FCC RADIO TEST REPORT

FCC ID	:	**HD5-CT30PL1N**
Equipment	:	**Mobile computer**
Brand Name	:	**Honeywell**
Model Name	:	**CT30PL1N**
Applicant	:	**Honeywell International Inc. 9680 Old Bailes Road, Fort Mill, SC 29707 USA**
Manufacturer	:	**Honeywell International Inc. 9680 Old Bailes Road, Fort Mill, SC 29707 USA**
Standard	:	**FCC Part 15 Subpart C §15.247**

The product was received on Feb. 14, 2022 and testing was performed from Feb. 22, 2022 to Apr. 14, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Table of Contents

History of this test report

Report No.	Version	Description	Issue Date
FR1N0508C	01	Initial issue of report	Apr. 20, 2022
FR1N0508C	02	1. Revise Appendix C and D 2. Revise description in section 3.5.3	Apr. 28, 2022

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	2.22 dB under the limit at 2483.500 MHz
3.6	15.207	AC Conducted Emission	Pass	11.97 dB under the limit at 0.173 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
   It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Wei Chen

Report Producer: Clio Lo

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 Feature	
HW version	v1.0
SW version	OS.11.003-HON.11.003
Sample	Scanner S0703
Antenna Type	WWAN <Ant. 1>: Loop Antenna <Ant. 2>: PIFA Antenna <Ant. 3>: Monopole Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS / Glonass / BDS / Galileo: PIFA Antenna NFC: Loop Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	2.5

Remark:

1. The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.
2. Internal tracking board version is DVT1 and SW PN is 311.C0.00.0838-G-DEBUG.

1.2 Modification of EUT

No modifications made to the EUT during the testing.

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.**
	CO05-HY (TAF Code: 1190)
Remark	The Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory

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.**
	TH05-HY, 03CH13-HY

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 declared by 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 the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). 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 with Accessory 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

The final test modes consider the modulation and the worst data rates as shown in the table below.

Single Antenna

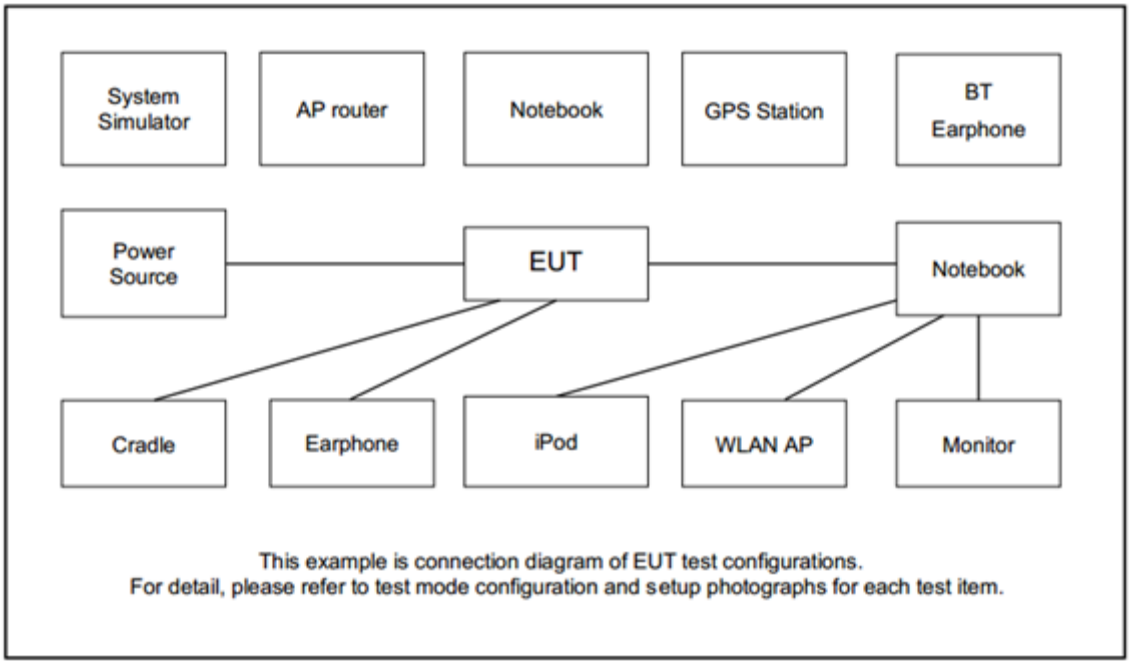
Modulation	Data Rate
802.11b	**1 Mbps**
802.11g	**6 Mbps**
802.11n HT20	**MCS0**
802.11n HT40	**MCS0**
802.11ac VHT20 (Covered by HT20)	**MCS0**
802.11ac VHT40 (Covered by HT40)	**MCS0**

Test Cases	
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4GHz) Link + 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 modulation and the data rate picked for testing are determined by 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	PY700A2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8m
3.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Notebook	Acer	N18Q13	PD9AX201NG	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	USB Cable	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT 4.0.00193.0” 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.

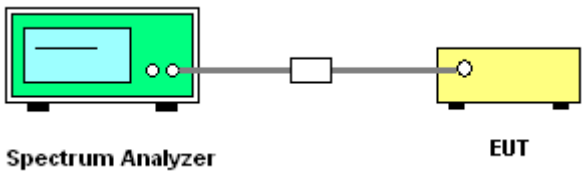
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in 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 is connected to the spectrum analyzer by RF cable and attenuator. The path loss is 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.

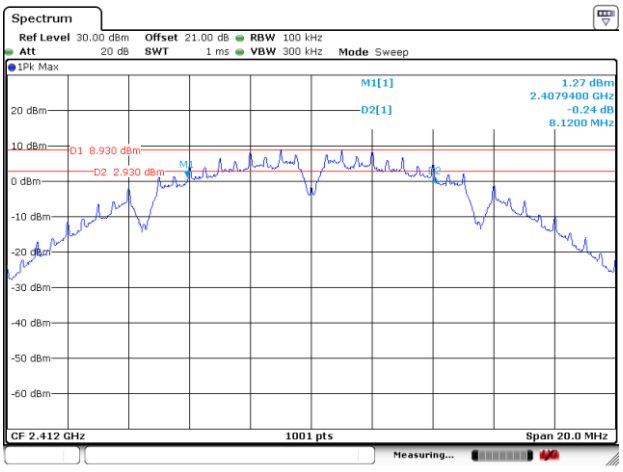
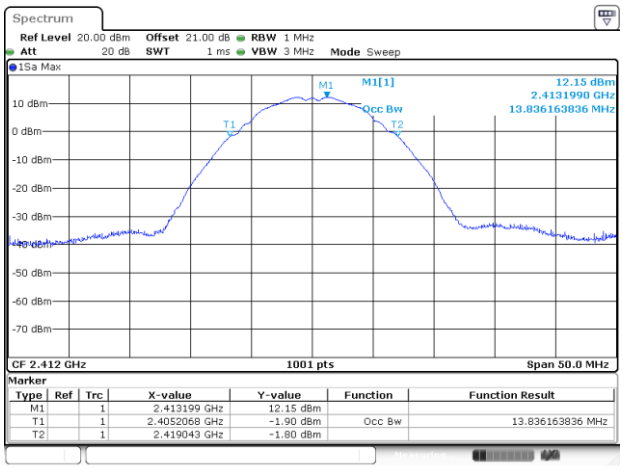
3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

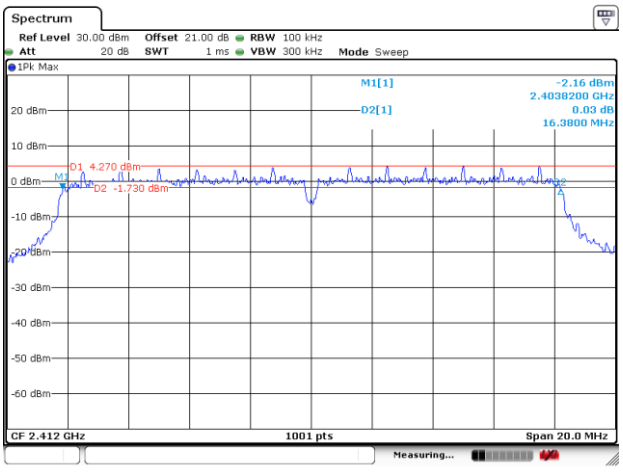
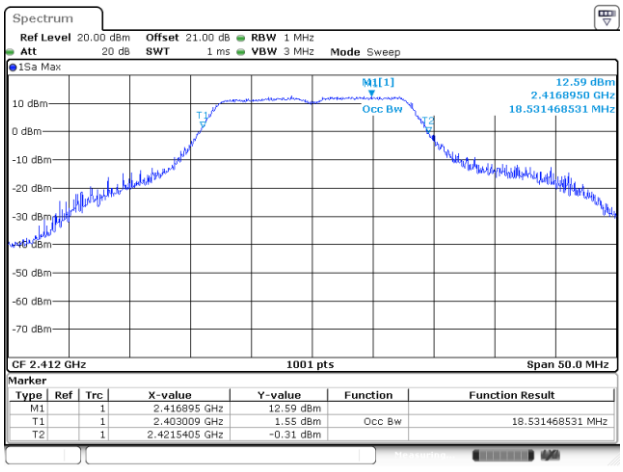
Please refer to Appendix A.

<802.11b>

6dB Bandwidth	99% Occupied Bandwidth
	

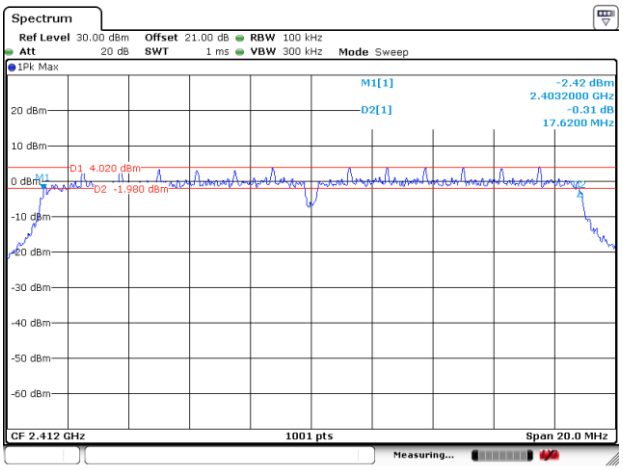
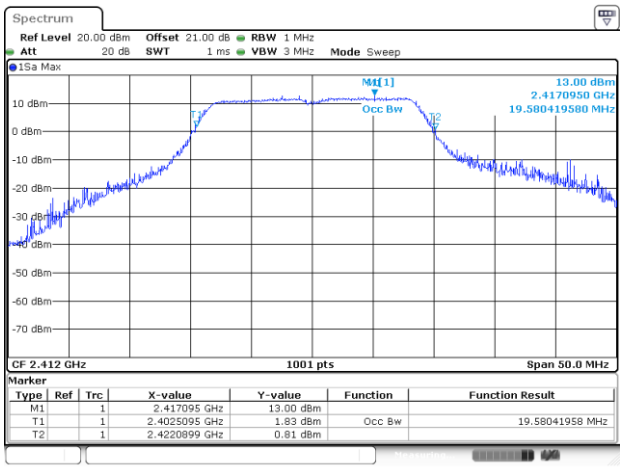
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11g>

6dB Bandwidth	99% Occupied Bandwidth
	

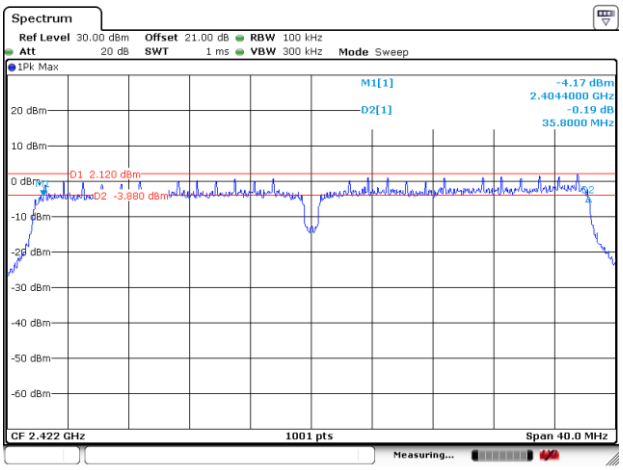
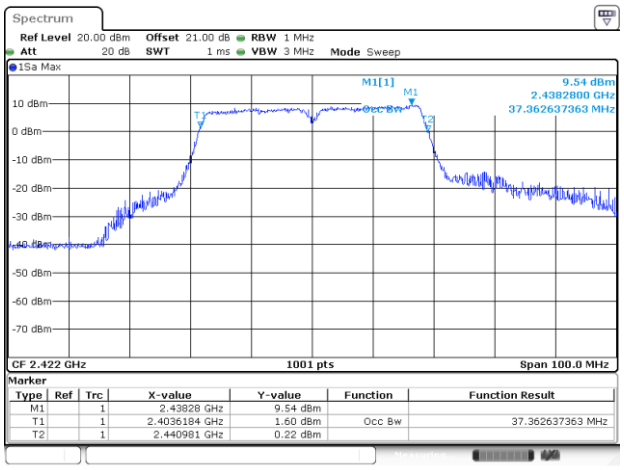
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11n HT20>

6dB Bandwidth	99% Occupied Bandwidth
	

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

<802.11n HT40>

6dB Bandwidth	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.

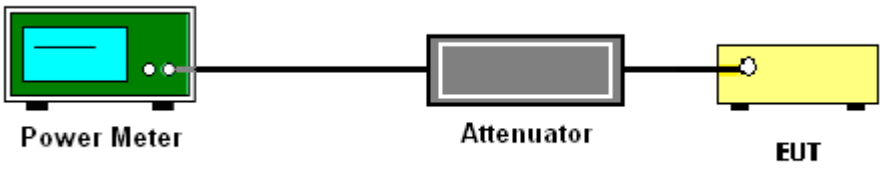
3.2.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.2.3 Test Procedures

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT is connected to the power meter by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

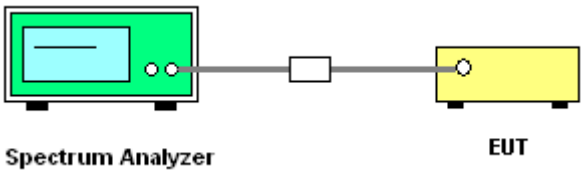
3.3.2 Measuring Instruments

Please refer to the measuring equipment list in 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 is connected to the spectrum analyzer by RF cable and attenuator. The path loss is 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.

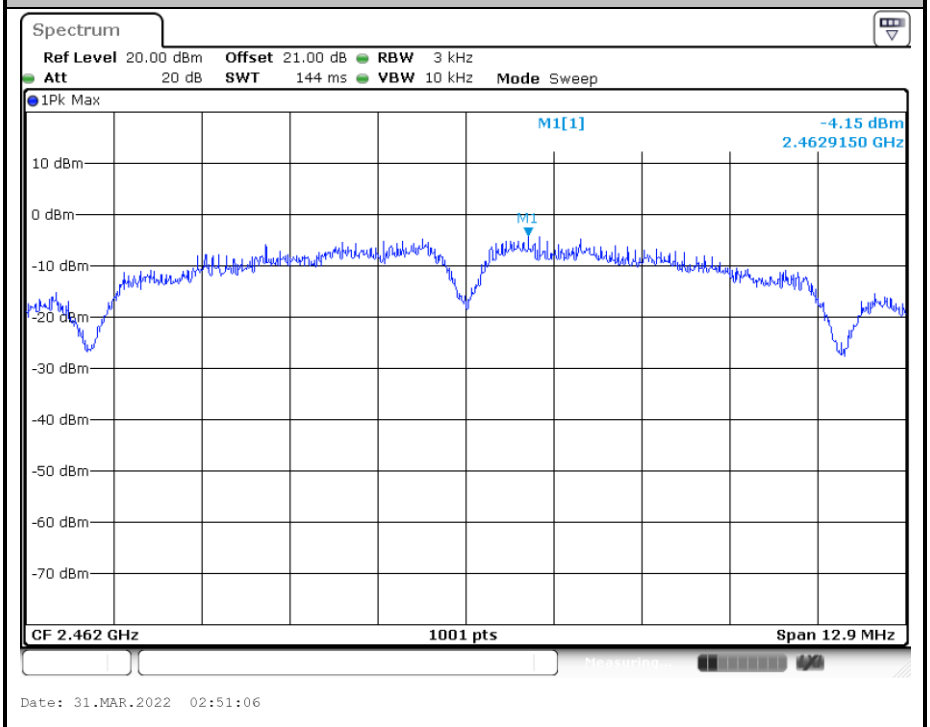
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Maximum Power Density Plot (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.

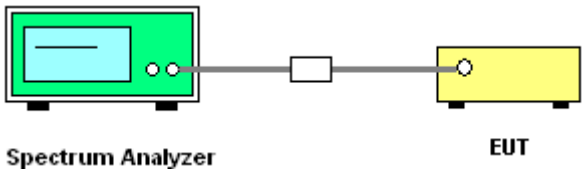
3.4.2 Measuring Instruments

Please refer to the measuring equipment list in 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 is connected to the spectrum analyzer by RF cable and attenuator. The path loss is 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.

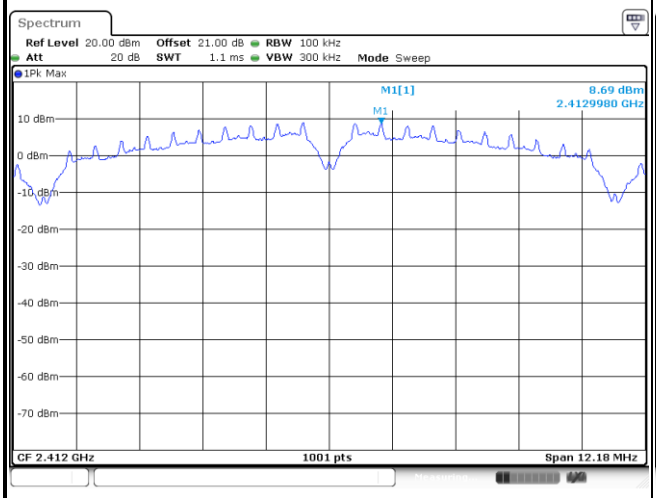
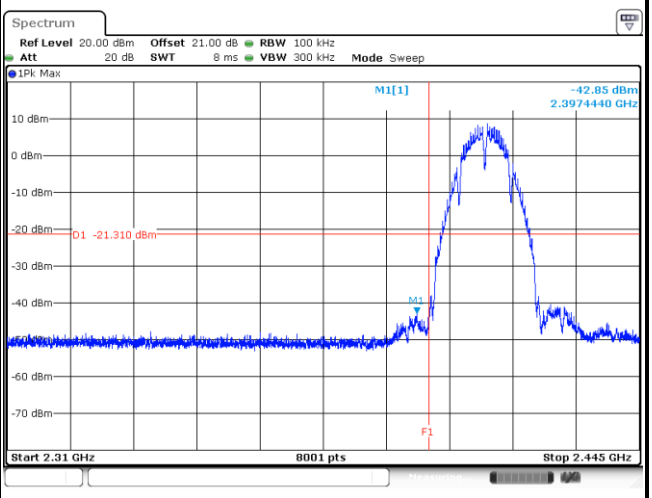
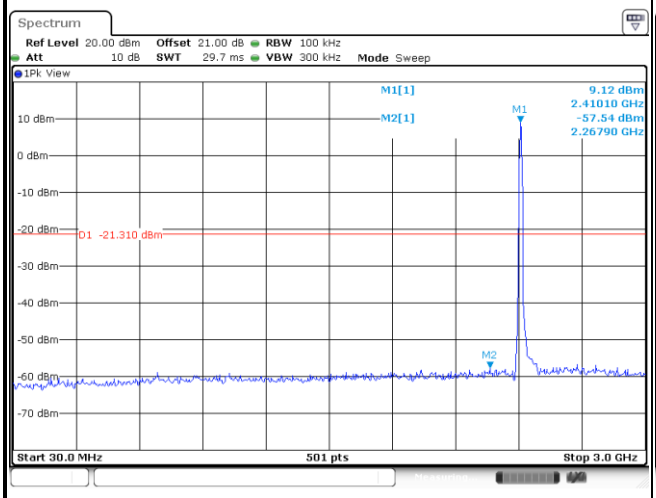
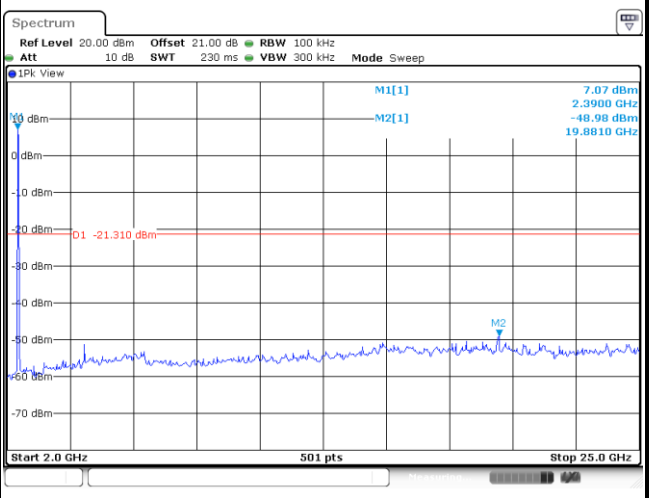
3.4.4 Test Setup



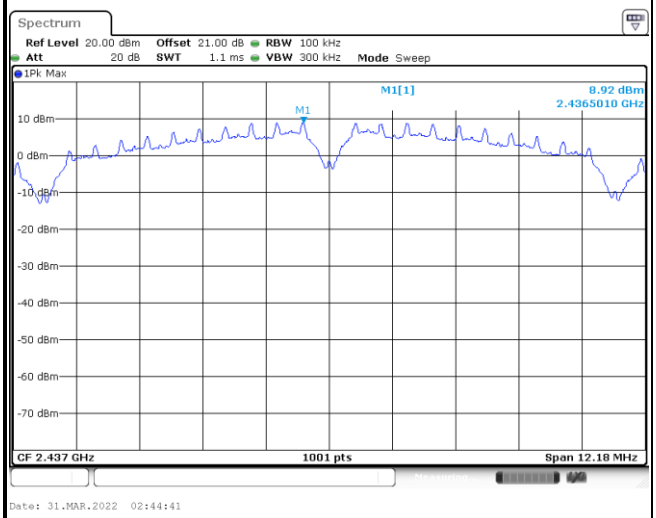
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

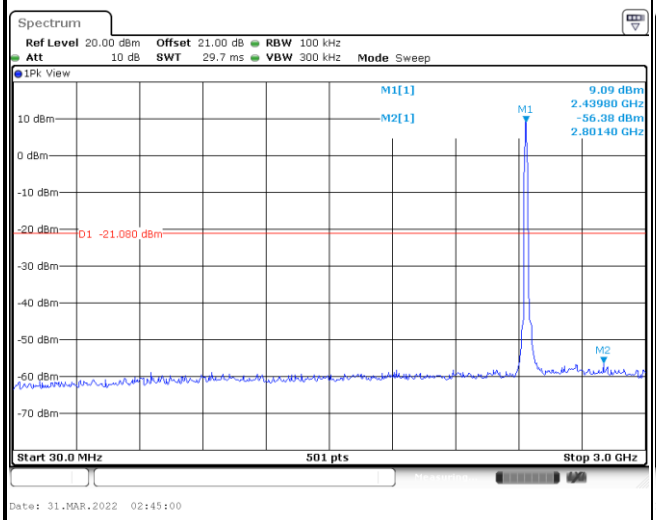
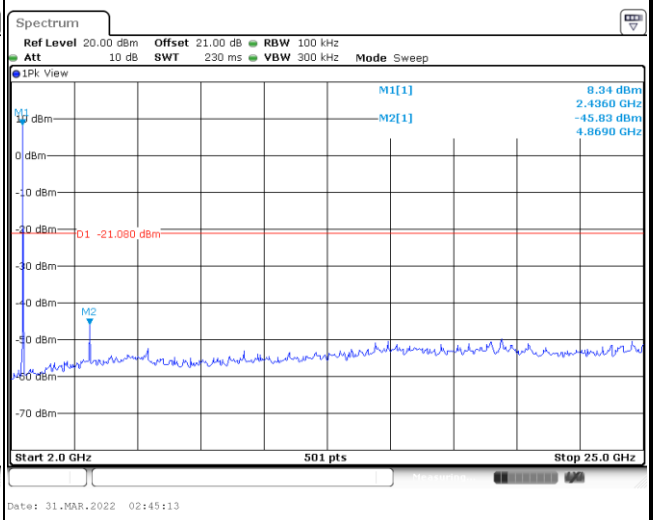
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

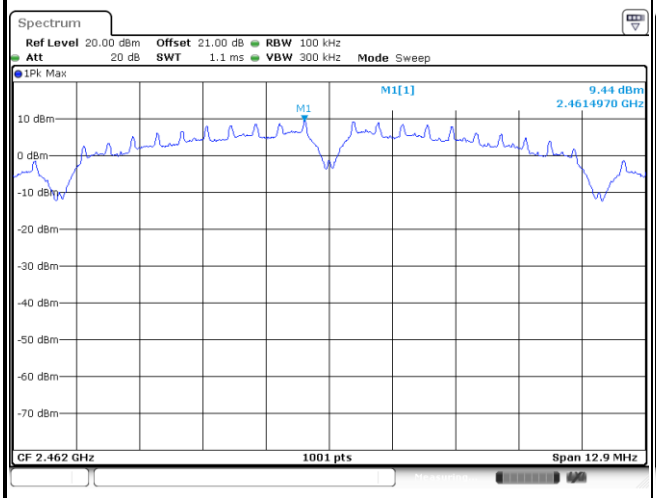
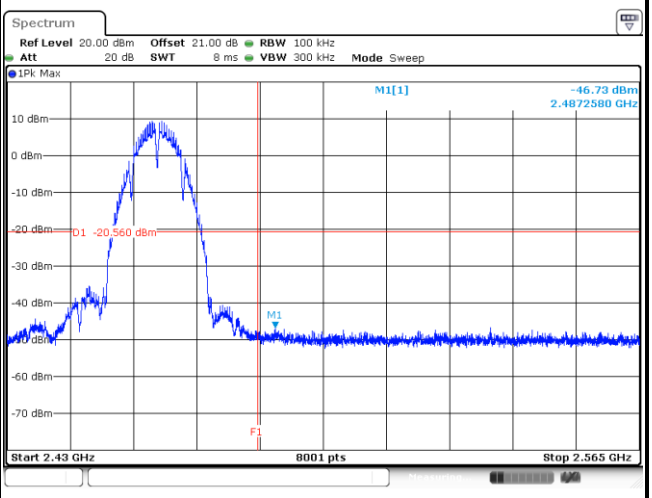
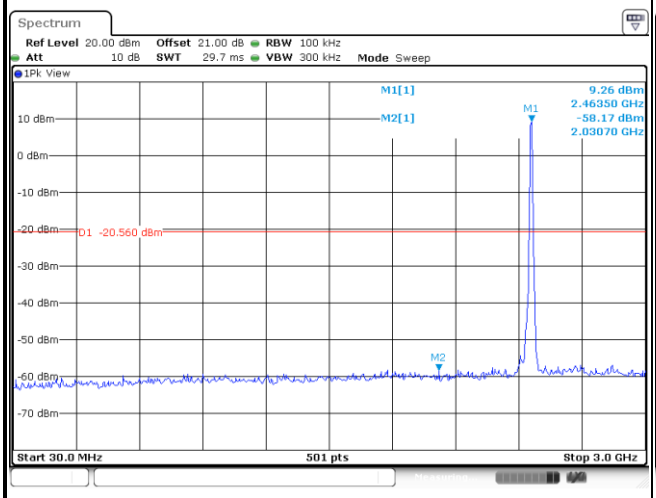
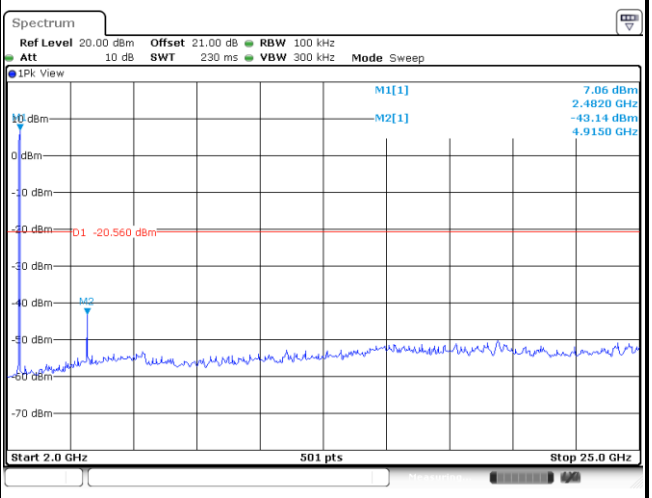
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11b	Test Channel :	06

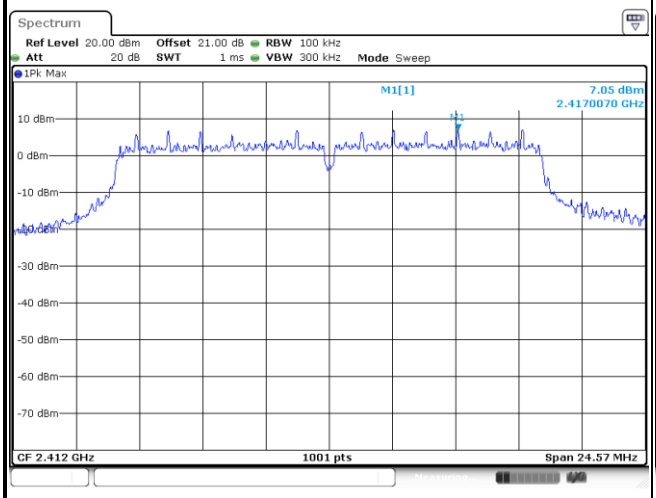
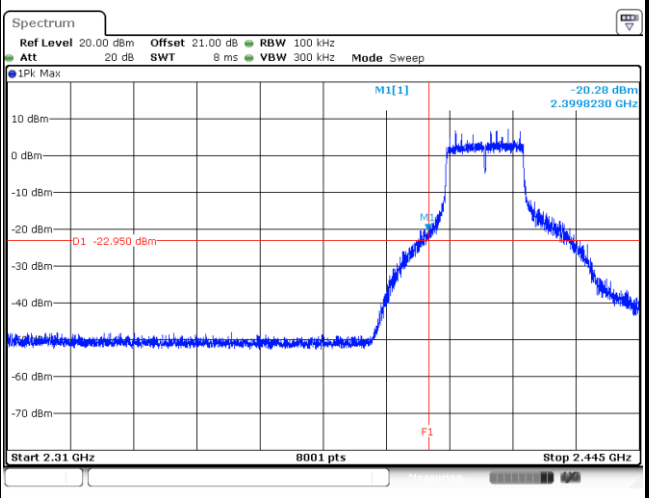
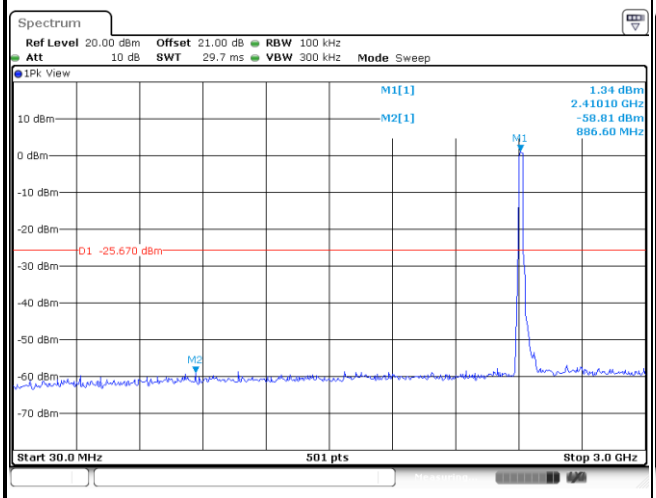
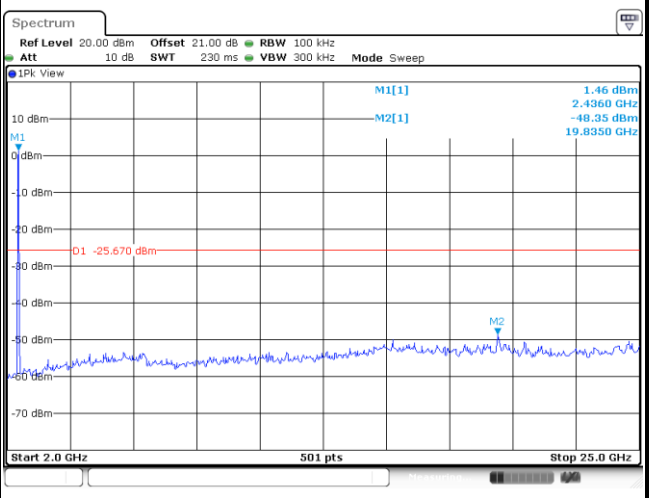
100kHz PSD reference Level	Channel Plot
	

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

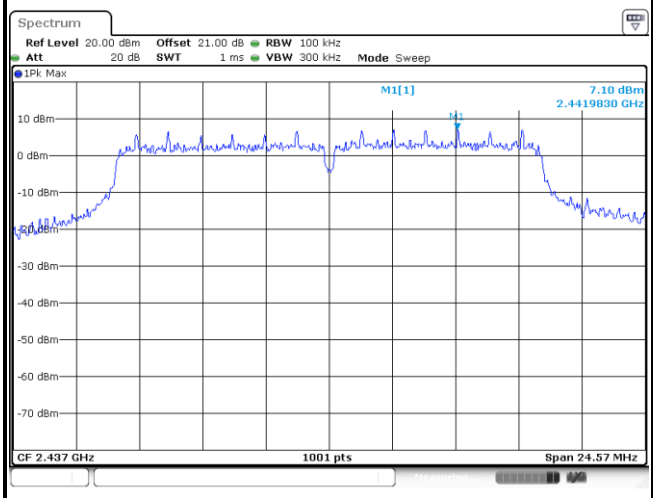
Test Mode :	802.11b	Test Channel :	11

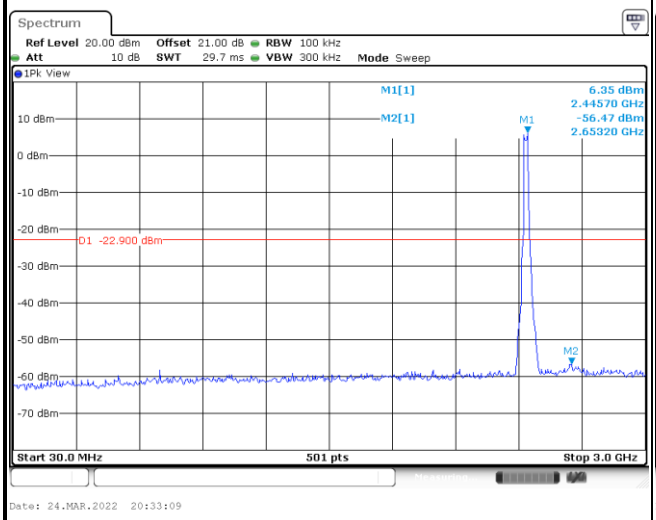
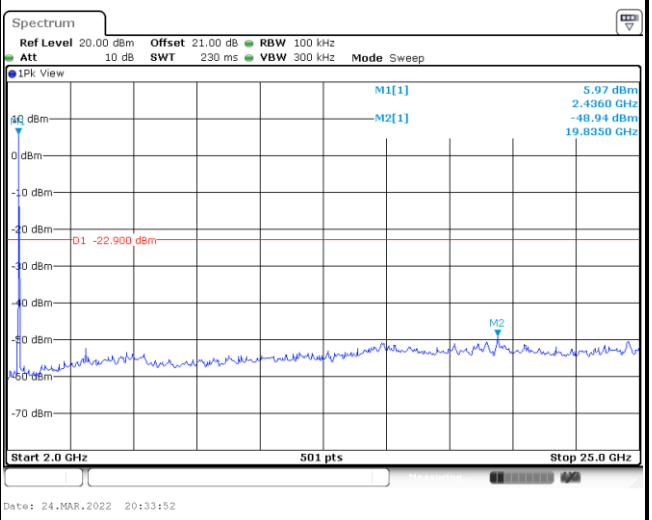
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	01

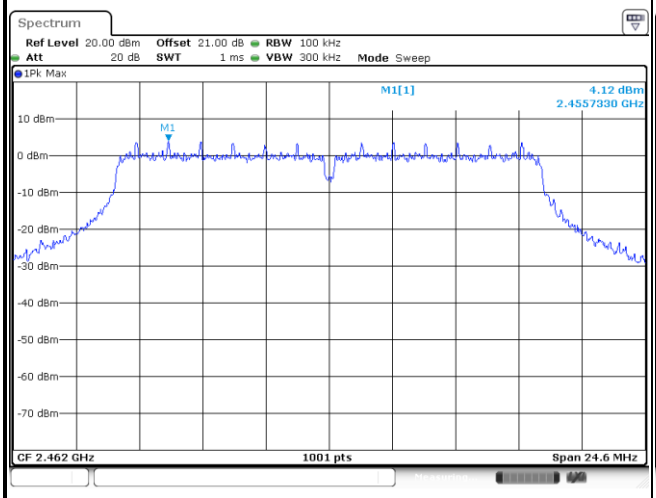
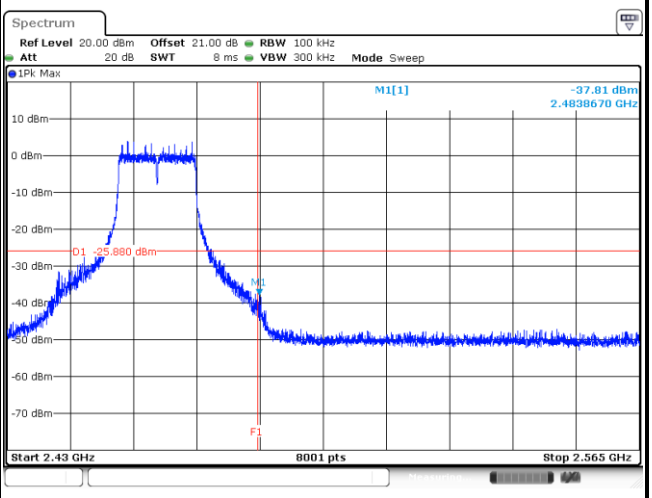
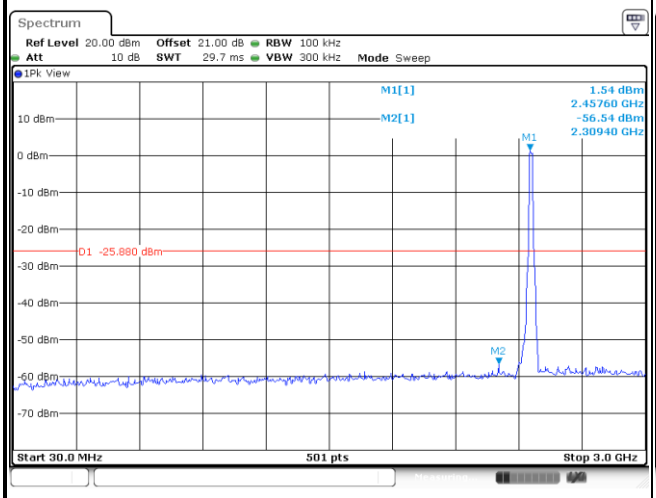
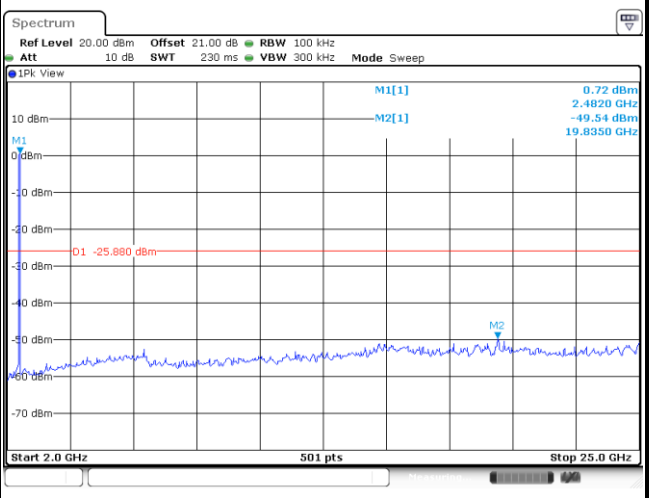
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	06

