

FCC Test Report

(Class II Permissive Change)

Product Name	Intel® Wi-Fi 6 AX200
Model No.	AX200D2WL
FCC ID.	CJ6AX200D2WLWB

Applicant	Dynabook Inc.
Address	6-15, Toyosu 5-chome, Koto-ku, Tokyo, 135-8505, Japan

Date of Receipt	Jan. 01, 2022
Issued Date	May 03, 2022
Report No.	2210170R-RFUSBLEV01-B
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.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.

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: May 03, 2022

Report No.: 2210170R-RFUSBLEV01-B



Product Name	Intel® Wi-Fi 6 AX200
Applicant	Dynabook Inc.
Address	6-15, Toyosu 5-chome, Koto-ku, Tokyo, 135-8505, Japan
Manufacturer	Intel Mobile Communications
Model No.	AX200D2WL
FCC ID.	CJ6AX200D2WLWB
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V / 60Hz
Trade Name	Intel
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By : Jinn Chen
(Supervisor / Jinn Chen)

Tested By : Ivan Chuang
(Senior Engineer / Ivan Chuang)

Approved By : Alan Chen
(Senior Engineer / Alan Chen)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION	5
1.1. EUT Description.....	5
1.2. Tested System Details.....	7
1.3. Configuration of Tested System	7
1.4. EUT Exercise Software	8
1.5. Test Facility	9
1.6. List of Test Equipment.....	10
1.7. Uncertainty	11
2. PEAK POWER OUTPUT	12
2.1. Test Setup	12
2.2. Limit	12
2.3. Test Procedure	12
2.4. Test Result of Peak Power Output.....	13
3. RADIATED EMISSION	14
3.1. Test Setup	14
3.2. Limits.....	15
3.3. Test Procedure	16
3.4. Test Result of Radiated Emission	18
4. BAND EDGE	20
4.1. Test Setup	20
4.2. Limit	21
4.3. Test Procedure	21
4.4. Test Result of Band Edge	23
5. DUTY CYCLE.....	27
5.1. Test Setup	27
5.2. Test Procedure	27
5.3. Test Result of Duty Cycle.....	28
6. EMI REDUCTION METHOD DURING COMPLIANCE TESTING	29
Appendix 1: EUT Test Photographs	
Appendix 2: Product Photos: Please refer to the file: 2210170R-Product Photos	

Revision History

Report No.	Version	Description	Issued Date
2210170R-RFUSBLEV01-B	V1.0	Initial issue of report.	May 03, 2022

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Intel® Wi-Fi 6 AX200
Trade Name	Intel
Model No.	AX200D2WL
FCC ID.	CJ6AX200D2WLWB
Frequency Range	2402 – 2480MHz
Channel Number	BLE: 40CH
Type of Modulation	BLE: GFSK
Antenna Type	Folded Dipole Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Power Adapter #1	MFR: Chicony, M/N: PA5177E-1AC3 Input: AC 100-240V~1.3A 50-60Hz Output: 19V $\overline{=}$ 2.37A Cable out: Non-Shielded, 1.8m. Power cord: Non-Shielded, 1.8m.
Power Adapter #2	MFR: Chicony, M/N: PA5177U-1ACA Input: AC 100-240V~1.3A 50-60Hz Output: 19V $\overline{=}$ 2.37A Cable out: Non-Shielded, 1.8m. Power cord: Non-Shielded, 1.8m.
Power Adapter #3	MFR: Lite-On, M/N: PA5177E-1AC3 Input: AC 100-240V~1.3A 50-60Hz Output: 19V $\overline{=}$ 2.37A Cable out: Non-Shielded, 1.8m. Power cord: Non-Shielded, 1.8m.
Power Adapter #4	MFR: Lite-On, M/N: PA5177U-1ACA Input: AC 100-240V~1.3A 50-60Hz Output: 19V $\overline{=}$ 2.37A Cable out: Non-Shielded, 1.8m. Power cord: Non-Shielded, 1.8m.

Antenna List

No.	Manufacturer	Part No. (Vendor)	Antenna Type	Peak Gain
1	SLEing	SLEingB219790388 (Main)	Folded Dipole	0.84dBi in 2.4 GHz
		SLEingB219790491 (Aux)	Folded Dipole	1.64dBi in 2.4 GHz

Note: The antenna of EUT is conforming to FCC 15.203.

Center Frequency of Each Channel: (For BLE)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 01:	2404 MHz	Channel 02:	2406 MHz	Channel 03:	2408 MHz
Channel 04:	2410 MHz	Channel 05:	2412 MHz	Channel 06:	2414 MHz	Channel 07:	2416 MHz
Channel 08:	2418 MHz	Channel 09:	2420 MHz	Channel 10:	2422 MHz	Channel 11:	2424 MHz
Channel 12:	2426 MHz	Channel 13:	2428 MHz	Channel 14:	2430 MHz	Channel 15:	2432 MHz
Channel 16:	2434 MHz	Channel 17:	2436 MHz	Channel 18:	2438 MHz	Channel 19:	2440 MHz
Channel 20:	2442 MHz	Channel 21:	2444 MHz	Channel 22:	2446 MHz	Channel 23:	2448 MHz
Channel 24:	2450 MHz	Channel 25:	2452 MHz	Channel 26:	2454 MHz	Channel 27:	2456 MHz
Channel 28:	2458 MHz	Channel 29:	2460 MHz	Channel 30:	2462 MHz	Channel 31:	2464 MHz
Channel 32:	2466 MHz	Channel 33:	2468 MHz	Channel 34:	2470 MHz	Channel 35:	2472 MHz
Channel 36:	2474 MHz	Channel 37:	2476 MHz	Channel 38:	2478 MHz	Channel 39:	2480 MHz

Note:

1. The EUT is an Intel® Wi-Fi 6 AX200 with built-in WLAN and Bluetooth transceiver, this report for BLE.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of BLE transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. This is to request a Class II permissive change for FCC ID: CJ6AX200D2WLWB, originally granted on 03/28/2022.

The major change filed under this application is:

Change #1: Additional Chassis added, Product name: Notebook PC, Model number: SATELLITE C50D-B, SATELLITE PRO C50D-B

Change #2: Reduce the Output Power through firmware, and SAR measurement were evaluated. (Only reduce Wi-Fi Output Power, Bluetooth Output Power haven't changes).

Change #3: Addition a Folded Dipole Antenna, the antenna type is different with the original application.

Test Mode	Mode 1: Transmit - BLE
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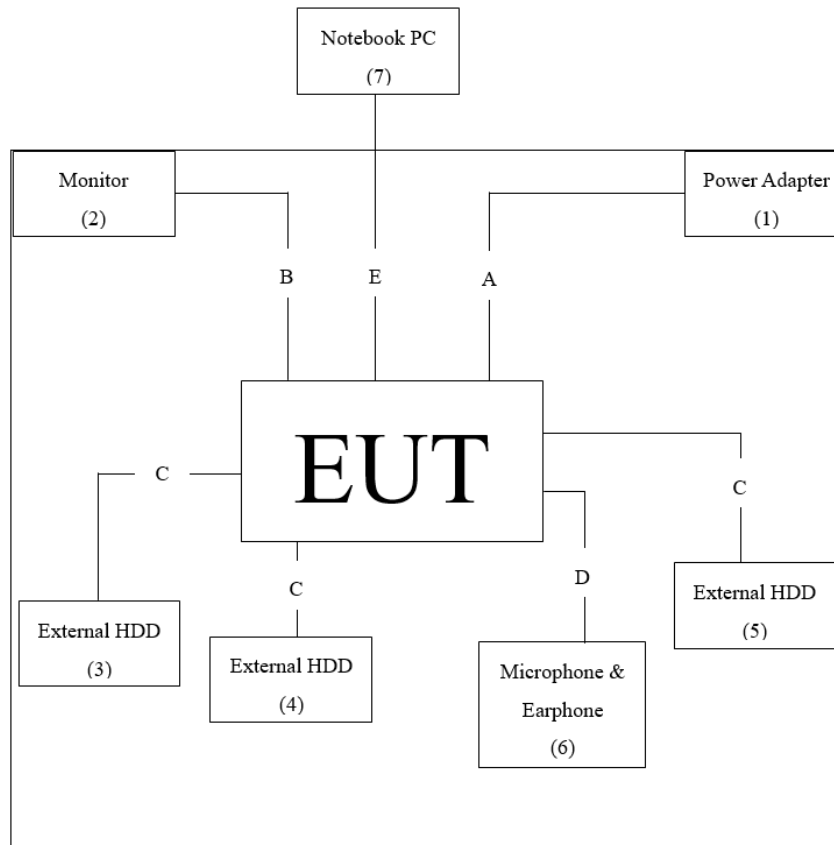
1.2. Tested System Details

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 Power Adapter	Chicony	PA-5177E-1AC3	N/A	Non-shielded, 1.8m
2 Monitor	Lenovo	A21215FS0	V5DMD987	Non-shielded, 1.8m
3 External HDD	Transcend	TS1TSJ25MC	F30467-0011	N/A
4 External HDD	Transcend	TS1TSJ25H3B	F21786-0005	N/A
5 External HDD	Transcend	TS1TSJ25H3B	F21786-0103	N/A
6 Microphone & Earphone	Verbatim	C09024VB	N/A	N/A
7 Notebook PC	DELL	Inspiron 15 3000	GT5JPJ2	N/A

Signal Cable Type	Signal cable Description
A Power Cable	Non-shielded, 1.8m
B HDMI Cable	Shielded, 1.8m
C USB Cable	Shielded, 1.5m, three PCS.
D Microphone & Earphone Cable	Non-shielded, 1.2m
E LAN Cable	Non-shielded, 3m

1.3. Configuration of Tested System



1.4. EUT Exercise Software

1. Setup the EUT as shown in Section 1.3.
2. Execute software “DRTU V22.21050.0.0-OEM.DRTU.12004” on the EUT.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Radiated Emission	Temperature (°C)	10~40 °C	23.8 °C
	Humidity (%RH)	10~90 %	62.4 %
Conductive	Temperature (°C)	10~40 °C	21.6 °C
	Humidity (%RH)	10~90 %	57.0 %

USA : **FCC Registration Number: TW0033**

Canada : **CAB Identifier Number: TW0323 / 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 Conducted measurements /SH2

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Spectrum Analyzer	R&S	FSV30	103464	2022/03/25	2023/03/24
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 /966-3

	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	9168-675	2021/08/11	2022/08/10
X	Horn Antenna	ETS-Lindgren	3117	00227700	2021/10/12	2022/10/11
	Horn Antenna	Com-Power	AH-840	101100	2021/10/04	2022/10/03
X	Pre-Amplifier	SGH	PRAMP118	20200202	2021/03/25	2022/03/24
X	Pre-Amplifier	EMCI	EMC001330	980302	2021/07/26	2022/07/25
	Pre-Amplifier	SGH	EM330	60736	2021.08.11	2022.08.10
X	Pre-Amplifier	EMCI	EMC051835SE	980313	2021/11/24	2022/11/23
	Pre-Amplifier	EMCI	EMC05820SE	980309	2021/09/27	2022/09/26
	Pre-Amplifier	EMCI	EMC05820SE	980310	2021/07/07	2022/07/06
	Pre-Amplifier	EMCI	EMC184045SE	980369	2021/04/27	2022/04/26
X	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314	2021/04/27	2022/04/26
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242	2021/04/27	2022/04/26
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	102793	2021/12/15	2022/12/14
X	Spectrum Analyzer	R&S	FSV3044	101114	2022/02/11	2023/02/10
	Coaxial Cable	SGH	HA800	GD20110222-3	2022/01/05	2023/01/04
X	Coaxial Cable	SGH	SGH18	20110223-1	2022/01/05	2023/01/04
	Coaxial Cable	SGH	SGH18	2021005-3	2022/01/05	2023/01/04
	Coaxial Cable	SGH	SGH18	2021001-18	2022/01/05	2023/01/04

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.

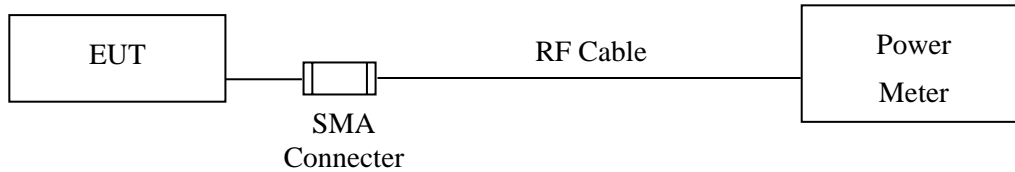
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

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	
Peak Power Output	Power Meter ± 0.91 dB	
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB
Duty Cycle	± 2.31 ms	

2. Peak Power Output

2.1. Test Setup



2.2. Limit

The maximum peak power shall be less 1Watt.

2.3. Test Procedure

The EUT was tested according to C63.10:2013 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using C63.10:2013 Section 11.9.1.3 PKPM1 Peak power meter method.

2.4. Test Result of Peak Power Output

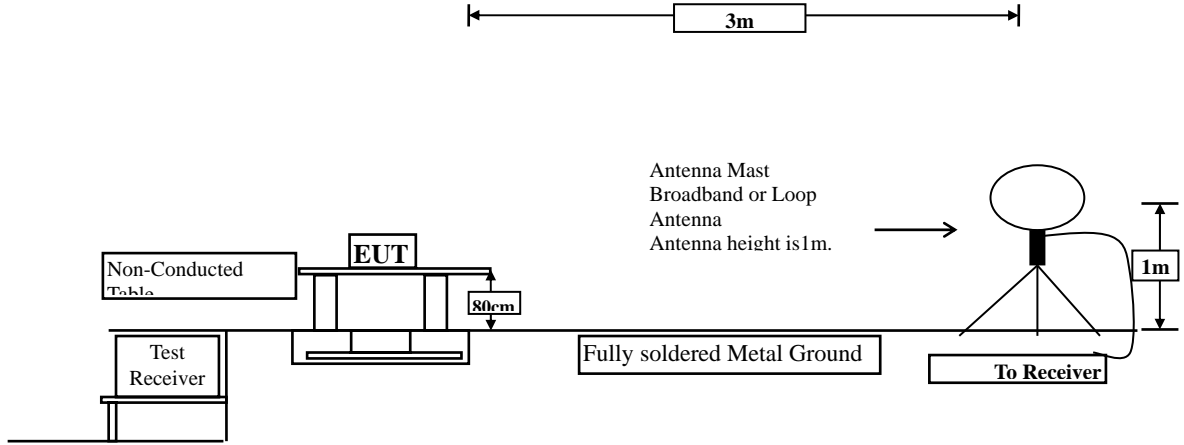
Product : Intel® Wi-Fi 6 AX200
Test Item : Peak Power Output
Test Mode : Mode 1: Transmit - BLE
Test Date : 2022/03/11

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	8.15	1 Watt= 30 dBm	Pass
Channel 19	2440.00	8.38	1 Watt= 30 dBm	Pass
Channel 39	2480.00	8.62	1 Watt= 30 dBm	Pass

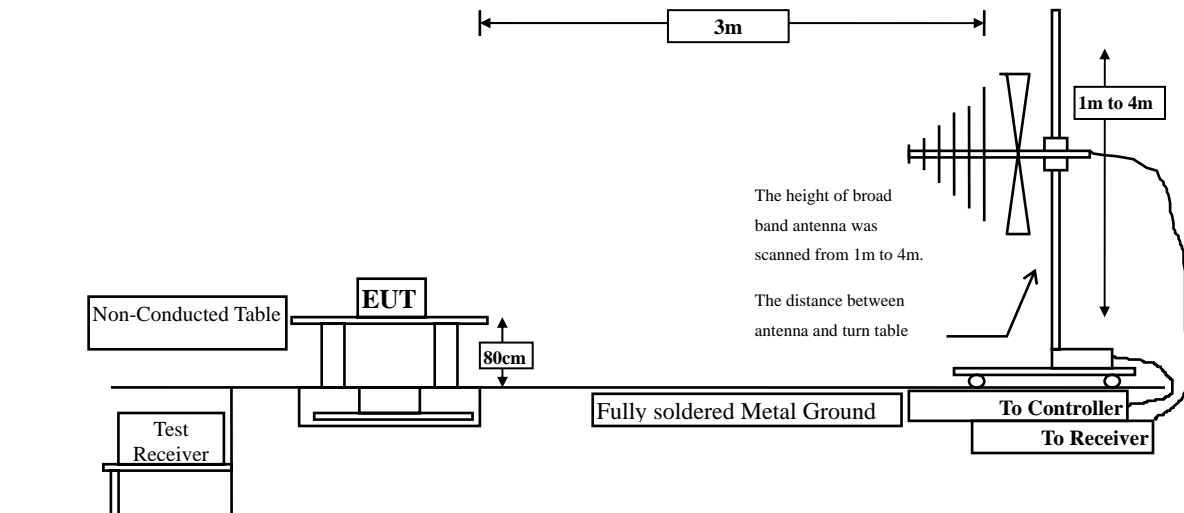
3. Radiated Emission

3.1. Test Setup

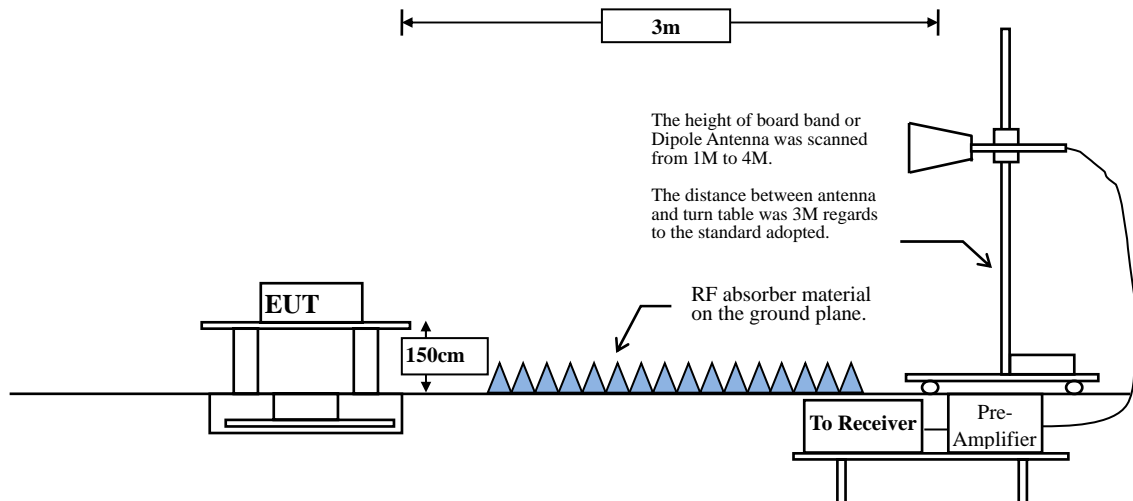
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.2. Limits

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

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

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

3.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to C63.10:2013 Section 11.12.1 for compliance to FCC 47CFR 15.247 requirements.

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

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

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

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

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

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

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

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure.

RBW = as specified in Table 1.

$VBW \geq 3 \times RBW$.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure.

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

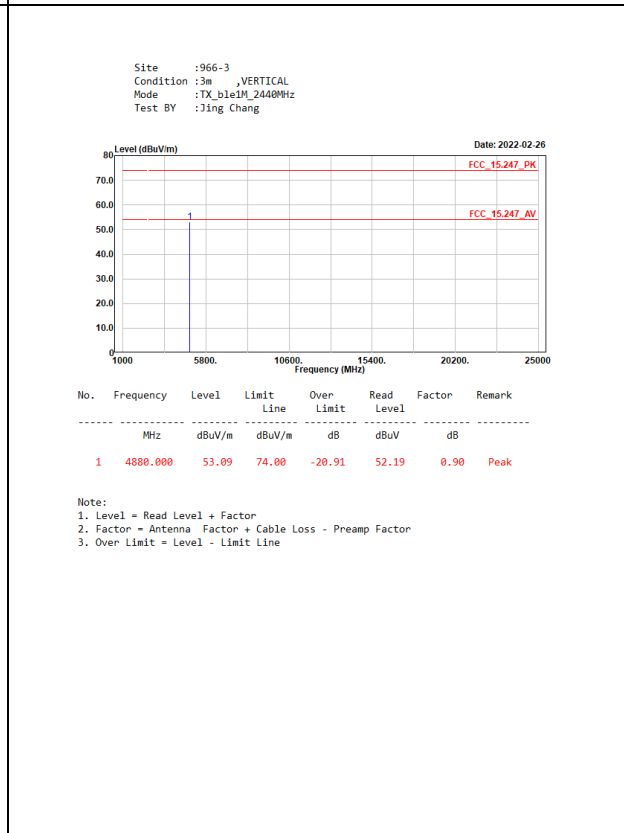
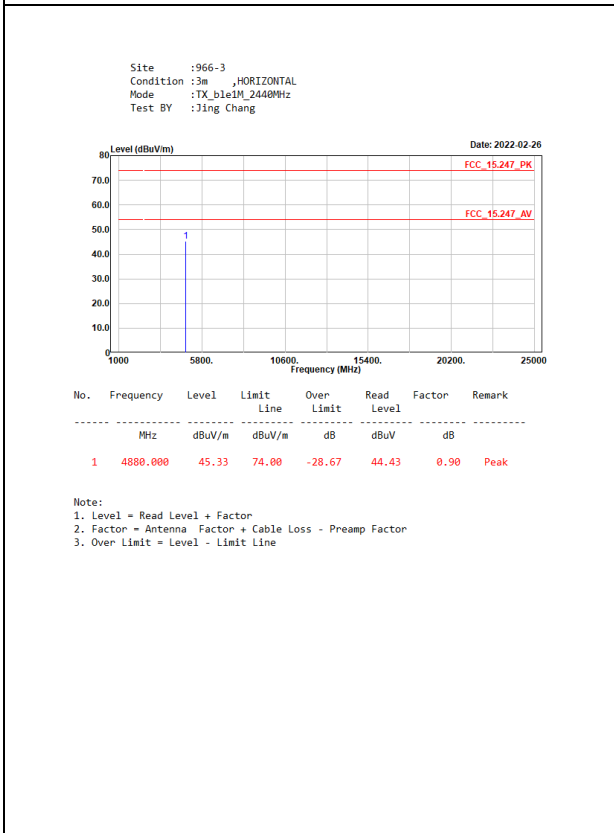
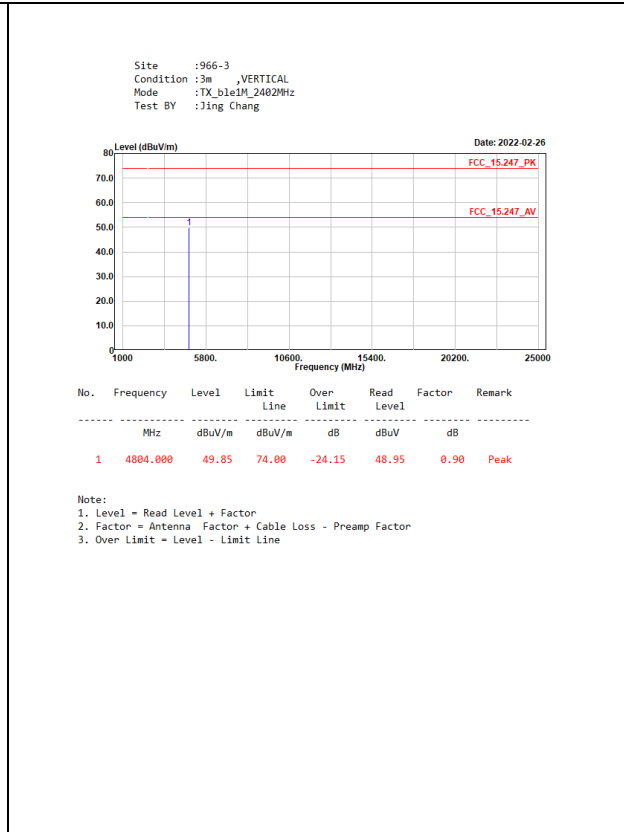
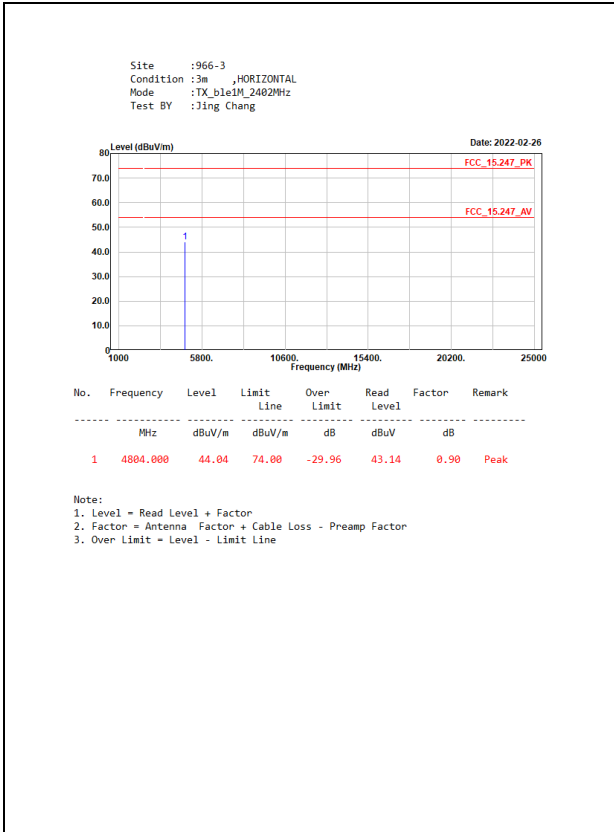
$VBW \geq 1/T$, when duty cycle < 98 %

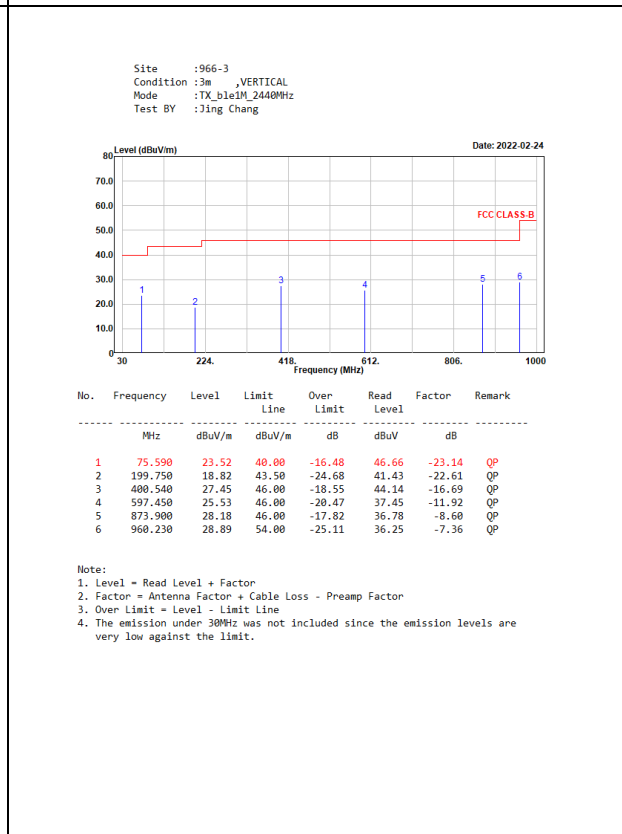
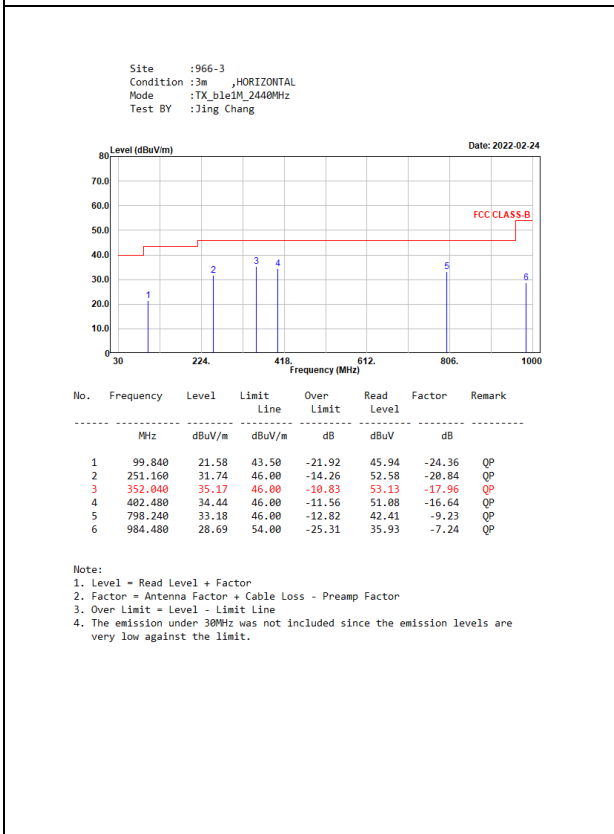
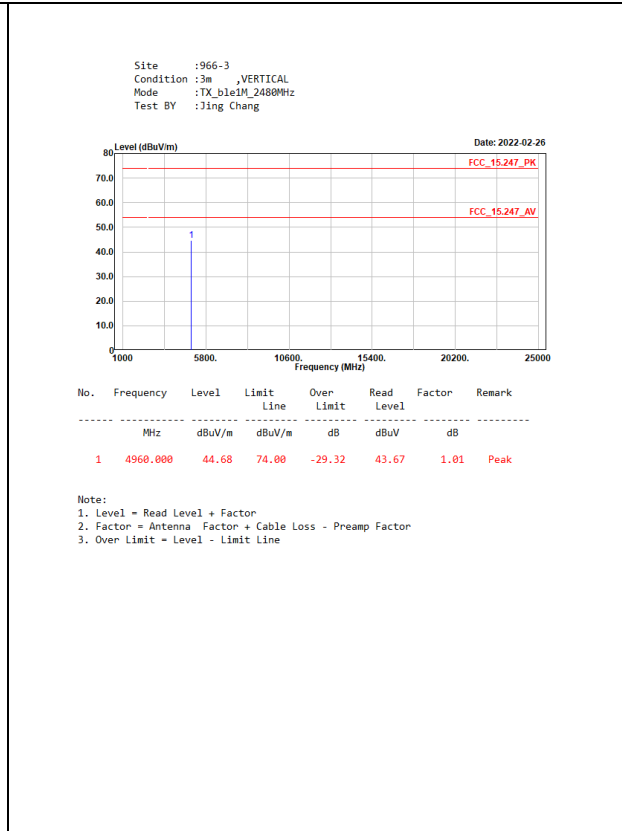
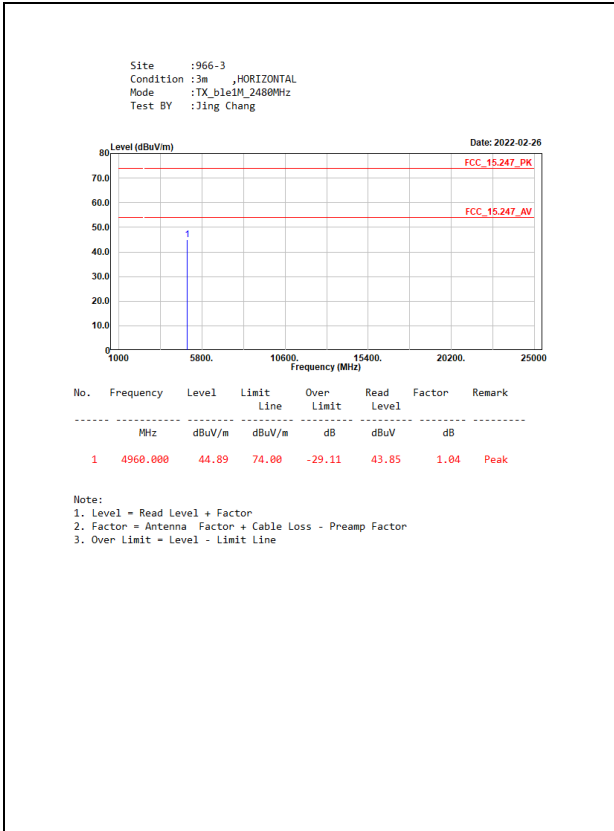
(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
BLE	85.37	2.1360	468	500

Note: Duty Cycle Refer to Section 9.

