



FCC RADIO TEST REPORT

FCC ID : A4RG454V
Equipment : Wireless Device
Model Name : G454V
Applicant : Google LLC
1600 Amphitheatre Parkway,
Mountain View, California, 94043 USA
Standard : FCC Part 15 Subpart C §15.247

The product was received on Oct. 05, 2021 and testing was performed from Oct. 08, 2021 to Nov. 05, 2021. 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



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History of this test report

Report No.	Version	Description	Issue Date
FR142340-05B	01	Initial issue of report	Nov. 17, 2021
FR142340-05B	02	1. Revise Radiated Spurious Emission typo 2. Revise summary remark	Nov. 23, 2021



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	1.58 dB under the limit at 2374.000 MHz
3.6	15.207	AC Conducted Emission	Pass	9.55 dB under the limit at 0.213 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Remark: The FR142340-05B report reuses AC Conducted Emission test data from the FD142340-04 report.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

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: Avis Chuang

Report Producer: Lucy Wu



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Device
Model Name	G454V
FCC ID	A4RG454V
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

Remark: The above EUT's information was declared by manufacturer.

EUT Information List	
S/N	Performed Test Item
1923105GN017RP	RF Conducted Measurement
1923105GN017WJ	Radiated Spurious Emission
1923105GN0180U	Conducted Emission

1.2 Product Specification of Equipment Under Test

Product Specification is subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel (37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	<Ant. 1> Bluetooth - LE (1Mbps): 8.40 dBm / 0.0069 W Bluetooth - LE (2Mbps): 7.90 dBm / 0.0062 W <Ant. 2> Bluetooth - LE (1Mbps): 8.50 dBm / 0.0071 W Bluetooth - LE (2Mbps): 8.10 dBm / 0.0065 W
99% Occupied Bandwidth	<Ant. 1> Bluetooth - LE (1Mbps): 1.023 MHz Bluetooth - LE (2Mbps): 2.034 MHz <Ant. 2> Bluetooth - LE (1Mbps): 1.025 MHz Bluetooth - LE (2Mbps): 2.038 MHz
Antenna Type / Gain	<Ant. 1>PCB PIFA Antenna with gain 3.03 dBi <Ant. 2>PCB PIFA Antenna with gain 2.73 dBi
Type of Modulation	Bluetooth - LE : GFSK

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



1.3 Modification of EUT

No modifications made to the EUT during the testing.

1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. CO05-HY (TAF Code: 1190)
Remark	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.

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	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
Test Site No.	Sporton Site No. TH05-HY, 03CH12-HY

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

FCC designation No.: TW1190 and TW3786

1.5 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

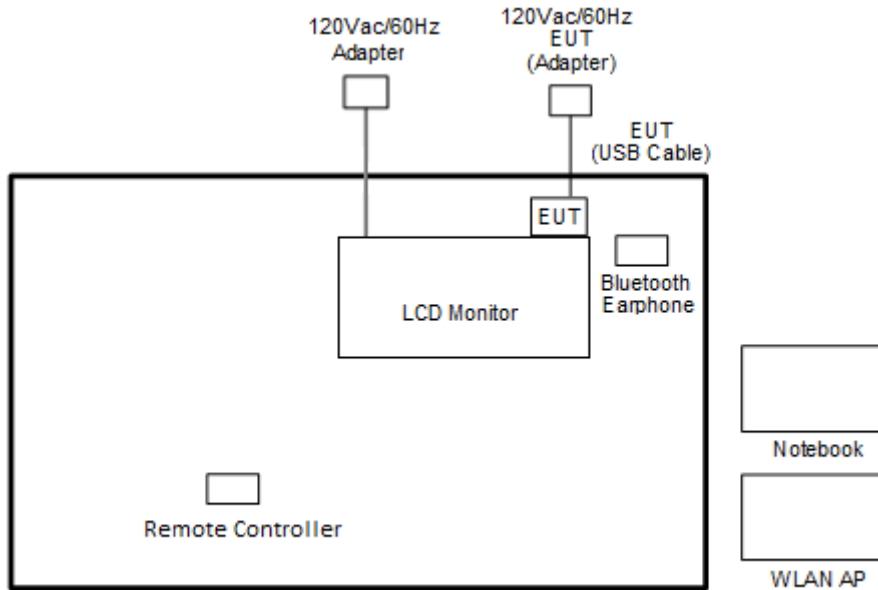
- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental 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 X plane for <Ant. 1> and <Ant. 2> 2Mbps; Y plane for <Ant. 2> 1Mbps 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.

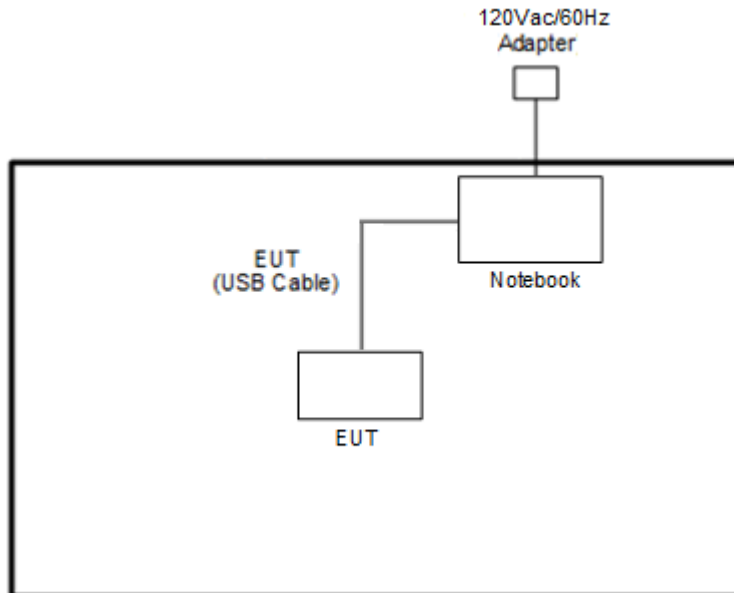
Summary table of Test Cases	
Test Item	Data Rate / Modulation
Conducted Test Cases	Bluetooth – LE / GFSK
	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps
	Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps
	Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
	Mode 4: Bluetooth Tx CH00_2402 MHz_2Mbps
	Mode 5: Bluetooth Tx CH19_2440 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: WLAN (2.4GHz) Link + Bluetooth Link (Bluetooth Earphone) + Controller Link + Video Streaming (1080p, 60Hz, 4:2:2, 12bits) + USB Cable 1 (Charging from AC Adapter (Salcomp))
Remark: For Radiated Test Cases, the tests were performed with USB Cable 2.	

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<Bluetooth - LE Tx Mode>





2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8m
3.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	LCD Monitor	Sharp	LC-50UA6800T	N/A	N/A	N/A
5.	Remote controller	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility "CMD v.10.0.18362.1256" 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



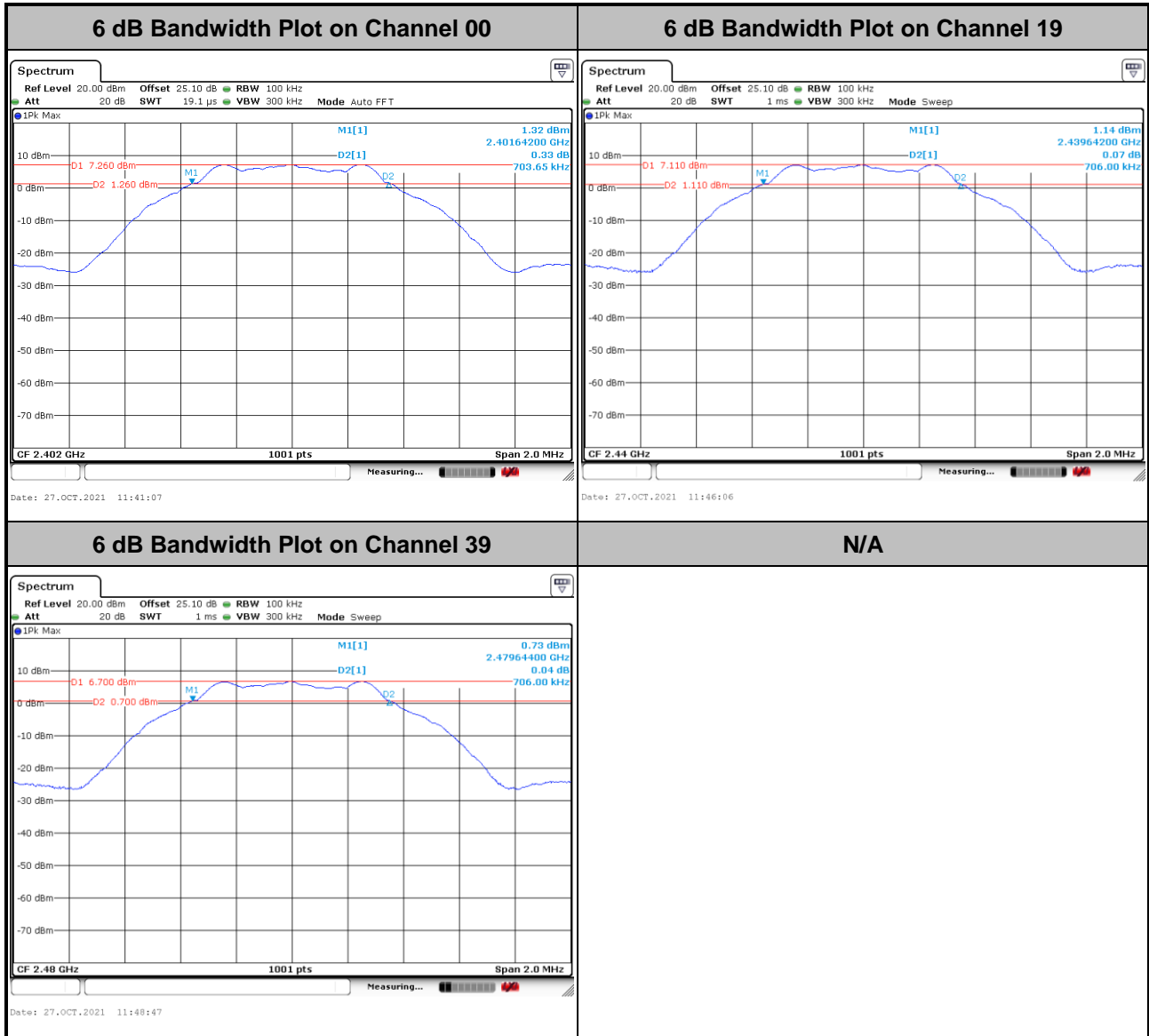


3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

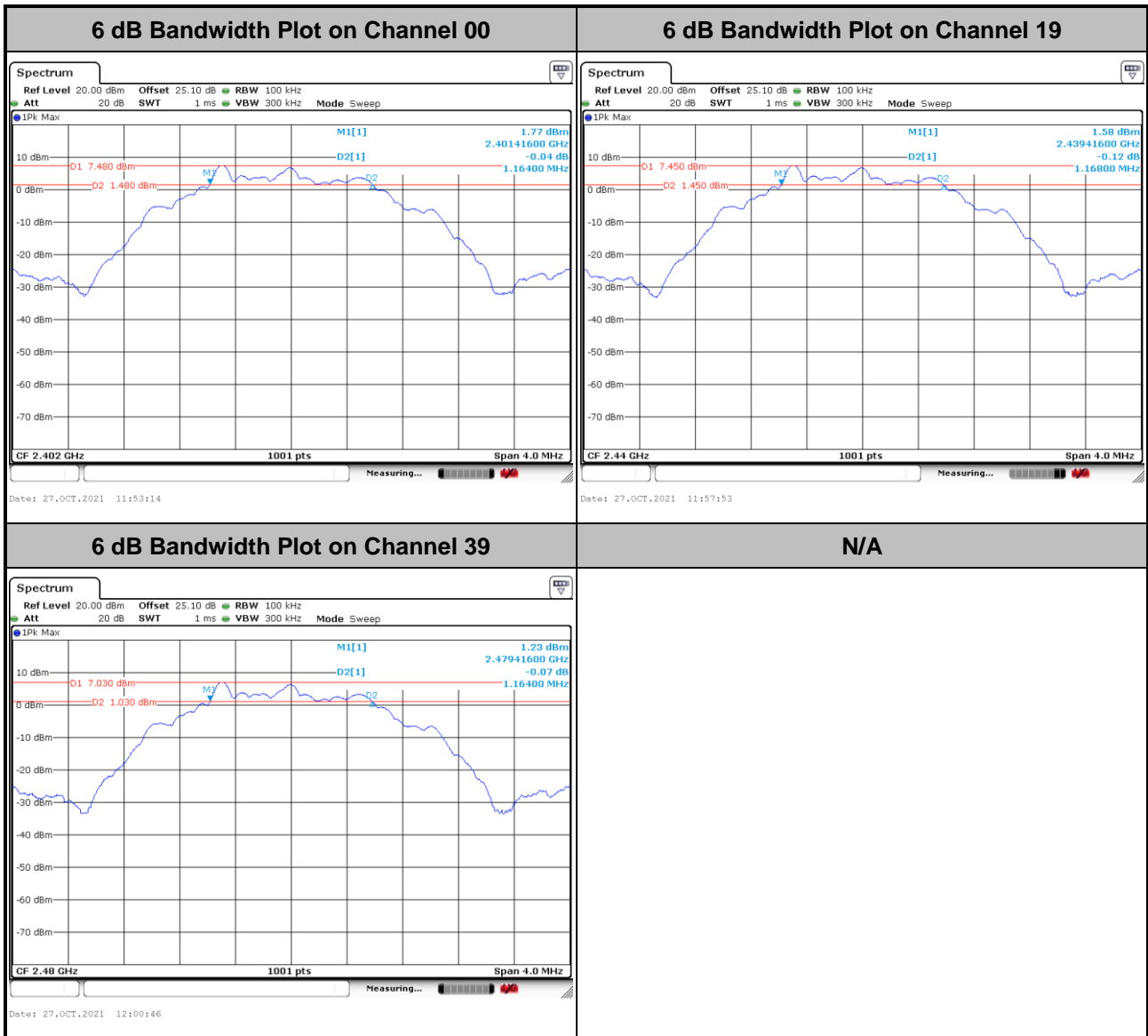
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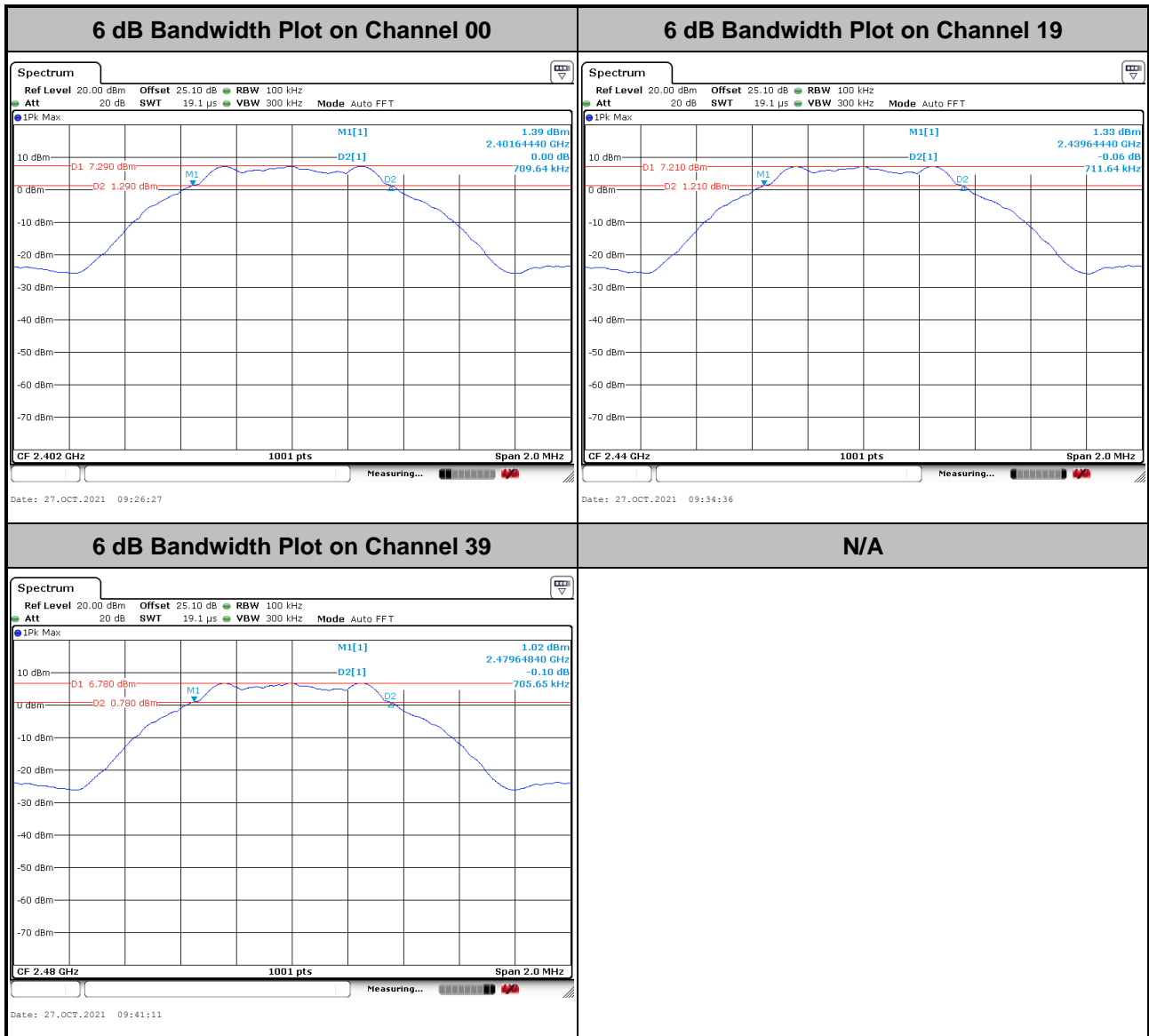
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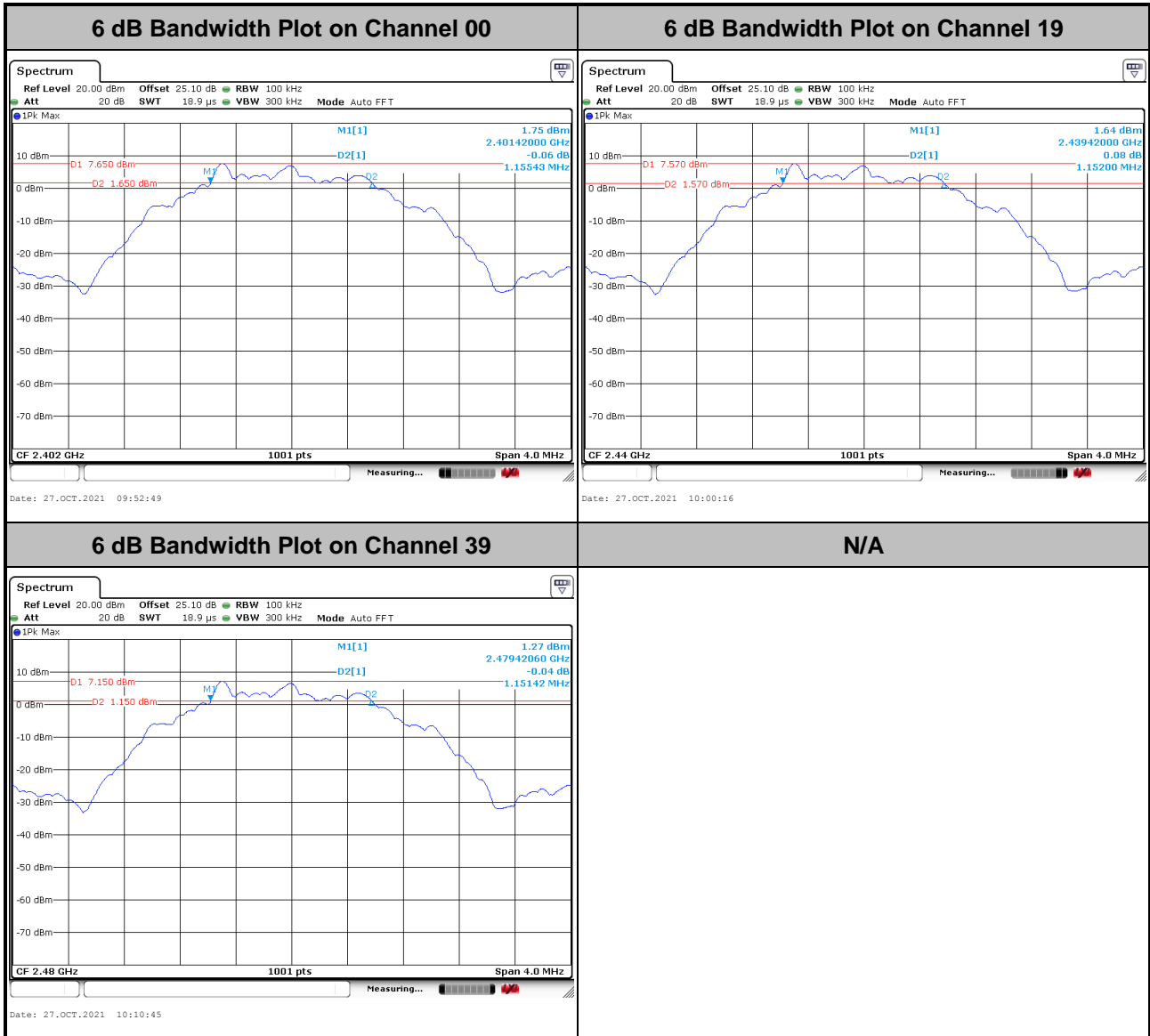
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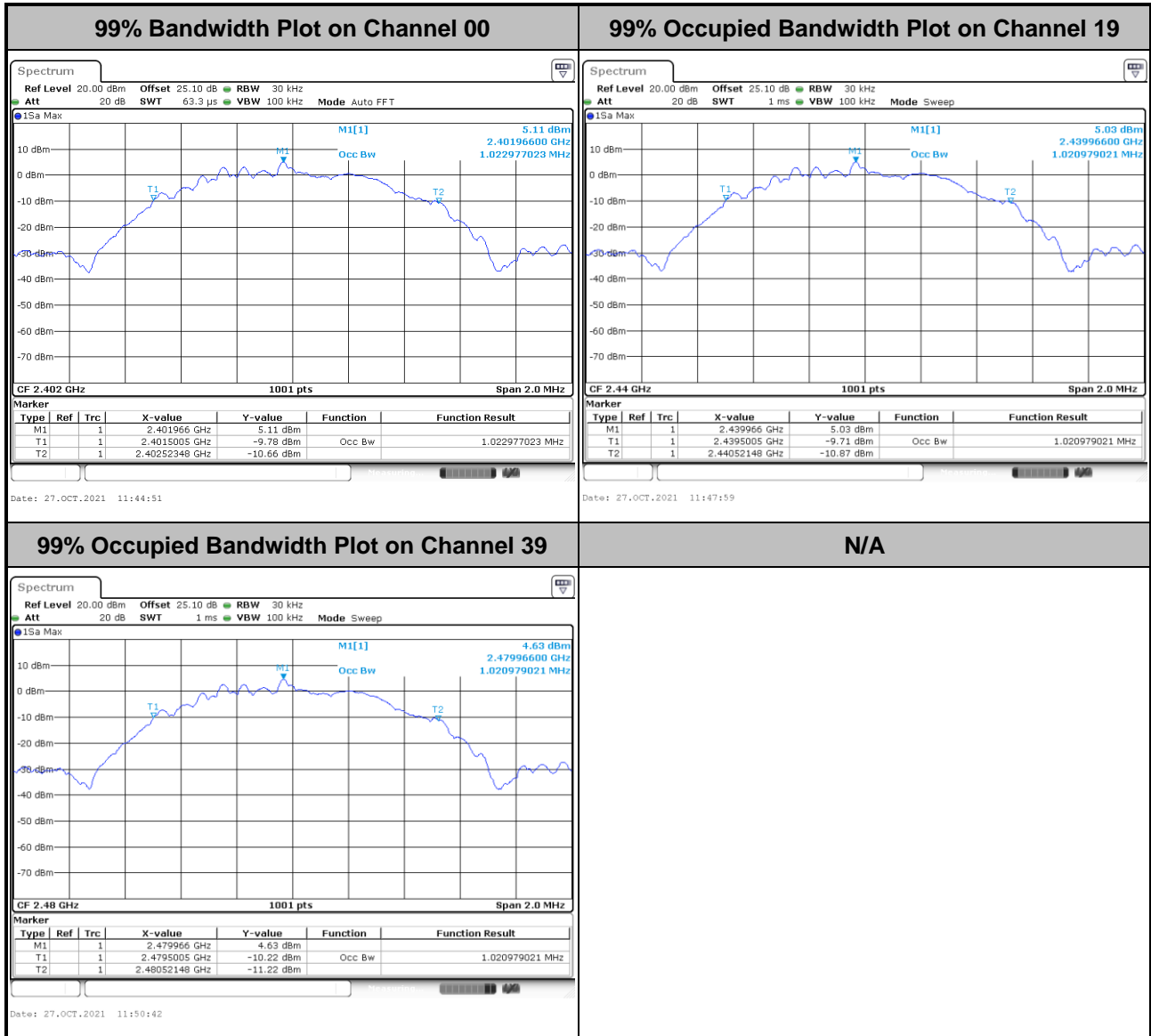


3.1.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

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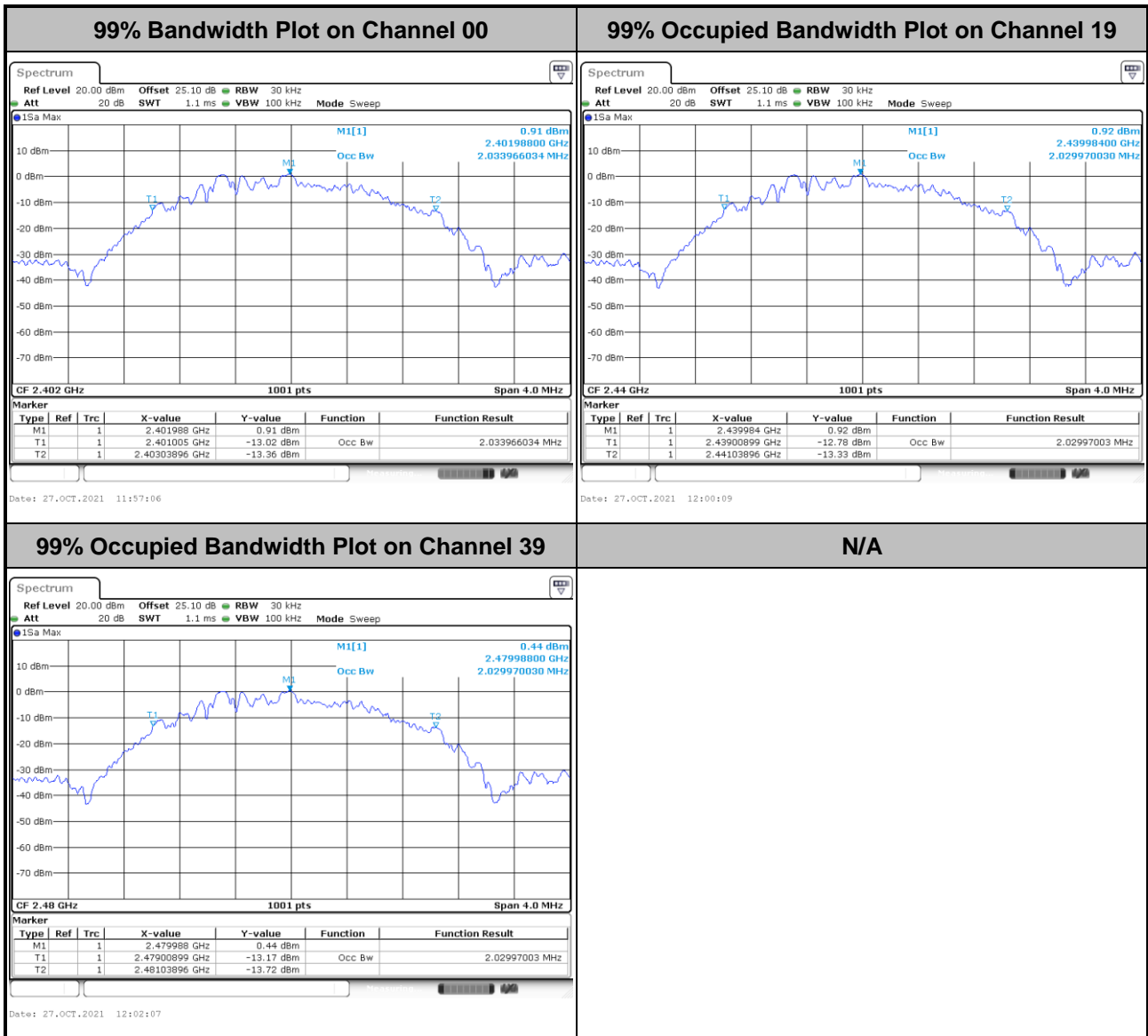
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Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



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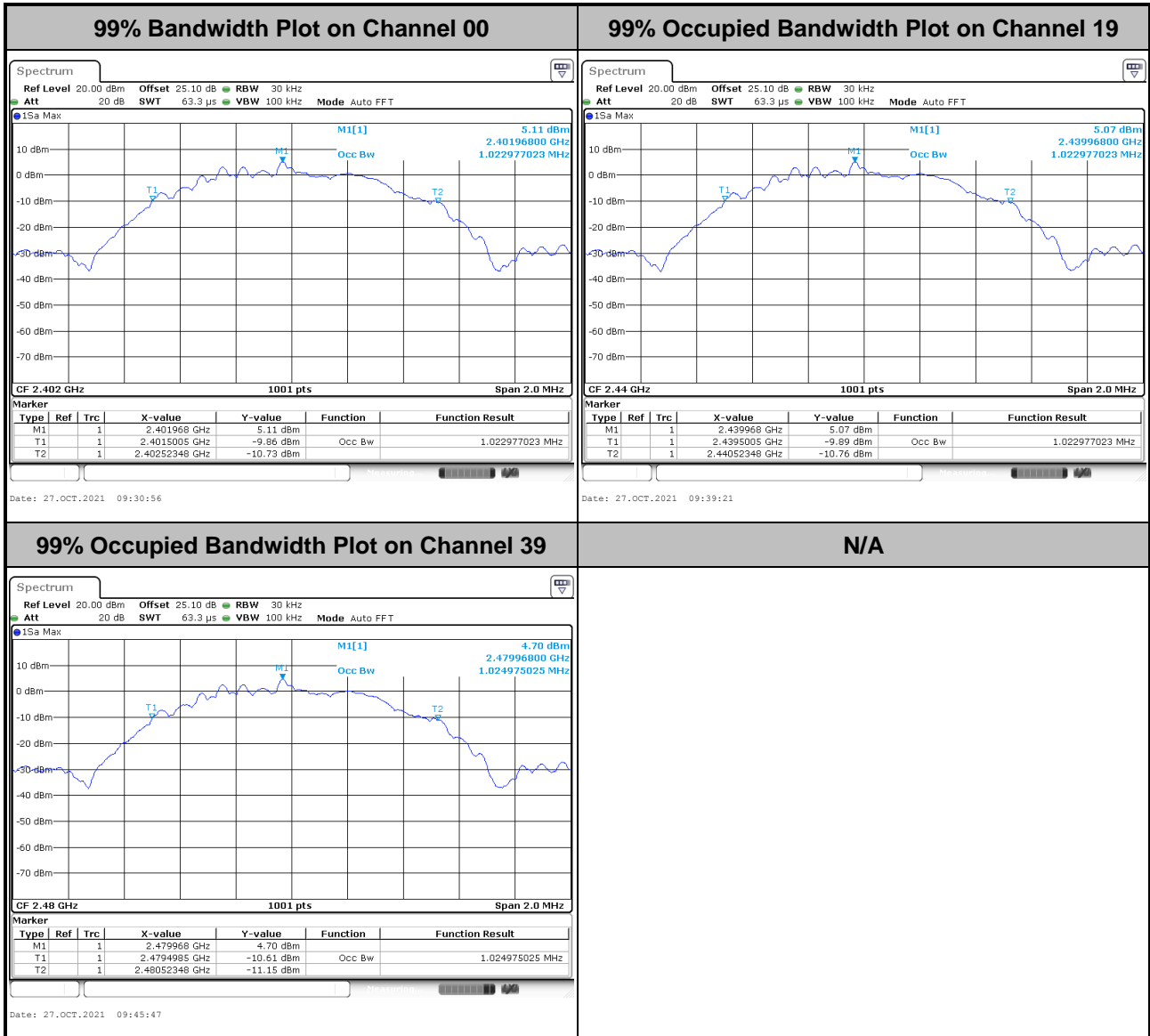


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



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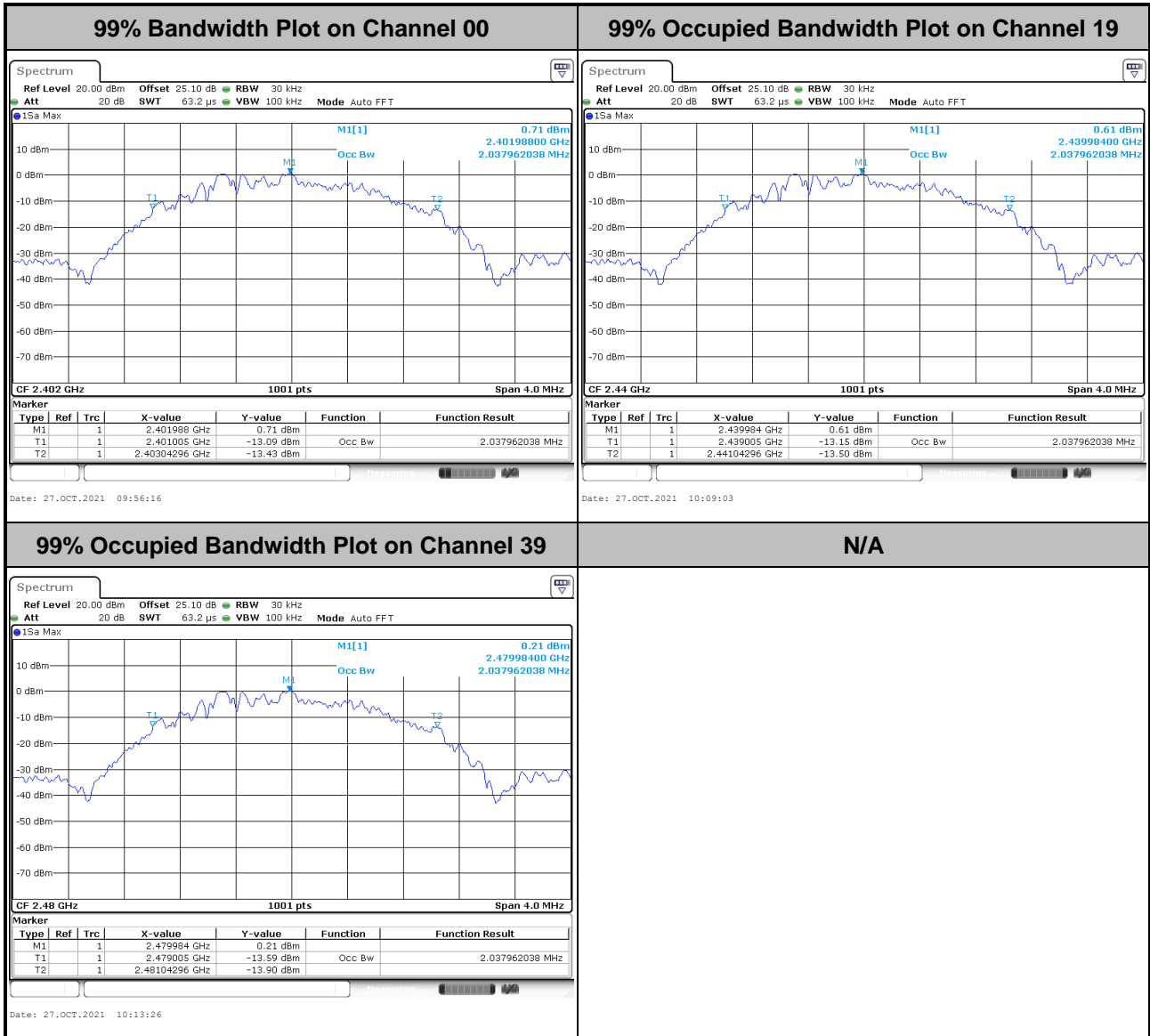
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Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



<2Mbps>



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.

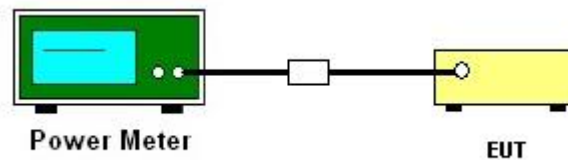
3.2.2 Measuring Instruments

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 AVGP-M-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

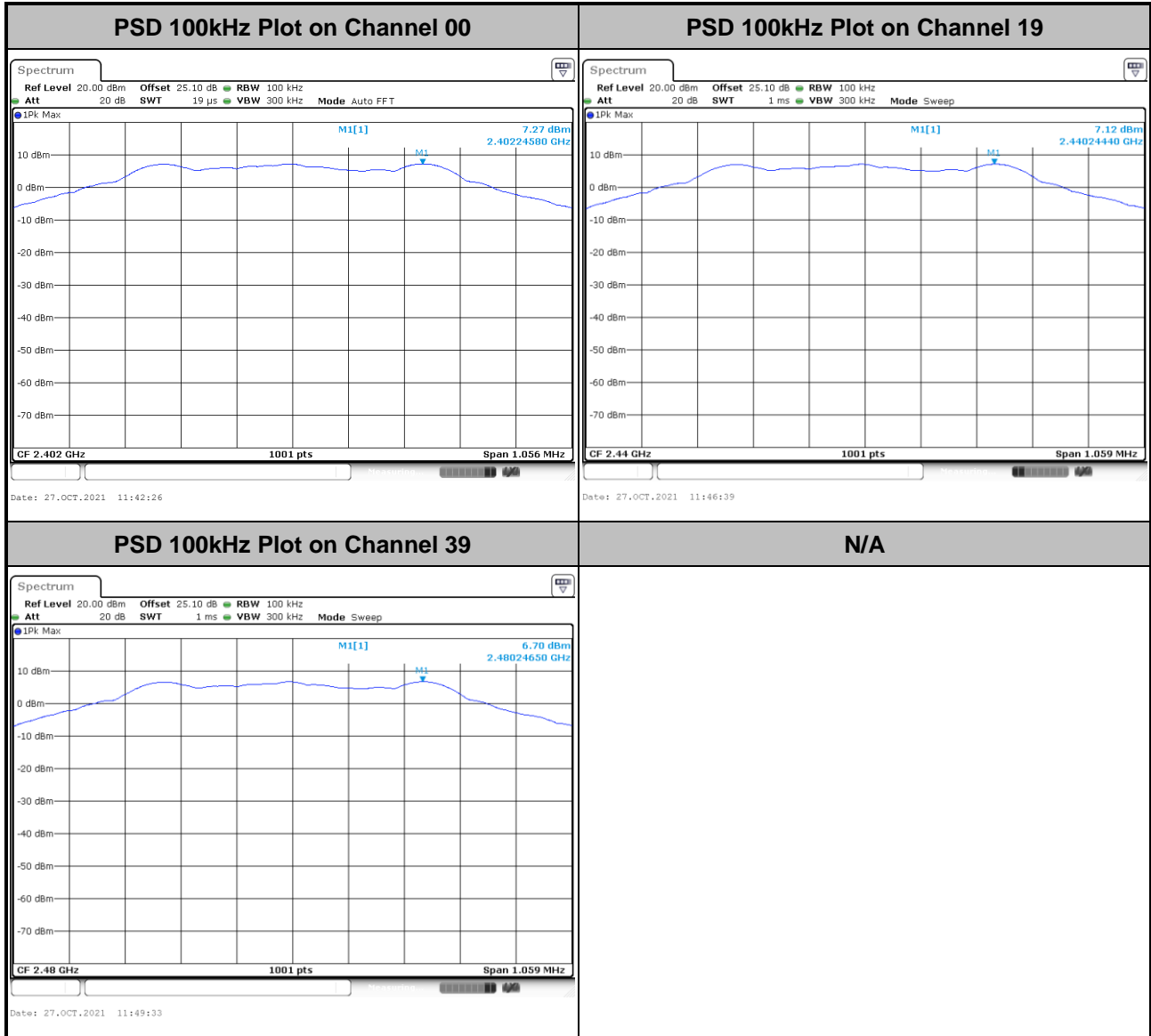
Please refer to Appendix A.



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

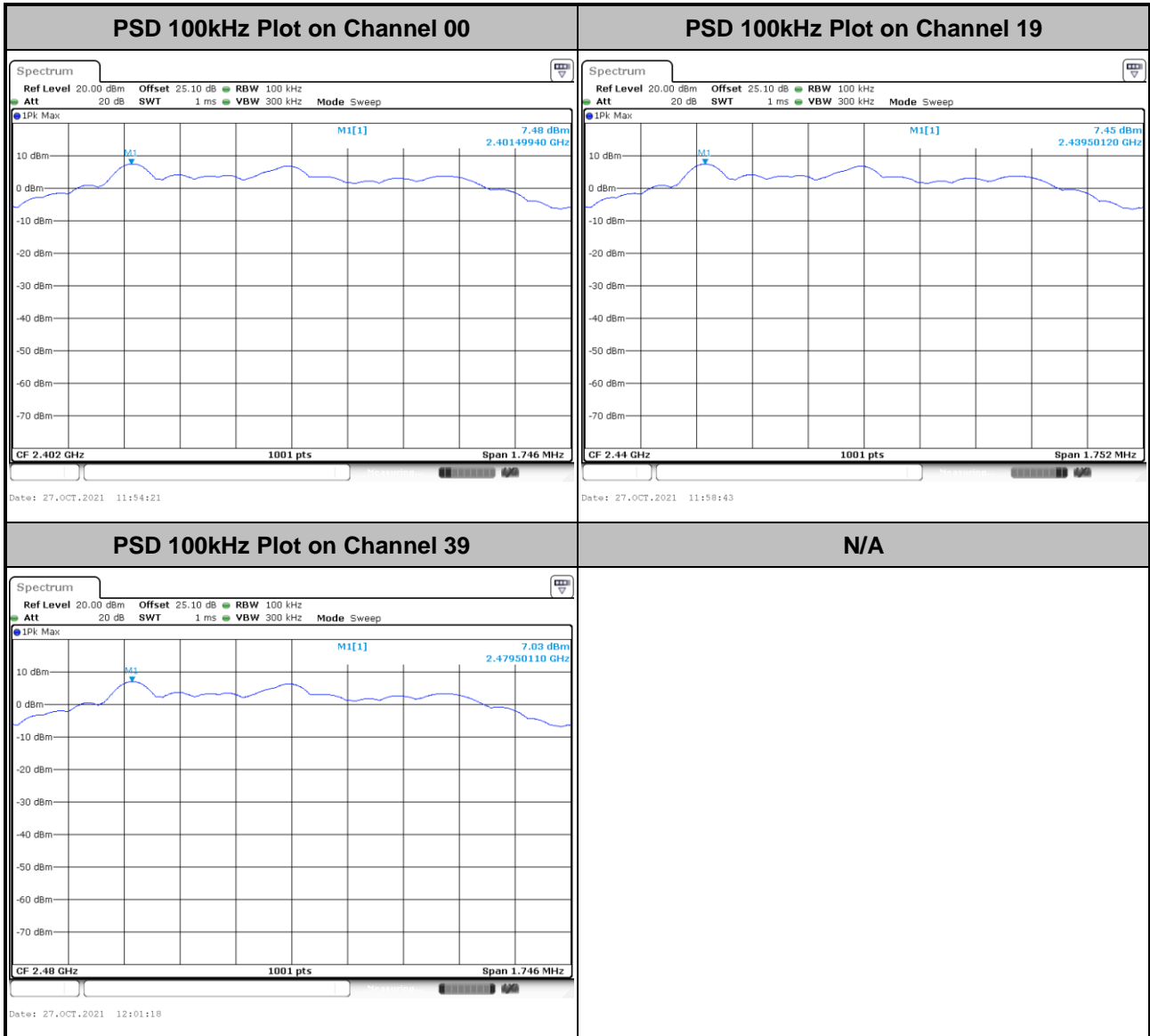
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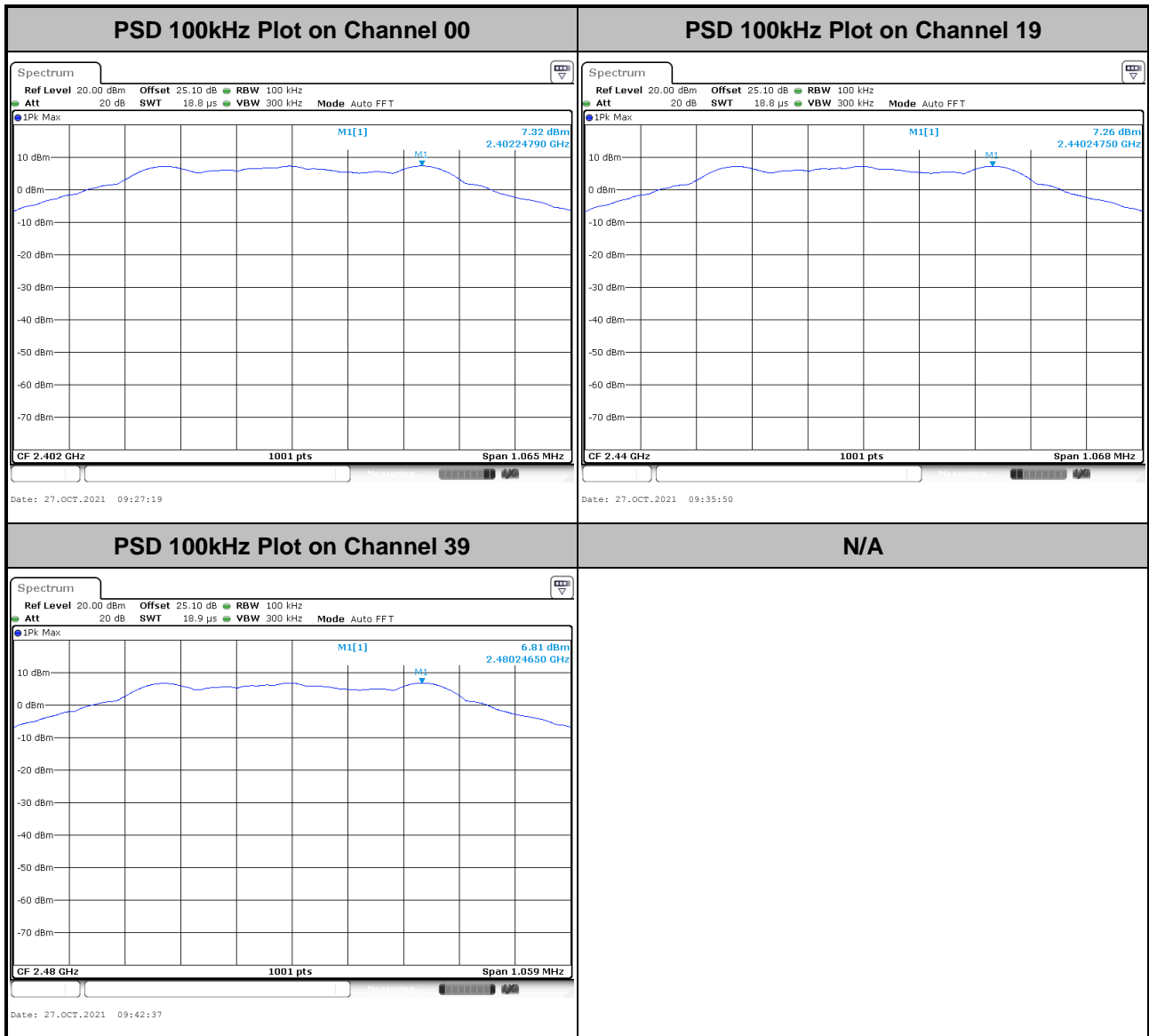
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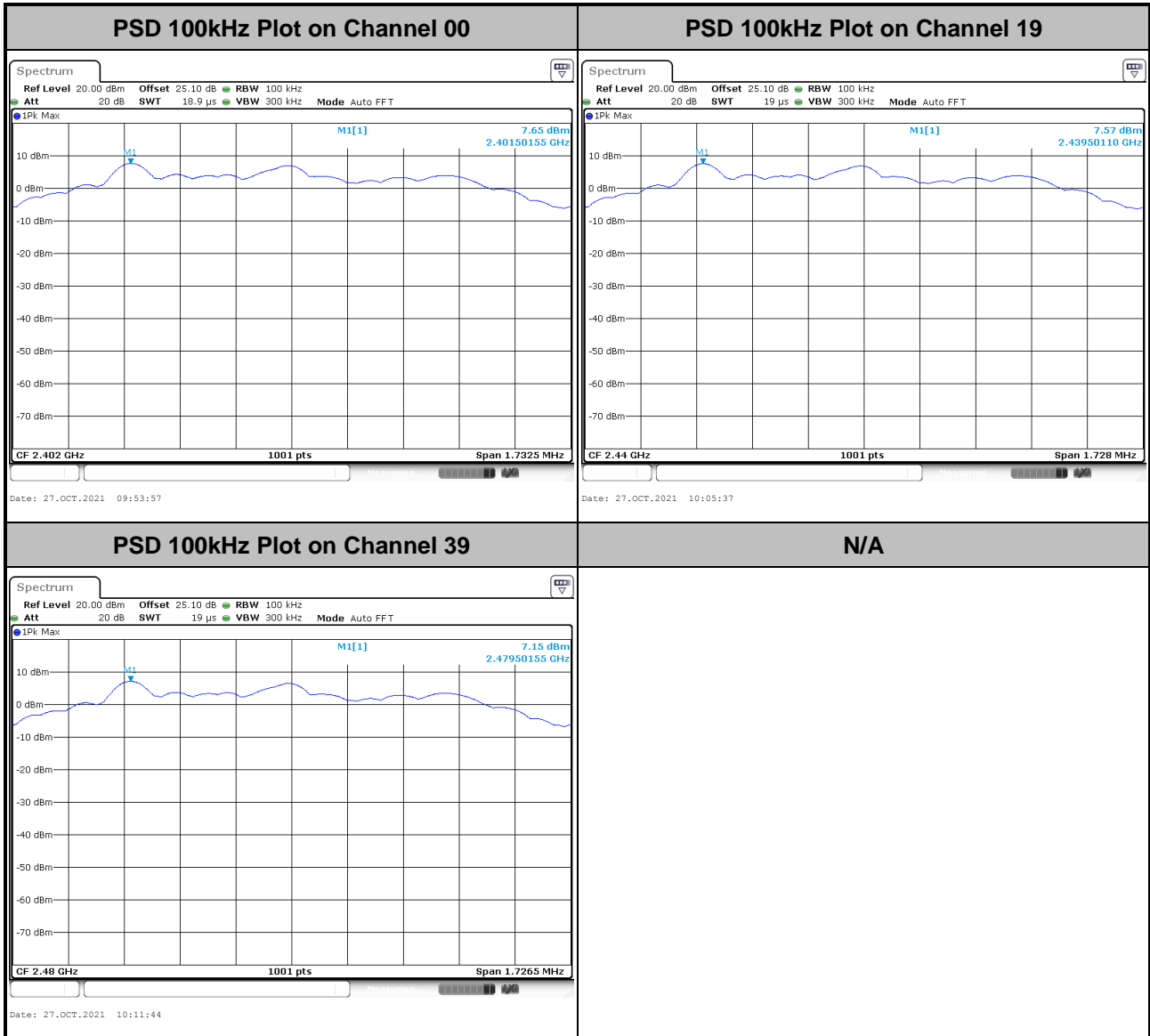
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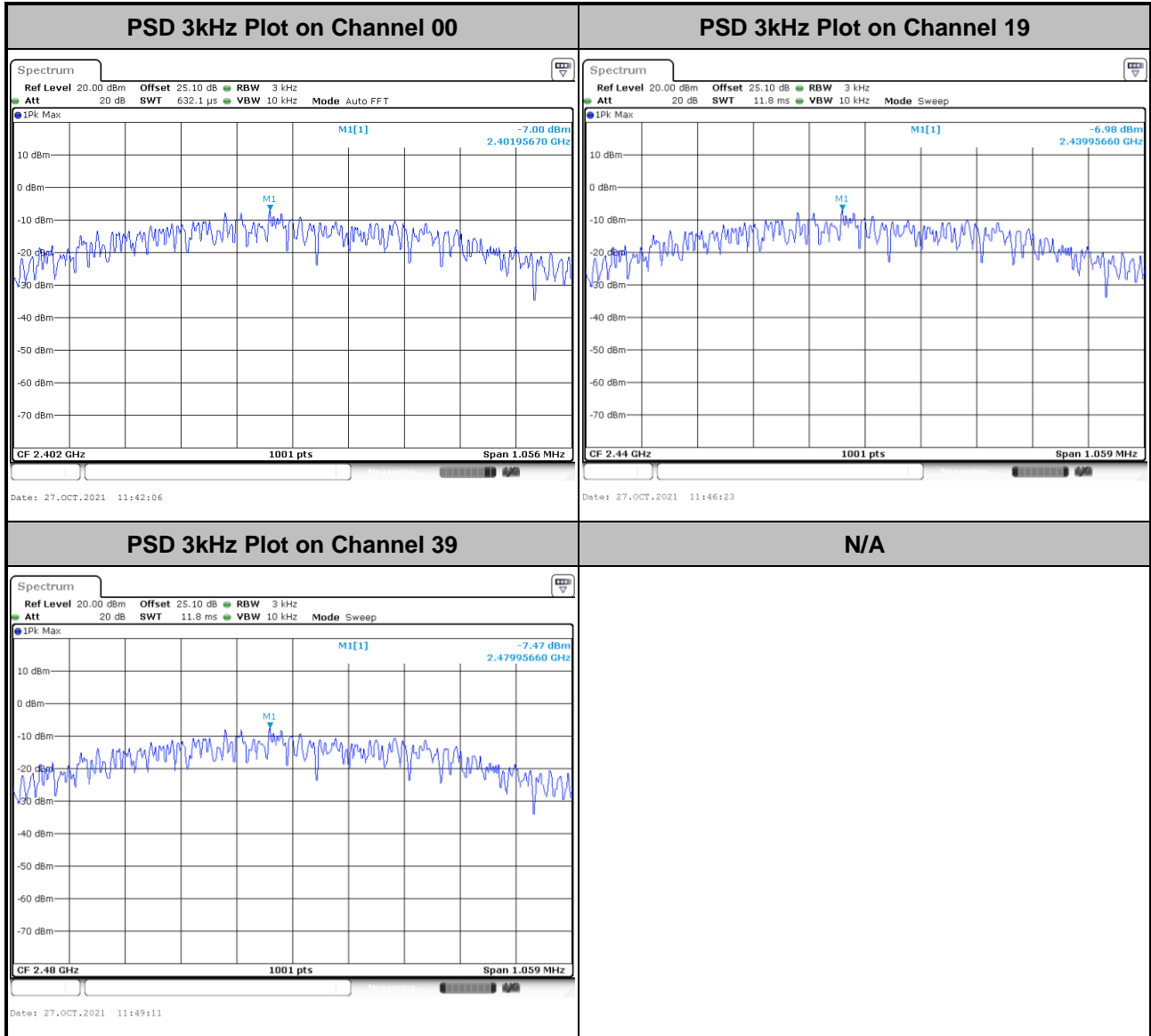




3.3.7 Test Result of Power Spectral Density Plots (3kHz)

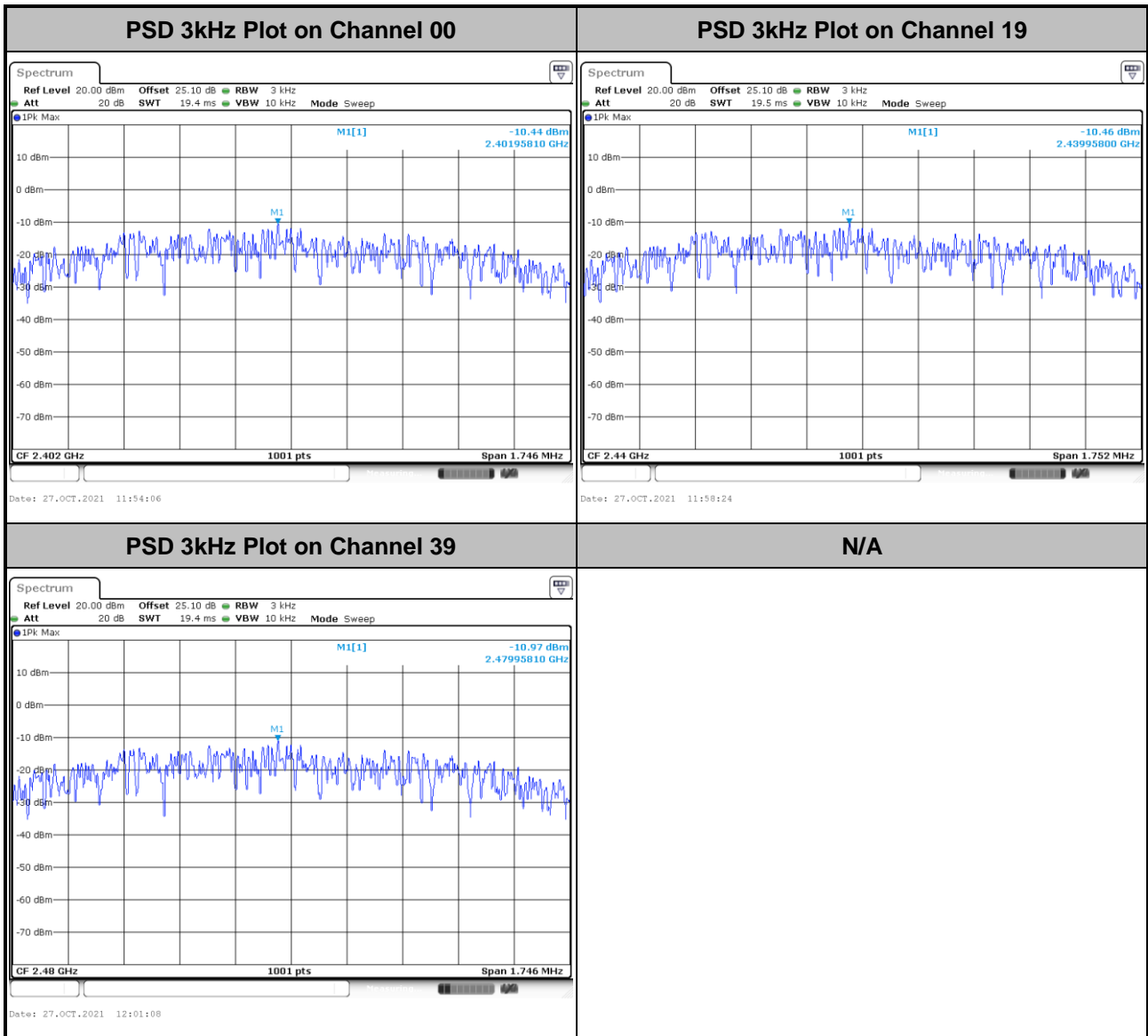
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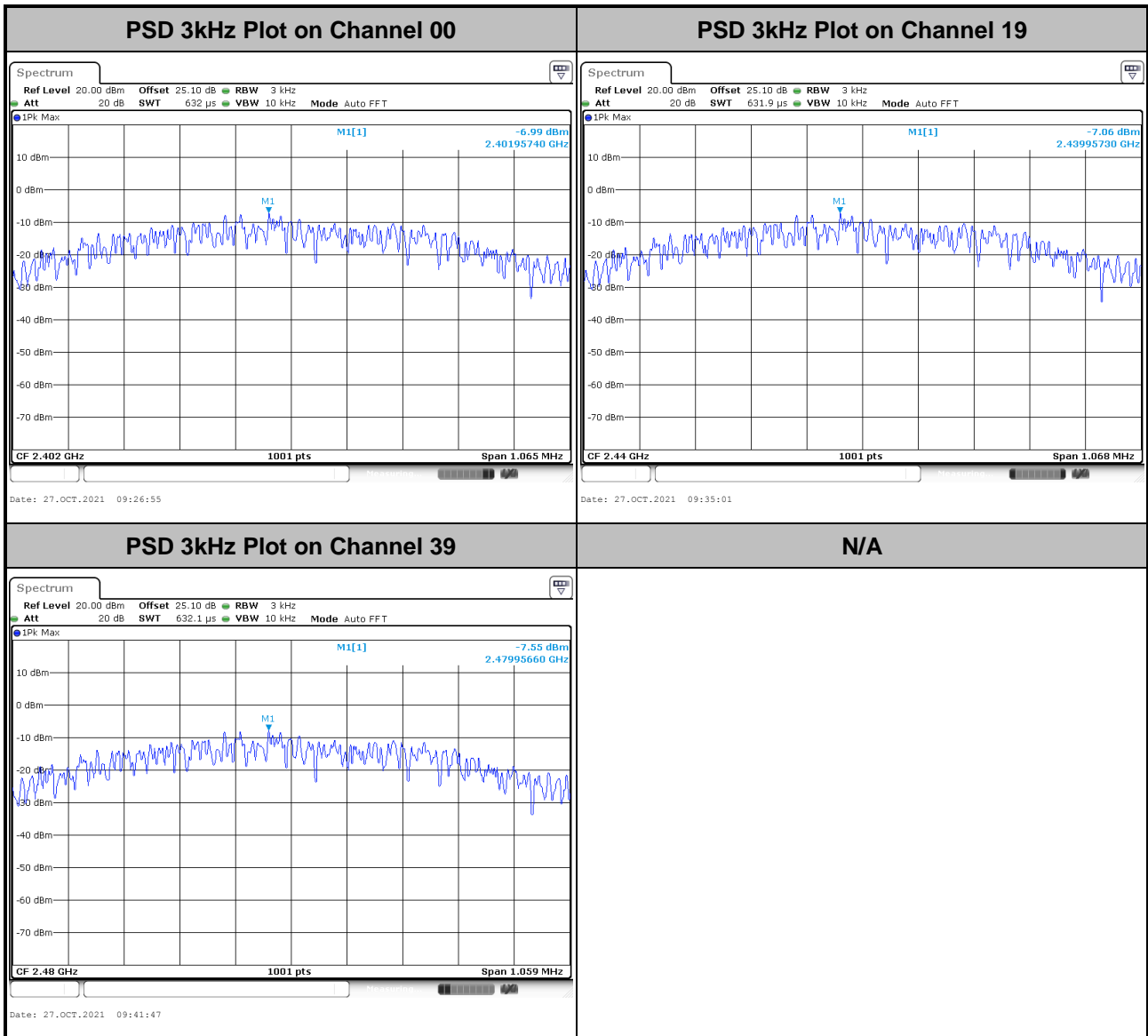
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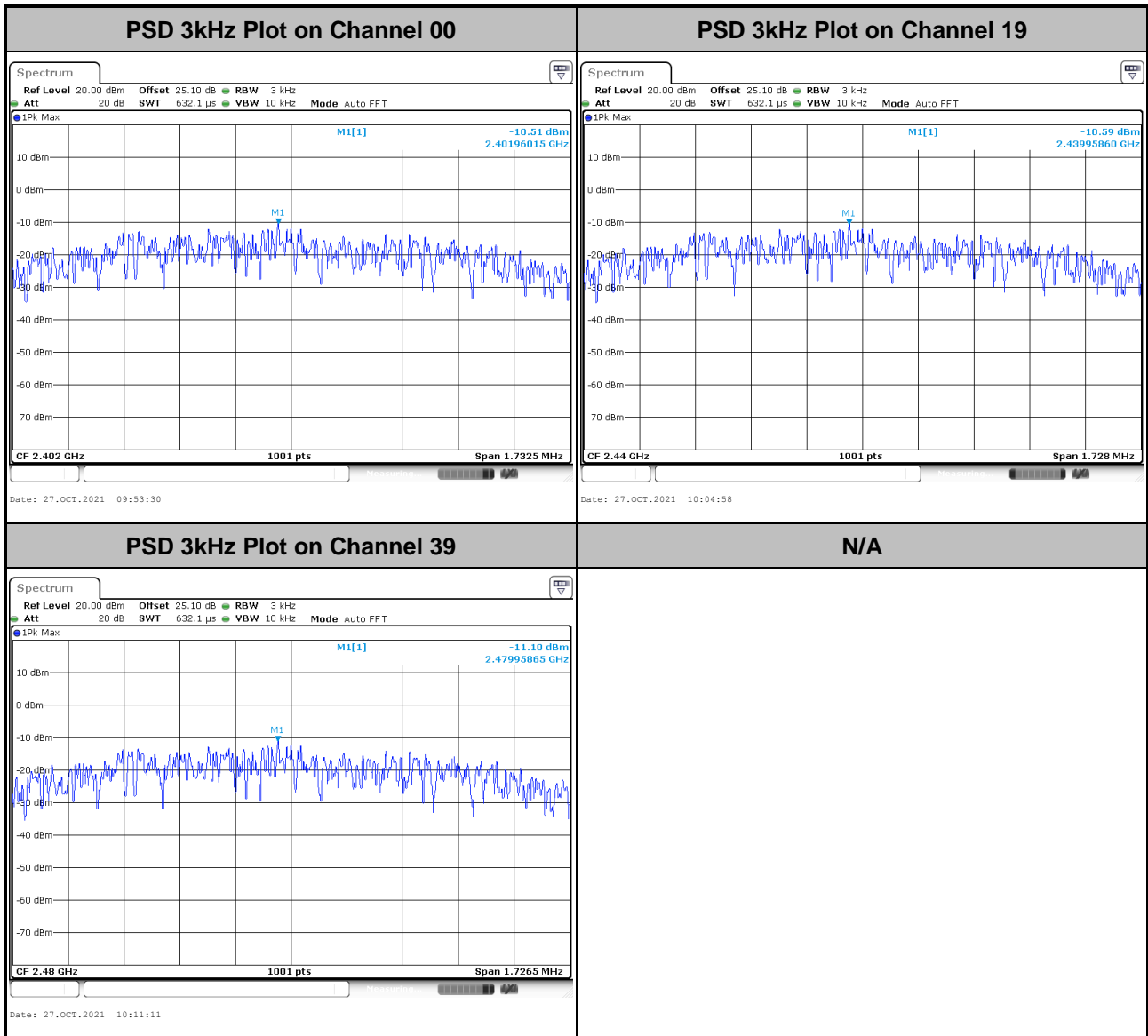
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3.4 Conducted Band Edges and Spurious Emission Measurement

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.

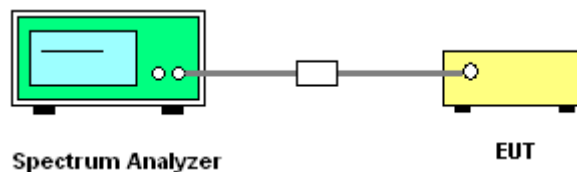
3.4.2 Measuring Instruments

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

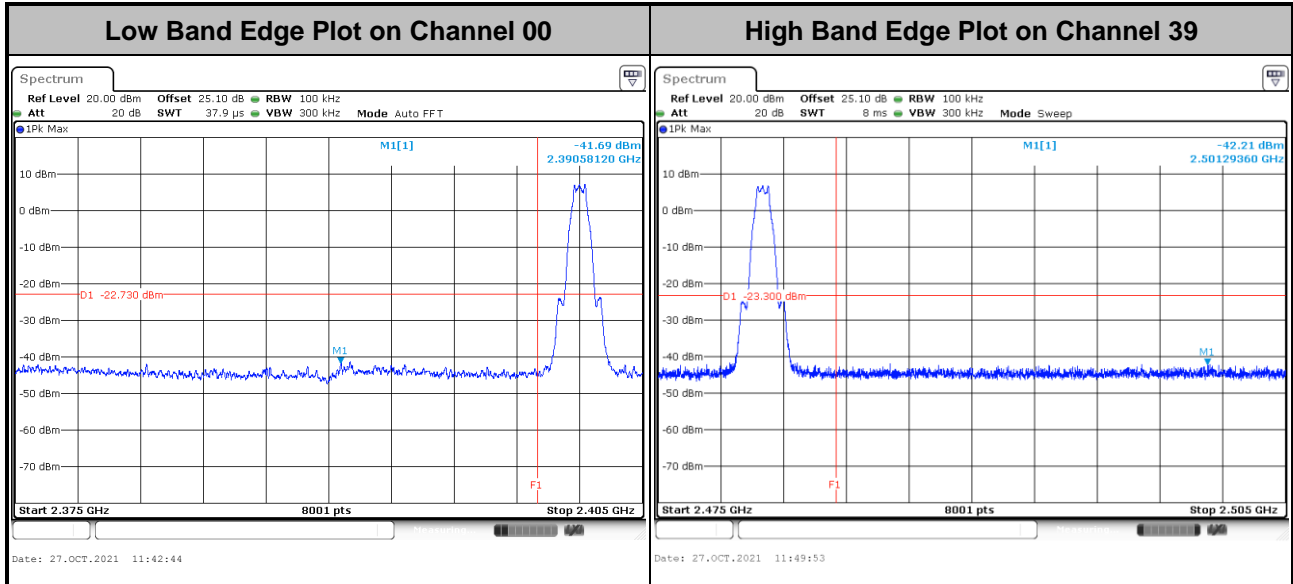




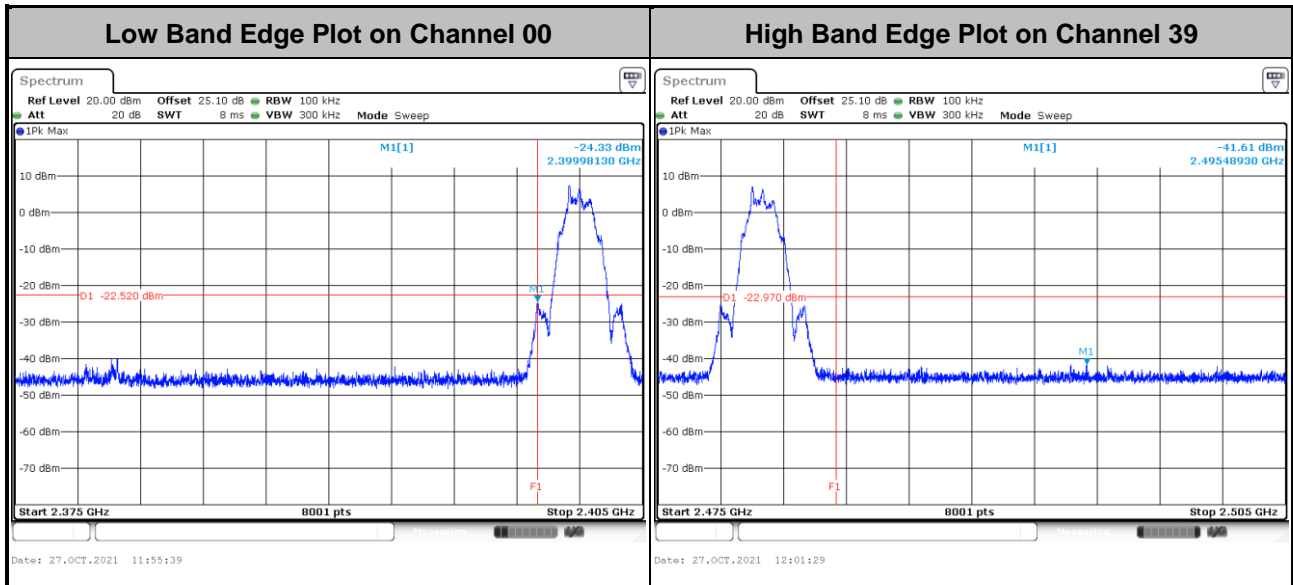
3.4.5 Test Result of Conducted Band Edges Plots

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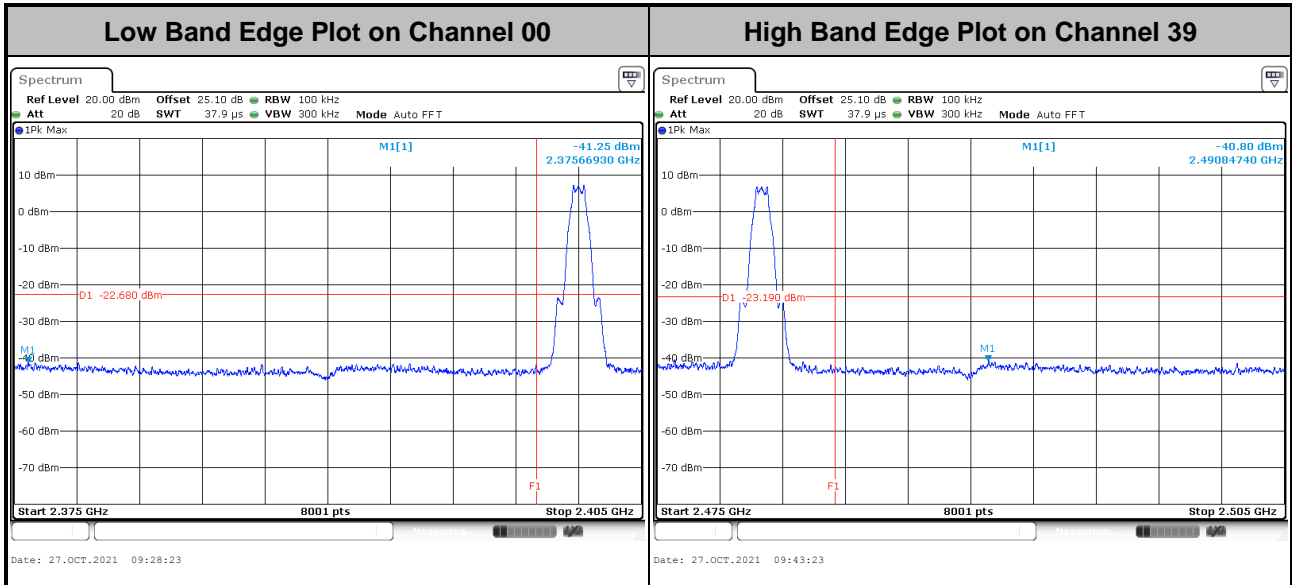
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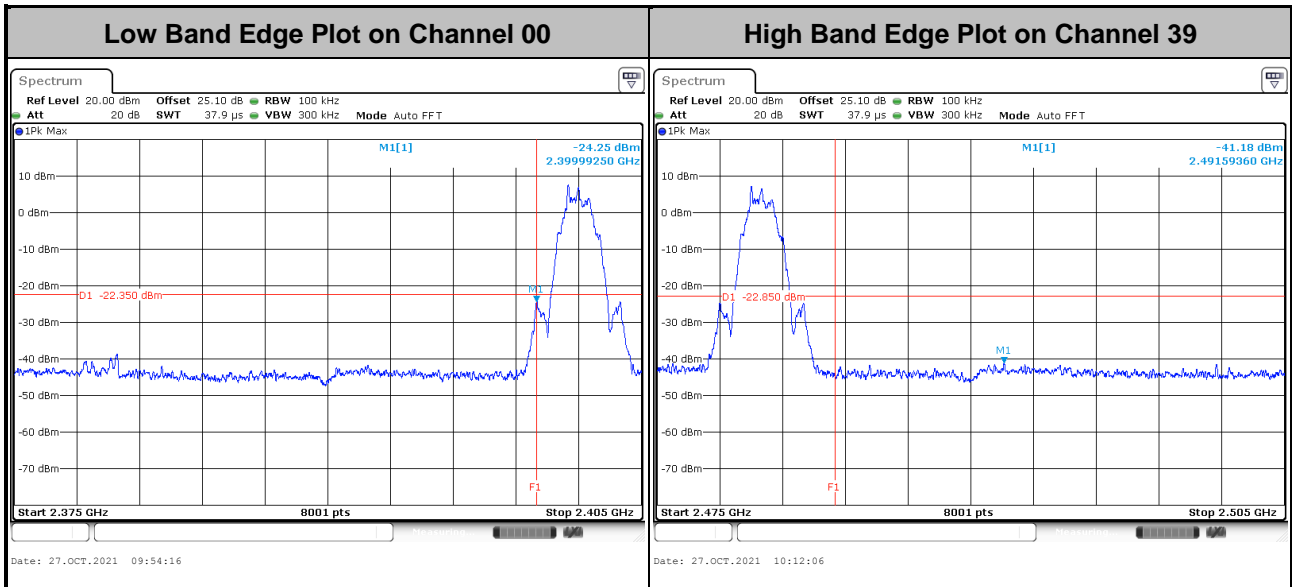


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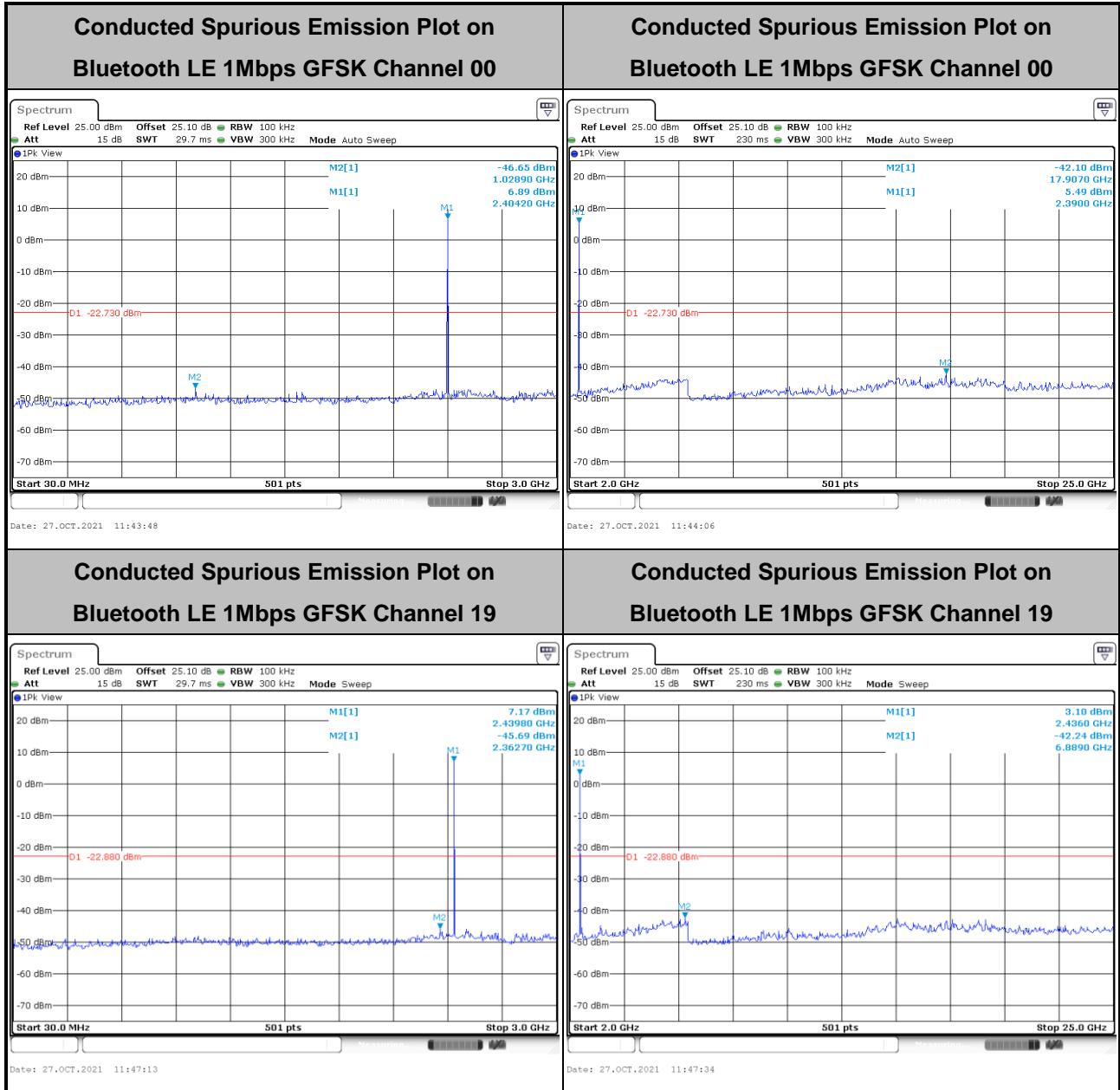


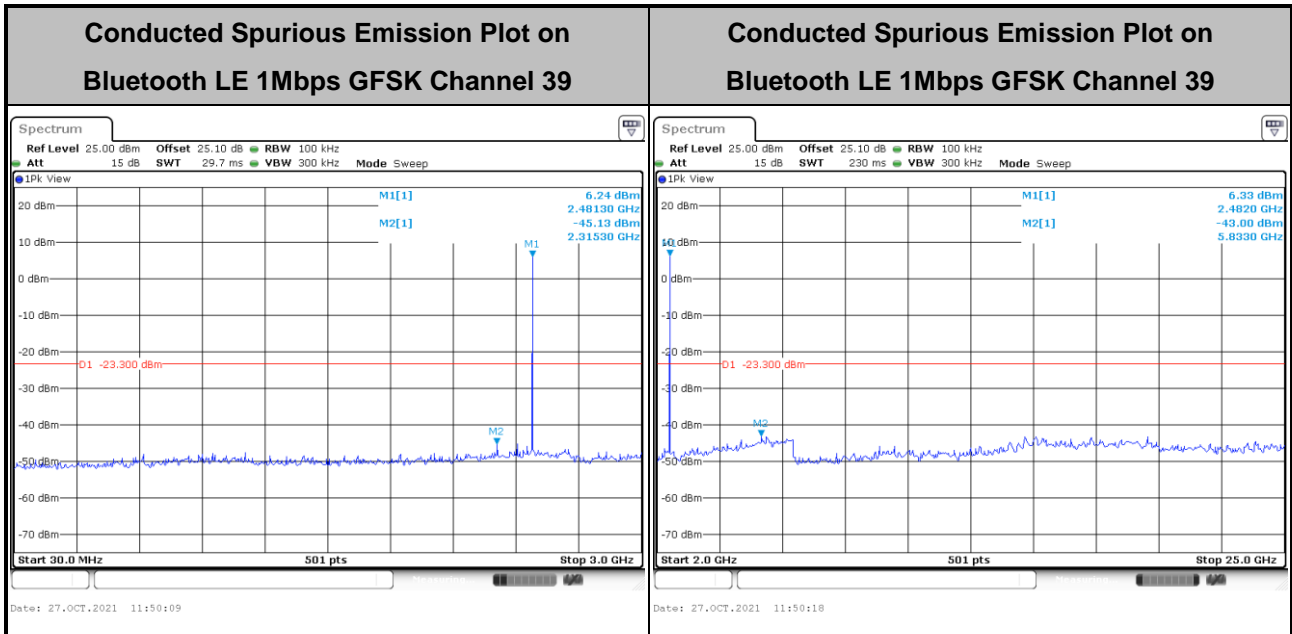


3.4.6 Test Result of Conducted Spurious Emission Plots

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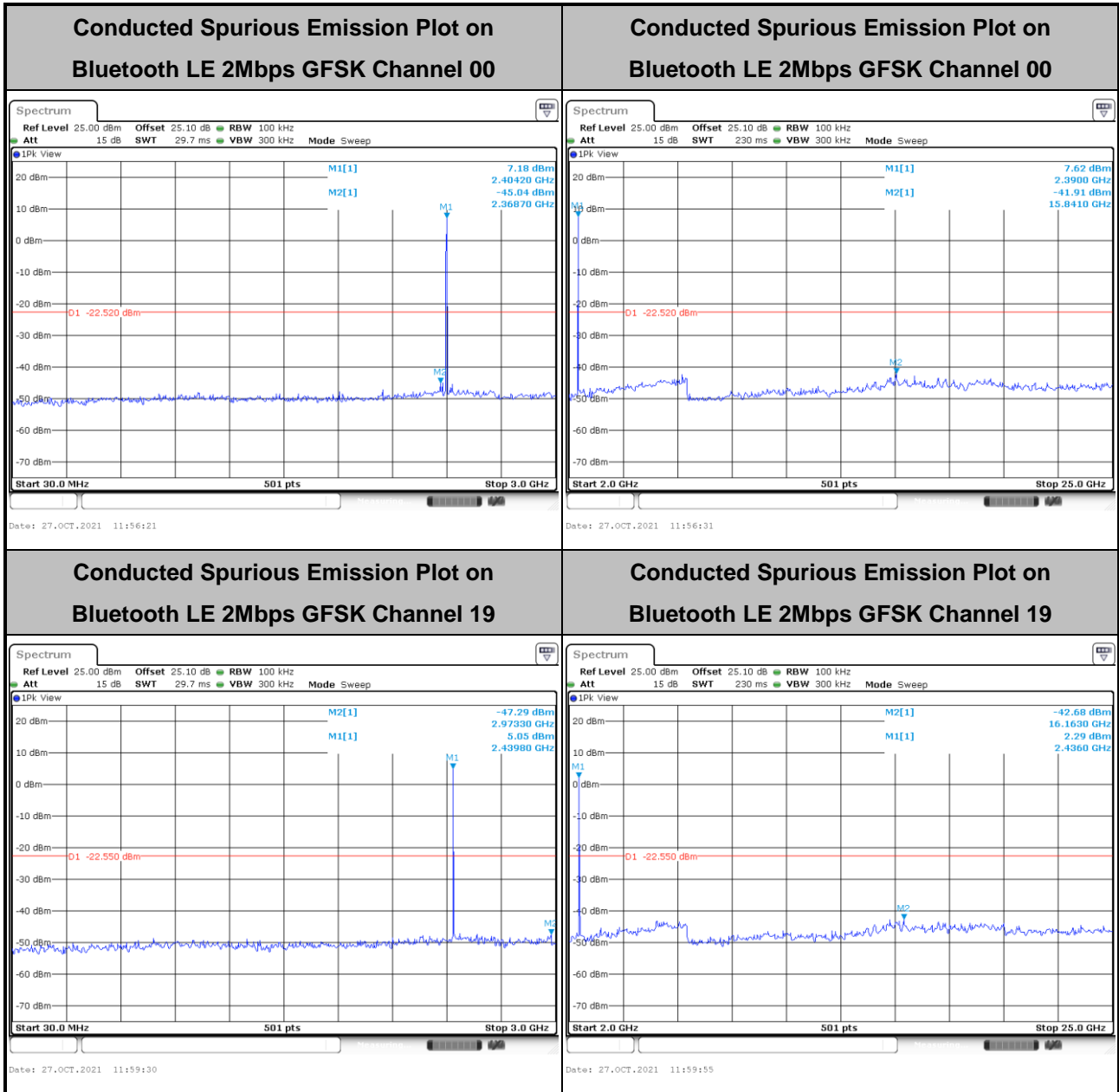
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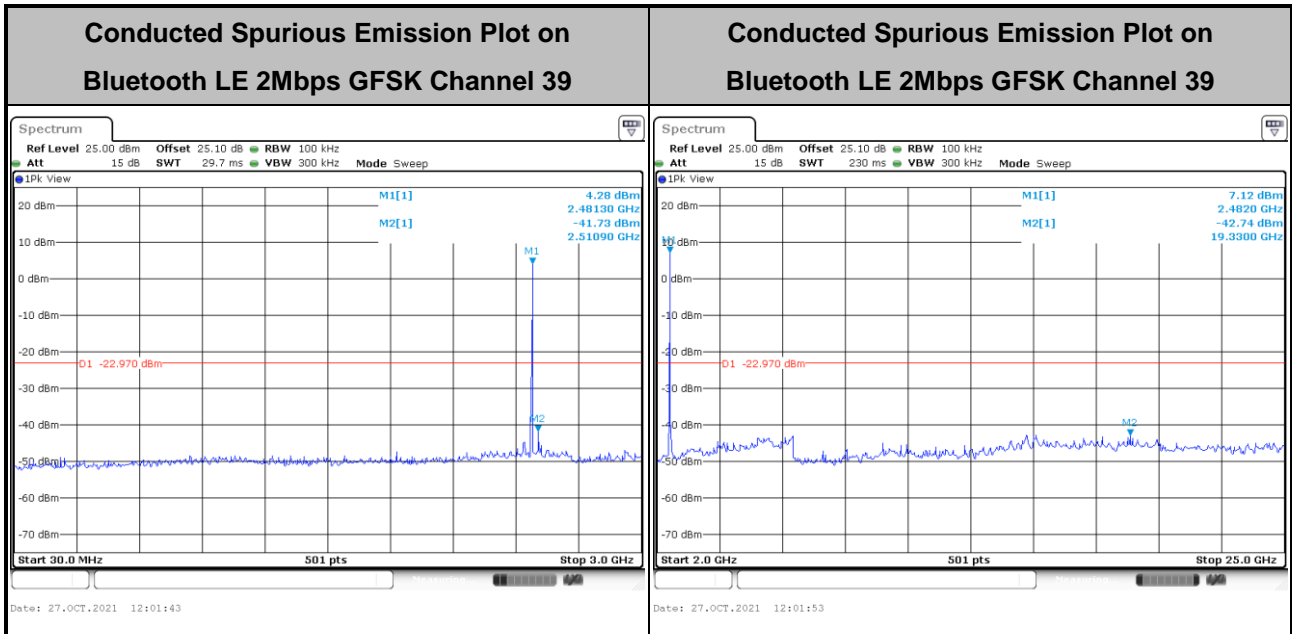






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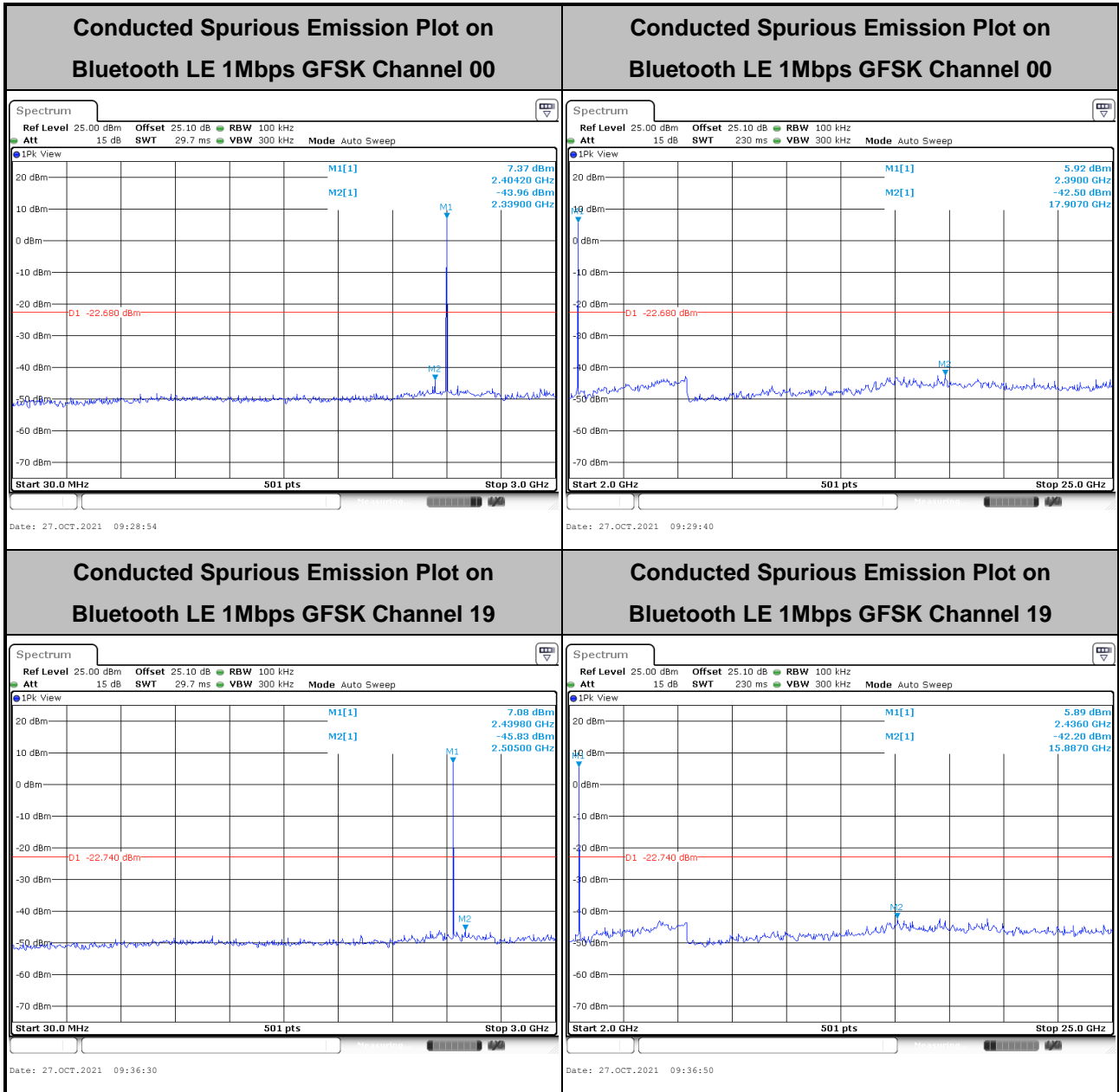


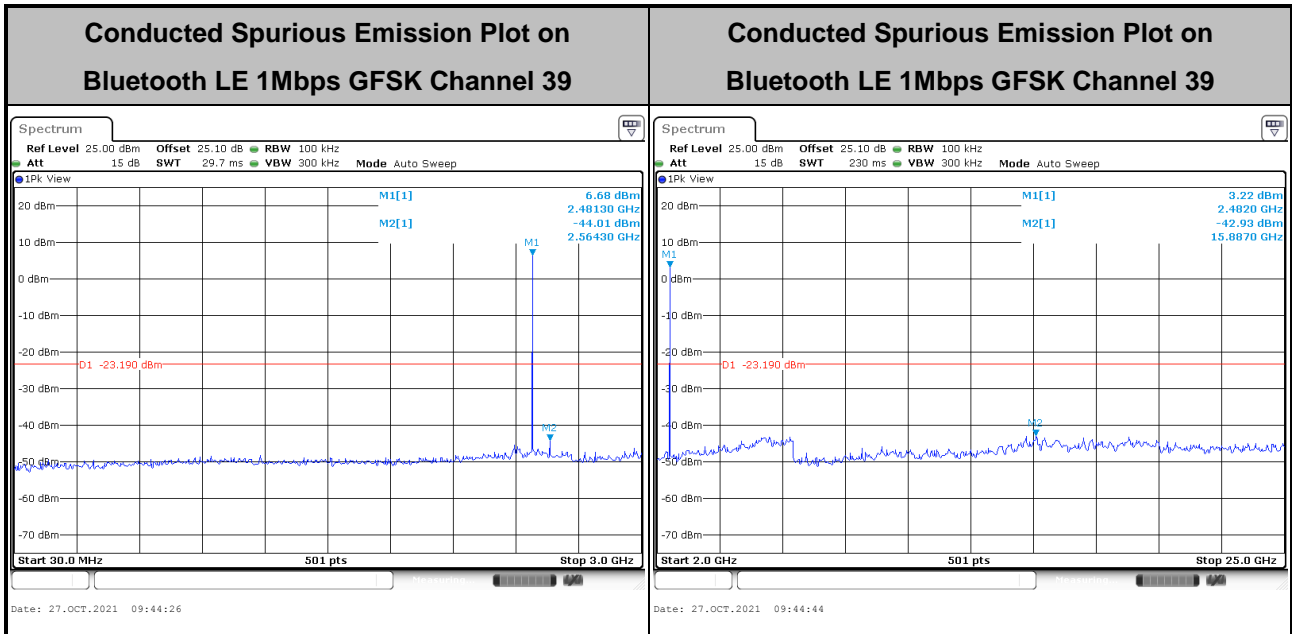




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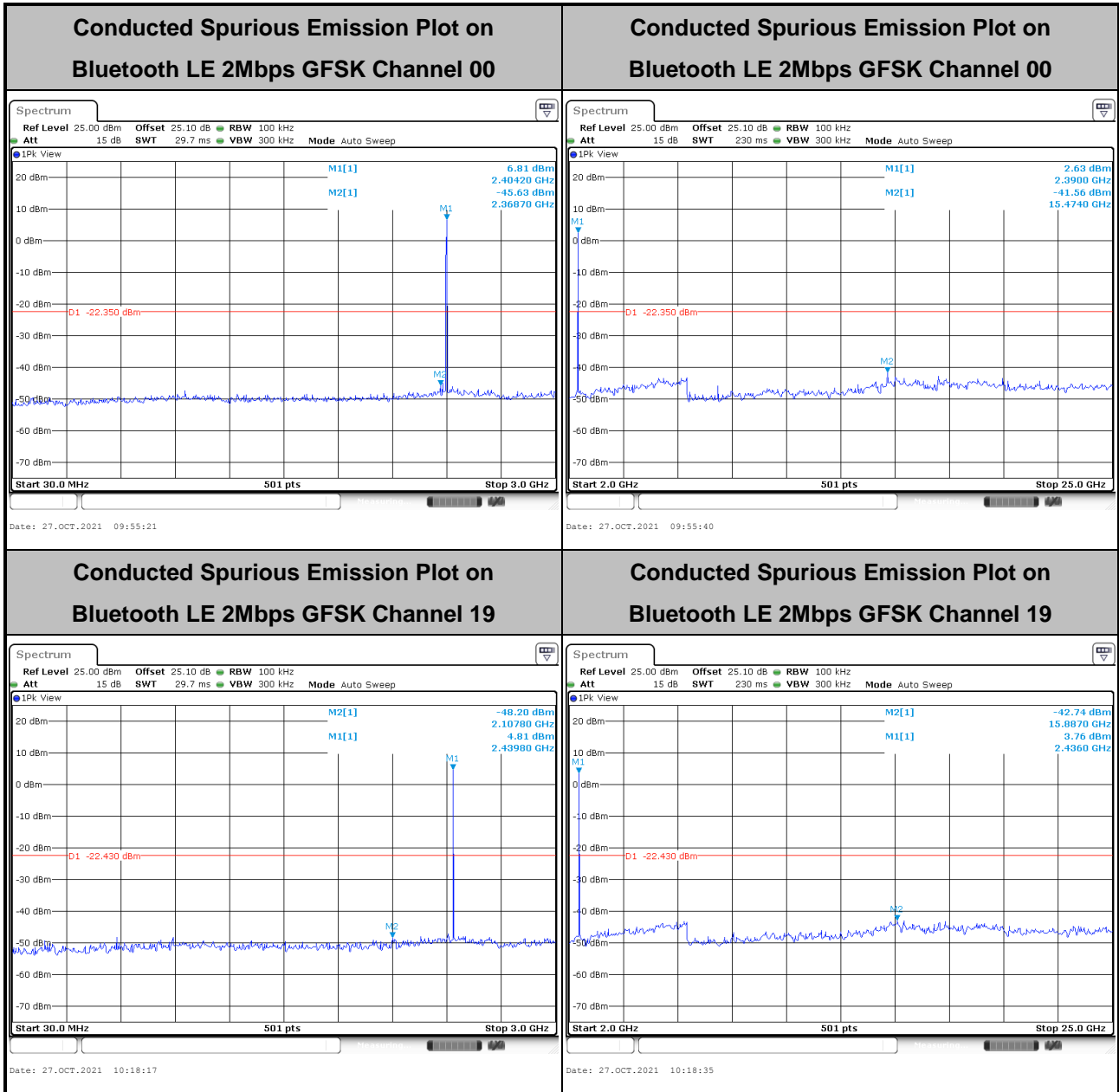
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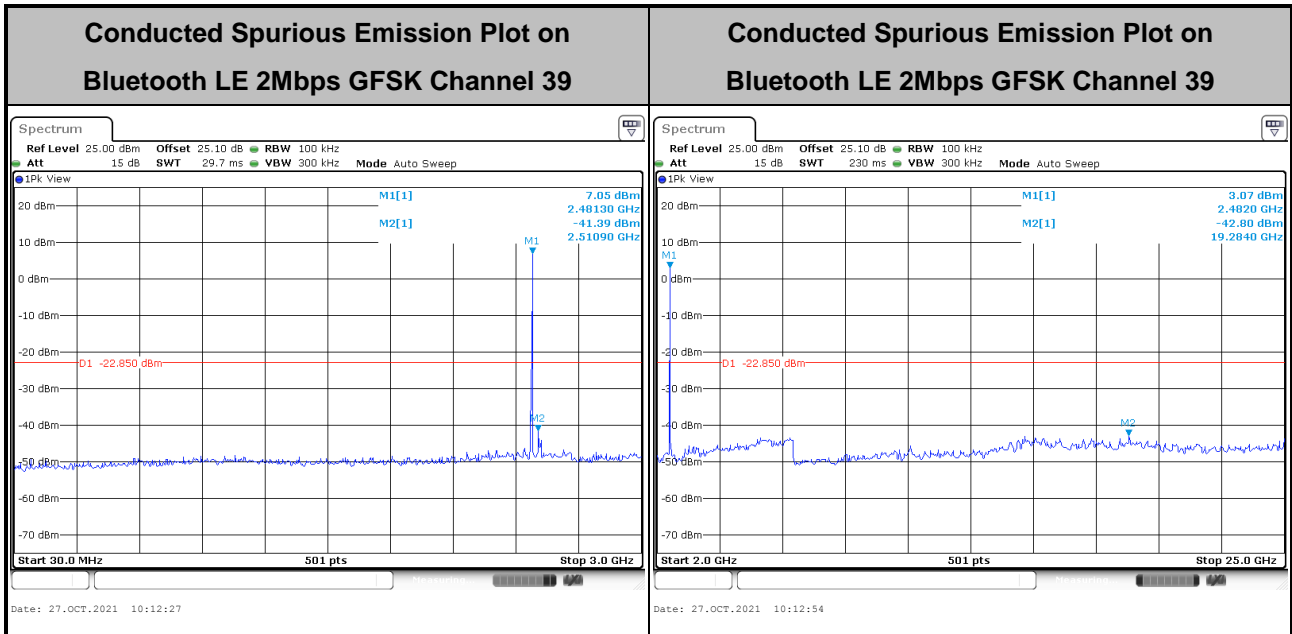






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3.5 Radiated Band Edges and Spurious Emission Measurement

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 interference 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.

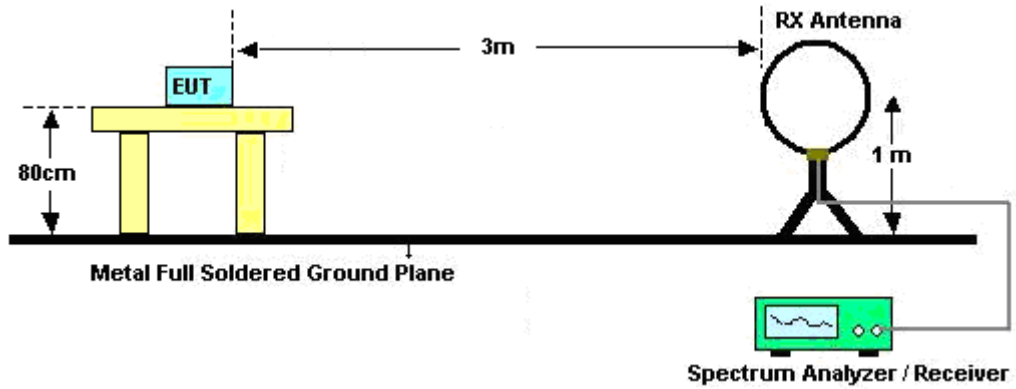
For average measurement:

 - Set RBW = 1 MHz, VBW= 3MHz; Sweep = auto; Detector function = RMS; Averaging type = power;
 - Perform a trace average of at least 100 traces.

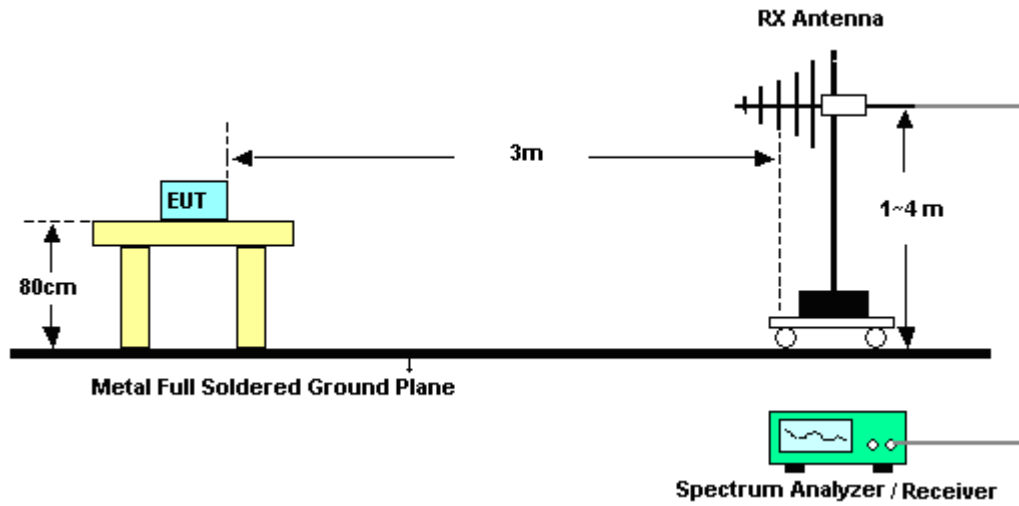
A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed $[10 \log (1 / D)]$, where D is the duty cycle.

3.5.4 Test Setup

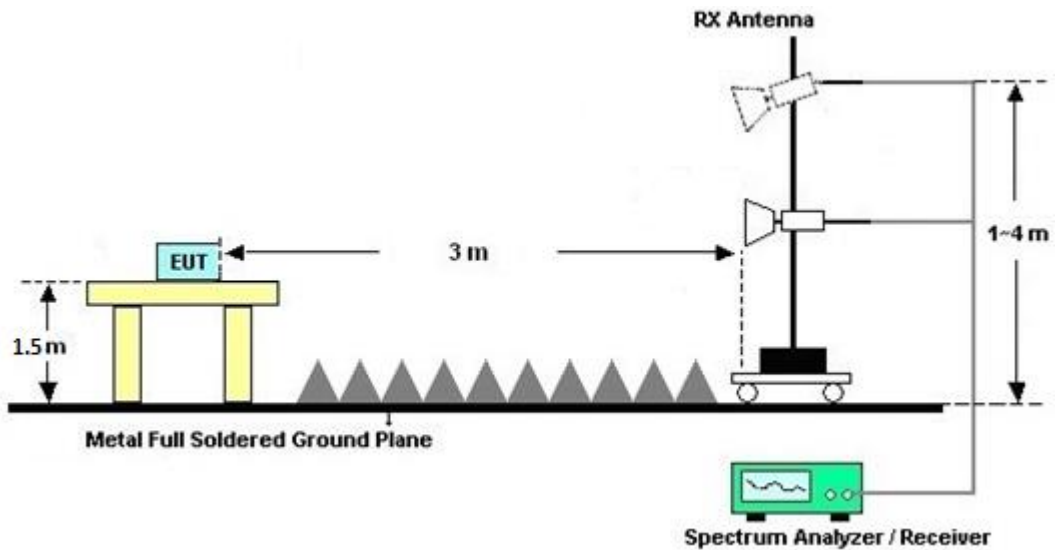
For radiated test below 30MHz



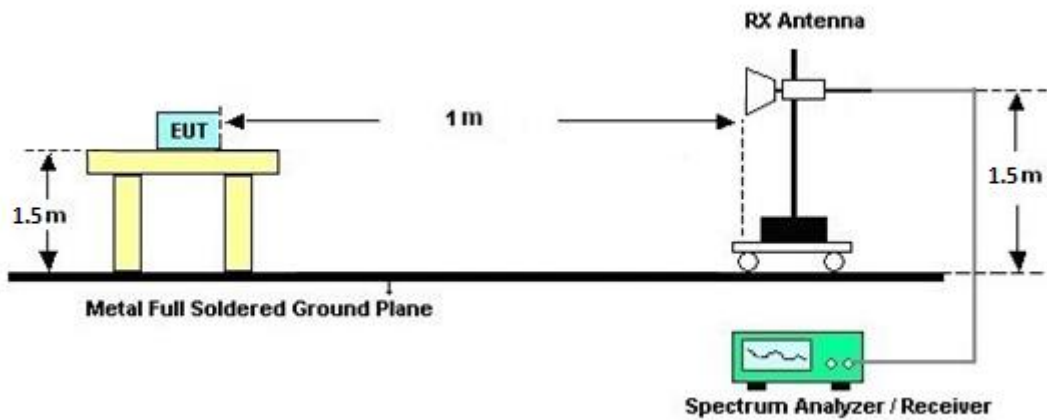
For radiated test from 30MHz to 1GHz



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 μ 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.

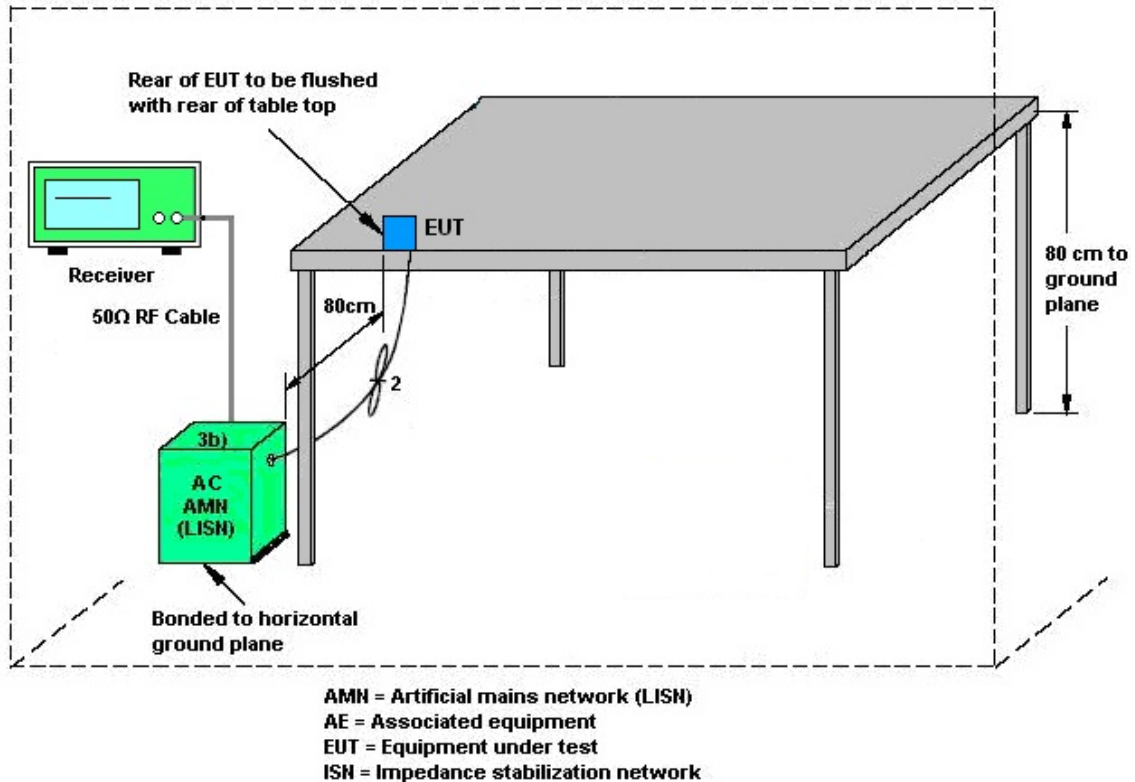
3.6.2 Measuring Instruments

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
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Oct. 12, 2021~ Nov. 05, 2021	Jan. 03, 2022	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	41912 & 05	30MHz~1GHz	Feb. 08, 2021	Oct. 12, 2021~ Nov. 05, 2021	Feb. 07, 2022	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 23, 2020	Oct. 12, 2021~ Nov. 05, 2021	Nov. 22, 2021	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	00993	18GHz~40GHz	Nov. 19, 2020	Oct. 12, 2021~ Nov. 05, 2021	Nov. 18, 2021	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 24, 2021	Oct. 12, 2021~ Nov. 05, 2021	Mar. 23, 2022	Radiation (03CH12-HY)
Preamplifier	Keysight	8449B	3008A02375	1GHz~26.5GHz	May 25, 2021	Oct. 12, 2021~ Nov. 05, 2021	May 24, 2022	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-30 3K	17100018000 54002	1GHz~18GHz	Jun. 16, 2021	Oct. 12, 2021~ Nov. 05, 2021	Jun. 15, 2022	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Oct. 12, 2021~ Nov. 05, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 15, 2021	Oct. 12, 2021~ Nov. 05, 2021	Jan. 14, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 17, 2021	Oct. 12, 2021~ Nov. 05, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass Filter	Jul. 12, 2021	Oct. 12, 2021~ Nov. 05, 2021	Jul. 11, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN2	6.75GHz High Pass Filter	Mar. 17, 2021	Oct. 12, 2021~ Nov. 05, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Oct. 12, 2021~ Nov. 05, 2021	Mar. 10, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 11, 2020	Oct. 12, 2021~ Nov. 05, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 22, 2021	Oct. 12, 2021~ Nov. 05, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 22, 2021	Oct. 12, 2021~ Nov. 05, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Sep. 30, 2021	Oct. 12, 2021~ Nov. 05, 2021	Sep. 29, 2022	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Oct. 12, 2021~ Nov. 05, 2021	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Oct. 12, 2021~ Nov. 05, 2021	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Oct. 12, 2021~ Nov. 05, 2021	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Oct. 12, 2021~ Nov. 05, 2021	N/A	Radiation (03CH12-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 01, 2021	Oct. 08, 2021~ Oct. 27, 2021	Feb. 28, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 12	10MHz~6GHz	Dec. 16, 2020	Oct. 08, 2021~ Oct. 27, 2021	Dec. 15, 2021	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101565	10Hz ~ 40GHz	Nov. 13, 2020	Oct. 08, 2021~ Oct. 27, 2021	Nov. 12, 2021	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	Oct. 08, 2021~ Oct. 27, 2021	Mar. 16, 2022	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Oct. 12, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Oct. 12, 2021	Nov. 29, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Oct. 12, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 01, 2020	Oct. 12, 2021	Nov. 30, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Oct. 12, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Oct. 12, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	Oct. 12, 2021	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Oct. 12, 2021	Dec. 30, 2021	Conduction (CO05-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.1 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.3 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.9 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Mina Liu	Temperature:	21~25	°C
Test Date:	2021/10/8~2021/10/27	Relative Humidity:	51~54	%

<Ant. 1>

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
BLE	1Mbps	1	0	2402	1.023	0.704	0.50	Pass
BLE	1Mbps	1	19	2440	1.021	0.706	0.50	Pass
BLE	1Mbps	1	39	2480	1.021	0.706	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	N _{TX}	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	8.40	30.00	3.03	11.43	36.00	Pass
BLE	1Mbps	1	19	2440	8.30	30.00	3.03	11.33	36.00	Pass
BLE	1Mbps	1	39	2480	8.10	30.00	3.03	11.13	36.00	Pass

TEST RESULTS DATA
Peak Power Density

Mod.	Data Rate	N _{TX}	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	7.27	-7.00	3.03	8.00	Pass
BLE	1Mbps	1	19	2440	7.12	-6.98	3.03	8.00	Pass
BLE	1Mbps	1	39	2480	6.70	-7.47	3.03	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
BLE	2Mbps	1	0	2402	2.034	1.164	0.50	Pass
BLE	2Mbps	1	19	2440	2.030	1.168	0.50	Pass
BLE	2Mbps	1	39	2480	2.030	1.164	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	2Mbps	1	0	2402	7.90	30.00	3.03	10.93	36.00	Pass
BLE	2Mbps	1	19	2440	7.80	30.00	3.03	10.83	36.00	Pass
BLE	2Mbps	1	39	2480	7.60	30.00	3.03	10.63	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	2Mbps	1	0	2402	7.48	-10.44	3.03	8.00	Pass
BLE	2Mbps	1	19	2440	7.45	-10.46	3.03	8.00	Pass
BLE	2Mbps	1	39	2480	7.03	-10.97	3.03	8.00	Pass

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

<Ant. 2>

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	1.023	0.710	0.50	Pass
BLE	1Mbps	1	19	2440	1.023	0.712	0.50	Pass
BLE	1Mbps	1	39	2480	1.025	0.706	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	8.50	30.00	2.73	11.23	36.00	Pass
BLE	1Mbps	1	19	2440	8.40	30.00	2.73	11.13	36.00	Pass
BLE	1Mbps	1	39	2480	8.20	30.00	2.73	10.93	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	7.32	-6.99	2.73	8.00	Pass
BLE	1Mbps	1	19	2440	7.26	-7.06	2.73	8.00	Pass
BLE	1Mbps	1	39	2480	6.81	-7.55	2.73	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
BLE	2Mbps	1	0	2402	2.038	1.155	0.50	Pass
BLE	2Mbps	1	19	2440	2.038	1.152	0.50	Pass
BLE	2Mbps	1	39	2480	2.038	1.151	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	2Mbps	1	0	2402	8.10	30.00	2.73	10.83	36.00	Pass
BLE	2Mbps	1	19	2440	8.00	30.00	2.73	10.73	36.00	Pass
BLE	2Mbps	1	39	2480	7.90	30.00	2.73	10.63	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	2Mbps	1	0	2402	7.65	-10.51	2.73	8.00	Pass
BLE	2Mbps	1	19	2440	7.57	-10.59	2.73	8.00	Pass
BLE	2Mbps	1	39	2480	7.15	-11.10	2.73	8.00	Pass

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



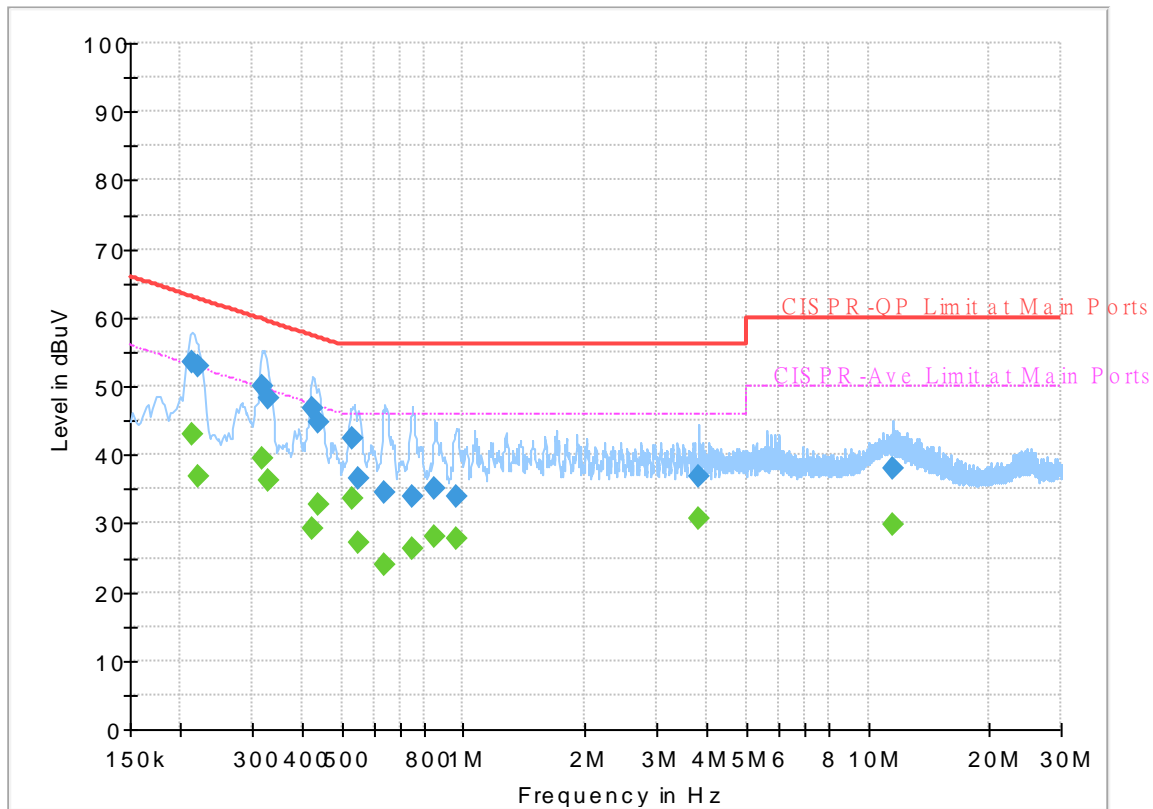
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	23~26°C
		Relative Humidity :	45~55%

EUT Information

Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum



Final_Result

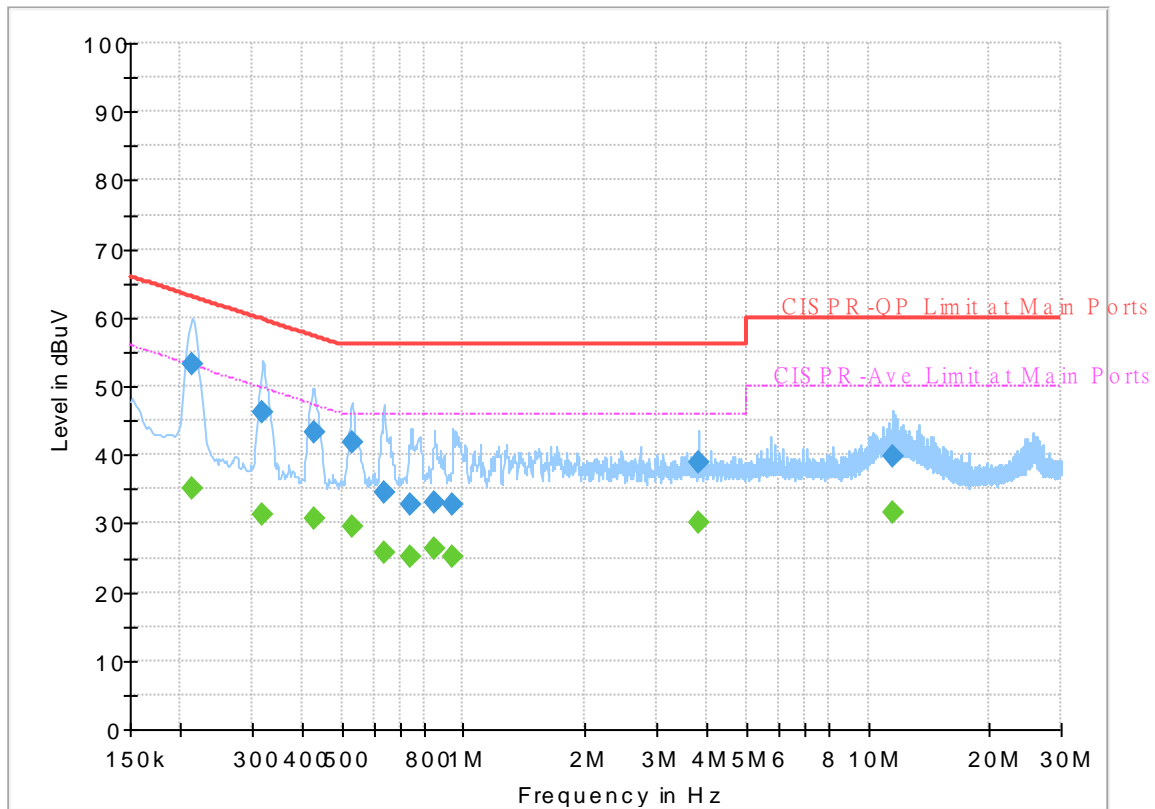
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.213000	---	42.87	53.09	10.22	L1	OFF	19.7
0.213000	53.54	---	63.09	9.55	L1	OFF	19.7
0.219750	---	36.83	52.83	16.00	L1	OFF	19.7
0.219750	53.00	---	62.83	9.83	L1	OFF	19.7
0.318750	---	39.54	49.74	10.20	L1	OFF	19.7
0.318750	50.02	---	59.74	9.72	L1	OFF	19.7
0.330000	---	36.24	49.45	13.21	L1	OFF	19.7
0.330000	48.16	---	59.45	11.29	L1	OFF	19.7
0.424500	---	29.23	47.36	18.13	L1	OFF	19.7
0.424500	46.66	---	57.36	10.70	L1	OFF	19.7
0.438000	---	32.88	47.10	14.22	L1	OFF	19.7
0.438000	44.74	---	57.10	12.36	L1	OFF	19.7
0.532500	---	33.77	46.00	12.23	L1	OFF	19.8
0.532500	42.36	---	56.00	13.64	L1	OFF	19.8
0.550500	---	27.15	46.00	18.85	L1	OFF	19.9
0.550500	36.59	---	56.00	19.41	L1	OFF	19.9
0.640500	---	24.02	46.00	21.98	L1	OFF	19.9
0.640500	34.47	---	56.00	21.53	L1	OFF	19.9
0.748500	---	26.31	46.00	19.69	L1	OFF	20.0
0.748500	33.79	---	56.00	22.21	L1	OFF	20.0
0.847500	---	28.03	46.00	17.97	L1	OFF	20.1

0.847500	34.97	---	56.00	21.03	L1	OFF	20.1
0.955500	---	27.80	46.00	18.20	L1	OFF	20.2
0.955500	34.06	---	56.00	21.94	L1	OFF	20.2
3.819750	---	30.76	46.00	15.24	L1	OFF	20.0
3.819750	36.72	---	56.00	19.28	L1	OFF	20.0
11.460750	---	29.95	50.00	20.05	L1	OFF	20.2
11.460750	38.03	---	60.00	21.97	L1	OFF	20.2

EUT Information

Test Voltage : 120Vac/60Hz
Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.213000	---	34.98	53.09	18.11	N	OFF	19.7
0.213000	53.18	---	63.09	9.91	N	OFF	19.7
0.318750	---	31.24	49.74	18.50	N	OFF	19.7
0.318750	46.15	---	59.74	13.59	N	OFF	19.7
0.426750	---	30.72	47.32	16.60	N	OFF	19.7
0.426750	43.19	---	57.32	14.13	N	OFF	19.7
0.530250	---	29.60	46.00	16.40	N	OFF	19.8
0.530250	41.80	---	56.00	14.20	N	OFF	19.8
0.636000	---	25.88	46.00	20.12	N	OFF	19.9
0.636000	34.49	---	56.00	21.51	N	OFF	19.9
0.741750	---	25.29	46.00	20.71	N	OFF	20.0
0.741750	32.81	---	56.00	23.19	N	OFF	20.0
0.847500	---	26.18	46.00	19.82	N	OFF	20.1
0.847500	32.94	---	56.00	23.06	N	OFF	20.1
0.942000	---	25.23	46.00	20.77	N	OFF	20.2
0.942000	32.80	---	56.00	23.20	N	OFF	20.2
3.819750	---	30.19	46.00	15.81	N	OFF	20.0
3.819750	38.81	---	56.00	17.19	N	OFF	20.0
11.458500	---	31.70	50.00	18.30	N	OFF	20.2
11.458500	39.83	---	60.00	20.17	N	OFF	20.2



Appendix C. Radiated Spurious Emission

Test Engineer :	Jack Cheng, Lance Chiang and Chuan Chu	Temperature :	23.8~26.2°C
		Relative Humidity :	56.5~68.6%

<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE Ant.	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		2340.765	59.63	-14.37	74	48.77	27.72	16.67	33.53	131	258	P	H	
		2340.555	49.4	-4.6	54	38.54	27.72	16.67	33.53	131	258	A	H	
	*	2402	106.17	-	-	95.27	27.7	16.76	33.56	131	258	P	H	
	*	2402	102.85	-	-	91.95	27.7	16.76	33.56	131	258	A	H	
													H	
														H
			2340.03	57.37	-16.63	74	46.51	27.72	16.67	33.53	299	14	P	V
			2340.45	47.36	-6.64	54	36.5	27.72	16.67	33.53	299	14	A	V
	*		2402	101.18	-	-	90.28	27.7	16.76	33.56	299	14	P	V
	*		2402	97.97	-	-	87.07	27.7	16.76	33.56	299	14	A	V
														V
														V
BLE CH 19 2440MHz		2364.46	58.19	-15.81	74	47.32	27.7	16.71	33.54	106	261	P	H	
		2374.68	47.71	-6.29	54	36.84	27.7	16.72	33.55	106	261	A	H	
	*	2440	105.02	-	-	94.18	27.62	16.81	33.59	106	261	P	H	
	*	2440	100.75	-	-	89.91	27.62	16.81	33.59	106	261	A	H	
			2488.38	55.73	-18.27	74	45.02	27.45	16.87	33.61	106	261	P	H
			2486.42	46.52	-7.48	54	35.81	27.45	16.87	33.61	106	261	A	H
			2364.18	56.55	-17.45	74	45.68	27.7	16.71	33.54	323	13	P	V
			2363.62	46.82	-7.18	54	35.95	27.7	16.71	33.54	323	13	A	V
	*		2440	100.64	-	-	89.8	27.62	16.81	33.59	323	13	P	V
	*		2440	96.56	-	-	85.72	27.62	16.81	33.59	323	13	A	V
			2497.48	54.72	-19.28	74	44.04	27.41	16.89	33.62	323	13	P	V
			2485.16	46.72	-7.28	54	36	27.46	16.87	33.61	323	13	A	V



BLE CH 39 2480MHz	*	2480	106.22	-	-	95.49	27.48	16.86	33.61	140	33	P	H
	*	2480	102.38	-	-	91.65	27.48	16.86	33.61	140	33	A	H
		2485.28	56.62	-17.38	74	45.9	27.46	16.87	33.61	140	33	P	H
		2487.56	47.76	-6.24	54	37.05	27.45	16.87	33.61	140	33	A	H
													H
													H
	*	2480	100.39	-	-	89.66	27.48	16.86	33.61	318	15	P	V
	*	2480	96.67	-	-	85.94	27.48	16.86	33.61	318	15	A	V
		2483.84	56.54	-17.46	74	45.82	27.46	16.87	33.61	318	15	P	V
		2497.48	46.72	-7.28	54	36.04	27.41	16.89	33.62	318	15	A	V
													V
													V
Remark	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 Ant. 1	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		2340	57.8	-16.2	74	46.94	27.72	16.67	33.53	101	77	P	H
		2340	50.61	-3.39	54	39.75	27.72	16.67	33.53	101	77	A	H
		4804	40.14	-33.86	74	57.34	31	11.56	59.76	-	-	P	H
		17985	59.46	-14.54	74	45.74	49.97	20.79	57.04	-	-	P	H
		17985	48.75	-5.25	54	35.03	49.97	20.79	57.04	-	-	A	H
		2340	55.51	-18.49	74	44.65	27.72	16.67	33.53	272	104	P	V
		2340	46.7	-7.3	54	35.84	27.72	16.67	33.53	272	104	A	V
		4804	39.53	-34.47	74	56.73	31	11.56	59.76	-	-	P	V
		17985	59.28	-14.72	74	45.56	49.97	20.79	57.04	-	-	P	V
		17985	48.8	-5.2	54	35.08	49.97	20.791	57.04	-	-	A	V
BLE CH 19 2440MHz		2374	58.72	-15.28	74	47.85	27.7	16.72	33.55	101	76	P	H
		2374	52.42	-1.58	54	41.55	27.7	16.72	33.55	101	76	A	H
		4880	40.46	-33.54	74	57.93	31	11.31	59.78	-	-	P	H
		7320	44.85	-29.15	74	55.4	36.26	13.27	60.08	-	-	P	H
		17970	59.51	-14.49	74	46.27	49.53	20.79	57.08	-	-	P	H
		17970	48.52	-5.48	54	35.28	49.53	20.79	57.08	-	-	A	H
		2364	55.69	-18.31	74	44.82	27.7	16.71	33.54	268	104	P	V
		2364	47.07	-6.93	54	36.2	27.7	16.71	33.54	268	104	A	V
		4880	40.28	-33.72	74	57.75	31	11.31	59.78	-	-	P	V
		7320	44.77	-29.23	74	55.32	36.26	13.27	60.08	-	-	P	V
		17970	59.18	-14.82	74	45.94	49.53	20.79	57.08	-	-	P	V
		17970	47.52	-6.48	54	34.28	49.53	20.79	57.08	-	-	A	V



BLE Ant. 1	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	40.43	-33.57	74	57.93	31.24	11.05	59.79	-	-	P	H
		7440	44.37	-29.63	74	54.71	36.28	13.34	59.96	-	-	P	H
		17970	59.95	-14.05	74	46.71	49.53	20.79	57.08	-	-	P	H
		17970	48.52	-5.48	54	35.28	49.53	20.79	57.08	-	-	A	H
		4960	39.7	-34.3	74	57.2	31.24	11.05	59.79	-	-	P	V
		7440	44.58	-29.42	74	54.92	36.28	13.34	59.96	-	-	P	V
		17985	59.15	-14.85	74	45.43	49.97	20.79	57.04	-	-	P	V
		17985	48	-6	54	34.28	49.97	20.79	57.04	-	-	A	V
Remark	<ol style="list-style-type: none"> 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. 												



Emission above 18GHz

2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz BLE SHF		38537	46.37	-21.83	68.2	38.95	44	19.11	55.69	-	-	P	H	
													H	
													H	
													H	
			38845	47.7	-26.3	74	40.07	44	19.19	55.56	-	-	P	V
														V
														V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. 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)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		60.07	25.16	-14.84	40	41.83	11.85	1.14	29.66	-	-	P	H
		209.45	34.26	-9.24	43.5	46.45	15.15	2.14	29.48	-	-	P	H
		378.23	35.06	-10.94	46	40.15	21.27	2.86	29.22	-	-	P	H
		704.15	34.79	-11.21	46	32.75	26.65	3.94	28.55	-	-	P	H
		760.41	33.48	-12.52	46	29.59	28.32	4.15	28.58	-	-	P	H
		901.06	37.11	-8.89	46	31.66	29.06	4.58	28.19	-	-	P	H
		30	26.08	-13.92	40	30.45	24.46	0.81	29.64	-	-	P	V
		204.6	29.1	-14.4	43.5	41.25	15.23	2.11	29.49	-	-	P	V
		473.29	32.76	-13.24	46	34.83	23.74	3.23	29.04	-	-	P	V
		710.94	37.17	-8.83	46	34.93	26.82	3.98	28.56	-	-	P	V
		746.83	36.69	-9.31	46	32.89	28.29	4.12	28.61	-	-	P	V
		898.15	38.05	-7.95	46	32.65	29.02	4.58	28.2	-	-	P	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 with sufficient margin against limit line or noise floor only.



2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
BLE CH 00 2402MHz		2340.555	58.23	-15.77	74	47.37	27.72	16.67	33.53	134	12	P	H	
		2340.555	49.54	-4.46	54	38.68	27.72	16.67	33.53	134	12	A	H	
	*	2402	105.89	-	-	94.99	27.7	16.76	33.56	134	12	P	H	
	*	2402	102.84	-	-	91.94	27.7	16.76	33.56	134	12	A	H	
													H	
														H
			2329.11	56.16	-17.84	74	45.29	27.74	16.65	33.52	280	84	P	V
			2340.345	47.73	-6.27	54	36.87	27.72	16.67	33.53	280	84	A	V
	*		2402	101.84	-	-	90.94	27.7	16.76	33.56	280	84	P	V
	*		2402	97.96	-	-	87.06	27.7	16.76	33.56	280	84	A	V
														V
														V
BLE CH 19 2440MHz		2364.32	58.4	-15.6	74	47.53	27.7	16.71	33.54	124	13	P	H	
		2374.68	49.47	-4.53	54	38.6	27.7	16.72	33.55	124	13	A	H	
	*	2440	105.72	-	-	94.88	27.62	16.81	33.59	124	13	P	H	
	*	2440	101.5	-	-	90.66	27.62	16.81	33.59	124	13	A	H	
			2491.74	55.12	-18.88	74	44.43	27.43	16.88	33.62	124	13	P	H
			2487.89	46.24	-7.76	54	35.53	27.45	16.87	33.61	124	13	A	H
			2364.18	56.21	-17.79	74	45.34	27.7	16.71	33.54	267	84	P	V
			2374.54	47.21	-6.79	54	36.34	27.7	16.72	33.55	267	84	A	V
	*		2440	102.43	-	-	91.59	27.62	16.81	33.59	267	84	P	V
	*		2440	98.1	-	-	87.26	27.62	16.81	33.59	267	84	A	V
			2485.51	54.82	-19.18	74	44.1	27.46	16.87	33.61	267	84	P	V
			2489.71	46.51	-7.49	54	35.8	27.44	16.88	33.61	267	84	A	V



BLE CH 39 2480MHz	*	2480	105.52	-	-	94.79	27.48	16.86	33.61	123	14	P	H
	*	2480	101.49	-	-	90.76	27.48	16.86	33.61	123	14	A	H
		2483.64	57.4	-16.6	74	46.67	27.47	16.87	33.61	123	14	P	H
		2491.08	46.46	-7.54	54	35.75	27.44	16.88	33.61	123	14	A	H
													H
													H
	*	2480	101.42	-	-	90.69	27.48	16.86	33.61	311	67	P	V
	*	2480	96.88	-	-	86.15	27.48	16.86	33.61	311	67	A	V
		2483.56	56	-18	74	45.27	27.47	16.87	33.61	311	67	P	V
		2487.96	46.64	-7.36	54	35.93	27.45	16.87	33.61	311	67	A	V
													V
													V
Remark	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 Ant. 2	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		2340	57.57	-16.43	74	46.71	27.72	16.67	33.53	264	339	P	H
		2340	49.67	-4.33	54	38.81	27.72	16.67	33.53	264	339	A	H
		4804	41.33	-32.67	74	58.53	31	11.56	59.76	-	-	P	H
		17970	59.38	-14.62	74	46.14	49.53	20.79	57.08	-	-	P	H
		17970	48.57	-5.43	54	35.33	49.53	20.79	57.08	-	-	A	H
		2340	57.52	-16.48	74	46.66	27.72	16.67	33.53	100	350	P	V
		2340	48.95	-5.05	54	38.09	27.72	16.67	33.53	100	350	A	V
		4804	39.87	-34.13	74	57.07	31	11.56	59.76	-	-	P	V
		17970	60.08	-13.92	74	46.84	49.53	20.79	57.08	-	-	P	V
		17970	48.85	-5.15	54	35.61	49.53	20.79	57.08	-	-	A	V
BLE CH 19 2440MHz		2374	57.12	-16.88	74	46.25	27.7	16.72	33.55	255	340	P	H
		2374	49.38	-4.62	54	38.51	27.7	16.72	33.55	255	340	A	H
		4880	40.01	-33.99	74	57.48	31	11.31	59.78	-	-	P	H
		7320	44.37	-29.63	74	54.92	36.26	13.27	60.08	-	-	P	H
		17970	60.49	-13.51	74	47.25	49.53	20.79	57.08	-	-	P	H
		17970	48.52	-5.48	54	35.28	49.53	20.79	57.08	-	-	A	H
		2374	56.22	-17.78	74	45.35	27.7	16.72	33.55	100	350	P	V
		2374	48.24	-5.76	54	37.37	27.7	16.72	33.55	100	350	A	V
		4880	39.9	-34.1	74	57.37	31	11.31	59.78	-	-	P	V
		7320	45.26	-28.74	74	55.81	36.26	13.27	60.08	-	-	P	V
		17985	59.61	-14.39	74	45.89	49.97	20.79	57.04	-	-	P	V
		17985	48.95	-5.05	54	35.23	49.97	20.79	57.04	-	-	A	V



BLE CH 39 2480MHz	4960	40.07	-33.93	74	57.57	31.24	11.05	59.79	-	-	P	H
	7440	44.65	-29.35	74	54.99	36.28	13.34	59.96	-	-	P	H
	18000	60.1	-13.9	74	45.9	50.4	20.8	57	-	-	P	H
	18000	48.44	-5.56	54	34.24	50.4	20.8	57	-	-	A	H
	4960	39.46	-34.54	74	56.96	31.24	11.05	59.79	-	-	P	V
	7440	44.58	-29.42	74	54.92	36.28	13.34	59.96	-	-	P	V
	17970	58.97	-15.03	74	45.73	49.53	20.79	57.08	-	-	P	V
	17970	48.32	-5.68	54	35.08	49.53	20.79	57.08	-	-	A	V
Remark	<ol style="list-style-type: none"> 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. 											



Emission above 18GHz

2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz BLE SHF		39274	46.67	-27.33	74	39.47	43.31	19.23	55.34	-	-	P	H	
													H	
													H	
													H	
			39813	47.27	-26.73	74	39.57	43.23	19.23	54.76	-	-	P	V
														V
														V
Remark	<ol style="list-style-type: none"> 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)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		60.07	25.86	-14.14	40	42.39	11.99	1.14	29.66	-	-	P	H
		208.48	31.11	-12.39	43.5	43.26	15.2	2.13	29.48	-	-	P	H
		368.53	34.18	-11.82	46	39.71	20.87	2.83	29.23	-	-	P	H
		623.64	32.18	-13.82	46	31.28	26.02	3.7	28.82	-	-	P	H
		743.92	37.38	-8.62	46	33.69	28.18	4.11	28.6	-	-	P	H
		950.53	36.02	-9.98	46	28.58	30.91	4.67	28.14	-	-	P	H
		80.44	27.28	-12.72	40	42.15	13.5	1.3	29.67	-	-	P	V
		207.51	27.44	-16.06	43.5	39.59	15.2	2.13	29.48	-	-	P	V
		584.84	31.72	-14.28	46	31.01	26	3.58	28.87	-	-	P	V
		788.54	33.75	-12.25	46	29.71	28.33	4.21	28.5	-	-	P	V
		924.34	35.08	-10.92	46	29.04	29.59	4.62	28.17	-	-	P	V
		953.44	35.8	-10.2	46	28.28	30.97	4.68	28.13	-	-	P	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. 												



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
BLE CH 00 2402MHz		2380.875	59.34	-14.66	74	48.46	27.7	16.73	33.55	120	11	P	H	
		2380.245	50.97	-3.03	54	40.09	27.7	16.73	33.55	120	11	A	H	
	*	2402	105.86	-	-	94.96	27.7	16.76	33.56	120	11	P	H	
	*	2402	101.1	-	-	90.2	27.7	16.76	33.56	120	11	A	H	
													H	
													H	
			2379.615	58.05	-15.95	74	47.17	27.7	16.73	33.55	299	27	P	V
			2380.665	50.35	-3.65	54	39.47	27.7	16.73	33.55	299	27	A	V
	*		2402	102.2	-	-	91.3	27.7	16.76	33.56	299	27	P	V
	*		2402	96.94	-	-	86.04	27.7	16.76	33.56	299	27	A	V
													V	
													V	
BLE CH 19 2440MHz		2359.84	56.3	-17.7	74	45.44	27.7	16.7	33.54	148	0	P	H	
		2387.14	49.68	-4.32	54	38.79	27.7	16.74	33.55	148	0	A	H	
	*	2440	105.04	-	-	94.2	27.62	16.81	33.59	148	0	P	H	
	*	2440	100.53	-	-	89.69	27.62	16.81	33.59	148	0	A	H	
			2494.54	55.9	-18.1	74	45.22	27.42	16.88	33.62	148	0	P	H
			2492.16	50.02	-3.98	54	39.33	27.43	16.88	33.62	148	0	A	H
			2373	55.4	-18.6	74	44.53	27.7	16.72	33.55	299	105	P	V
			2348.36	49.29	-4.71	54	38.44	27.7	16.68	33.53	299	105	A	V
	*		2440	102.14	-	-	91.3	27.62	16.81	33.59	299	105	P	V
	*		2440	97.91	-	-	87.07	27.62	16.81	33.59	299	105	A	V
			2490.55	56.32	-17.68	74	45.61	27.44	16.88	33.61	299	105	P	V
			2492.58	49.27	-4.73	54	38.58	27.43	16.88	33.62	299	105	A	V



BLE CH 39 2480MHz	*	2480	106.13	-	-	95.4	27.48	16.86	33.61	148	0	P	H
	*	2480	101.22	-	-	90.49	27.48	16.86	33.61	148	0	A	H
		2483.68	56.94	-17.06	74	46.21	27.47	16.87	33.61	148	0	P	H
		2485.36	50.23	-3.77	54	39.51	27.46	16.87	33.61	148	0	A	H
													H
													H
	*	2480	101.84	-	-	91.11	27.48	16.86	33.61	288	80	P	V
	*	2480	98.37	-	-	87.64	27.48	16.86	33.61	288	80	A	V
		2487.2	55.44	-18.56	74	44.73	27.45	16.87	33.61	288	80	P	V
		2483.56	49.41	-4.59	54	38.68	27.47	16.87	33.61	288	80	A	V
													V
													V
Remark	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 Ant. 1	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		2374	59.92	-14.08	74	49.05	27.7	16.72	33.55	120	11	P	H
		2374	50.96	-3.04	54	40.09	27.7	16.72	33.55	120	11	A	H
		4804	39.84	-34.16	74	57.04	31	11.56	59.76	-	-	P	H
		17925	55.72	-18.28	74	43.94	48.22	20.75	57.19	-	-	P	H
		17925	48.87	-5.13	54	37.09	48.22	20.758	57.19	-	-	A	H
		4804	39.78	-34.22	74	56.98	31	11.56	59.76	-	-	P	V
		17925	55.71	-18.29	74	43.93	48.22	20.75	57.19	-	-	P	V
		17925	48.84	-5.16	54	37.06	48.22	20.75	57.19	-	-	A	V
BLE CH 19 2440MHz		4880	39.55	-34.45	74	57.02	31	11.31	59.78	-	-	P	H
		7320	43.98	-30.02	74	54.53	36.26	13.27	60.08	-	-	P	H
		17970	57.8	-16.2	74	44.56	49.53	20.79	57.08	-	-	P	H
		17970	50.29	-3.71	54	37.05	49.53	20.79	57.08	-	-	A	H
		4880	39.61	-34.39	74	57.08	31	11.31	59.78	-	-	P	V
		7320	43.5	-30.5	74	54.05	36.26	13.27	60.08	-	-	P	V
		17970	57.83	-16.17	74	44.59	49.53	20.79	57.08	-	-	P	V
		17970	50.26	-3.74	54	37.02	49.53	20.79	57.08	-	-	A	V
BLE CH 39 2480MHz		2512	61.44	-12.56	74	50.76	27.38	16.91	33.61	-	-	P	H
		4960	39.19	-34.81	74	56.69	31.24	11.05	59.79	-	-	P	H
		7440	44.09	-29.91	74	54.43	36.28	13.34	59.96	-	-	P	H
		17925	55.62	-18.38	74	43.84	48.22	20.75	57.19	-	-	P	H
		17925	48.88	-5.12	54	37.1	48.22	20.75	57.19	-	-	A	H
		4960	40.2	-33.8	74	57.7	31.24	11.05	59.79	-	-	P	V
		7440	43.08	-30.92	74	53.42	36.28	13.34	59.96	-	-	P	V
		17925	54.85	-19.15	74	43.07	48.22	20.75	57.19	-	-	P	V
	17925	49.67	-4.33	54	37.89	48.22	20.75	57.19	-	-	A	V	
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. The emission level close to 18GHz is checked that the average emission level is noise floor only. 												



Emission above 18GHz

2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz BLE SHF		38185	45.42	-22.78	68.2	39.85	42.5	19.02	55.95	-	-	P	H	
													H	
													H	
													H	
			38438	46.42	-21.78	68.2	40.97	42.12	19.08	55.75	-	-	P	V
														V
														V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. 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)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		57.16	26.64	-13.36	40	43.02	12.17	1.11	29.66	-	-	P	H
		209.45	32.39	-11.11	43.5	44.53	15.2	2.14	29.48	-	-	P	H
		383.08	35.71	-10.29	46	40.83	21.22	2.88	29.22	-	-	P	H
		736.16	36.34	-9.66	46	32.91	27.95	4.07	28.59	-	-	P	H
		879.72	35.03	-10.97	46	29.78	29	4.52	28.27	-	-	P	H
		957.32	36.17	-9.83	46	28.5	31.09	4.7	28.12	-	-	P	H
		30	25.23	-14.77	40	28.86	25.2	0.81	29.64	-	-	P	V
		215.27	25.35	-18.15	43.5	37.74	14.92	2.16	29.47	-	-	P	V
		446.13	28.85	-17.15	46	31.8	23.02	3.14	29.11	-	-	P	V
		666.32	35.85	-10.15	46	34.09	26.6	3.84	28.68	-	-	P	V
		870.99	35.41	-10.59	46	30.22	29	4.5	28.31	-	-	P	V
	958.29	35.82	-10.18	46	28.11	31.13	4.7	28.12	-	-	P	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 with sufficient margin against limit line or noise floor only.



2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
BLE CH 00 2402MHz		2380.98	59.47	-14.53	74	48.59	27.7	16.73	33.55	125	356	P	H	
		2380.98	50.51	-3.49	54	39.63	27.7	16.73	33.55	125	356	A	H	
	*	2402	106.35	-	-	95.45	27.7	16.76	33.56	125	356	P	H	
	*	2402	102.4	-	-	91.5	27.7	16.76	33.56	125	356	A	H	
													H	
														H
			2380.98	57.8	-16.2	74	46.92	27.7	16.73	33.55	348	66	P	V
			2380.98	49.65	-4.35	54	38.77	27.7	16.73	33.55	348	66	A	V
	*		2402	101.69	-	-	90.79	27.7	16.76	33.56	348	66	P	V
	*		2402	97.34	-	-	86.44	27.7	16.76	33.56	348	66	A	V
														V
														V
BLE CH 19 2440MHz		2386.44	56.55	-17.45	74	45.66	27.7	16.74	33.55	123	357	P	H	
		2351.16	49.78	-4.22	54	38.92	27.7	16.69	33.53	123	357	A	H	
	*	2440	105.96	-	-	95.12	27.62	16.81	33.59	123	357	P	H	
	*	2440	101.43	-	-	90.59	27.62	16.81	33.59	123	357	A	H	
			2493.21	55.87	-18.13	74	45.18	27.43	16.88	33.62	123	357	P	H
			2492.93	49.59	-4.41	54	38.9	27.43	16.88	33.62	123	357	A	H
			2388.4	55.18	-18.82	74	44.3	27.7	16.74	33.56	363	64	P	V
			2385.74	49.29	-4.71	54	38.4	27.7	16.74	33.55	363	64	A	V
	*		2440	101.54	-	-	90.7	27.62	16.81	33.59	363	64	P	V
	*		2440	98.32	-	-	87.48	27.62	16.81	33.59	363	64	A	V
			2494.61	54.84	-19.16	74	44.16	27.42	16.88	33.62	363	64	P	V
			2486.77	49.13	-4.87	54	38.42	27.45	16.87	33.61	363	64	A	V



BLE CH 39 2480MHz	*	2480	106.02	-	-	95.29	27.48	16.86	33.61	122	358	P	H
	*	2480	100.66	-	-	89.93	27.48	16.86	33.61	122	358	A	H
		2484.08	56.18	-17.82	74	45.46	27.46	16.87	33.61	122	358	P	H
		2483.92	49.79	-4.21	54	39.07	27.46	16.87	33.61	122	358	A	H
													H
													H
	*	2480	101.82	-	-	91.09	27.48	16.86	33.61	340	63	P	V
	*	2480	97.61	-	-	86.88	27.48	16.86	33.61	340	63	A	V
		2486.32	55.06	-18.94	74	44.35	27.45	16.87	33.61	340	63	P	V
		2487.24	49.88	-4.12	54	39.17	27.45	16.87	33.61	340	63	A	V
													V
													V
Remark	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 Ant. 2	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		2372	59.72	-14.28	74	48.85	27.7	16.72	33.55	125	356	P	H
		2372	50.5	-3.5	54	39.63	27.7	16.72	33.55	125	356	A	H
		4804	40.5	-33.5	74	57.7	31	11.56	59.76	-	-	P	H
		17985	59.11	-14.89	74	45.39	49.97	20.79	57.04	-	-	P	H
		17985	50.73	-3.27	54	37.01	49.97	20.79	57.04	-	-	A	H
		4804	40.44	-33.56	74	57.64	31	11.56	59.76	-	-	P	V
		17970	59.37	-14.63	74	46.13	49.53	20.79	57.08	300	62	P	V
		17970	50.12	-3.88	54	36.88	49.53	20.79	57.08	300	62	A	V
BLE CH 19 2440MHz		4880	40.36	-33.64	74	57.83	31	11.31	59.78	-	-	P	H
		7320	44.31	-29.69	74	54.86	36.26	13.27	60.08	-	-	P	H
		17940	56.75	-17.25	74	44.48	48.66	20.77	57.16	-	-	P	H
		17940	49.38	-4.62	54	37.11	48.66	20.77	57.16	-	-	A	H
		4880	40.55	-33.45	74	58.02	31	11.31	59.78	-	-	P	V
		7320	44.07	-29.93	74	54.62	36.26	13.27	60.08	-	-	P	V
		17940	56.59	-17.41	74	44.32	48.66	20.77	57.16	234	66	P	V
		17940	48.83	-5.17	54	36.56	48.66	20.77	57.16	234	66	A	V
BLE CH 39 2480MHz		4960	39.96	-34.04	74	57.46	31.24	11.05	59.79	-	-	P	H
		7440	43.27	-30.73	74	53.61	36.28	13.34	59.96	-	-	P	H
		17925	55.25	-18.75	74	43.47	48.22	20.75	57.19	-	-	P	H
		17925	48.55	-5.45	54	36.77	48.22	20.75	57.19	-	-	A	H
		4960	39.44	-34.56	74	56.94	31.24	11.05	59.79	-	-	P	V
		7440	43.99	-30.01	74	54.33	36.28	13.34	59.96	-	-	P	V
		17925	55.72	-18.28	74	43.94	48.22	20.75	57.19	-	-	P	V
		17925	48.84	-5.16	54	37.06	48.22	20.75	57.19	-	-	A	V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against Peak and Average limit line. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. The emission level close to 18GHz is checked that the average emission level is noise floor only. 												



Emission above 18GHz

2.4GHz BLE (SHF)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)	
2.4GHz BLE SHF		38097	44.27	-23.93	68.2	38.79	42.5	19	56.02	-	-	P	H	
													H	
													H	
													H	
			38141	45.5	-22.7	68.2	39.98	42.5	19.01	55.99	-	-	P	V
														V
														V
Remark	<ol style="list-style-type: none"> No other spurious found. All results are PASS against limit line. 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)

BLE	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BLE LF		58.13	31.56	-8.44	40	48.11	11.99	1.12	29.66	-	-	P	H
		209.45	31.24	-12.26	43.5	43.38	15.2	2.14	29.48	-	-	P	H
		666.32	34.71	-11.29	46	32.95	26.6	3.84	28.68	-	-	P	H
		729.37	38.48	-7.52	46	35.36	27.66	4.05	28.59	-	-	P	H
		879.72	34.78	-11.22	46	29.53	29	4.52	28.27	-	-	P	H
		959.26	36.54	-9.46	46	28.79	31.17	4.7	28.12	-	-	P	H
		80.44	25.22	-14.78	40	40.09	13.5	1.3	29.67	-	-	P	V
		212.36	24.9	-18.6	43.5	37.17	15.06	2.15	29.48	-	-	P	V
		583.87	31.66	-14.34	46	30.95	26	3.58	28.87	-	-	P	V
		731.31	35.25	-10.75	46	32.03	27.75	4.06	28.59	-	-	P	V
		873.9	34.95	-11.05	46	29.74	29	4.5	28.29	-	-	P	V
		944.71	35.82	-10.18	46	28.73	30.58	4.66	28.15	-	-	P	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 with sufficient margin against limit line or noise floor only.												



Note symbol

*	Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is over limit line.
P/A	Peak or Average
H/V	Horizontal or Vertical



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.
		(MHz)	(dBμV/m)	(dB)	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
					(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 00		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
2402MHz													

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 :	Jack Cheng, Lance Chiang and Chuan Chu	Temperature :	23.8~26.2°C
		Relative Humidity :	56.5~68.6%

Note symbol

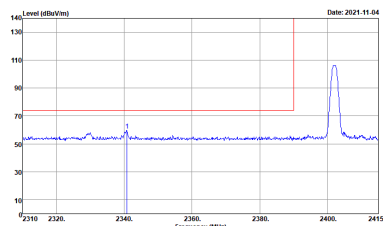
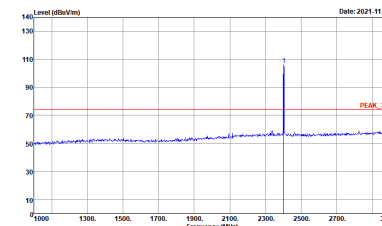
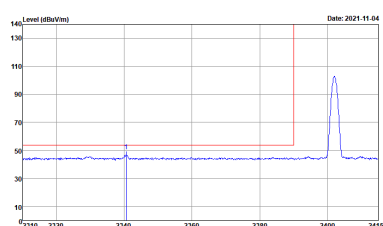
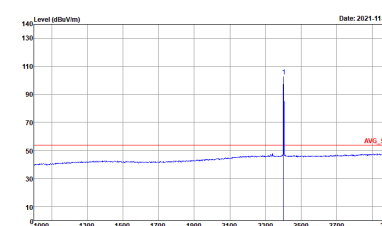
-L	Low channel location
-R	High channel location



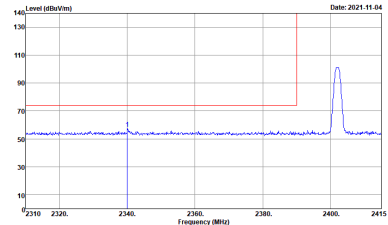
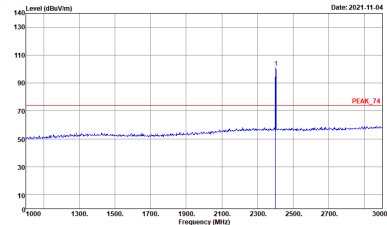
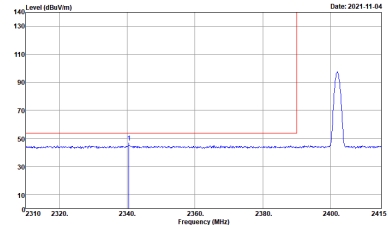
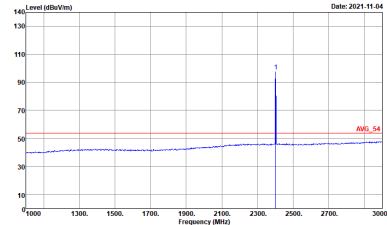
<1Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_F4 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_F4 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

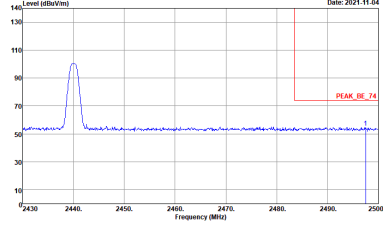
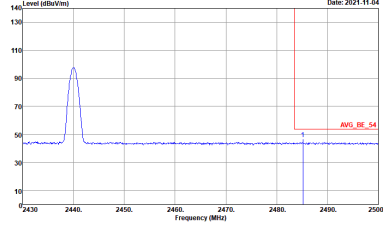


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Vertical	Fundamental
Peak	<p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

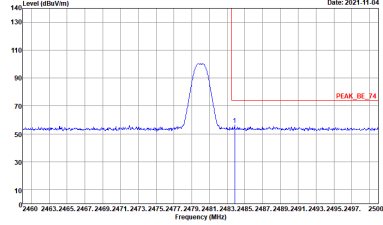
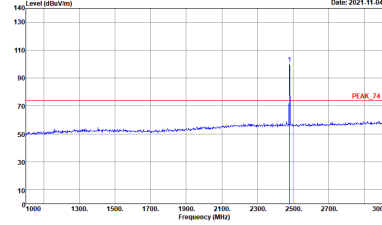
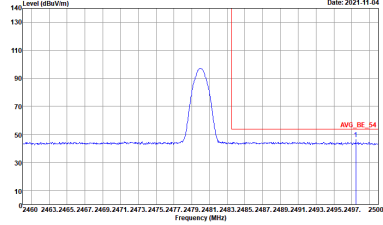
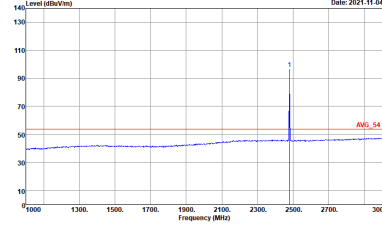


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank
Avg.	 <p>Site : 03CH2-HY Condition : AVG_BE_64 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>

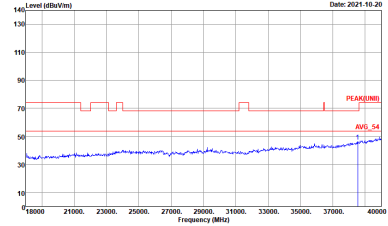
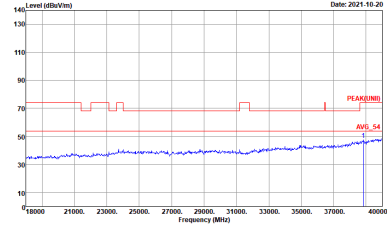


BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH39 2480MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



Emission above 18GHz

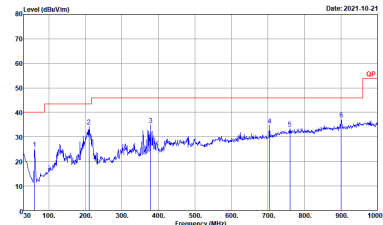
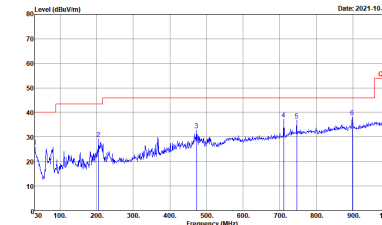
2.4GHz BLE (SHF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE SHF	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK(UNII) 1m SHF HORN BBHA9170584 HORIZONTAL</p>	 <p>Site : 03CH12-HY Condition : PEAK(UNII) 1m SHF HORN BBHA9170584 VERTICAL</p>



Emission below 1GHz

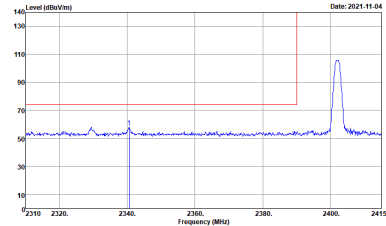
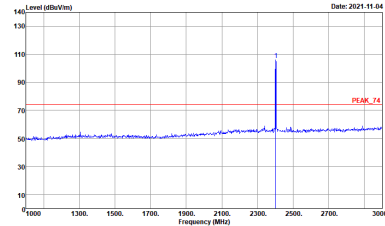
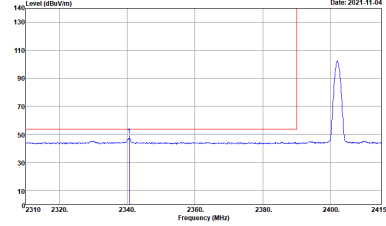
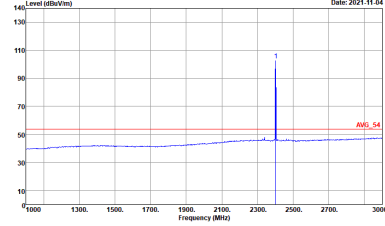
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
1	Horizontal	Vertical
QP / Peak	 <p>Site : :03CH12-IHY Condition : :QP 3m BIL06_6111D_4191Z HORIZONTAL</p>	 <p>Site : :03CH12-IHY Condition : :QP 3m BIL06_6111D_4191Z VERTICAL</p>

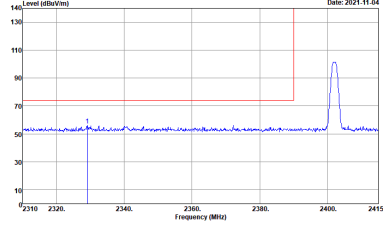
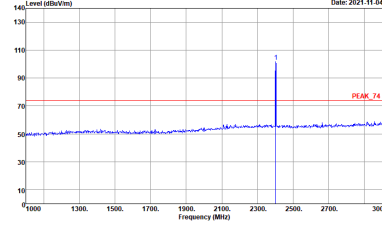
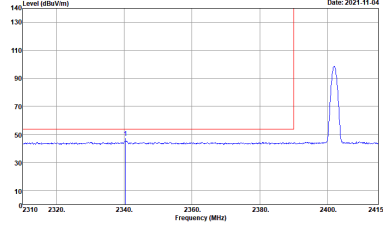
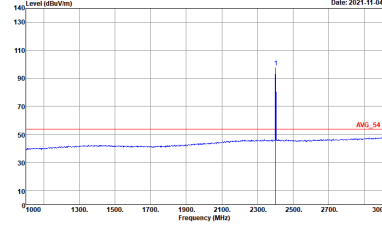


2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
2	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>
	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto</p>
Avg.		

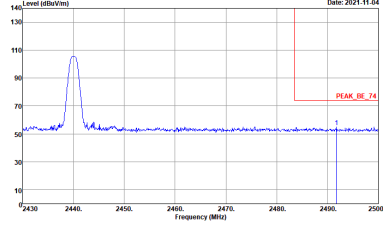
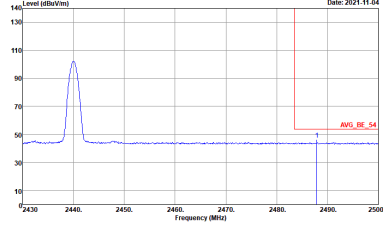


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
2	Vertical	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

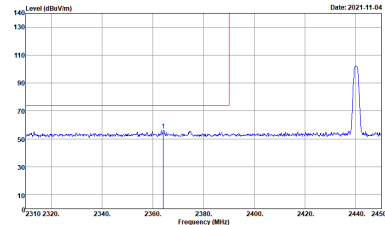
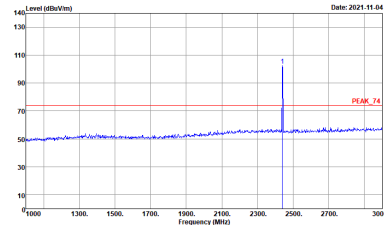
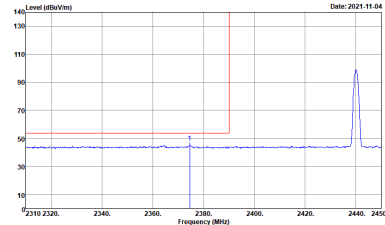
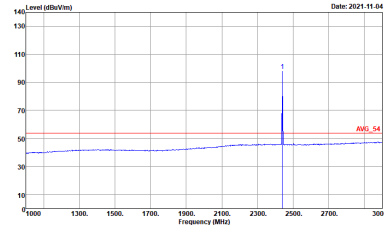


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
2	Horizontal	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
2	Horizontal	Fundamental
Peak	 <p>Site : 03CH2-1Y Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	Left blank
Avg.	 <p>Site : 03CH2-1Y Condition : AVG_BE_64 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	Left blank



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
2	Vertical	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

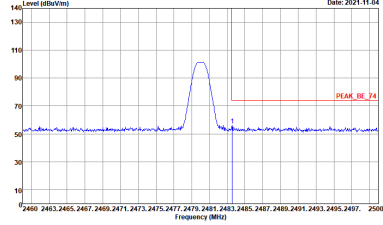
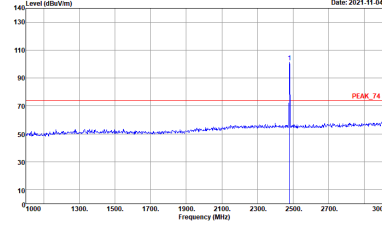
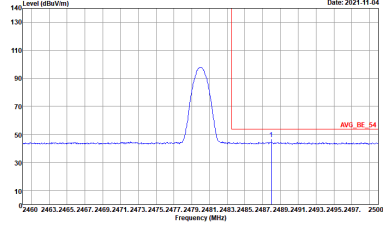
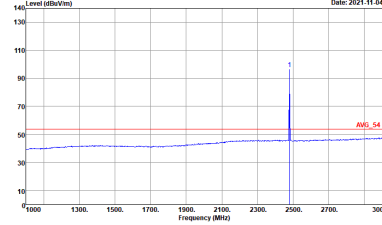


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
2	Vertical	Fundamental
<p>Peak</p>		<p>Left blank</p>
<p>Avg.</p>		<p>Left blank</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
2	Horizontal	Fundamental
Peak	<p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

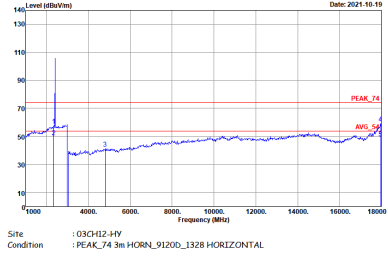
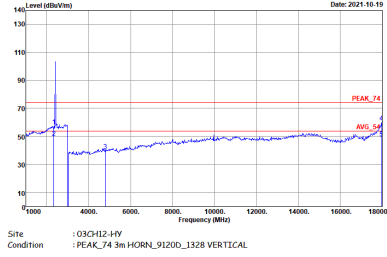


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
2	Vertical	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

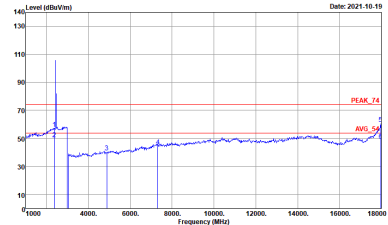
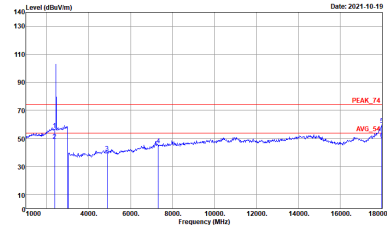


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
2	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	 <p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
2	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-1FY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	 <p>Site : 03CH12-1FY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>

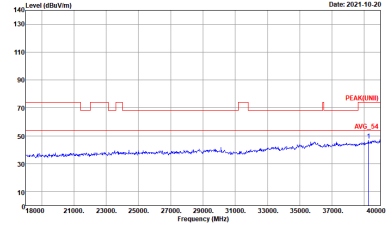
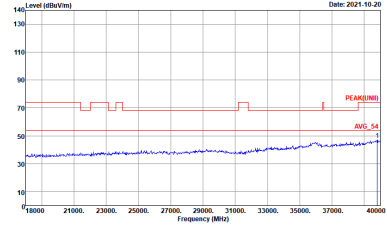


BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH39 2480MHz	
2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



Emission above 18GHz

2.4GHz BLE (SHF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE SHF	
2	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-HY Condition : PEAK(LINE) In SHF HORN 88HA9170993 HORIZONTAL</p>	 <p>Site : 03CH12-HY Condition : PEAK(LINE) In SHF HORN 88HA9170993 VERTICAL</p>



Emission below 1GHz

2.4GHz BLE (LF)

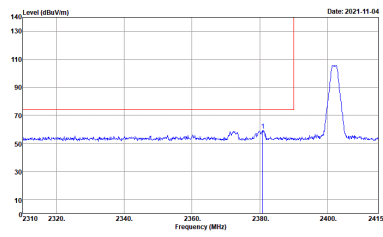
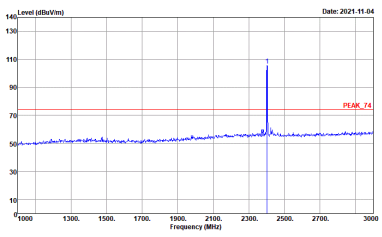
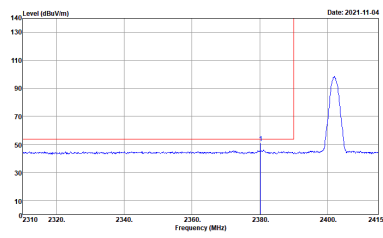
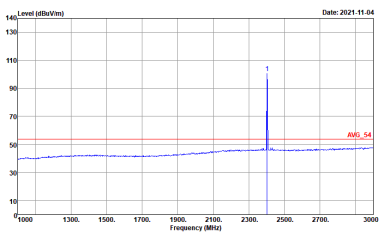
BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
2	Horizontal	Vertical
QP / Peak	<p>Site : 03CH12-HY Condition : QP 3m BIL06_6111D_41912 HORIZONTAL</p>	<p>Site : 03CH12-HY Condition : QP 3m BIL05_6111D_41912 VERTICAL</p>



<2Mbps>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

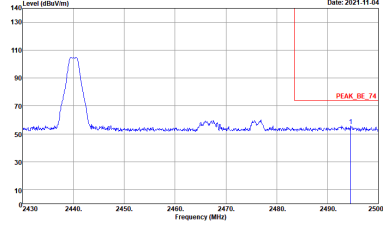
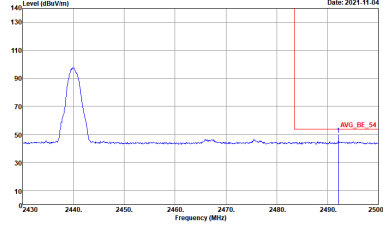


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH12-1HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-1HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-1HY Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

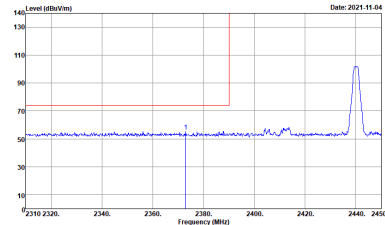
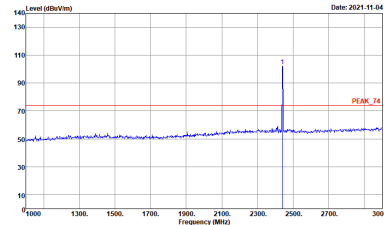
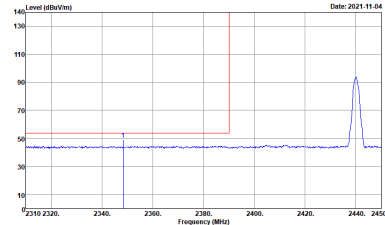
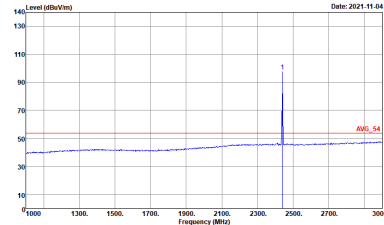


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH2-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank
Avg.	 <p>Site : 03CH2-HY Condition : AVG_BE_64 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank

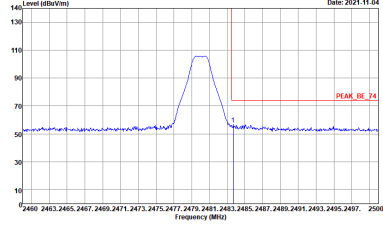
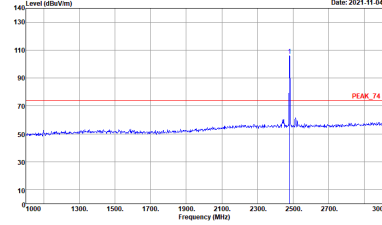
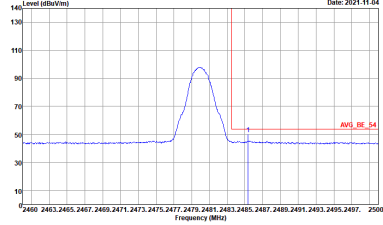
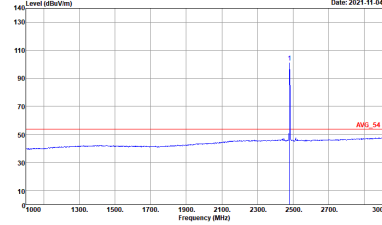


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_F4 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_F4 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
1	Vertical	Fundamental
<p>Peak</p>		<p>Left blank</p>
<p>Avg.</p>		<p>Left blank</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH2-1F Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH2-1F Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH2-1F Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH2-1F Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

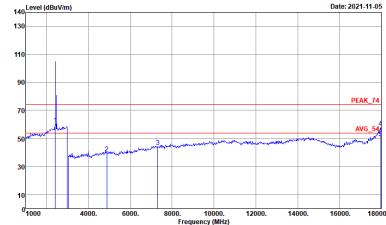
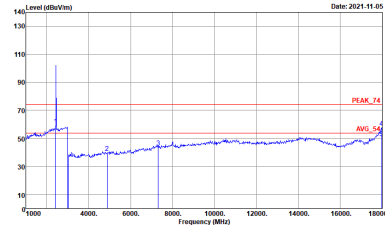


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH39 2480MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



Emission above 18GHz

2.4GHz BLE (SHF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE SHF	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-HY Condition : PEAK(LINE) In SHF HORN BBH49170993 HORIZONTAL</p>	<p>Site : 03CH12-HY Condition : PEAK(LINE) In SHF HORN BBH49170993 VERTICAL</p>



Emission below 1GHz

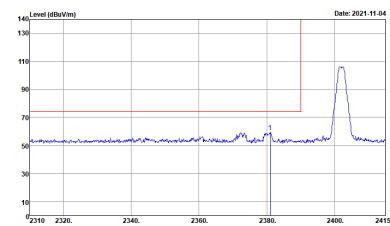
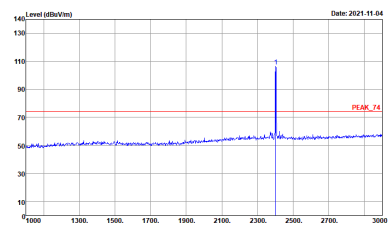
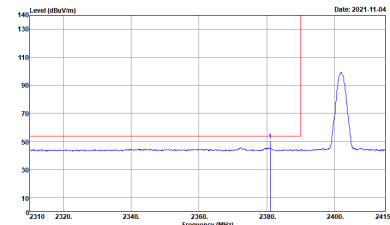
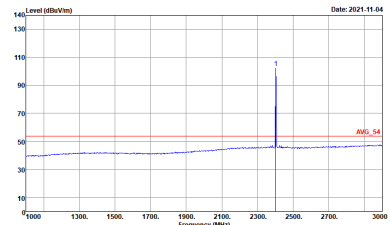
2.4GHz BLE (LF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
1	Horizontal	Vertical
QP / Peak		



2.4GHz 2400~2483.5MHz

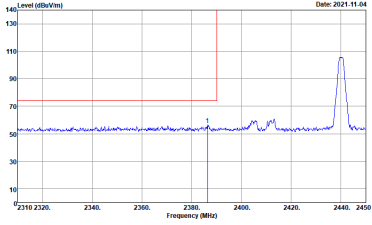
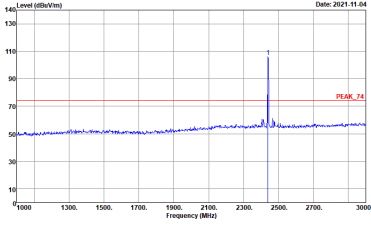
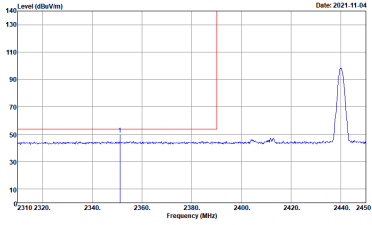
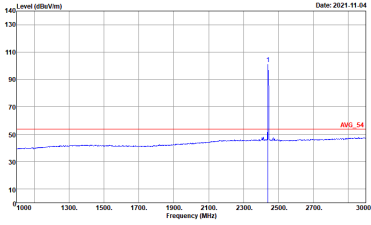
BLE (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
2	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SW1:Auto</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SW1:Auto</p>
	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SW1:Auto</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SW1:Auto</p>
Avg.		



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH00 2402MHz	
2	Vertical	Fundamental
Peak	<p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
2	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
2	Horizontal	Fundamental
<p>Peak</p>		<p>Left blank</p>
<p>Avg.</p>		<p>Left blank</p>

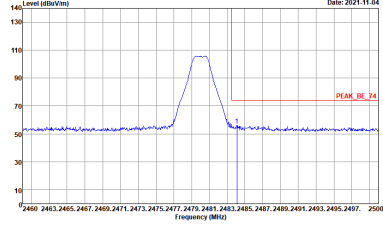
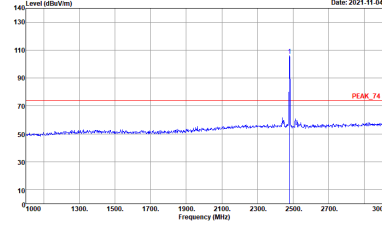
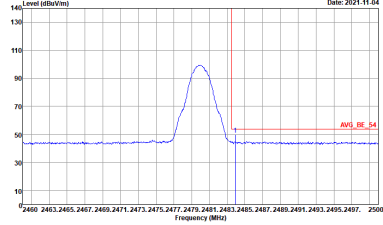
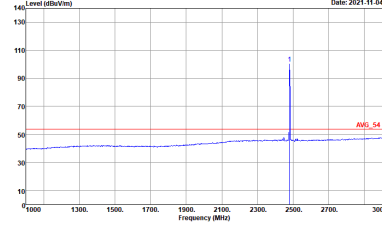


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - L	
2	Vertical	Fundamental
Peak	<p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : PEAK_F4 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : AVG_F4 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH19 2440MHz - R	
2	Vertical	Fundamental
<p>Peak</p>		<p>Left blank</p>
<p>Avg.</p>		<p>Left blank</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
2	Horizontal	Fundamental
Peak	 <p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	 <p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	 <p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>



BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE CH39 2480MHz	
2	Vertical	Fundamental
Peak	<p>Site : 03CH12-11Y Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>
Avg.	<p>Site : 03CH12-11Y Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>	<p>Site : 03CH12-11Y Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto</p>

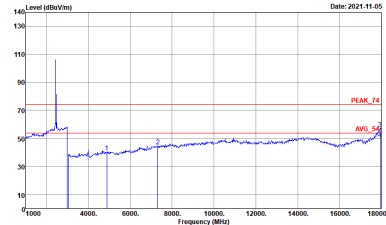
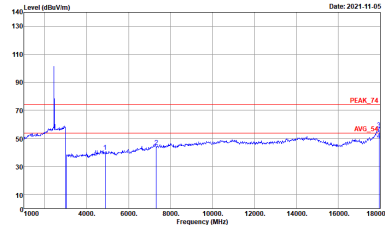


2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH00 2402MHz	
2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-1HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH19 2440MHz	
2	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	 <p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



BLE	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	BLE CH39 2480MHz	
2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL</p>	<p>Site : 03CH12-11Y Condition : PEAK_74 3m HORN_91200_1328 VERTICAL</p>



Emission above 18GHz

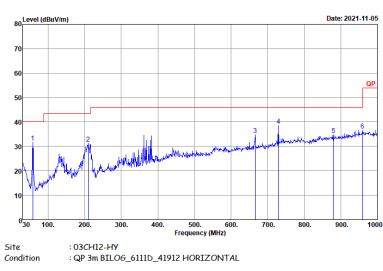
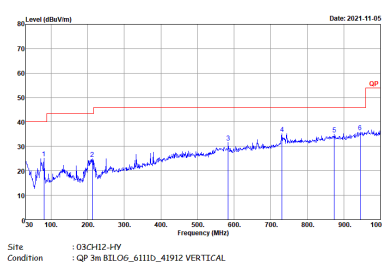
2.4GHz BLE (SHF)

BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE SHF	
2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH12-HY Condition : PEAK(LINE) In SHF HORN BBH49170993 HORIZONTAL</p>	<p>Site : 03CH12-HY Condition : PEAK(LINE) In SHF HORN BBH49170993 VERTICAL</p>



Emission below 1GHz

2.4GHz BLE (LF)

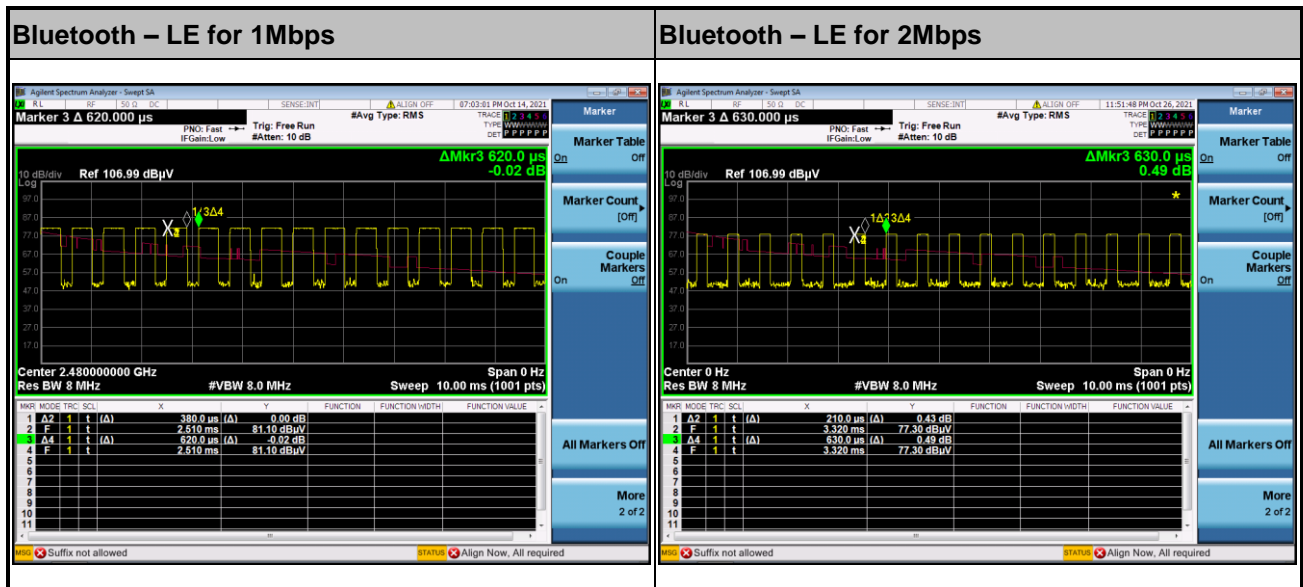
BLE	2.4GHz 2400~2483.5MHz	
ANT	BLE LF	
2	Horizontal	Vertical
QP / Peak	 <p>Site : 03CH12-HY Condition : QP 3m BIL06_6111D_41912 HORIZONTAL</p>	 <p>Site : 03CH12-HY Condition : QP 3m BIL05_6111D_41912 VERTICAL</p>



Appendix E. Duty Cycle Plots

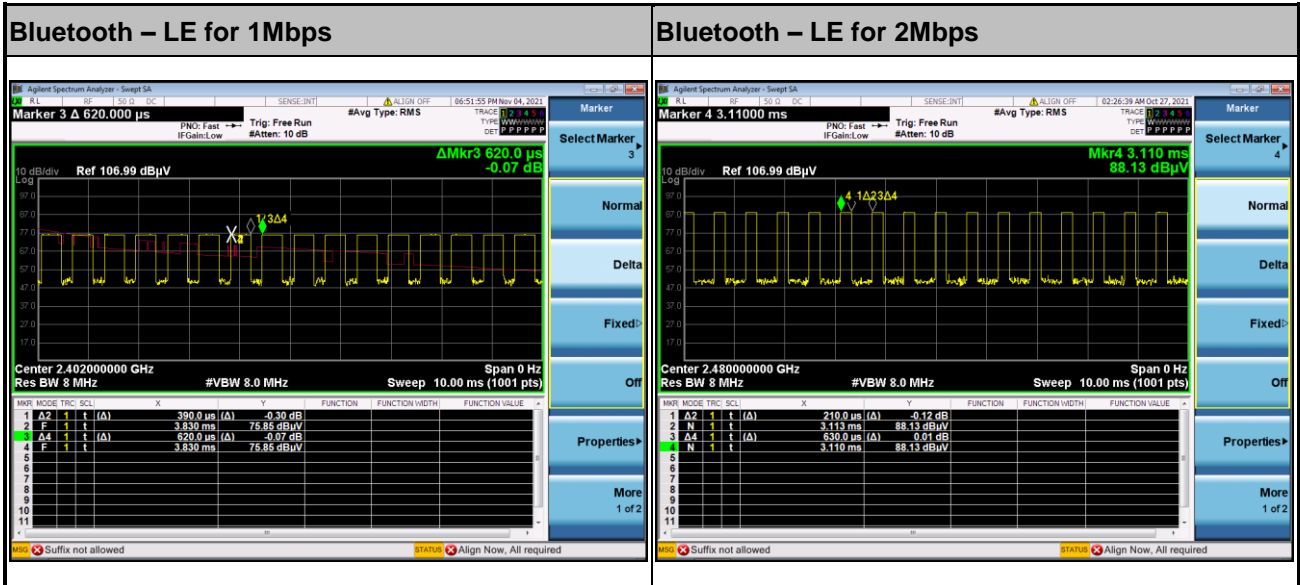
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	Bluetooth –LE for 1Mbps	61.29	380	2.63	3kHz
1	Bluetooth –LE for 2Mbps	33.33	210	4.76	10kHz
2	Bluetooth –LE for 1Mbps	62.90	390	2.56	3kHz
2	Bluetooth –LE for 2Mbps	33.33	210	4.76	10kHz

<Ant. 1>





<Ant. 2>



—THE END—