

EMC UPDATE TEST REPORT

For

Channel Well Technology Co., Ltd.

Switching Power supply

Model: PSHxy-zz (x= 350, 400, 450, 500, 550, 600, 650, 700, 750, 850; y=P, Q, R, S, V, P1, Q1, R1, S1, V1, H1, U1, F; z= 0-9, A-Z or Blank); GREATPOWER X14S4P3 500W; GREATPOWER X14S4P3 550W; GREATPOWER X14S4P4 650W; GREATPOWER X14S4P4 700W; GREATPOWER X14S4P4 650W; GREATPOWER X14S4P4 700W; GREATPOWER X14S4P4 750W; GREATPOWER X14S8P4 850W; CWT-abz (a = 500, 550, 600, 650, 700, 750, 850; b=P, Q, R, S, V; z = 0-9,A-Z or blank); NRP-MC651; NRP-MC751; NRP-MC851

Trade Name: CWT

Revision: 03

Description of Rev. 03:

- 1. Applicant modifies applicant's address as per customer required. (Please refer to page 3 on this report)
- 2. Applicant adds alternate Input and Output rating for model number: PSH-850V1-zz. (Please refer to Page 4 for input and Page 6 for output.)
- 3. Applicant adds alternate schematic and layout (only secondary different) and DC fan source to re-test.

(Please refer to have ****** mark items on this report)

4. Other information, please refer to the 51104105, 61012102, 70620101 and this test report.

Approved by:

Robert Huan Section Manager of Linkou Laboratory Compliance Certification Services Inc.

Reviewed by: U/e

Julia Wei Senior Specialist of Linkou Laboratory Compliance Certification Services Inc.

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1 TEST RESULT CERTIFICATION

Applicant:	Channel Well Technology Co., Ltd. NO. 222, SEC. 2, NANKAN RD., LUJHU TOWNSHIP, TAOYUAN HSIEN, TAIWAN, R.O.C.
Manufacturer:	Channel Well Technology Co., Ltd. 3rd F1-2, 888, Jing-Gwo Rd., Taoyuan City, Taiwan, R.O.C.
Equipment Under Test:	Switching Power supply
Trade Name:	CWT
Model:	PSHxy-zz (x= 350, 400, 450, 500, 550, 600, 650, 700, 750, 850; y=P, Q, R, S, V, P1, Q1, R1, S1, V1, H1, U1, F; z= 0-9, A-Z or Blank); GREATPOWER X14S4P3 500W; GREATPOWER X14S4P3 550W; GREATPOWER X14S4P4 600W; GREATPOWER X14S4P4 650W; GREATPOWER X14S4P4 700W; GREATPOWER X14S4P4 750W; GREATPOWER X14S4P4 850W; CWT-abz (a = 500, 550, 600, 650, 700, 750, 850; b=P, Q, R, S, V; z = 0-9, A-Z or blank); NRP-MC651; NRP-MC751; NRP-MC851
Detailed EUT Description:	See Item 2 of this report
Date of Test:	October 15 ~ 16, 2008

Applicable Standard	Class / Limit	Test Result							
FCC Part 15 Subpart B, IC ICES-003	Class B	No non-compliance noted							
Deviation from Applicable Standard									
None									

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedures were according to ANSI C63.4. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.



2 EUT DESCRIPTION

Product	Switching Power supply
Trade Name	CWT
Model	PSHxy-zz (x= 350, 400, 450, 500, 550, 600, 650, 700, 750, 850; y=P, Q, R, S, V, P1, Q1, R1, S1, V1, H1, U1, F; z= 0-9, A-Z or Blank); GREATPOWER X14S4P3 500W; GREATPOWER X14S4P3 550W; GREATPOWER X14S4P4 600W; GREATPOWER X14S4P4 650W; GREATPOWER X14S4P4 700W; GREATPOWER X14S4P4 750W; GREATPOWER X14S8P4 850W; CWT-abz (a = 500, 550, 600, 650, 700, 750, 850; b=P, Q, R, S, V; z = 0-9,A-Z or blank); NRP-MC651; NRP-MC751; NRP-MC851
Housing Type	Plastic
EUT Power Rating	see as below
AC Power Cord Type	Unshielded, 1.8m (Detachable)

