



# **FCC RADIO TEST REPORT**

FCC ID : NKR-LVSK-X1

Equipment : Wi-Fi Extender Mini

Brand Name : verizon

Model Name : LVX1

Applicant : Wistron NeWeb Corporation

20 Park Ave. II, Hsinchu Science Park, Hsinchu

308, Taiwan

Manufacturer : Wistron NeWeb Corporation

20 Park Ave. II, Hsinchu Science Park, Hsinchu

308, Taiwan

Standard : 47 CFR FCC Part 15.247

The product was received on Jul. 19, 2019, and testing was started from Jul. 27, 2019 and completed on Aug. 06, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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

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: Aug. 13, 2019

Report Version : 02

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Appendix H. Test Photos Photographs of EUT v02

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# History of this test report

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Report No.	Version	Description	Issued Date
FR953010AA	01	Initial issue of report	Aug. 13, 2019
FR953010AA	02	Modifying the Photographs of EUT to version 2.	Aug. 13, 2019

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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)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	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 test configuration, test mode and test software were written in this test report are declared by the manufacturer.
- 2. 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: Wendy Pan

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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	2412-2462	1-11 [11]
2400-2483.5	n (HT40), VHT40	2422-2452	3-9 [7]

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

#### 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 modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

#### 1.1.2 Antenna Information

Ant.	Port	Brand	Madal Nama	Antonno Tyno	Connector		Direction Gain (dBi)		
Ant.	Port	Dialiu	Woder Name	Antenna Type		2.4GHz	5GHz Band 1	5GHz Band 4	
1	1	WNC	LVX1	PCB DIPOLE	I-PEX MHF	4.51	-	5.85	
2	2	WNC	LVX1	Metal PIFA	I-PEX MHF	4.51	-	5.85	
3	1	WNC	LVX1	PCB DIPOLE	I-PEX MHF	-	5.20	-	
4	2	WNC	LVX1	PCB DIPOLE	I-PEX MHF	-	5.20	-	

Note: The above information was declared by manufacturer.

#### For 2.4GHz and 5GHz Band 4 function(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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#### For 5GHz Band 1 function(2TX/2RX):

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

Port 1 and Port 2 could transmit/receive simultaneously.

#### 1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b	0.992	0.03	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.96	0.18	2.03m	1k
VHT20	0.903	0.44	4.975m	300
VHT20-BF	0.96	0.18	1.755m	1k
VHT40	0.803	0.95	2.42m	1k
VHT40-BF	0.956	0.2	1.69m	1k

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$\Delta$	۰

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

#### 1.1.4 EUT Operational Condition

EUT Power Type	Internal power supply				
Beamforming Function	☑ With beamforming   ☐ Without beamforming				
beamorning randion	For 802.11n and VHT in 2.4GHz and 802.11n/ac in 5GHz.				
Function	Point-to-multipoint Point-to-point				
Test Software Version	For non- beamforming: AP.DK04_EVM curve.xtt (V 5.0-00163) For beamforming: Telnet				

Note: The above information was declared by manufacturer.

#### 1.1.5 Table for EUT support function

Function	Support Type	Support Band
Bridge	Master	WLAN 2.4GHz/WLAN 5GHz Band 1+4
Mesh	Master + Slave	WLAN 2.4GHz/WLAN 5GHz Band 1~4

Note: 1.The above information was declared by manufacturer.

2.Only the Mesh mode was tested and recorded in this test report that is designated by the 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
- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D01 v02r01

# 1.3 Testing Location Information

	Testing Location							
	HWA YA ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)							
		TEL	:	886-3-327-3456 FAX : 886-3-327-0973				
$\boxtimes$	JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.				
		TEL	:	886-3-656-9065 FAX : 886-3-656-9085				

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH02-CB	Jeff Wu	26.5~27.8°C / 62~65%	Jul. 27, 2019~Aug.03, 2019
Radiated<1GHz	03CH04-CB	Welson Chen	26.2~28.3°C / 56~60%	Aug. 01, 2019
Radiated>1GHz	03CH01-CB	Bruce Yang	26.6~28.2°C / 60~65%	Aug. 06, 2019
AC Conduction	CO02-CB	Peter Wu	24~25°C / 59~60%	Aug. 06, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

# 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 (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%

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# 2 Test Configuration of EUT

# 2.1 Test Channel Mode

Mode	PowerSetting
802.11b_Nss1,(1Mbps)_2TX	-
2412MHz	22
2437MHz	23
2462MHz	21.5
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	16.5
2417MHz	19
2437MHz	23
2457MHz	19
2462MHz	17
VHT20_Nss1,(MCS0)_2TX	-
2412MHz	18
2417MHz	20
2437MHz	23
2457MHz	20
2462MHz	18.5
VHT20-BF_Nss1,(MCS0)_2TX	-
2412MHz	19
2417MHz	21
2437MHz	25
2457MHz	22
2462MHz	20
VHT40_Nss1,(MCS0)_2TX	-
2422MHz	17.5
2437MHz	19
2452MHz	18
VHT40-BF_Nss1,(MCS0)_2TX	-
2422MHz	19
2427MHz	20
2437MHz	22
2452MHz	20

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#### Note:

- There are two modes of EUT for 802.11n and VHT in 2.4GHz. One is beamforming mode, and the other is non-beamforming mode, Both modes have been tested and recorded in this test report.
- VHT 20MHz / 40MHz modulation and bandwidth are similar for 802.11n mode for 20MHz / 40MHz, therefore investigated worst case to representative mode in test report.

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# 2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item	Tests Item AC power-line conducted emissions		
Condition	Condition AC power-line conducted measurement for line and neutral		
Operating Mode Normal Link			

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Th	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 sho be performed with highest antenna gain of each antenna type.			
Operating Mode < 1GHz	Normal Link			
1	EUT in Y axis			
Operating Mode > 1GHz CTX				
There are two modes of EUT, one is Y axis Power port is right side up , the other is Y axis Power port right side down, and the worst case was found at Y axis Power port is right side up. So the measurement w follow this same test configuration.				
1 EUT in Y axis Power port is right side up				

The Worst Case Mode for Following Conformance Tests			
Tests Item Simultaneous Transmission Analysis - Radiated Emission Co-location			
Test Condition Radiated measurement			
Operating Mode	Operating Mode Normal Link		
1 WLAN 2.4GHz + WLAN 5GHz Band 4			
Refer to Appendix G for Radiated Emission Co-location.			

The Worst Case Mode for Following Conformance Tests			
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation			
Operating Mode	Operating Mode		
1 WLAN 2.4GHz + WLAN 5GHz Band 1 + WLAN 5GHz Band 4			
Refer to Sporton Test Report No.: FA953010 for Co-location RF Exposure Evaluation.			

Note: The EUT can only be used Y axis.

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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

N/A

# 2.5 Support Equipment

#### For AC Conduction:

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	Device	Verizon	LVR1	N/A	
В	Notebook	DELL	E6430	N/A	
С	Device	Calix	100-05147 01	N/A	
D	Notebook	DELL	E6430	N/A	
Е	Device	Calix	100-05147 01	N/A	
F	Notebook	DELL	E6430	N/A	

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For Radiated (below 1GHz):

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	WLAN AP	Verizon	LVR1	N/A	
В	WLAN AP	Calix	100-05147 01	N/A	
С	WLAN AP	Calix	100-05147 01	N/A	
D	Notebook	DELL	E4300	N/A	
Е	Notebook	DELL	E4300	N/A	
F	Notebook	DELL	E4300	N/A	

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# For Radiated (above 1GHz) and RF Conducted: <For Non-Beamforming Mode>

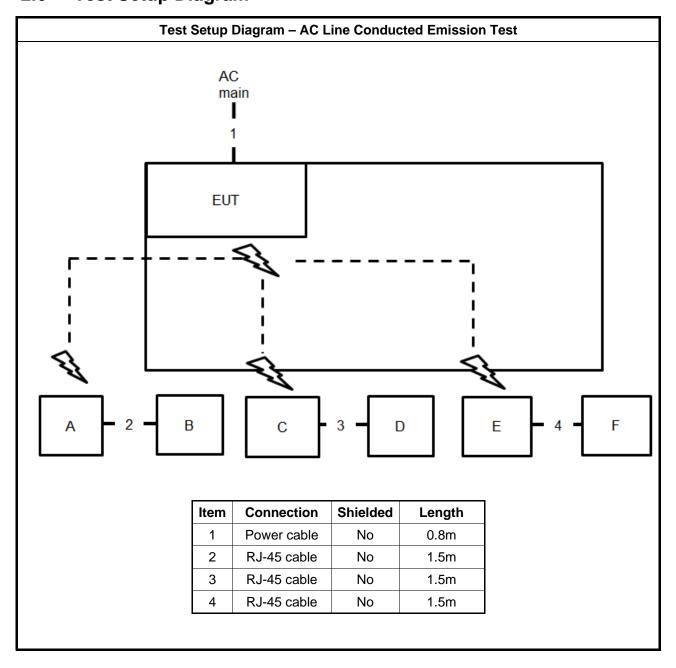
	Support Equipment			
No.	No. Equipment Brand Name Model Name FCC ID			
Α	A Notebook DELL E4300 N/A			

<For Beamforming Mode>

	Support Equipment			
No.	No. Equipment Brand Name Model Name FCC ID			
Α	Notebook	DELL	E4300	N/A
В	B Notebook DELL E4300 N/A		N/A	
С	RX Device	verizon	Wi-Fi Extender LVM1	N/A

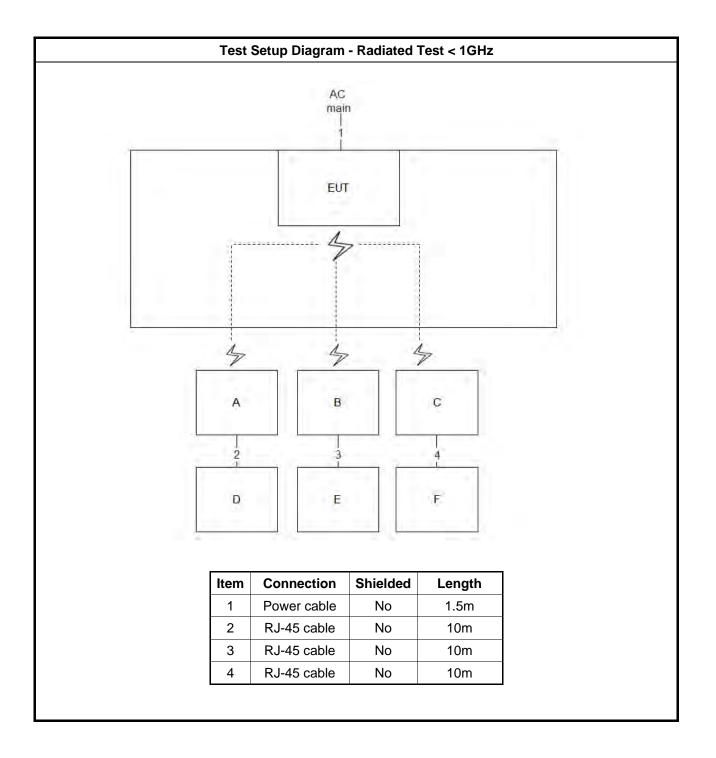
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# 2.6 Test Setup Diagram

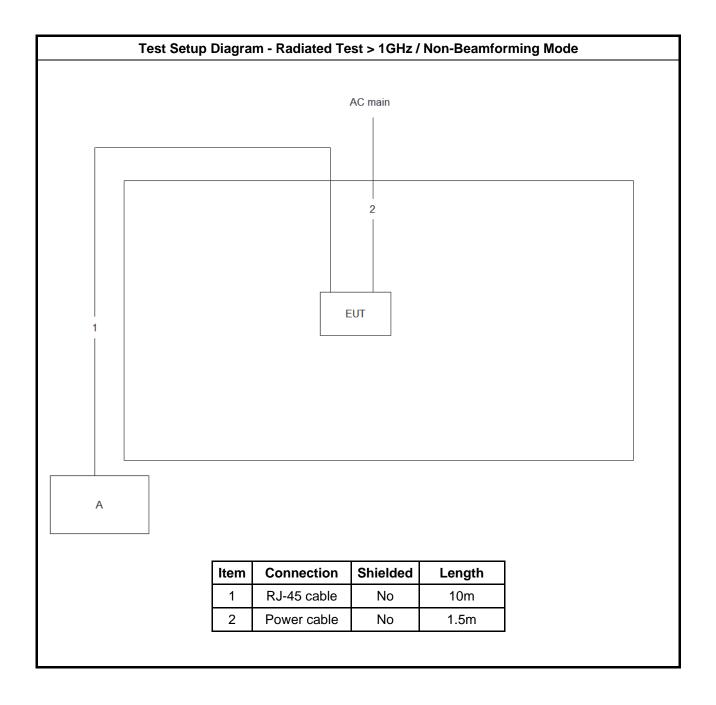


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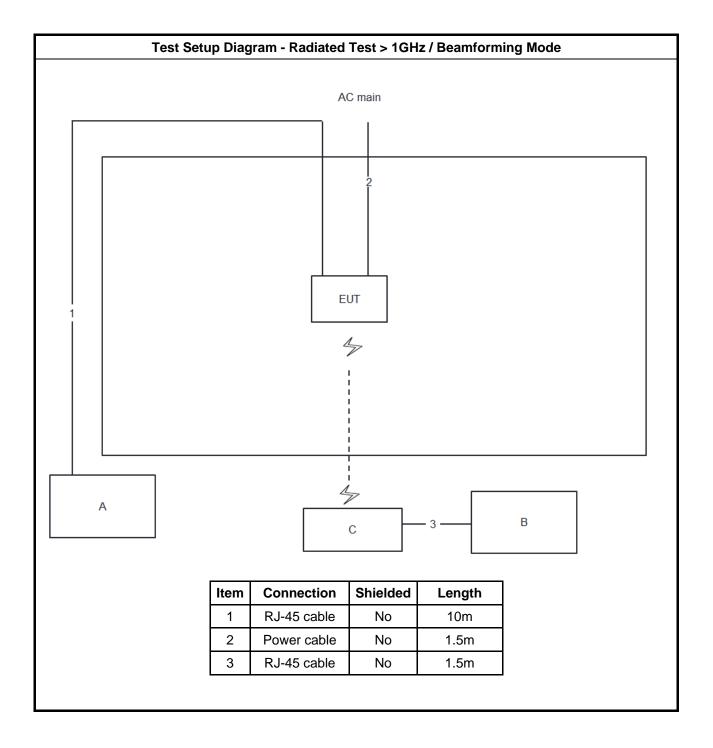
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# 3 Transmitter Test Result

# 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				
0.15-0.5 66 - 56 * 56 - 46 *				
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

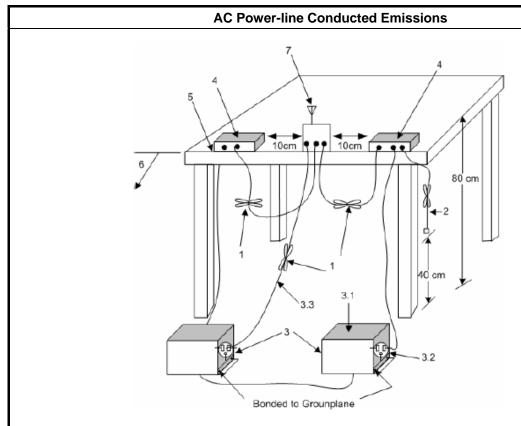
Refer a test equipment and calibration data table in this test report.

#### 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 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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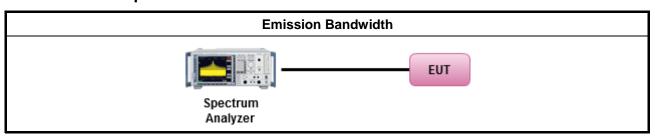
#### 3.2.2 Measuring Instruments

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.

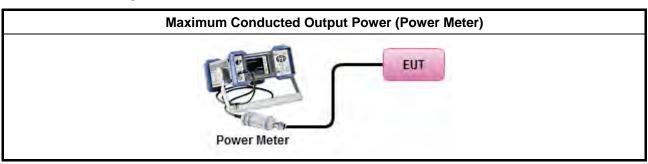
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#### 3.3.3 Test Procedures

		Test Method						
•	Maximum 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)						
	Mea	surement using a power meter (PM)						
	$\boxtimes$	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).						
		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

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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

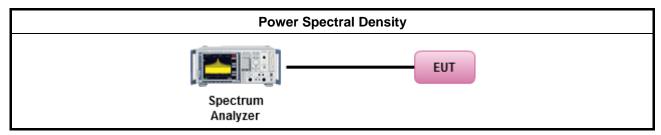
	Test Method					
•	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum 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).					
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.					
	[duty cycle ≥ 98% or external video / power trigger]					
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPSD-1.					
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPSD-2.					
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPSD-3.					
	duty cycle < 98% and average over on/off periods with duty factor					
Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPSD-1A. (alternative).						
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPSD-2A. (alternative)					
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPSD-3A. (alternative)					
-	For conducted measurement.					
	If 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,					

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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



#### 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.

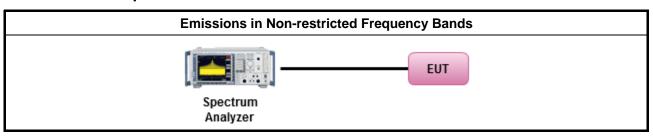
#### 3.5.2 Measuring Instruments

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 (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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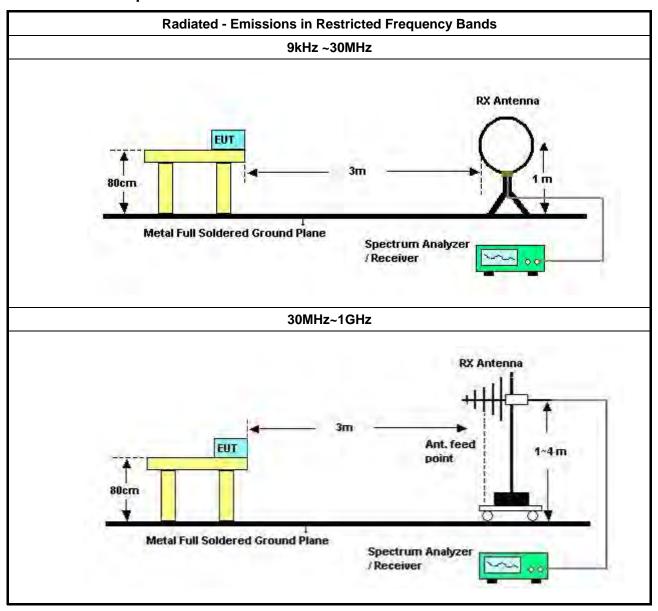
#### 3.6.3 Test Procedures

	Test Method							
•	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].							
•	<ul> <li>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.</li> </ul>							
•	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:						
_	<ul> <li>Refer as FCC KDB 558074 clause 8.7 &amp; 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.</li> </ul>							
	<ul> <li>Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.</li> </ul>							
	•	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).						
	<ul> <li>For conducted unwanted emissions into restricted bands (absolute emission limits).</li> <li>Devices with multiple transmit chains using options given below:</li> <li>(1) Measure and sum the spectra across the outputs or</li> <li>(2) Measure and add 10 log(N) dB</li> </ul>							
	•	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.						

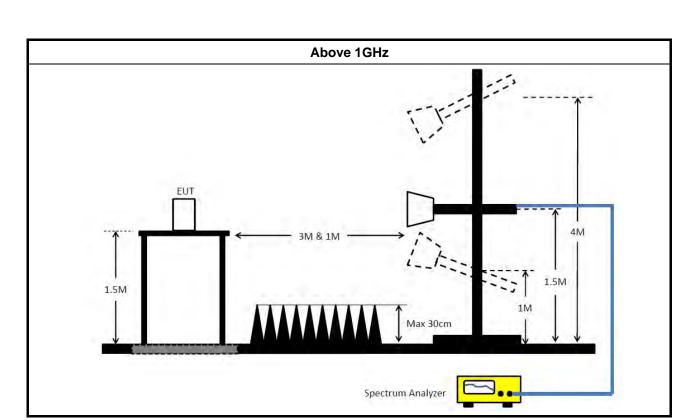
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# 3.6.4 Test Setup



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#### 3.6.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

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

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 10 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

	1	1	i	1	i	1	i
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2018	Nov. 20, 2019	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 05, 2018	Nov. 04, 2019	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2019	Jan. 15, 2020	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Nov. 06, 2018	Nov. 05, 2019	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
BILOG ANTENNA with 6 dB attenuator	Schaffner & Woken	CBL6112B & N-6-06	22021&AT-N06 07	30MHz ~ 1GHz	Oct. 12, 2018	Oct. 11, 2019	Radiation (03CH04-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH04-CB)
Pre-Amplifier	Agilent	310N	187291	0.1MHz ~ 1GHz	Mar. 19, 2019	Mar. 18, 2020	Radiation (03CH04-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Dec. 26, 2018	Dec. 25, 2019	Radiation (03CH04-CB
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH04-CB)
RF Cable-low	Woken	RG402	Low Cable-03+22	30MHz – 1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH04-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 13, 2018	Nov. 12, 2019	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH02-CB)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 24, 2018	Oct. 23, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)

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

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

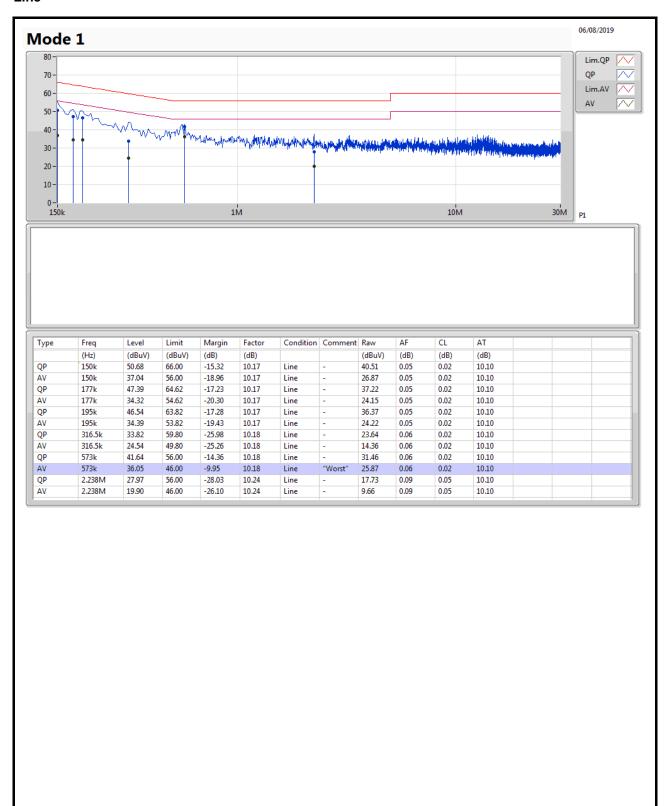
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#### AC Power Port Conducted Emission Result

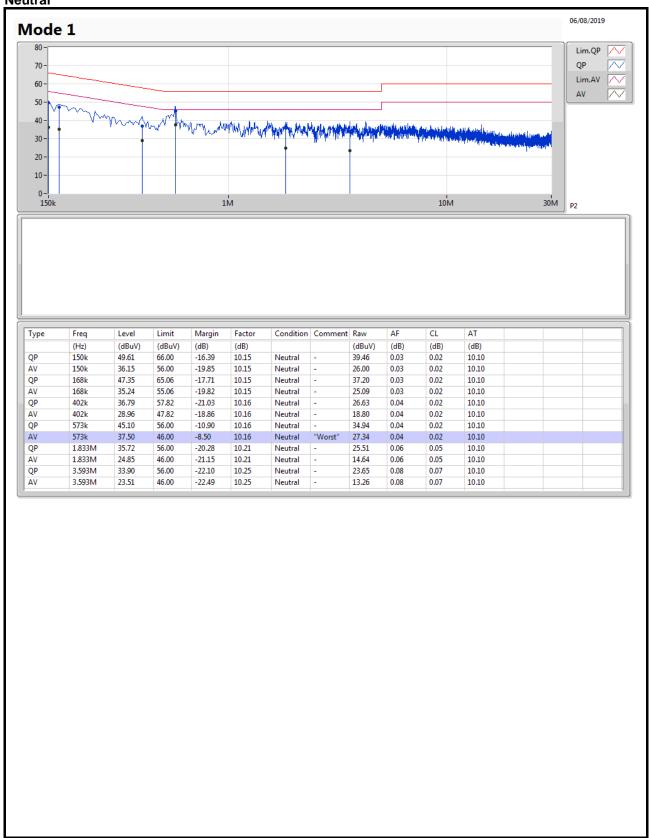
Test Mode	Mode 1	Frequency Range	0.15 MHz to 30 MHz

#### Line











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	-	-	-	-	-	
802.11b_Nss1,(1Mbps)_2TX	8.575M	14.018M	14M0G1D	7.975M	12.944M	
802.11g_Nss1,(6Mbps)_2TX	16.35M	21.514M	21M5D1D	16.1M	16.367M	
VHT20_Nss1,(MCS0)_2TX	17.6M	21.464M	21M5D1D	17.55M	17.591M	
VHT40_Nss1,(MCS0)_2TX	35.6M	36.032M	36M0D1D	32.6M	35.932M	

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;

