

電氣規格書



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FSP500-50FDB



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SPECIFICATION

FSP500-50FDB

Main Feature
Active PFC Circuit
Full Range Input

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REV:1.3



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MODEL: FSP500-50FDB

Revision History

Rev	Description	Date	Author
1.1	Add 6.2. DIELECTRIC STRENGTH	2018/8/31	Karl
1.2	Update 4.1.4.OUTPUT RISE TIME	2018/10/8	Karl
1.3	4.4. EFFICIENCY Add ※The efficiency will be adjusted in accordance with the change in the output wire	2019/4/19	Winnie (Karl)



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1. GENERAL DESCRIPTION AND SCOPE

This is the specification of Model FSP500-50FDB; AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 and with Full Range Input features. Designed and manufactured by FSP GROUP.

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
1	+3.3V	±5%	50 mV	0A	14.0 A
2	+5V	±5%	50 mV	0A	16.0 A
3	+12V	±5%	120 mV	0.1A	41.0 A
4	-12V	±10%	120 mV	0 A	0.3A
5	+5Vsb	±5%	50 mV	0 A	3A

The +3.3V and +5V total output shall not exceed 90watts. The total output for this subject power supply is 500 watts. 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 be bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

4.1.2. LOAD CAPACITY SPECIFICATIONS

The cross regulation defined as follows, the voltage regulation limits DC include DC Output ripple & noise.

LOAD	+3.3V	+5V	+12V	-12V	5VSB
1	8.31A	9.5A	34.13A	0.25A	2.5A
2	4.16A	4.75 A	17.07A	0.12A	1.25A
3	1.66 A	1.9A	6.83A	0.05A	0.5A
4	14 A	0A	0.1A	0A	0.1A
5	7A	0 A	0.1A	0A	0.1A
6	0A	8A	0.1A	0A	0.1A
7	0A	16A	0.1A	0A	0.1A
8	0A	8A	10A	0A	0.1A
9	0.1A	0.1A	20A	0A	0.1A
10	0A	0A	41A	0A	0.1A
11	0A	0A	20A	0A	0.1A
12	0A	0A	0.1A	0A	0A

4.1.3. HOLD-UP TIME(100% LOAD)

115V / 60Hz : $\geq 10\text{ms}$

230V / 50Hz : $\geq 12\text{ms}$

4.1.4.OUTPUT RISE TIME

(10% TO 90% OF FINAL OUTPUT VALUE, @FULL LOAD)

115V-rms or 230V-rms + 5Vdc : 20ms Maximum

4.1.5.OVER VOLTAGE PROTECTION

+5V _{dc} output: +5.7 V _{dc} minimum,	+ 7V _{dc} maximum
+12V _{dc} output: +13.3V _{dc} minimum,	+16V _{dc} maximum
+ 3.3V _{dc} output: +3.7V _{dc} minimum,	+ 4.5V _{dc} maximum

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 +3.3V, +5V or +12V output, the power supply will shutdown and latch off. 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.(PS/ON)

In the event of an output short circuit condition –12V output, the power supply will be latch off. The power supply shall return to normal operation as soon as the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

+5vsb output short circuit condition : output auto restart .

4.1.7. OVER POWER PROTECTION

Total output shall not exceed 500 watts , in the event of an output total power condition on output , If the total exceed 150% , the power supply will shutdown and latch off without damage to the power supply.

4.1.8.POWER GOOD SIGNAL

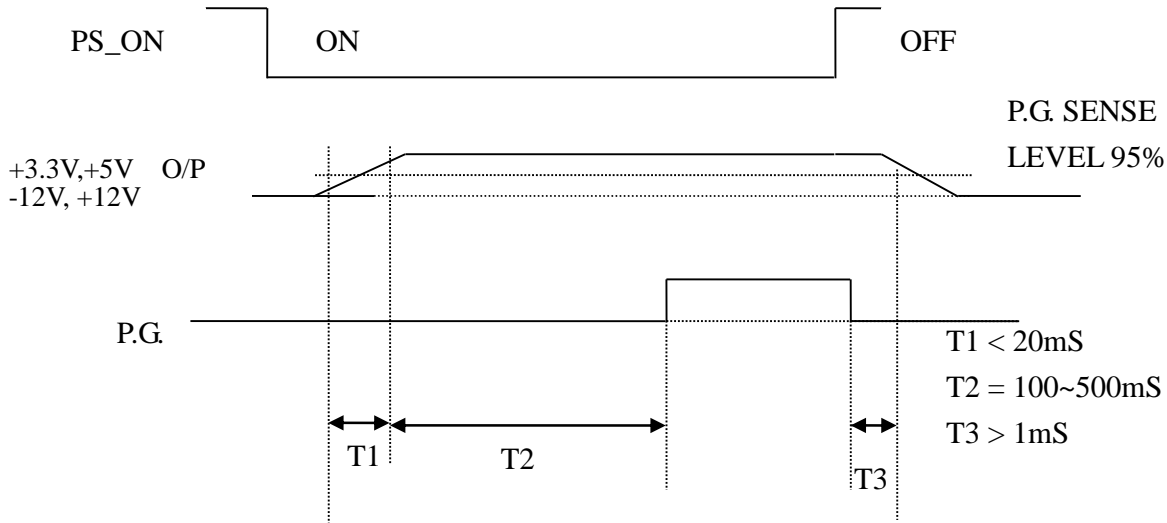
The power good signal is a TTL compatible signal for the purpose of initiating an orderly star-up procedure under normal input operating conditions. This signal is asserted (low) until +5Vdc has reached 4.75 volts during power up. Characteristics:

TTL signal asserted (low state) : less than 0.5V while sinking 10mA.

TTL signal asserted (high state): greater than 4.75V while sourcing 500uA.

High state output impedance: less or equal to 1Kohm from output to common.

POWER GOOD @ 115/230V, Typical (100%) LOAD	100 –500mSec.
POWER FAIL @115/230V, Typical (100%) LOAD	1 mSec. minimum



4.2. OUTPUT TRANSIENT LOAD RESPONSE

+5V and +12V and +3.3V must be within specification for a step change in current as specified below. The outputs will be tested one section at a time with all other sections at maximum load. The test transition will be from IA to IB and IB to IA.

On TRANSIENT test, power good signal should be take with ch4.1.8.

+5Vdc:

IA: 16.0 amps
 IB: 11.2amps
 Volts variation: +5V +-5%
 Setting time: 10 ms max
 +5Vsb: 0.1A , 12V: 0.1A , 3.3V: 0A , -12V: 0A

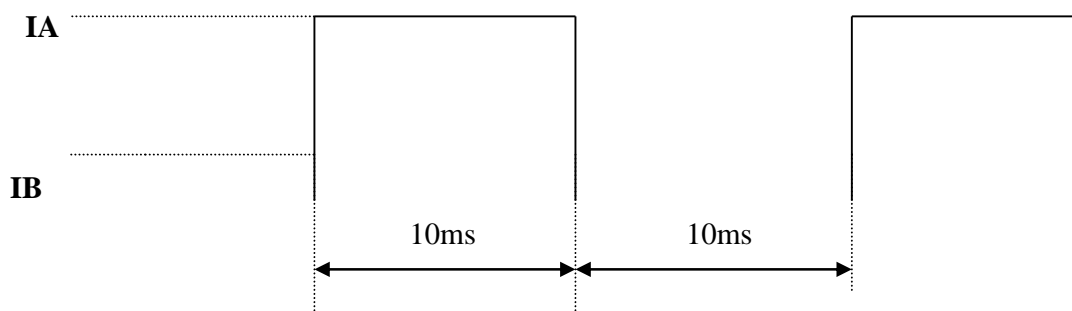
+12Vdc:

IA: 41.0 amps
 IB: 28.7 amps
 Volts variation: +12V +-5%
 Setting time: 10 ms max

+5Vsb: 0.1A , 5V: 0A , 3.3V: 0A , -12V: 0A

+3.3Vdc:

IA: 14.0 amps
 IB: 9.8 amps
 Volts variation: +3.3V +-5%
 Setting time: 10 ms max
 +5Vsb: 0.1A , 5V: 0A , 12V:0.1A , -12V: 0A



Transient Load Requirements

Output	Δ Step Load Size	Load Slew Rate	Capacitive Load
+3.3 V	30% of max load	0.1 A / μs	3300 μF
+5 V	30% of max load	0.1 A / μs	3300 μF
12V	30% of max load	0.1 A / μs	4700 μF

4.3. INPUT ELECTRICAL SPECIFICATIONS

4.3.1. VOLTAGE RANGE

PARAMETER		UNITS
V-in Range	90 - 264	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	50A
230V	100A

4.3.4. INPUT LINE CURRENT

115V	8 Amps – rms maximum
230V	4 Amps – rms maximum

4.4. EFFICIENCY

	Full load (100%)	Typical load (50%)	Light load (20%)
115VAC	87%	90%	87%
230VAC	87%	90%	87%

※ Meet 80plus GOLD level

※ The efficiency will be adjusted in accordance with the change in the output wire

(loading shown in Amps)

Loading	+12V	+5V	+3.3V	-12V	+5Vsb
Full (100%)	34.13A	9.50A	8.31A	0.25A	2.50A
Typical (50%)	17.07A	4.75A	4.16A	0.12A	1.25A
Light (20%)	6.83A	1.90A	1.66A	0.05A	0.50A

4.6. PS_ON#

PS_ON# is an active-low, TTL-compatible signal that allows a motherboard to remotely control the power supply in conjunction with features such as soft on/off, Wake on LAN+, or wake-on-modem. When PS_ON# is pulled to TTL low, the power supply should turn on the five main DC output rails: +12VDC, +5VDC, +3.3VDC and -12VDC. When PS_ON# is pulled to TTL high or open-circuited, the DC output rails should not deliver current and should be held at zero potential with respect to ground. PS_ON# has no effect on the +5VSB output, which is always enabled whenever the AC power is present. (PS_ON# Signal Characteristics)

The power supply shall provide an internal pull-up to TTL high. The power supply shall also provide debounce circuitry on PS_ON# to prevent it from oscillating on/off at startup when activated by a mechanical switch. The DC output enable circuitry must be SELV-compliant.

PS_ON# Signal Characteristics

	Min.	Max.
VIL, Input Low Voltage	0.0V	0.8V
IIL, Input Low Current (Vin = 0.4V)		-1.6mA
VIH, Input High Voltage (Iin = -200 μ A)	2.0V	
VIH OPEN circuit, Iin = 0		5.25V

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 +50 deg.
Storage	-40 to +80 deg. C

5.2. HUMIDITY

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

5.3 ALTITUDE

Operating: sea level to 5,000m

5.4. VIBRATION

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

Vibration Operating – Sine wave excited, 0.5 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.

5.5. SHOCK

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

Storage 40G, 9 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.

5.6 COOLING SPECIFICATIONS

5.6.1. The PSU is cooled by a self-contained FAN, 40mm, 12VDC.

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.

6.2. DIELECTRIC STRENGTH

Primary to Frame Ground : 1800Vac for 60 sec.

Primary to Secondary : 1800Vac for 60 sec

7. ELECTROMAGNETIC COMPATIBILITY

7.1 LINE CONDUCTED EMI

The subject power supplies will meet FCC class B requirements .

7.2. RADIATED EMI

The subject power supplies will meet FCC and CISPR 22 requirements .

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.