

FCC Test Report

Product Name	ROG Strix Wireless 2.4GHz Dongle
Model No.	ROGSTRIXWLDG
FCC ID	BJM-ROGSTRIXWLDG

Applicant	Tatung Company
Address	22 Chungshan N Road Sec 3, Taipei, Taiwan 10451

Date of Receipt	Apr. 25, 2016
Issued Date	May 11, 2016
Report No.	1640467R-RFUSP15V00
Report Version	V1.0



The test results relate only to the samples tested.

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

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Test Report

Issued Date: May 11, 2016

Report No.: 1640467R-RFUSP15V00



Product Name	ROG Strix Wireless 2.4GHz Dongle
Applicant	Tatung Company
Address	22 Chungshan N Road Sec 3, Taipei, Taiwan 10451
Manufacturer	DONG GUAN YI XING ELECTRONICS CO., LTD.
Model No.	ROGSTRIXWLDG
EUT Rated Voltage	DC 5V (Power by USB)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2015 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :

Joanne Lin

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Tested By :

Vic Chen

(Engineer / Vic Chen)

Approved By :

Vincent Lin

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	ROG Strix Wireless 2.4GHz Dongle
Trade Name	ASUS
Model No.	ROGSTRIXWLDG
FCC ID	BJM-ROGSTRIXWLDG
Frequency Range	2405.35-2477.35MHz
Channel Separation	2MHz
Number of Channels	37CH
Type of Modulation	Pi/4 DQPSK
Antenna Type	MULTILAYER CERAMIC
Channel Control	Auto
Antenna Gain	Refer to the table "Antenna List"

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Walsin	RFANT3216120A5T	MULTILAYER CERAMIC	2.12dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2405.35 MHz	Channel 11:	2425.35 MHz	Channel 21:	2445.35 MHz	Channel 31:	2465.35 MHz
Channel 2:	2407.35 MHz	Channel 12:	2427.35 MHz	Channel 22:	2447.35 MHz	Channel 32:	2467.35 MHz
Channel 3:	2409.35 MHz	Channel 13:	2429.35 MHz	Channel 23:	2449.35 MHz	Channel 33:	2469.35 MHz
Channel 4:	2411.35 MHz	Channel 14:	2431.35 MHz	Channel 24:	2451.35 MHz	Channel 34:	2471.35 MHz
Channel 5:	2413.35 MHz	Channel 15:	2433.35 MHz	Channel 25:	2453.35 MHz	Channel 35:	2473.35 MHz
Channel 6:	2415.35 MHz	Channel 16:	2435.35 MHz	Channel 26:	2455.35 MHz	Channel 36:	2475.35 MHz
Channel 7:	2417.35 MHz	Channel 17:	2437.35 MHz	Channel 27:	2457.35 MHz	Channel 37:	2477.35 MHz
Channel 8:	2419.35 MHz	Channel 18:	2439.35 MHz	Channel 28:	2459.35 MHz		
Channel 9:	2421.35 MHz	Channel 19:	2441.35 MHz	Channel 29:	2461.35 MHz		
Channel 10:	2423.35 MHz	Channel 20:	2443.35 MHz	Channel 30:	2463.35 MHz		

Note:

1. The EUT is a ROG Strix Wireless 2.4GHz Dongle with a built-in 2.4GHz wireless transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
4. The EUT is using dual-antennas(Ant1&Ant2) and only the worst case(Ant1) is shown in the report.

Test Mode	Mode 1: Transmit
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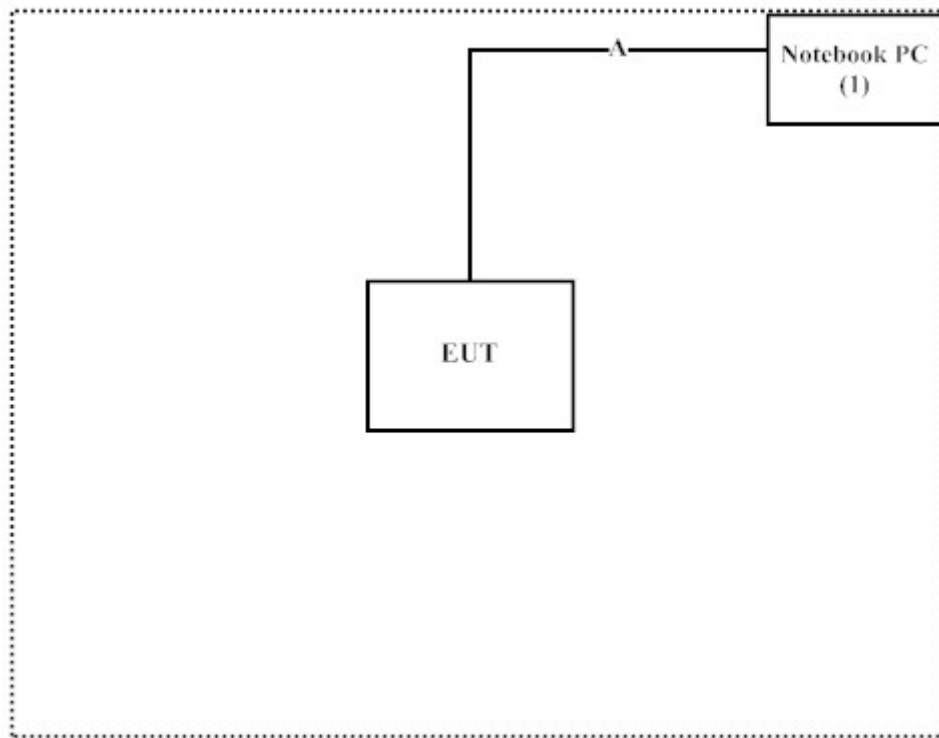
1.3. Tested System Details

