SPECIFICATION

P/N: P6301H N1F

Industrial Quality
1U Mini 300W ATX Power Supply
(81.5x150x40.3 mm)

Active PFC 100V-264V AC Input

*** Specification Approval ***

This specification (total 10 pages including cover page) in its entirety is approved by:

_____	_____	_____	_____
Company Name	Print Name	Signature	Date

Specification subject to change without prior notice.

3261 Keller St.
Santa Clara, CA 95054
Tel: 408-980-9813
Fax: 408-980-8626
E-mail: infor@topmmicro.com

This specification describes the requirements of 300 Watts switching power supply with an FLEX-ATX form-factor and TFX 12V,+5V standby voltage, remote on/off, dual line input capability.

1. AC INPUT

1.1 AC input requirements

The input voltage, current, and frequency requirements for continuous operation are stated below.

Table 1 AC Input Line Requirements FLEX-0130

Parameter	Min1	Nom.	Max	Unit
Vin (Full range)	90	100-240	265	VACrms
Vin Frequency	47		63	Hz
Full Load	100%	100%	100%	Watts
Iin (Current)		6 - 3		Arms

Power factor correction (PF)>0.95 at full load.

1.2 Inrush current regulation

50 A @ 115Vrms
100 A @ 230Vrms (at 25°C ambient cold start).

2. DC OUTPUT

2.1.1 DC voltage regulation

Parameter	Range	Min	Nom.	Max	Unit
+3.3V	±5%	+3.14	+3.3	+3.47	Volts
+5V	±5%	+4.75	+5.0	+5.25	Volts
+12V1	±5%	+11.40	+12.0	+12.6	Volts
+12V2	±5%	+11.40	+12.0	+12.6	Volts
-12V	±10%	-10.8	-12.0	-13.2	Volts
+5VSb	±5%	+4.75	+5.0	+5.25	Volts

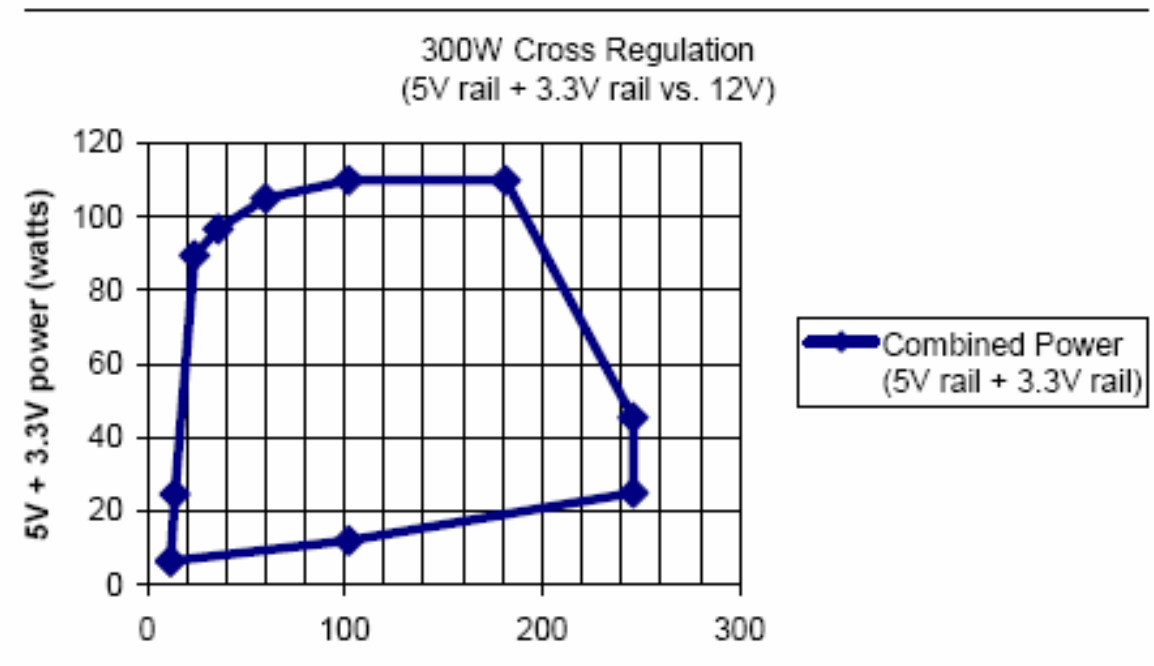
1) At +12V surge, regulation can go to ±10%.
2) At +12VDC peak loading, regulation at the +12V1DC output can go to ±10%.
3) Voltage tolerance is required at main connector and S-ATA connector (if used).
4) Minimum voltage during peak is greater than 11.0VDC.

2.2 LOAD RANGE

2.2.1 FLEX-0130

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.5	-	22		Amps
+5V	0.5	-	12		Amps
+12V1	1.0	-	6.0	7.0	Amps
+12V2	1.0	-	16	19	Amps
-12V	0.0	-	0.3		Amps
+5VSb	0.0	-	2.5		Amps

Notes:
(1) +5VSb is a SELV standby voltage that is always present when AC mains voltage is present.
(2) The maximum combined load on +5V and +3.3V outputs shall not exceed 110W.
(3) The maximum combined load on +12V1 and +12V2 outputs shall not exceed 250W.
(4) The maximum continuous average DC outputs power shall not exceed 300W.
(5) The maximum peak total DC outputs power shall not exceed 300W.
(6) When +12V&+3.3V is over 200W,+5V Min Load is 2A.
(7) peak current may last up to 17 seconds with not more than one occurrence per minute.
(8) 19Ampere peak current can last for 10ms,minimum voltage during peak is>11.0VDC.
(9) When maximum ambient 50℃ (De-rate 2.5W/℃ form 40℃ to 50℃);+12V1&+12V2 combined power cannot exceed 230W;Total output power shall not exceed 275W.



2.3 Output Ripple

2.3.1 Ripple regulation

Parameter	Ripple&Noise	Unit
+3.3V	50	mVp-p
+5V	50	mVp-p
+12V1	120	mVp-p
+12V2	120	mVp-p
-12V	120	mVp-p
+5VSb	50	mVp-p

2.3.2 Definition

The ripple voltage of the outputs shall be measured at the pins of the output connector when terminated in the load impedance specified in figure1.Ripple and noise are measured at the connectors with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor to simulate system loading. Ripple shall be measured under any condition of line voltage, output load, line frequency, operation temperature.

2.3.3 Ripple voltage test circuit

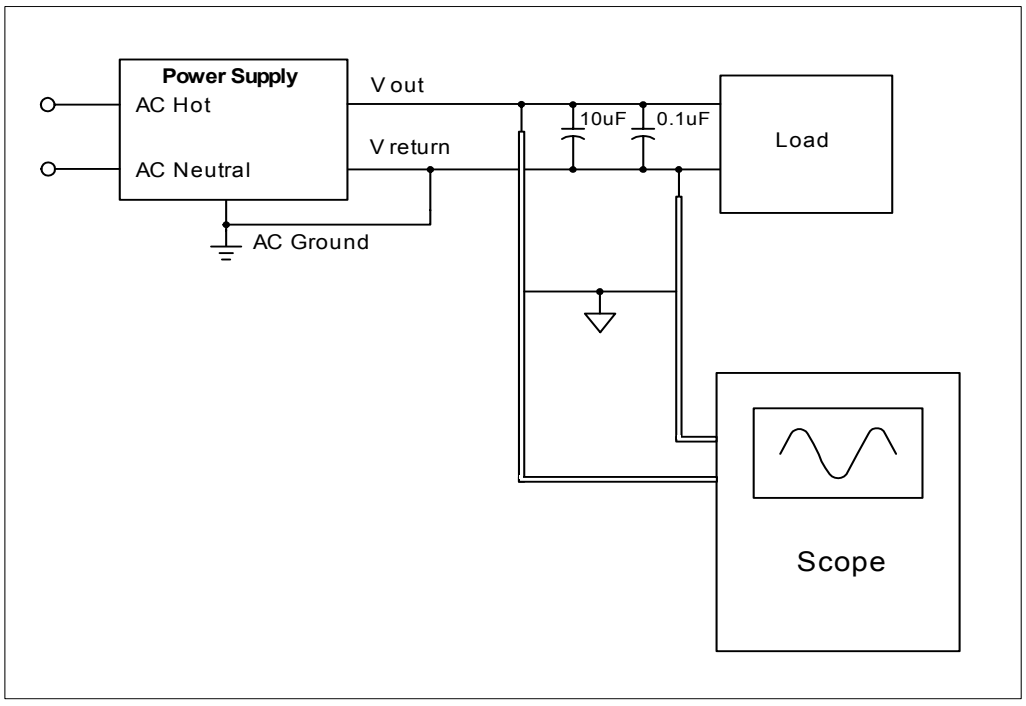


Figure 1. Ripple voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the nominal voltage value, all outputs shall be within the regulation limit of section 2.0 before issuing the power good signal of section 5.0.

2.5 Efficiency

Power supply efficiency typical 80% at normal AC main voltage and full load on all outputs.
5W "Energy Star" efficiency

Efficiency Vs Load

Loading	Full load	Typical load	Light load
Minimum Efficiency	80%	80%	80%

3. PROTECTION

3.1 Over-power protection

The power supply will be shutdown and latch off when output power over 110% ~ 160% of rated DC output.

3.2 Over voltage protection

The over voltage sense circuitry and reference shall reside in packages that are separate and distinct from the regulator control circuitry and reference. No single point fault shall be able to cause a sustained over voltage condition on any or all outputs. The supply shall provide latch-mode over voltage protection as defined in Table.

output	Minimum	Nominal	Maximum	Unit
+12 V1DC	13.4	15.0	15.6	Volts
+12V2 DC	13.4	15.0	15.6	Volts
+5 VDC	5.74	6.3	7.0	Volts
+3.3 VDC	3.76	4.2	4.3	Volts

3.3 Short circuit

An output short circuit is defined as any output impedance of less than 0.1 ohms. The power supply shall shut down and latch off for shorting the +3.3 VDC,+5 VDC,or+12 VDC rails to return or any other rail. Shorts between main output rails and +5VSB shall not cause any damage to the power supply. The power supply shall either shut down and latch off or fold back for shorting the negative rails.+5VSB must be capable of being shorted indefinitely, but when the short is removed, the power supply shall recover automatically or by cycling PS_ON#. The power supply shall be capable of withstanding a continuous short-circuit to the output without damage or overstress to the unit under the input conditions specified in section 1.1

3.4 No load operation

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

3.5 Over Current Protection

Overload currents applied to each tested output rail will cause the output to trip before reaching or exceeding 240 VA. For testing purposes, the overload currents should be ramped at a minimum rate of 10 A/s starting from full load.

3.6 Over-Temperature Protection

As an option, the power supply may include an over-temperature protection sensor, which can trip and shut down the power supply at a preset temperature point. Such an overheated condition is typically the result of internal current overloading or a cooling fan failure. If the protection circuit is non-latching, then it should have hysteretic built in to avoid intermittent tripping.

4. TIMING

4.1 Signal timing drawing

Figure 2 is a reference for signal timing for main power connector signals and rails.

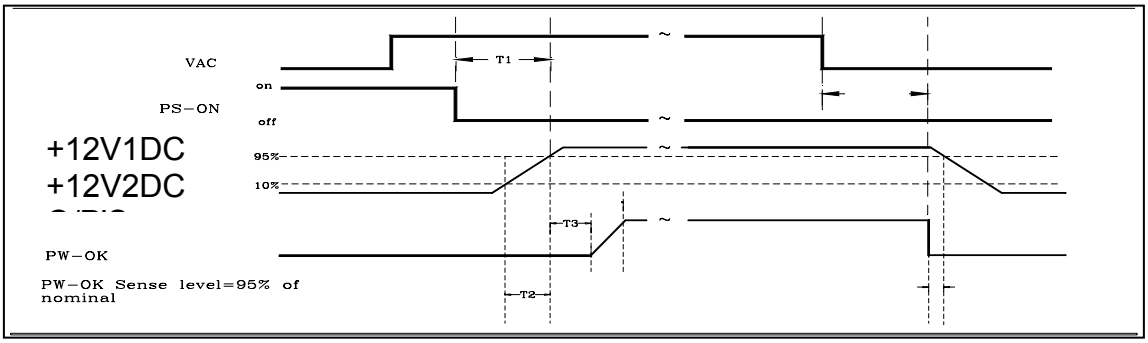


Figure 2. PS-OK Timing Sequence

(1)T2: Rise time (0.2ms~20ms)
(2)T3: Power good signal turn on delay time (100ms~500ms)
(3)T6: Power good signal turn off delay time (1ms min)
(4)T4: Rise time (10ms max)

