Thermaltake Toughpower GF A3 850W (HKC)

Serial Number PSTPD0850FNFAGCHPA000154

Lab ID TT85002252

Certification ID 252252

Test Result Report ID: 23PS2252A

Certificate Issue Date: Oct 10, 2023

Scheme: ETA-EMI PSU

115V



230V



Scheme: LAMBDA PSU

115V



230V





Outside Validation Scope



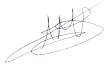
General Information

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 GF A3 850W (HKC)
OEM/ODM	HKC
Serial Number	PSTPD0850FNFAGCHPA000154
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240

Rated Current (Arms)	10
Rated Frequency (Hz)	50-60
Rated Power (W)	850
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Fluid Dynamic Bearing Fan [TT-1225 (BDH12025S)]
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	TT85002252
Date of receipt	Aug 17, 2023
Testing Date	Oct 5, 2023
Report Issued Date	Oct 10, 2023
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	18AWG	No
4+4 pin EPS12V (650mm+150mm)	1	2	18AWG	No
6+2 pin PCIe (500mm+150mm)	2	4	18AWG	No
12+4 pin PCIe (600mm) (450W)	1	1	18-26AWG	No

SATA (500mm+145mm+145mm+145mm)	2	8	18AWG	No
4-pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG	No
FDD Adapter (150mm)	1	1	22AWG	No
AC Power Cord (1380mm) - C13 coupler	1	1	18AWG	-

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	70.8	3	0.3
	Watts	100		849.6	15	3.6
Total Max. Power (W)		850				

Parts Description

General Data	
Manufacturer (OEM)	HKC
PCB Type	Double-Sided
Primary Side	
Transient Filter	6x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor 2.5D-15 (2.5 Ohm @ 25°C) & Relay
Bridge Rectifier(s)	2x Diodes GBU1506 (800V, 15A @ 125°C)
APFC MOSFETs	2x Lonten LSB65R099GT (650V, 26A @ 100°C, Rds(on): 0.099Ohm)
APFC Boost Diode	1x Global Power Tech. G3S06008J (600V, 8A @ 150°C)
Bulk Cap(s)	1x Rubycon (420V, 390uF , 3000h @ 105°C, MXK) 1x Nippon Chemi-Con (420V, 470uF , 2000h @ 105°C, KMZ)
Main Switchers	2x NCEPOWER NCE65TF130 (650V, 18A @ 100°C, Rds(on): 0.140Ohm)
APFC Controller	Champion CM6500UNX
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETs	6x Advanced Power Electronics AP4NA1R4CMT-A (45V, 39A @ 70°C, Rds(on): 1.4 mOhm)

5V & 3.3V	DC-DC Converters: 2x Advanced Power Electronics AP4024GEMT-HF (30V, 20.9A @ 70°C, Rds(on): 4.5mOhm) 2x Wayon WMB040N03LG2 (30V, 38A @ 100°C, Rds(on): 4.0mOhm) PWM Controller(s): 2x ANPEC APW7164
Filtering Capacitors	Electrolytic: 7x CapXon (3,000h @ 105°C, KF) 3x Teapo (3,000h @ 105°C, SC) Polymer:21x CapXon
Supervisor IC	IN1S3151 - SAG
Fan Model	TT-1225 (BDH12025S) (120mm, 12V, 0.3A, Sleeve Bearing Fan)
5VSB Circuit	
Rectifier	SB1045L (45V, 10A)
Standby PWM Controller	PN8141

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)	89.751%
Average Noise Output (>1450 Load Combinations)	28.46dBA
Average PF (>1450 Load Combinations)	0.984
Efficiency With 10W (≤500W) or 2% (>500W) Load	69.585%

Standby Power Consumption	0.0596W
Non-Accredited	
12V Ripple (Full Load)	39.01mV
5V Ripple (Full Load)	17.92mV
3.3V Ripple (Full Load)	19.13mV
5VSB Ripple (Full Load)	11.98mV
12V Load Regulation	0.12%
5V Load Regulation	1.62%
3.3V Load Regulation	2.72%
5VSB Load Regulation	4.60%
Inrush Current	67.740A

230V

Accredited	
Average Efficiency (>1450 load combinations)	91.867%
Average Noise Output (>1450 Load Combinations)	28.31dBA
Average PF (>1450 Load Combinations)	0.943
Efficiency With 10W (≤500W) or 2% (>500W) Load	68.343%
Standby Power Consumption	0.1158W
Non-Accredited	
12V Ripple (Full Load)	39.79mV
5V Ripple (Full Load)	17.94mV
3.3V Ripple (Full Load)	19.06mV
5VSB Ripple (Full Load)	13.85mV
12V Load Regulation	0.17%
5V Load Regulation	1.64%
3.3V Load Regulation	2.81%
5VSB Load Regulation	4.75%
Inrush Current	130.210A
12V Transient Response (200%)	11.59V
5V Transient Response (200%)	4.913V
3.3V Transient Response (200%)	3.177V