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

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Notebook PC	DELL	Latitude E5440	FS9TK32	Non-Shielded, 0.8m

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

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute “Avnera v2016.2.22.1” program on the Notebook.
- (3) Configure the test mode and the test channel
- (4) Start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

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

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/chinese/about/certificates.aspx?bval=5>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

Site Description: File on
Federal Communications Commission
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FCC Accreditation Number: TW1014

2. Conducted Emission

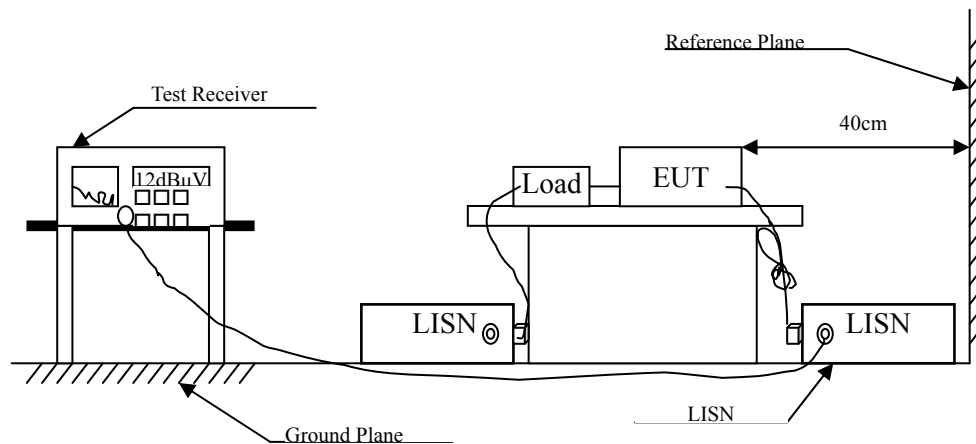
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2015	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2016	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2016	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar., 2016	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2016	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

2.2. Test Setup



2.3. Limits

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

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 1					
Quasi-Peak					
0.244	9.778	28.120	37.898	-25.416	63.314
0.404	9.781	25.870	35.651	-23.092	58.743
0.611	9.797	22.810	32.607	-23.393	56.000
0.978	9.835	19.320	29.155	-26.845	56.000
2.244	9.941	20.420	30.361	-25.639	56.000
4.990	10.008	17.530	27.538	-28.462	56.000
Average					
0.244	9.778	10.640	20.418	-32.896	53.314
0.404	9.781	17.730	27.511	-21.232	48.743
0.611	9.797	7.700	17.497	-28.503	46.000
0.978	9.835	7.920	17.755	-28.245	46.000
2.244	9.941	11.000	20.941	-25.059	46.000
4.990	10.008	5.390	15.398	-30.602	46.000

Note:

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

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBμV
	dB	dBμV	dBμV		
LINE 2					
Quasi-Peak					
0.166	9.832	40.100	49.932	-15.611	65.543
0.232	9.837	32.680	42.517	-21.140	63.657
0.502	9.858	31.530	41.388	-14.612	56.000
0.931	9.891	18.130	28.021	-27.979	56.000
6.705	10.121	13.510	23.631	-36.369	60.000
23.615	10.395	6.880	17.275	-42.725	60.000
Average					
0.166	9.832	29.230	39.062	-16.481	55.543
0.232	9.837	19.200	29.037	-24.620	53.657
0.502	9.858	21.560	31.418	-14.582	46.000
0.931	9.891	7.920	17.811	-28.189	46.000
6.705	10.121	7.380	17.501	-32.499	50.000
23.615	10.395	1.590	11.985	-38.015	50.000

Note:

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

3. Radiated Emission

3.1. Test Equipment

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

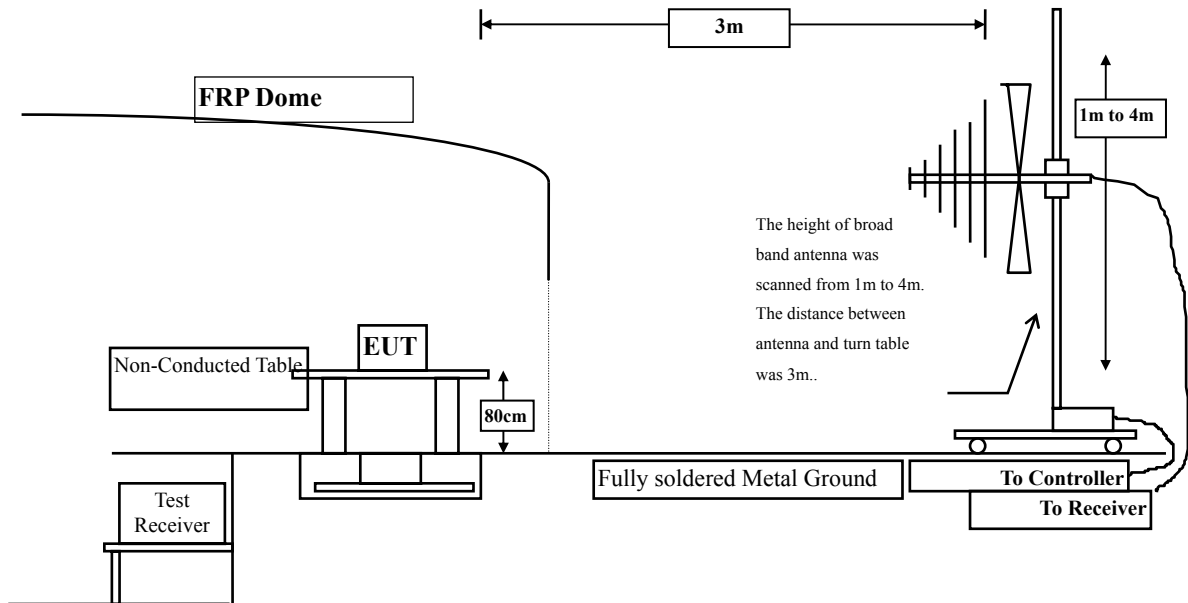
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Magnetic Loop Antenna	Teseq	HLA6121/ 37133	Sep., 2015
	X	Bilog Antenna	Schaffner Chase	CBL6112B/ 2707	Jun., 2015
	X	EMI Test Receiver	R&S	ESCS 30/838251/ 001	Jun., 2015
	X	Coaxial Cable	QTK(Arnist)	RG 214/ LC003-RG	Jun., 2015
	X	Coaxial signal switch	Arnist	MP59B/ 6200798682	Jun., 2015

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ CB # 8	X	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2015
	X	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	X	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan., 2016
	X	Horn Antenna	TRC	AH-0801/95051	Aug., 2015
	X	Pre-Amplifier	EMCI	EMC012630SE/980210	Jan., 2016
	X	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	X	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

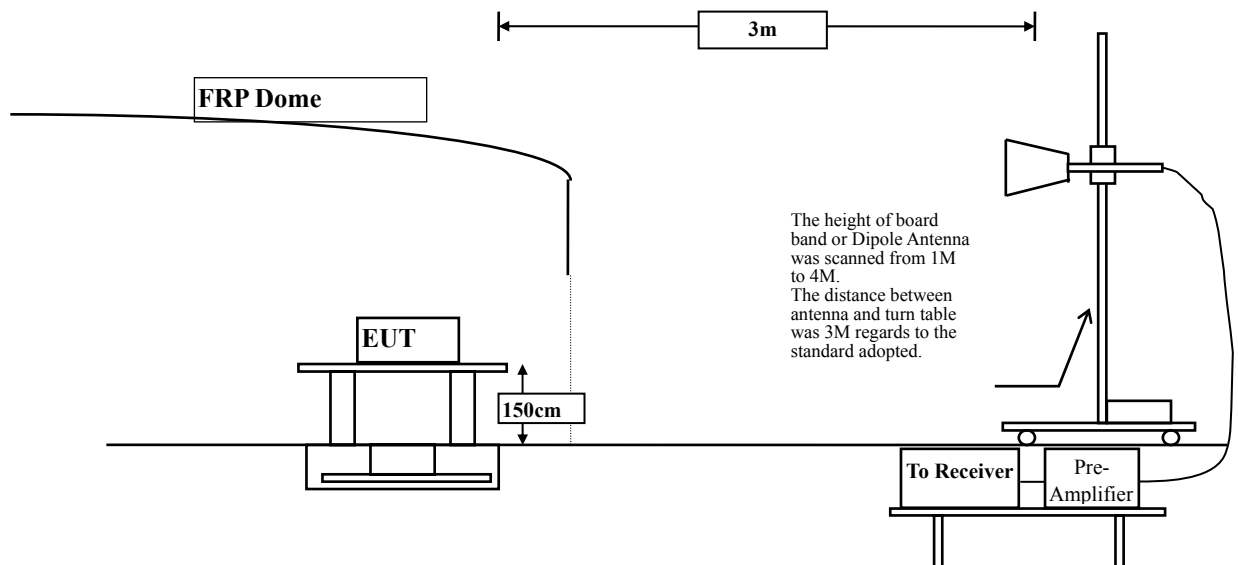
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart C Paragraph 15.249 Limits				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dBμV /m @3m)	(uV/m @3m)	(dBμV /m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

Remarks : 1. RF Voltage (dBμV /m) = 20 log RF Voltage (uV/m)
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

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

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

3.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.249 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground, when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

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

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

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

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

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

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Fundamental Radiated Emission
Test Site : No.3OATS
Test Mode : Mode 1: Transmit

X-Axis

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV /m	Margin dB	Limit dBμV /m
Horizontal					
Peak Detector:					
2405.350	-6.115	91.100	84.984	-29.016	114.000
2441.350	-6.068	90.509	84.441	-29.559	114.000
2477.350	-6.280	87.647	81.367	-32.633	114.000
Average Detector:					
2405.350	-6.115	87.406	81.290	-12.710	94.000
2441.350	-6.068	87.075	81.007	-12.993	94.000
2477.350	-6.280	84.189	77.909	-16.091	94.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit

X-Axis

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Vertical					
Peak Detector:					
2405.350	4.502	86.090	90.591	-23.409	114.000
2441.350	4.521	85.976	90.497	-23.503	114.000
2477.350	4.280	85.149	89.429	-24.571	114.000
Average					
Detector:					
2405.350	4.502	82.687	87.188	-6.812	94.000
2441.350	4.521	82.594	87.115	-6.885	94.000
2477.350	4.280	81.738	86.018	-7.982	94.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit

Y-Axis

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Horizontal					
Peak Detector:					
2405.350	-6.115	89.471	83.355	-30.645	114.000
2441.350	-6.068	88.916	82.848	-31.152	114.000
2477.350	-6.280	89.279	82.999	-31.001	114.000
Average					
Detector:					
2405.350	-6.115	85.594	79.478	-14.522	94.000
2441.350	-6.068	84.673	78.605	-15.395	94.000
2477.350	-6.280	85.312	79.032	-14.968	94.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit

Y-Axis

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Vertical					
Peak Detector:					
2405.350	4.502	85.987	90.488	-23.512	114.000
2441.350	4.521	89.067	93.588	-20.412	114.000
2477.350	4.280	86.340	90.620	-23.380	114.000
Average					
Detector:					
2405.350	4.502	82.314	86.815	-7.185	94.000
2441.350	4.521	85.105	89.626	-4.374	94.000
2477.350	4.280	82.947	87.227	-6.773	94.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Fundamental Radiated Emission
Test Site : No.3OATS
Test Mode : Mode 1: Transmit

Z-Axis

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Horizontal					
Peak Detector:					
2405.350	-6.115	87.159	81.043	-32.957	114.000
2441.350	-6.068	86.092	80.024	-33.976	114.000
2477.350	-6.280	83.730	77.450	-36.550	114.000
Average					
Detector:					
2405.350	-6.115	83.628	77.512	-16.488	94.000
2441.350	-6.068	82.717	76.649	-17.351	94.000
2477.350	-6.280	79.549	73.269	-20.731	94.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Fundamental Radiated Emission
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit

Z-Axis

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Vertical					
Peak Detector:					
2405.350	4.502	85.413	89.914	-24.086	114.000
2441.350	4.521	85.436	89.957	-24.043	114.000
2477.350	4.280	83.935	88.215	-25.785	114.000
Average					
Detector:					
2405.350	4.502	82.386	86.887	-7.113	94.000
2441.350	4.521	82.374	86.895	-7.105	94.000
2477.350	4.280	82.288	86.568	-7.432	94.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Horizontal					
Peak Detector:					
4810.700	3.319	36.630	39.950	-34.050	74.000
7216.050	10.308	32.780	43.088	-30.912	74.000
9621.400	13.583	33.020	46.603	-27.397	74.000
Average Detector:					
--					54.000
Vertical					
Peak Detector:					
4810.700	6.583	35.530	42.113	-31.887	74.000
7216.050	11.169	33.050	44.219	-29.781	74.000
9621.400	14.004	33.410	47.414	-26.586	74.000
Average Detector:					
--					54.000

Note:

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

Product : ROG Strix Wireless 2.4GHz Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBμV	dBμV /m	dB	dBμV /m
Horizontal					
Peak Detector:					
4882.700	2.999	37.000	39.998	-34.002	74.000
7324.050	11.851	33.580	45.431	-28.569	74.000
9765.400	12.556	32.850	45.406	-28.594	74.000
Average Detector:					
--					54.000
Vertical					
Peak Detector:					
4882.700	5.706	36.450	42.155	-31.845	74.000
7324.050	12.736	33.830	46.567	-27.433	74.000
9765.400	13.019	33.070	46.089	-27.911	74.000
Average Detector:					
--					54.000

Note:

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

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2477.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Horizontal					
Peak Detector:					
4954.700	2.775	36.110	38.885	-35.115	74.000
7432.050	12.492	34.310	46.801	-27.199	74.000
9909.400	13.396	34.560	47.957	-26.043	74.000
Average Detector:					
--					54.000
Vertical					
Peak Detector:					
4954.700	5.552	36.710	42.262	-31.738	74.000
7432.050	13.415	34.350	47.764	-26.236	74.000
9909.400	13.966	33.910	47.877	-26.123	74.000
Average Detector:					
--					54.000

Note:

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

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2441.35MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dB μ V	dB μ V /m	dB	dB μ V /m
Horizontal					
191.667	-10.208	30.927	20.719	-22.781	43.500
371.609	-1.104	21.293	20.189	-25.811	46.000
461.580	1.526	16.329	17.855	-28.145	46.000
596.536	4.016	16.620	20.636	-25.364	46.000
832.710	5.750	18.544	24.295	-21.705	46.000
928.304	6.909	18.271	25.179	-20.821	46.000
Vertical					
119.971	-3.705	26.001	22.296	-21.204	43.500
364.580	-2.168	19.396	17.228	-28.772	46.000
499.536	-0.848	20.575	19.727	-26.273	46.000
692.130	2.343	15.953	18.296	-27.704	46.000
832.710	2.333	22.889	25.223	-20.777	46.000
970.478	7.689	18.059	25.748	-28.252	54.000

Note:

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

4. Band Edge

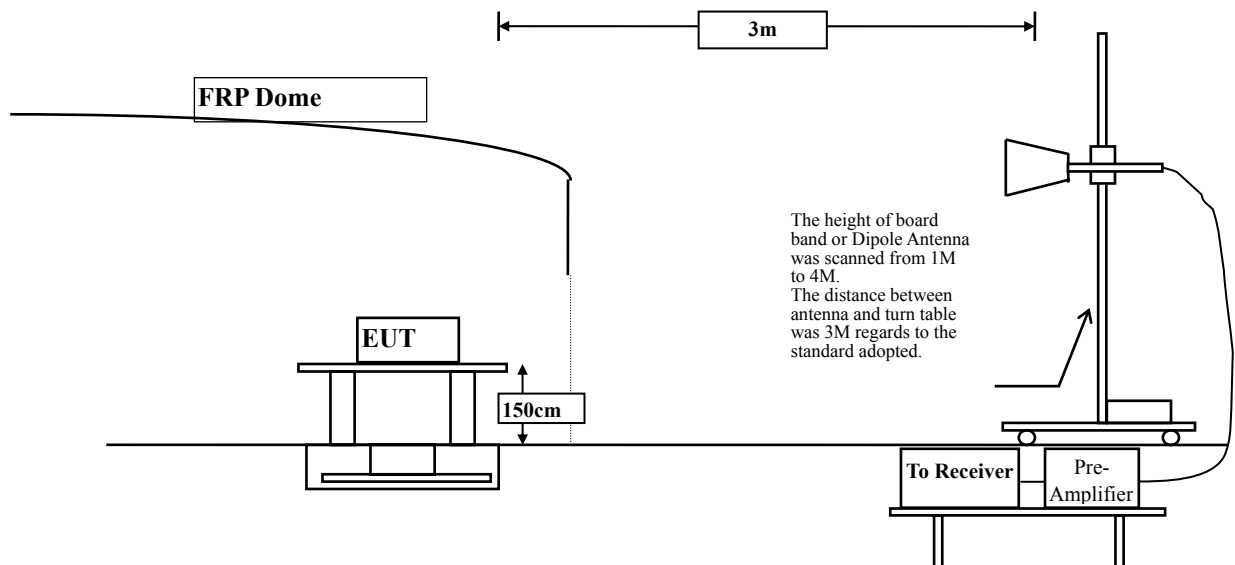
4.1. Test Equipment

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

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ CB # 8	X	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2015
	X	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	X	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan., 2016
	X	Horn Antenna	TRC	AH-0801/95051	Aug., 2015
	X	Pre-Amplifier	EMCI	EMC012630SE/980210	Jan., 2016
	X	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	X	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

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

4.2. Test Setup



4.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 50 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.4. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

4.5. Uncertainty

Conducted is ± 1.27 dB

Radiated is ± 3.9 dB

4.6. Test Result of Band Edge

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2405.35MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
2 (Peak)	2390.000	-6.204	43.274	37.070	74.00	54.00	Pass
2 (Peak)	2400.000	-6.124	47.675	41.550	--	--	--
2 (Peak)	2405.700	-6.116	90.799	84.683	--	--	--
2 (Average)	2390.000	-6.204	30.066	23.862	74.00	54.00	Pass
2 (Average)	2400.000	-6.124	37.075	30.950	--	--	--
2 (Average)	2405.400	-6.116	87.393	81.277	--	--	--

Figure Channel 2: Horizontal (Peak)

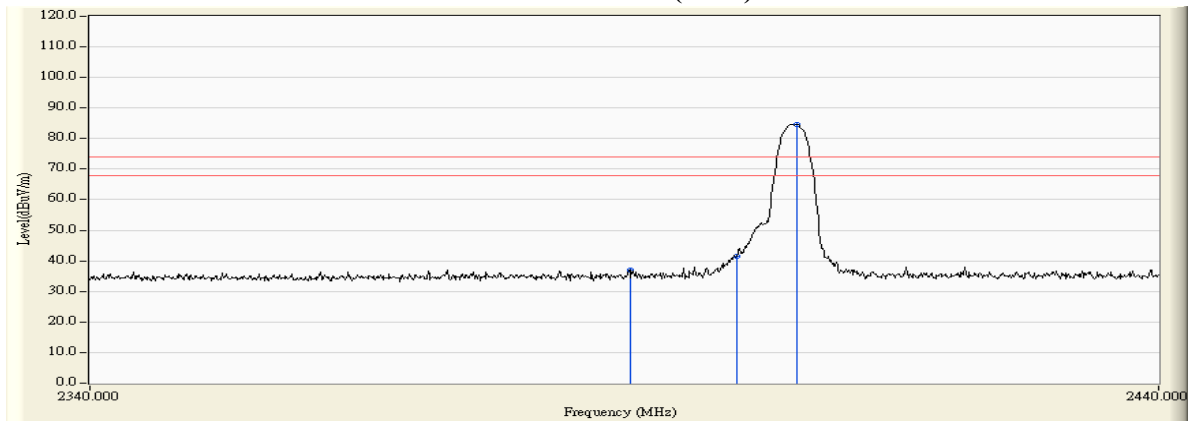
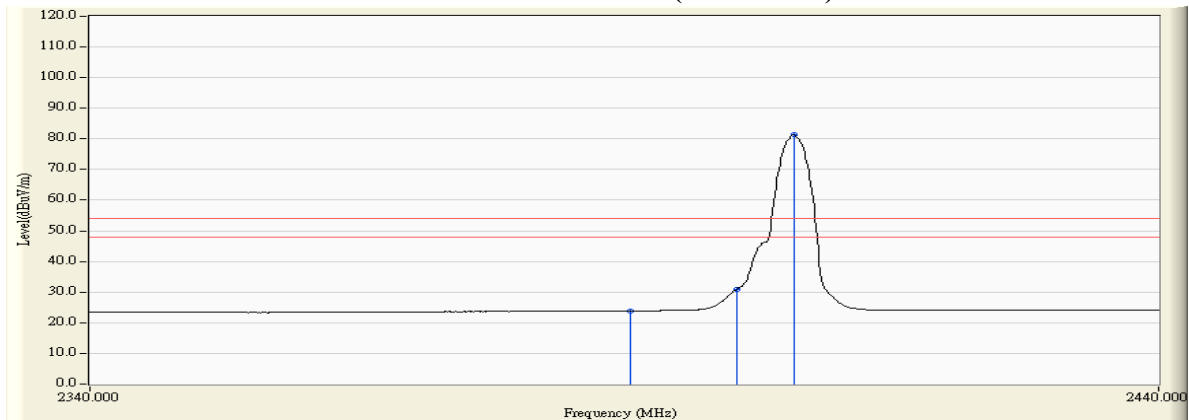


Figure Channel 2: Horizontal (AVERAGE)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2405.35MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dB μ V)	Emission Level (dB μ V /m)	Peak Limit (dB μ V /m)	Average Limit (dB μ V /m)	Result
2 (Peak)	2389.100	4.418	50.774	55.192	74.00	54.00	Pass
2 (Peak)	2390.000	4.426	46.608	51.034	74.00	54.00	Pass
2 (Peak)	2398.000	4.484	49.793	54.277	--	--	--
2 (Peak)	2400.000	4.497	47.137	51.634	--	--	--
2 (Peak)	2405.600	4.500	86.074	90.575	--	--	--
2 (Average)	2390.000	4.426	30.055	34.481	74.00	54.00	Pass
2 (Average)	2400.000	4.497	33.915	38.412	--	--	--
2 (Average)	2405.400	4.501	82.688	87.189	--	--	--

Figure Channel 2: Vertical (Peak)

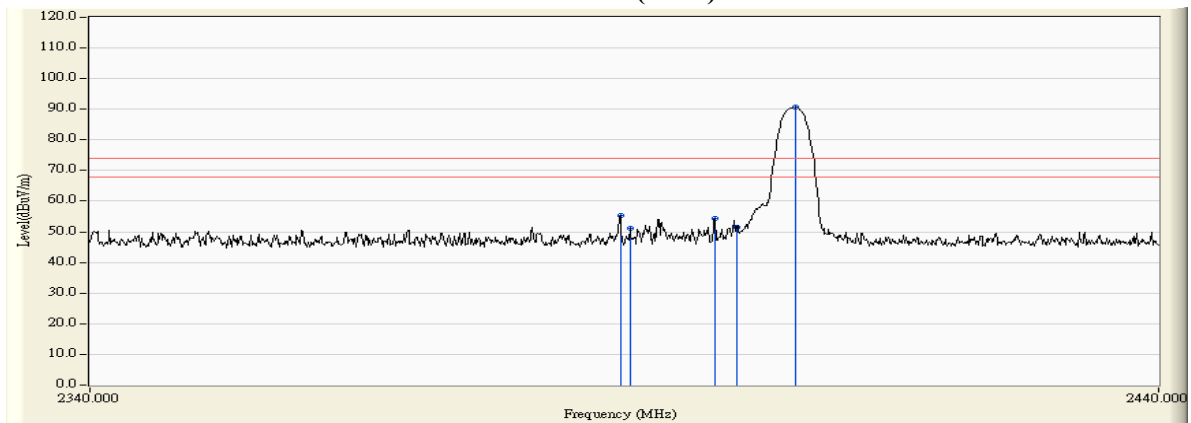
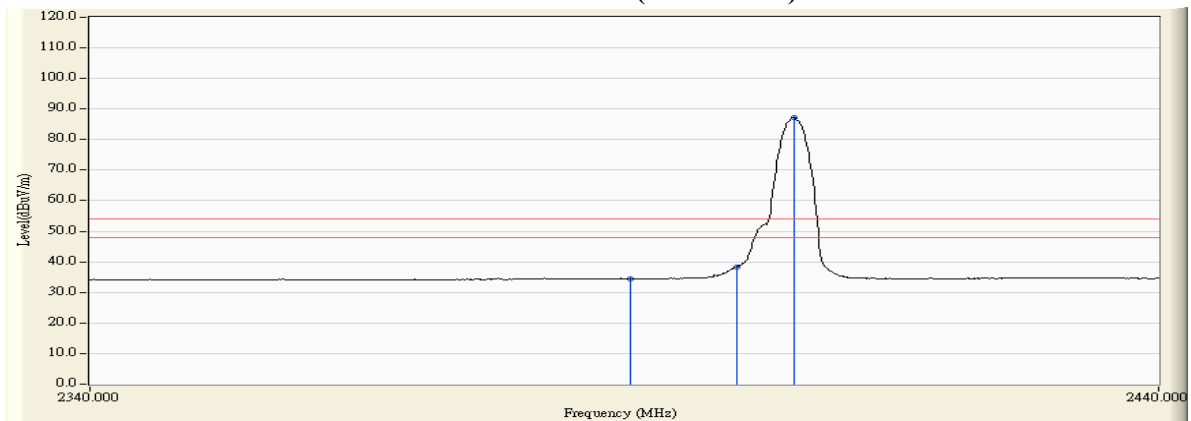


Figure Channel 2: Vertical (AVERAGE)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2477.35MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV /m)	Peak Limit (dBμV /m)	Average Limit (dBμV /m)	Result
38 (Peak)	2477.600	-6.281	87.604	81.324	--	--	--
38 (Peak)	2483.500	-6.296	41.155	34.859	74.00	54.00	Pass
38 (Peak)	2497.600	-6.355	43.737	37.383	74.00	54.00	Pass
38 (Average)	2477.400	-6.281	84.211	77.931	--	--	--
38 (Average)	2483.500	-6.296	30.052	23.756	74.00	54.00	Pass

Figure Channel 38: Horizontal (Peak)

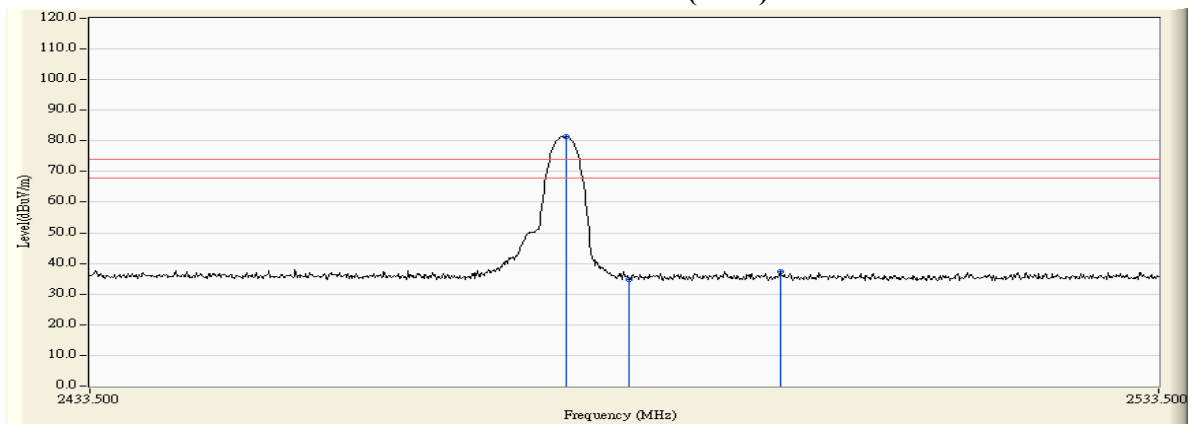
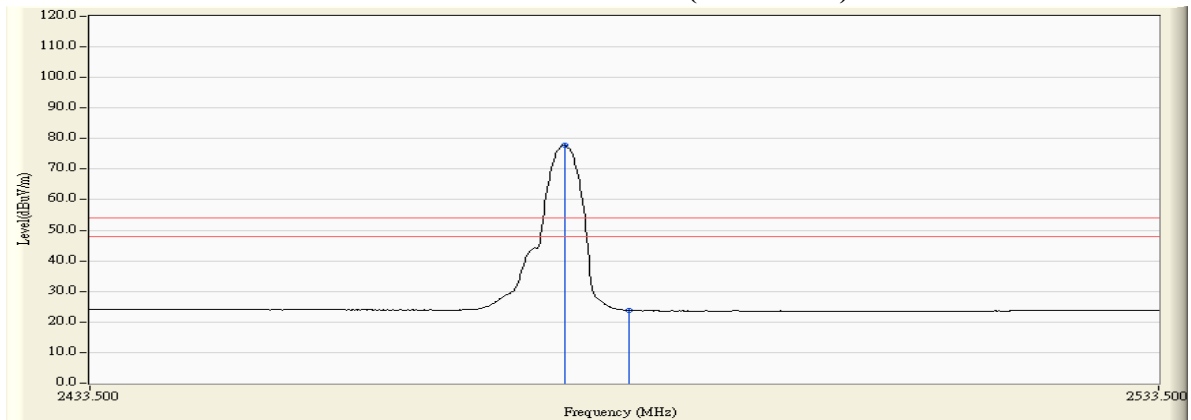


Figure Channel 38: Horizontal (AVERAGE)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.

Product : ROG Strix Wireless 2.4GHz Dongle
Test Item : Band Edge Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2477.35MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV /m)	Peak Limit (dBμV /m)	Average Limit (dBμV /m)	Result
38 (Peak)	2477.700	4.279	85.149	89.428	--	--	--
38 (Peak)	2483.500	4.260	40.712	44.972	74.00	54.00	Pass
38 (Peak)	2501.300	4.194	43.747	47.941	74.00	54.00	Pass
38 (Average)	2477.400	4.280	81.738	86.018	--	--	--
38 (Average)	2483.500	4.260	29.964	34.224	74.00	54.00	Pass

Figure Channel 38: Vertical (Peak)

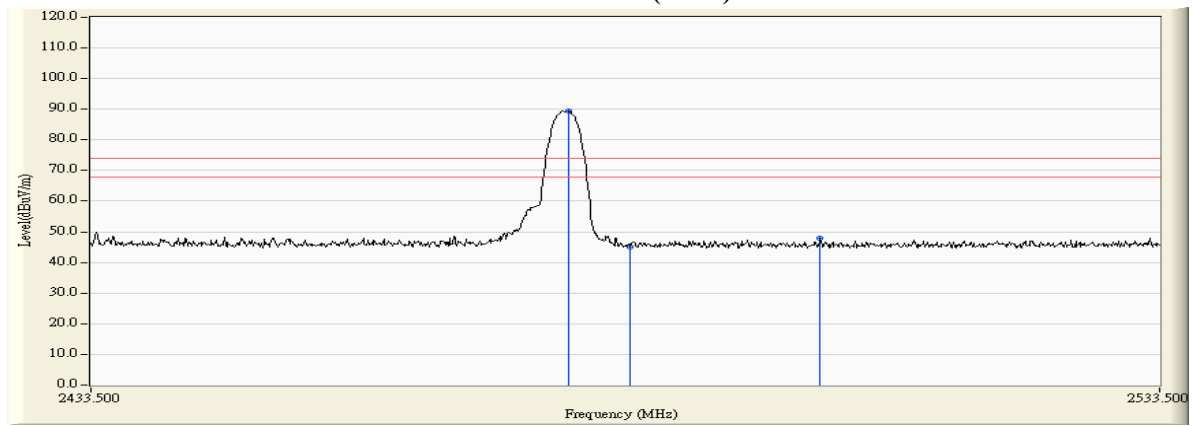
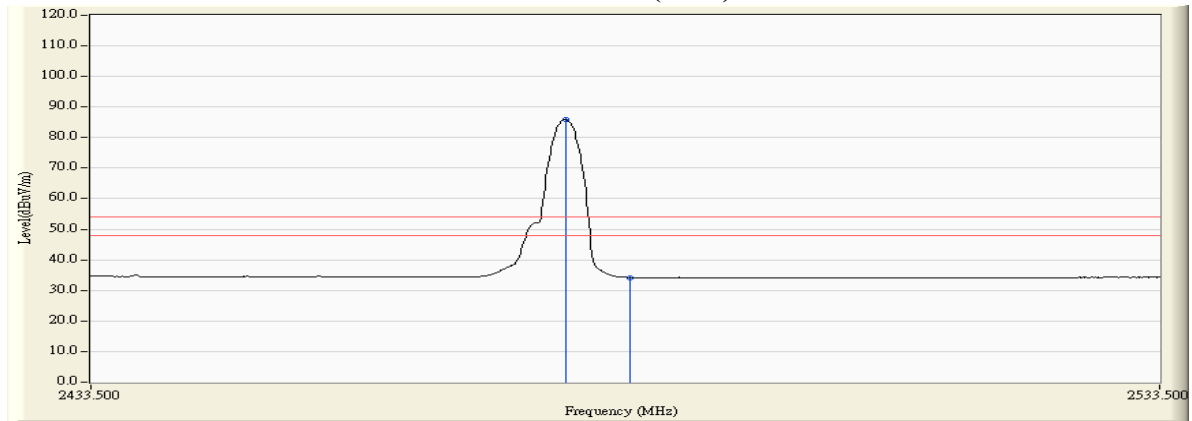


Figure Channel 38: Vertical (Peak)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs