EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

Thermaltake Toughpower GF3 1200W

Lab ID#: TT12002073
Receipt Date: Sep 1, 2022
Test Date: Oct 5, 2022

Report: 22PS2073A
Report Date: Oct 5, 2022

DUT INFORMATION

Brand	Thermaltake
Manufacturer (OEM)	CWT
Series	Toughpower GF3
Model Number	
Serial Number	
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	15-7
Rated Frequency (Hz)	50-60
Rated Power (W)	1200
Type	ATX12V
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525H12SF-Z)
Semi-Passive Operation	✓ (selectable)
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

EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

Thermaltake Toughpower GF3 1200W

RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6 (+-2°C / +- 3.6°F)
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	88.901%
Efficiency With 10W (≤500W) or 2% (>500W)	79.140
Average Efficiency 5VSB	79.248%
Standby Power Consumption (W)	0.0160000
Average PF	0.985
Avg Noise Output	40.90 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	Standard

230V

Average Efficiency	91.104%
Average Efficiency 5VSB	78.362%
Standby Power Consumption (W)	0.0765000
Average PF	0.964
Avg Noise Output	40.46 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	Standard

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	100	3	0.3
	Watts	120		1200	15	3.6
Total Max. Power (W)		1200				

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

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (600mm)	1	1	16AWG	No
8 pin EPS12V (700mm)	1	1	16AWG	No
4+4 pin EPS12V (700mm)	1	1	16AWG	No
6+2 pin PCIe (500mm+150mm)	2	4	16-18AWG	No
12+4 pin PCIe (600mm) (450W)	1	1	16-24AWG	No
SATA (500mm+150mm+150mm+150mm)	3	12	18AWG	No
4-pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG	No
FDD Adapter (100mm)	1	1	22AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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

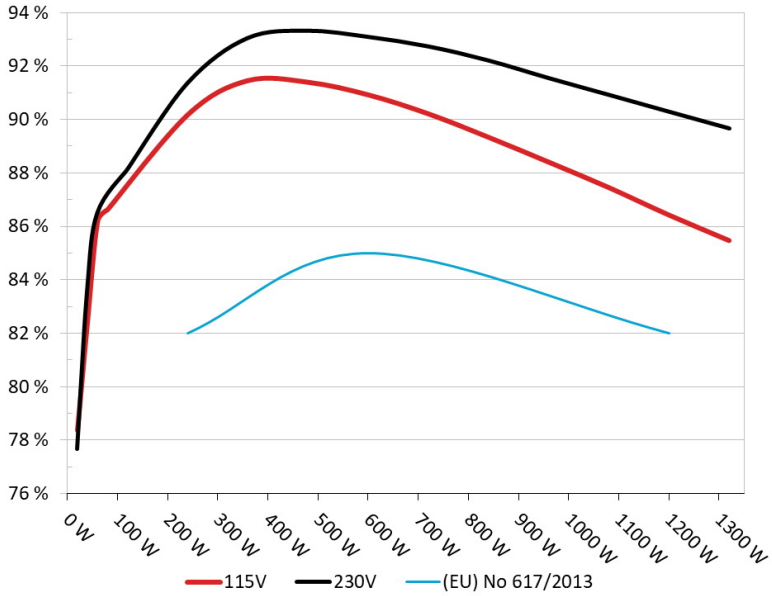
Thermaltake Toughpower GF3 1200W

General Data	-
Manufacturer (OEM)	CWT
Platform	CSZ
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor SCK-207R0 (7 Ohm) & Relay
Bridge Rectifier(s)	2x Vishay LVB2560 (600V, 25A @ 105°C)
APFC MOSFETs	3x Infineon IPA60R099P6 (600V, 24A @ 100°C, Rds(on): 0.099Ohm)
APFC Boost Diode	1x On Semiconductor FFSP1665A (650V, 16A @ 135°C)
Bulk Cap(s)	1x Rubycon (420V, 680uF, 2,000h @ 105°C, MXE) & 1x Nippon Chemi-Con (420V, 470uF, 2,000h @ 105°C, KMZ)
Main Switchers	2x Infineon IPA60R099P6 (600V, 24A @ 100°C, Rds(on): 0.099Ohm)
APFC Controller	Champion CM6500UNX & CM03X
Resonant Controller	Champion CU6901VAC
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	8x Infineon BSC010N04LS (40V, 178A @ 100°C, Rds(on): 1mOhm)
5V & 3.3V	DC-DC Converters: 2x UBIQ QN3107M6N (30V, 70A @ 100°C, Rds(on): 2.6mOhm) & 2x UBIQ QM3054M6 (30V, 61A @ 100°C, Rds(on): 4.8mOhm) PWM Controller(s): uPI-Semi uP3861P
Filtering Capacitors	Electrolytic: 3x Nippon Chemi-Con (105°C, W), 1x Nichicon (2-5,000h @ 105°C, HD), 2x Nichicon (4-10,000h @ 105°C, HE), 1x Rubycon (6-10,000h @ 105°C, ZLH), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KYA) Polymer: 21x FPCAP, 7x NIC
Supervisor IC	Weltrend WT7502R
Fan Controller	Microchip PIC16F1503
Fan Model	Hong Hua HA13525H12SF-Z (135mm, 12V, 0.5A, Fluid Dynamic Bearing Fan)
5VSB Circuit	-
Rectifier	1x D10S45L SBR (45V, 10A)
Standby PWM Controller	On-Bright OB2365T

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

EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Thermaltake Toughpower GF3 1200W
Ambient: 37°C - 47°C (98.6°F - 116.6°F)

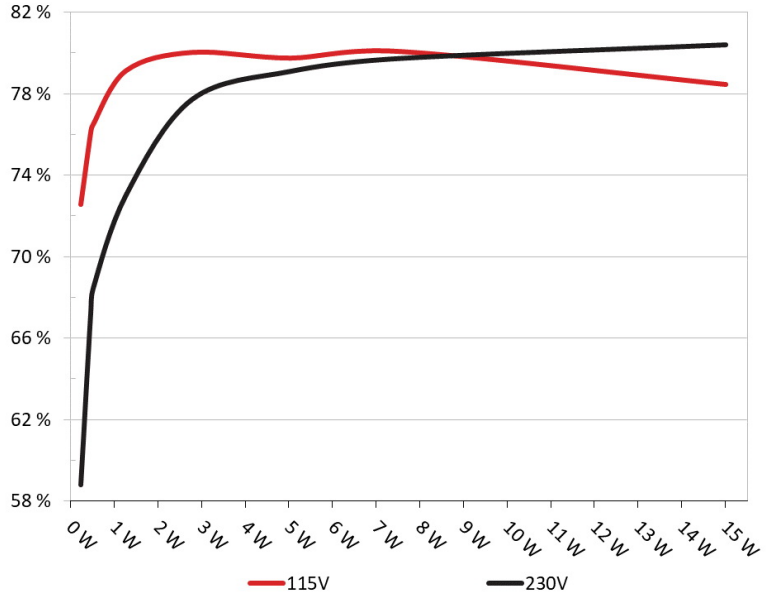


INFO

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: Thermaltake Toughpower GF3 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

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

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	72.061%	0.031
	5.059V	0.316W		114.93V
2	0.09A	0.455W	75.603%	0.058
	5.057V	0.602W		114.93V
3	0.55A	2.777W	79.547%	0.267
	5.049V	3.491W		114.93V
4	1A	5.041W	79.268%	0.374
	5.04V	6.359W		114.93V
5	1.5A	7.547W	79.594%	0.425
	5.031V	9.482W		114.94V
6	3A	15.013W	77.969%	0.5
	5.004V	19.255W		114.93V

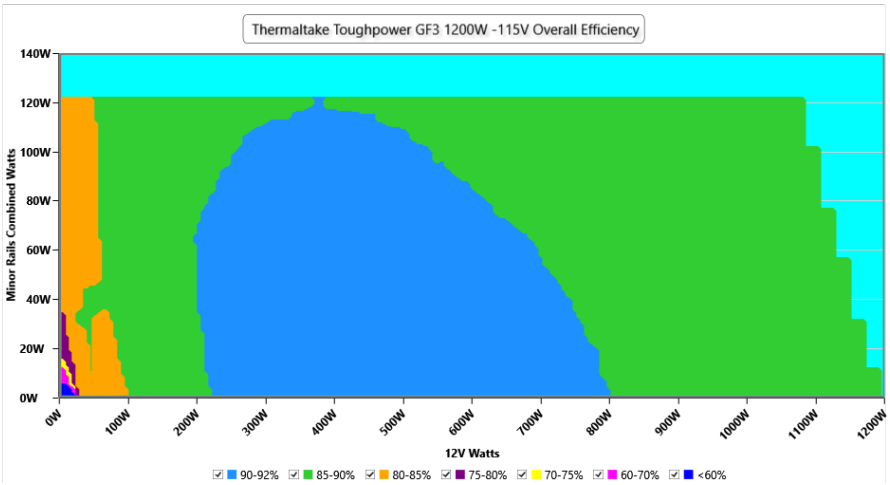
5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.228W	58.315%	0.011
	5.059V	0.392W		229.9V
2	0.09A	0.455W	66.735%	0.02
	5.058V	0.682W		229.9V
3	0.55A	2.777W	77.233%	0.1
	5.049V	3.596W		229.9V
4	1A	5.041W	78.617%	0.167
	5.041V	6.412W		229.9V
5	1.5A	7.548W	79.248%	0.227
	5.032V	9.524W		229.89V
6	3A	15.013W	79.917%	0.33
	5.004V	18.786W		229.89V

115V

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

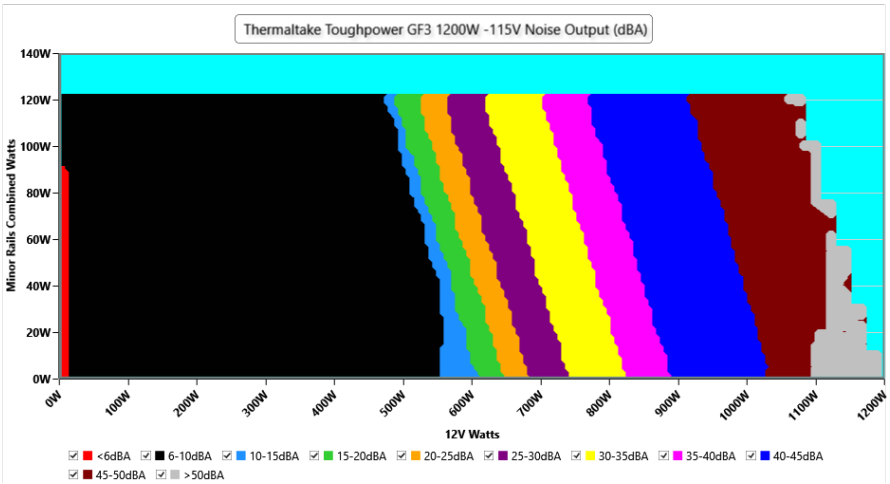
EFFICIENCY GRAPH 115V



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 (+-2 °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

VAMPIRE POWER -115V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.94 V	114.89 V	113.85 V	114.98 V	116.15 V	PASS
Mains Frequency:	59.99 Hz	59.98 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.417	1.416	1.340	1.419	1.490	PASS
Mains Voltage THD:	0.15 %	0.11 %	N/A	0.21 %	2.00 %	PASS
Real Power:	0.016 W	0.014 W	N/A	0.018 W	N/A	N/A
Apparent Power:	10.284 W	10.263 W	N/A	10.306 W	N/A	N/A
Power Factor:	0.002	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

COMMISSION REGULATION (EU) NO 617/2013 TESTING 115V

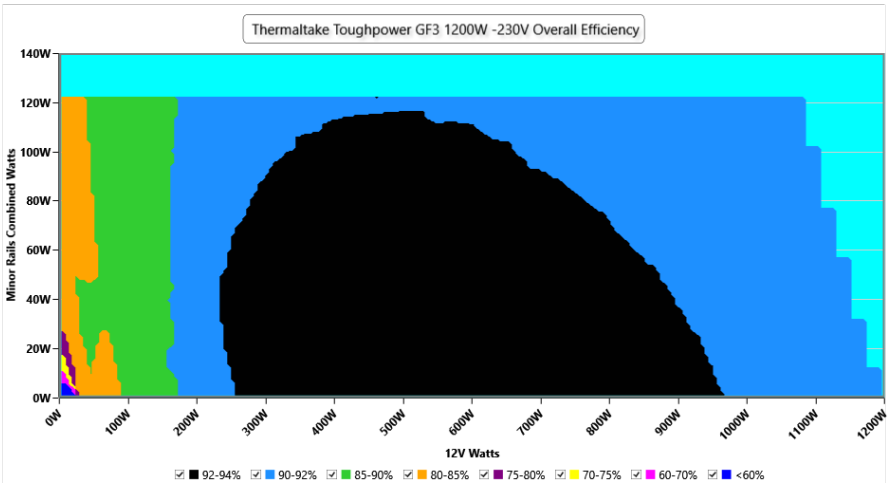
Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	8.133A	1.989A	2.008A	0.998A	120.024	86.631%	0	<6.0	44.34°C	0.977
	12.101V	5.027V	3.287V	5.013V	138.549				40.11°C	114.9V
20%	17.282A	2.986A	3.016A	1.198A	239.996	90.182%	0	<6.0	45.51°C	0.985
	12.098V	5.025V	3.283V	5.008V	266.121				40.79°C	114.88V
50%	45.625A	4.983A	5.044A	1.804A	599.503	90.928%	713	21.4	42.54°C	0.987
	12.033V	5.018V	3.271V	4.991V	659.323				48.99°C	114.78V
100%	92.765A	8.991A	9.132A	3.025A	1199.581	86.434%	2176	53.2	45.3°C	0.994
	11.964V	5.006V	3.252V	4.96V	1387.863				55.38°C	114.62V

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

230V

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

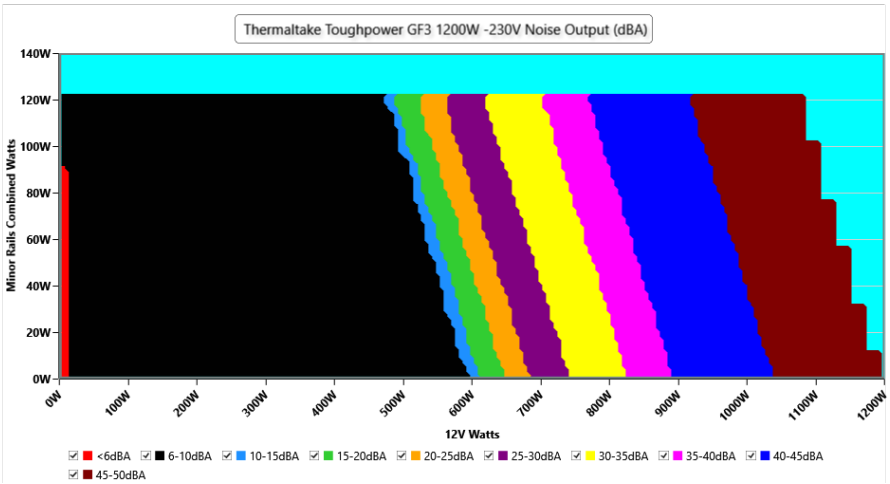
EFFICIENCY GRAPH 230V



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 (+-2 °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

VAMPIRE POWER -230V

Detailed Results

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.88 V	229.83 V	227.70 V	229.95 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	49.99 Hz	49.50 Hz	50.01 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.417	1.416	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.18 %	0.16 %	N/A	0.22 %	2.00 %	PASS
Real Power:	0.077 W	0.064 W	N/A	0.092 W	N/A	N/A
Apparent Power:	34.607 W	34.580 W	N/A	34.628 W	N/A	N/A
Power Factor:	0.002	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

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

COMMISSION REGULATION (EU) NO 617/2013 TESTING 230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	8.131A	1.989A	2.008A	0.998A	120.022	87.293%	0	<6.0	44.86°C	0.906
	12.104V	5.027V	3.287V	5.012V	137.496				40.62°C	229.88V
20%	17.280A	2.986A	3.016A	1.198A	239.993	91.356%	0	<6.0	45.59°C	0.951
	12.100V	5.024V	3.283V	5.007V	262.702				40.8°C	229.86V
50%	45.631A	4.984A	5.045A	1.804A	599.512	93.084%	753	23.0	42.21°C	0.977
	12.031V	5.017V	3.271V	4.99V	644.052				48.73°C	229.82V
100%	92.788A	8.994A	9.134A	3.026A	1199.615	90.287%	2175	53.2	45.31°C	0.986
	11.961V	5.005V	3.252V	4.959V	1328.675				55.34°C	229.75V

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

EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

Thermaltake Toughpower GF3 1200W

Top side

Power specifications label

CERTIFICATIONS 115V

CYBENETICS GOLD

CYBENETICS STANDARD

CERTIFICATIONS 230V

CYBENETICS PLATINUM 230v

CYBENETICS STANDARD 230v

Aristeidis Bitziopoulos
Lab Director

Cybenetics offers the ETA and Lambda voluntary certification programs, through which the efficient and silent power supplies are promoted

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