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# SPECIFICATION

## **FSP250-30PFJ**

**Main Feature:**  
**Active PFC Circuit**  
**Full Range Input**  
**Eup Lot 6**

**JUL,14,2015**  
**REV: 1.0**



**MODEL: FSP250-30PFJ**

**Revision History**

<u>Rev</u>	<u>Description</u>	<u>Date</u>	<u>Author</u>
1.0	4.1.1. OUTPUT RATING(+12V1&2 MIN→0.05A total)	2015.07.14	Winnie (Jimmy)

## **1. GENERAL DESCRIPTION AND SCOPE**

This is the specification of Model FSP250-30PFJ; AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 and with Full Range Input features. Also, 11Vaux power is less than  $1W_{input}$  at power off mode (PS\_ON input at high state) which is comply with EuP Lot 6 year 2010 requirement.

The specification below is intended to describe as detailedly as possible the functions and performance of the subject power supply. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as a new target for us to approach.

## **2. REFERENCE DOCUMENTS**

The subject power supply will meet the EMI requirements and obtain main safety approvals as following:

### **2.1 EMI REGULATORY**

- FCC Part 15 Subpart J, Class 'B' 115 Vac operation.
- CISPR 22 Class 'B' 230 Vac operation.

## **3. PHYSICAL REQUIREMENTS**

### **3.1 MECHANICAL SPECIFICATIONS**

The mechanical drawing of the subject power supply, which indicate the form factor, location of the mounting holes, location, the length of the connectors, and other physical specifications of the subject power supply. Please refer to the attachment drawing.

## **4. ELECTRICAL REQUIREMENTS**

### **4.1 OUTPUT ELECTRICAL REQUIREMENTS**

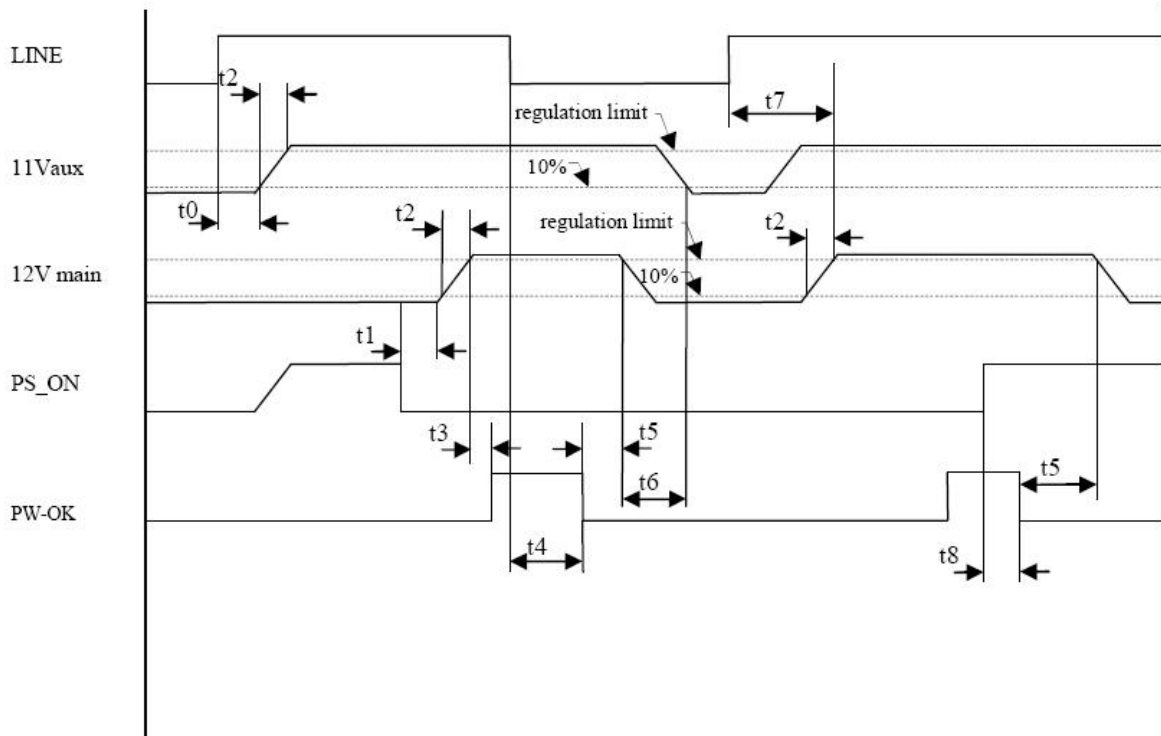
The subject power supply will meet all electrical specifications below, over the full operation temperature range and dynamic load regulation.

#### 4.1.1. OUTPUT RATING

Output	Nominal	Regulation	Ripple/Noise	Min	Max	Surge
1	+12V1	±5%	120mV	0.05A total	15.0 A	18.0A(20S)
2	+12V2	±5%	120mV		15.0 A	18.0A(20S)
3	+11Vaux	10.20V-11.80V	240mV	0 A	1 A	

- (1) The power supply will turn on and remain on when all DC outputs are at 0A load. This condition may last maximum 1 second after the 12V has reached 90% of the nominal value. PW\_OK will go HIGH at no load condition with the defined timing section.
- (2) The +12V1 and +12V2 total output shall not exceed 250watts, Surge power 280W for 20sec.
- (3) Total output for this subject power supply is 250 watts.
- (4) Ripple and noise measurements shall be made under all specified load conditions through a single pole low pass filter with 20MHz cutoff frequency. Outputs shall bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.
- (5) Steady state load condition is any load condition, which lasts longer than 1ms.
- (6) 11Vaux adjustment (set point) in production: 11.0V~11.4V@ 0A.

#### 4.1.2. Signal Diagram



t	time	value
t0	power on delay	max 2000ms
t1	PS_ON delay-time ON	10ms < t1 < 250ms

t2	rise time of the output voltages	1.5ms<t2<20ms	
t3	PW-OK-delay-time	100-500ms	
t4	min hold up time and min AC interruption time	Input voltage	Min 14ms
		100V <sub>AC</sub>	
		115V <sub>AC</sub>	
		230V <sub>AC</sub>	
t5	time between PW-OK=L and main converter output voltages reach their minimum regulation tolerances	min 1ms	
t6	hold up time of the auxiliary converter	min 5ms	
t7	turn on delay	max 2500ms	
t8	PS_ON delay time OFF	5ms ≤ t8 ≤ 50ms	
	PW-OK rise and fall time	max 100us	

#### 4.1.3. Signals

##### ON/OFF Signal

This is an input signal for the power supply.

This signal switches the main converter ON/OFF.

If the signal is open the main converter is switched OFF and the power supply operates in stand-by.

This signal is connected via pull up to PSU internal AUX voltage. PS\_ON open circuit voltage is max. 12.6V

		input voltage	input current
PS_ON=H	main converter OFF	PS_ON > 2V	
PS_ON=L	main converter ON	PS_ON < 0.8V	max – 1mA@0V

##### PW-OK - Signal

This is an output signal for the power supply.

This signal indicates that the main converter is running and the output voltages are ok.

This signal will be generated via an open collector.

There is no pull up resistor inside PSU. PW-OK open circuit voltage is max. 12.6V.

	PW-OK	output voltage
Operation mode and all output voltages are ok	High	--
Operation mode or output voltages are not ok	Low	max 0.4V@1mA

PW-OK has smooth rising and falling edges.

No glitches, bouncing or noise is allowed.

During start up in no load condition the PW-OK signal must behave as defined in section Timing Diagrams.

After PS\_ON signal transition from L-->H and output load smaller than minimum current defined in section Main DC Outputs, timing t8 may be shorter than specified. Bouncing of PW-OK is not allowed during this condition.

#### 4.1.4. OVER VOLTAGE PROTECTION

OUTPUT VOLTAGE	Protection Point
+12V1 & +12V2	13.4V-15.6V

#### 4.1.5. OVER-CURRENT PROTECTION

OUTPUT VOLTAGE	Max. overcurrent limit
+12V1	25A
+12V2	25A

#### 4.1.6. SHORT CIRCUIT PROTECTION

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +12V1 or +12V2 output, the power Supply will shutdown and latch off without damage to the power supply. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

#### 4.1.7. Maximum capacitive load

Maximum Capacitive Load			
Output Voltage	12V1	12V2	11Vaux
capacitive load (uF)	6000	6000	3000

#### 4.2. OUTPUT TRANSIENT LOAD RESPONSE

Output	Step Load Size	Load Slew Rate	Capacitive Load
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+12V1&+12V2	8A	0.5A/us	470uF(56mΩ)
+11Vaux	0.8A	0.5A/us	470uF(56mΩ)

### 4.3. INPUT ELECTRICAL SPECIFICATIONS

#### 4.3.1. VOLTAGE RANGE

PARAMETER		UNITS
Max/Min. V-in Range	90 – 264Vac	V-rms
Nominal input Voltage range	100 – 240Vac	V-rms

#### 4.3.2. INPUT FREQUENCY

INPUT FREQUENCY	47–63Hz
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#### 4.3.3. INRUSH CURRENT

(Cold start – 25 deg. C)

115V	NO damage
230V	NO damage

#### 4.3.4. INPUT LINE CURRENT

115V	6.0 Amps – rms maximum
230V	3.0 Amps – rms maximum

### 4.4. EFFICIENCY

	Full load (100%)	Typical load (50%)	Light load (20%)
115VAC	82%	85%	82%
230VAC	82%	85%	82%

	+12V1	+12V2	11VSB
Light load (20%)	2 A	2 A	0.2 A
Typical load (50%)	5 A	5 A	0.5 A
Full load (100%)	10 A	10 A	1 A

#### 4.4.1 Standby Power Consumption (ERP):

Input Power < 1W @ 11Vaux/45.5mA & 230Vac input

PS\_ON input signal @ High State

## 5. ENVIRONMENTAL REQUIREMENTS

The power supply will be compliant with each item in this specification for the following Environmental conditions.

### 5.1. TEMPERATURE RANGE

Operating	0 to +35 deg. C
Storage	-20 to +80 deg. C

### 5.2. HUMIDITY

Operating	85% RH, Non-condensing
Storage	95% RH, Non-condensing

### 5.3. VIBRATION

The subject power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Vibration Operating – Sine wave excited, 0.25 G maximum acceleration, 10-250 Hz swept at one octave / min. Fifteen minute dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursions two times large than non-resonant excursions.

Plane of vibration to be along three mutually perpendicular axes.

### 5.4. SHOCK

The subject power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Storage –40G, 11 mSec. half-sine wave pulse in both directions on three mutually perpendicular axes.

Operating -10G, 11mSec. half-sine wave pulse in both directions on three mutually Perpendicular axes.

## 6. SAFETY

### 6.1. LEAKAGE CURRENT

The leakage current from AC to safety ground will not exceed 3.5 mA-rms at 264Vac, 50 Hz.



## **7. ELECTROMAGNETIC COMPATIBILITY**

### **7.1 LINE CONDUCTED EMI**

The subject power supply will meet FCC and VFG class B requirements under full load conditions.

### **7.2. RADIATED EMI**

The subject power supply will meet FCC and CISPR 22 requirements under normal load conditions.

## **8. LABELLING**

Label marking will be permanent, legible and complied with all agency requirements.

### **8.1. MODEL NUMBER LABEL**

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo.
- Model no., serial no., revision level, location of manufacturer.
- The total power output and the maximum load for each output.
- AC input rating.

### **8.2 DC OUTPUT IDENTIFICATION**

Each output connector will be labeled.

## **9. RELIABILITY**

### **9.1. MTBF**

The power supply have a minimum predicted MTBF(MIL-HDBK-217) of 100,000 hours of continuous operation at 25°C, maximum-output load, and nominal AC input voltage.