FCC CO-LOCATION TEST REPORT

FCC ID	:	**UZ7MC3300U**
Equipment	:	**Mobile Computer**
Brand Name	:	**Zebra**
Model Name	:	**MC3300U**
Applicant	:	**Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742**
Manufacturer	:	**Zebra Technologies Corporation 1 Zebra Plaza, Holtsville, NY 11742**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Aug. 12, 2019 and testing was started from Nov. 18, 2019 and completed on Nov. 18, 2019. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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.)

Table of Contents

History of this test report **3**
Summary of Test Result **4**
1 General Description **5**
1.1 Product Feature of Equipment Under Test 5
1.2 Product Specification of Equipment Under Test 6
1.3 Modification of EUT 6
1.4 Testing Location 7
1.5 Applicable Standards 7
2 Test Configuration of Equipment Under Test **8**
2.1 Carrier Frequency and Channel 8
2.2 Test Mode 8
2.3 Connection Diagram of Test System 9
2.4 Support Unit used in test configuration and system 9
2.5 EUT Operation Test Setup 9
3 Test Result **10**
3.1 Unwanted Emissions Measurement 10
3.2 Antenna Requirements 14
4 List of Measuring Equipment **15**
5 Uncertainty of Evaluation **16**
Appendix A. Radiated Spurious Emission
Appendix B. Radiated Spurious Emission Plots
Appendix C. Duty Cycle Plots
Appendix D. Setup Photographs

History of this test report

Report No.	Version	Description	Issued Date
FR981238H	01	Initial issue of report	Dec. 09, 2019

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 5.34 dB at 4874.000 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: Yimin Ho

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Computer
Brand Name	Zebra
Model Name	MC3300U
FCC ID	UZ7MC3300U
EUT supports Radios application	NFC WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DV
SW Version	RFID Manager Application Version: 2.0.10.1 123 RFID Mobile Application Version: 1.0.0.11 Terminal Version: 02-11-14.00-PG-U07-PRD
FW Version	Module Version: PAAEES00-001-N20 Radio Version: 2.0.32.0 Terminal Version: FUSION_QA_2_1.2.0.006_P
MFD	27JUL19
EUT Stage	Identical Prototype

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

Specification of Accessories				
AC Adapter	**Brand Name**	Zebra	**Part Number**	PWR-WUA5V12W0US
USB Cable	**Brand Name**	Zebra	**Part Number**	CBL-MC33-USBCHG-01
MC32 2X battery (Inventus)	**Brand Name**	Symbol	**Part Number**	82-000012-02
MC33 2X battery (Inventus)	**Brand Name**	Zebra	**Part Number**	BT-000337-01
MC33 7000mA 2X (Inventus)	**Brand Name**	Zebra	**Part Number**	BT-000375-10
GUN Holster	**Brand Name**	Zebra	**Part Number**	SG-MC3021212-01R

<Sample Information>

	SKU1	SKU2	SKU3
Part Number	MC333U-GJ2EG4US	MC339U-GE2EG4US	MC339U-GF2EG4US
RFID Antenna	Middle range	Long range	Long range
Scanner	SE4770	SE4850	SE4750MR
Keypad	29	29	29
Region	US	US	US

	SKU7	SKU8	SKU9
Part Number	MC333U-GJ3EG4US	MC339U-GE3EG4US	MC339U-GF3EG4US
RFID Antenna	Middle range	Long range	Long range
Scanner	SE4770	SE4850	SE4750MR
Keypad	38	38	38
Region	US	US	US

	SKU13	SKU14	SKU15
Part Number	MC333U-GJ4EG4US	MC339U-GE4EG4US	MC339U-GF4EG4US
RFID Antenna	Middle range	Long range	Long range
Scanner	SE4770	SE4850	SE4750MR
Keypad	47	47	47
Region	US	US	US

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz 5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz
Antenna Type / Gain	**<2412 MHz ~ 2462 MHz>** Ant. 1 : Patch Antenna with gain 3.32 dBi **<5180 MHz ~ 5240 MHz>** Ant. 2 : Patch Antenna with gain 3.22 dBi **<5260 MHz ~ 5320 MHz>** Ant. 2 : Patch Antenna with gain 3.91 dBi **<5500 MHz ~ 5720 MHz>** Ant. 2 : Patch Antenna with gain 5.20 dBi **<5745 MHz ~ 5825 MHz>** Ant. 2 : Patch Antenna with gain 3.95 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.3 Modification of EUT

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

1.4 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.**
	03CH12-HY

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

FCC Designation No. TW0007

1.5 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 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- 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. 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 (Z plane) were recorded in this report.

2.1 Carrier Frequency and Channel

2400-2483.5 MHz 802.11b	
Channel	**Freq. (MHz)**
06	2437

5150-5250 MHz 802.11a		5250-5350 MHz 802.11a		5470-5725MHz 802.11a		5725-5850 MHz 802.11a	
Channel	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**	**Channel**	**Freq. (MHz)**
44	5220	60	5300	116	5580	157	5785

2.2 Test Mode

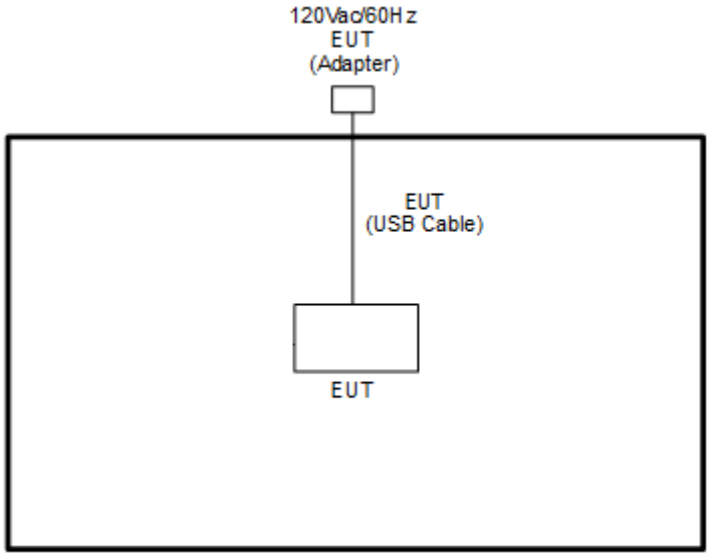
Final test modes are considering the modulation and worse data rates as below table.

<Co-Location>

Modulation	Data Rate
2.4GHz 802.11b for Ant. 1 + 5GHz 802.11a for Ant. 2	**1Mbps + 6Mbps**

Remark: All the tests were performed with MC32 2X battery (Inventus) and SKU 1.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	E330	NA	N/A	AC I/P: Unshielded, 1.2m DC O/P: Shielded, 1.8m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT v3.0.298.0” 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.

3.1.1 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.

$$E=\frac{1000000\sqrt{30P}}{3}$$ 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.

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

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

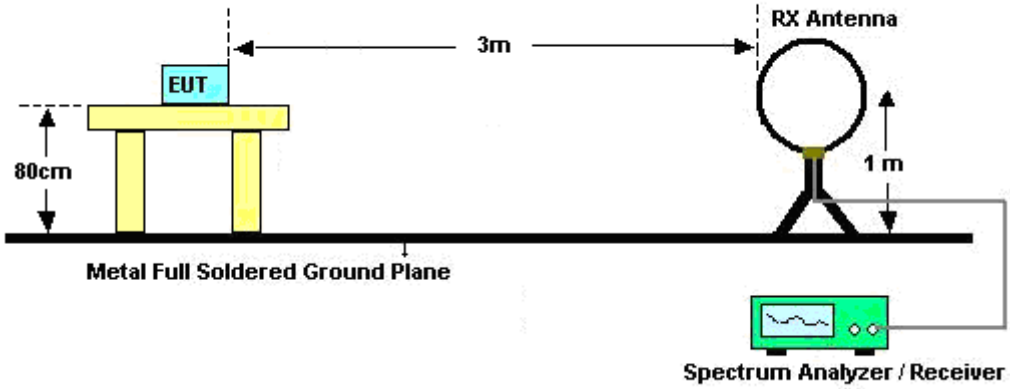
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

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

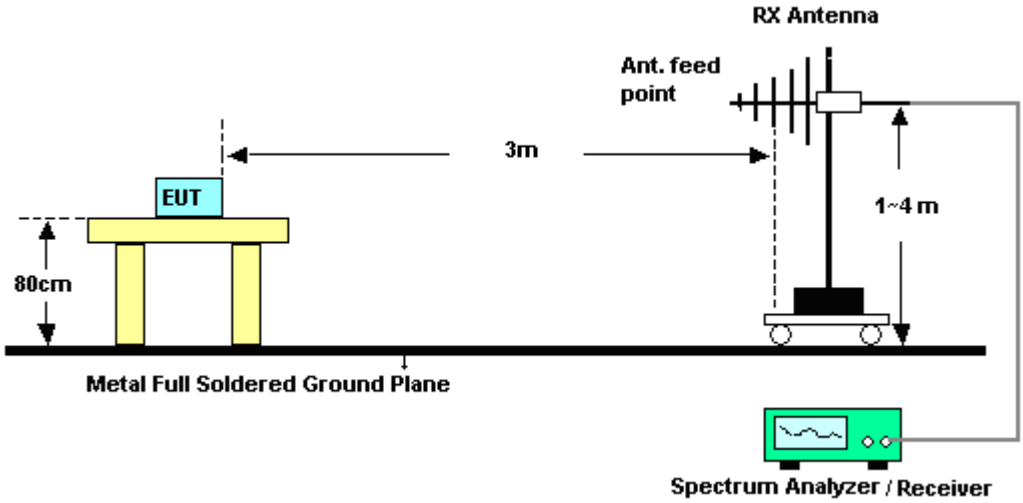
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting 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.

