power-one®
Changing the Shape of Power

Advance Product Release

RoHS Compliant

Features

- RoHS lead-free solder and lead-solder-exempted products are available
- Wide input voltage range 85-264 VAC
- Two outputs (one high current output)
- Low conducted and radiated EMI (EN 55022 class B)
- UL recognized to UL 60950/CSA 22.2 No. 60950-00, and TUV approved to EN 60950-1
- High density design 4" x 1.65" x 8.5" cassette
- Highly-efficient topology
- 100 kHz I^2C interface
- Overtemperature, output overvoltage, and output overcurrent protection
- Supervisory signaling
- Included ORing diode for true redundant operation

Applications

- Telecommunications equipment

Description

The FCP600-48 is a highly-efficient ac-dc power supply with one high current output and an auxiliary standby output, which can be used in a wide range of applications. Passive current share along with internal ORing diodes allow this unit to be also used in redundant, hot-swap applications. The FCP600-48 meets international safety standards and displays the CE Mark for the low Voltage Directive.

Model Selection

Model	Input Voltage VAC	Output 1		Standby Output		Rated Power W
		$V_{o\ nom}$ VDC	$I_{o\ max}$ ADC	$V_{o\ nom}$ VDC	$I_{o\ max}$ ADC	
FCP600-48	85-264	48	13	3.35	2.5	632

Ordering Information

Options	Suffixes to Add to Part Number
RoHS lead solder exemption	No RoHS suffix character required.
RoHS compliant for all 6 substances	Add "G" as the last character of the part number.

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings may cause performance degradation, adversely effect long-term reliability, and cause permanent damage to the converter.

Parameter	Conditions/Description	Min	Max	Units
Input Voltage	Continuous Transient, 60 ms		264 300	VAC VAC
Operating Temperature	Ambient $V_{i\,min}$-$V_{i\,max}$, $I_{o\,nom}$, cooling by internal fan	0	55	°C
Storage Temperature	Non-operational	-40	85	°C

Environmental, Mechanical, & Reliability Specifications

All specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

Parameter	Conditions/Description	Min	Nom	Max	Units
Operating Humidity	Relative humidity, non-condensing	10		90	%
Storage Humidity	Relative humidity, non-condensing	5		95	%
Shock	IEC/EN 60068-2-27, 11 ms			30	g_n
Sinusoidal Vibration	IEC/EN 60068-2-6 2-8 Hz 8-200 Hz 200-500 Hz		 7.5 2 4		 mil g_n g_n
MTBF	MIL-HDBK-217F Notice 2, G_B, 25 °C	TBD			kh

Isolation Specifications

The electric strength test is performed in the factory as routine test in accordance with EN 550116, IEC/EN 60950, and UL 1950 and should not be repeated in the field. Power-One will not honor any warranty claims resulting from electric strength field tests.

Parameter	Conditions/Description	Min	Nom	Max	Units
Insulation Safety Rating	Input/Case Input/Output Output/Case	Basic Reinforced Functional			
Electric Strength Test Voltage	Input/Case Input/Output Output/Case	2.121 3.6 0.5			kVDC kVDC kVDC

EMC Specifications

All specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

Parameter	Description	Criterion
Electrostatic Discharge	IEC/EN 61000-4-2, level 4 (contact/air)	8/15 kV, criterion B
Electromagnetic Field	IEC/EN 61000-4-3, level 3	10 V/m, criterion A
Electr. Fast Transients / Burst	IEC/EN 61000-4-4, level 3 (direct/capacitive)	2/1 kV, criterion B
Surge	IEC/EN 61000-4-5, level 3 (L/L, L/C)	1/2 kV, criterion B
Voltage Dips and Interruptions	IEC/EN 61000-4-11	Criterion B
RF Conducted Immunity	IEC/EN 61000-4-6	10 VAC, AM 80%, 1 kHz, criterion A
Emissions Radiated/Conducted	CISPR 22/EN 55022/EN 61204	Class B
Harmonics	IEC/EN 61000-3-2	Class B
Voltage Fluctuation and Flicker	IEC/EN 61000-3-3	Pass

Input Specifications

All specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

Parameter	Conditions/Description	Min	Nom	Max	Units
Input Voltage		85	115/230	264	VAC
Turn-On Input Voltage	Ramping up	70	-	85	VAC
Turn-Off Input Voltage	Ramping down	70	-	85	VAC
Input Frequency		47	50/60	63	Hz
Inrush Current Limitation	115/230 VAC			20	A
Power Factor	$V_{i\,nom}$, $I_{o\,nom}$	0.96			
Efficiency	V_i = 230 VAC, $I_{o\,nom}$	88			%

Output Specifications

All specifications apply over specified input voltage, output load and temperature range unless otherwise noted.

Parameter	Conditions/Description	Min	Nom	Max	Units
Output Voltage Setpoint Accuracy	V_i = 230 VAC, I_{o1} @ 6.5 ADC, T_C = 25 °C	-0.5		0.5.	% $V_{o\,nom}$
Output Current V1 Standby Output		0 0	13 2.5	14.3 2.75	ADC ADC
Static Line Regulation V1	$V_{i\,min}$-$V_{i\,max}$, $V_{i\,nom}$, 0-100% $I_{o\,nom}$	-0.5		0.5	% $V_{o\,nom}$
Static Load Regulation V1 (Droop Characteristic)	$V_{i\,min}$-$V_{i\,max}$, $V_{i\,nom}$, 0-100% $I_{o\,nom}$		-250		mV/A
Hold-Up Time	Starting at V_i = 230 VAC, $P_{o\,nom}$	20			ms
Dynamic Load Regulation	Load change = ±33%, dI_o/dt = 2A/µs voltage deviation recovery time	-2		 2 400	 % $V_{o\,nom}$ µs
Start-Up Time	$V_{i\,nom}$, $I_{o\,nom}$			1	s
Output Voltage Ripple and Noise	$V_{i\,nom}$, $I_{o\,nom}$, 20 MHz bandwidth			120	mVpp

Protection

All specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

Parameter	Conditions/Description	Min	Nom	Max	Units
Input Fuse	Not user accessible		12.5 AT		
Input Transient Protection	With varistor				
Output	No-load and short circuit proof short circuit proof overload (latch style)	 110		 130	% $I_{o\ nom}$ % $I_{o\ nom}$ % $I_{o\ nom}$
Overvoltage Protection	Latch style	110		115	% $V_{o\ nom}$
Overtemperature Protection	Automatic power shutdown at T_C = TBD				

Control

All specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

Parameter	Conditions/Description
I^2C Digital Bus	Reports information and monitors alarm functions
PS Seated Signal	Contact closure to GND
PS Remote Shutdown	TTL compatible signal, inhibited at High or TTL “1”
AC fail pre-warning (I^2C & OC)*	Supervisory AC input voltage; Pre-warning time >6 ms
DC fail (I^2C & OC)*	Supervisory under- and overvoltage pre-ORing diode of V1
Temperature Warning (I^2C & OC)*	Indicates if unit is operating normally or in overtemperature, Pre-warning time >10 ms
Fan OK (I^2C & OC)*	Indicates if fan is operating or has failed
Current Share	Droop load characteristic for V1
Status Indication	LEDs: DC OK (green), AC OK (green)

* Signal providing by I^2C interface (I^2C) or by open collector (OC)

Features

All specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

Parameter	Conditions/Description
Fan speed control	2 fan speed levels depending on internal heat sink temperature Fan speed level and temperature information available on I^2C digital bus
µC supply voltage in-/output (Pin 10)	If unit is operating: 5 to 7V is provided at pin 10. If unit is NOT operating, pin 10 is input from a parallel connected unit for µC supply.

Characteristic Curves:

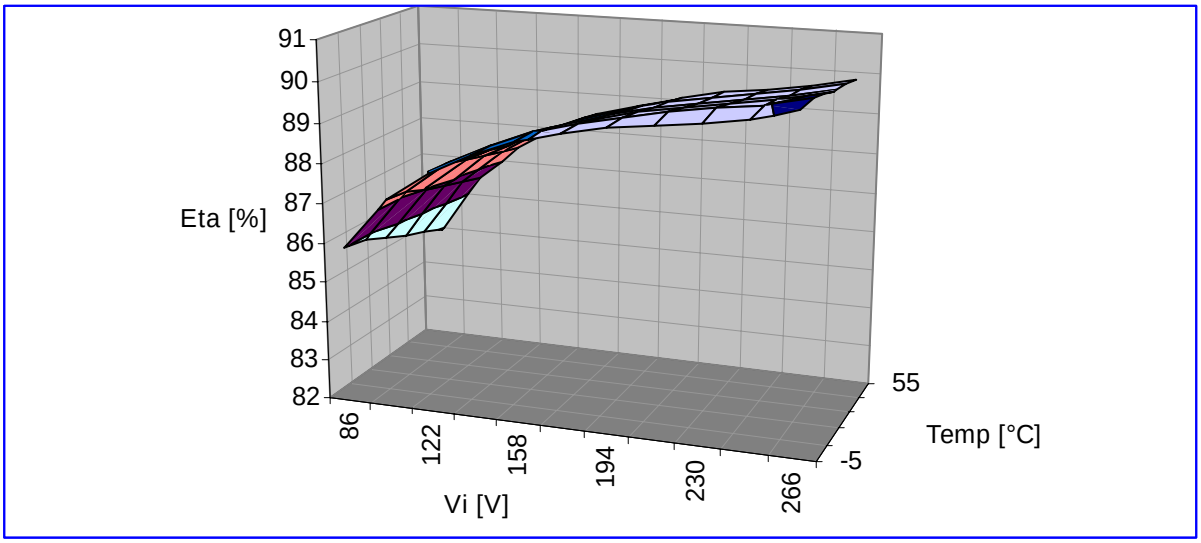


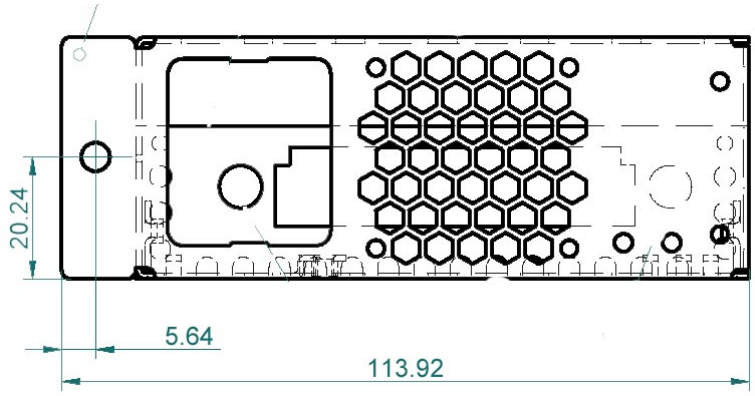
Figure 1. Efficiency vs. Input Voltage and Ambient Temperature, $I_o = I_{o\ nom}$

NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the respective divisional president of Power-One, Inc.

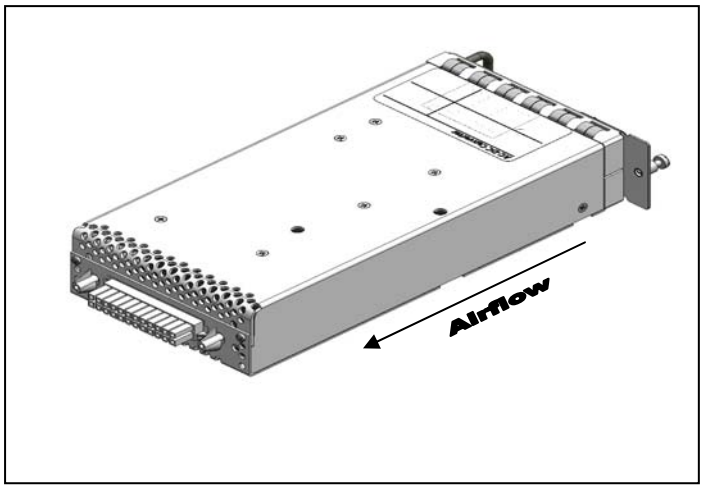
TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

Mechanical Data

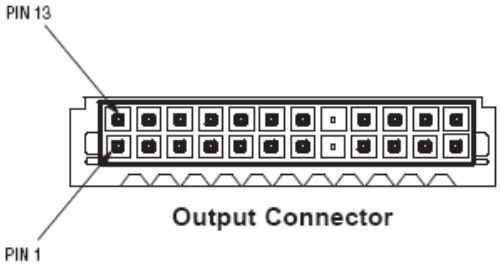
Mechanical Data (H, W, D)	4” (101.6mm) x 1.65” (41.9mm) x 8.5” (215.9mm)



Output Connector Descriptions



Rear View



Connector: Molex (15-06-0241)

Output Connector Description	Pin Location	Reference Name
48V Output	4,5,6,16,17,18	Vo1
48V Output RTN	1,2,3,13,14,15	Vo1 RTN
AC-fail, DC-fail, Temp.-fail	9	PF
Power Supply Present Signal	23	PSPRES
Serial Data Line	11	SDA
Serial Clock Line	12	SCL
Address Input Line A0	21	A0
5 to 7V	10	µC supply voltage bus
FAN FAIL	24	FF
PS Enable	22	PSEN
3.35V Standby RTN	7	Vo2 RTN / Logic Ground / 5 to 7V RTN
3.35V Standby	19	Vo2