

# 360 WATTS

## GRN-360 SINGLE OUTPUT AC-DC

### FEATURES:

- Compact 3.0" x 5.0" x 1.49" size
- 3 Year Warranty
- Universal 85-264V Input
- Single Output
- 94% Peak/93% Average Efficiency
- <500mW Standby Input Power
- -20 to +70°C Operating Temperature
- IEC 60601-1 3<sup>rd</sup> ed. Medical Cert.
- IEC 62368-1 2<sup>nd</sup> ed. Certification
- IEC 60601-1-2 4<sup>th</sup> ed. EMC
- Class B Emissions per EN55011/32
- Optional Chassis/Cover
- Optional Fan supply 12A/0.6A
- RoHS Compliant



OPEN FRAME

CHASSIS/COVER

### SAFETY SPECIFICATIONS



Underwriters Laboratories  
File E137708/E140259

UL 62368-1:2014, 2nd Edition  
CAN/CSA-C22.2 No. 62368-1-14  
AAMI/ANSI ES60601-1:2005/(R) 2012  
CAN/CSA-C22.2 No. 60601-1:2014



CB Reports/Certificates (including all National and Group Deviations)

IEC 62368-1:2014, 2nd Edition  
IEC 60601-1:2005/A1:2012



TUV SUD America

EN 62368-1:2014, 2nd Edition  
EN 60601-1:2006/A1:2013



Low Voltage Directive  
RoHS Directive (Recast)

(2014/35/EU of February 2014)  
(2015/863/EU of March 2015)



Electrical Equipment (Safety) Regulations 2016 SI No. 1101  
Restriction of the Use of Certain Hazardous Substances in EEE Regulations 2012 SI No. 3032 + 2019 SI No.492

### MODEL LISTING

MODEL	RATING
GRN-360-1001	12V/30A
GRN-360-1002	15V/24A
GRN-360-1003	18V/20A
GRN-360-1004	24V/15A
GRN-360-1005	36V/10A
GRN-360-1006	48V/7.5A
GRN-360-1007	56V/6.4A

### ORDERING INFORMATION

Please specify the following optional features when ordering:

CH – Chassis                      PF – Power fail warning  
CO – Cover                        FN – Fan supply 12V/0.6A  
A - 5000m

All specifications are maximum at 25°C, 360W unless otherwise stated, may vary by model and are subject to change without notice.

# GRN-360

## OUTPUT SPECIFICATIONS

Output Power at 50°C <sub>(1)</sub>	180W	Convection Cooled, 90-180 V <sub>IN</sub> , Open frame
	200W	Convection Cooled, 90-180 V <sub>IN</sub> , Chassis
	250W	Convection Cooled, 180-264 V <sub>IN</sub> , Open frame
	360W	300 LFM Forced Air, 90-264 V <sub>IN</sub> , Open frame
(See derating chart)		
Voltage Centering	Output 1:	± 0.5% (output at 50% load)
Voltage Adjust Range	Output 1:	95-105%
Load Regulation	Output 1:	± 0.5% (0-100% load change)
Source Regulation	Outputs 1:	0.5%
Ripple & Noise	Outputs 1:	1.0% (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, 5% maximum deviation.
Overvoltage Protection		Latching, between 110% and 150% of rated output voltage.
Overpower Protection		110-150% rated P <sub>OUT</sub> , cycle off/on, auto recovery
Hold Up Time		20 ms min., Full Power
Start Up Time		<1 Second, 115/230V Input
Minimum Load		No minimum load required
Remote Sense <sup>(9)</sup>		250mV compensation of output cable losses.

### INPUT SPECIFICATIONS

Protection Class	I
Source Voltage	85 – 264 Volts AC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection	Dual internal 8A time delay fuse, 1500A breaking capacity
Peak Inrush Current	40A max.
Peak Efficiency	Up to 94%
Average Efficiency	Up to 93% (Avg. of 25%, 50%, 75%, and 100% rated load)
Light Load Efficiency	>88%, 115/230V <sub>IN</sub> 33% power
No Load Input Power	<500mW, 115/230 V <sub>IN</sub> , no load

### 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 (5000m Consult Factory)
Temperature Coefficient	0.02%/°C
Vibration (MIL-STD-810G)	2.5G swept sine, 10-2000Hz, 1octave/min, 3 axis, 1hour each
Shock (MIL-STD-810G)	20G, 11ms, 3 axis.

