

# APPLICATION OF CERTIFICATION For

Altai Technologies Limited

A8in Super WiFi Base Station

Model Number: WA8011N-HE

FCC ID: UCC-WA8011N-HE

Prepared for : Altai Technologies Limited Units 209, 2/F, Lakeside 2, 10 Science Park West Avenue, Hong Kong Science Park, Shatin, Hong Kong, China

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Report Number	:	ACS- F13250
Date of Test	:	Oct.12~18, 2013
Date of Report	:	Apr.11, 2014



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AUDIX Technology (Shenzhen) Co., Ltd.

FCC ID: UCC-WA8011N-HE

# TEST REPORT CERTIFICATION

Applicant Manufacturer EUT Description FCC ID

Altai Technologies Limited
Altai Technologies Limited
A8in Super WiFi Base Station
UCC-WA8011N-HE
(A)Model No. : WA8011N-HE
(B) Power Supply : AC 100V-240V, 50/60Hz
(C) Test Voltage : DC 56V From Adapter Input AC 120V/60Hz

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart B Class B 2012

Date of Test : Oct.12~ 18, 2013

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both conducted and radiated emissions. The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed of full responsibility for the accuracy and completeness of these tests. This report contains data that are not covered by the NVLAP accreditation.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Report of date: Apr.11, 2014

	(-for) Reviewed by:
Lisa Liang / Assi	stánt Sunny Lu / Assistant Manager
	AUDIX <sup>®</sup> 信華科技 (深圳) 有限公司 Audix Technology (Shenzhen) Co., Ltd. EMC 部 門 報 告 専 用 章
	Stamp only for EMC Dept. Report
Approved & Authorized Signer :	Signature: David Jin 4.11
	David Jin / Manager



# 1. SUMMARY OF STANDARDS AND RESULTS

# 1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION				
<b>Description of Test Item</b>	Standard	Results	Remarks	
Power Line Conducted Emission Test	FCC Part 15: 2012 ANSI C63.4: 2009	PASS	Meets Class B Limit Minimum passing margin is 4.69dB at 20.269MHz	
Radiated Emission Test (30-1000MHz)	FCC Part 15: 2012 ANSI C63.4: 2009	PASS	Meets Class B Limit Minimum passing margin is 5.46dB at 37.760MHz	
Radiated Emission Test (1-6GHz)	FCC Part 15: 2012 ANSI C63.4: 2009	PASS	Meets Class B Limit Minimum passing margin is 11.26dB at 5030.960MHz	



# 2.1.Equipment under test (EUT) Product Name : A8in Super WiFi Base Station Model Number : WA8011N-HE FCC ID : UCC-WA8011N-HE

a/b/g/n

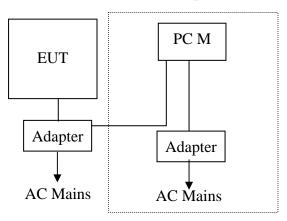
Operation Frequency	: IEEE 802.11a: 5745MHz—5825MHz IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11nHT20: 2412MHz—2462MHz, 5745MHz—5825MHz IEEE 802.11nHT40: 2422MHz—2452MHz, 5755MHz—5795MHz
Modulation Technology	: IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11a/g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Antenna Assembly Gain	: 2.4GHz: Built-in Antenna, 19dBi 5GHz : External Antenna, 20dBi;
Applicant	: Altai Technologies Limited Units 209, 2/F, Lakeside 2, 10 Science Park West Avenue, Hong Kong Science Park, Shatin, Hong Kong, China
Manufacturer	: Altai Technologies Limited Units 209, 2/F, Lakeside 2, 10 Science Park West Avenue, Hong Kong Science Park, Shatin, Hong Kong, China
AC Adapter	: Manufacturer: FSGREAT M/N: GRT-560110A S/N : 130840101
Date of Test	: Oct.12~18, 2013
Date of Receipt	: Mar.01, 2013
Sample Type	: Prototype production



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2	2.2. Tested Supporting System Details							
No.	Description	ACS No.	Manufacturer	Model	Serial Number	Approved type		
1	Personal Computer	Test PC M	DELL	Studio 540	224XK2X	⊠FCC DoC ⊠BSMI ID:R33002		
	-	Power Cord: Unshie Display Card: HD34						
2	Monitor	ACS-EMC-LM04R	DELL	1907FPt	CN-009759-7161 8-6AP-ACPP	ØFCC DoC ØBSMI ID: R3A002		
2		Monitor Power Cord: Unshielded, Detachable, 1.8m VGA Cable: Shielded, Detachable, 2.0m (with two cores) DVI Cable: Shielded, Detachable, 2.0m (with two cores)						
3	USB Mouse	ACS-EMC-M04R	DELL	M0C5UO	512024282	☑ FCC DoC ☑BSMI ID: R41108		
	Power Cord: shielded, Undetachable, 1.8m							
4	USB Keyboard	ACS-EMC- K04R	DELL	SK-8115	CN-ODJ313-716 16-6BB-049J	☑ FCC DoC ☑BSMI ID: T3A002		
	Power Cord: shielded, Undetachable, 2.0m							

# 2.3. Block Diagram of Test Setup



(EUT: A8in Super WiFi Base Station)



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2.4.Test Facility		
Site Description		
Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd. No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park,Nantou, Shenzhen, Guangdong, China
3m Anechoic Chamber	:	Certificated by FCC, USA Registration Number: 90454 Valid Date: Feb.22, 2015
3m & 10m Anechoic Chamber	:	Certificated by FCC, USA Registration Number: 794232 Valid Date: Oct.31, 2015
EMC Lab.	:	Certificated by DAkkS, Germany Registration No: D-PL-12151-01-01 Valid Date: Feb.01, 2014
		Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2014

# 2.5.Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty	
Uncertainty for Conduction emission test in No. 1 Conduction	3.10dB (150kHz~30MHz)	
	3.22 dB (30~200MHz, Polarize: H)	
Uncertainty for Radiation Emission test in 3m chamber (Distance: 3m)	3.23 dB (30~200MHz, Polarize: V)	
	3.49 dB (200M~1GHz, Polarize: H)	
	3.39 dB (200M~1GHz, Polarize: V)	
Uncertainty for Radiation Emission test in	5.04 dB (1-6GHz Distance: 3m)	
3m chamber (1GHz-18GHz)	5.06 dB (6-18GHz Distance: 3m)	
Uncertainty for test site temperature and	0.6°C	
humidity	3%	



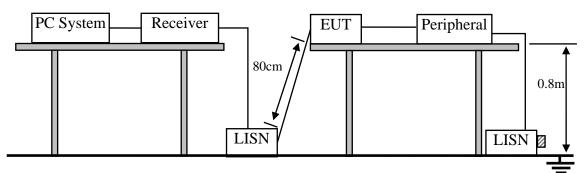
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# 3. POWER LINE CONDUCTED EMISSION MEASUREMENT

### 3.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Oct.31, 12	1 Year
2.	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	Oct.31, 12	1 Year
3.	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	May.08, 13	1 Year
4.	Terminator	Hubersuhner	50Ω	No. 1	May.08, 13	1 Year
5.	Terminator	Hubersuhner	50Ω	No. 2	May.08, 13	1 Year
6.	RF Cable	Fujikura	3D-2W	No.1	May.08, 13	1Year
7.	Coaxial Switch	Anritsu	MP59B	M50564	May.08, 13	1 Year
8.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	May.08, 13	1 Year

# 3.2.Block Diagram of Test Setup



 $\square$  :50 $\Omega$  Terminator

# 3.3. Power Line Conducted Emission Test Limits

	Maximum RF Line Voltage			
Frequency	Quasi-Peak Level	Average Level		
	dB(µV)	dB(µV)		
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*		
500kHz ~ 5MHz	56	46		
5MHz ~ 30MHz	60	50		

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

# 3.4.Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.1. A8in Super WiFi Base Station (EUT)

Model Number : WA8011N-HE Serial Number : N/A

3.4.2. Support Equipment : As Tested Supporting System Detail, in Section 2.2.



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# 3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.

