電氣規格書

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FSP500-601UE , FSP500-602UE

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SPECIFICATION

FSP500-601UE

FSP500-602UE

Main Feature:
Active PFC Circuit
Single Range Input

JAN.05.2018
REV: 1.3

全漢企業股份有限公司
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MODEL: FSP500-601/602UE

Revision History

Rev	Description	Date	Author
1.1	**UPDATE** **1. GENERAL DESCRIPTION AND SCOPE** The 5Vsb power is less than 0.5W_{input} at power off mode (PS_ON input at high state) which is comply with EuP Lot 6 year 2013 requirement.	11.7.2017	STAN
1.2	**UPDATE** 4.3.1. VOLTAGE RANGE PARAMETER / UNITS V-in Range: 162 - 264 V-rms Normal V-in Range: 180 - 240 V-rms	12.27.2017	STAN
1.3	4.1.2. LOAD CAPACITY SPECIFICATIONS DEL LOAD -5V 4.4. EFFICIENCY DEL LOAD -5V 4.2. OUTPUT TRANSIENT LOAD RESPONSE DEL +5Vsb **UPDATE** 5.3. VIBRATION Vibration Operation, 0.01g²/Hz at 5 Hz sloping to 0.02g²/Hz at 20 Hz, and maintaining 0.02g²/Hz from 20 Hz to 500 Hz. The area under the PSD curve is 3.13gRMS. The duration shall be 20 minutes per axis for all three axes on all samples.	01.05.2018	STAN
1.4			
1.5			

1. GENERAL DESCRIPTION AND SCOPE

This is the specification of Model FSP500-601/602UE; AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 and with input 230V Range Input features. Designed and manufactured by FSP GROUP.

The 5Vsb power is less than $0.5W_{input}$ at power off mode (PS_ON input at high state) which is comply with EuP Lot 6 year 2013 requirement.

The specification below is intended to describe as detail 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

- 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	peak
1	+3.3V	±5%	50mV	1.0A	18.0 A	
2	+5V	±5%	50mV	1.0A	16.0 A	
3	+12V	±5%	120mV	1.0A	36.0 A	
4	-12V	±10%	120mV	0 A	0.5 A	
5	+5VSB	±5%	50mV	0 .05A	3.0A	
6	-5V	±10%	100mV	0A	0.3A	

(1) The +3.3V and +5V total output shall not exceed 130watts.
(2) Total output for this subject power supply is 500 watts.
(3) 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 47uF electrolytic capacitor to simulate system loading.
(4) Maximum continous load on the combined 12V output shall not exceed 36A.
(5) -5V Option.

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	16.7A	15.0A	28.8A	0.5A	3.0A
2	2.0A	5.0A	4.0A	0.1A	0.1A
3	3.0A	16.0A	6.0A	0.1A	2.5A
4	10.0A	5.0A	2.0A	0.1A	0.1A
5	18.0A	3.0A	1.2A	0.1A	0.05A
6	8.5A	7.5A	14.6A	0.25A	1.5A
7	1.0A	6.0A	36.0A	0.1A	2.5A
8	1.0A	5.0A	8.0A	0.1A	0.1A
9	1.0A	4.0A	18A	0.1A	0.05A
10	3.4A	3.0A	5.76A	0.1A	0.6A
11	1.0A	1.0A	1.0A	0A	0.05A

4.1.3. HOLD-UP TIME (@80 %FULL LOAD)

230V / 50Hz : 14 mSec. Minimum.

The output voltage will remain within specification, in the event that the input power is removed or interrupted, for the duration of one cycle of the input frequency. The interruption may occur at any point in the AC voltage cycle. The power good signal shall remain high during this test.

4.1.4.OUTPUT RISE TIME

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

230V-rms + 5Vdc : 20ms Maximum

4.1.5.OVER VOLTAGE PROTECTION

Voltage Source	Protection Point
+ 3.3 V_{dc}	3.5V-4.8V
+5V_{dc}	5.5V-7V
+12V_{dc}	13.3V-16V

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 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.

In the event of an output short circuit condition on -12V and -5V output, the power supply will not be damaged. 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.

