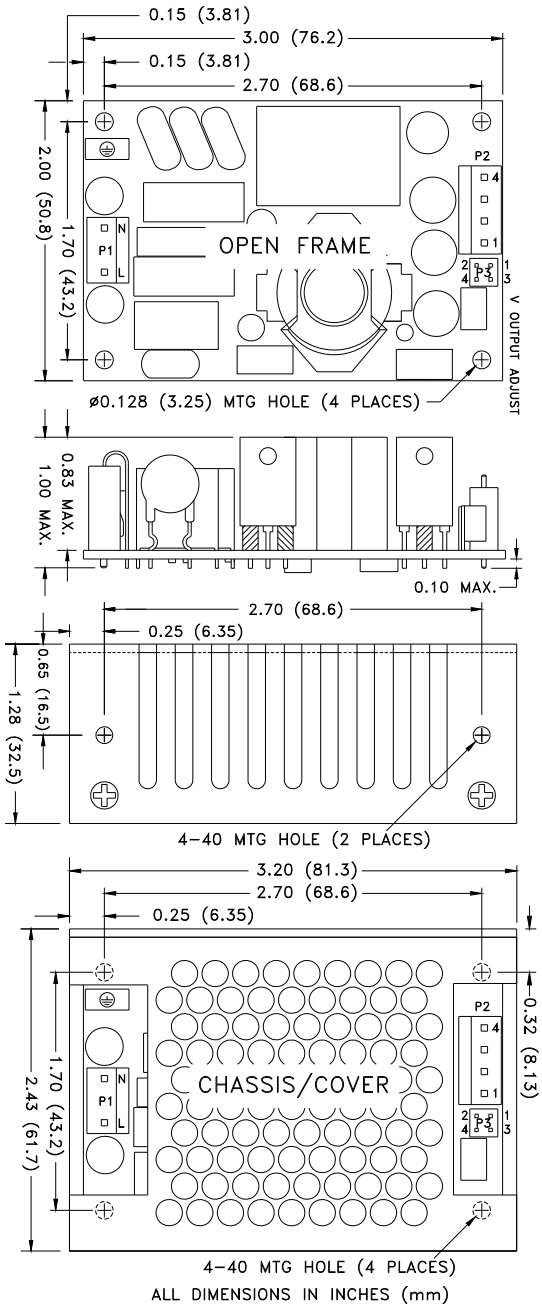
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(7, 8)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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
Switching Frequency	65 KHz
Remote Sense(9)	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

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

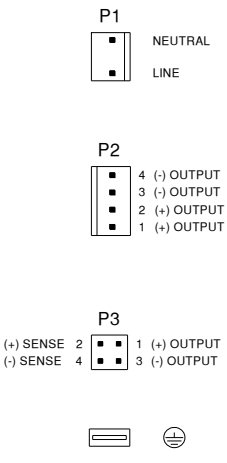
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge		A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM		A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz		A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line		A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM		A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.		A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V	A/A
		0% U_T, 1 cycles, 0°	100/240V	A/A
		40% U_T, 10/12 cycles, 0°	100/240V	B/A
		70% U_T, 25/30 cycles, 0°	100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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		
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant		

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



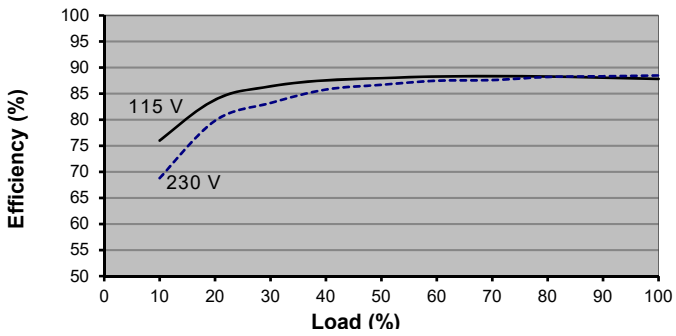
AC Input	0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.
DC Output	0.156 friction lock header mates with Tyco 770849-4 or equivalent crimp terminal housing with Tyco 3-640707-1 equivalent crimp terminal.
DC Sense	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

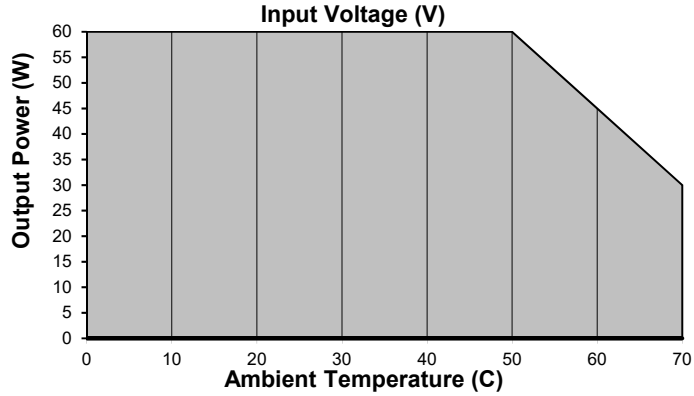
1. Continuous Output Power must not exceed 60W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to 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. 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 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.
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 - Derate from 100% load at 50ºC to 50% load at 70ºC.

REV. Q 2/23/2017

80 WATTS

SINGLE OUTPUT AC-DC

GRN-80

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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
TÜV SÜD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT	POUT
GRN-80-1001	3.3V/16A	53W
GRN-80-1002	5.0V/16A	80W
GRN-80-1003	12V/6.7A	80W
GRN-80-1004	15V/5.3A	80W
GRN-80-1005	24V/3.3A	80W
GRN-80-1006	28V/2.9A	80W
GRN-80-1007	48V/1.7A	80W

ORDERING INFORMATION

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

CH - Chassis
CO - Cover
OVP - Overvoltage Protection

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	80W	85-264 VIN
Voltage Centering	±0.5%	(Output at 50% load)
Voltage Adjust Range	95-105%	
Load Regulation	±0.5%	(0-100% load change)
Source Regulation	0.5%	
Ripple & Noise	1.0%	(1001 & 1002<3%)
Turn On Overshoot	None	
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µS maximum, 5% maximum deviation. (maximum deviation on 1001-8%, 1002-6%)	
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	20ms 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 – 63 Hz
Input Protection(5)	Internal 3A time delay fuse, 1500A breaking capacity
Peak Inrush Current	50A max. at 230 V
Peak Efficiency	89%, 115/230 VIN, 100% power (1001>84%) (1002>87%)
Average Efficiency	87% (1003-1007), 85% (1002), 82% (1001)
Light Load Efficiency	85%, 115/230 VIN, 33% power (1001>81%) (1002>84%)
No Load Input Power	<0.3W, 115/230 VIN, no load (1001<0.5W)

ENVIRONMENTAL SPECIFICATIONS

Cooling	Free air convection	
Ambient Operating Temperature	0°C to + 70°C 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 40,000 ft. ASL	Operating 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, 3 each direction.	

GENERAL SPECIFICATIONS

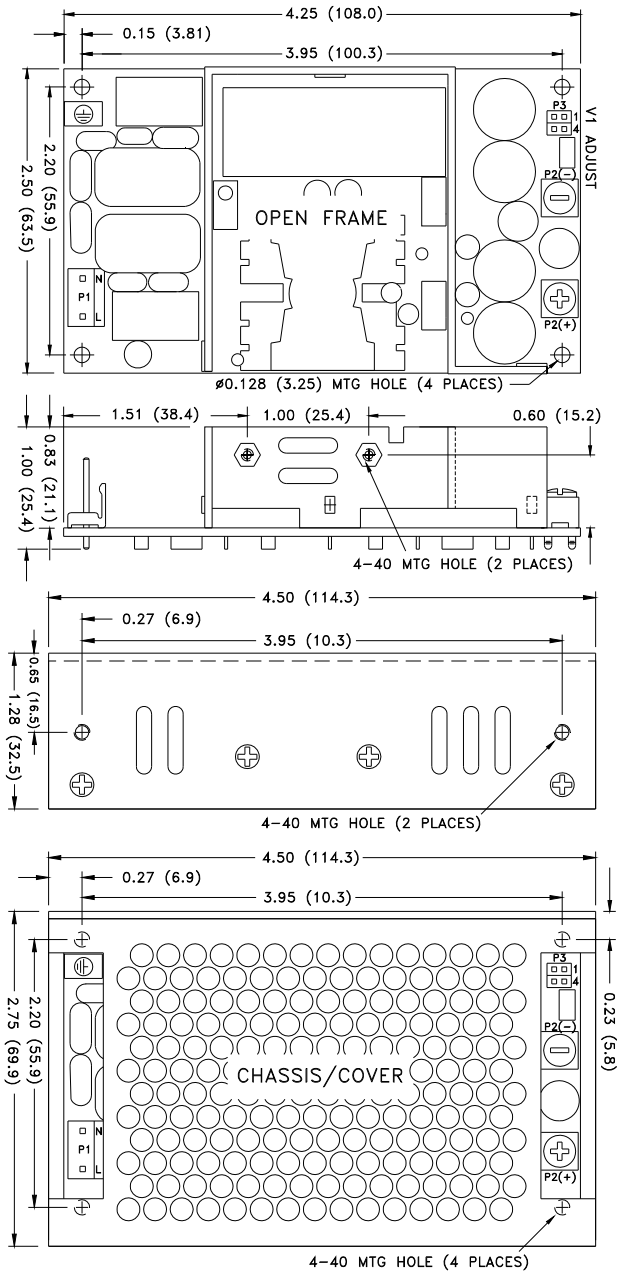
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(7, 8)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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
Switching Frequency	65 KHz
Remote Sense(9)	400 mV compensation of output cable losses
Mean-Time Between Failures	>250,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.43 lbs. Open frame / 0.56 lbs. Chassis and cover

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% UT, 0.5 cycles, 0-315°	100/240V A/A
		0% UT, 1 cycles, 0°	100/240V A/A
		40% UT, 10/12 cycles, 0°	100/240V B/A
		70% UT, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% UT, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

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

GRN-80 SINGLE MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS

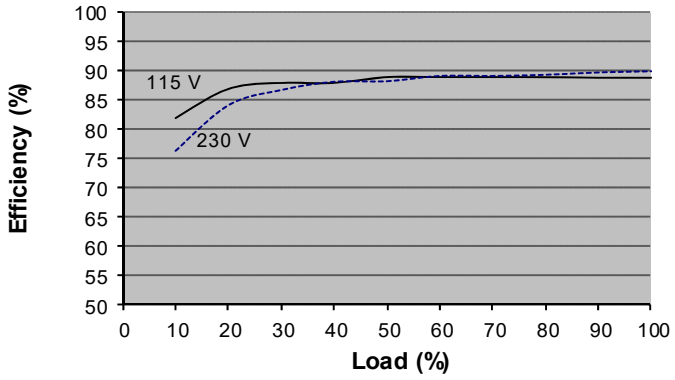
P1 NEUTRAL LINE	AC Input	0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp terminal housing with Tyco 3-640706-1 or equivalent crimp terminal.
P2 (+) OUTPUT (-) OUTPUT	DC Output	6-32 screw down terminal mates with #6 ring tongue terminal (10in-lb Max.)
P3 (-) SENSE 3 2 (+) SENSE (-) OUTPUT 4 1 (+) OUTPUT	Remote 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

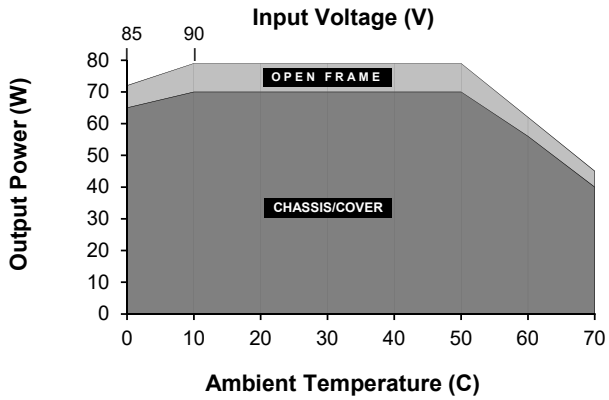
1. Continuous Output Power must not exceed 80W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply to 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 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-80-1004 Efficiency shown)



MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50ºC to 50% load at 70ºC.
- Derate from 100% load at 90V_{IN} to 90% load at 85V_{IN}.
- Derate 10% with chassis and cover.

REV. 8 2/23/2017

80 WATTS

MULTI OUTPUT AC-DC

GRN-80

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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
TÜV SÜD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-80-4001	+3.3V/8.0A	+5.0V/5.0A	+12V/1.5A	-12V/1.5A
GRN-80-4002	+5.0V/8.0A	-5.0V/5.0A	+12V/1.5A	-12V/1.5A
GRN-80-4003	+5.0V/8.0A	+24V/1.0A	+12V/1.5A	-12V/1.5A
GRN-80-4004	+5.0V/8.0A	+24V/1.0A	+15V/1.5A	-15V/1.5A
GRN-80-3001	+5.0V/8.0A		+12V/2.0A	-12V/2.0A
GRN-80-3002	+5.0V/8.0A		+15V/2.0A	-15V/2.0A
GRN-80-2001	+5.0V/8.0A	+24V/2.0A		
GRN-80-2002	+5.0V/8.0A	+12V/4.0A		
GRN-80-2003	+12V/4.0A	-12V/4.0A		
GRN-80-2004	+15V/3.0A	-15V/3.0A		

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	80W	85-264 VIN	
Voltage Centering	Output 1: Outputs 2 - 4:	±0.5% ±5.0%	(All outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%	
Load Regulation	Output 1: Outputs 2 - 4:	±0.5% ±5.0%	(0-100% load change) (10-100% load change)
Source Regulation	Outputs 1 - 4:	0.5%	
Cross Regulation	Outputs 2 - 4:	5.0%	
Ripple & Noise	Outputs 1 - 4	1.0%	
Turn On Overshoot	<1%		
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µS maximum, 4% maximum deviation.		
Overvoltage Protection	Latching, Output 1 between 110% and 150% of rated output voltage (optional)		
Overpower Protection	110%-150% rated POUT, 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	25ms typical		
Minimum Load(5)	No minimum load required		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 VAC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection(6)	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	85%, 115/230 VIN, 33% power
No Load Input Power	<1W, 115/230 VIN, no load

ENVIRONMENTAL SPECIFICATIONS

Cooling	Free air convection	
Ambient Operating Temperature Range	0°C to + 70°C 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 40,000 ft. ASL	Operating Non-operating
Temperature Coefficient	0.02%/°C	
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

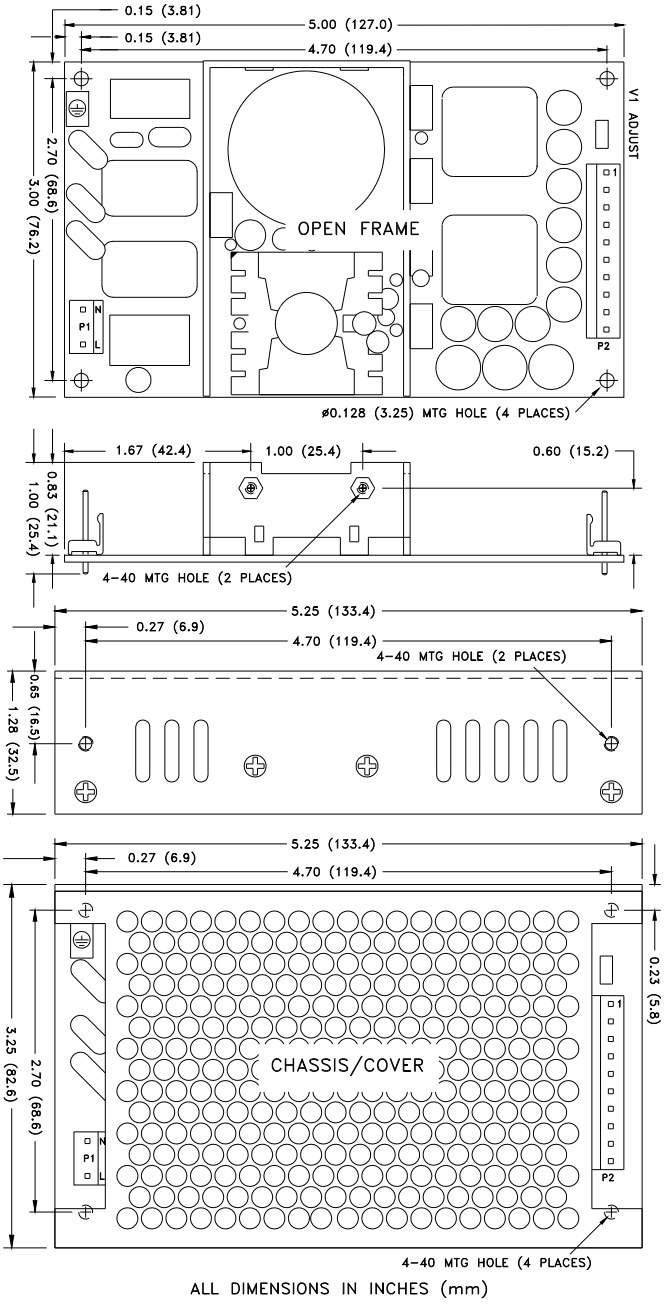
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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
Switching Frequency	100 KHz
Mean-Time Between Failures	>300,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.63 lbs. Open frame / 0.80 lbs. Chassis and cover

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

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	±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	30A/m, 60 Hz.		A
Voltage Dips	EN 61000-4-11	0% UT, 0.5 cycles, 0-315°	100/240V	A/A
		0% UT, 1 cycles, 0°	100/240V	A/A
		40% UT, 10/12 cycles, 0°	100/240V	B/A
		70% UT, 25/30 cycles, 0°	100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% UT, 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		
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant		

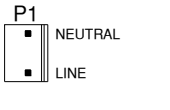
All specifications are maximum at 25°C/80W unless otherwise stated, may vary by model and are subject to change without notice.

GRN-80 MULTI MECHANICAL SPECIFICATIONS



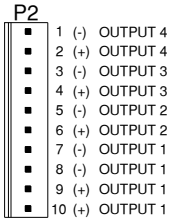
ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS



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.



DC Output

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

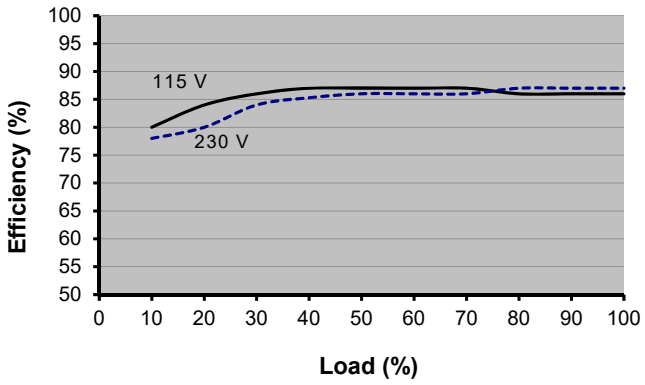
0.187 quick disconnect terminal

APPLICATIONS INFORMATION

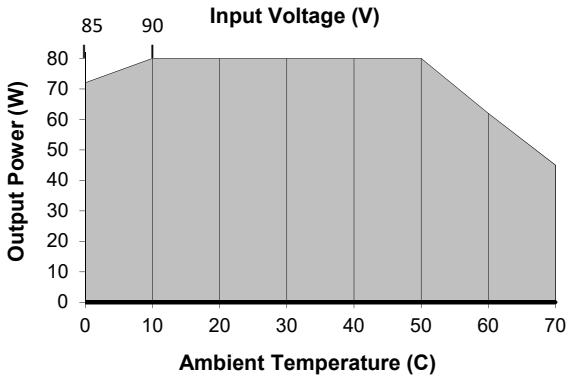
1. Each output can deliver its rated current but Total Output Power must not exceed 80W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area 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 IEC60601-1:2005. 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. 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 50ºC to 50% load at 70ºC.
- Derate from 100% load at 90VIN to 90% load at 85VIN.

REV. 9 2/23/2017

110 WATTS

SINGLE OUTPUT AC-DC

GRN-110

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 EN55011/32**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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
TÜV SÜD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT	POUT
GRN-110-1001	3.3V/22A	73W
GRN-110-1002	5.0V/22A	110W
GRN-110-1003	12V/9.2A	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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	110W	85-264 V_{IN}
Voltage Centering	±0.5%	(Output at 50% load)
Voltage Adjust Range	95-105%	
Load Regulation	±0.5%	(0-100% load change)
Source Regulation	0.5%	
Ripple & Noise	1.0%	(1001, 1002 < 3%)
Turn On Overshoot	None	
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µS maximum, 5% maximum deviation. (maximum deviation on 1001-8%, 1002-6%)	
Overvoltage Protection	Latching, Between 110% and 150% of rated output voltage (optional)	
Overpower Protection	110% rated P_{OUT} 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	47-63 Hz
Input Protection(5)	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%, 115/230 V_{IN}, 33% power (1001 >81%)
No Load Input Power	<0.3W, 115/230 V_{IN}, no load (1001<0.5W)

ENVIRONMENTAL SPECIFICATIONS

Cooling	Free air convection	
Ambient Operating Temperature Range	0°C to + 70 C 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 40,000 ft. ASL	Operating 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, 3 each direction.	

GENERAL SPECIFICATIONS

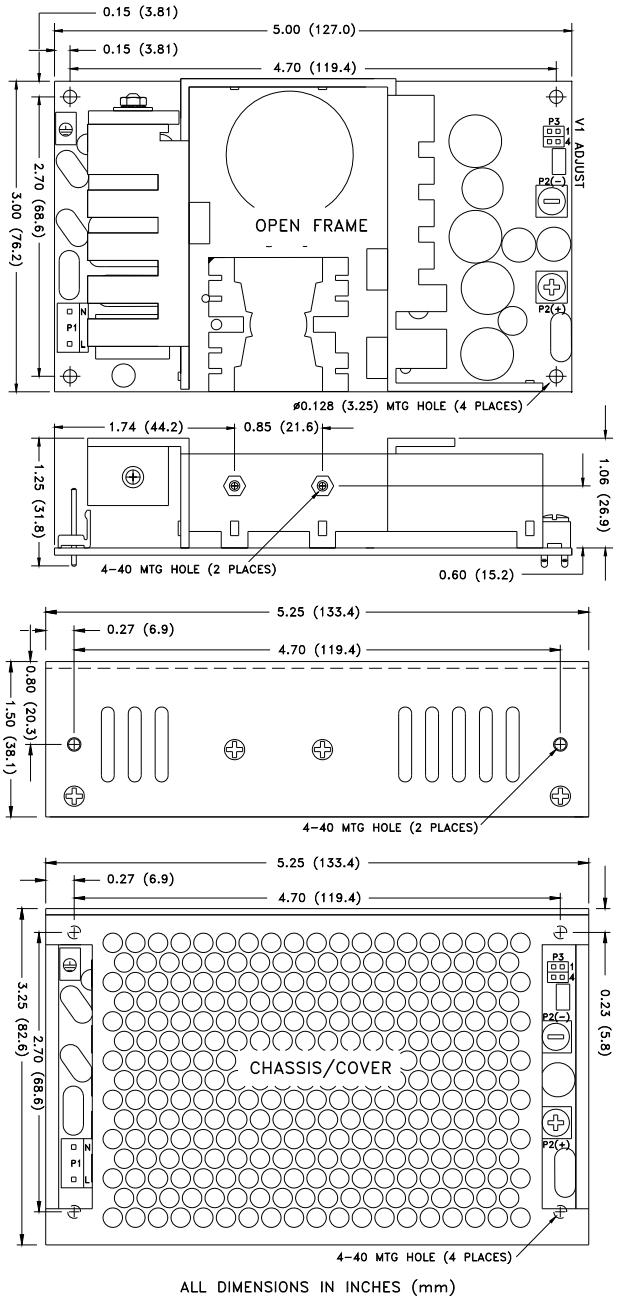
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(7, 8)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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
Switching Frequency	65 KHz
Remote Sense(9)	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

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

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	±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	30A/m, 60 Hz.		A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V	A/A
		0% U_T, 1 cycles, 0°	100/240V	A/A
		40% U_T, 10/12 cycles, 0°	100/240V	B/A
		70% U_T, 25/30 cycles, 0°	100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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 (<100W P_{IN})		
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant		

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

GRN-110 SINGLE MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS

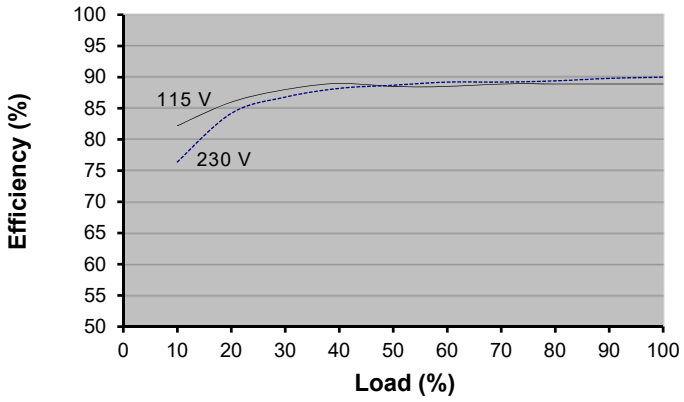
P1 NEUTRAL LINE	AC Input	0.156 friction lock header mates with Tyco 640250-3 or equivalent crimp housing with Tyco 640706-1 or equivalent crimp terminal.
P2 (+) OUTPUT (-) OUTPUT	DC Output	6-32 screw down terminal mates with #6 ring tongue terminal (10in-lb Max.)
P3 (-) SENSE 3 2 (+) SENSE (-) OUTPUT 4 1 (+) OUTPUT	Remote 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

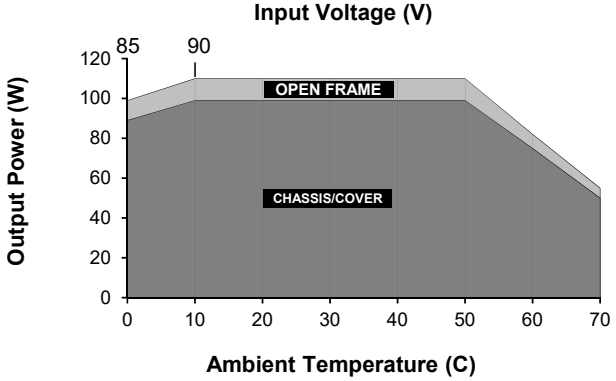
1. Continuous Output Power must not exceed 110W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply 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 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 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.
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 POUT vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50ºC to 50% load at 70ºC.
- Derate from 100% load at 90VIN to 90% load at 85VIN.
- Derate 10% with chassis and cover.

