



FCC RADIO TEST REPORT

FCC ID : 2AGOZ-K29W
Equipment : Media Receiver
Brand Name : FACEBOOK
Model Name : WT74BL
Applicant : Facebook Technologies, LLC
1 Hacker Way, Menlo Park, CA 94025, USA
Standard : FCC Part 15 Subpart C §15.247

The product was received on Mar. 24, 2021 and testing was started from Mar. 31, 2021 and completed on Apr. 30, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FR130215C	01	Initial issue of report	May 18, 2021



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.247(a)(2)	6dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.247(b)	Power Output Measurement	Pass	-
3.3	15.247(e)	Power Spectral Density	Pass	-
3.4	15.247(d)	Conducted Band Edges	Pass	-
		Conducted Spurious Emission	Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass	Under limit 1.18 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	Pass	Under limit 14.31 dB at 0.152 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:

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

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Ruby Zou



1 General Description

1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n and Wi-Fi 5GHz 802.11a/n/ac

Product Specification subjective to this standard	
Antenna Type	WLAN <Ant. 1>: PIFA Antenna <Ant. 2>: PIFA Antenna Bluetooth: PIFA Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	<Ant. 1>: 4.9 <Ant. 2>: 4.7

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

1.2 Modification of EUT

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



1.3 Testing Location

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

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

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH11-HY (TAF Code: 3786)
Remark	The Radiated Spurious Emissions test item subcontracted to Sporton International Inc. Wensan Laboratory

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

FCC designation No.: TW0007 and TW3786

1.4 Applicable Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in two config (Panel Setting Tilt and Panel Setting Upright). The worst cases (Panel Setting Tilt) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

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

2.2 Test Mode

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

MIMO Antenna

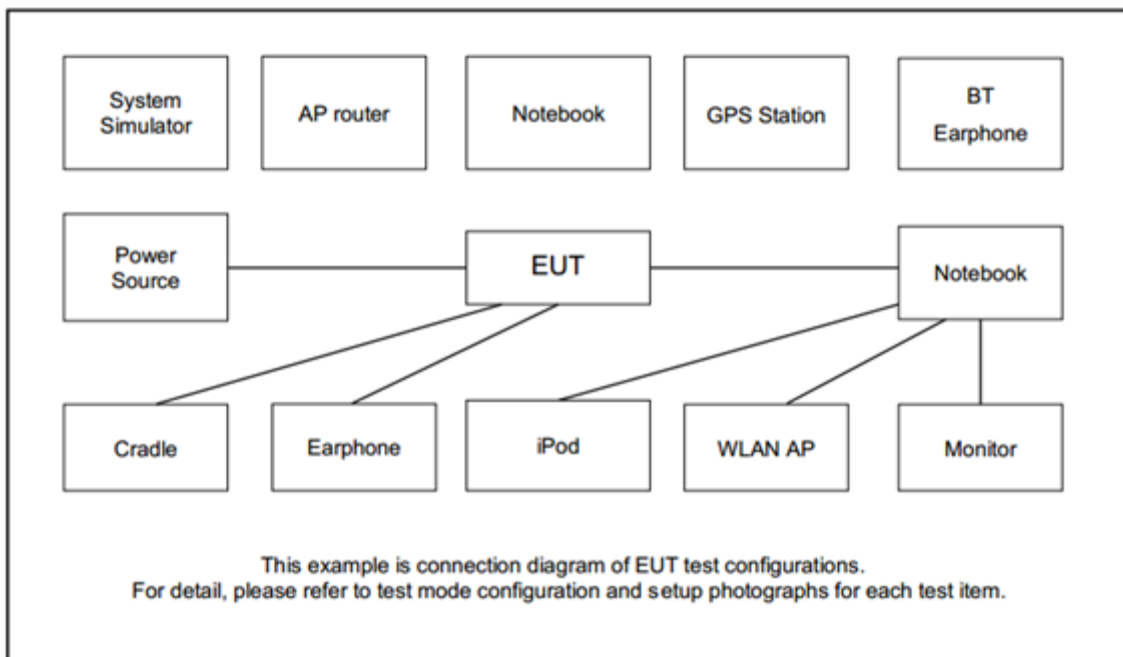
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4GHz) Link + Camera + Portable Device (USB Type C Charging) + AC Adapter 1
Remark: For Radiated Test Cases, the tests were performed with Adapter 1	

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

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

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	Latitude E6320	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
4.	Phone	SAMSUNG	SM-A730F/DS	A3LSMA730F	Shielded, 1.0m	N/A



2.5 EUT Operation Test Setup

The RF test items, utility “QRCT 4 Version4.0.00147.0” 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.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

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

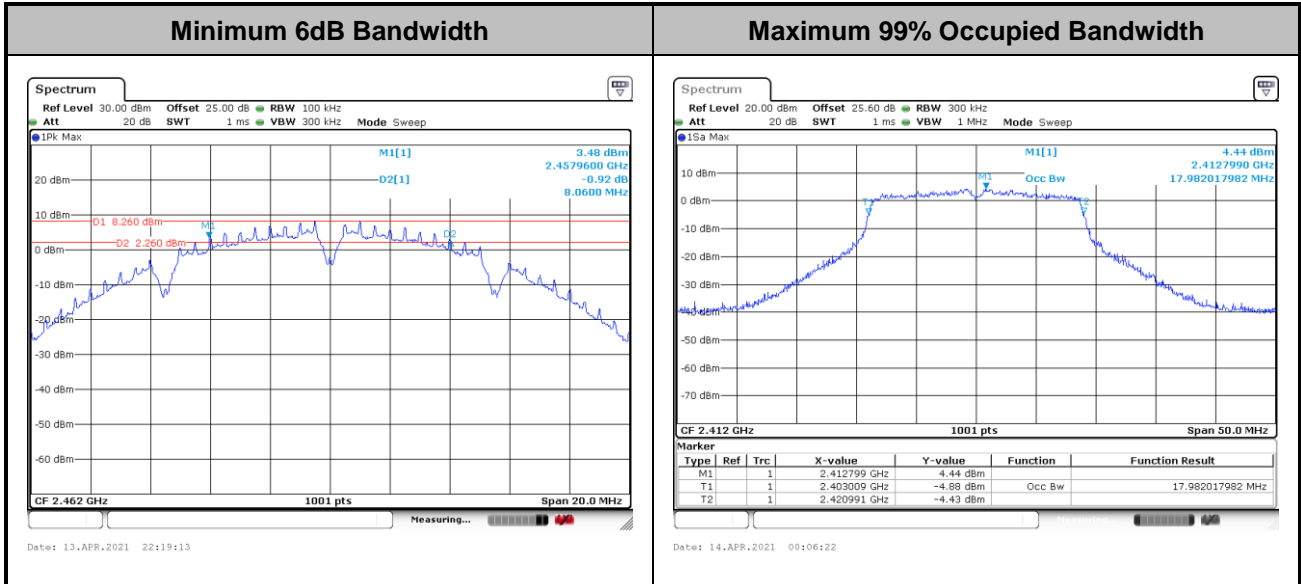
3.1.4 Test Setup





3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

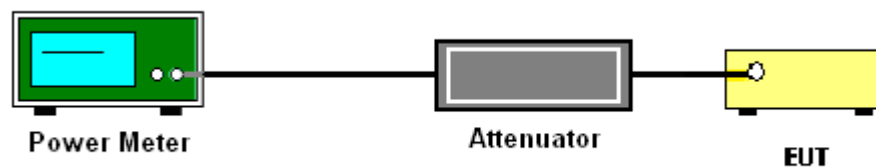
3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

3.2.3 Test Procedures

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

3.2.4 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

See list of measuring equipment of this test report.

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

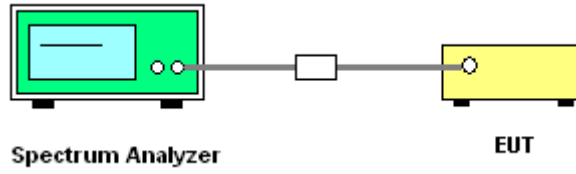
If measurements performed using method (2) plus $10 \log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

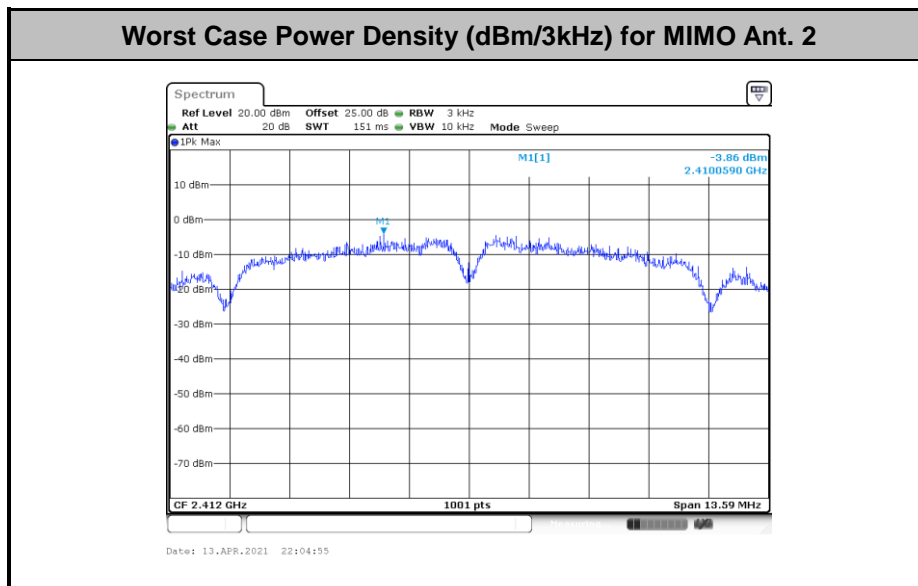
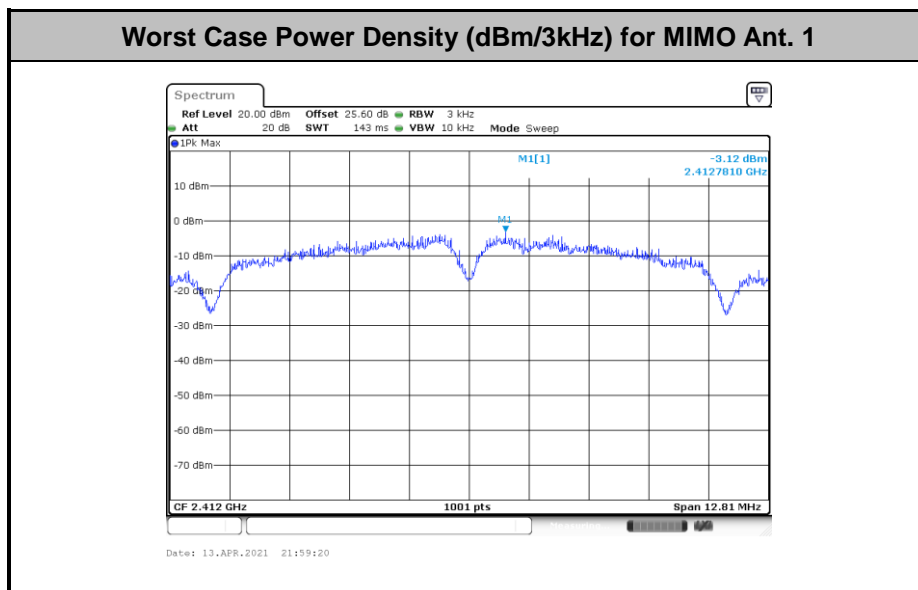
Method (2): Measure and add $10 \log(N)$ dB, where N is the number of outputs. (N=2)

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

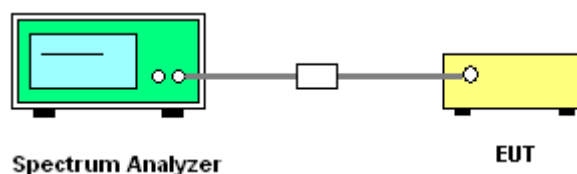
3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

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

3.4.4 Test Setup



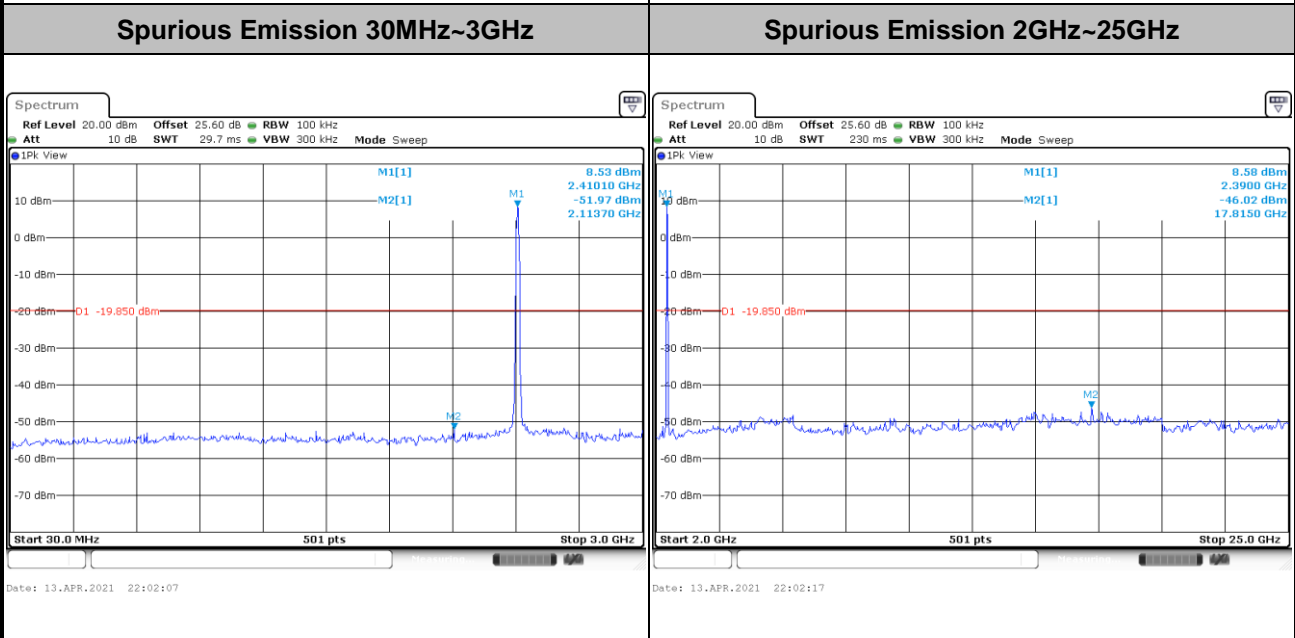
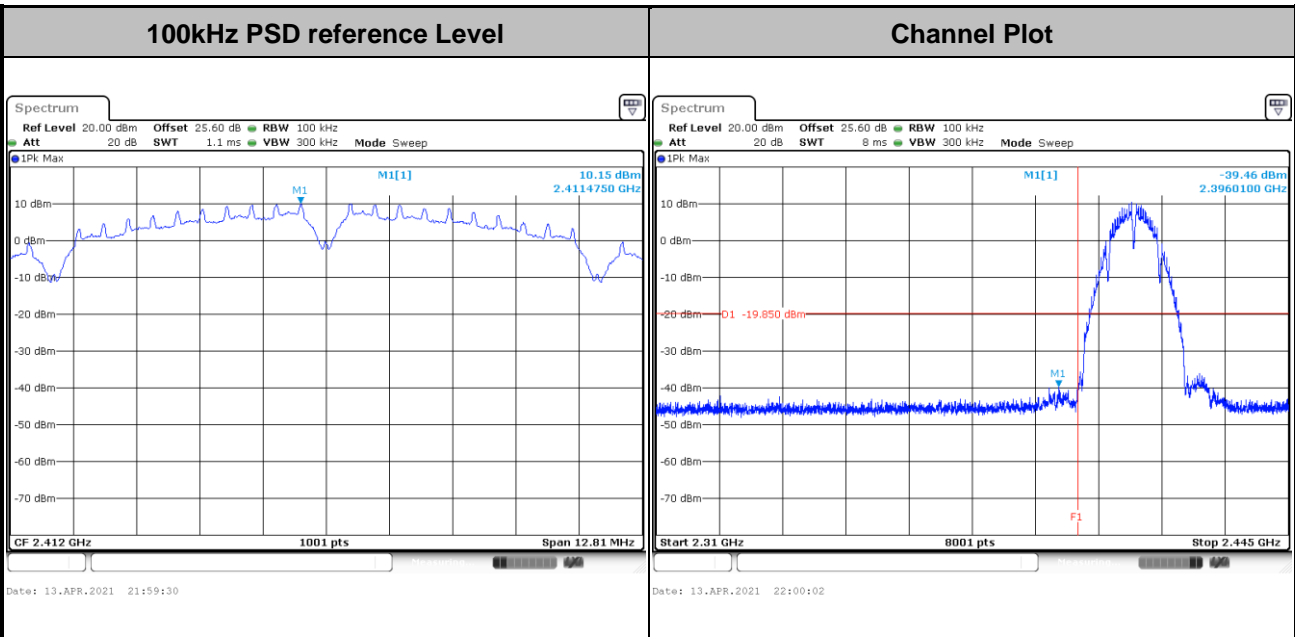


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Engineer : Junyu Zhou	Temperature :	22.8~23.2°C
	Relative Humidity :	46.6~57.4%

