

Lab ID#: TT75002065  
Receipt Date: Sep 1, 2022  
Test Date: Sep 19, 2022

Report: 22PS2065A  
Report Date: Sep 19, 2022

### DUT INFORMATION

Brand	Thermaltake
Manufacturer (OEM)	CWT
Series	Toughpower GF3
Model Number	TPD-0750AH3FCG
Serial Number	
DUT Notes	

### DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	50-60
Rated Power (W)	750
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

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## 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	88.430%
Efficiency With 10W (≤500W) or 2% (>500W)	75.039
Average Efficiency 5VSB	79.321%
Standby Power Consumption (W)	0.0129000
Average PF	0.990
Avg Noise Output	27.02 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A-

### 230V

Average Efficiency	90.469%
Average Efficiency 5VSB	78.188%
Standby Power Consumption (W)	0.0641000
Average PF	0.966
Avg Noise Output	26.83 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A-

## POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	22	22	62.5	3	0.3
	Watts	120		750	15	3.6
Total Max. Power (W)		750				

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## CABLES AND CONNECTORS

### 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 (700mm)	2	2	18AWG	No
6+2 pin PCIe (600mm+150mm)	2	4	18AWG	No
12+4 pin PCIe (600mm) (300W)	1	1	16-24AWG	No
SATA (500mm+150mm)	1	2	18AWG	No
SATA (500mm+150mm+150mm)	2	6	18AWG	No
4-pin Molex (500mm+150mm+150mm+150mm)	1	4	18AWG	No

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<b>General Data</b>	-
Manufacturer (OEM)	CWT
Platform	CSZ
PCB Type	Double Sided
<b>Primary Side</b>	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV
Inrush Protection	1x NTC Thermistor SCK-075 (7 Ohm) & Relay
Bridge Rectifier(s)	2x GBU806 (600V, 8A @ 100°C)
APFC MOSFETs	2x On Semiconductor FCP190N60E (600V, 13.1A @ 100°C, Rds(on): 0.190hm)
APFC Boost Diode	1x On Semiconductor FFSP0665A (650V, 6A @ 153°C)
Bulk Cap(s)	1x Rubycon (420V, 680uF, 2,000h @ 105°C, MXE)
Main Switchers	2x Infineon IPA60R190P6 (600V, 12.7A @ 100°C, Rds(on): 0.190hm)
APFC Controller	Champion CM6500UNX & CM03X
Resonant Controller	Champion CU6901VAC
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
<b>Secondary Side</b>	-
+12V MOSFETs	4x International Rectifier IRFH7004PbF (40V, 164A @ 100°C, Rds(on): 1.4mOhm)
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: 2x Nichicon (2-5,000h @ 105°C, HD), 6x Nichicon (4-10,000h @ 105°C, HE), 1x Rubycon (2-10,000h @ 105°C, YXF), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KY), 1x Nippon Chemi-Con (4-10,000h @ 105°C, KYA) Polymer: 8x Elite, 6x APAQ, 8x CapXon, 4x NIC
Supervisor IC	Weltrend WT7502R
Fan Controller	Microchip PIC16F1503
Fan Model	Hong Hua HA13525H12SF-Z (135mm, 12V, 0.5A, Fluid Dynamic Bearing Fan)
<b>5VSB Circuit</b>	-
Rectifier	1x PS1045L SBR (45V, 10A)
Standby PWM Controller	On-Bright OB2365T

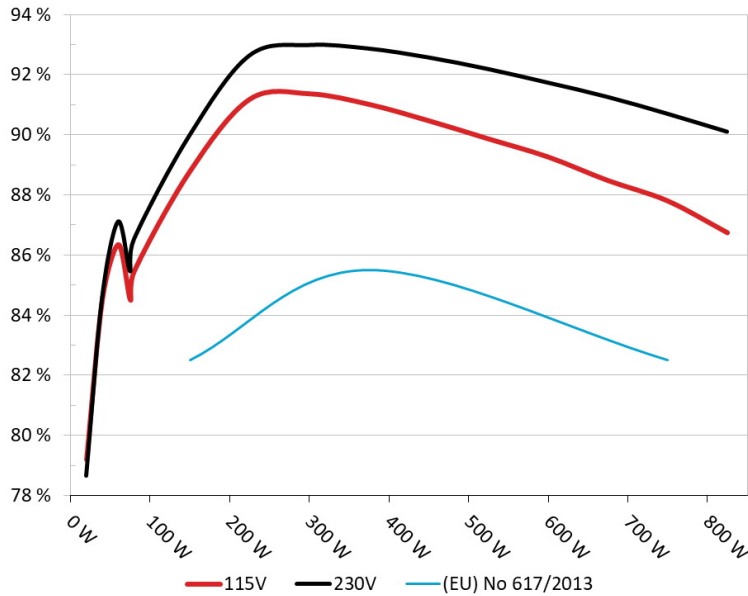
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### EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

**Efficiency: Thermaltake Toughpower GF3 750W**

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



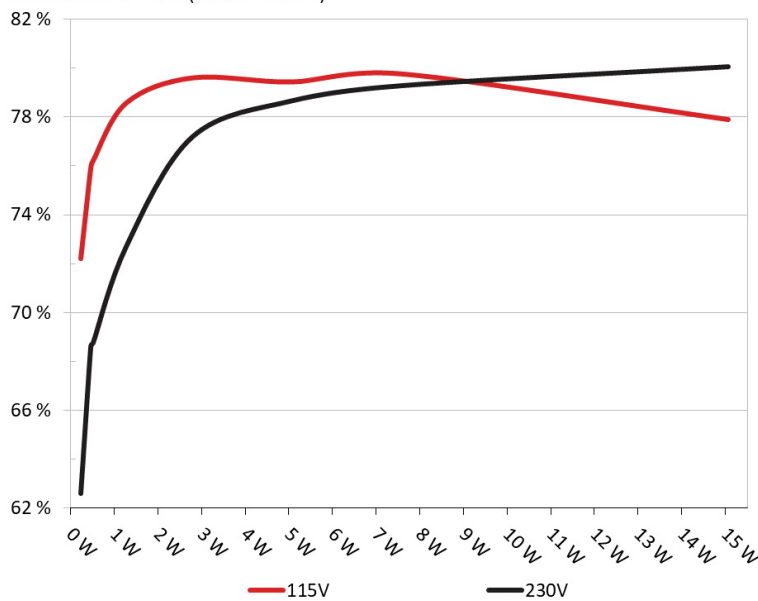
**INFO**

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 750W**

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)**

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229W	72.217%	0.032
	5.089V	0.317W		115.16V
2	0.09A	0.458W	75.938%	0.06
	5.088V	0.603W		115.16V
3	0.55A	2.792W	79.611%	0.27
	5.078V	3.507W		115.16V
4	1A	5.067W	79.442%	0.372
	5.068V	6.378W		115.16V
5	1.5A	7.585W	79.772%	0.424
	5.057V	9.508W		115.16V
6	2.999A	15.065W	77.906%	0.495
	5.023V	19.337W		115.16V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229W	62.586%	0.011
	5.089V	0.366W		230.34V
2	0.09A	0.458W	68.61%	0.02
	5.088V	0.667W		230.33V
3	0.55A	2.792W	77.189%	0.102
	5.078V	3.618W		230.33V
4	1A	5.068W	78.653%	0.17
	5.068V	6.444W		230.33V
5	1.5A	7.585W	79.274%	0.23
	5.057V	9.568W		230.33V
6	2.999A	15.064W	80.049%	0.335
	5.023V	18.818W		230.33V

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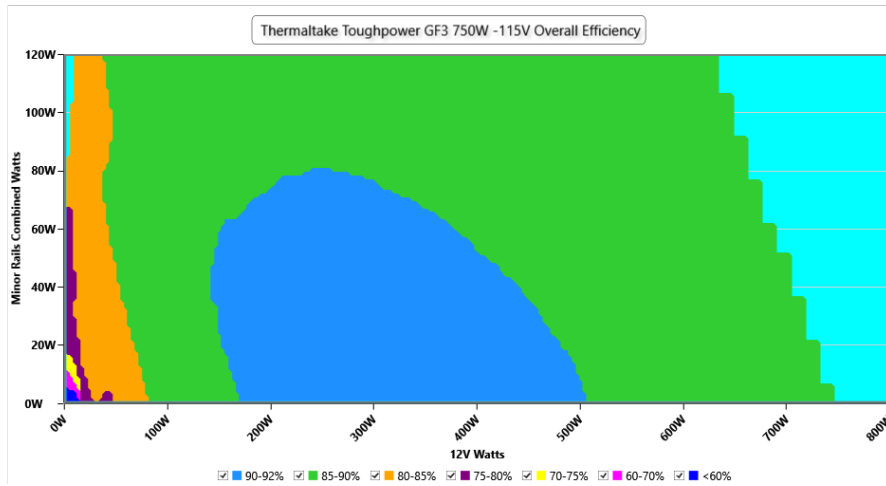
# 115V

