

FCC Test Report (Class II Permissive Change)

Product Name	802.11b/g/n 1T1R COMBO CARD
Model No	MT7630E
FCC ID.	RAS-MT7630E

Applicant	MediaTek Inc.
Address	No. 1, Dusing 1st Rd., Hsinchu Science Park, Hsinchu City 30078, Taiwan

Date of Receipt	Jun. 16, 2014
Issue Date	Jul. 08, 2014
Report No.	1460456R-RFUSP02V00
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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Test Report

Issue Date: Jul. 08, 2014

Report No.: 1460456R-RFUSP02V00



Product Name	802.11b/g/n 1T1R COMBO CARD
Applicant	MediaTek Inc.
Address	No. 1, Dusing 1st Rd., Hsinchu Science Park, Hsinchu City 30078, Taiwan
Manufacturer	MediaTek Inc.
Model No.	MT7630E
FCC ID.	RAS-MT7630E
EUT Rated Voltage	DC 3.3V (via Mini-PCI Express slot)
EUT Test Voltage	AC 120V/60Hz
Trade Name	MediaTek
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2014 ANSI C63.10: 2009, KDB 558074
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Joanne Lin)

Tested By :



(Engineer / Andy Lin)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	802.11b/g/n 1T1R COMBO CARD
Trade Name	MediaTek
Model No.	MT7630E
FCC ID.	RAS-MT7630E
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW, 2422-2452MHz for 802.11n-40BW
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 150Mbps
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto
Test Platform.(Notebook PC)	Brand Name: ASUS, M/N: TP300L
Power Adapter	MFR: PI (ASUS), M/N: AD883J20 Input: AC 100-240V, 50-60Hz, 1.0A Output: DC 19V, 2.37A Cable Out: Non-Shielded, 1.8m

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	INPAQ	WA-F-LBLB-04-024 (Main) WA-F-LBLB-04-024 (Aux)	PIFA	-0.94dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203.

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

802.11n-40MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 03:	2422 MHz	Channel 04:	2427 MHz	Channel 05:	2432 MHz	Channel 06:	2437 MHz
Channel 07:	2442 MHz	Channel 08:	2447 MHz	Channel 09:	2452 MHz		

Note:

1. This device is a 802.11b/g/n 1T1R COMBO CARD, Contains functions and so on WLAN 、Bluetooth , This report for WLAN.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps 、802.11g is 6Mbps 、802.11n(20M-BW) is 7.2Mbps 、802.11n(40M-BW) is 15Mbps).
4. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report.
5. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
6. This is to request a Class II permissive change for FCC ID: RAS-MT7630E, originally granted on 11/08/2013.

The major change filed under this application is:

Change #1: Additional Chassis added, Model number: TP300L

#2: In tablet mode,Reduce the Output Power through firmware
(only reduce Wi-Fi Power, bluetooth power haven't changes).

#3: Addition one new antenna, the antenna type is the same, the antenna gain is smaller than the original application.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
	Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

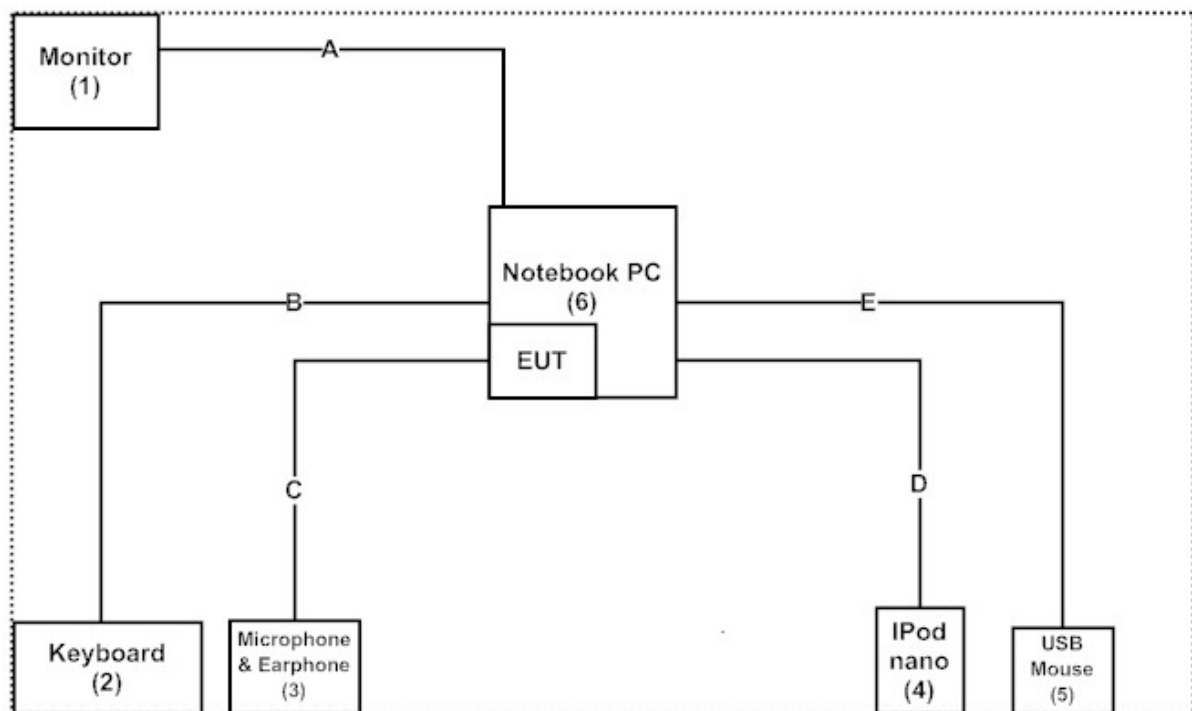
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Monitor	Dell	ST2320LF	CN-QM2NN672872-22I-C9WS	Non-Shielded, 1.8m
2	Keyboard	Logitech	Y-U0009	LZ027HU	N/A
3	Microphone & Earphone	PCHOME	N/A	N/A	N/A
4	iPod nano	Apple	A1199	YM709R18VQ5	N/A
5	USB Mouse	DELL	MOABBO	G0X00AXD	N/A
6	Notebook PC	ASUS	TP300L	N/A	N/A

Signal Cable Type	Signal cable Description
A HDMI Cable	Non-Shielded, 1.5m
B Keyboard Cable	Non-Shielded, 1.6m
C Microphone & Earphone Cable	Non-Shielded, 1.8m
D IPOD Cable	Non-Shielded, 1.2m
E Mouse Cable	Non-Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute software “MT76XXE QA (V2.0.3.0)” on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Site Name: Quietek Corporation
Site Address: No.5-22, Ruishukeng Linkou Dist., New Taipei City
24451, Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
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FCC Accreditation Number: TW1014

2. Peak Power Output

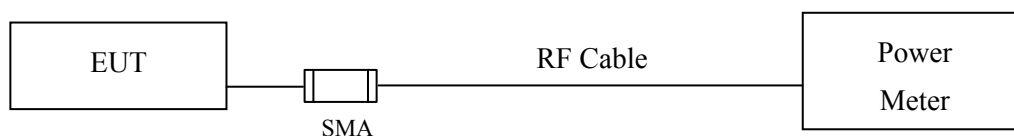
2.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2014
X	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2014
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2014
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2014
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2014

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

2.2. Test Setup



2.3. Limits

The maximum peak power shall be less 1 Watt.

2.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

2.5. Uncertainty

± 1.27 dB

2.6. Test Result of Peak Power Output

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	11.31	--	--	--	14.89	<30dBm	Pass
06	2437	11.37	11.27	11.19	11.09	14.93	<30dBm	Pass
11	2462	11.49	--	--	--	15.08	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	11.11	--	--	--	--	--	--	--	20.39	<30dBm	Pass
06	2437	11.16	11.09	10.98	10.87	10.75	10.68	10.61	10.52	20.45	<30dBm	Pass
11	2462	11.34	--	--	--	--	--	--	--	20.93	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2			
		Measurement Level (dBm)										
01	2412	11.29	--	--	--	--	--	--	--	20.47	<30dBm	Pass
06	2437	11.09	10.92	10.87	10.81	10.72	10.65	10.53	10.44	19.47	<30dBm	Pass
11	2462	11.31	--	--	--	--	--	--	--	20.01	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		15	30	45	60	90	120	135	150	15		
		Measurement Level (dBm)										
03	2422	10.78	--	--	--	--	--	--	--	19.43	<30dBm	Pass
06	2437	11.29	11.21	11.17	11.09	10.93	10.84	10.74	10.67	19.98	<30dBm	Pass
09	2452	11.05	--	--	--	--	--	--	--	19.68	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

3. Radiated Emission

3.1. Test Equipment

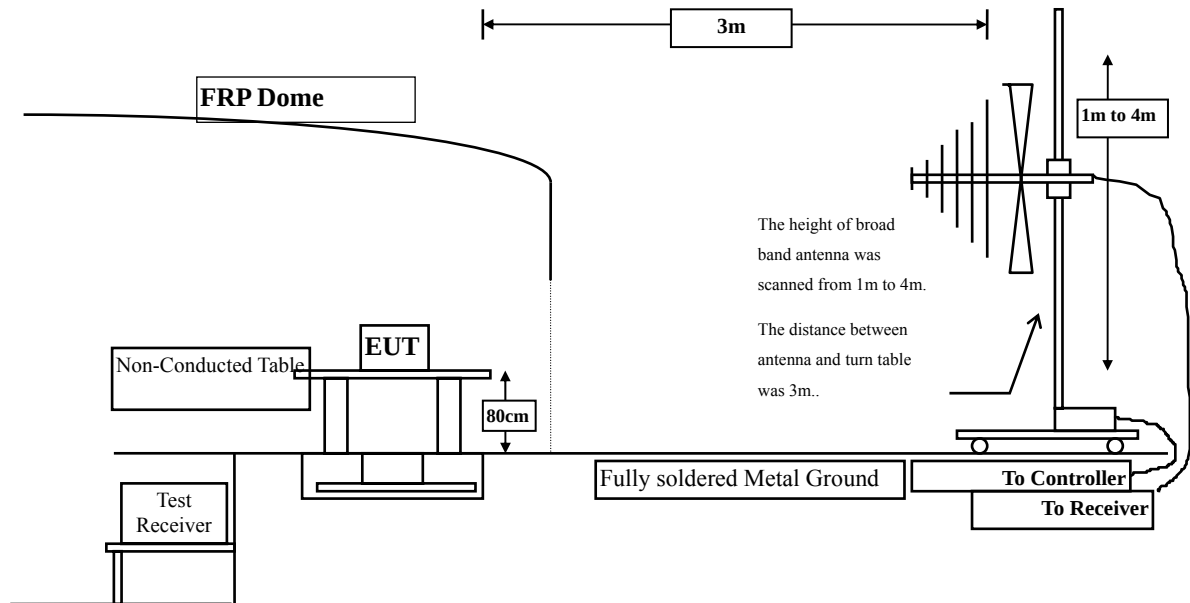
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2014
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2014
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2014
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2013
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar., 2014
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2014
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2014
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

