

# PFC250 Series

## AC-DC Power Supplies



The PerFormanCe Power PFC250 Series combines Power Factor Correction (PFC) with wide-range outputs to meet the requirements of data communications and industrial controls. The PFC250-4530G and PFC250-4350G provide high current +3.3 V and +5 V on a single platform to support mixed-mode, high-speed digital circuitry.

Bel Power Solutions unique dual-converter architecture combines high reliability with exceptional regulation. All models feature remote sense on outputs V1 and V2 to provide independent compensation of output cable losses. Other standard features include independent current sharing on V1 and V2, thermal shutdown, and remote inhibit. Airflow of 300 linear feet per minute (LFM) is required to deliver the full power density of 3.0 watts per cubic inch.

The PerFormanCe Power PFC250 meets international safety requirements and is CE Marked to the Low Voltage Directive.

### Key Features & Benefits

- RoHS Compliant
- Greater than 1 million hours demonstrated MTBF
- Active Power Factor Correction (PFC) meets EN61000-3-2
- Dual main outputs provide 3.3 V and 5 V for mixed-mode applications
- Single-wire current sense on outputs V1 and V2
- Remote sense on outputs V1 and V2
- Overtemperature, overload, and overvoltage protection
- Available with metric or SAE mountings
- Isolated V3 and V4 can be used as positive or negative outputs

## 1. SINGLE-OUTPUT MODEL SELECTION

MODEL <sup>3</sup>	OUTPUT VOLTAGE	ADJUSTMENT RANGE	MAX. OUTPUT CURRENT <sup>1</sup>	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE % p-p <sup>2</sup>	INITIAL SETTING ACCURACY
PFC250-1003G	3.3V	3.15V to 3.45V	50A	0.5%	0.8%	1%	3.28V to 3.32V
PFC250-1005G	5V	4.5V to 5.5V	50A	0.5%	0.8%	1%	4.98V to 5.02V
PFC250-1012G	12V	10.8V to 13.5V	23A	0.5%	0.8%	1%	11.94V to 12.06V
PFC250-1015G	15V	13.5V to 18.3V	18.3A	0.2%	1.0%	1%	14.92V to 15.08V
PFC250-1024G	24V	21.6V to 26.4V	10.5A	0.5%	0.8%	1%	23.88V to 24.12V
PFC250-1048G	48V	46.0V to 56.0V	6A	0.5%	1.0%	1%	47.52V to 48.48V

### NOTES:

- <sup>1</sup> Output currents ratings are expressed with 300 LFM forced air.
- <sup>2</sup> Maximum peak-to-peak noise expressed as a percentage of output voltage, 20 MHz bandwidth.
- <sup>3</sup> Models without suffix G use the lead solder exemption

## 2. MULTIPLE-OUTPUT MODEL SELECTION

250 W with 300 LFM Forced-Air Cooling. Isolated V3 and V4 can be used as Positive or Negative Outputs

MODEL <sup>5</sup>	OUTPUT VOLTAGE	ADJUSTMENT RANGE	OUTPUT CURRENT	LINE REGULATION	LOAD REGULATION	RIPPLE & NOISE % p-p <sup>1</sup>	INITIAL SETTING ACCURACY
PFC250-4000G <sup>2</sup>	+5V	5.0V to 5.5V	40A	0.5%	1%	1%	4.98V to 5.02V
	+12V	10.8V to 13.2V	10A	0.5%	1%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	6A	0.5%	7%	1%	11.94V to 12.06V
	5V	5.0V to 5.5V	3A	0.5%	2%	1%	4.98V to 5.02V
PFC250-4001G <sup>2,4</sup>	+5V	5.0V to 5.5V	40A	0.5%	1%	1%	4.98V to 5.02V
	+12V	10.8V to 13.2V	10A	0.5%	1%	1%	11.94V to 12.06V
	12V	10.8V to 13.2V	6A	0.5%	7%	1%	11.75V to 12.06V
	12V	10.8V to 13.2V	3A	0.5%	7%	1%	11.75V to 12.06V
PFC250-4004G <sup>3,4</sup>	+5V	5.0V to 5.5V	40A	0.5%	1%	1%	4.98V to 5.02V
	+12V	10.8V to 13.2V	10A	0.5%	1%	1%	11.94V to 12.06V
	15V	13.5V to 16.5V	6A	0.5%	7%	1%	14.70V to 15.30V
	15V	13.5V to 16.5V	3A	0.5%	7%	1%	14.70V to 15.30V
PFC250-4350G <sup>2,4</sup>	+3.3V	3.15V to 3.45V	40A	0.5%	1.5%	1%	3.28V to 3.32V
	+5V	5.0V to 5.5V	20A	0.5%	1%	1%	5.00V to 5.04V
	12V	10.8V to 13.2V	6A	0.5%	7%	1%	11.75V to 12.06V
	12V	10.8V to 13.2V	3A	0.5%	7%	1%	11.75V to 12.06V
PFC250-4530G <sup>2,4</sup>	+5V	5.0V to 5.5V	40A	0.5%	1%	1%	4.98V to 5.02V
	+3.3V	3.15V to 3.45V	20A	0.5%	1.5%	1%	3.28V to 3.32V
	12V	10.8V to 13.2V	6A	0.5%	7%	1%	11.75V to 12.06V
	12V	10.8V to 13.2V	3A	0.5%	7%	1%	11.75V to 12.06V

