

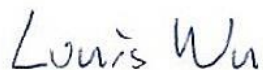


FCC CO-LOCATION RADIO TEST REPORT

FCC ID : S9E-121900
Equipment : Rugged Handheld Computer
Brand Name : Trimble
Model Name : 121900
Marketing Name : TSC5
Applicant : Trimble Inc.
5475 Kellenburger Rd., Dayton, Ohio, United States 45424
Manufacturer : Trimble Inc.
5475 Kellenburger Rd., Dayton, Ohio, United States 45424
Standard : FCC Part 15 Subpart E §15.407

The product was received on Aug. 19, 2020 and testing was started from Sep. 10, 2020 and completed on Oct. 14, 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.



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
FR081931F	01	Initial issue of report	Oct. 28, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
3.2	15.407(b)	Unwanted Emissions	Pass	Under limit 0.43 dB at 5468.530 MHz
3.3	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: Yimin Ho



1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN: <Ant. 1> Dipole Antenna <Ant. 2> Dipole Antenna Bluetooth: Dipole Antenna GPS/Glonass/BDS/Galileo: Patch Antenna

1.2 Modification of EUT

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

1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	TH05-HY

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.: TW1190 and TW0007



1.4 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 Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ♦ 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

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 (X plane for BLE Ant. 1 + 2.4GHz 802.11b Ant. 2 + LTE Band 41, 5GHz 802.11ac VHT40 MIMO Ant. 1+2 + LTE Band 41, and 2.4GHz 802.11b Ant. 1 + 5GHz 802.11ac VHT40 Ant. 2 + LTE Band 41; Y lane for BLE Ant. 1 + 2.4GHz 802.11ac VHT40 Ant. 2 + LTE Band 41, 2.4GHz 802.11b MIMO Ant. 1+2 + LTE Band 41, BLE Ant. 1 + 5GHz 802.11ac VHT40 Ant. 2 + LTE Band 41) were recorded in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth - LE		2400-2483.5 MHz 802.11b		2400-2483.5 MHz 802.11ac VHT40		5470-5725 MHz 802.11ac VHT40	
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
00	2402	01	2412	03	2422	102	5510

2.2 Test Mode

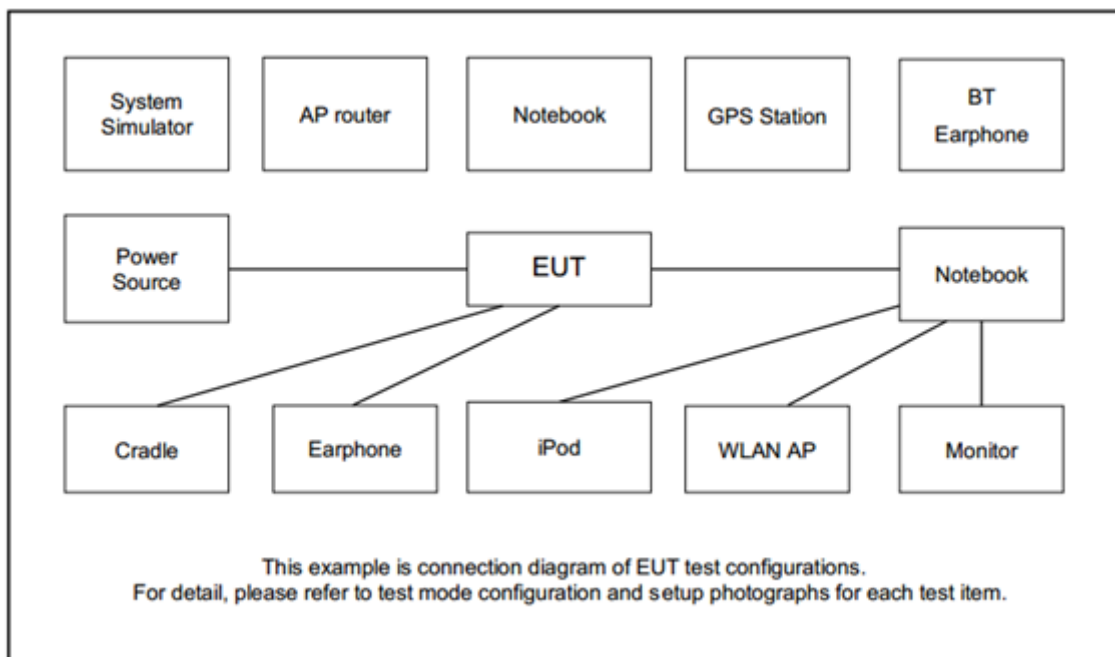
Final test modes are considering the modulation and worse data rates as below table.

<Co-Location>

Modulation	Data Rate
BLE for Ant. 1 + 2.4GHz 802.11b for Ant. 2 + LTE Band 41	2 Mbps + 1 Mbps + QPSK
BLE for Ant. 1 + 2.4GHz 802.11ac VHT40 for Ant. 2 + LTE Band 41	2 Mbps + MCS0 + QPSK
2.4GHz 802.11b for MIMO <Ant. 1+2> + LTE Band 41	1 Mbps + QPSK
BLE for Ant. 1 + 5GHz 802.11ac VHT40 for Ant. 2 + LTE Band 41	2 Mbps + MCS0 + QPSK
5GHz 802.11ac VHT40 for MIMO <Ant. 1+2> + LTE Band 41	MCS0 + QPSK
2.4GHz 802.11b for Ant. 1 + 5GHz 802.11ac VHT40 for Ant. 2 + LTE Band 41	1 Mbps + MCS0 + QPSK

Remark: During the Radiated Spurious Emission test, the EUT turn on the WWAN functions simultaneously.

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	Battery	Trimble	U80596R01	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility "QRCT4.0" 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 Maximum Conducted Output Power Measurement

3.1.1 Limit of Maximum Conducted Output Power

<For 2400-2483.5 MHz>

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

<For 5470-5725 MHz>

<FCC 14-30 CFR 15.407>

For the 5.25–5.725 GHz bands:

- The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm $10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

<For 2400-2483.5 MHz>

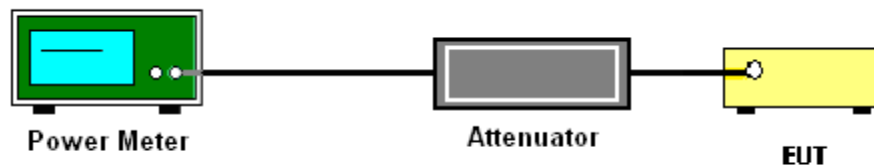
1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT was connected to the power meter by RF cable and attenuator.
3. The path loss was compensated to the results for each measurement.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.
6. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

<For 5470-5725 MHz>

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.1.4 Test Setup**3.1.5 Test Result of Maximum Conducted Output Power**

Please refer to Appendix A.

3.2 Unwanted Emissions Measurement

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

3.2.1 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.

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

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.

3.2.2 Measuring Instruments

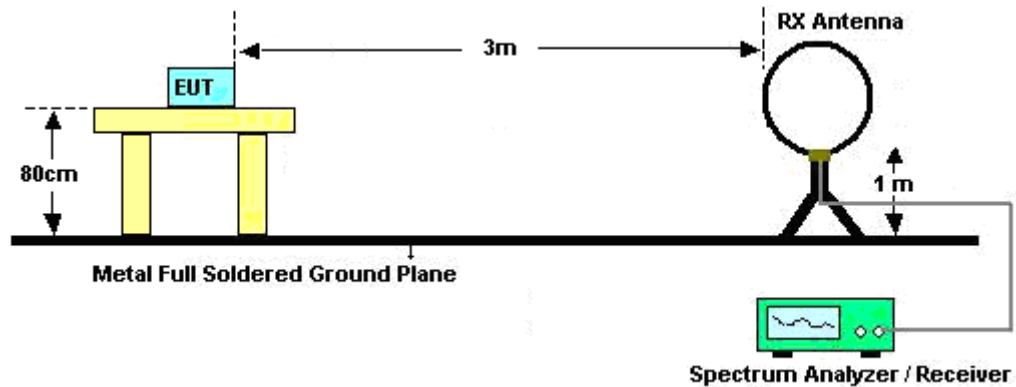
See list of measuring equipment of this test report.

3.2.3 Test Procedures

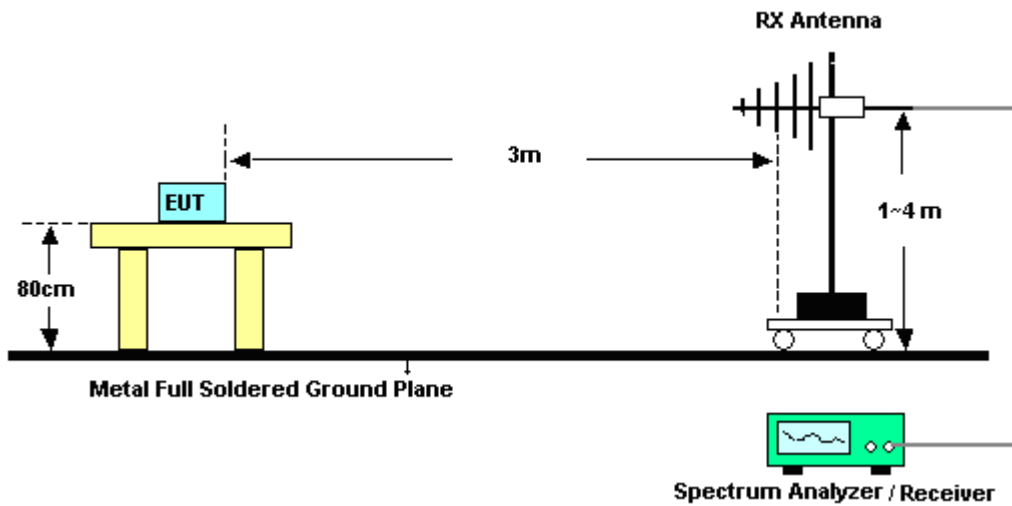
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 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 $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
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.

