NCC RADIO TEST REPORT

Equipment	:	**Mobile Cellular Phone**
Brand Name	:	**Motorola**
Model Name	:	**XT2173-2**
Applicant	:	**Motorola Mobility LLC** **222 W, Merchandise Mart Plaza, Chicago, IL60654 USA**
Manufacturer	:	**Motorola Mobility LLC** **222 W,Merchandise Mart Plaza, Chicago IL 60654 USA**
Standard	:	**NCC LP0002 (2020-07-01)**

The product was received on Aug. 02, 2021 and testing was started from Aug. 10, 2021 and completed on Aug. 19, 2021. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures NCC LP0002 (2020-07-01) 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.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan

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History of this test report

Report No.	Version	Description	Issued Date
TR170932-01C	01	Initial issue of report	Sep. 27, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	LP0002 4.10.1.6 (2)(A)	6dB Bandwidth	Pass	-
3.1	-	99% Occupied Bandwidth	Reporting only	-
3.2	LP0002 4.10.1.2 (1)(C)	Power Output Measurement	Pass	-
3.3	LP0002 4.10.1.6 (2)(B)	Power Spectral Density	Pass	-
3.4	LP0002 4.10.1.5	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	LP0002 4.10.1.5	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 3.27 dB at 2483.500 MHz
3.6	LP0002 3.3	AC Conducted Emission	Pass	Under limit 14.44 dB at 12.471 MHz
3.7	LP0002 3.2 4.10.1.3 4.10.1.4	Antenna Requirement	Pass	-
Annex A	LP0002 3.9	Receiver Radiated Emission	Pass	Please refer to Annex A
Annex B	LP0002 3.2 6.20.2	Maximum Power Density	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: Keven Cheng

Report Producer: Amy Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature		
Equipment	Mobile Cellular Phone	
Brand Name	Motorola	
Model Name	XT2173-2	
Sample 1	1st source (refer to the PED)	
Sample 2	2nd source (refer to the PED)	
Sample 3	3rd source (refer to the PED)	
Sample 4	4th source (refer to the PED)	
IMEI Code	**Conducted**	IMEI 1: 354943970039171 IMEI 2: 354943970039189
	Conduction :	IMEI 1: 354943970023498 IMEI 2: 354943970023506
	Radiation	IMEI 1: 354943970025477 IMEI 2: 354943970025485
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/FM/ Galileo/Glonass/GPS WLAN 11b/g/n HT20 WLAN 11an HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE	
HW Version	DVT2	
EUT Stage	Identical Prototype	

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

Accessory List		
AC Adapter 1	**Brand Name :**	Motorola
	Model Name :	MC-101
	Manufacturer :	Salcomp
AC Adapter 2	**Brand Name :**	Motorola
	Model Name :	MC-101
	Manufacturer :	Aohai
Battery 1	**Brand Name :**	Motorola
	Model Name :	JK50
	Manufacturer :	Sunwoda
Battery 2	**Brand Name :**	Motorola
	Model Name :	JK50
	Manufacturer :	ATL
Battery 3	**Brand Name :**	Motorola
	Model Name :	JK50
	Manufacturer :	SCUD
Earphone	**Brand Name :**	Motorola
	Model Name :	MH202
USB Cable 1	**Brand Name :**	Motorola
	Model Name :	5269AA000185
USB Cable 2	**Brand Name :**	Motorola
	Model Name :	5269AA000189

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	2400 MHz ~ 2483.5 MHz
Maximum Peak Output Power to antenna	802.11b: 20.45 dBm / 0.1109 W 802.11g: 24.96 dBm / 0.3133 W 802.11n HT20: 24.78 dBm / 0.3006 W
Maximum Average Output Power to antenna	802.11b: 18.30 dBm / 0.0676 W 802.11g: 18.30 dBm / 0.0676 W 802.11n HT20: 17.40 dBm / 0.0550 W
99% Occupied Bandwidth	802.11b: 13.39 MHz 802.11g: 18.53 MHz 802.11n HT20: 18.98 MHz
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

Antenna Information				
Antenna 2	**Brand Name**	HT	**Peak Gain**	WLAN 2.4GHz: -3.4 dBi
	Model Name	SH1371DIV	**Type**	PIFA Antenna

Remark:

1. The detail internal, external and transmit antenna photo please refer to Sporton report no.: EP170932-01.
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 TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	TH05-HY, 03CH15-HY, CO07-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:

- NCC LP0002 (2020-07-01)
- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- 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 (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.

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.

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4GHz) Link + MPEG 4 + Earphone + Battery 1 + USB Cable 1 (Charging from Adapter 1) for Sample 1

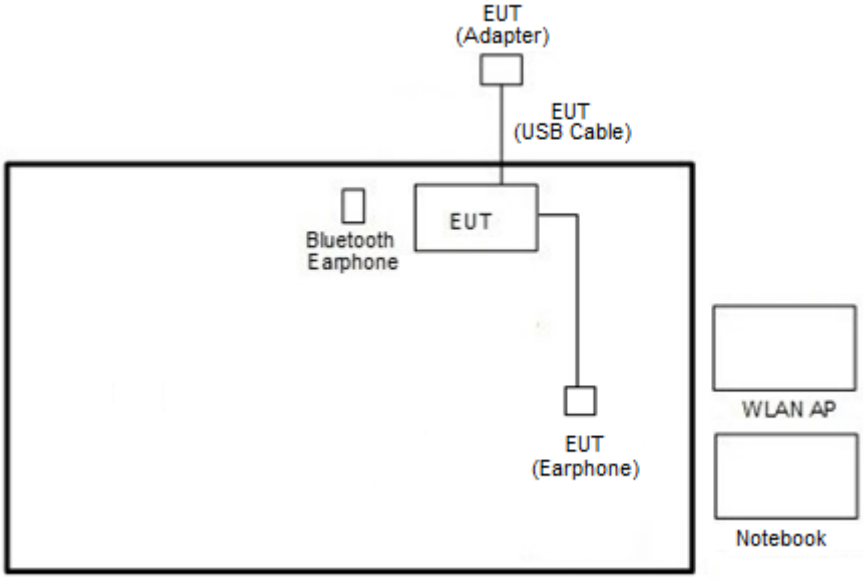
Remark:
1. For Radiated Test Cases, the tests were performed with Adapter 1, Battery 1, USB Cable 1 and Sample 1
2. For radiation spurious emission, after the test voltage (120Vac/60Hz and 110Vac/60Hz) is verified by lab, the test data can conform to the test requirements of NCC rule.

Ch. #	2400-2483.5 MHz		
	802.11b	802.11g	802.11n HT20
Low	01	01	01
Middle	06	06	06
High	11	11	11

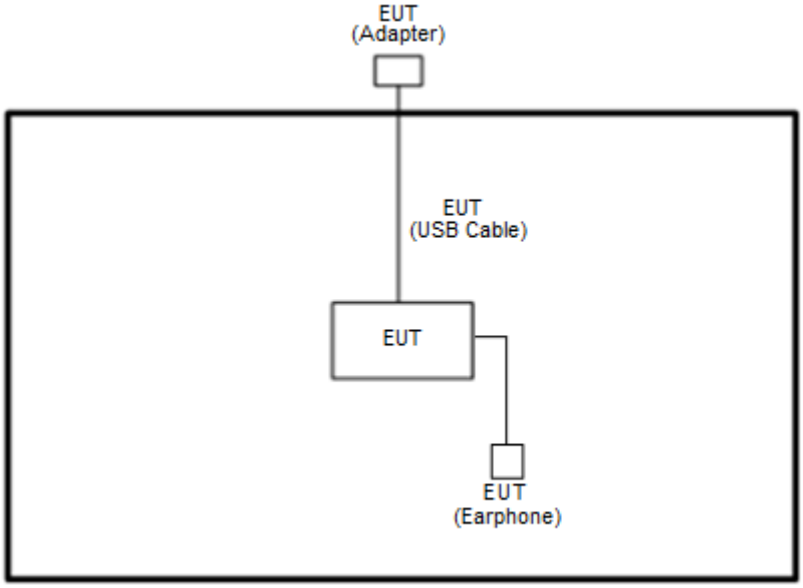
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<WLAN Tx Mode>



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.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

Remark: Applicant has ensured support unit would not be attached with the product on the market, support unit is provided by lab for testing.

2.5 EUT Operation Test Setup

The RF test items, make the EUT (SW: coful_g_userdebug_11_RRWB31.Q3-38_0bea6_intcfg_test-keys) get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

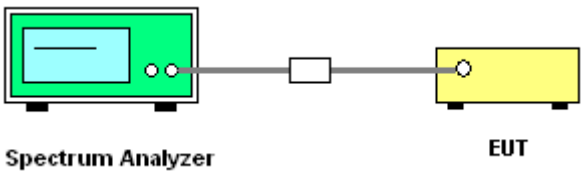
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

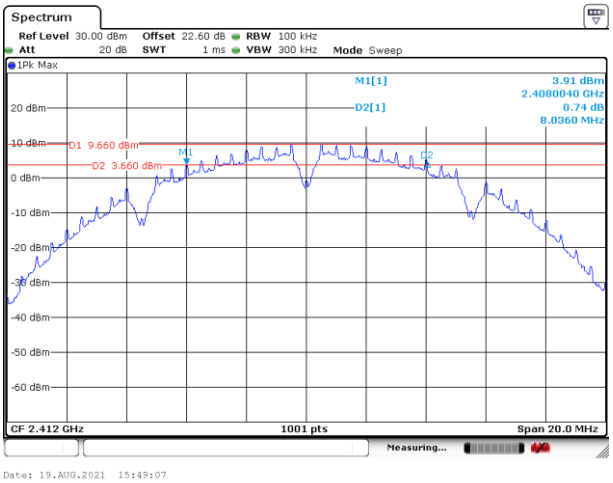
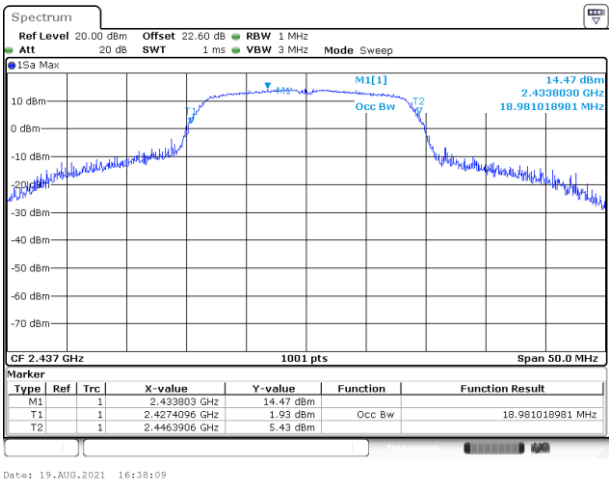
1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	

Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 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.

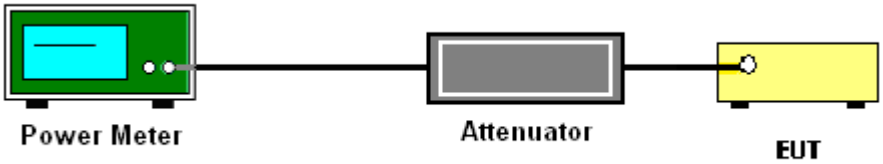
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

1. For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.3 PKPM1
2. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
3. 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.
4. Set the maximum power setting and enable the EUT to transmit continuously.
5. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

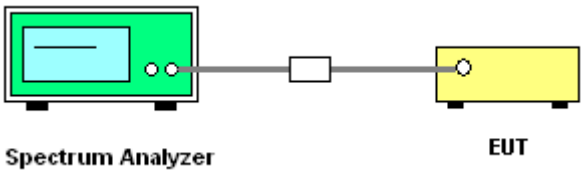
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer 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. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

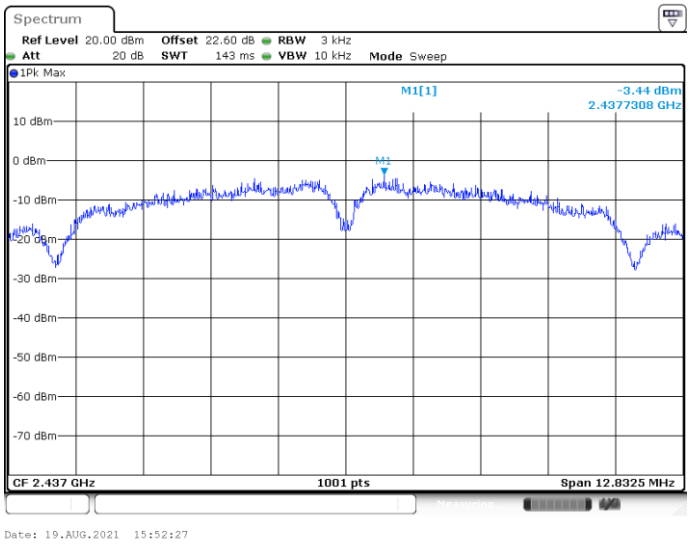
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/3kHz)



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in NCC LP0002 Section 3.5, must also comply with the radiated emission limits specified in NCC LP0002 Section 3.6.

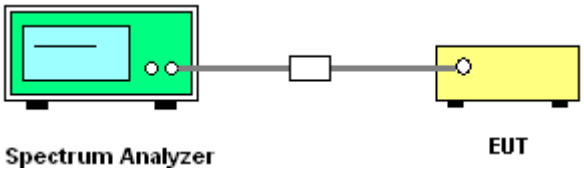
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement.
2. The RF output of EUT was connected to the spectrum analyzer 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. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



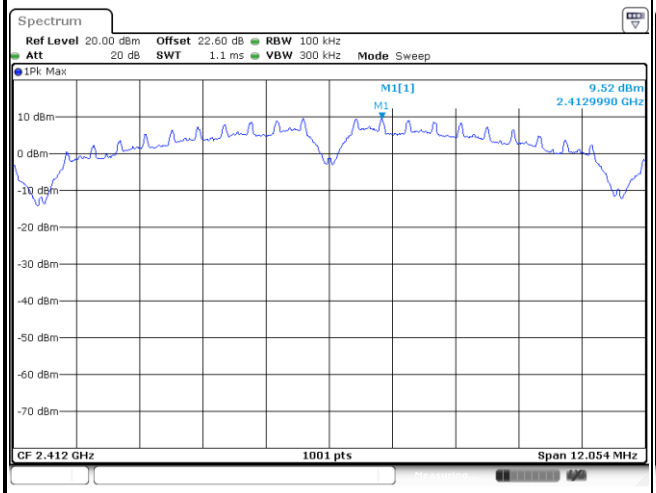
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer :	Jacob Yu	**Temperature :**	24.4~24.8℃
		Relative Humidity :	49.5~51.5%

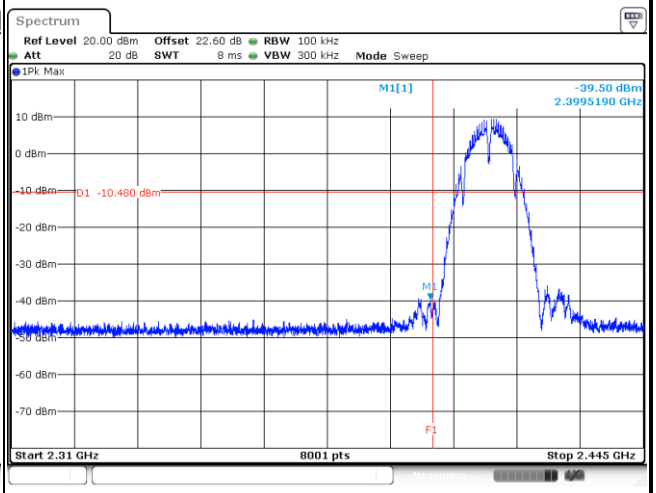
Number of TX = 1, Ant. 2 (Measured)

Test Mode :	802.11b	**Test Channel :**	01

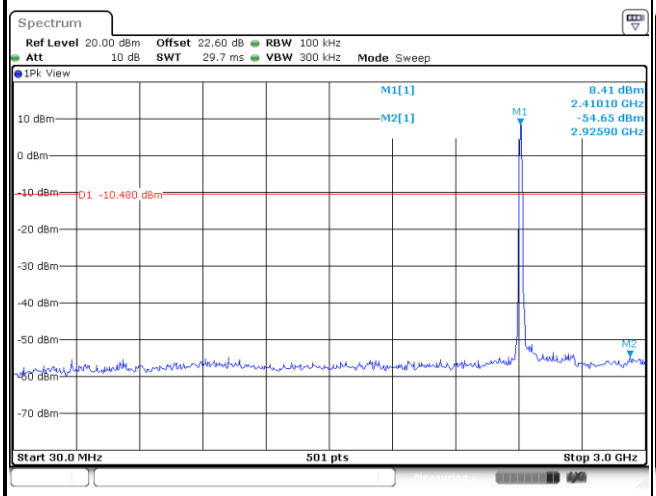
100kHz PSD reference Level



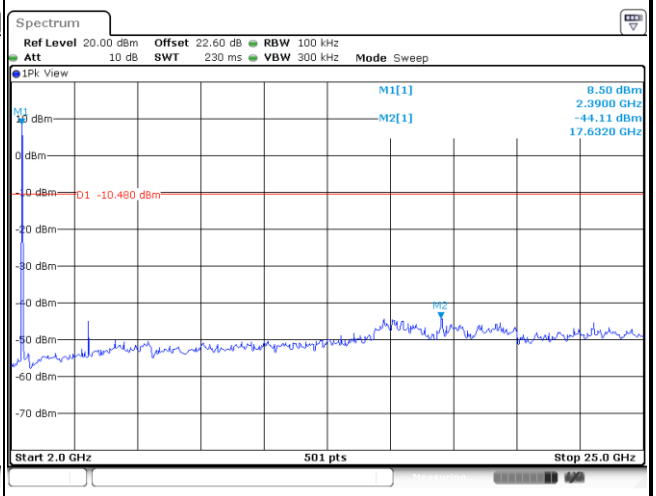
Low Channel Plot



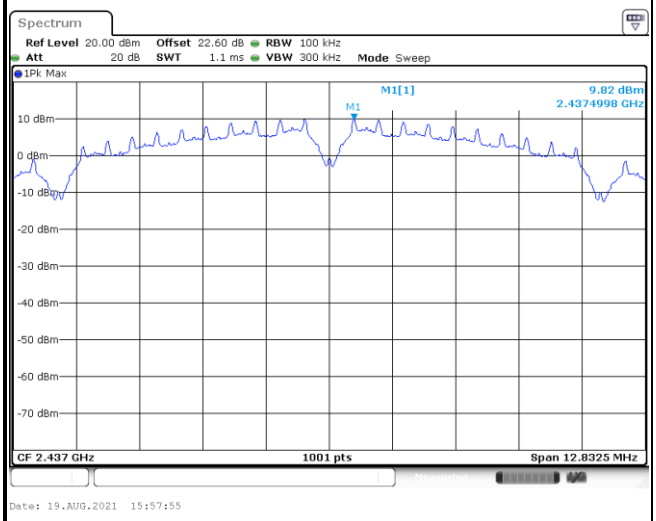
Spurious Emission 30MHz~3GHz

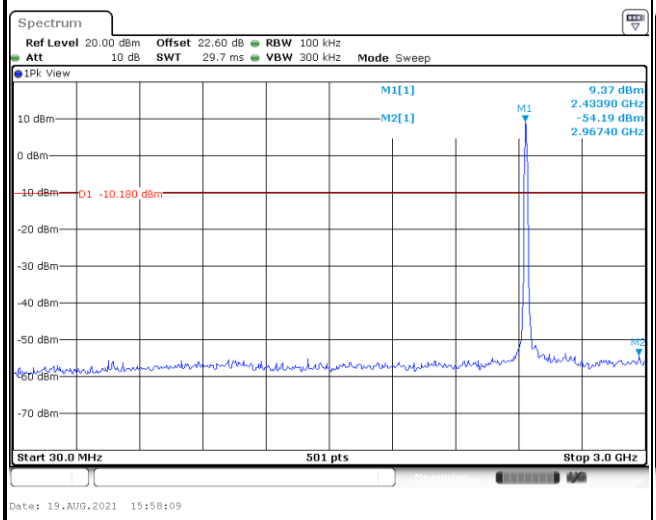
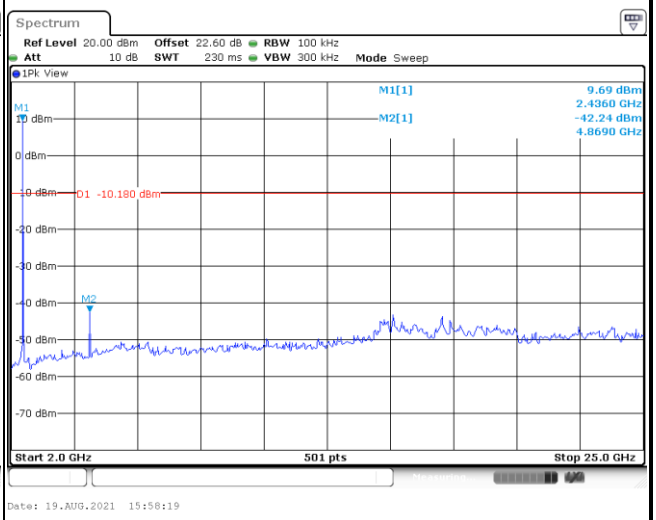


Spurious Emission 2GHz~25GHz

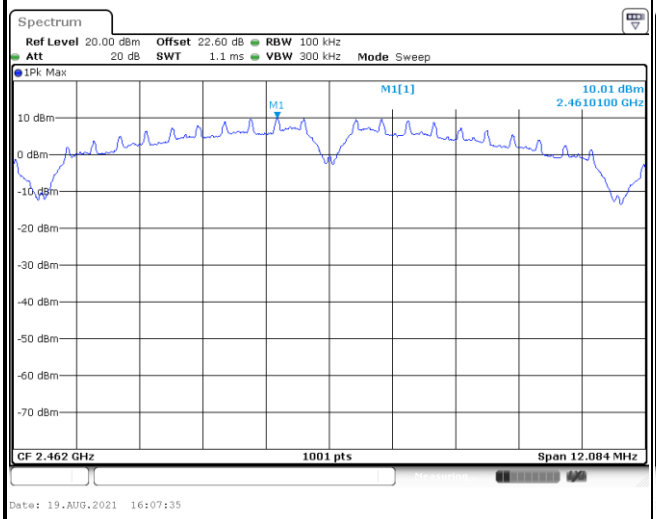
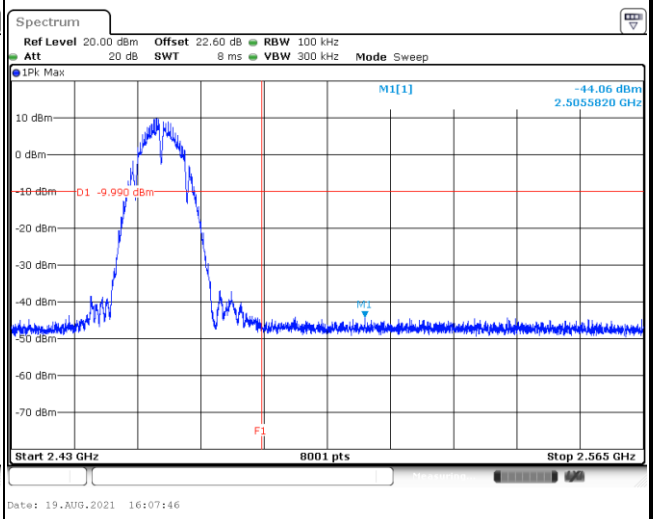
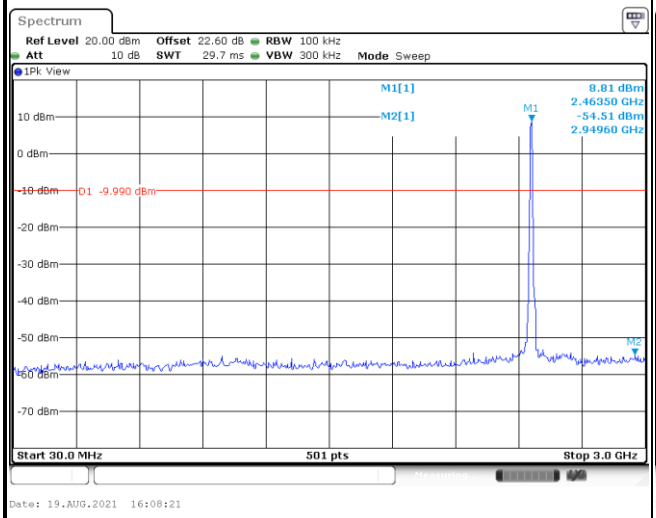
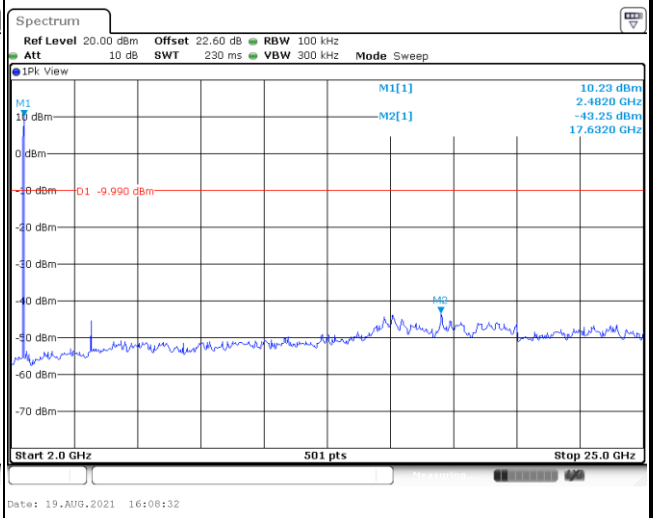


Test Mode :	802.11b	Test Channel :	06

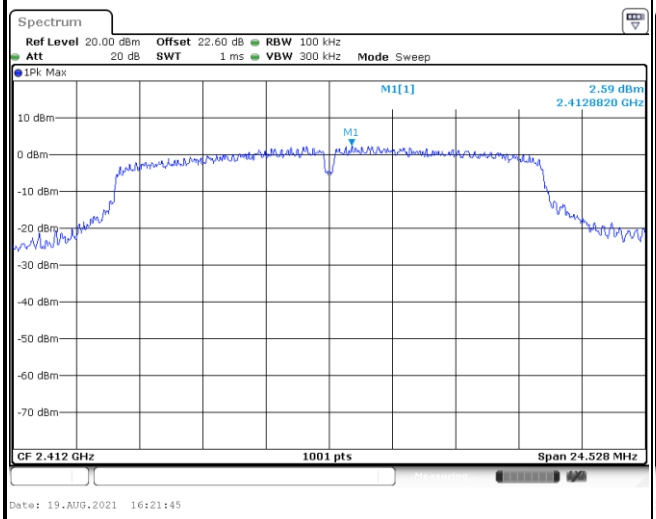
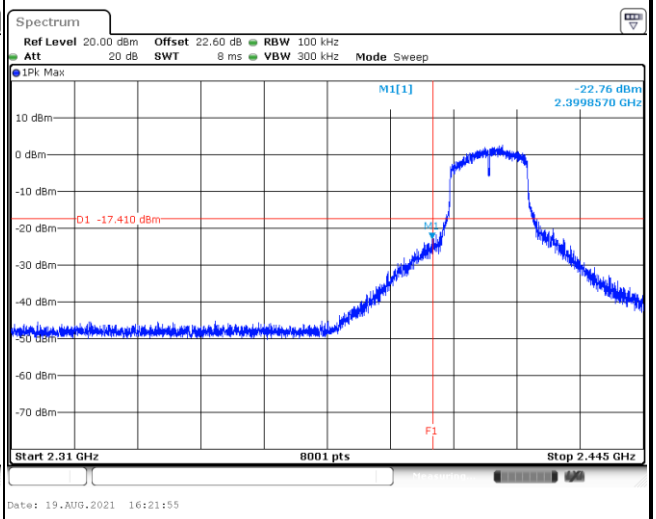
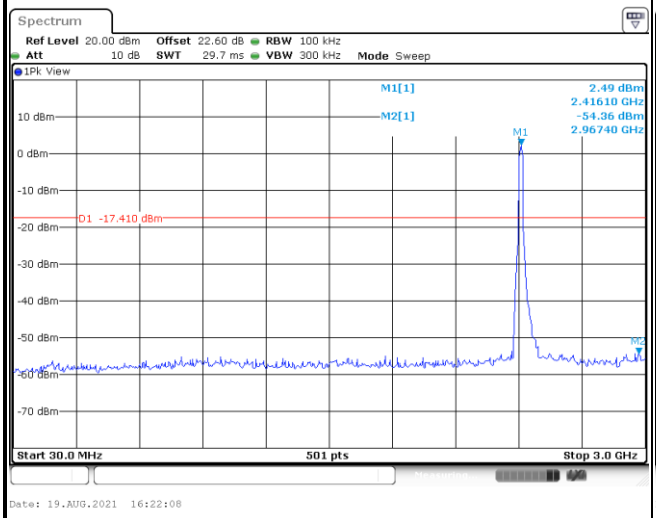
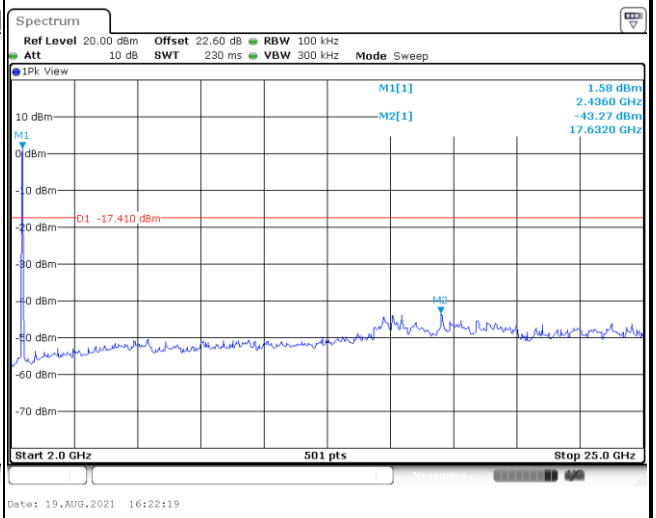
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

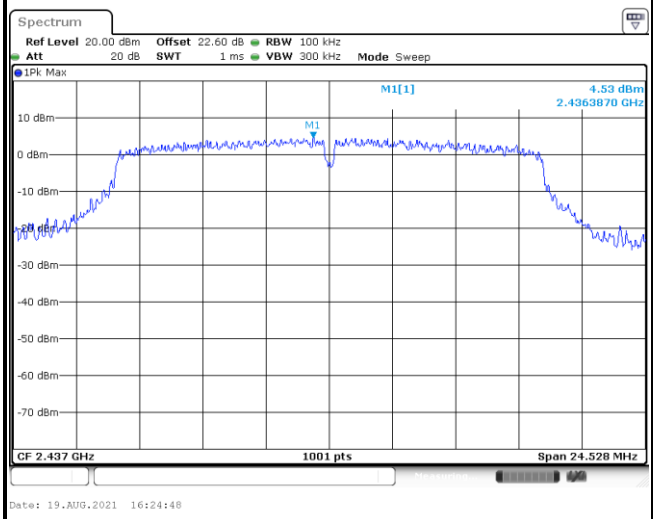
Test Mode :	802.11b	Test Channel :	11

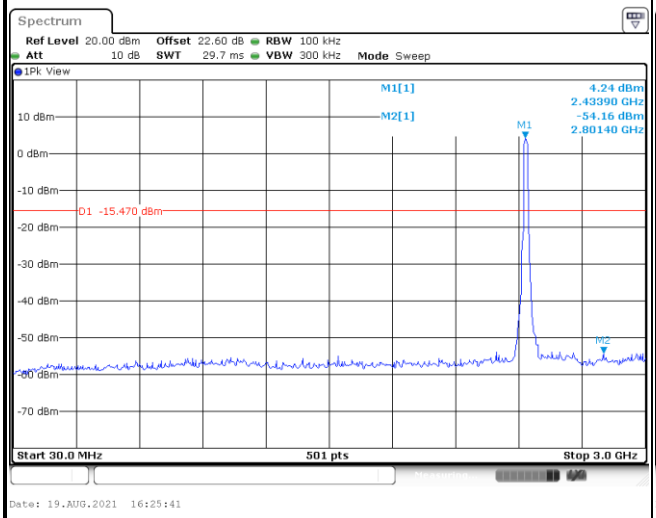
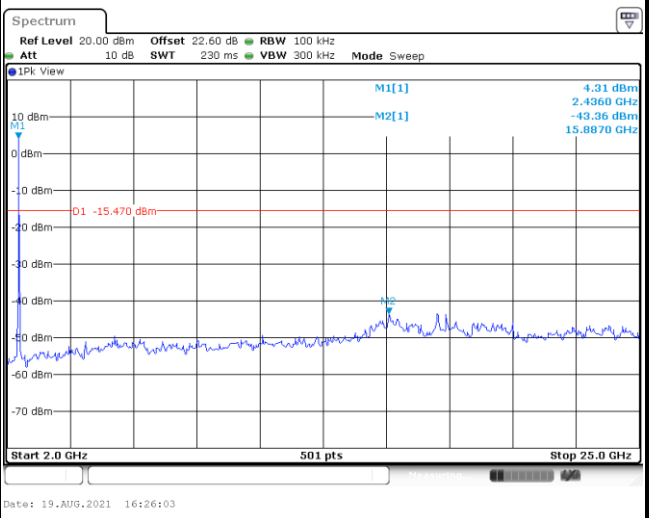
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	01

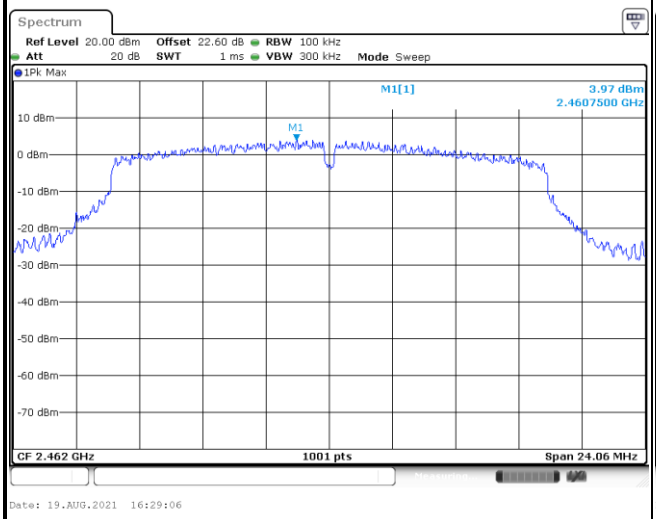
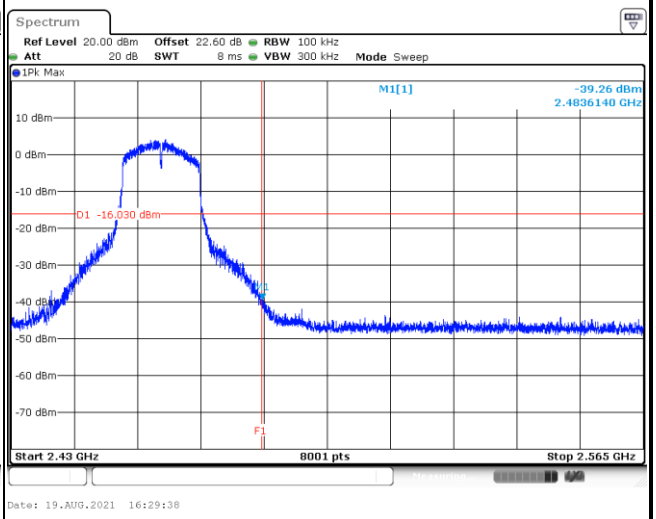
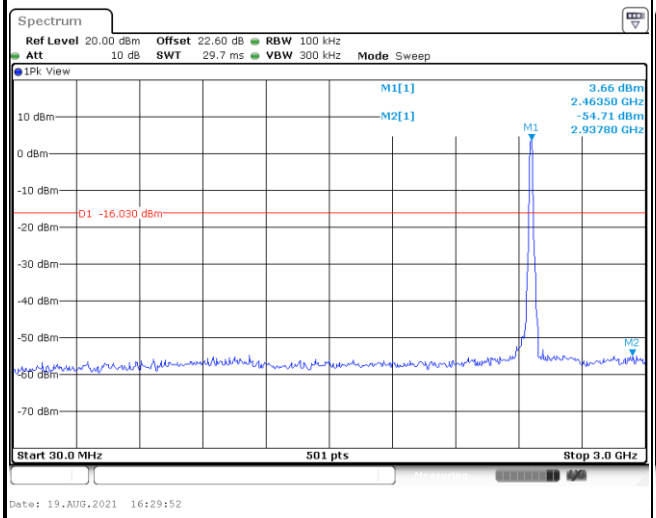
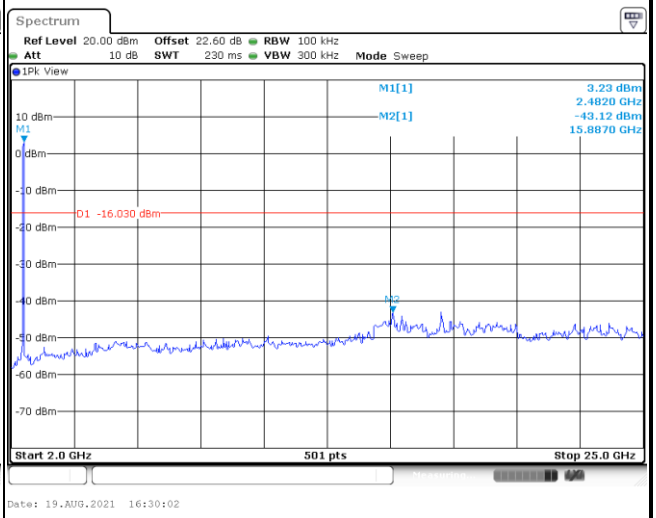
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	06

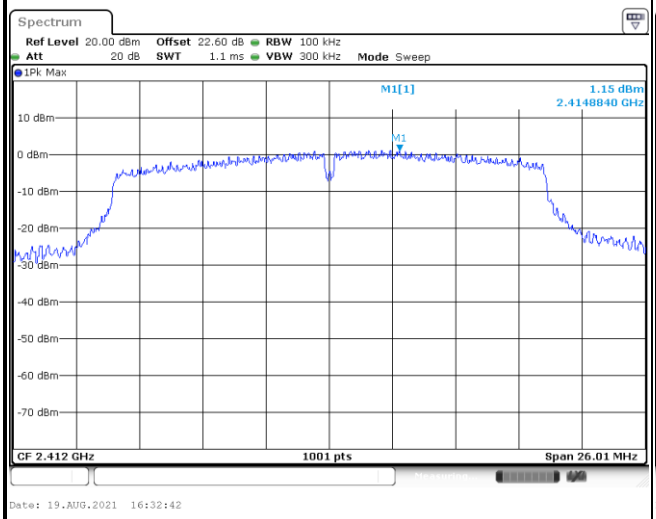
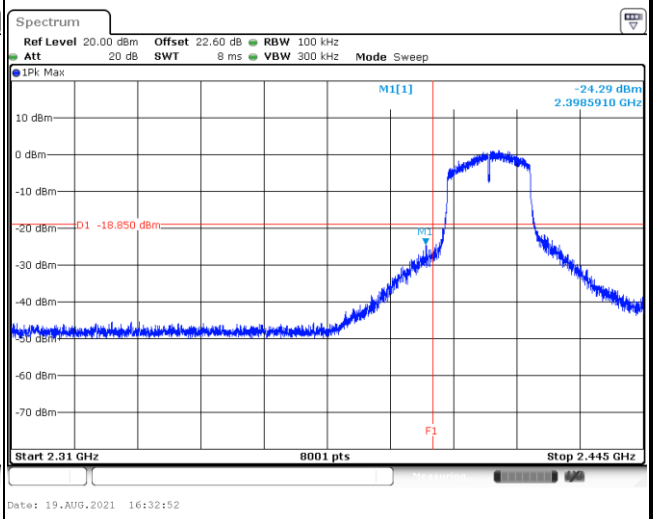
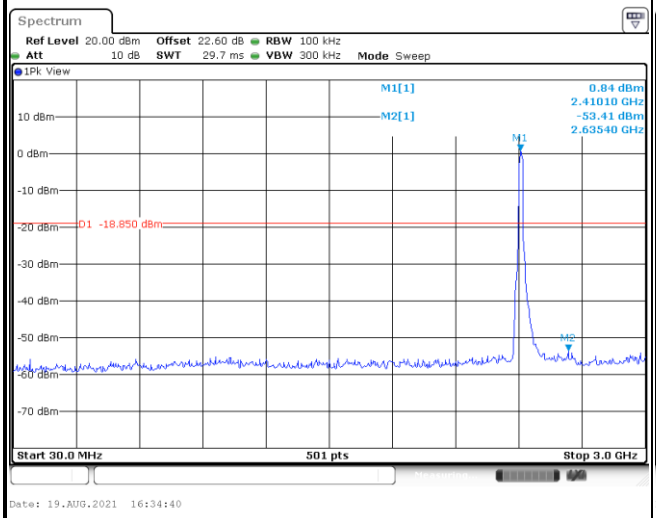
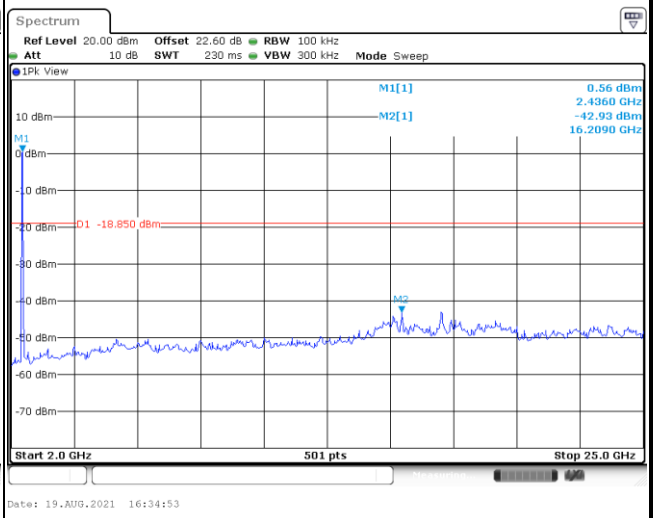
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

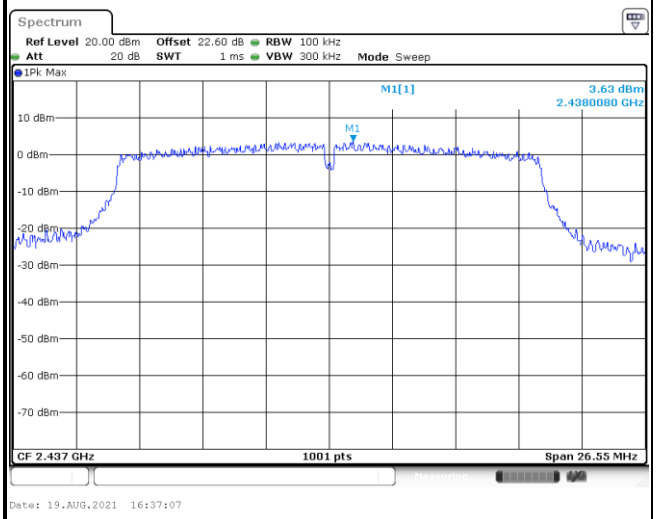
Test Mode :	802.11g	Test Channel :	11

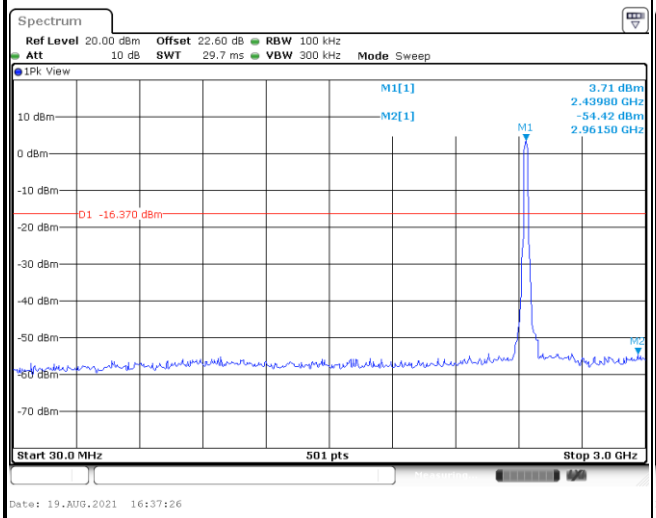
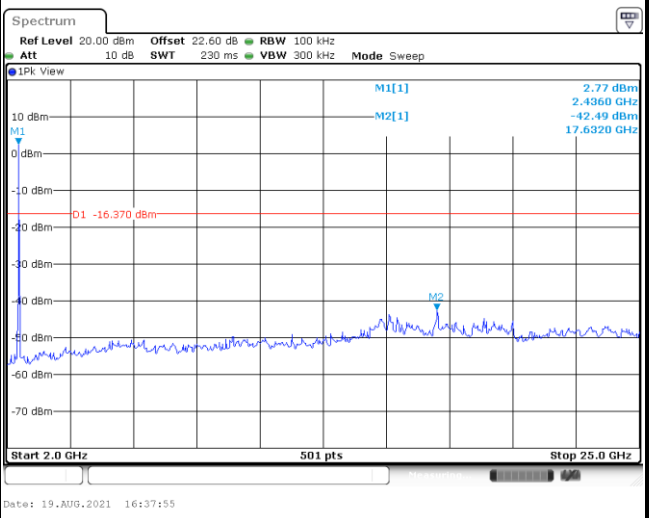
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

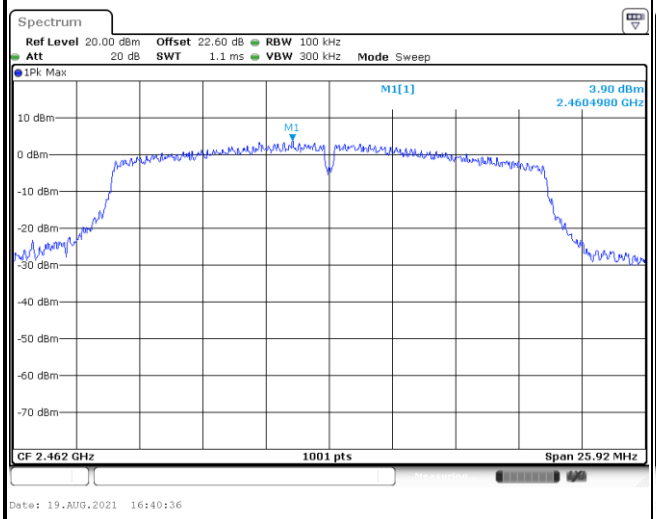
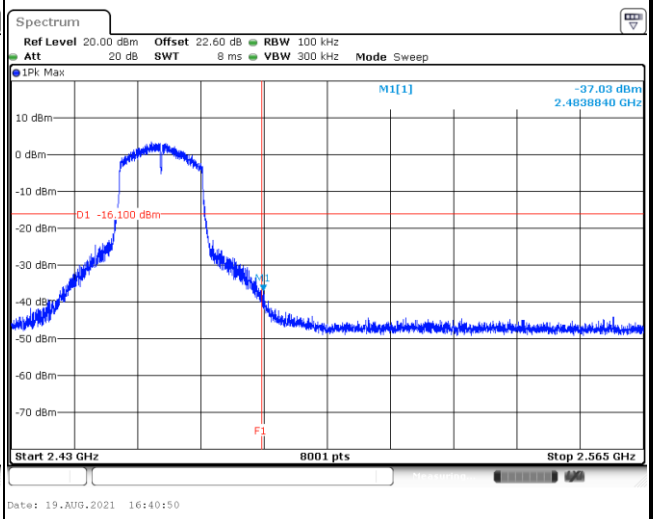
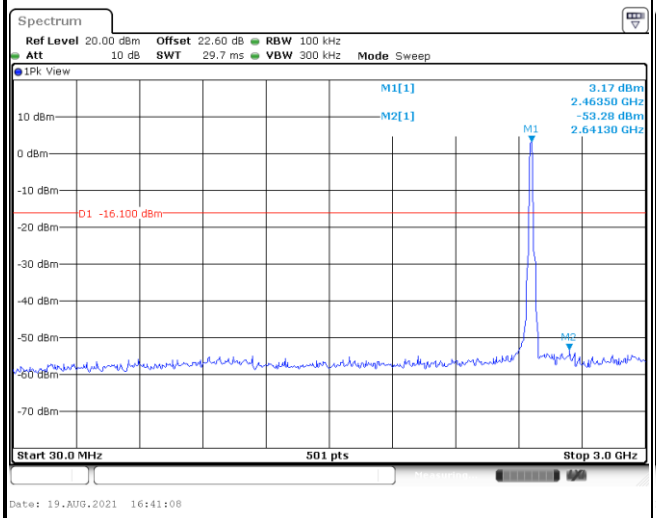
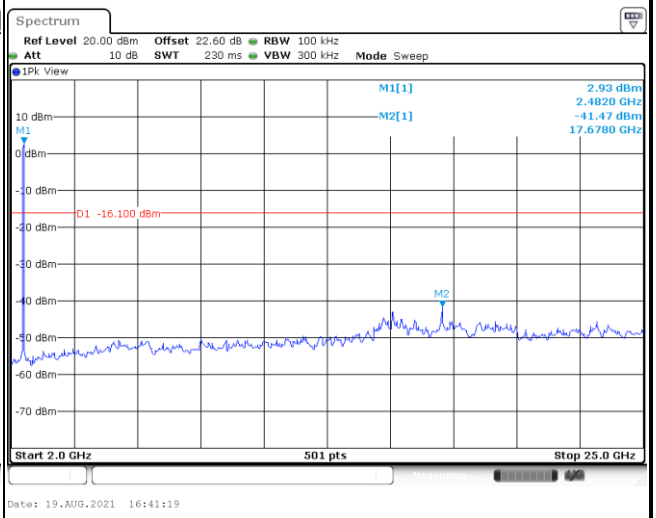
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 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 NCC LP0002 section 3.6 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

3.5.2 Measuring Instruments

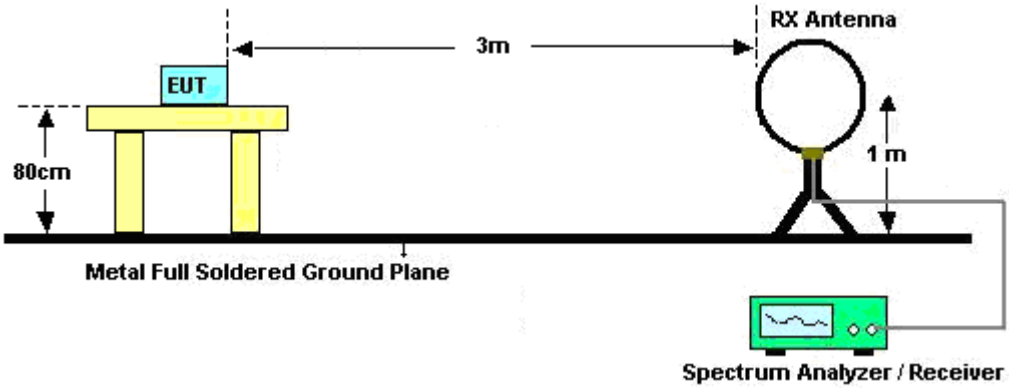
See list of measuring equipment of this test report.

3.5.3 Test Procedures

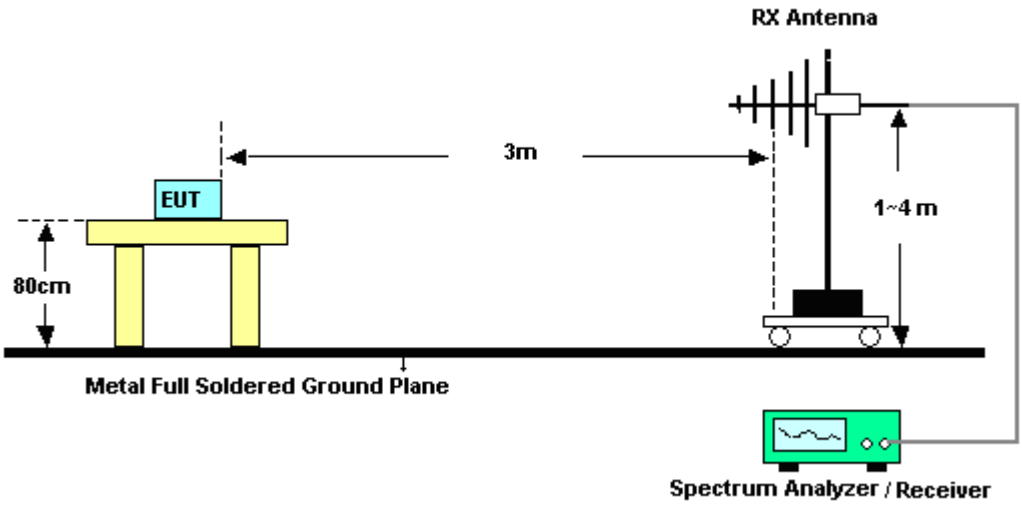
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1 GHz and 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 - Preamp Factor = Level
6. For testing below 1 GHz, 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 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.
8. 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 ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3 MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

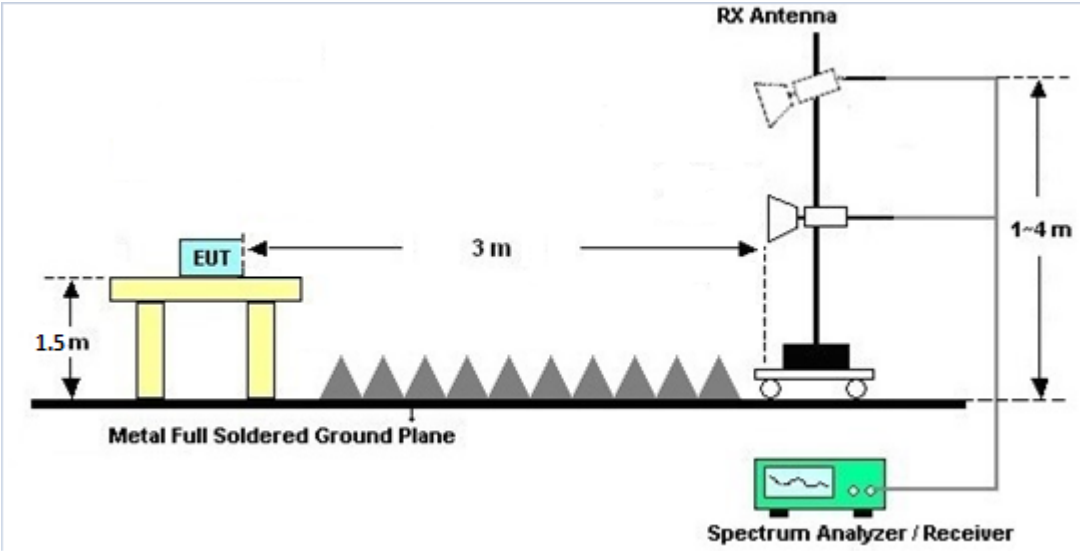
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated test above 1GHz



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per NCC LP0002 section 6.13 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.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 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 (dBμV)	
	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.

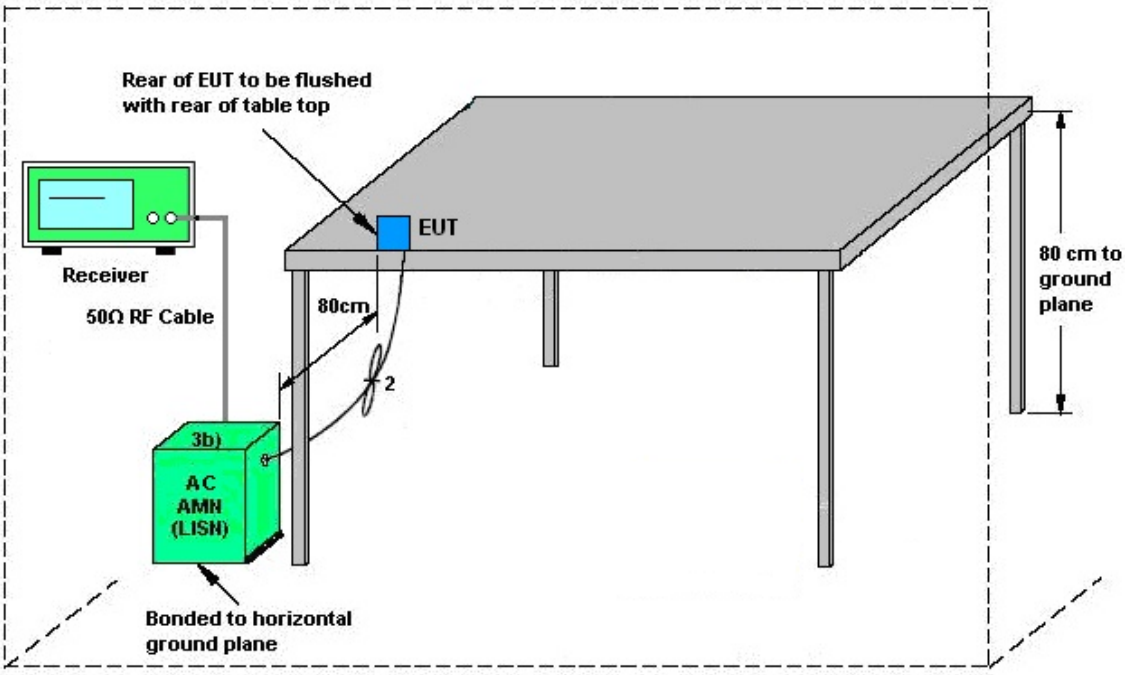
3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 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.

3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 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 LP0002 Section 3.2, Section 4.10.1.3, and Section 4.10.1.4

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Aug. 13, 2021~ Aug. 16, 2021	Jun. 03, 2022	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	41912 & 05	30MHz~1GHz	Feb. 08, 2021	Aug. 13, 2021~ Aug. 16, 2021	Feb. 07, 2022	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 28, 2020	Aug. 13, 2021~ Aug. 16, 2021	Dec. 27, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Nov. 03, 2020	Aug. 13, 2021~ Aug. 16, 2021	Nov. 02, 2021	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Dec. 02, 2020	Aug. 13, 2021~ Aug. 16, 2021	Dec. 01, 2021	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055006	1GHz~18GHz	May 06, 2021	Aug. 13, 2021~ Aug. 16, 2021	May 05, 2022	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 21, 2020	Aug. 13, 2021~ Aug. 16, 2021	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Oct. 27, 2020	Aug. 13, 2021~ Aug. 16, 2021	Oct. 26, 2021	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20MHz~8.4GHz	Nov. 02, 2020	Aug. 13, 2021~ Aug. 16, 2021	Nov. 01, 2021	Radiation (03CH15-HY
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 23, 2020	Aug. 13, 2021~ Aug. 16, 2021	Oct. 22, 2021	Radiation (03CH15-HY
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Aug. 13, 2021~ Aug. 16, 2021	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Aug. 13, 2021~ Aug. 16, 2021	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24 (k5)	RK-000451	N/A	N/A	Aug. 13, 2021~ Aug. 16, 2021	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE,508405/2E	30MHz~18G	Nov. 16, 2020	Aug. 13, 2021~ Aug. 16, 2021	Nov. 15, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 22, 2021	Aug. 13, 2021~ Aug. 16, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 22, 2021	Aug. 13, 2021~ Aug. 16, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Aug. 13, 2021~ Aug. 16, 2021	Mar. 10, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-1530-6000-40ST	SN4	1.53GHz Low Pass Filter	Jul. 02, 2021	Aug. 13, 2021~ Aug. 16, 2021	Jul. 01, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN4	3GHz High Pass Filter	Sep. 16, 2020	Aug. 13, 2021~ Aug. 16, 2021	Sep. 15, 2021	Radiation (03CH15-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Aug. 12, 2021	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Aug. 12, 2021	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Nov. 02, 2020	Aug. 12, 2021	Nov. 01, 2021	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	N/A	Aug. 12, 2021	N/A	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Feb. 01, 2021	Aug. 12, 2021	Jan. 31, 2022	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 11, 2020	Aug. 12, 2021	Sep. 10, 2021	Conduction (CO07-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 01, 2021	Aug. 10, 2021~ Aug. 19, 2021	Feb. 28, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO12	10MHz~6GHz	Dec. 16, 2020	Aug. 10, 2021~ Aug. 19, 2021	Dec. 15, 2021	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	1036004	N/A	Aug. 01, 2021	Aug. 10, 2021~ Aug. 19, 2021	Jul. 31, 2022	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 01, 2021	Aug. 10, 2021~ Aug. 19, 2021	Jul. 31, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101565	10Hz ~ 40GHz	Nov. 13, 2020	Aug. 10, 2021~ Aug. 19, 2021	Nov. 12, 2021	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	Aug. 10, 2021~ Aug. 19, 2021	Mar. 16, 2022	Conducted (TH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.2 dB

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

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

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

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

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

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

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jacob Yu	Temperature:	24.4~24.8	°C
Test Date:	2021/8/10-2021/8/19	Relative Humidity:	49.5~51.5	%

Maximum Power Density				
Max. Power	Gain	EIRP	20 cm PSD	PSD Limit
18.30	-3.40	14.90	0.0062	1.00
dBm	dBi	dBm	mW/cm^2	mW/cm^2

Report Number : TR170932-01C

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band Single Antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant2	-	Ant2	-		
11b	1Mbps	1	1	2412	13.04	-	8.04	-	0.50	Pass
11b	1Mbps	1	6	2437	13.39	-	8.56	-	0.50	Pass
11b	1Mbps	1	11	2462	13.04	-	8.06	-	0.50	Pass
11g	6Mbps	1	1	2412	18.18	-	16.35	-	0.50	Pass
11g	6Mbps	1	6	2437	18.53	-	16.35	-	0.50	Pass
11g	6Mbps	1	11	2462	17.73	-	16.04	-	0.50	Pass
HT20	MCS0	1	1	2412	18.78	-	17.34	-	0.50	Pass
HT20	MCS0	1	6	2437	18.98	-	17.70	-	0.50	Pass
HT20	MCS0	1	11	2462	18.38	-	17.28	-	0.50	Pass

Report Number : TR170932-01C

TEST RESULTS DATA
Peak Output Power

2.4GHz Band Single Antenna																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail	Setting
					Ant2	-	SUM	Ant2	-	Ant2	-	Ant2	-	Ant2	-		Ant 2
11b	1Mbps	1	1	2412	20.25	-		30.00	-	-3.40	-	16.85	-	36.00	-	Pass	18.00
11b	1Mbps	1	6	2437	20.32	-		30.00	-	-3.40	-	16.92	-	36.00	-	Pass	17.50
11b	1Mbps	1	11	2462	20.45	-		30.00	-	-3.40	-	17.05	-	36.00	-	Pass	18.00
11g	6Mbps	1	1	2412	23.83	-		30.00	-	-3.40	-	20.43	-	36.00	-	Pass	16.00
11g	6Mbps	1	6	2437	24.96	-		30.00	-	-3.40	-	21.56	-	36.00	-	Pass	18.00
11g	6Mbps	1	11	2462	24.08	-		30.00	-	-3.40	-	20.68	-	36.00	-	Pass	17.00
HT20	MCS0	1	1	2412	23.55	-		30.00	-	-3.40	-	20.15	-	36.00	-	Pass	15.00
HT20	MCS0	1	6	2437	24.78	-		30.00	-	-3.40	-	21.38	-	36.00	-	Pass	17.00
HT20	MCS0	1	11	2462	23.92	-		30.00	-	-3.40	-	20.52	-	36.00	-	Pass	16.50

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

Report Number : TR170932-01C

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	Setting
					Ant2	-	SUM	Ant2	-	Ant2	-	Ant2	-	Ant2	-		Ant 2
11b	1Mbps	1	1	2412	18.10	-		30.00	-	-3.40	-	14.70	-	36.00	-	Pass	18.00
11b	1Mbps	1	6	2437	18.20	-		30.00	-	-3.40	-	14.80	-	36.00	-	Pass	17.50
11b	1Mbps	1	11	2462	18.30	-		30.00	-	-3.40	-	14.90	-	36.00	-	Pass	18.00
11g	6Mbps	1	1	2412	15.80	-		30.00	-	-3.40	-	12.40	-	36.00	-	Pass	16.00
11g	6Mbps	1	6	2437	18.30	-		30.00	-	-3.40	-	14.90	-	36.00	-	Pass	18.00
11g	6Mbps	1	11	2462	16.90	-		30.00	-	-3.40	-	13.50	-	36.00	-	Pass	17.00
HT20	MCS0	1	1	2412	14.60	-		30.00	-	-3.40	-	11.20	-	36.00	-	Pass	15.00
HT20	MCS0	1	6	2437	17.40	-		30.00	-	-3.40	-	14.00	-	36.00	-	Pass	17.00
HT20	MCS0	1	11	2462	16.60	-		30.00	-	-3.40	-	13.20	-	36.00	-	Pass	16.50

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

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band Single Antenna												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant2	-	Worse + 3.01	Ant2	-	Ant2	-	
11b	1Mbps	1	1	2412	-4.27	-		-3.40	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-3.44	-		-3.40	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-3.59	-		-3.40	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-8.19	-		-3.40	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-6.39	-		-3.40	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-6.69	-		-3.40	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-9.92	-		-3.40	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-7.92	-		-3.40	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-8.29	-		-3.40	-	8.00	-	Pass

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

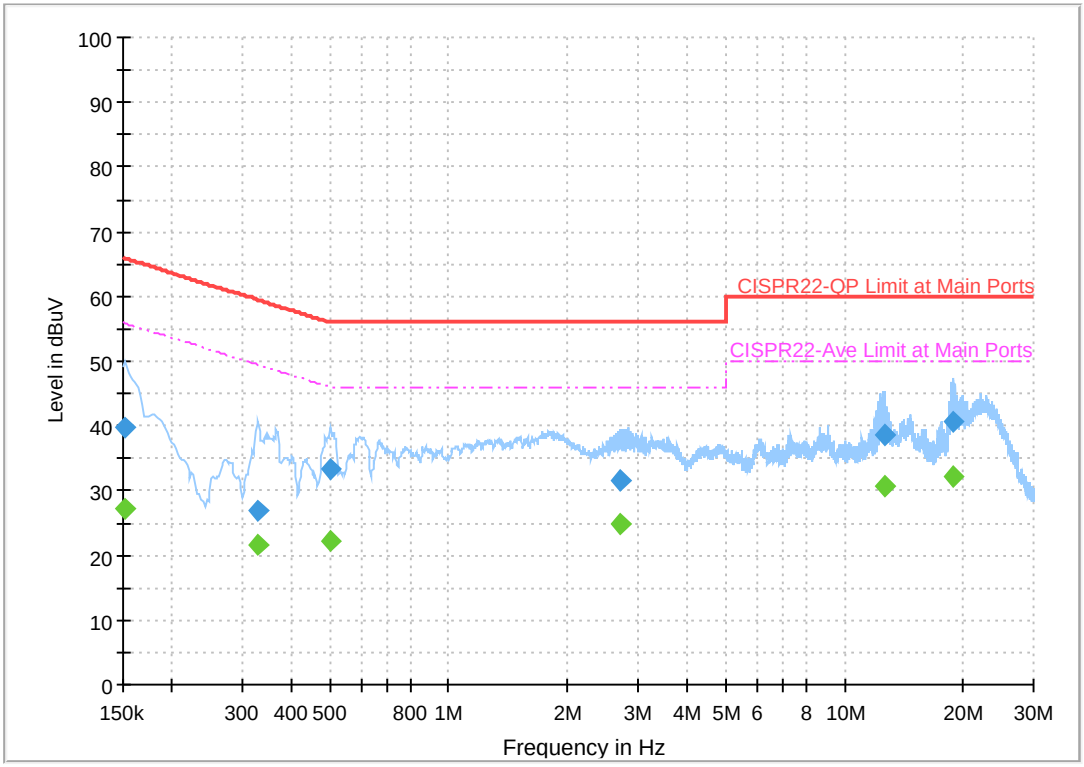
Appendix B. AC Conducted Emission Test Results

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

EUT Information

Report NO :	170932-01
Test Mode :	Mode 1
Test Voltage :	110Vac/60Hz
Phase :	Line

Full Spectrum



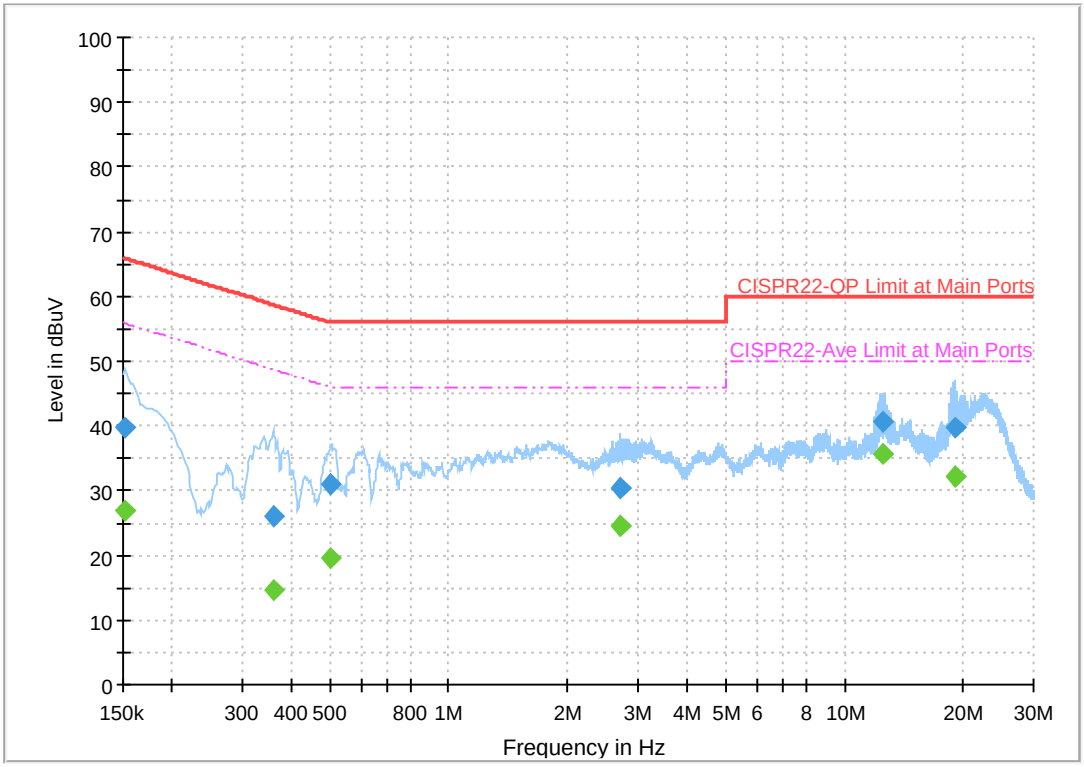
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	27.23	55.88	28.65	L1	OFF	20.0
0.152250	39.75	---	65.88	26.13	L1	OFF	20.0
0.327750	---	21.62	49.51	27.88	L1	OFF	20.0
0.327750	26.91	---	59.51	32.60	L1	OFF	20.0
0.503250	---	22.17	46.00	23.83	L1	OFF	20.0
0.503250	33.41	---	56.00	22.59	L1	OFF	20.0
2.717250	---	24.73	46.00	21.27	L1	OFF	20.1
2.717250	31.57	---	56.00	24.43	L1	OFF	20.1
12.565500	---	30.60	50.00	19.40	L1	OFF	20.2
12.565500	38.58	---	60.00	21.42	L1	OFF	20.2
18.856500	---	32.29	50.00	17.71	L1	OFF	20.2
18.856500	40.54	---	60.00	19.46	L1	OFF	20.2

EUT Information

Report NO :	170932-01
Test Mode :	Mode 1
Test Voltage :	110Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	26.98	55.88	28.90	N	OFF	20.0
0.152250	39.76	---	65.88	26.12	N	OFF	20.0
0.359250	---	14.48	48.75	34.27	N	OFF	20.0
0.359250	26.01	---	58.75	32.74	N	OFF	20.0
0.503250	---	19.66	46.00	26.34	N	OFF	20.0
0.503250	30.96	---	56.00	25.04	N	OFF	20.0
2.717250	---	24.53	46.00	21.47	N	OFF	20.1
2.717250	30.50	---	56.00	25.50	N	OFF	20.1
12.471000	---	35.56	50.00	14.44	N	OFF	20.2
12.471000	40.53	---	60.00	19.47	N	OFF	20.2
18.942000	---	32.11	50.00	17.89	N	OFF	20.3
18.942000	39.70	---	60.00	20.30	N	OFF	20.3

Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou, and Bigshow Wang	Temperature :	22.1~23.1°C
		Relative Humidity :	55~60%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2													
802.11b CH 01 2412MHz		2386.23	55.52	-18.48	74	42.32	27.56	16.56	30.92	100	292	P	H
		2387	44.28	-9.72	54	31.09	27.55	16.56	30.92	100	292	A	H
	*	2412	109.03	-	-	95.84	27.5	16.6	30.91	100	292	P	H
	*	2412	105.97	-	-	92.78	27.5	16.6	30.91	100	292	A	H
													H
													H
		2338.38	53.57	-20.43	74	40.31	27.72	16.48	30.94	334	256	P	V
		2387.22	43.01	-10.99	54	29.82	27.55	16.56	30.92	334	256	A	V
	*	2412	105.08	-	-	91.89	27.5	16.6	30.91	334	256	P	V
	*	2412	102.14	-	-	88.95	27.5	16.6	30.91	334	256	A	V
													V
													V
802.11b CH 06 2437MHz		2384.56	53.22	-20.78	74	40.03	27.56	16.55	30.92	100	294	P	H
		2389.84	42.89	-11.11	54	29.71	27.54	16.56	30.92	100	294	A	H
	*	2437	108.89	-	-	95.65	27.5	16.64	30.9	100	294	P	H
	*	2437	105.81	-	-	92.57	27.5	16.64	30.9	100	294	A	H
		2489.92	54.05	-19.95	74	40.78	27.42	16.72	30.87	100	294	P	H
		2489.2	43.53	-10.47	54	30.26	27.42	16.72	30.87	100	294	A	H
		2355.28	52.85	-21.15	74	39.59	27.68	16.51	30.93	330	257	P	V
		2389.84	42.38	-11.62	54	29.2	27.54	16.56	30.92	330	257	A	V
	*	2437	105.41	-	-	92.17	27.5	16.64	30.9	330	257	P	V
	*	2437	102.33	-	-	89.09	27.5	16.64	30.9	330	257	A	V
		2492.53	53.24	-20.76	74	39.98	27.41	16.72	30.87	330	257	P	V
		2489.56	42.67	-11.33	54	29.4	27.42	16.72	30.87	330	257	A	V

802.11b CH 11 2462MHz	*	2462	109.05	-	-	95.78	27.48	16.68	30.89	100	289	P	H
	*	2462	106.1	-	-	92.83	27.48	16.68	30.89	100	289	A	H
		2485.65	55.04	-18.96	74	41.78	27.43	16.71	30.88	100	289	P	H
		2488.6	43.79	-10.21	54	30.52	27.42	16.72	30.87	100	289	A	H
													H
													H
	*	2462	104.54	-	-	91.27	27.48	16.68	30.89	323	258	P	V
	*	2462	101.61	-	-	88.34	27.48	16.68	30.89	323	258	A	V
		2488.4	54.09	-19.91	74	40.82	27.42	16.72	30.87	323	258	P	V
		2488.85	42.85	-11.15	54	29.58	27.42	16.72	30.87	323	258	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 802.11b (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 01 2412MHz		4824	51.32	-22.68	74	69.01	31.1	10.07	58.86	100	64	P	H
		4824	49.24	-4.76	54	66.93	31.1	10.07	58.86	100	64	A	H
													H
													H
													H
													H
		4824	44.32	-29.68	74	62.01	31.1	10.07	58.86	100	0	P	V
													V
													V
													V
													V
													V
802.11b CH 06 2437MHz		4874	51.35	-22.65	74	69.09	31.05	10.11	58.9	100	68	P	H
		4874	49.37	-4.63	54	67.11	31.05	10.11	58.9	100	68	A	H
		7311	44.27	-29.73	74	54.09	36.3	12.31	58.43	100	0	P	H
													H
													H
													H
		4874	44.21	-29.79	74	61.95	31.05	10.11	58.9	100	0	P	V
		7311	44.02	-29.98	74	53.84	36.3	12.31	58.43	100	0	P	V
													V
													V
													V
													V

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 11 2462MHz		4924	45.87	-28.13	74	63.58	31.1	10.14	58.95	100	0	P	H
		7386	44.67	-29.33	74	54.31	36.3	12.35	58.29	100	0	P	H
													H
													H
													H
													H
		4924	41.47	-32.53	74	59.18	31.1	10.14	58.95	100	0	P	V
		7386	43.86	-30.14	74	53.5	36.3	12.35	58.29	100	0	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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		2389.42	64.16	-9.84	74	50.98	27.54	16.56	30.92	100	313	P	H
		2389.97	49.62	-4.38	54	36.44	27.54	16.56	30.92	100	313	A	H
	*	2412	108.64	-	-	95.45	27.5	16.6	30.91	100	313	P	H
	*	2412	101.09	-	-	87.9	27.5	16.6	30.91	100	313	A	H
													H
													H
		2387.99	63.26	-10.74	74	50.07	27.55	16.56	30.92	338	253	P	V
		2389.97	47.54	-6.46	54	34.36	27.54	16.56	30.92	338	253	A	V
	*	2412	106.06	-	-	92.87	27.5	16.6	30.91	338	253	P	V
	*	2412	98.42	-	-	85.23	27.5	16.6	30.91	338	253	A	V
													V
													V
802.11g CH 06 2437MHz		2386.64	53.48	-20.52	74	40.29	27.55	16.56	30.92	100	293	P	H
		2390	44.1	-9.9	54	30.92	27.54	16.56	30.92	100	293	A	H
	*	2437	111.08	-	-	97.84	27.5	16.64	30.9	100	293	P	H
	*	2437	103.36	-	-	90.12	27.5	16.64	30.9	100	293	A	H
		2489.11	54.73	-19.27	74	41.46	27.42	16.72	30.87	100	293	P	H
		2489.02	45	-9	54	31.73	27.42	16.72	30.87	100	293	A	H
		2315.92	52.63	-21.37	74	39.37	27.77	16.44	30.95	333	256	P	V
		2390	42.89	-11.11	54	29.71	27.54	16.56	30.92	333	256	A	V
	*	2437	107.24	-	-	94	27.5	16.64	30.9	333	256	P	V
	*	2437	99.84	-	-	86.6	27.5	16.64	30.9	333	256	A	V
		2486.86	53.89	-20.11	74	40.63	27.43	16.71	30.88	333	256	P	V
		2489.02	43.15	-10.85	54	29.88	27.42	16.72	30.87	333	256	A	V

802.11g CH 11 2462MHz	*	2462	109.26	-	-	95.99	27.48	16.68	30.89	100	310	P	H
	*	2462	101.83	-	-	88.56	27.48	16.68	30.89	100	310	A	H
		2483.55	63.6	-10.4	74	50.34	27.43	16.71	30.88	100	310	P	H
		2483.5	50.59	-3.41	54	37.33	27.43	16.71	30.88	100	310	A	H
													H
													H
	*	2462	106.91	-	-	93.64	27.48	16.68	30.89	367	253	P	V
	*	2462	99.36	-	-	86.09	27.48	16.68	30.89	367	253	A	V
		2483.55	61.66	-12.34	74	48.4	27.43	16.71	30.88	367	253	P	V
		2483.5	48.57	-5.43	54	35.31	27.43	16.71	30.88	367	253	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 802.11g (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)
802.11g CH 01 2412MHz		4824	40.51	-33.49	74	58.2	31.1	10.07	58.86	100	0	P	H
													H
													H
													H
													H
													H
		4824	38.93	-35.07	74	56.62	31.1	10.07	58.86	100	0	P	V
													V
													V
													V
													V
													V
802.11g CH 06 2437MHz		4874	43.63	-30.37	74	61.37	31.05	10.11	58.9	100	0	P	H
		7311	43.85	-30.15	74	53.67	36.3	12.31	58.43	100	0	P	H
													H
													H
													H
													H
		4874	39.73	-34.27	74	57.47	31.05	10.11	58.9	100	0	P	V
		7311	44.21	-29.79	74	54.03	36.3	12.31	58.43	100	0	P	V
													V
													V
													V
													V

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 11 2462MHz		4924	41.52	-32.48	74	59.23	31.1	10.14	58.95	100	0	P	H
		7386	44.93	-29.07	74	54.57	36.3	12.35	58.29	100	0	P	H
													H
													H
													H
													H
		4924	40.04	-33.96	74	57.75	31.1	10.14	58.95	100	0	P	V
		7386	44.74	-29.26	74	54.38	36.3	12.35	58.29	100	0	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (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)
802.11n HT20 CH 01 2412MHz		2389.75	64.18	-9.82	74	51	27.54	16.56	30.92	100	283	P	H
		2389.97	49.35	-4.65	54	36.17	27.54	16.56	30.92	100	283	A	H
	*	2412	107.31	-	-	94.12	27.5	16.6	30.91	100	283	P	H
	*	2412	99.72	-	-	86.53	27.5	16.6	30.91	100	283	A	H
													H
													H
		2390	58.2	-15.8	74	45.02	27.54	16.56	30.92	336	252	P	V
		2390	46.19	-7.81	54	33.01	27.54	16.56	30.92	336	252	A	V
	*	2412	103.85	-	-	90.66	27.5	16.6	30.91	336	252	P	V
	*	2412	96.56	-	-	83.37	27.5	16.6	30.91	336	252	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2386.32	53.87	-20.13	74	40.68	27.55	6.64	30.92	100	293	P	H
		2390	43.27	-10.73	54	30.09	27.54	6.64	30.92	100	293	A	H
	*	2437	110.21	-	-	96.97	27.5	6.72	30.9	100	293	P	H
	*	2437	101.82	-	-	88.58	27.5	6.72	30.9	100	293	A	H
		2483.62	55.84	-18.16	74	42.58	27.43	6.79	30.88	100	293	P	H
		2489.38	44.24	-9.76	54	30.97	27.42	6.8	30.87	100	293	A	H
		2385.52	53.32	-20.68	74	40.12	27.56	6.64	30.92	325	255	P	V
		2389.68	42.28	-11.72	54	29.1	27.54	6.64	30.92	325	255	A	V
	*	2437	105.79	-	-	92.55	27.5	6.72	30.9	325	255	P	V
	*	2437	97.83	-	-	84.59	27.5	6.72	30.9	325	255	A	V
		2489.56	53.98	-20.02	74	40.71	27.42	6.8	30.87	325	255	P	V
		2489.29	42.91	-11.09	54	29.64	27.42	6.8	30.87	325	255	A	V

	*	2462	109.58	-	-	96.32	27.48	16.67	30.89	100	312	P	H
	*	2462	101.78	-	-	88.52	27.48	16.67	30.89	100	312	A	H
		2483.9	66.63	-7.37	74	53.37	27.43	16.71	30.88	100	312	P	H
		2483.5	50.73	-3.27	54	37.47	27.43	16.71	30.88	100	312	A	H
802.11n													H
HT20													H
CH 11	*	2462	105.72	-	-	92.45	27.48	16.68	30.89	324	254	P	V
2462MHz	*	2462	98.12	-	-	84.85	27.48	16.68	30.89	324	254	A	V
		2483.5	62.35	-11.65	74	49.09	27.43	16.71	30.88	324	254	P	V
		2483.5	48.11	-5.89	54	34.85	27.43	16.71	30.88	324	254	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 802.11n HT20 (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)
802.11n HT20 CH 01 2412MHz		4824	39.45	-34.55	74	57.14	31.1	10.07	58.86	100	0	P	H
													H
													H
													H
													H
													H
		4824	38.77	-35.23	74	56.46	31.1	10.07	58.86	100	0	P	V
													V
													V
													V
													V
													V
802.11n HT20 CH 06 2437MHz		4874	42.79	-31.21	74	60.53	31.05	10.11	58.9	100	0	P	H
		7311	44.54	-29.46	74	54.36	36.3	12.31	58.43	100	0	P	H
													H
													H
													H
													H
		4874	39.23	-34.77	74	56.97	31.05	10.11	58.9	100	0	P	V
		7311	43.86	-30.14	74	53.68	36.3	12.31	58.43	100	0	P	V
													V
													V
													V
													V

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)
802.11n HT20 CH 11 2462MHz		4924	40.34	-33.66	74	58.05	31.1	10.14	58.95	100	0	P	H
		7386	44.54	-29.46	74	54.18	36.3	12.35	58.29	100	0	A	H
													H
													H
													H
													H
		4924	38.83	-35.17	74	56.54	31.1	10.14	58.95	100	0	P	V
		7386	43.98	-30.02	74	53.62	36.3	12.35	58.29	100	0	A	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

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)
2.4GHz 802.11n HT20 LF		30	23	-17	40	30.29	24.59	0.61	32.49	-	-	P	H
		107.6	30.04	-13.46	43.5	44.43	16.75	1.38	32.52	-	-	P	H
		187.14	33.14	-10.36	43.5	49.03	14.72	1.86	32.47	100	0	P	H
		287.05	31.99	-14.01	46	43.22	18.9	2.34	32.47	-	-	P	H
		553.8	26.08	-19.92	46	30.06	25.45	3.2	32.63	-	-	P	H
		896.21	33.95	-12.05	46	32.64	28.87	4.09	31.65	-	-	P	H
													H
													H
													H
													H
													H
													H
		43.58	23.58	-16.42	40	37.88	17.47	0.81	32.58	-	-	P	V
		105.66	28.58	-14.92	43.5	43.25	16.48	1.36	32.51	-	-	P	V
		184.23	29.79	-13.71	43.5	45.62	14.8	1.84	32.47	100	0	P	V
		268.62	26.02	-19.98	46	36.84	19.33	2.28	32.43	-	-	P	V
		438.37	26.92	-19.08	46	33.58	22.95	2.8	32.41	-	-	P	V
		868.08	31.51	-14.49	46	30.25	29.02	4.03	31.79	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

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

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

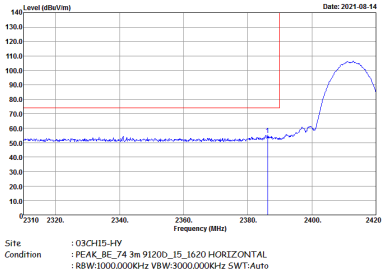
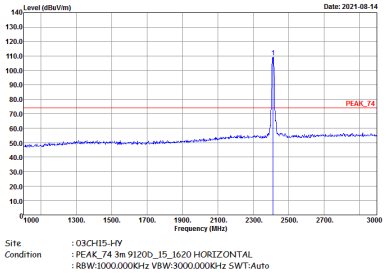
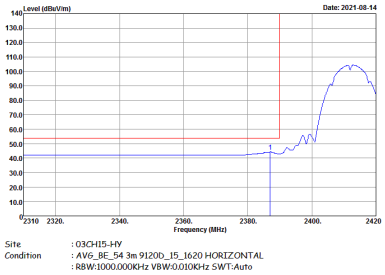
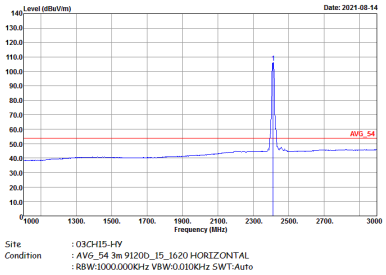
Test Engineer :	Leo Lee, Mancy Chou, and Bigshow Wang	**Temperature :**	22.1~23.1°C
		Relative Humidity :	55~60%

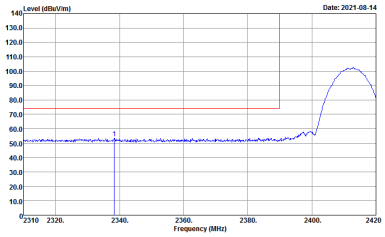
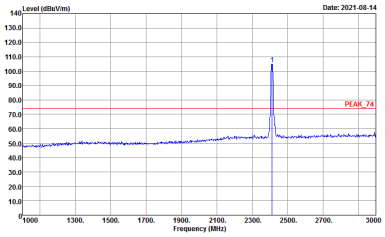
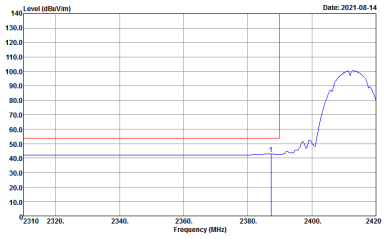
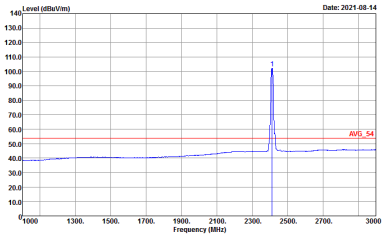
Note symbol

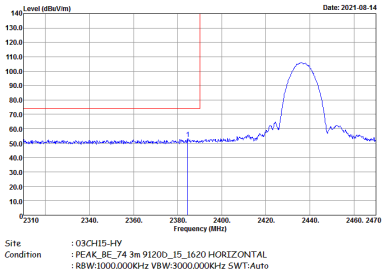
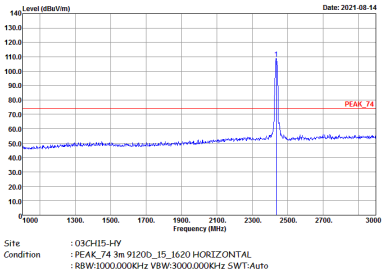
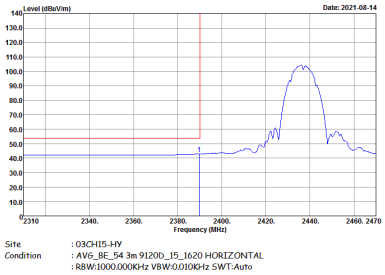
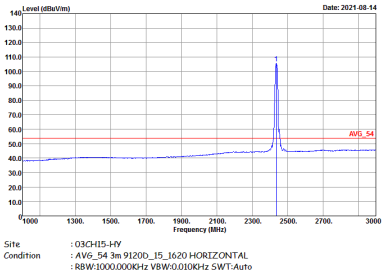
-L	**Low channel location**
-R	**High channel location**

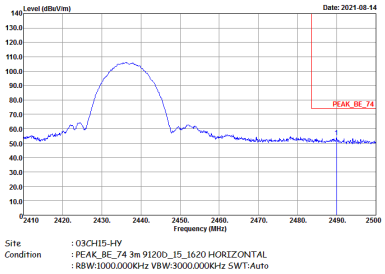
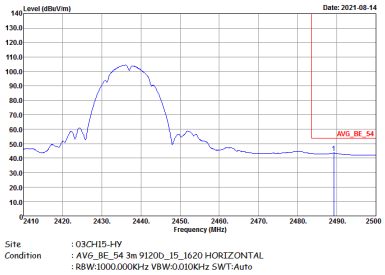
2.4GHz 2400~2483.5MHz

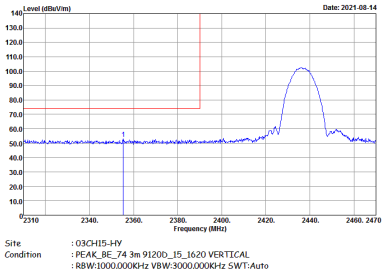
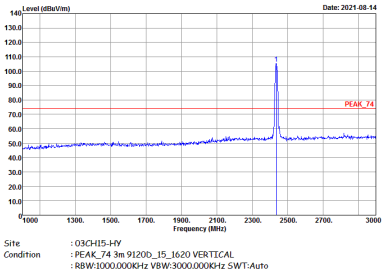
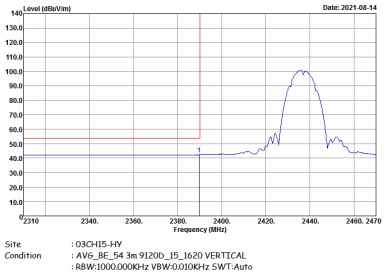
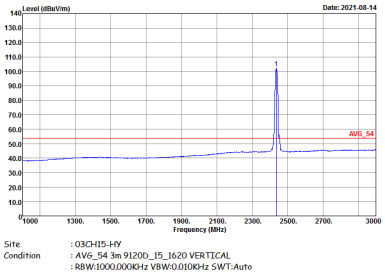
WIFI 802.11b (Band Edge @ 3m)

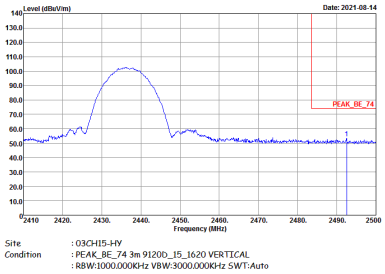
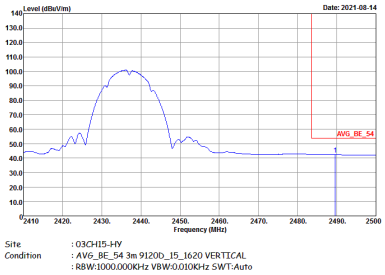
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
2	Horizontal	Fundamental
Peak		
Avg.		

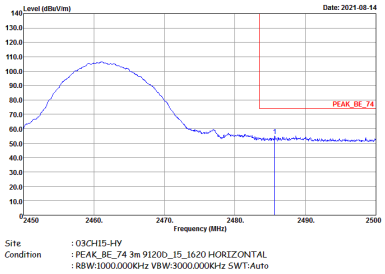
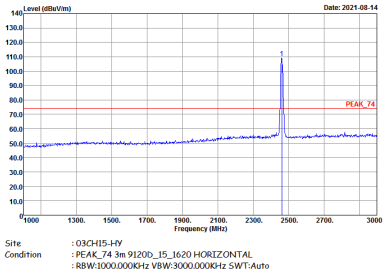
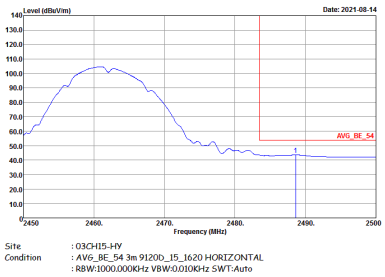
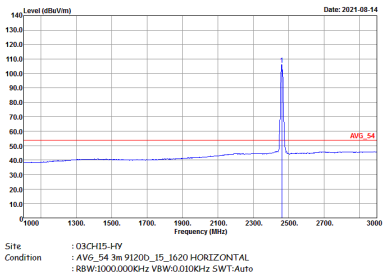
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE_74 3m 9120D_I5_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_I5_1620 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH15-HY Condition : AVG_BE_54 3m 9120D_I5_1620 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH15-HY Condition : AVG_54 3m 9120D_I5_1620 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

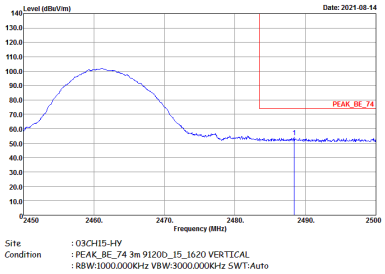
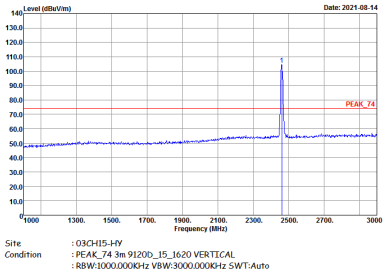
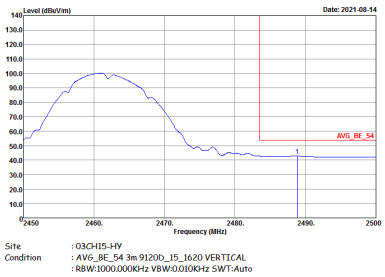
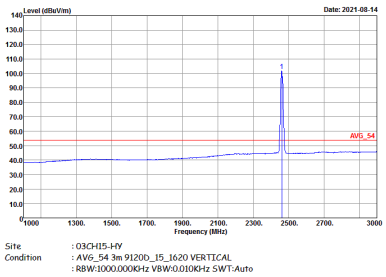
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		

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

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

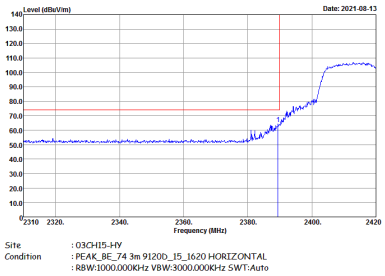
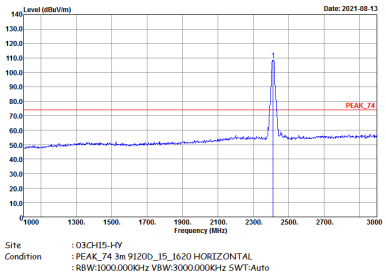
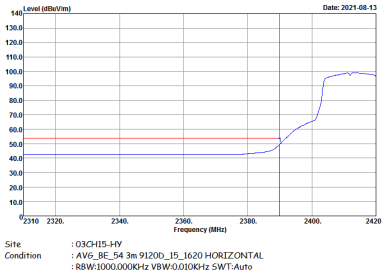
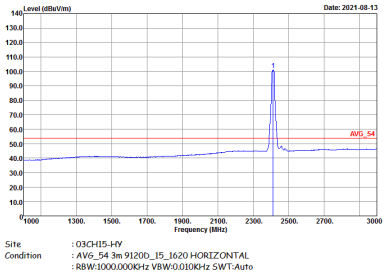
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

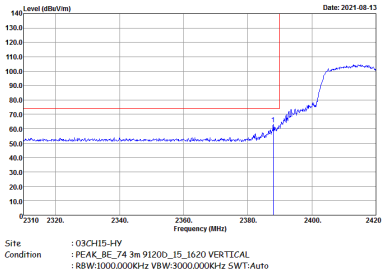
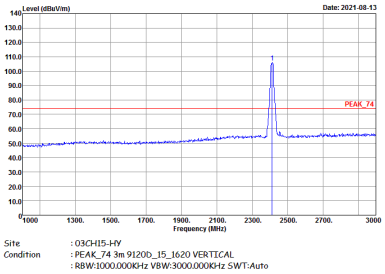
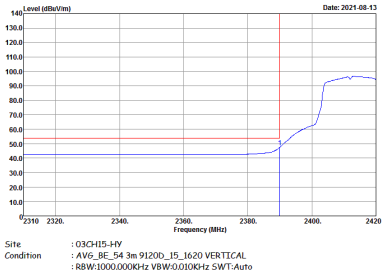
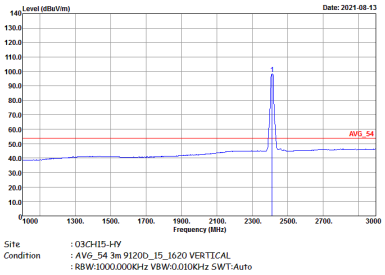
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
2	Horizontal	Fundamental
Peak		
Avg.		

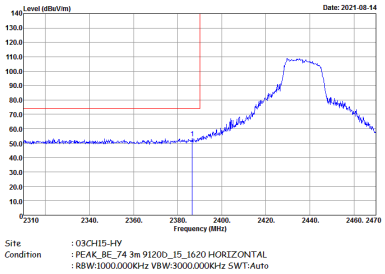
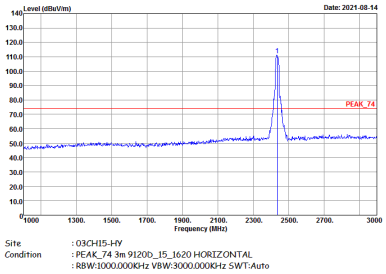
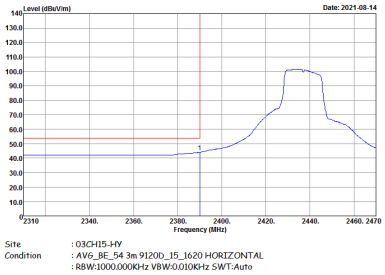
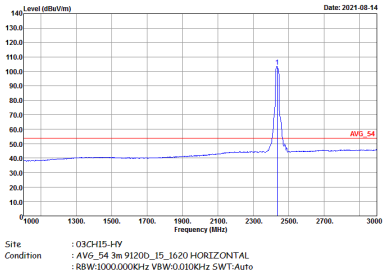
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
2	Vertical	Fundamental
Peak		
Avg.		

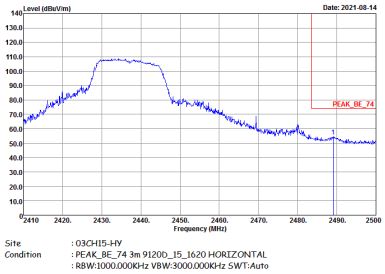
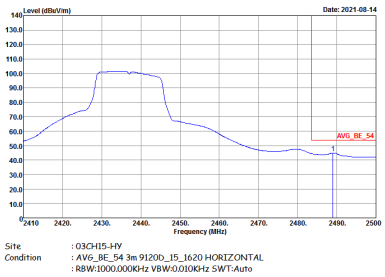
2.4GHz 2400~2483.5MHz

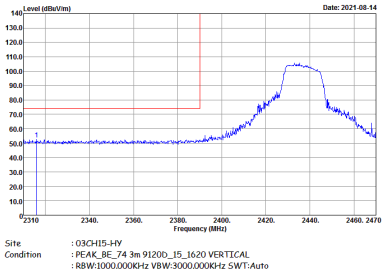
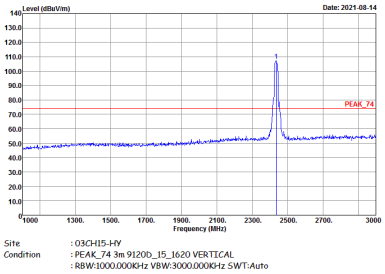
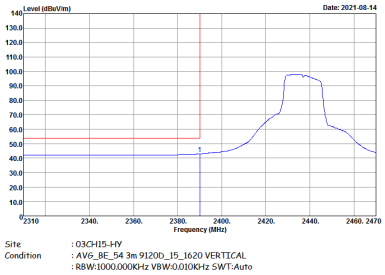
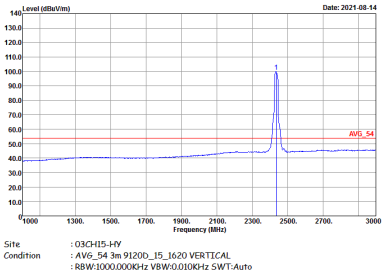
WIFI 802.11g (Band Edge @ 3m)

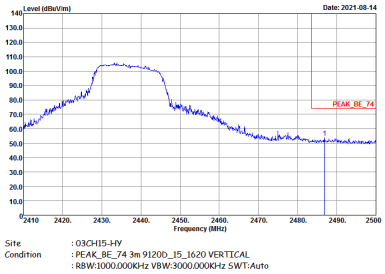
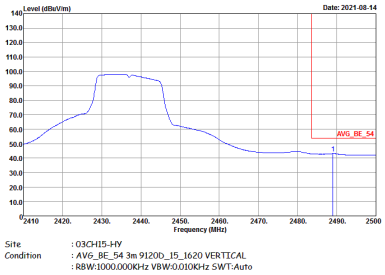
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
2	Horizontal	Fundamental
Peak		
Avg.		

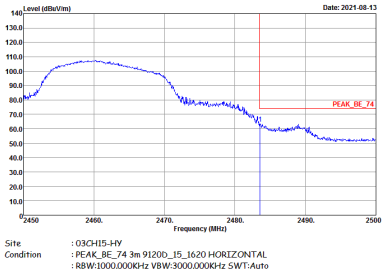
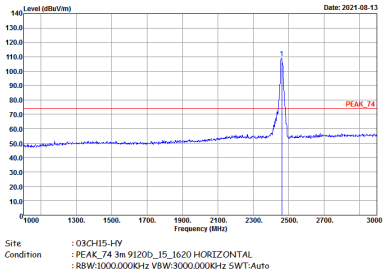
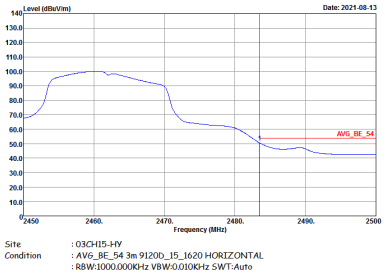
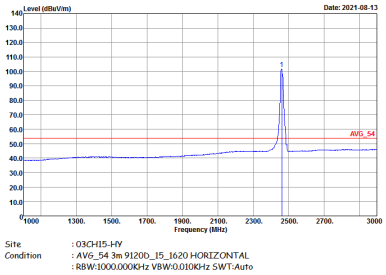
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
2	Vertical	Fundamental
Peak		
Avg.		

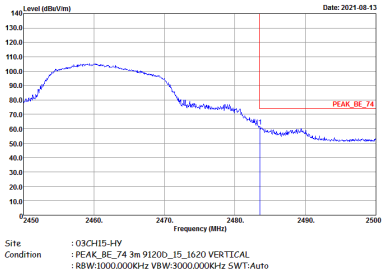
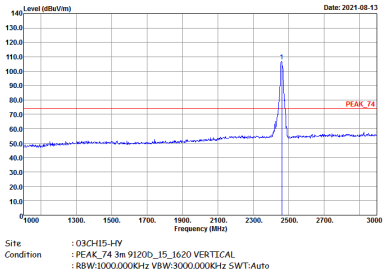
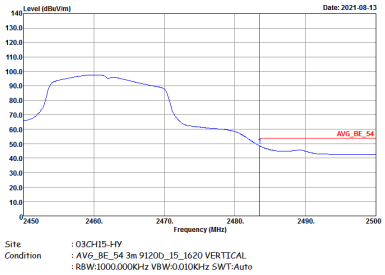
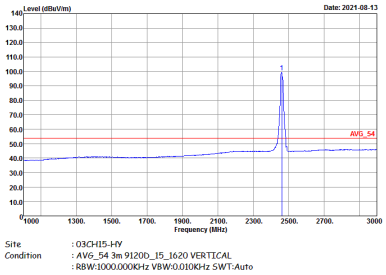
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		

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

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

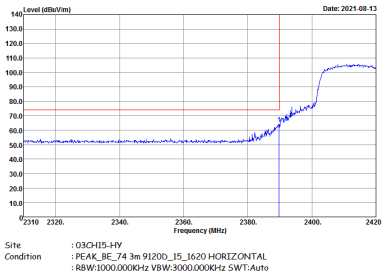
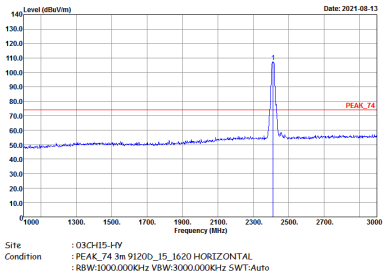
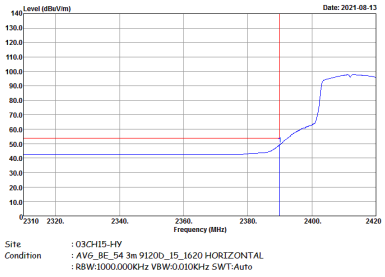
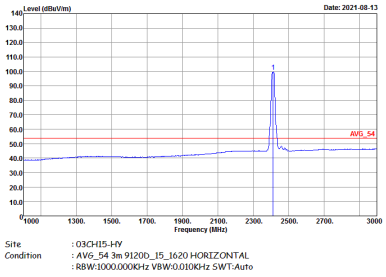
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
2	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

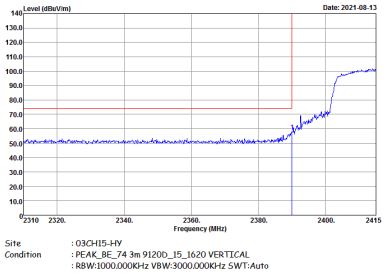
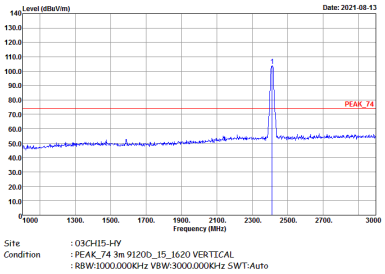
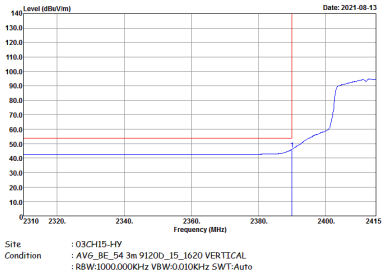
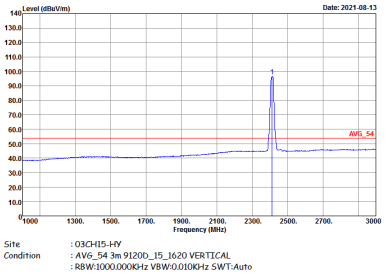
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
2	Horizontal	Fundamental
Peak		
Avg.		

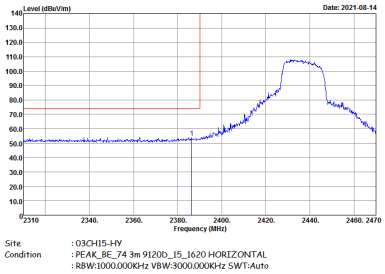
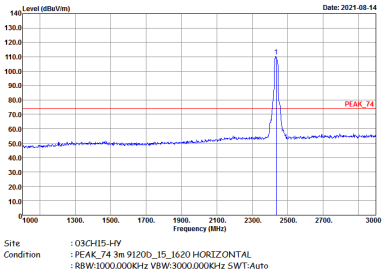
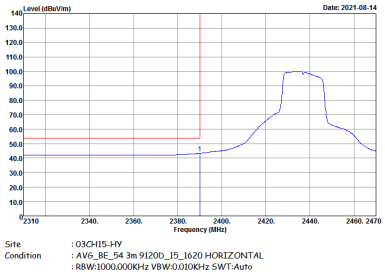
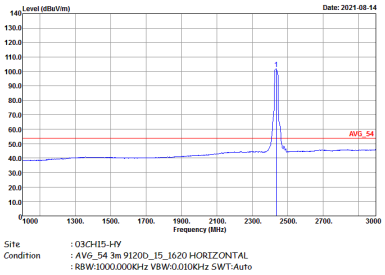
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
2	Vertical	Fundamental
Peak		
Avg.		

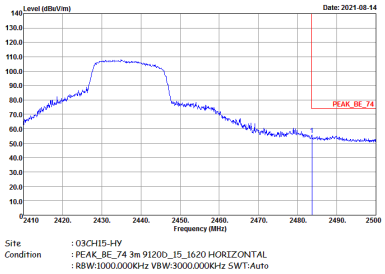
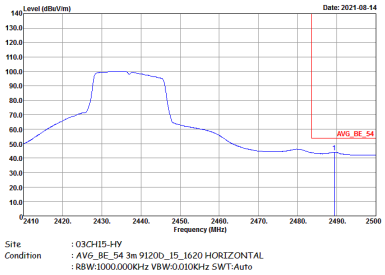
2.4GHz 2400~2483.5MHz

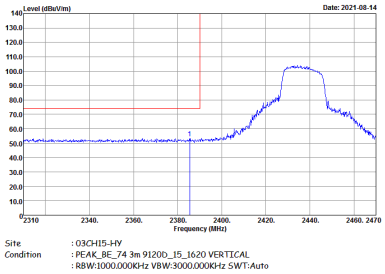
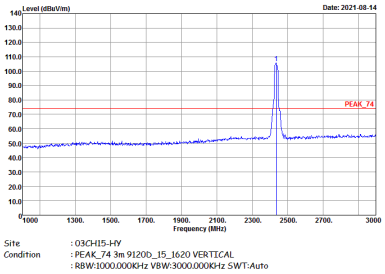
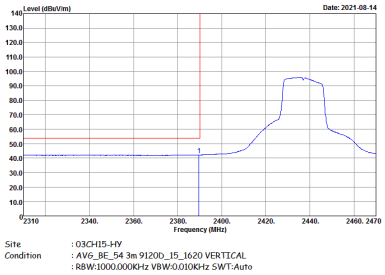
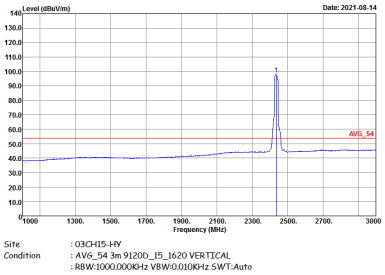
WIFI 802.11n HT20 (Band Edge @ 3m)

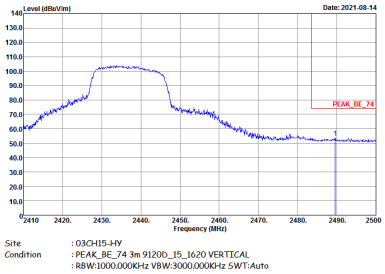
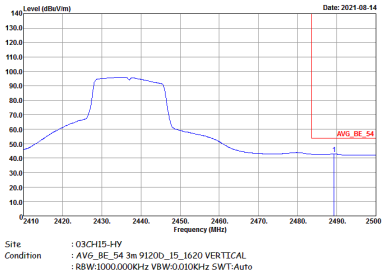
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
2	Horizontal	Fundamental
Peak		
Avg.		

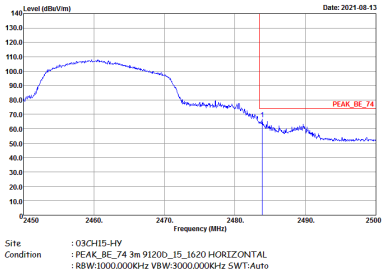
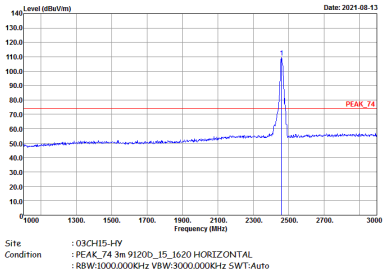
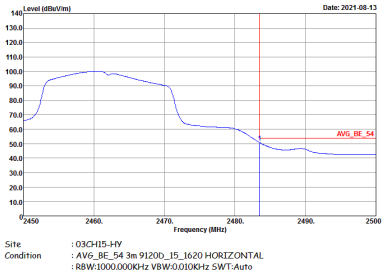
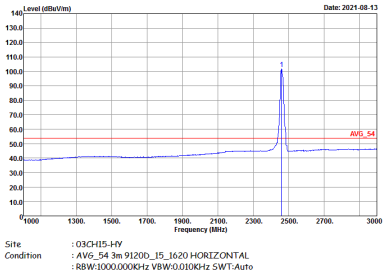
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
2	Vertical	Fundamental
Peak		
Avg.		

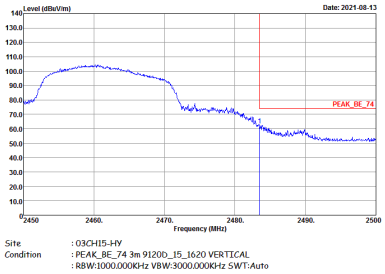
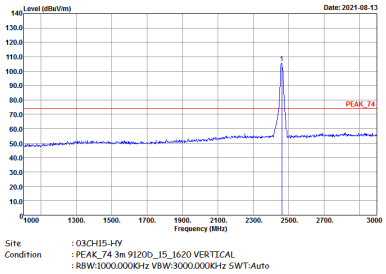
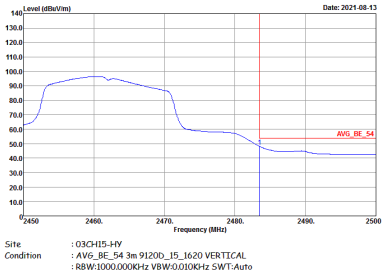
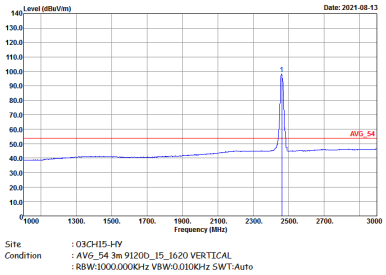
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		

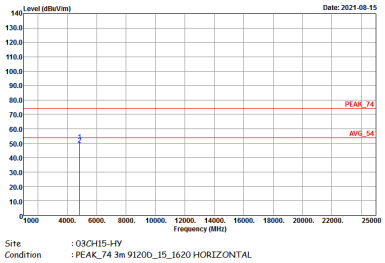
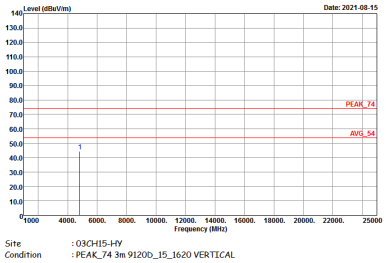
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
2	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

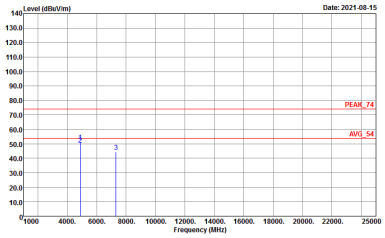
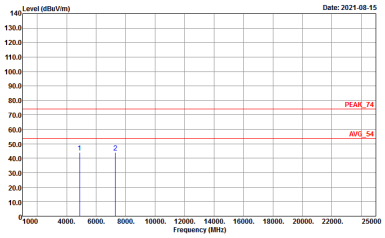
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
2	Horizontal	Fundamental
Peak		
Avg.		

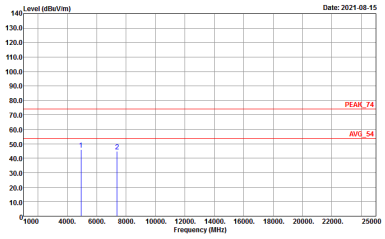
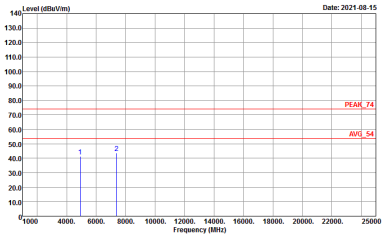
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
2	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

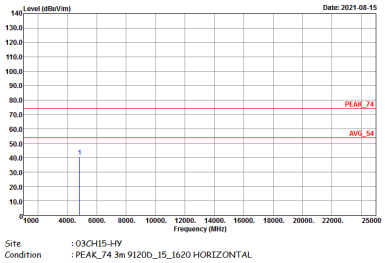
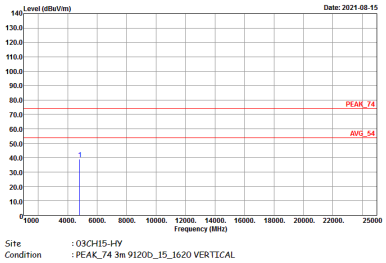
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
2	Horizontal	Vertical
Peak Avg.		

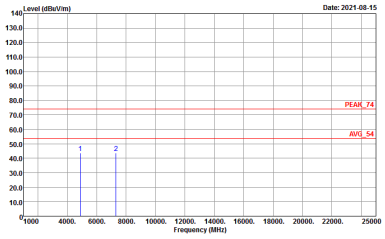
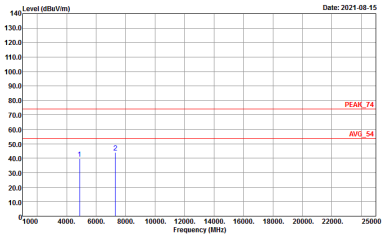
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL

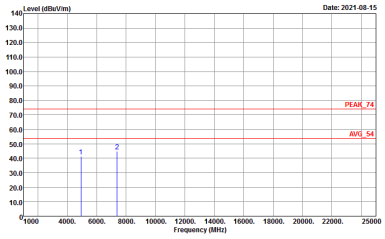
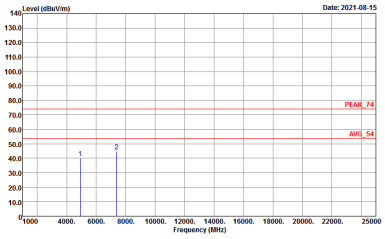
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

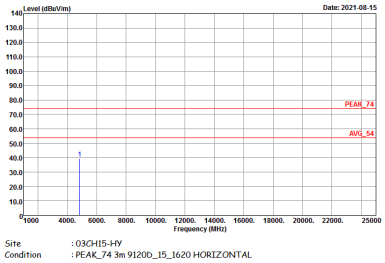
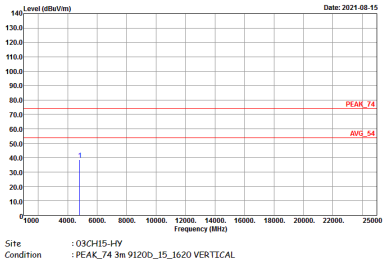
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
2	Horizontal	Vertical
Peak Avg.		

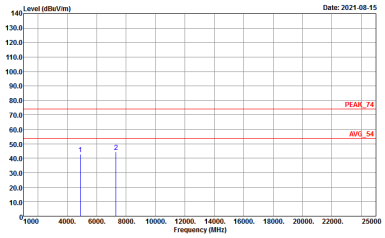
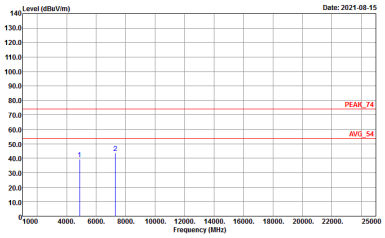
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL

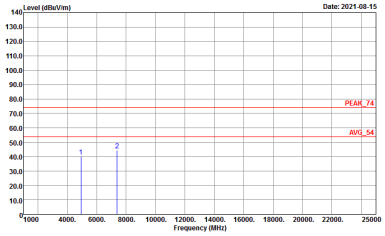
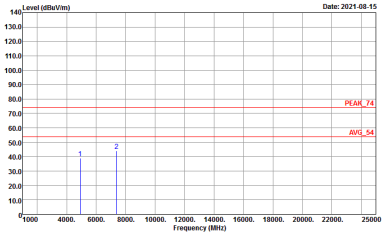
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

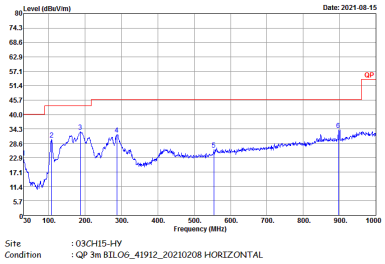
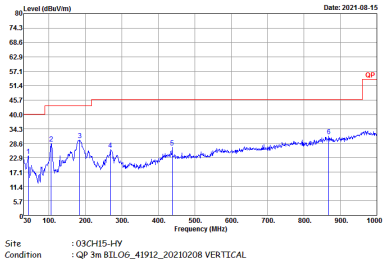
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
2	Horizontal	Vertical
QP / Peak		

Annex. A Receiver Radiated Emission Measurement

A.1 Limit of Receiver Radiated Emission

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

A.2 Measuring Instruments

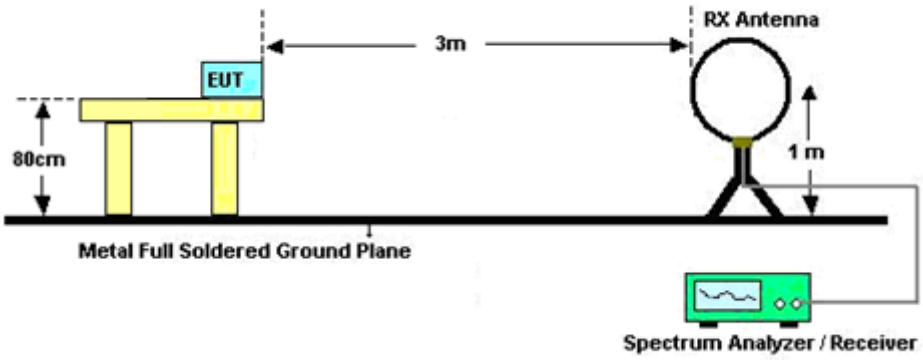
See list of measuring equipment of this test report.

A.3 Test Procedures

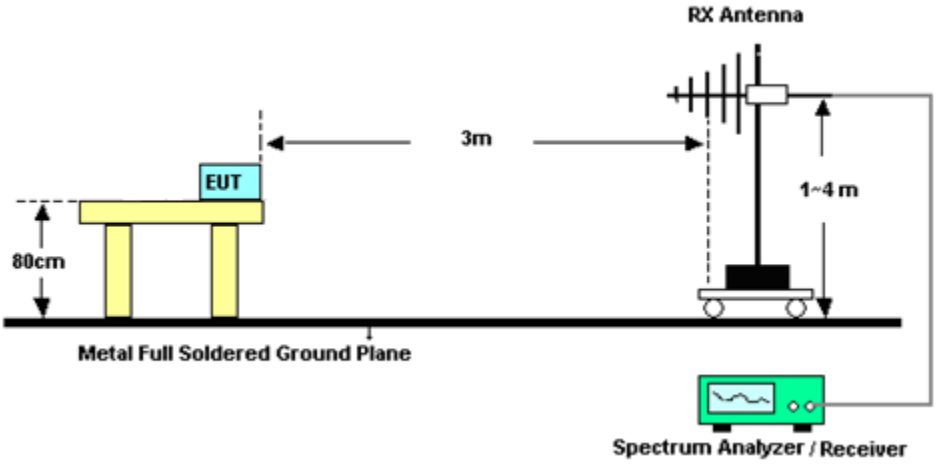
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to 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 tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

A.4 Test Setup

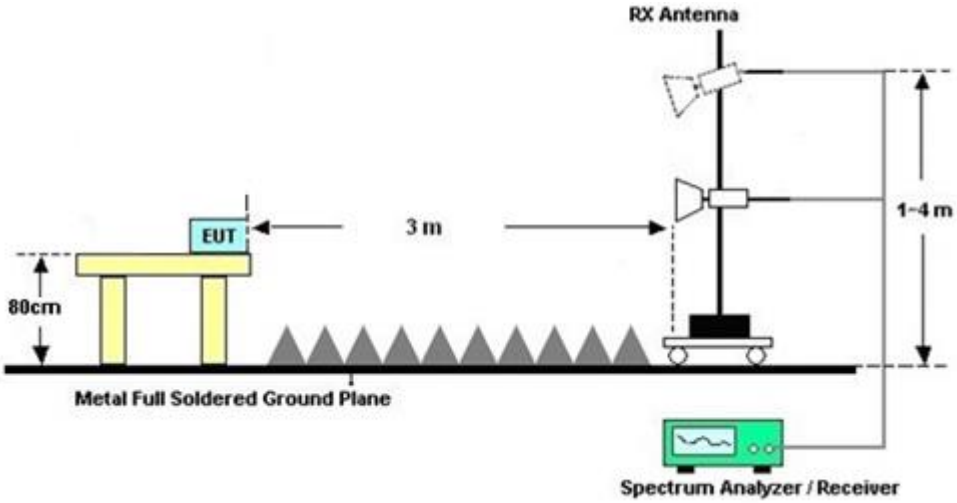
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

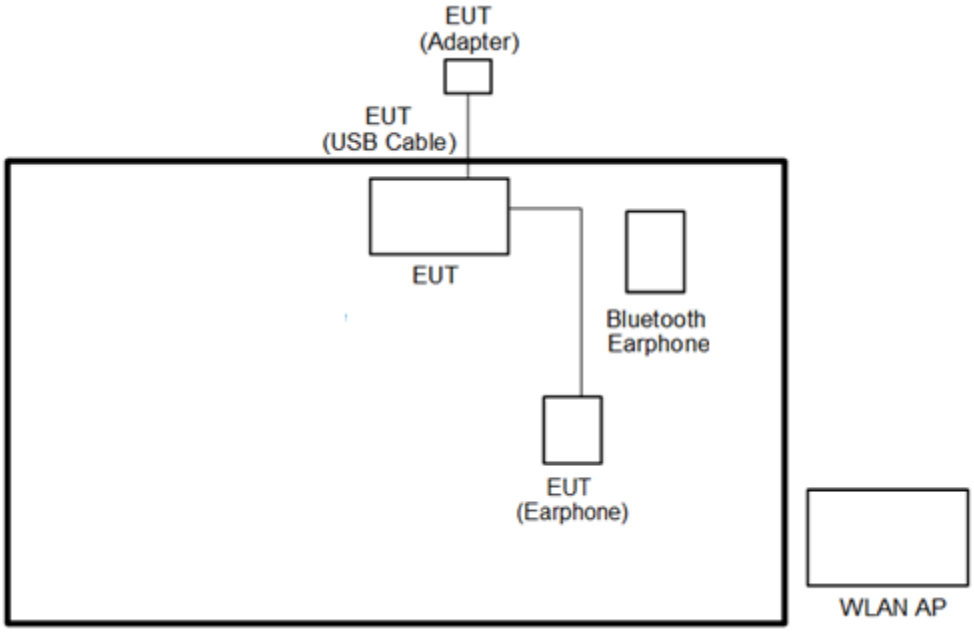


A.5 Test Result of Receiver Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per NCC LP0002 section 6.13 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.

A.6 Connection Diagram of Test System



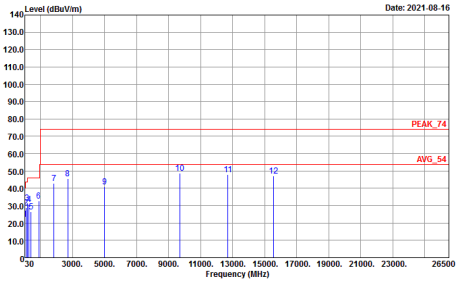
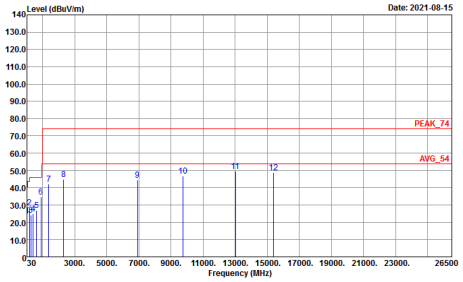
A.7 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	N/A	N/A

Remark: Applicant has ensured support unit would not be attached with the product on the market, support unit is provided by lab for testing.

A.8 Test Result of Receiver Radiated Spurious Emission (30MHz ~ 5th Harmonic)

Test Engineer :	Leo Lee, Mancy Chou, and Bigshow Wang	**Temperature :**	22.1~23.1°C
		Relative Humidity :	55~60%
Frequency :	898.150 MHz	**Margin :**	Under 11.35 dB
Test Mode :	Bluetooth Idle + WLAN (2.4GHz) Idle		

	Idle Mode	
	Horizontal	**Vertical**
Peak **Avg.**	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 HORIZONTAL Detector : Peak Project : 170932-01	 Site : 03CH15-HY Condition : PEAK_74 3m 9120D_15_1620 VERTICAL Detector : Peak Project : 170932-01

Horizontal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.00	22.17	-17.83	40.00	29.46	24.59	0.60	32.49	---	---	Peak
2	106.63	28.99	-14.51	43.50	43.52	16.62	1.33	32.52	---	---	Peak
3	187.14	31.66	-11.84	43.50	47.55	14.72	1.77	32.47	100	0	Peak
4	288.99	30.78	-15.22	46.00	41.99	18.91	2.21	32.47	---	---	Peak
5	424.79	26.70	-19.30	46.00	33.43	22.93	2.68	32.41	---	---	Peak
6	896.21	32.76	-13.24	46.00	31.45	28.87	3.92	31.65	---	---	Peak
7	1842.00	43.05	-30.95	74.00	43.31	25.30	5.72	31.28	---	---	Peak
8	2722.00	45.82	-28.18	74.00	41.58	27.94	7.15	30.85	---	---	Peak
9	5010.00	40.99	-33.01	74.00	58.40	31.38	9.85	59.01	---	---	Peak
10	9690.00	48.77	-25.23	74.00	56.08	38.60	13.14	59.67	100	0	Peak
11	12705.00	47.79	-26.21	74.00	55.55	38.51	15.14	61.99	---	---	Peak
12	15555.00	47.33	-26.67	74.00	54.50	37.79	16.70	62.30	---	---	Peak

Vertical

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	42.61	23.85	-16.15	40.00	37.63	18.00	0.76	32.58	---	---	Peak
2	181.32	28.34	-15.16	43.50	44.10	14.90	1.74	32.48	---	---	Peak
3	271.53	24.36	-21.64	46.00	35.50	19.00	2.14	32.44	---	---	Peak
4	426.73	24.88	-21.12	46.00	31.60	22.93	2.69	32.41	---	---	Peak
5	628.49	27.06	-18.94	46.00	30.07	25.99	3.26	32.40	---	---	Peak
6	898.15	34.65	-11.35	46.00	33.30	28.89	3.93	31.64	100	0	Peak
7	1392.00	42.31	-31.69	74.00	43.63	25.92	4.94	32.18	---	---	Peak
8	2304.00	44.80	-29.20	74.00	41.46	27.79	6.50	30.95	---	---	Peak
9	6915.00	44.43	-29.57	74.00	56.58	34.83	11.46	58.97	---	---	Peak
10	9765.00	46.84	-27.16	74.00	54.09	38.83	13.15	59.86	---	---	Peak
11	13020.00	49.43	-24.57	74.00	56.05	38.98	15.34	61.53	100	0	Peak
12	15375.00	48.80	-25.20	74.00	55.50	38.72	16.61	62.67	---	---	Peak

Annex. B Maximum Power Density

B.1 RF Exposure Limit Introduction

According to NCC LP0002, the criteria listed in Table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §5.20.2.1 and §5.20.2.2.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

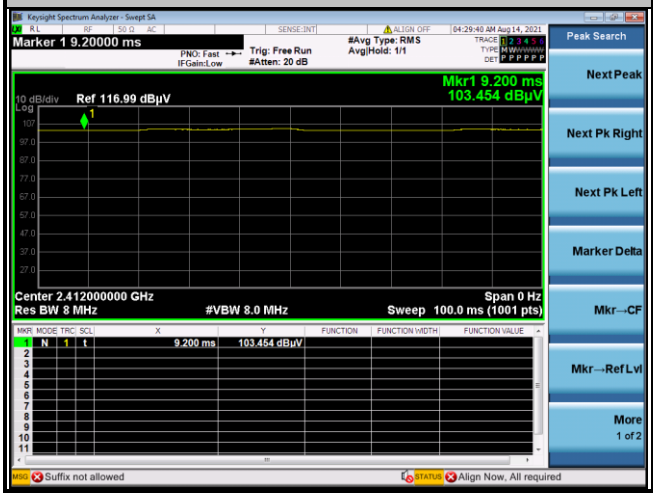
B.2 Standalone Power Density Calculation

Please refer to Appendix A.

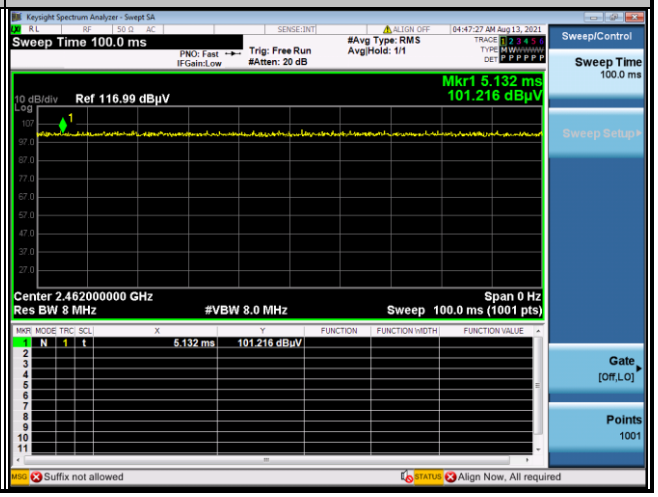
Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	100.00	-	-	10Hz
2.4GHz 802.11n HT20	100.00	-	-	10Hz

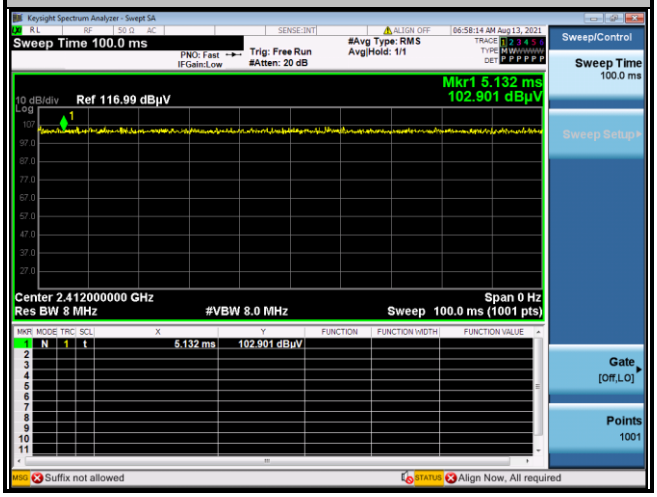
802.11b



802.11g



802.11n HT20



———THE END———