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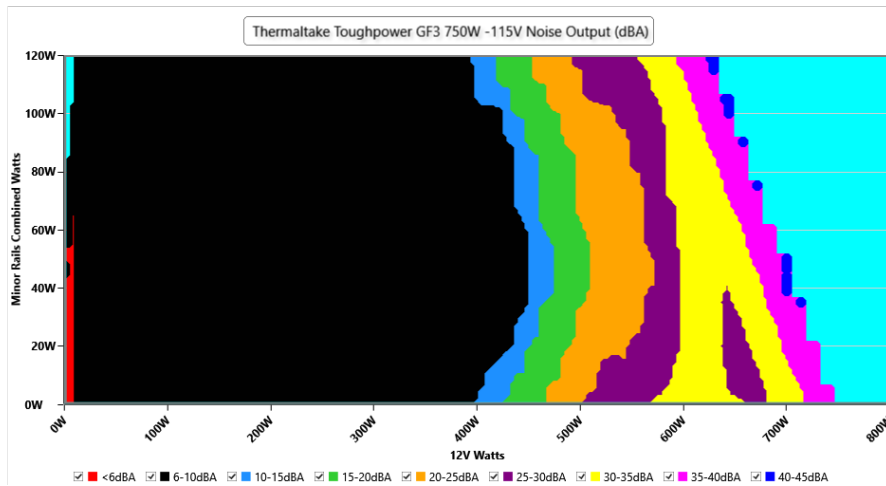
### EFFICIENCY GRAPH 115V



#### 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 (+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

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**VAMPIRE POWER -115V**

**Detailed Results**

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.17 V	115.13 V	113.85 V	115.20 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.94 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:	0.13 %	0.10 %	N/A	0.17 %	2.00 %	PASS
Real Power:	0.013 W	0.009 W	N/A	0.017 W	N/A	N/A
Apparent Power:	9.923 W	9.881 W	N/A	9.966 W	N/A	N/A
Power Factor:	0.001	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*

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**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%	4.418A	1.982A	1.999A	0.988A	74.991	84.017%	0	<6.0	44.47°C	0.98
	12.086V	5.045V	3.301V	5.059V	89.257				40.19°C	115.15V
20%	9.848A	2.975A	3.001A	1.188A	149.913	88.302%	0	<6.0	45.26°C	0.99
	12.084V	5.042V	3.299V	5.049V	169.776				40.51°C	115.13V
50%	26.856A	4.965A	5.011A	1.762A	374.359	90.525%	418	7.8	41.73°C	0.992
	12.059V	5.036V	3.293V	5.107V	413.545				47.84°C	115.07V
100%	54.900A	8.95A	9.038A	2.964A	749.546	87.312%	1247	38.8	45.74°C	0.995
	12.020V	5.027V	3.285V	5.059V	858.469				55.76°C	114.93V

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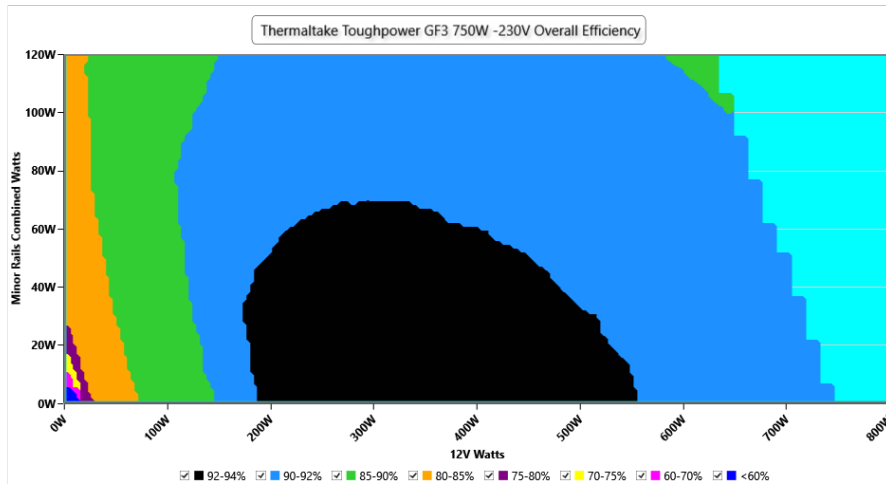
# 230V

