FCC Test Report

Equipment	:	**N600 DB Wireless N+ Router**
Brand Name	:	**Belkin**
Model No.	:	**F9K1102V2**
FCC ID	:	**K7SF9K1102V2**
Standard	:	**47 CFR FCC Part 15.247**
Applicant **Manufacturer**	:	**Belkin International Inc.** **12045 E. Waterfront Drive Playa Viste, CA 90094, USA**

The product sample received on Apr. 18, 2012 and completely tested on Jun. 21, 2012. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Wayne Hsu / Assistant Manager

Testing Laboratory
1190

Table of Contents

Summary of Test Result

Conformance Test Specifications					
Report Clause	**Ref. Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	0.3872MHz: 40.16dBuV (7.96dB) - AV 43.43dBuV (14.69dB) - QP [Ref. page 17]	FCC 15.207	Complied
3.2	15.247(a)	6dB Bandwidth	6dB Bandwidth Unit [MHz] 2412-2462MHz: 10.02-DSSS 2412-2462MHz: 17.76-OFDM 2422-2452MHz: 36.32-OFDM	≥500kHz	Complied
3.3	15.247(b)	RF Output Power (Maximum Peak Conducted Output Power)	Power [dBm] 2412-2462MHz: 15.85-DSSS 2412-2462MHz: 25.44-OFDM 2422-2452MHz: 23.74-OFDM	Power [dBm] 2412-2462MHz: 30 2422-2452MHz: 30	Complied
3.4	15.247(d)	Power Spectral Density	PSD [dBm/3kHz] 2412-2462MHz: -5.36-DSSS 2412-2462MHz: -12.68-OFDM 2422-2452MHz: -16.28-OFDM	PSD [dBm/3kHz] 2412-2462MHz: 8 2422-2452MHz: 8	Complied
3.5	15.247(c)	Transmitter Radiated Bandedge Emissions	Non-Restricted Bands: 2398.57MHz: 27.95dB [Ref. page 40] Restricted Bands [dBuV/m at 3m]: 2483.50MHz: 67.66 (Margin 6.34dB) - PK 52.90 (Margin 1.1dB) - AV [Ref. page 39]	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
3.6	15.247(c)	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 4824MHz: 52.52 (Margin 21.48dB) - PK 52.80 (Margin 1.2dB) - AV [Ref. page 52]	Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209	Complied
4.1	2.1091	Maximum Permissible Exposure	0.1671 mW/cm^2	1 mW/cm^2	Complied

Revision History

Report No.	Version	Description	Issued Date
FR241874AC	Rev. 01	Initial issue of report	Jun. 27, 2012

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11 Protocol**	**Ch. Frequency (MHz)**	**Channel Number**	**RF Output Power (dBm)**	**Designation of Emission**
2400-2483.5	b	2412-2462	1-11 [11]	15.85	15M0G1D
2400-2483.5	g	2412-2462	1-11 [11]	24.66	16M9D1D
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	25.44	17M9D1D
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	23.74	36M5D1D
Note 1: IEEE Std. 802.11-2007 modulation consists of IEEE Std. 802.11g-2003 and IEEE Std. 802.11b-1999. Note 2: IEEE Std. 802.11n-2009 modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 3: RF output power specifies that Maximum Peak Conducted Output Power.					

Transmitter Chains & Receiver Chains Information					
IEEE Std. 802.11 Protocol	**Number of Transmit Chains (N_{TX})**	**Number of Receive Chains (N_{RX})**	**Correlation Signals with Multiple N_{TX}**	**99% Emission Bandwidth (MHz)**	**Co-location**
b	1	1	N/A	14.96	N/A
g	2	2	Correlated	16.88	N/A
n (HT20)	2	2	Uncorrelated	17.88	N/A
n (HT40)	2	2	Uncorrelated	36.48	N/A
Note 1: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)					

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☒	Integral antenna (antenna permanently attached)
	☒ Temporary RF connector provided
	☐ No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☐	External antenna (dedicated antennas)
	☐ Single power level with corresponding antenna(s). Power Level (PL): 1
	☐ Multiple power level and corresponding antenna(s). Power Level (PL): 1~…
	☐ No RF connector provided
	☐ Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
	☐ RF connector provided
	☐ Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type…)
	☐ Standard antenna connector. (e.g., SMA, N, BNC, and TNC type…)

Antenna General Information									
Antenna Port (Total 2 Port)					1(TX/RX), 2(TX/RX)				
Maximum RF Output Power Level (PL)					1				
Transmit Chains Power Distribution					☒ symmetrical distribution ☐ asymmetrical distribution				
Ant. No.	**PL**	**Ant. Port** [Ant No. *X* connect to Ant. Port *Y*]	**Ant. Cat.**	**Ant. Type**	**Brand**	**Model**	**G_{ANT}** (dBi)	**DG (dBi)** [correlated] **N_{TX} = 1**	**DG (dBi)** [uncorrelated] **N_{TX} = 2**
1	1	1	Integral	PIFA	-	-	3.95	N/A	3.8
2	1	2	Integral	PIFA	-	-	3.65		
☒	The equipment is normally installed and point-to-point or point-to-multipoint systems: Ant. No. 1,2								

Note 1: For all transmitter outputs with equal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain (DG) = G_{ANT} + 10 log(N) dBi
All transmit signals are completely uncorrelated, Directional Gain (DG)= G_{ANT}

Note 2: For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain (DG) =
$10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N]$ dBi
All transmit signals are completely uncorrelated, Directional Gain (DG) =
$10 \log[(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})/N]$ dBi

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	☐ Production ; ☒Pre-Production ; ☒ Prototype

Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: …
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: …
☐	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle		
☐ Operated normally mode for worst duty cycle		
☒ Operated test mode for worst duty cycle		
Test Signal Duty Cycle (x)	**Power Duty Factor [dB] – (10 log 1/x)**	**Voltage Duty Factor [dB] – (20 log 1/x)**
☒ 100% - IEEE 802.11b	0	0
☒ 100% - IEEE 802.11g	0	0
☒ 100% - IEEE 802.11n (HT20)	0	0
☒ 100% - IEEE 802.11n (HT40)	0	0

1.1.5 EUT Operational Condition

Supply Voltage	☒ AC mains	☐ DC	
Type of DC Source	☒ Internal DC supply	☐ External DC adapter	☐ Battery
Operational Voltage	☒ Vnom (110 V)	☒ Vmax (126.5 V)	☒ Vmin (93.5 V)
Operational Climatic	☒ Tnom (20°C)	☒ Tmax (50°C)	☒ Tmin (-30°C)

1.2 Accessories and Support Equipment

Accessories				
No.	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
1	AC Adapter 1	belkin	DSA-12PFE-12 BUS 120100	-
2	AC Adapter 2	Sunny	SYS1381-1212-W2	-

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
1	Notebook	DELL	E5520	DoC

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2009
- FCC KDB 558074 - Guidance for Performing Compliance Measurements on DTS
- FCC KDB 662911 - Emissions Testing of Transmitters with Multiple Outputs
- FCC KDB 412172 - Guidelines for Determining the ERP and EIRP

1.4 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973			
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085			
Test Condition		**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Conducted Emission		CO04-HY	Sam	23℃ / 47%	22-May-12
RF Conducted		TH02-CB	Denis	23℃ / 63%	15-Jun-12 ~ 21- Jun-12
Radiated Emission		03CH02-HY	Streak	26.3℃ / 68%	20-May-12 ~ 31-May-12

1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty - HWA YA			
Test Item		**Uncertainty**	**Limit**
AC power-line conducted emissions		± 2.26 dB	N/A
All emissions, radiated	30 – 1000 MHz	± 2.54 dB	N/A
	1 – 18 GHz	±3.59 dB	N/A
	18 – 40 GHz	±3.82 dB	N/A
	40 – 200 GHz	N/A	N/A

Measurement Uncertainty - JHUBEI		
Test Item	**Uncertainty**	**Limit**
Emission bandwidth, 6dB bandwidth	±1.32 %	N/A
RF output power, conducted	±0.72 dB	N/A
Power density, conducted	±0.61 dB	N/A
Temperature	±0.7 ℃	N/A
Humidity	±2.6 %	N/A
DC and low frequency voltages	±3.4 %	N/A
Time	±1.82 %	N/A
Duty Cycle	±1.69 %	N/A

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing						
Power Level		1				
IEEE 802.11 Protocol	**Number of Transmit Chains (N_{TX})**	**Data Rate / MCS**	**Worst Data Rate / MCS**	**Worst Modulation Mode**	**RF Output Power (dBm)**	**Power Spectral Density (dBm/3kHz)**
b	1	1-11 Mbps	1 Mbps	11B-20M	**15.85**	**-5.36**
g	1	6-54 Mbps	6Mbps	11G-20M	**24.66**	**-14.52**
n (HT20)	2	MCS 0-15	MCS 8	11N2.4G-20M	**25.44**	**-12.68**
n (HT40)	2	MCS 0-15	MCS 8	11N2.4G-40M	**23.74**	**-16.28**
Note 1: IEEE Std. 802.11-2007 modulation consists of IEEE Std. 802.11g-2003 and IEEE Std. 802.11b-1999. Note 2: IEEE Std. 802.11n-2009 modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Worst modulation mode of Guard Interval (GI) is 400ns. Note 3: Modulation modes consist of 11B-20M, 11G-20M, 11N2.4G-20M, 11N2.4G-40M: 11B: IEEE 802.11b, 11G: IEEE 802.11g, 11N2.4G: IEEE 802.11n (2.4GHz Band) 20M/40M: Channel Bandwidth 20MHz/40MHz Note 4: RF output power specifies that Maximum Peak Conducted Output Power.						

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration		
IEEE 802.11 Protocol	**Worst Modulation Mode**	**Test Channel Frequencies (MHz) – FX (Frequencies Abbreviations)**
b	11B-20M	2412-(F1), 2437-(F2), 2462-(F3)
g	11G-20M	2412-(F1), 2437-(F2), 2462-(F3)
n (HT20)	11N2.4G-20M	2412-(F1), 2437-(F2), 2462-(F3)
n (HT40)	11N2.4G-40M	2422-(F4), 2437-(F5), 2452-(F6)
Note 1: Modulation modes consist of 11B-20M, 11G-20M, 11N2.4G-20M, 11N2.4G-40M: 11B: IEEE 802.11b, 11G: IEEE 802.11g, 11N2.4G: IEEE 802.11n (2.4GHz Band) 20M/40M: Channel Bandwidth 20M/40M		

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter					
Power Level		1			
Test Software Version		RTL819x2.2.4_11/11/01			
Worst Modulation Mode	**Number of Transmit Chains (N_{TX})**	**Frequency (MHz)**	**Power Setting**	**Worst Data Rate / MCS**	**RF Output Power (dBm)**
11B-20M	1	2412	36	1 Mbps	14.66
11B-20M	1	2442	36	1 Mbps	14.83
11B-20M	1	2472	38	1 Mbps	15.85
11G-20M	1	2412	47	6 Mbps	23.52
11G-20M	1	2442	50	6 Mbps	24.66
11G-20M	1	2472	45	6 Mbps	22.81
11N2.4G-20M	2	2412	46/46	MCS 8	24.04
11N2.4G-20M	2	2442	49/49	MCS 8	25.44
11N2.4G-20M	2	2472	44/44	MCS 8	23.27
11N2.4G-40M	2	2422	44/44	MCS 8	22.28
11N2.4G-40M	2	2437	47/47	MCS 8	23.74
11N2.4G-40M	2	2452	40/40	MCS 8	20.44

Note 1: Modulation modes consist of 11B-20M, 11G-20M, 11N2.4G-20M, 11N2.4G-40M:
11B: IEEE 802.11b, 11G: IEEE 802.11g, 11N2.4G: IEEE 802.11n (2.4GHz Band)
20M/40M: Channel Bandwidth 20MHz/40MHz
Note 2: RF output power specifies that Maximum Peak Conducted Output Power.

2.4 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests				
Tests Item	AC power-line conducted emissions			
Condition	AC power-line conducted measurement for line and neutral			
Operating Mode	**Operating Mode Description**	**Worst Modulation Mode**	**Test Freq.**	**Power Level**
1	Normal TX + Belkin Adapter	11N2.4G-20M	F2	1
2	Normal TX + Sunny Adapter	11N2.4G-40M	F5	1
For operating mode 1 is the worst case and it was record in this test report.				

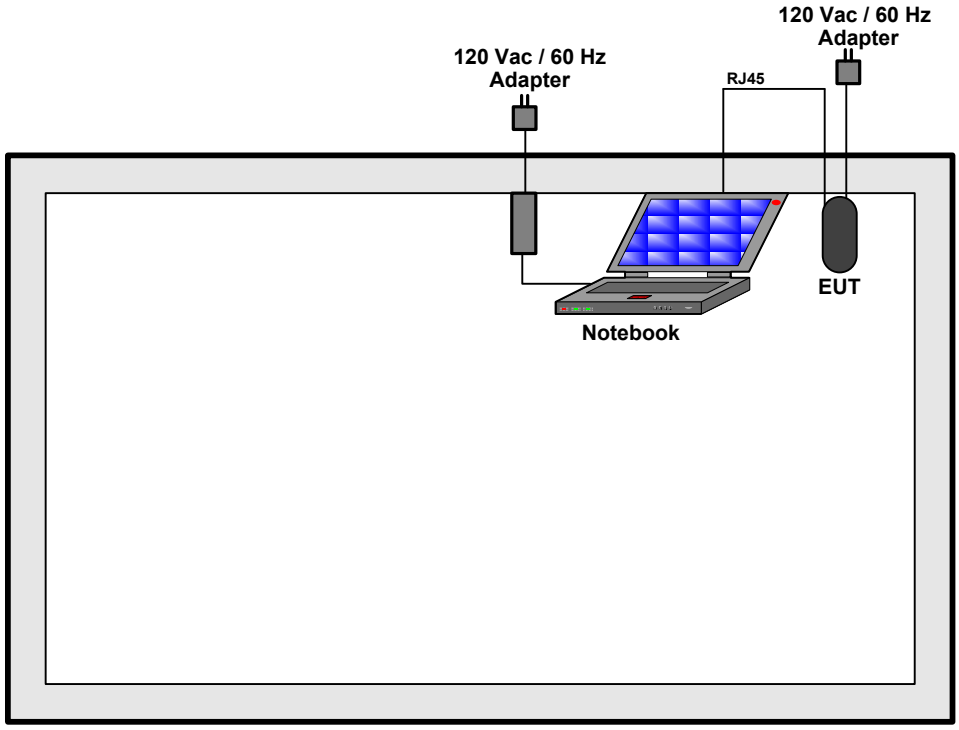
The Worst Case Mode for Following Conformance Tests				
Tests Item	RF Output Power Power Spectral Density 6 dB Bandwidth			
Test Condition	Conducted measurement at transmit chains			
Worst Modulation Mode	**Number of Transmit Chains (N_{TX})**	**Worst Data Rate / MCS**	**Test Frequency**	**Power Level**
11B-20M	1	1 Mbps	F1, F2, F3	1
11G-20M	1	6Mbps	F1, F2, F3	1
11N2.4G-20M	2	MCS 8	F1, F2, F3	1
11N2.4G-40M	2	MCS 8	F4, F5, F6	1

The Worst Case Mode for Following Conformance Tests				
Tests Item	Transmitter Radiated Bandedge Emissions			
Test Condition	Radiated measurement			
Worst Modulation Mode	**Number of Transmit Chains (N_{TX})**	**Worst Data Rate / MCS**	**Test Frequency**	**Power Level**
11B-20M	1	1 Mbps	F1, F3	1
11G-20M	1	6Mbps	F1, F3	1
11N2.4G-20M	2	MCS 8	F1, F3	1
11N2.4G-40M	2	MCS 8	F4, F6	1

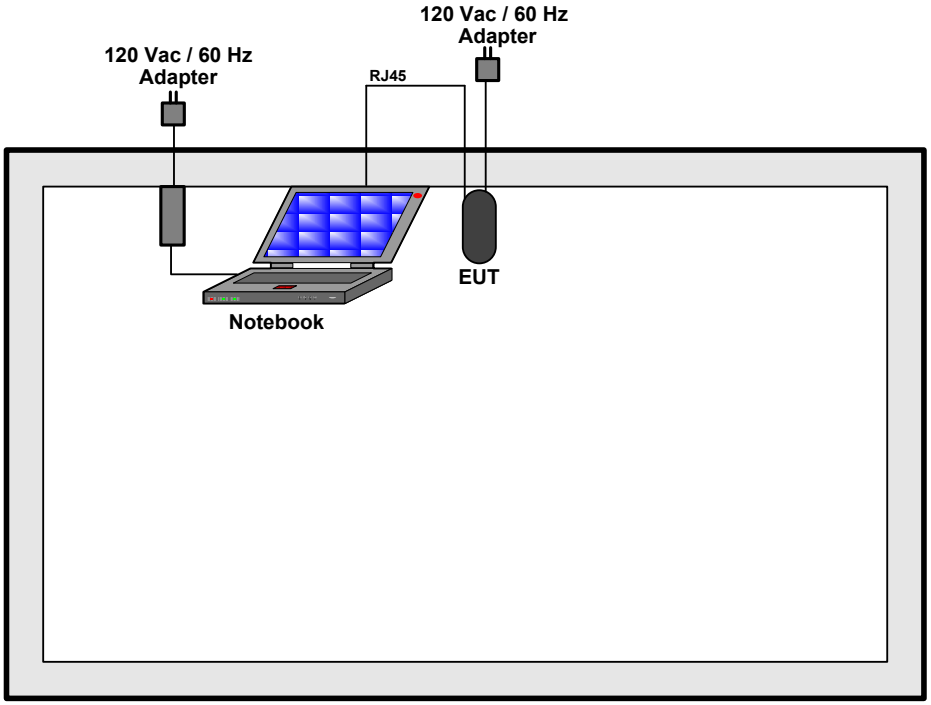
The Worst Case Mode for Following Conformance Tests						
Tests Item	Transmitter Radiated Unwanted Emissions					
Test Condition	Radiated measurement					
User Position	☒ EUT will be placed in fixed position.					
	☐ EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two or three orthogonal planes.					
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes.					
Operating Mode < 1GHz	☒ 1. Normal TX + Belkin Adapter					
	☒ 2. Normal TX + Sunny Adapter					
Worst Modulation Mode	**Number of Transmit Chains (N_{TX})**	**Worst Data Rate / MCS**	**Test Frequency**	**Power Level**	**Ant No.**	**Worst Orthogonal Planes of EUT**
11B-20M	1	1 Mbps	F1, F2, F3	1	1	Y Plane
11G-20M	1	6Mbps	F1, F2, F3	1	1	Y Plane
11N2.4G-20M	2	MCS 8	F1, F2, F3	1	1,2	Y Plane
11N2.4G-40M	2	MCS 8	F4, F5	1	1,2	Y Plane
Orthogonal Planes of EUT	**X Plane**		**Y Plane**		**Z Plane**	
						
For operating mode 1 is the worst case and it was record in this test report.						

2.5 Test Setup Diagram

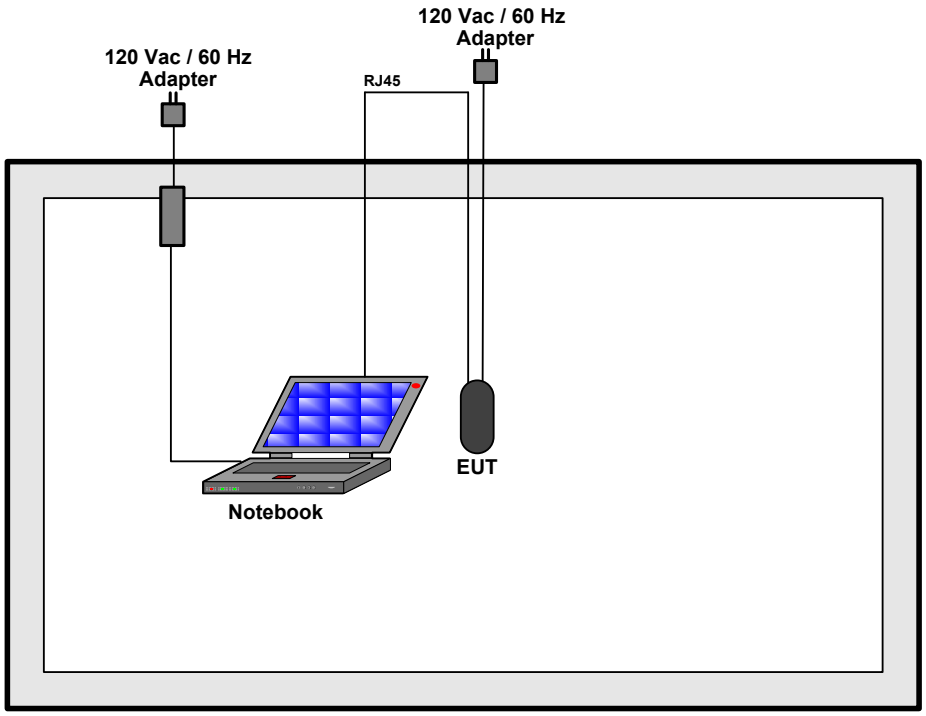
Test Setup Diagram – AC Line Conducted Emission Test	
Operating Mode 1	Normal TX + Belkin Adapter



Test Setup Diagram - Radiated Test (9kHz~1GHz)	
Operating Mode 1	Normal TX + Belkin Adapter



Test Setup Diagram - Radiated Test (above 1GHz)



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

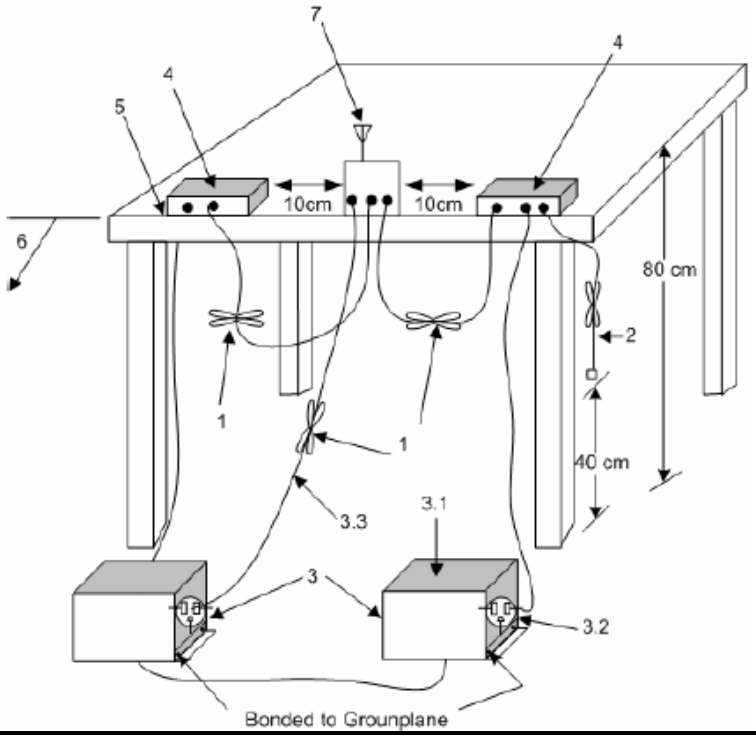
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

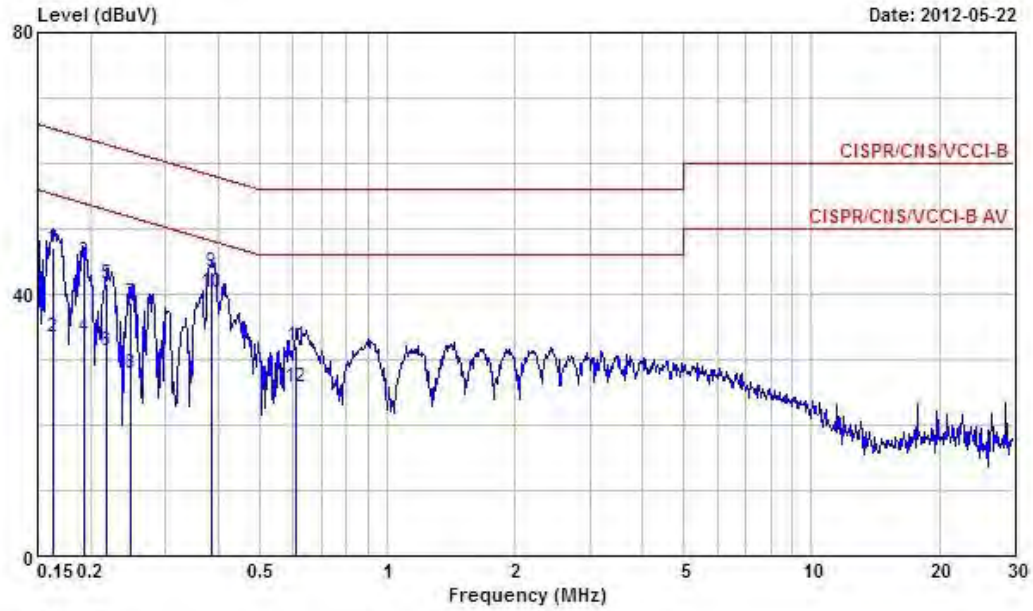
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

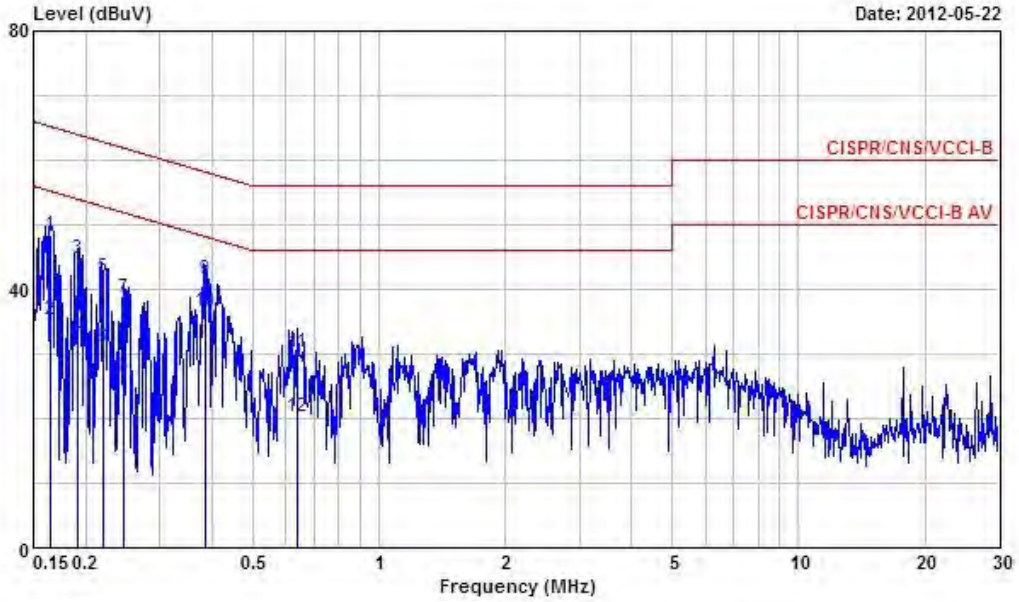
AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Mode	1	**Ant. No.**	1+2	**Power Phase**	Neutral
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1624080	47.16	-18.18	65.34	46.80	0.26	0.10	QP
2	0.1624080	33.34	-22.00	55.34	32.98	0.26	0.10	Average
3	0.1929470	44.90	-19.01	63.91	44.55	0.25	0.10	QP
4	0.1929470	33.55	-20.36	53.91	33.20	0.25	0.10	Average
5	0.2185070	41.51	-21.37	62.88	41.16	0.25	0.10	QP
6	0.2185070	31.37	-21.51	52.88	31.02	0.25	0.10	Average
7	0.2482410	38.77	-23.05	61.82	38.42	0.25	0.10	QP
8	0.2482410	27.91	-23.91	51.82	27.56	0.25	0.10	Average
9	0.3872360	43.43	-14.69	58.12	43.09	0.24	0.10	QP
10	@0.3872360	40.16	-7.96	48.12	39.82	0.24	0.10	Average
11	0.6107510	32.14	-23.86	56.00	31.80	0.24	0.10	QP
12	0.6107510	25.70	-20.30	46.00	25.36	0.24	0.10	Average

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)

AC Power-line Conducted Emissions Result					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Mode	1	**Ant. No.**	1+2	**Power Phase**	Line
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1641380	48.29	-16.96	65.25	47.89	0.30	0.10	QP
2	0.1641380	35.23	-20.02	55.25	34.83	0.30	0.10	Average
3	0.1903870	44.81	-19.21	64.02	44.41	0.30	0.10	QP
4	0.1903870	32.53	-21.49	54.02	32.13	0.30	0.10	Average
5	0.2191320	41.92	-20.93	62.85	41.52	0.30	0.10	QP
6	0.2191320	31.09	-21.76	52.85	30.69	0.30	0.10	Average
7	0.2468240	38.56	-23.30	61.86	38.16	0.30	0.10	QP
8	0.2468240	26.48	-25.38	51.86	26.08	0.30	0.10	Average
9	0.3839500	41.63	-16.56	58.19	41.23	0.30	0.10	QP
10	@0.3839500	36.47	-11.72	48.19	36.07	0.30	0.10	Average
11	0.6405800	30.29	-25.71	56.00	29.90	0.29	0.10	QP
12	0.6405800	20.20	-25.80	46.00	19.81	0.29	0.10	Average

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)

3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
☒ 6 dB bandwidth ≥ 500 kHz.

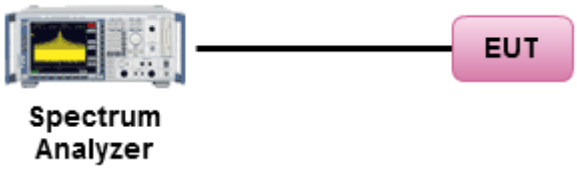
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

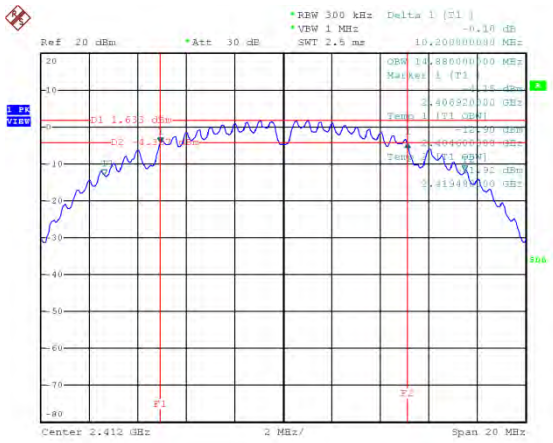
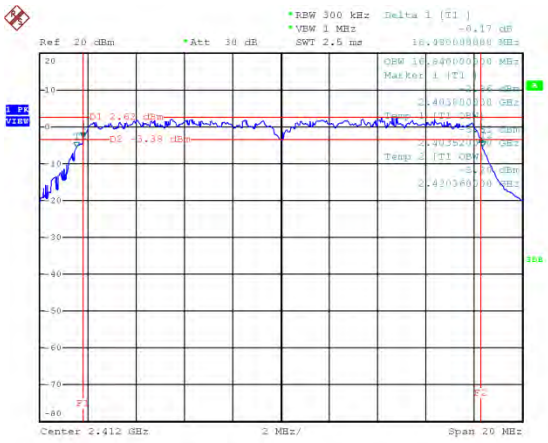
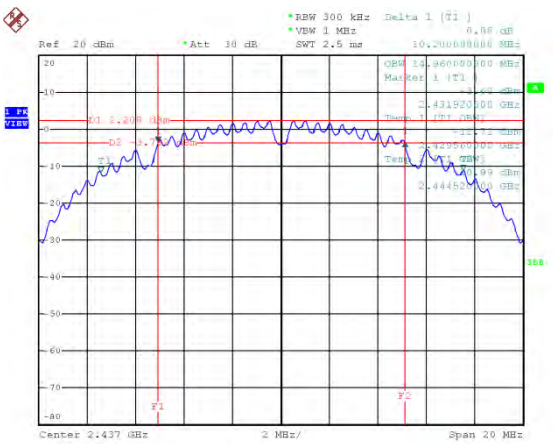
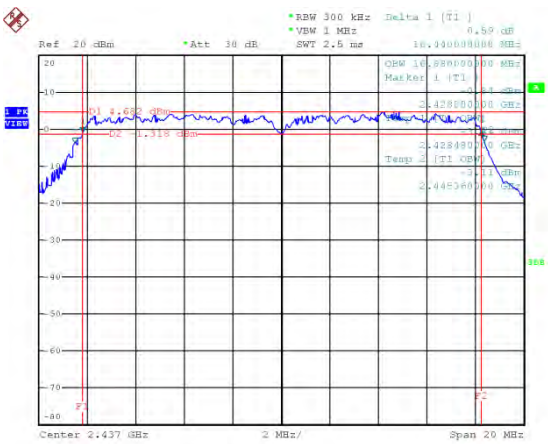
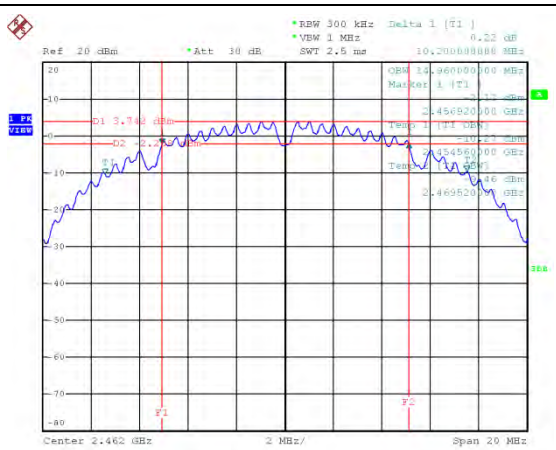
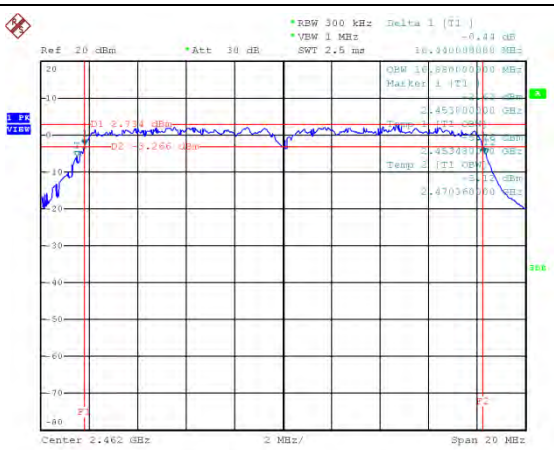
Test Method			
☒	For the emission bandwidth shall be measured using one of the options below:		
	☒	Refer as FCC KDB 558074, clause 5.1.1 Option 1 for 6 dB bandwidth measurement.	
	☐	Refer as FCC KDB 558074, clause 5.1.2 Option 2 for 6 dB bandwidth measurement.	
	☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.	
☒	For conducted measurement.		
	☒	For conducted measurements on devices with multiple transmit chains using options given below:	
		☐	Option 1: Multiple transmit chains measurements need to be performed on one of the active transmit chains (antenna outputs). All measurement had be performed on transmit chains 1.
		☒	Option 2: Multiple transmit chains measurements need to be performed on each transmit chains individually (antenna outputs). All measurement had be performed on all transmit chains.
		☐	Option 3: A power splitter/combiner shall be used to combine all the transmit chains (antenna outputs) into a single test point and record a single test point EBW.
☐	For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.		

3.2.4 Test Setup

Emission Bandwidth


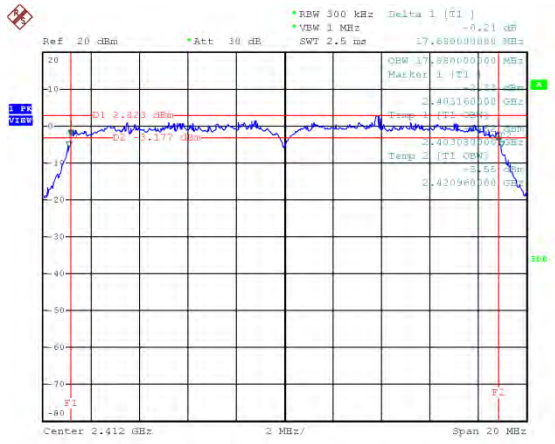
3.2.5 Test Result of Emission Bandwidth

Emission Bandwidth Result				
Power Level	**1**		**Emission Bandwidth (MHz)**	
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**99% Bandwidth**	**6dB Bandwidth**
11B-20M	1	2412	14.88	10.02
11B-20M	1	2437	14.96	10.02
11B-20M	1	2462	14.96	10.02
11G-20M	1	2412	16.84	16.48
11G-20M	1	2437	16.88	16.44
11G-20M	1	2462	16.88	16.44
11N2.4G-20M	2	2412	17.88	17.68
11N2.4G-20M	2	2437	17.84	17.64
11N2.4G-20M	2	2462	17.80	17.76
11N2.4G-40M	2	2412	36.32	36.32
11N2.4G-40M	2	2437	36.40	36.24
11N2.4G-40M	2	2462	36.48	36.32
Limit			**N/A**	**≥500 kHz**
Result			**Complied**	
Note 1: N_{TX} = Number of Transmit Chains				

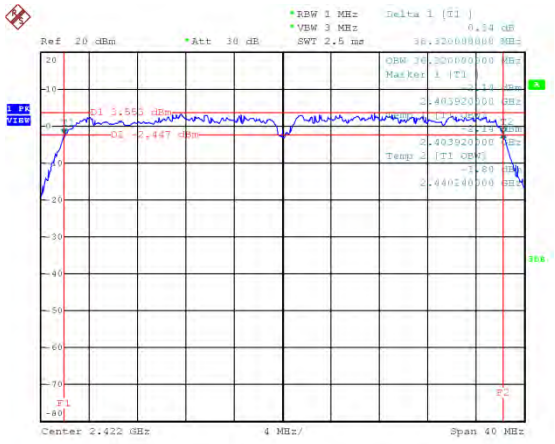
Emission Bandwidth Plots	
11B-20M – F1 [Port 1]	**11G-20M – F1 [Port 1]**
	
11B-20M – F2 [Port 1]	**11G-20M – F2 [Port 1]**
	
11B-20M – F3 [Port 1]	**11G-20M – F3 [Port 1]**
	

Emission Bandwidth Plots

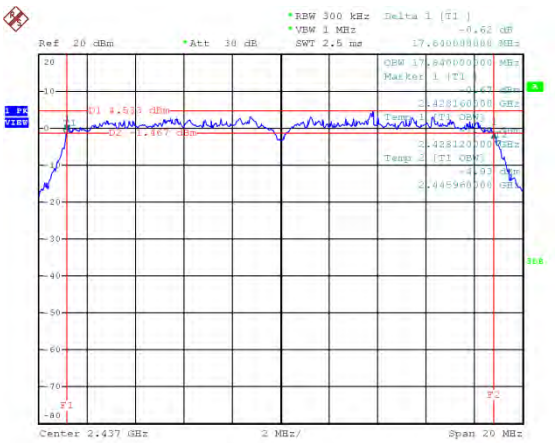
11N2.4G-20M – F1 [Port 1]



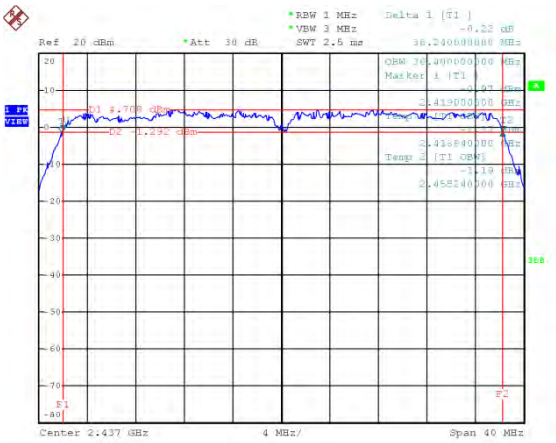
11N2.4G-40M – F4 [Port 1]



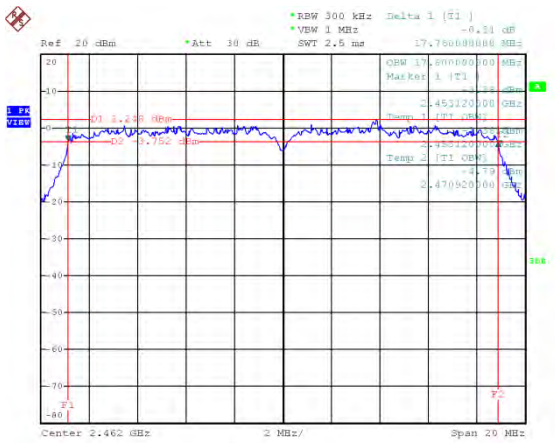
11N2.4G-20M – F2 [Port 1]



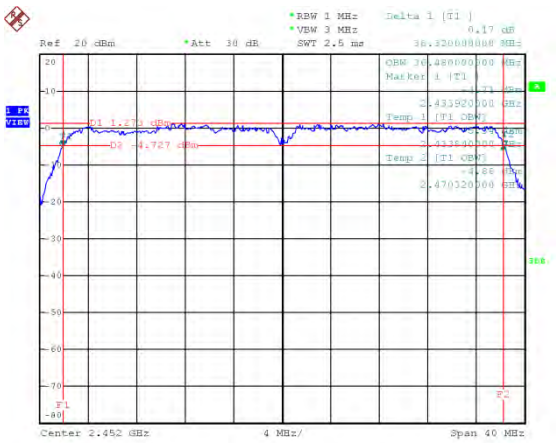
11N2.4G-40M – F5 [Port 1]



11N2.4G-20M – F3 [Port 1]



11N2.4G-40M – F6 [Port 1]



3.3 RF Output Power

3.3.1 RF Output Power Limit

RF Output Power Limit	
Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit	
☐	902-928 MHz Band:
	☐ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)
	☐ If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm
☒	2400-2483.5 MHz Band:
	☒ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)
	☒ Point-to-multipoint systems (P2M): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm
	☐ Point-to-point systems (P2P): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
	☐ Smart antenna system (SAS):
	☐ Single beam: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
	☐ Overlap beam: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 dBm
	☐ Aggregate power on all beams: If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)/3 + 8dB dBm
☐	5725-5850 MHz Band:
	☐ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)
	☐ Point-to-multipoint systems (P2M): If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) dBm
	☐ Point-to-point systems (P2P): If G_{TX} > 6 dBi, then P_{Out} = 30 dBm
e.i.r.p. Power Limit:	
☐	902-928 MHz Band: P_{eirp} ≤ 36 dBm (4 W)
☒	2400-2483.5 MHz Band
	☒ Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)
	☐ Point-to-point systems (P2P): P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX}]) dBm
	☐ Smart antenna system (SAS)
	☐ Single beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
	☐ Overlap beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
	☐ Aggregate power on all beams: P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX} + 8]) dBm
☐	5725-5850 MHz Band
	☐ Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)
	☐ Point-to-point systems (P2P): N/A
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi. **P_{eirp}** = e.i.r.p. Power in dBm.	