3.5.2. Turn on the power of all equipment..

3.5.3. PC run test software to control EUT work in (Running) mode.

# 3.6.Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#3). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4: 2009 on conducted Emission test.

The bandwidth of test receiver (R&S TEST RECEIVER ESHS10) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 3.7.

# 3.7. Conducted Emission at Mains Terminals Test Results

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

The EUT with the following test modes were tested and selected to read Q.P values and average values, all the test results are listed in next pages.

EUT: A8in Super WiFi Base Station Mc

Model No. : WA8011N-HE

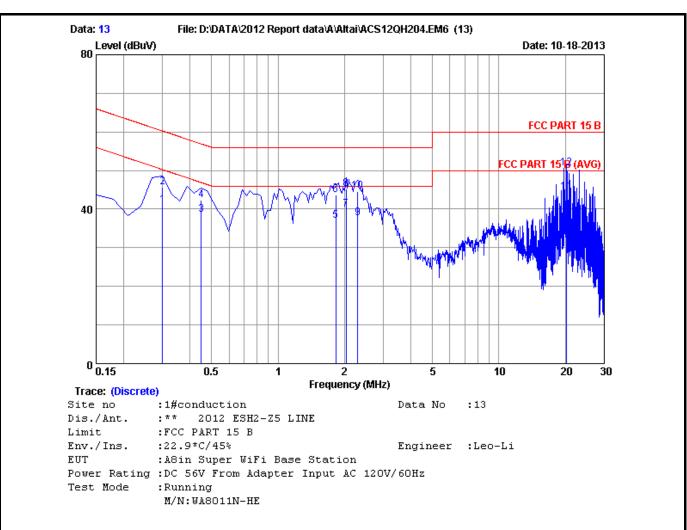
Test Date:Oct.18, 2013 Temperature: 22.9°C Humidity: 45%

The details of test mode are as follows :

No.	Test Mode	Reference Test Data No.		
		Line	Neutral	
1.	Running	# 13	# 12	



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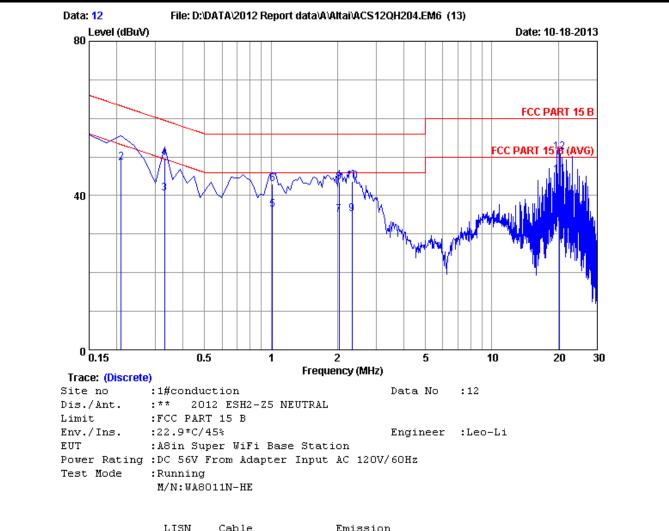
		LISN	Cable		Emissior	n		
No	Freq	Factor	Loss	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dB)	
1	0.29925	0.19	0.01	40.89	41.09	50.26	9.17	Average
2	0.29925	0.19	0.01	45.41	45.61	60.26	14.65	QP
3	0.44850	0.19	0.02	38.45	38.66	46.90	8.24	Average
4	0.44850	0.19	0.02	42.16	42.37	56.90	14.53	QP
5	1.822	0.24	0.04	36.77	37.05	46.00	8.95	Average
6	1.822	0.24	0.04	43.33	43.61	56.00	12.39	QP
7	2.031	0.24	0.04	39.59	39.87	46.00	6.13	Average
8	2.031	0.24	0.04	44.87	45.15	56.00	10.85	QP
9	2.299	0.25	0.04	37.29	37.58	46.00	8.42	Average
10	2.299	0.25	0.04	44.23	44.52	56.00	11.48	QP
11	20.269	1.18	0.14	42.92	44.24	50.00	5.76	Average
12	20.269	1.18	0.14	49.23	50.55	60.00	9.45	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.

2.If the average limit is met when useing a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



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		LISN	Cable		Emissior	1		
No	Freq	Factor	Loss	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dB)	
1	0.20970	0.21	0.01	46.86	47.08	53.22	6.14	Average
2	0.20970	0.21	0.01	48.32	48.54	63.22	14.68	QP
3	0.32910	0.22	0.01	40.36	40.59	49.47	8.88	Average
4	0.32910	0.22	0.01	49.36	49.59	59.47	9.88	QP
5	1.016	0.24	0.03	36.14	36.41	46.00	9.59	Average
6	1.016	0.24	0.03	42.70	42.97	56.00	13.03	QP
7	2.031	0.28	0.04	34.72	35.04	46.00	10.96	Average
8	2.031	0.28	0.04	43.16	43.48	56.00	12.52	QP
9	2.329	0.29	0.04	34.87	35.20	46.00	10.80	Average
10	2.329	0.29	0.04	43.28	43.61	56.00	12.39	QP
11	20.269	0.98	0.14	44.19	45.31	50.00	4.69	Average
12	20.269	0.98	0.14	50.04	51.16	60.00	8.84	QP

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.

2. If the average limit is met when useing a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.



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# 4. RADIATED EMISSION TEST

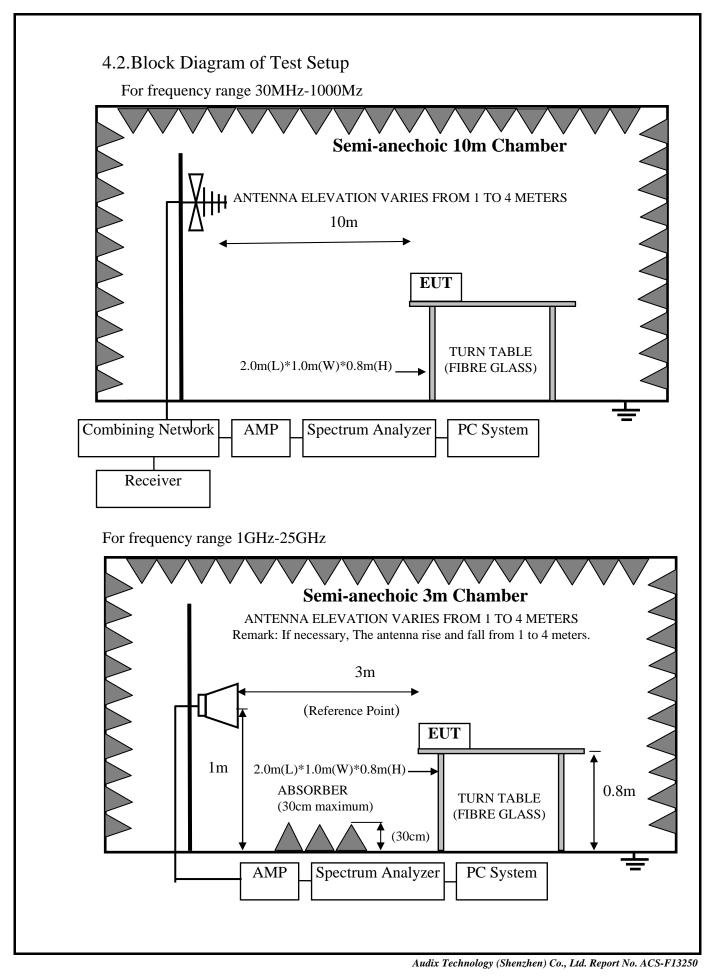
# 4.1.Test Equipment

4.1.1.For frequency range 30MHz~1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	3#Chamber	AUDIX	N/A	N/A	Nov.24, 12	1 Year
2	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 13	1 Year
3	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 13	1 Year
4	Amplifier	HP	8447D	2648A04738	May.08, 13	1 Year
5	Bilog Antenna	TESEQ	CBL6112D	35375	May.30, 13	1 Year
6	RF Cable	MIYAZAKI	CFD400-NL	3# Chamber No.1	May.08, 13	1 Year
7	Coaxial Switch	Anritsu	MP59B	M74389	May.08, 13	1 Year
	4.1.2.For frequency range 1GHz~6GHz					

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	May.08, 13	1 Year
2	Horn Antenna	EMCO	3115	9607-4877	Aug.27, 13	1 Year
3	Amplifier	Agilent	8449B	3008A00863	May.08, 13	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	May.08, 13	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX106	28616/2	May.08, 13	1 Year







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# 4.3.Radiated Emission Limit

Frequency	Distance	Field Strengths Limits
MHz	(Meters)	dB(µV)/m
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
960 ~ 1000	3	54.0
Above 1000	3	74(Peak)54(Average)

Remark: (1) Emission level = Antenna Factor + Cable Loss + Reading

Emission level = Antenna Factor - Amp Factor + Cable Loss + Reading (above 1000MHz)

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

# 4.4.EUT Configuration on Test

The configurations of EUT are listed in Section 3.4

# 4.5. Operating Condition of EUT

Same as Conducted Emission test that is listed in Section 3.5. except the test set up replaced by Section 4.2.



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# 4.6.Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4: 2009 on Radiated Emission test.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz.

### 4.7.Radiated Disturbance Test Results

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

EUT: A8in Super WiFi Base Station Model No. : WA8011N-HE

### For frequency range 30MHz~1000MHz

The EUT with the following test modes were tested and selected to read Q.P values, all the test results are listed in next pages.

Test Date: Oct.12, 2013 Temperature: 24°C Humidity: 65%

The details of test mode are as follows :

No.	Test Mode	Reference Test Data No.		
		Line	Neutral	
1.	Running	#7	# 8	

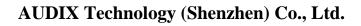
### For frequency range 1GHz~6GHz

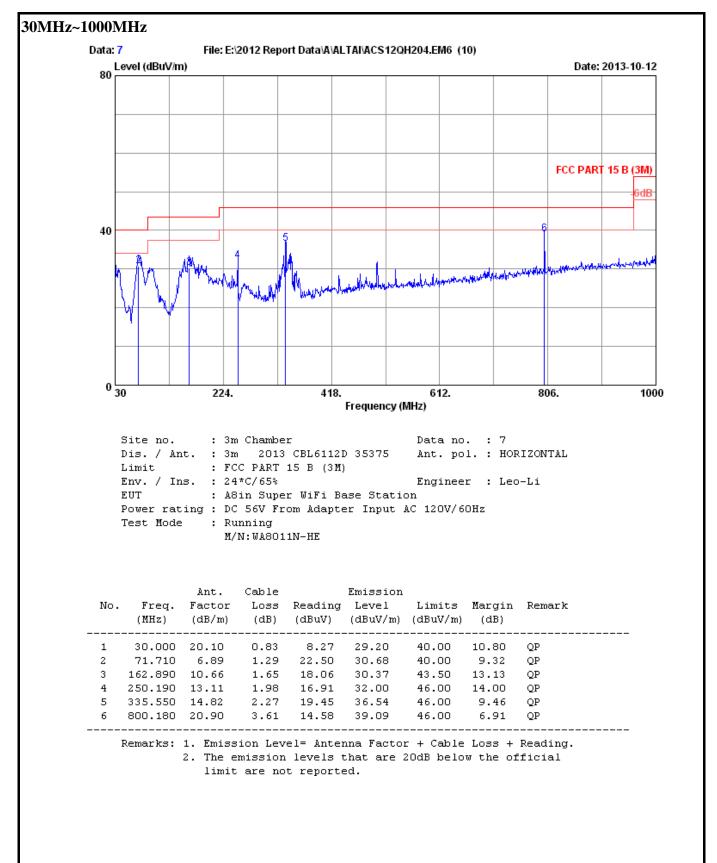
The EUT with below test mode were measured within Anechoic Chamber and the test results listed in next pages

Note: For all the emissions above 1GHz, the peak measured level comply with peak limit, so the average level were deemed to comply with average limit.

Test Date: Oct.12, 2013	Temperature: 24℃	Humidity: 56%

No.	Test Mode	Reference Test Data No.		
		Line	Neutral	
1.	Running	#9	# 10	

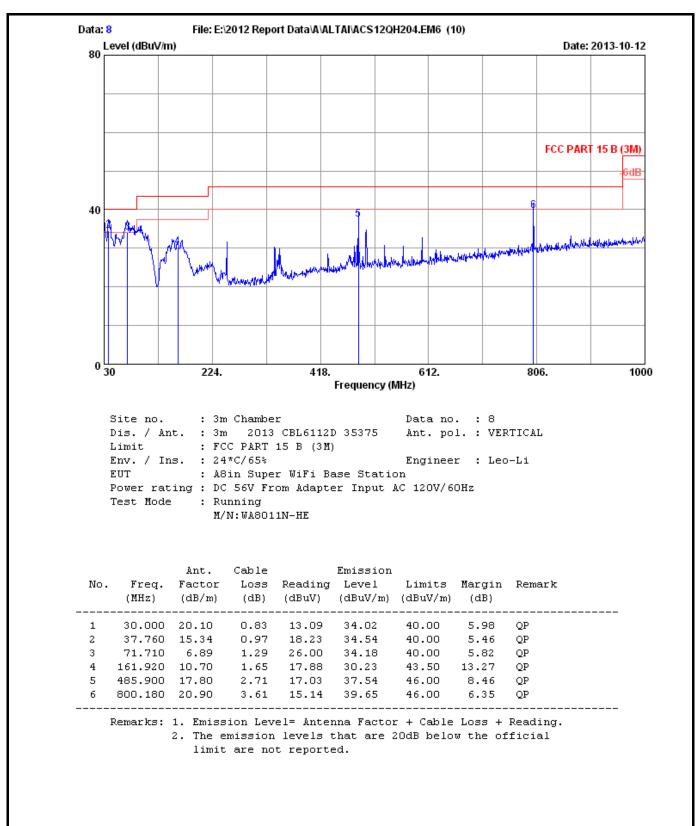






# AUDIX Technology (Shenzhen) Co., Ltd.

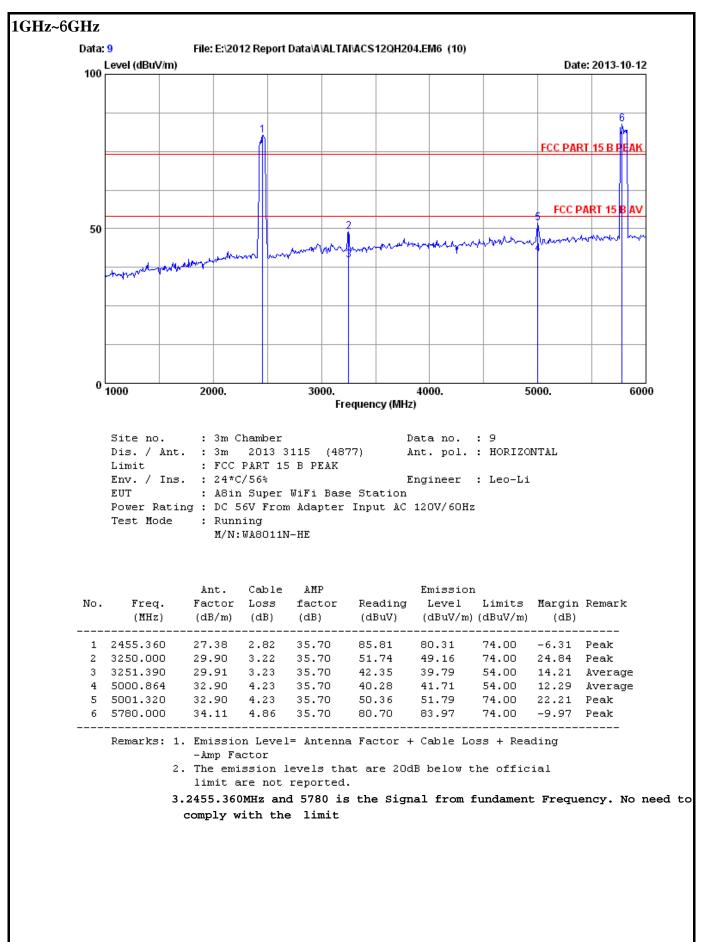
### FCC ID: UCC-WA8011N-HE



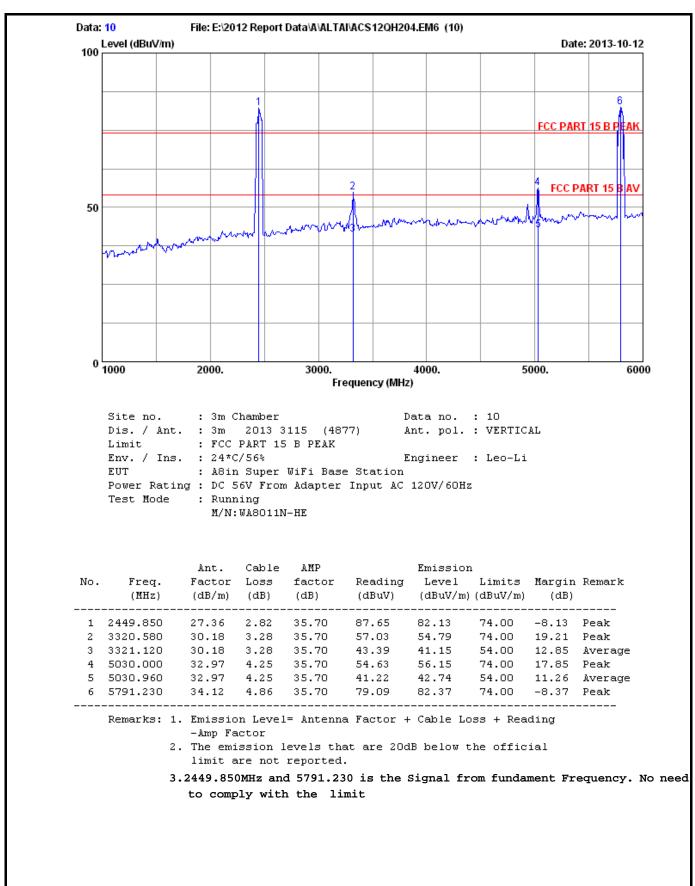


# AUDIX Technology (Shenzhen) Co., Ltd.

### FCC ID: UCC-WA8011N-HE









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# 5. DEVIATION TO TEST SPECIFICATIONS [NONE]