

FCC Test Report

Product Name	ROG Gladius II Wireless Gaming Mouse Dongle
Model No.	P702DONGLE
FCC ID	EMJDP702DONGLE

Applicant	Primax Electronics Ltd
Address	669 Ruey Kuang Road Neihu 114, Taipei, Taiwan

Date of Receipt	Jul. 04, 2018
Issued Date	Aug. 08, 2018
Report No.	1870056R-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: Aug. 08, 2018

Report No.: 1870056R-RFUSP15V00



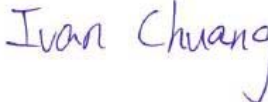
Product Name	ROG Gladius II Wireless Gaming Mouse Dongle
Applicant	Primax Electronics Ltd
Address	669 Ruey Kuang Road Neihu 114, Taipei, Taiwan
Manufacturer	Primax Electronics Ltd
Model No.	P702DONGLE
EUT Rated Voltage	DC 5V (Power by USB)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Joanne Lin)

Tested By :



(Engineer / Ivan Chuang)

Approved By :



(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	ROG Gladius II Wireless Gaming Mouse Dongle
Trade Name	ASUS
Model No.	P702DONGLE
FCC ID	EMJDP702DONGLE
Frequency Range	2402~2479MHz
Channel Number	78CH
Type of Modulation	GFSK
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Primax	51000040520	PIFA	1.46dBi 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 02:	2402 MHz	Channel 22:	2422 MHz	Channel 42:	2442 MHz	Channel 62:	2462 MHz
Channel 03:	2403 MHz	Channel 23:	2423 MHz	Channel 43:	2443 MHz	Channel 63:	2463 MHz
Channel 04:	2404 MHz	Channel 24:	2424 MHz	Channel 44:	2444 MHz	Channel 64:	2464 MHz
Channel 05:	2405 MHz	Channel 25:	2425 MHz	Channel 45:	2445 MHz	Channel 65:	2465 MHz
Channel 06:	2406 MHz	Channel 26:	2426 MHz	Channel 46:	2446 MHz	Channel 66:	2466 MHz
Channel 07:	2407 MHz	Channel 27:	2427 MHz	Channel 47:	2447 MHz	Channel 67:	2467 MHz
Channel 08:	2408 MHz	Channel 28:	2428 MHz	Channel 48:	2448 MHz	Channel 68:	2468 MHz
Channel 09:	2409 MHz	Channel 29:	2429 MHz	Channel 49:	2449 MHz	Channel 69:	2469 MHz
Channel 10:	2410 MHz	Channel 30:	2430 MHz	Channel 50:	2450 MHz	Channel 70:	2470 MHz
Channel 11:	2411 MHz	Channel 31:	2431 MHz	Channel 51:	2451 MHz	Channel 71:	2471 MHz
Channel 12:	2412 MHz	Channel 32:	2432 MHz	Channel 52:	2452 MHz	Channel 72:	2472 MHz
Channel 13:	2413 MHz	Channel 33:	2433 MHz	Channel 53:	2453 MHz	Channel 73:	2473 MHz
Channel 14:	2414 MHz	Channel 34:	2434 MHz	Channel 54:	2454 MHz	Channel 74:	2474 MHz
Channel 15:	2415 MHz	Channel 35:	2435 MHz	Channel 55:	2455 MHz	Channel 75:	2475 MHz
Channel 16:	2416 MHz	Channel 36:	2436 MHz	Channel 56:	2456 MHz	Channel 76:	2476 MHz
Channel 17:	2417 MHz	Channel 37:	2437 MHz	Channel 57:	2457 MHz	Channel 77:	2477 MHz
Channel 18:	2418 MHz	Channel 38:	2438 MHz	Channel 58:	2458 MHz	Channel 78:	2478 MHz
Channel 19:	2419 MHz	Channel 39:	2439 MHz	Channel 59:	2459 MHz	Channel 79:	2479 MHz
Channel 20:	2420 MHz	Channel 40:	2440 MHz	Channel 60:	2460 MHz		
Channel 21:	2421 MHz	Channel 41:	2441 MHz	Channel 61:	2461 MHz		

Note:

1. The EUT is a ROG Gladius II Wireless Gaming Mouse 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. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance of transmitter with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
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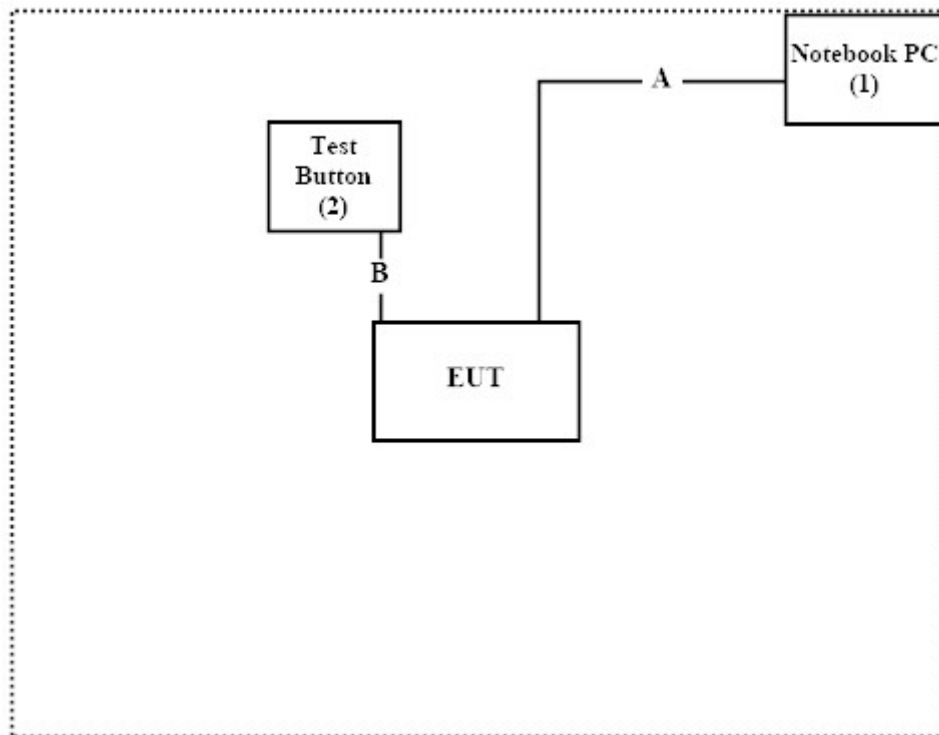
1.3. Tested System Details

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	P62G	229FJC2	N/A
2 Test Button	N/A	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A USB Cable	Non-Shielded, 0.8m
B Signal Cable	Non-Shielded, 0.1m

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Press the test button.
- (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 DEKRA Testing and Certification Co., Ltd. Web Site:

<http://www.dekra.com.tw/english/about/certificates.aspx?bval=5>

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en

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Accredited Number: 3023

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FCC Accreditation Number: TW0023

1.7. List of Test Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	101601	2018.02.08	2019.02.07
X	Two-Line V-Network	R&S	ENV216	101306	2018.03.09	2019.03.08
X	Two-Line V-Network	R&S	ENV216	101307	2018.03.20	2019.03.19
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2018.05.24	2019.05.23

Note:

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

For Conducted measurements /ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103464	2018.01.23	2019.01.22
	Power Meter	Anritsu	ML2496A	1548003	2017.12.11	2018.12.10
	Power Sensor	Anritsu	MA2411B	1531024	2017.12.11	2018.12.10
	Power Sensor	Anritsu	MA2411B	1531025	2017.12.11	2018.12.10
	Bluetooth Tester	R&S	CBT	101238	2018.01.18	2019.01.17

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test System V9.0.1

For Radiated measurements /ACB1

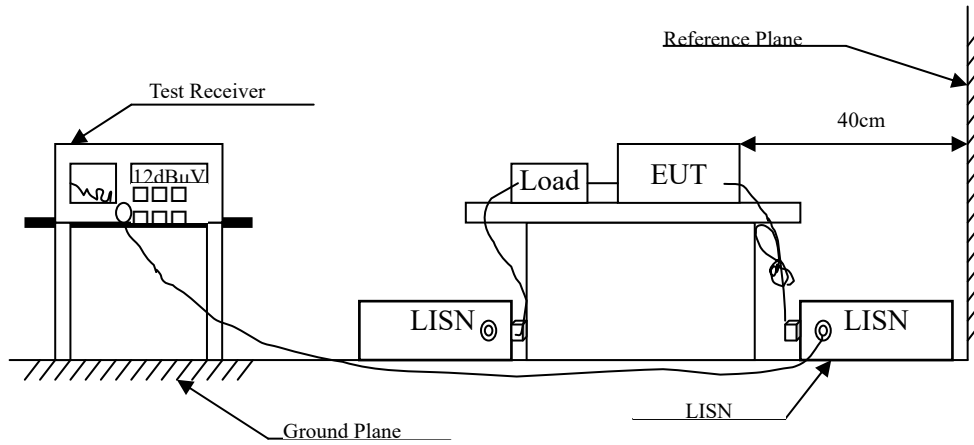
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	AMETEK	HLA6121	49611	2018.01.26	2019.01.25
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2018.04.02	2019.04.01
X	Horn Antenna	ETS-Lindgren	3117	00203800	2017.11.10	2018.11.09
X	Horn Antenna	Com-Power	AH-840	101087	2018.06.01	2019.05.31
X	Pre-Amplifier	EMCI	EMC001330	980316	2018.06.01	2019.05.31
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2018.06.04	2019.06.03
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2018.06.04	2019.06.03
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2018.05.16	2019.05.15
X	Filter	MICRO TRONICS	BRM50702	G251	2017.08.30	2018.08.29
	Filter	MICRO TRONICS	BRM50716	G188	2017.08.30	2018.08.29
X	EMI Test Receiver	R&S	ESR7	101602	2017.12.11	2018.12.10
X	Spectrum Analyzer	R&S	FSV40	101148	2018.02.08	2019.02.07
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2018.05.25	2019.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2018.05.16	2019.05.15

Note:

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

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) 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.

