

Lab ID#: MS65001959
Receipt Date: Dec 22, 2021
Test Date: Jan 7, 2022

Report: 21PS1959A

Report Date: Jan 7, 2022

DUT INFORMATION

Brand	MSI
Manufacturer (OEM)	CWT
Series	MPG
Model Number	
Serial Number	3067ZP0A17CE010048000478
DUT Notes	

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10
Rated Frequency (Hz)	47-63
Rated Power (W)	650
Type	ATX12V
Cooling	140mm Double Ball Bearing Fan (HA1425M12B-Z)
Semi-Passive Operation	X
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	✓

115V

Average Efficiency	89.303%
Efficiency With 10W (≤500W) or 2% (>500W)	62.293
Average Efficiency 5VSB	78.065%
Standby Power Consumption (W)	0.0466658
Average PF	0.977
Avg Noise Output	24.93 dB(A)
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A

230V

Average Efficiency	90.841%
Average Efficiency 5VSB	77.057%
Standby Power Consumption (W)	0.0667467
Average PF	0.924
Avg Noise Output	26.37 dB(A)
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A-

POWER SPECIFICATIONS

Rail		3.3V	5V	12V(1)	12V(2)	12V(3)	12V(4)	5VSB	-12V
Max. Power	Amps	20	20	25	25	30	30	2.5	0.3
	Watts	100		650				12.5	3.6
Total Max. Power (W)		650							

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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 (500mm+150mm)	2	4	18AWG	No
SATA (500mm+150mm+150mm+150mm)	2	8	18AWG	No
4 pin Molex (500mm+150mm+150mm+150mm) / FDD (+150mm)	1	4 / 1	18-20AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	-

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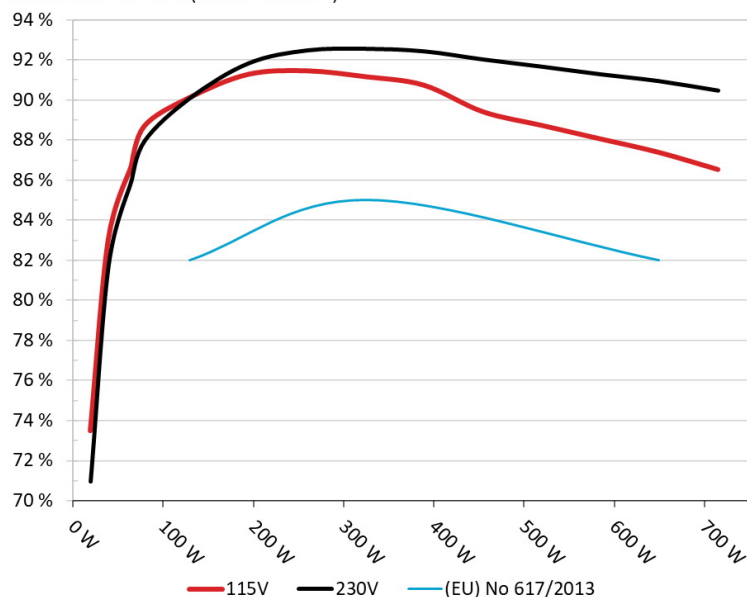
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General Data	-
Manufacturer (OEM)	CWT
PCB Type	Double Sided
Primary Side	-
Transient Filter	4x Y caps, 2x X caps, 2x CM chokes, 1x MOV, 1x Power Integrations CAP004DG (Discharge IC)
Inrush Protection	NTC Thermistor SCK-055 (5 Ohm) & Relay
Bridge Rectifier(s)	2x GBU1006 (600V, 10A @ 100°C)
APFC MOSFETs	2x Infineon IPA60R190P6 (600V, 12.7A @ 100°C, Rds(on): 0.19Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8S06D (600V, 8A)
Bulk Cap(s)	1x Nippon Chemi-Con (420V, 470uF, 2,000h @ 105°C, KMQ)
Main Switchers	2x ON Semiconductor FCPF125N65S3 (650V, 15A @ 100°C, Rds(on): 0.125Ohm)
APFC Controller	Champion CM6502UHH & CM03X
Resonant Controller	Champion CM6901X
Topology	Primary side: APFC, Half-Bridge & LLC converter Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	-
+12V MOSFETs	4x Infineon BSC014N06NS (60V, 152A @ 100°C, Rds(on): 1.45mOhm)
5V & 3.3V	DC-DC Converters: 2x UBIQ QM3006D (30V, 57A @ 100°C, Rds(on): 5.5mOhm) 2x UBIQ QM3016D (30V, 68A @ 100°C, Rds(on): 4mOhm) PWM Controller(s): ANPEC APW7159C
Filtering Capacitors	Electrolytic: 6x Nippon Chemi-Con (2-5,000h @ 105°C, KZE), 2x Nippon Chemi-Con (5-6,000h @ 105°C, KZH), 1x Rubycon (4-10,000h @ 105°C, YXJ), 8x Nichicon (4-10,000h @ 105°C, KY), 3x Nichicon (4-10,000h @ 105°C, KYA) Polymer: 11x FPCAP, 7x Nippon Chemi-Con
Supervisor IC	Sitronix ST9S429-PG14 (OCP, OVP, UVP, SCP, PG) & EST EST7618 (OCP, SC)
Fan Model	Hong Hua HA1425M12B-Z (140mm, 12V, 0.36A, Ball Bearing Fan)
5VSB Circuit	-
Standby PWM Controller	Power Integrations TNY177PN

EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: MSI MPG A650GF

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



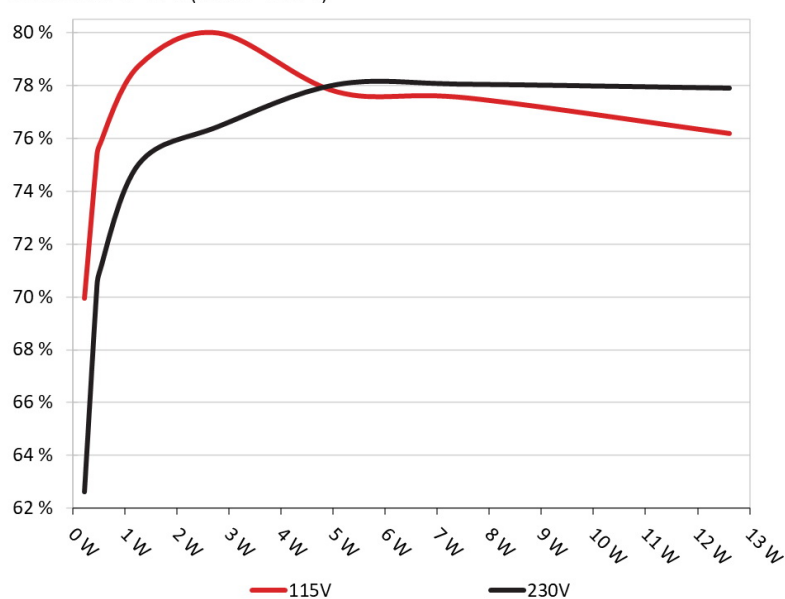
INFO

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: MSI MPG A650GF

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	0.23W	69.942%	0.032
	5.107V	0.329W		115.12V
2	0.09A	0.46W	75.142%	0.059
	5.106V	0.612W		115.11V
3	0.55A	2.803W	79.965%	0.265
	5.095V	3.505W		115.12V
4	1A	5.085W	77.742%	0.367
	5.084V	6.541W		115.12V
5	1.5A	7.609W	77.51%	0.423
	5.072V	9.817W		115.11V
6	2.5A	12.624W	76.172%	0.472
	5.049V	16.572W		115.11V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.23W	62.606%	0.011
	5.105V	0.367W		230.24V
2	0.09A	0.46W	70.105%	0.019
	5.105V	0.656W		230.24V
3	0.55A	2.803W	76.454%	0.101
	5.095V	3.666W		230.24V
4	1A	5.085W	78.044%	0.167
	5.084V	6.516W		230.24V
5	1.5A	7.608W	78.055%	0.227
	5.071V	9.747W		230.24V
6	2.5A	12.624W	77.908%	0.307
	5.049V	16.204W		230.24V

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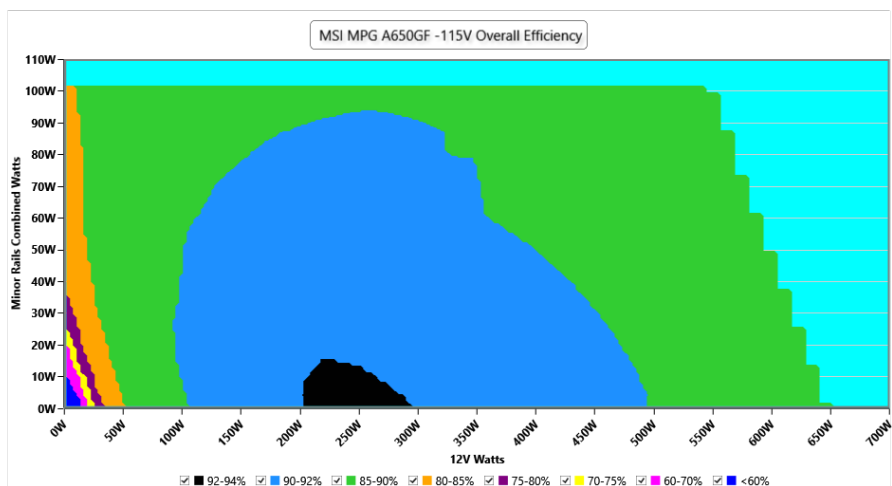
115V

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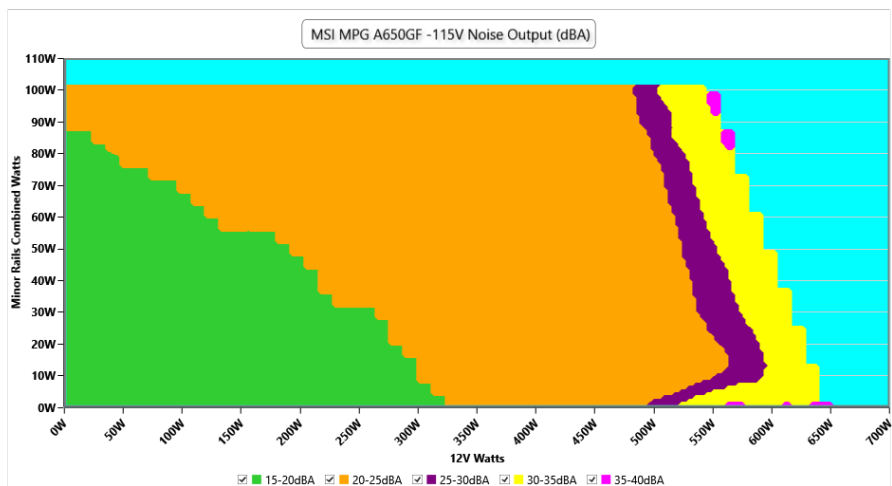
EFFICIENCY GRAPH 115V



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

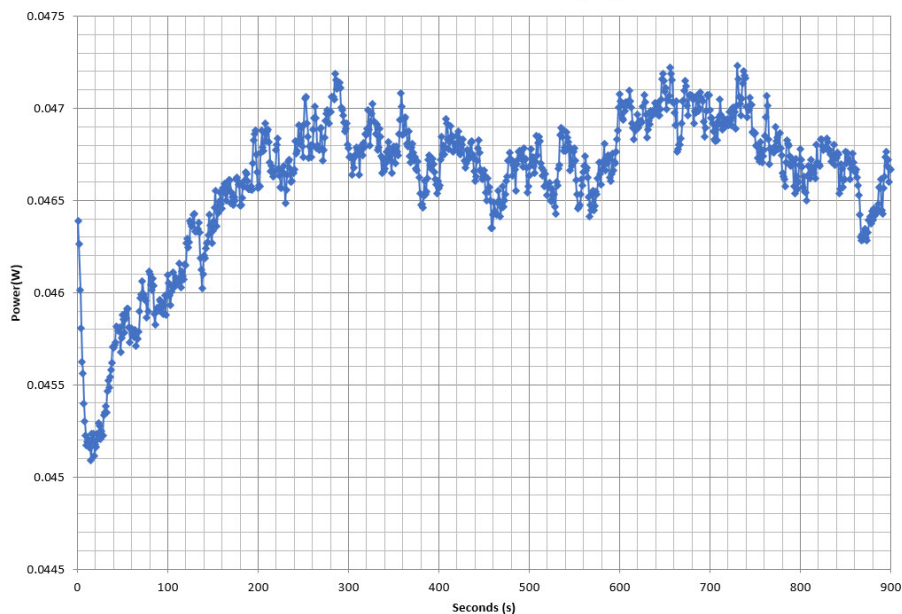
The PSU's noise in its entire operational range and under 30-32 °C (+2 °C) ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

