FCC Test Report

Product Name	Data Collector
Model No	PI-XXXX, AP-XXXX, SP-XXXX, PE-XX (X=0-9 , A-Z , a-z , dash , or blank)
FCC ID.	NBF-PI-1X30

Applicant	Argox Information Co.,Ltd.
Address	7F., No.126, Ln. 235, Baociao Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)

Date of Receipt	Jan. 13, 2017
Issue Date	Sep. 28, 2017
Report No.	1710337R-RFUSP27V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issue Date: Sep. 28, 2017
Report No.: 1710337R-RFUSP27V00

Product Name	Data Collector
Applicant	Argox Information Co.,Ltd.
Address	7F., No.126, Ln. 235, Baociao Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)
Manufacturer	Argox Information Co.,Ltd.
Model No.	PI-XXXX, AP-XXXX, SP-XXXX, PE-XX (X=0-9 , A-Z , a-z , dash , or blank)
FCC ID.	NBF-PI-1X30
EUT Rated Voltage	AC 100-240V / 50-60Hz or DC 3.6V by Battery or DC 5V by USB
EUT Test Voltage	AC 120V / 60Hz
Trade Name	ARGOX
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04
Test Result	Complied

Documented By : Jinn Chen

(Senior Adm. Specialist / Jinn Chen)

Tested By : Steven Tsai

(Assistant Engineer / Steven Tsai)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Data Collector
Trade Name	ARGOX
Model No.	PI-XXXX, AP-XXXX, SP-XXXX, PE-XX (X=0-9 , A-Z , a-z , dash , or blank)
FCC ID.	NBF-PI-1X30
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW
Number of Channels	802.11b/g/n-20MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n-20MHz: up to 72.2Mbps
Channel separation	802.11b/g/n-20MHz: 5 MHz
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g/n-20MHz:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Base (Option)	1 Set
USB Cable	Shielded, 2.0m
RS232 Cable	Shielded, 2.0m
USB Power Cable	Non-Shielded, 0.5m
Power Adapter (Option)	MFR: Powertron, M/N: PS1012-050HIB200 Input: AC 100-240V~50-60Hz 0.4A Output: 5V 2.0A Cable Out: Non-Shielded, 1.5m

Antenna List

No.	Manufacturer	Part No.	Antenna type	Peak Gain
1	ARISTOTLE	RFA-02-P377-70B-68	PIFA Antenna	3.17dBi in 2.4 GHz
2	wgt	N/A	PIFA Antenna	2.52dBi in 2.4 GHz

Note:

1. The antenna of EUT conforms to FCC 15.203.
2. Only the higher gain antenna was tested and recorded in this report.

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		

Note:

1. The EUT is a Data Collector with a built-in WLAN、Bluetooth transceiver, this report for 2.4GHz 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)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n-20MHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.

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: Charger Mode

1.3. Tested System Details

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

Transmitter Mode

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	P62G	9TSGJC2	Non-Shielded, 1.8m

Signal Cable Type		Signal cable Description
A	RS232 to USB Cable	Non-shielded, 1m
B	RS232 Cable	Shielded, 2m

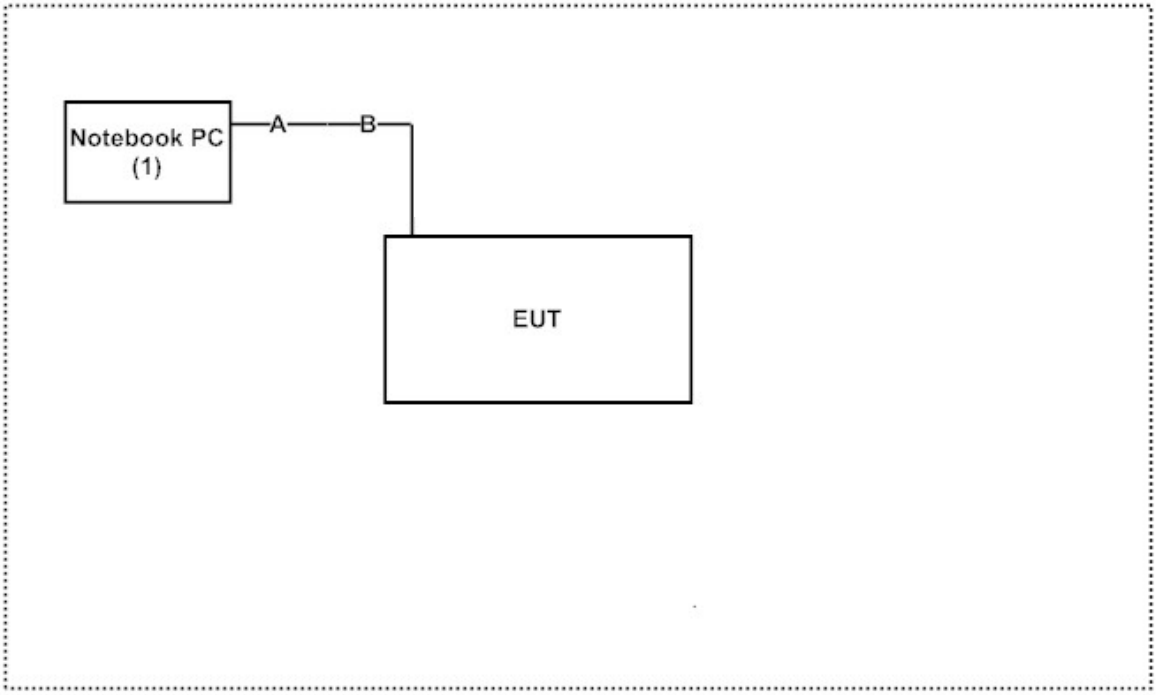
Charger Mode

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	P62G	9TSGJC2	Non-Shielded, 1.8m

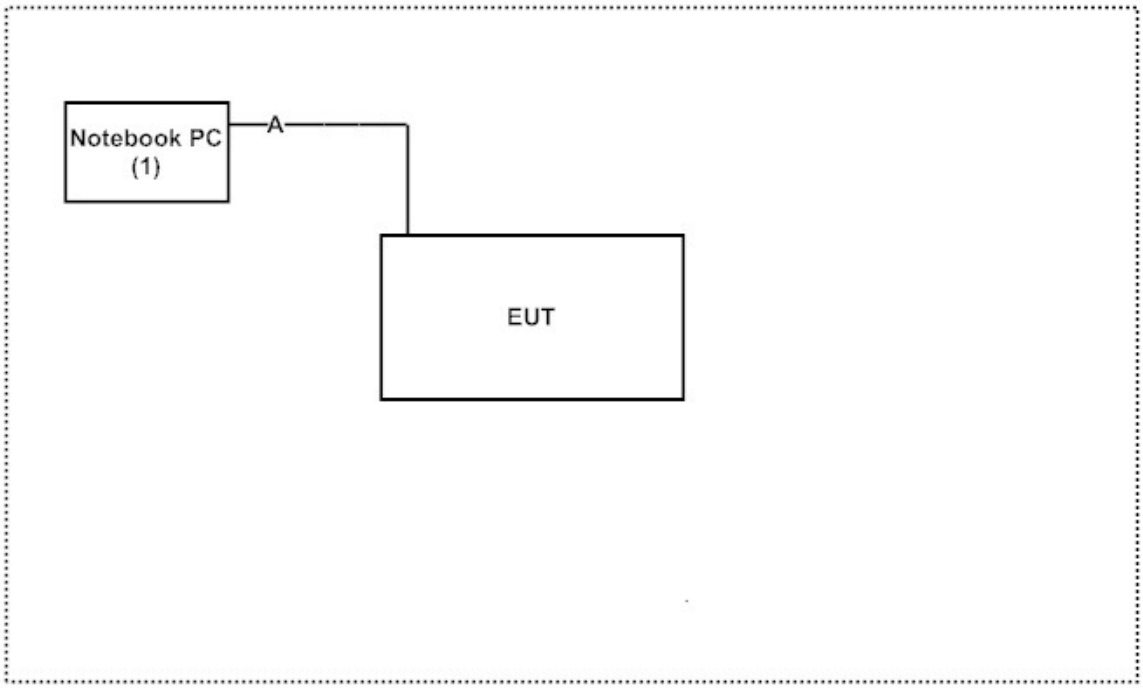
Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 2m

1.4. Configuration of Tested System

Transmitter Mode



Charger Mode



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Access Port137 Ver.1.37” 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 DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd.
Site Address: No.159, Sec. 2, Wenhua 1st Rd., Linkou Dist.,
New Taipei City 24457, Taiwan.
TEL: 886-2-2602-7968 / FAX : 866-2-2602-3286
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Item and Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	161601	2017.01.06	2018.01.05
X	Two-Line V-Network	R&S	ENV216	101306	2017.02.16	2018.02.15
X	Two-Line V-Network	R&S	ENV216	101307	2017.03.17	2018.03.16
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2017.05.24	2018.05.23

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

For Conducted measurements /ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103464	2017.01.09	2018.01.08
X	Power Meter	Anritsu	ML2496A	1548003	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531024	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531025	2016.12.15	2017.12.14
	Bluetooth Tester	R&S	CBT	101238	2017.01.03	2018.01.02

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek Conduction Test System V8.0.110

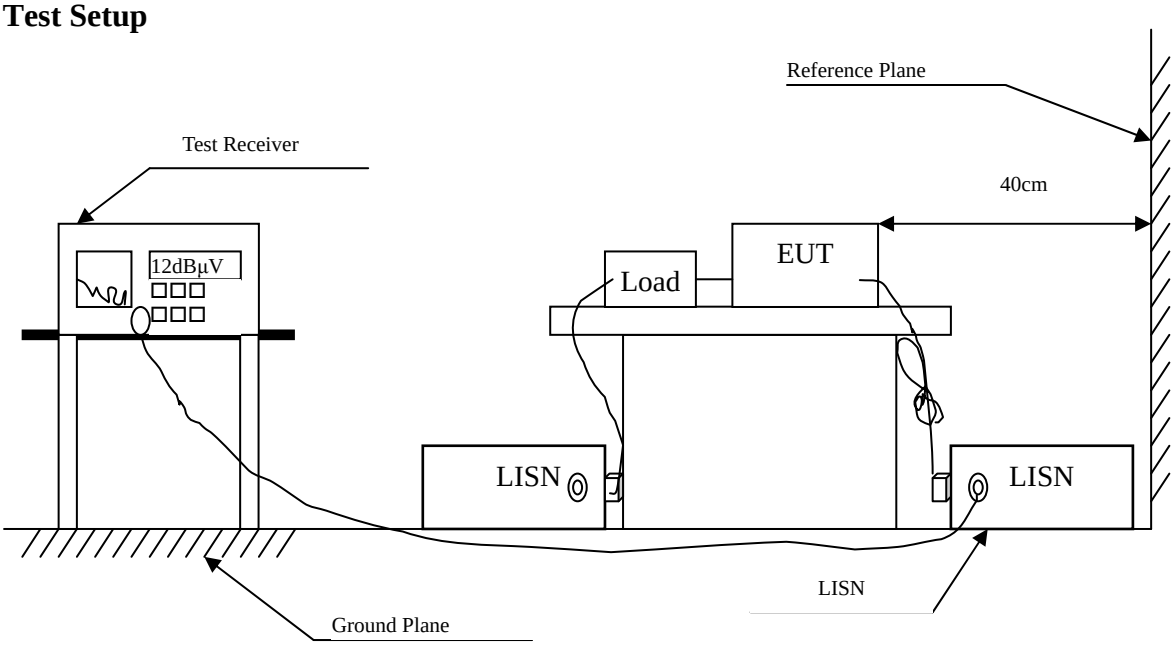
For Radiated measurements /ACB1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	TESEQ	HLA6121	37133	2016.03.18	2018.03.17
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2017.02.13	2018.02.12
X	Horn Antenna	ETS-Lindgren	3117	00203800	2016.10.13	2017.10.12
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.24	2018.05.23
X	Pre-Amplifier	EMCI	EMC001330	980316	2017.05.16	2018.05.15
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2017.05.17	2018.05.16
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2017.05.17	2018.05.16
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2017.05.17	2018.05.16
X	Filter	MICRO TRONICS	BRM50702	G249	2017.08.11	2018.08.10
	Filter	MICRO TRONICS	BRM50716	G187	2017.08.16	2018.08.15
X	EMI Test Receiver	R&S	ESR7	101602	2016.12.15	2017.12.14
X	Spectrum Analyzer	R&S	FSV40	101148	2017.01.24	2018.01.23
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2017.05.25	2018.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2017.08.11	2018.08.10

Note:
1. Loop Antenna is calibrated every two year, the other equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Uncertainty

± 2.35 dB

2.5. Test Result of Conducted Emission

Product : Data Collector
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 4: Charger Mode
Test Date : 2017/03/27

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 1					
Quasi-Peak					
0.152	9.561	27.662	37.223	-28.720	65.943
0.332	9.569	15.265	24.834	-35.966	60.800
0.483	9.579	15.677	25.256	-31.230	56.486
0.685	9.580	11.622	21.202	-34.798	56.000
2.675	9.587	18.535	28.122	-27.878	56.000
24.576	9.690	26.261	35.951	-24.049	60.000
Average					
0.152	9.561	11.527	21.088	-34.855	55.943
0.332	9.569	0.593	10.162	-40.638	50.800
0.483	9.579	0.582	10.161	-36.325	46.486
0.685	9.580	2.536	12.116	-33.884	46.000
2.675	9.587	12.930	22.517	-23.483	46.000
24.576	9.690	24.549	34.239	-15.761	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Data Collector
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 4: Charger Mode
Test Date : 2017/03/27

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 2					
Quasi-Peak					
0.152	9.552	27.412	36.963	-28.980	65.943
0.328	9.565	17.189	26.754	-34.160	60.914
0.474	9.570	20.059	29.628	-27.115	56.743
0.683	9.579	20.898	30.477	-25.523	56.000
2.299	9.583	20.356	29.939	-26.061	56.000
24.576	9.730	34.597	44.327	-15.673	60.000
Average					
0.152	9.552	14.013	23.565	-32.378	55.943
0.328	9.565	8.545	18.110	-32.804	50.914
0.474	9.570	4.224	13.793	-32.950	46.743
0.683	9.579	14.268	23.847	-22.153	46.000
2.299	9.583	13.380	22.963	-23.037	46.000
24.576	9.730	33.583	43.313	-6.687	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Data Collector
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)
Test Date : 2017/03/27

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 1					
Quasi-Peak					
0.152	9.561	32.730	42.291	-23.652	65.943
0.499	9.579	32.255	41.834	-14.195	56.029
2.328	9.583	20.129	29.712	-26.288	56.000
2.785	9.588	21.497	31.085	-24.915	56.000
20.920	9.690	30.282	39.972	-20.028	60.000
24.576	9.690	26.474	36.164	-23.836	60.000
Average					
0.152	9.561	16.098	25.659	-30.284	55.943
0.499	9.579	18.405	27.985	-18.044	46.029
2.328	9.583	13.556	23.139	-22.861	46.000
2.785	9.588	14.468	24.056	-21.944	46.000
20.920	9.690	24.462	34.152	-15.848	50.000
24.576	9.690	24.376	34.066	-15.934	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Data Collector
Test Item : Conducted Emission Test
Power Line : Line 2
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)
Test Date : 2017/03/27

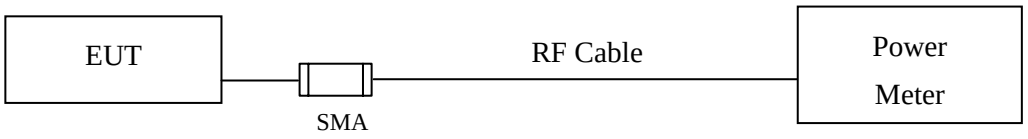
Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV	dB	dBµV
Line 2					
Quasi-Peak					
0.152	9.552	34.465	44.016	-21.927	65.943
0.503	9.570	35.351	44.922	-11.078	56.000
2.337	9.583	21.318	30.901	-25.099	56.000
2.722	9.587	22.376	31.963	-24.037	56.000
20.960	9.720	29.644	39.364	-20.636	60.000
24.576	9.730	26.506	36.236	-23.764	60.000
Average					
0.152	9.552	19.108	28.660	-27.283	55.943
0.503	9.570	22.134	31.705	-14.295	46.000
2.337	9.583	15.191	24.774	-21.226	46.000
2.722	9.587	15.427	25.014	-20.986	46.000
20.960	9.720	23.760	33.480	-16.520	50.000
24.576	9.730	24.175	33.905	-16.095	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ “ means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limits

The maximum peak power shall be less 1 Watt.

3.3. Test Procedure

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.

