FCC RADIO TEST REPORT

FCC ID	**:**	**APYHRO00303**
Equipment	**:**	**Smart phone**
Brand Name	**:**	**SHARP**
Model Name	**:**	**APYHRO00303**
Applicant	**:**	**SHARP CORPORATION** **1 Takumi-Cho, Sakai-Ku, Sakai-Shi, Osaka 590-8522, Japan**
Manufacturer	**:**	**SHARP CORPORATION** **1 Takumi-Cho, Sakai-Ku, Sakai-Shi, Osaka 590-8522, Japan**
Standard	**:**	**FCC Part 15 Subpart C §15.247**

The product was received on Sep. 07, 2021 and testing was started from Sep. 20, 2021 and completed on Oct. 13, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FR190730C	01	Initial issue of report	Oct. 28, 2021
FR190730C	02	Revise applicant information	Nov. 01, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 0.79 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 12.91 dB at 0.499 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Keven Cheng

Report Producer: Vivian Hsu

1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WWAN <Ant.0>: PIFA Antenna <Ant.1>: PIFA Antenna <Ant.2>: PIFA Antenna WLAN: Loop Antenna Bluetooth: Loop Antenna GPS/Glonass/BDS/Galileo: PIFA Antenna NFC: Loop Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	-1.36

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Modification of EUT

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

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH02-HY, CO05-HY

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

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH20-HY (TAF Code: 3786)
Remark	The Radiated Spurious Emissions test item subcontracted to Sporton International Inc. Wensan Laboratory.

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

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

- FCC Part 15 Subpart 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.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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). For radiated measurement, 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 Z 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.

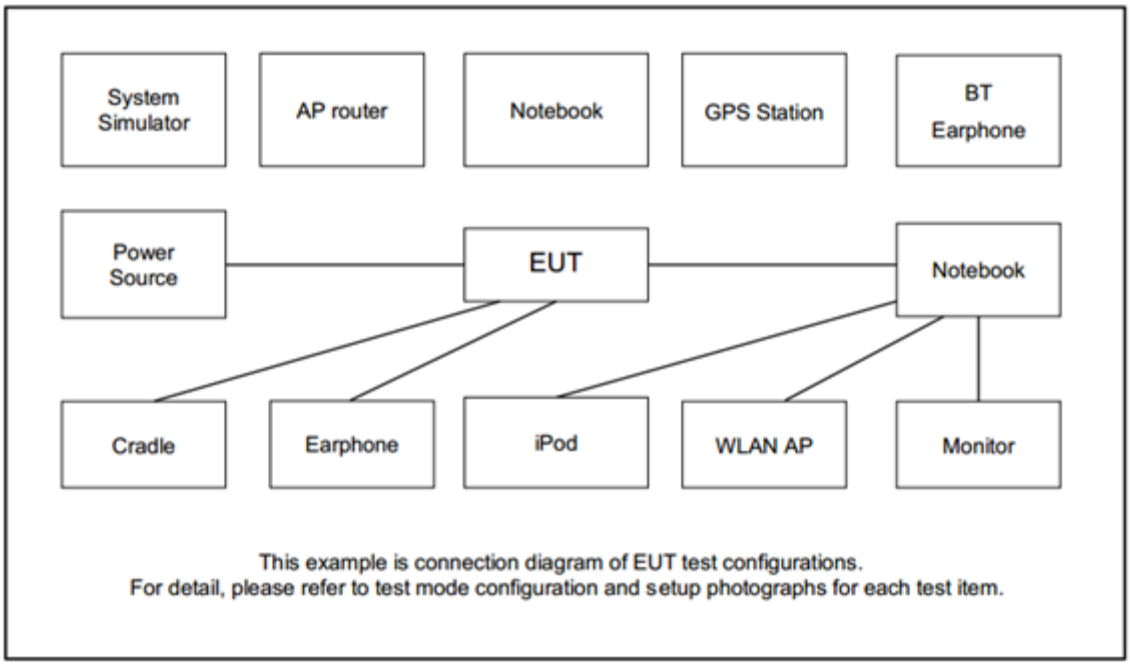
Modulation	Data Rate
802.11b	**1 Mbps**
802.11g	**6 Mbps**
802.11n HT20	**MCS0**
802.11n HT40	**MCS0**
802.11ac VHT20 (Covered by HT20)	**MCS0**
802.11ac VHT40 (Covered by HT40)	**MCS0**

Test Cases	
AC Conducted Emission	Mode 1: Bluetooth Link + WLAN (2.4GHz) Link + Earphone + MPEG4 + USB Cable (Charging from AC Adapter)

Ch. #	2400-2483.5 MHz			
	802.11b	802.11g	802.11n HT20	802.11n HT40
Low	01	01	01	03
Middle	06	06	06	06
High	11	11	11	09

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

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Earphone	Nokia	WH-108	FCC DoC	Unshielded,1.5m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT V4.0.00158.0” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

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.

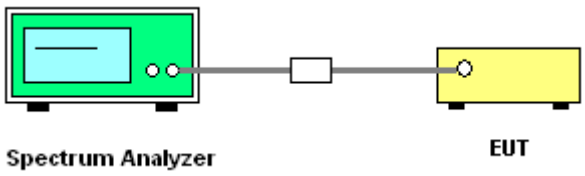
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

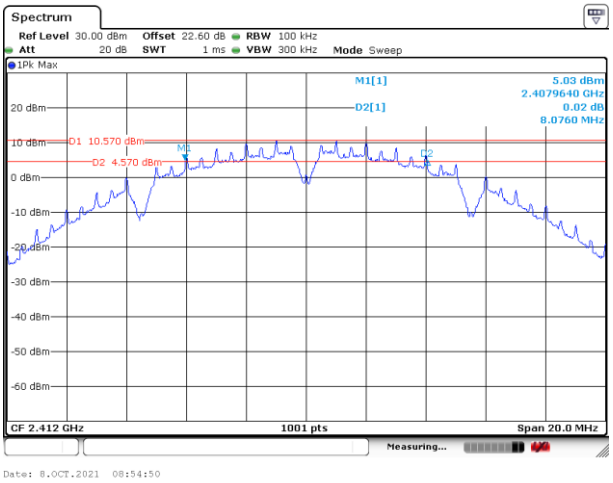
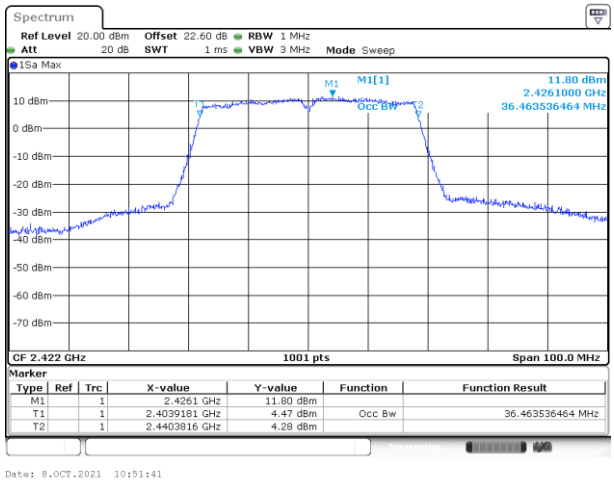
1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit 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.

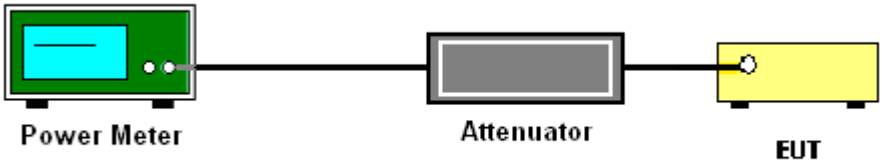
3.2.2 Measuring Instruments

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 (Reporting Only)

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.

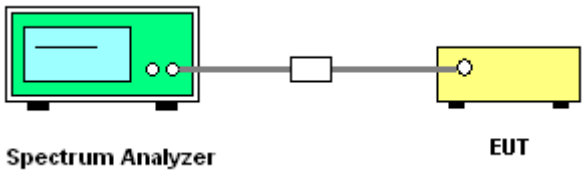
3.3.2 Measuring Instruments

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.

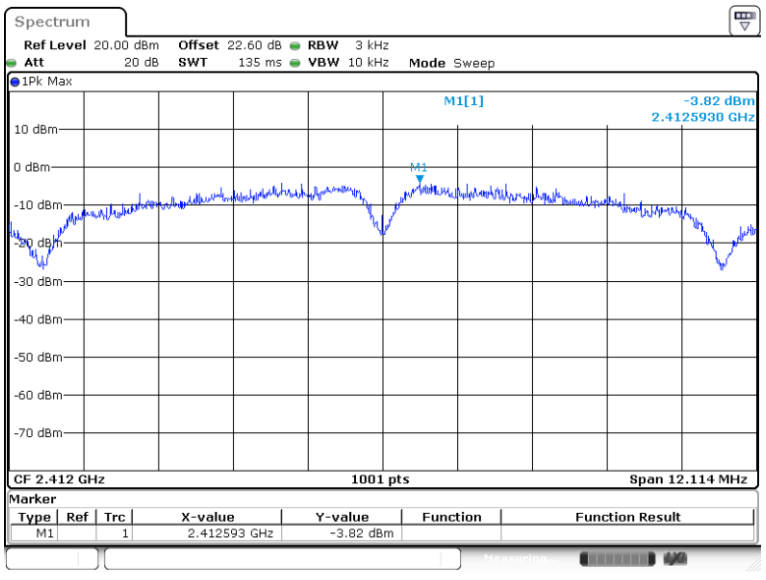
3.3.4 Test Setup



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.

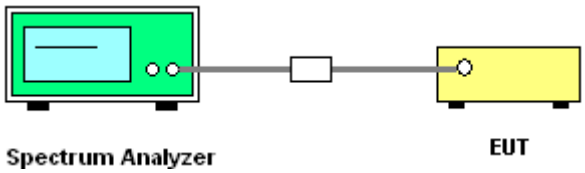
3.4.2 Measuring Instruments

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.

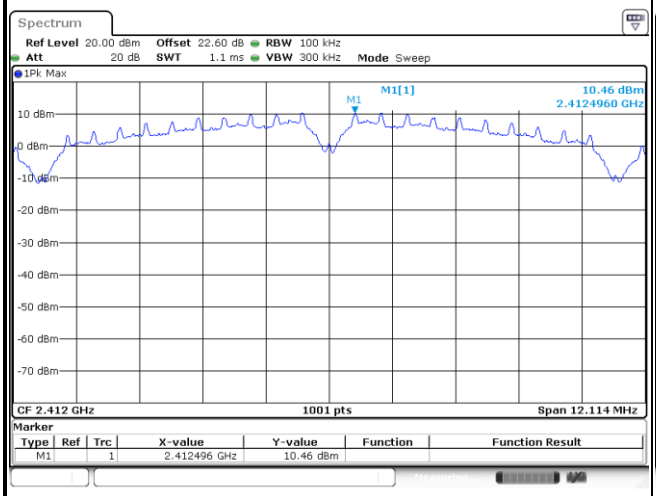
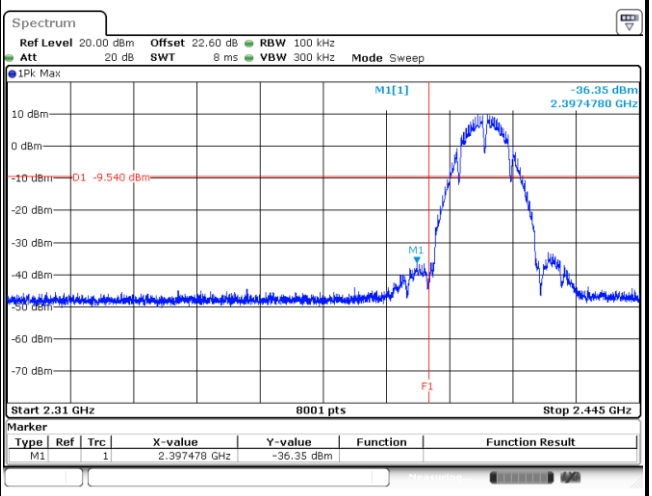
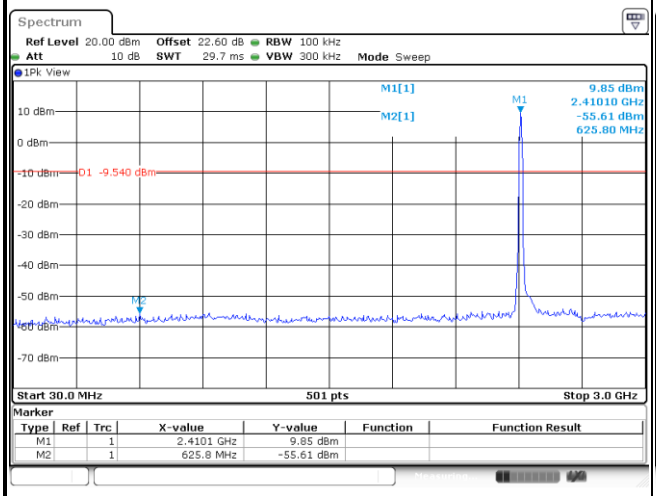
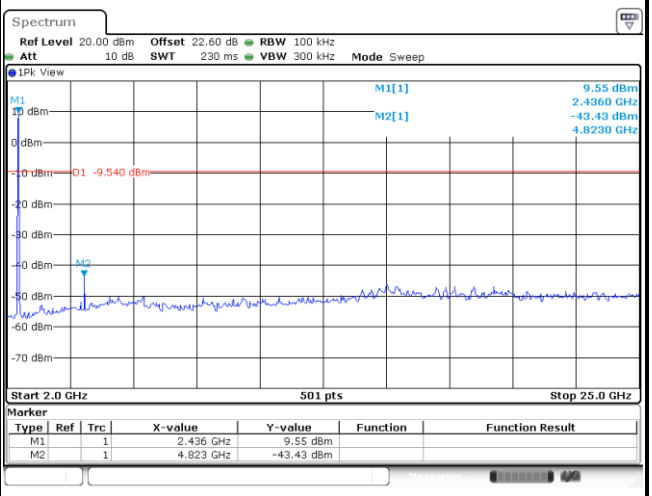
3.4.4 Test Setup



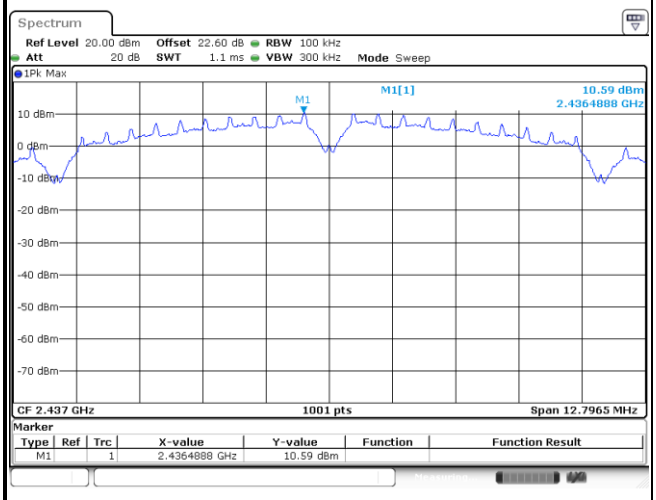
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

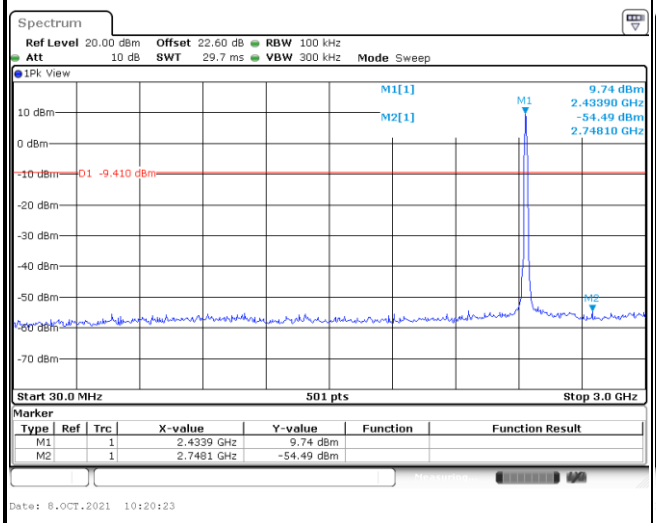
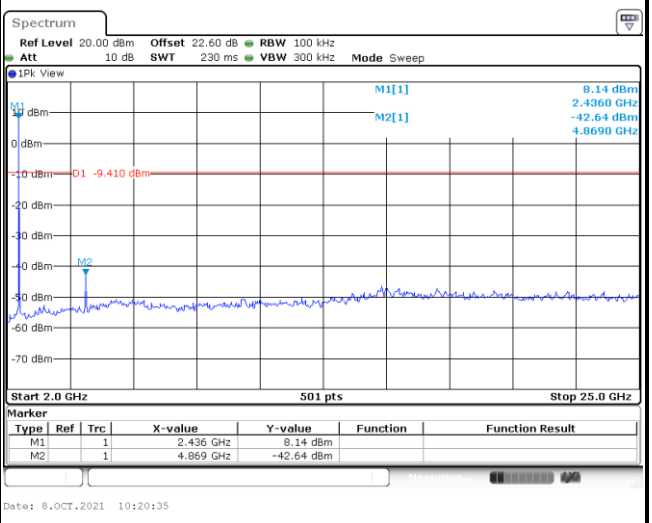
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

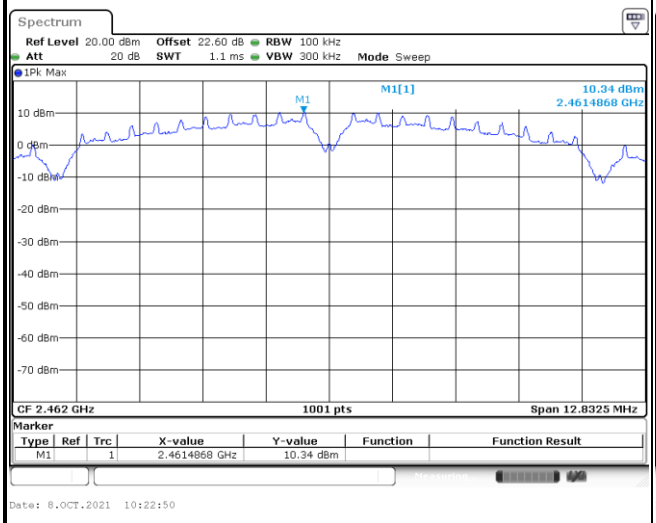
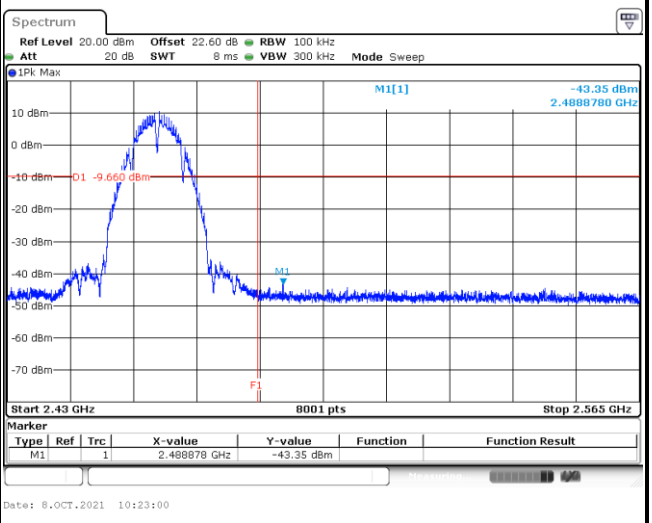
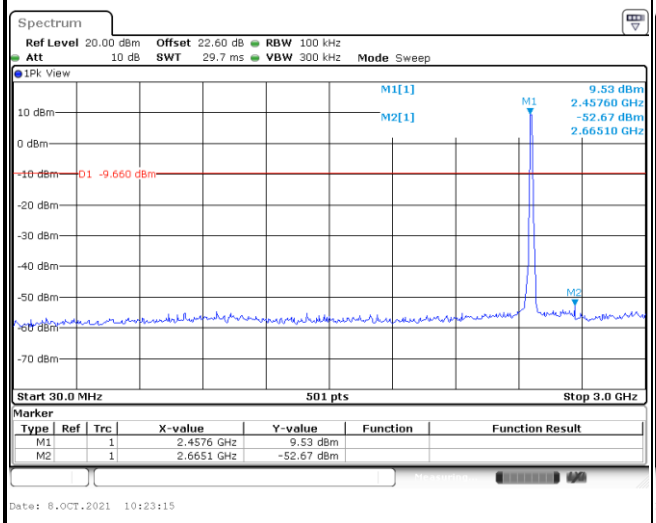
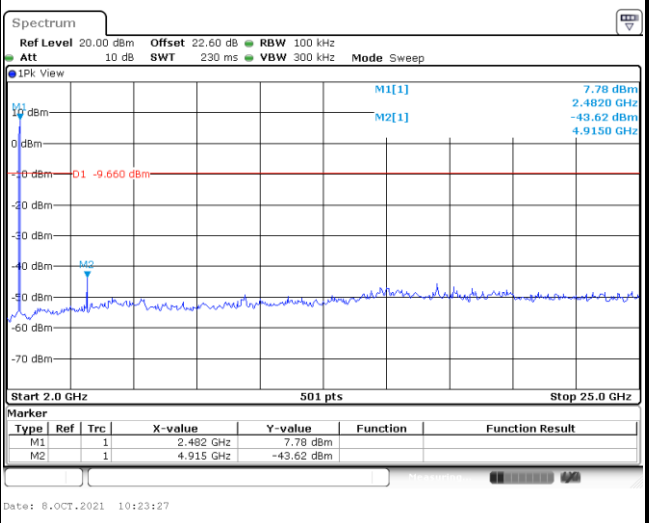
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11b	Test Channel :	06

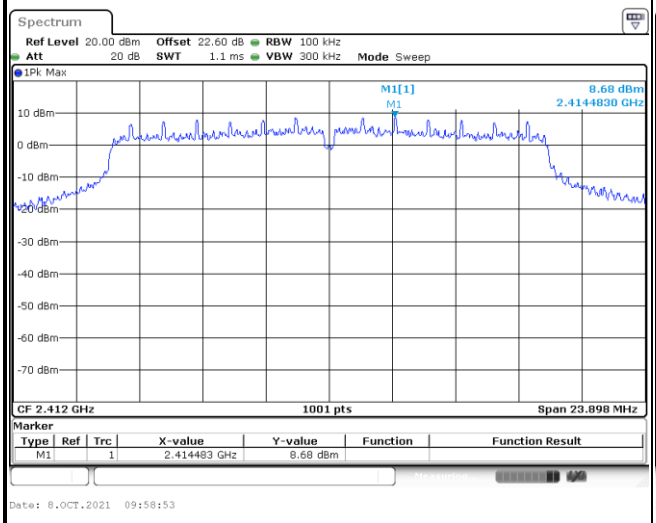
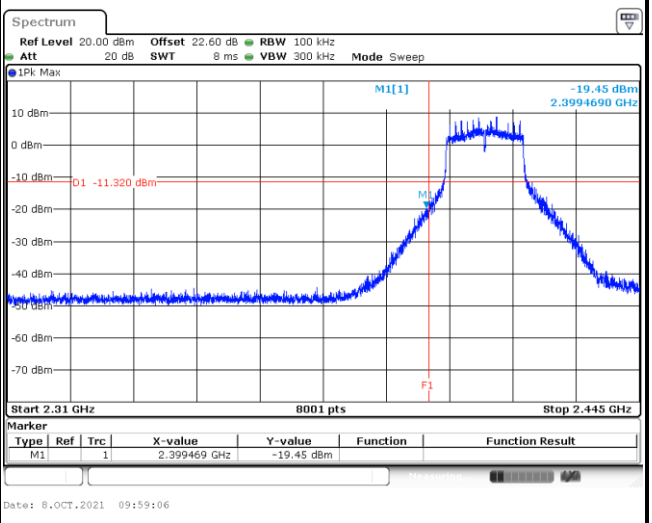
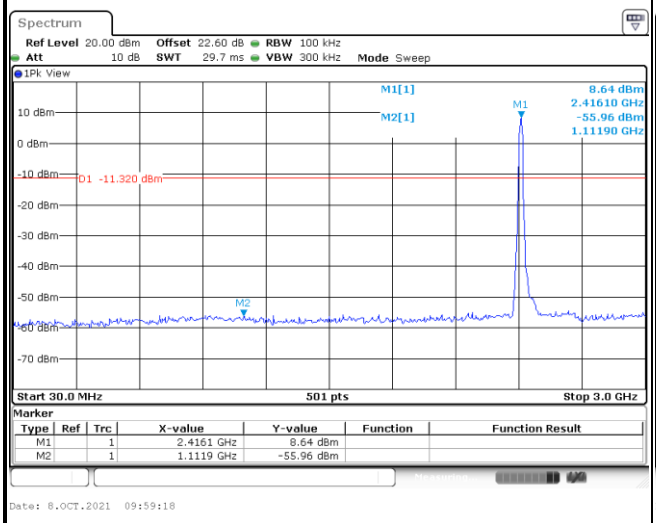
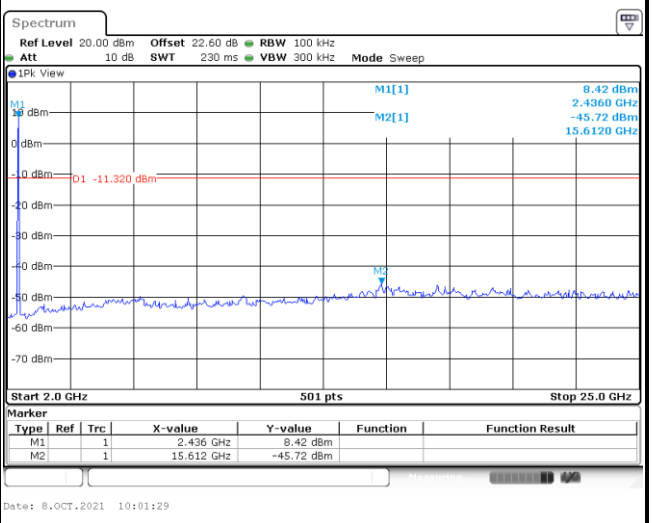
100kHz PSD reference Level	Mid Channel Plot
	

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

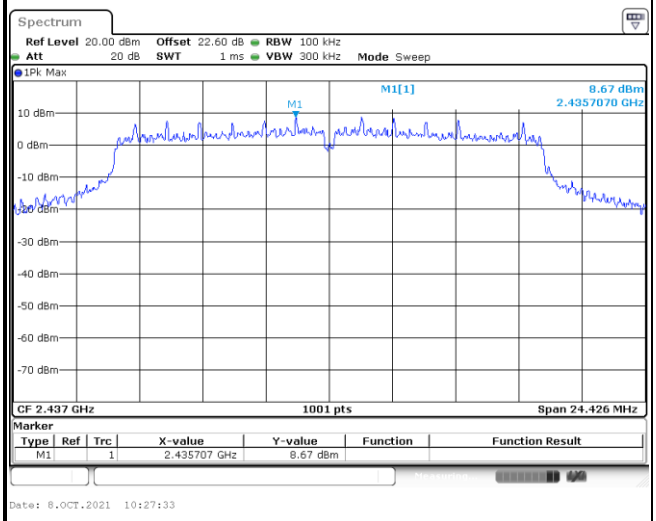
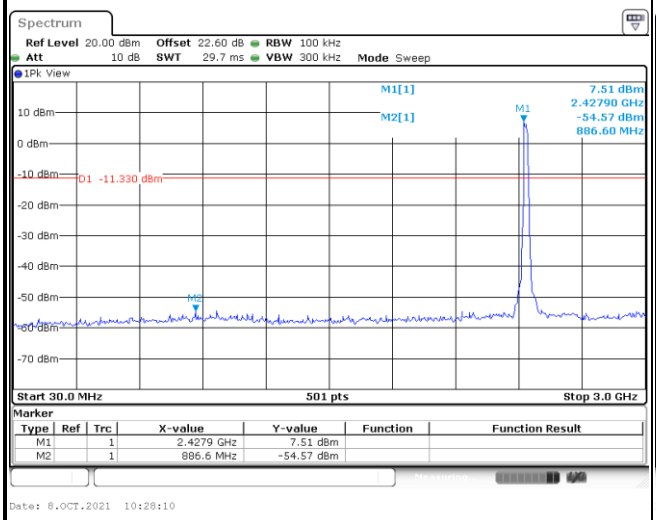
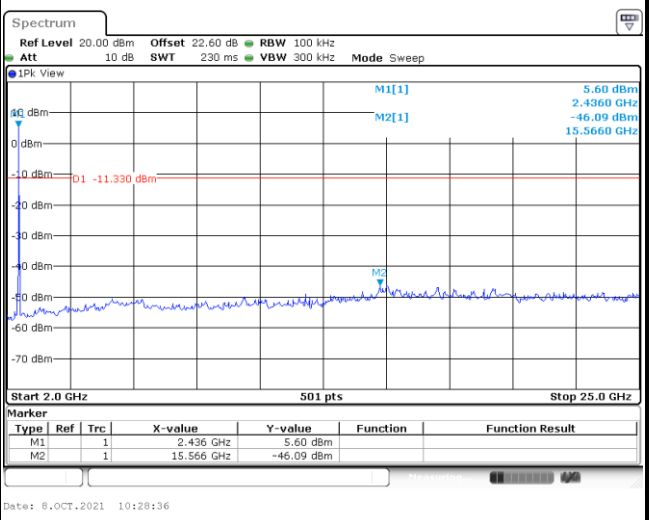
Test Mode :	802.11b	Test Channel :	11

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

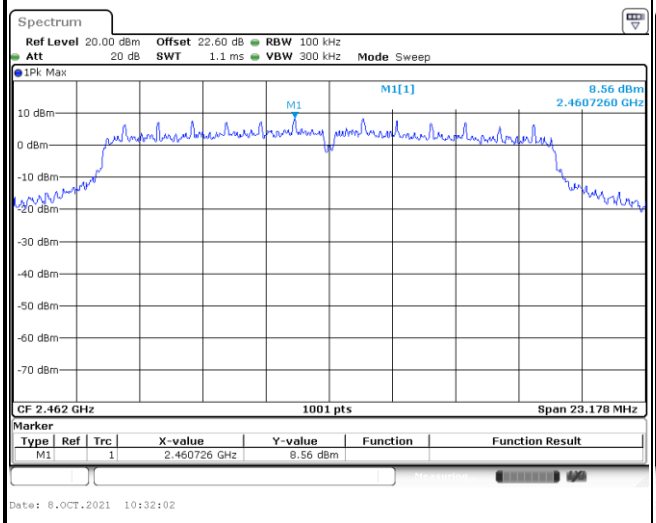
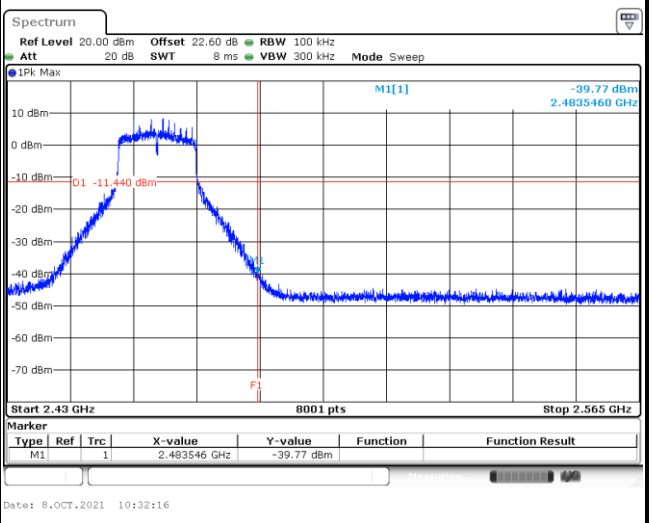
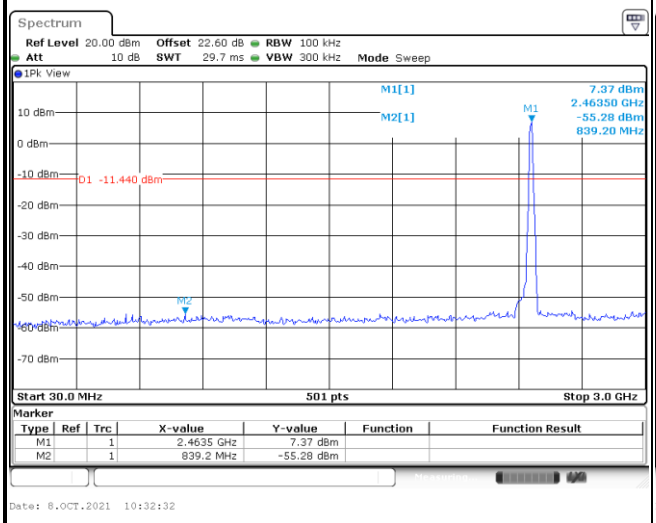
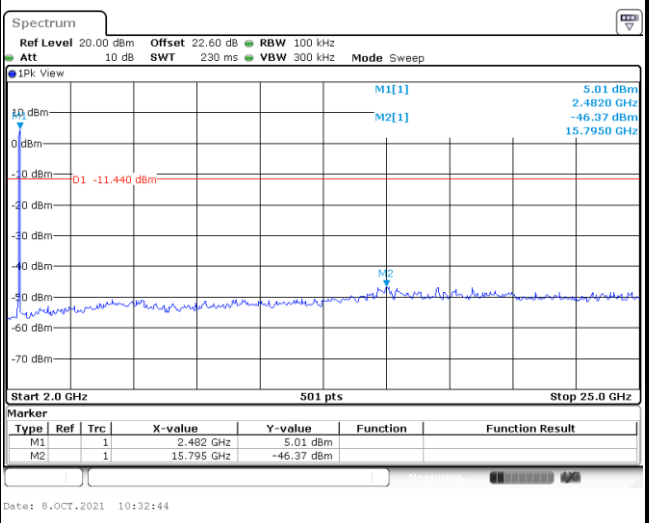
Test Mode :	802.11g	Test Channel :	01

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

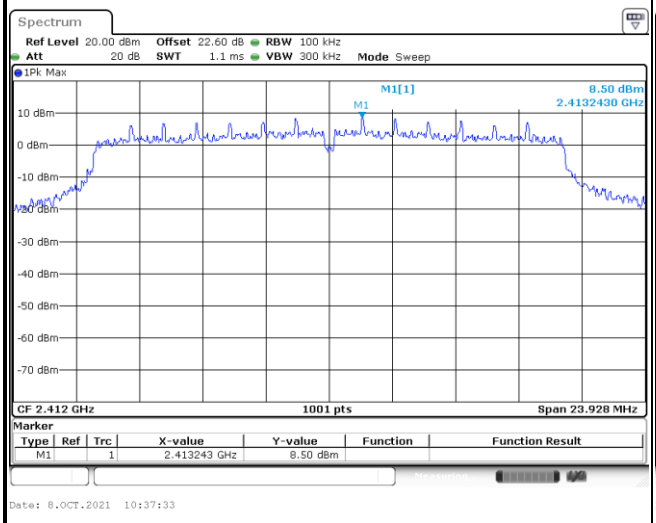
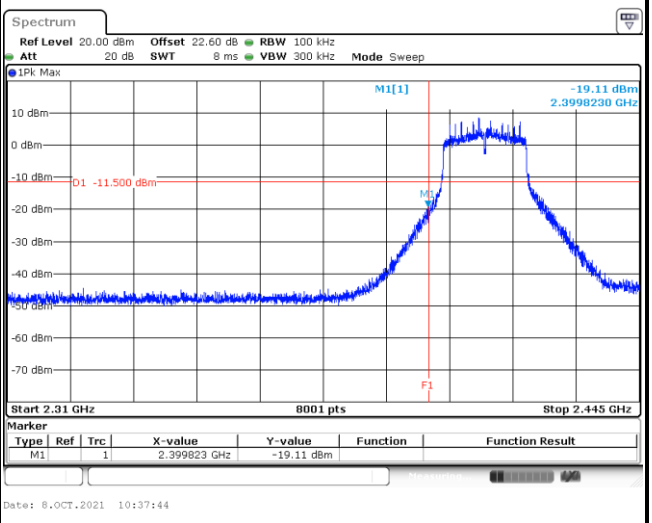
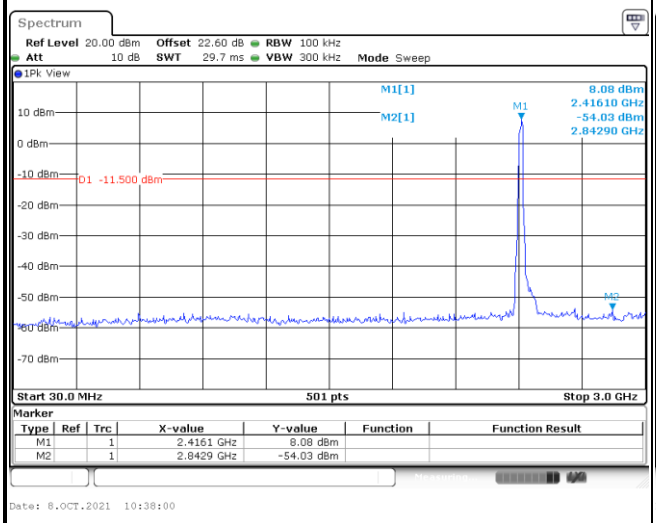
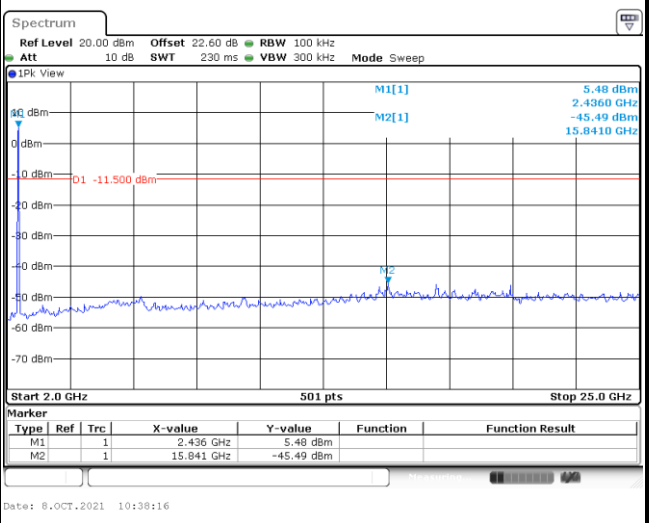
Test Mode :	802.11g	Test Channel :	06

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

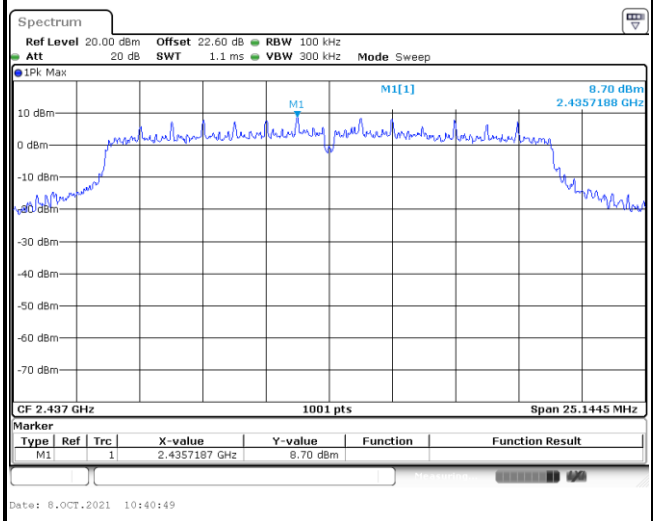
Test Mode :	802.11g	Test Channel :	11

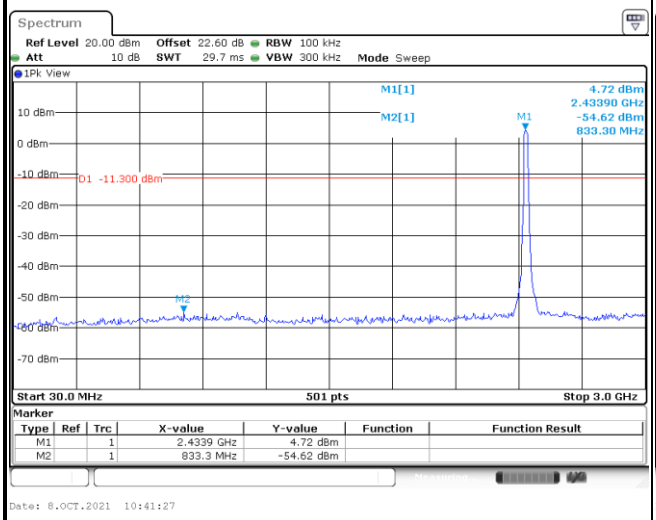
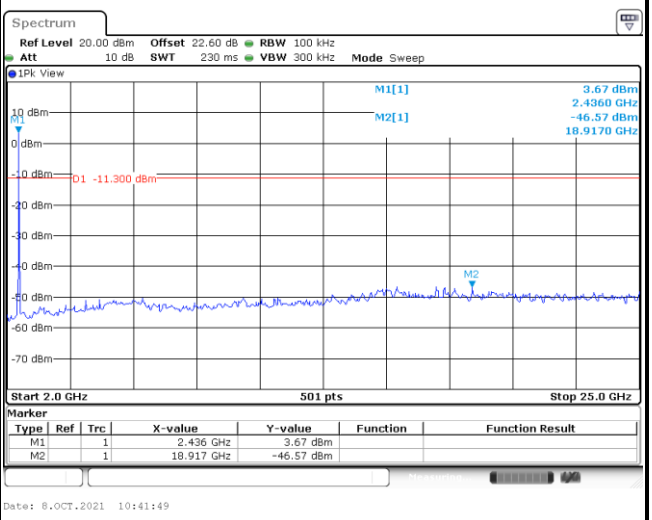
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

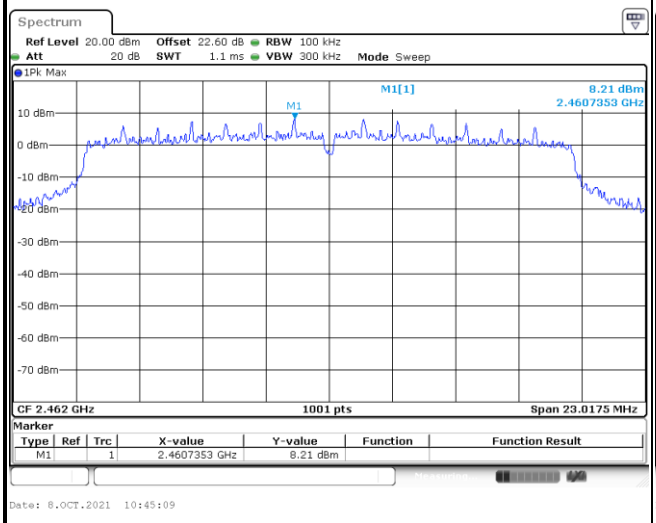
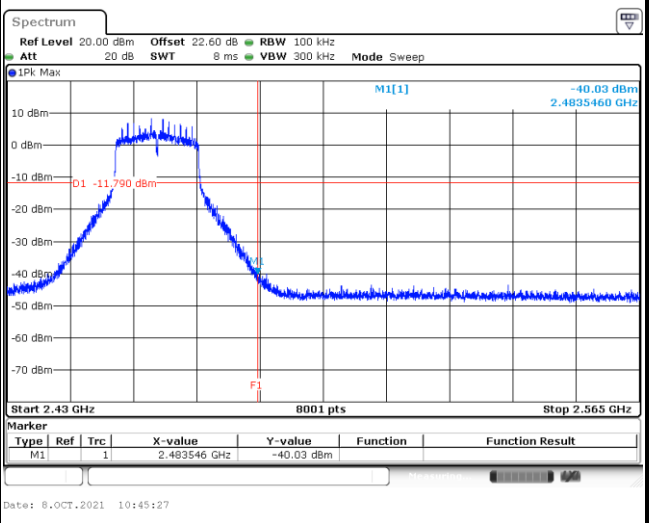
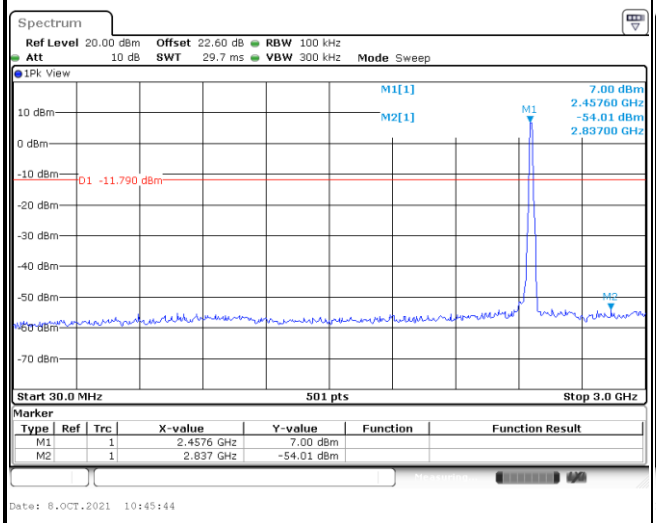
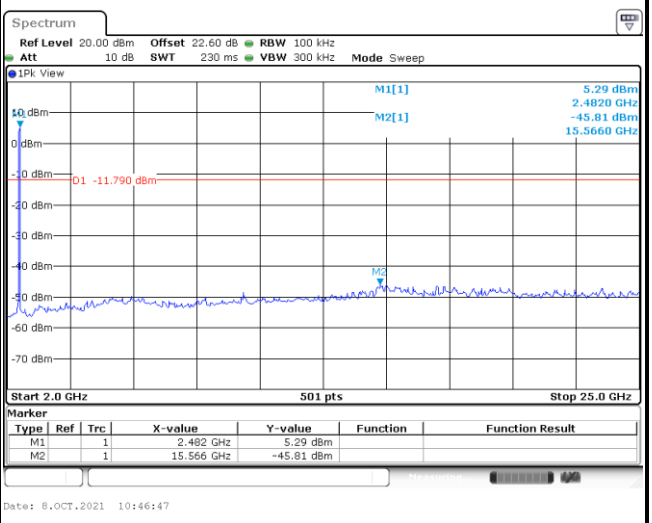
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

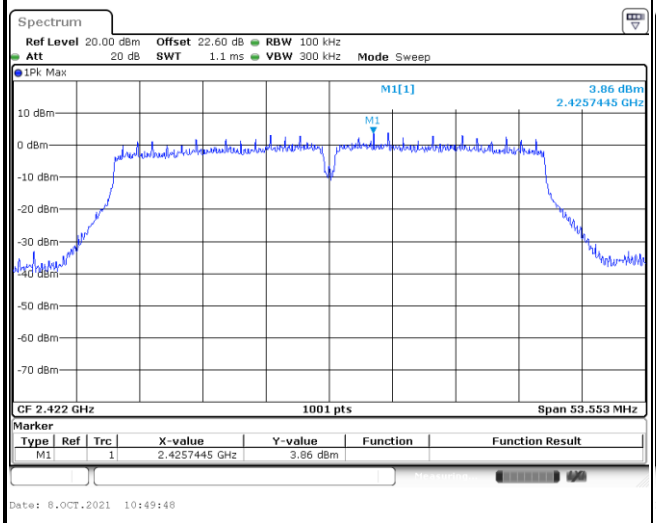
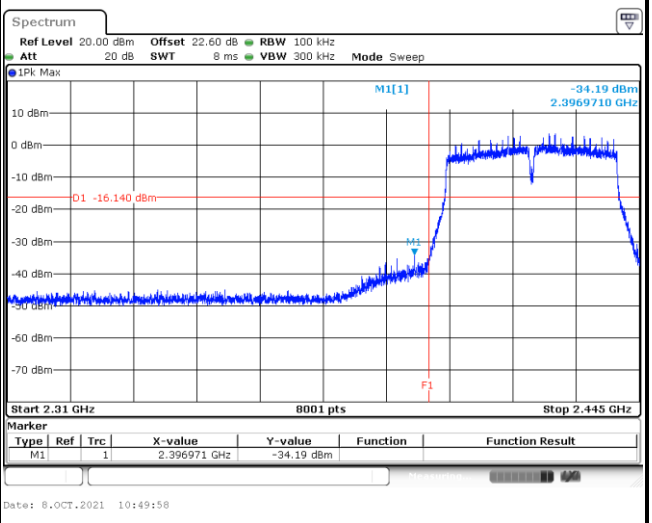
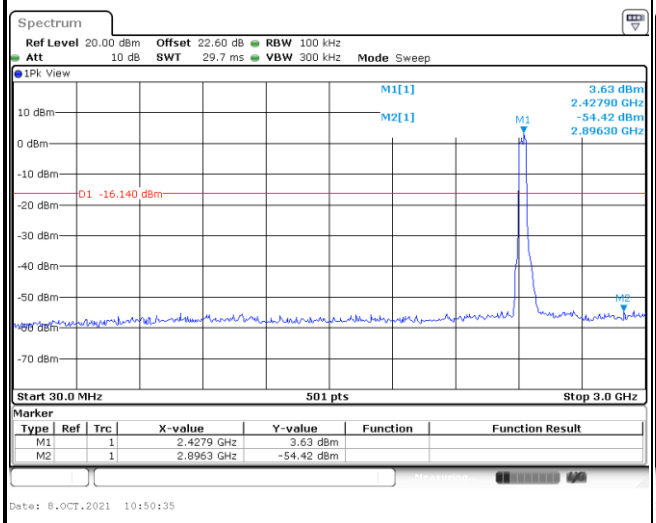
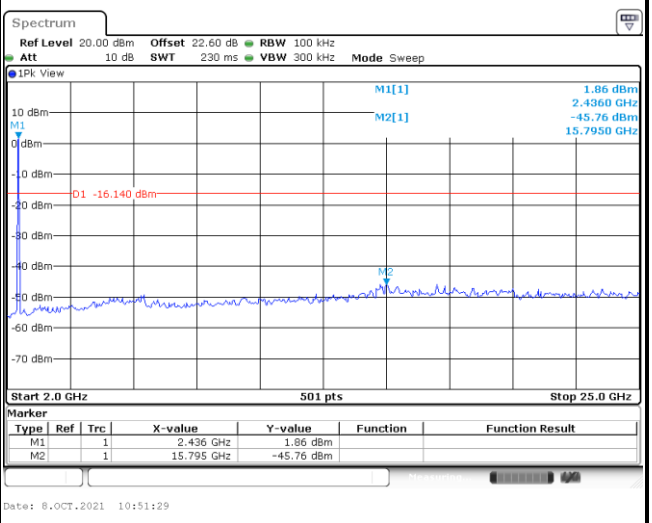
100kHz PSD reference Level	Mid Channel Plot
	

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

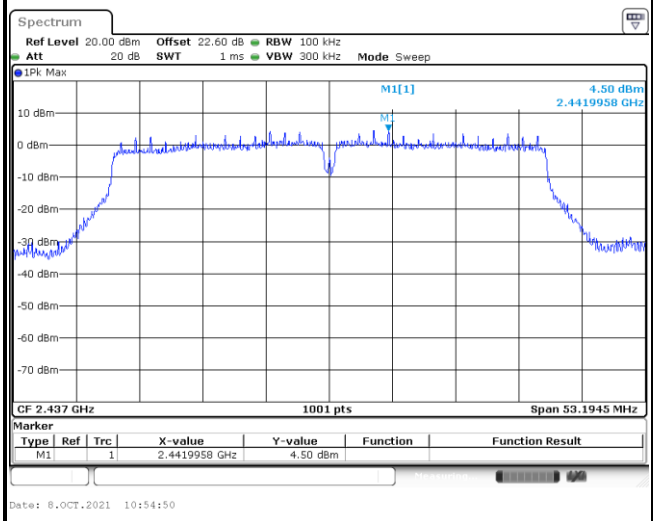
Test Mode :	802.11n HT20	Test Channel :	11

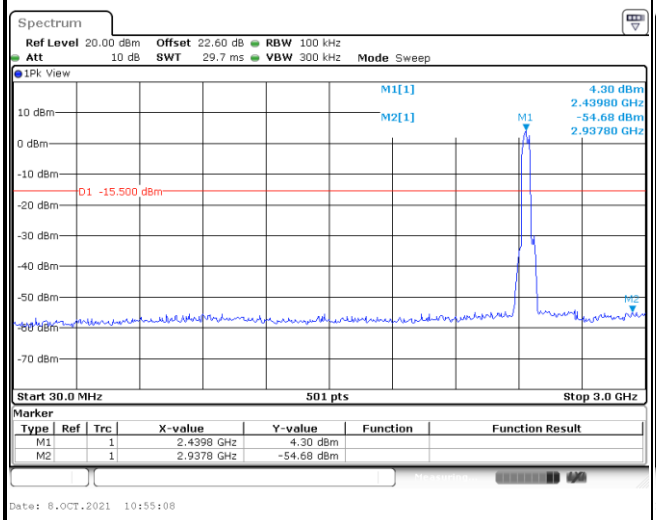
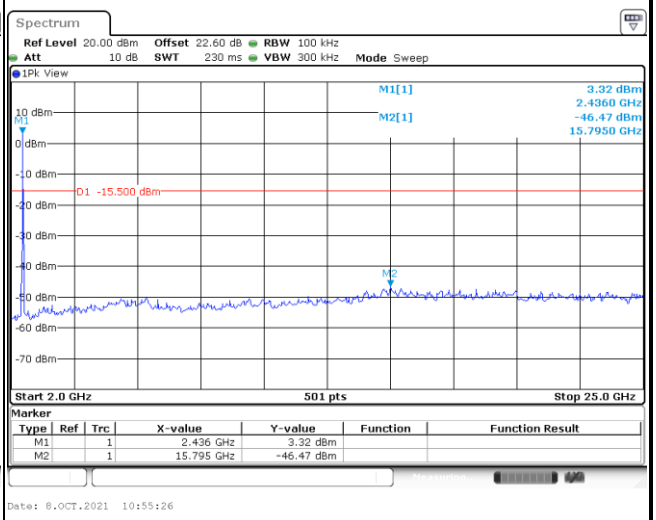
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	03

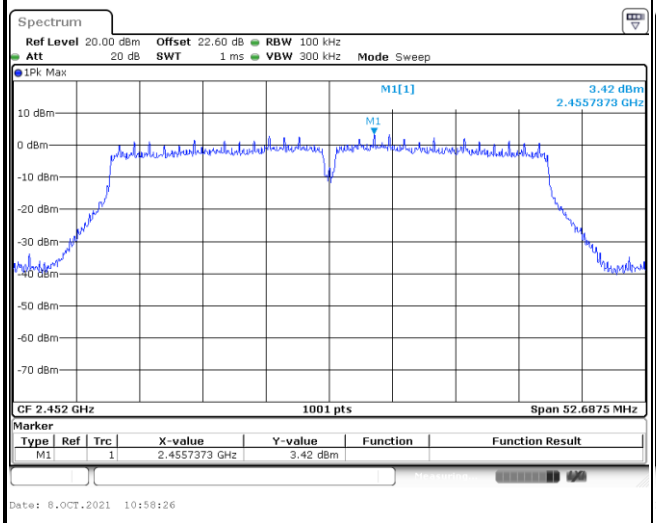
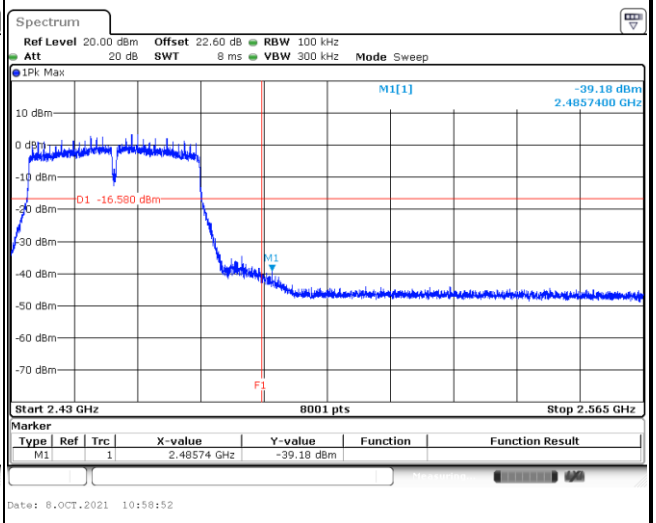
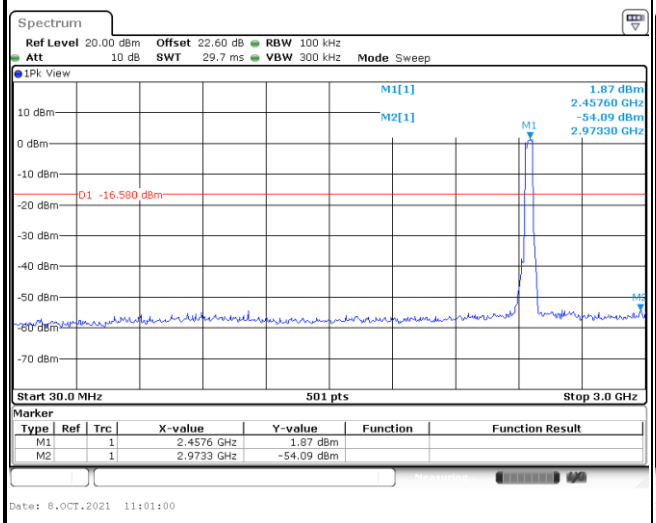
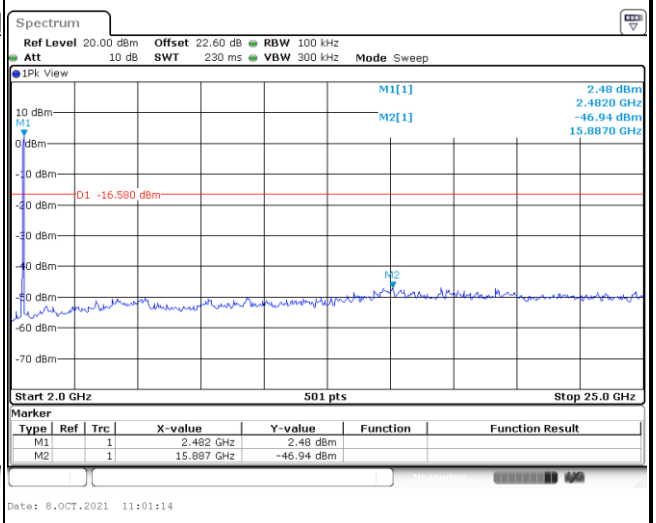
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	06

100kHz PSD reference Level	Mid Channel Plot
	

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

Test Mode :	802.11n HT40	Test Channel :	09

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 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

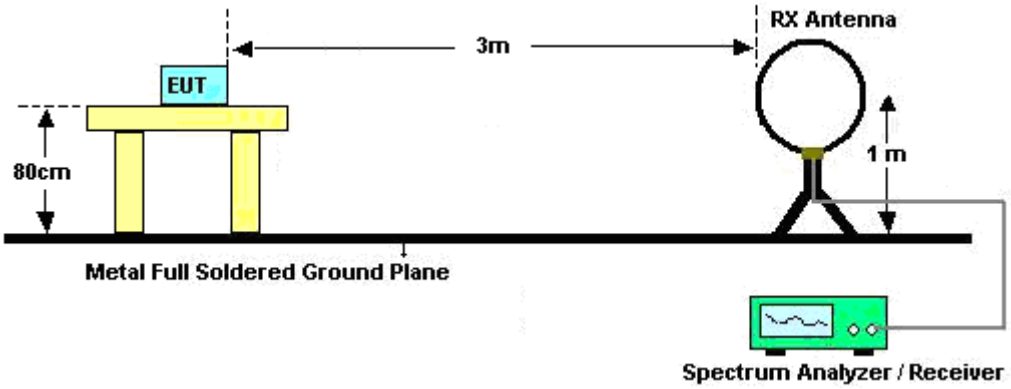
See list of measuring equipment of this test report.

3.5.3 Test Procedures

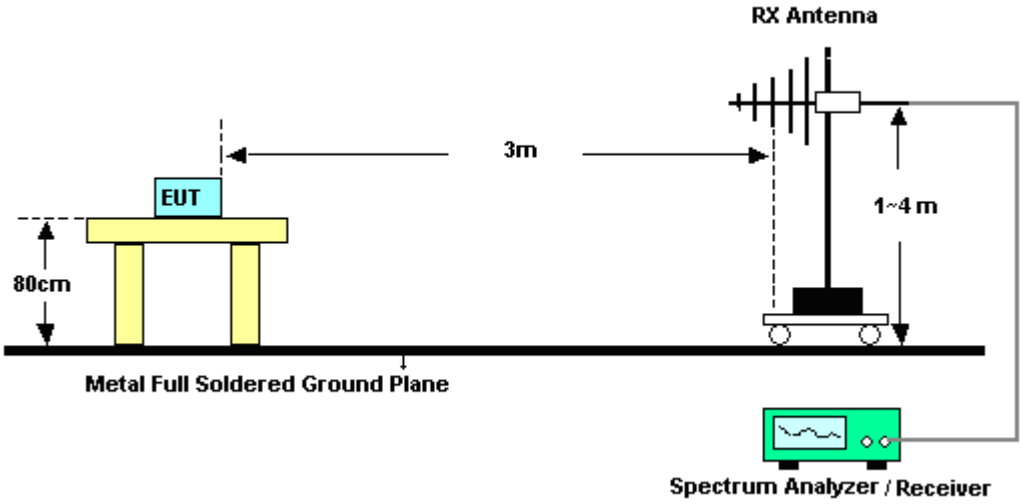
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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. Radiated testing below 1GHz was performed by adjusting the antenna tower from 1m to 4m and by rotating the turn table from 0degree to 360 degree to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6dB margin against QP limit line, the position is marked as "-".
7. Radiated testing above 1GHz was performed by adjusting the antenna tower from 1m to 4m and by rotating the turn table from 0degree to 360 degree to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6dB margin against average limit line, the position is marked as "-".
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

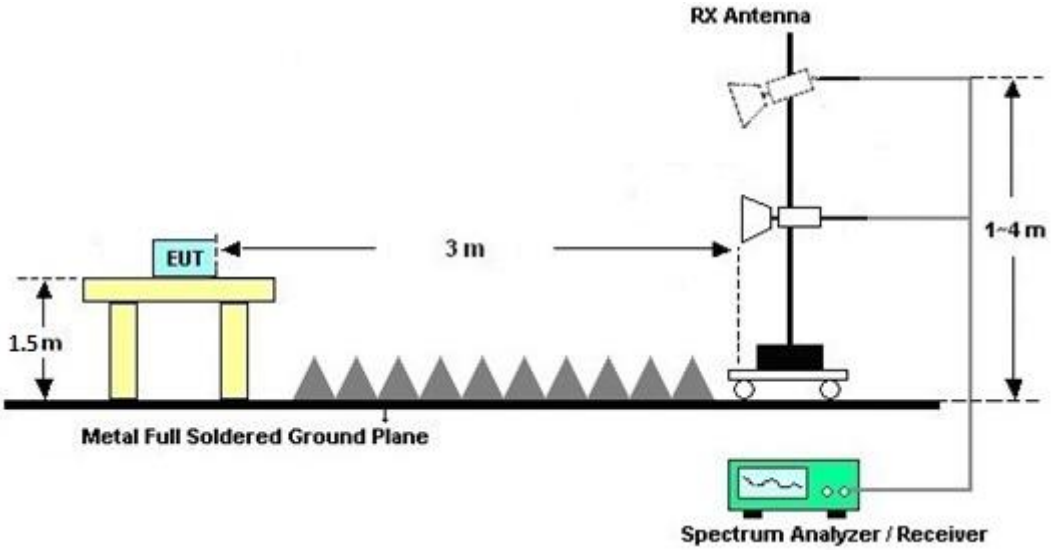
For radiated emissions below 30MHz



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 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.

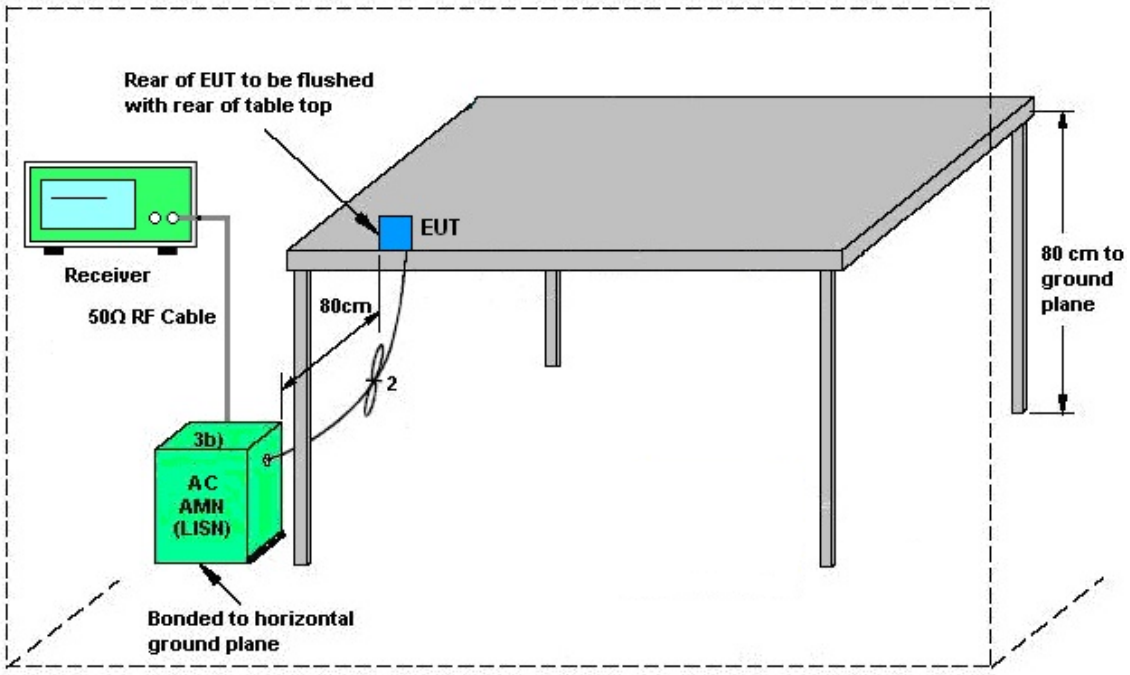
3.6.2 Measuring Instruments

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 rule.

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
EMI Test Receicver	Keysight	N9010B	MY60240520	10Hz~44GHz	Dec. 02, 2020	Sep. 30, 2021~ Oct. 13, 2021	Dec. 01, 2021	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz-1000MHz	Jan. 04, 2021	Sep. 30, 2021~ Oct. 13, 2021	Jan. 03, 2022	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 16, 2020	Sep. 30, 2021~ Oct. 13, 2021	Nov. 15, 2021	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Sep. 30, 2021~ Oct. 13, 2021	Dec. 10, 2021	Radiation (03CH20-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Sep. 30, 2021~ Oct. 13, 2021	Jan. 03, 2022	Radiation (03CH20-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802N 1D01N-06	55606 & 08	30MHz~1GHz	Oct. 22, 2020	Sep. 30, 2021~ Oct. 13, 2021	Oct. 21, 2021	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	002360	1GHz-18GHz	Nov. 03, 2020	Sep. 30, 2021~ Oct. 13, 2021	Nov. 02, 2021	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	009910	18GHz-40GHz	May 12, 2021	Sep. 30, 2021~ Oct. 13, 2021	May 11, 2022	Radiation (03CH20-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN27	1.53GHz Low Pass Filter	May 25, 2021	Sep. 30, 2021~ Oct. 13, 2021	May 24, 2022	Radiation (03CH20-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN8	N/A	Mar. 26, 2021	Sep. 30, 2021~ Oct. 13, 2021	Mar. 25, 2022	Radiation (03CH20-HY)
Filter	Wainwright	WHKX8-6090-7000-18000-40SS	SN99	N/A	Nov. 05, 2020	Sep. 30, 2021~ Oct. 13, 2021	Nov. 04, 2021	Radiation (03CH20-HY)
Notch Filter	ST1	STI15_9935_5150-5850	NA	N/A	Apr. 08, 2021	Sep. 30, 2021~ Oct. 13, 2021	Apr. 07, 2022	Radiation (03CH20-HY)
Notch Filter	Marvelous Microwave Inc	MFN_2400.2485.S5	40009N	N/A	Apr. 16, 2021	Sep. 30, 2021~ Oct. 13, 2021	Apr. 15, 2022	Radiation (03CH20-HY)
Hygrometer	TECPEL	DTM-303B	TP200728	N/A	Mar. 09, 2021	Sep. 30, 2021~ Oct. 13, 2021	Mar. 08, 2022	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804015/2,804027/2	N/A	Jan. 20, 2021	Sep. 30, 2021~ Oct. 13, 2021	Jan. 19, 2022	Radiation (03CH20-HY)
Software	Audix	E3 6.2009-8-24	RK-002156	N/A	N/A	Sep. 30, 2021~ Oct. 13, 2021	N/A	Radiation (03CH20-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Sep. 30, 2021~ Oct. 13, 2021	N/A	Radiation (03CH20-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Sep. 30, 2021~ Oct. 13, 2021	N/A	Radiation (03CH20-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Sep. 30, 2021~ Oct. 13, 2021	N/A	Radiation (03CH20-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 01, 2021	Sep. 20, 2021~ Oct. 08, 2021	Feb. 28, 2022	Conducted (TH02-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 12	10MHz~6GHz	Dec. 16, 2020	Sep. 20, 2021~ Oct. 08, 2021	Dec. 15, 2021	Conducted (TH02-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101565	10Hz ~ 40GHz	Nov. 13, 2020	Sep. 20, 2021~ Oct. 08, 2021	Nov. 12, 2021	Conducted (TH02-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	Sep. 20, 2021~ Oct. 08, 2021	Mar. 16, 2022	Conducted (TH02-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 27, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Sep. 27, 2021	Nov. 29, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Sep. 27, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 01, 2020	Sep. 27, 2021	Nov. 30, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Sep. 27, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	Sep. 27, 2021	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Sep. 27, 2021	Dec. 30, 2021	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.3 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.8 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.5 dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jacob Yu	Temperature:	22.9~24.9	°C
Test Date:	2021/9/20-2021/10/8	Relative Humidity:	50.4~52.4	%

Report Number : FR190730C

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
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	1	1	2412	14.14	-	8.08	-	0.50	Pass
11b	1Mbps	1	6	2437	14.04	-	8.53	-	0.50	Pass
11b	1Mbps	1	11	2462	13.99	-	8.56	-	0.50	Pass
11g	6Mbps	1	1	2412	18.13	-	15.93	-	0.50	Pass
11g	6Mbps	1	6	2437	17.98	-	16.28	-	0.50	Pass
11g	6Mbps	1	11	2462	18.03	-	15.45	-	0.50	Pass
HT20	MCS0	1	1	2412	19.03	-	15.95	-	0.50	Pass
HT20	MCS0	1	6	2437	19.03	-	16.76	-	0.50	Pass
HT20	MCS0	1	11	2462	18.88	-	15.35	-	0.50	Pass
HT40	MCS0	1	3	2422	36.46	-	35.70	-	0.50	Pass
HT40	MCS0	1	6	2437	36.46	-	35.46	-	0.50	Pass
HT40	MCS0	1	9	2452	36.36	-	35.13	-	0.50	Pass

Report Number : FR190730C

TEST RESULTS DATA
Average Output Power
(Reporting Only)

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	19.00	-	-	30.00	-	-1.36	-	17.64	-	36.00	-	Pass
11b	1Mbps	1	6	2437	18.70	-		30.00	-	-1.36	-	17.34	-	36.00	-	Pass
11b	1Mbps	1	11	2462	18.90	-		30.00	-	-1.36	-	17.54	-	36.00	-	Pass
11g	6Mbps	1	1	2412	19.00	-		30.00	-	-1.36	-	17.64	-	36.00	-	Pass
11g	6Mbps	1	6	2437	18.60	-		30.00	-	-1.36	-	17.24	-	36.00	-	Pass
11g	6Mbps	1	11	2462	18.40	-		30.00	-	-1.36	-	17.04	-	36.00	-	Pass
HT20	MCS0	1	1	2412	18.40	-		30.00	-	-1.36	-	17.04	-	36.00	-	Pass
HT20	MCS0	1	6	2437	18.60	-		30.00	-	-1.36	-	17.24	-	36.00	-	Pass
HT20	MCS0	1	11	2462	17.90	-		30.00	-	-1.36	-	16.54	-	36.00	-	Pass
HT40	MCS0	1	3	2422	16.90	-		30.00	-	-1.36	-	15.54	-	36.00	-	Pass
HT40	MCS0	1	6	2437	17.90	-		30.00	-	-1.36	-	16.54	-	36.00	-	Pass
HT40	MCS0	1	9	2452	16.30	-		30.00	-	-1.36	-	14.94	-	36.00	-	Pass
VHT20	MCS0	1	1	2412	18.30	-		30.00	-	-1.36	-	16.94	-	36.00	-	Pass
VHT20	MCS0	1	6	2437	18.50	-		30.00	-	-1.36	-	17.14	-	36.00	-	Pass
VHT20	MCS0	1	11	2462	17.80	-		30.00	-	-1.36	-	16.44	-	36.00	-	Pass
VHT40	MCS0	1	3	2422	16.80	-		30.00	-	-1.36	-	15.44	-	36.00	-	Pass
VHT40	MCS0	1	6	2437	17.80	-		30.00	-	-1.36	-	16.44	-	36.00	-	Pass
VHT40	MCS0	1	9	2452	16.20	-		30.00	-	-1.36	-	14.84	-	36.00	-	Pass

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

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
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	20.94	-	-	30.00	-	-1.36	-	19.58	-	36.00	-	Pass
11b	1Mbps	1	6	2437	20.74	-		30.00	-	-1.36	-	19.38	-	36.00	-	Pass
11b	1Mbps	1	11	2462	20.98	-		30.00	-	-1.36	-	19.62	-	36.00	-	Pass
11g	6Mbps	1	1	2412	22.84	-		30.00	-	-1.36	-	21.48	-	36.00	-	Pass
11g	6Mbps	1	6	2437	22.68	-		30.00	-	-1.36	-	21.32	-	36.00	-	Pass
11g	6Mbps	1	11	2462	22.42	-		30.00	-	-1.36	-	21.06	-	36.00	-	Pass
HT20	MCS0	1	1	2412	22.45	-		30.00	-	-1.36	-	21.09	-	36.00	-	Pass
HT20	MCS0	1	6	2437	22.70	-		30.00	-	-1.36	-	21.34	-	36.00	-	Pass
HT20	MCS0	1	11	2462	22.02	-		30.00	-	-1.36	-	20.66	-	36.00	-	Pass
HT40	MCS0	1	3	2422	22.36	-		30.00	-	-1.36	-	21.00	-	36.00	-	Pass
HT40	MCS0	1	6	2437	22.95	-		30.00	-	-1.36	-	21.59	-	36.00	-	Pass
HT40	MCS0	1	9	2452	21.98	-		30.00	-	-1.36	-	20.62	-	36.00	-	Pass
VHT20	MCS0	1	1	2412	22.41	-		30.00	-	-1.36	-	21.05	-	36.00	-	Pass
VHT20	MCS0	1	6	2437	22.62	-		30.00	-	-1.36	-	21.26	-	36.00	-	Pass
VHT20	MCS0	1	11	2462	21.95	-		30.00	-	-1.36	-	20.59	-	36.00	-	Pass
VHT40	MCS0	1	3	2422	22.25	-		30.00	-	-1.36	-	20.89	-	36.00	-	Pass
VHT40	MCS0	1	6	2437	22.83	-		30.00	-	-1.36	-	21.47	-	36.00	-	Pass
VHT40	MCS0	1	9	2452	21.84	-		30.00	-	-1.36	-	20.48	-	36.00	-	Pass

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
					Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	-3.82	-	-	-1.36	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-3.86	-		-1.36	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-3.89	-		-1.36	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-6.54	-		-1.36	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-6.91	-		-1.36	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-7.07	-		-1.36	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-6.93	-		-1.36	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-6.88	-		-1.36	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-7.33	-		-1.36	-	8.00	-	Pass
HT40	MCS0	1	3	2422	-11.96	-		-1.36	-	8.00	-	Pass
HT40	MCS0	1	6	2437	-10.59	-		-1.36	-	8.00	-	Pass
HT40	MCS0	1	9	2452	-12.07	-		-1.36	-	8.00	-	Pass

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

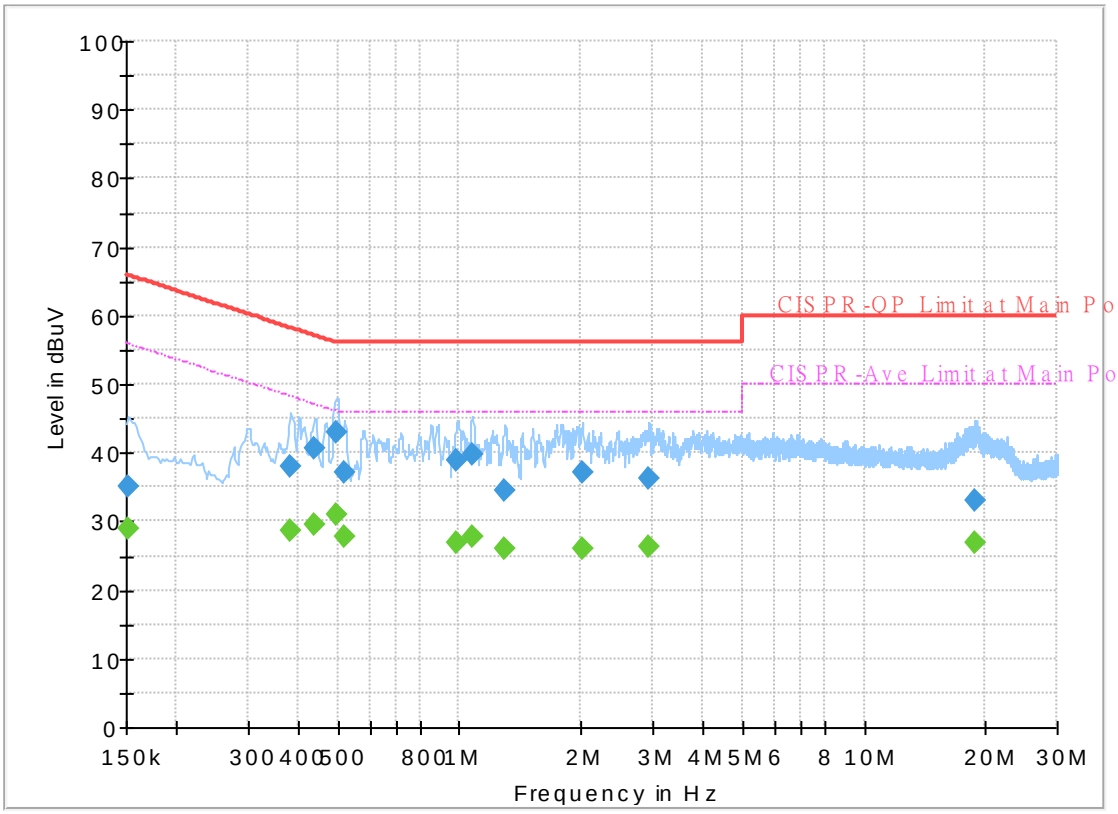
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	**Temperature :**	23~26℃
		Relative Humidity :	40~50%

EUT Information

Report NO :	190730
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



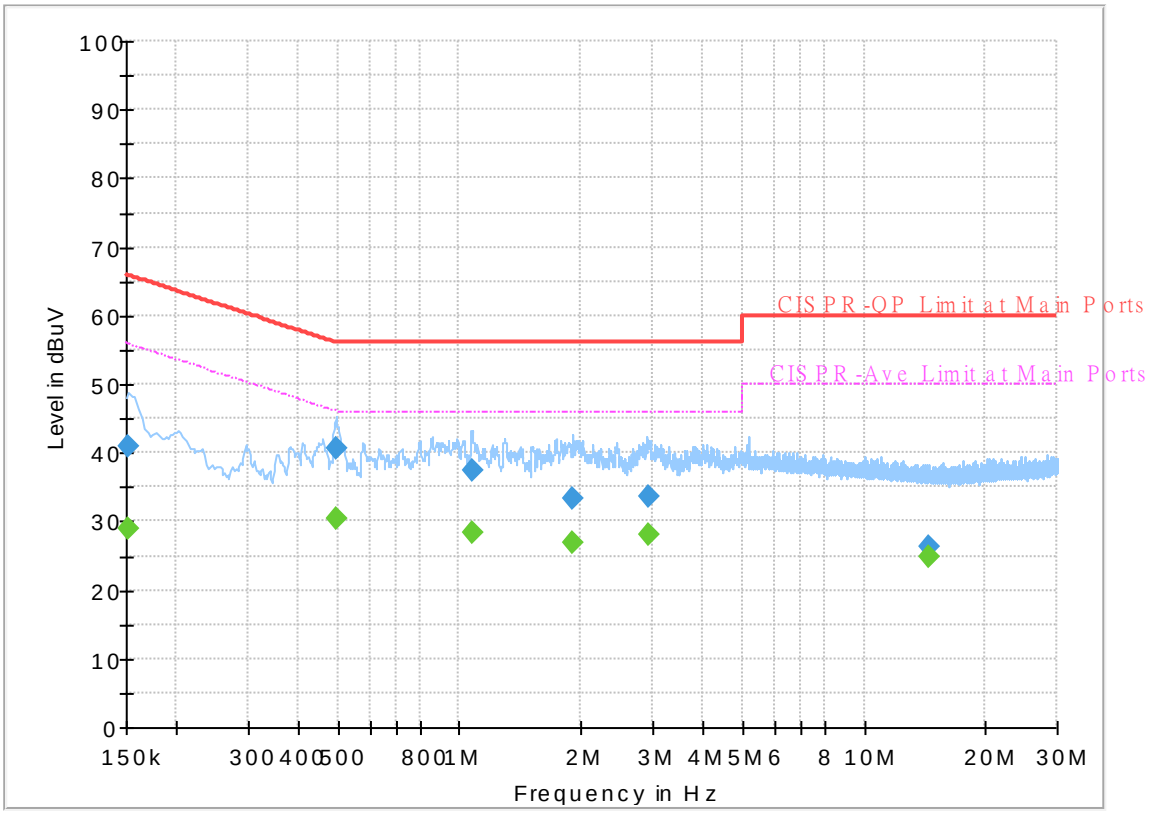
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	29.00	55.88	26.88	L1	OFF	19.6
0.152250	35.18	---	65.88	30.70	L1	OFF	19.6
0.384000	---	28.70	48.19	19.49	L1	OFF	19.7
0.384000	37.91	---	58.19	20.28	L1	OFF	19.7
0.438000	---	29.68	47.10	17.42	L1	OFF	19.7
0.438000	40.68	---	57.10	16.42	L1	OFF	19.7
0.498750	---	30.95	46.02	15.07	L1	OFF	19.8
0.498750	43.11	---	56.02	12.91	L1	OFF	19.8
0.521250	---	27.89	46.00	18.11	L1	OFF	19.8
0.521250	37.08	---	56.00	18.92	L1	OFF	19.8
0.984750	---	26.89	46.00	19.11	L1	OFF	20.2
0.984750	38.84	---	56.00	17.16	L1	OFF	20.2
1.072500	---	27.85	46.00	18.15	L1	OFF	20.2
1.072500	39.68	---	56.00	16.32	L1	OFF	20.2
1.297500	---	26.00	46.00	20.00	L1	OFF	20.2
1.297500	34.62	---	56.00	21.38	L1	OFF	20.2
2.013000	---	26.05	46.00	19.95	L1	OFF	20.1
2.013000	37.01	---	56.00	18.99	L1	OFF	20.1
2.946750	---	26.39	46.00	19.61	L1	OFF	20.0
2.946750	36.22	---	56.00	19.78	L1	OFF	20.0
18.881250	---	26.83	50.00	23.17	L1	OFF	20.4
18.881250	33.09	---	60.00	26.91	L1	OFF	20.4

EUT Information

Report NO :	190730
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	28.97	55.88	26.91	N	OFF	19.7
0.152250	40.98	---	65.88	24.90	N	OFF	19.7
0.494250	---	30.52	46.10	15.58	N	OFF	19.8
0.494250	40.65	---	56.10	15.45	N	OFF	19.8
1.072500	---	28.30	46.00	17.70	N	OFF	20.2
1.072500	37.37	---	56.00	18.63	N	OFF	20.2
1.907250	---	26.92	46.00	19.08	N	OFF	20.2
1.907250	33.44	---	56.00	22.56	N	OFF	20.2
2.949000	---	27.94	46.00	18.06	N	OFF	20.1
2.949000	33.70	---	56.00	22.30	N	OFF	20.1
14.507250	---	24.85	50.00	25.15	N	OFF	20.3
14.507250	26.34	---	60.00	33.66	N	OFF	20.3

Appendix C. Radiated Spurious Emission

Test Engineer :	Troye Hsieh and JC Liang	Temperature :	20.0~21.5°C
		Relative Humidity :	60.3~66.1%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2310.525	49.33	-24.67	74	40.21	27.02	18.27	36.17	182	62	P	H
		2387.595	38.03	-15.97	54	28.55	27.25	18.42	36.19	182	62	A	H
	*	2412	105.6	-	-	95.99	27.35	18.46	36.2	182	62	P	H
	*	2412	102.48	-	-	92.87	27.35	18.46	36.2	182	62	A	H
													H
													H
		2388.75	49.9	-24.1	74	40.42	27.25	18.42	36.19	100	102	P	V
		2388.225	38.43	-15.57	54	28.95	27.25	18.42	36.19	100	102	A	V
	*	2412	106.51	-	-	96.9	27.35	18.46	36.2	100	102	P	V
	*	2412	103.37	-	-	93.76	27.35	18.46	36.2	100	102	A	V
													V
													V
802.11b CH 06 2437MHz		2325.36	48.99	-25.01	74	39.81	27.05	18.3	36.17	300	140	P	H
		2389.68	36.33	-17.67	54	26.84	27.26	18.42	36.19	300	140	A	H
	*	2437	104.39	-	-	94.66	27.44	18.5	36.21	300	140	P	H
	*	2437	101.27	-	-	91.54	27.44	18.5	36.21	300	140	A	H
		2484.8	49.38	-24.62	74	39.38	27.64	18.59	36.23	300	140	P	H
		2484.96	37.66	-16.34	54	27.66	27.64	18.59	36.23	300	140	A	H
		2352.88	48.27	-25.73	74	38.99	27.11	18.35	36.18	100	105	P	V
		2390	36.27	-17.73	54	26.78	27.26	18.42	36.19	100	105	A	V
	*	2437	103.38	-	-	93.65	27.44	18.5	36.21	100	105	P	V
	*	2437	100.89	-	-	91.16	27.44	18.5	36.21	100	105	A	V
		2484.48	49.29	-24.71	74	39.29	27.64	18.59	36.23	100	105	P	V
		2484.08	37.62	-16.38	54	27.61	27.64	18.59	36.22	100	105	A	V

802.11b CH 11 2462MHz	*	2462	104.04	-	-	94.16	27.55	18.55	36.22	300	57	P	H
	*	2462	101.08	-	-	91.2	27.55	18.55	36.22	300	57	A	H
		2487.76	50.52	-23.48	74	40.51	27.65	18.59	36.23	300	57	P	H
		2483.52	39.34	-14.66	54	29.34	27.63	18.59	36.22	300	57	A	H
													H
													H
	*	2462	104.79	-	-	94.91	27.55	18.55	36.22	100	60	P	V
	*	2462	101.96	-	-	92.08	27.55	18.55	36.22	100	60	A	V
		2484.12	51.01	-22.99	74	41	27.64	18.59	36.22	100	60	P	V
		2483.52	40.42	-13.58	54	30.42	27.63	18.59	36.22	100	60	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. 4	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)
		4824	45.71	-28.29	74	38.28	32.14	12.73	37.44	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 01 2412MHz													H
		4824	54.02	-19.98	74	46.59	32.14	12.73	37.44	330	360	P	V
		4824	51.52	-2.48	54	44.09	32.14	12.73	37.44	330	360	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4874	44.04	-29.96	74	36.45	32.3	12.77	37.48	-	-	P	H
		7311	46.86	-27.14	74	33.07	36.76	15.38	38.35	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 06 2437MHz		4874	51.4	-22.6	74	43.81	32.3	12.77	37.48	325	360	P	V
		4874	48.65	-5.35	54	41.06	32.3	12.77	37.48	325	360	A	V
		7311	46.63	-27.37	74	32.84	36.76	15.38	38.35	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4924	45.34	-28.66	74	37.58	32.49	12.79	37.52	-	-	P	H
		7386	46.63	-27.37	74	33.12	36.46	15.46	38.41	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 11 2462MHz		4924	52.38	-21.62	74	44.62	32.49	12.79	37.52	316	356	P	V
		4924	49.23	-4.77	54	41.47	32.49	12.79	37.52	316	356	A	V
		7386	46.05	-27.95	74	32.54	36.46	15.46	38.41	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 4	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		2389.905	60.99	-13.01	74	51.5	27.26	18.42	36.19	350	134	P	H
		2390	51.24	-2.76	54	41.75	27.26	18.42	36.19	350	134	A	H
	*	2412	105.25	-	-	95.64	27.35	18.46	36.2	350	134	P	H
	*	2412	98.09	-	-	88.48	27.35	18.46	36.2	350	134	A	H
													H
													H
		2390	62.6	-11.4	74	53.11	27.26	18.42	36.19	100	127	P	V
		2390	52.06	-1.94	54	42.57	27.26	18.42	36.19	100	127	A	V
	*	2412	105.74	-	-	96.13	27.35	18.46	36.2	100	127	P	V
	*	2412	98.95	-	-	89.34	27.35	18.46	36.2	100	127	A	V
													V
													V
802.11g CH 06 2437MHz		2369.84	49.36	-24.64	74	39.99	27.18	18.38	36.19	200	134	P	H
		2390	37.54	-16.46	54	28.05	27.26	18.42	36.19	200	134	A	H
	*	2437	105.47	-	-	95.73	27.45	18.5	36.21	200	134	P	H
	*	2437	98.07	-	-	88.33	27.45	18.5	36.21	200	134	A	H
		2484.8	50.56	-23.44	74	40.56	27.64	18.59	36.23	200	134	P	H
		2483.52	39.76	-14.24	54	29.76	27.63	18.59	36.22	200	134	A	H
		2388.88	49.27	-24.73	74	39.78	27.26	18.42	36.19	100	61	P	V
		2390	37.77	-16.23	54	28.28	27.26	18.42	36.19	100	61	A	V
	*	2437	105.89	-	-	96.15	27.45	18.5	36.21	100	61	P	V
	*	2437	98.6	-	-	88.86	27.45	18.5	36.21	100	61	A	V
		2483.6	52.25	-21.75	74	42.25	27.63	18.59	36.22	100	61	P	V
		2483.52	40.51	-13.49	54	30.51	27.63	18.59	36.22	100	61	A	V

802.11g CH 11 2462MHz	*	2462	105.3	-	-	95.42	27.55	18.55	36.22	250	138	P	H
	*	2462	98.99	-	-	89.11	27.55	18.55	36.22	250	138	A	H
		2484.24	62.65	-11.35	74	52.64	27.64	18.59	36.22	250	138	P	H
		2483.52	52.34	-1.66	54	42.34	27.63	18.59	36.22	250	138	A	H
													H
													H
	*	2462	106.46	-	-	96.58	27.55	18.55	36.22	100	128	P	V
	*	2462	100.35	-	-	90.47	27.55	18.55	36.22	100	128	A	V
		2483.6	63.86	-10.14	74	53.86	27.63	18.59	36.22	100	128	P	V
		2483.52	51.92	-2.08	54	41.92	27.63	18.59	36.22	100	128	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. 4	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)
		4824	43.81	-30.19	74	36.38	32.14	12.73	37.44	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 01 2412MHz													H
		4824	52.07	-21.93	74	44.64	32.14	12.73	37.44	309	360	P	V
		4824	41.12	-12.88	54	33.69	32.14	12.73	37.44	309	360	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4874	42.47	-31.53	74	34.88	32.3	12.77	37.48	-	-	P	H
		7311	47.19	-26.81	74	33.4	36.76	15.38	38.35	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 06 2437MHz		4874	50.14	-23.86	74	42.55	32.3	12.77	37.48	324	360	P	V
		4874	39.31	-14.69	54	31.72	32.3	12.77	37.48	324	360	A	V
		7311	46.52	-27.48	74	32.73	36.76	15.38	38.35	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4924	42.89	-31.11	74	35.13	32.49	12.79	37.52	-	-	P	H
		7386	47.27	-26.73	74	33.76	36.46	15.46	38.41	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 11 2462MHz													H
		4924	46.79	-27.21	74	39.03	32.49	12.79	37.52	-	-	P	V
		7386	46.58	-27.42	74	33.07	36.46	15.46	38.41	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 4	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)
		2389.8	63.3	-10.7	74	53.81	27.26	18.42	36.19	250	138	P	H
		2390	52.28	-1.72	54	42.79	27.26	18.42	36.19	250	138	A	H
	*	2412	104.83	-	-	95.22	27.35	18.46	36.2	250	138	P	H
	*	2412	97.08	-	-	87.47	27.35	18.46	36.2	250	138	A	H
802.11n													H
HT20													H
CH 01		2390	63.22	-10.78	74	53.73	27.26	18.42	36.19	100	126	P	V
2412MHz		2390	53.21	-0.79	54	43.72	27.26	18.42	36.19	100	126	A	V
	*	2412	105.44	-	-	95.83	27.35	18.46	36.2	100	126	P	V
	*	2412	97.92	-	-	88.31	27.35	18.46	36.2	100	126	A	V
													V
													V
		2383.28	48.68	-25.32	74	39.23	27.23	18.41	36.19	200	132	P	H
		2390	37.69	-16.31	54	28.2	27.26	18.42	36.19	200	132	A	H
	*	2437	104.59	-	-	94.85	27.45	18.5	36.21	200	132	P	H
	*	2437	98.16	-	-	88.42	27.45	18.5	36.21	200	132	A	H
802.11n		2486.08	51.59	-22.41	74	41.59	27.64	18.59	36.23	200	132	P	H
HT20		2483.52	40.27	-13.73	54	30.27	27.63	18.59	36.22	200	132	A	H
CH 06		2387.76	49.84	-24.16	74	40.36	27.25	18.42	36.19	100	60	P	V
2437MHz		2389.84	37.9	-16.1	54	28.41	27.26	18.42	36.19	100	60	A	V
	*	2437	105.27	-	-	95.53	27.45	18.5	36.21	100	60	P	V
	*	2437	98.09	-	-	88.35	27.45	18.5	36.21	100	60	A	V
		2483.52	51.3	-22.7	74	41.3	27.63	18.59	36.22	100	60	P	V
		2483.52	40.78	-13.22	54	30.78	27.63	18.59	36.22	100	60	A	V

	*	2462	105	-	-	95.12	27.55	18.55	36.22	300	137	P	H
	*	2462	98.49	-	-	88.61	27.55	18.55	36.22	300	137	A	H
		2483.88	61.39	-12.61	74	51.38	27.64	18.59	36.22	300	137	P	H
		2483.56	51.4	-2.6	54	41.4	27.63	18.59	36.22	300	137	A	H
802.11n													H
HT20													H
CH 11	*	2462	106.34	-	-	96.46	27.55	18.55	36.22	100	127	P	V
2462MHz	*	2462	99.22	-	-	89.34	27.55	18.55	36.22	100	127	A	V
		2483.76	62.67	-11.33	74	52.66	27.64	18.59	36.22	100	127	P	V
		2483.52	52.47	-1.53	54	42.47	27.63	18.59	36.22	100	127	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. 4	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)
		4824	42.84	-31.16	74	35.41	32.14	12.73	37.44	-	-	P	H
													H
													H
													H
802.11n													H
HT20													H
CH 01		4824	50.26	-23.74	74	42.83	32.14	12.73	37.44	306	359	P	V
2412MHz		4824	40.35	-13.65	54	32.92	32.14	12.73	37.44	306	359	A	V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4874	42.22	-31.78	74	34.63	32.3	12.77	37.48	-	-	P	H
		7311	46.7	-27.3	74	32.91	36.76	15.38	38.35	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 06		4874	46.53	-27.47	74	38.94	32.3	12.77	37.48	-	-	P	V
2437MHz		7311	46.97	-27.03	74	33.18	36.76	15.38	38.35	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4924	42.69	-31.31	74	34.93	32.49	12.79	37.52	-	-	P	H
		7386	46.29	-27.71	74	32.78	36.46	15.46	38.41	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 11		4924	46.14	-27.86	74	38.38	32.49	12.79	37.52	-	-	P	V
2462MHz		7386	45.73	-28.27	74	32.22	36.46	15.46	38.41	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 4	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)
		2389.695	61.1	-12.9	74	51.61	27.26	18.42	36.19	250	138	P	H
		2389.065	51.83	-2.17	54	42.34	27.26	18.42	36.19	250	138	A	H
	*	2422	100.76	-	-	91.1	27.39	18.48	36.21	250	138	P	H
	*	2422	94.32	-	-	84.66	27.39	18.48	36.21	250	138	A	H
802.11n		2483.52	52.84	-21.16	74	42.84	27.63	18.59	36.22	250	138	P	H
HT40		2483.6	43.96	-10.04	54	33.96	27.63	18.59	36.22	250	138	A	H
CH 03		2390.01	60.3	-89.7	150	50.81	27.26	18.42	36.19	100	129	P	V
2422MHz		2389.59	51.55	-2.45	54	42.06	27.26	18.42	36.19	100	129	A	V
	*	2422	101.04	-	-	91.38	27.39	18.48	36.21	100	129	P	V
	*	2422	94.11	-	-	84.45	27.39	18.48	36.21	100	129	A	V
		2484.16	52.6	-21.4	74	42.59	27.64	18.59	36.22	100	129	P	V
		2483.92	43.01	-10.99	54	33	27.64	18.59	36.22	100	129	A	V
		2390	54.18	-19.82	74	44.69	27.26	18.42	36.19	250	136	P	H
		2389.36	44.67	-9.33	54	35.18	27.26	18.42	36.19	250	136	A	H
	*	2437	101.92	-	-	92.18	27.45	18.5	36.21	250	136	P	H
	*	2437	94.97	-	-	85.23	27.45	18.5	36.21	250	136	A	H
802.11n		2483.84	61.49	-12.51	74	51.48	27.64	18.59	36.22	250	136	P	H
HT40		2483.52	52.67	-1.33	54	42.67	27.63	18.59	36.22	250	136	A	H
CH 06		2388.72	55.02	-18.98	74	45.54	27.25	18.42	36.19	100	126	P	V
2437MHz		2389.36	44.53	-9.47	54	35.04	27.26	18.42	36.19	100	126	A	V
	*	2437	102.85	-	-	93.11	27.45	18.5	36.21	100	126	P	V
	*	2437	96.03	-	-	86.29	27.45	18.5	36.21	100	126	A	V
		2483.6	61.8	-12.2	74	51.8	27.63	18.59	36.22	100	126	P	V
		2483.52	52.42	-1.58	54	42.42	27.63	18.59	36.22	100	126	A	V

		2388.08	50.94	-23.06	74	41.46	27.25	18.42	36.19	300	135	P	H
		2389.52	39.66	-14.34	54	30.17	27.26	18.42	36.19	300	135	A	H
	*	2452	100.38	-	-	90.55	27.51	18.53	36.21	300	135	P	H
	*	2452	93.6	-	-	83.77	27.51	18.53	36.21	300	135	A	H
802.11n		2484.72	60.96	-13.04	74	50.96	27.64	18.59	36.23	300	135	P	H
HT40		2483.84	51.75	-2.25	54	41.74	27.64	18.59	36.22	300	135	A	H
CH 09		2388.08	49.51	-24.49	74	40.03	27.25	18.42	36.19	100	126	P	V
2452MHz		2390	39.67	-14.33	54	30.18	27.26	18.42	36.19	100	126	A	V
	*	2452	101.88	-	-	92.05	27.51	18.53	36.21	100	126	P	V
	*	2452	94.99	-	-	85.16	27.51	18.53	36.21	100	126	A	V
		2485.04	61.46	-12.54	74	51.46	27.64	18.59	36.23	100	126	P	V
		2483.52	52.19	-1.81	54	42.19	27.63	18.59	36.22	100	126	A	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 HT40 (Harmonic @ 3m)

WIFI Ant. 4	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)
		4844	41.46	-32.54	74	33.91	32.26	12.74	37.45	-	-	P	H
		7266	46.02	-27.98	74	32.19	36.8	15.35	38.32	-	-	P	H
													H
													H
802.11n													H
HT40													H
CH 03		4844	44.42	-29.58	74	36.87	32.26	12.74	37.45	-	-	P	V
2422MHz		7266	45.92	-28.08	74	32.09	36.8	15.35	38.32	-	-	P	V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4874	42.93	-31.07	74	35.34	32.3	12.77	37.48	-	-	P	H
		7311	46.44	-27.56	74	32.65	36.76	15.38	38.35	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 06		4874	44.29	-29.71	74	36.7	32.3	12.77	37.48	-	-	P	V
2437MHz		7311	46.89	-27.11	74	33.1	36.76	15.38	38.35	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 4	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)
		4904	42.49	-31.51	74	34.88	32.33	12.78	37.5	-	-	P	H
		7356	47.16	-26.84	74	33.54	36.58	15.43	38.39	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 09		4904	45.07	-28.93	74	37.46	32.33	12.78	37.5	-	-	P	V
2452MHz		7356	46.42	-27.58	74	32.8	36.58	15.43	38.39	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		30	22.64	-17.36	40	33.28	24.13	0.95	35.72	-	-	P	H
		136.7	22.49	-21.01	43.5	38.35	17.68	2.05	35.59	-	-	P	H
		158.04	23.98	-19.52	43.5	40.59	16.75	2.19	35.55	-	-	P	H
		872.93	33.47	-12.53	46	32.45	29.1	5.37	33.45	-	-	P	H
		937.92	34.2	-11.8	46	31.73	30.09	5.58	33.2	-	-	P	H
		958.29	34.66	-11.34	46	31.06	31.08	5.64	33.12	-	-	P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT20		31.94	24.85	-15.15	40	36.08	23.51	0.98	35.72	-	-	P	V
LF		99.84	22.83	-20.67	43.5	40.61	16.13	1.74	35.65	-	-	P	V
		147.37	18.75	-24.75	43.5	34.61	17.59	2.12	35.57	-	-	P	V
		856.44	32.38	-13.62	46	31.42	29.17	5.3	33.51	-	-	P	V
		900.09	37.52	-8.48	46	36.28	29.1	5.49	33.35	-	-	P	V
		948.59	34.65	-11.35	46	31.53	30.67	5.61	33.16	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

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.	
1		(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

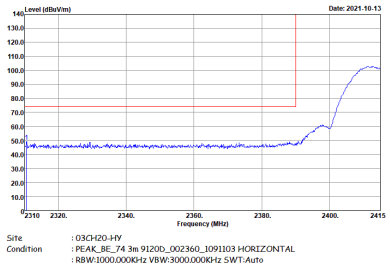
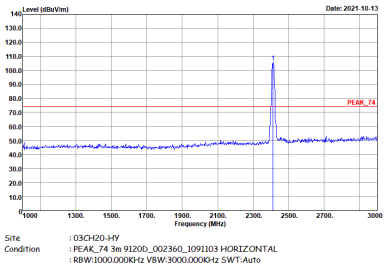
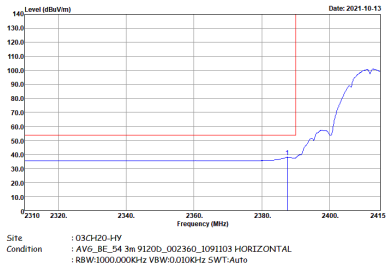
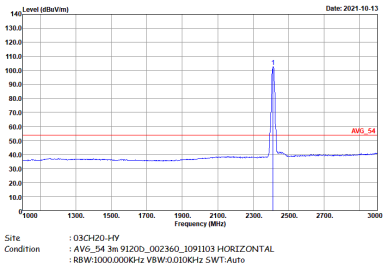
Test Engineer :	Troye Hsieh and JC Liang	**Temperature :**	20.0~21.5°C
		Relative Humidity :	60.3~66.1%

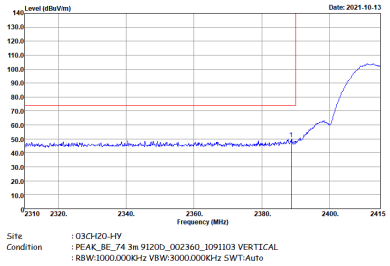
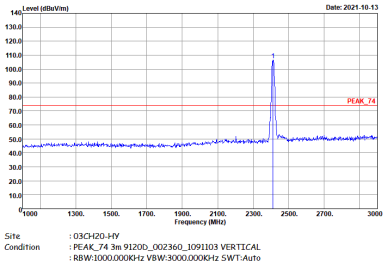
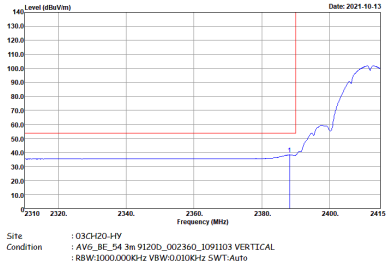
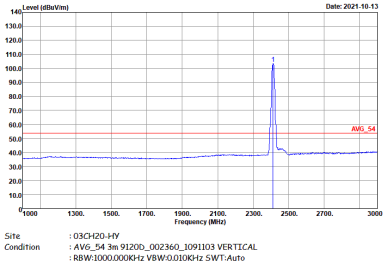
Note symbol

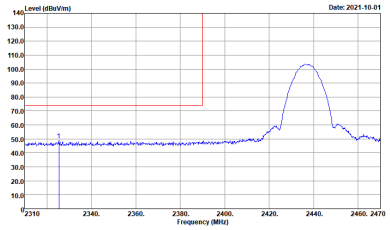
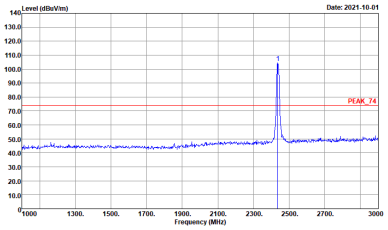
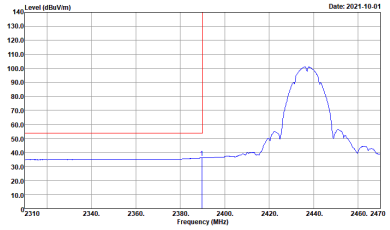
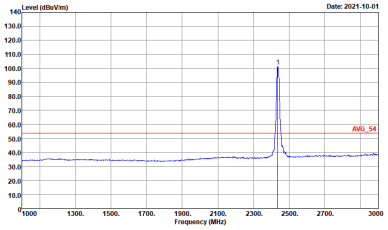
-L	**Low channel location**
-R	**High channel location**

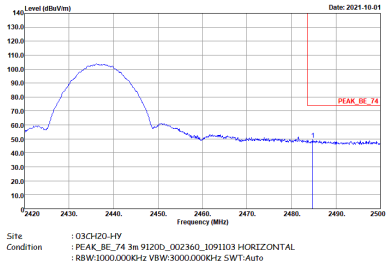
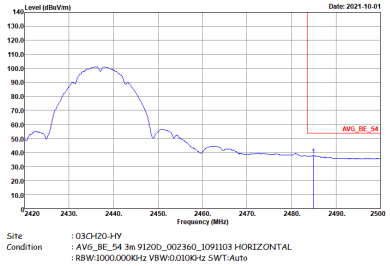
2.4GHz 2400~2483.5MHz

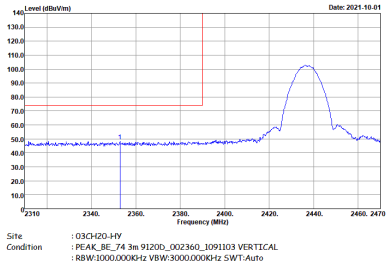
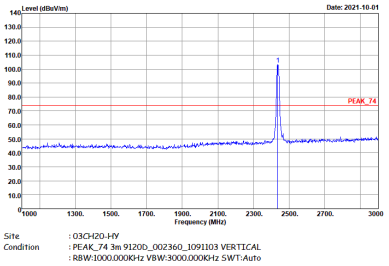
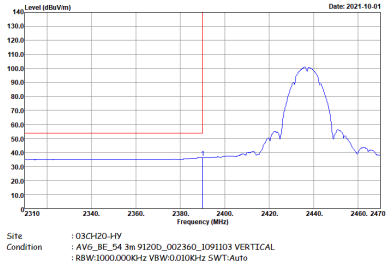
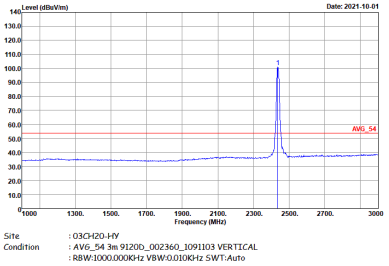
WIFI 802.11b (Band Edge @ 3m)

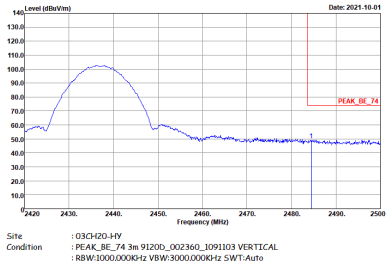
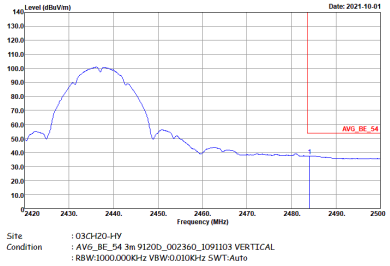
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
4	Horizontal	Fundamental
Peak		
Avg.		

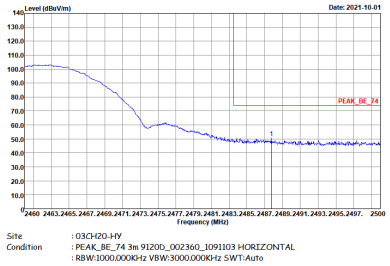
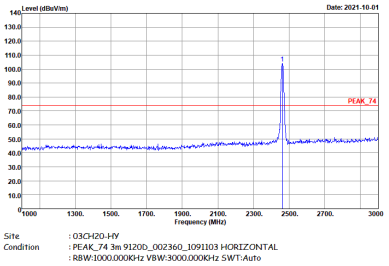
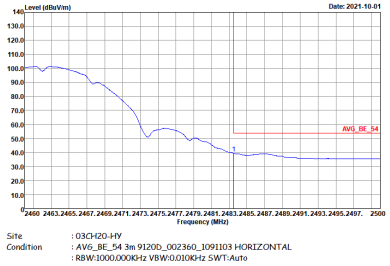
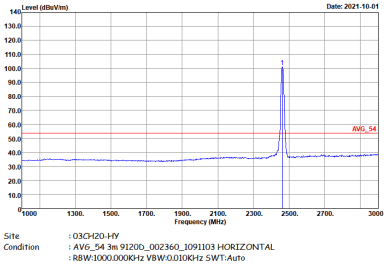
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
4	Vertical	Fundamental
Peak		
Avg.		

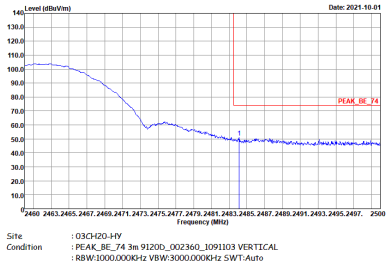
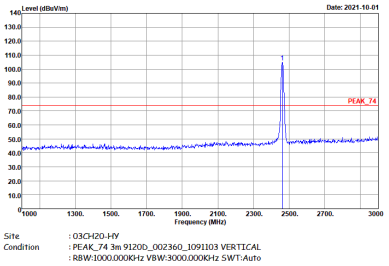
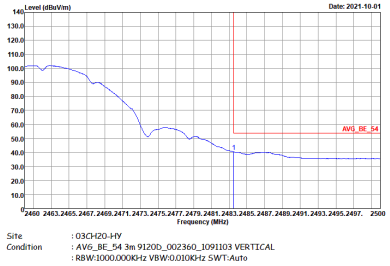
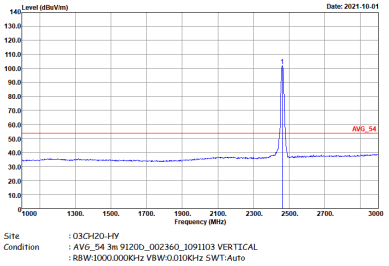
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
4	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_8E_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_8E_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

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

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

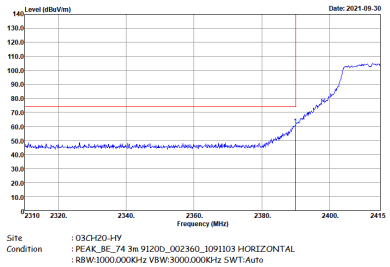
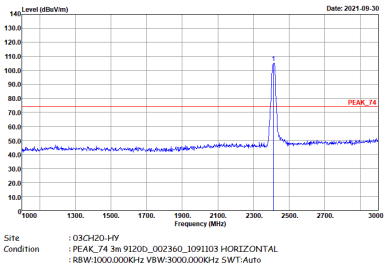
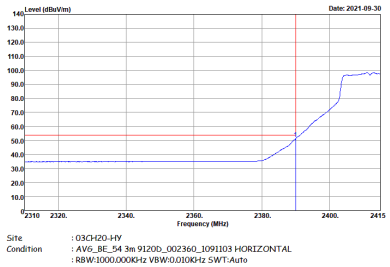
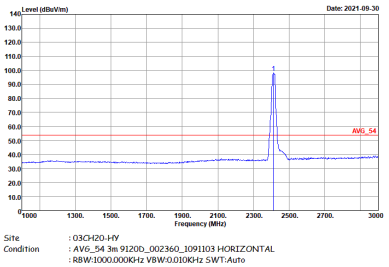
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
4	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

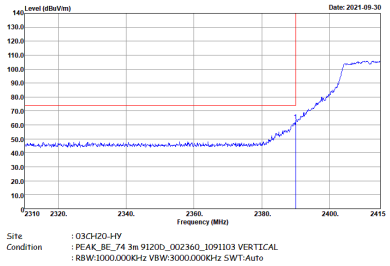
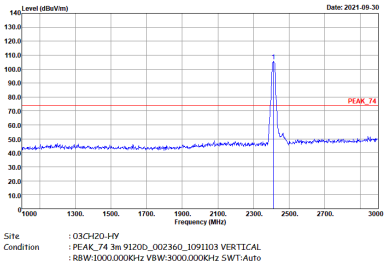
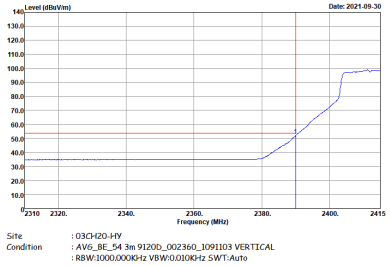
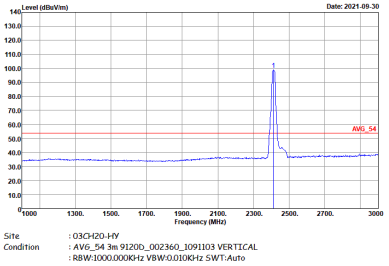
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
4	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

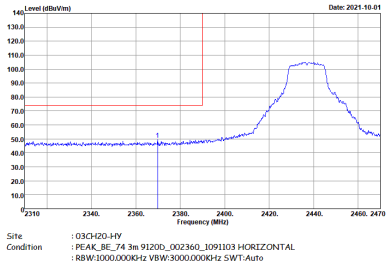
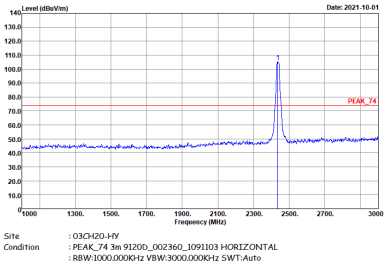
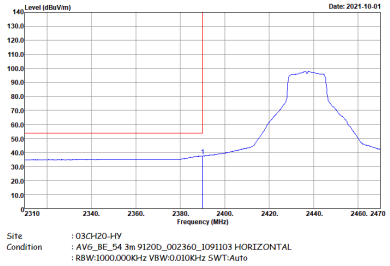
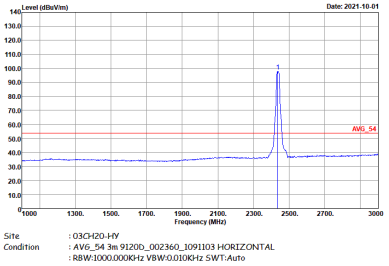
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
4	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

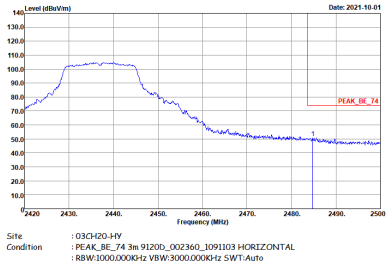
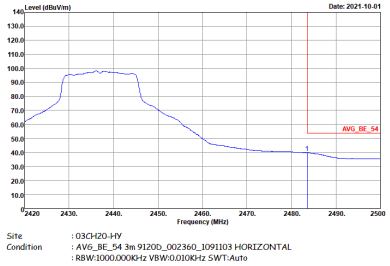
2.4GHz 2400~2483.5MHz

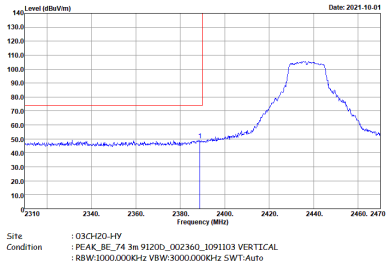
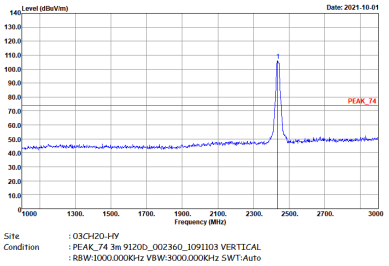
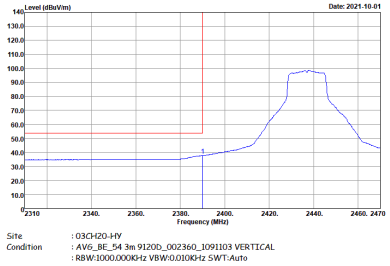
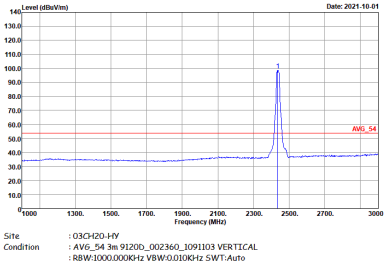
WIFI 802.11g (Band Edge @ 3m)

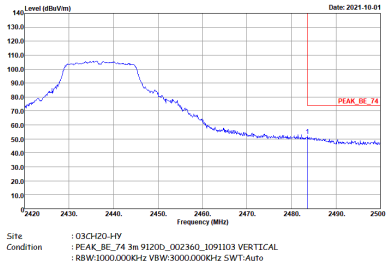
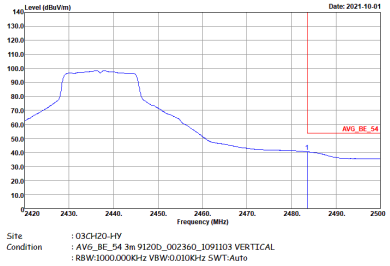
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
4	Horizontal	Fundamental
Peak		
Avg.		

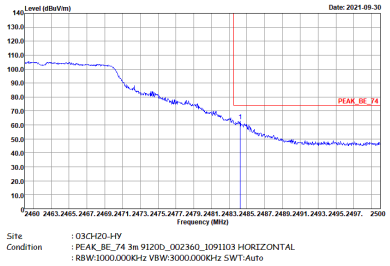
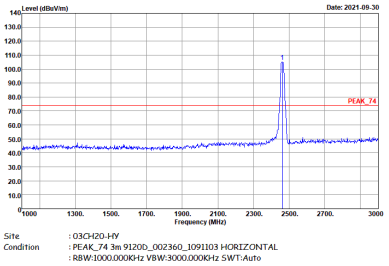
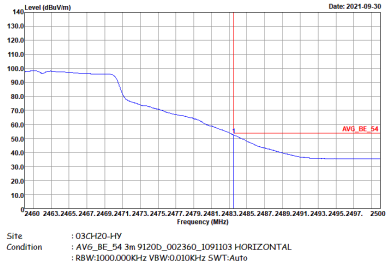
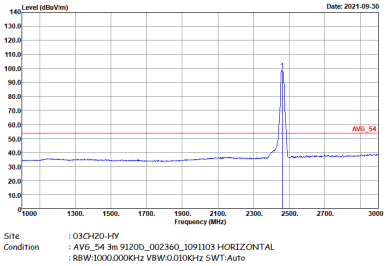
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
4	Vertical	Fundamental
Peak		
Avg.		

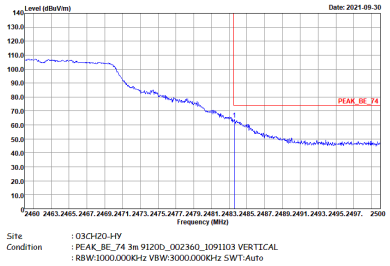
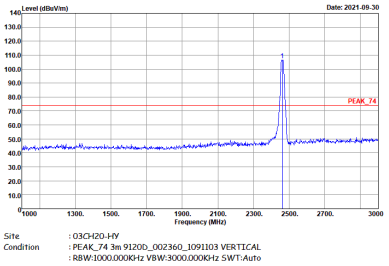
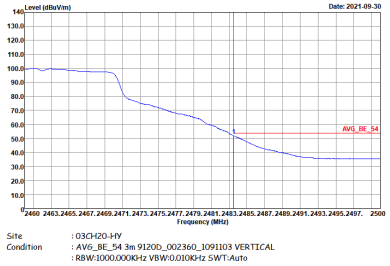
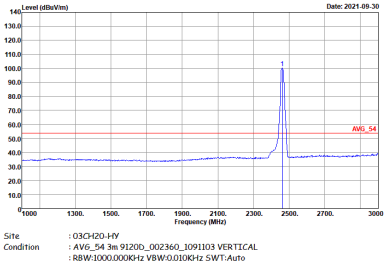
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
4	Horizontal	Fundamental
Peak		
Avg.		

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

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

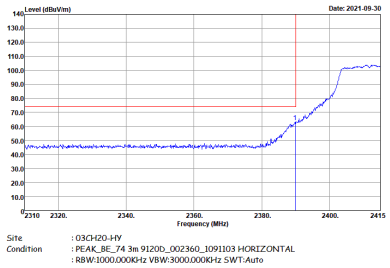
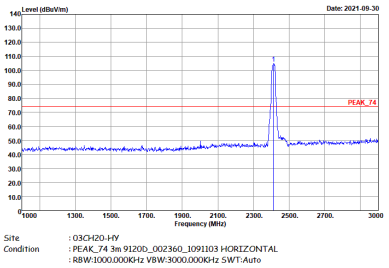
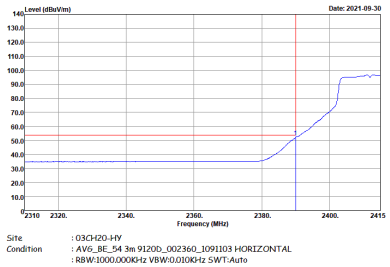
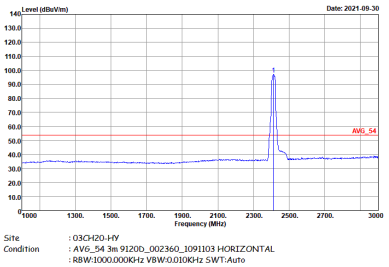
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
4	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

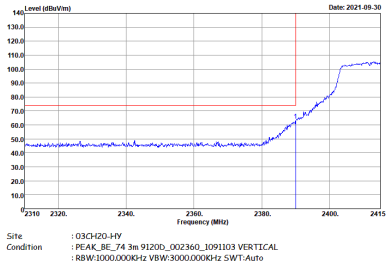
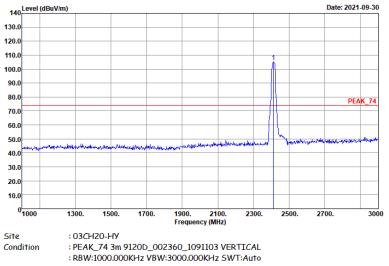
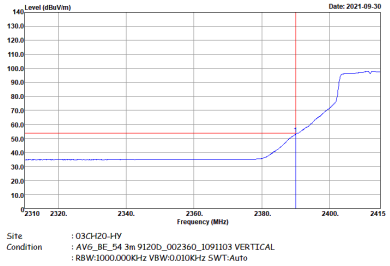
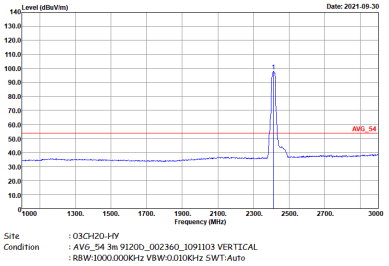
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
4	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

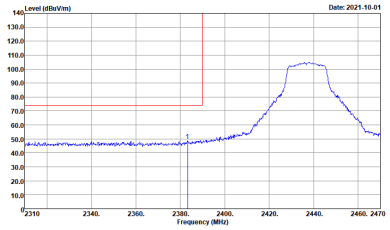
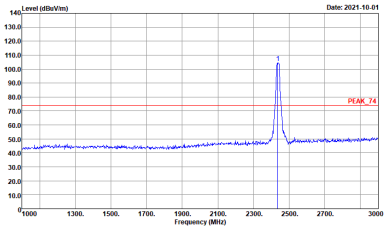
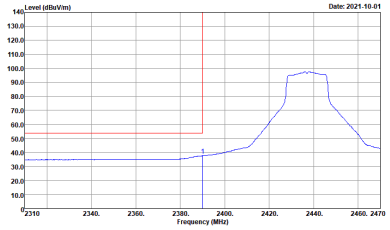
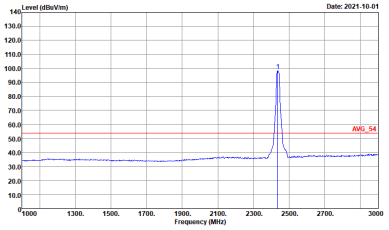
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
4	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

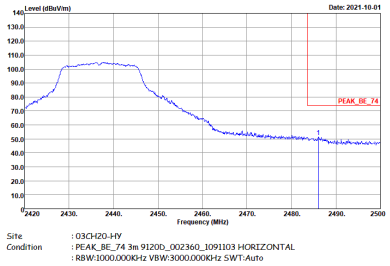
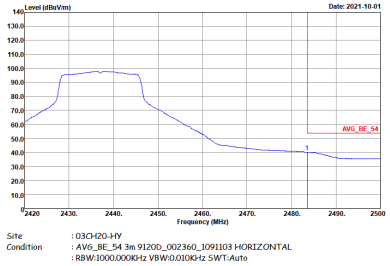
2.4GHz 2400~2483.5MHz

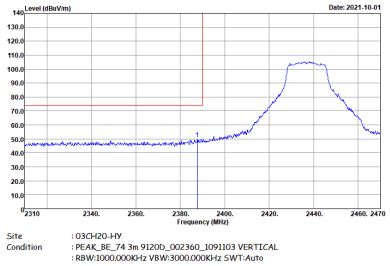
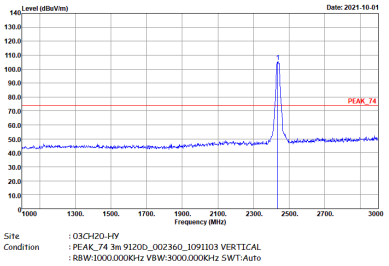
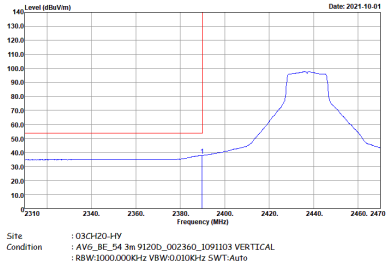
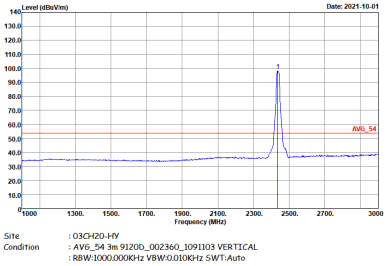
WIFI 802.11n HT20 (Band Edge @ 3m)

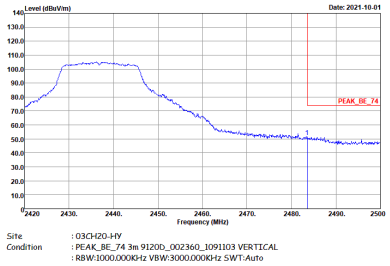
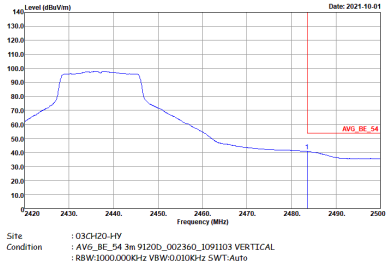
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
4	Horizontal	Fundamental
Peak		
Avg.		

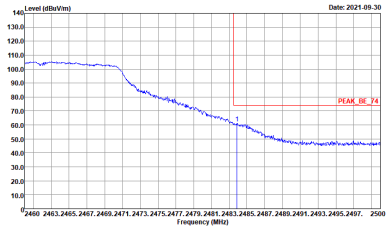
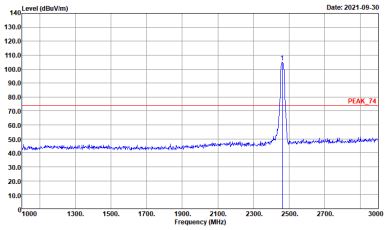
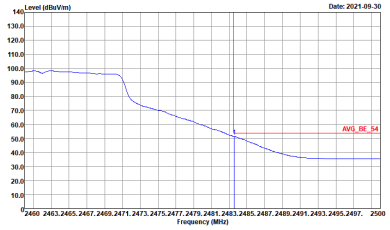
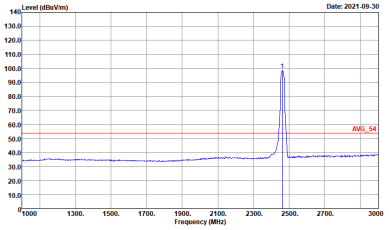
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
4	Vertical	Fundamental
Peak		
Avg.		

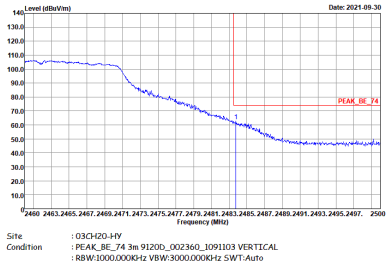
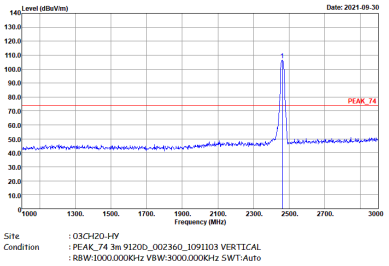
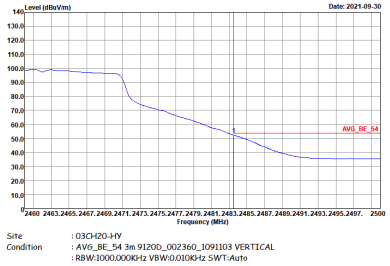
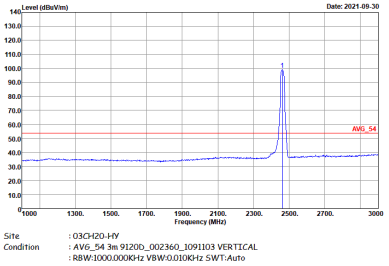
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
4	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_8E_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_8E_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

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

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

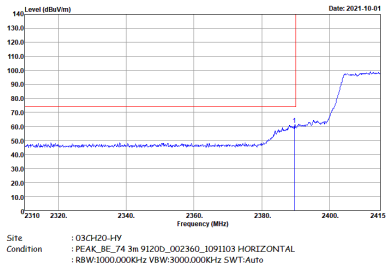
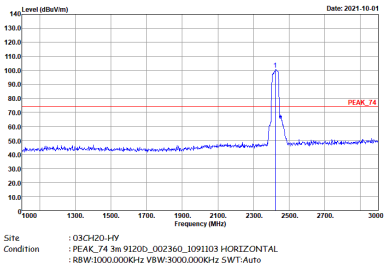
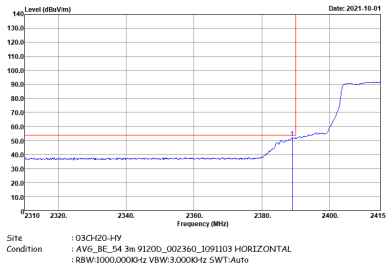
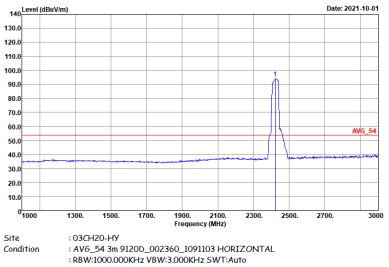
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
4	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

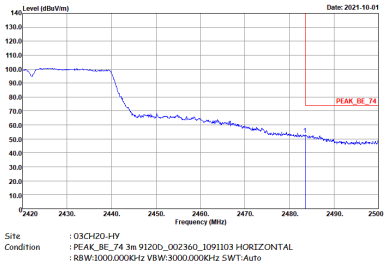
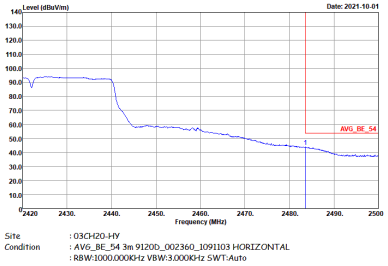
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
4	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

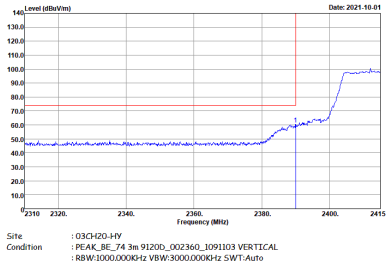
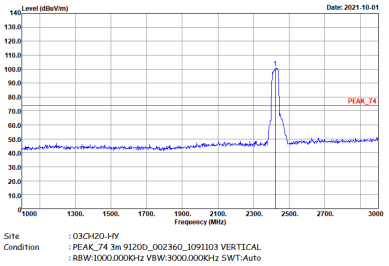
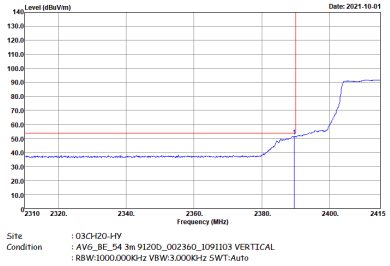
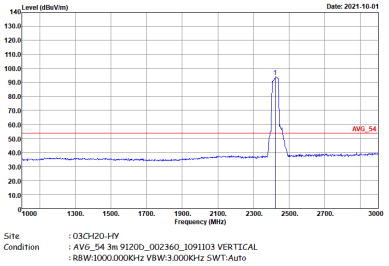
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
4	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

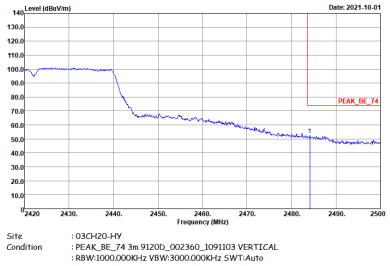
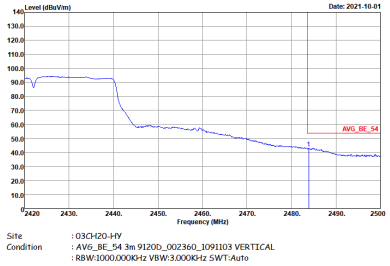
2.4GHz 2400~2483.5MHz

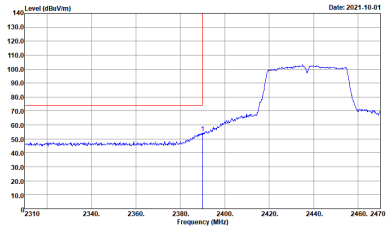
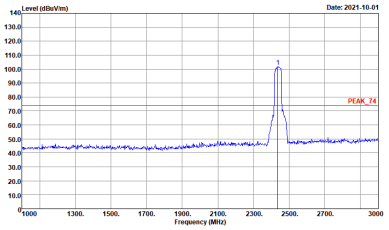
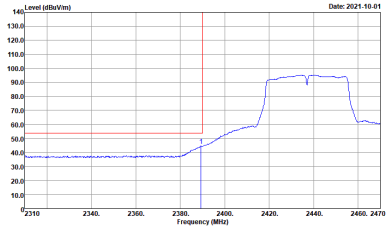
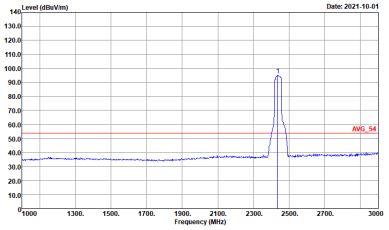
WIFI 802.11n HT40 (Band Edge @ 3m)

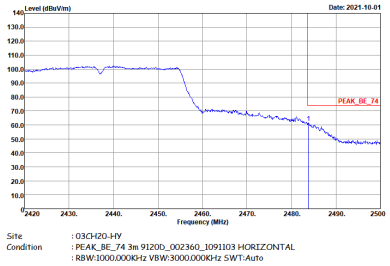
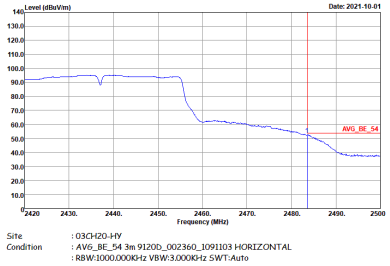
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
4	Horizontal	Fundamental
Peak		
Avg.		

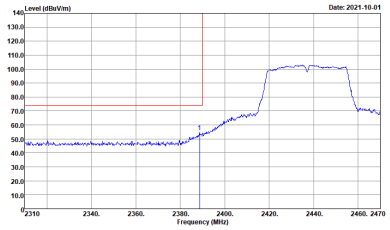
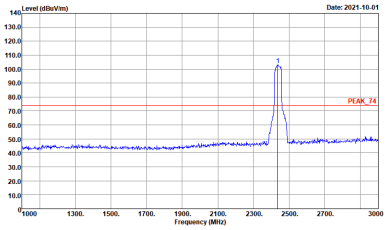
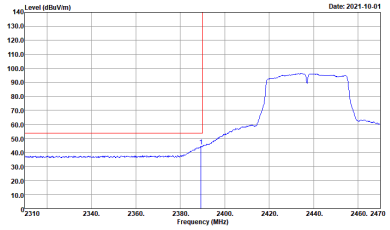
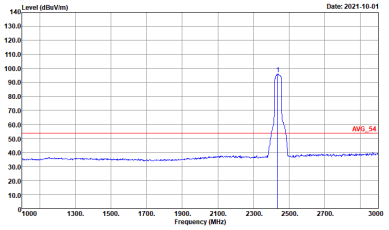
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
4	Horizontal	Fundamental
Peak		Left Blank
Avg.		Left Blank

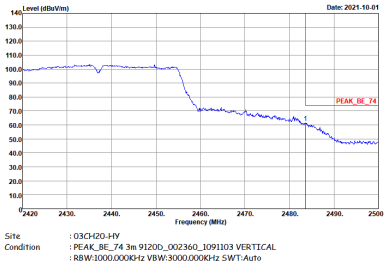
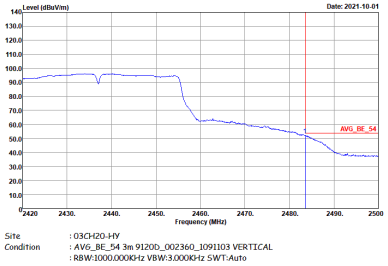
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
4	Vertical	Fundamental
Peak		
Avg.		

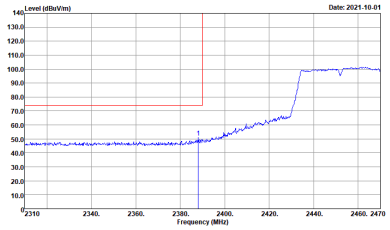
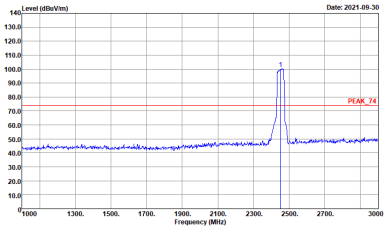
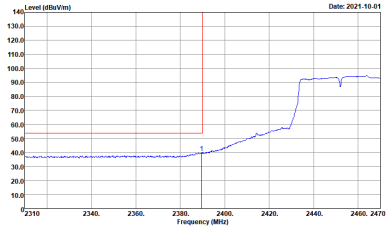
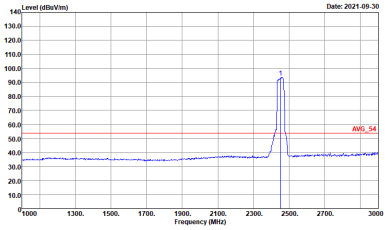
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
4	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

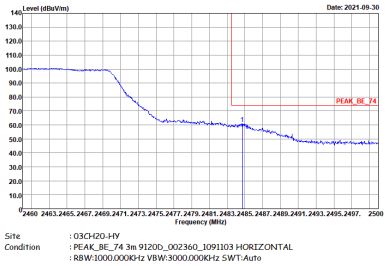
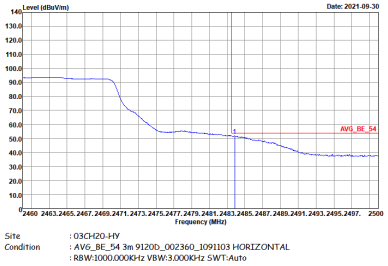
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
4	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_8E_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_8E_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto

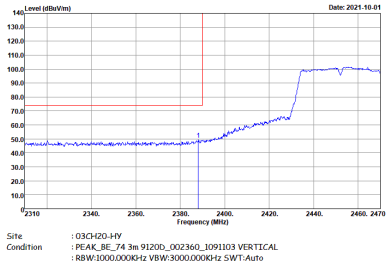
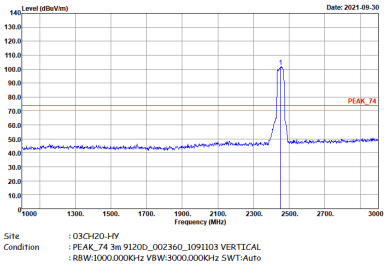
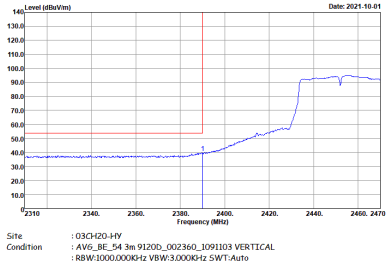
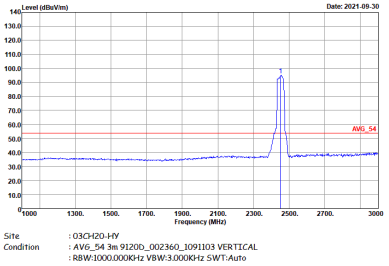
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
4	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

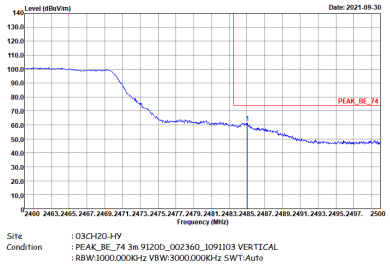
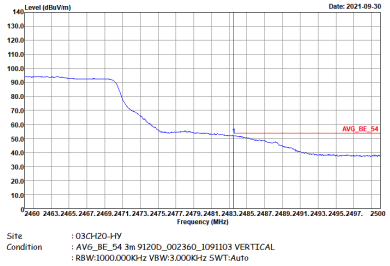
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
4	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_002360_1091103 VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
4	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
4	Horizontal	Fundamental
Peak		
Avg.		

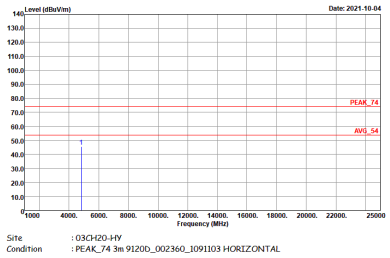
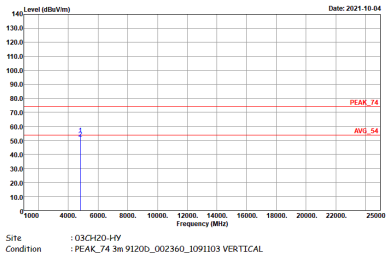
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
4	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

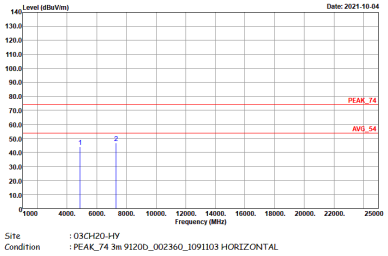
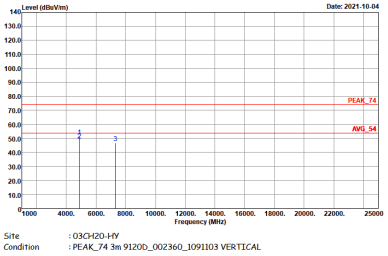
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
4	Vertical	Fundamental
Peak		
Avg.		

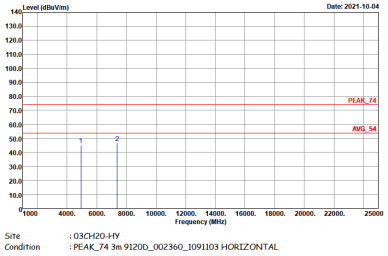
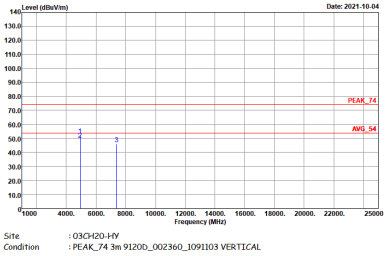
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
4	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

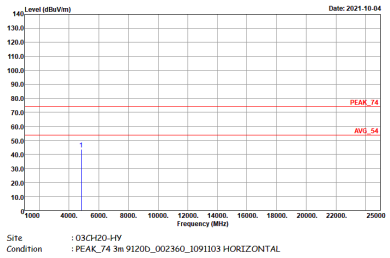
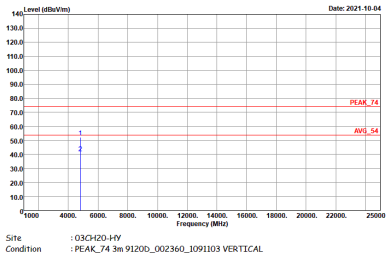
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
4	Horizontal	Vertical
Peak Avg.		

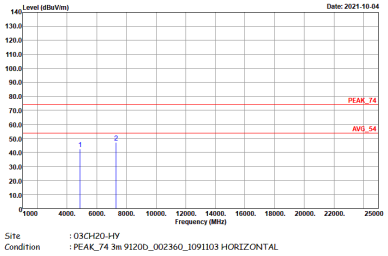
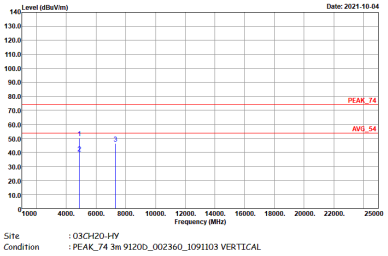
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
4	Horizontal	Vertical
Peak Avg.		

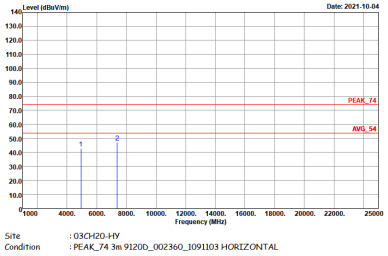
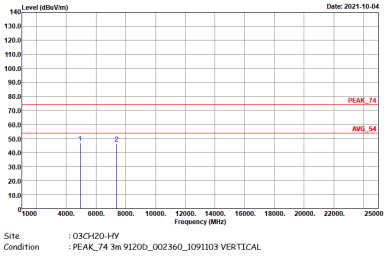
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
4	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

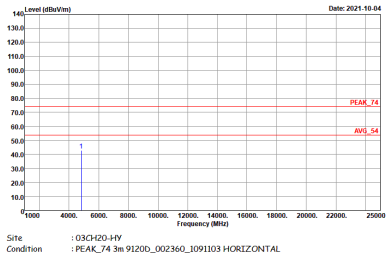
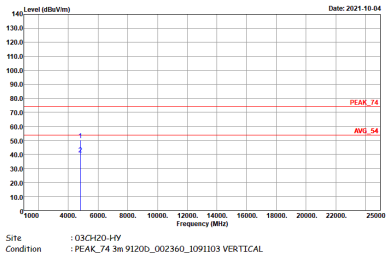
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
4	Horizontal	Vertical
Peak Avg.		

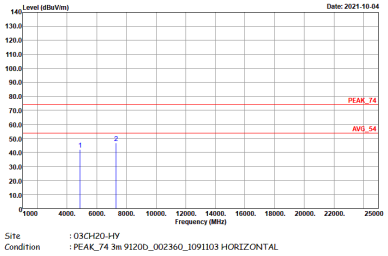
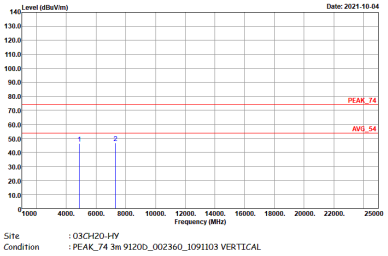
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
4	Horizontal	Vertical
Peak Avg.		

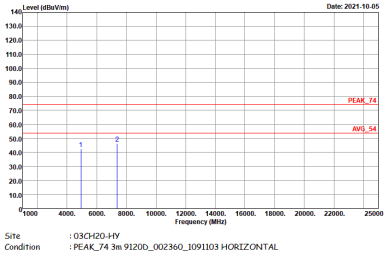
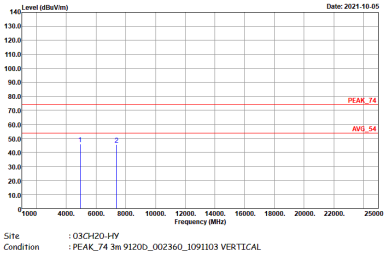
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
4	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

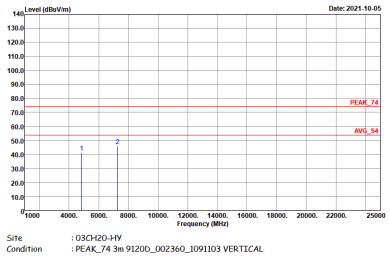
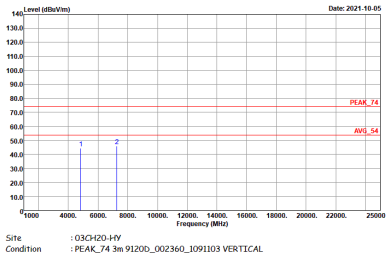
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
4	Horizontal	Vertical
Peak Avg.		

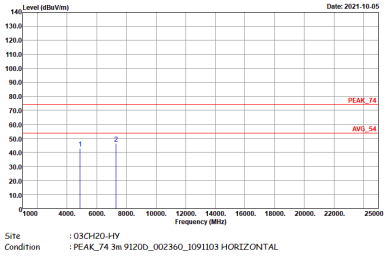
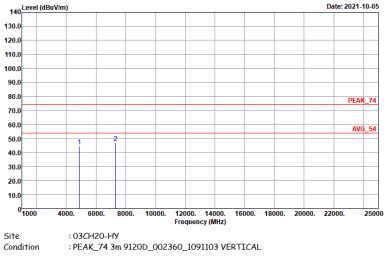
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
4	Horizontal	Vertical
Peak Avg.		

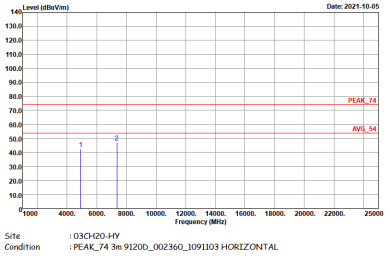
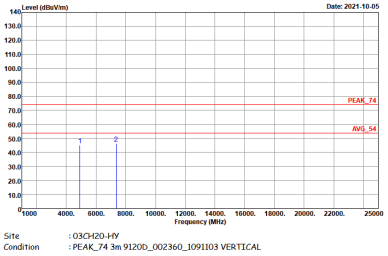
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
4	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

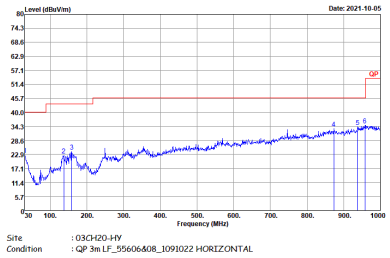
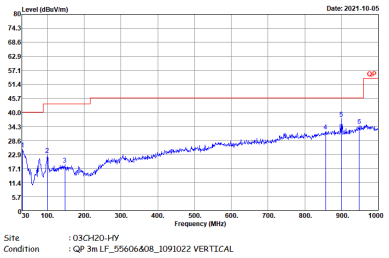
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH03 2422MHz	
4	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH06 2437MHz	
4	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH09 2452MHz	
4	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

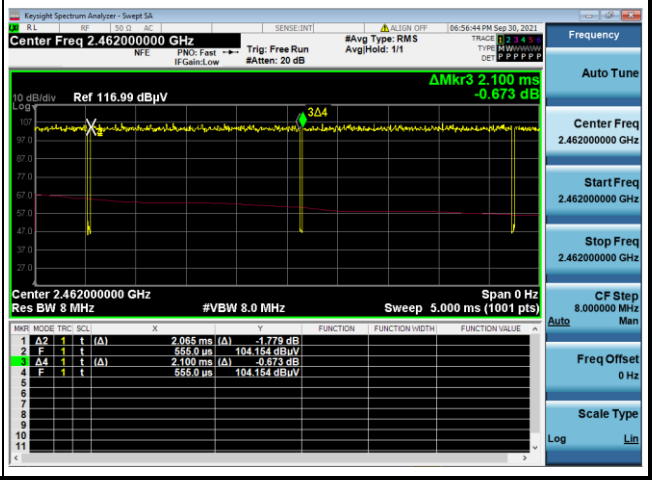
WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
4	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

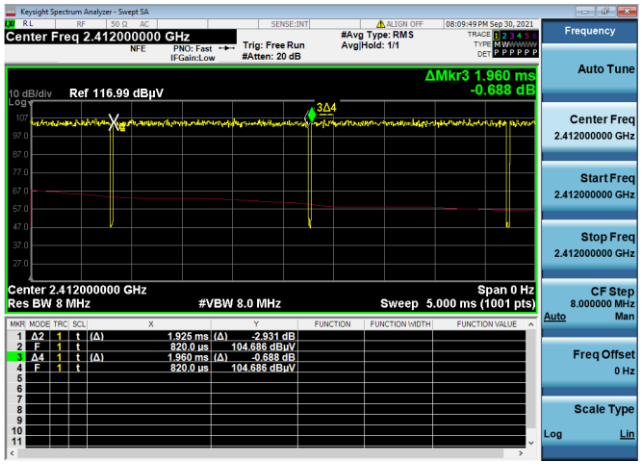
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	99.28	-	-	10Hz
802.11g	98.33	-	-	10Hz
2.4GHz 802.11n HT20	98.21	-	-	10Hz
2.4GHz 802.11n HT40	94.53	950	1.05	3kHz

802.11b

802.11g



802.11n HT20



802.11n HT40