



# RADIO TEST REPORT

FCC ID

: MSQ-RTAX8301

Equipment

: AX1800 + AV1300 Dual-band Powerline Mesh WiFi6 System,

ZenWiFi Hybrid Mesh Wi-Fi System

**Brand Name** 

: ASUS

Model Name

: XP4N, XP4 Node

Applicant

: ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan

Manufacturer

: ASUSTEK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan

Standard

: 47 CFR FCC Part 15.247

The product was received on Dec. 16, 2020, and testing was started from Dec. 17, 2020 and completed on Mar. 08, 2021. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8. Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

TEL: 886-3-656-9065 FAX: 886-3-656-9085

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: May 04, 2021

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# History of this test report

Report No.: FR042155AA

Report No.	Version	Description	Issued Date
FR042155AA	01	Initial issue of report	May 04, 2021

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# **Summary of Test Result**

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Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	PASS	-	
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-
Reference	to Sporton Pro	oject No.: 042147		

## **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: Sam Chen Report Producer: Viola Huang

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# 1 General Description

## 1.1 Information

#### 1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
2400-2483.5	b, g, n (HT20), VHT20, ax (HEW20)	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40, ax (HEW40)	2422-2452	3-9 [7]

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Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2
2.4-2.4835GHz	802.11g	20	2
2.4-2.4835GHz	802.11n HT20	20	2
2.4-2.4835GHz	802.11n HT20-BF	20	2
2.4-2.4835GHz	VHT20	20	2
2.4-2.4835GHz	VHT20-BF	20	2
2.4-2.4835GHz	HEW20	20	2
2.4-2.4835GHz	HEW20-BF	20	2
2.4-2.4835GHz	802.11n HT40	40	2
2.4-2.4835GHz	802.11n HT40-BF	40	2
2.4-2.4835GHz	VHT40	40	2
2.4-2.4835GHz	VHT40-BF	40	2
2.4-2.4835GHz	HEW40	40	2
2.4-2.4835GHz	HEW40-BF	40	2

#### Note:

- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.

• BWch is the nominal channel bandwidth.

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#### 1.1.2 Antenna Information

Ant.	2.4GHz Port	5GHz Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	2	-	Xinsheng	8000000031071341	PCB Antenna	I-PEX	
2	1	-	Xinsheng	8000000031081341	PCB Antenna	I-PEX	Note 1
3	-	2	Xinsheng	8000000031091341	PCB Antenna	I-PEX	Note 1
4	-	1	Xinsheng	8000000031101341	PCB Antenna	I-PEX	

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#### Note1:

Ant.	Gain (dBi)				
Ant.	WLAN 2.4GHz	WLAN 5GHz			
1	3.25	-			
2	3.27	-			
3	-	3.48			
4	-	3.41			

Note 2: The above information was declared by manufacturer.

#### For 2.4GHz function:

## IEEE 802.11b/g/n/VHT/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

## For 5GHz function:

## IEEE 802.11a/n/ac/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

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## 1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b	0.903	0.44	11.831m	100
802.11g	0.942	0.26	1.98m	1k
802.11ax HEW20-BF	0.975	0.11	9.438m	300
802.11ax HEW40-BF	0.977	0.1	9.473m	300

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- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

## 1.1.4 EUT Operational Condition

EUT Power Type Internal power supply					
	$\boxtimes$	With beamforming		Without beamforming	
Beamforming Function	The product has beamforming function for 11n/VHT/ax in 2.4GHz and 11n/ac/ax in 5GHz.				
Function   ☐ Point-to-multipoint ☐ Point-to-point				Point-to-point	
For non-beamforming mode: QSPR (Version : 5.0-00195) For beamforming mode: telnet (Version 6.1.7601)					

Note: The above information was declared by manufacturer.

## 1.1.5 Table for EUT Supports Functions

Function	Support Type
AP Router	Master
Mesh	Master

Note: After evaluating, there is only AP Router was selected to test and record in the report.

## 1.1.6 Table for Multiple Listing

Equipment Name	Model Name	Description
AX1800 + AV1300 Dual-band Powerline Mesh WiFi6 System, ZenWiFi Hybrid Mesh Wi-Fi System	XP4N, XP4 Node	The variation of equipment name/model name is for the strategy of marketing.  The circuit of each equipment name/model
		name is identical.

Note 1: From the above models, model: XP4N was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

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## 1.2 Applicable Standards

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

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- 47 CFR FCC Part 15
- ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D01 v02r01
- FCC KDB 414788 D01 v01r01

## 1.3 Testing Location Information

**Testing Location Information** 

Test Lab.: Sporton International Inc. Hsinchu Laboratory

Hsinchu ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

(TAF: 3787) TEL: 886-3-656-9065 FAX: 886-3-656-9085

Test site Designation No. TW3787 with FCC.

Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH03-CB	Jeff Wu	22.7~23.2 / 54~57	Jan. 13, 2021~Mar. 05, 2021
Radiated (For below 1GHz test)	03CH01-CB	KJ Chang	21.2~22.8 / 55~57	Dec. 26, 2020~Mar. 08, 2021
Radiated (For above 1GHz test)	03CH03-CB	KJ Chang	20.8~22 / 55~58	Dec. 26, 2020~Mar. 08, 2021
AC Conduction	CO02-CB	Wei Li	23~24 / 57~60	Dec. 17, 2020

## 1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	5.0 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.9 dB	Confidence levels of 95%
Conducted Emission	2.8 dB	Confidence levels of 95%
Output Power Measurement	1.4 dB	Confidence levels of 95%
Power Density Measurement	2.8 dB	Confidence levels of 95%
Bandwidth Measurement	0.4%	Confidence levels of 95%

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# 2 Test Configuration of EUT

## 2.1 Test Channel Mode

For non beamforming mode

Mode	Power Setting
802.11b_Nss1,(1Mbps)_2TX	-
2412MHz	26
2417MHz	26.5
2437MHz	26.5
2462MHz	26.5
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	21
2417MHz	25.5
2437MHz	26.5
2457MHz	24.5
2462MHz	20.5

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#### For beamforming mode

Mode	Power Setting
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
2412MHz	25
2437MHz	27
2462MHz	24
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
2422MHz	21
2427MHz	23
2437MHz	25
2447MHz	23
2452MHz	22

#### Note

- Evaluated HEW20/HEW40 mode only, due to similar modulation. The power setting of HT20/HT40/VHT20/VHT40 mode are the same or lower than HEW20/HEW40.
- There are two modes of EUT for 802.11n/VHT/ax in 2.4GHz and 802.11n/ac/ax in 5GHz. One is beamforming mode, and the other is non-beamforming mode, after evaluating, beamforming mode has been evaluated to be the worst case, so it was selected to test and record in this test report.

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# 2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item AC power-line conducted emissions			
Condition AC power-line conducted measurement for line and neutral			
Operating Mode Normal Link			
1	EUT-AP Router + Power cord		

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The Worst Case Mode for Following Conformance Tests		
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands	
Test Condition	Conducted measurement at transmit chains	

Th	The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands			
Test Condition  Radiated measurement  If EUT consist of multiple antenna assembly (multiple antenna are used in E regardless of spatial multiplexing MIMO configuration), the radiated test she be performed with highest antenna gain of each antenna type.				
Operating Mode < 1GHz	CTX			
1	EUT + Power cord_2.4GHz			
2	EUT + Power cord_5GHz			
For operating mode 1 is the worst case and it was record in this test report.				
Operating Mode > 1GHz	СТХ			
1	EUT + Power cord_2.4GHz			

The Worst Case Mode for Following Conformance Tests		
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation		
Operating Mode		
1 WLAN 2.4GHz + WLAN 5GHz		
Refer to Sporton Test Report No.: FA042155 for Co-location RF Exposure Evaluation.		

Note: The EUT can only use Y axis position.

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# 2.3 EUT Operation during Test

For CTX Mode:

#### non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

#### beamforming mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

- 1. During the test, the EUT operation to normal function.
- 2. Executed command fixed test channel under telnet.
- 3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by RX Device and transmit duty cycle no less than 98%.

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#### For Normal Link:

During the test, the EUT operation to normal function.

## 2.4 Accessories

Accessories
Power cord*1, non-shielded, 1.5m
RJ-45 cable*1, non-shielded, 1.5m

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# 2.5 Support Equipment

#### For AC Conduction:

	Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID		
Α	LAN1 NB	DELL	E6430	N/A		
В	2.4G NB	DELL	E6430	N/A		
С	5G NB	DELL	E6430	N/A		
D	LAN2 NB	DELL	E6430	N/A		

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For Radiated (below 1GHz):

	1 of Hadiatod (boton 1 of 12).					
Support Equipment						
No.	Equipment	Brand Name	Model Name	FCC ID		
Α	Notebook	DELL	E4300	N/A		

## For Radiated (above 1GHz) and RF Conducted:

For non beamforming mode

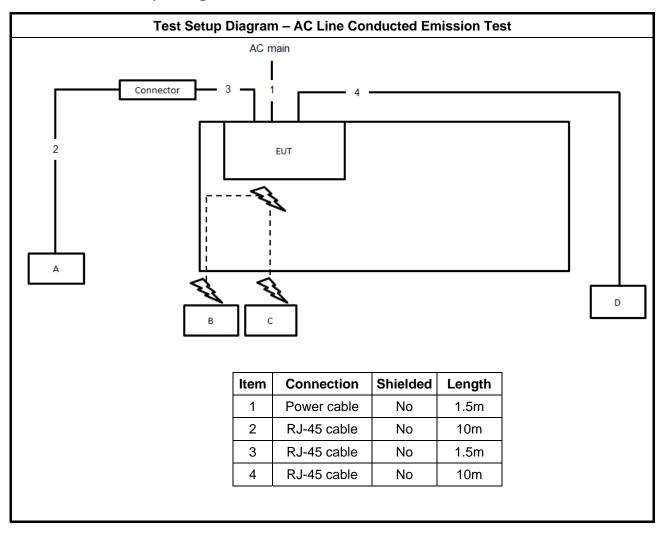
Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID				
Α	Notebook	DELL	E4300	N/A	

For beamforming mode

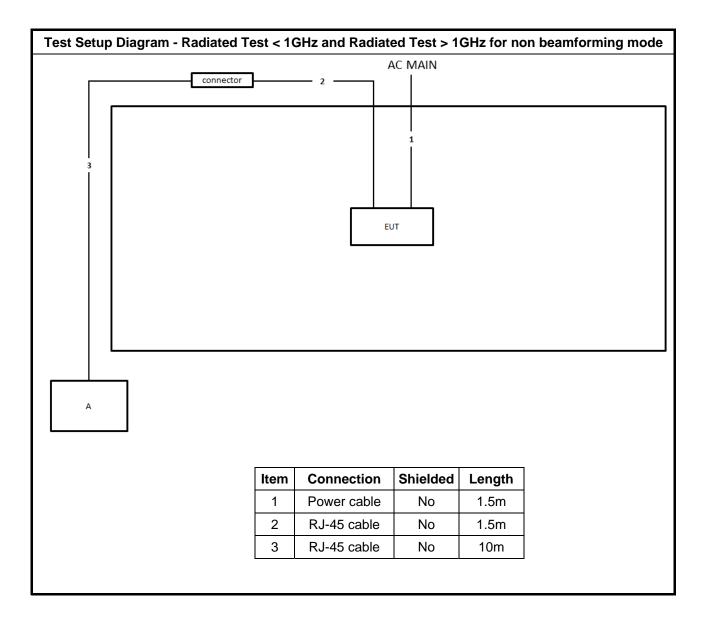
	Support Equipment							
No.	No. Equipment Brand Name Model Name FCC ID							
Α	Notebook	DELL	E4300	N/A				
В	RX Device	ASUS	XP4N	MSQ-RTAX8301				
С	Notebook	DELL	E4300	N/A				

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# 2.6 Test Setup Diagram

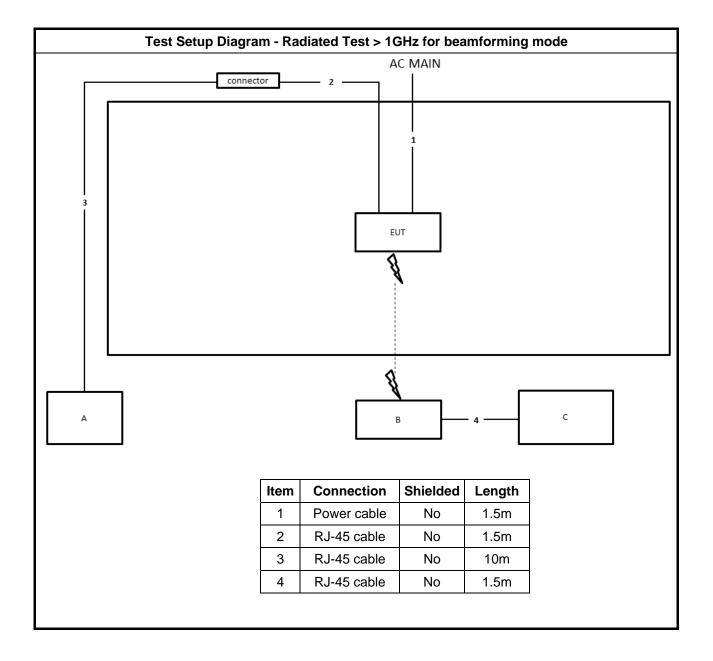


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## 3 Transmitter Test Result

## 3.1 AC Power-line Conducted Emissions

## 3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit  Frequency Emission (MHz)  Quasi-Peak  Average					
0.5-5	56	46			
5-30	60	50			
Note 1: * Decreases with the logarithm of the frequency.					

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## 3.1.2 Measuring Instruments

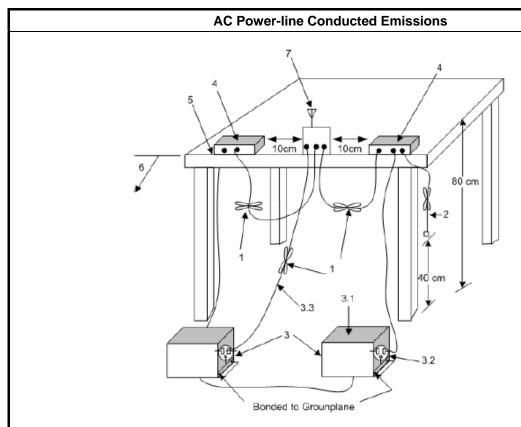
Refer a test equipment and calibration data table in this test report.

## 3.1.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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## 3.1.4 Test Setup



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.

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- 2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50  $\Omega$  loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
- 3.1—All other equipment powered from additional LISN(s).
- 3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
- 3.3—LISN at least 80 cm from nearest part of EUT chassis.
- 4—Non-EUT components of EUT system being tested.
- 5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
- 6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
- 7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

#### 3.1.5 Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level
- b. Margin = -Limit + Level

#### 3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

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## 3.2 DTS Bandwidth

## 3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit				
Systems using digital modulation techniques:				
■ 6 dB bandwidth ≥ 500 kHz.				

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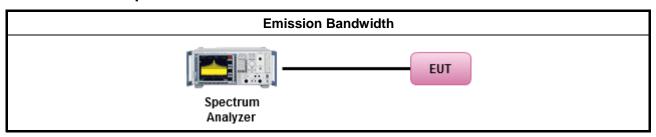
## 3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.2.3 Test Procedures

	Test Method							
•	For the emission bandwidth shall be measured using one of the options below:							
	$\boxtimes$	Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.						
		Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.						
		Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.						

## 3.2.4 Test Setup



## 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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## 3.3 Maximum Conducted Output Power

## 3.3.1 Maximum Conducted Output Power Limit

#### **Maximum Conducted Output Power Limit**

- If G<sub>TX</sub> ≤ 6 dBi, then P<sub>Out</sub> ≤ 30 dBm (1 W)
- Point-to-multipoint systems (P2M): If  $G_{TX} > 6$  dBi, then  $P_{Out} = 30 (G_{TX} 6)$  dBm
- Point-to-point systems (P2P): If  $G_{TX} > 6$  dBi, then  $P_{Out} = 30 (G_{TX} 6)/3$  dBm
- Smart antenna system (SAS):
  - Single beam: If  $G_{TX} > 6$  dBi, then  $P_{Out} = 30 (G_{TX} 6)/3$  dBm
  - Overlap beam: If  $G_{TX} > 6$  dBi, then  $P_{Out} = 30 (G_{TX} 6)/3$  dBm
  - Aggregate power on all beams: If  $G_{TX} > 6$  dBi, then  $P_{Out} = 30 (G_{TX} 6)/3 + 8$ dB dBm

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 $\mathbf{P}_{\text{Out}}$  = maximum peak conducted output power or maximum conducted output power in dBm,  $\mathbf{G}_{\text{TX}}$  = the maximum transmitting antenna directional gain in dBi.