3.4. Uncertainty

±0.86 dB

3.5. Test Result of Peak Power Output

Product : Data Collector
Test Item : Peak Power Output Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps)
Test Date : 2017/04/18

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	10.26	--	--	--	14.21	<30dBm	Pass
06	2437	10.17	10.13	10.09	10.05	14.13	<30dBm	Pass
11	2462	10.03	--	--	--	14.04	<30dBm	Pass

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

Product : Data Collector
Test Item : Peak Power Output Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps)
Test Date : 2017/04/18

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	14.68	--	--	--	--	--	--	--	21.62	<30dBm	Pass
06	2437	14.68	14.62	14.58	14.54	14.5	14.46	14.42	14.38	21.66	<30dBm	Pass
11	2462	14.55	--	--	--	--	--	--	--	21.65	<30dBm	Pass

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

Product : Data Collector
Test Item : Peak Power Output Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
Test Date : 2017/04/18

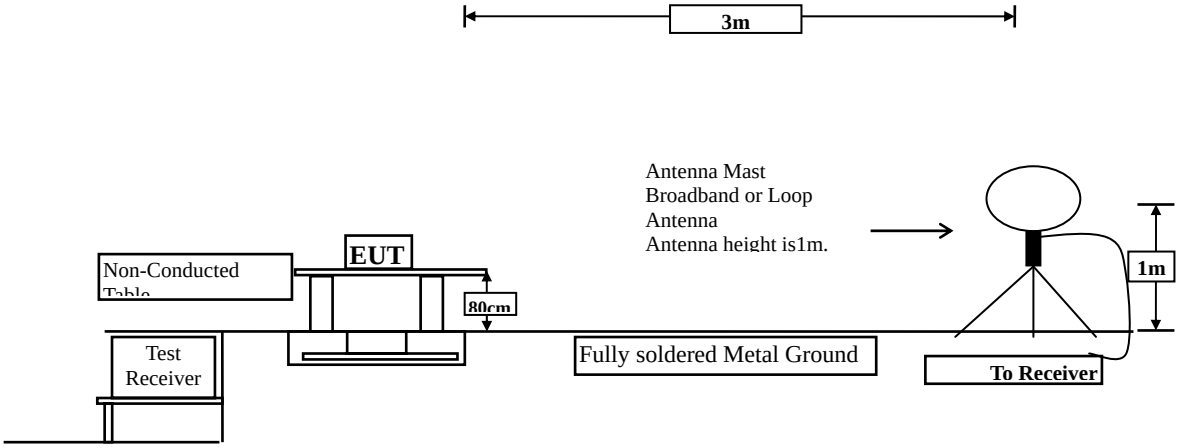
Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	7.2		
		Measurement Level (dBm)										
01	2412	14.91	--	--	--	--	--	--	--	21.71	<30dBm	Pass
06	2437	14.91	14.87	14.84	14.8	14.77	14.72	14.69	14.66	21.78	<30dBm	Pass
11	2462	14.8	--	--	--	--	--	--	--	21.83	<30dBm	Pass

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

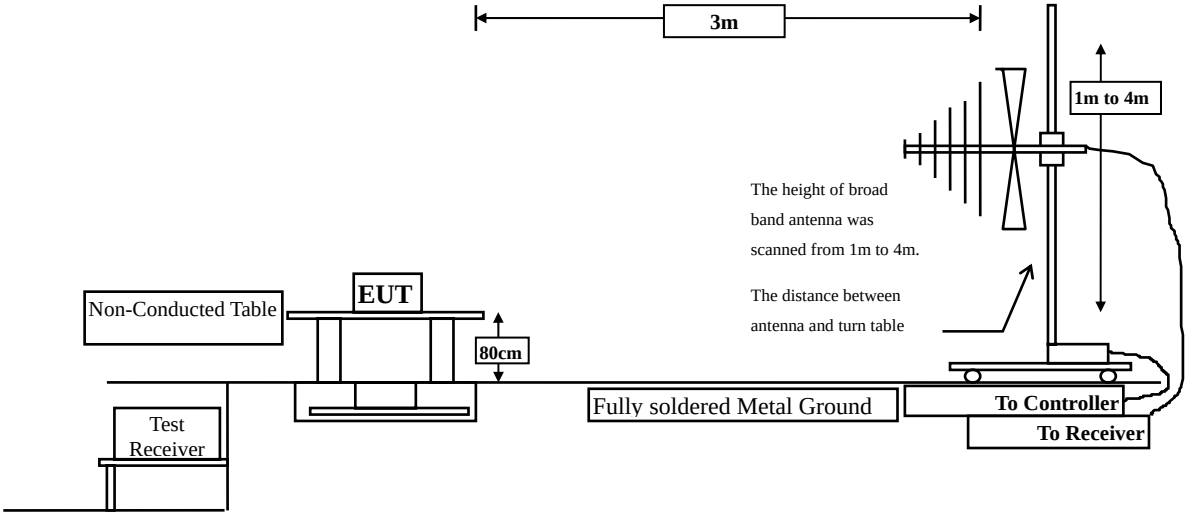
4. Radiated Emission

4.1. Test Setup

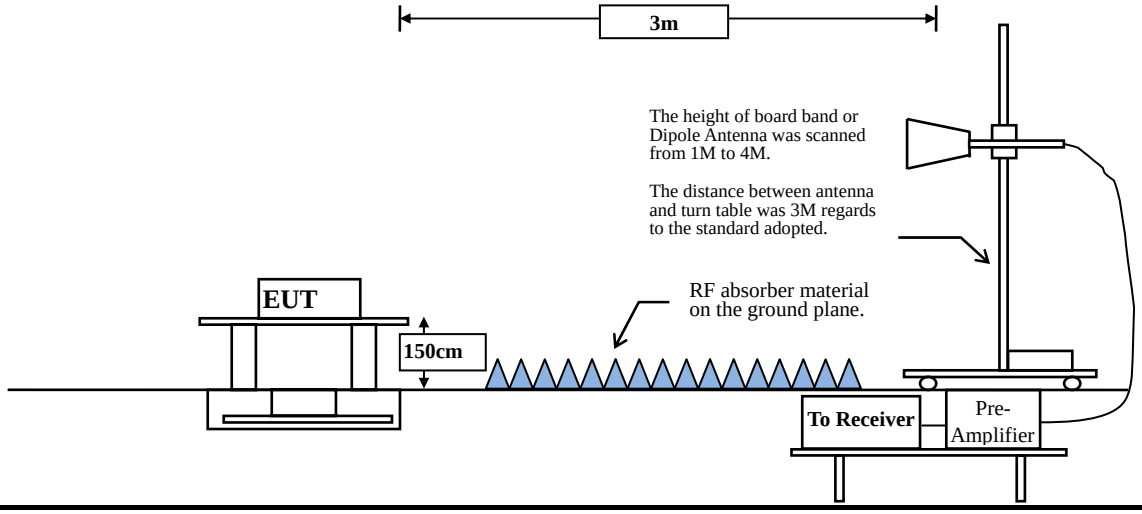
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

➢ **General Radiated Emission 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 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: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 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: 2013 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 measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

Horizontal：
30-300MHz: ±4.08dB；300M-1GHz: ±3.86dB；1-18GHz: ±3.77dB；18-40GHz: ±3.98dB。
Vertical：
30-300MHz: ±4.81dB；300M-1GHz: ±3.87dB；1-18GHz: ±3.83dB；18-40GHz: ±3.98dB。

4.5. Test Result of Radiated Emission

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
Test Date : 2017/04/18

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	-3.785	49.690	45.906	-28.094	74.000
7236.000	-0.753	45.710	44.956	-29.044	74.000
9648.000	1.186	45.270	46.456	-27.544	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4824.000	-3.785	53.180	49.396	-27.884	74.000
7236.000	-0.753	46.370	45.616	-29.504	74.000
9648.000	1.186	46.650	47.836	-30.664	74.000
Average Detector:					
--	--	--	--	--	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)
Test Date : 2017/03/24

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	-3.770	53.820	50.050	-23.950	74.000
7311.000	-0.719	47.290	46.572	-27.428	74.000
9748.000	1.331	47.360	48.691	-25.309	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4874.000	-3.770	55.640	51.870	-22.130	74.000
7311.000	-0.719	51.700	50.982	-23.018	74.000
9748.000	1.331	46.560	47.891	-26.109	74.000
Average Detector:					
--	--	--	--	--	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)
Test Date : 2017/03/24

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4924.000	-3.743	56.700	52.957	-21.043	74.000
7386.000	-0.683	45.780	45.097	-28.903	74.000
9848.000	1.571	46.500	48.071	-25.929	74.000
Average Detector:					
--	--	--	--	--	54.000
Vertical					
Peak Detector:					
4924.000	-3.743	56.180	52.437	-21.563	74.000
7986.000	-0.442	46.390	45.949	-28.051	74.000
9848.000	1.571	47.130	48.701	-25.299	74.000
Average Detector:					
--	--	--	--	--	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
Test Date : 2017/03/24

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	-3.785	67.430	63.646	-10.354	74.000
7236.000	-0.753	56.010	55.256	-18.744	74.000
9648.000	1.186	45.220	46.406	-27.594	74.000
Average Detector:					
4824.000	-3.785	47.750	43.966	-10.034	54.000
7236.000	-0.753	36.200	35.446	-18.554	54.000
Peak Detector:					
4824.000	-3.785	69.780	65.996	-8.004	74.000
7236.000	-0.753	56.740	55.986	-18.014	74.000
9648.000	1.186	47.440	48.626	-25.374	74.000
Average Detector:					
4824.000	-3.785	51.540	47.756	-6.244	54.000
7236.000	-0.753	45.550	44.796	-9.204	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)
Test Date : 2017/03/24

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	-3.770	65.820	62.050	-11.950	74.000
7311.000	-0.719	50.690	49.972	-24.028	74.000
9748.000	1.331	47.230	48.561	-25.439	74.000
Average Detector:					
4874.000	-3.770	44.540	40.770	-13.230	54.000
Vertical					
Peak Detector:					
4874.000	-3.770	68.180	64.410	-9.590	74.000
7311.000	-0.719	54.220	53.502	-20.498	74.000
9748.000	1.331	49.100	50.431	-23.569	74.000
Average Detector:					
4874.000	-3.770	48.140	44.370	-9.630	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4924.000	-3.743	63.050	59.307	-14.693	74.000
7386.000	-0.683	53.010	52.327	-21.673	74.000
9848.000	1.571	48.400	49.971	-24.029	74.000
Average Detector:					
4924.000	-3.743	40.710	36.967	-17.033	54.000
Vertical					
Peak Detector:					
4924.000	-3.743	65.110	61.367	-12.633	74.000
7386.000	-0.683	60.030	59.347	-14.653	74.000
9848.000	1.571	48.860	50.431	-23.569	74.000
Average Detector:					
4924.000	-3.743	43.900	40.157	-13.843	54.000
7386.000	-0.683	42.500	41.817	-12.183	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4824.000	-3.785	70.660	66.876	-7.124	74.000
7236.000	-0.753	53.310	52.556	-21.444	74.000
9648.000	1.186	46.430	47.616	-26.384	74.000
Average Detector:					
4824.000	-3.785	48.120	44.336	-9.664	54.000
Vertical					
Peak Detector:					
4824.000	-3.785	72.530	68.746	-5.254	74.000
7236.000	-0.753	56.510	55.756	-18.244	74.000
9648.000	1.186	47.850	49.036	-24.964	74.000
Average Detector:					
4824.000	-3.785	51.910	48.126	-5.874	54.000
7236.000	-0.753	35.710	34.956	-19.044	54.000

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.

Product	:	Data Collector
Test Item	:	Harmonic Radiated Emission Data
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)
Test Date	:	2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4874.000	-3.770	69.660	65.890	-8.110	74.000
7311.000	-0.719	53.110	52.392	-21.608	74.000
9748.000	1.331	48.060	49.391	-24.609	74.000
Average Detector:					
4874.000	-3.770	45.380	41.610	-12.390	54.000
Vertical					
Peak Detector:					
4874.000	-3.770	70.920	67.150	-6.850	74.000
7311.000	-0.719	58.460	57.742	-16.258	74.000
9748.000	1.331	49.790	51.121	-22.879	74.000
Average Detector:					
4874.000	-3.770	48.720	44.950	-9.050	54.000
7311.000	-0.719	38.490	37.772	-16.228	54.000

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.

Product : Data Collector
Test Item : Harmonic Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
Peak Detector:					
4924.000	-3.743	66.820	63.077	-10.923	74.000
7386.000	-0.683	58.410	57.727	-16.273	74.000
9848.000	1.571	47.350	48.921	-25.079	74.000
Average Detector:					
4924.000	-3.743	37.950	34.207	-19.793	54.000
7386.000	-0.683	38.380	37.697	-16.303	54.000
Vertical					
Peak Detector:					
4924.000	-3.743	68.700	64.957	-9.043	74.000
7386.000	-0.683	60.540	59.857	-14.143	74.000
9848.000	1.571	50.160	51.731	-22.269	74.000
Average Detector:					
4924.000	-3.743	44.780	41.037	-12.963	54.000
7386.000	-0.683	40.260	39.577	-14.423	54.000

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.

Product : Data Collector
Test Item : General Radiated Emission Data
Test Mode : Mode 4: Charger Mode
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
142.367	-11.010	47.239	36.228	-7.272	43.500
251.296	-11.783	47.244	35.462	-10.538	46.000
368.497	-8.461	45.686	37.225	-8.775	46.000
482.336	-5.852	39.341	33.489	-12.511	46.000
605.897	-3.286	38.955	35.669	-10.331	46.000
787.294	-0.809	36.823	36.014	-9.986	46.000
Vertical					
207.433	-13.338	47.265	33.928	-9.572	43.500
310.267	-9.852	46.964	37.113	-8.887	46.000
416.055	-7.210	43.928	36.718	-9.282	46.000
636.852	-3.035	36.408	33.374	-12.626	46.000
770.198	-1.004	37.029	36.024	-9.976	46.000
910.498	0.651	36.468	37.119	-8.881	46.000

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 : Data Collector
Test Item : General Radiated Emission Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
136.841	-11.393	49.487	38.093	-5.407	43.500
222.594	-12.839	52.574	39.736	-6.264	46.000
287.261	-10.362	50.445	40.083	-5.917	46.000
425.029	-7.001	45.500	38.500	-7.500	46.000
612.000	-3.240	42.559	39.319	-6.681	46.000
768.043	-1.030	38.039	37.009	-8.991	46.000
Vertical					
201.507	-13.590	48.607	35.017	-8.483	43.500
302.725	-10.014	46.178	36.164	-9.836	46.000
422.217	-7.066	45.431	38.365	-7.635	46.000
597.942	-3.375	38.674	35.300	-10.700	46.000
744.145	-1.322	36.221	34.899	-11.101	46.000
839.739	-0.188	38.471	38.284	-7.716	46.000

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 : Data Collector
Test Item : General Radiated Emission Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBμV	dBμV/m	dB	dBμV/m
Horizontal					
141.058	-11.059	45.503	34.444	-9.056	43.500
209.942	-13.233	47.351	34.118	-9.382	43.500
332.246	-9.369	43.773	34.405	-11.595	46.000
429.246	-6.903	40.458	33.555	-12.445	46.000
557.174	-4.361	37.636	33.275	-12.725	46.000
749.768	-1.247	34.236	32.989	-13.011	46.000
Vertical					
173.391	-11.499	49.967	38.468	-5.032	43.500
297.101	-10.139	43.116	32.977	-13.023	46.000
427.841	-6.935	44.209	37.274	-8.726	46.000
576.855	-3.884	37.470	33.586	-12.414	46.000
690.725	-2.113	36.450	34.337	-11.663	46.000
831.304	-0.287	35.709	35.422	-10.578	46.000

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 : Data Collector
Test Item : General Radiated Emission Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)
Test Date : 2017/03/25

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
127.000	-12.364	51.686	39.322	-4.178	43.500
195.884	-13.602	52.969	39.367	-4.133	43.500
332.246	-9.369	43.845	34.477	-11.523	46.000
432.058	-6.837	44.126	37.289	-8.711	46.000
561.391	-4.259	36.131	31.873	-14.127	46.000
692.130	-2.085	36.884	34.799	-11.201	46.000
Vertical					
183.232	-12.755	53.005	40.250	-3.250	43.500
261.957	-11.470	49.389	37.919	-8.081	46.000
399.725	-7.591	46.370	38.779	-7.221	46.000
597.942	-3.375	38.738	35.364	-10.636	46.000
775.072	-0.949	34.193	33.244	-12.756	46.000
865.043	0.118	35.669	35.787	-10.213	46.000

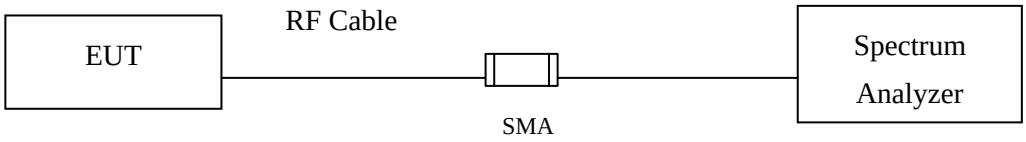
Note:

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.