**NOTES:**

- <sup>1</sup> Maximum peak-to-peak expressed as a percentage of output voltage, 20 MHz bandwidth.
  - <sup>2</sup> Total current available from V1 + V2 is 40 amperes, total current available from V3 + V4 is 6.6 amperes.
  - <sup>3</sup> Total current available from V1 + V2 is 40 amperes, total current available from V3 + V4 is 6.0 amperes.
  - <sup>4</sup> One adjustment pot is provided for both V3 and V4 outputs. One-to-one tracking is provided on V3 and V4 when equally loaded.
  - <sup>5</sup> Models without suffix G use the lead solder exemption
- Model numbers highlighted in yellow are not recommended for new designs or EOL.

**3. INPUT SPECIFICATIONS**

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Input Voltage - AC	Continuous input range.	85		264	VAC
Input Frequency	AC Input.	47		63	Hz
Brown Out Protection	Lowest AC input voltage that regulation is maintained with full rated loads.	80			VAC
Hold-up Time	After last AC line peak at 250 watts.	20			ms
Input Current	85 VAC at full rated load.			4.5	ARMS
Input Protection	Non-user serviceable internally located AC input line fuse.				
Inrush Surge Current	Internally limited by thermistor. Vin = 230 VAC, one cycle, 25°C.			35	APK
Power Factor	Per EN61000-3-2.	0.95			W/VA
Operating Frequency	Switching frequency of main output transformer. Switching frequency of secondary transformer. Switching frequency of Power Factor Correction circuit.		129 70 60		kHz

**4. OUTPUT SPECIFICATIONS**

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Efficiency	Full rated load, 110 VAC. Varies with distribution of loads among outputs.	65	75		%
Minimum Load, V1	Min. load required to maintain regulation on V2	Single output models All other models	0 4		Amps
Minimum Load, V3	Min. load required to maintain regulation on V4	Single output models PFC250-4000G All other models	N/A 1.25 0.6		Amps
Ripple and Noise	Full load, 20 MHz bandwidth.		See Model Selections		
Output Power	300 LFM forced-air cooling.			250	Watts
Overshoot /Undershoot	Output voltage overshoot/undershoot at turn-on.			0	%
	Varies by output. Total regulation includes: line changes over the specified input range, changes in load starting at 20% load and changing to 100% load.		See Model Selections		
Transient Response	Recovery time to within 1% of initial set point due to a 25% step load from any load setting from minimum to maximum load.		500		µs
Turn-on Delay	Time required for initial output voltage stabilization.		2		s
Turn-on Rise Time	Time required for output voltage to rise from 10% to 90%.		20		ms

