

Anex

FSP Technology Inc. Hydro PTM Pro 1200W ATX 3.0

Lab ID#: FS12002166
 Receipt Date: Mar 29, 2023
 Test Date: Apr 6, 2023

Report: 23PS2166A
 Report Date: Apr 7, 2023

DUT INFORMATION	
Brand	FSP Technology Inc.
Manufacturer (OEM)	FSP
Series	Hydro PTM Pro
Model Number	PPA12A1013
Serial Number	S2521000354
DUT Notes	

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	110-240
Rated Current (Arms)	14-9
Rated Frequency (Hz)	50-60
Rated Power (W)	1200
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (MGA13512XF-A25)
Semi-Passive Operation	✓ (selectable)
Cable Design	Fully Modular

TEST EQUIPMENT	
Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P
Power Analyzers	RS HMC8015, N4L PPA1530, N4L PPA5530
Oscilloscopes	Picoscope 4444, Rigol DS7014, Siglent SDS2104X PLUS
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Temperature Logger	Picoscope TC-08
Tachometer	UNI-T UT372
Multimeters	Keysight 34465A, Keithley 2015 - THD
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Isolation Transformer	4kVA

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX v3.0 PSU Power Excursion	✓

115V

Average Efficiency	89.771%
Efficiency With 10W (≤500W) or 2% (>500W)	65.302
Average Efficiency 5VSB	82.198%
Standby Power Consumption (W)	0.0812000
Average PF	0.993
Avg Noise Output	25.46 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A-

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	100	3	0.3
	Watts	120		1200	15	3.6
Total Max. Power (W)		1200				

HOLD-UP TIME & POWER OK SIGNAL (230V)

Hold-Up Time (ms)	19.7
AC Loss to PWR_OK Hold Up Time (ms)	17.7
PWR_OK Inactive to DC Loss Delay (ms)	2

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	16-22AWG	No
4+4 pin EPS12V (700mm)	1	1	16AWG	No
8 pin EPS12V (700mm) / 4+4 pin EPS12V (+150mm)	1	2	18AWG	No
6+2 pin PCIe (650mm+150mm)	3	6	18AWG	No
12+4 pin PCIe (700mm) (600W)	1	1	16-28AWG	No
SATA (500mm+155mm+155mm+155mm)	2	8	18AWG	No
SATA (500mm+155mm) / 4-pin Molex (+155mm+100mm)	1	2 / 2	18AWG	No
SATA (500mm+155mm) / 4-pin Molex (+155mm) / FDD (+155mm)	1	2 / 1 / 1	18-22AWG	No
AC Power Cord (1340mm) - C13 coupler	1	1	18AWG	-

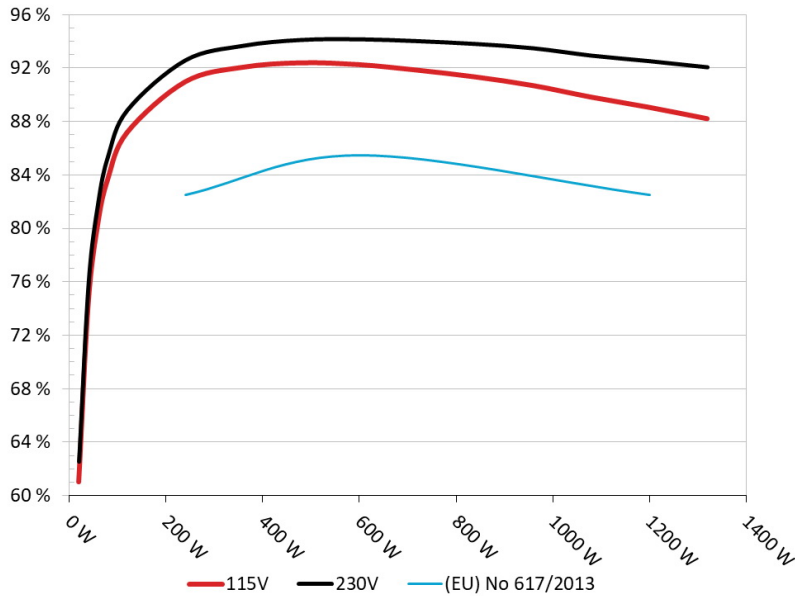
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: FSP Hydro PTM Pro 1200W
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

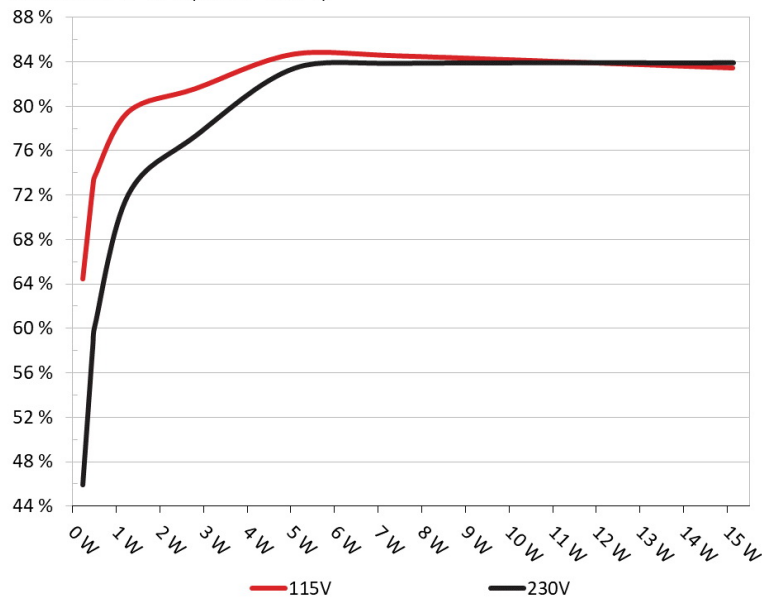


INFO

The PSU's efficiency under high ambient temperatures with 115V and 230V input. For this graph the results of the 10-110% load regulation table are used

5VSB EFFICIENCY

5VSB Efficiency: FSP Hydro PTM Pro 1200W
Ambient: 34°C - 36°C (93.2°F - 96.8°F)



INFO

This graph depicts the efficiency levels of the 5VSB rail with 115V and 230V input

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5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	63.959%	0.028
	5.104V	0.36W		114.87V
2	0.09A	0.459W	72.243%	0.049
	5.103V	0.636W		114.86V
3	0.55A	2.8W	81.038%	0.224
	5.092V	3.455W		114.86V
4	1A	5.085W	84.167%	0.322
	5.086V	6.042W		114.87V
5	1.5A	7.617W	83.971%	0.379
	5.078V	9.071W		114.87V
6	3A	15.121W	82.91%	0.468
	5.041V	18.238W		114.87V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	45.423%	0.011
	5.104V	0.508W		229.95V
2	0.09A	0.459W	57.949%	0.017
	5.104V	0.794W		229.95V
3	0.55A	2.8W	76.794%	0.076
	5.093V	3.648W		229.95V
4	1A	5.086W	82.933%	0.124
	5.086V	6.133W		229.95V
5	1.5A	7.62W	83.365%	0.174
	5.08V	9.141W		229.95V
6	3A	15.141W	83.412%	0.284
	5.047V	18.151W		229.95V

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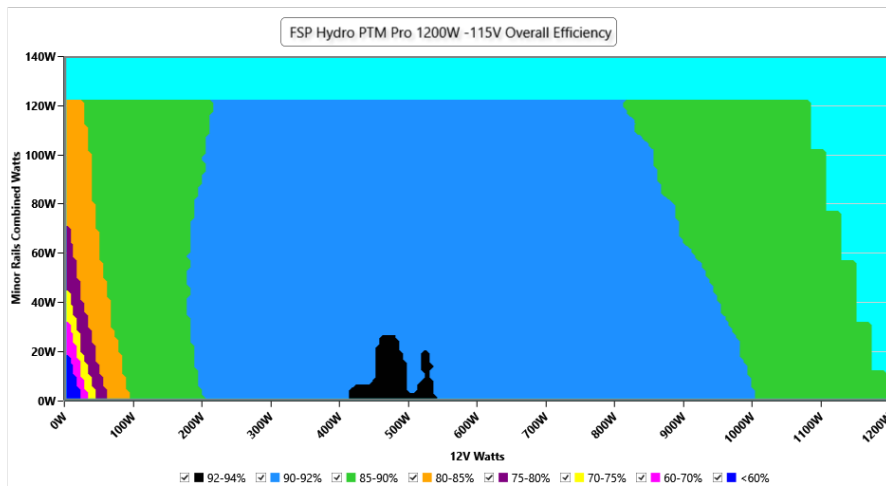
115V

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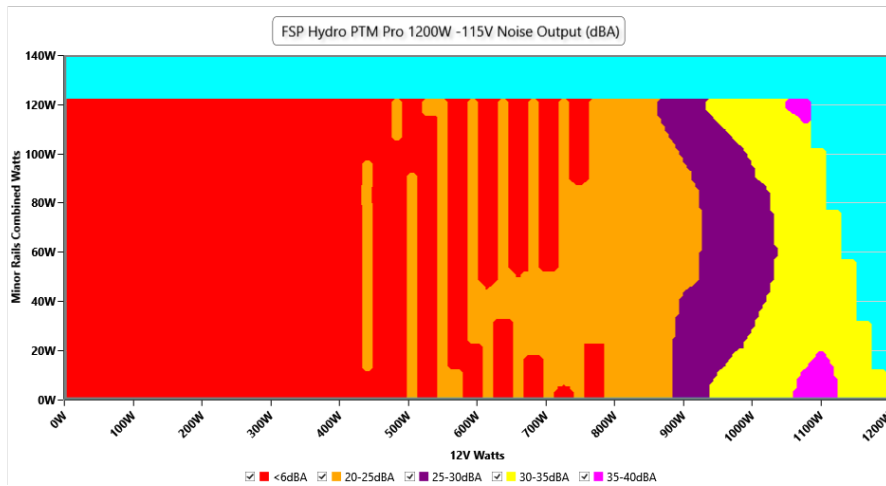
EFFICIENCY GRAPH 115V



INFO

This graph depicts the PSU's efficiency throughout its entire operational range. For the generation of the efficiency and noise graphs we set our loaders to auto mode through our custom-made software before trying thousands of possible load combinations

NOISE GRAPH 115V



INFO

The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.87 V	114.82 V	113.85 V	114.92 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.418	1.416	1.340	1.421	1.490	PASS
Mains Voltage THD:	0.15 %	0.09 %	N/A	0.25 %	2.00 %	PASS
Real Power:	0.081 W	0.062 W	N/A	0.104 W	N/A	N/A
Apparent Power:	13.627 W	13.604 W	N/A	13.658 W	N/A	N/A
Power Factor:	0.006	N/A	N/A	N/A	N/A	N/A

INFO

This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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10-110% LOAD TESTS 115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	8.083A	1.976A	1.976A	0.985A	119.964	86.666%	0	<6.0	44.72°C	0.98
	12.169V	5.061V	3.34V	5.075V	138.422				40.43°C	114.83V
20%	17.186A	2.965A	2.967A	1.184A	239.908	90.454%	0	<6.0	45.51°C	0.994
	12.162V	5.058V	3.336V	5.069V	265.226				40.64°C	114.79V
30%	26.573A	3.461A	3.466A	1.384A	359.107	91.547%	0	<6.0	46.45°C	0.995
	12.157V	5.057V	3.332V	5.057V	392.271				41.31°C	114.75V
40%	36.075A	3.957A	3.965A	1.586A	479.491	91.877%	0	<6.0	47.41°C	0.996
	12.149V	5.055V	3.329V	5.045V	521.884				41.86°C	114.71V
50%	45.199A	4.949A	4.963A	1.788A	599.254	91.744%	0	<6.0	48.38°C	0.996
	12.141V	5.052V	3.325V	5.033V	653.179				42.36°C	114.66V
60%	54.415A	5.943A	5.965A	1.992A	719.79	91.333%	793	23.1	42.77°C	0.996
	12.128V	5.048V	3.32V	5.02V	788.087		49.39°C	114.62V		
70%	63.593A	6.94A	6.97A	2.196A	839.525	90.826%	940	28.7	43.22°C	0.996
	12.115V	5.044V	3.314V	5.008V	924.327		50.28°C	114.57V		
80%	72.838A	7.937A	7.976A	2.301A	959.511	90.179%	1295	38.1	43.9°C	0.995
	12.104V	5.04V	3.309V	4.998V	1064.001		52.01°C	114.53V		
90%	82.370A	8.438A	8.472A	2.407A	1079.305	89.319%	1555	42.8	44.46°C	0.996
	12.102V	5.037V	3.305V	4.985V	1208.372		53.52°C	114.47V		
100%	91.775A	8.94A	9A	3.026A	1199.334	88.556%	1884	48.5	45.13°C	0.995
	12.091V	5.033V	3.3V	4.957V	1354.336		55.22°C	114.42V		
110%	101.133A	9.942A	10.107A	3.032A	1319.95	87.703%	2145	51.0	46.55°C	0.995
	12.079V	5.029V	3.294V	4.947V	1505.012		57.47°C	114.37V		
CL1	0.114A	14.316A	14.317A	0A	121.297	83.34%	786	22.7	40.96°C	0.983
	12.170V	5.043V	3.331V	5.087V	145.547		46.48°C	114.82V		
CL2	0.114A	19.843A	0A	0A	101.374	81.728%	780	22.4	40.53°C	0.974
	12.175V	5.039V	3.346V	5.094V	124.039		47.57°C	114.83V		
CL3	0.113A	0A	19.793A	0A	67.379	76.468%	0	<6.0	49.2°C	0.958
	12.173V	5.073V	3.334V	5.09V	88.113		40.19°C	114.84V		
CL4	99.182A	0A	0A	0.001A	1199.895	89.097%	1655	45.1	45.4°C	0.995
	12.097V	5.055V	3.313V	5.041V	1346.74		56.38°C	114.44V		

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20-80W LOAD TESTS 115V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20W	1.220A	0.494A	0.494A	0.196A	19.989	60.546%	0	<6.0	39.69°C	0.837
	12.170V	5.061V	3.342V	5.095V	33.015				36.58°C	114.86V
40W	2.685A	0.691A	0.691A	0.294A	39.989	74.034%	0	<6.0	40.99°C	0.919
	12.171V	5.062V	3.342V	5.092V	54.016				37.67°C	114.86V
60W	4.150A	0.889A	0.888A	0.393A	59.988	79.968%	0	<6.0	42.44°C	0.949
	12.171V	5.063V	3.342V	5.09V	75.013				38.67°C	114.85V
80W	5.611A	1.086A	1.086A	0.491A	79.917	83.162%	0	<6.0	43.47°C	0.962
	12.169V	5.061V	3.341V	5.087V	96.096				39.49°C	114.85V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.89mV	10.72mV	10.24mV	19.46mV	Pass
20% Load	11.36mV	12.26mV	10.86mV	27.20mV	Pass
30% Load	12.03mV	12.26mV	10.91mV	21.83mV	Pass
40% Load	13.11mV	11.95mV	11.27mV	22.86mV	Pass
50% Load	15.02mV	12.67mV	11.38mV	26.07mV	Pass
60% Load	15.79mV	13.76mV	12.46mV	25.34mV	Pass
70% Load	15.59mV	12.98mV	12.56mV	28.44mV	Pass
80% Load	17.84mV	12.78mV	13.70mV	29.22mV	Pass
90% Load	15.79mV	13.96mV	13.81mV	33.55mV	Pass
100% Load	25.92mV	14.71mV	15.90mV	38.09mV	Pass
110% Load	26.95mV	15.62mV	17.81mV	39.12mV	Pass
Crossload1	12.36mV	14.93mV	12.92mV	16.75mV	Pass
Crossload2	8.81mV	15.81mV	10.86mV	16.57mV	Pass
Crossload3	8.09mV	11.33mV	11.74mV	15.07mV	Pass
Crossload4	24.72mV	13.49mV	15.69mV	23.68mV	Pass

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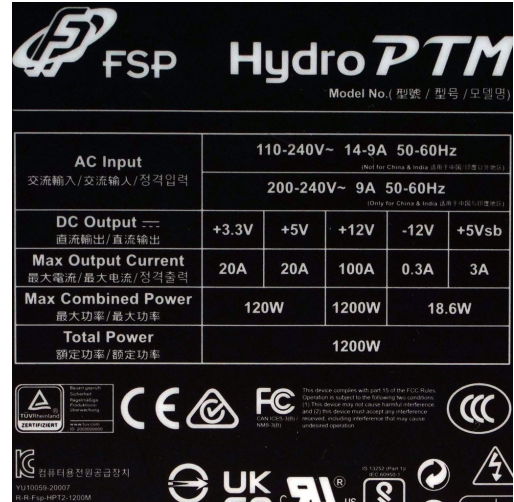
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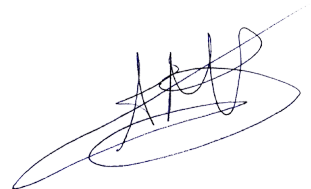
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AC Input		110-240V~ 14-9A 50-60Hz				
交流輸入 / 交流輸入 / 정격입력		200-240V~ 9A 50-60Hz				
DC Output		+3.3V	+5V	+12V	-12V	+5Vsb
直流輸出 / 直流輸出						
Max Output Current		20A	20A	100A	0.3A	3A
最大電流 / 最大電流 / 정격출력						
Max Combined Power		1200W		18.6W		
最大功率 / 最大功率						
Total Power		1200W				
額定功率 / 額定功率						

Power specifications label

CERTIFICATIONS 115V

Aristeidis Bitziopoulos
Lab Director

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