



PA SERIES

FEATURES

- Design comply with IEC 60601-1 and IEC 60950-1
- BF Class insulation
- High efficiency meet 80PLUS GOLD.
- Design meet INTEL 「Haswell」 platform requirement
- High altitude 5000 meters operation

SAFETY STANDARD APPROVAL



DESCRIPTION

This series of AC/DC switching power supplies in a standard 1U ATX form factor 220 x 100 x 40.5 mm are capable of delivering 400 or 500 watts continuous power. PSU build in DC/DC converter at +3.3V and +5V output rails to enhance load regulation. High efficiency design comply with 80PLUS GOLD efficiency.

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	
FSP400M-80PA:	5 A (rms) @115Vac, 60Hz 2.5 A (rms) @ 230Vac, 50Hz
FSP500M-80PA:	6 A (rms) @115Vac, 60Hz 3 A (rms) @ 230Vac, 50Hz
Earth leakage current:	300 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	See rating chart
Protection	
OVP:	+3.3V, +5V & +12V, Latch off
OCP, Shorted:	+3.3V, +5V & +12V, -12V, -5V, Latch off +5Vsb, Auto-recovery
OTP	Latch off

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0°C to +50°C
Storage temperature:	-20°C to +80°C
Relative humidity:	10% to 95% non-condensing
Derating:	Derate from 100% at +50°C linearly to 50% at +70°C

GENERAL SPECIFICATIONS

Power factor:	0.9 minimum
Efficiency:	Meet 80PLUS GOLD (87%, 90%, 87%)
Hold-up time:	12 mS minimum at 115VAC 17 mS minimum at 230 VAC
Line regulation:	$\pm$ 1% maximum at full load
Inrush current:	50 A @115 VAC at 25°C cold start 100 A @ 230 VAC at 25°C cold start
Withstand voltage:	4000 VAC from input to output (2 MOPP) 1500 VAC from input to ground (1 MOPP) 1500 VAC from output to ground
MTBF:	100,000 hours at full load & 25°C ambient, calculated per MIL-HDBK- 217
EMC Performance (IEC60601-1-2)	
EN55011:/ EN55022	Class B conducted, Class B radiated
FCC / VCCI:	Class B conducted, Class B radiated
EN61000-3-2:	Harmonic distortion, Class D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, $\pm$ 8 KV air and $\pm$ 6 KV contact
EN61000-4-3:	Radiated immunity, 10 V/m
EN61000-4-4:	Fast transient/burst, $\pm$ 2 KV
EN61000-4-5:	Surge, $\pm$ 1 KV diff., $\pm$ 2 KV com.
EN61000-4-6:	Conducted immunity, 10 Vrms
EN61000-4-8:	Magnetic field immunity, 30 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 60% reduction for 100 ms >95% reduction for 10 ms

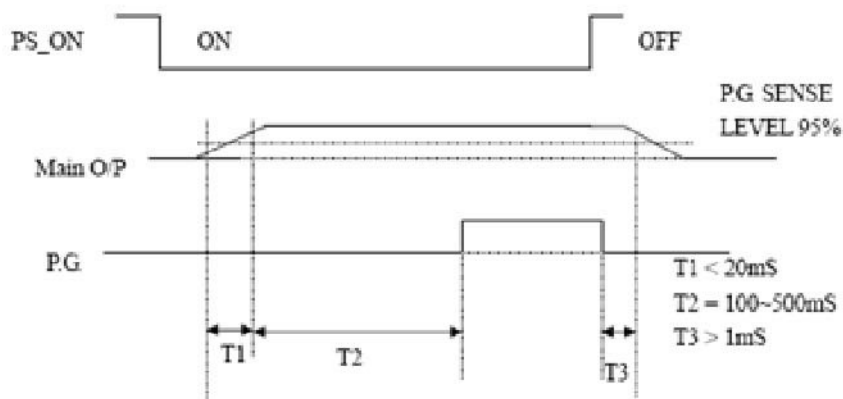
OUTPUT VOLTAGE/CURRENT RATING CHART

Rating Outputs	FSP400M-80PA		FSP500M-80PA		Load Regulation	Ripple & Noise
	Mini. Load	Maxi. Load	Mini. Load	Maxi. Load		
+3.3 V	0 A	18 A	0 A	20 A	±5%	50 mV P-P
+ 5 V	0 A	18 A	0 A	20 A	±5%	50 mV P-P
+12 V1	0 A	16 A	0 A	16 A	±5%	120 mV P-P
+12 V2	0 A	16 A	0 A	16 A	±5%	120 mV P-P
+12 V3	0.1 A	16 A	0.1 A	16 A	±5%	120 mV P-P
-5 V ¹	0 A	0.2 A	0 A	0.2 A	±10%	100 mV P-P
-12 V	0 A	0.5 A	0 A	0.5 A	±10%	120 mV P-P
+5 Vsb	0 A	3.0 A	0 A	3.0 A	±5%	50 mV P-P
+3.3 V & +5 V Combine Output Power	100W Maxi.		120W Maxi.			
+12V Total Output Power	32A Maxi.		41A Maxi.			
Total Output Power	400W		500W			

NOTES:

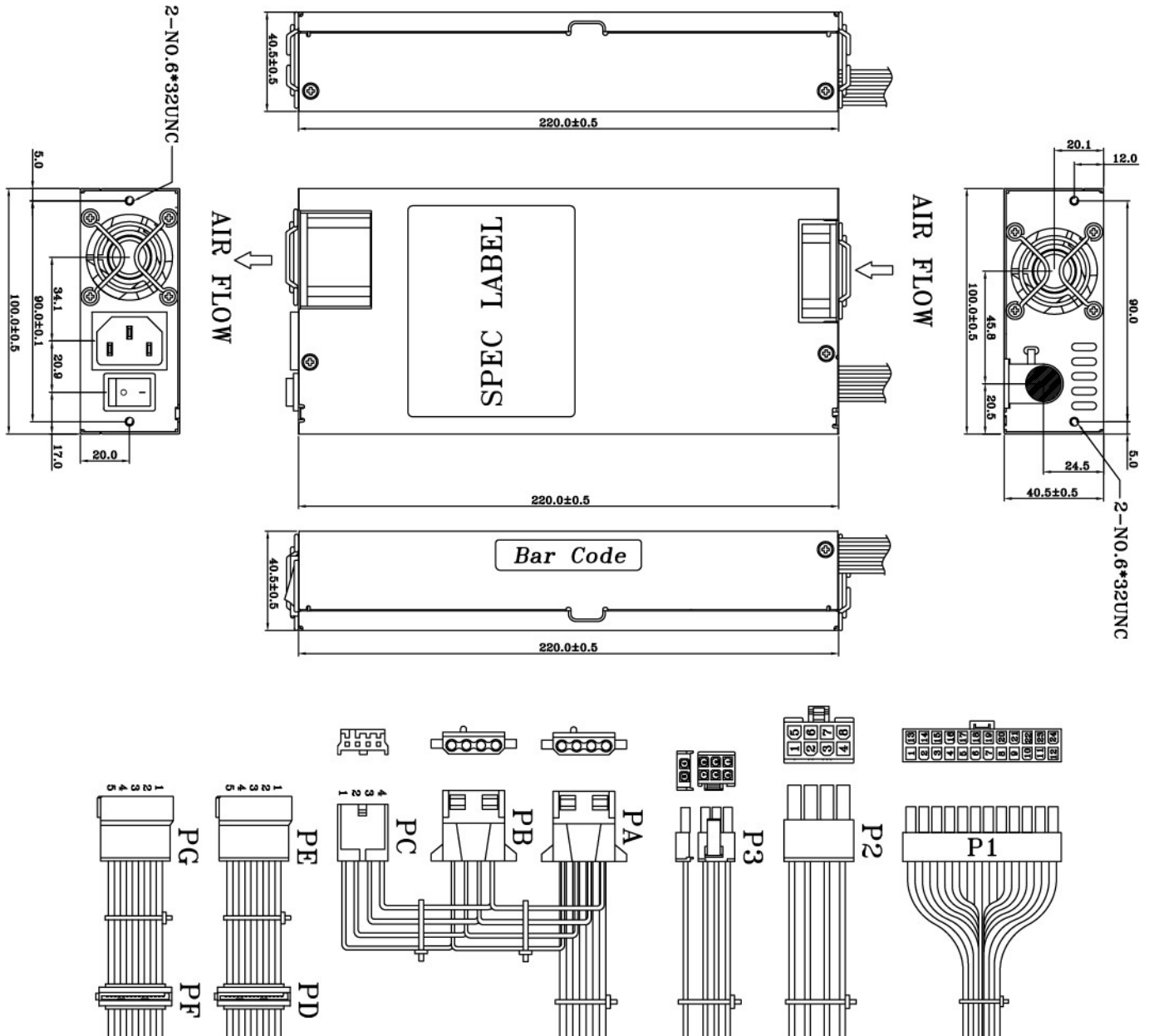
- Optional -5V output is upon request but not for standard model.
- Ripple and noise measurements shall be made under all specified load conditions through a single pole low pass filter with 20MHz cutoff frequency. Outputs shall be bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.
- +12V1, +12V2 & +12V3 should be able to supply peak current 18Amp for at least 10ms.

INTERFACE SIGNALS



- T1 : RISE TIME < 20 mS
- T2 : POWER GOOD DELAY TIME 100 ~ 500 mS
- T3 : POWER FAIL DELAY TIME > 1 mS

MECHANICAL SPECIFICATIONS



No.	Output connectors	Cable Length	Connector No.	Output connectors (equivalent)
P1	Mother board 24 pin	500 mm	1	MOLEX 39-01-2240
P2	CPU 8 pin	500 mm	2	MOLEX 39-01-2080
P3	PCI-e 6+2 pin	500 mm	1	WST P8-I42002K21B-B
PD,PE,PF,PG	SATA	500+150 mm	2 + 2	MOLEX SD-67926-0011 + SD-67582-0011
PA, PB, PC	PATA + Floppy con.	500+150+150 mm	1 + 1 + 1	AMP 1-480424-0 + AMP 171822-4

Weight: 1.57 Kg