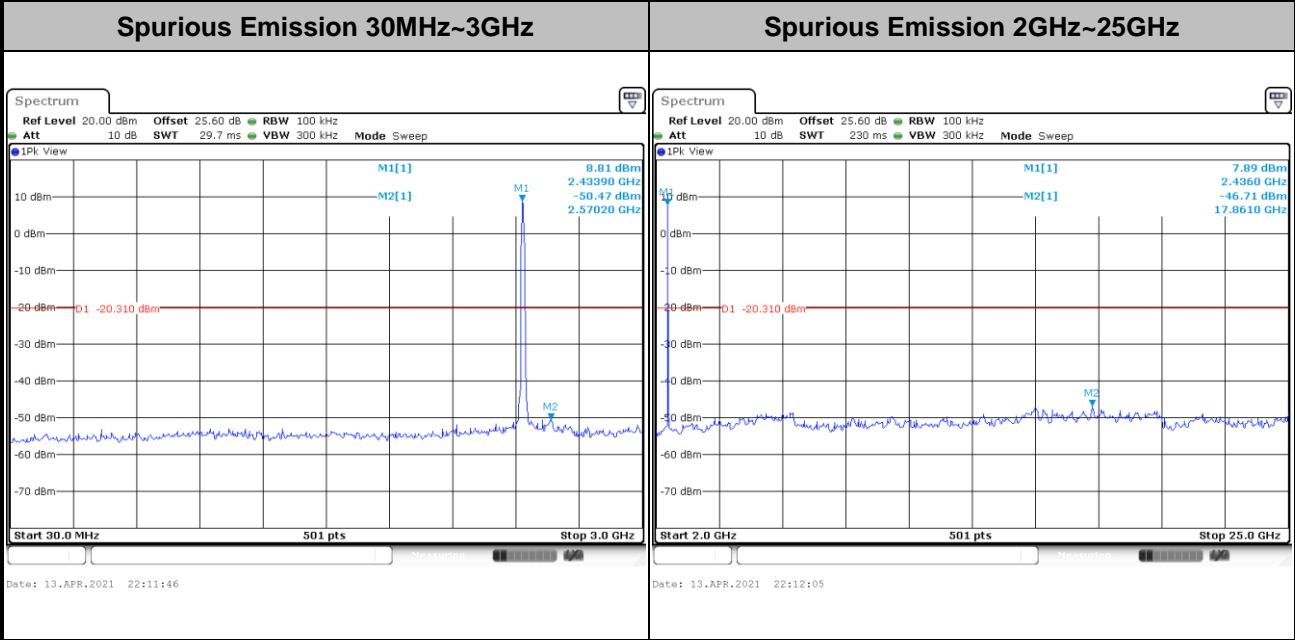
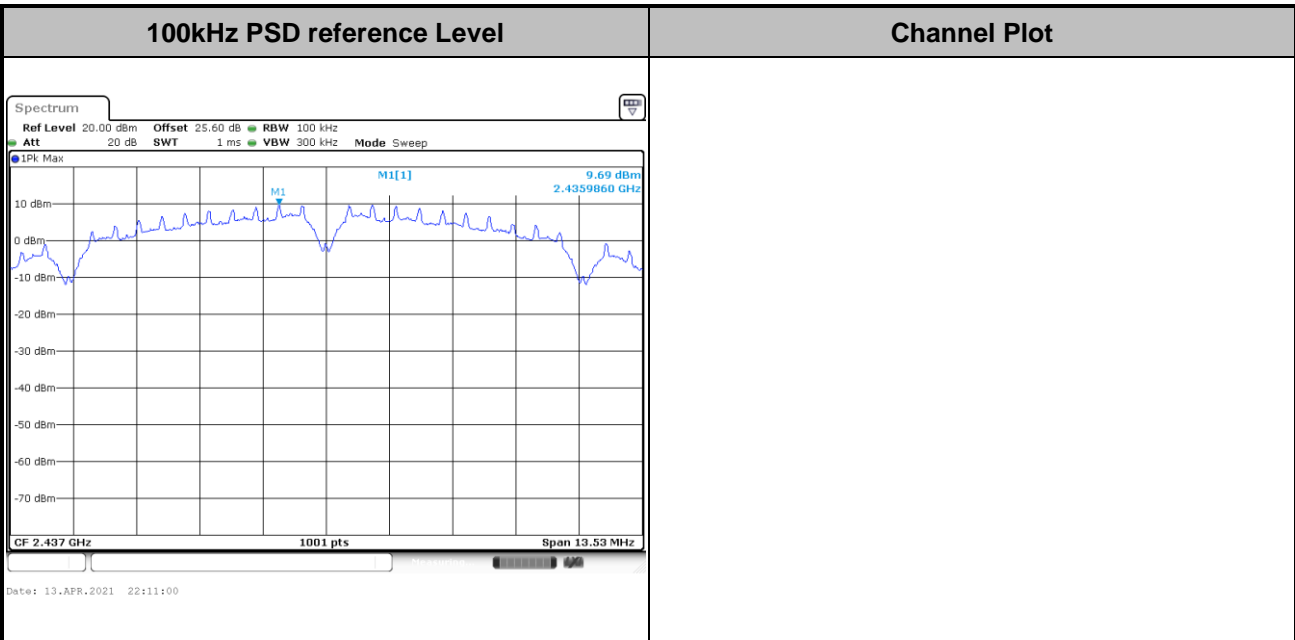
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01
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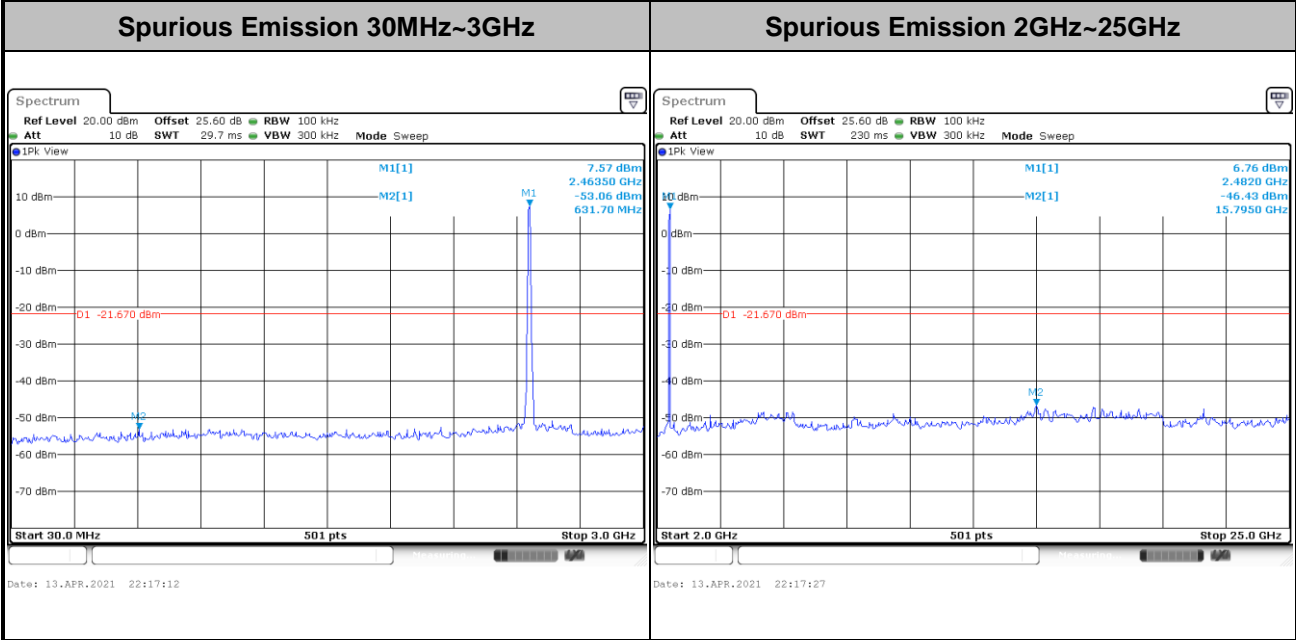
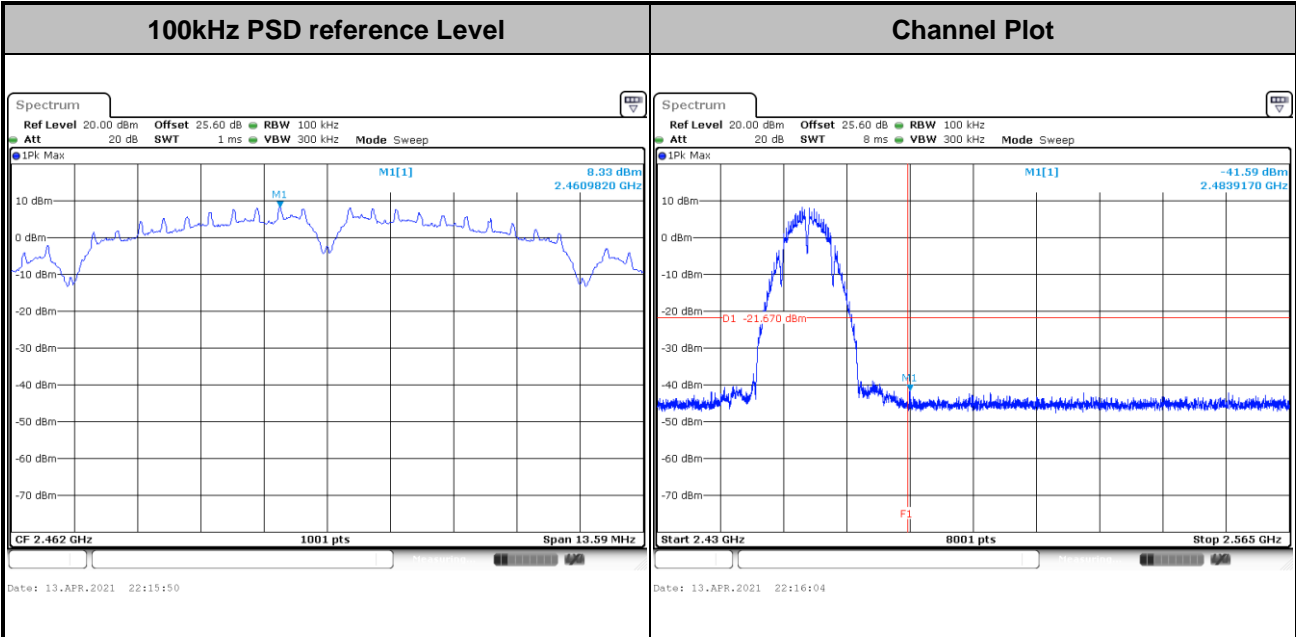


Test Mode :	802.11b	Test Channel :	06
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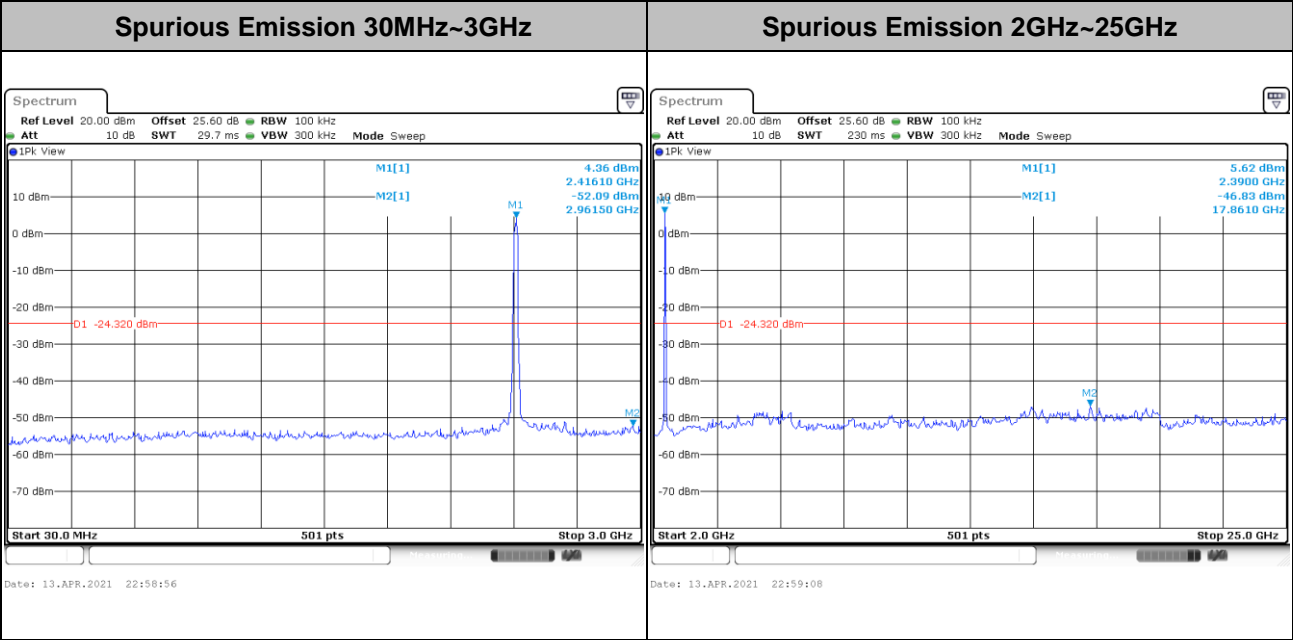
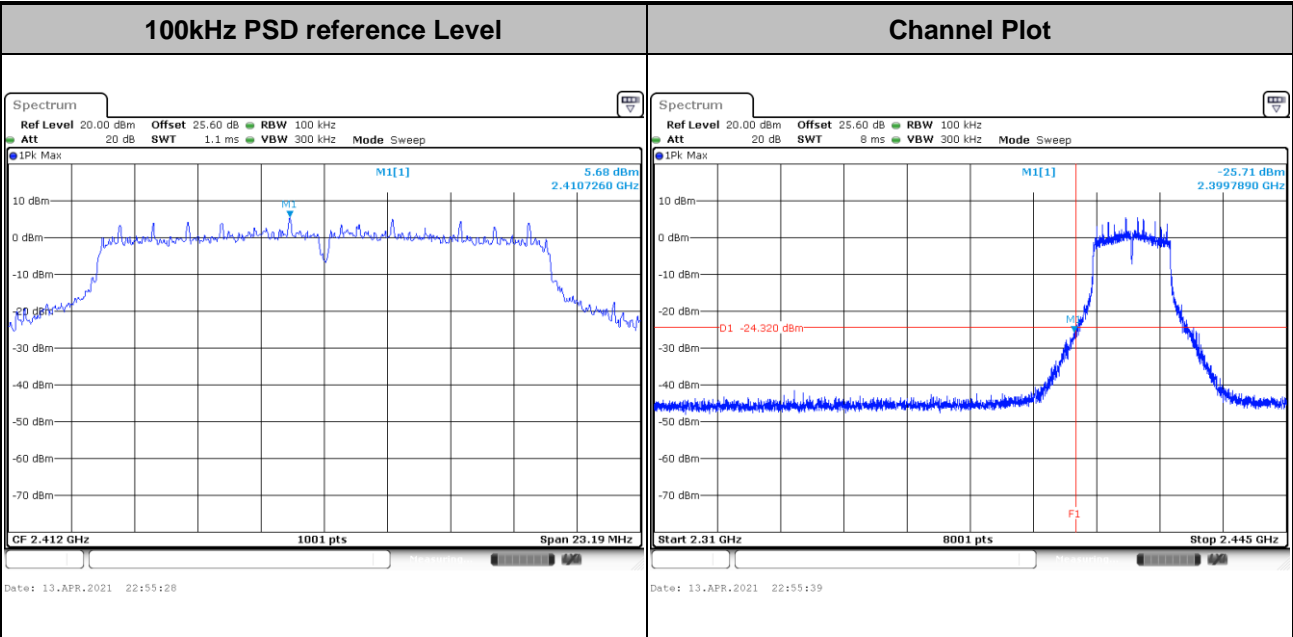


Test Mode :	802.11b	Test Channel :	11
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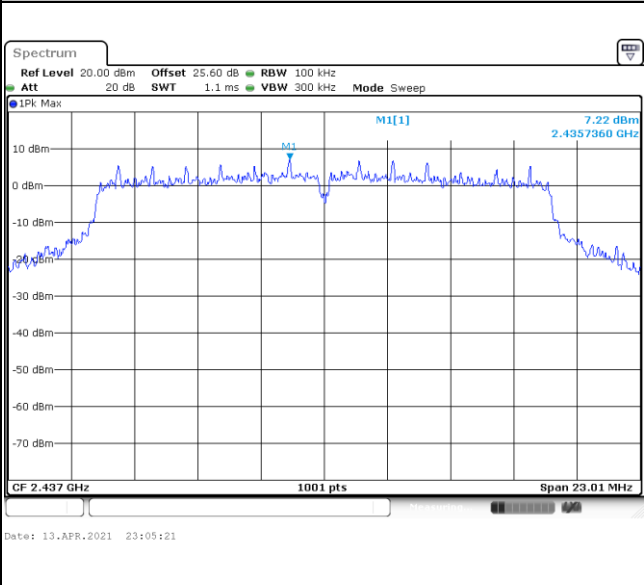
Test Mode : 802.11g Test Channel : 01



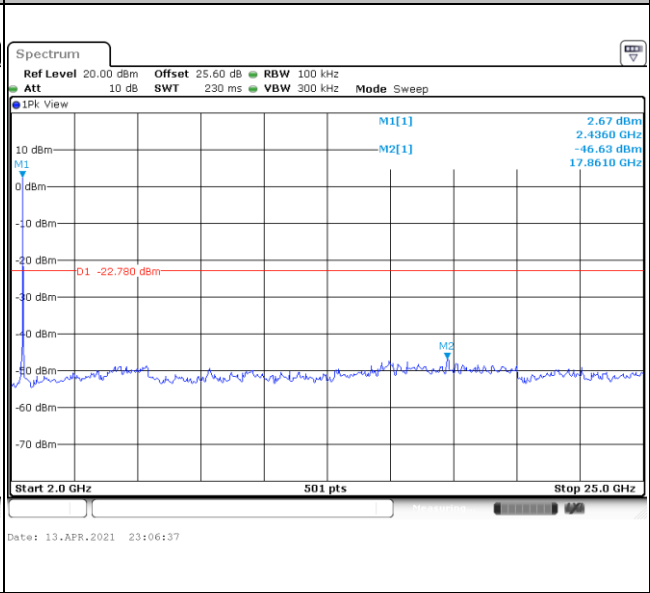
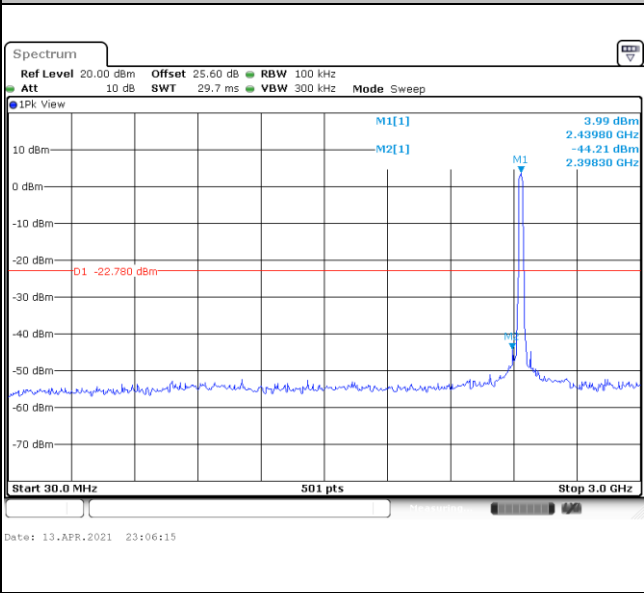


Test Mode :	802.11g	Test Channel :	06
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100kHz PSD reference Level	Channel Plot
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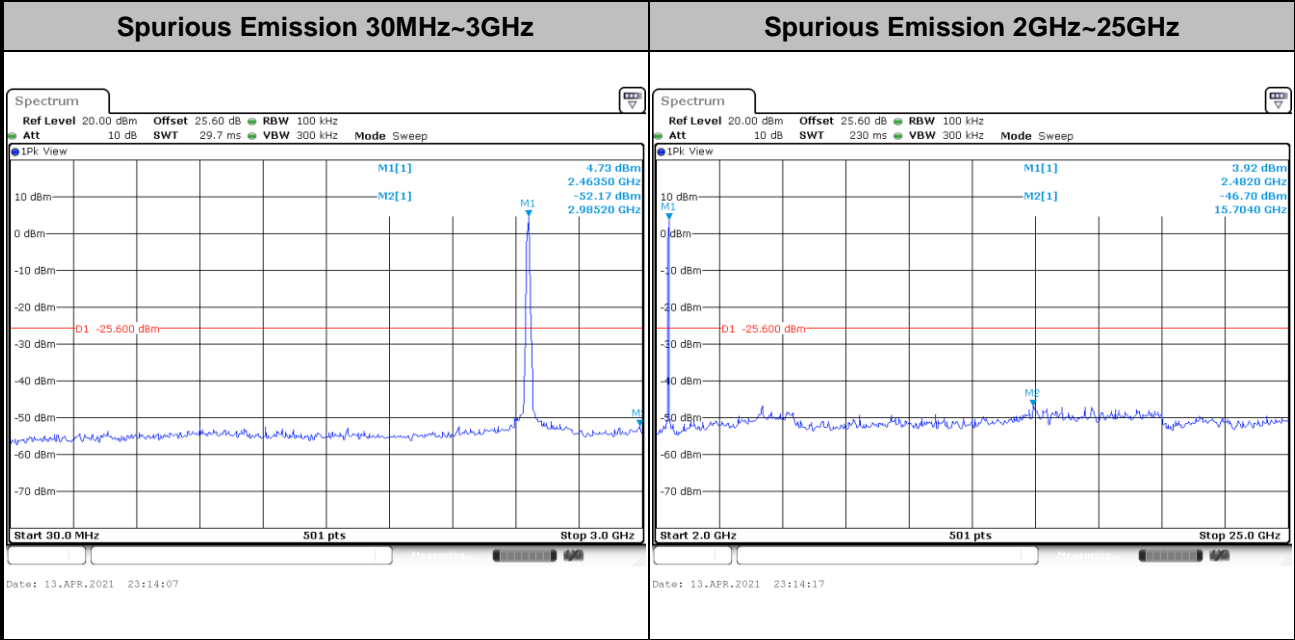
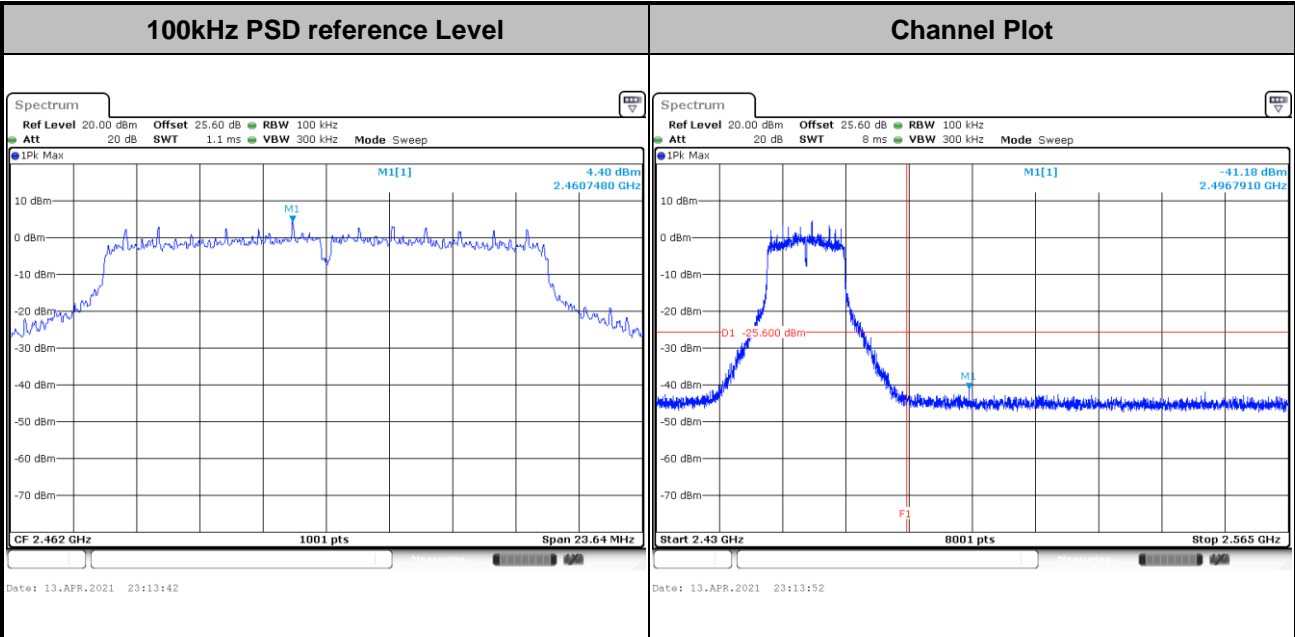


Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
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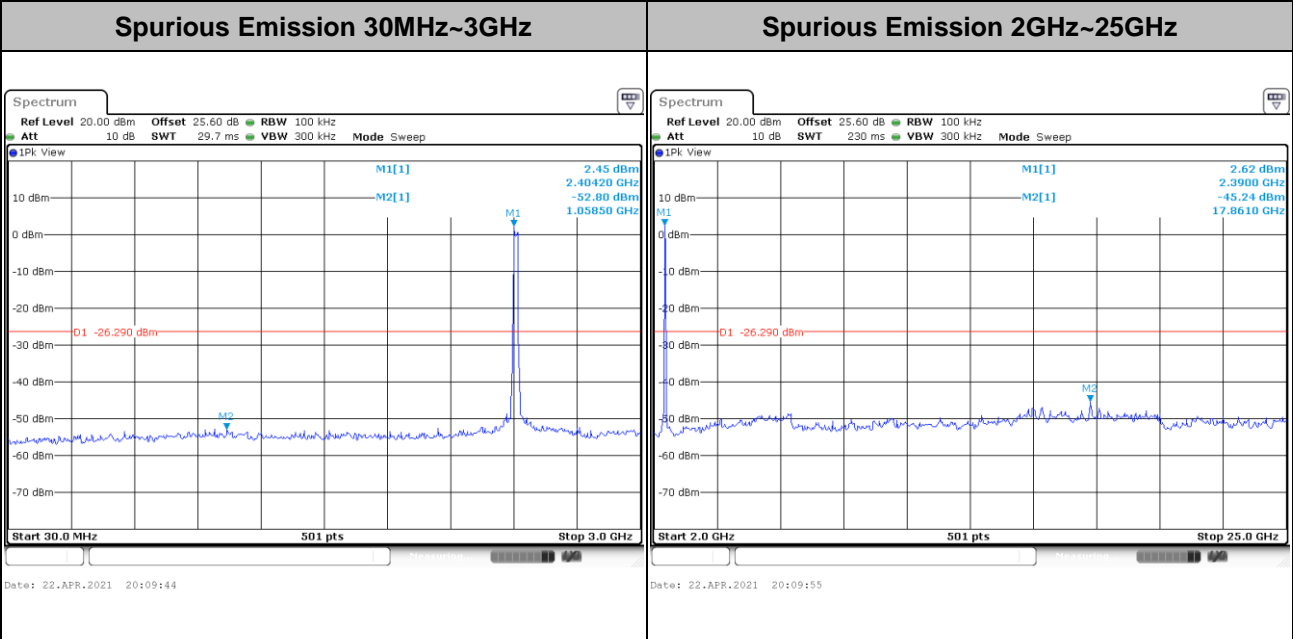
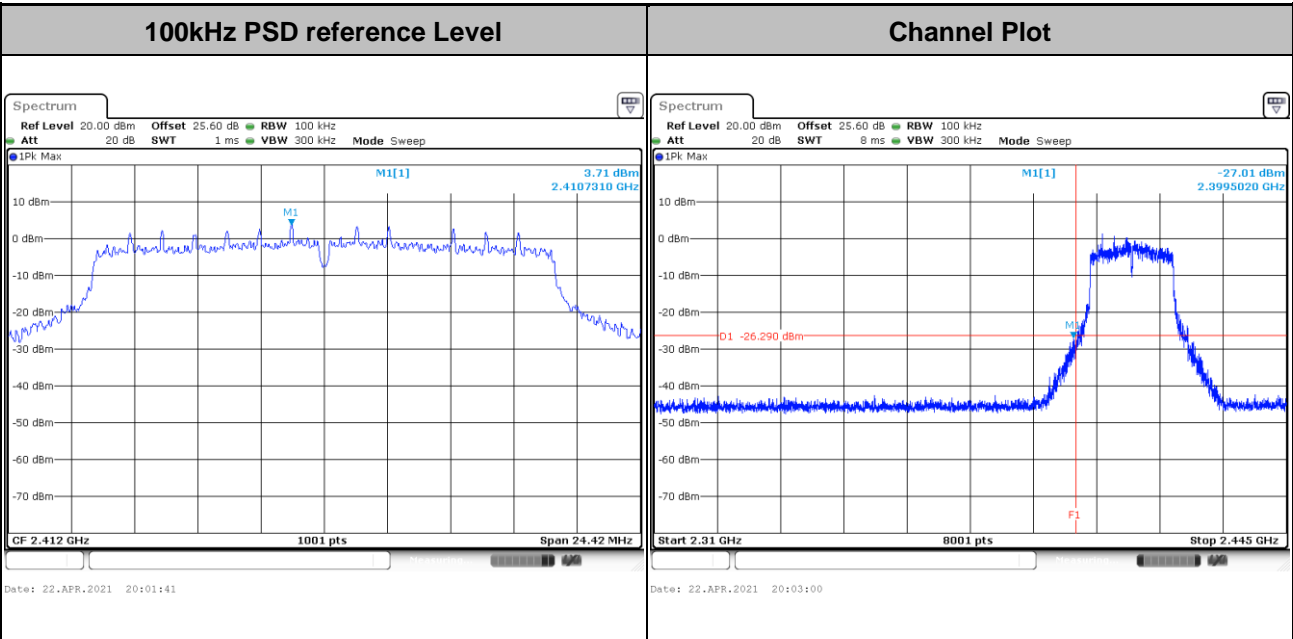


Test Mode :	802.11g	Test Channel :	11
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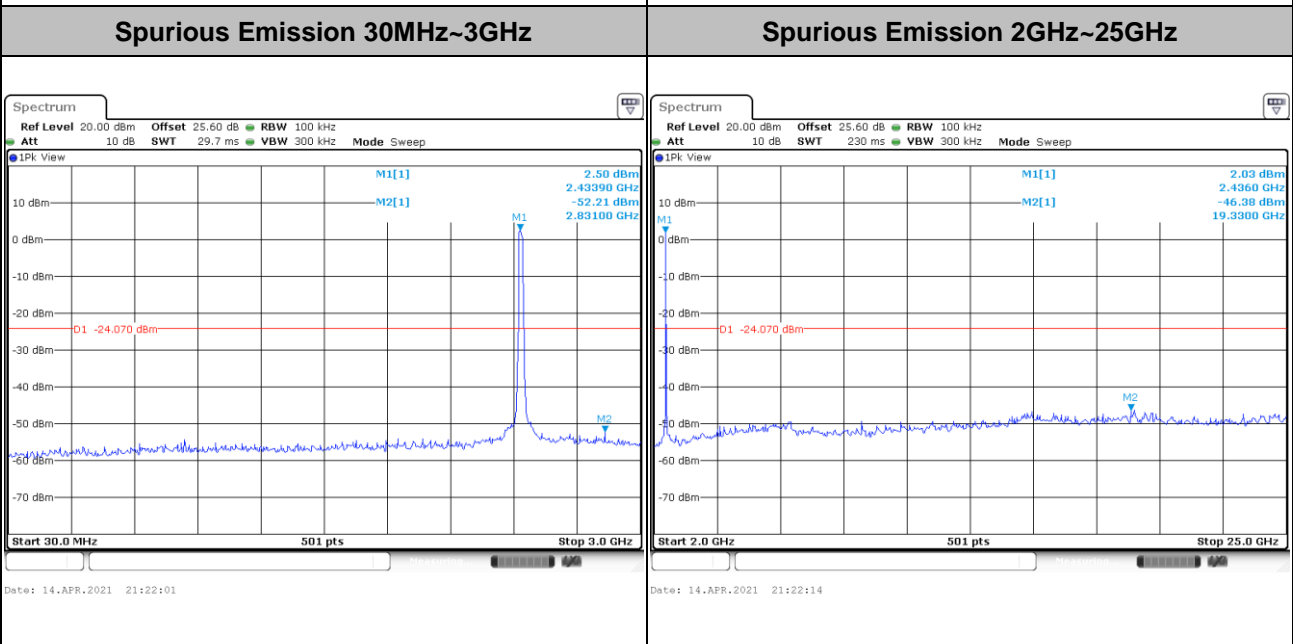
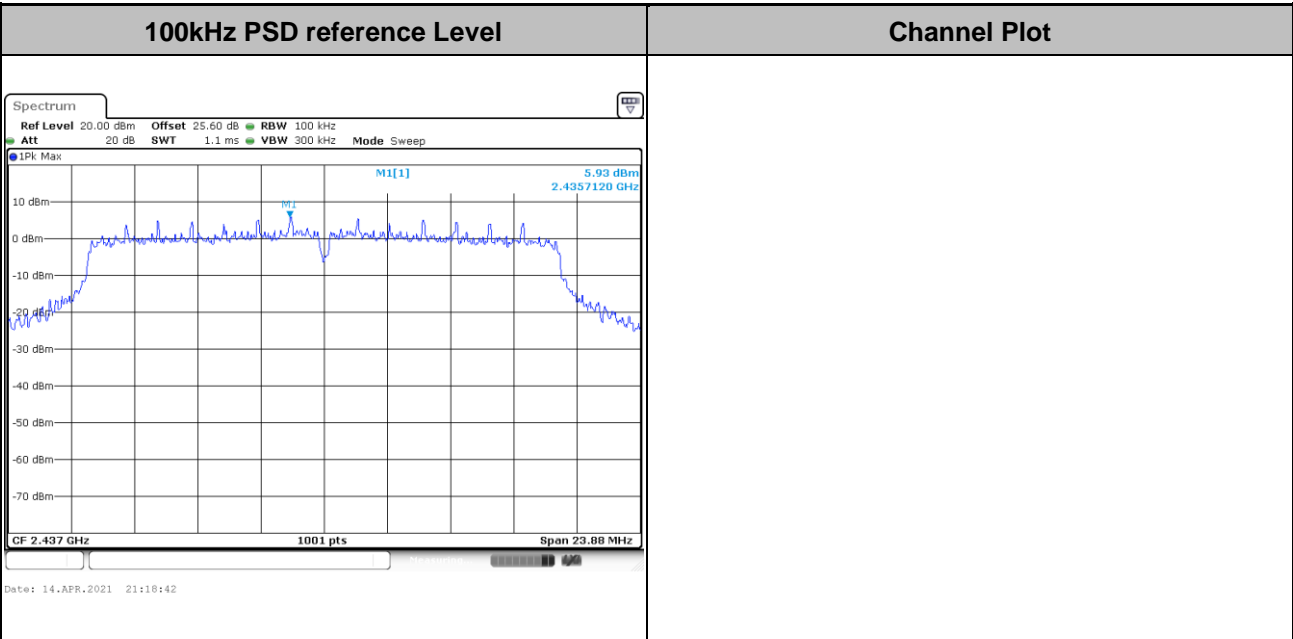


Test Mode : 802.11n HT20 Test Channel : 01



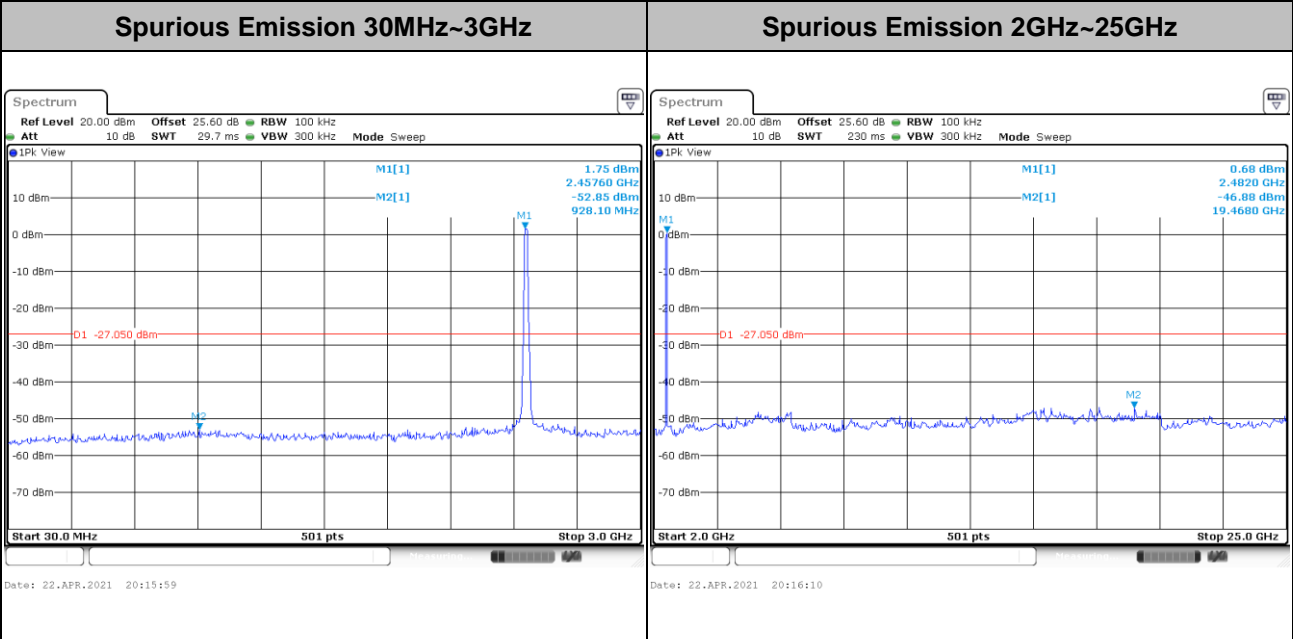
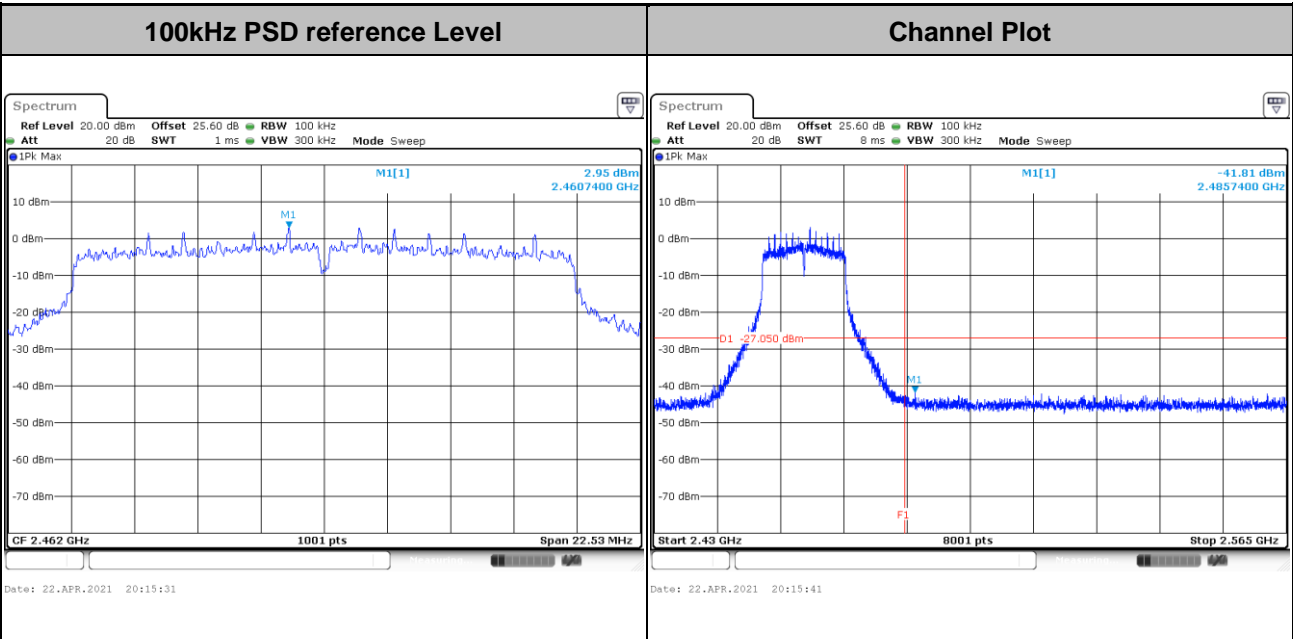


Test Mode :	802.11n HT20	Test Channel :	06
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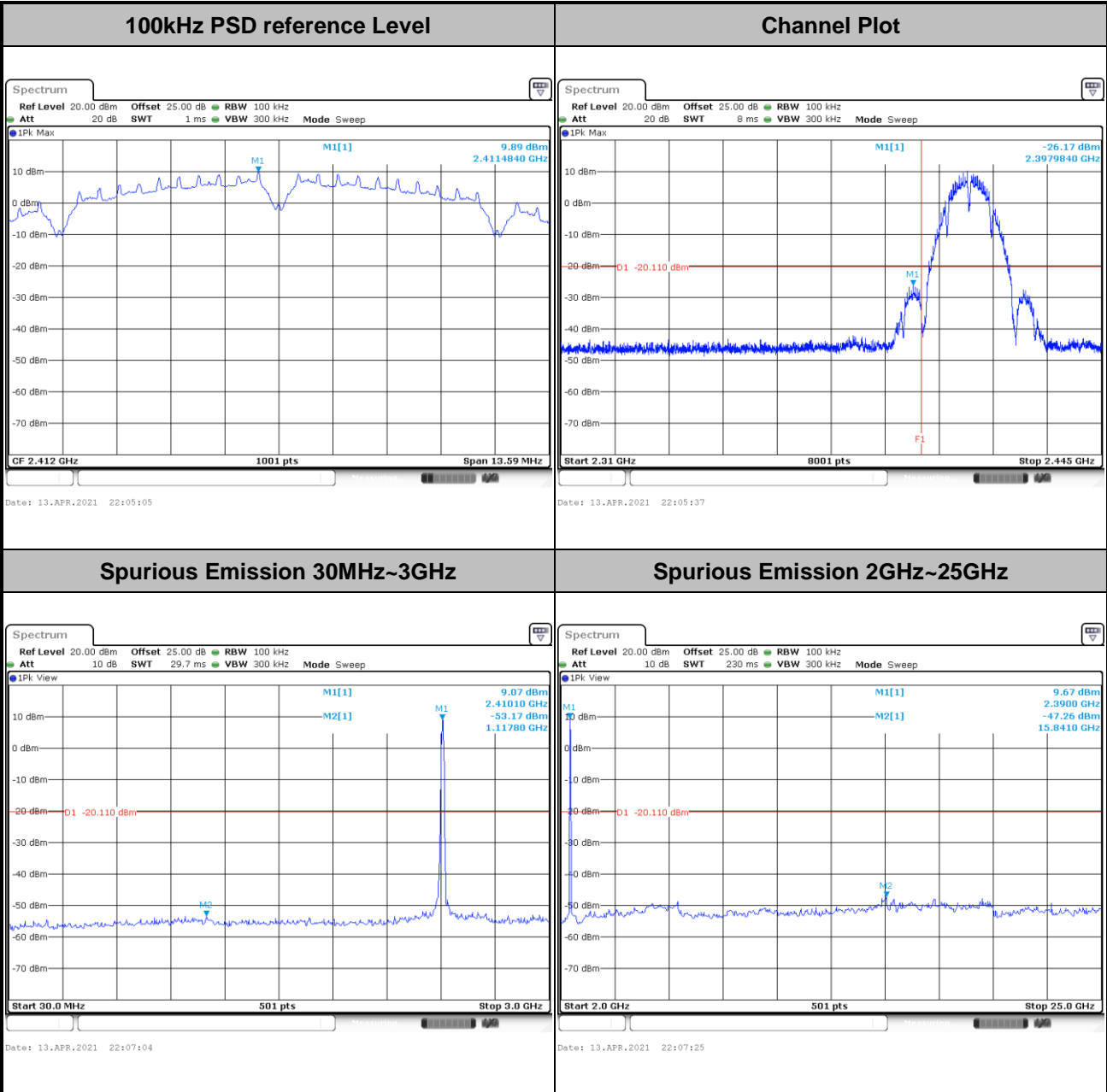
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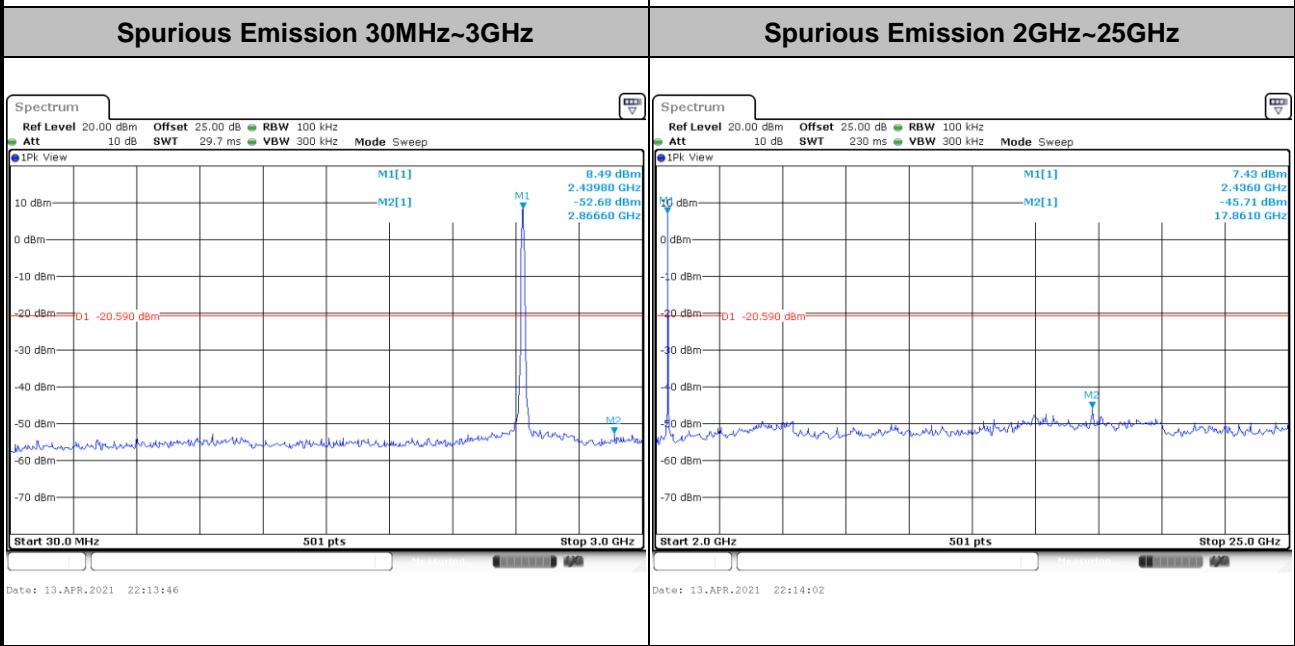
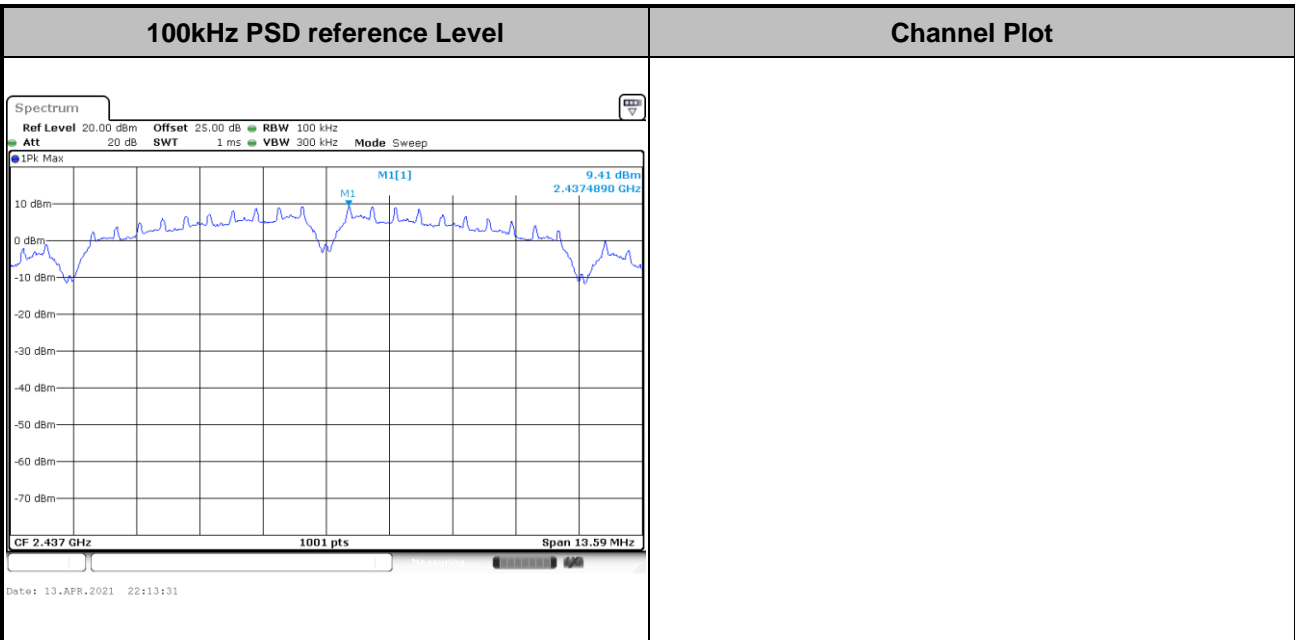
Number of TX = 2, Ant. 2 (Measured)