5. RF antenna conducted test

5.1. Test Setup

RF antenna Conducted Measurement:



5.2. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

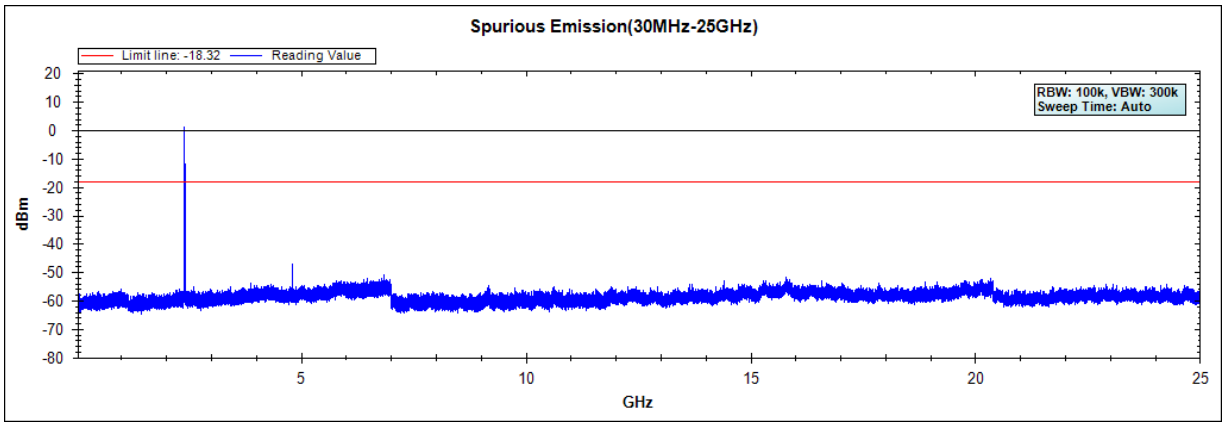
5.4. Uncertainty

±1.23dB

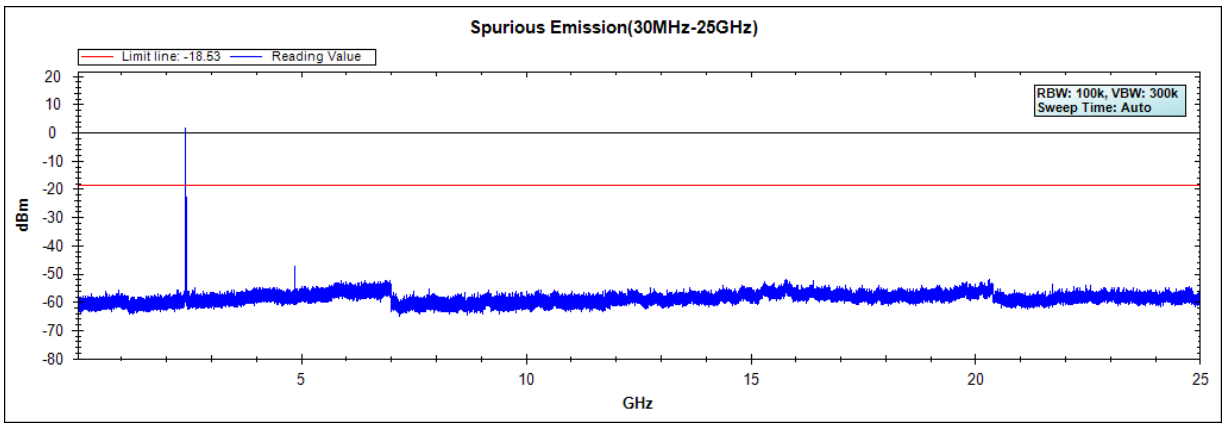
5.5. Test Result of RF antenna conducted test

Product : Data Collector
Test Item : RF antenna conducted test
Test Mode : Mode 1: Transmit (802.11b 1Mbps)
Test Date : 2017/04/18

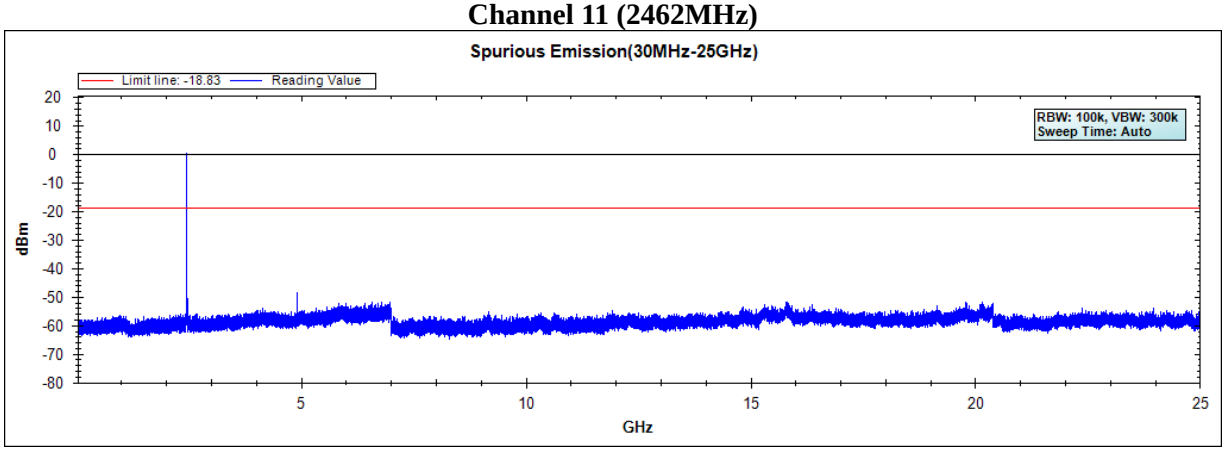
Channel 01 (2412MHz)



Channel 06 (2437MHz)



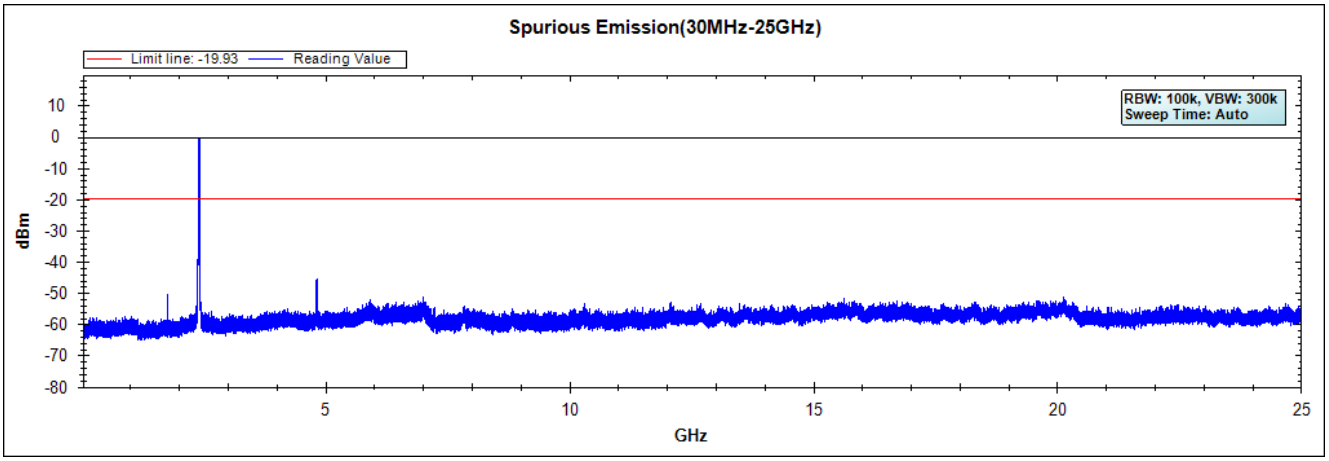
Channel 11 (2462MHz)



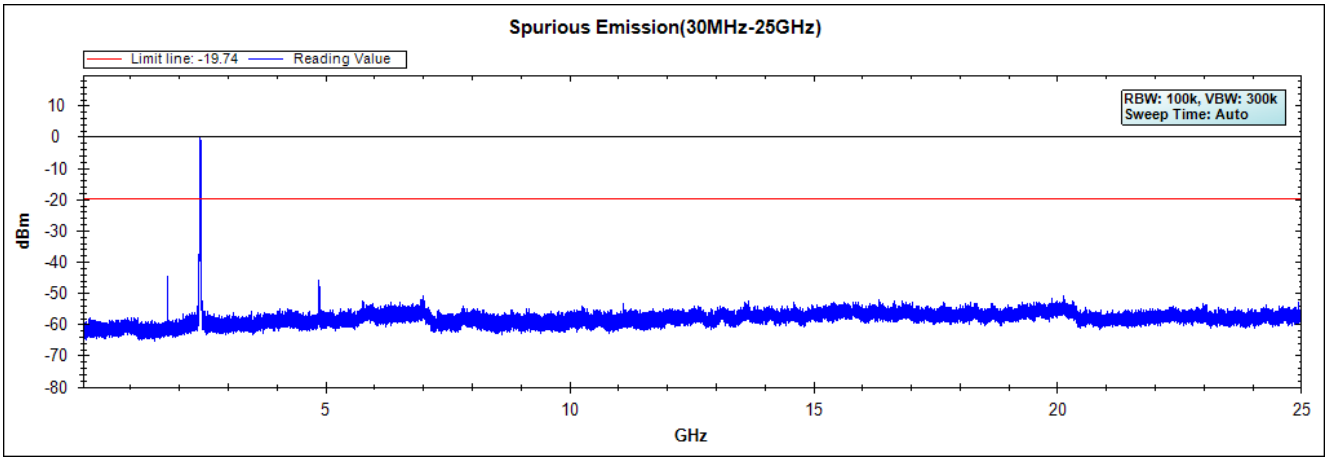
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Data Collector
Test Item	:	RF Antenna Conducted Spurious
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)
Test Date	:	2017/02/22

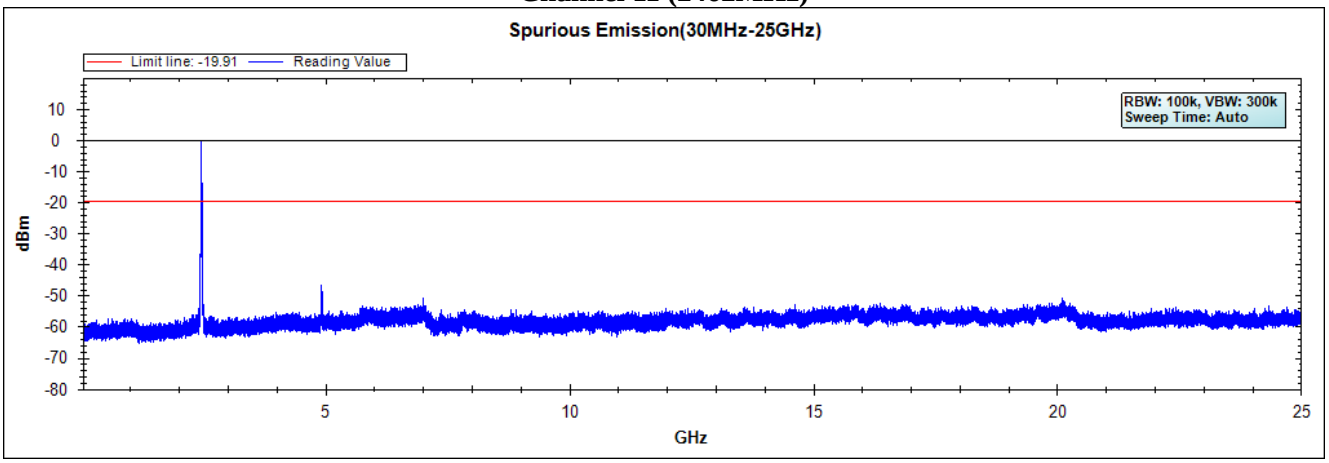
Channel 01 (2412MHz)



Channel 06 (2437MHz)



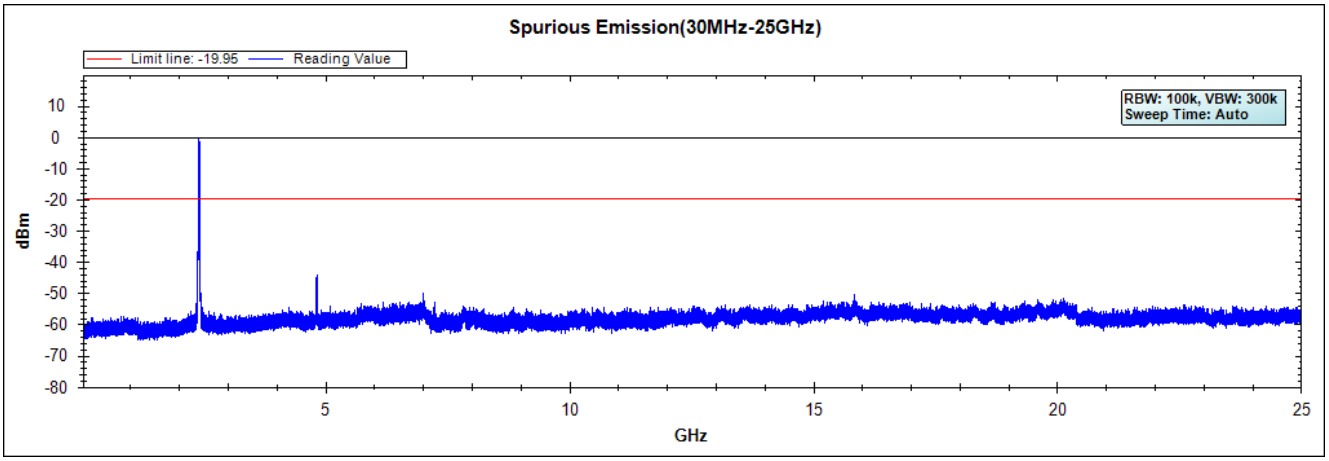
Channel 11 (2462MHz)



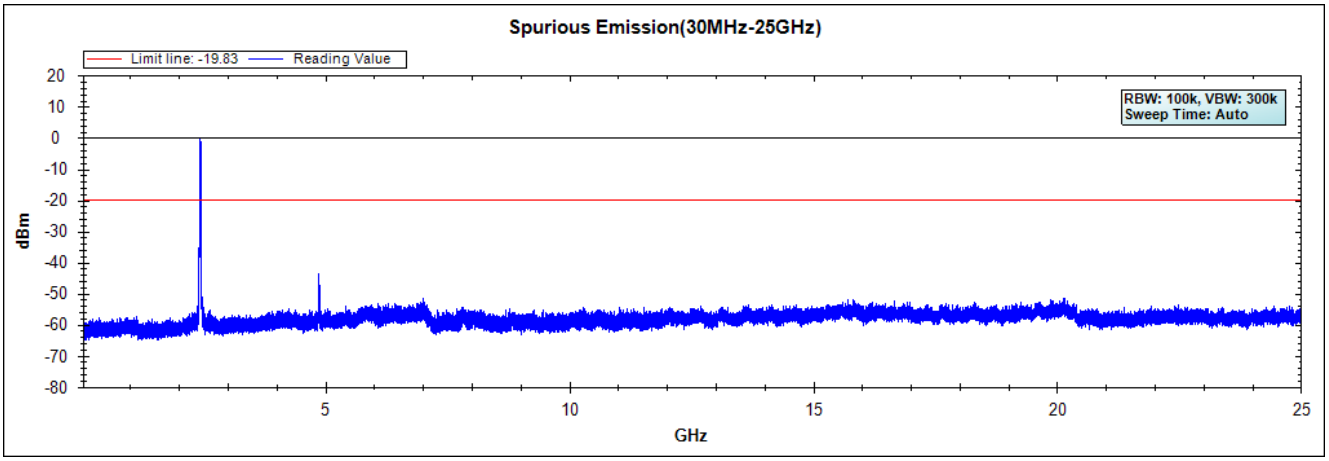
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Data Collector
Test Item	:	RF Antenna Conducted Spurious
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)
Test Date	:	2017/02/22

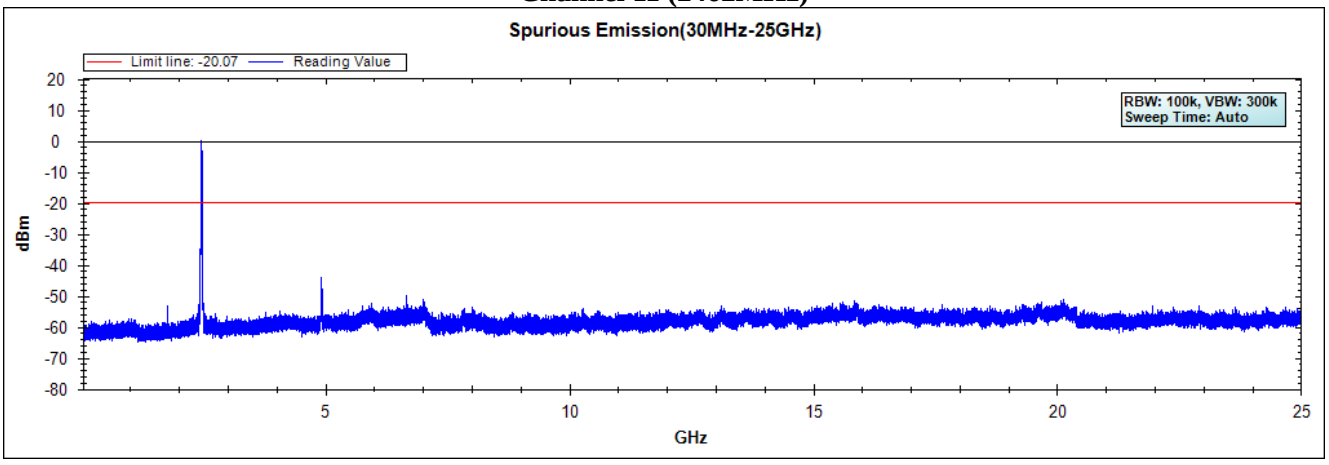
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)

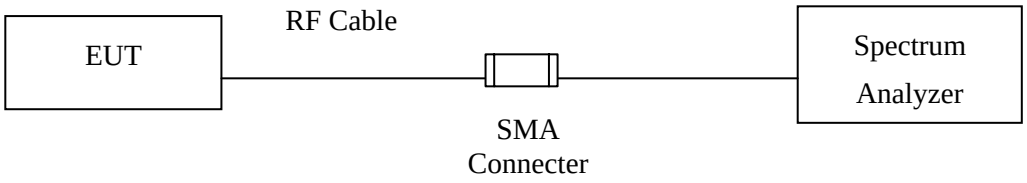


Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

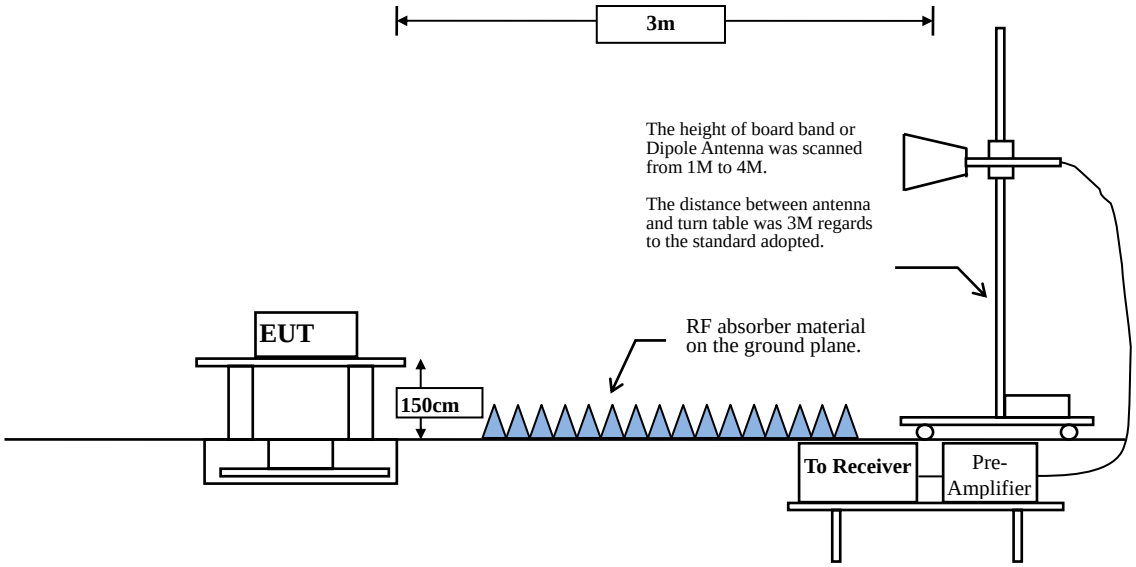
6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



6.2. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 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 1.5 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 C63.10:2013 on radiated measurement.