2.3. Test Procedure

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

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

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

2.4. Uncertainty

± 2.35 dB

2.5. Test Result of Conducted Emission

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Date : 2018/07/23
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
Line 1					
Quasi-Peak					
0.152	9.611	31.168	40.778	-25.165	65.943
0.460	9.627	16.027	25.654	-31.489	57.143
1.300	9.650	15.253	24.903	-31.097	56.000
3.200	9.692	13.101	22.793	-33.207	56.000
5.001	9.740	14.710	24.450	-35.550	60.000
17.520	9.958	12.420	22.378	-37.622	60.000
Average					
0.152	9.611	13.608	23.219	-32.724	55.943
0.460	9.627	8.629	18.256	-28.887	47.143
1.300	9.650	9.671	19.321	-26.679	46.000
3.200	9.692	7.347	17.039	-28.961	46.000
5.001	9.740	9.382	19.122	-30.878	50.000
17.520	9.958	2.359	12.317	-37.683	50.000

Note:

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

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Date : 2018/07/23
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
Line 2					
Quasi-Peak					
0.152	9.602	31.316	40.918	-25.025	65.943
0.453	9.619	19.029	28.648	-28.695	57.343
2.200	9.662	12.128	21.790	-34.210	56.000
5.000	9.740	15.125	24.865	-31.135	56.000
14.230	9.907	13.816	23.723	-36.277	60.000
17.400	9.970	13.380	23.350	-36.650	60.000
Average					
0.152	9.602	12.614	22.216	-33.727	55.943
0.453	9.619	12.055	21.674	-25.669	47.343
2.200	9.662	7.040	16.702	-29.298	46.000
5.000	9.740	9.916	19.656	-26.344	46.000
14.230	9.907	7.154	17.061	-32.939	50.000
17.400	9.970	3.163	13.133	-36.867	50.000

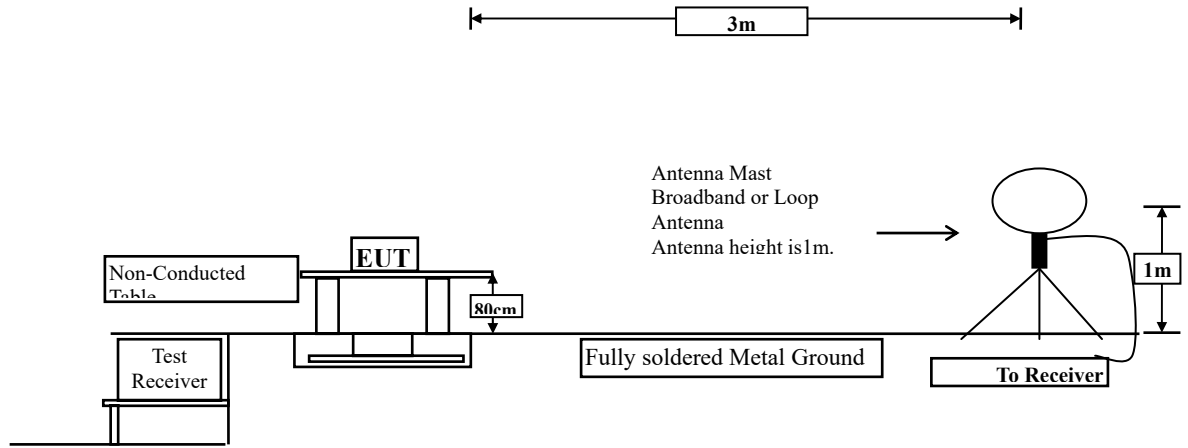
Note:

