



FCC RADIO TEST REPORT

FCC ID : PU5-TP00114C
Equipment : Notebook Computer
Brand Name : Lenovo
Model Name : TP00114C
Applicant : Wistron Corporation
21F, No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih
Dist, New Taipei City 221, Taiwan
Manufacturer : Lenovo PC HK Limited
23/F, Lincoln House, Taikoo Place, 979 King's
Road, Quarry Bay, Hong Kong, P.R. China
Standard : FCC Part 15 Subpart C §15.247

Equipment: Intel AX200NGW tested inside of Lenovo Notebook Computer.

The product was received on Apr. 08, 2021 and testing was started from Jun. 09, 2021 and completed on Jun. 14, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this partial 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 333, Taiwan



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History of this test report

Report No.	Version	Description	Issued Date
FR140857-01C	01	Initial issue of report	Jun. 15, 2021
FR140857-01C	02	Revise test data	Jun. 18, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.247(a)(2)	6dB Bandwidth	-	See Note
-	2.1049	99% Occupied Bandwidth	-	See Note
3.1	15.247(b)	Power Output Measurement	Pass	-
-	15.247(e)	Power Spectral Density	-	See Note
-	15.247(d)	Conducted Band Edges	-	See Note
		Conducted Spurious Emission	-	See Note
3.2	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 8.37 dB at 2390.000 MHz
3.3	15.207	AC Conducted Emission	Pass	Under limit 9.79 dB at 4.729 MHz
3.4	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Note: The module (Model: AX200NGW) makes no difference after verifying output power, this report reuses test data from the module report.

Declaration of Conformity:

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

Comments and Explanations:

The 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: Sheng Kuo

Report Producer: Vivian Hsu

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook Computer
Brand Name	Lenovo
Model Name	TP00114C
FCC ID	PU5-TP00114C
Sample 1	EUT with High-Tek Antenna
Sample 2	EUT with AWAN Antenna
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer.
2. Equipment: Intel AX200NGW tested inside of Lenovo Notebook Computer.

Antenna Information			
Antenna 1 (WLAN)	Manufacturer	High-Tek	
	Antenna Type	Main: PIFA Antenna	Aux: PIFA Antenna
	Part number	025.901JG.0011	025.901JH.0011
	Peak gain (dBi)	Main Antenna : WLAN(2.4G):-0.89	Aux Antenna : WLAN(2.4G):-1.97
Antenna 2 (WLAN)	Manufacturer	AWAN	
	Antenna Type	Main: PIFA Antenna	Aux: PIFA Antenna
	Part number	025.901JG.0021	025.901JH.0021
	Peak gain (dBi)	Main Antenna : WLAN(2.4G):-1.69	Aux Antenna : WLAN(2.4G):-2.55

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.
2. All the tests were performed with "High-Tek Antenna" as representative.

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard												
Tx/Rx Channel Frequency Range		2412 MHz ~ 2462 MHz										
Average Output Power to antenna		<Chain A> 802.11b: 16.80 dBm / 0.0479 W 802.11g: 16.80 dBm / 0.0479 W <Chain B> 802.11b: 16.90 dBm / 0.0490 W 802.11g: 16.90 dBm / 0.0490 W MIMO <Chain A+B> 802.11ax HE20: 18.66 dBm / 0.0735 W 802.11ax HE40: 17.46 dBm / 0.0558 W										
Type of Modulation		802.11b : DSSS (DBPSK/DQPSK/CCK) 802.11g/n: OFDM (BPSK/QPSK/16QAM/64QAM) 802.11ax: OFDM (BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM)										
Antenna Function Description		<table><tr><td></td><td>Chain A</td><td>Chain B</td></tr><tr><td>802.11 b/g</td><td>V</td><td>V</td></tr><tr><td>802.11 ax MIMO</td><td>V</td><td>V</td></tr></table>			Chain A	Chain B	802.11 b/g	V	V	802.11 ax MIMO	V	V
	Chain A	Chain B										
802.11 b/g	V	V										
802.11 ax MIMO	V	V										

Note:

- For other wireless features of this EUT, test report will be issued separately.
- MIMO Chain A+B is a calculated result from sum of the power MIMO Chain A and MIMO Chain B.

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.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan
Test Site No.	Sporton Site No.
	TH02-HY, CO05-HY

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

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan
Test Site No.	Sporton Site No.
	03CH12-HY (TAF Code: 3786)
Remark	The Radiated Spurious Emissions test item subcontracted to Sporton International Inc. Wensan Laboratory.

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

FCC designation No.: TW1190 and TW3786

1.5 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 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: conduction emission (150 kHz to 30 MHz), radiation emission (1 GHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in Tablet type (three orthogonal panels, X, Y, Z) and Notebook type. The worst cases (Notebook type without Accessory for Chain B ; Y Plane for MIMO <Chain A+B>) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Test Mode

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

Single Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps

MIMO Antenna

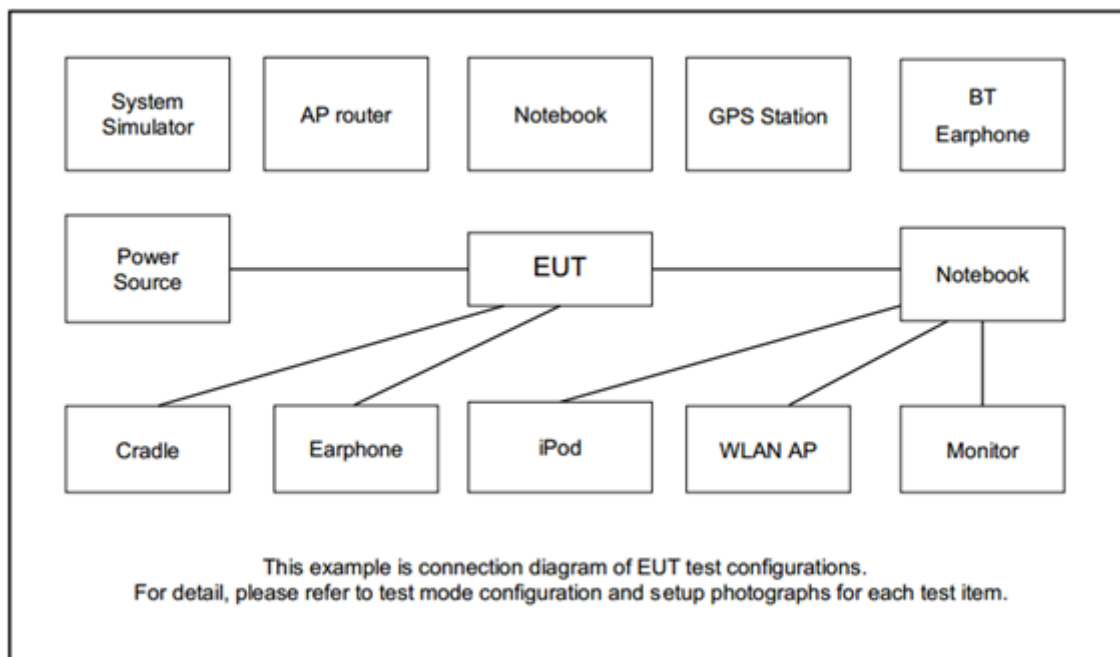
Modulation	Data Rate
802.11n HE20	MCS0
802.11n HE40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (2.4GHz) Link + TC + TF + Adapter
Remark: 1. TF stands for Test Function, and consists of H-Pattern, MPEG4, Camera and Fingerprint. 2. TC stands for Test Configuration, and consists of Earphone + Mic, Micro SD Card, USB HD (Data Link) (USB *2), LCD Monitor (HDMI Out) and LAN Link. 3. Data Link with USB HD means data application transferred mode between EUT and USB HD. 4. HDMI means media application transferred between EUT and external display.	

