



FSP Technology VITA GM 650W

Serial Number S4081000047

Lab ID FS65002557

Certification ID 252557

Test Result Report ID: 24PS2557A

Certificate Issue Date: Sep 5, 2024

Scheme: ETA-EMI PSU

115V

230V

115V

230V

Scheme: LAMBDA PSU

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	FSP Technology
Model	VITA GM 650W
OEM/ODM	FSP
Serial Number	S4081000047
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4

Rated Frequency (Hz)	50-60
Rated Power (W)	650
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fully Modular
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Rifle Bearing Fan (D12SH-12)
Semi-Passive Operation	X
Cybenetics Testing Information	
Lab ID	FS65002557
Date of receipt	Aug 27, 2024
Testing Date	Sep 3, 2024
Report Issued Date	Sep 5, 2024
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	18-22AWG	No
4+4 pin EPS12V (705mm)	2	2	18AWG	No
6+2 pin PCIe (650mm+150mm)	1	2	18AWG	No
6+2 pin PCIe (500mm+150mm)	1	2	18AWG	No
SATA (500mm+160mm) / 4-pin Molex (+155mm+100mm)	2	4 / 4	18AWG	No
SATA (495mm+150mm+150mm+150mm)	1	4	18AWG	No

Protection Features(Manufacturer)

Over Power Protection	✓
Over Current (+12V) Protection	✓
Over Temperature Protection	✗
Short Circuit Protection	✓
Surge Protection	✓
Inrush Current Protection	✓
Fan Failure Protection	✗

Power Specifications

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	20	54.17	3	0.3
	Watts	100		650	15	3.6
Total Max. Power (W)		650				

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 v3.1 PSU Power Excursion	✓

Performance Summary

115V

Accredited	
Average Efficiency (>1450 load combinations)	89.278%

Average Noise Output (>1450 Load Combinations)	18.45dBA
Average PF (>1450 Load Combinations)	0.980
Efficiency With 10W ($\leq$ 500W) or 2% (>500W) Load	65.270%
Standby Power Consumption	0.0569W
Non-Accredited	
12V Ripple (Full Load)	21.81mV
5V Ripple (Full Load)	16.89mV
3.3V Ripple (Full Load)	18.12mV
5VSB Ripple (Full Load)	18.54mV
12V Load Regulation	0.63%
5V Load Regulation	1.66%
3.3V Load Regulation	2.73%
5VSB Load Regulation	2.60%
Inrush Current	38.970A

230V

Accredited	
Average Efficiency (>1450 load combinations)	91.521%
Average Noise Output (>1450 Load Combinations)	18.30dBA
Average PF (>1450 Load Combinations)	0.934
Efficiency With 10W ($\leq$ 500W) or 2% (>500W) Load	64.212%
Standby Power Consumption	0.1428W
Non-Accredited	
12V Ripple (Full Load)	21.94mV
5V Ripple (Full Load)	17.37mV
3.3V Ripple (Full Load)	18.87mV
5VSB Ripple (Full Load)	18.14mV
12V Load Regulation	0.63%
5V Load Regulation	1.66%
3.3V Load Regulation	2.73%
5VSB Load Regulation	2.62%
Inrush Current	65.830A

12V Transient Response (150%)	11.96V	
5V Transient Response (150%)	4.995V	
3.3V Transient Response (150%)	3.263V	
5VSB Transient Response (150%)	4.987V	
Hold-Up Time & PWR_OK Signal	21.50ms	
AC Loss to PWR_OK Hold Up Time	16.80ms	
PWR_OK Inactive to DC Loss Delay	4.70ms	
PSU Timings: T1 (20% / 100%)	37.0ms	37.0ms
PSU Timings: T3 (20% / 100%)	111.0ms	111.0ms
12V OCP (26.2°C / 44.8°C)	71.80A (132.55%), 12.120V	68.20A (125.90%), 12.147V
5V OCP (26.2°C / 44.8°C)	25A (125.00%), 5.04V	24.4A (122.00%), 5.035V
3.3V OCP (26.2°C / 44.8°C)	25.5A (127.50%), 3.331V	24.3A (121.50%), 3.329V
5VSB OCP (26.2°C / 44.8°C)	4.1A (136.67%), 4.977V	4A (133.33%), 4.988V
OPP (26.21°C / 42.20°C)	148.16%	141.63%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	21.5
AC Loss to PWR_OK Hold Up Time (ms)	16.8
PWR_OK Inactive to DC Loss Delay (ms)	4.7

Vampire Power

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.08 V	115.05 V	113.85 V	115.13 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

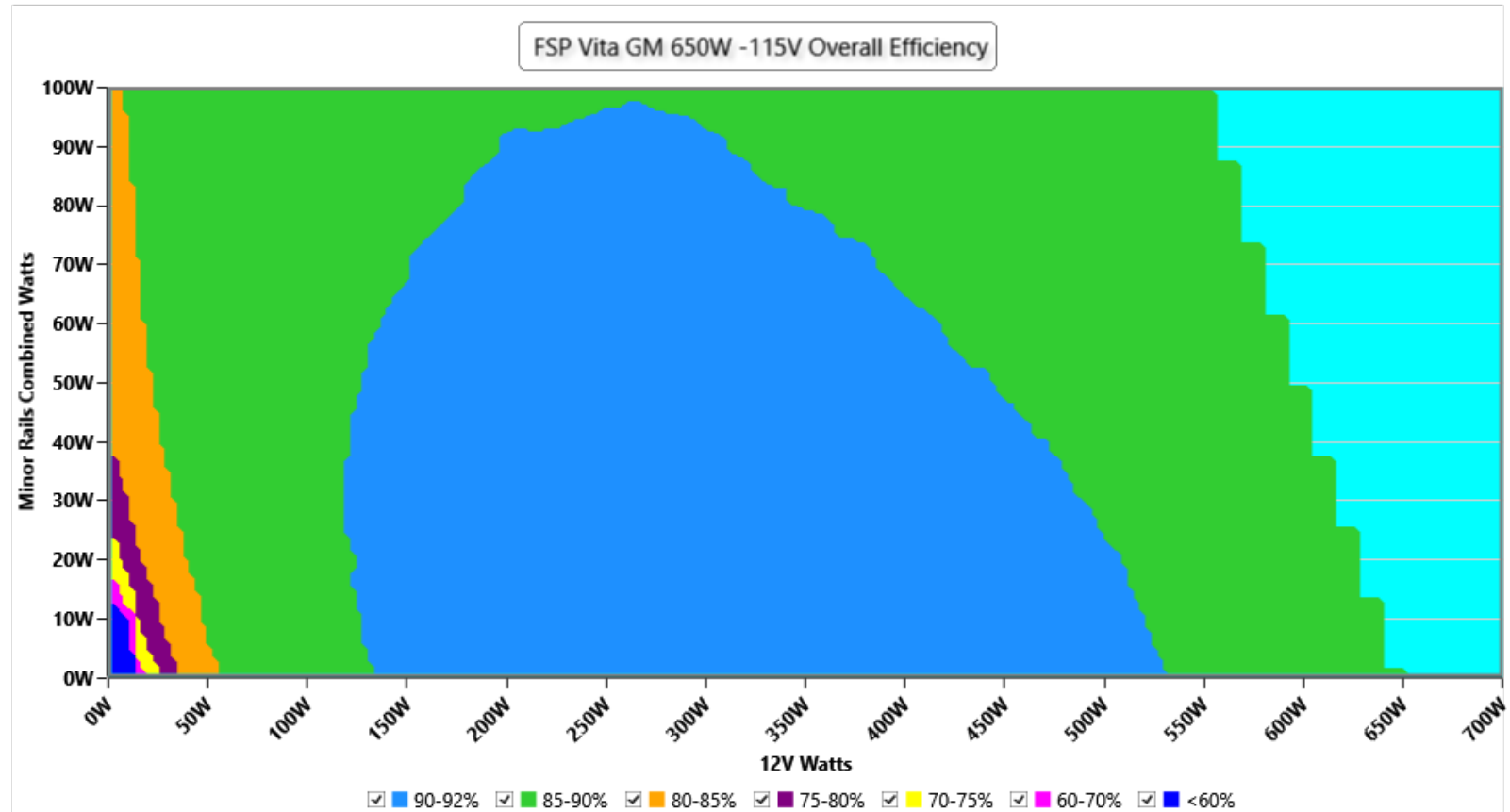
Mains Voltage THD:	0.13 %	0.09 %	N/A	0.18 %	2.00 %	PASS
Real Power:	0.057 W	0.008 W	N/A	0.089 W	N/A	N/A
Apparent Power:	13.014 W	12.956 W	N/A	13.082 W	N/A	N/A
Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	231.04 V	230.94 V	227.70 V	231.10 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:	1.417	1.416	1.340	1.419	1.490	PASS
Mains Voltage THD:	0.17 %	0.15 %	N/A	0.26 %	2.00 %	PASS
Real Power:	0.143 W	0.104 W	N/A	0.198 W	N/A	N/A
Apparent Power:	44.607 W	44.318 W	N/A	44.954 W	N/A	N/A
Power Factor:	0.004	N/A	N/A	N/A	N/A	N/A

