

Anex

Asus ROG Thor 1600T

Lab ID#: AS16001891
Receipt Date: Aug 25, 2021
Test Date: Aug 31, 2021

Report: 21PS1891A

Report Date: Sep 2, 2021

DUT INFORMATION

Brand	Asus ROG
Manufacturer (OEM)	Wentai
Series	Rog Thor
Model Number	ROG-THOR-1600T-GAMING
Serial Number	M7YENJ0001593Y4
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	15-7.5
Rated Frequency (Hz)	50-60
Rated Power (W)	1600
Type	ATX12V
Cooling	135mm Double Ball Bearing Fan (CF1325H12D)
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

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RESULTS

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

115V

Average Efficiency	91.726%
Efficiency With 10W (≤500W) or 2% (>500W)	73.817
Average Efficiency 5VSB	80.560%
Standby Power Consumption (W)	0.0607839
Average PF	0.994
Avg Noise Output	13.95 dB(A)
Efficiency Rating (ETA)	TITANIUM
Noise Rating (LAMBDA)	A++

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	133.3	3	0.3
	Watts	100		1600	15	3.6
Total Max. Power (W)		1600				

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

Hold-Up Time (ms)	22.3
AC Loss to PWR_OK Hold Up Time (ms)	19.1
PWR_OK Inactive to DC Loss Delay (ms)	3.2

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CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (610mm)	1	1	16-20AWG	No
4+4 pin EPS12V (660mm)	2	2	16AWG	No
6+2 pin PCIe (680mm)	4	4	16-20AWG	No
6+2 pin PCIe (690mm+80mm)	4	8	18-20AWG	No
SATA (400mm+120mm+120mm+120mm)	3	12	20AWG	No
4 pin Molex (450mm+120mm)	3	6	20AWG	No
RGB Cable (800mm)	1	1	22AWG	No
AC Power Cord (1300mm) - C19 coupler	1	1	14AWG	-

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General Data

Manufacturer (OEM)	Wentai
PCB Type	Double Sided

Primary Side

Transient Filter	6x Y caps, 3x X caps, 2x CM chokes, 1x MOV, 1x CAP200DG (Discharge IC)
Inrush Protection	1x NTC Thermistor SCK-105 (10 Ohm) & Relay
Bridge Rectifier(s) (Standby Mode)	5x GBJ25JL (600V, 25A @ 115°C)
Totem-Pole PFC MODFETs (HEMTs)	2x Transform TP65H050WS GaN FET (650V, 25A @ 100°C, Rds(on): 0.06Ohm)
Totem-Pole PFC Driver	2x On Semiconductor NCP81071 & 1x Champion CM03X (Phantom Power Remover)
Totem-pole PFC MOSFETs	4x Semihow HCA60R040 (600V, 43.5A @ 100°C, Rds(on): 0.04Ohm)
Boost Diode(s)	2x Cree C3D10060A (600V, 10A @ 153°C)
Bulk Cap(s)	5 x TK (400V, 470uF each or 2,350uF compined, 2,000h @ 105°C, LGW)
Main Switchers	4x Alpha & Omega AOTF29S50 (500V, 18A @ 100°C, Rds(on): 0.40Ohm)
IC Driver(s)	2x Silicon Labs Si8230BD
Primary DSC	2x Texas Instruments UCD3138A
Topology	Primary side: Digital Totem-Pole Bridgeless PFC, Full-Bridge & LLC converter Secondary side: Synchronous Rectification & Analogue Controlled DC-DC converters

Secondary Side

+12V MOSFETs	unknown number of FETs
5V & 3.3V	DC-DC Converters: 6x Excelliance MOS EMB04N03HR (30V, 45A @ 100°C, Rds(on): 4mOhm) PWM Controller(s): ANPEC APW7159C
Filtering Capacitors	Electrolytic: 14x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 4x Rubycon (4-10,000h @ 105°C, YXF), 2x Rubycon (6-10,000h @ 105°C, ZLH) Polymer: United Chemi-Con, NIC
Supervisor IC	Weltrend WT7502R (OVP, UVP, SCP, PG)
Flash Memory	Winbond W25X16
Microcontroller	NXP LPC5506
Fan Model	Champion CF1325H12D (135mm, 12V, 0.6A, Double Ball Bearing Fan)

5VSB Circuit

Rectifier	2x PS1045L SBR (45V, 10A) & 1x KEC KF5N65D FET (650V, 2.7A @ 100°C, Rds(on): 1.75Ohm)
Standby PWM Controller	On Bright OB5282CP

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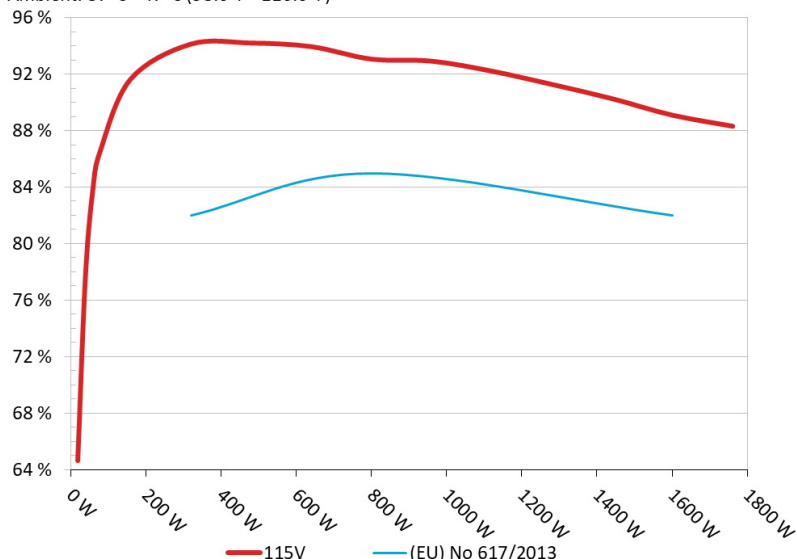
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: ASUS Rog Thor 1600T

Ambient: 37°C - 47°C (98.6°F - 116.6°F)



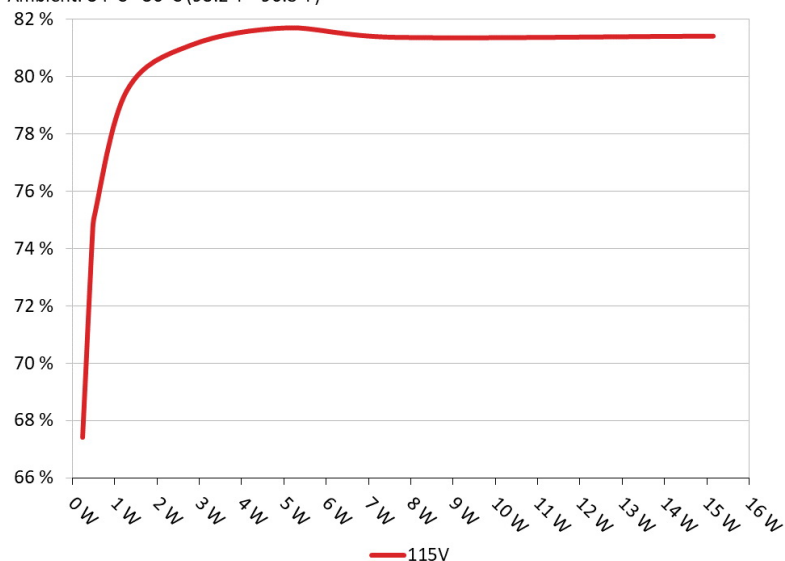
INFO

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: ASUS Rog Thor 1600T

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

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

5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts	
1	0.045A	0.23W	67.406%	0.02
	5.101V	0.341W		115.19V
2	0.09A	0.459W	74.38%	0.037
	5.099V	0.617W		115.19V
3	0.55A	2.8W	81.096%	0.185
	5.09V	3.453W		115.19V
4	1A	5.084W	81.697%	0.29
	5.082V	6.223W		115.19V
5	1.5A	7.613W	81.365%	0.368
	5.074V	9.357W		115.19V
6	3.001A	15.147W	81.406%	0.476
	5.048V	18.606W		115.19V

Test

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

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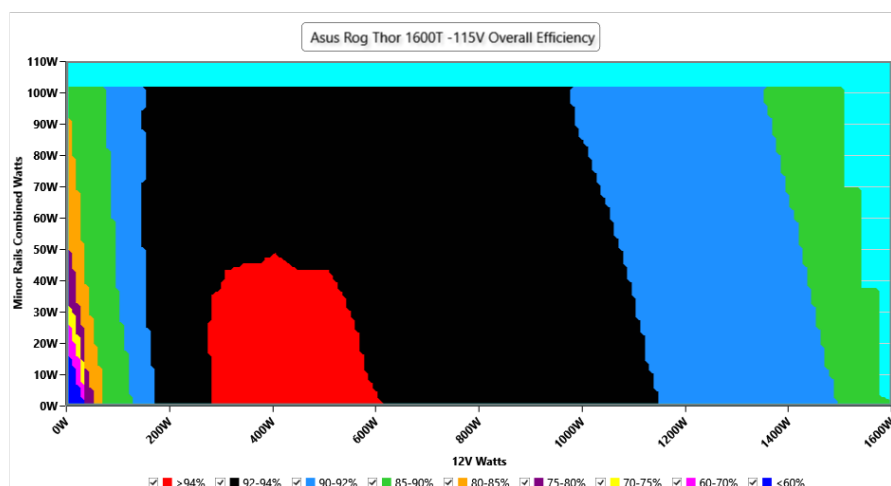
115V

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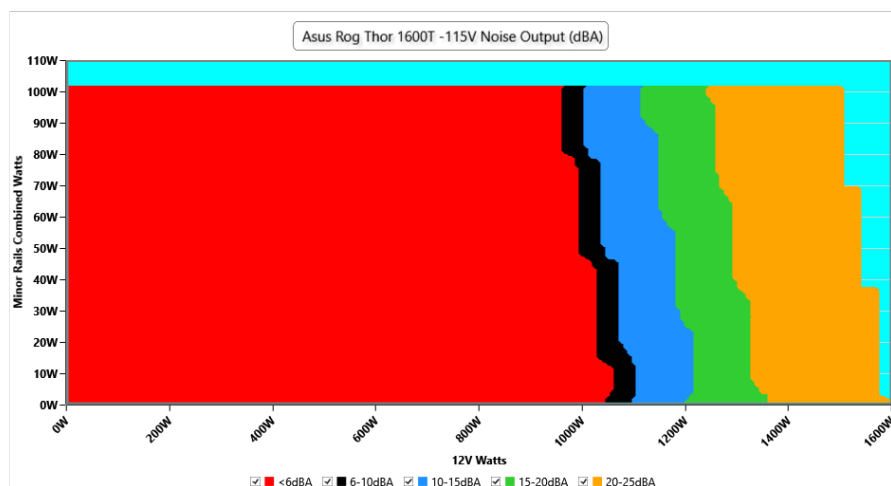
EFFICIENCY GRAPH 115V



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

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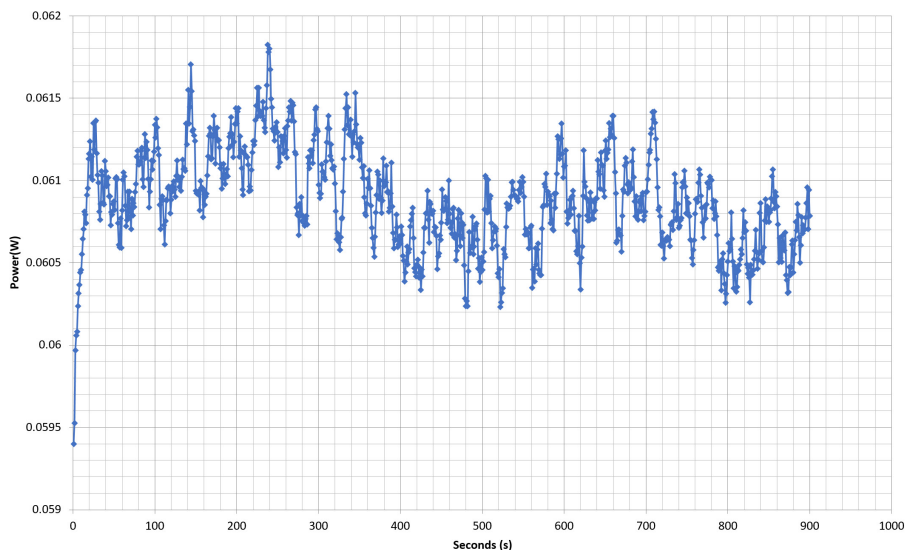
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VAMPIRE POWER -115V