Ch. #	2400-2483.5 MHz			
	802.11b	802.11g	802.11ax HE20	802.11ax HE40
Low	-	01	01	03
Middle	07	-	-	-
High	-	11	11	09

Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Notebook	Dell	Latitude 3400	FCC DOC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
5.	LCD Monitor	Asus	PB27UQ	FCC DoC	N/A	Unshielded, 1.8m
6.	USB HD	ADATA	HV620S-1T	FCC DoC	Shielded, 1.0m	N/A
7.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility "DRTU V_12.1947.0-10428" was installed in EUT 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 Output Power Measurement

3.1.1 Limit of Output Power

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

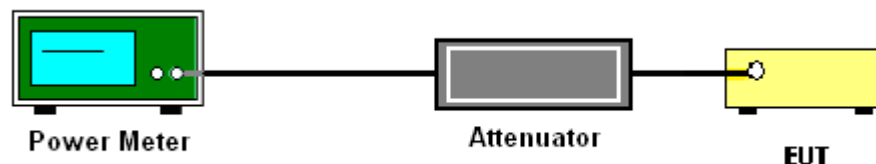
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of Average Output Power

Please refer to Appendix A.

3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.2.2 Measuring Instruments

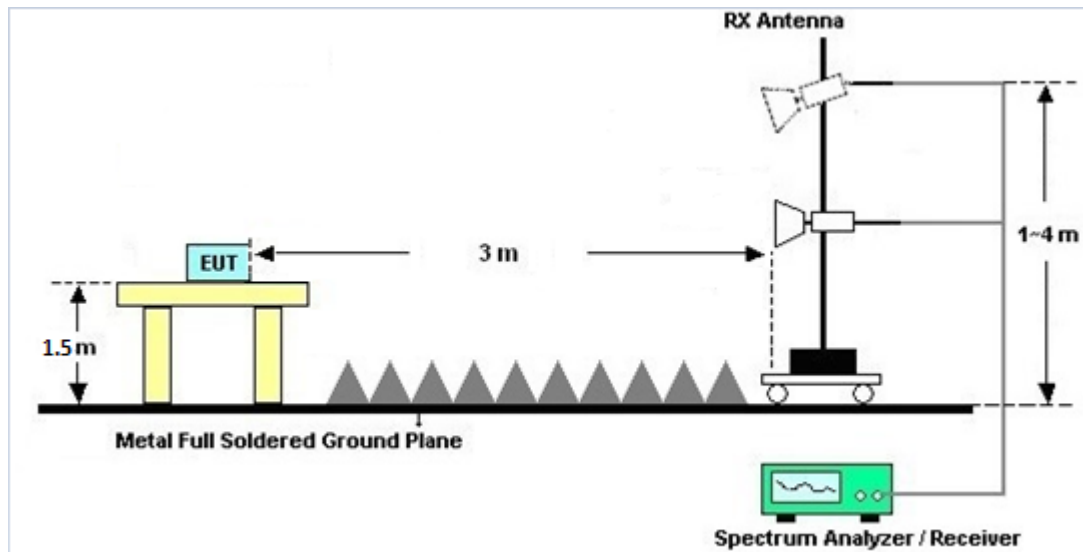
See list of measuring equipment of this test report.

3.2.3 Test Procedures

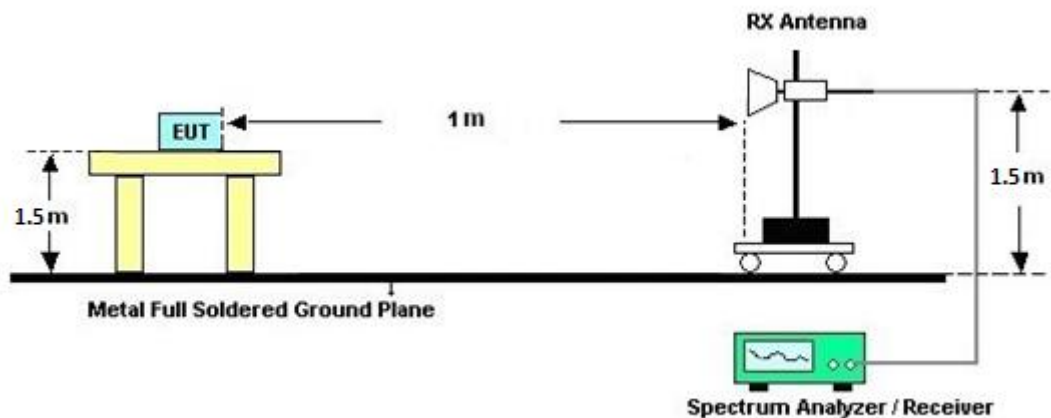
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamplifier Factor = Level
6. For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB 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.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW = 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3 MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - 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.

3.2.4 Test Setup

For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.2.5 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.2.6 Duty Cycle

Please refer to Appendix E.

3.2.7 Test Result of Radiated Spurious Emission

Please refer to Appendix C and D.

3.3 AC Conducted Emission Measurement

3.3.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

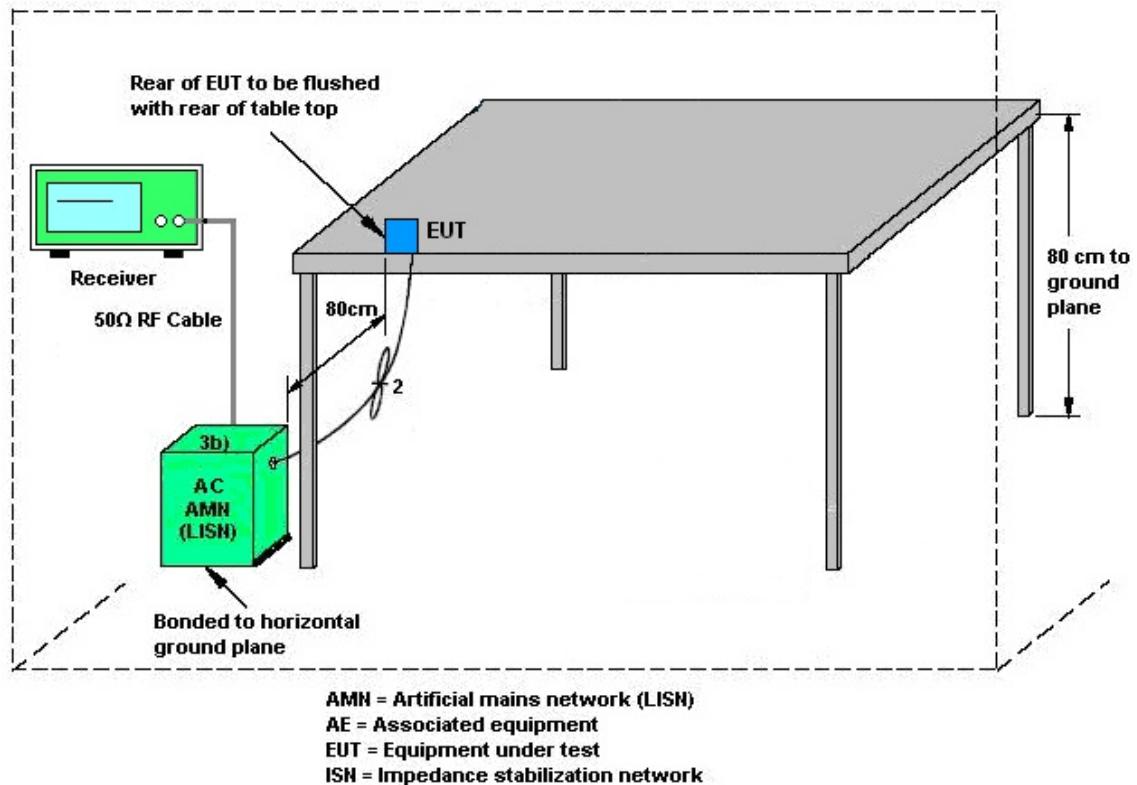
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.3.4 Test Setup



3.3.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.4 Antenna Requirements

3.4.1 Standard Applicable

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

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 23, 2020	Jun. 10, 2021~ Jun. 14, 2021	Nov. 22, 2021	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz~40GHz	Nov. 19, 2020	Jun. 10, 2021~ Jun. 14, 2021	Nov. 18, 2021	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY57280120	1GHz~26.5GHz	Jul. 20, 2020	Jun. 10, 2021~ Jun. 14, 2021	Jul. 19, 2021	Radiation (03CH12-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-100M-18G-56-01-A70	EC1900249	1GHz~18GHz	Dec. 05, 2020	Jun. 10, 2021~ Jun. 14, 2021	Dec. 04, 2021	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Jun. 10, 2021~ Jun. 14, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 15, 2021	Jun. 10, 2021~ Jun. 14, 2021	Jan. 14, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 11, 2020	Jun. 10, 2021~ Jun. 14, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 22, 2021	Jun. 10, 2021~ Jun. 14, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 22, 2021	Jun. 10, 2021~ Jun. 14, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 10, 2021~ Jun. 14, 2021	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 10, 2021~ Jun. 14, 2021	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jun. 10, 2021~ Jun. 14, 2021	N/A	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12SS	SN2	1.2GHz Low Pass Filter	Mar. 17, 2021	Jun. 10, 2021~ Jun. 14, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3GHz High Pass Filter	Jul. 14, 2020	Jun. 10, 2021~ Jun. 14, 2021	Jul. 13, 2021	Radiation (03CH12-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 12, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Jun. 12, 2021	Nov. 29, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 01, 2020	Jun. 12, 2021	Nov. 30, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Jun. 12, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jun. 12, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Feb. 25, 2021	Jun. 12, 2021	Feb. 24, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Jun. 12, 2021	Dec. 30, 2021	Conduction (CO05-HY)
Power Sensor	DARE	RPR3006W	17100015 SNO37	10MHz~6GHz	Dec. 02, 2020	Jun. 09, 2021	Dec. 01, 2021	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSQ	200578/026	20Hz~26.5GHz	Jul. 17, 2020	Jun. 09, 2021	Jul. 16, 2021	Conducted (TH02-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	Jun. 09, 2021	Mar. 16, 2022	Conducted (TH02-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.6 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.9 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ching Chen	Temperature:	24~25	°C
Test Date:	2021/6/9	Relative Humidity:	51~54	%

Remark: For Conducted Test Items, Ant. 1 means Chain A (Aux.) and Ant. 2 means Chain B (Main).

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	7	2442	16.80	16.90	-	30.00	30.00	-1.97	-0.89	14.83	16.01	36.00	36.00	Pass
11g	6Mbps	1	1	2412	16.80	16.90		30.00	30.00	-1.97	-0.89	14.83	16.01	36.00	36.00	Pass
11g	6Mbps	1	11	2462	14.70	14.80		30.00	30.00	-1.97	-0.89	12.73	13.91	36.00	36.00	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	RU Config	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
HE20	MCS0	2	1	2412	Full	15.60	15.70	18.66	30.00		-0.89		17.77		36.00		Pass
HE20	MCS0	2	11	2462	Full	13.90	14.00	16.96	30.00		-0.89		16.07		36.00		Pass
HE40	MCS0	2	3	2422	Full	13.50	13.80	16.66	30.00		-0.89		15.77		36.00		Pass
HE40	MCS0	2	9	2452	Full	14.30	14.60	17.46	30.00		-0.89		16.57		36.00		Pass

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



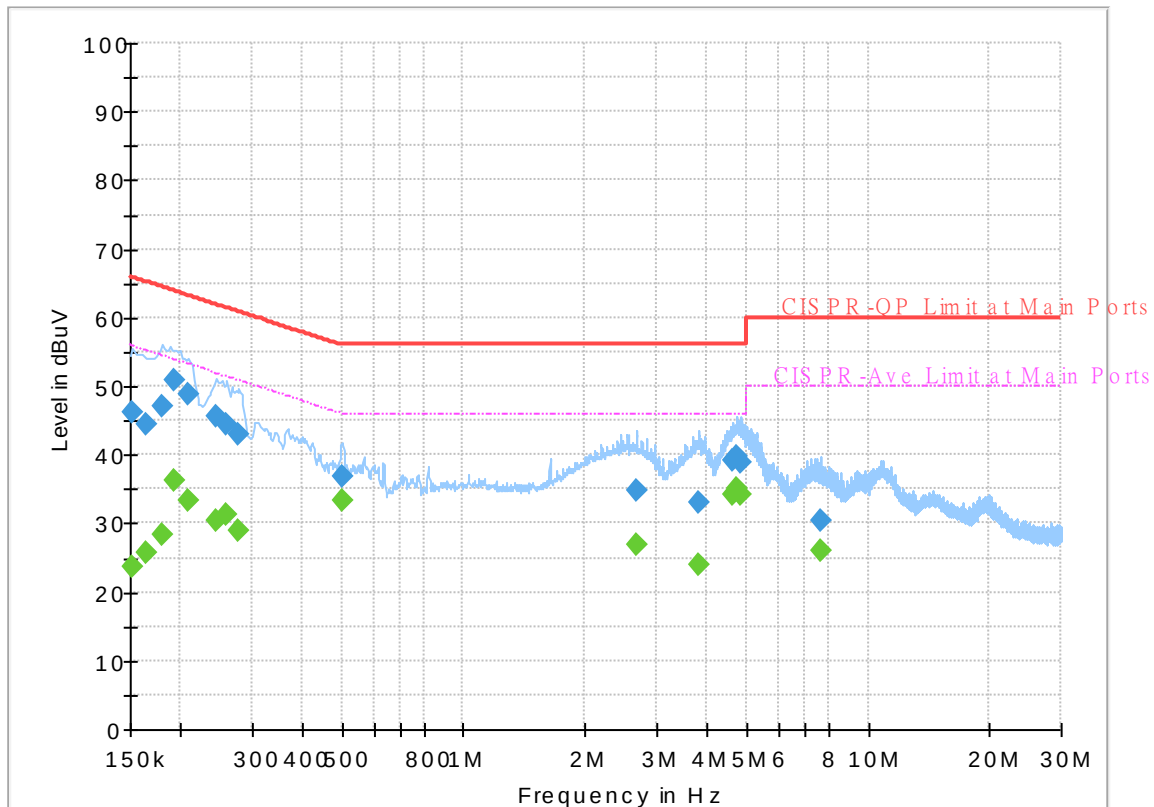
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	23~26℃
		Relative Humidity :	40~50%

EUT Information

Report NO : 140857-01
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



Final Result

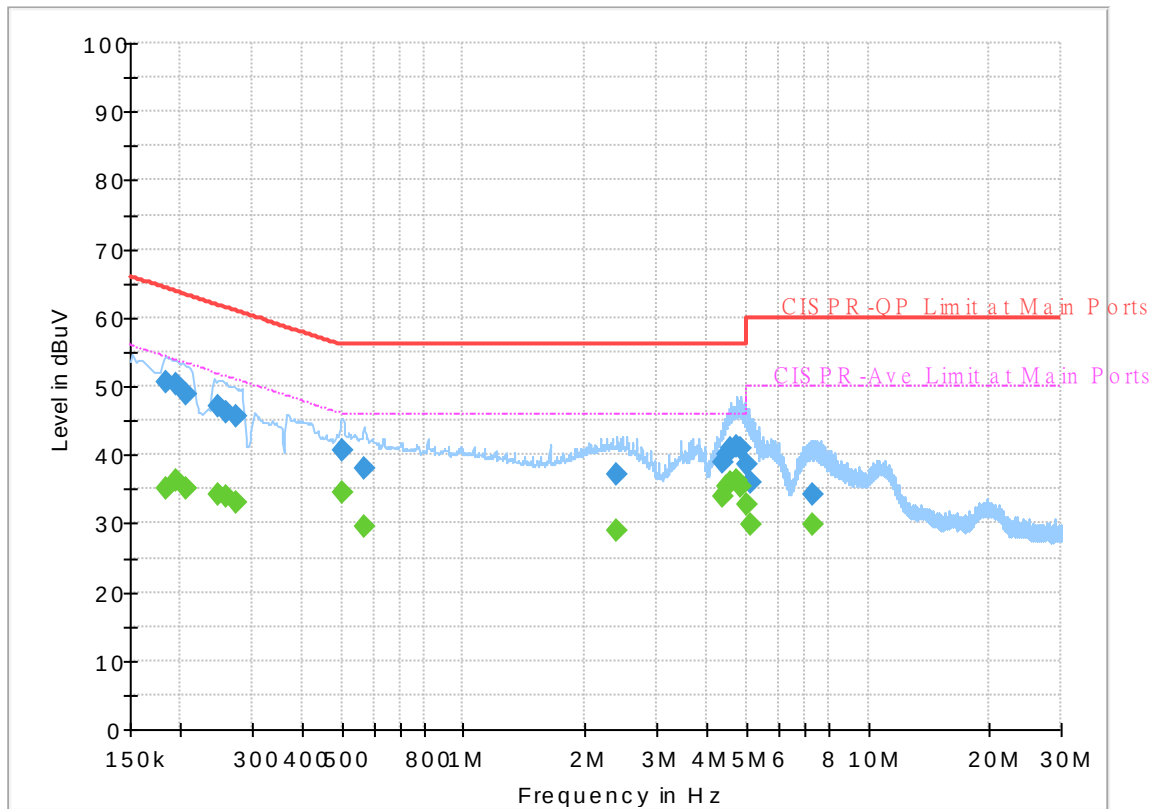
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	23.68	55.88	32.20	L1	OFF	19.6
0.152250	46.18	---	65.88	19.70	L1	OFF	19.6
0.163500	---	25.78	55.28	29.50	L1	OFF	19.6
0.163500	44.39	---	65.28	20.89	L1	OFF	19.6
0.179250	---	28.51	54.52	26.01	L1	OFF	19.6
0.179250	47.01	---	64.52	17.51	L1	OFF	19.6
0.192750	---	36.17	53.92	17.75	L1	OFF	19.6
0.192750	50.98	---	63.92	12.94	L1	OFF	19.6
0.208500	---	33.38	53.27	19.89	L1	OFF	19.6
0.208500	48.78	---	63.27	14.49	L1	OFF	19.6
0.244500	---	30.40	51.94	21.54	L1	OFF	19.6
0.244500	45.56	---	61.94	16.38	L1	OFF	19.6
0.260250	---	31.20	51.42	20.22	L1	OFF	19.6
0.260250	44.48	---	61.42	16.94	L1	OFF	19.6
0.278250	---	29.04	50.87	21.83	L1	OFF	19.6
0.278250	43.07	---	60.87	17.80	L1	OFF	19.6
0.501000	---	33.31	46.00	12.69	L1	OFF	19.7
0.501000	36.92	---	56.00	19.08	L1	OFF	19.7
2.683500	---	26.99	46.00	19.01	L1	OFF	20.0
2.683500	34.82	---	56.00	21.18	L1	OFF	20.0
3.817500	---	23.86	46.00	22.14	L1	OFF	19.9

3.817500	32.93	---	56.00	23.07	L1	OFF	19.9
4.616250	---	34.31	46.00	11.69	L1	OFF	19.9
4.616250	39.20	---	56.00	16.80	L1	OFF	19.9
4.740000	---	34.95	46.00	11.05	L1	OFF	19.9
4.740000	39.64	---	56.00	16.36	L1	OFF	19.9
4.868250	---	34.13	46.00	11.87	L1	OFF	19.9
4.868250	38.84	---	56.00	17.16	L1	OFF	19.9
7.635750	---	25.95	50.00	24.05	L1	OFF	20.0
7.635750	30.52	---	60.00	29.48	L1	OFF	20.0

EUT Information

Report NO : 140857-01
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.183750	---	35.09	54.31	19.22	N	OFF	19.6
0.183750	50.68	---	64.31	13.63	N	OFF	19.6
0.195000	---	36.30	53.82	17.52	N	OFF	19.6
0.195000	50.20	---	63.82	13.62	N	OFF	19.6
0.206250	---	34.97	53.36	18.39	N	OFF	19.6
0.206250	48.74	---	63.36	14.62	N	OFF	19.6
0.246750	---	34.08	51.87	17.79	N	OFF	19.6
0.246750	46.94	---	61.87	14.93	N	OFF	19.6
0.260250	---	33.99	51.42	17.43	N	OFF	19.6
0.260250	46.29	---	61.42	15.13	N	OFF	19.6
0.273750	---	33.00	51.00	18.00	N	OFF	19.6
0.273750	45.65	---	61.00	15.35	N	OFF	19.6
0.501000	---	34.53	46.00	11.47	N	OFF	19.7
0.501000	40.62	---	56.00	15.38	N	OFF	19.7
0.566250	---	29.46	46.00	16.54	N	OFF	19.8
0.566250	37.95	---	56.00	18.05	N	OFF	19.8
2.400000	---	29.08	46.00	16.92	N	OFF	20.0
2.400000	37.01	---	56.00	18.99	N	OFF	20.0
4.371000	---	33.82	46.00	12.18	N	OFF	19.9
4.371000	38.93	---	56.00	17.07	N	OFF	19.9
4.490250	---	35.35	46.00	10.65	N	OFF	19.9

4.490250	40.11	---	56.00	15.89	N	OFF	19.9
4.587000	---	35.85	46.00	10.15	N	OFF	19.9
4.587000	40.80	---	56.00	15.20	N	OFF	19.9
4.728750	---	36.21	46.00	9.79	N	OFF	19.9
4.728750	41.22	---	56.00	14.78	N	OFF	19.9
4.863750	---	35.33	46.00	10.67	N	OFF	19.9
4.863750	40.85	---	56.00	15.15	N	OFF	19.9
5.010000	---	32.61	50.00	17.39	N	OFF	19.9
5.010000	38.69	---	60.00	21.31	N	OFF	19.9
5.142750	---	29.79	50.00	20.21	N	OFF	20.0
5.142750	36.04	---	60.00	23.96	N	OFF	20.0
7.334250	---	29.83	50.00	20.17	N	OFF	20.0
7.334250	34.26	---	60.00	25.74	N	OFF	20.0



Appendix C. Radiated Spurious Emission

Test Engineer :	Jack Cheng, Lance Chiang and Chuan Chu	Temperature :	21.8~26.8°C
		Relative Humidity :	53.6~68.2%

Remark: For Radiated Spurious Emission Test Items, Ant. 1 means Chain A (Aux.) and Ant. 2 means Chain B (Main).

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 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)
802.11b CH 07 2442MHz		4884	44.77	-29.23	74	69.14	31	11.35	66.72	100	0	P	H
		7326	45.14	-28.86	74	61.14	36.25	13.15	65.4	100	0	P	H
													H
													H
		4884	45.97	-28.03	74	70.34	31	11.35	66.72	100	0	P	V
		7326	44.51	-29.49	74	60.51	36.25	13.15	65.4	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
WIFI 802.11g (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)
802.11g CH 01 2412MHz		2370.9	53.13	-20.87	74	43.77	27.7	15.82	34.16	115	198	P	H
		2388.855	42.88	-11.12	54	33.48	27.7	15.85	34.15	115	198	A	H
	*	2412	104.31	-	-	94.87	27.68	15.89	34.13	115	198	P	H
	*	2412	96.79	-	-	87.35	27.68	15.89	34.13	115	198	A	H
													H
													H
		2385.915	52.39	-21.61	74	42.99	27.7	15.85	34.15	400	167	P	V
		2388.855	42.59	-11.41	54	33.19	27.7	15.85	34.15	400	167	A	V
	*	2412	102.07	-	-	92.63	27.68	15.89	34.13	400	167	P	V
	*	2412	94.02	-	-	84.58	27.68	15.89	34.13	400	167	A	V
													V
													V



802.11g CH 11 2462MHz	*	2462	104.56	-	-	95.16	27.55	15.95	34.1	101	192	P	H
	*	2462	97.08	-	-	87.68	27.55	15.95	34.1	101	192	A	H
		2489.44	52.71	-21.29	74	43.37	27.44	15.99	34.09	101	192	P	H
		2483.92	43.26	-10.74	54	33.91	27.46	15.98	34.09	101	192	A	H
													H
													H
	*	2462	101.44	-	-	92.04	27.55	15.95	34.1	397	164	P	V
	*	2462	94.06	-	-	84.66	27.55	15.95	34.1	397	164	A	V
		2486.2	52.24	-21.76	74	42.88	27.46	15.99	34.09	397	164	P	V
		2483.64	42.9	-11.1	54	33.54	27.47	15.98	34.09	397	164	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



2.4GHz 2400~2483.5MHz

WIFI 802.11 ax HE20 Full (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.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ax HE20 Full CH 01 2412MHz		2389.905	53.74	-20.26	74	44.34	27.7	15.85	34.15	100	125	P	H
		2390	42.87	-11.13	54	33.47	27.7	15.85	34.15	100	125	A	H
	*	2412	101.38	-	-	91.94	27.68	15.89	34.13	100	125	P	H
	*	2412	92.71	-	-	83.27	27.68	15.89	34.13	100	125	A	H
													H
													H
		2389.485	55.95	-18.05	74	46.55	27.7	15.85	34.15	267	358	P	V
		2390	45.63	-8.37	54	36.23	27.7	15.85	34.15	267	358	A	V
	*	2412	108.05	-	-	98.61	27.68	15.89	34.13	267	358	P	V
	*	2412	99.75	-	-	90.31	27.68	15.89	34.13	267	358	A	V
													V
													V



WIFI Ant. 1+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)
8802.11ax HE20 Full CH 11 2462MHz	*	2462	99.55	-	-	90.15	27.55	15.95	34.1	271	6	P	H
	*	2462	90.83	-	-	81.43	27.55	15.95	34.1	271	6	A	H
		2499.76	52.01	-21.99	74	42.69	27.4	16	34.08	271	6	P	H
		2483.52	42.05	-11.95	54	32.69	27.47	15.98	34.09	271	6	A	H
													H
													H
	*	2462	106.14	-	-	96.74	27.55	15.95	34.1	298	346	P	V
	*	2462	97.43	-	-	88.03	27.55	15.95	34.1	298	346	A	V
		2485.12	53.6	-20.4	74	44.25	27.46	15.98	34.09	298	346	P	V
		2483.56	43.66	-10.34	54	34.3	27.47	15.98	34.09	298	346	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz****WIFI 802.11 ax HE40 Full (Band Edge @ 3m)**

WIFI Ant. 1+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)
802.11ax HE40 Full CH 03 2422MHz		2366.28	52.03	-21.97	74	42.68	27.7	15.81	34.16	370	0	P	H
		2389.94	42.29	-11.71	54	32.89	27.7	15.85	34.15	370	0	A	H
	*	2422	97.53	-	-	88.1	27.66	15.9	34.13	370	0	P	H
	*	2422	88.8	-	-	79.37	27.66	15.9	34.13	370	0	A	H
		2490.55	52.54	-21.46	74	43.2	27.44	15.99	34.09	370	0	P	H
		2497.9	41.48	-12.52	54	32.15	27.41	16	34.08	370	0	A	H
		2389.1	54.49	-19.51	74	45.09	27.7	15.85	34.15	260	358	P	V
		2389.94	44.14	-9.86	54	34.74	27.7	15.85	34.15	260	358	A	V
	*	2422	104.7	-	-	95.27	27.66	15.9	34.13	260	358	P	V
	*	2422	95.1	-	-	85.67	27.66	15.9	34.13	260	358	A	V
		2493.56	52.5	-21.5	74	43.15	27.43	16	34.08	260	358	P	V
		2484.18	41.74	-12.26	54	32.39	27.46	15.98	34.09	260	358	A	V



WIFI Ant. 1+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)
802.11ax HE40 Full CH 09 2452MHz		2315.6	52.61	-21.39	74	43.3	27.77	15.73	34.19	294	12	P	H
		2385.04	41.63	-12.37	54	32.23	27.7	15.85	34.15	294	12	A	H
	*	2452	97.68	-	-	88.26	27.59	15.94	34.11	294	12	P	H
	*	2452	88.19	-	-	78.77	27.59	15.94	34.11	294	12	A	H
		2489.43	52.66	-21.34	74	43.32	27.44	15.99	34.09	294	12	P	H
		2483.5	41.86	-12.14	54	32.5	27.47	15.98	34.09	294	12	A	H
		2383.92	52.64	-21.36	74	43.25	27.7	15.84	34.15	244	353	P	V
		2388.82	41.94	-12.06	54	32.54	27.7	15.85	34.15	244	353	A	V
	*	2452	103.96	-	-	94.54	27.59	15.94	34.11	244	353	P	V
	*	2452	95.34	-	-	85.92	27.59	15.94	34.11	244	353	A	V
		2483.83	54.25	-19.75	74	44.9	27.46	15.98	34.09	244	353	P	V
		2483.5	43.36	-10.64	54	34	27.47	15.98	34.09	244	353	A	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	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.	
2		(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 D. Radiated Spurious Emission Plots

Test Engineer :	Jack Cheng, Lance Chiang and Chuan Chu	Temperature :	21.8~26.8°C
		Relative Humidity :	53.6~68.2%

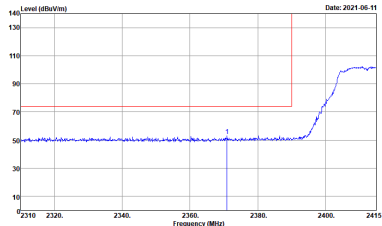
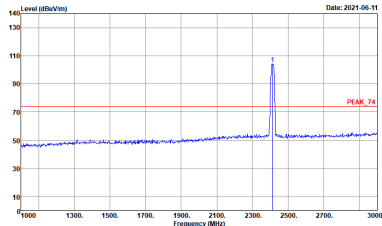
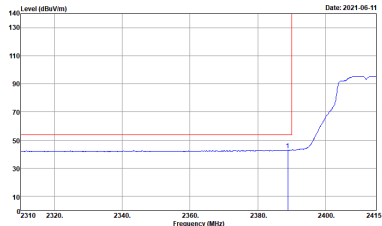
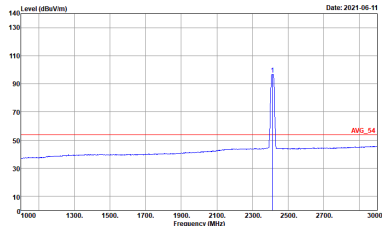
Remark: For Radiated Spurious Emission Test Items, Ant. 1 means Chain A (Aux.) and Ant. 2 means Chain B (Main).

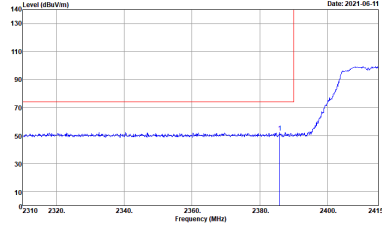
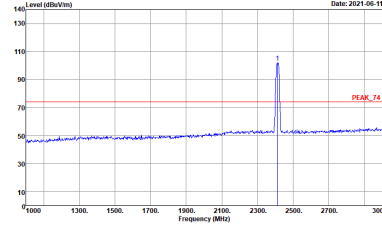
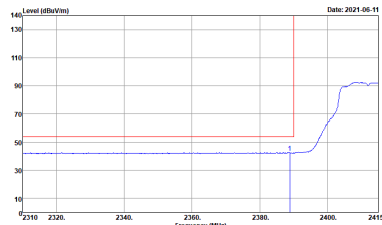
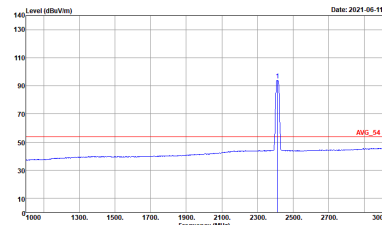
Note symbol

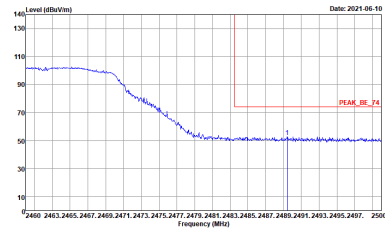
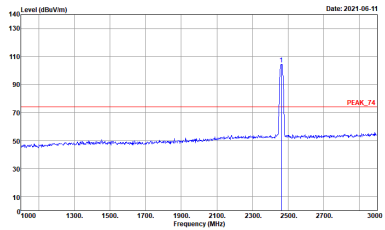
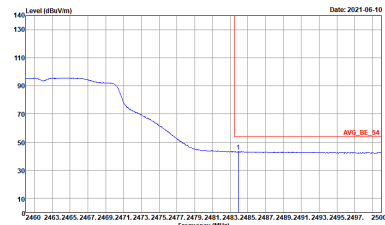
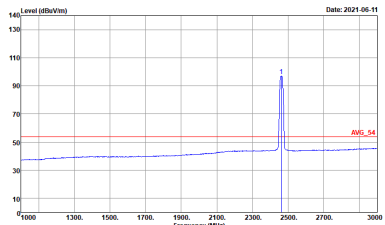
-L	Low channel location
-R	High channel location

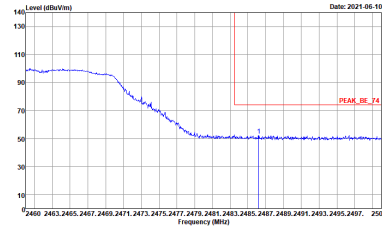
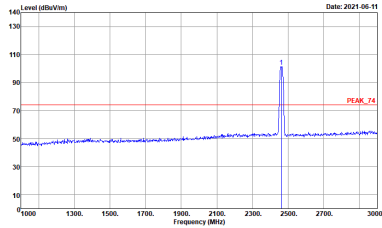
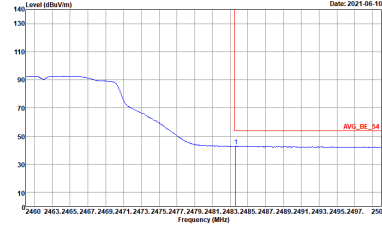
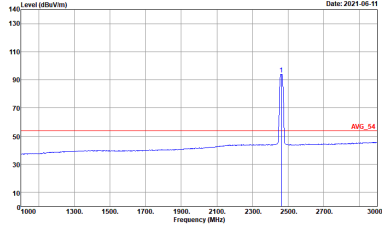


2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

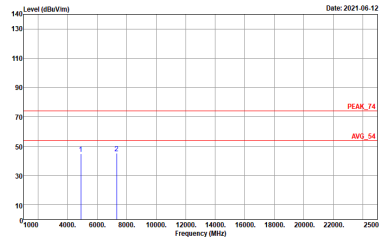
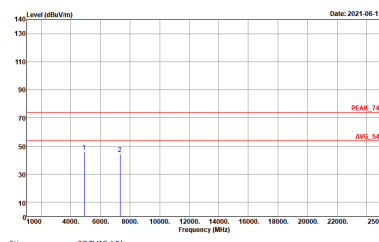
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto	 Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SW1:Auto	 Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SW1:Auto

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto
Avg.		

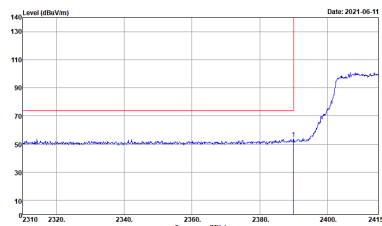
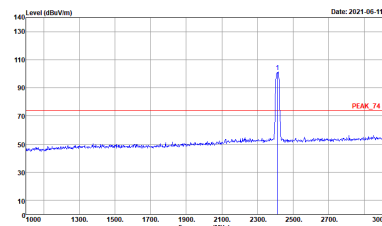
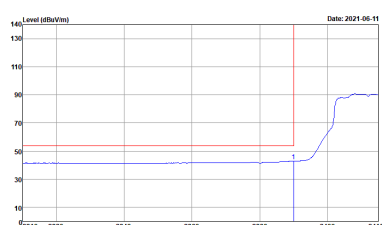
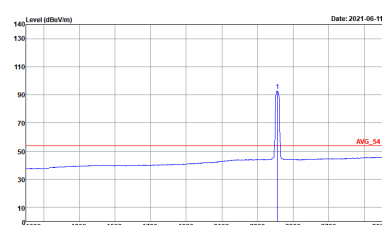
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto
Avg.		

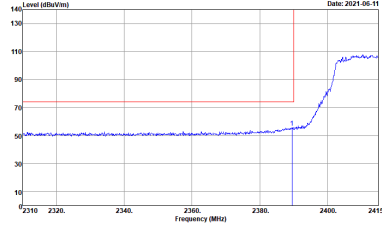
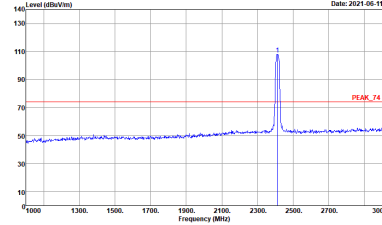
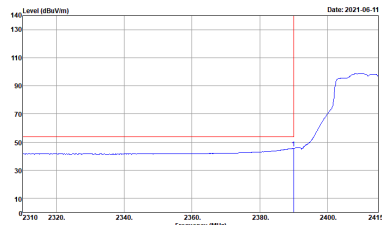
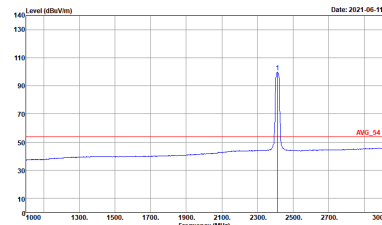
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto
Avg.		

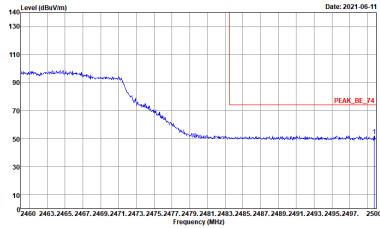
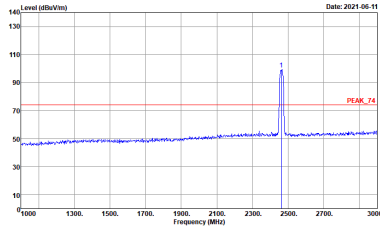
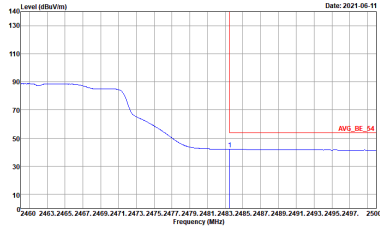
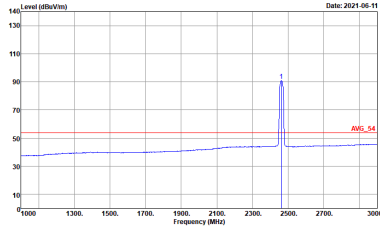
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

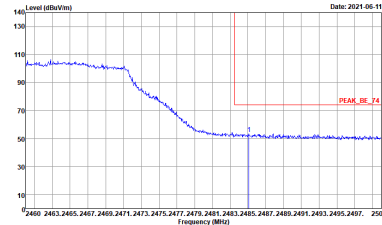
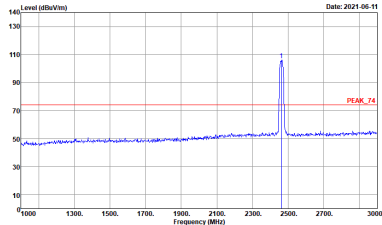
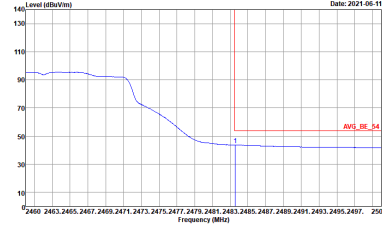
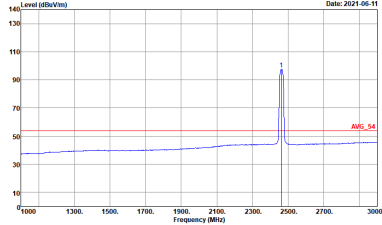
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH07 2442MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL

2.4GHz 2400~2483.5MHz
WIFI 802.11ax HE20 Full (Band Edge @ 3m)

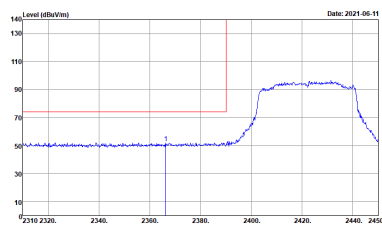
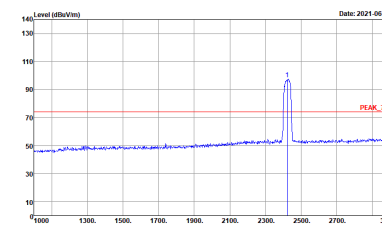
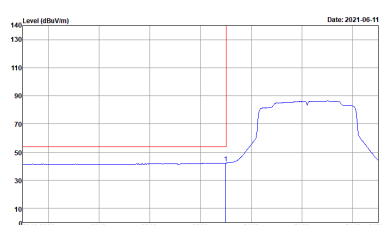
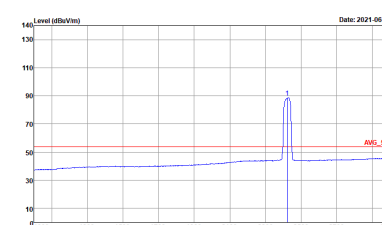
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto	 Site : 03CH12-HY Condition : PEAK_F4 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SW1:Auto	 Site : 03CH12-HY Condition : AVG_F4 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SW1:Auto

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.0000kHz VBW:3000.0000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.0000kHz VBW:0.0100kHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.0000kHz VBW:0.0100kHz SWT:Auto

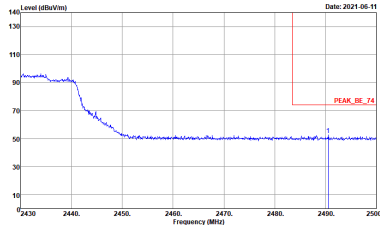
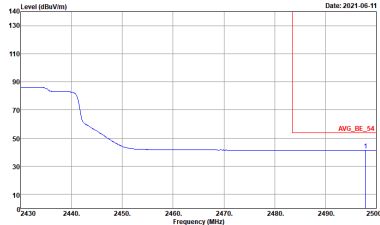
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SW1:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SW1:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SW1:Auto
Avg.		

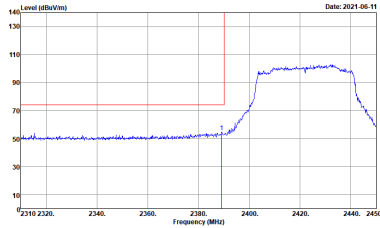
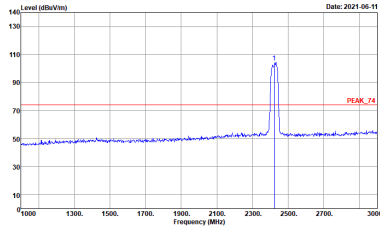
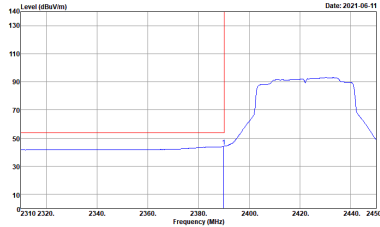
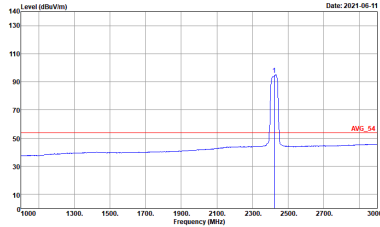
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AV6_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH12-HY Condition : AV6_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto
Avg.		

2.4GHz 2400~2483.5MHz
WIFI 802.11ax HE40 Full (Band Edge @ 3m)

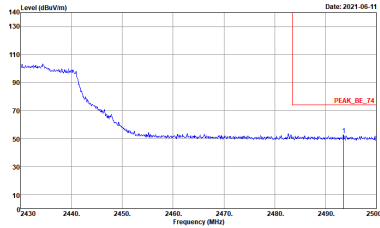
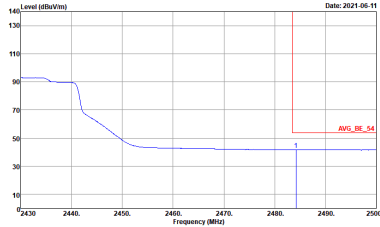
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site Condition : 03CH12-HY : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto	 Site Condition : 03CH12-HY : PEAK_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto
Avg.	 Site Condition : 03CH12-HY : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto	 Site Condition : 03CH12-HY : AVG_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.0000Hz VBW:0.0100Hz SWT:Auto

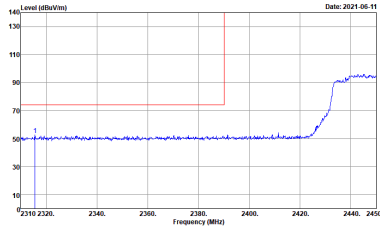
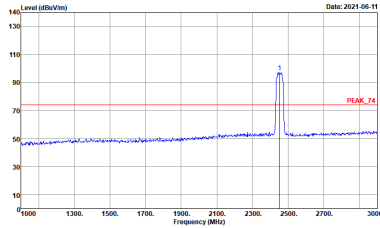
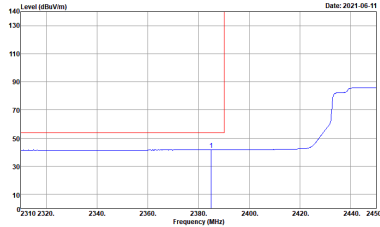
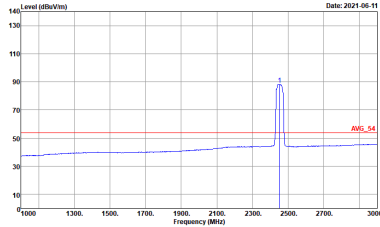


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	Left blank

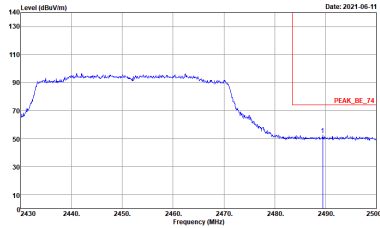
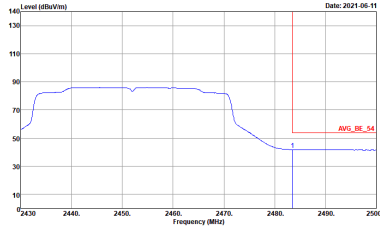
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto
Avg.		

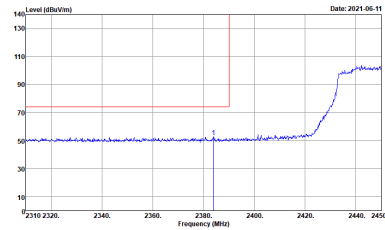
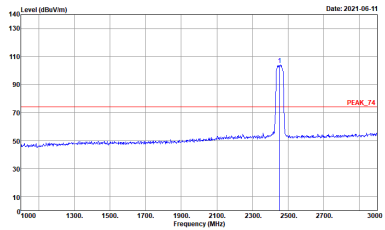
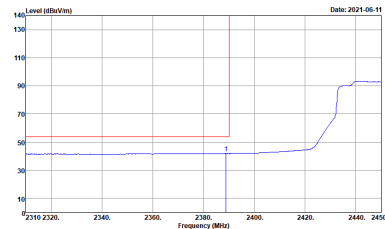
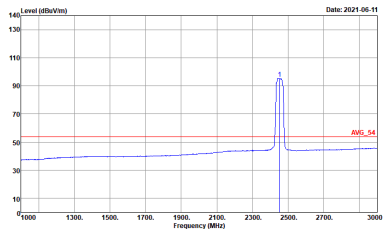


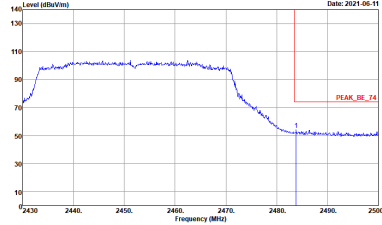
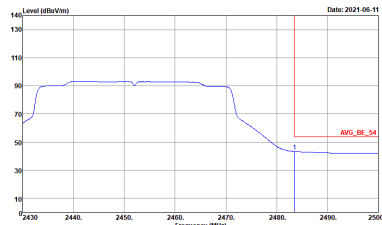
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH12-HY Condition : AVG_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto
Avg.		



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
	 Site : 03CH12-HY Condition : AV6_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	 Site : 03CH12-HY Condition : AV6_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto
Avg.		

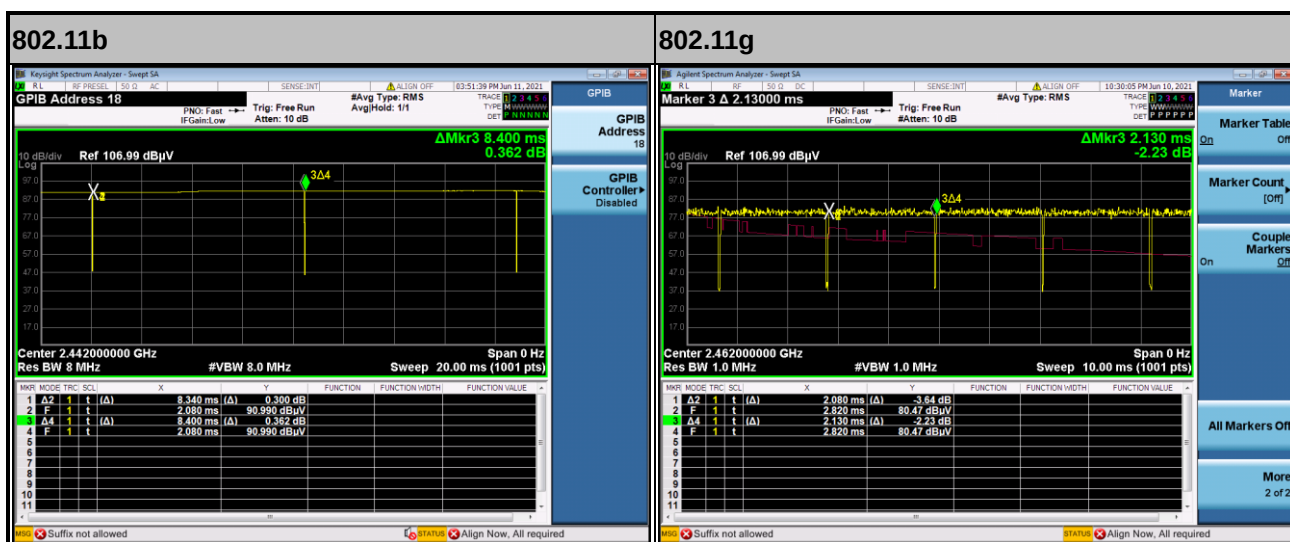
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	Left blank



Appendix E. Duty Cycle Plots

Chain	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
B	802.11b	99.29	-	-	10Hz	0.03
B	802.11g	97.65	2080	0.48	1kHz	0.10
A+B	2.4GHz 802.11ax HE20 Full RU	99.00	-	-	10Hz	0.04
A+B	2.4GHz 802.11ax HE40 Full RU	99.00	-	-	10Hz	0.04

<Chain B>



MIMO <Chain A+B>