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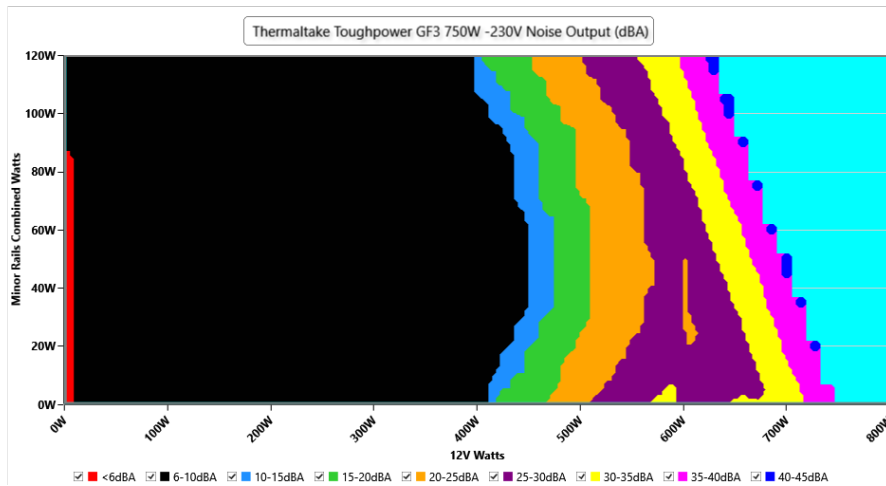
### EFFICIENCY GRAPH 230V



#### 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

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**VAMPIRE POWER -230V**

**Detailed Results**

	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	230.34 V	230.22 V	227.70 V	230.38 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:	1.416	1.415	1.340	1.417	1.490	PASS
Mains Voltage THD:	0.12 %	0.10 %	N/A	0.22 %	2.00 %	PASS
Real Power:	0.064 W	0.056 W	N/A	0.078 W	N/A	N/A
Apparent Power:	33.760 W	33.585 W	N/A	33.982 W	N/A	N/A
Power Factor:	0.002	N/A	N/A	N/A	N/A	N/A

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**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%	4.416A	1.982A	1.999A	0.988A	74.988	84.96%	0	<6.0	44.85°C	0.859
	12.089V	5.045V	3.301V	5.059V	88.262				40.59°C	230.34V
20%	9.846A	2.975A	3A	1.188A	149.91	89.489%	0	<6.0	45.58°C	0.942
	12.088V	5.042V	3.299V	5.048V	167.513				40.78°C	230.34V
50%	26.854A	4.966A	5.01A	1.762A	374.298	92.362%	419	7.8	42.26°C	0.981
	12.057V	5.035V	3.293V	5.107V	405.242				48.51°C	230.3V
100%	54.860A	8.95A	9.038A	2.965A	749.611	90.197%	1483	43.3	45.2°C	0.99
	12.030V	5.027V	3.285V	5.058V	831.078				55.21°C	230.25V

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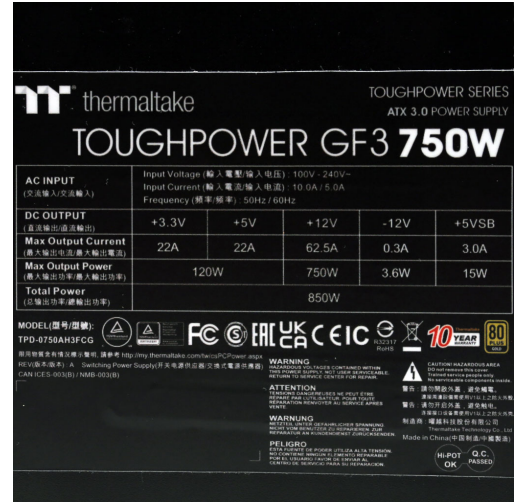
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EFFICIENCY AND NOISE REPORT IN ACCORDANCE WITH  
CYBENETICS ETA AND CYBENETICS LAMBDA PROCEDURE

## Thermaltake Toughpower GF3 750W

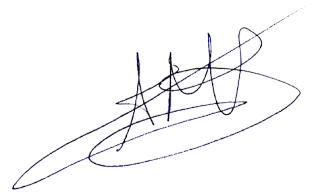


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Power specifications label

### CERTIFICATIONS 115V

**Aristeidis Bitziopoulos**  
Lab Director

### CERTIFICATIONS 230V



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