REV. Q 2/23/2017

110 WATTS

MULTI OUTPUT AC-DC

GRN-110

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-110-4001	+3.3V/10A	+5V/5A	+12V/2A	-12V/2A
GRN-110-4002	+5V/10A	-5V/5A	+12V/2A	-12V/2A
GRN-110-4003	+5V/10A	+24V/2A	+12V/2A	-12V/2A
GRN-110-4004	+5V/10A	+24V/2A	+15V/2A	-15V/2A
GRN-110-3001	+5V/12A		+12V/3A	-12V/3A
GRN-110-3002	+5V/12A		+15V/3A	-15V/3A
GRN-110-2001	+5V/12A	+24V/3A		
GRN-110-2002	+5V/12A	+12V/5A		
GRN-110-2003	+12V/5A	-12V/5A		
GRN-110-2004	+15V/4A	-15V/4A		

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
CO - Cover
OVP - Overvoltage Protection
I/O - Isolated Outputs

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	110W	85-264 V_{IN}	
Voltage Centering	Output 1: Outputs 2 - 4:	±0.5% ±5.0%	(All outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%	
Load Regulation	Output 1: Outputs 2 - 4:	±0.5% ±5.0%	(0-100% load change) (10-100% load change)
Source Regulation	Outputs 1 - 4:	0.5%	
Cross Regulation	Outputs 2 - 4:	5.0%	
Ripple & Noise	Outputs 1 - 4	1.0%	
Turn On Overshoot	<1%		
Transient Response	Output recovers to within 1% of initial set point due to a 50% step load change, 500µS maximum, 4% maximum deviation.		
Overvoltage Protection	Latching, Output 1 between 110% and 150% of rated output voltage (optional)		
Overpower Protection	110%-150% rated P_{OUT}, 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	25ms typical		
Minimum Load(5)	No minimum load required		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 VAC (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 230 V
Peak Efficiency	87%
Average Efficiency	85% (Avg. of 25%, 50%, 75% and 100% rated load)
Light Load Efficiency	85%, 115/230 V_{IN}, 33% power
No Load Input Power	<1W, 115/230 V_{IN}, no load

ENVIRONMENTAL SPECIFICATIONS

Cooling	Free air convection	
Ambient Operating Temperature Range	0°C to + 70°C 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 40,000 ft. ASL	Operating 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.	

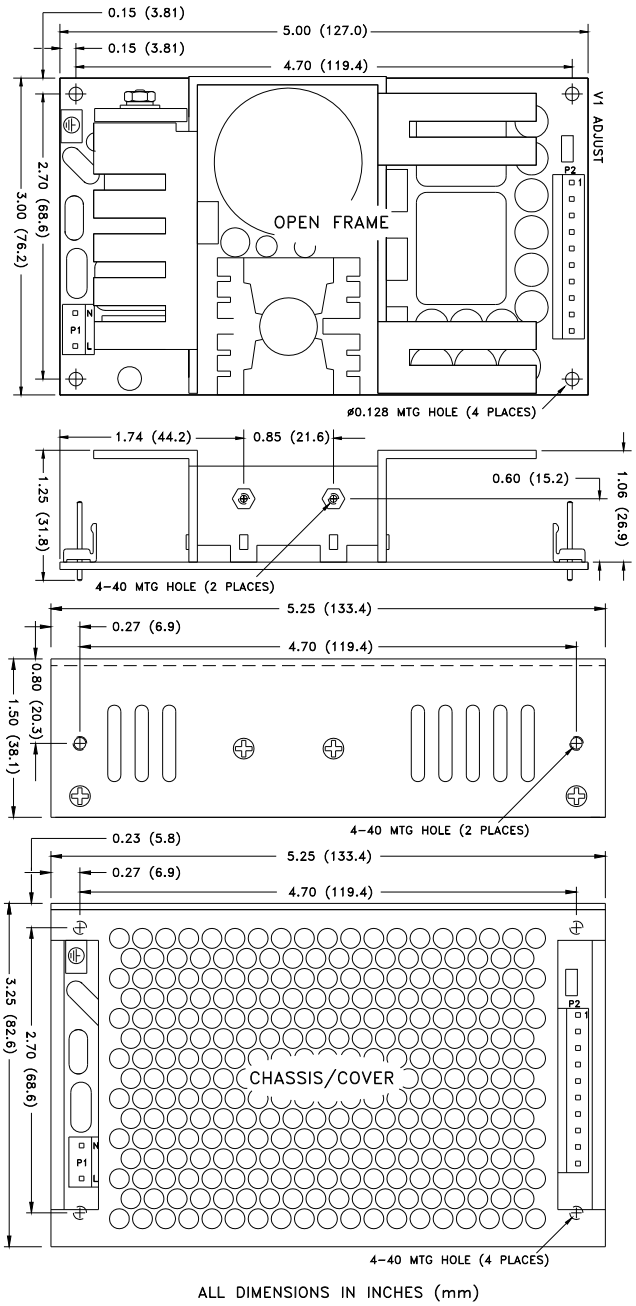
GENERAL SPECIFICATIONS

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 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
Switching Frequency	100 KHz
Mean-Time Between Failures	>250,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.79 lbs. Open frame / 1.00 lbs. Chassis and cover

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

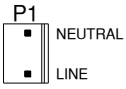
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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 (<100W P_{IN})	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

GRN-110 MULTI MECHANICAL SPECIFICATIONS



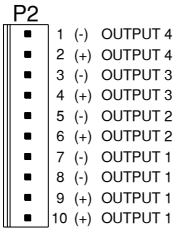
ALL DIMENSIONS IN INCHES (mm)

CONNECTOR SPECIFICATIONS



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.



DC Output

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

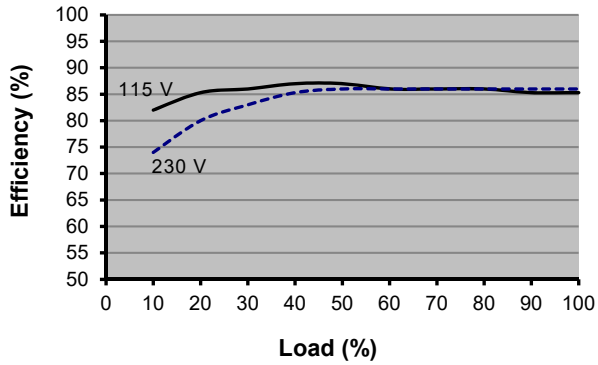
0.187 quick disconnect terminal

APPLICATIONS INFORMATION

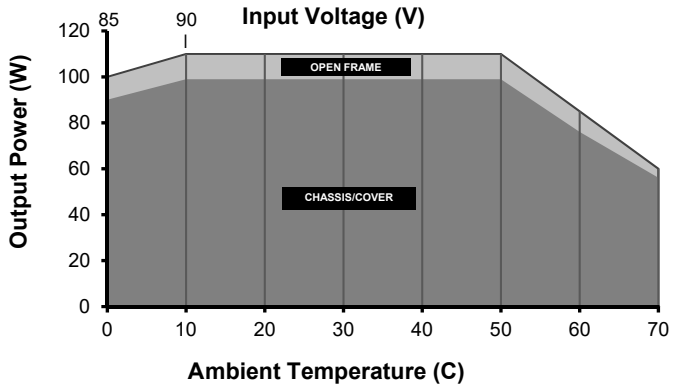
1. Each output can deliver its rated current but Total Output Power must not exceed 110W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area 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 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-110-3001 Efficiency shown)



MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements - Derate from 100% load at 50ºC to 50% load at 70ºC.
- Derate from 100% load at 90V_{IN} to 90% load at 85V_{IN}.
- Derate 10% with Chassis/Cover option.

REV. 9 2/23/2017

200 WATTS

MULTI OUTPUT AC-DC

GRN-200

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**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **IEC 62368-1 2nd ed. Certification**
- **IEC 60601-1-2 4th ed. EMC**
- **Class B Emissions per EN55011/32**
- **-20 to +70°C Operating Temperature**
- **Optional Power Fail Warning**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition UL 62368-1:2014, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 62368-1:2014, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	UL Recognition Mark for Canada File E137708/E140259	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14 CAN/CSA-C22.2 No. 60601-1:2014
TUV SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 62368-1:2014, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

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
CO - Cover
BF - Type BF
PF - Power Fail Warning
IO - Isolated Outputs

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1)	135W	Convection Cooled, Open Frame
(See Derating Chart)	200W	300LFM Forced Air, Open Frame(14)
Voltage Centering(15)	Output 1:	± 0.5% (all outputs at 50% load)
	Outputs 2-4:	± 5.0% (all outputs at 50% load)
Voltage Adjust Range	Output 1:	95-105%
Load Regulation	Output 1:	± 0.5% (0-100% load change)
	Outputs 2:	±6% (4001-4002 20-100% load change)
	Outputs 2-4:	± 5.0% (10-100% load change)
Source Regulation	Outputs 1-4:	0.5%
Cross Regulation	Outputs 2-4:	5.0%
Ripple & Noise	Outputs 1-4:	1.0% or 100mV p-p, 20MHz BW
Turn on Overshoot	None	
Transient Response	Output recovers to within 1% of initial set point due to a 50-100-50% step load change, 500µs maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-150% rated P_{OUT}, cycle on/off, auto recovery	
Hold Up Time	16ms minimum, full power	
Start Up Time	<1 sec., 115/230V Input	
Output Rise Time	25ms typical	
Minimum Load (5)	No minimum load required	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection	Dual internal 5A time delay fuses, 1500A breaking capacity
Peak Inrush Current	40A max
Peak Efficiency	Up to 90%
Average Efficiency	Up to 89% (Avg. of 25%, 50%, 75%, 100% rated load)
No Load Input Power	<300mW, 115/230 V_{IN}, no load <500mW, 115/230 V_{IN}, no load (PF Option)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temp. Range	-20°C to + 70°C, Derating (see derating Chart)
Ambient Storage Temp. Range	- 40°C to + 85°C
Operating Relative Humidity Range	20-90% non-condensing
Altitude	3,000m ASL Operating
Temperature Coefficient	0.02%/°C
Vibration (MIL-STD-810G)	2.5G swept sine, 10-2000Hz, 1octave/min, 3 axis, 1 hour each
Shock (MIL-STD-810G)	20G, 11ms, 3 axis.

GENERAL SPECIFICATIONS

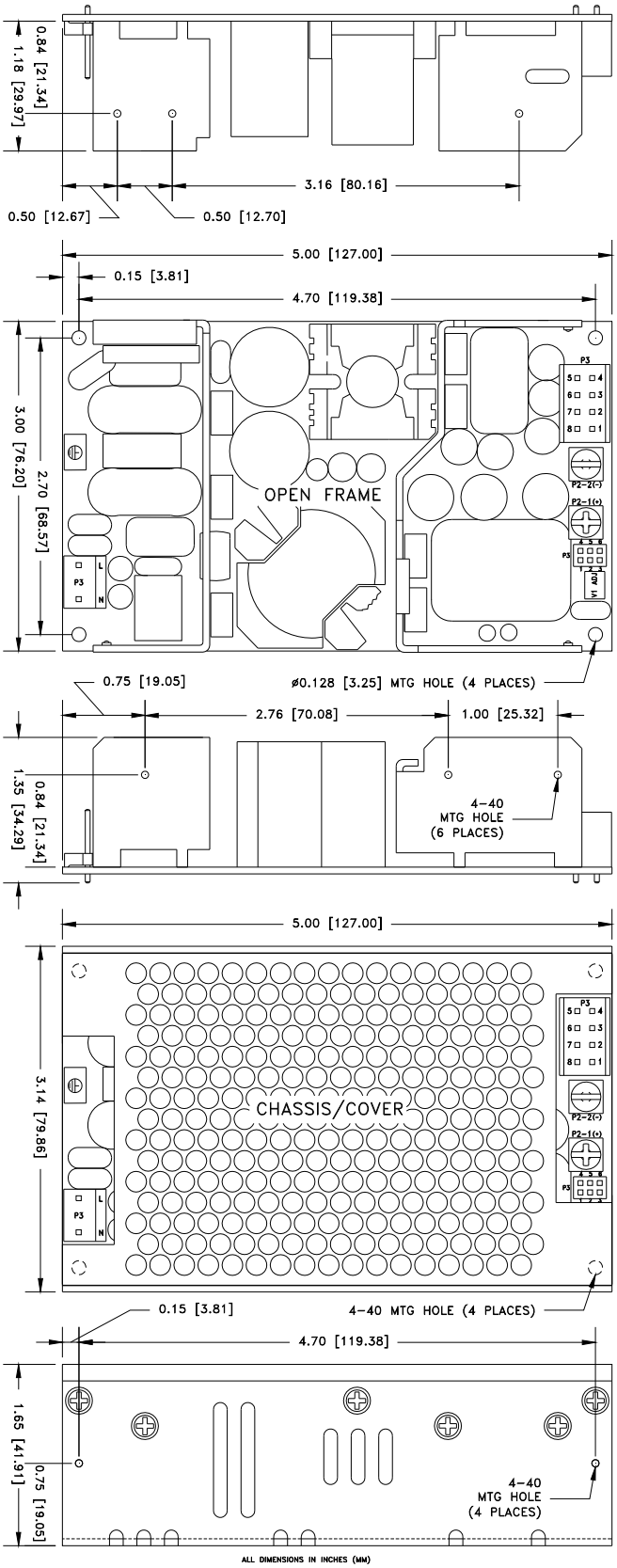
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation (1MOPP w/ Option BF)
Dielectric Strength(7, 8)	
Reinforced Insulation	5656 VDC (4000VAC)(12)
Basic Insulation	2121 VDC (1500VAC)(12)
Operational Insulation	707 VDC (500VAC)(12)/2121VDC(1500VAC)(12) w/ Option BF
Leakage Current	
Earth Leakage	<300µA NC, <1000µA SFC
Touch Current	<100µA NC, <500µA SFC
Patient Leakage Current	<100µA NC, <500µA SFC w/Option BF
Power Fail Signal	Logic low with input power failure 9ms prior to loss of Output 1.(13)
Switching Frequency	PWM:65 KHz/PFC:Variable
Remote Sense	250mV compensation of output cable losses (output 1)
Mean-Time Between Failures	>200,000 HOURS, MIL-HDBK-217F, 25° C, GB
Weight	1.0 lb. Open frame / 1.16 lb. Chassis and cover

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
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

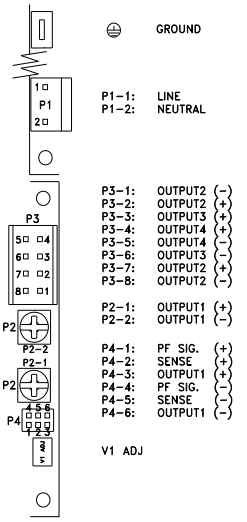
GRN-200 SERIES MECHANICAL SPECIFICATIONS



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 50ºC to 50% load at 70ºC.
- Derate Total Output Power linearly from 100% load at 90V_{IN} to 90% load at 85V_{IN}.
- 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.

CONNECTOR SPECIFICATIONS



Ground: 0.187 quick disconnect terminal.

P1: 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 80-50-0189 or equivalent crimp terminal.

P3: 5566 Mini-Fit Jr. header mates with 5557 Mini-Fit Jr. or equivalent crimp housing with 5556 Mini-Fit or equivalent crimp terminal.

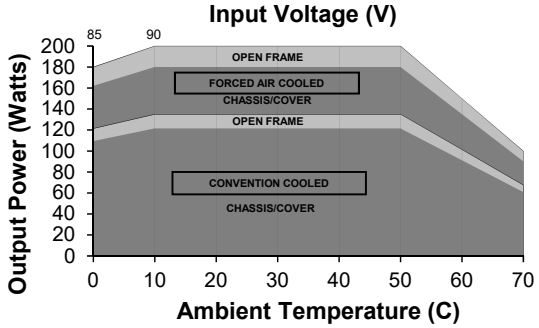
P2: 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)

P4: 0.100 friction lock header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

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 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 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.
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 on 4002 only.

MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Rev. HH 2/23/2017

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

70 WATTS

SINGLE/MULTI OUTPUT AC-DC

REL-70

FEATURES:

- **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 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ITE Certification**
- **IEC 60601-1-2 4th ed. EMC**
- **Class B Emissions per EN55011/32**
- **RoHS Compliant**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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
REL-70-4001	+3.3V/6A	+5V/5A	+12V/2A(21)	-12V/2A(21)
REL-70-4002	+5V/6A	+3.3V/5A	+12V/2A(21)	-12V/2A(21)
REL-70-4003	+5V/6A	+3.3V/5A	+15V/2A(21)	-15V/2A(21)
REL-70-4004	+5V/6A	-5V/5A	+12V/2A(21)	-12V/2A(21)
REL-70-4005	+5V/6A	-5V/5A	+15V/2A(21)	-15V/2A(21)
REL-70-4006	+5V/6A	+24V/2A	+12V/2A(21)	-12V/2A(21)
REL-70-4007	+5V/6A	+24V/2A	+15V/2A(21)	-15V/2A(21)
REL-70-4009	6.7V/5A	5V/4A	+15V/2A(21)	-15V/2A(21)
REL-70-3001	+5V/6A	+12V/2A		-12V/2A(21)
REL-70-3002	+5V/6A	+15V/2A		-15V/2A(21)
REL-70-3003	+5.1V/6A	+7.5V/2A		-7.5V/2A(21)
REL-70-3004	+3.3V/6A	+7V/5A	+12V/2A(21)	
REL-70-2001	+3.3V/6A	+5V/5A		
REL-70-2002	+5V/6A	+12V/4A		
REL-70-2003	+5V/6A	+24V/2A		
REL-70-2004	+12V/3A	-12V/3A		
REL-70-2005	+15V/3A	-15V/2A		
REL-70-2006	+5.5V/6A	-5.5V/5A		
REL-70-1001	2.5V/14A(20)			
REL-70-1002	3.3V/14A(20)			
REL-70-1003	5V/14A(20)			
REL-70-1004	12V/5.8A			
REL-70-1005	15V/4.7A			
REL-70-1006	24V/2.9A			
REL-70-1007	28V/2.5A			
REL-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
I/O - Isolated Outputs
TS - Terminal Strip

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	50W	Convection Cooled(16)(18)	
(See Derating Chart)	70W	300LFM Forced-Air Cooled(15)(17)(19)	
Output Voltage Centering	Output 1:	± 0.5%	(All outputs at 50% load)
	Output 2,3,4:	± 5.0%	
Output Voltage Adjust Range	Output 1:	95 - 105%	
Load Regulation	Output 1:	0.5%	(10-100% load change)
	Output 2:	5.0%	
	(4001-5)	8.0%	
	(2001)	8.0%	
	Output 3:	5.0%	
	Output 4:	5.0%	
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	5.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery		
Hold Up Time	16mS min., Full Power, 85V Input		
Start Up Time	4 Seconds, 120V Input		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Peak Inrush Current	40A
Efficiency	78% Typ., Full Power, 230V, varies by model
Power Factor	0.95 (Full Power, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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)
Primary to Ground	1MOPP (Means of Patient Protection)
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 Sense (singles only)(10)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.60 Lbs. Open Frame 1.00 Lbs. Chassis and Cover

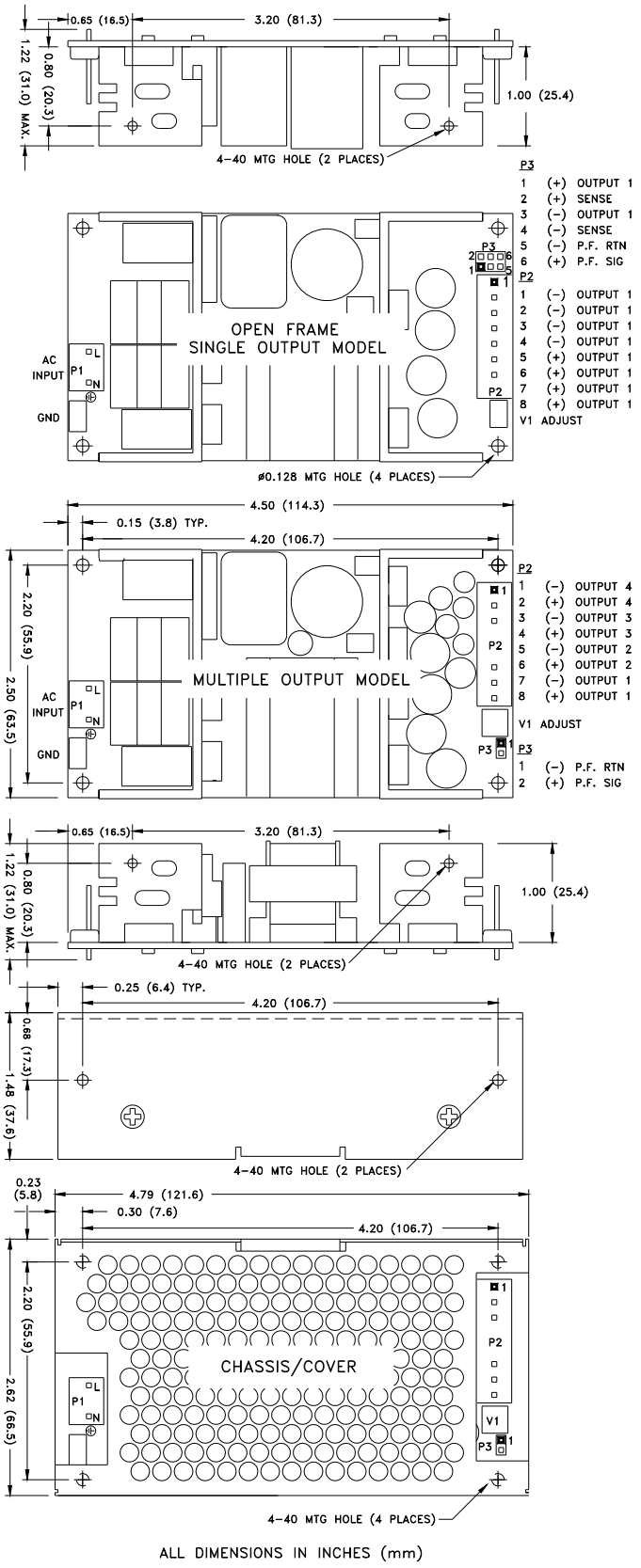
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ED./IEC 61000-6-2:2005)

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

All specifications are maximum at 25°C/70W 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*

REL-70 MECHANICAL SPECIFICATIONS

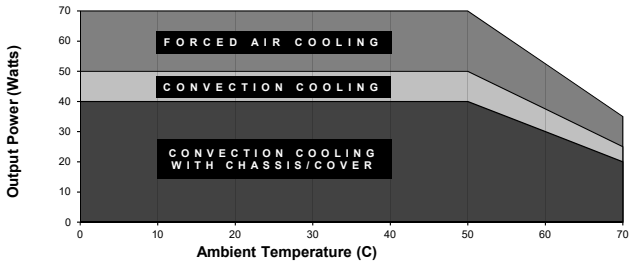


ALL DIMENSIONS IN INCHES (mm)

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. 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 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 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

P1	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 (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.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.
P3	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.