6.4. Uncertainty

Conducted: ±1.23dB
Radiated:
Horizontal polarization：1-18GHz: ±3.77dB
Vertical polarization：1-18GHz : ±3.83dB

6.5. Test Result of Band Edge

Product : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2368.261	11.489	40.244	51.732	74.000	54.000	Pass
01 (Peak)	2390.000	11.556	38.198	49.754	74.000	54.000	Pass
01 (Peak)	2400.000	11.579	38.786	50.365	--	--	Pass
01 (Peak)	2414.638	11.614	81.879	93.493	--	--	--
01 (Average)	2368.551	11.489	24.922	36.411	74.000	54.000	Pass
01 (Average)	2390.000	11.556	24.518	36.074	74.000	54.000	Pass
01 (Average)	2400.000	11.579	26.899	38.478	--	--	Pass
01 (Average)	2414.783	11.614	79.041	90.655	--	--	--

Figure Channel 01: Horizontal (Peak)

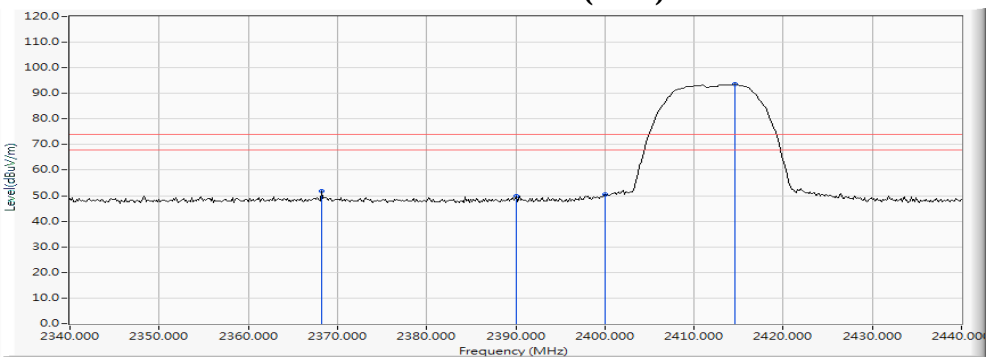
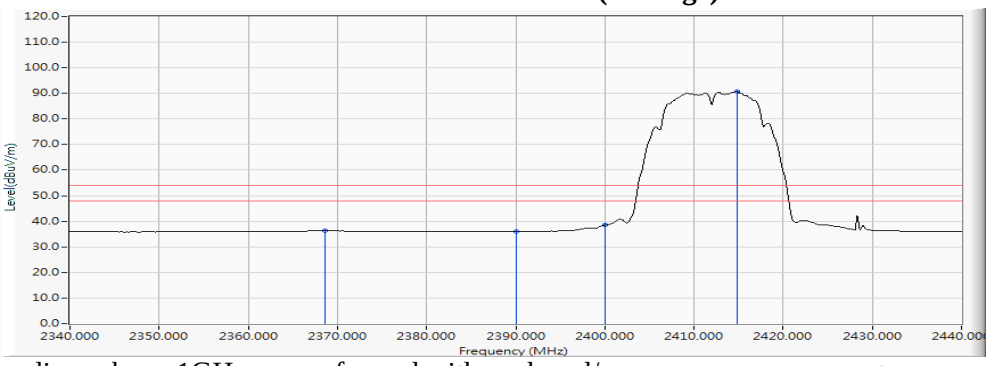


Figure Channel 01: Horizontal (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2365.362	11.478	37.907	49.385	74.000	54.000	Pass
01 (Peak)	2390.000	11.556	36.689	48.245	74.000	54.000	Pass
01 (Peak)	2400.000	11.579	41.782	53.361	--	--	Pass
01 (Peak)	2410.870	11.605	86.192	97.797	--	--	--
01 (Average)	2367.971	11.487	25.766	37.253	74.000	54.000	Pass
01 (Average)	2390.000	11.556	24.511	36.067	74.000	54.000	Pass
01 (Average)	2400.000	11.579	30.090	41.669	--	--	Pass
01 (Average)	2409.275	11.601	83.218	94.819	--	--	--

Figure Channel 01: Vertical (Peak)

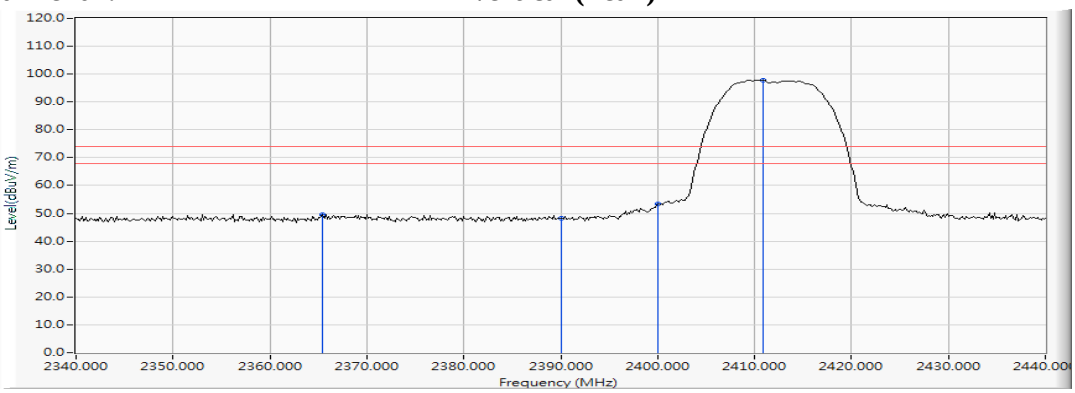
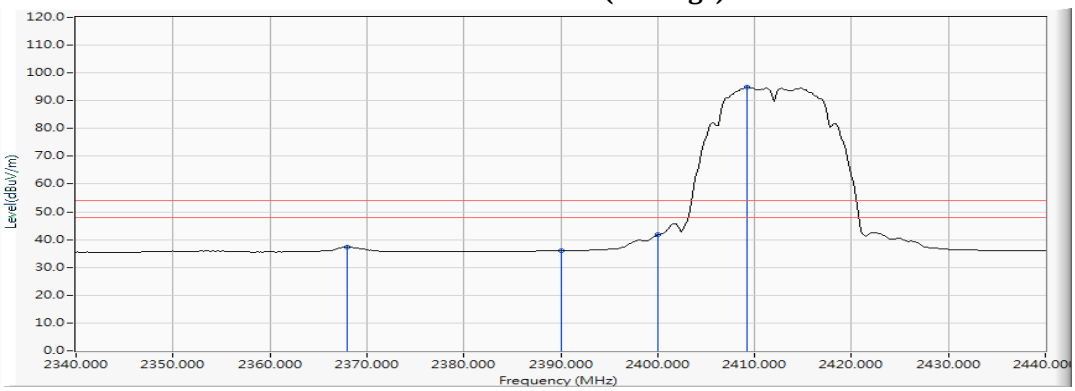


Figure Channel 01: Vertical (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2463.065	11.747	83.280	95.026	--	--	--
11 (Peak)	2483.500	11.800	36.943	48.743	74.000	54.000	Pass
11 (Peak)	2494.949	11.827	39.540	51.366	74.000	54.000	Pass
11 (Average)	2464.659	11.751	80.264	92.015	--	--	--
11 (Average)	2483.500	11.800	25.271	37.071	74.000	54.000	Pass
11 (Average)	2494.080	11.824	27.992	39.816	74.000	54.000	Pass

Figure Channel 11: Horizontal (Peak)

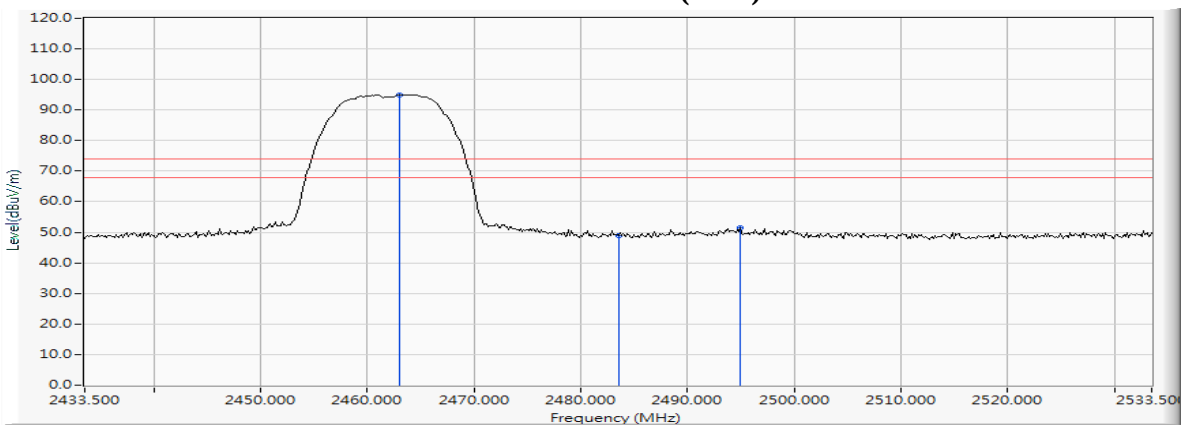
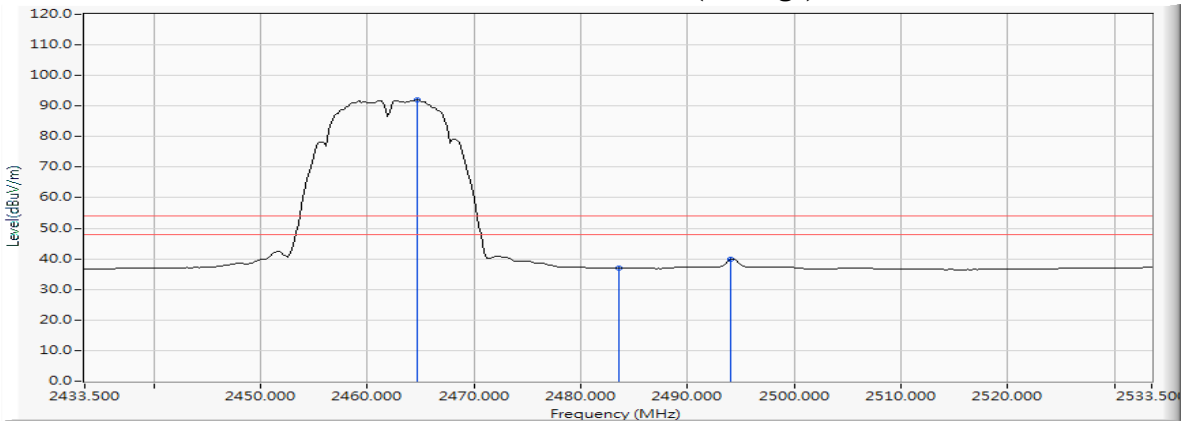


Figure Channel 11: Horizontal (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2462.920	11.745	85.772	97.518	--	--	--
11 (Peak)	2483.500	11.800	37.893	49.693	74.000	54.000	Pass
11 (Peak)	2485.819	11.805	39.012	50.817	74.000	54.000	Pass
11 (Average)	2464.659	11.751	82.686	94.437	--	--	--
11 (Average)	2483.500	11.800	24.476	36.276	74.000	54.000	Pass
11 (Average)	2506.254	11.851	25.126	36.978	74.000	54.000	Pass

Figure Channel 11: Vertical (Peak)

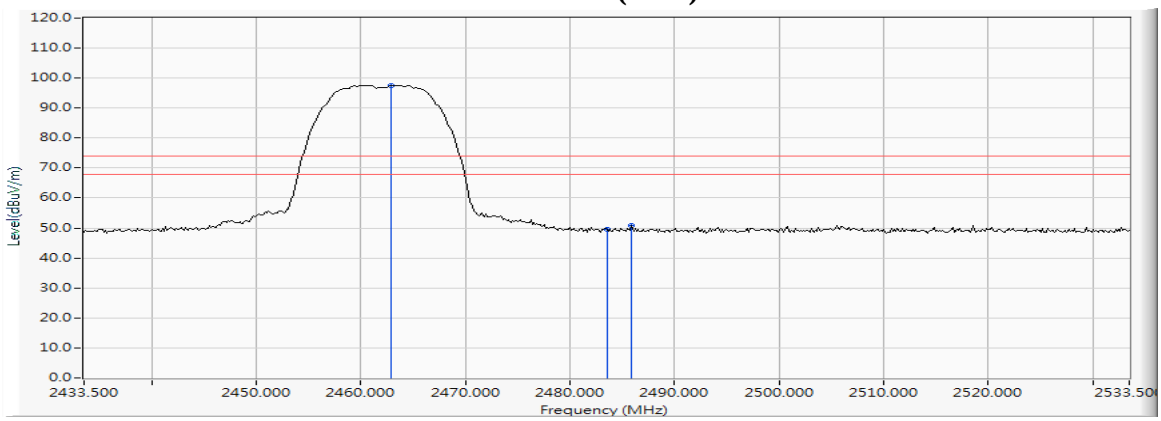
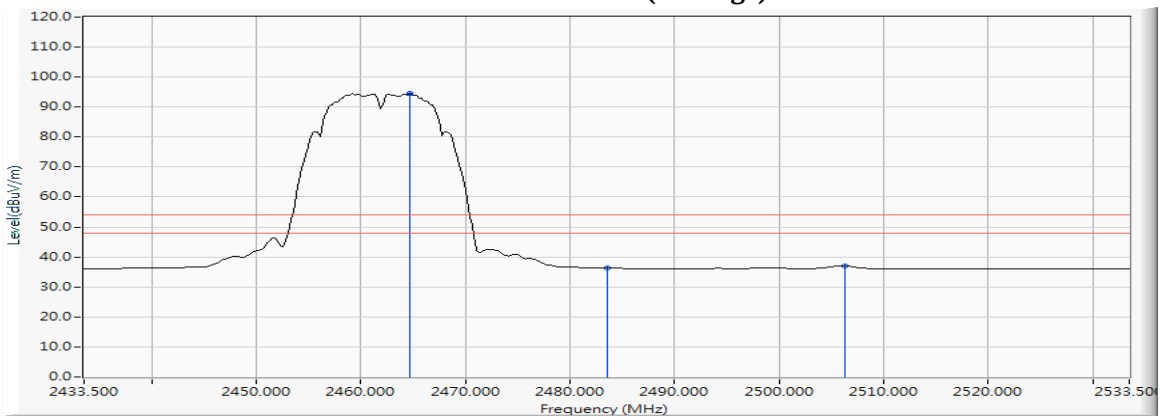


Figure Channel 11: Vertical (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	11.556	51.731	63.287	74.000	54.000	Pass
01 (Peak)	2400.000	11.579	63.808	75.387	--	--	Pass
01 (Peak)	2410.725	11.605	91.337	102.942	--	--	--
01 (Average)	2390.000	11.556	32.116	43.672	74.000	54.000	Pass
01 (Average)	2400.000	11.579	44.232	55.811	--	--	Pass
01 (Average)	2410.435	11.604	80.757	92.361	--	--	--

Figure Channel 01: Horizontal (Peak)

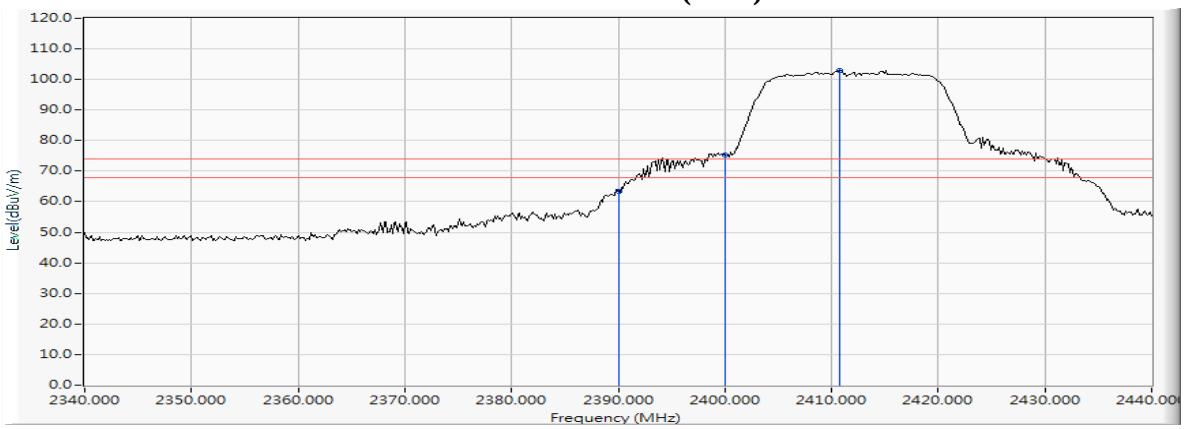
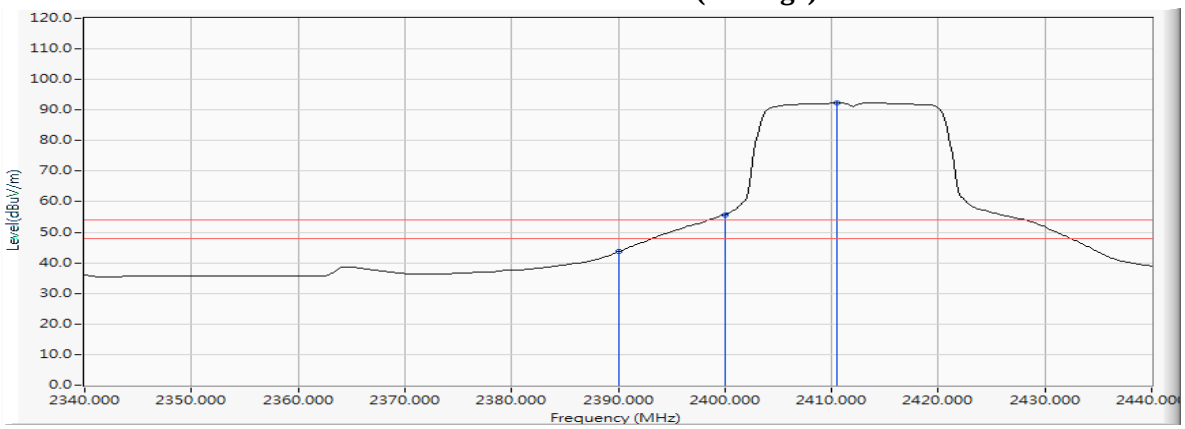


Figure Channel 01: Horizontal (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	11.556	53.188	64.744	74.000	54.000	Pass
01 (Peak)	2398.696	11.575	65.286	76.862	--	--	Pass
01 (Peak)	2400.000	11.579	64.855	76.434	--	--	Pass
01 (Peak)	2410.725	11.605	91.937	103.542	--	--	--
01 (Average)	2390.000	11.556	33.664	45.220	74.000	54.000	Pass
01 (Average)	2400.000	11.579	45.135	56.714	--	--	Pass
01 (Average)	2410.580	11.604	81.373	92.977	--	--	--

Figure Channel 01: Vertical (Peak)

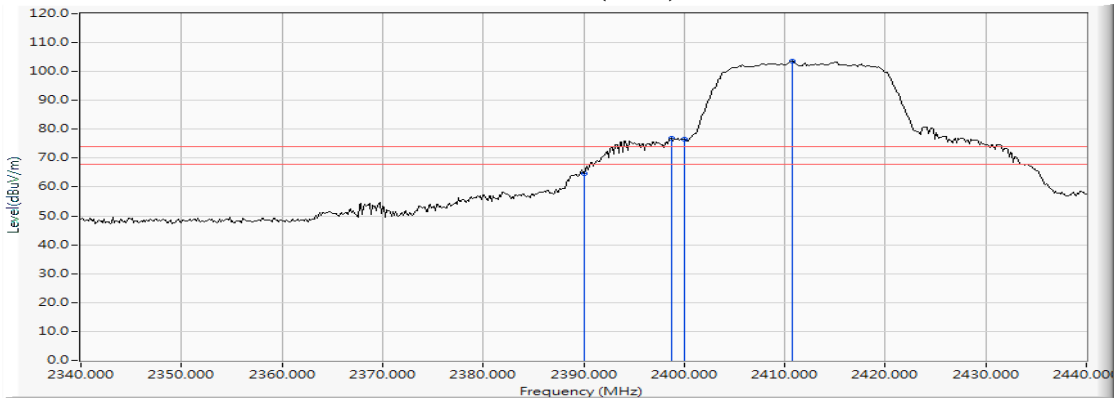
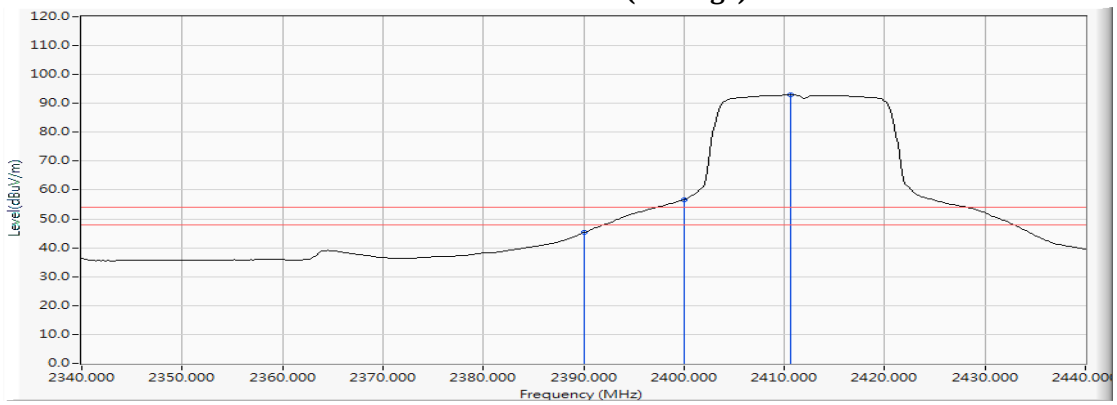


Figure Channel 01: Vertical (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2465.094	11.752	92.734	104.486	--	--	--
11 (Peak)	2483.500	11.800	54.260	66.060	74.000	54.000	Pass
11 (Average)	2460.601	11.739	82.156	93.895	--	--	--
11 (Average)	2483.500	11.800	32.895	44.695	74.000	54.000	Pass

Figure Channel 11: Horizontal (Peak)

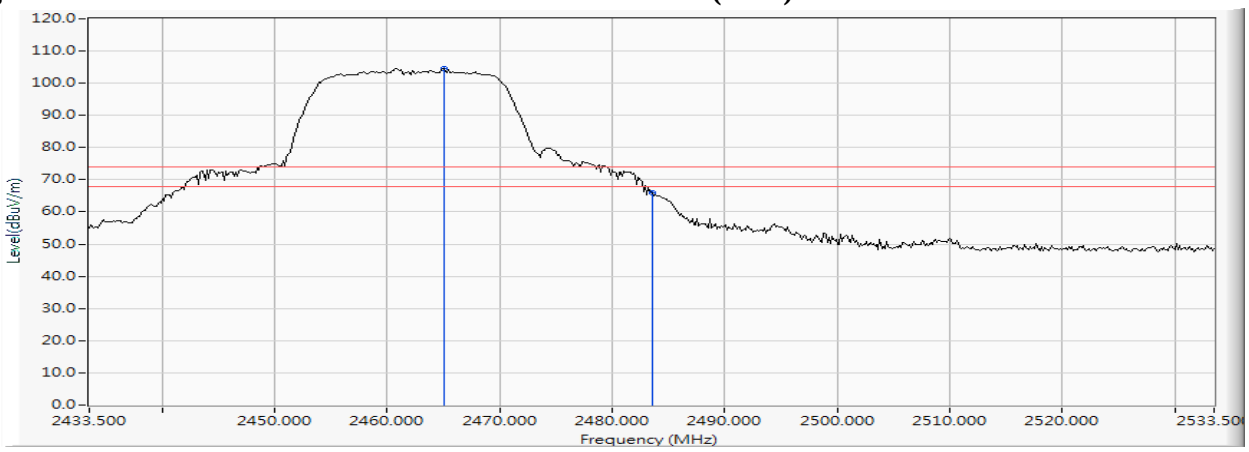
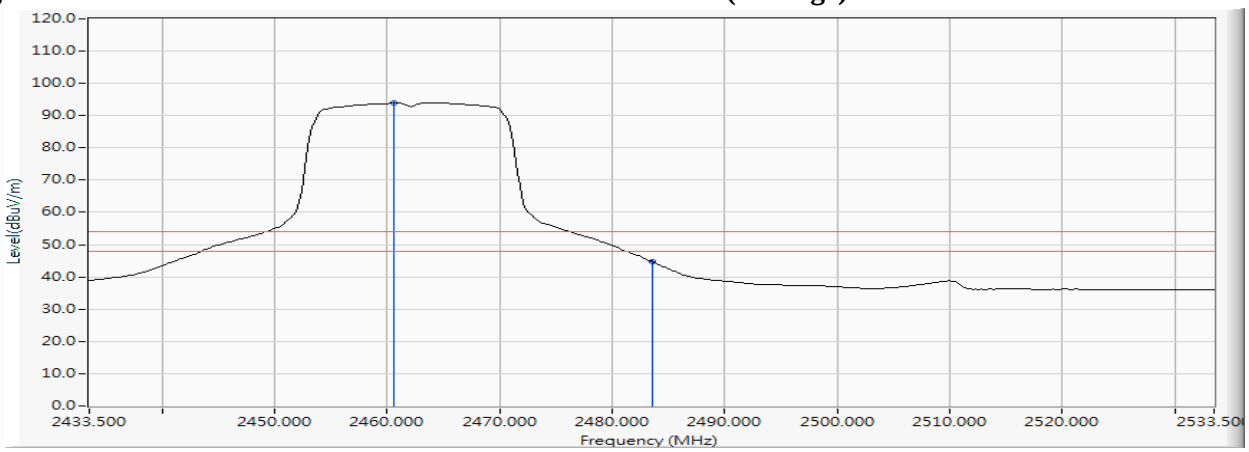


Figure Channel 11: Horizontal (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2460.746	11.739	93.363	105.102	--	--	--
11 (Peak)	2483.500	11.800	55.510	67.310	74.000	54.000	Pass
11 (Average)	2460.601	11.739	82.793	94.532	--	--	--
11 (Average)	2483.500	11.800	33.996	45.796	74.000	54.000	Pass

Figure Channel 11: Vertical (Peak)

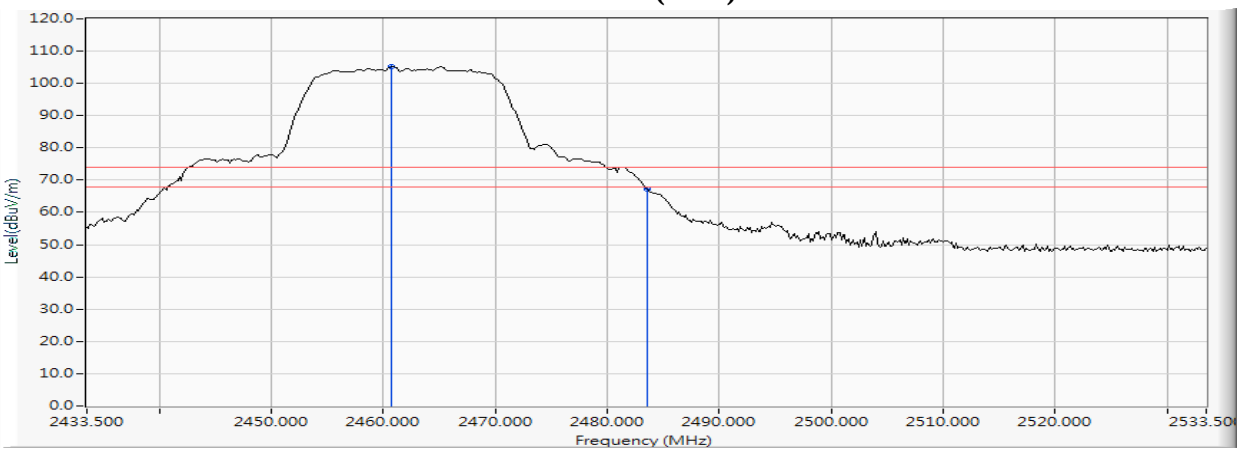
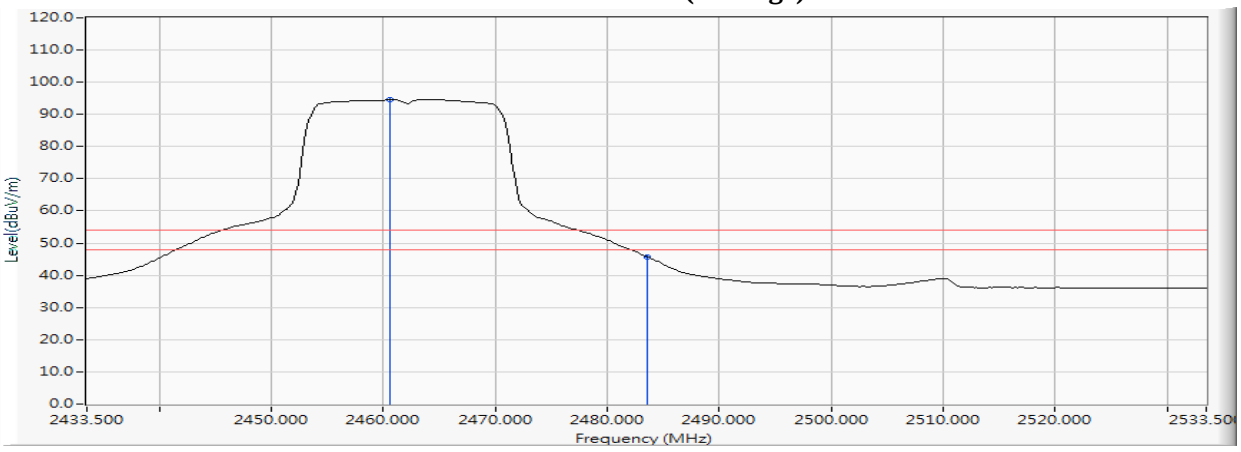


Figure Channel 11: Vertical (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	11.556	59.358	70.914	74.000	54.000	Pass
01 (Peak)	2399.420	11.578	70.587	82.165	--	--	Pass
01 (Peak)	2400.000	11.579	66.789	78.368	--	--	Pass
01 (Peak)	2412.029	11.608	92.657	104.265	--	--	--
01 (Average)	2390.000	11.556	34.740	46.296	74.000	54.000	Pass
01 (Average)	2400.000	11.579	46.535	58.114	--	--	Pass
01 (Average)	2410.435	11.604	81.198	92.802	--	--	--

Figure Channel 01: Horizontal (Peak)

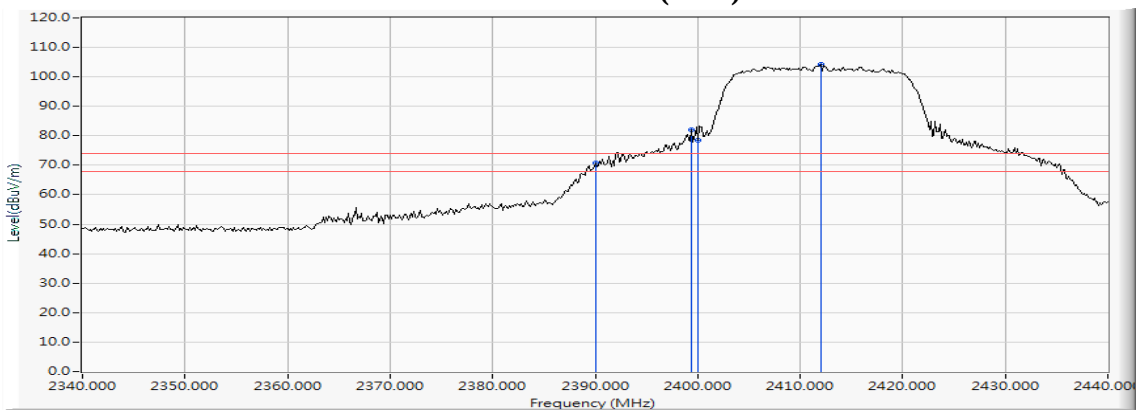
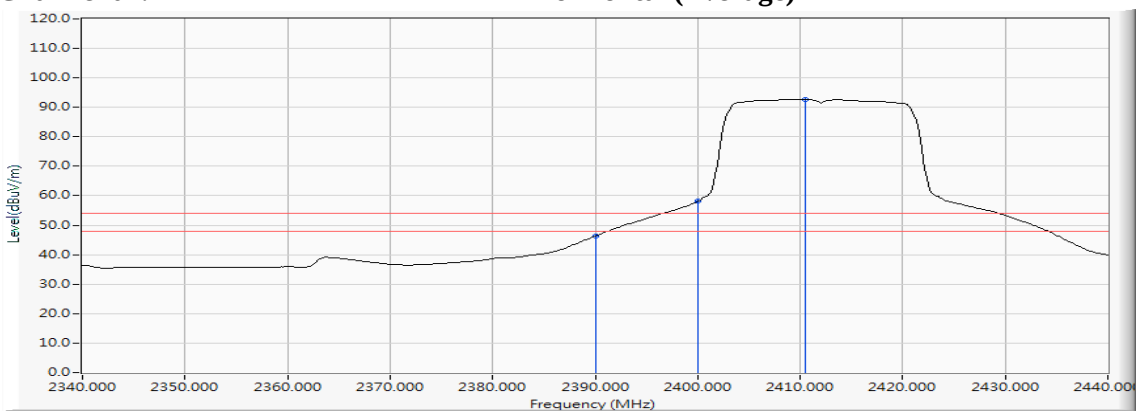


Figure Channel 01: Horizontal (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	11.556	61.232	72.788	74.000	54.000	Pass
01 (Peak)	2400.000	11.579	70.949	82.528	--	--	Pass
01 (Peak)	2412.174	11.609	92.828	104.436	--	--	--
01 (Average)	2390.000	11.556	36.456	48.012	74.000	54.000	Pass
01 (Average)	2400.000	11.579	45.944	57.523	--	--	Pass
01 (Average)	2415.217	11.616	81.305	92.920	--	--	--

Figure Channel 01: Vertical (Peak)

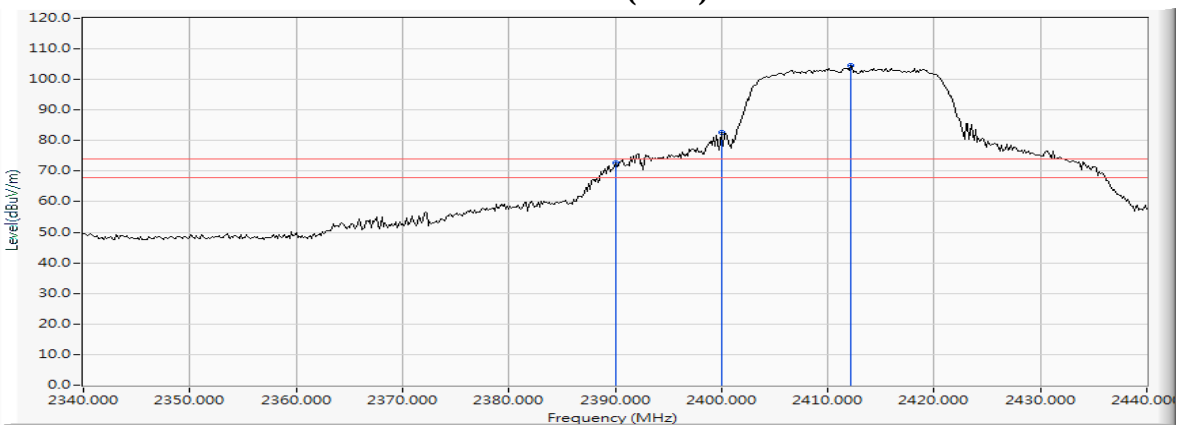
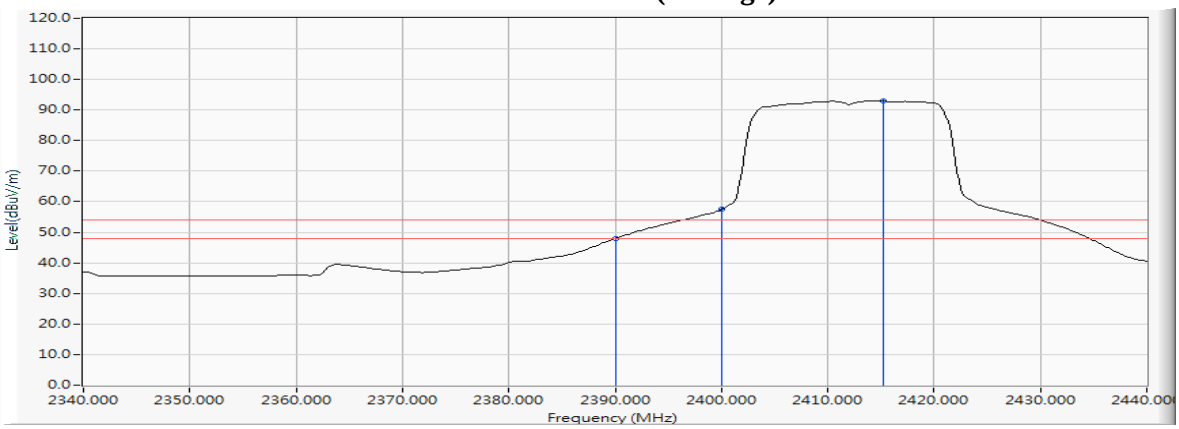


Figure Channel 01: Vertical (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2461.906	11.742	93.601	105.344	--	--	--
11 (Peak)	2483.500	11.800	59.310	71.110	74.000	54.000	Pass
11 (Average)	2460.457	11.739	82.110	93.848	--	--	--
11 (Average)	2483.500	11.800	35.162	46.962	74.000	54.000	Pass

Figure Channel 11: Horizontal (Peak)

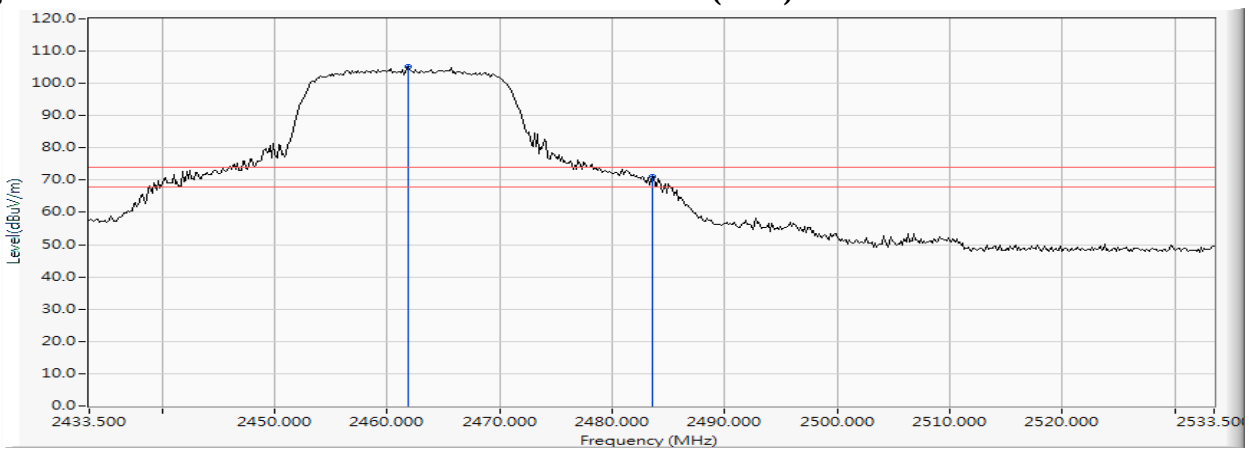
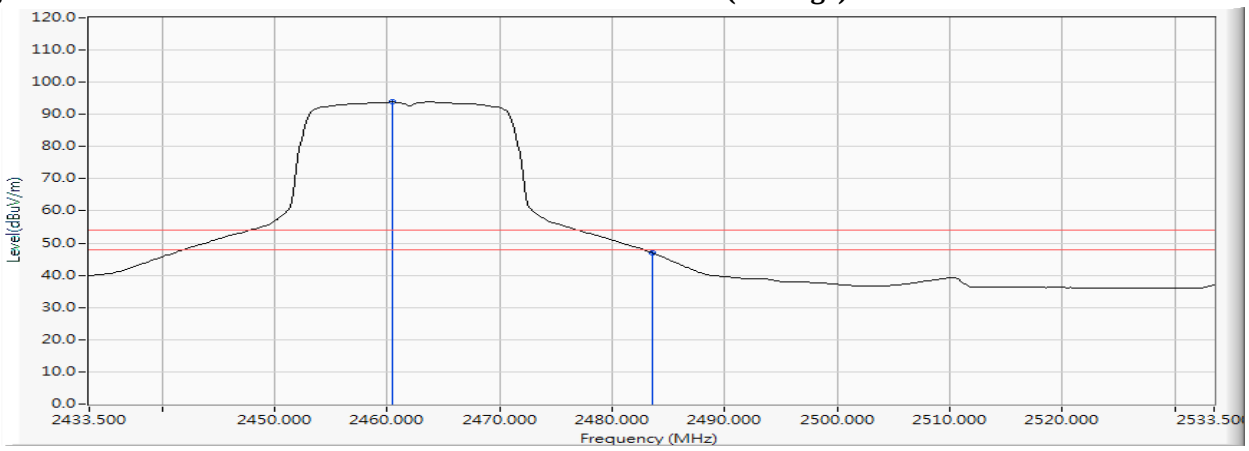


Figure Channel 11: Horizontal (Average)



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 : Data Collector
Test Item : Band Edge Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)
Test Date : 2017/04/18

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2462.051	11.742	94.261	106.004	--	--	--
11 (Peak)	2483.500	11.800	59.960	71.760	74.000	54.000	Pass
11 (Average)	2463.790	11.748	82.732	94.480	--	--	--
11 (Average)	2483.500	11.800	36.818	48.618	74.000	54.000	Pass

Figure Channel 11: Vertical (Peak)

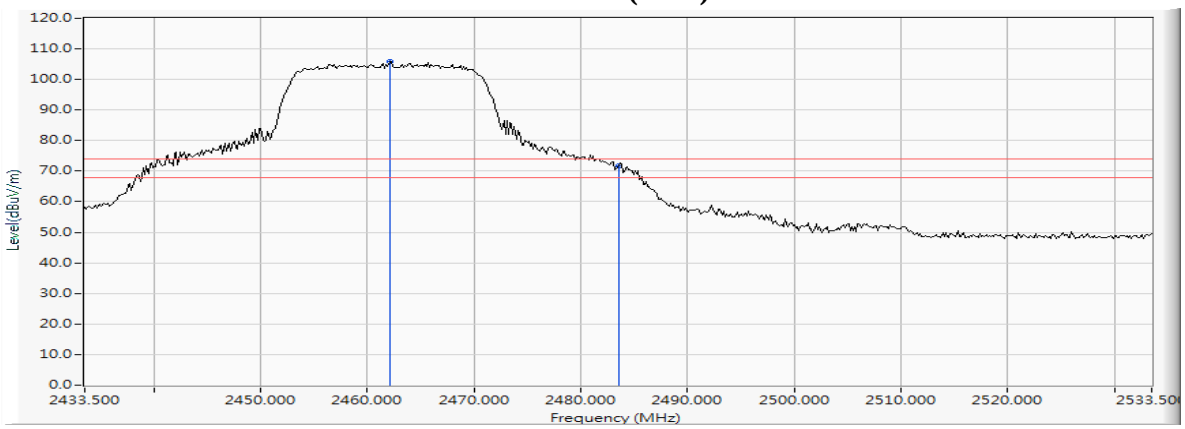
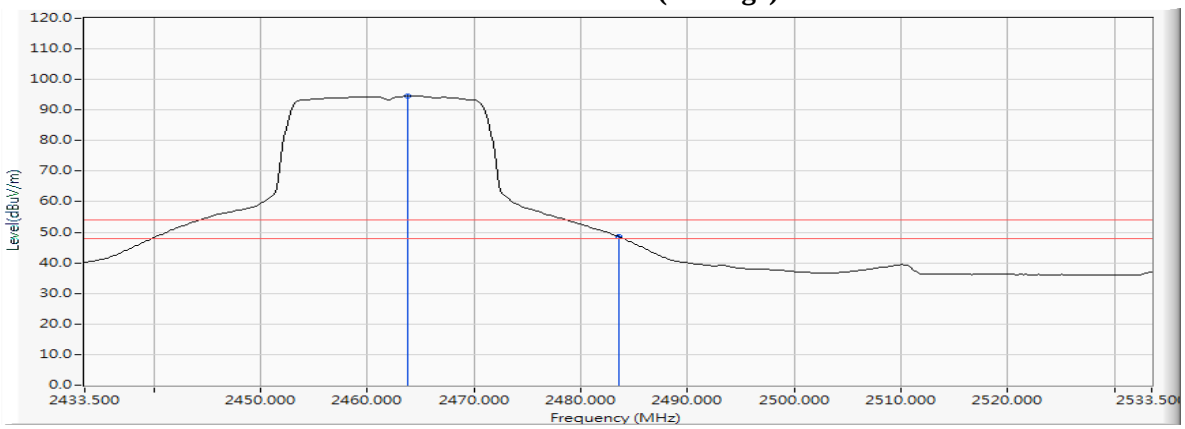


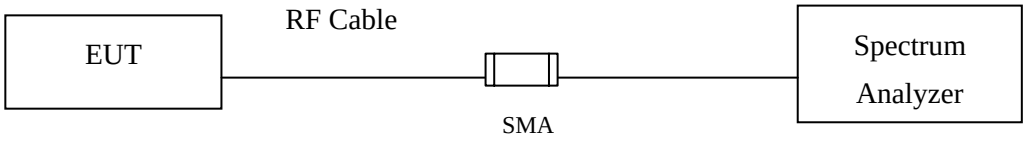
Figure Channel 11: Vertical (Average)



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.

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

The EUT was setup according to ANSI C63.4: 2014; tested according to DTS test procedure of Jan KDB558074 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

± 279.2Hz

7.5. Test Result of 6dB Bandwidth

Product : Data Collector
Test Item : 6dB Bandwidth Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	10150	>500	Pass
06	2437	10150	>500	Pass
11	2462	10100	>500	Pass

Figure Channel 1:

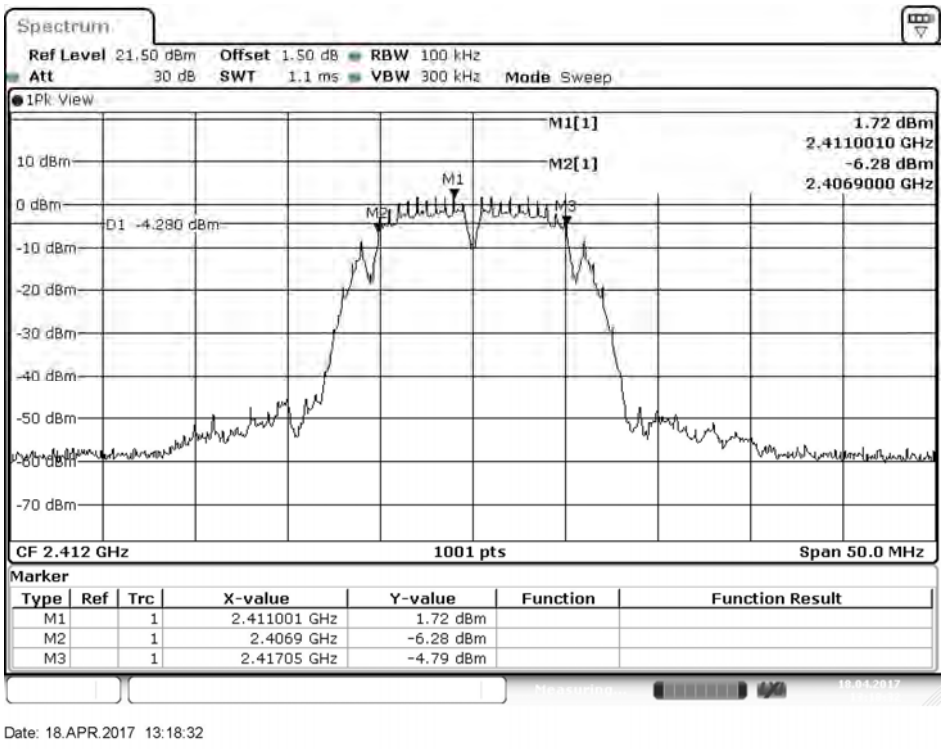
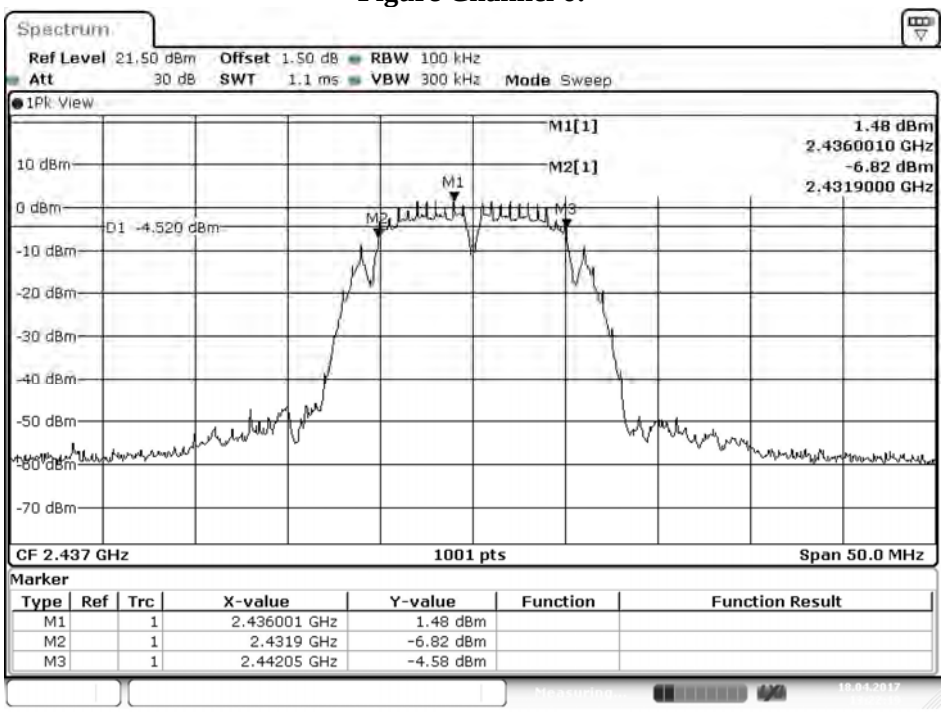
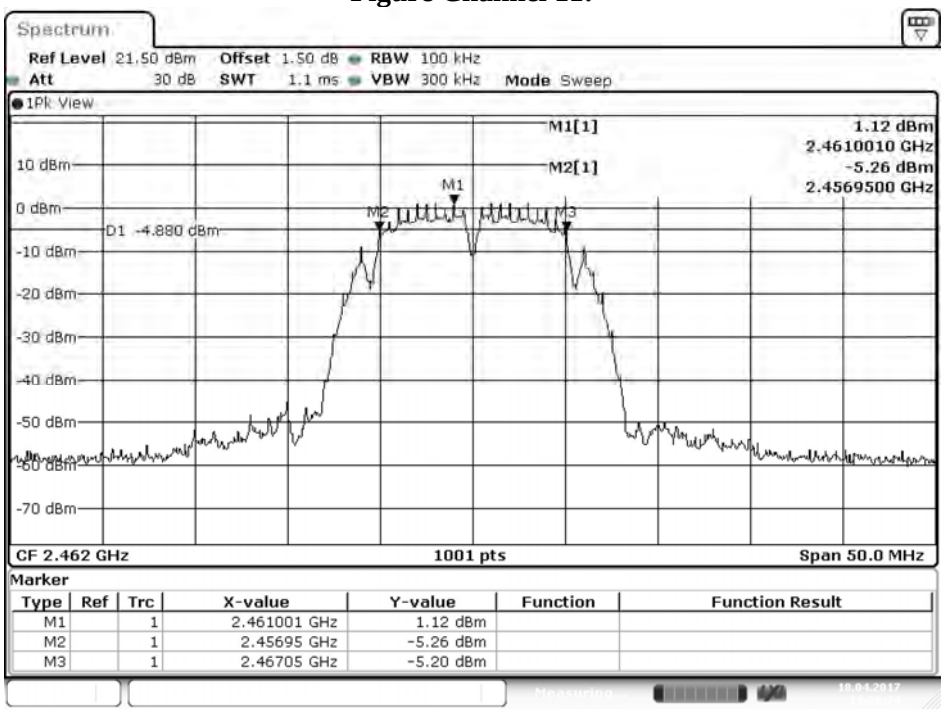


Figure Channel 6:



Date: 18.APR.2017 13:22:19

Figure Channel 11:



Date: 18.APR.2017 13:26:24

Product : Data Collector
Test Item : 6dB Bandwidth Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	16650	>500	Pass
06	2437	16650	>500	Pass
11	2462	16650	>500	Pass

Figure Channel 1:

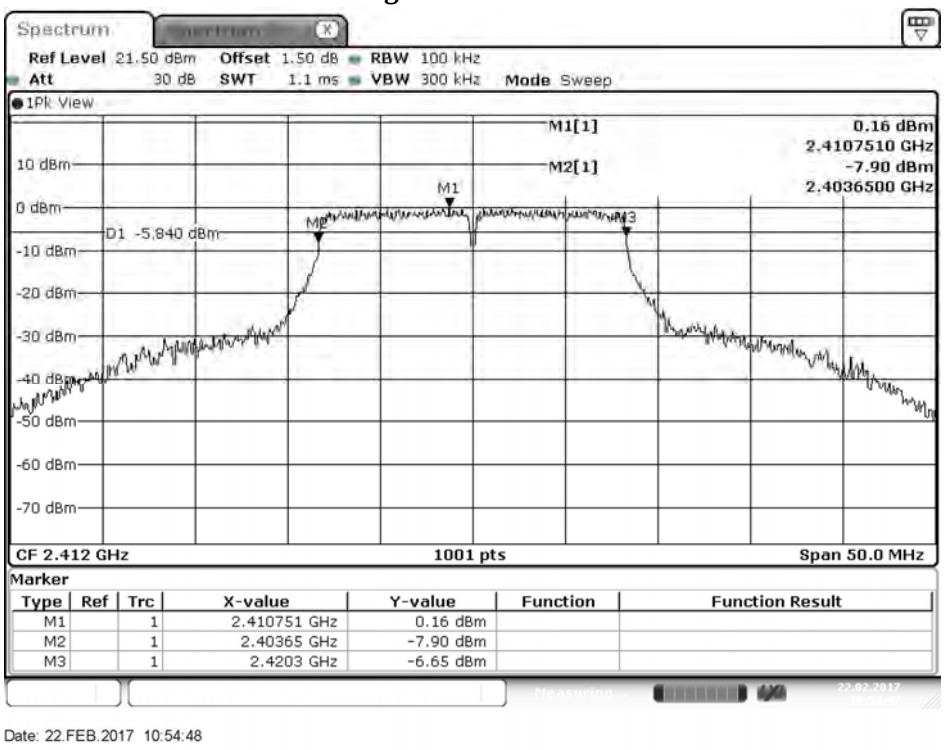
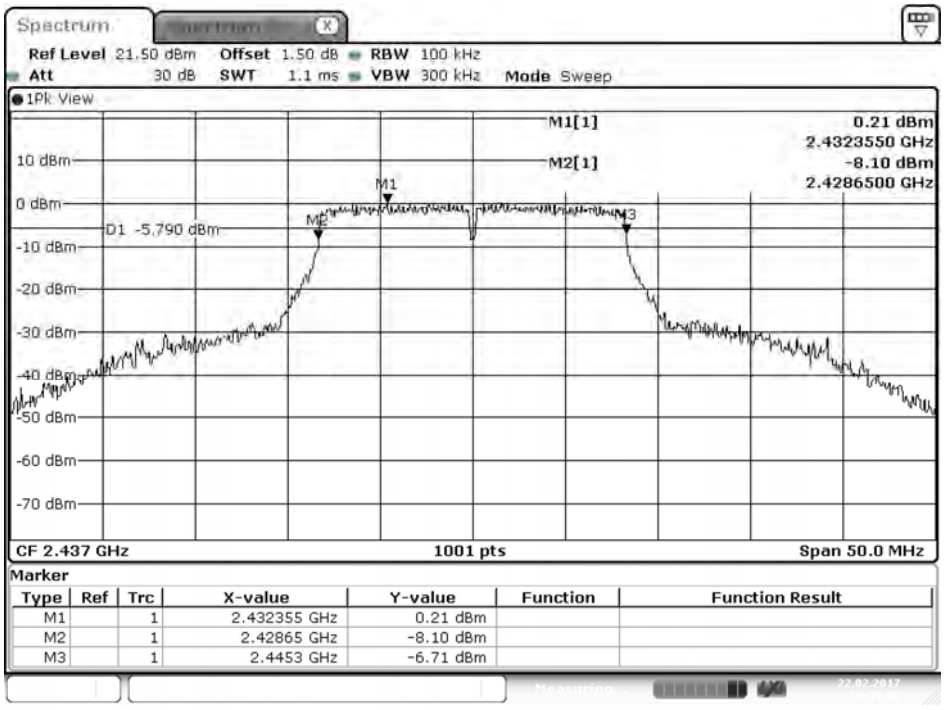
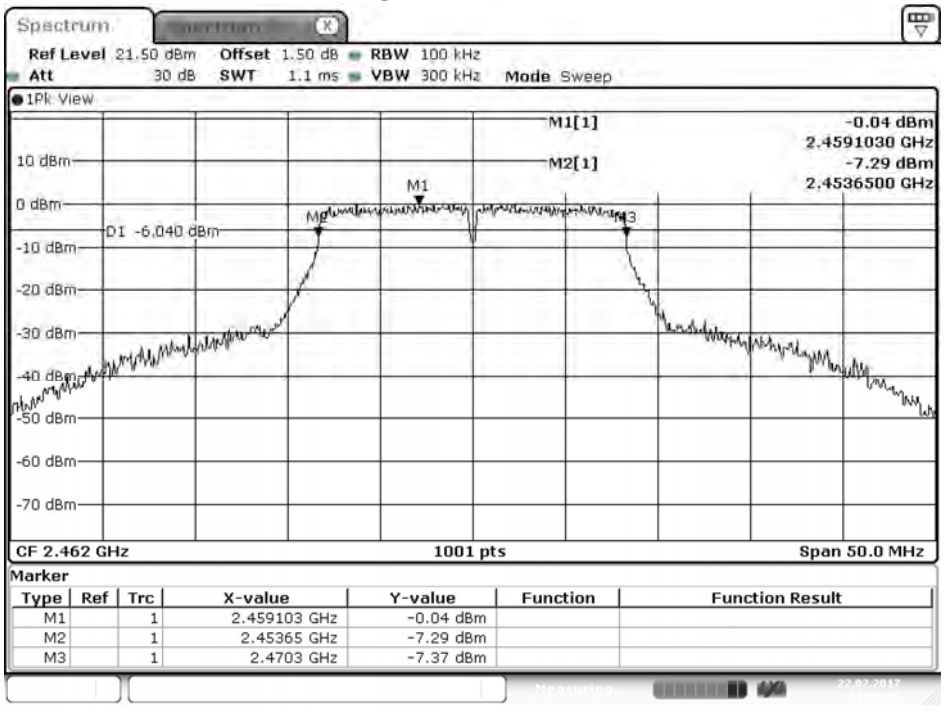


Figure Channel 6:



Date: 22.FEB.2017 10:59:00

Figure Channel 11:



Date: 22.FEB.2017 11:03:05

Product : Data Collector
Test Item : 6dB Bandwidth Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	17850	>500	Pass
06	2437	17900	>500	Pass
11	2462	17900	>500	Pass

Figure Channel 1:

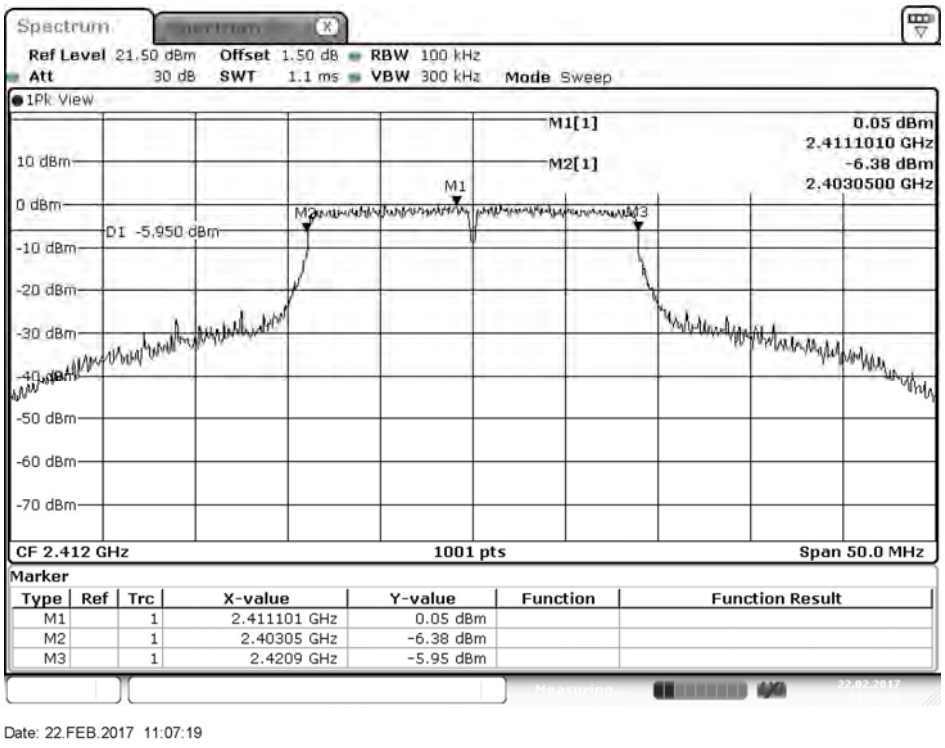
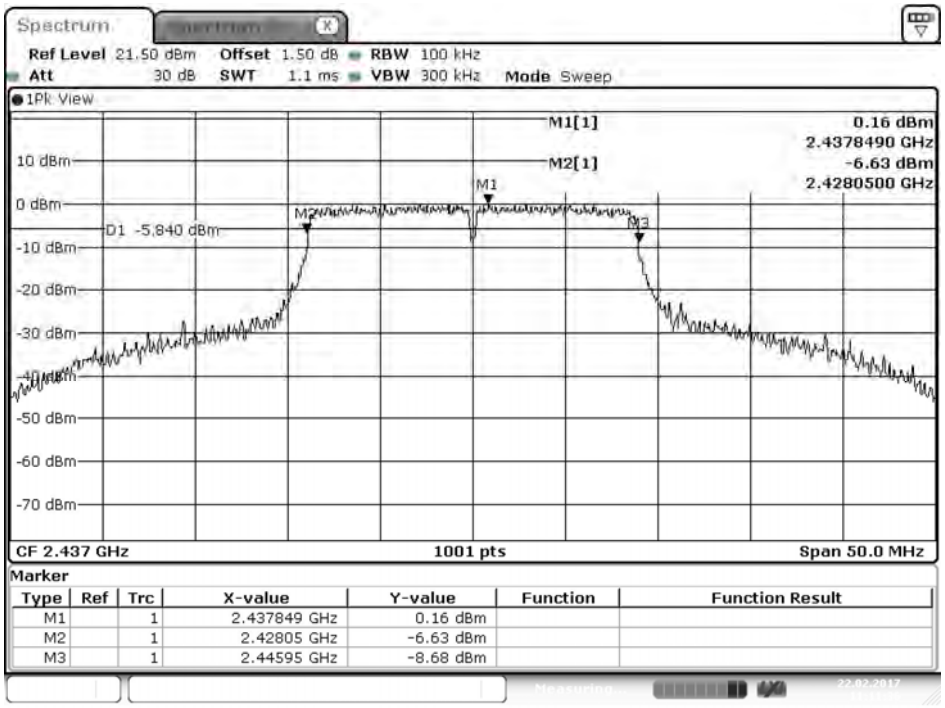
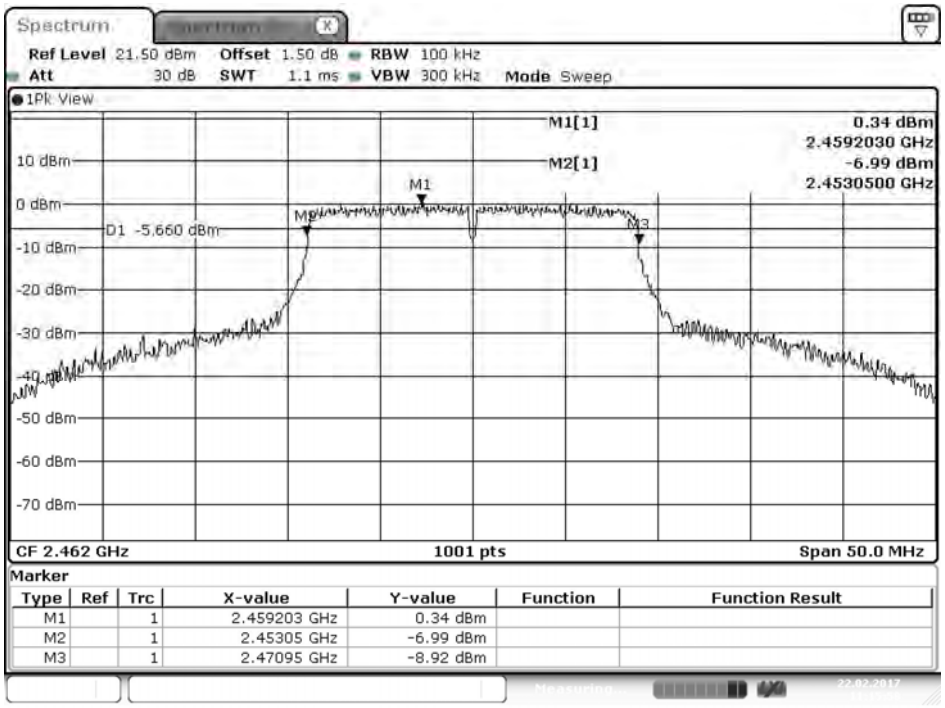


Figure Channel 6:



Date: 22.FEB.2017 11:11:36

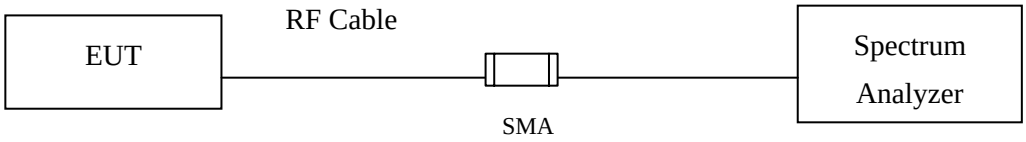
Figure Channel 11:



Date: 22.FEB.2017 11:15:58

8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.
The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.4. Uncertainty

± 1.23 dB

8.5. Test Result of Power Density

Product : Data Collector
Test Item : Power Density Data
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	1.680	≦8dBm	Pass
06	2437	1.470	≦8dBm	Pass
11	2462	1.170	≦8dBm	Pass

Figure Channel 1:

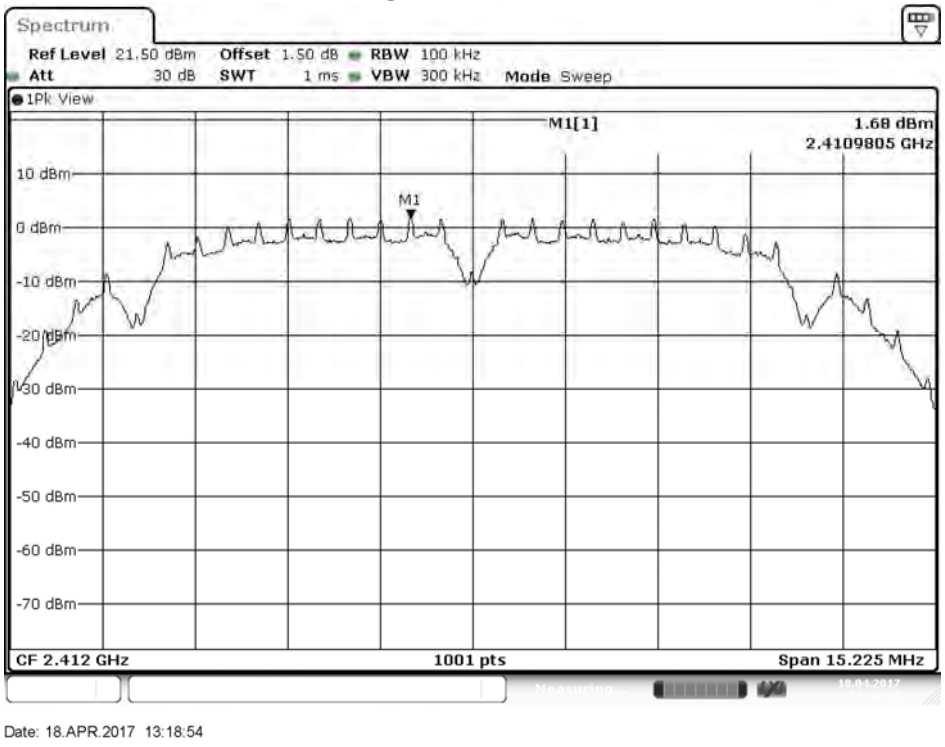
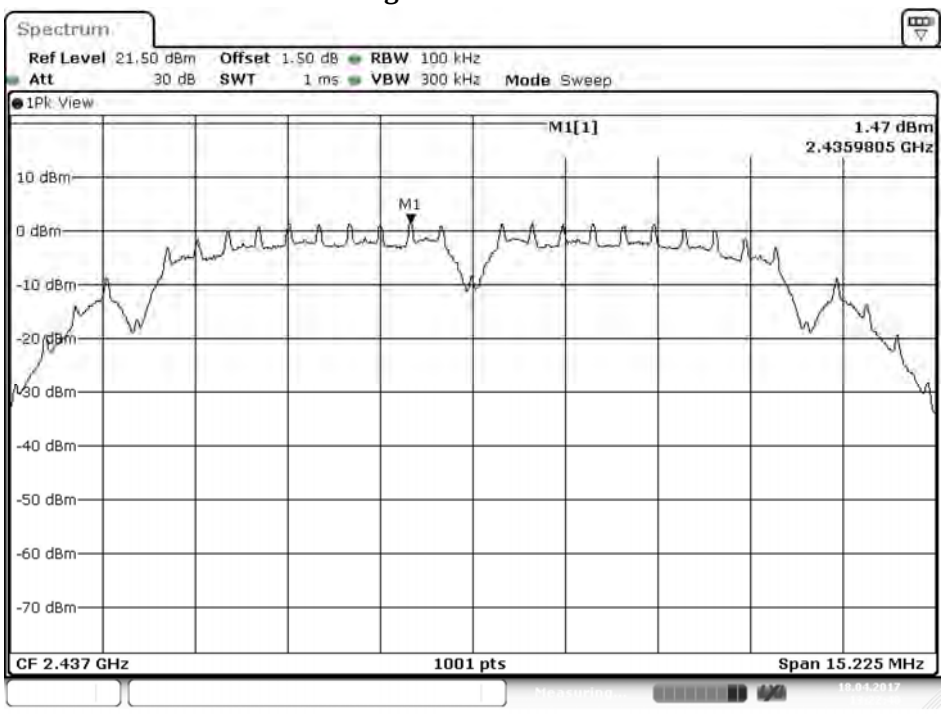
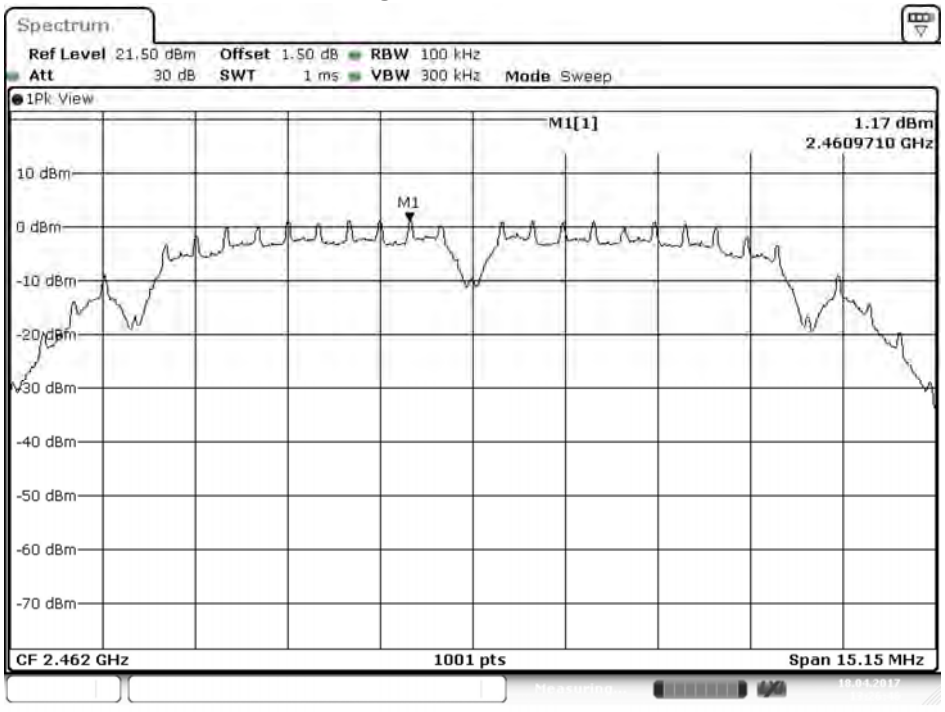


Figure Channel 6:



Date: 18.APR.2017 13:22:40

Figure Channel 11:



Date: 18.APR.2017 13:26:46

Product : Data Collector
Test Item : Power Density Data
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	0.070	≦8dBm	Pass
06	2437	0.260	≦8dBm	Pass
11	2462	0.090	≦8dBm	Pass

Figure Channel 1:

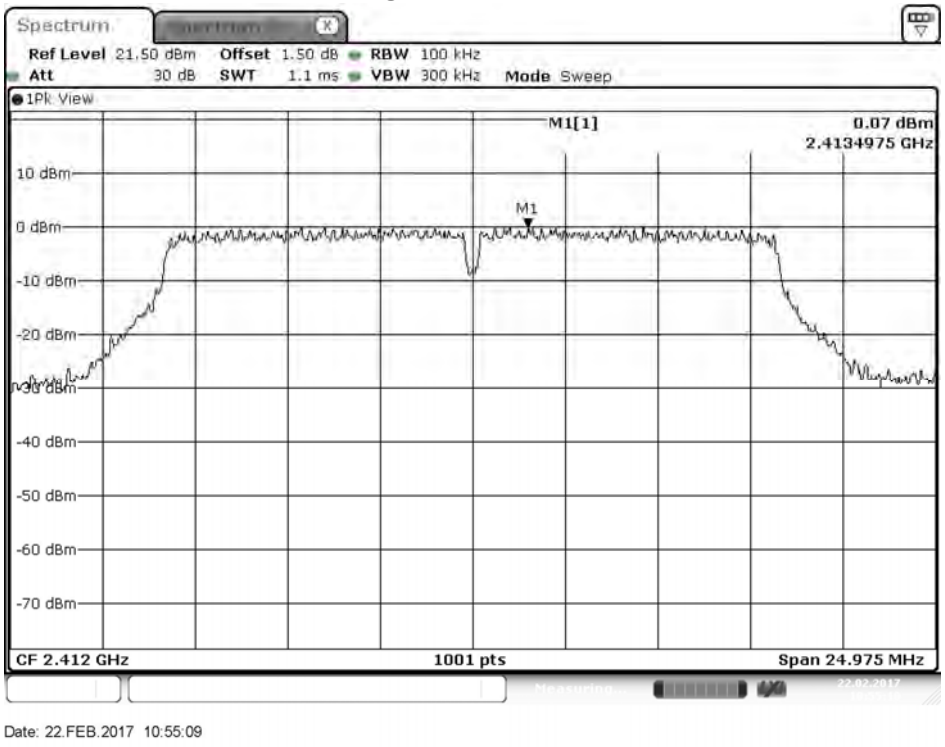
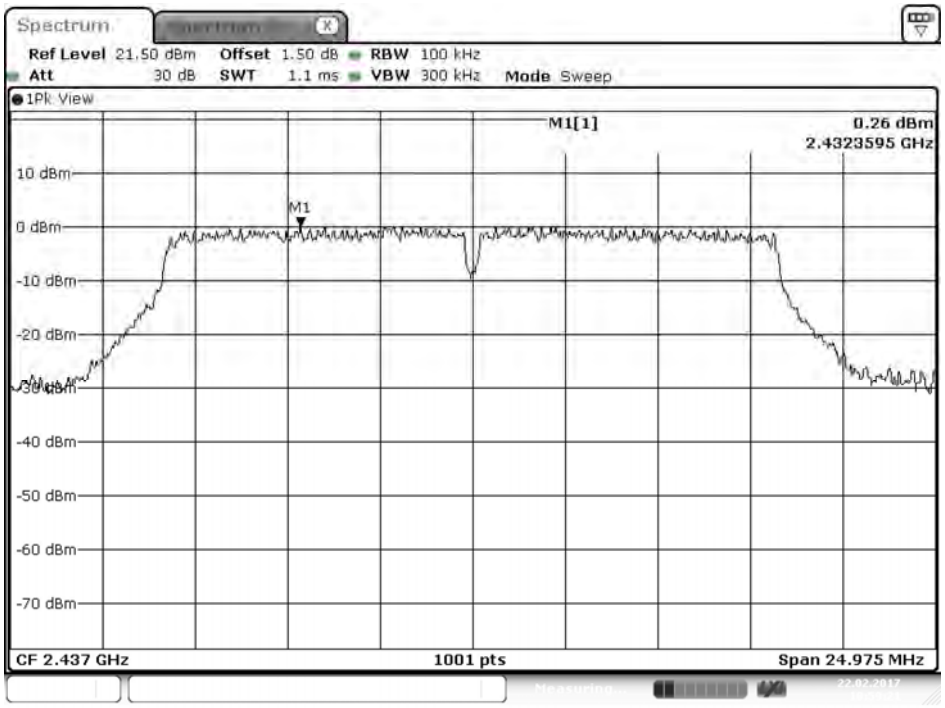
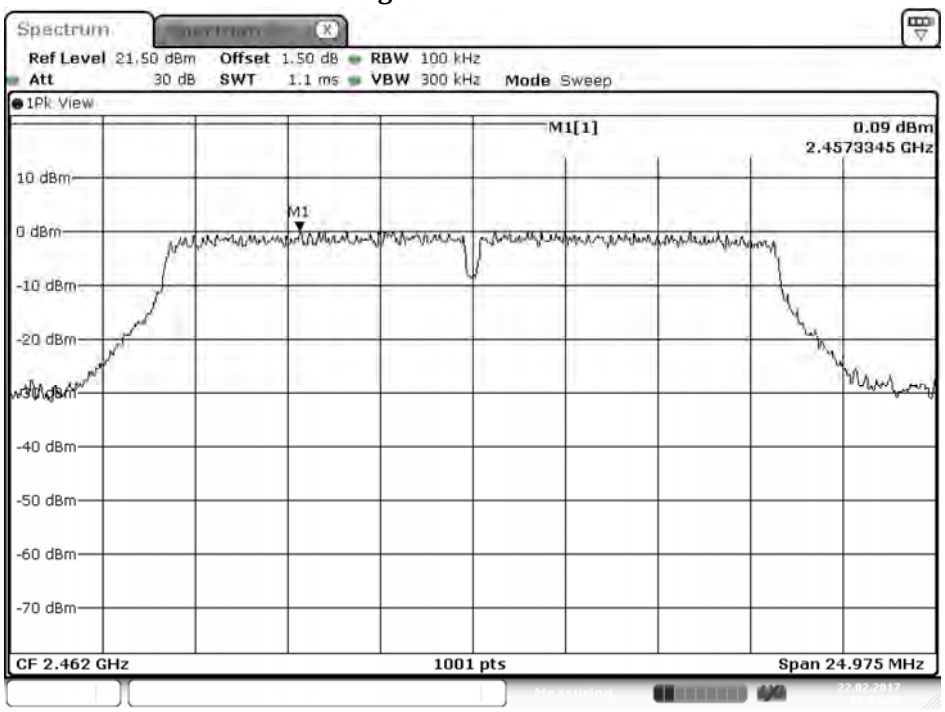


Figure Channel 6:



Date: 22.FEB.2017 10:59:21

Figure Channel 11:



Date: 22.FEB.2017 11:03:27

Product : Data Collector
Test Item : Power Density Data
Test Mode : Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	0.050	≦8dBm	Pass
06	2437	0.170	≦8dBm	Pass
11	2462	-0.070	≦8dBm	Pass

Figure Channel 1:

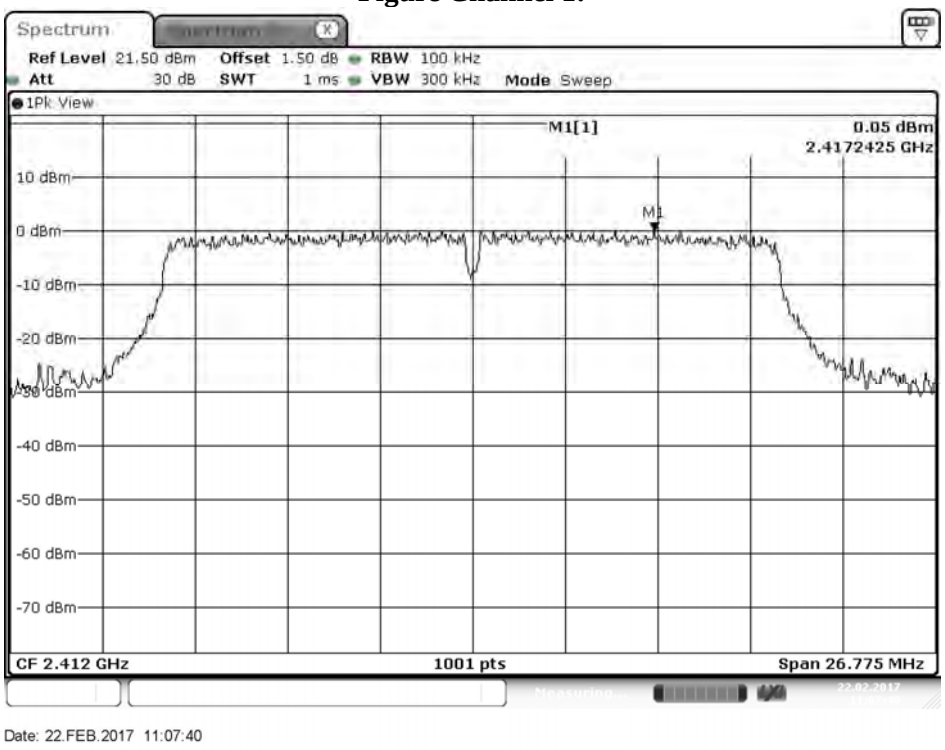


Figure Channel 6:

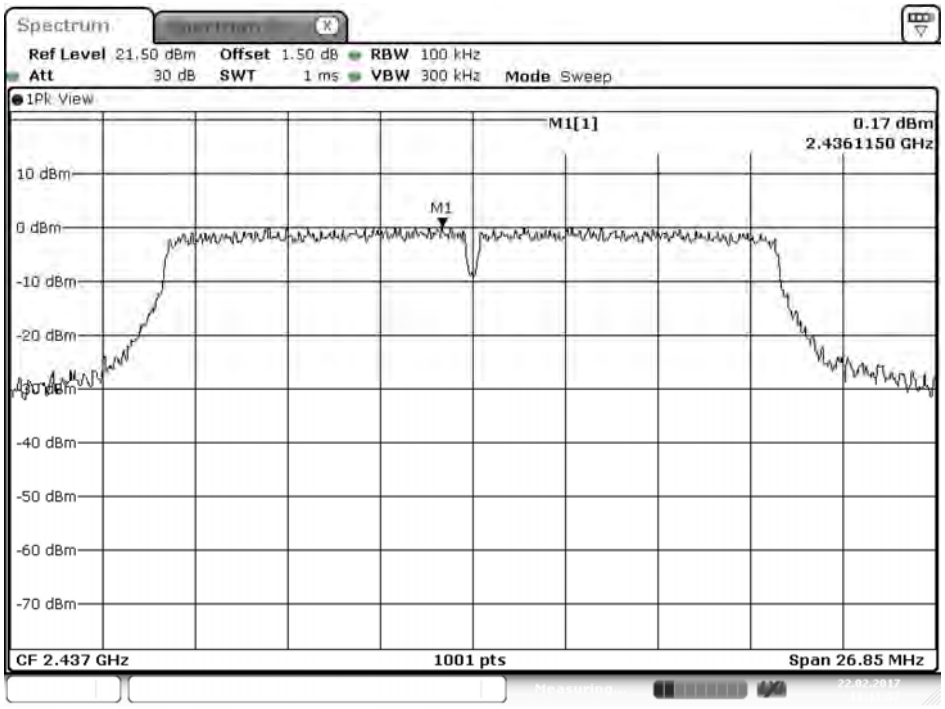
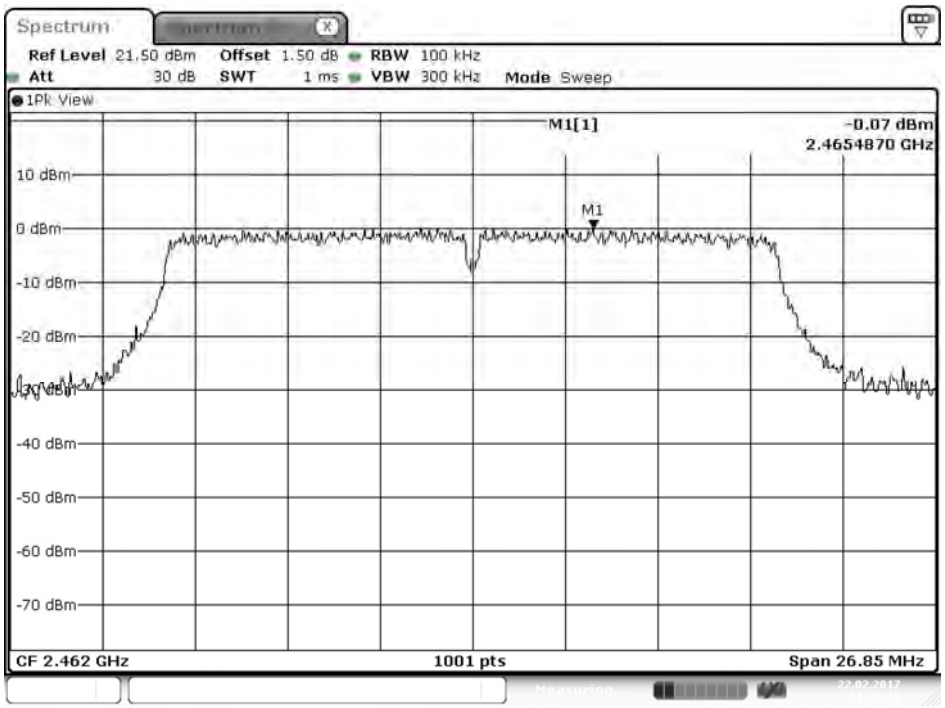


Figure Channel 11:



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.