5VSB Transient Response (200%)		4.878V
Hold-Up Time & PWR_OK Signal		24.50ms
AC Loss to PWR_OK Hold Up Time		20.60ms
PWR_OK Inactive to DC Loss Delay		3.90ms
PSU Timings: T1 (20% / 100%)	91.0ms	91.0ms
PSU Timings: T3 (20% / 100%)	132.0ms	131.0ms
OPP (26.84°C / 40.05°C)	138.46%	123.45%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	24.5
AC Loss to PWR_OK Hold Up Time (ms)	20.6
PWR_OK Inactive to DC Loss Delay (ms)	3.9

Vampire Power

Tables

115V

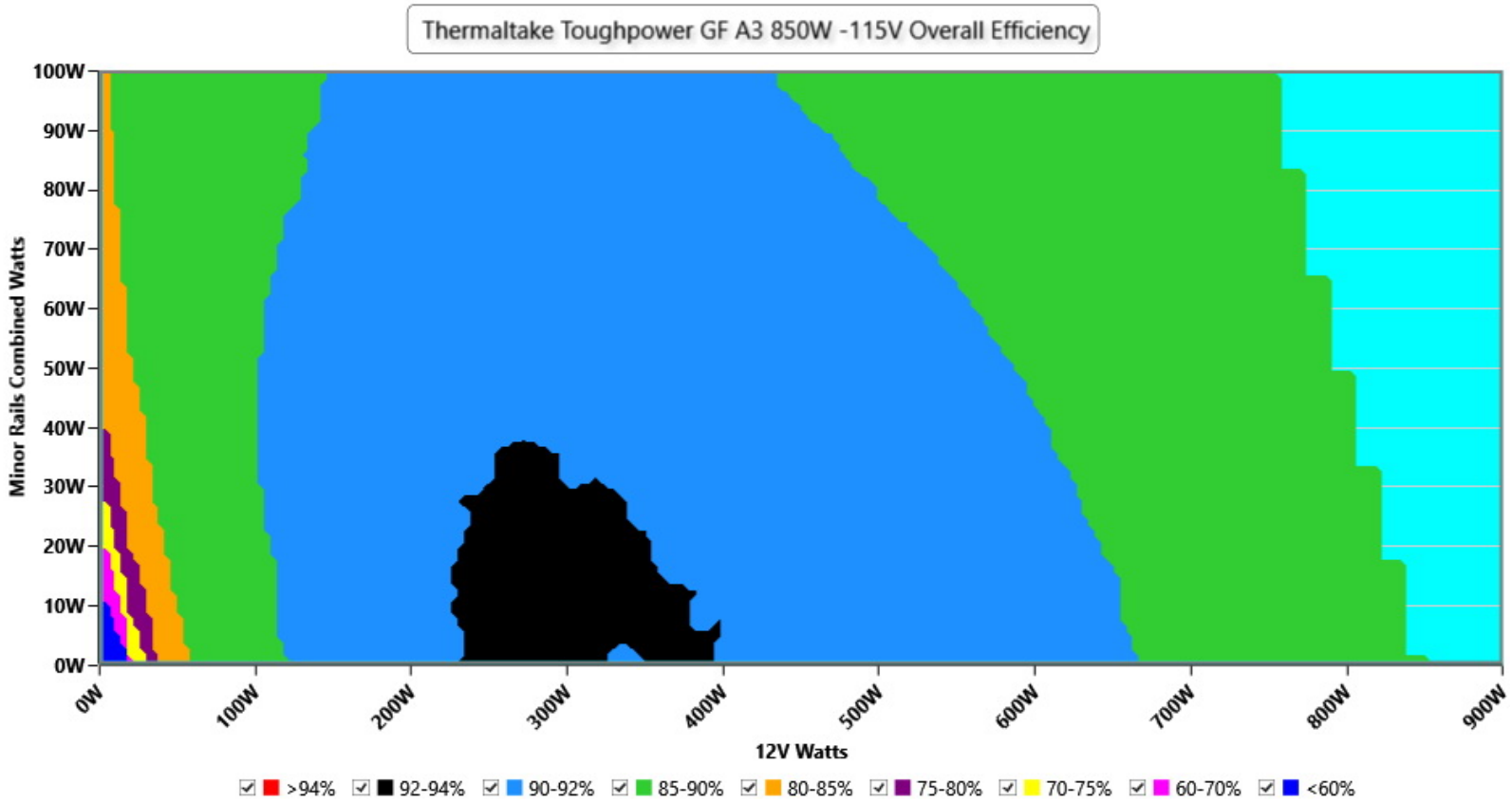
Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	114.88 V	114.84 V	113.85 V	114.92 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.99 Hz	59.40 Hz	60.01 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.416	1.415	1.340	1.418	1.490	PASS
Mains Voltage THD:	0.14 %	0.11 %	N/A	0.17 %	2.00 %	PASS
Real Power:	0.060 W	-0.002 W	N/A	0.099 W	N/A	N/A
Apparent Power:	10.962 W	10.935 W	N/A	10.993 W	N/A	N/A
Power Factor:	0.006	N/A	N/A	N/A	N/A	N/A

230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	229.97 V	229.90 V	227.70 V	229.99 V	232.30 V	PASS
Mains Frequency:	50.00 Hz	50.00 Hz	49.50 Hz	50.00 Hz	50.50 Hz	PASS
Mains Voltage CF:	1.416	1.415	1.340	1.416	1.490	PASS
Mains Voltage THD:	0.13 %	0.11 %	N/A	0.16 %	2.00 %	PASS
Real Power:	0.116 W	0.069 W	N/A	0.184 W	N/A	N/A
Apparent Power:	37.466 W	37.415 W	N/A	37.535 W	N/A	N/A
Power Factor:	0.003	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

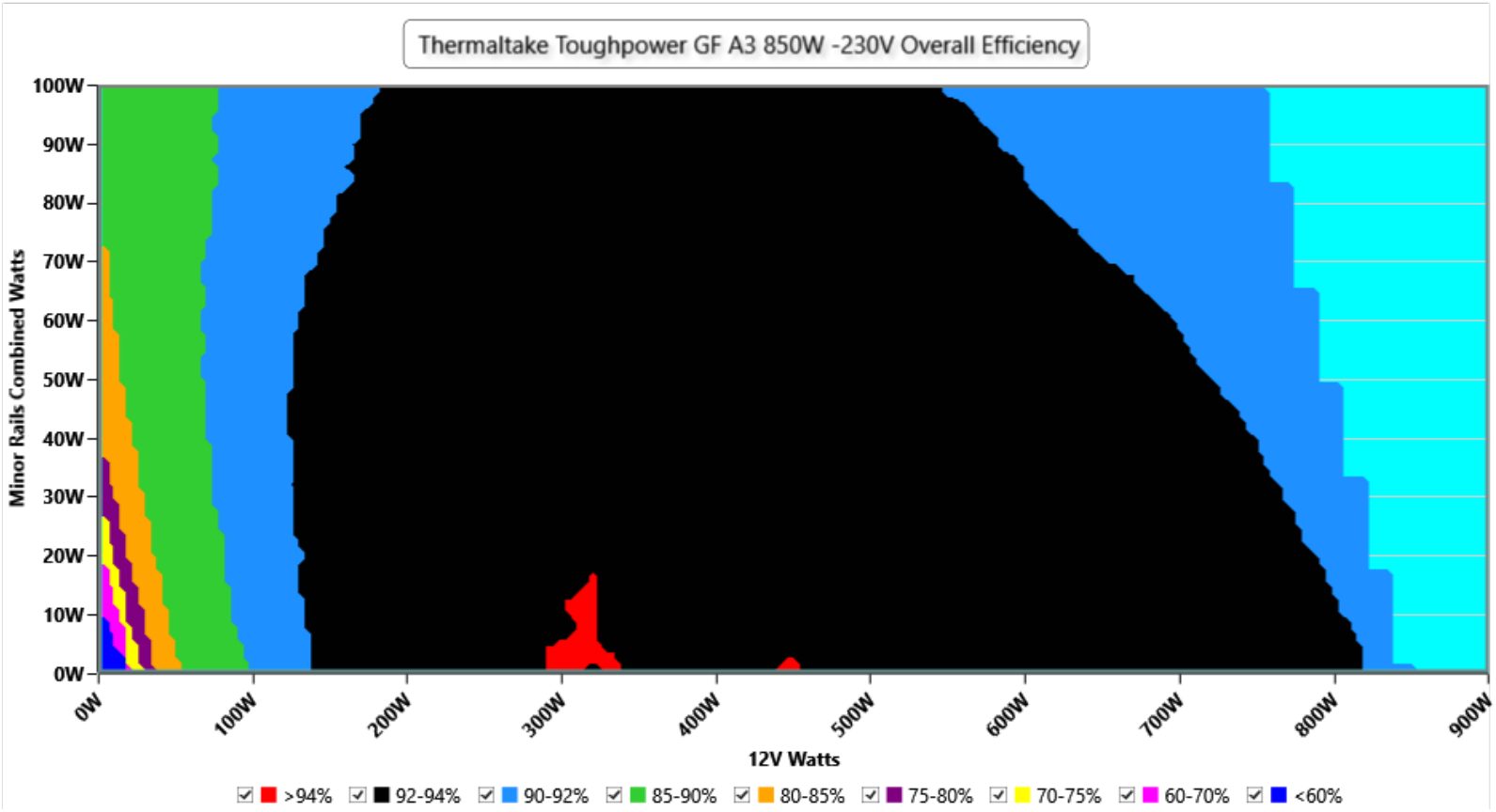
115V



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

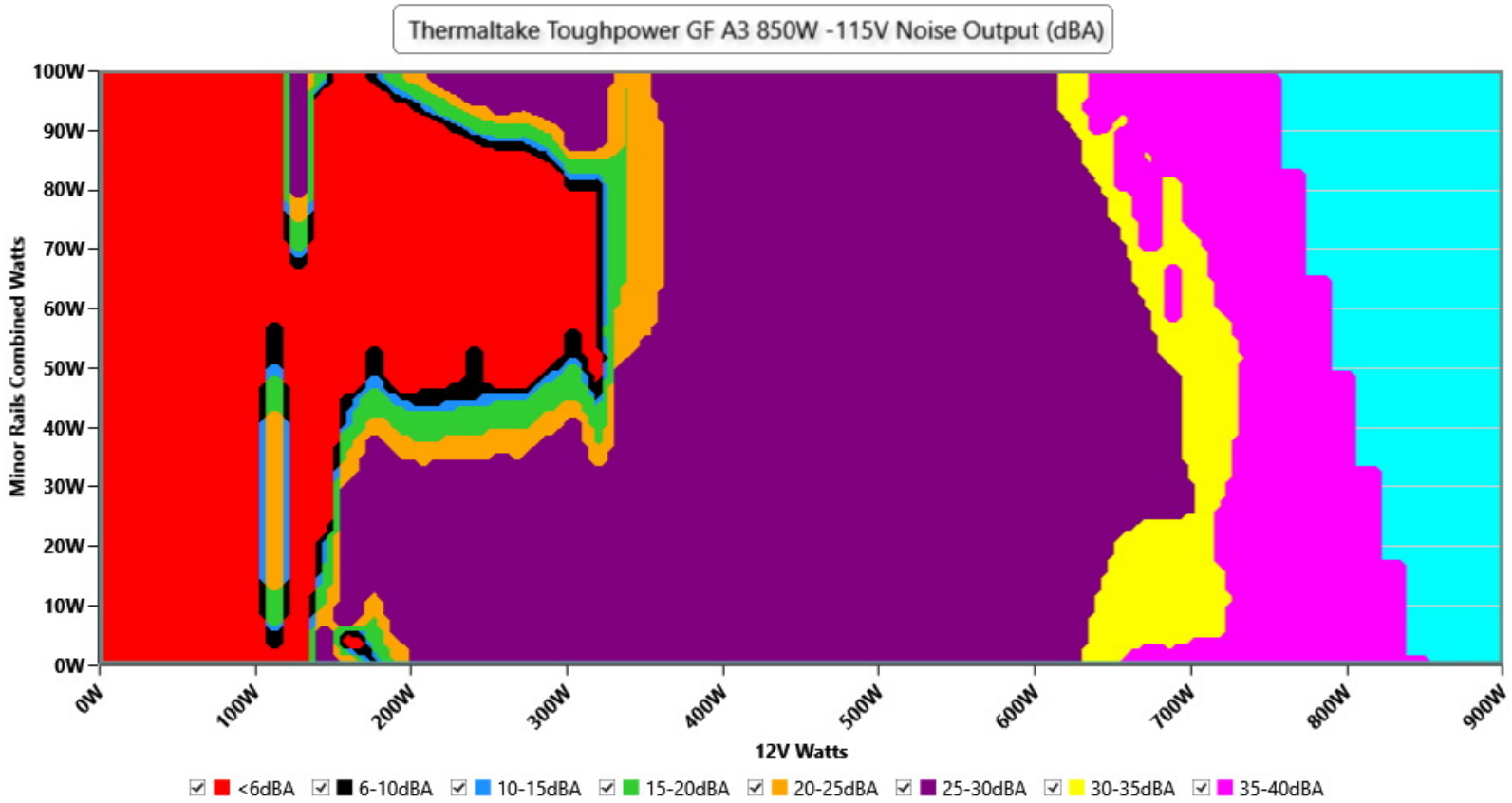


INFO

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

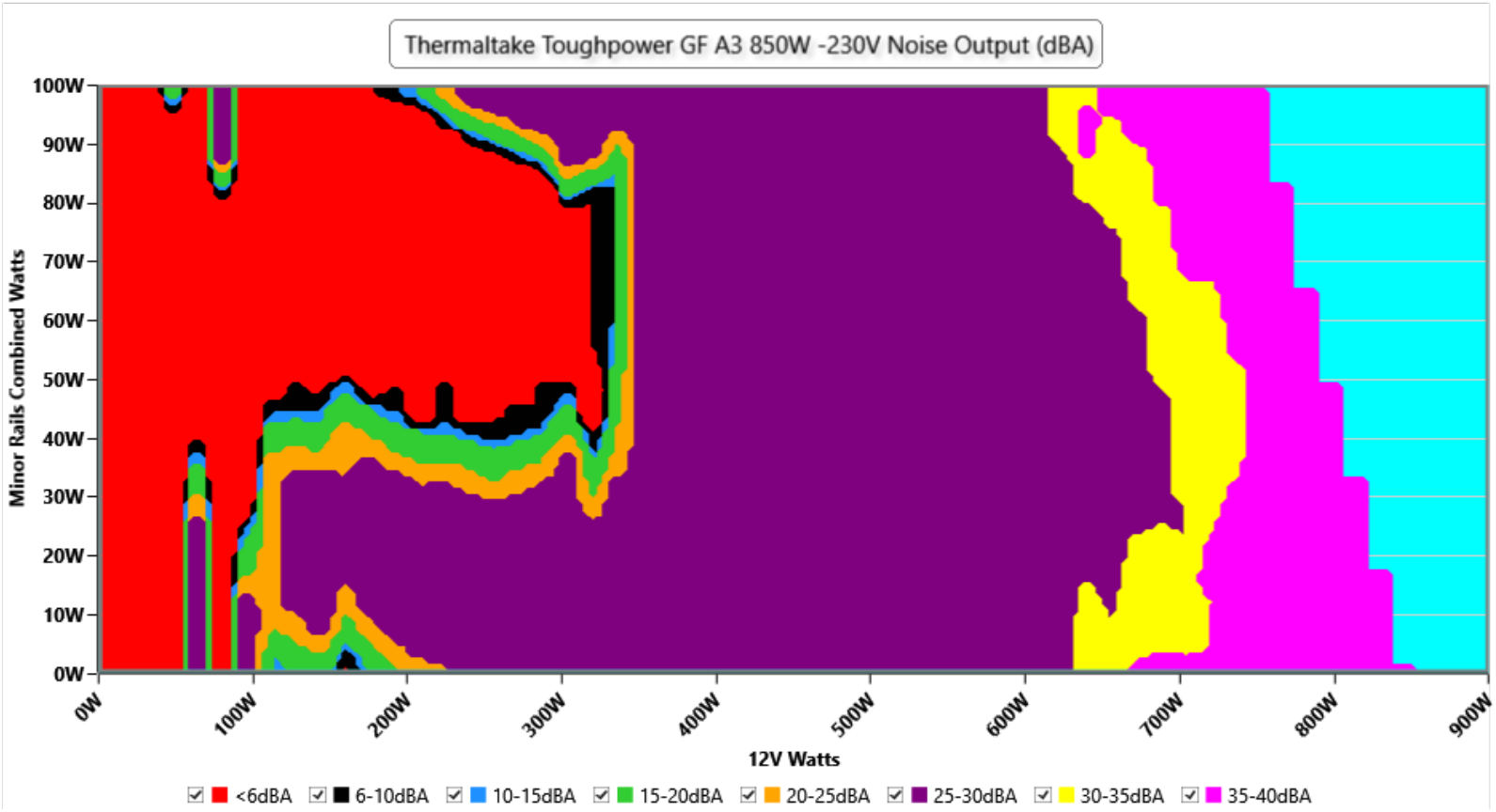
115V



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) · 44.2 °C	0 RPM · <6.0 dB(A) · 44.2 °C	fan off in both
20%	1040 RPM · 26.4 dB(A) · 40.7 °C	1040 RPM · 26.4 dB(A) · 40.7 °C	**+0.0 dB(A)**
50%	1044 RPM · 26.5 dB(A) · 42.1 °C	1044 RPM · 26.5 dB(A) · 42.1 °C	**+0.0 dB(A)**
100%	2160 RPM · 46.7 dB(A) · 45.1 °C	2160 RPM · 46.7 dB(A) · 45.1 °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) · 44.8 °C	0 RPM · <6.0 dB(A) · 44.8 °C	fan off in both
20%	983 RPM · 24.6 dB(A) · 40.7 °C	983 RPM · 24.6 dB(A) · 40.7 °C	**+0.0 dB(A)**
50%	1042 RPM · 26.4 dB(A) · 42.2 °C	1042 RPM · 26.4 dB(A) · 42.2 °C	**+0.0 dB(A)**
100%	1824 RPM · 42.2 dB(A) · 45.0 °C	1824 RPM · 42.2 dB(A) · 45.0 °C	**+0.0 dB(A)**

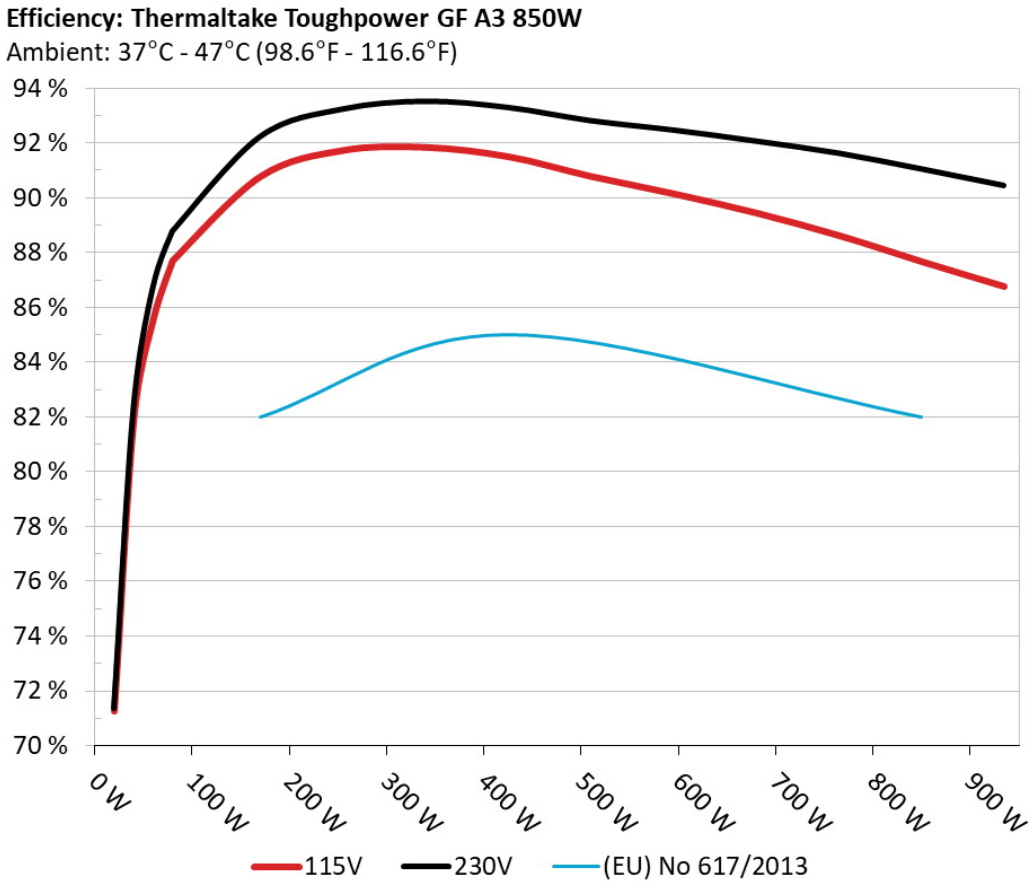
INFO

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: the fan is stopped or too quiet to measure (the fan speed column says which); 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

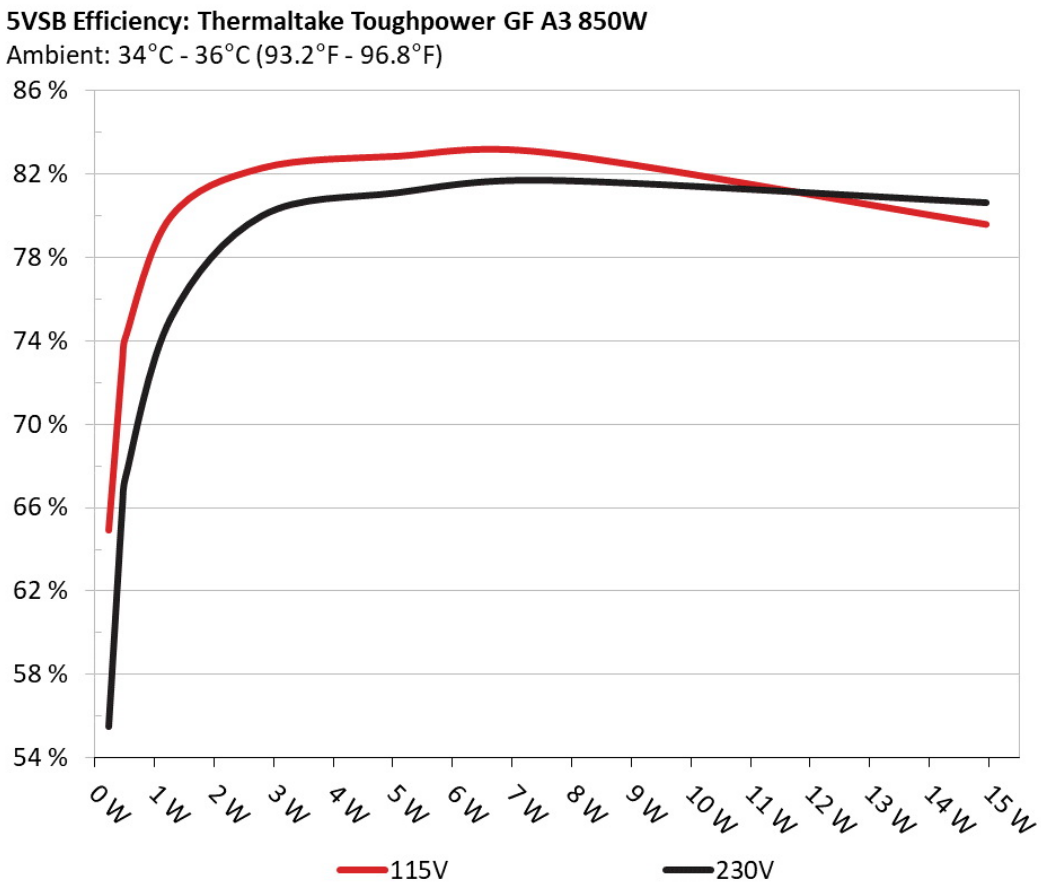
Efficiency under high ambient temperature



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	0.23W	64.442%	0.034
	5.107V	0.357W		114.86V
2	0.09A	0.459W	72.512%	0.06
	5.105V	0.633W		114.86V
3	0.55A	2.797W	81.762%	0.249
	5.085V	3.422W		114.87V
4	1A	5.067W	82.328%	0.326
	5.067V	6.154W		114.86V
5	1.5A	7.569W	82.5%	0.376
	5.046V	9.176W		114.87V
6	3A	14.946W	79.068%	0.445
	4.982V	18.903W		114.86V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	54.977%	0.012
	5.107V	0.419W		229.94V
2	0.09A	0.459W	65.607%	0.02
	5.105V	0.701W		229.94V
3	0.55A	2.797W	79.502%	0.096
	5.086V	3.519W		229.94V
4	1A	5.067W	80.612%	0.16
	5.067V	6.286W		229.93V
5	1.5A	7.569W	81.211%	0.204
	5.046V	9.32W		229.94V
6	3A	14.946W	80.139%	0.307
	4.982V	18.652W		229.94V

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%	5.203A	1.975A	1.967A	0.99A	85.002	87.719%	0	<6.0	44.23°C	0.974
	12.185V	5.065V	3.355V	5.05V	96.906				39.97°C	114.84V
20%	11.415A	2.968A	2.959A	1.192A	169.931	90.784%	1040	26.4	40.7°C	0.971
	12.180V	5.055V	3.346V	5.032V	187.181				45.39°C	114.81V
30%	17.980A	3.468A	3.461A	1.396A	254.924	91.745%	1041	26.5	41.46°C	0.979
	12.173V	5.047V	3.337V	5.015V	277.859				46.56°C	114.78V
40%	24.550A	3.969A	3.965A	1.601A	340.001	91.858%	1043	26.5	41.81°C	0.984
	12.171V	5.04V	3.329V	4.998V	370.142				47.39°C	114.75V
50%	30.751A	4.969A	4.969A	1.808A	424.777	91.517%	1044	26.5	42.13°C	0.988
	12.171V	5.032V	3.32V	4.979V	464.169				48.21°C	114.72V
60%	36.918A	5.973A	5.98A	2A	509.23	90.802%	1046	26.6	42.69°C	0.991
	12.176V	5.023V	3.311V	4.96V	560.811				49.24°C	114.69V
70%	43.153A	6.979A	6.997A	2.227A	594.61	90.162%	1251	32.1	43.39°C	0.993
	12.178V	5.015V	3.302V	4.94V	659.498				50.44°C	114.66V
80%	49.401A	7.99A	8.019A	2.335A	679.451	89.463%	1253	32.2	43.91°C	0.994
	12.177V	5.007V	3.292V	4.924V	759.476				51.98°C	114.63V
90%	56.039A	8.502A	8.528A	2.445A	764.923	88.632%	1576	38.5	44.39°C	0.995
	12.178V	4.998V	3.283V	4.908V	863.036				53.43°C	114.59V
100%	62.437A	9.018A	9.072A	3.081A	849.773	87.681%	2160	46.7	45.09°C	0.995
	12.173V	4.99V	3.274V	4.869V	969.167				55.17°C	114.56V
110%	68.706A	10.036A	10.202A	3.087A	934.336	86.772%	2165	46.7	46.64°C	0.996
	12.168V	4.982V	3.264V	4.859V	1076.767				57.57°C	114.53V
CL1	0.113A	11.933A	11.907A	0A	101.277	84.931%	1039	26.4	40.36°C	0.972
	12.185V	5.044V	3.334V	5.078V	119.242				45.88°C	114.84V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL2	0.113A	19.812A	0A	0A	101.363	83.544%	1038	26.3	40.35°C	0.971
	12.186V	5.046V	3.349V	5.084V	121.33				47.43°C	114.84V
CL3	0.113A	0A	19.809A	0A	67.376	78.908%	1038	26.3	40.35°C	0.97
	12.183V	5.059V	3.332V	5.081V	85.385				49.44°C	114.85V
CL4	69.814A	0A	0A	0.001A	849.498	88.789%	1448	36.1	45.06°C	0.995
	12.168V	5.011V	3.296V	5.025V	956.765				56.03°C	114.57V

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%	5.206A	1.975A	1.967A	0.99A	85.001	88.796%	0	<6.0	44.77°C	0.815
	12.180V	5.065V	3.355V	5.049V	95.728				40.49°C	229.93V
20%	11.418A	2.968A	2.959A	1.193A	169.94	92.244%	983	24.6	40.71°C	0.907
	12.177V	5.055V	3.345V	5.03V	184.232				45.39°C	229.91V
30%	17.986A	3.468A	3.462A	1.397A	254.947	93.258%	986	24.7	41.33°C	0.941
	12.170V	5.046V	3.336V	5.012V	273.377				46.39°C	229.9V
40%	24.561A	3.97A	3.967A	1.602A	340.036	93.543%	1040	26.4	41.82°C	0.954
	12.167V	5.038V	3.327V	4.994V	363.51				47.41°C	229.88V
50%	30.773A	4.971A	4.974A	1.809A	424.88	93.318%	1042	26.4	42.17°C	0.963
	12.165V	5.03V	3.318V	4.975V	455.308				48.13°C	229.87V
60%	36.942A	5.976A	5.985A	2A	509.313	92.839%	1044	26.5	42.8°C	0.973
	12.170V	5.021V	3.308V	4.956V	548.596				49.36°C	229.85V
70%	43.176A	6.983A	7.002A	2.228A	594.634	92.493%	1225	31.6	43.37°C	0.976
	12.172V	5.013V	3.3V	4.936V	642.901				50.45°C	229.84V
80%	49.426A	7.994A	8.025A	2.337A	679.448	92.09%	1248	32.1	43.59°C	0.979
	12.171V	5.004V	3.289V	4.92V	737.809				51.63°C	229.83V
90%	56.076A	8.507A	8.536A	2.447A	764.901	91.646%	1445	36.1	44.04°C	0.981
	12.169V	4.995V	3.28V	4.904V	834.626				53.11°C	229.81V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
100%	62.469A	9.024A	9.082A	3.084A	849.742	91.072%	1824	42.2	45.04°C	0.983
	12.167V	4.987V	3.27V	4.864V	933.043				55.14°C	229.8V
110%	68.733A	10.045A	10.214A	3.091A	934.293	90.47%	2112	46.2	46.68°C	0.985
	12.164V	4.977V	3.26V	4.853V	1032.716				57.59°C	229.78V
CL1	0.113A	11.936A	11.91A	0A	101.279	86.003%	1040	26.4	40.28°C	0.853
	12.194V	5.043V	3.333V	5.076V	117.761				45.81°C	229.93V
CL2	0.113A	19.816A	0A	0A	101.362	84.667%	1039	26.4	39.98°C	0.856
	12.189V	5.046V	3.349V	5.083V	119.717				47.01°C	229.93V
CL3	0.113A	0A	19.817A	0A	67.375	79.698%	1038	26.3	40.82°C	0.789
	12.183V	5.058V	3.33V	5.08V	84.538				49.86°C	229.93V
CL4	69.844A	0A	0A	0.001A	849.465	92.002%	1445	36.1	45.33°C	0.983
	12.162V	5.009V	3.293V	5.023V	923.316				56.31°C	229.8V

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	1.219A	0.493A	0.491A	0.196A	19.996	71.25%	0	<6.0	39.75°C	0.87
	12.179V	5.071V	3.363V	5.093V	28.069				36.64°C	114.86V
40W	2.684A	0.69A	0.687A	0.295A	39.998	81.933%	0	<6.0	41.01°C	0.927
	12.180V	5.069V	3.361V	5.087V	48.819				37.53°C	114.86V
60W	4.148A	0.888A	0.884A	0.394A	60	85.564%	0	<6.0	41.91°C	0.953
	12.182V	5.067V	3.359V	5.08V	70.124				38.13°C	114.85V
80W	5.608A	1.086A	1.081A	0.493A	79.949	87.938%	0	<6.0	42.99°C	0.973
	12.184V	5.066V	3.358V	5.073V	90.915				39.01°C	114.84V

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	1.220A	0.493A	0.491A	0.196A	19.994	71.368%	0	<6.0	39.68°C	0.482
	12.159V	5.069V	3.362V	5.095V	28.01				36.62°C	229.95V
40W	2.688A	0.691A	0.687A	0.295A	39.994	82.326%	0	<6.0	40.99°C	0.644
	12.163V	5.068V	3.36V	5.088V	48.581				37.7°C	229.95V
60W	4.152A	0.888A	0.884A	0.394A	59.995	86.738%	0	<6.0	42.1°C	0.741
	12.167V	5.067V	3.359V	5.081V	69.172				38.58°C	229.94V
80W	5.612A	1.086A	1.081A	0.493A	79.936	88.973%	0	<6.0	42.87°C	0.802
	12.171V	5.065V	3.357V	5.074V	89.841				39.06°C	229.93V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	8.25mV	10.77mV	8.07mV	4.39mV	Pass
20% Load	11.19mV	11.03mV	8.94mV	4.75mV	Pass
30% Load	13.30mV	12.41mV	9.31mV	5.63mV	Pass
40% Load	18.20mV	12.05mV	10.76mV	6.24mV	Pass
50% Load	22.84mV	12.83mV	11.48mV	6.87mV	Pass
60% Load	21.55mV	14.73mV	13.14mV	7.64mV	Pass
70% Load	25.06mV	14.17mV	13.91mV	8.36mV	Pass
80% Load	26.96mV	14.99mV	15.10mV	9.03mV	Pass
90% Load	29.80mV	15.97mV	15.93mV	9.70mV	Pass
100% Load	39.01mV	17.92mV	19.13mV	11.98mV	Pass
110% Load	42.19mV	20.11mV	20.54mV	12.89mV	Pass
Crossload1	17.10mV	15.48mV	13.16mV	8.39mV	Pass
Crossload2	15.93mV	17.88mV	12.00mV	8.51mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
Crossload3	11.60mV	12.78mV	12.00mV	11.66mV	Pass
Crossload4	35.74mV	15.74mV	17.61mV	13.55mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	7.68mV	10.35mV	7.81mV	3.97mV	Pass
20% Load	11.70mV	12.88mV	9.57mV	5.63mV	Pass
30% Load	14.44mV	12.00mV	11.53mV	6.25mV	Pass
40% Load	18.61mV	12.47mV	11.07mV	6.81mV	Pass
50% Load	21.91mV	13.03mV	11.94mV	7.59mV	Pass
60% Load	22.12mV	14.89mV	13.50mV	8.05mV	Pass
70% Load	24.49mV	14.79mV	14.27mV	9.91mV	Pass
80% Load	27.74mV	15.35mV	15.72mV	9.81mV	Pass
90% Load	30.31mV	17.83mV	16.60mV	10.63mV	Pass
100% Load	39.79mV	17.94mV	19.06mV	13.85mV	Pass
110% Load	43.85mV	19.54mV	19.94mV	13.99mV	Pass
Crossload1	17.78mV	15.27mV	12.67mV	9.18mV	Pass
Crossload2	16.19mV	18.45mV	11.94mV	8.83mV	Pass
Crossload3	12.22mV	12.57mV	11.33mV	8.52mV	Pass
Crossload4	36.12mV	14.85mV	17.07mV	13.74mV	Pass

The results above are not used in the certification process

Thermaltake Toughpower GF A3 850W (HKC)



Top side



Power specifications label

All data and graphs included in this test report can be used by any individual on the following conditions:

› It should be mentioned that the test results are provided by Cybenetics

› The link to the original test results document should be provided in any case

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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