

FCC Test Report

Product Name	ROG DELTA S WIRELESS DONGLE
Model No.	ROG DELTA S WIRELESS DONGLE
FCC ID	2AD8P-RDSWLDG

Applicant	Dongguan Laccess Electronic Technology Co., Ltd.
Address	No 20 Xiang Yang Road, Tianxin, Qiaotou Town, Dongguan, Guangdong, China

Date of Receipt	Jan. 25, 2022
Issued Date	Apr. 08, 2022
Report No.	2210781R-RFUSOTHV06-A
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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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: Apr. 08, 2022

Report No.: 2210781R-RFUSOTHV06-A



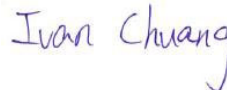
Product Name	ROG DELTA S WIRELESS DONGLE
Applicant	Dongguan Laccess Electronic Technology Co., Ltd.
Address	No 20 Xiang Yang Road, Tianxin, Qiaotou Town, Dongguan, Guangdong, China
Manufacturer	Dongguan Laccess Electronic Technology Co., Ltd.
Model No.	ROG DELTA S WIRELESS DONGLE
FCC ID	2AD8P-RDSWLDG
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 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Senior Project Specialist / Genie Chang)

Tested By :



(Senior Engineer / Ivan Chuang)

Approved By :



(Senior Engineer / Alan Chen)

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Appendix 1: EUT Test Photographs

Appendix 2: Product Photos-Please refer to the file: 2210781R-Product Photos

Revision History

Report No.	Version	Description	Issued Date
2210781R-RFUSOTHV06-A	V1.0	Initial issue of report.	2022-04-08

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	ROG DELTA S WIRELESS DONGLE
Trade Name	ASUS
Model No.	ROG DELTA S WIRELESS DONGLE
FCC ID	2AD8P-RDSWLDG
Frequency Range	2403-2479MHz
Channel Number	77CH
Type of Modulation	GFSK
Antenna Type	Chip Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Unictron	H2U38D1E1B0100	Chip Antenna	-0.2dBi for 2.4GHz

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 01:	2403 MHz	Channel 21: 2423 MHz	Channel 41: 2443 MHz	Channel 61: 2463 MHz			
Channel 02:	2404 MHz	Channel 22: 2424 MHz	Channel 42: 2444 MHz	Channel 62: 2464 MHz			
Channel 03:	2405 MHz	Channel 23: 2425 MHz	Channel 43: 2445 MHz	Channel 63: 2465 MHz			
Channel 04:	2406 MHz	Channel 24: 2426 MHz	Channel 44: 2446 MHz	Channel 64: 2466 MHz			
Channel 05:	2407 MHz	Channel 25: 2427 MHz	Channel 45: 2447 MHz	Channel 65: 2467 MHz			
Channel 06:	2408 MHz	Channel 26: 2428 MHz	Channel 46: 2448 MHz	Channel 66: 2468 MHz			
Channel 07:	2409 MHz	Channel 27: 2429 MHz	Channel 47: 2449 MHz	Channel 67: 2469 MHz			
Channel 08:	2410 MHz	Channel 28: 2430 MHz	Channel 48: 2450 MHz	Channel 68: 2470 MHz			
Channel 09:	2411 MHz	Channel 29: 2431 MHz	Channel 49: 2451 MHz	Channel 69: 2471 MHz			
Channel 10:	2412 MHz	Channel 30: 2432 MHz	Channel 50: 2452 MHz	Channel 70: 2472 MHz			
Channel 11:	2413 MHz	Channel 31: 2433 MHz	Channel 51: 2453 MHz	Channel 71: 2473 MHz			
Channel 12:	2414 MHz	Channel 32: 2434 MHz	Channel 52: 2454 MHz	Channel 72: 2474 MHz			
Channel 13:	2415 MHz	Channel 33: 2435 MHz	Channel 53: 2455 MHz	Channel 73: 2475 MHz			
Channel 14:	2416 MHz	Channel 34: 2436 MHz	Channel 54: 2456 MHz	Channel 74: 2476 MHz			
Channel 15:	2417 MHz	Channel 35: 2437 MHz	Channel 55: 2457 MHz	Channel 75: 2477 MHz			
Channel 16:	2418 MHz	Channel 36: 2438 MHz	Channel 56: 2458 MHz	Channel 76: 2478 MHz			
Channel 17:	2419 MHz	Channel 37: 2439 MHz	Channel 57: 2459 MHz	Channel 77: 2479 MHz			
Channel 18:	2420 MHz	Channel 38: 2440 MHz	Channel 58: 2460 MHz				
Channel 19:	2421 MHz	Channel 39: 2441 MHz	Channel 59: 2461 MHz				
Channel 20:	2422 MHz	Channel 40: 2442 MHz	Channel 60: 2462 MHz				

Note:

1. The EUT is a ROG DELTA S WIRELESS DONGLE with a built-in 2.4G 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. 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.

Test Mode	Mode 1: Transmit
	Mode 2: Normal mode

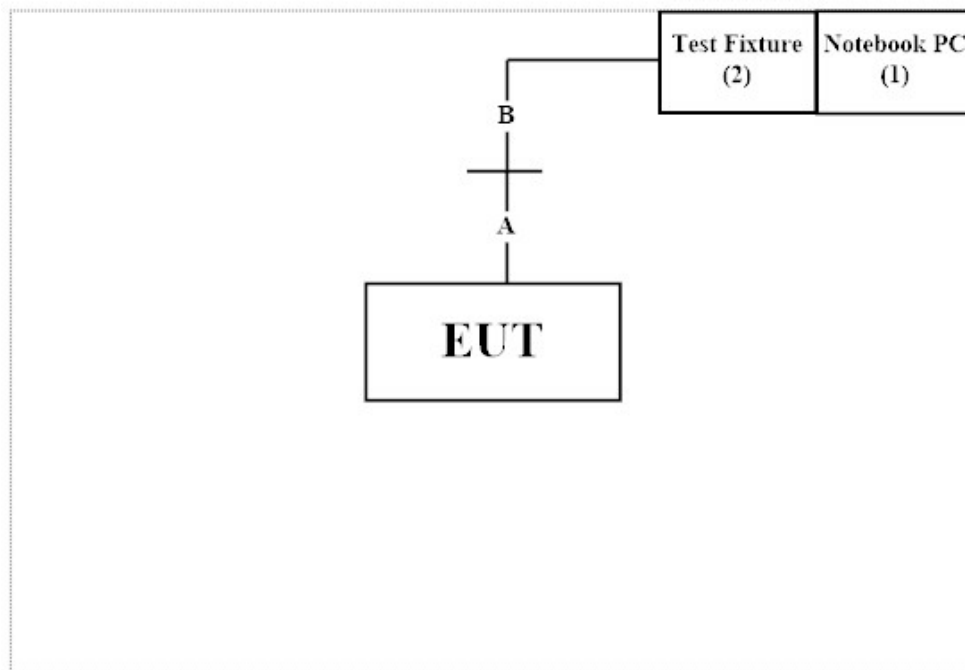
1.2. Tested System Details

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	Lenovo	TP00067C	PF-0EW26J	N/A
2	Test Fixture	JOY-IT	USB TO TTL	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Non-shielded, 1.8m
B	Signal Cable	Non-shielded, 0.1m

1.3. Configuration of Test System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.3.
- (2) Execute software "AppoTech RF Control Kit Version: 4.2.37" on the Notebook PC.
- (3) Configure the test mode and the test channel
- (4) Start the continuous transmit.
- (5) Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	21.5 °C
	Humidity (%RH)	10~90 %	60.9 %
Radiated Emission	Temperature (°C)	10~40 °C	23 °C
	Humidity (%RH)	10~90 %	62 %
Conductive	Temperature (°C)	10~40 °C	20.1°C
	Humidity (%RH)	10~90 %	65%

USA : FCC Registration Number: TW0033

Canada : CAB Identifier Number: TW3023 / Company Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 5-22, Ruishukeng Linkou District, New Taipei City,
24451, Taiwan

Performed Location : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City
333411, Taiwan, R.O.C.