Test Mode :	802.11b	Test Channel :	01
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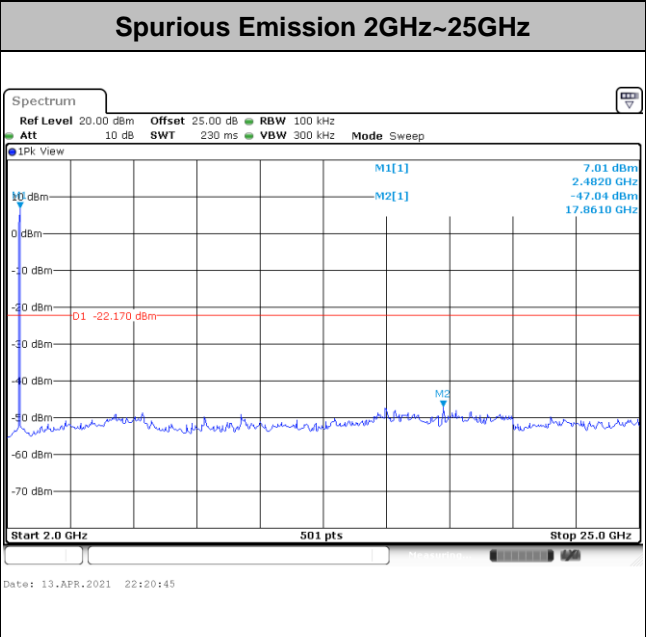
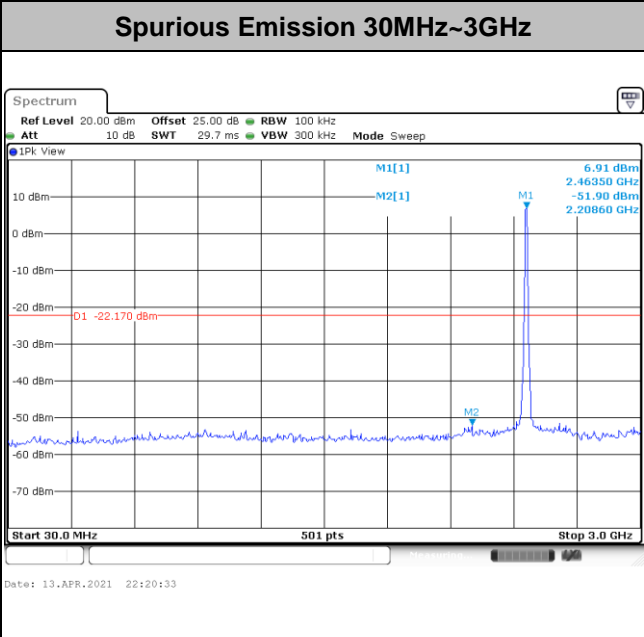
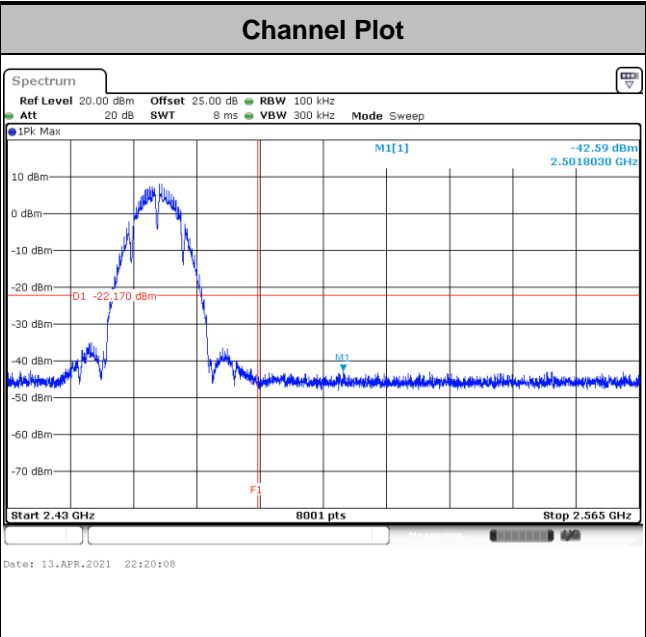
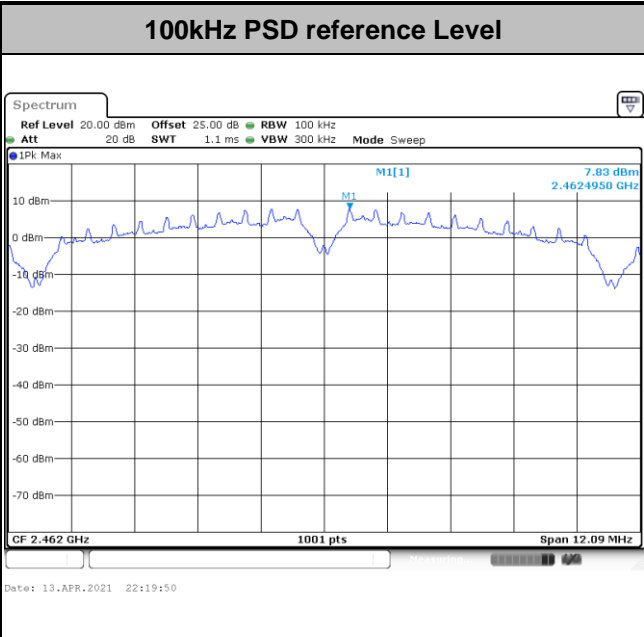


Test Mode :	802.11b	Test Channel :	06
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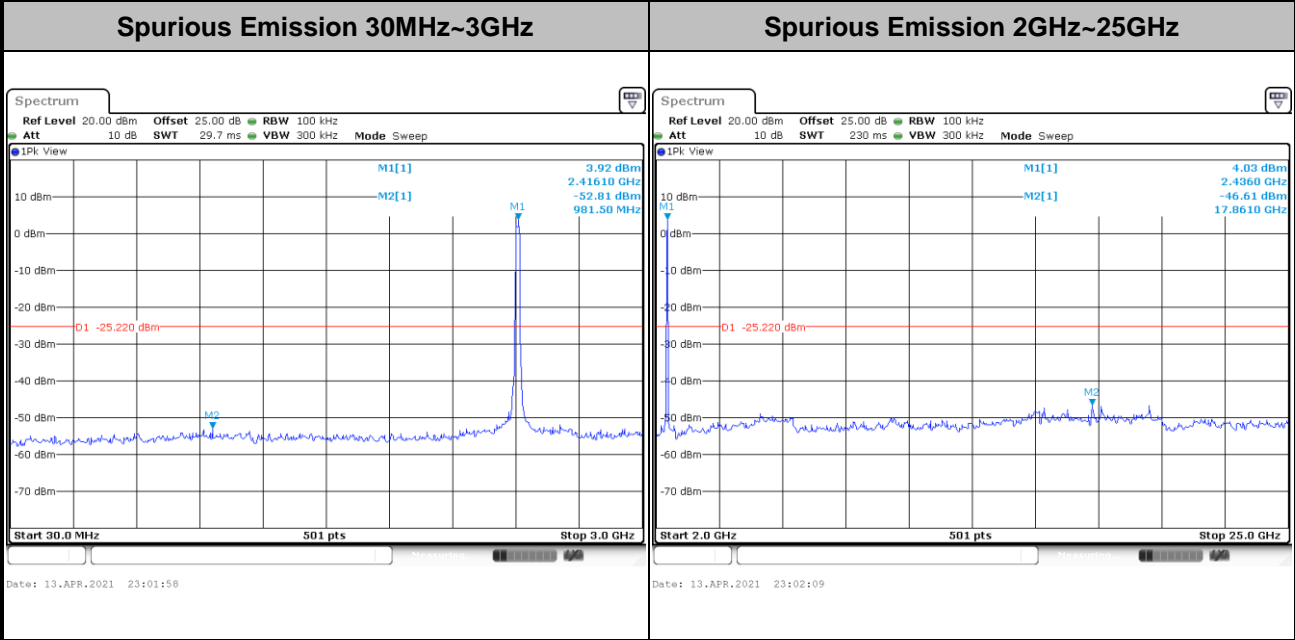
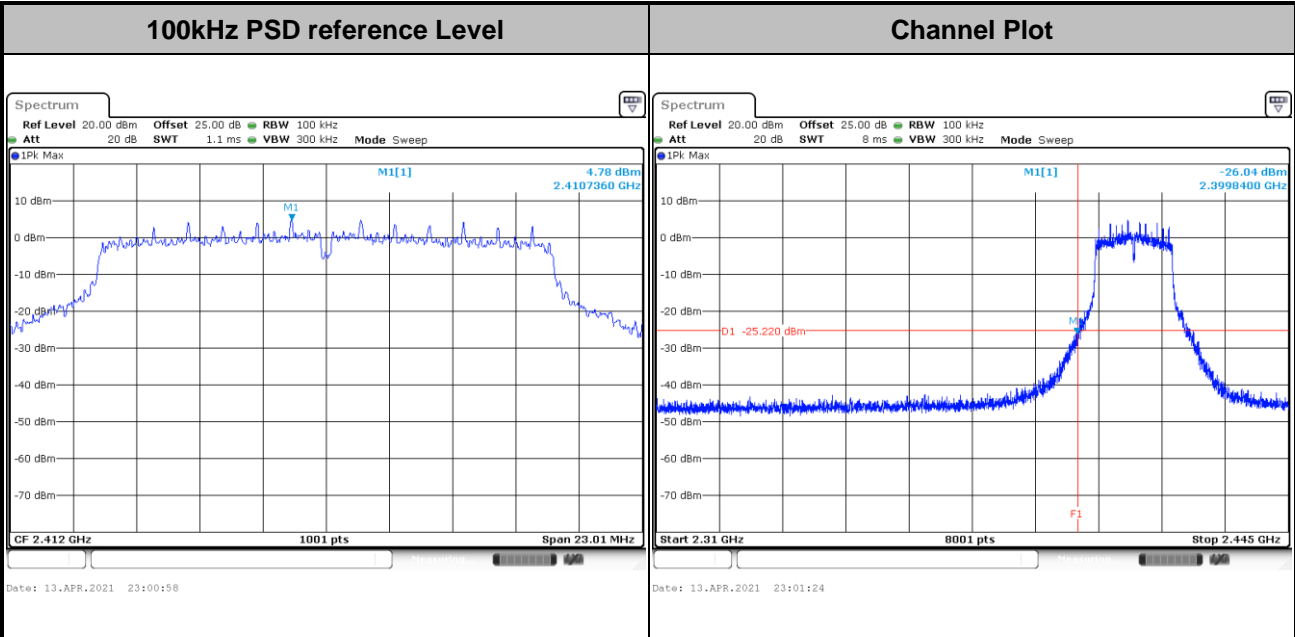


Test Mode : 802.11b Test Channel : 11



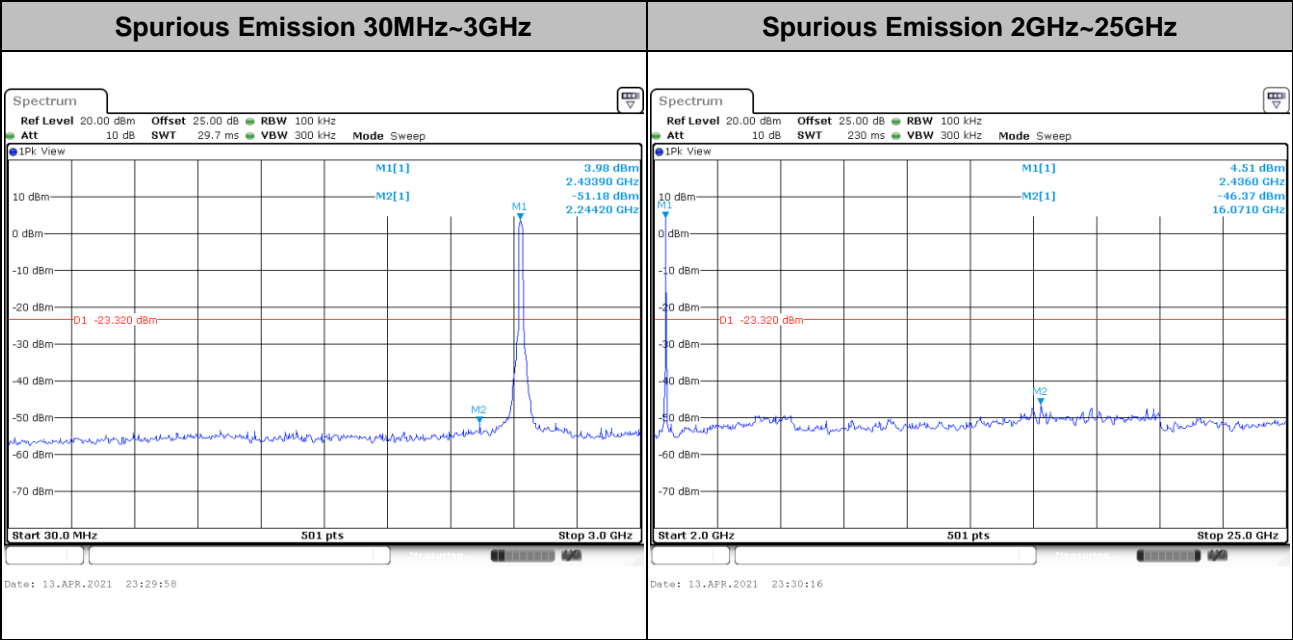
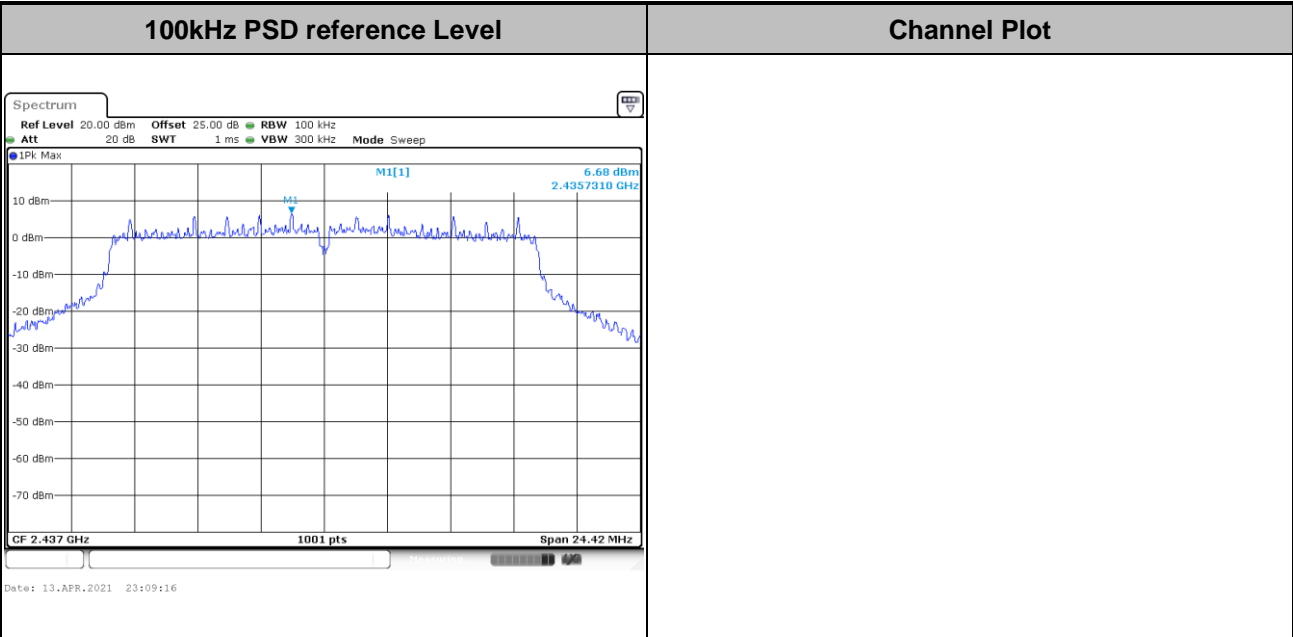


Test Mode : 802.11g Test Channel : 01



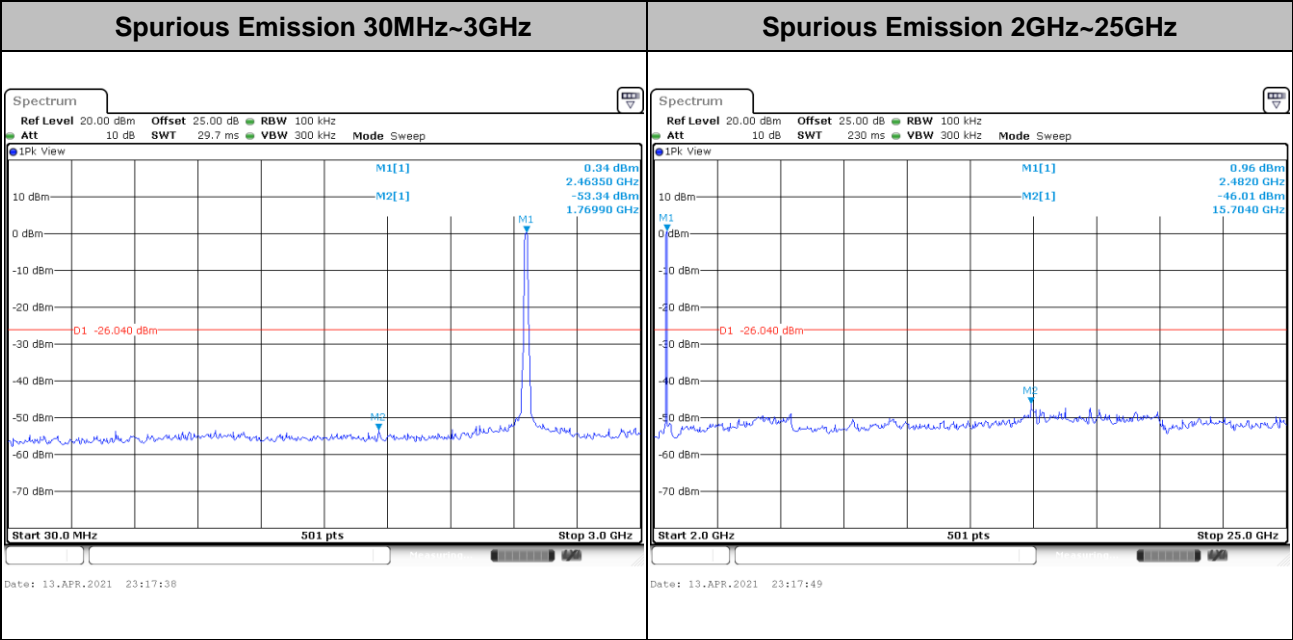
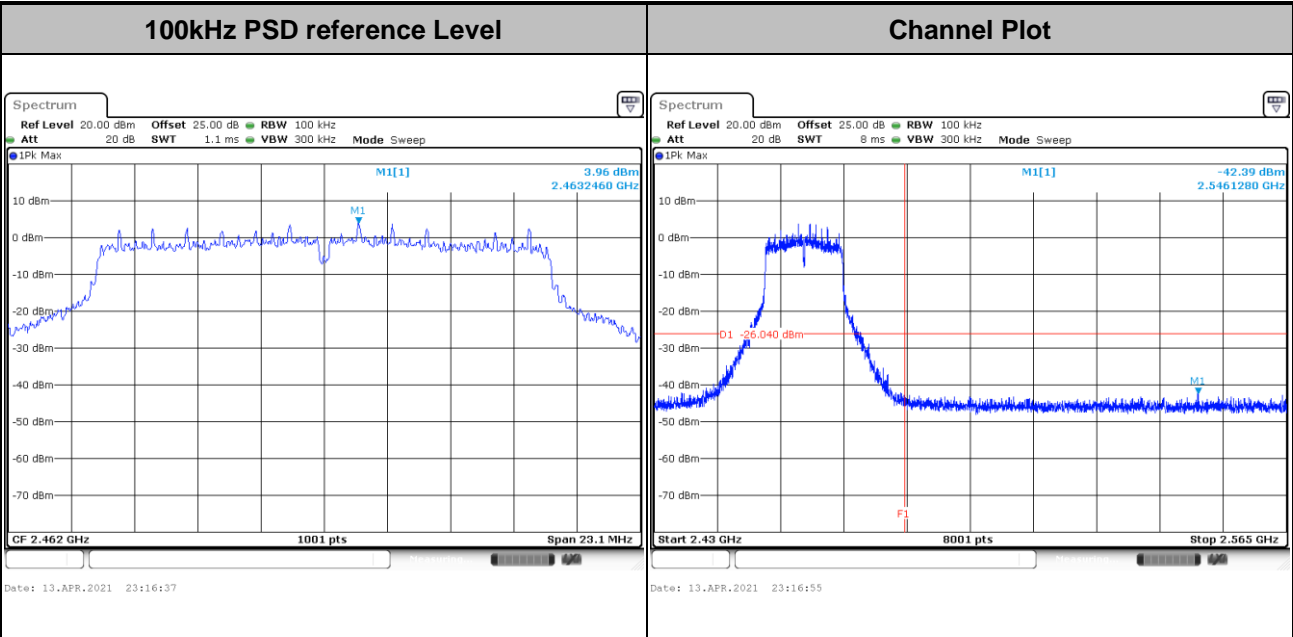


Test Mode :	802.11g	Test Channel :	06
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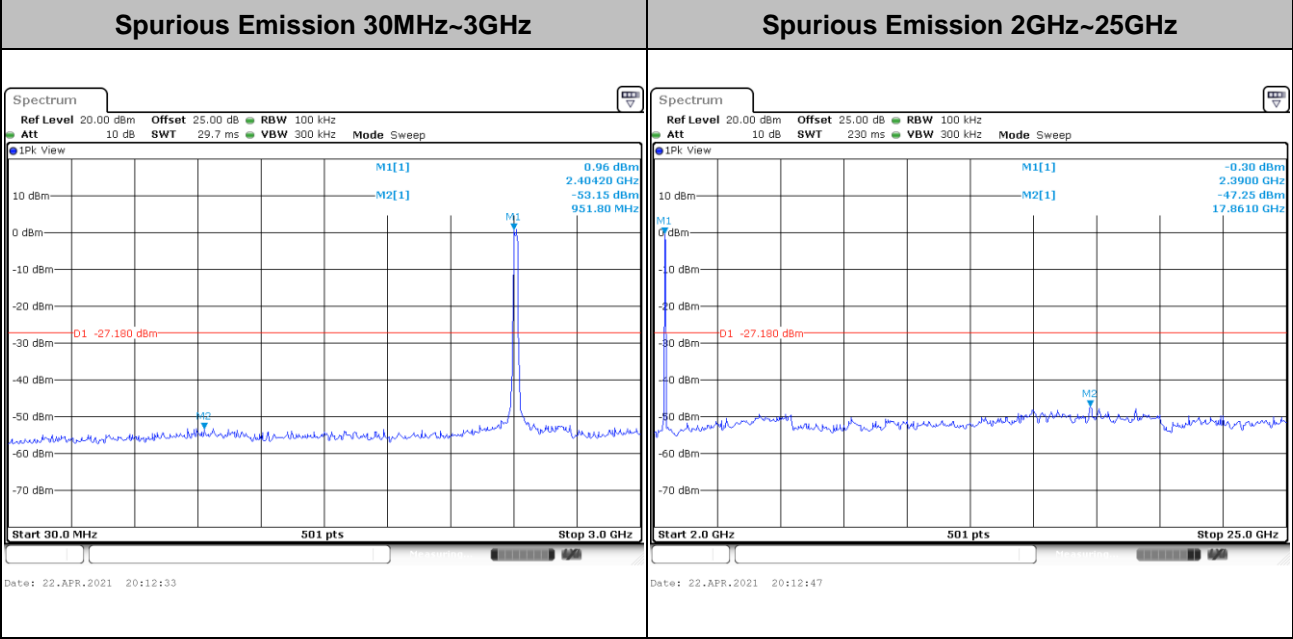
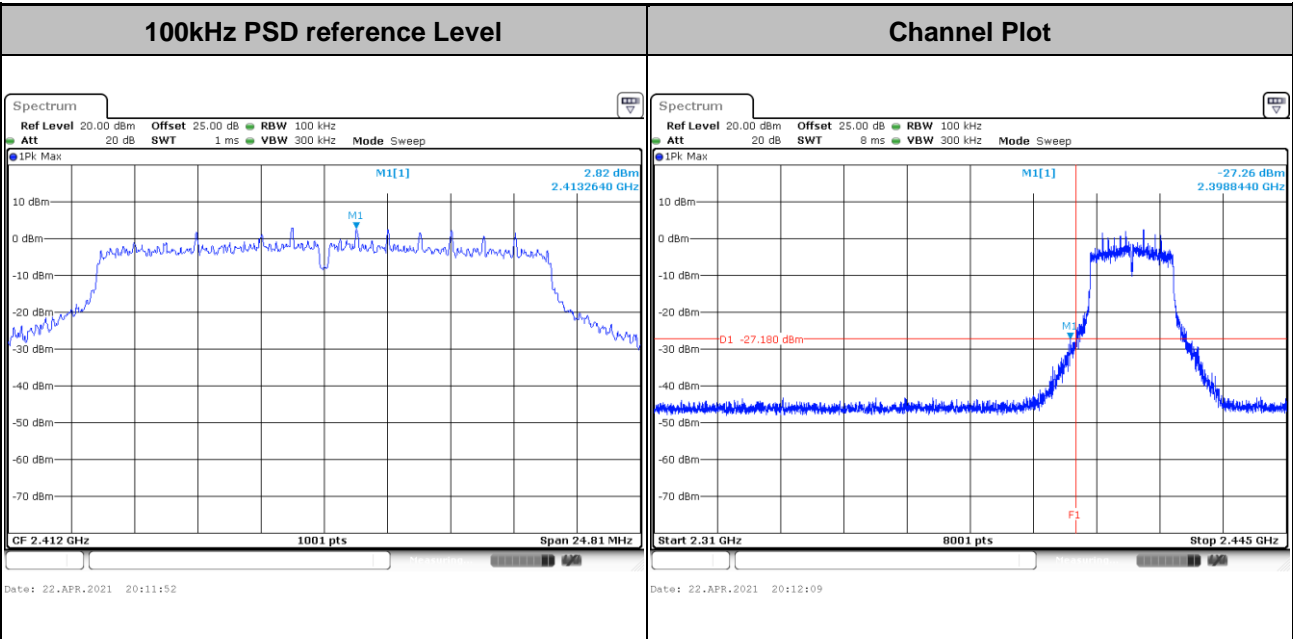


Test Mode :	802.11g	Test Channel :	11
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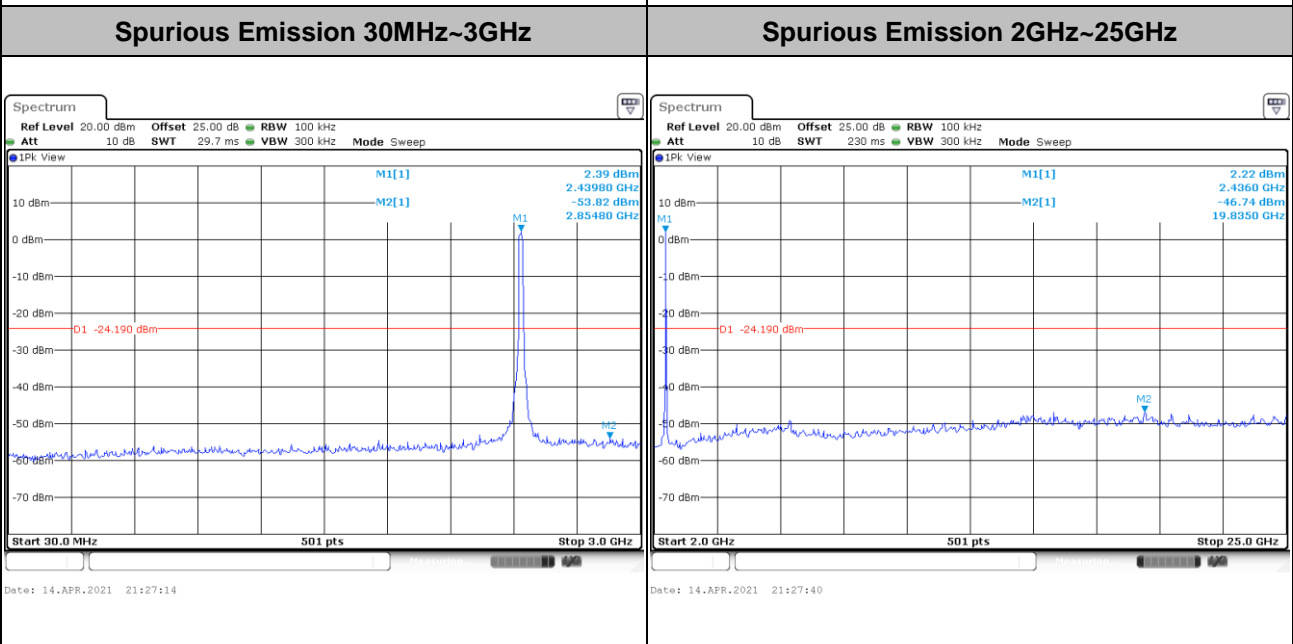
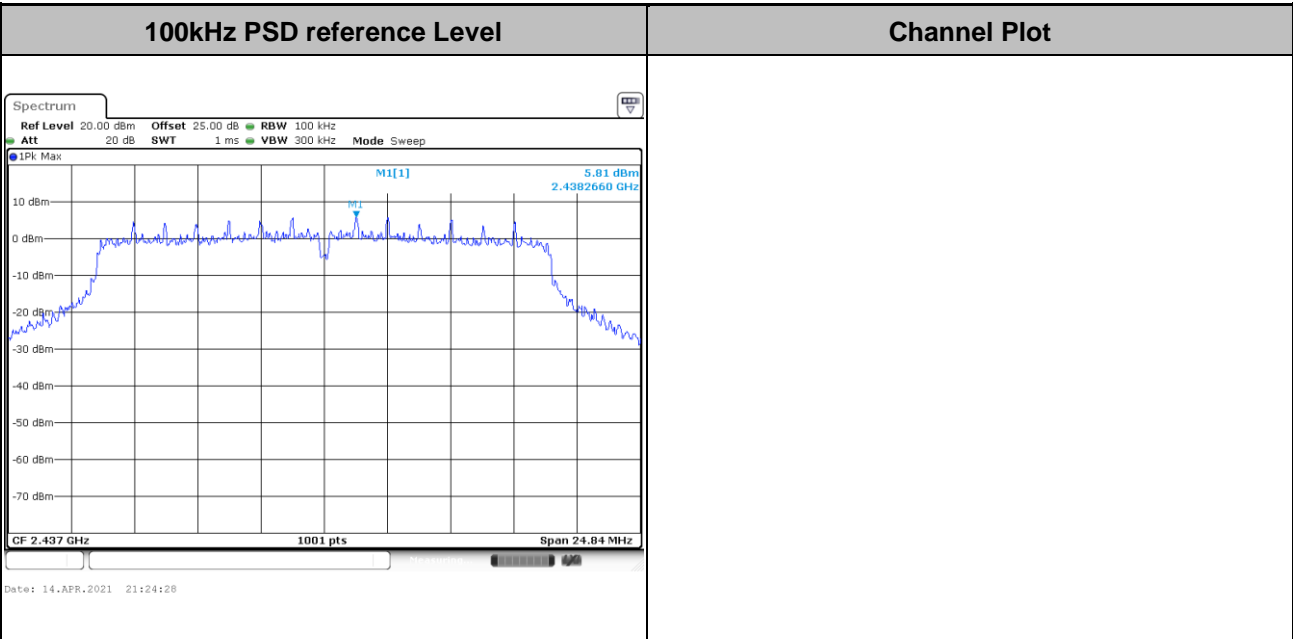


Test Mode : 802.11n HT20 Test Channel : 01



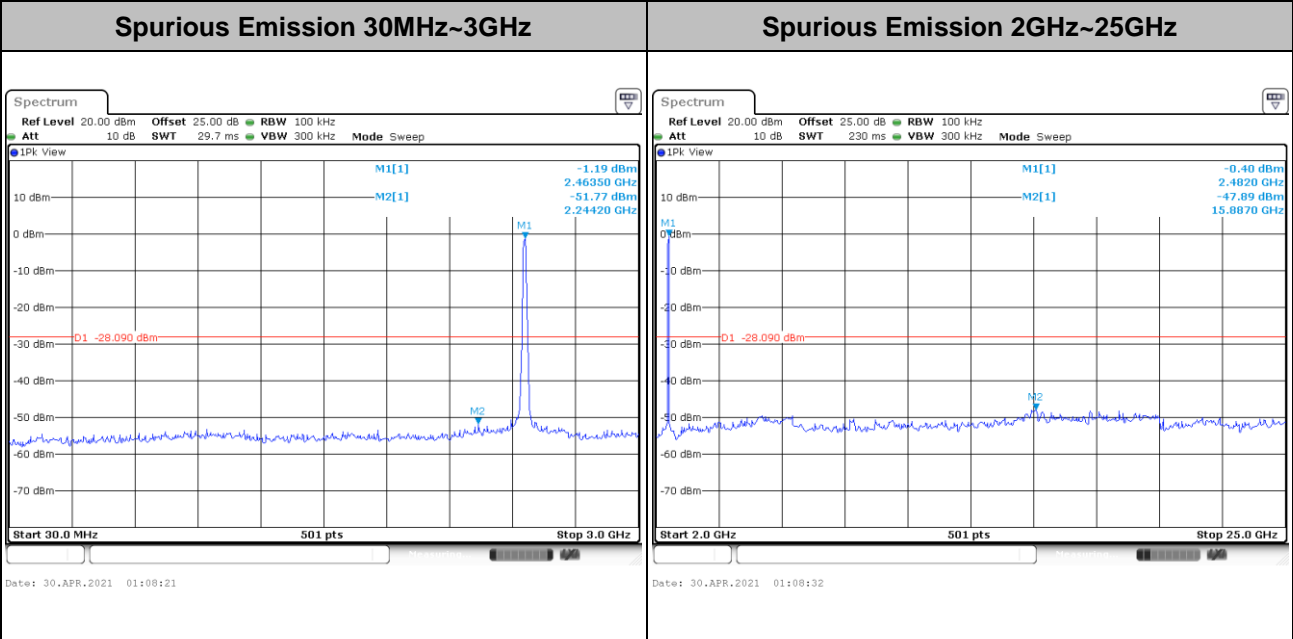
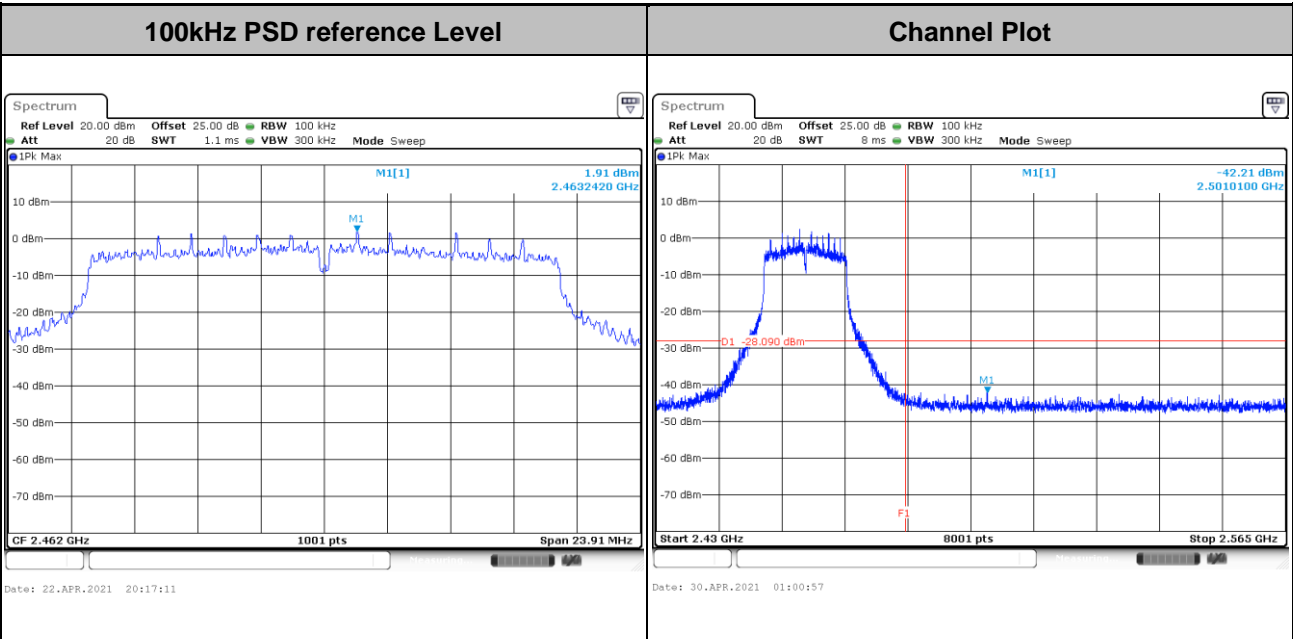


Test Mode :	802.11n HT20	Test Channel :	06
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Test Mode :	802.11n HT20	Test Channel :	11
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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

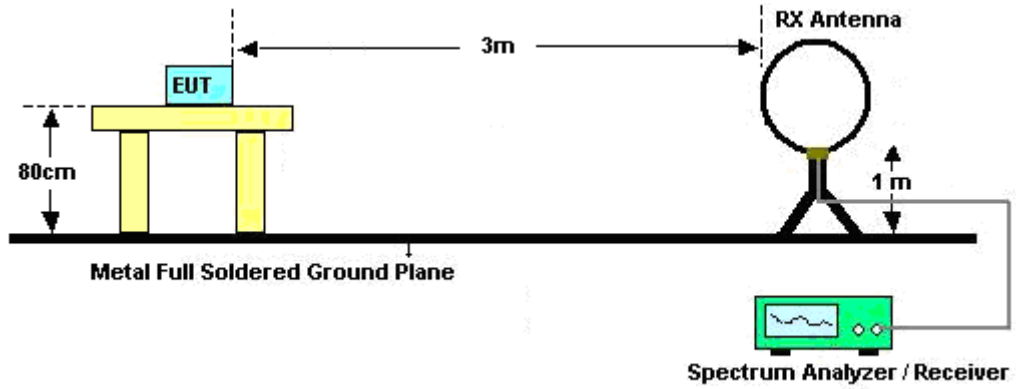


3.5.3 Test Procedures

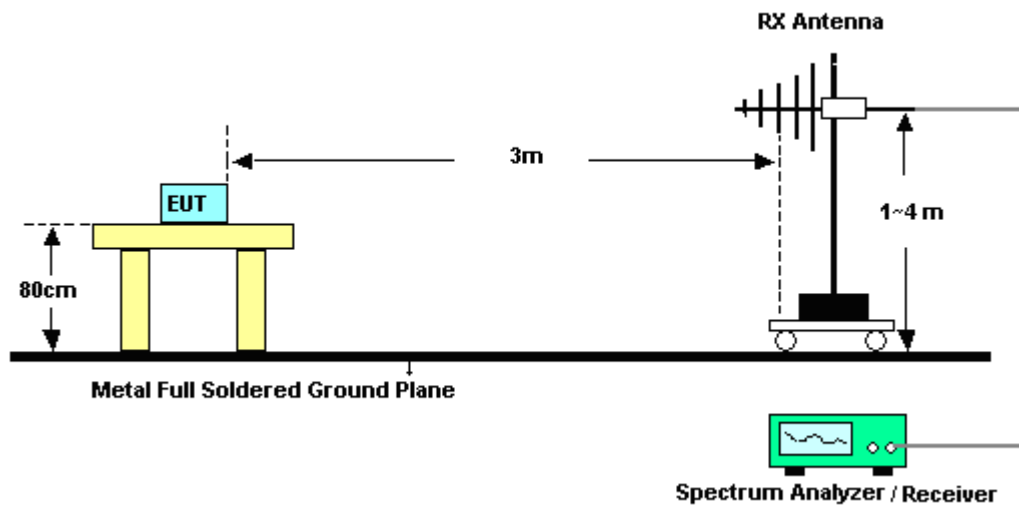
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1 GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW = 100 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, $VBW = 3$ MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

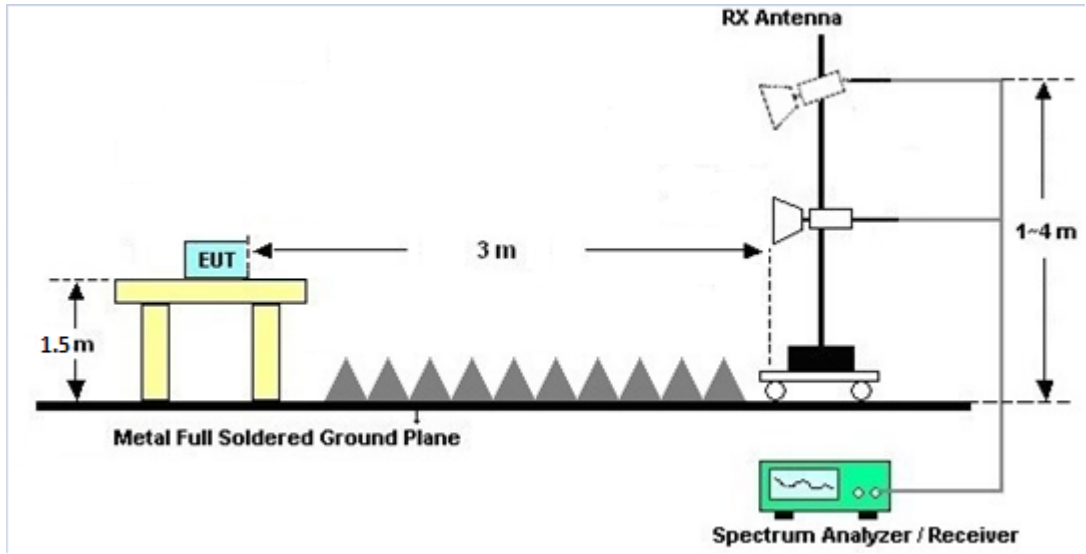
For radiated emissions below 30MHz



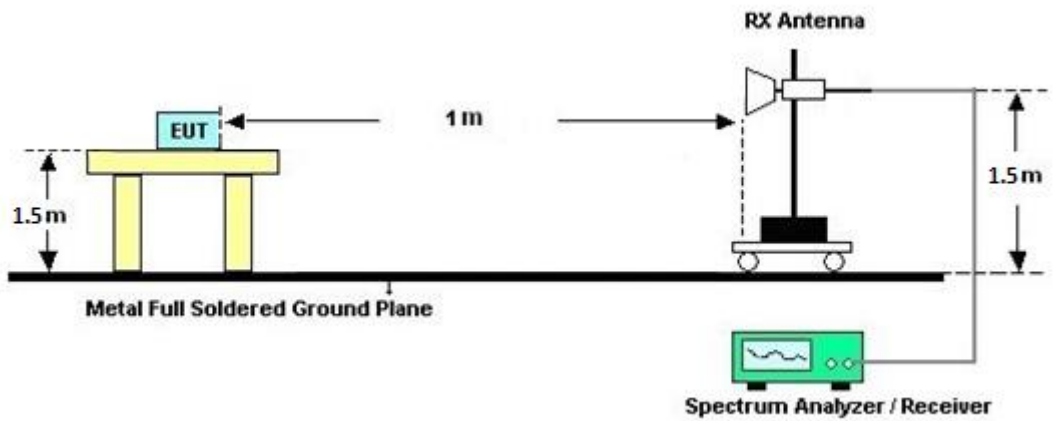
For radiated emissions from 30MHz to 1GHz



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

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

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

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

3.6.4 Test Setup



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

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

<CDD Modes>						
			DG	DG	Power	PSD
	Ant. 1	Ant. 2	for	for	Limit	Limit
	(dBi)	(dBi)	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
2.4 GHz	4.90	4.70	4.90	7.81	0.00	1.81

$Power\ Limit\ Reduction = DG(Power) - 6dBi, (min = 0)$

$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 04, 2021	Apr. 01, 2021~ Apr. 21, 2021	Jan. 03, 2022	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 11, 2020	Apr. 01, 2021~ Apr. 21, 2021	Oct. 10, 2021	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Nov. 03, 2020	Apr. 01, 2021~ Apr. 21, 2021	Nov. 02, 2021	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA9170	00994	18GHz~40GHz	Nov. 19, 2020	Apr. 01, 2021~ Apr. 21, 2021	Nov. 18, 2021	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 02, 2020	Apr. 01, 2021~ Apr. 21, 2021	Dec. 01, 2021	Radiation (03CH11-HY)
Preamplifier	EMEC	EM1G18G	060812	1GHz~18GHz	Oct. 27, 2020	Apr. 01, 2021~ Apr. 21, 2021	Oct. 26, 2021	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532700 80	1GHz~26.5GHz	Nov. 12, 2020	Apr. 01, 2021~ Apr. 21, 2021	Nov. 11, 2021	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 15, 2020	Apr. 01, 2021~ Apr. 21, 2021	Jun. 14, 2021	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz~44GHz	Oct. 23, 2020	Apr. 01, 2021~ Apr. 21, 2021	Oct. 22, 2021	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	Apr. 01, 2021~ Apr. 21, 2021	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Apr. 01, 2021~ Apr. 21, 2021	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-00105 3	N/A	N/A	Apr. 01, 2021~ Apr. 21, 2021	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz-30MHz	Mar. 11, 2021	Apr. 01, 2021~ Apr. 21, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 11, 2021	Apr. 01, 2021~ Apr. 21, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	30M-18G	Mar. 11, 2021	Apr. 01, 2021~ Apr. 21, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 11, 2021	Apr. 01, 2021~ Apr. 21, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-1 530-8000-40S S	SN11	1.53G Low Pass	Sep. 14, 2020	Apr. 01, 2021~ Apr. 21, 2021	Sep. 13, 2021	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN3	3GHz High Pass Filter	Sep. 14, 2020	Apr. 01, 2021~ Apr. 21, 2021	Sep. 13, 2021	Radiation (03CH11-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO12	10MHz~6GHz	Dec. 16, 2020	Mar. 31, 2021~ Apr. 30, 2021	Dec. 15, 2021	Conducted (TH02-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz ~ 40GHz	Jul. 22, 2020	Mar. 31, 2021~ Apr. 30, 2021	Jul. 21, 2021	Conducted (TH02-HY)
Switch Box & RF Cable	Burgeon	ETF058	EC130048 4	N/A	Nov. 19, 2020	Mar. 31, 2021~ Apr. 30, 2021	Nov. 18, 2021	Conducted (TH02-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. 31, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Mar. 31, 2021	Nov. 29, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Mar. 31, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 31, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Feb. 25, 2021	Mar. 31, 2021	Feb. 24, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Mar. 31, 2021	Dec. 30, 2021	Conduction (CO05-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.4
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Junyu Jhou	Temperature:	22.8~23.2	°C
Test Date:	2021/3/31~2021/4/30	Relative Humidity:	46.6~57.4	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO										
Mod.	Data Rate	N _{Tx}	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	2	1	2412	13.89	14.74	8.54	9.06	0.50	Pass
11b	1Mbps	2	6	2437	13.89	14.29	9.02	9.06	0.50	Pass
11b	1Mbps	2	11	2462	13.89	14.04	9.06	8.06	0.50	Pass
11g	6Mbps	2	1	2412	16.78	16.63	15.46	15.34	0.50	Pass
11g	6Mbps	2	6	2437	16.73	16.63	15.34	16.28	0.50	Pass
11g	6Mbps	2	11	2462	16.78	16.73	15.76	15.40	0.50	Pass
HT20	MCS0	2	1	2412	17.98	17.93	16.28	16.54	0.50	Pass
HT20	MCS0	2	6	2437	17.93	17.83	15.92	16.56	0.50	Pass
HT20	MCS0	2	11	2462	17.93	17.93	15.02	15.94	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																
Mod.	Data Rate	N _{Tx}	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	2	1	2412	18.30	18.00	21.16	30.00		4.90		26.06		36.00		Pass
11b	1Mbps	2	6	2437	18.00	17.50	20.77	30.00		4.90		25.67		36.00		Pass
11b	1Mbps	2	11	2462	16.70	16.20	19.47	30.00		4.90		24.37		36.00		Pass
11g	6Mbps	2	1	2412	15.30	14.80	18.07	30.00		4.90		22.97		36.00		Pass
11g	6Mbps	2	6	2437	17.00	16.80	19.91	30.00		4.90		24.81		36.00		Pass
11g	6Mbps	2	11	2462	14.20	13.80	17.01	30.00		4.90		21.91		36.00		Pass
HT20	MCS0	2	1	2412	13.60	13.00	16.32	30.00		4.90		21.22		36.00		Pass
HT20	MCS0	2	6	2437	16.90	16.60	19.76	30.00		4.90		24.66		36.00		Pass
HT20	MCS0	2	11	2462	12.60	12.00	15.32	30.00		4.90		20.22		36.00		Pass

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

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO												
Mod.	Data Rate	N _{TX}	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	2	1	2412	-3.12	-3.86	-0.11	7.81		6.19		Pass
11b	1Mbps	2	6	2437	-3.76	-5.20	-0.75	7.81		6.19		Pass
11b	1Mbps	2	11	2462	-5.05	-5.71	-2.04	7.81		6.19		Pass
11g	6Mbps	2	1	2412	-10.10	-10.81	-7.09	7.81		6.19		Pass
11g	6Mbps	2	6	2437	-6.00	-7.38	-2.99	7.81		6.19		Pass
11g	6Mbps	2	11	2462	-10.77	-11.60	-7.76	7.81		6.19		Pass
HT20	MCS0	2	1	2412	-11.56	-12.12	-8.55	7.81		6.19		Pass
HT20	MCS0	2	6	2437	-9.44	-10.09	-6.43	7.81		6.19		Pass
HT20	MCS0	2	11	2462	-12.67	-12.95	-9.66	7.81		6.19		Pass

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



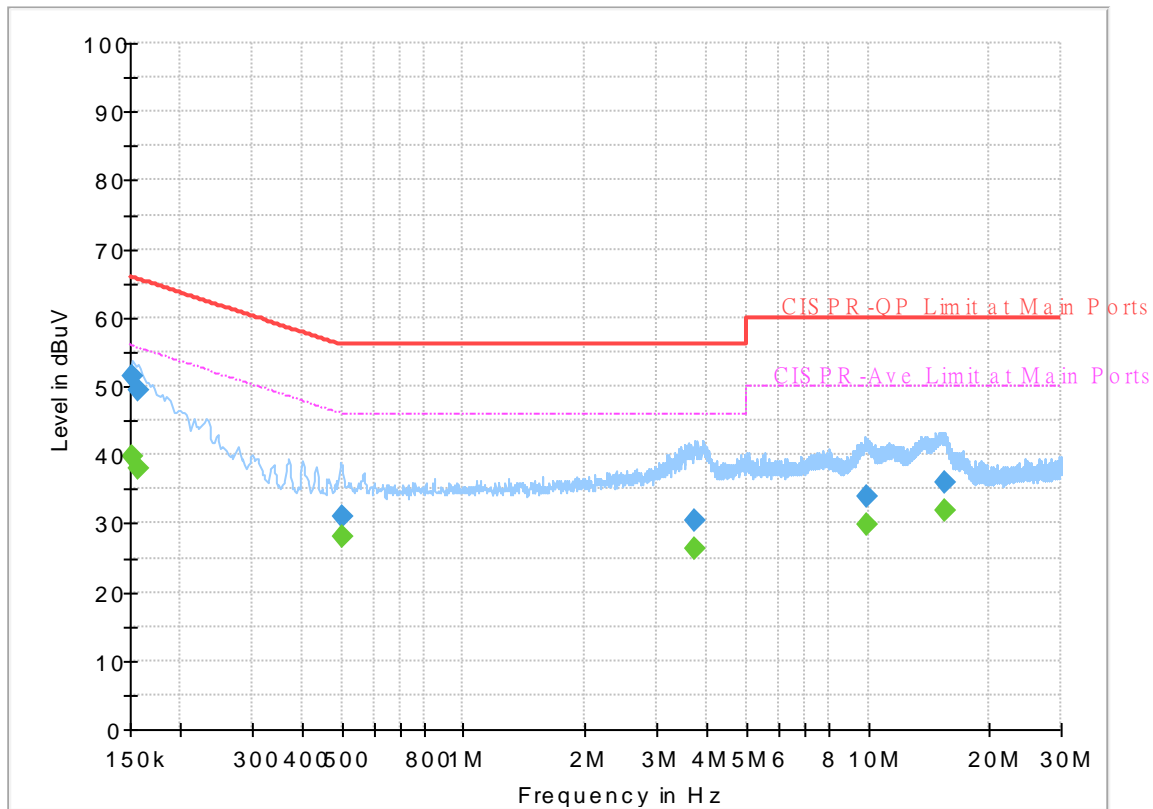
Appendix B. AC Conducted Emission Test Results

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

EUT Information

Report NO : 130215
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum



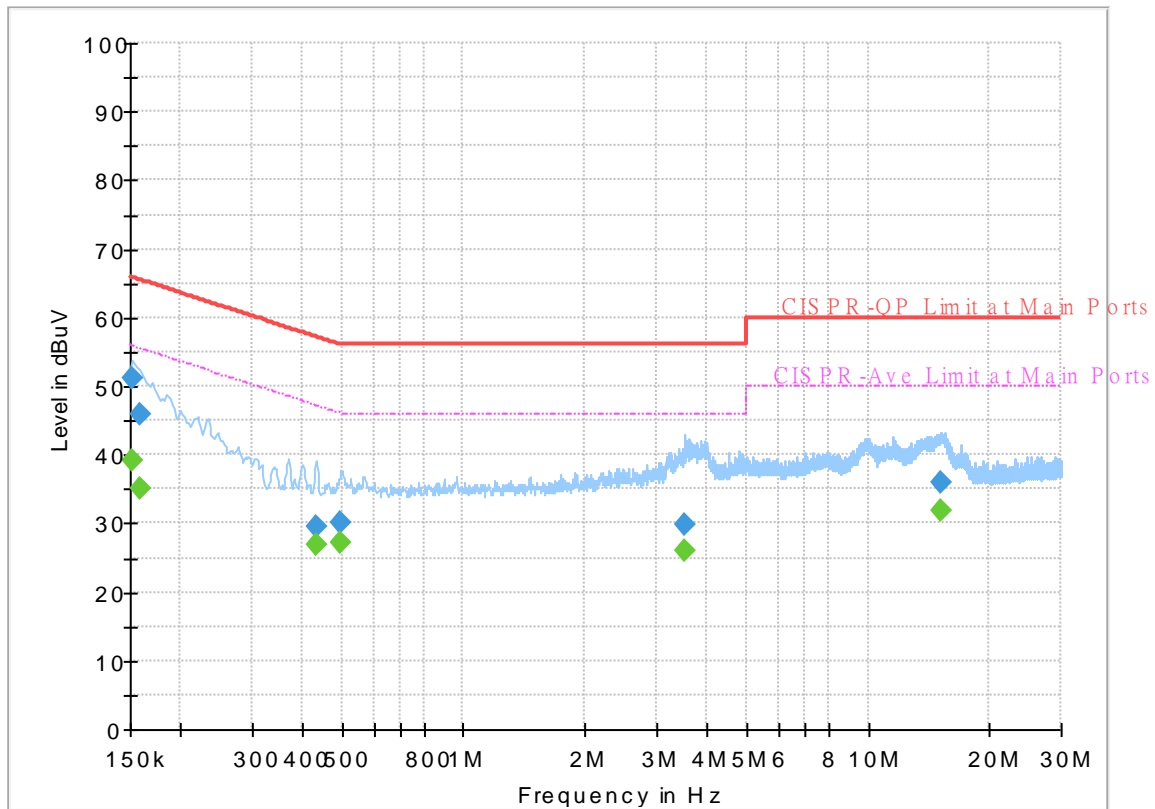
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	39.66	55.88	16.22	L1	OFF	19.7
0.152250	51.57	---	65.88	14.31	L1	OFF	19.7
0.156750	---	37.87	55.63	17.76	L1	OFF	19.7
0.156750	49.41	---	65.63	16.22	L1	OFF	19.7
0.501000	---	28.07	46.00	17.93	L1	OFF	19.9
0.501000	30.91	---	56.00	25.09	L1	OFF	19.9
3.723000	---	26.27	46.00	19.73	L1	OFF	20.1
3.723000	30.41	---	56.00	25.59	L1	OFF	20.1
9.906000	---	29.81	50.00	20.19	L1	OFF	20.2
9.906000	34.04	---	60.00	25.96	L1	OFF	20.2
15.429750	---	31.81	50.00	18.19	L1	OFF	20.4
15.429750	35.88	---	60.00	24.12	L1	OFF	20.4

EUT Information

Report NO : 130215
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	39.14	55.88	16.74	N	OFF	19.7
0.152250	51.18	---	65.88	14.70	N	OFF	19.7
0.159000	---	35.09	55.52	20.43	N	OFF	19.7
0.159000	45.86	---	65.52	19.66	N	OFF	19.7
0.431250	---	26.86	47.23	20.37	N	OFF	19.8
0.431250	29.55	---	57.23	27.68	N	OFF	19.8
0.496500	---	27.22	46.06	18.84	N	OFF	19.9
0.496500	29.99	---	56.06	26.07	N	OFF	19.9
3.507000	---	26.06	46.00	19.94	N	OFF	20.1
3.507000	29.78	---	56.00	26.22	N	OFF	20.1
15.207000	---	31.96	50.00	18.04	N	OFF	20.4
15.207000	35.98	---	60.00	24.02	N	OFF	20.4



Appendix C. Radiated Spurious Emission

Test Engineer :	Bill Chang, Fu Chen and Troye Hsieh	Temperature :	18.2~24.9°C
		Relative Humidity :	49.3~69.3%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11b CH 01 2412MHz		2389.8	56.16	-17.84	74	45.04	27.52	17.06	33.46	151	1	P	H	
		2389.17	47.45	-6.55	54	36.33	27.52	17.06	33.46	151	1	A	H	
	*	2412	113.39	-	-	102.24	27.5	17.09	33.44	151	1	P	H	
	*	2412	110.43	-	-	99.28	27.5	17.09	33.44	151	1	A	H	
													H	
			2384.97	59.17	-14.83	74	48.04	27.53	17.06	33.46	220	326	P	V
			2385.075	52.05	-1.95	54	40.92	27.53	17.06	33.46	220	326	A	V
	*		2412	117.1	-	-	105.95	27.5	17.09	33.44	220	326	P	V
	*		2412	113.93	-	-	102.78	27.5	17.09	33.44	220	326	A	V
														V
802.11b CH 06 2437MHz		2381.84	55.67	-18.33	74	44.54	27.54	17.05	33.46	250	8	P	H	
		2384.08	45.11	-8.89	54	33.98	27.53	17.06	33.46	250	8	A	H	
	*	2437	115.54	-	-	104.34	27.5	17.13	33.43	250	8	P	H	
	*	2437	112.37	-	-	101.17	27.5	17.13	33.43	250	8	A	H	
			2483.84	54.68	-19.32	74	43.46	27.43	17.2	33.41	250	8	P	H
			2483.92	43.55	-10.45	54	32.33	27.43	17.2	33.41	250	8	A	H
			2379.76	54.69	-19.31	74	43.56	27.54	17.05	33.46	350	321	P	V
			2379.44	44.2	-9.8	54	33.07	27.54	17.05	33.46	350	321	A	V
	*		2437	115.05	-	-	103.85	27.5	17.13	33.43	350	321	P	V
	*		2437	111.92	-	-	100.72	27.5	17.13	33.43	350	321	A	V
			2486.48	54.02	-19.98	74	42.8	27.43	17.2	33.41	350	321	P	V
			2484.08	43.22	-10.78	54	32	27.43	17.2	33.41	350	321	A	V



802.11b CH 11 2462MHz	*	2462	110.49	-	-	99.26	27.48	17.17	33.42	150	314	P	H
	*	2462	107.39	-	-	96.16	27.48	17.17	33.42	150	314	A	H
		2487.6	57.96	-16.04	74	46.74	27.42	17.21	33.41	150	314	P	H
		2487.6	50.23	-3.77	54	39.01	27.42	17.21	33.41	150	314	A	H
													H
													H
	*	2462	111.12	-	-	99.89	27.48	17.17	33.42	200	359	P	V
	*	2462	108.12	-	-	96.89	27.48	17.17	33.42	200	359	A	V
		2488.88	59.15	-14.85	74	47.93	27.42	17.21	33.41	200	359	P	V
		2488.8	52.43	-1.57	54	41.21	27.42	17.21	33.41	200	359	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+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	50.84	-23.16	74	74.78	31	11.22	66.16	232	22	P	H
		4824	48.74	-5.26	54	72.68	31	11.22	66.16	232	22	A	H
		17955	57.77	-16.23	74	52.58	46.5	23.86	65.17	100	0	P	H
		17955	47.53	-6.47	54	42.34	46.5	23.86	65.17	100	0	A	H
		4824	46.74	-27.26	74	70.68	31	11.22	66.16	100	0	P	V
		17970	57.66	-16.34	74	52.14	46.8	23.87	65.15	100	0	P	V
		17970	47.98	-6.02	54	42.46	46.8	23.87	65.15	100	0	A	V
													P
802.11b CH 06 2437MHz		4874	51.29	-22.71	74	74.65	31.43	11.33	66.12	235	20	P	H
		4874	49.18	-4.82	54	72.54	31.43	11.33	66.12	235	20	A	H
		7311	47.75	-26.25	74	63.63	36.4	13.44	65.72	100	0	P	H
		17955	58.8	-15.2	74	53.61	46.5	23.86	65.17	100	0	P	H
		17955	47.57	-6.43	54	42.38	46.5	23.86	65.17	100	0	A	H
		4874	48.1	-25.9	74	71.46	31.43	11.33	66.12	100	0	P	V
		7311	46.76	-27.24	74	62.64	36.4	13.44	65.72	100	0	P	V
		17955	58.86	-15.14	74	53.67	46.5	23.86	65.17	100	0	P	V
802.11b CH 11 2462MHz		4924	48.93	-25.07	74	72.11	31.47	11.43	66.08	100	0	P	H
		7386	41.32	-32.68	74	57.14	36.4	13.54	65.76	100	0	P	H
		17985	58.25	-15.75	74	52.38	47.1	23.89	65.12	100	0	P	H
		17985	48.15	-5.85	54	42.28	47.1	23.89	65.12	100	0	A	H
		4924	46.28	-27.72	74	69.46	31.47	11.43	66.08	100	0	P	V
		7386	41.4	-32.6	74	57.22	36.4	13.54	65.76	100	0	P	V
		17955	57.78	-16.22	74	52.59	46.5	23.86	65.17	100	0	P	V
		17955	47.46	-6.54	54	42.27	46.5	23.86	65.17	100	0	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 802.11g (Band Edge @ 3m)**

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11g CH 01 2412MHz		2387.28	61.17	-12.83	74	50.04	27.53	17.06	33.46	148	359	P	H	
		2387.385	50.22	-3.78	54	39.09	27.53	17.06	33.46	148	359	A	H	
	*	2412	112.35	-	-	101.2	27.5	17.09	33.44	148	359	P	H	
	*	2412	104.6	-	-	93.45	27.5	17.09	33.44	148	359	A	H	
													H	
														H
			2390	63.38	-10.62	74	52.26	27.52	17.06	33.46	292	330	P	V
			2390	52.21	-1.79	54	41.09	27.52	17.06	33.46	292	330	A	V
	*		2412	114.4	-	-	103.25	27.5	17.09	33.44	292	330	P	V
	*		2412	106.56	-	-	95.41	27.5	17.09	33.44	292	330	A	V
														V
														V
802.11g CH 06 2437MHz		2389.04	56.52	-17.48	74	45.4	27.52	7.13	33.46	150	348	P	H	
		2389.04	45.74	-8.26	54	34.62	27.52	7.13	33.46	150	348	A	H	
	*	2437	110.3	-	-	99.1	27.5	7.2	33.43	150	348	P	H	
	*	2437	102.18	-	-	90.98	27.5	7.2	33.43	150	348	A	H	
			2487.44	55.72	-18.28	74	44.49	27.43	7.28	33.41	150	348	P	H
			2483.52	45.84	-8.16	54	34.62	27.43	7.27	33.41	150	348	A	H
			2390	59.06	-14.94	74	47.94	27.52	7.13	33.46	288	348	P	V
			2390	48.79	-5.21	54	37.67	27.52	7.13	33.46	288	348	A	V
	*		2437	115.85	-	-	104.65	27.5	7.2	33.43	288	348	P	V
	*		2437	108.58	-	-	97.38	27.5	7.2	33.43	288	348	A	V
			2484.32	60.47	-13.53	74	49.25	27.43	7.27	33.41	288	348	P	V
			2485.36	49.62	-4.38	54	38.4	27.43	7.27	33.41	288	348	A	V



802.11g CH 11 2462MHz	*	2462	109.59	-	-	98.36	27.48	7.24	33.42	150	358	P	H
	*	2462	102.49	-	-	91.26	27.48	7.24	33.42	150	358	A	H
		2484.84	60.95	-13.05	74	49.73	27.43	7.27	33.41	150	358	P	H
		2484.64	49.24	-4.76	54	38.02	27.43	7.27	33.41	150	358	A	H
													H
													H
	*	2462	112.28	-	-	101.05	27.48	7.24	33.42	300	334	P	V
	*	2462	105.06	-	-	93.83	27.48	7.24	33.42	300	334	A	V
		2484.64	63.97	-10.03	74	52.75	27.43	7.27	33.41	300	334	P	V
		2484.76	52.13	-1.87	54	40.91	27.43	7.27	33.41	300	334	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+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	46.46	-27.54	74	70.4	31	11.22	66.16	100	0	P	H
		17970	57.92	-16.08	74	52.4	46.8	23.87	65.15	100	0	P	H
		17970	47.83	-6.17	54	42.31	46.8	23.87	65.15	100	0	A	H
													H
		4824	41.12	-32.88	74	65.06	31	11.22	66.16	100	0	P	V
		17970	57.86	-16.14	74	52.34	46.8	23.87	65.15	100	0	P	V
		17970	47.87	-6.13	54	42.35	46.8	23.87	65.15	100	0	A	V
802.11g CH 06 2437MHz		4874	48.03	-25.97	74	71.39	31.43	11.33	66.12	100	0	P	H
		7311	44.8	-29.2	74	60.68	36.4	13.44	65.72	100	0	P	H
		17970	58.48	-15.52	74	52.96	46.8	23.87	65.15	100	0	P	H
		17970	47.84	-6.16	54	42.32	46.8	23.87	65.15	100	0	A	H
		4874	46.1	-27.9	74	69.46	31.43	11.33	66.12	100	0	P	V
		7311	42.25	-31.75	74	58.13	36.4	13.44	65.72	100	0	P	V
		17970	58.13	-15.87	74	52.61	46.8	23.87	65.15	100	0	P	V
		17970	47.76	-6.24	54	42.24	46.8	23.87	65.15	100	0	A	V
802.11g CH 11 2462MHz		4924	44.02	-29.98	74	67.2	31.47	11.43	66.08	100	0	P	H
		7386	41.12	-32.88	74	56.94	36.4	13.54	65.76	100	0	P	H
		17970	58.31	-15.69	74	52.79	46.8	23.87	65.15	100	0	P	H
		17970	47.81	-6.19	54	42.29	46.8	23.87	65.15	100	0	A	H
		4924	40.13	-33.87	74	63.31	31.47	11.43	66.08	100	0	P	V
		7386	41.31	-32.69	74	57.13	36.4	13.54	65.76	100	0	P	V
		17955	58.01	-15.99	74	52.82	46.5	23.86	65.17	100	0	P	V
		17955	47.55	-6.45	54	42.36	46.5	23.86	65.17	100	0	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 HT20 (Band Edge @ 3m)**

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 01 2412MHz		2390	61.33	-12.67	74	50.21	27.52	17.06	33.46	150	360	P	H	
		2390	49.16	-4.84	54	38.04	27.52	17.06	33.46	150	360	A	H	
	*	2412	111.32	-	-	100.17	27.5	17.09	33.44	150	360	P	H	
	*	2412	103.54	-	-	92.39	27.5	17.09	33.44	150	360	A	H	
													H	
													H	
			2390	64.92	-9.08	74	53.8	27.52	17.06	33.46	288	330	P	V
			2390	52.82	-1.18	54	41.7	27.52	17.06	33.46	288	330	A	V
		*	2412	112.16	-	-	101.01	27.5	17.09	33.44	288	330	P	V
		*	2412	104.32	-	-	93.17	27.5	17.09	33.44	288	330	A	V
													V	
													V	
802.11n HT20 CH 06 2437MHz		2388.56	58.04	-15.96	74	46.92	27.52	17.06	33.46	150	360	P	H	
		2390	47.25	-6.75	54	36.13	27.52	17.06	33.46	150	360	A	H	
	*	2437	113.34	-	-	102.14	27.5	17.13	33.43	150	360	P	H	
	*	2437	105.44	-	-	94.24	27.5	17.13	33.43	150	360	A	H	
			2489.28	57.65	-16.35	74	46.43	27.42	17.21	33.41	150	360	P	H
			2485.2	47.29	-6.71	54	36.07	27.43	17.2	33.41	150	360	A	H
			2388.88	58.25	-15.75	74	47.13	27.52	17.06	33.46	344	335	P	V
			2390	48.2	-5.8	54	37.08	27.52	17.06	33.46	344	335	A	V
		*	2437	114.38	-	-	103.18	27.5	17.13	33.43	344	335	P	V
		*	2437	106.32	-	-	95.12	27.5	17.13	33.43	344	335	A	V
		2487.12	61.18	-12.82	74	49.95	27.43	17.21	33.41	344	335	P	V	
		2484.48	49.53	-4.47	54	38.31	27.43	17.2	33.41	344	335	A	V	



802.11n HT20 CH 11 2462MHz	*	2462	108.7	-	-	97.47	27.48	17.17	33.42	143	360	P	H
	*	2462	101.48	-	-	90.25	27.48	17.17	33.42	143	360	A	H
		2484.52	62.28	-11.72	74	51.06	27.43	17.2	33.41	143	360	P	H
		2483.52	50.45	-3.55	54	39.23	27.43	17.2	33.41	143	360	A	H
													H
													H
	*	2462	112.62	-	-	101.39	27.48	17.17	33.42	284	340	P	V
	*	2462	103.92	-	-	92.69	27.48	17.17	33.42	284	340	A	V
		2483.72	66	-8	74	54.78	27.43	17.2	33.41	284	340	P	V
		2483.52	52.66	-1.34	54	41.44	27.43	17.2	33.41	284	340	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+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 01 2412MHz		4824	45.4	-28.6	74	69.34	31	11.22	66.16	100	0	P	H	
		17940	57.69	-16.31	74	52.84	46.2	23.84	65.19	100	0	P	H	
		17940	47.11	-6.89	54	42.26	46.2	23.84	65.19	100	0	A	H	
													H	
			4824	38.66	-35.34	74	62.6	31	11.22	66.16	100	0	P	V
			17970	57.82	-16.18	74	52.3	46.8	23.87	65.15	100	0	P	V
			17970	47.85	-6.15	54	42.33	46.8	23.87	65.15	100	0	A	V
802.11n HT20 CH 06 2437MHz		4874	52.61	-21.39	74	75.97	31.43	11.33	66.12	225	19	P	H	
		4874	41.06	-12.94	54	64.42	31.43	11.33	66.12	225	19	A	H	
		7311	45.09	-28.91	74	60.97	36.4	13.44	65.72	100	0	P	H	
		17985	58.61	-15.39	74	52.74	47.1	23.89	65.12	100	0	P	H	
		17985	48.73	-5.27	54	42.86	47.1	23.89	65.12	100	0	A	H	
		4874	45.85	-28.15	74	69.21	31.43	11.33	66.12	100	0	P	V	
		7311	43	-31	74	58.88	36.4	13.44	65.72	100	0	P	V	
		17985	58.47	-15.53	74	52.6	47.1	23.89	65.12	100	0	P	V	
		17985	48.83	-5.17	54	42.96	47.1	23.89	65.12	100	0	A	V	
802.11n HT20 CH 11 2462MHz		4924	44.18	-29.82	74	67.36	31.47	11.43	66.08	100	0	P	H	
		7386	40.87	-33.13	74	56.69	36.4	13.54	65.76	100	0	P	H	
		17955	58.03	-15.97	74	52.84	46.5	23.86	65.17	100	0	P	H	
		17955	47.45	-6.55	54	42.26	46.5	23.86	65.17	100	0	A	H	
		4924	39.35	-34.65	74	62.53	31.47	11.43	66.08	100	0	P	V	
		7386	40.67	-33.33	74	56.49	36.4	13.54	65.76	100	0	P	V	
		17970	58.17	-15.83	74	52.65	46.8	23.87	65.15	100	0	P	V	
		17970	47.75	-6.25	54	42.23	46.8	23.87	65.15	100	0	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



Emission above 18GHz
2.4GHz WIFI 802.11n HT20 (SHF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT20 SHF		23488	39.85	-34.15	74	56.87	39.98	-3	54	100	0	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
			22585	40.84	-33.16	74	58.72	39.8	-3.25	54.43	100	0	P
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Emission below 1GHz
 2.4GHz WIFI 802.11n HT20 (LF)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
2.4GHz 802.11n HT20 LF		62.01	26.85	-13.15	40	46.46	11.72	1.21	32.54	-	-	P	H	
		151.25	31.32	-12.18	43.5	45.12	16.83	1.89	32.52	100	0	P	H	
		261.83	27.74	-18.26	46	37.93	19.62	2.48	32.29	-	-	P	H	
		407.33	29.2	-16.8	46	35.86	22.11	3.03	31.8	-	-	P	H	
		489.78	27.78	-18.22	46	32.78	23.83	3.31	32.14	-	-	P	H	
		860.32	30.76	-15.24	46	28.38	29.31	4.43	31.36	-	-	P	H	
														H
														H
														H
														H
														H
														H
			41.64	29.8	-10.2	40	42.87	18.43	1.01	32.51	100	0	P	V
			150.28	32.28	-11.22	43.5	46	16.92	1.88	32.52	-	-	P	V
			243.4	27.39	-18.61	46	39.94	17.41	2.4	32.36	-	-	P	V
			448.07	29.64	-16.36	46	35.45	23.01	3.15	31.97	-	-	P	V
			662.44	28.33	-17.67	46	30.72	26.35	3.84	32.58	-	-	P	V
		947.62	31.7	-14.3	46	27.34	30.56	4.69	30.89	-	-	P	V	
													V	
													V	
													V	
													V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													



Note symbol

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



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =
Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
= 55.45 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

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



Appendix D. Radiated Spurious Emission Plots

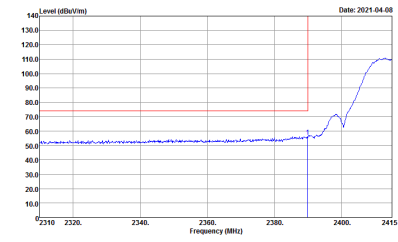
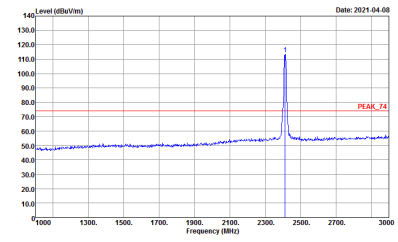
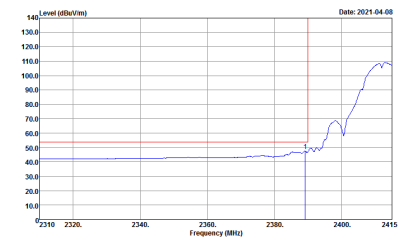
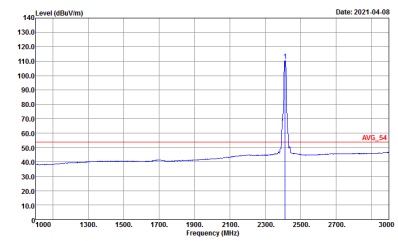
Test Engineer :	Bill Chang, Fu Chen and Troye Hsieh	Temperature :	18.2~24.9°C
		Relative Humidity :	49.3~69.3%

Note symbol

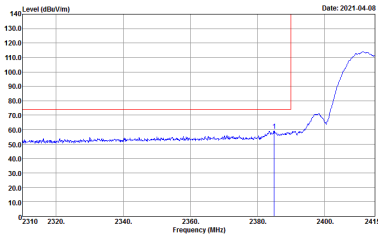
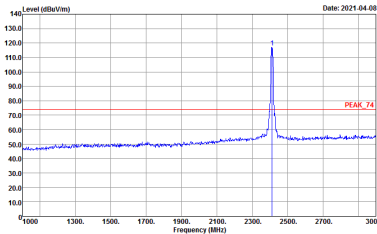
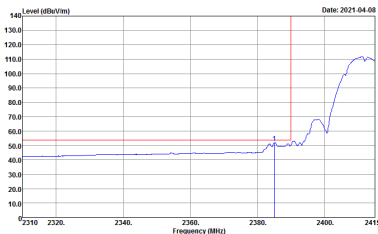
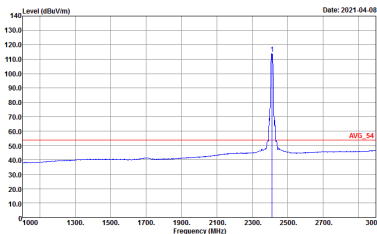
-L	Low channel location
-R	High channel location



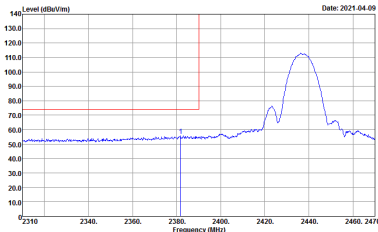
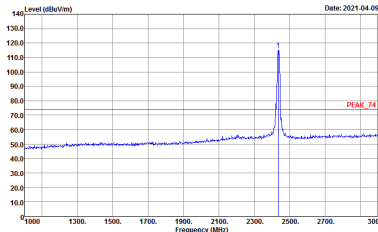
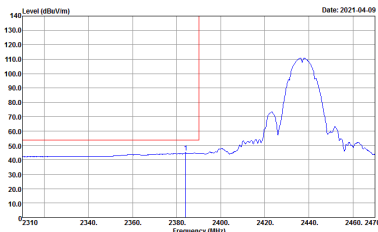
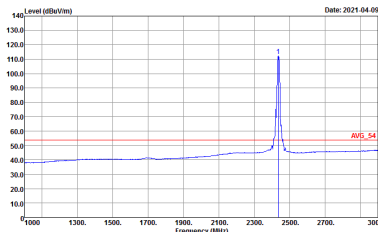
2.4GHz 2400~2483.5MHz
 WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

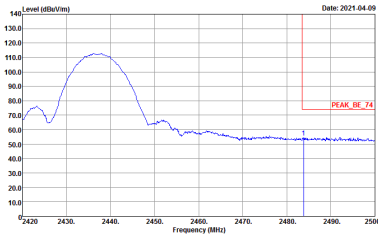
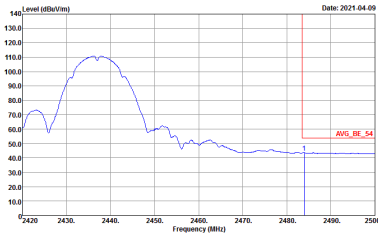


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-08</p> <p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-08</p> <p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-08</p> <p>Site : 03CHI1-HY Condition : AV6_BE_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-08</p> <p>Site : 03CHI1-HY Condition : AV6_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

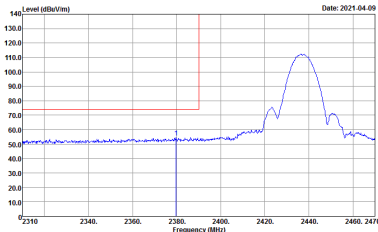
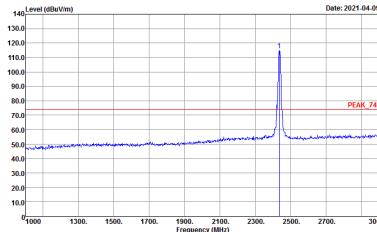
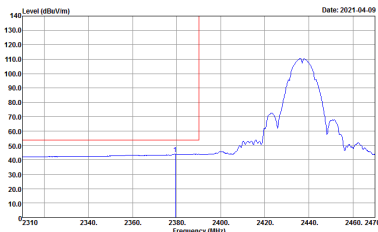
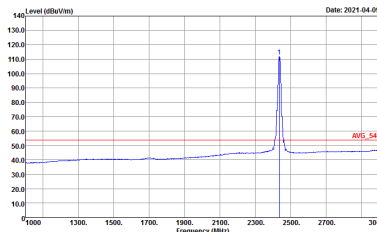


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CH11-HY Condition : AV6_BE_54 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : AV6_54 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

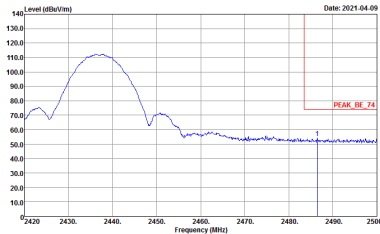
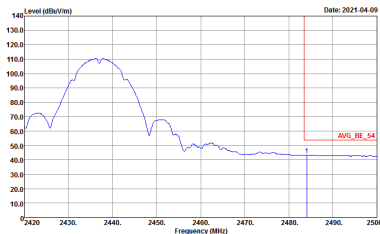


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.0100KHz SWT:Auto</p>	<p>Left blank</p>

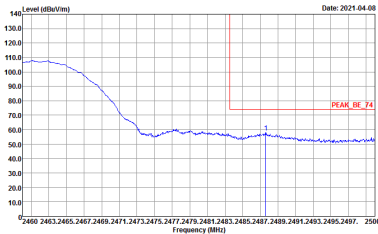
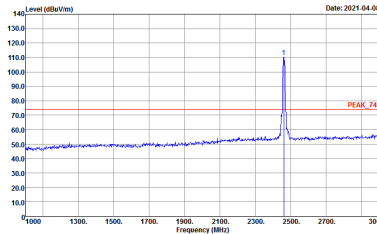
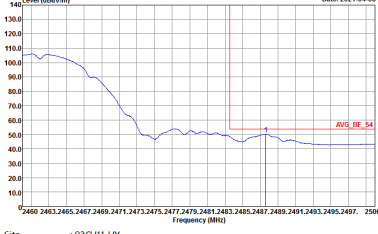
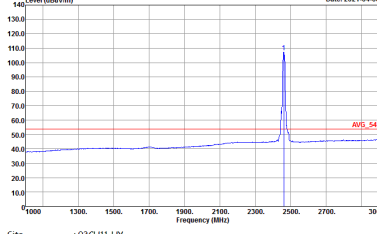


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-09</p> <p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-09</p> <p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-09</p> <p>Site : 03CHI1-HY Condition : AV6_BE_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-09</p> <p>Site : 03CHI1-HY Condition : AV6_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Vertical	Fundamental
<p>Peak</p>	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	<p>Left blank</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 <p>Level (dBm/1m) vs Frequency (MHz) plot showing a peak at 2462 MHz. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2400 to 2500 MHz. A red line indicates the peak level at approximately 110 dBm/1m.</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Level (dBm/1m) vs Frequency (MHz) plot showing a sharp peak at 2462 MHz. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2400 to 3000 MHz. A red line indicates the peak level at approximately 110 dBm/1m.</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Level (dBm/1m) vs Frequency (MHz) plot showing the average level. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2400 to 2500 MHz. A red line indicates the average level at approximately 55 dBm/1m.</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Level (dBm/1m) vs Frequency (MHz) plot showing the average level. The y-axis ranges from 10.0 to 140.0 dBm/1m, and the x-axis ranges from 2400 to 3000 MHz. A red line indicates the average level at approximately 55 dBm/1m.</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



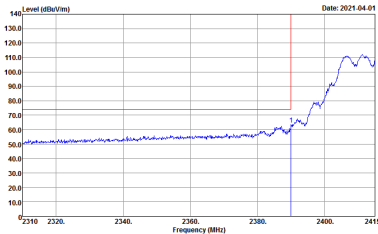
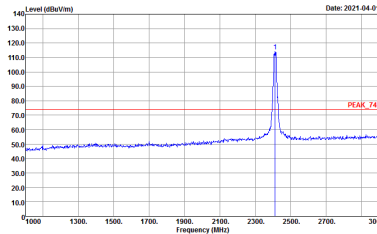
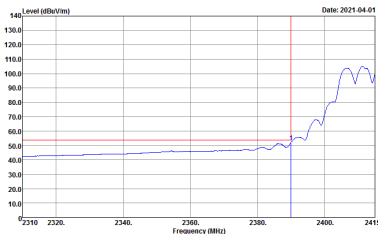
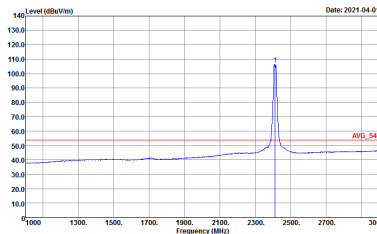
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	<p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH11-HY Condition : PEAK_F4 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	<p>Site : 03CH11-HY Condition : AVG_F4 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



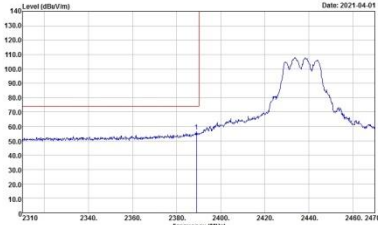
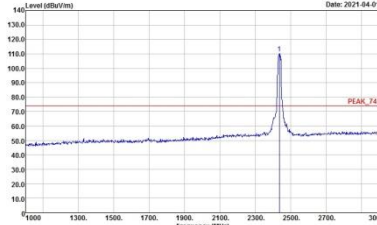
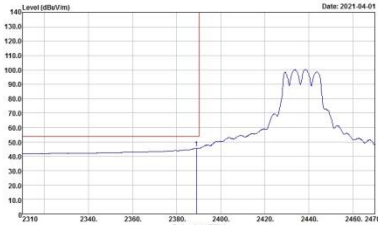
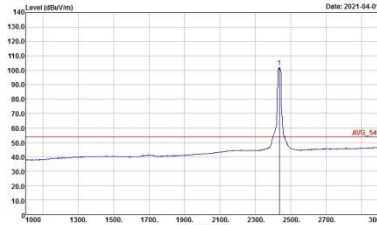
2.4GHz 2400~2483.5MHz
 WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	<p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	<p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

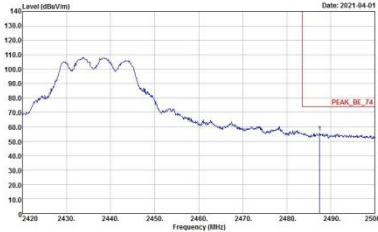
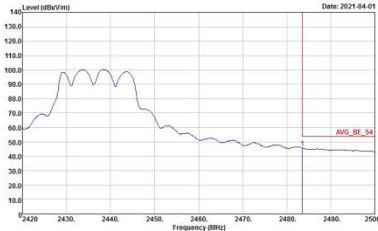


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 <p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CHI1-HY Condition : AV6_BE_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Site : 03CHI1-HY Condition : AV6_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

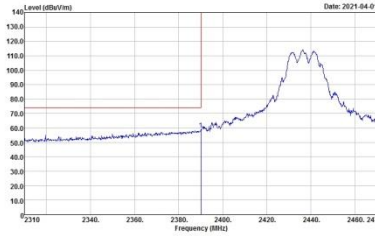
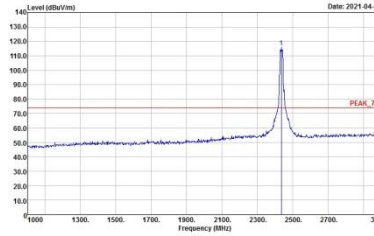
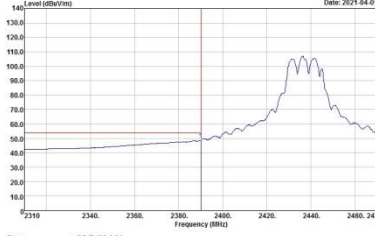
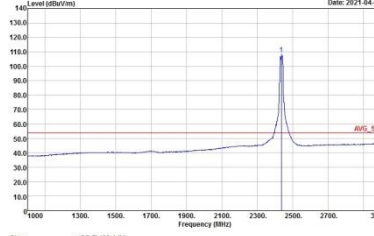


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

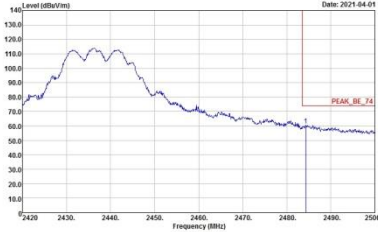
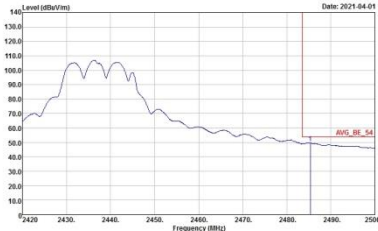


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	Left blank

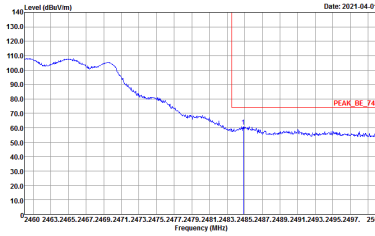
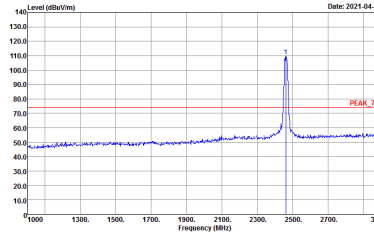
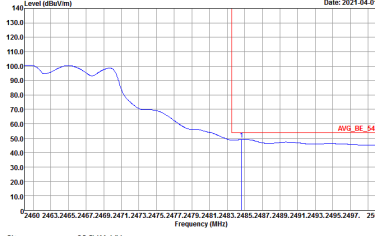
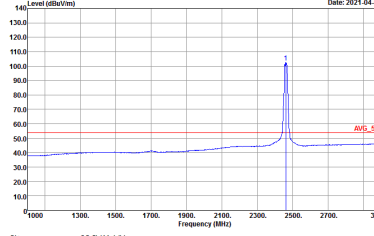


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

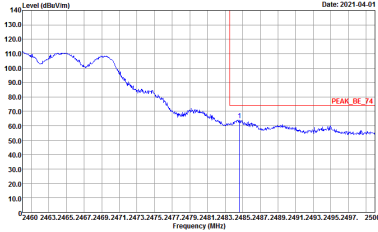
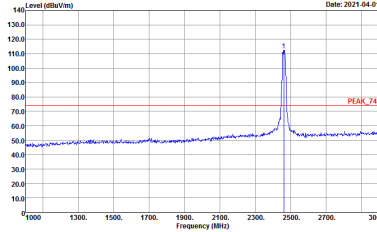
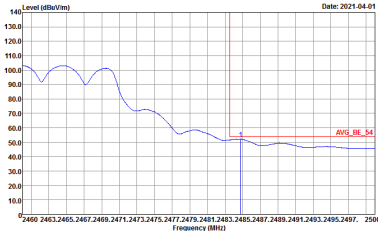
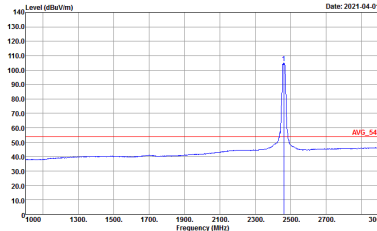


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak	 <p>Site : 03CHI1-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left Blank
Avg.	 <p>Site : 03CHI1-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	Left Blank



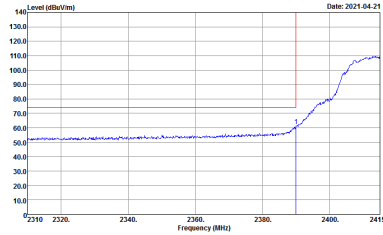
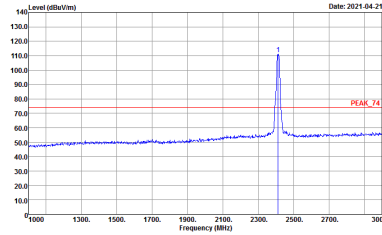
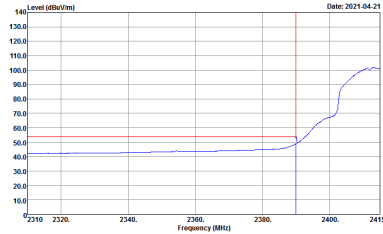
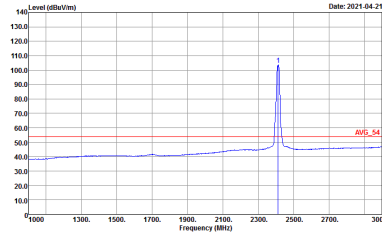
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



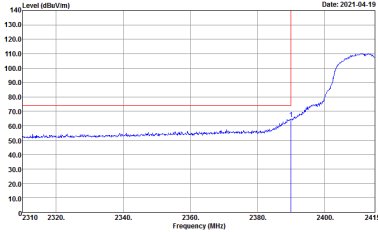
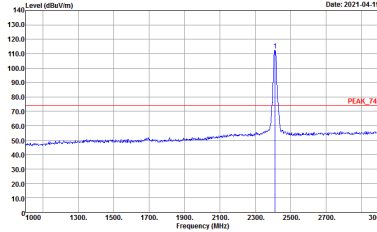
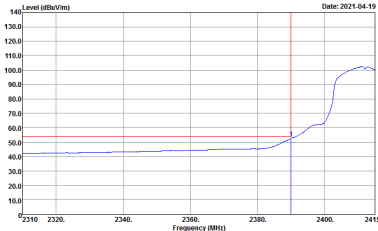
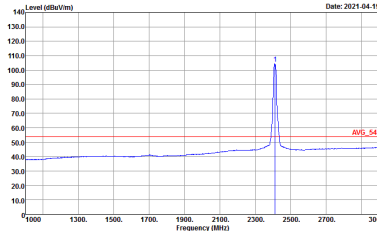
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-01</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



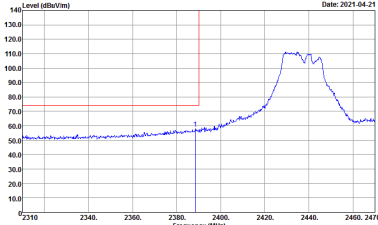
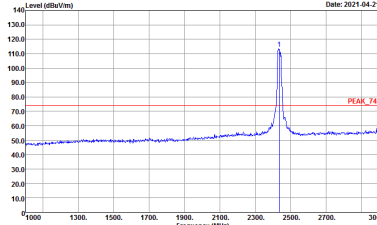
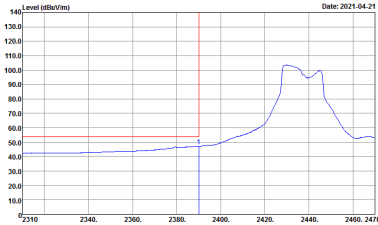
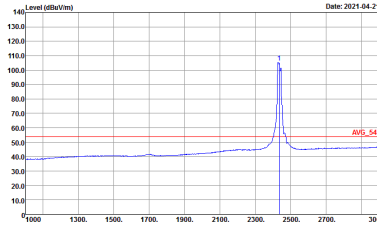
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

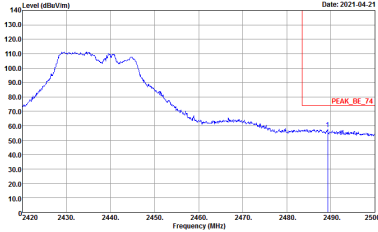
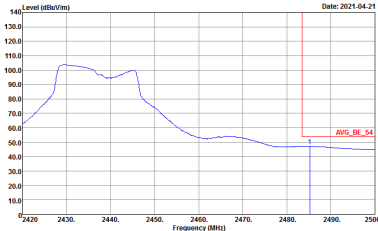


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : AV6_BE_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : AV6_54 3m HORN 9120D-HF_1326 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

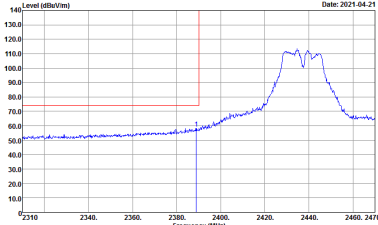
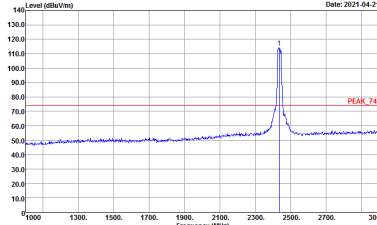
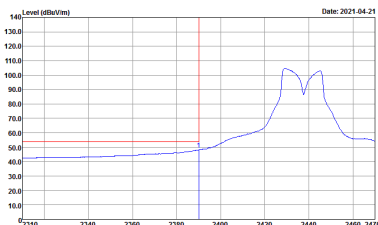
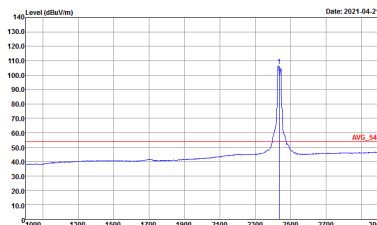


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1+2	Horizontal	Fundamental
<p>Peak</p>	 <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	<p>Left blank</p>
<p>Avg.</p>	 <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	<p>Left blank</p>

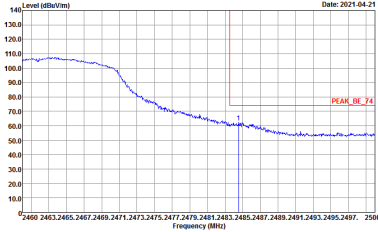
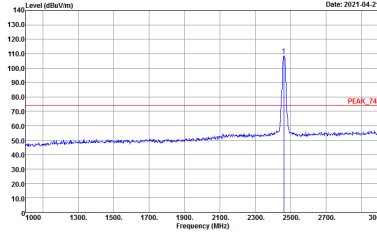
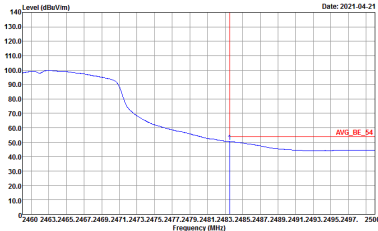
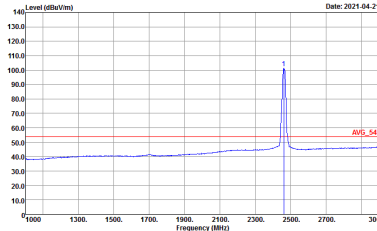


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 9120D-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>

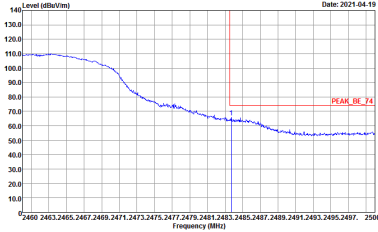
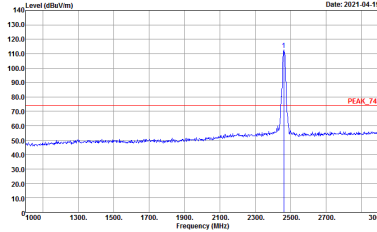
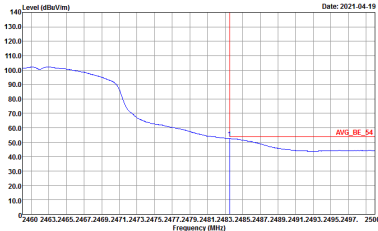
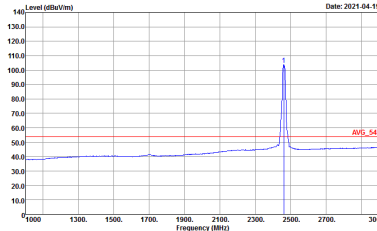


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-21</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : PEAK_BE_74 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Avg.	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : AVG_BE_54 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>	 <p>Date: 2021-04-19</p> <p>Site : 03CH11-HY Condition : AVG_54 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>



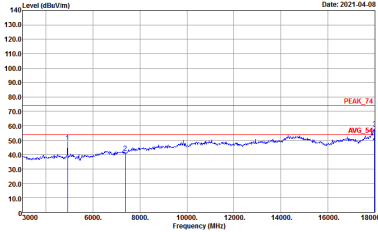
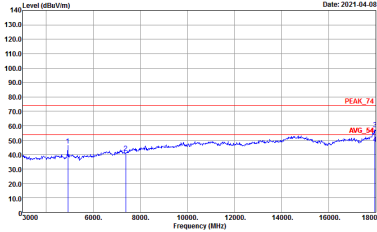
2.4GHz 2400~2483.5MHz
WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



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

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 9120D-HF_1326 VERTICAL Detector : Peak</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



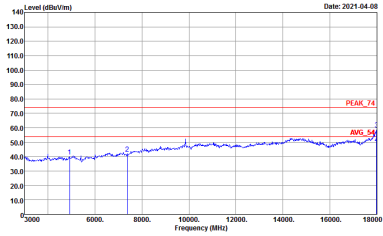
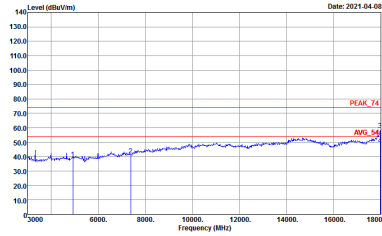
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CHI1-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	<p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1+2	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH11-HY Condition : PEAK_74 3m HORN 91200-HF_1326 VERTICAL Detector : Peak</p>



Emission above 18GHz
2.4GHz WIFI 802.11n HT20 (SHF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 SHF	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH15-HY Condition : PEAK_74_1M 1m SHF ANT_9170_00994 HORIZONTAL Detector: : Peak</p>	<p>Site : 03CH15-HY Condition : PEAK_74_1M 1m SHF ANT_9170_00994 VERTICAL Detector: : Peak</p>



Emission below 1GHz
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1+2	Horizontal	Vertical
QP / Peak	<p>Site : 03CHI1-HY Condition : QP 3m BE-LOG 6111D-LF_ETC HORIZONTAL Detector: : Peak</p>	<p>Site : 03CHI1-HY Condition : QP 3m BE-LOG 6111D-LF_ETC VERTICAL Detector: : Peak</p>

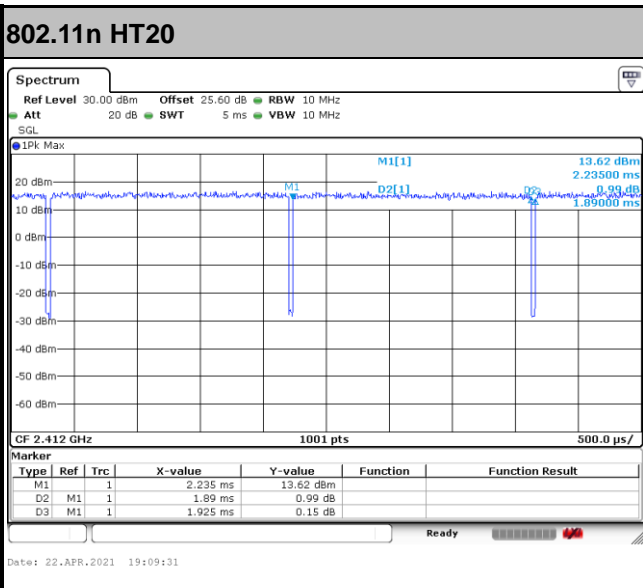
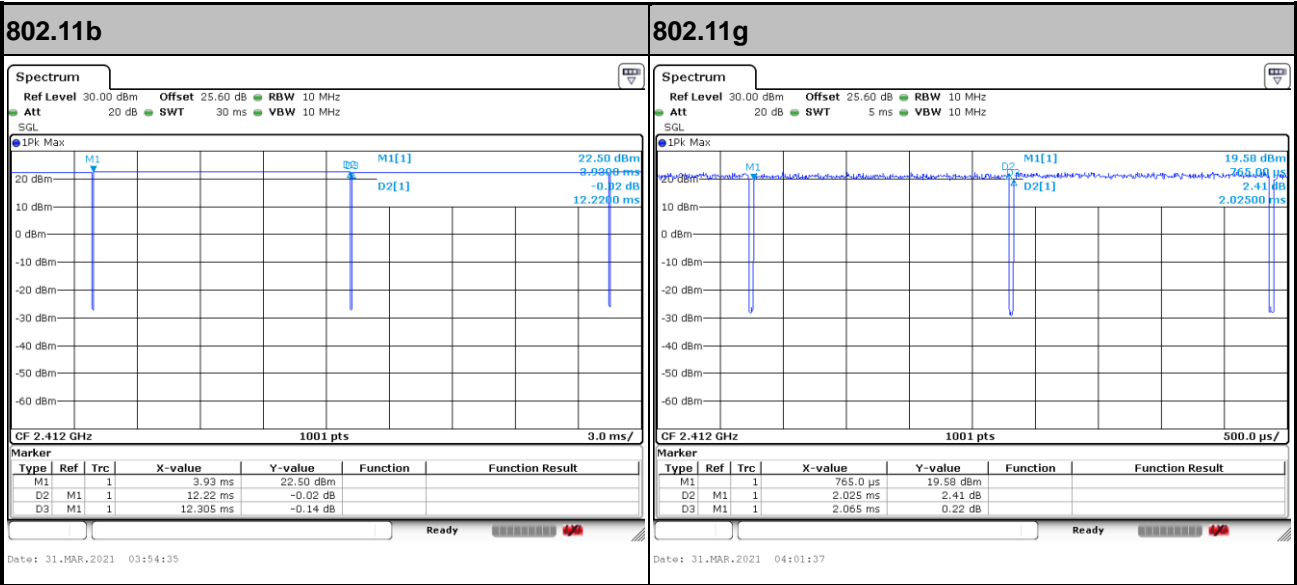


Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1+2	802.11b for Ant 1	99.31	-	-	10Hz	0.03
1+2	802.11b for Ant 2	99.15	-	-	10Hz	0.04
1+2	802.11g for Ant 1	98.06	-	-	10Hz	0.09
1+2	802.11g for Ant 2	98.31	-	-	10Hz	0.07
1+2	2.4GHz 802.11n HT20 for Ant 1	98.18	-	-	10Hz	0.08
1+2	2.4GHz 802.11n HT20 for Ant 2	98.18	-	-	10Hz	0.08



MIMO <Ant. 1>





MIMO <Ant. 2>

