





全漢企業股份有限公司  
SPI Electronic Co. Ltd.

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# SPECIFICATION

P.E	R/D	APPROVED	REV.
Anson Liao	Paul Chu	LJ Wei	1

表單編號：



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# Electrical Specification

## History

REV.	Description	Date	Drawn	Mechanical	Electrical	Approved
<u>0</u>	SPEC ISSUE	Mar.08'04	Paul Chu	Sum Chen	Paul Chu	LJ Wei
<u>1</u>	Modify Output DC Cable ( item 5.3 )	Mar.17'04	Paul Chu	Sum Chen	Paul Chu	LJ Wei

MODEL NO. **FSP120-AFB**

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## Electrical Requirements

### 1. Input Characteristics:

ITEM	CONDITION	SPECIFICATION
1.1 Rated Input Voltage		100Vac / 240Vac
1.2 Input Voltage Range	Continuously	90Vac to 264Vac
1.3 Input Frequency Range	Continuously	47Hz to 63Hz
1.4 Input Voltage Harmonic Distortion		$\leq 8\%$
1.5 Input Current Harmonic	Max. load	IEC1000-3-2
1.6 Efficiency (warm up after 1 hour)	100Vac / 2.5A 240Vac / 2.5A	$\geq 86\%$ $\geq 88\%$
1.7 Inrush Current	100Vac / 240Vac	shall be less than the rating of adapter critical component (including rectifiers, fuse surge and current limiting device).
1.8 No Load Power Consumption (Power saving)	240Vac / 0A load	$\leq 0.75W$

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## 2. Output Characteristics:

※Measured at the end of DC cable.

ITEM	CONDITION	SPECIFICATION
2.1 Output Rated Voltage		48V
2.2 Output Current	at constant voltage mode	0A to 2.5A
2.3 Output Voltage Setting	at the output end of DC cable	45.6 ~ 50.4V
2.4 Output Voltage Ripple and Noise: (0.1uF Ceramic Cap. and 63V 47uF Aluminum Cap. Paralleled between the end of output cable ,BW=20M Hz)	100Vac / 2.5A 240Vac / 2.5A	≤350mVp-p
2.5 Turn-On Delay Time	at 100Vac/120W load, output voltage shall remain regulation	≤ 2Sec.
2.6 Hold Up Time	at 100Vac or 240Vac / 120W load, output voltage shall remain regulation	≥8 mS
2.7 Rise Time	at 100Vac or 240Vac / 120W load, DC output rise time from 5% to 95% of Vo	≤ 80mS
2.8 Load Transient Response	Output load step from ±50% change of half load , S/R=0.5A/us, 100Hz & 1KHz 50% duty. Output voltage within spec.	45.6 ~ 50.4V

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### 3. Protection Characteristics:

ITEM	CONDITION	SPECIFICATION
3.1 Over Current Protection	When an internal fault occurs, or an external fault is applied to the adapter, such that an overload or short circuit is applied to the output, the adapter shall shut down. It will enter into normal condition if the fault condition is removed.	Shutdown and no damage.
3.2 Over-Voltage Protection	The adapter will enter into shut down that means no output while over voltage happened at output terminal that caused by internal fault, the output trip voltage shall not exceed 58 volts with a maximum duration of 250 milliseconds. That will be return to normal state by AC reset.	Shutdown and no damage.
3.3 Over Temperature Protection	The adapter have thermal protection for abnormal usage for/by parts failure. This protection shall operate before rising to reach to the cover-case's deformation and discoloration temperature. The adapter shall be shut down and enter latch-off mode. That will be return to normal state by AC reset.	No broken, no smoke



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## 4. Environmental Characteristics:

ITEM	CONDITION	SPECIFICATION
4.1 Electric Fast Transients : Refer to IEC1000-4-4 level 2	Impulse: $\pm 1\text{kV}$ applied L,N and .FG, pulse duration 50nS, period 5 min.	Normal operation shall be continued.
4.2 Lightning Surge: Refer to IEC1000-4-5	$\pm 1\text{kV}$ applied differential mode, pulse rise time 1.2us and duty time 50uS  $\pm 2\text{kV}$ applied common mode, pulse rise time 1.2us and duty time 50uS	Normal operation shall be continued.  Normal operation shall be continued.
4.4 Electron Static Discharge: (Refer to IEC1000-4-2 Energy Storage Capacitor 150pF; Discharge Resistor 330 $\Omega$ )	Air Discharge: $\pm 15\text{KV}$ min.  Contact Discharge: $\pm 8\text{KV}$ min.	Normal operation shall be continued.
4.5 Cooling	Natural air cooling	
4.6 EMI: Adapter comply with the following national standards: EMI Conducted Emission EMI Radiated Emission	The adapter internal filter to meet	FCC CLASS B  CISPR 22 CLASS B  VCCI CLASS II
4.7 Safety conforming	Regulated by customer	
4.10 Leakage Current	240Vac / 60Hz 100Vac / 60Hz	$\leq 250\mu\text{A}$ $\leq 100\mu\text{A}$
4.11 Insulation Resistance	Between AC input and secondary applied 500Vdc, test time 1 minute. DC 500V, test time 1 sec. for mass production	$\geq 100\text{M}\Omega$
4.12 Dielectric Strength: (Hi-Pot)	Between AC input and secondary applied AC 1.5kV, test time 1 minute, and cut off current shall be less than 10mA. AC 1.5kV, test time 1 sec. for mass production	

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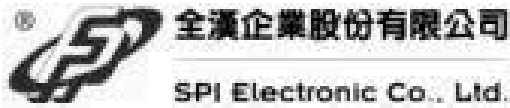


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ITEM	CONDITION	SPECIFICATION
4.13 Temperature	Operating Storage	0 to 40°C -20 to +80°C
4.14 Humidity	Operating Storage	20% ~ 80% 10% ~ 90%
4.15 MTBF	By count method	> 100000 hours

Note: 1. Differential mode is defined as between line and neutral.  
2. Common mode is defined as between phase and earth ground



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## 5. Mechanical Characteristics:

ITEM	CONDITION	SPECIFICATION
5.1 Dimension (Length x Width x Height)		167mm*65mm*37mm
5.2 Input AC socket Type		IEC 320 C6 Type
5.3 Output DC Cable Length		14# AWG L=1.8m
5.4 AC Cable Pulling Removal Strength	When the insert/withdraw force is between 2.5 ~ 3.0kgf, SPI should proceed the following test & submit samples to customer for confirmation: Insert the connector to the socket, no free falling of the adapter is allowed when the assembly is hanged vertically.	1 ~ 5Kgf
5.5 Plug Insert withdraw force		Pulling: 0.5 ~ 3.0kgf Removal: 0.5 ~ 2.0kgf
5.6 Shock	Storage: Shock acceleration 50G, sin, 10ms Directions of force: X, Y, Z One time at 6 directions  Operating: Shock acceleration 30G, sin, 10ms Directions of force: X, Y, Z One time at 6 directions	After shock test, the adapter is no damage
5.7 Drop	Storage: Lift this unit a height of 1 meter onto a hardwood surface one time at 6 directions. There should be no damage.	After drop test, the adapter is no damage
5.8 Random Vibration	Storage: 1) Frequency :5 to 100Hz 2) PSD:0.0563m <sup>2</sup> /s <sup>3</sup> (0.000586G <sup>2</sup> /Hz) 3) Overall Grms:2.31 m/s <sup>2</sup> (0.236G) 4) Vibration duration:20minutes 5) Vibration waveform:Random 6) Force Direction X,Y,Z	After vibration test, the adapter will be turned on normally

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ITEM	CONDITION	SPECIFICATION
	Operating: 1) Frequency :5 to 100Hz 2) PSD:0.0141m <sup>2</sup> /s <sup>3</sup> (0.000147G <sup>2</sup> /Hz) 3) Overall Grms:1.16 m/s <sup>2</sup> (0.118G) 4) Vibration duration:20minutes 5) Vibration waveform:Random 6) Force Direction X,Y,Z	
	Pacting Freight 1) Frequency :5 to 200Hz 2) PSD: 5Hz 0.96m <sup>2</sup> /s <sup>3</sup> (0.01G <sup>2</sup> /Hz) 100Hz 0.96m <sup>2</sup> /s <sup>3</sup> (0.01G <sup>2</sup> /Hz) 200Hz 0.096m <sup>2</sup> /s <sup>3</sup> (0.001G <sup>2</sup> /Hz) 3) Overall Grms:11.27m/s <sup>2</sup> (1.15G) 4) Vibration duration:20minutes 5) Vibration waveform:Random 6) Force Direction X,Y,Z	
5.9 Color		
Case		Black
DC Cable (including Molding Core)		Black

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