3.1.4 Test Setup

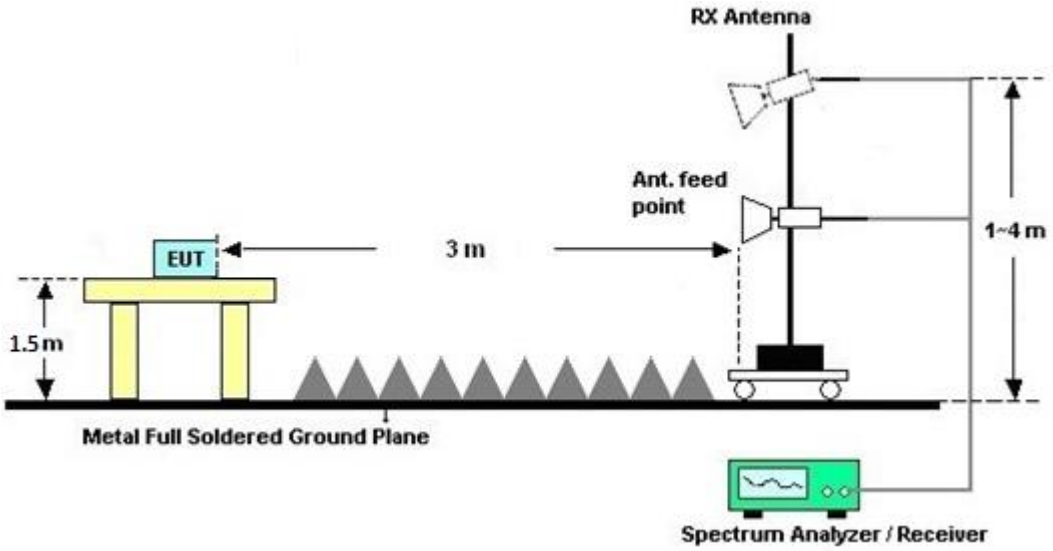
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 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.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.7 Duty Cycle

Please refer to Appendix C.

3.1.8 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	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	Nov. 18, 2019	Jan. 06, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 12, 2019	Nov. 18, 2019	Oct. 11, 2020	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-02037	1GHz ~ 18GHz	Oct. 28, 2019	Nov. 18, 2019	Oct. 27, 2020	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz ~ 40GHz	Dec. 05, 2018	Nov. 18, 2019	Dec. 04, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	Nov. 18, 2019	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	May 27, 2019	Nov. 18, 2019	May 26, 2020	Radiation (03CH12-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	May 20, 2019	Nov. 18, 2019	May 19, 2020	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 06, 2018	Nov. 18, 2019	Dec. 05, 2019	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100390	20Hz~26.5GHz	Dec. 26, 2018	Nov. 18, 2019	Dec. 25, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 19, 2019	Nov. 18, 2019	Mar. 18, 2020	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN1	1.2 GHz Lowpass	Mar. 22, 2019	Nov. 18, 2019	Mar. 21, 2020	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3GHz High Pass	Jul. 15, 2019	Nov. 18, 2019	Jul. 14, 2020	Radiation (03CH12-HY)
Filter	Woken	WHKX8-5272.5-6750-18000-40ST	SN2	6.75G Highpass	Mar. 19, 2019	Nov. 18, 2019	Mar. 18, 2020	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCGV2400/2483-2390/2493-35/10SS	SN4	2.4G	Nov. 01, 2019	Nov. 18, 2019	Oct. 31, 2020	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCJV12-5120-5150-5350-5380-40SS	SN6	5GBand1~2	Jul. 03, 2018	Nov. 18, 2019	Jul. 02, 2020	Radiation (03CH12-HY)
Notch Filter	Wainwright	RCJV16-5440-5470-5725-5755-40SS	SN3	5G Band3	Mar. 15, 2019	Nov. 18, 2019	Mar. 14, 2020	Radiation (03CH12-HY)
Notch Filter	Wainwright	WRCJV12-5695-5725-5850-5880-40SS	SN7	5G Band4	Jul. 03, 2019	Nov. 18, 2019	Jul. 02, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 13, 2019	Nov. 18, 2019	Mar. 12, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Feb. 26, 2019	Nov. 18, 2019	Feb. 25, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Feb. 26, 2019	Nov. 18, 2019	Feb. 25, 2020	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Nov. 18, 2019	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Nov. 18, 2019	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Nov. 18, 2019	N/A	Radiation (03CH12-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))	**5.1**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2**

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

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

Appendix A. Radiated Spurious Emission

Test Engineer :	Jack Cheng, Lance Chiang and Chuan Chu	Temperature :	23.1~26.4°C
		Relative Humidity :	51.8~60.9%

2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch44

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 06 2437MHz		2310.98	55.73	-18.27	74	44.2	28.06	16.53	33.06	262	1	P	H
		2389.94	44.9	-9.1	54	33.69	27.74	16.63	33.16	262	1	A	H
	*	2437	115.7	-	-	104.61	27.63	16.67	33.21	262	1	P	H
	*	2437	112.65	-	-	101.56	27.63	16.67	33.21	262	1	A	H
		2484.67	56.65	-17.35	74	45.61	27.6	16.71	33.27	262	1	P	H
		2485.79	48.16	-5.84	54	37.12	27.6	16.71	33.27	262	1	A	H
		2317.42	55.58	-18.42	74	44.08	28.03	16.54	33.07	102	93	P	V
		2311.26	44.64	-9.36	54	33.12	28.05	16.53	33.06	102	93	A	V
	*	2437	110.95	-	-	99.86	27.63	16.67	33.21	102	93	P	V
	*	2437	107.97	-	-	96.88	27.63	16.67	33.21	102	93	A	V
		2485.79	56.06	-17.94	74	45.02	27.6	16.71	33.27	102	93	P	V
		2485.79	46.32	-7.68	54	35.28	27.6	16.71	33.27	102	93	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 44 5220MHz		5128.18	51.32	-22.68	74	42.99	32	9.8	33.47	388	33	P	H
		5144.04	42.42	-11.58	54	34.07	32	9.82	33.47	388	33	A	H
	*	5220	108.32	-	-	100.18	31.68	9.92	33.46	388	33	P	H
	*	5220	101.14	-	-	93	31.68	9.92	33.46	388	33	A	H
		5426.12	50.63	-23.37	74	42.28	31.6	10.19	33.44	388	33	P	H
		5451.88	42.39	-11.61	54	33.99	31.61	10.22	33.43	388	33	A	H
		5113.88	50.93	-23.07	74	42.62	32	9.78	33.47	368	270	P	V
		5146.9	42.34	-11.66	54	33.99	32	9.82	33.47	368	270	A	V
	*	5220	107.29	-	-	99.15	31.68	9.92	33.46	368	270	P	V
	*	5220	99.93	-	-	91.79	31.68	9.92	33.46	368	270	A	V
		5424.72	51.03	-22.97	74	42.69	31.6	10.18	33.44	368	270	P	V
		5456.08	42.4	-11.6	54	33.96	31.64	10.23	33.43	368	270	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Co-location mode (Harmonic @ 3m)

Co-location	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)
Co-location mode		4874	56.04	-17.96	74	48.68	31.25	9.6	33.49	100	156	P	H
		4874	48.06	-5.94	54	40.7	31.25	9.6	33.49	100	156	A	H
		7311	46.12	-27.88	74	60.32	36.3	13.06	63.56	100	0	P	H
		10440	48.96	-19.24	68.2	57.84	39.8	15.09	63.77	100	0	P	H
		15660	45.88	-28.12	74	51.48	37.78	18.58	61.96	100	0	P	H
													H
													H
													H
		4874	54.87	-19.13	74	47.51	31.25	9.6	33.49	100	193	P	V
		4874	46.76	-7.24	54	39.4	31.25	9.6	33.49	100	193	A	V
		7311	44.66	-29.34	74	58.86	36.3	13.06	63.56	100	0	P	V
		10440	48.2	-20	68.2	57.08	39.8	15.09	63.77	100	0	P	V
		15660	45.92	-28.08	74	51.52	37.78	18.58	61.96	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch60