3.2.4 Test Setup

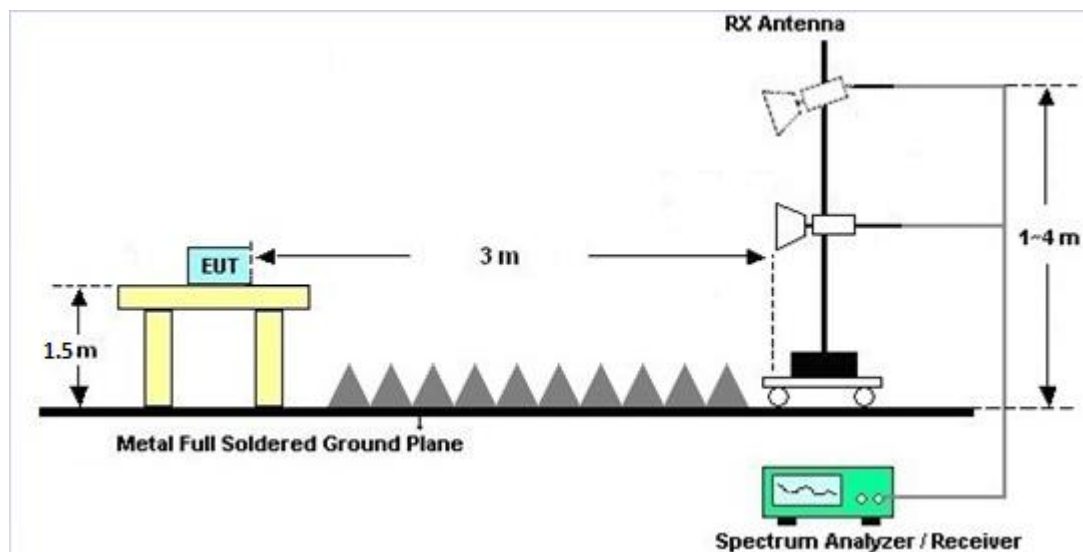
For radiated test below 30MHz



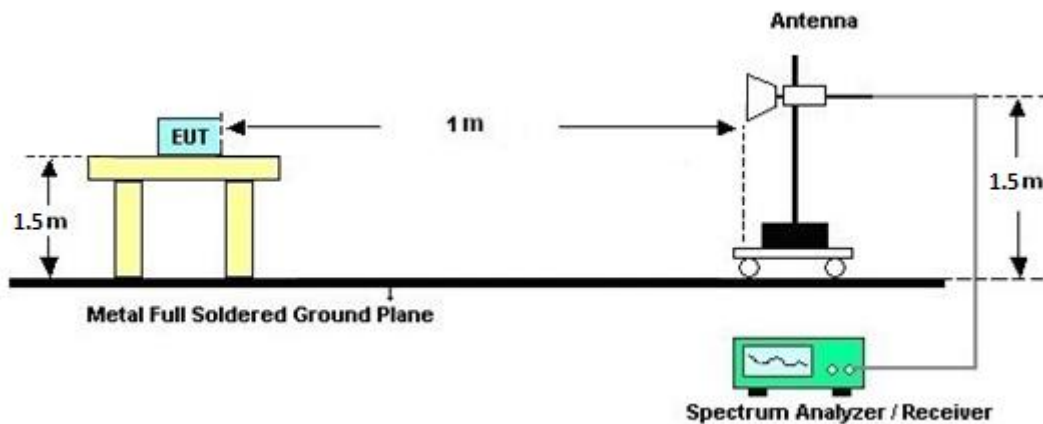
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.2.5 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.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.2.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.



3.3 Antenna Requirements

3.3.1 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.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 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	Jan. 09, 2020	Sep. 18, 2020~ Oct. 08, 2020	Jan. 08, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&0 0800N1D01N- 06	41912&05	30MHz to 1GHz	Feb. 09, 2020	Sep. 18, 2020~ Oct. 08, 2020	Feb. 08, 2021	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2019	Sep. 18, 2020~ Oct. 08, 2020	Dec. 26, 2020	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-162 0	1-18GHz	Oct. 28, 2019	Sep. 18, 2020~ Oct. 08, 2020	Oct. 27, 2020	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Dec. 10, 2019	Sep. 18, 2020~ Oct. 08, 2020	Dec. 09, 2020	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 0055006	1GHz~18GHz	May 07, 2020	Sep. 18, 2020~ Oct. 08, 2020	May 06, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY532701 95	1GHz~26.5GHz	Aug. 21, 2020	Sep. 18, 2020~ Oct. 08, 2020	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Sep. 18, 2020~ Oct. 08, 2020	Dec. 12, 2020	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY541300 85	20MHz~8.4GHz	Nov. 01, 2019	Sep. 18, 2020~ Oct. 08, 2020	Oct. 31, 2020	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY501801 36	3Hz~44GHz	May 04, 2020	Sep. 18, 2020~ Oct. 08, 2020	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Sep. 18, 2020~ Oct. 08, 2020	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Sep. 18, 2020~ Oct. 08, 2020	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24 (k5)	RK-00045 1	N/A	N/A	Sep. 18, 2020~ Oct. 08, 2020	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/ 4	30M-18G	Apr. 14, 2020	Sep. 18, 2020~ Oct. 08, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9838/4 PE	30M-18G	Apr. 14, 2020	Sep. 18, 2020~ Oct. 08, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY37710/ 4	30M-18G	Apr. 17, 2020	Sep. 18, 2020~ Oct. 08, 2020	Apr. 16, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 25, 2020	Sep. 18, 2020~ Oct. 08, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 25, 2020	Sep. 18, 2020~ Oct. 08, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz~30MHz	Mar. 12, 2020	Sep. 18, 2020~ Oct. 08, 2020	Mar. 11, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WLK4-1000-1 530-8000-40S S	SN4	1.53G Low Pass	Jul. 03, 2020	Sep. 18, 2020~ Oct. 08, 2020	Jul. 02, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000 -40ST	SN6	6.75GHz High Pass Filter	Jul. 03, 2020	Sep. 18, 2020~ Oct. 08, 2020	Jul. 02, 2021	Radiation (03CH15-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Sep. 10, 2020~ Oct. 14, 2020	Mar. 01, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 23, 2019	Sep. 10, 2020~ Oct. 14, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Dec. 30, 2019	Sep. 10, 2020~ Oct. 14, 2020	Dec. 29, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2020	Sep. 10, 2020~ Oct. 14, 2020	Mar. 16, 2021	Conducted (TH05-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.4
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0
--	-----

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Kathy Chen	Temperature:	23.5~24	°C
Test Date:	2020/09/10~2020/10/14	Relative Humidity:	53.6~54.2	%

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)
BLE	2Mbps	1	0	2402	2.60
BLE	2Mbps	1	19	2440	1.30
BLE	2Mbps	1	39	2480	2.40

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	17.10	13.00		30.00	30.00	3.10	1.40	20.20	14.40	36.00	36.00	Pass
HT40	MSC0	1	3	2422	12.50	11.90		30.00	30.00	3.10	1.40	15.60	13.30	36.00	36.00	Pass
VHT40	MCS0	1	3	2422	12.60	12.00		30.00	30.00	3.10	1.40	15.70	13.40	36.00	36.00	Pass

2.4GHz Band MIMO																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	2	1	2412	17.20	17.10	20.16	30.00		3.10		23.26		36.00		Pass
HT40	MCS0	2	3	2422	12.60	12.80	15.71	30.00		3.10		18.81		36.00		Pass
VHT40	MCS0	2	3	2422	12.70	12.90	15.81	30.00		3.10		18.91		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

TEST RESULTS DATA
Average Power Table

FCC Band III single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HT40	MCS0	1	102	5510	13.20	13.30		23.98	23.98	3.40	1.60	30	Pass
VHT40	MCS0	1	102	5510	13.30	13.40		23.98	23.98	3.40	1.60	30	Pass

FCC Band III MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HT40	MCS0	2	102	5510	13.30	13.40	16.36	23.98		3.40		30	Pass
VHT40	MCS0	2	102	5510	13.40	13.50	16.46	23.98		3.40		30	Pass



Appendix B. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.2°C
		Relative Humidity :	45~59%

Co-location

BLE + WLAN2.4G 802.11b + LTE

BLE (Band Edge @ 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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant 2 802.11b Ch01 2412MHz + LTE Band 41		2390	58.73	-15.27	74	44.54	27.76	17.35	30.92	357	323	P	H
		2389.17	52.78	-1.22	54	38.59	27.76	17.35	30.92	357	323	A	H
	*	2402	101.74	-	-	87.58	27.7	17.37	30.91	357	323	P	H
	*	2402	100.26	-	-	86.1	27.7	17.37	30.91	357	323	A	H
													H
													H
		2352.945	55.7	-18.3	74	41.38	27.98	17.27	30.93	100	193	P	V
		2389.065	48.37	-5.63	54	34.17	27.77	17.35	30.92	100	193	A	V
	*	2402	96.59	-	-	82.43	27.7	17.37	30.91	100	193	P	V
	*	2402	95.04	-	-	80.88	27.7	17.37	30.91	100	193	A	V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												


WLAN2.4G 802.11b (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant 2 802.11b Ch01 2412MHz + LTE Band 41		2389.485	56.96	-17.04	74	42.77	27.76	17.35	30.92	100	89	P	H
		2389.8	45.73	-8.27	54	31.54	27.76	17.35	30.92	100	89	A	H
	*	2412	103.22	-	-	89.07	27.68	17.38	30.91	100	89	P	H
	*	2412	100.09	-	-	85.93	27.68	17.39	30.91	100	89	A	H
													H
													H
		2319.975	56.94	-17.06	74	42.62	28.06	17.21	30.95	361	196	P	V
		2389.485	45.23	-8.77	54	31.04	27.76	17.35	30.92	361	196	A	V
	*	2412	101.66	-	-	87.5	27.68	17.39	30.91	361	196	P	V
	*	2412	98.52	-	-	84.36	27.68	17.39	30.91	361	196	A	V
													V
													V
Remark 1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



BLE + WLAN2.4G 802.11b + LTE (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant 2 802.11b Ch01 2412MHz + LTE Band 41		4804	39.36	-34.64	74	56.62	31.21	10.61	59.08	100	0	P	H
		4824	42.37	-31.63	74	59.6	31.25	10.61	59.09	100	0	P	H
													H
													H
													H
													H
													H
													H
		4804	38.87	-35.13	74	56.13	31.21	10.61	59.08	100	0	P	V
		4824	40.38	-33.62	74	57.61	31.25	10.61	59.09	100	0	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



BLE + WLAN2.4G 802.11ac VHT40 + LTE

BLE (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant 2 802.11ac VHT40 Ch03 2422MHz + LTE Band 41		2390	57.75	-16.25	74	43.56	27.76	17.35	30.92	354	325	P	H
		2389.59	51.21	-2.79	54	37.02	27.76	17.35	30.92	354	325	A	H
	*	2402	102.54	-	-	88.38	27.7	17.37	30.91	354	325	P	H
	*	2402	101.24	-	-	87.08	27.7	17.37	30.91	354	325	A	H
													H
													H
		2323.545	59.24	-14.76	74	44.92	28.05	17.21	30.94	290	108	P	V
		2353.785	50.29	-3.71	54	35.96	27.98	17.28	30.93	290	108	A	V
	*	2402	100.24	-	-	86.08	27.7	17.37	30.91	290	108	P	V
	*	2402	99.04	-	-	84.88	27.7	17.37	30.91	290	108	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WLAN2.4G 802.11ac VHT40 (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant 2 802.11ac VHT40 Ch03 2422MHz + LTE Band 41		2389.2	59.35	-14.65	74	45.16	27.76	17.35	30.92	105	104	P	H
		2389.52	52.12	-1.88	54	37.93	27.76	17.35	30.92	105	104	A	H
	*	2422	98.95	-	-	84.78	27.66	17.41	30.9	105	104	P	H
	*	2422	91.01	-	-	76.84	27.66	17.41	30.9	105	104	A	H
		2498.83	56.33	-17.67	74	42.16	27.5	17.54	30.87	105	104	P	H
		2494.42	46.9	-7.1	54	32.72	27.51	17.54	30.87	105	104	P	H
		2387.76	58.35	-15.65	74	44.16	27.77	17.34	30.92	372	197	P	V
		2389.84	49.7	-4.3	54	35.51	27.76	17.35	30.92	372	197	A	V
	*	2422	96.93	-	-	82.76	27.66	17.41	30.9	372	197	P	V
	*	2422	88.92	-	-	74.75	27.66	17.41	30.9	372	197	A	V
		2489.65	56.5	-17.5	74	42.32	27.52	17.53	30.87	372	197	P	V
		2493.07	47.15	-6.85	54	32.98	27.51	17.53	30.87	372	197	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



BLE + WLAN2.4G 802.11ac VHT40 + LTE (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant 2 802.11ac VHT40 Ch03 2422MHz + LTE Band 41		4804	40.37	-33.63	74	57.63	31.21	10.61	59.08	100	0	P	H
		4844	40.13	-33.87	74	57.34	31.29	10.61	59.11	100	0	P	H
		7266	45	-29	74	54.61	36.5	12.52	58.63	100	0	P	H
													H
													H
													H
													H
													H
		4804	40.54	-33.46	74	57.8	31.21	10.61	59.08	100	0	P	V
		4844	40.2	-33.8	74	57.41	31.29	10.61	59.11	100	0	P	V
		7266	44.7	-29.3	74	54.31	36.5	12.52	58.63	100	0	P	V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WLAN2.4G 802.11b + LTE

WLAN2.4G 802.11b (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)
Ant 1+2 802.11b Ch01 2412MHz + LTE Band 41		2384.445	56.71	-17.29	74	42.5	27.79	17.34	30.92	124	162	P	H
		2389.695	45.83	-8.17	54	31.64	27.76	17.35	30.92	124	162	A	H
	*	2412	111.19	-	-	97.03	27.68	17.39	30.91	124	162	P	H
	*	2412	108.13	-	-	93.97	27.68	17.39	30.91	124	162	A	H
													H
													H
		2377.935	57.22	-16.78	74	42.99	27.83	17.32	30.92	252	228	P	V
		2390	45.31	-8.69	54	31.12	27.76	17.35	30.92	252	228	A	V
	*	2412	109.58	-	-	95.42	27.68	17.39	30.91	252	228	P	V
	*	2412	106.49	-	-	92.33	27.68	17.39	30.91	252	228	A	V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



WLAN2.4G 802.11b + LTE (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)
Ant 1+2 802.11b Ch01 2412MHz + LTE Band 41		4824	52.16	-21.84	74	69.39	31.25	10.61	59.09	301	321	P	H
		4824	50.02	-3.98	54	67.25	31.25	10.61	59.09	301	321	A	H
													H
													H
													H
													H
													H
													H
		4824	48.28	-25.72	74	65.51	31.25	10.61	59.09	100	0	P	V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



BLE + WLAN5G 802.11ac VHT40 + LTE

BLE (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		2340.03	57.14	-16.86	74	42.81	28.02	17.25	30.94	100	329	P	H
		2362.92	48.77	-5.23	54	34.49	27.92	17.29	30.93	100	329	A	H
	*	2402	100.42	-	-	86.26	27.7	17.37	30.91	100	329	P	H
	*	2402	99.23	-	-	85.07	27.7	17.37	30.91	100	329	A	H
													H
													H
		2320.815	56.63	-17.37	74	42.31	28.06	17.21	30.95	182	115	P	V
		2344.125	48.93	-5.07	54	34.6	28.01	17.26	30.94	182	115	A	V
	*	2402	98.18	-	-	84.02	27.7	17.37	30.91	182	115	P	V
	*	2402	96.98	-	-	82.82	27.7	17.37	30.91	182	115	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WLAN5G 802.11ac VHT40 (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		5382.13	53.19	-20.81	74	40.37	31.59	11.23	30	290	244	P	H
		5461.78	53.59	-14.61	68.2	40.49	31.77	11.32	29.99	290	244	P	H
		5459.89	44.56	-9.44	54	31.47	31.76	11.32	29.99	290	244	A	H
	*	5510	98.37	-	-	85.03	31.96	11.38	30	290	244	P	H
	*	5510	90.6	-	-	77.26	31.96	11.38	30	290	244	A	H
		5732.24	53.18	-15.02	68.2	39.93	32	11.41	30.16	290	244	P	H
		5452.06	54.5	-19.5	74	41.47	31.71	11.31	29.99	108	246	P	V
		5469.88	54.49	-13.71	68.2	41.33	31.82	11.33	29.99	108	246	P	V
		5457.19	45.54	-8.46	54	32.47	31.74	11.32	29.99	108	246	A	V
	*	5510	101.88	-	-	88.54	31.96	11.38	30	108	246	P	V
	*	5510	93.97	-	-	80.63	31.96	11.38	30	108	246	A	V
		5734.445	53.48	-14.72	68.2	40.23	32	11.41	30.16	108	246	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												


BLE + WLAN5G 802.11ac VHT40 + LTE (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)
Ant 1 BLE(2M) Ch00 2402MHz + Ant2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		4804	53.21	-20.79	74	40.43	31.21	11.64	30.07	212	15	P	H
		4804	40.31	-13.69	54	27.53	31.21	11.64	30.07	212	15	A	H
		4824	54.13	-19.87	74	41.31	31.25	11.64	30.07	220	25	P	H
		4824	42.03	-11.97	54	29.21	31.25	11.64	30.07	220	25	A	H
		11020	48.37	-25.63	74	54.51	40.56	14.39	61.09	100	0	P	H
		16530	47.78	-20.42	68.2	50.19	38.83	18.14	59.38	100	0	P	H
													H
													H
		4804	53.22	-20.78	74	40.44	31.21	11.64	30.07	155	125	P	V
		4804	41.22	-12.78	54	28.44	31.21	11.64	30.07	155	125	A	V
		4824	53.45	-20.55	74	40.63	31.25	11.64	30.07	135	128	P	V
		4824	41.45	-32.55	74	28.63	31.25	11.64	30.07	135	128	A	V
		11020	49.68	-24.32	74	55.82	40.56	14.39	61.09	100	0	P	V
		16530	47.78	-20.42	68.2	50.19	38.83	18.14	59.38	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WLAN5G 802.11ac VHT40 + LTE