Phone number : +886-3-275-7255
Fax number : +866-3-327-8031
Email address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

1.6. List of Test Equipment

For Conduction measurements / SH1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	EMI Test Receiver	R&S	ESR7	101601	2021/06/19	2022/06/18
X	Two-Line V-Network	R&S	ENV216	101306	2021/04/08	2022/04/07
X	Two-Line V-Network	R&S	ENV216	101307	2021/05/04	2022/05/03
X	Coaxial Cable	DEKRA	RG400_BNC	RF001	2021/05/24	2022/05/23

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 : AUDIX e3 V9.

For Conducted measurements / SH2

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Spectrum Analyzer	R&S	FSV30	103466	2021/12/27	2022/12/26
X	Peak Power Analyzer	KEYSIGHT	8900B	MY51000539	2021/06/07	2022/06/06
X	Power Sensor	KEYSIGHT	N1923A	MY59240002	2021/05/17	2022/05/16
X	Power Sensor	KEYSIGHT	N1923A	MY59240003	2021/05/17	2022/05/16

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 V9.0.5.

For Radiated measurements / 966-1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
	Loop Antenna	AMETEK	HLA6121	56736	2021/04/14	2022/04/13
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2021/08/11	2022/08/10
X	Horn Antenna	ETS-Lindgren	3117	00201259	2021/11/09	2022/11/08
X	Horn Antenna	Com-Power	AH-1840	101101	2021/11/30	2022/11/29
X	Pre-Amplifier	SGH	0301	20211007-7	2022/02/22	2023/02/21
X	Pre-Amplifier	EMCI	EMC051835SE	980312	2022/02/22	2023/02/21
X	Pre-Amplifier	EMCI	EMC05820SE	980362	2021/08/24	2022/08/23
	Pre-Amplifier	EMCI	EMC184045SE	980369		
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314	2021/04/27	2022/04/26
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
X	Filter	MICRO TRONICS	BRM50702	G251	2021/09/16	2022/09/15
	Filter	MICRO TRONICS	BRM50716	G188	2021/09/16	2022/09/15
X	EMI Test Receiver	R&S	ESR3	102792	2021/12/15	2022/12/14
X	Spectrum Analyzer	R&S	FSV3044	101115	2022/01/10	2023/01/09
X	Coaxial Cable	SUHNER	SUCOFLEX 106	25450/6	2022/03/05	2023/03/04
	Coaxial Cable	SGH	HA800	GD20110222-8		
	Coaxial Cable	SGH	SGH18	2021003-8		
	Coaxial Cable	EMCI	EMC106	151113		

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 : AUDIX e3 V9.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

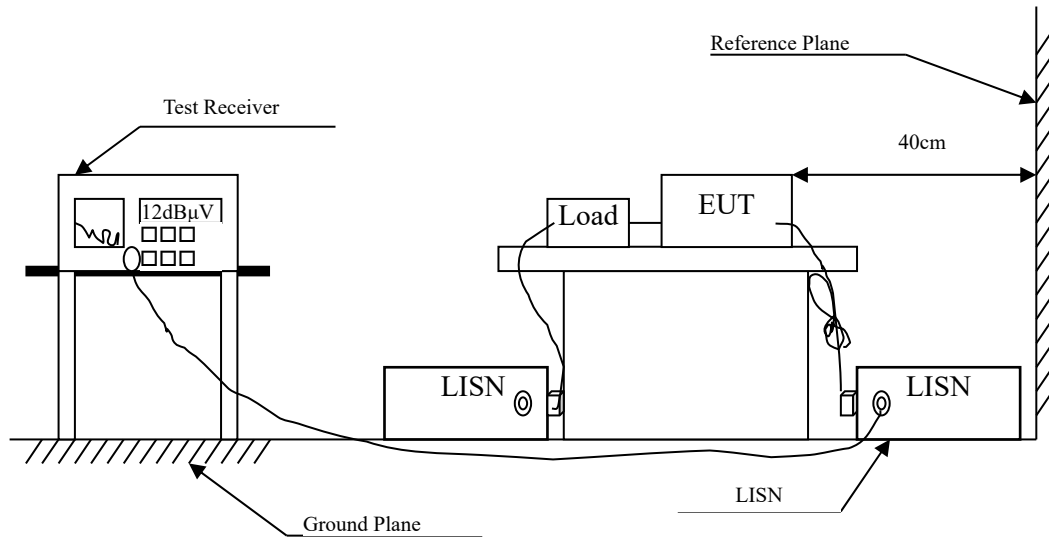
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB
Band Edge	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB
Duty Cycle	± 2.31 ms	

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.

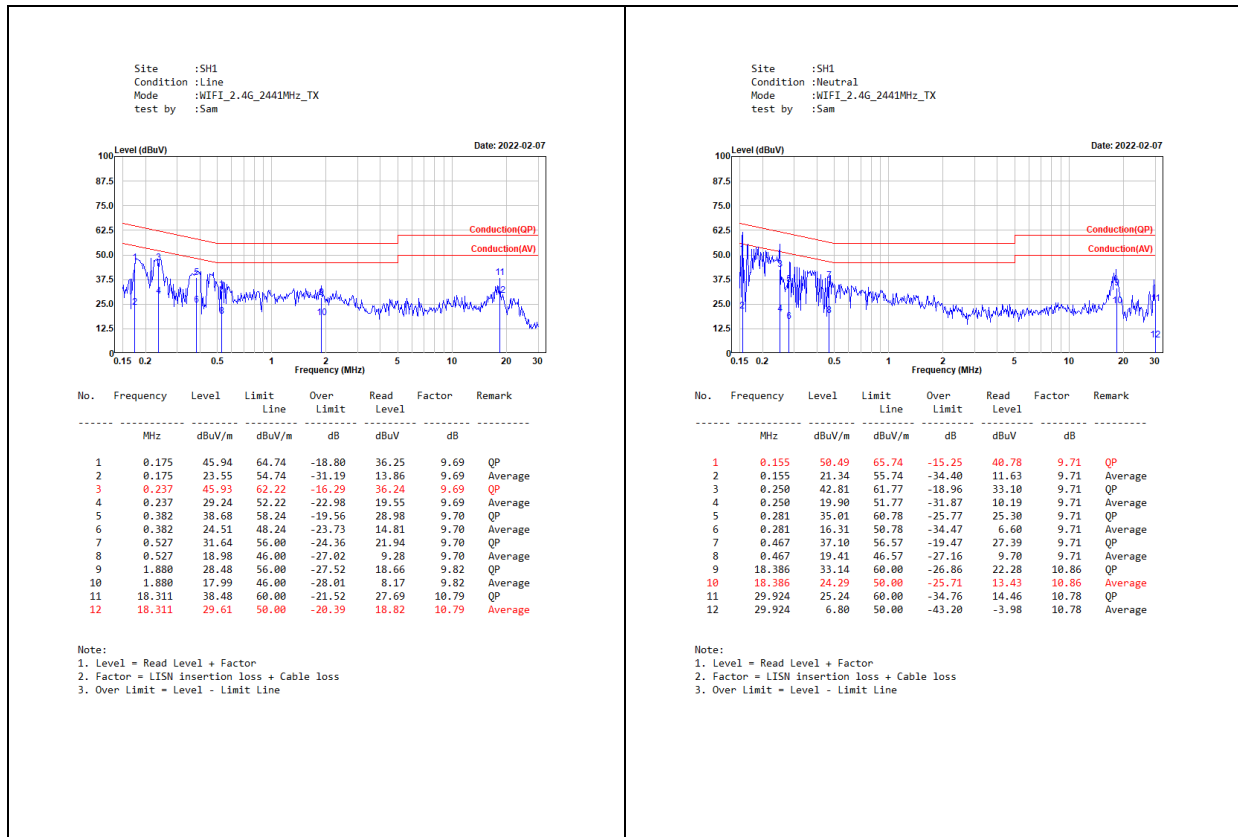
2.3. Test Procedure

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.

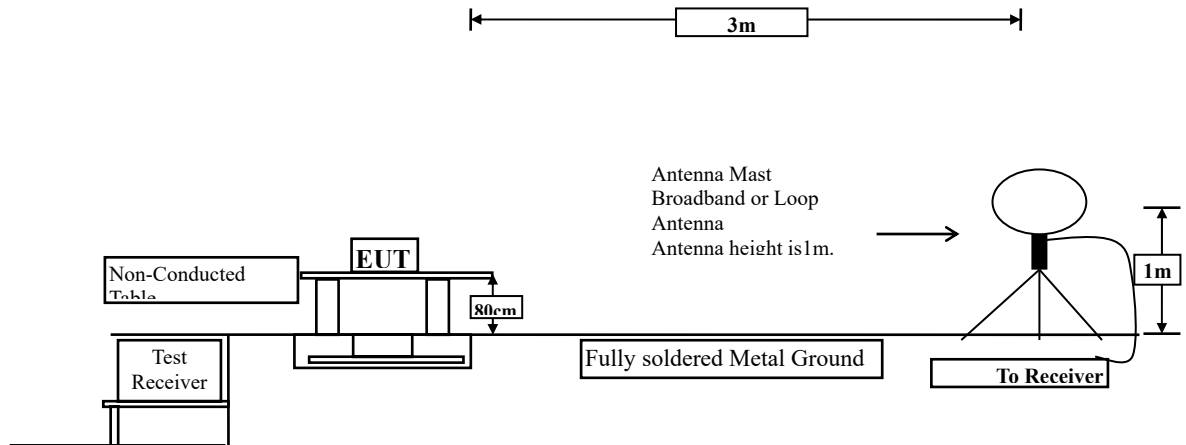
2.4. Test Result of Conducted Emission



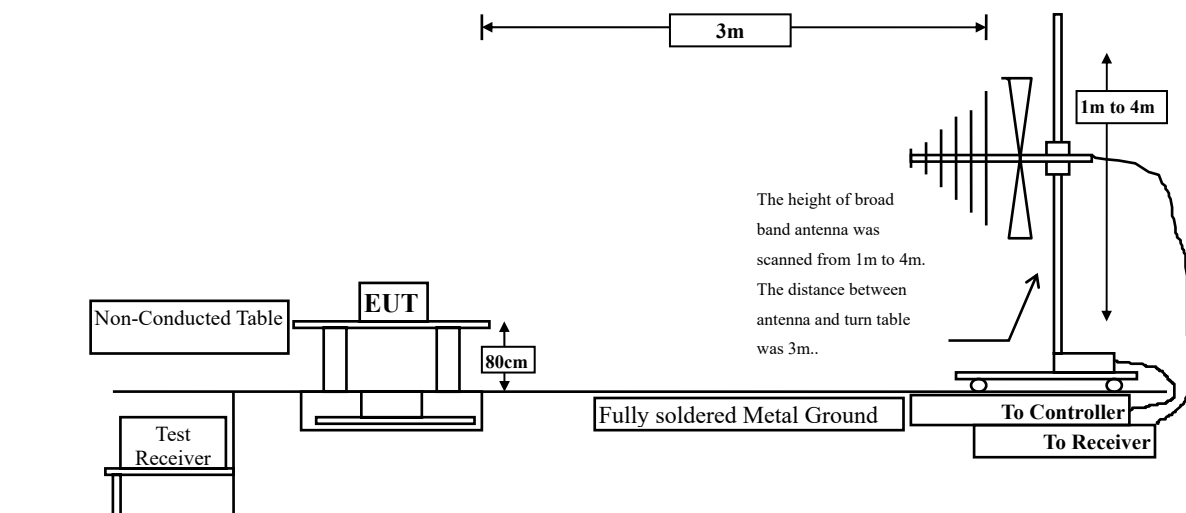
3. Radiated Emission

3.1. Test Setup

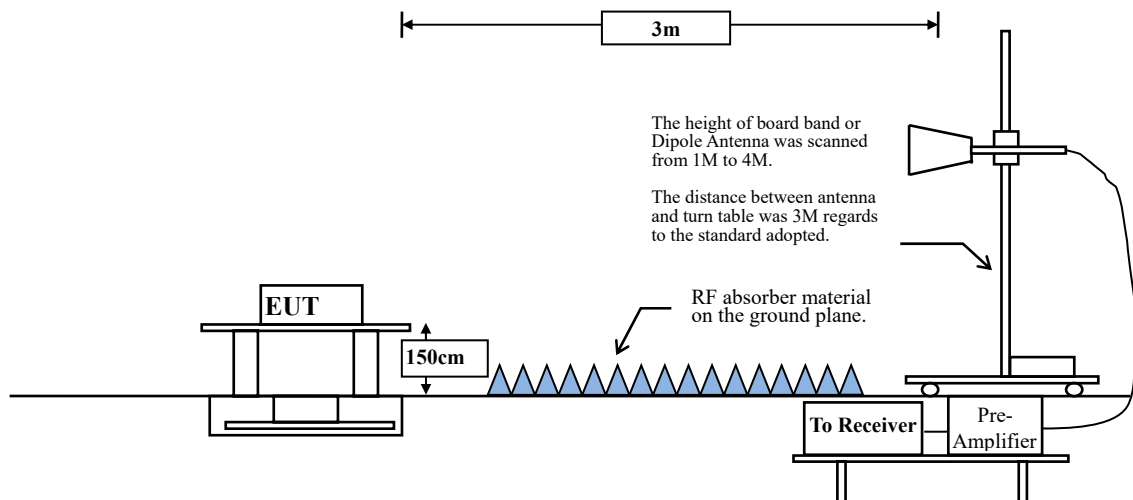
Radiated Emission Under 30MHz



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)	(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
24000-24250	250	108	2500	68

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)

3.3. 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.

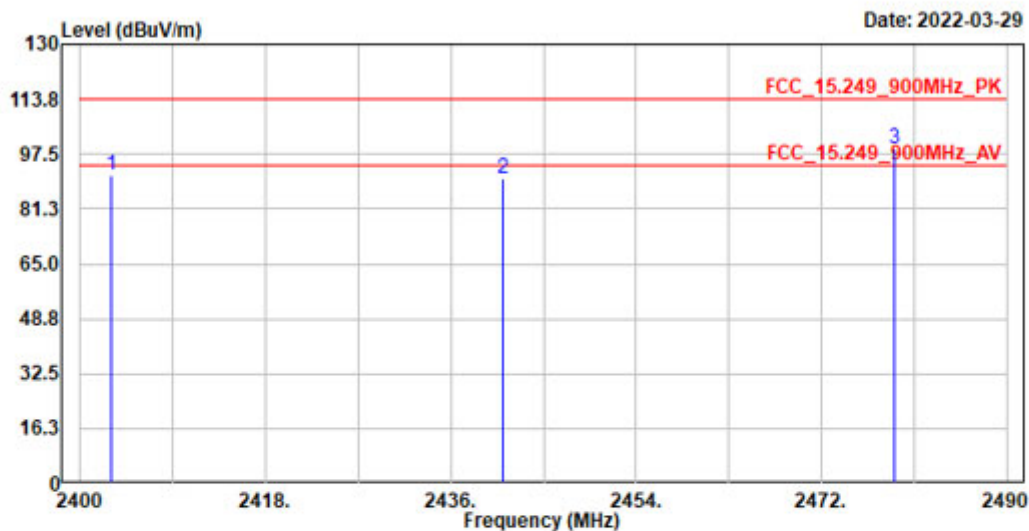
The measurement is divided into the Preliminary Measurement and the Final Measurement.

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. Test Result of Radiated Emission

Site :966-1
 Condition :3m ,Horizontal
 Mode :TX_2.4G Wireless_Fundamental_X
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	91.35	113.97	-22.62	80.04	11.31	Peak
2	2441.000	90.02	113.97	-23.95	78.74	11.28	Peak
3	2479.000	99.00	113.97	-14.97	87.72	11.28	Peak

Note:

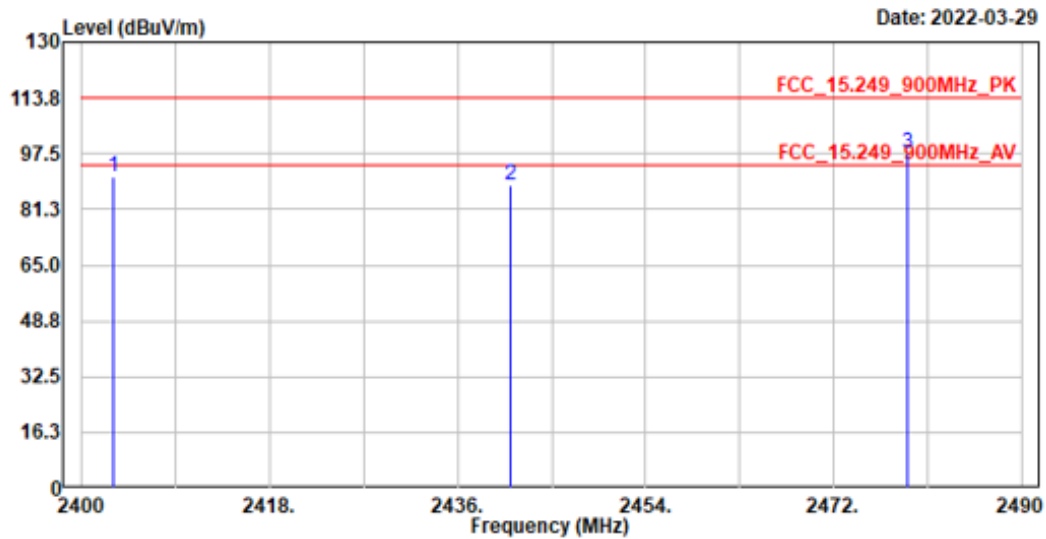
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403.000	91.35	-32.273	59.077	-34.893	93.970
2441.000	90.02	-32.273	57.747	-36.223	93.970
2479.000	99.00	-32.273	66.727	-27.243	93.970

Note:

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

Site :966-1
 Condition :3m ,Vertical
 Mode :TX_2.4G Wireless_Fundamental_X
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	90.53	113.97	-23.44	79.22	11.31	Peak
2	2441.000	88.51	113.97	-25.46	77.23	11.28	Peak
3	2479.000	97.76	113.97	-16.21	86.48	11.28	Peak

Note:

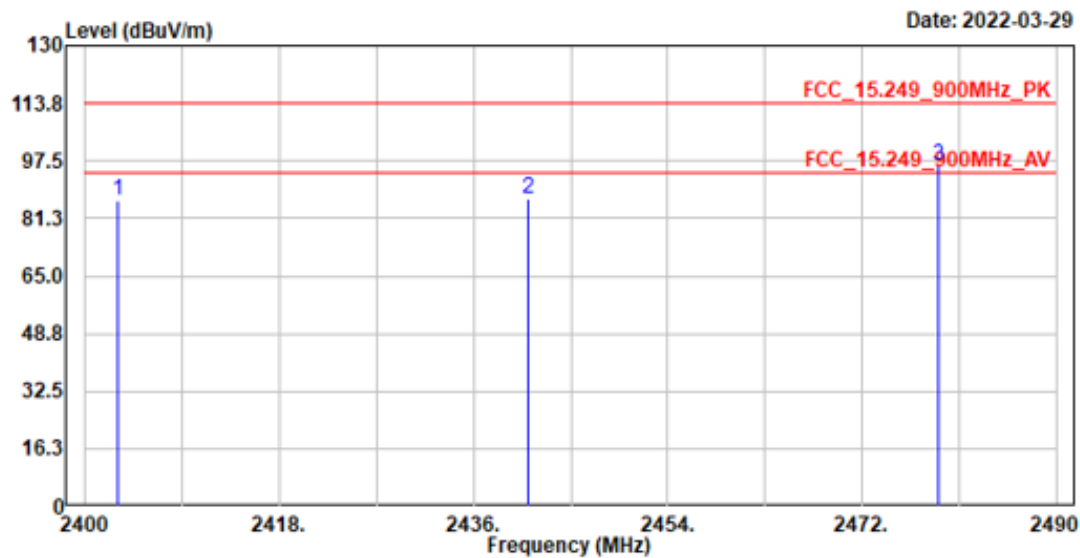
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403.000	90.53	-32.273	58.257	-35.713	93.970
2441.000	88.51	-32.273	56.237	-37.733	93.970
2479.000	97.76	-32.273	65.487	-28.483	93.970

Note:

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

Site :966-1
 Condition :3m ,Horizontal
 Mode :TX_2.4G Wireless_Fundamental_Y
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	86.14	113.97	-27.83	74.83	11.31	Peak
2	2441.000	86.91	113.97	-27.06	75.63	11.28	Peak
3	2479.000	95.99	113.97	-17.98	84.71	11.28	Peak

Note:

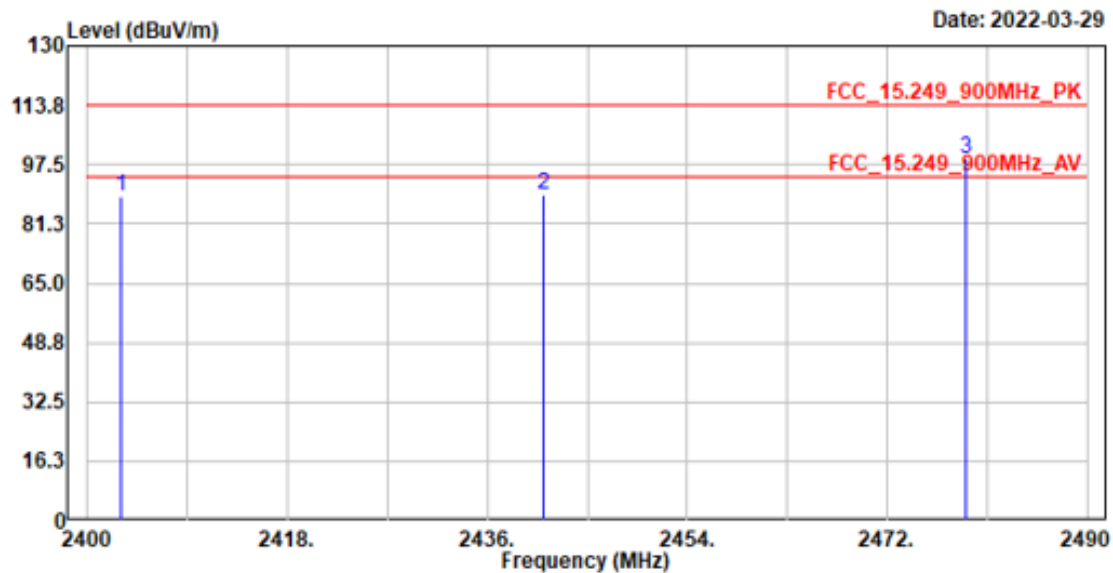
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403.000	86.14	-32.273	53.867	-40.103	93.970
2441.000	86.91	-32.273	54.637	-39.333	93.970
2479.000	95.99	-32.273	63.717	-30.253	93.970

Note:

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

Site :966-1
 Condition :3m ,Vertical
 Mode :TX_2.4G Wireless_Fundamental_Y
 TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level		
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	88.94	113.97	-25.03	77.63	11.31	Peak
2	2441.000	89.11	113.97	-24.86	77.83	11.28	Peak
3	2479.000	98.94	113.97	-15.03	87.66	11.28	Peak

Note:

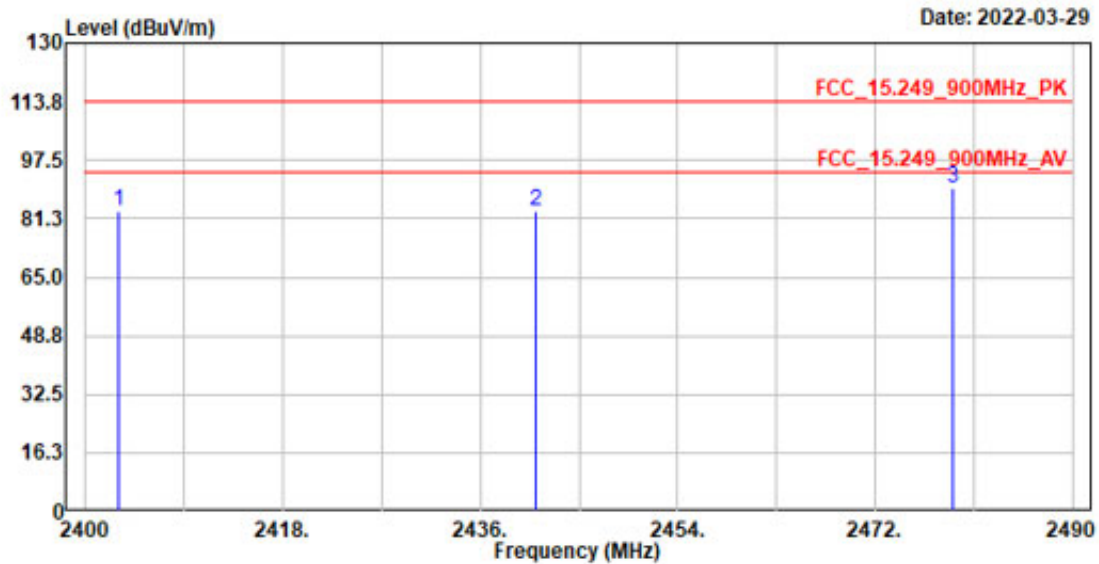
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403.000	88.94	-32.273	56.667	-37.303	93.970
2441.000	89.11	-32.273	56.837	-37.133	93.970
2479.000	98.94	-32.273	66.667	-27.303	93.970

Note:

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

Site :966-1
 Condition :3m ,Horizontal
 Mode :TX_2.4G Wireless_Fundamental_Z
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	83.25	113.97	-30.72	71.94	11.31	Peak
2	2441.000	83.52	113.97	-30.45	72.24	11.28	Peak
3	2479.000	90.00	113.97	-23.97	78.72	11.28	Peak

Note:

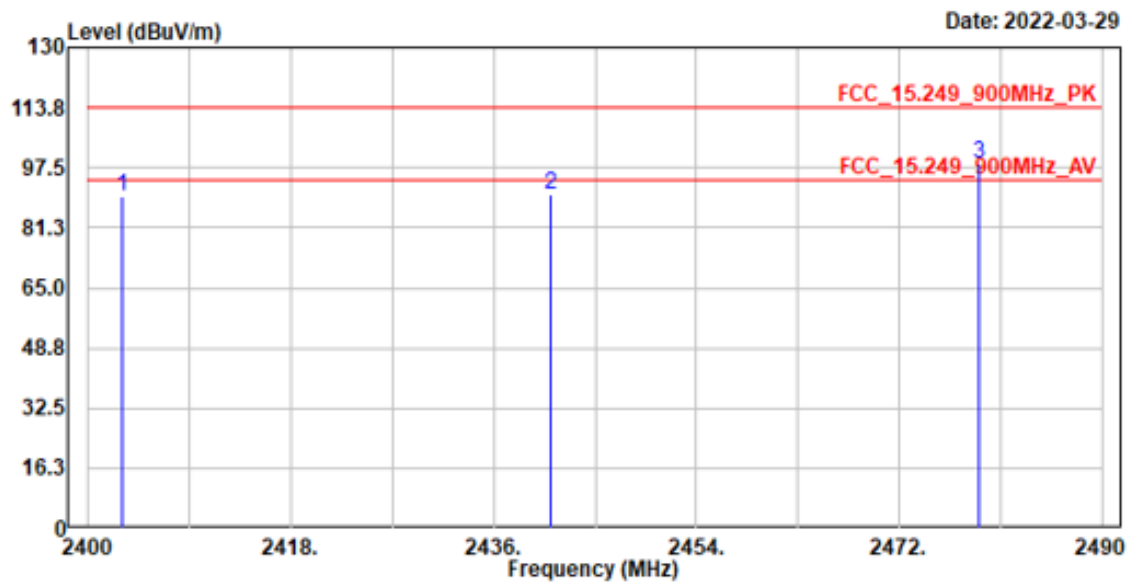
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403.000	83.25	-32.273	50.977	-42.993	93.970
2441.000	83.52	-32.273	51.247	-42.723	93.970
2479.000	90	-32.273	57.727	-36.243	93.970

Note:

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

Site :966-1
 Condition :3m ,Vertical
 Mode :TX_2.4G Wireless_Fundamental_Z
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2403.000	89.79	113.97	-24.18	78.48	11.31	Peak
2	2441.000	90.31	113.97	-23.66	79.03	11.28	Peak
3	2479.000	98.56	113.97	-15.41	87.28	11.28	Peak

Note:

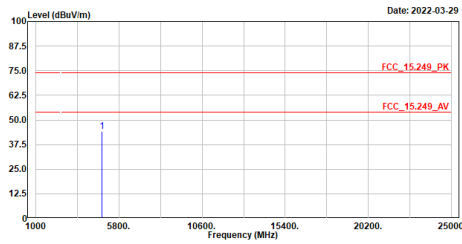
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)
2403.000	89.79	-32.273	57.517	-36.453	93.970
2440.000	90.31	-32.273	58.037	-35.933	93.970
2480.000	98.56	-32.273	66.287	-27.683	93.970

Note:

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

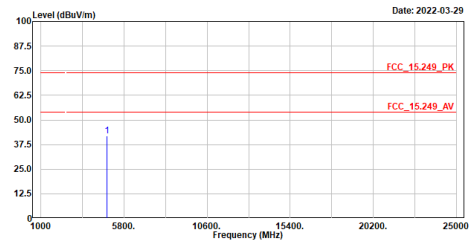
Site :966-1
Condition :3m ,HORIZONTAL
Mode :TX_2.4G Wireless_2403Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	4806.000	44.07	74.00	-29.93	47.41	-3.34	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

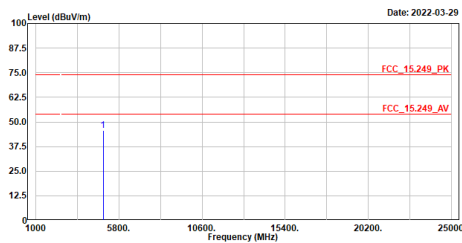
Site :966-1
Condition :3m ,VERTICAL
Mode :TX_2.4G Wireless_2403Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	4806.000	41.77	74.00	-32.23	45.11	-3.34	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

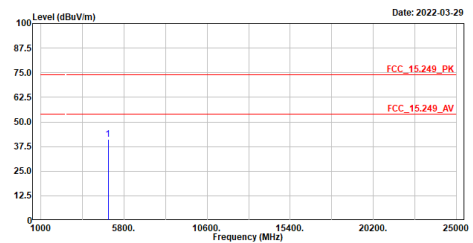
Site :966-1
Condition :3m ,HORIZONTAL
Mode :TX_2.4G Wireless_2441Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	4882.000	45.76	74.00	-28.24	49.11	-3.35	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

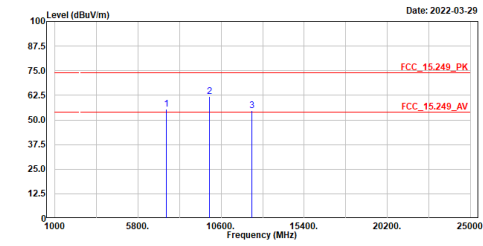
Site :966-1
Condition :3m ,VERTICAL
Mode :TX_2.4G Wireless_2441Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	Line	Limit	Level	dB	
1	4882.000	41.18	74.00	-32.82	44.53	-3.35	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

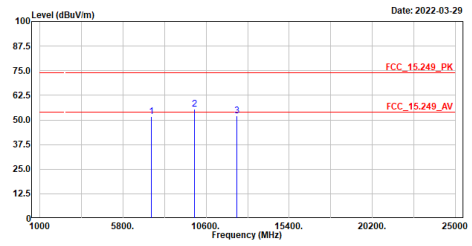
Site :966-1
Condition :3m ,HORIZONTAL
Mode :TX 2.4G Wireless_2479Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	Mhz	dBuV/m	Line	Limit	Level	dB	
1	7437.000	55.35	74.00	-18.65	54.51	0.84	Peak
2	9916.000	61.75	74.00	-12.25	58.85	2.90	Peak
3	12395.000	54.76	74.00	-19.24	49.96	4.00	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

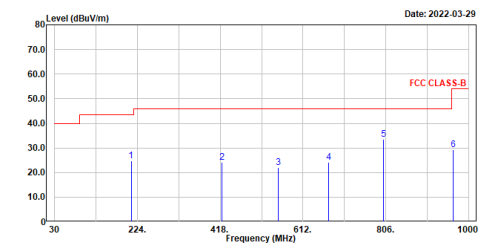
Site :966-1
Condition :3m ,VERTICAL
Mode :TX 2.4G Wireless_2479Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	Mhz	dBuV/m	Line	Limit	Level	dB	
1	7437.000	51.83	74.00	-22.17	50.99	0.84	Peak
2	9916.000	55.33	74.00	-18.67	52.43	2.90	Peak
3	12395.000	52.10	74.00	-21.90	47.30	4.80	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

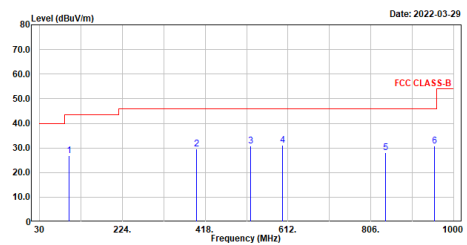
Site :966-1
Condition :3m ,HORIZONTAL
Mode :TX 2.4G Wireless_2441Mhz
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	Mhz	dBuV/m	Line	Limit	Level	dB	
1	209.450	24.86	43.50	-18.64	47.36	-22.50	QP
2	421.880	24.28	46.00	-21.72	40.67	-16.39	QP
3	554.770	22.02	46.00	-23.98	35.66	-13.64	QP
4	672.140	24.16	46.00	-21.84	35.46	-11.30	QP
5	800.180	33.53	46.00	-12.47	42.99	-9.46	QP
6	963.140	29.35	54.00	-24.65	36.94	-7.59	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :966-1
Condition :3m ,VERTICAL
Mode :TX 2.4G Wireless_2441Mhz
TEST BY :Caster



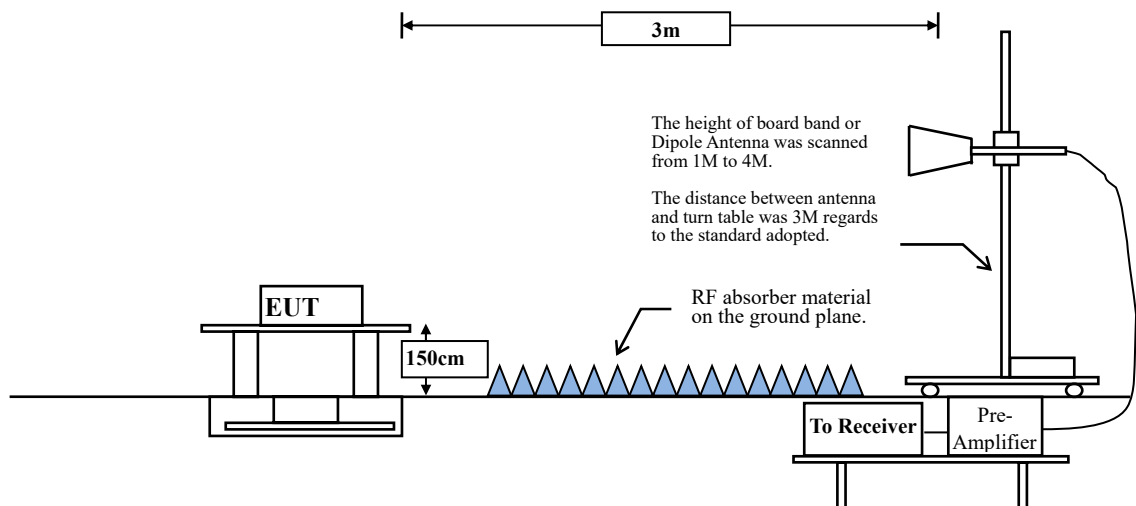
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	Mhz	dBuV/m	Line	Limit	Level	dB	
1	99.840	26.99	43.50	-16.51	51.43	-24.44	QP
2	398.600	29.71	46.00	-16.29	46.58	-16.87	QP
3	524.700	30.94	46.00	-15.06	44.97	-14.03	QP
4	599.390	31.07	46.00	-14.93	43.12	-12.05	QP
5	840.920	28.07	46.00	-17.93	37.05	-8.98	QP
6	954.410	30.80	46.00	-15.20	38.50	-7.70	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

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 (dB μ V /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.

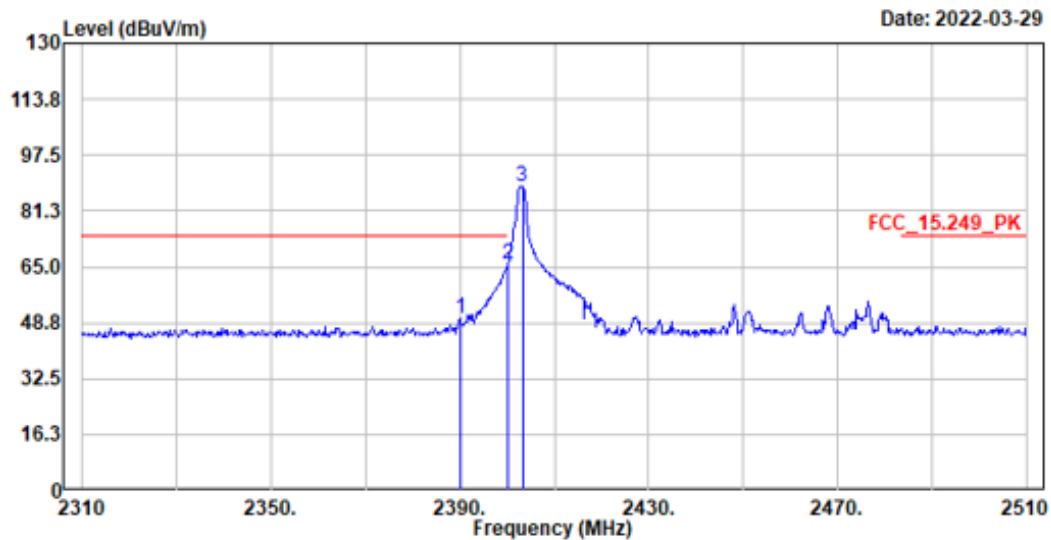
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

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. Test Result of Band Edge

Site :966-1
 Condition :3m ,HORIZONTAL
 Mode :TX_2.4G Wireless_2403Mhz
 TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	Limit	Level		
				dB	dBuV	dB	
1	2390.000	50.14	74.00	-23.86	38.85	11.29	Peak
2	2400.000	65.95	74.00	-8.05	54.63	11.32	Peak
3	2403.200	88.41	-----	-----	77.10	11.31	Peak

Note:

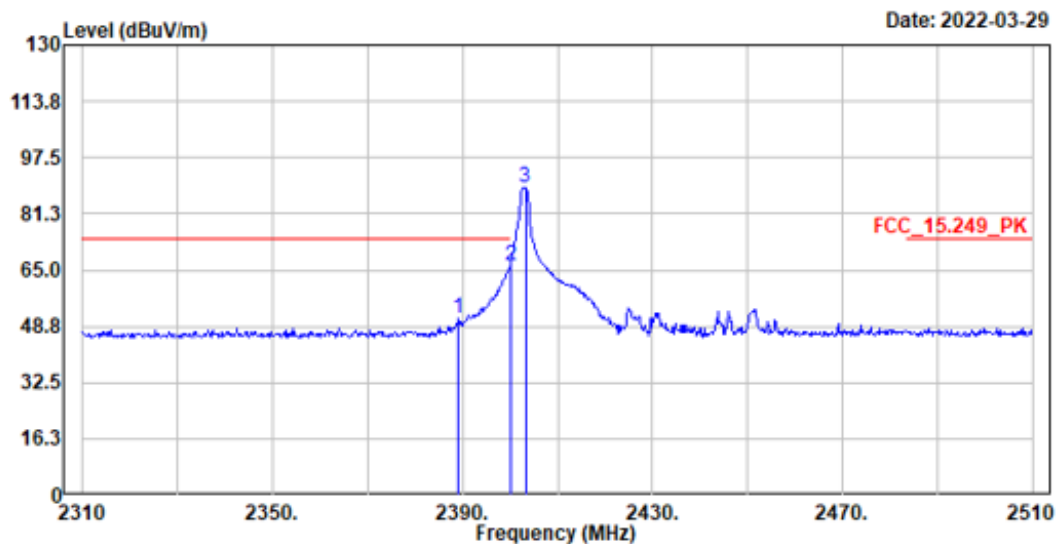
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2390	50.14	-32.273	17.867	-36.133	54.000	Pass
2400	65.95	-32.273	33.677	-20.323	54.000	Pass
2403.2	88.41	-32.273	56.137	--	--	Pass

Note:

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

Site :966-1
 Condition :3m ,VERTICAL
 Mode :TX_2.4G Wireless_2403Mhz
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2389.200	51.26	74.00	-22.74	39.97	11.29	Peak
2	2400.000	66.25	74.00	-7.75	54.93	11.32	Peak
3	2403.200	88.85	-----	-----	77.54	11.31	Peak

Note:

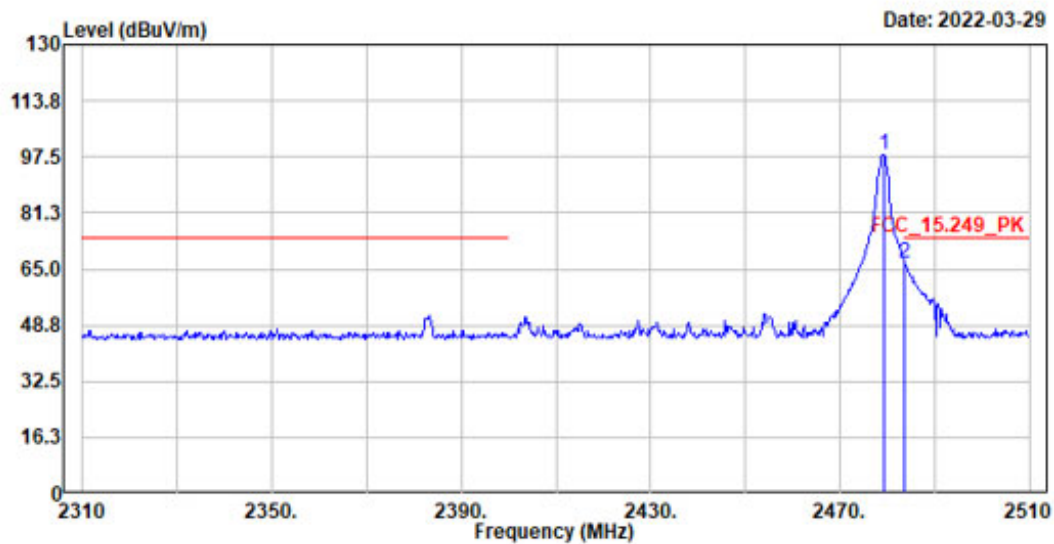
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBuV/m)	Duty Cycle Factor (dB)	Average Measurement (dBuV/m)	Margin (dB)	Average Limit (dBuV/m)	Result
2389.2	51.26	-32.273	18.987	-35.013	54.000	Pass
2400	66.25	-32.273	33.977	-20.023	54.000	Pass
2403.2	88.85	-32.273	56.577	--	--	Pass

Note:

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

Site :966-1
 Condition :3m ,HORIZONTAL
 Mode :TX_2.4G Wireless_2479Mhz
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2479.200	98.06	-----	-----	62.48	35.58	Peak
2	2483.600	66.96	74.00	-7.04	31.38	35.58	Peak

