FCC CO-LOCATION RADIO TEST REPORT

FCC ID	:	**MSQI005D**
Equipment	:	**ASUS Phone(Mobile Phone)**
Brand Name	:	**ASUS**
Model Name	:	**ASUS_I005D** **ASUS_I005DC**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Nov. 16, 2020 and testing was started from Nov. 24, 2020 and completed on Dec. 31, 2020. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications 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 of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR082114G	01	Initial issue of report	Feb. 04, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(b)	Unwanted Emissions	Pass	Under limit 2.81 dB at 5150.000 MHz
3.2	15.203 15.407(a)	Antenna Requirement	Pass	-

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 declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Vivian Hsu

1 General Description

1.1 Applicant

1. **ASUSTeK COMPUTER INC.**
   1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

1.2 Manufacturer

1. **Guangdong Enok Communication Co., Ltd.**
   No. 137, 139, Lixiang Road., Songmushan Village, Dalang Town, Dongguan City, Guangdong Province, China
2. **PT. SAT NUSAPERSADA TBK**
   JALAN PELITA VI. NO. 99, BATAM, 29443,INDONESIA

1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, NFC, and GNSS

Product specification subjective to this standard	
Sample 1	Model Name: ASUS_I005D
Sample 2	Model Name: ASUS_I005DC
Antenna Type	WWAN: PIFA Antenna WLAN <Ant. 4>: PIFA Antenna <Ant. 5>: PIFA Antenna <Ant. 6>: PIFA Antenna Bluetooth <Ant. 4>: PIFA Antenna <Ant. 5>: PIFA Antenna <Ant. 6>: PIFA Antenna GPS/Glonass/BDS/Galileo: PIFA Antenna NFC: Loop Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	Ant. 4: -0.5 Ant. 5: -0.8 Ant. 6: 2.7
5150 MHz ~ 5250 MHz	Peak Gain (dBi)	Ant. 4: -4.3 Ant. 5: 2.9 Ant. 6: 3.0

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

Sample Information		
Model Name	**ASUS_I005D**	**ASUS_I005DC**
SKU	SKU1	SKU2
	UE2S3	UE2S2
High-end or Entry level (Back cover CN or WW)	High-end WW (Etching + Black) PMOLED	High-end CN (Etching + Black) Light guide plate
PCB Manufacturer	COMPEQ	COMPEQ
Front Camera 24M (Brand/Model name)	TRIPLEWIN/CASF0-000A	LUXVISIONS/0BFO01P3
Rear CAM 64M+13M (Brand/Model name)	PRIMAX/50-704JHASC8	PRIMAX/50-704JHASC8
Rear CAM 8M (Brand/Model name)	TSPRECISION/O5F9323 VERA1	TSPRECISION/O5F9323 VERA1
BATT (Brand/Model name)	SCUD/C21P2001	SCUD/C21P2001
CPU (Brand/Model name)	QUALCOMM/ SM-8350-1-MPSP1393-TR-00-0-AB	QUALCOMM/ SM-8350-1-MPSP1393-TR-00-0-AB
DDR	12G	12G
Brand/Model name	Micron/MT62F1536M64D8CH-031WT:A	Micron/MT62F1536M64D8CH-031WT:A
UFS	512G	256G
Brand/Model name	Micron/MTFC512GARATAM-WT	Samsung/KLUEG8UHDC-B0E1

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH15-HY

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

FCC designation No.: TW0007

1.6 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases were recorded in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth EDR		2400-2483.5 MHz Bluetooth - LE		2400-2483.5 MHz 802.11b		5150-5250 MHz 802.11a	
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
78	2480	39	2480	11	2462	36	5180

2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

<Co-Location>
<Normal Mode>

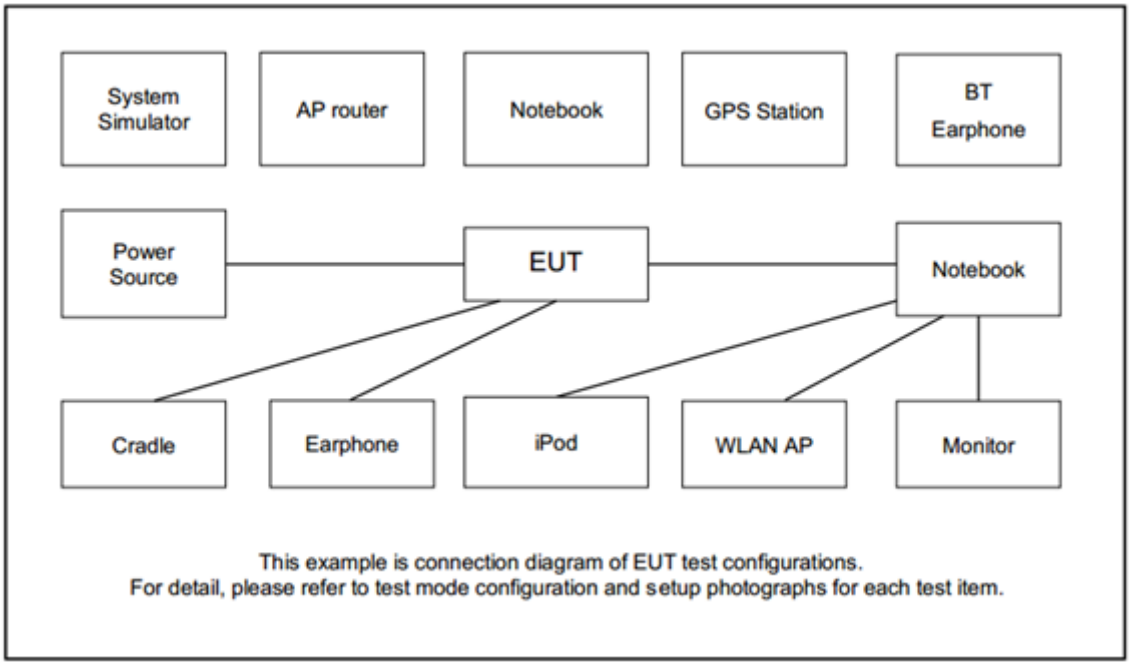
Modulation	Plane	Data Rate
Bluetooth Ant. 4 + WLAN 2.4GHz 802.11b for Ant. 5	X	1Mbps + 1Mbps
Bluetooth LE Ant. 4 + WLAN 2.4GHz 802.11b for Ant. 5	X	1Mbps + 1Mbps
Bluetooth LE Ant. 4 + WLAN 5GHz 802.11a for Ant. 5	X	1Mbps + 6Mbps
Bluetooth LE Ant. 4 + WLAN 5GHz 802.11a for Ant. 4	X	1Mbps + 6Mbps
Bluetooth LE Ant. 5 + WLAN 5GHz 802.11a for Ant. 4	Z	1Mbps + 6Mbps
Bluetooth LE Ant. 5 + WLAN 5GHz 802.11a for Ant. 5	X	1Mbps + 6Mbps

<Camera Mode>

Modulation	Plane	Data Rate
Bluetooth Ant. 6 + WLAN 2.4GHz 802.11b for Ant. 5	Z	1Mbps + 1Mbps
Bluetooth LE Ant. 6 + WLAN 2.4GHz 802.11b for Ant. 5	X	1Mbps + 1Mbps
Bluetooth LE Ant. 6 + WLAN 5GHz 802.11a for Ant. 5	Z	1Mbps + 6Mbps
Bluetooth LE Ant. 6 + WLAN 5GHz 802.11a for Ant. 6	Z	1Mbps + 6Mbps
Bluetooth LE Ant. 5 + WLAN 5GHz 802.11a for Ant. 6	Z	1Mbps + 6Mbps

Remark: All the tests were performed with Sample 1.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT Ver.4.0.00175.0” 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.

3 Test Result

3.1 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

<Limit of Unwanted Emissions>

(1) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table:

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

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

(2) KDB789033 D02 v02r01 G)2)c)

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of −27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.1.1 Measuring Instruments

See list of measuring equipment of this test report.

3.1.2 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

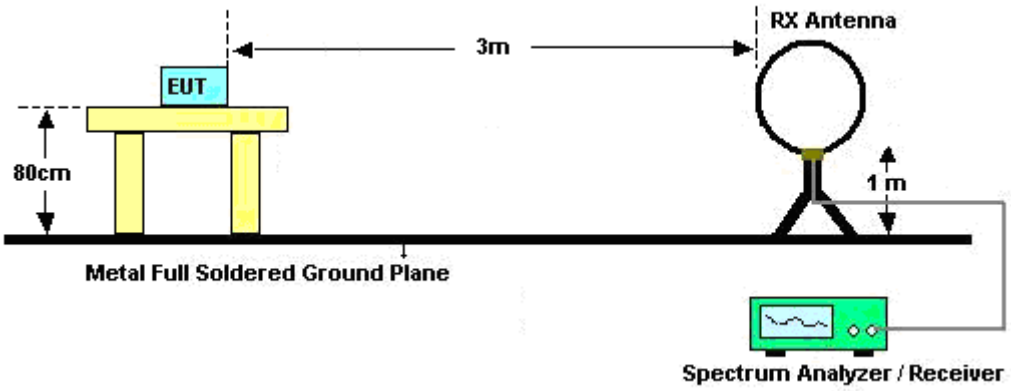
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

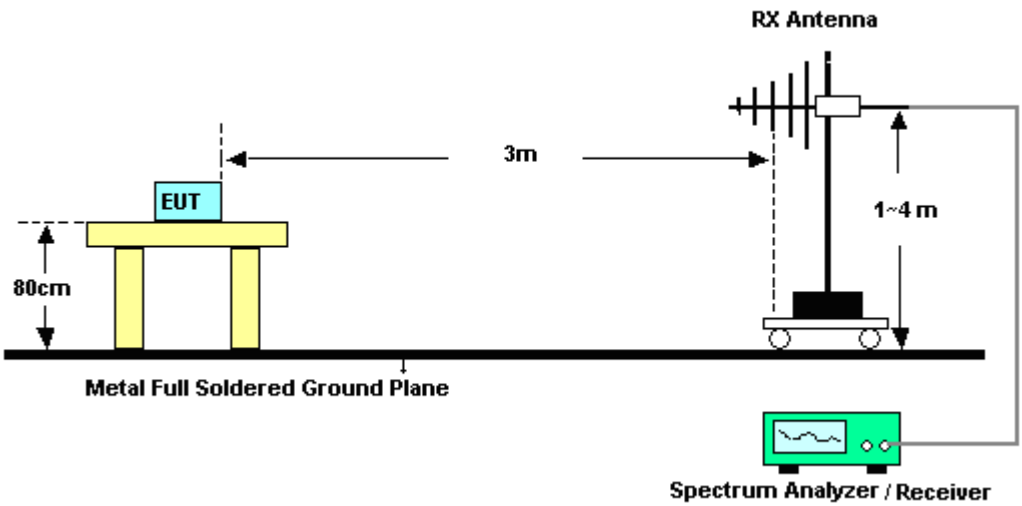
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.1.3 Test Setup

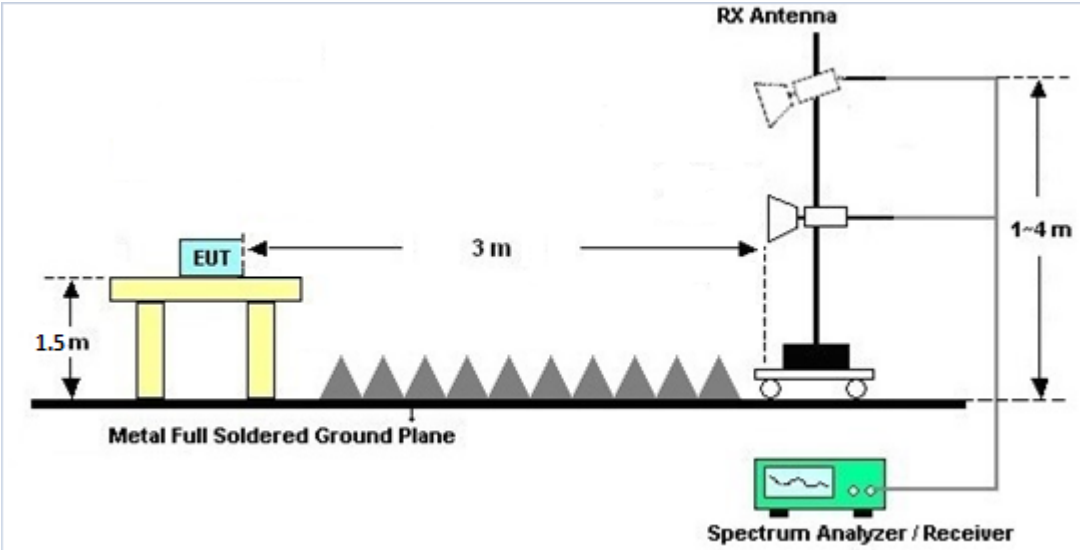
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated test above 1GHz



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

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

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

3.1.5 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.6 Duty Cycle

Please refer to Appendix C.

3.1.7 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix A and B.

3.2 Antenna Requirements

3.2.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.2.3 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	100488	9 kHz~30 MHz	Jul. 14, 2020	Nov. 24, 2020~ Dec. 31, 2020	Jul. 13, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	41912 & 05	30MHz~1GHz	Feb. 09, 2020	Nov. 24, 2020~ Dec. 31, 2020	Feb. 08, 2021	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2019	Nov. 24, 2020~ Dec. 25, 2020	Dec. 26, 2020	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 02, 2020	Dec. 26, 2020~ Dec. 31, 2020	Dec. 01, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Nov. 03, 2020	Nov. 24, 2020~ Dec. 31, 2020	Nov. 02, 2021	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917057 6	18GHz~40GHz	May 22, 2020	Nov. 24, 2020~ Dec. 31, 2020	May 21, 2021	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	1710001800 055006	1GHz~18GHz	May 07, 2020	Nov. 24, 2020~ Dec. 31, 2020	May 06, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 21, 2020	Nov. 24, 2020~ Dec. 31, 2020	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Oct. 27, 2020	Nov. 24, 2020~ Dec. 31, 2020	Oct. 26, 2021	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY54130085	20MHz~8.4GHz	Nov. 02, 2020	Nov. 24, 2020~ Dec. 31, 2020	Nov. 01, 2021	Radiation (03CH15-HY
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	May 04, 2020	Nov. 24, 2020~ Dec. 31, 2020	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Nov. 24, 2020~ Dec. 31, 2020	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Nov. 24, 2020~ Dec. 31, 2020	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24 (k5)	RK-000451	N/A	N/A	Nov. 24, 2020~ Dec. 31, 2020	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE ,508405/2E	30MHz~18G	Nov. 16, 2020	Nov. 24, 2020~ Dec. 31, 2020	Nov. 15, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 25, 2020	Nov. 24, 2020~ Dec. 31, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 25, 2020	Nov. 24, 2020~ Dec. 31, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 12, 2020	Nov. 24, 2020~ Dec. 31, 2020	Mar. 11, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-15 30-6000-40ST	SN4	1.53GHz Low Pass Filter	Jul. 03, 2020	Nov. 24, 2020~ Dec. 31, 2020	Jul. 02, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN6	6.75GHz High Pass Filter	Jul. 01, 2020	Nov. 24, 2020~ Dec. 31, 2020	Jun. 30, 2021	Radiation (03CH15-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.7**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.3**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.9**

Appendix A. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.5~24.2°C
		Relative Humidity :	44~57%

<Normal mode>

BT_Tx_Ch78 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
BT_Tx_Ch78 Ant. 4	*	2480	119.45	-	-	106.19	27.44	16.7	30.88	100	297	P	H
	*	2480	94.66	-	-	-	-	-	-	-	-	A	H
		2483.6	64.86	-9.14	74	51.6	27.43	16.71	30.88	100	297	P	H
		2483.6	40.07	-13.93	54	-	-	-	-	-	-	A	H
	*	2480	114.97	-	-	101.71	27.44	16.7	30.88	400	63	P	V
	*	2480	90.18	-	-	-	-	-	-	-	-	A	V
		2483.68	63.07	-10.93	74	49.81	27.43	16.71	30.88	400	63	P	V
		2483.68	38.28	-15.72	54	-	-	-	-	-	-	A	V
													V
													V
11b_Tx_Ch11 Ant. 5	*	2462	110.04	-	-	96.77	27.48	16.68	30.89	354	139	P	H
	*	2462	106.89	-	-	93.62	27.48	16.68	30.89	354	139	A	H
		2483.8	56.83	-17.17	74	43.57	27.43	16.71	30.88	354	139	P	H
		2483.52	46.54	-7.46	54	33.28	27.43	16.71	30.88	354	139	A	H
	*	2462	107.33	-	-	94.06	27.48	16.68	30.89	400	65	P	V
	*	2462	104.14	-	-	90.87	27.48	16.68	30.89	400	65	A	V
		2483.96	56.54	-17.46	74	43.28	27.43	16.71	30.88	400	65	P	V
		2483.52	45.33	-8.67	54	32.07	27.43	16.71	30.88	400	65	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BT_Tx_Ch78 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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)
BT_Tx_Ch78 Ant. 4 + 11b_Tx_Ch11 Ant. 5		4924	39.67	-34.33	74	57.58	31.1	10.14	59.15	100	0	P	H
		4960	39.19	-34.81	74	56.98	31.22	10.17	59.18	100	0	P	H
		4960	14.4	-39.6	54	-	-	-	-	-	-	A	H
		7386	44.65	-29.35	74	54.46	36.3	12.35	58.46	100	0	P	H
		7440	45.75	-28.25	74	55.44	36.3	12.39	58.38	100	0	P	H
		7440	20.96	-33.04	54	-	-	-	-	-	-	A	H
													H
													H
		4924	40.16	-33.84	74	58.07	31.1	10.14	59.15	100	0	P	V
		4960	39.38	-34.62	74	57.17	31.22	10.17	59.18	100	0	P	V
		4960	14.59	-39.41	54	-	-	-	-	-	-	A	V
		7386	44.6	-29.4	74	54.41	36.3	12.35	58.46	100	0	P	V
		7440	45.41	-28.59	74	55.1	36.3	12.39	58.38	100	0	P	V
		7440	20.62	-33.38	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

Ant. Simultaneously	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_Tx_Ch39 Ant. 4	*	2480	100.2	-	-	86.94	27.44	16.7	30.88	105	308	P	H
	*	2480	99.69	-	-	86.43	27.44	16.7	30.88	105	308	A	H
		2483.84	55.73	-18.27	74	42.47	27.43	16.71	30.88	105	308	P	H
		2490.12	46.39	-7.61	54	33.12	27.42	16.72	30.87	105	308	A	H
													H
													H
	*	2480	95.34	-	-	82.08	27.44	16.7	30.88	400	55	P	V
	*	2480	94.86	-	-	81.6	27.44	16.7	30.88	400	55	A	V
		2483.52	56.15	-17.85	74	42.89	27.43	16.71	30.88	400	55	P	V
		2490.8	46.67	-7.33	54	33.4	27.42	16.72	30.87	400	55	A	V
													V
													V
11b_Tx_Ch11 Ant. 5	*	2462	109.44	-	-	96.17	27.48	16.68	30.89	154	160	P	H
	*	2462	106.3	-	-	93.03	27.48	16.68	30.89	154	160	A	H
		2489.12	57.57	-16.43	74	44.3	27.42	16.72	30.87	154	160	P	H
		2490.2	48.02	-5.98	54	34.75	27.42	16.72	30.87	154	160	A	H
												P	H
												A	H
	*	2462	107.17	-	-	93.9	27.48	16.68	30.89	400	72	P	V
	*	2462	104.06	-	-	90.79	27.48	16.68	30.89	400	72	A	V
		2488.96	56.15	-17.85	74	42.88	27.42	16.72	30.87	400	72	P	V
		2490.16	45.96	-8.04	54	32.69	27.42	16.72	30.87	400	72	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 4 + 11b_Tx_Ch11 Ant 5		4924	39.71	-34.29	74	57.62	31.1	10.14	59.15	100	0	P	H
		4960	39.24	-34.76	74	57.03	31.22	10.17	59.18	100	0	P	H
		7386	44.77	-29.23	74	54.58	36.3	12.35	58.46	100	0	P	H
		7440	45.36	-28.64	74	55.05	36.3	12.39	58.38	100	0	P	H
													H
													H
													H
													H
		4924	40.29	-33.71	74	58.2	31.1	10.14	59.15	100	0	P	V
		4960	39.63	-34.37	74	57.42	31.22	10.17	59.18	100	0	P	V
		7386	44.43	-29.57	74	54.24	36.3	12.35	58.46	100	0	P	V
		7440	45.1	-28.9	74	54.79	36.3	12.39	58.38	100	0	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 4	*	2480	101.3	-	-	88.04	27.44	16.7	30.88	100	302	P	H
	*	2480	100.74	-	-	87.48	27.44	16.7	30.88	100	302	A	H
		2487.32	55.29	-18.71	74	42.02	27.43	16.72	30.88	100	302	P	H
		2489.2	45.35	-8.65	54	32.08	27.42	16.72	30.87	100	302	A	H
													H
													H
	*	2480	97.87	-	-	84.61	27.44	16.7	30.88	400	13	P	V
	*	2480	97.09	-	-	83.83	27.44	16.7	30.88	400	13	A	V
		2492.68	54.25	-19.75	74	40.99	27.41	16.72	30.87	400	13	P	V
		2483.52	45.52	-8.48	54	32.26	27.43	16.71	30.88	400	13	A	V
													V
													V
11a_Tx_Ch36 Ant. 5		5150	64.44	-9.56	74	52.14	31.8	10.51	30.01	100	235	P	H
		5150	50.24	-3.76	54	37.94	31.8	10.51	30.01	100	235	A	H
	*	5180	110.75	-	-	98.57	31.62	10.57	30.01	100	235	P	H
	*	5180	102.82	-	-	90.64	31.62	10.57	30.01	100	235	A	H
												P	H
												A	H
		5150	60.03	-13.97	74	47.73	31.8	10.51	30.01	400	23	P	V
		5150	46.9	-7.1	54	34.6	31.8	10.51	30.01	400	23	A	V
	*	5180	107.48	-	-	95.3	31.62	10.57	30.01	400	23	P	V
	*	5180	99.97	-	-	87.79	31.62	10.57	30.01	400	23	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5		4960	51.66	-22.34	74	39.25	31.22	11.22	30.03	100	322	P	H
		4960	42.03	-11.97	54	29.62	31.22	11.22	30.03	100	322	A	H
		7440	45.62	-28.38	74	55.05	36.3	12.65	58.38	100	0	P	H
		10360	48.07	-20.13	68.2	55.07	39.44	14.46	60.9	100	0	P	H
		15540	47.11	-26.89	74	54.71	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
		4960	51.48	-22.52	74	39.07	31.22	11.22	30.03	100	224	P	V
		4960	42.54	-11.46	54	30.13	31.22	11.22	30.03	100	224	A	V
		7440	46.59	-27.41	74	56.02	36.3	12.65	58.38	100	0	P	V
		10360	48.15	-20.05	68.2	55.15	39.44	14.46	60.9	100	0	P	V
		15540	47.15	-26.85	74	54.75	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 4 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 4	*	2480	101.3	-	-	88.04	27.44	16.7	30.88	100	295	P	H
	*	2480	100.79	-	-	87.53	27.44	16.7	30.88	100	295	A	H
		2485.52	55.93	-18.07	74	42.67	27.43	16.71	30.88	100	295	P	H
		2490.6	45.72	-8.28	54	32.45	27.42	16.72	30.87	100	295	A	H
													H
													H
	*	2480	97.82	-	-	84.56	27.44	16.7	30.88	400	15	P	V
	*	2480	97.28	-	-	84.02	27.44	16.7	30.88	400	15	A	V
		2485.32	54.74	-19.26	74	41.48	27.43	16.71	30.88	400	15	P	V
		2486.04	45.64	-8.36	54	32.38	27.43	16.71	30.88	400	15	A	V
													V
													V
11a_Tx_Ch36 Ant. 4		5149.24	56.41	-17.59	74	44.11	31.8	10.51	30.01	100	122	P	H
		5150	43.8	-10.2	54	31.5	31.8	10.51	30.01	100	122	A	H
	*	5180	100.31	-	-	88.13	31.62	10.57	30.01	100	122	P	H
	*	5180	92.26	-	-	80.08	31.62	10.57	30.01	100	122	A	H
												P	H
												A	H
		5147.42	57.3	-16.7	74	45.01	31.8	10.5	30.01	360	65	P	V
		5150	44.93	-9.07	54	32.63	31.8	10.51	30.01	360	65	A	V
	*	5180	102.86	-	-	90.68	31.62	10.57	30.01	360	65	P	V
	*	5180	95.51	-	-	83.33	31.62	10.57	30.01	360	65	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 4 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 4		4960	51.37	-22.63	74	38.96	31.22	11.22	30.03	100	128	P	H
		4960	41.7	-12.3	54	29.29	31.22	11.22	30.03	100	128	A	H
		7440	44.85	-29.15	74	54.28	36.3	12.65	58.38	100	0	P	H
		10360	48.63	-19.57	68.2	55.63	39.44	14.46	60.9	100	0	P	H
		15540	47.21	-26.79	74	54.81	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
		4960	51.26	-22.74	74	38.85	31.22	11.22	30.03	100	256	P	V
		4960	42.43	-11.57	54	30.02	31.22	11.22	30.03	100	256	A	V
		7440	45.5	-28.5	74	54.93	36.3	12.65	58.38	100	0	P	V
		10360	50.81	-17.39	68.2	57.81	39.44	14.46	60.9	100	0	P	V
		15540	47.17	-26.83	74	54.77	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 4 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 5	*	2480	98.94	-	-	85.68	27.44	16.7	30.88	288	31	P	H
	*	2480	98.29	-	-	85.03	27.44	16.7	30.88	288	31	A	H
		2489	54.73	-19.27	74	41.46	27.42	16.72	30.87	288	31	P	H
		2496.16	45.32	-8.68	54	32.05	27.41	16.73	30.87	288	31	A	H
													H
													H
	*	2480	100.62	-	-	87.36	27.44	16.7	30.88	317	325	P	V
	*	2480	100.05	-	-	86.79	27.44	16.7	30.88	317	325	A	V
		2490.68	55.27	-18.73	74	42	27.42	16.72	30.87	317	325	P	V
		2488.76	45.78	-8.22	54	32.51	27.42	16.72	30.87	317	325	A	V
													V
													V
11a_Tx_Ch36 Ant. 4		5148.98	57.08	-16.92	74	44.78	31.8	10.51	30.01	260	113	P	H
		5150	45.38	-8.62	54	33.08	31.8	10.51	30.01	260	113	A	H
	*	5180	104.64	-	-	92.46	31.62	10.57	30.01	260	113	P	H
	*	5180	96.82	-	-	84.64	31.62	10.57	30.01	260	113	A	H
												P	H
												A	H
		5145.08	54.84	-19.16	74	42.55	31.8	10.5	30.01	207	360	P	V
		5150	44.26	-9.74	54	31.96	31.8	10.51	30.01	207	360	A	V
	*	5180	102.68	-	-	90.5	31.62	10.57	30.01	207	360	P	V
	*	5180	95.04	-	-	82.86	31.62	10.57	30.01	207	360	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 4 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 4		4960	50.82	-23.18	74	38.41	31.22	11.22	30.03	100	324	P	H
		4960	42.65	-11.35	54	30.24	31.22	11.22	30.03	100	324	A	H
		7440	44.79	-29.21	74	54.22	36.3	12.65	58.38	100	0	P	H
		10360	47.33	-20.87	68.2	54.33	39.44	14.46	60.9	100	0	P	H
		15540	46.98	-27.02	74	54.58	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
		4960	51.74	-22.26	74	39.33	31.22	11.22	30.03	100	44	P	V
		4960	42.27	-11.73	54	29.86	31.22	11.22	30.03	100	44	A	V
		7440	44.84	-29.16	74	54.27	36.3	12.65	58.38	100	0	P	V
		10360	51.15	-17.05	68.2	58.15	39.44	14.46	60.9	100	0	P	V
		15540	46.65	-27.35	74	54.25	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 5 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 5	*	2480	101.53	-	-	88.27	27.44	16.7	30.88	127	294	P	H
	*	2480	101.02	-	-	87.76	27.44	16.7	30.88	127	294	A	H
		2486.6	55.13	-18.87	74	41.87	27.43	16.71	30.88	127	294	P	H
		2499.68	45.67	-8.33	54	32.41	27.4	16.73	30.87	127	294	A	H
													H
													H
	*	2480	98.14	-	-	84.88	27.44	16.7	30.88	400	14	P	V
	*	2480	97.6	-	-	84.34	27.44	16.7	30.88	400	14	A	V
		2485.4	55.69	-18.31	74	42.43	27.43	16.71	30.88	400	14	P	V
		2494.72	45.81	-8.19	54	32.54	27.41	16.73	30.87	400	14	A	V
													V
													V
11a_Tx_Ch36 Ant. 5		5149.76	59.78	-14.22	74	47.48	31.8	10.51	30.01	100	260	P	H
		5150	49.82	-4.18	54	37.52	31.8	10.51	30.01	100	260	A	H
	*	5180	109.93	-	-	97.75	31.62	10.57	30.01	100	260	P	H
	*	5180	101.83	-	-	89.65	31.62	10.57	30.01	100	260	A	H
												P	H
												A	H
		5150	57.38	-16.62	74	45.08	31.8	10.51	30.01	400	16	P	V
		5150	48.22	-5.78	54	35.92	31.8	10.51	30.01	400	16	A	V
	*	5180	108.79	-	-	96.61	31.62	10.57	30.01	400	16	P	V
	*	5180	100.97	-	-	88.79	31.62	10.57	30.01	400	16	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 5		4960	50.98	-23.02	74	38.57	31.22	11.22	30.03	100	221	P	H
		4960	41.77	-12.23	54	29.36	31.22	11.22	30.03	100	221	A	H
		7440	44.32	-29.68	74	53.75	36.3	12.65	58.38	100	0	P	H
		10360	48.05	-20.15	68.2	55.05	39.44	14.46	60.9	100	0	P	H
		15540	46.58	-27.42	74	54.18	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
		4960	51.55	-22.45	74	39.14	31.22	11.22	30.03	100	54	P	V
		4960	42.52	-11.48	54	30.11	31.22	11.22	30.03	100	54	A	V
		7440	45.15	-28.85	74	54.58	36.3	12.65	58.38	100	0	P	V
		10360	48.26	-19.94	68.2	55.26	39.44	14.46	60.9	100	0	P	V
		15540	47.98	-26.02	74	55.58	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

<Camera mode>

BT_Tx_Ch78 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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)
BT_Tx_Ch78 Ant. 6	*	2480	110.26	-	-	106.92	27.44	6.78	30.88	100	55	P	H
	*	2480	85.5	-	-	-	-	-	-	-	-	A	H
		2484.28	55.18	-18.82	74	51.84	27.43	6.79	30.88	100	55	P	H
		2484.28	30.42	-23.58	54	-	-	-	-	-	-	A	H
													H
													H
	*	2480	112.49	-	-	109.15	27.44	6.78	30.88	325	78	P	V
	*	2480	87.73	-	-	-	-	-	-	-	-	A	V
		2484.52	56.71	-17.29	74	53.37	27.43	6.79	30.88	325	78	P	V
		2484.52	31.95	-22.05	54	-	-	-	-	-	-	A	V
													V
													V
11b_Tx_Ch11 Ant. 5	*	2462	107.57	-	-	94.3	27.48	16.68	30.89	252	321	P	H
	*	2462	104.43	-	-	91.16	27.48	16.68	30.89	252	321	A	H
		2486.8	58.21	-15.79	74	44.95	27.43	16.71	30.88	252	321	P	H
		2486.8	50.4	-3.6	54	37.14	27.43	16.71	30.88	252	321	A	H
													H
													H
	*	2462	106.73	-	-	93.46	27.48	16.68	30.89	100	256	P	V
	*	2462	103.61	-	-	90.34	27.48	16.68	30.89	100	256	A	V
		2487.04	58.3	-15.7	74	45.04	27.43	16.71	30.88	100	256	P	V
		2486.68	50.52	-3.48	54	37.26	27.43	16.71	30.88	100	256	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BT_Tx_Ch78 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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)
BT_Tx_Ch78 Ant. 6 + 11b_Tx_Ch11 Ant. 5		4924	42.46	-31.54	74	60.37	31.1	10.14	59.15	100	0	P	H
		4960	41.16	-32.84	74	58.95	31.22	10.17	59.18	100	0	P	H
		4960	16.4	-37.6	54	-	-	-	-	-	-	A	H
		7386	46.78	-27.22	74	56.59	36.3	12.35	58.46	100	0	P	H
		7440	46.1	-27.9	74	55.79	36.3	12.39	58.38	100	0	P	H
		7440	21.34	-32.66	54	-	-	-	-	-	-	A	H
													H
													H
		4924	41.53	-32.47	74	59.44	31.1	10.14	59.15	100	0	P	V
		4960	40.91	-33.09	74	58.7	31.22	10.17	59.18	100	0	P	V
		4960	16.15	-37.85	54	-	-	-	-	-	-	A	V
		7386	46.53	-27.47	74	56.34	36.3	12.35	58.46	100	0	P	V
		7440	47.05	-26.95	74	56.74	36.3	12.39	58.38	100	0	P	V
		7440	22.29	-31.71	54	-	-	-	-	-	-	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6	*	2480	101.25	-	-	87.99	27.44	16.7	30.88	352	71	P	H
	*	2480	100.79	-	-	87.53	27.44	16.7	30.88	352	71	A	H
		2485.12	59.88	-14.12	74	46.62	27.43	16.71	30.88	352	71	P	H
		2483.52	46.4	-7.6	54	33.14	27.43	16.71	30.88	352	71	A	H
													H
													H
	*	2480	98.35	-	-	85.09	27.44	16.7	30.88	400	103	P	V
	*	2480	97.89	-	-	84.63	27.44	16.7	30.88	400	103	A	V
		2488.44	57.91	-16.09	74	44.64	27.42	16.72	30.87	400	103	P	V
		2490.24	46.33	-7.67	54	33.06	27.42	16.72	30.87	400	103	A	V
													V
													V
11b_Tx_Ch11 Ant. 5	*	2462	109.01	-	-	95.74	27.48	16.68	30.89	111	151	P	H
	*	2462	105.92	-	-	92.65	27.48	16.68	30.89	111	151	A	H
		2483.64	58.12	-15.88	74	44.86	27.43	16.71	30.88	111	151	P	H
		2483.52	50.84	-3.16	54	37.58	27.43	16.71	30.88	111	151	A	H
												P	H
												A	H
	*	2462	106	-	-	92.73	27.48	16.68	30.89	400	71	P	V
	*	2462	102.87	-	-	89.6	27.48	16.68	30.89	400	71	A	V
		2489	55.84	-18.16	74	42.57	27.42	16.72	30.87	400	71	P	V
		2483.52	46.27	-7.73	54	33.01	27.43	16.71	30.88	400	71	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6 + 11b_Tx_Ch11 Ant. 5		4924	39.79	-34.21	74	57.7	31.1	10.14	59.15	100	0	P	H
		4960	39.77	-34.23	74	57.56	31.22	10.17	59.18	100	0	P	H
		7386	45.12	-28.88	74	54.93	36.3	12.35	58.46	100	0	P	H
		7440	45.97	-28.03	74	55.66	36.3	12.39	58.38	100	0	P	H
													H
													H
													H
													H
		4924	40.1	-33.9	74	58.01	31.1	10.14	59.15	100	0	P	V
		4960	39.84	-34.16	74	57.63	31.22	10.17	59.18	100	0	P	V
		7386	45.27	-28.73	74	55.08	36.3	12.35	58.46	100	0	P	V
		7440	45.36	-28.64	74	55.05	36.3	12.39	58.38	100	0	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6	*	2480	102.89	-	-	89.63	27.44	16.7	30.88	110	46	P	H
	*	2480	102.42	-	-	89.16	27.44	16.7	30.88	110	46	A	H
		2496.64	55.15	-18.85	74	41.88	27.41	16.73	30.87	110	46	P	H
		2493.16	45.96	-8.04	54	32.7	27.41	16.72	30.87	110	46	A	H
													H
													H
	*	2480	104.87	-	-	91.61	27.44	16.7	30.88	250	76	P	V
	*	2480	104.42	-	-	91.16	27.44	16.7	30.88	250	76	A	V
		2486.12	55.52	-18.48	74	42.26	27.43	16.71	30.88	250	76	P	V
		2492.92	46.09	-7.91	54	32.83	27.41	16.72	30.87	250	76	A	V
													V
													V
11a_Tx_Ch36 Ant. 5		5149.5	55.51	-18.49	74	43.21	31.8	10.51	30.01	100	305	P	H
		5150	44.69	-9.31	54	32.39	31.8	10.51	30.01	100	305	A	H
	*	5180	111.8	-	-	99.62	31.62	10.57	30.01	100	305	P	H
	*	5180	103.83	-	-	91.65	31.62	10.57	30.01	100	305	A	H
												P	H
												A	H
		5135.2	53.14	-20.86	74	40.87	31.8	10.48	30.01	100	272	P	V
		5150	43.55	-10.45	54	31.25	31.8	10.51	30.01	100	272	A	V
	*	5180	109.95	-	-	97.77	31.62	10.57	30.01	100	272	P	V
	*	5180	101.63	-	-	89.45	31.62	10.57	30.01	100	272	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5		4960	49.94	-24.06	74	37.53	31.22	11.22	30.03	100	0	P	H
		7440	45.05	-28.95	74	54.48	36.3	12.65	58.38	100	0	P	H
		10360	48.36	-19.84	68.2	55.36	39.44	14.46	60.9	100	0	P	H
		15540	47.04	-26.96	74	54.64	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
													H
		4960	49.86	-24.14	74	37.45	31.22	11.22	30.03	100	0	P	V
		7440	44.63	-29.37	74	54.06	36.3	12.65	58.38	100	0	P	V
		10360	48.4	-19.8	68.2	55.4	39.44	14.46	60.9	100	0	P	V
		15540	46.91	-27.09	74	54.51	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 6 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6	*	2480	104.68	-	-	91.42	27.44	16.7	30.88	136	55	P	H
	*	2480	104.21	-	-	90.95	27.44	16.7	30.88	136	55	A	H
		2487.56	55.12	-18.88	74	41.86	27.42	16.72	30.88	136	55	P	H
		2489.08	45.67	-8.33	54	32.4	27.42	16.72	30.87	136	55	A	H
													H
													H
	*	2480	104.53	-	-	91.27	27.44	16.7	30.88	288	85	P	V
	*	2480	103.83	-	-	90.57	27.44	16.7	30.88	288	85	A	V
		2499.8	54.61	-19.39	74	41.35	27.4	16.73	30.87	288	85	P	V
		2487.2	45.55	-8.45	54	32.28	27.43	16.72	30.88	288	85	A	V
													V
													V
11a_Tx_Ch36 Ant. 6		5146.9	64.57	-9.43	74	52.28	31.8	10.5	30.01	200	3	P	H
		5150	51.19	-2.81	54	38.89	31.8	10.51	30.01	200	3	A	H
	*	5180	109.64	-	-	97.46	31.62	10.57	30.01	200	3	P	H
	*	5180	101.9	-	-	89.72	31.62	10.57	30.01	200	3	A	H
												P	H
												A	H
		5148.98	59.74	-14.26	74	47.44	31.8	10.51	30.01	267	40	P	V
		5150	46.72	-7.28	54	34.42	31.8	10.51	30.01	267	40	A	V
	*	5180	104.96	-	-	92.78	31.62	10.57	30.01	267	40	P	V
	*	5180	97.15	-	-	84.97	31.62	10.57	30.01	267	40	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 6 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 6		4960	50.76	-23.24	74	38.35	31.22	11.22	30.03	100	32	P	H
		4960	42.23	-11.77	54	29.82	31.22	11.22	30.03	100	32	A	H
		7440	44.45	-29.55	74	53.88	36.3	12.65	58.38	100	0	P	H
		10360	47.9	-20.3	68.2	54.9	39.44	14.46	60.9	100	0	P	H
		15540	47.74	-26.26	74	55.34	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
		4960	50.6	-23.4	74	38.19	31.22	11.22	30.03	300	256	P	V
		4960	42.63	-11.37	54	30.22	31.22	11.22	30.03	300	256	A	V
		7440	44.21	-29.79	74	53.64	36.3	12.65	58.38	100	0	P	V
		10360	48.37	-19.83	68.2	55.37	39.44	14.46	60.9	100	0	P	V
		15540	47.58	-26.42	74	55.18	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 6 (Band Edge @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 5	*	2480	103.06	-	-	89.8	27.44	16.7	30.88	250	84	P	H
	*	2480	102.54	-	-	89.28	27.44	16.7	30.88	250	84	A	H
		2490.36	55.48	-18.52	74	42.21	27.42	16.72	30.87	250	84	P	H
		2499.12	45.77	-8.23	54	32.51	27.4	16.73	30.87	250	84	A	H
													H
													H
	*	2480	99.79	-	-	86.53	27.44	16.7	30.88	400	92	P	V
	*	2480	99.25	-	-	85.99	27.44	16.7	30.88	400	92	A	V
		2492.6	55.13	-18.87	74	41.87	27.41	16.72	30.87	400	92	P	V
		2484.36	45.61	-8.39	54	32.35	27.43	16.71	30.88	400	92	A	V
													V
													V
11a_Tx_Ch36 Ant. 6		5150	55.31	-18.69	74	43.01	31.8	10.51	30.01	100	3	P	H
		5150	43.62	-10.38	54	31.32	31.8	10.51	30.01	100	3	A	H
	*	5180	109.66	-	-	97.48	31.62	10.57	30.01	100	3	P	H
	*	5180	101.46	-	-	89.28	31.62	10.57	30.01	100	3	A	H
												P	H
												A	H
		5098.54	52.95	-21.05	74	40.76	31.8	10.4	30.01	372	65	P	V
		5150	41.88	-12.12	54	29.58	31.8	10.51	30.01	372	65	A	V
	*	5180	106.55	-	-	94.37	31.62	10.57	30.01	372	65	P	V
	*	5180	98.75	-	-	86.57	31.62	10.57	30.01	372	65	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 6 (Harmonic @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 6		4960	51.14	-22.86	74	38.73	31.22	11.22	30.03	100	129	P	H
		4960	43.67	-10.33	54	31.26	31.22	11.22	30.03	100	129	A	H
		7440	43.54	-30.46	74	52.97	36.3	12.65	58.38	100	0	P	H
		10360	47.35	-20.85	68.2	54.35	39.44	14.46	60.9	100	0	P	H
		15540	47.23	-26.77	74	54.83	37.82	17.29	62.71	100	0	P	H
													H
													H
													H
		4960	51.11	-22.89	74	38.7	31.22	11.22	30.03	100	39	P	V
		4960	42.29	-11.71	54	29.88	31.22	11.22	30.03	100	39	A	V
		7440	44.34	-29.66	74	53.77	36.3	12.65	58.38	100	0	P	V
		10360	48.16	-20.04	68.2	55.16	39.44	14.46	60.9	100	0	P	V
		15540	47.14	-26.86	74	54.74	37.82	17.29	62.71	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

<Normal mode>

Emission below 1GHz

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5 (LF @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
Simultaneously		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5		139.61	32.39	-11.11	43.5	45.64	17.58	1.69	32.52	-	-	P	H
		157.07	37.26	-6.24	43.5	51.11	16.88	1.79	32.52	-	-	P	H
		186.17	38.53	-4.97	43.5	54.02	15.06	1.98	32.53	100	6	QP	H
		680.87	38.35	-7.65	46	41.11	26.18	3.55	32.49	-	-	P	H
		716.76	39.62	-6.38	46	41.52	26.73	3.63	32.26	-	-	P	H
		779.81	39.28	-6.72	46	39.57	27.64	3.83	31.76	-	-	P	H
													H
													H
													H
													H
													H
													H
		38.73	32.71	-7.29	40	44.41	20	0.79	32.49	-	-	P	V
		94.02	30.05	-13.45	43.5	45.75	15.44	1.37	32.51	-	-	P	V
		186.17	33.15	-10.35	43.5	48.64	15.06	1.98	32.53	-	-	P	V
		385.99	25.7	-20.3	46	33.62	21.22	2.68	31.82	-	-	P	V
		715.79	39.45	-6.55	46	41.42	26.67	3.63	32.27	100	0	P	V
		910.76	35.74	-10.26	46	33.96	28.71	4.2	31.13	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

<Camera mode>

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5 (LF @ 3m)

WIFI Ant. Simultaneously	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_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5		99.84	29.61	-13.89	43.5	44.45	16.22	1.44	32.5	-	-	P	H
		147.37	35.02	-8.48	43.5	48.4	17.41	1.73	32.52	-	-	P	H
		186.17	36.66	-6.84	43.5	52.15	15.06	1.98	32.53	100	0	P	H
		242.43	30.56	-15.44	46	43.41	17.27	2.25	32.37	-	-	P	H
		746.83	35.55	-10.45	46	36.2	27.66	3.71	32.02	-	-	P	H
		836.07	39.05	-6.95	46	38.22	28.29	4	31.46	-	-	P	H
													H
													H
													H
													H
													H
													H
		39.7	33.97	-6.03	40	46.13	19.53	0.81	32.5	100	0	P	V
		96.93	27.2	-16.3	43.5	42.5	15.8	1.4	32.5	-	-	P	V
		148.34	26.25	-17.25	43.5	39.68	17.35	1.74	32.52	-	-	P	V
		185.2	26.15	-17.35	43.5	41.64	15.06	1.98	32.53	-	-	P	V
		713.85	39.1	-6.9	46	41.19	26.57	3.62	32.28	-	-	P	V
		837.04	35.84	-10.16	46	34.9	28.39	4	31.45	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

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	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

WIFI	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)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix B. Radiated Spurious Emission Plots

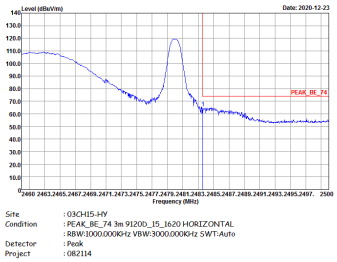
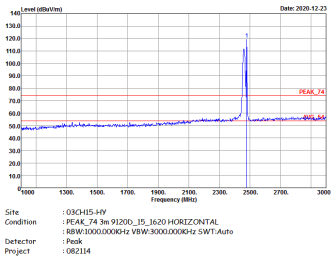
Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	**Temperature :**	22.5~24.2°C
		Relative Humidity :	44~57%

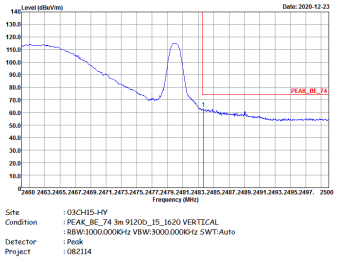
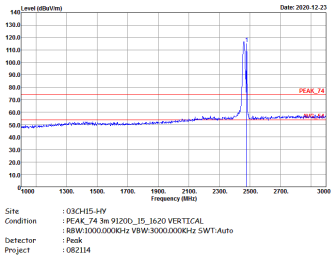
Note symbol

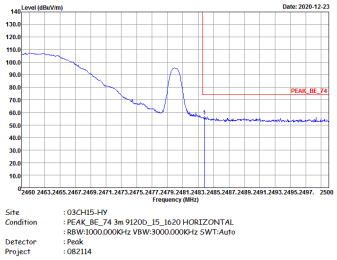
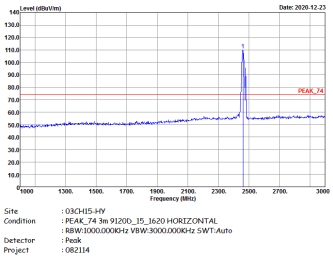
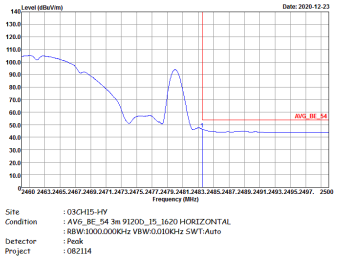
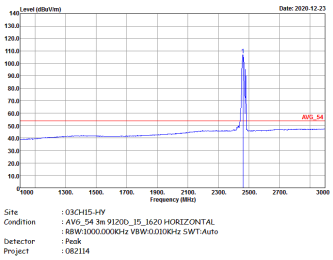
-L	**Low channel location**
-R	**High channel location**

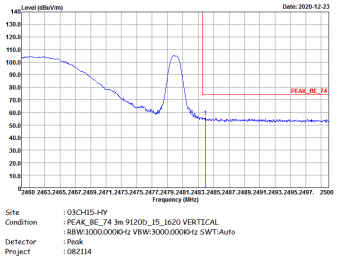
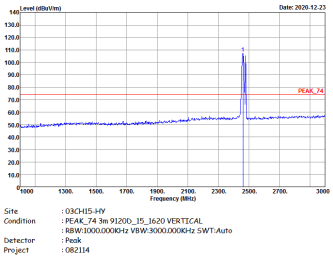
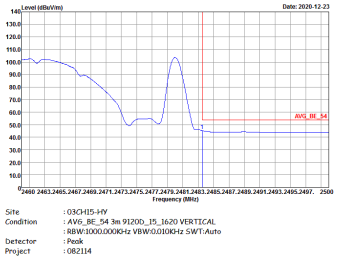
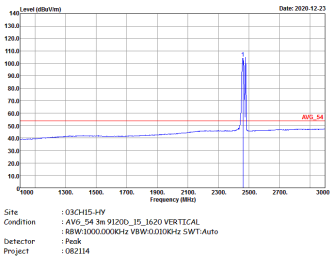
<Normal mode>

BT_Tx_Ch78 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

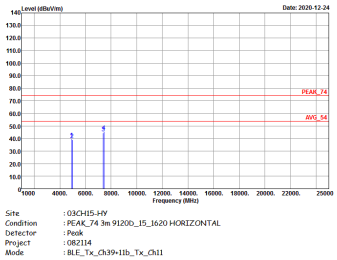
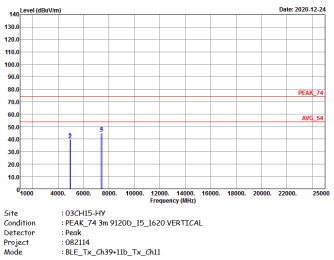
ANT	BT_Tx_Ch78 Ant. 4	
Simultaneously	Horizontal	Fundamental
Peak		

ANT	BT_Tx_Ch78 Ant. 4	
Simultaneously	Vertical	Fundamental
Peak		

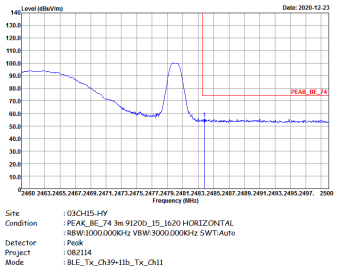
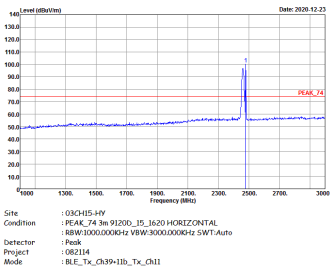
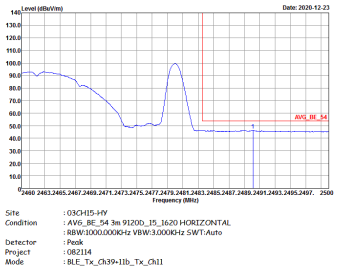
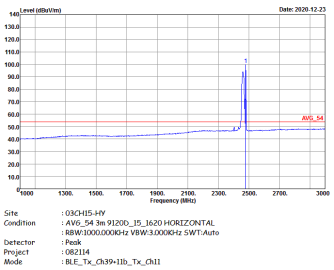
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

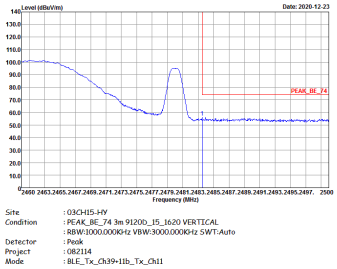
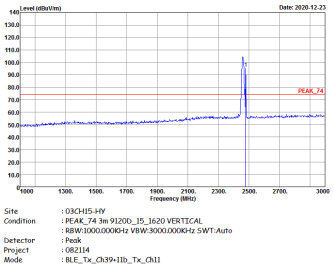
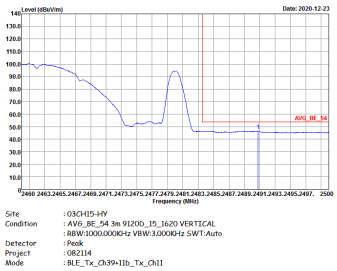
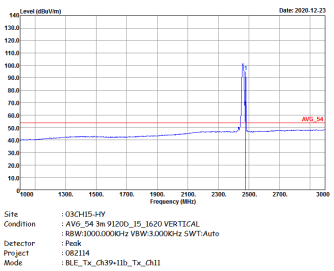
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

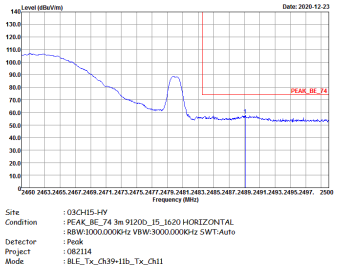
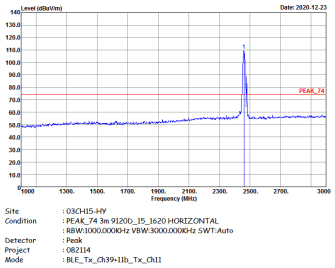
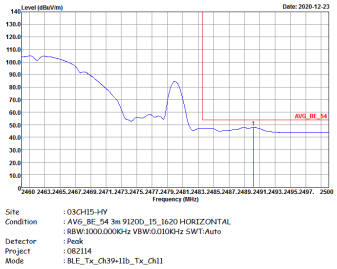
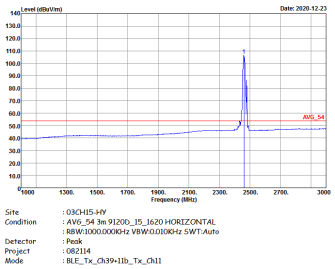
BT_Tx_Ch78 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

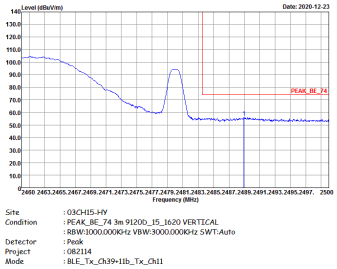
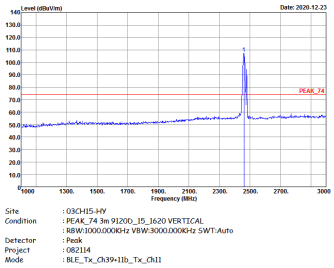
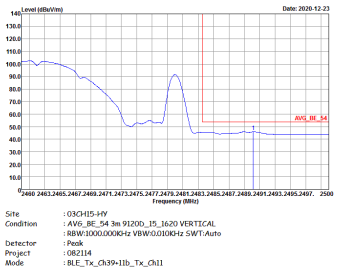
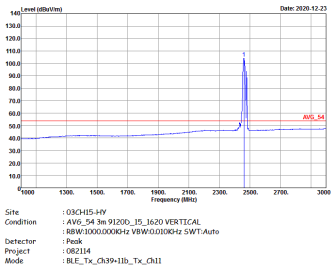
ANT	BT_Tx_Ch78 Ant. 4 + 11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 4 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

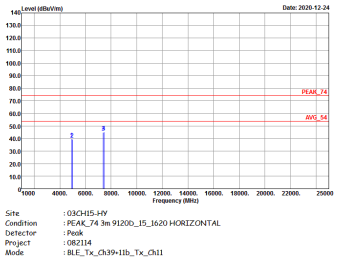
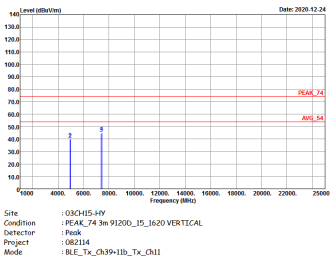
ANT	BLE_Tx_Ch39 Ant. 4	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 4	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

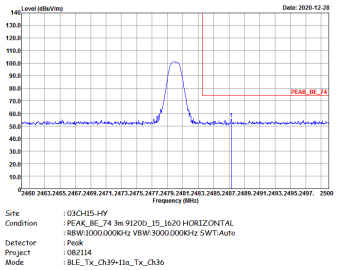
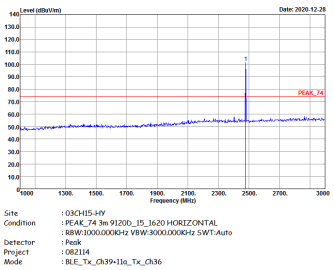
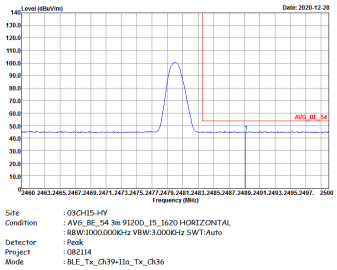
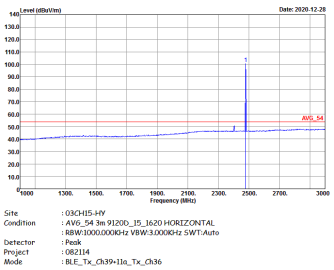
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

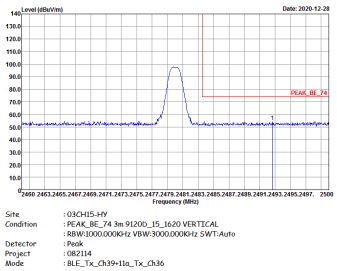
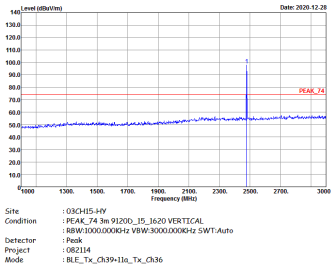
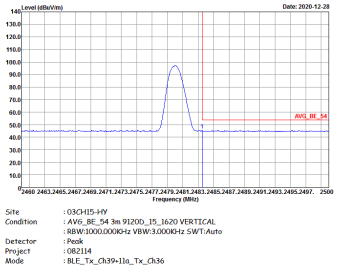
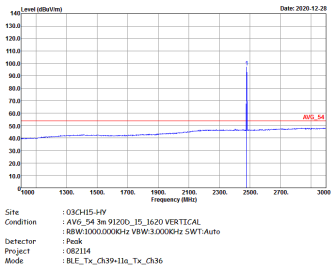
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

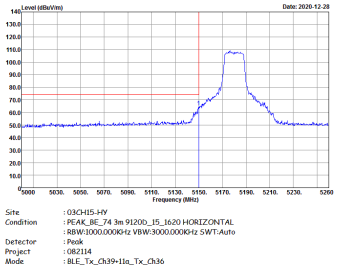
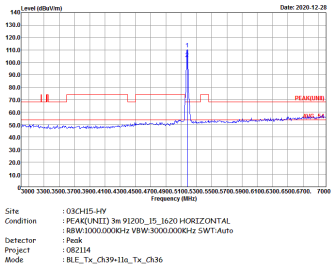
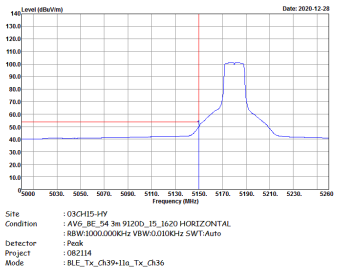
BLE_Tx_Ch39 Ant 4 + 11b_Tx_Ch11 Ant 5 (Harmonic @ 3m)

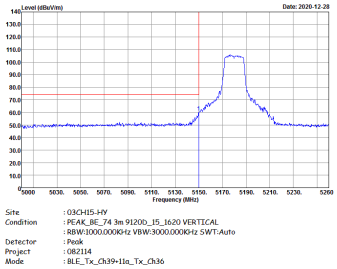
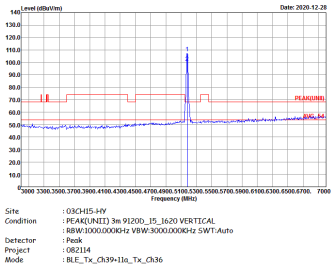
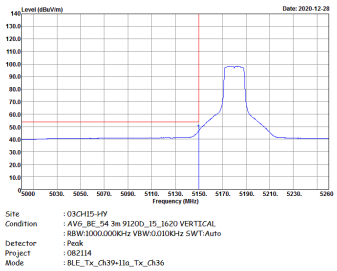
ANT	BLE_Tx_Ch39 Ant. 4 + 11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5 (Band Edge @ 3m)

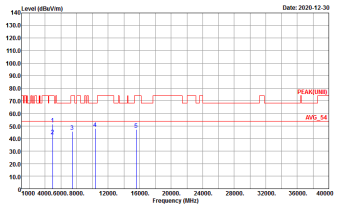
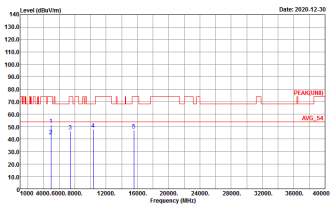
ANT	BLE_Tx_Ch39 Ant. 4	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 4	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

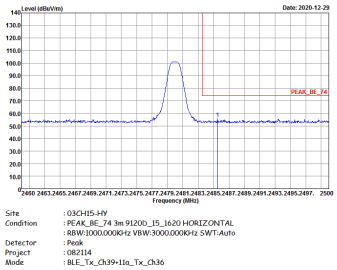
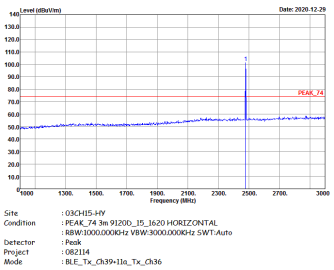
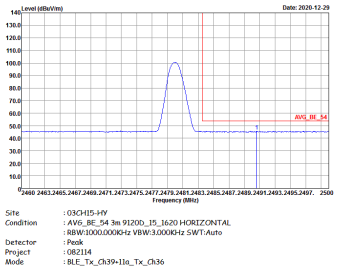
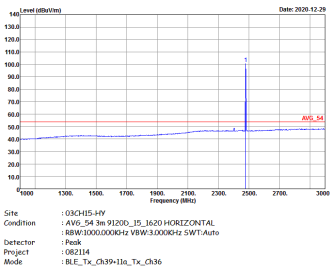
ANT	11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

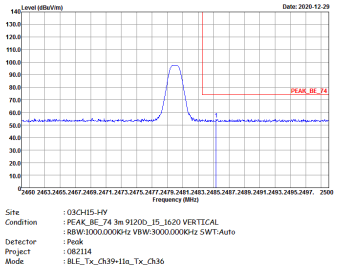
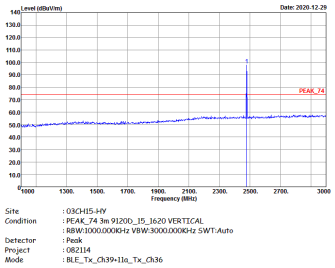
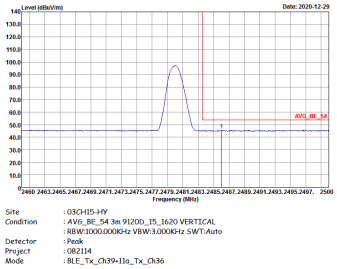
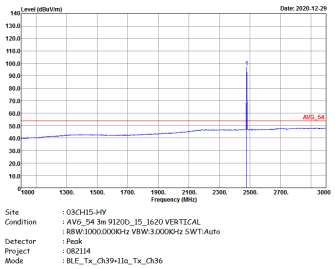
ANT	11a_Tx_Ch36 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

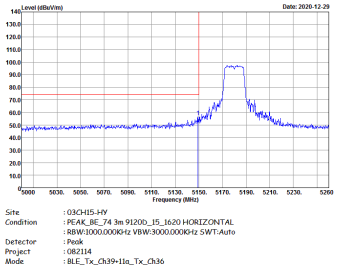
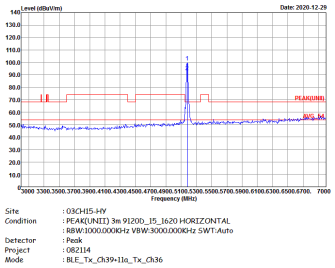
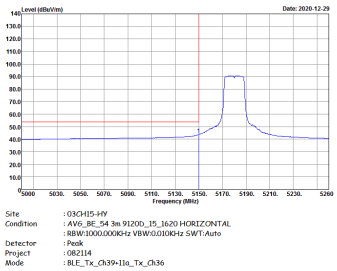
BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5 (Harmonic @ 3m)

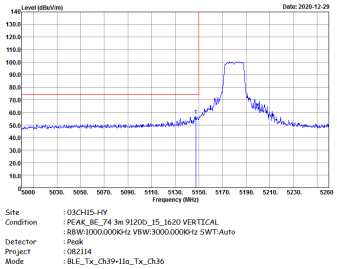
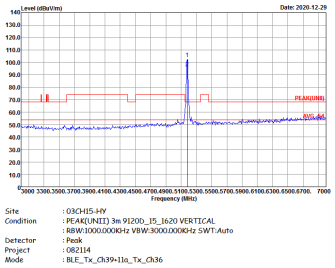
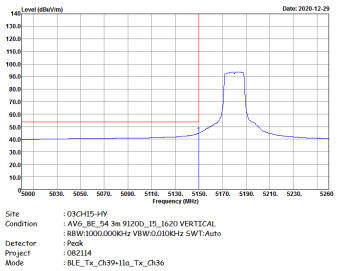
ANT	BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 4 (Band Edge @ 3m)

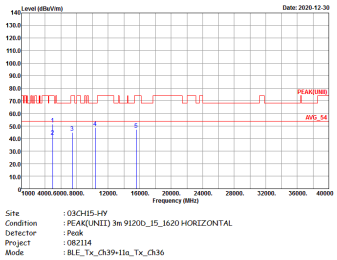
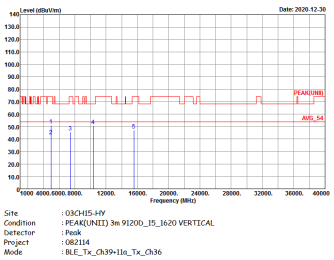
ANT	BLE_Tx_Ch39 Ant. 4	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 4	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

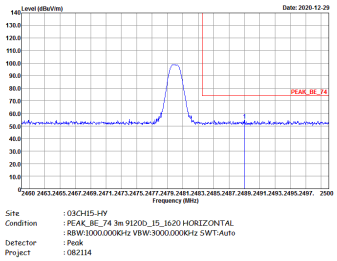
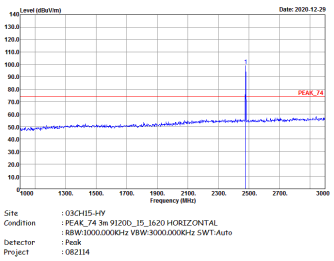
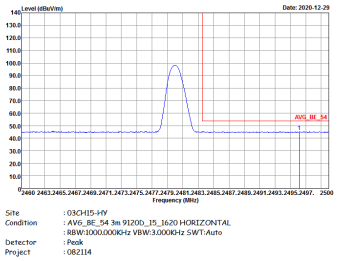
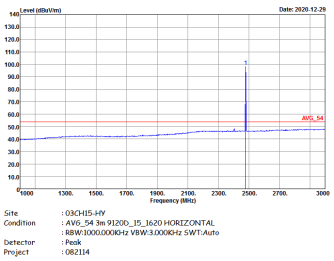
ANT	11a_Tx_Ch36 Ant. 4	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

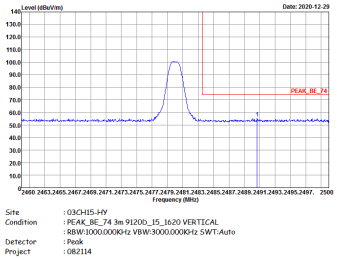
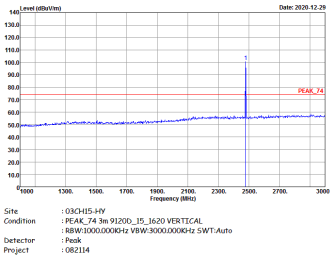
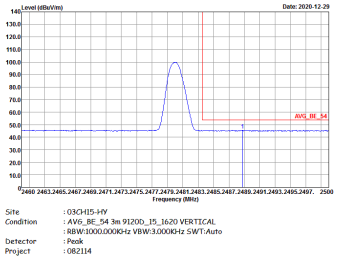
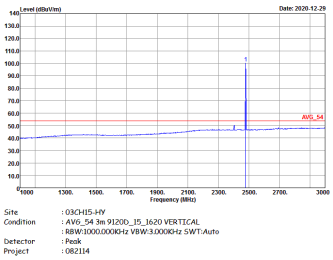
ANT	11a_Tx_Ch36 Ant. 4	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

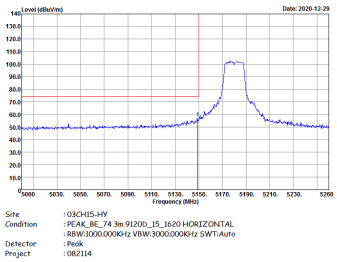
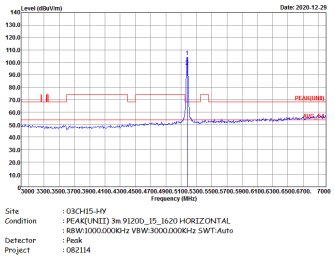
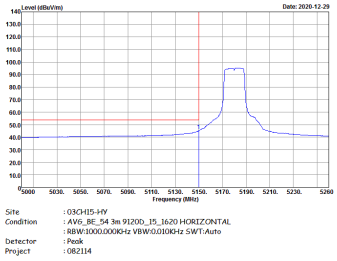
BLE_Tx_Ch39 Ant 4 + 11a_Tx_Ch36 Ant. 4 (Harmonic @ 3m)

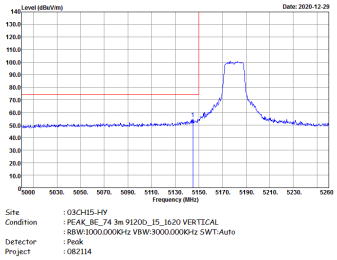
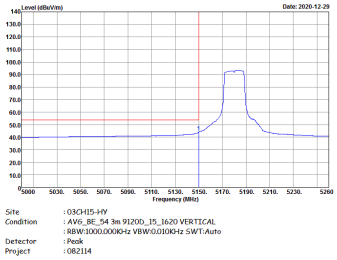
ANT	BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 4	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 9120D_I5_1620 HORIZONTAL Detector : Peak Project : 082114 Mode : BLE_Tx_Ch39+11a_Tx_Ch36	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 9120D_I5_1620 VERTICAL Detector : Peak Project : 082114 Mode : BLE_Tx_Ch39+11a_Tx_Ch36

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 4 (Band Edge @ 3m)

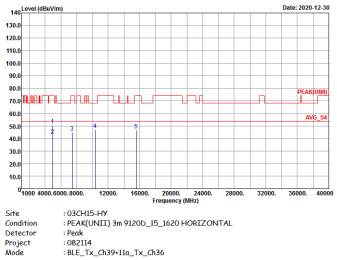
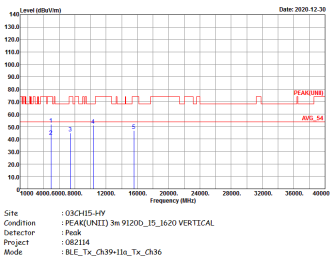
ANT	BLE_Tx_Ch39 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

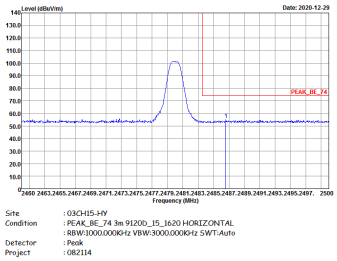
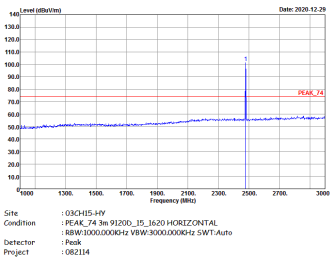
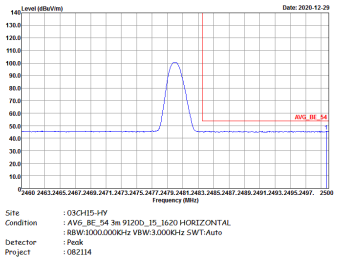
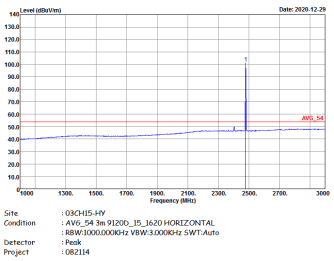
ANT	11a_Tx_Ch36 Ant. 4	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

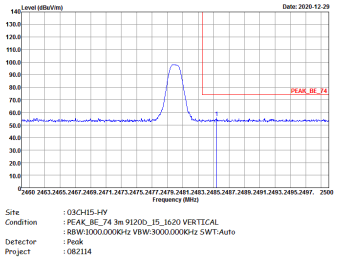
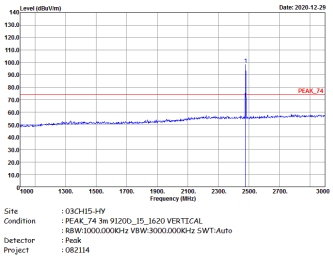
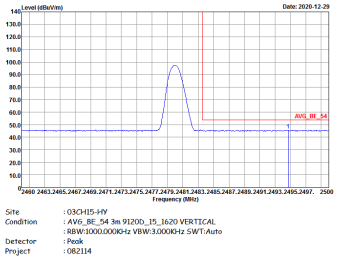
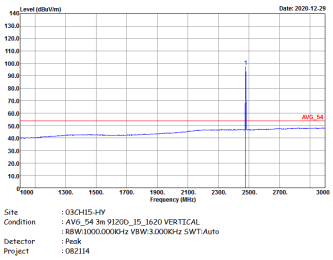
ANT	11a_Tx_Ch36 Ant. 4	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

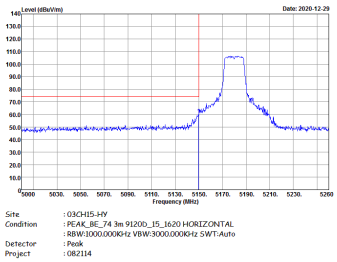
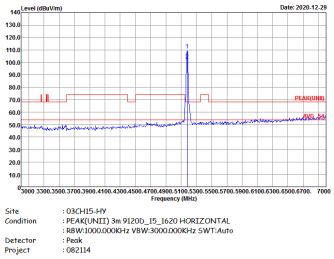
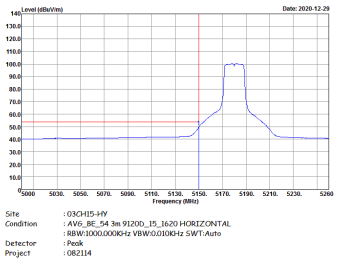
BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 4 (Harmonic @ 3m)

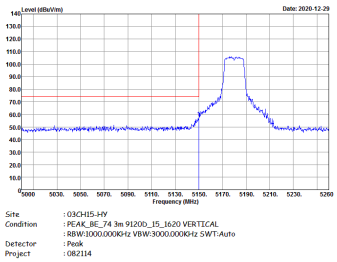
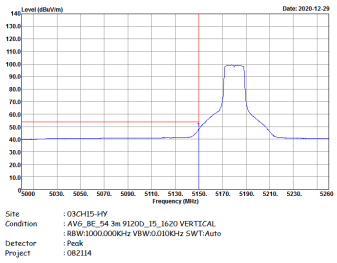
ANT	BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 4	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 5 (Band Edge @ 3m)

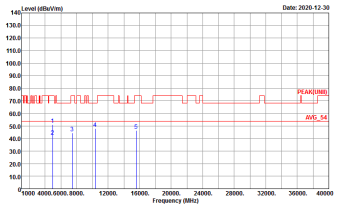
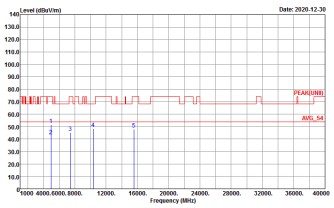
ANT	BLE_Tx_Ch39 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

ANT	11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

ANT	11a_Tx_Ch36 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 5 (Harmonic @ 3m)

ANT	BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

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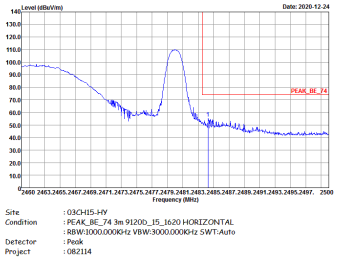
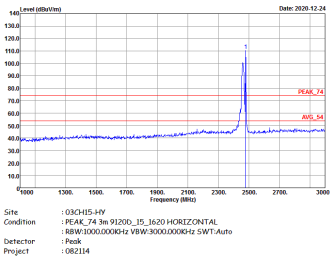
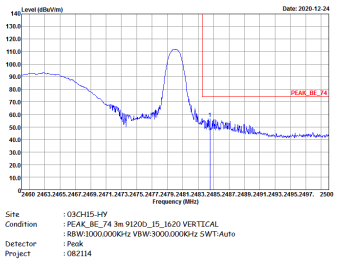
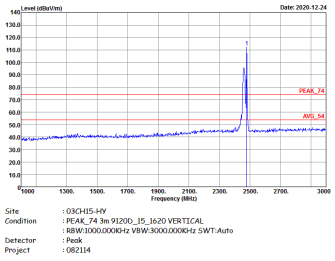
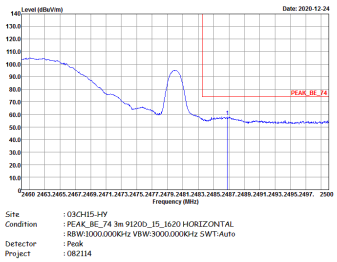
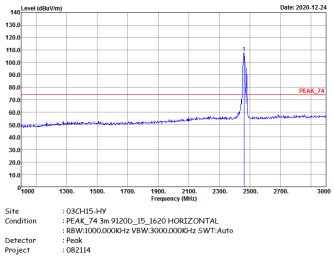
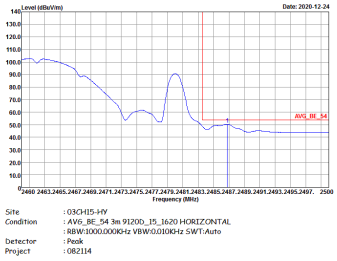
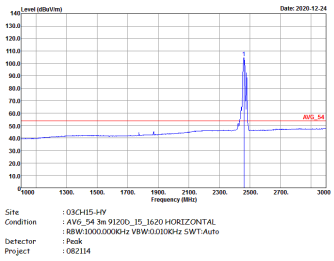
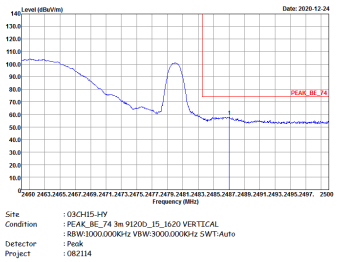
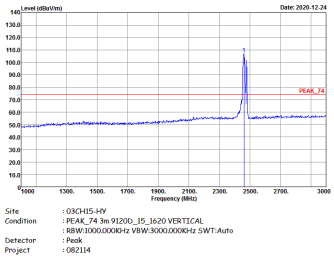
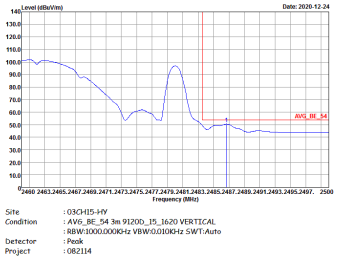
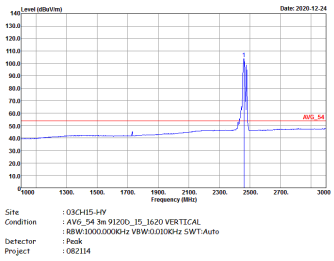
BT_Tx_Ch78 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

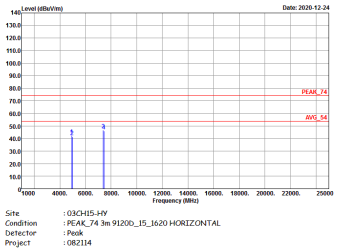
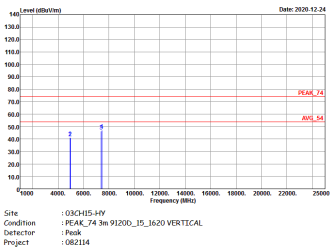
ANT	BT_Tx_Ch78 Ant. 6	
Simultaneously	Horizontal	Fundamental
Peak		

ANT	BT_Tx_Ch78 Ant. 6	
Simultaneously	Vertical	Fundamental
Peak		

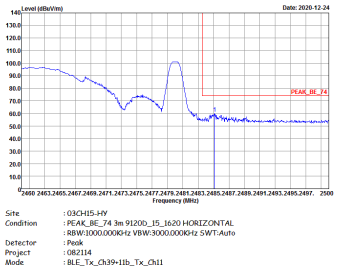
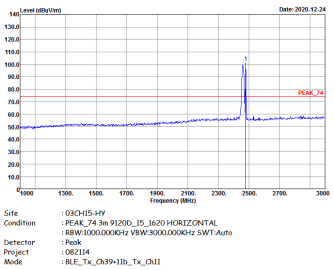
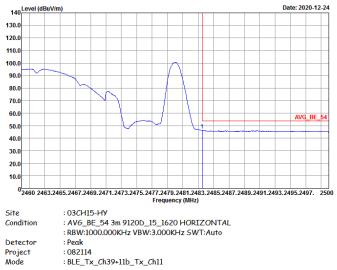
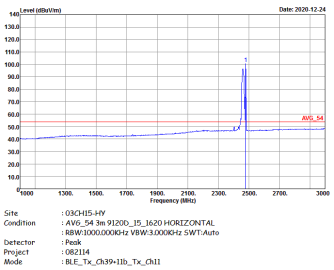
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

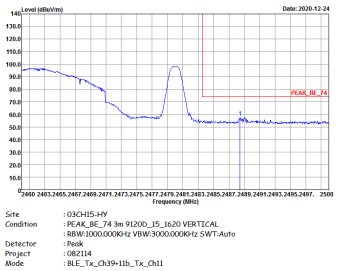
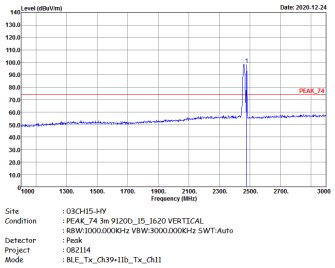
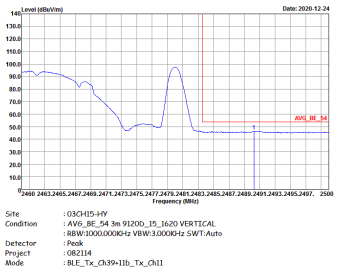
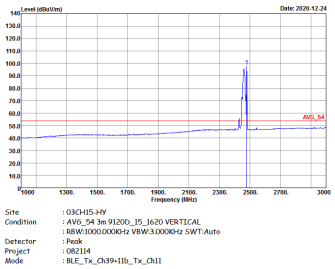
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

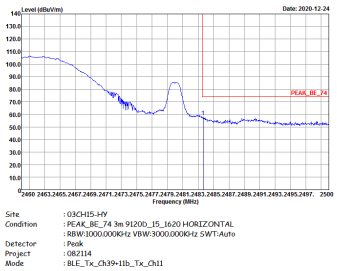
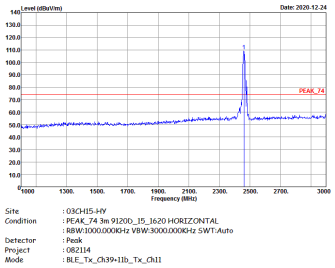
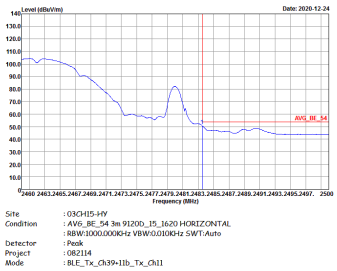
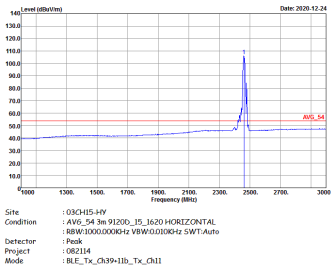
BT_Tx_Ch78 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

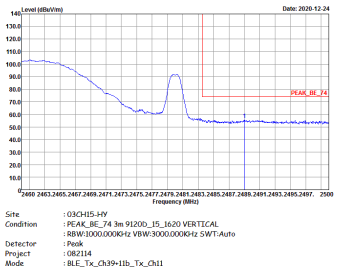
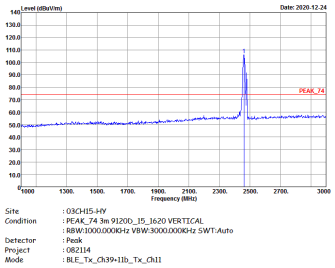
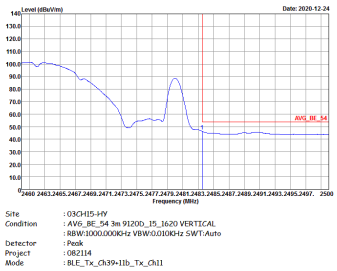
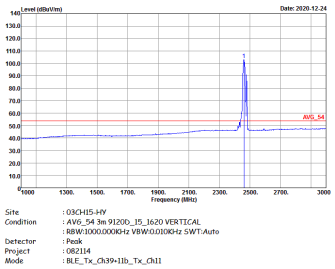
ANT	BT_Tx_Ch78 Ant. 6 + 11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Band Edge @ 3m)

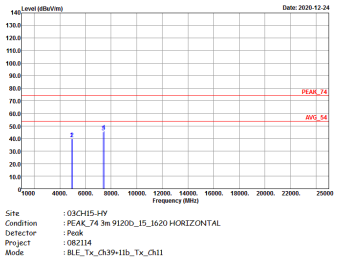
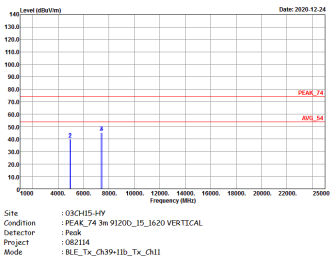
ANT	BLE_Tx_Ch39 Ant. 6	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 6	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

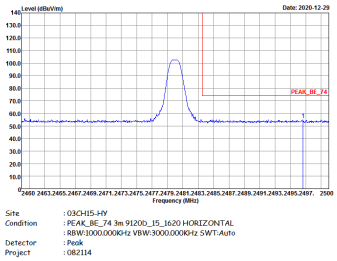
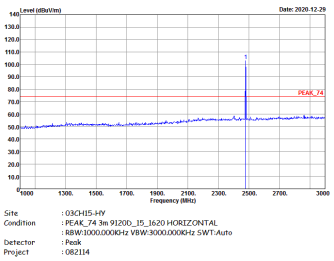
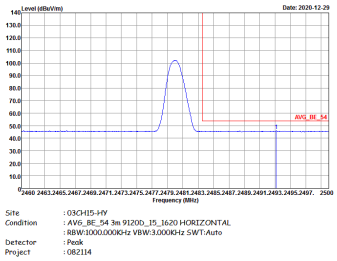
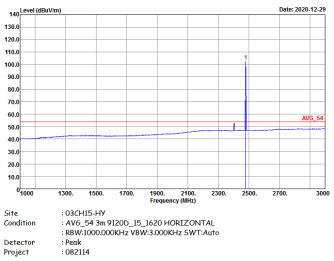
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

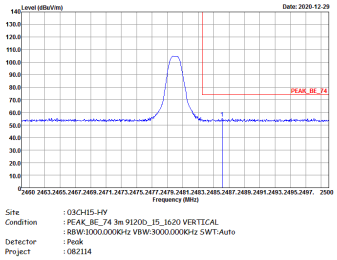
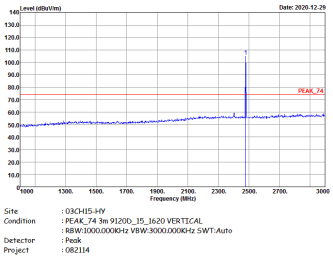
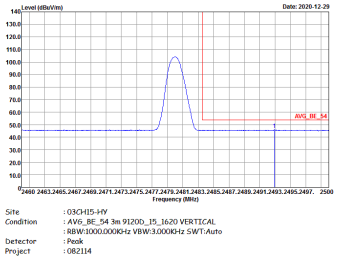
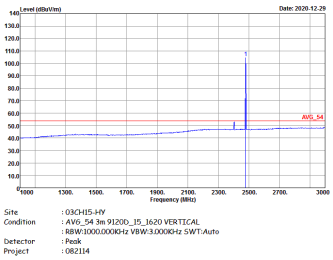
ANT	11b_Tx_Ch11 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

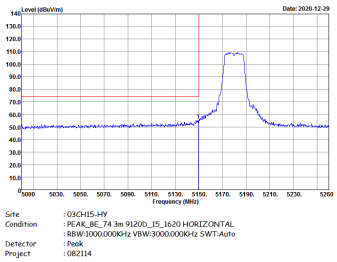
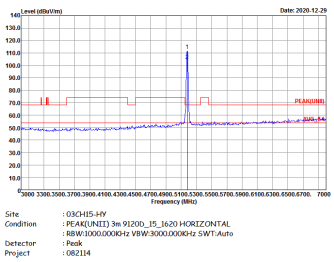
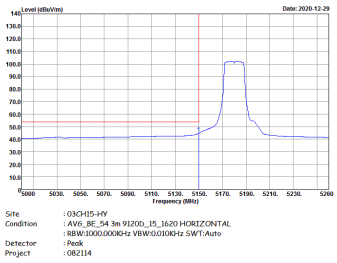
BLE_Tx_Ch39 Ant. 6 + 11b_Tx_Ch11 Ant. 5 (Harmonic @ 3m)

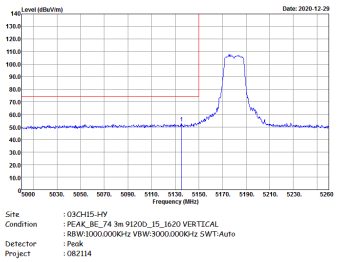
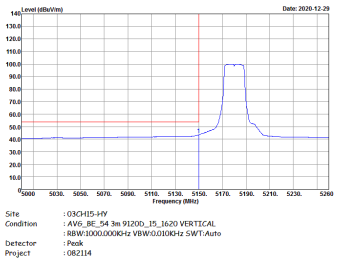
ANT	BLE_Tx_Ch39 Ant. 6 + 11b_Tx_Ch11 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5 (Band Edge @ 3m)

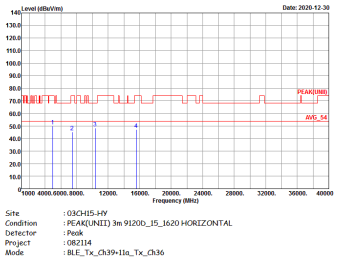
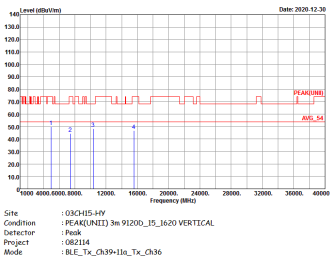
ANT	BLE_Tx_Ch39 Ant 6	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 6	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

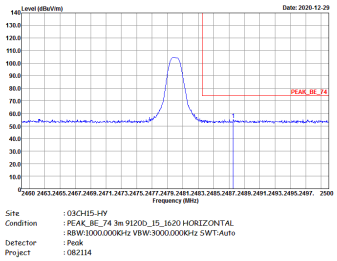
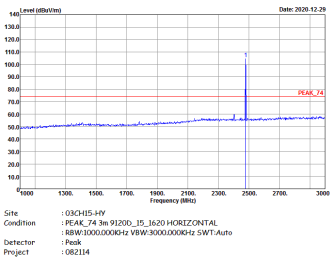
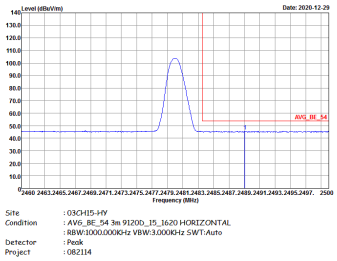
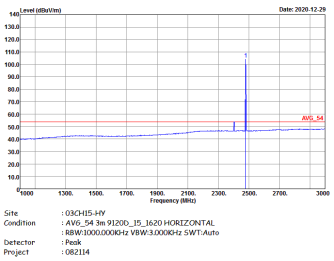
ANT	11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

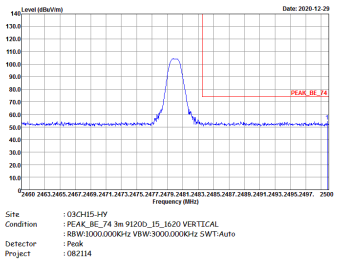
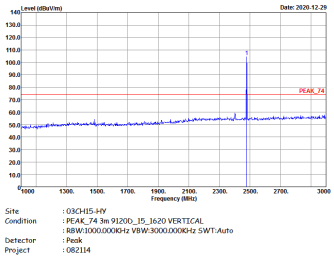
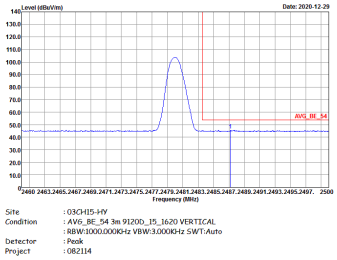
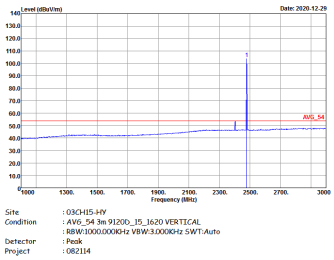
ANT	11a_Tx_Ch36 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

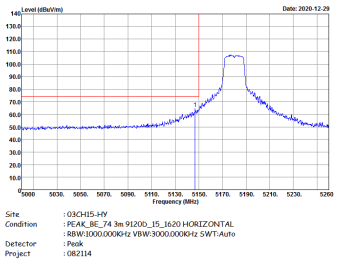
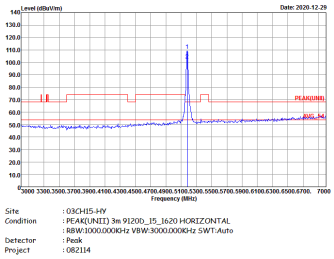
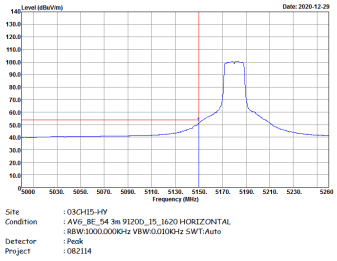
BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5 (Harmonic @ 3m)

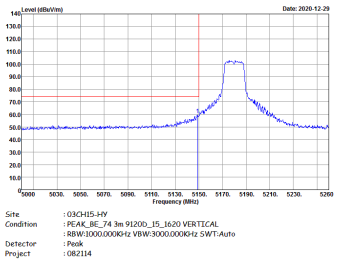
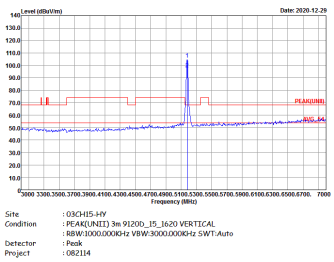
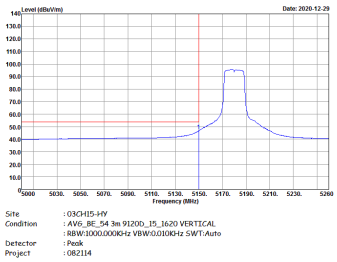
ANT	BLE_Tx_Ch39 Ant 6 + 11a_Tx_Ch36 Ant 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 6 (Band Edge @ 3m)

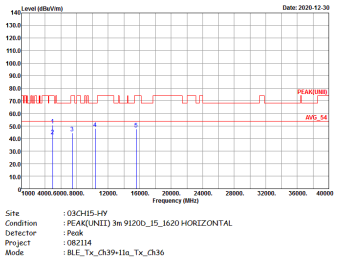
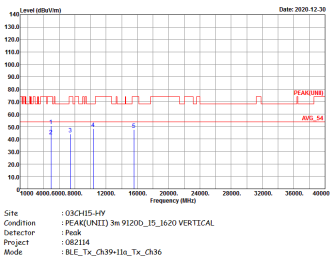
ANT	BLE_Tx_Ch39 Ant 6	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 6	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

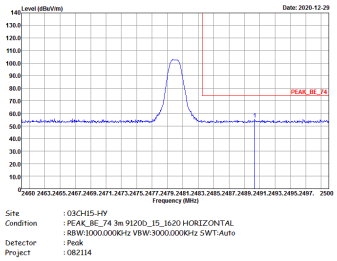
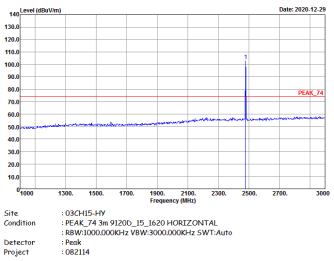
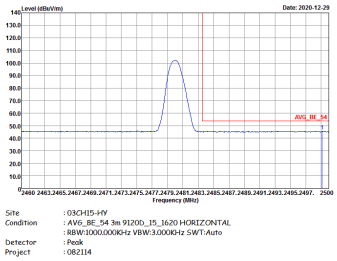
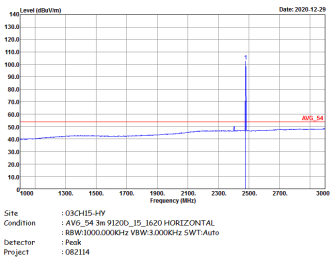
ANT	11a_Tx_Ch36 Ant. 6	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

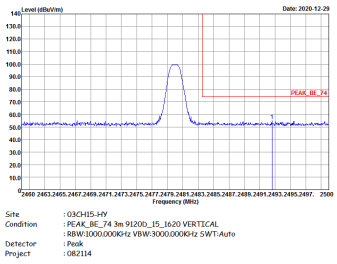
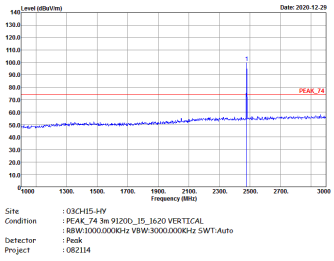
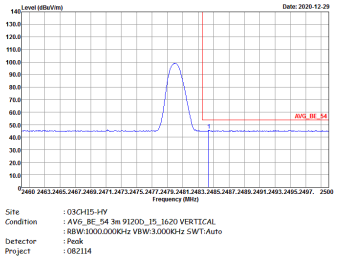
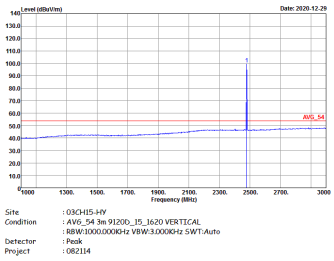
ANT	11a_Tx_Ch36 Ant. 6	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

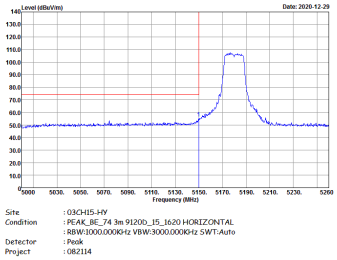
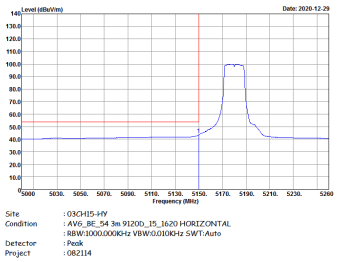
BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 6 (Harmonic @ 3m)

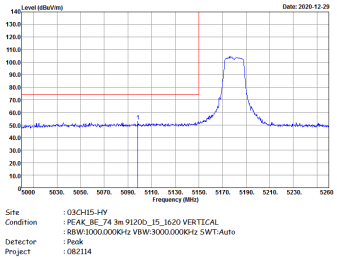
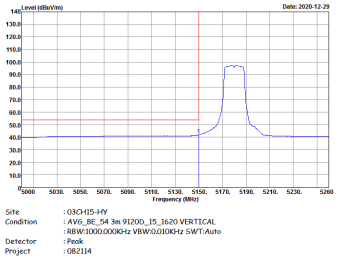
ANT	BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 6	
Simultaneously	Horizontal	Vertical
Peak Avg.		

BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 6 (Band Edge @ 3m)

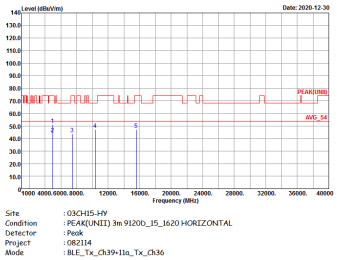
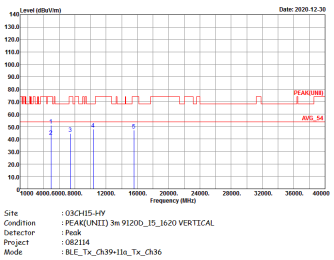
ANT	BLE_Tx_Ch39 Ant. 5	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		

ANT	BLE_Tx_Ch39 Ant. 5	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		

ANT	11a_Tx_Ch36 Ant. 6	
Simultaneously	Horizontal	Fundamental
Peak		
Avg.		Left blank

ANT	11a_Tx_Ch36 Ant. 6	
Simultaneously	Vertical	Fundamental
Peak		
Avg.		Left blank

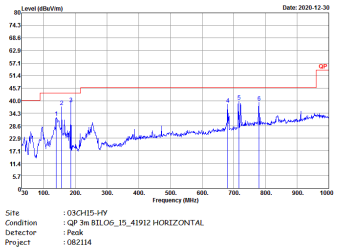
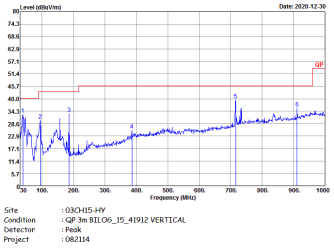
BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 6 (Harmonic @ 3m)

ANT	BLE_Tx_Ch39 Ant. 5 + 11a_Tx_Ch36 Ant. 6	
Simultaneously	Horizontal	Vertical
Peak Avg.		

<Normal mode>

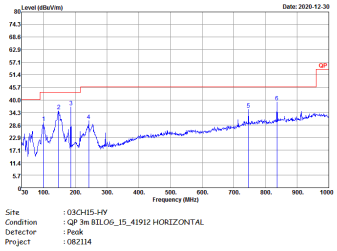
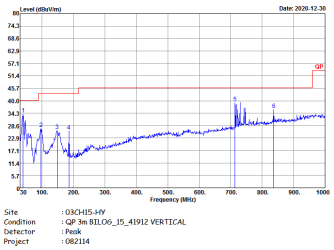
Emission below 1GHz

BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5 (LF @ 3m)

ANT	BLE_Tx_Ch39 Ant. 4 + 11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

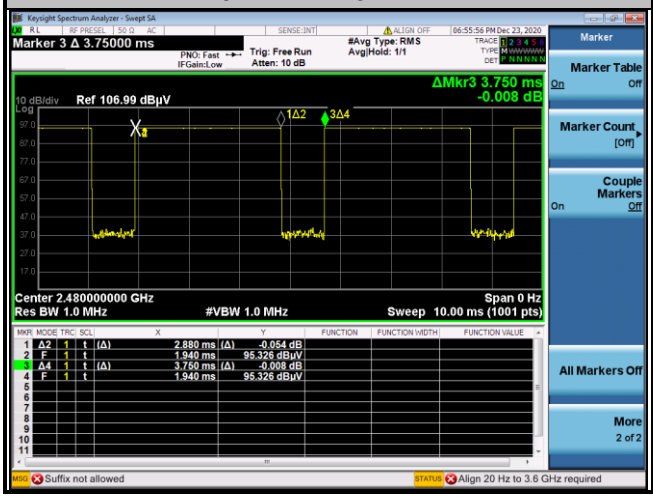
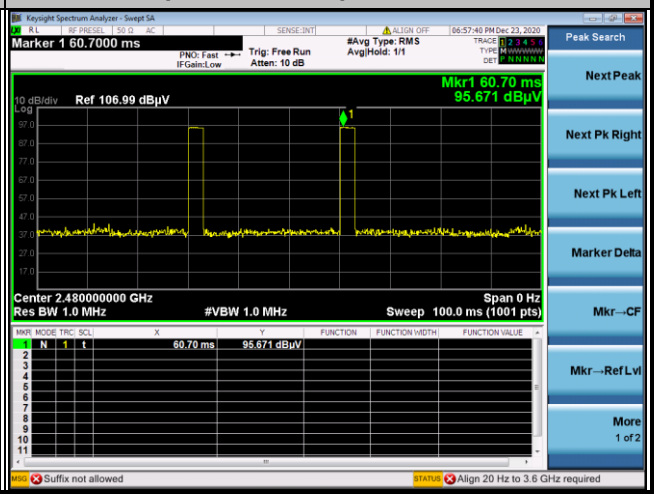
<Camera mode>

BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5 (LF @ 3m)

ANT	BLE_Tx_Ch39 Ant. 6 + 11a_Tx_Ch36 Ant. 5	
Simultaneously	Horizontal	Vertical
Peak Avg.		

Appendix C. Duty Cycle Plots

<Normal Mode with Ant. 4>

3DH5 on time (One Pulse) Plot on Channel 39	on time (Count Pulses) Plot on Channel 39
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.88 / 100 = 5.76 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.79 dB
3. **3DH5** has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.6 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 57.6 ms] = 2 hops

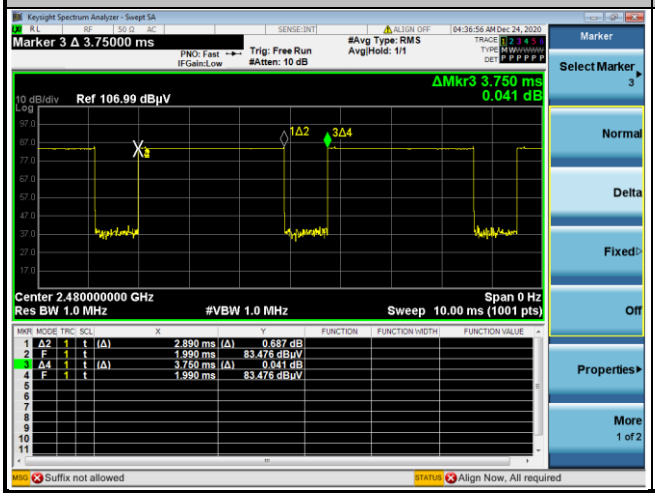
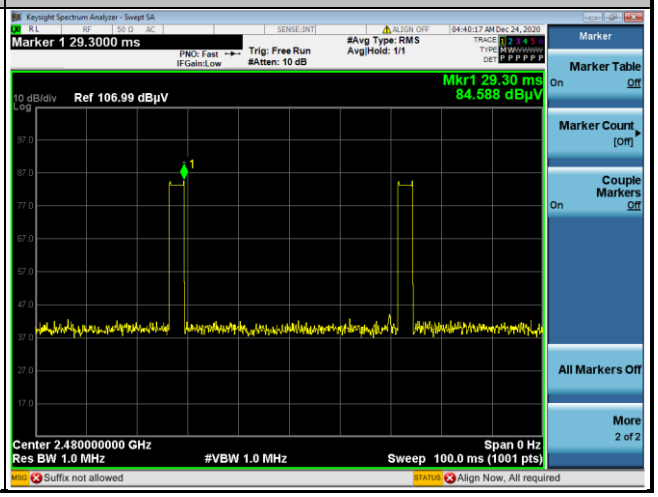
Thus, the maximum possible ON time:

2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.76 ms/100 ms) = -24.79 dB

<Camera Mode with Ant. 6>

3DH5 on time (One Pulse) Plot on Channel 39	on time (Count Pulses) Plot on Channel 39
	

Note:

1. Worst case Duty cycle = on time/100 milliseconds = 2 * 2.89 / 100 = 5.78 %
2. Worst case Duty cycle correction factor = 20*log(Duty cycle) = -24.76 dB
3. **3DH5** has the highest duty cycle worst case and is reported.

Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

2.88 ms x 20 channels = 57.7 ms

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. [100 ms / 57.7 ms] = 2 hops

Thus, the maximum possible ON time:

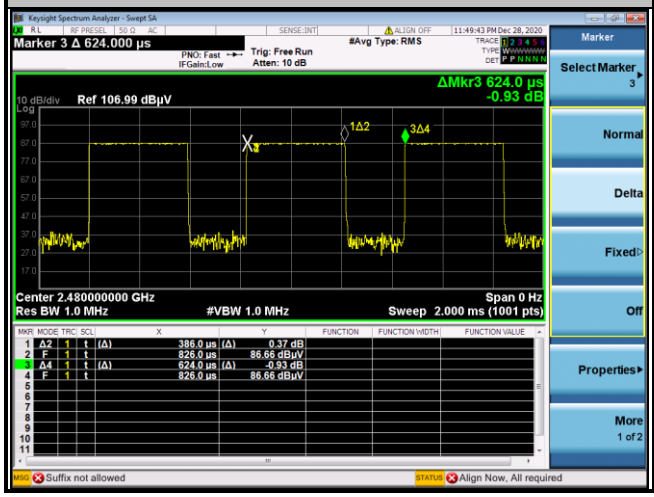
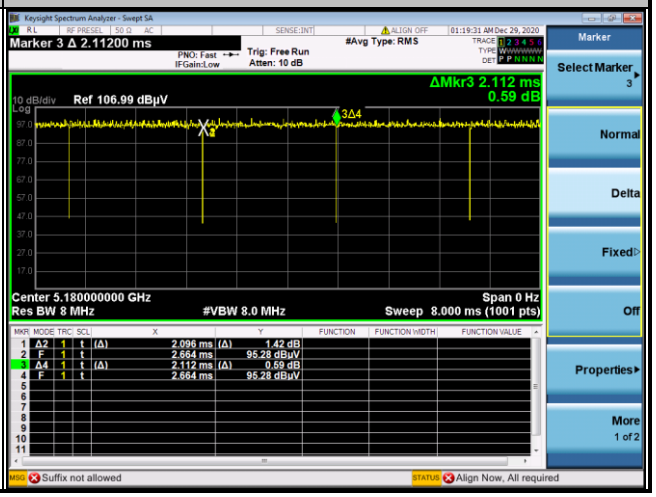
2.88 ms x 2 = 5.76 ms

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

20 x log(5.77 ms/100 ms) = -24.79 dB

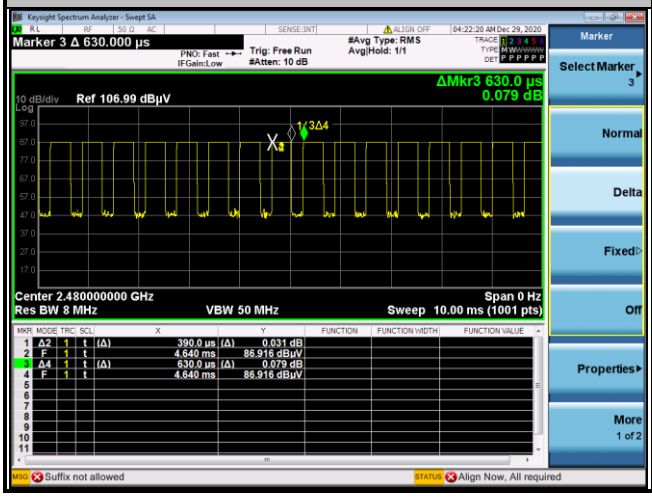
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
4	Bluetooth –LE for 1Mbps	61.86	386	2.59	3kHz	2.09
5	Bluetooth –LE for 1Mbps	61.90	390	2.56	3kHz	2.08
6	Bluetooth –LE for 1Mbps	61.86	386	2.59	3kHz	2.09
5	802.11b	98.22	-	-	10Hz	0.08
4	802.11a	99.24	-	-	10Hz	0.04
5	802.11a	99.24	-	-	10Hz	0.04
6	802.11a	99.29	-	-	10Hz	0.03

<Ant. 4>

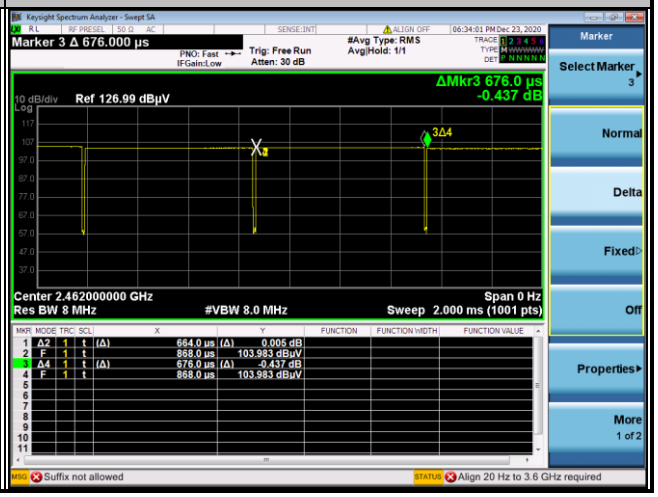
Bluetooth – LE for 1Mbps	802.11a
	

<Ant. 5>

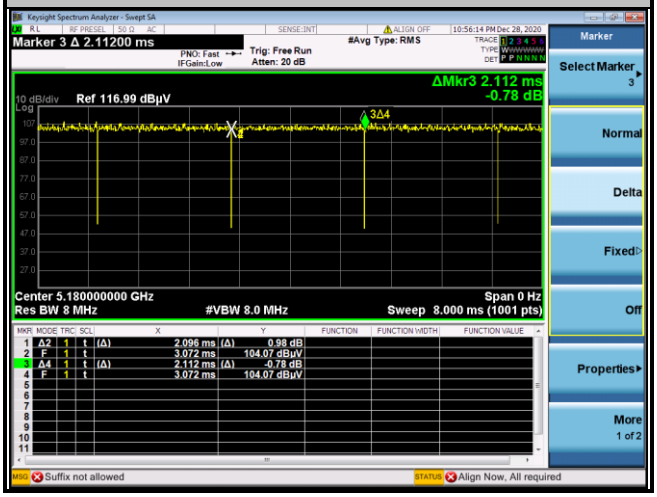
Bluetooth – LE for 1Mbps

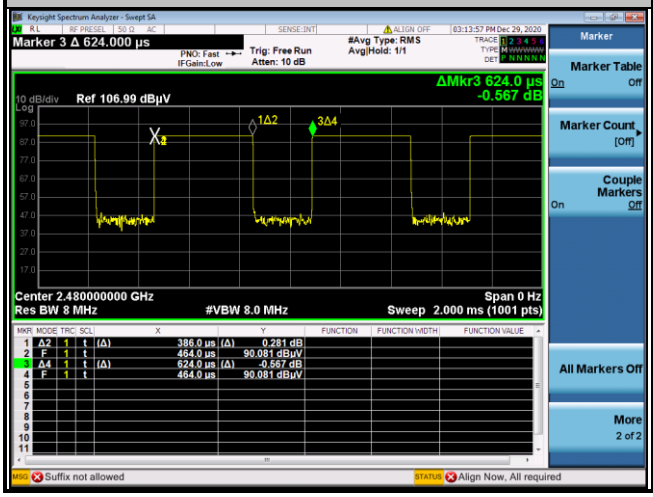
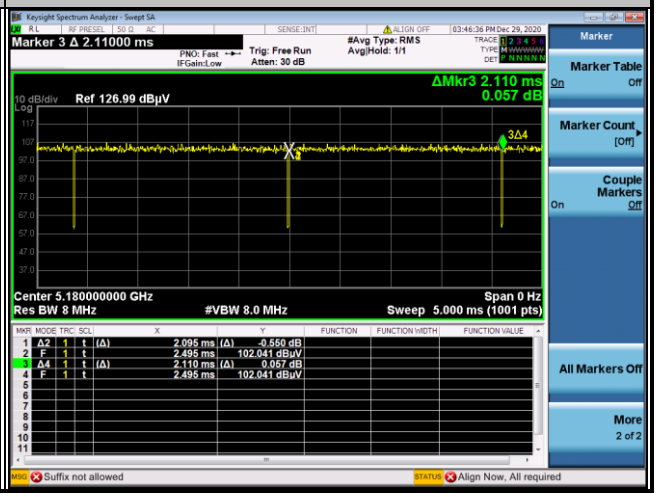


802.11b



802.11a



<Ant. 6>

Bluetooth – LE for 1Mbps	802.11a