REV. M 2/23/2017

110 WATTS

SINGLE/MULTI OUTPUT AC-DC

REL-110

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**
- **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**
- **RoHS Compliant**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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
TÜV SÜD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(21)	OUTPUT 2(21)	OUTPUT 3(20)	OUTPUT 4(20)
REL-110-4001	+3.3V/10A(22)	+5V/6A	+12V/2A	-12V/2A
REL-110-4002	+5V/10A(22)	+3.3V/6A	+12V/2A	-12V/2A
REL-110-4003	+5V/10A(22)	+3.3V/6A	+15V/2A	-15V/2A
REL-110-4004	+5V/10A(22)	-5V/6A	+12V/2A	-12V/2A
REL-110-4005	+5V/10A(22)	-5V/6A	+15V/2A	-15V/2A
REL-110-4006	+5V/10A(22)	+24V/2A	+12V/2A	-12V/2A
REL-110-4007	+5V/10A(22)	+24V/2A	+15V/2A	-15V/2A
REL-110-4009	+5V/10A(22)	+24V/2A	+7V/2.5A	-7V/2.5A
REL-110-3001	+5V/10A(22)	+12V/3A		-12V/3A
REL-110-3002	+5V/10A(22)	+15V/2A		-15V/2A
REL-110-3003	+8V/6A	-8V/1A		+30V/1A
REL-110-3004	+9V/3A	-24V/3A	+13V/2A	
REL-110-2001	+3.3V/10A(22)	+5V/6A		
REL-110-2002	+5V/10A(22)	+12V/5A		
REL-110-2003	+5V/10A(22)	+24V/3A		
REL-110-2004	+12V/5A	-12V/4A		
REL-110-2005	+15V/4A	-15V/3A		
REL-110-2006	+18V/4A	-18V/3A		
REL-110-1001	2.5V/22A(23)			
REL-110-1002	3.3V/22A(23)			
REL-110-1003	5V/22A(23)			
REL-110-1004	12V/9.2A			
REL-110-1005	15V/7.3A			
REL-110-1006	24V/4.6A			
REL-110-1007	28V/3.9A			
REL-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
CO – Cover
I/O – Isolated Outputs
TS – Terminal Strip

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	80W	Convection Cooled(16)(18)	
(See Derating Chart)	110W	300LFM Forced-Air Cooled(15)(17)(19)	
Output 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%	
	(4001-5 Models)	8.0%	
	(2001 Model)	6.0%	
	Output 3:	5.0%	
	Output 4:	5.0%	
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	5.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery		
Hold Up Time	16mS min., Full Power, 85V Input		
Start Up Time	4 Seconds, 120V Input		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Peak Inrush Current	40A
Efficiency	82% Typ., Full Power, 230V, varies by model
Power Factor	0.95 (Full Power, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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)
Primary to Ground	1MOPP (Means of Patient Protection)
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 Sense (singles only)(10)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.80 Lbs. Open Frame/ 1.28 Lbs. Chassis and Cover

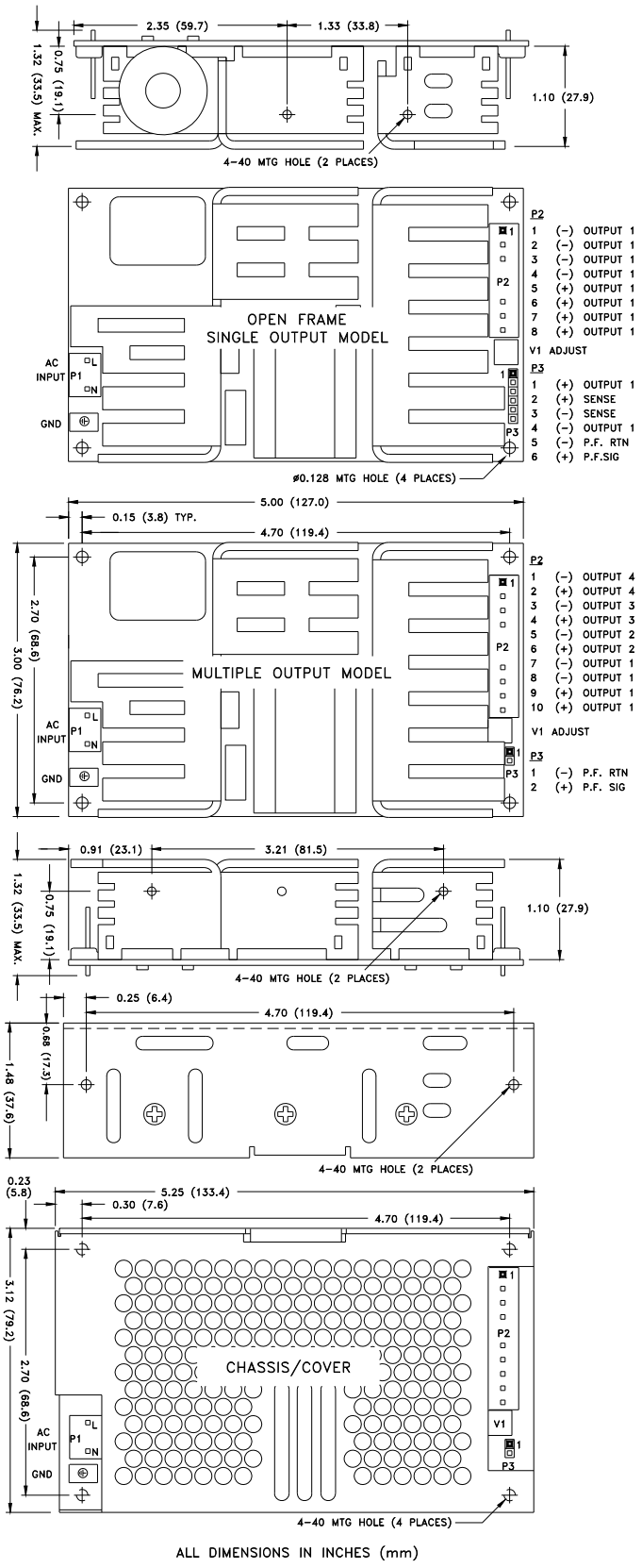
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ed./IEC 61000-6-2:2005)

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

All specifications are maximum at 25° C, 110W 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

REL-110 SERIES MECHANICAL SPECIFICATIONS

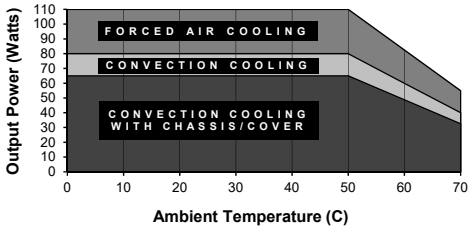


ALL DIMENSIONS IN INCHES (mm)

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 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 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 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 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



CONNECTOR SPECIFICATIONS

P1	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 (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.

REV. N 2/23/2017

150 WATTS

SINGLE/MULTI OUTPUT AC-DC

REL-150

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**
- **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**
- **RoHS Compliant**
- **Optional Remote Inhibit/Enable**
- **Optional Chassis/Cover**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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(18)	OUTPUT 4(18)
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/.31A
REL-150-4010	5V/15A(20)	12V/5A	24V/1A	24V/1A
REL-150-3001	+5V/15A(20)	+12V/4A		-12V/3A
REL-150-3002	+5V/15A(20)	+15V/3A		-15V/2A
REL-150-3003	+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		
REL-150-2002	+5V/15A(20)	+12V/5A		
REL-150-2003	+5V/15A(20)	+24V/3A		
REL-150-2004	+12V/7.5A	-12V/5A		
REL-150-2005	+15V/5A	-15V/5A		
REL-150-1001	2.5V/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.

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	100W	Convection Cooled(16)(17)	
(See Derating Chart)	150W	Forced-Air Cooled(15)(16)(17)	
Output Voltage Centering	Output 1:	± 0.5%	(All outputs at 50% load)
	Output 2:	± 5.0%	
	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%	(10-100% load change)
	(4001-5 Models)	8.0%	(20-100% load change)
	(2001 Model)	6.0%	(20-100% load change)
	Output 3:	5.0%	(10-100% load change)
	Output 4:	5.0%	(10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	5.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery		
Hold Up Time	16mS min., Full Power, 85V Input		
Start Up Time	5 Seconds, 120V Input		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Peak Inrush Current	40A
Efficiency	82% Typ., Full Power, 230V, varies by model
Power Factor	0.95 (Full Power, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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)
Primary to Ground	1MOPP (Means of Patient Protection)
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 Inhibit (optional)	Contact closure inhibits all outputs
Remote Sense(10)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.15 Lbs. Open Frame/ 1.82 Lbs. Chassis and Cover

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

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	±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	30A/m, 60 Hz.		A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V	A/A
		0% U_T, 1 cycles, 0°	100/240V	A/A
		40% U_T, 10/12 cycles, 0°	100/240V	B/A
		70% U_T, 25/30 cycles, 0°	100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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		
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant		

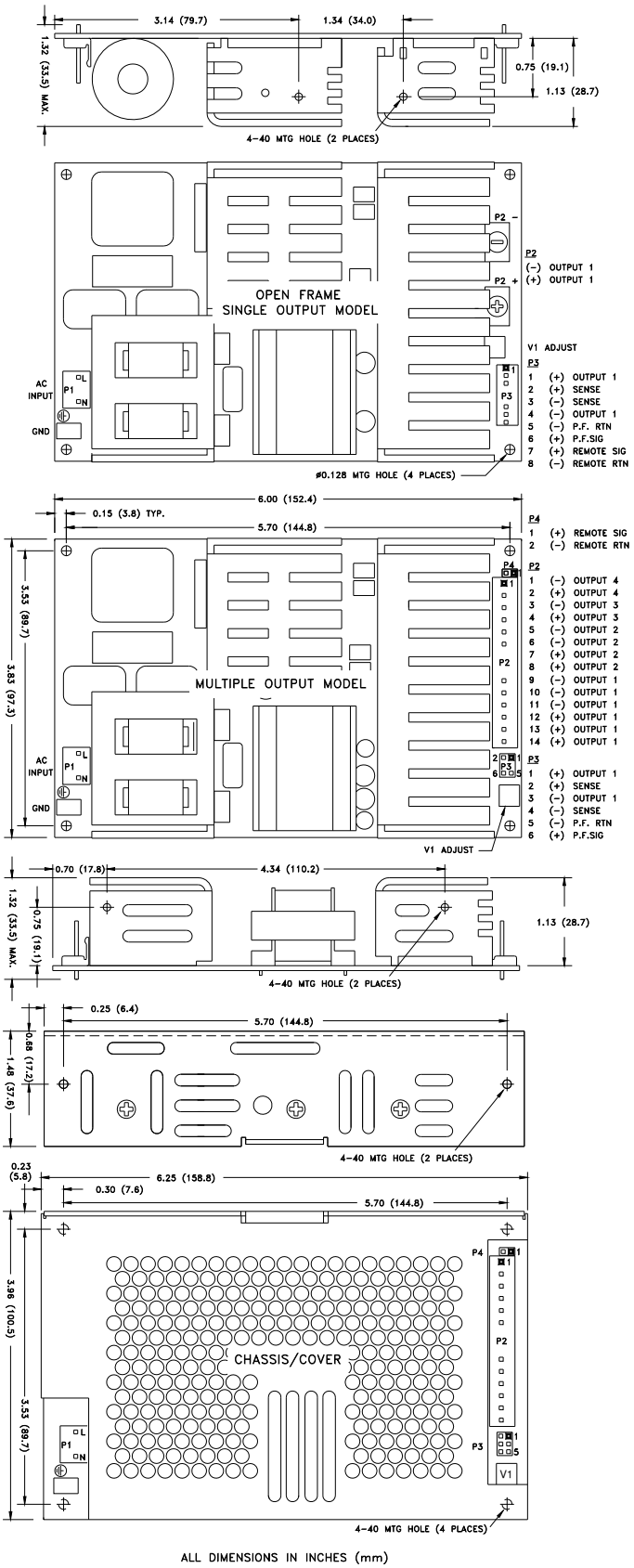
ORDERING INFORMATION

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

REL-150 SERIES MECHANICAL SPECIFICATIONS

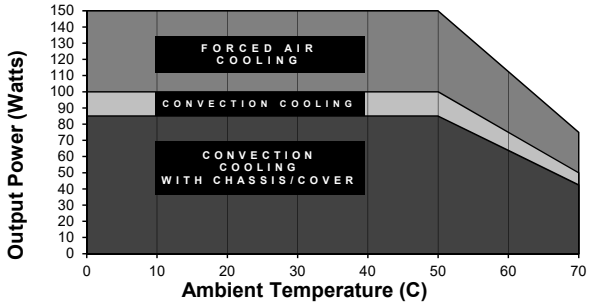


ALL DIMENSIONS IN INCHES (mm)

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. 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 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



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 (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.
G	Ground	0.187 quick disconnect terminal.
P3	Remote/P.F./ Sense (Single)	0.100 friction lock header mates with Molex 50-57-9008or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	P.F./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.
P4	Remote (Multiple)	0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 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

185 WATTS

SINGLE/MULTI OUTPUT AC-DC

REL-185

FEATURES:

- **Compact 4.2" x 7.0" x 1.5" Size**
- **2 Year Warranty**
- **Universal 85-264V Input**
- **One to Four Outputs**
- **High Efficiency**
- **0-70°C Operating Temperature**
- **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**
- **RoHS Compliant**
- **Optional Remote Inhibit/Enable**
- **Optional Chassis/Cover**

CHASSIS/COVER OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

MODEL NO.	OUTPUT 1(21)	OUTPUT 2(21)	OUTPUT 3(20)	OUTPUT 4(20)
REL-185-4001	+3.3V/20A(22)	+5V/10A	+12V/2A	-12V/2A
REL-185-4002	+5V/20A(22)	+3.3V/10A	+12V/2A	-12V/2A
REL-185-4003	+5V/20A(22)	+3.3V/10A	+15V/2A	-15V/2A
REL-185-4004	+5V/20A(22)	-5V/10A	+12V/2A	-12V/2A
REL-185-4005	+5V/20A(22)	-5V/10A	+15V/2A	-15V/2A
REL-185-4006	+5V/20A(22)	+24V/3A	+12V/2A	-12V/2A
REL-185-4007	+5V/20A(22)	+24V/3A	+15V/2A	-15V/2A
REL-185-3001	+5V/20A(22)	+12V/5A		-12V/3A
REL-185-3002	+5V/20A(22)	+15V/4A		-15V/3A
REL-185-2001	+3.3V/20A(22)	+5V/10A		
REL-185-2002	+5V/20A(22)	+12V/8A		
REL-185-2003	+5V/20A(22)	+24V/4A		
REL-185-2004	+12V/10A	-12V/6A		
REL-185-2005	+15V/8A	-15V/5A		
REL-185-2006	+15V/6A	+24V/4A		
REL-185-2007	+35V/3.5A	+12V/5.2A		
REL-185-1001	2.5V/37A(23)			
REL-185-1002	3.3V/37A(23)			
REL-185-1003	5V/37A(23)			
REL-185-1004	12V/15.4A			
REL-185-1005	15V/12.3A			
REL-185-1006	24V/7.7A			
REL-185-1007	28V/6.6A			
REL-185-1008	48V/3.8A			
REL-185-1009	6.3V/29A(23)			

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
TS – Terminal Strip
RE – Remote Inhibit
I/O – Isolated Outputs

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	135W	Convection Cooled(16)(18)	
(See Derating Chart)	185W	Forced-Air Cooled(15)(17)(19)	
Output Voltage Centering	Output 1:	± 0.5%	(All outputs at 50% load)
	Output 2:	± 5.0%	
	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%	(10-100% load change)
	(4001,4,5, 2001)	10.0%	(20-100% load change)
	(4002,4003)	15.0%	(20-100% load change)
	Output 3:	5.0%	(10-100% load change)
	Output 4:	5.0%	(10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	6.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery		
Hold Up Time	16ms min., Full Power, 85V Input		
Start Up Time	5 Seconds, 120V Input		

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Peak Inrush Current	40A
Efficiency	82% Typical, Full Power, 230V, varies by model
Power Factor	0.95 (Full Power, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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)
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 Inhibit (optional)	Contact closure inhibits all outputs
Remote Sense(10)	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

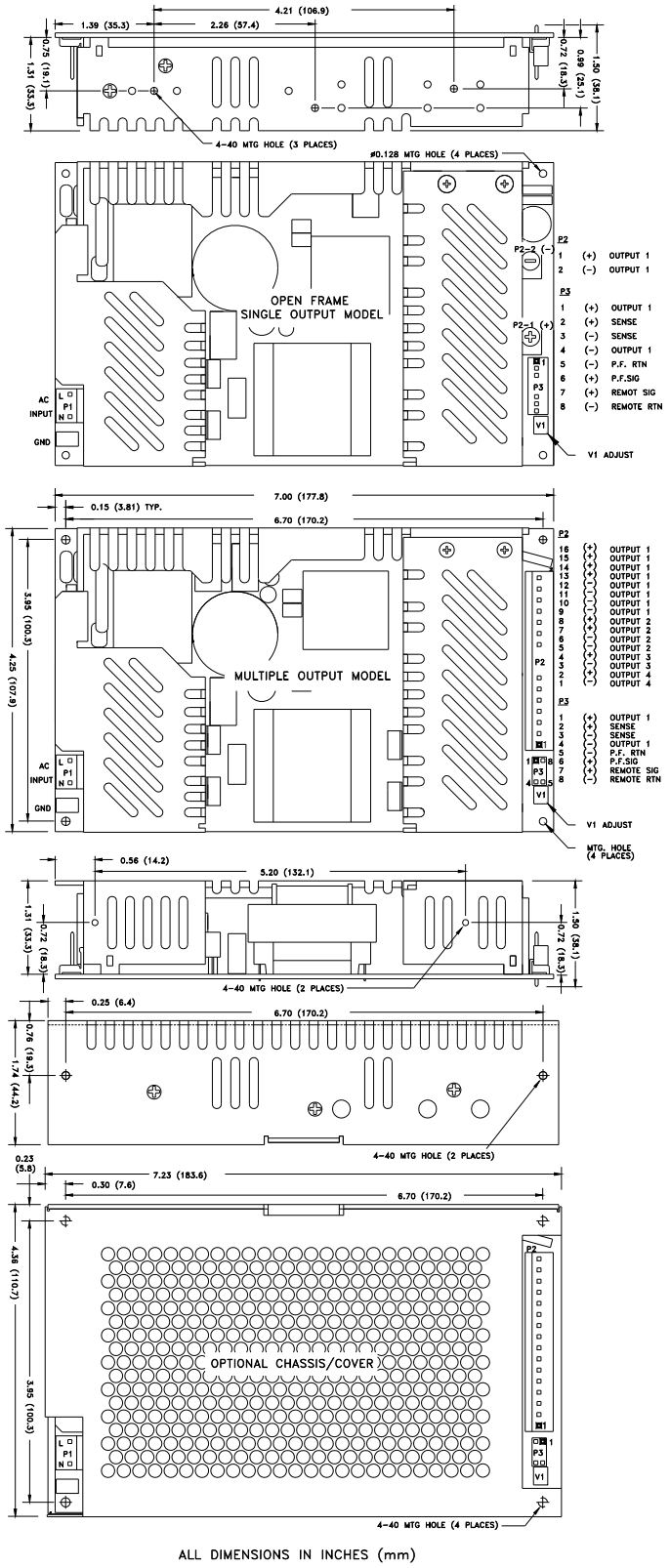
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ed./IEC 61000-6-2:2005)

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

All specifications are maximum at 25°C/185W 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

REL-185 SERIES MECHANICAL SPECIFICATIONS

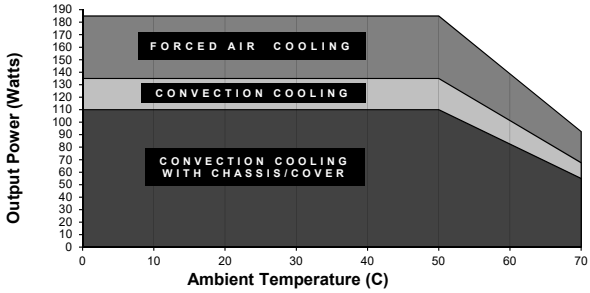


ALL DIMENSIONS IN INCHES (mm)

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. 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 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 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 135W 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 (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 09-50-3161 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense (Single)	0.100 friction lock header mates with Molex 50-57-9008or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.
P3	Option/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.

REV. N 2/23/2017

150 WATTS

SINGLE/MULTI OUTPUT AC-DC

CE-150

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**
- **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 Remote Inhibit/Enable**
- **Optional Power Fail Warning**
- **Optional Perforated Cover**

CHASSIS/COVER OPEN CHASSIS

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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
CE-150-4001	+3.3V/15A	+5V/5A	+12V/2A	-12V/2A
CE-150-4002	+5V/15A	+3.3V/5A	+12V/2A	-12V/2A
CE-150-4003	+5V/15A	+3.3V/5A	+15V/2A	-15V/2A
CE-150-4004	+5V/15A	-5.2V/5A	+12V/2A	-12V/2A
CE-150-4005	+5V/15A	-5.2V/5A	+15V/2A	-15V/2A
CE-150-4006	+5V/15A	+12V/5A	+12V/2A	-12V/2A
CE-150-4007	+5V/15A	+12V/5A	+15V/2A	-15V/2A
CE-150-4008	+15V/5A	-15V/5A	24V/1A	24V/1A
CE-150-4009	+5V/15A	+12V/5A	+15V/2A	-12V/2A
CE-150-4011	+5V/15A	+12V/5A	-5V/1A	-12V/1A
CE-150-4101	+5V/15A	+24V/5A	+12V/2A	-12V/2A
CE-150-4102	+5V/15A	+24V/5A	+15V/2A	-15V/2A
CE-150-4103IT	+5V/15A	+24V/5A(6ApK)	+12V/2A	-12V/2A
CE-150-3001	+5V/15A	+12V/5A		-12V/2A
CE-150-3002	+5V/15A	+15V/5A		-15V/2A
CE-150-3003	+15V/5A	-15V/5A	+5V/2A	
CE-150-3004	+5V/15A	+15V/5A	+36V/2.5A	
CE-150-2001	+12V/7.5A	-12V/5A		
CE-150-2002	+15V/5A	-15V/5A		
CE-150-2003	+5V/15A	+12V/6A		
CE-150-2101	+5V/15A	+24V/5A		
CE-150-1001	3.3V/30A(18)			
CE-150-1002	5V/30A(18)			
CE-150-1003	12V/12.5A			
CE-150-1004	15V/10A			
CE-150-1005	24V/6.25A			
CE-150-1006	28V/5.4A			
CE-150-1007	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:

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

OUTPUT SPECIFICATIONS

Total Output Power(1)	100W	Convection Cooled(16)
(See Derating Chart)	125W	Convection Cooled, w/1Sq. ft. Baseplate(17)
	150W	300LFM Forced-Air Cooled(15)
Output Voltage Centering	Output 1:	± 0.25% (All outputs at 50% load)
	Output 2:	±0.25% (X0XX), ±3.0% (X1XX)
	Output 3:	± 2.0%
	Output 4:	± 2.0%
Output Voltage Adjust Range	Outputs 1 –2:	95-105% (X0XX)
	Output 1:	95-105% (X1XX)
	Output 1:	85-105% (1001, 4001)
	Output 2:	85-105% (4002,4003)
Load Regulation	Output 1:	0.5% (0-100% load change)
	Output 2:	
	(XOXX)	0.5% (0-100% load change)
	(X1XX)	3.0% (10-100% load change)
	Output 3:	2.0% (10-100% load change)
	Output 4:	2.0% (0-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Output 2:	0.2% (X0XX)
(Output 1 load varied 50-100%)		5.0% (X1XX)
	Output 3:	2.0% (Output 1 load
	Output 4:	2.0% varied 50-100%)
Output Noise	Outputs 1 - 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 1 – 4	
Voltage Deviation	5.0%	
Recovery Time	500µS	
Load Change	50% to 100%	
Output Overvoltage Protection	Output 1:	110% to 150%.
(Optional)		Shuts down all outputs. Cycle input to restart.
Output Overpower Protection	165 W Min., Outputs 1 and 2, Outputs cycle on/off, auto recovery	
Output Overcurrent Protection	110% Min., Outputs 3 and 4	
Hold Up Time	20mS min., 150W, 120V Input	
Start Up Time	3 Seconds	

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	0.68-0.80(varies by model)
Power Factor	0.90 (150 W, 230V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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)
Primary to Ground	1MOPP (Means of Patient Protection)
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) (Optional)	Logic low with input power failure 10 ms minimum prior to Output 1 dropping 1%
Remote Inhibit (optional)	Contact closure inhibits all outputs
Remote Sense(Single models)(10)	250mV compensation of output cable losses
Mean-Time Between Failures	150,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	2.0 Lbs.