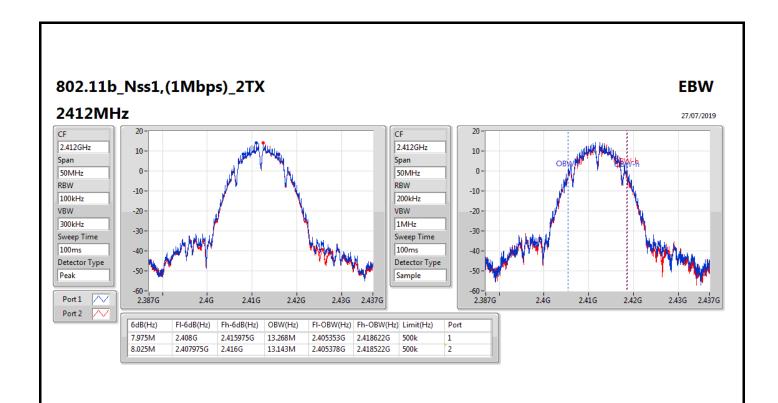
Appendix B.1

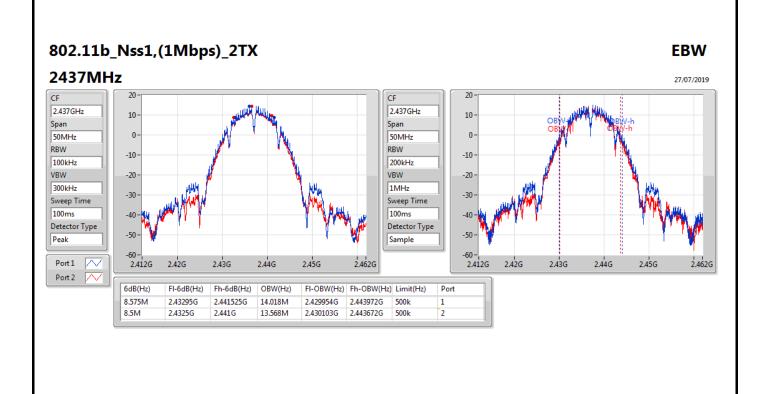
#### Result

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	7.975M	13.268M	8.025M	13.143M
2437MHz	Pass	500k	8.575M	14.018M	8.5M	13.568M
2462MHz	Pass	500k	8.05M	13.093M	8M	12.944M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.325M	16.392M	16.325M	16.367M
2437MHz	Pass	500k	16.1M	21.514M	16.35M	19.14M
2462MHz	Pass	500k	16.325M	16.417M	16.35M	16.392M
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	17.575M	17.616M	17.575M	17.591M
2437MHz	Pass	500k	17.6M	21.464M	17.575M	19.24M
2462MHz	Pass	500k	17.55M	17.616M	17.6M	17.616M
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	33.85M	35.982M	35.05M	35.982M
2437MHz	Pass	500k	34.9M	35.932M	32.6M	36.032M
2452MHz	Pass	500k	33M	36.032M	35.6M	36.032M

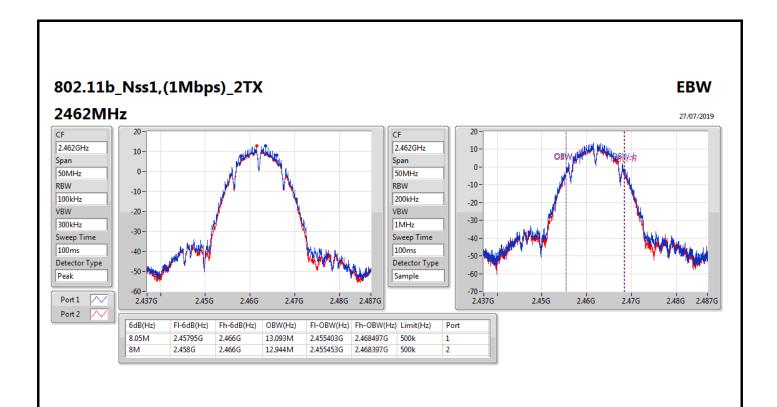
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

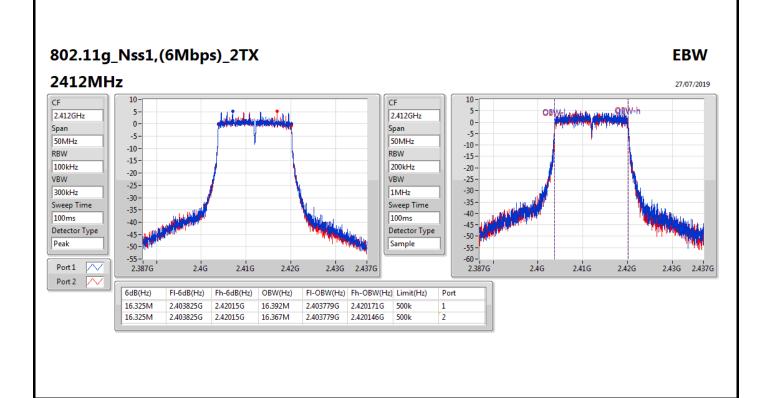
EBW Appendix B.1





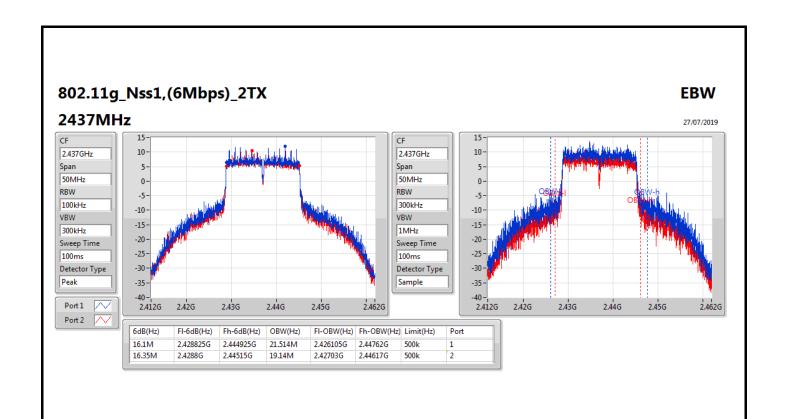
EBW Appendix B.1

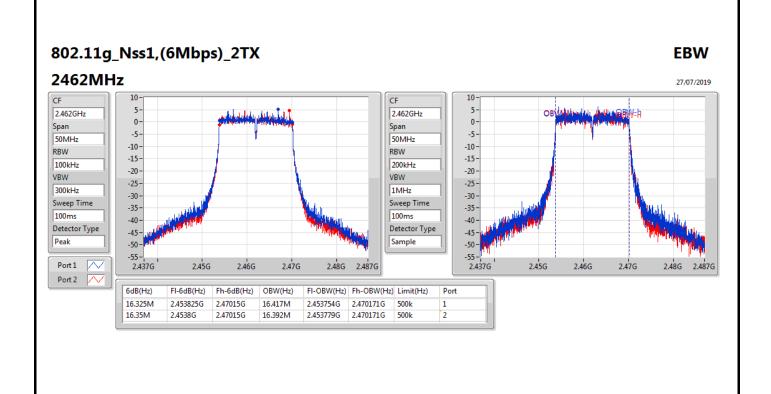


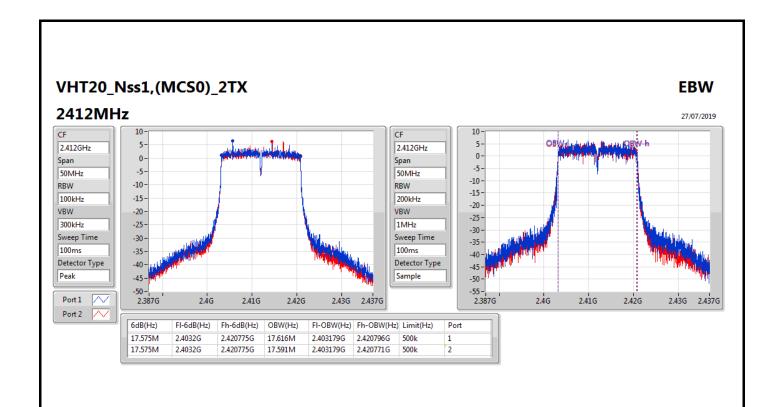


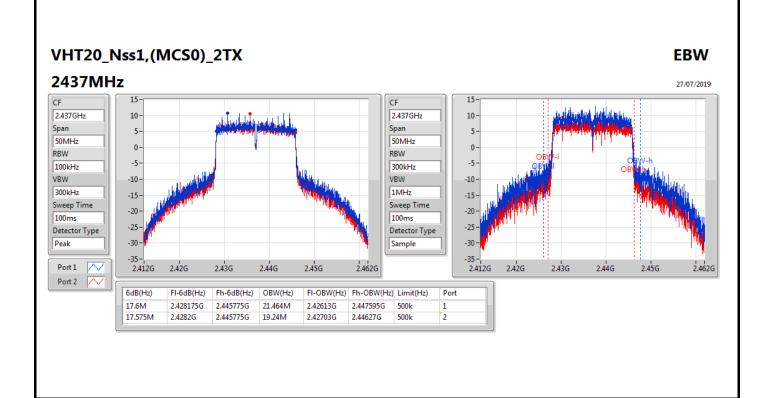
Appendix B.1

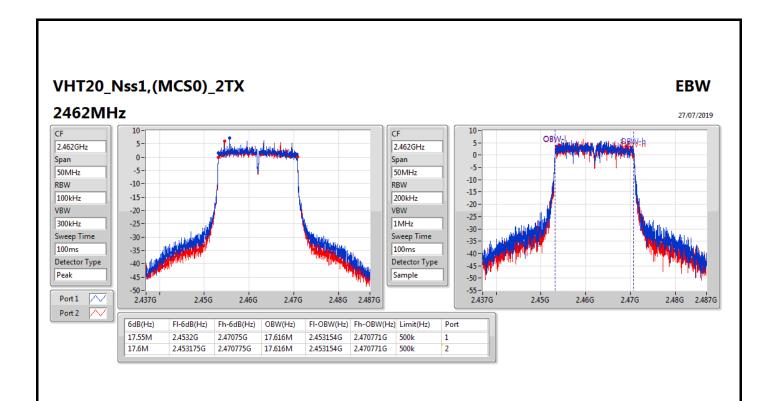


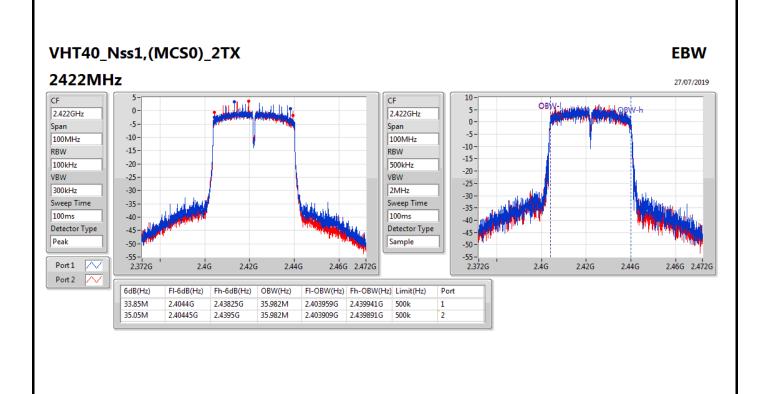


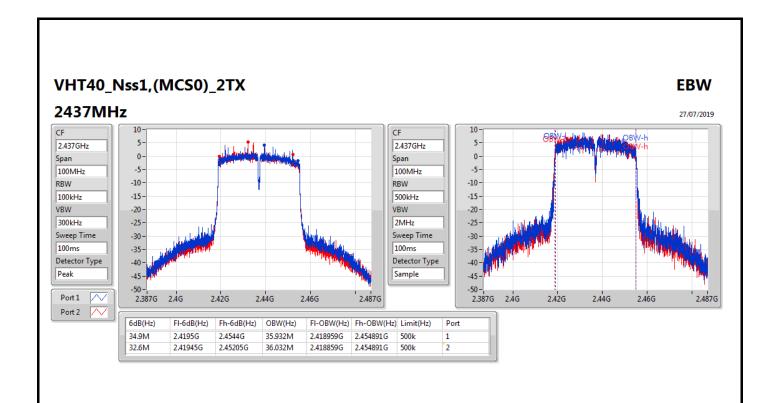


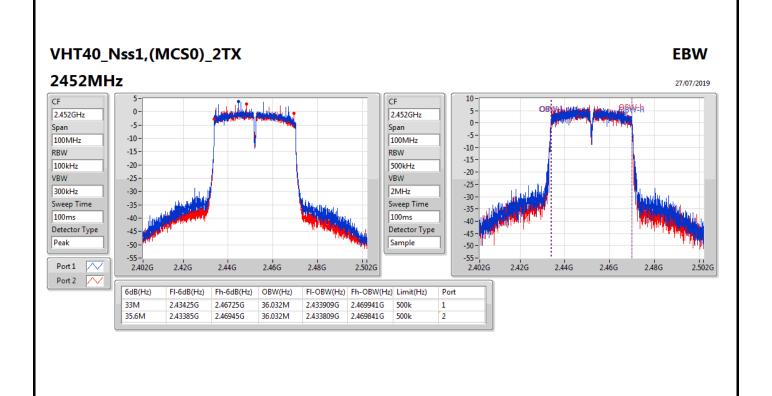














**Summary** 

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_2TX	17.55M	17.67M	17M7D1D	15.275M	17.572M
VHT40-BF_Nss1,(MCS0)_2TX	35.25M	35.941M	35M9D1D	31.35M	35.855M

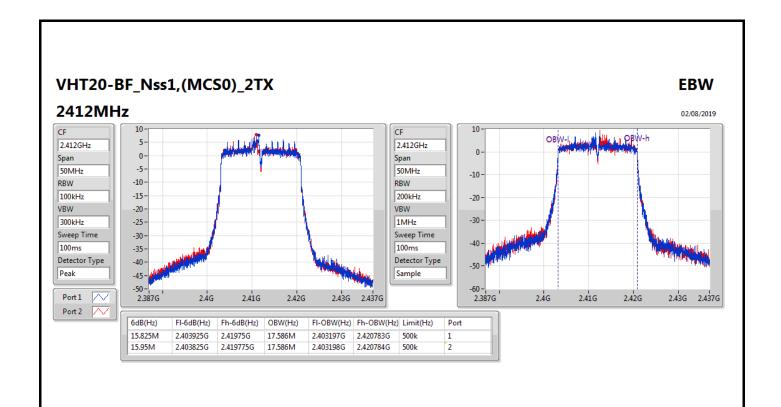
**Max-N dB** = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth; **Min-N dB** = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

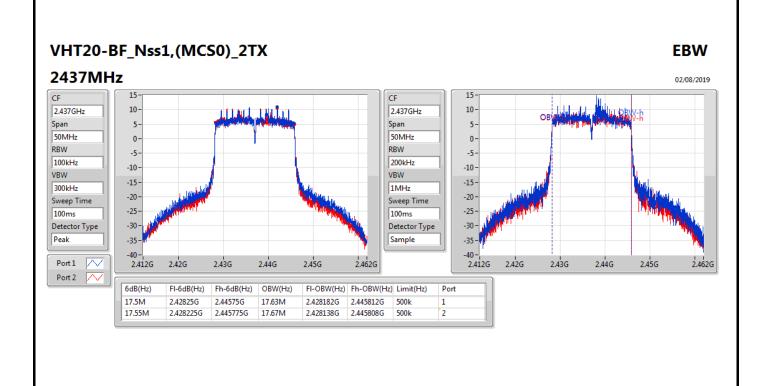
# Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	15.825M	17.586M	15.95M	17.586M
2437MHz	Pass	500k	17.5M	17.63M	17.55M	17.67M
2462MHz	Pass	500k	16.85M	17.572M	15.275M	17.607M
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	31.35M	35.941M	35M	35.889M
2437MHz	Pass	500k	33.7M	35.919M	35.25M	35.906M
2452MHz	Pass	500k	35M	35.901M	34.95M	35.855M

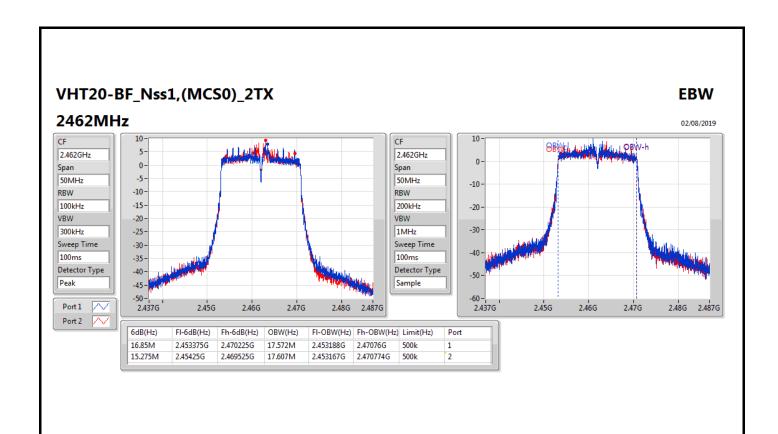
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

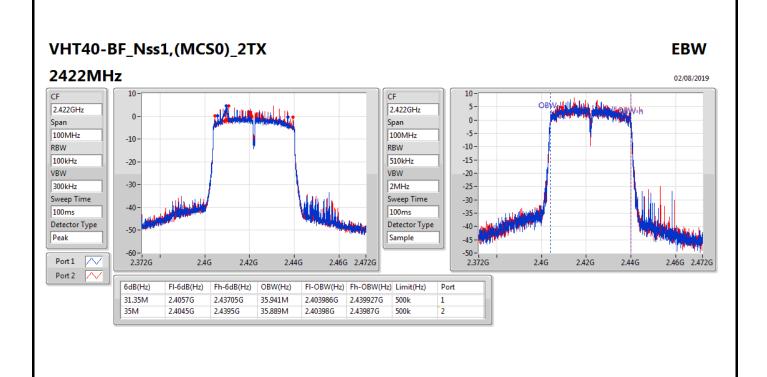




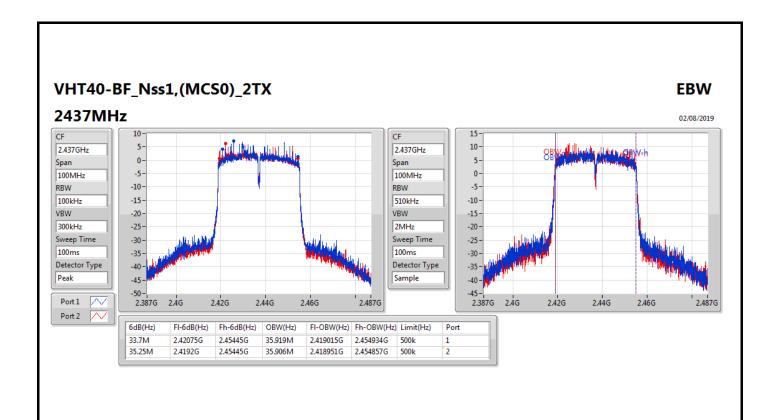


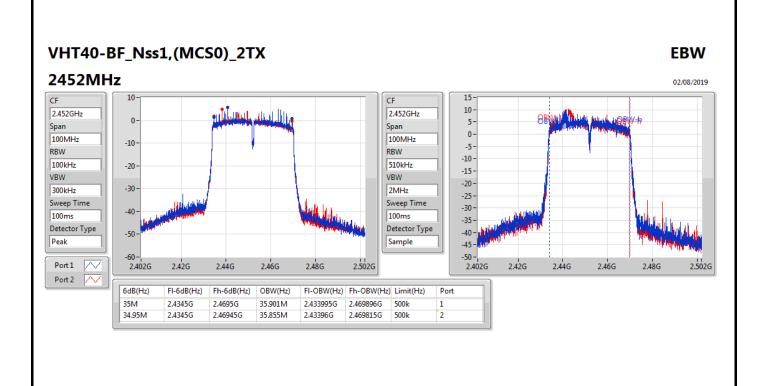














Average Power Appendix C.1

**Summary** 

Gammary		
Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	27.06	0.50816
802.11g_Nss1,(6Mbps)_2TX	26.23	0.41976
VHT20_Nss1,(MCS0)_2TX	26.15	0.41210
VHT40_Nss1,(MCS0)_2TX	22.38	0.17298

Average Power Appendix C.1

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	23.23	23.16	26.21	30.00
2437MHz	Pass	4.51	24.18	23.92	27.06	30.00
2462MHz	Pass	4.51	22.50	22.05	25.29	30.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	17.46	17.36	20.42	30.00
2417MHz	Pass	4.51	19.70	19.82	22.77	30.00
2437MHz	Pass	4.51	23.35	23.08	26.23	30.00
2457MHz	Pass	4.51	19.69	19.40	22.56	30.00
2462MHz	Pass	4.51	17.71	17.57	20.65	30.00
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	18.97	18.86	21.93	30.00
2417MHz	Pass	4.51	20.77	20.49	23.64	30.00
2437MHz	Pass	4.51	23.23	23.05	26.15	30.00
2457MHz	Pass	4.51	20.38	20.37	23.39	30.00
2462MHz	Pass	4.51	19.04	18.84	21.95	30.00
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.51	18.15	18.00	21.09	30.00
2437MHz	Pass	4.51	19.40	19.34	22.38	30.00
2452MHz	Pass	4.51	18.54	18.20	21.38	30.00

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



Average Power Appendix C.2

**Summary** 

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
VHT20-BF_Nss1,(MCS0)_2TX	25.03	0.31842
VHT40-BF_Nss1,(MCS0)_2TX	22.76	0.18880





## Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	17.40	17.56	20.49	30.00
2417MHz	Pass	4.51	19.40	19.34	22.38	30.00
2437MHz	Pass	4.51	22.08	21.96	25.03	30.00
2457MHz	Pass	4.51	20.27	20.04	23.17	30.00
2462MHz	Pass	4.51	18.10	17.92	21.02	30.00
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.51	17.25	16.91	20.09	30.00
2427MHz	Pass	4.51	17.84	17.96	20.91	30.00
2437MHz	Pass	4.51	19.64	19.85	22.76	30.00
2452MHz	Pass	4.51	17.79	17.65	20.73	30.00

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



Page No.

**Summary** 

Mode	PD
	(dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	1.71
802.11g_Nss1,(6Mbps)_2TX	-1.48
VHT20_Nss1,(MCS0)_2TX	-1.09
VHT40_Nss1,(MCS0)_2TX	-8.01

RBW=3 kHz.



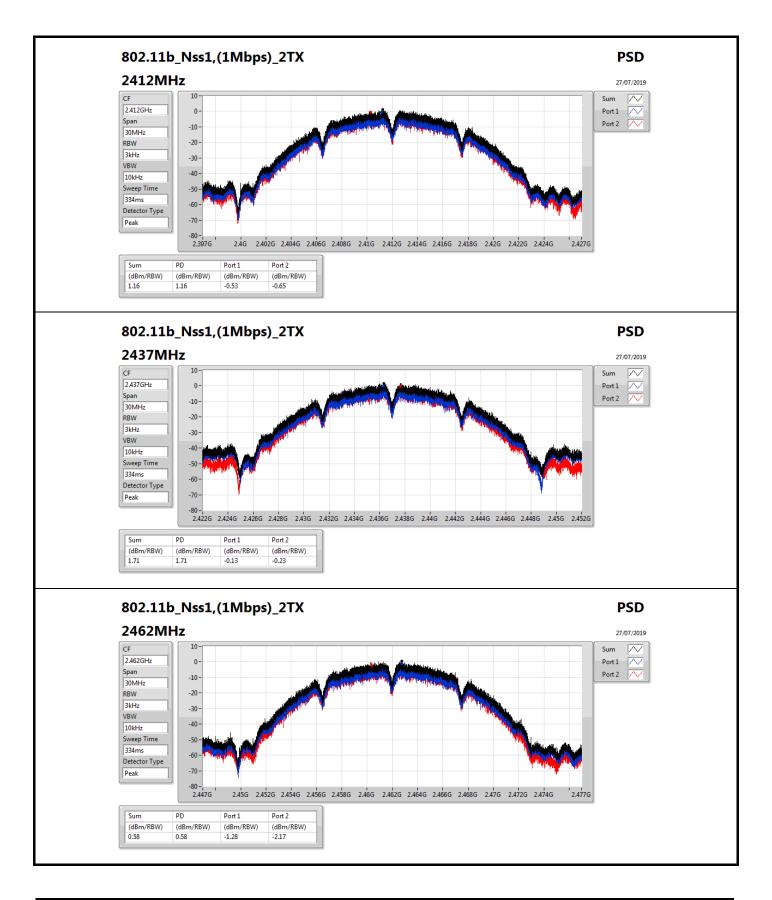
Page No.

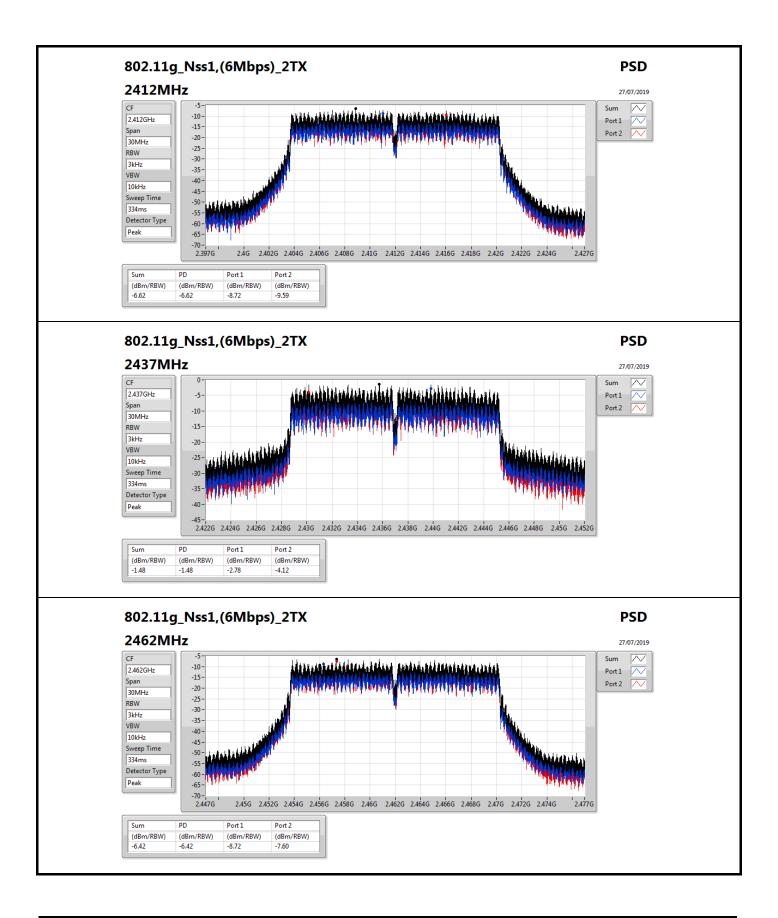
: 2 of 6

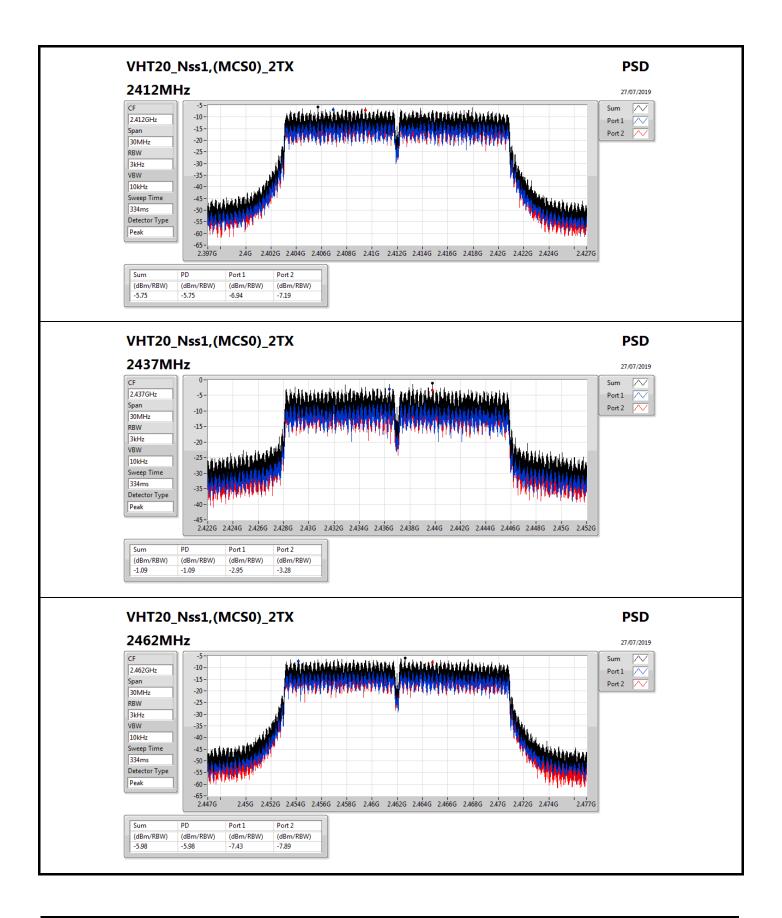
Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	-0.53	-0.65	1.16	8.00
2437MHz	Pass	4.51	-0.13	-0.23	1.71	8.00
2462MHz	Pass	4.51	-1.28	-2.17	0.58	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	-8.72	-9.59	-6.62	8.00
2437MHz	Pass	4.51	-2.78	-4.12	-1.48	8.00
2462MHz	Pass	4.51	-8.72	-7.60	-6.42	8.00
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	-6.94	-7.19	-5.75	8.00
2437MHz	Pass	4.51	-2.95	-3.28	-1.09	8.00
2462MHz	Pass	4.51	-7.43	-7.89	-5.98	8.00
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.51	-10.51	-11.09	-9.49	8.00
2437MHz	Pass	4.51	-9.68	-9.58	-8.01	8.00
2452MHz	Pass	4.51	-10.17	-10.20	-9.02	8.00

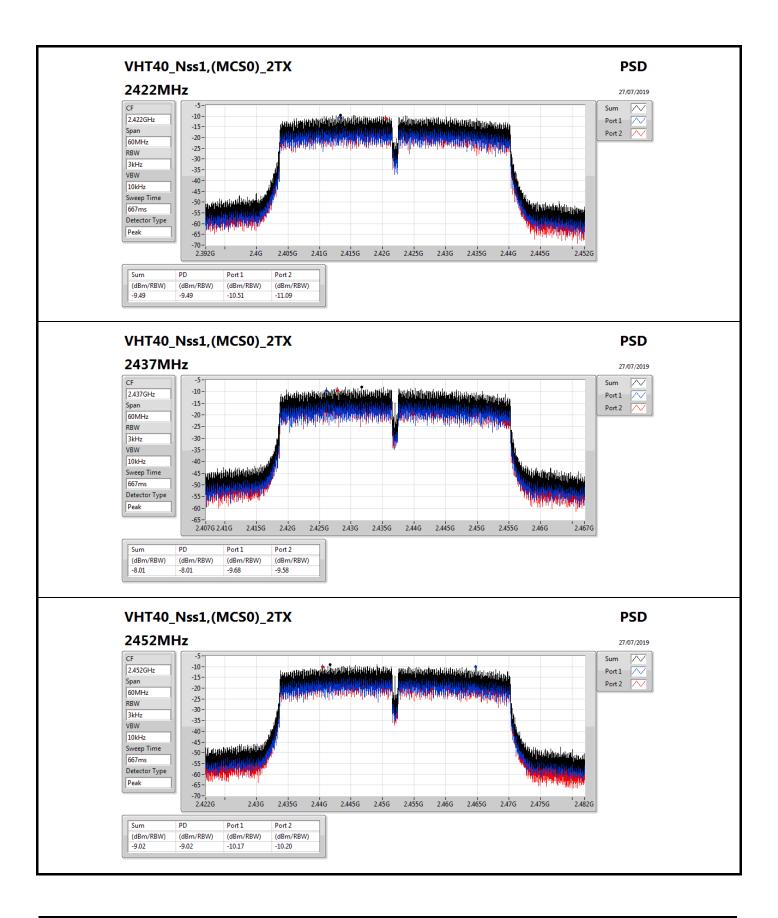
**DG** = Directional Gain; RBW=3 kHz;

**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	-
VHT20-BF_Nss1,(MCS0)_2TX	3.18
VHT40-BF_Nss1,(MCS0)_2TX	-2.10

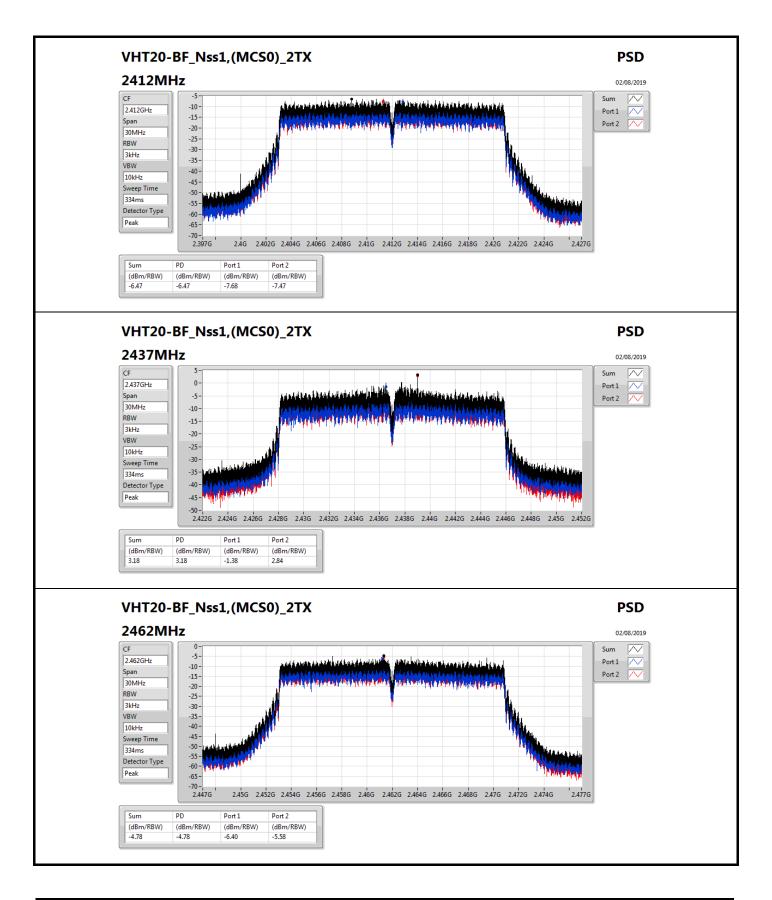
RBW=3 kHz.

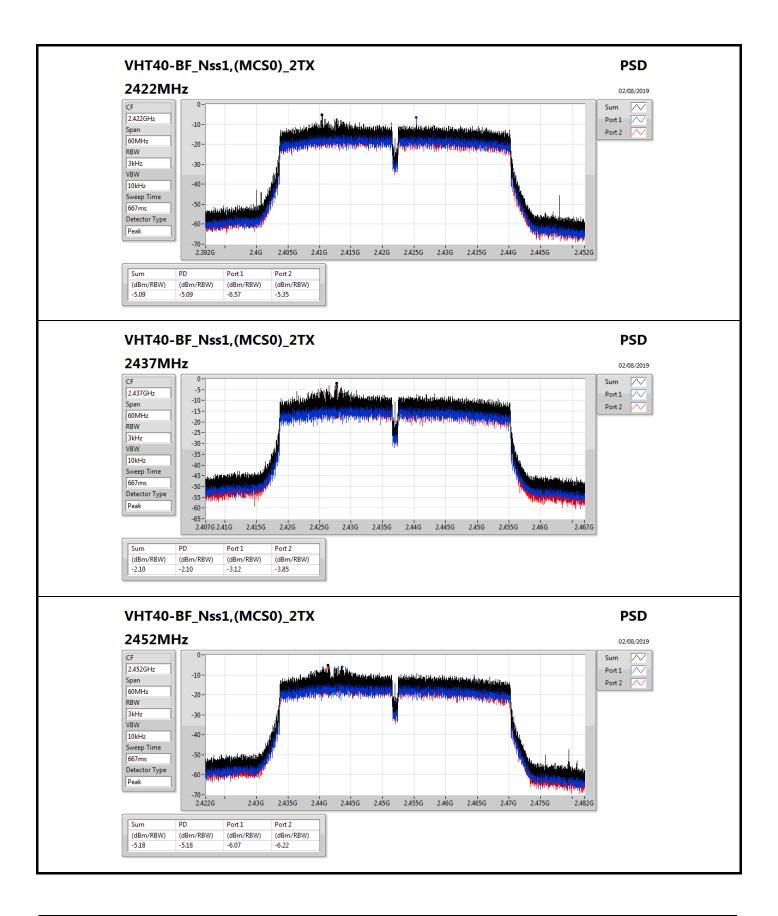


Appendix D.2 **PSD** 

Mode	Result	DG	Port 1			PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
VHT20-BF_Nss1,(MCS0)_2TX	=	-	=	-	-	-
2412MHz	Pass	4.51	-7.68	-7.47	-6.47	8.00
2437MHz	Pass	4.51	-1.38	2.84	3.18	8.00
2462MHz	Pass	4.51	-6.40	-5.58	-4.78	8.00
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.51	-6.57	-5.35	-5.09	8.00
2437MHz	Pass	4.51	-3.12	-3.85	-2.10	8.00
2452MHz	Pass	4.51	-6.07	-6.22	-5.18	8.00

DG = Directional Gain; RBW=3 kHz;PD = trace bin-by-bin of each transmits port summing can be performed maximum power density;Port X = Port X power density;







# CSE(Non-restricted Band)

Appendix E.1

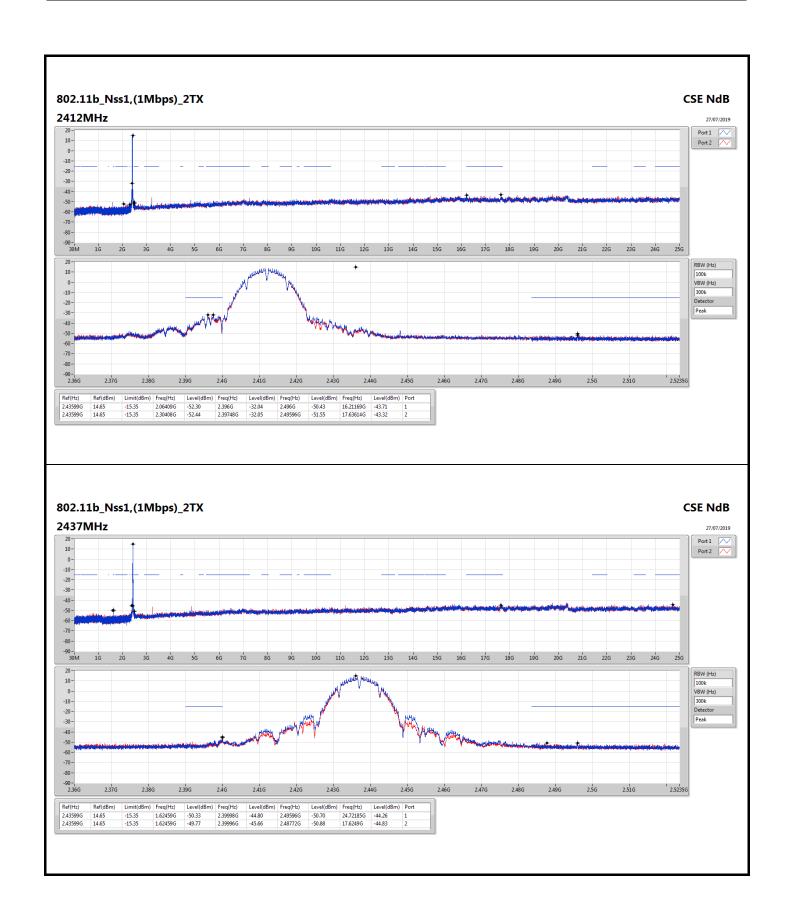
**Summary** 

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-		-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	Pass	2.43599G	14.65	-15.35	2.06409G	-52.30	2.396G	-32.04	2.496G	-50.43	16.21169G	-43.71	1
802.11g_Nss1,(6Mbps)_2TX	Pass	2.44196G	11.84	-18.16	2.30408G	-52.85	2.39954G	-33.01	2.49604G	-50.54	17.66423G	-43.43	1
VHT20_Nss1,(MCS0)_2TX	Pass	2.442G	12.16	-17.84	805.02M	-52.50	2.39978G	-28.55	2.49596G	-49.86	24.98033G	-44.86	1
VHT40_Nss1,(MCS0)_2TX	Pass	2.44075G	4.89	-25.11	2.30426G	-51.25	2.39956G	-32.01	2.48482G	-40.67	15.29341G	-43.87	2

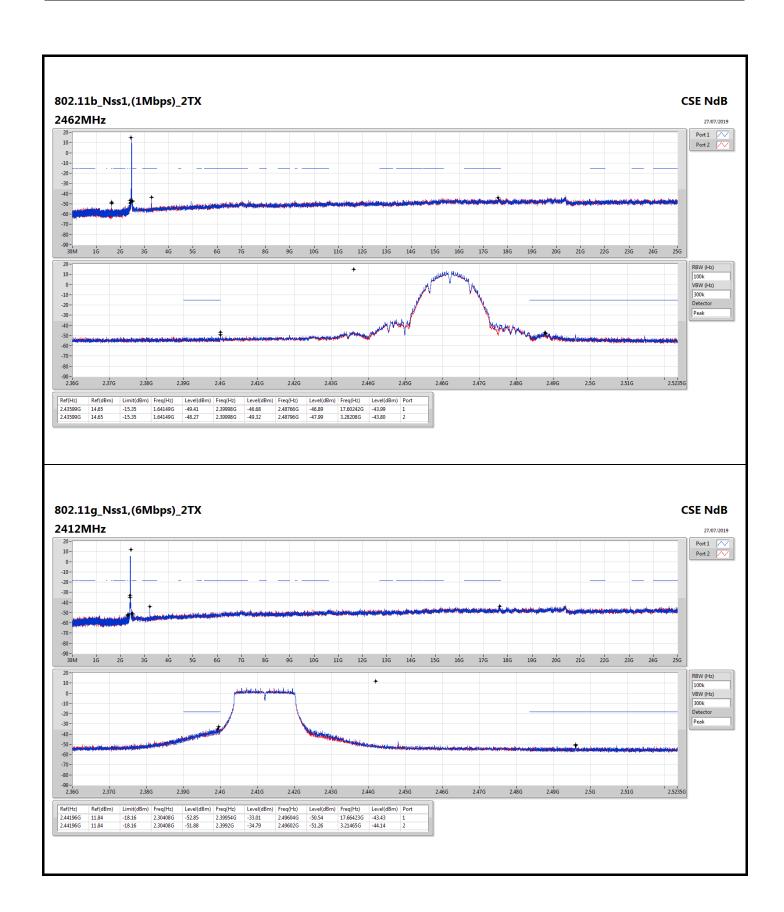


Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43599G	14.65	-15.35	2.06409G	-52.30	2.396G	-32.04	2.496G	-50.43	16.21169G	-43.71	1
2412MHz	Pass	2.43599G	14.65	-15.35	2.30408G	-52.44	2.39748G	-32.05	2.49596G	-51.55	17.63614G	-43.32	2
2437MHz	Pass	2.43599G	14.65	-15.35	1.62459G	-50.33	2.39998G	-44.80	2.49596G	-50.70	24.72185G	-44.26	1
2437MHz	Pass	2.43599G	14.65	-15.35	1.62459G	-49.77	2.39996G	-45.66	2.48772G	-50.88	17.6249G	-44.83	2
2462MHz	Pass	2.43599G	14.65	-15.35	1.64149G	-49.41	2.39998G	-46.68	2.48766G	-46.89	17.60242G	-43.99	1
2462MHz	Pass	2.43599G	14.65	-15.35	1.64149G	-48.27	2.39998G	-49.32	2.48796G	-47.99	3.28208G	-43.80	2
802.11g_Nss1,(6Mbps)_2TX	-	-	-		-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.44196G	11.84	-18.16	2.30408G	-52.85	2.39954G	-33.01	2.49604G	-50.54	17.66423G	-43.43	1
2412MHz	Pass	2.44196G	11.84	-18.16	2.30408G	-51.88	2.3992G	-34.79	2.49602G	-51.26	3.21465G	-44.14	2
2437MHz	Pass	2.44196G	11.84	-18.16	717.64M	-53.41	2.39952G	-35.42	2.487G	-43.58	21.75215G	-44.92	1
2437MHz	Pass	2.44196G	11.84	-18.16	2.30408G	-51.52	2.39914G	-36.71	2.48384G	-44.63	24.12061G	-43.62	2
2462MHz	Pass	2.44196G	11.84	-18.16	2.1602G	-51.93	2.39996G	-46.66	2.4839G	-44.27	13.90223G	-42.93	1
2462MHz	Pass	2.44196G	11.84	-18.16	497.17M	-52.77	2.39998G	-48.77	2.48472G	-43.82	3.28208G	-42.98	2
VHT20_Nss1,(MCS0)_2TX	-	-	-		-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.442G	12.16	-17.84	805.02M	-52.50	2.39978G	-28.55	2.49596G	-49.86	24.98033G	-44.86	1
2412MHz	Pass	2.442G	12.16	-17.84	2.30408G	-49.95	2.39882G	-29.43	2.50088G	-51.69	17.60804G	-44.53	2
2437MHz	Pass	2.442G	12.16	-17.84	846.08M	-54.03	2.39954G	-36.16	2.48368G	-44.07	17.63614G	-44.38	1
2437MHz	Pass	2.442G	12.16	-17.84	2.30408G	-52.15	2.3998G	-36.72	2.4838G	-43.60	24.72466G	-44.73	2
2462MHz	Pass	2.442G	12.16	-17.84	2.1602G	-51.15	2.39998G	-47.05	2.48388G	-34.94	17.66423G	-44.40	1
2462MHz	Pass	2.442G	12.16	-17.84	2.30408G	-50.99	2.39998G	-48.80	2.48384G	-38.87	3.28208G	-42.93	2
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.44075G	4.89	-25.11	2.30426G	-53.58	2.3914G	-33.00	2.48482G	-50.43	16.2105G	-44.18	1
2422MHz	Pass	2.44075G	4.89	-25.11	2.30168G	-52.72	2.39576G	-34.23	2.49314G	-50.21	17.66046G	-44.15	2
2437MHz	Pass	2.44075G	4.89	-25.11	763.66M	-53.82	2.3958G	-32.21	2.4841G	-41.07	17.67168G	-44.27	1
2437MHz	Pass	2.44075G	4.89	-25.11	2.30426G	-51.25	2.39956G	-32.01	2.48482G	-40.67	15.29341G	-43.87	2
2452MHz	Pass	2.44075G	4.89	-25.11	589.05M	-53.02	2.3998G	-42.92	2.48514G	-33.53	17.32952G	-43.58	1
2452MHz	Pass	2.44075G	4.89	-25.11	2.30426G	-53.24	2.39708G	-45.22	2.48442G	-38.53	3.26745G	-42.56	2

