APPLICATION FOR CERTIFICATION On Behalf of Powertech Industrial Co Ltd Green Power Surge Protector Model No. : (1)R9P014 (2)R9P015 FCC ID : NHS-R9P014

Prepared for : Powertech Industrial Co Ltd 10F, No. 407, Chung Shan Rd., Sec 2 Chung Ho City, Taipei Hsien, 235 Taiwan

Prepared by : AUDIX Technology Corporation EMC Department No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei Hsien, Taiwan

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TEST REPORT CERTIFICATION

Applicant	:	Powertech Industrial Co	o L	td
EUT Description	:	Green Power Surge Protector		
FCC ID	:	NHS-R9P014		
		(A) MODEL NO.	:	(1)R9P014 (2)R9P015
		(B) SERIAL NO.	:	N/A
		(C) POWER SUPPLY	:	DC 6V
		(D) TEST VOLTAGE	:	DC 6V

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, October 2009 AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.207, §15.249, §15.209)

The device described above was tested by AUDIX Technology Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX Technology Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : Sep. 29 ~ Oct. 29, 2010

Date of Report : Oct. 29, 2010

Producer :

(Julie Hsu/Administrator)

Reviewer :

(Henning Chang/Supervisor)

(Ben Cheng/Manager)

Signatory:

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

	Description	:	Green Power Surge Protector (Transceiver)
	Model Number	:	(1)R9P014 (With Relay)(2)R9P015 (Without Relay)
			The M/N R9P014 is representative selected to test in this report
	FCC ID	:	NHS-R9P014
	Applicant	:	Powertech Industrial Co Ltd 10F, No. 407, Chung Shan Rd., Sec 2 Chung Ho City, Taipei Hsien, 235 Taiwan
	Fundamental Frequency	:	915MHz
	AC Rating	:	DC 6V
	Date of Receipt of Sample	:	Sep. 15, 2010
	Date of Test	:	Sep. 29 ~ Oct. 29, 2010
1.2.	Description of Test Faci	lity	
	Name of Firm	:	AUDIX Technology Corporation EMC Department
			No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei Hsien, Taiwan.
	Test Facility & Location (C2/AC)	:	No. 2 Shielded Room & Semi-Anechoic Chamber No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei Hsien, Taiwan.
			Renewal on May 14, 2009 Federal Communication Commission Registration Number: 90993
	NVLAP Lab. Code	:	200077-0
	TAF Accreditation No	:	1724

1.3. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)	
	30MHz~300MHz	±2.91dB	
Radiation Test	300MHz~1000MHz	±2.94dB	
(Distance, 511)	Above 1GHz	± 5.02dB	
Remark : Uncertainty = $ku_c(y)$			

2. POWERLINE CONDUCTED EMISSION MEASUREMENT

【The EUT only employ battery power for operation, no conductive emissions limits are required according to FCC Part 15 Section §15.207】

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

3.1.1. For Frequency Range 30MHz~1000MHz (Semi-Anechoic Chamber)

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R & S	ESCS30	100339	Mar. 10, 10'	Mar. 09, 11'
2.	Spectrum Analyzer	HP	8564EC	3946A00249	Oct. 27, 10'	Oct. 26, 11'
3.	Pre-Amplifier	HP	8447D	2944A06305	Feb. 03, 10'	Feb. 02, 11'
4.	Biconical Antenna	CHASE	VBA6106A	1264	Mar. 13, 10'	Mar. 12, 11'
5.	Log Periodic	Schwarzback	UHALP	0810	Mor 12 10'	Mor 12 11'
	Antenna	Schwalzbeck	9108-A	0010	wiai. 15, 10	wiai. 12, 11

3.1.2. For Frequency Range Above 1GHz (Semi-Anechoic Chamber)

Item	Туре	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Oct. 27, 10'	Oct. 26, 11'
2.	Amplifier	HP	8449B	3008A00529	Dec. 15, 09'	Dec. 14, 10'
3.	Horn Antenna	EMCO	3115	9112-3775	May 10, 10'	May 09, 11'

3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz

ANTENNA TOWER



GROUND PLANE

3.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



ANTENNA TOWER

3.3. Radiated Emission Limits (§15.209)

FREQUENCY	DISTANCE	FIELD STREN	GTHS LIMITS
MHz	Meters	μV/m	dBµV/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 dBµV/m (Peak)	
		54.0 dBµV/m (Average)	

Remark : (1) Emission level ($dB\mu V/m$) = 20 log Emission level ($\mu V/m$)

(2) The tighter limit applies at the edge between two frequency bands.

- (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- (4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
- (5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

3.4. Fundamental Frequency Limits (§15.249)

FUNDAMENTAL	QP
FREQUENCY	
MHZ	
902-928	94 dBµV/m

3.5. Operating Condition of EUT

- 3.5.1. Setup the EUT as shown on 3.2.
- 3.5.2. Turn on the power of all equipment.
- 3.5.3. The EUT was on Tranceive function at the stand, side and lie conditions during all testing. (worst mode is stand condition)

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set to 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log-periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of test spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of test spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 10GHz (Up to 10th harmonics from fundamental frequency) was checked.

3.7. Radiated Emission Measurement Test Results

PASSED.

(All emissions not reported below are too low against the prescribed limits.)

EUT : Green Power Surge Protector	M/N : R9P014
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Test Date : Sep. 29, 2010	Temperature ∶ 26°C	Humidity : 53%
Test Date : Oct. 29, 2010	Temperature ∶ 26°C	Humidity : 53%

For Frequency Range 30MHz~1000MHz:

The EUT was measured during this section testing and all the test results are listed in section 3.7.1.

Mada	Test Mode	Reference Test Data		
Mode	Test Mode	Horizontal	Vertical	
1.	Transceive	#7	# 8	

* Above all final readings were measured with Quasi-Peak detector.

For Out of Band:

The EUT was measured during this section testing and all the test results are listed in section 3.7.2.

Model Test Mode		Reference Test Data	
Mode	Test Mode	Horizontal	Vertical
1.	Transceive	#1	# 2

For Frequency above 1GHz:

The EUT with the following test modes was measured within semi-anechoic chamber. All the graphical results are listed in section 3.7.3.

NO.	Test Mode	Test Frequency Range
1.		1000-2680MHz
2.	Transceive	2680-5500MHz
3.		5500-10000MHz

* Above all final readings were measured with Peak detector and Average detector. (Frequency range: 2680-10000MHz emissions level is too low to be measured, therefore, the reading values not reported.)

For Fundamental Frequency:

The EUT was measured during this section testing and all the test results are listed in section 3.7.4.

3.7.1. Frequency Range 30-1000MHz



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	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin Remark (dB)			
1	201.690	22.07 18.58	3.03 6.30	2.02 1.80	27.12 26.68	43.50 46.00	16.38 19.32			
3	715.790	22.74	6.55	1.76	31.06	46.00	14.94			
4	747.800	23.11	6.70	2.60	32.41	46.00	13.59			
5	760.410	23.66	6.75	3.79	34.20	46.00	11.80			
6	872.930	25.45	7.29	5.71	38.45	46.00	7.55			
	, , , –						· · · · ·			
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.										
2. The emission levels that are 20dB below the official limit are not reported.										

3. All readings are Quasi-Peak values.





	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin Remark (dB)		
1	200.720	22.08	3.00	5.39	30.47	43.50	13.03		
2	515.000	19.97	6.80	1.42	28.19	46.00	17.81		
3	656.620	22.09	6.40	2.24	30.74	46.00	15.26		
4	707.060	23.55	6.60	2.67	32.82	46.00	13.18		
5	747.800	23.11	6.70	1.98	31.79	46.00	14.21		
6	760.410	23.66	6.75	3.10	33.51	46.00	12.49		
7	841.890	25.11	7.10	3.78	36.00	46.00	10.00		
8	893.300	25.04	7.30	4.81	37.15	46.00	8.85		
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading. 2. The emission levels that are 20dB below the official limit are not reported.									

3. All readings are Quasi-Peak values.

3.7.2. Out of Band



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Test Mo	ode	:	oper	ating
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	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin Remark (dB)
1	901.900	24.92	7.40	33.71	39.05	46.00	6.95
2	960.000	26.42	7.60	23.26	30.45	46.00	15.55
3	971.700	26.77	7.70	25.49	33.19	54.00	20.81





	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	901.900	24.92	7.40	31.81	37.15	46.00	8.85	
2	960.000	26.42	7.60	23.87	31.06	46.00	14.94	
3	970.400	26.81	7.69	25.93	33.65	54.00	20.35	

3.7.3. Frequency Range 1000-10000MHz



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	Freq. (MHz)		Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1834	4.960	26.97	6.72	11.68	45.37	74.00	28.63	Peak
Remai	rks:	1. En 2. Th	nission I ne emissi mit are	Sevel=	Antenna : vels that	Factor + C are 20dB	able Los: below the	s + Read e offici	ling. Lal





		Ant.	Cable		Emission			
	Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)	
1	1834.960	26.97	6.72	7.39	41.07	54.00	12.93	Average
Rema	rks: 1. Em	ission 1	Level=	Antenna	Factor + (Cable Los:	s + Read	ling.

 The emission levels that are 20dB below the official limit are not reported.





	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBµV)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	1834.960	26.97	6.72	12.81	46.50	74.00	27.50	Peak
Remai	rks: 1. En 2. Th	nission 1 he emissi	Level= ion lev	Antenna 1 vels that	Factor + C are 20dB	able Los: below th	s + Read e offic:	ling. Lal

limit are not reported.





	(1	MHz))	(dB/m)	(dB)	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)	
1	183	4.9	60	26.97	6.72	9.17	42.85	54.00	11.15	Average
Rema:	rks:	1.	Emi	ission	Level=	Antenna	Factor +	Cable Los	s + Rea	ding.

 2. The emission levels that are 20dB below the official limit are not reported.













3.7.4. Fundamental Frequency



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		Ant.	Cable		Emission			
	Freq. (MHz)	Factor (dB/m)	Loss (dB)	Reading (dBµV)	Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Remark
1	914.970	24.90	7.40	56.94	89.23	94.00	4.77	QP
	 ka•1 Fm	ieeion '	 .evel=	Antenne	\mathbf{F}	 Yahla T.og	 = + Deed	

 The emission levels that are 20dB below the official limit are not reported.

 Because fundament frequency peak values have bee lower than the average limit, so most don't measure the average value.

4. **DEVIATION TO TEST SPECIFICATIONS**[NONE]