Sharkoon Rebel P10 650

Serial Number

Lab ID SK65002588

Certification ID 252588

Test Result Report ID: 24PS2588A

Certificate Issue Date: Nov 14, 2024

Scheme: ETA-EMI PSU

115V: CYBENETICS BRONZE

230V: CYBENETICS SILVER 230v

Scheme: LAMBDA PSU

115V: CYBENETICS STANDARD++

230V: CYBENETICS STANDARD++ 230v

CYBENETICS ATX 3.1 PASS

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	Sharkoon
Model	Rebel P10 650
OEM/ODM	Andyson
Serial Number	
Product Specifications	
Manufacturer-Provided Information	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	4-8

Rated Frequency (Hz)	50-60
Rated Power (W)	650
Operating Temperature (Continuous Full Load) (°C)	
Type	ATX12V
Cable Design	Fixed cables
Warranty	-
Cybenetics Measurements	
Dimensions (W x H x D)	
Weight	
Cooling	120mm Sleeve Bearing Fan (S1202512L)
Semi-Passive Operation	✗
Cybenetics Testing Information	
Lab ID	SK65002588
Date of receipt	Nov 29, 2024
Testing Date	Nov 13, 2024
Report Issued Date	Nov 14, 2024
Engineer Name	-
Authorized By the Laboratory Technical Manager	Aristeidis Bitziopoulos
Signature	

Cables and Connectors(Non-accredited measurements)

Captive Cables				
Description	**Cable Count**	**Connector Count (Total)**	**Gauge**	In Cable Capacitors
ATX connector 20+4 pin (545mm)	1	1	18-22AWG	No
4+4 pin EPS12V (630mm)	2	2	18AWG	No
6+2 pin PCIe (570mm+150mm)	1	2	18AWG	No
SATA (465mm+120mm+120mm)	1	3	18AWG	No
SATA (460mm+120mm) / 4-pin Molex (+120mm)	1	2 / 1	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	18	18	54.1	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)	84.550%

Average Noise Output (>1450 Load Combinations)	31.12dBA
Average PF (>1450 Load Combinations)	0.976
Efficiency With 10W (≤500W) or 2% (>500W) Load	60.291%
Standby Power Consumption	0.0792W
Non-Accredited	
12V Ripple (Full Load)	49.28mV
5V Ripple (Full Load)	39.04mV
3.3V Ripple (Full Load)	24.78mV
5VSB Ripple (Full Load)	30.63mV
12V Load Regulation	0.61%
5V Load Regulation	1.44%
3.3V Load Regulation	4.04%
5VSB Load Regulation	3.80%
Inrush Current	32.950A

230V

Accredited	
Average Efficiency (>1450 load combinations)	87.305%
Average Noise Output (>1450 Load Combinations)	30.64dBA
Average PF (>1450 Load Combinations)	0.941
Efficiency With 10W (≤500W) or 2% (>500W) Load	0.001%
Standby Power Consumption	0.1649W
Non-Accredited	
12V Ripple (Full Load)	48.66mV
5V Ripple (Full Load)	36.76mV
3.3V Ripple (Full Load)	24.72mV
5VSB Ripple (Full Load)	25.92mV
12V Load Regulation	0.59%
5V Load Regulation	1.52%
3.3V Load Regulation	4.07%
5VSB Load Regulation	3.80%
Inrush Current	65.690A

12V Transient Response (150%)	11.85V	
5V Transient Response (150%)	4.955V	
3.3V Transient Response (150%)	3.210V	
5VSB Transient Response (150%)	4.944V	
Hold-Up Time & PWR_OK Signal	15.40ms	
AC Loss to PWR_OK Hold Up Time	14.00ms	
PWR_OK Inactive to DC Loss Delay	1.40ms	
PSU Timings: T1 (20% / 100%)	28.0ms	28.0ms
PSU Timings: T3 (20% / 100%)	123.0ms	122.0ms
12V OCP (30.5°C / 43.3°C)	72.60A (134.20%), 12.186V	63.80A (117.93%), 12.189V
5V OCP (30.5°C / 43.3°C)	22.3A (123.89%), 5.066V	20.9A (116.11%), 5.081V
3.3V OCP (30.5°C / 43.3°C)	21.5A (119.44%), 3.323V	20.4A (113.33%), 3.32V
5VSB OCP (30.5°C / 43.3°C)	4.7A (156.67%), 4.96V	4.6A (153.33%), 4.969V
OPP (31.58°C / 43.94°C)	132.65%	115.31%

Hold-Up Time & PWR_OK Signal

Hold-Up Time (ms)	15.4
AC Loss to PWR_OK Hold Up Time (ms)	14
PWR_OK Inactive to DC Loss Delay (ms)	1.4

Stromverbrauch im Ruhezustand

Tables

115V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	115.06 V	115.03 V	113.85 V	115.10 V	116.15 V	PASS
Mains Frequency:	60.00 Hz	59.94 Hz	59.40 Hz	60.02 Hz	60.60 Hz	PASS
Mains Voltage CF:	1.416	1.415	1.340	1.418	1.490	PASS