## 5. INTERFACE SIGNALS & INTERNAL PROTECTION

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Overvoltage Protection	Latch style overvoltage protection. Available on all single output models and V1, V2, and V3 on all multiple-output models.	3.3V output, V1	4.1	4.65	V
		3.3V output, V2	4.2	4.2	
		5V output, V1, V2	6.0	6.4	
		12V output, V1, V2	14.0	16.0	
		15V output, V1	18.3	19.8	
		24V output, V1	27.0	30.7	
		48V output, V1	60.0	70.0	
Overload Protection	Fully protected against output overload and short circuit. Automatic recovery upon removal of overload condition.				
Overtemperature Protection	System shutdown due to excessive internal temperature, automatic reset.				
Output Good	TTL compatible signal. Signal is high when V1 output is within 5% of nominal. Signal shall remain low for 20 milliseconds following loss of Output Good.	3.3 V	3.16		V
		5 V	4.75		
Input Power Fail Warning	TTL compatible logic signal. Time before regulation dropout due to loss of input power. May be used as independent PSOK signal in redundant applications.	5			ms
Current Share	Accuracy of shared current with up to 6 parallel units. Single-wire current share on V1 and V2 with return via negative (-) Sense return. Minimum current share load is 6 A or 50 W, whichever is smaller.		10		%
Remote Sense	Available on V1 and V2. Total voltage compensation for cable losses with respect to the main output.		250		mV
Inhibit	Output voltage is inhibited by application of external high (5 V) signal.				
Standby Power	Available with fan option versions only (+5 VDC).		100		mA

## 6. SAFETY, REGULATORY AND EMC SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Agency Approvals	Approved to the latest edition of the following standards. UL/CSA60950-1, EN60950-1 and IEC60950-1		Approved		
Dielectric Withstand Voltage	Input to Output per EN60950.	2600			VDC
Electromagnetic Interference	FCC CFR title 47 Part 15 Sub-Part B - Conducted. EN55022 / CISPR 22 Conducted.	B B			Class
ESD Susceptibility	Per EN61000-4-2, level 4.	8			kV
Radiated Susceptibility	Per EN61000-4-3, level 3.	10			V/M
EFT/Burst	Per EN61000-4-4, level 4.	± 4			kV
Input Transient Protection	Per EN61000-4-5 level 3.	Line-to-Line	1		kV
		Line-to-Ground	2		
Insulation Resistance	Input-to-Output.		10		MΩ
Leakage Current	Per EN60950, 264 VAC.			1500	μA

## 7. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Altitude	Operating. Non-Operating.			10k 40k	ASL Ft.
Operating Temperature	Derate linearly above 50°C by 2.5% per °C. At 100% load: At 50% load:	0		50 70	°C
Storage Temperature		-55		85	°C
Temperature Coefficient	0°C to 70°C (after 15 minute warmup).		± 0.02	± 0.05	%/°C
Relative Humidity	Non-Condensing.	5		95	%RH
Shock	Peak acceleration.			20	G <sub>PK</sub>
Vibration	Random vibration, 10 Hz to 2 kHz, 3 axes.			6	G <sub>RMS</sub>

## 8. MECHANICAL SPECIFICATIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Dimensions	Overall Size		215.9 x 120.7 x 50.8 8.50 x 4.75 x 2.00		mm in
	Overall Length With Fan		250.4 10.00		mm in
			1.12 2.75		kg lb
Weight					

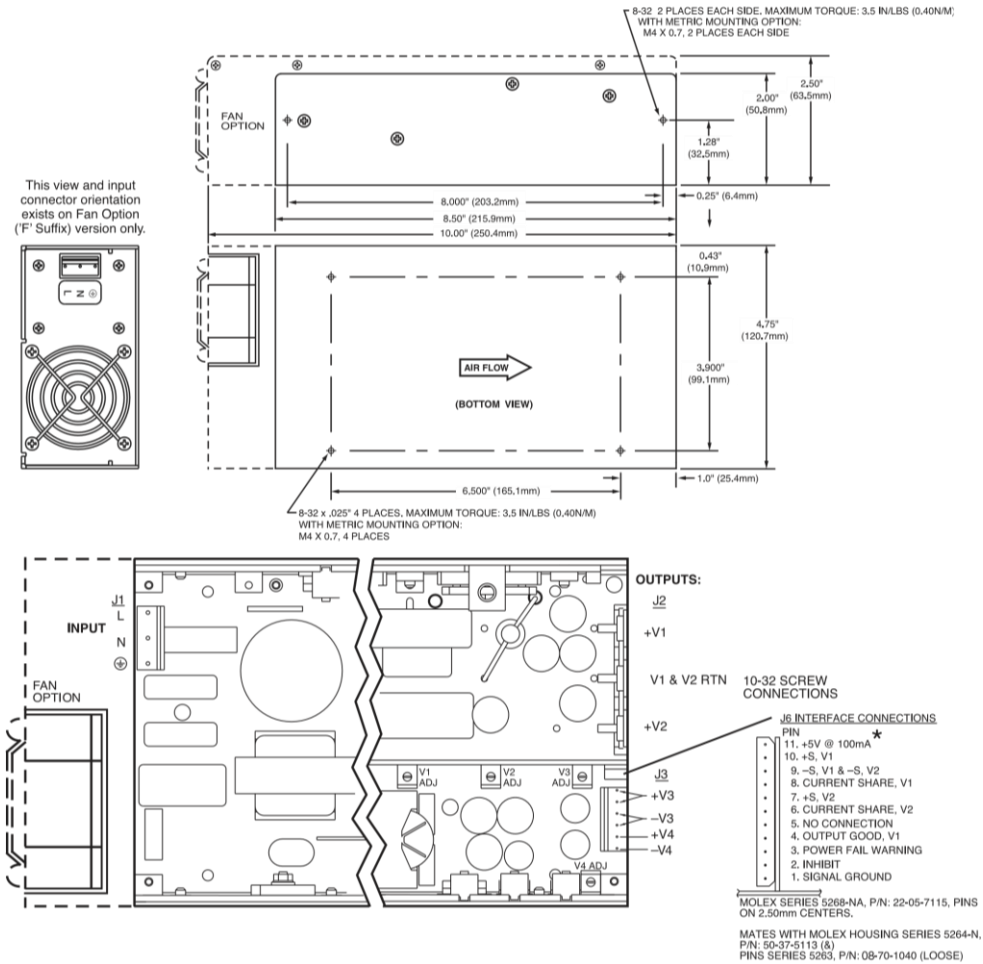
## 9. OPTIONS

PARAMETER	CONDITIONS / DESCRIPTION	MIN	NOM	MAX	UNITS
Metric Mounting	Add "M" as a suffix to the model number to order chassis with M4 x 0.7 mounting inserts.	215.9 x 120.7 x 50.8 8.50 x 4.75 x 2.00			mm in
Fan	Add "F" as a suffix to the model number to order integral fan. Adds 1.5" (38.1 mm) to overall length and 0.5" (12.7 mm) to height.	250.4 x 120.7 x 63.5 10.00 x 4.75 x 2.50			mm in

## 10. CONNECTIONS

CONNECTOR	MOLEX SERIES	HOUSING	PIN SERIES	PINS (LOOSE)	PINS (CHAIN)	WIRE GAUGE
J1	41695	09-50-8051	6838	08-50-0189	08-50-0187	18-20 AWG
	41695	09-50-8051	2478	08-50-0106	08-50-0105	18-20 AWG
	2139	09-50-3051	2478	08-50-0106	08-50-0105	18-20 AWG
J3	41695	09-50-8061	6838	08-50-0189	08-50-0187	18-20 AWG
	41695	09-50-8061	2478	08-50-0106	08-50-0105	18-20 AWG
	2139	09-50-3061	2478	08-50-0106	08-50-0105	18-20 AWG
J6 *	5264-N	50-37-5113	5263	08-70-1040	08-70-1039	22-28 AWG

**NOTE:** \* The +5V @ 100mA standby power output (J6-11) is available only on units with the fan option.



Chassis: 0.063" (1.6mm) Aluminum Alloy,  
With Clear Finish

Figure 1. Mechanical Drawing PFC250

## 11. REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGE	ECO/MCO REFERENCE NO.
2019-Jun-27	AC	Page 3: Transient Response updated from 500 s to 500 $\mu$ s Page 4: Insulation Resistance updated from 10 M to 10 M $\Omega$ Leakage Current updated from 1500 A to 1500 $\mu$ A	C94228

For more information on these products consult: [tech.support@psbel.com](mailto:tech.support@psbel.com)

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