



# FCC RADIO TEST REPORT

**FCC ID** : 2AIWVN302  
**Equipment** : Nanit Pro Baby Monitor  
**Brand Name** : Nanit  
**Model Name** : N302  
**Applicant** : Udisense Inc. DBA: Nanit  
244 Fifth Avenue Suite #2702, New York,  
NY, United States 10001  
**Manufacturer** : Udisense Inc. DBA: Nanit  
244 Fifth Avenue Suite #2702, New York,  
NY, United States 10001  
**Standard** : FCC Part 15 Subpart C §15.247

The product was received on Feb. 18, 2022 and testing was performed from Mar. 03, 2022 to Mar. 30, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

*Louis Wu*

Approved by: Louis Wu

**Sporton International Inc. Wensan Laboratory**

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)



## Table of Contents

<b>History of this test report.....</b>	<b>3</b>
<b>Summary of Test Result.....</b>	<b>4</b>
<b>1 General Description.....</b>	<b>5</b>
1.1 Product Feature of Equipment Under Test.....	5
1.2 Modification of EUT .....	5
1.3 Testing Location .....	6
1.4 Applicable Standards.....	6
<b>2 Test Configuration of Equipment Under Test .....</b>	<b>7</b>
2.1 Carrier Frequency Channel .....	7
2.2 Test Mode.....	8
2.3 Connection Diagram of Test System.....	9
2.4 Support Unit used in test configuration and system .....	9
2.5 EUT Operation Test Setup .....	10
2.6 Measurement Results Explanation Example.....	10
<b>3 Test Result.....</b>	<b>11</b>
3.1 6dB and 99% Bandwidth Measurement .....	11
3.2 Output Power Measurement.....	16
3.3 Power Spectral Density Measurement .....	17
3.4 Conducted Band Edges and Spurious Emission Measurement .....	22
3.5 Radiated Band Edges and Spurious Emission Measurement .....	28
3.6 AC Conducted Emission Measurement.....	32
3.7 Antenna Requirements.....	34
<b>4 List of Measuring Equipment .....</b>	<b>35</b>
<b>5 Uncertainty of Evaluation.....</b>	<b>36</b>
<b>Appendix A. Conducted Test Results</b>	
<b>Appendix B. AC Conducted Emission Test Result</b>	
<b>Appendix C. Radiated Spurious Emission</b>	
<b>Appendix D. Radiated Spurious Emission Plots</b>	
<b>Appendix E. Duty Cycle Plots</b>	
<b>Appendix F. Setup Photographs</b>	



## History of this test report

Report No.	Version	Description	Issue Date
FR221836B	01	Initial issue of report	May 03, 2022
FR221836B	02	Revise Product Feature of Equipment	May 10, 2022

## Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)(3)	Output Power	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	Pass	4.11 dB under the limit at 2376.150 MHz
3.6	15.207	AC Conducted Emission	Pass	15.98 dB under the limit at 0.618 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

**Declaration of Conformity:**

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.  
It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
- The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

**Comments and Explanations:**

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Yun Huang**

**Report Producer: Kaye Yang**



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac.

Product Feature	
Antenna Type	WLAN <Ant. 1>: Dipole Antenna <Ant. 2>: Dipole Antenna Bluetooth: Dipole Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	2.0

**Remark:** The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

## 1.2 Modification of EUT

No modifications made to the EUT during the testing.

### 1.3 Testing Location

<b>Test Site</b>	Sporton International Inc. EMC & Wireless Communications Laboratory
<b>Test Site Location</b>	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
<b>Test Site No.</b>	<b>Sporton Site No.</b> CO05-HY (TAF Code: 1190)
<b>Remark</b>	The AC Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory.

**Note:** The test site complies with ANSI C63.4 2014 requirement.

<b>Test Site</b>	Sporton International Inc. Wensan Laboratory
<b>Test Site Location</b>	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
<b>Test Site No.</b>	<b>Sporton Site No.</b> TH05-HY, 03CH20-HY

FCC designation No.: TW1190 and TW3786

### 1.4 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ ANSI C63.10-2013

**Remark:**

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.—

## 2 Test Configuration of Equipment Under Test

### 2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	0	2402	21	2444
	1	2404	22	2446
	2	2406	23	2448
	3	2408	24	2450
	4	2410	25	2452
	5	2412	26	2454
	6	2414	27	2456
	7	2416	28	2458
	8	2418	29	2460
	9	2420	30	2462
	10	2422	31	2464
	11	2424	32	2466
	12	2426	33	2468
	13	2428	34	2470
	14	2430	35	2472
	15	2432	36	2474
	16	2434	37	2476
	17	2436	38	2478
	18	2438	39	2480
	19	2440	-	-
	20	2442	-	-

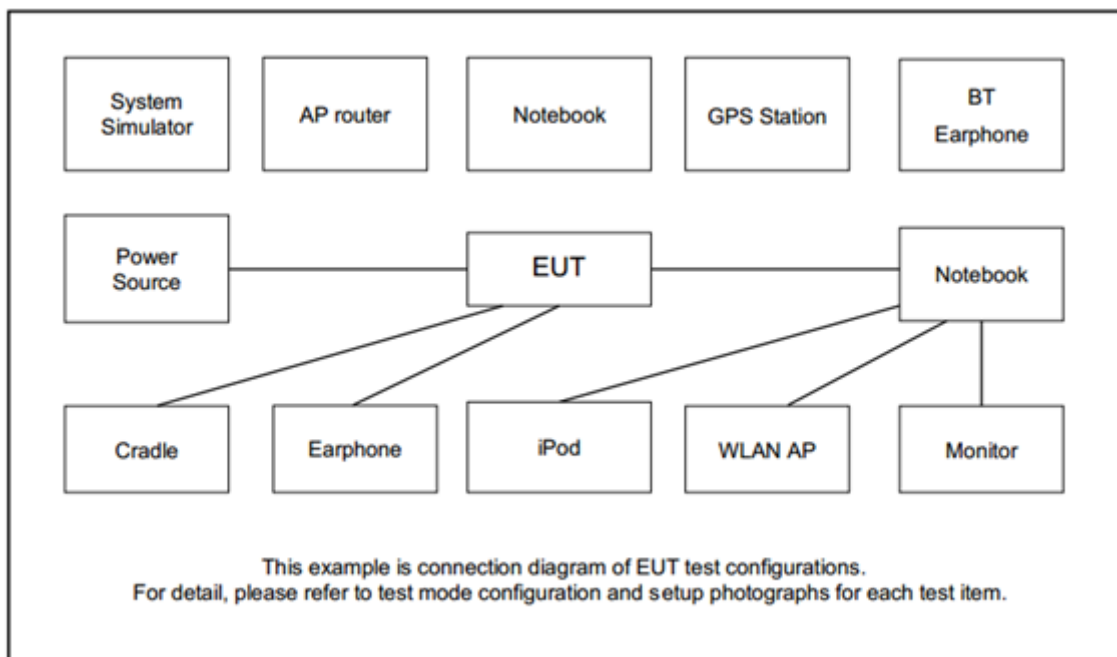
## 2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find Z plane with Notebook as worst plane.
- b. AC power line Conducted Emission was tested under maximum output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	Data Rate / Modulation
Conducted Test Cases	Bluetooth – LE / GFSK
	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps
	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
	Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps
	Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps
	Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps
Radiated Test Cases	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps
	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
	Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps
	Mode 5: Bluetooth Tx CH19_2440 MHz_2Mbps
	Mode 6: Bluetooth Tx CH39_2480 MHz_2Mbps
AC Conducted Emission	Mode 1: Bluetooth Link + WLAN (2.4GHz) Link + Multi Stand + Adapter (US)

## 2.3 Connection Diagram of Test System



## 2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8m
2.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	Dell	Latitude 5310	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Mobile Phone	SAMSUNG	SM-A730F/DS	A3LSMA730F	N/A	N/A



## 2.5 EUT Operation Test Setup

The RF test items, utility "Command v10.0.17134.1304" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

## 2.6 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

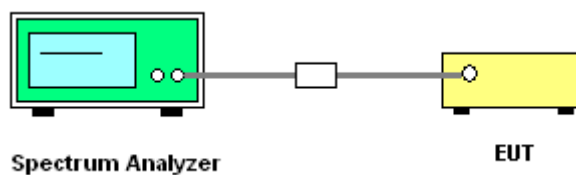
##### 3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

##### 3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW)  $\geq 3 * RBW$ .
6. Measure and record the results in the test report.

##### 3.1.4 Test Setup

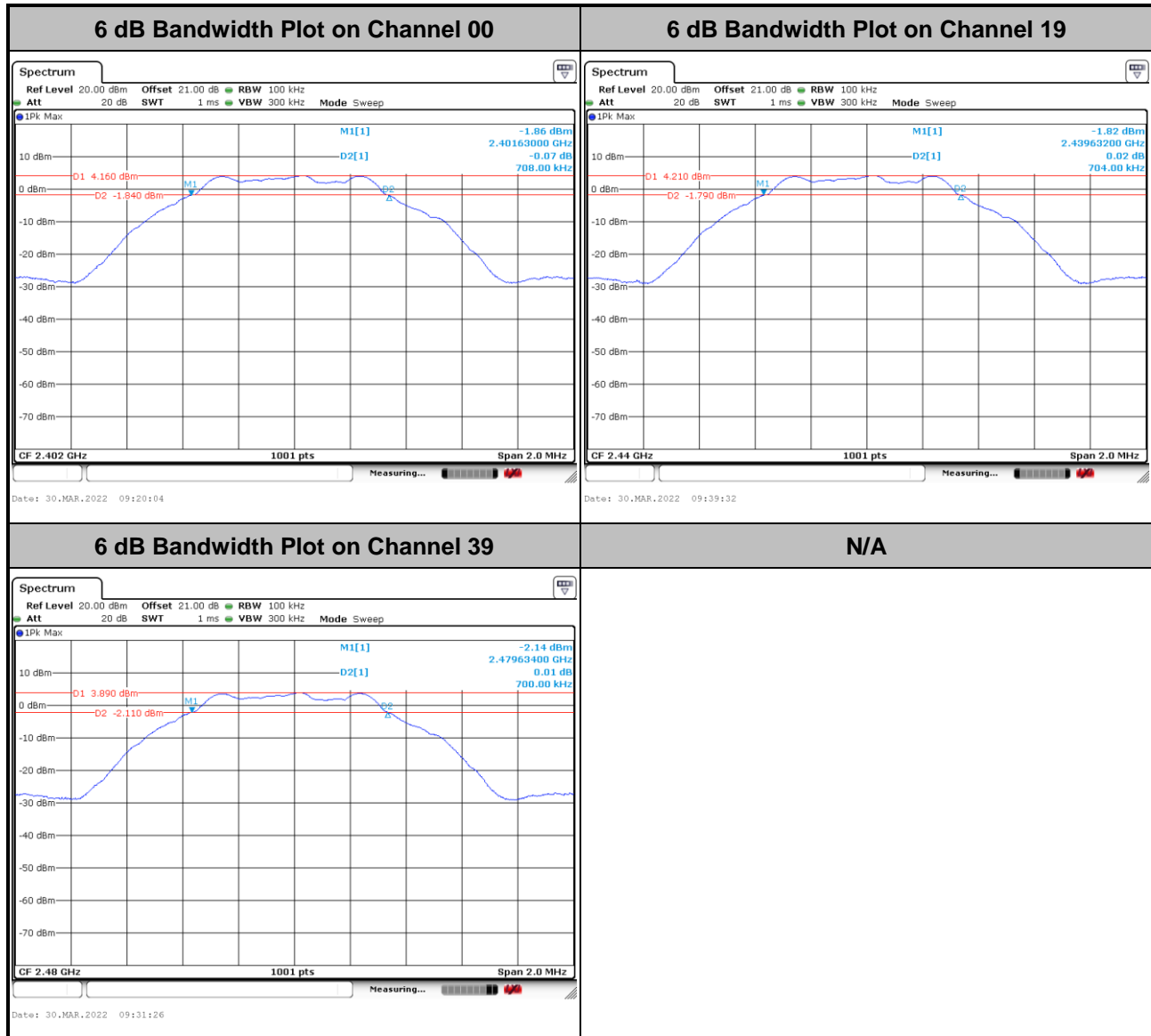




## 3.1.5 Test Result of 6dB Bandwidth

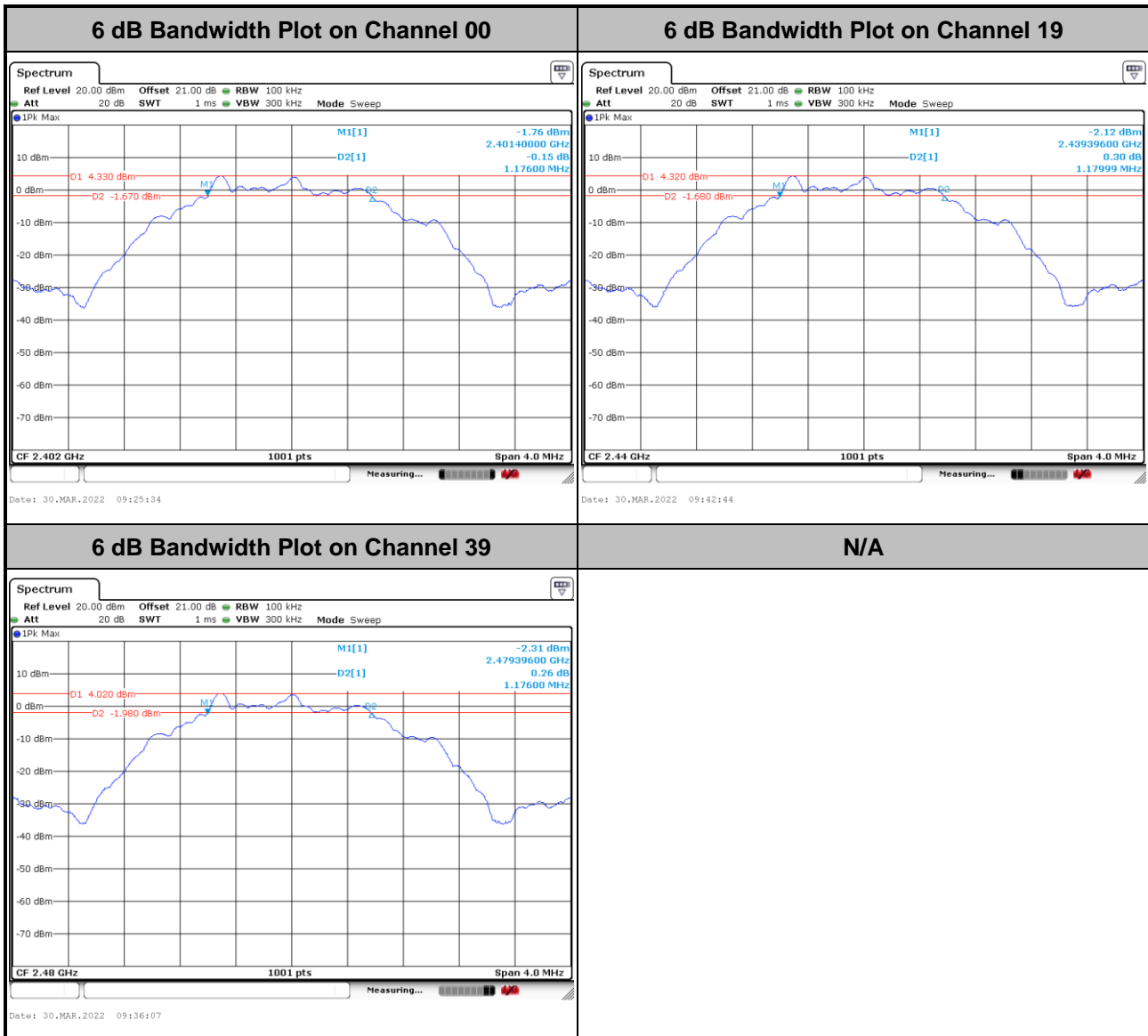
Please refer to Appendix A.

&lt;1Mbps&gt;





<2Mbps>

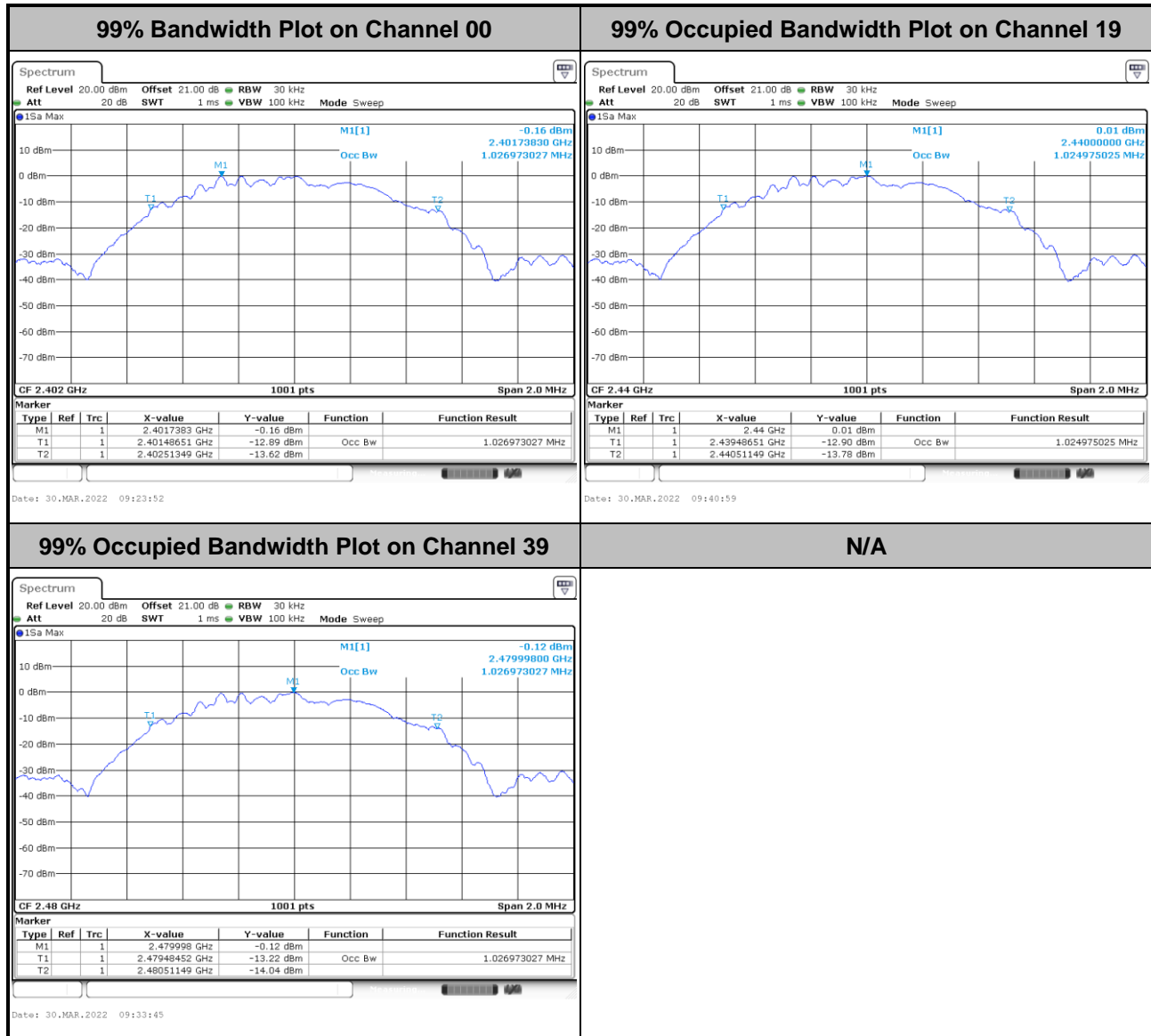




## 3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

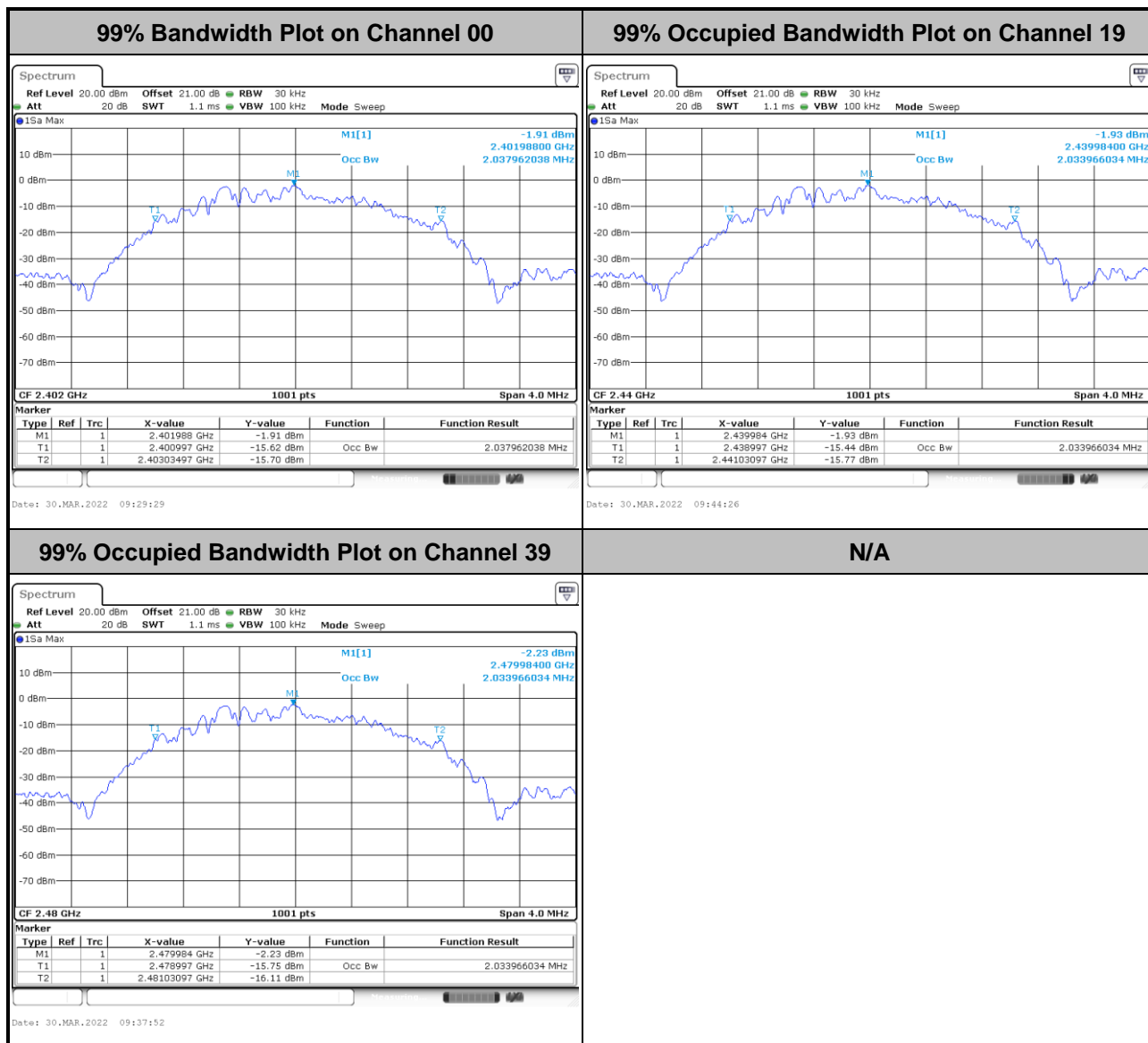
&lt;1Mbps&gt;



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



&lt;2Mbps&gt;



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

## **3.2 Output Power Measurement**

### **3.2.1 Limit of Output Power**

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna of directional gain greater than 6 dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

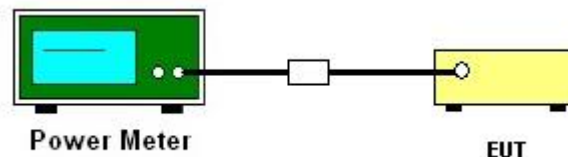
### **3.2.2 Measuring Instruments**

Please refer to the measuring equipment list in this test report.

### **3.2.3 Test Procedures**

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT is connected to the power meter by RF cable and attenuator.
3. The path loss is compensated to the results for each measurement.
4. Set the maximum power setting and enable the EUT to transmit continuously.
5. Measure the conducted output power and record the results in the test report.

### **3.2.4 Test Setup**



### **3.2.5 Test Result of Average Output Power**

Please refer to Appendix A.

### 3.3 Power Spectral Density Measurement

#### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

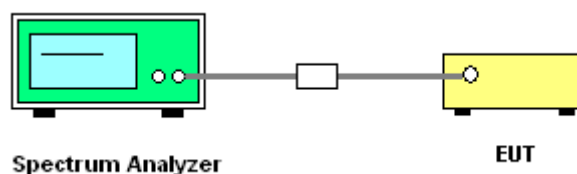
#### 3.3.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

#### 3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth (VBW) = 10 kHz. In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6 dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100 kHz is a reference level and is used as 20 dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

#### 3.3.4 Test Setup



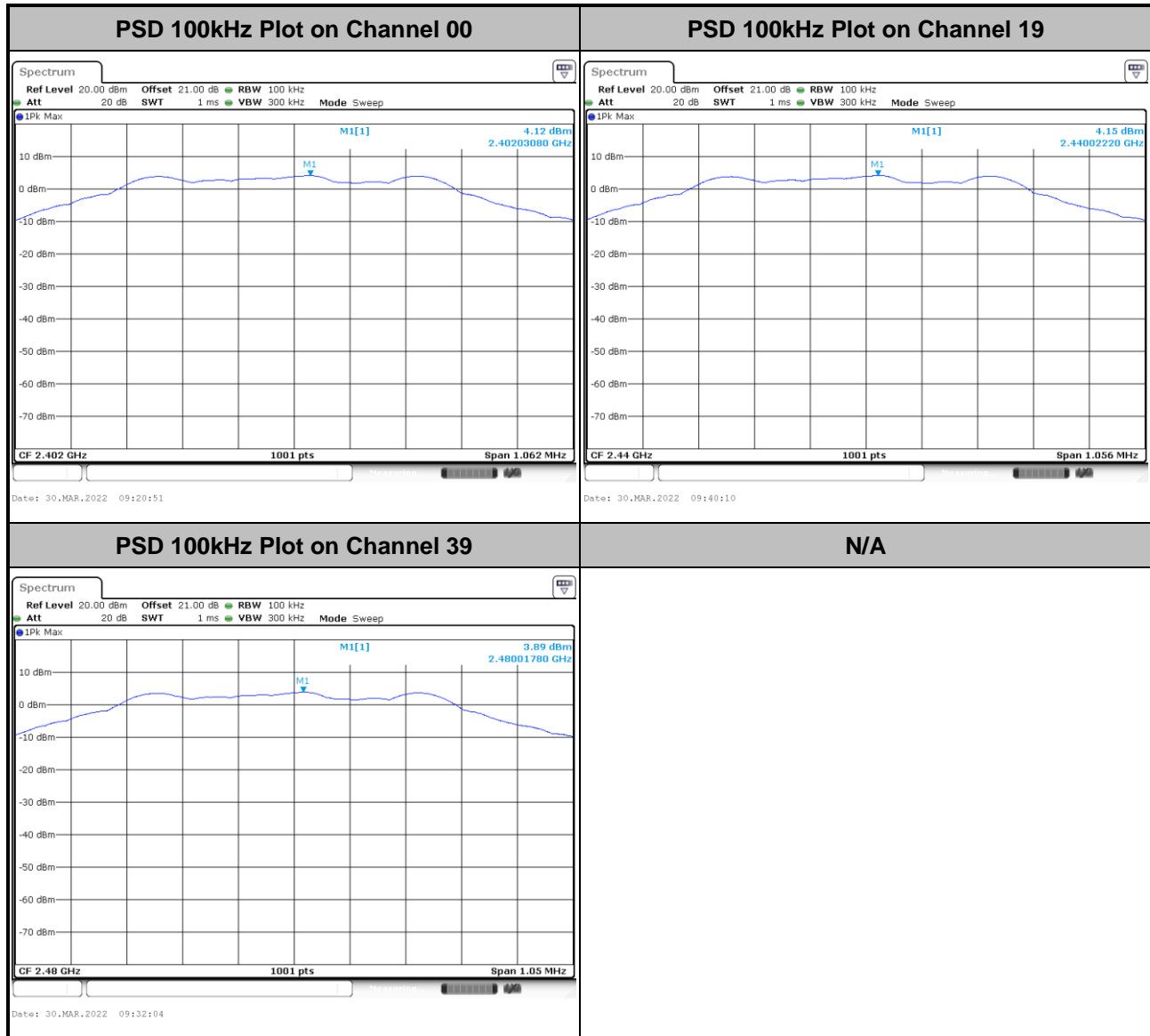
#### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



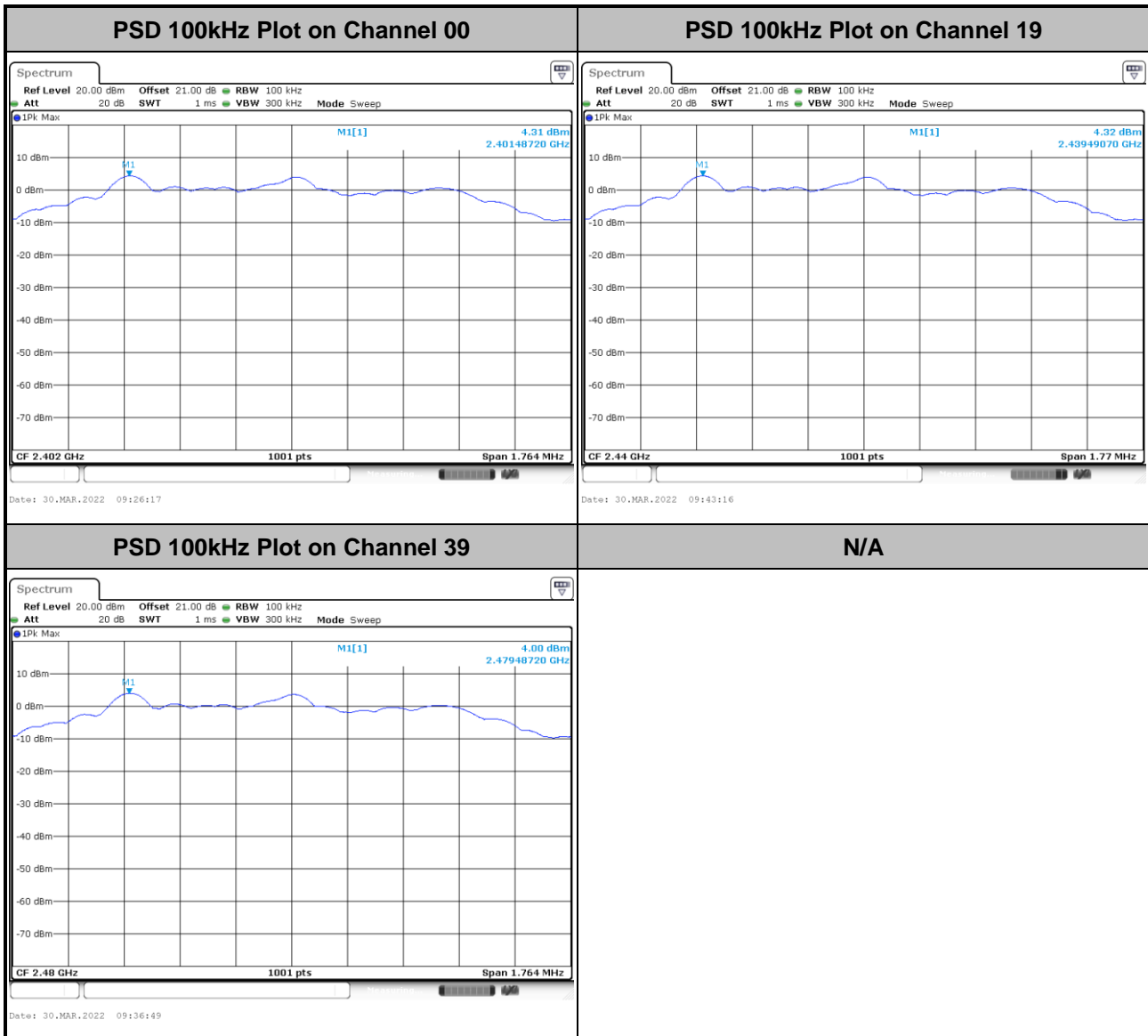
## 3.3.6 Test Result of Power Spectral Density Plots (100kHz)

&lt;1Mbps&gt;





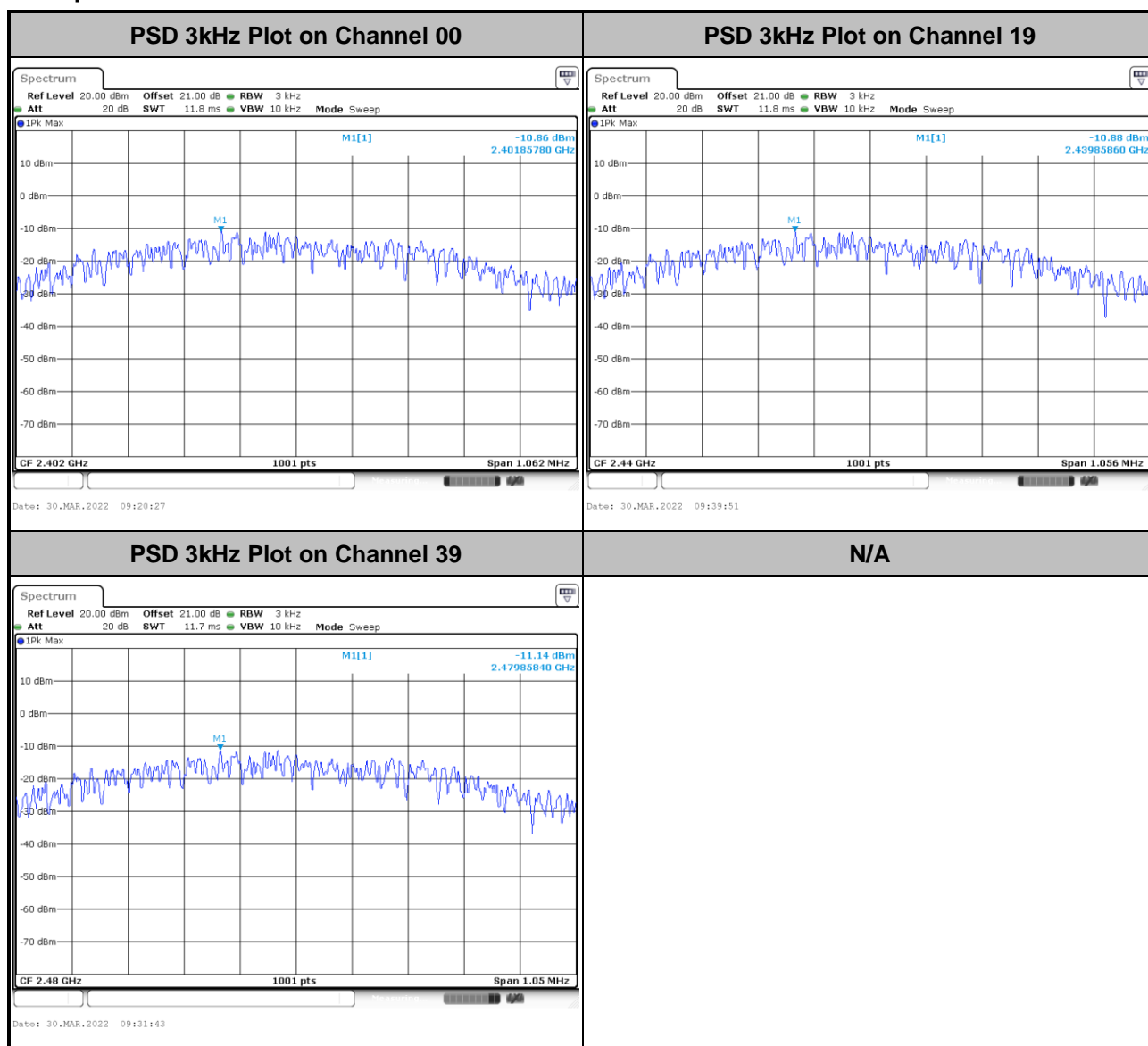
<2Mbps>





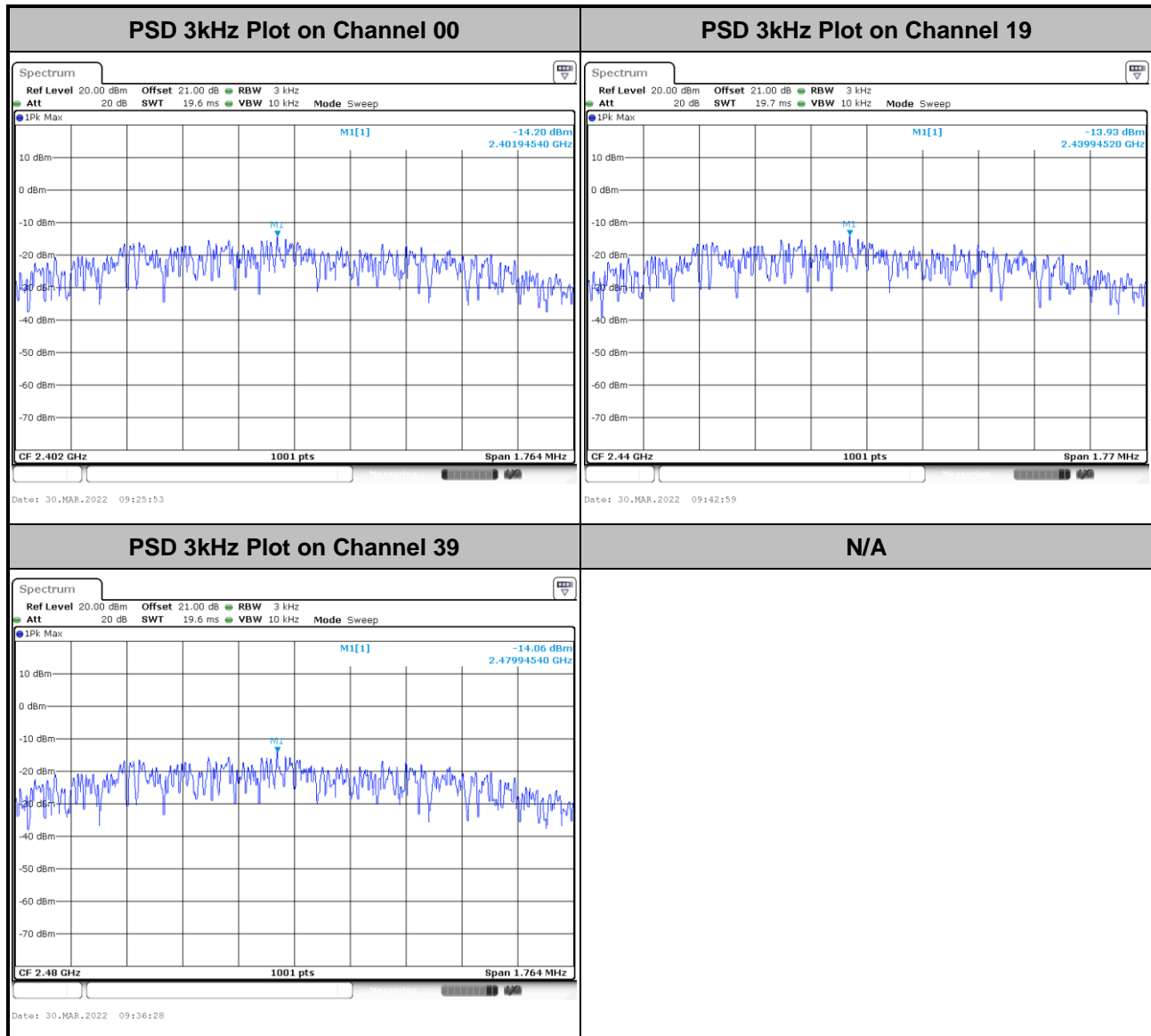
## 3.3.7 Test Result of Power Spectral Density Plots (3kHz)

&lt;1Mbps&gt;





<2Mbps>



### **3.4 Conducted Band Edges and Spurious Emission Measurement**

#### **3.4.1 Limit of Conducted Band Edges and Spurious Emission**

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

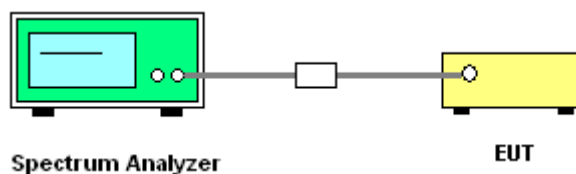
#### **3.4.2 Measuring Instruments**

Please refer to the measuring equipment list in this test report.

#### **3.4.3 Test Procedure**

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Set RBW = 100 kHz, VBW = 300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. 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.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

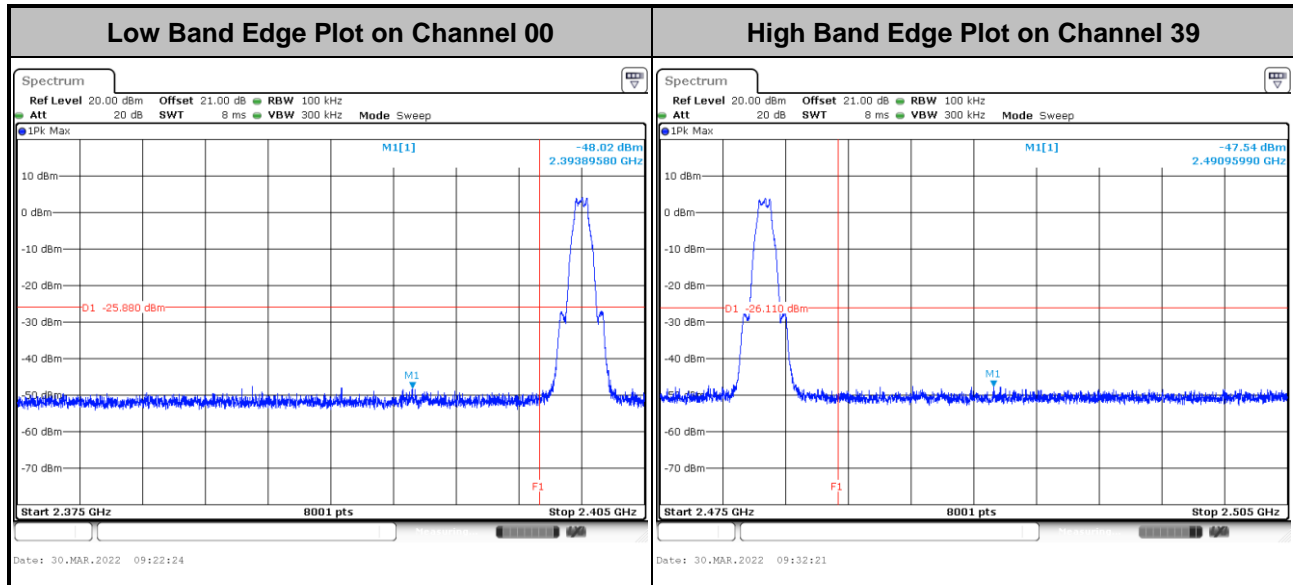
#### **3.4.4 Test Setup**



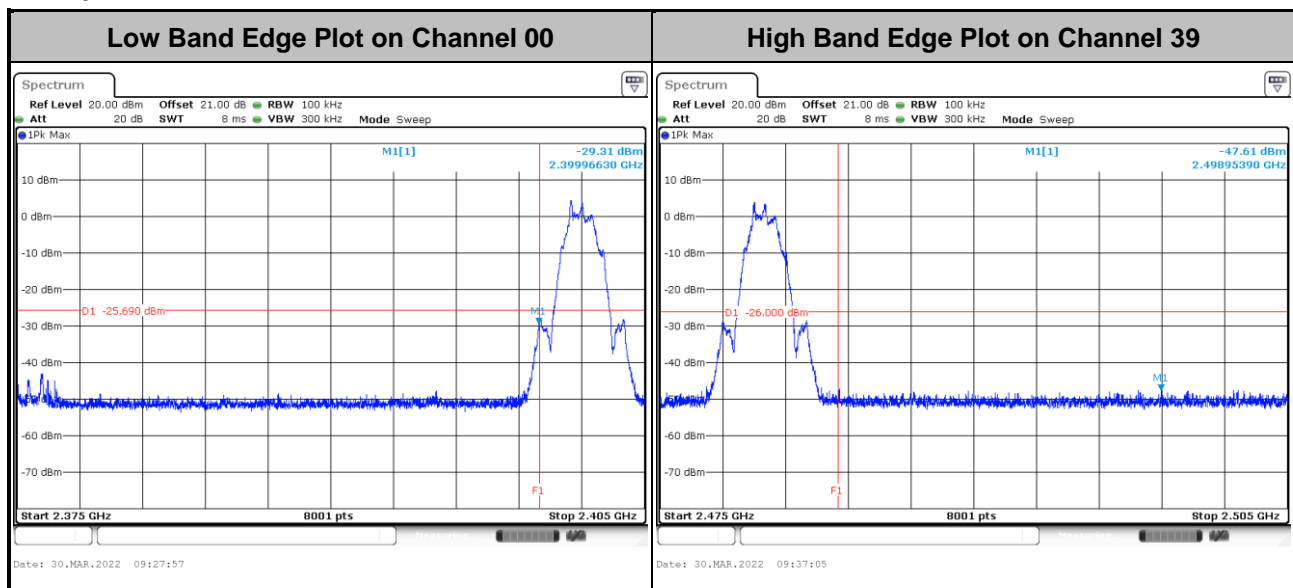


## 3.4.5 Test Result of Conducted Band Edges Plots

&lt;1Mbps&gt;



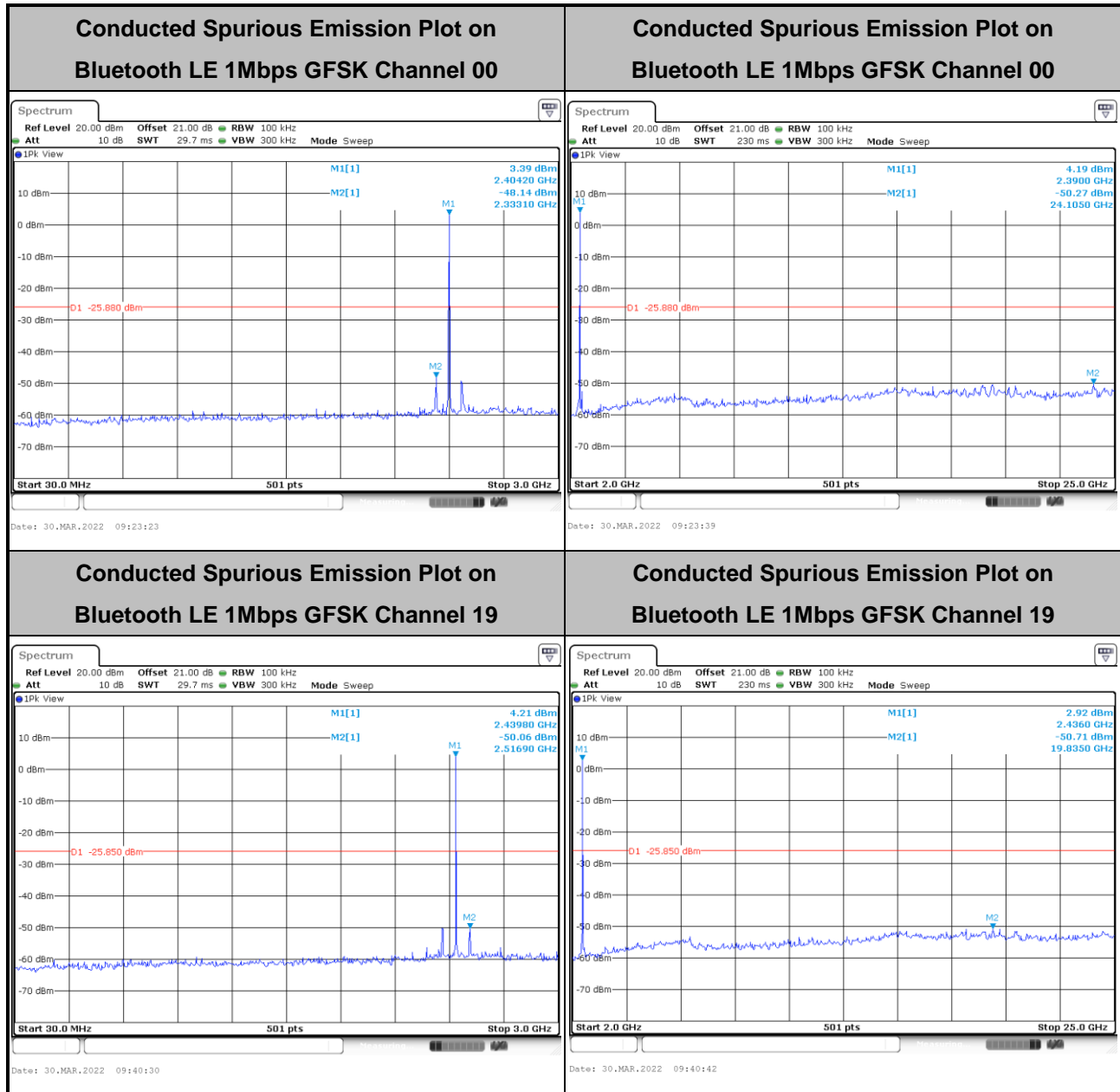
&lt;2Mbps&gt;





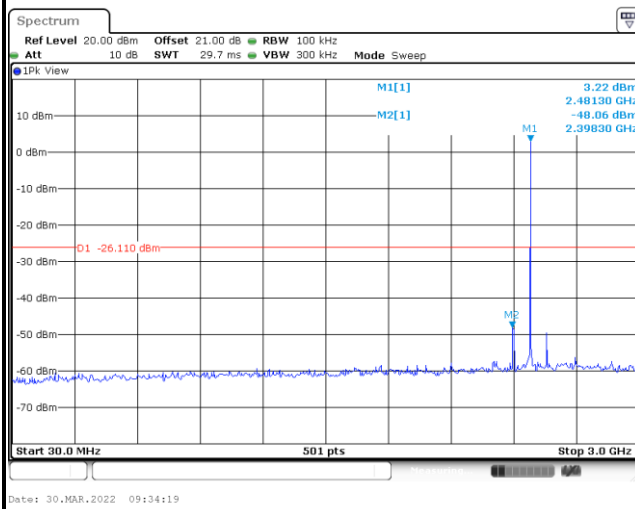
## 3.4.6 Test Result of Conducted Spurious Emission Plots

&lt;1Mbps&gt;

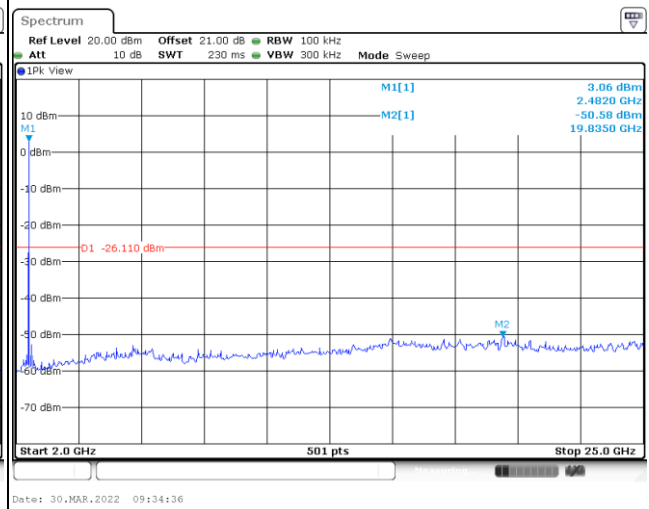




Conducted Spurious Emission Plot on  
Bluetooth LE 1Mbps GFSK Channel 39

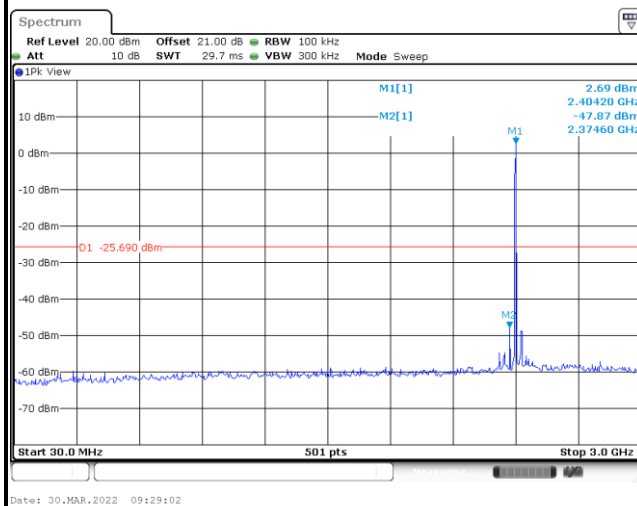
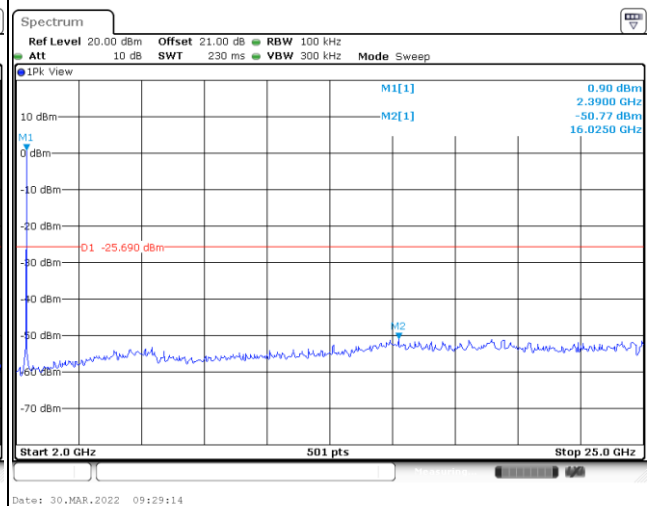
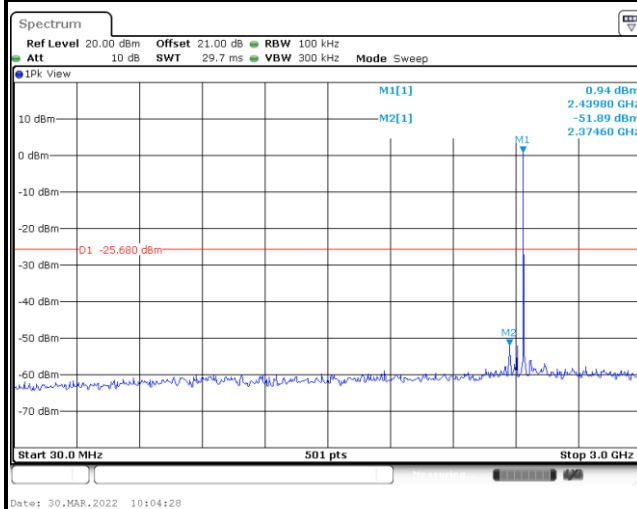
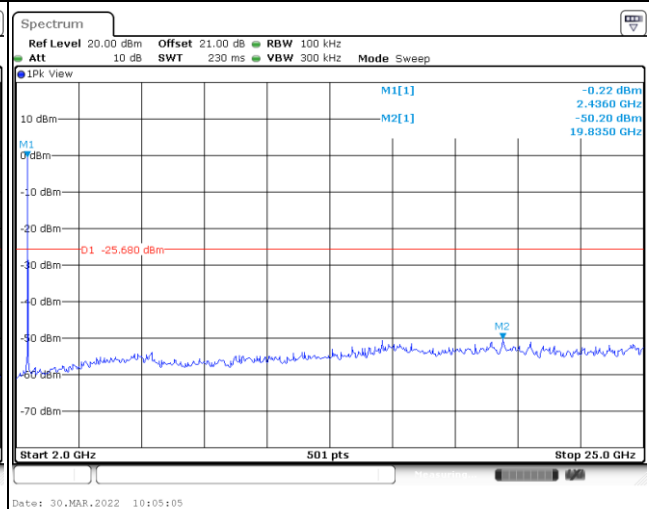


Conducted Spurious Emission Plot on  
Bluetooth LE 1Mbps GFSK Channel 39



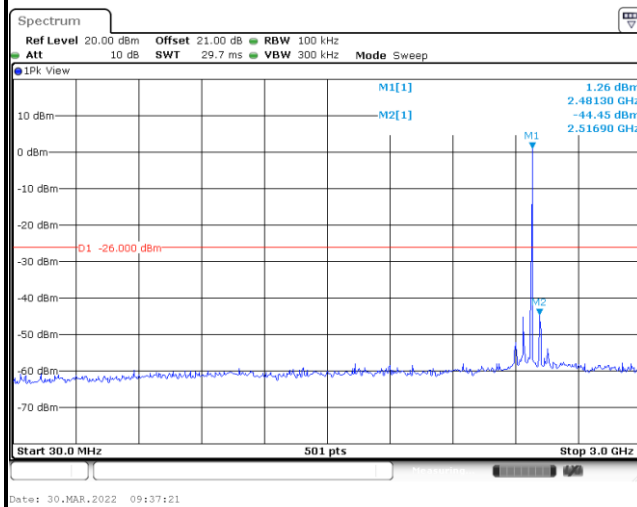


&lt;2Mbps&gt;

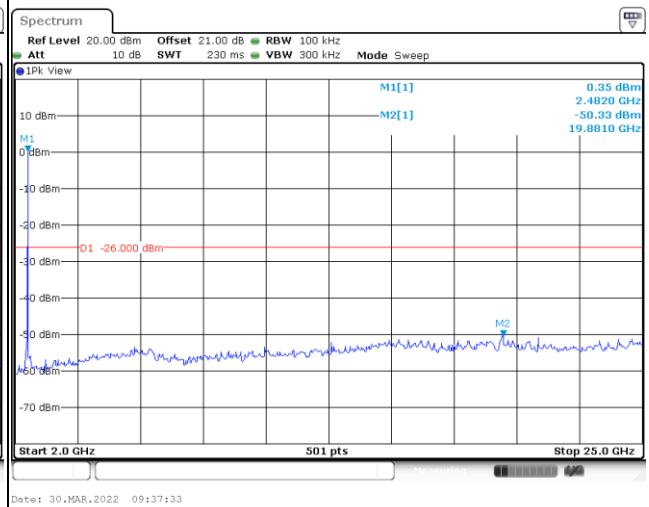
**Conducted Spurious Emission Plot on  
Bluetooth LE 2Mbps GFSK Channel 00****Conducted Spurious Emission Plot on  
Bluetooth LE 2Mbps GFSK Channel 00****Conducted Spurious Emission Plot on  
Bluetooth LE 2Mbps GFSK Channel 19****Conducted Spurious Emission Plot on  
Bluetooth LE 2Mbps GFSK Channel 19**



Conducted Spurious Emission Plot on  
Bluetooth LE 2Mbps GFSK Channel 39



Conducted Spurious Emission Plot on  
Bluetooth LE 2Mbps GFSK Channel 39



### 3.5 Radiated Band Edges and Spurious Emission Measurement

#### 3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device is measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

#### 3.5.2 Measuring Instruments

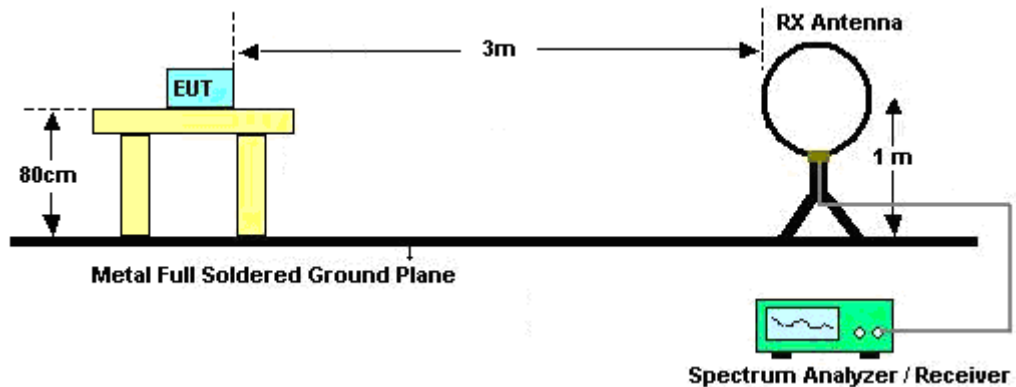
Please refer to the measuring equipment list in this test report.

### 3.5.3 Test Procedures

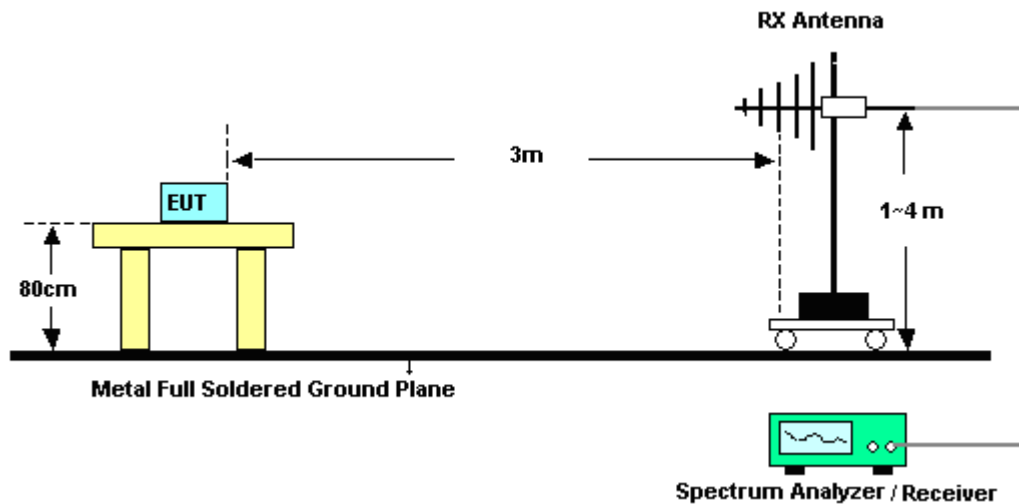
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-”.
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-”.
8. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW = 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW = 3 MHz for  $f \geq 1$  GHz for peak measurement.For average measurement:
  - VBW = 10 Hz, when duty cycle is no less than 98 percent.
  - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is 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.

### 3.5.4 Test Setup

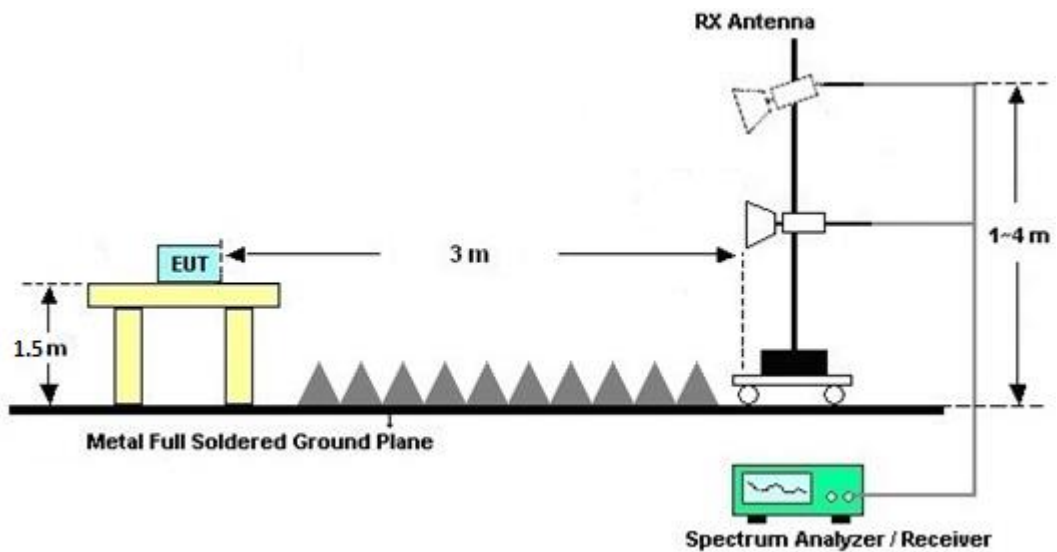
For radiated test below 30MHz



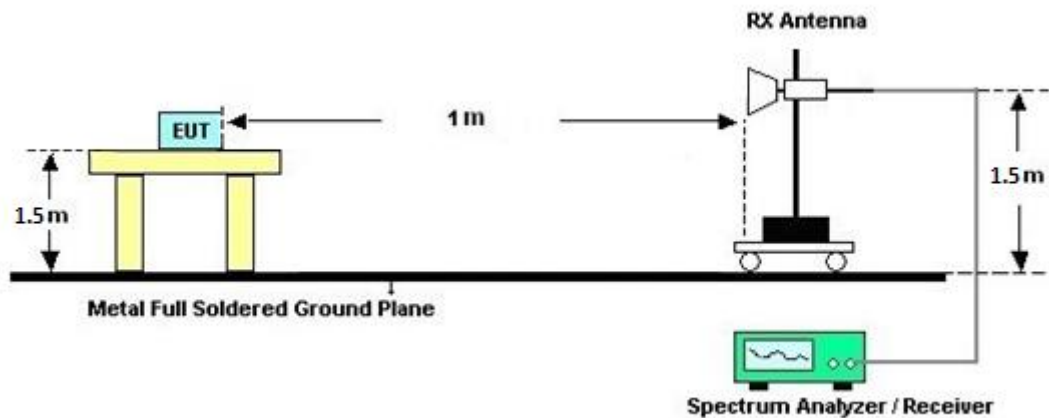
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



### 3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result comes out very similar.

### 3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

### 3.5.7 Duty Cycle

Please refer to Appendix E.

### 3.5.8 Test Result of Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

### 3.6 AC Conducted Emission Measurement

#### 3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

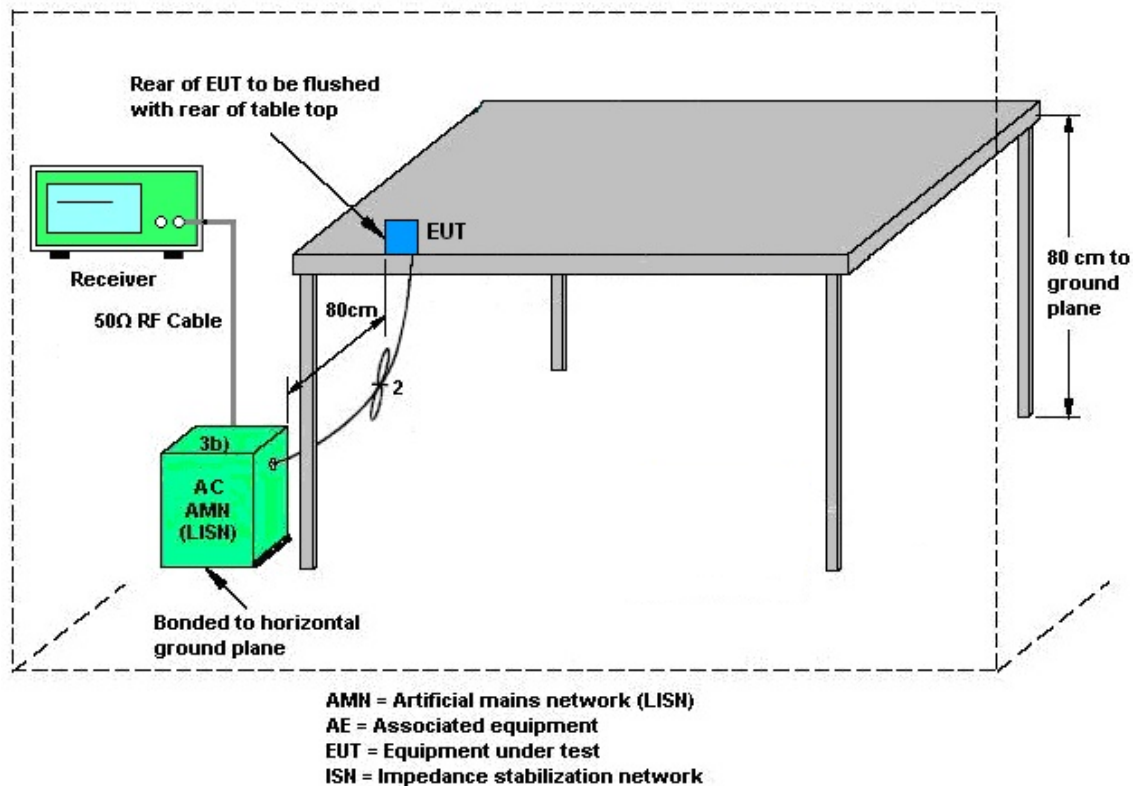
#### 3.6.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

#### 3.6.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9 kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

### 3.6.4 Test Setup



### 3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



## **3.7 Antenna Requirements**

### **3.7.1 Standard Applicable**

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

### **3.7.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.7.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



## 4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 03, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Mar. 03, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Mar. 03, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Mar. 03, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Mar. 03, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-FN	00691	N/A	Jul. 28, 2021	Mar. 03, 2022	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Mar. 03, 2022	Dec. 29, 2022	Conduction (CO05-HY)
Hygrometer	TECEPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Mar. 07, 2022~ Mar. 30, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15I00041SNO 10 (NO:248)	10MHz~6GHz	Dec. 29, 2021	Mar. 07, 2022~ Mar. 30, 2022	Dec. 28, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Mar. 07, 2022~ Mar. 30, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Manframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Mar. 07, 2022~ Mar. 30, 2022	Aug. 11, 2022	Conducted (TH05-HY)
EMI Test Receiver	Keysight	N9010B	MY60241055	10Hz~44GHz	Jul. 12, 2021	Mar. 15, 2022~ Mar. 26, 2022	Jul. 11, 2022	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz~1000MHz	Jan. 03, 2022	Mar. 15, 2022~ Mar. 26, 2022	Jan. 02, 2023	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 15, 2021	Mar. 15, 2022~ Mar. 26, 2022	Nov. 14, 2022	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 22, 2021	Mar. 15, 2022 ~ Mar. 26, 2022	Jun. 21, 2022	Radiation (03CH20-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 07, 2022	Mar. 15, 2022~ Mar. 26, 2022	Jan. 06, 2023	Radiation (03CH20-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802 N1D01N-06	55606 & 08	30MHz~1GHz	Oct. 17, 2021	Mar. 15, 2022~ Mar. 26, 2022	Oct. 16, 2022	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02294	1GHz~18GHz	Jun. 23, 2021	Mar. 15, 2022~ Mar. 26, 2022	Jun. 22, 2022	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz~40GHz	Nov. 30, 2021	Mar. 15, 2022~ Mar. 26, 2022	Nov. 29, 2022	Radiation (03CH20-HY)
Hygrometer	TECEPEL	DTM-303B	TP200889	N/A	Sep. 30, 2021	Mar. 15, 2022~ Mar. 26, 2022	Sep. 29, 2022	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804 015/2,804027 /2	N/A	Jan. 19, 2022	Mar. 15, 2022~ Mar. 26, 2022	Jan. 18, 2023	Radiation (03CH20-HY)
Software	Audix	E3 6.2009-8-24	RK-002156	N/A	N/A	Mar. 15, 2022~ Mar. 26, 2022	N/A	Radiation (03CH20-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Mar. 15, 2022~ Mar. 26, 2022	N/A	Radiation (03CH20-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 15, 2022~ Mar. 26, 2022	N/A	Radiation (03CH20-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Mar. 15, 2022~ Mar. 26, 2022	N/A	Radiation (03CH20-HY)

## 5 Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ )	3.1 dB
--	--------

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ )	5.9 dB
--	--------

### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ )	5.2 dB
--	--------

### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2U_c(y)$ )	5.7 dB
--	--------

## Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ching Chen	Temperature:	21~25	°C
Test Date:	2022/3/7-2022/3/30	Relative Humidity:	51~54	%

### TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.027	0.708	0.50	Pass
BLE	1Mbps	1	19	2440	1.025	0.704	0.50	Pass
BLE	1Mbps	1	39	2480	1.027	0.700	0.50	Pass

### TEST RESULTS DATA Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE	1Mbps	1	0	2402	5.30	30.00	2.00	7.30	36.00	Pass
BLE	1Mbps	1	19	2440	5.10	30.00	2.00	7.10	36.00	Pass
BLE	1Mbps	1	39	2480	5.00	30.00	2.00	7.00	36.00	Pass

### TEST RESULTS DATA Peak Power Density

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE	1Mbps	1	0	2402	4.12	-10.86	2.00	8.00	Pass
BLE	1Mbps	1	19	2440	4.15	-10.88	2.00	8.00	Pass
BLE	1Mbps	1	39	2480	3.89	-11.14	2.00	8.00	Pass

**Note:** PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.

**TEST RESULTS DATA**  
**6dB and 99% Occupied Bandwidth**

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE5.0	2Mbps	1	0	2402	2.038	1.176	0.50	Pass
BLE5.0	2Mbps	1	19	2440	2.034	1.180	0.50	Pass
BLE5.0	2Mbps	1	39	2480	2.034	1.176	0.50	Pass

**TEST RESULTS DATA**  
**Average Power Table**

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
BLE5.0	2Mbps	1	0	2402	5.20	30.00	2.00	7.20	36.00	Pass
BLE5.0	2Mbps	1	19	2440	5.00	30.00	2.00	7.00	36.00	Pass
BLE5.0	2Mbps	1	39	2480	4.90	30.00	2.00	6.90	36.00	Pass

**TEST RESULTS DATA**  
**Peak Power Density**

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /100kHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
BLE5.0	2Mbps	1	0	2402	4.31	-14.20	2.00	8.00	Pass
BLE5.0	2Mbps	1	19	2440	4.32	-13.93	2.00	8.00	Pass
BLE5.0	2Mbps	1	39	2480	4.00	-14.06	2.00	8.00	Pass

**Note:** PSD (dBm/ 100kHz) is a reference level used for Conducted Band Edges and Conducted Spurious Emission 30dBc limit.



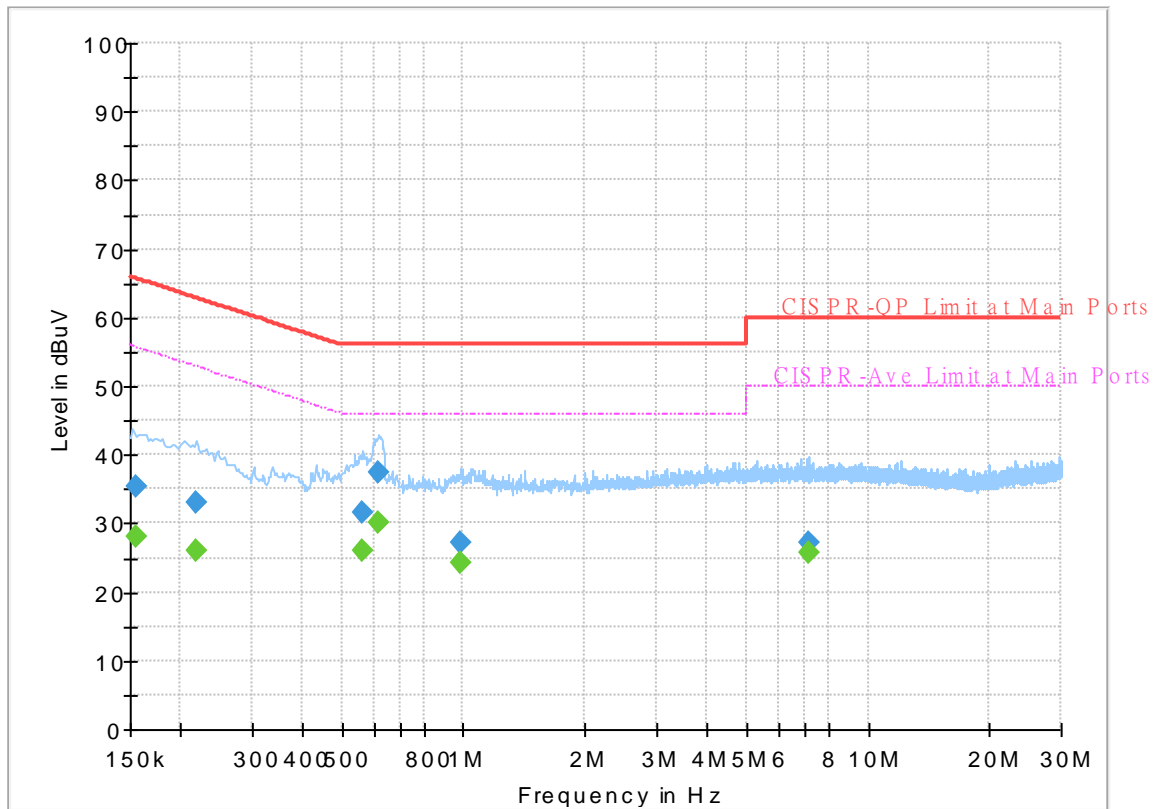
## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	Temperature :	23~26°C
		Relative Humidity :	45~55%

## EUT Information

Report NO : 221836  
Test Mode : Mode 1  
Test Voltage : 120Vac/60Hz  
Phase : Line

Full Spectrum



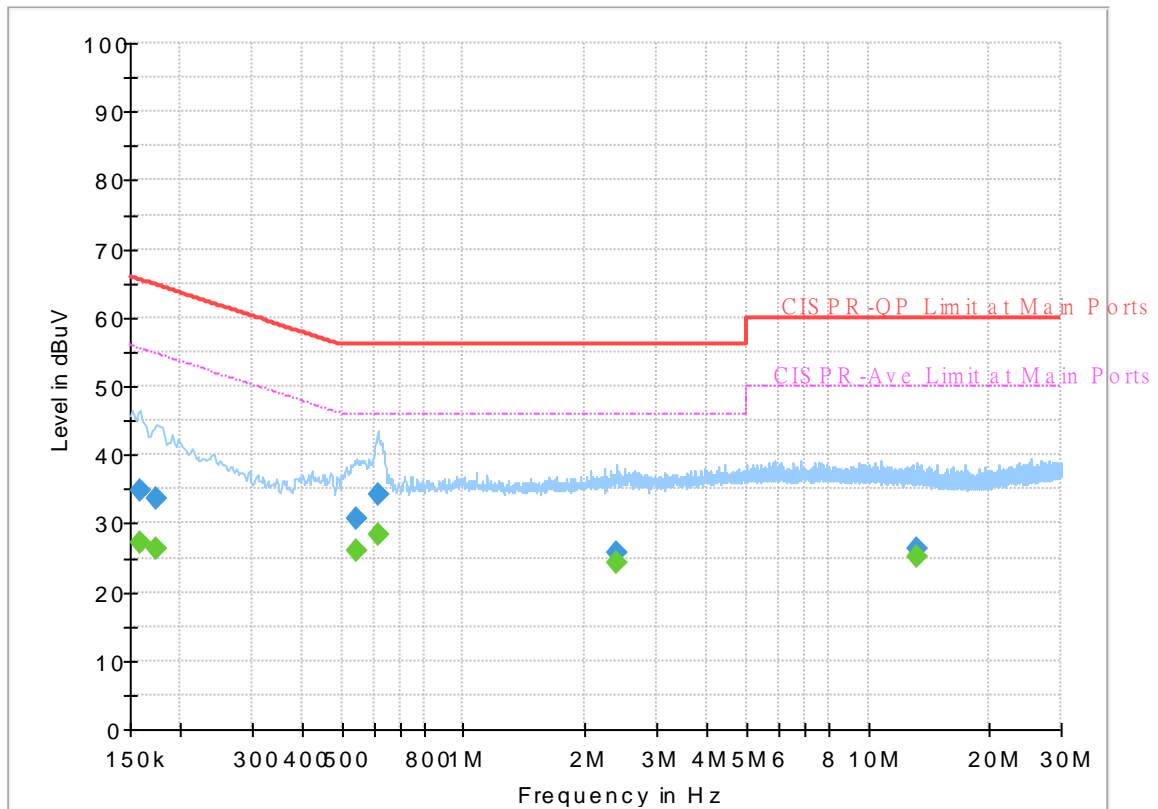
## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154500	---	27.94	55.75	27.81	L1	OFF	19.6
0.154500	35.32	---	65.75	30.43	L1	OFF	19.6
0.217500	---	25.90	52.91	27.01	L1	OFF	19.6
0.217500	32.96	---	62.91	29.95	L1	OFF	19.6
0.564000	---	25.97	46.00	20.03	L1	OFF	19.6
0.564000	31.56	---	56.00	24.44	L1	OFF	19.6
0.618000	---	30.02	46.00	15.98	L1	OFF	19.6
0.618000	37.45	---	56.00	18.55	L1	OFF	19.6
0.982500	---	24.22	46.00	21.78	L1	OFF	19.6
0.982500	27.10	---	56.00	28.90	L1	OFF	19.6
7.158750	---	25.62	50.00	24.38	L1	OFF	19.9
7.158750	27.10	---	60.00	32.90	L1	OFF	19.9

## EUT Information

Report NO : 221836  
Test Mode : Mode 1  
Test Voltage : 120Vac/60Hz  
Phase : Neutral

Full Spectrum



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.159000	---	27.26	55.52	28.26	N	OFF	19.6
0.159000	34.89	---	65.52	30.63	N	OFF	19.6
0.174750	---	26.19	54.73	28.54	N	OFF	19.6
0.174750	33.51	---	64.73	31.22	N	OFF	19.6
0.546000	---	25.93	46.00	20.07	N	OFF	19.6
0.546000	30.85	---	56.00	25.15	N	OFF	19.6
0.613500	---	28.32	46.00	17.68	N	OFF	19.6
0.613500	34.07	---	56.00	21.93	N	OFF	19.6
2.379750	---	24.21	46.00	21.79	N	OFF	19.7
2.379750	25.73	---	56.00	30.27	N	OFF	19.7
13.260750	---	25.01	50.00	24.99	N	OFF	20.2
13.260750	26.32	---	60.00	33.68	N	OFF	20.2



## Appendix C. Radiated Spurious Emission

Test Engineer :	Bill Chang 、 JC Liang 、 Bigshow Wang	Temperature :	18~20°C
		Relative Humidity :	68~70%



&lt;1Mbps&gt;

## 2.4GHz 2400~2483.5MHz

## BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BLE CH 00 2402MHz		2321.76	48.86	-25.14	74	39.44	27.1	18.56	36.24	365	180	P	H
		2385.6	39.77	-14.23	54	30.13	27.24	18.67	36.27	365	180	A	H
	*	2402	90.82	-	-	81.09	27.31	18.7	36.28	365	180	P	H
	*	2402	89.68	-	-	79.95	27.31	18.7	36.28	365	180	A	H
													H
													H
		2330.685	51.47	-22.53	74	42.04	27.1	18.58	36.25	182	214	P	V
		2332.89	42.92	-11.08	54	33.49	27.1	18.58	36.25	182	214	A	V
	*	2402	101.81	-	-	92.08	27.31	18.7	36.28	182	214	P	V
	*	2402	101.23	-	-	91.5	27.31	18.7	36.28	182	214	A	V
													V
													V
BLE CH 19 2440MHz		2378.96	49.02	-24.98	74	39.41	27.22	18.66	36.27	135	206	P	H
		2369.04	39.62	-14.38	54	30.06	27.18	18.64	36.26	135	206	A	H
	*	2440	88.97	-	-	79.02	27.46	18.78	36.29	135	206	P	H
	*	2440	88.24	-	-	78.29	27.46	18.78	36.29	135	206	A	H
		2485.12	49.38	-24.62	74	39.19	27.64	18.86	36.31	135	206	P	H
		2495.28	40.1	-13.9	54	29.86	27.68	18.88	36.32	135	206	A	H
		2364.08	51.52	-22.48	74	41.98	27.16	18.64	36.26	199	208	P	V
		2367.12	43.37	-10.63	54	33.82	27.17	18.64	36.26	199	208	A	V
	*	2440	102.04	-	-	92.09	27.46	18.78	36.29	199	208	P	V
	*	2440	101.54	-	-	91.59	27.46	18.78	36.29	199	208	A	V
		2487.76	50.4	-23.6	74	40.19	27.65	18.87	36.31	199	208	P	V
		2491.6	40.09	-13.91	54	29.87	27.67	18.87	36.32	199	208	A	V



<b>BLE CH 39 2480MHz</b>	*	2480	90.17	-	-	80.01	27.62	18.85	36.31	137	206	P	H
	*	2480	89.26	-	-	79.1	27.62	18.85	36.31	137	206	A	H
		2492.68	49.82	-24.18	74	39.59	27.67	18.88	36.32	137	206	P	H
		2499.24	40.14	-13.86	54	29.87	27.7	18.89	36.32	137	206	A	H
													H
													H
	*	2480	104	-	-	93.84	27.62	18.85	36.31	184	209	P	V
	*	2480	103.46	-	-	93.3	27.62	18.85	36.31	184	209	A	V
		2487.48	51.56	-22.44	74	41.35	27.65	18.87	36.31	184	209	P	V
		2487.48	43.62	-10.38	54	33.41	27.65	18.87	36.31	184	209	A	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## BLE (Harmonic @ 3m)

BLE	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
BLE CH 00 2402MHz		4804	44	-30	74	36.29	32.22	13.03	37.54	-	-	P	H
		12555	52.4	-21.6	74	35.36	39.26	21.06	43.28	-	-	P	H
		12555	41.4	-12.6	54	24.36	39.26	21.06	43.28	-	-	A	H
		13305	53.64	-20.36	74	35.17	39.81	21.81	43.15	-	-	P	H
		13305	42.7	-11.3	54	24.23	39.81	21.81	43.15	-	-	A	H
		17985	54.79	-19.21	74	33.68	41.69	24.88	45.46	-	-	P	H
		17985	46.44	-7.56	54	25.33	41.69	24.88	45.46	-	-	A	H
													H
													H
													H
													H
													H
		4804	49.07	-24.93	74	41.36	32.22	13.03	37.54	105	298	P	V
		4804	44.07	-9.93	54	36.36	32.22	13.03	37.54	105	298	A	V
		12600	52.35	-21.65	74	35.2	39.3	21.11	43.26	-	-	P	V
		12600	41.47	-12.53	54	24.32	39.3	21.11	43.26	-	-	A	V
		13380	53.74	-20.26	74	35.06	39.96	21.89	43.17	-	-	P	V
		13380	43.19	-10.81	54	24.51	39.96	21.89	43.17	-	-	A	V
		17940	54.56	-19.44	74	33.76	41.38	24.85	45.43	-	-	P	V
		17940	46.15	-7.85	54	25.35	41.38	24.85	45.43	-	-	A	V
													V
													V
													V
													V



BLE	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
BLE CH 19 2440MHz		4880	42.62	-31.38	74	34.64	32.58	13	37.6	-	-	P	H
		7320	47.88	-26.12	74	33.72	36.76	15.93	38.53	-	-	P	H
		12570	52.74	-21.26	74	35.66	39.27	21.08	43.27	-	-	P	H
		12570	41.33	-12.67	54	24.25	39.27	21.08	43.27	-	-	A	H
		13260	53.85	-20.15	74	35.46	39.76	21.78	43.15	-	-	P	H
		13260	42.73	-11.27	54	24.34	39.76	21.78	43.15	-	-	A	H
		17925	54.65	-19.35	74	33.96	41.27	24.84	45.42	-	-	P	H
		17925	46.04	-7.96	54	25.35	41.27	24.84	45.42	-	-	A	H
													H
													H
													H
													H
		4880	42.7	-31.3	74	34.72	32.58	13	37.6	-	-	P	V
		7320	47.96	-26.04	74	33.8	36.76	15.93	38.53	-	-	P	V
		12675	52.09	-21.91	74	34.68	39.45	21.19	43.23	-	-	P	V
		12675	41.66	-12.34	54	24.25	39.45	21.19	43.23	-	-	A	V
		13260	53.89	-20.11	74	35.5	39.76	21.78	43.15	-	-	P	V
		13260	42.74	-11.26	54	24.35	39.76	21.78	43.15	-	-	A	V
		17970	54.52	-19.48	74	33.51	41.59	24.87	45.45	-	-	P	V
		17970	46.36	-7.64	54	25.35	41.59	24.87	45.45	-	-	A	V
													V
													V
													V
													V

BLE	Note	Frequency  ( MHz )	Level  ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)	
BLE CH 39 2480MHz		4960	43.25	-30.75	74	34.93	33.02	12.96	37.66	-	-	P	H	
		7440	47.39	-26.61	74	33.82	36.22	15.98	38.63	-	-	P	H	
		12270	52.23	-21.77	74	35.52	39.13	20.76	43.18	-	-	P	H	
		12270	40.96	-13.04	54	24.25	39.13	20.76	43.18	-	-	A	H	
		13365	53.62	-20.38	74	34.99	39.93	21.87	43.17	-	-	P	H	
		13365	42.9	-11.1	54	24.27	39.93	21.87	43.17	-	-	A	H	
		17955	54.95	-19.05	74	34.04	41.49	24.86	45.44	-	-	P	H	
		17955	46.29	-7.71	54	25.38	41.49	24.86	45.44	-	-	A	H	
													H	
													H	
													H	
													H	
		4960	44.47	-29.53	74	36.15	33.02	12.96	37.66	-	-	P	V	
		7440	46.7	-27.3	74	33.13	36.22	15.98	38.63	-	-	P	V	
		12675	52.76	-21.24	74	35.35	39.45	21.19	43.23	-	-	P	V	
		12675	41.54	-12.46	54	24.13	39.45	21.19	43.23	-	-	A	V	
		13320	53.46	-20.54	74	34.94	39.84	21.84	43.16	-	-	P	V	
		13320	42.93	-11.07	54	24.41	39.84	21.84	43.16	-	-	A	V	
		17850	55.07	-18.93	74	34.98	40.65	24.8	45.36	-	-	P	V	
		17850	45.42	-8.58	54	25.33	40.65	24.8	45.36	-	-	A	V	
													V	
													V	
													V	
													V	
	Remark	1. No other spurious found.												
		2. All results are PASS against Peak and Average limit line.												
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.														
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.														

[illegible]

## Emission below 1GHz

## 2.4GHz BLE (LF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
2.4GHz  BLE  LF		39.7	24.6	-15.4	40	39.42	19.45	1.35	35.62	-	-	P	H
		149.31	27.37	-16.13	43.5	43.05	17.32	2.46	35.46	-	-	P	H
		405.39	28.23	-17.77	46	37.08	22.13	3.85	34.83	-	-	P	H
		600.36	30.7	-15.3	46	34.92	25.47	4.69	34.38	-	-	P	H
		721.61	36.64	-9.36	46	38.58	26.85	5.06	33.85	-	-	P	H
		952.47	35.03	-10.97	46	31.5	30.51	5.99	32.97	-	-	P	H
													H
													H
													H
													H
													H
													H
		75.59	32.5	-7.5	40	53.44	12.86	1.78	35.58	-	-	P	V
		137.67	25.5	-18	43.5	41.04	17.58	2.38	35.5	-	-	P	V
		600.36	33.39	-12.61	46	37.61	25.47	4.69	34.38	-	-	P	V
		719.67	34.14	-11.86	46	36.21	26.74	5.05	33.86	-	-	P	V
		749.74	36.21	-9.79	46	37.1	27.66	5.19	33.74	-	-	P	V
		908.82	35.09	-10.91	46	33.39	28.89	5.91	33.1	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against limit line.												
	3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.												



&lt;2Mbps&gt;

## 2.4GHz 2400~2483.5MHz

## BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BLE CH 00 2402MHz		2355.57	49.59	-24.41	74	40.11	27.12	18.62	36.26	109	200	P	H
		2358.09	41.9	-12.1	54	32.41	27.13	18.62	36.26	109	200	A	H
	*	2402	89.96	-	-	80.23	27.31	18.7	36.28	109	200	P	H
	*	2402	88.38	-	-	78.65	27.31	18.7	36.28	109	200	A	H
													H
													H
		2374.995	55.42	-18.58	74	45.83	27.2	18.65	36.26	177	206	P	V
		2376.15	49.89	-4.11	54	40.3	27.2	18.66	36.27	177	206	A	V
	*	2402	101.37	-	-	91.64	27.31	18.7	36.28	177	206	P	V
	*	2402	100.24	-	-	90.51	27.31	18.7	36.28	177	206	A	V
													V
													V
BLE CH 19 2440MHz		2351.12	49.16	-24.84	74	39.7	27.1	18.61	36.25	108	209	P	H
		2389.04	41.29	-12.71	54	31.62	27.26	18.68	36.27	108	209	A	H
	*	2440	89.94	-	-	79.99	27.46	18.78	36.29	108	209	P	H
	*	2440	88.29	-	-	78.34	27.46	18.78	36.29	108	209	A	H
		2486.6	49.95	-24.05	74	39.75	27.65	18.86	36.31	108	209	P	H
		2488	42.15	-11.85	54	31.94	27.65	18.87	36.31	108	209	A	H
		2374	50.99	-23.01	74	41.4	27.2	18.65	36.26	144	222	P	V
		2377.68	44.02	-9.98	54	34.42	27.21	18.66	36.27	144	222	A	V
	*	2440	103.29	-	-	93.34	27.46	18.78	36.29	144	222	P	V
	*	2440	102.02	-	-	92.07	27.46	18.78	36.29	144	222	A	V
		2492.6	51.02	-22.98	74	40.79	27.67	18.88	36.32	144	222	P	V
		2499.9	45.5	-8.5	54	35.23	27.7	18.89	36.32	144	222	A	V



<b>BLE CH 39 2480MHz</b>	*	2480	90.62	-	-	80.46	27.62	18.85	36.31	137	207	P	H
	*	2480	89.08	-	-	78.92	27.62	18.85	36.31	137	207	A	H
		2488.4	50	-24	74	39.79	27.65	18.87	36.31	137	207	P	H
		2485.2	42.14	-11.86	54	31.95	27.64	18.86	36.31	137	207	A	H
													H
													H
	*	2480	104.15	-	-	93.99	27.62	18.85	36.31	189	220	P	V
	*	2480	102.99	-	-	92.83	27.62	18.85	36.31	189	220	A	V
		2483.72	53	-21	74	42.82	27.63	18.86	36.31	189	220	P	V
		2487.04	45.48	-8.52	54	35.27	27.65	18.87	36.31	189	220	A	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



## 2.4GHz 2400~2483.5MHz

## BLE (Harmonic @ 3m)

BLE	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
BLE CH 00 2402MHz		4804	42.9	-31.1	74	35.19	32.22	13.03	37.54	-	-	P	H
		12660	52.38	-21.62	74	35.03	39.42	21.17	43.24	-	-	P	H
		12660	41.6	-12.4	54	24.25	39.42	21.17	43.24	-	-	A	H
		13380	53.31	-20.69	74	34.63	39.96	21.89	43.17	-	-	P	H
		13380	42.91	-11.09	54	24.23	39.96	21.89	43.17	-	-	A	H
		17985	54.71	-19.29	74	33.6	41.69	24.88	45.46	-	-	P	H
		17985	46.47	-7.53	54	25.36	41.69	24.88	45.46	-	-	A	H
													H
													H
													H
													H
													H
		4804	49.23	-24.77	74	41.52	32.22	13.03	37.54	100	302	P	V
		4804	43.81	-10.19	54	36.1	32.22	13.03	37.54	100	302	A	V
		11325	52.06	-21.94	74	35.55	38.95	19.87	42.31	-	-	P	V
		11325	40.86	-13.14	54	24.35	38.95	19.87	42.31	-	-	A	V
		13395	53.14	-20.86	74	34.42	39.99	21.9	43.17	-	-	P	V
		13395	42.9	-11.1	54	24.18	39.99	21.9	43.17	-	-	A	V
		17985	54.39	-19.61	74	33.28	41.69	24.88	45.46	-	-	P	V
		17985	46.44	-7.56	54	25.33	41.69	24.88	45.46	-	-	A	V
													V
													V
													V
													V



BLE	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
<b>BLE CH 19 2440MHz</b>		4880	43.91	-30.09	74	35.93	32.58	13	37.6	-	-	P	H
		7320	47.79	-26.21	74	33.63	36.76	15.93	38.53	-	-	P	H
		12690	52.2	-21.8	74	34.73	39.48	21.21	43.22	-	-	P	H
		12690	41.82	-12.18	54	24.35	39.48	21.21	43.22	-	-	A	H
		13290	53.33	-20.67	74	34.89	39.79	21.8	43.15	-	-	P	H
		13290	42.81	-11.19	54	24.37	39.79	21.8	43.15	-	-	A	H
		17985	55.37	-18.63	74	34.26	41.69	24.88	45.46	-	-	P	H
		17985	46.34	-7.66	54	25.23	41.69	24.88	45.46	-	-	A	H
													H
													H
													H
													H
		4880	44.79	-29.21	74	36.81	32.58	13	37.6	-	-	P	V
		7320	47.38	-26.62	74	33.22	36.76	15.93	38.53	-	-	P	V
		12345	51.96	-22.04	74	35.28	39.06	20.84	43.22	-	-	P	V
		12345	40.91	-13.09	54	24.23	39.06	20.84	43.22	-	-	A	V
		13395	53.35	-20.65	74	34.63	39.99	21.9	43.17	-	-	P	V
		13395	42.88	-11.12	54	24.16	39.99	21.9	43.17	-	-	A	V
		17910	54.61	-19.39	74	34.02	41.17	24.83	45.41	-	-	P	V
		17910	45.81	-8.19	54	25.22	41.17	24.83	45.41	-	-	A	V
													V
													V
													V
													V

[illegible]



## 2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
<b>2.4GHz BLE SHF</b>		24986	41.46	-32.54	74	35.65	39.19	19.73	53.11	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		24293	40.63	-33.37	74	36.29	38.93	18.98	53.57	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

## Emission below 1GHz

## 2.4GHz BLE (LF)

[illegible]



**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>P</b> eak or <b>A</b> verage
H/V	<b>H</b> orizontal or <b>V</b> ertical

**A calculation example for radiated spurious emission is shown as below:**

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
BLE CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =  
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)  
= 55.45 (dBμV/m)
2. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)  
= 43.54 (dBμV/m)
2. Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 43.54(dBμV/m) – 54(dBμV/m)  
= -10.46(dB)

**Both peak and average measured complies with the limit line, so test result is “PASS”.**



## Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Bill Chang 、 JC Liang 、 Bigshow Wang	Temperature :	18~20°C
		Relative Humidity :	68~70%

### Note symbol

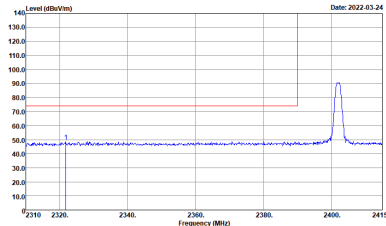
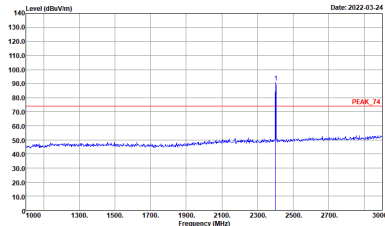
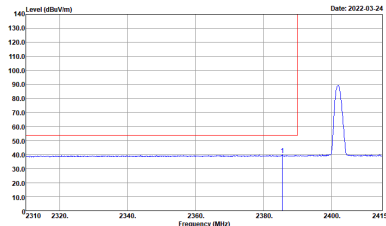
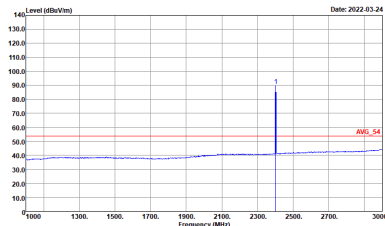
-L	Low channel location
-R	High channel location



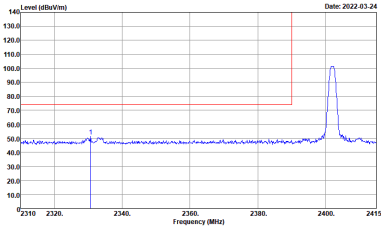
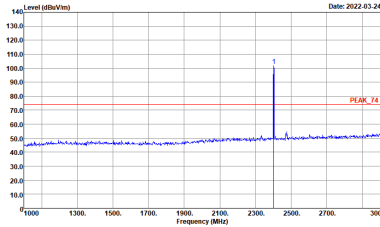
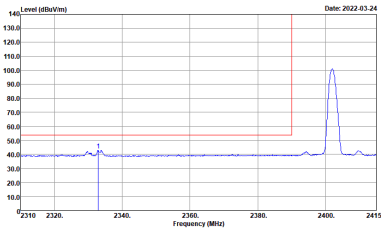
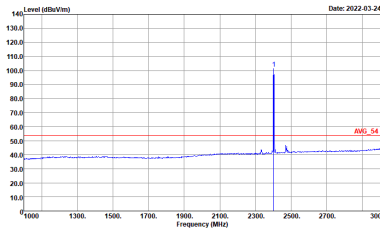
&lt;1Mbps&gt;

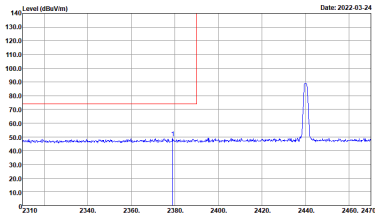
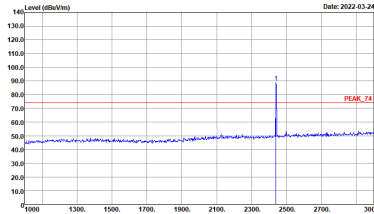
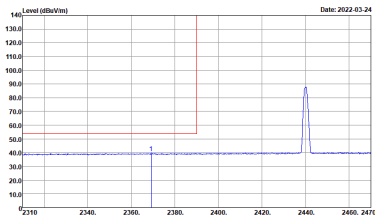
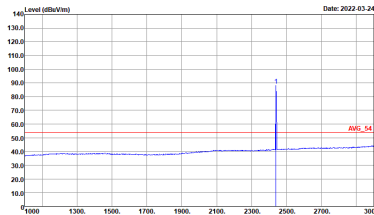
2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

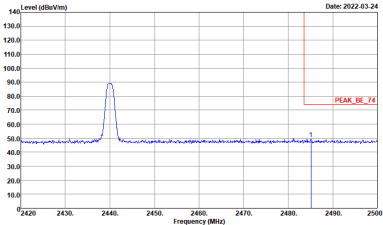
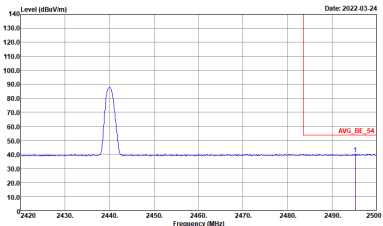
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Fundamental
Peak	 <p>Site : 03CH20-1HY Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH20-1HY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL Detector : Peak</p>
Avg.	 <p>Site : 03CH20-1HY Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH20-1HY Condition : AVG_54 3m 91200_02294_1110622 HORIZONTAL Detector : Peak</p>



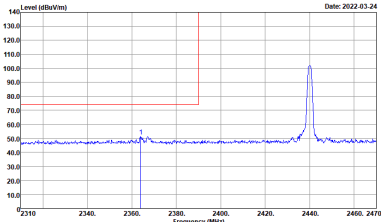
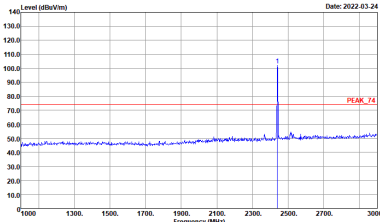
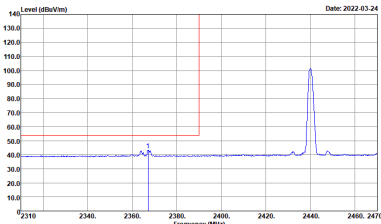
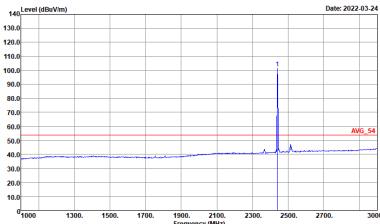
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH20-HV Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>	<div><p>Site : 03CH20-HV Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>
Avg.	<div><p>Site : 03CH20-HV Condition : AV6_BE_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>	<div><p>Site : 03CH20-HV Condition : AV6_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Horizontal	Fundamental
Peak	 <p>           Site : 03CH20-HY            Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL            Detector : Peak         </p>	 <p>           Site : 03CH20-HY            Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL            Detector : Peak         </p>
Avg.	 <p>           Site : 03CH20-HY            Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL            Detector : Peak         </p>	 <p>           Site : 03CH20-HY            Condition : AVG_54 3m 91200_02294_1110622 HORIZONTAL            Detector : Peak         </p>

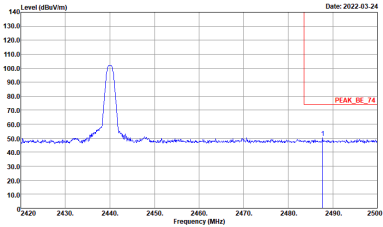
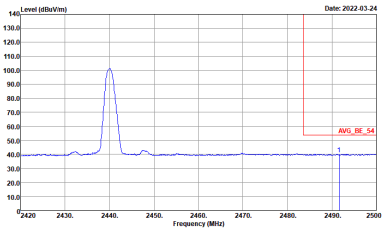


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH20-1FV Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	Left blank
Avg.	<div><p>Site : 03CH20-1FV Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	Left blank

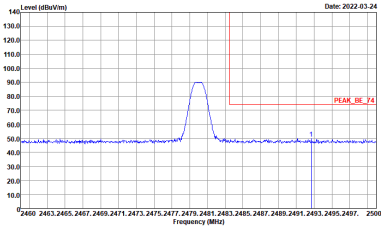
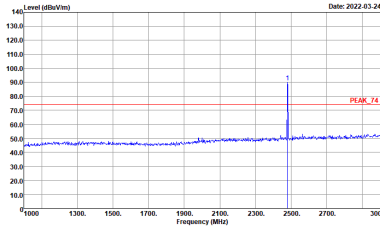
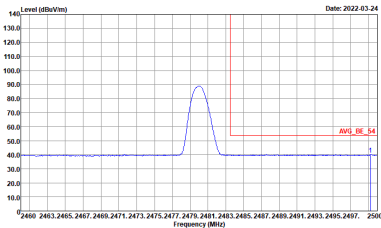
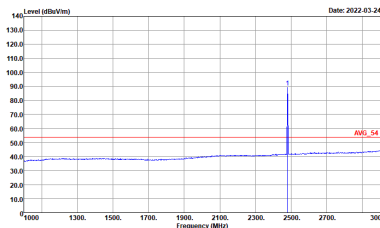


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Vertical	Fundamental
Peak	 <p>Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>	 <p>Site : 03CH20-HY Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>
Avg.	 <p>Site : 03CH20-HY Condition : AV6_BE_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>	 <p>Site : 03CH20-HY Condition : AV6_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH20-1VY Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	Left blank
Avg.	<div><p>Site : 03CH20-1VY Condition : AVG_BE_54 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH20-1V Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	<div><p>Site : 03CH20-1V Condition : PEAK_F4 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>
Avg.	<div><p>Site : 03CH20-1V Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak</p></div>	<div><p>Site : 03CH20-1V Condition : AVG_F4 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak</p></div>

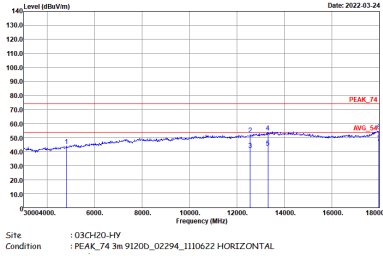
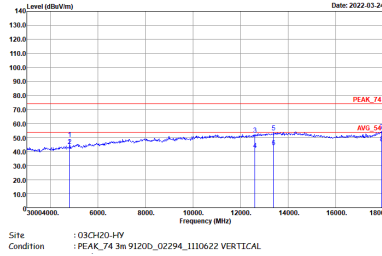


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	<div><p>Level (dBm/Vm)</p><p>Date: 2022-03-24</p><p>PEAK_BE_74</p><p>Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Peak</p></div>	<div><p>Level (dBm/Vm)</p><p>Date: 2022-03-24</p><p>PEAK_F4</p><p>Site : 03CH20-HY Condition : PEAK_F4 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Peak</p></div>
Avg.	<div><p>Level (dBm/Vm)</p><p>Date: 2022-03-24</p><p>AVG_BE_54</p><p>Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Peak</p></div>	<div><p>Level (dBm/Vm)</p><p>Date: 2022-03-24</p><p>AVG_F4</p><p>Site : 03CH20-HY Condition : AVG_F4 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Peak</p></div>

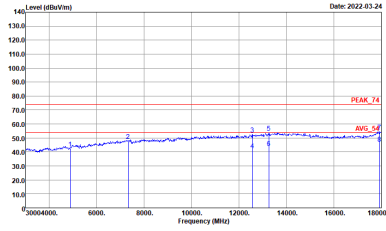
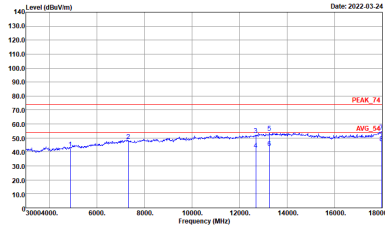


2.4GHz 2400~2483.5MHz

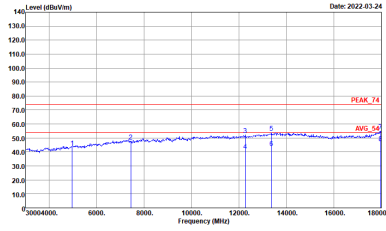
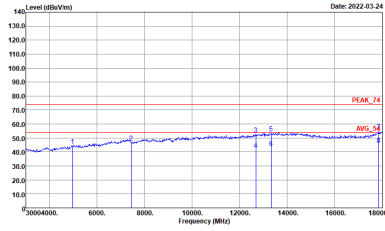
BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH00-1FY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL</p>	 <p>Site : 03CH00-1FY Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL</p>



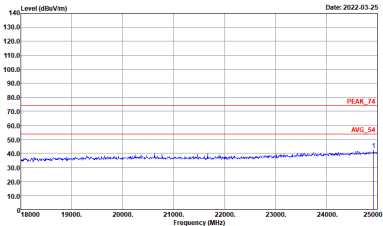
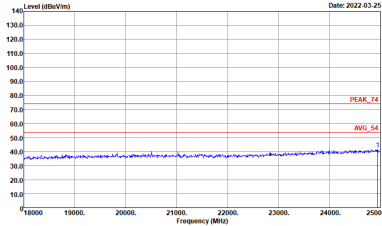
BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH19 2440MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH20-4FY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL</p>	 <p>Site : 03CH20-4FY Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH420-4FY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL</p>	 <p>Site : 03CH420-4FY Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL</p>



Emission above 18GHz  
2.4GHz BLE (SHF @ 1m)

BLE	2.4GHz 2400~2483.5MHz	
	BLE SHF	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH20-HY Condition : PEAK_74 1m SHF_00993_211130 HORIZONTAL</p>	 <p>Site : 03CH20-HY Condition : PEAK_74 1m SHF_00993_211130 VERTICAL</p>



Emission below 1GHz  
2.4GHz BLE (LF)

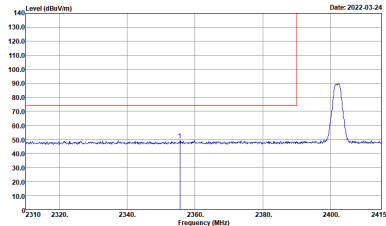
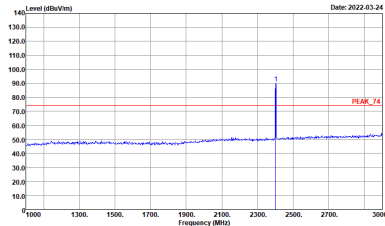
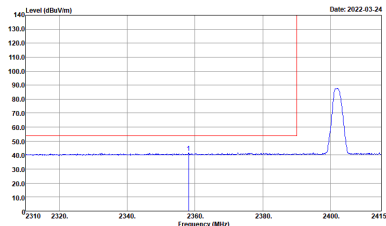
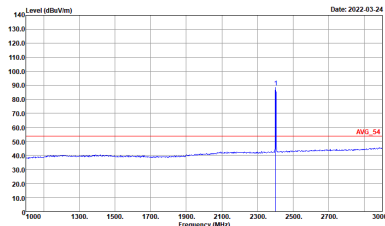
BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	<p>Level (dBm/100kHz)</p> <p>Date: 2022-03-25</p> <p>Site : 03CH20-14Y Condition : QP 3m LF_55606&amp;08_1101017 HORIZONTAL</p>	<p>Level (dBm/100kHz)</p> <p>Date: 2022-03-25</p> <p>Site : 03CH20-14Y Condition : QP 3m LF_55606&amp;08_1101017 VERTICAL</p>



&lt;2Mbps&gt;

2.4GHz 2400~2483.5MHz

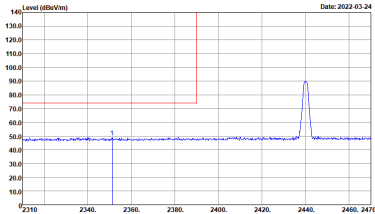
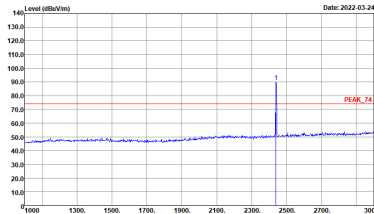
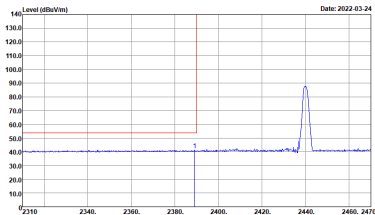
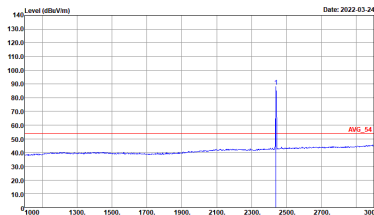
BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Fundamental
Peak	 <p>Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH20-HY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Avg.	 <p>Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH20-HY Condition : AVG_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p>

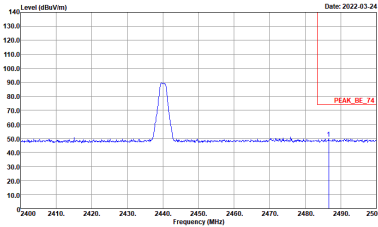
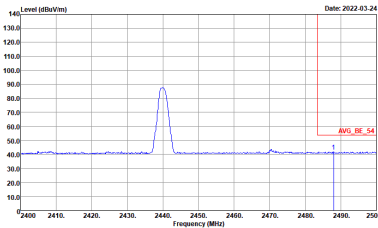


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH00 2402MHz	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH20-1V Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>	<div><p>Site : 03CH20-1V Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>
Avg.	<div><p>Site : 03CH20-1V Condition : AV6_BE_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>	<div><p>Site : 03CH20-1V Condition : AV6_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p></div>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Horizontal	Fundamental
Peak	<div><p>Date: 2022-03-24</p><p>Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	<div><p>Date: 2022-03-24</p><p>Site : 03CH20-HY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>
Avg.	<div><p>Date: 2022-03-24</p><p>Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p></div>	<div><p>Date: 2022-03-24</p><p>Site : 03CH20-HY Condition : AVG_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p></div>

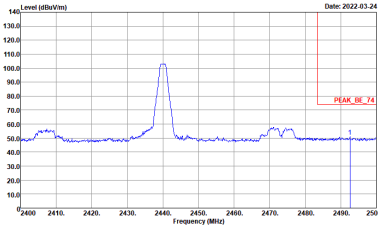
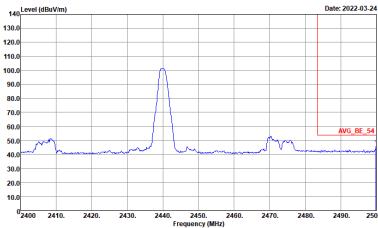


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH20-1VY Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto : Peak</p></div>	Left blank
Avg.	<div><p>Site : 03CH20-1VY Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto : Peak</p></div>	Left blank

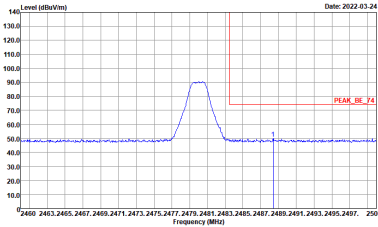
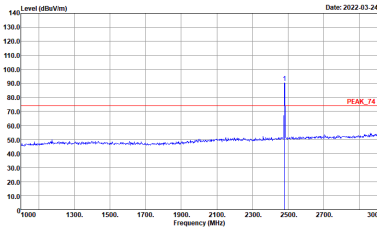
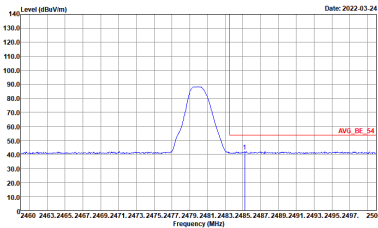
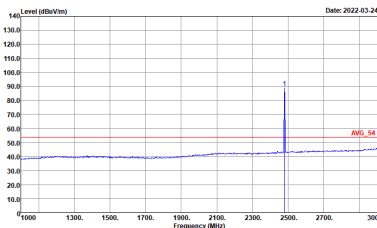


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - L	
	Vertical	Fundamental
Peak	<p>Site : 03CH20-1V Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>	<p>Site : 03CH20-1V Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>
Avg.	<p>Site : 03CH20-1V Condition : AV6_BE_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>	<p>Site : 03CH20-1V Condition : AV6_54 3m 91200_02294_1110622 VERTICAL Detector : Peak</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH19 2440MHz - R	
	Vertical	Fundamental
Peak	<div><p>Site : 03CH20-1V Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	Left blank
Avg.	<div><p>Site : 03CH20-1V Condition : AVG_BE_54 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p></div>	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Fundamental
Peak	<div><p>Site : 03CH20-14Y Condition : PEAK_BE_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>	<div><p>Site : 03CH20-14Y Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p></div>
Avg.	<div><p>Site : 03CH20-14Y Condition : AVG_BE_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p></div>	<div><p>Site : 03CH20-14Y Condition : AVG_54 3m 91200_02294_1110622 HORIZONTAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p></div>

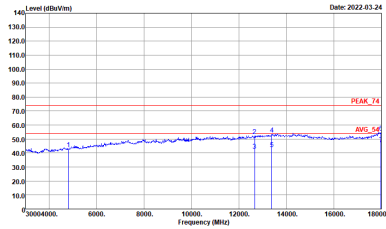
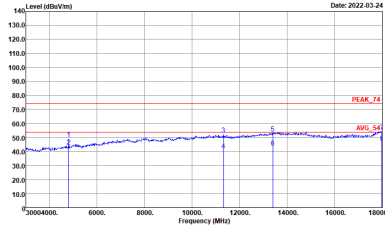


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
	BLE CH39 2480MHz	
	Vertical	Fundamental
Peak	<p>Site : 03CH20-HV Condition : PEAK_BE_74 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH20-HV Condition : PEAK_F4 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Avg.	<p>Site : 03CH20-HV Condition : AVG_BE_54 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH20-HV Condition : AVG_F4 3m 91200_02294_1110622 VERTICAL Detector : RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak</p>

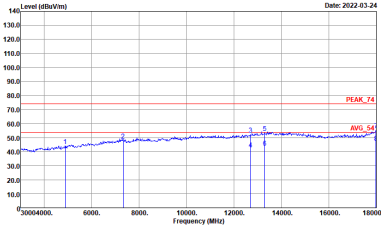
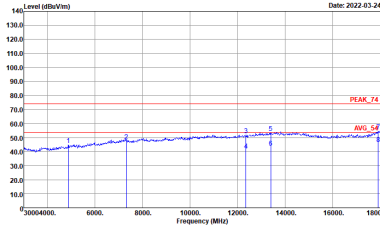


2.4GHz 2400~2483.5MHz

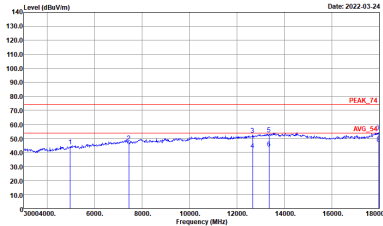
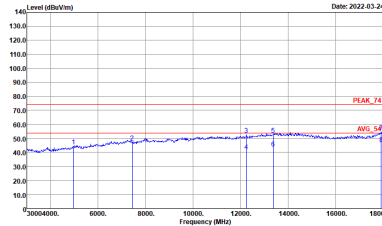
BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH00 2402MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH20-1HY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL</p>	 <p>Site : 03CH20-1HY Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH19 2440MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH-00-1HY Condition : PEAK_74 3m 91200_02294_1110622 HORIZONTAL</p>	 <p>Site : 03CH-00-1HY Condition : PEAK_74 3m 91200_02294_1110622 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
	BLE CH39 2480MHz	
	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH20-HY Condition : PEAK_T4 3m 9120D_02294_1110622 HORIZONTAL</p>	 <p>Site : 03CH20-HY Condition : PEAK_T4 3m 9120D_02294_1110622 VERTICAL</p>

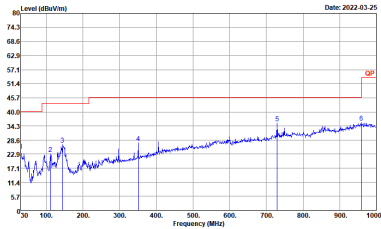
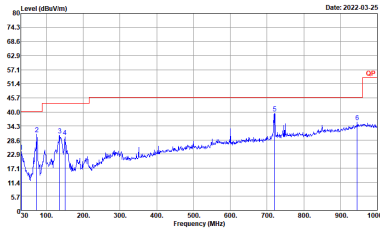


Emission above 18GHz  
2.4GHz BLE (SHF @ 1m)

BLE	2.4GHz 2400~2483.5MHz	
	BLE SHF	
	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH20-4Y Condition : PEAK_74 1m SHF_00993_211130 HORIZONTAL</p>	<p>Site : 03CH20-4Y Condition : PEAK_74 1m SHF_00993_211130 VERTICAL</p>



Emission below 1GHz  
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
	BLE LF	
	Horizontal	Vertical
QP / Peak	 <p>Site : 03CH20-HY Condition : QP 3m LF_35606408_1101017 HORIZONTAL</p>	 <p>Site : 03CH20-HY Condition : QP 3m LF_35606408_1101017 VERTICAL</p>

## Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
Bluetooth - LE for 1Mbps	62.64	392	2.55	3kHz
Bluetooth - LE for 2Mbps	32.59	204	4.90	10kHz