WIFI 802.11b (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.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 06 2437MHz		2384.9	55.18	-18.82	74	43.95	27.76	16.62	33.15	262	1	P	H
		2389.94	44.88	-9.12	54	33.67	27.74	16.63	33.16	262	1	A	H
	*	2437	115.67	-	-	104.58	27.63	16.67	33.21	262	1	P	H
	*	2437	112.64	-	-	101.55	27.63	16.67	33.21	262	1	A	H
		2484.95	57.02	-16.98	74	45.98	27.6	16.71	33.27	262	1	P	H
		2484.46	48.29	-5.71	54	37.25	27.6	16.71	33.27	262	1	A	H
		2345	55.8	-18.2	74	44.41	27.92	16.57	33.1	102	93	P	V
		2311.96	44.68	-9.32	54	33.16	28.05	16.53	33.06	102	93	A	V
	*	2437	111.1	-	-	100.01	27.63	16.67	33.21	102	93	P	V
	*	2437	108.02	-	-	96.93	27.63	16.67	33.21	102	93	A	V
		2486.14	56.11	-17.89	74	45.07	27.6	16.71	33.27	102	93	P	V
		2485.86	46.58	-7.42	54	35.54	27.6	16.71	33.27	102	93	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 60 5300MHz		5126.14	51.37	-22.63	74	43.05	32	9.79	33.47	393	34	P	H
		5113.22	42.28	-11.72	54	33.98	32	9.77	33.47	393	34	A	H
	*	5300	108.99	-	-	101.12	31.3	10.02	33.45	393	34	P	H
	*	5300	101.65	-	-	93.78	31.3	10.02	33.45	393	34	A	H
		5356.56	51.12	-22.88	74	43.12	31.34	10.1	33.44	393	34	P	H
		5352.48	43.74	-10.26	54	35.78	31.31	10.09	33.44	393	34	A	H
		5119.68	51.55	-22.45	74	43.24	32	9.78	33.47	339	265	P	V
		5112.2	42.34	-11.66	54	34.04	32	9.77	33.47	339	265	A	V
	*	5300	107.77	-	-	99.9	31.3	10.02	33.45	339	265	P	V
	*	5300	99.11	-	-	91.24	31.3	10.02	33.45	339	265	A	V
		5356.56	51.89	-22.11	74	43.89	31.34	10.1	33.44	339	265	P	V
		5350.32	43.28	-10.72	54	35.33	31.3	10.09	33.44	339	265	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Co-location mode (Harmonic @ 3m)

Co-location	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)
Co-location mode		4874	56.46	-17.54	74	49.1	31.25	9.6	33.49	100	154	P	H
		4874	48.66	-5.34	54	41.3	31.25	9.6	33.49	100	154	A	H
		7311	44.78	-29.22	74	58.98	36.3	13.06	63.56	100	0	P	H
		10600	48.16	-25.84	74	56.72	39.9	15.18	63.64	100	0	P	H
		15900	43.85	-30.15	74	50.2	37	18.71	62.06	100	0	P	H
													H
													H
													H
		4874	53.97	-20.03	74	46.61	31.25	9.6	33.49	100	187	P	V
		4874	47.06	-6.94	54	39.7	31.25	9.6	33.49	100	187	A	V
		7311	45.25	-28.75	74	59.45	36.3	13.06	63.56	100	0	P	V
		10600	48.64	-25.36	74	57.2	39.9	15.18	63.64	100	0	P	V
		15900	44.26	-29.74	74	50.61	37	18.71	62.06	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch116

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 06 2437MHz (1)		2354.94	55.7	-18.3	74	44.35	27.88	16.59	33.12	262	1	P	H
		2388.68	44.96	-9.04	54	33.74	27.75	16.63	33.16	262	1	A	H
	*	2437	115.6	-	-	104.51	27.63	16.67	33.21	262	1	P	H
	*	2437	112.38	-	-	101.29	27.63	16.67	33.21	262	1	A	H
		2484.32	56.9	-17.1	74	45.86	27.6	16.71	33.27	262	1	P	H
		2485.79	48.14	-5.86	54	37.1	27.6	16.71	33.27	262	1	A	H
		2331.98	55.8	-18.2	74	44.36	27.97	16.56	33.09	102	93	P	V
		2311.68	44.76	-9.24	54	33.24	28.05	16.53	33.06	102	93	A	V
	*	2437	110.79	-	-	99.7	27.63	16.67	33.21	102	93	P	V
	*	2437	107.68	-	-	96.59	27.63	16.67	33.21	102	93	A	V
		2484.95	55.89	-18.11	74	44.85	27.6	16.71	33.27	102	93	P	V
		2485.72	46.19	-7.81	54	35.15	27.6	16.71	33.27	102	93	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 116 5580MHz		5407.36	49.95	-24.05	74	41.63	31.6	10.16	33.44	350	31	P	H
		5463.52	49.87	-18.33	68.2	41.38	31.68	10.24	33.43	350	31	P	H
		5425.12	42.57	-11.43	54	34.22	31.6	10.19	33.44	350	31	A	H
	*	5580	107.95	-	-	99.23	31.76	10.4	33.44	350	31	P	H
	*	5580	100.57	-	-	91.85	31.76	10.4	33.44	350	31	A	H
		5756.81	51.13	-17.07	68.2	42.05	32.03	10.52	33.47	350	31	P	H
		5455.12	50.28	-23.72	74	41.85	31.63	10.23	33.43	350	271	P	V
		5464	48.59	-19.61	68.2	40.1	31.68	10.24	33.43	350	271	P	V
		5428.48	42.11	-11.89	54	33.76	31.6	10.19	33.44	350	271	A	V
	*	5580	105.1	-	-	96.38	31.76	10.4	33.44	350	271	P	V
	*	5580	97.72	-	-	89	31.76	10.4	33.44	350	271	A	V
		5759.33	50.61	-17.59	68.2	41.52	32.04	10.52	33.47	350	271	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Co-location mode (Harmonic @ 3m)

Co-location	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)
Co-location mode		4874	54.34	-19.66	74	46.98	31.25	9.6	33.49	100	154	P	H
		4874	47.09	-6.91	54	39.73	31.25	9.6	33.49	100	154	A	H
		7311	44.5	-29.5	74	58.7	36.3	13.06	63.56	100	0	P	H
		11160	48.32	-25.68	74	56.25	39.98	15.52	63.43	100	0	P	H
		16740	47.51	-20.69	68.2	50.08	40.18	19.41	62.16	100	0	P	H
													H
													H
													H
		4874	52.69	-21.31	74	45.33	31.25	9.6	33.49	100	191	P	V
		4874	46.3	-7.7	54	38.94	31.25	9.6	33.49	100	191	A	V
		7311	44.66	-29.34	74	58.86	36.3	13.06	63.56	100	0	P	V
		11160	47.13	-26.87	74	55.06	39.98	15.52	63.43	100	0	P	V
		16740	48.2	-20	68.2	50.77	40.18	19.41	62.16	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch157