## 3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

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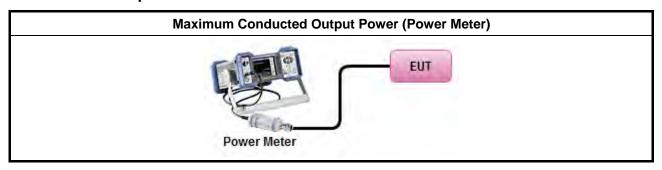
## 3.3.3 Test Procedures

		Test Method		
•	Max	imum Peak Conducted Output Power		
		Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).		
		Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).		
•	Max	imum Conducted Output Power		
	[duty	/ cycle ≥ 98% or external video / power trigger]		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)		
	duty	cycle < 98% and average over on/off periods with duty factor		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)		
	Measurement using a power meter (PM)			
		Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).		
	$\boxtimes$	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).		
•	For	conducted measurement.		
	•	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.		
	•	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$		

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## 3.3.4 Test Setup



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## 3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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## 3.4 Power Spectral Density

## 3.4.1 Power Spectral Density Limit

# Power Spectral Density Limit Power Spectral Density (PSD) ≤ 8 dBm/3kHz

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## 3.4.2 Measuring Instruments

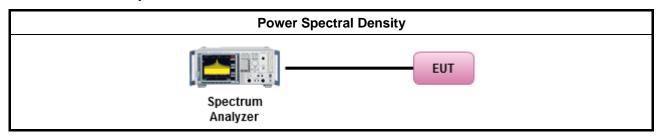
Refer a test equipment and calibration data table in this test report.

## 3.4.3 Test Procedures

	Test Method						
•	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).						
	$\boxtimes$	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD.					
•	For	onducted measurement.					
	•	f The EUT supports multiple transmit chains using options given below:					
		Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.					
		Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,					
		Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.					

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## 3.4.4 Test Setup



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## 3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

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## 3.5 Emissions in Non-restricted Frequency Bands

## 3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit				
RF output power procedure	Limit (dBc)			
Peak output power procedure	20			
Average output power procedure	30			

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- Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
- Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

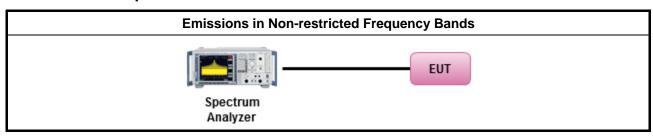
## 3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

#### 3.5.3 Test Procedures

Test Method	
Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.	

#### 3.5.4 Test Setup



## 3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

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## 3.6 Emissions in Restricted Frequency Bands

## 3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit							
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)				
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300				
0.490~1.705	24000/F(kHz)	33.8 - 23	30				
1.705~30.0	30	29	30				
30~88	100	40	3				
88~216	150	43.5	3				
216~960	200	46	3				
Above 960	500	54	3				

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- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.
- Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

#### 3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

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## 3.6.3 Test Procedures

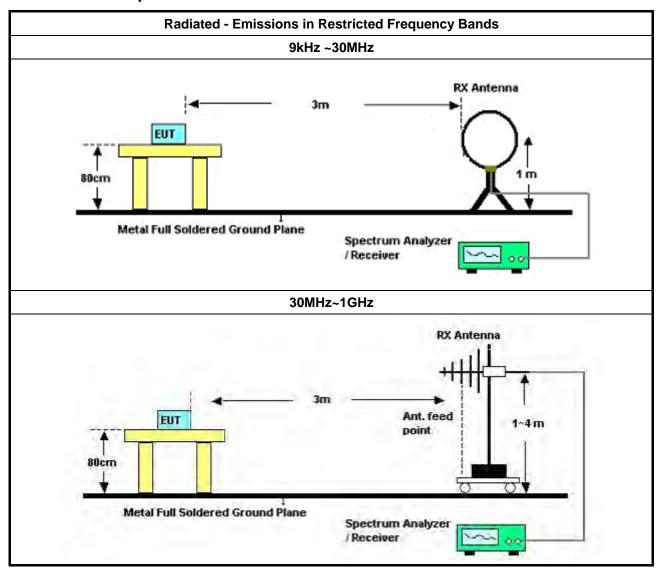
	Test Method					
•	The	average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].				
•	Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.					
•	For	the transmitter unwanted emissions shall be measured using following options below:				
	•	Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.				
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).				
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).				
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).				
		Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.				
		Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.				
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.				
•	For	the transmitter band-edge emissions shall be measured using following options below:				
	•	Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.				
	•	Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.				
	•	Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).				
	•	For conducted unwanted emissions into restricted bands (absolute emission limits).  Devices with multiple transmit chains using options given below:  (1) Measure and sum the spectra across the outputs or  (2) Measure and add 10 log(N) dB				
	•	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.				

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## 3.6.4 Test Setup



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#### 3.6.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

## 3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.

## 3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

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# 4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Dec. 04, 2020	Dec. 03, 2021	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 20, 2020	Nov. 19, 2021	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Mar. 10, 2020	Mar. 09, 2021	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 20, 2020	Oct. 19, 2021	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Mar. 19, 2020	Mar. 18, 2021	Conduction (CO02-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH01-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH01-CB	30 MHz ~ 1 GHz	Jan. 28, 2020	Jan. 27, 2021	Radiation (03CH01-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH01-CB	30 MHz ~ 1 GHz	Jan. 26, 2021	Jan. 25, 2022	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Feb. 28, 2020	Feb. 27, 2021	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Feb. 22, 2021	Feb. 21, 2022	Radiation (03CH01-CB)
Preamplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	Jul. 03, 2020	Jun. 02, 2021	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Apr. 16, 2020	Apr. 15, 2021	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH01-CB)
RF Cable-low	Woken	RG402	Low Cable-16+17	30 MHz ~ 1 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH01-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH03-CB	1GHz ~18GHz 3m	May 28, 2020	May 27, 2021	Radiation (03CH03-CB)
Horn Antenna	COM-POWER	AH-118	071028	1GHz ~ 18GHz	Jun. 09, 2020	Jun. 08, 2021	Radiation (03CH03-CB)
Horn Antenna	ETS • Lindgren	3115	6821	750MHz~18GHz	Jan. 26, 2021	Jan. 25, 2022	Radiation (03CH03-CB)

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Calibration Calibration Instrument **Brand** Model No. Serial No. Characteristics Remark **Date Due Date** Radiation Jun. 09, 2020 COM-POWER 071028 1GHz ~ 18GHz Jun. 08, 2021 Horn Antenna AH-118 (03CH03-CB) Radiation BBHA9170252 Horn Antenna Schwarzbeck **BBHA 9170** 15GHz ~ 40GHz Jul. 21, 2020 Jul. 20, 2021 (03CH03-CB) Radiation 8449B 3008A02097 1GHz ~ 26.5GHz Jul. 03, 2020 Pre-Amplifier Agilent Jun. 02, 2021 (03CH03-CB) TTA1840-35-H Radiation Pre-Amplifier MITFO 1864479 18GHz ~ 40GHz Jul. 08, 2020 Jul. 07, 2021 (03CH03-CB) G Spectrum Radiation R&S FSP40 100019 9kHz ~ 40GHz Jun. 09, 2020 Jun. 08, 2021 (03CH03-CB) Analyzer High Radiation 1GHz ~ 18GHz RF Cable-high Woken RG402 Oct. 05, 2020 Oct. 04, 2021 Cable-20+29 (03CH03-CB) Radiation RF Cable-high Woken RG402 High Cable-29 1GHz ~ 18GHz Oct. 05, 2020 Oct. 04, 2021 (03CH03-CB) High Radiation RF Cable-high Woken RG402 18GHz ~ 40 GHz Jul. 16, 2020 Jul. 15, 2021 (03CH03-CB) Cable-40G#1 High Radiation 18GHz ~ 40 GHz RF Cable-high Woken RG402 Jul. 16, 2020 Jul. 15, 2021 Cable-40G#2 (03CH03-CB) Radiation Test Software **SPORTON** SENSE V5.10 N.C.R. N.C.R. (03CH03-CB) Spectrum Conducted R&S FSV40 101028 9kHz~40GHz Dec. 31, 2020 Dec. 30, 2021 analyzer (TH03-CB) Conducted Power Sensor Anritsu MA2411B 1726195 300MHz~40GHz Aug. 17, 2020 Aug. 16, 2021 (TH03-CB) Conducted 1035008 Aug. 16, 2021 Power Meter Anritsu ML2495A 300MHz~40GHz Aug. 17, 2020 (TH03-CB) Conducted RF Cable-high Woken RG402 High Cable-11 1 GHz -18 GHz Oct. 05, 2020 Oct. 04, 2021 (TH03-CB) Conducted RF Cable-high Woken RG402 High Cable-12 1 GHz -18 GHz Oct. 05, 2020 Oct. 04, 2021 (TH03-CB) Conducted RF Cable-high Woken RG402 High Cable-13 1 GHz -18 GHz Oct. 05, 2020 Oct. 04, 2021 (TH03-CB) Conducted Oct. 05, 2020 RF Cable-high Woken RG402 High Cable-14 1 GHz -18 GHz Oct. 04, 2021 (TH03-CB) Conducted RG402 High Cable-15 1 GHz -18 GHz Oct. 05, 2020 Oct. 04, 2021 RF Cable-high Woken (TH03-CB)

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Conducted

(TH03-CB)

N.C.R.

N.C.R.

Note: Calibration Interval of instruments listed above is one year.

SENSE

N.C.R. means Non-Calibration required.

**SPORTON** 

Test Software

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V5.10



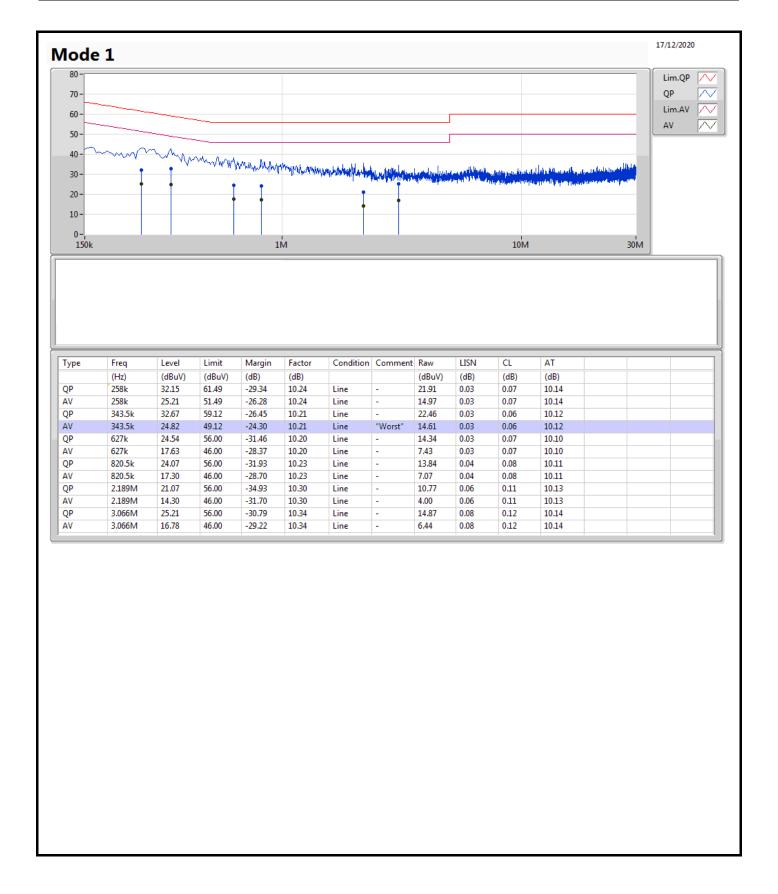
## Conducted Emissions at Powerline

Appendix A

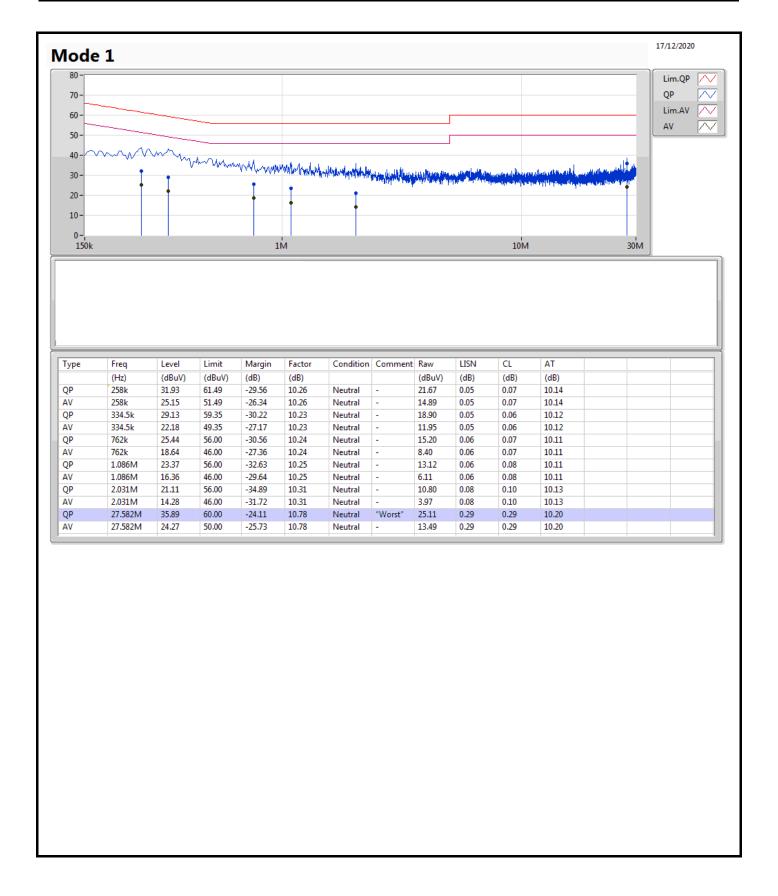
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	27.582M	35.89	60.00	-24.11	Neutral











EBW Appendix B.1

**Summary** 

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	7.575M	13.818M	13M8G1D	7.075M	12.919M
802.11g_Nss1,(6Mbps)_2TX	16.3M	16.392M	16M4D1D	15.75M	16.367M

**Max-N dB** = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth; **Min-N dB** = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;



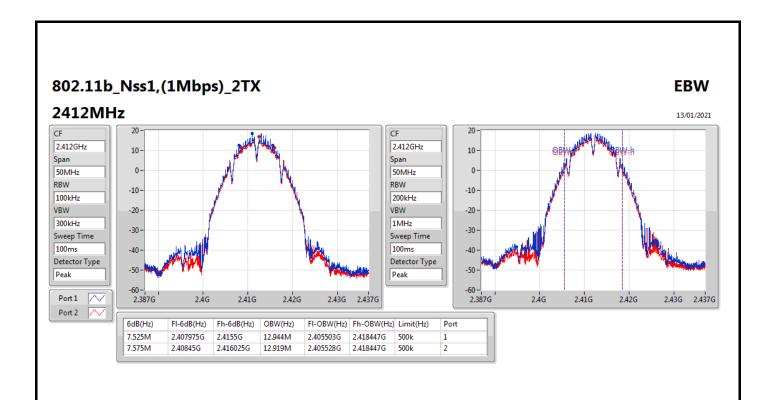
EBW Appendix B.1

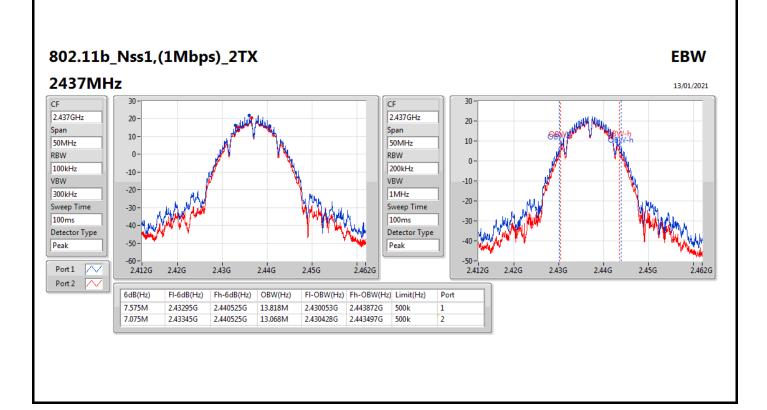
#### Result

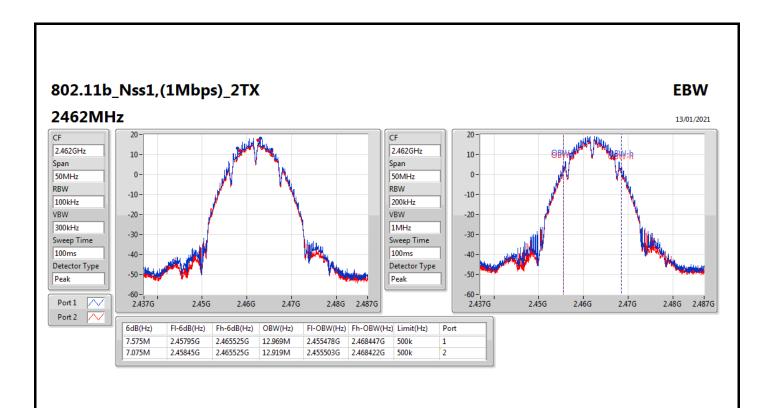
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	7.525M	12.944M	7.575M	12.919M
2437MHz	Pass	500k	7.575M	13.818M	7.075M	13.068M
2462MHz	Pass	500k	7.575M	12.969M	7.075M	12.919M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.3M	16.367M	15.775M	16.367M
2437MHz	Pass	500k	15.875M	16.367M	15.75M	16.392M
2462MHz	Pass	500k	16M	16.367M	16.05M	16.392M

