

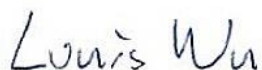


FCC CO-LOCATION RADIO TEST REPORT

FCC ID : A4RGB7N6
Equipment : Phone
Model Name : GB7N6, GR1YH
Applicant : Google LLC
1600 Amphitheatre Parkway,
Mountain View, California, 94043 USA
Standard : FCC Part 15 Subpart E §15.407

The product was received on Jun. 03, 2021 and testing was started from Jun. 11, 2021 and completed on Jul. 27, 2021. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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



Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

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



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History of this test report

Report No.	Version	Description	Issued Date
FR0D2942-05I	01	Initial issue of report	Aug. 04, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(b)	Unwanted Emissions	Pass	Under limit 1.58 dB at 5381.600 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: William Chen

Report Producer: Cindy Liu



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Phone
Model Name	GB7N6, GR1YH
FCC ID	A4RGB7N6
EUT supports Radios application	GSM/EGPRS/WCDM/HSPA/LTE/5G NR/NFC/ GNSS/WPC/WPT WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE

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

EUT Information List	
S/N	Performed Test Item
15171FDF600099	Radiated Spurious Emission

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard												
Tx/Rx Channel Frequency Range		2400 MHz ~ 2483.5 MHz 5180 MHz ~ 5240 MHz 5925 MHz ~ 6425 MHz										
Antenna Type / Gain		<Bluetooth> <Ant. 4> : ILA Antenna with gain -1.1 dBi <Ant. 3> : IFA Antenna with gain -1.4 dBi <2400 MHz ~ 2483.5 MHz> <Ant. 4> : ILA Antenna with gain -1.1 dBi <Ant. 3> : IFA Antenna with gain -1.4 dBi <5180 MHz ~ 5240 MHz> <Ant. 4> : ILA Antenna with gain -1.1 dBi <Ant. 3> : IFA Antenna with gain -2.6 dBi <5925 MHz ~ 6425 MHz> <Ant. 4> : ILA Antenna with gain -1.0 dBi <Ant. 3> : IFA Antenna with gain -0.1 dBi										
Type of Modulation		Bluetooth BR (1Mbps) : GFSK Bluetooth LE : GFSK 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax : OFDMA (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)										
Antenna Function for Transmitter		<table><tr><td></td><td>Ant. 4</td><td>Ant. 3</td></tr><tr><td>Bluetooth-LE</td><td>V</td><td>-</td></tr><tr><td>802.11 g/ax/ Bluetooth MIMO</td><td>V</td><td>V</td></tr></table>			Ant. 4	Ant. 3	Bluetooth-LE	V	-	802.11 g/ax/ Bluetooth MIMO	V	V
	Ant. 4	Ant. 3										
Bluetooth-LE	V	-										
802.11 g/ax/ Bluetooth MIMO	V	V										

Remark:

1. MIMO Ant. 4+3 is a calculated result from sum of the power MIMO Ant. 4 and MIMO Ant. 3.
2. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.3 Modification of EUT

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

1.4 Testing Location

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH16-HY

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

FCC designation No.: TW3786

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 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 987594 D02 U-NII 6 GHz EMC Measurement v01
- ♦ 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.

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

2400-2483.5 MHz Bluetooth EDR		2400-2483.5 MHz Bluetooth – LE	
Channel	Freq. (MHz)	Channel	Freq. (MHz)
78	2480	39	2480

2400-2483.5 MHz 802.11g		5150-5350 MHz 802.11ax HE160		5925-6425MHz 802.11ax HE160	
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
11	2462	50	5250	15	6025

2.2 Test Mode

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

<Co-Location>

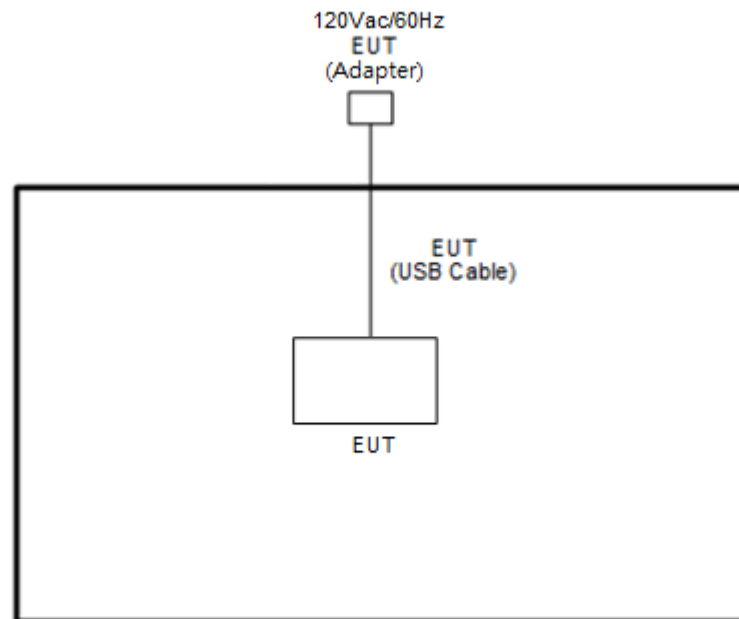
Modulation	Data Rate
Bluetooth for MIMO <Ant. 4+3> + WLAN 5GHz 802.11ax HE160 for MIMO <Ant. 4 + 3>	1Mbps + MCS0
Bluetooth-LE for Ant. 4 + WLAN 5GHz 802.11ax HE160 for MIMO <Ant. 4 + 3>	1Mbps + MCS0
WLAN 2.4GHz 802.11g for MIMO <Ant. 4+3> + WLAN 5GHz 802.11ax HE160 for MIMO <Ant. 4 + 3>	MCS0 + MCS0
Bluetooth for MIMO <Ant. 4+3> + WLAN 6GHz 802.11ax HE160 for MIMO <Ant. 4 + 3>	1Mbps + MCS0
Bluetooth LE for Ant. 4 + WLAN 6GHz 802.11ax HE160 for MIMO <Ant. 4 + 3>	1Mbps + MCS0
WLAN 2.4GHz 802.11g for MIMO <Ant. 4+3> + WLAN 6GHz 802.11ax HE160 for MIMO <Ant. 4 + 3>	MCS0 + MCS0

Remark:

1. For Radiated Test Cases, the tests were performed with Adapter 2 and USB Cable 2.
2. During the preliminary test, both charging modes (Adapter mode and WPC Charging mode) were verified. It is determined that the adaptor mode is the worst case for official test.

2.3 Connection Diagram of Test System

<Co-Location Tx Mode>



2.4 EUT Operation Test Setup

The RF test items, utility "CMD V10.0.18362.267 and adb command V_1.0.36" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

3 Test Result

3.1 Unwanted Emissions Measurement

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

<Limit of Unwanted Emissions>

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

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

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

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

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) For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of -27 dBm/MHz.

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27 (RMS)	68.3
- 7 (Peak)	88.3

According 987594 D02 U-NII 6GHz EMC Measurement v01 section G:

Unwanted emissions outside of restricted bands are measured with a RMS detector.

In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit

3.1.1 Measuring Instruments

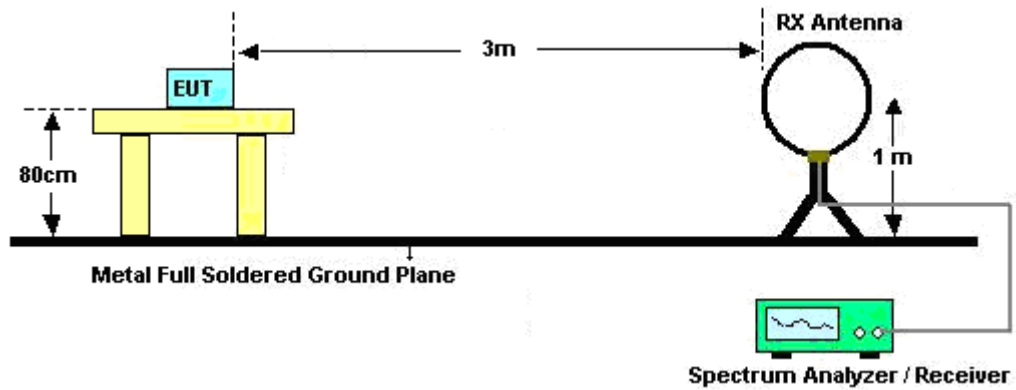
See list of measuring equipment of this test report.

3.1.2 Test Procedures

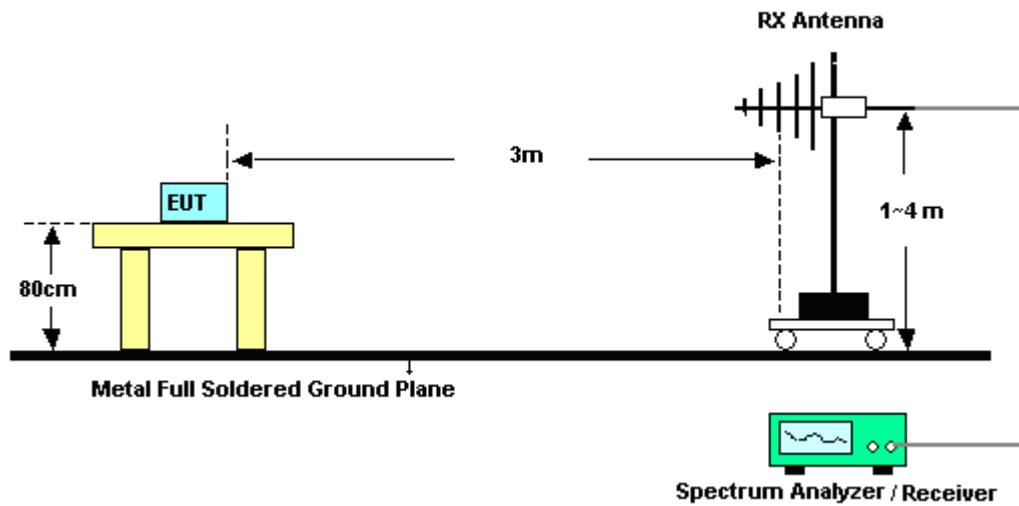
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
(1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 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.

