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MEASUREMENT REPORT of WIFI MODULE

Applicant: PEGATRON CORPORATION

EUT : WIFI MODULE

Model No. : UPWL6025

FCC ID : VUIUPWL6025A

Tested by:

Training Research Co., Ltd.

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CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (2003) as a reference. All test were conducted by *Training Research Co., Ltd.*, 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart C Section 15.247.

Applicant: PEGATRON CORPORATION

Applicant Address: 5F, NO. 76, LIGONG ST., BEITOU DISTRICT,

TAIPEI CITY, Taiwan

FCC ID : VUIUPWL6025A

Report No. : P5515100156

Test Date : August 20, 2010

Prepared by:

Jack Tsai

Approved by:

Frank Tsai

Conditions of issue:

(1) This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.

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I. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of applicant in support that the certification in accordance with Part 2 Subpart J and Part 15 Subpart A, B and C of the Commission's Rules and Regulations.

1.2 Description of EUT

FCC ID : VUIUPWL6025A

Product Name : WIFI MODULE

Model Name : UPWL6025

Frequency Range : IEEE 802.11b/g/n Draft 1.0 20M: 2.412GHz ~ 2.462GHz

IEEE 802.11n Draft 1.0 40M: 2.422GHz ~ 2.452GHz

Channel Spacing: 5MHz

Support Channel: IEEE 802.11b/g/n Draft 1.0 20M: 11 Channels

IEEE 802.11n Draft 1.0 40M: 7 Channels

Modulation Skill : DBPSK, DQPSK, CCK, OFDM

Power Type : Powered by PCI Express interface of client's device

1.3 Test method

- 1.3.1 Insert the EUT into the PCI Express interface of extend card of the test fixture.
- 1.3.2 Using the computer and software provided by the manufacturer to control EUT. The software is operated under the Windows to control the EUT in the mode of continuous transmission; the test is performed under the specific conditions.
- 1.3.3 Set different data rate and channel (IEEE 802.11b/g/n Draft 1.0 20M: CH01/CH06/CH11, IEEE 802.11n Draft 1.0 40M: CH03/CH06/CH09) being tested and repeat the procedures above.
 - (a) Conducted test and Radiated test: making EUT to the continuously (TX) mode.

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1.4 Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

Notebook : DELL

Model No. : JX285 (PP26L)
Serial No. : 410362204
FCC ID : Doc Approved

BSMI : R33002

Power Adaptor : DELL

Model No. : LA65NS1-00 Part No. : PA-1650-05D3

Serial No. : CN-0YD637-716145-82T-0B8F

FCC ID : Doc Approved

BSMI : R33275

Power type : $100 \sim 240 \text{VAC} / 50 - 60 \text{Hz}$, 1.5A, Switching

Power cord (Main power to adaptor): Non-shielded, 0.90m length, Plastic hood, No ferrite core

Power cord (DC plug to adaptor): Shielded, 1.83m length, Plastic hood, ferrite core

Test fixture

(PCI Express Extend Card): PEGATRON CORPORATION

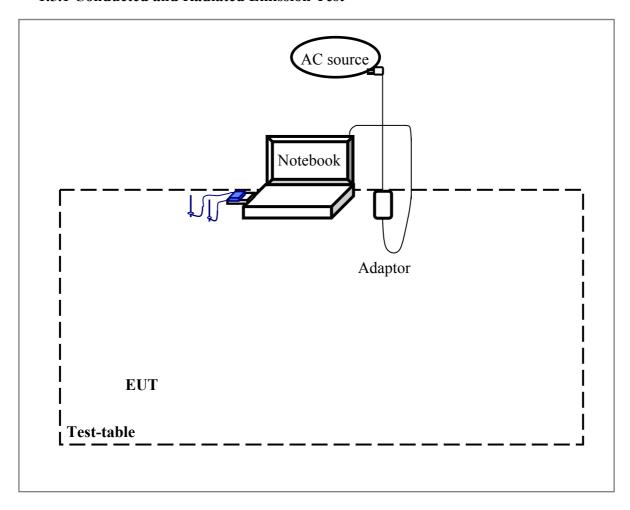
Model No. : ADC-PEMCCC01

Serial No. : N/A
Power type : By NB

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1.5 Configuration of System Under Test

1.5.1 Conducted and Radiated Emission Test



Notebook PC:

*Mini-PCI Port EUT

The tests below are carried with the EUT transmitter set at high power in TDD mode. The EUT is forced to select of output power level and channel number by USB port.

The setting up procedure was recorded in 1.3 test method.

1.6 Verify the Frequency and Channel

Channel	Frequency (GHz)
1	2.412
2	2.417
3	2.422
4	2.427
5	2.432
6	2.437
7	2.442
8	2.447
9	2.452
10	2.457
11	2.462

Note:

- 1. This is for confirming that all frequencies of IEEE 802.11b/g/n Draft 1.0 20M are in 2.412GHz to 2.462GHz. and all frequencies of IEEE 802.11n Draft 1.0 40M are in 2.422GHz to 2.452GHz.
- Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz (The locations of these frequencies one near the top, one near the middle and one near the bottom.)
- 3. After test, the EUT operating frequencies are in 2.412GHz to 2.462GHz and 2.422GHz to 2.452GHz. So all the items as followed in testing report are need to test these three frequencies: IEEE 802.11b/g/n Draft 1.0 20M: CH01/CH06/CH11, IEEE 802.11n Draft 1.0 40M: CH03/CH06/CH09

1.7 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (2003) and the pre-setup was written on 1.3 test method, the detail setup was written on each test item.

1.8 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter**, **Semi-anechoic Chamber (FCC Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a semi-anechoic chamber also located at Training Research Co., Ltd.

No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.9 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

In test, they were set in high power and continuously transmitting mode that controlled by computer. The ch01, ch06 and ch11 of EUT were all tested. The setting up procedure is recorded on 1.3 test method.

II. Section 15.203: Antenna requirement

The EUT can be equipped with detachable antenna. The external antenna is affixed to the EUT using a unique connector. The antenna requirement stated in Section15.203 is inapplicable to this EUT.

The antenna specification of list as follows,

Antenna No.	Antenna Manufacturer	Model	Connector	Antenna Type	Antenna Gain (Max.)
Antenna#1	WHA YU INDUSTRIAL CO., LTD	C1336S510053-A	MHF	PCB	2.00dBi
Antenna#2	WHA YU INDUSTRIAL CO., LTD	C1336S510032-A	MHF	PCB	3.97dBi

Note:

1) For more detailed features description, please reference to the Antenna Specifications. (Please reference to RF Exposure Information)

III. Section 15.207: Power Line Conducted Emissions for AC Powered Units

3.1 Test Condition & Setup

The power line conducted emission measurements were performed in an semi-anechoic chamber. The EUT was assembled on a wooden table, which is 80 centimeters high, was placed 40 centimeters from the backwall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer (or EMI receiver) was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak and average detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.3

There is a test condition apply in this test item, the test procedure description as <1.3>. Three channels were tested, one in the top, one in the middle and the other in bottom.

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3.2 List of Test Instruments

Calibration Date

				Calibration Date
Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	03/12/11
RF Filter Section	85460A	HP	3448A00217	03/12/11
LISN	3816/2	EMCO	00042976	01/26/11
(EUT)				
LISN	3816/2	EMCO	00042989	01/15/11
(Support E.)				
Pre-amplifier	15542 ZFL-500	Mini –	0 0117	10/10/10
		Circuits		
6dB	MCL BW-S6W2	Mini –	9915 –	10/10/10
Attenuator		Circuits	Conducted	
10dB	A5542 VAT010	Mini –	0215 –	10/10/10
Attenuator		Circuits	Conducted	
Coaxial Cable	A30A30-0058-50FS-2M	Jyebao	SMA-08	10/10/10
(2.0 meter)				
Coaxial Cable	A30A30-0058-50FS-1M	Jyebao	SMA-09	10/10/10
(1.1 meter)				
Coaxial Cable	RG-214/U	Jyebao	NP-01	10/10/10
(20 meter)				
Coaxial Cable	RG-214/U	Jyebao	NP-02	10/10/10
(20 meter)				
Auto Switch Box	ASB-01	TRC	9904-01	10/10/10
(< 30MHz)				

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3.3 Test Result of Power Line Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions on the LIVE and NETURAL conductors of the EUT power cord. Show as follows.

Test Conditions: Temperature: 25 °C Humidity: 73 % RH

Test mode: IEEE 802.11b Channel 1

Po	ver Conne	ected 1	Emissions	S		Class B	
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	783.025	44.29	40.77	32.10	56.00	46.00	-13.90
	841.495	40.20	37.27	31.70	56.00	46.00	-14.30
	3356.885	48.42	42.67	25.50	56.00	46.00	-13.33
Line 1	3582.150	49.10	45.62	29.06	56.00	46.00	-10.38
	3807.275	52.73	48.38	31.88	56.00	46.00	-7.62
	4089.870	47.70	42.47	26.39	56.00	46.00	-13.53
	226.000	47.94			63.83	53.83	-5.89
	781.000	41.69			56.00	46.00	-4.31
	841.000	41.76			56.00	46.00	-4.24
Line 2	902.000	39.66			56.00	46.00	-6.34
	3349.000	41.69			56.00	46.00	-4.31
	3638.660	45.90	42.23	28.33	56.00	46.00	-13.77

NOTE:

⁽¹⁾Margin = Peak Amplitude – Limit, *The reading amplitudes are all under limit.*

⁽²⁾A "+" sign in the margin column means the emission is OVER the Class B Limit and "-" sign of means UNDER the Class B limit

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Test mode: IEEE 802.11b Channel 6

Po	ver Conne	ected 1	Emissions	S		Class B	
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	166.000	50.21			65.54	55.54	-5.33
	504.000	39.76			56.00	46.00	-6.24
	781.000	42.35			56.00	46.00	-3.65
Line 1	841.000	42.25			56.00	46.00	-3.75
	3524.625	50.99	46.82	28.58	56.00	46.00	-9.18
	3859.715	52.70	49.70	32.59	56.00	46.00	-6.30
	499.000	40.74			56.03	46.03	-5.29
	784.510	46.59	43.43	38.47	56.00	46.00	-7.53
	846.310	45.38	42.23	38.55	56.00	46.00	-7.45
Line 2	902.000	41.14			56.00	46.00	-4.86
	3670.000	42.40			56.00	46.00	-3.60
	3915.545	49.90	47.48	32.29	56.00	46.00	-8.52

Test mode: IEEE 802.11b Channel 11

Por	ver Conne	ected	Emissions	S	Class B			
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin	
	(KHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)	
	725.415	38.45	36.42	29.65	56.00	46.00	-16.35	
	782.190	47.40	44.33	40.03	56.00	46.00	-5.97	
	847.435	46.68	43.74	40.56	56.00	46.00	-5.44	
Line 1	909.785	44.07	41.61	37.09	56.00	46.00	-8.91	
	3464.215	49.90	45.35	28.28	56.00	46.00	-10.65	
	3799.720	52.08	49.10	32.20	56.00	46.00	-6.90	
	846.430	49.43	45.98	41.49	56.00	46.00	-4.51	
	908.625	47.41	45.12	42.30	56.00	46.00	-3.70	
	1113.165	45.97	43.33	38.76	56.00	46.00	-7.24	
Line 2	3445.000	41.83			56.00	46.00	-4.17	
	3742.700	48.48	45.10	30.80	56.00	46.00	-10.90	
	4024.210	48.55	45.77	30.93	56.00	46.00	-10.23	

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Test mode: IEEE 802.11g Channel 1

Por	ver Conne	ected	Emissions	S		Class B	
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)
	163.035	78.02	42.75	33.24	65.51	55.51	-22.27
	781.000	40.14			56.00	46.00	-5.86
	902.000	42.40			56.00	46.00	-3.60
Line 1	3221.000	39.56			56.00	46.00	-6.44
	3434.750	49.00	43.28	25.79	56.00	46.00	-12.72
	3499.670	51.62	46.15	27.21	56.00	46.00	-9.85
	172.000	52.30			65.37	55.37	-3.07
	622.000	36.19			56.00	46.00	-9.81
	774.000	42.12			56.00	46.00	-3.88
Line 2	844.330	45.70	42.21	43.69	56.00	46.00	-2.31
	902.000	42.64			56.00	46.00	-3.36
	3742.915	46.48	37.26	19.66	56.00	46.00	-18.74

Test mode: IEEE 802.11g Channel 6

Pov	ver Conne	ected	Emissions	S		Class B	
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)
	169.000	50.35			65.46	55.46	-5.11
	391.000	41.20			59.11	49.11	-7.91
	781.000	41.87			56.00	46.00	-4.13
Line 1	841.000	42.32			56.00	46.00	-3.68
	902.000	39.53			56.00	46.00	-6.47
	3922.900	52.31	49.54	32.78	56.00	46.00	-6.46
	169.000	52.33			65.46	55.46	-3.13
	226.000	46.94			63.83	53.83	-6.89
	783.340	47.26	44.62	40.71	56.00	46.00	-5.29
Line 2	841.000	42.84			56.00	46.00	-3.16
	3285.000	39.55			56.00	46.00	-6.45
	3809.090	47.84	45.24	31.31	56.00	46.00	-10.76

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Test mode: IEEE 802.11g Channel 11

Pov	Power Connected Emissions					C Class	В
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	782.595	43.16	40.40	35.07	56.00	46.00	-10.93
	843.250	41.36	37.50	31.80	56.00	46.00	-14.20
	896.510	39.18	36.33	30.95	56.00	46.00	-15.05
Line 1	3525.950	51.18	45.04	27.88	56.00	46.00	-10.96
	3862.595	52.18	48.99	31.70	56.00	46.00	-7.01
	4088.545	47.35	45.26	28.37	56.00	46.00	-10.74
	499.000	39.63			56.03	46.03	-6.40
	782.665	50.60	43.71	39.01	56.00	46.00	-6.99
	842.575	45.93	40.21	35.19	56.00	46.00	-10.81
Line 2	907.355	44.59	40.43	34.91	56.00	46.00	-11.09
	1333.000	39.26			56.00	46.00	-6.74
	3863.000	48.81	44.45	29.78	56.00	46.00	-11.55

Test mode: IEEE 802.11n 20M Channel 1

Po	ver Conne	ected 1	Emissions	S		Class B	
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)
	783.295	48.95	45.73	41.26	56.00	46.00	-4.74
	847.525	47.33	44.59	41.24	56.00	46.00	-4.76
	908.525	44.89	43.36	39.18	56.00	46.00	-6.82
Line 1	3350.260	48.42	42.04	26.09	56.00	46.00	-13.96
	3686.310	51.47	48.34	31.53	56.00	46.00	-7.66
	3789.340	51.20	45.26	25.10	56.00	46.00	-10.74
	504.000	40.57			56.00	46.00	-5.43
	784.920	49.11	46.41	44.02	56.00	46.00	-1.98
	848.350	46.93	44.29	38.19	56.00	46.00	-7.81
Line 2	894.065	46.44	44.00	39.24	56.00	46.00	-6.76
	3682.000	46.52	42.67	28.57	56.00	46.00	-13.33
	4014.000	41.64			56.00	46.00	-4.36

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Test mode: IEEE 802.11n 20M Channel 6

Power Connected Emissions				Class B			
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	783.340	43.11	40.67	36.00	56.00	46.00	-10.00
	832.000	41.25			56.00	46.00	-4.75
	893.000	42.05			56.00	46.00	-3.95
Line 1	3406.135	48.67	44.08	27.74	56.00	46.00	-11.92
	3628.685	51.65	47.54	29.33	56.00	46.00	-8.46
	3796.720	51.05	48.07	31.88	56.00	46.00	-7.93
	166.000	50.44			65.54	55.54	-5.10
	785.005	47.48	45.12	41.78	56.00	46.00	-4.22
	843.610	49.64	39.62	33.92	56.00	46.00	-12.08
Line 2	893.000	42.55			56.00	46.00	-3.45
	3510.000	42.02			56.00	46.00	-3.98
	3968.375	46.83	44.22	29.58	56.00	46.00	-11.78

Test mode: IEEE 802.11n 20M Channel 11

Power Connected Emissions					Class B		
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dB)
	391.000	43.58			59.11	49.11	-5.53
	786.805	46.12	43.19	40.77	56.00	46.00	-5.23
	849.865	48.76	46.32	40.11	56.00	46.00	-5.89
Line 1	904.115	45.14	34.36	25.74	56.00	46.00	-20.26
	3573.405	48.47	41.86	23.26	56.00	46.00	-14.14
	3916.245	50.56	48.58	31.11	56.00	46.00	-7.42
	499.000	41.41			56.06	46.06	-4.65
	786.715	47.76	43.90	41.03	56.00	46.00	-4.97
	852.610	49.12	47.45	41.60	56.00	46.00	-4.40
Line 2	904.025	45.90	37.33	29.57	56.00	46.00	-16.43
	3746.645	45.92	42.59	29.72	56.00	46.00	-13.41
	4014.000	41.37			56.00	46.00	-4.63

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Test mode: IEEE 802.11n 40M Channel 3

Power Connected Emissions				Class B			
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	167.000	51.66			65.51	55.51	-3.85
	2133.680	44.09	42.01	36.70	56.00	46.00	-9.30
	3368.090	47.89	42.62	28.37	56.00	46.00	-13.38
Line 1	3590.470	51.51	46.58	31.55	56.00	46.00	-9.42
	3872.695	52.43	49.99	34.33	56.00	46.00	-6.01
	4100.705	48.20	43.64	27.57	56.00	46.00	-12.36
	1971.960	42.59	35.09	25.38	56.00	46.00	-20.62
	2071.335	43.65	40.33	31.47	56.00	46.00	-14.53
	2243.000	42.84			56.00	46.00	-3.16
Line 2	3365.285	49.98	44.81	27.76	56.00	46.00	-11.19
	3701.930	53.18	49.98	32.85	56.00	46.00	-6.02
	3984.275	53.99	51.18	34.72	56.00	46.00	-4.82

Test mode: IEEE 802.11n 40M Channel 6

Por	Power Connected Emissions				Class B		
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	169.000	52.09			65.46	55.46	-3.37
	1841.670	42.94	33.87	23.95	56.00	46.00	-22.05
	2075.655	43.38	40.72	34.88	56.00	46.00	-11.12
Line 1	3594.095	49.84	44.83	29.11	56.00	46.00	-11.17
	3817.910	51.58	48.59	32.84	56.00	46.00	-7.41
	3983.990	50.76	47.05	31.83	56.00	46.00	-8.95
	167.000	51.60			65.51	55.51	-3.91
	1566.000	41.20			56.00	46.00	-4.80
	1731.000	41.70			56.00	46.00	-4.30
Line 2	3536.545	50.85	45.51	29.83	56.00	46.00	-10.49
	3703.070	52.12	48.05	31.00	56.00	46.00	-7.95
	4091.135	47.90	41.57	24.69	56.00	46.00	-14.43

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Test mode: IEEE 802.11n 40M Channel 9

Po	Power Connected Emissions				FC	C Class	В
Conductor	Frequency	Peak	QP	Average	QP-limit	AVG-limit	Margin
	(KHz)	(dBµV)	(dBµV)	(dBµV)	$(dB\mu V)$	(dBµV)	(dB)
	167.000	50.34			65.51	55.51	-5.17
	1731.000	41.71			56.00	46.00	-4.29
	1906.000	41.16			56.00	46.00	-4.84
Line 1	2072.000	41.24			56.00	46.00	-4.76
	3482.035	49.03	41.87	26.56	56.00	46.00	-14.13
	3814.260	51.10	49.04	34.19	56.00	46.00	-6.96
	1854.000	42.56			56.00	46.00	-3.44
	3027.790	42.90	36.80	24.07	56.00	46.00	-19.20
	3252.965	47.96	41.54	25.79	56.00	46.00	-14.46
Line 2	3591.455	51.01	46.60	30.52	56.00	46.00	-9.40
	3704.290	52.19	48.46	32.69	56.00	46.00	-7.54
	3926.875	53.11	50.30	33.94	56.00	46.00	-5.70

IV. Section 15.247 (a): Technical description of the EUT

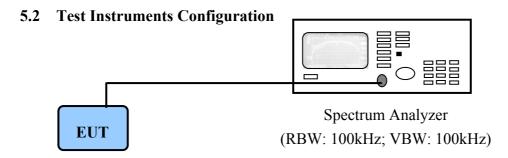
Direct Sequence System is a spread spectrum system in which the carrier has been modulated by a high speed spreading code and an information data stream. The high speed code sequence dominates the "modulating function" and is the direct cause of the wide spreading of the transmitted signal. In the operational description demonstrates the operation principles of the Baseband processor employed by the EUT, shows that which is a complete DSSS baseband processor and meets the definition of the direct sequence spread spectrum system.

Test Report ------ 21/81

V. Section 15.247(a)(2): Bandwidth for Direct Sequence System.

5.1 Test Condition & Setup

The transmitter bandwidth measurements were performed by the contact manner. The EUT was set to transmit continuously, also various channels were investigated to find the maximum occupied bandwidth. The output of the EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency is observed by the spectrum analyzer with 100kHz RBW and 100kHz VBW.



PC to control the EUT at maximal power output and channel number and set antenna kit

5.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	10/20/10

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5.4 Test Result of Bandwidth

IEEE 802.11b

TEEE 002:110		
Channel	Limited (kHz)	Antenna(MHz)
CH01	≧ 500	10.04
CH06	≥ 500	10.04
CH11	≧ 500	10.08

IEEE 802.11g

<u> </u>		
CH01	≥ 500	16.68
CH06	≥ 500	16.72
CH11	≥ 500	16.64

IEEE 802 11n 20M

TEEE 002.1111 20141			
Channel	Limit (kHz)	Antenna#1(MHz)	Antwnna#2(MHz)
CH01	≥ 500	17.80	17.76
CH06	≧ 500	17.84	17.76
CH11	≧ 500	17.84	17.84

IEEE 802.11n 40M

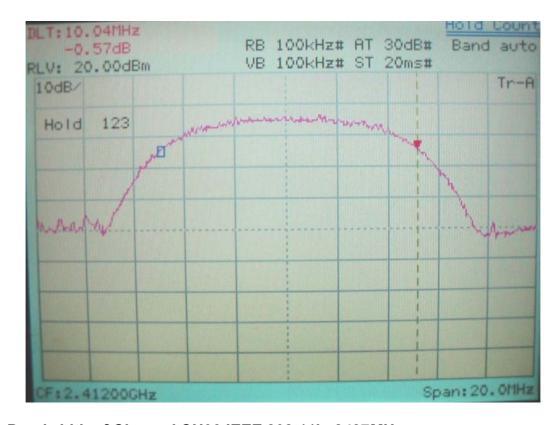
CH03	≧ 500	36.80	36.80
CH06	≧ 500	36.80	36.60
CH09	≧ 500	36.80	36.80

Note: 1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy. According to the guidance, we'd made the measurement with the spectrum analyzer's resolution bandwidth (RBW)=100kHz and set the span>>RBW. The results show the measured 6dB bandwidth comply with the minimum 500kHz requirement.

2. The attachments show these on the following pages.

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6dB Bandwidth of Channel CH01 IEEE 802.11b, 2412MHz



6dB Bandwidth of Channel CH06 IEEE 802.11b, 2437MHz

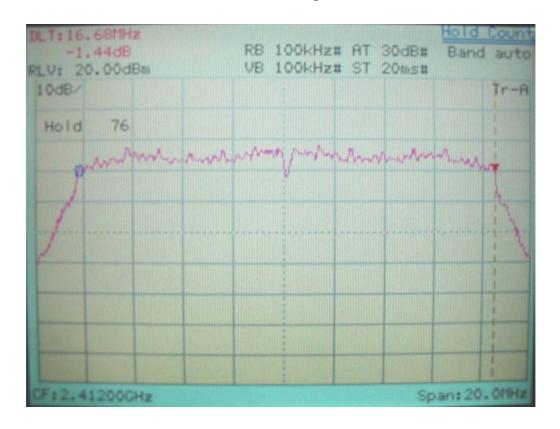


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6dB Bandwidth of Channel CH11 IEEE 802.11b, 2462MHz

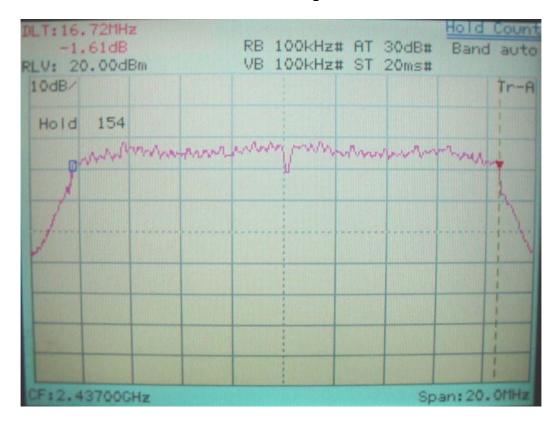


6dB Bandwidth of Channel CH01 IEEE 802.11g, 2412MHz

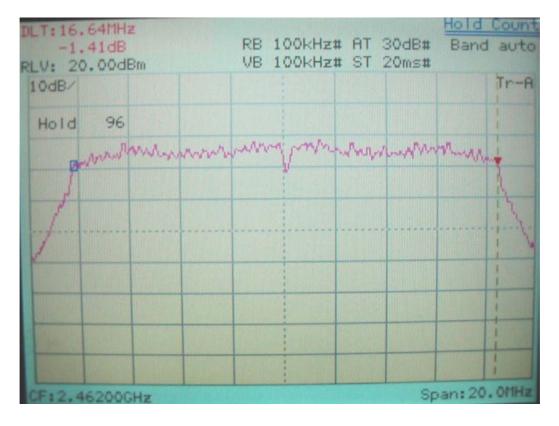


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6dB Bandwidth of Channel CH06 IEEE 802.11g, 2437MHz

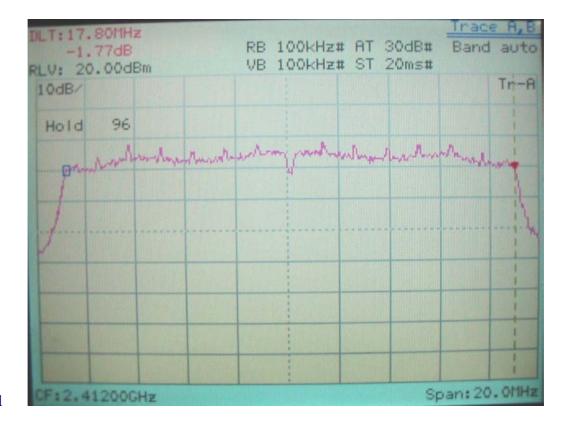


6dB Bandwidth of Channel CH11 IEEE 802.11g, 2462MHz

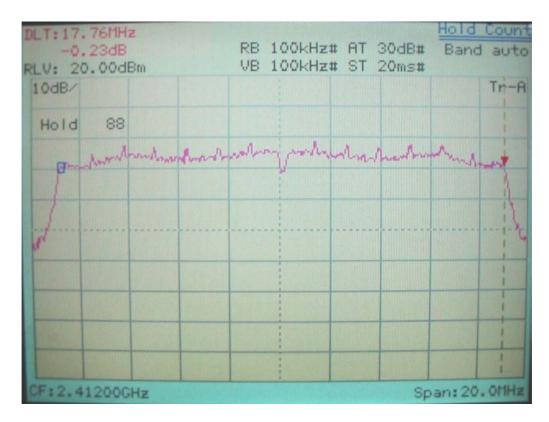


Report No.: P5515100156, FCC Part 15.247

6dB Bandwidth of Channel 01 IEEE 802.11n 20M, 2412MHz

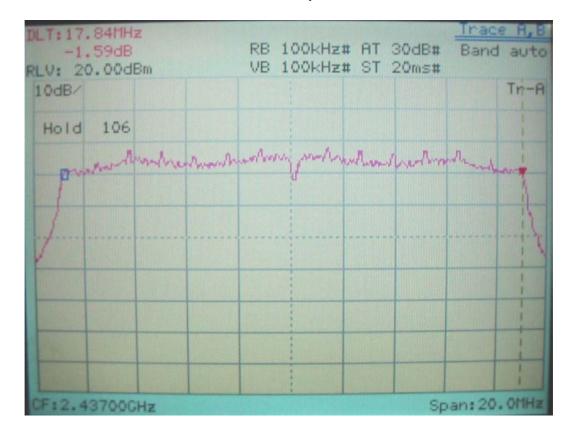


Ant#1

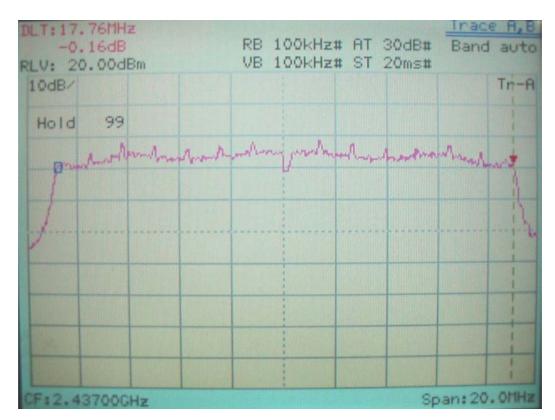


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6dB Bandwidth of Channel 06 IEEE 802.11n 20M, 2437MHz



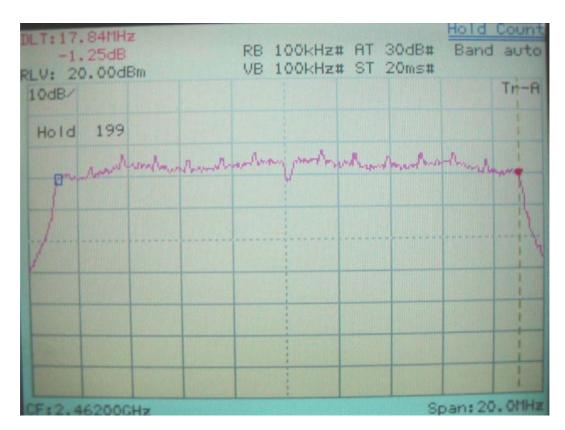
Ant#1



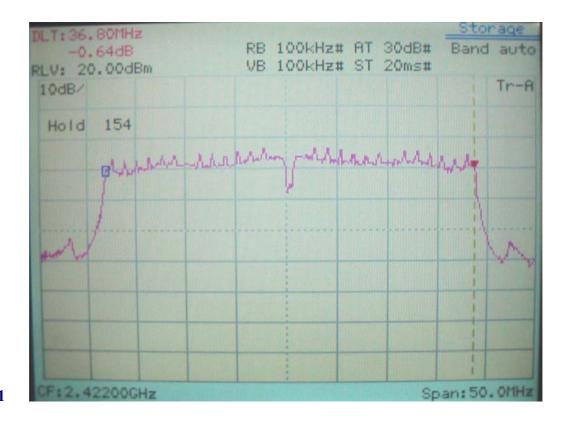
6dB Bandwidth of Channel 11 IEEE 802.11n 20M, 2462MHz



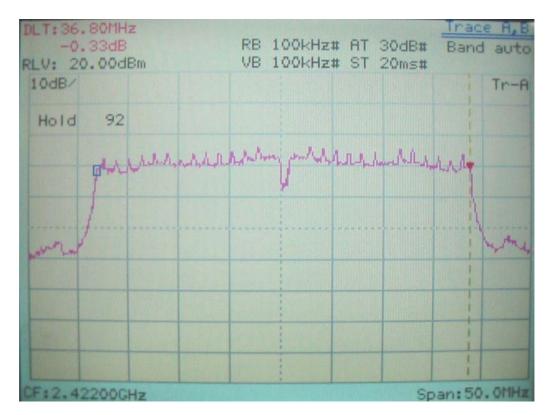
Ant#1



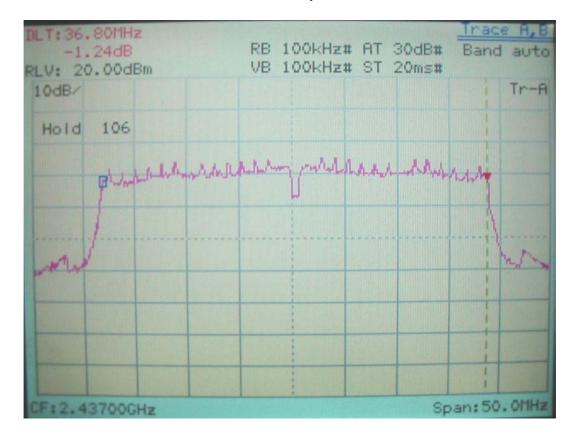
6dB Bandwidth of Channel 03 IEEE 802.11n 40M, 2422MHz



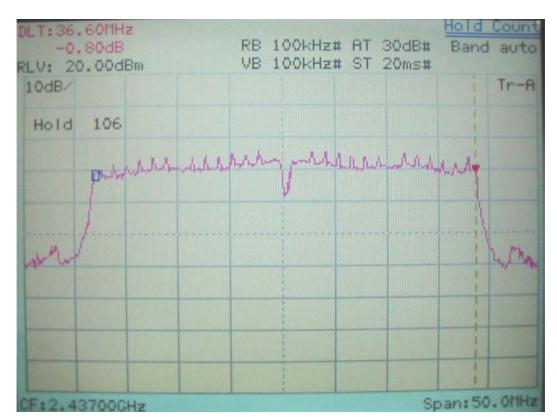
Ant#1



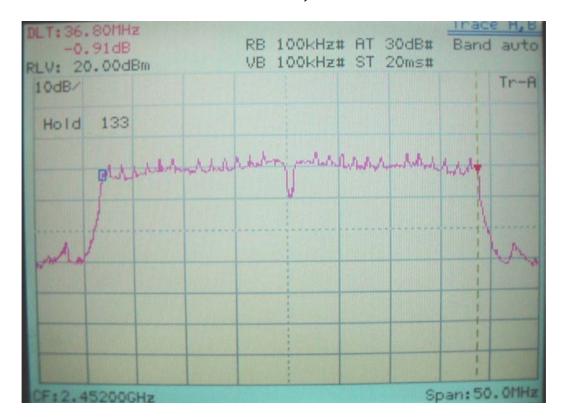
6dB Bandwidth of Channel 06 IEEE 802.11n 40M, 2437MHz



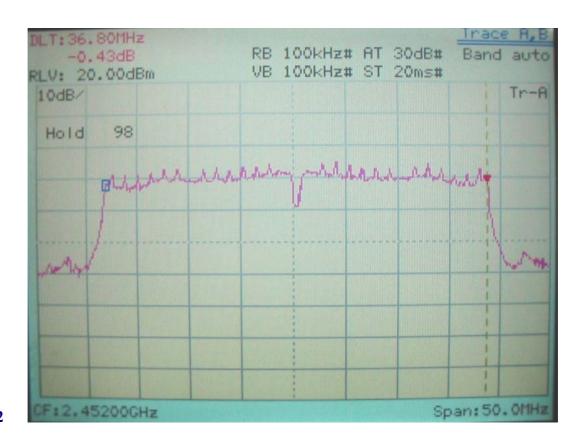
Ant#1



6dB Bandwidth of Channel 09 IEEE 802.11n 40M, 2452MHz



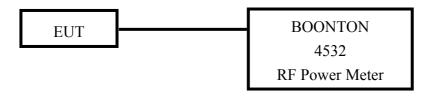
Ant#1



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VI. Section 15.247(b): Power Output

6.1 Test Condition & Setup



- 1. The output of the transmitter is connected to the BOONTON RF Power Meter.
- 2. The calibration is performed before every test. The values of the output power of the EUT will shown in the dBm directly are the transmitter output peak power. Recording as follows.

6.2 List of Test Instruments

Instrument Name	Model	Brand	Serial No.	Next time
RF Power Meter	4532	BOONTON	117501	03/11/10
Peak Power Sensor	57340	BOONTON	2696	03/11/10

6.3 Test Result

Formula:

RF Output of EUT + |Cable Loss| = Output Peak Power

Channel (MHz)	Output Level	Cable Loss	Limit	Output	Peak Power
	dBm	dBm	(DSS)	dBm	mW
IEEE 802.11b					
CH 01 /2412	17.60	7.00	30dBm	24.60	288.40
СН 06 /2437	17.51	7.00	30dBm	24.51	282.49
CH 11 /2462	17.30	7.00	30dBm	24.30	269.15
IEEE 802.11g	T	1		T	
CH 01 /2412	17.85	7.00	30dBm	24.85	305.49
СН 06 /2437	18.06	7.00	30dBm	25.06	320.63
СН 11 /2462	17.89	7.00	30dBm	24.89	308.32

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Formula:

Total Power = $10 \log (10^{\circ} (Ant#1 Power / 10) + 10^{\circ} (Ant#2 Power / 10))$

Channel	Output Level		Cable	Limit	Total Output Peak			
(MHz)	Ant#1	Ant#2	Loss		Power			
	dBm	dBm	dB	(DSS)	dBm	mW		
802.11n 20M								
CH Lowest/2412	18.07	17.72	7.00	30dBm	27.91	617.85		
CH Middle/2437	17.82	17.66	7.00	30dBm	27.75	595.80		
CH Highest/2462	17.43	16.98	7.00	30dBm	27.22	527.37		
802.11n 40M								
CH Lowest /2422	16.70	16.62	7.00	30dBm	26.67	464.57		
CH Middle/2437	16.64	16.59	7.00	30dBm	26.63	459.77		
CH Highest/2452	16.59	16.52	7.00	30dBm	26.57	453.47		

VII. Section 15.247 (C): Spurious Emissions (Radiated)

7.1 Test Condition & Setup

We'd performed the test by the *radiated emission* skill: The EUT was placed in an semi-anechoic chamber, and set the EUT transmitting continuously and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emissions was noted so it could be reproduced later during the final tests. For the measurement above 1GHz, according to the guidance we'd set the spectrum analyzer's 6dB bandwidth RBW to 1MHz.

This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, semi-anechoic chamber. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0×1.5 meter.

The spectrum was examined from 30MHz to 1000MHz using an Hewlett Packard 85460A EMI Receiver, SCHWARZECK whole range Small Biconical Antenna (Model No.: UBAA9114 & BBVU9135) is used to measure frequency from 30 MHz to 1GHz. The final test is used the HP 85460A spectrum and 8564E spectrum was examined from 1GHz to 25GHz using an Hewlett Packard Spectrum Analyzer, EMCO/HP Horn Antenna (Model 3115 / 84125-80008) for 1G - 25GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing, HP 85460A for frequency 30MHz to 1000MHz, and 8564E for frequency 1GHz to 25GHz. No post-detector video filters were used in the test. The spectrum analyzer's 6dB bandwidth was set to 120KHz (spectrum was examined from 30 MHz to 1000 MHz), the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1GHz to 25GHz) and the analyzer was operated in the maximum hold mode. There is a test condition applies in this test item, the test procedure description as the following:

Three channels were tested, one in the top, one in the middle and the other in bottom. The setting up procedure is recorded on <1.3>

The radiated emissions data presented represents the worst case of the two antennas supplied with the EUT.

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With the transmitter operating from a AC source and using the internal of EUT, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to upper, middle and bottom channels in the $2400 \sim 2483.5$ MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter ($dB\mu V/m$) is determined by algebraically adding the measured reading in $dB\mu V$, the antenna factor (dB), and cable loss (dB) at the appropriate frequency. Since the EUT was set to transmit continuously, no *duty cycle* is present.

For frequency between 30MHz to 1000MHz

FIa $(dBuV/m) = FIr (dB\mu V) + Correction Factors$

FIa: Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain) + Switching Box Loss

For frequency between 1GHz to 25GHz

FIa $(dB\mu V/m)$ = FIr $(dB\mu V)$ + Correction Factor

FIa: Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain) + Switching Box Loss

Test Report ----- 36/81

7.2 List of Test Instruments

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time	
EMI Receiver	8546A	HP	3520A00242	03/12/11	
RF Filter Section	85460A	HP	3448A00217	03/12/11	
Small Biconical	UBAA9114 &	Schwarzeck	127	01/10/11	
Antenna	BBVU9135				
Pre-amplifier	PA1F	TRC	1FAC	10/10/10	
Coaxial Cable	A30A30-0058-50FS-15M	JYEBAO	SMA-01	10/10/10	
(Double shielded,					
15 meter)					
Coaxial Cable	A30A30-0058-50FS-1M	JYEBAO	SMA-02	10/10/10	
(1.1 meter)					
Spectrum Analyzer	8564E	HP	3720A00840	09/17/10	
Microwave	84125C	HP	US36433002	11/05/10	
Preamplifier					
Horn Antenna	3115	EMCO	9104-3668	11/06/10	
Standard Guide	84125-80008	HP	18-26.5GHz	09/14/10	
Horn Antenna					
Standard Guide	84125-80001	HP	26.5-40GHz	11/12/10	
Horn Antenna					
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	11/13/10	
Pre-amplifier	PA2F	TRC	2F1GZ	10/10/10	
Coaxial Cable	A30A30-0058-50FST118	JYEBAO	MSA-05	10/10/10	
(3 miter)					
Coaxial Cable	A30A30-0058-50FST118	JYEBAO	MSA-04	10/10/10	
(1 meter)					

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7.3 Test Result of Spurious Radiated Emissions

The highest peak values of radiated emissions form the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following.

Test Conditions: Temperature: 25 ° C Humidity: 73 % RH

Test mode: IEEE 802.11b CH01 for 30MHz to 1GHz [Horizontal]

	Radiated Emission				Corrected Amplitude		ss B m)	
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
196.60	45.07	1.00	266	-3.45	41.62	43.50	-1.88	
261.59	38.92	1.00	259	-3.88	35.04	46.00	-10.96	
299.64	43.28	1.00	178	-2.92	40.36	46.00	-5.64	
334.34	38.26	1.00	158	-2.47	35.79	46.00	-10.21	
369.50	44.03	1.00	178	-1.81	42.22	46.00	-3.78	
433.76	35.16	1.00	178	0.45	35.61	46.00	-10.39	

Test mode: IEEE 802.11b CH01 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Class B (3 m)		
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
40.91	27.59	1.00	153	4.98	32.57	40.00	-7.43	
168.22	34.29	1.00	197	-4.10	30.19	43.50	-13.31	
198.54	38.57	1.00	156	-3.36	35.21	43.50	-8.29	
365.86	35.93	1.00	312	-1.89	34.04	46.00	-11.96	
698.09	29.45	1.00	269	9.47	38.92	46.00	-7.08	
895.72	23.74	1.00	241	15.00	38.74	46.00	-7.26	

Note:

- 1. Margin = Amplitude limit, *if margin is minus means under limit*.
- 2. Corrected Amplitude = Reading Amplitude + Correction Factors
- 3. Correction factor = Antenna factor + (Cable Loss Amplitude gain) + Switching Box Loss

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Test mode: IEEE 802.11b CH01 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor			Li	Limit	
			Peak .	/ Ave.		Peak / Ave.		Peak / Ave		
MHz	m	degree	dB	μV	dB/m	dΒμ	V/m	dΒμ	ιV/m	dB
2479.99	1.00	79	48.69	35.83	9.43	58.12	45.26	73.96	53.96	-8.70
2572.32	1.00	68	49.49	39.33	9.63	59.12	48.96	73.96	53.96	-5.00
2639.99	1.00	91	44.86	34.33	9.75	54.61	44.08	73.96	53.96	-9.88
7233.75	1.00	55	38.11		10.07	48.18		73.96	53.96	-5.78
19296.25	1.00	63	46.79	-	1.60	48.39		73.96	53.96	-5.57
21708.12	1.00	182	46.54		2.87	49.41		73.96	53.96	-4.55

Test mode: IEEE 802.11b CH01 for 1GHz to 26.5GHz [Vertical]

_					01 JUI 10112 to					7.5
Frequency	Ant.	Table	Ampl	itude	Correction	Corrected		Limit		Margin
	Н.				Factor	Ampl	litude			
			Peak .	/ Ave.		Peak .	/ Ave.	Peak	/ Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	vV/m	dΒμ	ιV/m	dB
2360.42	1.00	101	41.50		9.10	50.60		73.96	53.96	-3.36
2493.34	1.00	62	44.00	30.67	9.47	53.47	40.14	73.96	53.96	-13.82
2572.92	1.00	101	41.16		9.63	50.79		73.96	53.96	-3.17
2731.98	1.00	37	42.16	31.67	9.93	52.09	41.60	73.96	53.96	-12.36
7233.75	1.00	275	41.78		10.07	51.85		73.96	53.96	-2.11
21708.12	1.00	187	46.58		2.87	49.45		73.96	53.96	-4.51

Note:

- 1. Margin = Corrected Limit.
- 2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF radiated emissions levels do comply with the *20dBc limit* both at its bandedges and other spurious emissions.
- 3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

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Test mode: IEEE 802.11b CH06 for 30MHz to 1GHz [Horizontal]

	Radiated Emission				Corrected Amplitude	(2		
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dBμV/m)	Limit (dBµV/m)	Margin (dB)	
196.60	44.96	1.00	146	-3.45	41.51	43.50	-1.99	
261.59	39.10	1.00	160	-3.88	35.22	46.00	-10.78	
299.40	41.03	1.00	170	-2.93	38.10	46.00	-7.90	
335.55	39.11	1.00	180	-2.45	36.66	46.00	-9.34	
368.29	44.69	1.00	180	-1.83	42.86	46.00	-3.14	
434.97	34.67	1.00	180	0.51	35.18	46.00	-10.82	

Test mode: IEEE 802.11b CH06 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Clas (3)	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
39.70	26.87	1.00	218	5.21	32.08	40.00	-7.92
167.01	34.45	1.00	233	-4.10	30.35	43.50	-13.15
198.54	38.36	1.00	167	-3.36	35.00	43.50	-8.50
367.07	35.29	1.00	320	-1.86	33.43	46.00	-12.57
698.09	28.36	1.00	273	9.47	37.83	46.00	-8.17
896.94	23.29	1.00	245	15.04	38.33	46.00	-7.67

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Test mode: IEEE 802.11b CH06 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor		ected litude	Limit		Margin
	-		Peak .	/ Ave.		1	/Ave.	Peak	/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	ιV/m	dΒμ	ιV/m	dB
2355.47	1.00	63	44.98	32.17	9.09	54.07	41.26	73.96	53.96	-12.70
2601.99	1.00	62	51.33	40.50	9.68	61.01	50.18	73.96	53.96	-3.78
2682.99	1.00	62	46.66	36.00	9.83	56.49	45.83	73.96	53.96	-8.13
7312.29	1.00	76	42.44		10.30	52.74		73.96	53.96	-1.22
21934.79	1.00	31	45.64		3.09	48.73		73.96	53.96	-5.23
24371.46	1.00	121	45.56		3.26	48.82		73.96	53.96	-5.14

Test mode: IEEE 802.11b CH06 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak.	/Ave.	Peak	/ Ave.	
MHz	m	degree	dΒμV		dB/m	dΒμ	ıV/m	dΒμ	ιV/m	dB
2600.99	1.00	319	44.83	34.17	9.68	54.51	43.85	73.96	53.96	-10.11
2681.59	1.00	41	42.50	31.83	9.83	52.33	41.66	73.96	53.96	-12.30
7310.40	1.00	25	45.77	31.61	10.30	56.07	41.91	73.96	53.96	-12.05
9747.08	1.00	230	36.60	-	11.89	48.49		73.96	53.96	-5.47
21934.79	1.00	40	45.64		3.09	48.73		73.96	53.96	-5.23
24371.46	1.00	113	45.52		3.26	48.78		73.96	53.96	-5.18

Test Report ------ 41/81

Test mode: IEEE 802.11b CH11 for 30MHz to 1GHz [Horizontal]

	Radiated Emission				Corrected Amplitude	(2		
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
196.61	44.82	1.00	146	-3.45	41.37	43.50	-2.13	
261.59	39.50	1.00	129	-3.88	35.62	46.00	-10.38	
298.89	43.07	1.00	180	-2.95	40.12	46.00	-5.88	
334.34	37.75	1.00	170	-2.47	35.28	46.00	-10.72	
369.50	44.37	1.00	180	-1.81	42.56	46.00	-3.44	
433.76	35.12	1.00	180	0.45	35.57	46.00	-10.43	

Test mode: IEEE 802.11b CH11 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Clas (3)	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
31.21	39.07	1.00	211	7.62	31.19	40.00	-8.81
198.54	39.07	1.00	153	-3.36	35.71	43.50	-7.79
369.50	36.16	1.00	299	-1.81	34.35	46.00	-11.65
564.71	26.29	1.00	276	5.47	31.76	46.00	-14.24
698.09	29.52	1.00	80	9.47	38.99	46.00	-7.01
896.94	22.93	1.00	252	15.04	37.97	46.00	-8.03

Test Report ------ 42/81

Test mode: IEEE 802.11b CH11 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corr Ampi	ected litude	Limit		Margin
			Peak .	/ Ave.		Peak.	/Ave.	Peak	/ Ave.	
MHz	m	degree	dB	μV	dB/m	dBμV/m dBμV/m		ıV/m	dB	
2354.17	1.00	79	41.17		9.08	50.25		73.96	53.96	-3.71
2525.63	1.00	79	45.52	33.67	9.54	55.06	43.21	73.96	53.96	-10.75
2621.68	1.00	79	50.33	39.00	9.72	60.05	48.72	73.96	53.96	-5.24
2661.77	1.00	79	44.83	32.83	9.79	54.62	42.62	73.96	53.96	-11.34
7384.79	1.00	293	38.94		10.42	49.36		73.96	53.96	-4.60
24619.37	1.00	247	45.23		3.01	48.24		73.96	53.96	-5.72

Test mode: IEEE 802.11b CH11 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak.	/Ave.	Peak	/Ave.	
MHz	m	degree	$dB\mu V$		dB/m	dΒμ	ıV/m	dBμV/m		dB
2379.17	1.00	118	40.17		9.15	49.32		73.96	53.96	-4.64
2620.54	1.00	38	43.33	34.00	9.72	53.05	43.72	73.96	53.96	-10.24
7386.76	1.00	29	46.28	33.61	10.42	56.70	44.03	73.96	53.96	-9.93
19696.46	1.00	235	45.96		1.81	47.77		73.96	53.96	-6.19
22157.92	1.00	255	44.22		3.25	47.47		73.96	53.96	-6.49
24619.37	1.00	226	45.45		3.01	48.46		73.96	53.96	-5.50

Test Report ------ 43/81

Test mode: IEEE 802.11g CH01 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
168.22	37.18	1.00	275	-4.10	33.08	43.50	-10.42
196.60	45.62	1.00	153	-3.45	42.17	43.50	-1.33
259.16	39.84	1.00	268	-3.82	36.02	46.00	-9.98
299.60	42.07	1.00	166	-2.92	39.15	46.00	-6.85
366.23	39.23	1.00	177	-1.88	37.35	46.00	-8.65
434.97	34.65	1.00	177	0.51	35.16	46.00	-10.84

Test mode: IEEE 802.11g CH01 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
43.34	24.56	1.00	182	4.55	29.11	40.00	-10.89
199.75	37.95	1.00	155	-3.31	34.64	43.50	-8.86
302.81	36.35	1.00	289	-2.86	33.49	46.00	-12.51
631.40	25.82	1.00	267	7.43	33.25	46.00	-12.75
700.51	29.04	1.00	260	9.54	38.58	46.00	-7.42
895.72	23.23	1.00	239	15.00	38.23	46.00	-7.77

Test Report ------ 44/81

Test mode: IEEE 802.11g CH01 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	/ Ave.	Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dΒμ	vV/m	dΒμ	ιV/m	dB
2345.83	1.00	67	39.50		9.06	48.56		73.96	53.96	-5.40
2498.28	1.00	54	45.64	29.33	9.49	55.13	38.82	73.96	53.96	-15.14
2570.45	1.00	54	44.50	29.00	9.62	54.12	38.62	73.96	53.96	-15.34
7233.75	1.00	45	38.28		10.07	48.35		73.96	53.96	-5.61
19296.25	1.00	62	46.77		1.60	48.37		73.96	53.96	-5.59
21708.12	1.00	184	46.50		2.87	49.37		73.96	53.96	-4.59

Test mode: IEEE 802.11g CH01 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/Ave.		Peak	/Ave.	Peak	/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	vV/m	dΒμ	ιV/m	dB
1606.25	1.00	242	34.00		14.23	48.23		73.96	53.96	-5.73
2489.74	1.00	26	44.35	28.00	9.46	53.81	37.46	73.96	53.96	-16.50
3216.67	1.00	19	36.17		11.47	47.64		73.96	53.96	-6.32
7233.75	1.00	277	37.61		10.07	47.68		73.96	53.96	-6.28
21708.12	1.00	140	45.20		2.87	48.07		73.96	53.96	-5.89
24120.00	1.00	196	45.20		3.40	48.60		73.96	53.96	-5.36

Report No.: P5515100156, FCC Part 15.247

Test Report ------ 45/81

Test mode: IEEE 802.11g CH06 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
168.22	37.52	1.00	146	-4.10	33.42	43.50	-10.08
196.60	45.58	1.00	278	-3.45	42.13	43.50	-1.37
260.37	38.56	1.00	160	-3.88	34.68	46.00	-11.32
299.80	44.67	1.00	180	-2.91	41.76	46.00	-4.24
369.50	44.58	1.00	180	-1.81	42.77	46.00	-3.23
433.76	35.21	1.00	180	0.45	35.66	46.00	-10.34

Test mode: IEEE 802.11g CH06 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas (3)	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
198.54	38.50	1.00	135	-3.36	35.14	43.50	-8.36
302.81	35.13	1.00	320	-2.86	32.27	46.00	-13.73
369.50	33.92	1.00	299	-1.81	32.11	46.00	-13.89
564.71	37.54	1.00	252	-5.47	32.07	46.00	-13.93
631.40	25.08	1.00	273	7.43	32.51	46.00	-13.49
698.09	28.77	1.00	266	9.47	38.24	46.00	-7.76

Test Report ------ 46/81

Test mode: IEEE 802.11g CH06 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/Ave.		Peak .		Peak	/Ave.	
MHz	m	degree	dΒμV		dB/m	dΒμ	vV/m	dΒμ	ιV/m	dB
2530.92	1.00	82	44.17	28.33	9.55	53.72	37.88	73.96	53.96	-16.80
2598.22	1.00	82	47.67	29.50	9.67	57.34	39.17	73.96	53.96	-14.79
2675.00	1.00	107	41.67		9.82	51.49		73.96	53.96	-2.47
7312.29	1.00	187	37.94		10.30	48.24		73.96	53.96	-5.72
21934.79	1.00	42	45.77		3.09	48.86		73.96	53.96	-5.10
24371.46	1.00	124	45.58		3.26	48.84		73.96	53.96	-5.12

Test mode: IEEE 802.11g CH06 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	/ Ave.	Peak	/ Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dΒμ	ιV/m	dB
2606.68	1.00	35	41.99	27.00	9.69	51.68	36.69	73.96	53.96	-17.27
2681.25	1.00	35	38.83		9.83	48.66		73.96	53.96	-5.30
7312.29	1.00	304	38.61		10.30	48.91		73.96	53.96	-5.05
19494.58	1.00	124	46.64		1.69	48.33		73.96	53.96	-5.63
21934.79	1.00	41	45.40		3.09	48.49		73.96	53.96	-5.47
24371.46	1.00	107	45.21		3.26	48.47		73.96	53.96	-5.49

Test Report ------ 47/81

Test mode: IEEE 802.11g CH11 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dBμV/m)	Limit (dBµV/m)	Margin (dB)
168.22	37.61	1.00	156	-4.10	33.51	43.50	-9.99
196.60	45.60	1.00	156	-3.45	42.15	43.50	-1.35
299.50	41.51	1.00	180	-2.92	38.59	46.00	-7.41
334.34	38.05	1.00	180	-2.47	35.58	46.00	-10.42
368.29	44.37	1.00	180	-1.83	42.54	46.00	-3.46
433.76	35.19	1.00	190	0.45	35.64	46.00	-10.36

Test mode: IEEE 802.11g CH11 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas (3)	-
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
38.49	25.53	1.00	182	5.43	30.96	40.00	-9.04
100.32	30.50	1.00	347	-0.57	29.93	43.50	-13.57
198.54	39.61	1.00	145	-3.36	36.25	43.50	-7.25
368.29	34.25	1.00	299	-1.83	32.42	46.00	-13.58
698.09	29.41	1.00	266	9.47	38.88	46.00	-7.12
896.94	23.11	1.00	231	15.04	38.15	46.00	-7.85

Test Report ------ 48/81

Test mode: IEEE 802.11g CH11 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor		Corrected Amplitude		Limit	
			Peak .	/ Ave.		Peak	/Ave.	Peak / Ave.		
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dBμV/m		dB
2366.67	1.00	82	40.33		9.12	49.45		73.96	53.96	-4.51
2622.30	1.00	82	44.82	28.83	9.72	54.54	38.55	73.96	53.96	-15.41
2706.25	1.00	82	39.00		9.88	48.88		73.96	53.96	-5.08
9849.79	1.00	45	33.44		11.93	45.37		73.96	53.96	-8.59
19696.46	1.00	238	46.08		1.81	47.89		73.96	53.96	-6.07
24619.37	1.00	241	45.64		3.01	48.65		73.96	53.96	-5.31

Test mode: IEEE 802.11g CH11 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	Peak / Ave.		/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	vV/m	$dB\mu$	ιV/m	dB
2627.08	1.00	27	40.33		9.73	50.06		73.96	53.96	-3.90
7384.79	1.00	9	37.28		10.42	47.70		73.96	53.96	-6.26
12308.75	1.00	0	36.77		9.56	46.33		73.96	53.96	-7.63
19696.46	1.00	225	46.23		1.81	48.04		73.96	53.96	-5.92
22157.92	1.00	255	44.37		3.25	47.62		73.96	53.96	-6.34
24619.37	1.00	244	45.54		3.01	48.55		73.96	53.96	-5.41

Report No.: P5515100156, FCC Part 15.247

Test Report ------ 49/81

Test mode: IEEE 802.11n 20M CH01 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
196.60	45.00	1.00	153	-3.45	41.55	43.50	-1.95
259.16	39.98	1.00	177	-3.82	36.16	46.00	-9.84
299.40	41.07	1.00	167	-2.93	38.14	46.00	-7.86
334.34	38.09	1.00	187	-2.47	35.62	46.00	-10.38
368.29	44.23	1.00	177	-1.83	42.40	46.00	-3.60
896.94	22.63	1.00	154	15.04	37.67	46.00	-8.33

Test mode: IEEE 802.11n 20M CH01 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Class B (3 m)		
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
39.70	25.99	1.00	173	5.21	31.20	40.00	-8.80	
198.54	39.10	1.00	146	-3.36	35.74	43.50	-7.76	
368.29	35.73	1.00	302	-1.83	33.90	46.00	-12.10	
632.61	24.48	1.00	273	7.47	31.95	46.00	-14.05	
700.51	28.69	1.00	267	9.54	38.23	46.00	-7.77	
896.94	24.02	1.00	232	15.04	39.06	46.00	-6.94	

Report No.: P5515100156, FCC Part 15.247

Test Report ----- 50/81

Test mode: IEEE 802.11n 20M CH01 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	/ Ave.	Peak	/ Ave.	
MHz	m	degree	$dB\mu V$		dB/m	dΒμ	vV/m	dΒμ	ıV/m	dB
2498.00	1.00	41	45.17	32.50	9.48	54.65	41.98	73.96	53.96	-11.98
2564.14	1.00	234	42.67	31.50	9.61	52.28	41.11	73.96	53.96	-12.85
2643.75	1.00	69	40.67		9.76	50.43		73.96	53.96	-3.53
7233.75	1.04	38	41.28		10.07	51.35		73.96	53.96	-2.61
21708.12	1.00	139	45.37		2.87	48.24		73.96	53.96	-5.72
24120.00	1.00	205	45.33		3.40	48.73		73.96	53.96	-5.23

Test mode: IEEE 802.11n 20M CH01 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant.	Table	Ampl	itude	Correction	Corr	ected	Limit		Margin
	Н.		-		Factor	Ampl	litude			
			Peak ,	/ Ave.		Peak .	/ Ave.	Peak	/ Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	V/m	dΒμ	ιV/m	dB
2489.68	1.00	228	44.18	29.33	9.46	53.64	38.79	73.96	53.96	-15.17
2577.08	1.00	97	37.17		9.63	46.80		73.96	53.96	-7.16
7233.75	1.00	322	41.44		10.07	51.51		73.96	53.96	-2.45
19296.25	1.00	83	45.26		1.60	46.86		73.96	53.96	-7.10
21708.12	1.00	132	45.10		2.87	47.97		73.96	53.96	-5.99
24120.00	1.00	205	45.04		3.40	48.44		73.96	53.96	-5.52

Test Report ----- 51/81

Test mode: IEEE 802.11n 20M CH06 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
168.22	37.73	1.00	283	-4.10	33.63	43.50	-9.87
196.60	44.98	1.00	161	-3.45	41.53	43.50	-1.97
227.64	39.96	1.00	141	-3.80	36.16	46.00	-9.84
260.37	40.55	1.00	135	-3.88	36.67	46.00	-9.33
299.51	41.58	1.00	175	-2.92	38.66	46.00	-7.34
369.50	44.42	1.00	175	-1.81	42.61	46.00	-3.39

Test mode: IEEE 802.11n 20M CH06 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas (3)	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
39.70	26.61	1.00	199	5.21	31.82	40.00	-8.18
198.54	38.86	1.00	161	-3.36	35.50	43.50	-8.00
369.50	35.66	1.00	306	-1.81	33.85	46.00	-12.15
631.40	25.15	1.00	280	7.43	32.58	46.00	-13.42
698.09	29.80	1.00	280	9.47	39.27	46.00	-6.73
896.94	23.41	1.00	238	15.04	38.45	46.00	-7.55

Test Report ----- 52/81

Test mode: IEEE 802.11n 20M CH06 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor		ected litude	Limit		Margin
			Peak .	/ Ave.		Peak .	/Ave.	Peak .	/ Ave.	
MHz	m	degree	$dB\mu V$		dB/m	dΒμ	vV/m	dΒμ	vV/m	dB
2495.28	1.00	1	47.66	33.33	9.48	57.14	42.81	73.96	53.96	-11.15
2600.37	1.00	221	43.83	32.83	9.68	53.51	42.51	73.96	53.96	-11.45
2681.25	1.00	54	39.83		9.83	49.66		73.96	53.96	-4.30
7312.29	1.00	18	41.94		10.30	52.24		73.96	53.96	-1.72
19494.58	1.00	96	46.77		1.69	48.46		73.96	53.96	-5.50
21934.79	1.00	28	45.60		3.09	48.69		73.96	53.96	-5.27

Test mode: IEEE 802.11n 20M CH06 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/Ave.		Peak	/ Ave.	Peak	/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dΒμ	ıV/m	dB
2600.00	1.00	306	39.50		9.68	49.18		73.96	53.96	-4.78
2677.08	1.00	4	39.67		9.82	49.49		73.96	53.96	-4.47
12187.92	1.00	234	39.27	-	9.74	49.01		73.96	53.96	-4.95
19494.58	1.00	124	46.60	-	1.69	48.29		73.96	53.96	-5.67
21934.79	1.00	22	45.64		3.09	48.73		73.96	53.96	-5.23
24371.46	1.00	132	45.52	-	3.26	48.78		73.96	53.96	-5.18

Test Report ----- 53/81

Test mode: IEEE 802.11n 20M CH11 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	(2)		
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
196.60	44.98	1.00	156	-3.45	41.53	43.50	-1.97	
259.16	40.78	1.00	139	-3.82	36.96	46.00	-9.04	
299.80	44.56	1.00	180	-2.91	41.65	46.00	-4.35	
337.97	38.60	1.00	170	-2.42	36.18	46.00	-9.82	
369.50	44.37	1.00	323	-1.81	42.56	46.00	-3.44	
433.76	35.26	1.00	312	0.45	35.71	46.00	-10.29	

Test mode: IEEE 802.11n 20M CH11 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
31.21	25.06	1.00	220	7.62	32.68	40.00	-7.32
168.22	34.04	1.00	183	-4.10	29.94	43.50	-13.56
198.54	38.84	1.00	153	-3.36	35.48	43.50	-8.02
368.29	35.84	1.00	317	-1.83	34.01	46.00	-11.99
698.09	30.06	1.00	273	9.47	39.53	46.00	-6.47
896.94	23.39	1.00	231	15.04	38.43	46.00	-7.57

Test Report ----- 54/81

Test mode: IEEE 802.11n 20M CH11 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor		ected litude	Limit		Margin
			Peak .	/ Ave.		Peak	/ Ave.	Peak	/ Ave.	
MHz	m	degree	dΒμV		dB/m	dBμV/m dBμV/m		ιV/m	dB	
2360.42	1.00	3	39.00		9.10	48.10		73.96	53.96	-5.86
2622.23	1.00	38	41.66	31.67	9.72	51.38	41.39	73.96	53.96	-12.57
9849.79	1.00	151	33.61		11.93	45.54		73.96	53.96	-8.42
19696.42	1.00	238	45.94		1.81	47.75		73.96	53.96	-6.21
22157.92	1.00	253	44.61		3.25	47.86		73.96	53.96	-6.10
24619.37	1.00	231	45.74		3.01	48.75		73.96	53.96	-5.21

Test mode: IEEE 802.11n 20M CH11for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak .	/Ave.	Peak	Peak / Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dΒμ	dBμV/m	
2618.75	1.00	112	38.00		9.71	47.71		73.96	53.96	-6.25
7384.79	1.00	32	37.78		10.42	48.20		73.96	53.96	-5.76
9849.79	1.00	252	34.28		11.93	46.21		73.96	53.96	-7.75
19696.46	1.00	228	46.17		1.81	47.98		73.96	53.96	-5.98
22157.92	1.00	254	44.28		3.25	47.53		73.96	53.96	-6.43
24619.37	1.00	247	45.43		3.01	48.44		73.96	53.96	-5.52

Test Report ----- 55/81

Test mode: IEEE 802.11n 40M CH03 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
168.22	37.47	1.00	153	-4.10	33.37	43.50	-10.13
196.60	45.23	1.00	153	-3.45	41.78	43.50	-1.72
261.59	39.62	1.00	185	-3.88	35.74	46.00	-10.26
299.60	42.05	1.00	185	-2.92	39.13	46.00	-6.87
367.07	44.35	1.00	182	-1.86	42.49	46.00	-3.51
898.15	22.96	1.00	161	15.09	38.05	46.00	-7.95

Test mode: IEEE 802.11n 40M CH03 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas (3	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
38.49	25.30	1.00	131	5.43	30.73	40.00	-9.27
168.22	34.39	1.00	215	-4.10	30.29	43.50	-13.21
198.54	39.03	1.00	155	-3.36	35.67	43.50	-7.83
368.29	36.19	1.00	299	-1.83	34.36	46.00	-11.64
698.09	29.94	1.00	266	9.47	39.41	46.00	-6.59
763.56	24.52	1.00	252	10.47	34.99	46.00	-11.01

Test Report ----- 56/81

Test mode: IEEE 802.11n 40M CH03 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor			Limit		Margin
			Peak .	/ Ave.		Peak .	/Ave.	Peak .	/ Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	V/m	dΒμ	vV/m	dB
2583.33	1.00	91	41.16		9.65	50.81		73.96	53.96	-3.15
9686.67	1.00	96	34.60		11.63	46.23		73.96	53.96	-7.73
12109.37	1.00	327	36.94		9.61	46.55		73.96	53.96	-7.41
19374.17	1.00	324	45.33		1.60	46.93		73.96	53.96	-7.03
21796.67	1.00	77	45.31		2.72	48.03		73.96	53.96	-5.93
24219.17	1.00	7	45.04		2.85	47.89		73.96	53.96	-6.07

Test mode: IEEE 802.11n 40M CH03 for 1GHz to 26.5GHz [Vertical]

Test		moue. IEEE 002.11n 40M			21105 Jul 1 G11	OII.	j v eriicaij			
Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	/ Ave.	Peak	/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dΒμ	ιV/m	dB
1606.25	1.00	325	35.17		14.23	49.40		73.96	53.96	-4.56
2579.17	1.00	125	39.17		9.64	48.81		73.96	53.96	-5.15
12109.37	1.00	212	37.27		9.61	46.88		73.96	53.96	-7.08
19374.17	1.00	322	45.49		1.60	47.09		73.96	53.96	-6.87
21796.67	1.00	86	45.45		2.72	48.17		73.96	53.96	-5.79
24219.17	1.00	14	45.04		2.85	47.89		73.96	53.96	-6.07

Test Report ----- 57/81

Test mode: IEEE 802.11n 40M CH06 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	(2)		
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
198.54	43.75	1.00	155	-3.36	40.39	43.50	-3.11	
259.16	39.13	1.00	249	-3.82	35.31	46.00	-10.69	
299.50	41.45	1.00	188	-2.92	38.53	46.00	-7.47	
336.76	37.73	1.00	188	-2.44	35.29	46.00	-10.71	
367.07	44.45	1.00	178	-1.86	42.59	46.00	-3.41	
896.94	23.15	1.00	196	15.04	38.19	46.00	-7.81	

Test mode: IEEE 802.11n 40M CH06 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas (3)	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
33.64	24.90	1.00	173	6.63	31.53	40.00	-8.47
198.54	36.57	1.00	146	-3.36	33.21	43.50	-10.29
367.07	34.70	1.00	302	-1.86	32.84	46.00	-13.16
504.09	29.72	1.00	275	2.01	31.73	46.00	-14.27
698.09	28.21	1.00	251	9.47	37.68	46.00	-8.32
896.94	24.93	1.00	244	15.04	39.97	46.00	-6.03

Test Report ----- 58/81

Test mode: IEEE 802.11n 40M CH06 for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	/ Ave.	Peak .	/ Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	V/m	dΒμ	vV/m	dB
1472.92	1.00	226	33.84		15.98	49.82		73.96	53.96	-4.14
2606.25	1.00	37	41.83	-	9.69	51.52		73.96	53.96	-2.44
12187.92	1.00	224	37.60		9.74	47.34		73.96	53.96	-6.62
19494.58	1.00	121	46.69		1.69	48.38		73.96	53.96	-5.58
21934.79	1.00	24	45.89	-	3.09	48.98		73.96	53.96	-4.98
24371.46	1.00	111	45.15		3.26	48.41		73.96	53.96	-5.55

Test mode: IEEE 802.11n 40M CH06 for 1GHz to 26.5GHz [Vertical]

Frequency	Ant. H.	Table	Ampl	litude	Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/ Ave.		Peak	/Ave.	Peak	/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dΒμ	ιV/m	dB
1593.75	1.00	251	33.50		14.43	47.93		73.96	53.96	-6.03
2608.33	1.00	279	39.00		9.69	48.69		73.96	53.96	-5.27
9747.08	1.00	102	35.27		11.89	47.16		73.96	53.96	-6.80
19494.58	1.00	101	46.81		1.69	48.50		73.96	53.96	-5.46
21934.79	1.00	31	45.93		3.09	49.02		73.96	53.96	-4.94
24371.46	1.00	107	45.40		3.26	48.66		73.96	53.96	-5.30

Report No.: P5515100156, FCC Part 15.247

Test Report ----- 59/81

Test mode: IEEE 802.11n 40M CH09 for 30MHz to 1GHz [Horizontal]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Class B (3 m)		
Frequency (MHz)	Amplitude (dB µV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)	
196.60	43.07	1.00	272	-3.45	39.62	43.50	-3.88	
299.50	41.40	1.00	173	-2.92	38.48	46.00	-7.52	
352.52	42.09	1.00	67	-2.21	39.88	46.00	-6.12	
367.07	44.08	1.00	184	-1.86	42.22	46.00	-3.78	
397.39	39.43	1.00	56	-1.14	38.29	46.00	-7.71	
438.61	40.23	1.00	46	0.67	40.90	46.00	-5.10	

Test mode: IEEE 802.11n 40M CH09 for 30MHz to 1GHz [Vertical]

	Radiat Emissi			Correction Factors	Corrected Amplitude	Clas	-
Frequency (MHz)	Amplitude (dBµV)	Ant. H. (m)	Table ()	(dB)	(dB µV/m)	Limit (dBµV/m)	Margin (dB)
38.49	26.74	1.00	173	5.43	32.17	40.00	-7.83
198.54	36.87	1.00	156	-3.36	33.51	43.50	-9.99
367.07	35.16	1.00	312	-1.86	33.30	46.00	-12.70
602.30	25.69	1.00	197	6.53	32.22	46.00	-13.78
698.09	27.77	1.00	246	9.47	37.24	46.00	-8.76
896.94	23.17	1.00	253	15.04	38.21	46.00	-7.79

Report No.: P5515100156, FCC Part 15.247

Test Report ----- 60/81

Test mode: IEEE 802.11n 40M CH09for 1GHz to 26.5GHz [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak .	/Ave.		Peak.	/Ave.	Peak	/Ave.	
MHz	m	degree	dB	μV	dB/m	dΒμ	vV/m	dΒμ	ιV/m	dB
1458.33	1.00	214	34.00		16.03	50.03		73.96	53.96	-3.93
2611.38	1.00	360	43.33	30.33	9.70	53.03	40.03	73.96	53.96	-13.93
12260.42	1.00	350	36.11		9.86	45.97		73.96	53.96	-7.99
19618.54	1.00	145	46.05		1.70	47.75		73.96	53.96	-6.21
22069.37	1.00	16	44.87		2.77	47.64		73.96	53.96	-6.32
24520.21	1.00	139	46.08		2.37	48.45		73.96	53.96	-5.51

Test mode: IEEE 802.11n 40M CH09 for 1GHz to 26.5GHz [Vertical]

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Frequency	Ant. H.	Table	Ampl Peak		Correction Factor	Corrected Amplitude Peak / Ave.		Limit Peak / Ave.		Margin
MHz	m	degree	dB	μV	dB/m	dΒμ	ıV/m	dΒμ	dBμV/m	
2608.33	1.00	325	39.17		9.69	48.86		73.96	53.96	-5.10
2768.75	1.00	3	36.00		10.00	46.00		73.96	53.96	-7.96
12260.42	1.00	272	36.61	-	9.86	46.47		73.96	53.96	-7.49
19618.54	1.00	137	45.85		1.70	47.55		73.96	53.96	-6.41
22069.37	1.00	23	45.18		2.77	47.95		73.96	53.96	-6.01
24520.21	1.00	129	46.16		2.37	48.53		73.96	53.96	-5.43

Report No.: P5515100156, FCC Part 15.247

7.4 Test Result of the Bandedge

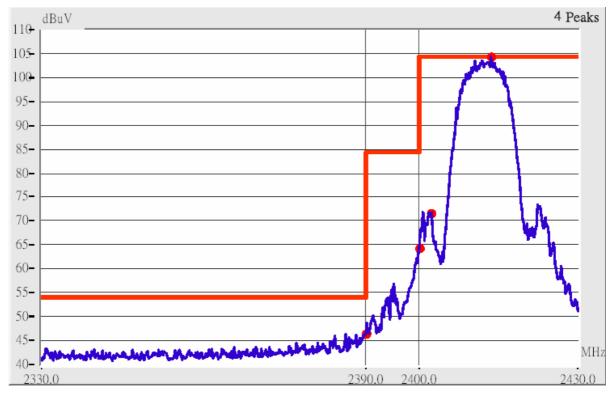
If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified id §15.209(a),

We'd made the observation up to 10th harmonics and the criterion is all the harmonic/spurious emissions must be 20dB below the highest emission level measured. If the emissions fall in the restricted bands stated in the Part15.205(a) must also comply with the radiated emission limits specified in Part15.209(a). (Peak mode: RBW=VBW=1MHz, Average mode: RBW=1MHz; VBW=10Hz)

The following pages show our observations referring to the channel 1 and 11 respectively. Test Condition & Setup: same as < 8.1 >

Test Report ----- 62/81

Channel 1 of IEEE 802.11b



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

- 1. The lobe left by the fundamental side is already 20dB below the highest emission level.
- 2. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below.

	Radiated Emission					ected litude	Class B (3m)			
Frequency	Ant.	Ant. H.	Table	Factors (dBμV/m) Limit (dBμV/m)		(dBµV/m)		BμV/m)	Margin	
(MHz)	Р.	(m)	()	(dB)	Peak Average		Peak	Ave.	(dB)	
2389.03	Hor	1.00	55	9.18	56.68	43.35	73.96	53.96	-10.61	
2390.29	Hor	1.00	97	9.18	59.35	44.68	73.96	53.96	-9.28	
2386.99	Ver	1.00	118	9.17	55.67 40.67		73.96	53.96	-13.29	
2390.33	Ver	1.00	118	9.18	57.68	43.18	73.96	53.96	-10.78	

Test Report ----- 63/81

Channel 11 of IEEE 802.11b



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 11.

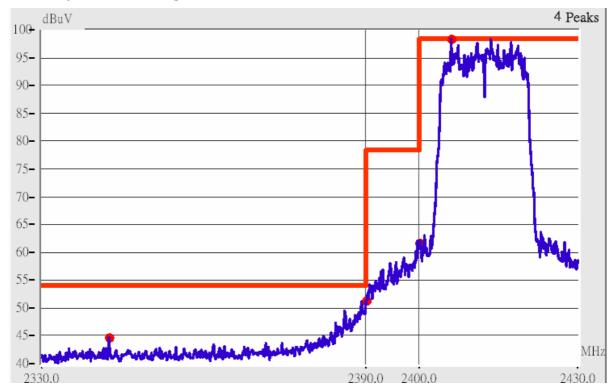
- 3. The lobe right by the fundamental side is already 20dB below the highest emission level.
- 4. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below

	Radiated Emission					ected litude	Class B (3m)			
Frequency	Ant.	Ant. H.	Table	Factors	rs (dBμV/m)		Limit (d	BμV/m)	Margin	
(MHz)	Р.	(m)	()	(dB)	Peak	Average	Peak	Ave.	(dB)	
2483.26	Hor	1.00	171	9.44	65.61	49.27	73.96	53.96	-4.69	
2492.00	Hor	1.00	171	9.47	62.13	47.64	73.96	53.96	-6.32	
2499.97	Hor	1.00	171	9.49	54.66	45.16	73.96	53.96	-8.80	
2510.97	Hor	1.00	171	9.51	55.34	43.68	73.96	53.96	-10.28	
2483.01	Ver	1.00	344	9.44	58.78	43.94	73.96	53.96	-10.02	
2491.97	Ver	1.00	141	9.47	57.13 41.64		73.96	53.96	-12.32	
2499.98	Ver	1.00	182	9.49	52.16 38.82		73.96	53.96	-15.14	
2503.51	Ver	1.00	342	9.50	50.16		73.96	53.96	-3.80	

Report No.: P5515100156, FCC Part 15.247

Test Report ----- 64/81

Channel 1 of IEEE 802.11g



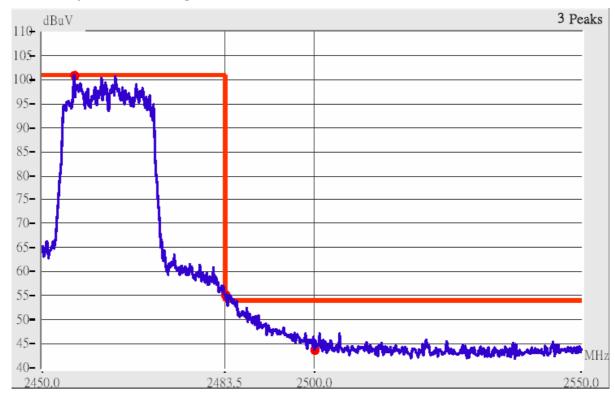
This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

- 5. The lobe left by the fundamental side is already 20dB below the highest emission level.
- 6. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below.

	Radiated Emission					ected litude	Class B (3m)			
Frequency	Ant.	Ant. H.	Table	e Factors (dBμV/m) Limit (dBμV/m)		(dBµV/m)		BμV/m)	Margin	
(MHz)	Р.	(m)	()	(dB)	Peak Average		Peak	Ave.	(dB)	
2386.14	Hor	1.00	52	9.17	64.17	40.00	73.96	53.96	-9.79	
2390.15	Hor	1.00	54	9.18	70.68	42.85	73.96	53.96	-3.28	
2386.34	Ver	1.00	111	9.17	63.01	38.34	73.96	53.96	-10.95	
2390.68	Ver	1.00	25	9.18	65.52	41.51	73.96	53.96	-8.44	

Test Report ----- 65/81

Channel 11 of IEEE 802.11g



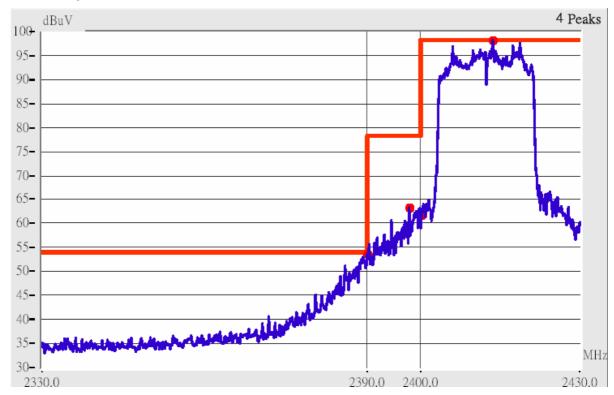
This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 11.

- 7. The lobe right by the fundamental side is already 20dB below the highest emission level.
- 8. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below

	Radiated Emission					ected litude	Class B (3m)		
Frequency	quency Ant. Ant. H. Table Factors (dBμV/m)		(dBµV/m)		Limit (dBµV/m)				
(MHz)	Р.	(m)	()	(dB)	Peak	Average	Peak	Ave.	(dB)
2483.24	Hor	1.00	157	9.44	70.11	44.27	73.96	53.96	-3.85
2487.01	Hor	1.00	157	9.45	65.95	42.28	73.96	53.96	-8.01
2500.04	Hor	1.00	162	9.49	55.66	38.99	73.96	53.96	-14.97
2503.48	Hor	1.00	163	9.50	55.83	38.00	73.96	53.96	-15.96
2483.22	Ver	1.00	346	9.44	65.28	41.44	73.96	53.96	-8.68
2485.34	Ver	1.00	138	9.45	59.62	39.78	73.96	53.96	-14.18
2499.16	Ver	1.00	139	9.49	53.49	37.32	73.96	53.96	-16.64
2513.07	Ver	1.00	134	9.51	48.51		73.96	53.96	-5.45

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Channel 01 of IEEE 802.11n 20M



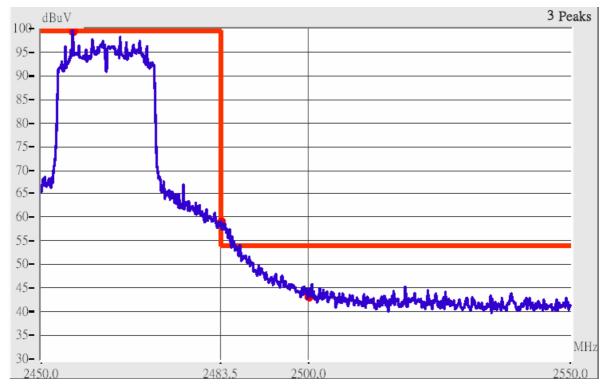
This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

- 9. The lobe left by the fundamental side is already 20dB below the highest emission level.
- 10. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below.

	Radiated Emission					ected litude	Class B (3m)			
Frequency	Ant.	Ant. H.	Table	e Factors (dBμV/m) Limit (dBμV/m)		(dBµV/m)		BμV/m)	Margin	
(MHz)	Р.	(m)	()	(dB)	Peak Average		Peak	Ave.	(dB)	
2386.19	Hor	1.00	72	9.17	64.84	46.00	73.96	53.96	-7.96	
2390.39	Hor	1.00	75	9.18	71.02	51.18	73.96	53.96	-2.78	
2388.82	Ver	1.00	73	9.18	62.18	44.35	73.96	53.96	-9.61	
2390.74	Ver	1.00	73	9.18	65.68	46.51	73.96	53.96	-7.45	

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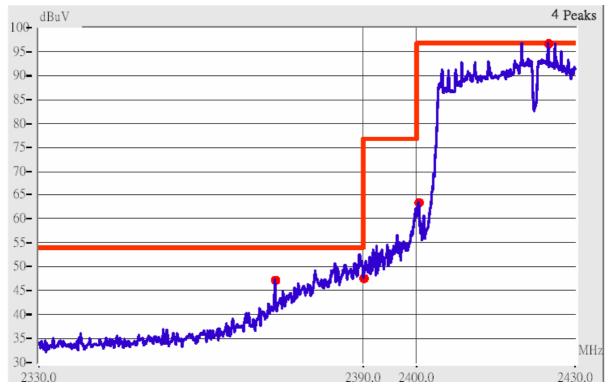
This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 11.

- 11. The lobe right by the fundamental side is already 20dB below the highest emission level.
- 12. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below

	Radiated Emission					ected litude	Class B (3m)		
Frequency	Ant.	Ant. H.	nt. H. Table Factors (dB\(\mu\text{V/m}\) Limit (dB\(\mu\text{V/m}\)		le Factors (dBµV/m)		BμV/m)	Margin	
(MHz)	Р.	(m)	()	(dB)	Peak	Average	Peak	Ave.	(dB)
2483.85	Hor	1.00	115	9.44	68.78	51.77	73.96	53.96	-2.19
2486.01	Hor	1.00	41	9.45	64.95	49.12	73.96	53.96	-4.84
2499.78	Hor	1.00	122	9.49	55.66	41.66	73.96	53.96	-12.30
2502.10	Hor	1.00	90	9.49	53.16	40.49	73.96	53.96	-13.47
2482.93	Ver	1.00	297	9.44	65.94	50.11	73.96	53.96	-3.85
2484.76	Ver	1.00	296	9.45	61.12	47.95	73.96	53.96	-6.01
2500.01	Ver	1.00	157	9.49	50.82		73.96	53.96	-3.14
2508.18	Ver	1.00	298	9.51	49.34		73.96	53.96	-4.62

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Channel CH03 of IEEE 802.11n 40M



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 3.

- 13. The lobe left by the fundamental side is already 20dB below the highest emission level.
- 14. The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below.

	Radiated Emission					ected litude	Class B (3m)			
Frequency	Ant.	Ant. H.	Table	Factors (dB\(\mu\)V/m) Limit (dB\(\mu\)V/m)		$(dB\mu V/m)$		BμV/m)	Margin	
(MHz)	Р.	(m)	()	(dB)	Peak Average		Peak	Ave.	(dB)	
2383.20	Hor	1.00	276	9.16	66.66	48.99	73.96	53.96	-4.97	
2389.76	Hor	1.00	275	9.18	68.68	51.01	73.96	53.96	-2.95	
2381.38	Ver	1.00	52	9.16	65.99 44.83		73.96	53.96	-7.97	
2390.16	Ver	1.00	85	9.18	65.68	47.85	73.96	53.96	-6.11	

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Channel 09 of IEEE 802.11n 40M



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 09.

- 15. The lobe right by the fundamental side is already 20dB below the highest emission level.
- 16.The emissions recorded in the restricted band is do comply with the Part 15.209(a) as below

	Radiated Emission					ected litude	Class B (3m)				
Frequency	Ant.	Ant. H.	Table	Factors	(dBµV/m)		(dBµV/m)		Limit (dBµV/m)		Margin
(MHz)	Р.	(m)	()	(dB)	Peak	Average	Peak	Ave.	(dB)		
2483.91	Hor	1.00	79	9.44	70.11	51.94	73.96	53.96	-2.02		
2487.59	Hor	1.00	0	9.46	69.79	52.29	73.96	53.96	-1.67		
2499.48	Hor	1.00	114	9.49	59.32	45.66	73.96	53.96	-8.30		
2510.32	Hor	1.00	95	9.51	56.34	40.34	73.96	53.96	-13.62		
2483.24	Ver	1.00	304	9.44	66.11	49.61	73.96	53.96	-4.35		
2487.02	Ver	1.00	307	9.45	67.79 49.45		73.96	53.96	-4.51		
2499.77	Ver	1.00	305	9.49	56.32 42.32		73.96	53.96	-11.64		
2504.35	Ver	1.00	305	9.50	53.00	38.83	73.96	53.96	-15.13		

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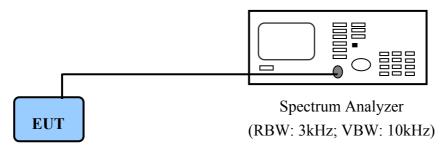
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VIII. Section 15.247(d): Power Spectral Density

8.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power in TDD mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

8.2 Test Instruments Configuration



PC to control the EUT at maximal power output and channel number and set antenna kit

8.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	10/20/10

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8.4 Test Result of Power spectral density

The following table shows a summary of the test results of the Power Spectral Density.

IEEE 802.11b

Channel	Ppr (dBm)	Cable Loss (dB)	Ppq (dBm)	Limit (dB)	Margin (dB)
G 0.4			- 00		10.00
CH 01	-5.88	3.00	-2.88	8.00	-10.88
CH 06	-5.68	3.00	-2.68	8.00	-10.68
CII 11	5.01	2.00	2.01	0.00	10.01
CH 11	-5.91	3.00	-2.91	8.00	-10.91

IEEE 802.11g

Channel	Ppr (dBm)	Cable Loss (dB)	Ppq (dBm)	Limit (dB)	Margin (dB)
CH 01	-12.88	3.00	-9.88	8.00	-17.88
CH 06	-12.77	3.00	-9.77	8.00	-17.77
CH 11	-13.50	3.00	-10.50	8.00	-18.50

Note:

- 1. The following pages show the results of spectrum reading.
- 2. Ppr: spectrum read power density (using peak search mode), Ppq: actual peak power density in the spread spectrum band.
- 3. Ppq = Ppr + |Cable Loss|

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Formula:

Total PPSD (Ppq) = $10 \log (10^{\circ} (Ant#1 Ppr + cable loss / 10) + 10^{\circ} (Ant#2 Ppr + cable loss / 10))$

IEEE 802.11n 20M

Channel	Ant#1 Ppr	Ant#2 Ppr	Cable Loss	Ppq	Limit	Margin
	(dE	(dBm)		(dBm)	(dB)	(dB)
CH 01/2412	-13.62	-13.29	3.00	-7.44	8.00	-15.44
CH 06/2437	-13.64	-13.16	3.00	-7.38	8.00	-15.38
CH 11/2462	-15.00	-14.53	3.00	-8.75	8.00	-16.75

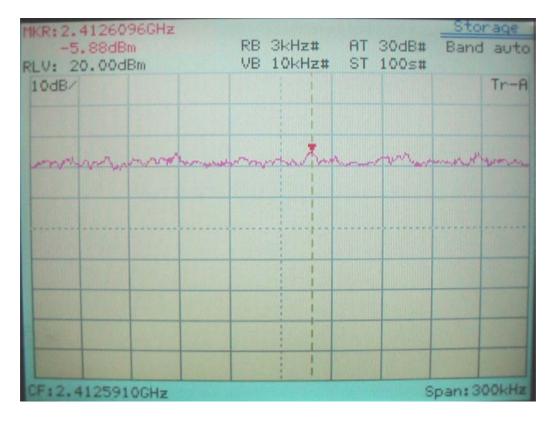
IEEE 802.11n 40M

Channel	Ant#1 Ppr	Ant#2 Ppr	Cable Loss	Ppq	Limit	Margin
	(dBm)		(dB)	(dBm)	(dB)	(dB)
CH 03/2412	-16.96	-16.37	3.00	-10.64	8.00	-18.64
СН 06/2437	-16.76	-16.51	3.00	-10.62	8.00	-18.62
CH 09/2452	-17.09	-17.09	3.00	-11.08	8.00	-19.08

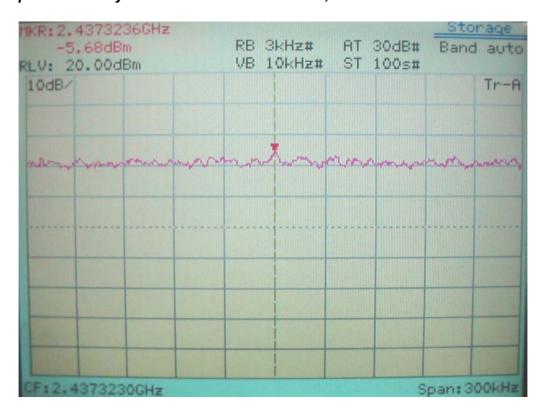
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Power Spectral Density for IEEE 802.11b Channel 01, 2412MHz

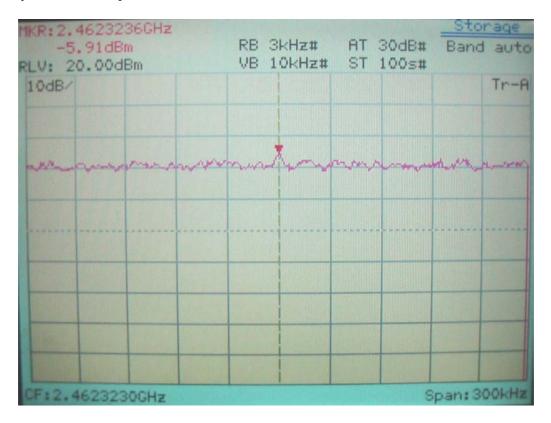


Power Spectral Density for IEEE 802.11b Channel 06, 2437MHz

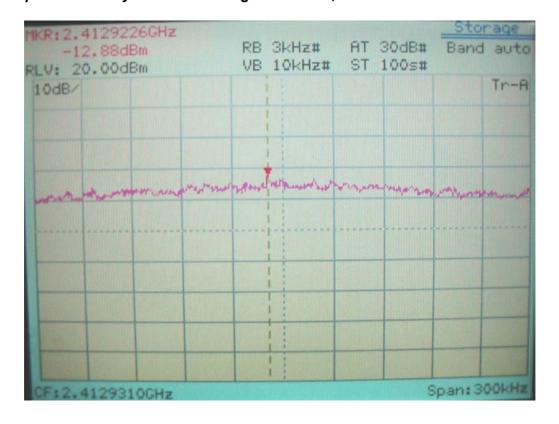


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Power Spectral Density for IEEE 802.11b Channel 11, 2462MHz

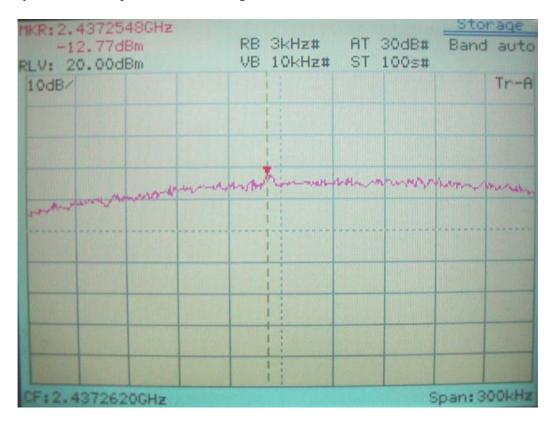


Power Spectral Density for IEEE 802.11g Channel 01, 2412MHz

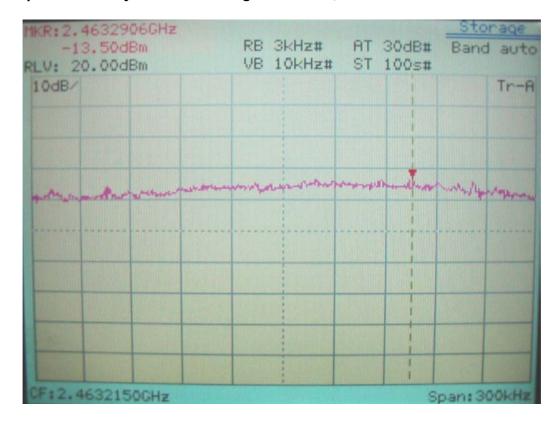


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Power Spectral Density for IEEE 802.11g Channel 06, 2437MHz



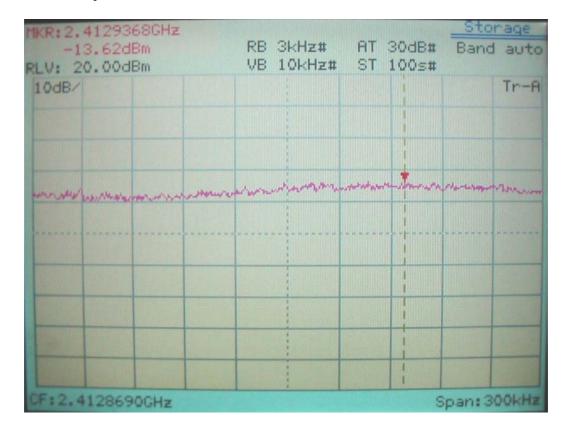
Power Spectral Density for IEEE 802.11g Channel 11, 2462MHz

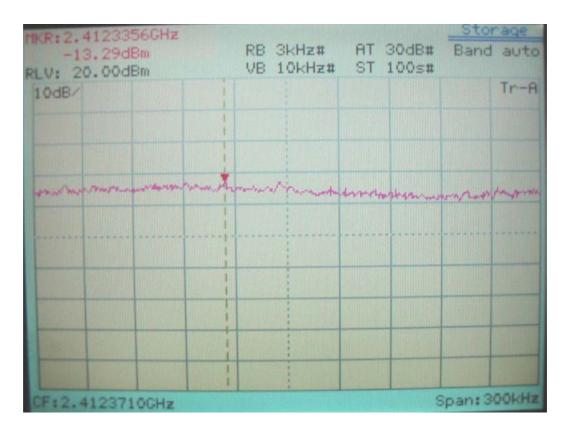


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Power Spectral Density for IEEE 802.11n 20M Channel 01, 2412MHz

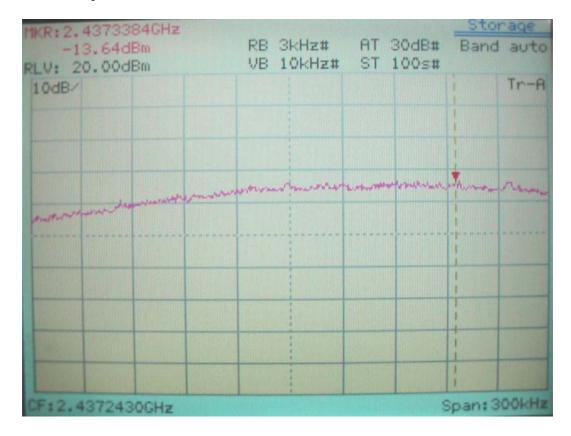


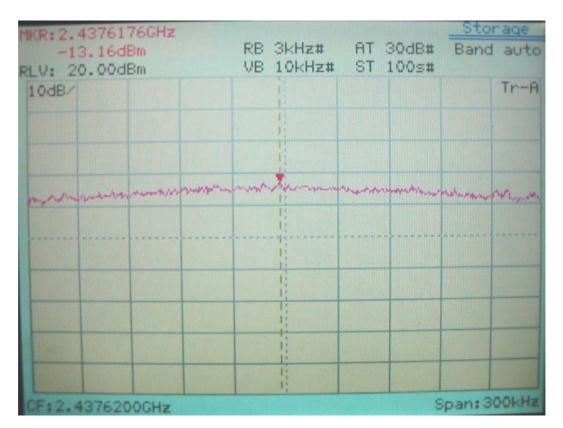


Ant #2

Test Report ----- 77/81

Power Spectral Density for IEEE 802.11n 20M Channel 06, 2437MHz

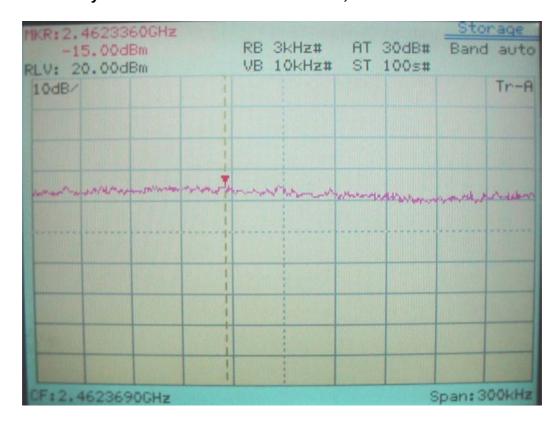


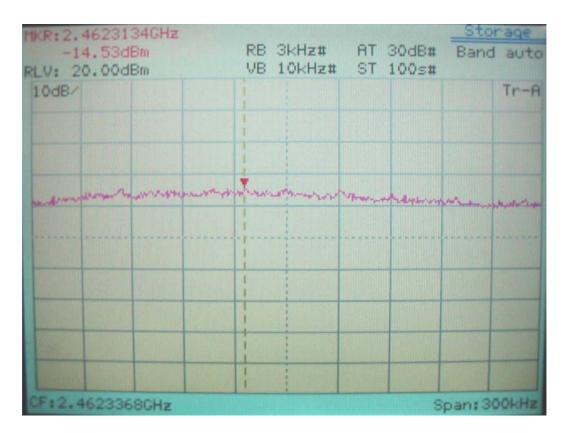


Ant #2

Test Report ----- 78/81

Power Spectral Density for IEEE 802.11n 20M Channel 11, 2462MHz

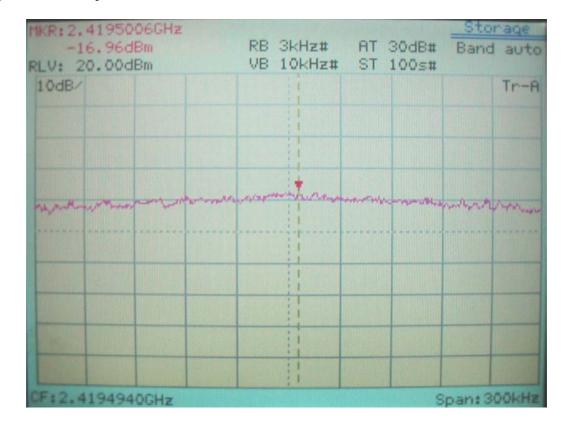


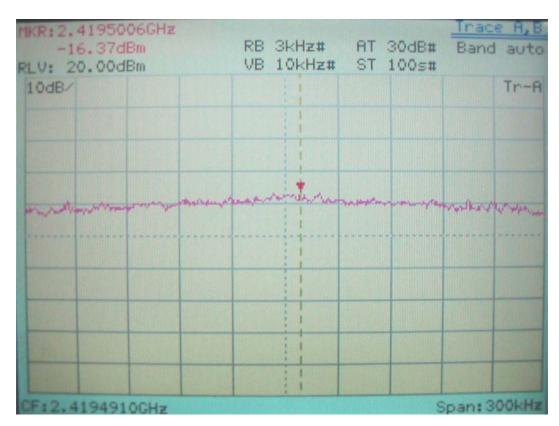


Ant #2

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Power Spectral Density for IEEE 802.11n 40M Channel 03, 2422MHz

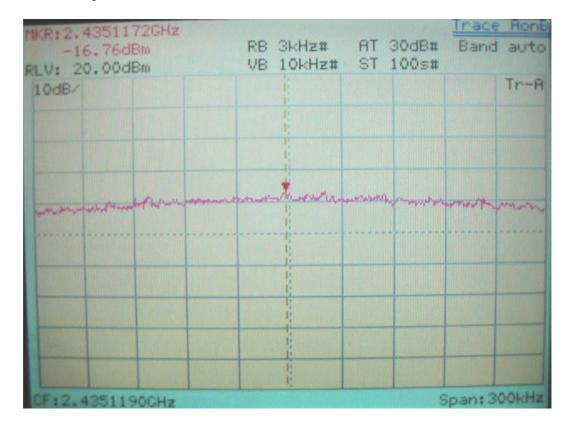




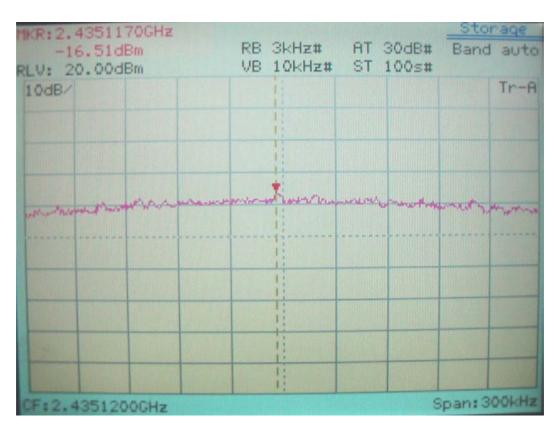
Ant #2

Test Report ----- 80/81

Power Spectral Density for IEEE 802.11n 40M Channel 06, 2437MHz

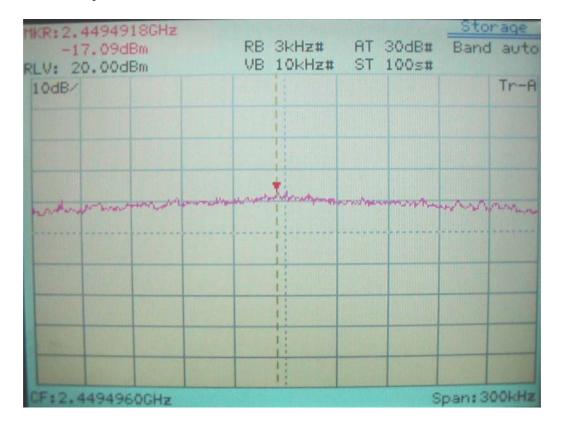


Ant #1



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Power Spectral Density for IEEE 802.11n 40M Channel 09, 2452MHz



Ant #1