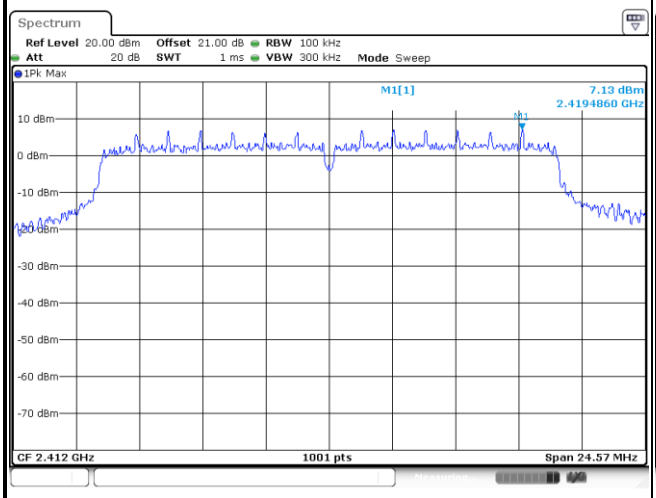
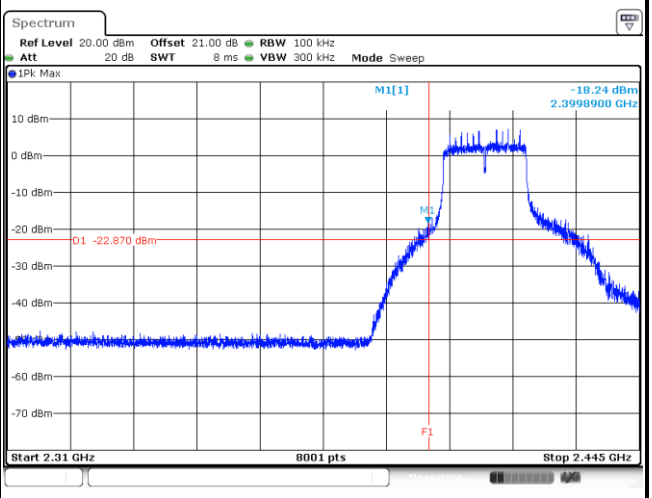
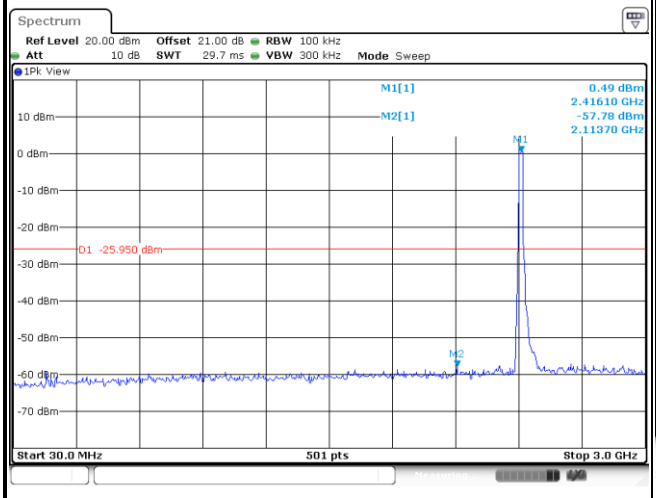
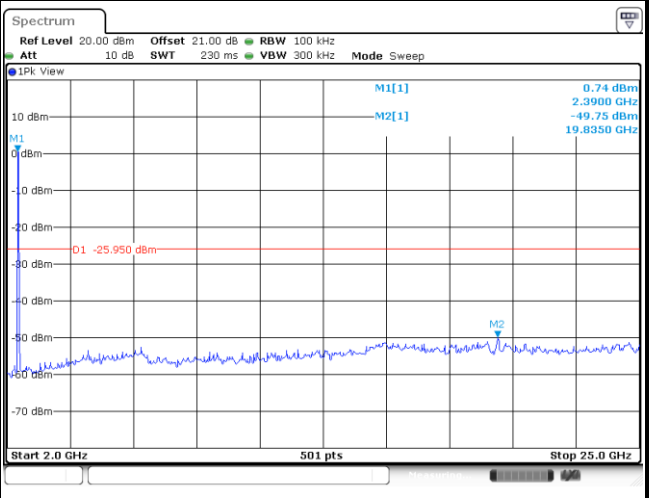
100kHz PSD reference Level	Channel Plot
	

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

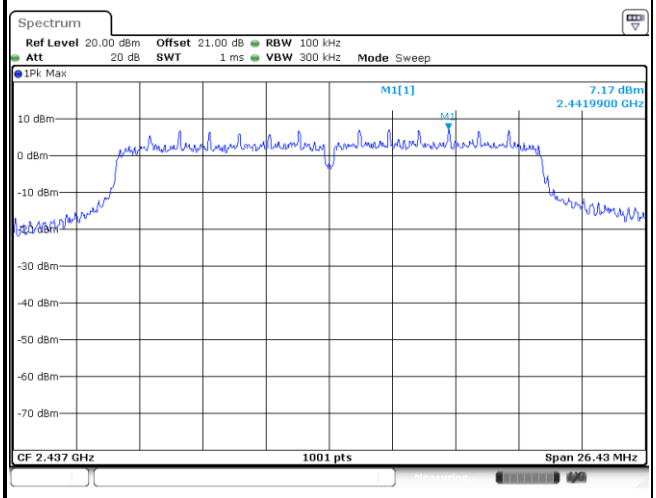
Test Mode :	802.11g	Test Channel :	11

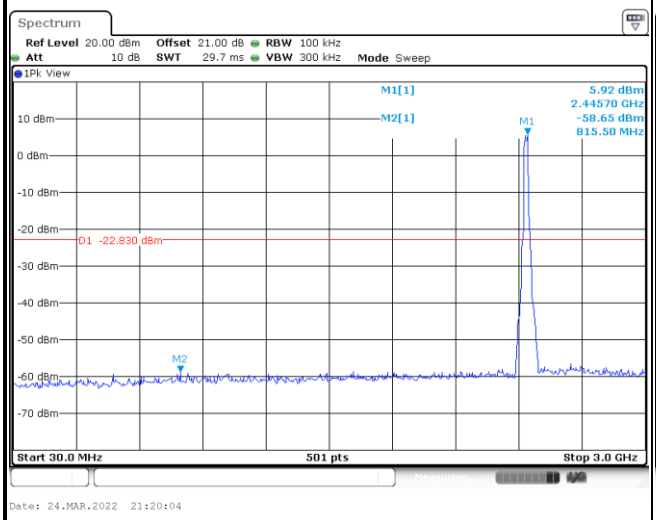
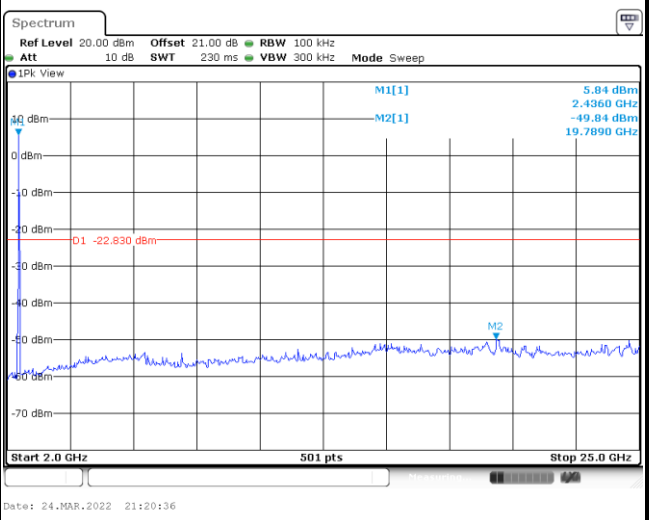
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

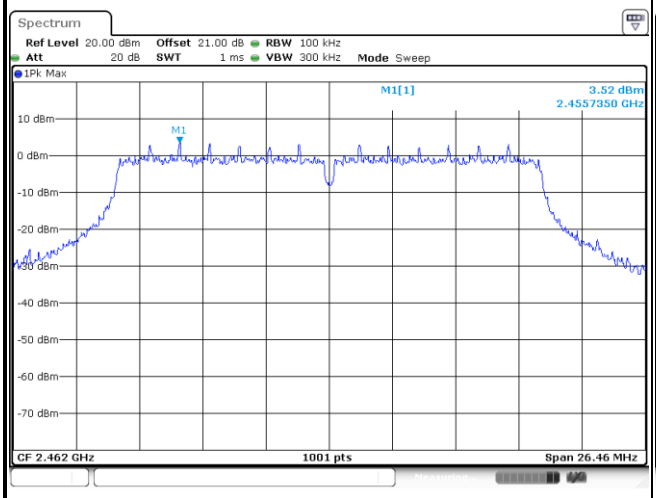
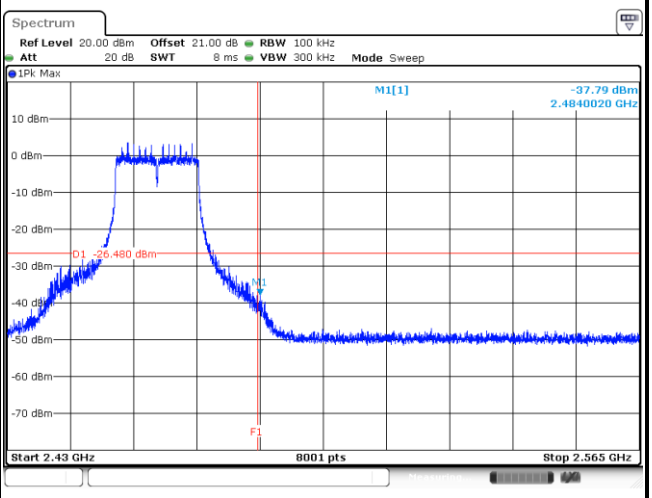
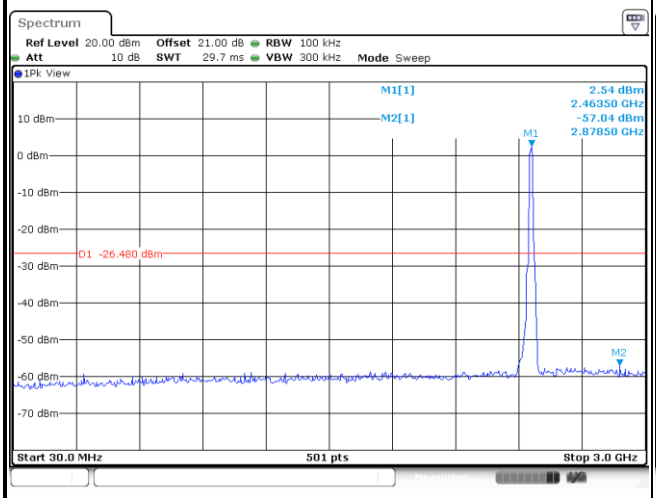
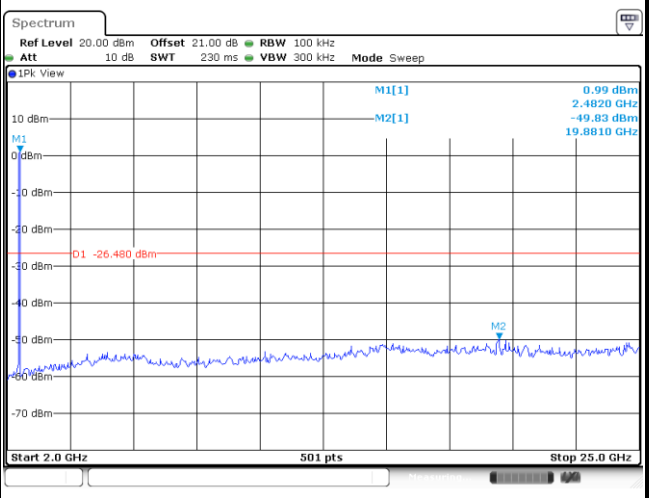
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

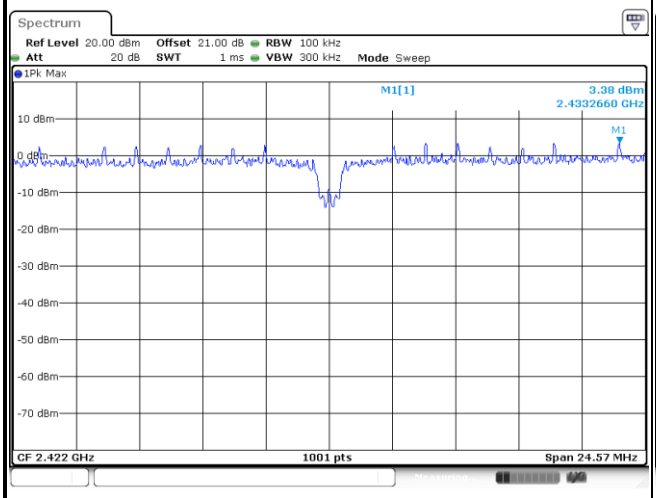
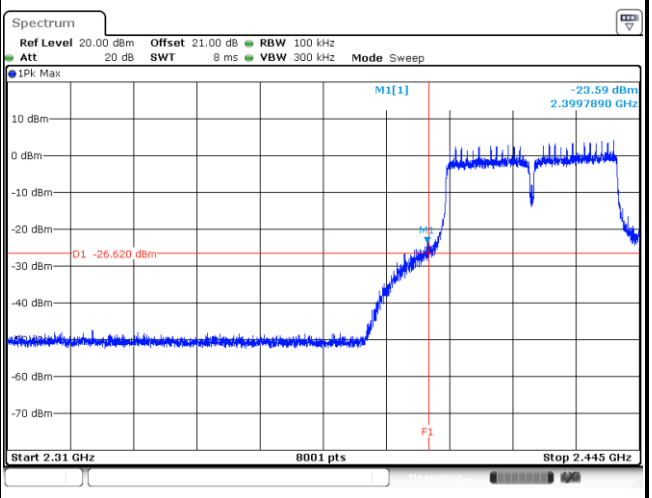
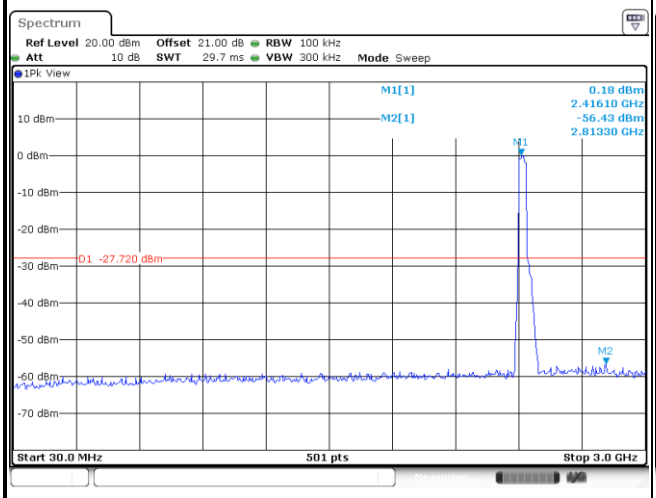
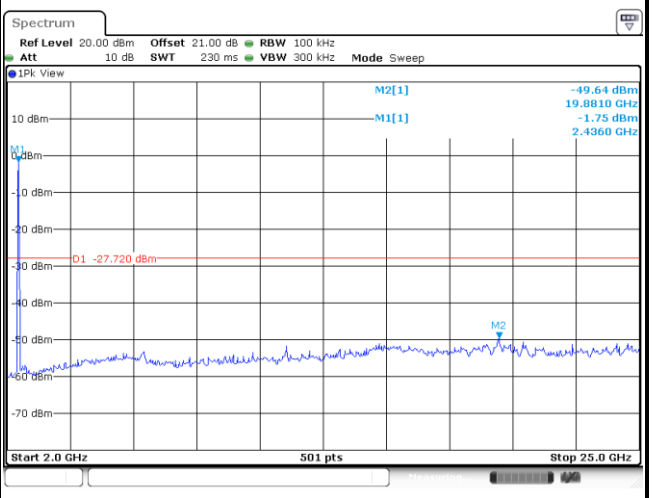
100kHz PSD reference Level	Channel Plot
	

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

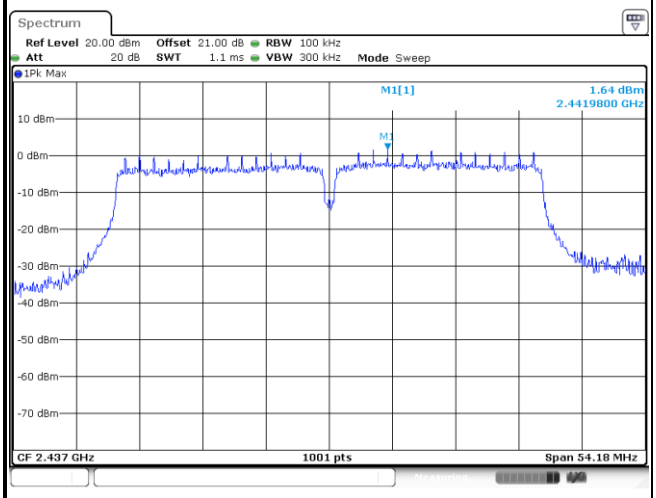
Test Mode :	802.11n HT20	Test Channel :	11

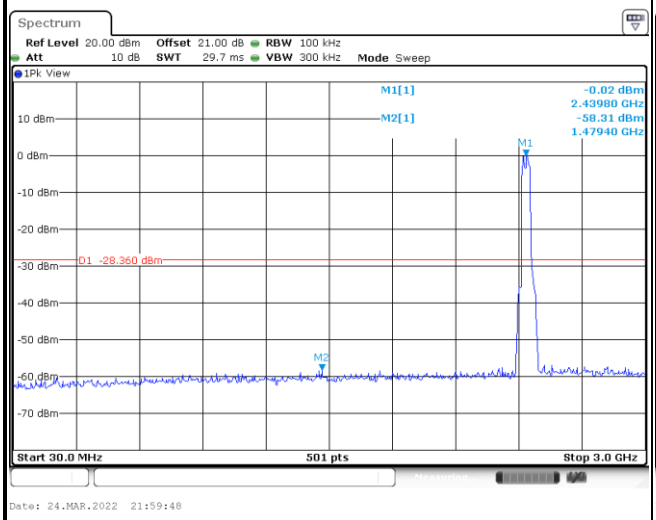
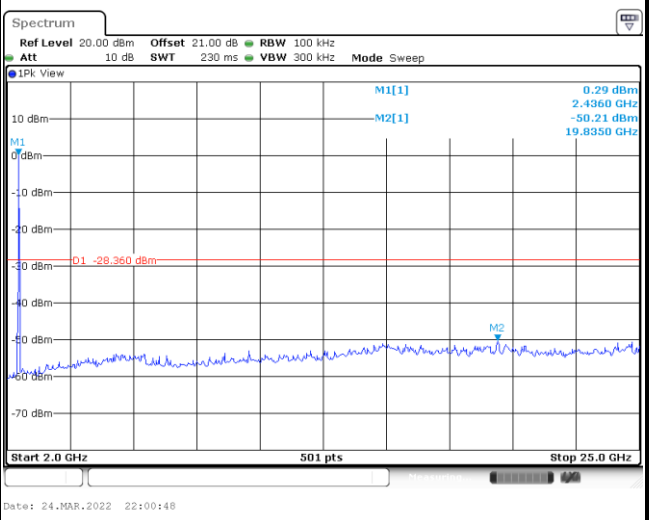
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	03

