

# FSP250-50LC series

## 1U Mini-ITX AC/DC ATX 250W Power Supply



- Compact Form Factor with 81.5 x 40.5 x 150 mm (W x H x D) of Dimension.
- Full Range 90~264V / 47~63Hz AC Power Input.
- 250 Watts of Continuous Power Output Capacity.
- 17A MAX on +12V DC Output under Continuous Loading.
- 20+4 pin ATX and SATA Power Connector.
- Over 85% of Efficiency under with 50% of Full Loading.
- Under 1 Watt of True Input Power on Standby Mode. EuP Lot-6/2010 Compliant.
- MTBF over 100,000 hours under 100% Loading / 25°C.
- UL+CUL, TUV EN60950-1, CB, CCC, CE, BSMI Certificated.
- Meets 1U and Mini-ITX Platform with ATX Power Requirement.

## Overview

The Liantec FSP250-50LC 1U Mini-ITX / FlexATX power supply supports full range 90~264V / 47~63Hz AC power input and +5V, +12V, -12V, +3.3V and +5Vsb ATX power output with 250 watts of power capacity within 81.5 x 40.5 x 150 mm (W x H x D) of dimension, meets the requirement of x86-based 1U low profile and mini-ITX / FlexATX embedded Small Form Factor (SFF) computing applications.

## Specification

### Power Input Range

The FSP250-50LC PSU could operate at wide input voltages defined in below table.

Range	Input	Min.	Nom.	Max.
Low Range	V-in (Wrms) / I-in (Arms)	90 / ---	100-127 / 3.5	135 / ---
High Range	V-in (Wrms) / I-in (Arms)	180 / ---	200-240 / 2	264 / ---
Frequency (Hz)		47	---	63

- Inrush current : No component was damaged and input fuse shall not blow.
- Input Fuse Requirement : The PSU shall be protected from primary over current by input fuse.
- Power factor correction greater than 0.9 at full loading.

### Power Output Voltage Regulation

The DC output voltages of FSP250-50LC PSU measured at the end of the connectors should be remained within the regulation ranges shown in below table

DC Output	Min.	Nom.	Max.	Tolerance
+5V (Volts)	+4.75	+5.00	+5.25	+5% / -5%
+12V (Volts)	+11.4	+12.0	+12.6	+5% / -5%
-12V (Volts)	-10.8	-12.0	-13.2	+10% / -10%
+5Vsb (Volts)	+4.75	+5.00	+5.25	+5% / -5%
+3.3V (Volts)	+3.135	+3.30	+3.465	+5% / -5%

## DC Output Load Current Ranges

The DC output load current is specified as shown in below table. The maximum continuous output power at steady state operating should be limited at watts. The +5Vsb output should be remained within the regulation limits during the DC fault condition.

DC Output Load	Min. (A)	Nom. (A)	Max. (A)	Reak (A)
+5V (Volts)	1	6	12	
+12V (Volts)	1	9	17	22
-12V (Volts)	0	0.25	0.50	
+5Vsb (Volts)	0	1	2	
+3.3V (Volts)	0	3	6	

## Max. Combined DC Output

Max continuous DC output power should not exceed **250W at 25°C** and de-rating power 1.6W/°C from 25°C to 50°C to get a maximum continuous power de-rating to **210W at 50°C** each output maximum load de-crease in proportion. The total combined 3.3V, 5V power should not exceed **60W** steady state. The total combined 3.3V, 5V, 12V and -12V power should not exceed **240W**. The total peak power should not exceed **300W**. The surge duration should be less than 20ms.

DC Output	Combined Max. Power			Peak Max. Power
+3.3V (Volts)	250W	240W	60W	300W
+5V (Volts)				
+12V (Volts)				
-12V (Volts)				
+5Vsb (Volts)				

## Ripple & Noise Specification

	+5V	+12V	-12V	+5Vsb	+3.3V
Ripple & Noise	50mV	120mV	120mV	50mV	50mV

- Ripple & noise test by the oscilloscope bandwidth are setting at 20MHz.
- Add a 0.1 $\mu$ F ceramic disk capacitor in parallel with a 10 $\mu$ F electrolytic capacitor at output connector terminals for ripple & noise measurements. If ambient temperature is under 20°C or over 30°C, the AC input should be nominal input.

## Efficiency

The efficiency of the power supply during normal operating should be in below table at 115Vac/230Vac line input voltage.

Load %	+12V	+5V	+3.3V	-12V	+5Vsb	Efficiency
20%	3.04A	1.61A	0.81A	0.09A	0.36A	> 82%
50%	7.59A	4.03A	2.01A	0.22A	0.89A	> 85%
100%	15.18A	8.06A	4.03A	0.446A	1.786A	> 82%

## Standby Efficiency

At 115Vac, while in standby mode with a 100mA load on the +5Vsb DC output, the PSU should draw less than 1 watt of true input power.