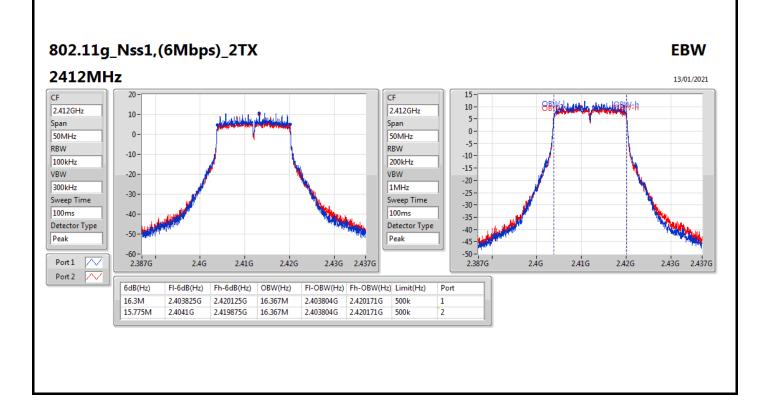
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

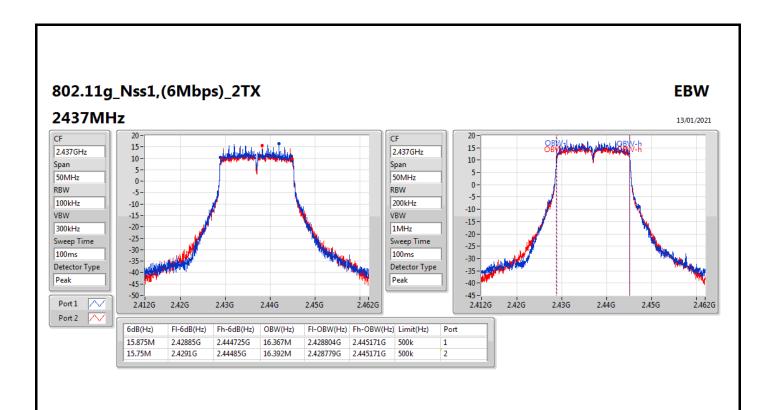
EBW Appendix B.1

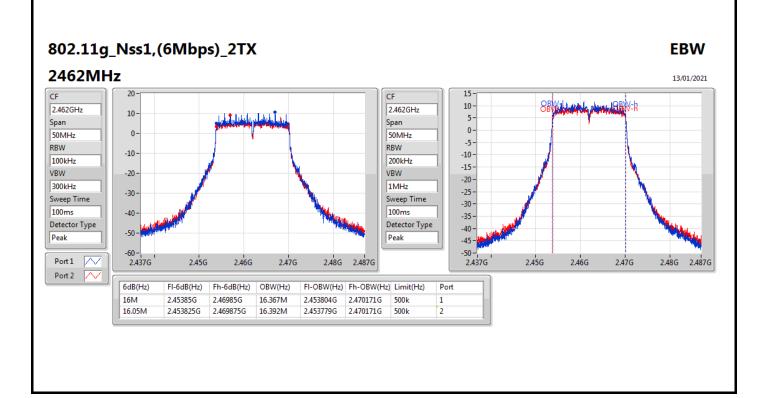














Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	17.85M	18.891M	18M9D1D	16.575M	18.841M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	33.75M	37.731M	37M7D1D	7.05M	37.681M

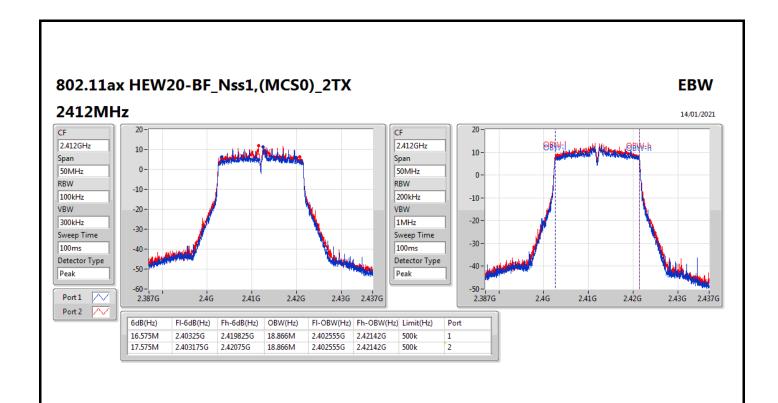
**Max-N dB** = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth; **Min-N dB** = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

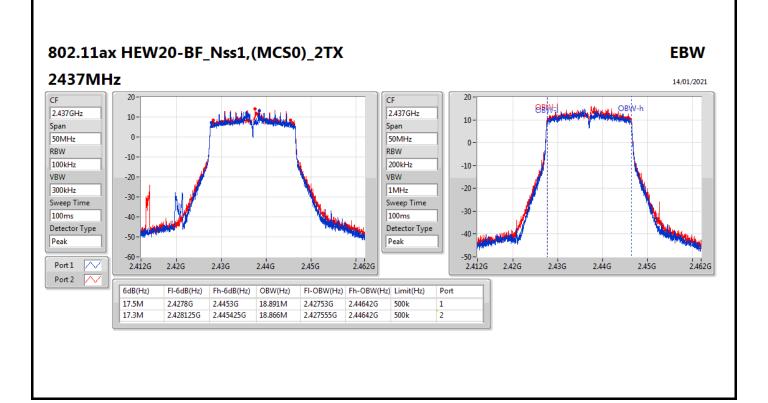


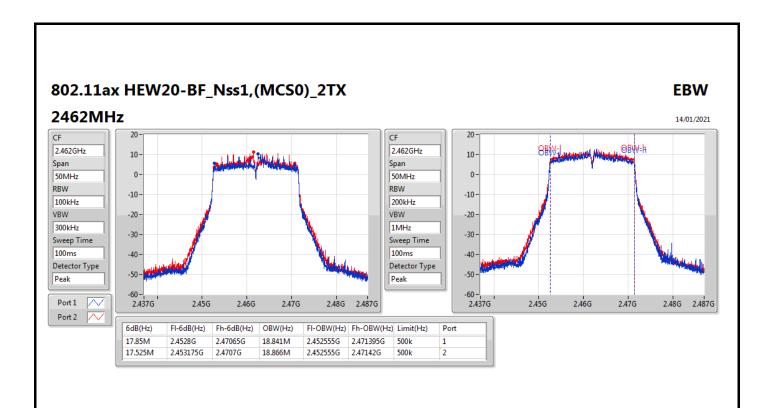
### Result

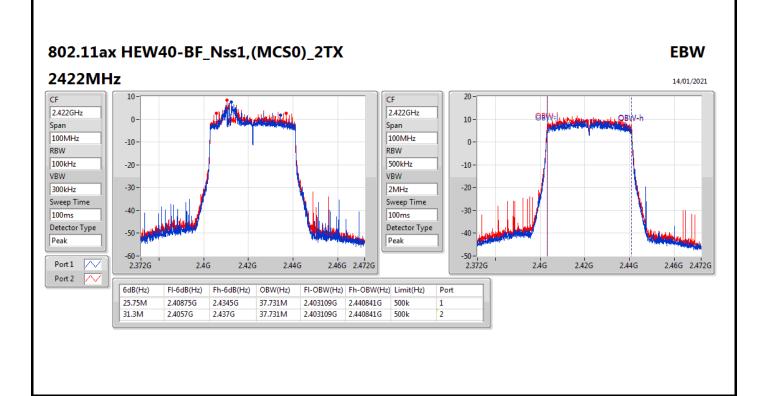
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.575M	18.866M	17.575M	18.866M
2437MHz	Pass	500k	17.5M	18.891M	17.3M	18.866M
2462MHz	Pass	500k	17.85M	18.841M	17.525M	18.866M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	25.75M	37.731M	31.3M	37.731M
2437MHz	Pass	500k	28.75M	37.731M	31.2M	37.681M
2452MHz	Pass	500k	7.05M	37.681M	33.75M	37.731M

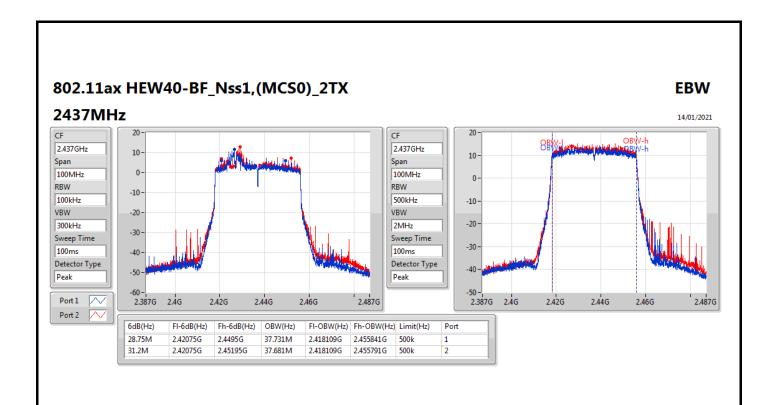
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

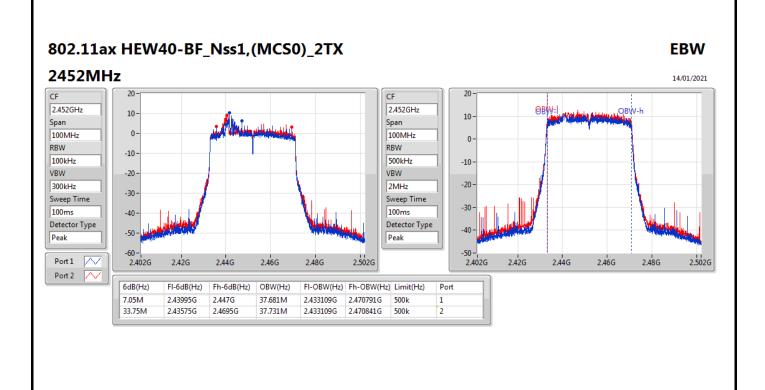














Mode	Total Power (dBm)	Total Power (W)			
2.4-2.4835GHz	-	-			
802.11b_Nss1,(1Mbps)_2TX	29.82	0.95940			
802.11g_Nss1,(6Mbps)_2TX	29.88	0.97275			

### Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit	
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	
2412MHz	Pass	3.27	26.83	25.77	29.34	30.00	
2417MHz	Pass	3.27	26.66	26.21	29.45	30.00	
2437MHz	Pass	Pass 3.27 27.29 26.26		26.26	29.82	30.00	
2462MHz	Pass	3.27	27.11	26.06	29.63	30.00	
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	
2412MHz	Pass	3.27	21.92	20.92	24.46	30.00	
2417MHz	Pass	3.27	26.23	25.29	28.80	30.00	
2437MHz	Pass	3.27	27.31	26.39	29.88	30.00	
2457MHz	Pass	3.27	25.19	24.34	27.80	30.00	
2462MHz	Pass	3.27	21.24	20.32	23.81	30.00	

**DG** = Directional Gain; **Port X** = Port X output power



Mode	Total Power (dBm)	Total Power (W)			
2.4-2.4835GHz	-	-			
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	26.59	0.45604			
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	25.00	0.31623			

### Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.27	20.32	22.14	24.33	29.73
2437MHz	Pass	6.27	23.11	24.01	26.59	29.73
2462MHz	Pass	6.27	20.08	21.17	23.67	29.73
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	6.27	17.33	18.49	20.96	29.73
2427MHz	Pass	6.27	19.38	20.45	22.96	29.73
2437MHz	Pass	6.27	21.47	22.45	25.00	29.73
2447MHz	Pass	6.27	19.27	20.26	22.80	29.73
2452MHz	Pass	6.27	18.25	19.39	21.87	29.73

**DG** = Directional Gain; **Port X** = Port X output power



**Summary** 

Mode	PD (dBm/RBW)					
2.4-2.4835GHz	-					
802.11b_Nss1,(1Mbps)_2TX	5.21					
802.11g_Nss1,(6Mbps)_2TX	0.62					

RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;

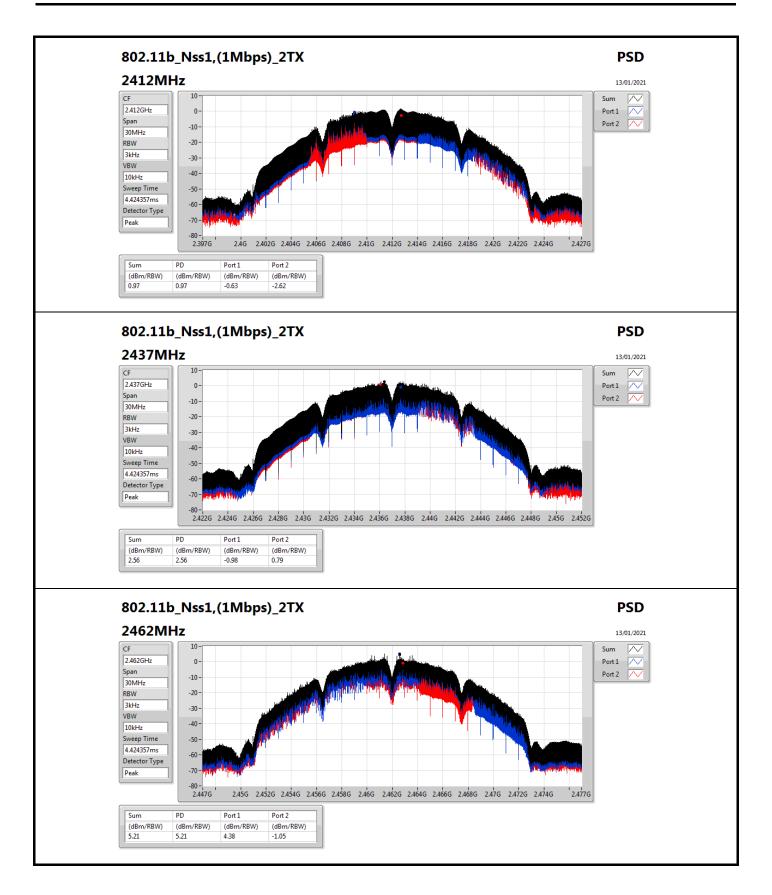


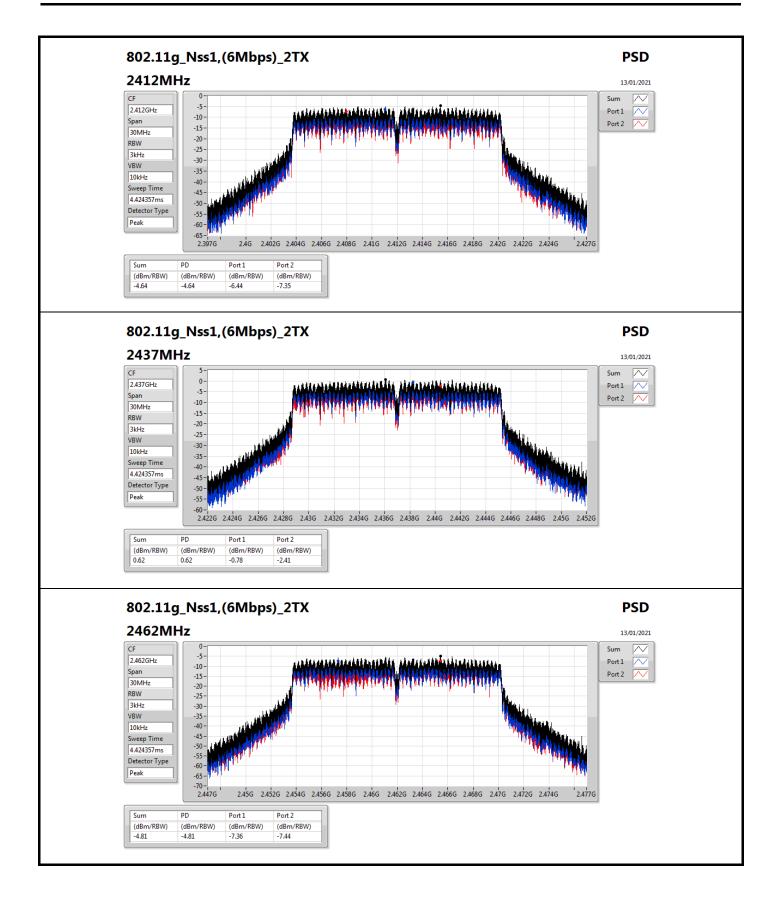
Appendix D.1 **PSD** 

### Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.27	-0.63	-2.62	0.97	7.73
2437MHz	Pass	6.27	-0.98	0.79	2.56	7.73
2462MHz	Pass	6.27	4.38	-1.05	5.21	7.73
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.27	-6.44	-7.35	-4.64	7.73
2437MHz	Pass	6.27	-0.78	-2.41	0.62	7.73
2462MHz	Pass	6.27	-7.36	-7.44	-4.81	7.73

DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;







**Summary** 

Mode	PD (dBm/RBW)					
2.4-2.4835GHz	-					
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-0.37					
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-2.15					

RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;

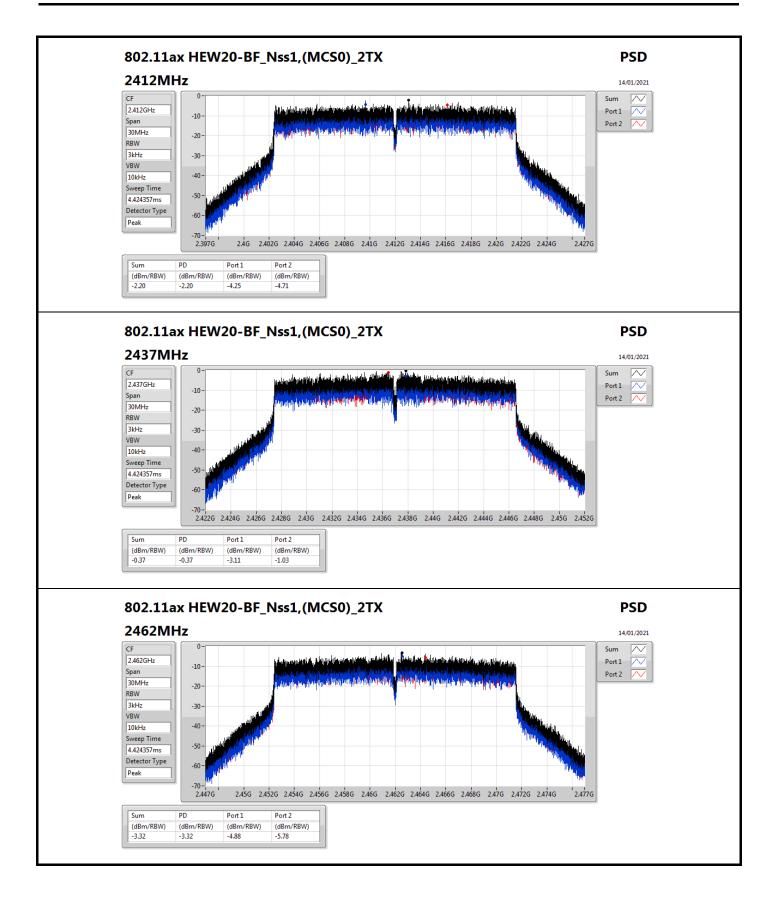


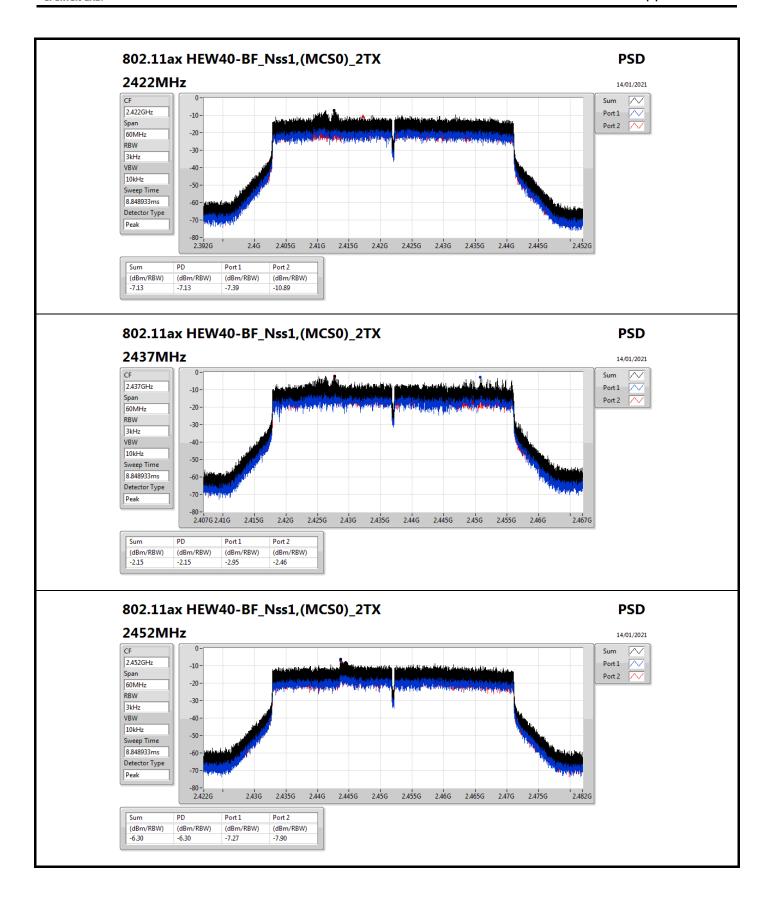
Appendix D.2 **PSD** 

### Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit	
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
2412MHz	Pass	6.27	-4.25	-4.71	-2.20	7.73	
2437MHz	Pass	6.27	-3.11	-1.03	-0.37	7.73	
2462MHz	Pass	6.27	-4.88	-5.78	-3.32	7.73	
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
2422MHz	Pass	6.27	-7.39	-10.89	-7.13	7.73	
2437MHz	Pass	6.27	-2.95	-2.46	-2.15	7.73	
2452MHz	Pass	6.27	-7.27	-7.90	-6.30	7.73	

DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
 PD = trace bin-by-bin of each transmits port summing can be performed maximum power density;







# CSE(Non-restricted Band)

Appendix E.1

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	Pass	2.43749G	17.42	-12.58	2.18117G	-47.32	2.39974G	-35.45	2.4G	-45.58	2.51588G	-45.55	7.23514G	-30.29	1
802.11g_Nss1,(6Mbps)_2TX	Pass	2.44196G	16.55	-13.45	1.88322G	-48.03	2.39988G	-25.46	2.4G	-26.24	2.5005G	-46.27	16.73708G	-40.33	1



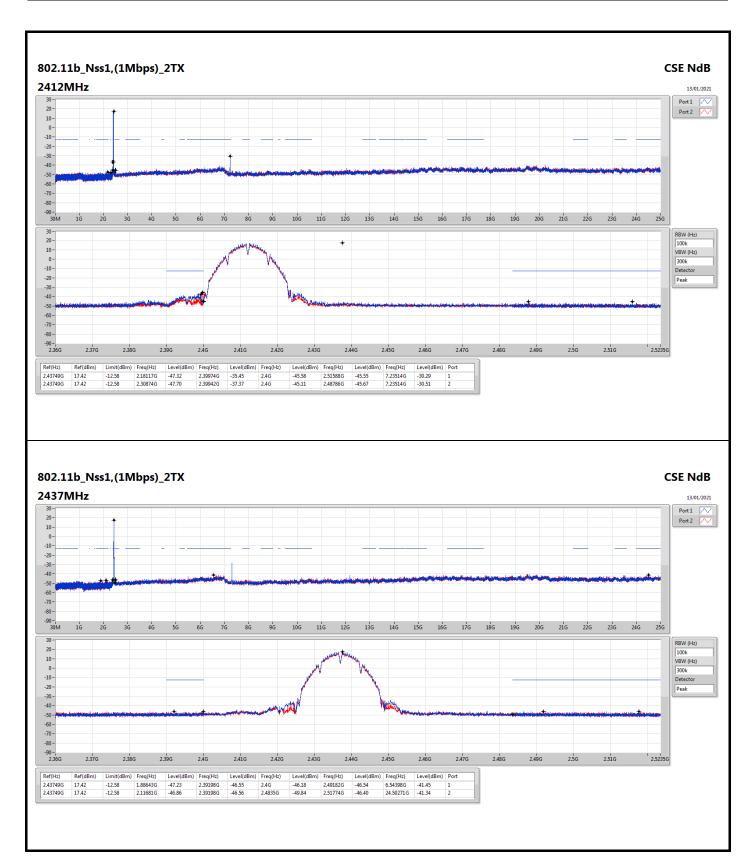
# CSE(Non-restricted Band)

Appendix E.1

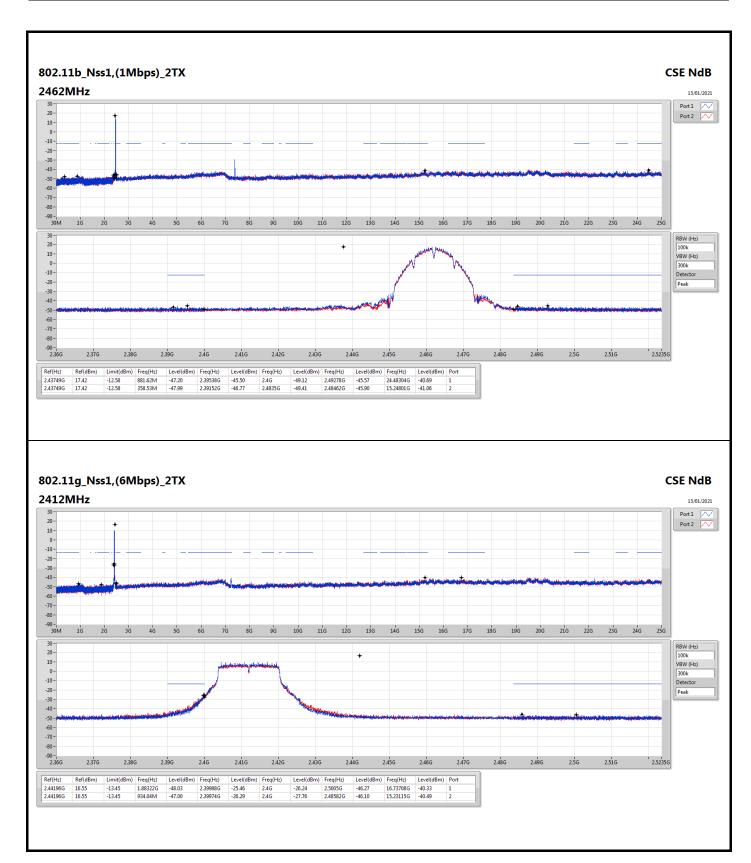
### Result

Mode	Result	Ref	Ref	Limit	Frea	Level	Frea	Level	Frea	Level	Freq	Level	Freq	Level	Port
ode	, result	(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43749G	17.42	-12.58	2.18117G	-47.32	2.39974G	-35.45	2.4G	-45.58	2.51588G	-45.55	7.23514G	-30.29	1
2412MHz	Pass	2.43749G	17.42	-12.58	2.30874G	-47.70	2.39942G	-37.37	2.4G	-45.11	2.48786G	-45.67	7.23514G	-30.51	2
2437MHz	Pass	2.43749G	17.42	-12.58	1.88643G	-47.23	2.39198G	-46.55	2.4G	-46.18	2.49182G	-46.54	6.54398G	-41.45	1
2437MHz	Pass	2.43749G	17.42	-12.58	2.11681G	-46.86	2.39198G	-46.56	2.4835G	-49.84	2.51774G	-46.40	24.50271G	-41.34	2
2462MHz	Pass	2.43749G	17.42	-12.58	881.62M	-47.20	2.39538G	-45.50	2.4G	-49.12	2.49278G	-45.57	24.48304G	-40.69	1
2462MHz	Pass	2.43749G	17.42	-12.58	358.53M	-47.99	2.39152G	-46.77	2.4835G	-49.41	2.48462G	-45.90	15.24801G	-41.06	2
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.44196G	16.55	-13.45	1.88322G	-48.03	2.39988G	-25.46	2.4G	-26.24	2.5005G	-46.27	16.73708G	-40.33	1
2412MHz	Pass	2.44196G	16.55	-13.45	934.04M	-47.00	2.39974G	-26.29	2.4G	-27.76	2.48582G	-46.10	15.23115G	-40.49	2
2437MHz	Pass	2.44196G	16.55	-13.45	942.78M	-47.99	2.39544G	-44.07	2.4G	-46.19	2.49382G	-45.14	6.6367G	-41.47	1
2437MHz	Pass	2.44196G	16.55	-13.45	537.65M	-47.92	2.3979G	-44.41	2.4G	-45.81	2.51398G	-44.46	21.52176G	-41.24	2
2462MHz	Pass	2.44196G	16.55	-13.45	2.09991G	-48.24	2.39864G	-47.39	2.4835G	-47.12	2.48636G	-44.11	16.24259G	-41.62	1
2462MHz	Pass	2.44196G	16.55	-13.45	899.96M	-46.97	2.397G	-47.15	2.4835G	-45.58	2.48386G	-43.67	17.18099G	-41.09	2

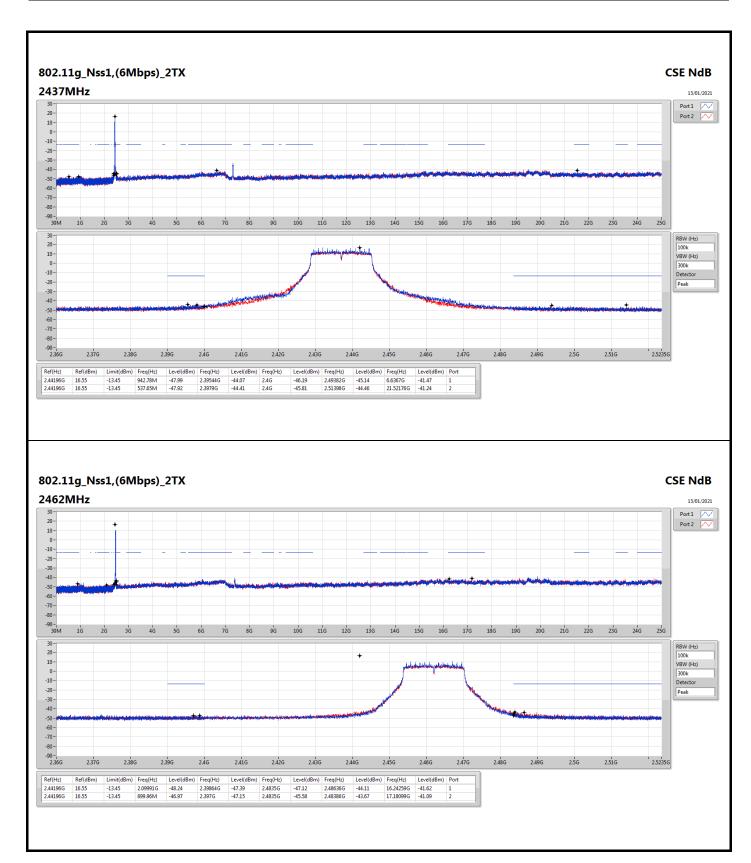














# CSE(Non-restricted Band)

Appendix E.2

<u> </u>																
	Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
			(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX		Pass	2.43549G	13.85	-16.15	1.76672G	-48.72	2.4G	-19.74	2.4G	-22.45	2.51714G	-46.77	7.22952G	-39.13	2
802.11ax HEW4	0-BF_Nss1,(MCS0)_2TX	Pass	2.42801G	12.50	-17.50	2.08384G	-48.74	2.4G	-29.27	2.4G	-44.78	2.4869G	-40.53	24.4447G	-42.20	2



Appendix E.2

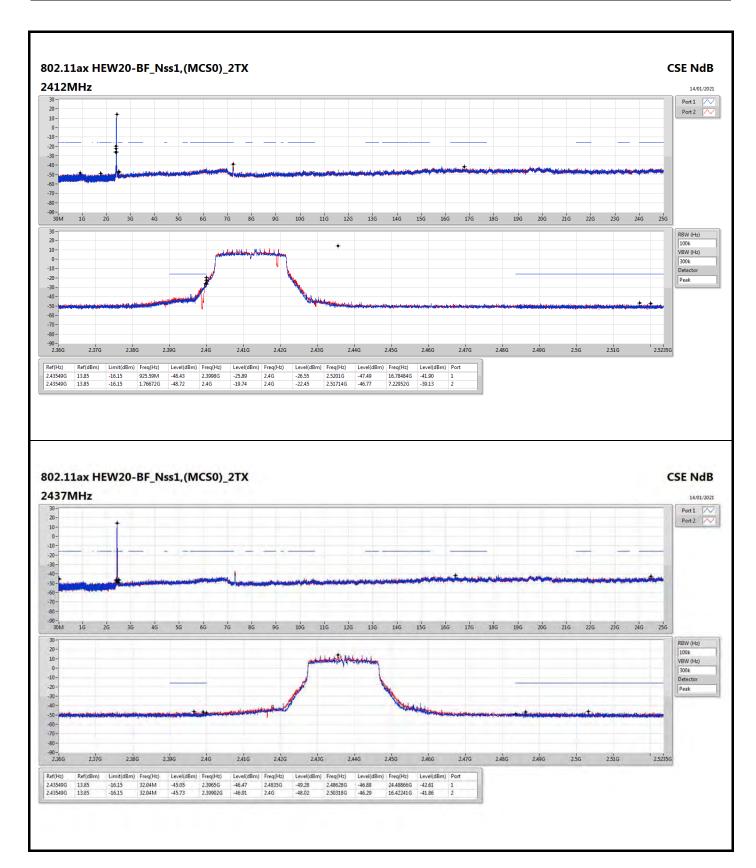
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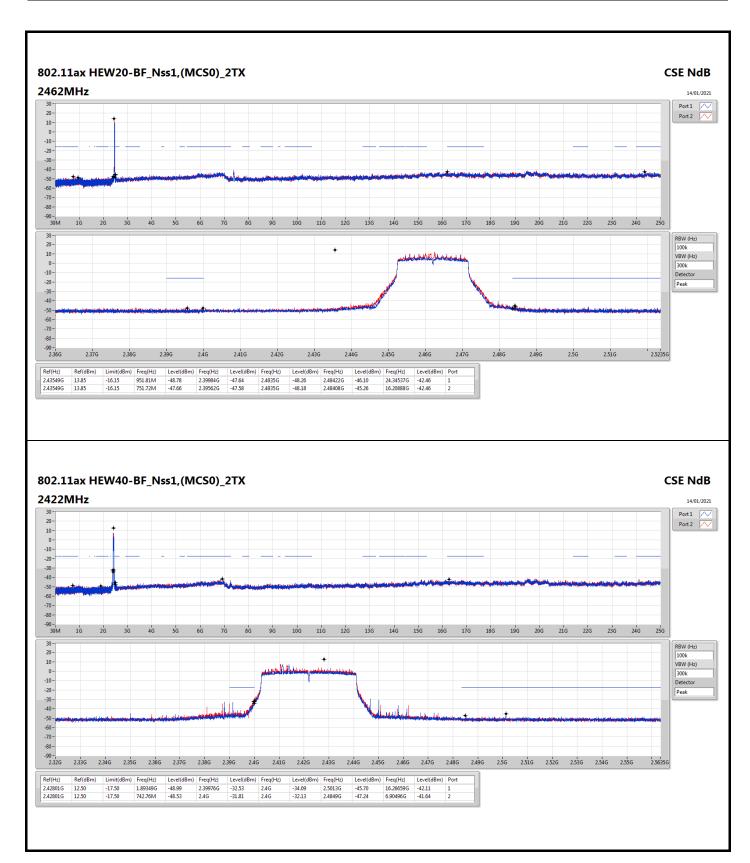