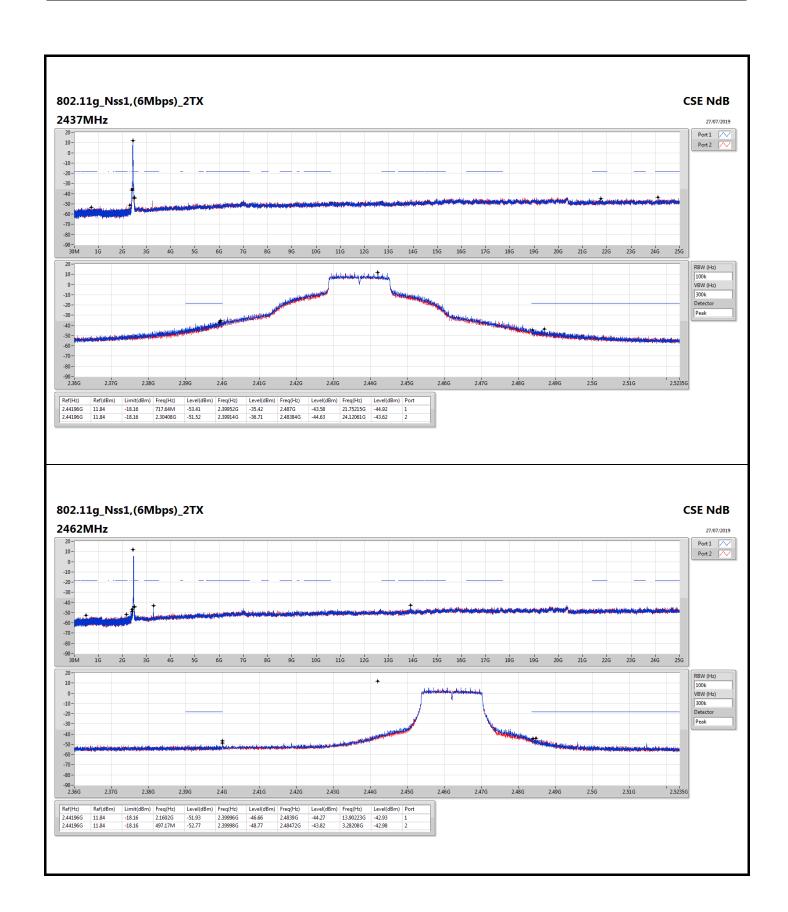




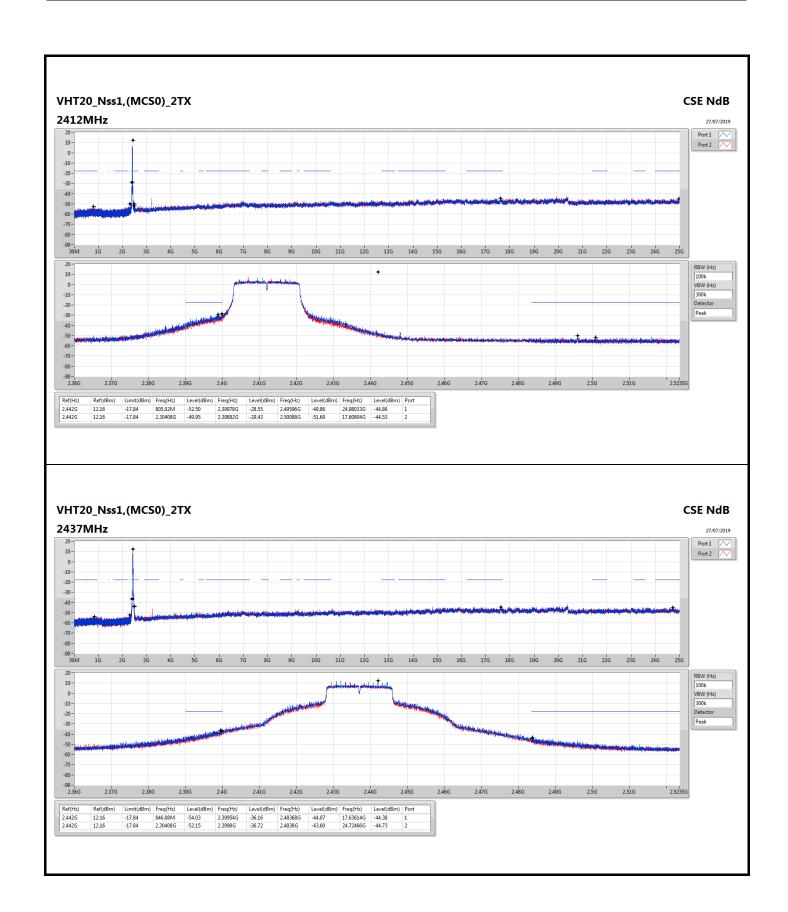




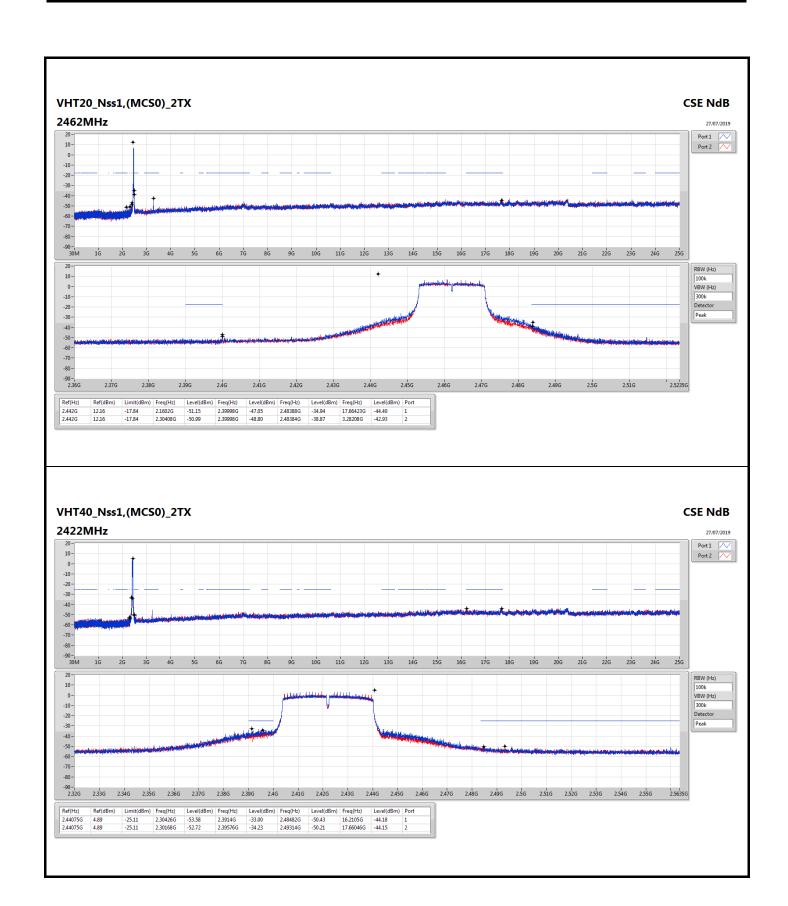




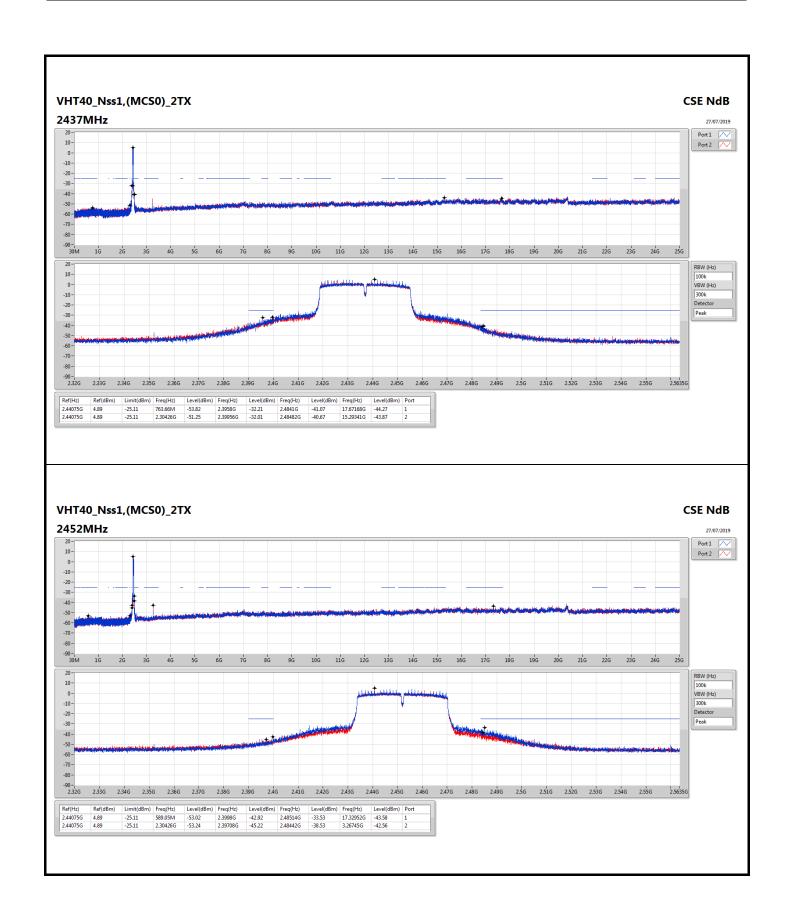














# CSE(Non-restricted Band)

Appendix E.2

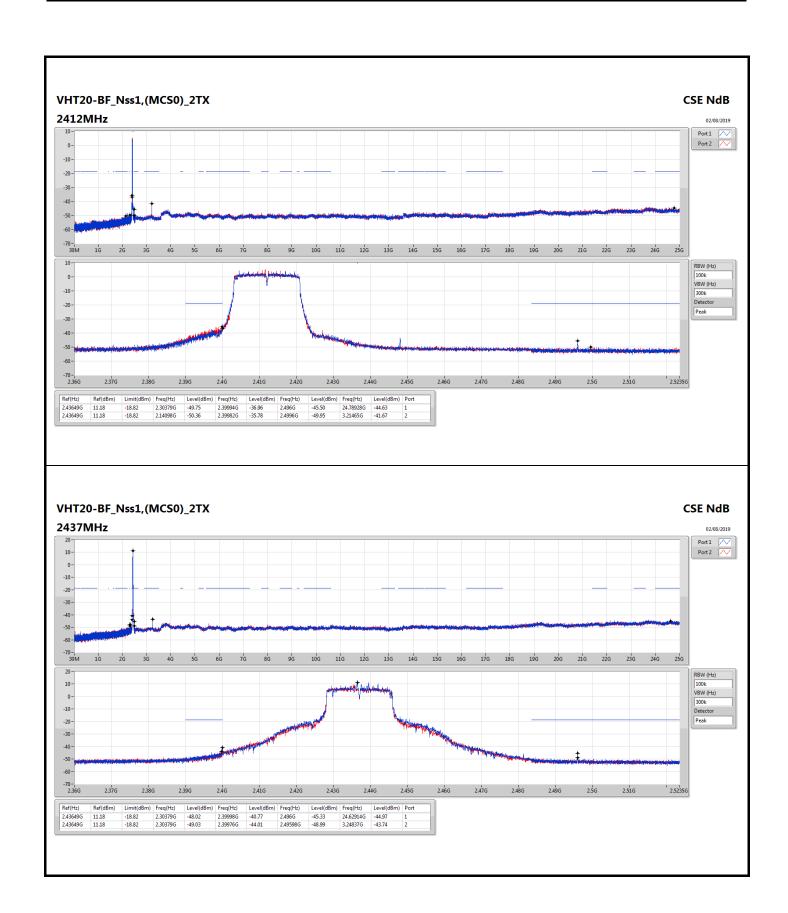
**Summary** 

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_2TX	Pass	2.43649G	11.18	-18.82	2.14098G	-50.36	2.39982G	-35.78	2.4996G	-49.95	3.21465G	-41.67	2
VHT40-BF_Nss1,(MCS0)_2TX	Pass	2.42751G	6.80	-23.20	50.04M	-34.60	2.39984G	-34.45	2.4857G	-42.82	3.25062G	-43.11	2

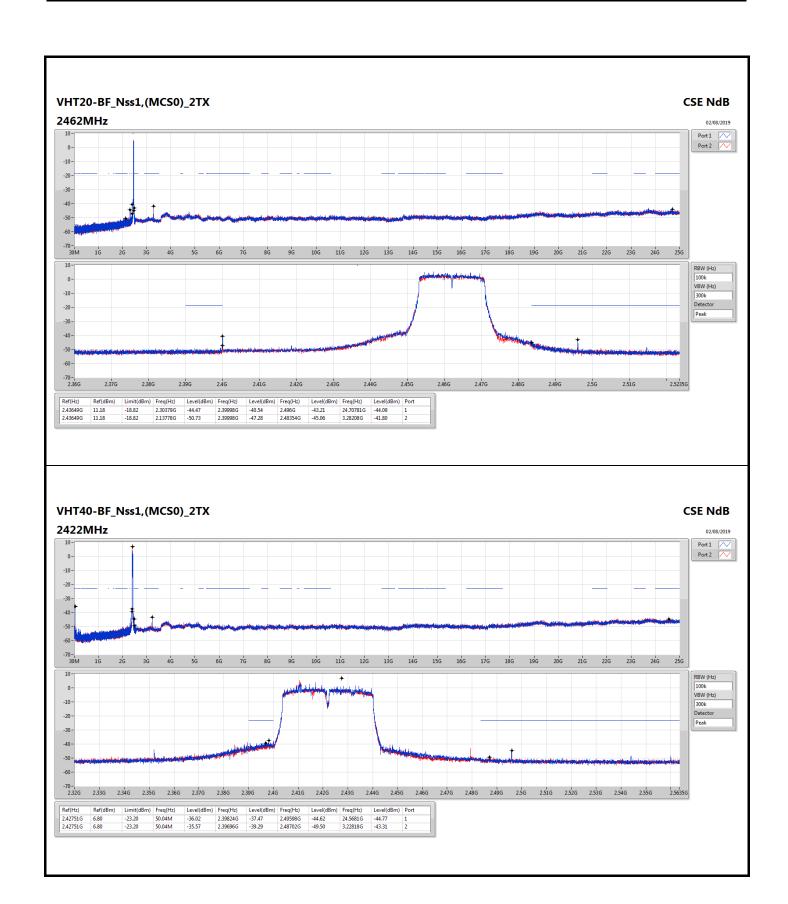


Nesuit	_	1			1		1				1		
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43649G	11.18	-18.82	2.30379G	-49.75	2.39994G	-36.96	2.496G	-45.50	24.78928G	-44.63	1
2412MHz	Pass	2.43649G	11.18	-18.82	2.14098G	-50.36	2.39982G	-35.78	2.4996G	-49.95	3.21465G	-41.67	2
2437MHz	Pass	2.43649G	11.18	-18.82	2.30379G	-48.02	2.39998G	-40.77	2.496G	-45.33	24.62914G	-44.97	1
2437MHz	Pass	2.43649G	11.18	-18.82	2.30379G	-49.03	2.39976G	-44.01	2.49598G	-48.99	3.24837G	-43.74	2
2462MHz	Pass	2.43649G	11.18	-18.82	2.30379G	-44.47	2.39998G	-40.54	2.496G	-43.21	24.70781G	-44.09	1
2462MHz	Pass	2.43649G	11.18	-18.82	2.13778G	-50.73	2.39998G	-47.28	2.48354G	-45.06	3.28208G	-41.80	2
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.42751G	6.80	-23.20	50.04M	-36.02	2.39824G	-37.47	2.49598G	-44.62	24.5681G	-44.77	1
2422MHz	Pass	2.42751G	6.80	-23.20	50.04M	-35.57	2.39696G	-39.29	2.48702G	-49.50	3.22818G	-43.31	2
2437MHz	Pass	2.42751G	6.80	-23.20	50.04M	-34.77	2.39976G	-35.23	2.4857G	-42.10	24.02121G	-44.28	1
2437MHz	Pass	2.42751G	6.80	-23.20	50.04M	-34.60	2.39984G	-34.45	2.4857G	-42.82	3.25062G	-43.11	2
2452MHz	Pass	2.42751G	6.80	-23.20	50.04M	-35.54	2.39996G	-45.76	2.49602G	-43.87	24.60175G	-44.66	1
2452MHz	Pass	2.42751G	6.80	-23.20	50.04M	-35.31	2.39996G	-46.73	2.48466G	-41.60	3.27025G	-43.21	2

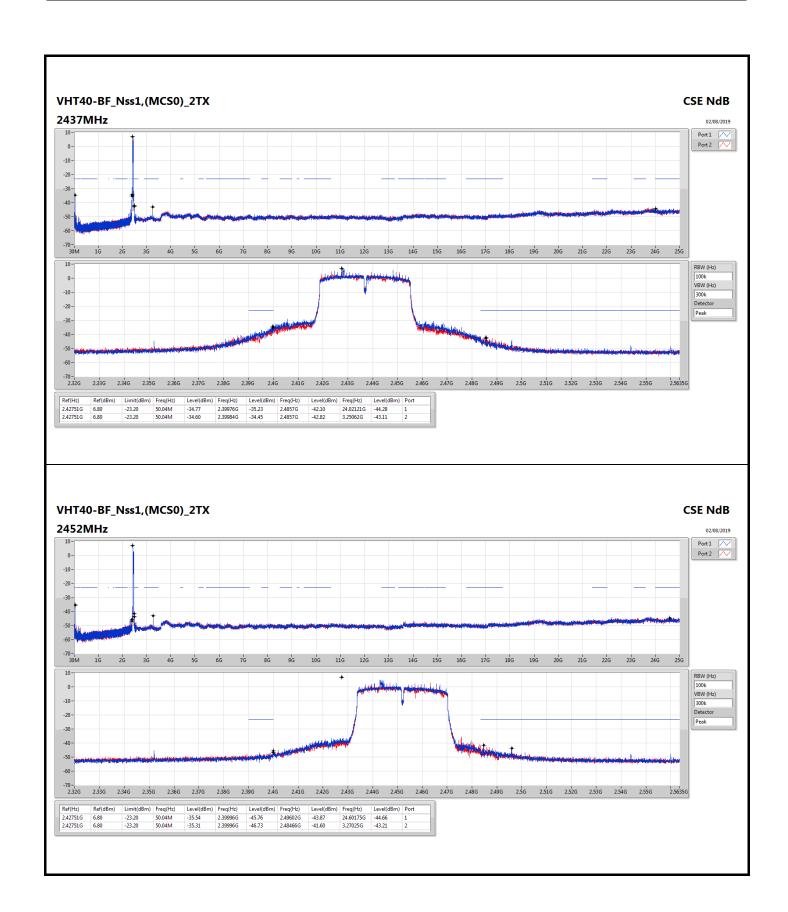








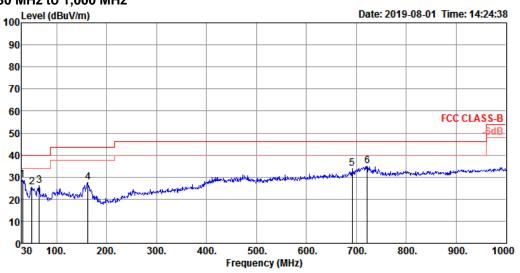




## Radiated Emission below 1GHz Result

30 MHz to 1,000 MHz **Test Mode** Mode 1 **Frequency Range** 

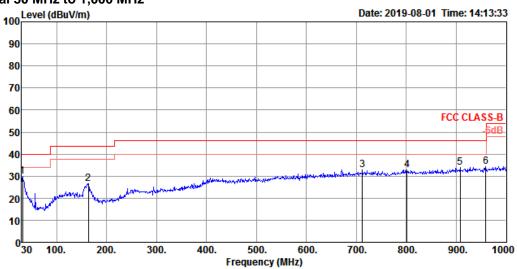
## Vertical 30 MHz to 1,000 MHz



	Frea	Level		Over Limit					-	T/Pos	Remark	Pol/Phase
												,
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	31.94	28.64	40.00	-11.36	37.39	0.52	22.93	32.20	100	201	Peak	VERTICAL
2	50.37	25.49	40.00	-14.51	43.44	0.73	13.50	32.18	125	351	Peak	VERTICAL
3	64.92	26.16	40.00	-13.84	45.45	0.83	12.03	32.15	100	178	Peak	VERTICAL
4	162.89	27.65	43.50	-15.85	42.49	1.31	15.95	32.10	100	46	Peak	VERTICAL
5	691.54	33.82	46.00	-12.18	37.73	2.83	25.18	31.92	100	166	Peak	VERTICAL
6	721.61	34.88	46.00	-11.12	38.52	2.88	25.46	31.98	100	107	Peak	VERTICAL



## Horizontal 30 MHz to 1,000 MHz



	Freq	Level		Limit					A/Pos	1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	31.94	30.05	40.00	-9.95	38.80	0.52	22.93	32.20	200	317	Peak	HORIZONTAL
2	163.86	26.49	43.50	-17.01	41.36	1.31	15.91	32.09	150	168	Peak	HORIZONTAL
3	711.91	32.73	46.00	-13.27	36.49	2.87	25.31	31.94	200	360	Peak	HORIZONTAL
4	801.15	33.00	46.00	-13.00	35.34	3.08	26.23	31.65	100	4	Peak	HORIZONTAL
5	907.85	34.01	46.00	-11.99	35.34	3.12	26.71	31.16	200	85	Peak	HORIZONTAL
6	959.26	34.23	46.00	-11.77	34.92	3.28	26.70	30.67	200	5	Peak	HORIZONTAL



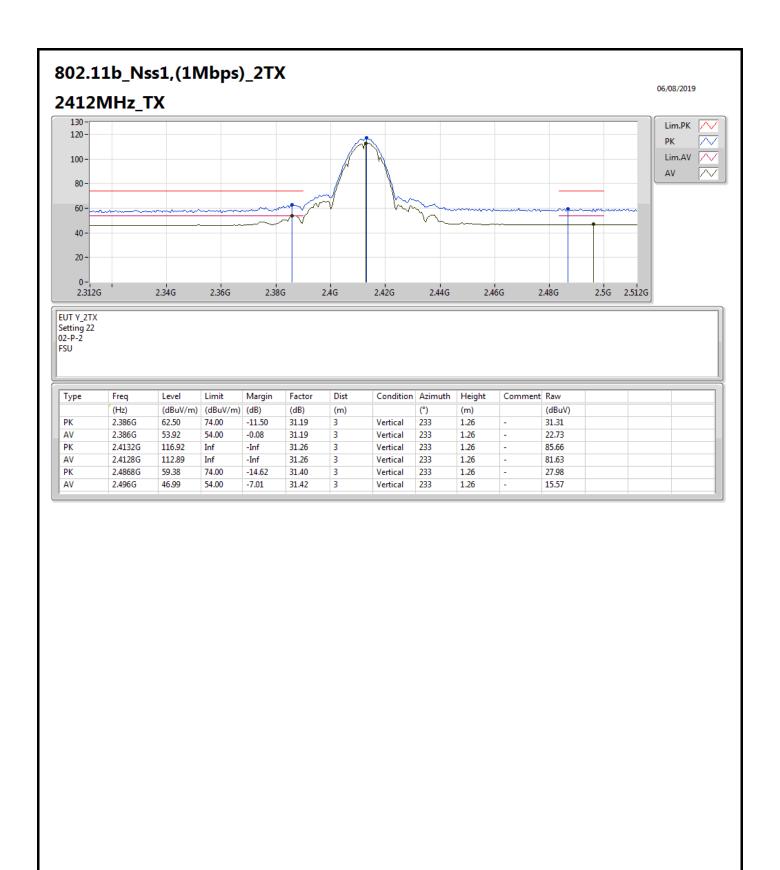
## RSE TX above 1GHz

Appendix F.2

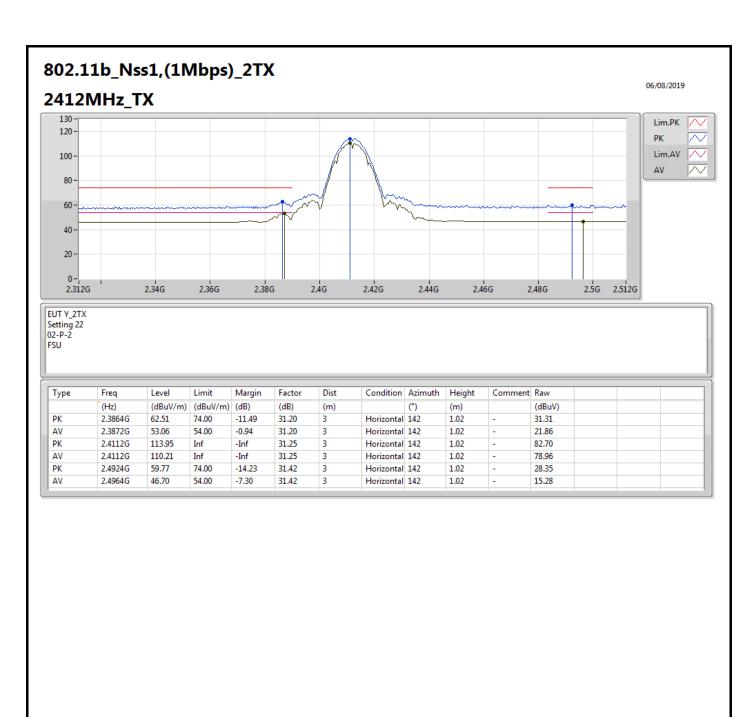
**Summary** 

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
VHT20_Nss1,(MCS0)_2TX	Pass	AV	2.4835G	53.95	54.00	-0.05	31.39	3	Horizontal	206	1.36	-

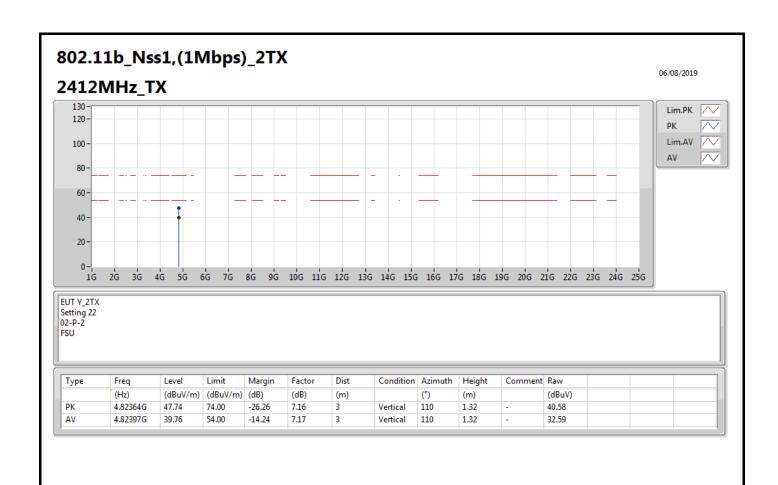




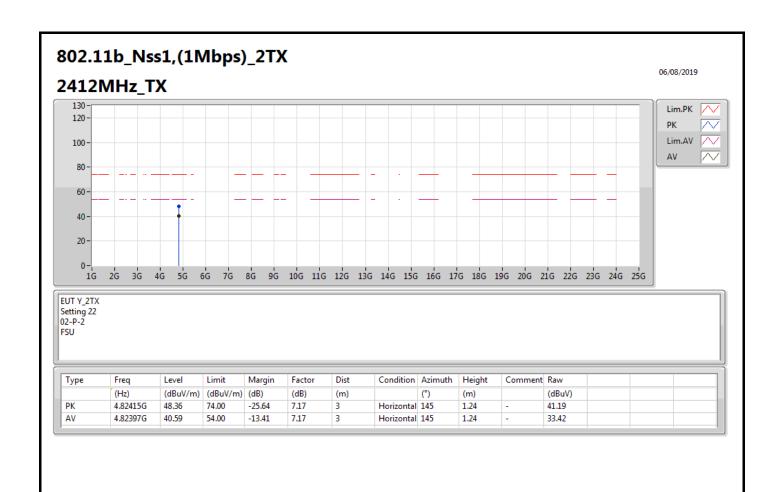




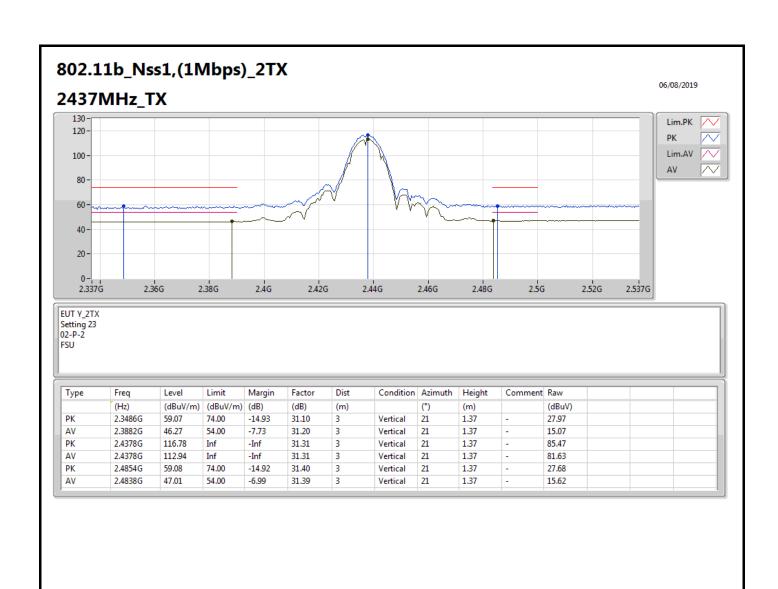




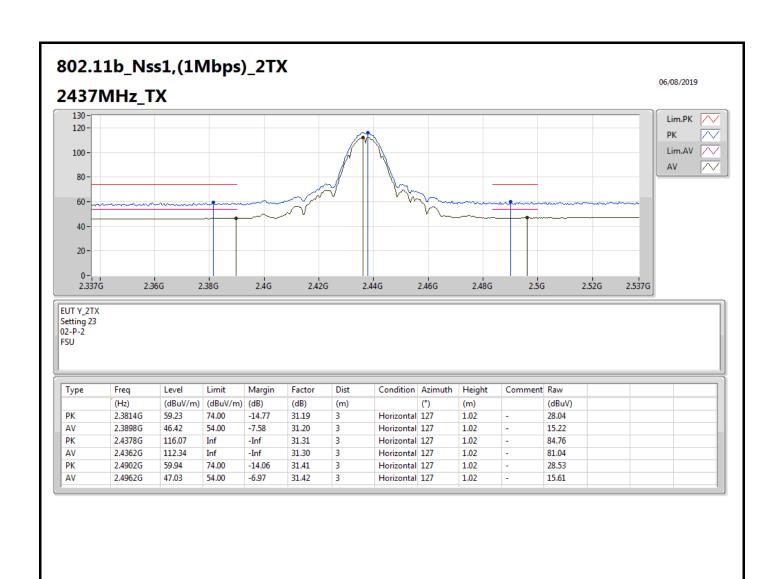




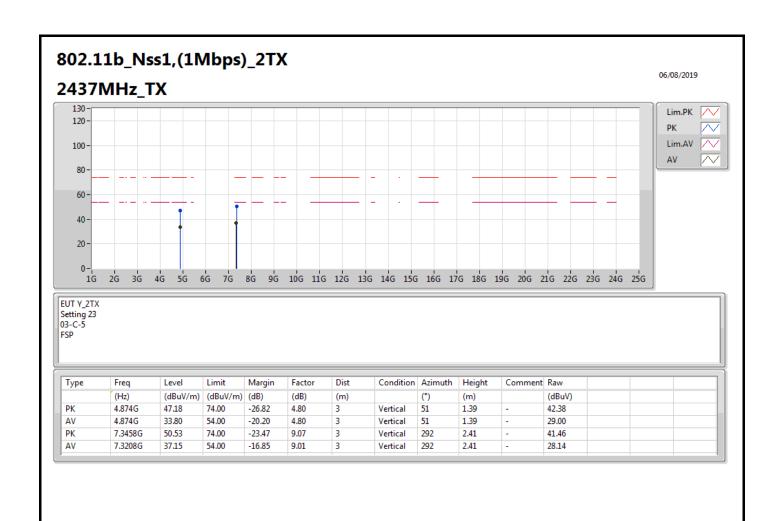




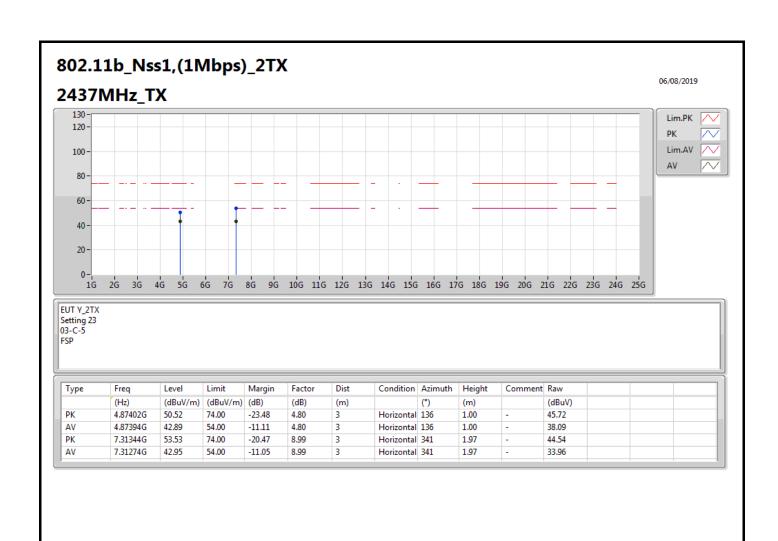




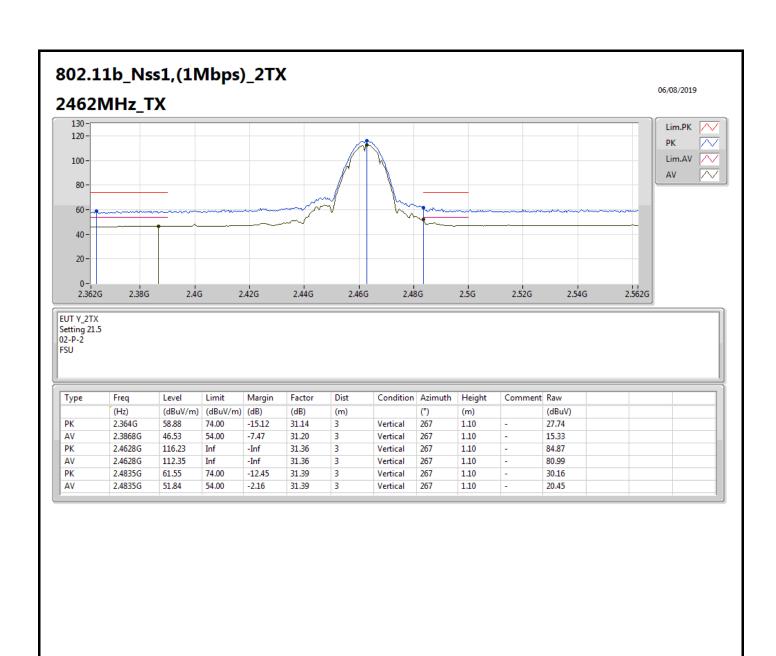




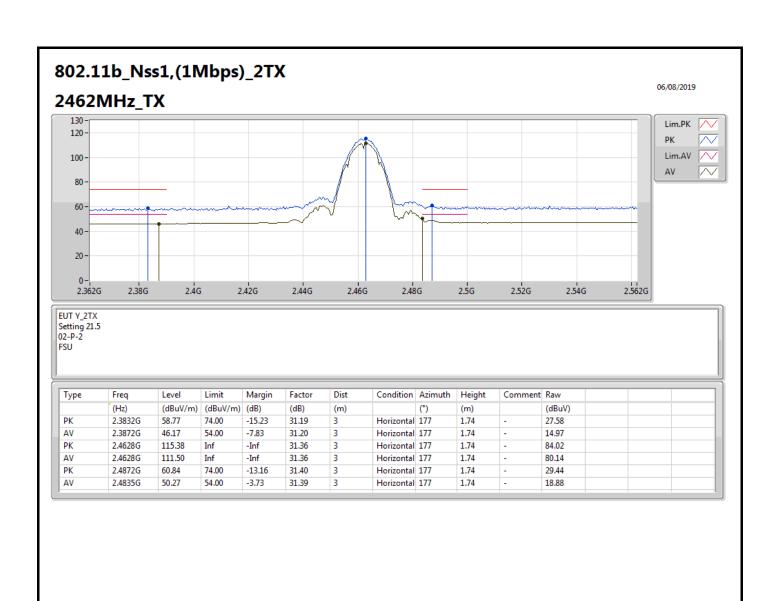






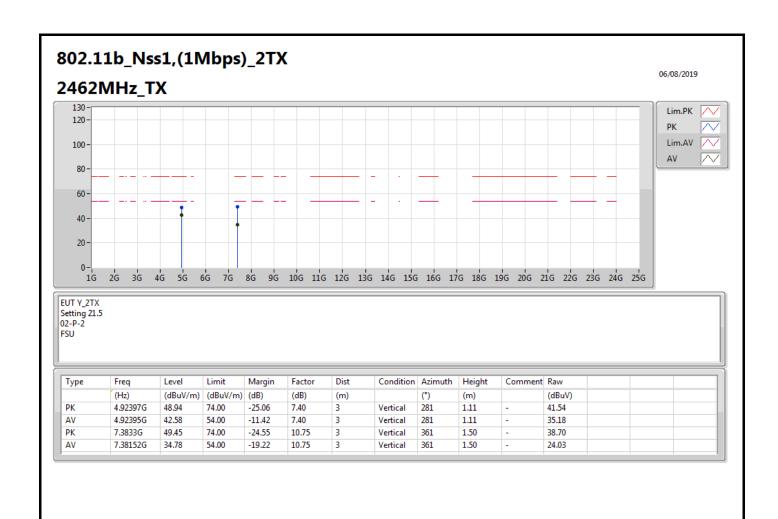




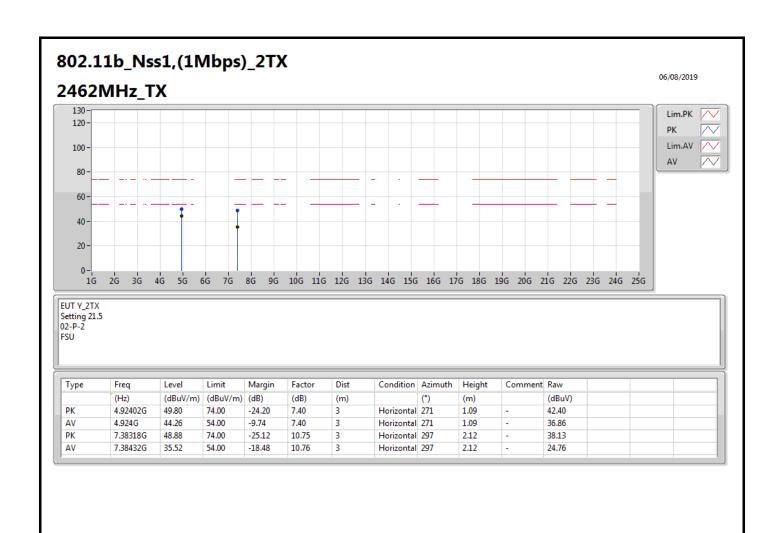


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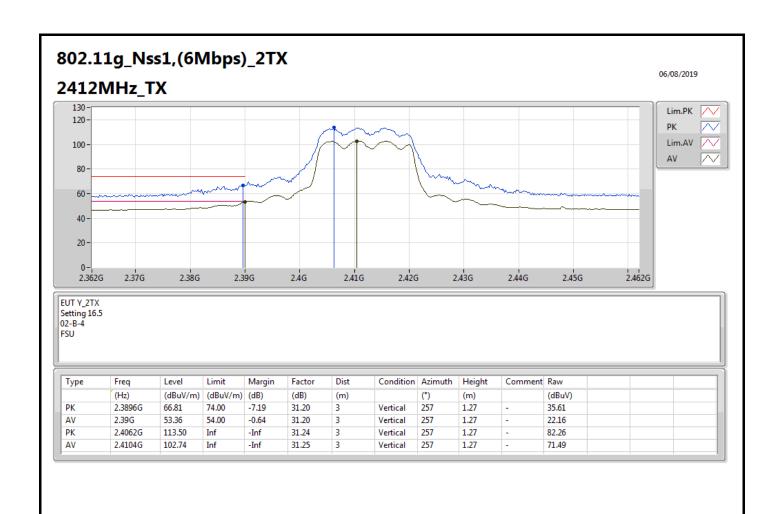




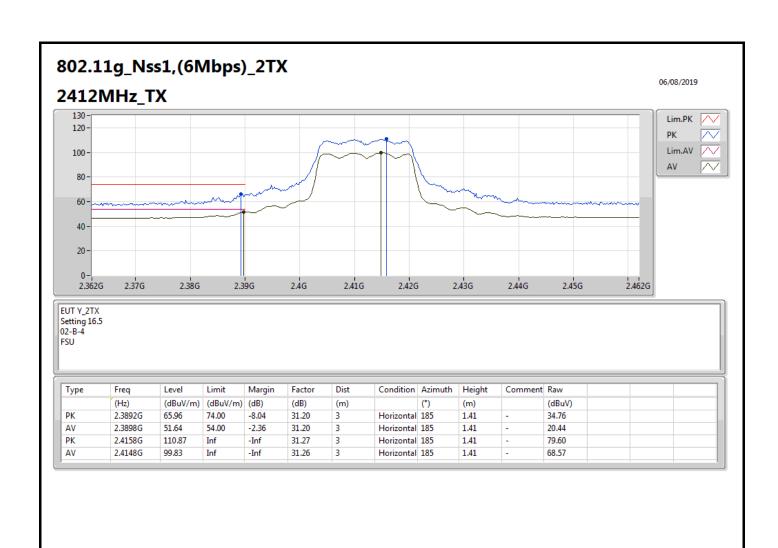




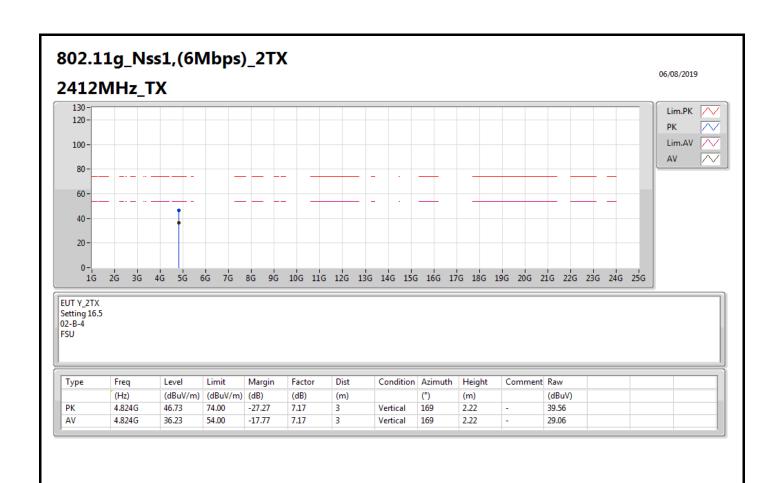






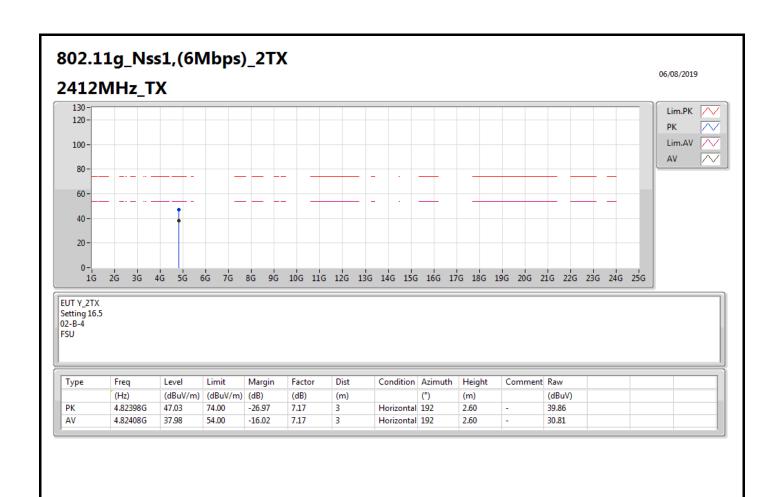




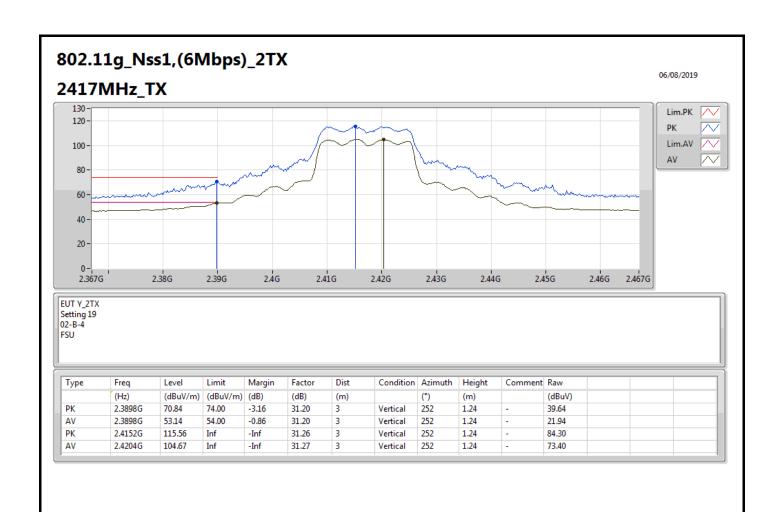


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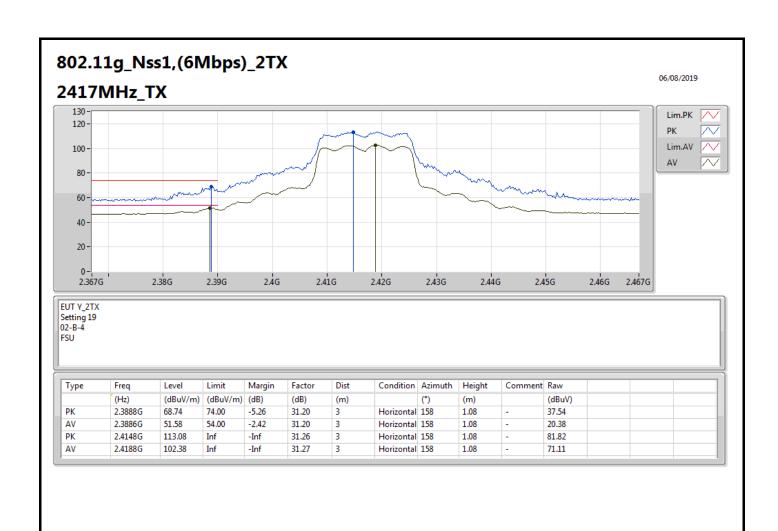




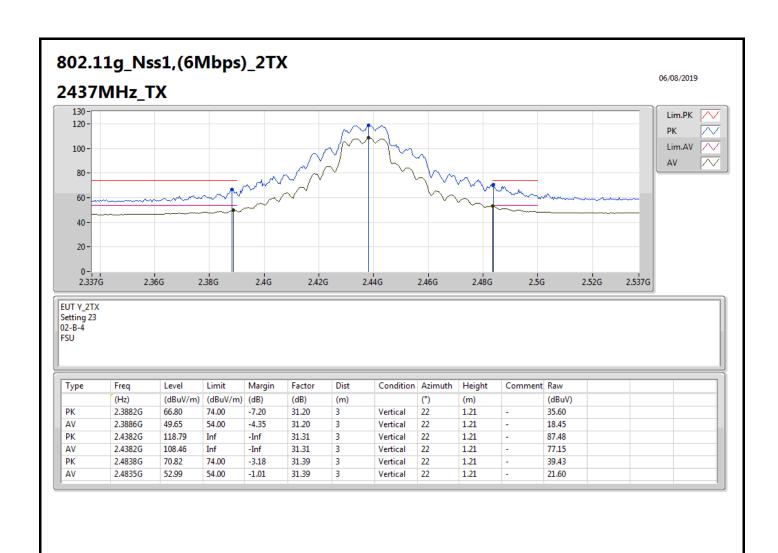




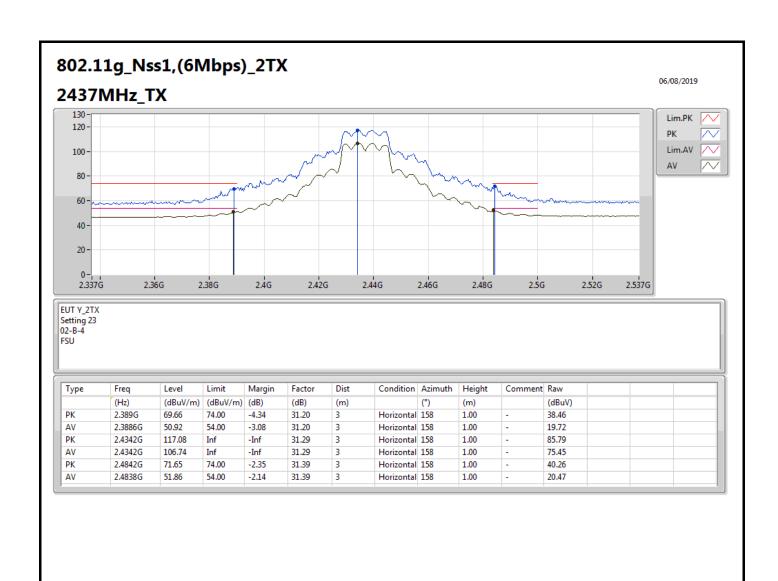




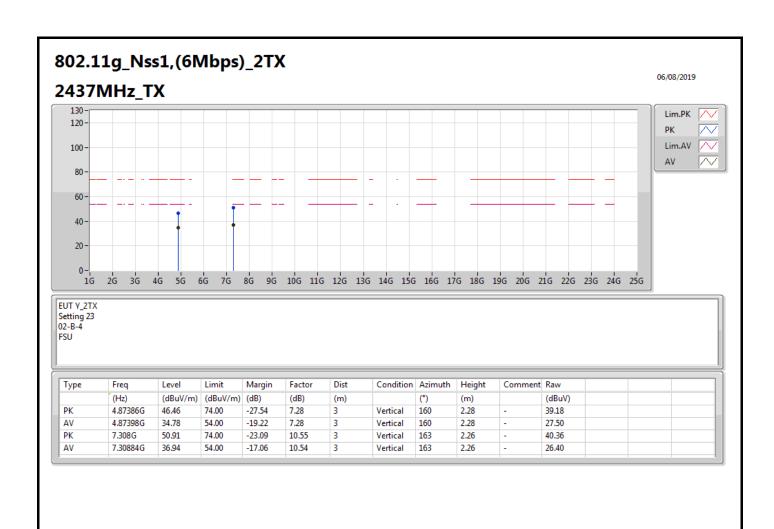




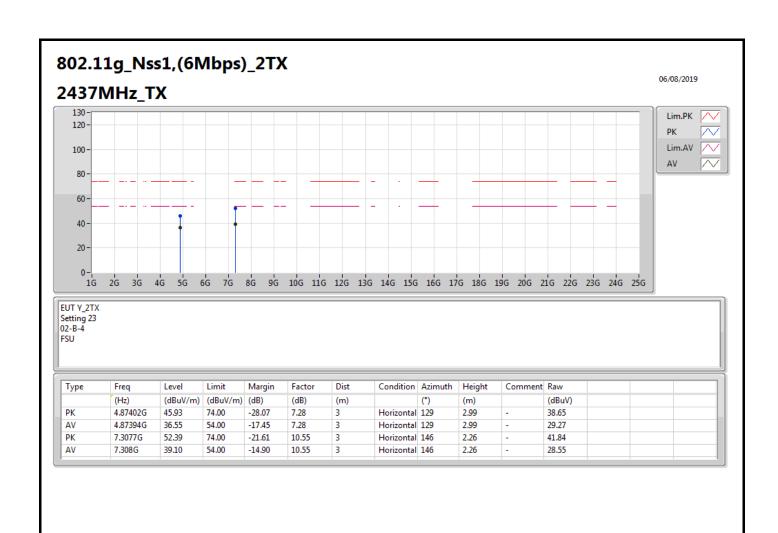




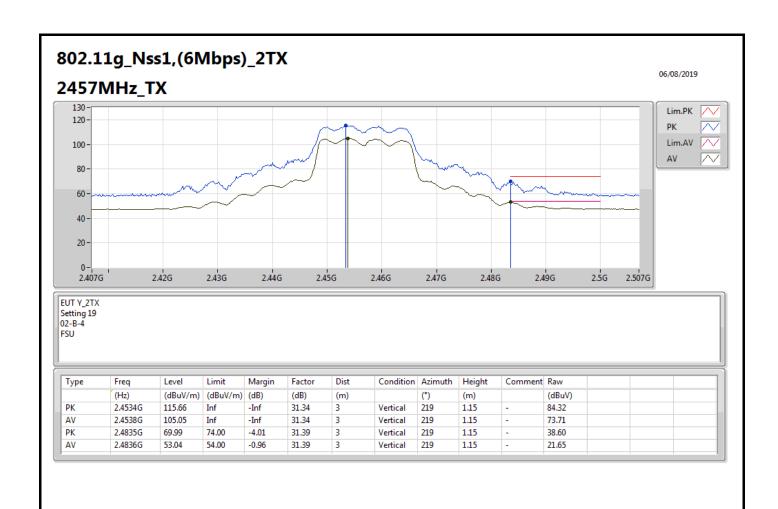




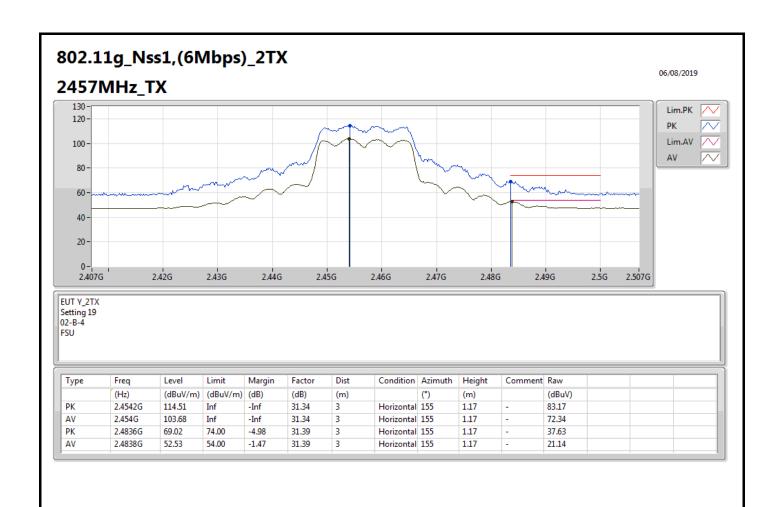




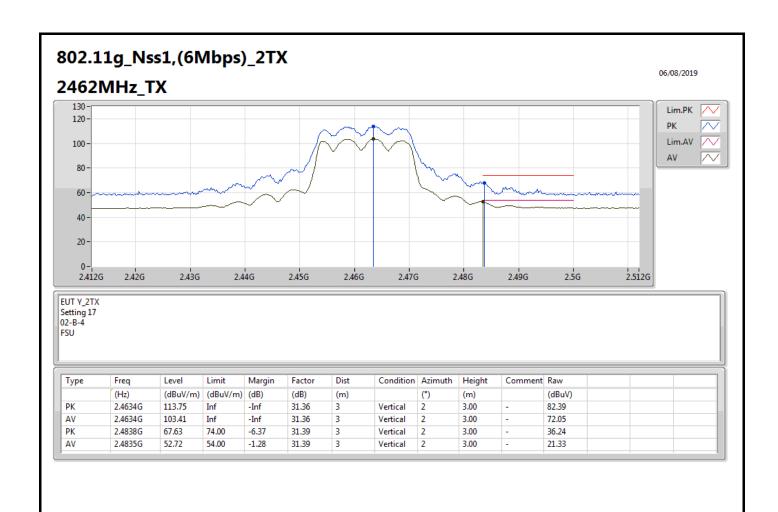




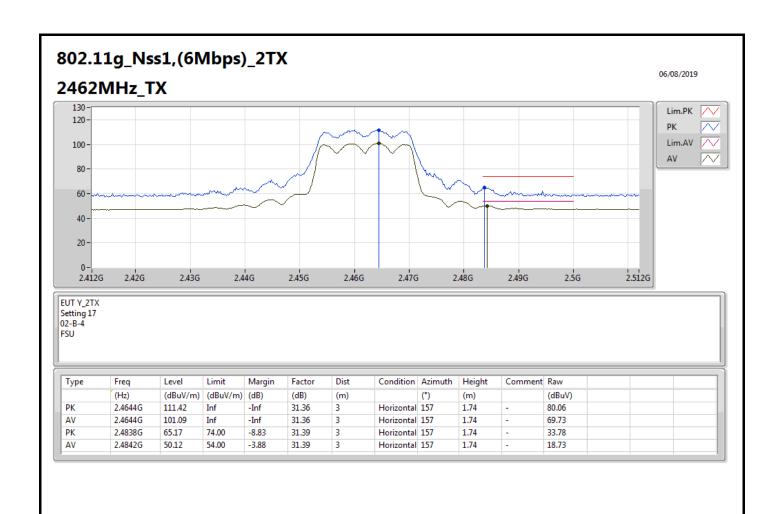




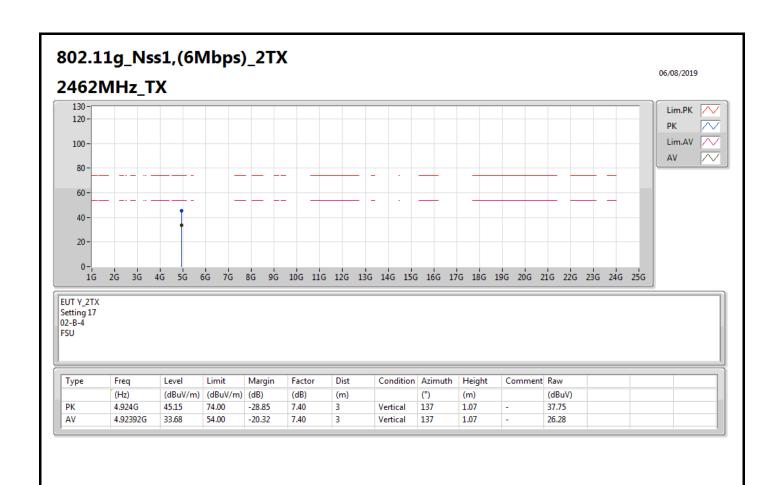




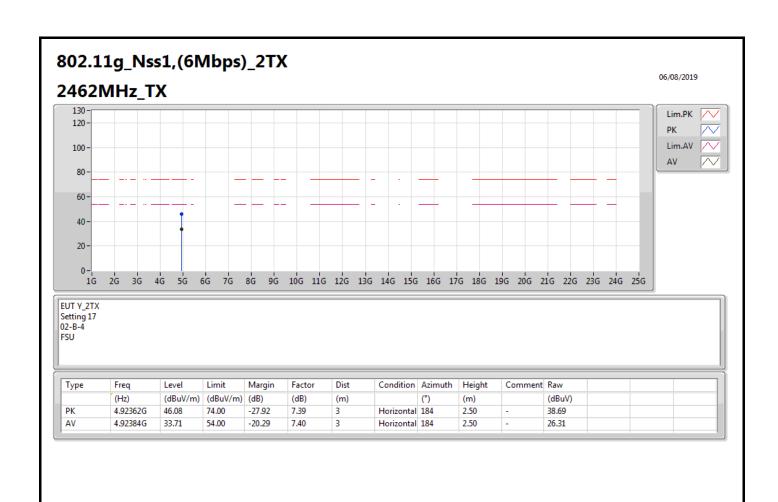




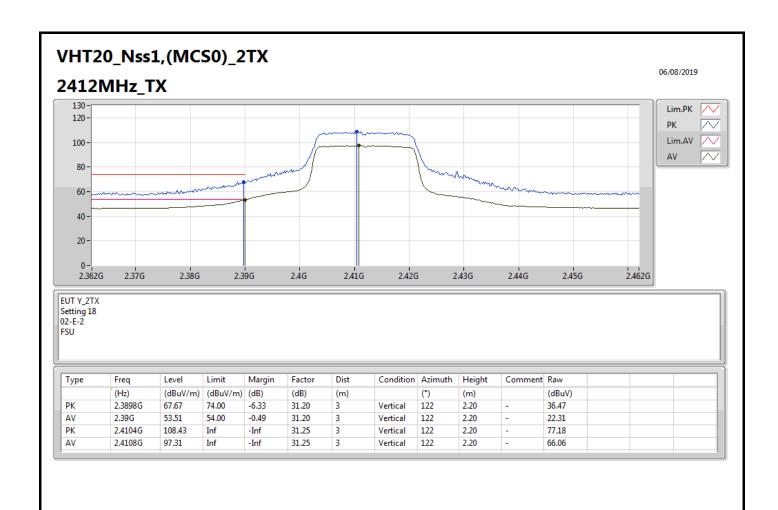




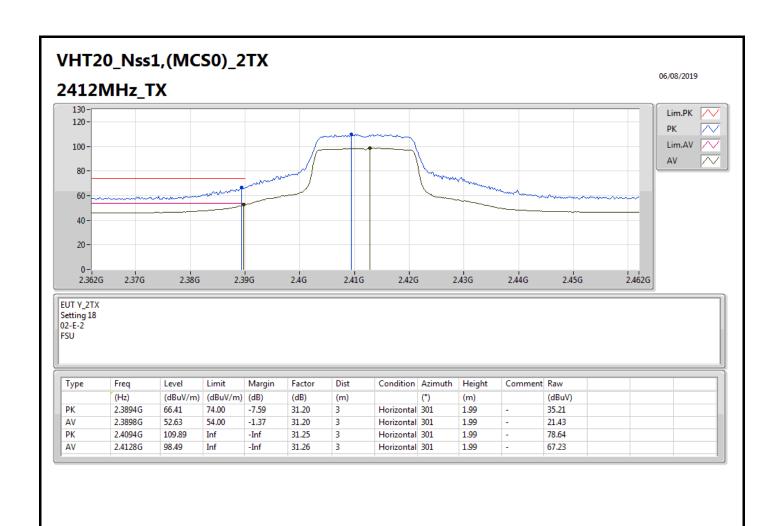




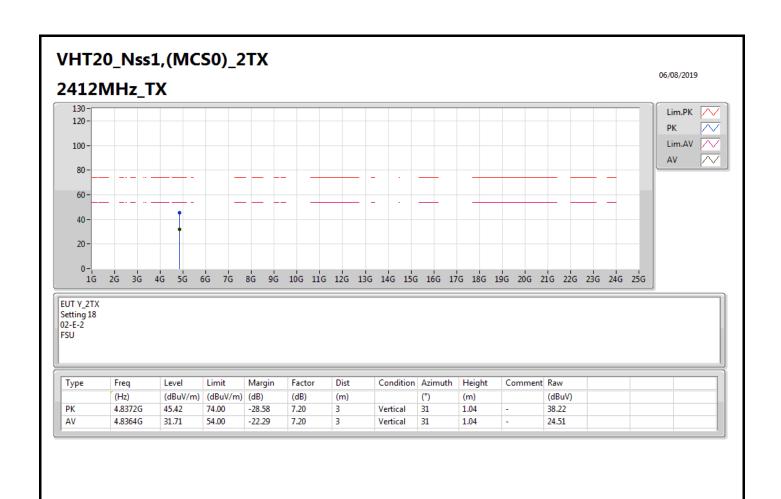




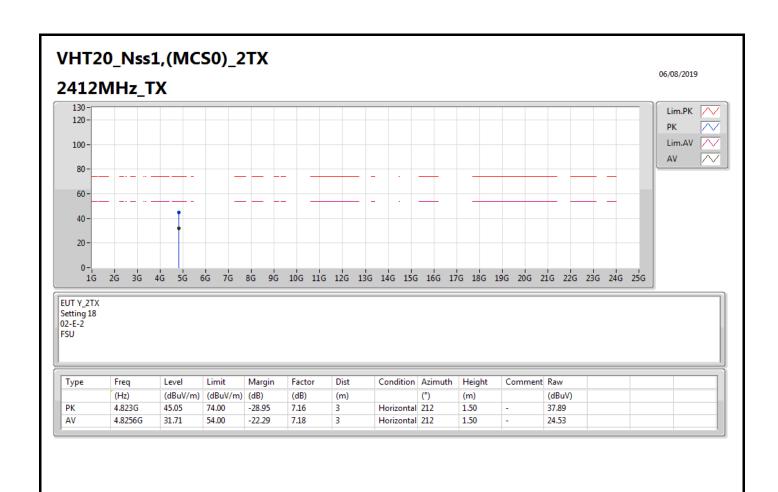




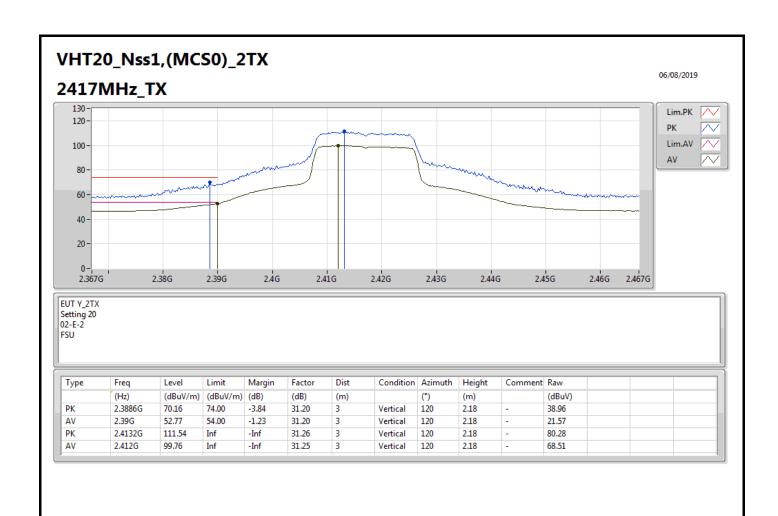






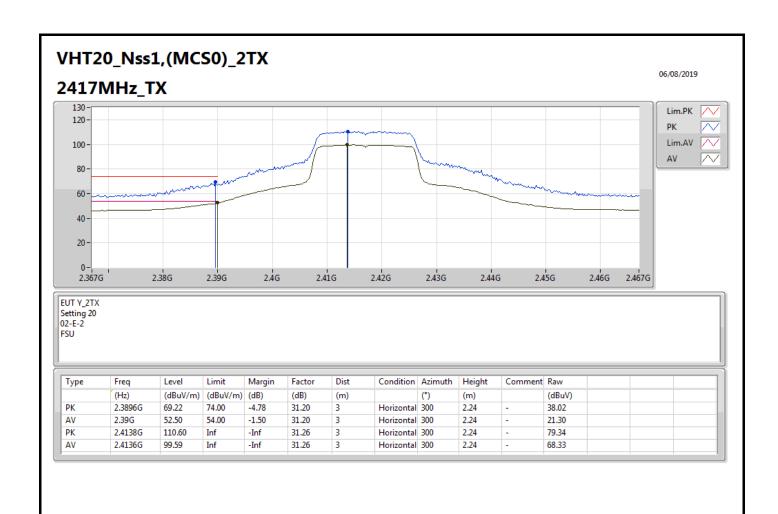




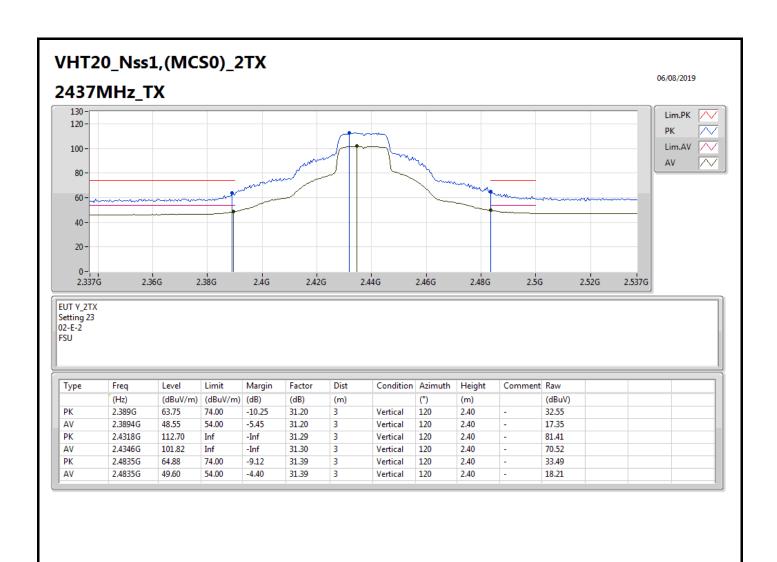


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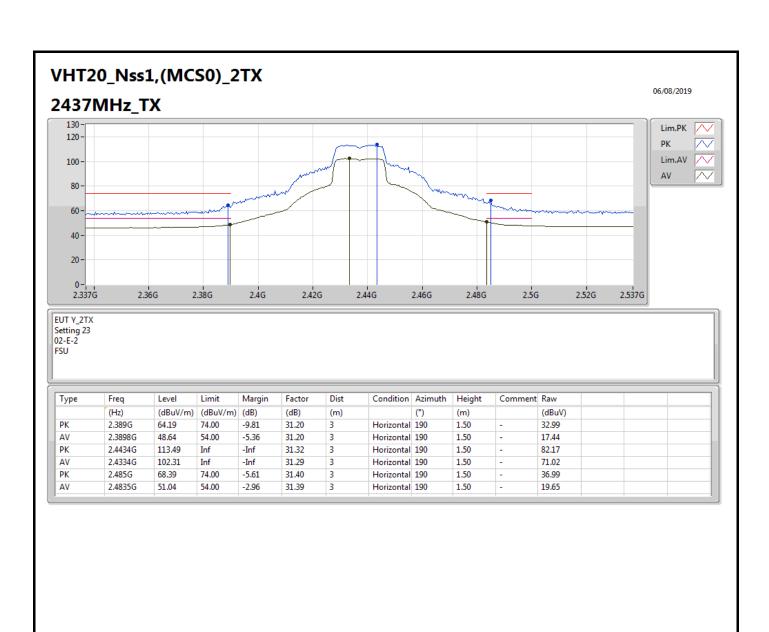




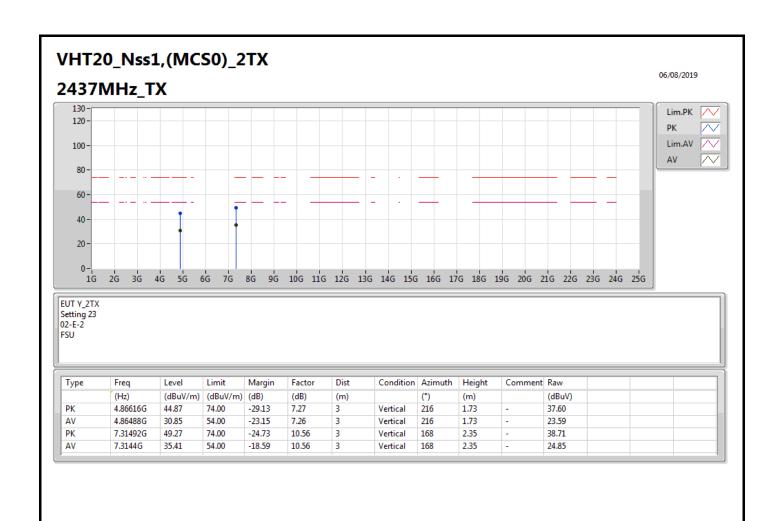




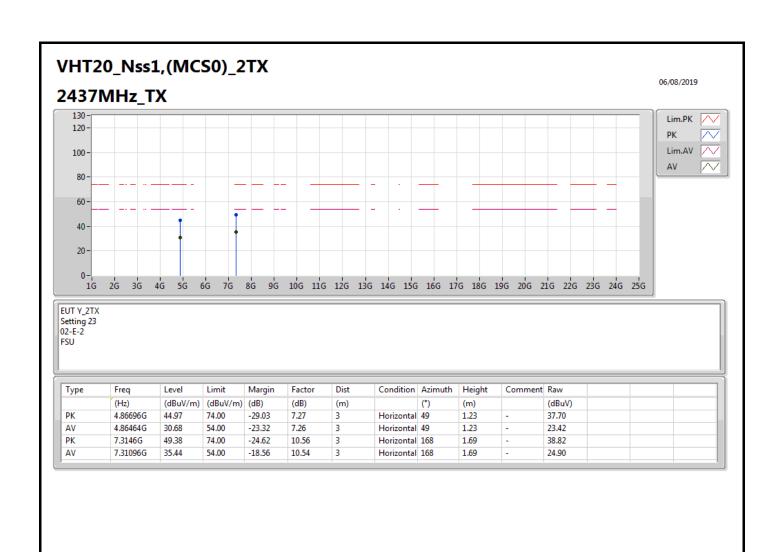




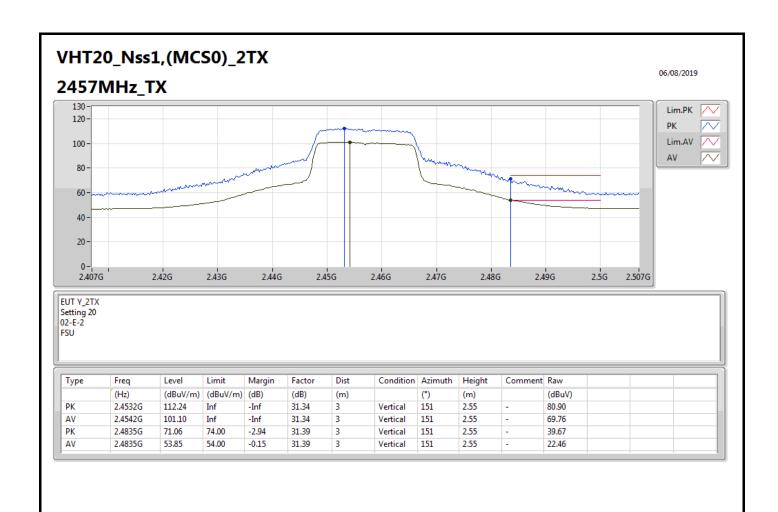




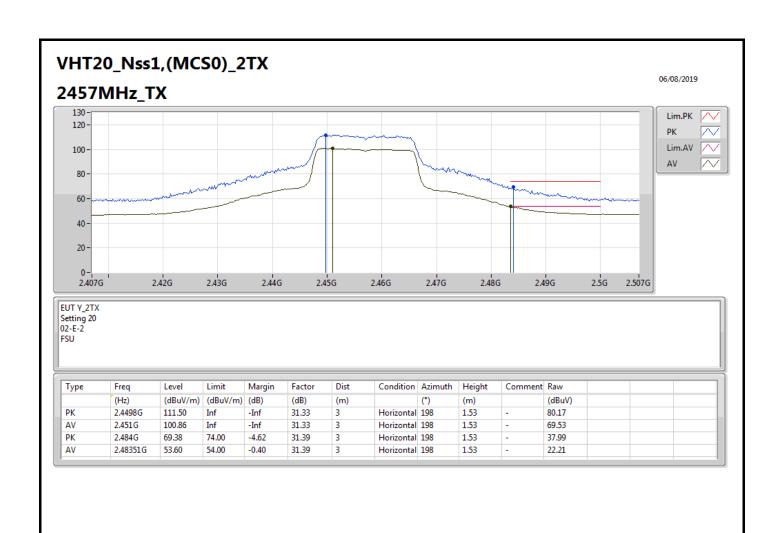






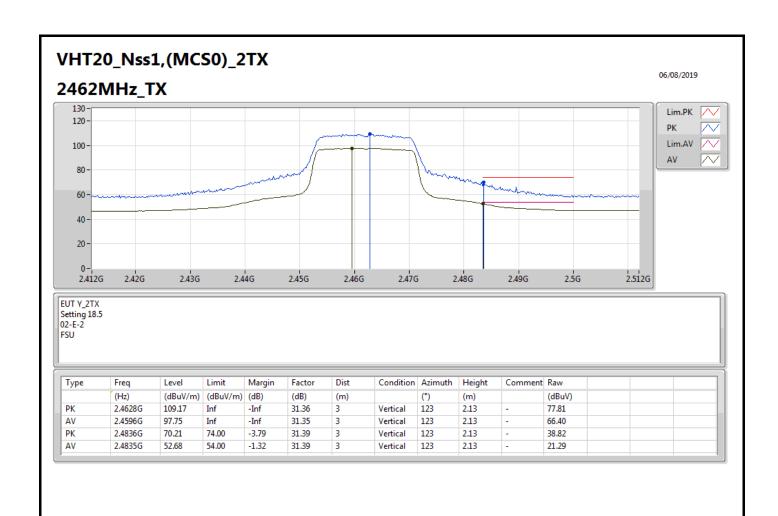




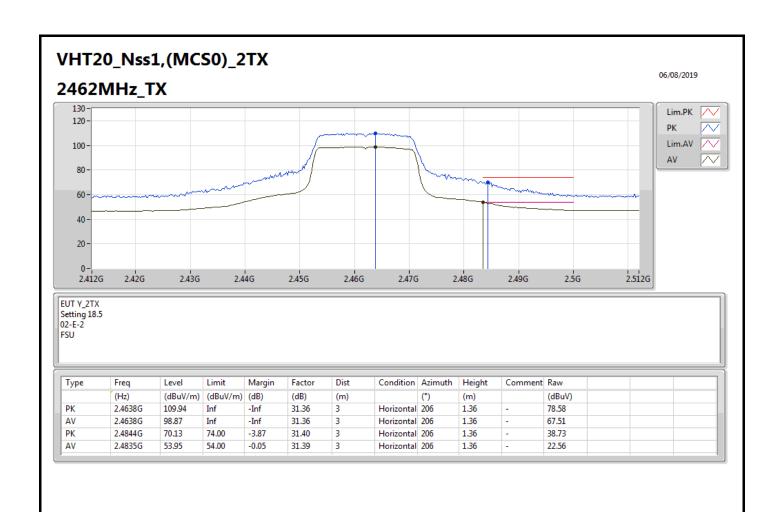


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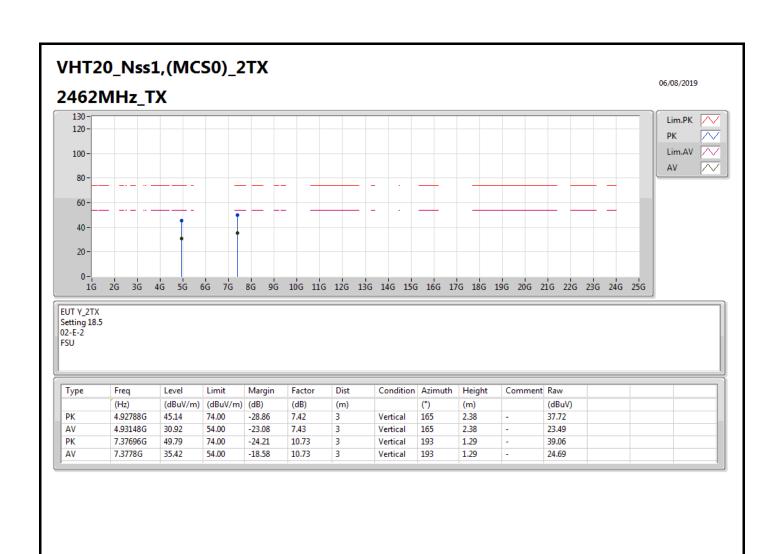