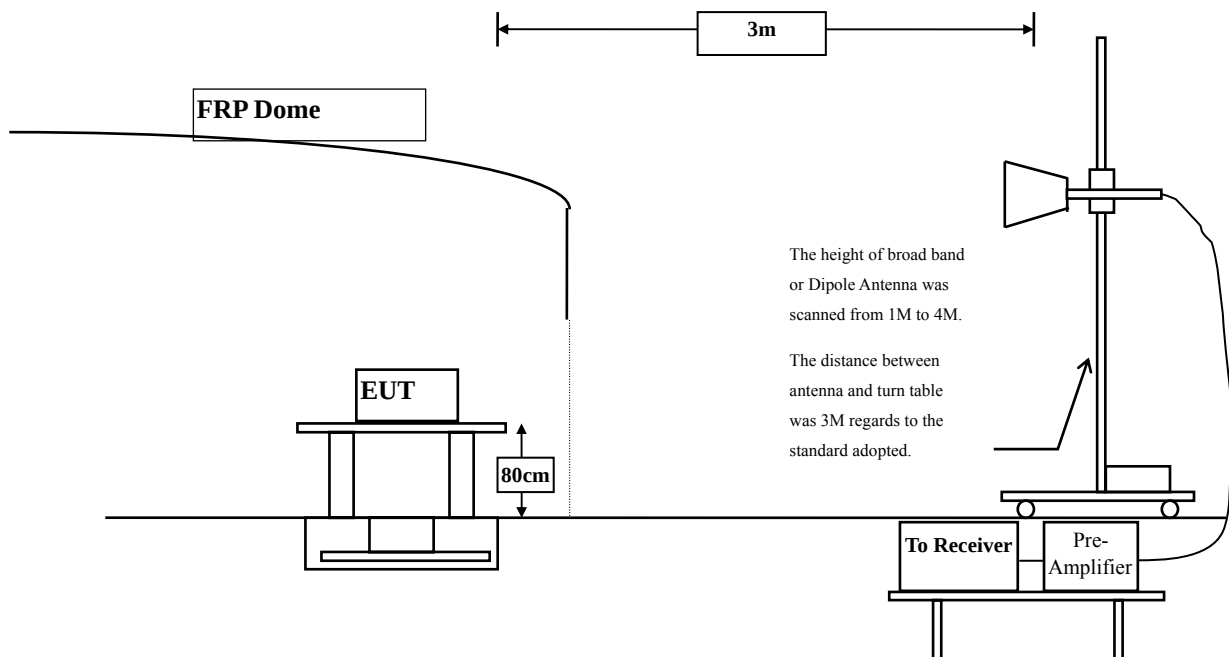
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: E field strength (dBμV/m) = 20 log E field strength (uV/m)

3.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10, 2009 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The frequency range from 9kHz to 10th harmonics is checked.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : 802.11b/g/n 1T1R COMBO CARD
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4824.000	2.428	43.800	46.229	-27.771	74.000
7236.000	9.177	39.300	48.477	-25.523	74.000
9648.000	10.019	39.540	49.560	-24.440	74.000

Average Detector:

--

Vertical

Peak Detector:

4824.000	2.836	42.160	44.997	-29.003	74.000
7236.000	9.676	39.560	49.236	-24.764	74.000
9648.000	10.556	40.000	50.557	-23.443	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m

Horizontal

Peak Detector:

4874.000	2.076	43.780	45.857	-28.143	74.000
7311.000	9.512	39.260	48.772	-25.228	74.000
9748.000	9.630	39.530	49.160	-24.840	74.000

Average Detector:

--

Vertical

Peak Detector:

4874.000	2.532	44.280	46.812	-27.188	74.000
7311.000	10.089	39.800	49.889	-24.111	74.000
9748.000	10.266	39.900	50.167	-23.833	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4924.000	2.191	44.100	46.291	-27.709	74.000
7386.000	10.373	39.200	49.574	-24.426	74.000
9848.000	9.964	39.870	49.834	-24.166	74.000

Average Detector:

--

Vertical

Peak Detector:

4924.000	2.805	44.260	47.065	-26.935	74.000
7386.000	11.180	40.100	51.280	-22.720	74.000
9848.000	10.801	40.410	51.211	-22.789	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4824.000	2.428	43.650	46.079	-27.921	74.000
7236.000	9.177	40.180	49.357	-24.643	74.000
9648.000	10.019	39.840	49.860	-24.140	74.000

Average Detector:

--

Vertical

Peak Detector:

4824.000	2.836	42.470	45.307	-28.693	74.000
7236.000	9.676	39.800	49.476	-24.524	74.000
9648.000	10.556	40.120	50.677	-23.323	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m

Horizontal

Peak Detector:

4874.000	2.076	44.950	47.027	-26.973	74.000
7311.000	9.512	39.150	48.662	-25.338	74.000
9748.000	9.630	40.200	49.830	-24.170	74.000

Average Detector:

--

Peak Detector:

4874.000	2.532	42.690	45.222	-28.778	74.000
7311.000	10.089	40.280	50.369	-23.631	74.000
9748.000	10.266	40.390	50.657	-23.343	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4924.000	2.191	44.880	47.071	-26.929	74.000
7386.000	10.373	39.620	49.994	-24.006	74.000
9848.000	9.964	40.110	50.074	-23.926	74.000

Average Detector:

--

Vertical

Peak Detector:

4924.000	2.805	43.660	46.465	-27.535	74.000
7386.000	11.180	39.910	51.090	-22.910	74.000
9848.000	10.801	40.350	51.151	-22.849	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4824.000	2.428	45.190	47.619	-26.381	74.000
7236.000	9.177	40.520	49.697	-24.303	74.000
9648.000	10.019	41.330	51.350	-22.650	74.000

Average Detector:

--

Vertical

Peak Detector:

4824.000	2.836	43.260	46.097	-27.903	74.000
7236.000	9.676	40.790	50.466	-23.534	74.000
9648.000	10.556	41.120	51.677	-22.323	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m

Horizontal

Peak Detector:

4874.000	2.076	43.610	45.687	-28.313	74.000
7311.000	9.512	39.670	49.182	-24.818	74.000
9748.000	9.630	40.590	50.220	-23.780	74.000

Average Detector:

--

Vertical

Peak Detector:

4874.000	2.532	43.920	46.452	-27.548	74.000
7311.000	10.089	39.220	49.309	-24.691	74.000
9748.000	10.266	40.160	50.427	-23.573	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m

Horizontal

Peak Detector:

4924.000	2.191	43.810	46.001	-27.999	74.000
7386.000	10.373	39.190	49.564	-24.436	74.000
9848.000	9.964	39.890	49.854	-24.146	74.000

Average Detector:

--

Vertical

Peak Detector:

4924.000	2.805	43.970	46.775	-27.225	74.000
7386.000	11.180	39.430	50.610	-23.390	74.000
9848.000	10.801	40.620	51.421	-22.579	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2422MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4844.000	2.280	43.410	45.691	-28.309	74.000
7266.000	9.106	39.790	48.896	-25.104	74.000
9688.000	9.663	39.500	49.163	-24.837	74.000

Average Detector:

--

Vertical

Peak Detector:

4844.000	2.707	43.420	46.128	-27.872	74.000
7266.000	9.626	41.520	51.146	-22.854	74.000
9688.000	10.284	40.630	50.914	-23.086	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V/m	dB	dB μ V/m

Horizontal

Peak Detector:

4844.000	2.280	44.440	46.721	-27.279	74.000
7266.000	9.106	40.420	49.526	-24.474	74.000
9688.000	9.663	40.760	50.423	-23.577	74.000

Average Detector:

--

Vertical

Peak Detector:

4844.000	2.707	43.890	46.598	-27.402	74.000
7266.000	9.626	40.940	50.566	-23.434	74.000
9688.000	10.284	39.810	50.094	-23.906	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2452 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m

Horizontal

Peak Detector:

4904.000	2.000	43.460	45.461	-28.539	74.000
7356.000	10.308	39.830	50.138	-23.862	74.000
9808.000	9.850	39.480	49.330	-24.670	74.000

Average Detector:

--

Vertical

Peak Detector:

4904.000	2.513	44.280	46.794	-27.206	74.000
7356.000	11.022	39.040	50.062	-23.938	74.000
9808.000	10.512	38.700	49.212	-24.788	74.000

Average Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
39.700	-3.625	29.380	25.755	-14.245	40.000
128.940	-7.390	27.580	20.190	-19.810	40.000
255.040	-5.409	32.207	26.798	-20.202	47.000
344.280	-1.814	32.629	30.815	-16.185	47.000
584.840	3.251	32.852	36.103	-10.897	47.000
904.940	6.009	25.590	31.599	-15.401	47.000
Vertical					
30.000	-3.010	38.551	35.541	-4.459	40.000
119.240	-3.571	28.193	24.623	-15.377	40.000
255.040	-5.089	30.413	25.324	-21.676	47.000
373.380	0.043	30.044	30.087	-16.913	47.000
532.460	1.209	24.727	25.936	-21.064	47.000
947.620	3.231	27.762	30.993	-16.007	47.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
253.100	-5.669	32.504	26.835	-20.165	47.000
474.260	2.294	30.535	32.829	-14.171	47.000
579.020	3.421	30.610	34.031	-12.969	47.000
592.600	3.437	29.649	33.086	-13.914	47.000
827.340	7.361	24.323	31.684	-15.316	47.000
881.660	6.789	25.912	32.701	-14.299	47.000
988.360	7.541	26.364	33.905	-20.095	54.000
Vertical					
30.000	-3.010	37.784	34.774	-5.226	40.000
278.320	-6.092	31.023	24.931	-22.069	47.000
379.200	0.881	24.717	25.598	-21.402	47.000
524.700	1.130	24.804	25.934	-21.066	47.000
685.720	2.254	24.021	26.275	-20.725	47.000
941.800	3.460	26.847	30.307	-16.693	47.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
39.700	-3.625	29.794	26.169	-13.831	40.000
123.120	-7.320	25.430	18.110	-21.890	40.000
253.100	-5.669	33.789	28.120	-18.880	47.000
398.600	0.879	32.282	33.161	-13.839	47.000
580.960	3.466	32.600	36.066	-10.934	47.000
877.780	6.207	26.530	32.737	-14.263	47.000
Vertical					
45.520	-10.625	43.249	32.624	-7.376	40.000
103.720	-5.090	36.641	31.550	-8.450	40.000
284.140	-5.517	32.749	27.232	-19.768	47.000
542.160	1.855	23.996	25.851	-21.149	47.000
796.300	2.639	26.036	28.675	-18.325	47.000
945.680	3.300	27.974	31.274	-15.726	47.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
39.700	-3.625	29.111	25.486	-14.514	40.000
101.780	-9.100	30.231	21.130	-18.870	40.000
262.800	-5.484	31.970	26.486	-20.514	47.000
367.560	0.592	26.582	27.173	-19.827	47.000
580.960	3.466	30.960	34.426	-12.574	47.000
885.540	6.542	28.522	35.064	-11.936	47.000
Vertical					
45.520	-10.625	43.418	32.793	-7.207	40.000
251.160	-4.958	31.615	26.657	-20.343	47.000
379.200	0.881	25.991	26.872	-20.128	47.000
540.220	2.169	23.451	25.620	-21.380	47.000
679.900	1.223	23.789	25.012	-21.988	47.000
937.920	3.110	30.422	33.532	-13.468	47.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

4. Band Edge

4.1. Test Equipment

RF Radiated Measurement:

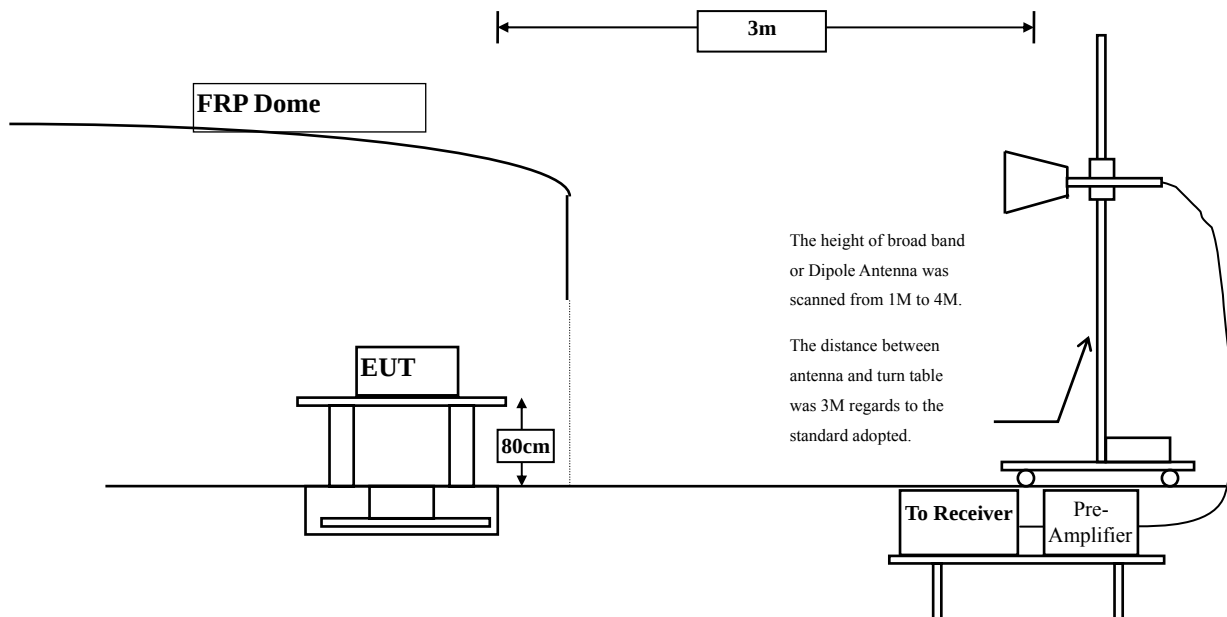
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2014
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2014
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2014
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

RF Radiated Measurement:



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

4.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10, 2009 on radiated measurement.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Band Edge

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	11.672	47.769	59.441	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	60.587	72.289	--	--	Pass
01 (Peak)	2410.900	11.740	97.872	109.612	--	--	Pass
01 (Average)	2390.000	11.672	36.709	48.381	74.00	54.00	Pass
01 (Average)	2400.000	11.703	54.398	66.100	--	--	Pass
01 (Average)	2411.200	11.740	95.255	106.995	--	--	Pass

Figure Channel 01: Horizontal (Peak)

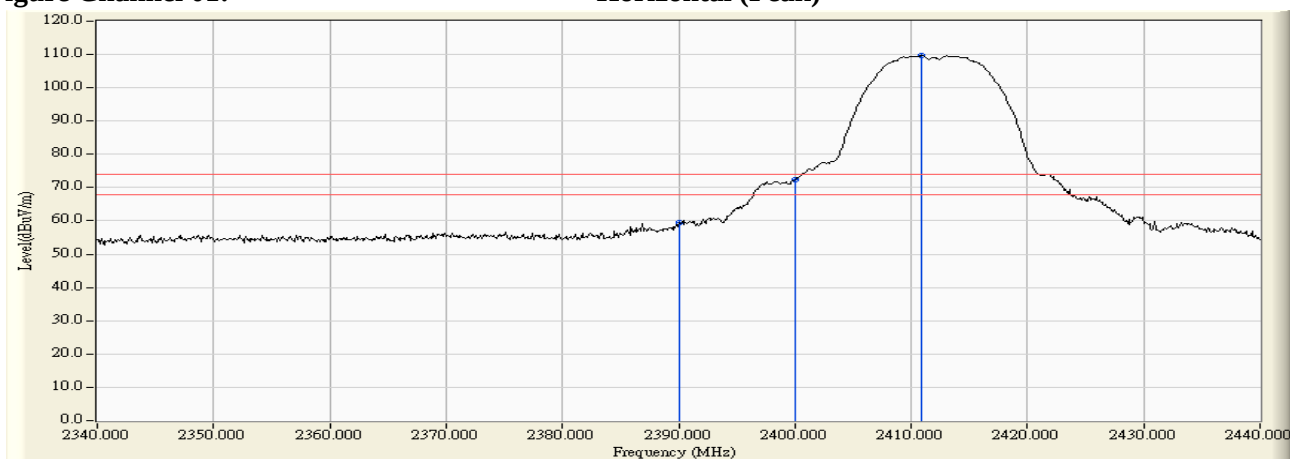
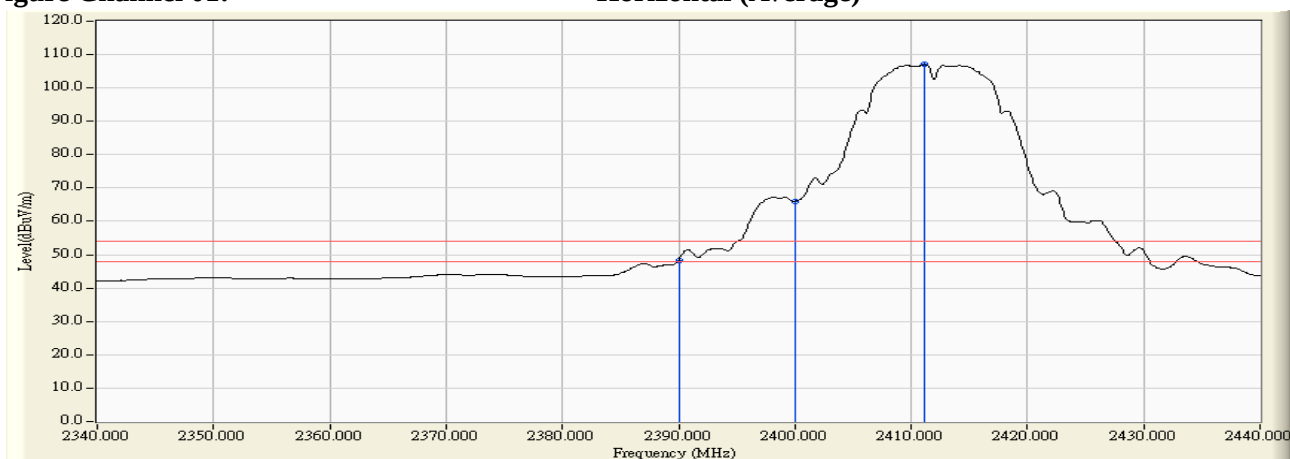


Figure Channel 01: Horizontal (Average)



- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	11.672	41.503	53.175	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	44.940	56.642	--	--	Pass
01 (Peak)	2411.000	11.740	82.028	93.768	--	--	Pass
01 (Average)	2390.000	11.672	29.074	40.746	74.00	54.00	Pass
01 (Average)	2400.000	11.703	33.797	45.499	--	--	Pass
01 (Average)	2411.200	11.740	79.362	91.102	--	--	Pass

Figure Channel 01: Vertical (Peak)

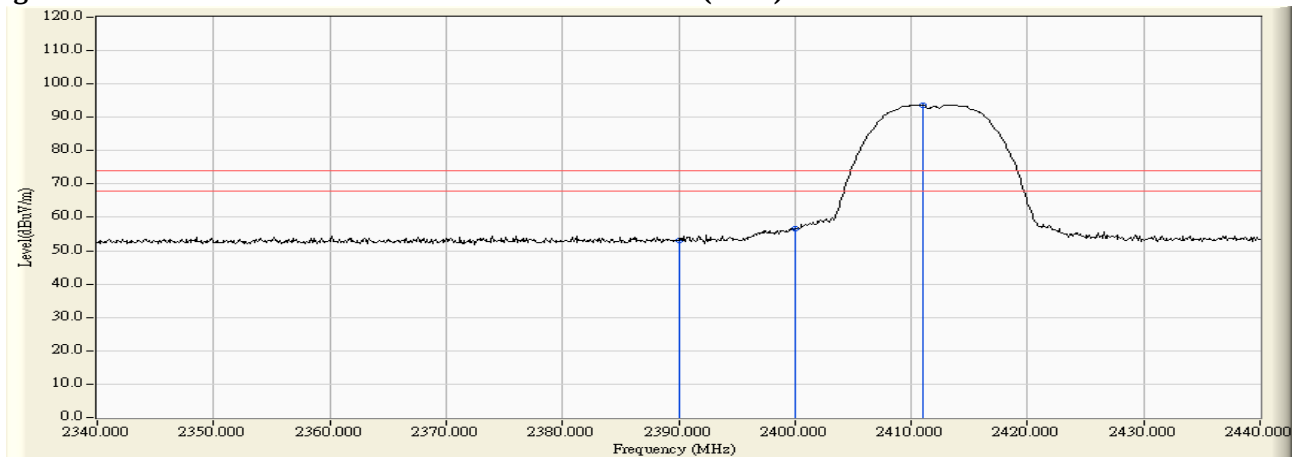
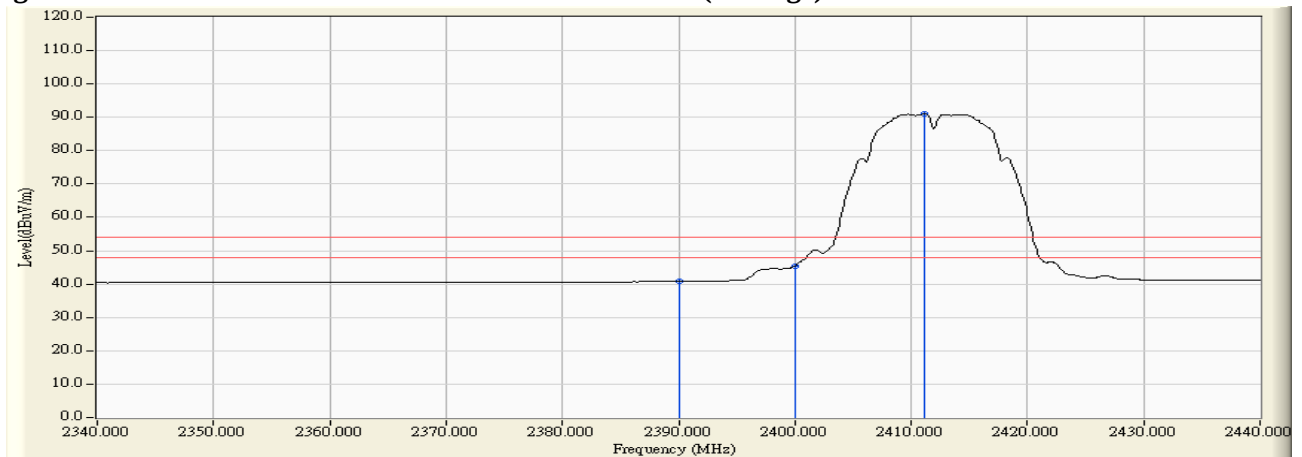


Figure Channel 01: Vertical (Average)



- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2460.900	11.781	92.572	104.353	--	--	Pass
11 (Peak)	2483.500	12.049	42.573	54.622	74.00	54.00	Pass
11 (Average)	2461.200	11.786	89.873	101.659	--	--	Pass
11 (Average)	2483.500	12.049	30.402	42.451	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

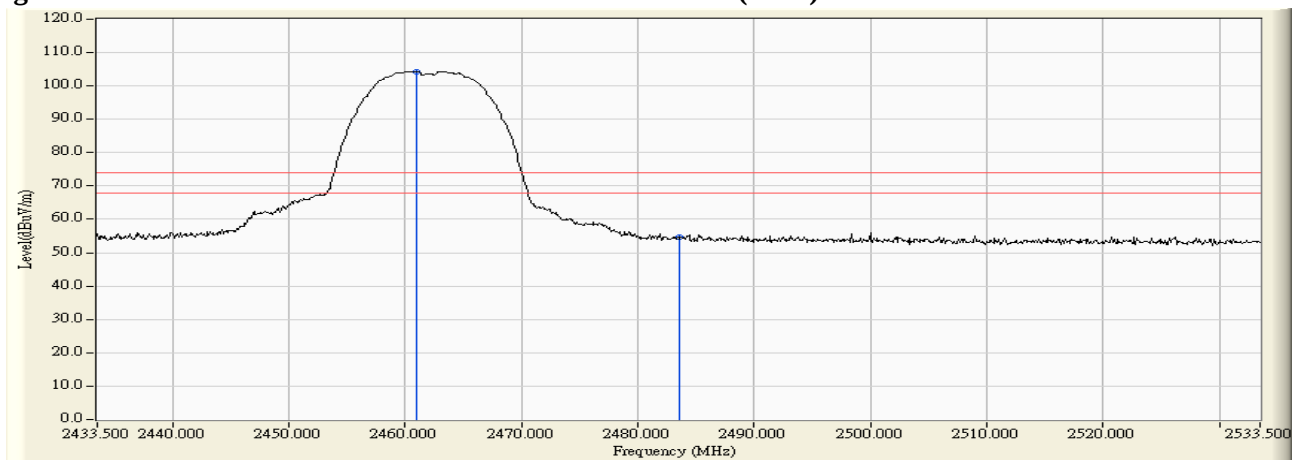
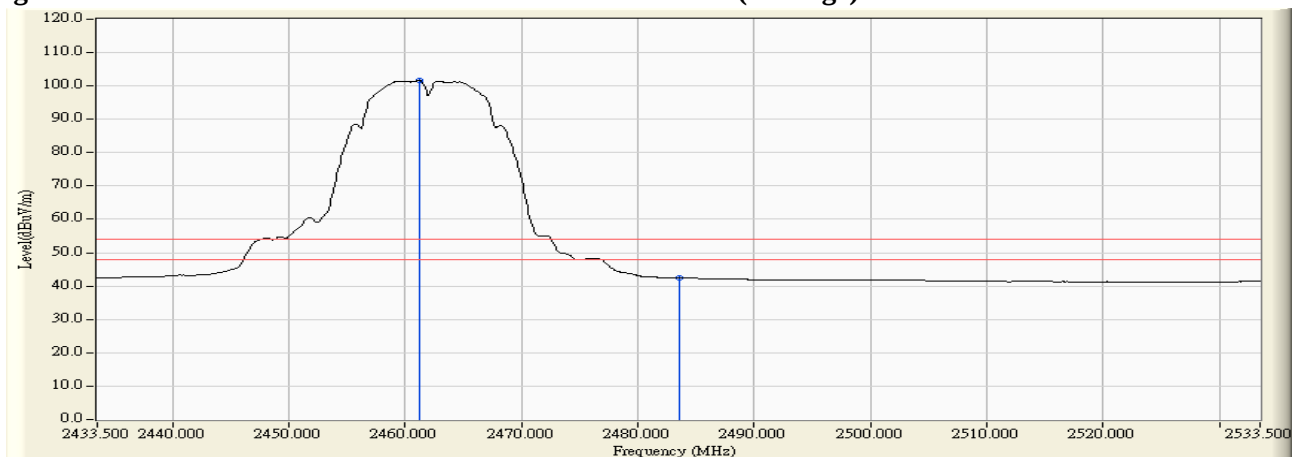


Figure Channel 11: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2460.900	11.781	83.120	94.901	--	--	Pass
11 (Peak)	2483.500	12.049	40.770	52.819	74.00	54.00	Pass
11 (Average)	2461.200	11.786	80.359	92.145	--	--	Pass
11 (Average)	2483.500	12.049	29.325	41.374	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

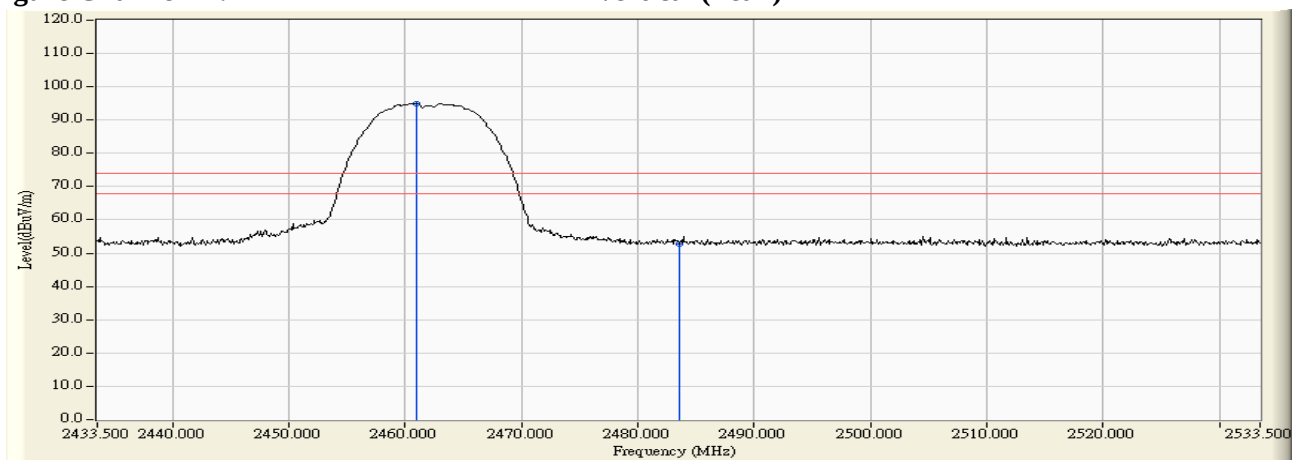
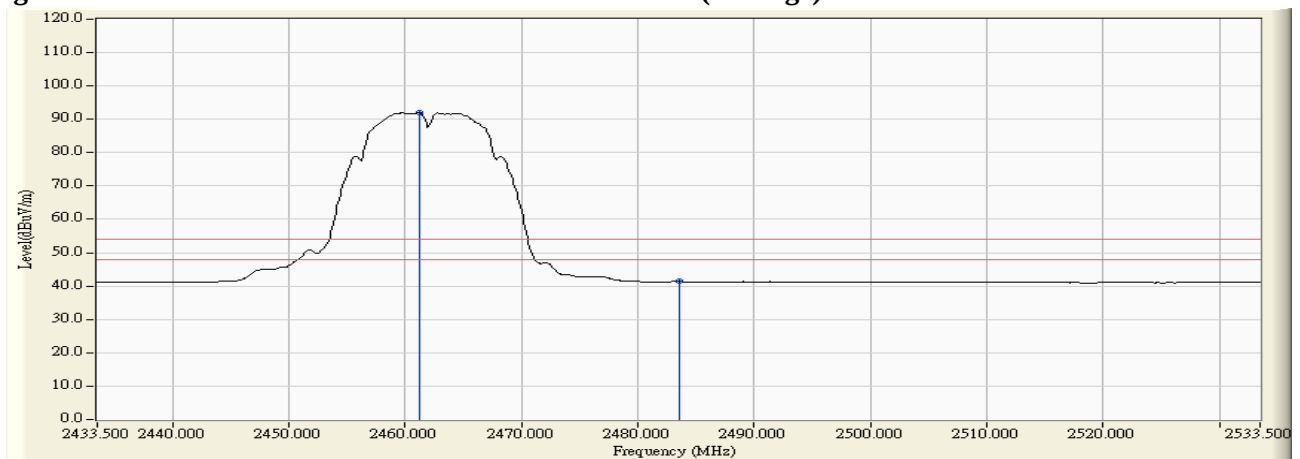


Figure Channel 11: Vertical (Average)



- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	11.672	56.264	67.936	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	65.258	76.960	--	--	Pass
01 (Peak)	2410.800	11.740	95.076	106.815	--	--	Pass
01(Average)	2390.000	11.672	37.943	49.615	74.00	54.00	Pass
01(Average)	2400.000	11.703	51.696	63.398	--	--	Pass
01(Average)	2410.500	11.738	86.604	98.342	--	--	Pass

Figure Channel 01: Horizontal (Peak)

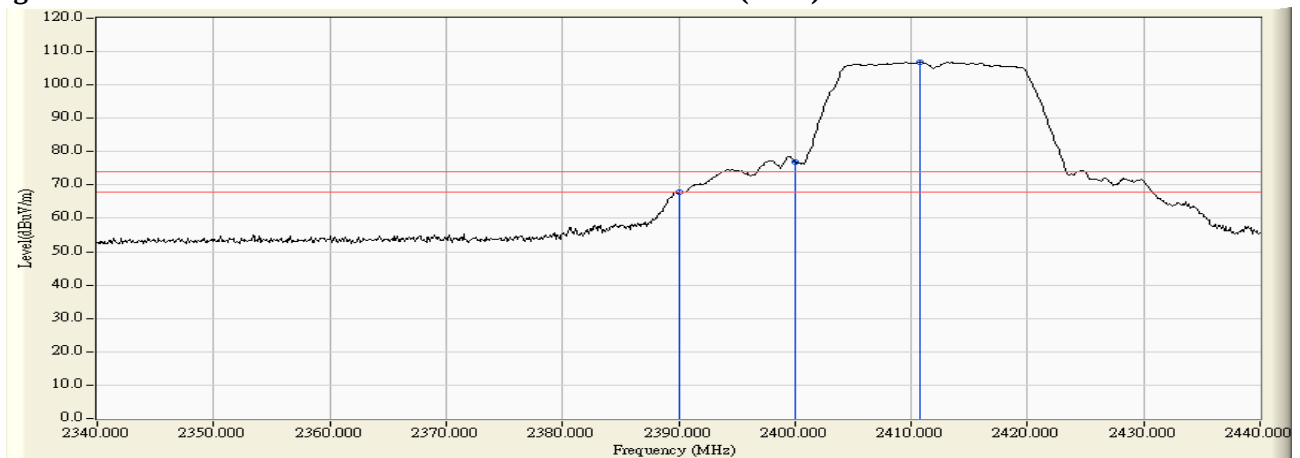
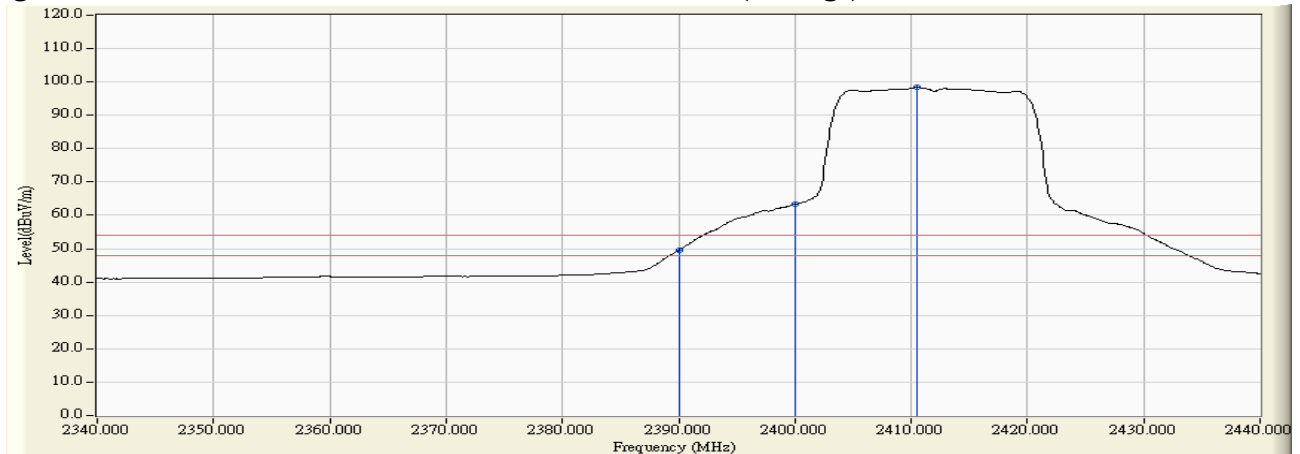


Figure Channel 01: Horizontal (Average)



- Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	11.672	46.023	57.695	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	53.167	64.869	--	--	Pass
01 (Peak)	2413.400	11.746	83.383	95.128	--	--	Pass
01 (Average)	2390.000	11.672	31.019	42.691	74.00	54.00	Pass
01 (Average)	2400.000	11.703	40.303	52.005	--	--	Pass
01 (Average)	2410.700	11.739	74.738	86.477	--	--	Pass

Figure Channel 01: Vertical (Peak)

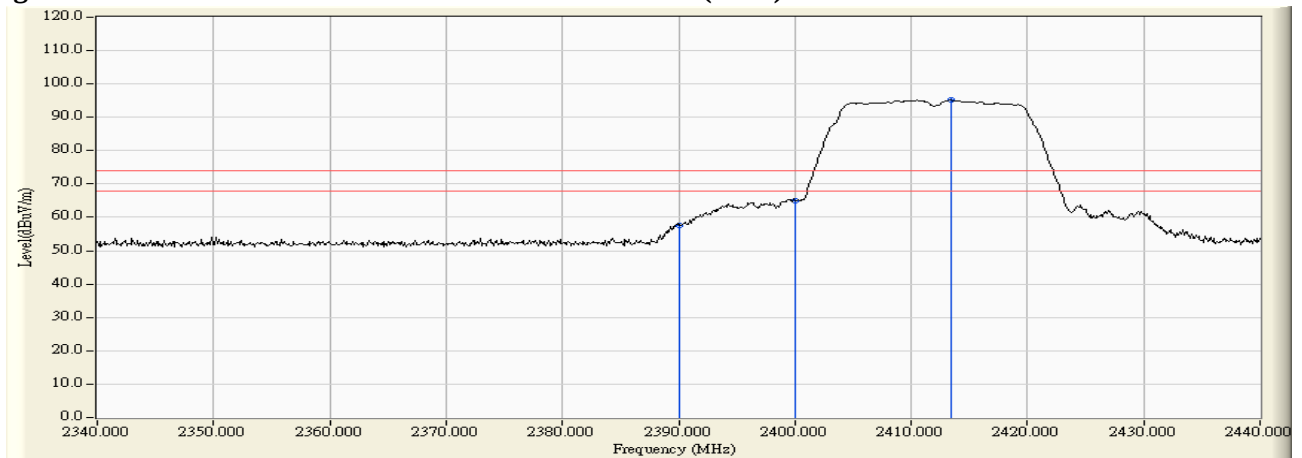
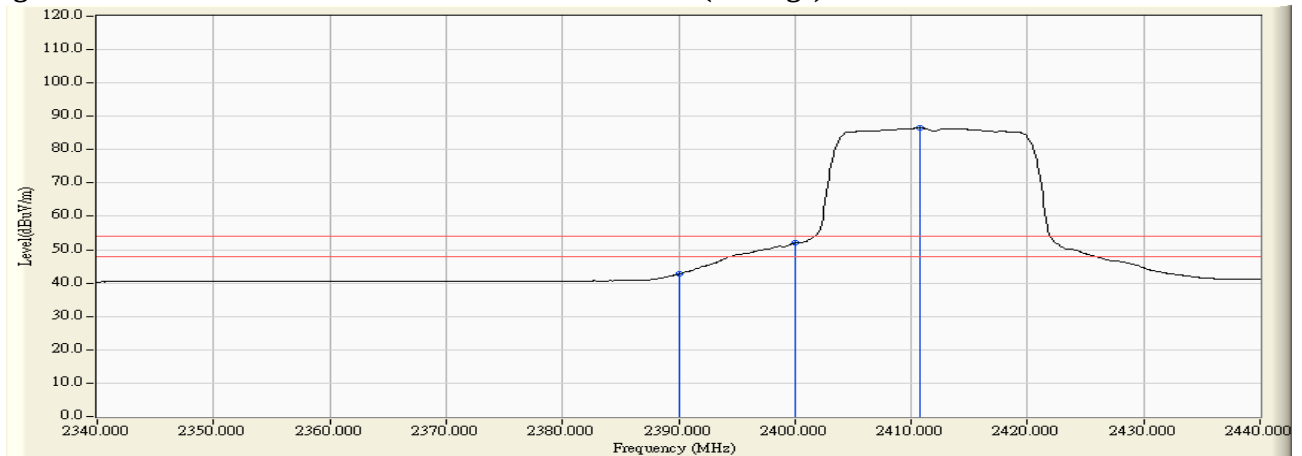


Figure Channel 01: Vertical (Average)



- Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2460.700	11.779	94.259	106.038	--	--	Pass
11 (Peak)	2483.500	12.049	48.375	60.424	74.00	54.00	Pass
11 (Peak)	2484.600	12.058	48.697	60.755	74.00	54.00	Pass
11 (Average)	2460.200	11.771	85.757	97.528	--	--	Pass
11 (Average)	2483.500	12.049	34.598	46.647	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

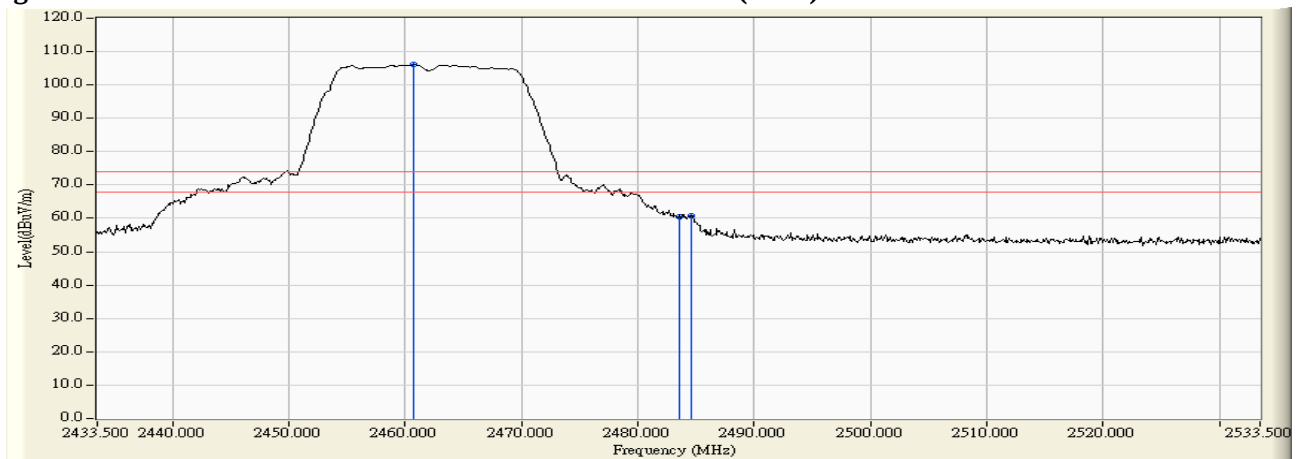
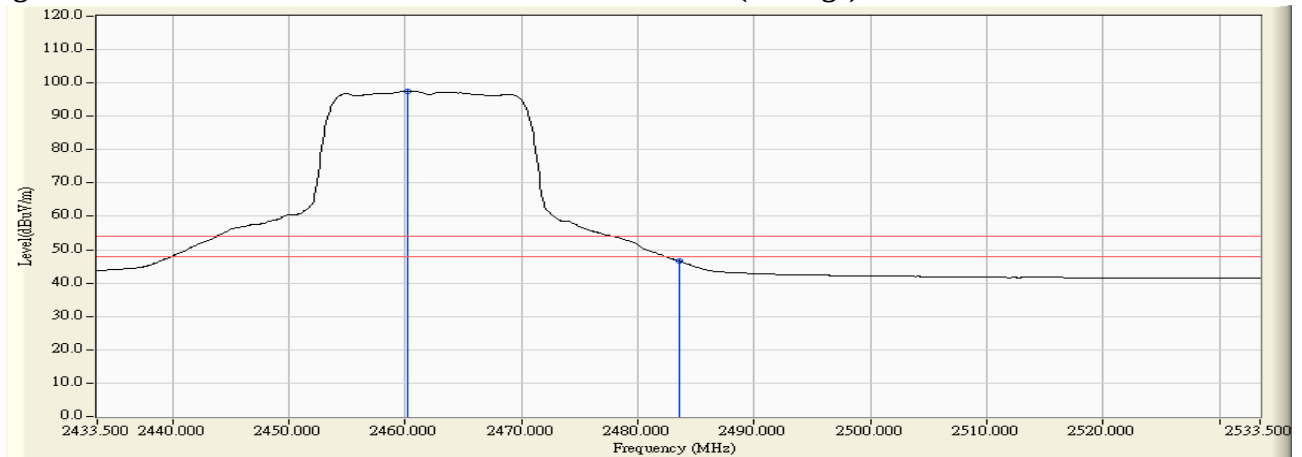


Figure Channel 11: Horizontal (Average)



- Note: 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
 4. “ * ”, means this data is the worst emission level.
 5. Measurement Level = Reading Level + Correct Factor.
 6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2463.400	11.818	84.767	96.585	--	--	Pass
11 (Peak)	2483.500	12.049	43.102	55.151	74.00	54.00	Pass
11 (Average)	2460.900	11.781	76.077	87.858	--	--	Pass
11 (Average)	2483.500	12.049	30.674	42.723	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

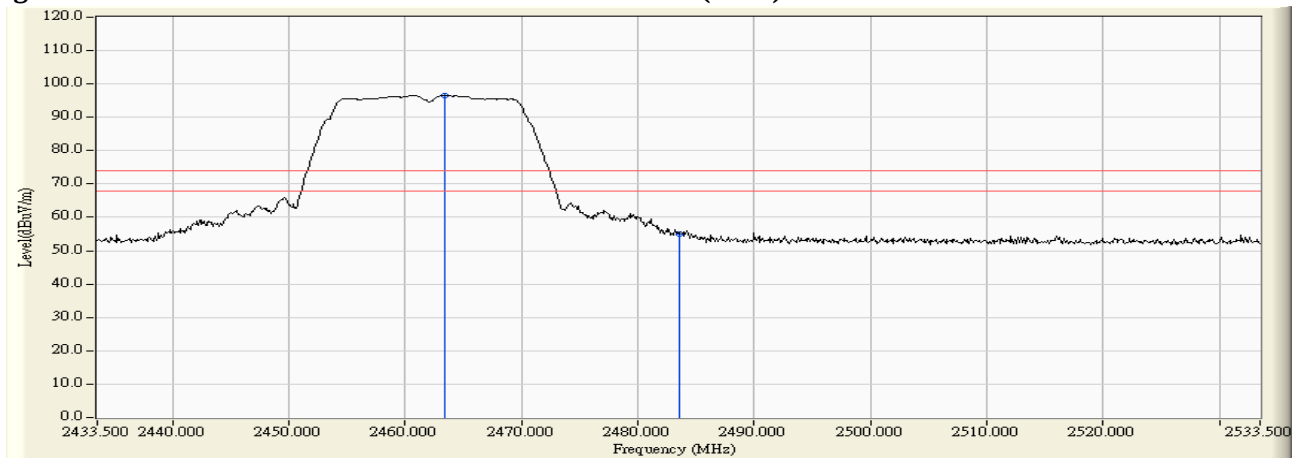
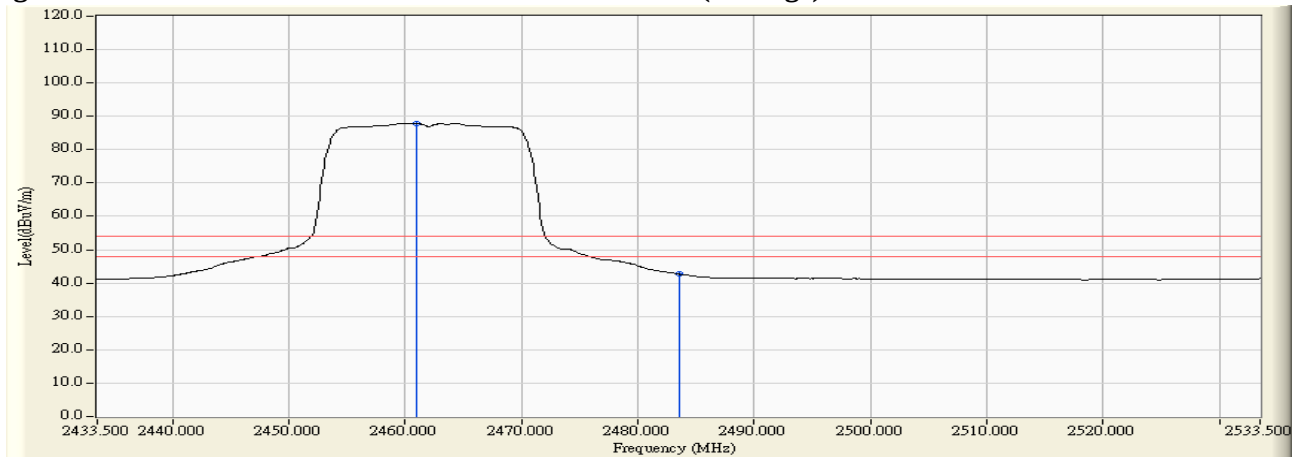