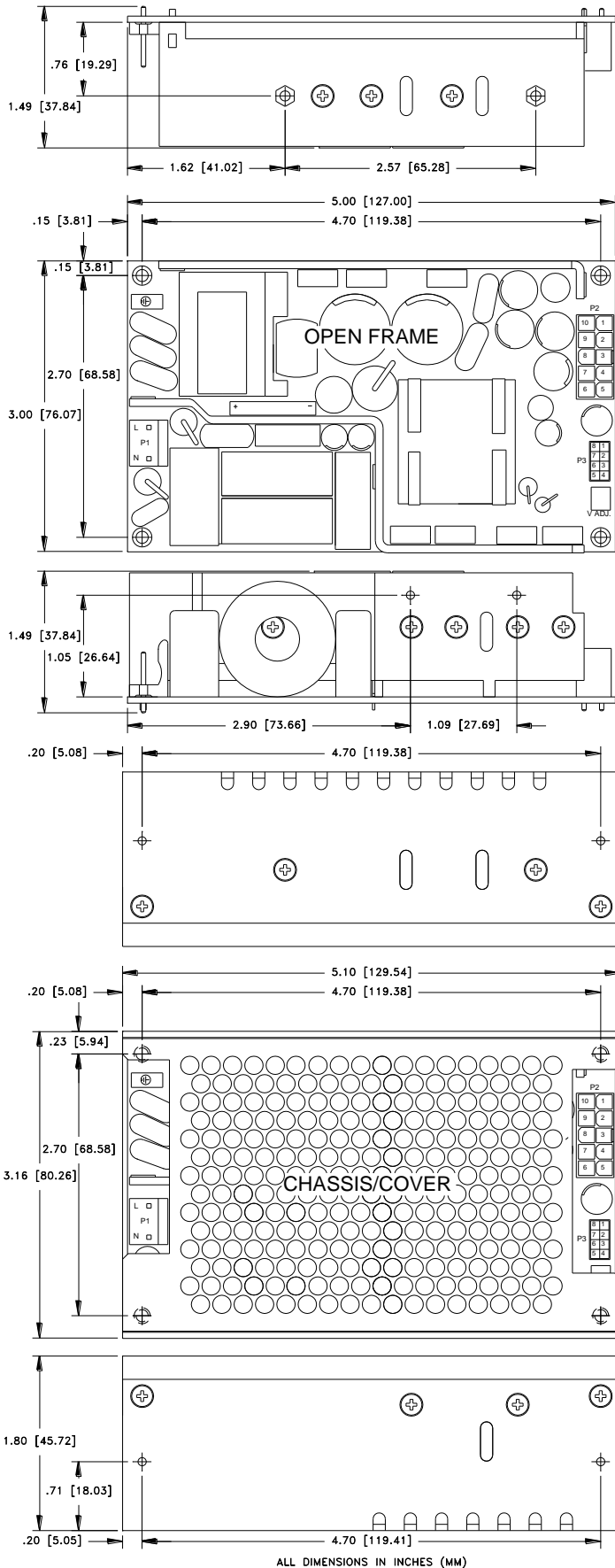
### GENERAL SPECIFICATIONS

Means of Protection	
Primary to Secondary	2MOPP (Means of Patient Protection)
Primary to Ground	1MOPP (Means of Patient Protection)
Secondary to Ground	Operational Insulation
Dielectric Strength <sup>(7,8)</sup>	
Reinforced Insulation	5656 VDC (4000VAC) <sup>(7)</sup>
Basic Insulation	2121 VDC (1500VAC) <sup>(7)</sup>
Operational Insulation	707 VDC (500VAC) <sup>(7)</sup>
Leakage Current	
Earth Leakage	<300µA NC, <1000µA SFC
Touch Current	<100µA NC, <500µA SFC
AC Power Fail Signal	Logic low 10-15ms prior to V1 loss of regulation.
Fan Supply Output	12VDC/0.6A
Switching Frequency	PFC/LLC 65KHz Variable
Mean-Time Between Failures	>150,000 HOURS, MIL-HDBK-217F, 25° C, GB
Weight	1.00 Lbs. Open Frame/1.23 Lbs. Chassis and Cover

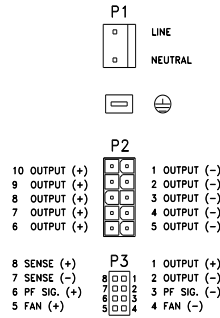
### EMC SPECIFICATIONS (IEC 60601-1-2:2014, 4<sup>TH</sup> ed./IEC 61000-6-2:2016)

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 <sub>T</sub> , 0.5 cycles, 0-315°	100/240V A/A
		0% U <sub>T</sub> , 1 cycles, 0°	100/240V A/A
		40% U <sub>T</sub> , 10/12 cycles, 0°	100/240V B/A
		70% U <sub>T</sub> , 25/30 cycles, 0°	100/240V B/A
Voltage Interruptions	EN 61000-4-11	0% U <sub>T</sub> , 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-360 SERIES MECHANICAL SPECIFICATIONS



## CONNECTOR SPECIFICATIONS



**P1:** 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.

**Ground:** 0.187 quick disconnect terminal

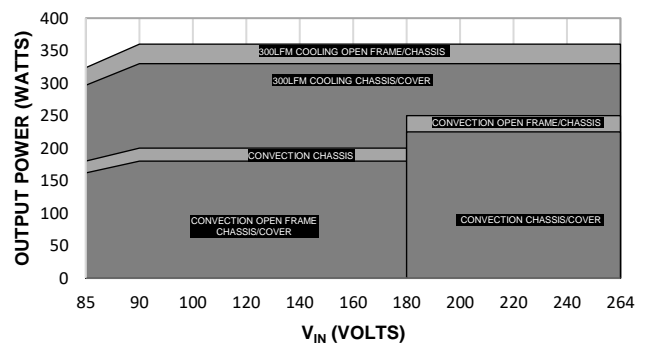
**P2:** 5566 Mini-Fit Jr. header mates with 5557 Mini-Fit Jr. or equivalent crimp housing with 5556 Mini-Fit or equivalent Crimp Terminal.

**P3:** .100 breakaway header mates with Molex 22-55-2081 or equivalent crimp housing with Molex 70058 or equivalent crimp terminal.

## APPLICATIONS INFORMATION

- Total Output power must not exceed 360W, as determined by the cooling method.
- 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.
- Sufficient area must be provided around power supply to allow natural movement of air to develop in convection-cooled applications.
- 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.
- Minimum load is not required for reliable operation.
- 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.
- 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 1<sup>ST</sup> Edition are not exceeded during a production-line dielectric strength test of the assembled end product. Please consult factory for further information.
- 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.
- 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.
- Maximum screw penetration into bottom chassis mounting holes is 0.100 inches. Maximum screw penetration into side chassis mounting holes is 0.188 inches.
- To comply with emissions specifications, all four mounting hole pads must be electrically connected to common metal chassis, Chassis/cover option is recommended. Refer to Operating Instructions for additional information.
- Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to Operating Instructions for additional information.
- 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.
- 300LFM minimum of airflow must be maintained one inch above all points of top-side components or cover when forced-air cooling is required.
- GRN-360-1001 P2 crimp terminals require the use of 16 AWG wire.

## MAX P<sub>OUT</sub> vs. V<sub>IN</sub> @ 50 °C AMBIENT



## DERATING REQUIREMENTS

Configuration	90-180VAC Input		180-264VAC Input	
	300LFM FA Cooling	Convection Cooling	300LFM FA Cooling	Convection Cooling
Open Frame	360W	180W	360W	250W
Chassis	360W	200W	360W	250W
Chassis/Cover	330W	180W	330W	225W

- Derate total output power linearly from 100% at 90V<sub>in</sub> to 90% at 85V<sub>in</sub> (Any Configuration)
- Derate total output power linearly from 100% at 50°C to 50% at 70°C (Any Configuration)