Thermaltake Toughpower GF3 1200W

Serial Number

Lab ID TT12002073

Certification ID 252073

Test Result Report ID: 22PS2073A

Certificate Issue Date: Oct 5, 2022

Scheme: ETA-EMI PSU

115V



230V



Scheme: LAMBDA PSU

115V



230V





Outside Validation Scope



General Information

Test Equipment

Electronic Loads	Chroma 63601-5 x2 Chroma 63600-2 Chroma 63640-80-80 x10 Chroma 63610-80-20
AC Sources	Chroma 6530, APM SP300VAC4000W-P, GW Instek ASR-3500
Power Analyzers	Rohde & Schwarz HMC8015 & NPA701
Oscilloscopes	Picoscope 4444, 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
EMI Analyzer	TekBox TBMR-110M-EU
Isolation Transformer	4kVA
UPS	FSP Champ Tower 3kVA, CyberPower OLS3000E 3kVA
Testing Methodology	Cybenetics PSU Test Protocol

DUT Information(Non-accredited measurements)

Product Identification Details	
Brand	Thermaltake
Model	Toughpower GF3 1200W
OEM/ODM	CWT
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	15-7

Rated Frequency (Hz)	50-60
Rated Power (W)	1200
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	135mm Fluid Dynamic Bearing Fan (HA13525H12SF-Z)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	TT12002073
Date of receipt	Sep 1, 2022
Testing Date	Oct 5, 2022
Report Issued Date	Oct 5, 2022
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

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	-

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				

Parts Description

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

Test Results

Temperature & Compliance Info

Temperature Range (°C /°F)	28-32 / 82.4-89.6
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
ALPM (Alternative Low Power Mode) compatible	✓
ATX v3.0 Compliance	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	88.901%
Average Noise Output (>1450 Load Combinations)	40.90dBA
Average PF (>1450 Load Combinations)	0.985
Efficiency With 10W (≤500W) or 2% (>500W) Load	79.140%
Standby Power Consumption	0.0160W
Non-Accredited	
12V Ripple (Full Load)	14.58mV
5V Ripple (Full Load)	6.19mV

3.3V Ripple (Full Load)	10.28mV
5VSB Ripple (Full Load)	5.54mV
12V Load Regulation	1.14%
5V Load Regulation	0.76%
3.3V Load Regulation	1.35%
5VSB Load Regulation	1.61%
Inrush Current	24.610A

230V

Accredited	
Average Efficiency (>1450 load combinations)	91.104%
Average Noise Output (>1450 Load Combinations)	40.46dBA
Average PF (>1450 Load Combinations)	0.964
Efficiency With 10W (≤500W) or 2% (>500W) Load	78.483%
Standby Power Consumption	0.0765W
Non-Accredited	
12V Ripple (Full Load)	15.24mV
5V Ripple (Full Load)	6.05mV
3.3V Ripple (Full Load)	9.97mV
5VSB Ripple (Full Load)	5.55mV
12V Load Regulation	1.19%
5V Load Regulation	0.74%
3.3V Load Regulation	1.35%
5VSB Load Regulation	1.61%
Inrush Current	46.580A
12V Transient Response (200%)	11.10V
5V Transient Response (200%)	4.949V
3.3V Transient Response (200%)	3.139V
5VSB Transient Response (200%)	4.864V
Hold-Up Time & PWR_OK Signal	21.80ms
AC Loss to PWR_OK Hold Up Time	19.20ms
PWR_OK Inactive to DC Loss Delay	2.60ms

PSU Timings: T1 (20% / 100%)	62.0ms	62.0ms
PSU Timings: T3 (20% / 100%)	130.0ms	130.0ms
OPP (29.23°C / 39.52°C)	117.27%	117.27%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	21.8
AC Loss to PWR_OK Hold Up Time (ms)	19.2
PWR_OK Inactive to DC Loss Delay (ms)	2.6

Stromverbrauch im Ruhezustand

Tables

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

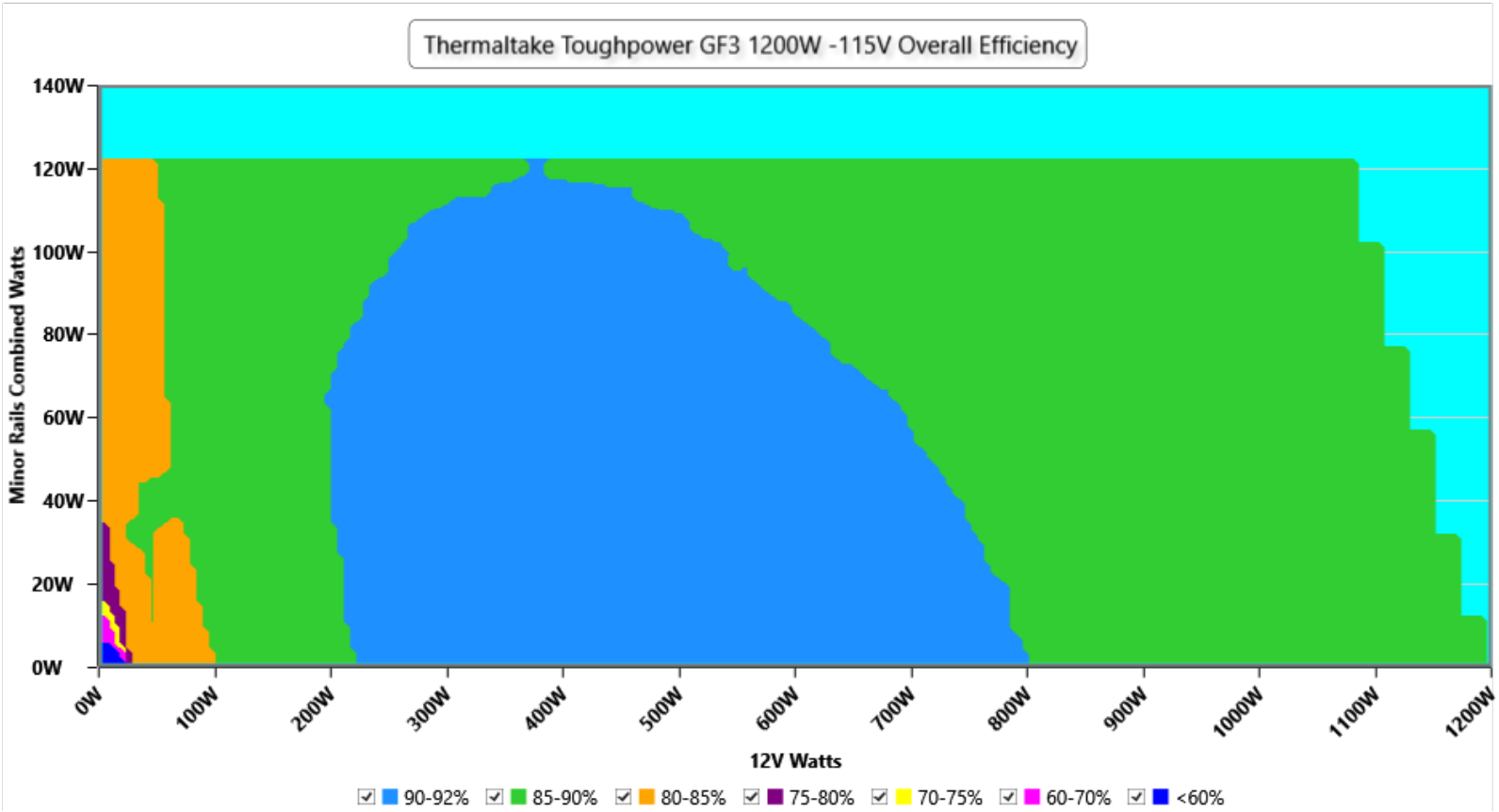
230V

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

Efficiency Graph

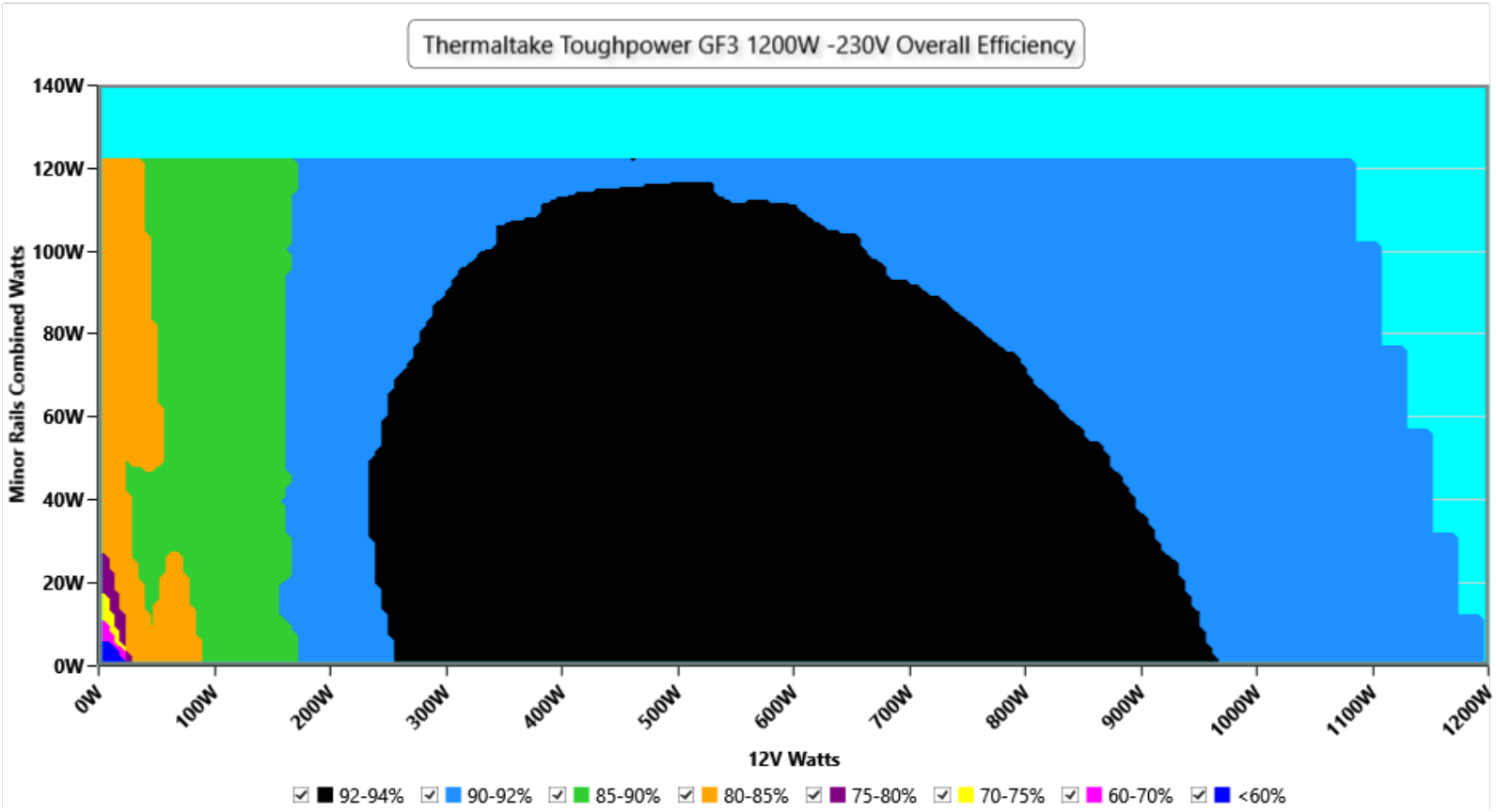
115V



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

230V

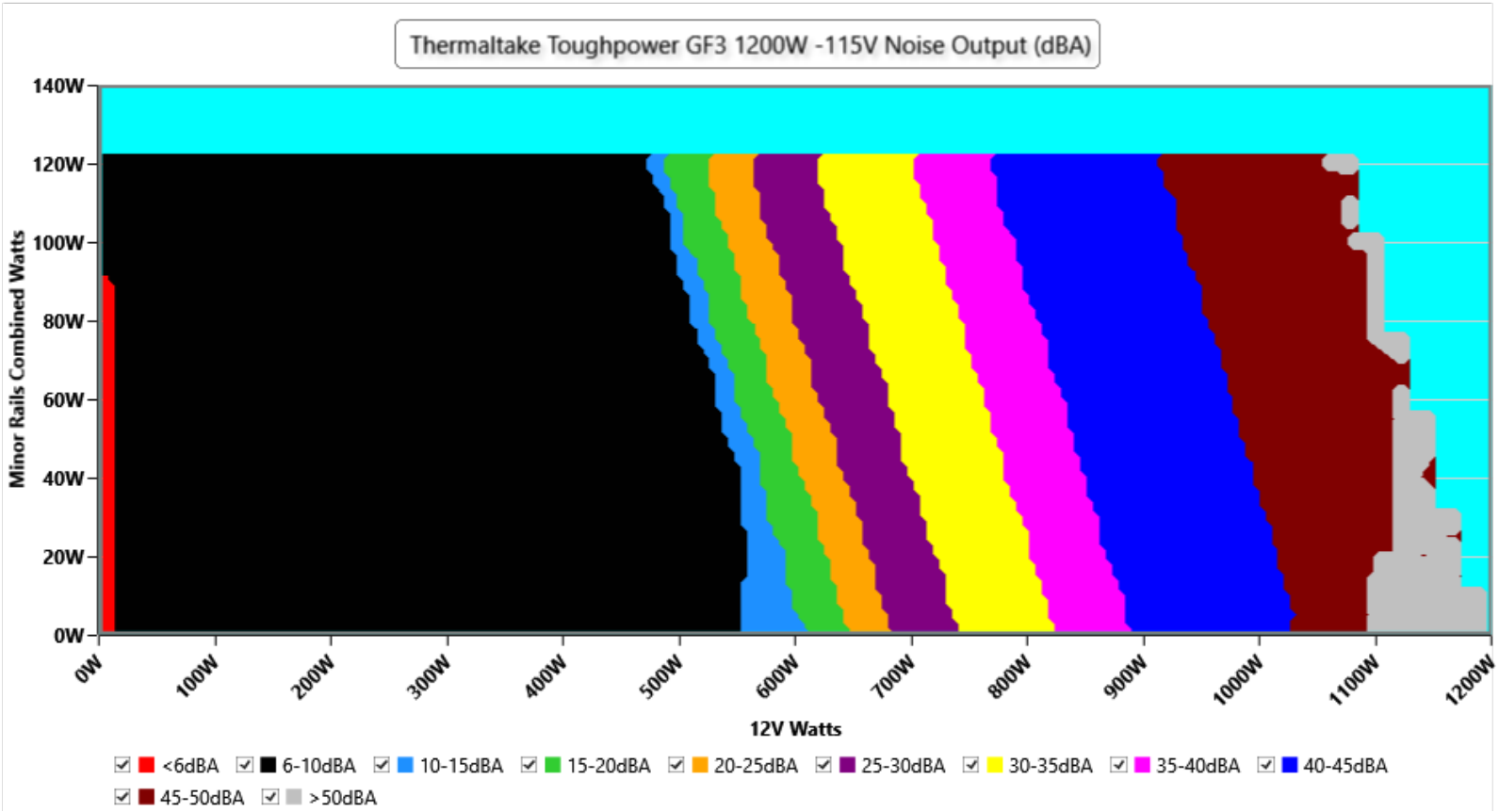


INFO

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

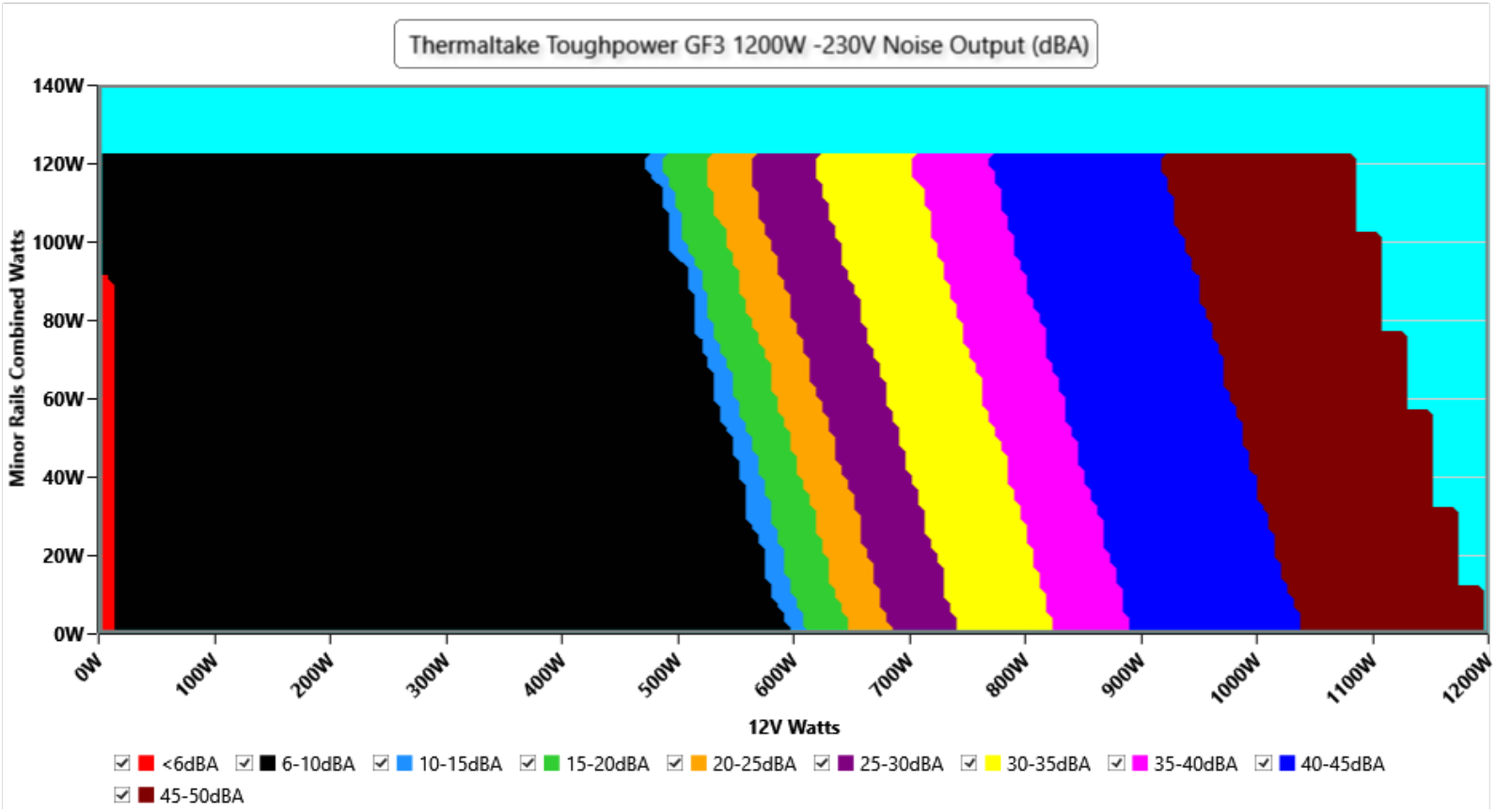
115V



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

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

Noise under high ambient temperature (indicative)

115V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	0 RPM · <6.0 dB(A) · 44.3 °C	0 RPM · <6.0 dB(A) · 44.3 °C	fan off in both
20%	0 RPM · <6.0 dB(A) · 45.5 °C	0 RPM · <6.0 dB(A) · 45.5 °C	fan off in both
50%	713 RPM · 21.4 dB(A) · 42.5 °C	713 RPM · 21.4 dB(A) · 42.5 °C	**+0.0 dB(A)**
100%	2176 RPM · 53.2 dB(A) · 45.3 °C	2176 RPM · 53.2 dB(A) · 45.3 °C	**+0.0 dB(A)**

230V

Load	Normal ambient fan · noise · intake	High ambient fan · noise · intake	Noise change
10%	0 RPM · <6.0 dB(A) · 44.9 °C	0 RPM · <6.0 dB(A) · 44.9 °C	fan off in both
20%	0 RPM · <6.0 dB(A) · 45.6 °C	0 RPM · <6.0 dB(A) · 45.6 °C	fan off in both
50%	753 RPM · 23.0 dB(A) · 42.2 °C	753 RPM · 23.0 dB(A) · 42.2 °C	**+0.0 dB(A)**
100%	2175 RPM · 53.2 dB(A) · 45.3 °C	2175 RPM · 53.2 dB(A) · 45.3 °C	**+0.0 dB(A)**

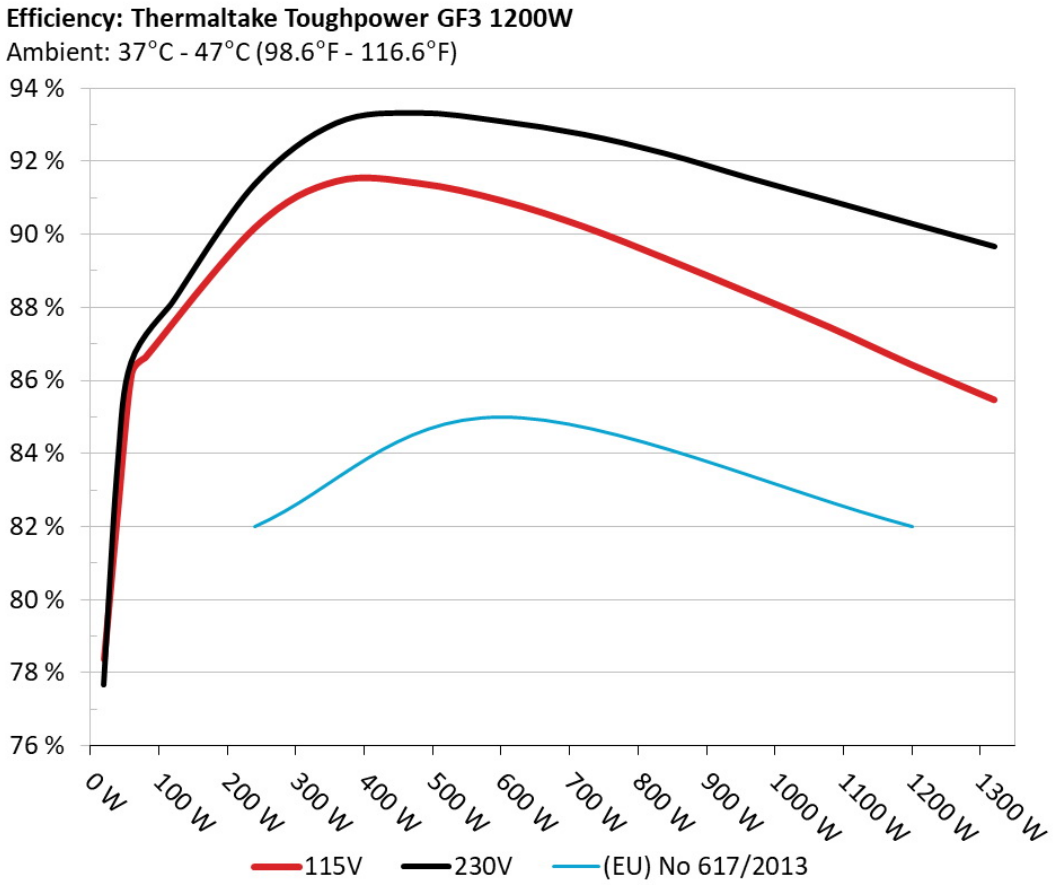
INFO

Fan speed, noise and the measured intake temperature at 10, 20, 50 and 100 % load, from the two load regulation tests: at normal ambient (about 30-32 °C) and at high ambient (about 40-47 °C). These are stabilized readings at fixed loads, not averages over the certification sweep, so they are indicative of how the fan behaves when it is hot. "<6.0" is the floor of our sound meter, with the fan stopped; with the fan stopped, the intake sensor can read higher than the chamber air.

Informational. Not part of the ETA or LAMBDA rating.

Indicative Performance

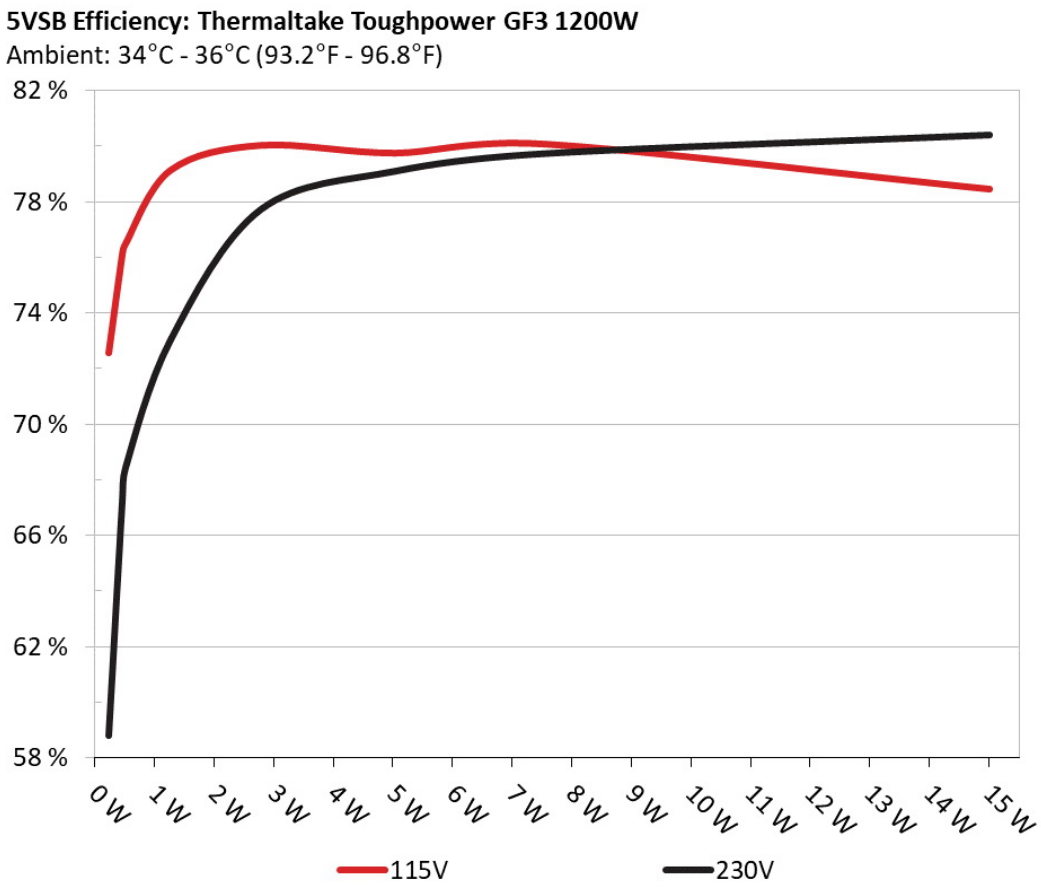
Efficiency under high ambient temperature



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

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

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

230V

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

Supplementary Tests (For Reference)

Typical 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%	8.133A	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
30%	26.793A	3.485A	3.523A	1.4A	359.41	91.457%	418	7.8	41.45°C	0.982
	12.069V	5.022V	3.279V	5.001V	392.988				46.65°C	114.85V
40%	36.393A	3.985A	4.031A	1.602A	479.776	91.399%	472	9.0	41.95°C	0.984
	12.051V	5.02V	3.275V	4.996V	524.925				47.71°C	114.82V
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
60%	54.955A	5.982A	6.059A	2A	720.003	90.217%	993	32.0	42.89°C	0.989
	12.014V	5.016V	3.268V	4.987V	798.087				49.87°C	114.76V
70%	64.253A	6.982A	7.078A	2.209A	839.767	89.342%	1371	41.2	43.37°C	0.991
	11.994V	5.014V	3.264V	4.982V	939.941				50.69°C	114.72V
80%	73.636A	7.985A	8.097A	2.311A	959.742	88.413%	1761	48.0	43.7°C	0.992
	11.976V	5.011V	3.26V	4.978V	1085.525				51.81°C	114.68V
90%	83.302A	8.487A	8.598A	2.414A	1079.541	87.462%	2146	52.7	44.69°C	0.993
	11.969V	5.009V	3.256V	4.973V	1234.298				53.71°C	114.66V
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
110%	102.179A	9.997A	10.259A	3.027A	1320.045	85.475%	2176	53.2	46.67°C	0.995
	11.957V	5.003V	3.246V	4.957V	1544.333				57.57°C	114.6V
CL1	0.116A	14.406A	14.528A	0A	121.317	81.634%	511	10.4	42.92°C	0.978
	12.124V	5.013V	3.283V	5.04V	148.616				48.36°C	114.9V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL2	0.115A	21.958A	0A	0A	111.427	79.901%	510	10.4	43.94°C	0.978
	12.132V	5.011V	3.29V	5.058V	139.46				50.97°C	114.91V
CL3	0.118A	0A	22.141A	0A	74.03	76.148%	441	8.2	44.6°C	0.965
	12.105V	5.026V	3.279V	5.02V	97.219				53.65°C	114.91V
CL4	100.249A	0A	0A	0A	1200.001	87.271%	2179	53.3	46.39°C	0.994
	11.970V	5.023V	3.257V	5.009V	1375.037				56.35°C	114.64V

The results above are not used in the certification process

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
30%	26.787A	3.486A	3.523A	1.4A	359.415	93.035%	418	7.8	41.32°C	0.967
	12.072V	5.021V	3.279V	5.001V	386.32				46.59°C	229.85V
40%	36.393A	3.986A	4.031A	1.602A	479.789	93.309%	559	13.2	41.83°C	0.973
	12.051V	5.019V	3.275V	4.995V	514.191				47.88°C	229.84V
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
60%	54.964A	5.983A	6.06A	2A	720.03	92.725%	992	31.9	42.31°C	0.979
	12.012V	5.015V	3.268V	4.985V	776.523				49.38°C	229.81V
70%	64.258A	6.984A	7.079A	2.209A	839.802	92.201%	1375	41.3	43.15°C	0.981
	11.994V	5.013V	3.264V	4.98V	910.838				50.82°C	229.8V
80%	73.623A	7.987A	8.098A	2.312A	959.771	91.542%	1792	48.5	43.96°C	0.983
	11.978V	5.01V	3.26V	4.976V	1048.457				51.98°C	229.78V
90%	83.308A	8.49A	8.6A	2.414A	1079.574	90.917%	2127	52.4	44.18°C	0.984
	11.969V	5.007V	3.256V	4.972V	1187.422				53.26°C	229.77V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
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
110%	102.159A	10A	10.26A	3.028A	1320.187	89.659%	2177	53.2	46.51°C	0.987
	11.960V	5.001V	3.245V	4.956V	1472.452				57.37°C	229.74V
CL1	0.116A	14.41A	14.53A	0A	121.327	81.807%	646	18.2	42.57°C	0.914
	12.127V	5.012V	3.283V	5.039V	148.308				48.01°C	229.88V
CL2	0.115A	21.961A	0A	0A	111.428	80.292%	443	8.3	43.23°C	0.907
	12.131V	5.011V	3.29V	5.058V	138.783				50.33°C	229.88V
CL3	0.118A	0A	22.141A	0A	74.032	77.82%	441	8.2	44.07°C	0.858
	12.102V	5.027V	3.279V	5.021V	95.132				52.09°C	229.88V
CL4	100.309A	0A	0A	0A	1200.032	90.981%	2171	53.1	45.4°C	0.985
	11.963V	5.023V	3.257V	5.009V	1318.995				55.36°C	229.75V

The results above are not used in the certification process

Light 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	1.230A	0.496A	0.501A	0.198A	20.009	78.374%	0	<6.0	40.11°C	0.891
	12.083V	5.044V	3.296V	5.04V	25.53				36.97°C	114.94V
40W	2.706A	0.695A	0.701A	0.298A	40.009	82.467%	0	<6.0	41.85°C	0.927
	12.086V	5.04V	3.295V	5.035V	48.516				38.37°C	114.92V
60W	4.182A	0.894A	0.903A	0.398A	60.009	86.194%	0	<6.0	42.57°C	0.964
	12.085V	5.031V	3.29V	5.025V	69.61				38.8°C	114.92V
80W	5.658A	1.094A	1.104A	0.498A	79.971	86.291%	0	<6.0	43.97°C	0.963
	12.078V	5.029V	3.288V	5.022V	92.673				39.98°C	114.91V

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20W	1.230A	0.496A	0.501A	0.198A	20.008	77.682%	0	<6.0	39.76°C	0.528
	12.072V	5.042V	3.296V	5.039V	25.761				36.71°C	229.89V
40W	2.706A	0.695A	0.701A	0.298A	40.008	83.638%	0	<6.0	40.42°C	0.713
	12.085V	5.039V	3.295V	5.034V	47.834				37.15°C	229.89V
60W	4.183A	0.894A	0.903A	0.398A	60.008	86.493%	0	<6.0	41.92°C	0.807
	12.082V	5.031V	3.29V	5.025V	69.377				38.38°C	229.89V
80W	5.659A	1.094A	1.104A	0.498A	79.968	88.128%	0	<6.0	43.62°C	0.851
	12.075V	5.028V	3.288V	5.021V	90.74				39.85°C	229.89V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	5.99mV	4.39mV	6.70mV	4.25mV	Pass
20% Load	6.35mV	4.19mV	7.52mV	4.15mV	Pass
30% Load	10.62mV	4.39mV	6.85mV	4.61mV	Pass
40% Load	8.67mV	4.60mV	7.00mV	4.35mV	Pass
50% Load	9.01mV	4.65mV	7.06mV	4.35mV	Pass
60% Load	9.16mV	12.97mV	17.08mV	12.49mV	Pass
70% Load	8.91mV	4.90mV	8.39mV	4.66mV	Pass
80% Load	9.98mV	5.16mV	8.49mV	4.81mV	Pass
90% Load	9.82mV	5.57mV	9.41mV	4.97mV	Pass
100% Load	14.58mV	6.19mV	10.28mV	5.54mV	Pass
110% Load	14.94mV	6.64mV	10.76mV	5.62mV	Pass
Crossload1	7.96mV	6.15mV	9.85mV	4.89mV	Pass
Crossload2	8.85mV	7.20mV	6.65mV	4.45mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	64.22mV	6.74mV	14.42mV	6.70mV	Pass
Crossload4	14.28mV	5.13mV	8.44mV	5.11mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	6.04mV	4.34mV	6.44mV	4.35mV	Pass
20% Load	6.35mV	4.75mV	7.11mV	4.56mV	Pass
30% Load	11.38mV	4.95mV	7.00mV	4.50mV	Pass
40% Load	9.69mV	4.64mV	7.26mV	4.45mV	Pass
50% Load	8.83mV	4.65mV	7.21mV	4.56mV	Pass
60% Load	9.11mV	12.97mV	16.82mV	12.85mV	Pass
70% Load	10.03mV	4.85mV	8.54mV	5.12mV	Pass
80% Load	10.44mV	5.31mV	10.13mV	5.48mV	Pass
90% Load	9.67mV	5.46mV	9.77mV	5.32mV	Pass
100% Load	15.24mV	6.05mV	9.97mV	5.55mV	Pass
110% Load	15.05mV	6.58mV	10.47mV	5.81mV	Pass
Crossload1	7.63mV	6.16mV	9.35mV	4.82mV	Pass
Crossload2	8.55mV	7.15mV	7.16mV	4.45mV	Pass
Crossload3	62.84mV	6.23mV	14.83mV	6.55mV	Pass
Crossload4	14.23mV	5.24mV	8.60mV	5.26mV	Pass

The results above are not used in the certification process

Thermaltake Toughpower GF3 1200W



Top side



Power specifications label

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