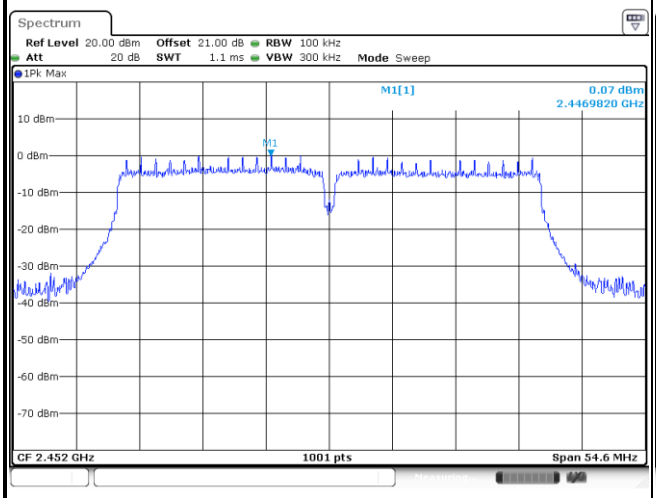
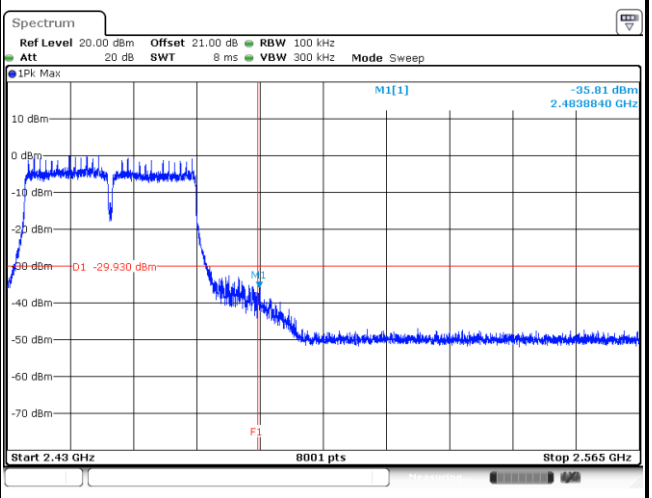
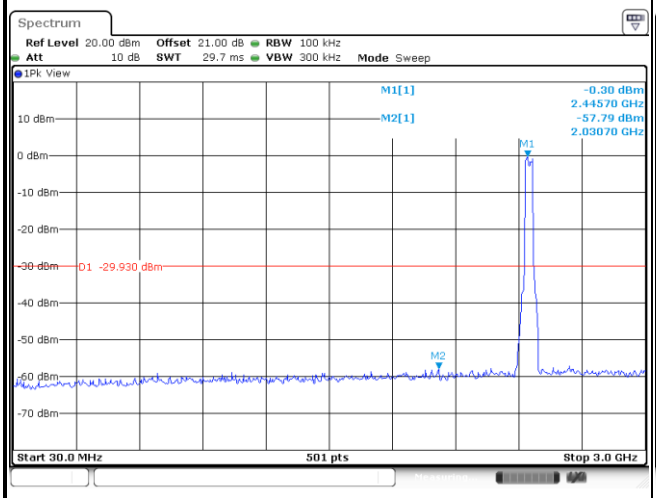
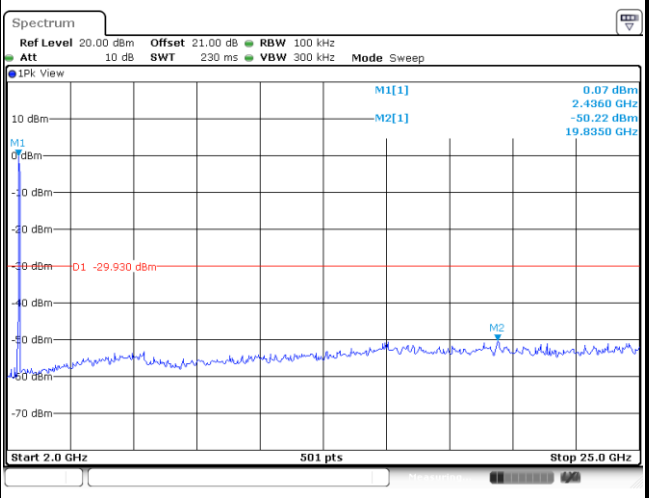
100kHz PSD reference Level	Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11n HT40	Test Channel :	06

100kHz PSD reference Level	Channel Plot
	

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

Test Mode :	802.11n HT40	Test Channel :	09

100kHz PSD reference Level	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 is 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

Please refer to the measuring equipment list in 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 is 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 is 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 is set 3 meters away from the receiving antenna, which is 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 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as "-".
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees 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 6 dB margin against average limit line, the position is marked as "-".
8. Use the following spectrum analyzer settings:

   For average measurement:

   The procedure for method trace averaging is as follows:

   a) RBW = 1 MHz.
   b) VBW ≥ [3 × RBW].
   c) Detector = RMS (power averaging), if [span / (# of points in sweep)] ≤ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
   d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging.
   e) Sweep time = auto.

f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / *D*, where *D* is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)

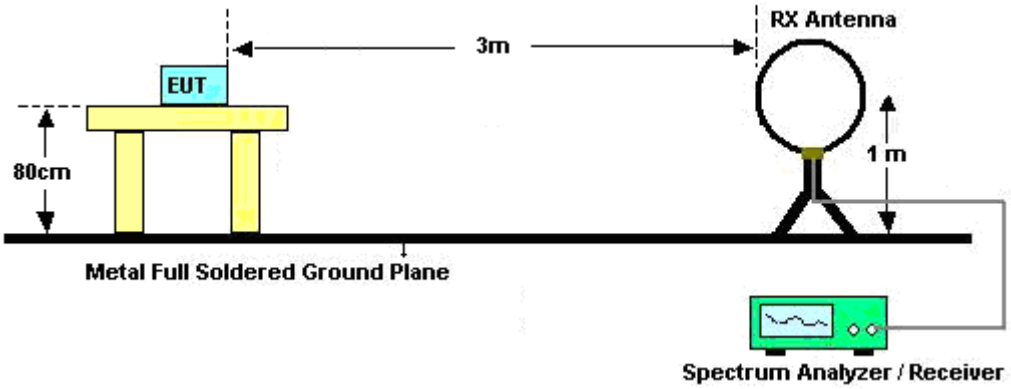
g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

   1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is [10 log (1 / *D*)], where *D* is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

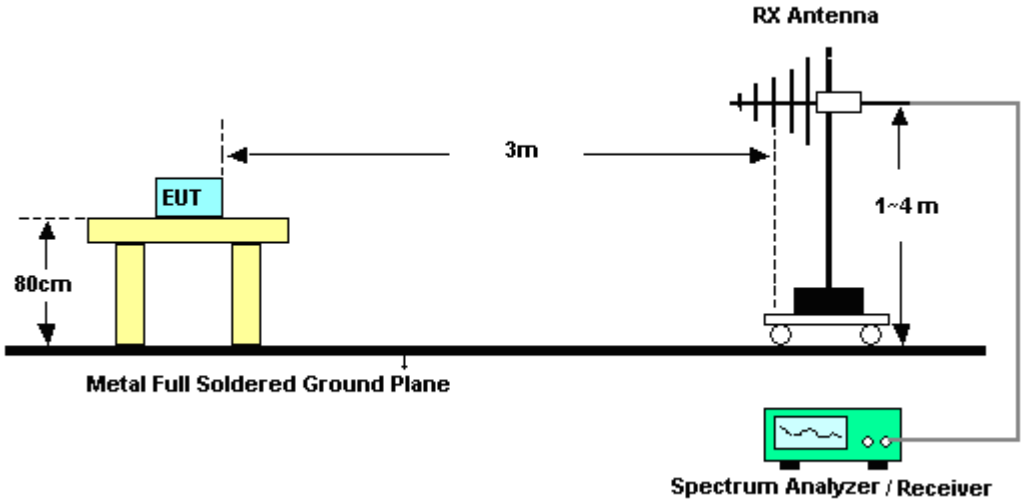
   2) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

3.5.4 Test Setup

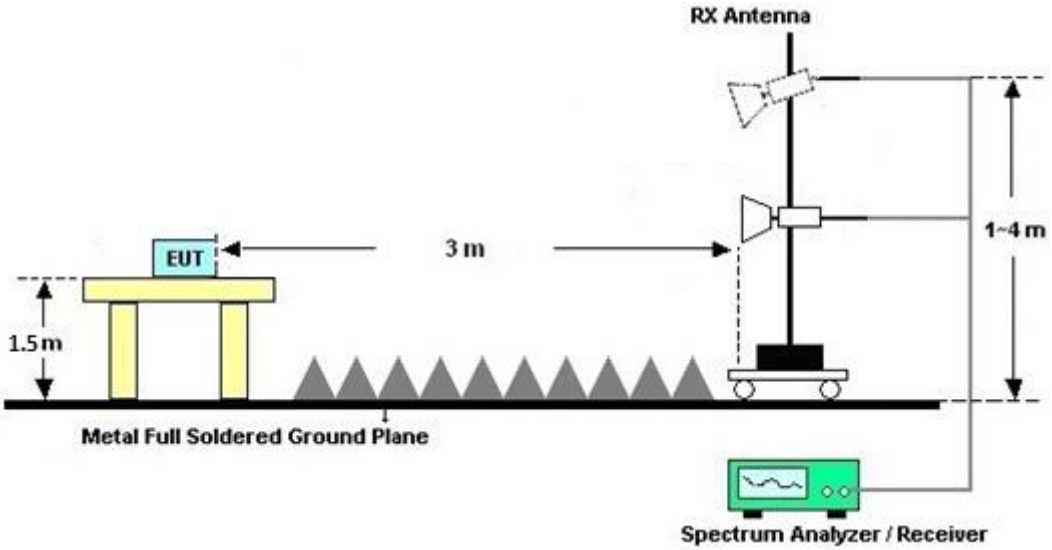
For radiated emissions below 30MHz



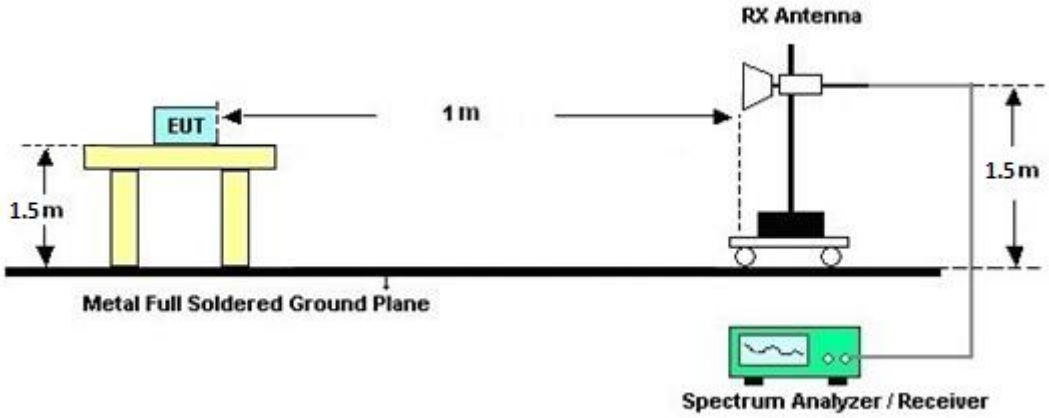
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is 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 comes 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.

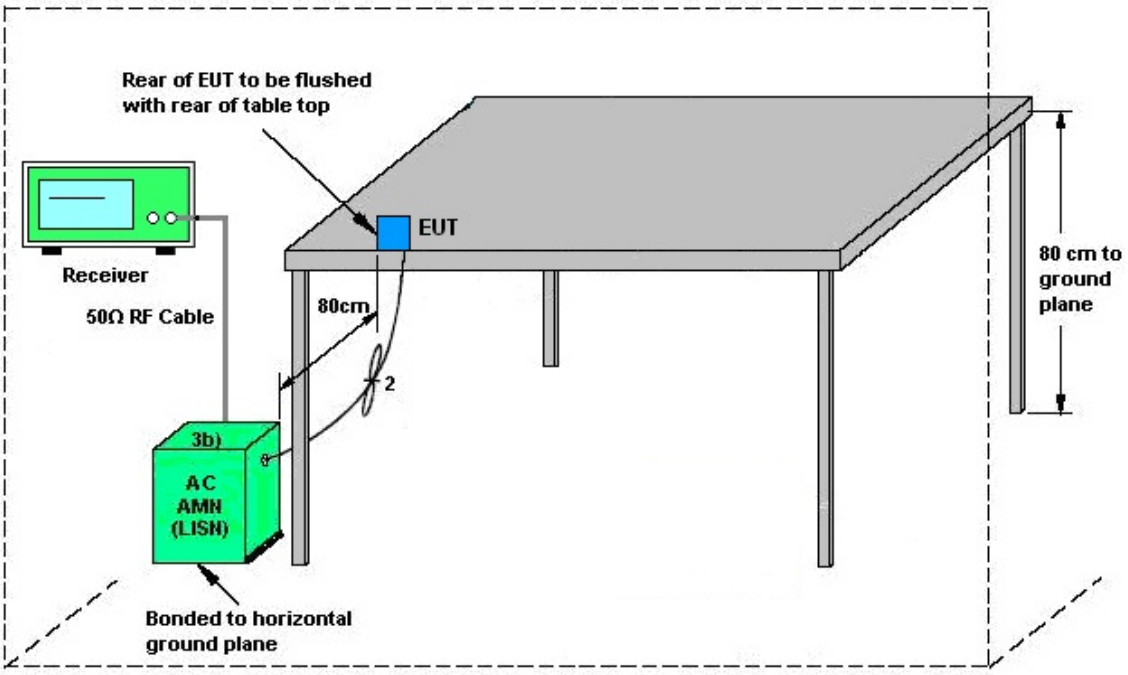
3.6.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.6.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is 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 Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
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
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 07, 2021	Mar. 05, 2022~ Apr. 14, 2022	Sep. 06, 2022	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 24, 2021	Mar. 05, 2022~ Apr. 14, 2022	Dec. 23, 2022	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz-40GHz	Nov. 30, 2021	Mar. 05, 2022~ Apr. 14, 2022	Nov. 29, 2022	Radiation (03CH13-HY)
Amplifier	SONOMA	310N	187282	9kHz~1GHz	Dec. 15, 2021	Mar. 05, 2022~ Apr. 14, 2022	Dec. 14, 2022	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	40103 & 07	30MHz~1GHz	Apr. 28, 2021	Mar. 05, 2022~ Apr. 14, 2022	Apr. 27, 2022	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz~18GHz	Jul. 13, 2021	Mar. 05, 2022~ Apr. 14, 2022	Jul. 12, 2022	Radiation (03CH13-HY)
Hygrometer	TECPEL	DTM-303B	TP200889	N/A	Sep. 30, 2021	Mar. 05, 2022~ Apr. 14, 2022	Sep. 29, 2022	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 18, 2021	Mar. 05, 2022~ Apr. 14, 2022	May 17, 2022	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 26, 2021	Mar. 05, 2022~ Apr. 14, 2022	Oct. 25, 2022	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 18, 2021	Mar. 05, 2022~ Mar. 16, 2022	Mar. 17, 2022	Radiation (03CH13-HY)
Signal Analyzer	Keysight	N9010B	MY60240520	N/A	Dec. 23, 2021	Mar. 17, 2022~ Apr. 14, 2022	Dec. 22, 2022	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 14, 2021	Mar. 05, 2022~ Apr. 14, 2022	Sep. 13, 2022	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN2	3GHz High Pass Filter	Jul. 12, 2021	Mar. 05, 2022~ Apr. 14, 2022	Jul. 11, 2022	Radiation (03CH13-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN6	6.75GHz High Pass Filter	Jun. 30, 2021	Mar. 05, 2022~ Apr. 14, 2022	Jun. 29, 2022	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30MHz~18GHz	Feb. 09, 2022	Mar. 05, 2022~ Apr. 14, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30MHz~18GHz	Feb. 09, 2022	Mar. 05, 2022~ Apr. 14, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30MHz~18GHz	Feb. 09, 2022	Mar. 05, 2022~ Apr. 14, 2022	Feb. 08, 2023	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Mar. 05, 2022~ Apr. 14, 2022	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Mar. 05, 2022~ Apr. 14, 2022	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 05, 2022~ Apr. 14, 2022	N/A	Radiation (03CH13-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 10, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Mar. 10, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Mar. 10, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Mar. 10, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Mar. 10, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	Mar. 10, 2022	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Mar. 10, 2022	Dec. 29, 2022	Conduction (CO05-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Feb. 22, 2022~ Mar. 31, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	DARE	RPR3006W	15I00041SNO 10 (NO:248)	10MHz~6GHz	Dec. 29, 2021	Feb. 22, 2022~ Mar. 31, 2022	Dec. 28, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Feb. 22, 2022~ Mar. 31, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Manframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Feb. 22, 2022~ Mar. 31, 2022	Aug. 11, 2022	Conducted (TH05-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))	**3.1 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.0 dB**

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.9 dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ching Chen	Temperature:	21~25	°C
Test Date:	2022/2/22-2022/3/31	Relative Humidity:	51~54	%

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	13.84	-	8.12	-	0.50	Pass
11b	1Mbps	1	6	2437	13.94	-	8.12	-	0.50	Pass
11b	1Mbps	1	11	2462	14.09	-	8.60	-	0.50	Pass
11g	6Mbps	1	1	2412	18.53	-	16.38	-	0.50	Pass
11g	6Mbps	1	6	2437	21.43	-	16.38	-	0.50	Pass
11g	6Mbps	1	11	2462	18.63	-	16.40	-	0.50	Pass
HT20	MCS0	1	1	2412	19.58	-	17.62	-	0.50	Pass
HT20	MCS0	1	6	2437	22.58	-	17.62	-	0.50	Pass
HT20	MCS0	1	11	2462	19.58	-	17.64	-	0.50	Pass
HT40	MCS0	1	3	2422	37.36	-	35.80	-	0.50	Pass
HT40	MCS0	1	6	2437	37.26	-	36.12	-	0.50	Pass
HT40	MCS0	1	9	2452	37.36	-	36.40	-	0.50	Pass

Report Number : FR1N0508C

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	17.70	-		30.00	-	2.50	-	20.20	-	36.00	-	Pass
11b	1Mbps	1	6	2437	18.00	-		30.00	-	2.50	-	20.50	-	36.00	-	Pass
11b	1Mbps	1	11	2462	18.00	-		30.00	-	2.50	-	20.50	-	36.00	-	Pass
11g	6Mbps	1	1	2412	15.70	-		30.00	-	2.50	-	18.20	-	36.00	-	Pass
11g	6Mbps	1	6	2437	18.50	-		30.00	-	2.50	-	21.00	-	36.00	-	Pass
11g	6Mbps	1	11	2462	15.70	-		30.00	-	2.50	-	18.20	-	36.00	-	Pass
HT20	MCS0	1	1	2412	15.50	-		30.00	-	2.50	-	18.00	-	36.00	-	Pass
HT20	MCS0	1	6	2437	18.40	-		30.00	-	2.50	-	20.90	-	36.00	-	Pass
HT20	MCS0	1	11	2462	15.20	-		30.00	-	2.50	-	17.70	-	36.00	-	Pass
HT40	MCS0	1	3	2422	15.40	-		30.00	-	2.50	-	17.90	-	36.00	-	Pass
HT40	MCS0	1	6	2437	15.50	-		30.00	-	2.50	-	18.00	-	36.00	-	Pass
HT40	MCS0	1	9	2452	14.20	-		30.00	-	2.50	-	16.70	-	36.00	-	Pass
VHT20	MCS0	1	1	2412	15.40	-		30.00	-	2.50	-	17.90	-	36.00	-	Pass
VHT20	MCS0	1	6	2437	18.30	-		30.00	-	2.50	-	20.80	-	36.00	-	Pass
VHT20	MCS0	1	11	2462	15.10	-		30.00	-	2.50	-	17.60	-	36.00	-	Pass
VHT40	MCS0	1	3	2422	15.30	-		30.00	-	2.50	-	17.80	-	36.00	-	Pass
VHT40	MCS0	1	6	2437	15.40	-		30.00	-	2.50	-	17.90	-	36.00	-	Pass
VHT40	MCS0	1	9	2452	14.10	-		30.00	-	2.50	-	16.60	-	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	-4.92	-		2.50	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-4.49	-		2.50	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-4.15	-		2.50	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-8.92	-		2.50	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-6.14	-		2.50	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-9.27	-		2.50	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-9.77	-		2.50	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-7.30	-		2.50	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-10.69	-		2.50	-	8.00	-	Pass
HT40	MCS0	1	3	2422	-12.17	-		2.50	-	8.00	-	Pass
HT40	MCS0	1	6	2437	-12.53	-		2.50	-	8.00	-	Pass
HT40	MCS0	1	9	2452	-13.67	-		2.50	-	8.00	-	Pass

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

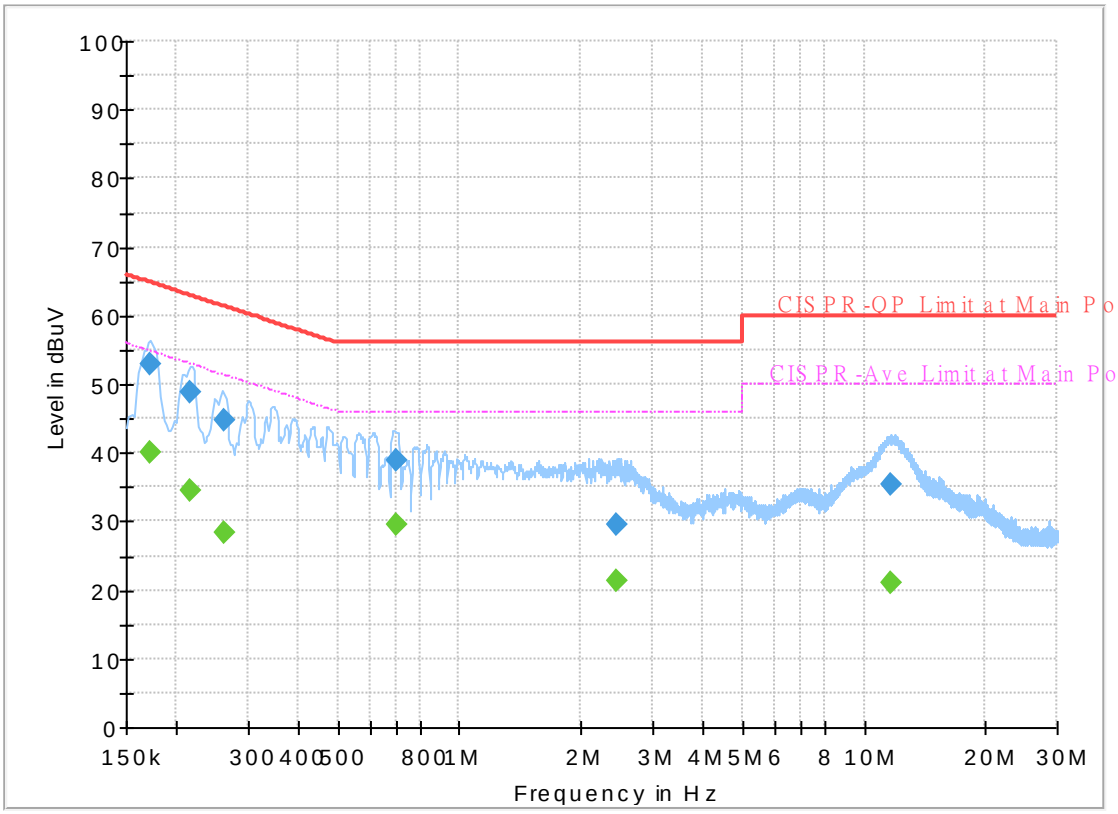
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	**Temperature :**	23~26℃
		Relative Humidity :	45~55%

EUT Information

Report NO :	1N0508
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



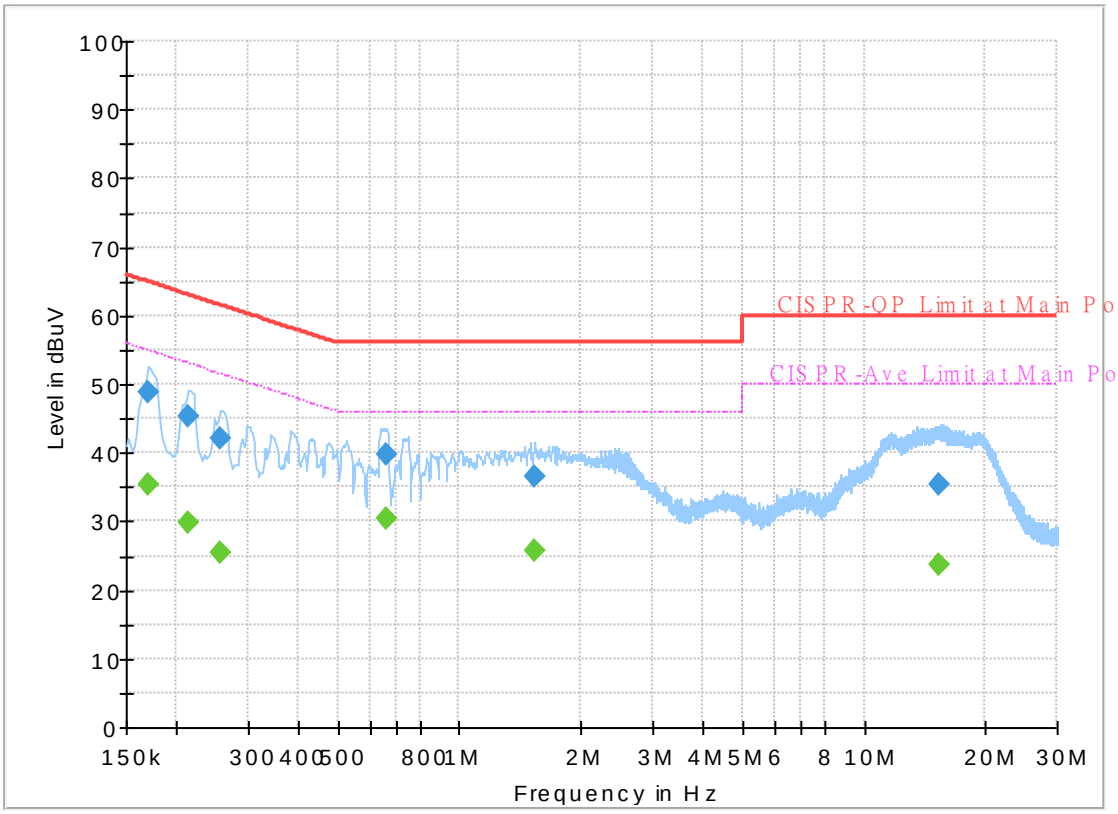
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.172500	---	40.12	54.84	14.72	L1	OFF	19.6
0.172500	52.87	---	64.84	11.97	L1	OFF	19.6
0.215250	---	34.45	53.00	18.55	L1	OFF	19.6
0.215250	48.78	---	63.00	14.22	L1	OFF	19.6
0.262500	---	28.31	51.35	23.04	L1	OFF	19.6
0.262500	44.70	---	61.35	16.65	L1	OFF	19.6
0.694500	---	29.46	46.00	16.54	L1	OFF	19.6
0.694500	38.83	---	56.00	17.17	L1	OFF	19.6
2.456250	---	21.27	46.00	24.73	L1	OFF	19.6
2.456250	29.64	---	56.00	26.36	L1	OFF	19.6
11.625000	---	21.16	50.00	28.84	L1	OFF	19.8
11.625000	35.27	---	60.00	24.73	L1	OFF	19.8

EUT Information

Report NO :	1N0508
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)
0.170250	---	35.42	54.95	19.53	N	OFF	19.6
0.170250	48.69	---	64.95	16.26	N	OFF	19.6
0.213000	---	29.94	53.09	23.15	N	OFF	19.6
0.213000	45.22	---	63.09	17.87	N	OFF	19.6
0.255750	---	25.32	51.57	26.25	N	OFF	19.6
0.255750	42.20	---	61.57	19.37	N	OFF	19.6
0.656250	---	30.49	46.00	15.51	N	OFF	19.6
0.656250	39.76	---	56.00	16.24	N	OFF	19.6
1.538250	---	25.66	46.00	20.34	N	OFF	19.6
1.538250	36.59	---	56.00	19.41	N	OFF	19.6
15.265500	---	23.76	50.00	26.24	N	OFF	19.9
15.265500	35.44	---	60.00	24.56	N	OFF	19.9

Appendix C. Radiated Spurious Emission

Test Engineer :	Yuan Lee, Jacky Hong and Peter Liao	Temperature :	20~25°C
		Relative Humidity :	50~60%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2385.285	56.3	-17.7	74	41.58	27.73	14.06	27.07	380	51	P	H
		2333.1	45.04	-8.96	54	30.17	27.94	14.01	27.08	380	51	A	H
	*	2412	108.92	-	-	94.22	27.68	14.08	27.06	380	51	P	H
	*	2412	104.55	-	-	89.85	27.68	14.08	27.06	380	51	A	H
													H
													H
		2368.17	56.61	-17.39	74	41.88	27.76	14.04	27.07	100	77	P	V
		2355.465	44.98	-9.02	54	30.24	27.79	14.03	27.08	100	77	A	V
	*	2412	108.83	-	-	94.13	27.68	14.08	27.06	100	77	P	V
	*	2412	103.18	-	-	88.48	27.68	14.08	27.06	100	77	A	V
													V
													V
802.11b CH 06 2437MHz		2350.04	55.59	-18.41	74	40.84	27.8	14.03	27.08	372	59	P	H
		2372.72	44.89	-9.11	54	30.16	27.75	14.05	27.07	372	59	A	H
	*	2437	107.84	-	-	93.16	27.63	14.1	27.05	372	59	P	H
	*	2437	103.93	-	-	89.25	27.63	14.1	27.05	372	59	A	H
		2496.57	56.19	-17.81	74	41.37	27.69	14.16	27.03	372	59	P	H
		2484.81	44.83	-9.17	54	30.04	27.67	14.15	27.03	372	59	A	H
		2389.38	55.69	-18.31	74	40.98	27.72	14.06	27.07	136	118	P	V
		2315.04	44.89	-9.11	54	29.91	28.08	13.99	27.09	136	118	A	V
	*	2437	109.1	-	-	94.42	27.63	14.1	27.05	136	118	P	V
	*	2437	105.2	-	-	90.52	27.63	14.1	27.05	136	118	A	V
		2487.26	55.62	-18.38	74	40.83	27.67	14.15	27.03	136	118	P	V
		2484.32	45.09	-8.91	54	30.31	27.67	14.15	27.04	136	118	A	V

802.11b CH 11 2462MHz	*	2462	108.24	-	-	93.53	27.62	14.13	27.04	376	61	P	H
	*	2462	104.09	-	-	89.38	27.62	14.13	27.04	376	61	A	H
		2487.8	56.51	-17.49	74	41.71	27.68	14.15	27.03	376	61	P	H
		2487.28	46.07	-7.93	54	31.28	27.67	14.15	27.03	376	61	A	H
													H
													H
	*	2462	109.24	-	-	94.53	27.62	14.13	27.04	100	117	P	V
	*	2462	105.18	-	-	90.47	27.62	14.13	27.04	100	117	A	V
		2487.44	57.67	-16.33	74	42.88	27.67	14.15	27.03	100	117	P	V
		2488.04	47.09	-6.91	54	32.29	27.68	14.15	27.03	100	117	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	52.71	-21.29	74	71.52	31.45	6.8	57.06	265	335	P	H
		4824	50.28	-3.72	54	69.09	31.45	6.8	57.06	265	335	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	51.67	-22.33	74	70.48	31.45	6.8	57.06	101	78	P	V
		4824	49.19	-4.81	54	68	31.45	6.8	57.06	101	78	A	V
													V
													V
													V
													V
													V
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													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	51.2	-22.8	74	69.9	31.45	6.82	56.97	224	202	P	H
		4874	48.8	-5.2	54	67.5	31.45	6.82	56.97	224	202	A	H
		7311	45.94	-28.06	74	57.32	37.08	8.44	56.9	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 06 2437MHz													H
		4874	51.05	-22.95	74	69.75	31.45	6.82	56.97	100	77	P	V
		4874	48.56	-5.44	54	67.26	31.45	6.82	56.97	100	77	A	V
		7311	45.84	-28.16	74	57.22	37.08	8.44	56.9	-	-	P	V
													V
													V
													V
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													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	51.91	-22.09	74	70.4	31.54	6.85	56.88	229	297	P	H
		4924	50.23	-3.77	54	68.72	31.54	6.85	56.88	229	297	A	H
		7386	47.02	-26.98	74	58.45	37.07	8.55	57.05	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 11 2462MHz		4924	51.44	-22.56	74	69.93	31.54	6.85	56.88	102	77	P	V
		4924	49.37	-4.63	54	67.86	31.54	6.85	56.88	102	77	A	V
		7386	46.71	-27.29	74	58.14	37.07	8.55	57.05	-	-	P	V
													V
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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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2389.905	60.4	-13.6	74	45.69	27.72	14.06	27.07	205	56	P	H
		2390	47.72	-6.28	54	33.01	27.72	14.06	27.07	205	56	A	H
	*	2412	107.45	-	-	92.75	27.68	14.08	27.06	205	56	P	H
	*	2412	99.44	-	-	84.74	27.68	14.08	27.06	205	56	A	H
													H
													H
		2389.8	62.12	-11.88	74	47.41	27.72	14.06	27.07	102	80	P	V
		2390	48.86	-5.14	54	34.15	27.72	14.06	27.07	102	80	A	V
	*	2412	110.25	-	-	95.55	27.68	14.08	27.06	102	80	P	V
	*	2412	101.33	-	-	86.63	27.68	14.08	27.06	102	80	A	V
													V
													V
802.11g CH 06 2437MHz		2314.62	55.85	-18.15	74	40.87	28.08	13.99	27.09	372	53	P	H
		2346.96	45.06	-8.94	54	30.3	27.82	14.02	27.08	372	53	A	H
	*	2437	108.49	-	-	93.81	27.63	14.1	27.05	372	53	P	H
	*	2437	99.9	-	-	85.22	27.63	14.1	27.05	372	53	A	H
		2484.11	57.21	-16.79	74	42.43	27.67	14.15	27.04	372	53	P	H
		2484.88	45.44	-8.56	54	30.65	27.67	14.15	27.03	372	53	A	H
		2382.38	57.3	-16.7	74	42.58	27.74	14.05	27.07	100	120	P	V
		2387	44.81	-9.19	54	30.09	27.73	14.06	27.07	100	120	A	V
	*	2437	109.38	-	-	94.7	27.63	14.1	27.05	100	120	P	V
	*	2437	100.76	-	-	86.08	27.63	14.1	27.05	100	120	A	V
		2487.05	57	-17	74	42.21	27.67	14.15	27.03	100	120	P	V
		2483.55	46.02	-7.98	54	31.24	27.67	14.15	27.04	100	120	A	V

802.11g CH 11 2462MHz	*	2462	104.96	-	-	90.25	27.62	14.13	27.04	361	54	P	H
	*	2462	96.4	-	-	81.69	27.62	14.13	27.04	361	54	A	H
		2483.6	63.99	-10.01	74	49.21	27.67	14.15	27.04	361	54	P	H
		2483.8	50.19	-3.81	54	35.41	27.67	14.15	27.04	361	54	A	H
													H
													H
	*	2462	106.75	-	-	92.04	27.62	14.13	27.04	125	118	P	V
	*	2462	97.95	-	-	83.24	27.62	14.13	27.04	125	118	A	V
		2483.72	67.03	-6.97	74	52.25	27.67	14.15	27.04	125	118	P	V
		2483.56	51.65	-2.35	54	36.87	27.67	14.15	27.04	125	118	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	46.78	-27.22	74	65.59	31.45	6.8	57.06	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	45.23	-28.77	74	64.04	31.45	6.8	57.06	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	46.16	-27.84	74	64.86	31.45	6.82	56.97	-	-	P	H
		7311	45.1	-28.9	74	56.48	37.08	8.44	56.9	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 06 2437MHz													H
		4874	45.9	-28.1	74	64.6	31.45	6.82	56.97	-	-	P	V
		7311	45.35	-28.65	74	56.73	37.08	8.44	56.9	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	42.94	-31.06	74	61.43	31.54	6.85	56.88	-	-	P	H
		7386	46.05	-27.95	74	57.48	37.07	8.55	57.05	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 11 2462MHz													H
		4924	43.8	-30.2	74	62.29	31.54	6.85	56.88	-	-	P	V
		7386	45.26	-28.74	74	56.69	37.07	8.55	57.05	-	-	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. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2390	65.25	-8.75	74	50.54	27.72	14.06	27.07	202	54	P	H
		2390	49.68	-4.32	54	34.97	27.72	14.06	27.07	202	54	A	H
	*	2412	107.56	-	-	92.86	27.68	14.08	27.06	202	54	P	H
	*	2412	99.86	-	-	85.16	27.68	14.08	27.06	202	54	A	H
802.11n													H
HT20													H
CH 01		2389.8	68.09	-5.91	74	53.38	27.72	14.06	27.07	102	81	P	V
2412MHz		2390	50.53	-3.47	54	35.82	27.72	14.06	27.07	102	81	A	V
	*	2412	110.32	-	-	95.62	27.68	14.08	27.06	102	81	P	V
	*	2412	102.19	-	-	87.49	27.68	14.08	27.06	102	81	A	V
													V
													V
		2317.14	55.74	-18.26	74	40.77	28.06	14	27.09	197	52	P	H
		2320.64	44.92	-9.08	54	29.98	28.03	14	27.09	197	52	A	H
	*	2437	106.6	-	-	91.92	27.63	14.1	27.05	197	52	P	H
	*	2437	98.92	-	-	84.24	27.63	14.1	27.05	197	52	A	H
802.11n		2488.52	55.66	-18.34	74	40.86	27.68	14.15	27.03	197	52	P	H
HT20		2483.55	45.43	-8.57	54	30.65	27.67	14.15	27.04	197	52	A	H
CH 06		2333.8	56.07	-17.93	74	41.21	27.93	14.01	27.08	129	80	P	V
2437MHz		2344.44	45.09	-8.91	54	30.31	27.84	14.02	27.08	129	80	A	V
	*	2437	109.51	-	-	94.83	27.63	14.1	27.05	129	80	P	V
	*	2437	101.41	-	-	86.73	27.63	14.1	27.05	129	80	A	V
		2483.62	56.72	-17.28	74	41.94	27.67	14.15	27.04	129	80	P	V
		2484.53	46.03	-7.97	54	31.24	27.67	14.15	27.03	129	80	A	V

	*	2462	103.8	-	-	89.09	27.62	14.13	27.04	196	56	P	H
	*	2462	96.17	-	-	81.46	27.62	14.13	27.04	196	56	A	H
		2483.84	63.61	-10.39	74	48.83	27.67	14.15	27.04	196	56	P	H
		2483.52	49.14	-4.86	54	34.36	27.67	14.15	27.04	196	56	A	H
802.11n													H
HT20													H
CH 11	*	2462	105.49	-	-	90.78	27.62	14.13	27.04	126	80	P	V
2462MHz	*	2462	97.72	-	-	83.01	27.62	14.13	27.04	126	80	A	V
		2484.16	65.45	-8.55	74	50.67	27.67	14.15	27.04	126	80	P	V
		2483.6	50.25	-3.75	54	35.47	27.67	14.15	27.04	126	80	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	46.71	-27.29	74	65.52	31.45	6.8	57.06	-	-	P	H
													H
													H
													H
802.11n													H
HT20													H
CH 01		4824	46.62	-27.38	74	65.43	31.45	6.8	57.06	-	-	P	V
2412MHz													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	45.35	-28.65	74	64.05	31.45	6.82	56.97	-	-	P	H
		7311	45.48	-28.52	74	56.86	37.08	8.44	56.9	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 06		4874	47.63	-26.37	74	66.33	31.45	6.82	56.97	-	-	P	V
2437MHz		7311	45.59	-28.41	74	56.97	37.08	8.44	56.9	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	42.6	-31.4	74	61.09	31.54	6.85	56.88	-	-	P	H
		7386	45.34	-28.66	74	56.77	37.07	8.55	57.05	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 11		4924	43.04	-30.96	74	61.53	31.54	6.85	56.88	-	-	P	V
2462MHz		7386	45.41	-28.59	74	56.84	37.07	8.55	57.05	-	-	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. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2389.24	59.57	-14.43	74	44.86	27.72	14.06	27.07	197	51	P	H
		2389.8	49.26	-4.74	54	34.55	27.72	14.06	27.07	197	51	A	H
	*	2422	103.88	-	-	89.18	27.66	14.09	27.05	197	51	P	H
	*	2422	96.57	-	-	81.87	27.66	14.09	27.05	197	51	A	H
802.11n		2484.11	58	-16	74	43.22	27.67	14.15	27.04	197	51	P	H
HT40		2483.62	47.24	-6.76	54	32.46	27.67	14.15	27.04	197	51	A	H
CH 03		2389.66	63.01	-10.99	74	48.3	27.72	14.06	27.07	101	81	P	V
2422MHz		2389.94	51.3	-2.7	54	36.59	27.72	14.06	27.07	101	81	A	V
	*	2422	106.14	-	-	91.44	27.66	14.09	27.05	101	81	P	V
	*	2422	98.51	-	-	83.81	27.66	14.09	27.05	101	81	A	V
		2484.39	60.36	-13.64	74	45.57	27.67	14.15	27.03	101	81	P	V
		2483.83	47.6	-6.4	54	32.82	27.67	14.15	27.04	101	81	A	V
		2336.04	55.56	-18.44	74	40.72	27.91	14.01	27.08	200	51	P	H
		2311.4	45.28	-8.72	54	30.27	28.11	13.99	27.09	200	51	A	H
	*	2437	101.47	-	-	86.79	27.63	14.1	27.05	200	51	P	H
	*	2437	94.2	-	-	79.52	27.63	14.1	27.05	200	51	A	H
802.11n		2483.55	63.45	-10.55	74	48.67	27.67	14.15	27.04	200	51	P	H
HT40		2483.9	49.37	-4.63	54	34.59	27.67	14.15	27.04	200	51	A	H
CH 06		2336.6	55.85	-18.15	74	41.01	27.91	14.01	27.08	130	81	P	V
2437MHz		2311.68	45.09	-8.91	54	30.08	28.11	13.99	27.09	130	81	A	V
	*	2437	103.4	-	-	88.72	27.63	14.1	27.05	130	81	P	V
	*	2437	96.21	-	-	81.53	27.63	14.1	27.05	130	81	A	V
		2483.55	66.39	-7.61	74	51.61	27.67	14.15	27.04	130	81	P	V
		2484.04	51.1	-2.9	54	36.32	27.67	14.15	27.04	130	81	A	V

		2326.1	55.63	-18.37	74	40.73	27.99	14	27.09	375	56	P	H
		2329.32	45.05	-8.95	54	30.15	27.97	14.01	27.08	375	56	A	H
	*	2452	101.06	-	-	86.39	27.6	14.12	27.05	375	56	P	H
	*	2452	92.77	-	-	78.1	27.6	14.12	27.05	375	56	A	H
802.11n		2484.6	63.6	-10.4	74	48.81	27.67	14.15	27.03	375	56	P	H
HT40		2483.5	49.99	-4.01	54	35.21	27.67	14.15	27.04	375	56	A	H
CH 09		2320.64	55.88	-18.12	74	40.94	28.03	14	27.09	100	119	P	V
2452MHz		2370.2	45.22	-8.78	54	30.49	27.76	14.04	27.07	100	119	A	V
	*	2452	102.18	-	-	87.51	27.6	14.12	27.05	100	119	P	V
	*	2452	93.9	-	-	79.23	27.6	14.12	27.05	100	119	A	V
		2483.97	64.92	-9.08	74	50.14	27.67	14.15	27.04	100	119	P	V
		2483.5	51.78	-2.22	54	37	27.67	14.15	27.04	100	119	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4844	42.89	-31.11	74	61.61	31.49	6.81	57.02	-	-	P	H
		7266	46.44	-27.56	74	57.95	36.9	8.39	56.8	-	-	P	H
													H
													H
802.11n													H
HT40													H
CH 03		4844	42.1	-31.9	74	60.82	31.49	6.81	57.02	-	-	P	V
2422MHz		7266	45.21	-28.79	74	56.72	36.9	8.39	56.8	-	-	P	V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	42.19	-31.81	74	60.89	31.45	6.82	56.97	-	-	P	H
		7311	45.04	-28.96	74	56.42	37.08	8.44	56.9	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 06		4874	40.82	-33.18	74	59.52	31.45	6.82	56.97	-	-	P	V
2437MHz		7311	45.63	-28.37	74	57.01	37.08	8.44	56.9	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4904	40.12	-33.88	74	58.77	31.42	6.84	56.91	-	-	P	H
		7356	46.72	-27.28	74	58.19	37.01	8.51	56.99	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 09		4904	40.35	-33.65	74	59	31.42	6.84	56.91	-	-	P	V
2452MHz		7356	45.18	-28.82	74	56.65	37.01	8.51	56.99	-	-	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 HT40 (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	22.07	-17.93	40	29.12	24.57	0.72	32.34	-	-	P	H
		124.09	24.8	-18.7	43.5	38.4	17.56	1.14	32.3	-	-	P	H
		188.11	26.47	-17.03	43.5	42.66	14.78	1.3	32.27	-	-	P	H
		309.36	26.76	-19.24	46	38.03	19.29	1.61	32.17	-	-	P	H
		778.84	29.25	-16.75	46	31.17	27.77	2.38	32.07	-	-	P	H
		949.56	32.25	-13.75	46	30.53	30.28	2.56	31.12	-	-	P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT40		30.97	21.99	-18.01	40	29.77	23.85	0.72	32.35	-	-	P	V
LF		80.44	23.63	-16.37	40	41.56	13.42	0.96	32.31	-	-	P	V
		120.21	29.15	-14.35	43.5	42.82	17.5	1.13	32.3	-	-	P	V
		159.01	26.18	-17.32	43.5	40.66	16.55	1.26	32.29	-	-	P	V
		750.71	29.2	-16.8	46	31.41	27.63	2.32	32.16	-	-	P	V
		954.41	32.23	-13.77	46	30.23	30.51	2.57	31.08	-	-	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 and emission level has at least 6dB margin against limit or emission is 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)

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)+Duty factor
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 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

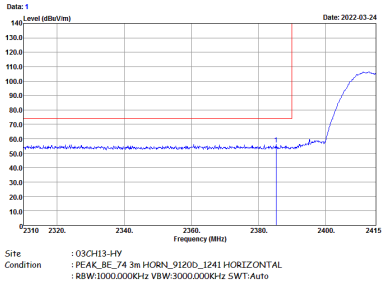
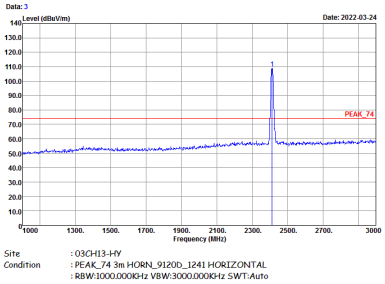
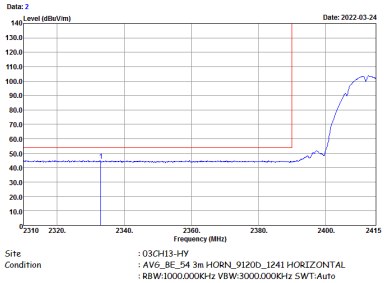
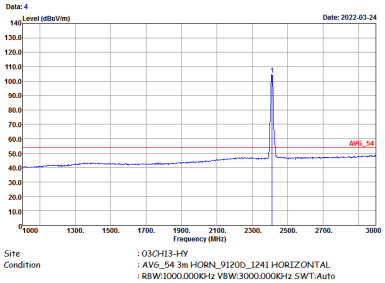
Test Engineer :	Yuan Lee, Jacky Hong and Peter Liao	**Temperature :**	20~25°C
		Relative Humidity :	50~60%

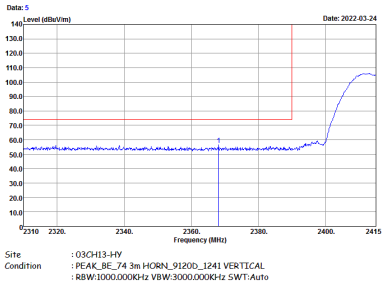
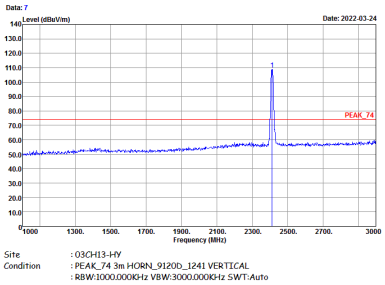
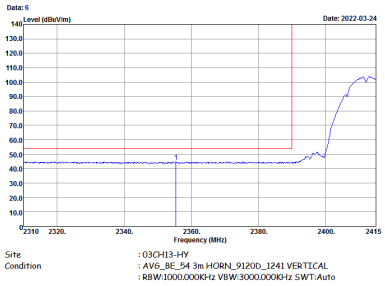
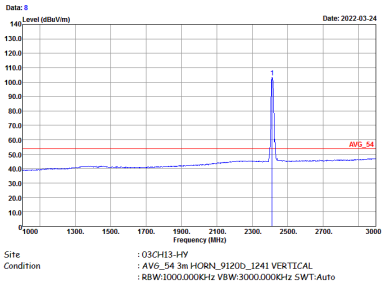
Note symbol

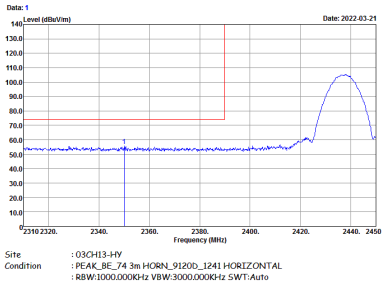
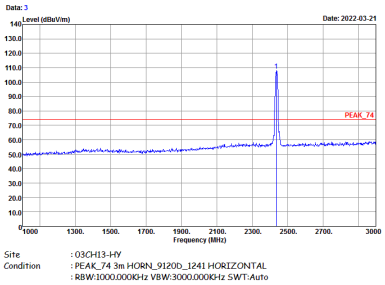
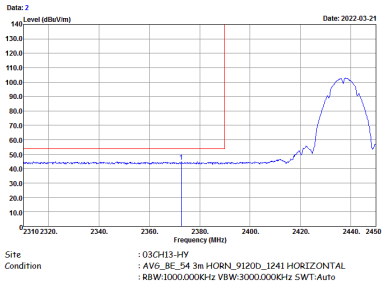
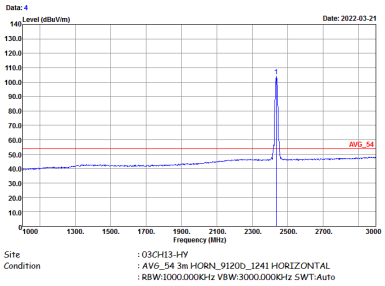
-L	**Low channel location**
-R	**High channel location**

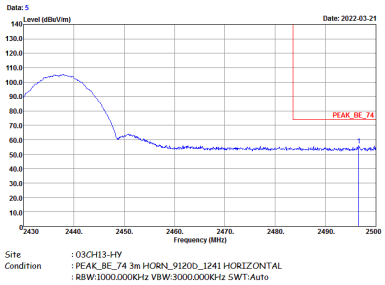
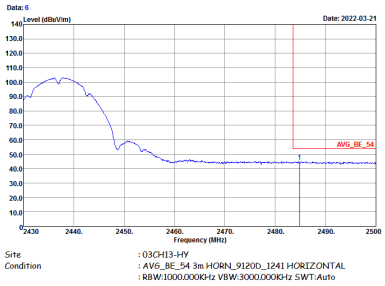
2.4GHz 2400~2483.5MHz

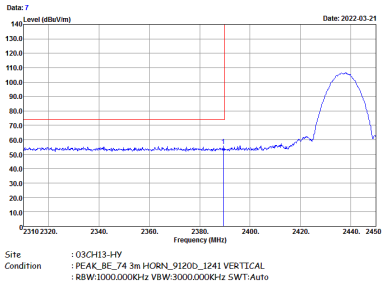
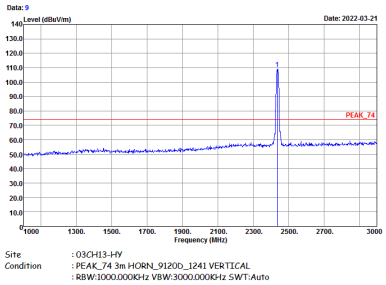
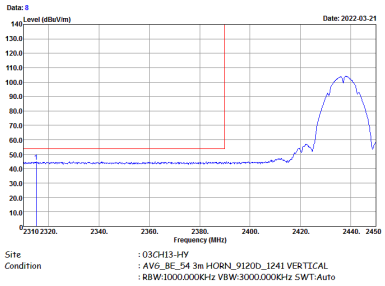
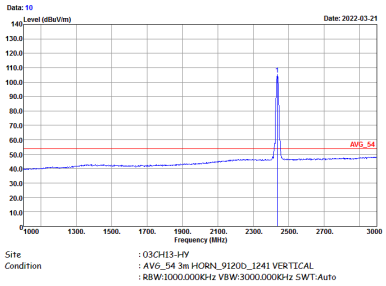
WIFI 802.11b (Band Edge @ 3m)

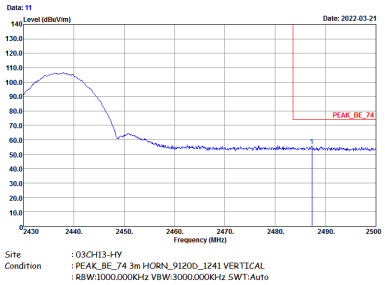
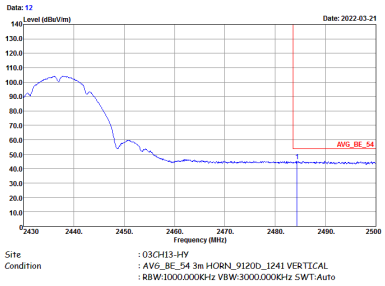
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

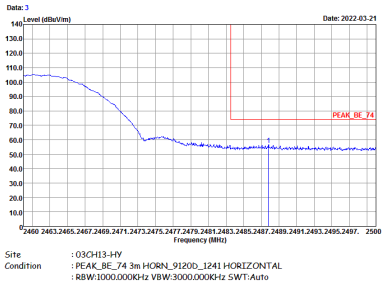
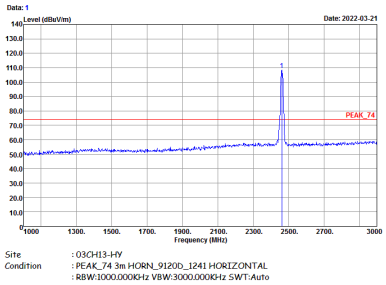
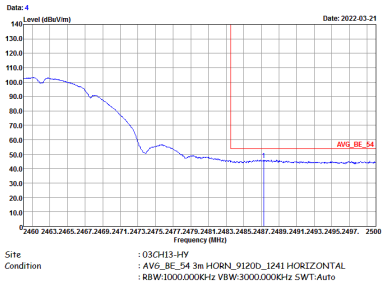
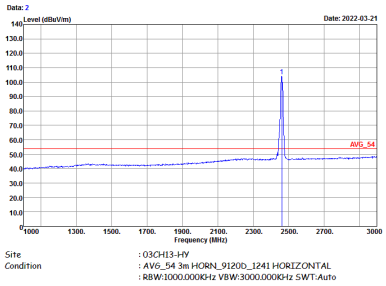
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

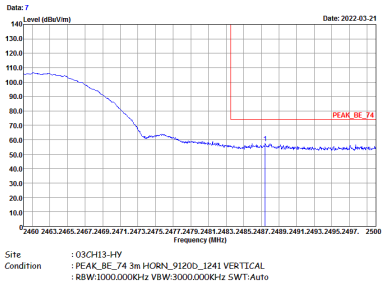
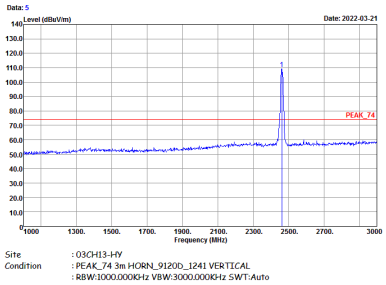
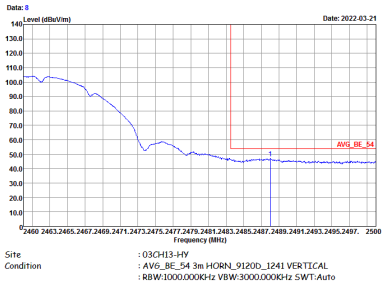
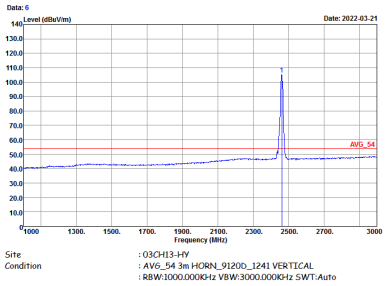
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

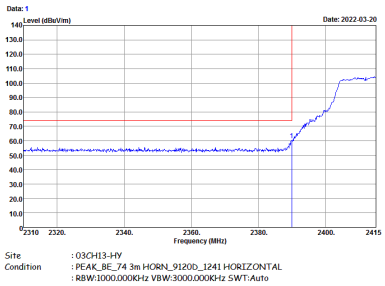
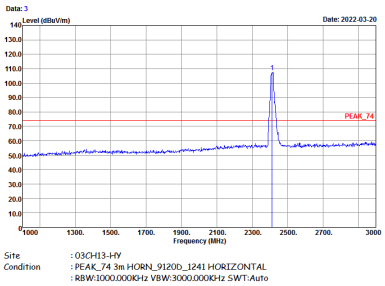
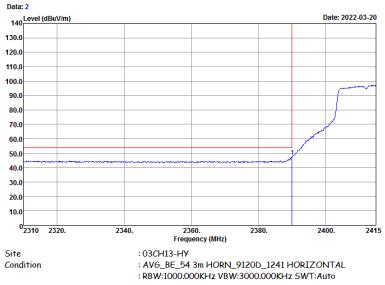
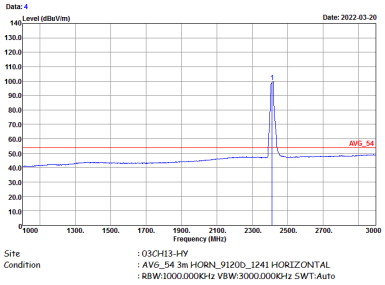
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

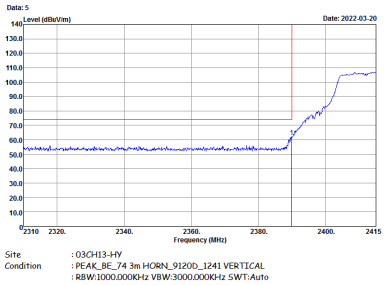
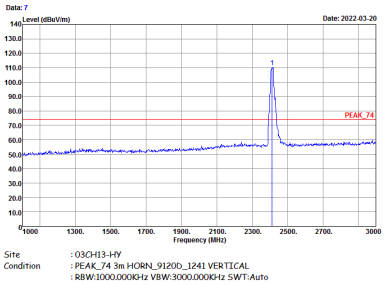
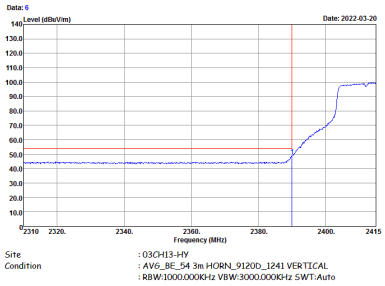
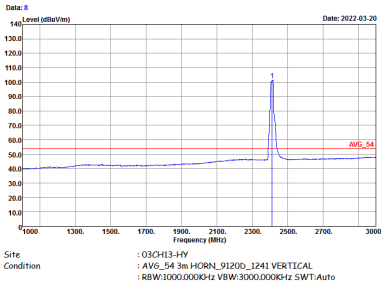
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

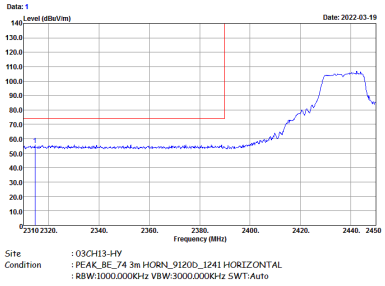
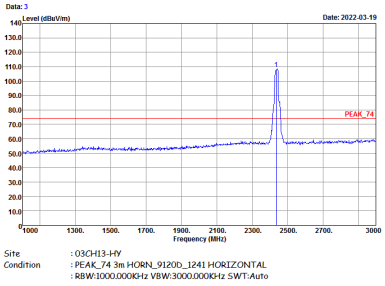
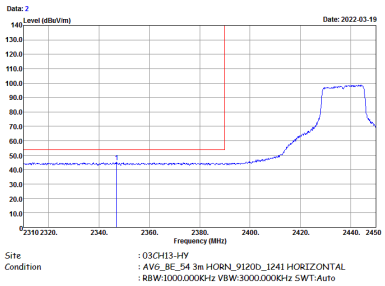
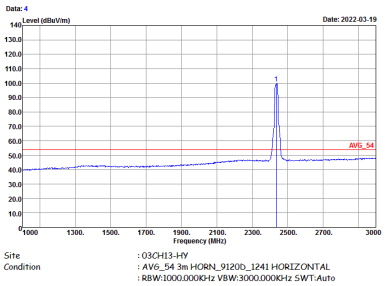
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

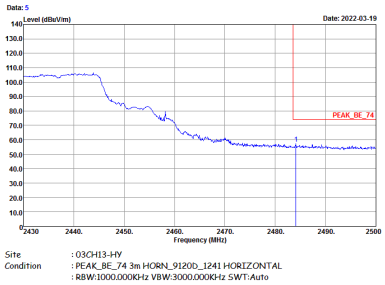
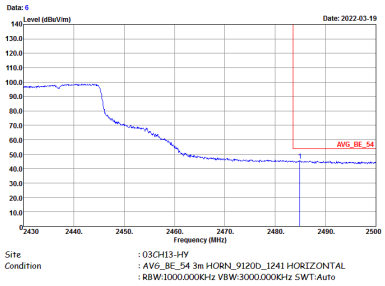
2.4GHz 2400~2483.5MHz

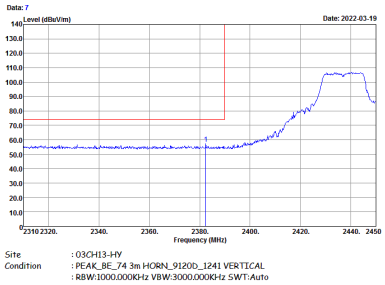
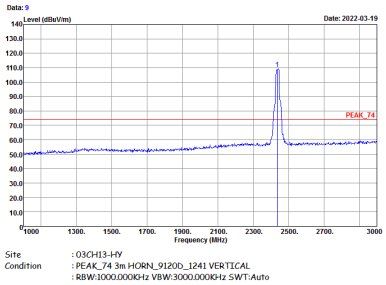
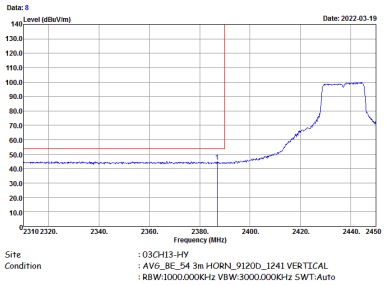
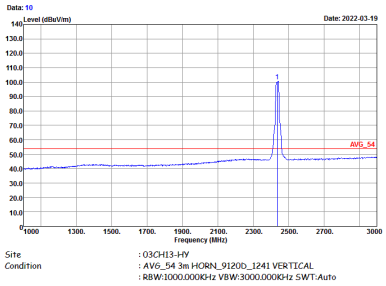
WIFI 802.11g (Band Edge @ 3m)

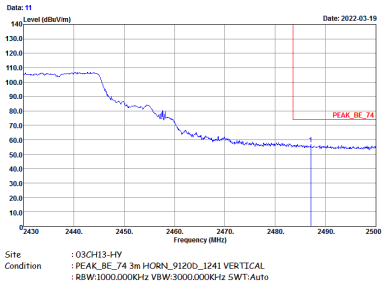
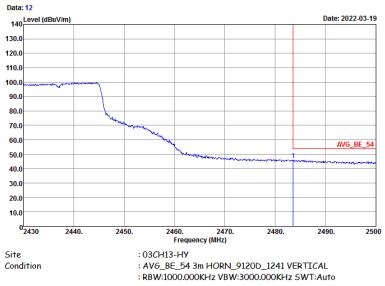
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

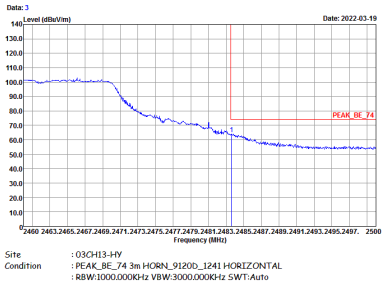
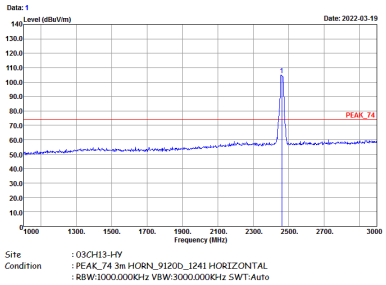
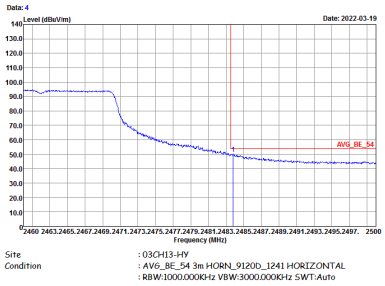
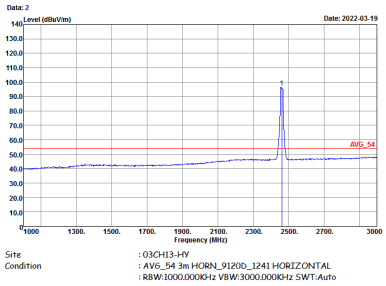
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

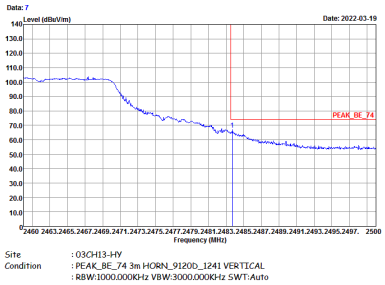
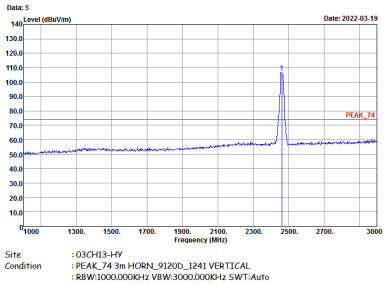
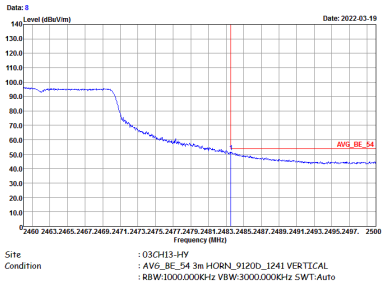
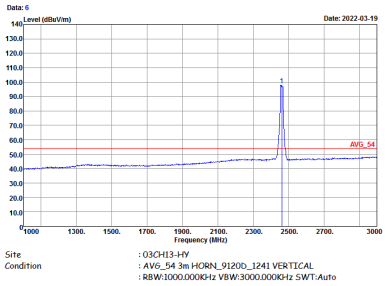
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

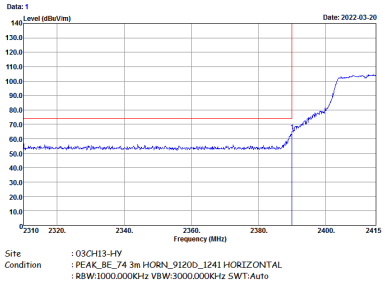
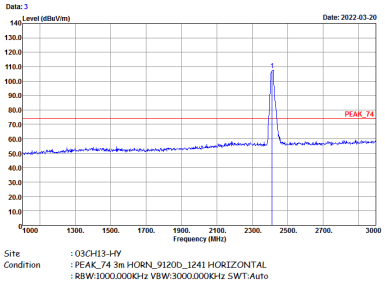
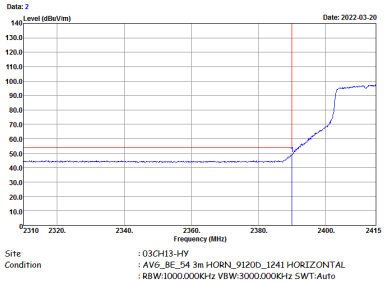
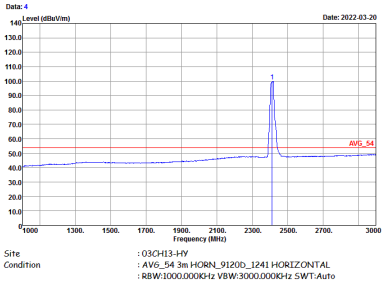
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

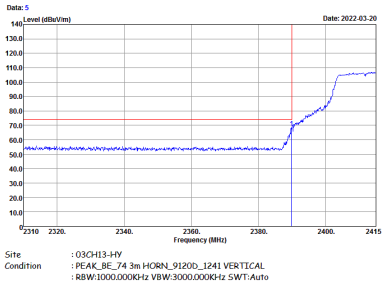
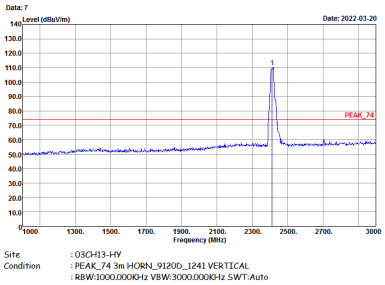
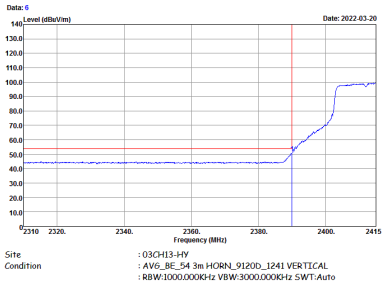
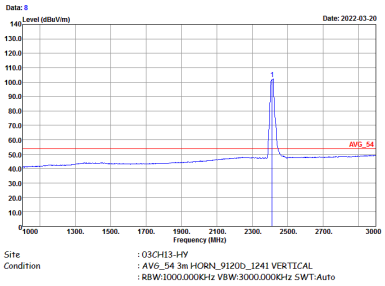
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

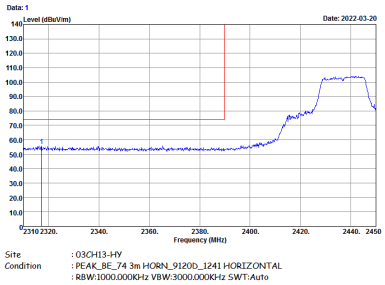
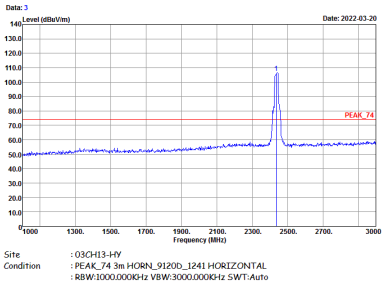
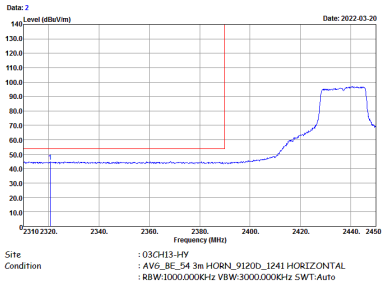
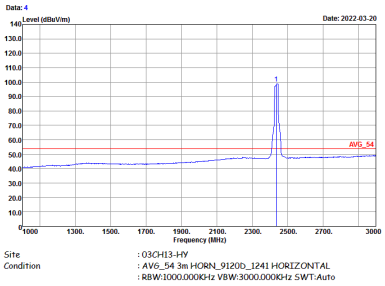
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

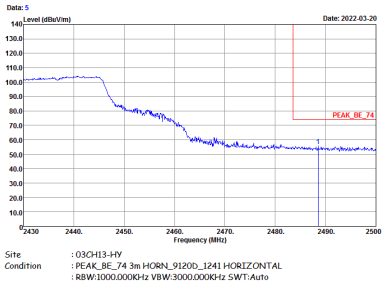
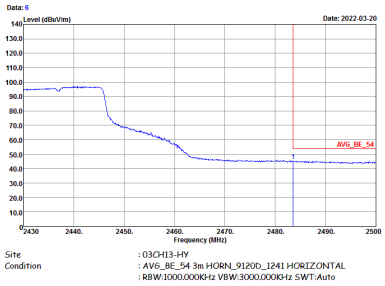
2.4GHz 2400~2483.5MHz

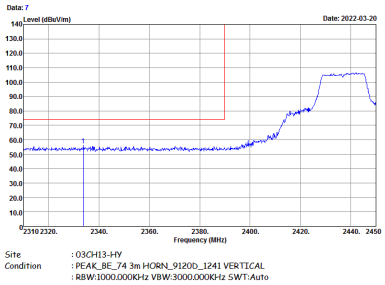
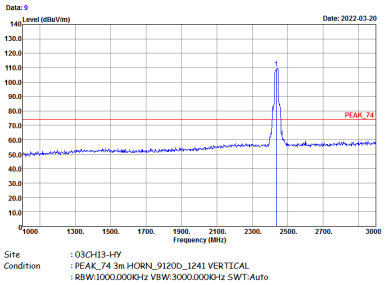
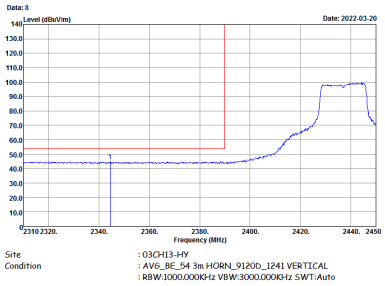
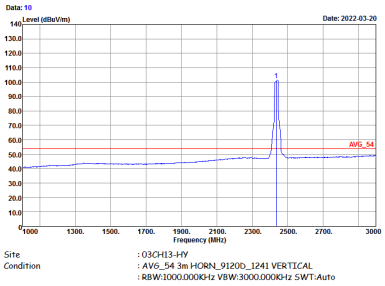
WIFI 802.11n HT20 (Band Edge @ 3m)

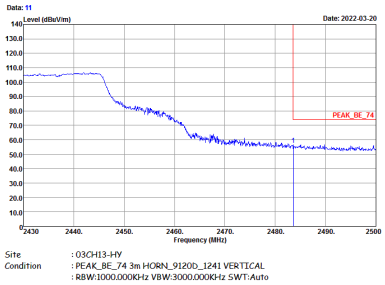
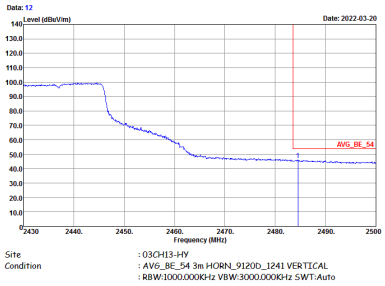
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

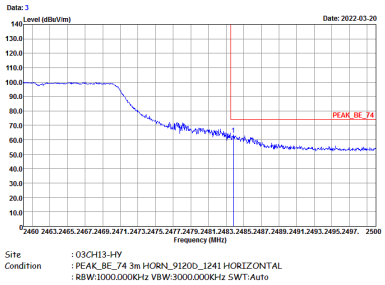
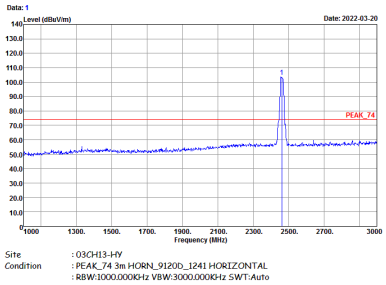
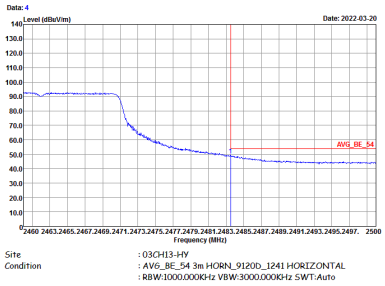
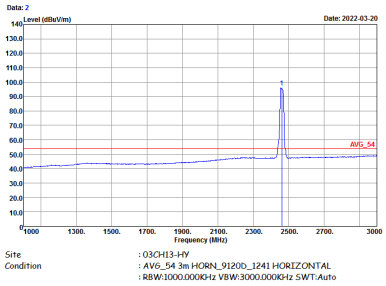
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

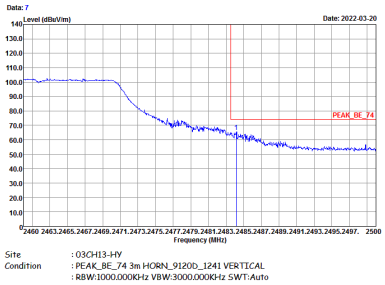
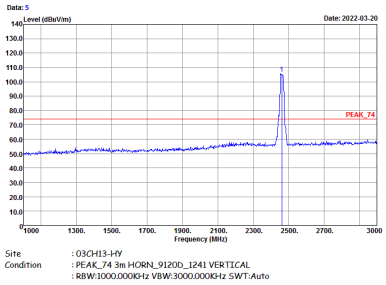
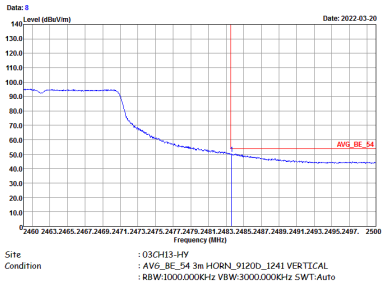
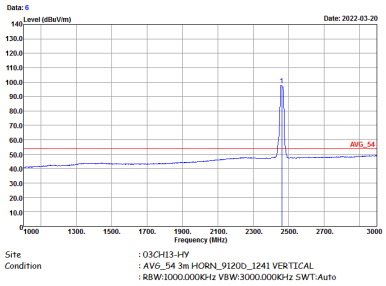
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

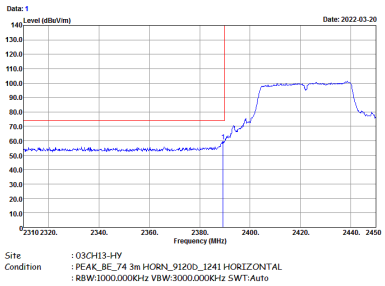
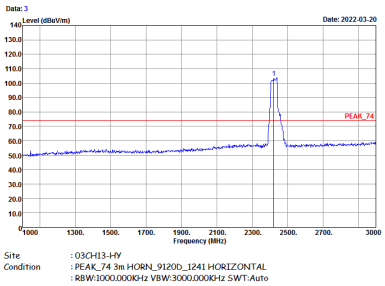
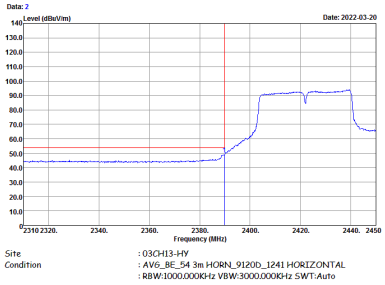
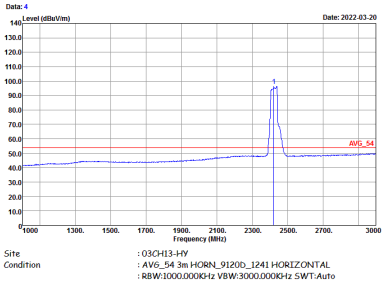
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

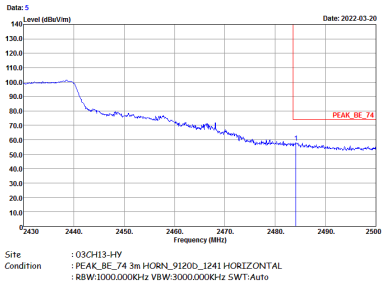
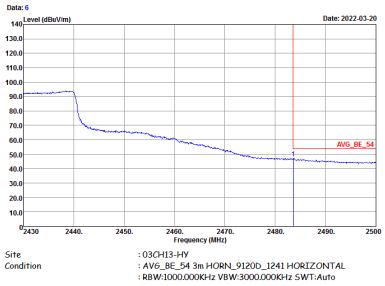
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

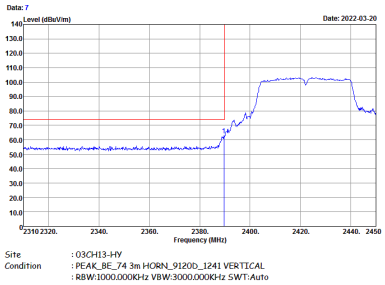
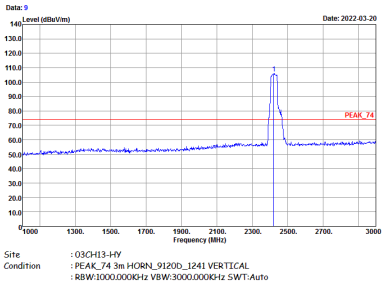
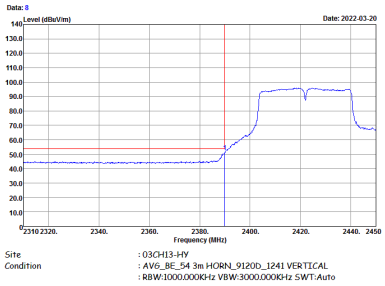
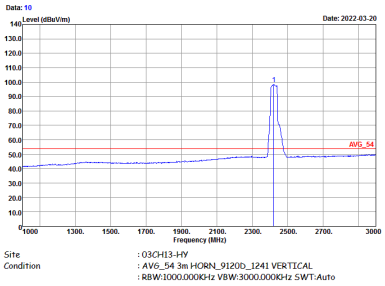
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

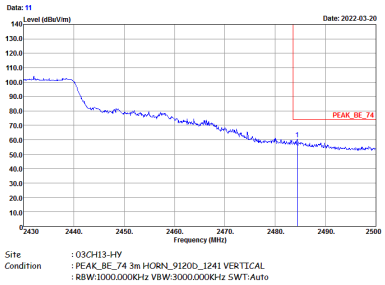
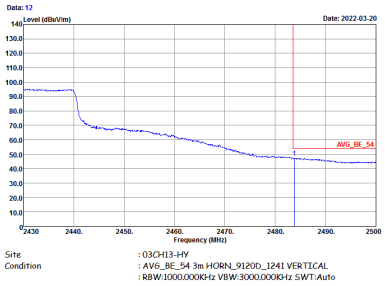
2.4GHz 2400~2483.5MHz

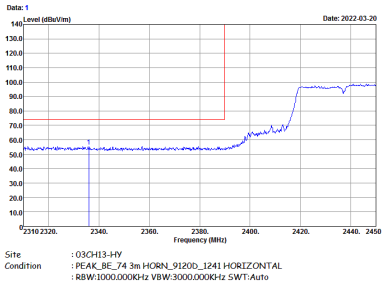
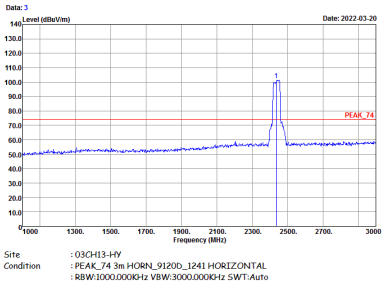
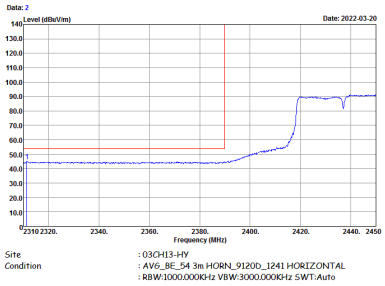
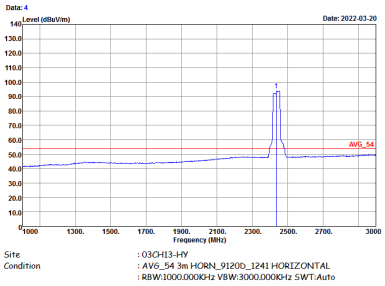
WIFI 802.11n HT40 (Band Edge @ 3m)

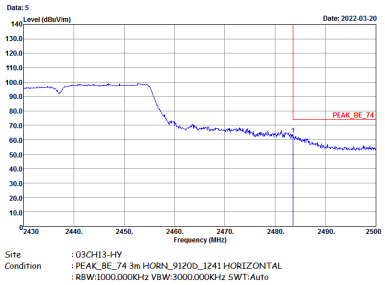
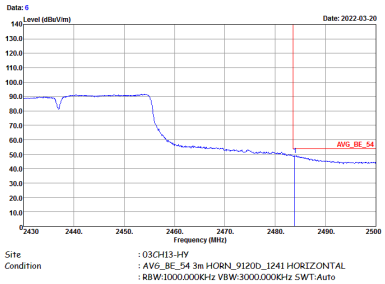
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

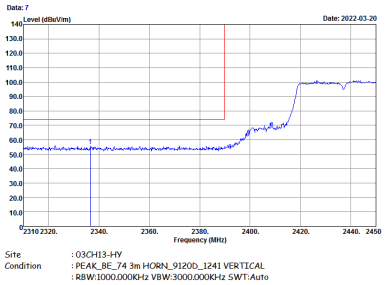
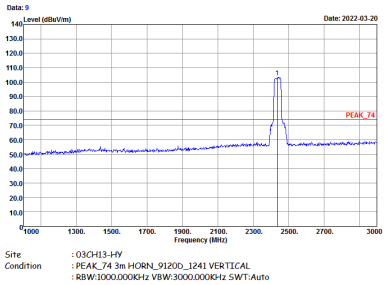
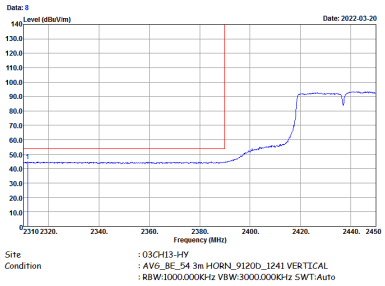
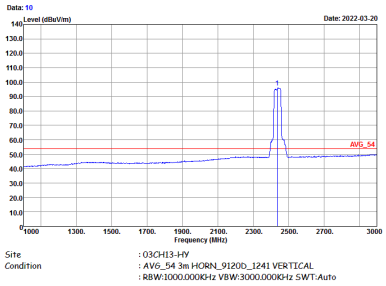
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
1	Horizontal	Fundamental
Peak		Left Blank
Avg.		Left Blank

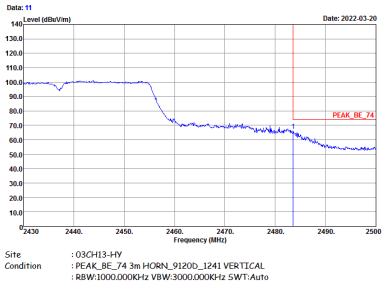
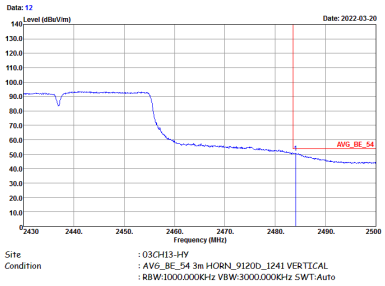
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

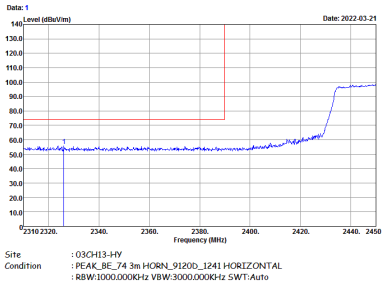
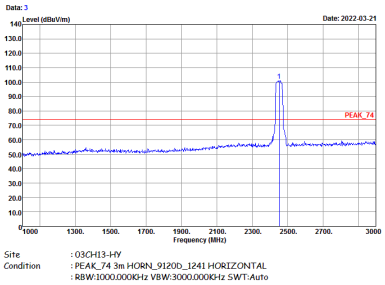
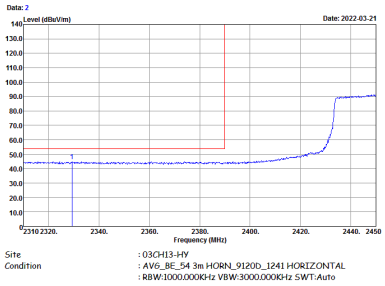
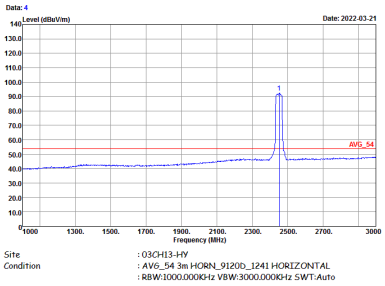
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH03 2422MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

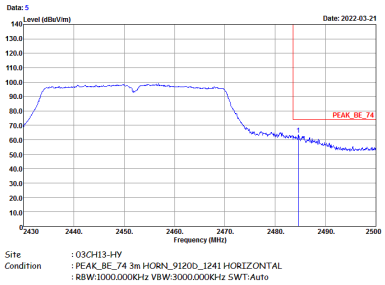
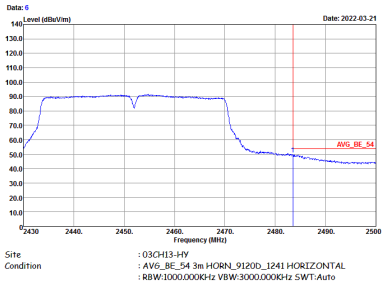
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

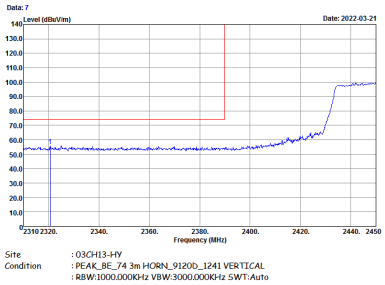
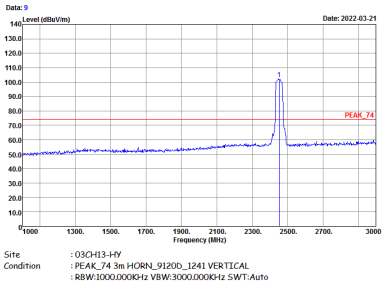
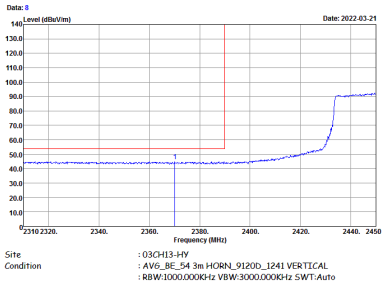
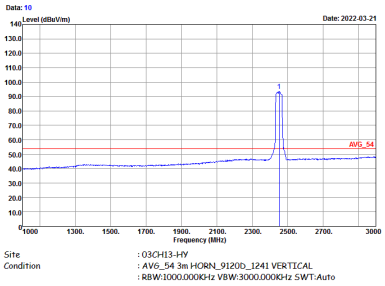
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

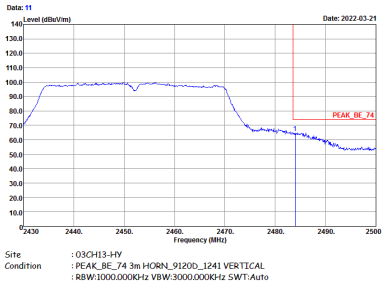
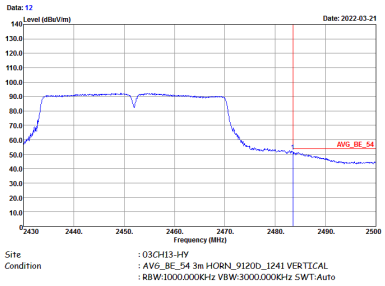
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

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

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

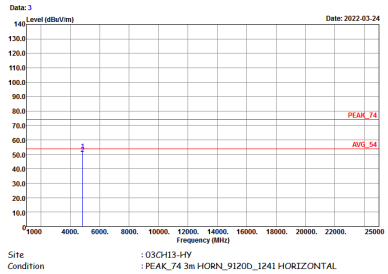
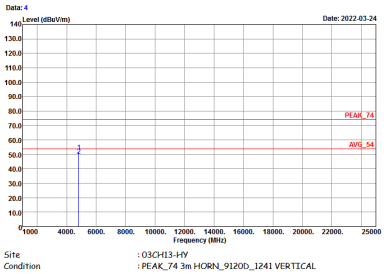
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

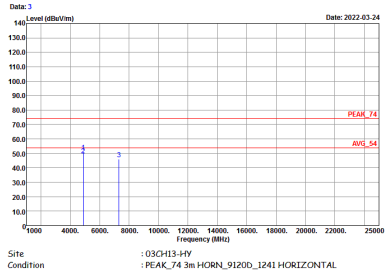
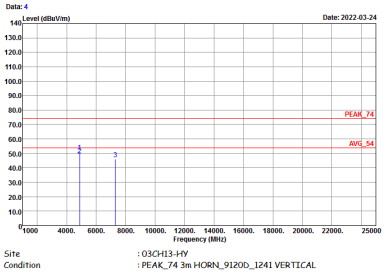
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		

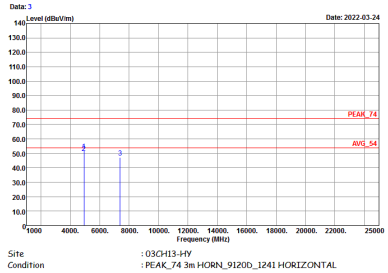
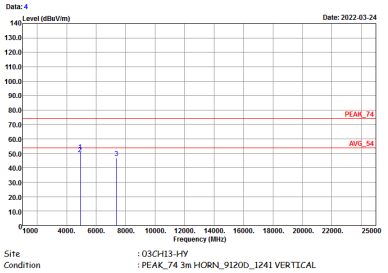
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT40 CH09 2452MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

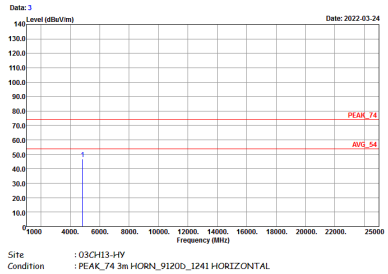
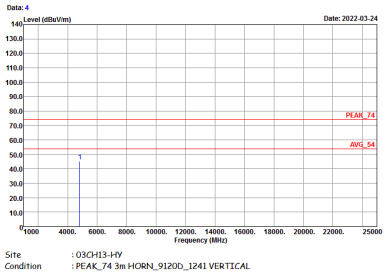
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

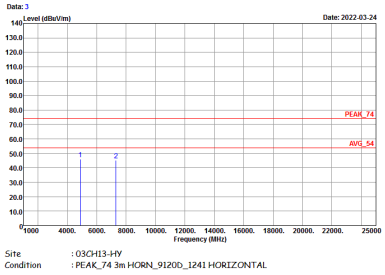
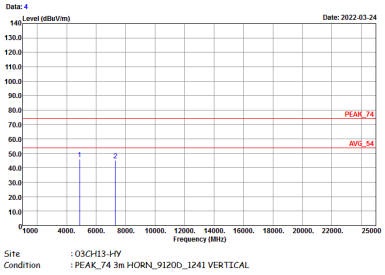
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

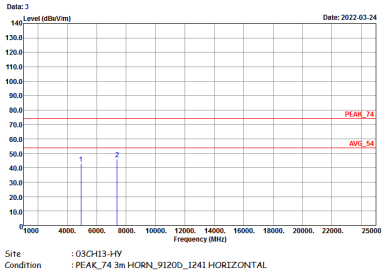
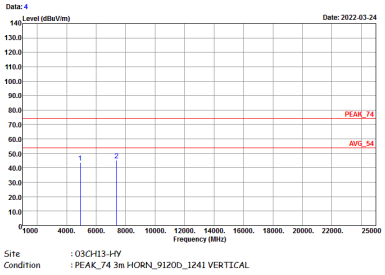
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

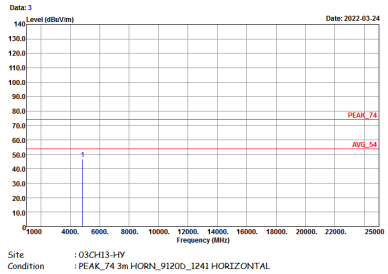
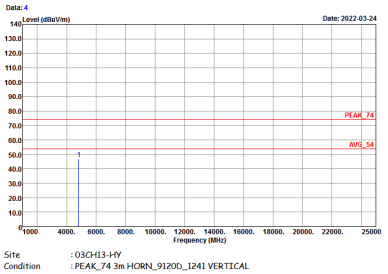
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

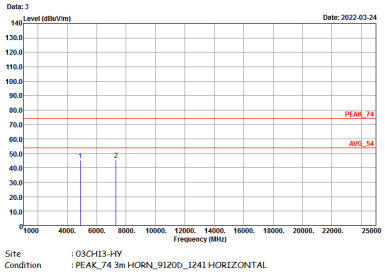
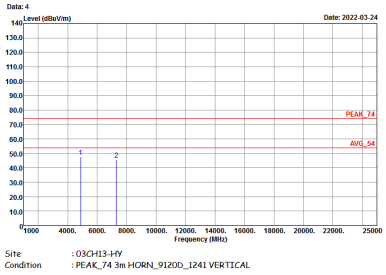
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

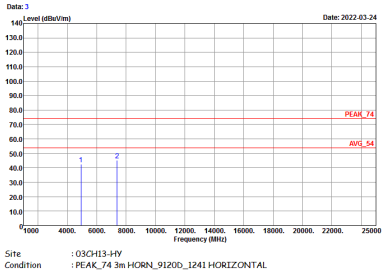
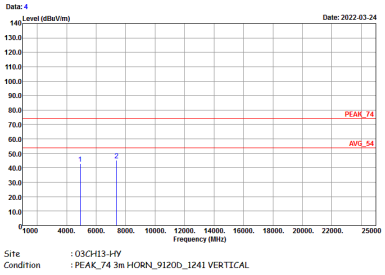
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

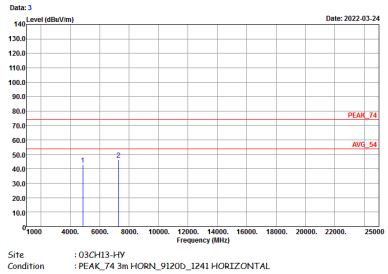
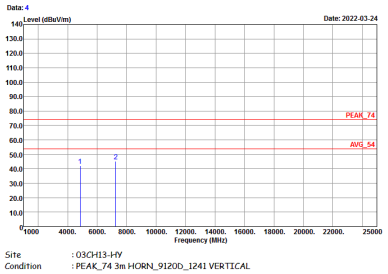
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

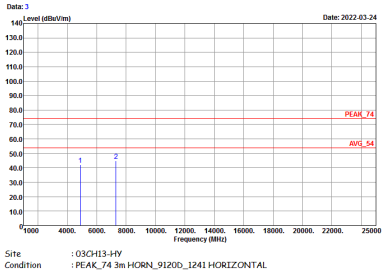
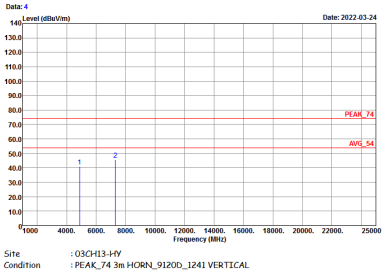
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

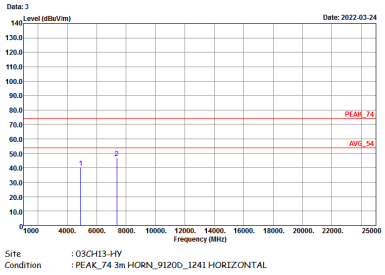
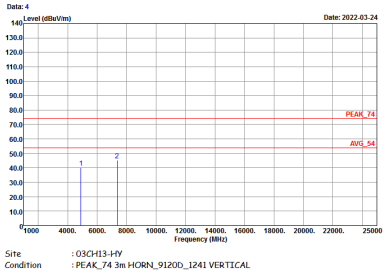
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

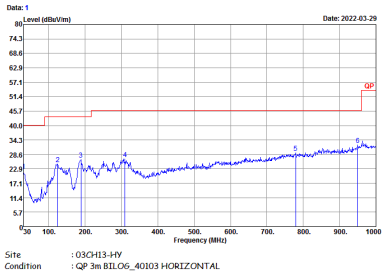
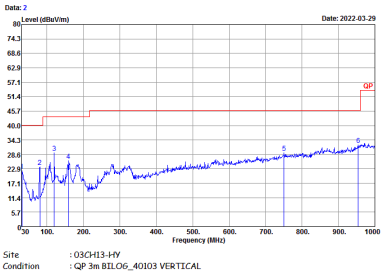
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT40 CH03 2422MHz	
1	Horizontal	Vertical
Peak Avg.		

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

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

Emission below 1GHz

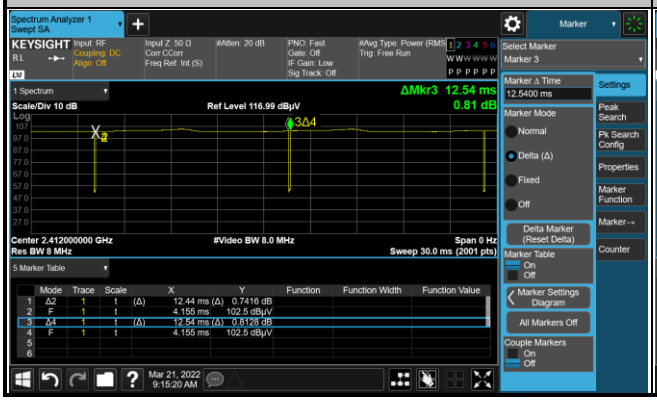
2.4GHz WIFI 802.11n HT40 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT40 LF	
1	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

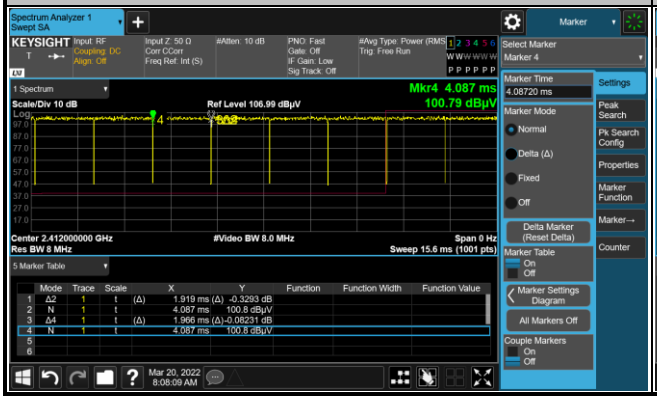
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	99.20	-	-	10Hz
802.11g	98.19	-	-	10Hz
2.4GHz 802.11n HT20	97.61	1919	0.52	1kHz
2.4GHz 802.11n HT40	95.00	950	1.05	3kHz

802.11b



802.11g

802.11n HT20



802.11n HT40