4.2 Hold up time

After nominal AC input loss, the outputs voltages shall maintain
17ms in regulation limit at 70% load

5. ENVIRONMENT

5.1 Operation

Temperature	0℃ to 40℃
Relative Humidity	to 85%,on-condensing

5.2 Shipping and Storage

Temperature	-40 to 70°C
Relative Humidity	to 95%,non-condensing

5.3 Altitude

Operating	10,000FT max.
Storage	50,000FT max.

6. SAFETY

6.1 Underwriters Laboratory (UL) recognition.
The power supply designed to meet UL EN 60950-1:2001.

6.2 The power supply must bear the German Bauart Mark from TUV.
The power supply designed to meet TUV EN 60950-1:2001.

7.0 ELECTROMAGNETIC COMPATIBILITY (EMC)

7.1 ELECTROSTATIC DISCHARGE (ESD) - EN 61000 – 4 - 2：1998

7.2 ELECTRICAL FAST TRANSIENT / BURST (EFT/B) – EN 61000 – 4 - 4：1998

7.3 SURGE – EN 61000 – 4 - 5：1998

7.4 POWER FREQUENCY MAGNETIC FIELD – EN 61000 – 4 - 8：1998

7.5 VOLTAGE DIPS – RN 61000 – 4 - 11：1998

7.6 RADIATED SUSCEPTIBILTY – EN 61000 – 4 – 3 ：1998

7.7 CONDUCTED SUSCEPTIBILTY – EN 61000 – 4 - 6：1998

7.8 VOLTAGE FLUCTATION - EN 61000 – 3 – 3 ：1995+A1/2001

7.9 EN61000-3-2:2000 harmonic current emissions.

If applicable to sales in Japan or Europe, the power supply shall meet the requirements of EN 61000-3-2 Class D and the Guidelines for the Suppression of Harmonics in Appliances and General Use Equipment Class D for harmonic line current content at full-rated power.

7.10 EN55022 Class B Radio interference (CISPR 22).
7.11 FCC Part 15, Subpart J class B .

8. MTBF

8.1 MTBF (mean time between failures) calculation

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C, 75% of full load and 120V AC input. The MTBF of the power supply shall be calculated in accordance with MIL-HDBK-217F. The DC FAN is not included.

9. MECHANICAL REQUIREMENTS

9.1 Connectors (INTEL approved equivalent)

P1 connector (Molex 39-01-2200 or equivalent)

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Orange +3.3VDC		13	1	+3.3VDC	Orange
Orange(22AWG) +3.3VDC	+3.3v' default sense	13			
Blue	-12VDC	14	2	+3.3VDC	Orange
Black	COM	15	3	COM	Black
Green	PS-ON#	16	4	+5VDC	Red
Black	COM	17	5	COM	Black
Black	COM	18	6	+5VDC	Red
Black	COM	19	7	COM	Black
NC	Reserved	20	8	PWR_OK	Grey
Red	+5VDC	21	9	+5VSB	Purple
Red	+5VDC	20	10	+12V1DC	Yellow
Red	+5VDC	23	11	+12V1DC	Yellow
Black	COM	24	12	+3.3 VDC	Orange

P3,P4,P5(AMP 1-480424-0 or Molex 8981-04P or equivalent)

P7 (AMP 171822-4 or equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	22AWG wire
Yellow	+12V1DC	1	1	+5VDC	Red
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5VDC	4	4	+12V1DC	Yellow

P2 Optional Connector (Molex 39-01-2060 or equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Black	COM	1	3	+12V2DC	Yellow/Black Stripe
Black	COM	2	4	+12V2DC	Yellow/Black Stripe

