EFFICIENCY AND NOISE LEVEL CERTIFICATIONS

Anex

Chieftec Polaris 750W

Lab ID#: CF75001628
Receipt Date: Mar 9, 2020
Test Date: Mar 23, 2020

Report: 20PS1628A
Report Date: Apr 1, 2020

DUT INFORMATION

Brand	Chieftec
Manufacturer (OEM)	High Power
Series	Polaris
Model Number	PPS-750FC
Serial Number	1938080045191750JGD1F04000047
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	750
Type	ATX12V
Cooling	120mm Sleeve Bearing Fan (PY-1225M12s)
Semi-Passive Operation	✗
Cable Design	Fully Modular

TEST EQUIPMENT

Electronic Loads	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Keysight AC6804B
Power Analyzers	N4L PPA1530 x2
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2
Tachometer	UNI-T UT372 x2
Digital Multimeter	Keysight U1273AX, Fluke 289, Keithley 2015 - THD
UPS	CyberPower OLS3000E 3kVA x2
Transformer	3kVA x2

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓

115V	
Average Efficiency	88.794%
Efficiency With 10W (≤500W) or 2% (>500W)	50.646
Average Efficiency 5VSB	78.737%
Standby Power Consumption (W)	0.0750366
Average PF	0.987
Avg Noise Output	31.84 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard++

230V	
Average Efficiency	90.477%
Average Efficiency 5VSB	77.518%
Standby Power Consumption (W)	0.1468080
Average PF	0.944
Avg Noise Output	31.63 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	62.5	3	0.3
	Watts	120		750	15	3.6
Total Max. Power (W)		750				

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

Hold-Up Time (ms)	15
AC Loss to PWR_OK Hold Up Time (ms)	12.4
PWR_OK Inactive to DC Loss Delay (ms)	2.6

Anex

Chieftec Polaris 750W

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (650mm)	1	1	18-22AWG	No
4+4 pin EPS12V (650mm+150mm)	1	2	16-18AWG	No
6+2 pin PCIe (500mm+150mm)	2	4	16-18AWG	No
SATA (450mm+150mm+150mm+150mm)	2	8	18AWG	No
4-pin Molex (450mm+150mm+150mm) / FDD (+150mm)	1	3 / 1	18-22AWG	No
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

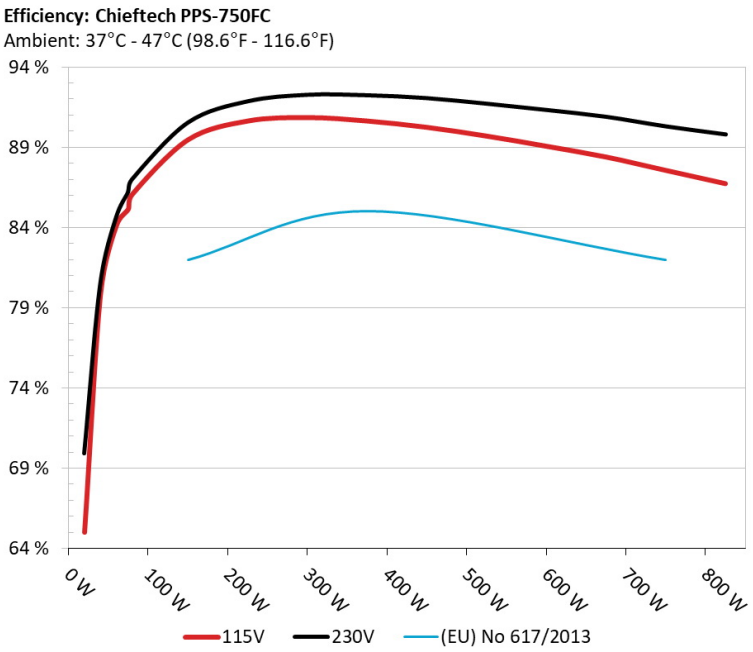
Chieftec Polaris 750W

General Data	-
Manufacturer (OEM)	High Power
PCB Type	Single Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x Discharge IC
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x GBU1006F (600V, 10A @ 100°C)
APFC MOSFETs	2x Infineon IPA60R120P7 (650V, 16A @ 100°C, 0.12Ohm)
APFC Boost Diode	1x USCi UJD06508TS (650V, 8A @ 152°C)
Hold-up Cap(s)	1x Nichicon (400V, 680uF, 2,000h @ 105°C, GG)
Main Switchers	2x Infineon IPA60R180P7S (650V, 11A @ 100°C, 0.18Ohm)
APFC Controller	Infineon ICE3PCS01G
Resonant Controller	Champion CM6901X
Topology	Primary side: Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	6x Infineon BSC027N04LS (40V, 88A @ 100°C, 2.7mOhm)
5V & 3.3V	DC-DC Converters: 4x Advansed Power AP3R303GMT (30V, 25A @ 70°C, 3.3mOhm) PWM Controllers: ANPEC APW7159C
Filtering Capacitors	Electrolytic: 6x Rubycon (3-6,000h @ 105°C, YXG), 2x Nippon Chemi-Con (1-2,000h @ 105°C, KMG), 5x Teapo (1-3,000h @ 105°C, SC) Polymer: 7x Teapo
Supervisor IC	SITI PS224 (OCP, OVP, UVP, SCP, PG)
Fan Model	Poweryear PY-1225M12S (120mm, 12V, 0.26A, Sleeve Bearing Fan)
5VSB Circuit	-
Rectifier	1xPFC P10V45SP SBR (45V, 10A) & IPS ITA04N65R FET (650V, 4A, 2.8Ohm)
Standby PWM Controller	ON Semiconductor NCP1230
-12V Circuit	-
Rectifier	KEC KIA7912PI (-12V, 1A)

Anex

Chieftec Polaris 750W

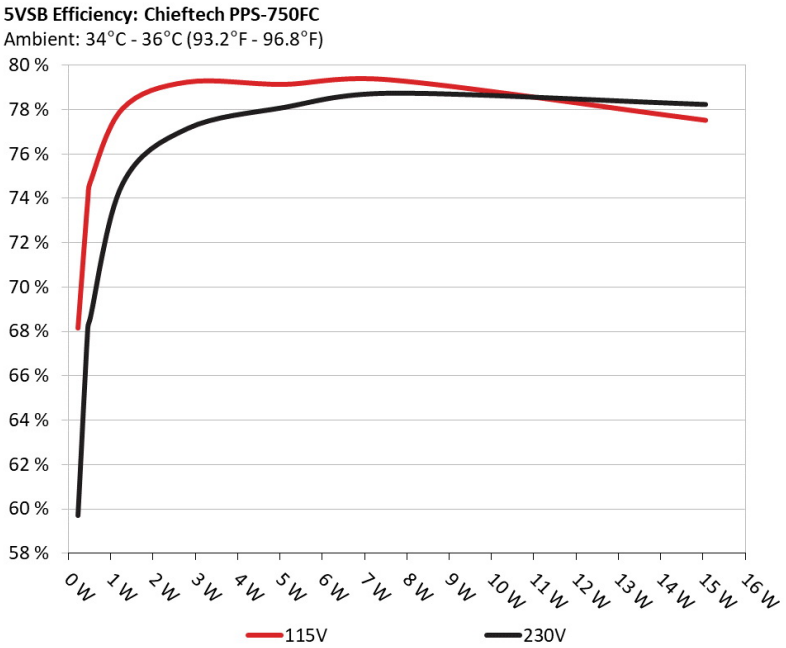
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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



INFO

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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	68.142%	0.070
	5.133V	0.339		115.09V
2	0.090A	0.462	73.920%	0.123
	5.133V	0.625		115.09V
3	0.550A	2.814	79.223%	0.350
	5.117V	3.552		115.07V
4	1.000A	5.100	79.119%	0.409
	5.101V	6.446		115.07V
5	1.500A	7.622	79.321%	0.441
	5.083V	9.609		115.07V
6	2.999A	15.056	77.504%	0.483
	5.021V	19.426		115.09V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.231	59.690%	0.024
	5.130V	0.387		230.24V
2	0.090A	0.462	68.142%	0.042
	5.130V	0.678		230.25V
3	0.550A	2.816	77.130%	0.187
	5.119V	3.651		230.22V
4	1.000A	5.102	78.084%	0.266
	5.102V	6.534		230.23V
5	1.500A	7.623	78.726%	0.314
	5.082V	9.683		230.24V
6	2.999A	15.065	78.219%	0.379
	5.024V	19.260		230.23V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

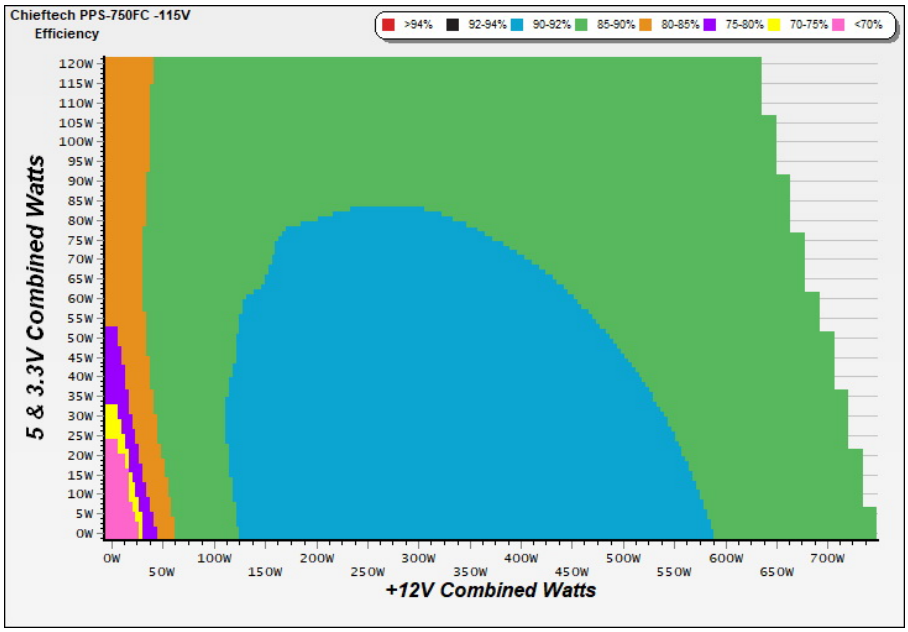
115V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

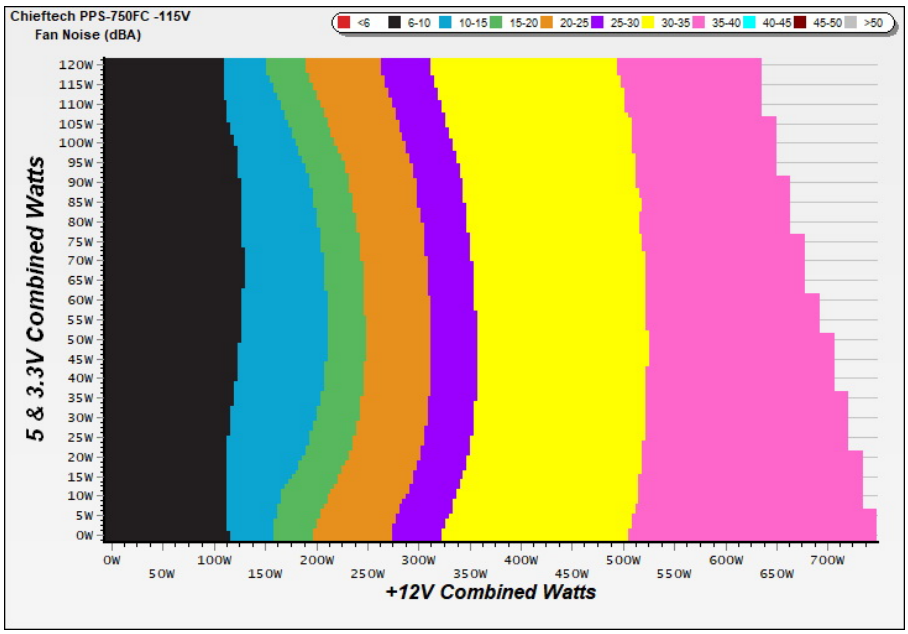
EFFICIENCY GRAPH 115V



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



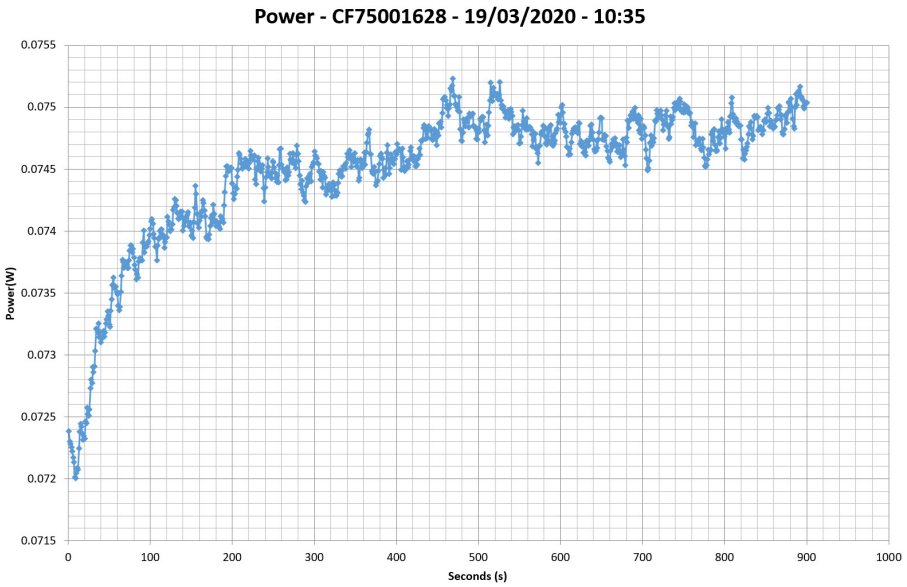
INFO

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

Anex

Chieftec Polaris 750W

VAMPIRE POWER -115V



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

Anex

Chieftec Polaris 750W

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
1	4.343A	1.980A	1.978A	0.986A	74.967	85.146%	1184	27.0	40.45°C	0.966
	12.287V	5.051V	3.337V	5.075V	88.045				46.01°C	115.12V
2	9.712A	2.978A	2.980A	1.187A	150.035	89.463%	1279	29.7	41.32°C	0.987
	12.266V	5.037V	3.324V	5.056V	167.706				47.44°C	115.11V
3	15.433A	3.482A	3.485A	1.390A	225.042	90.629%	1398	32.1	41.69°C	0.994
	12.246V	5.026V	3.313V	5.039V	248.310				48.43°C	115.11V
4	21.170A	3.989A	3.997A	1.594A	300.053	90.845%	1482	34.3	41.85°C	0.997
	12.227V	5.014V	3.303V	5.022V	330.290				49.67°C	115.11V
5	26.549A	5.002A	5.018A	1.800A	374.597	90.631%	1517	35.1	42.09°C	0.995
	12.207V	4.999V	3.289V	5.002V	413.320				50.52°C	115.10V
6	31.972A	6.021A	6.046A	2.000A	449.488	90.241%	1533	35.3	42.57°C	0.996
	12.189V	4.985V	3.276V	4.980V	498.095				51.61°C	115.10V
7	37.446A	7.045A	7.083A	2.220A	524.842	89.694%	1535	35.3	43.59°C	0.996
	12.170V	4.970V	3.262V	4.958V	585.145				53.12°C	115.09V
8	42.937A	8.003A	8.127A	2.433A	599.784	89.063%	1537	35.3	44.14°C	0.997
	12.151V	4.955V	3.248V	4.934V	673.435				54.13°C	115.09V
9	48.806A	8.600A	8.649A	2.440A	674.681	88.392%	1539	35.4	45.22°C	0.997
	12.133V	4.944V	3.237V	4.919V	763.283				55.54°C	115.09V
10	54.502A	9.129A	9.208A	3.075A	749.912	87.559%	1540	35.4	45.50°C	0.997
	12.113V	4.932V	3.225V	4.881V	856.466				56.29°C	115.08V
11	60.794A	9.141A	9.235A	3.086A	825.142	86.728%	1539	35.4	46.81°C	0.997
	12.097V	4.924V	3.216V	4.863V	951.413				58.01°C	115.08V
CL1	0.102A	14.005A	13.999A	0.000A	116.676	82.236%	1533	35.3	42.25°C	0.955
	12.274V	4.968V	3.275V	5.046V	141.880				50.55°C	115.11V
CL2	62.517A	1.000A	1.000A	1.000A	771.640	88.215%	1543	35.5	44.95°C	0.997
	12.131V	4.992V	3.269V	4.985V	874.725				56.41°C	115.08V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

20-80W LOAD TESTS 115V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.207A	0.494A	0.491A	0.196A	19.999	65.010%	760	13.6	0.813
	12.301V	5.068V	3.351V	5.116V	30.763				115.13V
2	2.414A	0.988A	0.985A	0.392A	39.988	79.847%	910	18.4	0.894
	12.299V	5.062V	3.346V	5.106V	50.081				115.13V
3	3.626A	1.483A	1.480A	0.589A	60.018	84.125%	938	19.6	0.961
	12.293V	5.056V	3.341V	5.094V	71.344				115.13V
4	4.832A	1.980A	1.976A	0.787A	79.967	86.067%	1071	23.9	0.959
	12.287V	5.051V	3.337V	5.083V	92.913				115.12V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.50mV	8.80mV	9.30mV	3.20mV	Pass
20% Load	9.90mV	9.60mV	9.70mV	3.20mV	Pass
30% Load	8.50mV	10.70mV	11.60mV	3.40mV	Pass
40% Load	8.20mV	11.70mV	10.70mV	3.40mV	Pass
50% Load	9.10mV	12.10mV	10.30mV	3.30mV	Pass
60% Load	9.80mV	12.00mV	9.90mV	3.30mV	Pass
70% Load	10.70mV	12.40mV	9.90mV	3.70mV	Pass
80% Load	11.70mV	13.10mV	11.20mV	4.00mV	Pass
90% Load	12.70mV	15.20mV	12.50mV	4.60mV	Pass
100% Load	17.90mV	15.00mV	12.10mV	6.70mV	Pass
110% Load	19.50mV	16.70mV	12.70mV	6.90mV	Pass
Crossload1	15.50mV	15.30mV	12.60mV	9.80mV	Pass
Crossload2	18.40mV	11.10mV	10.20mV	5.10mV	Pass

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

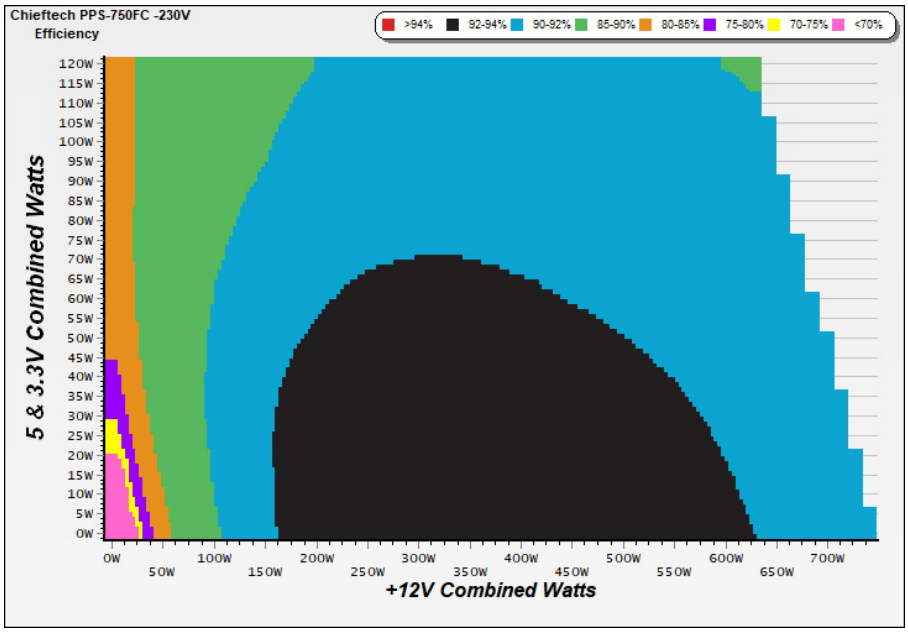
230V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

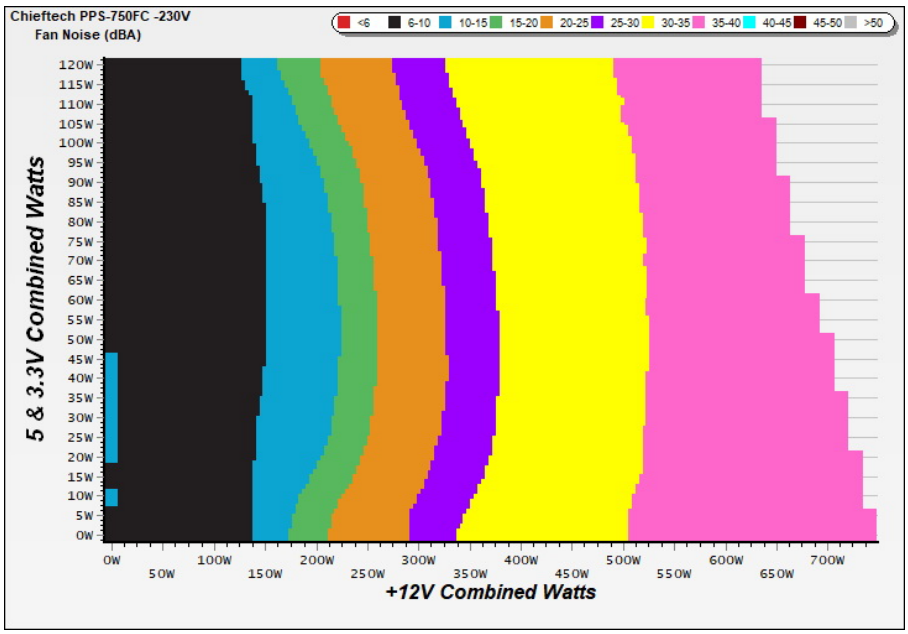
EFFICIENCY GRAPH 230V



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 230V



INFO

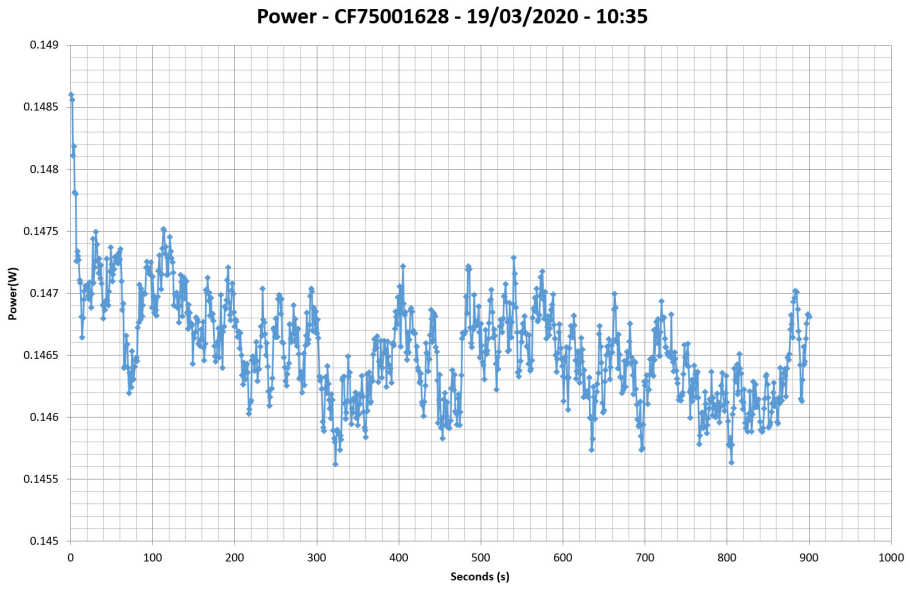
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

VAMPIRE POWER -230V



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

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

10-110% LOAD TESTS 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	4.342A	1.979A	1.979A	0.985A	74.965	86.201%	993	21.2	40.04°C	0.862
	12.290V	5.052V	3.337V	5.076V	86.965				45.12°C	230.23V
2	9.710A	2.979A	2.979A	1.187A	150.033	90.529%	1132	26.3	40.89°C	0.933
	12.268V	5.037V	3.324V	5.057V	165.730				46.71°C	230.23V
3	15.430A	3.481A	3.486A	1.389A	225.042	91.855%	1275	29.6	41.58°C	0.962
	12.248V	5.026V	3.313V	5.040V	244.997				47.83°C	230.23V
4	21.166A	3.989A	3.999A	1.593A	300.052	92.262%	1449	33.6	41.76°C	0.977
	12.229V	5.015V	3.303V	5.022V	325.219				48.85°C	230.23V
5	26.547A	5.001A	5.017A	1.799A	374.618	92.235%	1511	34.9	42.07°C	0.982
	12.209V	5.000V	3.289V	5.003V	406.158				49.83°C	230.23V
6	31.971A	6.019A	6.046A	2.000A	449.509	92.056%	1536	35.3	42.77°C	0.986
	12.190V	4.986V	3.276V	4.982V	488.297				51.17°C	230.23V
7	37.445A	7.044A	7.081A	2.218A	524.858	91.710%	1543	35.5	43.52°C	0.989
	12.171V	4.971V	3.262V	4.960V	572.303				52.89°C	230.23V
8	42.936A	8.003A	8.127A	2.431A	599.821	91.321%	1545	35.5	43.91°C	0.993
	12.152V	4.956V	3.248V	4.938V	656.824				53.97°C	230.23V
9	48.799A	8.598A	8.648A	2.439A	674.692	90.895%	1548	35.6	44.37°C	0.995
	12.135V	4.945V	3.237V	4.922V	742.276				55.18°C	230.23V
10	54.504A	9.126A	9.210A	3.073A	749.934	90.296%	1548	35.6	45.34°C	0.997
	12.113V	4.933V	3.225V	4.883V	830.527				56.42°C	230.23V
11	60.804A	9.142A	9.234A	3.082A	825.161	89.796%	1548	35.6	46.81°C	0.997
	12.095V	4.925V	3.217V	4.869V	918.925				58.53°C	230.23V
CL1	0.104A	14.004A	13.999A	0.000A	116.710	83.039%	1538	35.4	42.55°C	0.851
	12.273V	4.970V	3.274V	5.049V	140.548				49.75°C	230.24V
CL2	62.521A	1.000A	1.000A	1.000A	771.504	90.989%	1551	35.6	45.01°C	0.996
	12.128V	4.992V	3.269V	4.987V	847.910				56.85°C	230.22V

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

20-80W LOAD TESTS 230V

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.207A	0.491A	0.492A	0.196A	19.995	69.937%	761	13.6	0.568
	12.307V	5.069V	3.352V	5.114V	28.590				230.23V
2	2.413A	0.988A	0.985A	0.392A	39.984	80.436%	804	14.7	0.694
	12.302V	5.063V	3.346V	5.105V	49.709				230.23V
3	3.624A	1.483A	1.483A	0.589A	60.014	84.633%	911	18.4	0.817
	12.296V	5.057V	3.341V	5.093V	70.911				230.23V
4	4.830A	1.980A	1.979A	0.787A	79.965	86.997%	937	19.5	0.865
	12.290V	5.051V	3.337V	5.082V	91.917				230.24V

RIPPLE MEASUREMENTS 230V

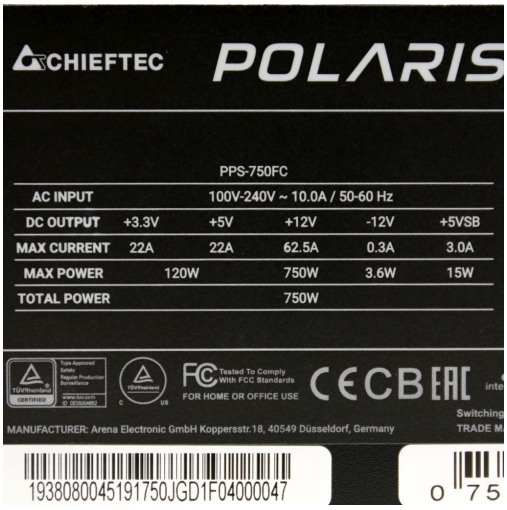
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.80mV	9.00mV	11.30mV	3.40mV	Pass
20% Load	11.00mV	9.50mV	10.60mV	3.40mV	Pass
30% Load	9.00mV	10.60mV	12.00mV	3.50mV	Pass
40% Load	8.00mV	10.70mV	10.90mV	3.50mV	Pass
50% Load	8.20mV	11.40mV	11.20mV	3.70mV	Pass
60% Load	8.90mV	12.10mV	10.90mV	3.50mV	Pass
70% Load	9.90mV	12.70mV	11.30mV	3.80mV	Pass
80% Load	11.00mV	13.20mV	12.50mV	4.00mV	Pass
90% Load	11.40mV	13.90mV	11.60mV	4.60mV	Pass
100% Load	16.90mV	15.20mV	13.50mV	6.00mV	Pass
110% Load	20.00mV	16.10mV	14.40mV	6.30mV	Pass
Crossload1	17.30mV	15.70mV	15.30mV	9.70mV	Pass
Crossload2	18.10mV	10.90mV	11.70mV	5.30mV	Pass

www.cybenetics.com -info@cybenetics.com
CYBENETICS LTD
Syrou 6, Latsia, 2231, Nicosia Cyprus

Anex

Chieftec Polaris 750W

Top side



Power specifications label

CERTIFICATIONS 115V

CYBENETICS GOLD

CYBENETICS STANDARD++

CERTIFICATIONS 230V

CYBENETICS GOLD 230v

CYBENETICS STANDARD++ 230v

Aristeidis Bitziopoulos
Lab Director