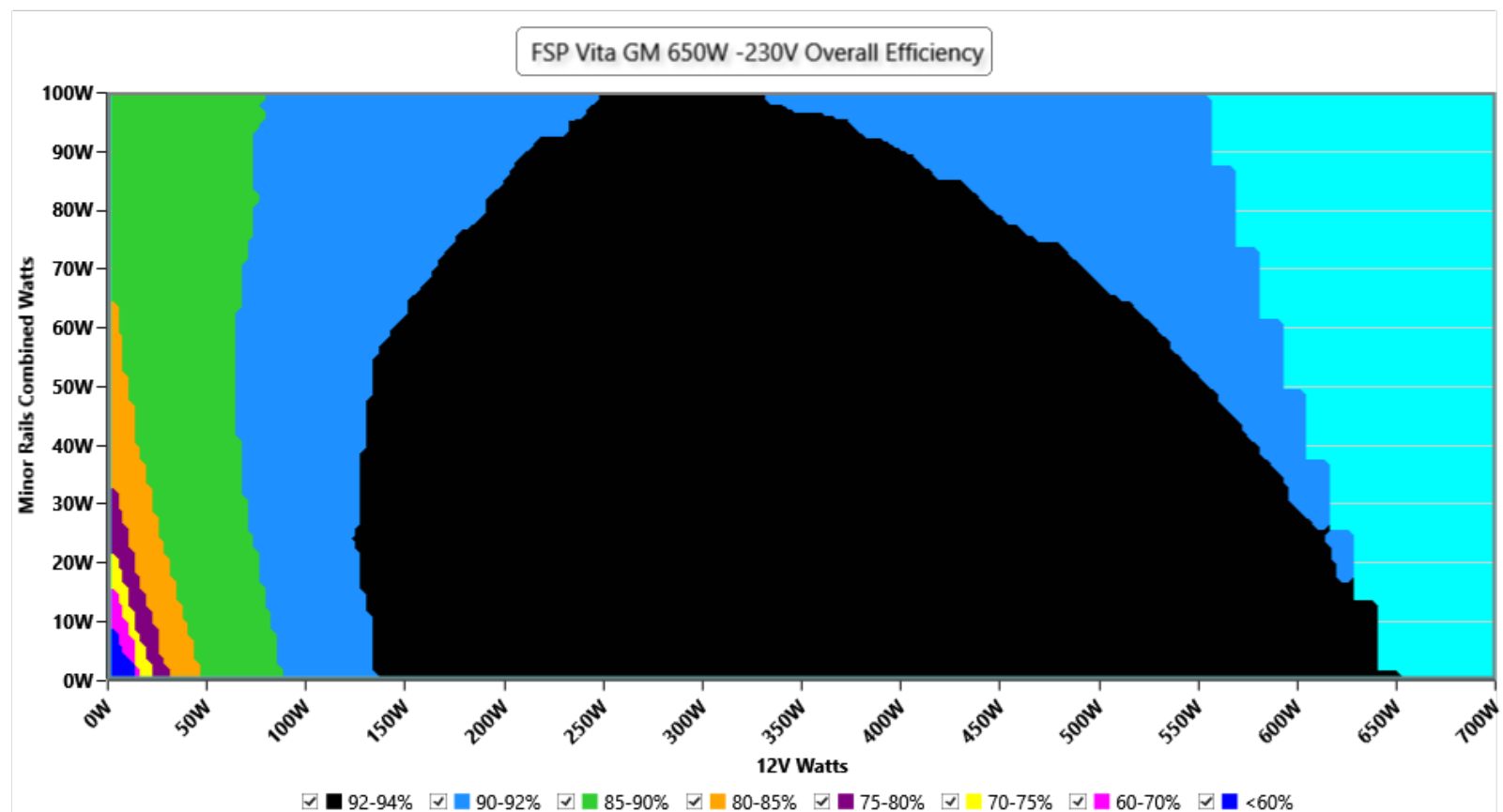
Efficiency Graph

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