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VAMPIRE POWER -115V

Power - 3067ZP0A17CE010048000478 - 30/12/2021 - 13:59



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%	3.590A	1.988A	1.97A	0.985A	64.998	86.401%	738	21.3	40.67°C	0.955
	12.086V	5.03V	3.351V	5.078V	75.229				44.78°C	115.1V
20%	8.198A	2.983A	2.957A	1.184A	129.929	90.098%	739	21.4	40.81°C	0.973
	12.079V	5.028V	3.348V	5.07V	144.208				45.21°C	115.1V
50%	22.767A	4.978A	4.937A	1.784A	325.025	91.14%	744	21.6	42°C	0.982
	12.058V	5.022V	3.342V	5.045V	356.62				47.59°C	115.1V
100%	46.834A	8.982A	8.917A	2.496A	649.813	87.364%	1740	45.3	45.96°C	0.982
	12.012V	5.011V	3.331V	5.009V	743.803				56.04°C	115.1V

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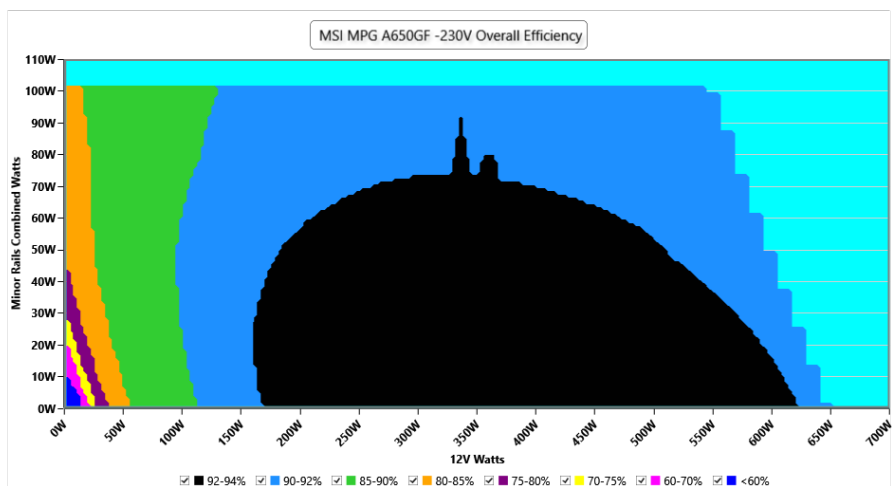
230V

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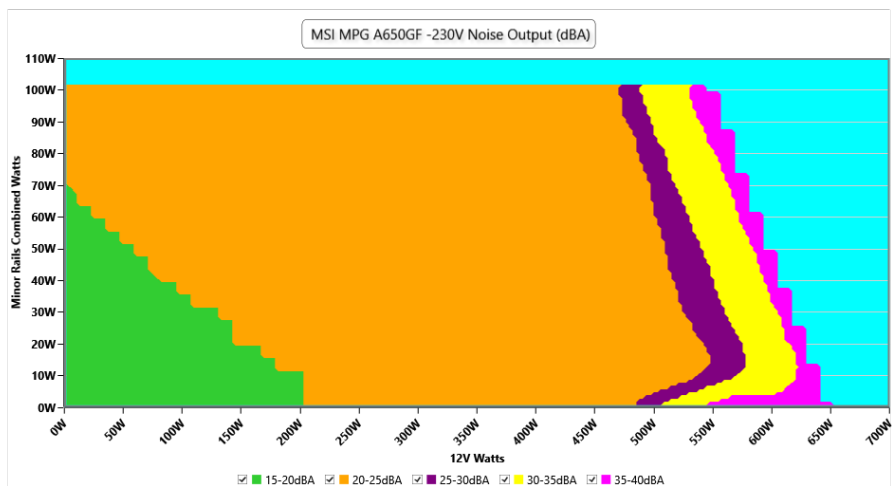
EFFICIENCY GRAPH 230V



