Thermaltake Toughpower iRGB Plus 1200W Platinum

Serial Number PSTPI1200F2FDPU1AL000004

Lab ID 198

Certification ID 25198

Test Result Report ID:

Certificate Issue Date: Oct 17, 2018

Scheme: ETA-EMI PSU

115V



230V



115V



230V



Scheme: LAMBDA PSU



Aristeidis Bitziopoulos, Certification Body General Manager

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 iRGB Plus 1200W Platinum
OEM/ODM	Channel Well Technology
Serial Number	PSTPI1200F2FDPU1AL000004
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	14
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	140mm HDB RGB Fan (TT-1425/A1425S12S)
Semi-Passive Operation	✓ (selectable)
Cybenetics Testing Information	
Lab ID	198
Date of receipt	Oct 2, 2018
Testing Date	Oct 13, 2018
Report Issued Date	Oct 17, 2018
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
ATX connector 20+4 pin (600mm)	1	1	16AWG
4+4 pin EPS12V (650mm)	1	1	16AWG
8 pin EPS12V (650mm)	1	1	16AWG
6+2 pin PCIe (500mm+150mm)	4	8	16-18AWG
SATA (500mm+150mm+150mm+150mm)	3	12	18AWG
4 pin Molex (500mm+150mm+150mm+150mm)	2	8	18AWG
FDD Adapter (+100mm)	1	1	22AWG
USB Cable (+600mm)	1	1	24-28AWG

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	100	3	0.3
	Watts	130		1200	15	3.6
Total Max. Power (W)		1200				

Parts Description

General Data	
Manufacturer (OEM)	CWT
Platform Model	-
Primary Side	
Transient Filter	6x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x CM02X
Inrush Protection	NTC Thermistor & Relay
Bridge Rectifier(s)	2x Vishay LVB2560 (600V, 25A @ 105°C)
APFC MOSFETS	2x Toshiba TK25A60X (600V, 25A @ 150°C, 0.105Ohm)
APFC Boost Diode	2x CREE C3D10060A (600V, 10A @ 153°C)
Hold-up Cap(s)	2x Nichicon (400V, 680uF, 2000h @ 105°C, GG)
Main Switchers	4x A25N60EFL
Driver ICs	2x Silicon Labs Si8230BD
APFC MCU	Texas Instruments UCD3138A (31.25 MHz, 32-bit ARM7TDMI-S Processor, 32KB Flash, 4KB RAM, 3x Feedback loop control, 14-bit DAC, up to 2 MHz switching frequency)
USB Interface MCU	Microchip PIC32MX230F064D (40 MHz, 64KB Flash, 13x analog channels, 10-bit ADC)
LLC Resonant MCU	Texas Instruments UCD3138A (31.25 MHz, 32-bit ARM7TDMI-S Processor, 32KB Flash, 4KB RAM, 3x Feedback loop control, 14-bit DAC, up to 2 MHz switching frequency)
Topology	Primary side: Interleaved PFC, Full-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	8x Infineon BSC014N06NS (60V, 100A @ 100°C, 1.45mOhm)
5V & 3.3V	DC-DC Converters: 5x FETS PWM Controller: 1x
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (1-5,000 @ 105°C, KZE), Nippon Chemi-Con (4-10,000 @ 105°C, KY) Polymers: CapXon & Suscon

Supervisor IC	Weltrend WT751002 (OVP, UVP, PG) & LM358
Fan Model	Thermaltake TT-1425 (Hong Sheng OEM, A1425S12S-2, 140mm, 12V, 0.70A, hydro dynamic bearing, RGB LED Lighting)
5VSB Circuit	
Rectifiers	ISD04N65A (650V, 4A, 2.5Ohm), SPN5003 (N-Channel Enhancement Mode FET) & PS1045L SBR
Driver IC	Texas Instruments UCC27324
PWM Controller	On-Bright OB5282CP

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	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	89.708%
Average Noise Output (>1450 Load Combinations)	32.10dBA
Average PF (>1450 Load Combinations)	0.993
Efficiency With 10W (≤500W) or 2% (>500W) Load	-
Standby Power Consumption	0.0404W
Non-Accredited	
12V Ripple (Full Load)	21.82mV
5V Ripple (Full Load)	13.00mV
3.3V Ripple (Full Load)	17.34mV
5VSB Ripple (Full Load)	13.44mV
12V Load Regulation	0.37%
5V Load Regulation	0.45%
3.3V Load Regulation	0.81%

