

1. INTRODUCTION

The "SPC-201" is a Power Supply designed to be used "MICRO-ATX" form factor personal computers.

1.1 SCOPE

The scope of this document is limited to the requirements of "MICRO-ATX" PC form factor switching Power Supply. Especially, It is applied to the line input capability, remote ON/OFF, cooling, standby voltage("VSB") and electrical characteristics.

Form-factor		MICRO-ATX		
POWER		207.4 Watt max peak 180.4 Watt max Continuous		
Efficiency		≥68% at Full load		
Output voltage	Regulation	Min load(Amps)	Max load(Amps)	Peak current(Amps)
+12VDC	±5%	1.0A	5.0A	6.0A
+5VDC	±5%	2.0A	15.0A	18.0A
+3.3VDC	±5%	1.0A	10.0A	
-12VDC	±10%	0.0A	0.2A	
+5VSB	±5%	0.0A	2.0A	

2. ELECTRICAL SPECIFICATION

2.1 AC INPUT LINE REQUIREMENTS

Parameter	MIN	NOM	MAX	UNIT
VIN(115VAC)	90	110	132	VAC rms
VIN(230VAC)	180	220	264	VAC rms
VIN frequency	47		63	Hz
VIN(115VAC)			4.0	A rms
VIN(230VAC)			2.0	A rms

* The load is half load at cold start from 90VAC(60Hz).

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2.1.1 INRUSH CURRENT

VIN(110VAC) ~ 4.0A, VIN(220VAC) ~ 2.0A

2.2 DC OUTPUT REQUIREMENTS

2.2.1 OUTPUT REQUIREMENTS

TEST POINT : OUTPUT CONNECTOR LOAD TERMINALS.

Parameter	Range	MIN	NOM	MAX	UNIT
+12VDC	±5%	+11.40	+12.00	+12.60	Volts
+5VDC	±5%	+4.75	+5.00	+5.25	Volts
+3.3VDC	±5%	+3.14	+3.30	+3.47	Volts
-12VDC	±10%	-10.80	-12.00	-13.20	Volts
+5VSB	±5%	+4.75	+5.00	+5.25	Volts

* The load regulation of +3.3V and +5V operate MIN or MAX at the same time.

* All outputs regulation do not apply at no load (+3.3V)

2.2.2 DC output CURRENT

- 1) Maximum continuous total DC output power shall not exceed 180.4Watts.
- 2) Maximum +5V and +3.3V output power shall not exceed 110Watts.
- 3) Maximum Peak Total DC output power shall not exceed 207.4Watts.
- 4) It shall not exceed 12 seconds in duration at peak +12VDC out put power, 72Watts.
- 5) Output voltage of +5VSB shall be maintained within the power shut down.

Range	Parameter	MIN	NOM	MAX	PEAK	UNIT
Range 1 (Normal Load)	+12VDC	1.0	-	2.0	-	Amps
	+5VDC	2.0	-	6.0	-	"
	+3.3VDC	2.0	-	6.0	-	"
	-12VDC	0.0	-	0.2	-	"
	+5VSB	0.0	-	0.72	-	"
Range 2 (High Load)	+12VDC	1.0	-	2.0	3.0	Amps
	+5VDC	2.0	-	6.0	8.0	"
	+3.3VDC	2.0	-	6.0	-	"
	-12VDC	0.0	-	0.2	-	"
	+5VSB	0.0	-	0.72	-	"

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2.2.3 EFFICIENCY

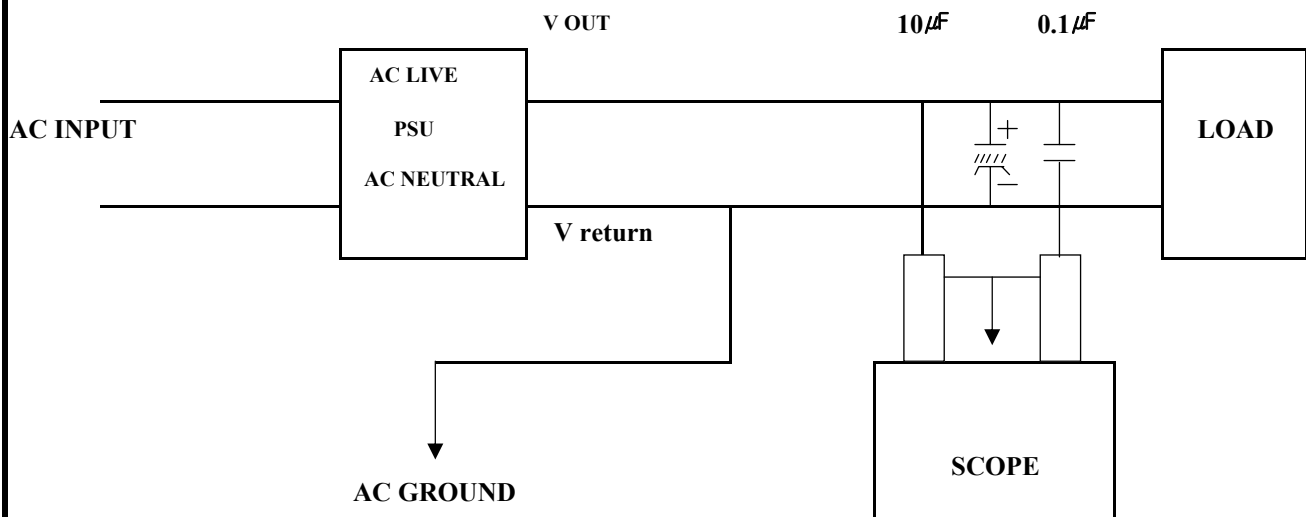
1) The power supply at full load provide DC conversion efficiency 68% minimum.

(EX = +5V:15.0A +3.3V:10.0A +12V:5.0A -12V:0.2A +5VSB:2.0A)

2.2.4 OUTPUT RIPPLE/NOISE

. The measurements should be made by crossing a $10\mu F$ electrolytic capacitor and a $0.1\mu F$ Ceramic capacitors at each output with measuring band width from DC to 20MHz.

Parameter	Range	MIN	NOR	MAX	UNIT
+12VDC	$\pm 1.0\%$	-		120	mVp-p
+5VDC	$\pm 1.0\%$	-		50	"
+3.35VDC	$\pm 1.5\%$	-		50	"
-12VDC	$\pm 1.0\%$	-		120	"
+5VSB	$\pm 1.0\%$	-		50	"



2.2.5 OUTPUT TRANSIENT RESPONSE & OVERSHOOT AT TURN ON/OFF

. Load Slew Rate : $0.2A/\mu s$

Parameter	+12V	+5VDC	+3.3VDC	-12VDC	+5VSB
MAX step	1.5A	3.0A	1.8A	0.1A	-
Voltage range	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 10\%$	-
Shoot range	$\pm 5\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	-

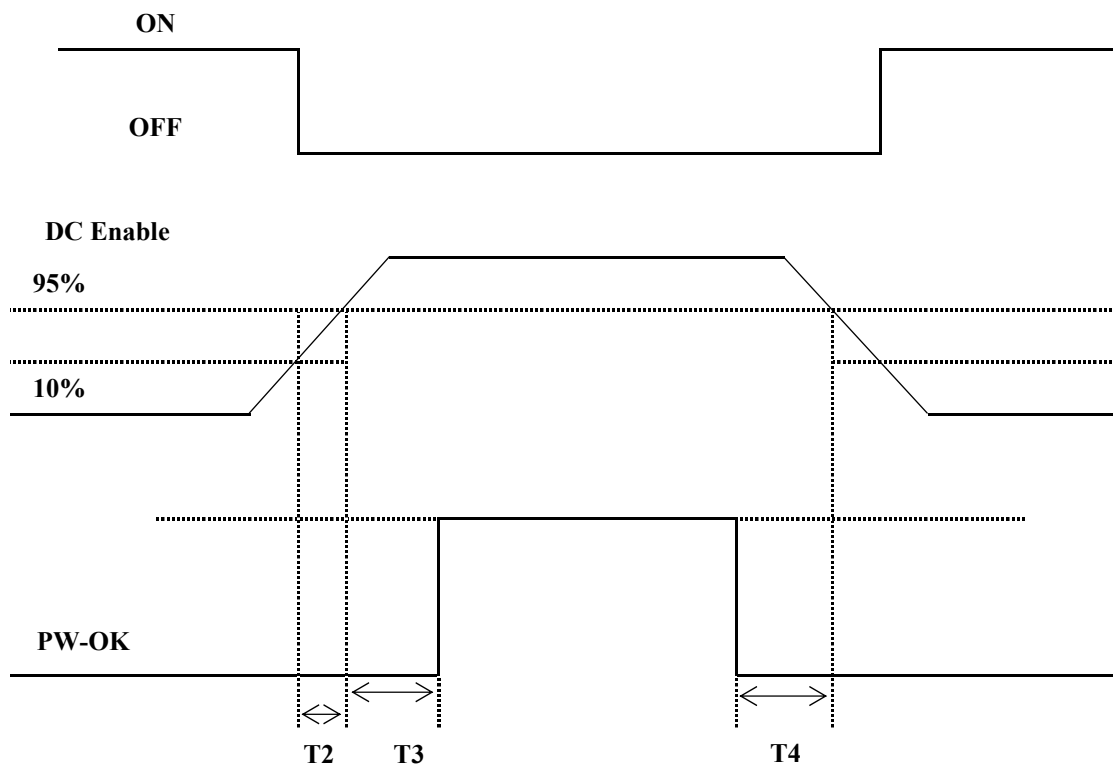
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2.3 TIMING / HOUSE KEEPING



* PW-OK sense level : 95% of nominal

2.3.1 REMOTE ON/OFF CONTROL

The power supply DC outputs (with the exception of +5VSB) shall be enabled with an active-low, TTL-compatible signal("PS-ON"). The +5VSB is on whenever the AC power is present.

- . When PS-ON is pulled to TTL low, the DC outputs are to be enabled.
- . When PS-ON is pulled to TTL high or open circuited, the DC outputs are to be disabled. Turn ON/OFF delay $\geq 1000\text{ms}$

2.3.2 POWER UP DELAY

The output voltages shall rise from $<10\%$ of nominal to within the regulation ranges specified in sec 2.2.1 within 0.1 to 30ms.

$$2\text{ms} \leq T2 \leq 30\text{ms}.$$

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2.3.3 POWER GOOD SIGNAL, POK

- . Signal Type : Open Collector +5VDC, TTL compatible.
- . Logic level Low : <0.4V 4mA
- . Logic level High :Between 2.4VDC and 5VDC output while sourcing current, 200 μ A
- . POK Delay : 100ms<T3<500ms
- . Power Down Warning : T4>1ms

2.3.4 VOLTAGE HOLE-UP TIME

The power supply shall maintain output regulation per section 2.2.1 despite a loss of input power at the low-end nominal range at maximum continuous output load as specified in section 1.1 for a minimum 16ms.

2.4 OUTPUT PROTECTION

2.4.1. OVER VOLTAGE PROTECTION

Parameter	Min	Nom	Max	Unit
+5VDC	5.6	6.3	7.0	V
+3.3VDC	3.76	4.2	4.8	V

*Change latch mode at above voltage in power supply unit.

2.4.2. SHORT CIRCUIT PROTECTION

- . Shutdown or latch at short +3.3, +5V and +12V.
- . No damage in compenents, PCB trace connector at continous shout.
- . The maximum short circuit current shall not exceed 240VA.

2.4.3. OVER POWER PROTECTION

- . +5V : 20A ~ 40A Test Condition : Output Full Load
- . +3.3V : 16A ~ 44A
- . +12V : 6A ~ 16A

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2.4.4 AC INPUT PROTECTION

- . Use proper fuse for AC input over current protection.
- . For export : Use UL or VDE approval Fuse(50T)

2.4.5. BURN-IN

Primary lot is output full load at 45 °C 24HR

2.4.6. MEAN TIME BETWEEN FAILURES

- . Operating Time
- . 25°C 30,000HR

2.4.7. This power supply shall comply with the followings.

- . UL1950(File No : E145461)
- . CSA C22.2 NO220 & CSA Bulletin 1402c, Level3
- . VDE 0806, EN60950 A3
- . IEC950

2.4.8. EMI

- . FCC Part 15 Sub Part J, Class B
- . VDE 0871/6.78 Class B

2.4.9. POWER SWITCH On/Off TEST

Control Signal	Output Status
Logic " Low"	On
Logic " High"	Off

2.4.10. INSULATION VOLTAGE WITHSTAND

- . Primary to Secondary : 500VDC 100MΩ
- . Primary to FG : 500VDC 100MΩ

2.4.11. LEAKAGE CURRENT

- . The Maximum Leakage Current Following The Frame / AC Sine Conductor
Shall be 1.0mA Maximum at 220VAC Input

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2.4.12. DIELECTRIC STRENGTH

- . Between Input and Output : 1500VAC 10mA 1min or 1800VAC 10mA 3sec
- . Between Input and FG : 1500VAC 10mA 1min or 1800VAC 10mA 3sec
- Production 1800V 10mA 1sec

2.4.13. TEMPRATURE RANGE

- . Operating : 0 °C ~ 40 °C
- . Storage : -20 °C ~ 85 °C

2.4.14. HUMIDITY RANGE

- . Operating : 20% ~ 80%
- . Storage : 10% ~ 95%

2.4.15. VIBRATION TEST

- . Non Operation : Sweep Test
- . Frequency : 5 ⇒ 20 ⇒ 500 ⇒ 5Hz
- . Acceleration :0.02G
- . Airection : X, Y, Z
- . Period : 6 Minutes
- . Cycie : 10

2.4.16. ACOUSTIC NOISE

- . The power Supply Must not generate Acoustic Noise in excess of 30dB at a Distance of 1 Meter from any Point on The requirments Surface.

2.4.17. AC LINE NOISE

- . The Power Supply Shall Operate Normally When AC Line Noise is Applied
- . Noise Crest Value : 1000VAC
- . Polarity : +, -
- . Pulse Width : 1/μs
- . Phase : 0 - 360°
- . Mode : Common, Normal
- . Time : 3Minutes

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2.5. DC CONNECTOR REQUIREMENTS

2.5.1 BASE BOARD CONNECTOR

PS1 Connector : MOLEX 39-01-2200 or equivalent

Wire Color	Signal	Pin	Pin	Signal	Wire Color
Orange	+3.3VDC	11	1	+3.3VDC	Orange
Blue	-12VDC	12	2	+3.3VDC	Orange
Black	COM	13	3	COM	Black
Green	PS-ON	14	4	+5VDC	Red
Black	COM	15	5	COM	Black
Black	COM	16	6	+5VDC	Red
Black	COM	17	7	COM	Black
--	NC	18	8	POK	Gray
Red	+5VDC	19	9	+5VSB	Violet
Red	+5VDC	20	10	+12VDC	Yellow

. PS-2 Connector : AMP 39-01-2040 or chd1140-20 GEO YOUNG

Pin	Signal	Wire Color
1	+12VDC	Yellow
2	+12VDC	Yellow
3	COM	Black
4	COM	Black

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2.5.2. PERIPHERAL CONNECTORS

. PA, PB, PC, PD

. Connector : AMP 1-480424-0 or Molex 8981-04P or equivalent.

. Contacts : AMP 61314-1 terminals or equivalent.

Pin	Signal	Wire Color
1	+12VDC	Yellow
2	COM	Black
3	COM	Black
4	+5VDC	Red

. PE

. Connector : AMP 171822-4 or equivalent.

Pin	Signal	Wire Color
1	+5VDC	Red
2	COM	Black
3	COM	Black
4	+12VDC	Yellow

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3. MECHANICAL

3.1. PHYSICAL DIMENSION

Dimension : L * W * H

125mm * 100mm * 63.5mm

INFORMATION TO THE USER

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one more of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help.

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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