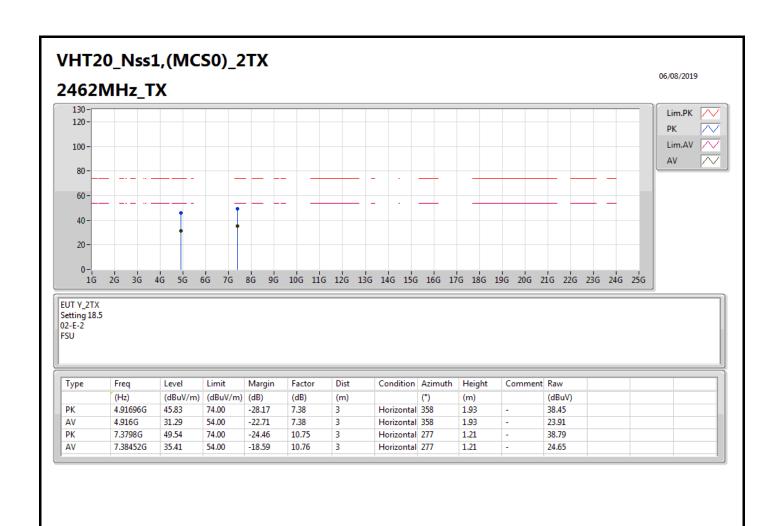




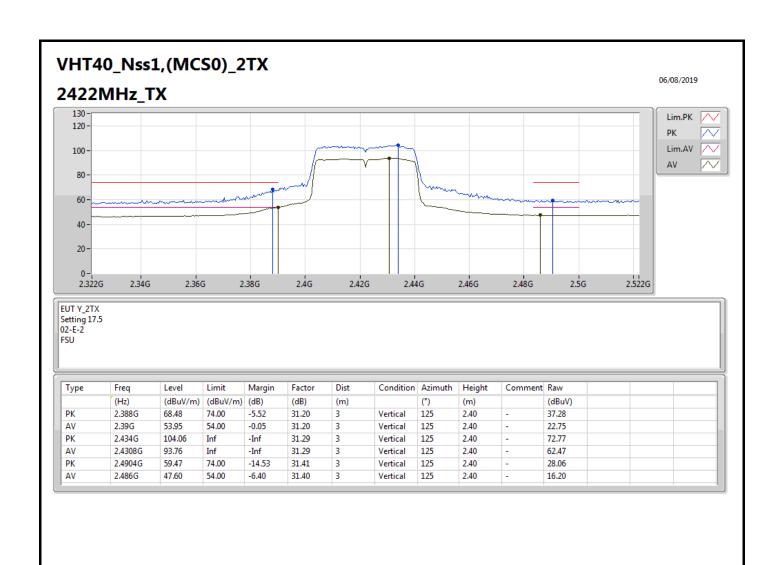




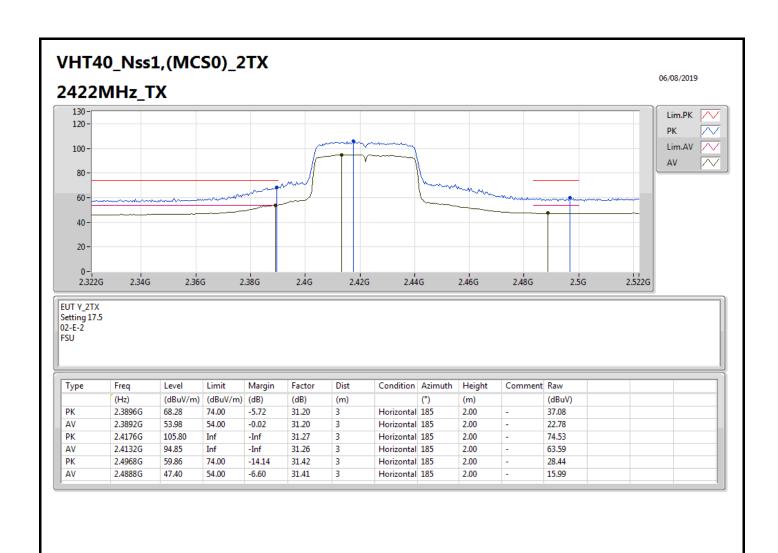




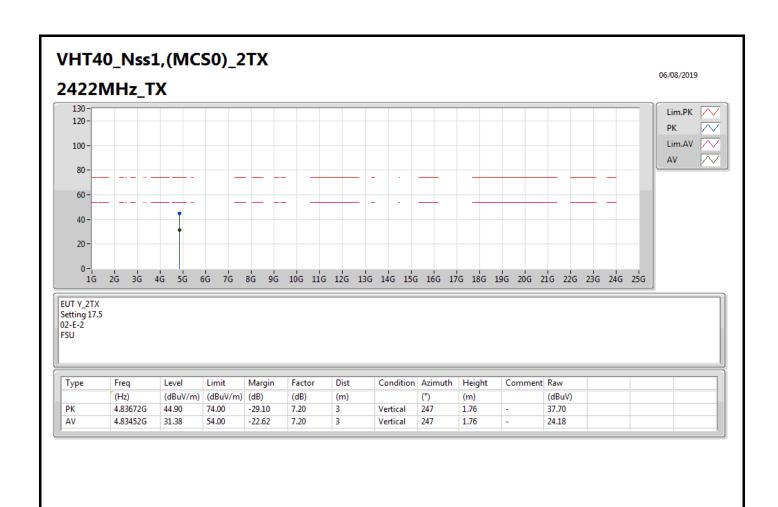




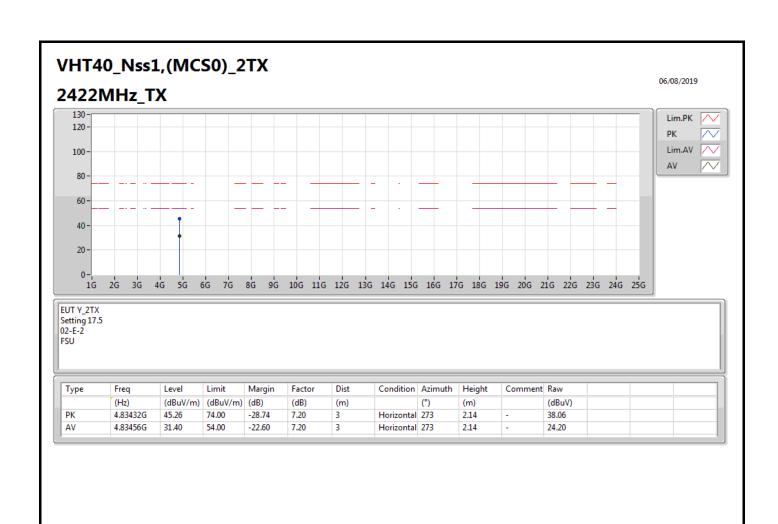




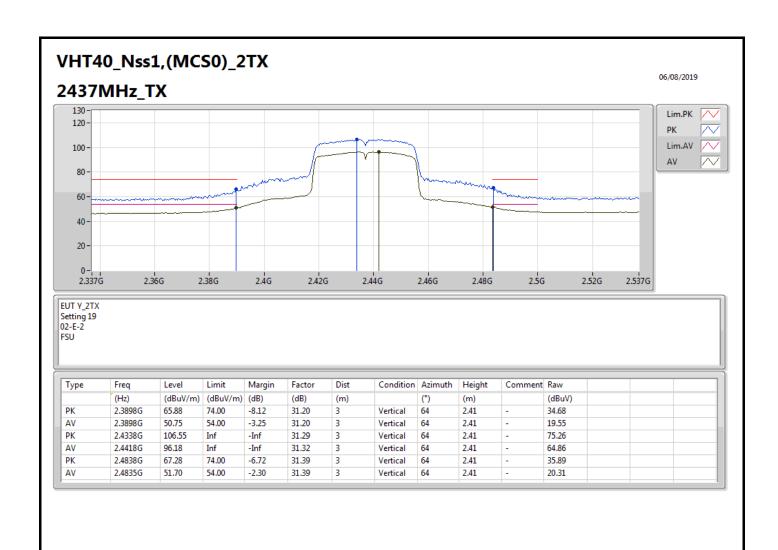




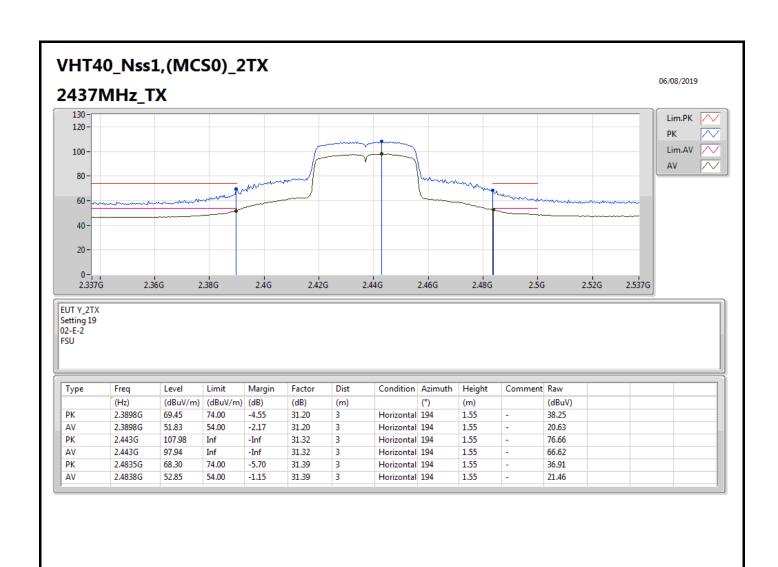




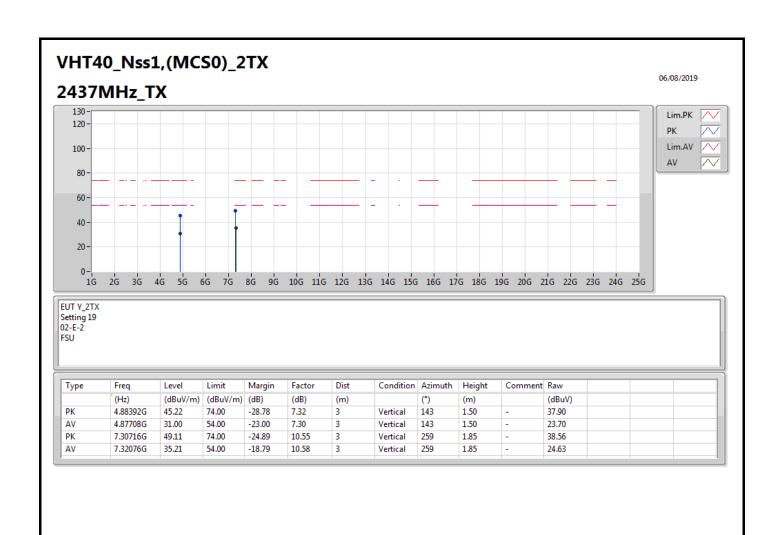




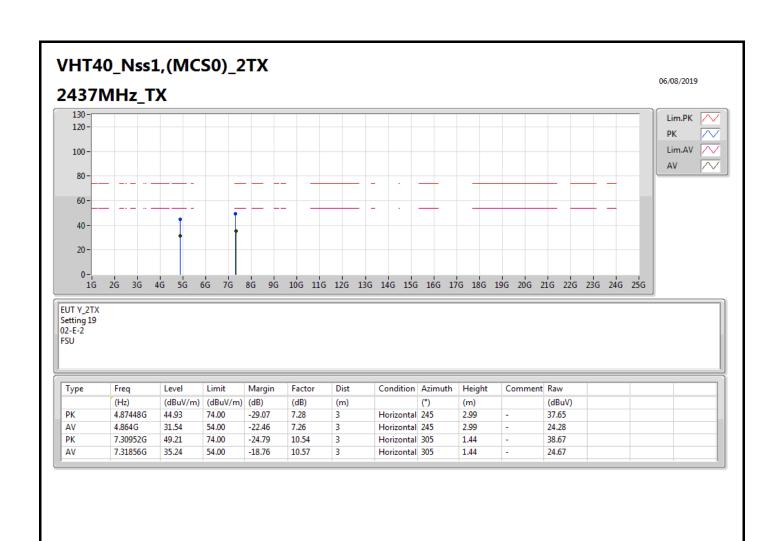




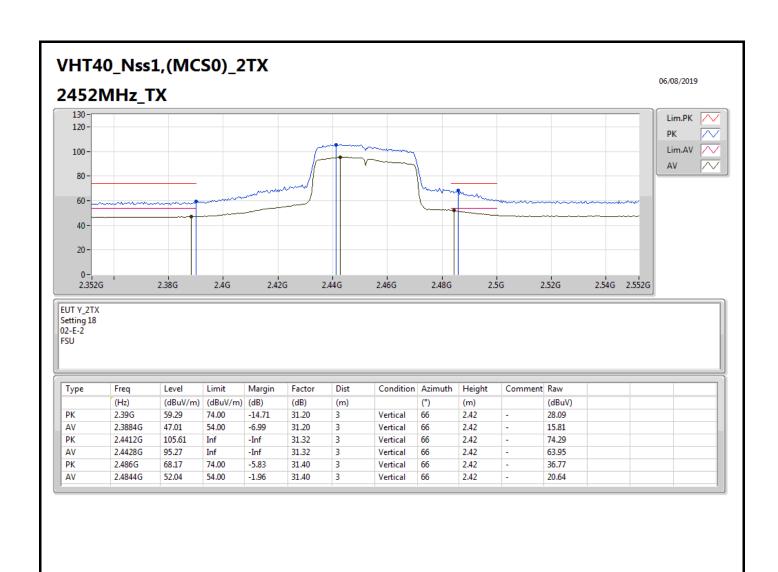




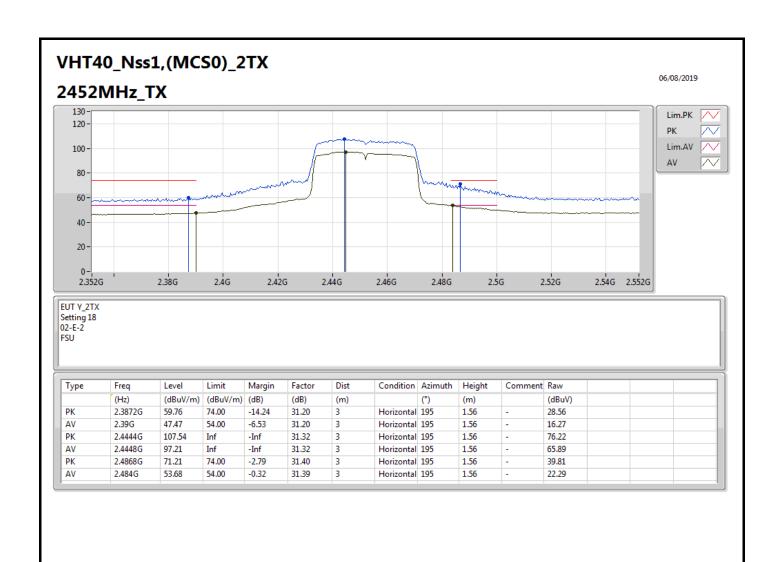




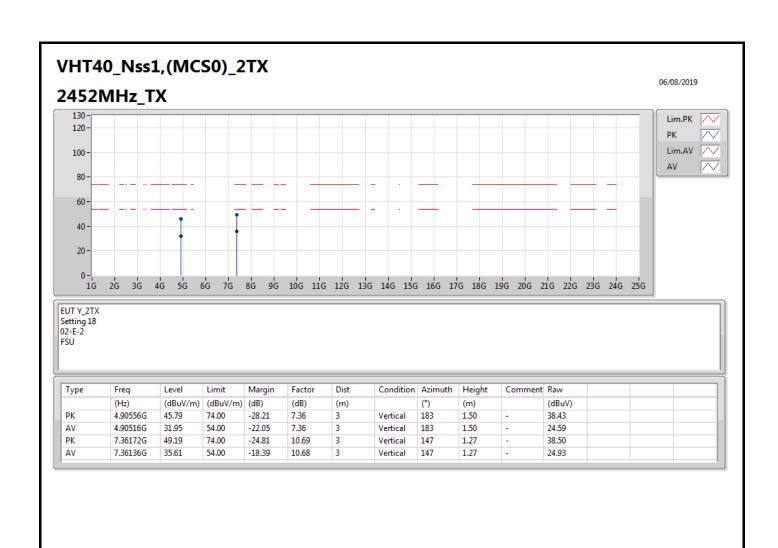




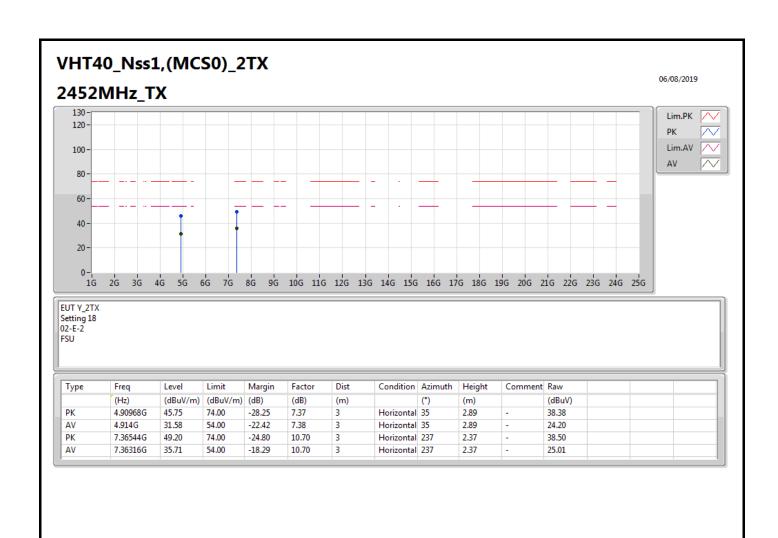




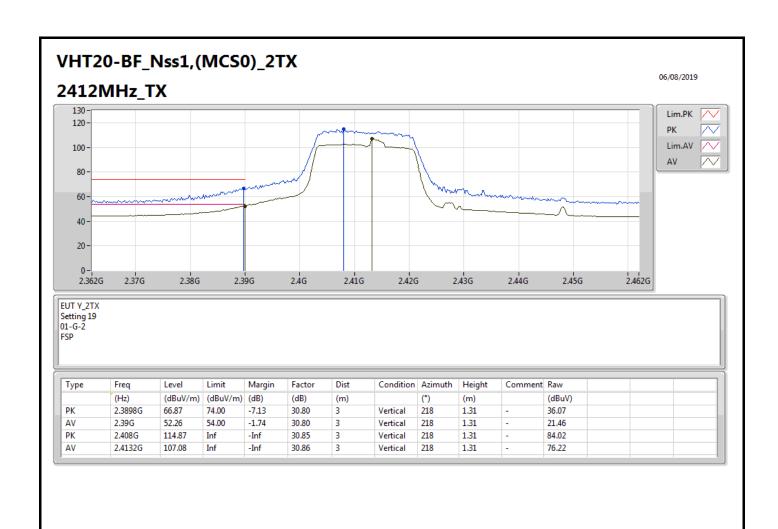




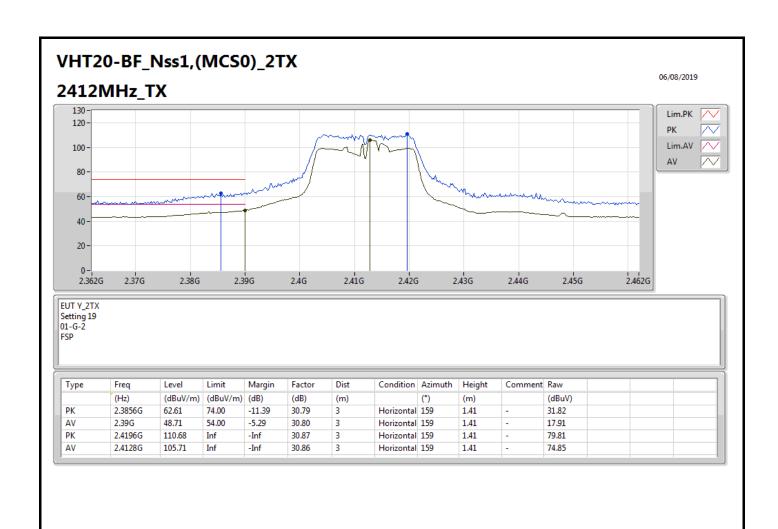




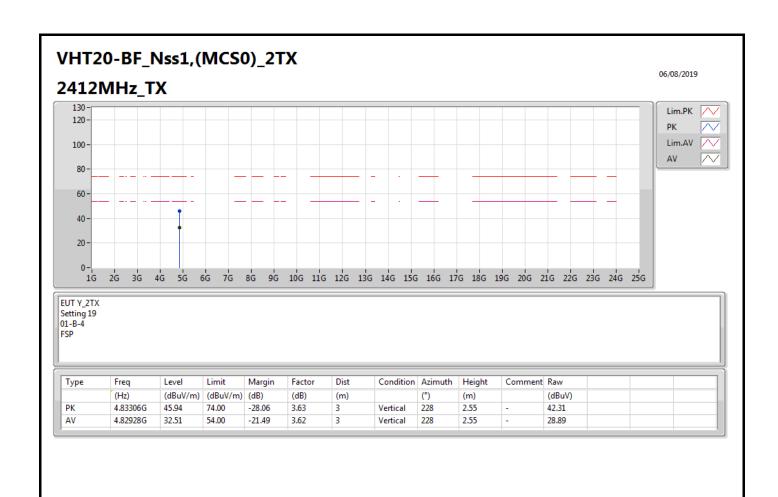




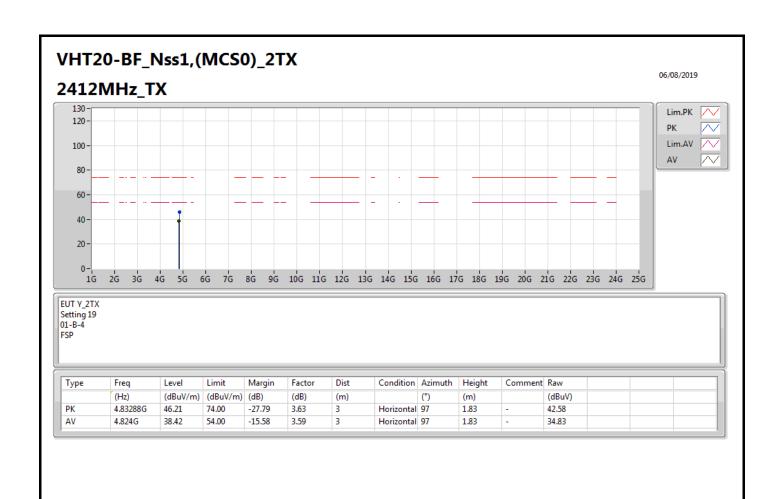




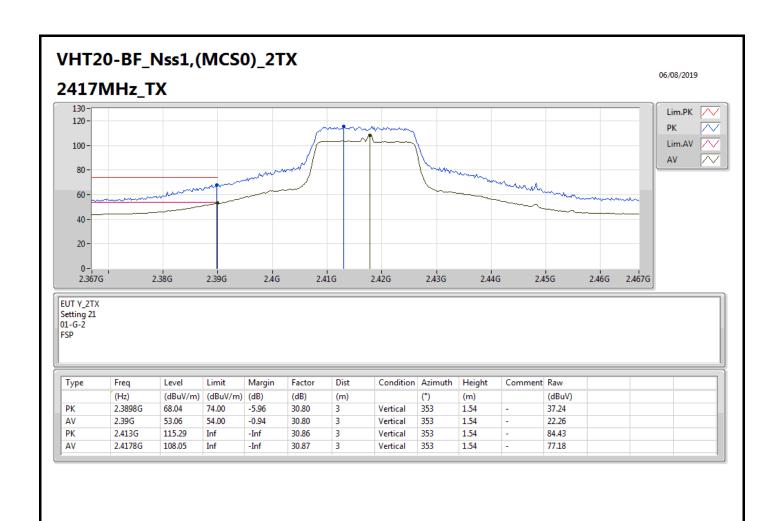




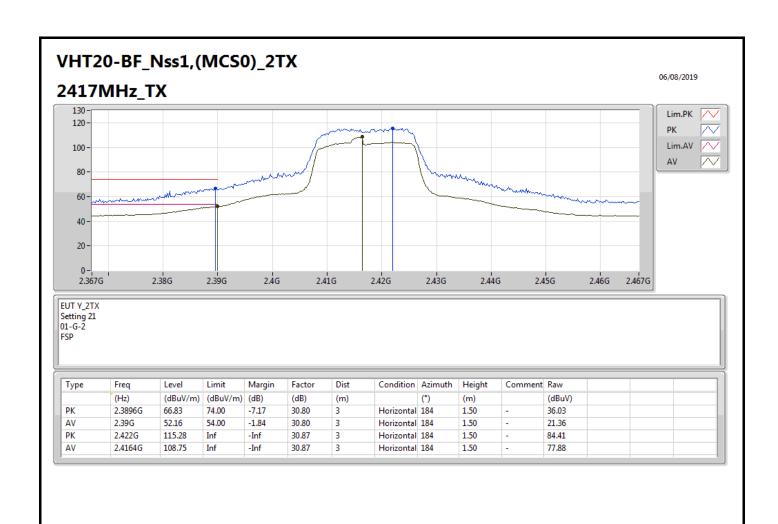




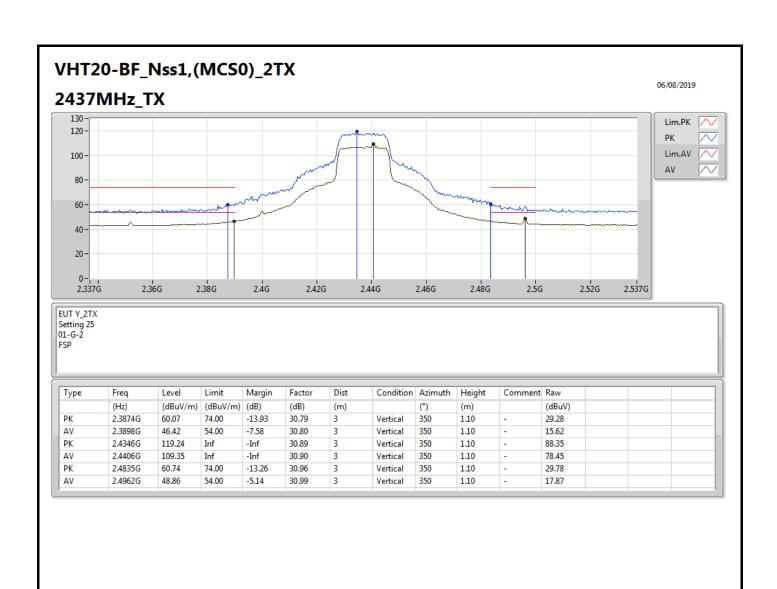




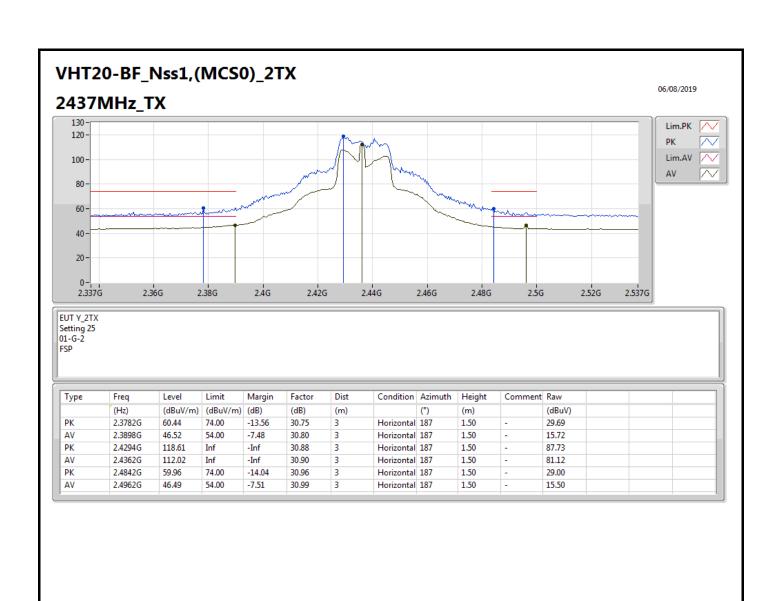




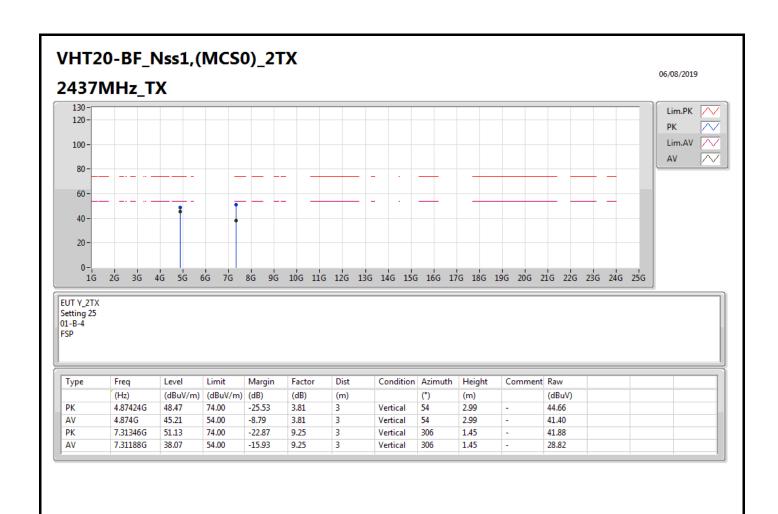




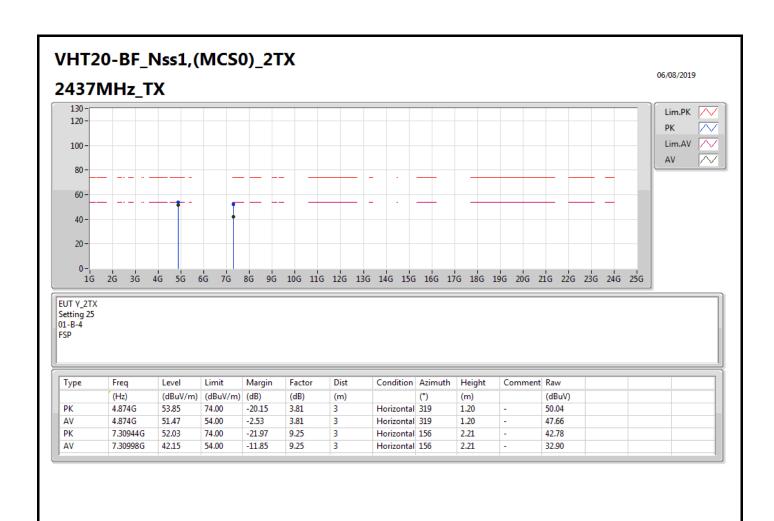




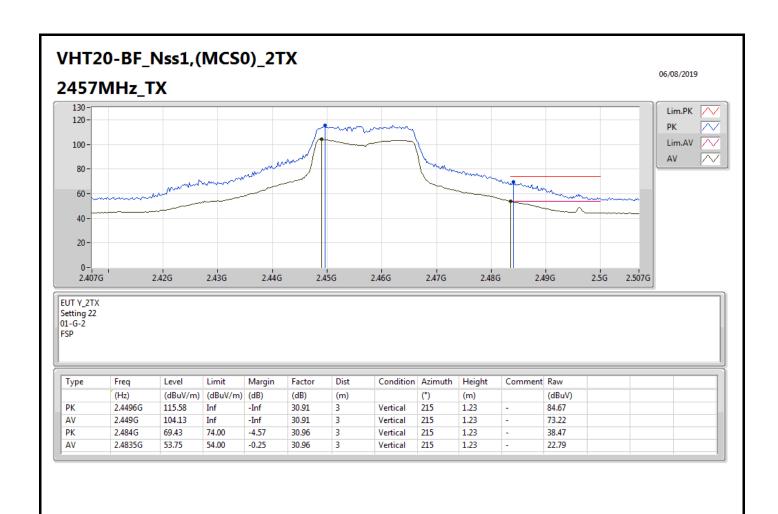




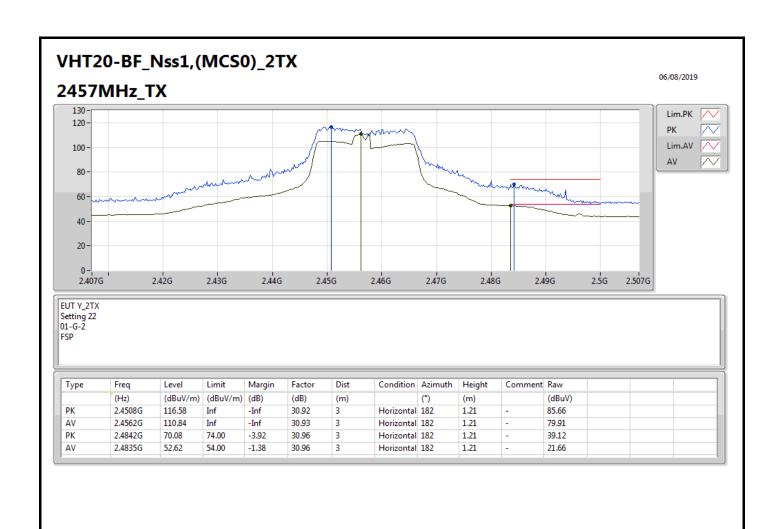




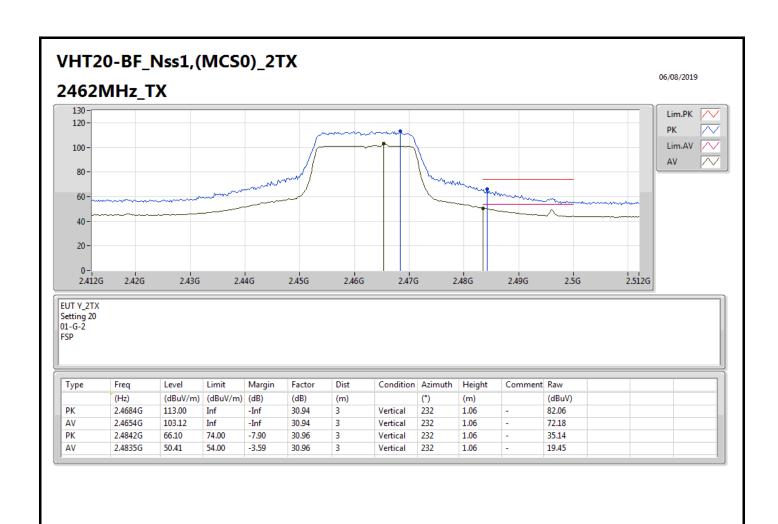




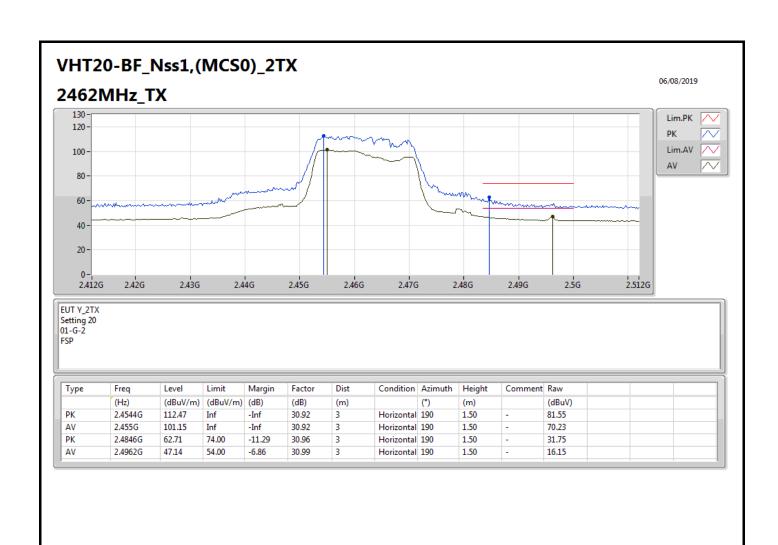




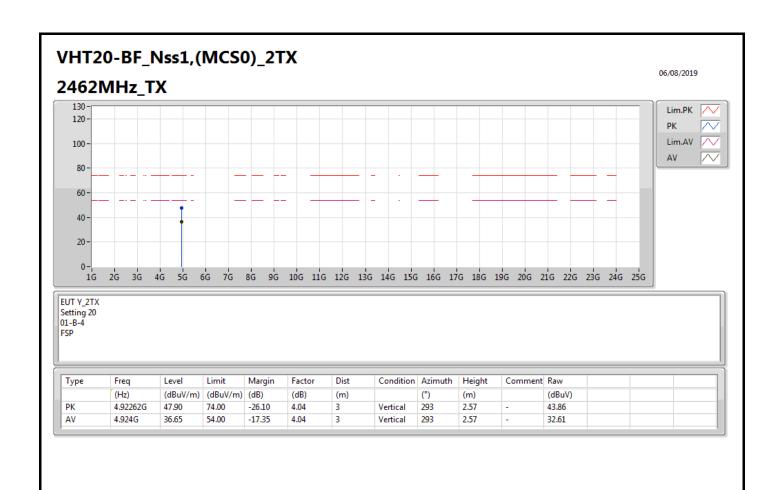




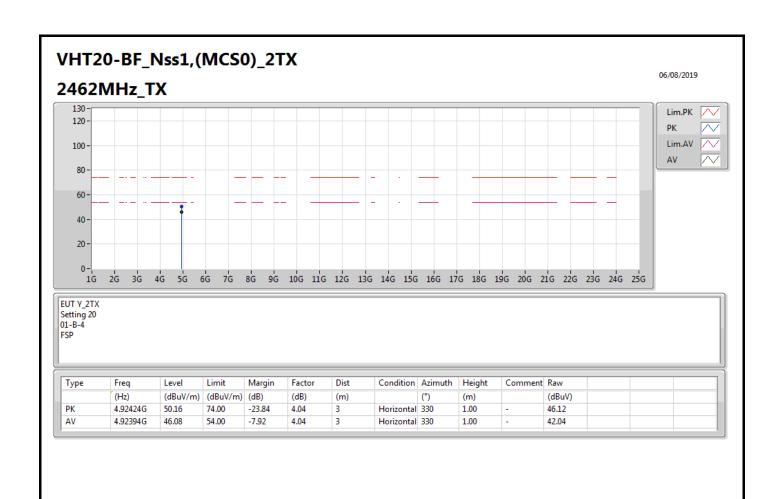




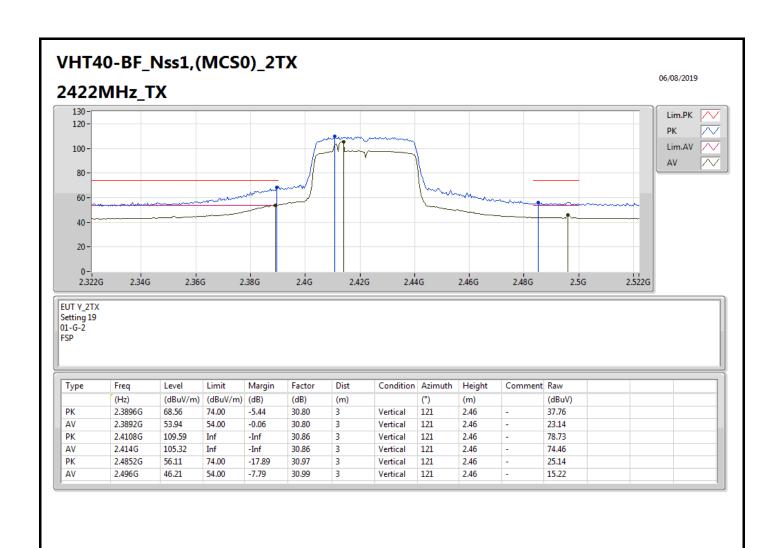




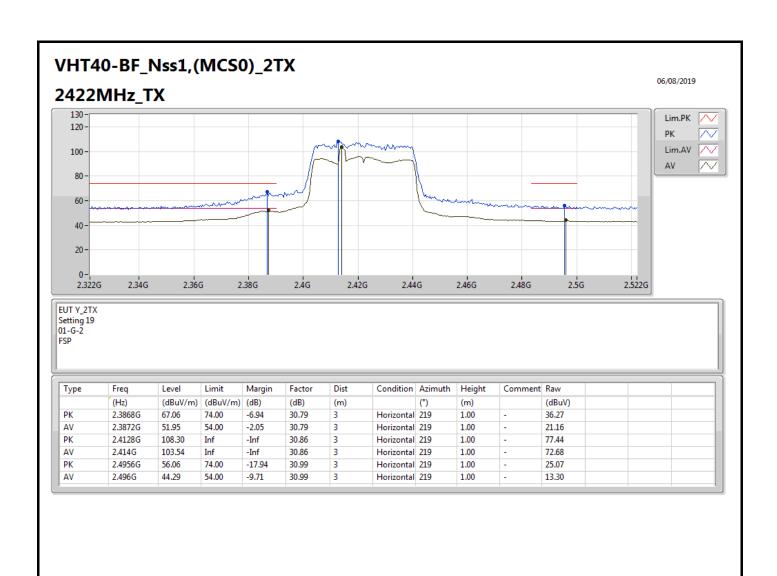




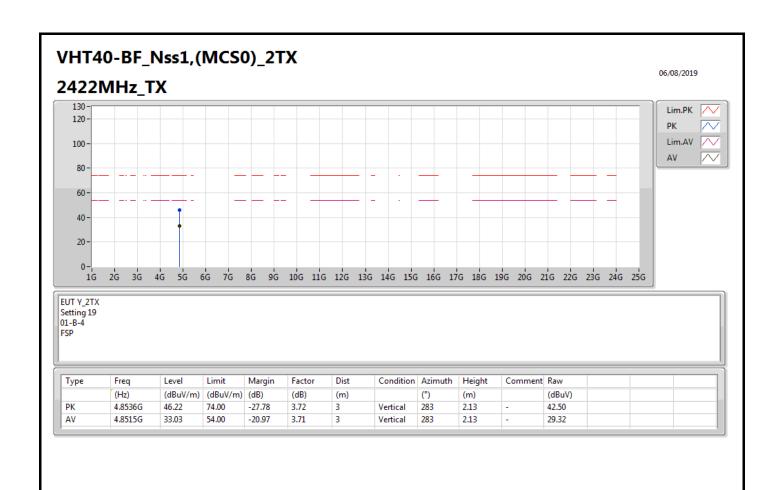