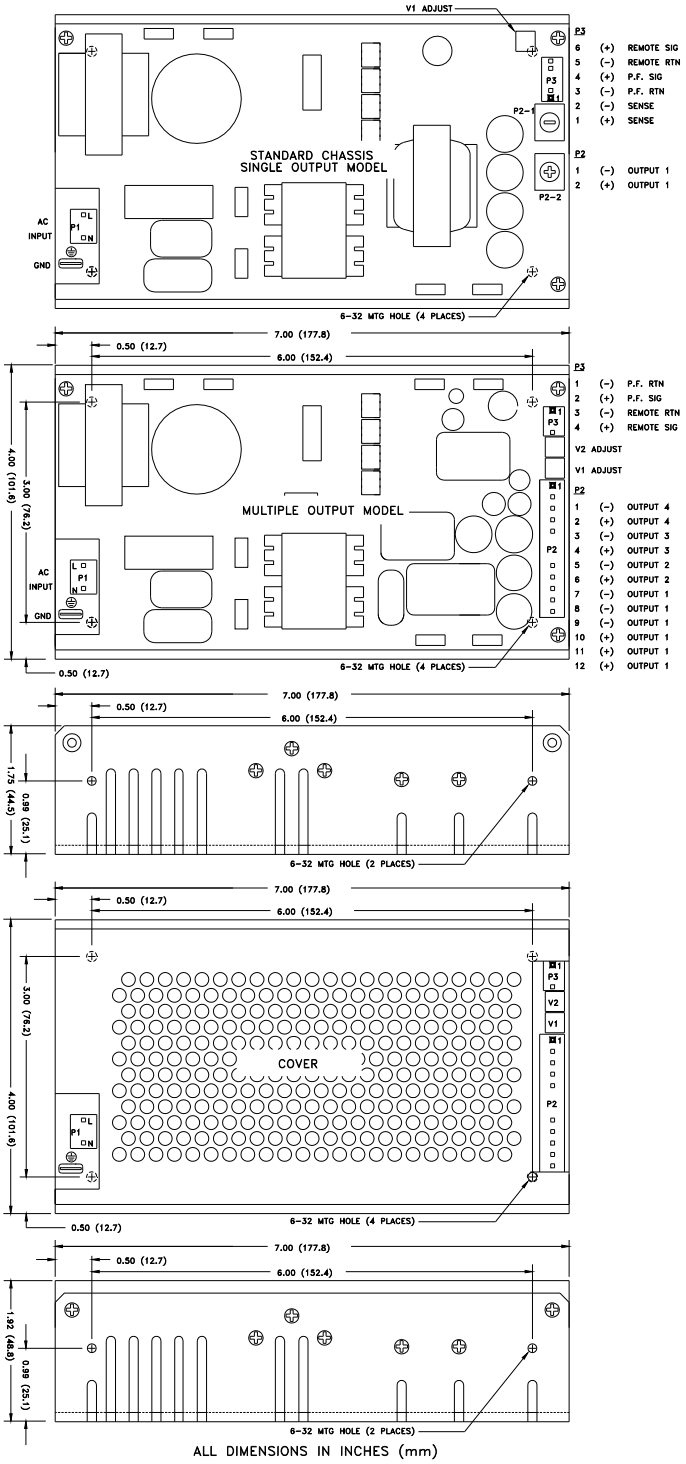
All specifications are maximum at 25°C/150W unless otherwise stated, may vary by model and are subject to change without notice.

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

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

CE-150 SERIES MECHANICAL SPECIFICATIONS

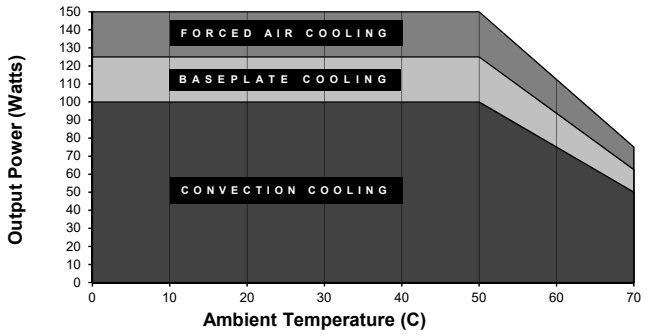


ALL DIMENSIONS IN INCHES (mm)

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 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 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 125W 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	0.156 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 (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 22-01-2067or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
P3	Option/Sense (Multiple)	0.100 friction lock header mates with Molex 22-01-2047or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

REV. N 2/23/2017

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

225 WATTS

SINGLE/MULTI OUTPUT AC-DC

CE-225

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**
- **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 Remote Inhibit/Enable**
- **Optional Power Fail Warning**
- **Optional Perforated Cover**

CHASSIS/COVER

OPEN CHASSIS

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	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
CE-225-4001	+3.3V/25A(16)	+5V/8A(16)	+12V/2A	-12V/2A
CE-225-4002	+5V/25A(16)	+3.3V/8A(16)	+12V/2A	-12V/2A
CE-225-4003	+5V/25A(16)	+3.3V/8A(16)	+15V/2A	-15V/2A
CE-225-4004	+5V/25A(16)	-5.2V/8A(16)	+12V/2A	-12V/2A
CE-225-4005	+5V/25A(16)	-5.2V/8A(16)	+15V/2A	-15V/2A
CE-225-4006	+5V/25A(16)	+12V/8A(16)	+12V/2A	-12V/2A
CE-225-4007	+5V/25A(16)	+12V/8A(16)	+15V/2A	-15V/2A
CE-225-4008	+5V/25A(16)	+12V/8A(16)	+9V/2A	-9V/2A
CE-225-4101	+5V/25A(16)	+24V/8A(16)	+12V/2A	-12V/2A
CE-225-4102	+5V/25A(16)	+24V/8A(16)	+15V/2A	-15V/2A
CE-225-4104	+24V/6A(16)	+24V/3A(16)	+12V/2A	5V/2A
CE-225-3001	+5V/25A(16)	+12V/8A(16)		-12V/2A
CE-225-3002	+5V/25A(16)	+15V/8A(16)		-15V/2A
CE-225-2001	+12V/10A(16)	-12V/8A(16)		
CE-225-2002	+15V/10A(16)	-15V/8A(16)		
CE-225-2003	+5V/25A(16)	+12V/8A(16)		
CE-225-2004	+5.2V/30A(16)	-9V/6A		
CE-225-2005	+3.3V/25A(16)	+12V/8A(16)		
CE-225-2101	+5V/25A(16)	+24V/8A(16)		
CE-225-1001	3.3V/45A(17)			
CE-225-1002	5V/45A(17)			
CE-225-1003	12V/18.8A(16)			
CE-225-1004	15V/15A(16)			
CE-225-1005	24V/9.4A(16)			
CE-225-1006	28V/8A(16)			
CE-225-1007	48V/4.7A(16)			
CE-225-1008	48V/4.7A(16)			
CE-225-1009	39V/5.8A(16)			

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

OUTPUT SPECIFICATIONS

Total Output Power(1)	150W	Convection Cooled(18)
(See Derating Chart)	225W	300LFM Forced-Air Cooled(15)
Output Voltage Centering	Output 1:	± 0.25% (All outputs at 50% load)
	Output 2:	± 0.25% (X0XX), ± 5.0% (X1XX)
	Output 3:	± 2.0%
	Output 4:	± 2.0%
Output Voltage Adjust Range	Outputs 1-2:	95 - 105% (X0XX)
	Output 1:	95 - 105% (X1XX)
	Output 1:	85 - 105% (1001, 4001)
	Output 2:	85 - 105% (4002, 4003)
Load Regulation	Output 1:	0.5% (10-100% load change)
	Output 2:	
	(XOXX)	0.5% (0-100% load change)
	(XIXX)	5.0% (10-100% load change)
	Output 3:	2.0% (0-100% load change)
	Output 4:	2.0% (0-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2:	0.2% (X0XX), 0.5% (X1XX)
	Output 3:	2.0%
	Output 4:	2.0%
Output Noise	Outputs 1 - 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 1 – 4	
Voltage Deviation	5.0%	
Recovery Time	500µS	
Load Change	50% to 100%	
Output Overvoltage Protection	Output 1:	110% to 150%
(Optional)	Shuts down all outputs	
	Cycle input to restart	
Output Overpower Protection	250 W Min., Output 1 and 2	
	Outputs, cycle on/off, auto recovery	
Output Overcurrent Protection	110% Min., Outputs 3 & 4	
Hold Up Time	20ms min., 225W Output, 120V Input	
Start Up Time	3 Seconds	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Source Current	
True RMS	4.25A at 85V Input
Peak Inrush	30A
Peak Repetitive	6.0A at 85V Input
Harmonic Distortion	0.05
Efficiency	0.68-0.80 (varies by model)
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 + 85°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)
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 (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(10)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	3.00 Lbs.

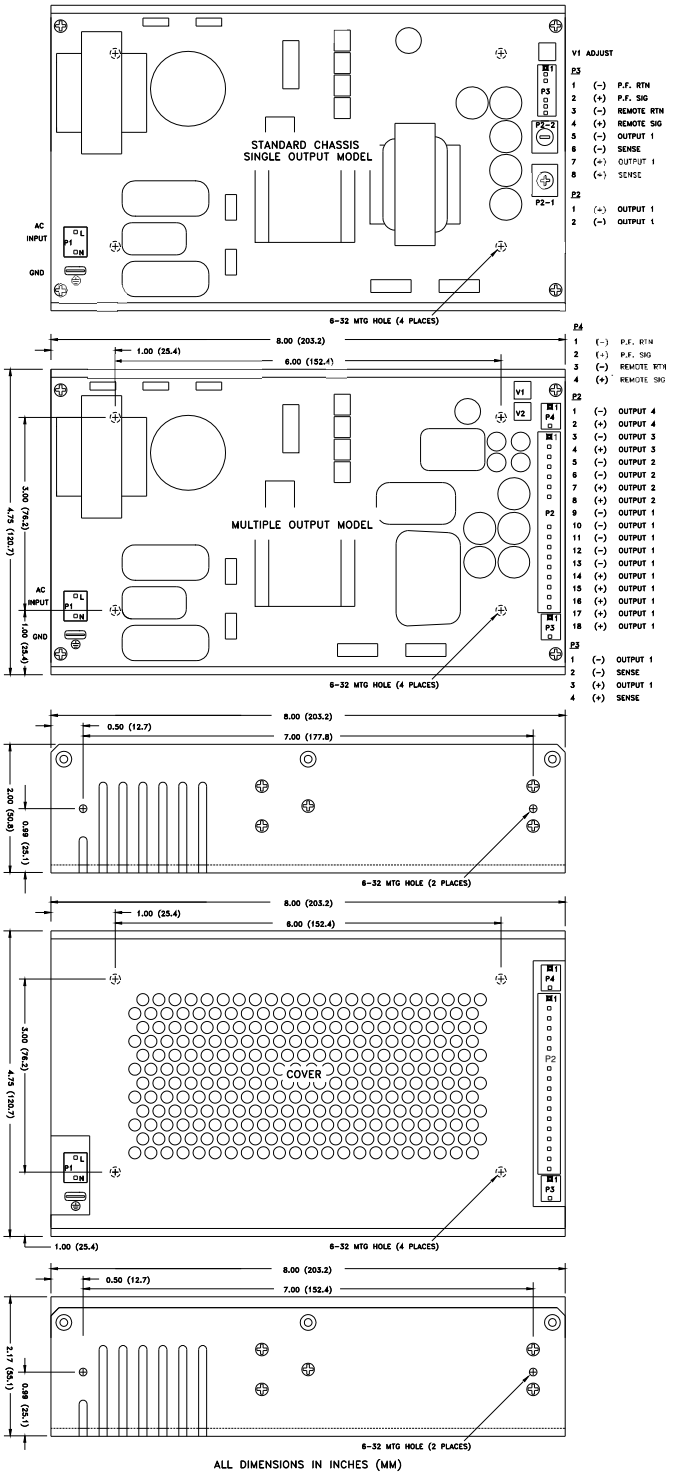
All specifications are maximum at 25°C/225W unless otherwise stated, may vary by model and are subject to change without notice.

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

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

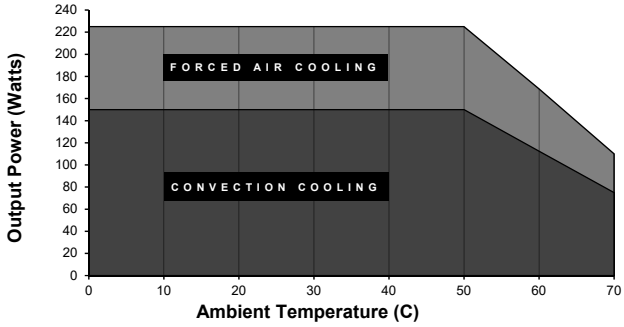
CE-225 SERIES MECHANICAL SPECIFICATIONS



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 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 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 30A maximum when convection cooled only.
18. Free-Air convection cooling, 150W maximum output power.

MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



CONNECTOR SPECIFICATIONS

	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 (Single)	6-32 screw down terminal mates with #6 ring tongue terminal.
P2	DC Output (Multiple)	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.
G	Ground	0.187 quick disconnect terminal.
P3	Option/Sense (Single)	0.100 friction lock header mates with Molex 22-01-2087or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.
P3/P4	Option/Sense (Multiple)	0.100 friction lock header mates with Molex 22-01-2047or equivalent crimp terminal housing with Molex 6459 or equivalent crimp terminal.

REV. P 2/23/2017

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

400 WATTS

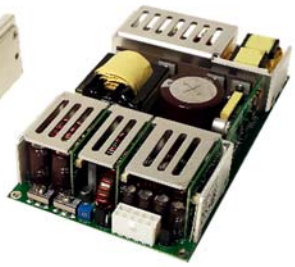
MULTI OUTPUT AC-DC

NXT-400M

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**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **IEC 62368-1 2nd ed. Certification**
- **IEC 60601-1-2 4th ed. EMC**
- **Class B Emissions per EN55011/32**
- **Optional 5V/2A Standby Output**
- **Optional Remote Inhibit/Enable**
- **Optional Chassis/Cover**

CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition UL 62368-1:2014, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 62368-1:2014, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	UL Recognition Mark for Canada File E137708/E140259	CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14 CAN/CSA-C22.2 No. 60601-1:2014
TUV SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 62368-1:2014, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

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

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-Isolated Outputs
CO-Cover	PF-Power Fail Warning
RE/SB- 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.

OUTPUT SPECIFICATIONS

Output Power at 50°C(1)	200W	Convection Cooled, Open Frame
(See Derating Chart)	400W	300LFM Forced-Air Cooled, Open Frame
Voltage Centering	Outputs 1-4:	±0.5% (All outputs at 50% load)
Voltage Adjust Range	Outputs 1:	95-105%
	Outputs 2-4:	90-110%(2)
Load Regulation	Outputs 1:	±0.2% (0-100% load change)(4)
	Outputs 2-4:	±1.0% (0-100% load change)
Source Regulation	Outputs 1-4:	0.2%
Cross Regulation	Outputs 2-4:	0.2%
Ripple & Noise	Outputs 1-4	1.0% or 100mV p-p, 20MHz BW
Turn On Overshoot	None	
Transient Response	Output recovers to within 1% of initial set point due to a 50-100-50% step load change, 1ms maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, Output 1, 110% and 150% of rated output Voltage.	
Overpower Protection	110%-150% rated POUT, cycle off/on, auto recovery.	
Hold-Up Time	16ms minimum, full power.	
Start-Up Time	<1 sec., 115/230V input.	
Output Rise Time	Output 1: 5ms typical. Outputs 2-4: 30ms typical.	
Minimum Load(5)	No minimum load required.	
Remote Sense(9)	Output 1: 250mV compensation of output cable losses.	
Enable/Inhibit (System)(16)	Contact closure enables all outputs with RE/SB option.	
Enable/Inhibit (Outputs 2, 3, 4)(17)	Contact closure inhibits individual output.	
Standby Output	Provides 5V/2A while all other outputs are Inhibited /off with RE/SB option.	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 VAC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection	Dual internal 8A time delay fuses, 1500A breaking capacity
Peak Inrush Current	40A max
Peak Efficiency	Up to 90%
Average Efficiency	Up to 87% (Avg. of 25%, 50%, 75% and 100% rated load)
No Load Input Power	<300mW (with RE/SB option) <500mW (with RE/SB and PF option)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temp. Range	-20°C to + 70°C, Derating: (see derating chart)
Ambient Storage Temp. Range	- 40°C to + 85°C
Operating Relative Humidity Range	20-90% non-condensing
Altitude	3,000m ASL Operating (5,000m consult factory)
Temperature Coefficient	0.02%/°C
Vibration (MIL-STD-810G)	2.5G swept sine, 10-2000Hz, 1 octave/min, 3 axis, 1 hour each
Shock (MIL-STD-810G)	20g, 11 ms, 3 axis.

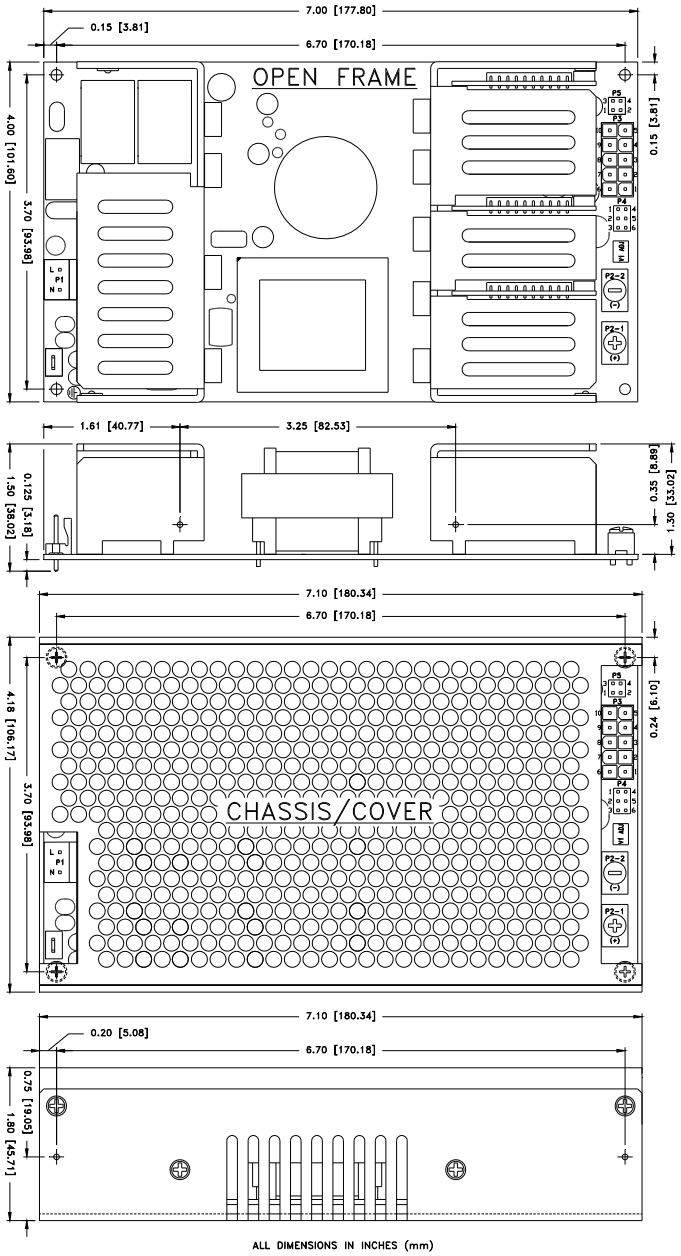
GENERAL SPECIFICATIONS

Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation (1MOPP w/ Option BF)
Dielectric Strength(7, 8)	
Reinforced Insulation	5656VDC (4000VAC) (12)
Basic Insulation	2121VDC (1500VAC) (12)
Operational Insulation	707VDC (500VAC)(12)/2121VDC (1500VAC)(12) w/ Option BF
Leakage Current	
Earth Leakage	<300µA NC, <1000µA SFC
Touch Current	<100µA NC, <500µA SFC
Patient Leakage Current	<100µA NC, <500µA SFC w/Option BF
Power Fail Signal	Logic low 10-15ms prior to AC input failure.
Switching Frequency	PWM:133 KHz/PFC:Variable
Mean-Time Between Failures	150,000 hours, MIL-HDBK-217F, 25°C, GB
Weight	1.7 lb. Open frame / 2.2 lb. Chassis and cover

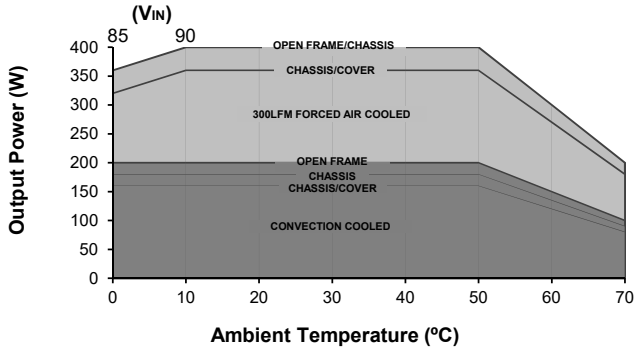
EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4TH ed./IEC 61000-6-2:2005)

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% UT, 0.5 cycles, 0-315° 100/240V	A/A
		0% UT, 1 cycles, 0° 100/240V	A/A
		40% UT, 10/12 cycles, 0° 100/240V	B/A
		70% UT, 25/30 cycles, 0° 100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% UT, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

NXT-400M MULTI MECHANICAL SPECIFICATIONS

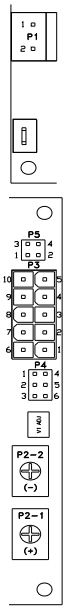


MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



- Derate Outputs 1 (3.3-5V) current rating 40% when convection cooled.
- Derate Outputs 1 (12-15V) current rating 25% when convection cooled.
- Derate Outputs 2 (3.3-15V) current rating 25% when convection cooled.
- Derate Total Output Power linearly from 100% at 50ºC to 50% at 70ºC.
- Derate Total Output Power linearly from 100% at 90V_{IN} to 90% at 85V_{IN} when forced-air cooled.
- Derate Total Output Power 10% when convection cooled using Chassis or Chassis/Cover.
- Derate Total Output Power 20% when convection cooled using Chassis/Cover (4001, 4002 only).
- Derate Total Output Power 10% when forced-air cooled using Chassis/Cover.