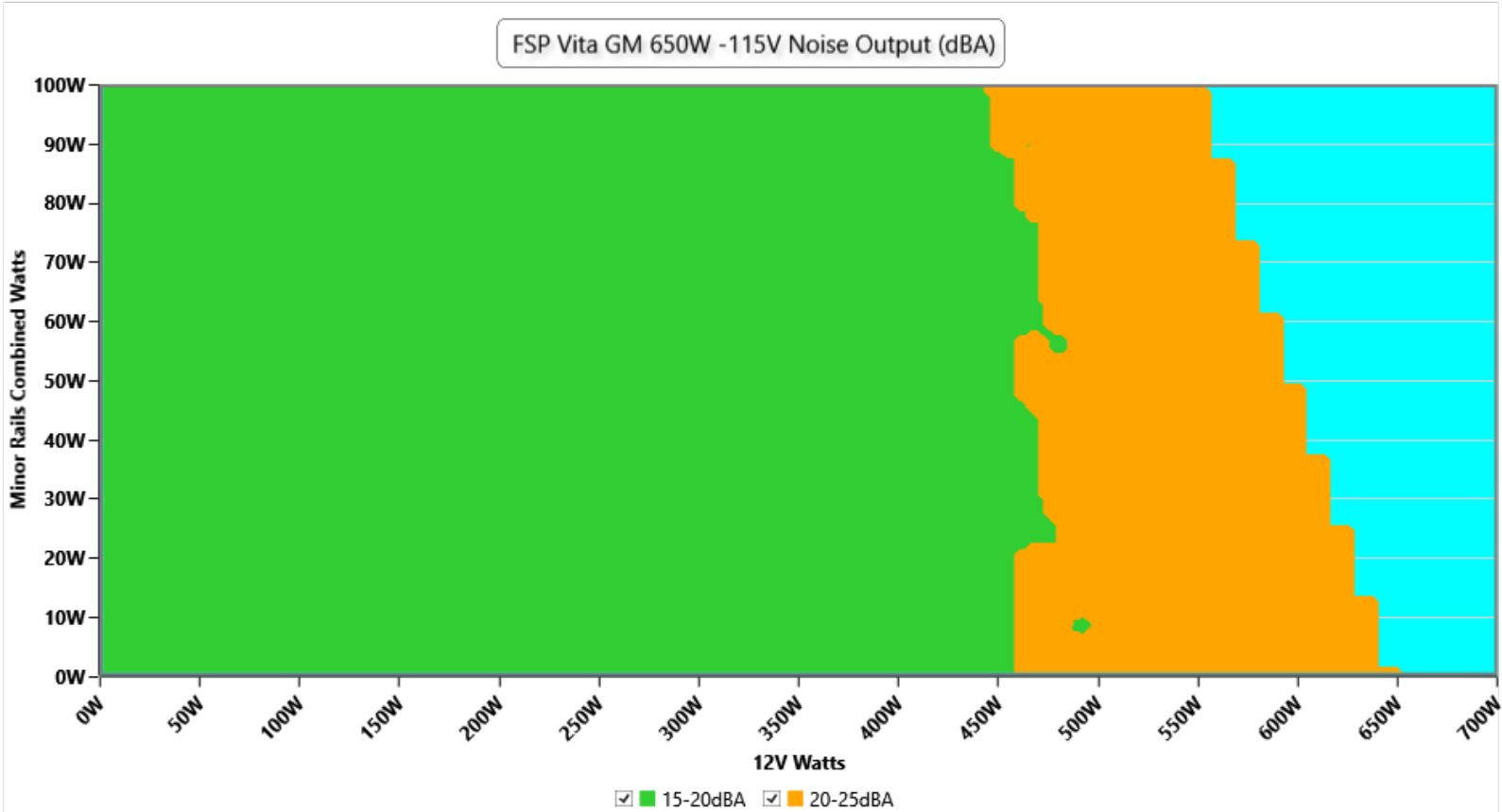


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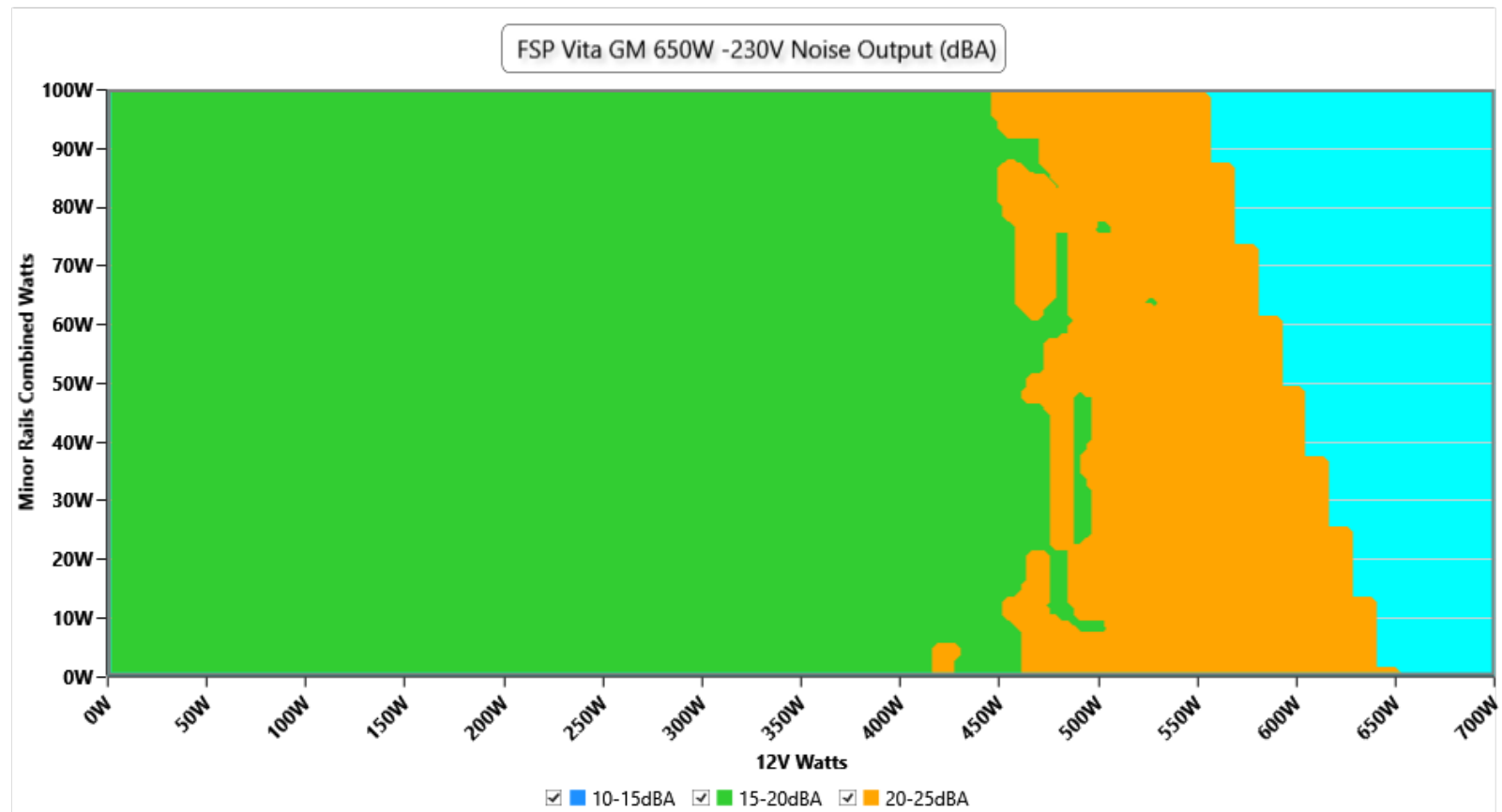
Noise Graph