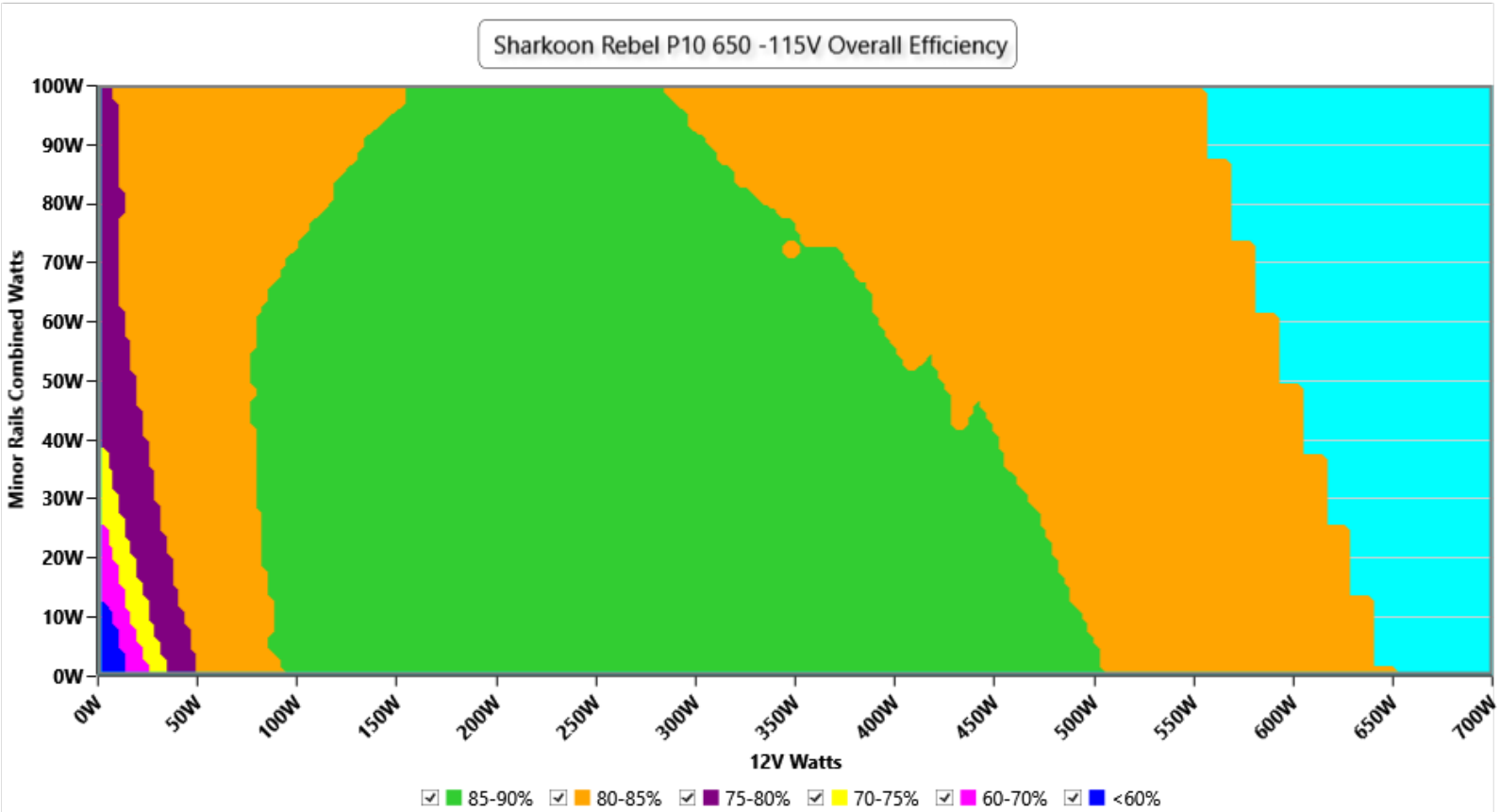
Mains Voltage THD:	0.13 %	0.09 %	N/A	0.19 %	2.00 %	PASS
Real Power:	0.079 W	0.005 W	N/A	0.118 W	N/A	N/A
Apparent Power:	7.670 W	7.437 W	N/A	7.943 W	N/A	N/A
Power Factor:	0.010	N/A	N/A	N/A	N/A	N/A

230V

Detailed Results						
	Average	Min	Limit Min	Max	Limit Max	Result
Mains Voltage RMS:	231.02 V	230.92 V	227.70 V	231.09 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:	0.165 W	0.123 W	N/A	0.231 W	N/A	N/A
Apparent Power:	25.297 W	24.945 W	N/A	25.676 W	N/A	N/A
Power Factor:	0.006	N/A	N/A	N/A	N/A	N/A