3.1.3 Test Setup

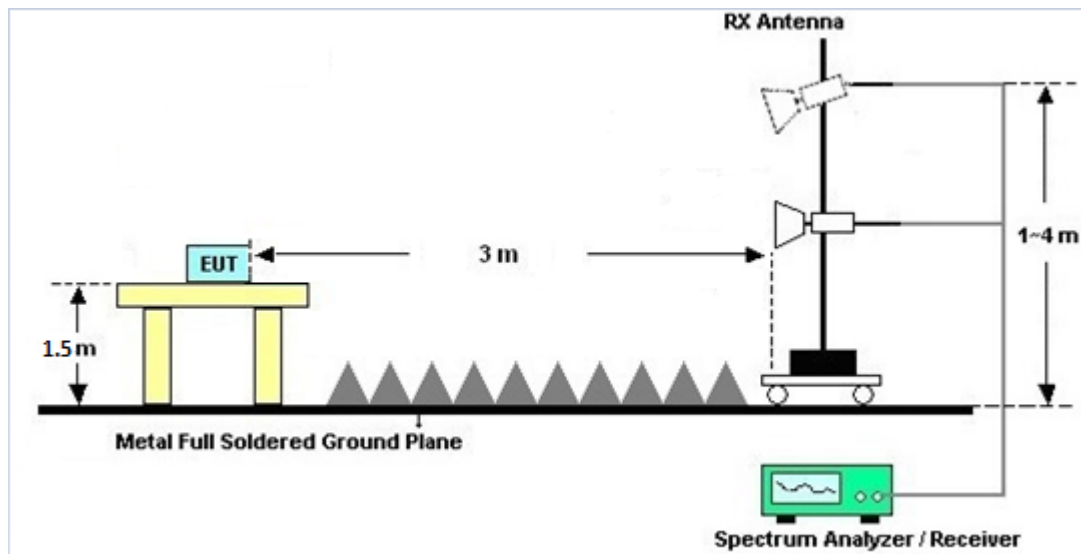
For radiated emissions below 30MHz



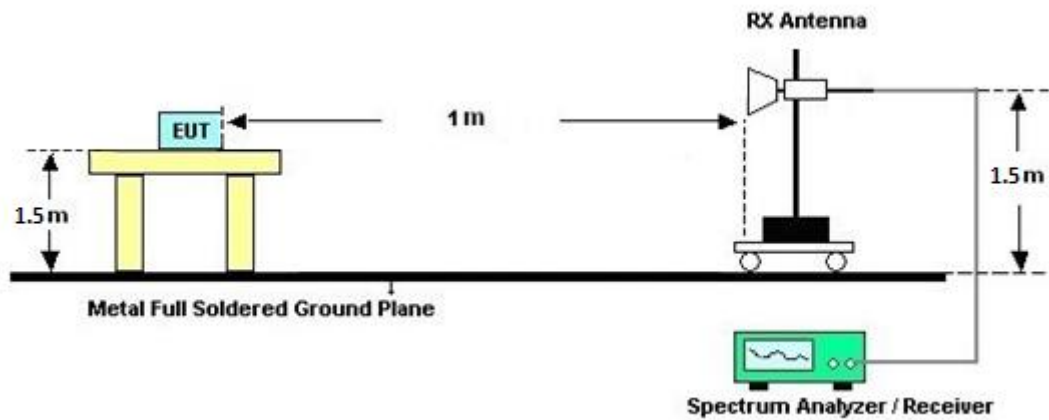
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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

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

3.1.5 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.6 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix A and B.



3.2 Antenna Requirements

3.2.1 Standard Applicable

<Bluetooth, Bluetooth-LE, WLAN 2.4GHz and WLAN 5GHz>

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

<WLAN 6GHz>

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Jun.11.,2021~ Jul. 27.,2021	Jan. 03, 2022	Radiation (03CH16-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00802N1D01N -06	47020 & 06	30MHz to 1GHz	Oct. 11, 2020	Jun. 11, 2021~ Jul. 27, 2021	Oct. 10, 2021	Radiation (03CH16-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-152 2	1G~18GHz	Sep. 29, 2020	Jun. 11, 2021~ Jul. 27, 2021	Sep. 28, 2021	Radiation (03CH16-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	00993	18GHz ~40GHz	Nov. 19, 2020	Jun. 11, 2021~ Jul. 27, 2021	Nov. 18, 2021	Radiation (03CH16-HY)
Amplifier	SONOMA	310N	371607	9kHz~1GHz	Sep. 30, 2020	Jun. 11, 2021~ Jul. 04, 2021	Sep. 29, 2021	Radiation (03CH16-HY)
Amplifier	EMCI	EMC051845SE	980729	1-18GHz	Jul. 10, 2020	Jun. 11, 2021~ Jul. 08, 2021	Jul. 09, 2021	Radiation (03CH16-HY)
Amplifier	EMCI	EMC051845SE	980729	1-18GHz	Jul. 09, 2021	Jul. 09, 2021~ Jul. 27, 2021	Jul. 08, 2022	Radiation (03CH16-HY)
Preamplifier	Jet-Power	JPA0118-55-30 3	171000180 0054001	1-18GHz	Sep. 04, 2020	Jun. 11, 2021~ Jul. 27, 2021	Sep. 03, 2021	Radiation (03CH16-HY)
Preamplifier	Keysight	83017A	MY532702 64	1GHz~26.5GHz	Dec. 10, 2020	Jun. 11, 2021~ Jul. 27, 2021	Dec. 09, 2021	Radiation (03CH16-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Jun. 11, 2021~ Jul. 27, 2021	Dec. 10, 2021	Radiation (03CH16-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY572901 11	3Hz~26.5GHz	Dec. 11, 2020	Jun. 11, 2021~ Jul. 27, 2021	Dec. 10, 2021	Radiation (03CH16-HY)
EMI Test Receiver	Keysight	N9010B	MY602405 20	3Hz ~40GHz	Dec. 02, 2020	Jun. 11, 2021~ Jul. 27, 2021	Dec. 01, 2021	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY11680/ 4PE	NA	Aug. 29, 2020	Jun. 11, 2021~ Jul. 27, 2021	Aug. 28, 2021	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY11688/ 4PE	NA	Aug. 29, 2020	Jun. 11, 2021~ Jul. 27, 2021	Aug. 28, 2021	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	EC-A5-300 -5757	NA	Aug. 29, 2020	Jun. 11, 2021~ Jul. 27, 2021	Aug. 28, 2021	Radiation (03CH16-HY)
Hygrometer	TECPEL	DTM-303B	TP200881	QA-3-031	Oct. 22, 2020	Jun. 11, 2021~ Jul. 27, 2021	Oct. 21, 2021	Radiation (03CH16-HY)
Software	Audix	E3 6.2009-8-24	RK-001136	N/A	N/A	Jun. 11, 2021~ Jul. 27, 2021	N/A	Radiation (03CH16-HY)
Controller	ChainTek	3000-1	N/A	Control Turn table & Ant Mast	N/A	Jun. 11, 2021~ Jul. 27, 2021	N/A	Radiation (03CH16-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Jun. 11, 2021~ Jul. 27, 2021	N/A	Radiation (03CH16-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Jun. 11, 2021~ Jul. 27, 2021	N/A	Radiation (03CH16-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7 dB
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Appendix A. Radiated Spurious Emission

Test Engineer :	Karl Hou and Andy Yang	Temperature :	20~25°C
		Relative Humidity :	50~60%

2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz

Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

BT Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preampl Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
4+3		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 78 2480MHz	*	2480	109.41	-	-	103.53	27.4	8.74	30.26	113	226	P	H
	*	2480	84.65	-	-	-	-	-	-	-	-	P	H
		2483.88	47.62	-26.38	74	41.73	27.4	8.74	30.25	113	226	P	H
		2483.88	22.86	-31.14	54	-	-	-	-	-	-	A	H
												P	H
												A	H
	*	2480	106.66	-	-	100.78	27.4	8.74	30.26	393	124	P	V
	*	2480	81.9	-	-	-	-	-	-	-	-	P	V
		2492.88	47.11	-26.89	74	41.2	27.4	8.76	30.25	393	124	P	V
		2492.88	22.35	-31.65	54	-	-	-	-	-	-	A	V
												P	V
												A	V



Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preampl	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE160 CH50 5250MHz		5145.34	58.77	-15.23	74	43.6	31.8	13.04	29.67	264	58	P	H
		5141.44	46.34	-7.66	54	31.17	31.8	13.04	29.67	264	58	A	H
	*	5250	101.43	-	-	86.62	31.3	13.2	29.69	264	58	P	H
	*	5250	91.93	-	-	77.12	31.3	13.2	29.69	264	58	A	H
		5381.04	60.42	-13.58	74	45.47	31.22	13.44	29.71	264	58	P	H
		5372.36	51.3	-2.7	54	36.4	31.19	13.42	29.71	264	58	A	H
		5144.3	57.83	-16.17	74	42.66	31.8	13.04	29.67	386	115	P	V
		5132.34	46.08	-7.92	54	30.92	31.8	13.03	29.67	386	115	A	V
	*	5250	99.73	-	-	84.92	31.3	13.2	29.69	386	115	P	V
	*	5250	90.24	-	-	75.43	31.3	13.2	29.69	386	115	A	V
		5398.68	58.16	-15.84	74	43.11	31.29	13.47	29.71	386	115	P	V
		5388.04	51.24	-2.76	54	36.25	31.25	13.45	29.71	386	115	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch50 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 78 2480MHz + 802.11ax HE160 CH 50 5250MHz		4960	55.77	-18.23	74	39.47	31.34	14.6	29.64	100	0	P	H
		4960	31.01	-22.99	54	-	-	-	-	-	-	A	H
		7440	46.38	-27.62	74	51.22	36.4	16.75	57.99	100	0	P	H
		7440	21.62	-32.38	54	-	-	-	-	-	-	A	H
		10500	49.12	-19.08	68.2	51.94	39.8	19.48	62.1	100	0	P	H
		15750	45.42	-28.58	74	44.89	37.35	23.38	60.2	100	0	P	H
													H
		4960	55.29	-18.71	74	38.99	31.34	14.6	29.64	100	0	P	V
		4960	30.53	-23.47	54	-	-	-	-	-	-	A	V
		7440	46.28	-27.72	74	51.12	36.4	16.75	57.99	100	0	P	V
		7440	21.52	-32.48	54	-	-	-	-	-	-	A	V
		10500	48.7	-19.5	68.2	51.52	39.8	19.48	62.1	100	0	P	V
		15750	46.02	-27.98	74	45.49	37.35	23.38	60.2	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz

Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz	*	2480	108	-	-	92.2	27.4	8.74	30.26	105	240	P	H
	*	2480	105.98	-	-	90.18	27.4	8.74	30.26	105	240	P	H
		2499.92	56.54	-17.46	74	40.7	27.4	8.77	30.25	105	240	P	H
		2483.56	46	-8	54	30.19	27.4	8.74	30.25	105	240	A	H
												P	H
												A	H
	*	2480	101.71	-	-	85.91	27.4	8.74	30.26	344	63	P	V
	*	2480	99.11	-	-	83.31	27.4	8.74	30.26	344	63	P	V
		2499.6	56.74	-17.26	74	40.9	27.4	8.77	30.25	344	63	P	V
		2489.12	45.84	-8.16	54	30.02	27.4	8.75	30.25	344	63	A	V
												P	V
												A	V



Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE160 CH50 5250MHz		5148.98	62.26	-11.74	74	47.08	31.8	13.05	29.67	264	58	P	H
		5132.6	47.4	-6.6	54	32.24	31.8	13.03	29.67	264	58	A	H
	*	5250	102.58	-	-	87.77	31.3	13.2	29.69	264	58	P	H
	*	5250	96.56	-	-	81.75	31.3	13.2	29.69	264	58	A	H
		5388.32	62.66	-11.34	74	47.67	31.25	13.45	29.71	264	58	P	H
		5381.6	52.42	-1.58	54	37.46	31.23	13.44	29.71	264	58	A	H
		5144.3	60.62	-13.38	74	45.45	31.8	13.04	29.67	400	116	P	V
		5143.52	45.87	-8.13	54	30.7	31.8	13.04	29.67	400	116	A	V
	*	5250	100.54	-	-	85.73	31.3	13.2	29.69	400	116	P	V
	*	5250	90.92	-	-	76.11	31.3	13.2	29.69	400	116	A	V
		5383	60.27	-13.73	74	45.31	31.23	13.44	29.71	400	116	P	V
		5388.04	50.2	-3.8	54	35.21	31.25	13.45	29.71	400	116	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												


Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (Harmonic @ 3m)

WIFI Ant. Simultaneously	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz + 802.11ax HE160 CH50 5250MHz		4960	56.81	-17.19	74	40.51	31.34	14.6	29.64	100	301	P	H
		4960	48	-6	54	31.7	31.34	14.6	29.64	100	301	A	H
		7440	46.64	-27.36	74	51.48	36.4	16.75	57.99	100	0	P	H
		10500	48.86	-19.34	68.2	51.68	39.8	19.48	62.1	100	0	P	H
		15750	45.66	-28.34	74	45.13	37.35	23.38	60.2	100	0	P	H
													H
													H
		4960	54.9	-19.1	74	38.6	31.34	14.6	29.64	350	169	P	V
		4960	46.91	-7.09	54	30.61	31.34	14.6	29.64	350	169	A	V
		7440	46.16	-27.84	74	51	36.4	16.75	57.99	100	0	P	V
		10500	48.53	-19.67	68.2	51.35	39.8	19.48	62.1	100	0	P	V
		15750	45.52	-28.48	74	44.99	37.35	23.38	60.2	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission above 18GHz

Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (SHF @ 1m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preampl	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz + 802.11ax HE160 CH50 5250MHz		19104	36.95	-37.05	74	57.11	38.58	-3.66	55.08	150	0	P	H
		35898	44.77	-23.43	68.2	60.07	44.56	-1.16	58.7	150	0	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		22816	38.22	-35.78	74	56.71	38.97	-3.21	54.25	150	0	P	V
		37158	45.21	-22.99	68.2	60.92	43.23	-1.13	57.81	150	0	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.												



Emission below 1GHz

Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BLE CH 39 2480MHz + 802.11ax HE160 CH50 5250MHz		63.95	18.95	-21.05	40	38.11	11.94	1.17	32.27	-	-	P	H
		100.81	23.55	-19.95	43.5	38.13	16.16	1.56	32.3	-	-	P	H
		130.88	25.57	-17.93	43.5	38.41	17.62	1.81	32.27	-	-	P	H
		205.57	21.55	-21.95	43.5	36.21	15.23	2.37	32.26	-	-	P	H
		260.86	19.15	-26.85	46	28.68	19.99	2.73	32.25	-	-	P	H
		730.34	30.69	-15.31	46	30.62	27.78	4.65	32.36	100	0	P	H
													H
													H
													H
													H
													H
													H
		50.37	31.02	-8.98	40	48.15	14.2	0.97	32.3	100	0	P	V
		97.9	32.71	-10.79	43.5	47.61	15.88	1.52	32.3	-	-	P	V
		129.91	25.27	-18.23	43.5	38.22	17.52	1.8	32.27	-	-	P	V
		188.11	21.37	-22.13	43.5	36.33	15.03	2.25	32.24	-	-	P	V
		260.86	19.65	-26.35	46	29.18	19.99	2.73	32.25	-	-	P	V
		735.19	30.93	-15.07	46	30.66	27.96	4.66	32.35	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
Remark	3. No other spurious found. 4. All results are PASS against limit line.												


2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz
Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 11 2462MHz	*	2462	114.7	-	-	98.94	27.4	18.62	30.26	100	290	P	H
	*	2462	106.8	-	-	91.04	27.4	18.62	30.26	100	290	P	H
		2483.52	60.21	-13.79	74	44.4	27.4	18.66	30.25	100	290	P	H
		2483.56	50.23	-3.77	54	34.42	27.4	18.66	30.25	100	290	A	H
												P	H
												A	H
	*	2462	109.33	-	-	93.57	27.4	18.62	30.26	400	124	P	V
	*	2462	101.64	-	-	85.88	27.4	18.62	30.26	400	124	P	V
		2497.8	57.18	-16.82	74	41.34	27.4	18.69	30.25	400	124	P	V
		2483.76	47.2	-6.8	54	31.39	27.4	18.66	30.25	400	124	A	V
												P	V
												A	V



Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE160 CH50 5250MHz		5147.68	60.22	-13.78	74	45.05	31.8	13.04	29.67	268	61	P	H
		5141.44	46.65	-7.35	54	31.48	31.8	13.04	29.67	268	61	A	H
	*	5250	102.56	-	-	87.75	31.3	13.2	29.69	268	61	P	H
	*	5250	91.85	-	-	77.04	31.3	13.2	29.69	268	61	A	H
		5388.32	61.43	-12.57	74	46.44	31.25	13.45	29.71	268	61	P	H
		5381.32	51.93	-2.07	54	36.97	31.23	13.44	29.71	268	61	A	H
		5143.78	58.17	-15.83	74	43	31.8	13.04	29.67	383	110	P	V
		5142.22	46.16	-7.84	54	30.99	31.8	13.04	29.67	383	110	A	V
	*	5250	99.68	-	-	84.87	31.3	13.2	29.69	383	110	P	V
	*	5250	90.01	-	-	75.2	31.3	13.2	29.69	383	110	A	V
		5386.36	60.43	-13.57	74	45.44	31.25	13.45	29.71	383	110	P	V
		5381.32	51.1	-2.9	54	36.14	31.23	13.44	29.71	383	110	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch50 (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)
802.11g CH 11 2462MHz + 802.11ax HE160 CH50 5250MHz		4874	54.44	-19.56	74	38.36	31.15	14.56	29.63	100	0	P	H
		4874	43.52	-10.48	54	27.44	31.15	14.56	29.63	100	0	A	H
		7386	45.09	-28.91	74	49.91	36.43	16.73	57.98	100	0	P	H
		10500	48.5	-19.7	68.2	51.32	39.8	19.48	62.1	100	0	P	H
		15750	46.27	-27.73	74	45.74	37.35	23.38	60.2	100	0	P	H
													H
													H
		4874	54.88	-19.12	74	38.8	31.15	14.56	29.63	100	0	P	V
		4874	43.44	-10.56	54	27.36	31.15	14.56	29.63	100	0	A	V
		7386	46.25	-27.75	74	51.07	36.43	16.73	57.98	100	0	P	V
		10500	48.58	-19.62	68.2	51.4	39.8	19.48	62.1	100	0	P	V
		15750	45.45	-28.55	74	44.92	37.35	23.38	60.2	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz + Band 5 - 5925~6425MHz

Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 78 2480MHz	*	2480	109.4	-	-	103.52	27.4	8.74	30.26	112	226	P	H
	*	2480	84.64	-	-	-	-	-	-	-	-	P	H
		2483.88	47.97	-26.03	74	42.08	27.4	8.74	30.25	112	226	P	H
		2483.88	23.21	-30.79	54	-	-	-	-	-	-	A	H
												P	H
												A	H
	*	2480	106.35	-	-	100.47	27.4	8.74	30.26	388	137	P	V
	*	2480	81.59	-	-	-	-	-	-	-	-	P	V
		2487.92	47.67	-26.33	74	41.77	27.4	8.75	30.25	388	137	P	V
		2487.92	22.91	-31.09	54	-	-	-	-	-	-	A	V
												P	V
												A	V



Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch15 (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)
802.11ax HE160 CH 15 6025MHz		5916.84	75.96	-12.24	88.2	59.81	32.23	13.81	29.89	100	60	P	H
		5916.52	65.14	-3.06	68.2	48.99	32.23	13.81	29.89	100	60	A	H
	*	6025	104.02	-	-	87.73	32.35	13.87	29.93	100	60	P	H
	*	6025	94.76	-	-	78.47	32.35	13.87	29.93	100	60	A	H
												P	H
												A	H
		5873.64	75.68	-12.52	88.2	59.59	32.15	13.81	29.87	377	118	P	V
		5907.56	64.6	-3.6	68.2	48.45	32.22	13.81	29.88	377	118	A	V
	*	6025	103.28	-	-	86.99	32.35	13.87	29.93	377	118	P	V
	*	6025	94.6	-	-	78.31	32.35	13.87	29.93	377	118	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												


Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch15 (Harmonic @ 3m)

WIFI Ant. Simultaneously	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 78 2480MHz + 802.11ax HE160 CH 15 6025MHz		4960	44.3	-29.7	74	56.62	31.34	14.36	58.02	100	0	P	H
		4960	19.54	-34.46	54	-	-	-	-	-	-	A	H
		7440	46.91	-27.09	74	50.95	36.4	17.55	57.99	100	0	P	H
		7440	22.15	-31.85	54	-	-	-	-	-	-	A	H
		12050	48	-26	74	50.01	38.85	20.06	60.92	100	0	P	H
		17968	59.18	-14.82	74	42.11	48.63	25.28	56.84	100	0	P	H
		17968	47.93	-6.07	54	30.86	48.63	25.28	56.84	100	0	A	H
		18075	37.08	-36.92	74	58.67	37.96	-3.72	55.83	100	0	P	H
		4960	43.36	-30.64	74	55.68	31.34	14.36	58.02	100	0	P	V
		4960	18.6	-35.4	54	-	-	-	-	-	-	A	V
		7440	46.81	-27.19	74	50.85	36.4	17.55	57.99	100	0	P	V
		7440	22.05	-31.95	54	-	-	-	-	-	-	A	V
		12050	47.84	-26.16	74	49.85	38.85	20.06	60.92	100	0	P	V
		17968	58.93	-15.07	74	41.86	48.63	25.28	56.84	100	0	P	V
		17968	47.56	-6.44	54	30.49	48.63	25.28	56.84	100	0	A	V
		18075	43.39	-30.61	74	65	37.96	-3.72	55.85	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz + Band 5 - 5925~6425MHz****Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)**

BLE	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz	*	2480	109.1	-	-	93.3	27.4	18.66	30.26	106	235	P	H
	*	2480	107.54	-	-	91.74	27.4	18.66	30.26	106	235	P	H
		2490.16	56.77	-17.23	74	40.94	27.4	18.68	30.25	106	235	P	H
		2483.56	46.25	-7.75	54	30.44	27.4	18.66	30.25	106	235	A	H
												P	H
												A	H
	*	2480	102.16	-	-	86.36	27.4	18.66	30.26	356	79	P	V
	*	2480	100.61	-	-	84.81	27.4	18.66	30.26	356	79	P	V
		2493.88	57.03	-16.97	74	41.2	27.4	18.68	30.25	356	79	P	V
		2484.08	45.65	-8.35	54	29.84	27.4	18.66	30.25	356	79	A	V
												P	V
												A	V



Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE160 CH 15 6025MHz		5873.64	73.13	-15.07	88.2	57.04	32.15	13.81	29.87	301	64	P	H
		5916.52	63.05	-5.15	68.2	46.9	32.23	13.81	29.89	301	64	A	H
	*	6025	103.39	-	-	87.1	32.35	13.87	29.93	301	64	P	H
	*	6025	93.35	-	-	77.06	32.35	13.87	29.93	301	64	A	H
												P	H
												A	H
		5907.88	74	-14.2	88.2	57.85	32.22	13.81	29.88	396	117	P	V
		5907.56	62.49	-5.71	68.2	46.34	32.22	13.81	29.88	396	117	A	V
	*	6025	105.32	-	-	89.03	32.35	13.87	29.93	396	117	P	V
	*	6025	94.61	-	-	78.32	32.35	13.87	29.93	396	117	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch15 (Harmonic @ 3m)

WIFI Ant. Simultaneously	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BLE CH 39 2480MHz + 802.11ax HE160 CH 15 6025MHz		4960	47.09	-26.91	74	59.41	31.34	14.36	58.02	100	0	P	H
		7440	47.2	-26.8	74	51.24	36.4	17.55	57.99	100	0	P	H
		12050	47.26	-26.74	74	49.27	38.85	20.06	60.92	100	0	P	H
		17976	58.72	-15.28	74	41.46	48.8	25.29	56.83	100	0	P	H
		17976	47.87	-6.13	54	30.61	48.8	25.29	56.83	100	0	A	H
		18075	36.16	-37.84	74	57.75	37.96	-3.72	55.83	100	0	P	
													H
													H
		4960	45.43	-28.57	74	57.75	31.34	14.36	58.02	100	0	P	V
		7440	46.94	-27.06	74	50.98	36.4	17.55	57.99	100	0	P	V
		12050	47.55	-26.45	74	49.56	38.85	20.06	60.92	100	0	P	V
		17968	58.1	-15.9	74	41.03	48.63	25.28	56.84	100	0	P	V
		17968	47.94	-6.06	54	30.87	48.63	25.28	56.84	100	0	A	V
		18075	44.08	-29.92	74	65.67	37.96	-3.72	55.83	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz + Band 5 - 5925~6425MHz

Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (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)
802.11g CH 11 2462MHz	*	2462	113.55	-	-	97.79	27.4	18.62	30.26	100	304	P	H
	*	2462	106.38	-	-	90.62	27.4	18.62	30.26	100	304	P	H
		2484	62.42	-11.58	74	46.61	27.4	18.66	30.25	100	304	P	H
		2483.52	51.69	-2.31	54	35.88	27.4	18.66	30.25	100	304	A	H
												P	H
												A	H
	*	2462	108.37	-	-	92.61	27.4	18.62	30.26	400	121	P	V
	*	2462	100.09	-	-	84.33	27.4	18.62	30.26	400	121	P	V
		2491.88	57.09	-16.91	74	41.26	27.4	18.68	30.25	400	121	P	V
		2483.68	47.25	-6.75	54	31.44	27.4	18.66	30.25	400	121	A	V
												P	V
												A	V



Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (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)
802.11ax HE160 CH 15 6025MHz		5916.84	77.5	-10.7	88.2	61.35	32.23	13.81	29.89	297	66	P	H
		5907.56	65.62	-2.58	68.2	49.47	32.22	13.81	29.88	297	66	A	H
	*	6025	-	-	88.2	87.01	32.35	13.87	29.93	297	66	P	H
	*	6025	-	-	68.2	77.15	32.35	13.87	29.93	297	66	A	H
												P	H
												A	H
		5879.72	75.49	-12.71	88.2	59.39	32.16	13.81	29.87	397	116	P	V
		5907.88	65.58	-2.62	68.2	49.43	32.22	13.81	29.88	397	116	A	V
	*	6025	-	-	88.2	86.1	32.35	13.87	29.93	397	116	P	V
	*	6025	-	-	68.2	77.49	32.35	13.87	29.93	397	116	A	V
												P	V
												A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (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)
802.11g CH 11 2462MHz + 802.11ax HE160 CH 15 6025MHz		4924	44.83	-29.17	74	57.31	31.2	14.35	58.03	100	0	P	H
		7386	46.76	-27.24	74	50.82	36.43	17.49	57.98	100	0	P	H
		12050	47.51	-26.49	74	49.52	38.85	20.06	60.92	100	0	P	H
		17968	58.32	-15.68	74	41.25	48.63	25.28	56.84	100	0	P	H
		17968	47.75	-6.25	54	30.68	48.63	25.28	56.84	100	0	A	H
		18075	35.68	-38.32	74	57.27	37.96	-3.72	55.83	100	0	P	H
													H
		4924	44.43	-29.57	74	56.91	31.2	14.35	58.03	100	0	P	V
		7386	46.49	-27.51	74	50.55	36.43	17.49	57.98	100	0	P	V
		12050	47.32	-26.68	74	49.33	38.85	20.06	60.92	100	0	P	V
		17976	58.24	-15.76	74	40.98	48.8	25.29	56.83	100	0	P	V
		17976	47.91	-6.09	54	30.65	48.8	25.29	56.83	100	0	A	V
		18075	41.06	-32.94	74	62.65	37.96	-3.72	55.83	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
Simultaneously		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 11 2462MHz + 802.11ax HE160 CH 15 6025MHz		64.92	18.12	-21.88	40	37.29	11.92	1.18	32.27	-	-	P	H
		98.87	31.96	-11.54	43.5	46.76	15.96	1.54	32.3	100	0	P	H
		128.94	25.94	-17.56	43.5	38.94	17.48	1.79	32.27	-	-	P	H
		210.42	28.68	-14.82	43.5	43.35	15.19	2.4	32.26	-	-	P	H
		331.67	23.09	-22.91	46	32.34	19.94	3.06	32.25	-	-	P	H
		714.82	30.66	-15.34	46	31.47	26.95	4.62	32.38	-	-	P	H
													H
													H
													H
													H
													H
													H
		48.43	29.28	-10.72	40	45.71	14.93	0.94	32.3	-	-	P	V
		66.86	28.41	-11.59	40	47.32	12.17	1.2	32.28	-	-	P	V
		97.9	33.79	-9.71	43.5	48.69	15.88	1.52	32.3	100	0	P	V
		166.77	20.88	-22.62	43.5	35.01	16.02	2.09	32.24	-	-	P	V
		211.39	20.56	-22.94	43.5	35.22	15.19	2.41	32.26	-	-	P	V
		746.83	31.92	-14.08	46	31.44	28.13	4.69	32.34	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
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													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.
-	The signal is Unintentional Radiators .
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.	
Simultaneously		(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 B. Radiated Spurious Emission Plots

Test Engineer :	Karl Hou and Andy Yang	Temperature :	20~25°C
		Relative Humidity :	50~60%

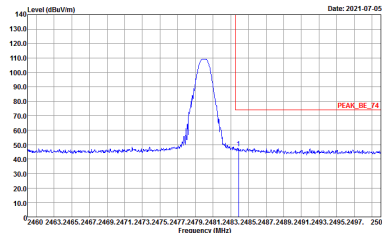
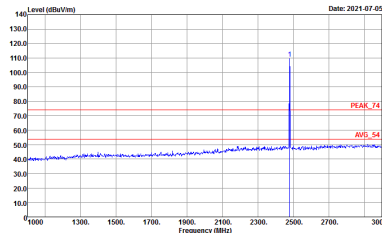
Note symbol

-L	Low channel location
-R	High channel location

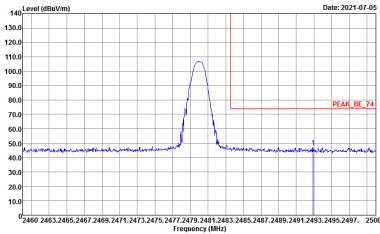
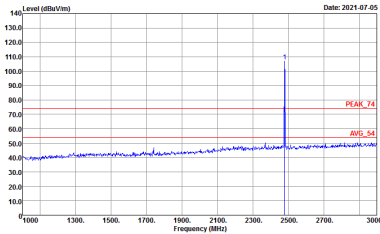


2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz

Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

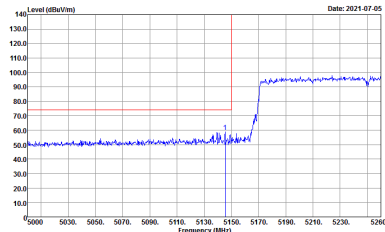
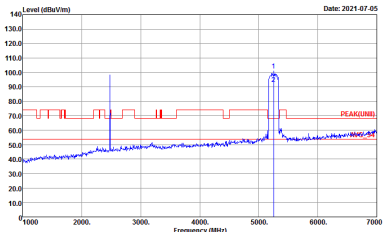
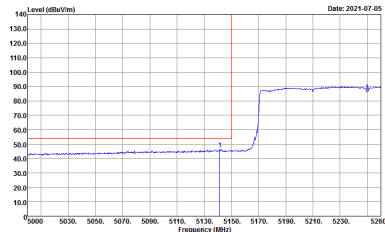
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
4+3	Horizontal	Fundamental
Peak	 Site Condition : 03CH16-HV : PEAK_BE_74 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site Condition : 03CH16-HV : PEAK_74 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto



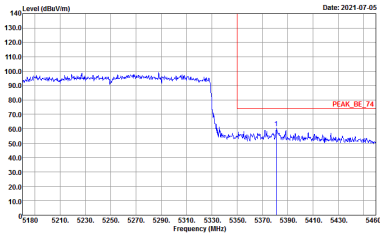
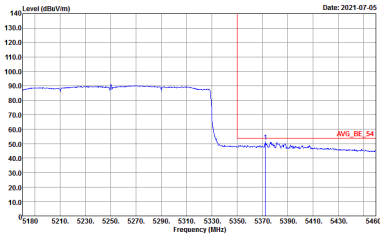
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_0E_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto



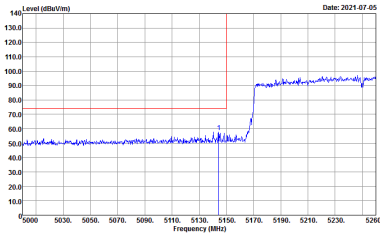
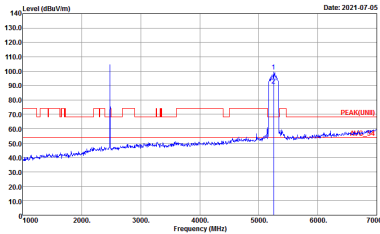
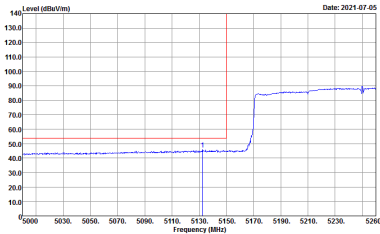
Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - L	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE_74 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HV Condition : PEAK(UNIT) 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HV Condition : AVG_BE_54 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank

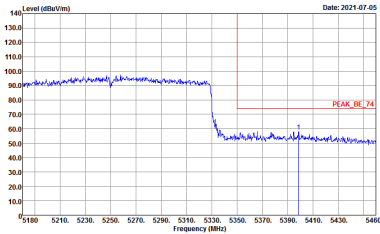
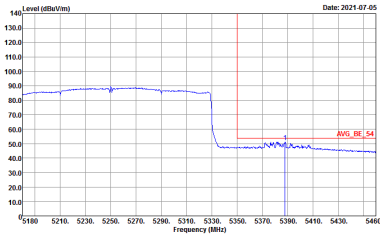


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - R	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



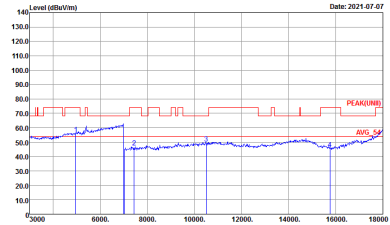
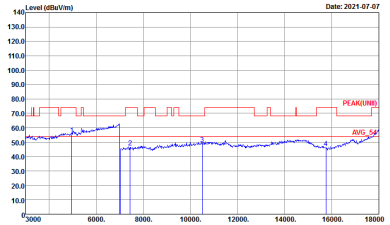
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



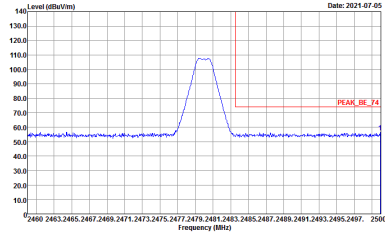
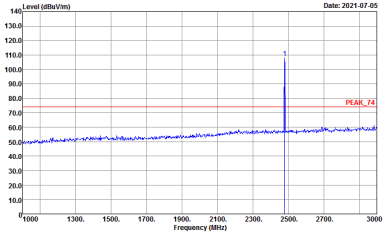
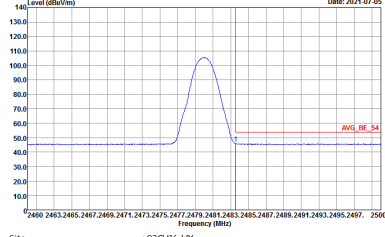
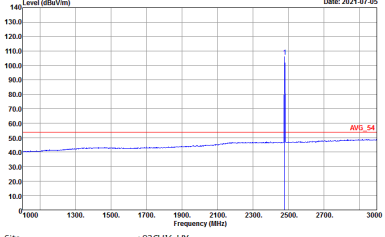
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - R	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch50 (Harmonic @ 3m)

BT +WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz + 802.11ax HE160 CH50 5250MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 9120D_1522 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 9120D_1522 VERTICAL Detector : Peak

2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz
Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

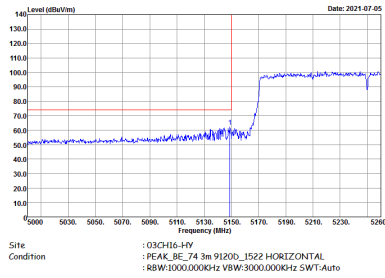
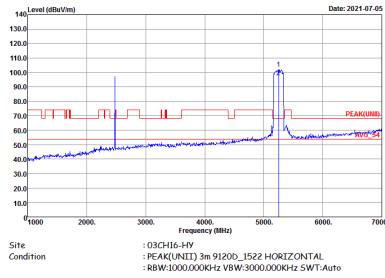
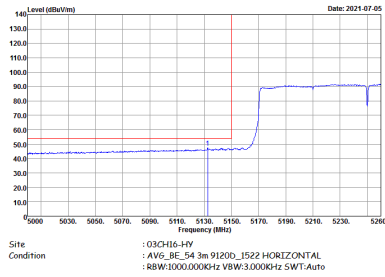
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE_CH39 2480MHz	
4	Horizontal	Fundamental
Peak	 Site Condition : 03CH16-HY : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site Condition : 03CH16-HY : PEAK_74 3m 91200_1522 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site Condition : 03CH16-HY : AVG_BE_54 3m 91200_1522 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto	 Site Condition : 03CH16-HY : AVG_54 3m 91200_1522 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto
Avg.		



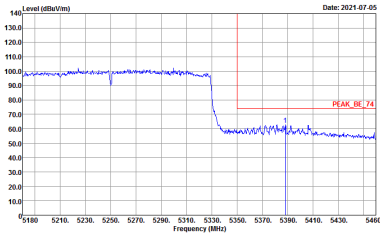
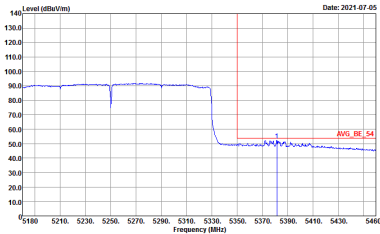
BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE_CH39 2480MHz	
4	Vertical	Fundamental
Peak	Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Site : 03CH16-HY Condition : AVG_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto



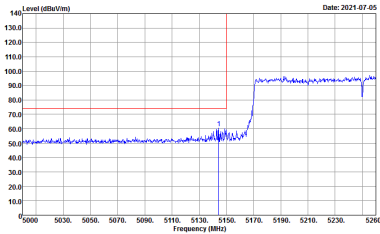
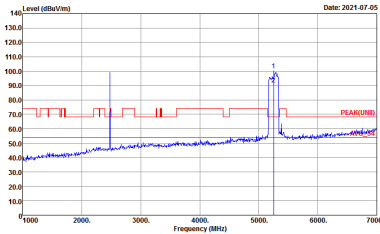
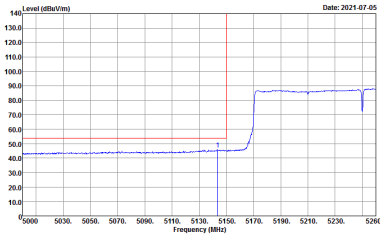
Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - L	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HV Condition : PEAK(UNIT) 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HV Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank

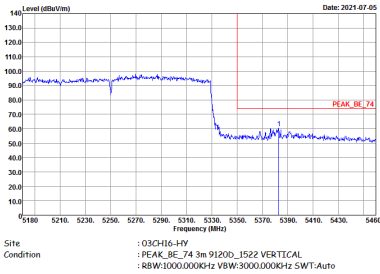
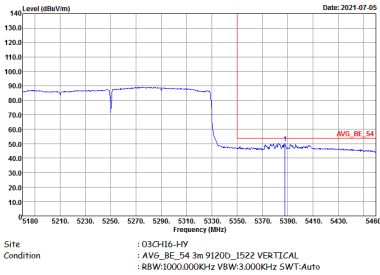


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - R	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank



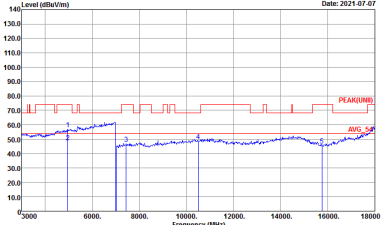
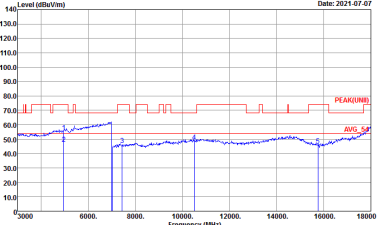
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank



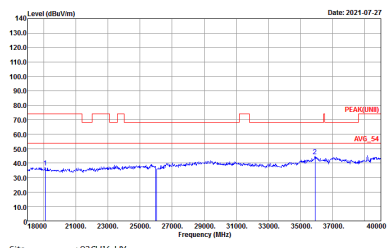
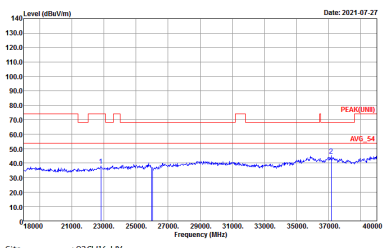
Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (Harmonic @ 3m)

BLE + WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz Harmonic @ 3m	
ANT	BLE_CH39 2480MHz + 802.11ax HE160 CH50 5250MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 9120D_1522 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 9120D_1522 VERTICAL Detector : Peak

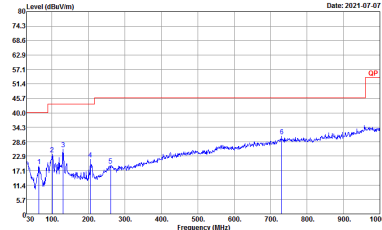
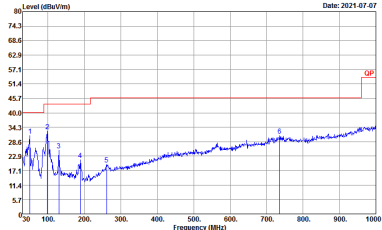


Emission above 18GHz

Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (SHF)

BLE + WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz	
ANT	BLE_CH39 2480MHz + 802.11ax HE160 CH50 5250MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK(UNIT) 1m SHF ANT_9170_00993 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : PEAK(UNIT) 1m SHF ANT_9170_00993 VERTICAL Detector : Peak

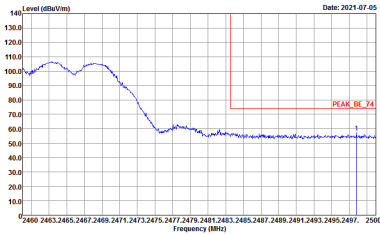
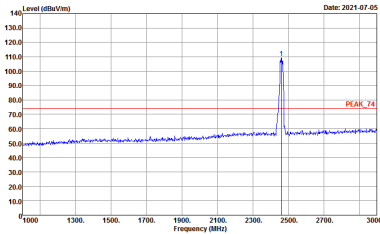
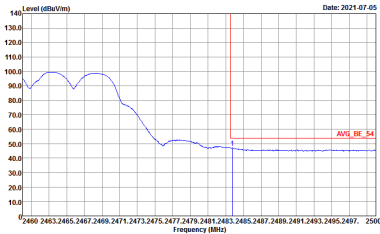
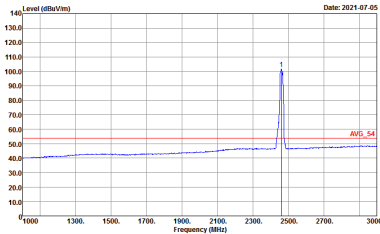
**Emission below 1GHz****Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch50 (LF)**

BLE + WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz LF	
ANT	BLE_CH39 2480MHz + 802.11ax HE160 CH50 5250MHz	
Simultaneously	Horizontal	Vertical
QP / Peak	 Site : 03CH16-HY Condition : QP 3m B1L06_47020&06 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : QP 3m B1L06_47020&06 VERTICAL Detector : Peak

**2.4GHz 2400~2483.5MHz + Band 1 - 5150~5250MHz****Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)**

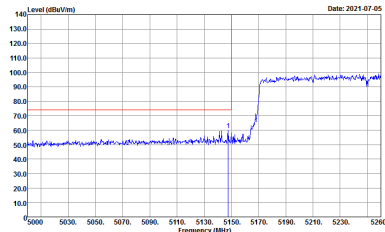
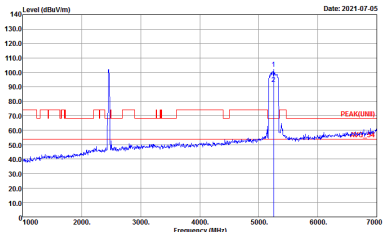
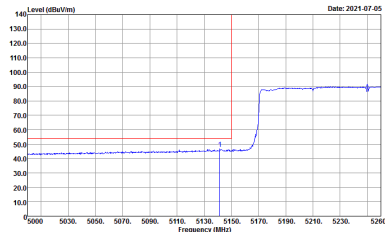
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	11g_CH11 2462MHz	
4+3	Horizontal	Fundamental
Peak	Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Site : 03CH16-HY Condition : AVG_54 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto



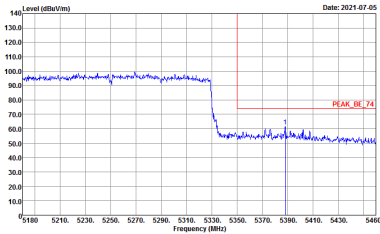
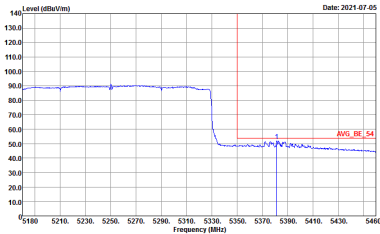
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	11g_CH11 2462MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	 Site : 03CH16-HY Condition : AVG_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto

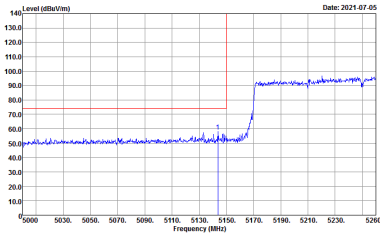
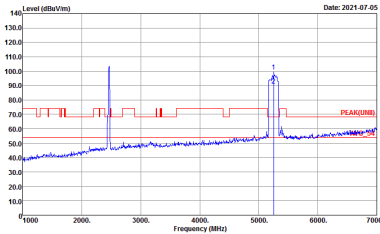
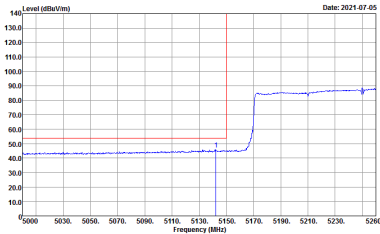


Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch50 (Band Edge @ 3m)

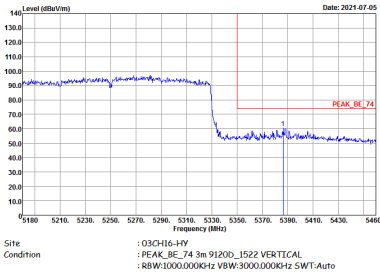
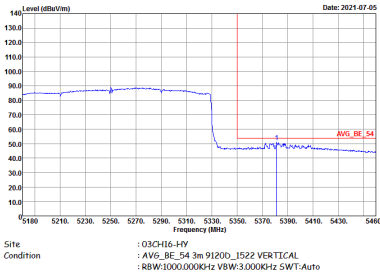
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - L	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE_74 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HV Condition : PEAK(UNIT) 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HV Condition : AVG_BE_54 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - R	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

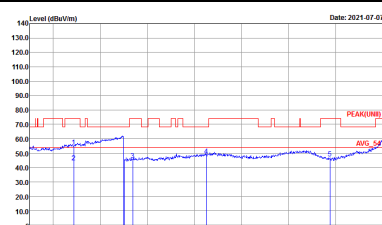
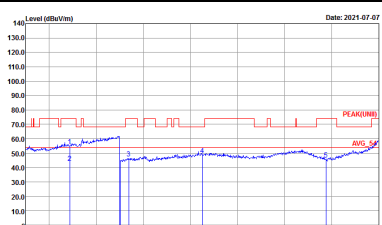
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH50 5250MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank



Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch50 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz + Band 1 5150~5250MHz Harmonic @ 3m	
ANT	11g_CH11 2462MHz + 802.11ax HE160 CH50 5250MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 9120D_1522 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : PEAK(UNIT) 3m 9120D_1522 VERTICAL Detector : Peak

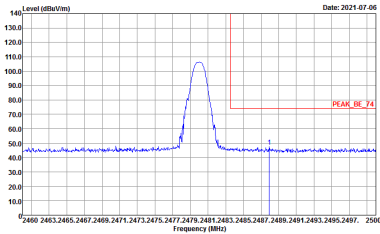
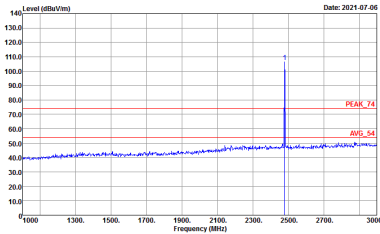


2.4GHz 2400~2483.5MHz + Band 5 - 5925~6425MHz

Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

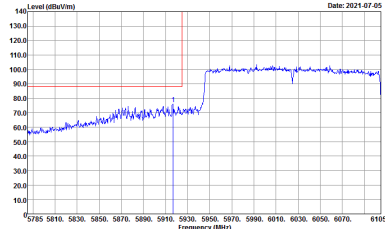
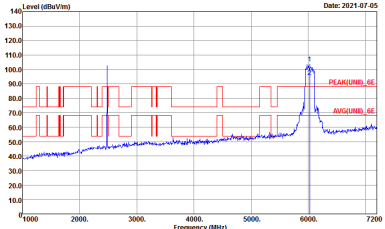
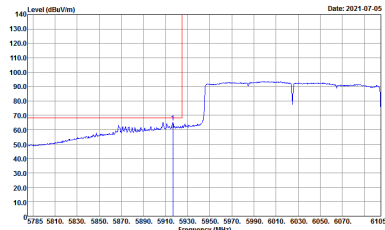
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
4+3	Horizontal	Fundamental
Peak	Site Condition : 03CH16-44Y : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site Condition : 03CH16-44Y : PEAK_74 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto



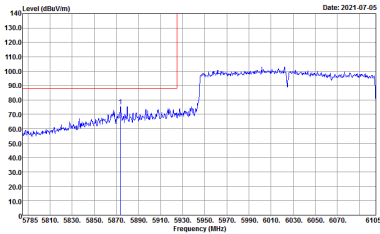
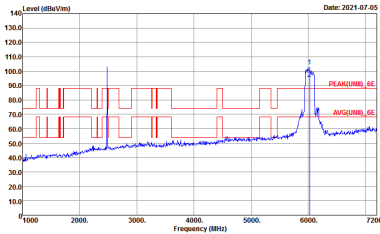
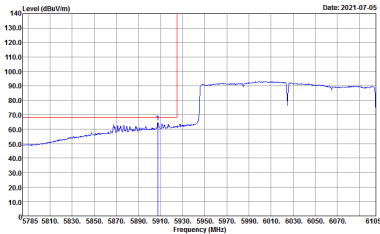
BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BC_74 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto



Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

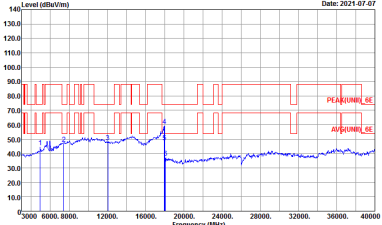
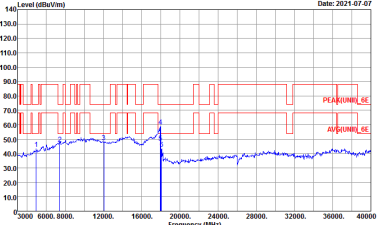
WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH15 6025MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_BE(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



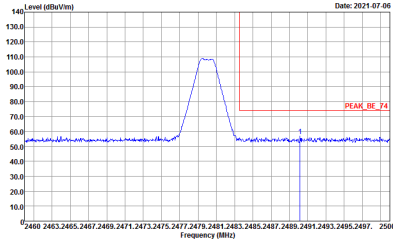
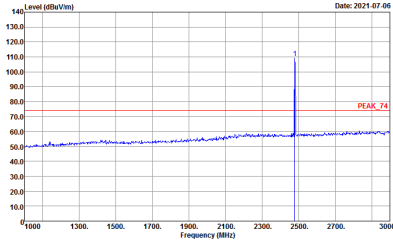
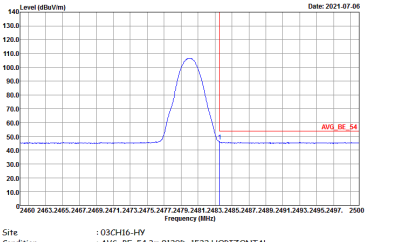
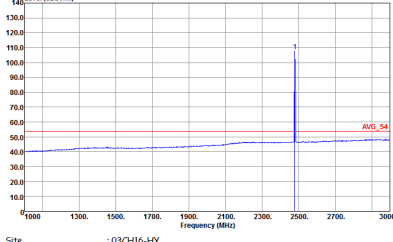
WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH15 6025MHz - L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : :PEAK_BE(UNIT)_6E 3m 91200_1522 VERTICAL :RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : :PEAK(UNIT)_6E 3m 91200_1522 VERTICAL :RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : :AVG_BE(UNIT)_6E 3m 91200_1522 VERTICAL :RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



Ant. 4+3_BT_Tx_Ch78 + Ant. 4+3_11ax HE160_Tx_Ch15 (Harmonic @ 3m)

BT + WIFI	2.4GHz 2400~2483.5MHz + Band 5 5925~6425MHz Harmonic @ 3m	
ANT	BT CH78 2480MHz + 802.11ax HE160 CH15 6025MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 1m SHF ANT_9170_00993 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 1m SHF ANT_9170_00993 VERTICAL Detector : Peak

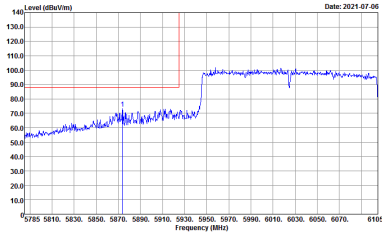
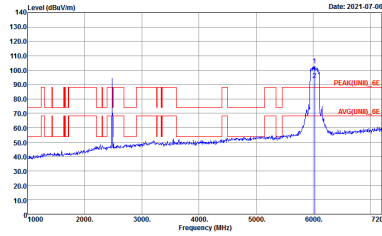
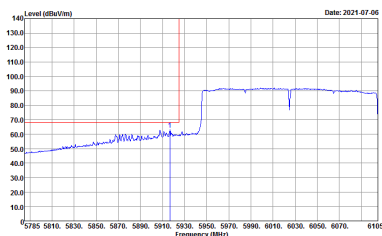
2.4GHz 2400~2483.5MHz + Band 5 - 5925~6425MHz
Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE_CH39 2480MHz	
4	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 HORIZONTAL : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto
	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL : RBW:1000.0000kHz VBW:10000kHz SWT:Auto	 Site : 03CH16-HY Condition : AVG_54 3m 91200_1522 HORIZONTAL : RBW:1000.0000kHz VBW:10000kHz SWT:Auto
Avg.		

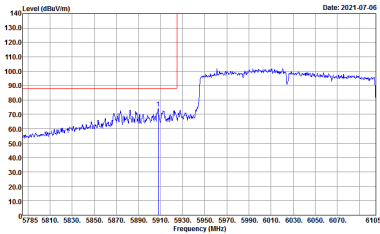
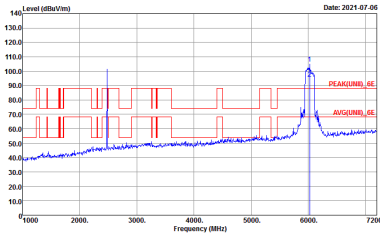
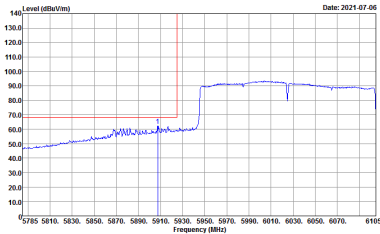


BLE	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BLE_CH39 2480MHz	
4	Vertical	Fundamental
Peak	Site : 03CH16-HY Condition : - PEAK_BE_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH16-HY Condition : - PEAK_74 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH16-HY Condition : - AVG_BE_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto	Site : 03CH16-HY Condition : - AVG_54 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto

Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH15 6025MHz- L	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_BE(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH15 6025MHz- L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : - PEAK_BE(UNIT)_6E 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : - PEAK(UNIT)_6E 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : - AV6_BE(UNIT)_6E 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



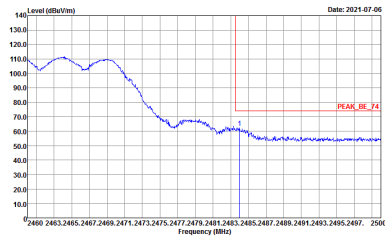
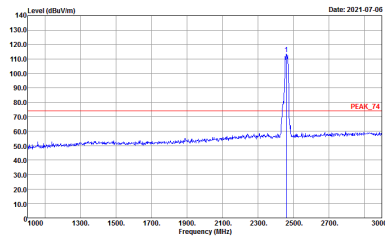
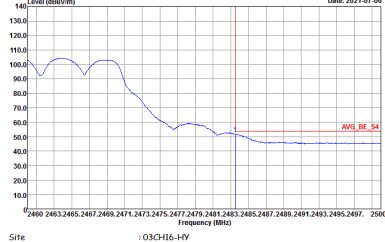
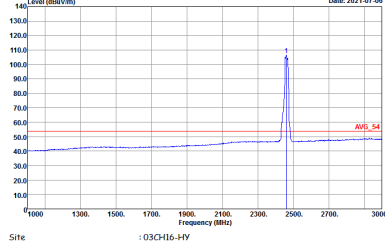
Ant. 4_BLE_Tx_Ch39 + Ant. 4+3_11ax HE160_Tx_Ch15 (Harmonic @ 3m)

BT + WIFI	2.4GHz 2400~2483.5MHz + Band 5 5925~6425MHz Harmonic @ 3m	
ANT	BLE_CH39 2480MHz + 802.11ax HE160 CH15 6025MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	Level (dBμV/m) 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0 5000 6000 8000 12000 16000 20000 24000 28000 32000 36000 40000 Frequency (MHz) Site : 03CH16-HY Condition : PEAK(UNIT)_6E 1m SHF ANT_9170_00993 HORIZONTAL Detector : Peak	Level (dBμV/m) 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0 140.0 130.0 120.0 110.0 100.0 90.0 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0 5000 6000 8000 12000 16000 20000 24000 28000 32000 36000 40000 Frequency (MHz) Site : 03CH16-HY Condition : PEAK(UNIT)_6E 1m SHF ANT_9170_00993 VERTICAL Detector : Peak

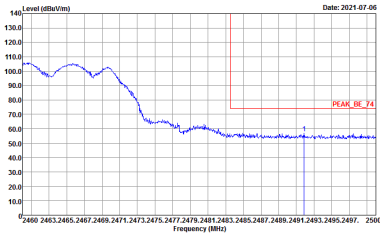
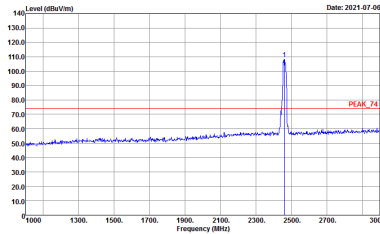
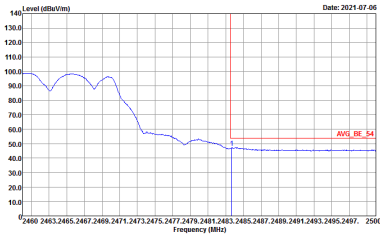
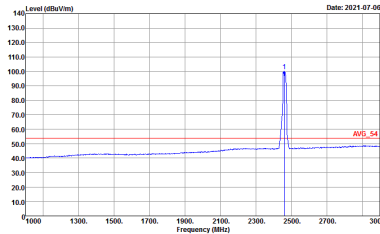


2.4GHz 2400~2483.5MHz + Band 5 - 5925~6425MHz

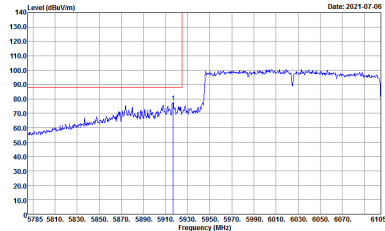
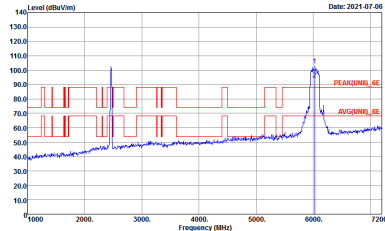
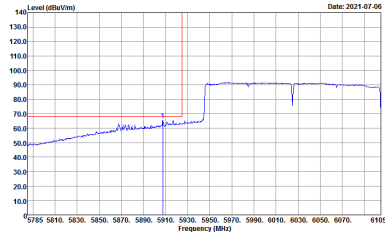
Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto	 Site : 03CH16-HY Condition : AVG_54 3m 91200_1522 HORIZONTAL RBW:1000.000KHz VBW:1000KHz SWT:Auto

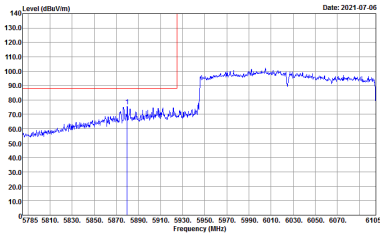
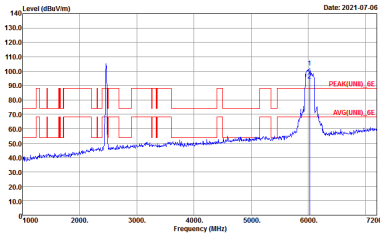
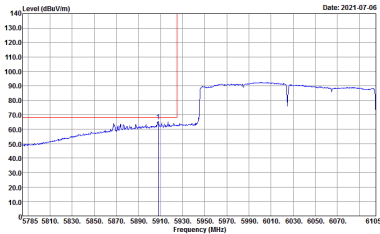


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE_74 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK_74 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH16-HY Condition : AV6_BE_54 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:1000KHz SWT:Auto	 Site : 03CH16-HY Condition : AV6_54 3m 91200_1522 VERTICAL RBW:1000.000KHz VBW:1000KHz SWT:Auto
Avg		

Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (Band Edge @ 3m)

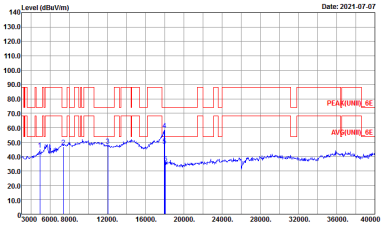
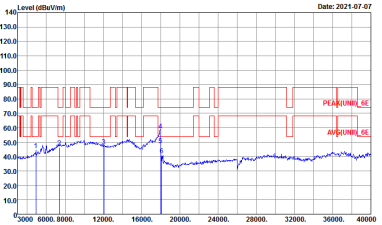
WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH15 6025MHz- L	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HY Condition : PEAK_BE(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : AVG_SEC(UNIT)_6E 3m 91200_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



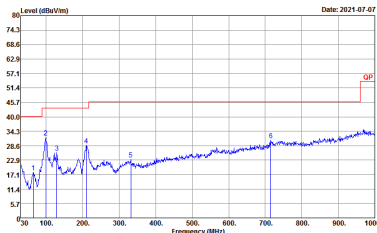
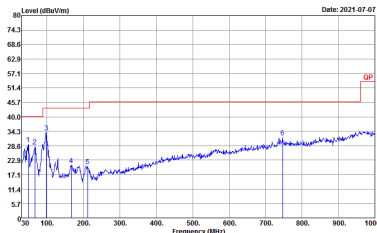
WIFI	Band 5 5925~6425MHz Band Edge @ 3m	
ANT	802.11ax HE160 CH15 6025MHz- L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HY Condition : - PEAK_BE(UNIT)_6E 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH16-HY Condition : - PEAK(UNIT)_6E 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH16-HY Condition : - AVG_BE(UNIT)_6E 3m 91200_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (Harmonic @ 3m)

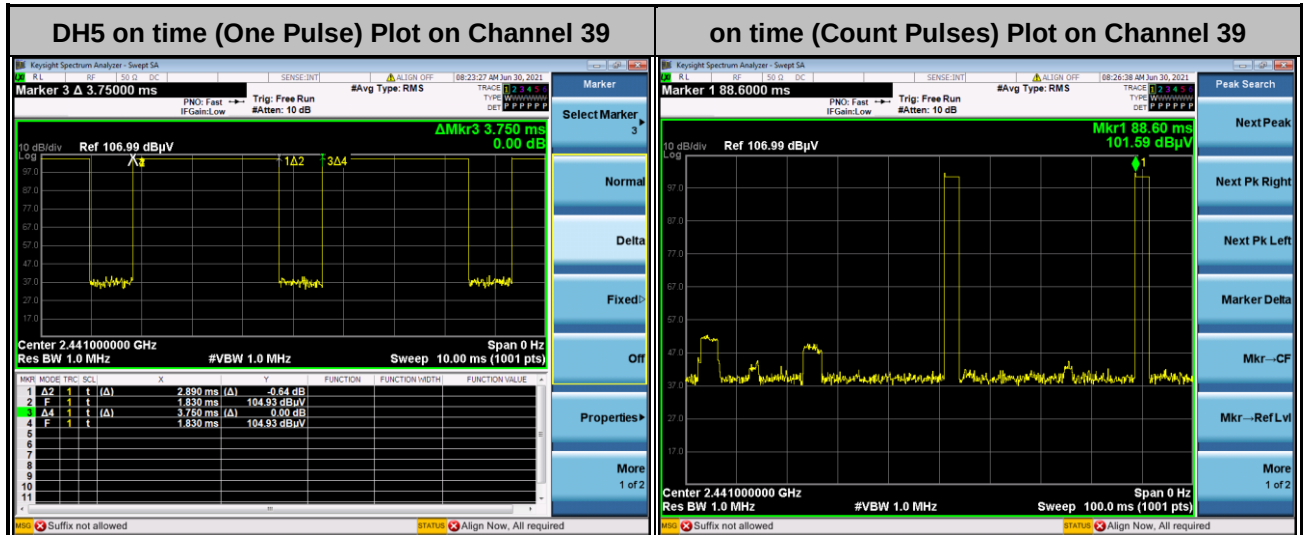
WIFI	2.4GHz 2400~2483.5MHz + Band 5 5925~6425MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz + 802.11ax HE160 CH15 6025MHz	
Simultaneously	Horizontal	Vertical
Peak Avg.	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 1m SHF ANT_9170_00993 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : PEAK(UNIT)_6E 1m SHF ANT_9170_00993 VERTICAL Detector : Peak

Emission below 1GHz
Ant. 4+3_11g_Tx_Ch11 + Ant. 4+3_11ax HE160_Tx_Ch15 (LF)

WIFI	2.4GHz 2400~2483.5MHz + Band 5 5925~6425MHz LF	
ANT	802.11g CH11 2462MHz + 802.11ax HE160 CH15 6025MHz	
Simultaneously	Horizontal	Vertical
QP / Peak	 Site : 03CH16-HY Condition : QP 3m 8ILO6_47020806 HORIZONTAL Detector : Peak	 Site : 03CH16-HY Condition : QP 3m 8ILO6_47020806 VERTICAL Detector : Peak

Appendix C. Duty Cycle Plots

MIMO <Ant. 4+3>



Note:

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

Duty Cycle Correction Factor Consideration for AFH mode:

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

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

$$2.89 \text{ ms} \times 20 \text{ channels} = 57.8 \text{ ms}$$

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period. $[100 \text{ ms} / 57.8 \text{ ms}] = 2 \text{ hops}$

Thus, the maximum possible ON time:

$$2.89 \text{ ms} \times 2 = 5.78 \text{ ms}$$

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

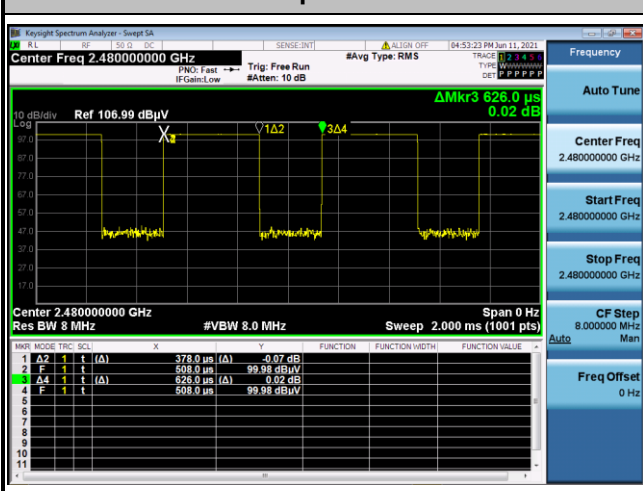
$$20 \times \log(5.78 \text{ ms}/100 \text{ ms}) = -24.76 \text{ dB}$$



Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
4	Bluetooth – LE for 1Mbps	60.38	378	2.65	3kHz
4+3	802.11g	93.14	1425	0.70	1kHz
4+3	5GHz 802.11ax HE160 Full RU	85.07	570	1.75	3kHz

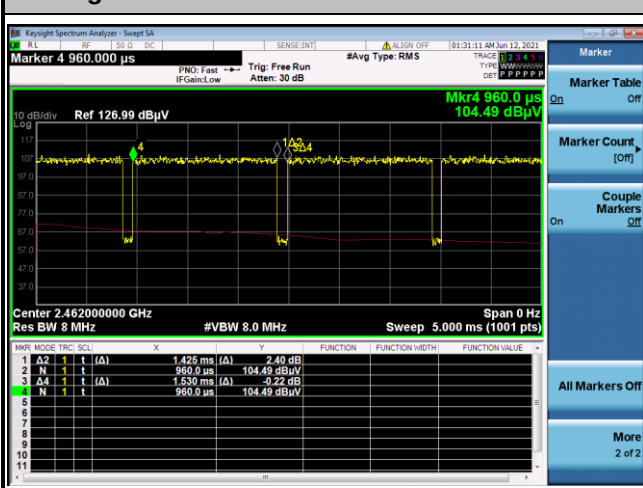
<Ant. 4>

Bluetooth – LE for 1Mbps

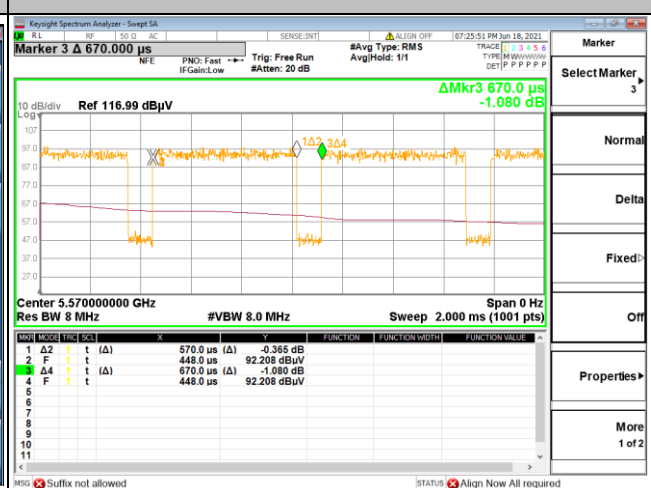


MIMO <Ant. 4+3>

802.11g



802.11ax HE160 Full RU



—THE END—