3.4. Test Result of Radiated Emission

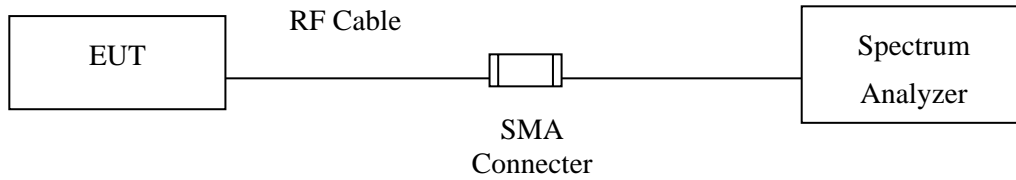




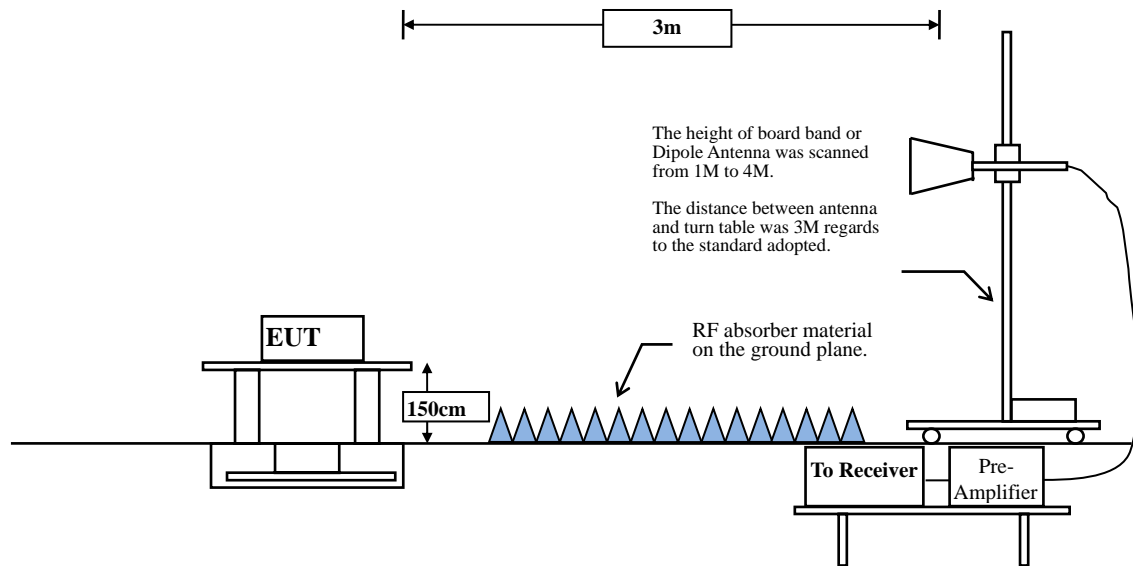
4. Band Edge

4.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



4.2. Limit

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

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to C63.10:2013 Section 11.12.1 for compliance to FCC 47CFR 15.247 requirements.

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

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

RBW and VBW Parameter setting:

According to C63.10 Section 11.12.2.4 Peak measurement procedure.

RBW = as specified in Table 1.

$VBW \geq 3 \times RBW$.

Table 1 - RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to C63.10 Section 11.12.2.5 Average measurement procedure.

RBW = 1MHz.

VBW = 10Hz, when duty cycle $\geq 98 \%$

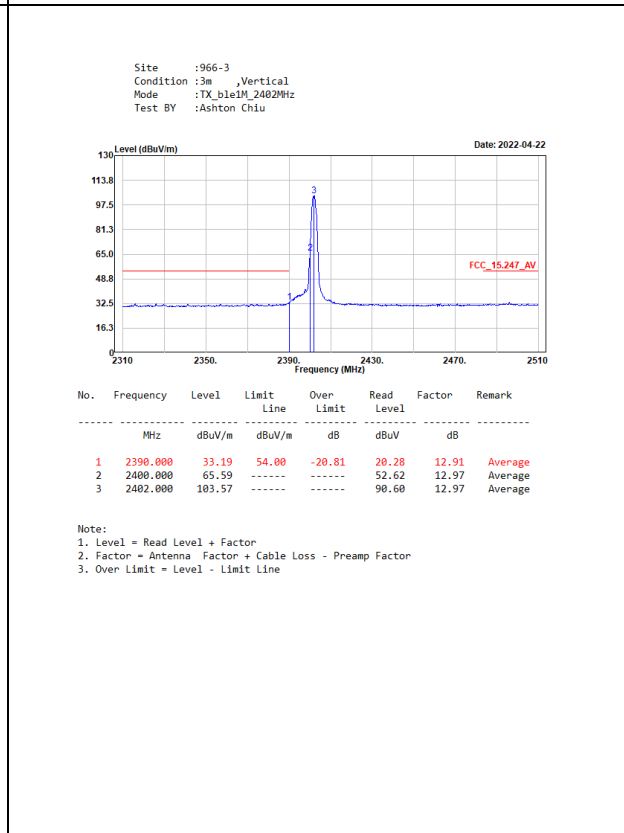
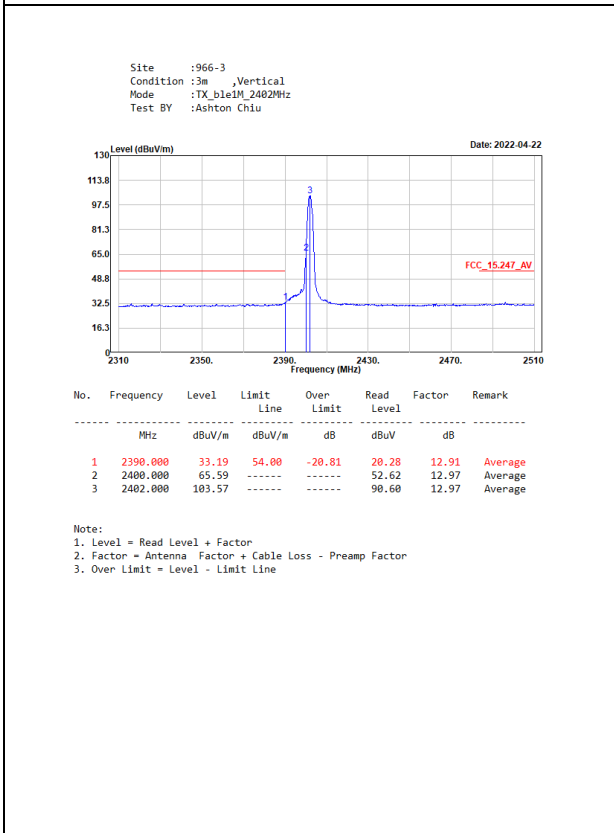
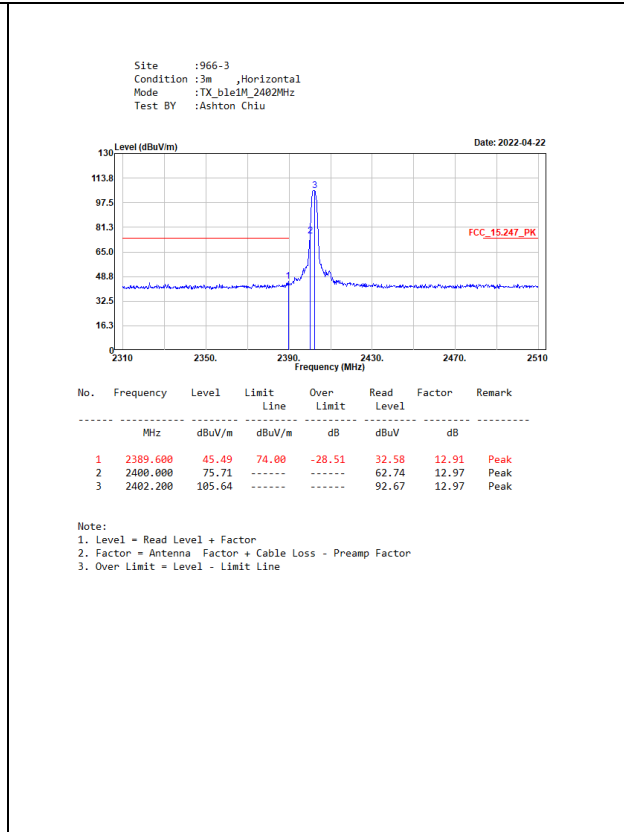
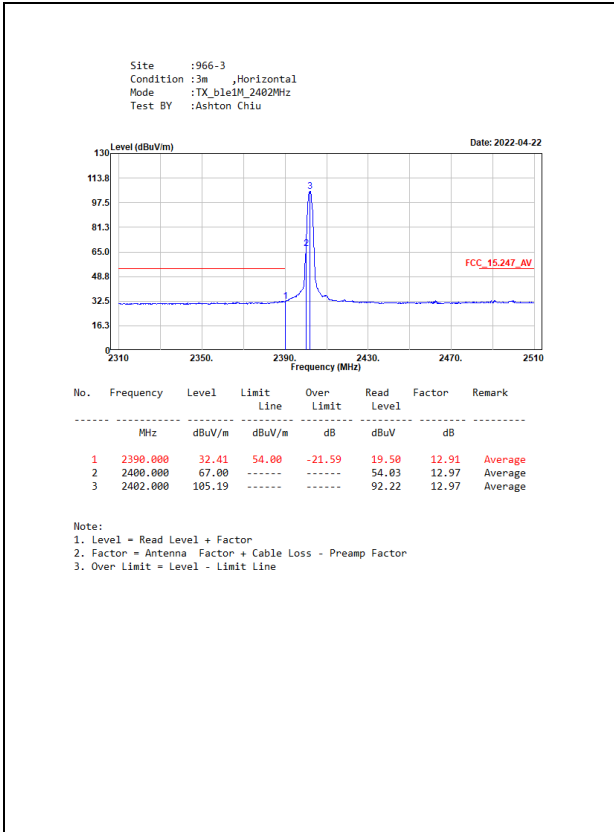
$VBW \geq 1/T$, when duty cycle $< 98 \%$

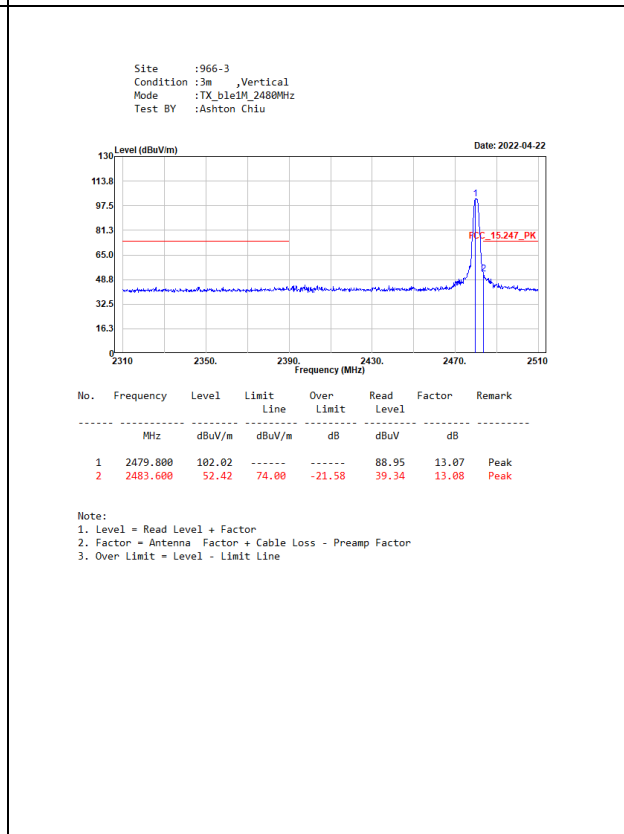
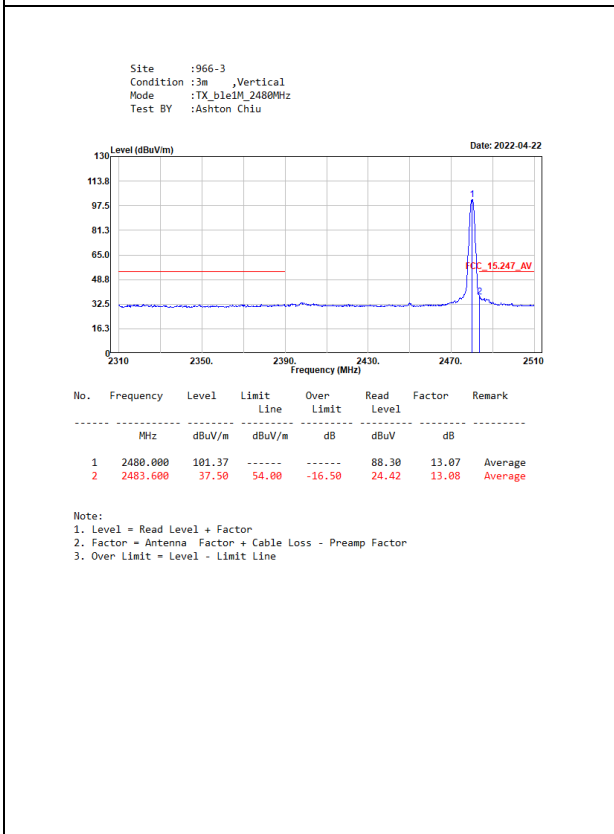
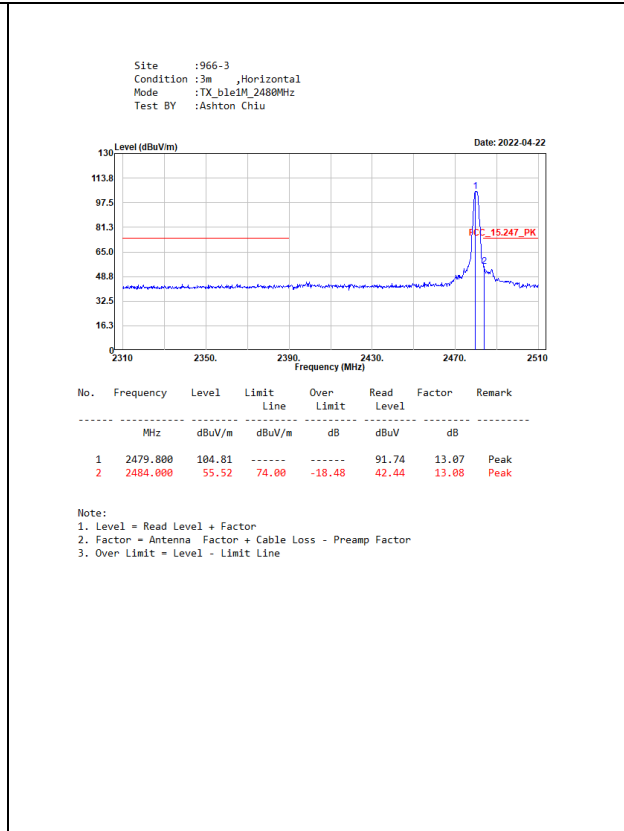
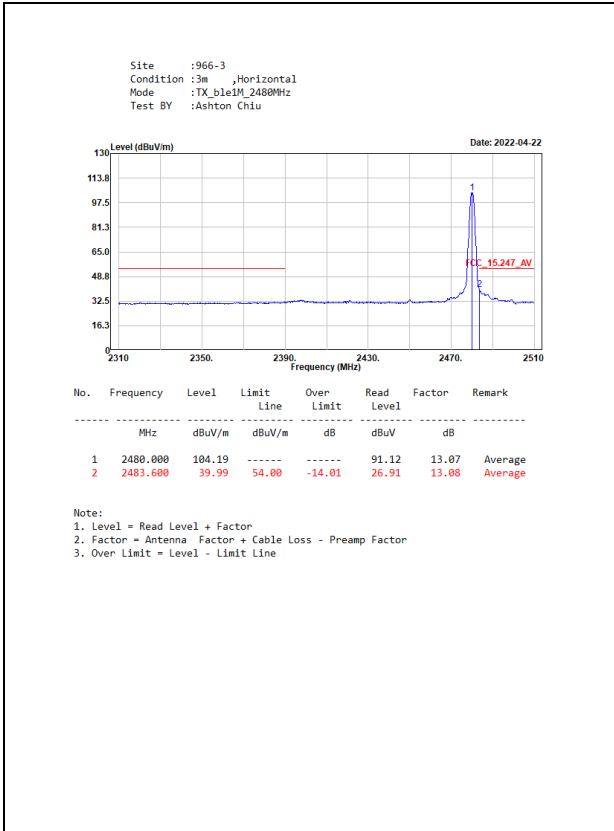
(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

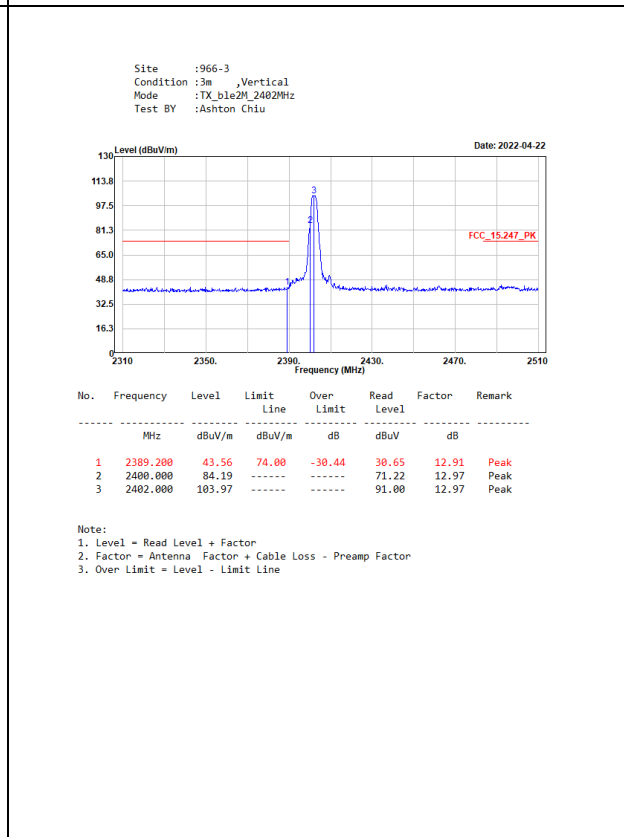
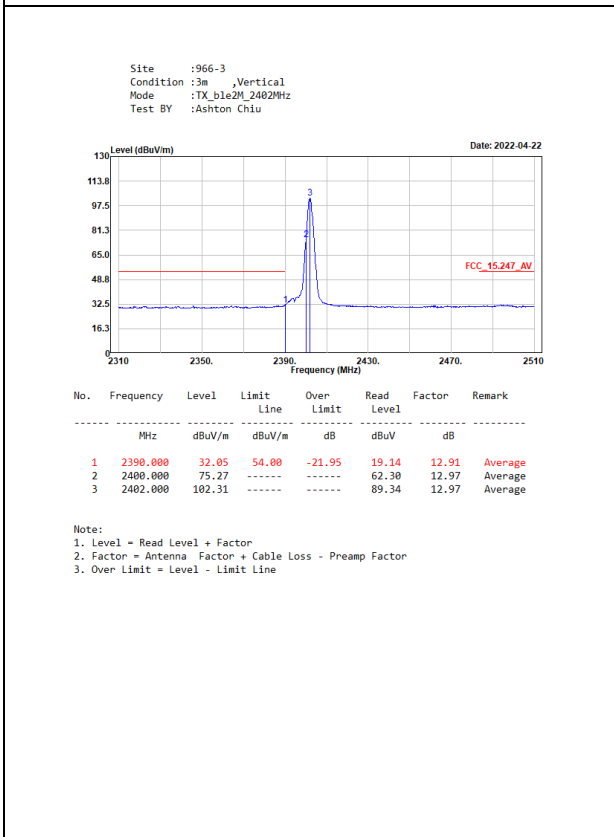
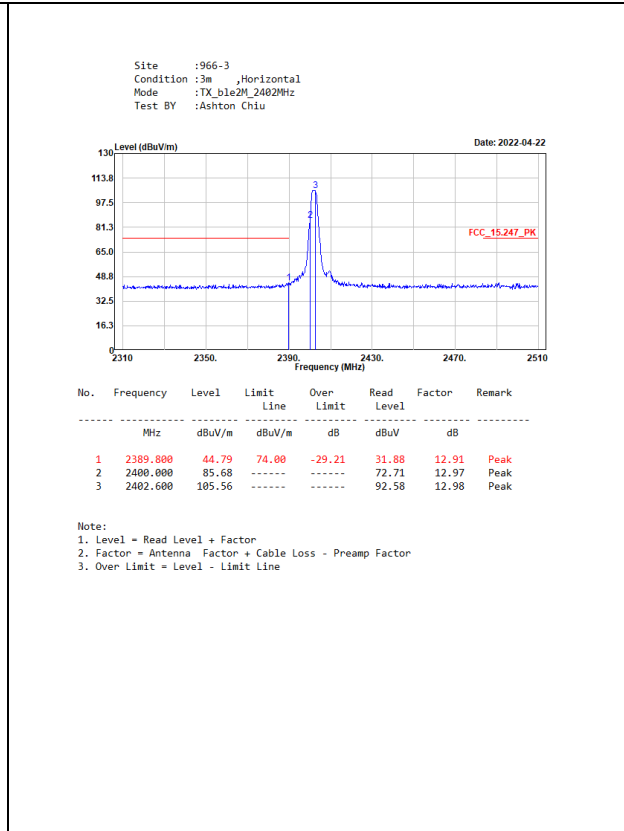
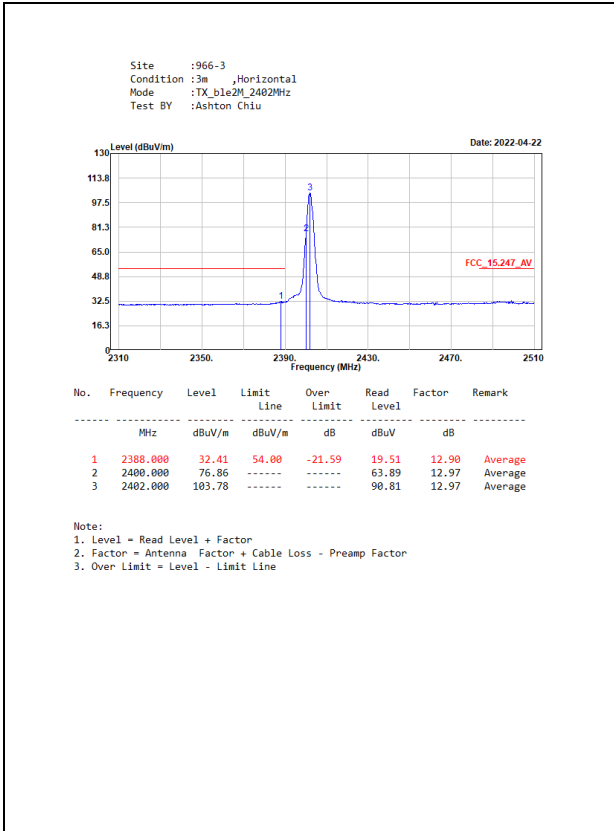
2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
BLE	85.37	2.1360	468	500

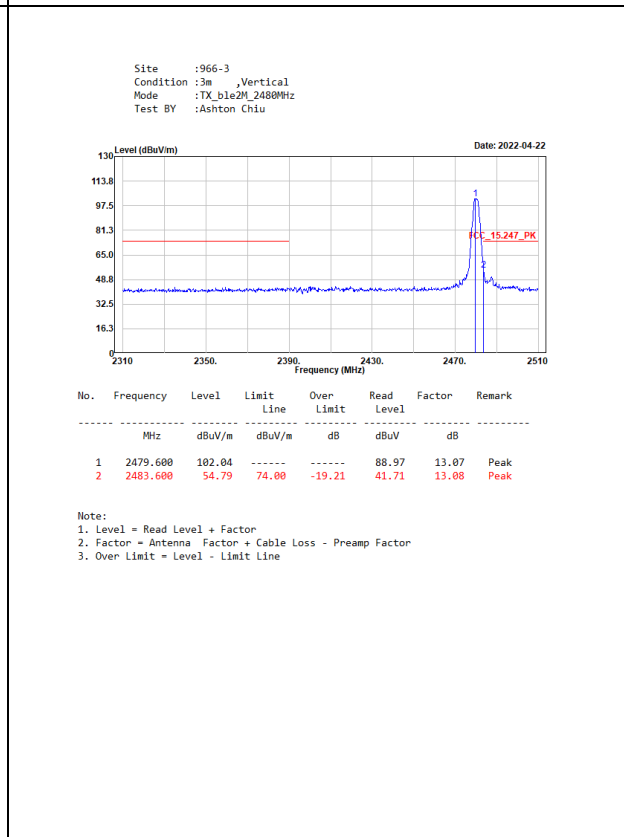
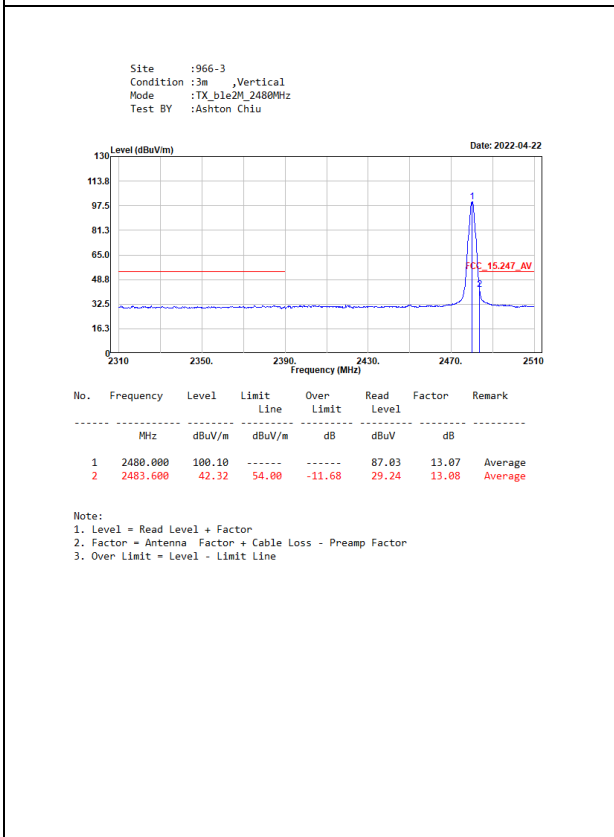
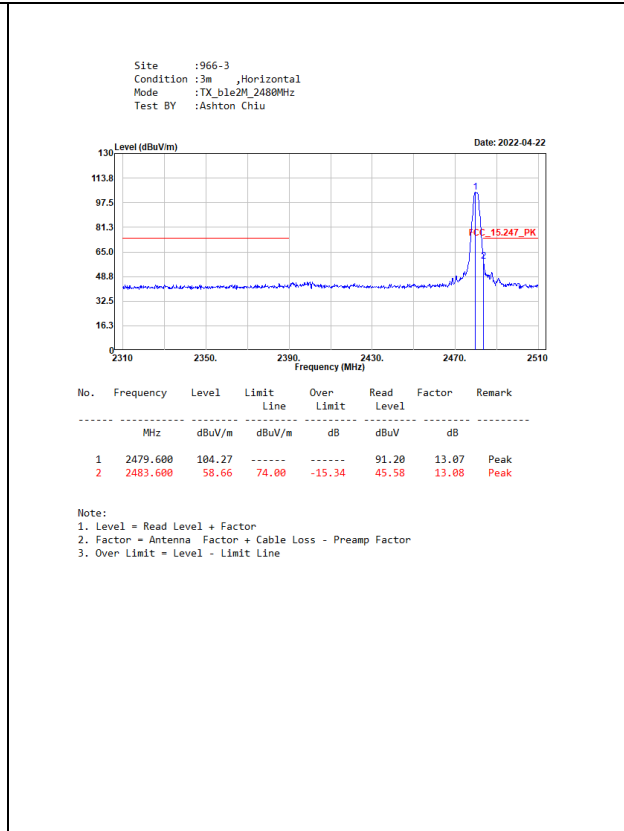
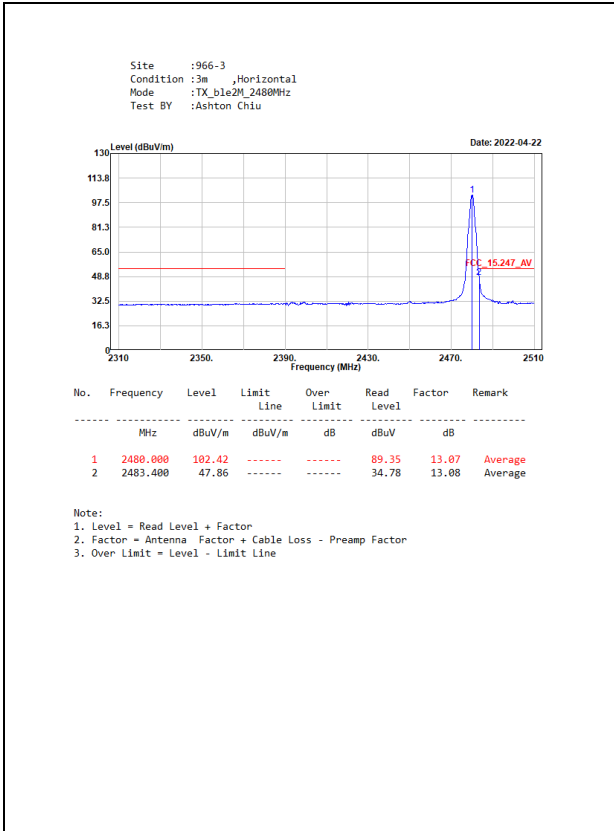
Note: Duty Cycle Refer to Section 9.

4.4. Test Result of Band Edge



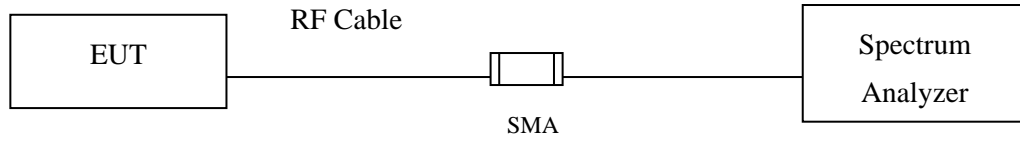






5. Duty Cycle

5.1. Test Setup



5.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to ANSI C63.10 2013 for compliance to FCC 47CFR 15.247 requirements.

5.3. Test Result of Duty Cycle

Product : Intel® Wi-Fi 6 AX200
 Test Item : Duty Cycle
 Test Mode : Mode 1: Transmit - BLE

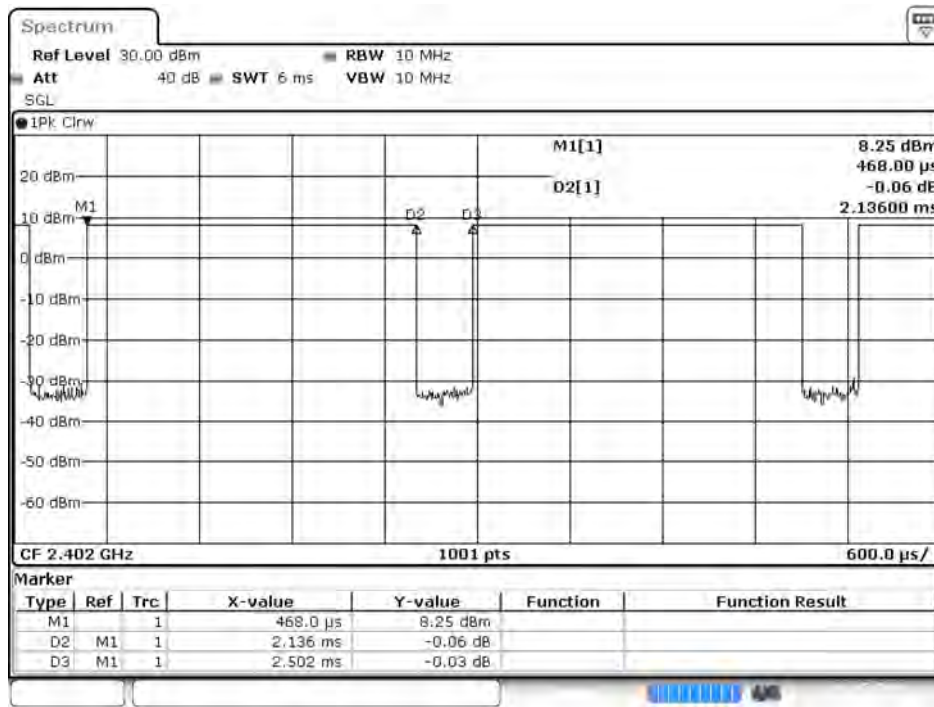
Duty Cycle Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

$$\text{Duty Factor} = 10 \text{ Log} (1/\text{Duty Cycle})$$

Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
BLE 1Mbps	2.1360	2.5020	85.37	0.69



Date: 15 FEB 2022 10:42:11

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.