

Engineering Specification

Model: FP-500

|

Revision:	A01
-----------	-----

Engineer:	Elvis_
-----------	--------

ATX 12V Power Supply Specification

Revision: A01 2026/1/10

Prepared By: Elvis_

*****ITEM OF CONTENTS*****

1. INPUT SPECIALITY	5
1-1. Input condition.....	5
1-2. Output Voltage and Ripple Noise Requirements	5
2. OUTPUT SPECIALITY	6
2-1. DC Load Requirements.....	6
2-2. Cross Regulation	6
2-3. Output Transient Response.....	6
2-4. Output Closed-loop Stability	7
2-5. Over Shoot.....	7
3. TIMING	7
4. POWER GOOD SIGNAL	8
4-1. Power Good Signal	8
4-2. Power Good Signal Characteristics.....	8
5. PROTECTIONS	8
5-1. Over Voltage Protection.....	8
5-2. Short Circuit Protection	9
5-3. Protection Reset.....	9
6. NO LOAD OPERATION	9
7.FAN SPEED CONTROL	o

1. Input Requirements

1-1. Input condition:

Range Select	Nominal	Units
V in	200 - 240	VAC
Frequency	47-63	Hz
AC input current	4	AMPS

1-2. Output Voltage and Ripple Noise Requirements

Output Voltage	MIN	MAX	Regulation (%)	Ripple Max	Min Capacitive load
+5V	4.75	5.25	+5% ~ -5%	120mV	3300uF
+3.3V	3.13	3.46	+5% ~ -5%	120mV	4700uF
+12V	11.4	12.6	+5% ~ -5%	200mV	4400uF
-12V	10.8	13.2	+10% ~ -10%	200mV	330uF
+5Vs	4.75	5.25	+5% ~ -5%	100mV	330uF

Note: 1). The output voltage should be measured at output connector terminals.

2). The output Ripple Noise should be tested with 0.1uf ceramic disk capacitors, 10uf tantalum capacitor and Min Capacitive load at the point of load.

2. Output Requirements

2-1. DC Load Requirements

Output Voltage	MIN	FULL LOAD	Combined	Total
+5V	0.2A	10A	70W	200W
+3.3V	0.1A	6A		
+12V	0.5A	10A	120W	
-12V	0.0A	0.5A	6W	
+5Vs	0.05A	1.5A	7.5W	

2-2. Cross Regulation

The cross regulation is defined in the matrix below:

Load	+5V	+3.3V	+12V	-12V	+5Vs	Remark
(1)	5	5	12.1	0.5	1.5	+12V Max
(2)	10	6	10	0.5	1.5	Full load
(3)	5	3	5	0.25	0.75	Half load
(4)	0.2	0.1	0.5	0	0.05	Min load

- 1). The total continuous output power is 200W at +25°C, 80% load at +45°C.
- 2). The +5V , +3.3V and +12V outputs Max-combined power is 200W (25°C)

2-3. Output Transient Response

- 4). The output voltage will remain within the regulation after applying following load changes.
- 5). Simultaneous load step on the +5V, +3.3V, and +12V outputs. (all steps occurring in the same direction.)
- 6). Load – changing repetition rate of 50Hz to 10K Hz.

Output	Output Range	Load step	Slew Rate	Test condition	Min. Dynamic Capacitive load
+12V1	1.0A to 15A	60%	1A/ usec	Load 3	10000uF
+5V	0.5A to 10A	30%	1A/ usec	Load 2	10000uF
+3.3V	0.5A to 10A	30%	1A/ usec	Load 1	10000uF
+5Vs	0.05A to 2A	0.5A	0.5A/ usec		10000uF
-12v	0.0A to 0.3A	0.1A	0.1A/ usec		350uF

The dynamic load transient response test must follow 2-2 Cross Regulation table.

2-4. Output Closed-loop Stability

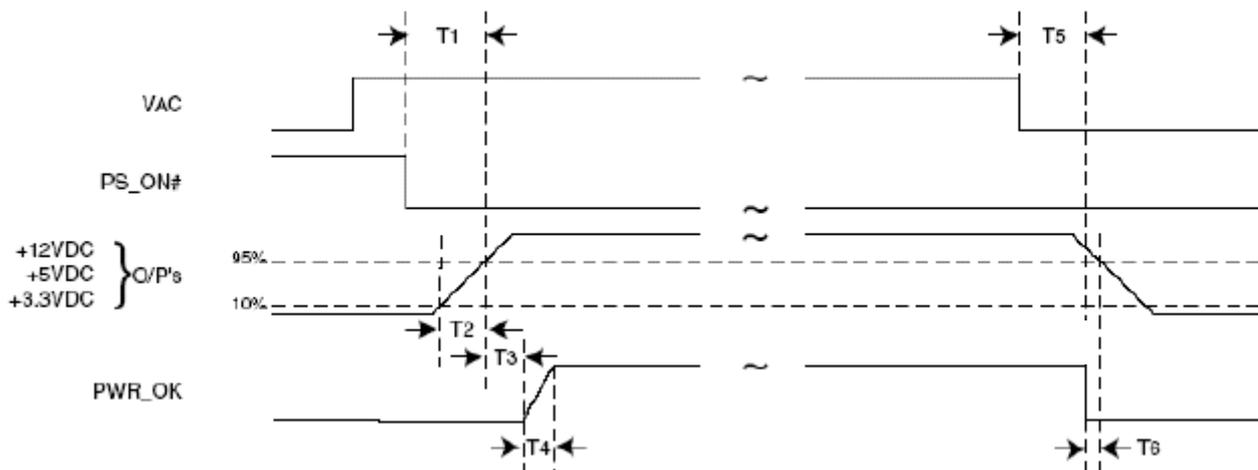
The power supply shall be unconditionally stable under all line/load conditions including capacitive loads. A minimum of 45 degrees phase margin and 10dB gain is recommended at both the maximum and minimum load.

2-5. Over Shoot

The output voltage overshoot upon the application or removal of the input voltage, or the assertion /de-assertion of PS_ON#, under the condition specified in 1-6 Output Voltage table, shall be less than 10% above the nominal voltage. No voltage of opposite polarity shall be present on any output during turn-on or turn-off.

3. Timing

3-1. Power supply Time:



Parameter	Description	Value
T1	Power-on time	<500mS
T2	Rise time	0.2 – 20mS
T3	PWR_OK delay time	100 – 500mS
T4	PWR_OK rise time	<10mS
T5	AC loss to 5Vout hold-up time	16mS

T6	Power-down warning	>1mS
----	--------------------	------

3-2. Hold-up Time

The power supply with 70% load at 230V/50Hz, should supply regulated output for at least 16mS after the loss of the AC input voltage.

Test load condition as below.

Load	+5V	+3.3V	+12V	-12V	+5Vs	Total (W)
Max. Load	7	4.2	7	0.35	1.05	140

4. Power Good Signal

4-1. Power Good Signal

The power supply should provide a "Power-Good" signal to reset system logic, indicate proper operation of the power supply and give advance warning of impending loss of regulation at turn off.

It should be an up level during normal operation, or a down level when fault conditions occur or during turn off. When the power supply is turned off for a minimum of 3.0 sec. and then turned on the power good signal should be generated.

4-2. Power Good Signal Characteristics

Signal Type	+5V TTL compatible
Logic level low	< 0.4V while sinking 4mA
Logic level high	Between 2.4V and 5V output while sourcing 200uA
High-state output impedance	1k ohms from output to common

5. Protections

5-1. Over Voltage Protection

OVP	Max.
12 V	16.0 V
5 V	7.0 V
3.3 V	4.5V

5-2. Short Circuit Protection

The short circuit placed on +3.3V, +5V, + 12V and –12V output shall cause no damage and the power supply shall shut down and latch.

5-3. Protection Reset

When the power supply latches into shutdown condition due to a fault on output (Over-Current, Over-Voltage, Short circuit), the protection latch must reset at after the fault has been removed and the on/off signal has switched state.

6. No Load Operation

No damage or hazardous condition will occur with all the DC output connectors disconnected from the load. The power supply may latch into the shutdown state.

7 DC WIRE

Model: FP-500