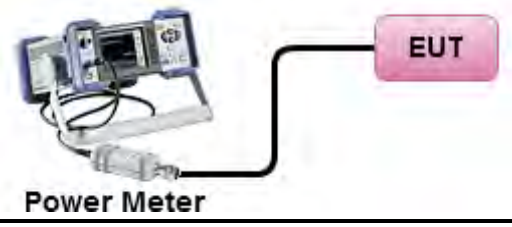
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	Maximum Peak Conducted Output Power
	☐ Refer as FCC KDB 558074, clause 7.2.1.1 Option 1 (zero-span method).
	☐ Refer as FCC KDB 558074, clause 7.2.1.2 Option 2 (integrated band power method).
	☒ Refer as FCC KDB 558074, clause 7.2.1.3 Option 3 (peak power meter method).
	☐ Refer as FCC KDB 558074, clause 7.2.1.4 Alternative 1 (bandwidth correction method).
	☐ Refer as ANSI C63.10, clause 6.10.2.1 a) for peak power meter.
	☐ Refer as ANSI C63.10, clause 6.10.2.1 a) for spectrum analyzer - (RBW ≥ EBW).
	☐ Refer as ANSI C63.10, clause 6.10.2.1 b) for spectrum analyzer - BW correction factor.
☐	Maximum Conducted Output Power
	☐ Refer as FCC KDB 558074, clause 7.2.2.1 Option 1 (RMS detection with slow sweep speed).
	☐ Refer as FCC KDB 558074, clause 7.2.2.2 Option 2 (spectral trace averaging).
	☐ Refer as FCC KDB 558074, clause 7.2.2.3 Option 3 (average power meter method).
	☐ Refer as FCC KDB 558074, clause 7.2.2.4 Alternative 1 (reduced VBW with max hold)
	☐ Refer as FCC KDB 558074, clause 7.2.2.5 Alternative 2 (zero-span with trace averaging)
	☐ Refer as FCC KDB 558074, clause 7.2.2.6 Alternative 3 (average on/off duty) - refer clause 1.1.4
	☐ Refer as ANSI C63.10, clause 6.10.3.1 for spectrum analyzer - Method 1 (trace averaging).
	☐ Refer as ANSI C63.10, clause 6.10.3.2 for spectrum analyzer - Method 2 (zero-span averaging).
	☐ Refer as ANSI C63.10, clause 6.10.3.2 for spectrum analyzer - Method 3 (band power max-hold).
☒	Refer as FCC KDB 558074, clause 3 for conducted measurement.
	☒ For conducted measurements on devices with multiple transmit chains: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	☒ If multiple transmit chains, EIRP calculation could be following as methods:
	☐ Method 1: $EIRP_1 = P_1 + G_{ANT1}$; $EIRP_2 = P_2 + G_{ANT2}$; … $EIRP_n = Pn + G_{ANTn}$ $EIRP_{total} = EIRP_1 + EIRP_2 + … + EIRP_n$ (calculated in linear unit [mW] and transfer to log unit [dBm])
	☒ Method 2: $P_{total} = P_1 + P_2 + … + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$
☐	Refer as FCC KDB 558074, clause 3 for radiated measurement.

3.3.4 Test Setup

RF Output Power (Spectrum Analyzer)


3.3.5 Test Result of Maximum Peak Conducted Output Power

Maximum Peak Conducted Output Power Result										
Power Level		1	**RF Output Power (dBm)**							
Directional Gain (dBi)		3.95								
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	-	-	**Sum Chain**	**Power Limit**	**EIRP Power**	**EIRP Limit**
11B-20M	1	2412	14.66	-	-	-	14.66	30	18.61	36
11B-20M	1	2437	14.83	-	-	-	14.83	30	18.78	36
11B-20M	1	2462	15.85	-	-	-	15.85	30	19.80	36
Result			**Complied**							
Note 1: N_{TX} = Number of Transmit Chains Note 2: EUT support diversity transmit and transmit chains port 1 is the worst than other transmit chains.										

Maximum Peak Conducted Output Power Result										
Power Level		1	**RF Output Power (dBm)**							
Directional Gain (dBi)		3.95								
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	-	-	**Sum Chain**	**Power Limit**	**EIRP Power**	**EIRP Limit**
11G-20M	1	2412	23.52	-	-	-	23.52	30	27.47	36
11G-20M	1	2437	24.66	-	-	-	24.66	30	28.61	36
11G-20M	1	2462	22.81	-	-	-	22.81	30	26.76	36
Result			**Complied**							
Note 1: N_{TX} = Number of Transmit Chains Note 2: EUT support diversity transmit and transmit chains port 1 is the worst than other transmit chains.										

Maximum Peak Conducted Output Power Result										
Power Level		1	**RF Output Power (dBm)**							
Directional Gain (dBi)		3.8								
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	-	-	**Sum Chain**	**Power Limit**	**EIRP Power**	**EIRP Limit**
11N2.4G-20M	2	2412	20.2	21.73	-	-	24.04	30	27.84	36
11N2.4G-20M	2	2437	21.96	22.86	-	-	25.44	30	29.24	36
11N2.4G-20M	2	2462	19.89	20.6	-	-	23.27	30	27.07	36
Result			**Complied**							
Note 1: N_{TX} = Number of Transmit Chains										

Maximum Peak Conducted Output Power Result										
Power Level		1	**RF Output Power (dBm)**							
Directional Gain (dBi)		3.8								
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	-	-	**Sum Chain**	**Power Limit**	**EIRP Power**	**EIRP Limit**
11N2.4G-40M	2	2422	18.44	19.96	-	-	22.28	30	26.08	36
11N2.4G-40M	2	2437	19.92	21.42	-	-	23.74	30	27.54	36
11N2.4G-40M	2	2452	17.01	17.81	-	-	20.44	30	24.24	36
Result			**Complied**							
Note 1: N_{TX} = Number of Transmit Chains										

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
☒ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

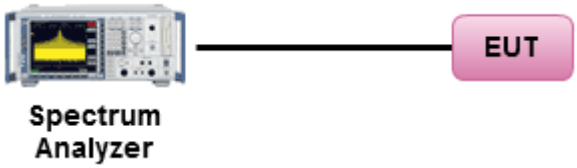
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method			
☒	Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a “worst-case” measured level for comparison to the limit. Therefore, whenever the DTS bandwidth exceeds 500 kHz, it is acceptable to utilize the peak PSD procedure to demonstrate compliance to the PSD limit, regardless of how the fundamental output power was measured. For the power spectral density shall be measured using below options:		
	☒	Refer as FCC KDB 558074, clause 7.3.1 Option 1 (peak PSD; BWCF=-15.2dB).	
	☐	Refer as FCC KDB 558074, clause 7.3.2 Option 2 (average PSD; BWCF=-15.2dB).	
	☐	Refer as FCC KDB 558074, clause 7.3.3 Alternative 1 (peak PSD; RBW=3kHz; sweep=100s).	
	☐	Refer as FCC KDB 558074, clause 7.3.4 Alternative 2 (average PSD; RBW=3kHz; average=100).	
	☐	Refer as ANSI C63.10, clause 6.11.2.3 for PSD for DTS - (RBW=3kHz; sweep=100s).	
	☐	Refer as ANSI C63.10, clause 6.11.2.4 for Alternative PSD for DTS - (RBW=3kHz; average=100)	
☒	Refer as FCC KDB 558074, clause 3 for conducted measurement.		
	☒	For conducted measurements on devices with multiple transmit chains using options given below:	
		☐	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N_{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace. The new data trace samples added 100 kHz segment and found the highest value of each 100 kHz segments. Add the bandwidth correction factor (BWCF) [-15.2 dB] adjusting in power spectral density per 3kHz.
		☒	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
☐	Refer as FCC KDB 558074, clause 3 for radiated measurement.		

3.4.4 Test Setup

Power Spectral Density


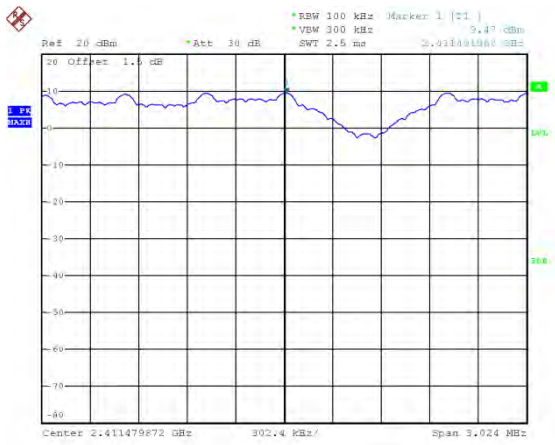
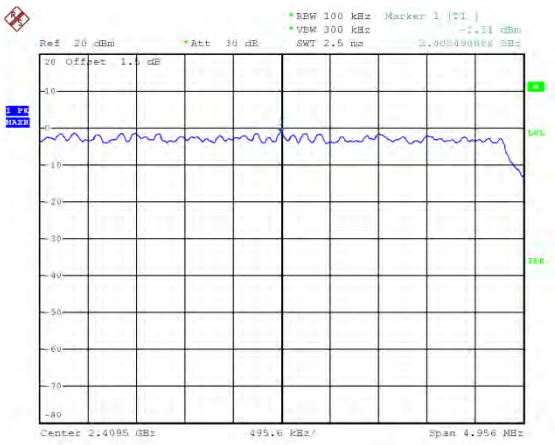
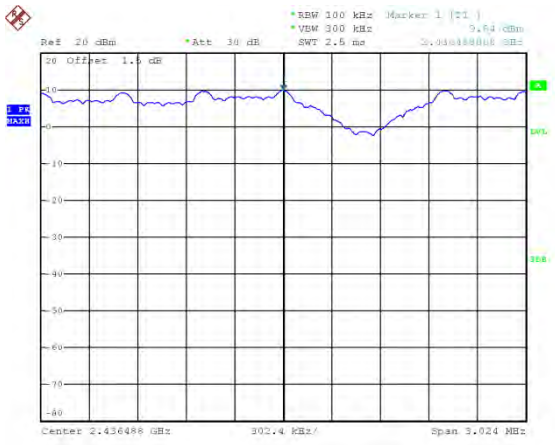
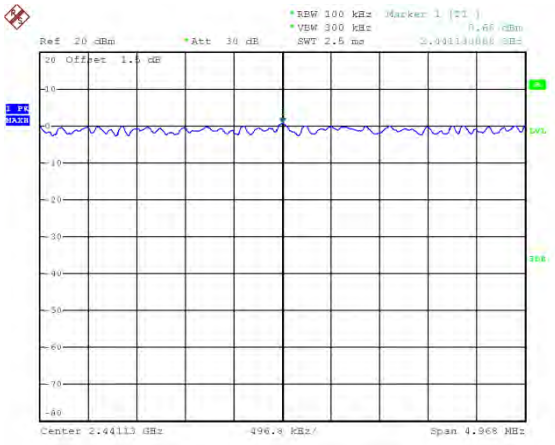
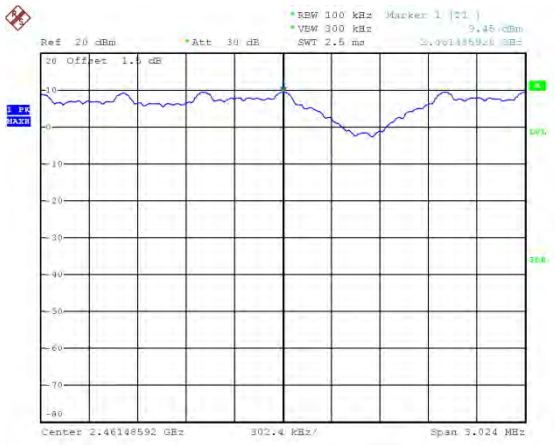
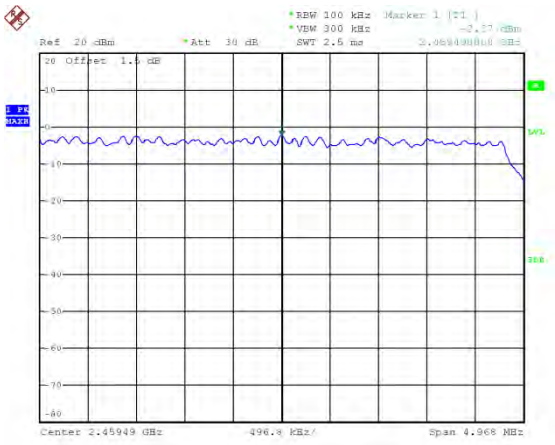
3.4.5 Test Result of Power Spectral Density

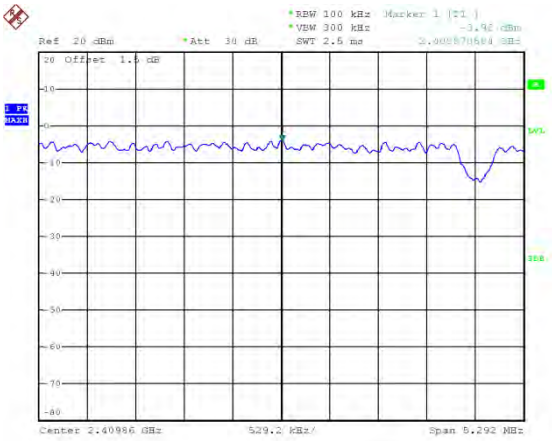
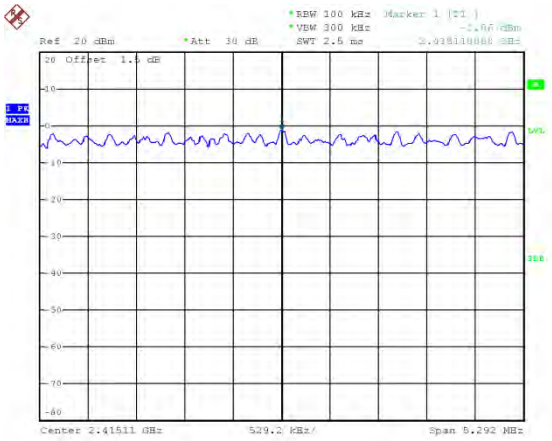
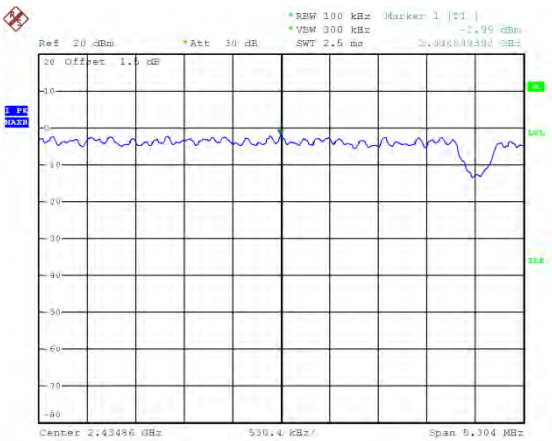
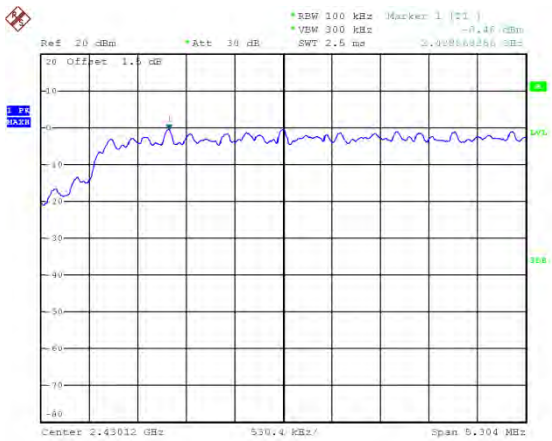
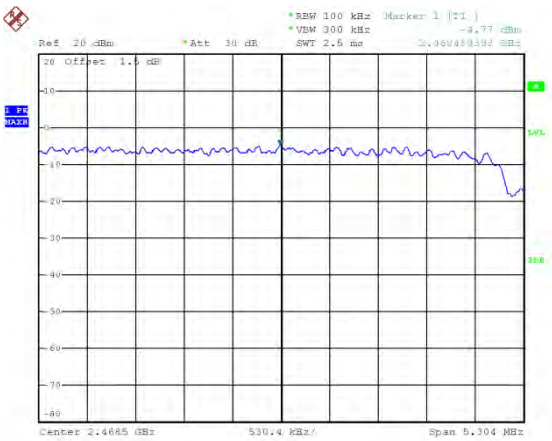
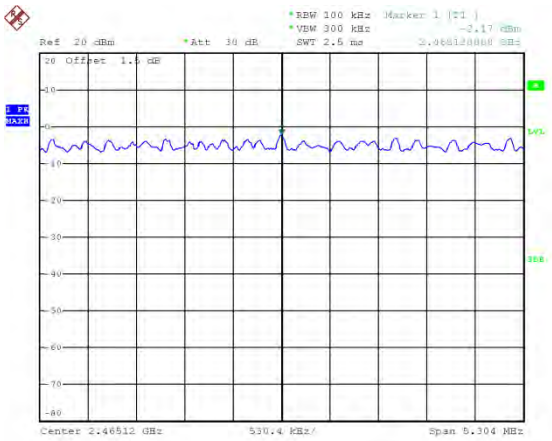
Power Spectral Density Result							
Power Level		1	**Power Spectral Density (dBm/3kHz)**				
Directional Gain (dBi)		3.95					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	-	-	**PSD Limit**
11B-20M	1	2412	-5.73	-	-	-	8
11B-20M	1	2437	-5.36	-	-	-	8
11B-20M	1	2462	-5.75	-	-	-	8
Result			**Complied**				
Note 1: N_{TX} = Number of Transmit Chains Note 2: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN_{TX}							

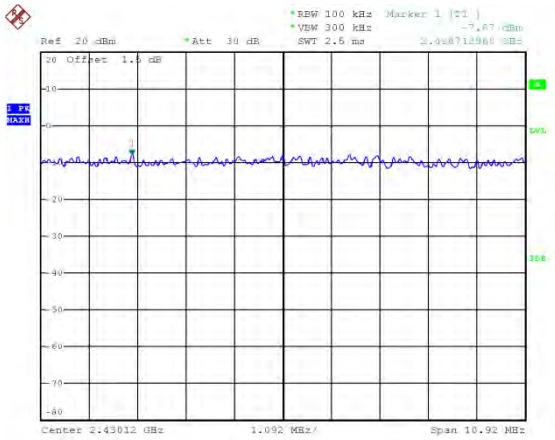
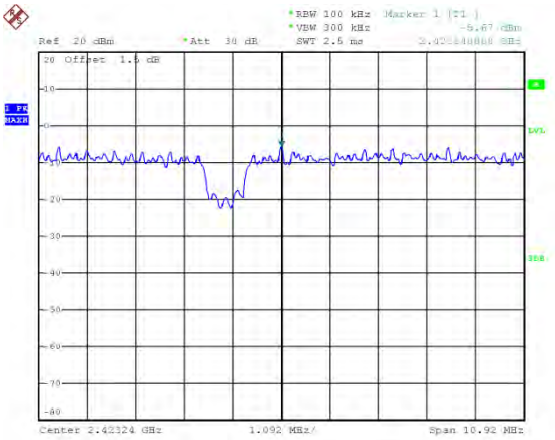
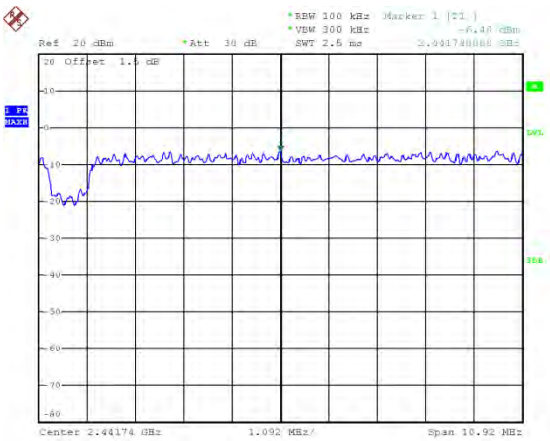
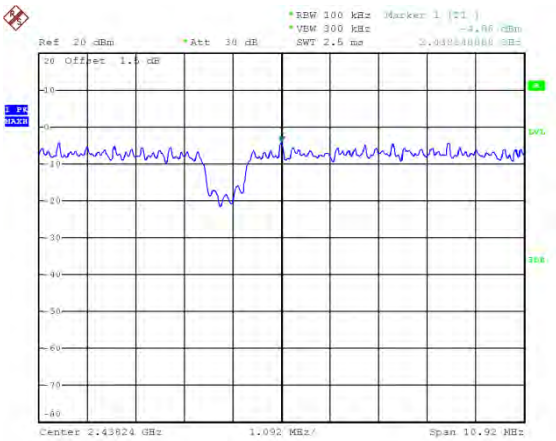
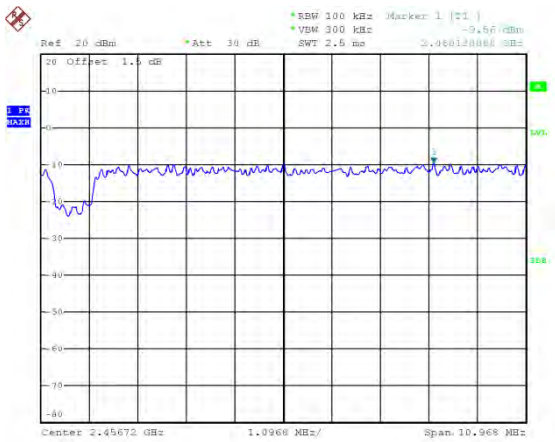
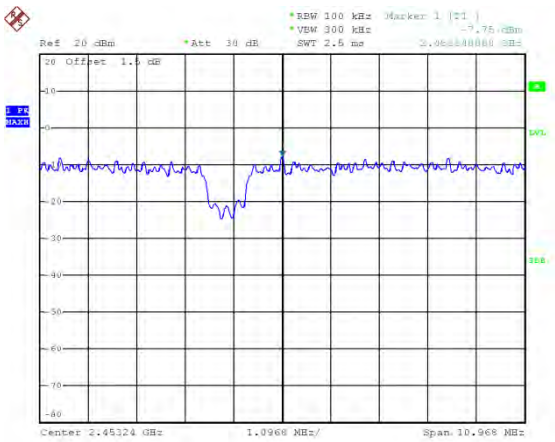
Power Spectral Density Result							
Power Level		1	**Power Spectral Density (dBm/3kHz)**				
Directional Gain (dBi)		3.95					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	-	-	**PSD Limit**
11G-20M	1	2412	-16.51	-	-	-	8
11G-20M	1	2437	-14.52	-	-	-	8
11G-20M	1	2462	-17.57	-	-	-	8
Result			**Complied**				
Note 1: N_{TX} = Number of Transmit Chains Note 2: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN_{TX}							

Power Spectral Density Result							
Power Level		1	**Power Spectral Density (dBm/3kHz)**				
Directional Gain (dBi)		3.8					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	**Chain-Port 3**	**Chain-Port 4**	**PSD Limit**
11N2.4G-20M	2	2412	-16.12	-13.26	-	-	8
11N2.4G-20M	2	2437	-14.19	-12.68	-	-	8
11N2.4G-20M	2	2462	-16.97	-14.37	-	-	8
Result			**Complied**				
Note 1: N_{TX} = Number of Transmit Chains Note 2: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN_{TX}							

Power Spectral Density Result							
Power Level		1	**Power Spectral Density (dBm/3kHz)**				
Directional Gain (dBi)		3.8					
Modulation Mode	**N_{TX}**	**Freq. (MHz)**	**Chain-Port 1**	**Chain-Port 2**	**Chain-Port 3**	**Chain-Port 4**	**PSD Limit**
11N2.4G-40M	2	2422	-20.07	-17.87	-	-	8
11N2.4G-40M	2	2437	-18.6	-16.28	-	-	8
11N2.4G-40M	2	2452	-21.76	-19.95	-	-	8
Result			**Complied**				
Note 1: N_{TX} = Number of Transmit Chains Note 2: PSD [dBm/3kHz] = each transmit chains PSD [dBm/100kHz] + BWFC [-15.2 dB] + 10logN_{TX}							

Power Spectral Density Plots - w/o BWFC	
11B-20M – F1 [Chain-Port 1]	**11G-20M – F1 [Chain-Port 1]**
	
11B-20M – F2 [Chain-Port 1]	**11G-20M – F2 [Chain-Port 1]**
	
11B-20M – F3 [Chain-Port 1]	**11G-20M – F3 [Chain-Port 1]**
	

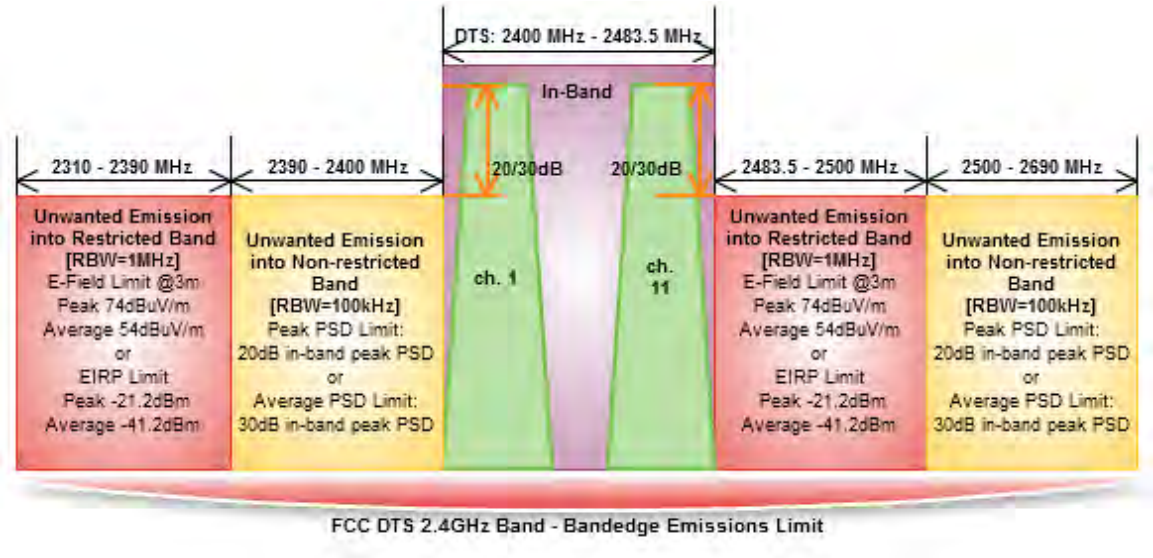
Power Spectral Density Plots - w/o BWFC and 10 x log 2	
11N2.4G-20M – F1 [Chain-Port 1]	**11N2.4G-20M – F1 [Chain-Port 2]**
	
11N2.4G-20M – F2 [Chain-Port 1]	**11N2.4G-20M – F2 [Chain-Port 2]**
	
11N2.4G-20M – F3 [Chain-Port 1]	**11N2.4G-20M – F3 [Chain-Port 2]**
	

Power Spectral Density Plots - w/o BWFC and 10 x log 2	
11N2.4G-40M – F4 [Chain-Port 1]	**11N2.4G-40M – F4 [Chain-Port 2]**
	
11N2.4G-40M – F5 [Chain-Port 1]	**11N2.4G-40M – F5 [Chain-Port 2]**
	
11N2.4G-40M – F6 [Chain-Port 1]	**11N2.4G-40M – F6 [Chain-Port 2]**
	

3.5 Transmitter Radiated Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit

Transmitter Radiated Bandedge Emissions Limit



3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

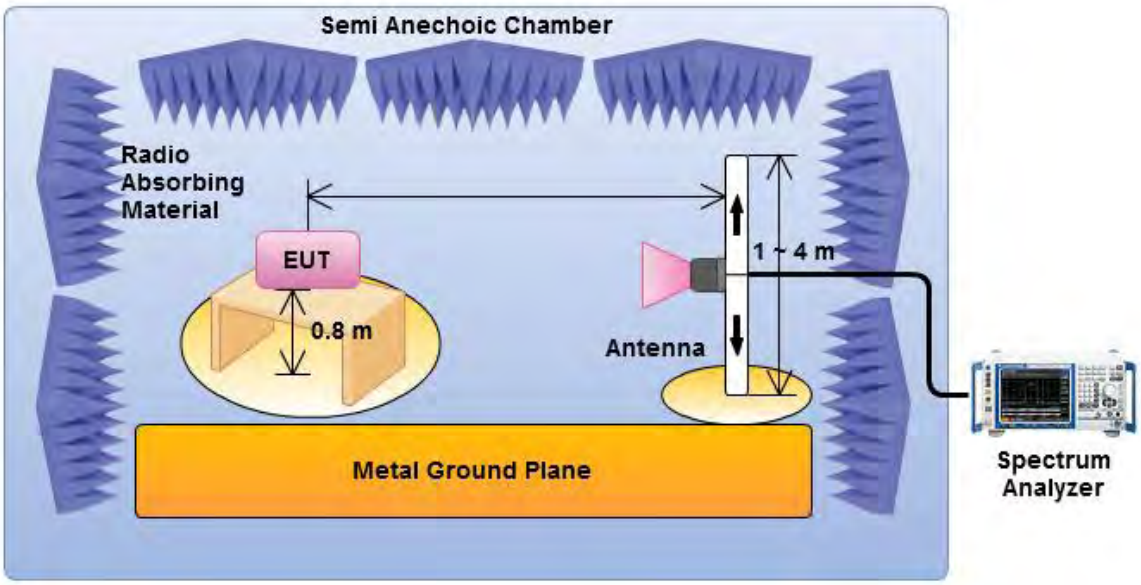
3.5.3 Test Procedures

Test Method – General Information		
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or external video / power trigger].	
☒	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
☒	For the transmitter unwanted emissions shall be measured using following options below:	
	☒	Refer as FCC KDB 558074, clause 7.4.1 for unwanted emissions into non-restricted bands.
	☒	Refer as FCC KDB 558074, clause 7.4.2 for unwanted emissions into restricted bands.
		☐ Refer as FCC KDB 558074, clause 7.4.2.2.2.1 Option 1 (Power Averaging).
		☐ Refer as FCC KDB 558074, clause 7.4.2.2.2.2 Option 2 (Trace Averaging).
		☐ Refer as FCC KDB 558074, clause 7.4.2.2.2.2 Option 3 (Reduced VBW).
		☒ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW).
		☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☐ Refer as FCC KDB 558074, clause 7.4.2.2.3 measurement procedure peak limit.
		☐ Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:	
	☐	Refer as FCC KDB 558074, clause 7.4.2.2.4 for narrower resolution bandwidth using the band power and summing the spectral levels (i.e., 100 kHz or 1 MHz).
	☒	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
	☐	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.

Test Method	
☐	Refer as FCC KDB 558074, clause 3 for conducted measurement.
☐	For unwanted emissions into non-restricted bands (relative emission limits).
☐	For conducted measurements on devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
☐	For unwanted emissions into restricted bands. Test conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).
☐	Refer as FCC KDB 558074, clause 7.4.2.2.1 unwanted emissions in restricted bands on frequencies ≤ 1000 MHz
☐	Refer as FCC KDB 558074, clause 7.4.2.2.2 unwanted emissions in restricted bands on frequencies > 1000 MHz
☐	For conducted measurements on devices with multiple transmit chains using options given below:
☐	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, out-of-band and spurious emission measurement. The trace data for each transmit chain has to be individually recorded and each transmit chain trace data shall be added and compared with the limit.
☐	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
☐	Temporary RF connector provided: Using temporary RF connector provided for connected measurement.
☐	No temporary RF connector provided: Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path...
☒	Refer as FCC KDB 558074, clause 3 for radiated measurement.
☐	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
☐	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from above 1 GHz.

3.5.4 Test Setup

Transmitter Radiated Bandedge Emissions

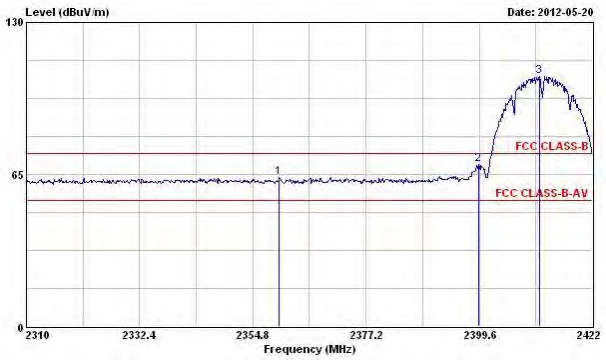


Electric field tests shall be performed in transmitter bandedge emissions using a calibrated horn antenna.

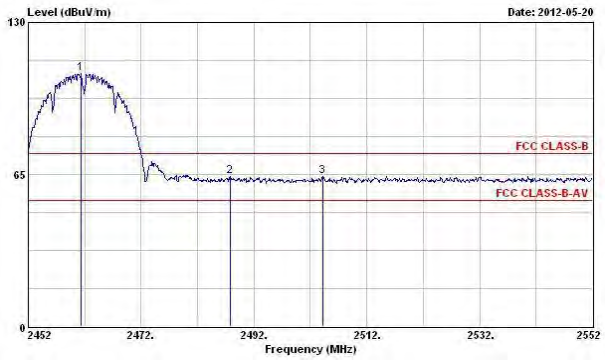
3.5.5 Test Result of Transmitter Radiated Bandedge Emissions

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain (dBi)**	3.95	**Non-restricted Band Emissions**					
Modulation	11B-20M								
Non-restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	1	2412	106.73	2399.49	69.30	37.43	20	PK	V
2500-2690	1	2462	107.99	2504.20	64.25	43.74	20	PK	V

Low Band



Up Band



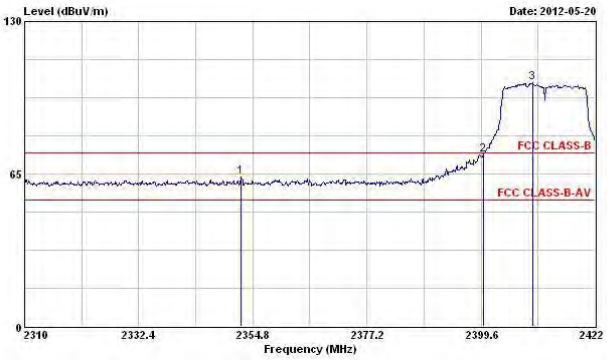
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain (dBi)**	3.95	**Restricted Band Emissions**					
Modulation	11B-20M								
Restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/1MHz)**	**RBE Freq. (MHz)**	**Measure Distance (m)**	**Out-Band Level (dBuV/m)**	**Limit (dBuV/m)**	**Level Type**	**Pol. note 1**
2310-2390	1	2412	110.43	2385.62	3	61.36	74	PK	V
2310-2390	1	2412	106.51	2390.00	3	49.26	54	AV	V
2483.5-2500	1	2462	110.17	2483.66	3	60.63	74	PK	V
2483.5-2500	1	2462	106.09	2483.50	3	49.84	54	AV	V

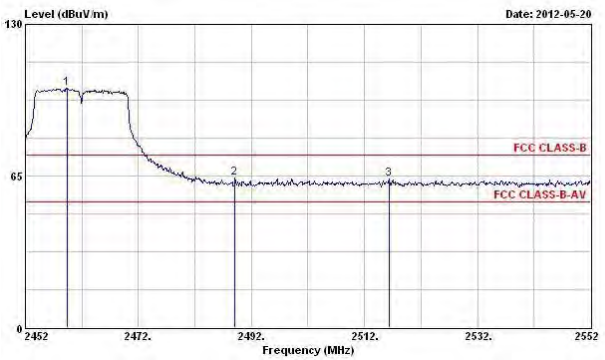
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain (dBi)**	3.95	**Non-restricted Band Emissions**					
Modulation	11G-20M								
Non-restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	1	2412	103.78	2400.00	73.19	30.59	20	PK	V
2500-2690	1	2462	102.68	2516.30	63.65	39.03	20	PK	V

Low Band



Up Band



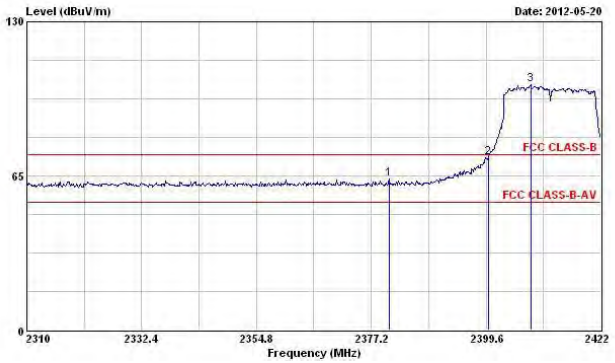
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain (dBi)**	3.95	**Restricted Band Emissions**					
Modulation	11G-20M								
Restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/1MHz)**	**RBE Freq. (MHz)**	**Measure Distance (m)**	**Out-Band Level (dBuV/m)**	**Limit (dBuV/m)**	**Level Type**	**Pol. note 1**
2310-2390	1	2412	112.19	2390.00	3	67.66	74	PK	V
2310-2390	1	2412	102.71	2390.00	3	48.71	54	AV	V
2483.5-2500	1	2462	110.53	2483.85	3	66.64	74	PK	V
2483.5-2500	1	2462	100.96	2483.50	3	52.78	54	AV	V

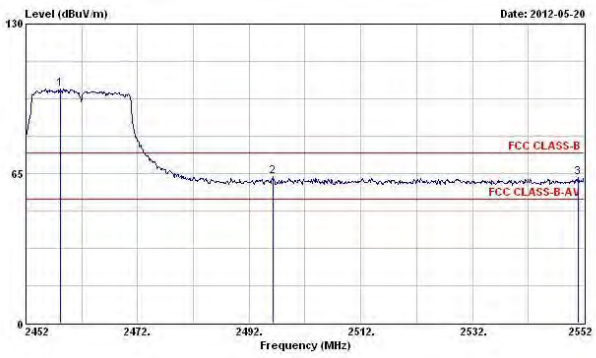
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain (dBi)**	3.8	**Non-restricted Band Emissions**					
Modulation	11N2.4G-20M								
Non-restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/100kHz)**	**NBE Freq. (MHz)**	**Out-band PSD [o] (dBuV/100kHz)**	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol. note 1**
2390-2400	2	2412	103.29	2400.00	72.87	30.42	20	PK	V
2500-2690	2	2462	101.89	2551.00	63.24	38.65	20	PK	V

Low Band



Up Band



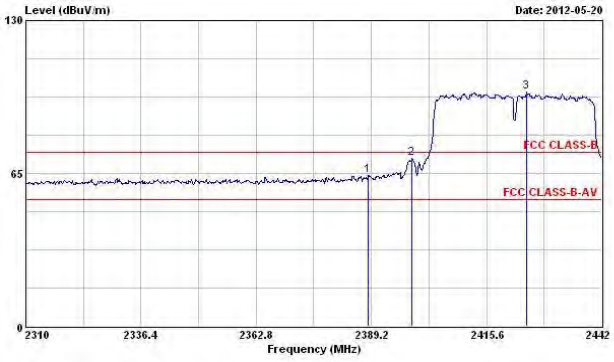
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain (dBi)**	3.8	**Restricted Band Emissions**					
Modulation	11N2.4G-20M								
Restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i] (dBuV/1MHz)**	**RBE Freq. (MHz)**	**Measure Distance (m)**	**Out-Band Level (dBuV/m)**	**Limit (dBuV/m)**	**Level Type**	**Pol. note 1**
2310-2390	2	2412	111.81	2388.85	3	67.48	74	PK	V
2310-2390	2	2412	101.46	2390.00	3	52.51	54	AV	V
2483.5-2500	2	2462	110.51	2483.50	3	67.10	74	PK	V
2483.5-2500	2	2462	99.81	2483.50	3	52.90	54	AV	V

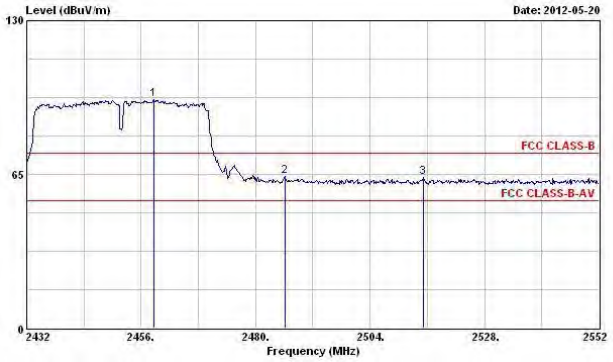
Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain** (dBi)	3.8	**Non-restricted Band Emissions**					
Modulation	11N2.4G-40M								
Non-restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i]** (dBuV/100kHz)	**NBE Freq. (MHz)**	**Out-band PSD [o]** (dBuV/100kHz)	**[i] – [o] (dB)**	**Limit (dB)**	**Level Type**	**Pol.** note 1
2390-2400	2	2422	99.51	2398.57	71.56	27.95	20	PK	V
2500-2690	2	2452	96.59	2515.28	63.86	32.73	20	PK	V

Low Band



Up Band



Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical)

Transmitter Radiated Bandedge Emissions Result									
Power Level	1	**Gain** (dBi)	3.8	**Restricted Band Emissions**					
Modulation	11N2.4G-40M								
Restricted Band (MHz)	**N_{TX}**	**Test Ch. Freq. (MHz)**	**In-band PSD [i]** (dBuV/1MHz)	**RBE Freq. (MHz)**	**Measure Distance (m)**	**Out-Band Level (dBuV/m)**	**Limit** (dBuV/m)	**Level Type**	**Pol.** note 1
2310-2390	2	2422	108.06	2386.38	3	65.67	74	PK	V
2310-2390	2	2422	97.14	2390.00	3	52.71	54	AV	V
2483.5-2500	2	2452	105.40	2483.50	3	66.42	74	PK	V
2483.5-2500	2	2452	94.08	2483.50	3	52.46	54	AV	V

Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical).

3.6 Transmitter Radiated Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

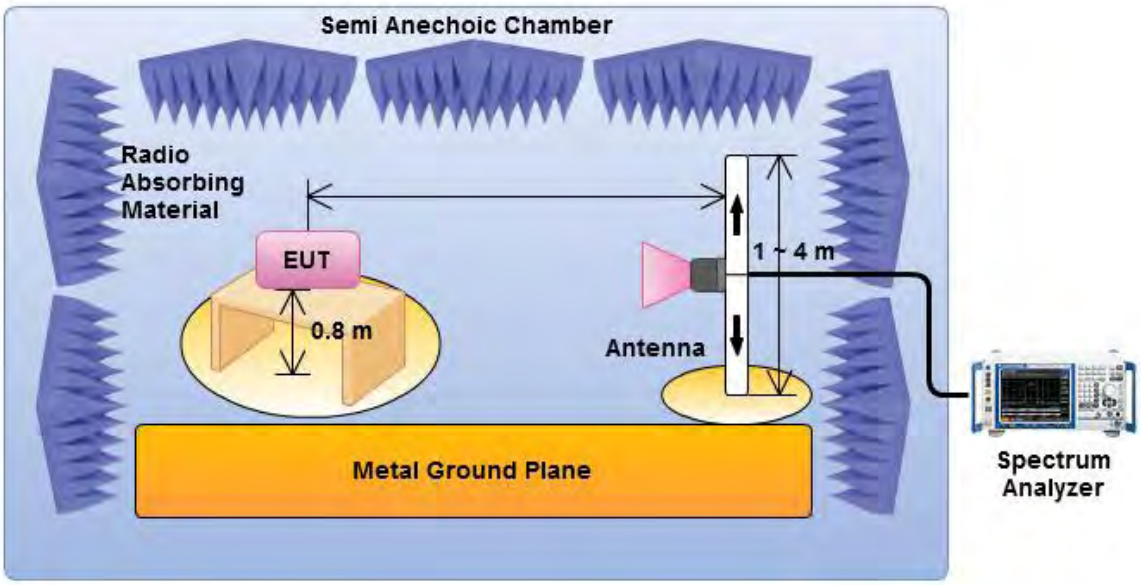
3.6.3 Test Procedures

Test Method – General Information			
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).		
	☒	Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.	
	☒	Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit.	
☒	For the transmitter unwanted emissions shall be measured using following options below:		
	☒	Refer as FCC KDB 558074, clause 7.4.1 for unwanted emissions into non-restricted bands.	
	☒	Refer as FCC KDB 558074, clause 7.4.2 for unwanted emissions into restricted bands.	
		☐	Refer as FCC KDB 558074, clause 7.4.2.2.2.1 Option 1 (Power Averaging).
		☐	Refer as FCC KDB 558074, clause 7.4.2.2.2.2 Option 2 (Trace Averaging).
		☐	Refer as FCC KDB 558074, clause 7.4.2.2.2.2 Option 3 (Reduced VBW).
		☒	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW).
		☐	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 7.4.2.2.3 measurement procedure peak limit.
		☐	Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.

Test Method	
☐	Refer as FCC KDB 558074, clause 3 for conducted measurement.
☐	For unwanted emissions into non-restricted bands (relative emission limits).
☐	For conducted measurements on devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.
☐	For unwanted emissions into restricted bands. Test conducted spurious emissions and radiated by the cabinet with the antenna connector(s) terminated by a specified load (cabinet radiation).
☐	Refer as FCC KDB 558074, clause 7.4.2.2.1 unwanted emissions in restricted bands on frequencies ≤ 1000 MHz
☐	Refer as FCC KDB 558074, clause 7.4.2.2.2 unwanted emissions in restricted bands on frequencies > 1000 MHz
☐	For conducted measurements on devices with multiple transmit chains using options given below:
☐	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, out-of-band and spurious emission measurement. The trace data for each transmit chain has to be individually recorded and each transmit chain trace data shall be added and compared with the limit.
☐	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
☐	Temporary RF connector provided: Using temporary RF connector provided for connected measurement.
☐	No temporary RF connector provided: Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path...
☒	For radiated measurement.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from above 1 GHz.

3.6.4 Test Setup

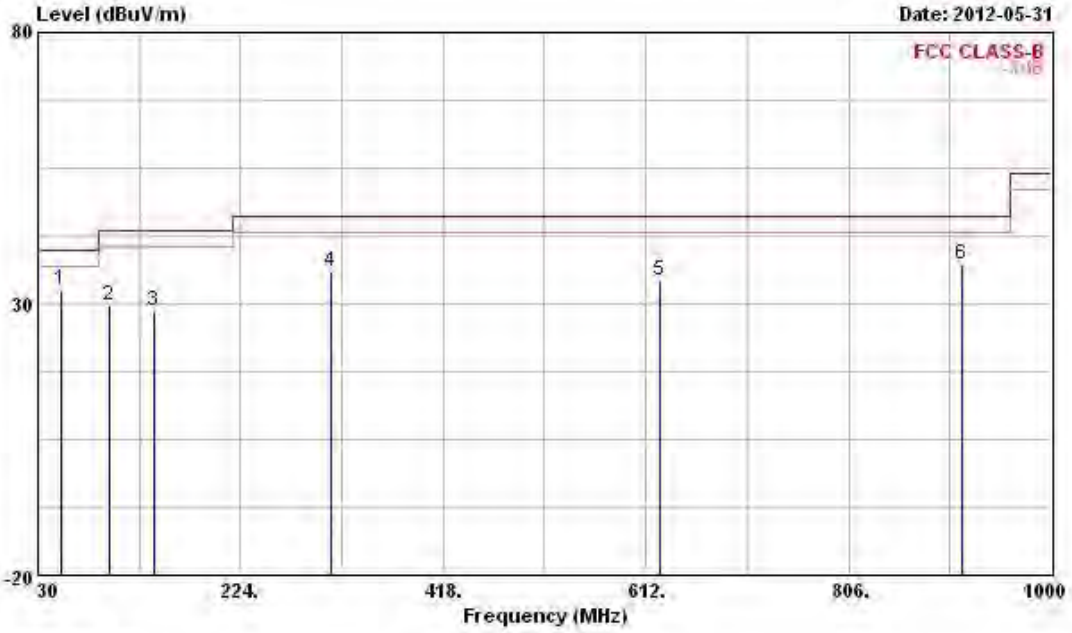
Transmitter Radiated Unwanted Emissions



Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

3.6.5 Test Result of Transmitter Radiated Unwanted Emissions (Below 1GHz)

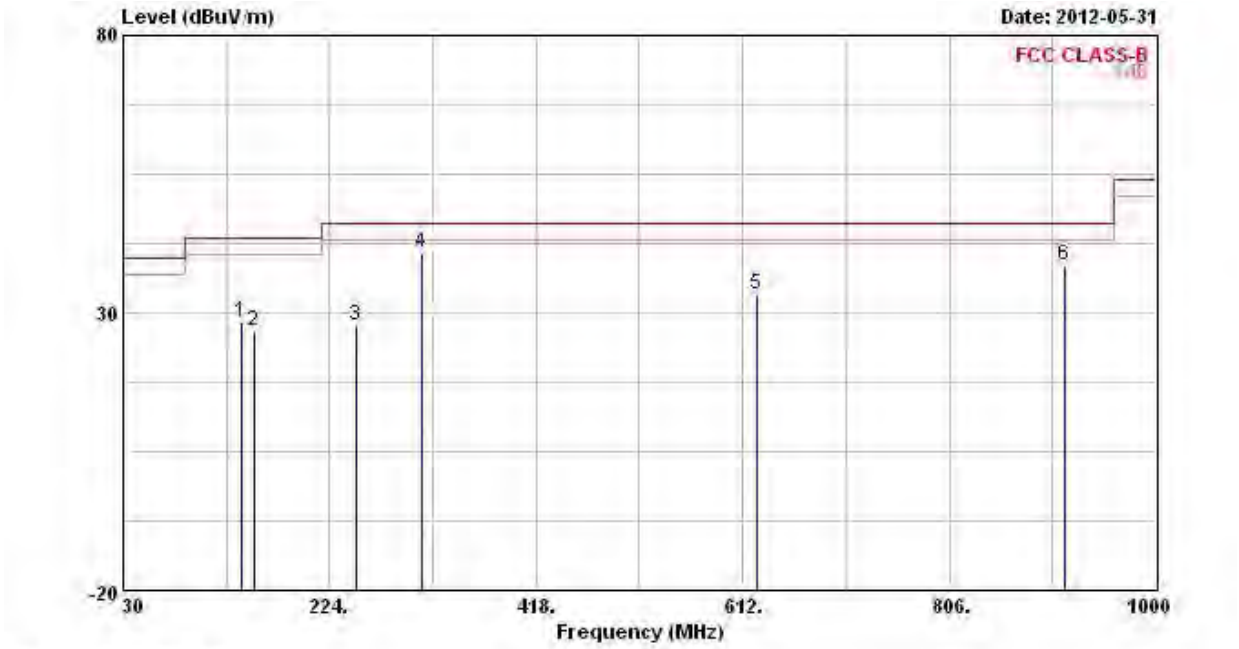
Transmitter Radiated Unwanted Emissions (Below 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Mode	1	**Ant. No.**	1	**Polarization**	V
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	52.310	32.64	-7.36	40.00	50.33	8.94	1.22	27.85	Peak	---	---
2	97.900	29.79	-13.71	43.50	45.16	10.84	1.64	27.85	Peak	---	---
3	141.550	28.72	-14.78	43.50	42.61	11.78	2.00	27.67	Peak	---	---
4	311.300	35.99	-10.01	46.00	46.34	13.88	3.01	27.24	Peak	---	---
5	625.580	34.41	-11.59	46.00	38.66	19.84	4.32	28.41	Peak	---	---
6	913.670	37.35	-8.65	46.00	39.20	20.37	5.33	27.55	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

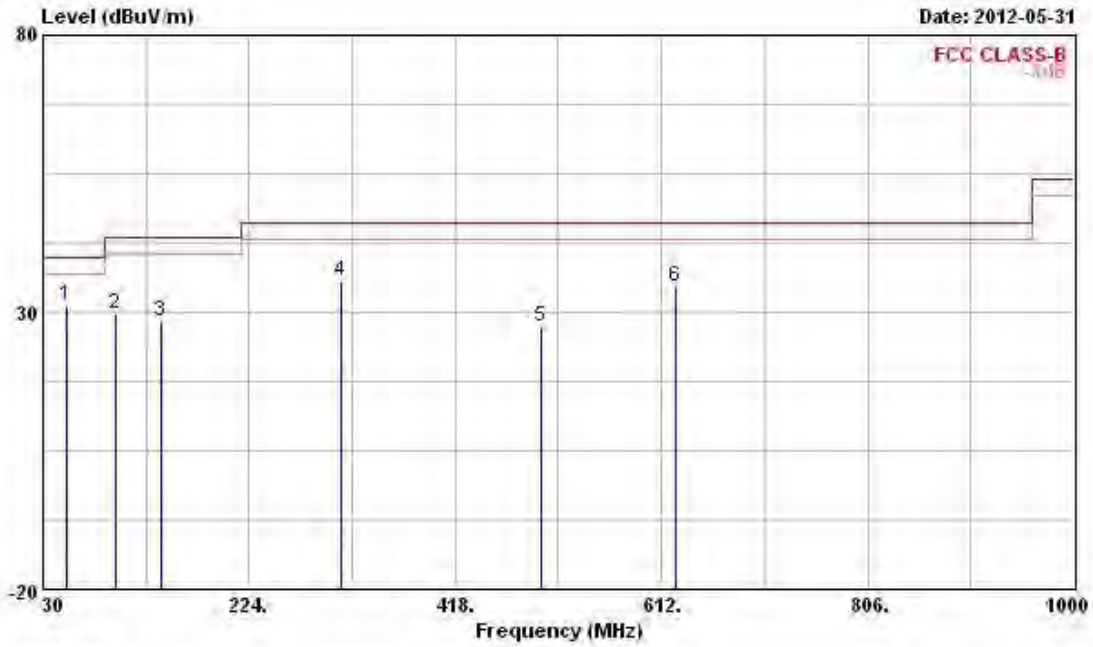
Transmitter Radiated Unwanted Emissions (Below 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Mode	1	**Ant. No.**	1	**Polarization**	H
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	141.550	28.38	-15.12	43.50	42.27	11.78	2.00	27.67	Peak	---	---
2	153.190	26.68	-16.82	43.50	41.56	10.70	2.04	27.62	Peak	---	---
3	249.220	27.83	-18.17	46.00	39.38	12.97	2.77	27.29	Peak	---	---
4	311.300	40.87	-5.13	46.00	51.22	13.88	3.01	27.24	Peak	---	---
5	625.580	33.13	-12.87	46.00	37.38	19.84	4.32	28.41	Peak	---	---
6	913.670	38.58	-7.42	46.00	40.43	20.37	5.33	27.55	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

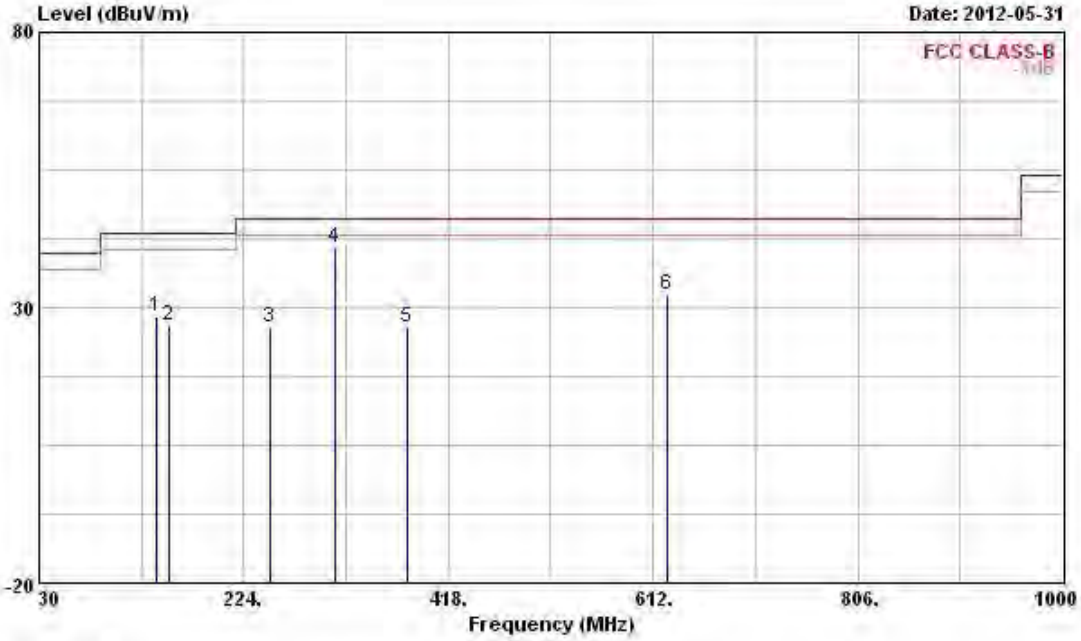
Transmitter Radiated Unwanted Emissions (Below 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Mode	1	**Ant. No.**	1+2	**Polarization**	V
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	52.310	31.40	-8.60	40.00	49.09	8.94	1.22	27.85	Peak	---	---
2	97.900	29.60	-13.90	43.50	44.97	10.84	1.64	27.85	Peak	---	---
3	141.550	28.24	-15.26	43.50	42.13	11.78	2.00	27.67	Peak	---	---
4	311.300	35.67	-10.33	46.00	46.02	13.88	3.01	27.24	Peak	---	---
5	498.510	27.39	-18.61	46.00	34.67	17.26	3.82	28.36	Peak	---	---
6	625.580	34.45	-11.55	46.00	38.70	19.84	4.32	28.41	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

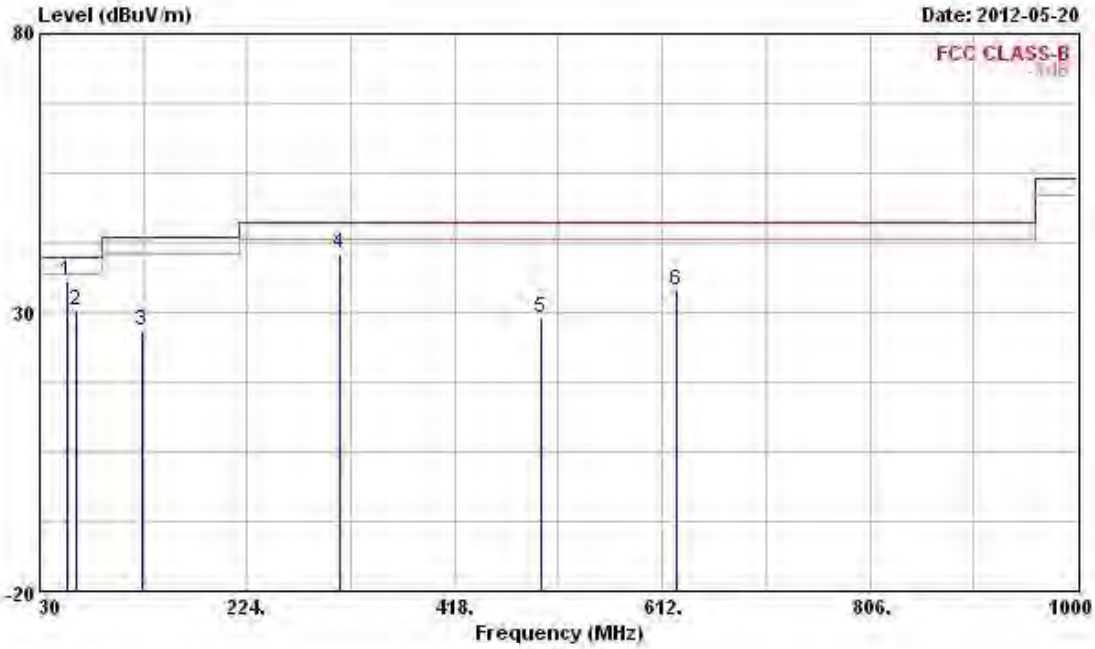
Transmitter Radiated Unwanted Emissions (Below 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Mode	1	**Ant. No.**	1+2	**Polarization**	H
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	141.550	28.21	-15.29	43.50	42.10	11.78	2.00	27.67	Peak	---	---
2	153.190	26.73	-16.77	43.50	41.61	10.70	2.04	27.62	Peak	---	---
3	249.220	26.42	-19.58	46.00	37.97	12.97	2.77	27.29	Peak	---	---
4	311.300	40.91	-5.09	46.00	51.26	13.88	3.01	27.24	Peak	---	---
5	378.230	26.39	-19.61	46.00	35.87	14.92	3.31	27.71	Peak	---	---
6	625.580	32.36	-13.64	46.00	36.61	19.84	4.32	28.41	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

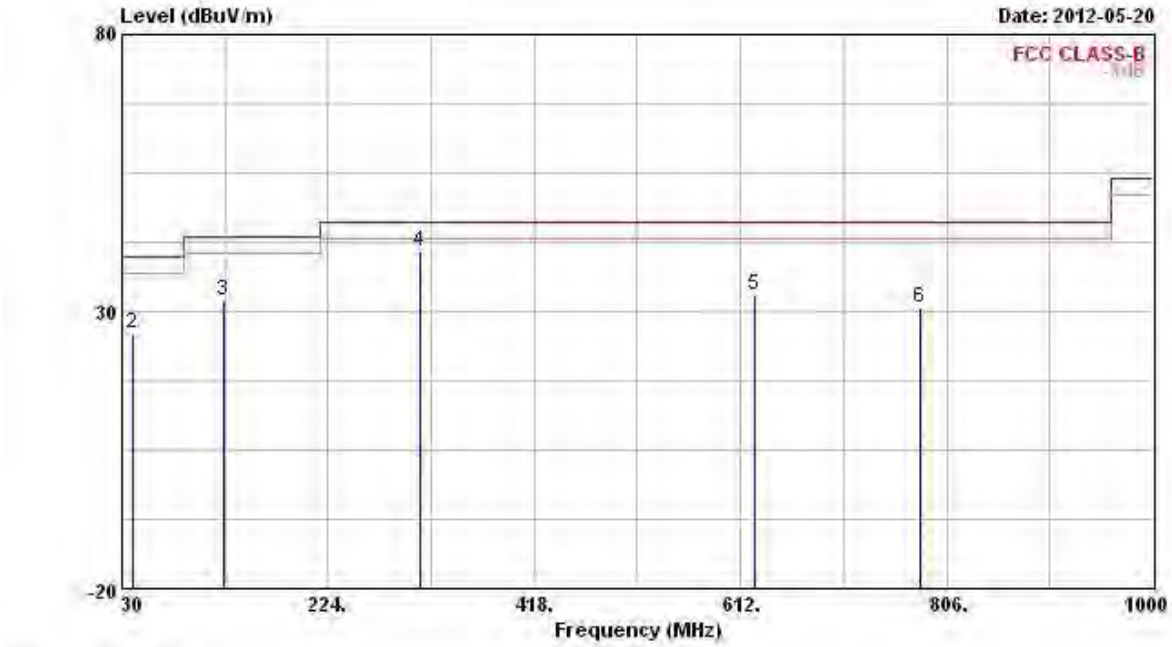
Transmitter Radiated Unwanted Emissions (Below 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F5
Operating Mode	1	**Ant. No.**	1+2	**Polarization**	V
Operating Function	Normal TX + Belkin Adapter				



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	55.220	35.51	-4.49	40.00	53.84	8.27	1.25	27.85	Peak	---	---
2	63.950	30.27	-9.73	40.00	49.79	6.98	1.35	27.85	Peak	---	---
3	125.060	26.63	-16.87	43.50	39.33	13.18	1.86	27.74	Peak	---	---
4	311.300	40.39	-5.61	46.00	50.74	13.88	3.01	27.24	Peak	---	---
5	498.510	29.17	-16.83	46.00	36.45	17.26	3.82	28.36	Peak	---	---
6	625.580	33.89	-12.11	46.00	38.14	19.84	4.32	28.41	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions (Below 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F5
Operating Mode	1	**Ant. No.**	1+2	**Polarization**	H
Operating Function	Normal TX + Belkin Adapter				

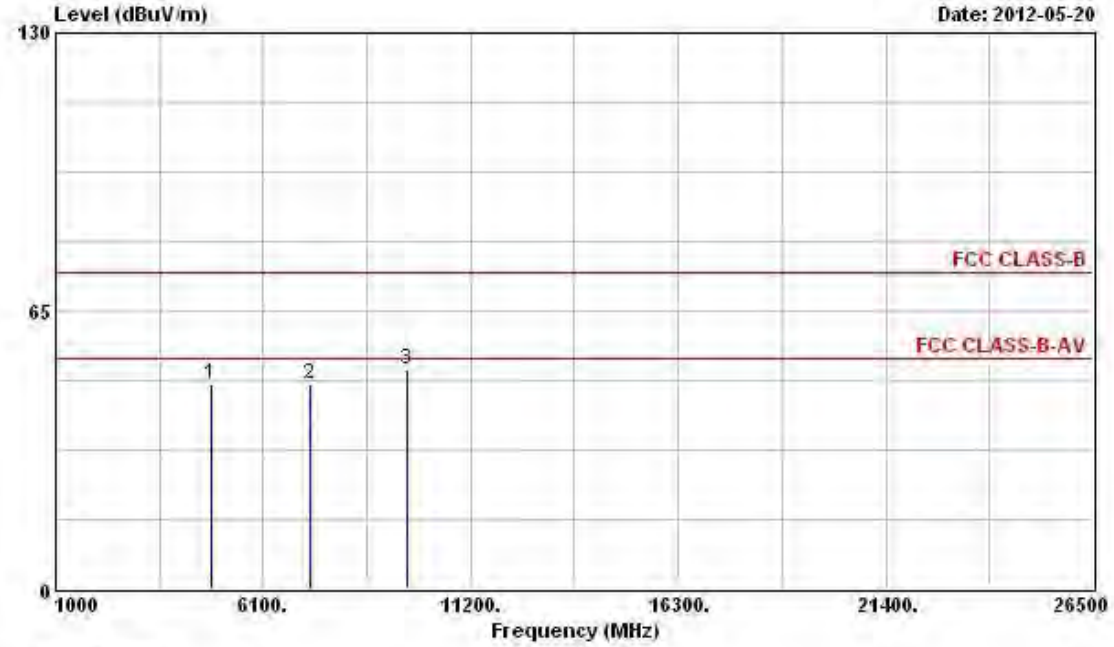


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	30.000	27.47	-12.53	40.00	38.31	16.22	0.89	27.95	Peak	---	---
2	40.670	26.13	-13.87	40.00	39.97	13.01	1.05	27.90	Peak	---	---
3	125.060	31.81	-11.69	43.50	44.51	13.18	1.86	27.74	Peak	---	---
4	311.300	40.84	-5.16	46.00	51.19	13.88	3.01	27.24	Peak	---	---
5	625.580	32.99	-13.01	46.00	37.24	19.84	4.32	28.41	Peak	---	---
6	781.750	30.81	-15.19	46.00	33.98	20.01	4.82	28.00	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

3.6.6 Test Result of Transmitter Radiated Unwanted Emissions (Above 1GHz)

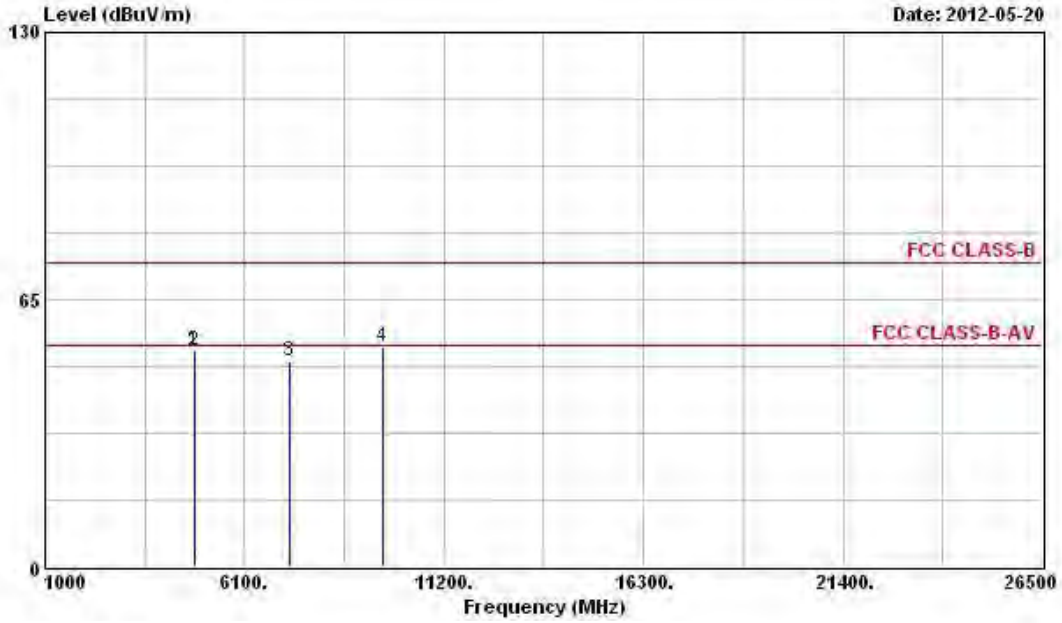
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11B-20M	**Power Level**	1	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	48.05	-5.95	54.00	43.14	35.13	4.58	34.80	PK	---	---
2	7236.000	48.04	-25.96	74.00	40.59	36.90	5.63	35.08	Peak	---	---
3	9648.000	51.27	-22.73	74.00	41.81	38.59	6.34	35.47	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

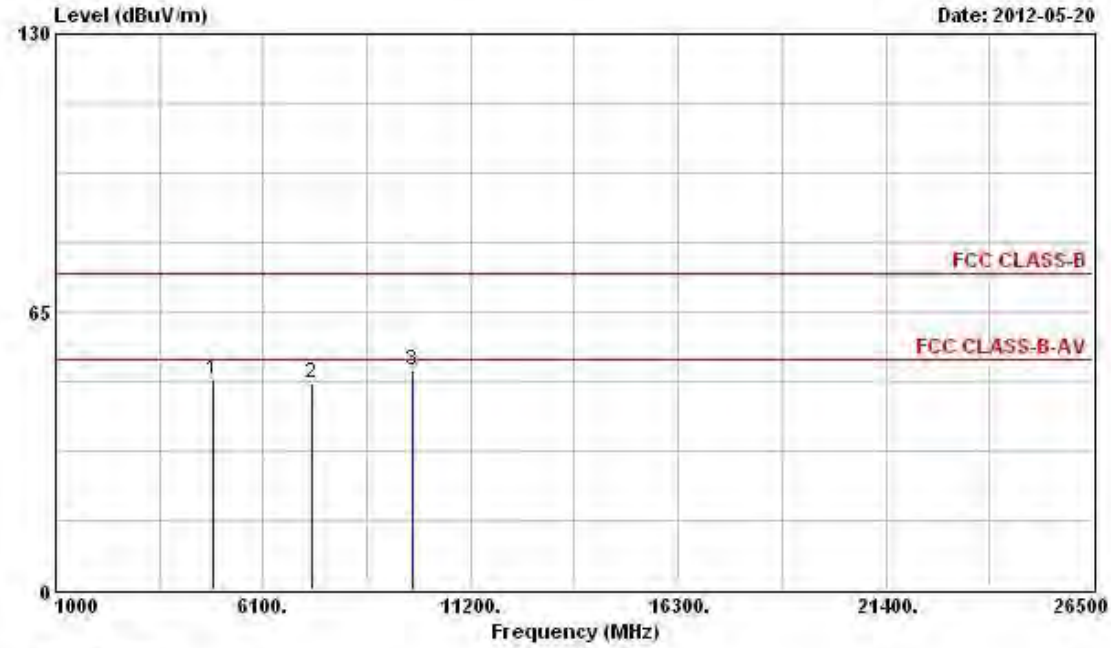
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11B-20M	**Power Level**	1	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	52.52	-21.48	74.00	46.98	35.76	4.58	34.80	Peak	---	---
2	4824.000	52.80	-1.20	54.00	47.26	35.76	4.58	34.80	Average	---	---
3	7236.000	50.16	-23.84	74.00	41.76	37.85	5.63	35.08	Peak	---	---
4	9648.000	53.27	-20.73	74.00	43.01	39.39	6.34	35.47	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

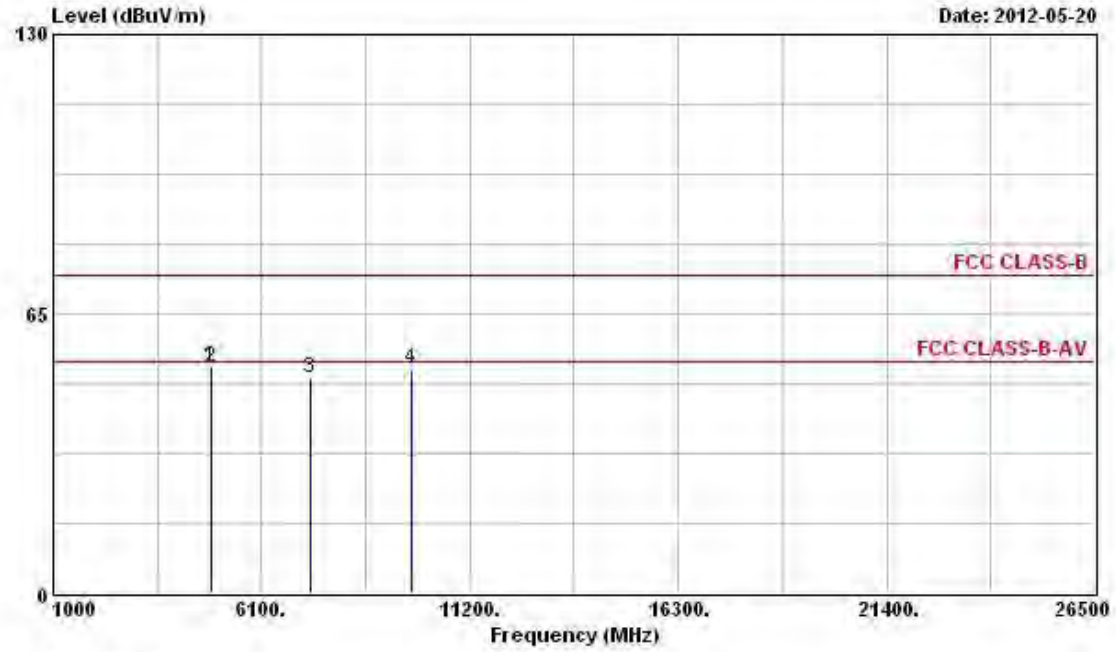
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11B-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	49.01	-4.99	54.00	44.00	35.18	4.61	34.78	PK	---	---
2	7311.000	48.33	-5.67	54.00	40.87	36.92	5.64	35.10	PK	---	---
3	9748.000	51.32	-22.68	74.00	41.73	38.71	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

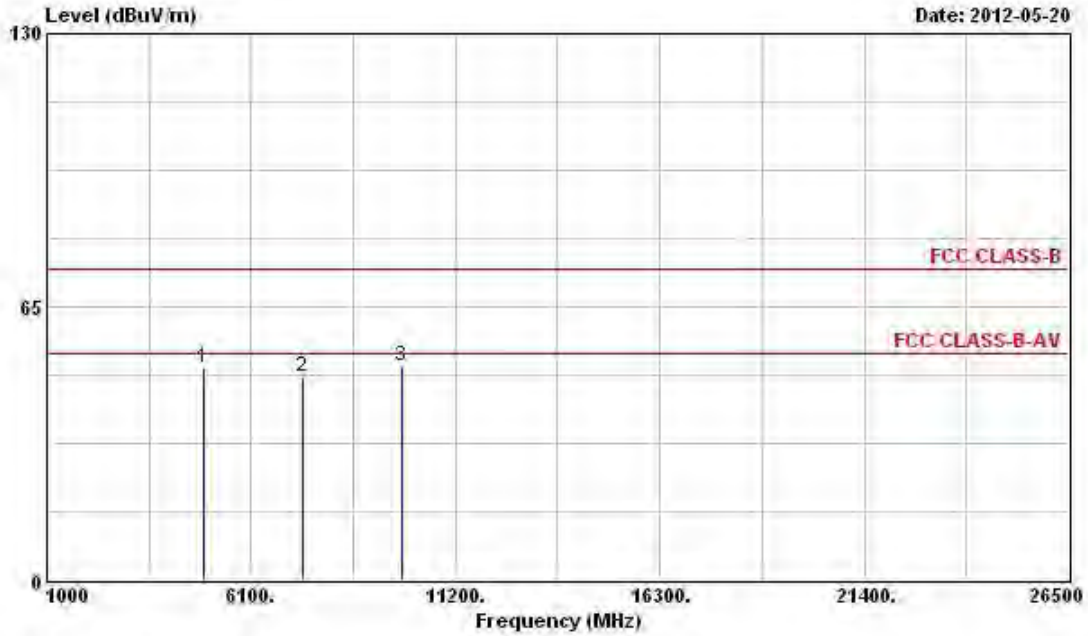
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11B-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	52.60	-21.40	74.00	46.94	35.83	4.61	34.78	Peak	---	---
2	4874.000	52.45	-1.55	54.00	46.79	35.83	4.61	34.78	Average	---	---
3	7311.000	49.95	-4.05	54.00	41.55	37.86	5.64	35.10	PK	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

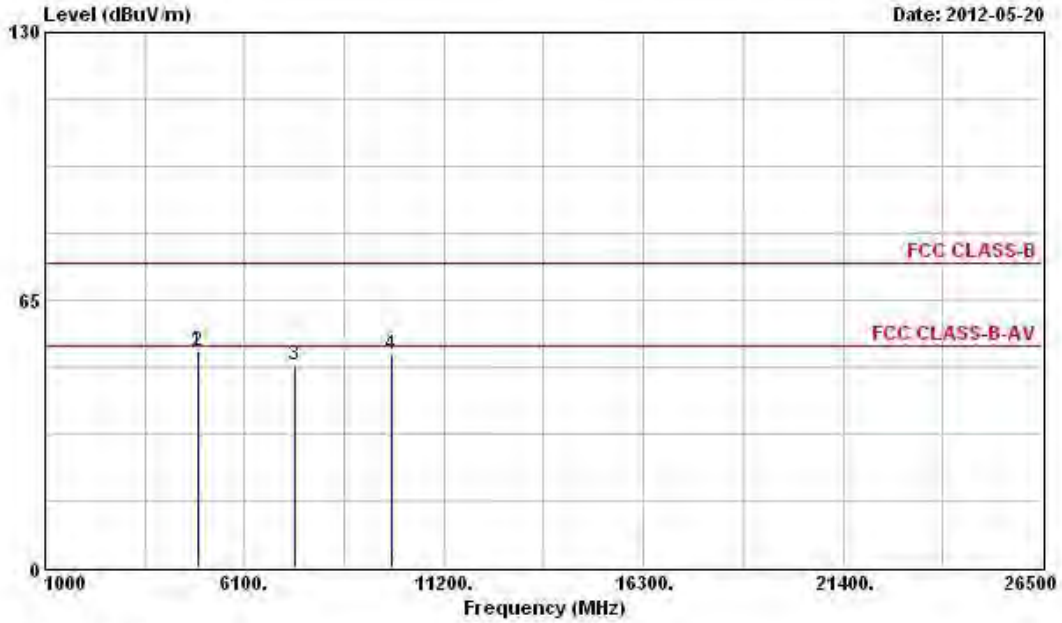
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11B-20M	**Power Level**	1	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	50.34	-3.66	54.00	45.20	35.23	4.68	34.77	PK	---	---
2	7386.000	48.34	-5.66	54.00	40.85	36.96	5.65	35.12	PK	---	---
3	9848.000	51.07	-22.93	74.00	41.37	38.81	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

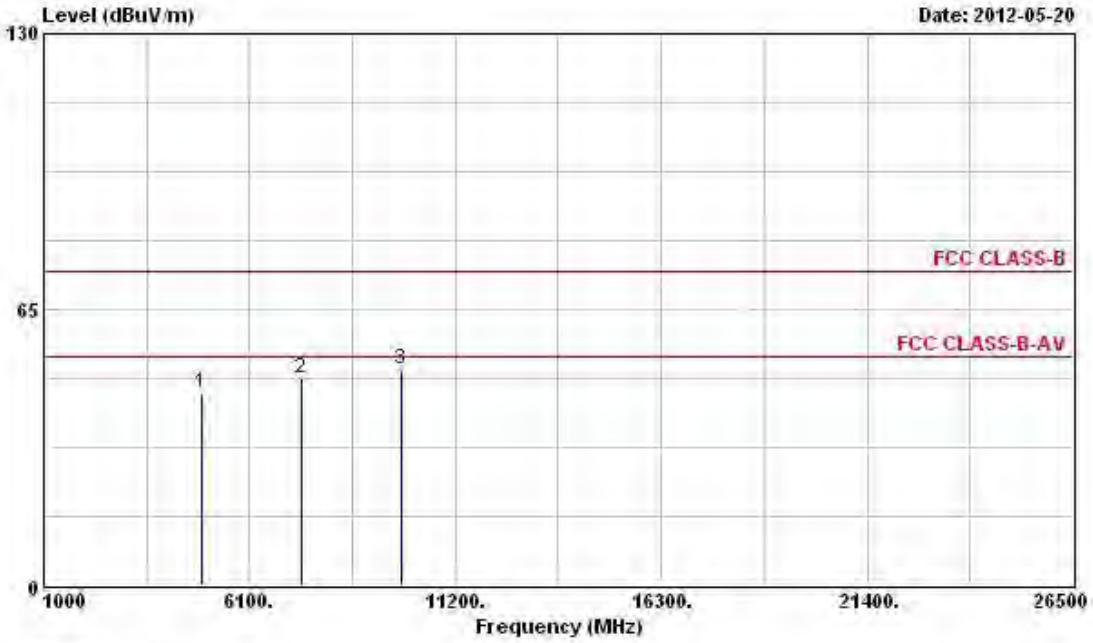
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11B-20M	**Power Level**	1	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	52.70	-21.30	74.00	46.89	35.90	4.68	34.77	Peak	---	---
2	4924.000	52.63	-1.37	54.00	46.82	35.90	4.68	34.77	Average	---	---
3	7386.000	49.31	-4.69	54.00	40.90	37.88	5.65	35.12	PK	---	---
4	9848.000	51.84	-22.16	74.00	41.34	39.61	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

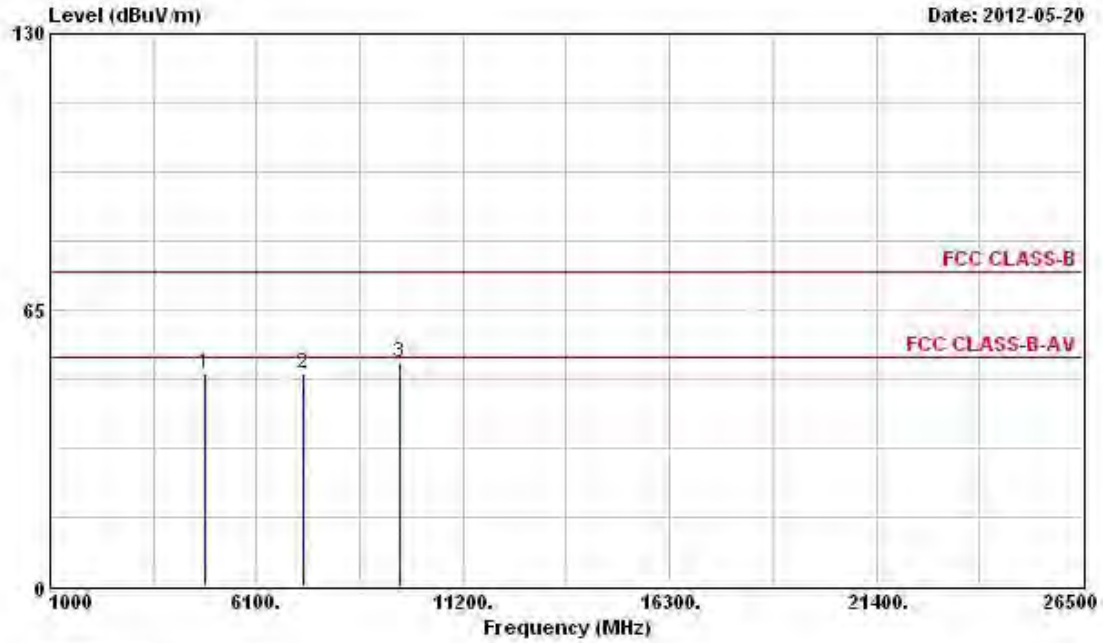
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	45.37	-8.63	54.00	40.23	35.23	4.68	34.77	PK	---	---
2	7386.000	48.75	-5.25	54.00	41.26	36.96	5.65	35.12	PK	---	---
3	9848.000	50.71	-23.29	74.00	41.01	38.81	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

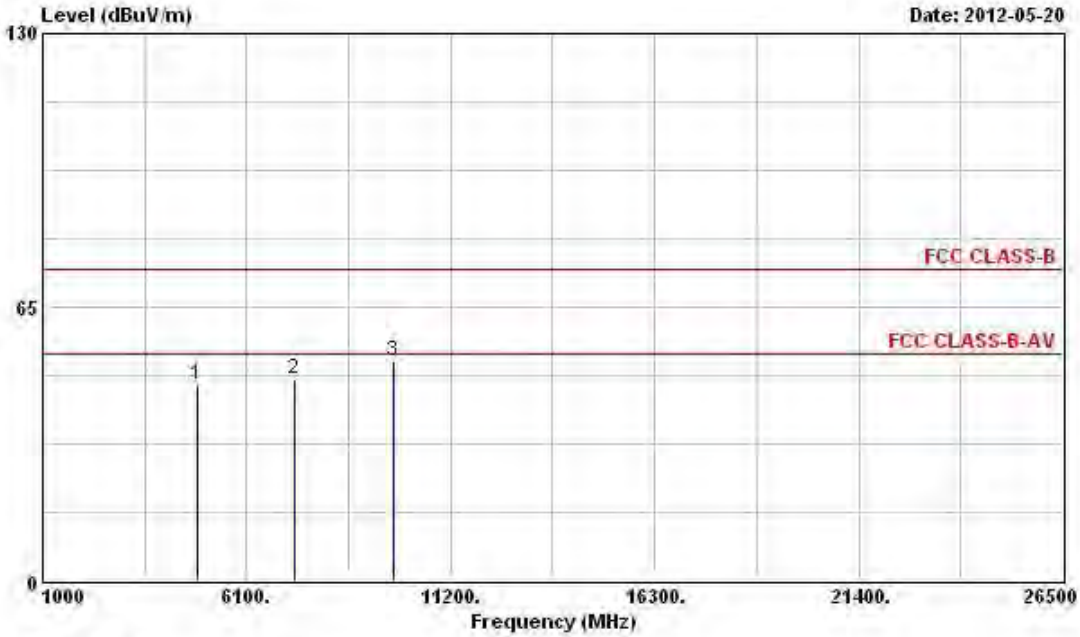
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	49.98	-4.02	54.00	44.44	35.76	4.58	34.80	PK	---	---
2	7236.000	50.07	-3.93	54.00	41.67	37.85	5.63	35.08	PK	---	---
3	9648.000	52.79	-21.21	74.00	42.53	39.39	6.34	35.47	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

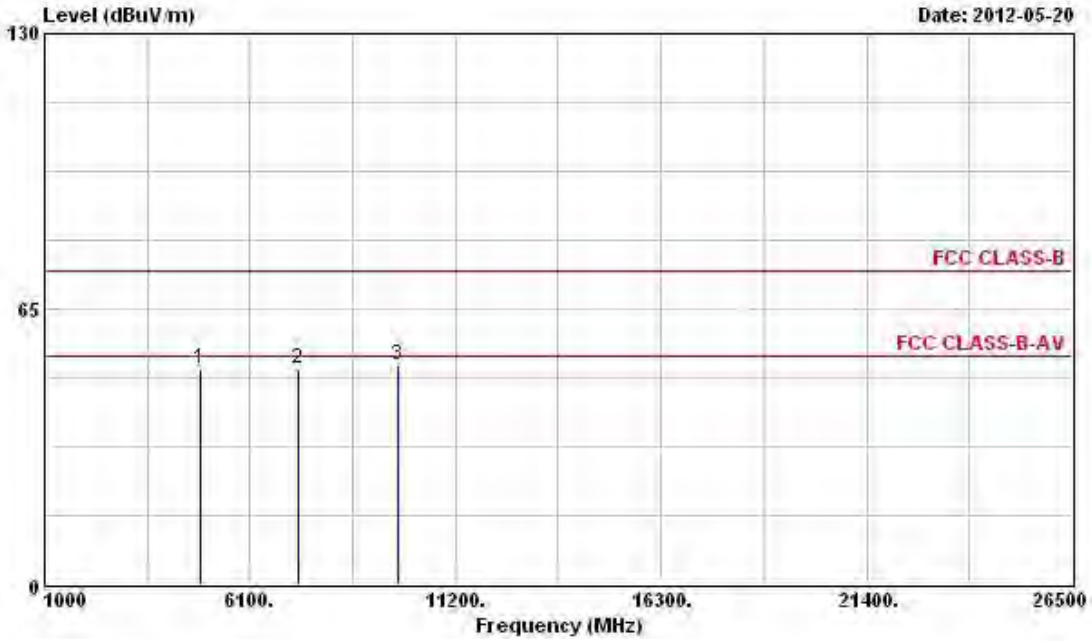
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Ant. No.**	2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	46.46	-7.54	54.00	41.45	35.18	4.61	34.78	PK	---	---
2	7311.000	47.99	-6.01	54.00	40.53	36.92	5.64	35.10	PK	---	---
3	9748.000	52.02	-21.98	74.00	42.43	38.71	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

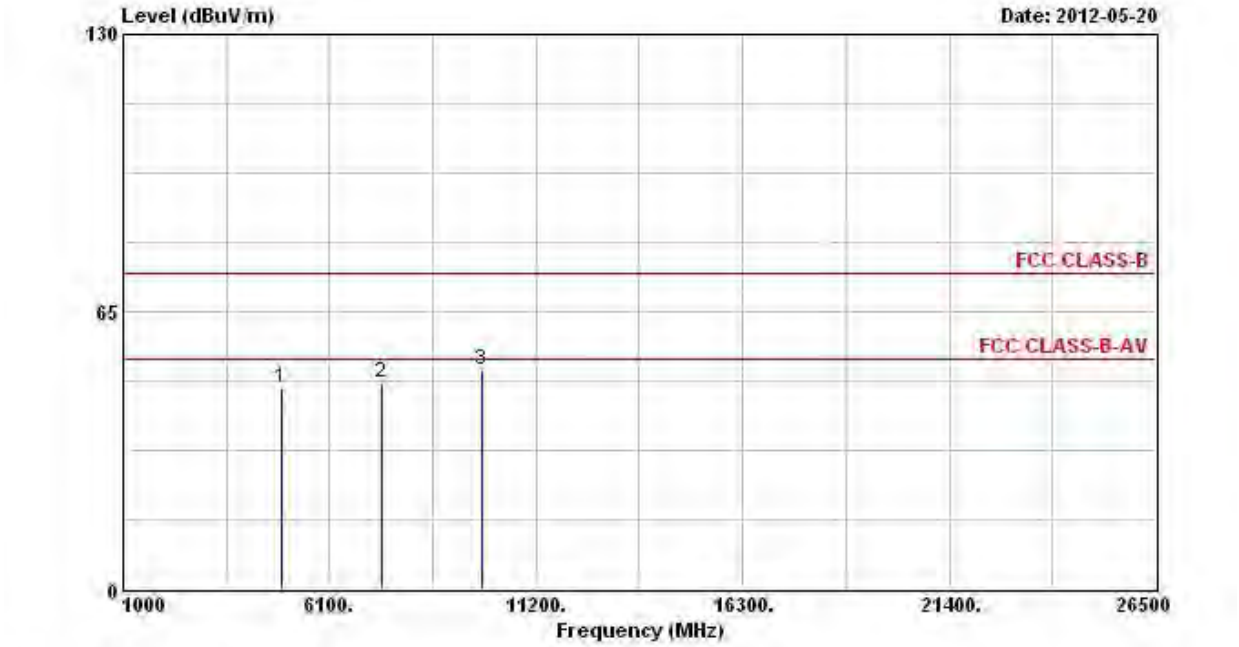
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	50.90	-3.10	54.00	45.24	35.83	4.61	34.78	PK	---	---
2	7311.000	50.95	-3.05	54.00	42.55	37.86	5.64	35.10	PK	---	---
3	9748.000	51.82	-22.18	74.00	41.43	39.51	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

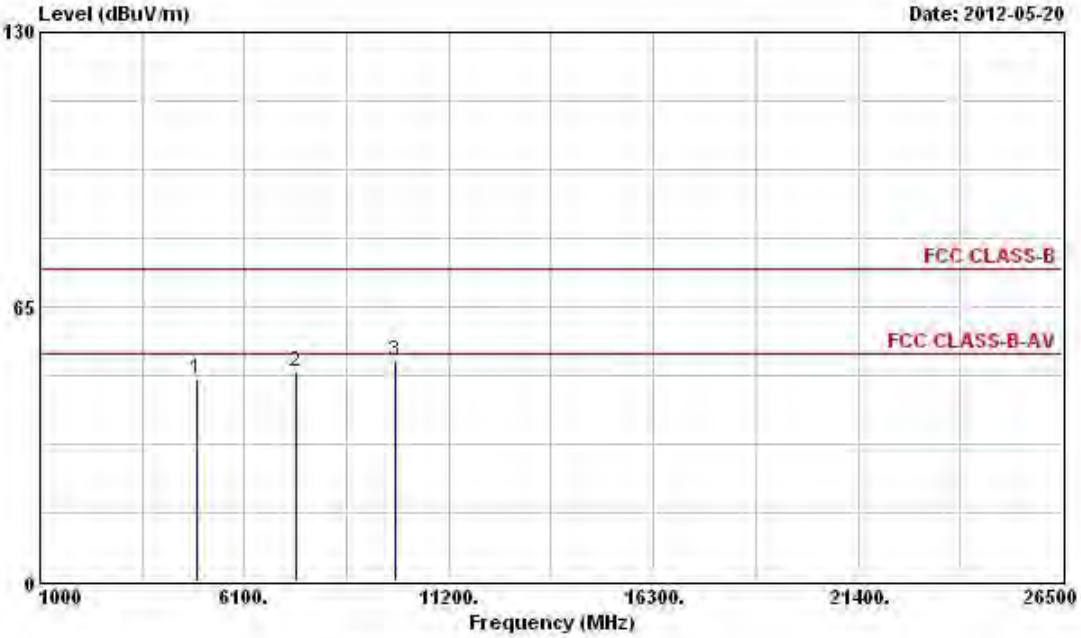
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	47.24	-6.76	54.00	42.10	35.23	4.68	34.77	PK	---	---
2	7386.000	48.11	-5.89	54.00	40.62	36.96	5.65	35.12	PK	---	---
3	9848.000	51.22	-22.78	74.00	41.52	38.81	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

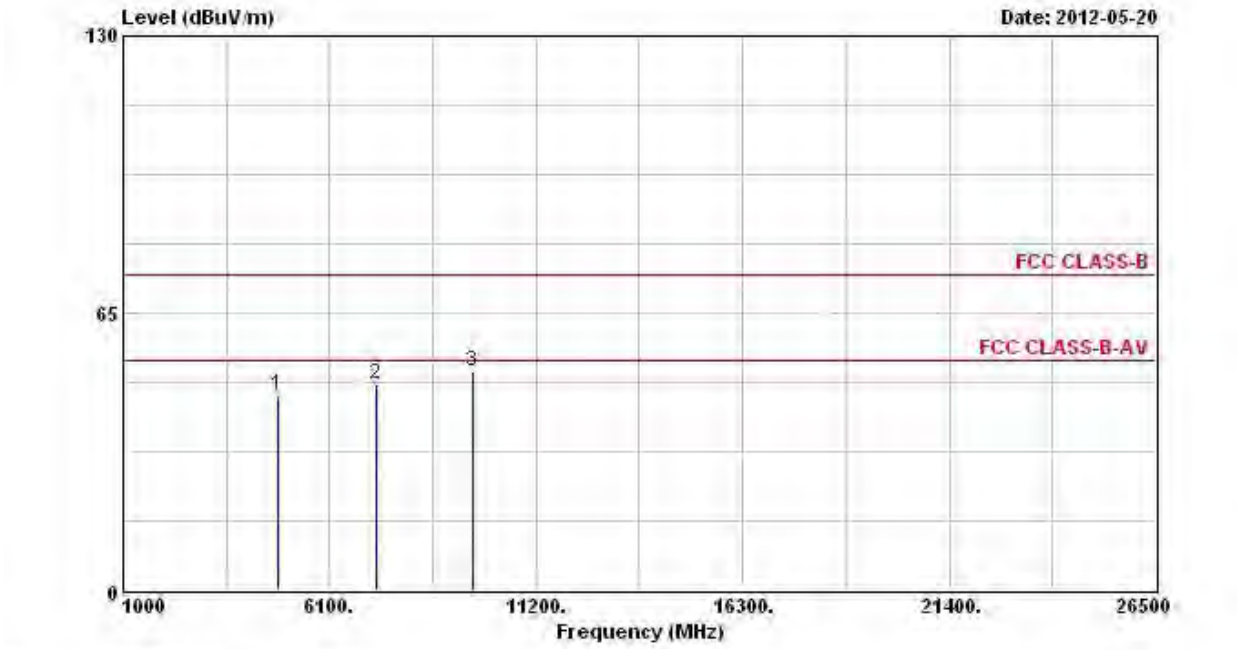
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11G-20M	**Power Level**	1	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Ant. No.**	1	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	48.08	-5.92	54.00	42.27	35.90	4.68	34.77	PK	---	---
2	7386.000	49.46	-4.54	54.00	41.05	37.88	5.65	35.12	PK	---	---
3	9848.000	51.97	-22.03	74.00	41.47	39.61	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

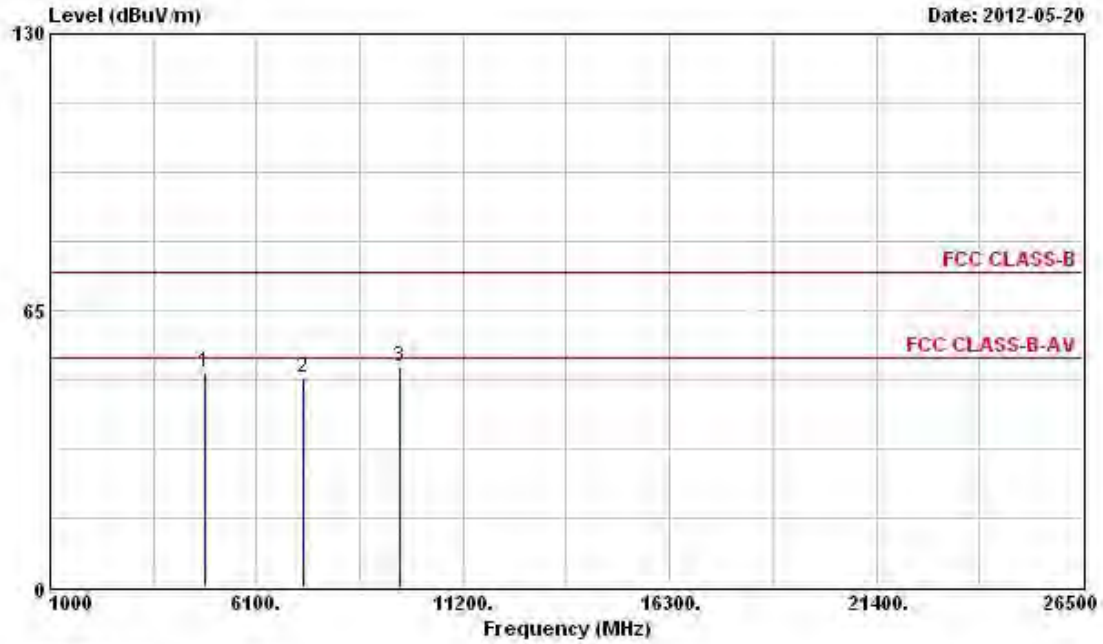
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	45.79	-8.21	54.00	40.88	35.13	4.58	34.80	PK	---	---
2	7236.000	48.29	-25.71	74.00	40.84	36.90	5.63	35.08	Peak	---	---
3	9648.000	51.40	-22.60	74.00	41.94	38.59	6.34	35.47	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

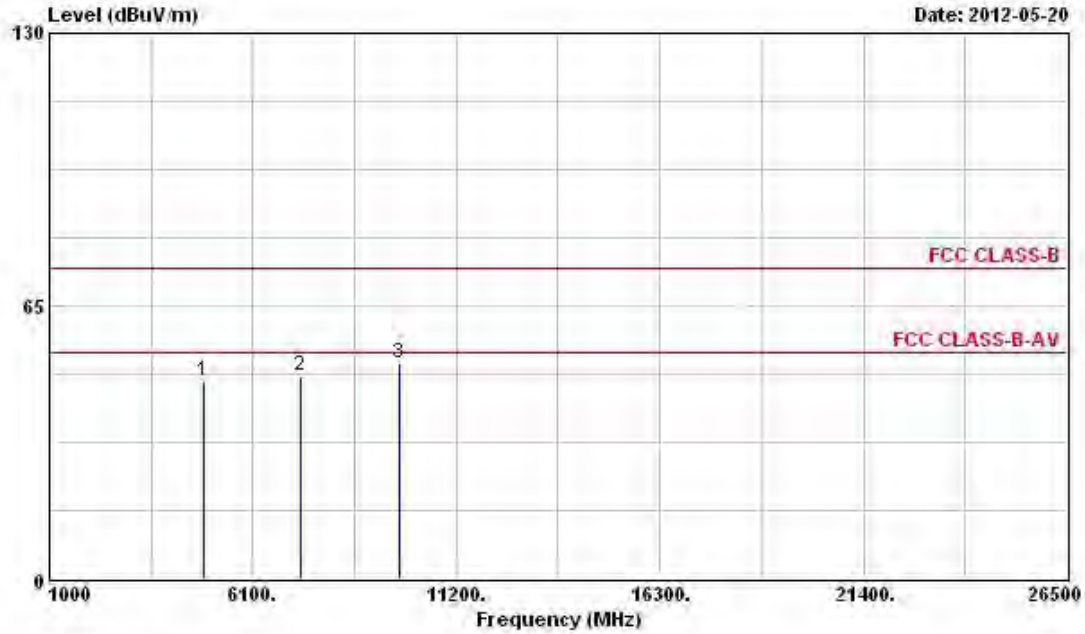
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F1
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4824.000	50.49	-3.51	54.00	44.95	35.76	4.58	34.80	PK	---	---
2	7236.000	49.07	-24.93	74.00	40.67	37.85	5.63	35.08	Peak	---	---
3	9648.000	51.68	-22.32	74.00	41.42	39.39	6.34	35.47	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

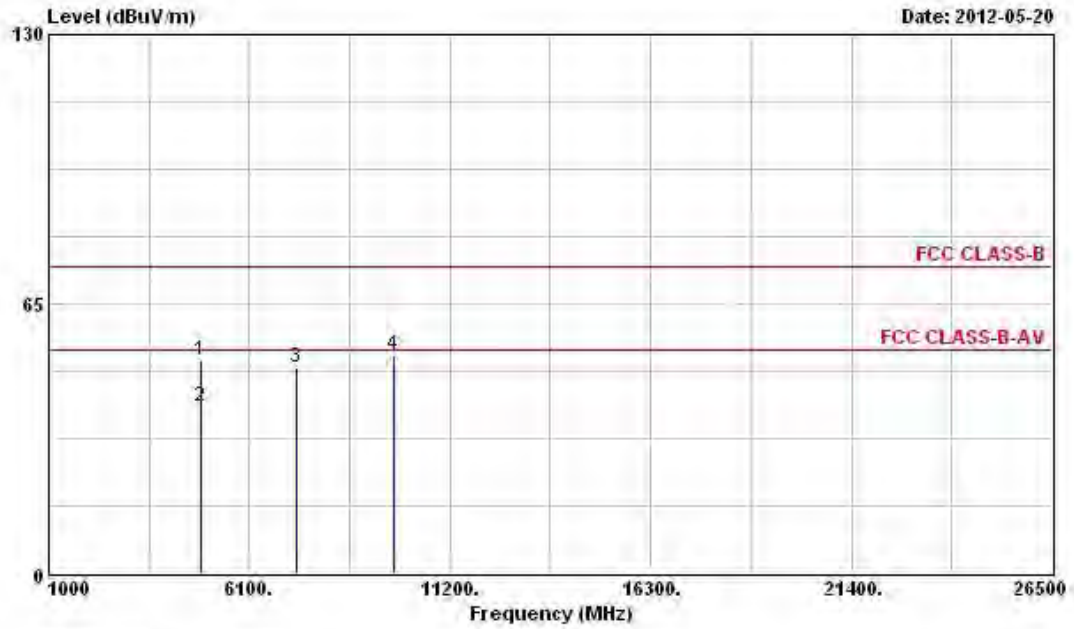
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	47.17	-6.83	54.00	42.16	35.18	4.61	34.78	PK	---	---
2	7311.000	48.16	-5.84	54.00	40.70	36.92	5.64	35.10	PK	---	---
3	9748.000	51.17	-22.83	74.00	41.58	38.71	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

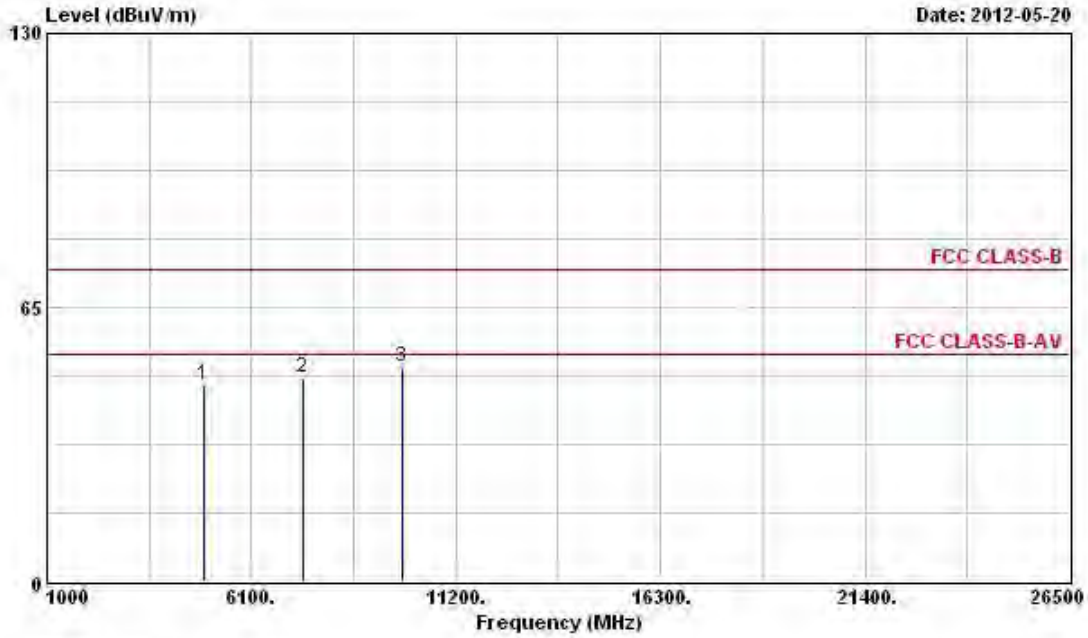
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F2
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	51.31	-22.69	74.00	45.65	35.83	4.61	34.78	Peak	---	---
2	4874.000	40.04	-13.96	54.00	34.38	35.83	4.61	34.78	Average	---	---
3	7311.000	49.44	-4.56	54.00	41.04	37.86	5.64	35.10	PK	---	---
4	9748.000	52.43	-21.57	74.00	42.04	39.51	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

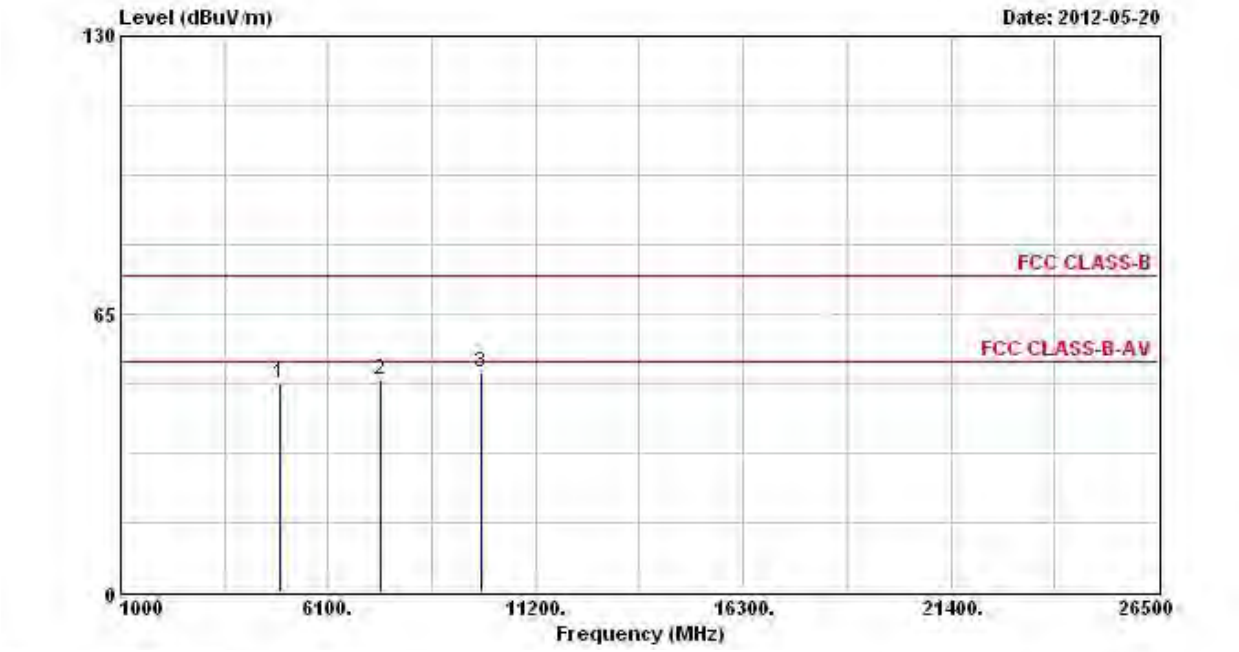
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	46.45	-7.55	54.00	41.31	35.23	4.68	34.77	PK	---	---
2	7386.000	48.40	-5.60	54.00	40.91	36.96	5.65	35.12	PK	---	---
3	9848.000	50.84	-23.16	74.00	41.14	38.81	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

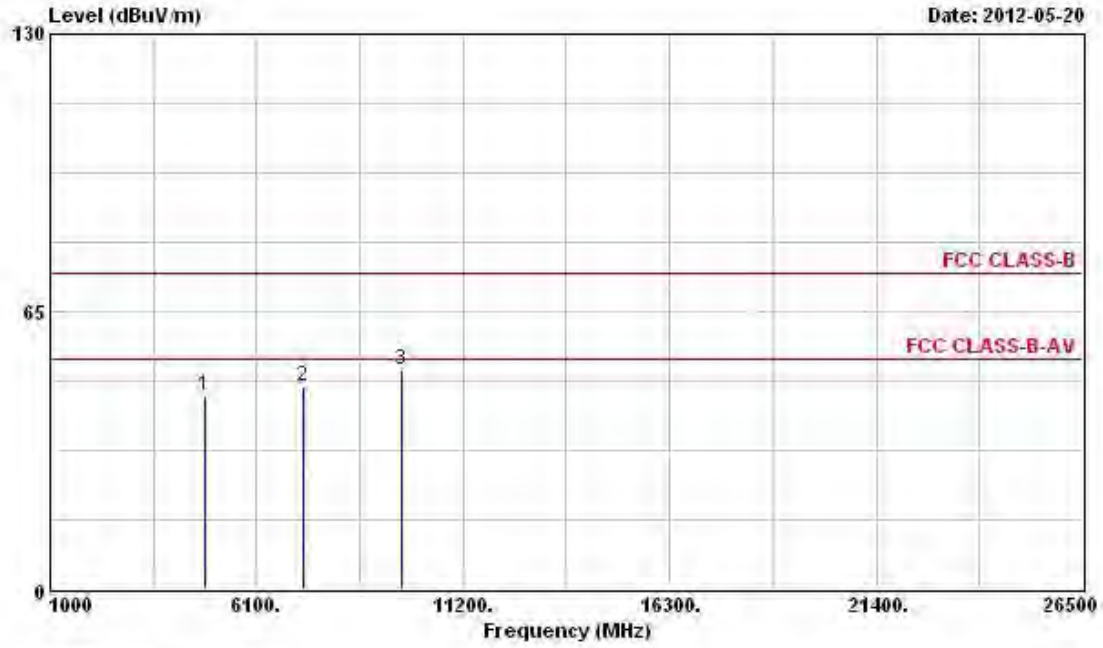
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-20M	**Power Level**	1	**Test Freq. (FX)**	F3
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4924.000	48.64	-5.36	54.00	42.83	35.90	4.68	34.77	PK	---	---
2	7386.000	49.41	-4.59	54.00	41.00	37.88	5.65	35.12	PK	---	---
3	9848.000	51.26	-22.74	74.00	40.76	39.61	6.38	35.49	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

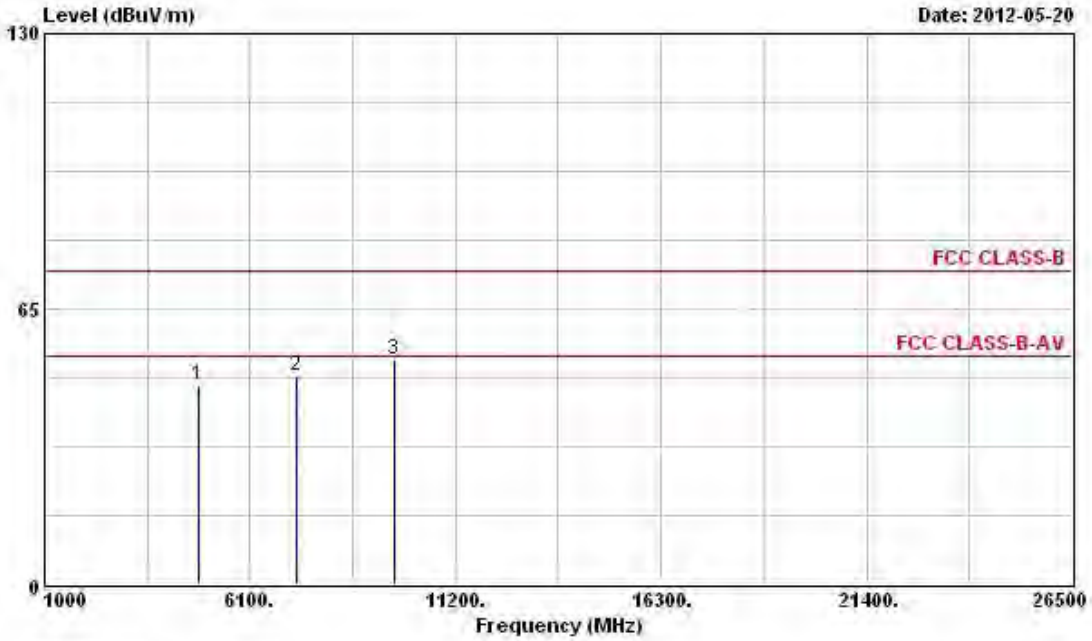
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F4
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4844.000	45.28	-8.72	54.00	40.32	35.14	4.61	34.79	PK	---	---
2	7266.000	47.59	-6.41	54.00	40.14	36.91	5.63	35.09	PK	---	---
3	9688.000	51.18	-22.82	74.00	41.68	38.63	6.35	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

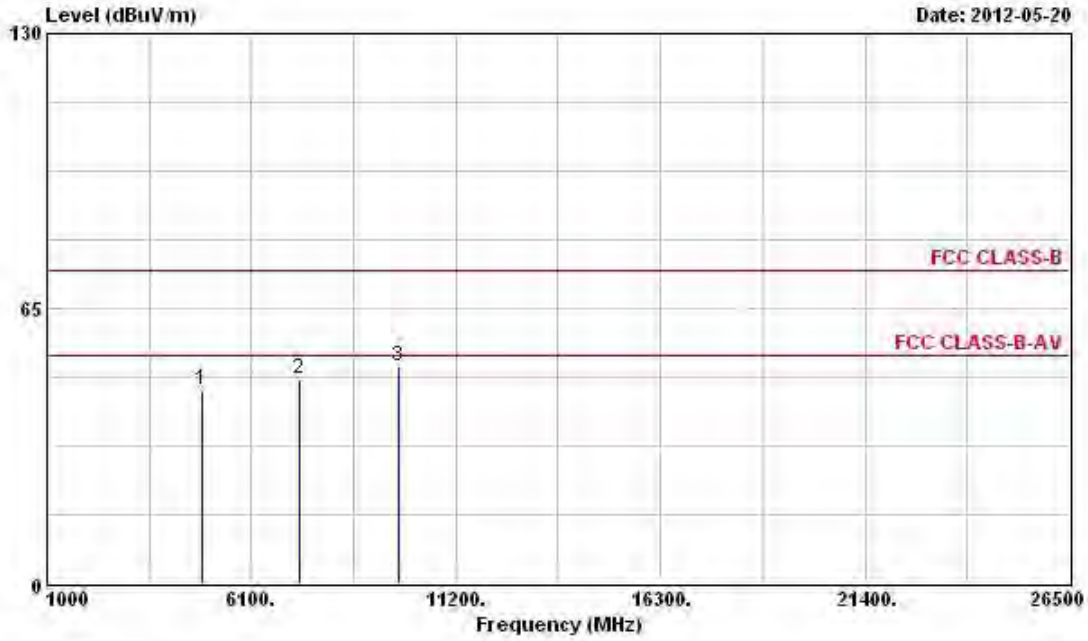
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F4
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4844.000	47.00	-7.00	54.00	41.40	35.78	4.61	34.79	PK	---	---
2	7266.000	49.11	-4.89	54.00	40.71	37.86	5.63	35.09	PK	---	---
3	9688.000	52.85	-21.15	74.00	42.55	39.43	6.35	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

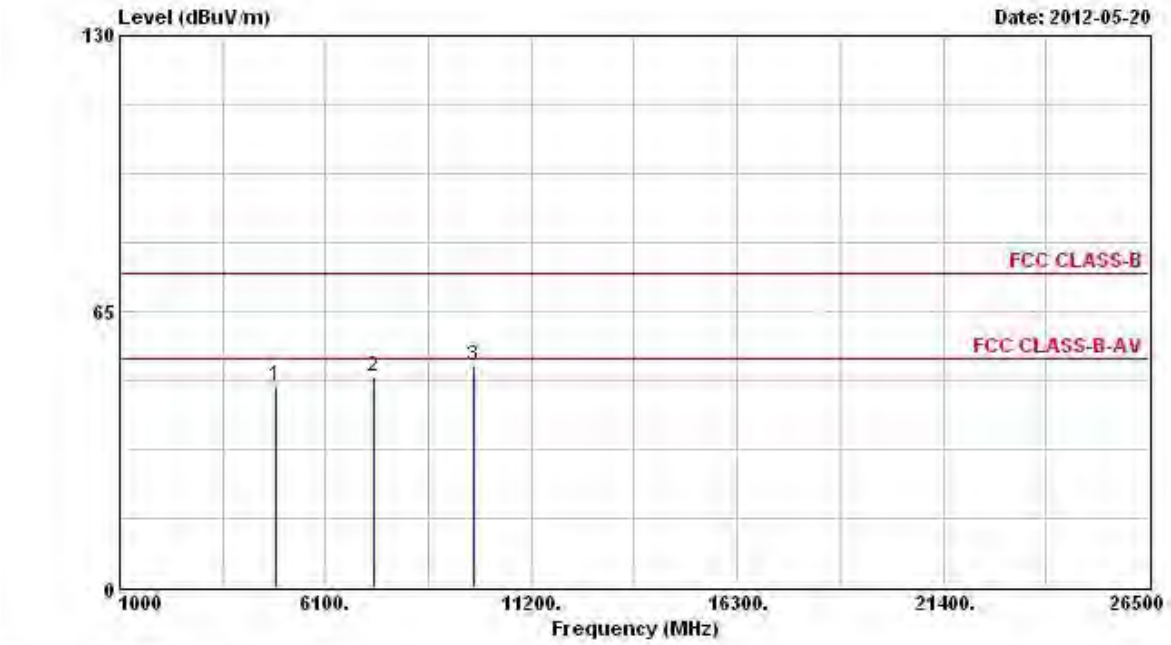
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F5
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	45.63	-8.37	54.00	40.62	35.18	4.61	34.78	PK	---	---
2	7311.000	48.15	-5.85	54.00	40.69	36.92	5.64	35.10	PK	---	---
3	9748.000	51.50	-22.50	74.00	41.91	38.71	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

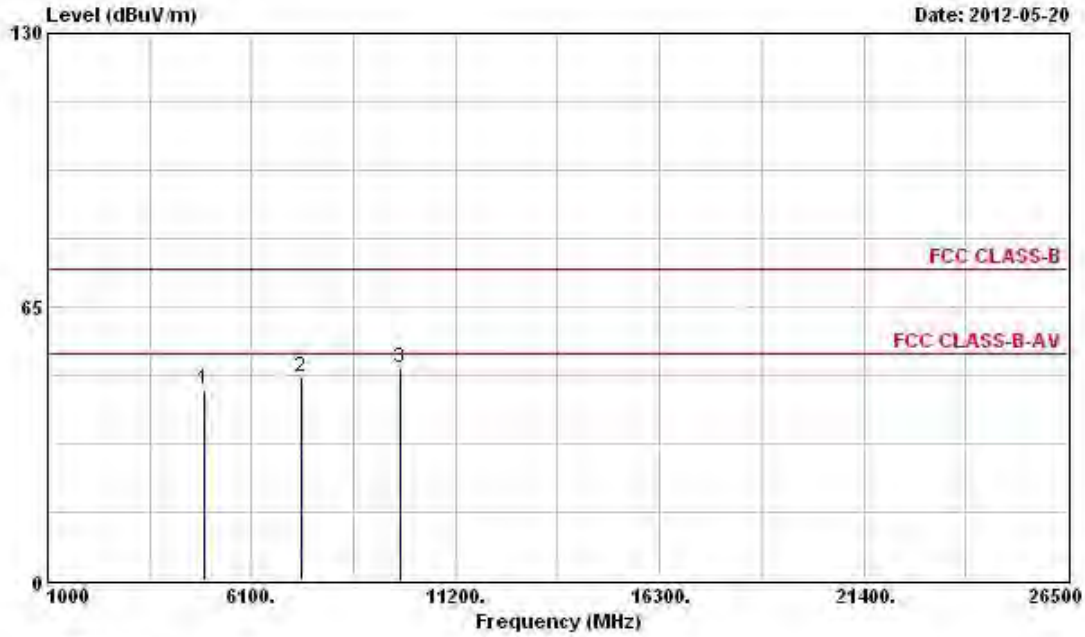
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F5
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4874.000	47.41	-6.59	54.00	41.75	35.83	4.61	34.78	PK	---	---
2	7311.000	49.40	-4.60	54.00	41.00	37.86	5.64	35.10	PK	---	---
3	9748.000	52.13	-21.87	74.00	41.74	39.51	6.36	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

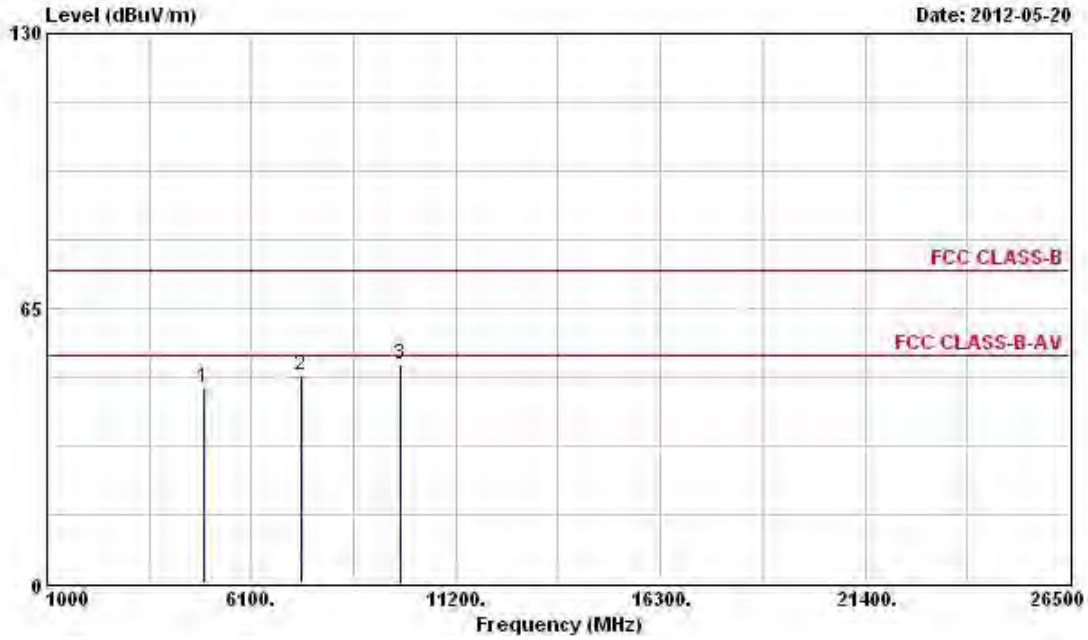
Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F6
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	V



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4904.000	45.32	-8.68	54.00	40.25	35.21	4.64	34.78	PK	---	---
2	7356.000	48.33	-5.67	54.00	40.86	36.94	5.64	35.11	PK	---	---
3	9808.000	50.51	-23.49	74.00	40.85	38.77	6.37	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions (Above 1GHz)					
Modulation Mode	11N2.4G-40M	**Power Level**	1	**Test Freq. (FX)**	F6
Operating Function	Transmit	**Ant. No.**	1+2	**Polarization**	H



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	4904.000	46.30	-7.70	54.00	40.56	35.88	4.64	34.78	PK	---	---
2	7356.000	49.35	-4.65	54.00	40.95	37.87	5.64	35.11	PK	---	---
3	9808.000	51.85	-22.15	74.00	41.39	39.57	6.37	35.48	Peak	---	---

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

4 Maximum Permissible Exposure

4.1 Maximum Permissible Exposure

4.1.1 Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30
Note 1: f = frequency in MHz ; *Plane-wave equivalent power density Note 2: For the applicable limit, see FCC 1.1310				

RF Field Strength Limits for Controlled Use Devices (Controlled Environment)				
Frequency Range (MHz)	**Electric Field (V/m rms)**	**Magnetic Field (A/m rms)**	**Power Density (W/m2)**	**Averaging Time (minutes)**
0.003-1	600	4.9	-	6
1-10	600/f	4.9/f	-	6
10-30	60	4.9/f	-	6
30-300	60	0.163	10*	6
300-1500	3.54 f 0.5	0.0094 f 0.5	f/30	6
1500-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/f 1.2
150000-300000	0.354 f 0.5	9.4 x 10-4 f 0.5	3.33 x 10-4 f	616000/f 1.2
RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)				
Frequency Range (MHz)	**Electric Field (V/m rms)**	**Magnetic Field (A/m rms)**	**Power Density (W/m2)**	**Averaging Time (minutes)**
0.003-1	280	2.19	-	6
1-10	280/f	2.19/f	-	6
10-30	28	2.19/f	-	6
30-300	28	0.073	2*	6
300-1500	1.585 $f^{0.5}$	0.0042 $f^{0.5}$	f/150	6
1500-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/$f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10^{-4} $f^{0.5}$	6.67 x 10^{-5} f	616000/$f^{1.2}$
Note 1: f is frequency in MHz. Note 2: For the applicable limit, see IC RSS-102				

4.1.2 MPE Calculation Method

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$

Power Density: Pd (W/m^2) = $\frac{E^2}{377}$

E = Electric field (V/m)
P = RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

4.1.3 Result of Maximum Permissible Exposure

Transmitter Chains & Receiver Chains Information					
IEEE Std. 802.11 Protocol	**Number of Transmit Chains (N_{TX})**	**Number of Receive Chains (N_{RX})**	**Correlation Signals with Multiple N_{TX}**	**RF Output Power (dBm)**	**Co-location**
b	1	1	N/A	15.85	N/A
g	2	2	Correlated	24.66	N/A
n (HT20)	2	2	Uncorrelated	25.44	N/A
n (HT40)	2	2	Uncorrelated	23.74	N/A
Note 1: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)					

Worst Maximum RF Output Power Result									
Exposure Environment		General Population / Uncontrolled Exposure							
Separation Distance (cm)		20							
Power Level	1	**RF Output Power (dBm)**							
Modulation Mode	**N_{TX}**	**Chain-Port 1**	**Chain-Port 2**	-	-	**Sum Chain**	**Gain (dBi)**	**EIRP Power**	**PD (S) (mW/cm²)**
11B-20M	1	15.85	-	-	-	15.85	3.95	19.80	0.0190
11G-20M	1	24.66	-	-	-	24.66	3.95	28.61	0.1445
11N2.4G-20M	2	21.96	22.86	-	-	25.44	3.80	29.24	0.1671
11N2.4G-40M	2	19.92	21.42	-	-	23.74	3.80	27.54	0.1130
Maximum Permissible Exposure Limit (mW/cm²)									1
Note 1: N_{TX} = Number of Transmit Chains									

5 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9 kHz ~ 2.75 GHz	Mar. 23, 2012	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz – 30MHz	Feb. 08, 2012	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9 kHz ~ 30 MHz	Apr. 20, 2012	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	CB049	9 kHz ~ 30 MHz	Apr. 25, 2012	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Sep. 26, 2011	Conducted (TH02-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	May. 20, 2012	Conducted (TH02-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Nov. 22, 2011	Conducted (TH02-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	Conducted (TH02-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	Conducted (TH02-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	Conducted (TH02-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	May. 09, 2012	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 01, 2011	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 01, 2011	Conducted (TH02-CB)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100593	9 kHz ~ 40 GHz	Aug. 08, 2011	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz ~ 1 GHz 3m	May 10, 2012	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz ~ 1.3 GHz	Jul. 25, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1 GHz ~ 26.5 GHz	Jul. 25, 2011	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1 GHz ~ 18 GHz	Nov. 15, 2011	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz ~ 1 GHz	Nov. 11, 2011	Radiation (03CH02-HY)
RF Cable-high	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz ~ 40 GHz	Jan. 18, 2012	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz ~ 2 GHz	Oct. 22, 2011	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 29, 2010*	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is two year.

6 Certification of TAF Accreditation

Certificate No. : L1190-111208

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 08, 2011

P1, total 24 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix