

45 WATTS

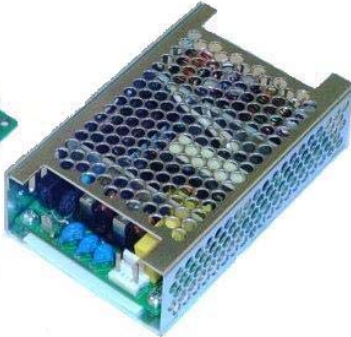
GRN-45 MULTI OUTPUT AC-DC

FEATURES:

- RoHS Compliant
- 2 Year Warranty
- Advanced SMT Design
- 85% Peak Efficiency
- 80% Light Load Efficiency
- <1W No Load Input Power
- Dual, Triple & Quad Outputs
- Compact 2.5" x 4.25" x 1.0" Size
- Optional Chassis/Cover
- EN 60950-1 ITE Certification
- EN 60601-1 Medical Certification








OPEN FRAME



CHASSIS/COVER

SAFETY SPECIFICATIONS

General	Protection Class: I
	Overvoltage Category: II
	Pollution Degree: 2
 Underwriters Laboratories File E137708/E140259	UL 60950-1 Second Edition, 2007 UL 60601-1 First Edition, 2006 AAMI/ANSI ES6060-1 Edition 1, 2010
	CB Reports/Certificates (including all National and Group Deviations) IEC 60950-1/A1:2009, Second Edition IEC 60601-1:1988 +A1:1991 +A2:1995 IEC 60601-1:2005 Third Edition
 UL Recognition Mark for Canada File E137708/E140259	CAN/CSA-C22.2 No. 60950-1-07, Second Edition CAN/CSA-C22.2 No. 601-1-M90, 2005 CAN/CSA-C22.2 No. 60601-1:2008
 TUV	EN 60950-1/A1:2010 EN 60601-1/A2:1995 EN 60601-1:2006
	Low Voltage Directive (2006/95/EC of December 2006)

MODEL LISTING

MODEL	OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
GRN-45-4001	+3.3V/5A	+5V/5A	+12V/1A	-12V/1A
GRN-45-4002	+5V/5A	-5V/5A	+12V/1A	-12V/1A
GRN-45-4003	+5V/5A	+24V/1A	+12V/1A	-12V/1A
GRN-45-4004	+5V/5A	+24V/1A	+15V/1A	-15V/1A
GRN-45-3001	+5V/5A		+12V/1A	-12V/1A
GRN-45-3002	+5V/5A		+15V/1A	-15V/1A
GRN-45-2001	+5V/5A	+24V/1A		
GRN-45-2002	+5V/5A	+12V/2A		
GRN-45-2003	+12V/2A			
GRN-45-2004	+15V/2A	-15V/2A		

ORDERING INFORMATION

Please specify the following optional features when ordering:

- C - 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.

GREEN MODE

OUTPUT SPECIFICATIONS

Output Power at 50°C	45W	85-264 V _{IN} (see derating chart)
Voltage Centering	Output 1: ±0.5%	(All outputs at 50% load)
	Outputs 2 - 4: ±5.0%	
Voltage Adjust Range	Output 1: 95-105%	
Load Regulation	Output 1: ±0.5%	(0-100% 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%	
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	Output 1 between 110% and 150% of rated output voltage (latching)	
Overpower Protection	130% rated P _{OUT} min, cycle on/off, auto recovery	
Hold-Up Time	16 ms typical, full power, 115V input	
Start-Up Time	1 sec., 115/230V input	
Output Rise Time	25 ms typical	
Minimum Load	No minimum load required	

INPUT SPECIFICATIONS

Source Voltage	85 – 264 VAC (see derating chart)
Frequency Range	47 – 63 Hz
Input Protection	Internal 2A time delay fuse
Peak Inrush Current	50A max. at 230 V
Peak Efficiency	85%
Light Load Efficiency	80%, 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 Operating 40,000 ft. ASL Non-operating
Temperature Coefficient	0.02%/°C
Vibration	MIL-STD-810E, Method 514.4, Category 1
Shock	Transit drop per MIL-STD-810E Method 516.4, Procedure IV