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 06 2437MHz (Ant. 1)		2364.18	55.15	-18.85	74	43.84	27.84	16.6	33.13	262	1	P	H
		2389.52	44.9	-9.1	54	33.69	27.74	16.63	33.16	262	1	A	H
	*	2437	115.45	-	-	104.36	27.63	16.67	33.21	262	1	P	H
	*	2437	112.35	-	-	101.26	27.63	16.67	33.21	262	1	A	H
		2484.95	57.27	-16.73	74	46.23	27.6	16.71	33.27	262	1	P	H
		2485.79	47.82	-6.18	54	36.78	27.6	16.71	33.27	262	1	A	H
		2331.28	55.21	-18.79	74	43.77	27.97	16.56	33.09	102	93	P	V
		2388.4	44.75	-9.25	54	33.53	27.75	16.63	33.16	102	93	A	V
	*	2437	110.86	-	-	99.77	27.63	16.67	33.21	102	93	P	V
	*	2437	107.72	-	-	96.63	27.63	16.67	33.21	102	93	A	V
		2486.35	55.7	-18.3	74	44.66	27.6	16.71	33.27	102	93	P	V
		2485.86	46.4	-7.6	54	35.36	27.6	16.71	33.27	102	93	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5615.6	52.48	-15.72	68.2	43.75	31.74	10.44	33.45	361	33	P	H
		5698.2	51.14	-52.73	103.87	42.13	31.99	10.48	33.46	361	33	P	H
		5708.6	50.59	-57.02	107.61	41.56	32	10.49	33.46	361	33	P	H
		5724.6	51.29	-70	121.29	42.25	32	10.5	33.46	361	33	P	H
	*	5785	104	-	-	94.8	32.14	10.53	33.47	361	33	P	H
	*	5785	96.83	-	-	87.63	32.14	10.53	33.47	361	33	A	H
		5854.2	50.59	-62.03	112.62	41.26	32.22	10.59	33.48	361	33	P	H
		5868.2	50.95	-56.15	107.1	41.56	32.27	10.6	33.48	361	33	P	H
		5900.6	51.95	-34.27	86.22	42.41	32.4	10.63	33.49	361	33	P	H
		5929.4	52.56	-15.64	68.2	42.93	32.46	10.66	33.49	361	33	P	H
		5639.2	50.17	-18.03	68.2	41.53	31.64	10.45	33.45	400	280	P	V
		5691.6	51.21	-47.8	99.01	42.26	31.93	10.48	33.46	400	280	P	V
		5710.2	50.77	-57.29	108.06	41.74	32	10.49	33.46	400	280	P	V
		5720.8	52.43	-60.19	112.62	43.39	32	10.5	33.46	400	280	P	V
	*	5785	100.76	-	-	91.56	32.14	10.53	33.47	400	280	P	V
	*	5785	93.26	-	-	84.06	32.14	10.53	33.47	400	280	A	V
		5852	51.16	-66.48	117.64	41.84	32.21	10.59	33.48	400	280	P	V
		5873.4	51.74	-53.91	105.65	42.32	32.29	10.61	33.48	400	280	P	V
		5902	51.64	-33.54	85.18	42.1	32.4	10.63	33.49	400	280	P	V
		5938.4	51.45	-16.75	68.2	41.8	32.48	10.66	33.49	400	280	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Co-location mode (Harmonic @ 3m)

Co-location	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)
Co-location mode		4874	53.86	-20.14	74	46.5	31.25	9.6	33.49	100	151	P	H
		4874	47.17	-6.83	54	39.81	31.25	9.6	33.49	100	151	A	H
		7311	44.29	-29.71	74	58.49	36.3	13.06	63.56	100	0	P	H
		11570	47.89	-26.11	74	55.34	40.19	15.86	63.5	100	0	P	H
		17355	49.04	-19.16	68.2	48.68	41.74	20.12	61.5	100	0	P	H
													H
													H
													H
		4874	54.3	-19.7	74	46.94	31.25	9.6	33.49	100	193	P	V
		4874	46.97	-7.03	54	39.61	31.25	9.6	33.49	100	193	A	V
		7311	44.8	-29.2	74	59	36.3	13.06	63.56	100	0	P	V
		11570	47.18	-26.82	74	54.63	40.19	15.86	63.5	100	0	P	V
		17355	48.25	-19.95	68.2	47.89	41.74	20.12	61.5	100	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average 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 Ant. 0	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)
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

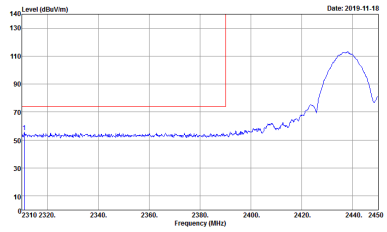
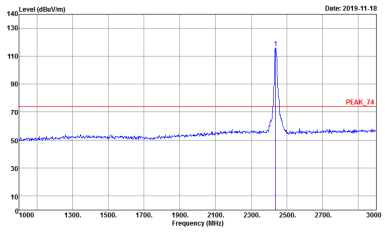
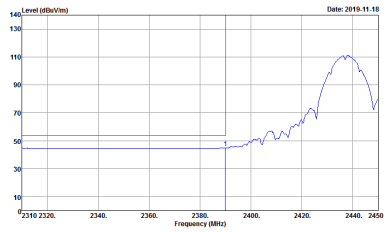
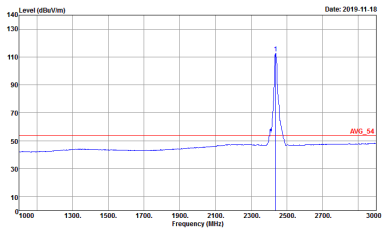
Test Engineer :	Jack Cheng, Lance Chiang and Chuan Chu	**Temperature :**	21~24°C
		Relative Humidity :	56~68%

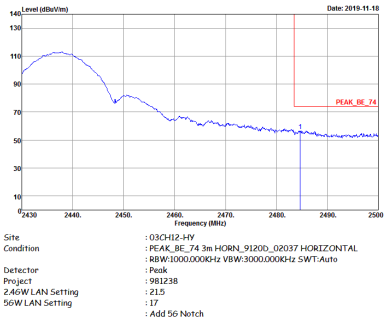
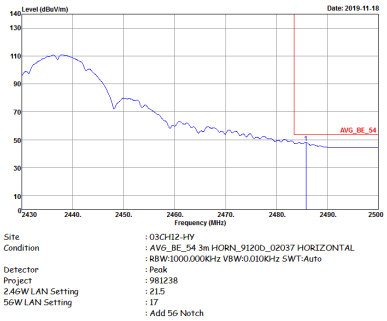
Note symbol

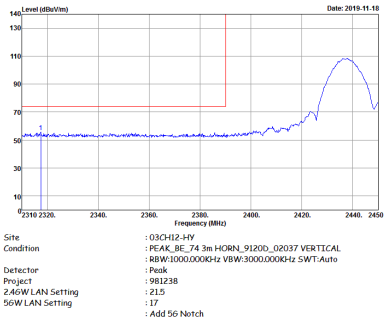
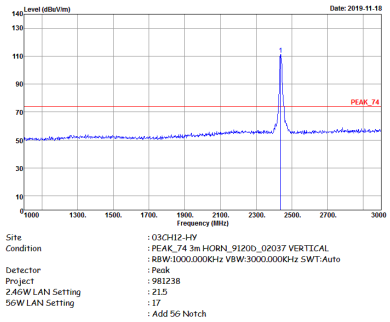
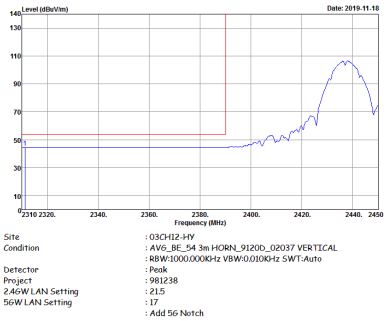
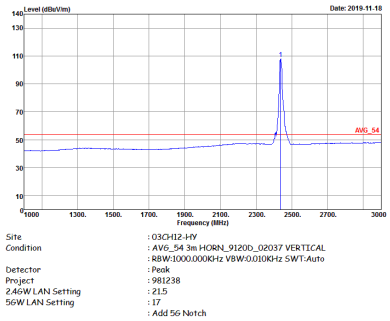
-L	**Low channel location**
-R	**High channel location**

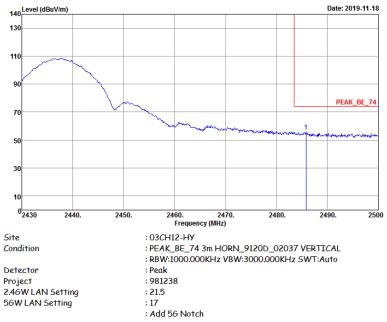
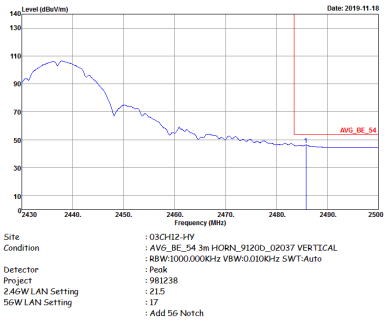
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch44

WIFI 802.11b (Band Edge @ 3m)

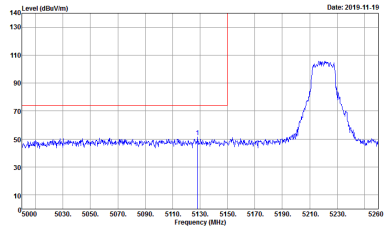
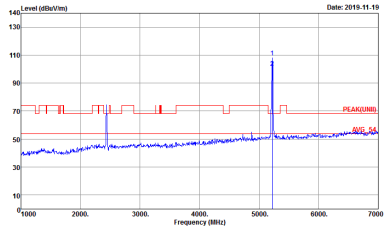
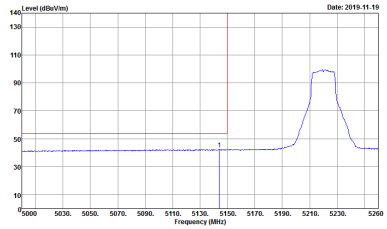
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17 : Add 5G Notch	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17 : Add 5G Notch
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17 : Add 5G Notch	 Site : 03CH12-HY Condition : AVG_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17 : Add 5G Notch

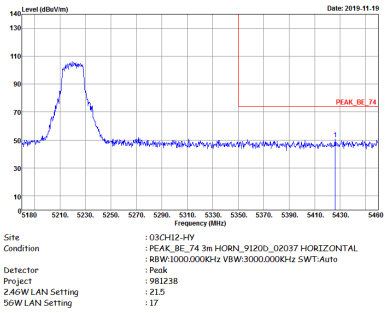
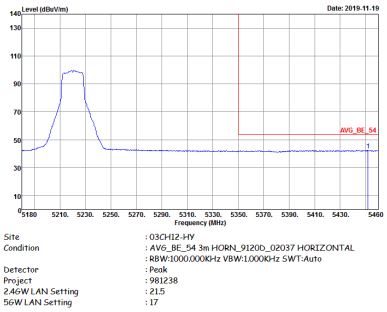
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

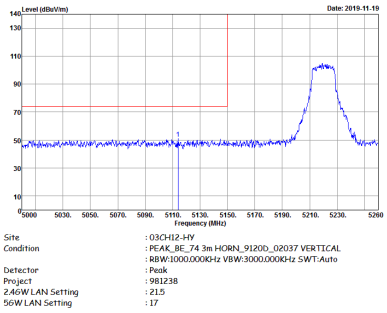
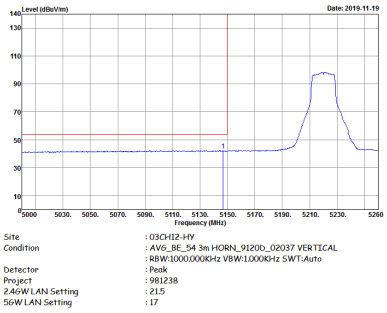
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

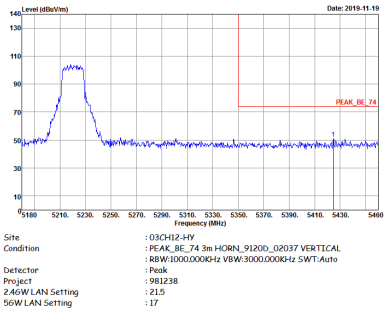
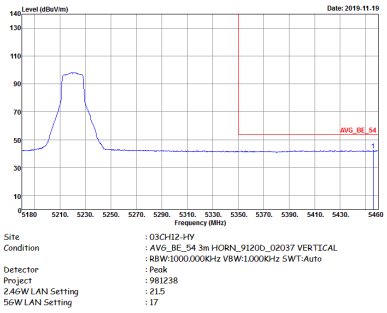
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17	Left blank

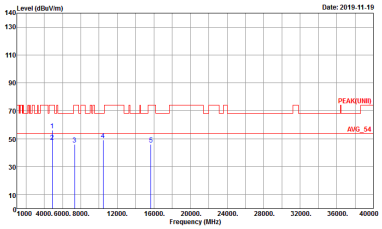
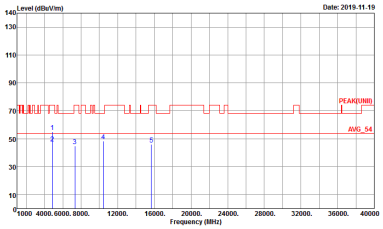
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

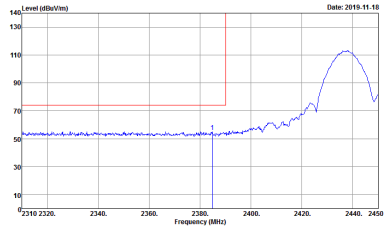
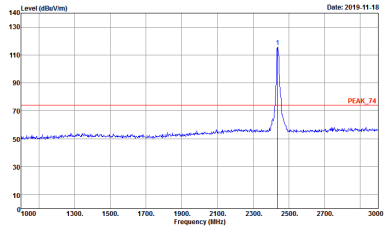
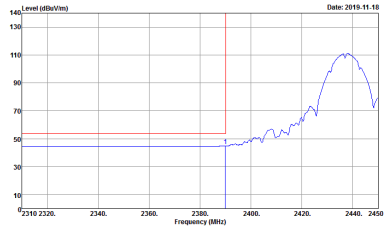
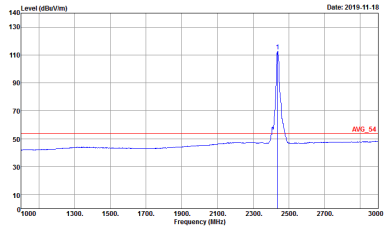
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch44

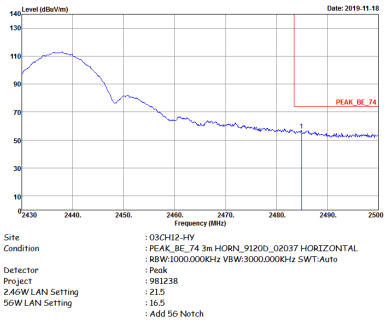
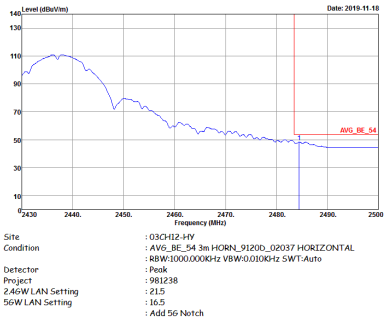
Co-location mode (Harmonic @ 3m)

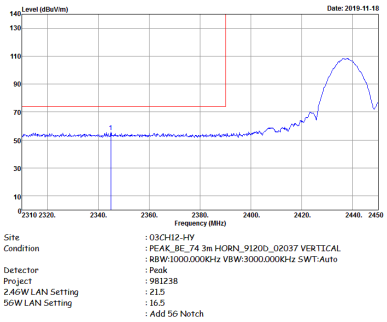
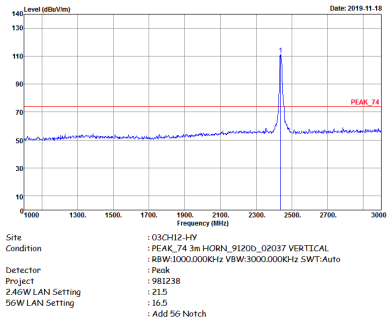
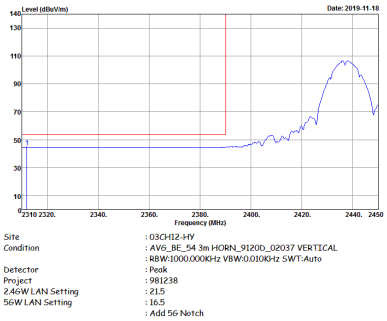
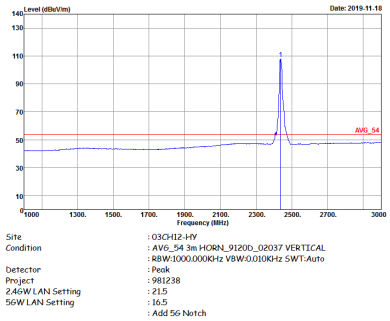
	Co-location mode Harmonic @ 3m	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 17	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 VERTICAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 17

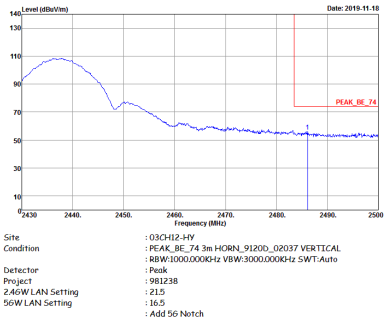
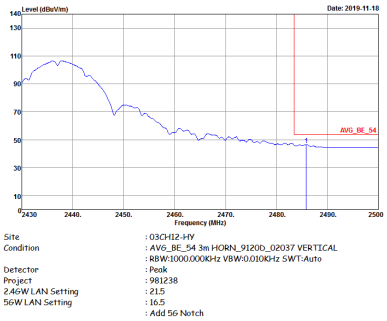
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch60

WIFI 802.11b (Band Edge @ 3m)

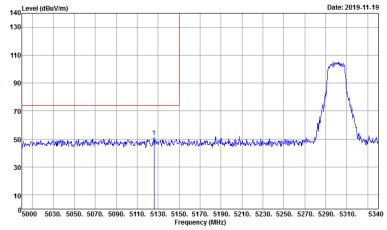
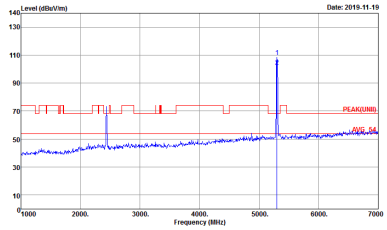
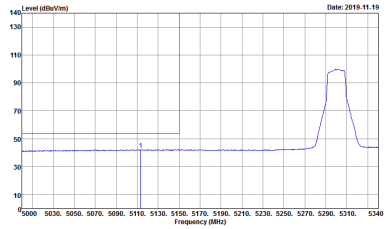
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch
Avg.	 Site : 03CH12-HY Condition : AV6_BE_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch	 Site : 03CH12-HY Condition : AV6_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch

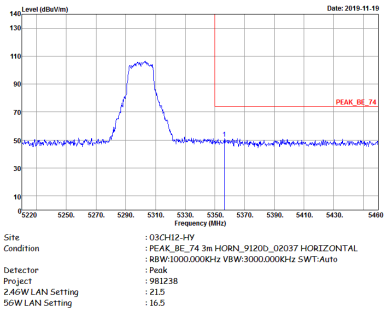
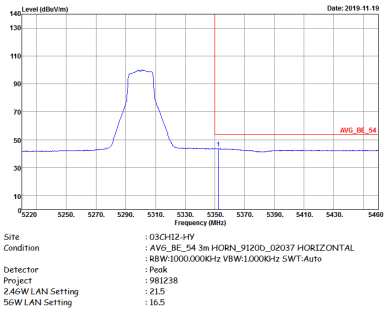
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

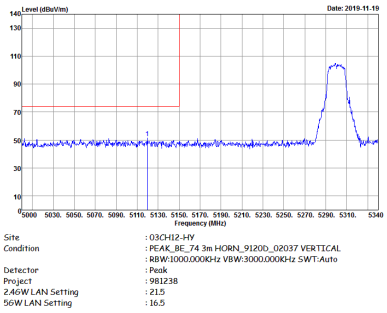
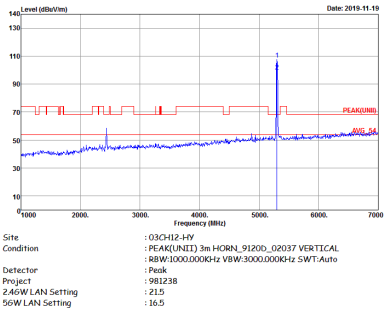
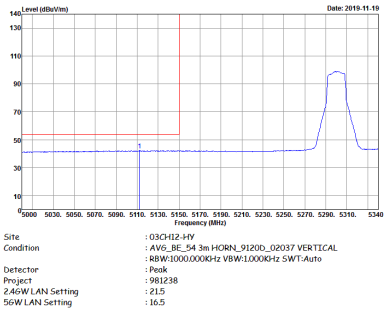
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

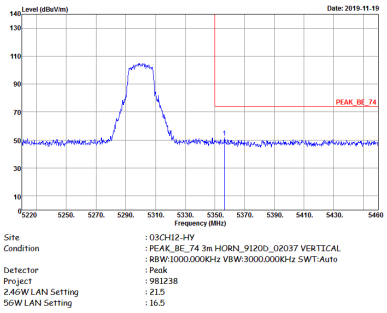
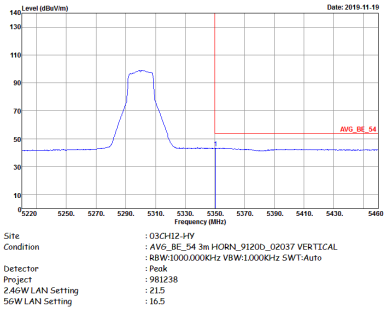
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11a CH60 5300MHz - L	
2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5	Left blank

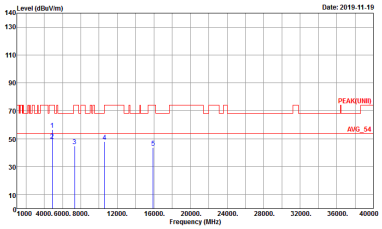
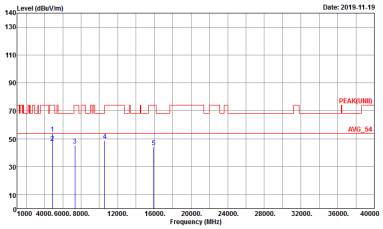
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11a CH60 5300MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11a CH60 5300MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11a CH60 5300MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

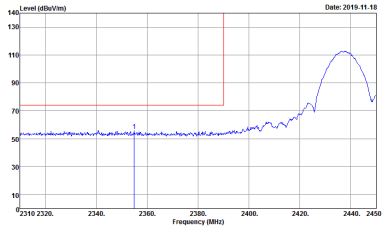
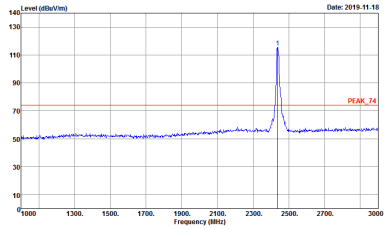
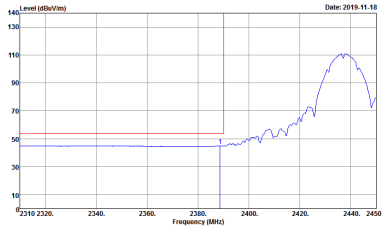
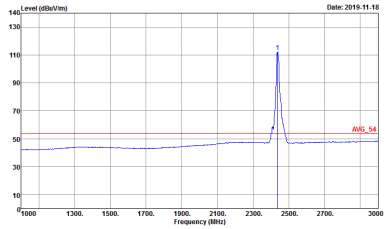
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch60

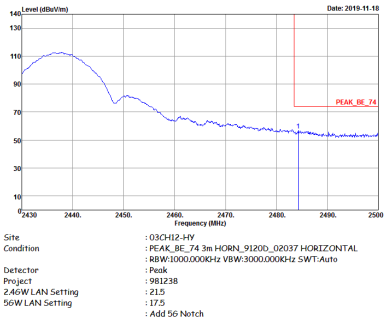
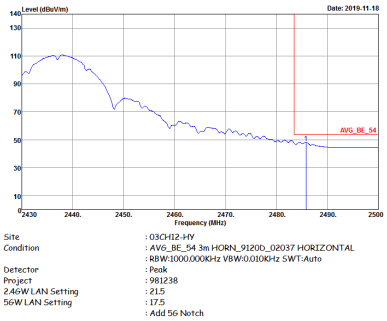
Co-location mode (Harmonic @ 3m)

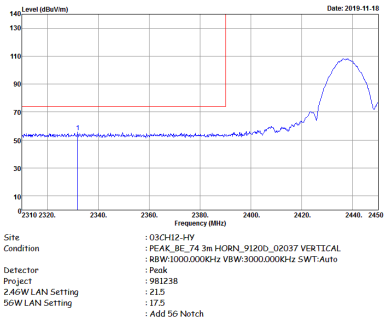
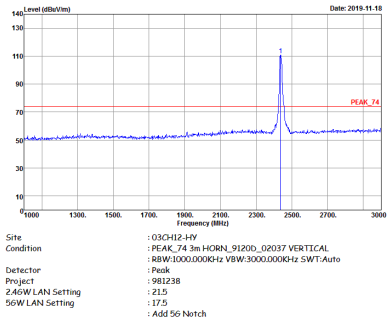
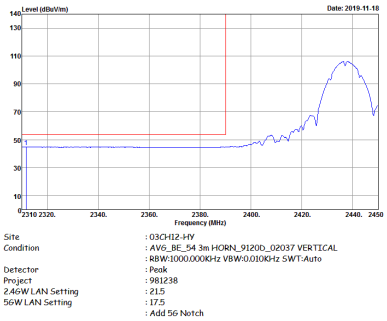
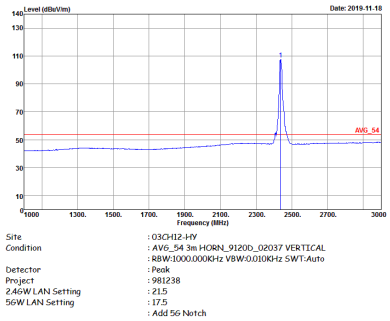
	Co-location mode Harmonic @ 3m	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 16.5	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 VERTICAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 16.5