5VSB Load Regulation	1.33%
Inrush Current	32.013A

230V

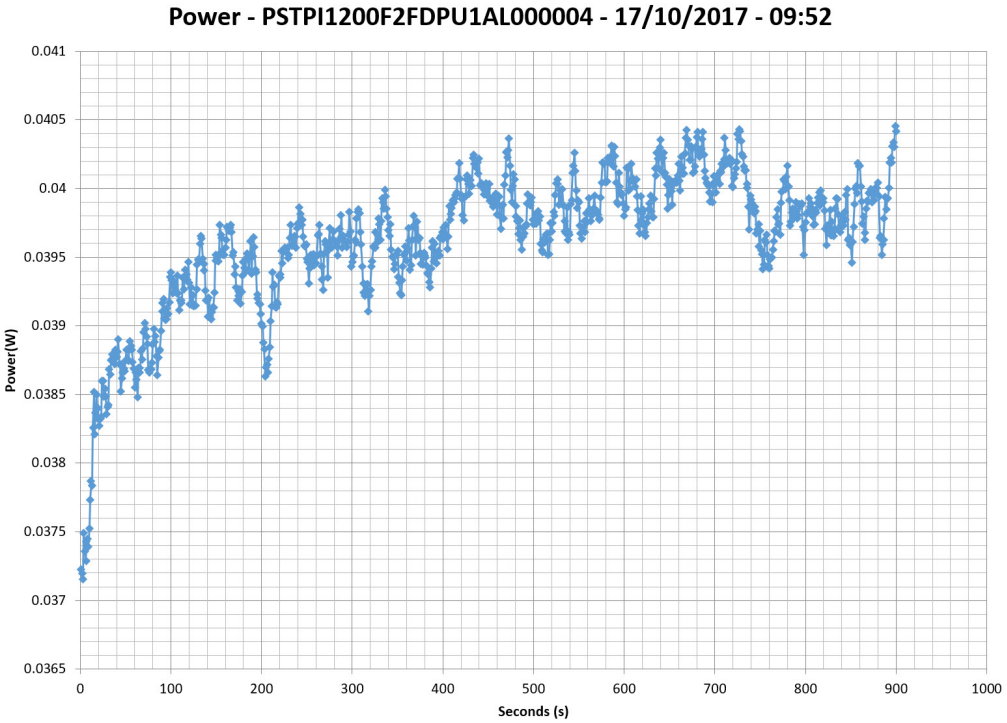
Accredited		
Average Efficiency (>1450 load combinations)	91.721%	
Average Noise Output (>1450 Load Combinations)	31.47dBA	
Average PF (>1450 Load Combinations)	0.936	
Efficiency With 10W (≤500W) or 2% (>500W) Load	-	
Standby Power Consumption	0.0588W	
Non-Accredited		
12V Ripple (Full Load)	23.21mV	
5V Ripple (Full Load)	11.17mV	
3.3V Ripple (Full Load)	15.16mV	
5VSB Ripple (Full Load)	9.28mV	
12V Load Regulation	0.61%	
5V Load Regulation	0.34%	
3.3V Load Regulation	0.69%	
5VSB Load Regulation	1.07%	
Inrush Current	65.320A	
Hold-Up Time & PWR_OK Signal	18.20ms	
AC Loss to PWR_OK Hold Up Time	22.40ms	
PWR_OK Inactive to DC Loss Delay	-4.20ms	
OPP (0.00°C / 0.00°C)	-	-

Hold-Up Time & PWR_OK Signal

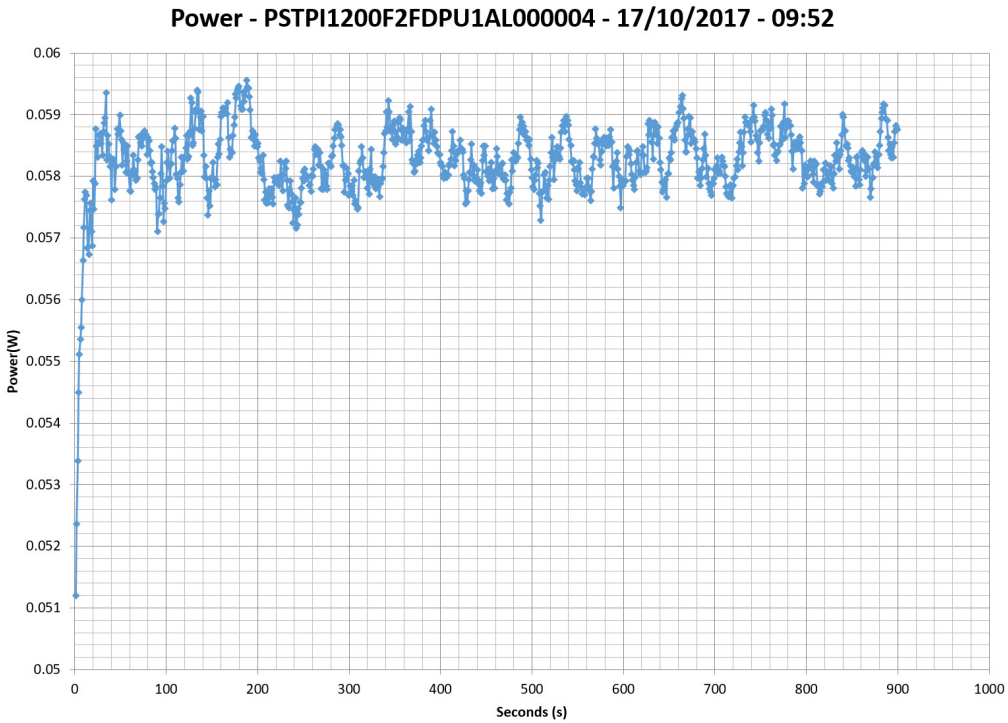
Hold-Up Time (ms)	18.2
AC Loss to PWR_OK Hold Up Time (ms)	22.4
PWR_OK Inactive to DC Loss Delay (ms)	-4.2

Graphs

115V

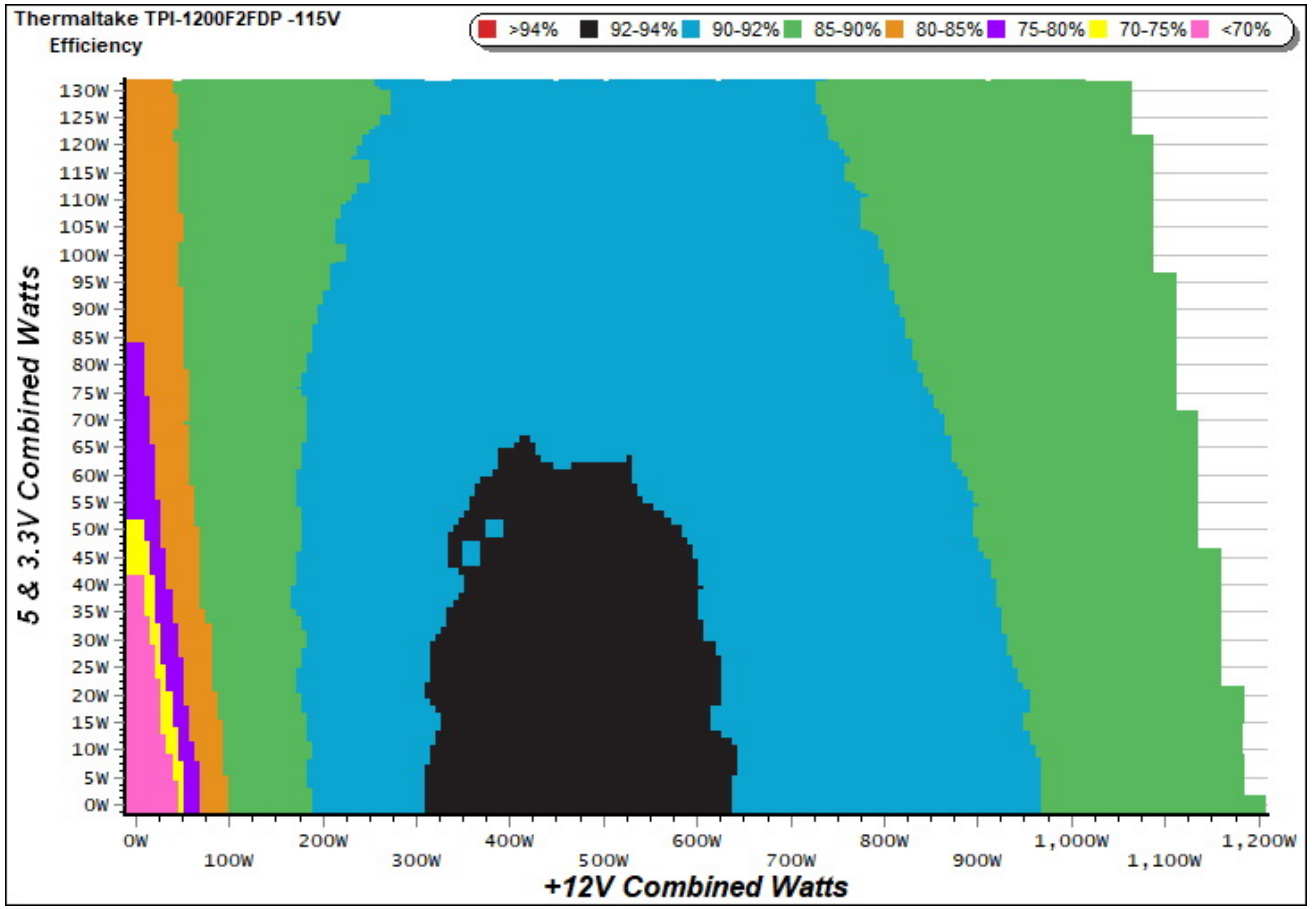


230V



Efficiency Graph

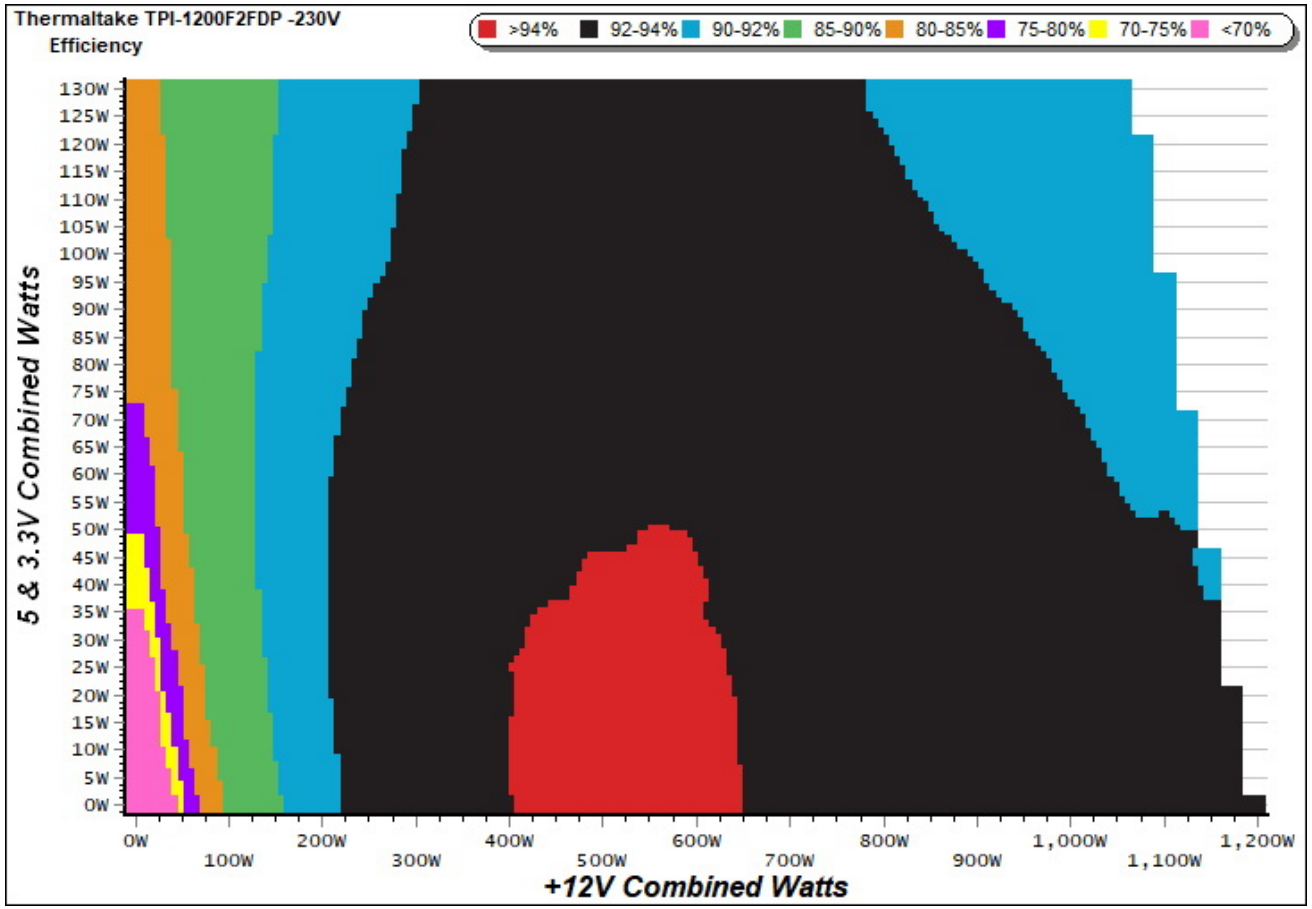
115V



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

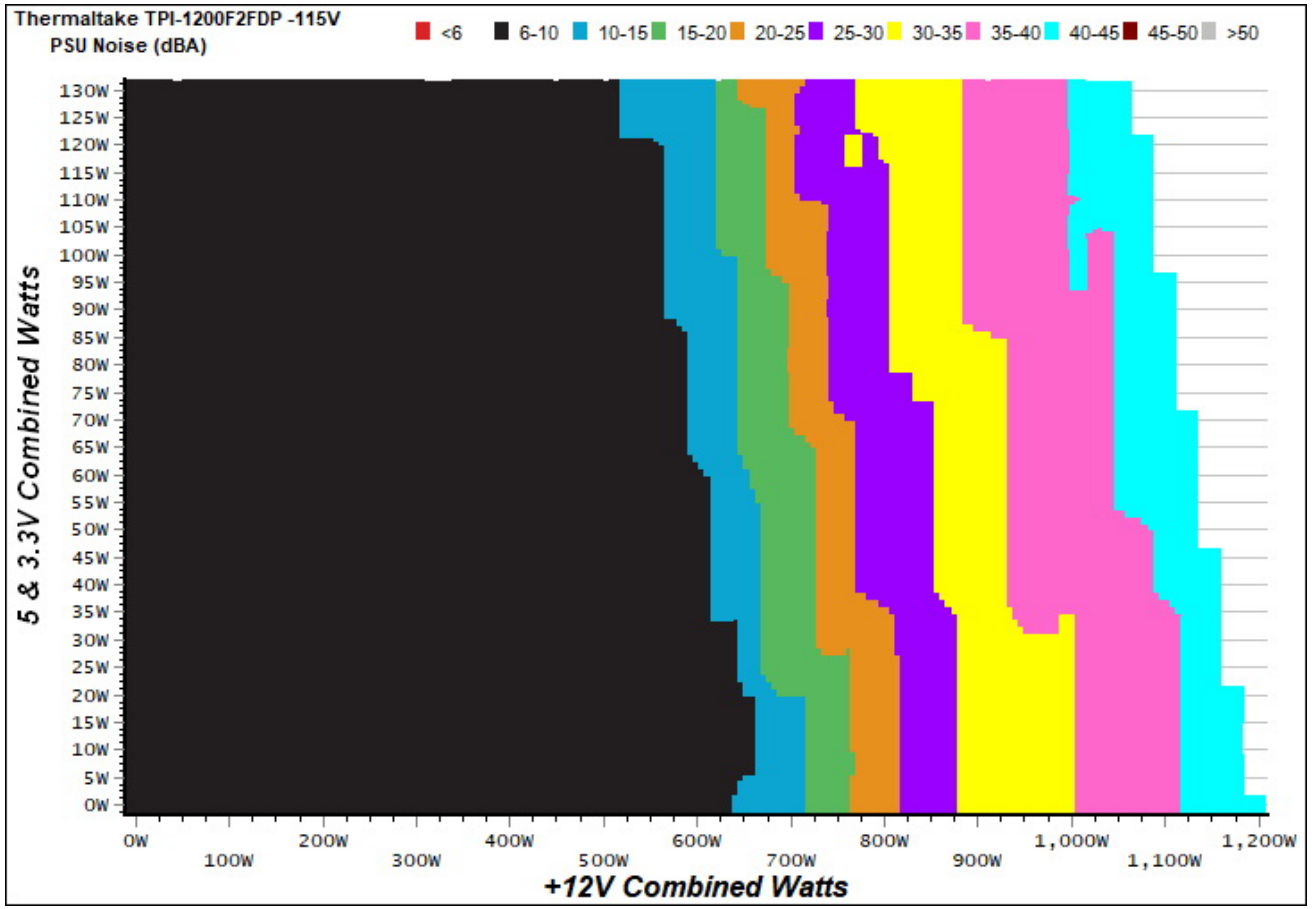


INFO

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

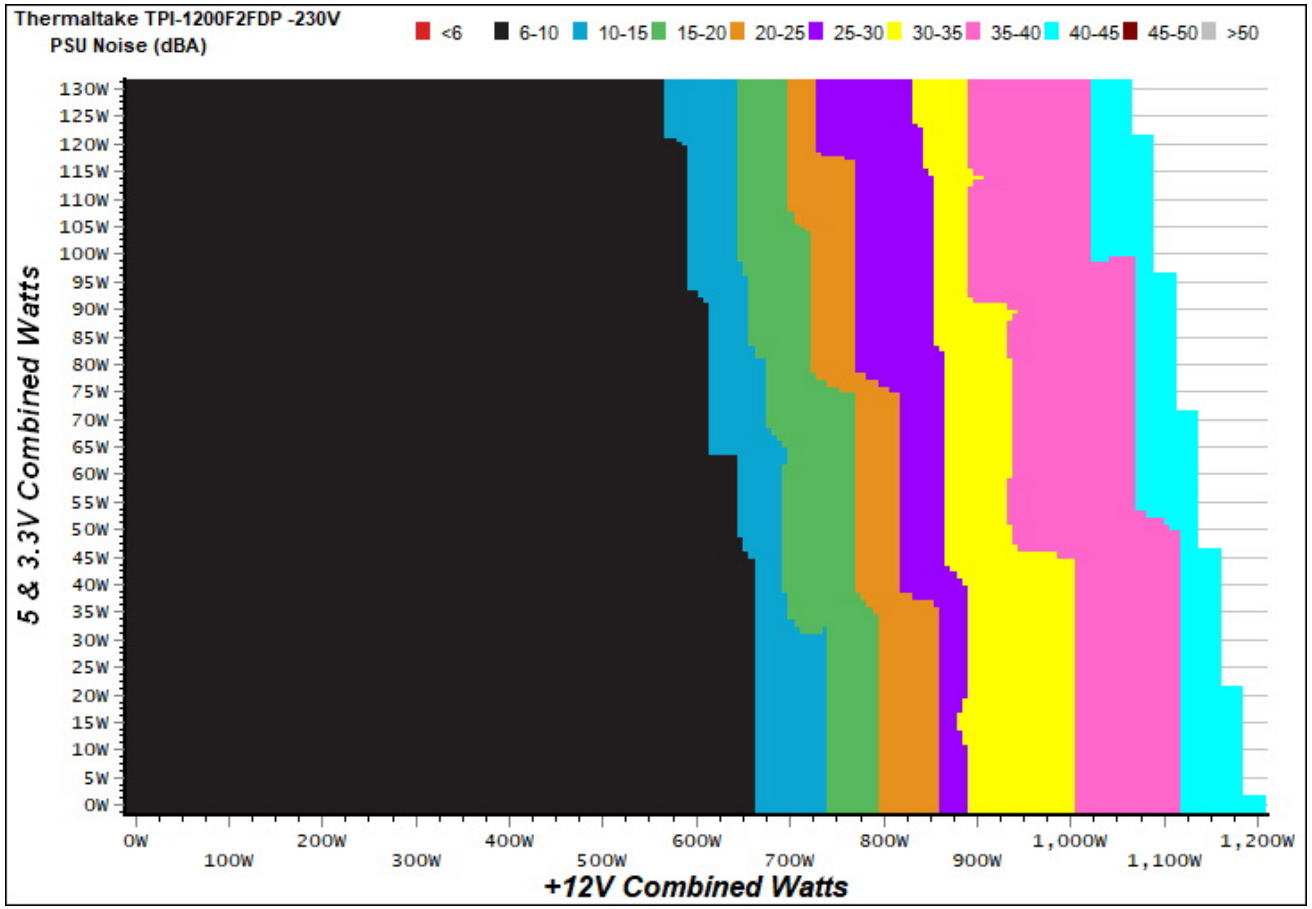
115V



INFO

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

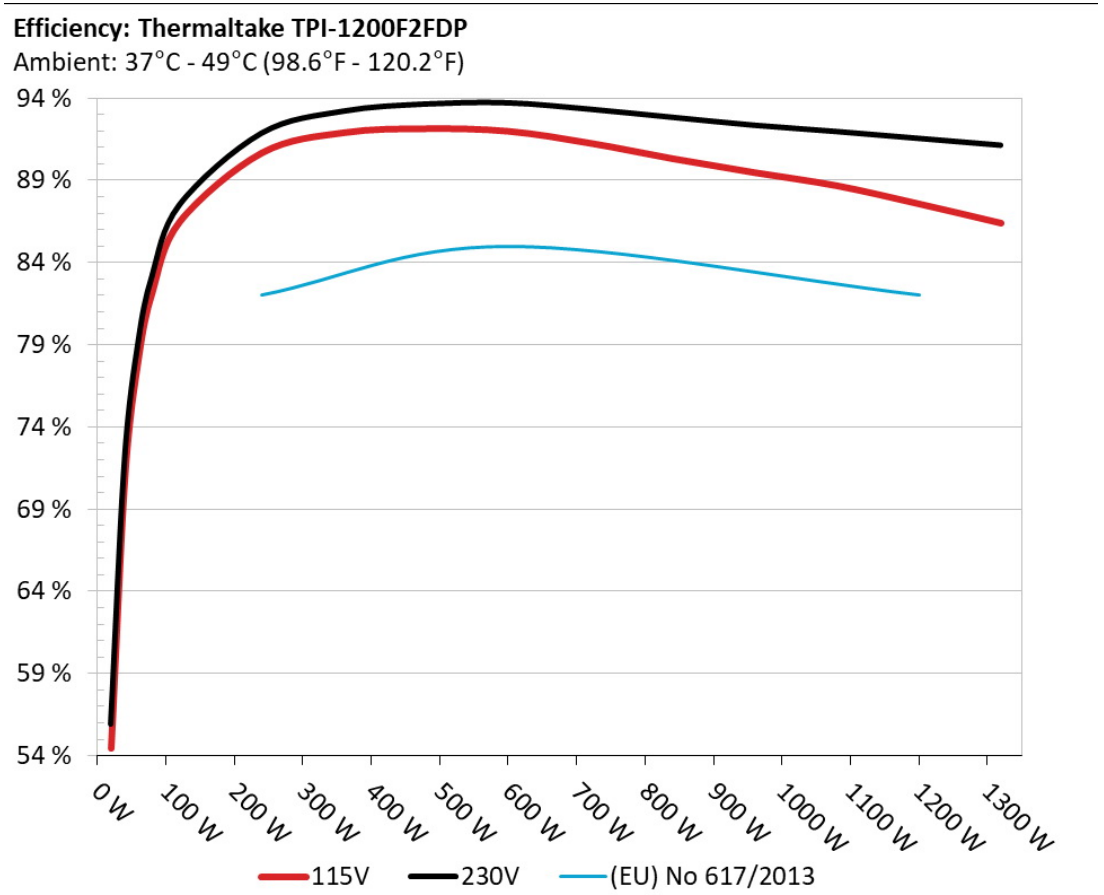


INFO