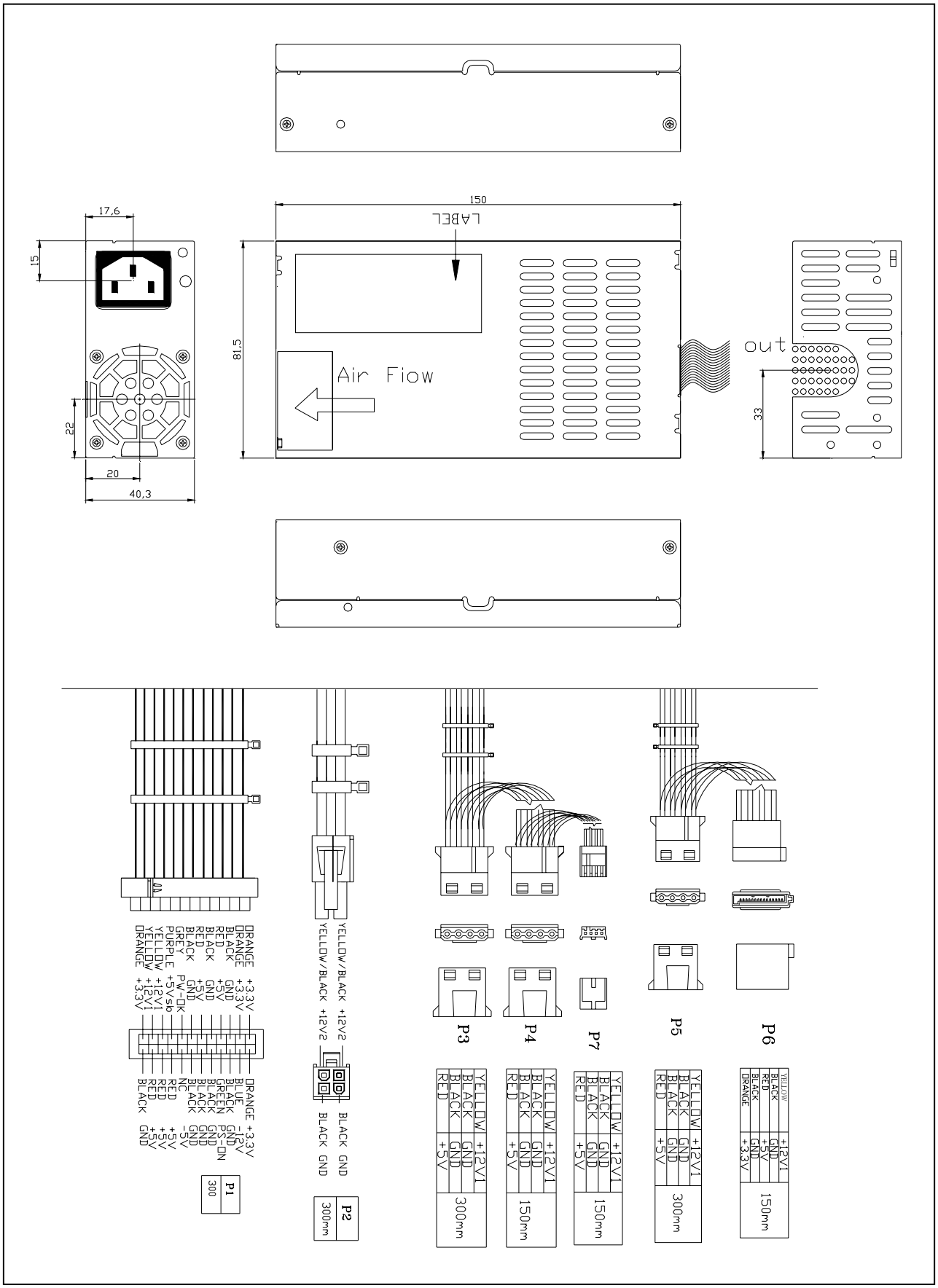
P6 (optional) SATA Power Connector (Molex* 88751 or equivalent)

18 AWG wire	Signal	Pin
Orange	+3.3V	5
Black	GND	4
Red	+5V	3
Black	GND	2
Yellow	+12V1DC	1

10. FAN SPEED CONTROL

Fan voltage varies with the ambient temperature and/or output power.

11. DRAWING


17,6
15
22
20
40,3
150
LABEL
81,5
Air Flow
out
33
P1
300
P2
300mm
P3
P4
P7
P5
P6
150mm