Result															
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43549G	13.85	-16.15	925.59M	-48.43	2.3998G	-25.89	2.4G	-26.55	2.5201G	-47.49	16.78484G	-41.90	1
2412MHz	Pass	2.43549G	13.85	-16.15	1.76672G	-48.72	2.4G	-19.74	2.4G	-22.45	2.51714G	-46.77	7.22952G	-39.13	2
2437MHz	Pass	2.43549G	13.85	-16.15	32.04M	-45.05	2.3965G	-46.47	2.4835G	-49.28	2.48628G	-46.88	24.48866G	-42.61	1
2437MHz	Pass	2.43549G	13.85	-16.15	32.04M	-45.73	2.39902G	-46.91	2.4G	-48.02	2.50318G	-46.29	16.42241G	-41.86	2
2462MHz	Pass	2.43549G	13.85	-16.15	951.81M	-48.78	2.39984G	-47.64	2.4835G	-48.26	2.48422G	-46.10	24.34537G	-42.46	1
2462MHz	Pass	2.43549G	13.85	-16.15	751.72M	-47.66	2.39562G	-47.58	2.4835G	-48.18	2.48408G	-45.26	16.20888G	-42.46	2
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.42801G	12.50	-17.50	1.89349G	-48.99	2.39976G	-32.53	2.4G	-34.09	2.5013G	-45.70	16.26659G	-42.11	1
2422MHz	Pass	2.42801G	12.50	-17.50	742.76M	-48.53	2.4G	-31.81	2.4G	-32.13	2.4849G	-47.24	6.90496G	-41.64	2
2437MHz	Pass	2.42801G	12.50	-17.50	2.16399G	-48.14	2.39948G	-41.73	2.4G	-47.15	2.48502G	-46.18	16.73495G	-42.11	1
2437MHz	Pass	2.42801G	12.50	-17.50	2.08384G	-48.74	2.4G	-29.27	2.4G	-44.78	2.4869G	-40.53	24.4447G	-42.20	2
2452MHz	Pass	2.42801G	12.50	-17.50	675.49M	-48.25	2.39872G	-45.36	2.4835G	-48.56	2.48446G	-41.02	21.81402G	-42.62	1
2452MHz	Pass	2.42801G	12.50	-17.50	2.07783G	-49.30	2.39376G	-41.76	2.4835G	-45.76	2.48942G	-37.70	24.70272G	-42.30	2



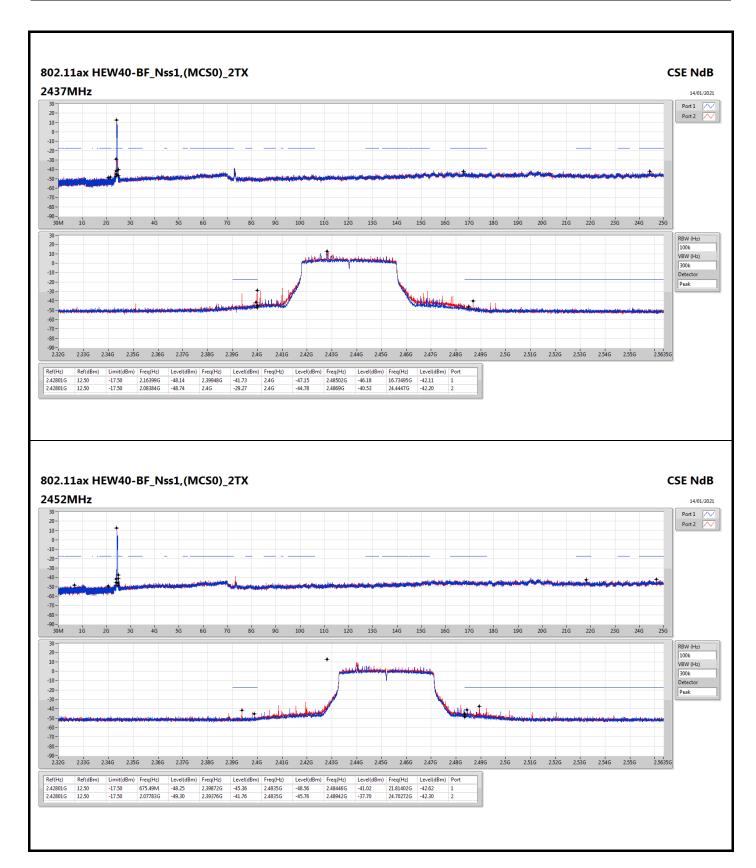






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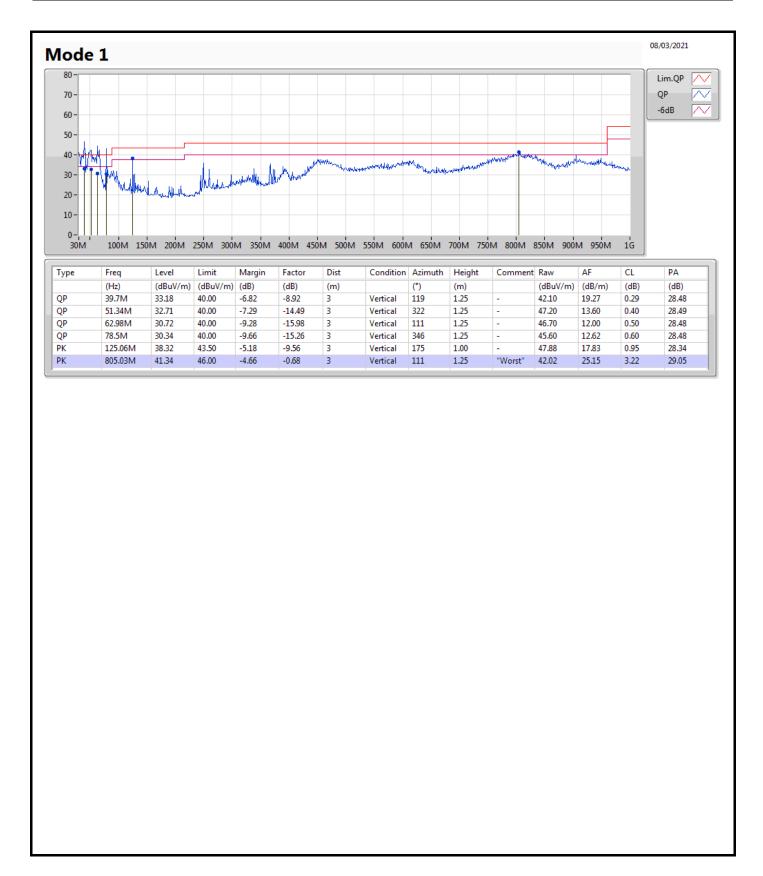


## Radiated Emissions below 1GHz

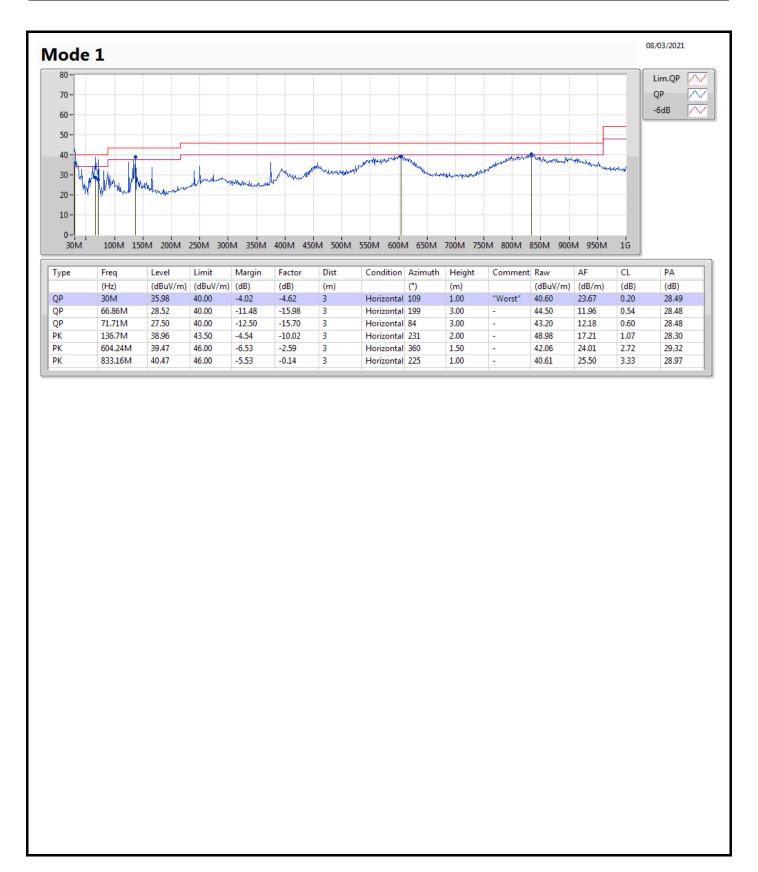
Appendix F.1

Mode	Result	Туре	Freq	Level	Limit	Margin	Condition
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	
Mode 1	Pass	QP	30M	35.98	40.00	-4.02	Horizontal











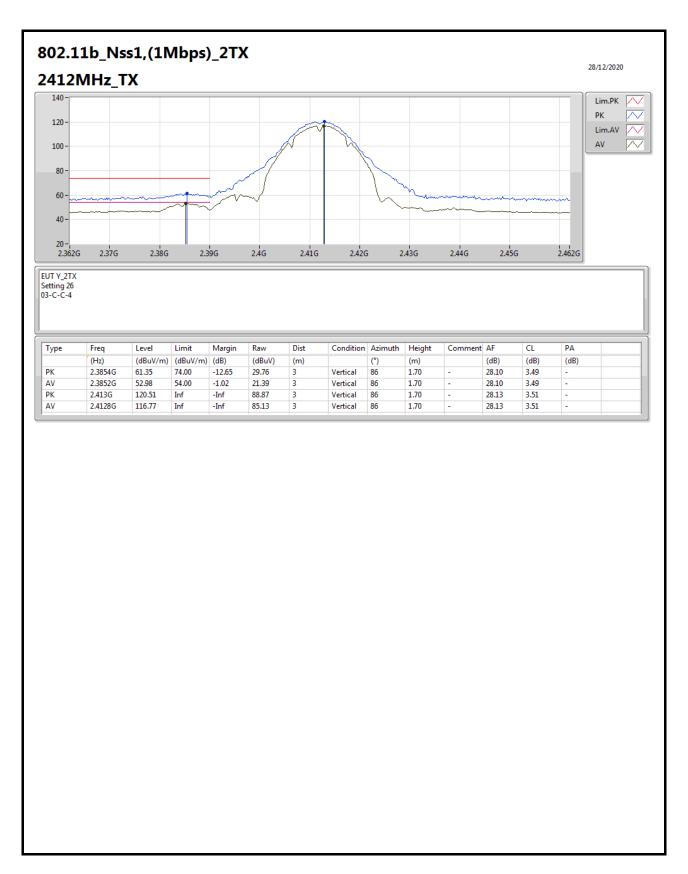
### RSE TX above 1GHz

Appendix F.2

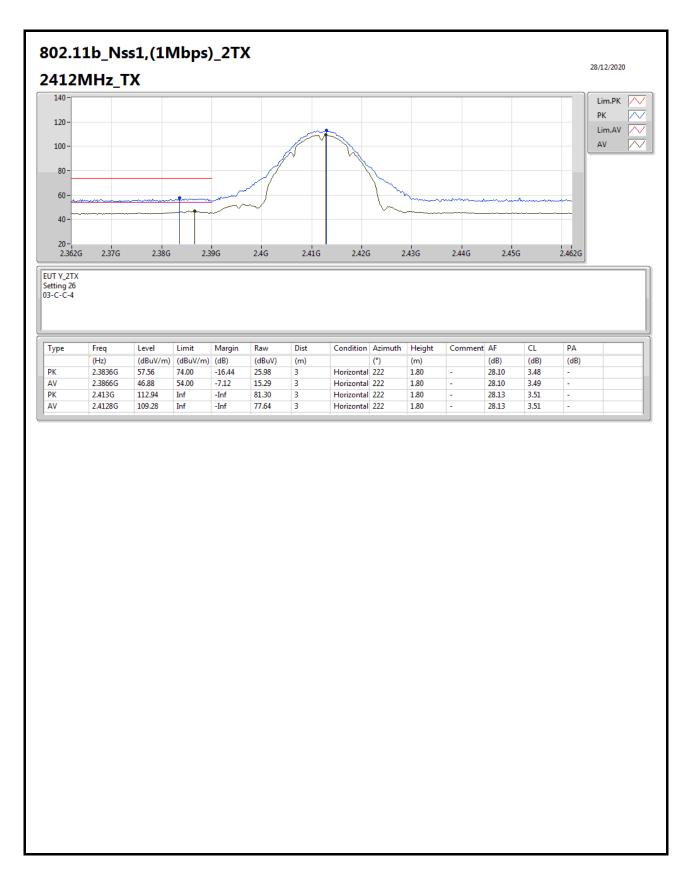
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Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	Pass	AV	2.3852G	52.98	54.00	-1.02	3	Vertical	86	1.70	-

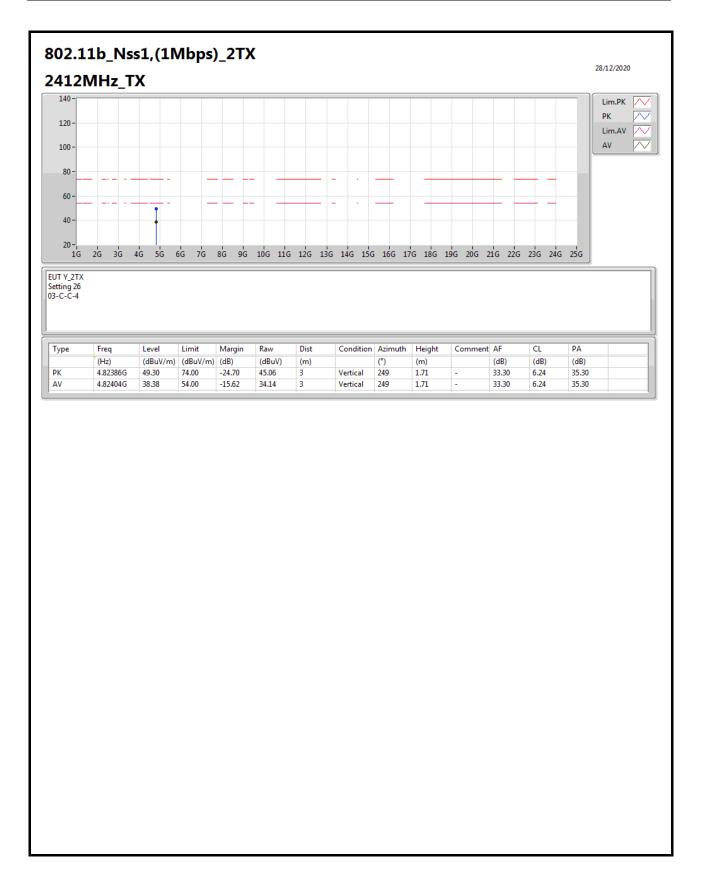






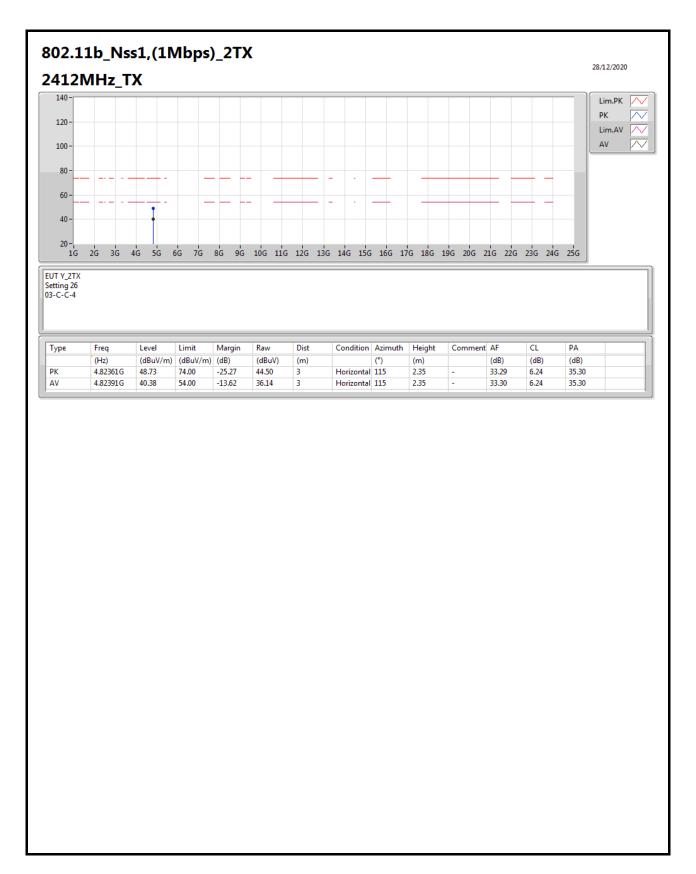




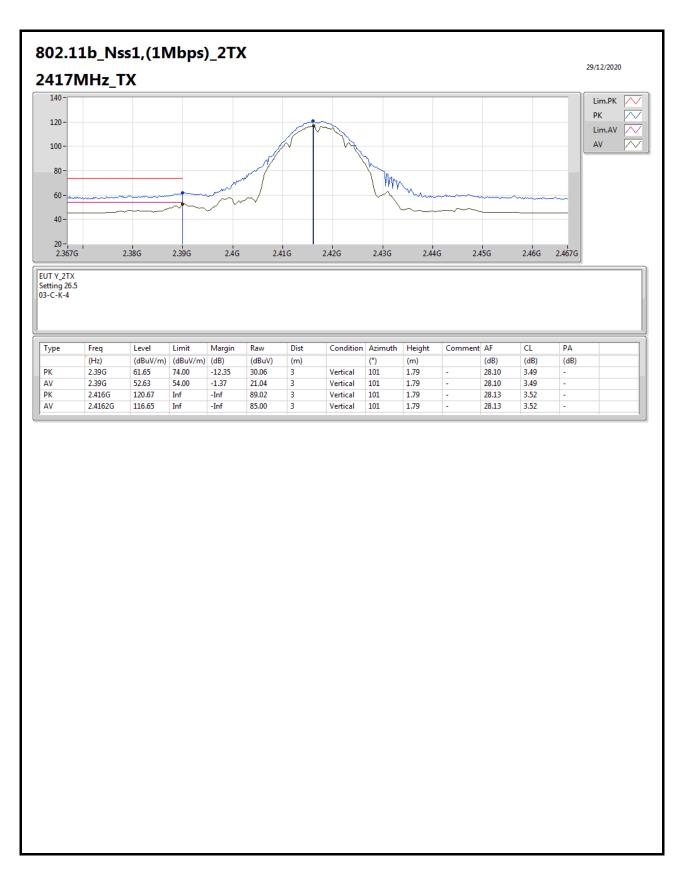


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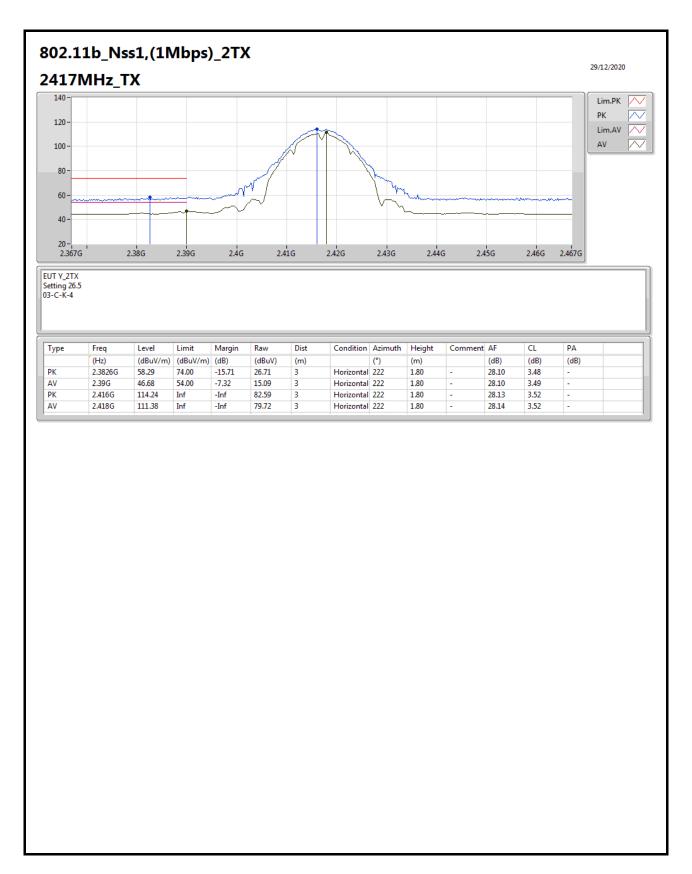