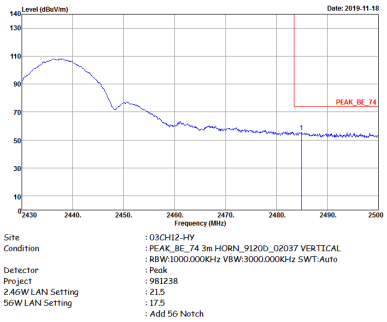
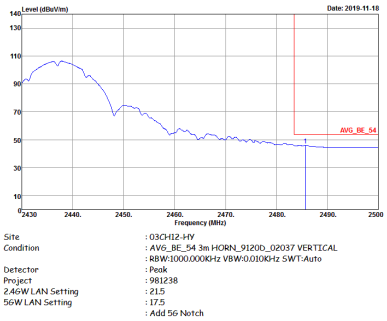
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch116

WIFI 802.11b (Band Edge @ 3m)

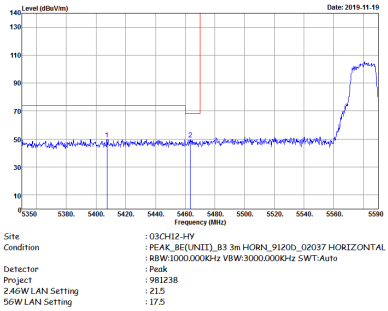
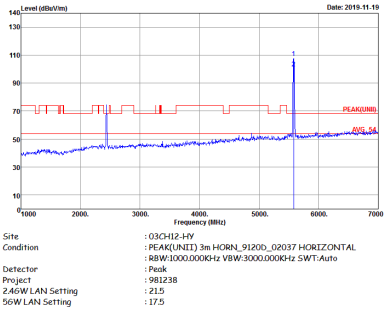
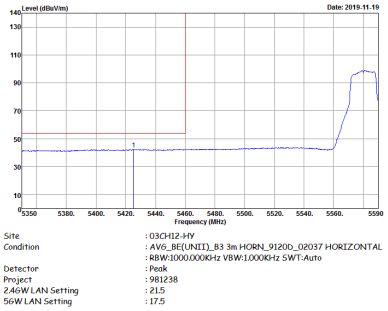
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17.5 : Add 5G Notch	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17.5 : Add 5G Notch
Avg.	 Site : 03CH12-HY Condition : AV6_BE_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17.5 : Add 5G Notch	 Site : 03CH12-HY Condition : AV6_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 17.5 : Add 5G Notch

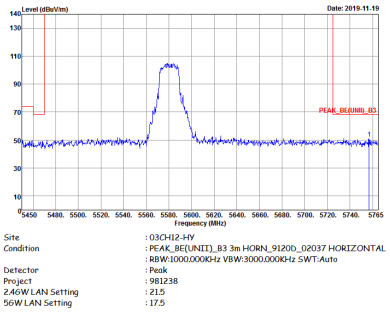
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

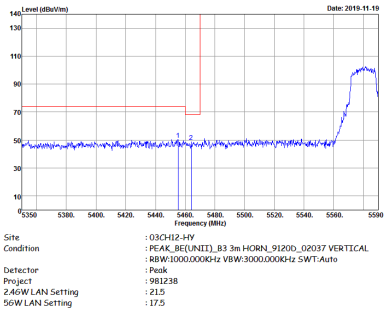
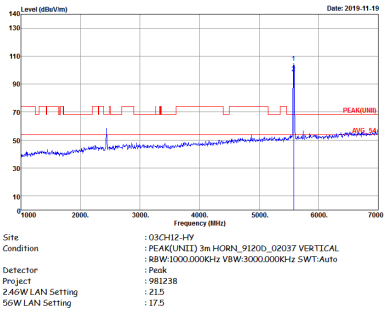
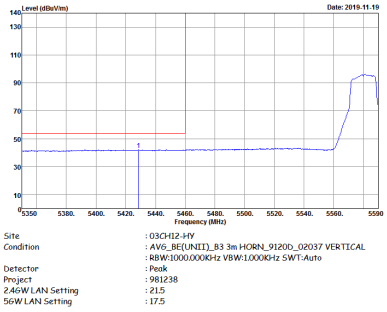
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

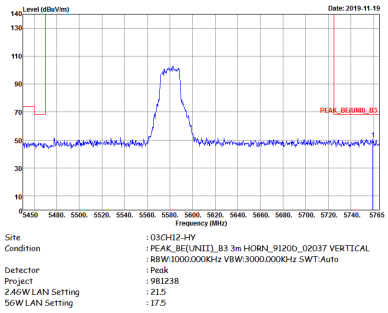
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH116 5580MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

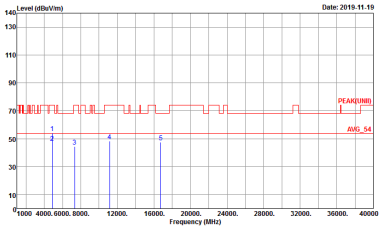
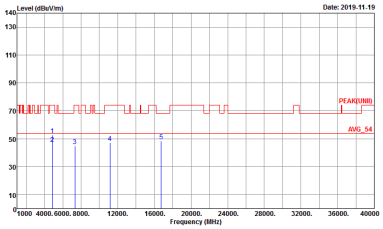
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH116 5580MHz - R	
2	Horizontal	Fundamental
Peak		Left blank

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH116 5580MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH116 5580MHz - R	
2	Vertical	Fundamental
Peak		Left blank

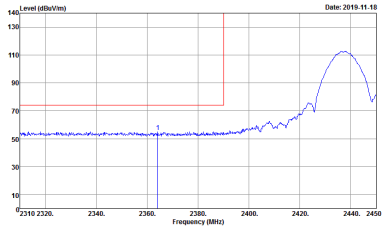
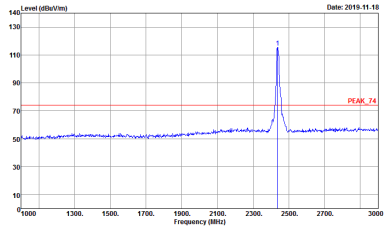
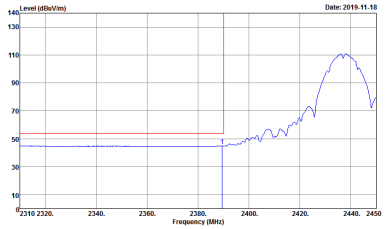
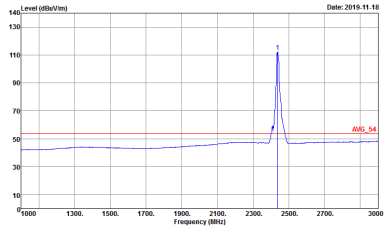
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch116

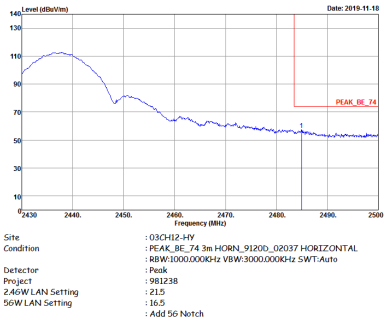
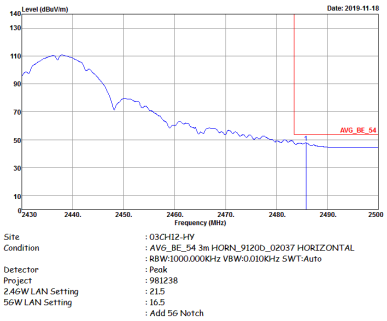
Co-location mode (Harmonic @ 3m)

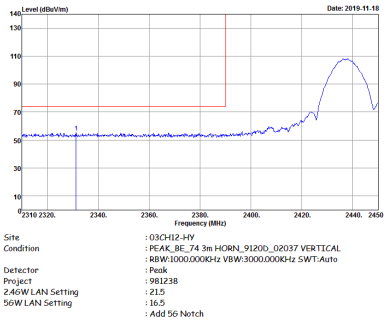
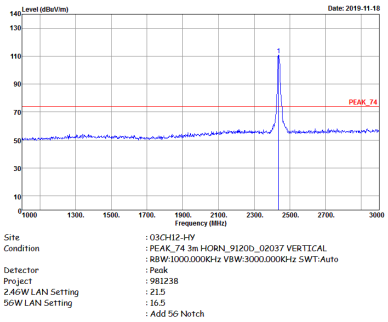
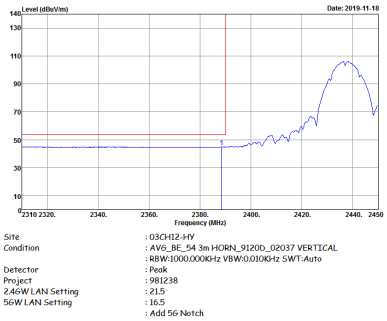
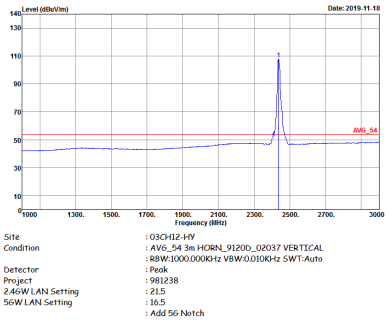
	Co-location mode Harmonic @ 3m	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 17.5	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 VERTICAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 17.5