Note:

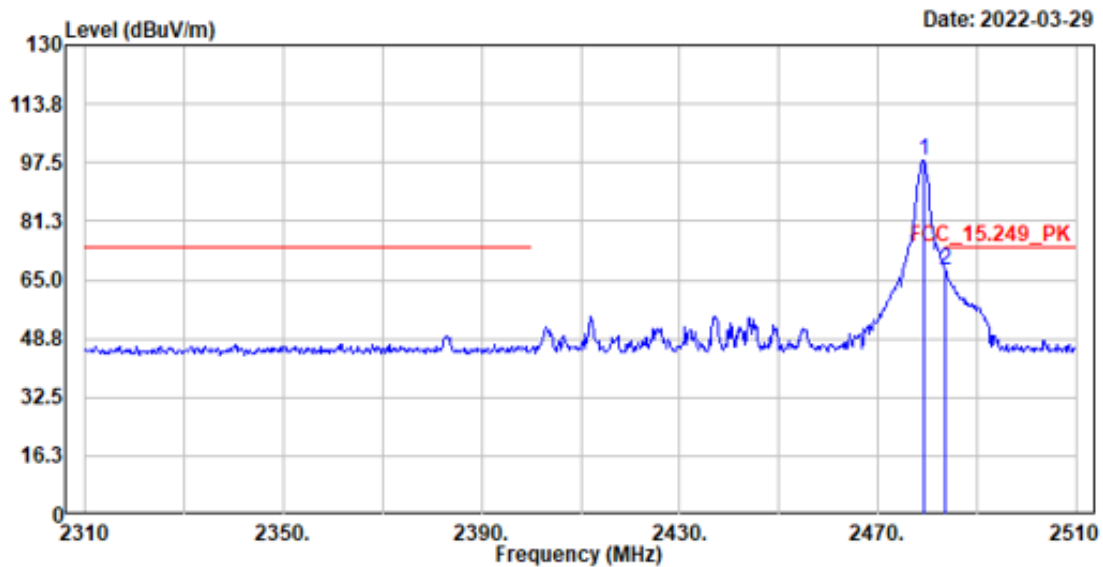
1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2479.2	98.06	-32.273	65.787	--	--	Pass
2483.6	66.96	-32.273	34.687	-19.313	54.000	Pass

Note:

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

Site :966-1
 Condition :3m ,VERTICAL
 Mode :TX_2.4G Wireless_2479Mhz
 TEST BY :Caster



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	2479.200	97.92	-----	-----	62.34	35.58	Peak
2	2483.600	67.71	74.00	-6.29	32.13	35.58	Peak

Note:

1. Level = Read Level + Factor
2. Factor = Antenna- Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line

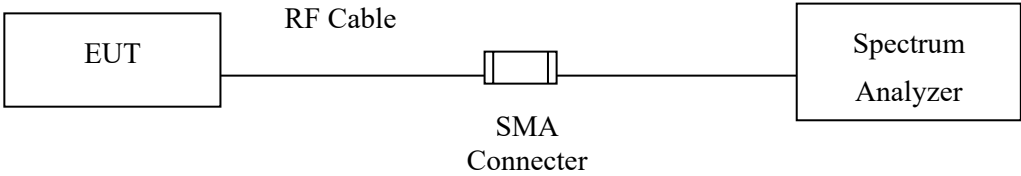
Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Average Measurement (dBμV/m)	Margin (dB)	Average Limit (dBμV/m)	Result
2479.2	97.92	-32.273	65.647	--	--	Pass
2483.6	67.71	-32.273	35.437	-18.563	54.000	Pass

Note:

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

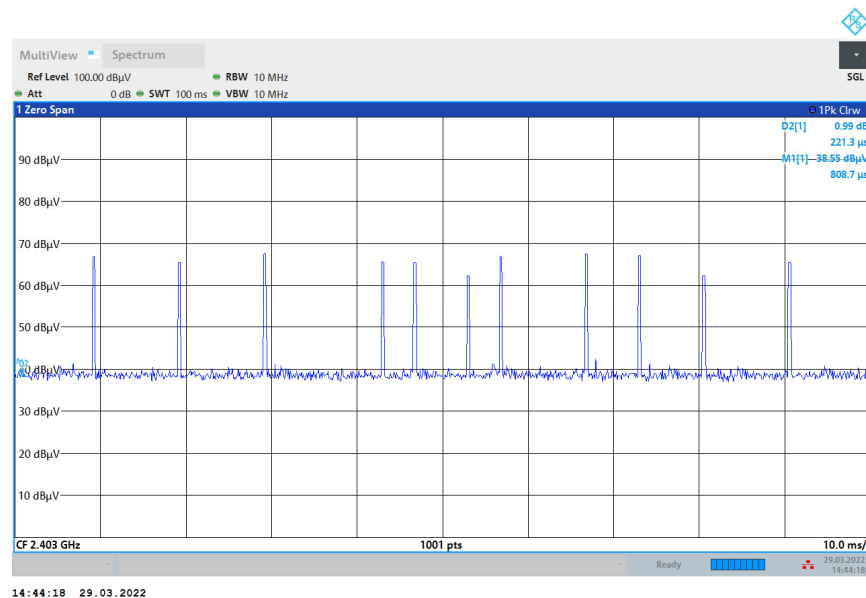
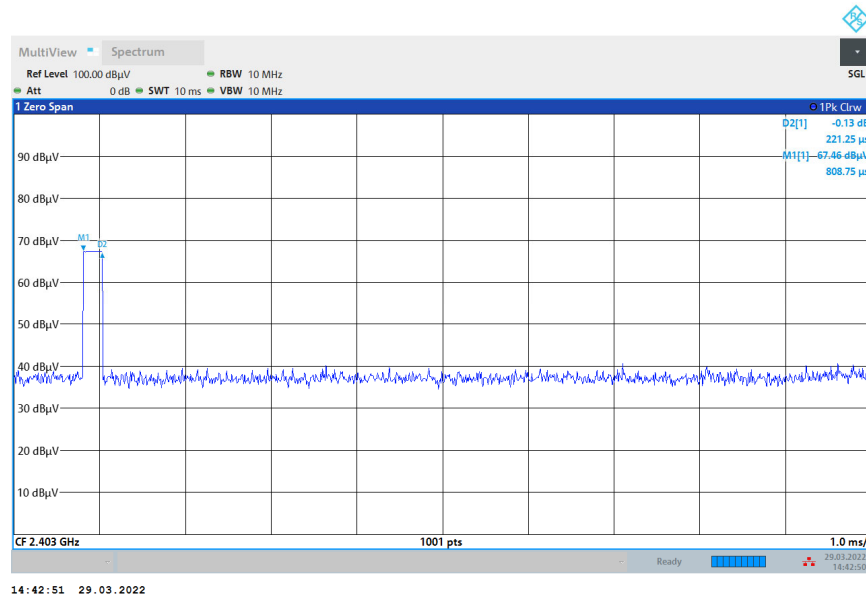
5. Duty Cycle

5.1. Test Setup



5.2. Test Result of Duty Cycle

Product : ROG DELTA S WIRELESS DONGLE
 Test Item : Duty Cycle Data
 Test Mode : Mode 2: Normal mode



Time on of 100ms = 2.434ms

Duty Cycle= 2.434ms / 100ms= 0.024343

Duty Cycle correction factor= 20 LOG 0.024343= -32.273 dB

Duty Cycle correction factor	-32.273 dB
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6. EMI Reduction Method During Compliance Testing

No modification was made during testing.