

Tel:(86) 755-26825180 Fax:(86) 755-86170310

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## Test Report

Product Name: 802.11b/g Wireless Module

FCC ID: XB5-UMS5001-1

MODEL NO. : AWM50G-US, AWM503g-WT, WT-mU-MTRa01

## Applicant:

Shenzhen Allwins Technology Corporation 902#, Block A, R&D Building, Tsinghua Hi-Tech Park, Nanshan District, Shenzhen, Guangdong, China

Date Received: 08/07/2009

Date Tested: 08/05-06/2009

APPLICANT: Shenzhen Allwins Technology Corporation



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APPLICANT: Shenzhen Allwins Technology Corporation FCC ID: XB5-UMS5001-1



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# EMC Equipment List

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.
					Interval
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100492	Mar 10,2009	1 Year
LISN	ROHDE&SCHWARZ	ENV216	100093	Mar 10,2009	1Year
EMI Test Receiver	ROHDE&SCHWARZ		101202	Mar 10,2009	1 Year
Spectrum Analyzer	ANRITSU	MS2651B	6200238316	Mar 10,2009	1 Year
50 Coaxial Switch	ANRITSU CORP	MP59B	6200283933	Mar 10,2009	1 Year
Bilog Antenna	Sunol	JB3	A121206	Mar 10,2009	1 Year
Horn Antenna	EMCO	3115	640201028-0 6	Mar 10,2009	1 Year
50 Coaxial Switch	ANRITSU CORP	MP59B	6200283933	Mar 10,2009	1 Year
Cable	Resenberger	N/A	NO.1	Mar 10,2009	1 Year
Cable	SCHWARZBECK	N/A	NO.2	Mar 10,2009	1 Year
Cable	SCHWARZBECK	N/A	NO.3	Mar 10,2009	1 Year
Single Phase Power	Kikusui	LIN40MA-PC	LM002352	Mar 10,2009	1Year
Line Filter		R-L			
AC Power Source	Kikusui	AC40MA	LM003232	Mar 10,2009	1Year
Test analyzer	Kikusui	KHA1000	LM003720	Mar 10,2009	1Year
ESD Tester	Kikusui	KES4021	LM003537	Mar 10,2009	1 Year
Signal Generator	IFR	2032	203002/100	Mar 10,2009	1 Year
Amplifier	A&R	150W1000	301584	NCR	NCR
Dual Directional	A&R	DC6080	301508	Mar 10,2009	1 Year
Coupler				-	
Power Head	A&R	PH2000	301193	Mar 10,2009	1 Year
Power Meter	A&R	PM2002	302799	Mar 10,2009	1 Year
Field Monitor	A&R	FM5004	300329	Mar 10,2009	1 Year
Field Probe	A&R	FP5000	300221	Mar 10,2009	1 Year
EMCPRO System	EM Test	UCS-500-M4	V064810202 6	Mar 10,2009	1 Year
EMCPRO System	EM Test	UCS-500-M4	V064810202 6	·	1 Year
Spectrum Analyzer	Agilent	E4446A	US44300459		1 Year
Attenuator	Agilent	8491B	MY39262165	Mar 10,2009	1 Year

# Remark:

Test Firm Name: Most Technology Service Co., Ltd.

Test Firm Address:

No. 5, 2nd Langshan Road, North District, Hi-tech Industrial Pa

rk, Nanshan, Shenzhen, Guangdong, China

FCC Registered Test Site Number: 490827

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#### TEST PROCEDURE

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of MOST TECHNOLOGY SERVICE CO., LTD. The EUT was transmitting a test signal during the testing.

**POWER LINE CONDUCTED INTERFERENCE:** The test procedure used was ANSI Standard C63.4-2003 using a 50 U H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25 with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3 MHz above 1 GHz. The ambient temperature of the EUT was 25 with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings were converted to average readings based on the duration of "ON" time.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard  $C63.4-2003\ 10.1.7$  with the EUT 40 cm from the vertical ground wall.

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**APPLICANT:** Shenzhen Allwins Technology Corporation

FCC ID: XB5-UMS5001-1

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

**RULES PART NUMBER:** 15.207(a), 15.247

REQUIREMENTS:

Frequency of Emission (MHz)

0.15-0.5

0.5-5

56

5-30

Conducted Limit (dBuV)

Quasi-peak
Average

56 to 46 \*

60

50

TEST PROCEDURE: ANSI STANDARD C63.4-2003

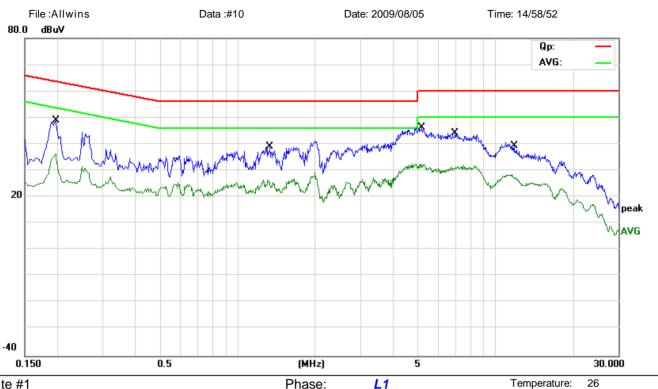
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<sup>\*</sup> Decreases with the logarithm of the frequency.

Address:No.5,Langshan 2nd Rd., North Hi-Tech Industrial park

Guangdong, China Tel: 0755-86170306 Fax: 0755-86170310

#### **Conducted Emission Measurement**



Site site #1 Limit: FCC Part 15C Conduction (QP)

EUT: 802.11b/g Wireless Module

M/N: AWM50G-US Mode: WIFI Mode

Note:

No. M	k. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1980	37.14	11.88	49.02	63.69	-14.67	QP	
2	0.1980	37.14	11.88	49.02	63.69	-14.67	QP	
3	1.3380	29.54	9.66	39.20	56.00	-16.80	QP	
4 *	5.2100	34.33	11.87	46.20	60.00	-13.80	QP	
5	7.0140	33.50	10.79	44.29	60.00	-15.71	QP	
6	11.8500	30.49	9.00	39.49	60.00	-20.51	QP	

Phase:

L1

Power: DC 5V from PC Input AC 120V/60Hz Humidity: 60 %

Temperature:

APPLICANT: Shenzhen Allwins Technology Corporation

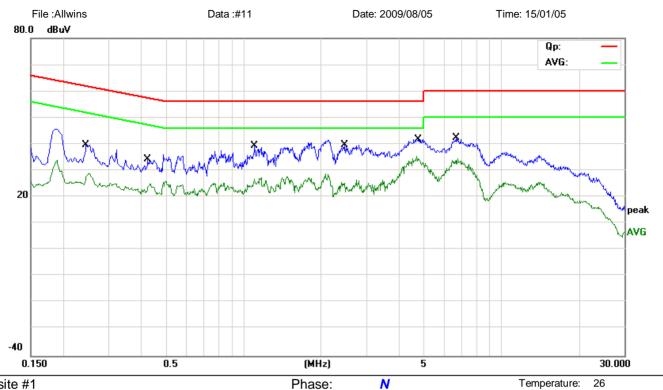
<sup>\*:</sup>Maximum data x:Over limit !:over margin

Address:No.5,Langshan 2nd Rd., North Hi-Tech Industrial park

Power: DC 5V from PC Input AC 120V/60Hz Humidity: 60 %

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#### **Conducted Emission Measurement**



Site site #1 Limit: FCC Part 15C Conduction (QP)

EUT: 802.11b/g Wireless Module

M/N: AWM50G-US Mode: WIFI Mode

Note:

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.2460	27.87	11.69	39.56	61.89	-22.33	QP	
2	0.4260	23.91	10.49	34.40	57.33	-22.93	QP	
3	1.1100	29.49	9.89	39.38	56.00	-16.62	QP	
4	2.4780	30.07	9.48	39.55	56.00	-16.45	QP	
5 *	4.7619	30.09	11.76	41.85	56.00	-14.15	QP	
6	6.7180	31.29	10.97	42.26	60.00	-17.74	QP	

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<sup>\*:</sup>Maximum data x:Over limit !:over margin



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**FCC ID:** XB5-UMS5001-1

NAME OF TEST: RADIATION INTERFERENCE

**RULES PART NUMBER:** 15.247, 15.209(a)

#### **REQUIREMENTS:**

30-88 MHz 40 dBuV/m @3m 88-216 MHz 43.5 dBuV/m @3m 216-960 MHz 46 dBuV/m @3m 960-1000 MHz 54 dBuV/m @3m

Above 1000MHz 74 dBuV/m(Peak) @3m, 54 dBuV/m(AV) @3m

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 50 Db BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

REMARK: Emissions attenuated more than 20 dB below the permissible value are not reported.

Frequency	Antenna	Emission Lev	el (dBuV/m)		FCC 15 Subpart C
(MHz)	Polarization	Avg	QP	Peak	Limit(dBuV/m)
	   11Mbps for I	 EEE 802.11b T	 X High frequenc	 cy (2412.00MHz)	)
214.10	Vertical		31.04	33.21	43.5
4824.00	Vertical			29.22	74.0
7236.13	Vertical			30.43	74.0
9648.25	Vertical			30.27	74.0
332.07	Horizontal		30.45	32.67	46.0
4824.02	Horizontal			32.24	74.0
7236.10	Horizontal			32.56	74.0
9648.23	Horizontal			30.32	74.0
	54Mbps for I	EEE 802.11g T	X High frequen	cy (2412.00MHz)	)
213.91	Vertical		31.25	34.13	43.5
4824.09	Vertical			30.60	74.0
7236.10	Vertical			31.22	74.0
9648.02	Vertical			30.45	74.0
332.14	Horizontal		30.42	33.62	46.0
4824.03	Horizontal			32.04	74.0
7236.10	Horizontal			32.50	74.0
9648.22	Horizontal			30.17	74.0

Emissions attenuated more than 20 dB below the permissible value are not reported.

TEST PROCEDURE: ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector and an appropriate antenna. The resolution bandwidth of spectrum analyzer was 100 kHz below 1 GHz and 1 MHz above 1 GHz. An appropriate sweep speed was used. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

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**FCC ID:** XB5-UMS5001-1

NAME OF TEST: RADIATION INTERFERENCE

**RULES PART NUMBER:** 15.247, 15.209(a)

#### **REQUIREMENTS:**

30-88 MHz 40 dBuV/m @3m 88-216 MHz 43.5 dBuV/m @3m 216-960 MHz 46 dBuV/m @3m 960-1000 MHz 54 dBuV/m @3m Above 1000MHz 74 dBuV/m(Peak) @3m, 54 dBuV/m(AV) @3m

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 50 Db BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

REMARK: Emissions attenuated more than 20 dB below the permissible value are not reported. Continued:

Frequency	Antenna	Emission :	Level (dBuV/m)	)	FCC 15 Subpart C
(MHz)	Polarization	Avg	QP	Peak	Limit(dBuV/m)
	 11Mbps for I	<u> </u> EEE 802.11]	b TX High fred	 quency (2442.00	)MHz)
213.90	Vertical		32.09	34.02	43.5
4884.10	Vertical			31.27	74.0
7326.03	Vertical			30.82	74.0
9768.30	Vertical			32.56	74.0
332.04	Horizontal		31.75	33.67	46.0
4884.10	Horizontal			30.79	74.0
7326.20	Horizontal			31.37	74.0
9768.00	Horizontal			30.22	74.0
	54Mbps for I	EEE 802.11	b TX High free	quency (2442.00	MHz)
214.01	Vertical		31.30	33.45	43.5
4884.09	Vertical			30.21	74.0
7326.00	Vertical			32.45	74.0
9768.11	Vertical			32.20	74.0
332.08	Horizontal		31.52	34.18	46.0
4884.10	Horizontal			31.44	74.0
7324.13	Horizontal			32.03	74.0
9768.01	Horizontal			30.32	74.0

Emissions attenuated more than 20 dB below the permissible value are not reported.

TEST PROCEDURE: ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector and an appropriate antenna. The resolution bandwidth of spectrum analyzer was 100 kHz below 1 GHz and 1 MHz above 1 GHz. An appropriate sweep speed was used. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

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NAME OF TEST: RADIATION INTERFERENCE

**RULES PART NUMBER:** 15.247, 15.209(a)

#### **REQUIREMENTS:**

30-88 MHz 40 dBuV/m @3m 88-216 MHz 43.5 dBuV/m @3m 216-960 MHz 46 dBuV/m @3m 960-1000 MHz 54 dBuV/m @3m Above 1000MHz 74 dBuV/m(Peak) @3m, 54 dBuV/m(AV) @3m

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 50 Db BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

REMARK: Emissions attenuated more than 20 dB below the permissible value are not reported. Continued:

reported. Co	ontinued:				
Frequency	Antenna	Emission Leve	el (dBuV/m)		FCC 15 Subpart C
(MHz)	Polarization	Avg	QP	Peak	Limit(dBuV/m)
					,
	11Mbps for I	EEE 802.11b TX	High frequenc	cy (2462.00MHz)	)
214.12	Vertical		31.39	33.73	43.5
4924.09	Vertical			30.30	74.0
7386.13	Vertical			31.37	74.0
9848.10	Vertical			32.63	74.0
331.93	Horizontal			34.34	46.0
4924.08	Horizontal		32.31	33.15	74.0
7386.20	Horizontal			31.29	74.0
9848.02	Horizontal			30.40	74.0
	54Mbps for I	EEE 802.11b TX	K High frequenc	cy (2462.00MHz)	)
214.13	Vertical		31.40	34.25	43.5
4924.09	Vertical			30.37	74.0
7386.11	Vertical			32.29	74.0
9848.10	Vertical			31.07	74.0
332.05	Horizontal			30.35	46.0
4924.05	Horizontal		32.26	34.22	74.0
7386.10	Horizontal			31.34	74.0
9848.07	Horizontal			32.61	74.0

Emissions attenuated more than 20 dB below the permissible value are not reported.

TEST PROCEDURE: ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector and an appropriate antenna. The resolution bandwidth of spectrum analyzer was 100 kHz below 1 GHz and 1 MHz above 1 GHz. An appropriate sweep speed was used. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

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**FCC ID:** XB5-UMS5001-1

NAME OF TEST: 6dB Bandwidth Test

**RULES PART NUMBER:** 15.247(a)(2)

REQUIREMENTS: The transmitter output was connected to a spectrum analyzer via a Attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 100 KHz VBW. The 6dB Bandwidith is defined as the total spectrum the power of which is lower than peak power minus 6dB, The 6dB bandwidth shall be at least 500 KHz.

#### TEST RESULTS:

Test Mode: 11Mbps for IEEE 802.11b TX

rese node illiaps for fille ouz. II.								
Test Frequency (MHz)	6dB Bandwidth(MHz)	Limit	Conclusion					
CH1:2412MHz	13.05	>500	PASS					
CH7:2442MHz	13.40	>500	PASS					
CH11:2462MHz	13.27	>500	PASS					

Test Mode: 54Mbps for IEEE 802.11g TX

	2		
Test Frequency (MHz)	6dB Bandwidth(MHz)	Limit	Conclusion
CH1:2412MHz	14.24	>500	PASS
CH7:2442MHz	14.22	>500	PASS
CH11:2462MHz	14.24	>500	PASS

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FCC ID: XB5-UMS5001-1

NAME OF TEST: Output Power Test

**RULES PART NUMBER:** 15.247(b)(3)

**REQUIREMENTS:** The transmitter output was connected to a power meter via a Attenuator, use

the power meter to read out the peak output power, the peak output power shall be not exceed  $30\mbox{dBmw}$  .

# TEST RESULTS:

Test mode: 11Mbps for IEEE 802.11b TX

Test Frequency	Read(PK)	Cable loss	Atten loss	Result	Limit	Conclusion
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	
CH1:2412MHz	-1.89	0.6	20	18.71	30	PASS
CH7:2442MHz	-1.87	0.6	20	18.73	30	PASS
CH11:2462MHz	-2.65	0.6	20	17.95	30	PASS

Test mode: 54Mbps for IEEE 802.11g TX

Tebe mode: 5 mops for fille 002:119 fx								
Test Frequency	Read(PK)	Cable loss	Atten loss	Result	Limit	Conclusion		
(MHz)	(dBm)	(dB)	(dB)	(dBm)	(dBm)			
CH1:2412MHz	-4.36	0.6	20	16.24	30	PASS		
CH7:2442MHz	-4.28	0.6	20	16.32	30	PASS		
CH11:2462MHz	-4.35	0.6	20	16.25	30	PASS		
CHII: 240ZMHZ	-4.33	0.0	۷ کا	10.25	30	PADD		

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FCC ID: XB5-UMS5001-1

NAME OF TEST: Band Edge Compliance Test

**RULES PART NUMBER:** 15.205(b), 15.247(d)

**REQUIREMENTS:** 

APPLICANT: Shenzhen Allwins Technology Corporation FCC ID: XB5-UMS5001-1

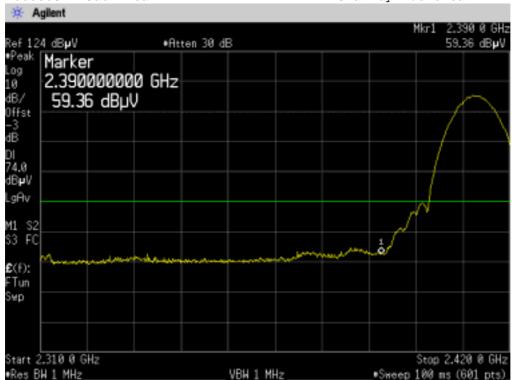


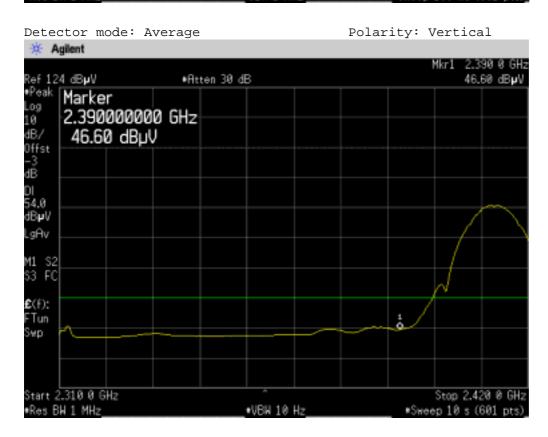
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Test mode: 11Mbps for IEEE 802.11b TX (Low Channel)

Detector mode: Peak Polarity: Vertical





APPLICANT: Shenzhen Allwins Technology Corporation

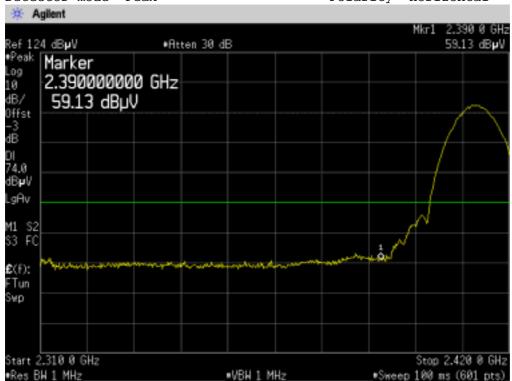


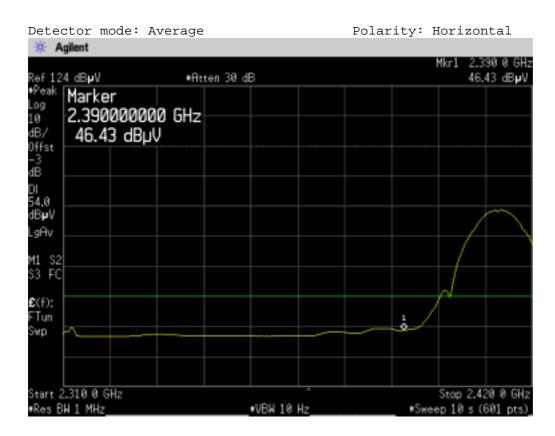
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Test mode: 11Mbps for IEEE 802.11b TX (Low Channel)

Detector mode: Peak Polarity: Horizontal





APPLICANT: Shenzhen Allwins Technology Corporation

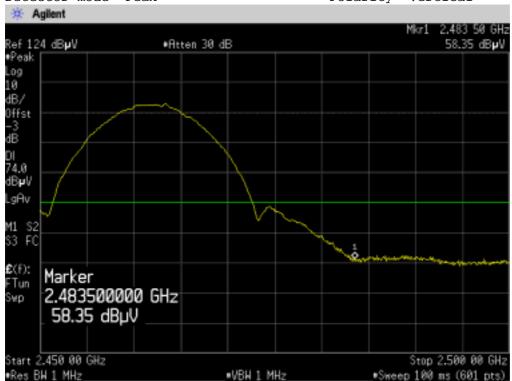


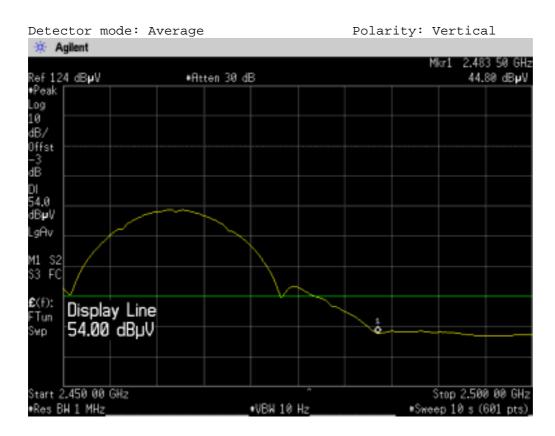
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Test mode: 11Mbps for IEEE 802.11b TX (High Channel)

Detector mode: Peak Polarity: Vertical





APPLICANT: Shenzhen Allwins Technology Corporation

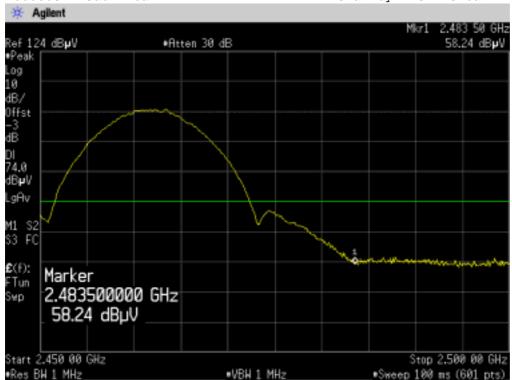


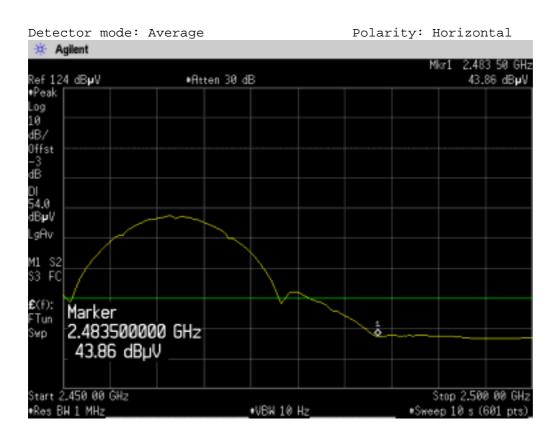
Tel:(86) 755-26825180 Fax:(86) 755-86170310

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Test mode: 11Mbps for IEEE 802.11b TX (High Channel)

Detector mode: Peak Polarity: Horizontal





APPLICANT: Shenzhen Allwins Technology Corporation



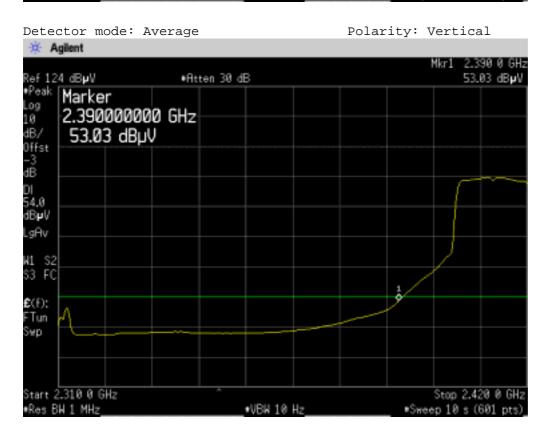
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Test mode: 54Mbps for IEEE 802.11g TX (Low Channel)

Detector mode: Peak Polarity: Vertical





APPLICANT: Shenzhen Allwins Technology Corporation

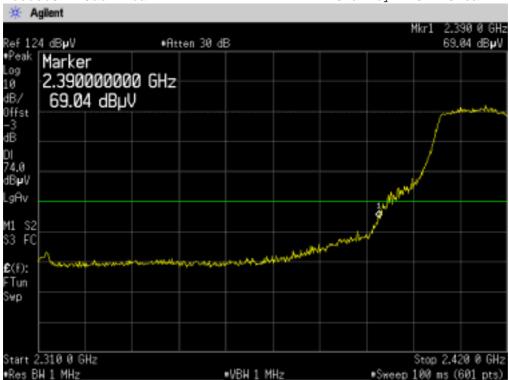


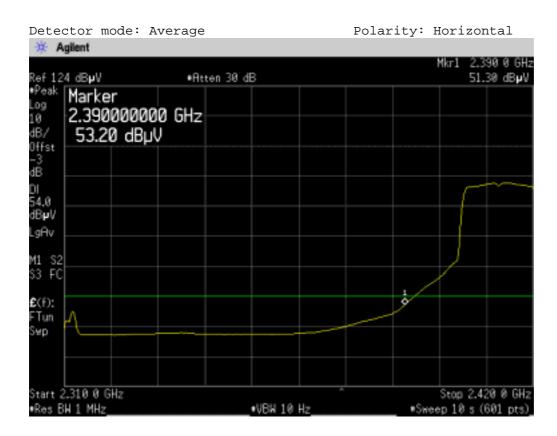
Tel:(86) 755-26825180 Fax:(86) 755-86170310

Http://www.szmost.com Email: szmost@szmost.com

Test mode: 54Mbps for IEEE 802.11g TX (Low Channel)

Detector mode: Peak Polarity: Horizontal





APPLICANT: Shenzhen Allwins Technology Corporation

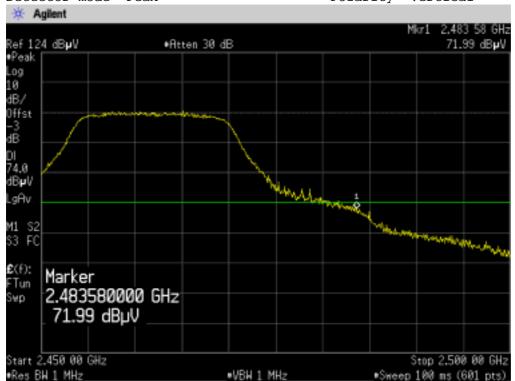


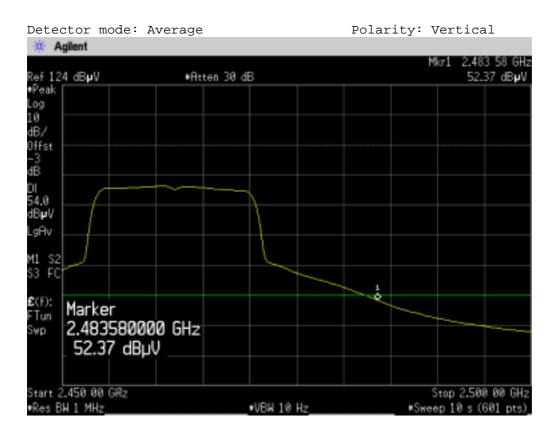
Tel:(86) 755-26825180 Fax:(86) 755-86170310

Http://www.szmost.com Email: szmost@szmost.com

Test mode: 54Mbps for IEEE 802.11g TX (High Channel)

Detector mode: Peak Polarity: Vertical





APPLICANT: Shenzhen Allwins Technology Corporation

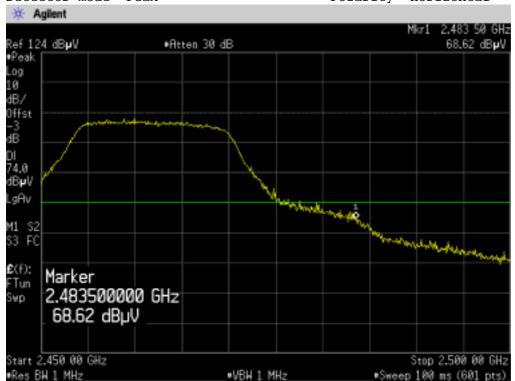


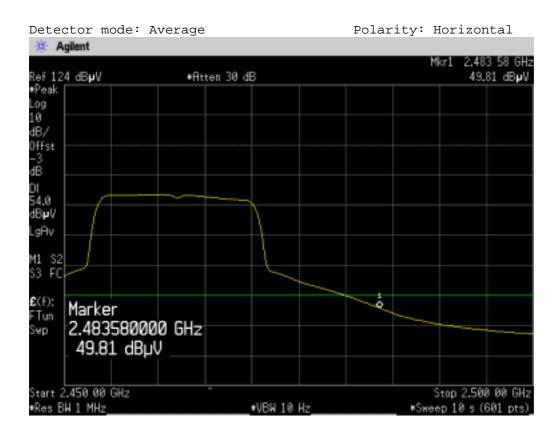
Tel:(86) 755-26825180 Fax:(86) 755-86170310

Http://www.szmost.com Email: szmost@szmost.com

Test mode: 54Mbps for IEEE 802.11g TX (High Channel)

Detector mode: Peak Polarity: Horizontal





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**APPLICANT:** Shenzhen Allwins Technology Corporation

FCC ID: XB5-UMS5001-1

NAME OF TEST: Power Spectral Density Test

RULES PART NUMBER: 15.247(e)

REQUIREMENTS: The transmitter output was connected to a spectrum analyzer via a

Attenuator. The power density was measured by spectrum analyzer with 3 KHz RBW and 30 KHz VBW, sweep time=span/3KHz, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3KHz band during any time interval of continuous

transmission.

#### TEST RESULTS:

Test mode: 11Mbps for IEEE 802.11b TX

		<u>L</u>				
Test Frequency (MHz)	Read(PK) (dBm/3KHz)	Cable loss (dB)	Atten loss (dB)	Result (dBm/3KHz)	Limit (dBm/3KHz)	Conclusion
CH1:2412MHz	-23.07	0.6	20	-2.47	8	PASS
CH7:2442MHz	-22.43	0.6	20	-1.83	8	PASS
CH11:2462MHz	-23.08	0.6	20	-2.48	8	PASS

Test mode: 54Mbps for IEEE 802.11g TX

Test	Read(PK)	Cable loss	Atten loss	Result	Limit	Conclusion
Frequency	(dBm/3KHz)	(dB)	(dB)	(dBm/3KHz)	(dBm/3KHz)	
(MHz)						
CH1:2412MHz	-25.33	0.6	20	-4.73	8	PASS
CH7:2442MHz	-24.83	0.6	20	-4.23	8	PASS
CH11:2462MHz	-25.25	0.6	20	-4.65	8	PASS

APPLICANT: Shenzhen Allwins Technology Corporation