

Anex

DeepCool DQ650-M

Lab ID#: 525

Receipt Date: -

Test Date: -

Report:

Report Date: Oct 31, 2018

DUT INFORMATION

Brand	DeepCool
Manufacturer (OEM)	Channel Well Technology
Series	DQ-M
Model Number	DQ650-M
Serial Number	DQ650M-2018-1804000600
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	120mm Fluid Dynamic Bearing Fan (DF1202512CH-003)
Semi-Passive Operation	X
Cable Design	Fully Modular

POWER SPECIFICATIONS

Rail		3.3V	5V	12V MBPH	12V CPU	12V VGA1	12V VGA2	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							

CABLES AND CONNECTORS

Modular Cables

Description	Cable Count	Connector Count (Total)	Gauge	In Cable Capacitors
ATX connector 20+4 pin (550mm)	1	1	18AWG	No
4+4 pin EPS12V (700mm)	2	2	18AWG	No
6+2 pin PCIe (500mm+100mm)	2	4	18AWG	No
SATA (450mm+150mm+150mm) / 4-pin Molex (+150mm)	1	3 / 1	20AWG	No
4-pin Molex (550mm+150mm) / SATA (+150mm+150mm)	1	2 / 2	20AWG	No
4-pin Molex (450mm+150mm) / SATA (+150mm+150mm)	1	2 / 2	20AWG	No
AC Power Cord (1400mm) - C13 coupler	1	1	18AWG	No

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PAGE 1/8

Anex

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RESULTS

Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	89.297
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	65.776
Average Efficiency 5VSB	78.464
Standby Power Consumption (W) -115V	0.0432041
Standby Power Consumption (W) -230V	0.0608224
Average PF	0.983
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	27.07
Efficiency Rating (ETA)	PLATINUM
Noise Rating (LAMBDA)	A-

TEST EQUIPMENT

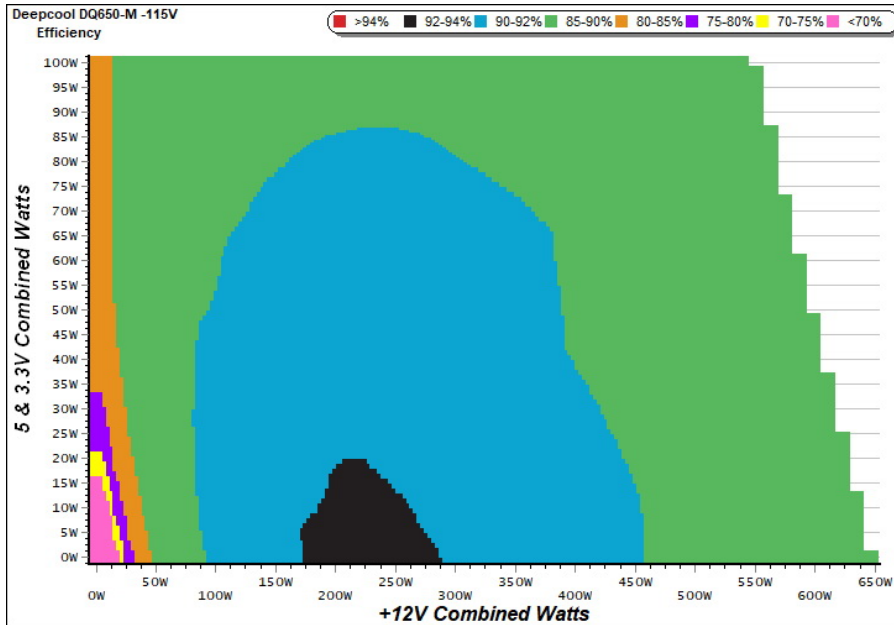
Electronic Loads	Chroma 6314A x2 63123A x6 63102A 63101A	Chroma 63601-5 x4 Chroma 63600-2 x2 63640-80-80 x20 63610-80-20 x2
AC Sources	Chroma 6530, Chroma 61604, Keysight AC6804B	
Power Analyzers	N4L PPA1530 x2, N4L PPA5530	
Oscilloscopes	Picoscope 4444 & 3424, Keysight DSOX3024A, Rigol DS2072A	
Voltmeter	Keithley 2015 THD 6.5 Digit	
Sound Analyzer	Bruel & Kjaer 2250-L G4	
Microphone	Bruel & Kjaer Type 4955-A, Bruel & Kjaer Type 4189	
Data Loggers	Picoscope TC-08 x2, Labjack U3-HV x2	

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PAGE 2/8

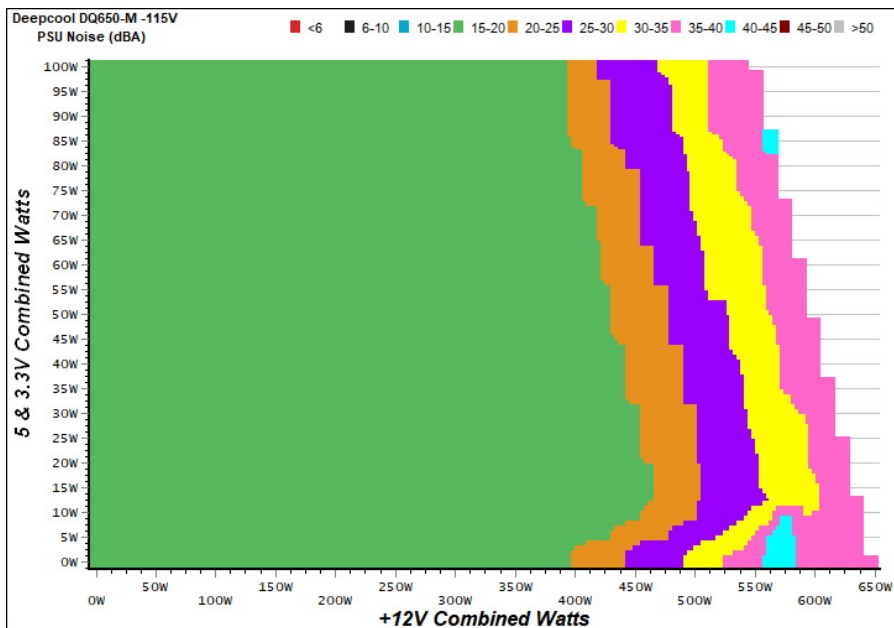
EFFICIENCY GRAPH



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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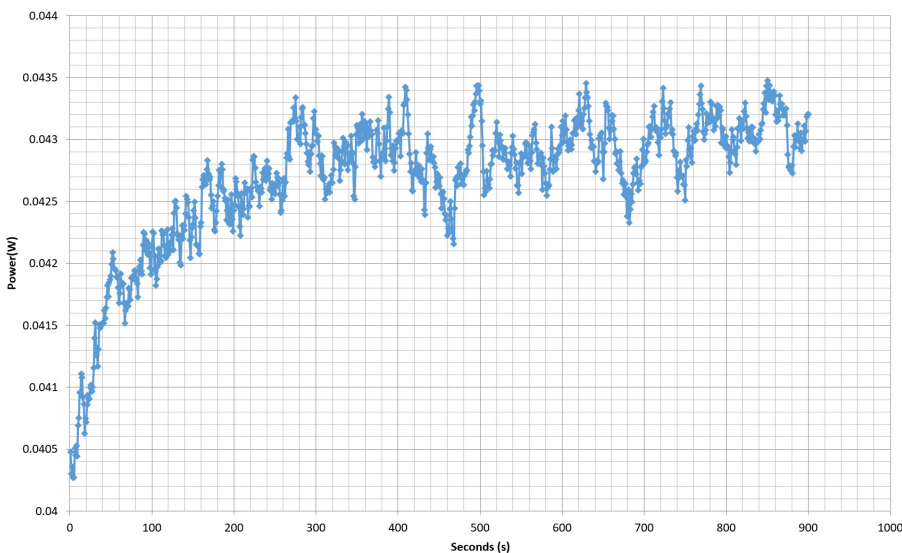
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5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)				
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	71.651%	0.064
	5.095V	0.321		115.13V
2	0.090A	0.459	76.246%	0.115
	5.095V	0.602		115.13V
3	0.550A	2.798	80.218%	0.352
	5.085V	3.488		115.13V
4	1.000A	5.077	78.108%	0.416
	5.076V	6.500		115.13V
5	1.500A	7.599	78.002%	0.450
	5.065V	9.742		115.13V
6	2.500A	12.611	75.664%	0.480
	5.044V	16.667		115.13V

5VSB EFFICIENCY -230V (ERP LOT 3/6 & CEC)				
Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.045A	0.230	66.860%	0.187
	5.069V	0.344		230.29V
2	0.090A	0.459	72.512%	0.039
	5.095V	0.633		230.29V
3	0.550A	2.798	77.917%	0.183
	5.085V	3.591		230.30V
4	1.000A	5.077	78.664%	0.264
	5.076V	6.454		230.30V
5	1.500A	7.598	78.768%	0.316
	5.064V	9.646		230.30V
6	2.501A	12.613	78.723%	0.369
	5.044V	16.022		230.29V

VAMPIRE POWER -115V

Power - DQ650M-2018-1804000600 - 10/09/2018 - 09:06



INFO

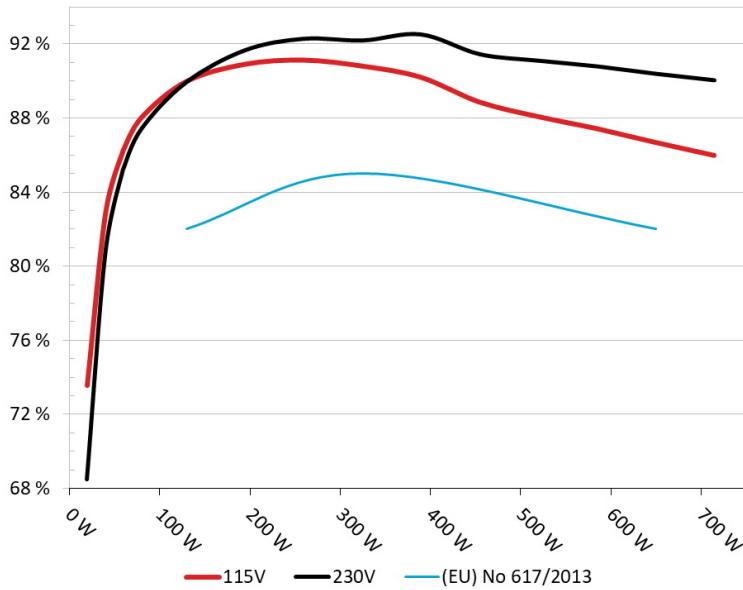
This graph is generated by the PPA Standby Power Analysis software which takes full control of the power analyzer during the whole procedure. This application features all of the EN50564 & IEC62301 test limits for standby power software testing

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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: Deepcool DQ650-M
Ambient: 38°C - 47°C (100.4°F - 116.6°F)

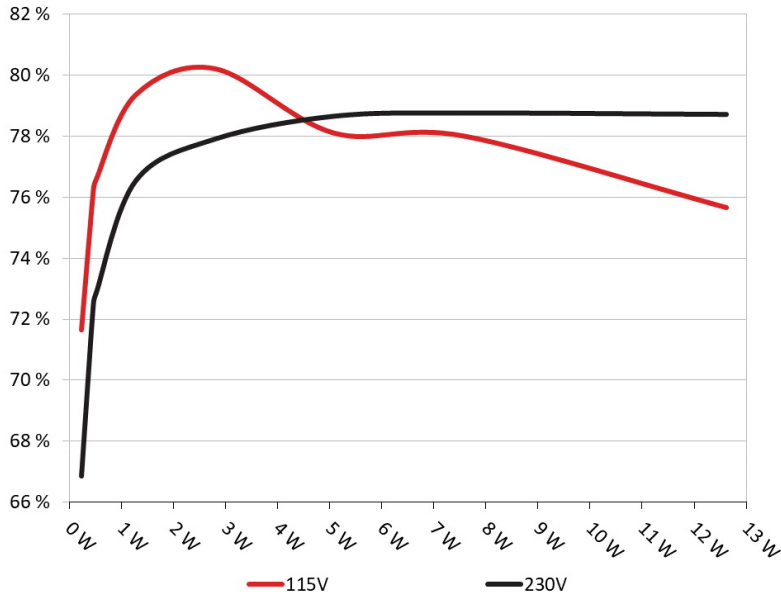


INFO

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: Deepcool DQ650-M
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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10-110% LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.591A	1.971A	1.964A	0.986A	64.829	86.279%	752	18.7	40.13°C	0.967
	12.041V	5.070V	3.359V	5.071V	75.139				42.81°C	115.10V
2	8.179A	2.961A	2.948A	1.185A	129.311	89.980%	763	18.8	40.51°C	0.982
	12.032V	5.067V	3.357V	5.065V	143.711				43.55°C	115.10V
3	13.178A	3.455A	3.426A	1.384A	194.449	90.915%	768	18.8	41.11°C	0.986
	12.024V	5.065V	3.356V	5.058V	213.879				44.58°C	115.10V
4	18.181A	3.951A	3.934A	1.584A	259.663	91.135%	760	18.8	41.79°C	0.987
	12.016V	5.063V	3.354V	5.051V	284.920				45.78°C	115.10V
5	22.856A	4.941A	4.921A	1.785A	324.956	90.811%	757	18.7	42.27°C	0.987
	12.008V	5.060V	3.352V	5.044V	357.837				46.81°C	115.12V
6	27.477A	5.931A	5.910A	1.986A	389.504	90.208%	950	22.1	43.00°C	0.986
	11.999V	5.059V	3.350V	5.037V	431.783				47.98°C	115.16V
7	32.176A	6.926A	6.899A	2.187A	454.817	88.865%	1748	40.9	43.18°C	0.985
	11.987V	5.057V	3.348V	5.030V	511.806				48.64°C	115.10V
8	36.875A	7.914A	7.889A	2.390A	520.133	88.082%	1748	40.9	43.88°C	0.985
	11.979V	5.055V	3.346V	5.023V	590.507				49.81°C	115.10V
9	41.985A	8.413A	8.368A	2.391A	585.066	87.432%	1748	40.9	44.45°C	0.986
	11.970V	5.053V	3.345V	5.020V	669.168				50.66°C	115.11V
10	47.034A	8.911A	8.882A	2.493A	649.787	86.693%	1750	40.9	45.26°C	0.987
	11.961V	5.051V	3.344V	5.015V	749.530				51.72°C	115.10V
11	52.482A	8.915A	8.884A	2.494A	714.563	85.997%	1750	40.9	46.59°C	0.988
	11.954V	5.048V	3.342V	5.012V	830.919				53.65°C	115.09V
CL1	0.139A	12.001A	12.000A	0.000A	102.609	84.411%	770	18.9	42.84°C	0.980
	12.028V	5.063V	3.348V	5.082V	121.559				47.67°C	115.12V
CL2	54.176A	1.001A	0.999A	1.000A	662.002	87.483%	1753	40.9	45.39°C	0.987
	11.971V	5.054V	3.352V	5.053V	756.718				51.66°C	115.09V

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20-80W LOAD TESTS

Test #	12V	5V	3.3V	5VSB	DC/AC (Watts)	Efficiency	Fan Speed (RPM)	PSU Noise (dB[A])	PF/AC Volts
1	1.196A	0.492A	0.474A	0.197A	19.500	73.582%	757	18.7	0.880
	12.047V	5.073V	3.362V	5.091V	26.501				115.10V
2	2.460A	0.986A	0.980A	0.393A	39.918	82.910%	760	18.8	0.946
	12.044V	5.071V	3.360V	5.085V	48.146				115.10V
3	3.657A	1.478A	1.456A	0.591A	59.421	86.282%	757	18.7	0.966
	12.041V	5.070V	3.360V	5.080V	68.868				115.10V
4	4.918A	1.973A	1.964A	0.788A	79.803	88.045%	760	18.8	0.975
	12.038V	5.070V	3.359V	5.075V	90.639				115.10V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	12.6 mV	10.9 mV	11.8 mV	7.3 mV	Pass
20% Load	18.2 mV	11.2 mV	12.0 mV	8.7 mV	Pass
30% Load	16.1 mV	11.3 mV	13.6 mV	8.1 mV	Pass
40% Load	15.7 mV	12.1 mV	14.1 mV	9.3 mV	Pass
50% Load	16.8 mV	12.7 mV	14.3 mV	9.1 mV	Pass
60% Load	17.4 mV	12.6 mV	15.3 mV	13.1 mV	Pass
70% Load	17.3 mV	13.1 mV	16.1 mV	13.3 mV	Pass
80% Load	15.3 mV	14.0 mV	19.6 mV	19.3 mV	Pass
90% Load	15.3 mV	14.8 mV	20.4 mV	23.0 mV	Pass
100% Load	22.3 mV	16.6 mV	22.6 mV	22.7 mV	Pass
110% Load	23.3 mV	17.6 mV	22.1 mV	20.8 mV	Pass
Crossload 1	21.1 mV	12.1 mV	21.7 mV	7.2 mV	Pass
Crossload 2	21.7 mV	16.4 mV	15.4 mV	18.1 mV	Pass

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DeepCool DQ650-M

HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	12.20
AC Loss to PWR_OK Hold Up Time (ms)	11.40
PWR_OK Inactive to DC Loss Delay (ms)	0.80



CERTIFICATIONS



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