Figure Channel 11: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	11.672	61.114	72.786	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	65.345	77.047	--	--	Pass
01 (Peak)	2410.800	11.740	94.969	106.708	--	--	Pass
01 (Average)	2390.000	11.672	40.426	52.098	74.00	54.00	Pass
01 (Average)	2400.000	11.703	51.582	63.284	--	--	Pass
01 (Average)	2410.400	11.738	85.895	97.633	--	--	Pass

Figure Channel 01: Horizontal (Peak)

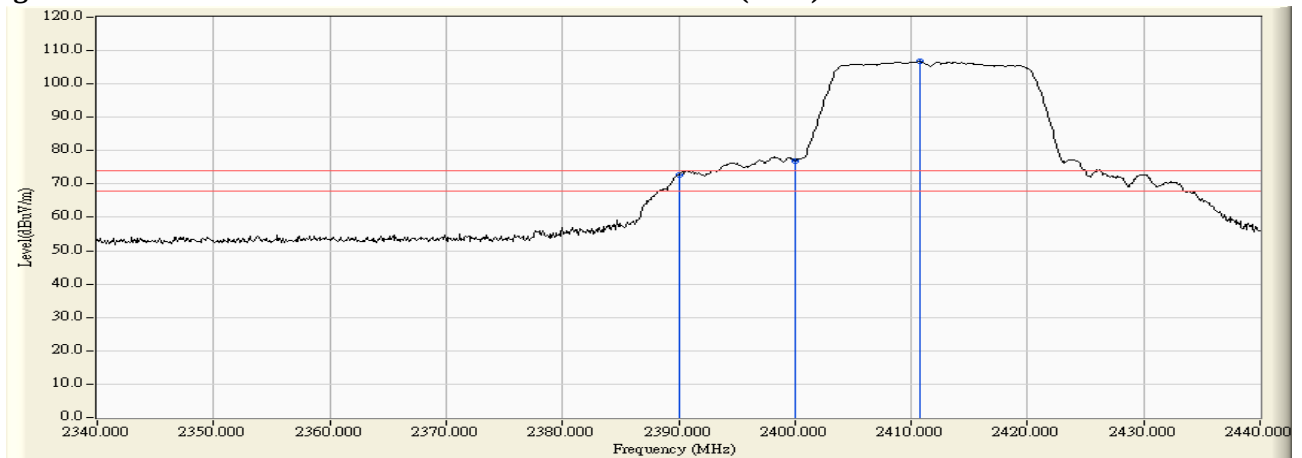
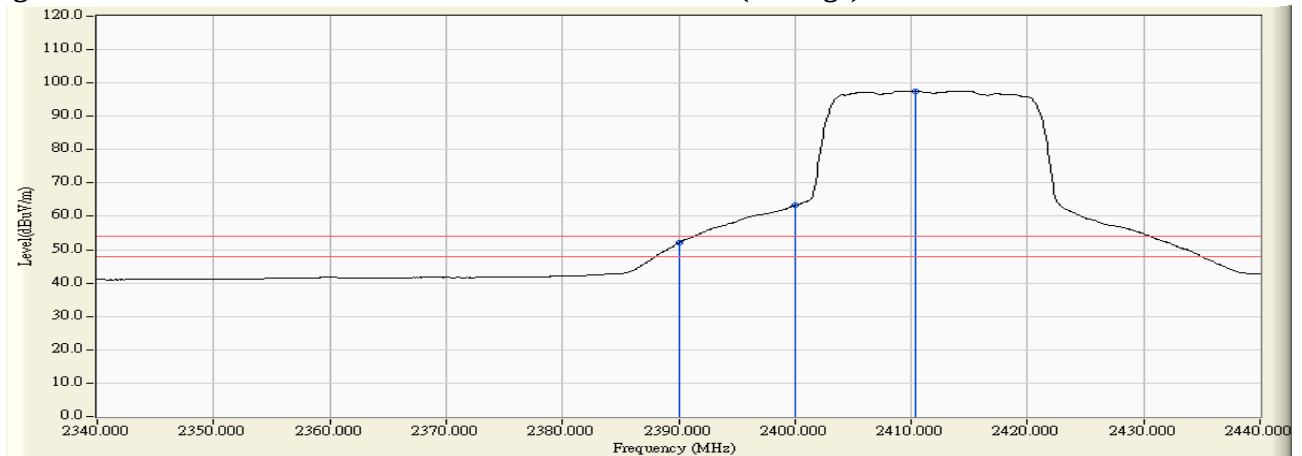


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2390.000	11.672	51.209	62.881	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	53.641	65.343	--	--	Pass
01 (Peak)	2408.900	11.733	83.352	95.085	--	--	Pass
01 (Average)	2390.000	11.672	32.212	43.884	74.00	54.00	Pass
01 (Average)	2400.000	11.703	39.925	51.627	--	--	Pass
01 (Average)	2413.600	11.746	74.156	85.902	--	--	Pass

Figure Channel 01: Vertical (Peak)

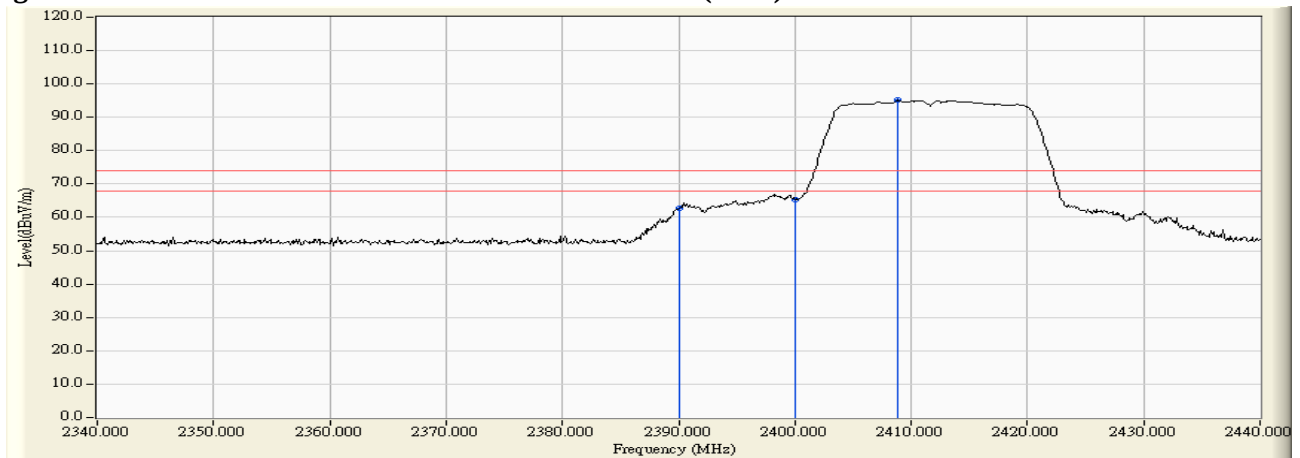
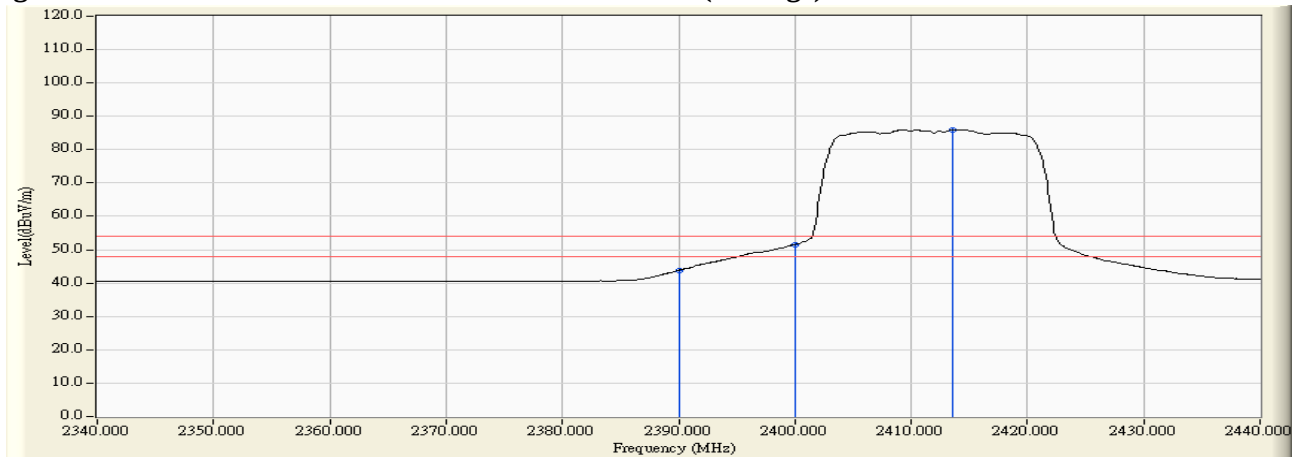


Figure Channel 01: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2460.700	11.779	94.320	106.099	--	--	Pass
11 (Peak)	2483.500	12.049	52.508	64.557	74.00	54.00	Pass
11 (Average)	2460.500	11.775	85.046	96.822	--	--	Pass
11 (Average)	2483.500	12.049	35.614	47.663	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

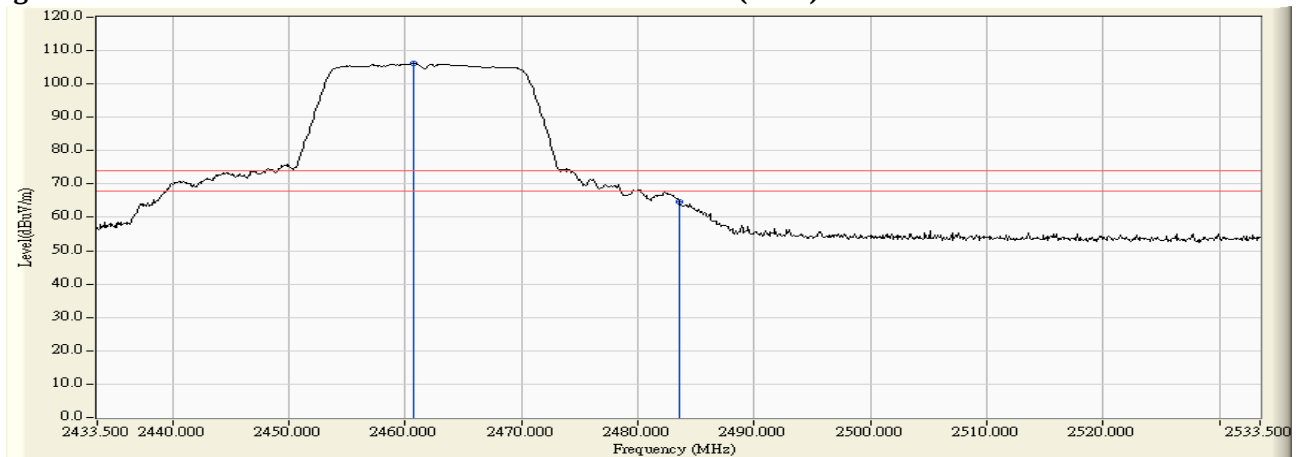
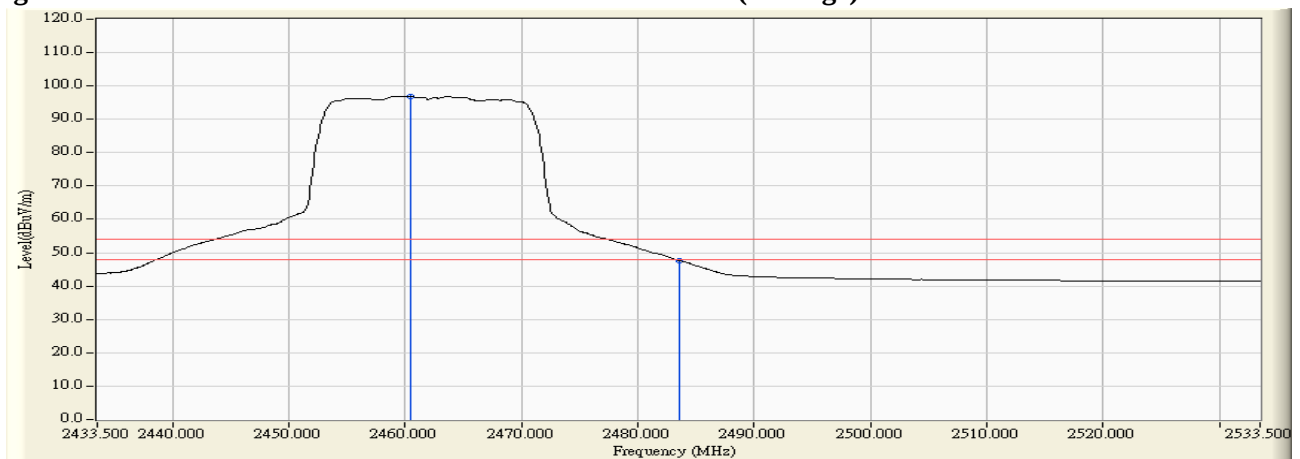


Figure Channel 11: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
11 (Peak)	2458.900	11.753	84.671	96.423	--	--	Pass
11 (Peak)	2483.500	12.049	45.851	57.900	74.00	54.00	Pass
11 (Average)	2460.500	11.775	75.572	87.348	--	--	Pass
11 (Average)	2483.500	12.049	31.214	43.263	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

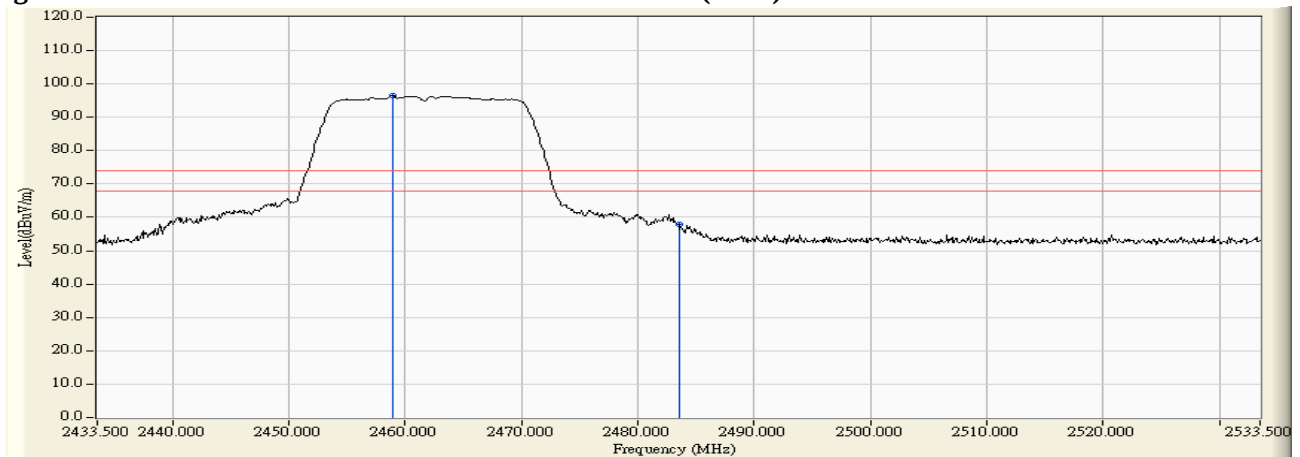
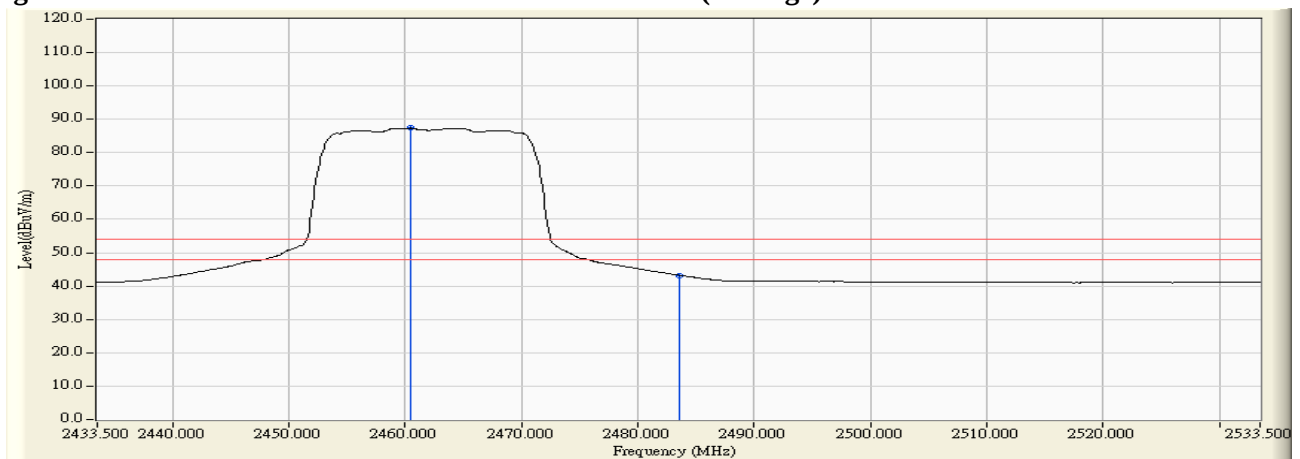


Figure Channel 11: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2422MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2388.700	11.669	58.283	69.952	74.00	54.00	Pass
01 (Peak)	2390.000	11.672	54.561	66.233	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	60.504	72.206	--	--	Pass
01 (Peak)	2419.700	11.760	91.897	103.657	--	--	Pass
01 (Average)	2390.000	11.672	42.137	53.809	74.00	54.00	Pass
01 (Average)	2400.000	11.703	48.721	60.423	--	--	Pass
01 (Average)	2416.600	11.753	82.533	94.286	--	--	Pass

Figure Channel 01:

Horizontal (Peak)

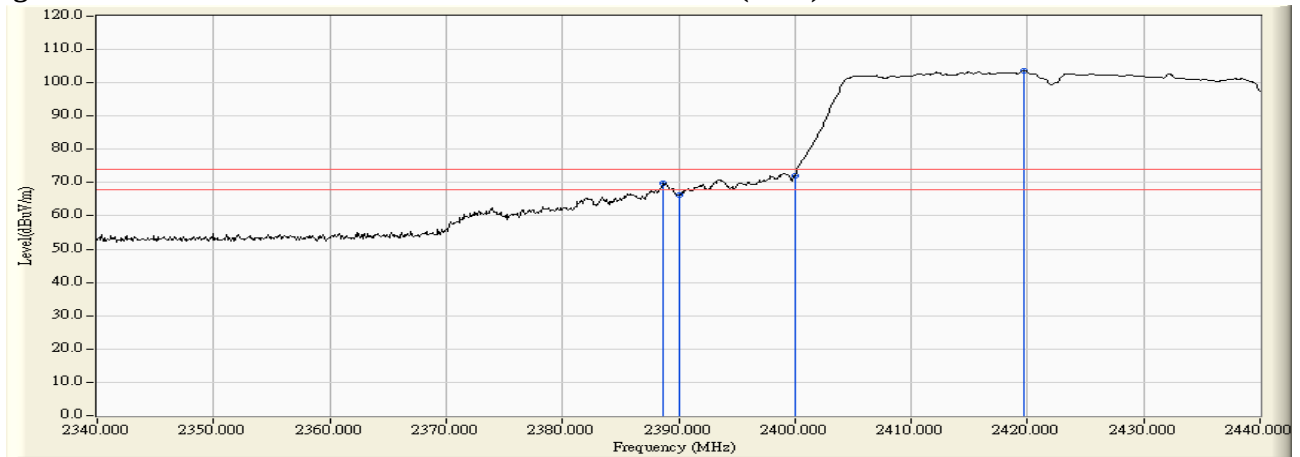
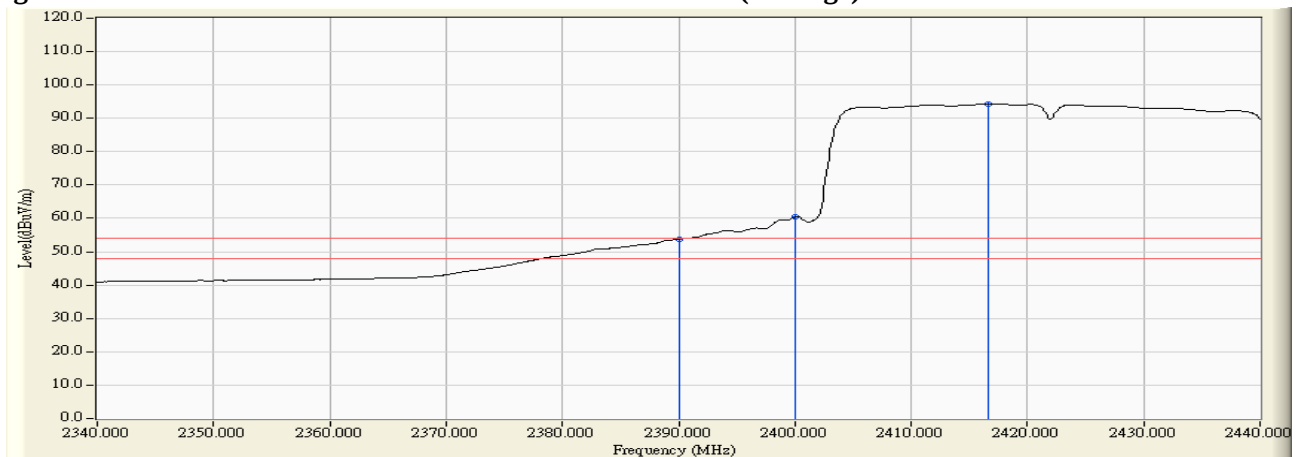


Figure Channel 01:

Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2422MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
01 (Peak)	2389.000	11.669	48.133	59.803	74.00	54.00	Pass
01 (Peak)	2390.000	11.672	44.591	56.263	74.00	54.00	Pass
01 (Peak)	2400.000	11.703	48.600	60.302	--	--	Pass
01 (Peak)	2419.700	11.760	79.941	91.701	--	--	Pass
01 (Average)	2390.000	11.672	32.922	44.594	74.00	54.00	Pass
01 (Average)	2400.000	11.703	37.291	48.993	--	--	Pass
01 (Average)	2416.500	11.752	70.897	82.650	--	--	Pass

Figure Channel 01: Vertical (Peak)

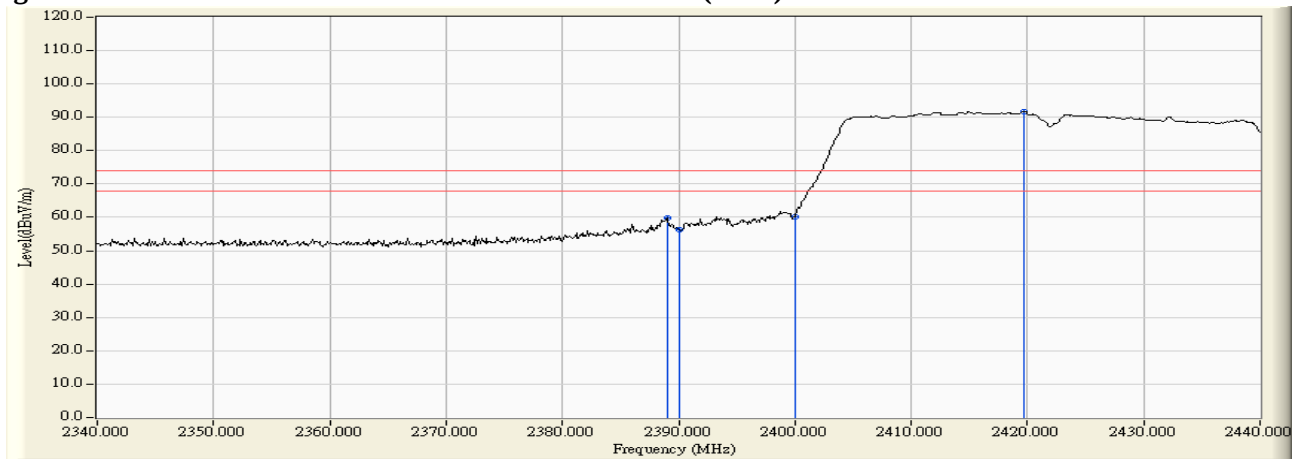
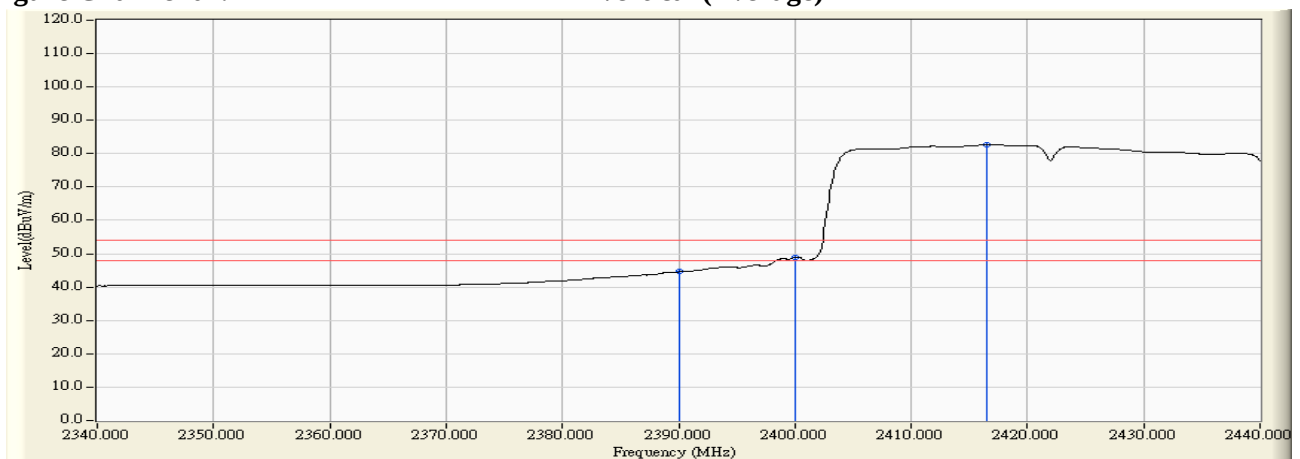


Figure Channel 01: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2452MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
07 (Peak)	2449.600	11.811	92.277	104.088	--	--	Pass
07 (Peak)	2483.500	12.049	52.373	64.422	74.00	54.00	Pass
07 (Peak)	2487.100	12.078	54.569	66.647	74.00	54.00	Pass
07 (Average)	2446.600	11.859	82.692	94.551	--	--	Pass
07 (Average)	2483.500	12.049	40.616	52.665	74.00	54.00	Pass

Figure Channel 07: Horizontal (Peak)

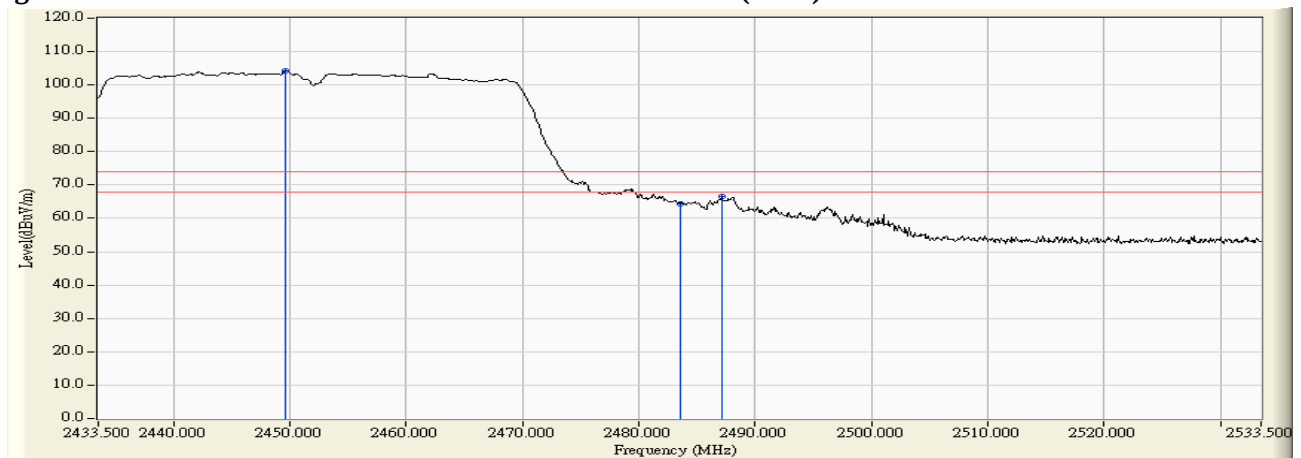
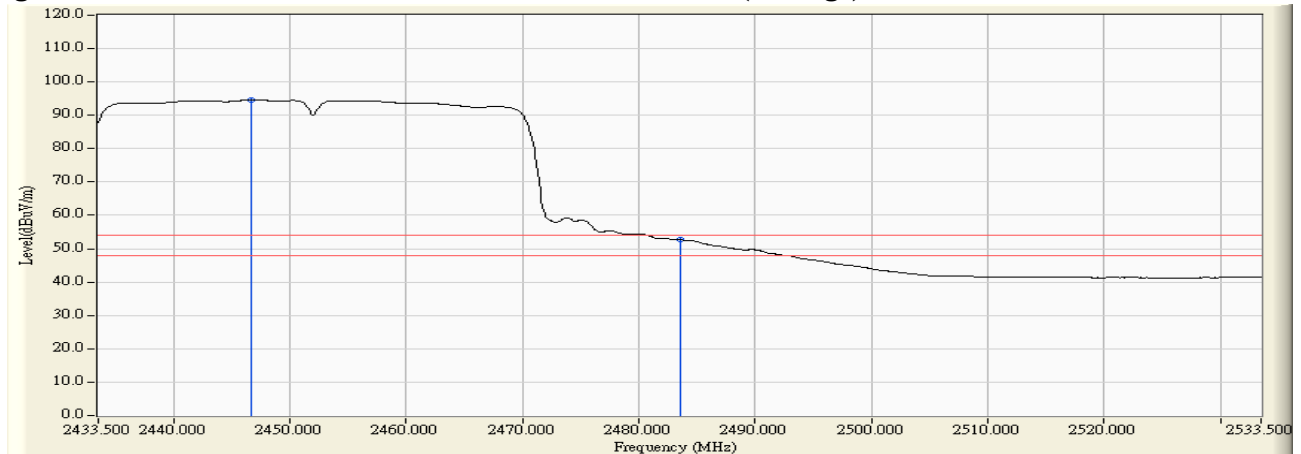


Figure Channel 07: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : 802.11b/g/n 1T1R COMBO CARD
 Test Item : Band Edge
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit (802.11n MCS0 15Mbps 40M-BW) (2452MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
07 (Peak)	2462.200	11.800	81.685	93.485	--	--	Pass
07 (Peak)	2483.500	12.049	46.932	58.981	74.00	54.00	Pass
07 (Average)	2457.000	11.724	72.769	84.494	--	--	Pass
07 (Average)	2483.500	12.049	34.072	46.121	74.00	54.00	Pass

Figure Channel 07: Vertical (Peak)

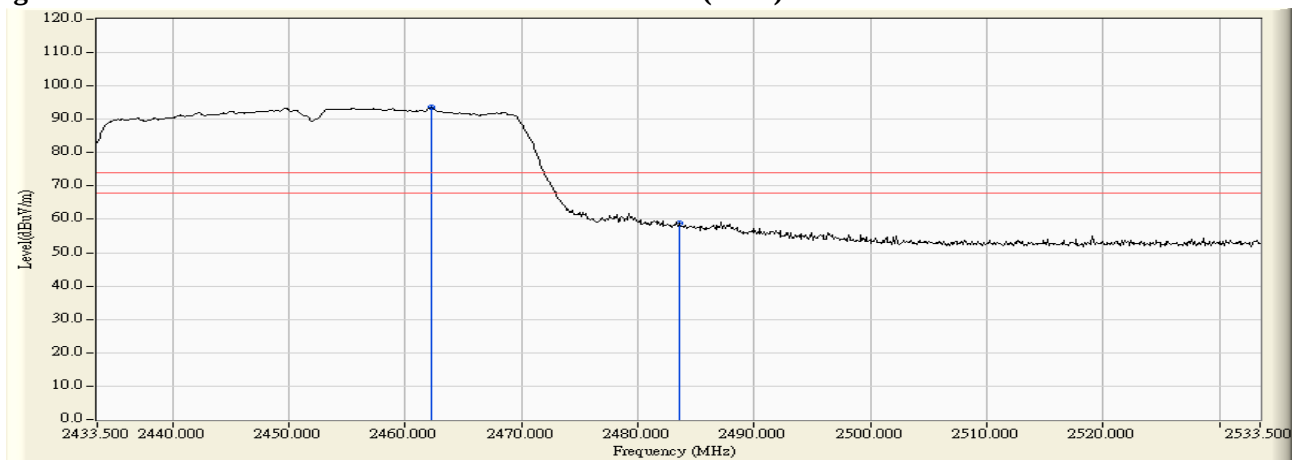
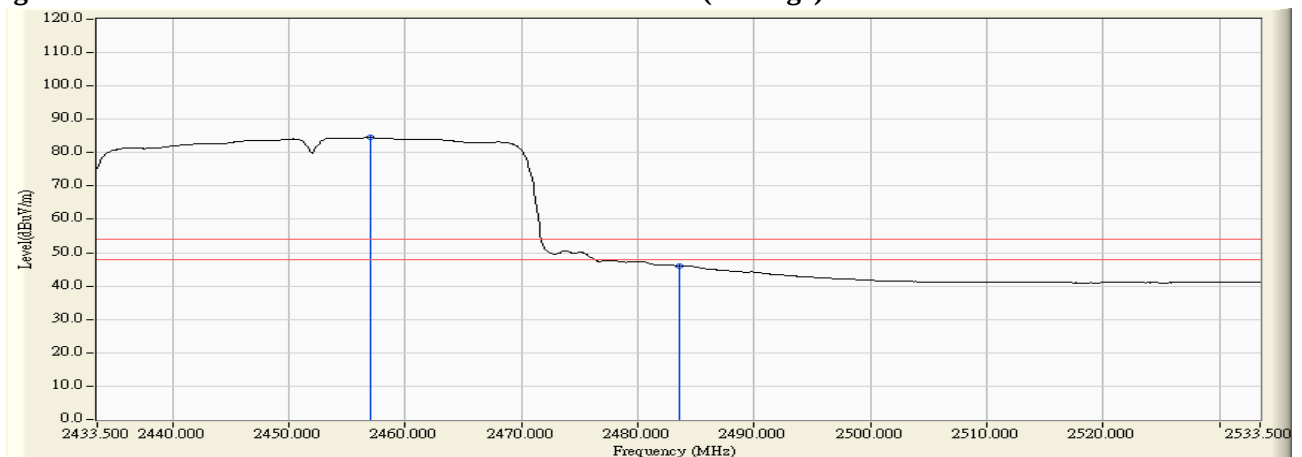


Figure Channel 07: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs