1. Scope

This specification defines the performances and characteristics of a ground, single phase, ***300*** watts, ***5*** output level power supply. This specification also defines worldwide safety and electromagnetic compatible requirements for the power supply witch are intended for use in personal computer product.

2. AC Input

2.1 Input Requirements

Parameter	Minimum	Nominal	Maximum	Unit
Vin	***100***	***115/230***	***240***	VAC rms
Vin Frequency	***47***	***60/50***	***63***	Hz
Iin			***5***	A rms

2.2 Inrush Current

70 Amps peak maximum for one half cycle of AC (cold start) at input range voltage specified in section 2.1 and 25 ℃ ambient.

2.3 Efficiency

The power supply efficiency should not be less than ***70%*** at the maximum load of section 3.1 with nominal AC input voltage specified in section 2.1.

2 DC Output

2.4 Output Power Distribution

Output	Load Current (A)			Maximum Combined Power (W)		
	Minimum	Maximum	Peak			
+12V1	**1.0**	**7**	**9**	**225**	**285**	**300**
+12V2	**1.0**	**13**	**--**			
+5V	**0.3**	**23**	**--**	**165**		
+3.3V	**0.5**	**20**	**--**			
-12V	**0**	**0.3**	**--**			
+5VSB	**0**	**2**	**2.5**			

Note：When +12V output Peak current shall not exceed 17 seconds in duration , and other output shall not exceed 75% load.

3.2 Output Voltage Regulation

Output	Range	Minimum	Nominal	Maximum	Unit
+12V1	±5%	**11.40**	**12.00**	**12.60**	Volts
+12V2	±5%	**11.40**	**12.00**	**12.60**	Volts
+5V	±5%	**4.75**	**5.00**	**5.25**	Volts
+3.3V	±5%	**3.14**	**3.30**	**3.46**	Volts
-12V	±10%	**-10.80**	**-12.00**	**-13.20**	Volts
+5VSB	±5%	**4.75**	**5.00**	**5.25**	Volts

Note：At DC output peak loading, regulation at the DC output can go to ±10%.

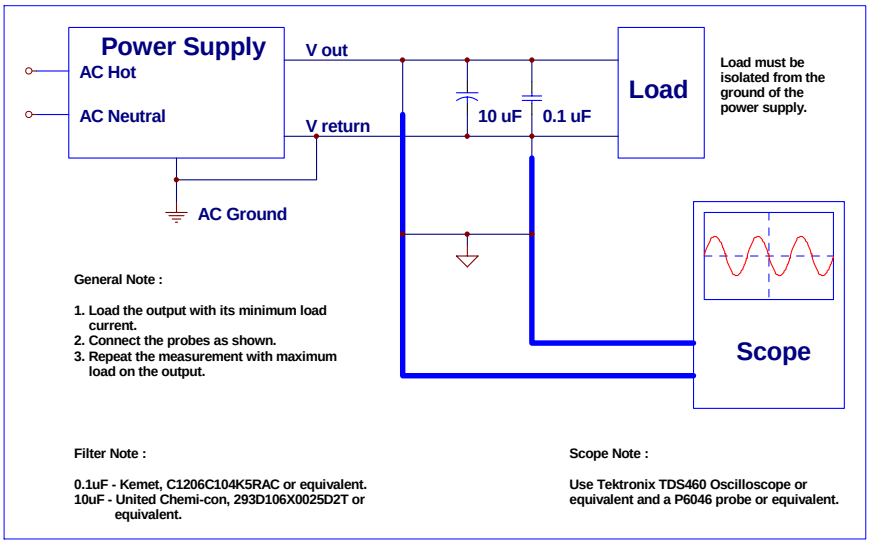
3.3 Output Ripple and Noise

3.3.1 The output ripple & noise requirements listed in below should be met throughout the load ranges specified in section 3.1 and under all input voltage conditions as specified in section 2.1

3.3.2 Ripple and noise are defined as periodic or random signals over frequency band of 10Hz to 20MHz. Measurement shall be made with an oscilloscope with 20MHz bandwidth. Output should be bypass at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

3.3.3 Specification:

Output	Maximum Ripple & Noise (mVp-p)
+12V1	**120**
+12V2	**200**
+5V	**60**
+3.3V	**60**
-12V	**120**
+5VSB	**100**



Differential Noise Test Setup

3.4 +5VSB Output

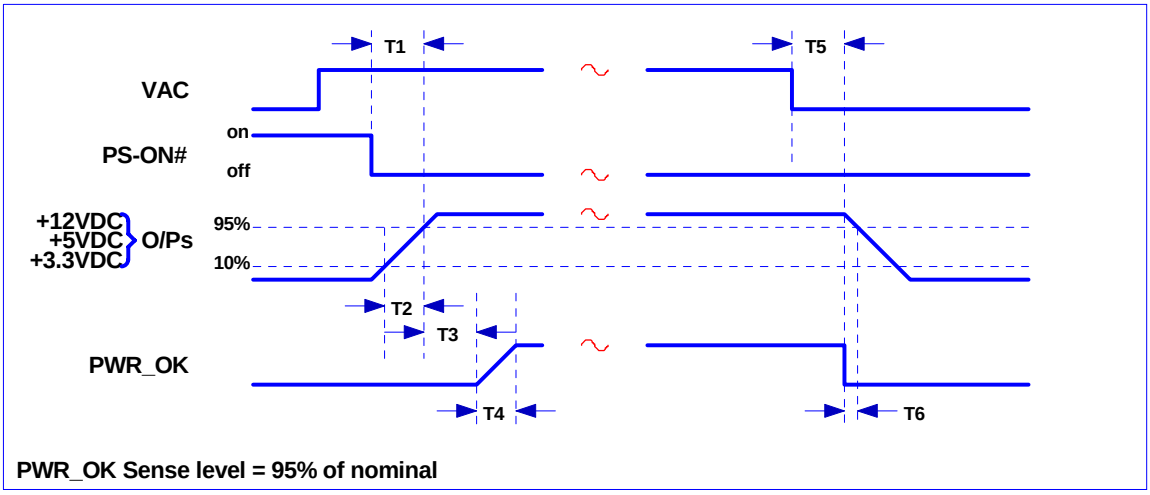
The +5VSB is a standby supply output is active whenever the AC power is present.

3.5 DC Output

This DC output +5VSB is controlled by the AC ON/OFF switch, but the other DC output is controlled by the " PS-ON# " signal and AC ON/OFF switch.

4. Timing and Signal

4.1 Signal Time Drawing



Signal Timing Drawing

4.2 Overshoot and Undershoot

Any overshoot at turn on or undershoot at turn off shall be less than ***±10%*** of the nominal output voltage values.

4.3 Power-on Time

The Power-on time is defined as the time from when PS-ON# is pulled low to when the +12VDC, +5VDC, and +3.3VDC output are within the regulation range specified in section 3.2. The power-on time shall be less than ***500ms*** ($T_1 < 500ms$).

4.4 Rise Time

The output voltage shall rise from 10% of nominal to within the regulation ranges specified in section 3.1 within ***0.2ms*** to ***20ms*** ($0.2ms \leqq T_2 \leqq 20ms$).

4.5 Power Good Signal

This is a TTL-compatible signal, At power turn on, the power good signal shall have a turn on delay of at least ***100ms*** , but no greater than ***500ms*** after +5V output has reached its minimum sense level 4.75V. At power turn off, the power good signal shall go to a down level at least ***1ms*** before +5V fall below the regulation limits described in section 3.2 (100ms≦T_3≦500ms and T_6≧1ms).

4.6 Hold Up Time

The power supply unit shall maintain the output voltage within voltage specifications at least ***17ms*** after lose of AC input Power (T_5≧17ms).

4.7 PS-ON# Signal

PS-ON# is an active-low, TTL-compatible signal. When PS-ON# is pulled to TTL low, the power supply should turn on the four main DC output rails: +12VDC, +5VDC, +3.3VDC, and –12VDC. When PS-ON# is pulled to TTL high or open-circuit, the DC output rails should not deliver current. PS-ON# has no effect on +5VSB output, which is always enable whenever the AC power is present.

Logic level：“High ” is 2.0V ~ 5.25V
“Low ” is 0.0V ~ 0.8V

5. Output Protection

5.1 Over Voltage Protection

When the +12VDC, +5Vdc, and +3.3VDC output have over voltage condition, the power supply shall provide latch mode over voltage protection as defined in following table.

Output	Minimum	Nominal	Maximum	Unit
+12V1	**13.4**	**13.8**	**15.6**	Volts
+12V2	**13.4**	**13.8**	**15.6**	Volts
+5V	**5.7**	**6.1**	**7.0**	Volts
+3.3V	**3.7**	**3.9**	**4.3**	Volts

5.2 Short Circuit Protection

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 +3.3VDC, +5VDC, or +12VDC rails to return or any other rail. Shorts between main output rails and +5Vsb shall not cause any damage to 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.
The +5Vsb will be auto-recovery when fault was removed.

5.3 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.

5.2 Over Power Protection

The power supply can use electronic circuit to limit the output power against excessing ***120%-160%*** of surge power or protected against exceesive power delivery at section 8.1 temperature environment due to short circuit of any output or over total power at any line condition

5.4 Reset After Shutdown

If the power supply latches into a shutdown state because of a fault condition on its outputs, the power supply shall return to normal operation only after the fault has been removed and PS_ON# has been cycled OFF/ON with a minimum OFF time of two seconds.

6. Safety Requirements

6.1 The power supply must comply with the following international standards:

-United Stated Standard:
-UL： UL60950, Third Edition (2000).
-Canadian Standard:
-CSA： CSA22.2 No.60950-00
-European Standards:
-TUV： EN60950:2000.

6.2 Dielectric Withstand

Primary to secondary: 3000VAC for 1 minute.
Primary to frame ground: 1800VAC for 1 minute.

6.3 Insulation Resistance

Primary to secondary: ***20 MΩ*** minimum, 500VDC
Primary to frame ground: ***20 MΩ*** minimum, 500VDC

6.4 Ground Leakage Current

The power supply ground leakage current shall be less than ***3.5mA*** .

6.5 Grounding Resistance

The resistance of connection between the earthing terminal or earthing contact and parts required to be earthed, shall be less than ***100mΩ*** .

The test current shall be 1.5 times the current capacity of any hazardous voltage circuit at the point where failure of basic insulation would make the earthed part live. The test voltage shall not exceed 12V and the test current may be either AC or DC but no more than 25A (CSA for 30A).