INFO

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NOISE GRAPH 230V



INFO

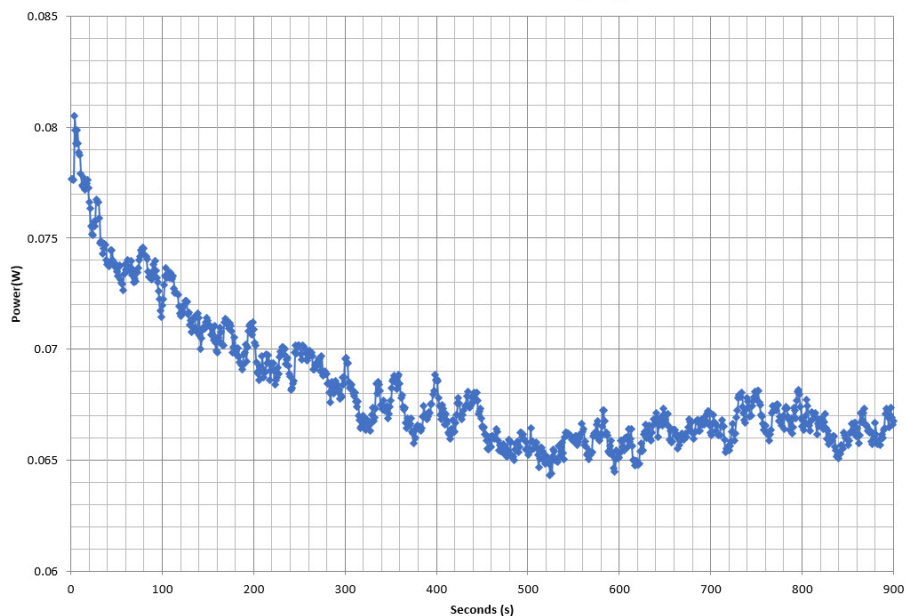
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COMMISSION REGULATION (EU) NO 617/2013 TESTING 230V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
10%	3.594A	1.988A	1.97A	0.985A	64.999	85.838%	736	21.3	40.37°C	0.764
	12.076V	5.03V	3.35V	5.077V	75.722				44.58°C	230.21V
20%	8.206A	2.983A	2.957A	1.184A	129.933	90.073%	739	21.4	40.48°C	0.878
	12.069V	5.027V	3.348V	5.069V	144.253				44.87°C	230.21V
50%	22.769A	4.978A	4.937A	1.784A	325.025	92.534%	744	21.6	42.64°C	0.944
	12.057V	5.023V	3.342V	5.045V	351.248				48.14°C	230.22V
100%	46.828A	8.982A	8.917A	2.496A	649.852	90.92%	1741	45.3	45.45°C	0.961
	12.015V	5.012V	3.331V	5.01V	714.755				55.86°C	230.25V

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Top side

msi		MPG A650GF							
AC INPUT 交流输入 / 交流輸入		100-240V~ / 10.0A / 47-63Hz							
DC OUTPUT 直流输出 / 直流輸出		+5V	+3.3V	+12VMBPH	+12VCPU	+12VVGAT	+12VVGAT2	-12V	+5Vsb
		20.0A	20.0A	25.0A	25.0A	30.0A	30.0A	0.3A	2.5A
TOTAL POWER 大輸出/輸出功率		100W		650W		650W			


CAUTION: 警告
Do not open the power supply / 請勿打開電源供應器 /
請勿打開電源供應器 / N'ouvrez pas l'alimentation électrique
Potential lethal voltages inside / 內部隱藏致命電壓 /
內部電壓可能致命 / Des tensions potentiellement mortelles sont
présentes à l'intérieur

■ Select the right input voltage / 選擇正確的輸入電壓 /
選擇正確的輸入電壓 / Sélectionnez la bonne tension d'entrée
■ Warranty void if security seal is damaged, removed or lost /
如果封條被破壞、遺失或損毀，本開關電源保固
如果封條被破壞、遺失或損毀，本開關電源保固
Annulation de la garantie si le sceau est endommagé, retiré ou perdu

CE FC RoHS R43016
Mark: CWT 制作商: 研能科技股份有限公司
Rating Power Supply / 電源供應器 / 電源供應器
Model No. / 型号 / 型號: GPU650V Made in China / 中國製造 / 中國製造

Power specifications label

CERTIFICATIONS 115V

Aristeidis Bitziopoulos
Lab Director

CERTIFICATIONS 230V



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