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.

Indicative Performance

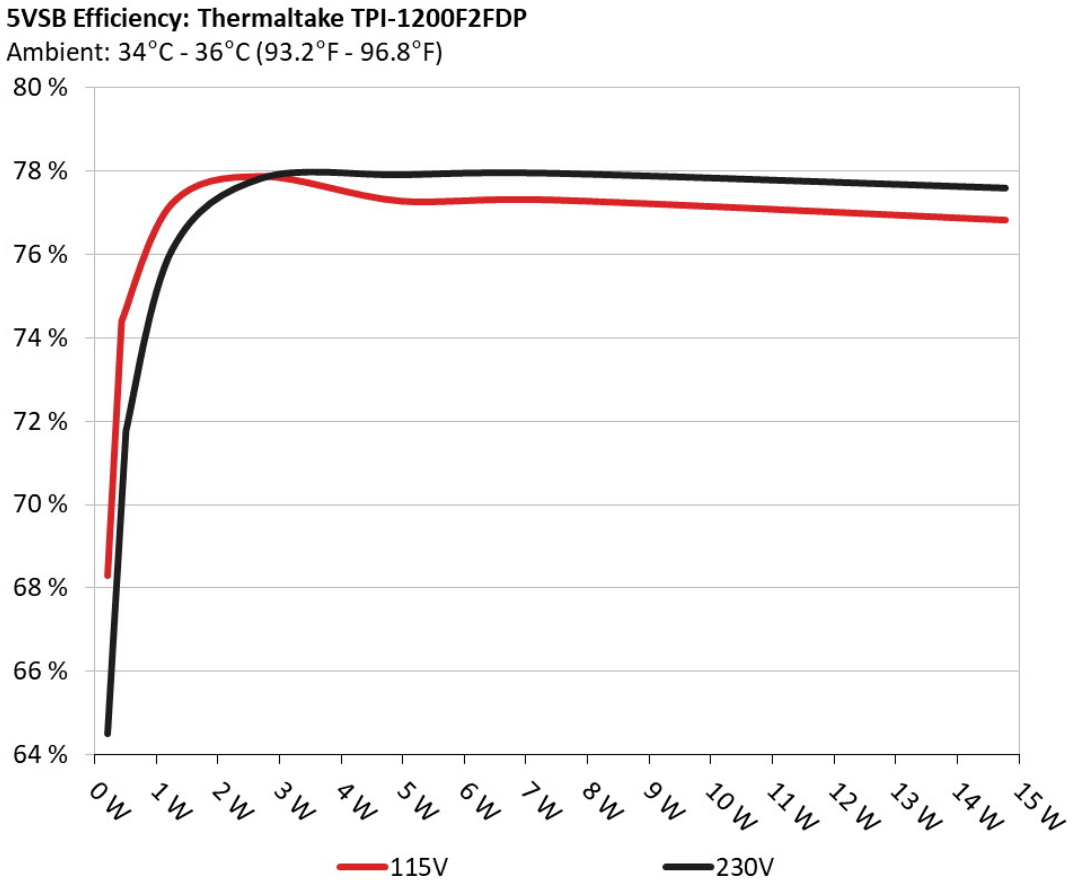
Efficiency under high ambient temperature



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	0.042A	0.209	68.301%	0.031
	4.984V	0.306		115.05V
2	0.087A	0.436	74.403%	0.057
	4.983V	0.586		115.05V
3	0.542A	2.697	77.880%	0.270
	4.972V	3.463		115.05V
4	1.002A	4.975	77.288%	0.382
	4.963V	6.437		115.06V
5	1.502A	7.440	77.315%	0.442
	4.954V	9.623		115.06V
6	3.002A	14.779	76.834%	0.506
	4.923V	19.235		115.06V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.209	64.506%	0.010
	4.985V	0.324		230.24V
2	0.087A	0.435	71.782%	0.018
	4.984V	0.606		230.24V
3	0.543A	2.698	77.819%	0.099
	4.973V	3.467		230.23V
4	1.002A	4.975	77.905%	0.169
	4.964V	6.386		230.24V
5	1.502A	7.441	77.941%	0.230
	4.954V	9.547		230.24V
6	3.002A	14.778	77.587%	0.342
	4.923V	19.047		230.24V

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
1	8.172A	1.975A	1.985A	0.991A	119.795	86.464%	498	8.8	38.41°C	0.982
	12.020V	5.057V	3.319V	5.038V	138.549				43.96°C	115.10V
2	17.370A	2.959A	2.984A	1.191A	239.635	90.647%	499	8.8	38.90°C	0.994
	12.020V	5.055V	3.316V	5.034V	264.361				46.34°C	115.10V
3	26.937A	3.465A	3.499A	1.391A	359.820	91.879%	500	8.8	39.40°C	0.996
	12.018V	5.052V	3.313V	5.028V	391.622				49.46°C	115.10V
4	36.488A	3.962A	3.983A	1.591A	479.627	92.119%	502	8.8	40.09°C	0.996
	12.016V	5.050V	3.311V	5.023V	520.658				51.45°C	115.10V
5	45.704A	4.957A	4.985A	1.790A	599.583	91.963%	504	8.8	40.68°C	0.996
	12.014V	5.048V	3.308V	5.018V	651.982				53.30°C	115.11V
6	54.948A	5.945A	5.988A	1.993A	719.478	91.235%	653	14.6	41.94°C	0.997
	12.006V	5.045V	3.305V	5.013V	788.596				60.71°C	115.12V
7	64.214A	6.945A	6.989A	2.195A	839.348	90.301%	914	26.1	42.96°C	0.998
	11.995V	5.043V	3.303V	5.008V	929.502				67.15°C	115.12V
8	73.495A	7.934A	8.001A	2.396A	959.289	89.452%	1165	33.9	44.70°C	0.998
	11.986V	5.040V	3.300V	5.003V	1072.409				70.01°C	115.12V
9	83.193A	8.442A	8.519A	2.397A	1079.350	88.652%	1415	38.7	45.58°C	0.997
	11.981V	5.038V	3.298V	5.001V	1217.518				71.06°C	115.13V
10	92.650A	8.943A	9.014A	3.005A	1199.190	87.552%	1611	42.5	47.06°C	0.993
	11.975V	5.035V	3.294V	4.987V	1369.683				75.33°C	115.11V
11	102.722A	8.946A	9.020A	3.005A	1319.188	86.378%	1827	45.5	48.87°C	0.987
	11.969V	5.033V	3.293V	4.985V	1527.224				77.63°C	115.10V
CL1	0.098A	16.027A	16.003A	0.004A	135.506	82.158%	519	9.4	45.82°C	0.975
	12.018V	5.061V	3.324V	5.086V	164.933				64.06°C	115.14V

CL2	99.935A	1.003A	1.003A	1.002A	1210.713	87.862%	1628	42.6	47.40°C	0.992
	11.981V	5.039V	3.298V	5.020V	1377.965				74.97°C	115.11V

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
1	8.170A	1.972A	1.984A	0.992A	119.753	88.193%	438	7.6	38.76°C	0.827
	12.018V	5.058V	3.321V	5.043V	135.785				42.61°C	230.63V
2	17.360A	2.964A	2.983A	1.191A	239.484	92.325%	442	7.6	39.38°C	0.893
	12.016V	5.056V	3.318V	5.039V	259.391				43.60°C	230.65V
3	26.893A	3.461A	3.467A	1.391A	359.008	93.574%	442	7.6	39.86°C	0.921
	12.011V	5.055V	3.316V	5.035V	383.661				44.31°C	230.57V
4	36.502A	3.956A	3.982A	1.591A	479.471	93.934%	443	7.6	40.08°C	0.947
	12.007V	5.054V	3.313V	5.031V	510.436				46.12°C	230.48V
5	45.754A	4.948A	4.981A	1.790A	599.628	93.969%	442	7.6	40.96°C	0.955
	12.002V	5.052V	3.311V	5.028V	638.112				48.09°C	230.50V
6	55.040A	5.939A	5.982A	1.991A	719.782	93.558%	557	10.2	42.36°C	0.974
	11.991V	5.051V	3.309V	5.025V	769.347				50.33°C	230.40V
7	64.329A	6.933A	6.988A	2.192A	839.507	92.898%	809	21.5	42.79°C	0.982
	11.976V	5.048V	3.306V	5.020V	903.688				51.01°C	230.43V
8	73.685A	7.925A	7.990A	2.392A	960.047	92.286%	1006	28.9	44.05°C	0.983
	11.965V	5.048V	3.304V	5.018V	1040.296				52.65°C	230.33V
9	83.373A	8.423A	8.481A	2.393A	1079.411	91.839%	1293	36.7	45.42°C	0.984
	11.957V	5.047V	3.302V	5.017V	1175.335				54.86°C	230.23V
10	92.922A	8.923A	9.004A	2.999A	1199.762	91.421%	1496	40.2	46.10°C	0.985
	11.946V	5.044V	3.299V	5.003V	1312.355				55.82°C	230.21V
11	103.046A	8.926A	9.011A	3.000A	1319.883	90.904%	1683	43.3	47.20°C	0.986
	11.938V	5.043V	3.296V	5.002V	1451.950				57.00°C	230.14V
CL1	0.738A	16.004A	16.000A	0.000A	143.077	83.732%	442	7.6	44.84°C	0.783
	12.013V	5.061V	3.326V	5.097V	170.875				52.82°C	230.92V

CL2	100.011A	1.001A	1.000A	1.000A	1208.816	91.723%	1431	39.1	45.30°C	0.985
	11.953V	5.049V	3.301V	5.030V	1317.901				54.74°C	230.24V

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])	PF/AC Volts
1	1.217A	0.489A	0.479A	0.196A	19.675	54.464%	495	8.8	0.858
	12.013V	5.058V	3.321V	5.054V	36.125				115.10V
2	2.457A	0.980A	0.990A	0.395A	39.765	70.975%	496	8.8	0.927
	12.017V	5.058V	3.321V	5.050V	56.027				115.10V
3	3.697A	1.476A	1.503A	0.591A	59.873	78.261%	497	8.8	0.943
	12.019V	5.058V	3.320V	5.047V	76.504				115.10V
4	4.927A	1.974A	1.986A	0.791A	79.784	82.188%	497	8.8	0.965
	12.019V	5.058V	3.320V	5.043V	97.075				115.10V

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])	PF/AC Volts
1	1.179A	0.492A	0.478A	0.198A	19.243	56.761%	434	7.6	0.478
	12.014V	5.059V	3.323V	5.056V	33.902				230.68V
2	2.442A	0.985A	0.989A	0.396A	39.614	72.872%	438	7.6	0.618
	12.017V	5.059V	3.322V	5.053V	54.361				230.69V
3	3.642A	1.481A	1.469A	0.594A	59.145	79.995%	437	7.6	0.704
	12.019V	5.059V	3.322V	5.050V	73.936				230.66V
4	4.904A	1.974A	1.984A	0.793A	79.517	84.005%	438	7.6	0.765
	12.019V	5.058V	3.321V	5.046V	94.657				230.67V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.5 mV	5.1 mV	3.3 mV	4.5 mV	Pass
20% Load	16.0 mV	5.6 mV	3.8 mV	5.1 mV	Pass
30% Load	17.7 mV	6.1 mV	4.3 mV	5.6 mV	Pass
40% Load	16.3 mV	5.6 mV	5.0 mV	5.6 mV	Pass
50% Load	20.0 mV	5.9 mV	5.8 mV	5.8 mV	Pass
60% Load	18.3 mV	10.4 mV	10.8 mV	9.6 mV	Pass
70% Load	19.3 mV	6.8 mV	7.6 mV	6.6 mV	Pass
80% Load	19.9 mV	7.0 mV	8.8 mV	6.8 mV	Pass
90% Load	19.8 mV	16.2 mV	17.1 mV	16.2 mV	Pass
100% Load	21.8 mV	13.0 mV	17.3 mV	13.4 mV	Pass
110% Load	25.1 mV	10.6 mV	11.9 mV	11.6 mV	Pass
Crossload 1	12.7 mV	4.6 mV	5.0 mV	3.6 mV	Pass
Crossload 2	21.6 mV	10.8 mV	15.4 mV	11.2 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.9 mV	4.4 mV	4.1 mV	3.0 mV	Pass
20% Load	17.7 mV	5.4 mV	5.3 mV	3.5 mV	Pass
30% Load	18.6 mV	5.8 mV	5.4 mV	4.0 mV	Pass
40% Load	17.3 mV	6.9 mV	7.9 mV	5.4 mV	Pass
50% Load	20.7 mV	7.0 mV	7.1 mV	5.2 mV	Pass
60% Load	18.8 mV	7.4 mV	7.9 mV	5.4 mV	Pass
70% Load	20.4 mV	8.5 mV	8.6 mV	6.2 mV	Pass
80% Load	22.0 mV	8.8 mV	10.2 mV	6.8 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
90% Load	23.1 mV	14.1 mV	16.3 mV	12.1 mV	Pass
100% Load	23.2 mV	11.2 mV	15.2 mV	9.3 mV	Pass
110% Load	25.1 mV	11.0 mV	13.0 mV	9.4 mV	Pass
Crossload 1	20.8 mV	8.2 mV	7.7 mV	4.8 mV	Pass
Crossload 2	21.3 mV	9.5 mV	11.2 mV	9.0 mV	Pass

The results above are not used in the certification process

Thermaltake Toughpower iRGB Plus 1200W Platinum



Top side



Power specifications label