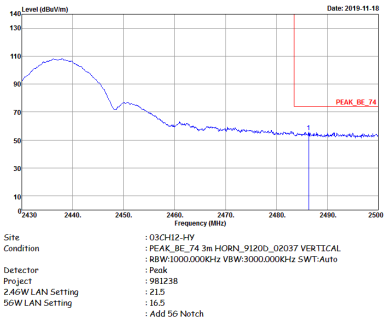
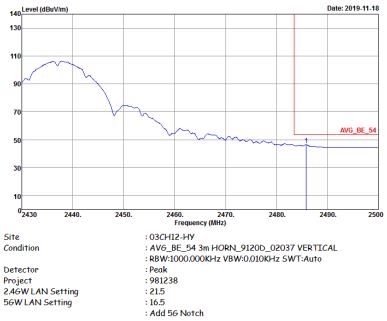
2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch157

WIFI 802.11b (Band Edge @ 3m)

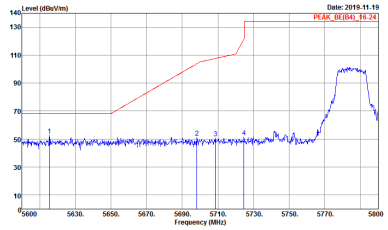
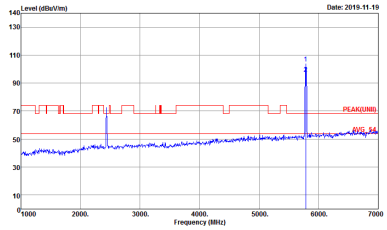
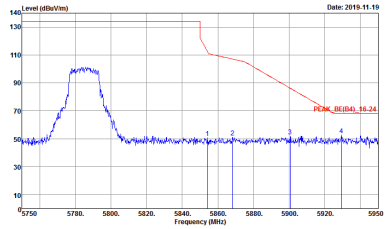
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch
Avg.	 Site : 03CH12-HY Condition : AV6_BE_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch	 Site : 03CH12-HY Condition : AV6_54 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 5G Notch

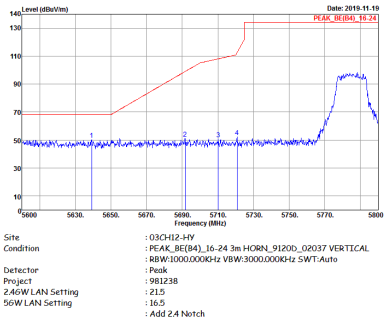
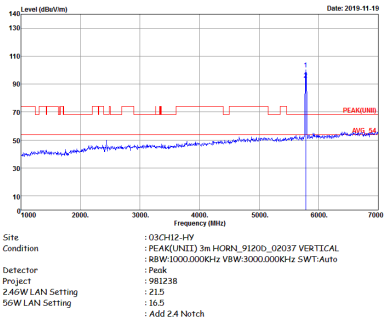
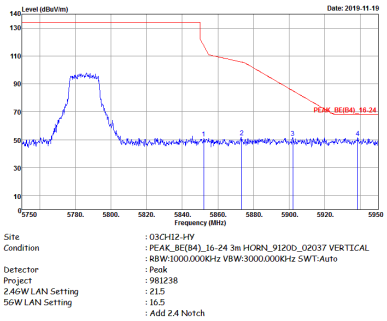
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

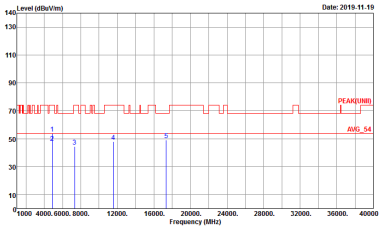
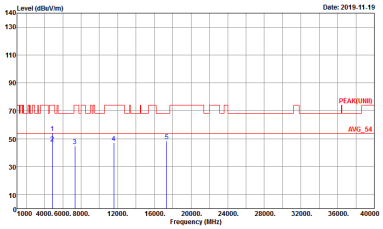
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 2.4 Notch	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 2.4 Notch
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_02037 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 981238 2.4GW LAN Setting : 21.5 5GW LAN Setting : 16.5 : Add 2.4 Notch	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Vertical	Fundamental
Peak		
Peak		Left blank

2.4G 11b_Tx_Ch06 + 5G 11a_Tx_Ch157

Co-location mode (Harmonic @ 3m)

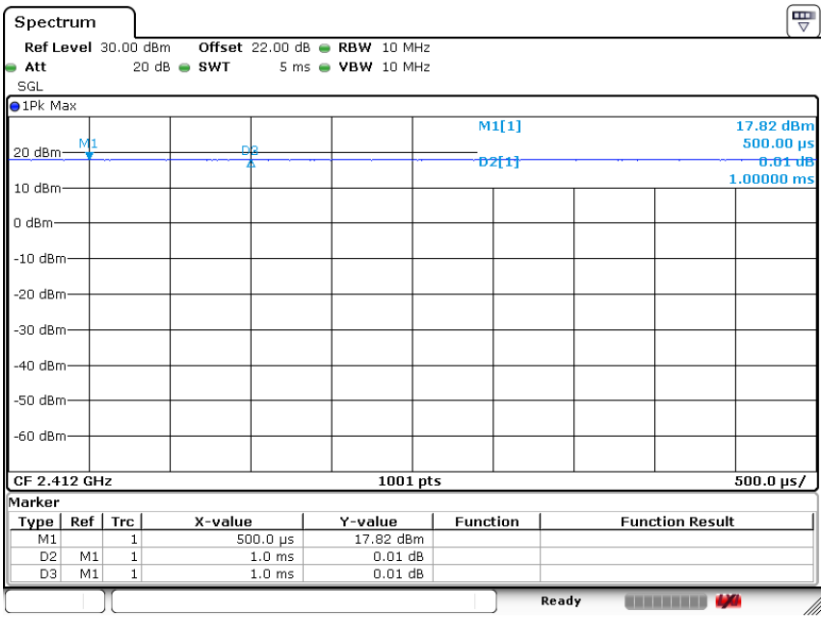
	Co-location mode Harmonic @ 3m	
	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 HORIZONTAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 16.5	 Site : 03CH12-HY Condition : PEAK(UNII) 3m HORN_9120D_02037 VERTICAL Detector : Peak Project : 981238 2.4G WLAN Setting : 21.5 5G WLAN Setting : 16.5

Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor (dB)
1	2.4GHz 802.11b	100.00	-	-	10Hz	0.00
2	5GHz 802.11a	95.82	2062	0.48	1kHz	0.19

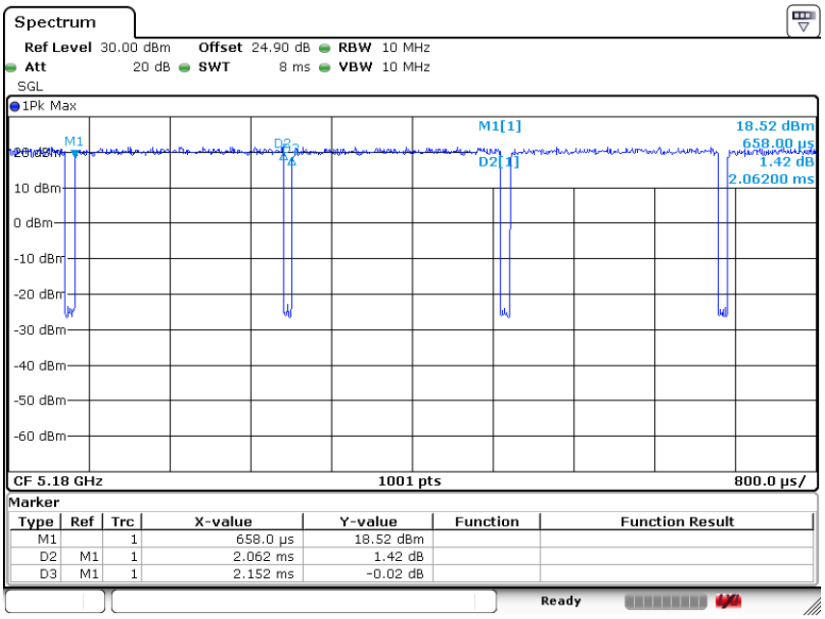
<Ant. 1>

2.4GHz 802.11b



<Ant. 2>

5GHz 802.11a



Date: 11.OCT.2019 19:06:31