CONNECTOR SPECIFICATIONS



P1-1: LINE
P1-2: NEUTRAL

GROUND

P5-1: STBY RTN
P5-2: INHIBIT RETURN
P5-3: 5V/2A STBY
P5-4: INHIBIT

P3-1: OUTPUT 2 (-)
P3-2: OUTPUT 2 (-)
P3-3: OUTPUT 2 (-)
P3-4: OUTPUT 3 (-)
P3-5: OUTPUT 4 (-)
P3-6: OUTPUT 2 (+)
P3-7: OUTPUT 2 (+)
P3-8: OUTPUT 2 (+)
P3-9: OUTPUT 3 (+)
P3-10: OUTPUT 4 (+)

P4-1: PF RETURN
P4-2: SNS (-)
P4-3: SNS (+)
P4-4: PF
P4-5: OUTPUT 1 (-)
P4-6: OUTPUT 1 (+)

P2-1: OUTPUT 1 (+)
P2-2: OUTPUT 1 (-)

P1: 0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 80-50-0189 or equivalent crimp terminal.

Ground: 0.187 quick disconnect terminal.

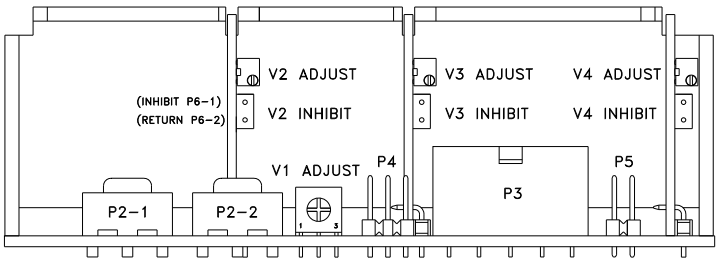
P5: 0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

P3: 5566 Mini-Fit Jr. header mates with 5557 Mini-Fit Jr. or equivalent crimp housing with 5556 Mini-Fit or equivalent Crimp Terminal.

P4: 0.100 breakaway header mates with Molex 22-55-2061 or equivalent crimp terminal housing with Molex type 70058 or equivalent crimp terminal.

P2: 6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max).

OUTPUT VOLTAGE ADJUSTMENT LOCATIONS



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 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.
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 0.100 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. 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. 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. 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.

REV. WW 2/23/2017

100 WATTS

SINGLE OUTPUT AC-DC

NXT-100

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

	OPEN FRAME		CHASSIS/COVER	
MODEL	300 LFM	CONVECTION COOLED	300 LFM	CONVECTION COOLED
NXT-100-1001	2.5V/20.0A	2.5V/14.0A	2.5V/18.0A	2.5V/12.6A
NXT-100-1002	3.3V/20.0A	3.3V/14.0A	3.3V/18.0A	3.3V/12.6A
NXT-100-1003	5V/20.0A	5V/14.0A	5V/18.0A	5V/12.6A
NXT-100-1004	12V/8.3A	12V/5.8A	12V/7.5A	12V/5.2A
NXT-100-1005	15V/6.7A	15V/4.7A	15V/6.0A	15V/4.2A
NXT-100-1006	24V/4.2A	24V/2.9A	24V/3.8A	24V/2.6A
NXT-100-1007	28V/3.6A	28V/2.5A	28V/3.2A	28V/2.3A
NXT-100-1008	48V/2.1A	48V/1.5A	48V/1.9A	48V/1.4A

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

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1)	70W	Convection Cooled, Open Frame
(See Derating Chart)	100W	300LFM Forced-Air Cooled(15)
Power Derating	1.0 W_{OUT} / 1 V_{IN} below 100 V_{IN}	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	
Load Regulation	0.5%	(0-100% load change)
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, 500µS maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-130% rated Pout, cycle on/off, auto recovery	
Hold Up Time	16ms min., Full Power, 85-264V Input	
Start Up Time	3 Seconds, 120V Input	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Input Protection(6)	Internal 2.5A Time Delay fuse
Peak Inrush Current	50A (cold)
Efficiency	85% Typical, Full Power varies by model
Power Factor	0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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 40,000 ft. ASL	Operating Non-operating
Temperature Coefficient	0.02%/°C	
Vibration	2.5g, 10Hz. -2KHz per MIL-STD-810F Method 514.5	
Shock	20g, peak per MIL-STD-810F Method 514.5	

GENERAL SPECIFICATIONS

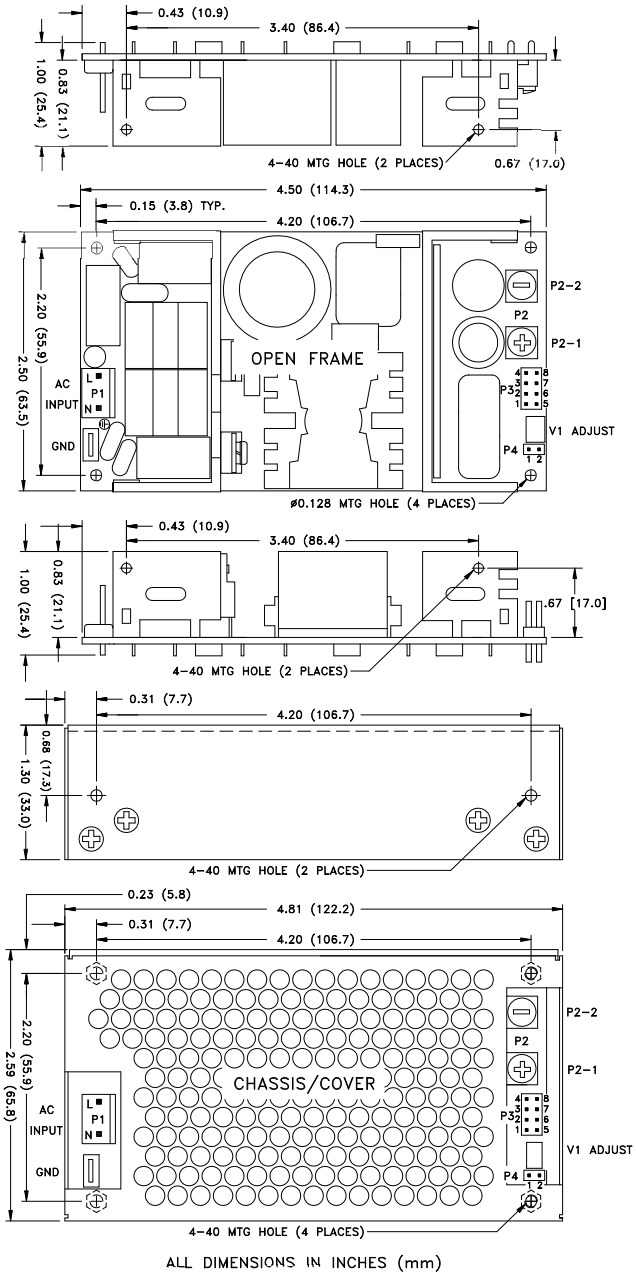
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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 Inhibit (optional)(20)	Connection to external 5V bias inhibits output.
Load Share (optional)(16, 17, 18)	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.
Remote Sense(10)	400mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours, MIL-HDBK-217F, 25° C, GB
Weight	0.56 Lbs. Open Frame/ 0.96 Lbs. Chassis and Cover

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
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-100 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

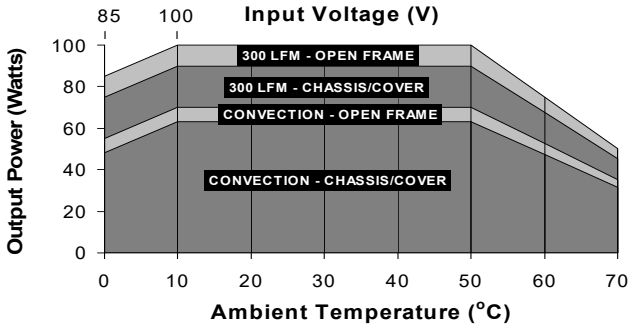
CONNECTOR SPECIFICATIONS

P1 LINE NEUTRAL	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 OUTPUT 1 (+) 1 2 OUTPUT 1 (-)	DC Output	6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)
P3 SENSE (+) 4 8 OUTPUT 1 (+) SENSE (-) 3 7 OUTPUT 1 (-) ENABLE 2 6 P.F. RTN SENSE (-) 1 5 P.F. SIG (+)	Power Fail, Sense	0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or crimp equivalent terminal.
P4 SHARE BUS 1 2 INHIBIT	Inhibit, Load Share	0.100 friction lock header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.
⏚	Ground	0.187 quick disconnect terminal.

APPLICATIONS INFORMATION

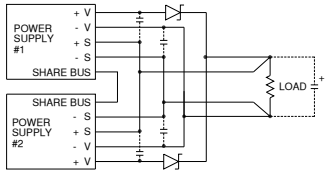
1. Continuous Output Power must not exceed 100W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply 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 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 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. P3-2 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.

MAX P_{OUT} vs. AMBIENT TEMPERATURE/INPUT VOLTAGE



Derating requirements – Chart above applies to models 1003 thru 1008 only. 100W 300 LFM forced air, open frame. 70W convection cooled open frame. Derate 10% with Chassis and Cover. Derate 1.0W_{OUT} / 1V_{IN} below 100V_{IN} and between 100V_{IN} and 85V_{IN}. Use larger of the two deratings when using chassis/cover below 100V_{IN}. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



REV. M 2/23/2017

175 WATTS

SINGLE OUTPUT AC-DC

NXT-175

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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

	OPEN FRAME		CHASSIS/COVER	
MODEL	**300 LFM**	**CONVECTION COOLED**	**300 LFM**	**CONVECTION COOLED**
NXT-175-1001	2.5V/35.0A	2.5V/23.0A	2.5V/31.5A	2.5V/20.7A
NXT-175-1002	3.3V/35.0A	3.3V/23.0A	3.3V/31.5A	3.3V/20.7A
NXT-175-1003	5V/35.0A	5V/23.0A	5V/31.5A	5V/20.7A
NXT-175-1004	12V/14.6A	12V/9.6A	12V/13.1A	12V/8.6A
NXT-175-1005	15V/11.7A	15V/7.7A	15V/10.5A	15V/6.9A
NXT-175-1006	24V/7.3A	24V/4.8A	24V/6.6A	24V/4.3A
NXT-175-1007	28V/6.3A	28V/4.1A	28V/5.6A	28V/3.7A
NXT-175-1008	48V/3.6A	48V/2.4A	48V/3.2A	48V/2.2A

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
LSEVB - Load Share Evaluation Board
RE - Remote Inhibit

All specifications are maximum at 25°C/175W unless otherwise stated, may vary by model and are subject to change without notice.

OUTPUT SPECIFICATIONS

Output Power at 50°C(1)	115W	Convection Cooled, Open Frame
(See Derating Chart)	175W	300 LFM Forced-Air Cooled(15)
Power Derating	1.0 W_{OUT} / 1 V_{IN} below 100 V_{IN}	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	
Load Regulation	0.5%	(0-100% load change)
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, 500µS maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-130% rated Pout, cycle on/off, auto recovery	
Hold Up Time	16ms min., Full Power, 85-264V Input	
Start Up Time	3 Seconds, 120V Input	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Input Protection(6)	Internal 5A Time Delay fuse
Peak Inrush Current	50A (cold)
Efficiency	85% Typical, Full Power varies by model
Power Factor	0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C (100% load) 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. ASL Non-Operating
Temperature Coefficient	0.02%/°C
Vibration	2.5g, 10Hz. -2KHz per MIL-STD-810F Method 516.5
Shock	20g, peak per MIL-STD-810F Method 516.5

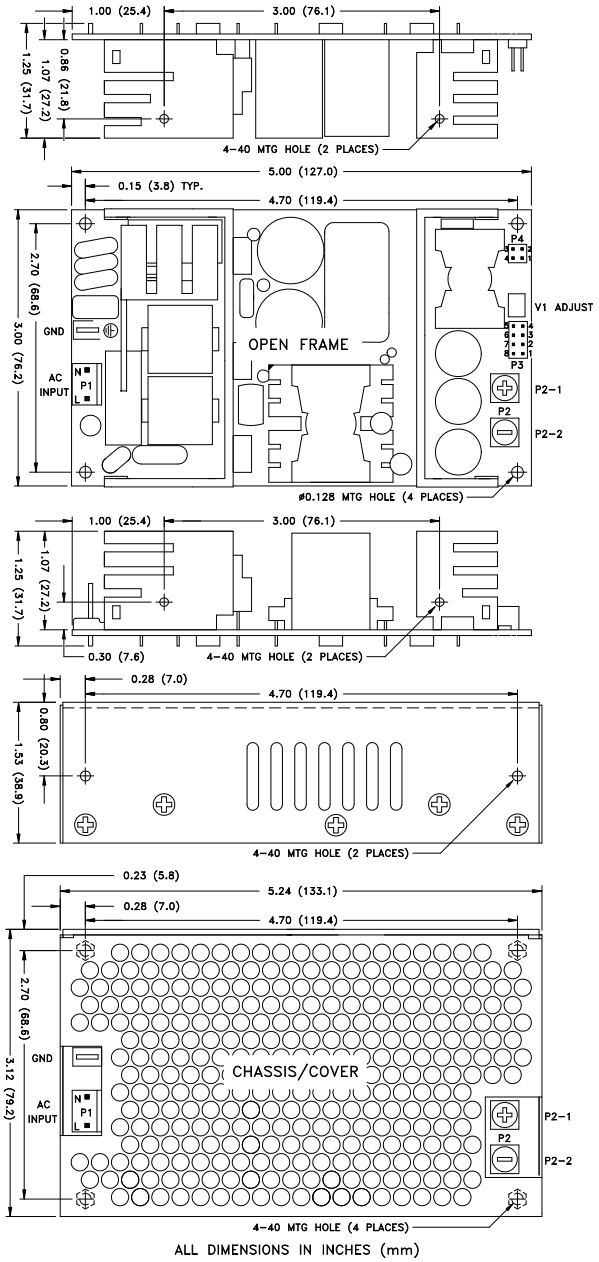
GENERAL SPECIFICATIONS

Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOOP (Means of Operator Protection)
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 Inhibit (optional)	Isolated. Contact closure inhibits output.
Load Share (optional)(16, 17, 18)	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)(19)	Isolated 5 Vdc ± 10%, 10 mA available only with Remote Inhibit option.
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/ 1.37 Lbs. Chassis and Cover

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
Voltage Fluctuations/Flicker	EN 61000-3-3	Compliant	

NXT-175 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

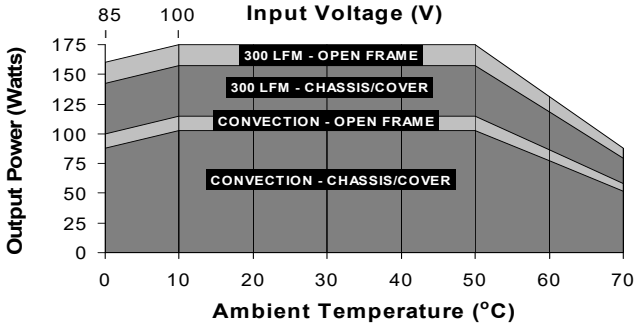
CONNECTOR SPECIFICATIONS

P1 NEUTRAL LINE	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 OUTPUT 1 (-) OUTPUT 1 (+)	DC Output	6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)
P3 SHARE BUS 5 — 4 ENABLE P.F. SIG (+) 6 — 3 P.F. RTN SENSE (-) 7 — 2 OUTPUT 1 (-) SENSE (+) 8 — 1 OUTPUT 1 (+)	Power Fail, Load Share, Sense	0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or crimp equivalent terminal.
P4 INHIBIT 3 — 2 INHIBIT RTN STBY PWR (+) 4 — 1 STBY RTN (-)	Inhibit, Standby Power	0.100 friction lock 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

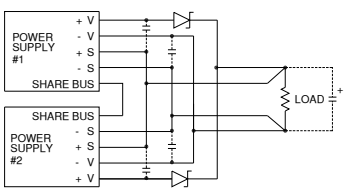
1. Continuous Output Power must not exceed 175W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply 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 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 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% 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. 175W 300LFM forced air, open frame. 115W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.0W_{OUT} /1V_{IN} below 100V_{IN} and between 100V_{IN} and 85V_{IN}. Use larger of the two deratings when using chassis/cover below 100V_{IN}. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE APPLICATION



REV. L 2/23/2017

225 WATTS

SINGLE OUTPUT AC-DC

NXT-225

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

	OPEN FRAME		CHASSIS/COVER	
MODEL	**300 LFM**	**CONVECTION COOLED**	**300 LFM**	**CONVECTION COOLED**
NXT-225-1001	2.5V/53.0A	2.5V/30.0A	2.5V/47.7A	2.5V/27.0A
NXT-225-1002	3.3V/53.0A	3.3V/30.0A	3.3V/47.7A	3.3V/27.0A
NXT-225-1003	5V/45.0A	5V/30.0A	5V/40.5A	5V/27.0A
NXT-225-1004	12V/18.8A	12V/12.5A	12V/16.9A	12V/11.3A
NXT-225-1005	15V/15.0A	15V/10.0A	15V/13.5A	15V/9.0A
NXT-225-1006	24V/9.4A	24V/6.3A	24V/8.5A	24V/5.7A
NXT-225-1007	28V/8.0A	28V/5.4A	28V/7.2A	28V/4.9A
NXT-225-1008	48V/4.7A	48V/3.1A	48V/4.2A	48V/2.8A

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
CO - Cover
LS - Single Wire Load Sharing
LSEVB - Load Share Evaluation Board
RE - Remote Inhibit

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1)	150W	Convection Cooled, Open Frame
(See Derating Chart)	225W	300LFM Forced-Air Cooled(15)
Power Derating	1.5 W_{OUT} / 1 V_{IN} below 100 V_{IN}	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	
Load Regulation	0.5%	(0-100% load change)
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, 500µS maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-130% rated Pout, cycle on/off, auto recovery	
Hold Up Time	16m min., Full Power, 85-264V Input	
Start Up Time	3 Seconds, 120V Input	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Input Protection(6)	Internal 5A Time Delay fuse
Peak Inrush Current	50A (cold)
Efficiency	85% Typical, Full Power varies by model
Power Factor	0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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 516.5
Shock	20g, peak per MIL-STD-810F Method 516.5

GENERAL SPECIFICATIONS

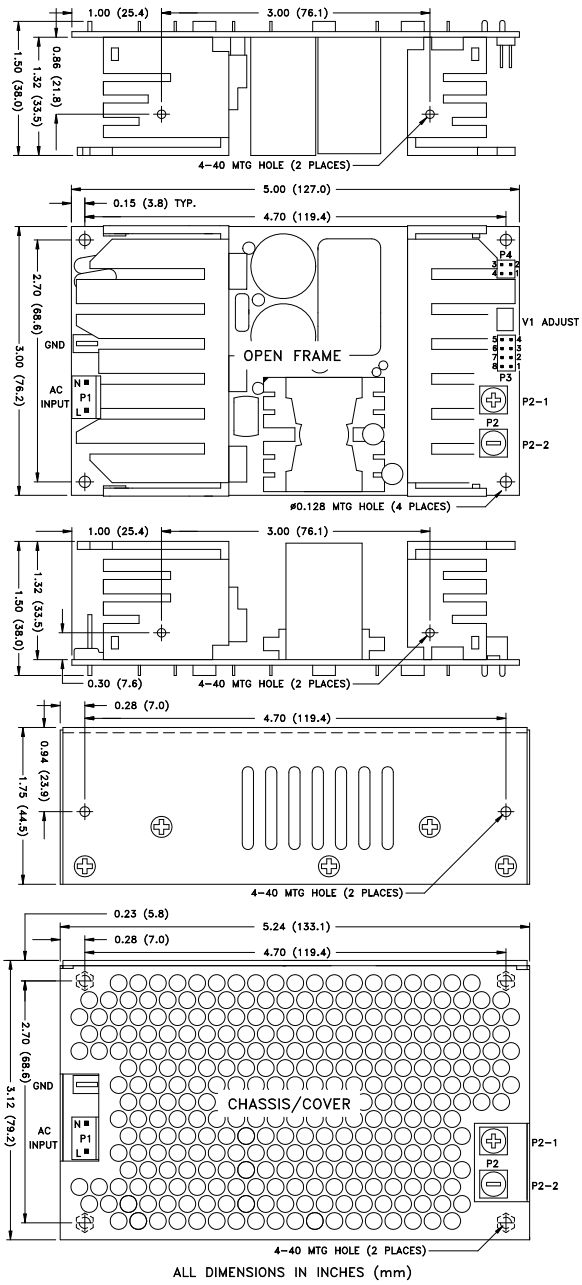
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOOP (Means of Operator Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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 Inhibit (optional)	Isolated. Contact closure inhibits output.
Load Share (optional)(16, 17, 18)	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)(19)	Isolated 5 Vdc ± 10%, 10 mA available only with Remote Inhibit option.
Remote Sense(10)	400mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.98 Lbs. Open Frame/ 1.50 Lbs. Chassis and Cover

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

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	±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	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
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-225 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

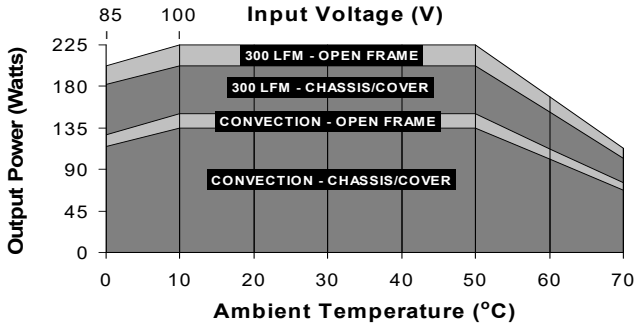
CONNECTOR SPECIFICATIONS

P1 NEUTRAL LINE	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 OUTPUT 1 (-) OUTPUT 1 (+)	DC Output	6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)
P3 SHARE BUS 5 — 4 ENABLE P.F. SIG (+) 6 — 3 P.F. RTN SENSE (-) 7 — 2 OUTPUT 1 (-) SENSE (+) 8 — 1 OUTPUT 1 (+)	Power Fail, Load Share, Sense	0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or crimp equivalent terminal.
P4 INHIBIT 3 — 2 INHIBIT RTN STBY PWR (+) 4 — 1 STBY RTN (-)	Inhibit, Standby Power	0.100 friction lock 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

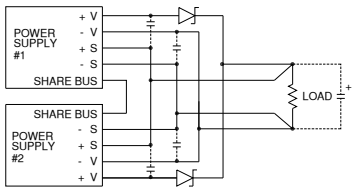
1. Continuous Output Power must not exceed 225W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply 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 60601-1:2005, 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 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-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 300LFM forced air, open frame. 150W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.5W$_{OUT}$/1V$_{IN}$ below 100V$_{IN}$ and between 100V$_{IN}$ and 85V$_{IN}$. Use larger of the two deratings when using chassis/cover below 100V$_{IN}$. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



REV. K 2/23/2017

325 WATTS

SINGLE OUTPUT AC-DC

NXT-325

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 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**

CHASSIS/COVER

OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

	OPEN FRAME		CHASSIS/COVER	
MODEL	**300 LFM**	**CONVECTION COOLED**	**300 LFM**	**CONVECTION COOLED**
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/16.7A	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
CO - Cover
LS - Single Wire Load Sharing
LSEVB - Load Share Evaluation Board
RE - Remote Inhibit

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1) (See Derating Chart)	100-202W 163-350W	Convection Cooled, Open Frame 300LFM Forced-Air Cooled(15)
Power Derating	2.0 W_{OUT} / 1 V_{IN} below 100 V_{IN}	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	
Load Regulation	0.5%	(0-100% load change)
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, 500µS maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-130% rated Pout, cycle on/off, auto recovery	
Hold Up Time	16ms min., Full Power, 85-264V Input	
Start Up Time	3 Seconds, 120V Input	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Input Protection(6)	Internal 8A Time Delay fuse
Peak Inrush Current	50A (cold)
Efficiency	85% Typical, Full Power varies by model
Power Factor	0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C Derating: See Power Rating Chart
Thermal Shutdown	Output voltage is inhibited during excessive internal temperatures, automatic reset.
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, 10–2000Hz, 1 octave/min, 3 axis, 1 hour each
Shock	20g, 11ms, 3 axis.

GENERAL SPECIFICATIONS

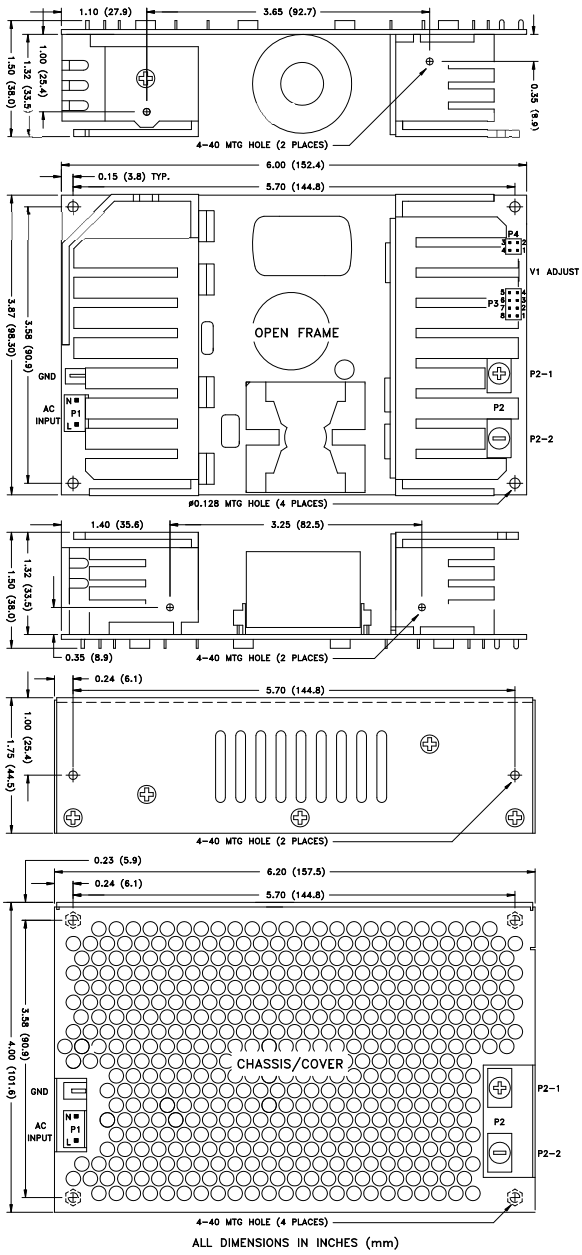
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection
Primary to Ground	1MOOP (Means of Operator Protection)
Secondary to Ground	Operational Insulation(Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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 Inhibit (optional)	Isolated. Contact closure inhibits output.
Load Share (optional)(16, 17, 18)	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)(19)	Isolated 5 Vdc ± 10%, 10 mA available only with Remote Inhibit option.
Remote Sense(10)	400mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.40 Lbs. Open Frame/ 2.15 Lbs. Chassis and Cover

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

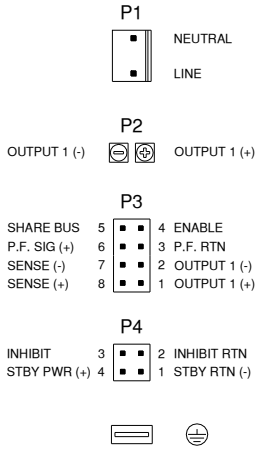
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge	A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM	A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz	A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line	A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM	A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.	A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V A/A
		0% U_T, 1 cycles, 0°	100/240V A/A
		40% U_T, 10/12 cycles, 0°	100/240V B/A
		70% U_T, 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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	
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-325 SERIES MECHANICAL SPECIFICATIONS



CONNECTOR SPECIFICATIONS

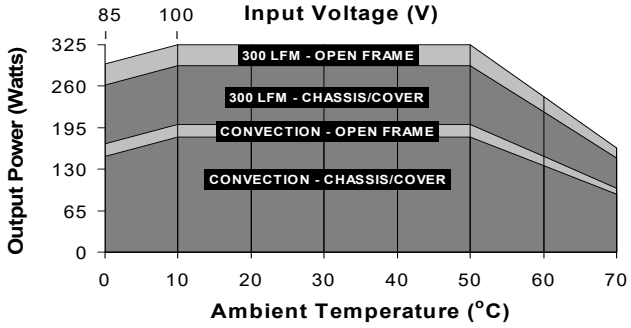


AC Input	0.156 friction lock header mates with Molex 09-50-3031 or equivalent crimp terminal housing with Molex 2478 or equivalent crimp terminal.
DC Output	6-32 screw down terminal mates with #6 ring tongue terminal. (10 in-lb Max)
Power Fail, Load Share, Sense	0.100 friction lock header mates with Molex 22-55-2081 or equivalent crimp terminal housing with Molex 71851 or crimp equivalent terminal.
Inhibit, Standby Power	0.100 friction lock 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

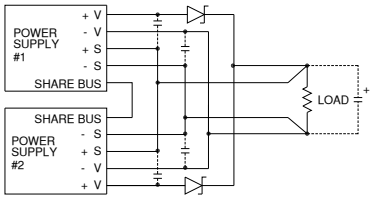
1. Continuous Output Power must not exceed 350W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply 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), 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 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-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. 325W 300LFM forced air, open frame. 200W convection cooled open frame. Derate 10% with chassis and cover. Derate 1.5W$_{OUT}$/1V$_{IN}$ below 100V$_{IN}$ and between 100V$_{IN}$ and 85V$_{IN}$. Use larger of the two deratings when using chassis/cover below 100V$_{IN}$. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



REV. L 2/23/2017

400 WATTS

SINGLE OUTPUT AC-DC

NXT-400

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 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**

CHASSIS/COVER OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	Low Voltage Directive RoHS Directive (Recast)	(2014/35/EU of February 2014) (2011/65/EU of June 2011)

MODEL LISTING

	OPEN FRAME		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.

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

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

OUTPUT SPECIFICATIONS

Output Power at 50°C(1)	225W	Convection Cooled, Open Frame
(See Derating Chart)	400W	300LFM Forced-Air Cooled(15)
Power Derating	2.5 W_{OUT} / 1 V_{IN} below 100 V_{IN}	
Voltage Centering	± 0.5%	(50% load)
Voltage Adjust Range	95-105%	
Load Regulation	0.5%	(0-100% load change)
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, 500µS maximum, 4% maximum deviation.	
Overvoltage Protection	Latching, between 110% and 150% of rated output voltage.	
Overpower Protection	110-130% rated Pout, cycle on/off, auto recovery	
Hold Up Time	16ms min., Full Power, 85-264V Input	
Start Up Time	3 Seconds, 120V Input	

INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC
Frequency Range	47 – 63 Hz
Input Protection(6)	Internal 10A Time Delay fuse
Peak Inrush Current	50A (cold)
Efficiency	85% Typical, Full Power varies by model
Power Factor	0.95 (Full Power, 230V), 0.98 (Full Power, 120V)

ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C Derating: See Power Rating Chart
Thermal Shutdown	Output voltage is inhibited during excessive internal temperatures, automatic reset.
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, 10Hz. – 2KHz per MIL-STD-810F Method 514.5
Shock	20g, peak per MIL-STD-810F Method 516.5

GENERAL SPECIFICATIONS

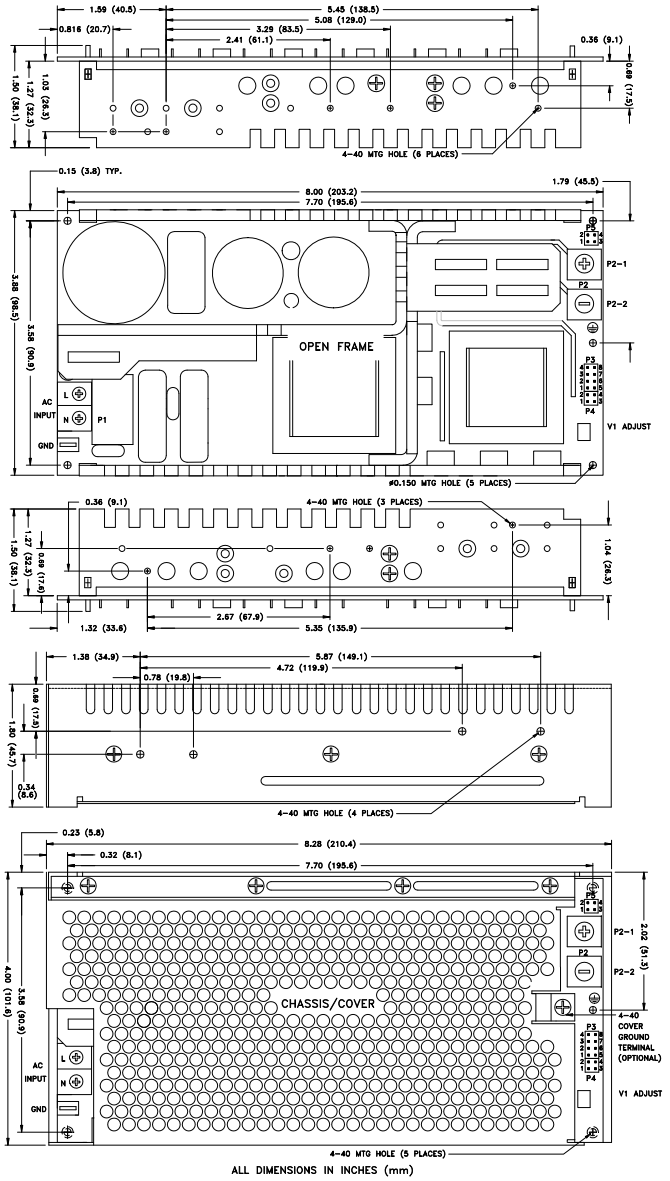
Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOOP (Means of Operator Protection)
Secondary to Ground	Operational Insulation (Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(8, 9)	
Reinforced Insulation	5656 VDC, Primary to Secondary
Basic Insulation	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 Inhibit (optional)	Isolated. Contact closure inhibits output.
Load Share (optional)(16, 17, 18)	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)(19)	Isolated 5 VDC ± 10%, 10mA available with Remote Inhibit Option.
Remote Sense(10)	400mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	2.65 Lbs. Open Frame/ 3.60 Lbs. Chassis and Cover

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

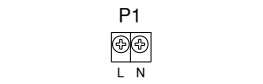
Electrostatic Discharge	EN 61000-4-2	±8KV contact / ±15KV air discharge		A
Radiated Electromagnetic Field	EN 61000-4-3	80MHz-2.7GHz, 10V/m, 80% AM		A
Electrical Fast Transients/Bursts	EN 61000-4-4	±2 KV, 5KHz/100KHz		A
Surge Immunity	EN 61000-4-5	±2 KV line to earth / ±1 KV line to line		A
Conducted Immunity	EN 61000-4-6	0.15 to 80MHz, 10V, 80% AM		A
Magnetic Field Immunity	EN 61000-4-8	30A/m, 60 Hz.		A
Voltage Dips	EN 61000-4-11	0% U_T, 0.5 cycles, 0-315°	100/240V	A/A
		0% U_T, 1 cycles, 0°	100/240V	A/A
		40% U_T, 10/12 cycles, 0°	100/240V	B/A
		70% U_T, 25/30 cycles, 0°	100/240V	B/A
Voltage Interruptions	EN 61000-4-11	0% U_T, 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		
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

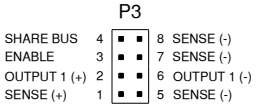


CONNECTOR SPECIFICATIONS

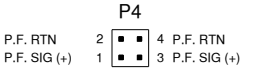


AC Input	Terminal block with 6-32 screws on 0.325 centers mates with #6, spade terminals. (8 in-lb max)

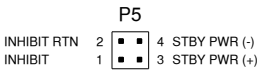
DC Output	10-32 screw down terminal mates with #10 ring tongue terminal. (10 in-lb Max)



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.



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



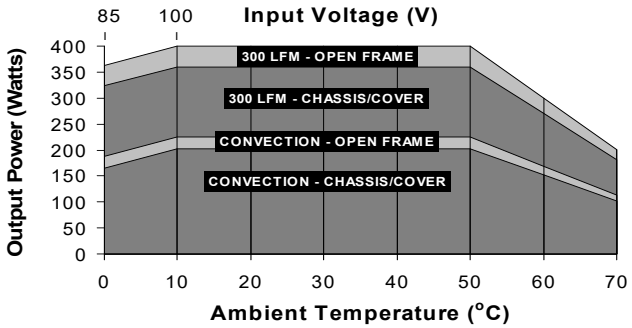
Inhibit, Standby Power	0.100 friction lock header mates with Molex 22-55-2041 or equivalent crimp terminal housing with Molex 71851 or equivalent crimp terminal.

Ground	0.187 quick disconnect terminal.

APPLICATIONS INFORMATION

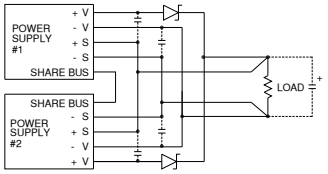
1. Continuous Output Power must not exceed 400W.
2. Generally, adequate cooling is provided when semiconductor case temperatures do not exceed 70°C rise and transformer temperature does not exceed 60°C rise at any specified ambient temperature.
3. Sufficient area must be provided around power supply 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. 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 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-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. 400W 300LFM forced air, open frame. 225W convection cooled open frame. Derate 10% with chassis and cover. Derate 2.5W_{OUT}/1V_{IN} below 100V_{IN} and between 100V_{IN} and 85V_{IN}. Use larger of the two deratings when using chassis/cover below 100V_{IN}. Derate output power linearly to 50% between 50° and 70°C.

TYPICAL LOAD SHARE/REMOTE SENSE APPLICATION



REV. K 2/23/2017

70 WATTS

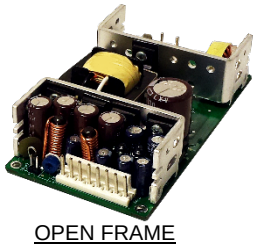
SINGLE/MULTI OUTPUT DC-DC

DC2-70

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**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**

CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
DC2-70-4001	+3.3V/6A	+5V/5A	+12V/2A(18)	-12V/2A(18)
DC2-70-4002	+5V/6A	+3.3V/5A	+12V/2A(18)	-12V/2A(18)
DC2-70-4003	+5V/6A	+3.3V/5A	+15V/2A(18)	-15V/2A(18)
DC2-70-4004	+5V/6A	-5V/5A	+12V/2A(18)	-12V/2A(18)
DC2-70-4005	+5V/6A	-5V/5A	+15V/2A(18)	-15V/2A(18)
DC2-70-4006	+5V/6A	+24V/2A	+12V/2A(18)	-12V/2A(18)
DC2-70-4007	+5V/6A	+24V/2A	+15V/2A(18)	-15V/2A(18)
DC2-70-3001	+5V/6A	+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(17)			
DC2-70-1002	3.3V/14A(17)			
DC2-70-1003	5V/14A(17)			
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

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	50W	Convection Cooled(16, 18)
(See Derating Chart)	70W	300LFM Forced-Air Cooled(15, 17, 19)
Output 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%
	Output 2:	5.0% load change)
	(4001-5 Models)	8.0%
	(2001 Model)	8.0%
	Output 3:	5.0%
	Output 4:	5.0%
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	5.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, 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

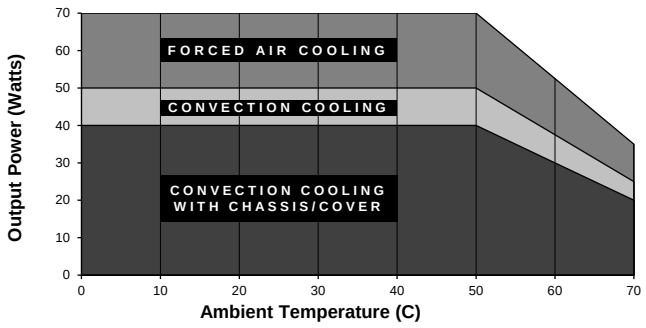
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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	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(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense (singles only)(9)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.60 Lbs. Open Frame 1.00 Lbs. Chassis and Cover

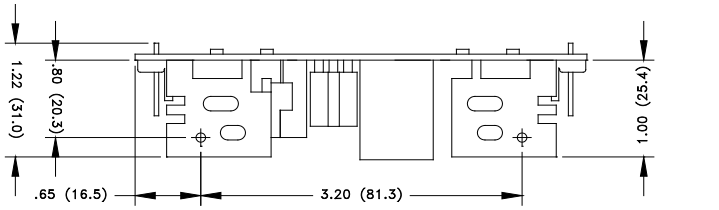
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE

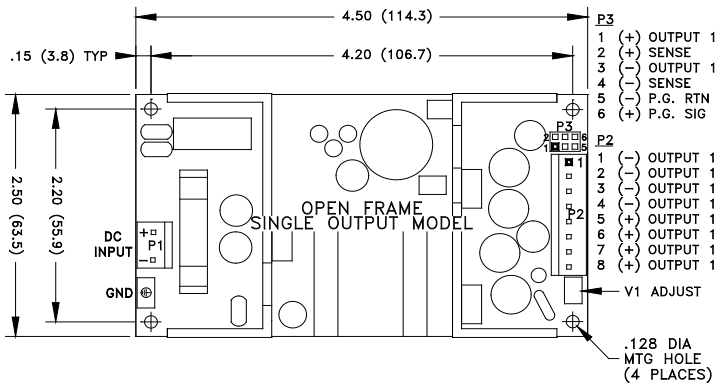


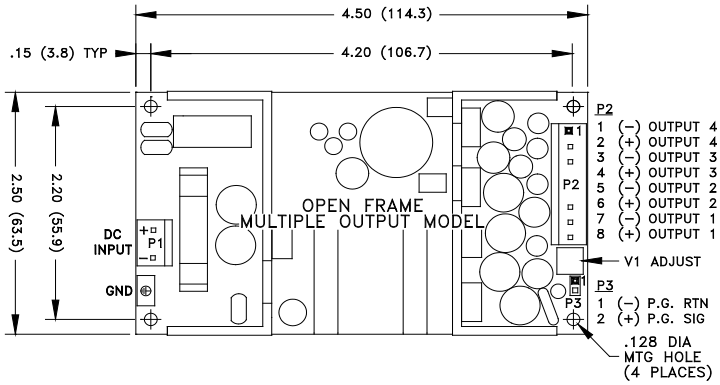
All specifications are maximum at 25°C/70W unless otherwise stated, may vary by model and are subject to change without notice.

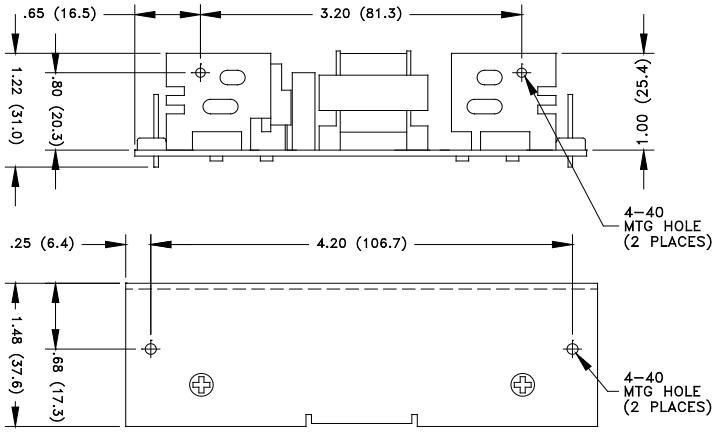
INTEGRATED POWER DESIGNS 300 Stewart Road ■ Wilkes-Barre, PA 18706 ■ Phone: (570) 824-4666 ■ Fax: (570) 824-4843 ■ Email: sales@ipdpower.com ■ Web: www.ipdpower.com

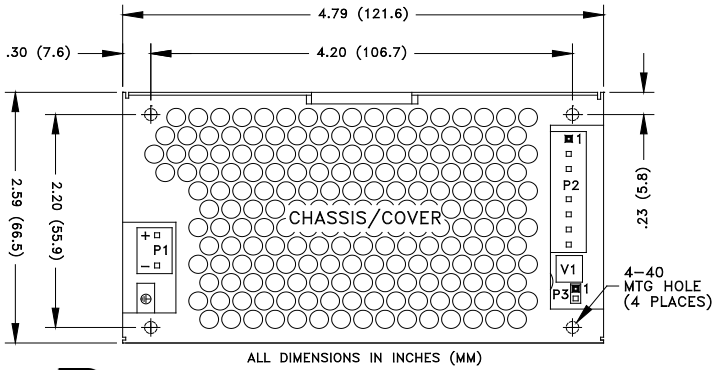
DC2-70 SERIES MECHANICAL SPECIFICATIONS











ALL DIMENSIONS IN INCHES (MM)

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 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 (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 3-640706-1 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 22-55-2061 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.

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

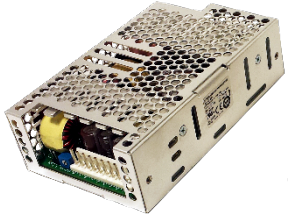
110 WATTS

SINGLE/MULTI OUTPUT DC-DC

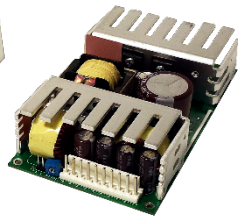
DC2-110

FEATURES:

- **Compact 3" x 5" x 1.3" Size**
- **2 Year Warranty**
- **18-36VDC Input**
- **One to Four Outputs**
- **4242VDC Reinforced Insulation**
- **Under/Overvoltage Lockout**
- **Size/Pin Compatible with REL-110 Series**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**



CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(20)	OUTPUT 2(20)	OUTPUT 3(19)	OUTPUT 4(19)
DC2-110-4001	+3.3V/10A(17)	+5V/6A	+12V/2A	-12V/2A
DC2-110-4002	+5V/10A(17)	+3.3V/6A	+12V/2A	-12V/2A
DC2-110-4003	+5V/10A(17)	+3.3V/6A	+15V/2A	-15V/2A
DC2-110-4004	+5V/10A(17)	-5V/6A	+12V/2A	-12V/2A
DC2-110-4005	+5V/10A(17)	-5V/6A	+15V/2A	-15V/2A
DC2-110-4006	+5V/10A(17)	+24V/2A	+12V/2A	-12V/2A
DC2-110-4007	+5V/10A(17)	+24V/2A	+15V/2A	-15V/2A
DC2-110-3001	+5V/10A(17)	+12V/3A		-12V/3A
DC2-110-3002	+5V/10A(17)	+15V/2A		-15V/2A
DC2-110-2001	+3.3V/10A(17)	+5V/6A		
DC2-110-2002	+5V/10A(17)	+12V/5A		
DC2-110-2003	+5V/10A(17)	+24V/3A		
DC2-110-2004	+12V/5A	-12V/4A		
DC2-110-2005	+15V/4A	-15V/3A		
DC2-110-1001	2.5V/22A(18)			
DC2-110-1002	3.3V/22A(18)			
DC2-110-1003	5V/22A(18)			
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
CO – Cover
BD – Reverse Input Protection
I/O – Isolated Outputs
TS – Terminal Strip

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	80W	Convection Cooled(13, 15)
(See Derating Chart)	110W	300LFM Forced-Air Cooled(12, 14, 16)
Output 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%
	Output 2:	5.0% load change)
	(4001-5 Models)	8.0%
	(2001 Model)	6.0%
	Output 3:	5.0%
	Output 4:	5.0%
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	5.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery	
Start Up Time	5 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	8.5 A
Reflected Ripple Current	5 %
Efficiency	82% Typ., Full Power, 24VDC, varies by model

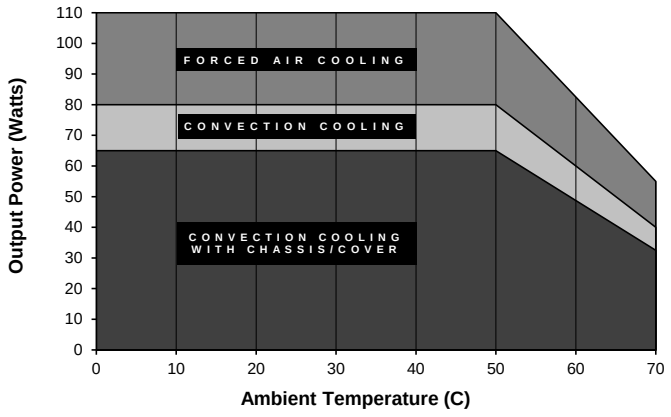
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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	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(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense (singles only)(9)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.65 Lbs. Open Frame 1.15 Lbs. Chassis and Cover

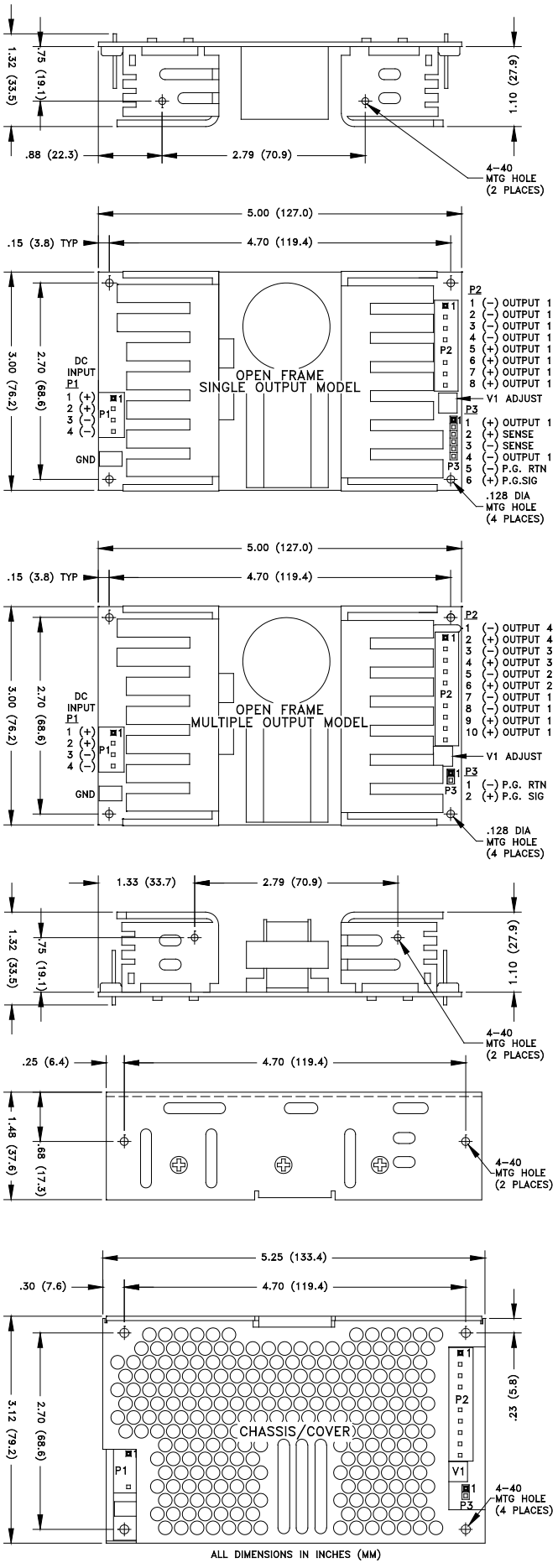
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



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

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

DC2-110 SERIES MECHANICAL SPECIFICATIONS



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 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 (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

P1	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.
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.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.
P3	P.G. (Multiple)	0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

REV. K 12/21/2016

150 WATTS

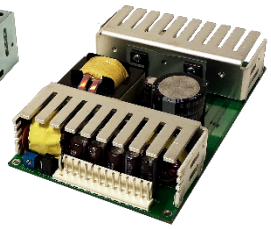
SINGLE/MULTI OUTPUT DC-DC

DC2-150

FEATURES:

- **Compact 3.8" x 6" x 1.3" Size**
- **2 Year Warranty**
- **18-36VDC Input**
- **One to Four Outputs**
- **4242VDC Reinforced Insulation**
- **Under/Overvoltage Lockout**
- **Size/Pin Compatible with REL-150 Series**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**

CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(20)	OUTPUT 2(20)	OUTPUT 3(19)	OUTPUT 4(19)
DC2-150-4001	+3.3V/15A(17)	+5V/8A	+12V/2A	-12V/2A
DC2-150-4002	+5V/15A(17)	+3.3V/8A	+12V/2A	-12V/2A
DC2-150-4003	+5V/15A(17)	+3.3V/8A	+15V/2A	-15V/2A
DC2-150-4004	+5V/15A(17)	-5V/8A	+12V/2A	-12V/2A
DC2-150-4005	+5V/15A(17)	-5V/8A	+15V/2A	-15V/2A
DC2-150-4006	+5V/15A(17)	+24V/3A	+12V/2A	-12V/2A
DC2-150-4007	+5V/15A(17)	+24V/3A	+15V/2A	-15V/2A
DC2-150-3001	+5V/15A(17)	+12V/4A		-12V/3A
DC2-150-3002	+5V/15A(17)	+15V/3A		-15V/2A
DC2-150-2001	+3.3V/15A(17)	+5V/8A		
DC2-150-2002	+5V/15A(17)	+12V/5A		
DC2-150-2003	+5V/15A(17)	+24V/3A		
DC2-150-2004	+12V/7.5A	-12V/5A		
DC2-150-2005	+15V/5A	-15V/5A		
DC2-150-1001	2.5V/30A(18)			
DC2-150-1002	3.3V/30A(18)			
DC2-150-1003	5V/30A(18)			
DC2-150-1004	12V/12.5A			
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

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	100W	Convection Cooled(13, 15)	
(See Derating Chart)	150W	300LFM Forced-Air Cooled(12, 14, 16)	
Output Voltage Centering	Output 1:	± 0.5%	(All outputs at 50% load)
	Output 2:	± 5.0%	
	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%	(10-100% load change)
	(4001-5 Models)	8.0%	(20-100% load change)
	(2001 Model)	6.0%	(20-100% load change)
	Output 3:	5.0%	(10-100% load change)
	Output 4:	5.0%	(10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	5.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery		
Start Up Time	5 Seconds		

INPUT SPECIFICATIONS

Input Voltage Range	18-36 VDC
Input Under-Voltage Lockout	
Turn-0n 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

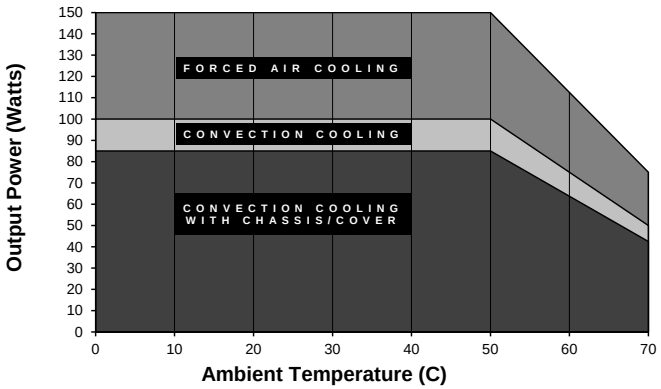
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0° C to + 70° C 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	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(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense(9)	250mV compensation of output cable losses
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

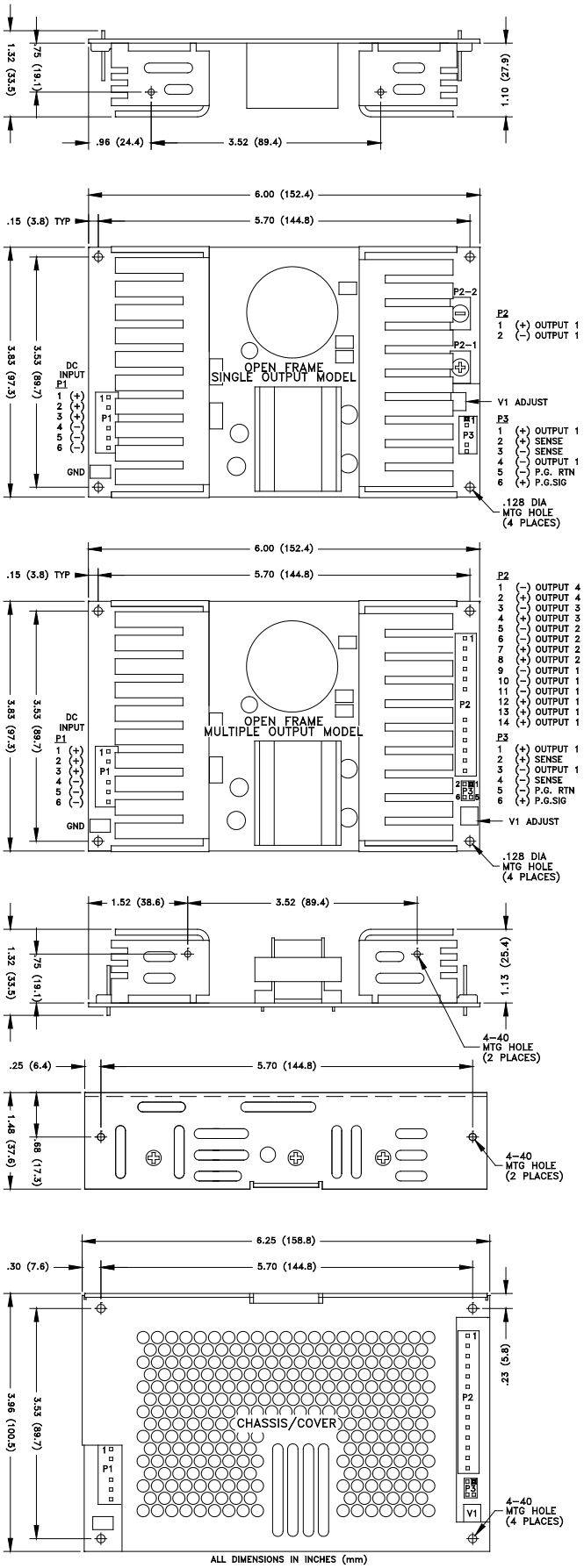
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



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 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

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.
G	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 71851 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.

REV. J 12/21/2016

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

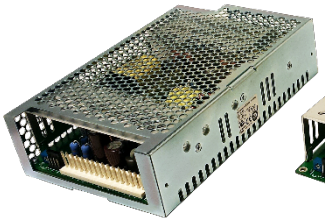
185 WATTS

SINGLE/MULTI OUTPUT DC-DC

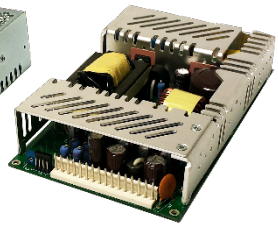
DC2-185

FEATURES:

- **Compact 4.2" x 7.0" x 1.5" Size**
- **2 Year Warranty**
- **18-36VDC Input**
- **One to Four Outputs**
- **4242VDC Reinforced Insulation**
- **Under/Overvoltage Lockout**
- **Size/Pin Compatible with REL-185 Series**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compatible**
- **Optional Chassis/Cover**
- **Power Good Signal**



CHASSIS/COVER



OPEN CHASSIS

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(20)	OUTPUT 2(20)	OUTPUT 3(19)	OUTPUT 4(19)
DC2-185-4001	+3.3V/20A(17)	+5V/10A	+12V/2A	-12V/2A
DC2-185-4002	+5V/20A(17)	+3.3V/10A	+12V/2A	-12V/2A
DC2-185-4003	+5V/20A(17)	+3.3V/10A	+15V/2A	-15V/2A
DC2-185-4004	+5V/20A(17)	-5V/10A	+12V/2A	-12V/2A
DC2-185-4005	+5V/20A(17)	-5V/10A	+15V/2A	-15V/2A
DC2-185-4006	+5V/20A(17)	+24V/3A	+12V/2A	-12V/2A
DC2-185-4007	+5V/20A(17)	+24V/3A	+15V/2A	-15V/2A
DC2-185-3001	+5V/20A(17)	+12V/5A		-12V/3A
DC2-185-3002	+5V/20A(17)	+15V/4A		-15V/3A
DC2-185-2001	+3.3V/20A(17)	+5V/10A		
DC2-185-2002	+5V/20A(17)	+12V/8A		
DC2-185-2003	+5V/20A(17)	+24V/4A		
DC2-185-2004	+12V/10A	-12V/6A		
DC2-185-2005	+15V/8A	-15V/5A		
DC2-185-1001	2.5V/37A(18)			
DC2-185-1002	3.3V/37A(18)			
DC2-185-1003	5V/37A(18)			
DC2-185-1004	12V/15.4A			
DC2-185-1005	15V/12.3A			
DC2-185-1006	24V/7.7A			
DC2-185-1007	28V/6.6A			
DC2-185-1008	48V/3.8A			

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

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	135W	Convection Cooled(13,15)
(See Derating Chart)	185W	300LFM Forced-Air Cooled(12, 14, 16)
Output 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% (20-100% load change)
	(4001,4,5,2001)	10.0% (20-100% load change)
	(4002,3)	15.0%
	Output 3:	5.0%
	Output 4:	5.0%
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	6.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery	
Start Up Time	5 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	14.0 A
Reflected Ripple Current	5 %
Efficiency	77% Typ., Full Power, 24VDC, varies by model

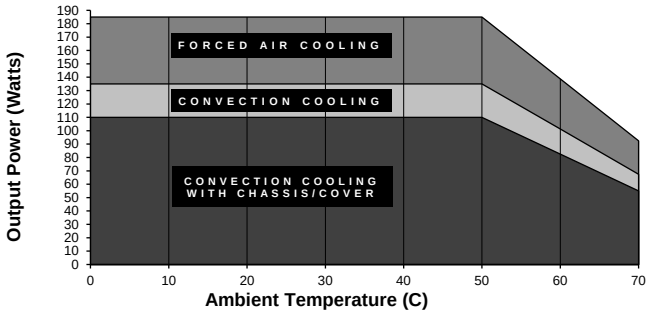
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0° C to + 70° C 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	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(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense (singles only)(9)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.28 Lbs. Open Frame 2.16 Lbs. Chassis and Cover

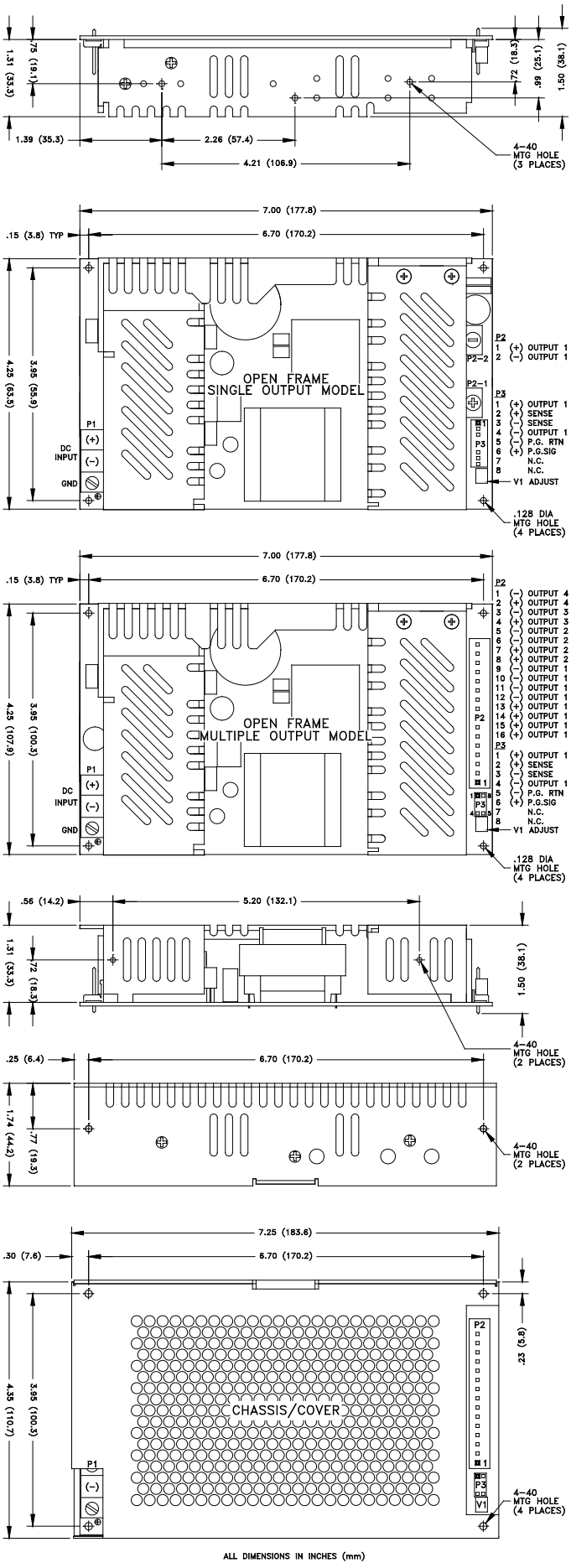
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



All specifications are maximum at 25°C/185W unless otherwise stated, may vary by model and are subject to change without notice.

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

DC2-185 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

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 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 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)
P2	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.
G	Ground	0.187 quick disconnect terminal.
P3	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.
P3	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.

Rev. J 12/21/16

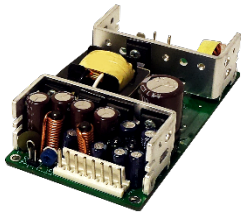
70 WATTS

SINGLE/MULTI OUTPUT DC-DC

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 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**

CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
DC4-70-4001	+3.3V/6A	+5V/5A	+12V/2A(18)	-12V/2A(18)
DC4-70-4002	+5V/6A	+3.3V/5A	+12V/2A(18)	-12V/2A(18)
DC4-70-4003	+5V/6A	+3.3V/5A	+15V/2A(18)	-15V/2A(18)
DC4-70-4004	+5V/6A	-5V/5A	+12V/2A(18)	-12V/2A(18)
DC4-70-4005	+5V/6A	-5V/5A	+15V/2A(18)	-15V/2A(18)
DC4-70-4006	+5V/6A	+24V/2A	+12V/2A(18)	-12V/2A(18)
DC4-70-4007	+5V/6A	+24V/2A	+15V/2A(18)	-15V/2A(18)
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		
DC4-70-2002	+5V/6A	+12V/4A		
DC4-70-2003	+5V/6A	+24V/2A		
DC4-70-2004	+12V/3A	-12V/3A		
DC4-70-2005	+15V/3A	-15V/2A		
DC4-70-1001	2.5V/14A(17)			
DC4-70-1002	3.3V/14A(17)			
DC4-70-1003	5V/14A(17)			
DC4-70-1004	12V/5.8A			
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

DC4-70

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	50W	Convection Cooled(13, 15)
(See Derating Chart)	70W	300LFM Forced-Air Cooled(12, 14, 16)
Output 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%
	Output 2:	5.0% load change)
	(4001-5 Models)	8.0%
	(2001 Model)	8.0%
	Output 3:	5.0%
	Output 4:	5.0%
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	5.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery	
Start Up Time	4 Seconds	

INPUT SPECIFICATIONS

Input Voltage Range	36-72 VDC
Input Under-Voltage Lockout	
Turn-On Voltage	29.0-35.0 VDC
Turn-Off Voltage	28.0-34.0 VDC
Input Overvoltage Shutdown	77.0-85.0 VDC
Maximum Input Current	2.7 A
Reflected Ripple Current	5 %
Efficiency	78% Typ., Full Power, 48VDC, varies by model

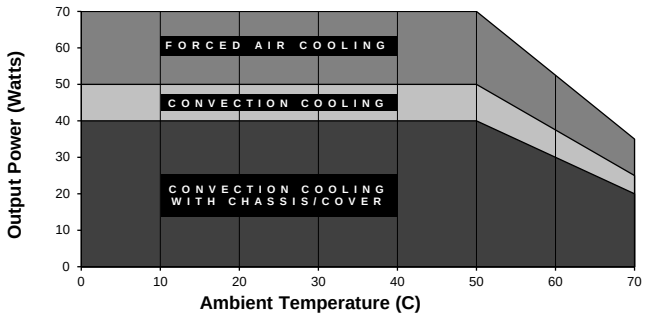
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating	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	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(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense (singles only)(9)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.60 Lbs. Open Frame
	1.00 Lbs. Chassis and Cover

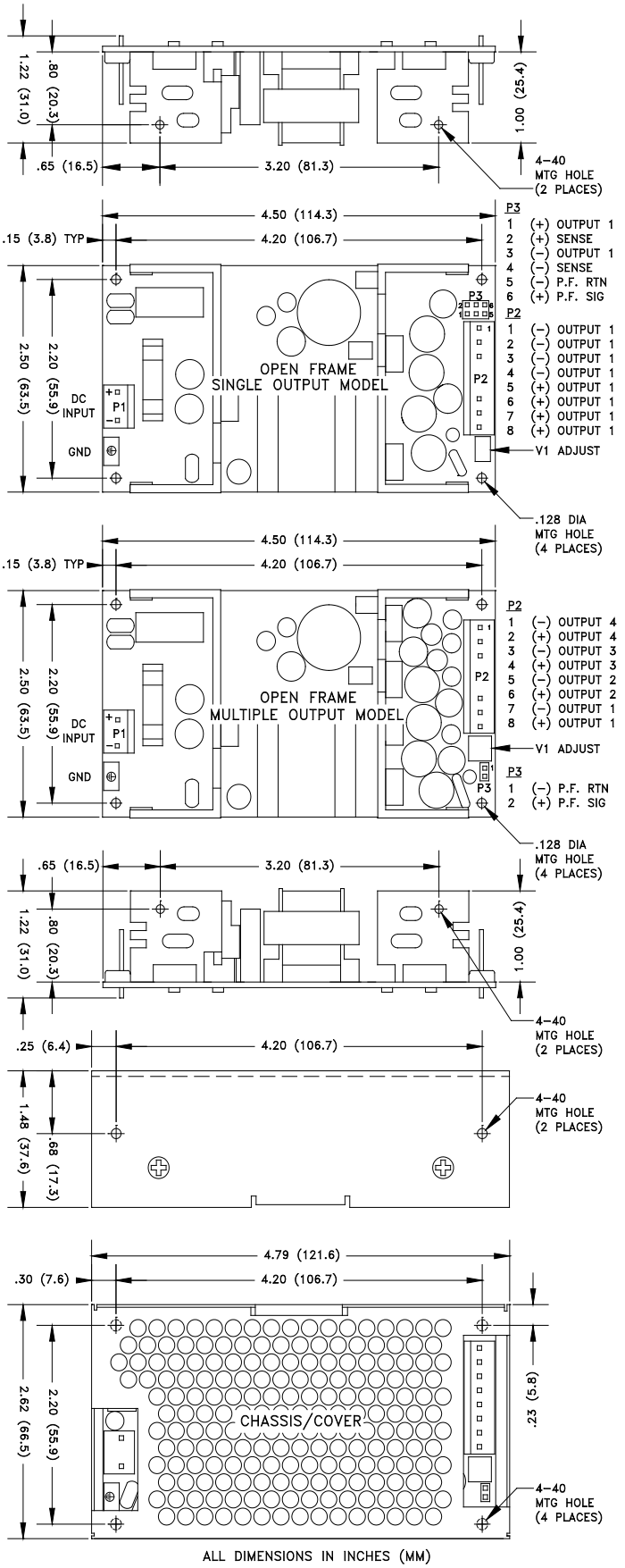
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



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

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

DC4-70 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (MM)

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 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 (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 3-640706-1 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 22-55-2061 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.

REV.J 12/20/2016

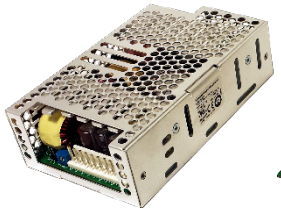
110 WATTS

SINGLE/MULTI OUTPUT DC-DC

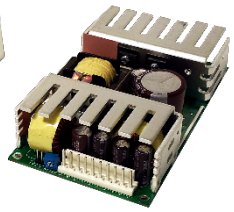
DC4-110

FEATURES:

- **Compact 3" x 5" x 1.3" Size**
- **2 Year Warranty**
- **36-72VDC Input**
- **One to Four Outputs**
- **4242VDC Reinforced Insulation**
- **Under/Overvoltage Lockout**
- **Size/Pin Compatible with REL-110 Series**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**



CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

c UL us	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
c UL us	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(20)	OUTPUT 2(20)	OUTPUT 3(19)	OUTPUT 4(19)
DC4-110-4001	+3.3V/10A(17)	+5V/6A	+12V/2A	-12V/2A
DC4-110-4002	+5V/10A(17)	+3.3V/6A	+12V/2A	-12V/2A
DC4-110-4003	+5V/10A(17)	+3.3V/6A	+15V/2A	-15V/2A
DC4-110-4004	+5V/10A(17)	-5V/6A	+12V/2A	-12V/2A
DC4-110-4005	+5V/10A(17)	-5V/6A	+15V/2A	-15V/2A
DC4-110-4006	+5V/10A(17)	+24V/2A	+12V/2A	-12V/2A
DC4-110-4007	+5V/10A(17)	+24V/2A	+15V/2A	-15V/2A
DC4-110-3001	+5V/10A(17)	+12V/3A		-12V/3A
DC4-110-3002	+5V/10A(17)	+15V/2A		-15V/2A
DC4-110-2001	+3.3V/10A(17)	+5V/6A		
DC4-110-2002	+5V/10A(17)	+12V/5A		
DC4-110-2003	+5V/10A(17)	+24V/3A		
DC4-110-2004	+12V/5A	-12V/4A		
DC4-110-2005	+15V/4A	-15V/3A		
DC4-110-1001	2.5V/22A(18)			
DC4-110-1002	3.3V/22A(18)			
DC4-110-1003	5V/22A(18)			
DC4-110-1004	12V/9.2A			
DC4-110-1005	15V/7.3A			
DC4-110-1006	24V/4.6A			
DC4-110-1007	28V/3.9A			
DC4-110-1008	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
CO - Cover
BD – Reverse Input Protection
I/O – Isolated Outputs
TS – Terminal Strip

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	80W	Convection Cooled(13, 15)
(See Derating Chart)	110W	300LFM Forced-Air Cooled(12, 14, 16)
Output 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%
	(4001-5 Models)	8.0%
	(2001 Model)	6.0%
	Output 3:	5.0%
	Output 4:	5.0%
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	5.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery	
Start Up Time	5 Seconds	

INPUT SPECIFICATIONS

Input Voltage Range	36-72 VDC
Input Under-Voltage Lockout	
Turn-On Voltage	29.0-35.0 VDC
Turn-Off Voltage	28.0-34.0 VDC
Input Overvoltage Shutdown	77.0-85.0 VDC
Maximum Input Current	4.2 A
Reflected Ripple Current	5 %
Efficiency	82% Typ., Full Power, 48VDC, varies by model

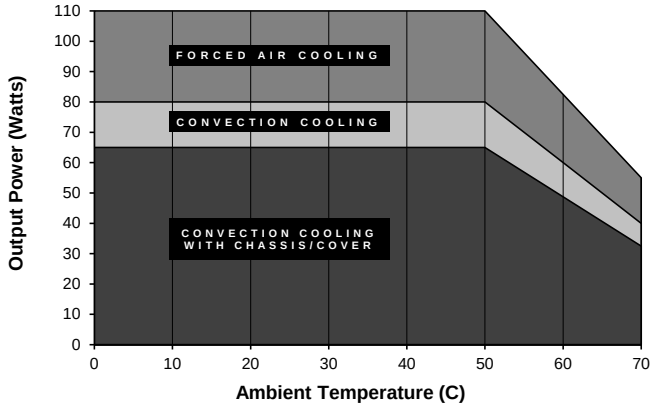
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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	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(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense (singles only)(9)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	0.65 Lbs. Open Frame 1.15 Lbs. Chassis and Cover

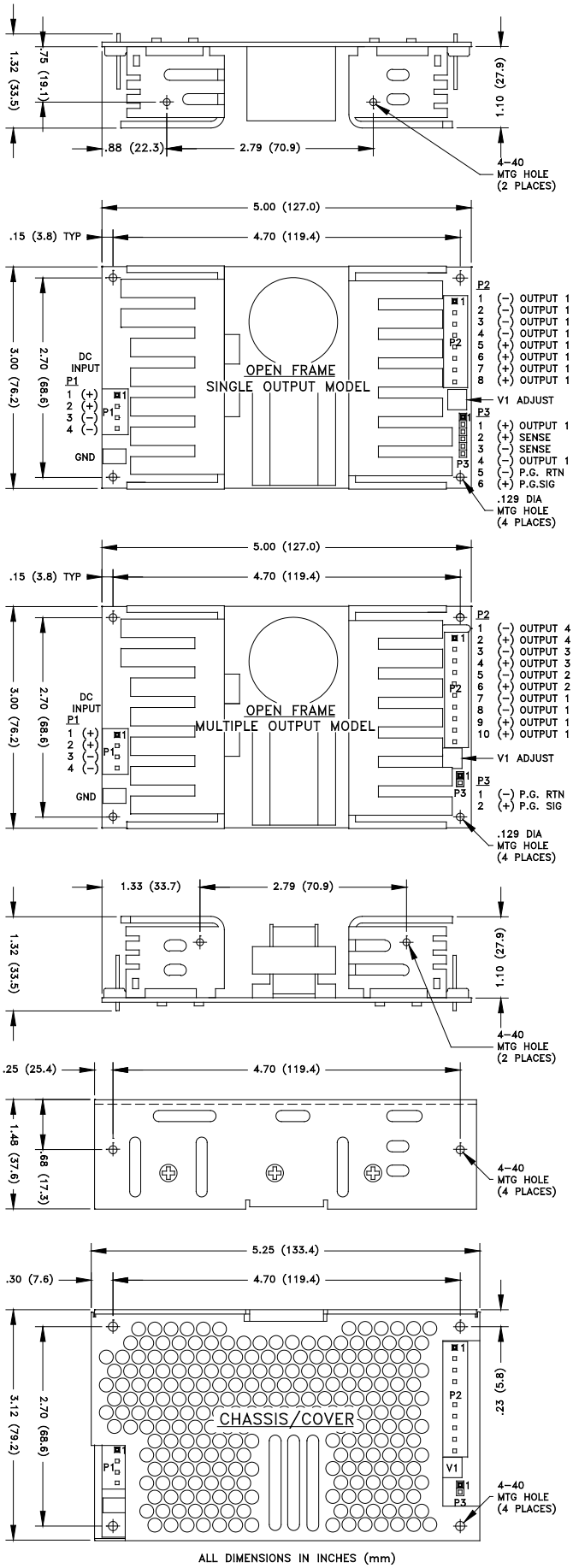
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



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

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

DC4-110 SERIES MECHANICAL SPECIFICATIONS



ALL DIMENSIONS IN INCHES (mm)

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 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 (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

P1	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.
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.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.
P3	P.G. (Multiple)	0.100 breakaway header mates with Molex 50-57-9002 or equivalent crimp terminal housing with Molex type 71851 or equivalent crimp terminal.

REV. K 12/21/2016

150 WATTS

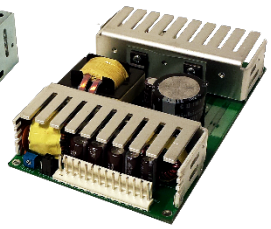
SINGLE/MULTI OUTPUT DC-DC

DC4-150

FEATURES:

- **Compact 3.8" x 5" x 1.3" Size**
- **2 Year Warranty**
- **36-72VDC Input**
- **One to Four Outputs**
- **4242VDC Reinforced Insulation**
- **Under/Overvoltage Lockout**
- **Size/Pin Compatible with REL-150 Series**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**

CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(20)	OUTPUT 2(20)	OUTPUT 3(19)	OUTPUT 4(19)
DC4-150-4001	+3.3V/15A(17)	+5V/8A	+12V/2A	-12V/2A
DC4-150-4002	+5V/15A(17)	+3.3V/8A	+12V/2A	-12V/2A
DC4-150-4003	+5V/15A(17)	+3.3V/8A	+15V/2A	-15V/2A
DC4-150-4004	+5V/15A(17)	-5V/8A	+12V/2A	-12V/2A
DC4-150-4005	+5V/15A(17)	-5V/8A	+15V/2A	-15V/2A
DC4-150-4006	+5V/15A(17)	+24V/3A	+12V/2A	-12V/2A
DC4-150-4007	+5V/15A(17)	+24V/3A	+15V/2A	-15V/2A
DC4-150-3001	+5V/15A(17)	+12V/4A		-12V/3A
DC4-150-3002	+5V/15A(17)	+15V/3A		-15V/2A
DC4-150-2001	+3.3V/15A(17)	+5V/8A		
DC4-150-2002	+5V/15A(17)	+12V/5A		
DC4-150-2003	+5V/15A(17)	+24V/3A		
DC4-150-2004	+12V/7.5A	-12V/5A		
DC4-150-2005	+15V/5A	-15V/5A		
DC4-150-1001	2.5V/30A(18)			
DC4-150-1002	3.3V/30A(18)			
DC4-150-1003	5V/30A(18)			
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			

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

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	100W	Convection Cooled(13, 15)	
(See Derating Chart)	150W	300LFM Forced-Air(12, 14, 16)	
Output 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%	(10-100% load change)
	(4001-5 Models)	8.0%	(20-100% load change)
	(2001 Model)	6.0%	(20-100% load change)
	Output 3:	5.0%	(10-100% load change)
	Output 4:	5.0%	(10-100% load change)
Source Regulation	Outputs 1 – 4:	0.5%	
Cross Regulation	Outputs 2 – 4:	5.0%	
Output Noise	Outputs 1 – 4:	1.0%	
Turn on Overshoot	None		
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery		
Start Up Time	5 Seconds		

INPUT SPECIFICATIONS

Input Voltage Range	36-72 VDC	
Input Under-Voltage Lockout		
Turn-0n Voltage	29.0-35.0 VDC	
Turn-off Voltage	28.0-34.0 VDC	
Input Overvoltage Shutdown	77.0-85.0 VDC	
Maximum Input Current	6.0 A	
Reflected Ripple Current	5 %	
Efficiency	82% Typ., Full Power, 48 VDC, varies by model	

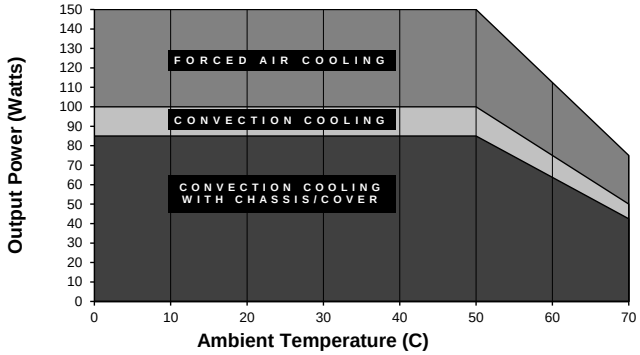
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating	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	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(7, 8)		
Reinforced Insulation	4242 VDC, Primary to Secondary	
Basic Insulation	2121 VDC, Primary to Ground	
Operational Insulation	707 VDC, Secondary to Ground	
Power Good Signal(11)	Logic high with input voltage above Vin min.	
Remote Sense(9)	250mV compensation of output cable losses	
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

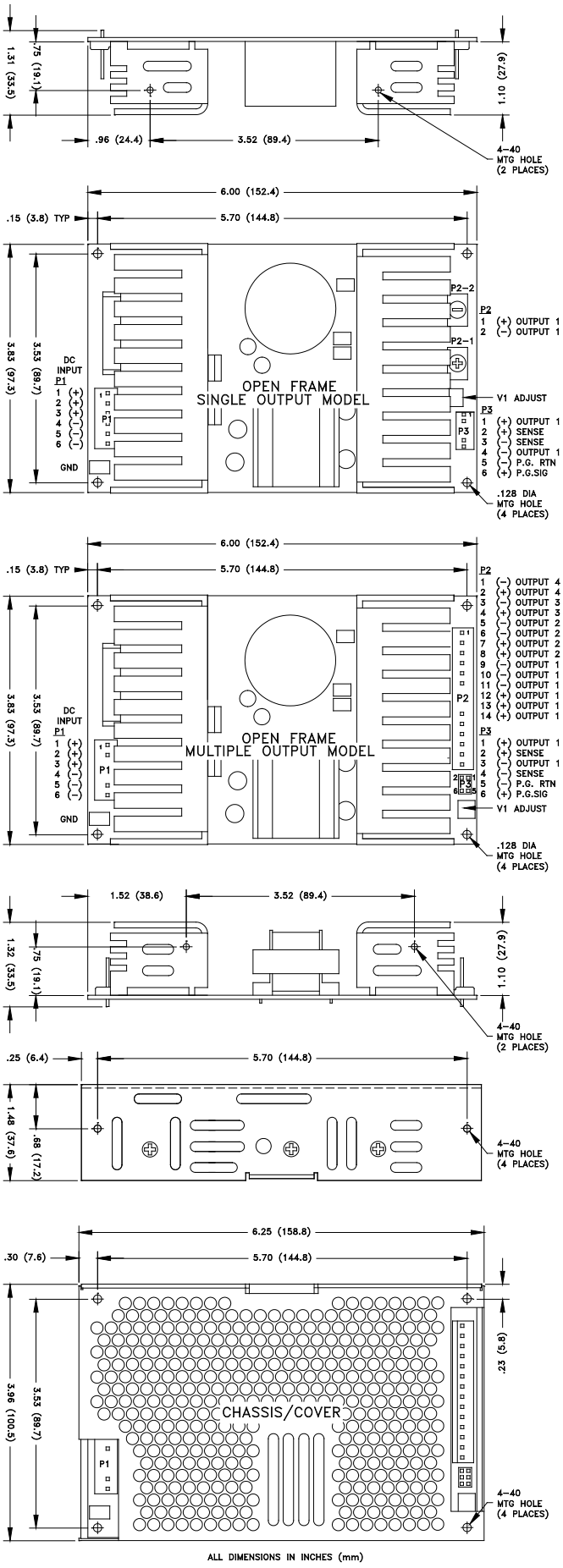
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



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

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

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.
G	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 71851 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.

REV. J 12/21/2016

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

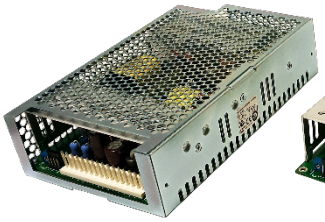
185 WATTS

SINGLE/MULTI OUTPUT DC-DC

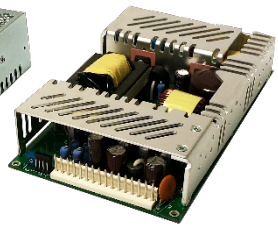
DC4-185

FEATURES:

- **Compact 4.2" x 7.0" x 1.5" Size**
- **2 Year Warranty**
- **36-72VDC Input**
- **One to Four Outputs**
- **4242VDC Reinforced Insulation**
- **Under/Overvoltage Lockout**
- **Size/Pin Compatible with REL-185 Series**
- **IEC 60601-1 3rd ed. Medical Cert.**
- **IEC 60950-1 2nd ed. ITE Certification**
- **0-70°C Operating Temperature**
- **RoHS Compliant**
- **Optional Chassis/Cover**
- **Power Good Signal**



CHASSIS/COVER



OPEN FRAME

SAFETY SPECIFICATIONS

cULus	Underwriters Laboratories File E137708/E140259	UL 60950-1:2007, 2nd Edition AAMI/ANSI ES60601-1:2005/(R) 2012
IECEE CB SCHEME		CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A2:2013, 2nd Edition IEC 60601-1:2005/A1:2012
cULus	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 SUD	TUV	EN 60950-1/A2:2013, 2nd Edition EN 60601-1:2006/A1:2013
CE	RoHS Directive (Recast)	(2011/65/EU of June 2011)

MODEL LISTING

MODEL	OUTPUT 1(20)	OUTPUT 2(20)	OUTPUT 3(19)	OUTPUT 4(19)
DC4-185-4001	+3.3V/20A(17)	+5V/10A	+12V/2A	-12V/2A
DC4-185-4002	+5V/20A(17)	+3.3V/10A	+12V/2A	-12V/2A
DC4-185-4003	+5V/20A(17)	+3.3V/10A	+15V/2A	-15V/2A
DC4-185-4004	+5V/20A(17)	-5V/10A	+12V/2A	-12V/2A
DC4-185-4005	+5V/20A(17)	-5V/10A	+15V/2A	-15V/2A
DC4-185-4006	+5V/20A(17)	+24V/3A	+12V/2A	-12V/2A
DC4-185-4007	+5V/20A(17)	+24V/3A	+15V/2A	-15V/2A
DC4-185-3001	+5V/20A(17)	+12V/5A		-12V/3A
DC4-185-3002	+5V/20A(17)	+15V/4A		-15V/3A
DC4-185-2001	+3.3V/20A(17)	+5V/10A		
DC4-185-2002	+5V/20A(17)	+12V/8A		
DC4-185-2003	+5V/20A(17)	+24V/4A		
DC4-185-2004	+12V/10A	-12V/6A		
DC4-185-2005	+15V/8A	-15V/5A		
DC4-185-1001	2.5V/37A(18)			
DC4-185-1002	3.3V/37A(18)			
DC4-185-1003	5V/37A(18)			
DC4-185-1004	12V/15.4A			
DC4-185-1005	15V/12.3A			
DC4-185-1006	24V/7.7A			
DC4-185-1007	28V/6.6A			
DC4-185-1008	48V/3.8A			

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

OUTPUT SPECIFICATIONS

Total Output Power at 50°C(1)	135W	Convection Cooled(13, 15)
(See Derating Chart)	185W	300LFM Forced-Air(12, 14, 16)
Output 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% (20-100% load change)
	(4001,4,5,2001)	10.0% (20-100% load change)
	(4002,3)	15.0%
	Output 3:	5.0%
	Output 4:	5.0%
Source Regulation	Outputs 1 – 4:	0.5%
Cross Regulation	Outputs 2 – 4:	6.0%
Output Noise	Outputs 1 – 4:	1.0%
Turn on Overshoot	None	
Transient Response	Outputs 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	110-160% rated Pout, cycle on/off, auto recovery	
Start Up Time	5 Seconds	

INPUT SPECIFICATIONS

Input Voltage Range	36-72 VDC
Input Under-Voltage Lockout	
Turn-On Voltage	29.0-35.0 VDC
Turn-Off Voltage	28.0-34.0 VDC
Input Overvoltage Shutdown	77.0-85.0 VDC
Maximum Input Current	7.0 A
Reflected Ripple Current	5 %
Efficiency	84% Typ., Full Power, 48VDC, varies by model

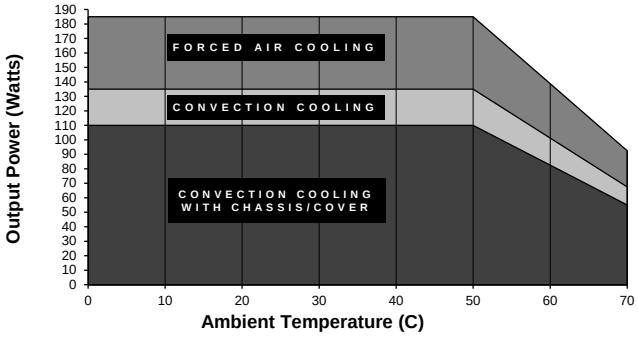
ENVIRONMENTAL SPECIFICATIONS

Ambient Operating Temperature Range	0°C to + 70°C 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	
Reinforced Insulation	2MOOP (Means of Operator Protection)
Reinforced Insulation	1MOOP (Means of Operator Protection)
Reinforced Insulation	Operational Insulation (Consult factory for 1MOOP or 1MOPP)
Dielectric Strength(7, 8)	
Reinforced Insulation	4242 VDC, Primary to Secondary
Basic Insulation	2121 VDC, Primary to Ground
Operational Insulation	707 VDC, Secondary to Ground
Power Good Signal(11)	Logic high with input voltage above Vin min.
Remote Sense (singles only)(9)	250mV compensation of output cable losses
Mean-Time Between Failures	100,000 Hours min., MIL-HDBK-217F, 25° C, GB
Weight	1.28 Lbs. Open Frame 2.16 Lbs. Chassis and Cover

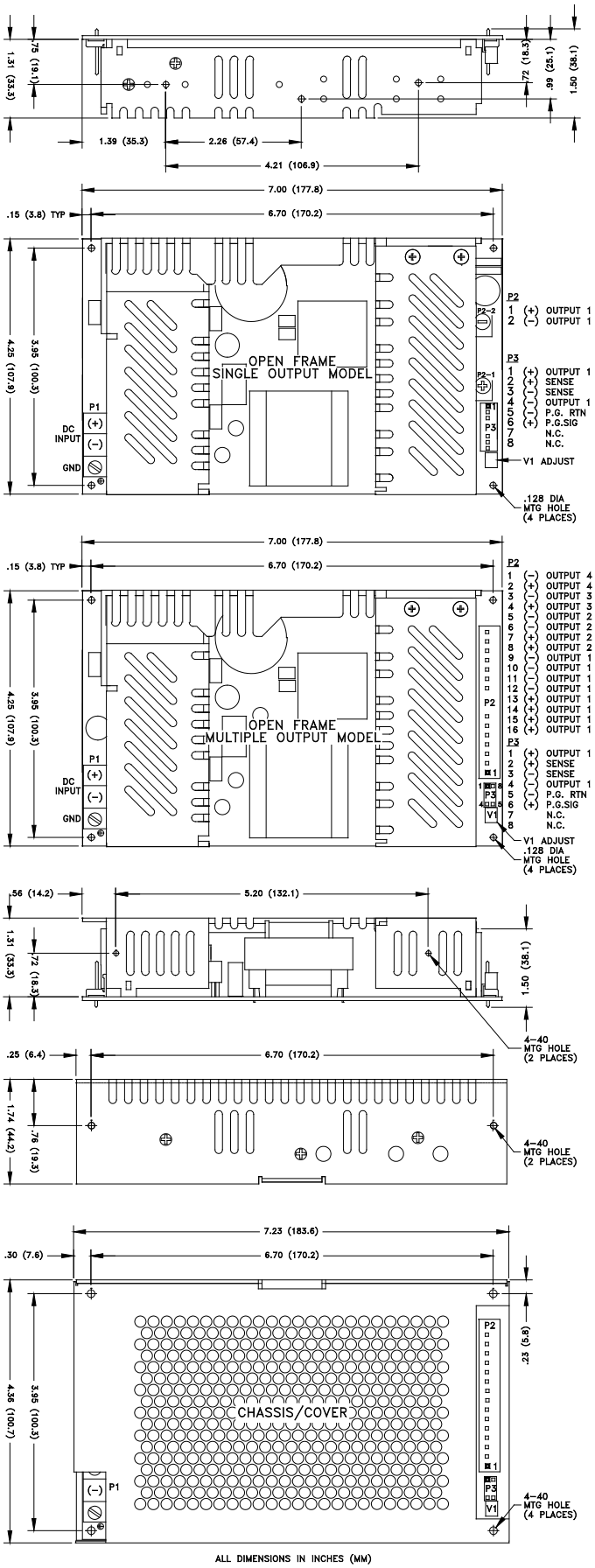
MAXIMUM OUTPUT POWER vs. AMBIENT TEMPERATURE



All specifications are maximum at 25°C/185W unless otherwise stated, may vary by model and are subject to change without notice.

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

DC4-185 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 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 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)
P2	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.
G	Ground	0.187 quick disconnect terminal.
P3	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.
P3	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.

Rev. J 12/21/16

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