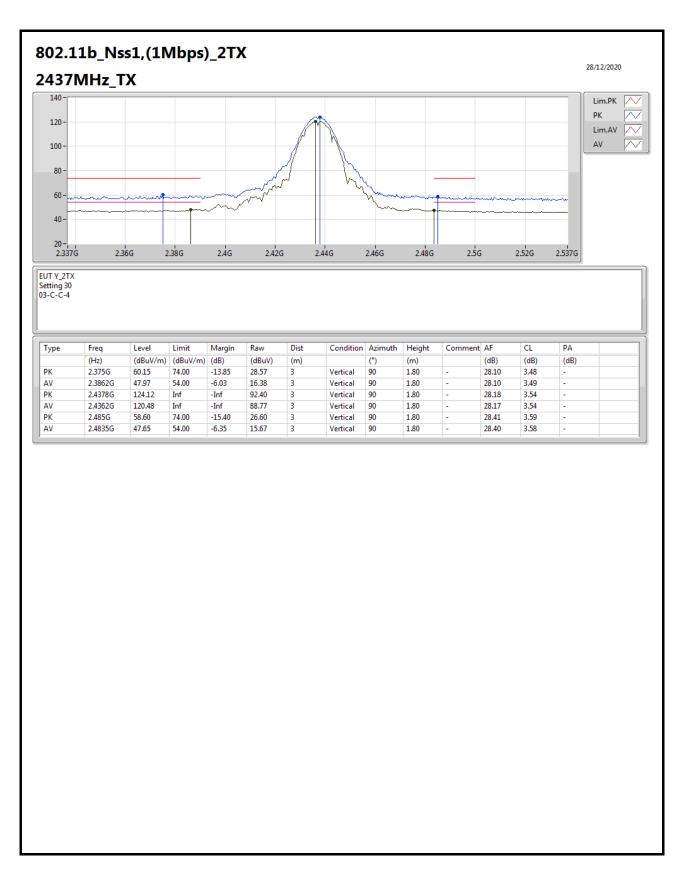




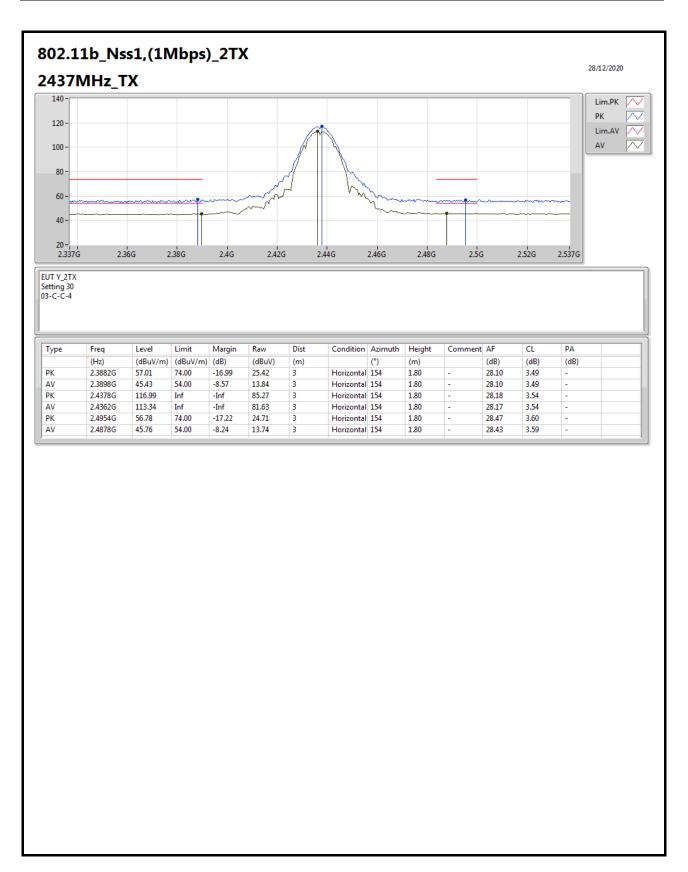




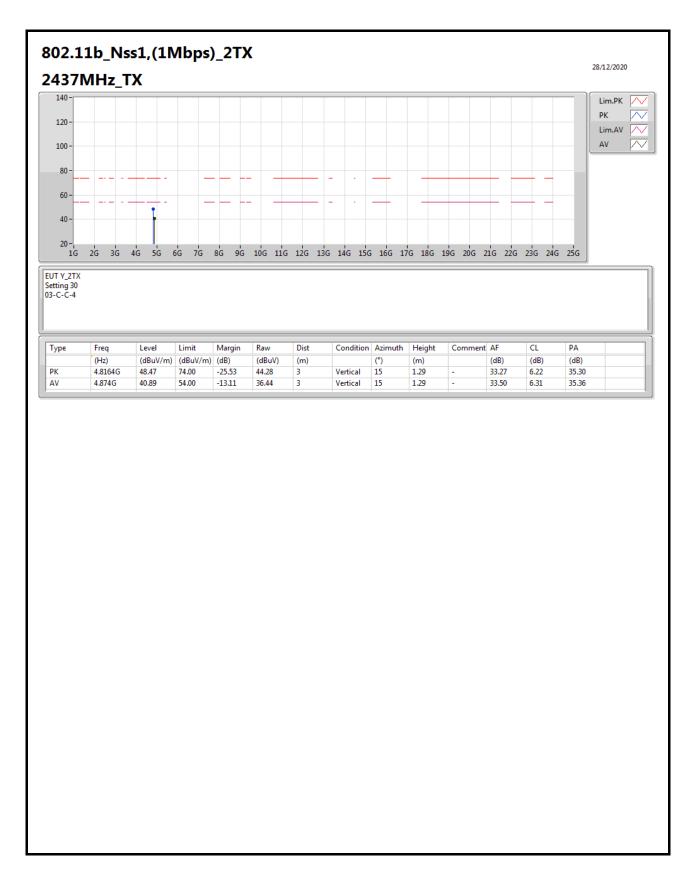




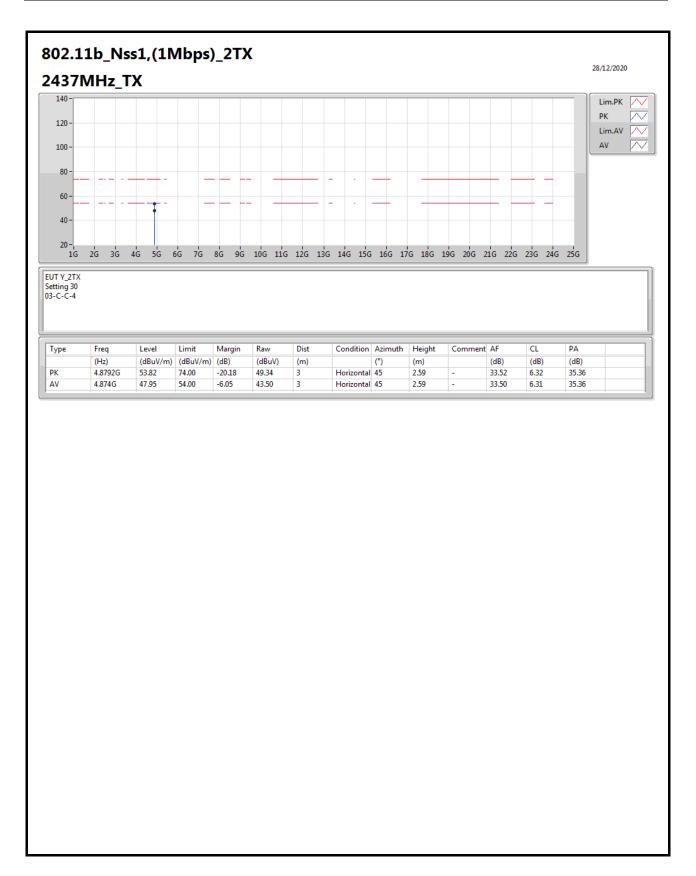




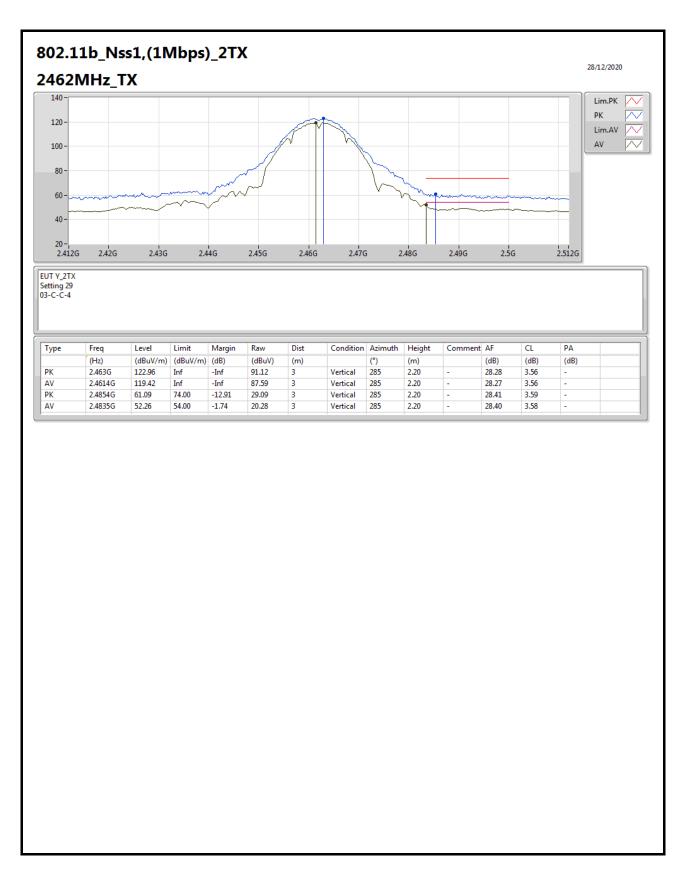




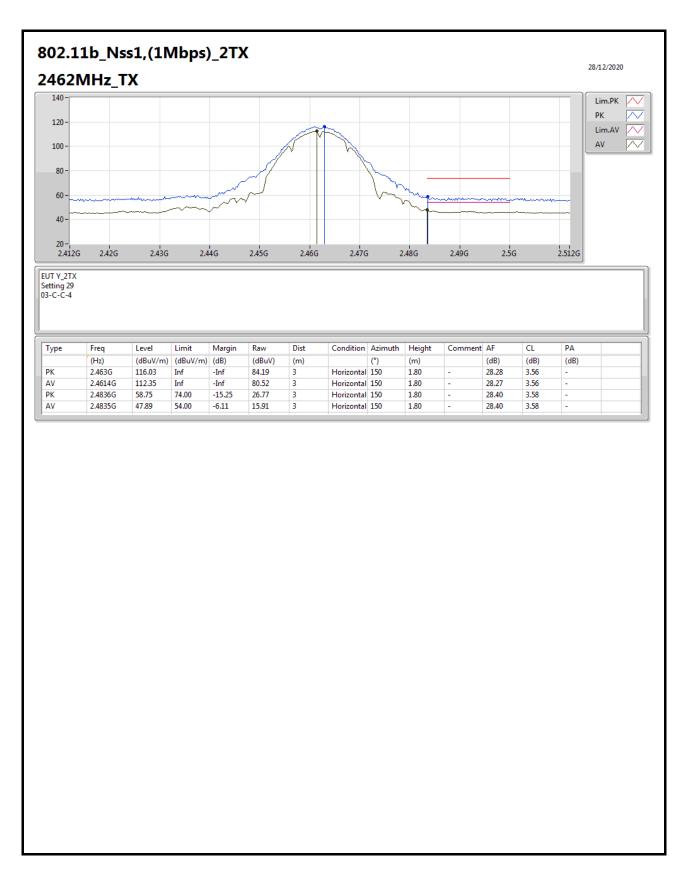




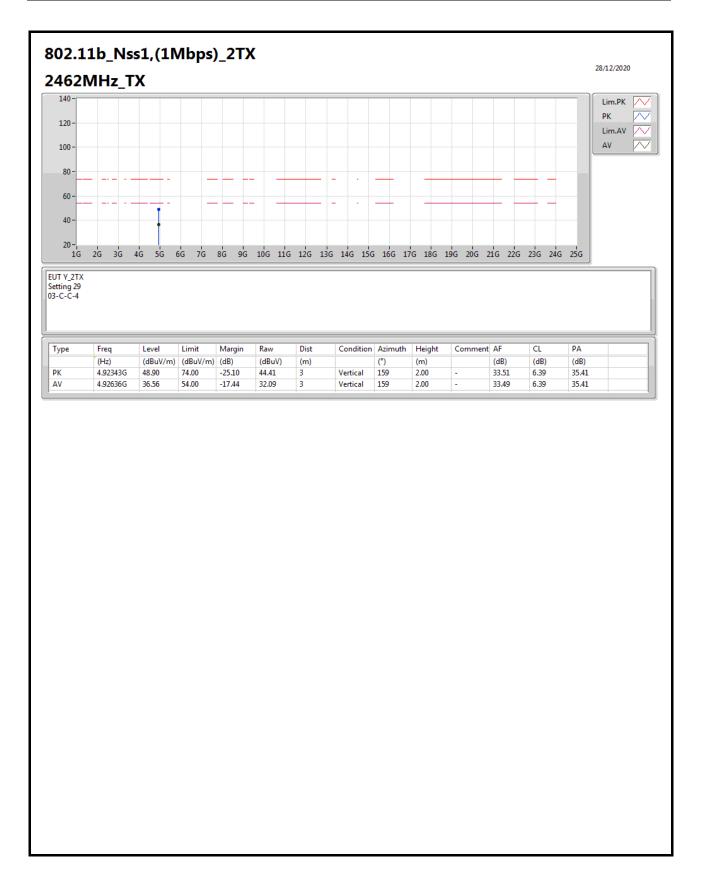




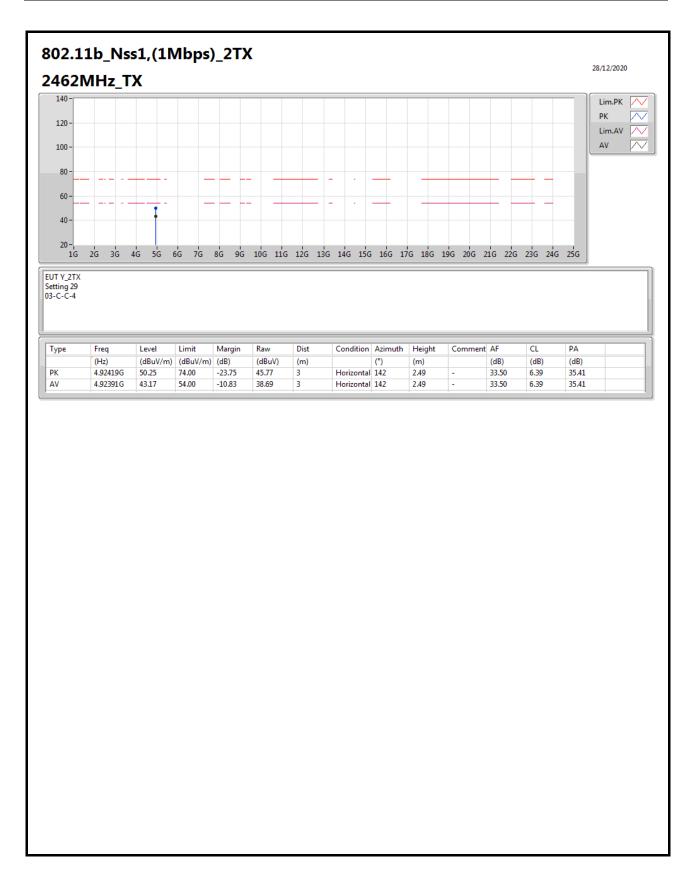




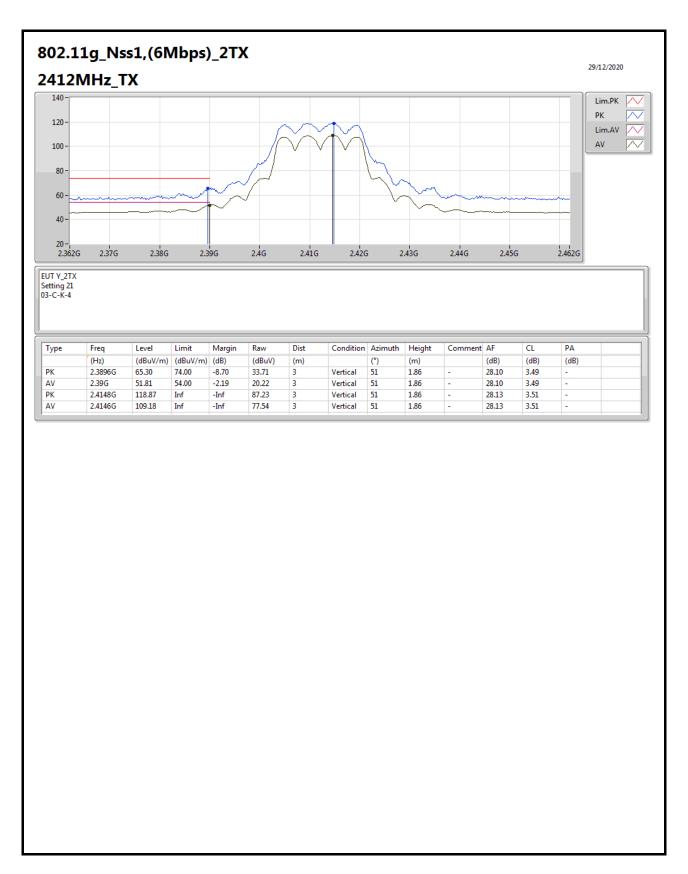




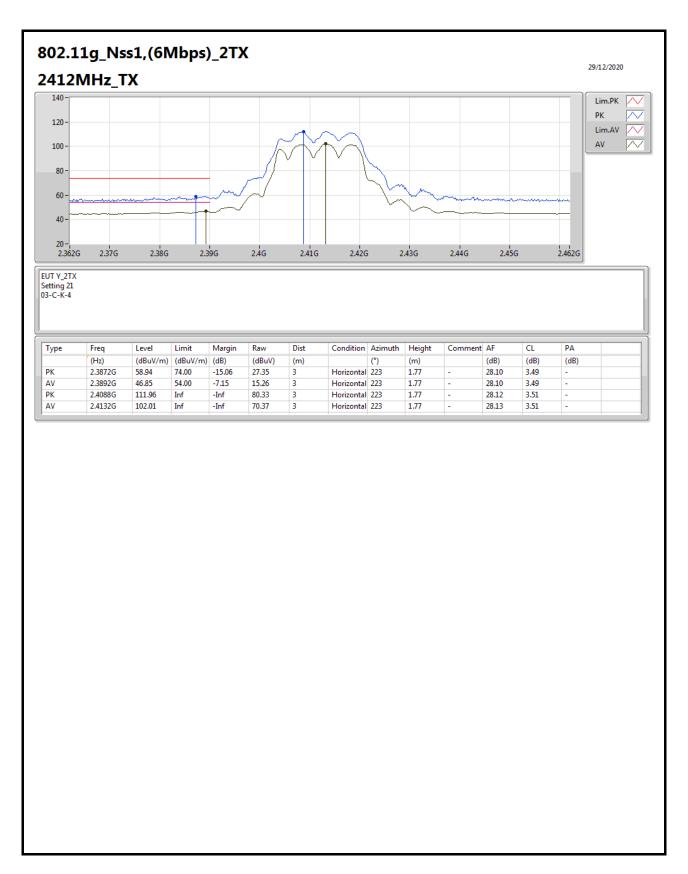




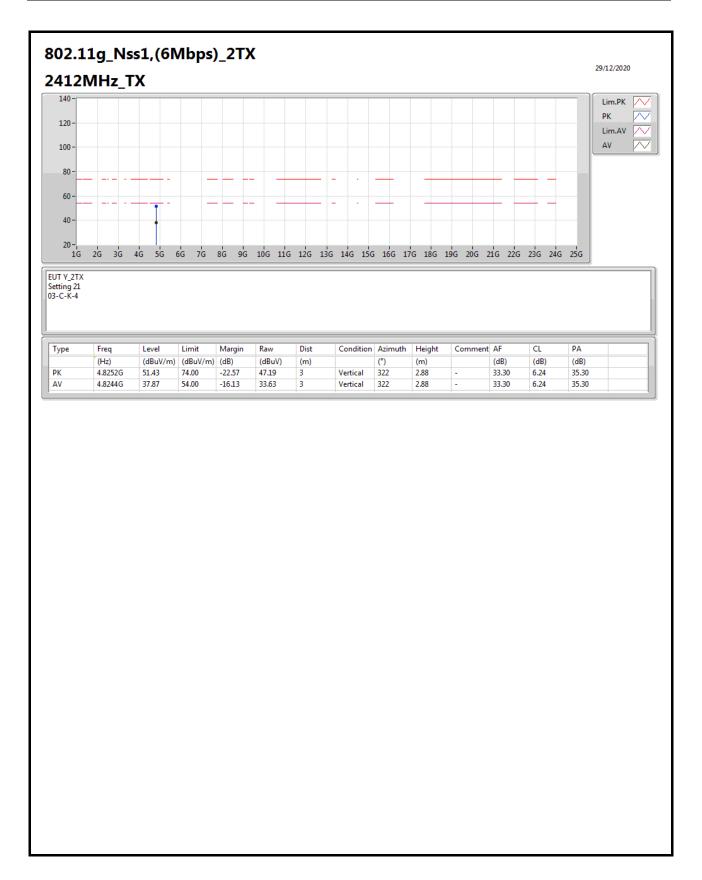






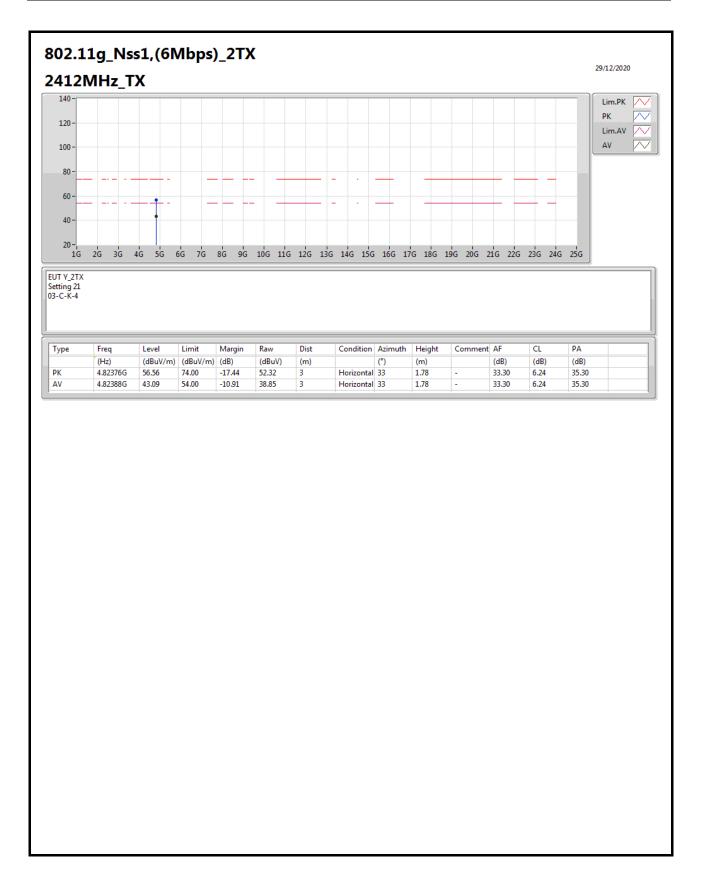




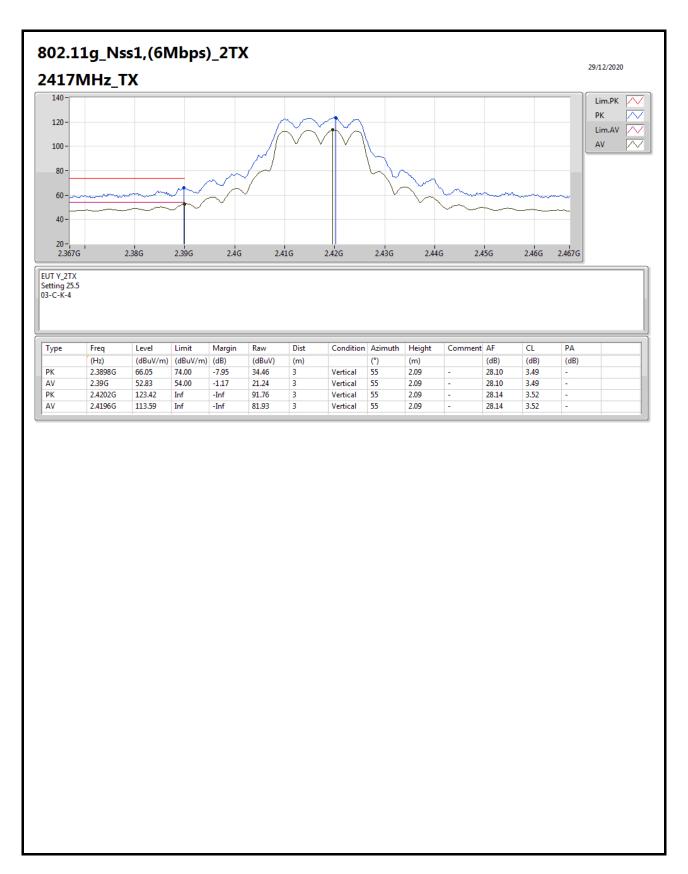


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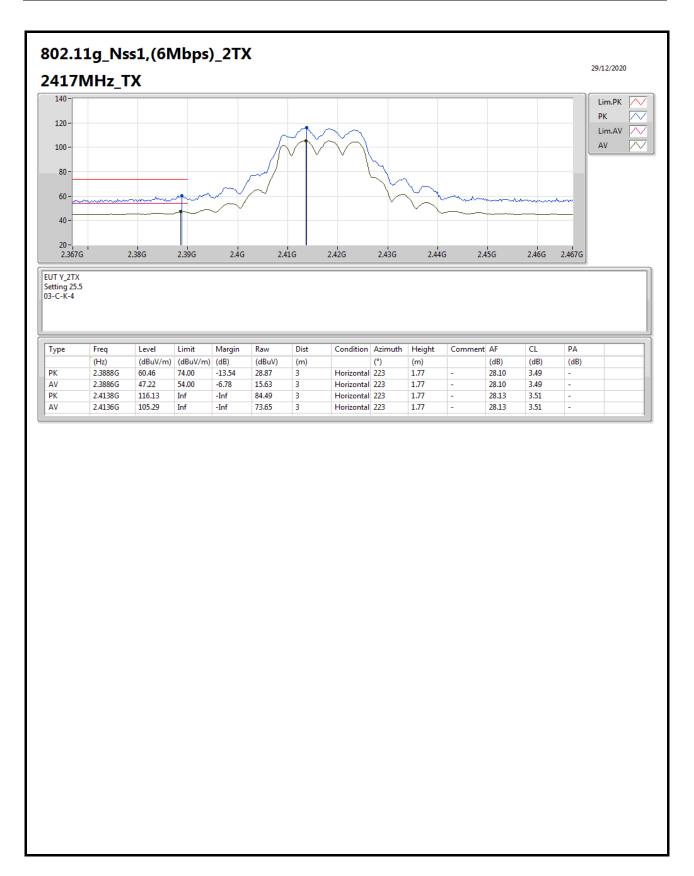




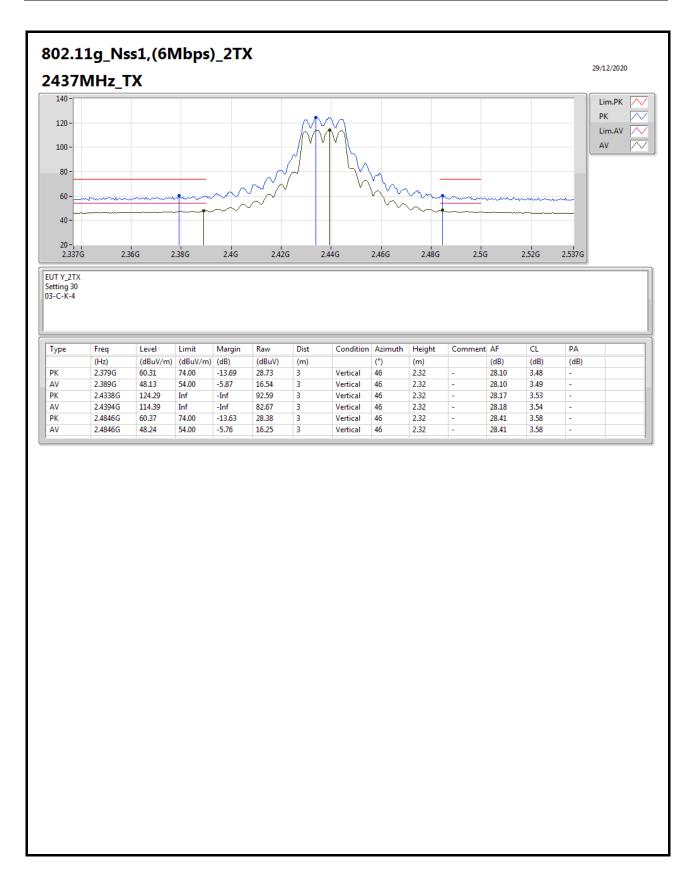




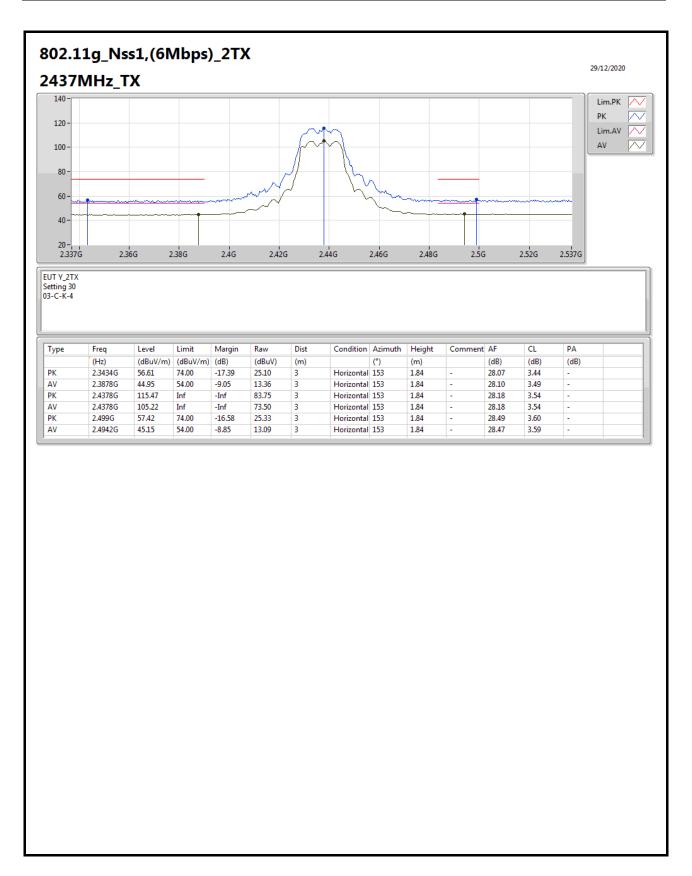




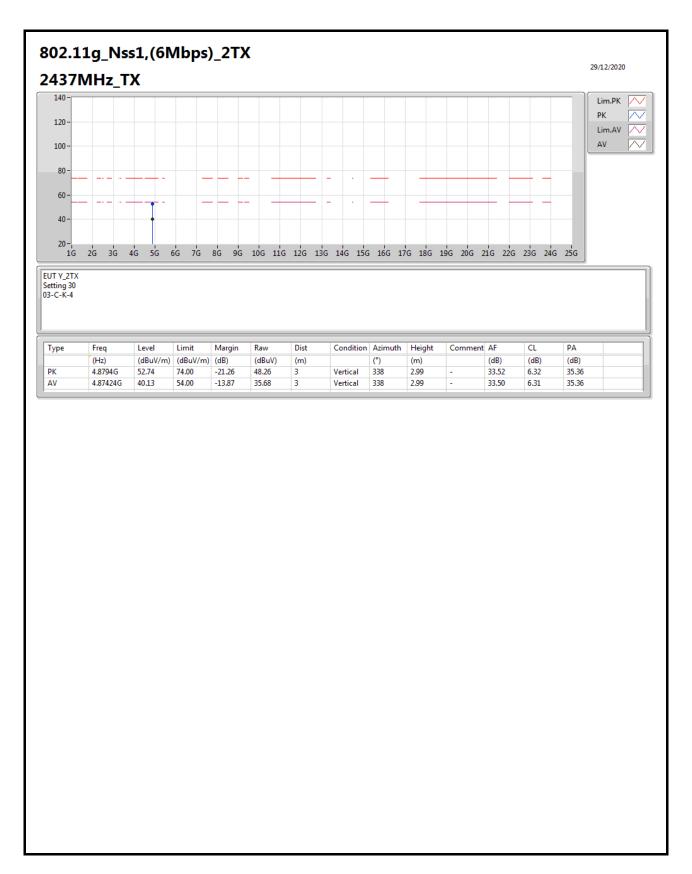




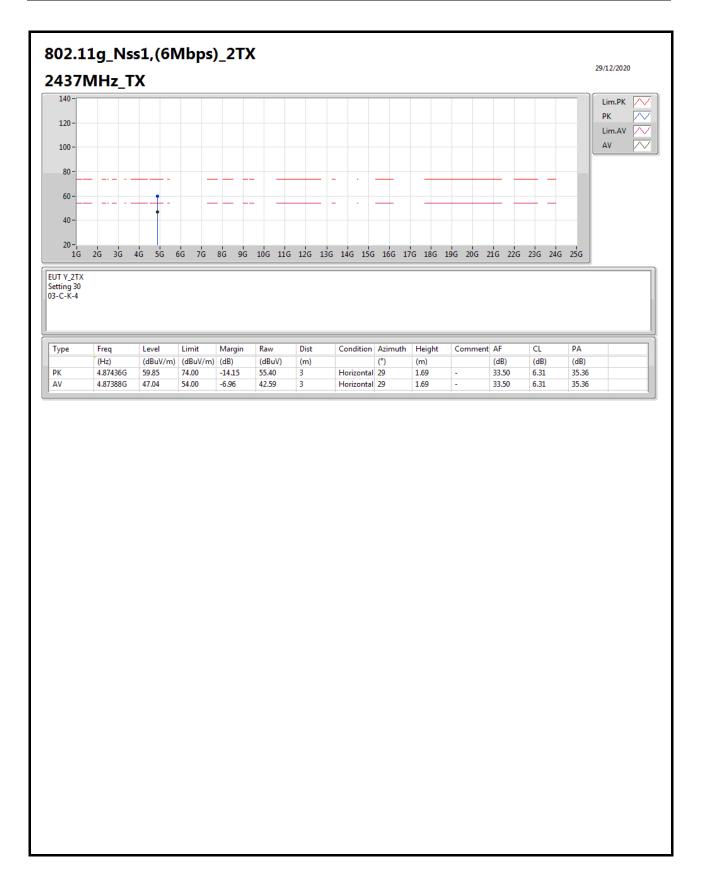




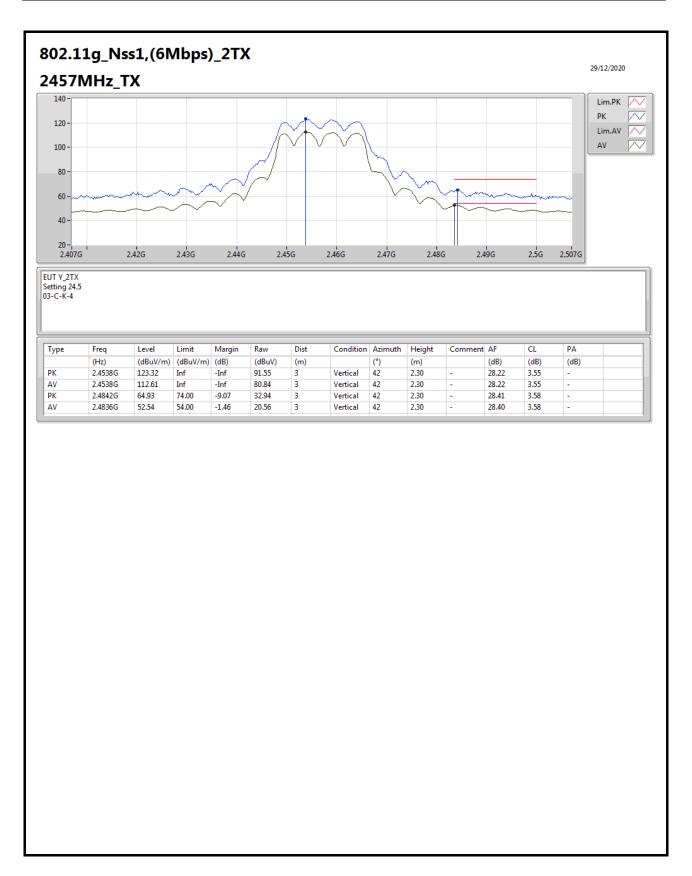




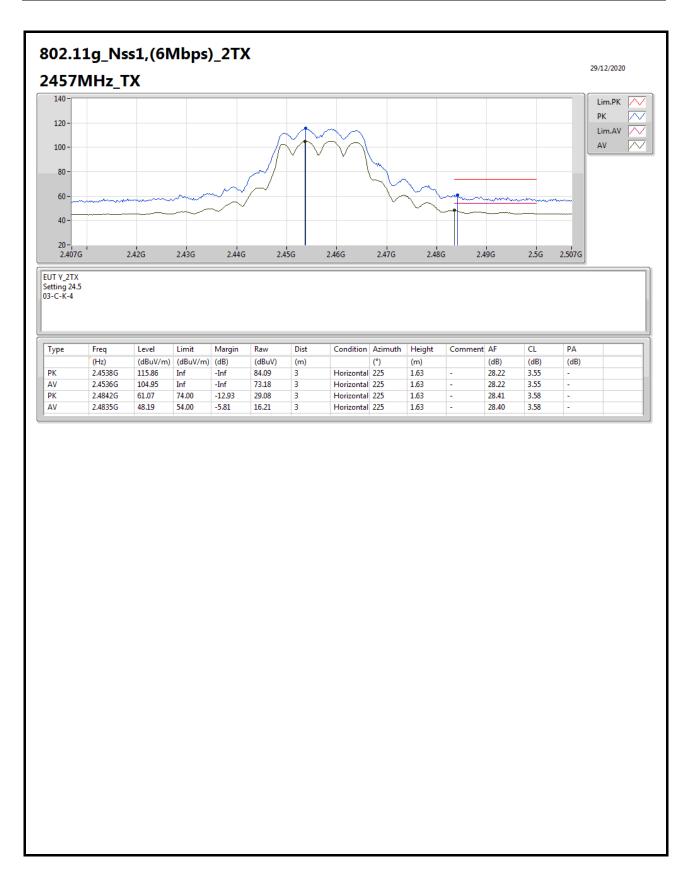




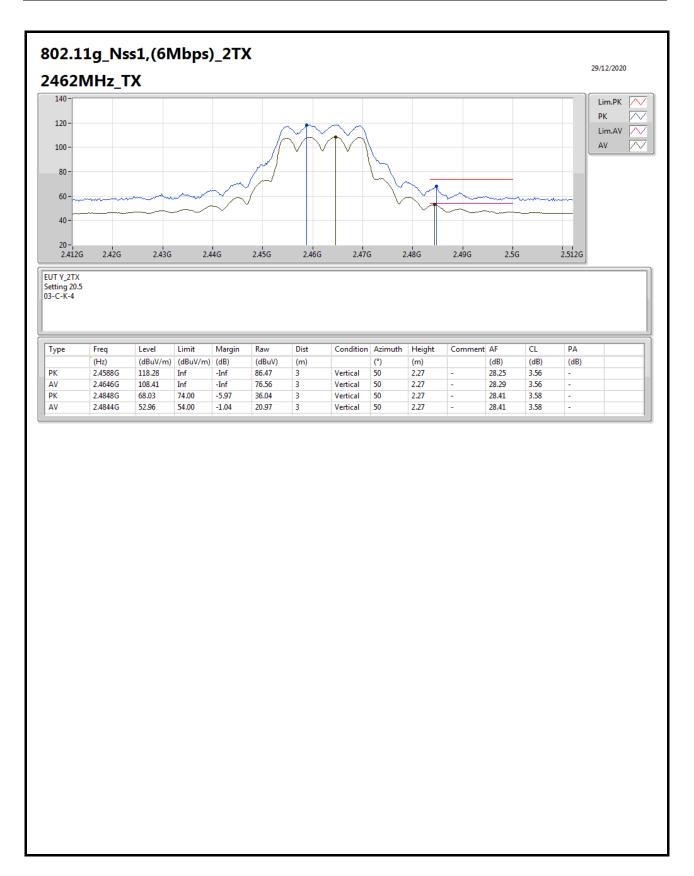




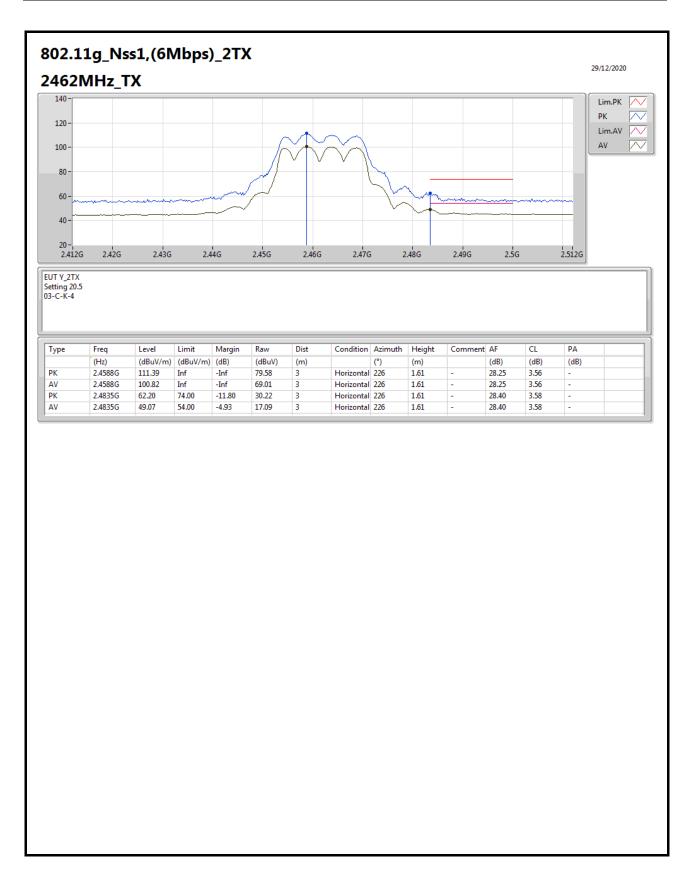




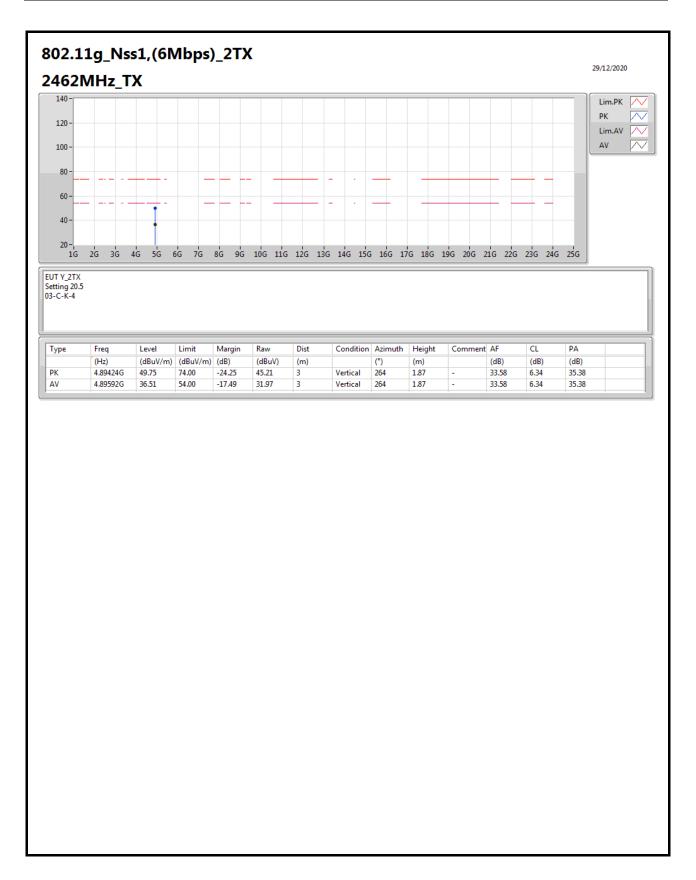




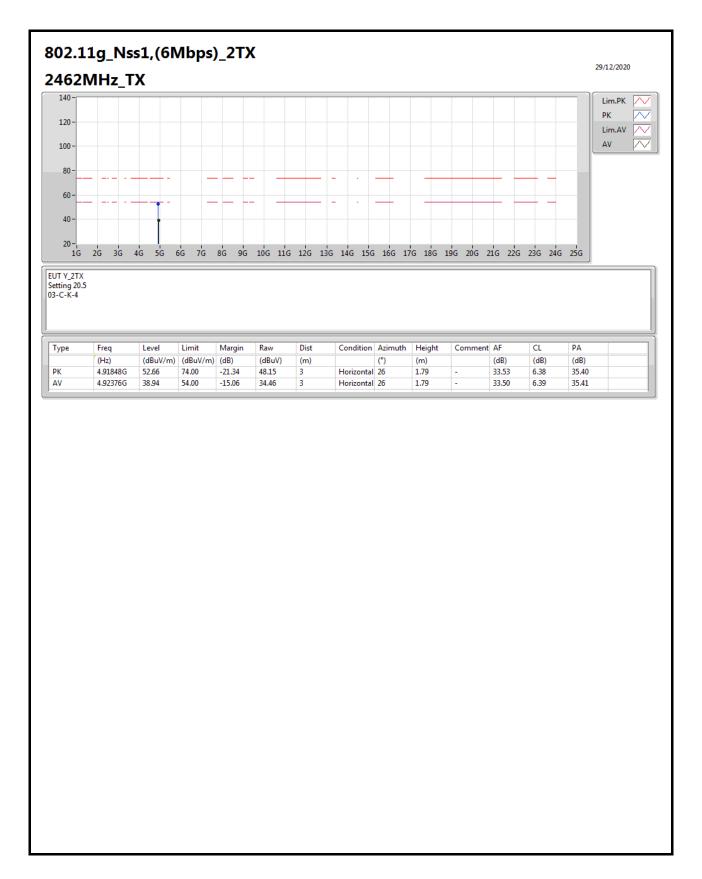














## RSE TX above 1GHz

Appendix F.3

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**Summary** 

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	Pass	AV	2.3894G	52.85	54.00	-1.15	3	Vertical	52	2.20	-



