



全漢企業股份有限公司
FSP TECHNOLOGY INC.

台灣桃園市建國東路22號 統一編號：84239055
No. 22, Jianguo East Road., Taoyuan City, Taiwan, R.O.C.
TEL:+886-3-375-9888 Website : www.FSP-group.com
FAX:+886-3-375-6966 Email : sales@fsp-group.com.tw

SPECIFICATION



ESD13025646

FSP060-1S35-12

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全漢企業股份有限公司

SPI Electronic Co.,Ltd.

SPECIFICATION

G,P.FSP060-1S35-12

R&D	CHECK	APPROVED	REV.
			1

The spec. change list

Item	Revision	Descriptions	Date
1	1	Initial spec. release	10/03'2006
1	1	Correct the dimension of width	07/06'2010

1. SCOPE

The FSP060-1S35-12 is a 60 Watts single output, **full range input** switching power supply with POWER SAVING function, which could be use on many kinds of products .

2. MECHANICAL REQUIREMENTS

2.1 Power supply Dimension Constraints

127.0(L)*76.2(W)*25.0(H) (Height above the PCB) mm.

Note : Detail mechanic dimension please check the outline drawing .

2.2 Power Supply Connectors

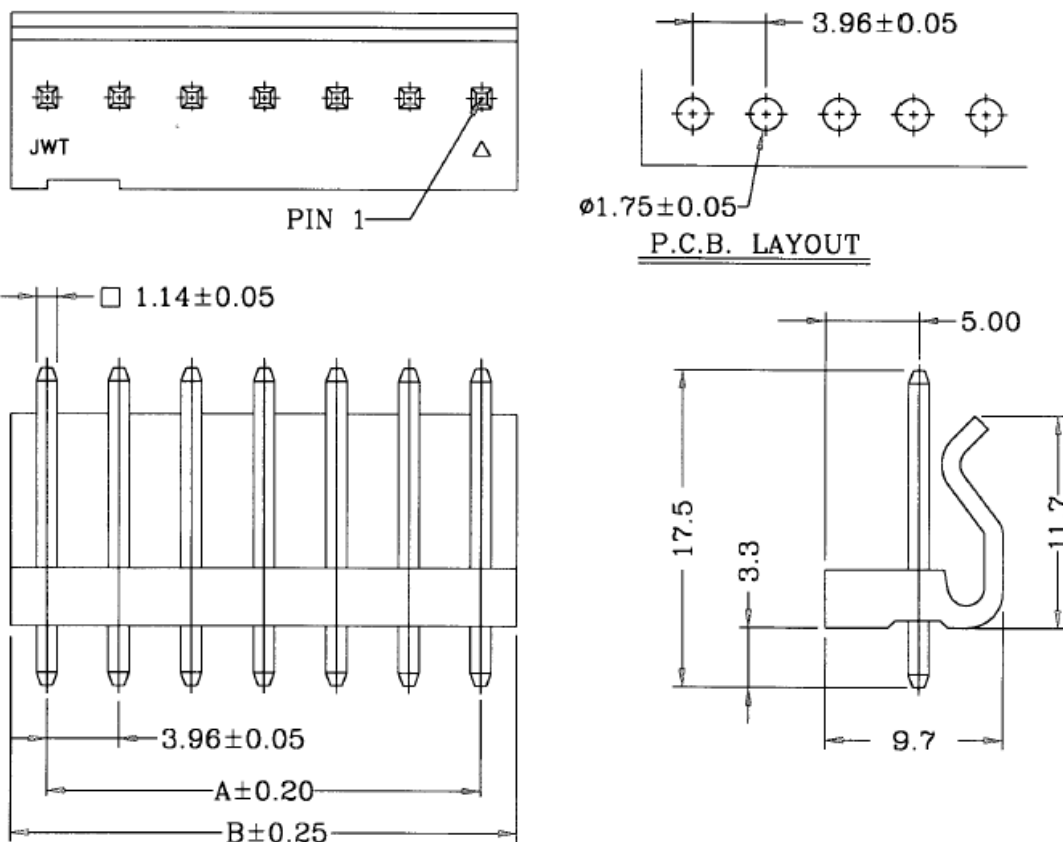
Output Pin-Out

Pin assignment

Pin number	Output Name	Wire Color	Wire AWG
1	+12V		
2	+12V		
3	+12V		
4	GND		
5	GND		
6	GND		

Note : connector spec. list below

Material: *Insulator: Nyion 66 UL94V-2
 *Contact: 1.14mm Tin Plated Square Pin

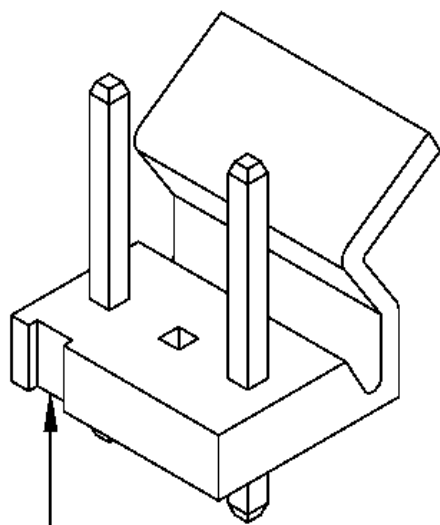
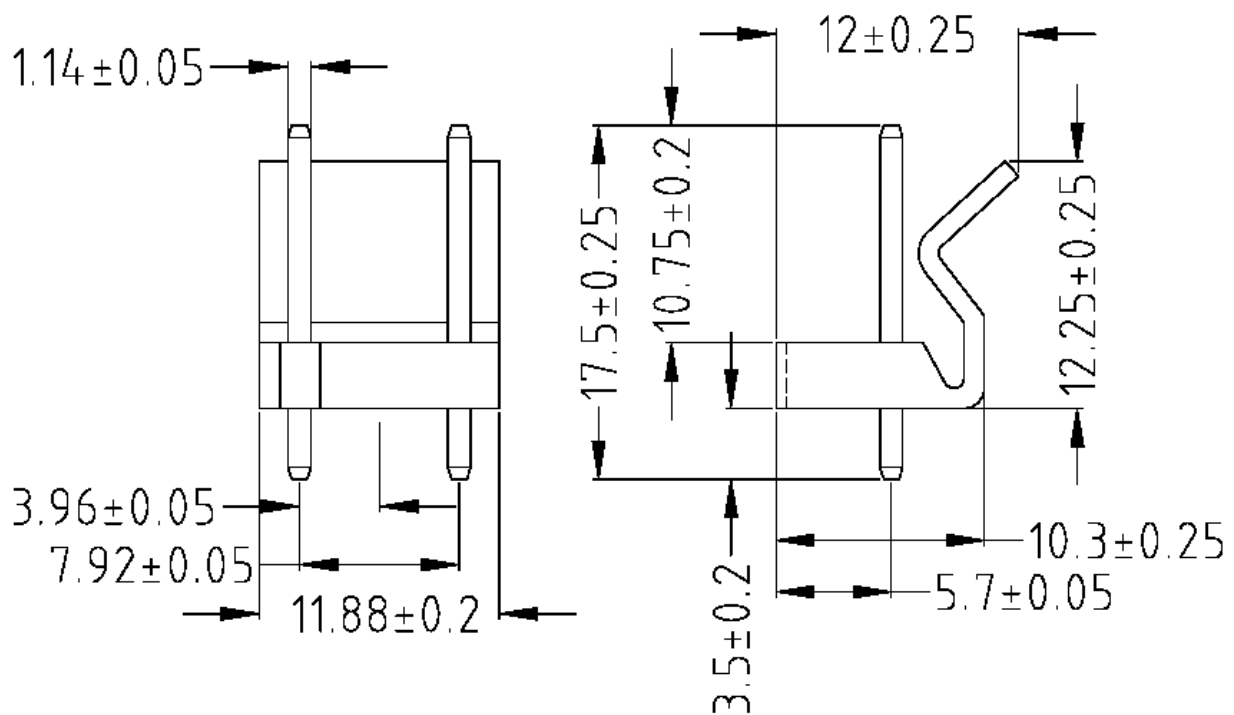


Dimensional & Ordering Information:

Circuits	Part No	Dimensions		PCS/BAG
		A	B	
2	A3961WV2- 2P	3.96	7.92	1000
3	A3961WV2- 3P	7.92	11.88	1000
4	A3961WV2- 4P	11.88	15.84	1000
5	A3961WV2- 5P	15.84	19.80	1000
6	A3961WV2- 6P	19.80	23.76	1000
7	A3961WV2- 7P	23.76	27.72	500
8	A3961WV2- 8P	27.72	31.68	500
9	A3961WV2- 9P	31.68	35.64	500
10	A3961WV2- 10P	35.64	39.60	300
11	A3961WV2- 11P	39.60	43.56	300
12	A3961WV2- 12P	43.56	47.52	200
13	A3961WV2- 13P	47.52	51.48	200
14	A3961WV2- 14P	51.48	55.44	200
15	A3961WV2- 15P	55.44	59.40	200

AC input Pin

Pin number	Output Name	Wire Color	Wire AWG
1	Line		
2	NC		
3	Netural		



Insulator: Nylon 6/6 ul 94V-2
P.C board $\phi 1.8 \pm 0.1$

此固定孔無功能，故位置參考用。

3. ELECTRICAL REQUIREMENTS

3.1 Input AC

3.1.1 Input voltage

Minimum	Nominal	Maximum	
90	110/230	264	VAC

3.1.2 Input Frequency

Min	Nominal	Max	
47	50/60	63	Hz

3.2 Output voltages and loads

Output voltage was measured at the load end of connected cables.

Table.1 SMPS load and regulation limits

A. Table 1 .Loading .

Signal Name	Voltage (Volts)				Current (A)	
	Min	Typ	Max		I max.	I min..
+12V	11.40	12.0	12.60	+/-5%	5.0	0.0

Note :

1. The output voltage shall within its regulation spec. under any line condition and I_{max} ,I_{min}. condition .

3.3 Ripple and Noise

3.3.1 Ripple and Noise required specification

Table.3 lists the Ripple and Noise limitations of switching power supply unit only under nominal operating AC line voltage and over all the full load range.

Table.3 Ripple and Noise Limitations

Signal Name	Ripple & Noise (mV)
+12V	150

Note:

1. The measuring is done by 20MHz bandwidth limited oscilloscope and terminated each output with a 10uF capacitor in parallel with a 0.1uF capacitor.
2. While test ripple noise of the output the probe shall avoid any coupling from other circuit or equipment .or the test result will not show power supply's actual ripple/noise .

3.4 Protection

The switching power supply will be auto recovery while the fault is removed.

3.4.1 Short circuit protection

Each DC output shall have short circuit protection. A short condition on any of DC outputs shall cause **no damage** to the power supply. The unit shall recover and function automatically as soon as the short condition is removed.

3.4.2 Fuse protection

The Fuse inside the power supply shall open when the AC input current is over the rated current of fuse. This Fuse protection will cause switching power supply to fail.

3.4.3 Over voltage protection

.The output have the over voltage protection. When the main feedback control circuit fault occur .The power supply shall be over voltage protection to protect the whole system.. The unit shall recover and function automatically as soon as the fault condition is removed.

3.5 Efficiency and Power consumption

Efficiency : >77% .

No load power consumption : 0.5Watts under AC 230V input

3.6 Hold-up time

The power supply shall maintain voltage regulation within the specified limits in table 1 for at least **20.0** milliseconds after losing of input voltage under the following conditions:

Input voltage: 230Vac

Loading: max output load

3.7 Mean Time Between Failure (MTBF)

100,000 hrs at 25 Degrees centigrade when calculated using MIL-HDBK-217F. Use agreed upon F.I.T. (failure – in - time) number in place of MTBF.

3.8 Feedback reliability

The power supply feedback circuit system shall be test under all the line and load condition .For the reliability consideration the gain margin shall be large 6db or phase margin large than 45 degree.

That's mean if power supply meet the spec describe above the feedback loop is in stably condition. There is no any oscillation phenomenon will occur.

4. ENVIRONMENTAL REQUIREMENTS

4.1 Operating Temperature

Power Operating	0 to +50 °C
Storage	-20 to +65 °C

Note :

- 1) Thermal test must be done at nom. AC and at I max. load.

4.2 Humidity (Non-condensing)

Operating	0% to 90% RH
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4.3 Vibration

10~55Hz,19.6m/sec² (2G), 3 minutes period ,60 minutes each along x,y,z axis

5. INTERNATIONAL STANDARDS

5.1 EMI standards and EMS standards

Designed to meet the following conducted & radiation limits:

- Electromagnetic emission must comply with EN55022 (1998) + A1 + A2 and EN55013 (2001)+A1 standards
- Electromagnetic immunity must comply with EN55020 (2002) + A1 and EN55024 (1998) +A1 + A2 standards
- EN61000-3-2
- EN61000-3-3 + A1
- EN61000-4-5 for surges
- Power Supply Transient Immunity shall be in conformance with surge testing as per EN61000-4-4 applying quick burst of power.
- Electrostatic Discharge Immunity shall be in conformance with EN61000-4-2
- Power shortage immunity shall be in conformance with immunity to 20 ms shortages as per EN61000-4-11
- EMC filtering is required on mains

5.2 Safety Compliance

IEC60950

IEC60065

5.4 RoHS Compliant

All the component of the power supply have to be RoHS compliant.