WLAN5G 802.11ac VHT40 (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)
Ant 1+2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		5459.62	55.23	-18.77	74	42.14	31.76	11.32	29.99	381	84	P	H
		5466.1	60.81	-7.39	68.2	47.67	31.8	11.33	29.99	381	84	P	H
		5459.89	47.64	-6.36	54	34.55	31.76	11.32	29.99	381	84	A	H
	*	5510	105.4	-	-	92.06	31.96	11.38	30	381	84	P	H
	*	5510	97.99	-	-	84.65	31.96	11.38	30	381	84	A	H
		5733.815	53.36	-14.84	68.2	40.11	32	11.41	30.16	381	84	P	H
		5458.54	59.91	-14.09	74	46.83	31.75	11.32	29.99	100	121	P	V
		5468.53	67.77	-0.43	68.2	54.62	31.81	11.33	29.99	100	121	P	V
		5458.81	51.53	-2.47	54	38.45	31.75	11.32	29.99	100	121	A	V
	*	5510	109.51	-	-	96.17	31.96	11.38	30	100	121	P	V
	*	5510	101.71	-	-	88.37	31.96	11.38	30	100	121	A	V
		5734.13	55.45	-12.75	68.2	42.2	32	11.41	30.16	100	121	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WLAN5G 802.11ac VHT40 + LTE (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)
Ant 1+2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		11020	49.07	-24.93	74	55.21	40.56	14.39	61.09	100	0	P	H
		16530	47.76	-20.44	68.2	50.17	38.83	18.14	59.38	100	0	P	H
													H
													H
													H
													H
													H
													H
		11020	48.57	-25.43	74	54.71	40.56	14.39	61.09	100	0	P	V
		16530	48.04	-20.16	68.2	50.45	38.83	18.14	59.38	100	0	P	V
													V
													V
													V
													V
													V
													V
Remark		1. No other spurious found. 2. All results are PASS against Peak and Average limit line.											



WLAN2.4G 802.11b + WLAN5G 802.11ac VHT40 + LTE

WLAN2.4G 802.11b (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)
Ant 1 802.11b Ch01 2412MHz + Ant 2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		2388.645	59.13	-14.87	74	44.94	27.77	17.34	30.92	367	324	P	H
		2388.645	49.87	-4.13	54	35.68	27.77	17.34	30.92	367	324	A	H
	*	2412	113.58	-	-	99.42	27.68	17.39	30.91	367	324	P	H
	*	2412	110.68	-	-	96.52	27.68	17.39	30.91	367	324	A	H
													H
													H
		2386.965	57.61	-16.39	74	43.41	27.78	17.34	30.92	200	121	P	V
		2387.385	47.79	-6.21	54	33.59	27.78	17.34	30.92	200	121	A	V
	*	2412	110.76	-	-	96.6	27.68	17.39	30.91	200	121	P	V
	*	2412	107.76	-	-	93.6	27.68	17.39	30.91	200	121	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												


WLAN5G 802.11ac VHT40 (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)
Ant 1 802.11b Ch01 2412MHz + Ant 2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		5459.62	56.34	-17.66	74	43.25	31.76	11.32	29.99	384	265	P	H
		5468.53	61.79	-6.41	68.2	48.64	31.81	11.33	29.99	384	265	P	H
		5459.89	48.82	-5.18	54	35.73	31.76	11.32	29.99	384	265	A	H
	*	5510	102.21	-	-	88.87	31.96	11.38	30	384	265	P	H
	*	5510	94.44	-	-	81.1	31.96	11.38	30	384	265	A	H
		5734.13	53.6	-14.6	68.2	40.35	32	11.41	30.16	384	265	P	H
		5459.89	62.28	-11.72	74	49.19	31.76	11.32	29.99	100	231	P	V
		5469.88	67.39	-0.81	68.2	54.23	31.82	11.33	29.99	100	231	P	V
		5459.89	53.38	-0.62	54	40.29	31.76	11.32	29.99	100	231	A	V
	*	5510	104.86	-	-	91.52	31.96	11.38	30	100	231	P	V
	*	5510	97.13	-	-	83.79	31.96	11.38	30	100	231	A	V
		5738.54	53.1	-15.1	68.2	39.85	32	11.41	30.16	100	231	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



WLAN2.4G 802.11b + WLAN5G 802.11ac VHT40 + LTE (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)
Ant 1 802.11b Ch01 2412MHz + Ant 2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		4824	55.28	-18.72	74	42.07	31.25	12.03	30.07	232	135	P	H
		4824	42.54	-11.46	54	29.33	31.25	12.03	30.07	232	135	A	H
		11020	49.89	-24.11	74	56.03	40.56	14.39	61.09	100	0	P	H
		16530	48.35	-19.85	68.2	50.76	38.83	18.14	59.38	100	0	P	H
													H
													H
													H
													H
		4824	55.23	-18.77	74	42.02	31.25	12.03	30.07	330	241	P	V
		4824	41.98	-12.02	54	28.77	31.25	12.03	30.07	330	241	A	V
		11020	49.26	-24.74	74	55.4	40.56	14.39	61.09	100	0	P	V
		16530	48.03	-20.17	68.2	50.44	38.83	18.14	59.38	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.											

Emission Above 18GHz

WLAN5G 802.11ac VHT40 + LTE (SHF)

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)
Ant 1+2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		23610	41.81	-32.19	74	42.24	39.85	13.02	53.3	150	0	P	H
		39780	49.85	-24.15	74	39.53	45.01	19.96	54.65	150	0	P	H
													H
													H
													H
													H
													H
													H
		23522	41.65	-26.55	68.2	42.19	39.73	13.03	53.3	150	0	P	V
		39890	49.89	-24.11	74	39.14	45.06	20.17	54.48	150	0	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

WLAN5G 802.11ac VHT40 + LTE (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)
Ant 1+2 802.11ac VHT40 Ch102 5510MHz + LTE Band 41		30	20.04	-19.96	40	29.21	22.45	0.71	32.33	-	-	P	H
		97.9	32.79	-10.71	43.5	47.81	15.91	1.35	32.28	100	0	P	H
		186.17	30.19	-13.31	43.5	45.58	15.06	1.93	32.38	-	-	P	H
		217.21	33.51	-12.49	46	48.83	14.97	2.1	32.39	-	-	P	H
		503.36	33.75	-12.25	46	39.18	23.85	3.14	32.42	-	-	P	H
		729.37	34.53	-11.47	46	35.94	27.26	3.77	32.44	-	-	P	H
													H
													H
													H
													H
													H
													H
		64.92	29.49	-10.51	40	48.01	12.24	1.05	31.81	100	0	P	V
		97.9	32.19	-11.31	43.5	47.21	15.91	1.35	32.28	-	-	P	V
		191.99	26.95	-16.55	43.5	42.35	15.01	1.97	32.38	-	-	P	V
		217.21	27.14	-18.86	46	42.46	14.97	2.1	32.39	-	-	P	V
		482.02	33.69	-12.31	46	39.68	23.46	3.04	32.49	-	-	P	V
		923.37	33.3	-12.7	46	31.31	29.2	4.38	31.59	-	-	P	V
													V
													V
													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	Peak or Average
H/V	Horizontal or Vertical



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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 C. Radiated Spurious Emission Plots

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.2°C
		Relative Humidity :	45~59%

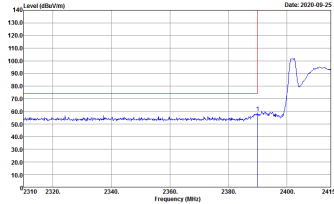
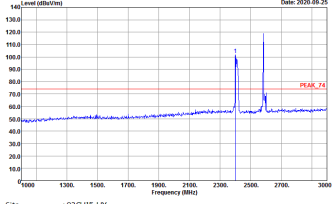
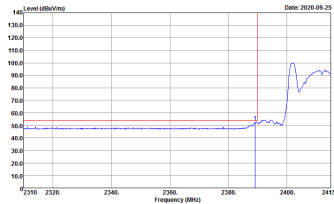
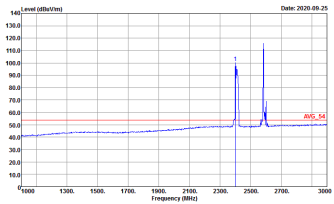
Note symbol

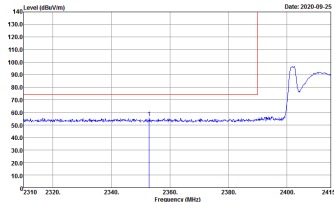
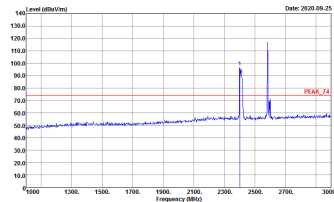
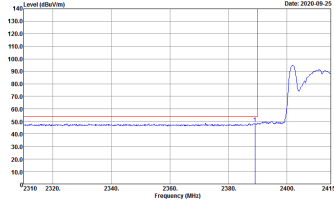
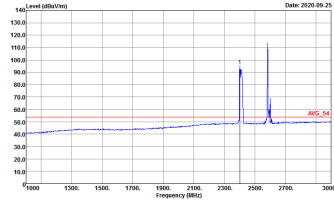
-L	Low channel location
-R	High channel location