Note:

- 1. The means of xy-zz (x= 350, 400, 450, 500, 550, 600, 650, 700, 750, 850;
- y=P, Q, R, S, VP1, Q1, R1, S1, V1, H1, U1, F; z= 0-9, A-Z or Blank) on model number are list as below:
 x represents max. Input / Output wattage; x = 350, 400, 450, 500, 550, 600, 650, 700, 750, 850; for PSHxy-zz

Madal	AC Input Power Rating				
Model	VAC	A	Hz		
	100-240	5-2.5			
PSH350y-zz	115-230	5/2.5	17 62		
PSH400y-zz	200-240	2.3	47-05		
	230	2.5	-		
DCI1450	100-240	6-3			
PSH450y-zz DSU500	115-230	6/3	17 62		
CDEATDOWED VIASAD2 500W, CWT 500b-	200-240	3	4/-03		
GREATFOWER A1454F5 500W, CW 1-50002	230	3			
PSH550y-zz	100-240	8-4			
PSH600y-zz	115-230	8/4			
PSH650y-zz	200-240	4			
GREATPOWER X14S4P3 550W			47-63		
GREATPOWER X14S4P4 600W	230	1			
GREATPOWER X14S4P4 650W;	250	4			
CWT-550bz; CWT-600bz; CWT-650bz					
PSH700y-zz	100-240	10-5			
PSH750y-zz	115-230	10/5			
GREATPOWER X14S4P4 700W	200-240	5	47-63		
GREATPOWER X14S4P4 750W			11 05		
GREATPOWER X14S8P4 850W;	230	5			
<i>CWT-700bz; CWT-750bz; CWT-850bz; PSH850y-zz</i>					
NRP-MC651	100-240V	8/4	47-63		
NRP-MC751; NRP-MC851	100-240V	10/5	47-63		
PSH850V1-zz	**100-240V	**12	**50/60		



DC Output Power Rating						117			
Model		+3.31	+12V1	+12V2	+12V3	+12V4	-12V	+5Vsb	Watt
	21	22	10	15	(A)	(A)	0.8	3	
PSH350y-zz		20	10	15			0.8	3	350W
DELLAG	28	30	14	15			0.8	3	10011
PSH400y-zz	14	20	14	15			0.8	3	400W
DELLISO	28	30	14	16			0.8	3	45011
PSH450y-zz	15	22	14	16			0.8	3	430W
PSH500y-zz	28	30	18	18	16		0.8	3	
GREATPOWER X14S4P3 500W; CWT-500bz	16	22	18	18	16		0.8	3	500W
PSH550y-zz	28	30	18	18	16		0.8	3	
GREATPOWER X14S4P3 550W; CWT-550bz	24	24	18	18	16		0.8	3	550W
PSH600y-zz	28	30	18	18	18	18	0.8	3	
GREATPOWER X14S4P4 600W; CWT-600bz	24	24	18	18	18	18	0.8	3	600W
PSH650y-zz	28	30	18	18	18	18	0.8	3	
GREATPOWER X14S4P4 650W; CWT-650bz	24	24	18	18	18	18	0.8	3	650W
PSH700y-zz	28	30	18	18	18	18	0.8	3	
GREATPOWER X14S4P4 700W; CWT-700bz	24	24	18	18	18	18	0.8	3	700W
PSH750y-zz	28	30	18	18	18	18	0.8	3	
GREATPOWER X14S4P4 750W; CWT-750bz; NRP-MC751	24	24	18	18	18	18	0.8	3	750W
PSH850y-zz GREATPOWER X14S8P4 850W; CWT-850bz; NRP-MC851	30	30	18	18	30	30	0.8	3	850W
**+12V3, +12V4 for Optional		•		•	•	•		•	
			DC O	utput F	Power I	Rating			
Model	+5V (A)		+3.3V (A)	+1	2V 4)	-12V (A)	+	+5Vsb (A)	watt
**PSH850V1-zz	30		30	7	0	0.8		3	850W



•	y repre	esents the	form fo	actor; j	<i>y</i> = <i>P</i> ,	Q, R,	<i>S</i> ,	V, P1,	Q1,	<i>R1,</i>	S1,	V1,	H1,	UI,	F	
										Г	11 11	מ	10			

у	W x L x H	FAN	EMI Board & Main Board	PCB No. x 1	PCB No. x 2
	150 x 140 x 86.0 mm	80mm x 1			350W, 400W
P; P1	150 x 140 x 86.0 mm (Cable Management)	80mm x 1	Separate		450W, 500W 550W, 600W 650W, 700W 750W
	150 x 160 x 86.0 mm				
Q; Q1	150 x 160 x 86.0 mm	120mm x 1 on top	Combine	350W 400W	
	(Cable Management)			450W 500W	350W, 400W
	150 x 160 x 86.0 mm	On middle $x 2$		550W. 600W	450W, 500W
R; R1	150 160 060	On Side x 2	Separate		550W, 600W
	150 x 160 x 86.0 mm (Cable Management)	On Side x 2	1		650W, 700W 750W;
S; S1	150 x 140 x 86.0 mm	120mm x 1	Combine		**850W for
	150 x 160 x 86.0 mm	140mm x 1			Case V and R
V; V1	150 x 160 x 86.0 mm	120mm x 1	Combine		
	(Cable Management)	140mm x 1			
Ul	150 x 160 x 86.0 mm	140mm x 1	Combine		55W
Hl	150 x 160 x 86.0 mm	140mm x 1	Combine		750W
					500W;
F	150 x 160 x 86.0 mm	140mm x 1	Combine		550W;
					600W; 650W

• *z* represents cosmetic changes; z = 0.9, A-Z, or Blank

2. Client consigns four model samples (Model number: PSH350Y, PSH450Y, PSH600P, PSH750Y) to test. Therefore, testing Lab. just guarantees the units, which have been tested.

3. Client consigns four model samples (Model number: PSH850V) to test. Therefore, testing Lab. just guarantees the units, which have been tested.

4. The means of "x (x= 500, 550, 600, 650, 700, 750, 850F)" on model number is list as below:

M - 1-1		DC Out	tput Power	TOTAL POWER	Waste						
Model	+5V (A)	+3.3V (A)	+12V (A)	-12V (A)	+5Vsb (A)	+5V&+3.3V	watt				
For $y = P1$, $Q1$,	For $y = P1$, Q1, R1, S1, V1, H1 or U1 ($y = H1$ for $x = 550$ only, $y = U1$ for $x = 750$ only)										
DSH5000 77	28	30	36	0.8	3.0	140	500W				
1 S11500y-22	16	22	36	0.8	3.0	130	5001				
DSH5500 77	28	30	41	0.8	3.0	140	550W				
1 S11550y-22	24	24	41	0.8	3.0	140	550W				
DELLCOD	28	30	48	0.8	3.0	180	600W				
1 S11000y-22	24	24	48	0.8	3.0	180	00011				
DSH650 77	28	30	52	0.8	3.0	180	650W				
1 S11050y-22	24	24	52	0.8	3.0	180	0501				
DSH700 77	28	30	56	0.8	3.0	180	700W				
1 S11700y-22	24	24	56	0.8	3.0	180	700₩				
DSU750n ==	28	30	60	0.8	3.0	180	750W				
F 5117 50y-22	24	24	60	0.8	3.0	180	/30₩				
PSH850y-zz	30	30	62	0.8	3.0	180	850W				
PSH850V1-zz	**30	**30	**70	**0.8	**3.0	**180	**850W				

5. Client consigns four model samples (Model number: PSH750U) to test. Therefore, testing Lab. just guarantees the units, which have been tested.

**6. Client consigns four model samples (Model number: PSH850V1-ZZ) to test. Therefore, testing Lab. just guarantees the units, which have been tested.



3 TEST METHODOLOGY

3.1 DECISION OF FINAL TEST MODE

1. The following test mode(s) were scanned during the preliminary test:

 $Full \ Load - PSH850V1\text{-}ZZ$

2. After preliminary test, found mode 1 producing the highest emission level, used this mode for all final test.

4 SETUP OF EQUIPMENT UNDER TEST

Setup Diagram

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

<u>Support Equipment</u>

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	РС	DX-6120	SGH53102TR	FCC DoC	HP	N/A	Unshielded, 1.8m
2	Monitor	959NF	AQ19H2RT706121B	FCC DoC	SAMSUNG	Shielded, 1.8m with two cores	Unshielded, 1.8m
3	Modem	DM-1414	304012262	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
4	Printer	STYLUS C60	DR3K041515	FCC DoC	EPSON	Unshielded, 1.8m	Unshielded, 1.8m
5	PS/2 Keyboard	Y-SJ17	SY520U00642	FCC DoC	Logitech	Unshielded, 1.8m	N/A
6	PS/2 Mouse	M-SBF69	HCA51604416	DZL211029	Logitech	Unshielded, 1.8m	N/A

Note: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

Mode 1



5 LABORATORY ACCREDITATIONS AND LISTINGS

5.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

5.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective manual.

Conducted Emission Test Site # 3										
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due						
EMI Test Receiver	R&S	ESCS30	845552/030	04/08/2009						
LISN	R&S	ENV216	100074	12/03/2008						
LISN	FCC	FCC-LISN-50/ 250-16-2-07	06013	10/12/2009						
Test S/W	LabVIEW 6.1 (CCS Conduction Test SW Version_01)									

Equipment Used for Emission Measurement

Note: The measurement uncertainty is less than +/-1.7806dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



Open Area Test Site # 5									
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due					
Spectrum Analyzer	ADVANTEST	R3132	91700456	N.C.R					
EMI Test Receiver	R&S	ESVS10	846285/016	06/06/2009					
Bilog Antenna	TESEQ	CBL 6112D	23190	06/27/2009					
Pre-Amplifier	WIRELESS	FPA-6592G	060010	08/29/2009					
Turn Table	CCS	CC-T-1F	N/A	N.C.R					
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R					
Controller	CCS	CC-C-1F	04	N.C.R					
RF Switch	ANRITSU	MP59B	10877	N.C.R					
Site NSA	CCS	N/A	N/A	11/23/2008					
Test S/W	La	abVIEW 6.1 (CCS)	OATS EMI SW V2	.7)					

 Iest S/W
 LabVIEW 6.1 (CCS OATS EMI SW V2./)

 Note: The measurement uncertainty is less than +/- 3.8906dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



6 TEST RESULTS

Line Conducted Emission

-				CCS	5 Conduc	tion Te	st 3					
Mo	odel No. PSH850V1-ZZ 6dB Bar				andwidth	9	9 kHz					
Env Cor	vironment aditions	al	25°C, 57	% RH		Test Mode			Mode 1			
Tested By			Alex Tsa	i		Line		L	1			
80.1		The second secon							5 MMMM	QP: AVG:	7	
0.0	V.W.	. <i>h</i> . M	איע אייע									
0.	150		0.5		()	(Hz)		5			30.000	
NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)	
1	0.1773	35.80	35.30	9.70	45.50	45.00	64.61	54.61	-19.11	-9.61	Pass	
2	0.2437	24.60	24.30	9.70	34.30	34.00	61.97	51.97	-27.67	-17.97	Pass	
3	0.2633	31.60	31.50	9.70	41.30	41.20	61.33	51.33	-20.03	-10.13	Pass	
4*	0.3531	30.09	29.99	9.71	39.80	39.70	58.89	48.89	-19.09	-9.19	Pass	
5	11.9898	15.86	13.36	10.24	26.10	23.60	60.00	50.00	-33.90	-26.40	Pass	
6	18.5237	26.62	17.42	10.38	37.00	27.80	60.00	50.00	-23.00	-22.20	Pass	
7	20.4469	35.77	25.47	10.43	46.20	35.90	60.00	50.00	-13.80	-14.10	Pass	

REMARKS: L1 = Line One (Live Line)



CCS Conduction Test 3

Moo	del No.		PSH850V	V1-ZZ	6dB Bandwidth		9	9 kHz				
Env Con	rironmenta ditions	l	25°C, 579	% RH		Test M	lode	Ν	Mode 1			
Test	ted By		Alex Tsa	i		Line		L	L2			
80.0) dBuV						1 - 7					
40	N N	A W W						J	NMM	۹۲: AVG:		
0.	150		0.5		4)	(Hz)		5			30.000	
NO.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)	
1*	0.1773	41.90	41.50	9.70	51.60	51.20	64.61	54.61	-13.01	-3.41	Pass	
2	0.2437	32.50	32.40	9.70	42.20	42.10	61.97	51.97	-19.77	-9.87	Pass	
3	0.3531	25.69	25.39	9.71	35.40	35.10	58.89	48.89	-23.49	-13.79	Pass	
4	12.2477	24.76	23.46	10.24	35.00	33.70	60.00	50.00	-25.00	-16.30	Pass	
5	20.6148	34.77	24.67	10.43	45.20	35.10	60.00	50.00	-14.80	-14.90	Pass	
6	21.7149	27.81	15.61	10.49	38.30	26.10	60.00	50.00	-21.70	-23.90	Pass	

REMARKS: L2 = Line Two (Neutral Line)



Radiated Emission

CCS Radiated Test OATS 5

Model No.	PSH850V1-ZZ	Test Mode	Mode 1
Environmental Conditions	34°C, 64% RH	6dB Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function:	Quasi-peak.	Tested By	Steve Cheng



No.	Frequency	Reading	Correction	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	41.26	10.01	13.53	23.54	30.00	-6.46	222.60	100.00	QP
2	59.32	16.96	7.76	24.72	30.00	-5.28	276.60	100.00	QP
3	68.49	17.69	7.78	25.47	30.00	-4.53	33.90	100.00	QP
4	137.18	8.89	15.28	24.18	30.00	-5.82	106.80	100.00	QP
5	157.50	9.58	14.32	23.90	30.00	-6.10	194.50	100.00	QP
6	229.16	8.14	15.80	23.93	30.00	-6.07	81.40	100.00	QP
7	311.40	11.82	20.16	31.98	37.00	-5.02	154.30	324.30	QP
8	374.60	7.74	22.75	30.49	37.00	-6.51	53.70	324.30	QP
9	456.60	8.32	24.44	32.76	37.00	-4.24	311.70	184.00	QP
10	526.20	3.27	25.16	28.43	37.00	-8.57	10.30	146.20	QP
11	687.30	2.57	28.00	30.57	37.00	-6.43	321.10	135.10	QP
12	775.50	2.74	28.90	31.65	37.00	-5.35	10.20	112.50	QP
13	867.30	2.55	29.42	31.97	37.00	-5.03	109.70	100.00	QP
14	933.30	0.36	29.87	30.23	37.00	-6.77	76.90	100.00	QP

REMARKS: The other emission levels were very low against the limit.



Model No.	PSH850V1-ZZ	Test Mode	Mode 1
Environmental Conditions	34°C, 64% RH	6dB Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function:	Quasi-peak.	Tested By	Steve Cheng

CCS Radiated Test OATS 5



No.	Frequency	Reading	Correction	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	44.34	12.96	11.98	24.94	30.00	-5.06	49.80	399.70	QP
2	66.38	14.85	7.74	22.60	30.00	-7.40	314.00	399.70	QP
3	115.74	9.16	15.44	24.61	30.00	-5.39	239.30	399.70	QP
4	172.62	8.10	13.80	21.90	30.00	-8.10	47.70	399.70	QP
5	229.67	10.10	15.85	25.95	30.00	-4.05	269.60	399.70	QP
6	289.99	10.55	19.49	30.04	37.00	-6.96	20.60	399.70	QP
7	348.80	5.67	21.77	27.43	37.00	-9.57	321.40	367.10	QP
8	400.00	4.41	23.71	28.12	37.00	-8.88	304.80	367.10	QP
9	431.80	5.68	24.18	29.86	37.00	-7.14	149.50	187.20	QP
10	523.50	4.52	25.08	29.60	37.00	-7.40	209.10	147.10	QP
11	659.90	4.08	27.79	31.87	37.00	-5.13	0.70	136.30	QP
12	761.30	1.60	28.84	30.44	37.00	-6.56	353.90	117.10	QP
13	865.50	0.34	29.40	29.74	37.00	-7.26	101.70	100.40	QP
14	905.10	2.19	29.88	32.07	37.00	-4.93	71.00	100.40	QP

REMARKS: The other emission levels were very low against the limit.



APPENDIX I - PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST







RADIATED EMISSION TEST