GENERAL SPECIFICATIONS

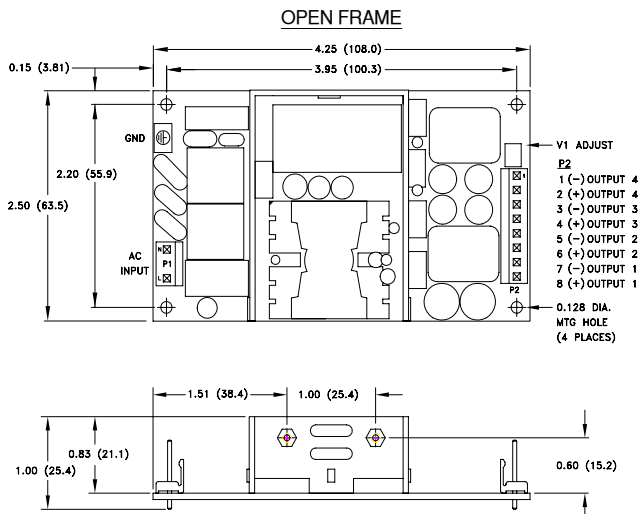
Dielectric Strength ^(a)	Reinforced Insulation 5656 VDC, primary to secondary, 1 sec.
	Basic Insulation 2545 VDC, primary to ground, 1 sec.
	Operational Insulation 707 VDC, secondary to ground, 1 sec.
Leakage Current	<300uA earth leakage current
Switching Frequency	100 KHz
Mean-Time Between Failures	>400,000 hours, MIL-HDBK-217F, 25° C, GB
Weight	0.48 lbs. Open frame 0.62 lbs. Chassis and cover

ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS

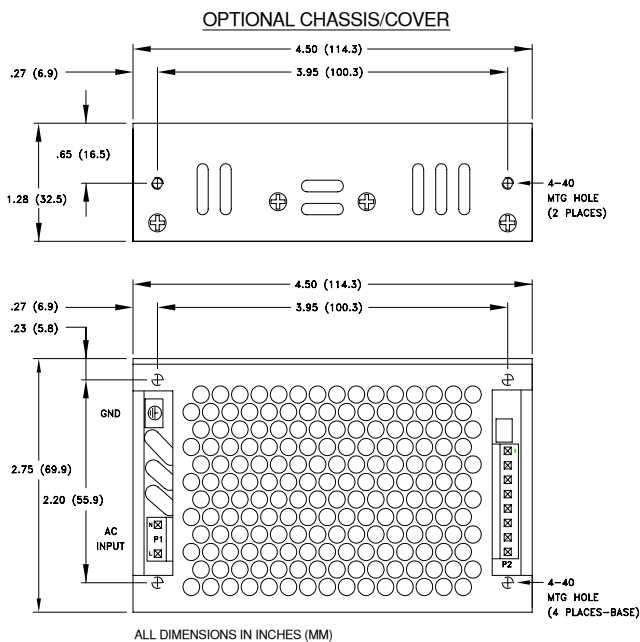
Electrostatic Discharge	EN 61000-4-2	± 6kV contact discharge ± 8kV air discharge
Radiated Electromagnetic Field	EN 61000-4-3	26-1000MHz, 10V/m, 80% AM
EFT/Bursts	EN 61000-4-4	± 2 kV
Surges	EN 61000-4-5	± 2 kV line to earth ± 1 kV line to line
Conducted Immunity	EN 61000-4-6	.15 to 80MHz, 10V, 80% AM
Magnetic Field Immunity	EN 61000-4-8	30A/m, 50/60 Hz.
Voltage Dips	EN 61000-4-11	95% dip, 10ms 30% dip, 500ms 60% reduction, 1 sec. (Criteria B)
Voltage Interruptions	EN 61000-4-11	95% reduction, 5 sec.
Radiated Emissions	EN 55011/22, FCC Part 15	Class B
Conducted Emissions	EN 55011/22, FCC Part 15	Class B
Harmonic Current Emissions	EN 61000-3-2	Class A
Voltage Fluctuations and Flicker	EN 61000-3-3	Compliance

GRN-45 MULTI MECHANICAL SPECIFICATIONS

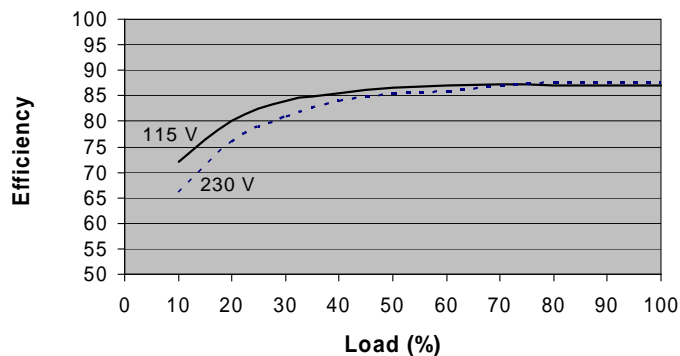
APPLICATIONS INFORMATION



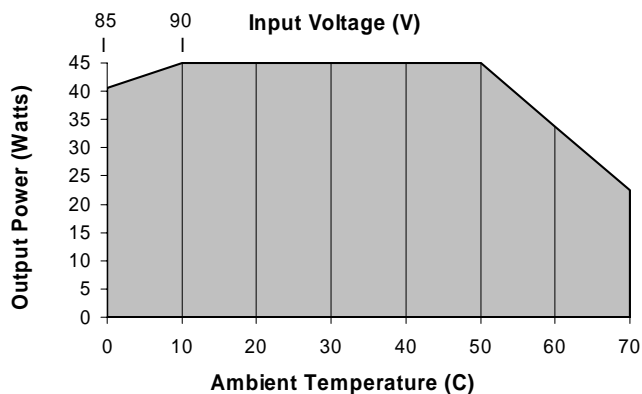
- Each output can deliver its rated current but total continuous output power must not exceed 45 Watts.
- Minimum load is not required for reliable operation however a light load is required on output 1 when loading outputs 2, 3 or 4.
- Sufficient area must be provided around power supply to allow natural movement of air to develop in convection cooled applications.
- 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.
- 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. Common RF shielding precautions may need to be taken to assure emissions compliance. Refer to operating instructions for additional information.
- This product includes only one fuse in the input circuit. In consideration of clause 57.6 of UL 60601-1, a second fuse may be required in the end product.
- 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, 20 MHz bandwidth.
- This product was type tested and safety certified using the dielectric strength test voltages listed in Table V of UL 60601-1. In consideration of Clause 20.4g, care must be taken to insure that the voltage applied to a reinforced insulation does not overstress basic insulation. Secondary to ground capacitors may need to be removed prior to performing a dielectric strength type test on the end product. It is highly recommended that the DC test voltages listed in DVB.1, Annex DVB 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.
- Maximum screw penetration into bottom chassis mounting holes is .100 inches.
- Maximum screw penetration into side chassis mounting holes is .188 inches.
- To comply with emissions specifications, all four mounting hole pads must be electrically connected to a common metal chassis. Chassis/cover option is recommended.



TYPICAL EFFICIENCY vs. LOAD

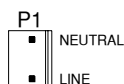


MAX Pout vs. AMBIENT TEMPERATURE/INPUT VOLTAGE

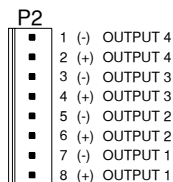


Derating requirements - Derate from 100% load at 50° C to 50% load at 70° C.
- Derate from 100% load at 90 V_{IN} to 90% load at 85 V_{IN}.

CONNECTOR SPECIFICATIONS



AC Input
.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
.156 friction lock header mates with Tyco 770849-8 or equivalent crimp terminal housing with Tyco 3-640707-1 or equivalent crimp terminal.



Ground .187 quick disconnect terminal