Anex

Corsair CX650M

Lab ID#: 110
Receipt Date: -
Test Date: -

Report:
Report Date: May 17, 2018

DUT INFORMATION

Brand	Corsair
Manufacturer (OEM)	Channel Well Technology
Series	CXM
Model Number	CX650M
Serial Number	16457117000022410765
DUT Notes	CP-9020103

DUT SPECIFICATIONS

Rated Voltage (Vrms)	100-240
Rated Current (Arms)	10-5
Rated Frequency (Hz)	47-63
Rated Power (W)	650
Type	ATX12V
Cooling	120mm Sleeve Bearing Fan (HA1225H12S-Z)
Semi-Passive Operation	✗
Cable Design	Semi Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	25	25	54	3	0.8
	Watts	130		648	15	9.6
Total Max. Power (W)		650				

CABLES AND CONNECTORS

Native Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (610mm)	1	1	16-22AWG
4+4 pin EPS12V (650mm)	1	1	18AWG
Modular Cables			
6+2 pin PCIe (600mm+150mm)	2	4	16-18AWG
SATA (360mm+120mm+120mm+120mm)	1	4	18AWG
SATA (490mm+120mm)	1	2	18AWG
4 pin Molex (450mm+100mm+100mm) / FDD (+100mm)	1	3 / 1	18-22AWG

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General Data	
Manufacturer (OEM)	CWT
Platform Model	-
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM & 1x DM chokes, 1x MOV
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	1x GBU1006 (600 V, 10 A @ 100 °C)
APFC MOSFETS	2x Fairchild FCPF190N60E (650 V, 13.1 A @ 100 °C, 0.16 Ohm)
APFC Boost Diode	1x STMicroelectronics STTH8S06D (600 V, 8 A @ 125 °C)
Hold-up Cap(s)	1x Nippon Chemi-Con (400 V, 470 uF, 2000 h @ 105 °C, KMW)
Main Switchers	2x Infineon IPA50R280CE (550 V, 11.4 A @ 100 °C, 0.28 Ohm)
Combo APFC/PWM Controller	Champion CM6800TX
Topology	Primary side: Double-Forward Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	4x Infineon BSC039N06NS (60 V, 65 A @ 100 °C, 3.9 mOhm)
5V & 3.3V	DC-DC Converters: 3x UBIQ QM3006D (30 V, 57 A @ 100 °C, 5.5 mOhm), 3x UBIQ QM3004D (30 V, 40 A @ 100 °C, 8.5 mOhm) PWM Controller: APW7159
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (105 °C, KY), SAMXON (105 °C), Suscon (105 °C) Polymers: Nippon Chemi-Con, APAQ, Teapo
Supervisor IC	Weltrend WT7502 (OVP, UVP, OCP, SCP, OTP)
Fan Model	Power Logic PLA13525S12M (12 V, 0.40 A, 111.1 CFM, 41.6 dBA, Hydro Dynamic Bearing)
5VSB Circuit	
Rectifier	1x MBR2045CT SBR (45 V, 20 A)
Standby PWM Controller	On-Bright OB5269CP

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RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	85.784
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	79.818
Standby Power Consumption (W) -115V	0.0438863
Standby Power Consumption (W) -230V	0.0559482
Average PF	0.993
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	29.91
Efficiency Rating (ETA)	GOLD
Noise Rating (LAMBDA)	A-

TEST EQUIPMENT		
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x2 Chroma 63600-2 63640-80-80 x10 63610-80-20
AC Sources	Chroma 6530, Chroma 61604	
Power Analyzers	N4L PPA1530, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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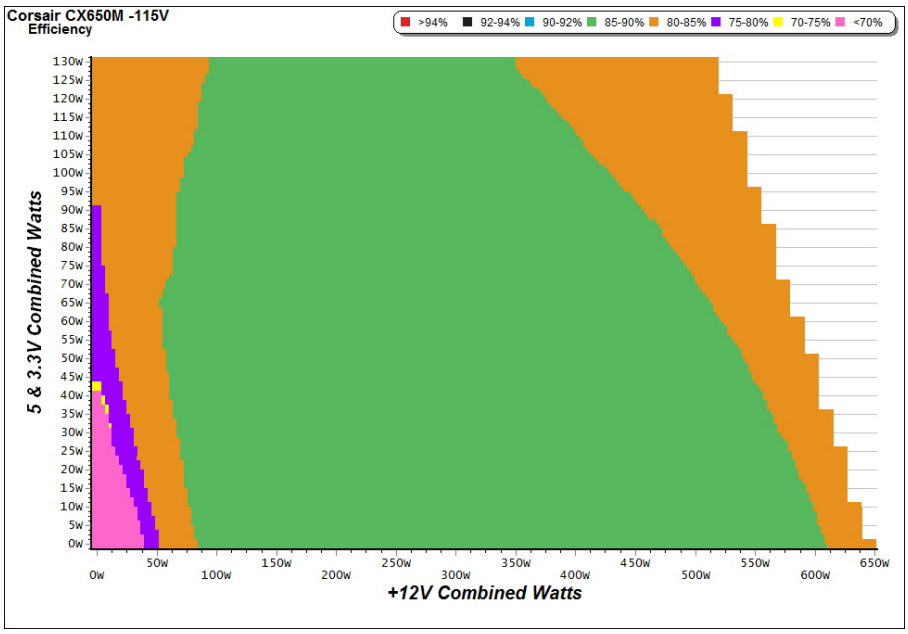
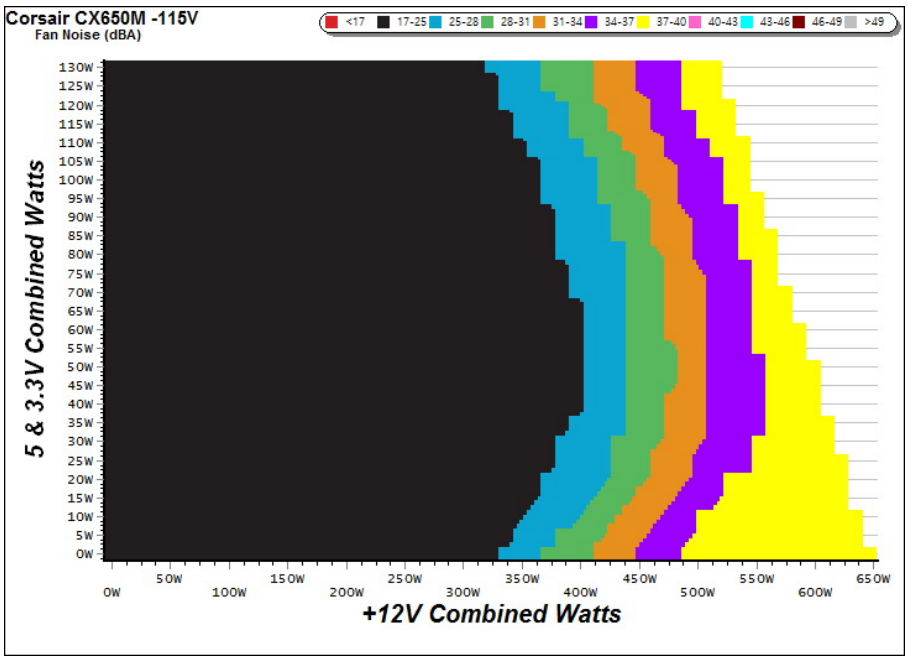
EFFICIENCY GRAPH



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



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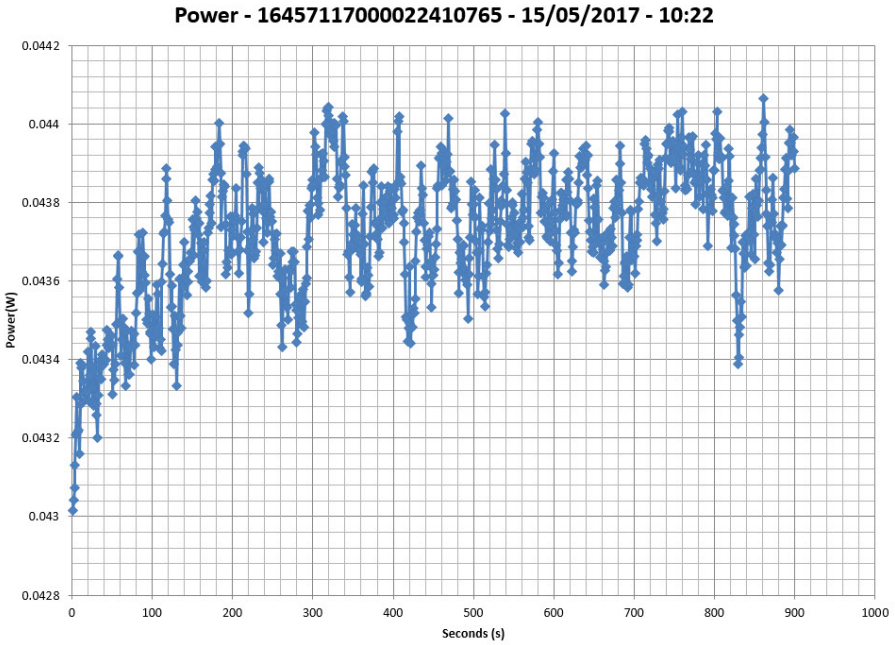
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.211	70.100%	0.031
	5.033V	0.301		115.11V
2	0.087A	0.438	75.779%	0.059
	5.032V	0.578		115.11V
3	0.532A	2.673	80.270%	0.254
	5.027V	3.330		115.11V
4	1.002A	5.030	80.172%	0.343
	5.020V	6.274		115.10V
5	1.502A	7.528	80.119%	0.389
	5.013V	9.396		115.12V
6	3.001A	14.982	79.111%	0.447
	4.992V	18.938		115.10V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.210	65.831%	0.010
	5.032V	0.319		230.30V
2	0.087A	0.438	72.397%	0.018
	5.032V	0.605		230.29V
3	0.532A	2.673	78.826%	0.096
	5.026V	3.391		230.28V
4	1.002A	5.030	79.513%	0.164
	5.020V	6.326		230.28V
5	1.502A	7.527	79.592%	0.219
	5.012V	9.457		230.28V
6	3.001A	14.981	79.627%	0.316
	4.992V	18.814		230.28V

VAMPIRE POWER -115V



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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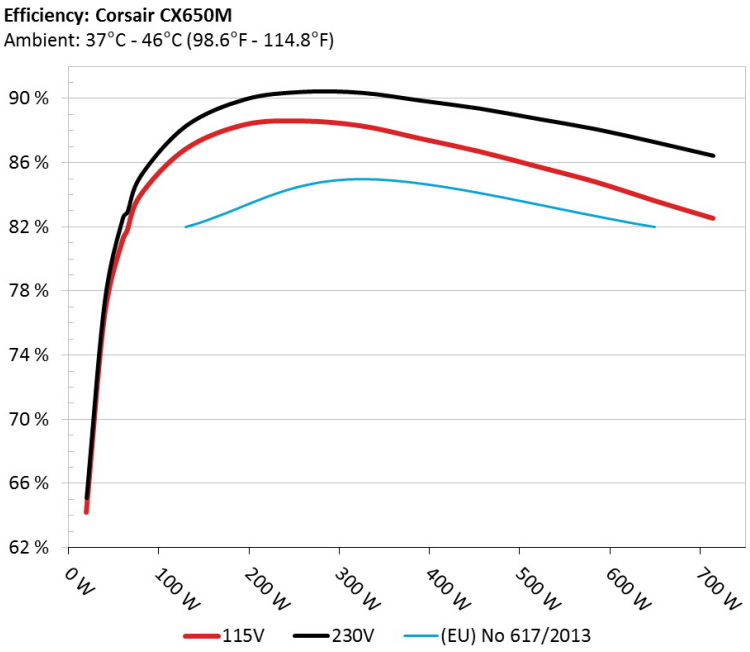
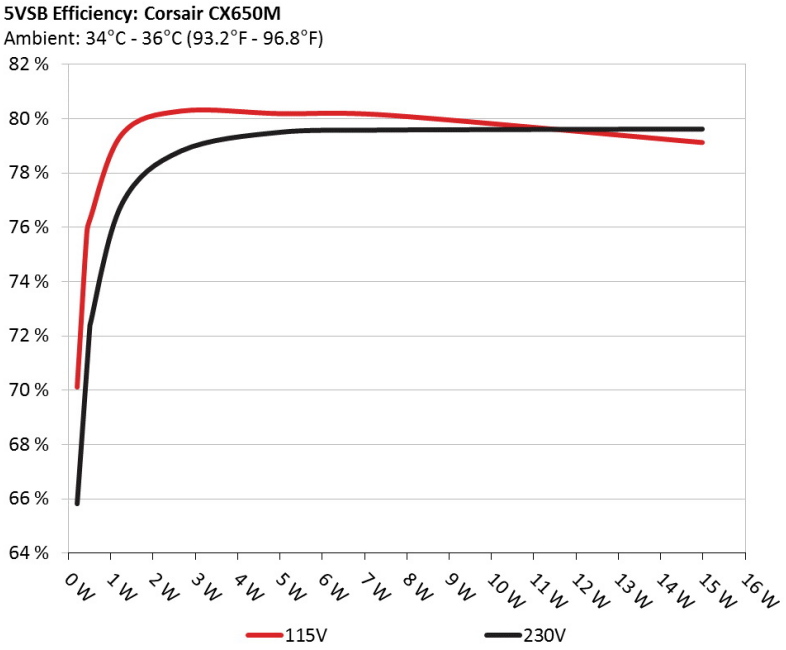
EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE



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

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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.560A	1.975A	1.994A	0.995A	64.795	81.714%	925	20.3	38.50°C	0.971
	12.141V	5.063V	3.307V	5.003V	79.295				42.99°C	115.13V
2	8.160A	2.968A	3.004A	1.201A	129.800	86.834%	925	20.3	38.99°C	0.989
	12.124V	5.049V	3.293V	4.988V	149.480				44.29°C	115.12V
3	13.115A	3.478A	3.529A	1.406A	194.916	88.348%	925	20.3	39.33°C	0.993
	12.109V	5.038V	3.284V	4.975V	220.623				45.84°C	115.12V
4	18.078A	3.977A	4.028A	1.610A	259.771	88.579%	925	20.3	39.94°C	0.995
	12.092V	5.027V	3.274V	4.964V	293.264				47.84°C	115.13V
5	22.716A	4.980A	5.053A	1.815A	324.723	88.275%	925	20.3	40.20°C	0.996
	12.075V	5.013V	3.262V	4.947V	367.853				49.63°C	115.12V
6	27.365A	6.004A	6.092A	2.025A	389.760	87.487%	1190	25.1	41.09°C	0.996
	12.058V	4.999V	3.248V	4.934V	445.505				51.50°C	115.12V
7	32.024A	7.021A	7.137A	2.236A	454.669	86.689%	1480	30.4	41.98°C	0.997
	12.041V	4.983V	3.235V	4.917V	524.482				52.80°C	115.12V
8	36.702A	8.056A	8.192A	2.445A	519.668	85.743%	1780	35.7	42.73°C	0.997
	12.023V	4.968V	3.222V	4.901V	606.077				54.24°C	115.12V
9	41.820A	8.576A	8.753A	2.453A	584.729	84.774%	2070	39.8	44.07°C	0.998
	12.007V	4.956V	3.210V	4.890V	689.753				56.18°C	115.12V
10	46.705A	9.100A	9.276A	3.078A	649.572	83.612%	2190	42.6	45.13°C	0.998
	11.988V	4.945V	3.200V	4.870V	776.885				58.33°C	115.12V
11	52.196A	9.116A	9.305A	3.086A	714.532	82.513%	2190	42.6	46.32°C	0.998
	11.971V	4.937V	3.191V	4.859V	865.958				60.59°C	115.12V
CL1	0.099A	16.027A	16.004A	0.004A	132.821	81.393%	925	20.3	42.94°C	0.989
	12.111V	4.977V	3.239V	4.969V	163.185				54.04°C	115.13V
CL2	54.119A	1.003A	1.002A	1.001A	662.123	84.095%	2190	42.6	45.35°C	0.998
	11.991V	4.996V	3.242V	4.919V	787.353				58.21°C	115.12V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	Fan Noise (dB[A])	PF/AC Volts
1	1.202A	0.491A	0.479A	0.195A	19.671	64.182%	925	20.3	0.908
	12.154V	5.075V	3.318V	5.026V	30.649				115.12V
2	2.428A	0.980A	0.995A	0.396A	39.750	76.378%	925	20.3	0.950
	12.149V	5.070V	3.314V	5.019V	52.044				115.12V
3	3.661A	1.475A	1.507A	0.596A	59.902	81.157%	925	20.3	0.970
	12.143V	5.066V	3.310V	5.010V	73.810				115.12V
4	4.876A	1.975A	1.994A	0.797A	79.756	83.963%	925	20.3	0.979
	12.137V	5.062V	3.305V	5.004V	94.989				115.12V

RIPPLE MEASUREMENTS

Ripple Measurements
Corsair CX650M

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	10.6 mV	7.8 mV	10.7 mV	12.5 mV	Pass
20% Load	11.6 mV	8.6 mV	10.8 mV	15.6 mV	Pass
30% Load	12.9 mV	9.3 mV	10.2 mV	17.4 mV	Pass
40% Load	15.0 mV	10.6 mV	11.8 mV	20.2 mV	Pass
50% Load	17.5 mV	12.6 mV	14.5 mV	23.2 mV	Pass
60% Load	23.0 mV	13.4 mV	15.7 mV	27.2 mV	Pass
70% Load	26.1 mV	14.7 mV	16.1 mV	29.6 mV	Pass
80% Load	28.5 mV	16.0 mV	16.6 mV	33.9 mV	Pass
90% Load	29.9 mV	16.9 mV	16.8 mV	37.7 mV	Pass
100% Load	30.2 mV	18.9 mV	20.9 mV	41.1 mV	Pass
110% Load	33.2 mV	19.5 mV	20.7 mV	44.2 mV	Pass
Crossload 1	11.8 mV	10.4 mV	12.6 mV	16.9 mV	Pass
Crossload 2	31.6 mV	18.7 mV	19.5 mV	42.0 mV	Pass

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	12.56
AC Loss to PWR_OK Hold Up Time (ms)	9.54
PWR_OK Inactive to DC Loss Delay (ms)	3.02

Top side

Power specifications label

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