4.1.7.OVER CURRENT PROTECTION

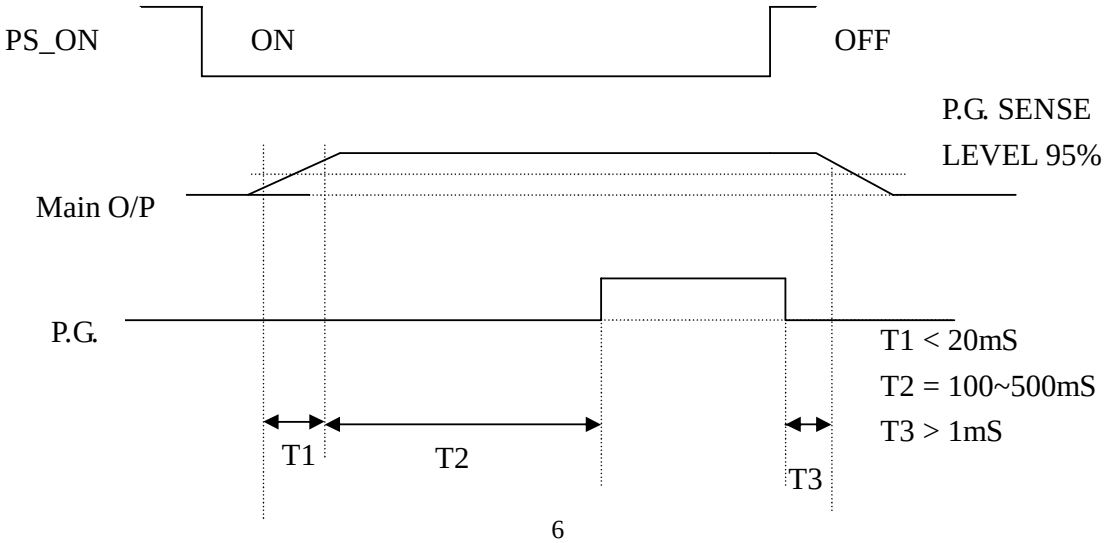
V	(A) Limit
+12V	40A~48A
+5V	20A~30A
+3.3V	20A~30A

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 @ 230V,FULL LOAD	100 –500mSec.
POWER FAIL @ 230V, FULL LOAD	1 mSec. minimum

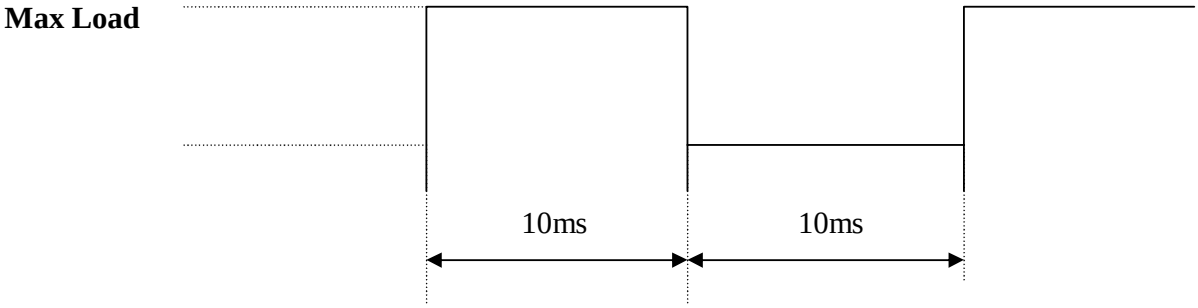


4.2. OUTPUT TRANSIENT LOAD RESPONSE

The output voltages shall remain within the limits specified in 4.1.1 output rating table for the step loading and within the limits specified in Table 1 for the capacitive loading. The load transient repetition rate shall be tested between 50Hz and 1 kHz at duty cycles ranging from 10%-90%. The load transient repetition rate is only a test specification shown in Table 1.
The step load may occur anywhere within the MIN load to the MAX load

Table 1: Transient Load Reguirements

Output	Step Load Size	Load Slew Rate	Capacitive Load
+3.3V	30% of max load	0.5A/us	3300uF
+5V	30% of max load	0.5A/us	4700uF
+12V	50% of max load	1.0A/us	4700uF



4.3. INPUT ELECTRICAL SPECIFICATIONS

4.3.1. VOLTAGE RANGE

PARAMETER		UNITS
V-in Range	162 - 264	V-rms
Normal V-in Range	180 - 240	V-rms

4.3.2. INPUT FREQUENCY

INPUT FREQUENCY	47–63Hz

4.3.3. INRUSH CURRENT

(Cold start – 25 deg. C)

230V	100A

(Hot start – No damage)

4.3.4. INPUT LINE CURRENT

230V	3.6 Amps – rms maximum

4.4. EFFICIENCY

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

(loading shown in Amps)

Loading	+12V	+5V	+3.3V	-12V	+5Vsb
Full (100%)	30.87A	12.8A	14.4A	0.43A	2.57A
Typical (50%)	15.44A	6.40A	7.2A	0.21A	1.29A
Light (20%)	6.17A	2.56A	2.88A	0.09A	0.51A

4.5. Standby Power Consumption (5Vsb):

Input Power < 1W @ 5Vsb/100mA & 230Vac input

PS_ON input signal @ High State

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,-5VDC,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. Table 15 lists 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.

Table 15. PS_ON# Signal Characteristics

	Min.	Max.
V_{IL}, Input Low Voltage	0.0V	0.8V
I_{IL}, Input Low Current (Vin = 0.4V)		-1.6mA
V_{IH}, Input High Voltage (lin = -200 μ A)	2.0V	
V_{IH} OPEN circuit, lin = 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	500W	0 to +50 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 Operation, $0.01g^2/Hz$ at 5 Hz sloping to $0.02g^2/Hz$ at 20 Hz, and maintaining $0.02g^2/Hz$ from 20 Hz to 500 Hz. The area under the PSD curve is 3.13gRMS. The duration shall be 20 minutes per axis for all three axes on all samples.

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, 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.

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. ELECTORMAGNETIC COMPATIBILITY

7.1 LINE CONDUCTED EMI

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

7.2. RADIATED EMI

The subject power suppy 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℃, maximum-output load, and nominal AC input voltage.