Power - M7YENJ0001593Y4 - 27/08/2021 - 15:25



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

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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
10%	11.402A	1.953A	1.996A	0.979A	160.038	91.636%	0	<6.0	46.15°C	0.992
	12.141V	5.122V	3.307V	5.109V	174.649				40.92°C	115.18V
20%	23.795A	2.931A	2.996A	1.176A	320.019	94.125%	0	<6.0	47.27°C	0.995
	12.150V	5.119V	3.305V	5.105V	339.993				41.35°C	115.17V
30%	36.526A	3.421A	3.497A	1.373A	479.52	94.208%	0	<6.0	47.89°C	0.996
	12.141V	5.117V	3.303V	5.1V	509.005				41.56°C	115.17V
40%	49.276A	3.912A	3.998A	1.57A	639.94	93.955%	0	<6.0	48.69°C	0.996
	12.150V	5.114V	3.302V	5.096V	681.114				41.94°C	115.19V
50%	61.617A	4.892A	5.001A	1.768A	799.656	93.073%	0	<6.0	50.23°C	0.997
	12.158V	5.112V	3.3V	5.092V	859.171				42.8°C	115.2V
60%	74.109A	5.874A	6.005A	1.967A	960.153	92.925%	407	<6.0	43.19°C	0.998
	12.149V	5.108V	3.298V	5.086V	1033.257				51.17°C	115.19V
70%	86.530A	6.859A	7.011A	2.165A	1119.947	92.217%	541	10.1	43.36°C	0.998
	12.144V	5.105V	3.295V	5.081V	1214.472				51.82°C	115.19V
80%	98.874A	7.843A	8.018A	2.265A	1280.073	91.275%	671	17.1	44.42°C	0.997
	12.158V	5.102V	3.293V	5.078V	1402.431				53.22°C	115.19V
90%	111.668A	8.338A	8.508A	2.365A	1439.903	90.267%	747	20.1	45.29°C	0.997
	12.155V	5.099V	3.291V	5.075V	1595.168				54.6°C	115.18V
100%	124.269A	8.833A	9.029A	2.964A	1599.92	89.1%	747	20.1	45.78°C	0.996
	12.152V	5.096V	3.29V	5.063V	1795.647				55.9°C	115.17V
110%	137.017A	9.818A	10.128A	2.964A	1760.247	88.317%	748	20.1	46.92°C	0.995
	12.129V	5.094V	3.288V	5.062V	1993.12				57.84°C	115.16V
CL1	0.115A	11.73A	12.039A	0A	101.314	85.306%	0	<6.0	49.7°C	0.983
	12.171V	5.133V	3.298V	5.145V	118.767				42.69°C	115.19V
CL2	0.115A	19.441A	0A	0A	101.4	84.472%	0	<6.0	51.67°C	0.983
	12.167V	5.144V	3.302V	5.172V	120.039				43.41°C	115.19V
CL3	0.115A	0A	20.02A	0A	67.398	78.152%	0	<6.0	53.83°C	0.968
	12.167V	5.122V	3.297V	5.115V	86.243				44.62°C	115.19V
CL4	131.813A	0A	0A	0A	1600.241	89.687%	743	20.0	45.19°C	0.996
	12.140V	5.093V	3.3V	5.1V	1784.261				55.24°C	115.17V

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20-80W 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	1.222A	0.488A	0.499A	0.195A	20.008	64.633%	0	<6.0	40.09°C	0.819
	12.156V	5.123V	3.309V	5.122V	30.958				36.86°C	115.19V
40W	2.690A	0.683A	0.698A	0.293A	40.006	77.547%	0	<6.0	41.02°C	0.92
	12.155V	5.123V	3.309V	5.12V	51.588				37.14°C	115.18V
60W	4.158A	0.879A	0.898A	0.391A	60.005	83.836%	0	<6.0	43.34°C	0.958
	12.153V	5.123V	3.308V	5.118V	71.576				38.94°C	115.18V
80W	5.624A	1.074A	1.097A	0.489A	79.971	86.586%	0	<6.0	44.78°C	0.97
	12.150V	5.122V	3.308V	5.117V	92.358				39.93°C	115.18V

RIPPLE MEASUREMENTS 115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.11mV	6.90mV	7.88mV	7.34mV	Pass
20% Load	12.72mV	7.41mV	8.29mV	8.06mV	Pass
30% Load	16.09mV	12.99mV	24.67mV	12.19mV	Pass
40% Load	16.04mV	8.18mV	8.91mV	8.16mV	Pass
50% Load	18.29mV	19.48mV	34.24mV	18.35mV	Pass
60% Load	15.88mV	8.69mV	9.42mV	8.51mV	Pass
70% Load	16.65mV	12.12mV	16.17mV	11.22mV	Pass
80% Load	16.14mV	12.99mV	21.90mV	12.39mV	Pass
90% Load	16.24mV	13.75mV	23.44mV	12.34mV	Pass
100% Load	19.20mV	14.92mV	23.89mV	13.63mV	Pass
110% Load	23.47mV	14.57mV	24.19mV	13.50mV	Pass
Crossload1	11.72mV	7.67mV	15.40mV	8.21mV	Pass
Crossload2	10.78mV	7.00mV	6.81mV	7.65mV	Pass
Crossload3	15.02mV	7.42mV	17.45mV	8.26mV	Pass
Crossload4	20.19mV	15.64mV	23.92mV	15.82mV	Pass

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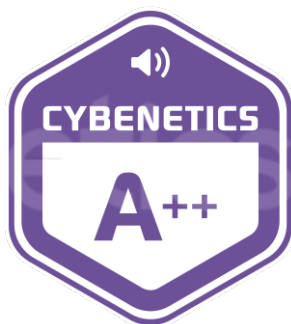


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Power specifications label

CERTIFICATIONS 115V



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