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

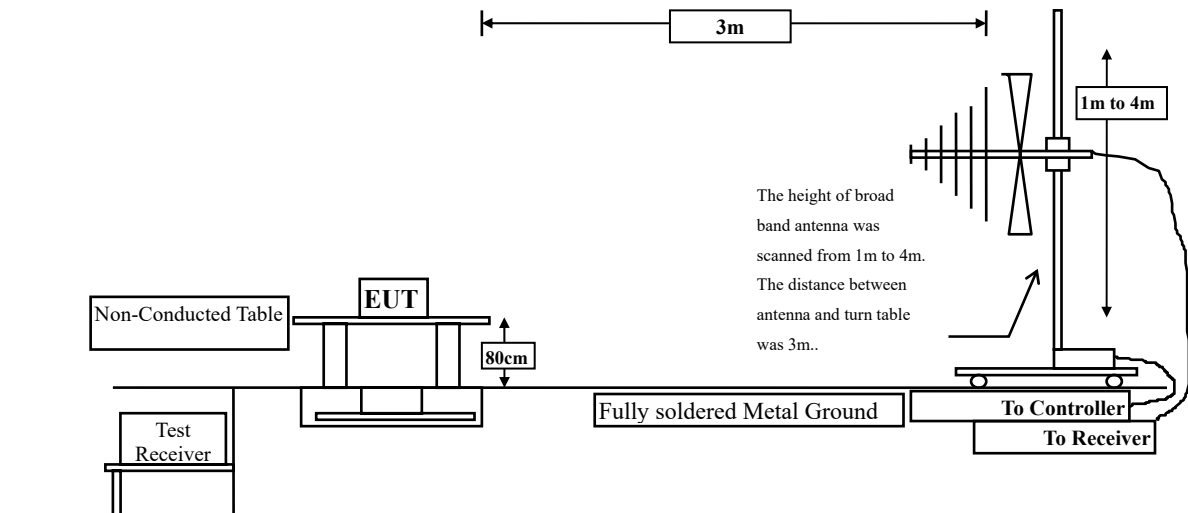
3. Radiated Emission

3.1. Test Setup

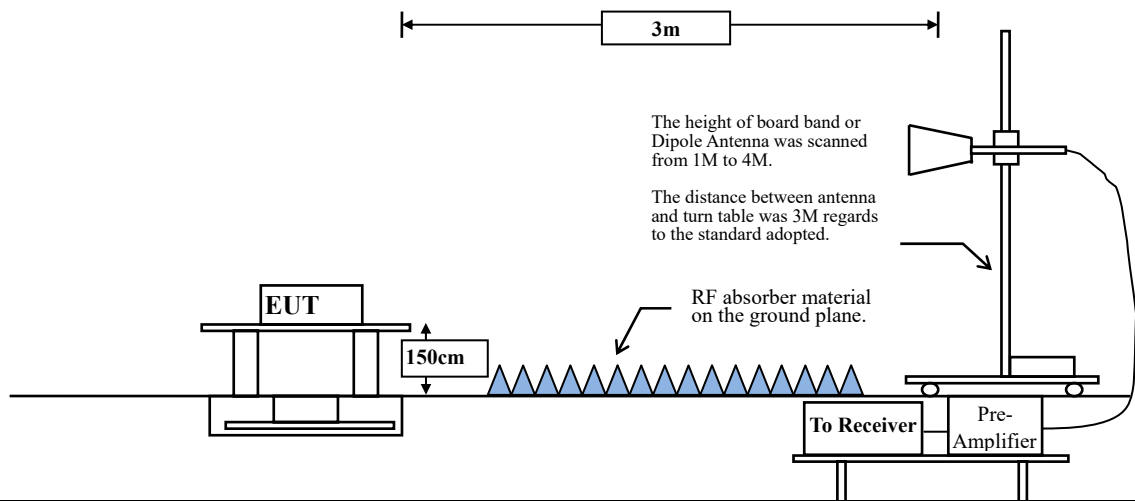
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.2. 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)	(dB μ V /m @3m)	(uV/m @3m)	(dB μ V /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 (dB μ V /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 (dB μ V /m) = 20 log E field strength (uV/m)

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

3.4. Uncertainty

Horizontal :

30-300MHz: ± 4.08 dB ; 300M-1GHz: ± 3.86 dB ; 1-18GHz: ± 3.77 dB ; 18-40GHz: ± 3.98 dB ◦

Vertical :

30-300MHz: ± 4.81 dB ; 300M-1GHz: ± 3.87 dB ; 1-18GHz: ± 3.83 dB ; 18-40GHz: ± 3.98 dB ◦

3.5. Test Result of Radiated Emission

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Fundamental Radiated Emission
 Test Date : 2018/07/13
 Test Mode : Mode 1: Transmit (X-Axis)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
2402.000	-8.907	106.940	98.034	-15.966	114.000
2441.000	-8.761	107.270	98.510	-15.490	114.000
2479.000	-8.620	106.660	98.040	-15.960	114.000
Vertical					
Peak Detector:					
2402.000	-8.907	107.930	99.024	-14.976	114.000
2441.000	-8.761	107.720	98.960	-15.040	114.000
2479.000	-8.620	107.620	99.000	-15.000	114.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Average Detector:					
2402.000	98.034	-24.437	73.597	-20.403	94.000
2441.000	98.510	-24.437	74.073	-19.927	94.000
2479.000	98.040	-24.437	73.603	-20.397	94.000
Vertical					
Average Detector:					
2402.000	99.024	-24.437	74.587	-19.413	94.000
2441.000	98.960	-24.437	74.523	-19.477	94.000
2479.000	99.000	-24.437	74.563	-19.437	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Fundamental Radiated Emission
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (Y-Axis)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Peak Detector:					
2402.000	-8.907	107.930	99.024	-14.976	114.000
2441.000	-8.761	107.660	98.900	-15.100	114.000
2479.000	-8.620	106.620	98.000	-16.000	114.000
Vertical					
Peak Detector:					
2402.000	-8.907	107.830	98.924	-15.076	114.000
2441.000	-8.761	107.410	98.650	-15.350	114.000
2479.000	-8.620	106.620	98.000	-16.000	114.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Average Detector:					
2402.000	99.024	-24.437	74.587	-19.413	94.000
2441.000	98.900	-24.437	74.463	-19.537	94.000
2479.000	98.000	-24.437	73.563	-20.437	94.000
Vertical					
Average Detector:					
2402.000	98.924	-24.437	74.487	-19.513	94.000
2441.000	98.650	-24.437	74.213	-19.787	94.000
2479.000	98.000	-24.437	73.563	-20.437	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Fundamental Radiated Emission
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (Z-Axis)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
2402.000	-8.907	103.660	94.754	-19.246	114.000
2441.000	-8.761	104.780	96.020	-17.980	114.000
2479.000	-8.620	104.510	95.890	-18.110	114.000
Vertical					
Peak Detector:					
2402.000	-8.907	104.720	95.814	-18.186	114.000
2441.000	-8.761	108.060	99.300	-14.700	114.000
2479.000	-8.620	105.900	97.280	-16.720	114.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Average Detector:					
2402.000	94.754	-24.437	70.317	-23.683	94.000
2441.000	96.020	-24.437	71.583	-22.417	94.000
2479.000	95.890	-24.437	71.453	-22.547	94.000
Vertical					
Average Detector:					
2402.000	95.814	-24.437	71.377	-22.623	94.000
2441.000	99.300	-24.437	74.863	-19.137	94.000
2479.000	97.280	-24.437	72.843	-21.157	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2402MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Peak Detector:					
4804.000	-6.081	55.370	49.289	-24.711	74.000
7206.000	-3.033	48.150	45.117	-28.883	74.000
9608.000	-0.774	46.190	45.417	-28.583	74.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Average Detector:					
--					54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2402MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Vertical					
Peak Detector:					
4804.000	-6.081	57.110	51.029	-22.971	74.000
7206.000	-3.033	48.740	45.707	-28.293	74.000
9608.000	-0.774	46.220	45.447	-28.553	74.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Vertical					
Average Detector:					
--					54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor Db	Reading Level dB μ V	Measurement Level dB μ V /m	Margin Db	Limit dB μ V /m
Horizontal					
Peak Detector:					
4882.000	-6.042	53.530	47.488	-26.512	74.000
7323.000	-2.954	47.720	44.766	-29.234	74.000
9764.000	-0.487	47.070	46.583	-27.417	74.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Average Detector:					
--					54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor Db	Reading Level dB μ V	Measurement Level dB μ V /m	Margin Db	Limit dB μ V /m
Vertical					
Peak Detector:					
4882.000	-6.042	54.880	48.838	-25.162	74.000
7323.000	-2.954	48.070	45.116	-28.884	74.000
9764.000	-0.487	46.580	46.093	-27.907	74.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Vertical					
Average Detector:					
--					54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2479MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Peak Detector:					
4958.000	-6.041	53.060	47.019	-26.981	74.000
7437.000	-2.813	47.030	44.217	-29.783	74.000
9916.000	-0.278	45.470	45.192	-28.808	74.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
Average Detector:					
--					54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Harmonic Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2479MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Vertical					
Peak Detector:					
4958.000	-6.041	51.830	45.789	-28.211	74.000
7437.000	-2.813	47.720	44.907	-29.093	74.000
9916.000	-0.278	45.350	45.072	-28.928	74.000

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Frequency MHz	Peak Measurement dB μ V /m	Duty Cycle Correct Factor dB	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Vertical					
Average Detector:					
--					54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : General Radiated Emission Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V /m	Margin dB	Limit dB μ V /m
Horizontal					
119.971	-13.432	42.368	28.936	-14.564	43.500
375.826	-8.591	34.645	26.054	-19.946	46.000
498.130	-5.984	32.884	26.901	-19.099	46.000
690.725	-3.122	31.041	27.919	-18.081	46.000
807.406	-1.541	31.424	29.883	-16.117	46.000
991.565	0.897	30.938	31.835	-22.165	54.000
Vertical					
55.304	-11.572	41.705	30.133	-9.867	40.000
119.971	-13.432	42.643	29.211	-14.289	43.500
429.246	-7.309	30.917	23.608	-22.392	46.000
614.812	-3.915	31.090	27.176	-18.824	46.000
789.130	-1.740	31.639	29.898	-16.102	46.000
977.507	0.714	31.061	31.775	-22.225	54.000

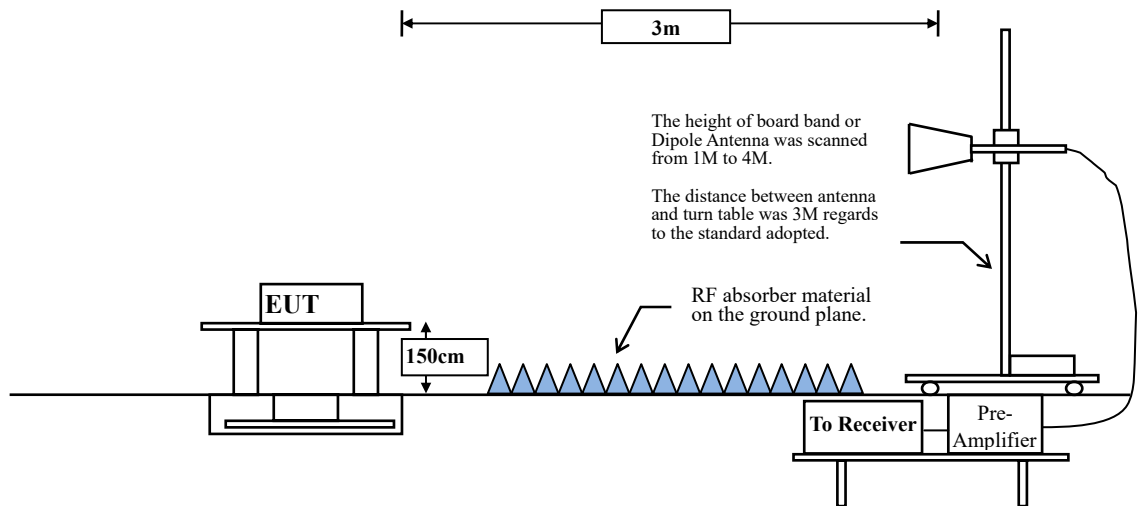
Note:

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. Measurement Level = Reading Level + Correct Factor.
4. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
5. The average measurement was not performed when the peak measured data under the limit of average detection.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.
7. No emission found between lowest internal used/generated frequency to 30MHz.

4. Band Edge

4.1. Test Setup

RF Radiated Measurement:



4.2. 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)

4.3. 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.

4.4. Uncertainty

Horizontal polarization : 1-18GHz: ± 3.77 dB

Vertical polarization : 1-18GHz : ± 3.83 dB

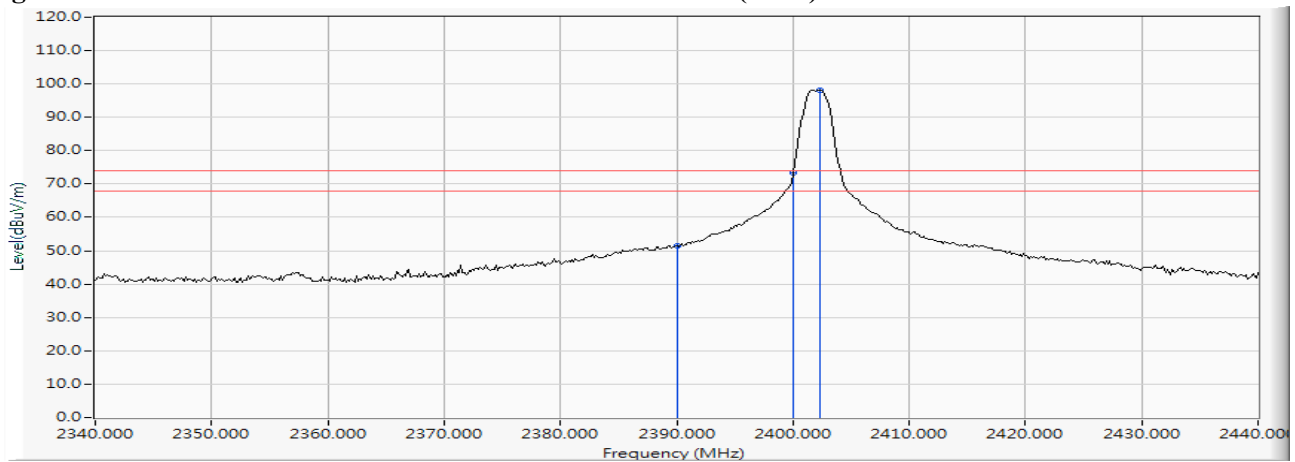
4.5. Test Result of Band Edge

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Band Edge Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2402MHz)

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
02 (Peak)	2390.000	10.841	40.572	51.413	74.00	54.00	Pass
02 (Peak)	2400.000	10.884	62.467	73.351	74.00	54.00	Pass
02 (Peak)	2402.319	10.893	87.177	98.070	--	--	--

Figure Channel 02: Horizontal (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. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
02 (Average)	2390.000	51.413	-24.437	26.976	74.00	54.00	Pass
02 (Average)	2400.000	73.351	-24.437	48.914	74.00	54.00	Pass

Note:

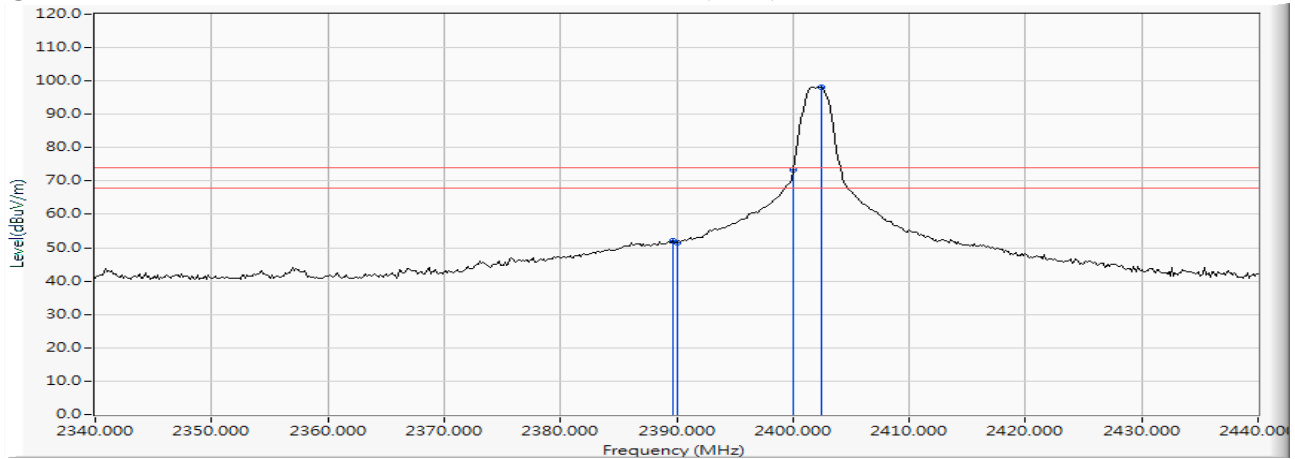
1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Band Edge Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2402MHz)

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
02 (Peak)	2389.710	10.840	41.161	52.001	74.00	54.00	Pass
02 (Peak)	2390.000	10.841	40.702	51.543	74.00	54.00	Pass
02 (Peak)	2400.000	10.884	62.440	73.324	74.00	54.00	Pass
02 (Peak)	2402.464	10.894	87.177	98.071	--	--	--

Figure Channel 02: 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. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
02 (Average)	2389.710	52.001	-24.437	27.564	74.00	54.00	Pass
02 (Average)	2390.000	51.543	-24.437	27.106	74.00	54.00	Pass
02 (Average)	2400.000	73.324	-24.437	48.887	74.00	54.00	Pass

Note:

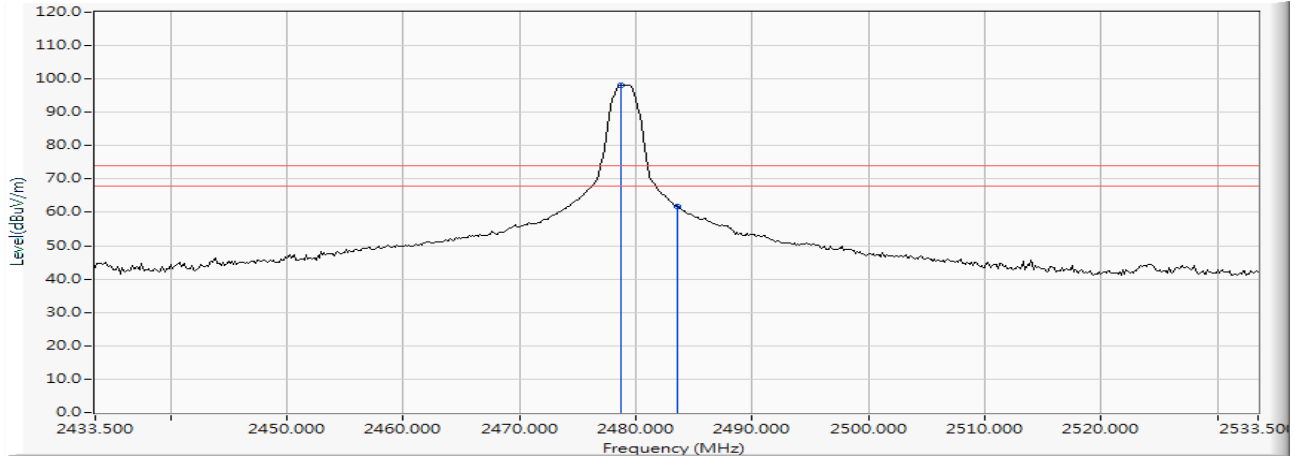
1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Band Edge Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2479MHz)

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
79 (Peak)	2478.717	11.210	86.950	98.161	--	--	--
79 (Peak)	2483.500	11.229	50.432	61.662	74.00	54.00	Pass

Figure Channel 79: Horizontal (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. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
79 (Average)	2483.500	61.662	-24.437	37.225	74.00	54.00	Pass

Note:

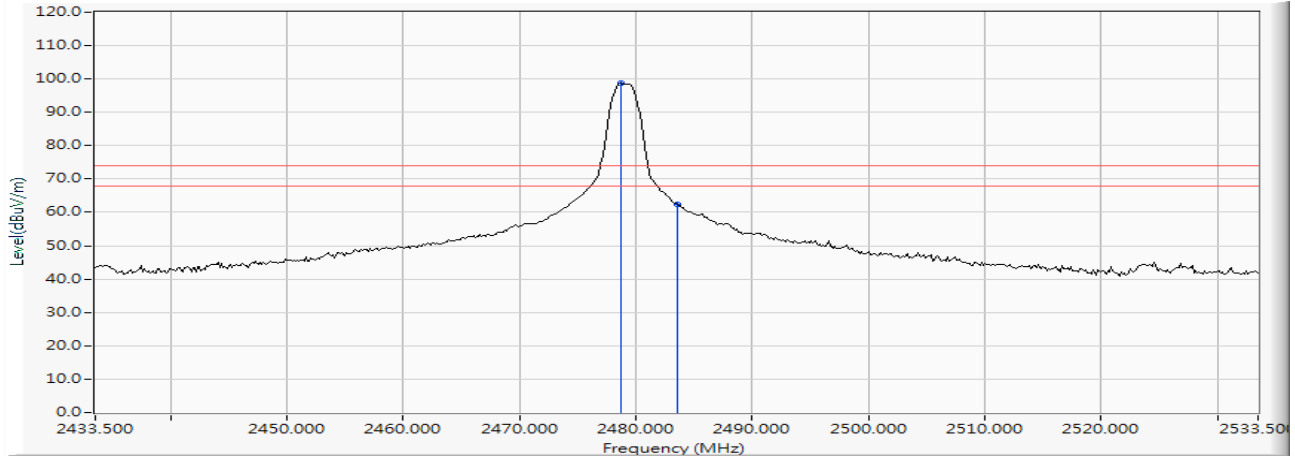
1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Band Edge Data
 Test Date : 2018/07/14
 Test Mode : Mode 1: Transmit (2479MHz)

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
79 (Peak)	2478.717	11.210	87.427	98.638	--	--	--
79 (Peak)	2483.500	11.229	51.177	62.407	74.00	54.00	Pass

Figure Channel 79: 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. Measurement Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

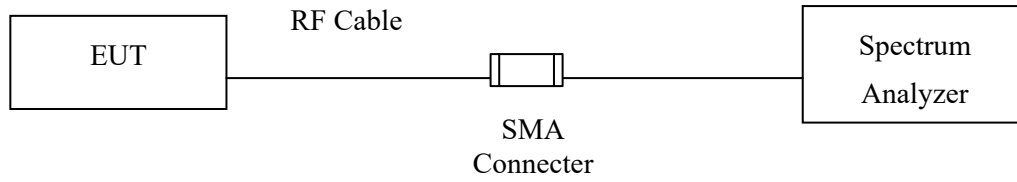
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
79 (Average)	2483.500	62.407	-24.437	37.970	74.00	54.00	Pass

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 5.

5. Duty Cycle

5.1. Test Setup

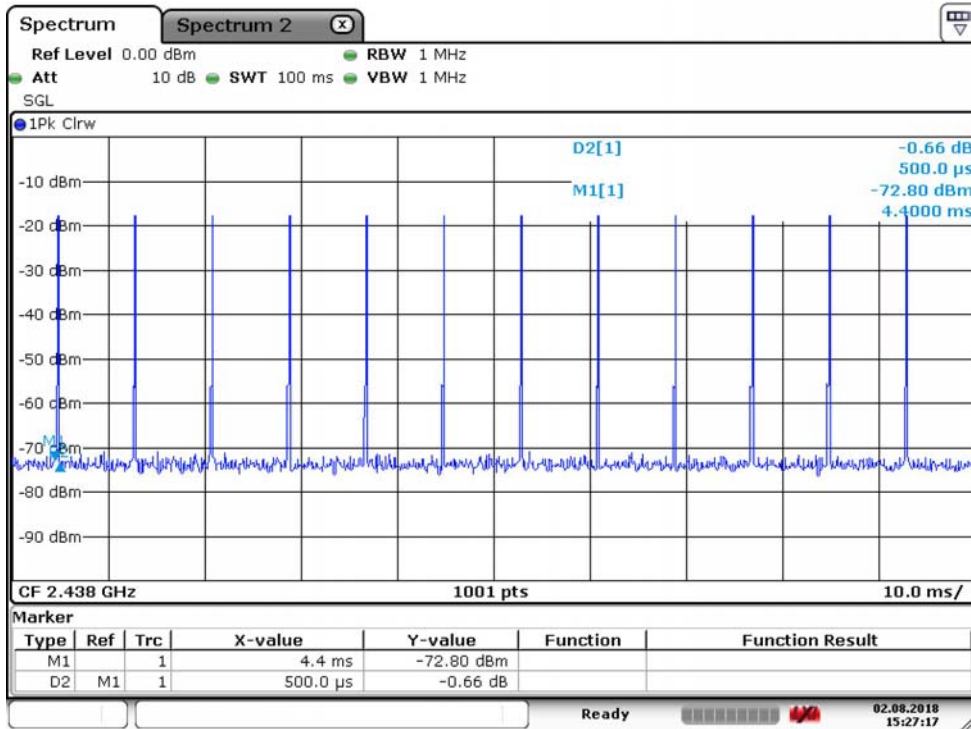


5.2. Uncertainty

$\pm 2.31\text{ms}$

5.3. Test Result of Duty Cycle

Product : ROG Gladius II Wireless Gaming Mouse Dongle
 Test Item : Duty Cycle Data
 Test Mode : Normal mode



Time on of 100ms= 500us*12= 6ms

Duty Cycle=6ms / 100ms= 0.06

Duty Cycle correction factor= 20 LOG 0.06= -24.437 dB

Duty Cycle correction factor	-24.437	dB
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6. EMI Reduction Method During Compliance Testing

No modification was made during testing.