Co-location

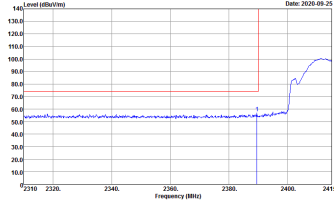
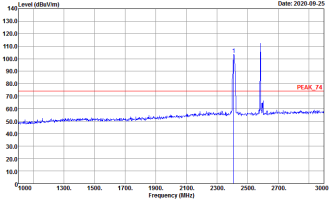
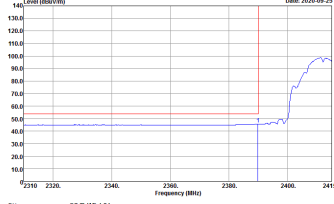
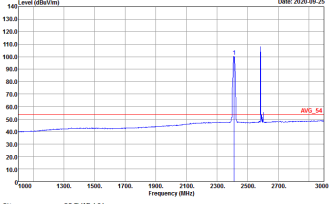
BLE + WLAN2.4G 802.11b + LTE

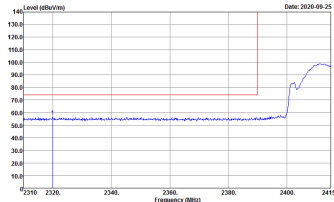
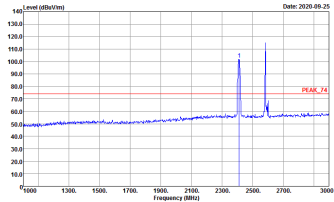
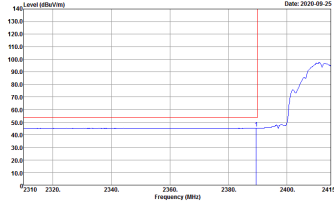
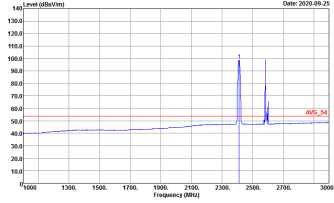
BLE (Band Edge @ 3m)

Ant	Ant 1 BLE(2M) Ch00 + Ant 2 11b Ch01 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Project : Peak	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Project : Peak
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Project : Peak	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto Project : Peak

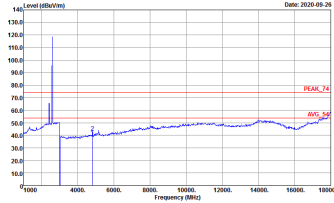
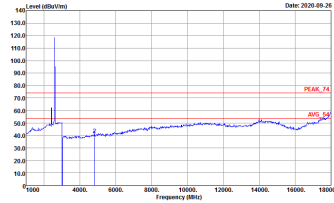
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11b Ch01 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Date: 2020-09-25 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 081931	 Date: 2020-09-25 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 081931
Avg.	 Date: 2020-09-25 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL RBW:1000.0000Hz VBW:10.0000Hz SWT:Auto Detector : Peak Project : 081931	 Date: 2020-09-25 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL RBW:1000.0000Hz VBW:10.0000Hz SWT:Auto Detector : Peak Project : 081931

WLAN2.4G 802.11b (Band Edge @ 3m)

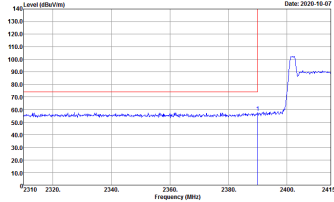
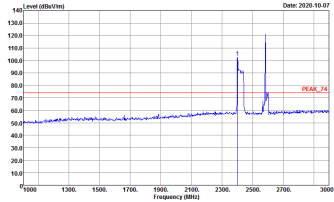
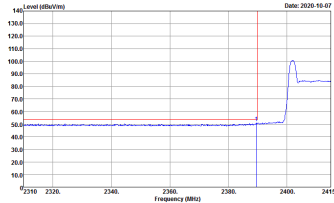
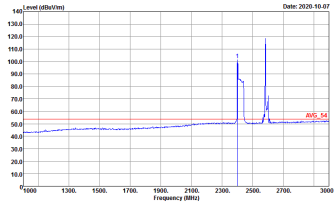
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11b Ch01 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Date: 2020-09-25 Site : 030-H5-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931	 Date: 2020-09-25 Site : 030-H5-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931
Avg.	 Date: 2020-09-25 Site : 030-H5-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto Project : 081931	 Date: 2020-09-25 Site : 030-H5-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto Project : 081931

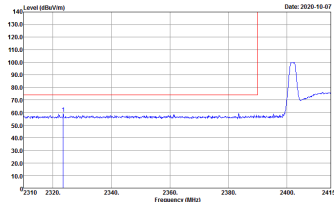
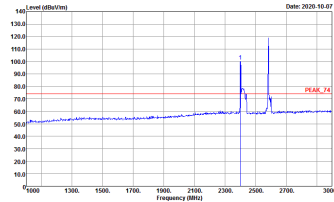
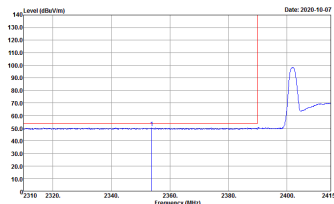
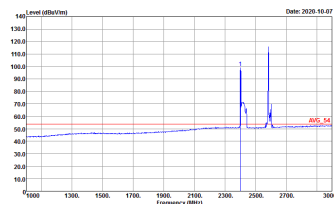
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11b Ch01 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto Project : 081931

BLE + WLAN2.4G 802.11b + LTE (Harmonic @ 3m)

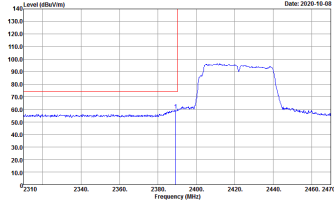
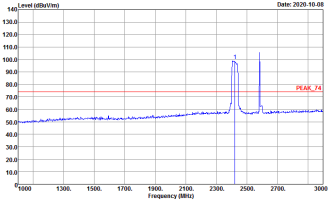
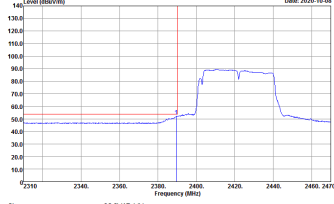
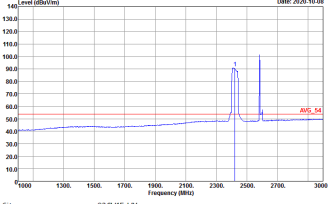
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11b Ch01 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-4Y Condition : PEAK_74 3m 91200_35_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-4Y Condition : PEAK_74 3m 91200_35_1620 VERTICAL Detector : Peak Project : 081931

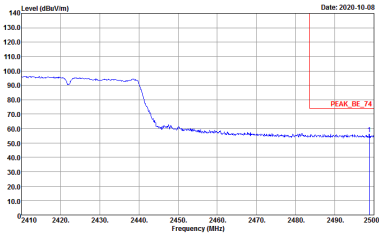
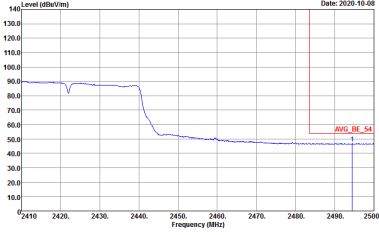
BLE + WLAN2.4G 802.11ac VHT40 + LTE
BLE (Band Edge @ 3m)

ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:10.000kHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL RBW:1000.000kHz VBW:10.000kHz SWT:Auto Detector : Peak Project : 081931
Avg.		

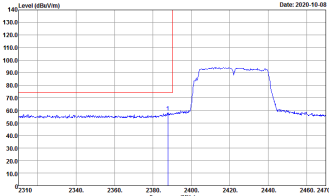
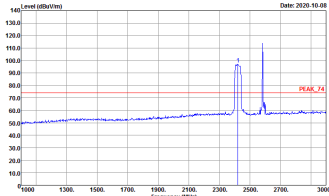
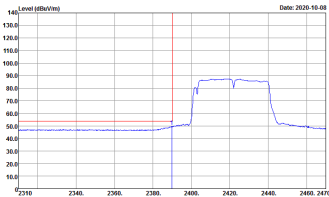
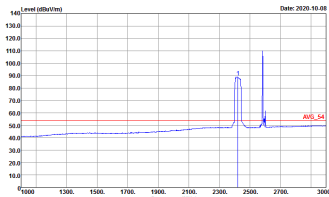
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

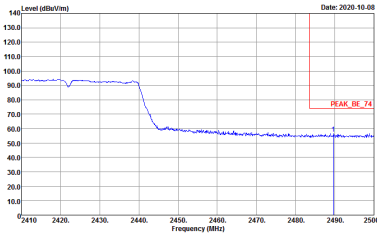
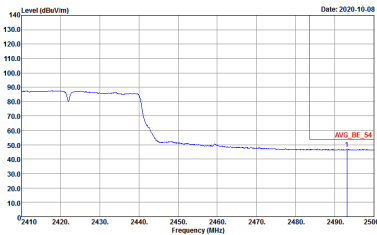
WLAN2.4G 802.11ac VHT40 (Band Edge @ 3m)

ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_RE_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:3000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : RBW:3000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931
Avg.	 Site : 03CH15-HY Condition : AVG_RE_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:3000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL Detector : RBW:3000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931

ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41 - R	
Simultaneously	Horizontal	Fundamental
Peak	 Date: 2020-10-08 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank
Avg.	 Date: 2020-10-08 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank

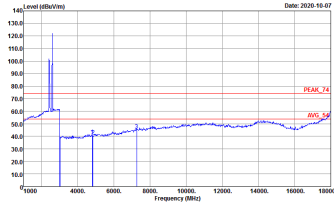
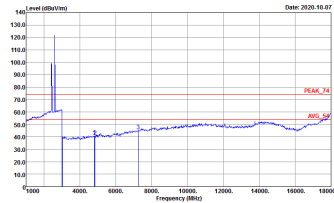


ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : 80W:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : 80W:1000.0000Hz VBW:3000.0000Hz SWT:Auto Project : 081931
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : 80W:1000.0000Hz VBW:3.0000Hz SWT:Auto Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : 80W:1000.0000Hz VBW:3.0000Hz SWT:Auto Project : 081931

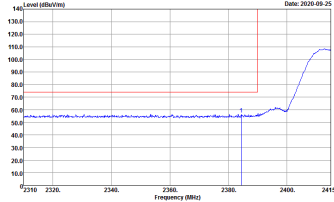
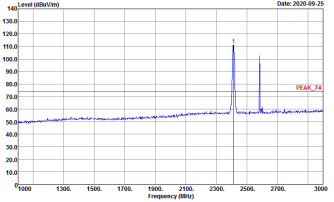
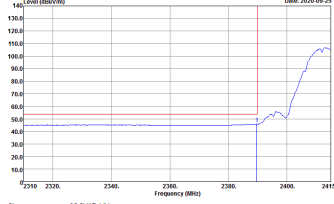
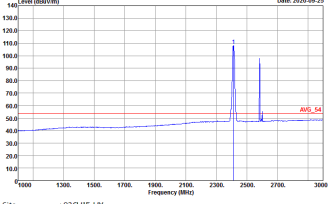
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41 - R	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH15-HV Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak : 081931	Left blank
Avg.	 Site : 03CH15-HV Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak : 081931	Left blank



BLE + WLAN2.4G 802.11ac VHT40 + LTE (Harmonic @ 3m)

ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch03 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

WLAN2.4G 802.11b + LTE (Band Edge @ 3m)

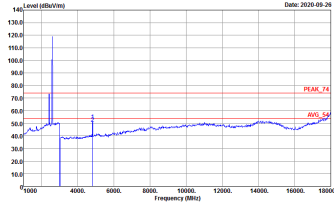
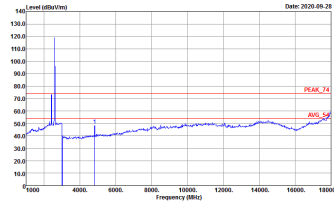
ANT	Ant 1+2 11b Ch01 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931



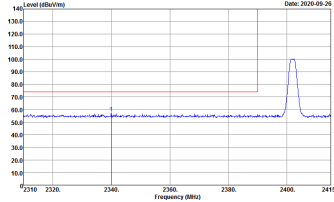
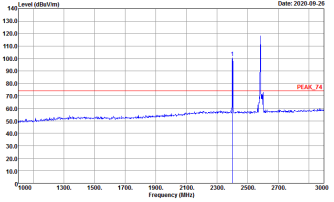
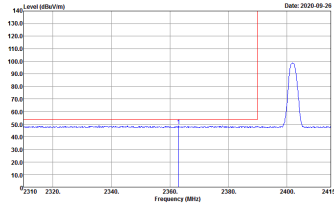
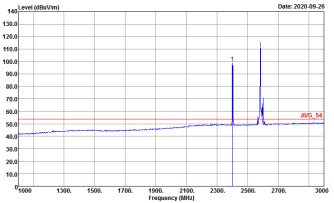
ANT	Ant 1+2 11b Ch01 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 081931	Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 081931
Avg.	Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:0.010kHz SWT:Auto Project : 081931	Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:0.010kHz SWT:Auto Project : 081931



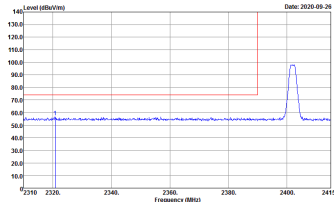
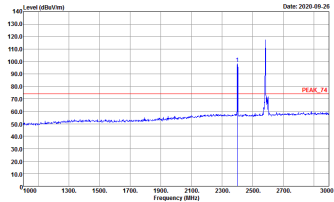
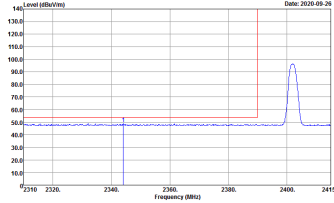
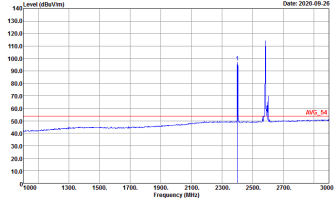
WLAN2.4G 802.11b + LTE (Harmonic @ 3m)

ANT	Ant 1+2 11b Ch01 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-94Y Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-94Y Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

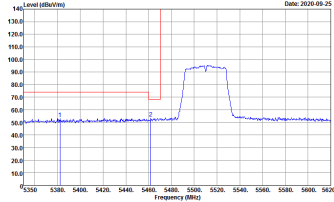
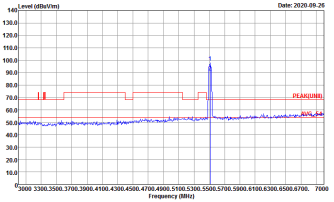
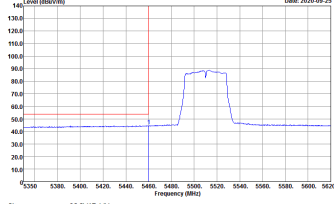
BLE + WLAN5G 802.11ac VHT40 + LTE
BLE (Band Edge @ 3m)

ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
Avg.		

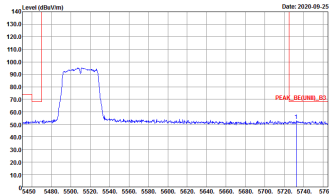


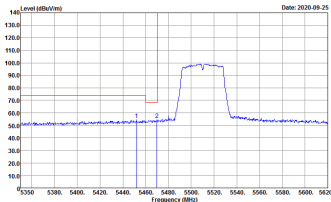
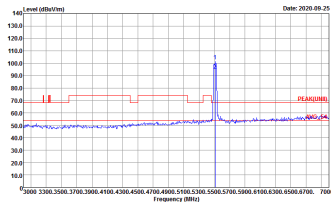
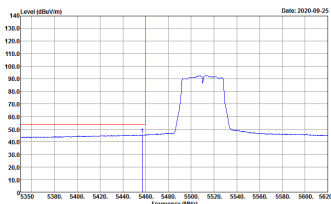
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
Avg.		

WLAN5G 802.11ac VHT40 (Band Edge @ 3m)

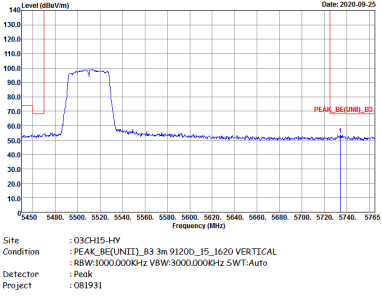
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE[UNIT]_B3 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK[UNIT] 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE[UNIT]_B3 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931	Left blank



ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41 - R	
Simultaneously	Horizontal	Fundamental
Peak	 Site: 03CH15-HY Condition: PEAK_MEASUREMENT_83 3m 91200_15_3620 HORIZONTAL RBW:1000.000000Hz VIEW:3000.000000Hz SWT:Auto Detector: Peak Project: 081931	Left blank

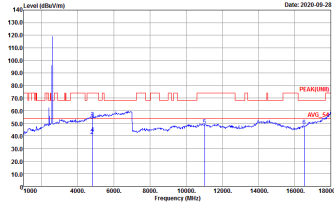
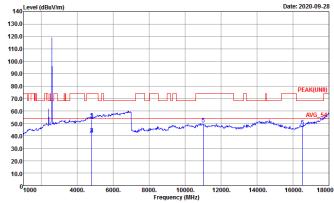
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK[UNIT]_B3 3m 91200_15_3620 VERTICAL Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL Detector : Peak Project : 081931	Left blank



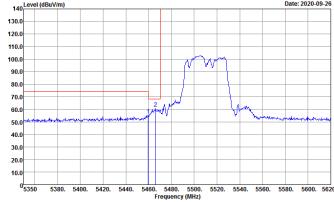
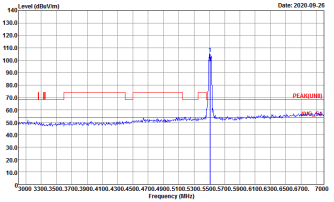
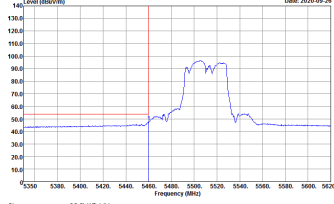
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41 - R	
Simultaneously	Vertical	Fundamental
Peak		Left blank



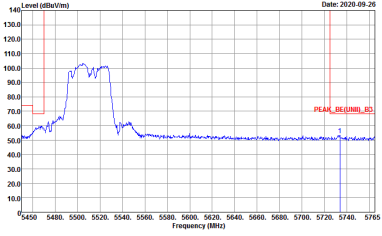
BLE + WLAN5G 802.11ac VHT40 + LTE (Harmonic @ 3m)

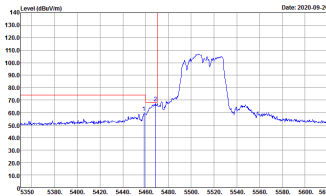
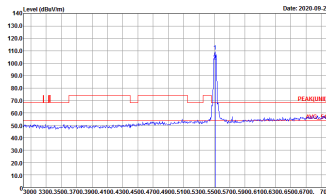
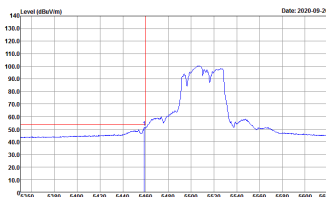
ANT	Ant 1 BLE(2M) Ch00 + Ant 2 11ac VHT40 Ch102 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(AVERAGE) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(AVERAGE) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

WLAN5G 802.11ac VHT40 + LTE (Band Edge @ 3m)

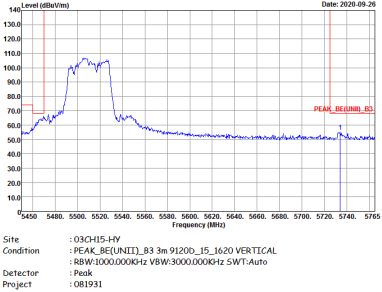
ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE[UNIT]_B3 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK[UNIT] 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE[UNIT]_B3 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931	Left blank



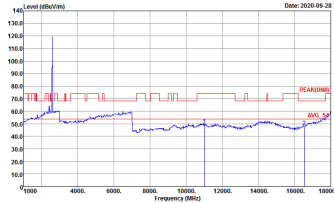
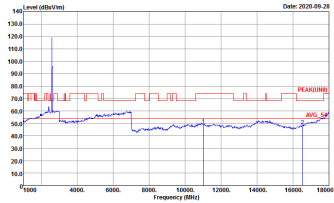
ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41 - R	
Simultaneously	Horizontal	Fundamental
Peak	 Date: 2020-09-26 Site : 03CH15-HY Condition : PEAK_BE(UNIT1)_B3 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank

ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931	Left blank

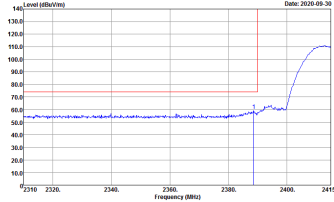
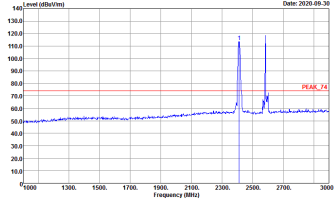
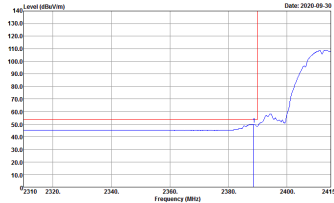
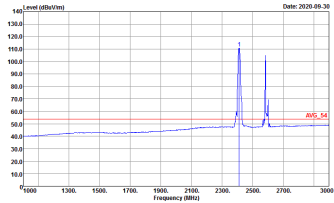


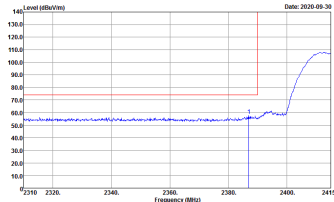
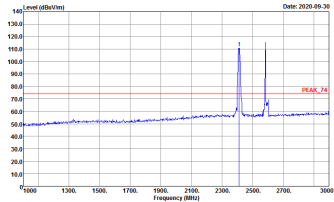
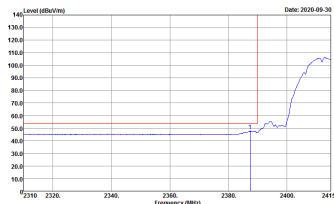
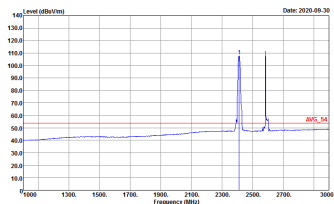
ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41 - R	
Simultaneously	Vertical	Fundamental
Peak		Left blank

WLAN5G 802.11ac VHT40 + LTE (Harmonic @ 3m)

ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH5-HY Condition : PEAK(AVERAGE) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK(AVERAGE) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

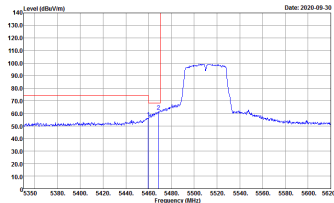
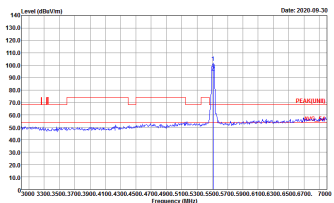
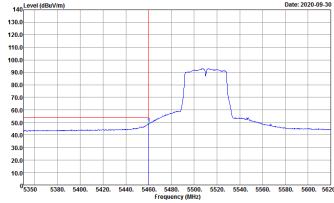
WLAN2.4G 802.11b + WLAN5G 802.11ac VHT40 + LTE
WLAN2.4G 802.11b (Band Edge @ 3m)

ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 081931
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 HORIZONTAL : RBW:1000.000kHz VBW:10000kHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 HORIZONTAL : RBW:1000.000kHz VBW:10000kHz SWT:Auto Detector : Peak Project : 081931

ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_74 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : AVG_BE_54 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : AVG_54 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
Avg.		

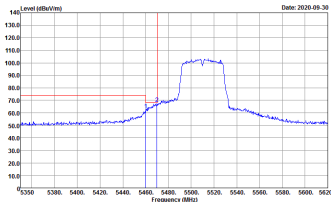
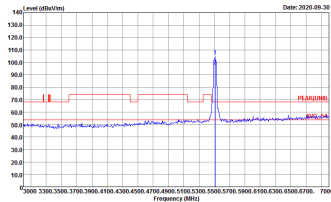
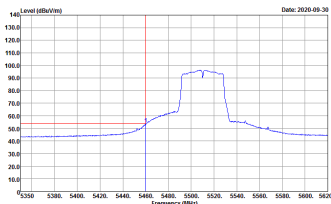


WLAN5G 802.11ac VHT40 (Band Edge @ 3m)

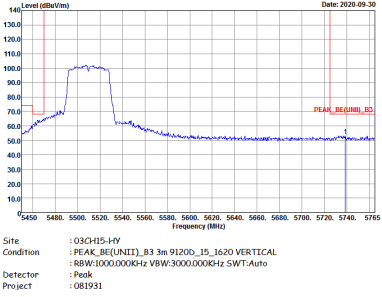
ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41 - L	
Simultaneously	Horizontal	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE(UNIT)_B3 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK(UNIT) 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE(UNIT)_B3 3m 91200_15_3620 HORIZONTAL Detector : Peak Project : 081931	Left blank



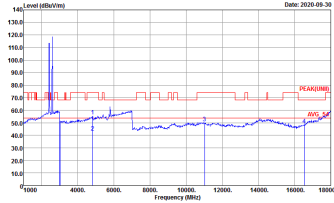
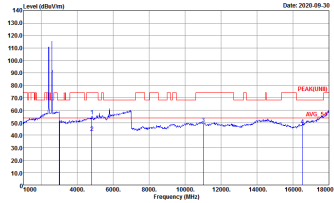
ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41 - R	
Simultaneously	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE(UNIT1)_B3 3m 91200_15_1620 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931	Left blank

ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41 - L	
Simultaneously	Vertical	Fundamental
Peak	 Site : 03CH5-HY Condition : PEAK_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH5-HY Condition : PEAK[LINE] 3m 91200_15_3620 VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 081931
Avg.	 Site : 03CH5-HY Condition : AVG_BE[UNIT]_B3 3m 91200_15_3620 VERTICAL RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto Detector : Peak Project : 081931	Left blank

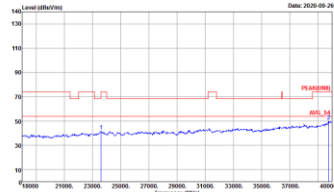
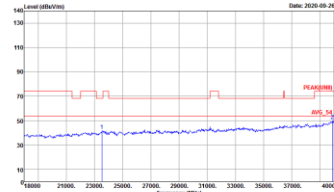


ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41 - R	
Simultaneously	Vertical	Fundamental
Peak		Left blank

WLAN2.4G 802.11b + WLAN5G 802.11ac VHT40 + LTE (Harmonic @ 3m)

ANT	Ant 1 11b Ch01 + Ant 2 11ac VHT40 Ch102+ LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HV Condition : PEAK(AV) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HV Condition : PEAK(AV) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

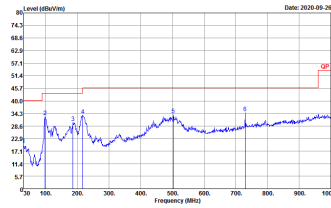
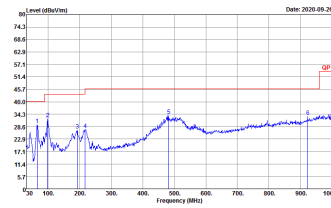
Emission above 18GHz
WLAN5G 802.11ac VHT40 + LTE (SHF)

ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH22-4Y Condition : PEAK(UNIT) In SHF HORN BBH49170584 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH22-4Y Condition : PEAK(UNIT) In SHF HORN BBH49170584 VERTICAL Detector : Peak Project : 081931



Emission below 1GHz

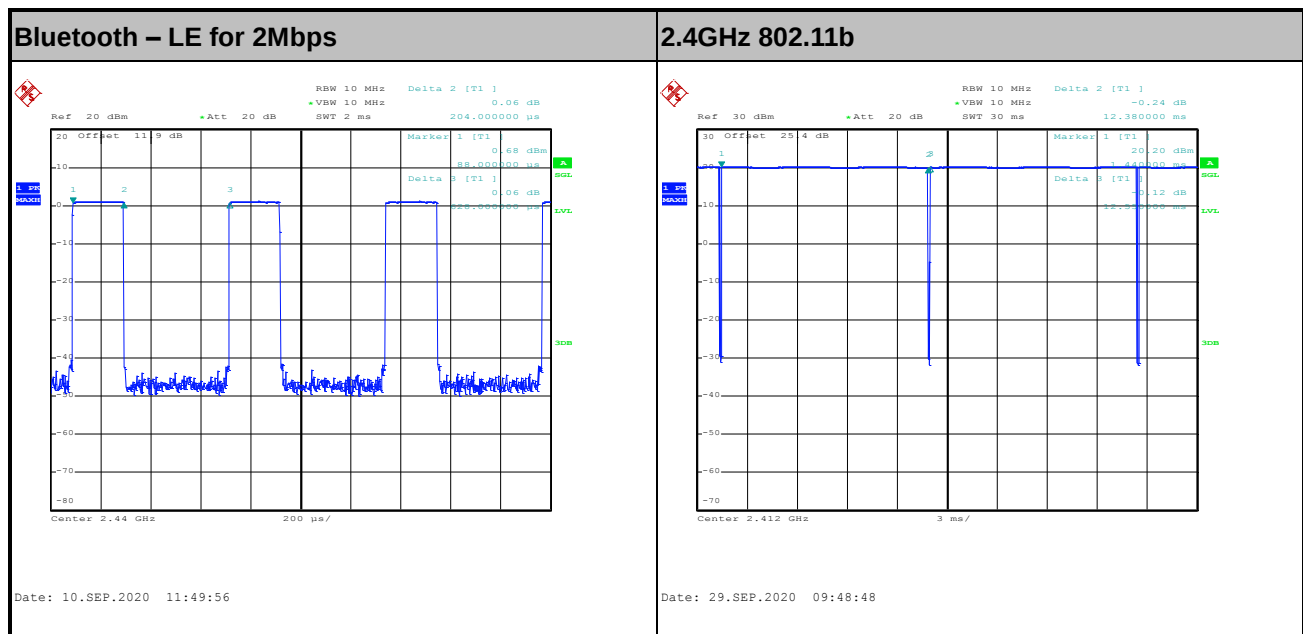
WLAN5G 802.11ac VHT40 + LTE (LF @ 3m)

ANT	Ant 1+2 11ac VHT40 Ch102 + LTE Band 41	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HV Condition : QP 5m BTLO6_15_41912 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HV Condition : QP 5m BTLO6_15_41912 VERTICAL Detector : Peak Project : 081931

Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1	Bluetooth –LE for 2Mbps	32.48	204	4.90	10kHz	4.88
1	2.4GHz 802.11b	98.65	-	-	10Hz	0.06
2	2.4GHz 802.11b	99.04	-	-	10Hz	0.04
1+2	2.4GHz 802.11b for Ant. 1	98.97	-	-	10Hz	0.04
1+2	2.4GHz 802.11b for Ant. 2	99.00	-	-	10Hz	0.04
2	2.4GHz 802.11ac VHT40	94.06	950	1.05	3kHz	0.27
2	5GHz 802.11ac VHT40	95.48	940	1.06	3kHz	0.20
1+2	5GHz 802.11ac VHT40 for Ant. 1	95.98	955	1.05	3kHz	0.18
1+2	5GHz 802.11ac VHT40 for Ant. 2	95.48	950	1.05	3kHz	0.20

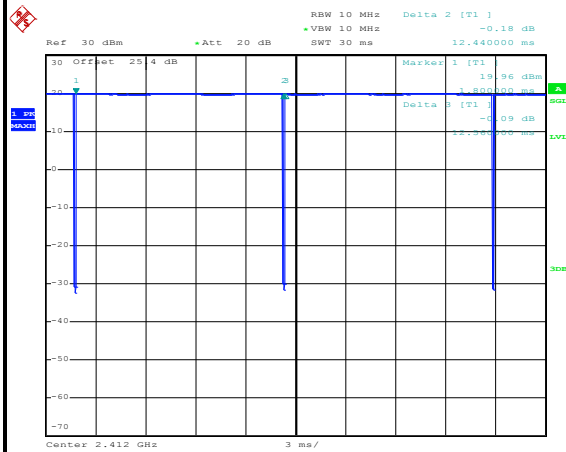
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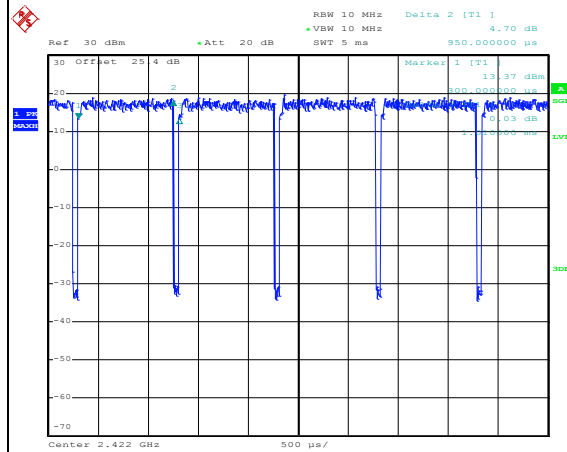
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2.4GHz 802.11b



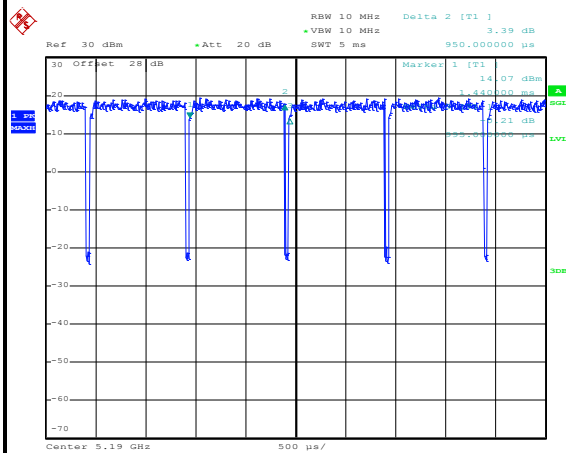
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2.4GHz 802.11ac VHT40



Date: 14.OCT.2020 15:55:00

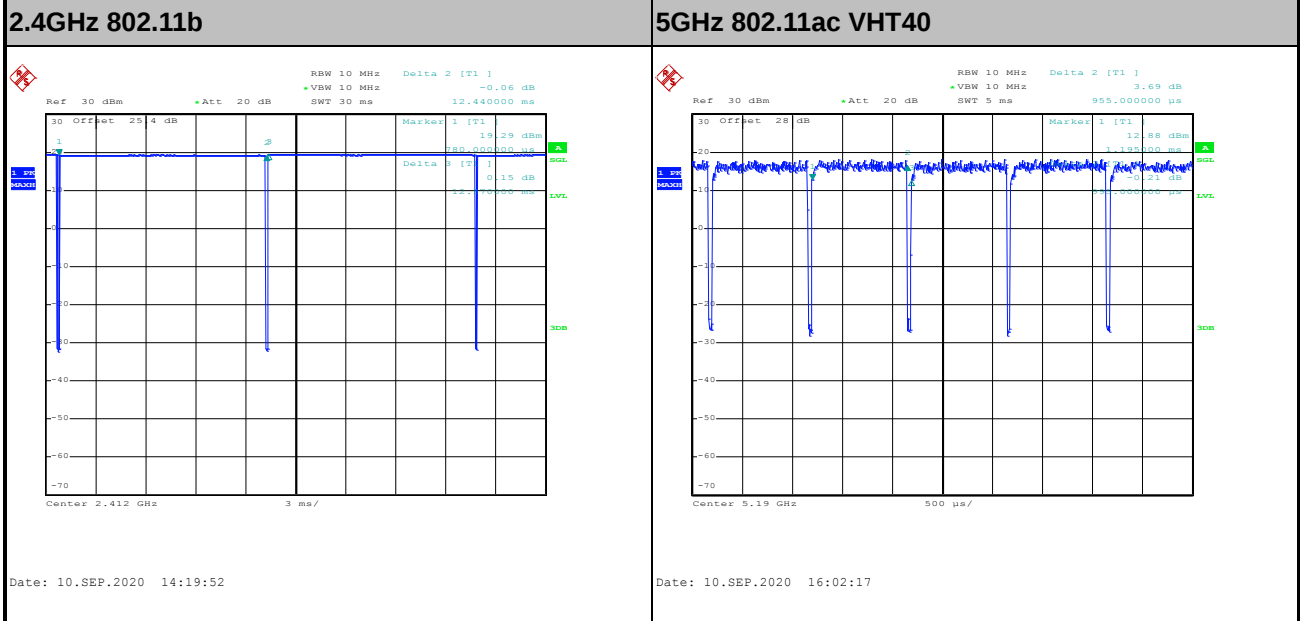
5GHz 802.11ac VHT40



Date: 14.OCT.2020 16:01:49



MIMO <Ant. 1>



MIMO <Ant. 2>