## Over Voltage Protection

+5V, +3.3V and +12V output of PSU should be protected from over voltage as below table

DC Output	-12V	+5V	+3.3V
Max.	15.6V	7V	4.8V

## Environmental Requirement

- Operating Temperature : 0 to 50°C.
- Storage Temperature : -40 to 70°C.
- Operating Humidity : 20 to 85% related humidity (non-condensing).
- Non-Operating Humidity : 10 to 95% related humidity (non-condensing).

## Electromagnetic Compatibility and Safety Requirements

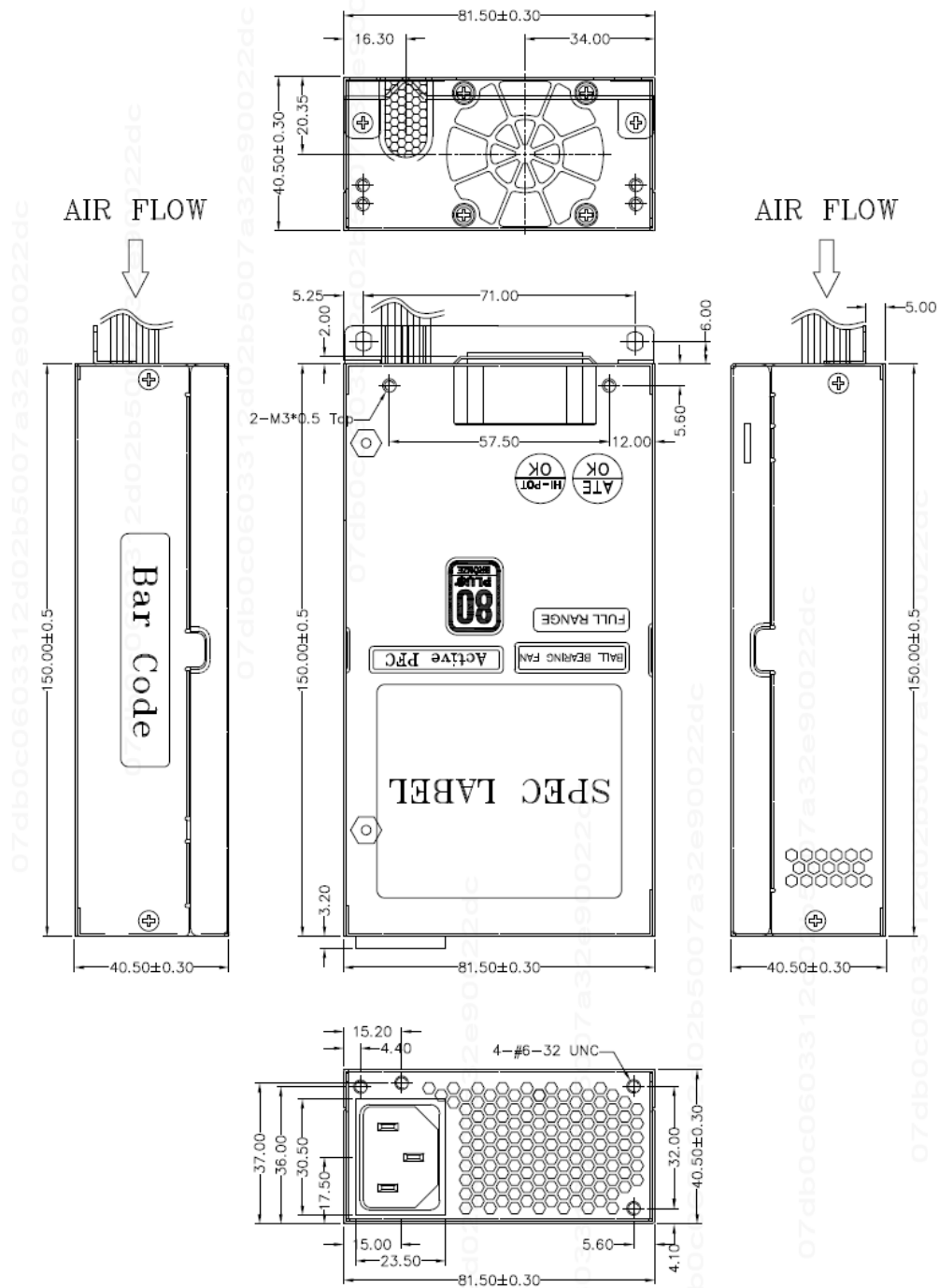
- Conducted EMI : CE, BSMI, FCC, CISPR 22 class B.
- Safety : UL+CUL, TUV EN60950-1, CB, CCC, CE, BSMI.

## Reliability

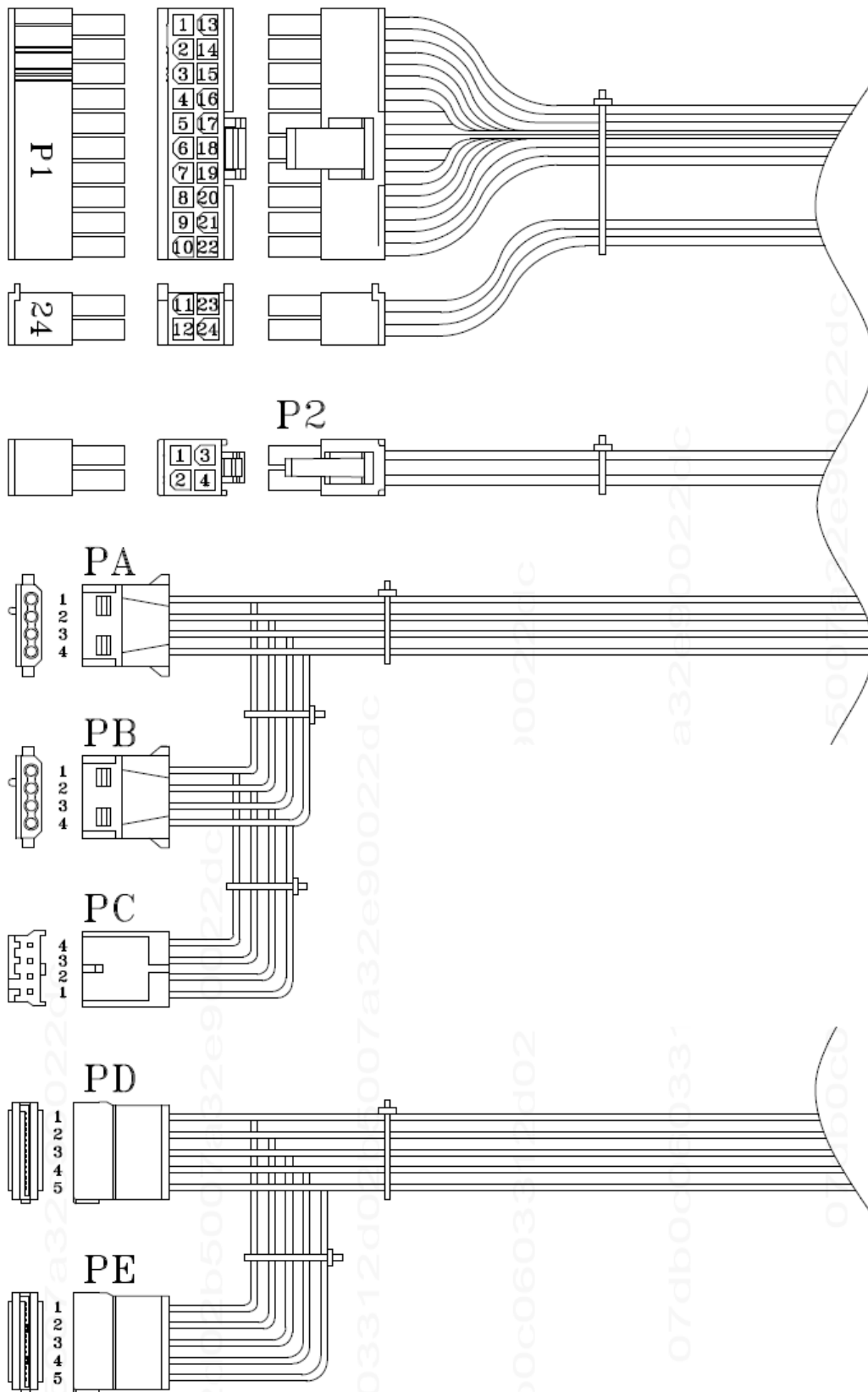
- MTBF : > 100,000 hours under 100% loading / 25°C.
- Safety : UL+CUL, TUV EN60950-1, CB, CCC, CE, BSMI.

## Dimension

- Body : 81.5 x 40.5 x 150 mm (W x H x D)



## Power Output Cable



	Power Output	Function	Gauge	Connector Type	Length
<b>P1</b>	+3.3V, +5V, +12V, -12V, +5Vsb, PW-OK, PS-ON	ATX 20+4-pin Power	20/22	WST P20-I42002K11D P4-I42002K11D or EQIV.	300 +/- 15 mm
<b>P2</b>	+12V	ATX P4 (+12V Aux.)	20	Molex 39-01-2040 or EQIV.	300 +/- 15 mm
<b>PA</b>	+5V, +12V	AT/4P Big (HDD Type)	20	AMP 1-480424-0 or EQIV.	250 +/- 15 mm
<b>PB</b>	+5V, +12V	AT/4P Big HDD Type)	20	AMP 1-480424-0 or EQIV.	155 +/- 15 mm
<b>PC</b>	+5V, +12V	AT/4P Small (FDD Type)	20	AMP 171822-4 or EQIV.	155 +/- 15 mm
<b>PD</b>	+3.3V, +5V, +12V	SATA Power	20	Molex SD-67582-001 or EQIV.	300 +/- 15 mm
<b>PE</b>	+3.3V, +5V, +12V	SATA Power	20	Molex SD-67582-001 or EQIV.	155 +/- 15 mm

## Ordering Code

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Ordering Code	Description
<b>FSP250-50LC</b>	1U Mini-ITX/FlexATX 250W ATX Power Supply
<b>FSP250-50LC-OEM</b>	OEM FSP2250-50LC with Customized power output cable