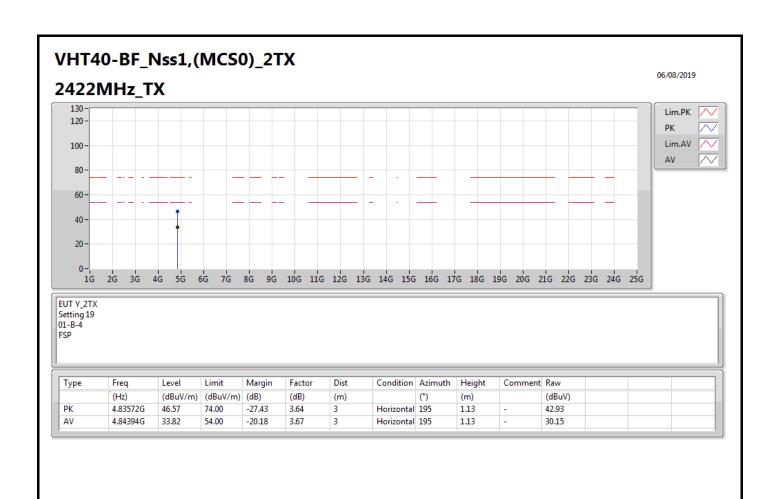




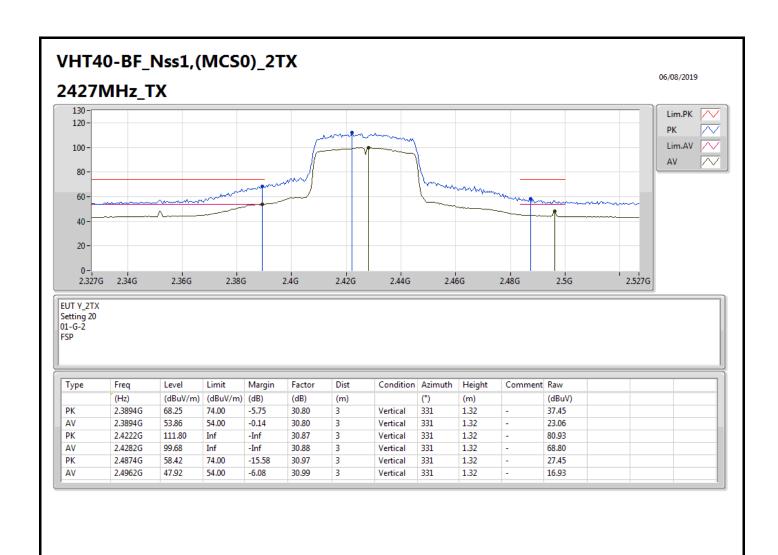




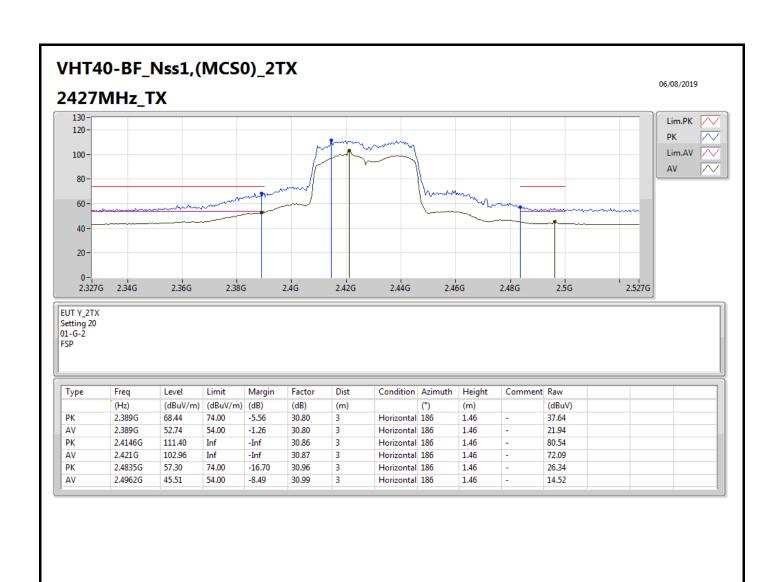




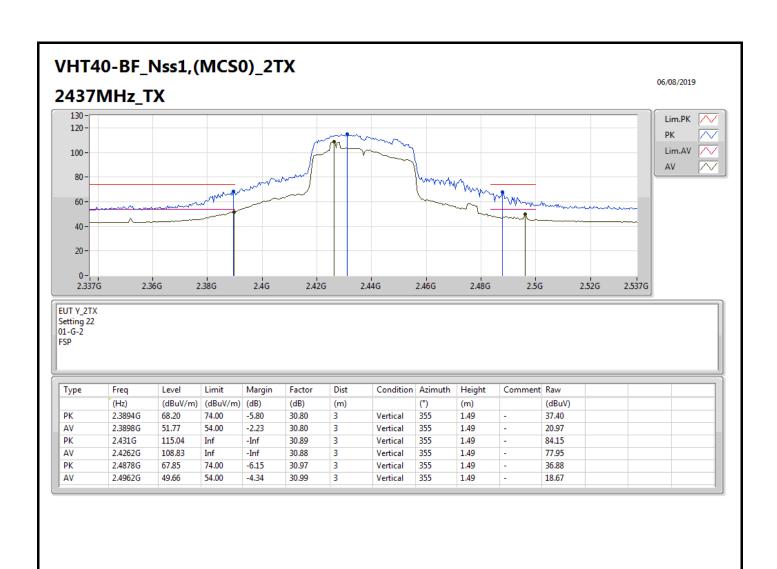




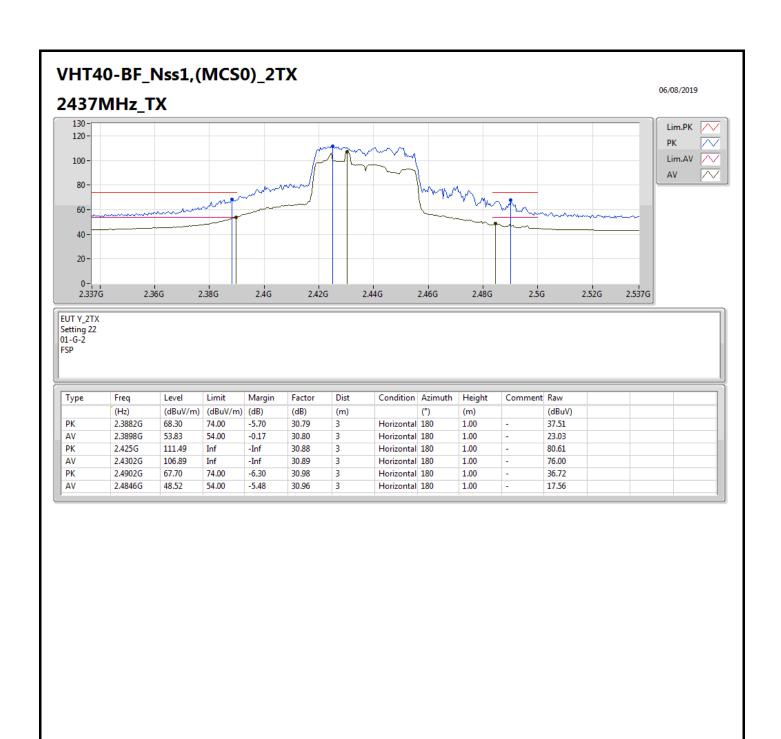




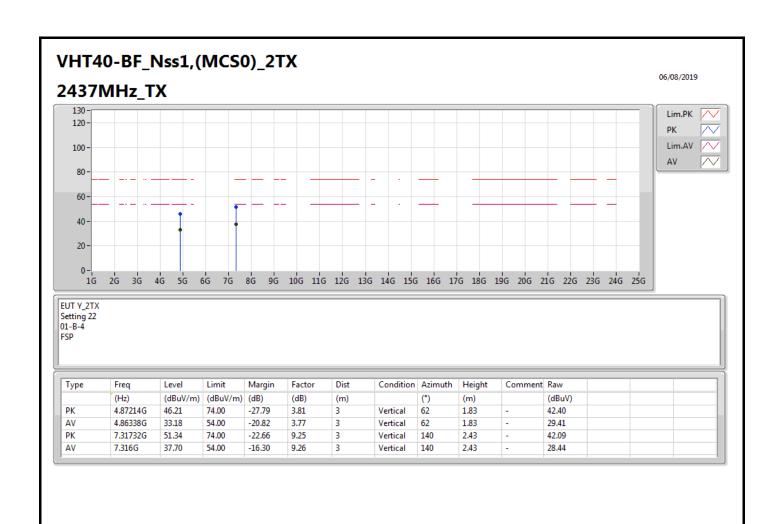




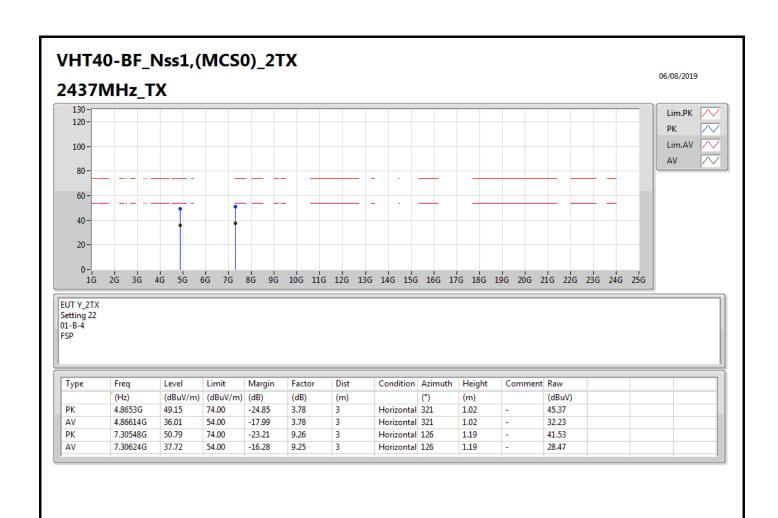




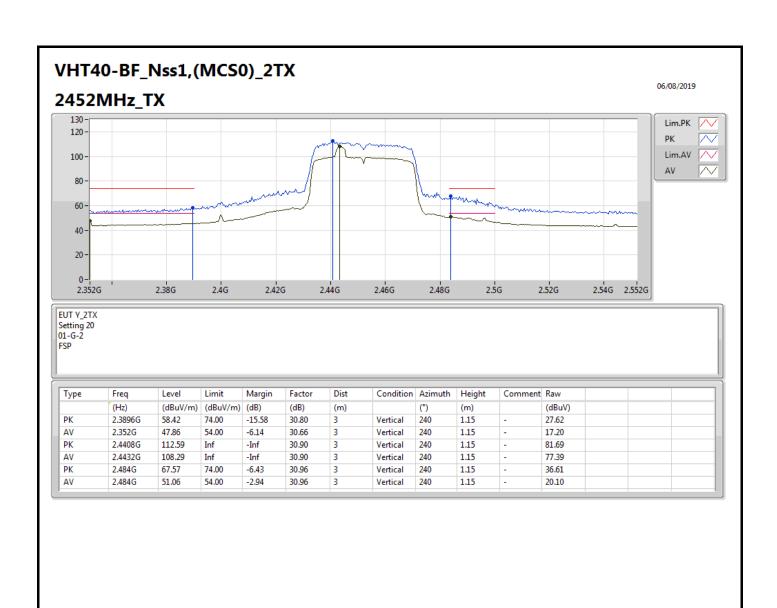




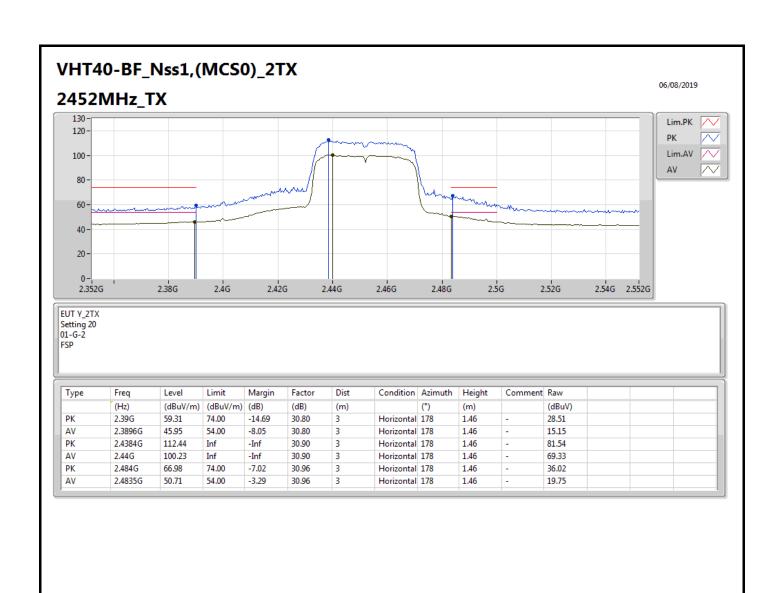




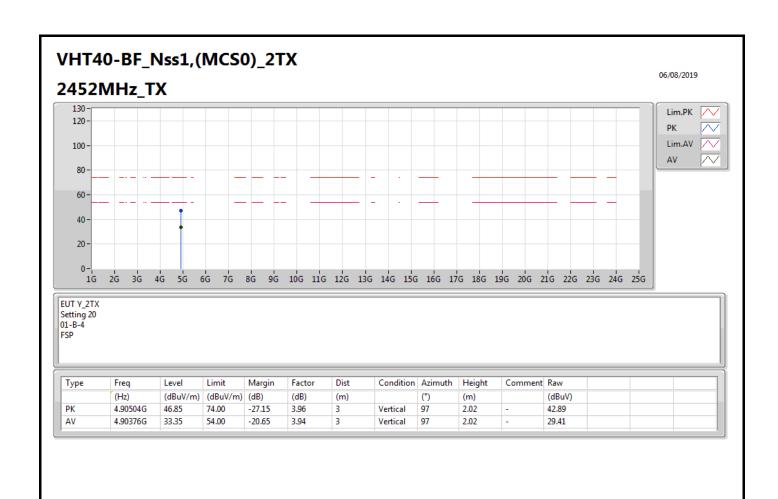




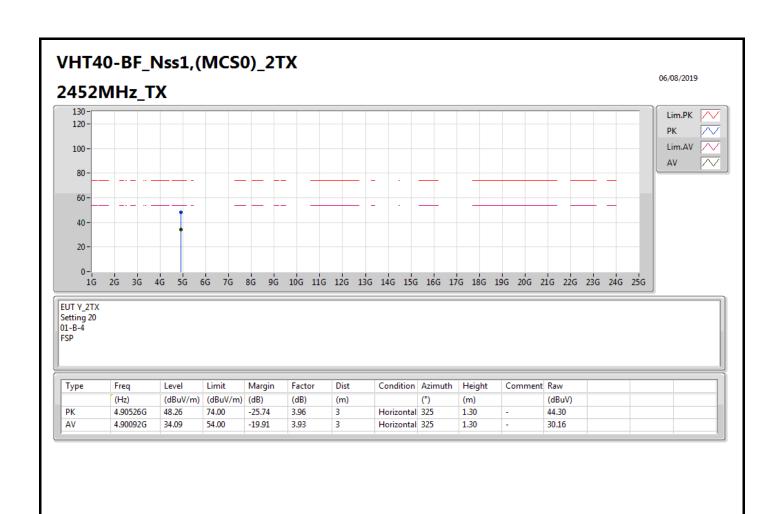




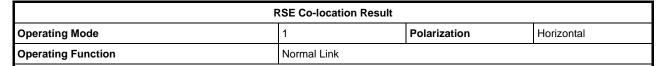


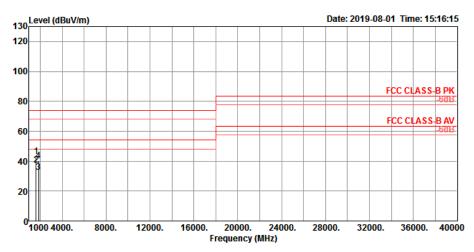






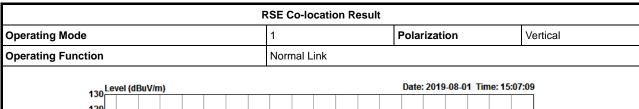


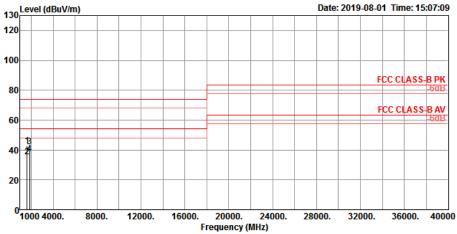




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-	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1624.78	43.23	74.00	-30.77	51.12	2.32	25.40	35.61	150	187	Peak	HORIZONTAL
2	1624.97	37.61	54.00	-16.39	45.50	2.32	25.40	35.61	150	187	Average	HORIZONTAL
3	1874.99	32.48	54.00	-21.52	39.05	2.51	26.22	35.30	100	201	Average	HORIZONTAL
4	1875 05	40 07	74 00	-33 03	46 64	2 51	26 22	35 30	100	201	Dook	HODITONITAL







	Freq	Level		Over Limit						1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1624.92	42.68	74.00	-31.32	50.57	2.32	25.40	35.61	200	177	Peak	VERTICAL
2	1625.04	35.41	54.00	-18.59	43.30	2.32	25.40	35.61	200	177	Average	VERTICAL
3	1874.84	42.30	74.00	-31.70	48.87	2.51	26.22	35.30	166	158	Peak	VERTICAL
4	1874.99	37.46	54.00	-16.54	44.03	2.51	26.22	35.30	166	158	Average	VERTICAL