

Anex

FSP Technology Inc. SDA600

Lab ID#: 96
Receipt Date: -
Test Date: -

Report:

Report Date: Apr 22, 2018

DUT INFORMATION	
Brand	FSP Technology Inc.
Manufacturer (OEM)	FSP
Series	Dagger
Model Number	SDA600
Serial Number	S6470050023
DUT Notes	

DUT SPECIFICATIONS	
Rated Voltage (Vrms)	100-240
Rated Current (Arms)	8-4
Rated Frequency (Hz)	50-60
Rated Power (W)	600
Type	SFX
Cooling	80mm Double Ball Bearing (PLA08010B12HH)
Semi-Passive Operation	x
Cable Design	Fully Modular

POWER SPECIFICATIONS						
Rail		3.3V	5V	12V	5VSB	-12V
Max. Power	Amps	20	15	50	2.5	0.3
	Watts	90		600	12.5	3.6
Total Max. Power (W)		600				

CABLES AND CONNECTORS			
Modular Cables			
Description	Cable Count	Connector Count (Total)	Gauge
ATX connector 20+4 pin (350mm)	1	1	18-22AWG
4+4 pin EPS12V (400mm)	1	1	18AWG
6+2 pin PCIe (350mm)	2	2	18AWG
SATA (350mm+100mm) / 4 pin Molex (+100mm) / FDD Adapter (+100mm)	1	2 / 1 / 1	18-22AWG
SATA (350mm+100mm+100mm) / 4 pin Molex (+100mm)	1	3 / 1	18AWG

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General Data	
Manufacturer (OEM)	FSP
Platform Model	-
Primary Side	
Transient Filter	4x Y caps, 2x X caps, 2x CM & 1 DM chokes
Inrush Protection	NTC Thermistor & Diode
Bridge Rectifier(s)	1x GBU1506U (600V, 15A @ 100°C)
APFC MOSFETS	2x STMicroelectronics STF24N60M2 (650V, 12A @ 100°C, 0.190hm)
APFC Boost Diode	1x CREE C3D06060 (600V, 6A @ 154°C)
Hold-up Cap	1x Chemi-Con (450V, 330uF, 2000h @ 105 °C, KMW)
APFC Disconnect IC	SEN013DG
Main Switchers	2x Toshiba TK16A60W (600V, 15.8A @ 150°C, 0.160hm)
Resonant Controller	Champion CM6901TX
Topology	Primary side: Half-Bridge & LLC Resonant Controller Secondary side: Synchronous Rectification & DC-DC converters
Secondary Side	
+12V MOSFETS	3x Toshiba TPHP85 04PL (SOP Advance Series, 40V, 150A @ 25C, 0.85 m ²)
5V & 3.3V	DC-DC Converters: 2x TI CSD86350Q5D (25V, 40A) PWM Controller: 2x Anpec APWxxxx
Filtering Capacitors	Electrolytics: Nippon Chemi-Con (5-6,000 @ 105°C, KZH), Nichicon Polymers: AiSHi (X-CON), CapXon
Supervisor IC	SITI PS223 (OVP, UVP, PG, OTP) & AS358N & AS393
Fan Model	Power Logic PLA08010B12HH (80mm, 12V, 0.35A, Double Ball Bearing)
5VSB Circuit	
Standby PWM Controller	Power Integrations TNY278PN

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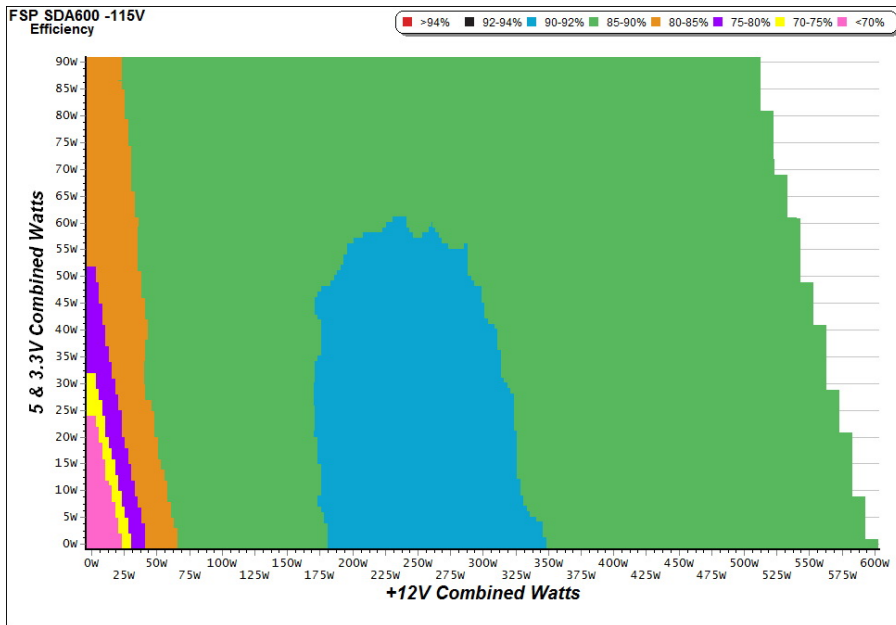
RESULTS	
Temperature Range (°C /°F)	30-32 / 86-89.6
Average Efficiency	88.239
Efficiency With 10W (≤500W) or 2% (>500W) Load -115V	0.000
Average Efficiency 5VSB	73.402
Standby Power Consumption (W) -115V	0.0786763
Standby Power Consumption (W) -230V	0.1614890
Average PF	0.996
ErP Lot 3/6 Ready	✓
(EU) No 617/2013 Compliance	✓
Avg Noise Output	22.80
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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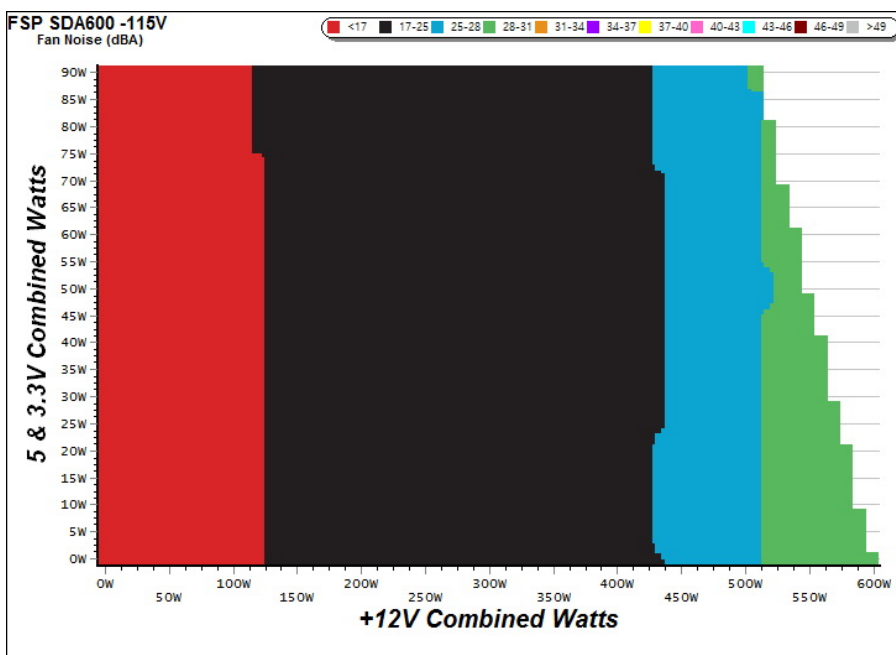
EFFICIENCY GRAPH



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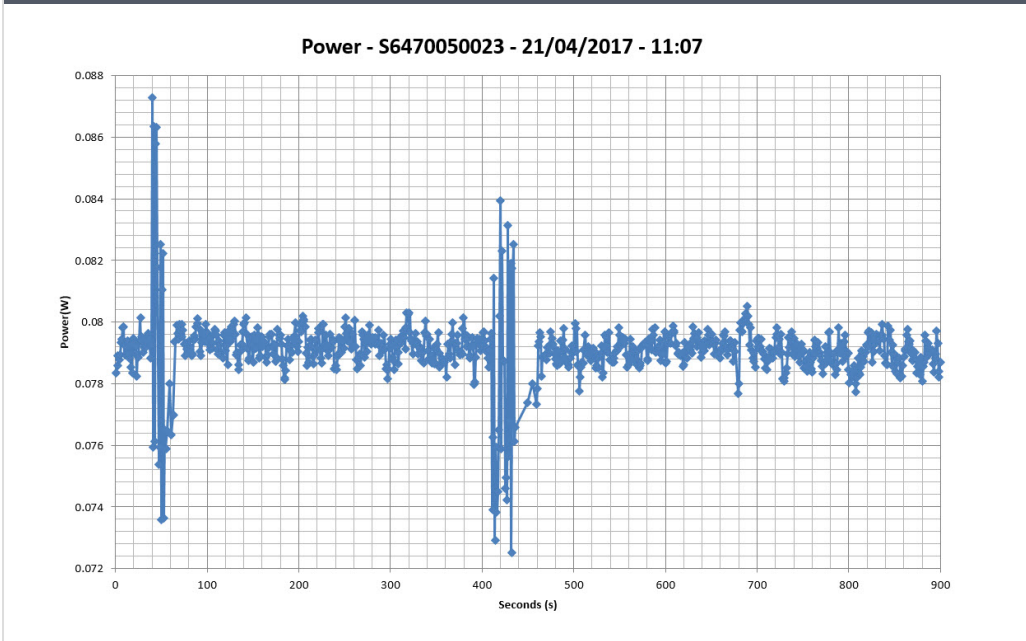
5VSB EFFICIENCY -115V (ERP LOT 3/6 & CEC)

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.211	59.943%	0.043
	5.049V	0.352		115.10V
2	0.088A	0.442	68.315%	0.077
	5.048V	0.647		115.09V
3	0.532A	2.679	74.541%	0.296
	5.036V	3.594		115.09V
4	2.501A	12.460	72.895%	0.477
	4.982V	17.093		115.09V

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

Test #	5VSB	DC/AC (Watts)	Efficiency	PF/AC Volts
1	0.042A	0.211	47.738%	0.016
	5.048V	0.442		230.26V
2	0.088A	0.442	59.489%	0.027
	5.048V	0.743		230.26V
3	0.532A	2.679	72.700%	0.124
	5.035V	3.685		230.27V
4	2.501A	12.458	73.865%	0.334
	4.981V	16.866		230.26V

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

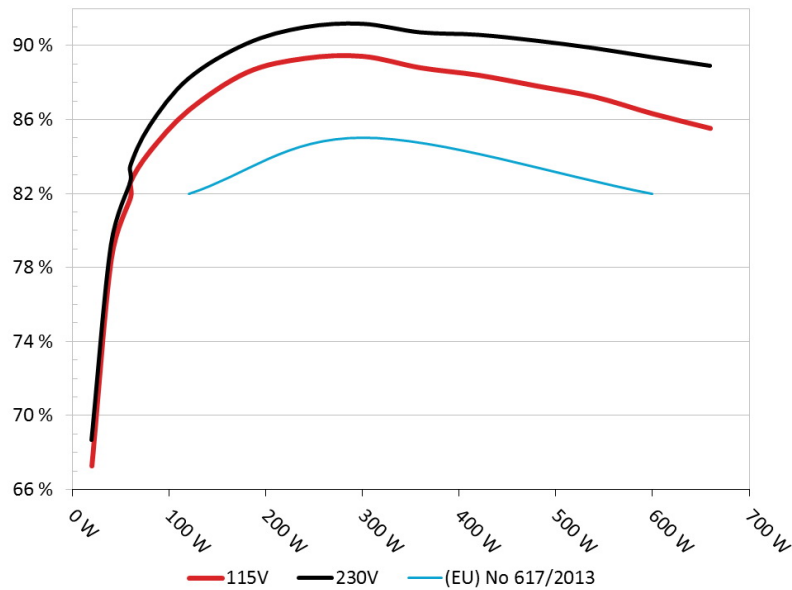
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EFFICIENCY UNDER HIGH AMBIENT TEMPERATURE

Efficiency: FSP SDA600

Ambient: 37°C - 46°C (98.6°F - 114.8°F)



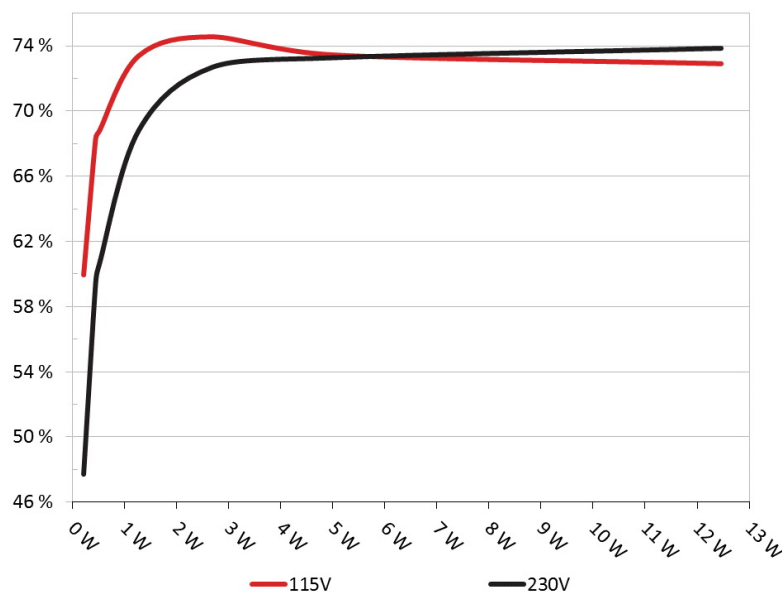
INFO

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 SDA600

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)	Fan Noise (dB[A])	Temps (In/Out)	PF/AC Volts
1	3.167A	2.010A	1.947A	0.996A	59.793	81.817%	1544	20.3	38.26°C	0.986
	12.063V	4.977V	3.386V	5.013V	73.081				41.97°C	115.13V
2	7.376A	3.015A	2.932A	1.200A	119.773	86.498%	1544	20.3	38.85°C	0.995
	12.053V	4.968V	3.374V	5.000V	138.469				42.80°C	115.12V
3	11.939A	3.521A	3.444A	1.400A	179.823	88.539%	1748	23.0	39.39°C	0.997
	12.044V	4.959V	3.364V	4.988V	203.100				43.65°C	115.13V
4	16.497A	4.042A	3.933A	1.604A	239.753	89.300%	1851	23.8	39.91°C	0.999
	12.037V	4.950V	3.354V	4.975V	268.479				44.73°C	115.12V
5	20.720A	5.060A	4.937A	1.811A	299.694	89.416%	2006	24.9	40.34°C	0.999
	12.028V	4.939V	3.341V	4.963V	335.168				45.96°C	115.12V
6	24.948A	6.091A	5.947A	2.021A	359.714	88.793%	2213	25.8	41.36°C	0.999
	12.021V	4.928V	3.329V	4.948V	405.122				47.75°C	115.12V
7	29.181A	7.121A	6.966A	2.225A	419.645	88.394%	2330	30.3	42.09°C	0.999
	12.014V	4.914V	3.315V	4.935V	474.746				49.59°C	115.12V
8	33.419A	8.162A	7.994A	2.437A	479.608	87.815%	2768	32.3	42.68°C	0.999
	12.005V	4.904V	3.302V	4.920V	546.158				51.05°C	115.12V
9	38.098A	8.688A	8.534A	2.441A	539.673	87.224%	3410	39.0	43.61°C	0.999
	11.997V	4.895V	3.292V	4.912V	618.724				52.30°C	115.12V
10	42.734A	9.217A	9.050A	2.546A	599.514	86.319%	3695	41.6	44.65°C	0.999
	11.988V	4.885V	3.283V	4.903V	694.535				54.24°C	115.14V
11	47.762A	9.233A	9.070A	2.552A	659.480	85.523%	3695	41.6	45.67°C	0.999
	11.982V	4.875V	3.274V	4.894V	771.114				56.61°C	115.11V
CL1	0.099A	11.017A	11.005A	0.005A	92.236	83.120%	2238	26.1	43.22°C	0.995
	12.067V	4.934V	3.331V	5.017V	110.967				52.12°C	115.12V
CL2	49.954A	1.003A	1.002A	1.002A	612.523	86.963%	3659	40.8	44.05°C	0.999
	11.997V	4.909V	3.325V	4.959V	704.346				52.96°C	115.11V

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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	1.210A	0.503A	0.470A	0.196A	19.673	67.286%	1275	18.3	0.924
	12.069V	4.975V	3.392V	5.042V	29.238				115.13V
2	2.447A	1.001A	0.972A	0.396A	39.786	78.472%	1359	18.6	0.968
	12.065V	4.973V	3.389V	5.034V	50.701				115.13V
3	3.684A	1.497A	1.475A	0.596A	59.854	82.647%	1415	19.1	0.985
	12.061V	4.975V	3.388V	5.026V	72.421				115.13V
4	4.910A	2.014A	1.949A	0.796A	79.807	84.282%	1506	19.5	0.991
	12.059V	4.973V	3.384V	5.017V	94.690				115.13V

RIPPLE MEASUREMENTS

Test	12V	5V	3.3V	5VSB	Pass/Fail
10% Load	17.4 mV	21.4 mV	26.6 mV	10.6 mV	Pass
20% Load	19.3 mV	20.5 mV	29.5 mV	11.4 mV	Pass
30% Load	25.1 mV	22.7 mV	34.1 mV	11.5 mV	Pass
40% Load	21.2 mV	23.3 mV	38.9 mV	11.4 mV	Pass
50% Load	22.6 mV	25.6 mV	43.7 mV	11.8 mV	Pass
60% Load	22.0 mV	27.5 mV	49.6 mV	16.1 mV	Pass
70% Load	23.0 mV	29.2 mV	54.9 mV	19.7 mV	Fail
80% Load	23.2 mV	30.0 mV	62.5 mV	17.3 mV	Fail
90% Load	27.1 mV	33.2 mV	63.7 mV	18.1 mV	Fail
100% Load	27.5 mV	35.1 mV	68.2 mV	20.7 mV	Fail
110% Load	27.9 mV	36.6 mV	72.6 mV	21.6 mV	Fail
Crossload 1	18.6 mV	21.0 mV	33.0 mV	6.1 mV	Pass
Crossload 2	26.2 mV	24.5 mV	72.6 mV	17.5 mV	Fail

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HOLD-UP TIME & POWER OK SIGNAL (230V)	
Hold-Up Time (ms)	11.06
AC Loss to PWR_OK Hold Up Time (ms)	8.26
PWR_OK Inactive to DC Loss Delay (ms)	2.80



CERTIFICATIONS



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