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



INFO

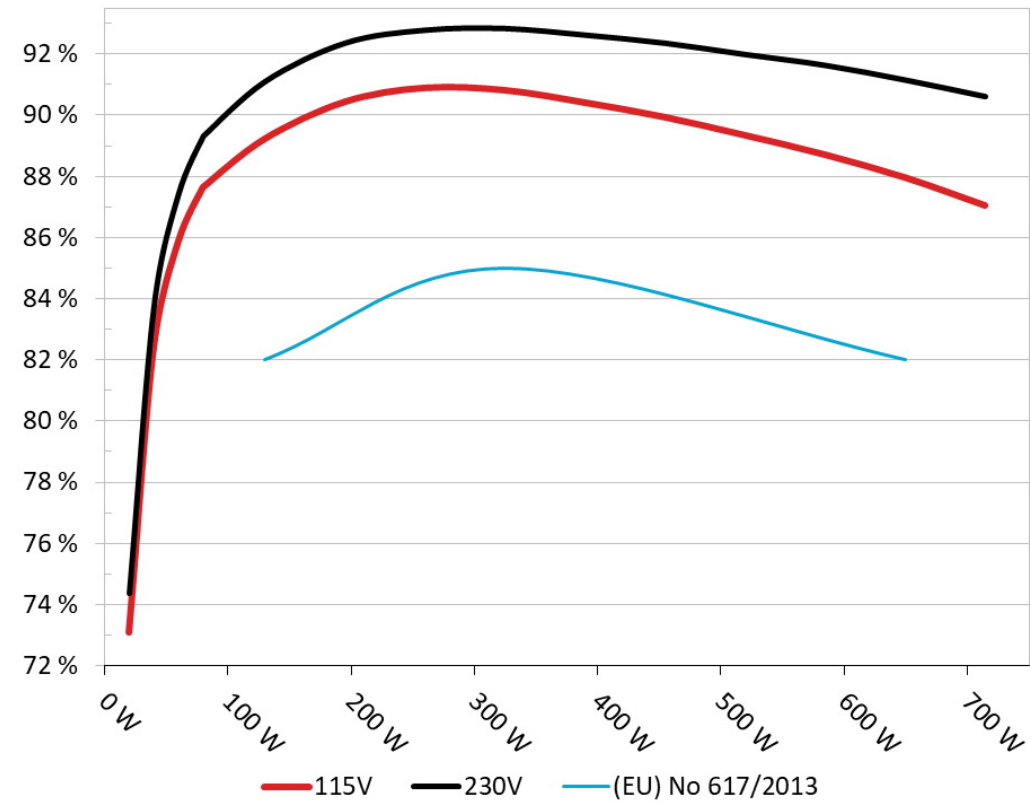
The PSU's noise in its entire operational range and under 30-32 °C ambient is depicted in this graph. The X axis represents the load on the +12V rail(s) while the Y axis is the load on the minor rails

Indicative Performance

Efficiency under high ambient temperature

Efficiency: FSP Vita GM 650W

Ambient: 36°C - 47°C (96.8°F - 116.6°F)



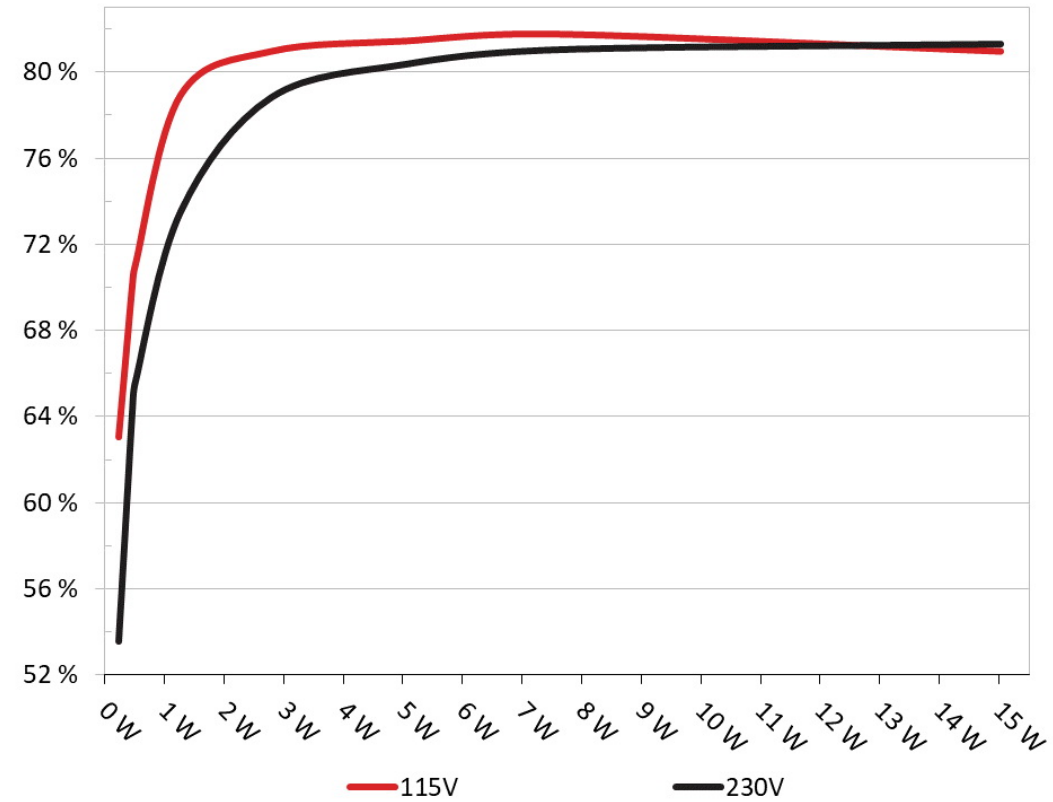
INFO

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: FSP Vita GM 650W

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

5VSB Efficiency (ERP LOT 3/6 & CEC)

115V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229W	63.045%	0.028
	5.093V	0.363W		114.87V
2	0.09A	0.458W	70.146%	0.05
	5.086V	0.653W		114.88V
3	0.55A	2.791W	80.968%	0.223
	5.074V	3.447W		114.87V
4	1A	5.063W	81.45%	0.327
	5.063V	6.216W		114.87V
5	1.5A	7.576W	81.767%	0.387
	5.051V	9.265W		114.87V
6	3A	15.034W	80.968%	0.471
	5.012V	18.568W		114.87V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.229W	53.56%	0.01
	5.094V	0.429W		229.94V
2	0.09A	0.458W	64.332%	0.016
	5.093V	0.713W		229.94V
3	0.55A	2.791W	78.842%	0.077
	5.076V	3.54W		229.94V
4	1A	5.064W	80.39%	0.132
	5.064V	6.3W		229.94V
5	1.5A	7.577W	81.057%	0.184
	5.052V	9.347W		229.94V
6	3A	15.035W	81.32%	0.294
	5.012V	18.489W		229.94V

Protection Features

OCP (Cold @ 26.2°C)	12V: 71.80A (132.55%), 12.120V 5V: 25A (125.00%), 5.04V 3.3V: 25.5A (127.50%), 3.331V 5VSB: 4.1A (136.67%), 4.977V
OCP (Hot) @ 44.8°C)	12V: 68.20A (125.90%), 12.147V 5V: 24.4A (122.00%), 5.035V 3.3V: 24.3A (121.50%), 3.329V 5VSB: 4A (133.33%), 4.988V
OPP (Cold @ 26.2°C)	963.02W (148.16%)
OPP (Hot @ 42.2°C)	920.62W (141.63%)
OTP	✗ (Didn't shut down)
SCP	12V to Earth: ✓ 5V to Earth: ✓ 3.3V to Earth: ✓ 5VSB to Earth: ✓ -12V to Earth: ✓
PWR_OK	Proper Operation
NLO	✓
Fan Failure Protection	✗
SIP	Surge: MOV Inrush: NTC & Bypass Relay