Efficiency Graph

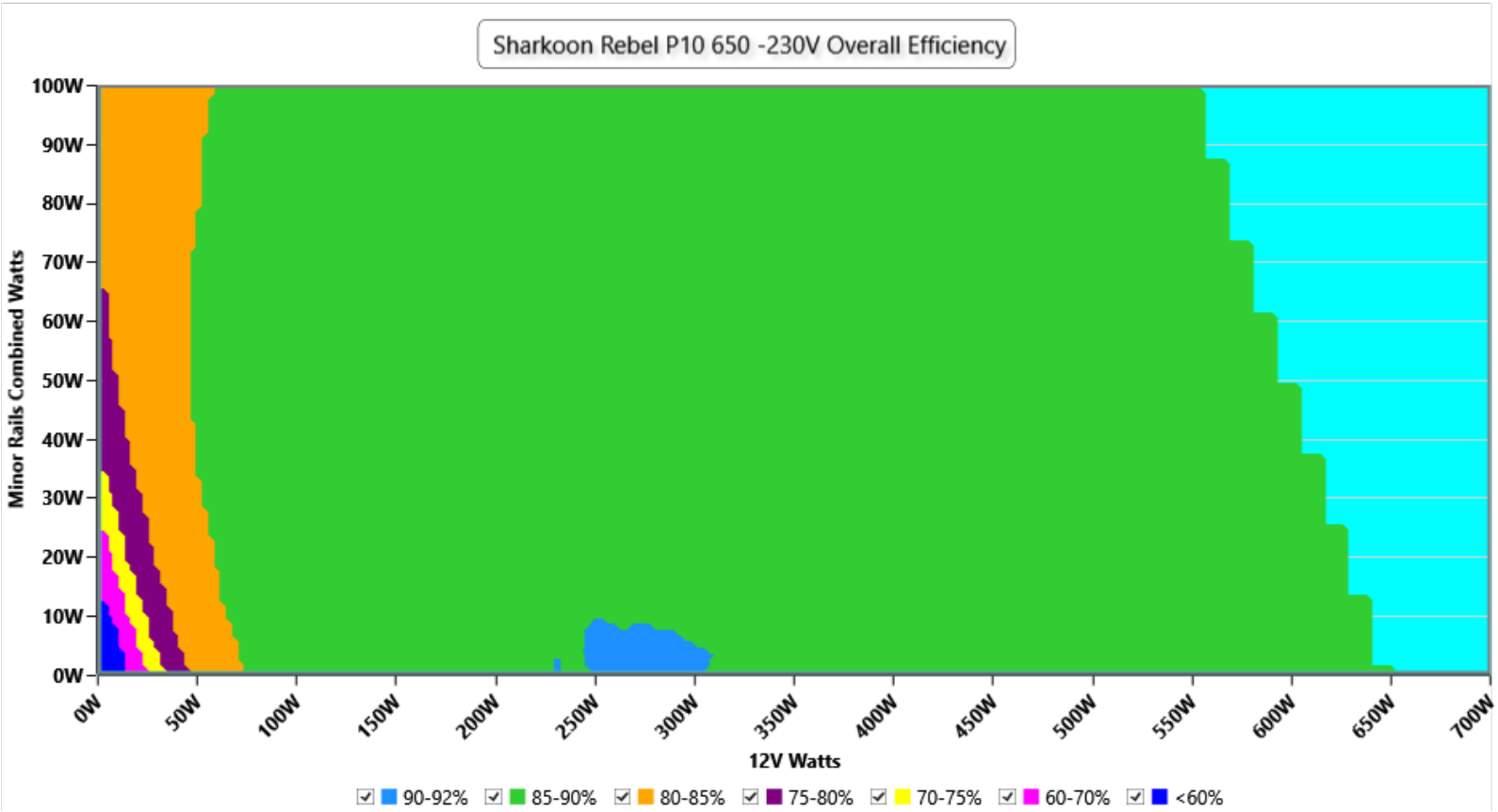
115V



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

230V



INFO

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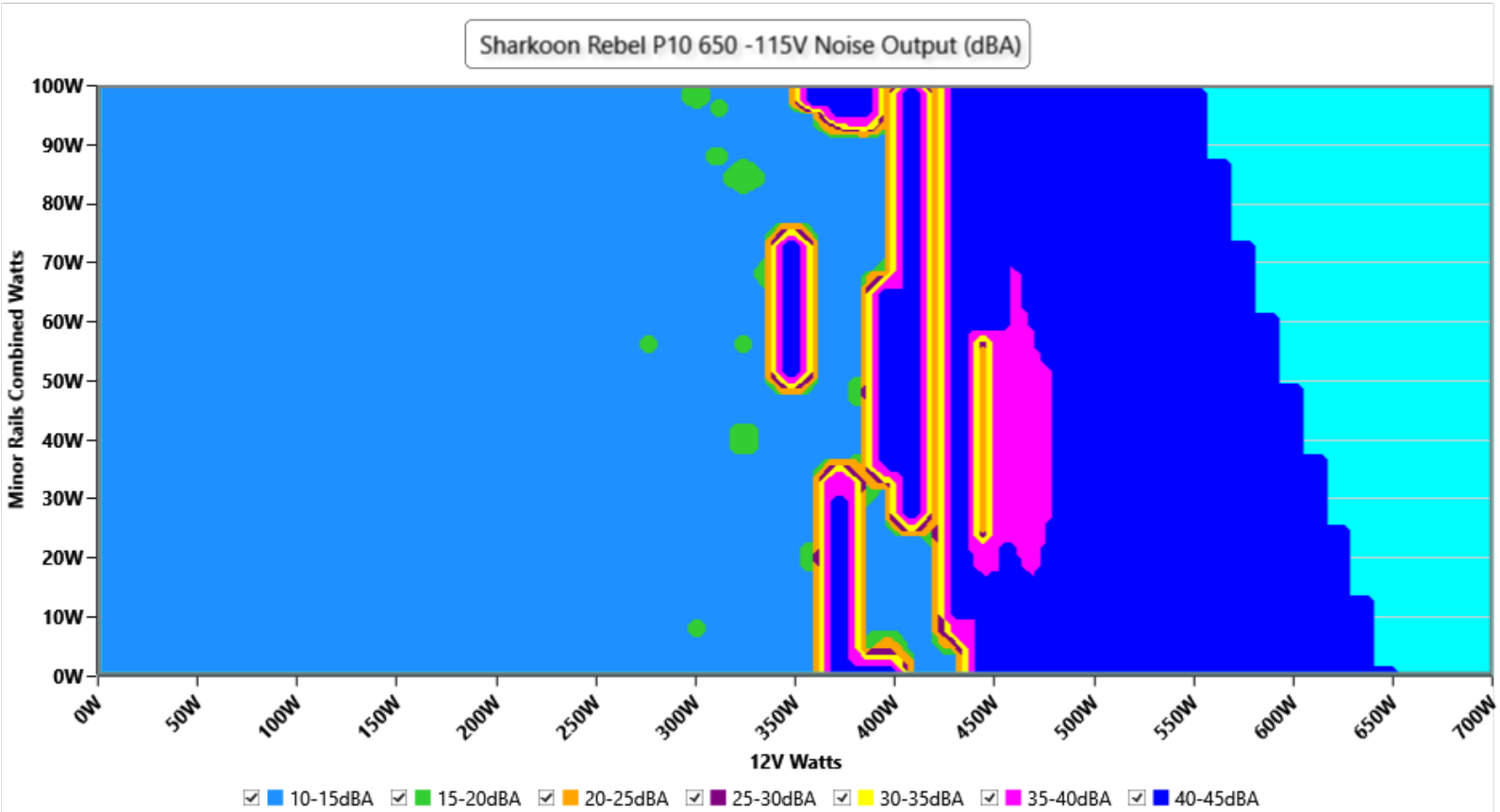
Noise Graph

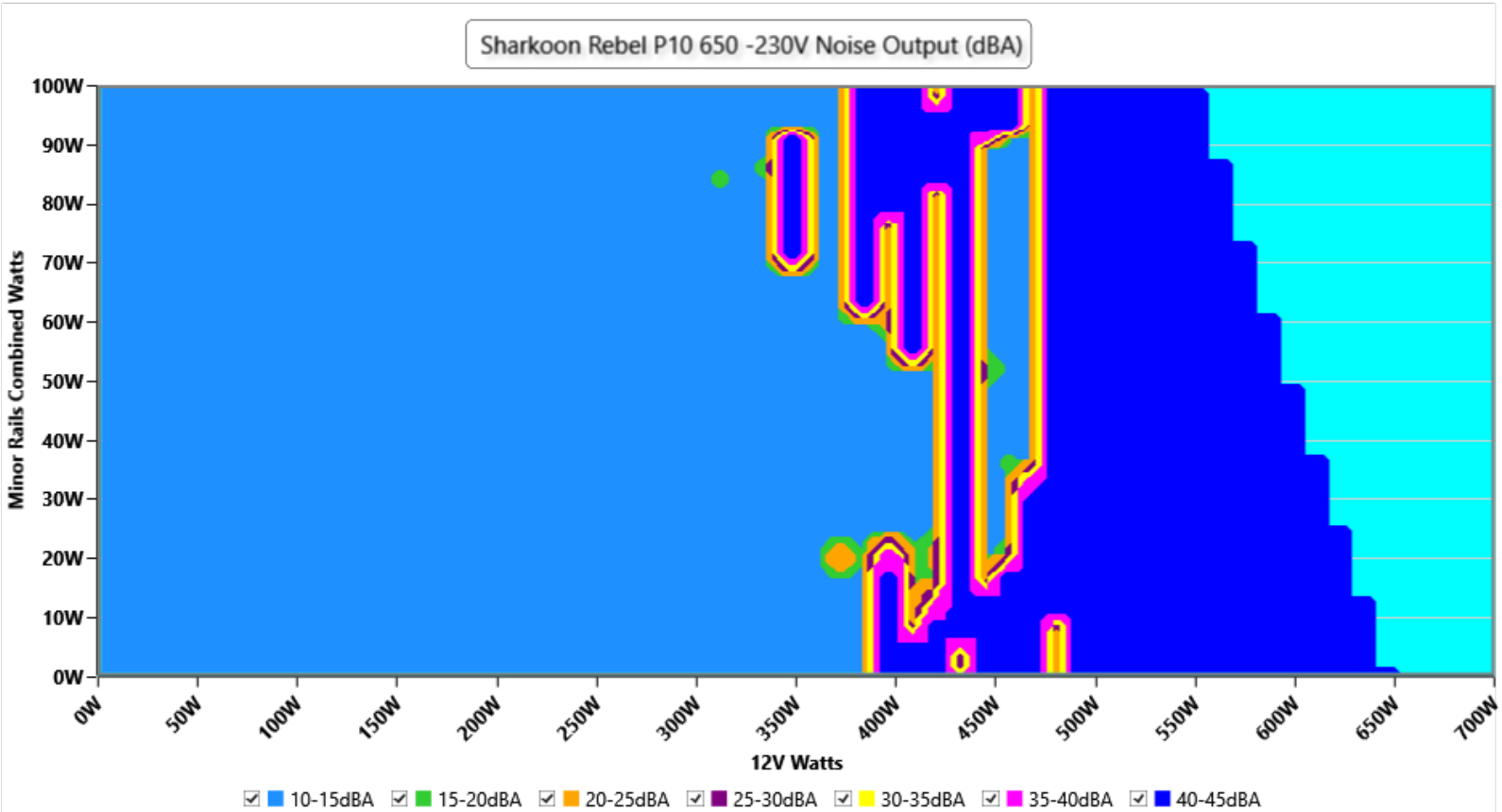
115V



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

230V

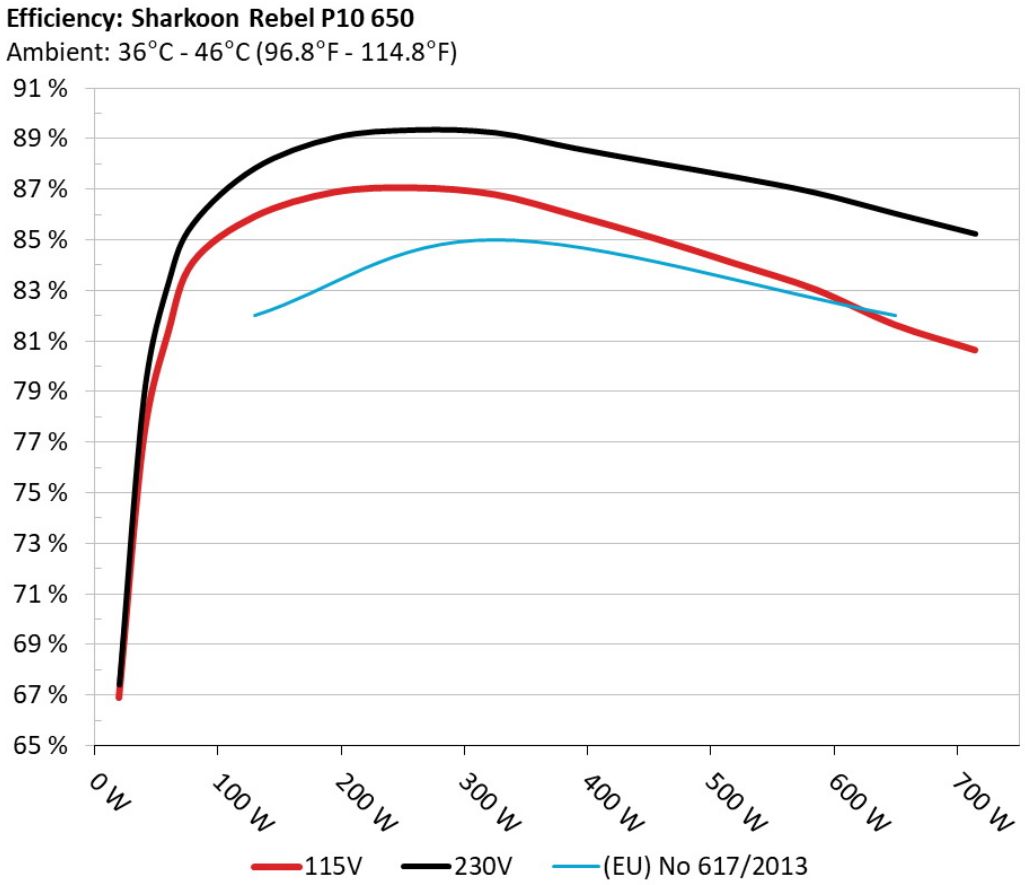


INFO

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

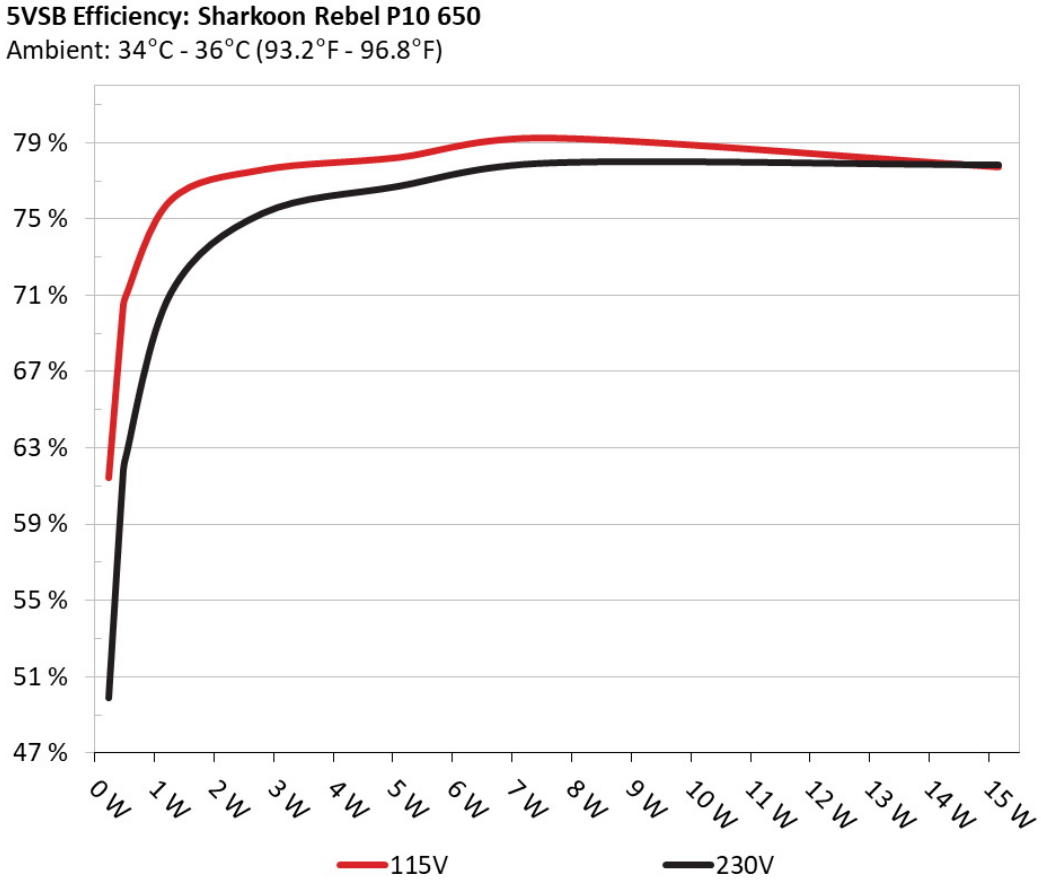
Efficiency under high ambient temperature



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	**0.045A**	0.23W	61.453%	0.048
	5.114V	0.374W		114.89V
2	**0.09A**	0.46W	70.032%	0.082
	5.113V	0.657W		114.88V
3	**0.55A**	2.807W	77.612%	0.303
	5.103V	3.617W		114.87V
4	**1A**	5.094W	78.258%	0.367
	5.094V	6.51W		114.87V
5	**1.5A**	7.625W	79.281%	0.411
	5.083V	9.618W		114.87V
6	**3A**	15.153W	77.76%	0.467
	5.05V	19.487W		114.87V

230V

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	**0.045A**	0.23W	49.87%	0.017
	5.115V	0.462W		229.94V
2	**0.09A**	0.46W	61.141%	0.028
	5.113V	0.753W		229.95V
3	**0.55A**	2.807W	75.294%	0.13
	5.103V	3.729W		229.94V
4	**1A**	5.094W	76.719%	0.206
	5.094V	6.639W		229.94V
5	**1.5A**	7.625W	77.943%	0.242
	5.083V	9.784W		229.94V
6	**3.001A**	15.152W	77.839%	0.341
	5.05V	19.466W		229.94V

Protection Features

OCP (Normal @ 30.5°C)	12V: 72.60A (134.20%), 12.186V 5V: 22.3A (123.89%), 5.066V 3.3V: 21.5A (119.44%), 3.323V 5VSB: 4.7A (156.67%), 4.96V
OCP (Hot @ 43.3°C)	12V: 63.80A (117.93%), 12.189V 5V: 20.9A (116.11%), 5.081V 3.3V: 20.4A (113.33%), 3.32V 5VSB: 4.6A (153.33%), 4.969V
OPP (Normal @ 31.6°C)	862.24W (132.65%)
OPP (Hot @ 43.9°C)	749.50W (115.31%)
OTP	✓ (125°C @ Secondary Side)
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%	**3.547A**	**1.966A**	**1.964A**	**0.984A**	65.009	81.107%	708	12.9	40.2°C	0.912
	12.238V	5.088V	3.361V	5.08V	80.149				41.08°C	114.86V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
20%	**8.098A**	**2.953A**	**2.957A**	**1.185A**	129.951	85.931%	711	12.9	40.95°C	0.953
	12.231V	5.08V	3.348V	5.063V	151.229				42.38°C	114.83V
30%	**12.999A**	**3.449A**	**3.462A**	**1.387A**	194.956	86.896%	716	13.2	41.4°C	0.971
	12.224V	5.074V	3.336V	5.048V	224.356				43.75°C	114.82V
40%	**17.913A**	**3.946A**	**3.971A**	**1.59A**	260.044	87.068%	714	13.1	41.81°C	0.981
	12.217V	5.07V	3.324V	5.032V	298.67				44.35°C	114.79V
50%	**22.487A**	**4.938A**	**4.987A**	**1.795A**	325.046	86.802%	717	13.2	42.03°C	0.985
	12.208V	5.064V	3.309V	5.015V	374.468				45.72°C	114.76V
60%	**27.019A**	**5.935A**	**6.012A**	**2A**	389.446	85.986%	1879	41	42.95°C	0.989
	12.200V	5.056V	3.294V	4.997V	452.924				47.16°C	114.74V
70%	**31.622A**	**6.947A**	**7.037A**	**2.209A**	454.767	85.07%	1874	40.9	43.37°C	0.991
	12.196V	5.039V	3.283V	4.98V	534.584				47.07°C	114.71V
80%	**36.236A**	**7.951A**	**8.076A**	**2.317A**	519.573	84.078%	1893	41.2	43.54°C	0.992
	12.189V	5.031V	3.269V	4.964V	617.975				48.05°C	114.69V
90%	**41.251A**	**8.459A**	**8.597A**	**2.425A**	584.962	83.049%	1909	41.4	44.76°C	0.993
	12.181V	5.024V	3.257V	4.95V	704.359				50.38°C	114.66V
100%	**46.016A**	**8.969A**	**9.159A**	**3.049A**	649.786	81.648%	1910	41.4	45.15°C	0.993
	12.171V	5.017V	3.243V	4.921V	795.85				52.47°C	114.64V
110%	**50.647A**	**9.995A**	**10.303A**	**3.057A**	714.411	80.657%	1915	41.5	45.11°C	0.994
	12.165V	5.003V	3.232V	4.909V	885.755				52.1°C	114.61V
CL1	**0.115A**	**11.864A**	**11.99A**	**0A**	101.299	78.592%	733	13.8	41.78°C	0.946
	12.229V	5.074V	3.311V	5.076V	128.888				45.72°C	114.84V
CL2	**0.114A**	**17.703A**	**0A**	**0.001A**	91.397	77.685%	863	18.5	40.74°C	0.939
	12.234V	5.084V	3.334V	5.088V	117.65				43.6°C	114.84V
CL3	**0.113A**	**0A**	**17.875A**	**0A**	60.788	72.203%	718	13.2	41.85°C	0.915
	12.232V	5.079V	3.323V	5.086V	84.19				43.98°C	114.85V
CL4	**53.343A**	**0A**	**0A**	**0.002A**	649.623	83.135%	1920	41.7	44.65°C	0.993
	12.178V	5.034V	3.29V	5.019V	781.421				51.44°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%	**3.548A**	**1.966A**	**1.964A**	**0.984A**	65.011	83.149%	707	12.9	40.4°C	0.796
	12.237V	5.088V	3.361V	5.08V	78.186				41.35°C	229.94V
20%	**8.099A**	**2.953A**	**2.958A**	**1.185A**	129.952	87.844%	709	12.9	40.95°C	0.893
	12.230V	5.08V	3.347V	5.063V	147.936				42.52°C	229.93V
30%	**12.999A**	**3.45A**	**3.463A**	**1.387A**	194.957	89.06%	712	12.9	41.12°C	0.931
	12.223V	5.074V	3.336V	5.048V	218.903				43.23°C	229.92V
40%	**17.914A**	**3.947A**	**3.972A**	**1.59A**	260.046	89.357%	714	13.1	41.72°C	0.951
	12.216V	5.069V	3.324V	5.032V	291.019				43.98°C	229.9V
50%	**22.486A**	**4.94A**	**4.987A**	**1.795A**	325.046	89.247%	718	13.2	42.4°C	0.963
	12.209V	5.062V	3.309V	5.014V	364.209				45.69°C	229.89V
60%	**27.015A**	**5.942A**	**6.008A**	**2A**	389.45	88.633%	1886	41	42.77°C	0.97
	12.202V	5.05V	3.296V	4.997V	439.394				45.98°C	229.88V
70%	**31.619A**	**6.95A**	**7.035A**	**2.21A**	454.769	88.056%	1871	40.8	43.05°C	0.973
	12.197V	5.038V	3.284V	4.98V	516.454				46.02°C	229.87V
80%	**36.233A**	**7.955A**	**8.073A**	**2.317A**	519.567	87.498%	1895	41.2	43.96°C	0.976
	12.189V	5.028V	3.27V	4.964V	593.801				47.34°C	229.86V
90%	**41.249A**	**8.463A**	**8.597A**	**2.425A**	584.967	86.868%	1910	41.4	44.52°C	0.98
	12.181V	5.022V	3.257V	4.949V	673.396				48.91°C	229.85V
100%	**46.013A**	**8.973A**	**9.16A**	**3.049A**	649.791	86.045%	1916	41.5	45.74°C	0.983
	12.172V	5.015V	3.242V	4.921V	755.18				51.05°C	229.84V
110%	**50.648A**	**9.995A**	**10.307A**	**3.057A**	714.419	85.248%	1920	41.7	46.23°C	0.986
	12.164V	5.003V	3.23V	4.907V	838.052				51.4°C	229.83V
CL1	**0.115A**	**11.874A**	**11.983A**	**0A**	101.299	80.411%	1574	37	40.93°C	0.876
	12.229V	5.07V	3.313V	5.076V	125.978				44.46°C	229.93V
CL2	**0.114A**	**17.712A**	**0A**	**0.001A**	91.397	79.833%	737	13.8	40.86°C	0.861
	12.235V	5.081V	3.336V	5.088V	114.487				43.19°C	229.93V
CL3	**0.113A**	**0A**	**17.877A**	**0A**	60.788	74.039%	718	13.2	40.28°C	0.806
	12.231V	5.079V	3.322V	5.085V	82.102				42.34°C	229.94V

Test	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
CL4	**53.340A**	**0A**	**0A**	**0.001A**	649.624	87.193%	1915	41.5	45.51°C	0.982
	12.178V	5.032V	3.29V	5.019V	745.046				49.64°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**	**0.491A**	**0.489A**	**0.196A**	20.007	66.918%	700	12.7	36.07°C	0.816
	12.245V	5.089V	3.374V	5.108V	29.898				36.48°C	114.87V
40W	**2.670A**	**0.688A**	**0.685A**	**0.294A**	40.006	77.136%	708	12.7	37.27°C	0.873
	12.243V	5.088V	3.371V	5.103V	51.866				37.63°C	114.87V
60W	**4.128A**	**0.885A**	**0.882A**	**0.392A**	60.006	81.362%	701	12.9	38.1°C	0.905
	12.241V	5.086V	3.367V	5.097V	73.752				38.75°C	114.86V
80W	**5.583A**	**1.082A**	**1.079A**	**0.491A**	79.957	84.124%	704	12.7	39.26°C	0.92
	12.238V	5.086V	3.363V	5.091V	95.047				39.76°C	114.85V

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**	**0.491A**	**0.489A**	**0.196A**	20.009	67.412%	701	12.7	36.65°C	0.538
	12.244V	5.091V	3.374V	5.108V	29.684				37.8°C	229.95V
40W	**2.671A**	**0.688A**	**0.685A**	**0.294A**	40.008	78.846%	702	12.7	37.6°C	0.699
	12.242V	5.089V	3.371V	5.102V	50.741				38.58°C	229.94V
60W	**4.129A**	**0.885A**	**0.882A**	**0.392A**	60.007	83.341%	702	12.7	38.4°C	0.778
	12.240V	5.087V	3.367V	5.097V	72.001				39.38°C	229.94V
80W	**5.584A**	**1.082A**	**1.079A**	**0.491A**	79.959	85.656%	702	12.7	39.2°C	0.827
	12.238V	5.086V	3.364V	5.091V	93.347				40.19°C	229.94V

The results above are not used in the certification process

Ripple Measurements

115V

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.44mV	16.59mV	11.17mV	18.74mV	Pass
20% Load	13.56mV	19.11mV	13.65mV	20.18mV	Pass
30% Load	15.98mV	20.50mV	13.81mV	20.03mV	Pass
40% Load	19.18mV	22.31mV	14.22mV	20.91mV	Pass
50% Load	21.14mV	24.47mV	15.10mV	21.47mV	Pass
60% Load	26.86mV	26.74mV	16.39mV	22.46mV	Pass
70% Load	26.76mV	26.84mV	18.72mV	22.71mV	Pass
80% Load	30.32mV	29.62mV	21.30mV	24.10mV	Pass
90% Load	38.51mV	34.67mV	21.62mV	25.35mV	Pass
100% Load	49.28mV	39.04mV	24.78mV	30.63mV	Pass
110% Load	57.21mV	42.02mV	26.57mV	32.48mV	Pass
Crossload1	19.72mV	31.58mV	22.93mV	19.88mV	Pass
Crossload2	19.54mV	35.76mV	19.14mV	21.01mV	Pass
Crossload3	15.26mV	19.53mV	23.01mV	15.12mV	Pass
Crossload4	49.63mV	23.61mV	17.43mV	27.66mV	Pass

The results above are not used in the certification process

230V

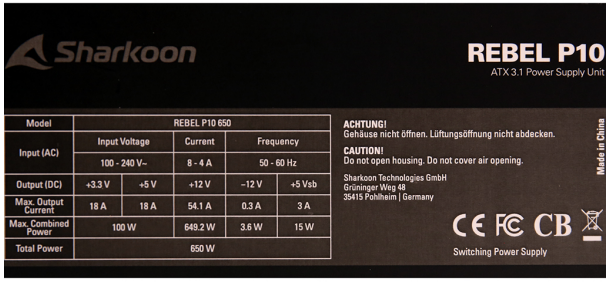
Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	11.14mV	17.47mV	11.94mV	17.81mV	Pass
20% Load	13.10mV	18.85mV	13.75mV	18.58mV	Pass
30% Load	15.72mV	21.23mV	13.03mV	20.18mV	Pass
40% Load	16.81mV	22.31mV	13.96mV	19.05mV	Pass
50% Load	19.13mV	23.29mV	15.05mV	20.80mV	Pass
60% Load	24.49mV	25.97mV	16.50mV	20.08mV	Pass

Test	12V	5V	3.3V	5VSB	Pass/Fail
70% Load	26.04mV	26.33mV	17.43mV	20.39mV	Pass
80% Load	29.85mV	29.93mV	21.36mV	20.75mV	Pass
90% Load	36.04mV	33.74mV	20.89mV	22.14mV	Pass
100% Load	48.66mV	36.76mV	24.72mV	25.92mV	Pass
110% Load	55.43mV	39.59mV	25.60mV	27.31mV	Pass
Crossload1	17.93mV	31.37mV	23.55mV	18.79mV	Pass
Crossload2	17.22mV	35.08mV	18.82mV	19.46mV	Pass
Crossload3	14.80mV	19.58mV	23.58mV	14.19mV	Pass
Crossload4	50.45mV	24.17mV	18.13mV	23.00mV	Pass

The results above are not used in the certification process

Sharkoon Rebel P10 650

Top side



Power specifications label

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