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%	3.550A	1.964A	1.955A	0.987A	64.997	85.554%	703	16.6	40.12°C	0.958
	12.227V	5.091V	3.377V	5.065V	75.972				42.67°C	114.85V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20%	8.105A	2.952A	2.94A	1.187A	129.922	89.22%	704	16.7	40.91°C	0.977
	12.218V	5.082V	3.367V	5.054V	145.62				43.54°C	114.82V
30%	13.012A	3.449A	3.439A	1.388A	194.922	90.435%	705	16.8	41.22°C	0.981
	12.210V	5.075V	3.359V	5.044V	215.538				44.32°C	114.81V
40%	17.932A	3.947A	3.939A	1.59A	260.006	90.894%	706	16.9	41.95°C	0.982
	12.201V	5.067V	3.351V	5.033V	286.055				45.61°C	114.78V
50%	22.512A	4.943A	4.939A	1.792A	325.002	90.815%	740	17.5	42.23°C	0.983
	12.193V	5.058V	3.341V	5.022V	357.875				47.27°C	114.76V
60%	27.041A	5.942A	5.944A	1.996A	389.316	90.415%	862	21.5	42.76°C	0.984
	12.185V	5.049V	3.332V	5.01V	430.587				49.34°C	114.74V
70%	31.661A	6.945A	6.955A	2.2A	454.637	89.935%	949	23.6	43.11°C	0.985
	12.177V	5.04V	3.322V	4.999V	505.517				50.5°C	114.71V
80%	36.288A	7.95A	7.971A	2.304A	519.418	89.345%	1059	26.5	43.64°C	0.987
	12.167V	5.031V	3.312V	4.99V	581.362				51.9°C	114.69V
90%	41.316A	8.46A	8.476A	2.409A	584.837	88.705%	1166	29.9	44.48°C	0.988
	12.159V	5.023V	3.303V	4.981V	659.307				53.23°C	114.67V
100%	46.087A	8.972A	9.015A	3.025A	649.656	87.958%	1196	30	45.5°C	0.989
	12.150V	5.015V	3.294V	4.958V	738.603				55.26°C	114.63V
110%	50.734A	9.989A	10.139A	3.029A	714.294	87.048%	1390	34.3	46.16°C	0.99
	12.142V	5.005V	3.284V	4.952V	820.571				57.22°C	114.61V
CL1	0.114A	11.901A	11.863A	0A	101.283	84.607%	800	19.4	40.94°C	0.973
	12.219V	5.058V	3.346V	5.085V	119.709				50.74°C	114.84V
CL2	0.113A	19.78A	0A	0A	101.368	83.223%	740	17.5	40.27°C	0.973
	12.222V	5.055V	3.364V	5.087V	121.805				47.93°C	114.83V
CL3	0.113A	0A	19.751A	0A	67.375	78.809%	738	17.5	40.94°C	0.962
	12.218V	5.07V	3.341V	5.082V	85.492				47.11°C	114.85V
CL4	53.427A	0A	0A	0.001A	649.494	88.961%	1191	30	45.74°C	0.989
	12.156V	5.041V	3.321V	5.049V	730.099				53.14°C	114.64V

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%	3.550A	1.964A	1.955A	0.987A	65	87.158%	704	16.7	40.38°C	0.76
	12.226V	5.091V	3.375V	5.065V	74.578				43.27°C	229.93V
20%	8.105A	2.952A	2.941A	1.187A	129.928	91.101%	704	16.7	40.62°C	0.886
	12.217V	5.082V	3.366V	5.054V	142.618				43.38°C	229.92V
30%	13.013A	3.449A	3.44A	1.388A	194.928	92.36%	706	16.9	41.05°C	0.929
	12.209V	5.074V	3.358V	5.044V	211.054				44.81°C	229.91V
40%	17.934A	3.947A	3.941A	1.59A	260.012	92.784%	706	16.9	41.61°C	0.948
	12.201V	5.067V	3.35V	5.033V	280.233				45.63°C	229.9V
50%	22.510A	4.943A	4.94A	1.792A	324.998	92.836%	772	18.3	42.09°C	0.959
	12.194V	5.058V	3.34V	5.022V	350.079				47.51°C	229.89V
60%	27.042A	5.942A	5.946A	1.996A	389.309	92.624%	830	21	42.81°C	0.965
	12.185V	5.049V	3.33V	5.01V	420.31				48.48°C	229.88V
70%	31.661A	6.945A	6.958A	2.2A	454.631	92.357%	978	24.2	43.27°C	0.97
	12.177V	5.04V	3.32V	4.998V	492.256				49.8°C	229.87V
80%	36.290A	7.95A	7.974A	2.305A	519.421	91.989%	1077	27.7	43.96°C	0.973
	12.167V	5.031V	3.31V	4.989V	564.66				49.88°C	229.86V
90%	41.323A	8.46A	8.48A	2.409A	584.852	91.632%	1138	29.6	44.24°C	0.975
	12.157V	5.023V	3.302V	4.98V	638.263				51.46°C	229.85V
100%	46.090A	8.973A	9.019A	3.026A	649.673	91.151%	1226	30.6	45.68°C	0.977
	12.150V	5.015V	3.293V	4.957V	712.746				53.2°C	229.84V
110%	50.742A	9.989A	10.143A	3.029A	714.293	90.614%	1627	38.4	46.26°C	0.979
	12.140V	5.005V	3.283V	4.951V	788.291				54.15°C	229.82V
CL1	0.114A	11.9A	11.868A	0A	101.283	86.371%	772	18.3	40.85°C	0.857
	12.218V	5.058V	3.345V	5.084V	117.265				49.3°C	229.93V
CL2	0.113A	19.78A	0A	0A	101.37	84.908%	771	18.3	40.45°C	0.86
	12.222V	5.055V	3.363V	5.087V	119.389				47.43°C	229.93V
CL3	0.113A	0A	19.76A	0A	67.375	80.347%	740	17.5	40.67°C	0.788
	12.218V	5.07V	3.34V	5.083V	83.855				46.81°C	229.93V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL4	53.425A	0A	0A	0.001A	649.488	92.102%	1188	30	45.45°C	0.977
	12.157V	5.041V	3.319V	5.049V	705.185				52.22°C	229.83V

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	1.214A	0.49A	0.488A	0.197A	19.993	73.08%	692	15.9	36.24°C	0.846
	12.225V	5.098V	3.384V	5.087V	27.362				37.07°C	114.86V
40W	2.673A	0.687A	0.683A	0.295A	39.994	82.379%	697	16.1	37.44°C	0.927
	12.227V	5.096V	3.382V	5.084V	48.546				38.22°C	114.86V
60W	4.133A	0.883A	0.879A	0.394A	59.995	85.863%	698	16.2	38.41°C	0.952
	12.225V	5.094V	3.38V	5.081V	69.874				40.23°C	114.85V
80W	5.588A	1.08A	1.075A	0.492A	79.935	87.638%	700	16.4	39.32°C	0.963
	12.224V	5.092V	3.378V	5.077V	91.208				41.24°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	1.214A	0.49A	0.488A	0.197A	19.996	74.384%	695	15.9	36.08°C	0.443
	12.226V	5.098V	3.383V	5.087V	26.88				36.76°C	229.94V
40W	2.674A	0.687A	0.683A	0.295A	40	83.762%	697	16.1	37.32°C	0.629
	12.224V	5.096V	3.381V	5.084V	47.755				38.41°C	229.94V
60W	4.134A	0.884A	0.879A	0.394A	60.003	87.439%	698	16.2	38.21°C	0.738
	12.223V	5.094V	3.378V	5.08V	68.627				39.59°C	229.93V
80W	5.589A	1.08A	1.075A	0.492A	79.946	89.322%	701	16.4	39.34°C	0.802
	12.223V	5.092V	3.376V	5.077V	89.503				41.25°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	14.5 mV	12.7 mV	12.7 mV	10.8 mV	Pass
20% Load	14.3 mV	11.9 mV	12.4 mV	11.4 mV	Pass
30% Load	12.8 mV	14.8 mV	15.7 mV	12.5 mV	Pass
40% Load	13.7 mV	12.9 mV	13.3 mV	12.5 mV	Pass
50% Load	13.3 mV	13.1 mV	13.7 mV	13.5 mV	Pass
60% Load	13.0 mV	14.6 mV	15.9 mV	15.6 mV	Pass
70% Load	13.5 mV	15.8 mV	16.5 mV	15.0 mV	Pass
80% Load	14.5 mV	14.4 mV	16.8 mV	15.5 mV	Pass
90% Load	14.8 mV	15.3 mV	17.4 mV	16.3 mV	Pass
100% Load	21.8 mV	16.9 mV	18.1 mV	18.5 mV	Pass
110% Load	22.4 mV	17.9 mV	19.7 mV	18.7 mV	Pass
Crossload 1	20.5 mV	13.1 mV	13.9 mV	11.4 mV	Pass
Crossload 2	14.9 mV	15.6 mV	12.8 mV	9.1 mV	Pass
Crossload 3	19.3 mV	15.7 mV	27.9 mV	8.8 mV	Pass
Crossload 4	22.3 mV	17.4 mV	17.1 mV	17.0 mV	Pass

The results above are not used in the certification process

230V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	14.3 mV	11.1 mV	12.2 mV	11.2 mV	Pass
20% Load	13.7 mV	13.2 mV	13.4 mV	11.0 mV	Pass
30% Load	12.3 mV	15.2 mV	16.7 mV	11.8 mV	Pass
40% Load	12.6 mV	12.4 mV	13.5 mV	13.0 mV	Pass
50% Load	13.5 mV	13.1 mV	13.6 mV	13.6 mV	Pass
60% Load	13.9 mV	13.6 mV	16.6 mV	14.0 mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
70% Load	14.2 mV	14.1 mV	14.5 mV	15.6 mV	Pass
80% Load	14.2 mV	15.7 mV	16.6 mV	15.6 mV	Pass
90% Load	14.2 mV	16.3 mV	16.4 mV	16.0 mV	Pass
100% Load	21.9 mV	17.4 mV	18.9 mV	18.1 mV	Pass
110% Load	21.9 mV	18.1 mV	18.2 mV	18.2 mV	Pass
Crossload 1	22.1 mV	13.8 mV	14.0 mV	10.9 mV	Pass
Crossload 2	14.1 mV	15.7 mV	12.6 mV	9.1 mV	Pass
Crossload 3	14.4 mV	11.2 mV	14.8 mV	8.7 mV	Pass
Crossload 4	22.2 mV	18.1 mV	16.5 mV	16.6 mV	Pass

The results above are not used in the certification process

FSP Technology VITA GM 650W



Top side

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

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Power specifications label

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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