



FCC RADIO TEST REPORT

FCC ID

: 2AOIDGRYPHON02

Equipment

: Gryphon Guardian

Brand Name

: Gryphon

Model Name

: Guardian

Applicant

: Gryphon Online Safety, Inc.

10265 Prairie Springs Road, San Diego CA 92127 USA

Manufacturer

: Gryphon Online Safety, Inc.

10265 Prairie Springs Road, San Diego CA 92127 USA

Standard

: 47 CFR FCC Part 15.247

The product was received on Oct. 31, 2019, and testing was started from Nov. 01, 2019 and completed on Jan. 17, 2020. 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

Report Template No.: CB-A10_10 Ver1.0

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Issued Date

: Jan. 23, 2020

Report Version : 01

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History of this test report

Report No.: FR990901AA

Report No.	Version	Description	Issued Date
FR990901AA	01	Initial issue of report	Jan. 23, 2020

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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 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	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	2
2.4-2.4835GHz	802.11g	20	2
2.4-2.4835GHz	802.11n HT20	20	2
2.4-2.4835GHz	VHT20	20	2
2.4-2.4835GHz	VHT20-BF	20	2
2.4-2.4835GHz	802.11n HT40	40	2
2.4-2.4835GHz	VHT40	40	2
2.4-2.4835GHz	VHT40-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 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.

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1.1.2 Antenna Information

Ant.	Port	rt Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
Ant.	Fort	Dialiu	Woder Name	Antenna Type	Connector	2.4GHz	5GHz
1	1	Gemtek	WRTQ-348ACN	PIFA Antenna	I-PEX	2.58	5.94
2	2	Gemtek	WRTQ-348ACN	PIFA Antenna	I-PEX	4.15	5.34

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Note1: The EUT has two antennas.

Note2: The above information was declared by manufacturer.

<For 2.4GHz Band>

For IEEE 802.11b/g/n/VHT mode (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 Band>

For IEEE 802.11a/n/ac mode (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	0.994	0.03	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.963	0.16	2.075m	1k
VHT20	0.984	0.07	n/a (DC>=0.98)	n/a (DC>=0.98)
VHT20-BF	0.95	0.22	1.759m	1k
VHT40	0.968	0.14	2.445m	1k
VHT40-BF	0.921	0.36	1.694m	1k

Note:

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

1.1.4 EUT Operational Condition

EUT Power Type From Power Adapter					
Beamforming Function					
Beamerming randion	For VHT in 2.4GHz and 11n/ac in 5GHz				
Function	⊠ Point-to-multipoint □ Point-to-point				
Test Software Version	QRCT: v3.0.298.0				

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

1.3 Testing Location Information

	Testing Location					
	HWA YA	ADD	:	lo. 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	TH01-CB	Eddie Weng	23.4~24.9°C / 54~59%	Nov. 05, 2019~Nov. 06, 2019
Radiated below 1GHz	03CH03-CB	KJ Chang	22.4~23.4°C / 57~61%	Jan. 17, 2020
Radiated above 1GHz	03CH05-CB	Justin Lin	22.8~24.1°C / 54~58%	Nov. 01, 2019~Nov. 06, 2019
AC Conduction	CO02-CB	Rick Yeh	20~21°C / 50~51%	Dec. 09, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D 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	22
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	17.5
2417MHz	20(
2437MHz	26
2457MHz	20
2462MHz	17
VHT20_Nss1,(MCS0)_2TX	-
2412MHz	17
2417MHz	19.5
2437MHz	26
2457MHz	19.5
2462MHz	17
VHT40_Nss1,(MCS0)_2TX	-
2422MHz	17
2437MHz	18
2452MHz	17
VHT20-BF_Nss1,(MCS0)_2TX	-
2412MHz	20
2417MHz	21.5
2437MHz	26
2457MHz	21.5
2462MHz	20.5
VHT40-BF_Nss1,(MCS0)_2TX	-
2422MHz	19.5
2437MHz	21.5
2452MHz	20

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Note:

- VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.
- There are two modes of EUT for VHT in 2.4GHz and 11n/ac in 5GHz. One is beamforming mode, and the other is non-beamforming mode. Both modes have been tested and recorded 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	Tests Item AC power-line conducted emissions		
Condition AC power-line conducted measurement for line and neutral			
Operating Mode	Operating Mode Normal Link		
1	EUT + Adapter (Mesh Mode)		

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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.

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 EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Normal Link
1	EUT + Adapter (Mesh Mode)
Operating Mode > 1GHz	CTX

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		
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	1 WLAN 2.4GHz + WLAN 5GHz		
Refer to Sporton Test Report No.: FA990901 for Co-location RF Exposure Evaluation.			

Note: The EUT supports AP Router and Mesh mode, after evaluating, only Mesh mode was tested and recorded in this test report.

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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			
Equipment Name Brand Holder Model Name Rating			
AC Adapter	CHENZHOU FRECOM ELECTRONICS CO.,LTD.	F12L33-120100SPAU	INPUT: 100-240V, 50/60Hz, 0.3A OUTPUT: 12V, 1A
Other			
RJ-45 cable*1: Non-Shielded, 1m			

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Support Equipment 2.5

For AC Conduction:

	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
Α	LAN NB	DELL	E6430	N/A
В	2.4G NB	DELL	E6430	N/A
С	5G NB	DELL	E6430	N/A
D	AP Router	ASUS	RP-N53	N/A
Е	AP Router NB	DELL	E6430	N/A

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For Radiated (below 1GHz):

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	NB	DELL	E4300	N/A	
В	NB	DELL	E4300	N/A	
С	Phone	HTC	One X9	N/A	
D	NB	Apple	Mac Book	N/A	
Е	WLAN AP	D-LINK	DIR860L	N/A	

For Radiated (above 1GHz) and RF Conducted: For non-beamforming mode

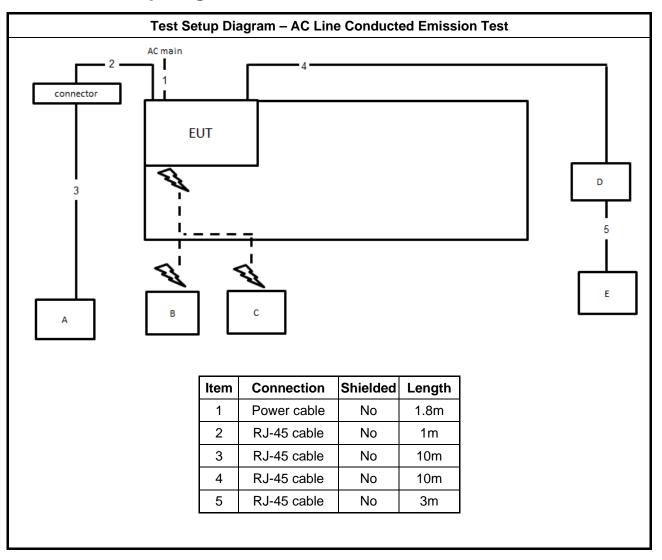
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
Α	NB	DELL	E4300	N/A

For beamforming mode

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
Α	NB	DELL	E4300	N/A
В	RX Device	Gryphon	Guardian	2AOIDGRYPHON02
С	NB	DELL	E4300	N/A

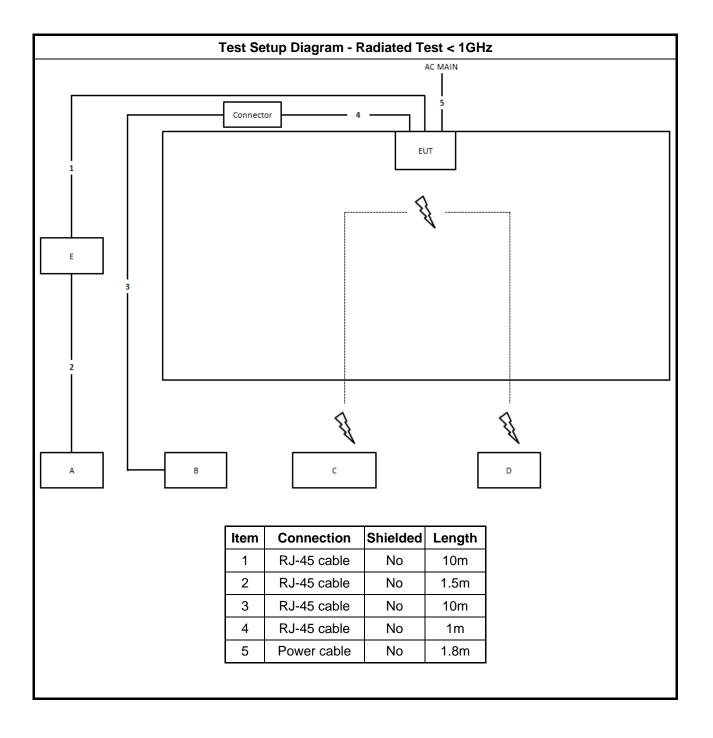
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2.6 Test Setup Diagram

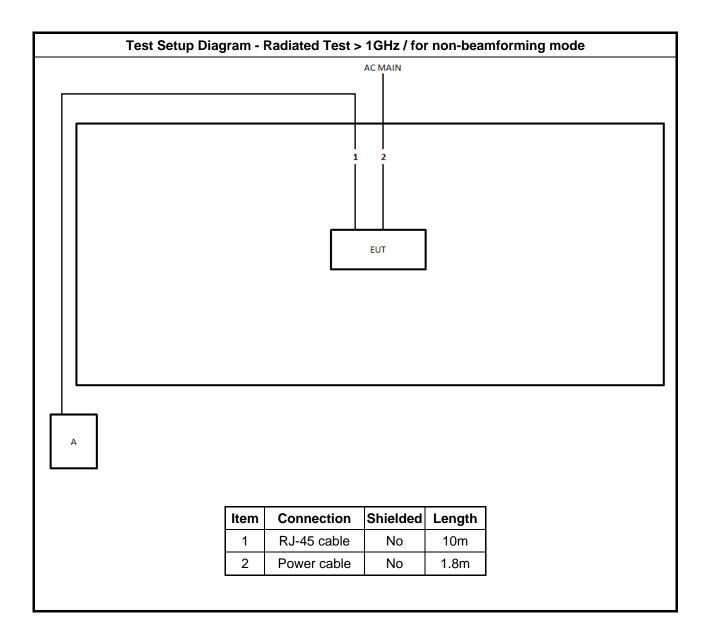


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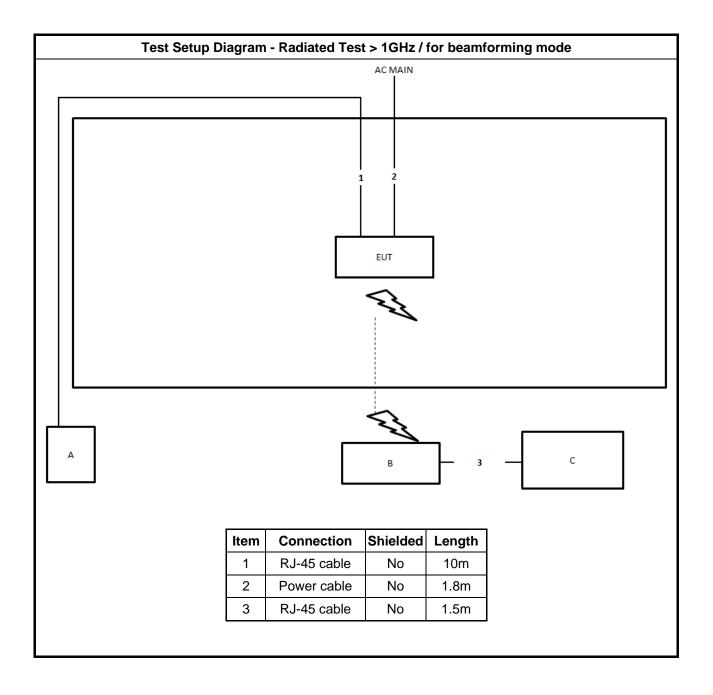
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3 Transmitter Test Result

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

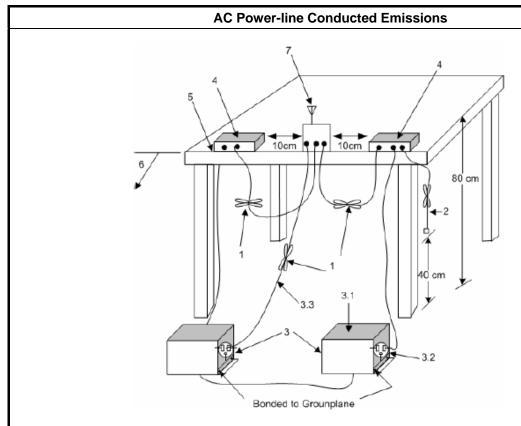
Refer a test equipment and calibration data table in this test report.

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 Ω 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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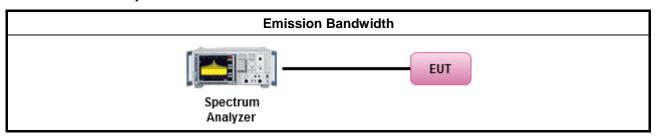
3.2.2 Measuring Instruments

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 $G_{TX} \le 6$ dBi, then $P_{Out} \le 30$ 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}_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, \mathbf{G}_{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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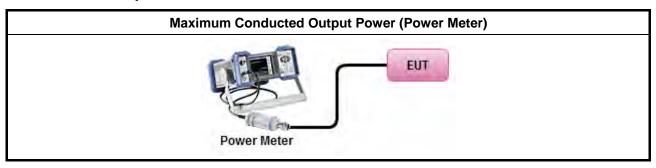
3.3.3 Test Procedures

		Test Method				
•	Мах	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)				
	Mea	surement 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: $P_{total} = P_1 + P_2 + \ldots + P_n \\ \text{(calculated in linear unit [mW] and transfer to log unit [dBm])} \\ \text{EIRP}_{total} = P_{total} + DG$				

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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

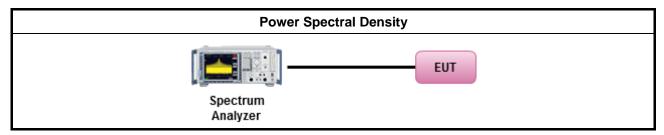
	Test Method
•	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum 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).
	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.

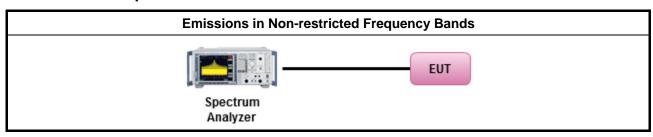
3.5.2 Measuring Instruments

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 (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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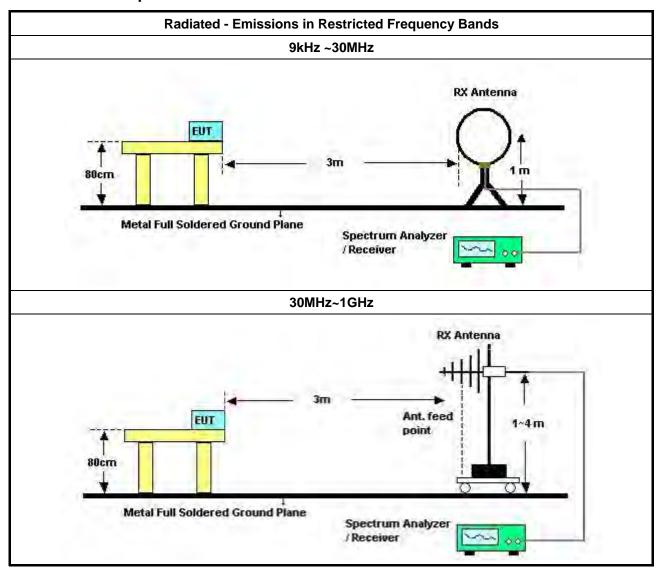
3.6.3 Test Procedures

		Test Method						
•	The	average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].						
•		er as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency nnel 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.						

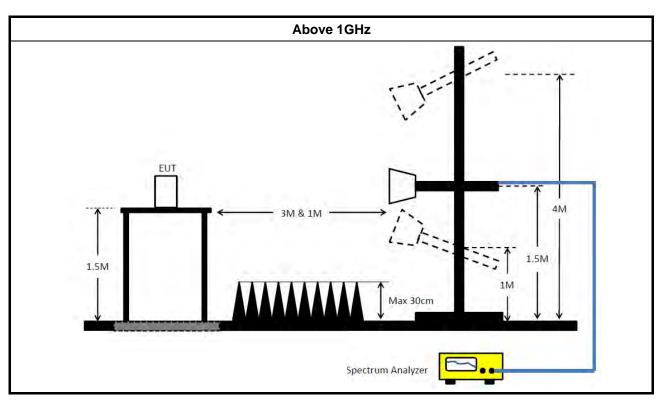
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3.6.4 Test Setup



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3.6.5 Measurement Results Calculation

The measured Level is calculated using:

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2019	Nov. 20, 2020	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Oct. 30, 2019	Oct. 29, 2020	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	Oct. 21, 2019	Oct. 20, 2020	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Bilog Antenna with 6dB Attenuator	Schaffner & EMCI	CBL6112 & N-6-06	2888 & AT-N0611	30MHz ~ 1GHz	Oct. 12, 2019	Oct. 11, 2020	Radiation (03CH03-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH03-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100019	9kHz ~ 40GHz	Jun. 19, 2019	Jun. 18, 2020	Radiation (03CH03-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH03-CB)
RF Cable-low	Woken	RG402	Low Cable-02+27	25MHz ~ 1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH03-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1291	1GHz~18GHz	Oct. 05, 2019	Oct. 04, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC12630SE	980287	1GHz – 26.5GHz	Apr. 16, 2019	Apr. 15, 2020	Radiation (03CH05-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-28	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04+28	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)

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Report Version : 01

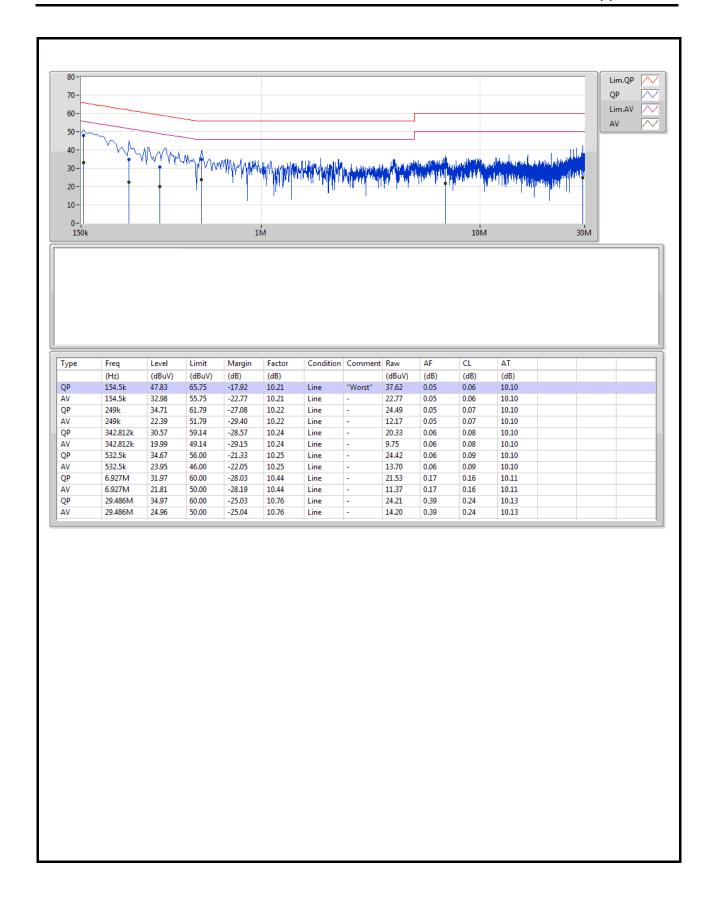
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 19, 2018	Nov. 18, 2019	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)

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

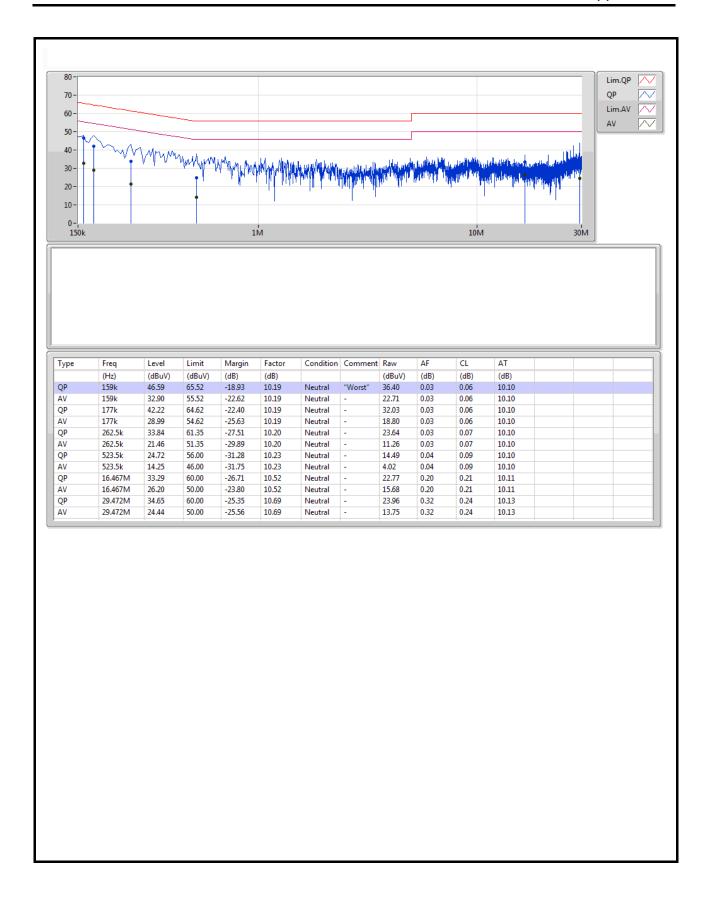
N.C.R. means Non-Calibration required.

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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	9.05M	13.643M	13M6G1D	7.075M	12.969M
802.11g_Nss1,(6Mbps)_2TX	16.325M	28.486M	28M5D1D	16.275M	16.392M
VHT20_Nss1,(MCS0)_2TX	17.575M	29.91M	29M9D1D	17.55M	17.616M
VHT40_Nss1,(MCS0)_2TX	35.25M	35.932M	35M9D1D	33.8M	35.832M

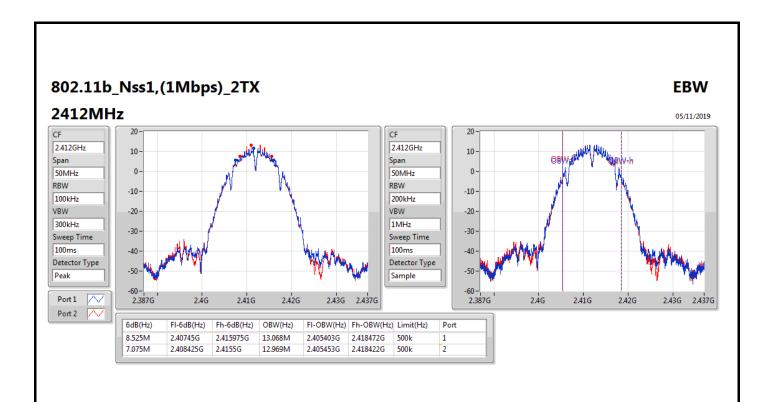
Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth; Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth;

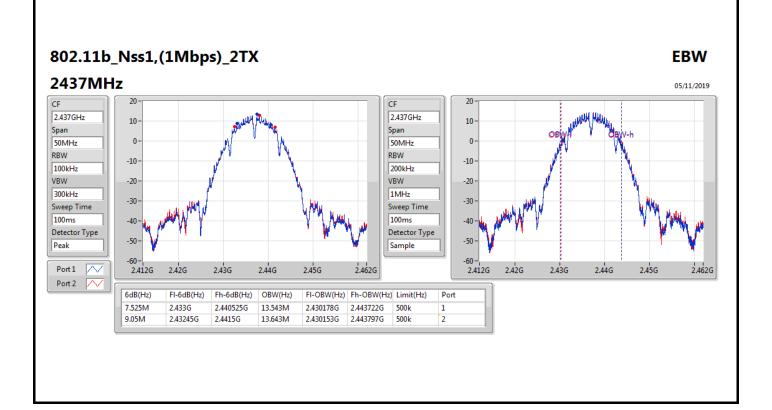


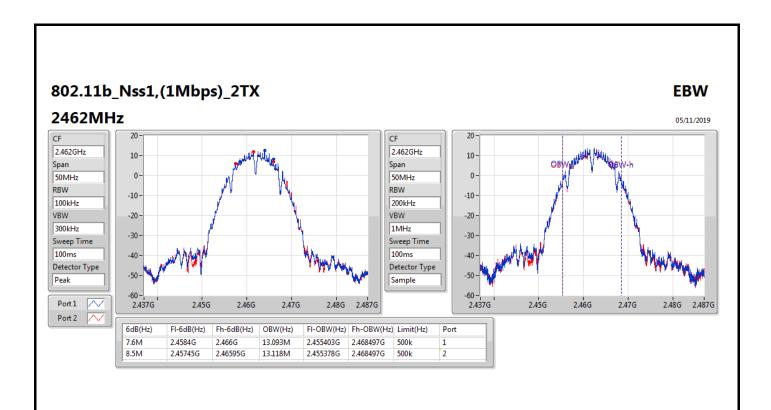
Result

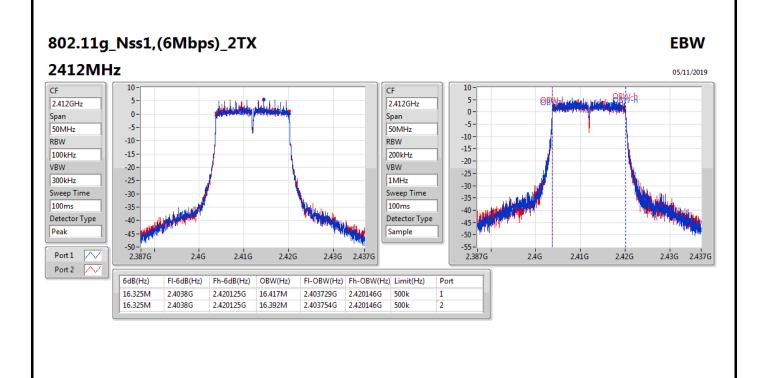
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	8.525M	13.068M	7.075M	12.969M
2437MHz	Pass	500k	7.525M	13.543M	9.05M	13.643M
2462MHz	Pass	500k	7.6M	13.093M	8.5M	13.118M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.325M	16.417M	16.325M	16.392M
2437MHz	Pass	500k	16.275M	28.486M	16.275M	27.861M
2462MHz	Pass	500k	16.325M	16.392M	16.325M	16.392M
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	17.575M	17.616M	17.575M	17.616M
2437MHz	Pass	500k	17.55M	29.91M	17.575M	29.36M
2462MHz	Pass	500k	17.575M	17.616M	17.575M	17.616M
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	35.25M	35.932M	35M	35.832M
2437MHz	Pass	500k	33.85M	35.932M	33.8M	35.882M
2452MHz	Pass	500k	34.2M	35.882M	35M	35.882M

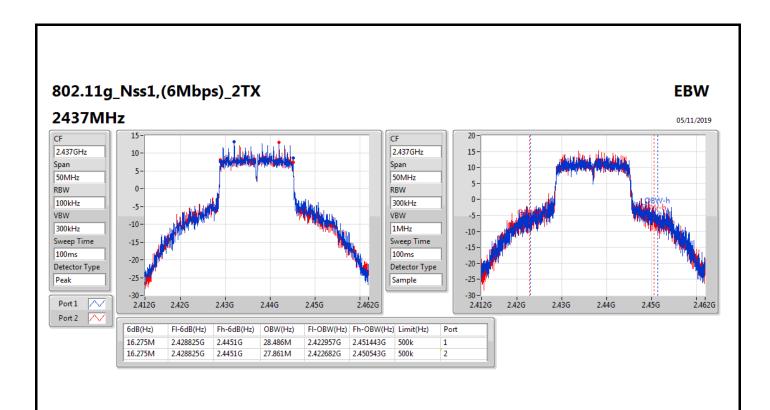
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

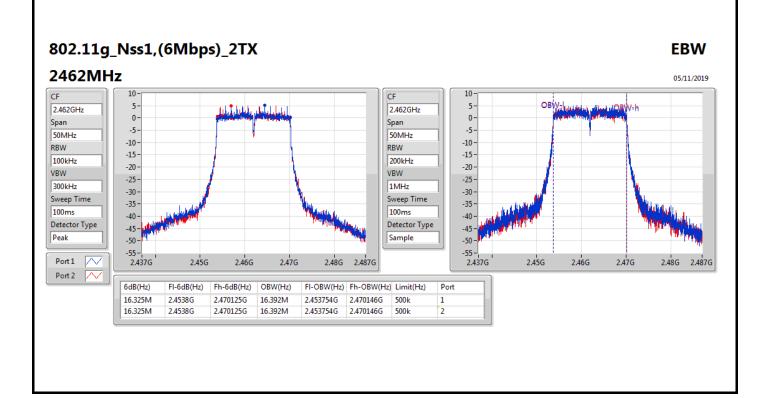


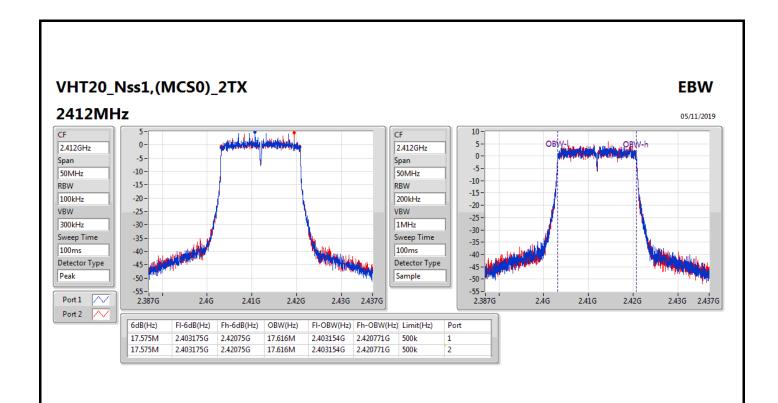


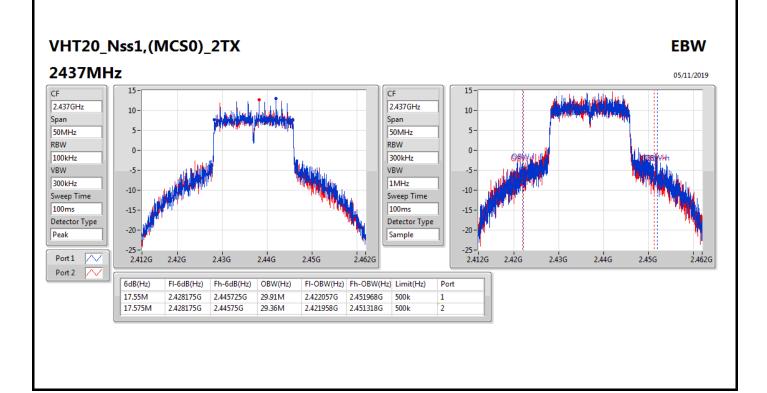


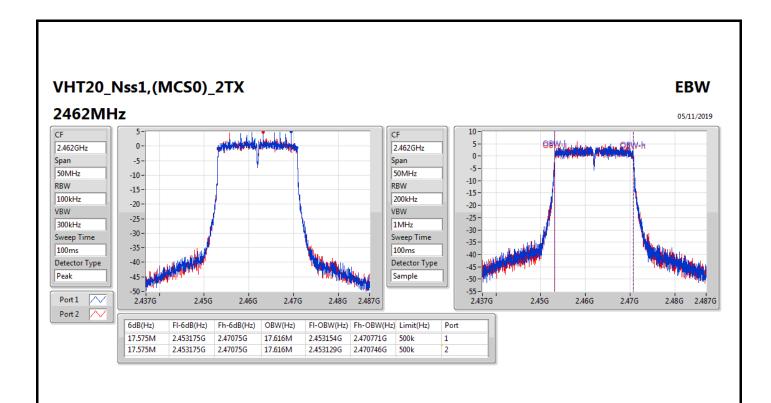


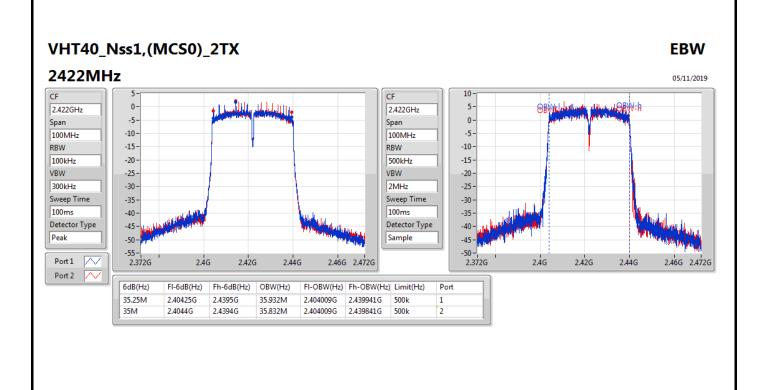


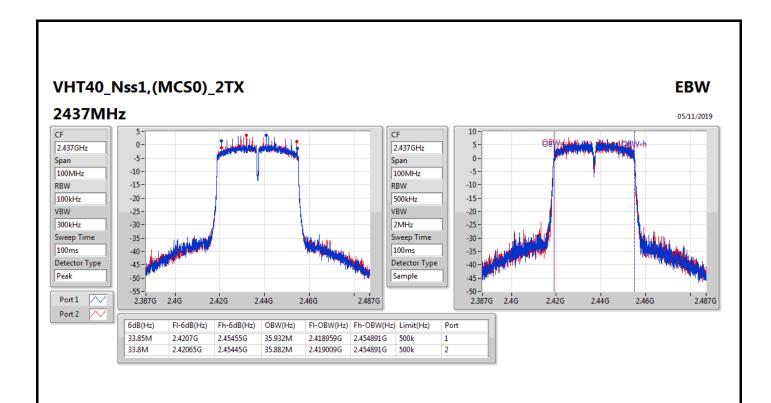


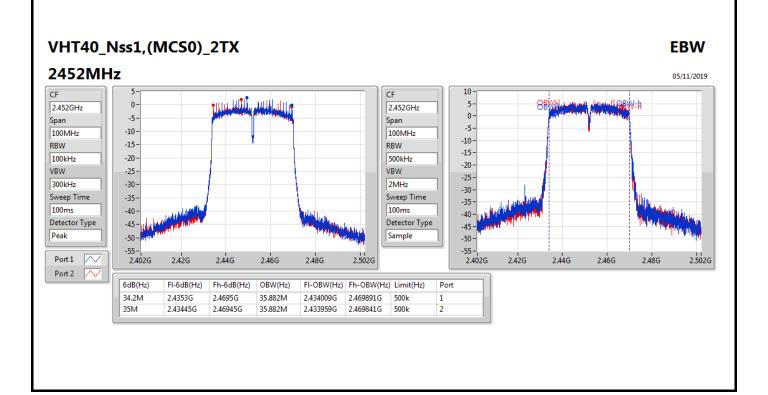














Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
VHT20-BF_Nss1,(MCS0)_2TX	17.55M	17.791M	17M8D1D	15.95M	17.591M
VHT40-BF_Nss1,(MCS0)_2TX	35M	35.982M	36M0D1D	27.55M	35.832M

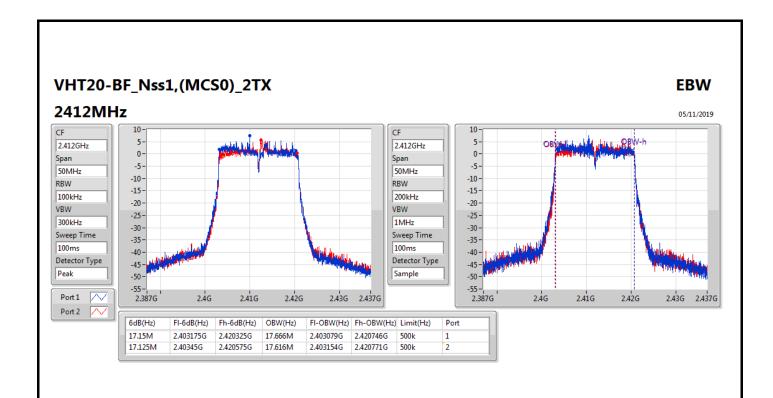
Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth; **Min-N dB** = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

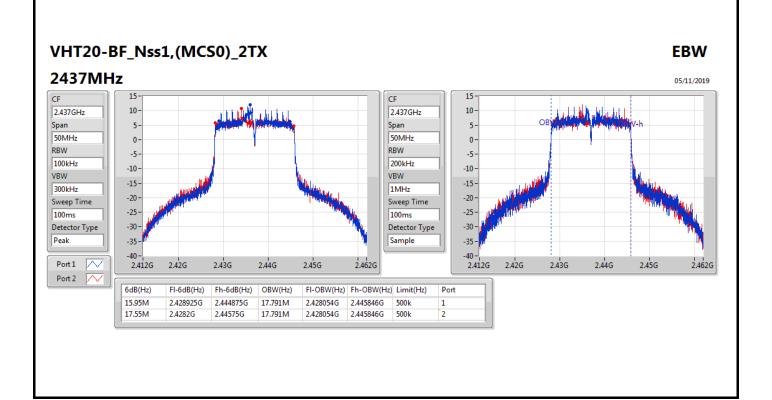


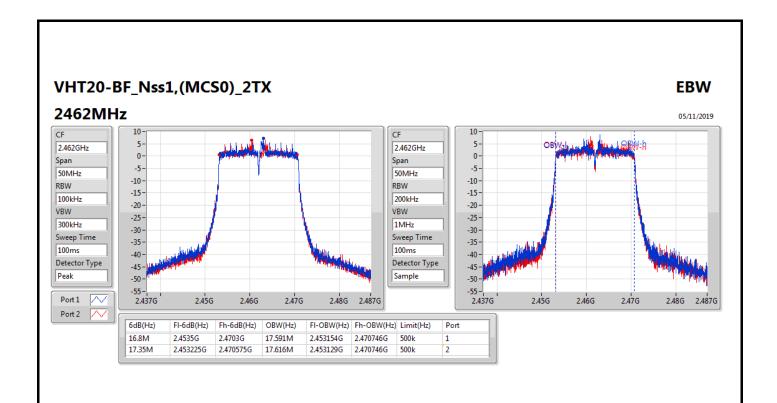
Result

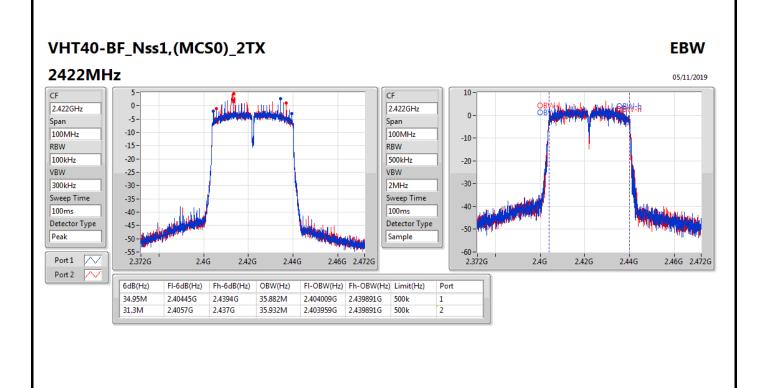
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	17.15M	17.666M	17.125M	17.616M
2437MHz	Pass	500k	15.95M	17.791M	17.55M	17.791M
2462MHz	Pass	500k	16.8M	17.591M	17.35M	17.616M
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	34.95M	35.882M	31.3M	35.932M
2437MHz	Pass	500k	32.55M	35.982M	27.55M	35.832M
2452MHz	Pass	500k	32.6M	35.932M	35M	35.932M

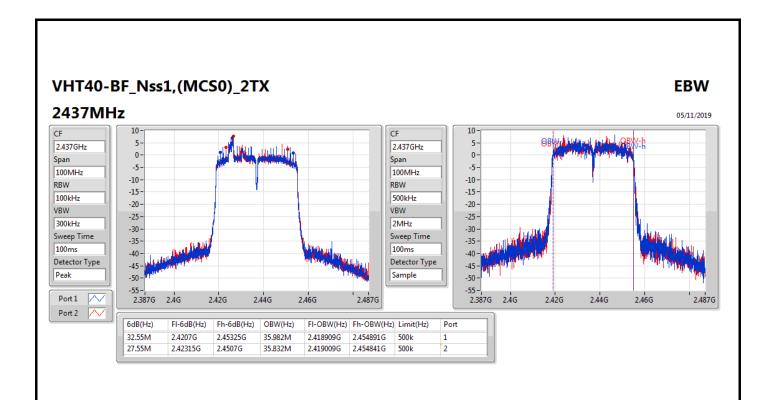
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

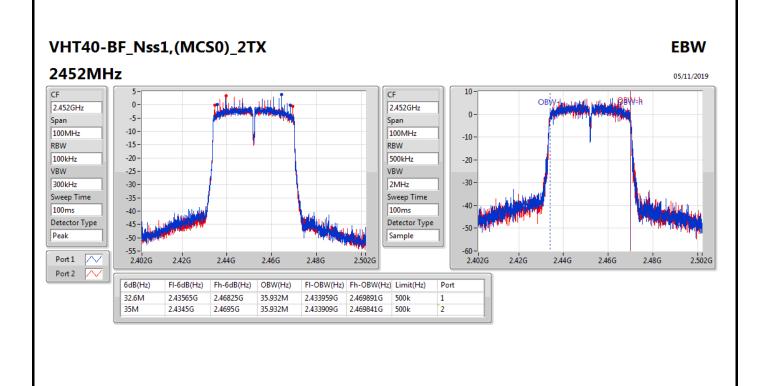














Summary

Gaiiiiiai y		
Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	26.47	0.44361
802.11g_Nss1,(6Mbps)_2TX	27.35	0.54325
VHT20_Nss1,(MCS0)_2TX	27.51	0.56364
VHT40_Nss1,(MCS0)_2TX	21.24	0.13305



Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.15	22.19	22.15	25.18	30.00
2437MHz	Pass	4.15	23.43	23.48	26.47	30.00
2462MHz	Pass	4.15	22.28	22.39	25.35	30.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.15	17.87	17.84	20.87	30.00
2417MHz	Pass	4.15	19.97	20.08	23.04	30.00
2437MHz	Pass	4.15	24.27	24.40	27.35	30.00
2457MHz	Pass	4.15	20.17	20.13	23.16	30.00
2462MHz	Pass	4.15	17.47	17.43	20.46	30.00
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.15	17.42	17.40	20.42	30.00
2417MHz	Pass	4.15	19.68	19.65	22.68	30.00
2437MHz	Pass	4.15	24.45	24.55	27.51	30.00
2457MHz	Pass	4.15	19.69	19.66	22.69	30.00
2462MHz	Pass	4.15	17.51	17.51	20.52	30.00
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.15	17.14	17.18	20.17	30.00
2437MHz	Pass	4.15	18.19	18.26	21.24	30.00
2452MHz	Pass	4.15	17.34	17.26	20.31	30.00

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



Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	
VHT20-BF_Nss1,(MCS0)_2TX	24.65	0.29174
VHT40-BF_Nss1,(MCS0)_2TX	20.73	0.11830



Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit	
		(dBi)	(dBi) (dBm) (dBm) (dBm)		(dBm)	(dBm)	
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
2412MHz	Pass	6.41	17.46	17.27	20.38	29.59	
2417MHz	Pass	6.41	18.26	18.17	21.23	29.59	
2437MHz	Pass	6.41	21.92	21.35	24.65	29.59	
2457MHz	Pass	6.41	18.58	18.28	21.44	29.59	
2462MHz	Pass	6.41	17.49	17.32	20.42	29.59	
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
2422MHz	Pass	6.41	15.71	15.68	18.71	29.59	
2437MHz	Pass	6.41	17.66	17.77	20.73	29.59	
2452MHz	Pass	6.41	16.97	16.73	19.86	29.59	

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



Summary

PD
(dBm/RBW)
·
-3.29
-2.46
-2.01
-9.30

RBW=3 kHz.



Page No.

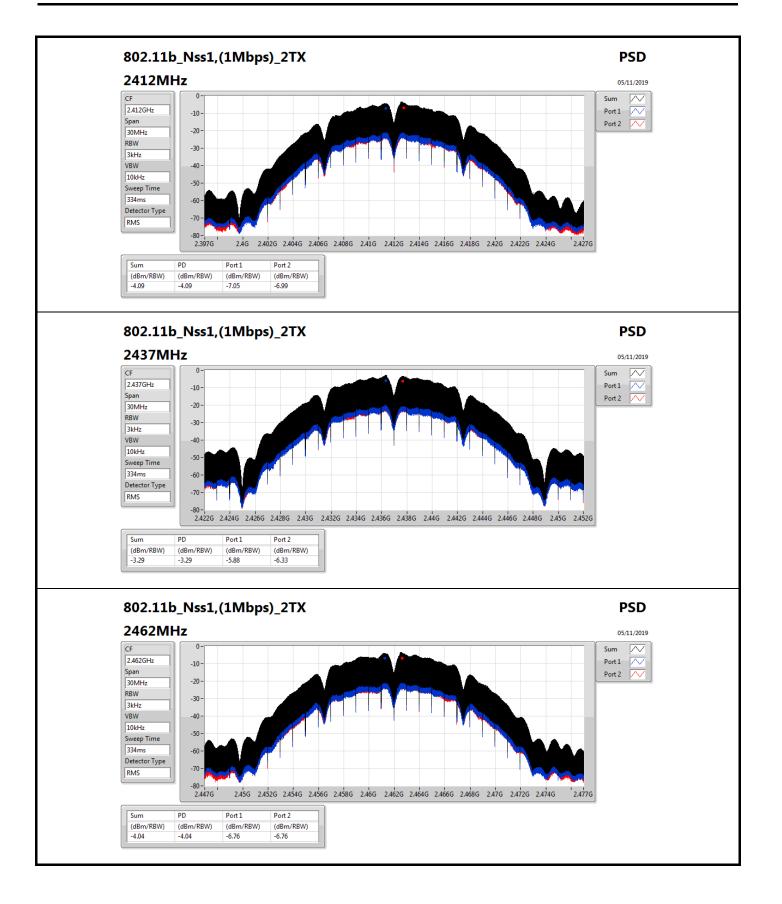
: 2 of 6

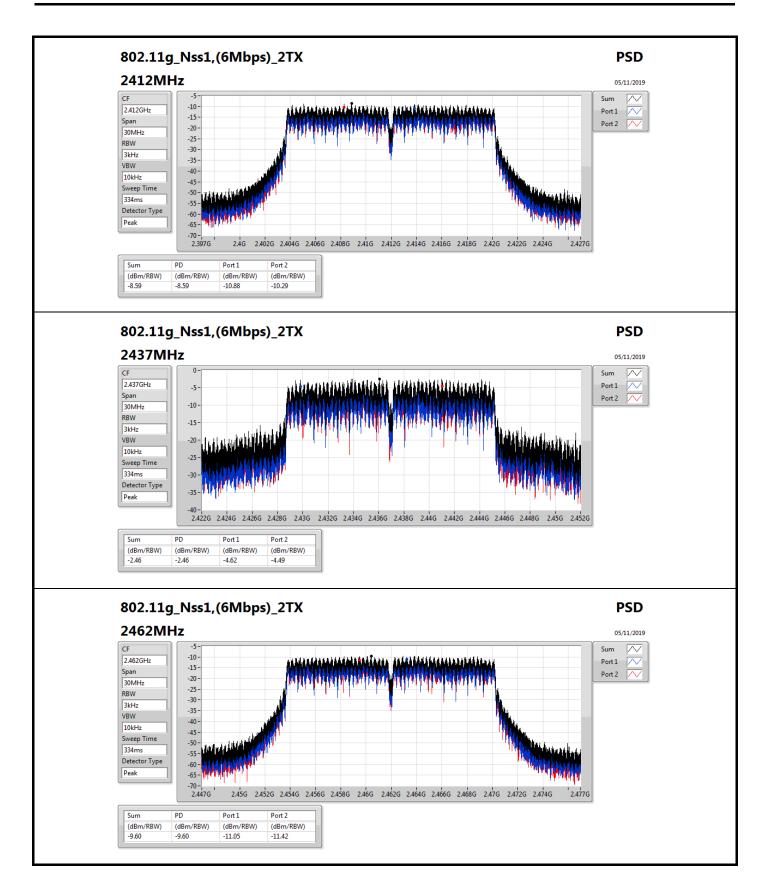
Result

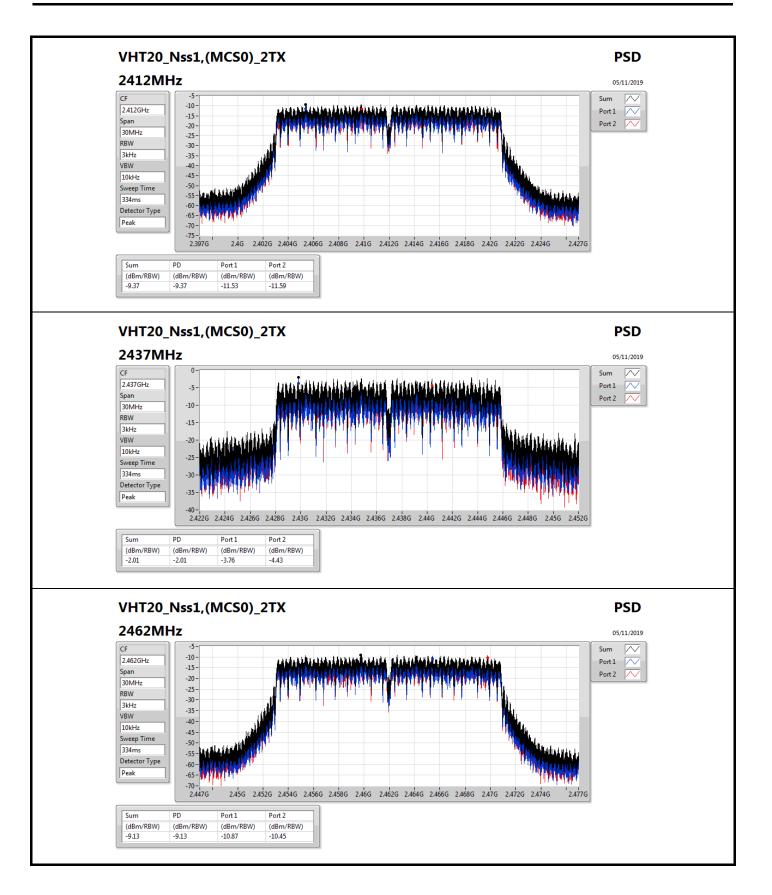
Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-			-
2412MHz	Pass	6.41	-7.05	-6.99	-4.09	7.59
2437MHz	Pass	6.41	-5.88	-6.33	-3.29	7.59
2462MHz	Pass	6.41	-6.76	-6.76	-4.04	7.59
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.41 -10.88 -10.29 -8		-8.59	7.59	
2437MHz	Pass	6.41	-4.62	-4.49	-2.46	7.59
2462MHz	Pass	6.41	-11.05	-11.42	-9.60	7.59
VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.41	-11.53	-11.59	-9.37	7.59
2437MHz	Pass	6.41	-3.76	-4.43	-2.01	7.59
2462MHz	Pass	6.41	-10.87	-10.45	-9.13	7.59
VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	6.41	-12.79	-13.02	-11.19	7.59
2437MHz	Pass	6.41	-11.51	-12.86	-9.30	7.59
2452MHz	Pass	6.41	-12.82	-13.59	-10.58	7.59

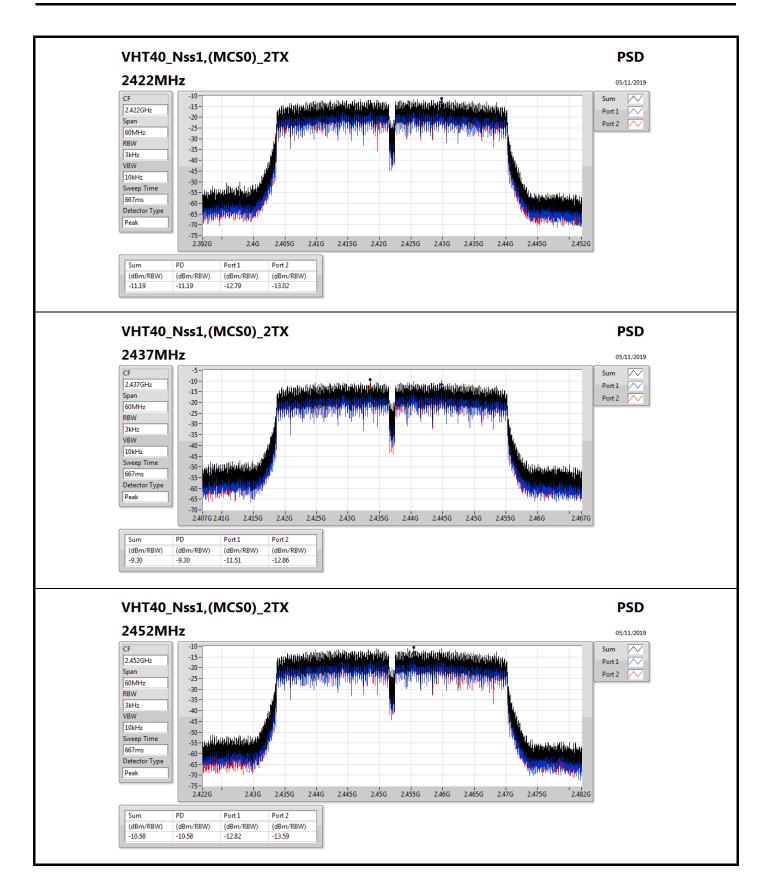
DG = Directional Gain; RBW=3 kHz;

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	-2.03
VHT40-BF_Nss1,(MCS0)_2TX	-4.30

RBW=3 kHz.

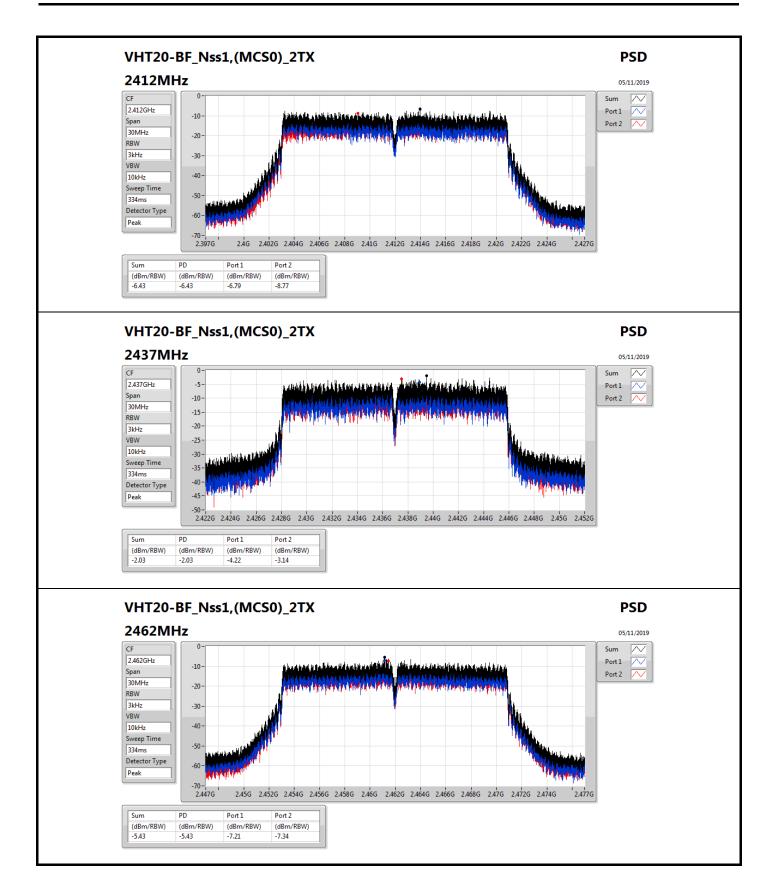


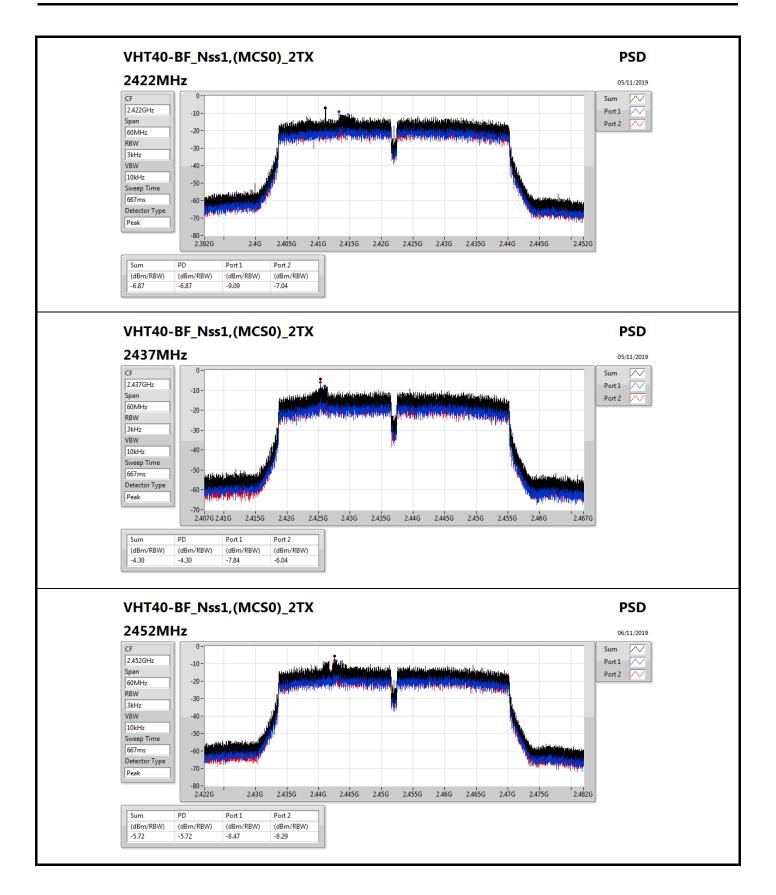
Appendix D.2 **PSD**

Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	6.41	-6.79	-8.77	-6.43	7.59
2437MHz	Pass	6.41	-4.22	-3.14	-2.03	7.59
2462MHz	Pass	6.41	-7.21	-7.34	-5.43	7.59
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	6.41	-9.09	-7.04	-6.87	7.59
2437MHz	Pass	6.41	-7.84	-6.04	-4.30	7.59
2452MHz	Pass	6.41	-8.47	-8.29	-5.72	7.59

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	2.43745G	12.77	-17.23	857.73M	-53.62	2.39598G	-36.47	2.49758G	-52.14	17.69233G	-45.58	2
802.11g_Nss1,(6Mbps)_2TX	Pass	2.43194G	13.25	-16.75	811.42M	-53.67	2.39948G	-29.03	2.48416G	-39.19	24.89043G	-45.25	1
VHT20_Nss1,(MCS0)_2TX	Pass	2.43194G	13.11	-16.89	852.2M	-53.66	2.39982G	-29.42	2.4857G	-38.25	24.87076G	-45.67	1
VHT40_Nss1,(MCS0)_2TX	Pass	2.43444G	3.46	-26.54	802.59M	-53.64	2.39948G	-34.86	2.48374G	-44.95	24.8766G	-45.49	1



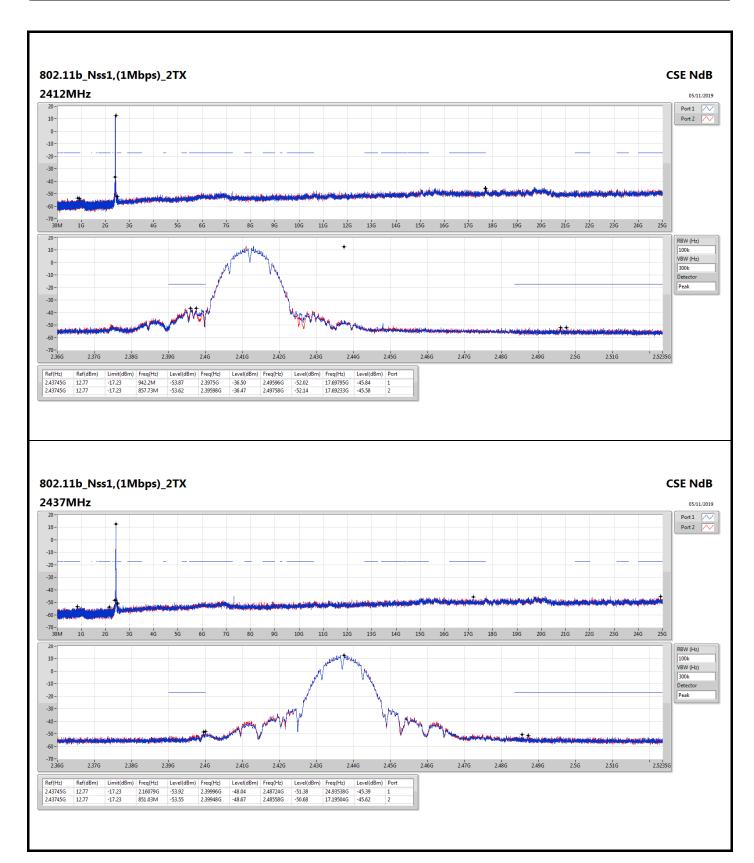
CSE(Non-restricted Band)

Appendix E.1

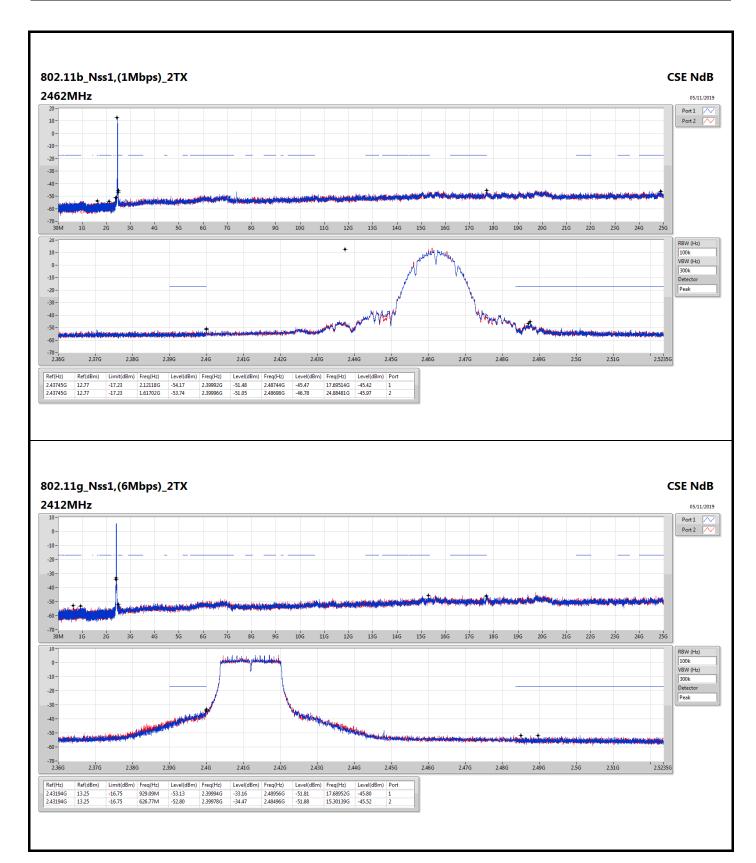
Result

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	2.43745G	12.77	-17.23	942.2M	-53.87	2.3975G	-36.50	2.49596G	-52.02	17.69795G	-45.84	1
2412MHz	Pass	2.43745G	12.77	-17.23	857.73M	-53.62	2.39598G	-36.47	2.49758G	-52.14	17.69233G	-45.58	2
2437MHz	Pass	2.43745G	12.77	-17.23	2.16079G	-53.92	2.39996G	-48.04	2.48724G	-51.38	24.93538G	-45.39	1
2437MHz	Pass	2.43745G	12.77	-17.23	851.03M	-53.55	2.39948G	-48.67	2.48558G	-50.68	17.19504G	-45.62	2
2462MHz	Pass	2.43745G	12.77	-17.23	2.12118G	-54.17	2.39992G	-51.48	2.48744G	-45.47	17.69514G	-45.42	1
2462MHz	Pass	2.43745G	12.77	-17.23	1.61702G	-53.74	2.39996G	-51.05	2.48698G	-46.78	24.88481G	-45.97	2
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43194G	13.25	-16.75	929.09M	-53.13	2.39994G	-33.16	2.48956G	-51.81	17.68952G	-45.80	1
2412MHz	Pass	2.43194G	13.25	-16.75	626.77M	-52.80	2.39978G	-34.47	2.48496G	-51.88	15.30139G	-45.52	2
2437MHz	Pass	2.43194G	13.25	-16.75	811.42M	-53.67	2.39948G	-29.03	2.48416G	-39.19	24.89043G	-45.25	1
2437MHz	Pass	2.43194G	13.25	-16.75	888.02M	-53.42	2.39948G	-31.74	2.48358G	-38.94	24.87076G	-45.95	2
2462MHz	Pass	2.43194G	13.25	-16.75	1.87827G	-53.90	2.3925G	-52.33	2.48412G	-43.24	15.07101G	-45.93	1
2462MHz	Pass	2.43194G	13.25	-16.75	372.22M	-53.55	2.39998G	-51.75	2.48514G	-44.05	24.81176G	-45.99	2
VHT20_Nss1,(MCS0)_2TX	-	-	-		-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43194G	13.11	-16.89	2.09176G	-54.21	2.3999G	-35.82	2.49594G	-51.85	24.55047G	-46.06	1
2412MHz	Pass	2.43194G	13.11	-16.89	942.49M	-53.74	2.3979G	-36.16	2.48984G	-50.91	16.26788G	-46.12	2
2437MHz	Pass	2.43194G	13.11	-16.89	852.2M	-53.66	2.39982G	-29.42	2.4857G	-38.25	24.87076G	-45.67	1
2437MHz	Pass	2.43194G	13.11	-16.89	2.14914G	-53.80	2.39946G	-30.23	2.49006G	-38.63	15.03448G	-45.51	2
2462MHz	Pass	2.43194G	13.11	-16.89	2.30233G	-53.35	2.39996G	-50.15	2.48412G	-43.29	15.04853G	-45.74	1
2462MHz	Pass	2.43194G	13.11	-16.89	1.84041G	-54.37	2.39992G	-52.42	2.48418G	-44.35	15.34634G	-45.32	2
VHT40_Nss1,(MCS0)_2TX	-	-	-		-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.43444G	3.46	-26.54	2.18575G	-53.34	2.39884G	-38.28	2.55998G	-48.95	16.3956G	-45.82	1
2422MHz	Pass	2.43444G	3.46	-26.54	2.30426G	-53.47	2.397G	-38.19	2.48698G	-50.52	24.86538G	-46.09	2
2437MHz	Pass	2.43444G	3.46	-26.54	802.59M	-53.64	2.39948G	-34.86	2.48374G	-44.95	24.8766G	-45.49	1
2437MHz	Pass	2.43444G	3.46	-26.54	2.18861G	-54.67	2.3998G	-38.70	2.4837G	-42.39	15.041G	-45.98	2
2452MHz	Pass	2.43444G	3.46	-26.54	1.98566G	-54.21	2.39988G	-48.28	2.48438G	-41.77	15.24293G	-45.36	1
2452MHz	Pass	2.43444G	3.46	-26.54	766.52M	-54.26	2.3982G	-46.99	2.48382G	-43.32	15.26536G	-46.53	2

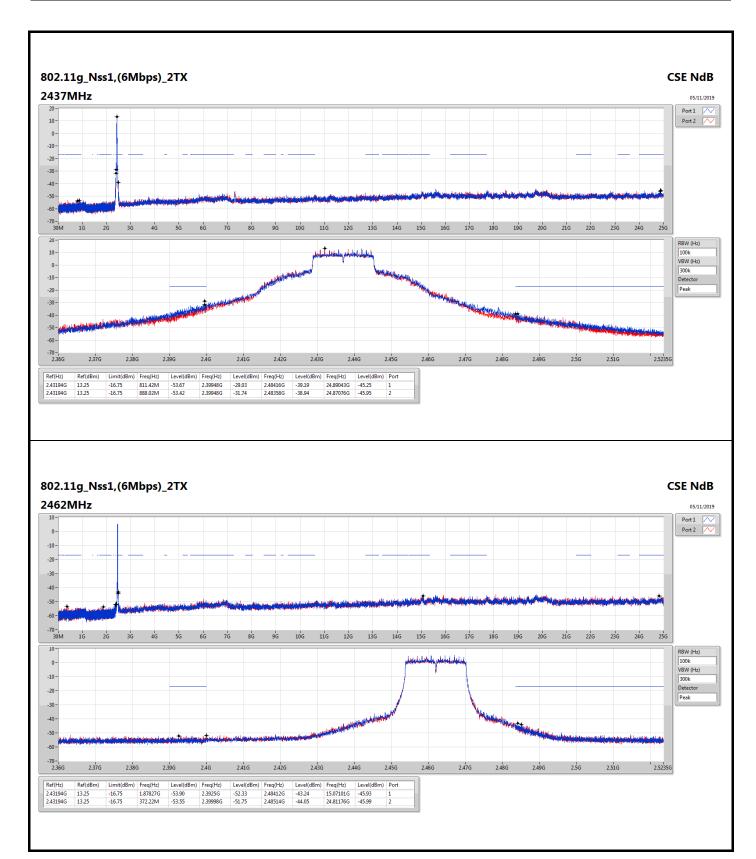




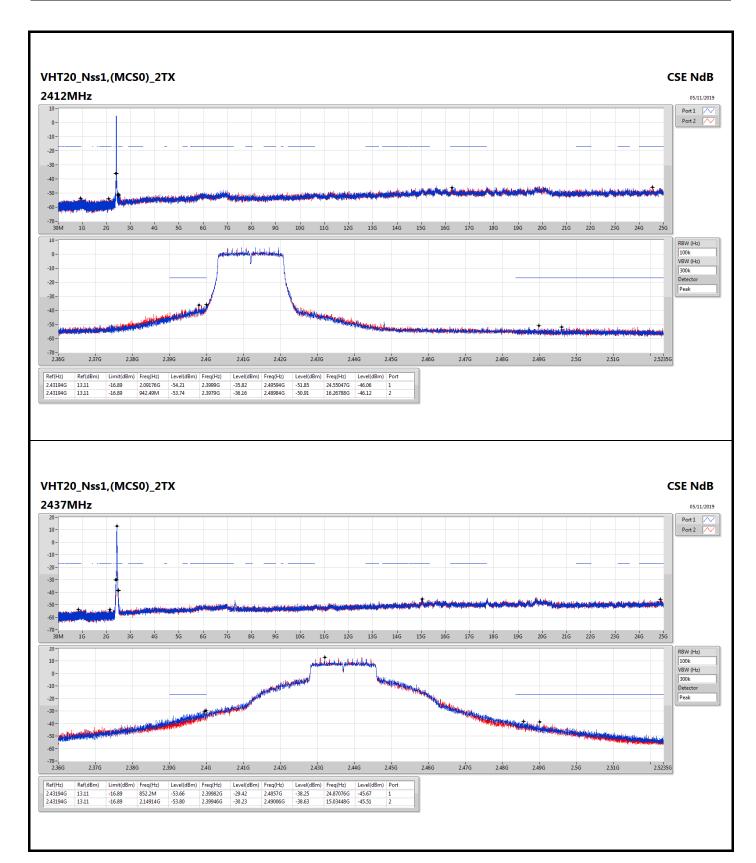












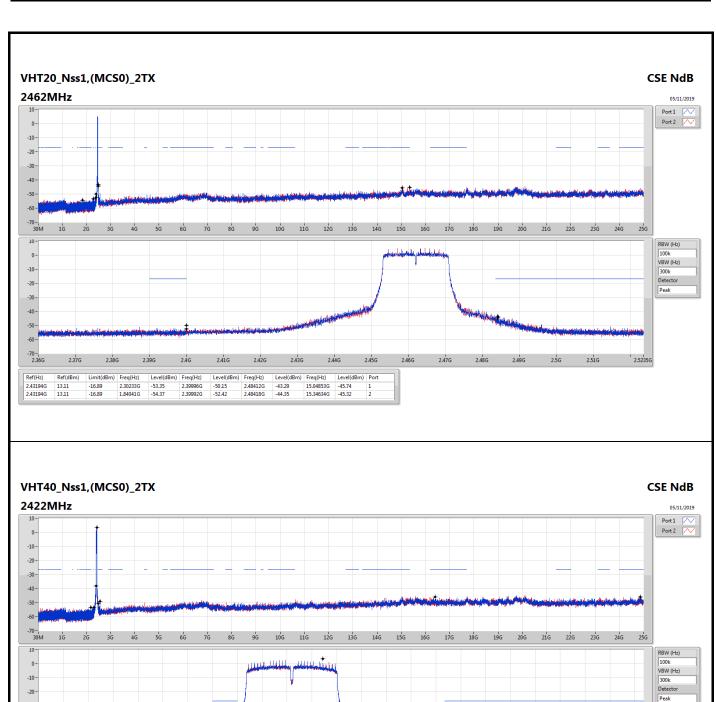


-40

2.33G 2.34G 2.35G 2.36G

2.18575G 2.30426G 2.37G

Level(dBm) Freq(Hz) -53.34 2.39884G -53.47 2.397G



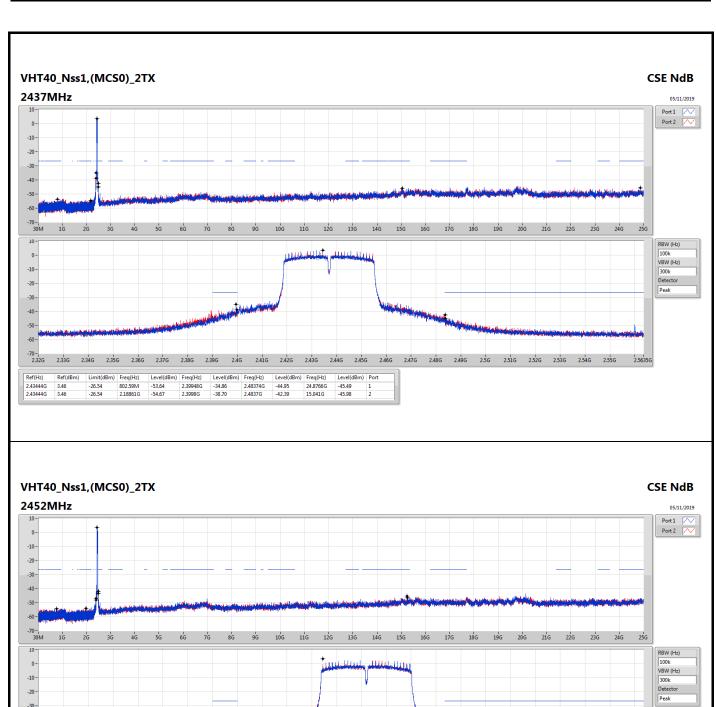
2386 2396 246 2416 2426 2436 2446 2456 2466 2476 2486 2496 256 2516 2526 2536 2546 2556

Level(dBm) Freq(Hz)
-38.28 2.55998G
-38.19 2.48698G



-40

2.34G 2.35G 2.36G 2.37G



24G 241G 242G 243G 244G 245G 246G 247G 248G 249G 25G 251G 252G 253G 254G 255G

2.38G

Level(dBm) Freq(Hz)
-48.28 2.48438G
-46.99 2.48382G

-41.77 -43.32 15.24293G 15.26536G



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	2.44196G	10.34	-19.66	2.01982G	-49.77	2.397G	-36.33	2.51098G	-48.26	24.94662G	-41.06	2
VHT40-BF_Nss1,(MCS0)_2TX	Pass	2.42847G	7.21	-22.79	1.8328G	-49.71	2.39448G	-37.76	2.51758G	-48.48	24.89343G	-40.75	2



CSE(Non-restricted Band)

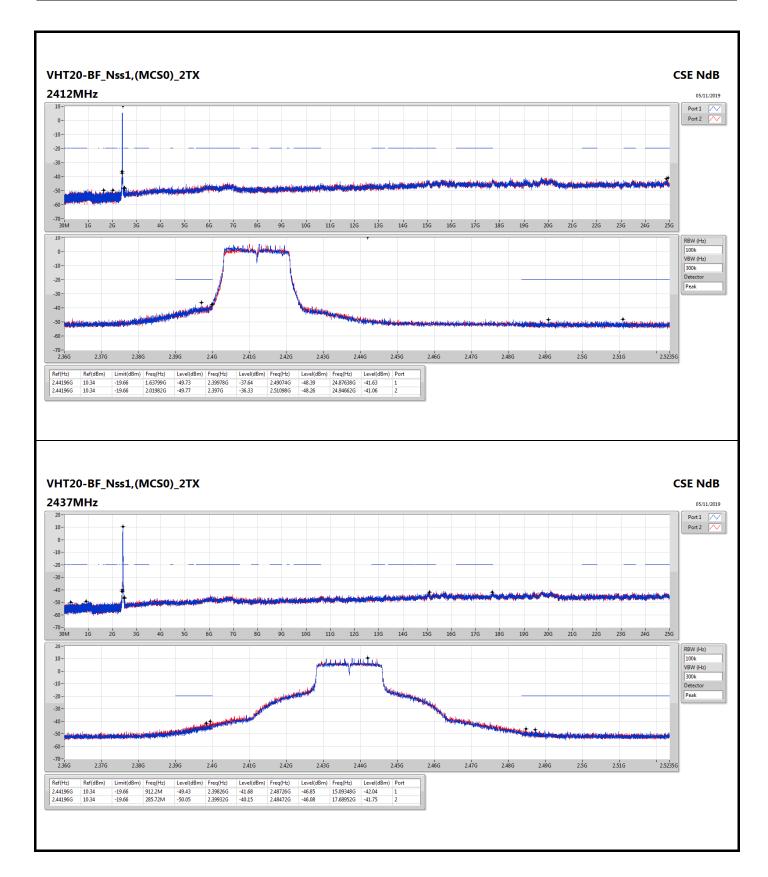
Appendix E.2

Result

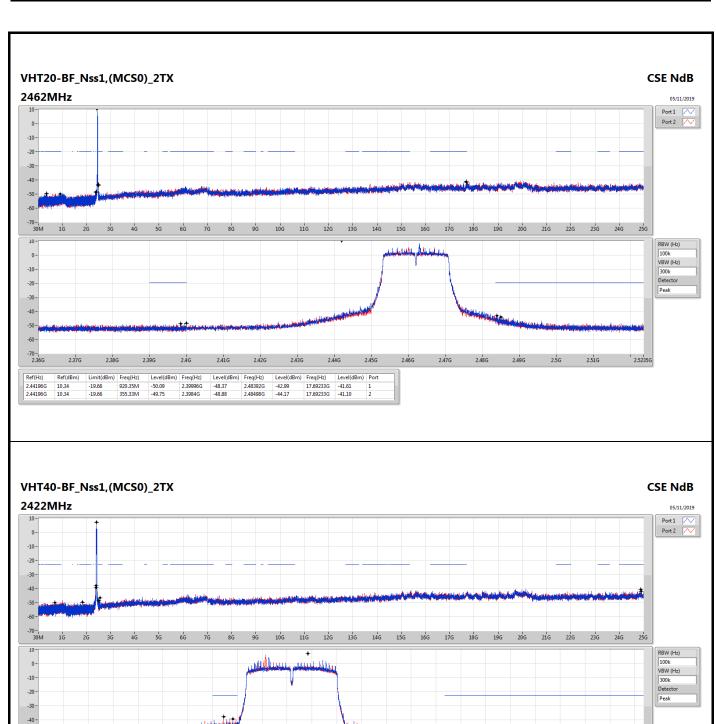
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.44196G	10.34	-19.66	1.63799G	-49.73	2.39978G	-37.64	2.49074G	-48.39	24.87638G	-41.63	1
2412MHz	Pass	2.44196G	10.34	-19.66	2.01982G	-49.77	2.397G	-36.33	2.51098G	-48.26	24.94662G	-41.06	2
2437MHz	Pass	2.44196G	10.34	-19.66	912.2M	-49.43	2.39826G	-41.68	2.48726G	-46.85	15.09348G	-42.04	1
2437MHz	Pass	2.44196G	10.34	-19.66	285.72M	-50.05	2.39932G	-40.15	2.48472G	-46.08	17.68952G	-41.75	2
2462MHz	Pass	2.44196G	10.34	-19.66	920.35M	-50.09	2.39996G	-48.37	2.48392G	-42.99	17.69233G	-41.61	1
2462MHz	Pass	2.44196G	10.34	-19.66	355.33M	-49.75	2.3984G	-48.88	2.48498G	-44.17	17.69233G	-41.10	2
VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.42847G	7.21	-22.79	698.68M	-49.97	2.3982G	-39.39	2.55998G	-46.59	24.90745G	-41.79	1
2422MHz	Pass	2.42847G	7.21	-22.79	1.8328G	-49.71	2.39448G	-37.76	2.51758G	-48.48	24.89343G	-40.75	2
2437MHz	Pass	2.42847G	7.21	-22.79	1.9745G	-49.65	2.39884G	-39.51	2.48818G	-43.76	17.69692G	-41.90	1
2437MHz	Pass	2.42847G	7.21	-22.79	1.97478G	-50.04	2.39824G	-40.40	2.48982G	-42.72	16.9453G	-40.79	2
2452MHz	Pass	2.42847G	7.21	-22.79	561.85M	-50.03	2.39572G	-44.31	2.48502G	-43.08	16.95932G	-41.48	1
2452MHz	Pass	2.42847G	7.21	-22.79	921.96M	-49.30	2.39968G	-45.41	2.48502G	-43.60	15.04661G	-41.39	2

: 2 of 5









238G 239G 24G 241G 242G 243G 244G 245G 246G 247G 248G 249G 25G 251G 252G 253G 254G 255G

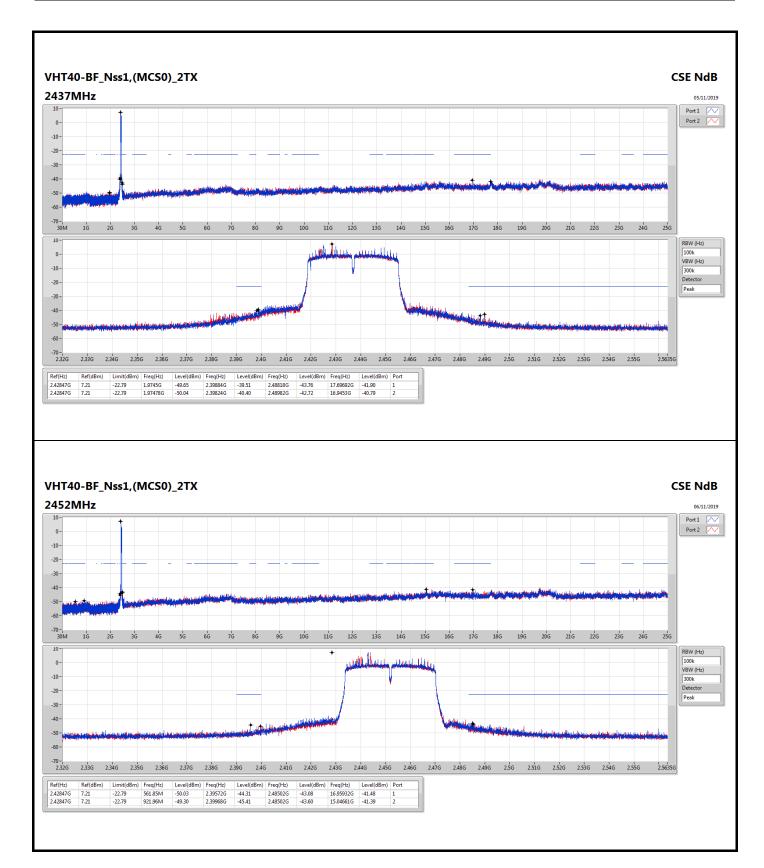
Level(dBm) Freq(Hz) -39.39 2.55998G -37.76 2.51758G

24.90745G -41.79 24.89343G -40.75

Level(dBm) Freq(Hz) -49.97 2.3982G -49.71 2.39448G

2.33G 2.34G 2.35G 2.36G 2.37G

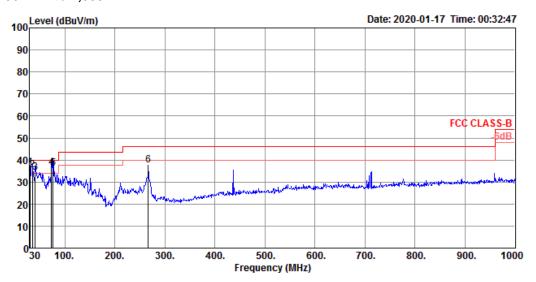




Radiated Emission below 1GHz Result

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

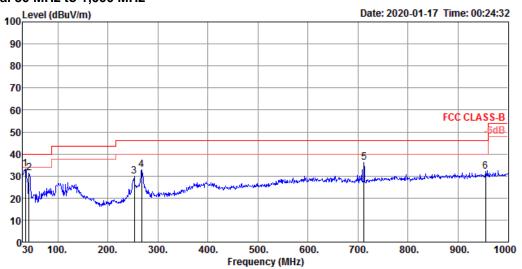
Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit					Factor		T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.97	36.39	40.00	-3.61	40.50	0.60	23.86	28.57	300	356	Peak	VERTICAL
2	34.85	35.49	40.00	-4.51	41.58	0.60	21.88	28.57	200	67	QP	VERTICAL
3	40.67	34.44	40.00	-5.56	43.68	0.60	18.72	28.56	200	360	QP	VERTICAL
4	73.65	36.56	40.00	-3.44	52.22	0.67	12.18	28.51	100	127	QP	VERTICAL
5	76.56	36.12	40.00	-3.88	51.28	0.70	12.64	28.50	100	209	QP	VERTICAL
6	266.68	37.59	46.00	-8.41	45.03	1.57	18.96	27.97	200	182	Peak	VERTICAL



Horizontal 30 MHz to 1,000 MHz



	Freq	Level						Factor	A/Pos	1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	34.85	33.16	40.00	-6.84	39.25	0.60	21.88	28.57	300	35	Peak	HORIZONTAL
2	42.61	31.46	40.00	-8.54	41.77	0.60	17.65	28.56	200	206	Peak	HORIZONTAL
3	253.10	29.74	46.00	-16.26	37.46	1.51	18.76	27.99	200	302	Peak	HORIZONTAL
4	267.65	32.70	46.00	-13.30	40.21	1.57	18.89	27.97	150	248	Peak	HORIZONTAL
5	711.91	36.08	46.00	-9.92	37.40	2.93	25.20	29.45	100	129	Peak	HORIZONTAL
6	955.38	32.06	46.00	-13.94	30.39	3.59	26.99	28.91	100	318	Peak	HORIZONTAL



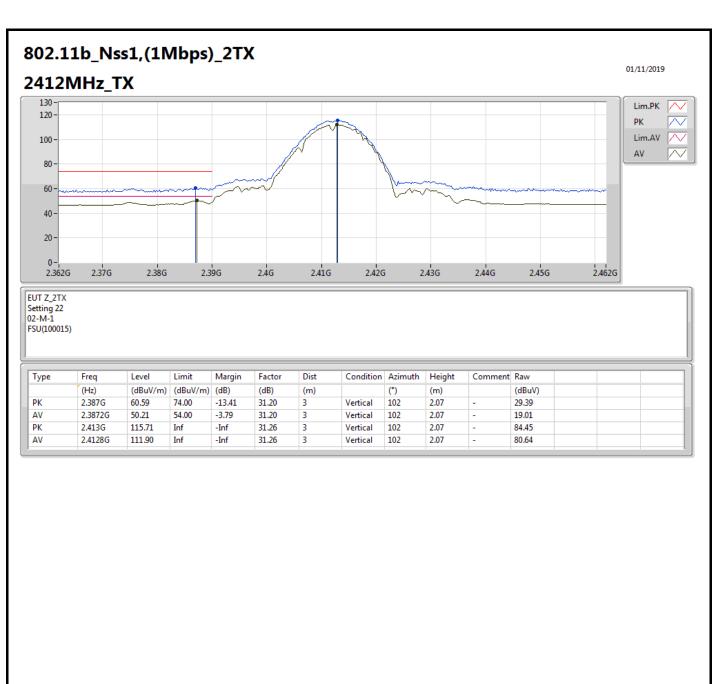
RSE TX above 1GHz

Appendix F.2

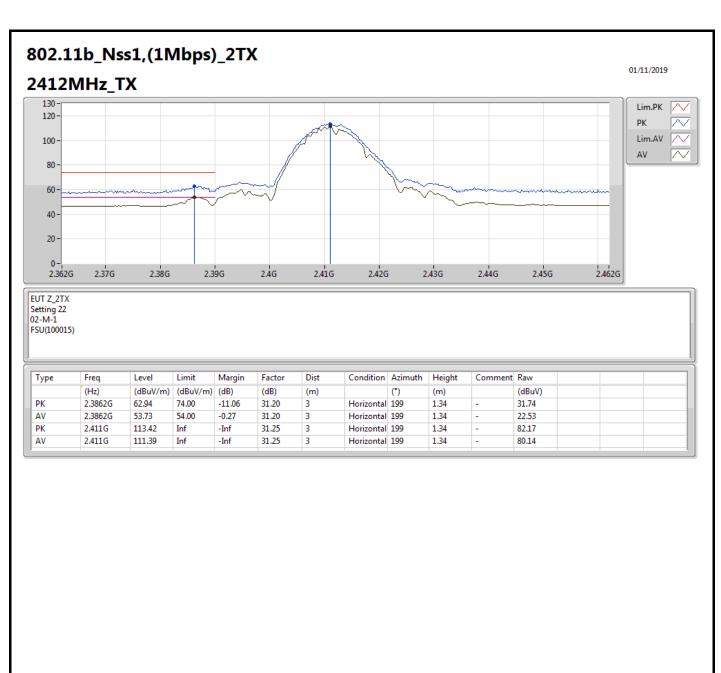
Summary

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	53.98	54.00	-0.02	31.39	3	Vertical	152	2.99	-

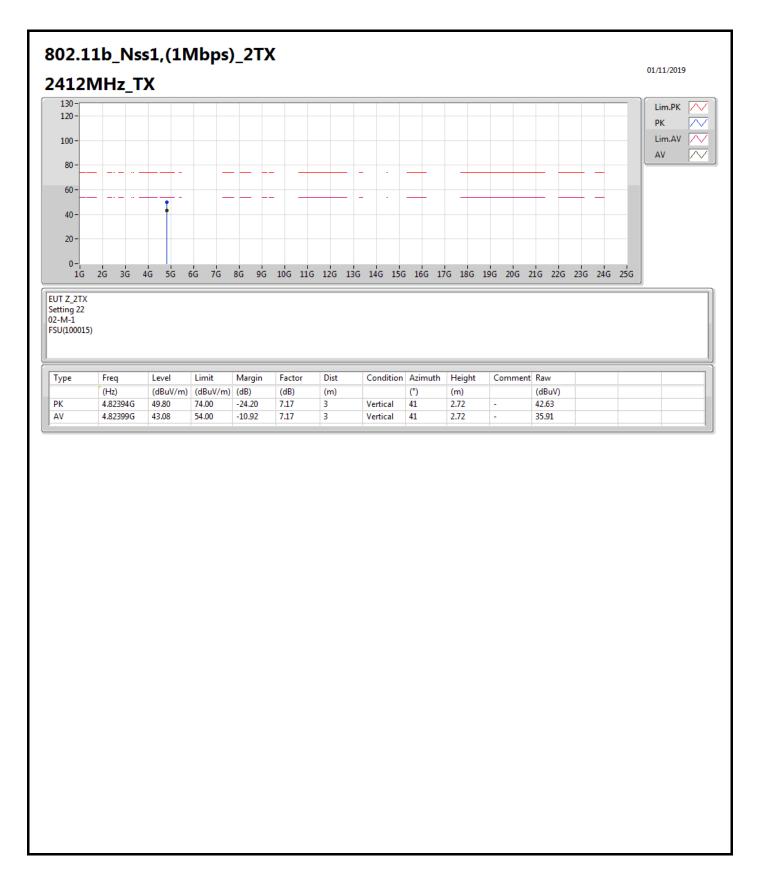




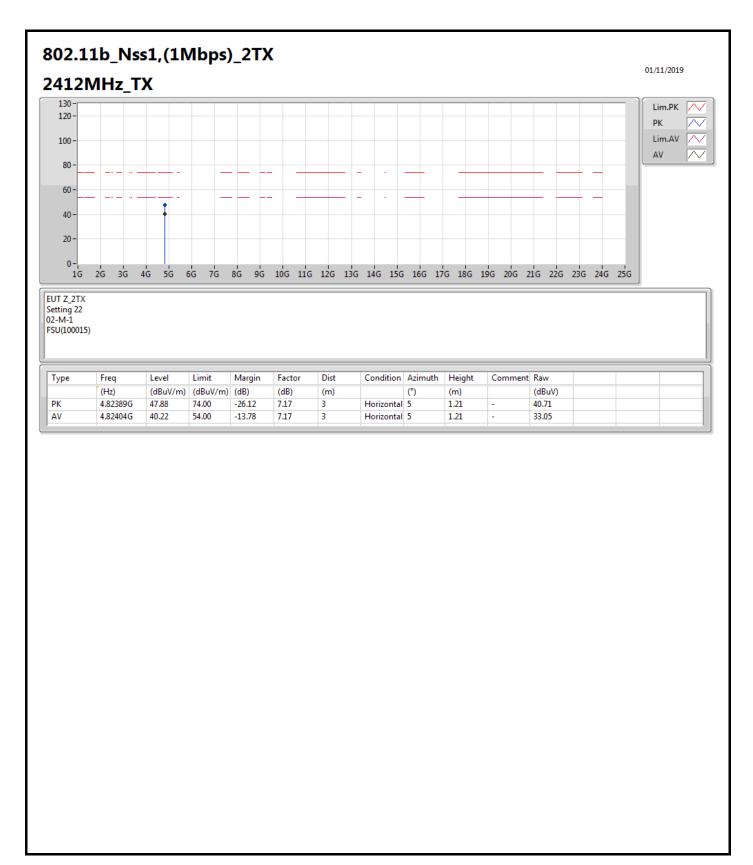




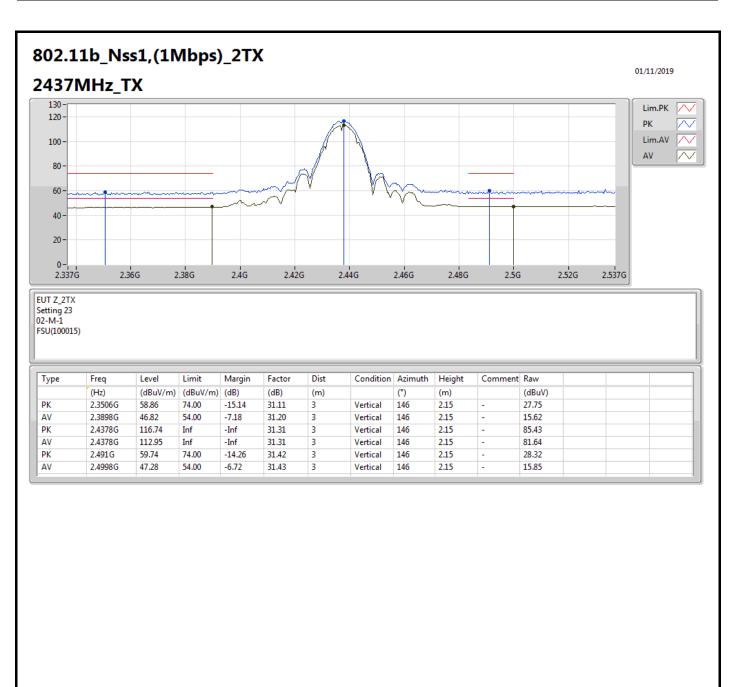




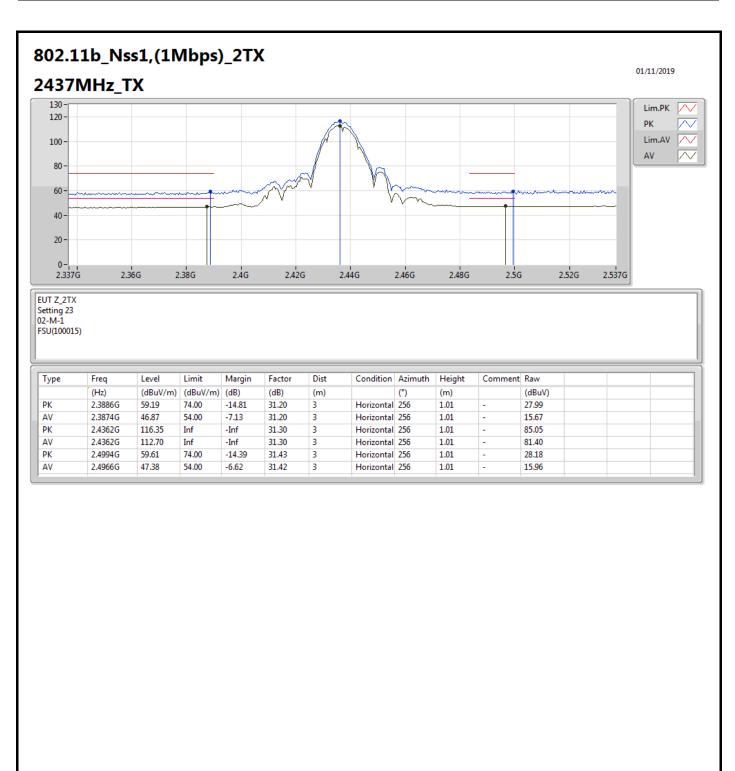




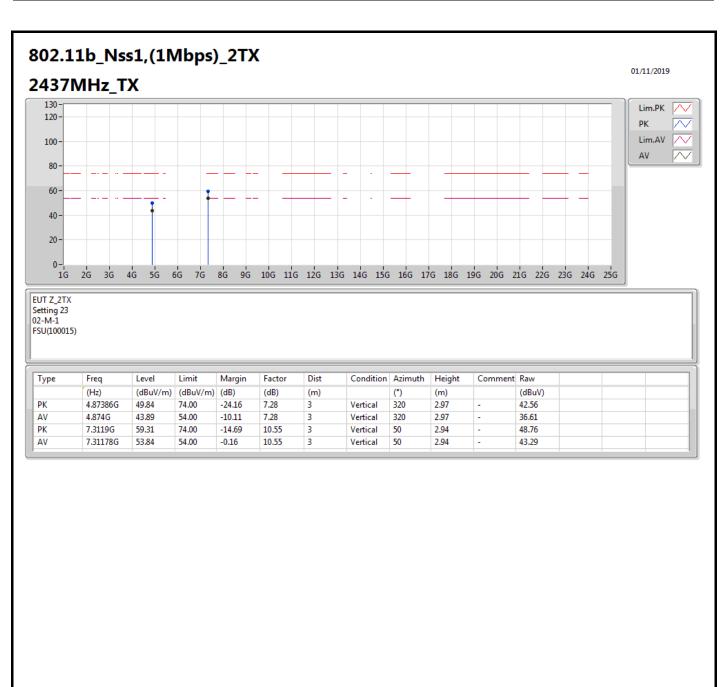




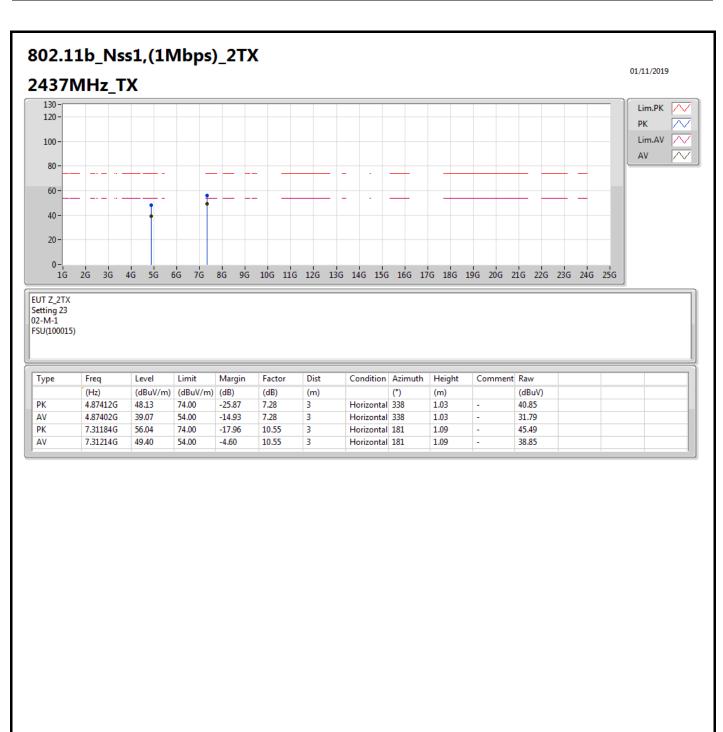




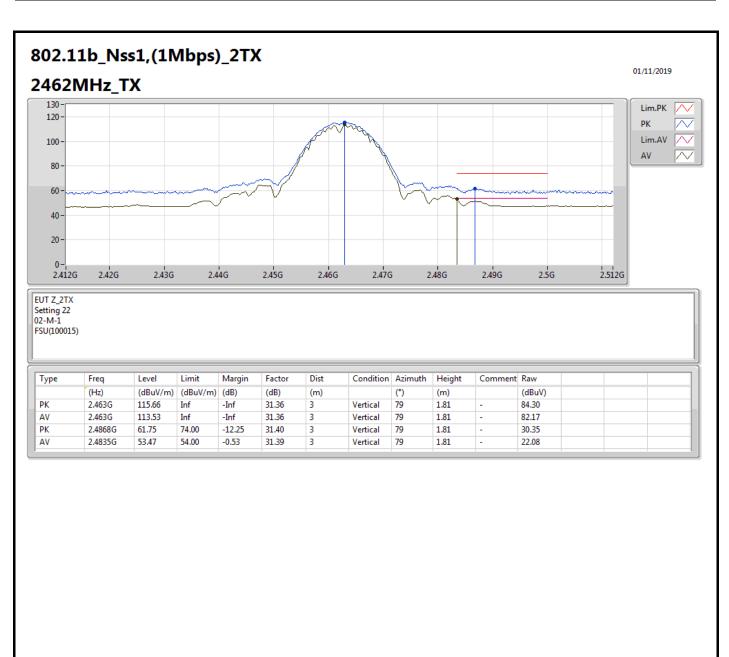




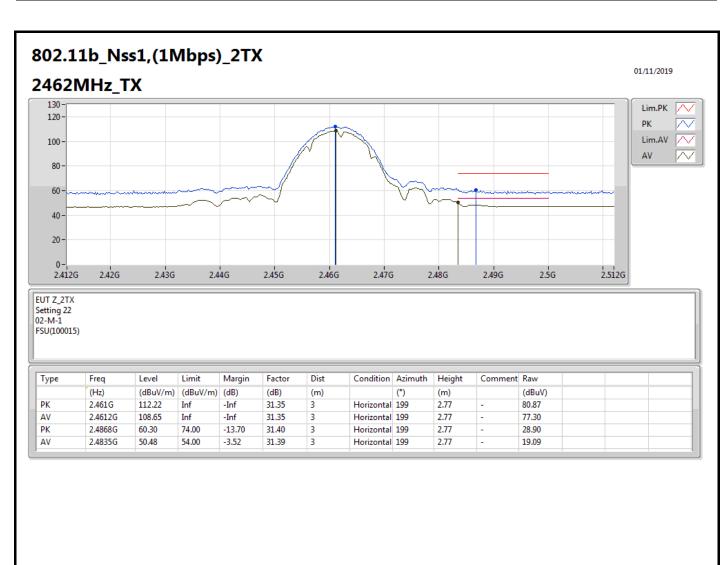




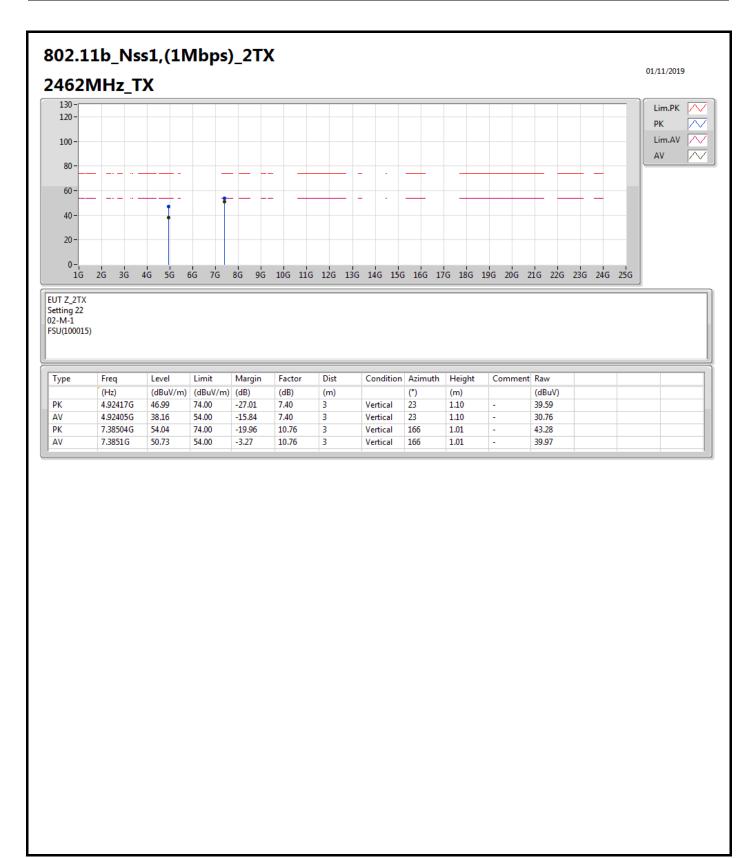




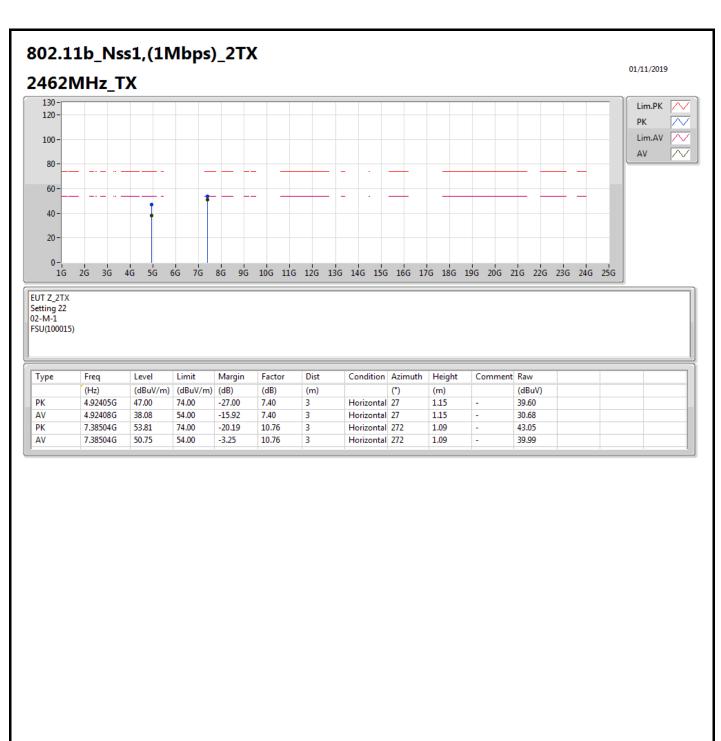




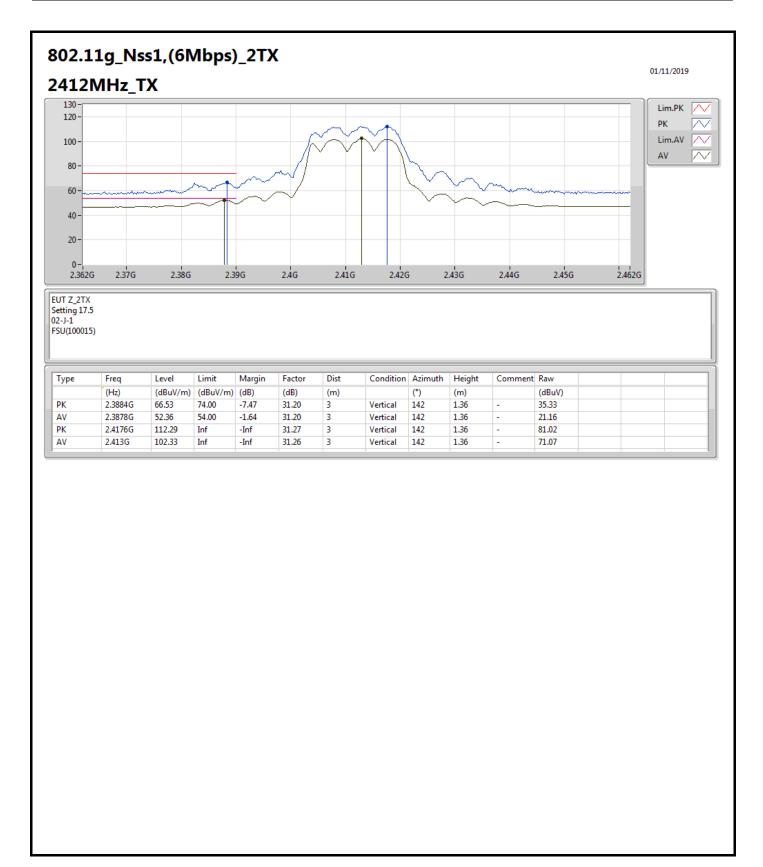




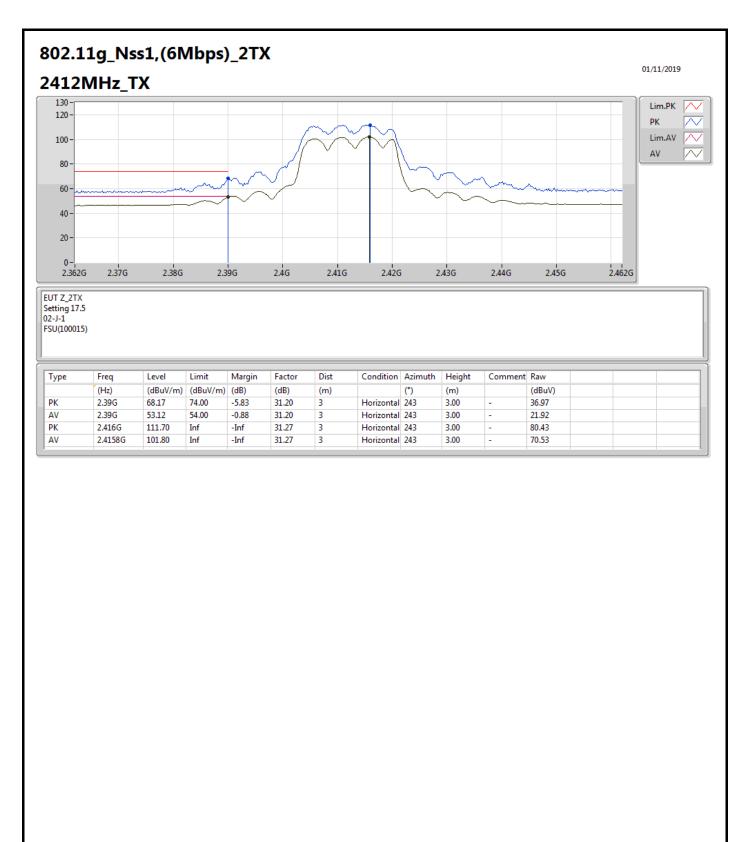




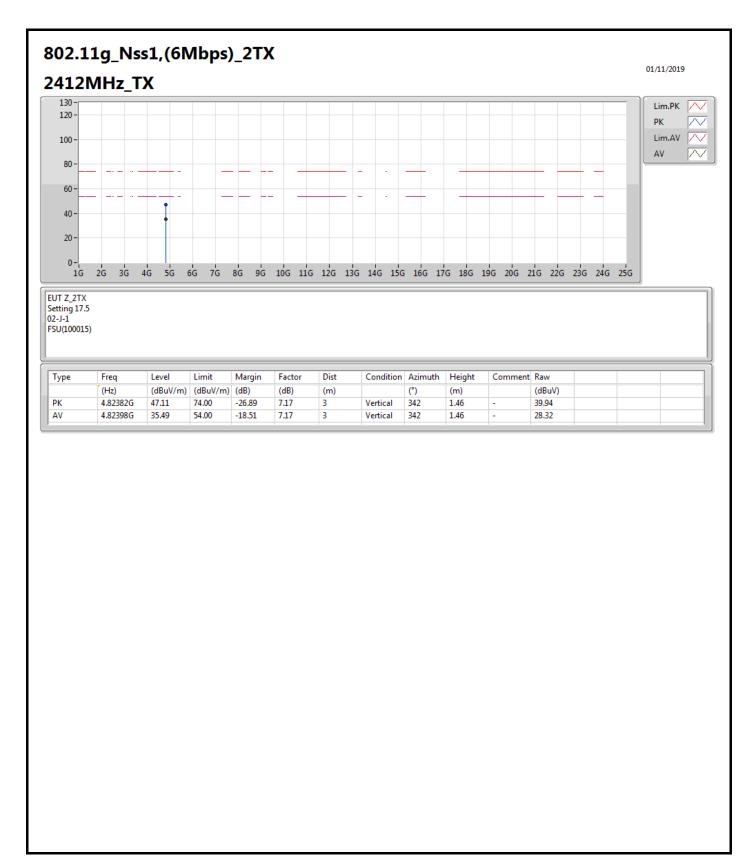




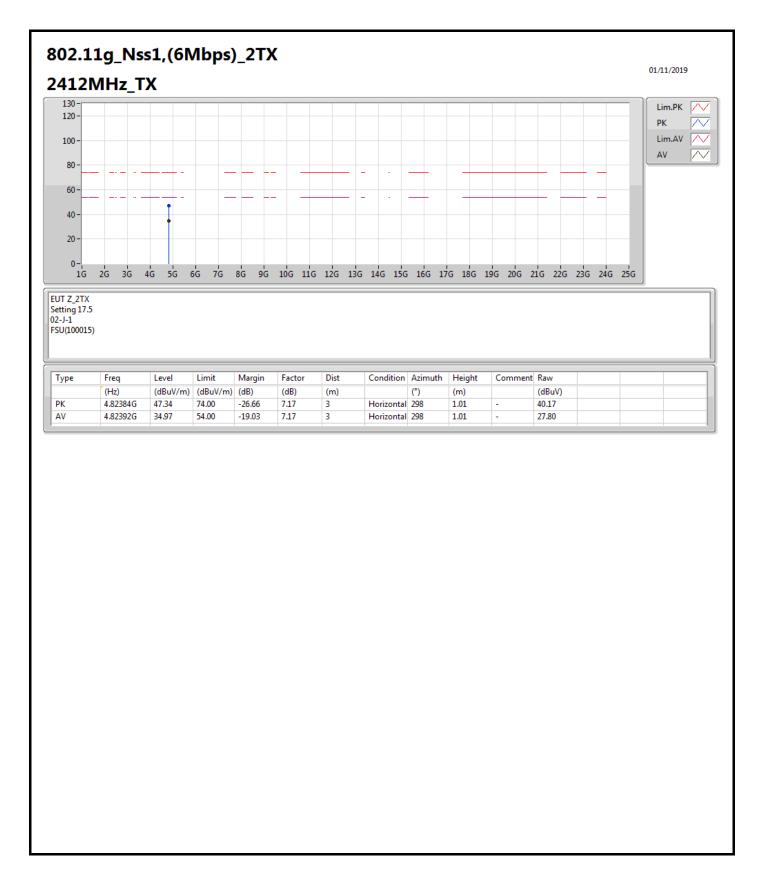




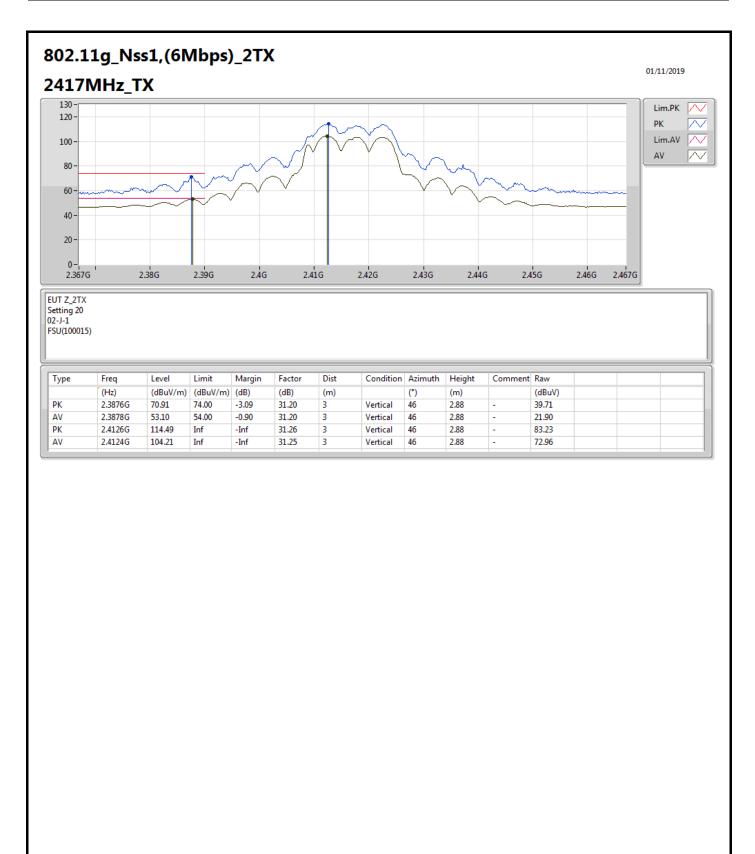




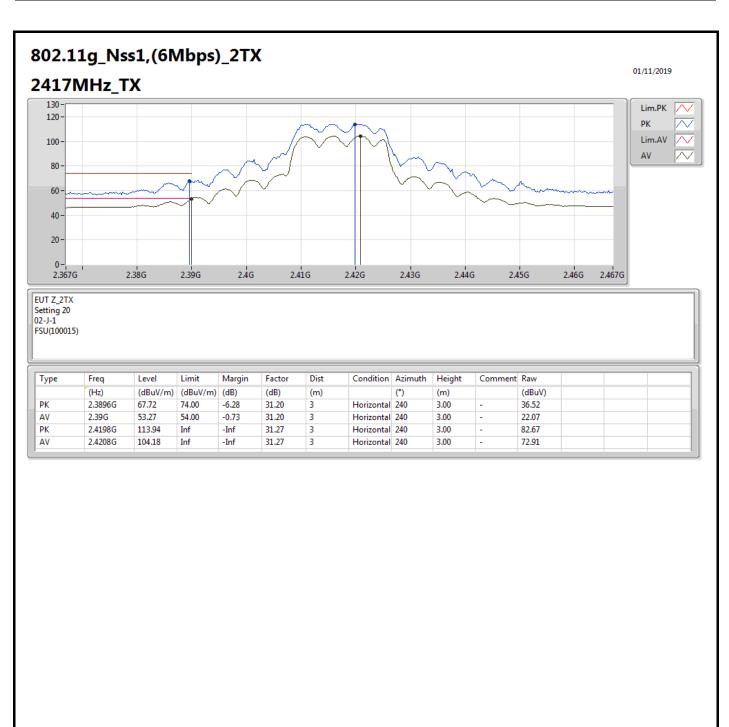




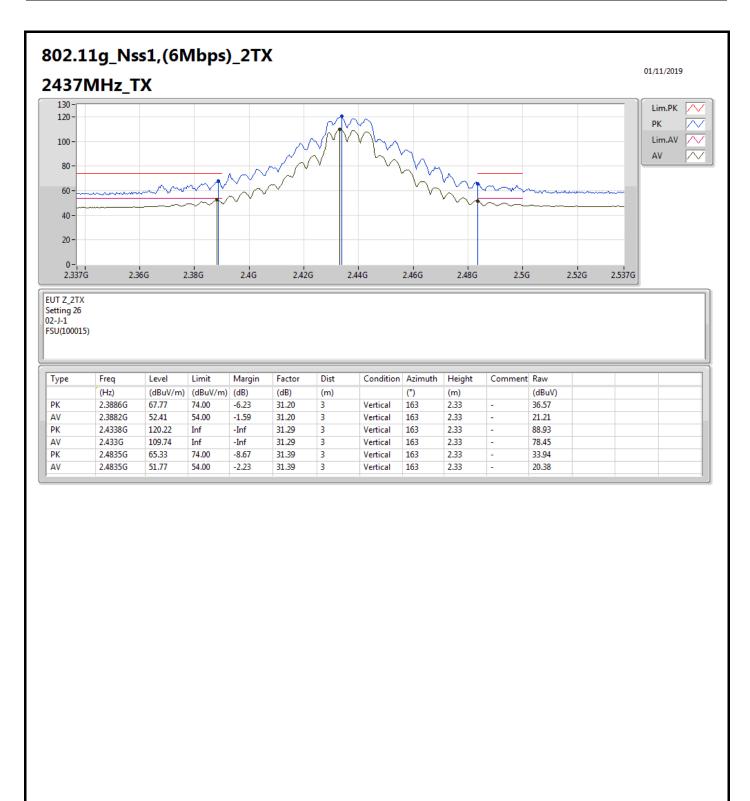




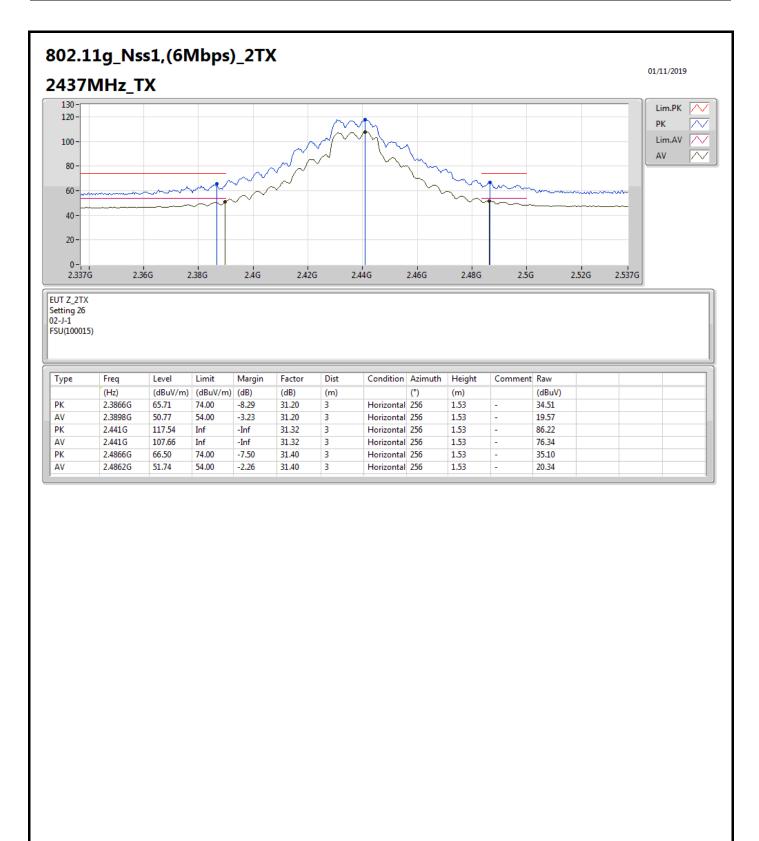




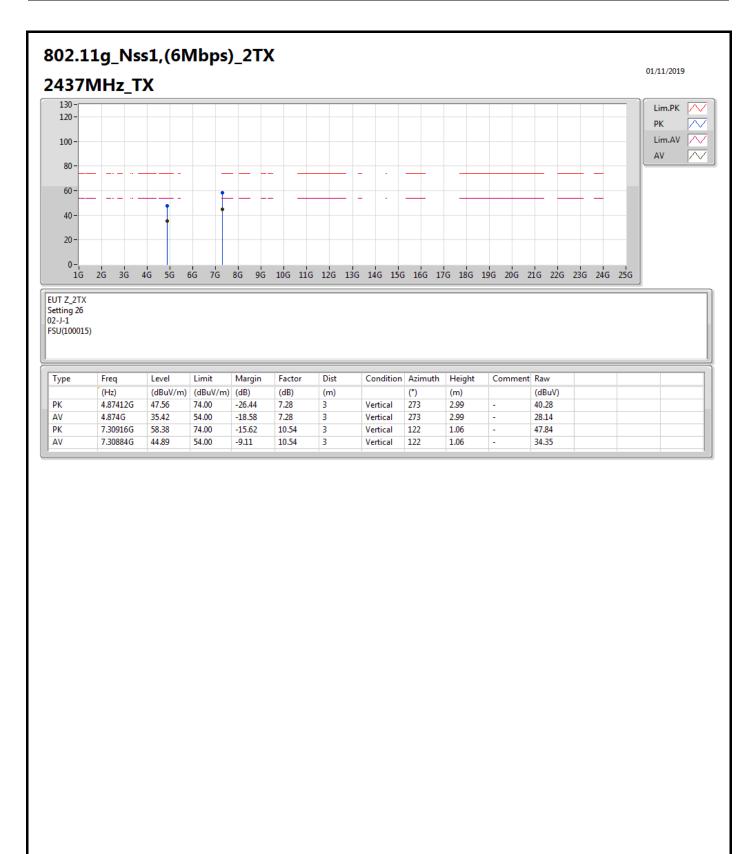




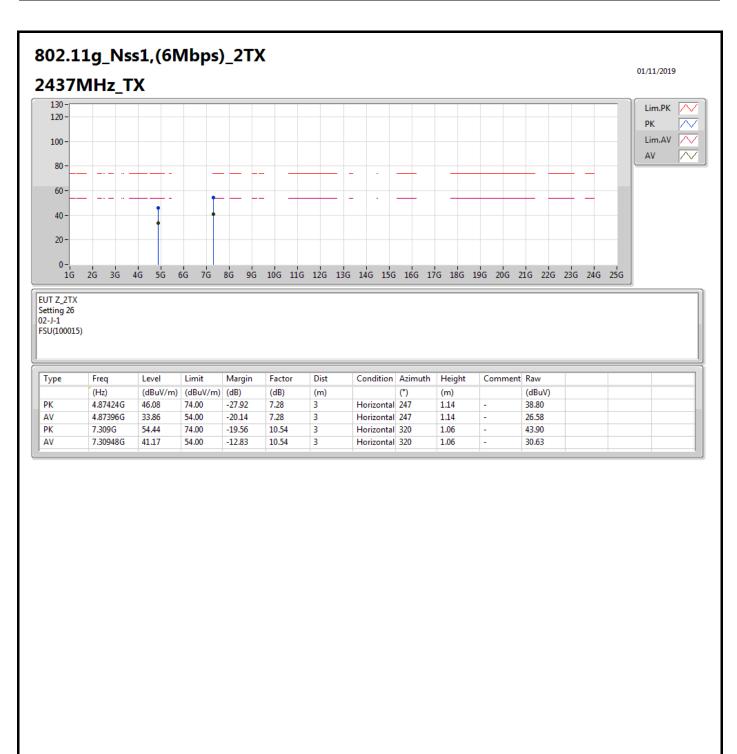




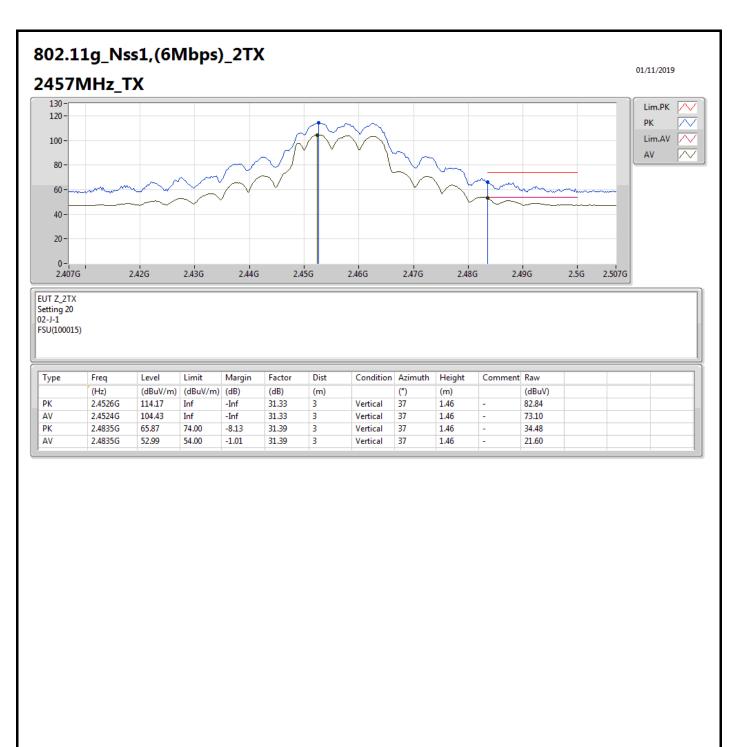




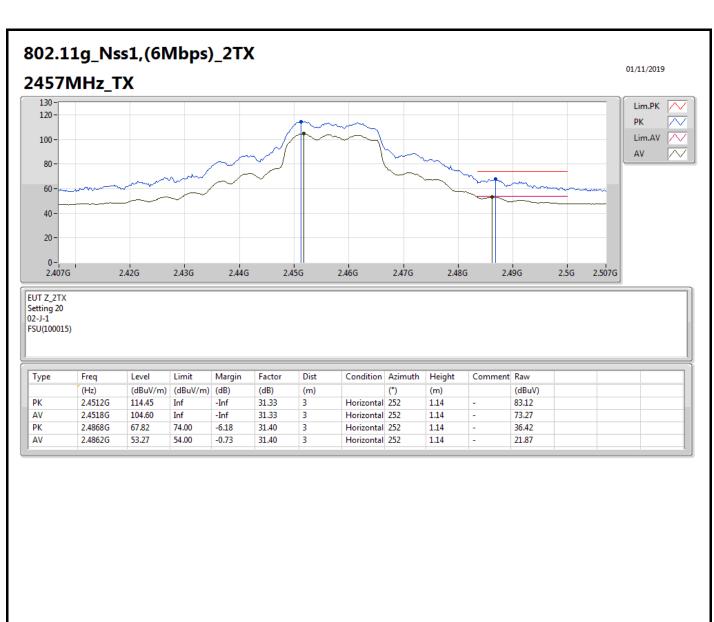




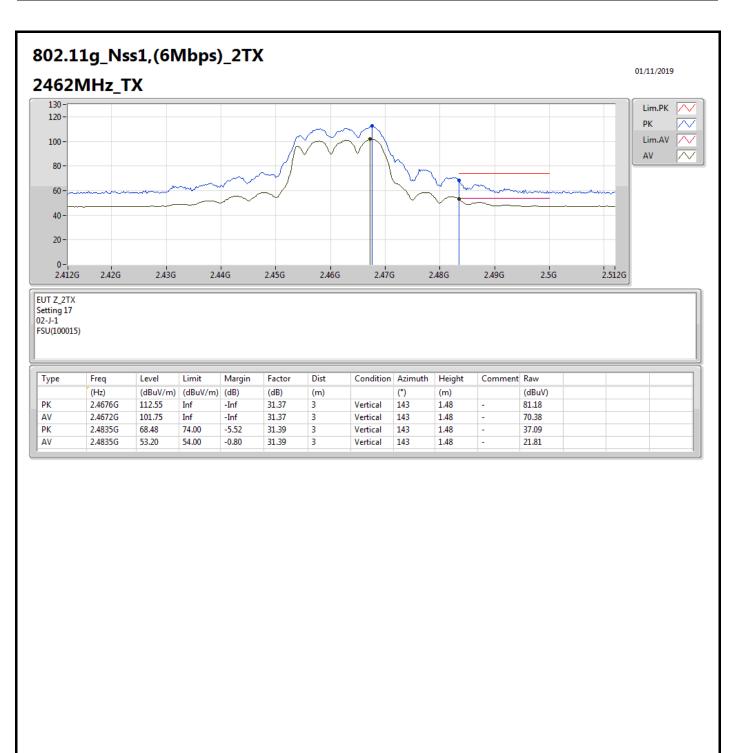




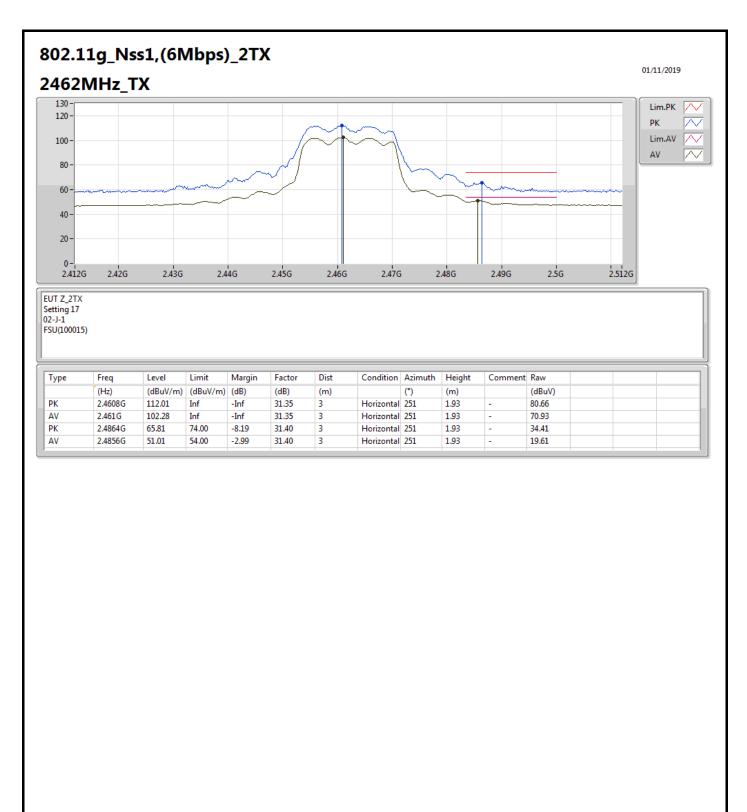




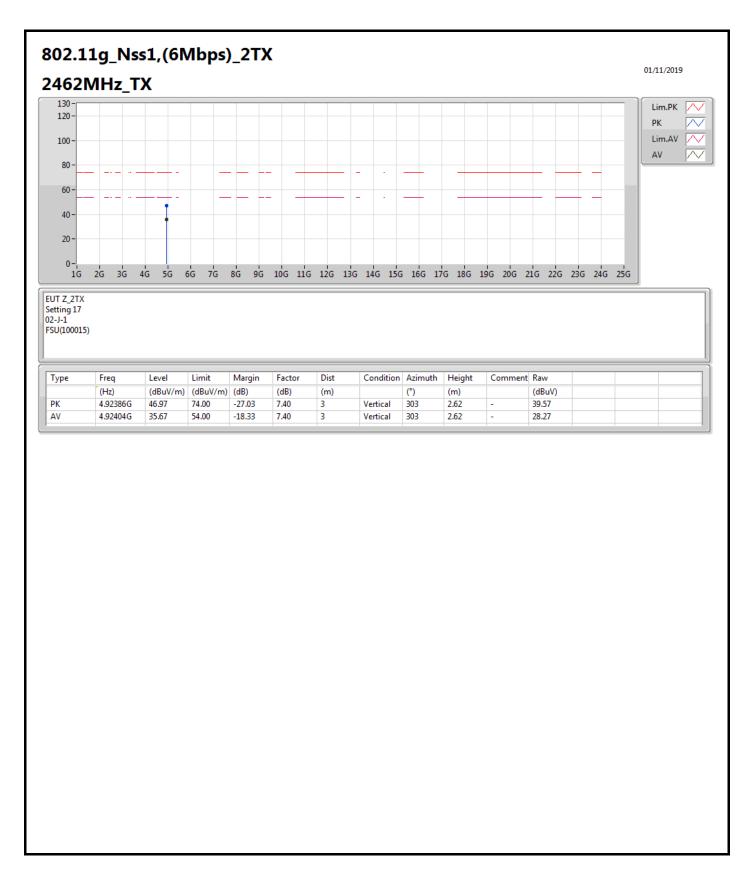




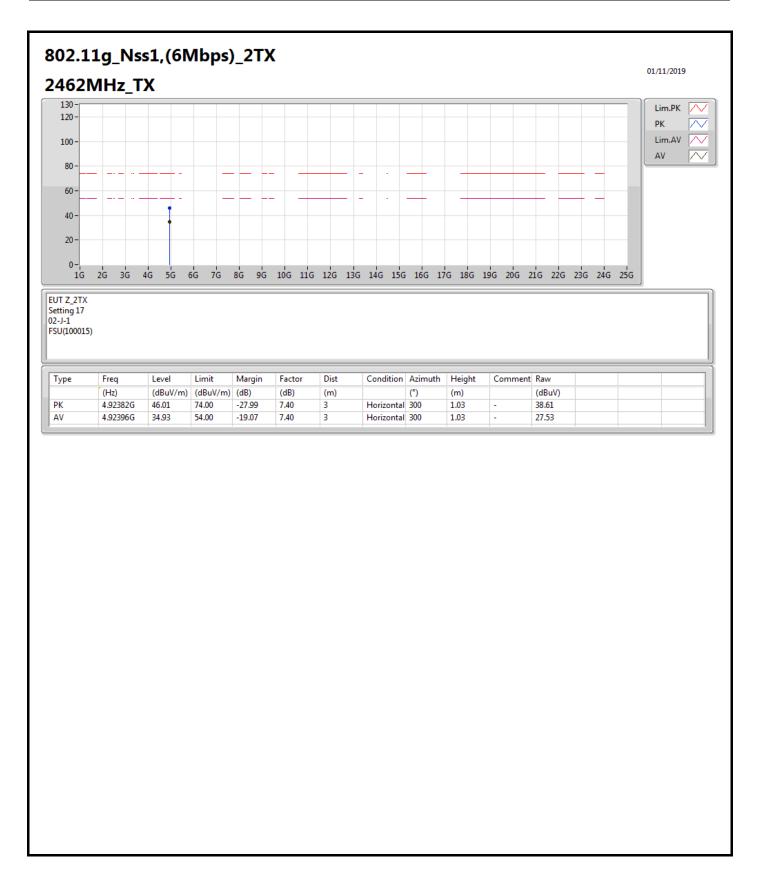




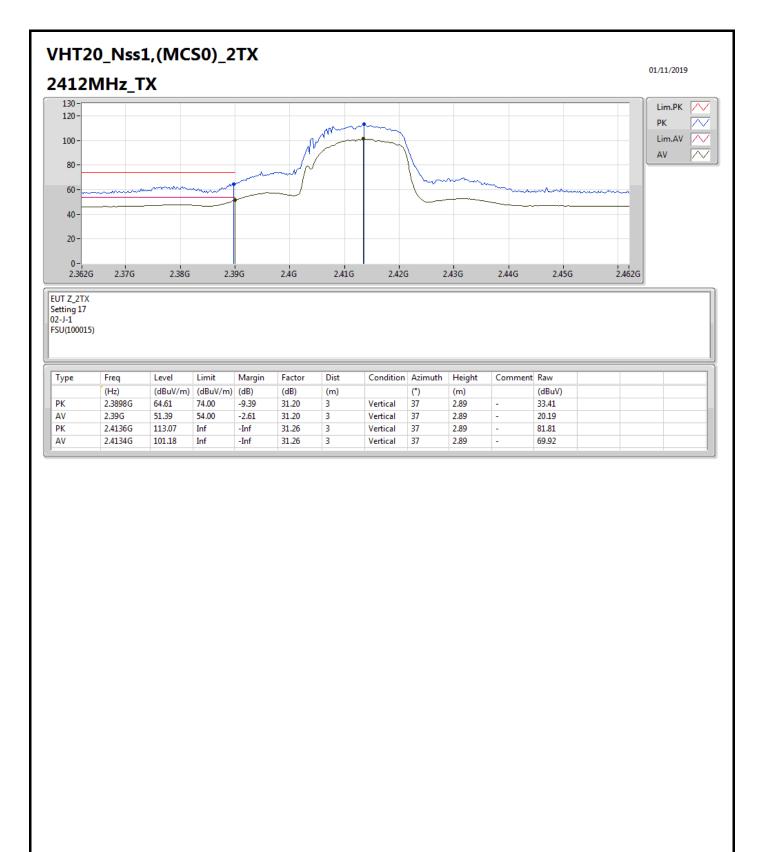




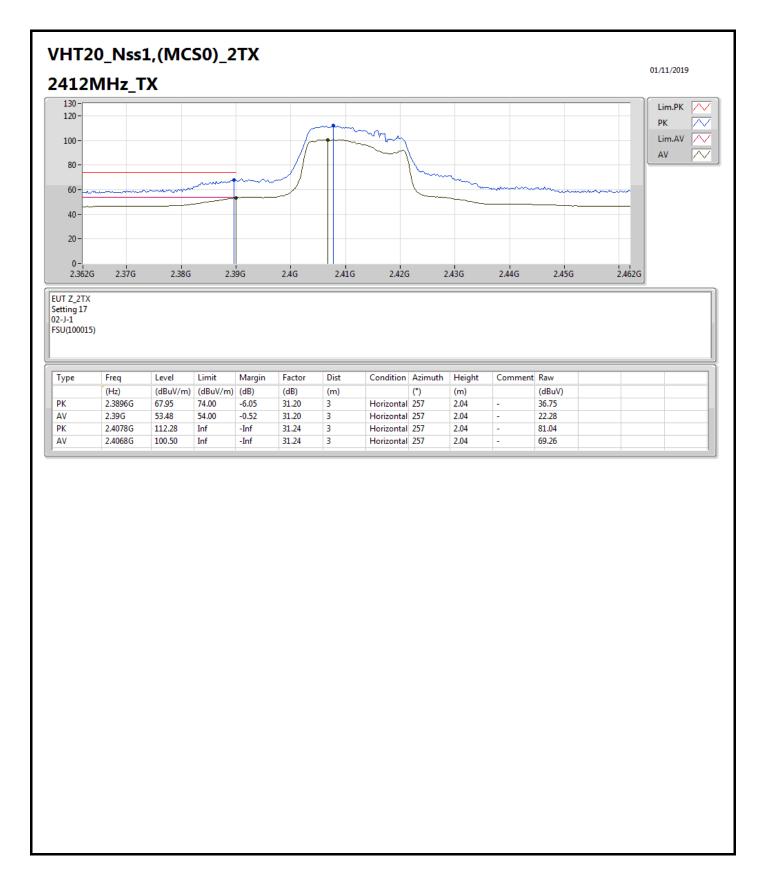




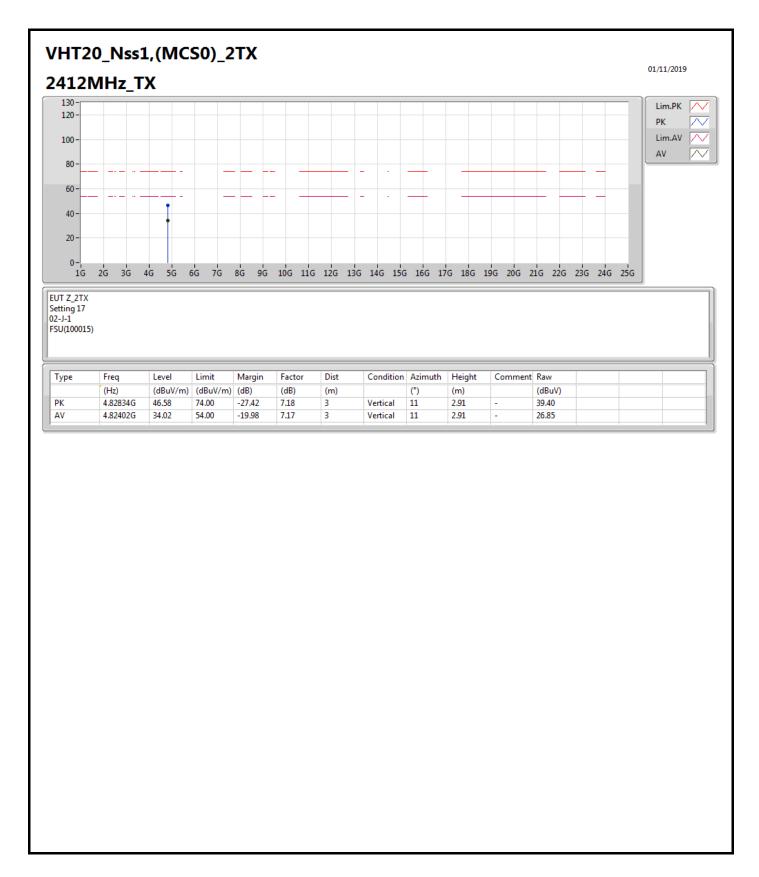




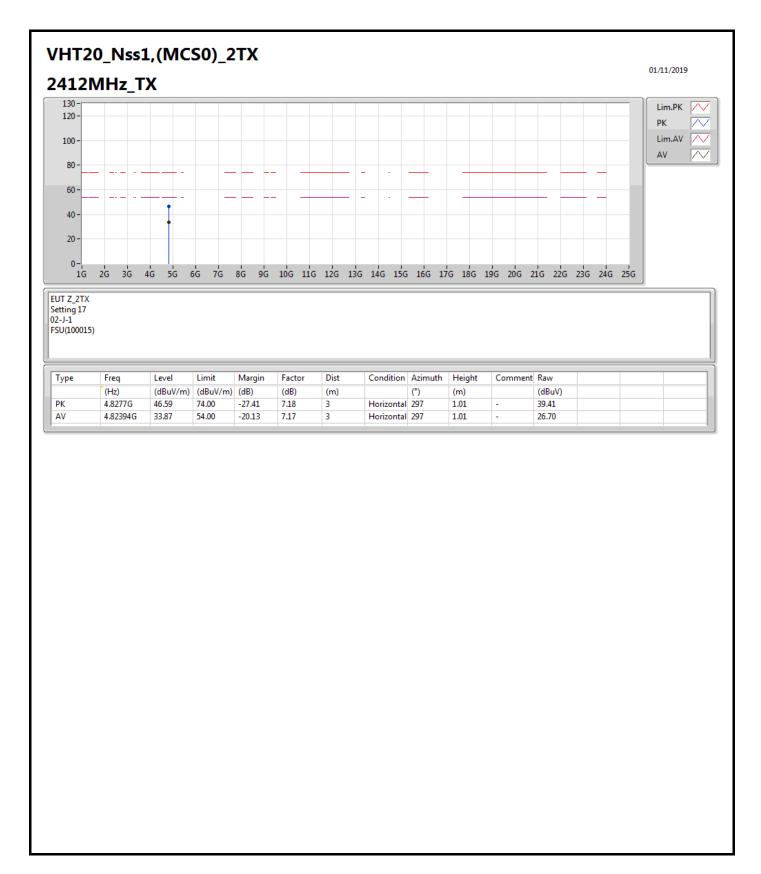




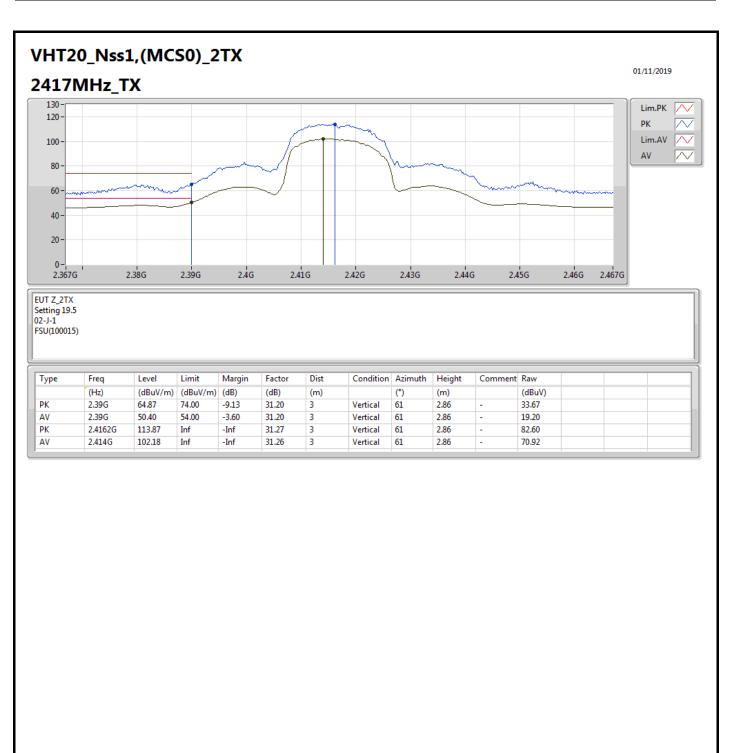




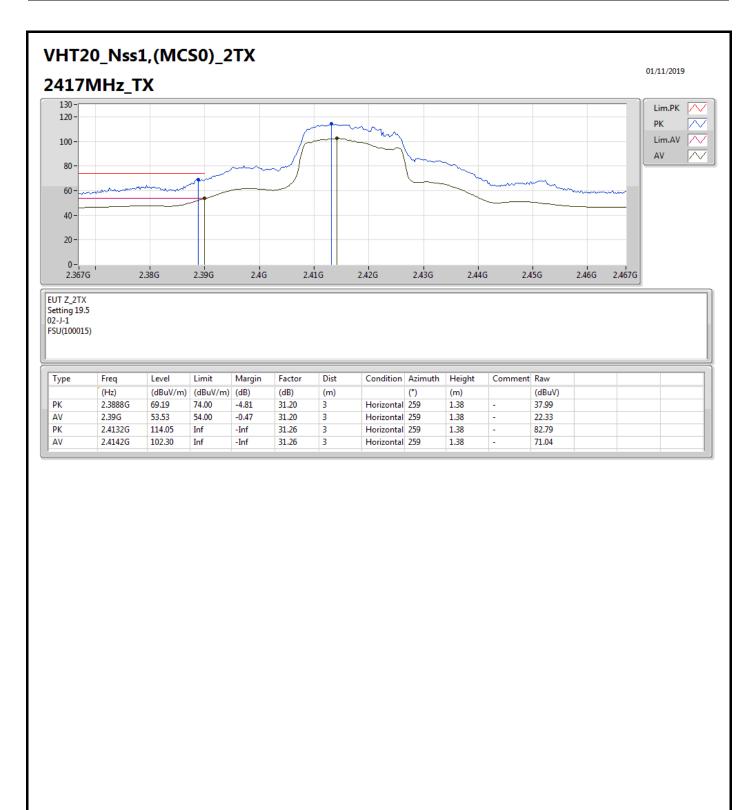




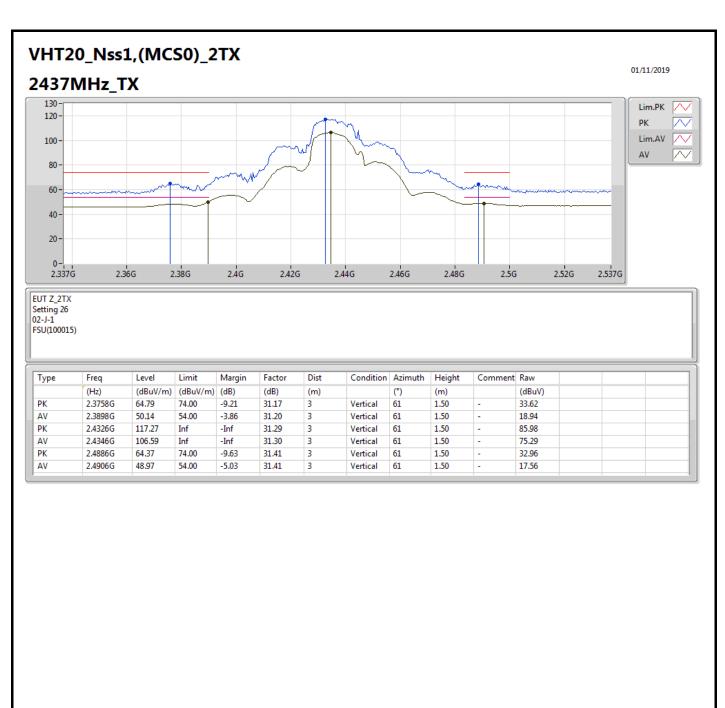




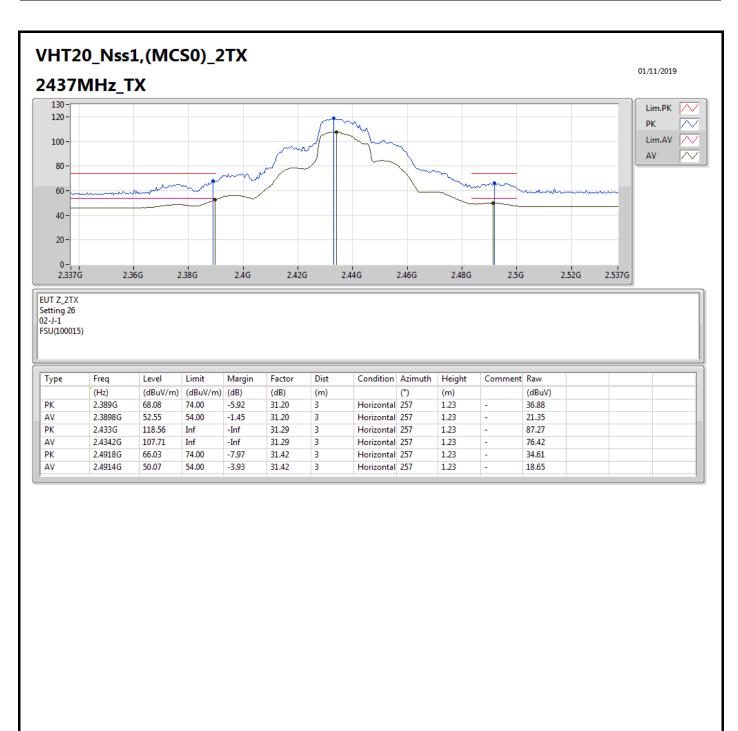




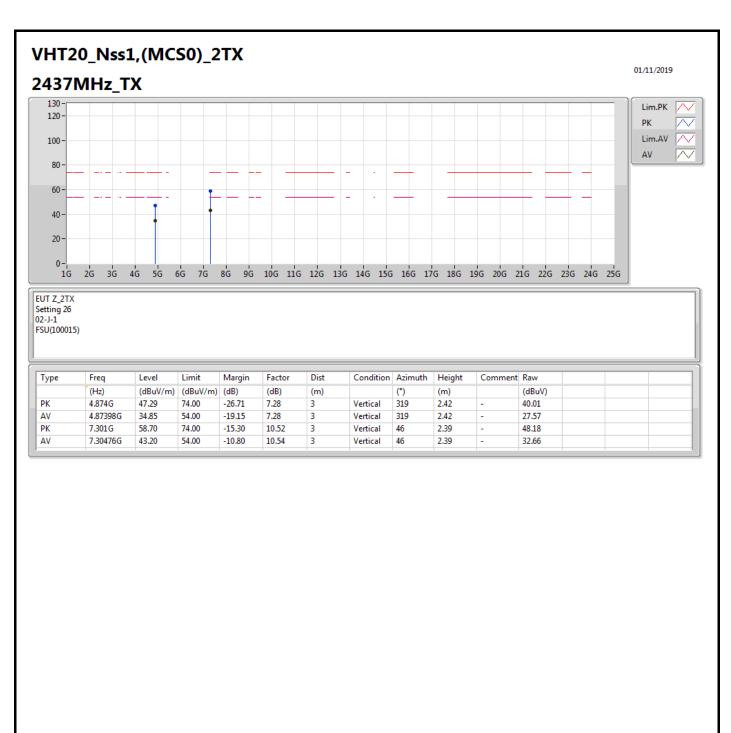




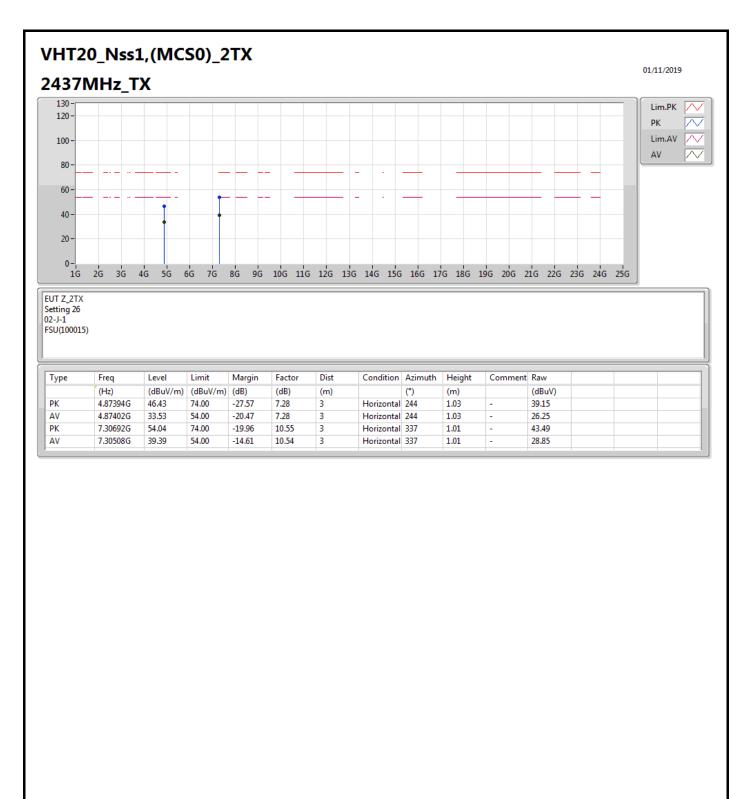




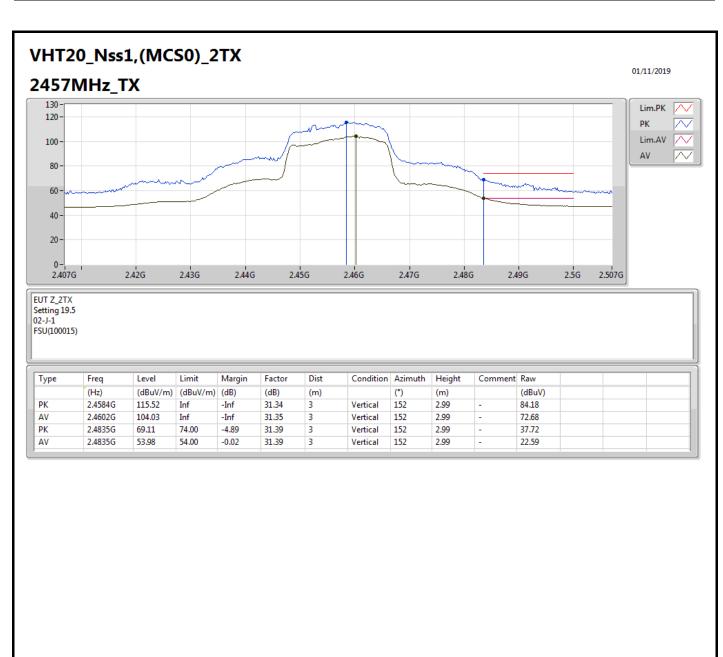




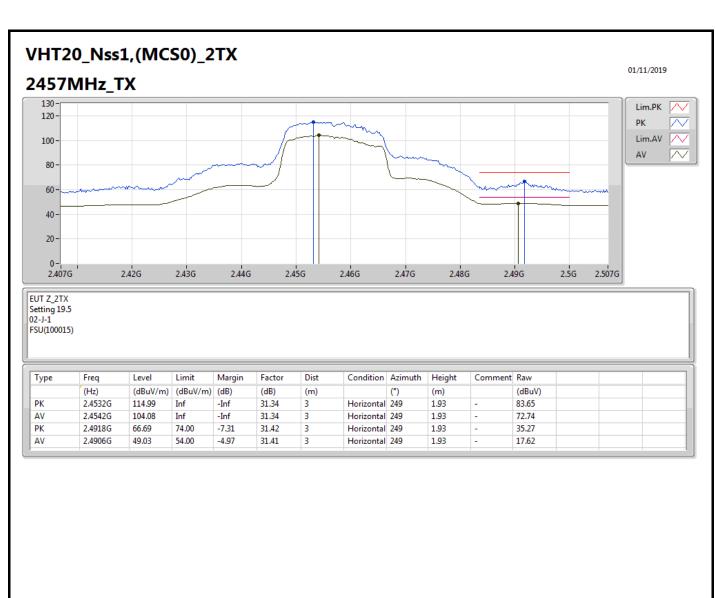




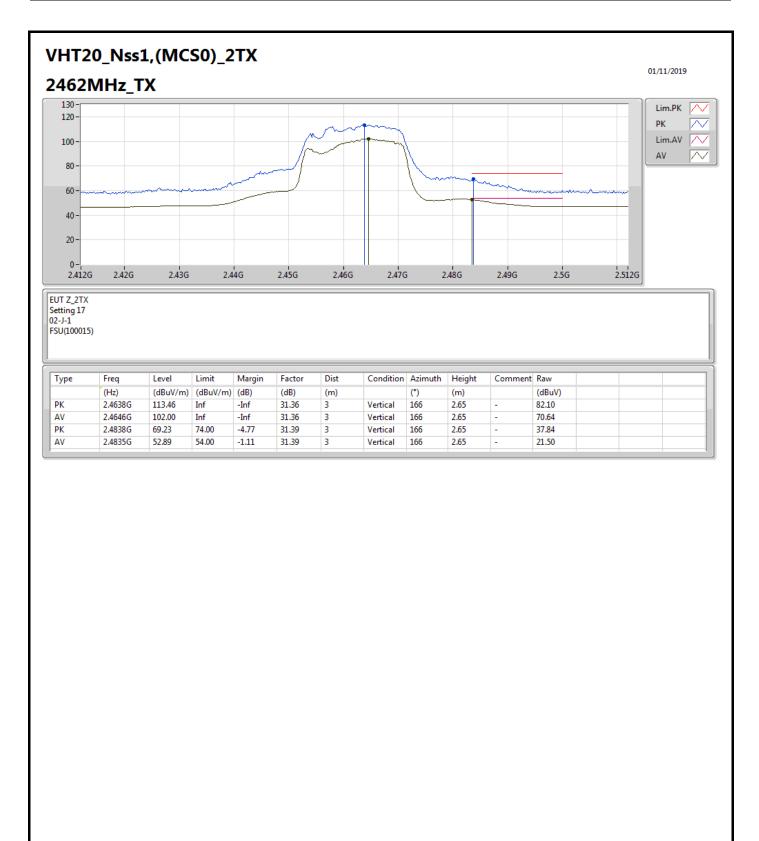




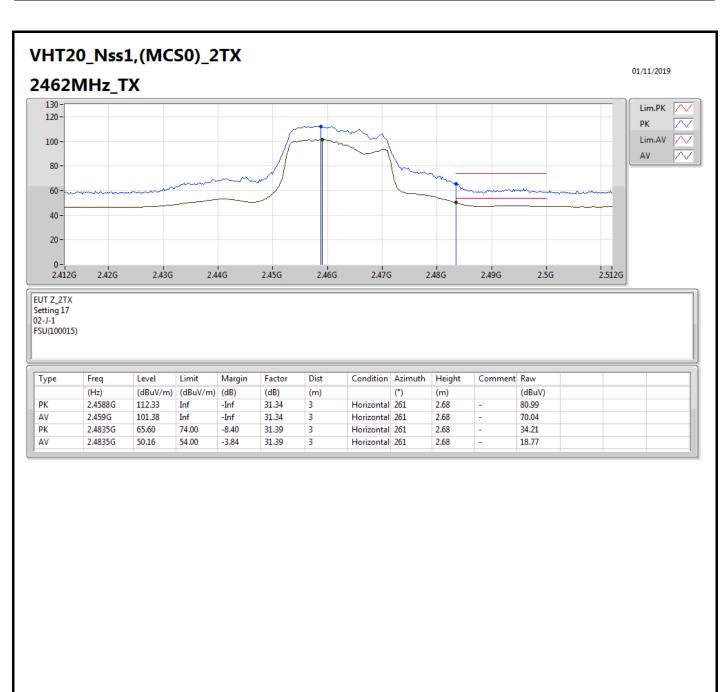




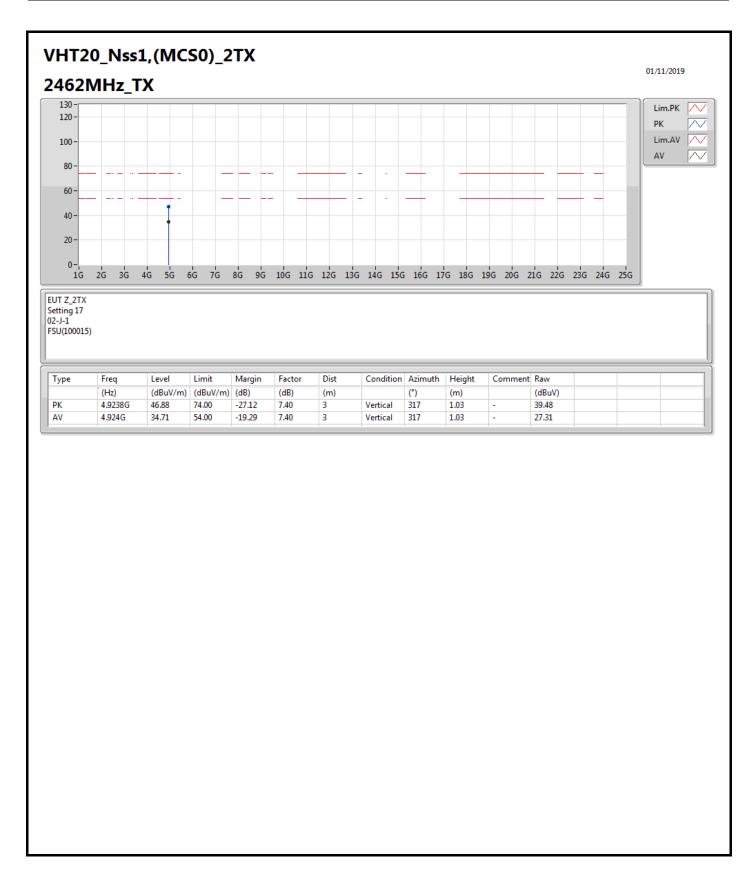




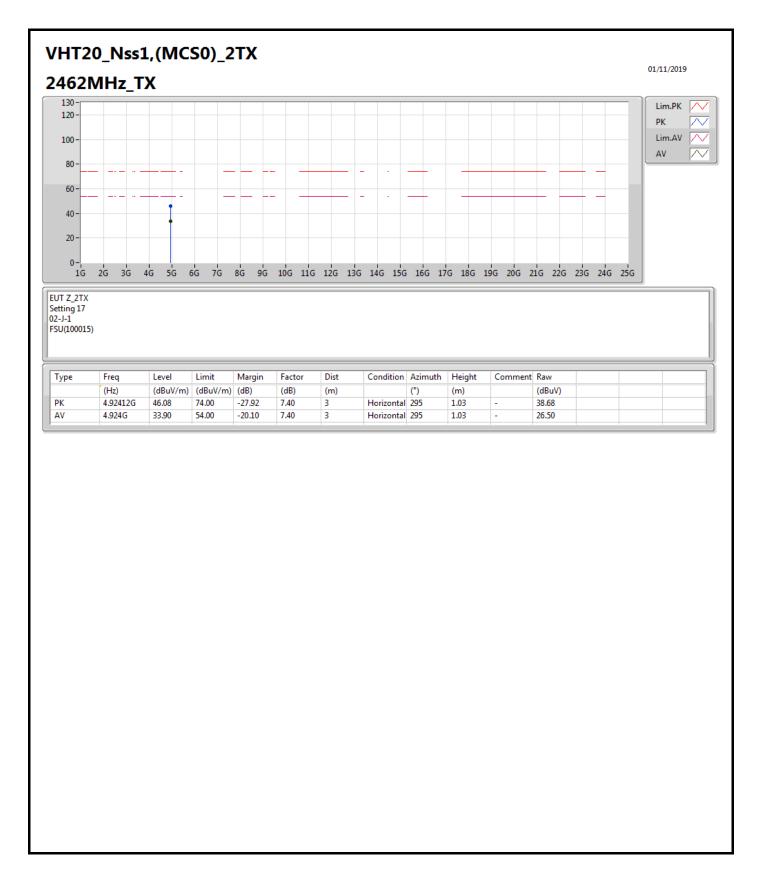




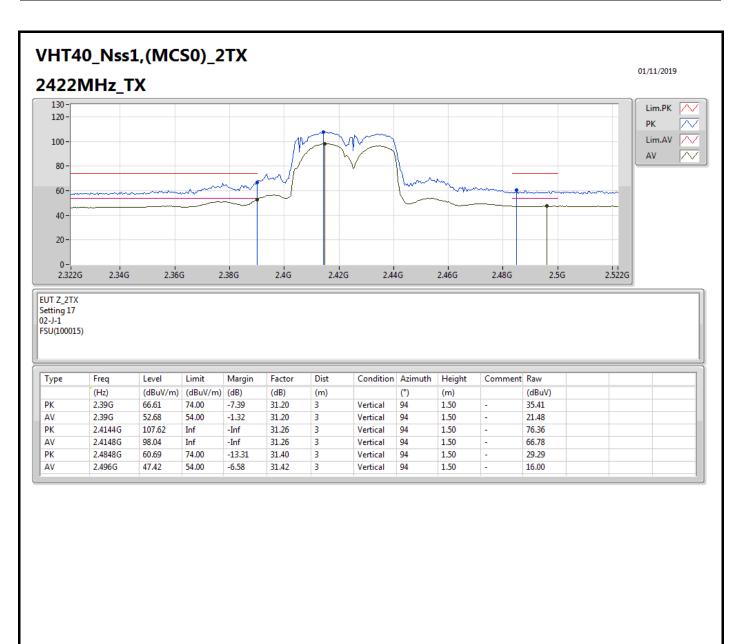




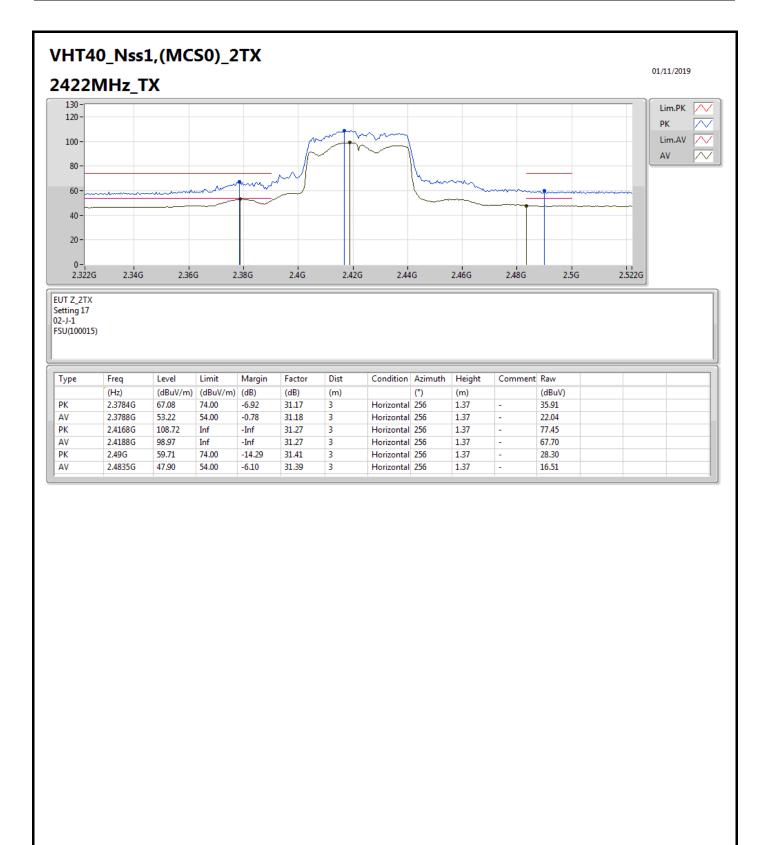




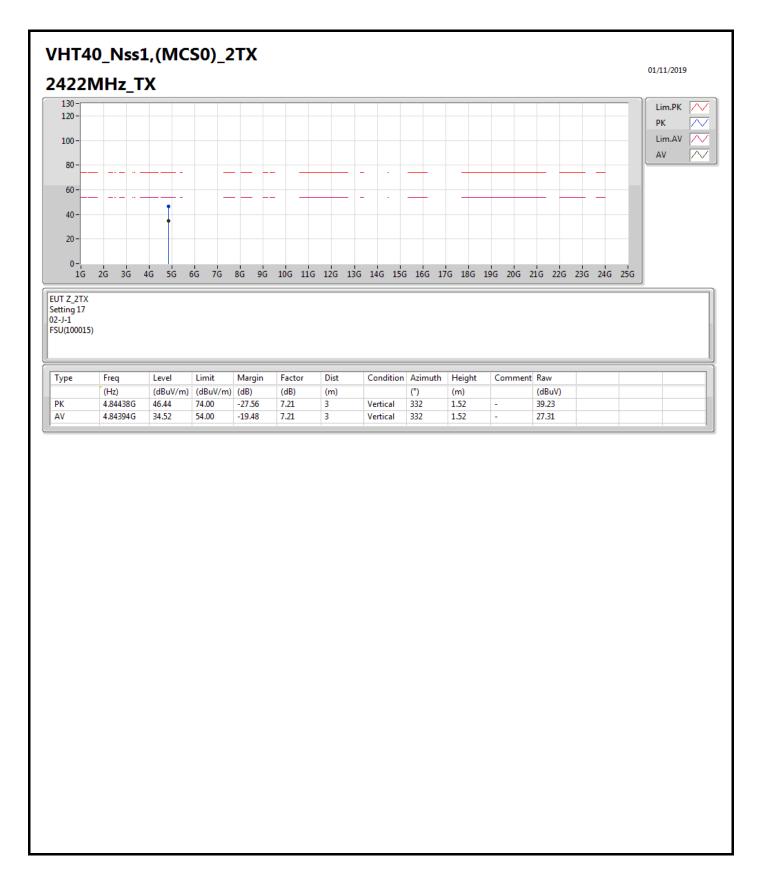




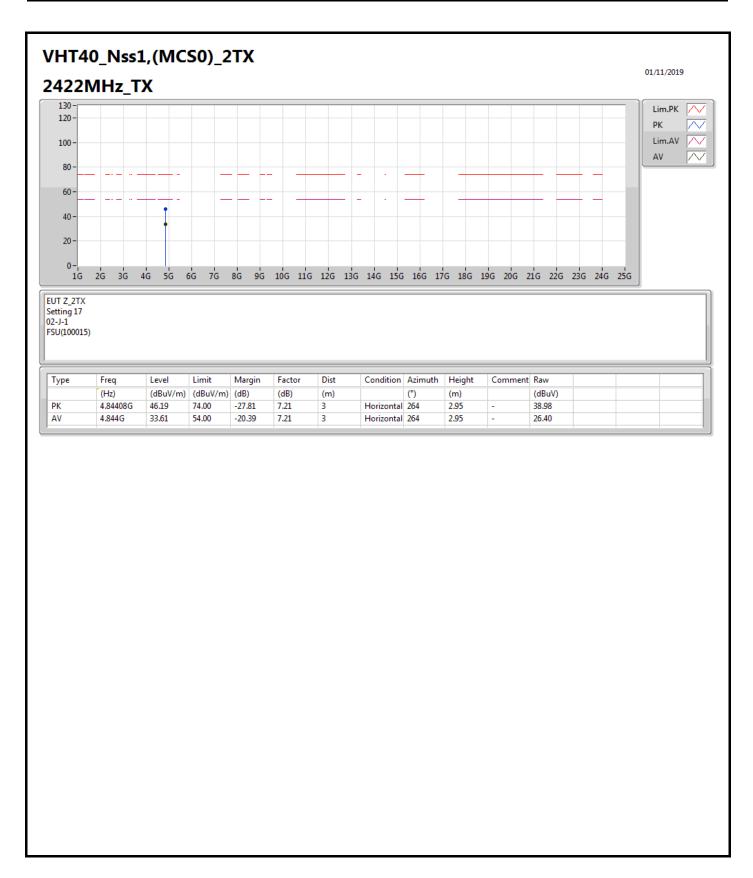




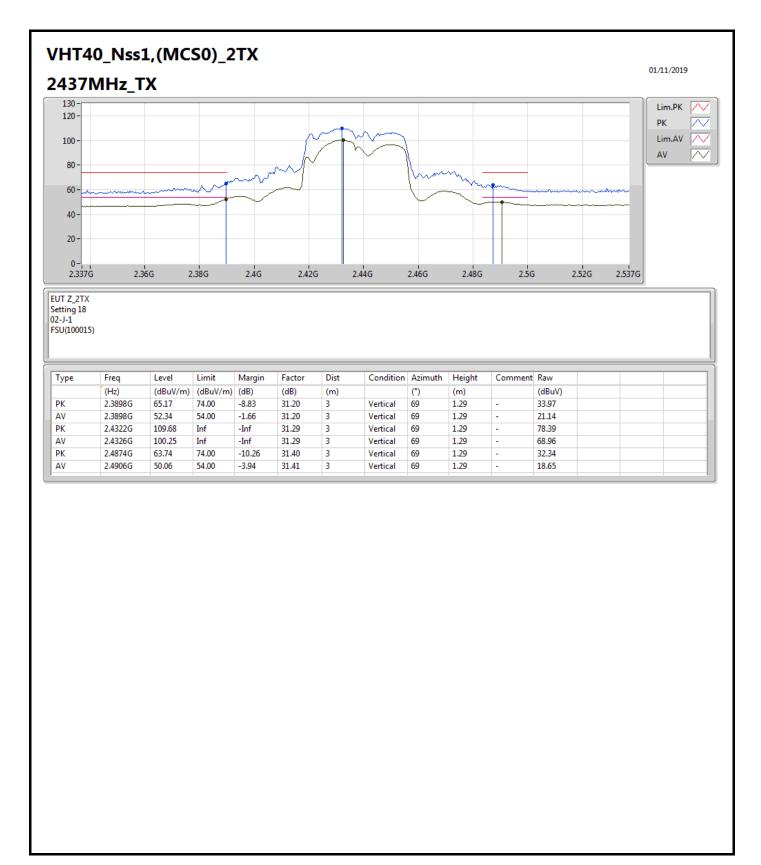




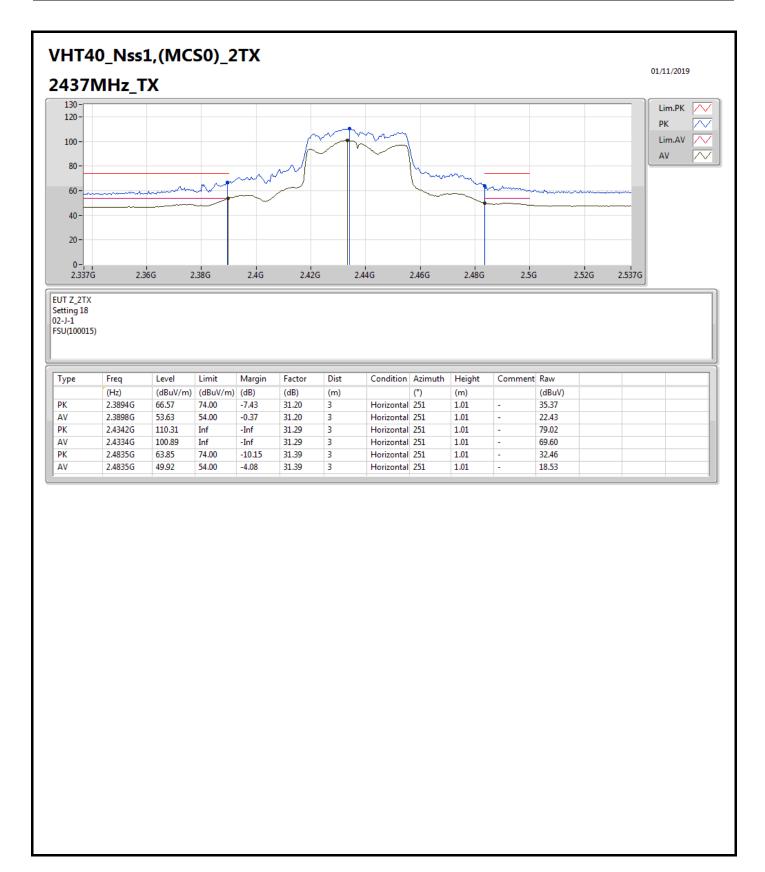




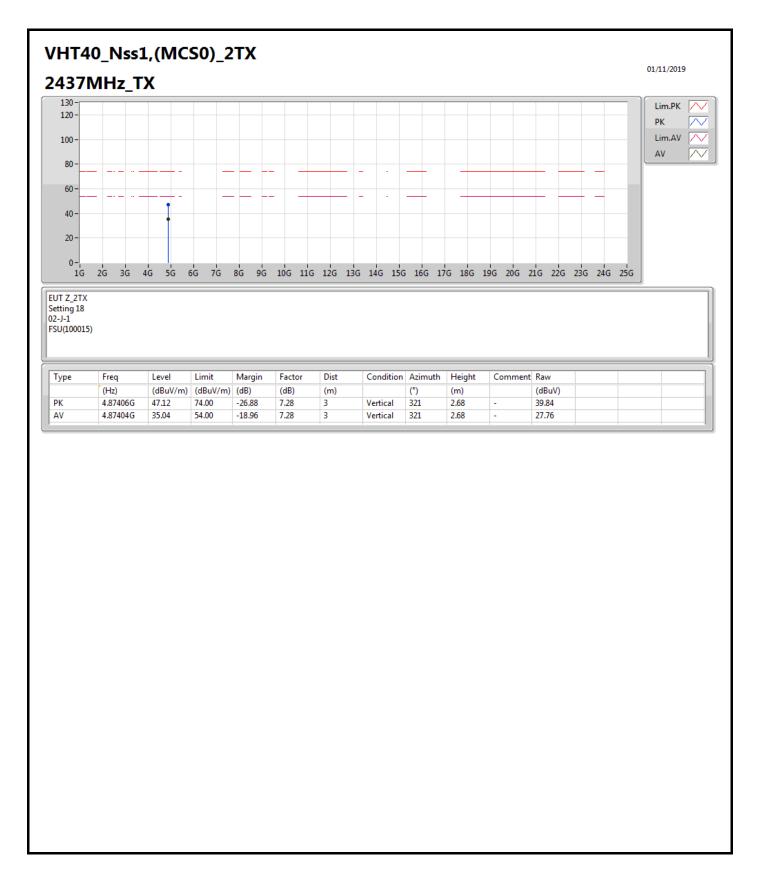




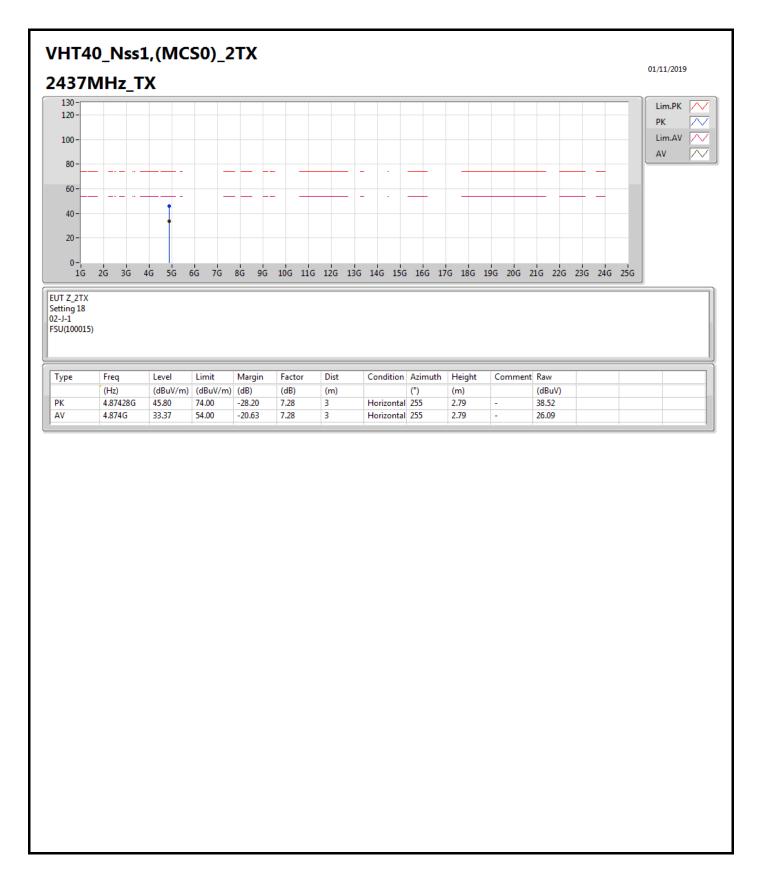




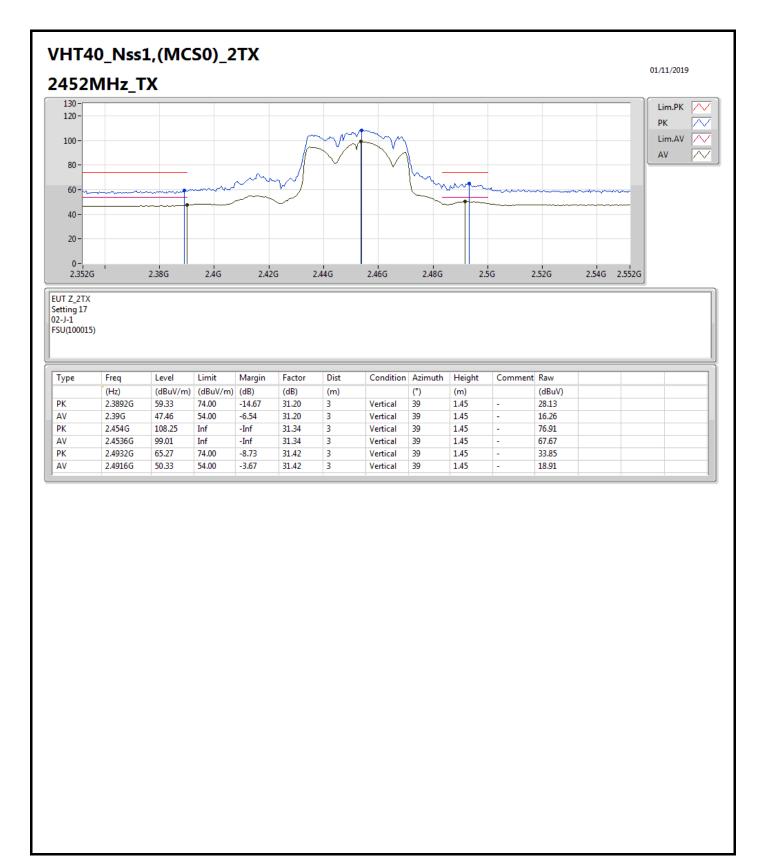




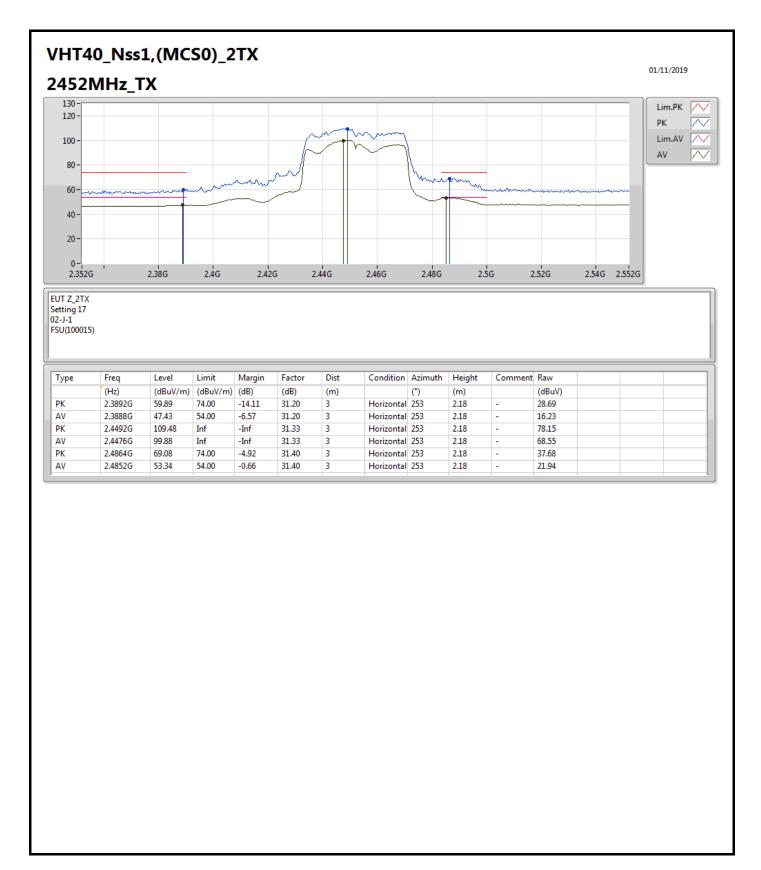




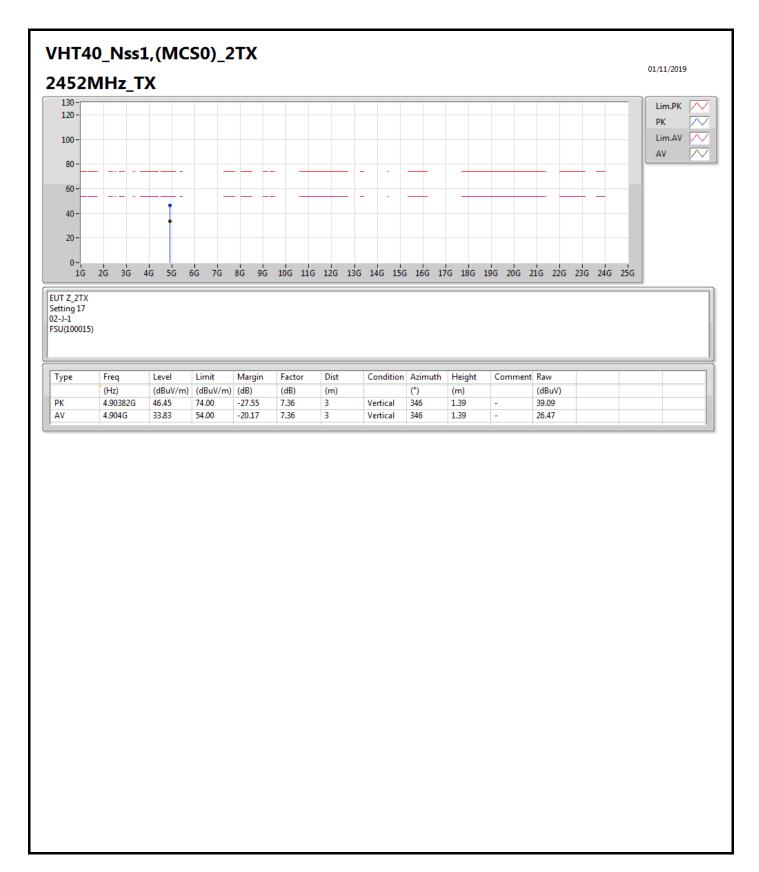




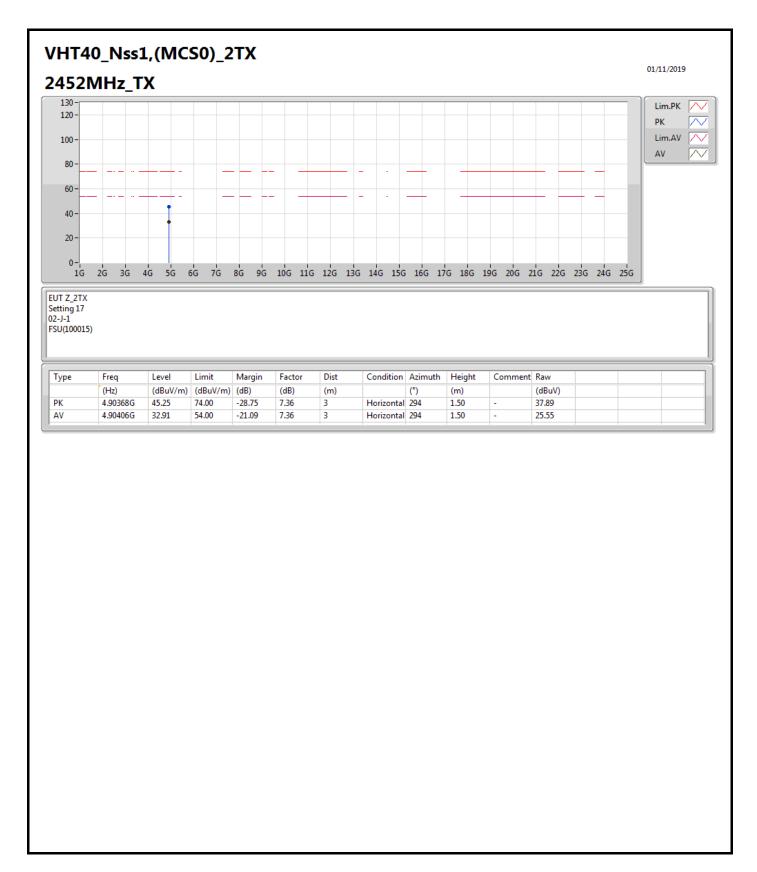














RSE TX above 1GHz

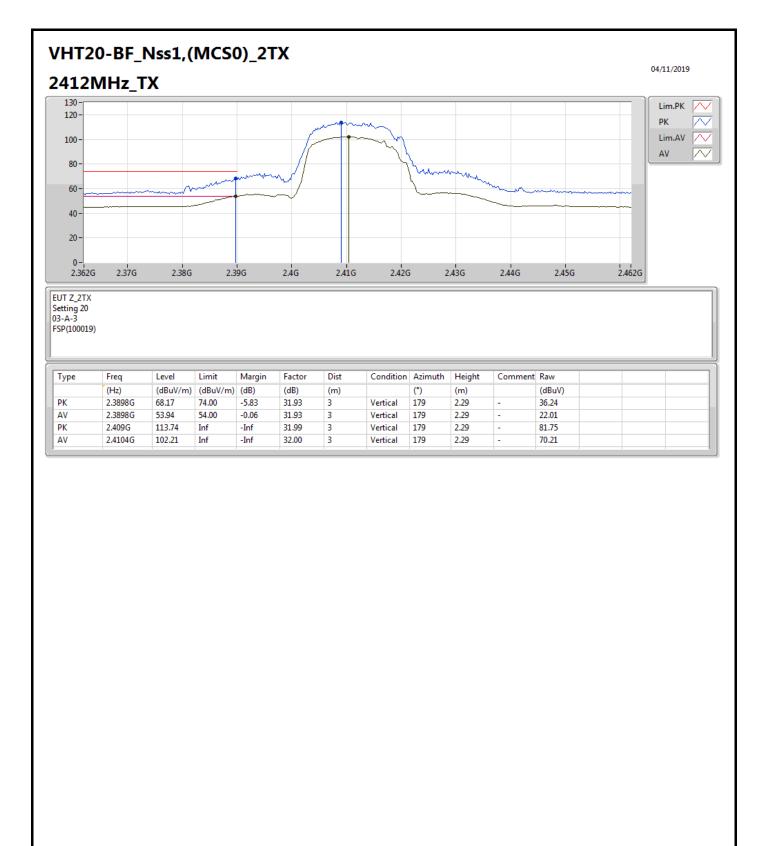
Appendix F.3

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-BF_Nss1,(MCS0)_2TX	Pass	AV	2.3898G	53.94	54.00	-0.06	31.93	3	Vertical	179	2.29	-

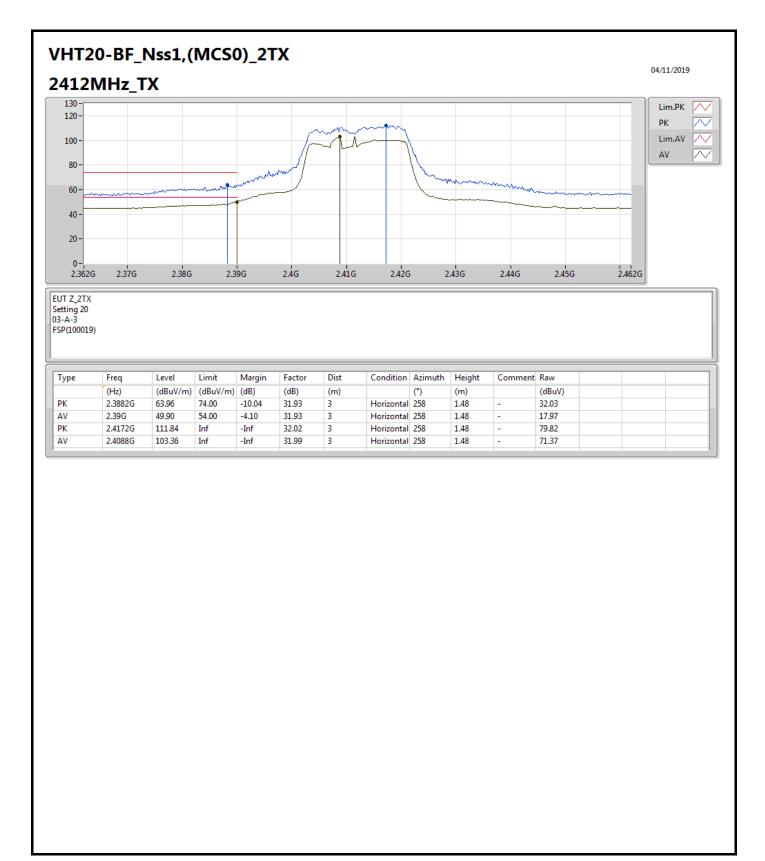
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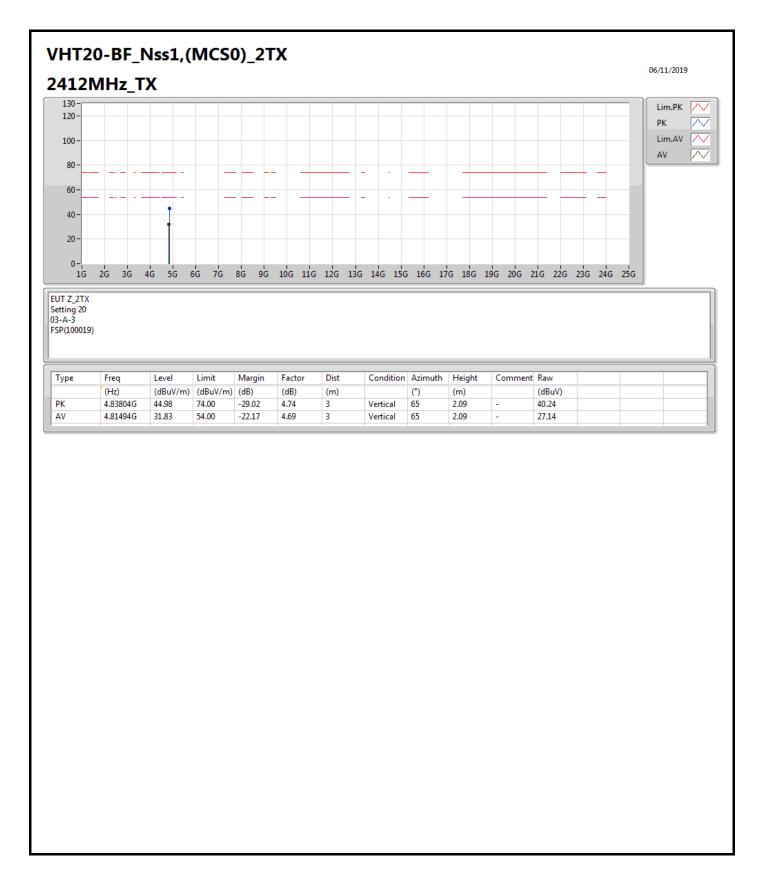
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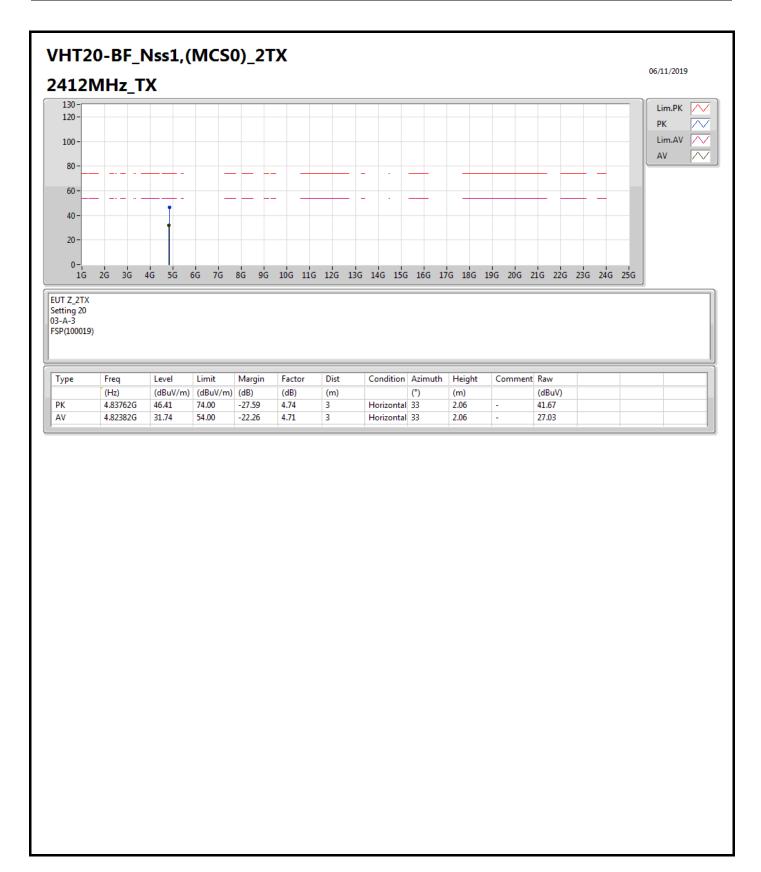
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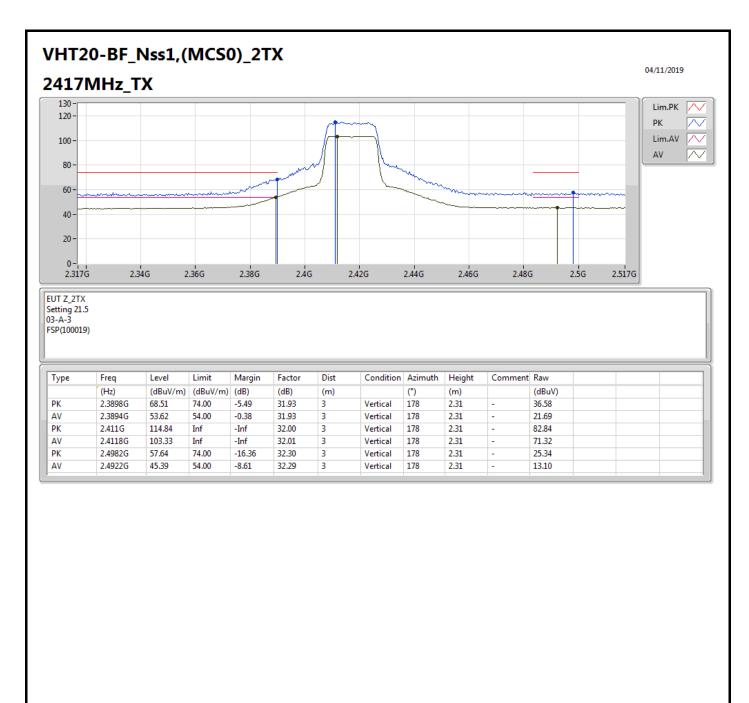
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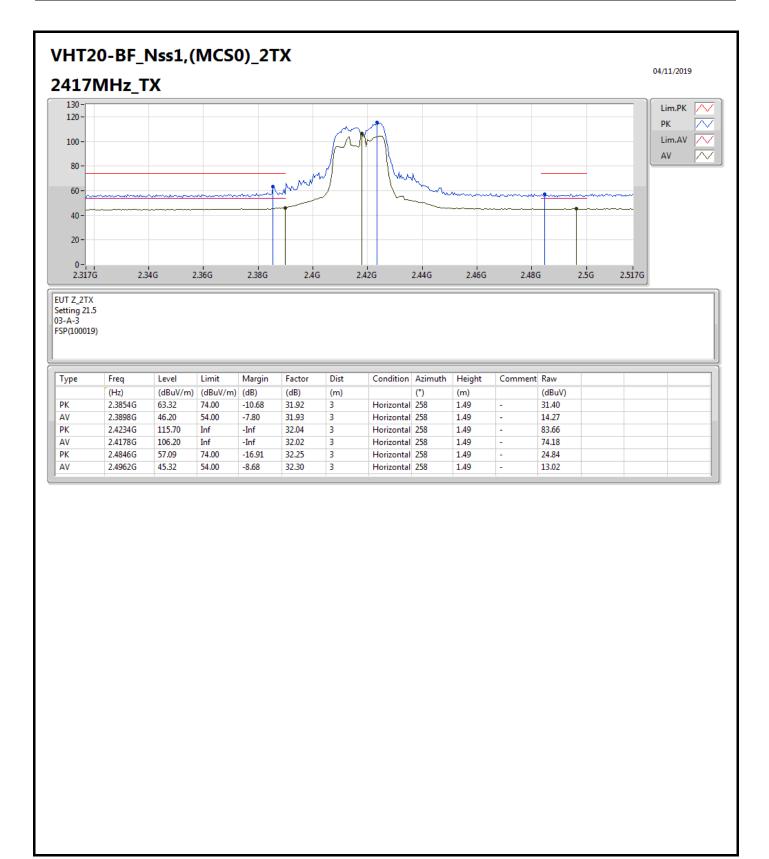


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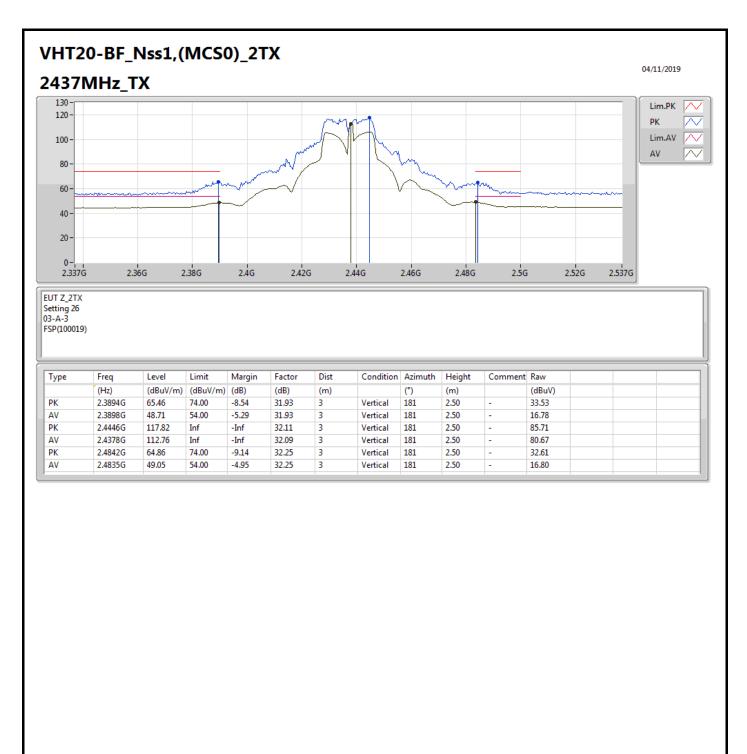






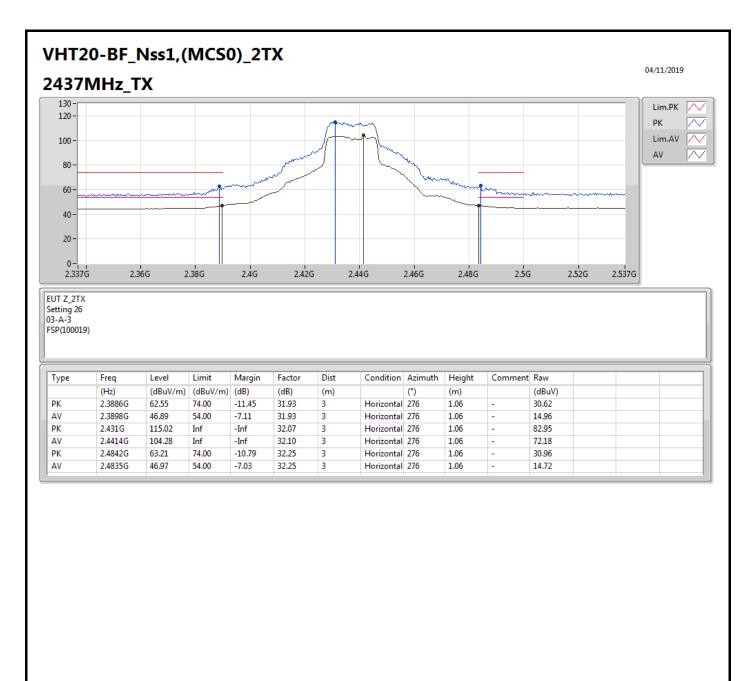
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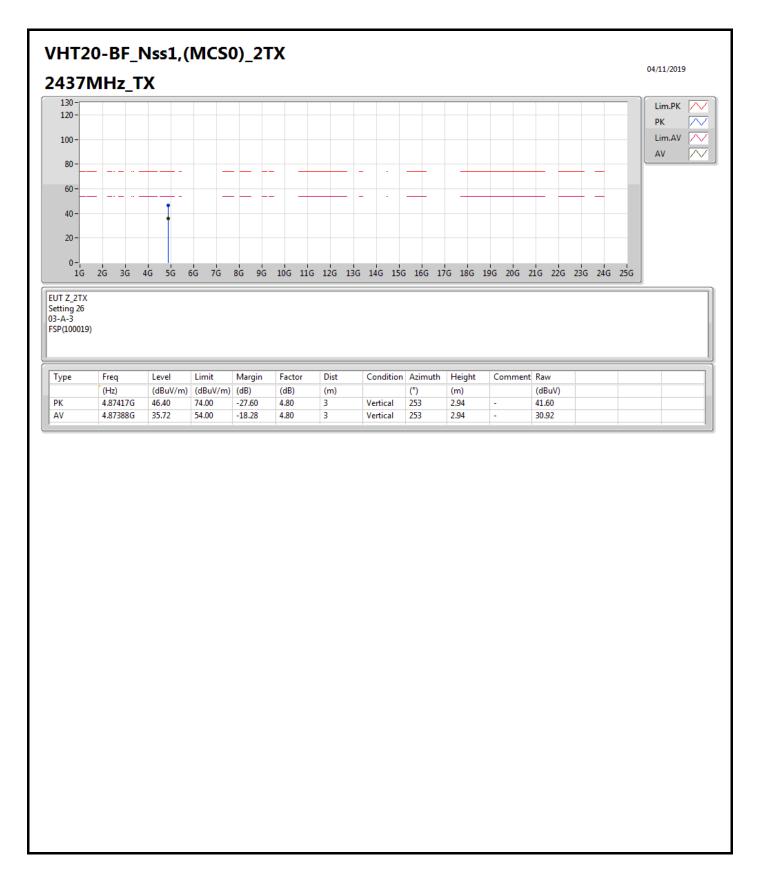
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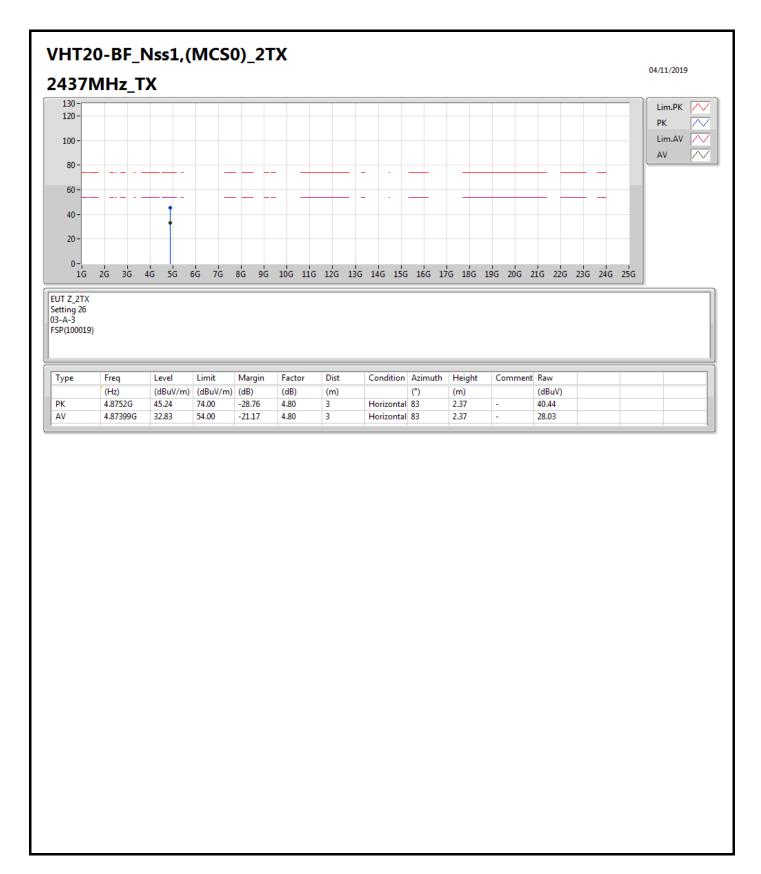
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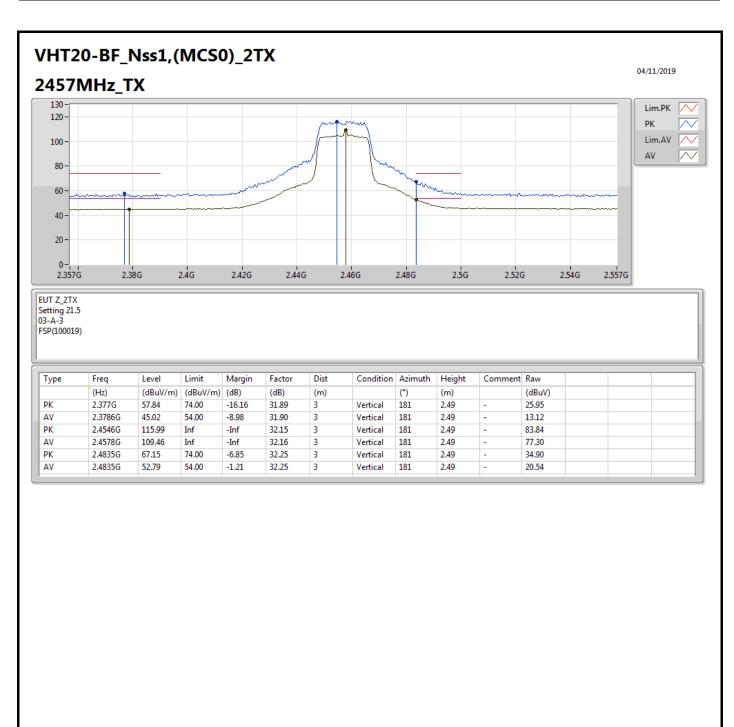
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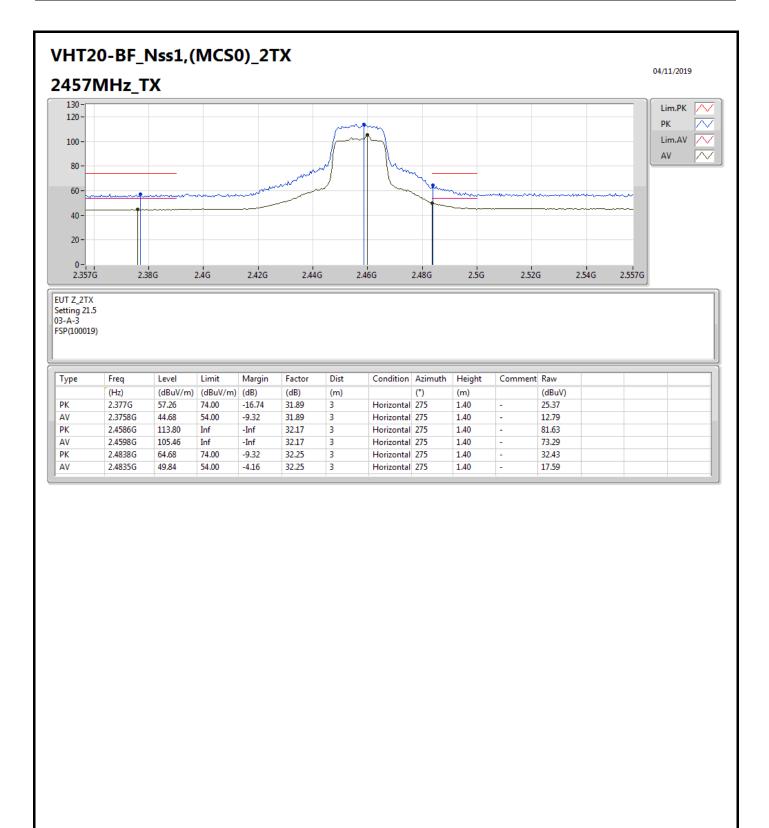


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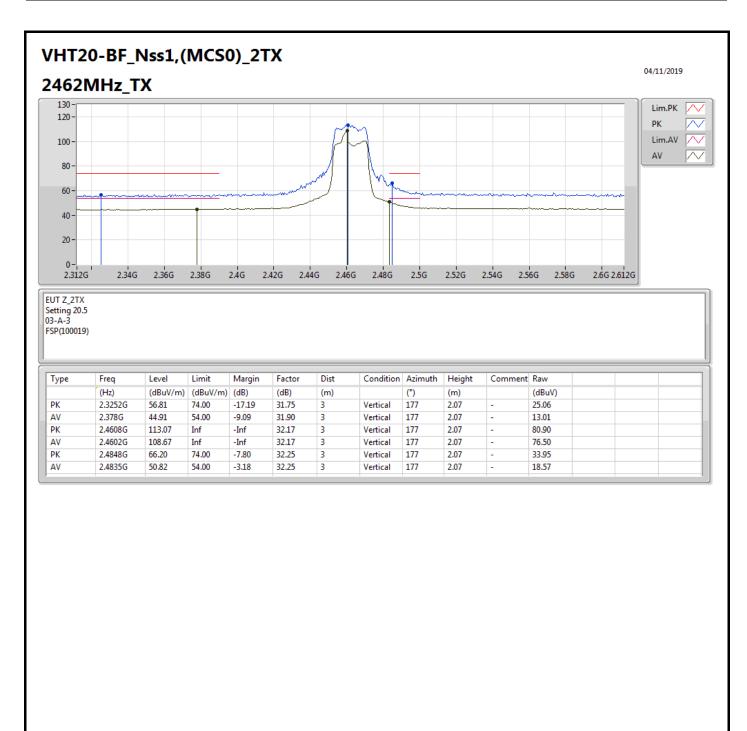






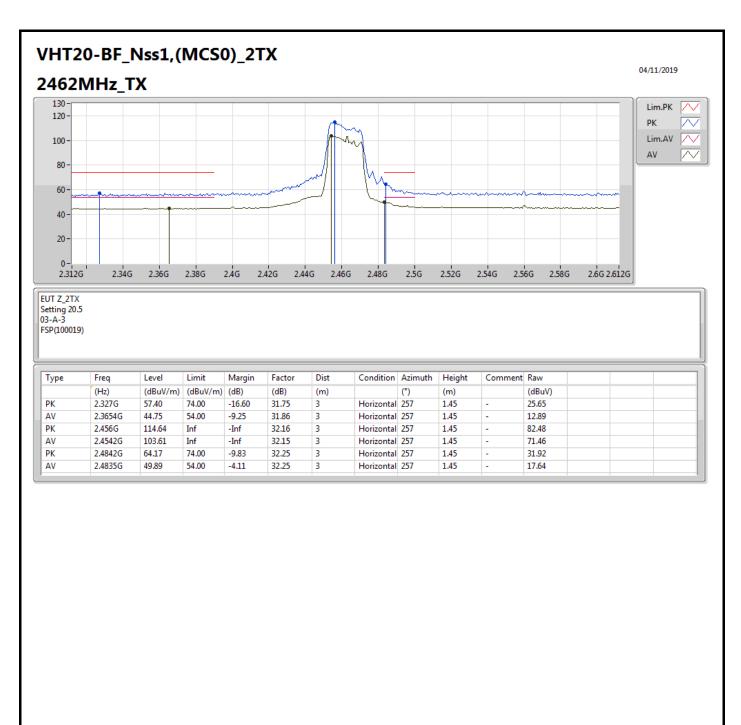
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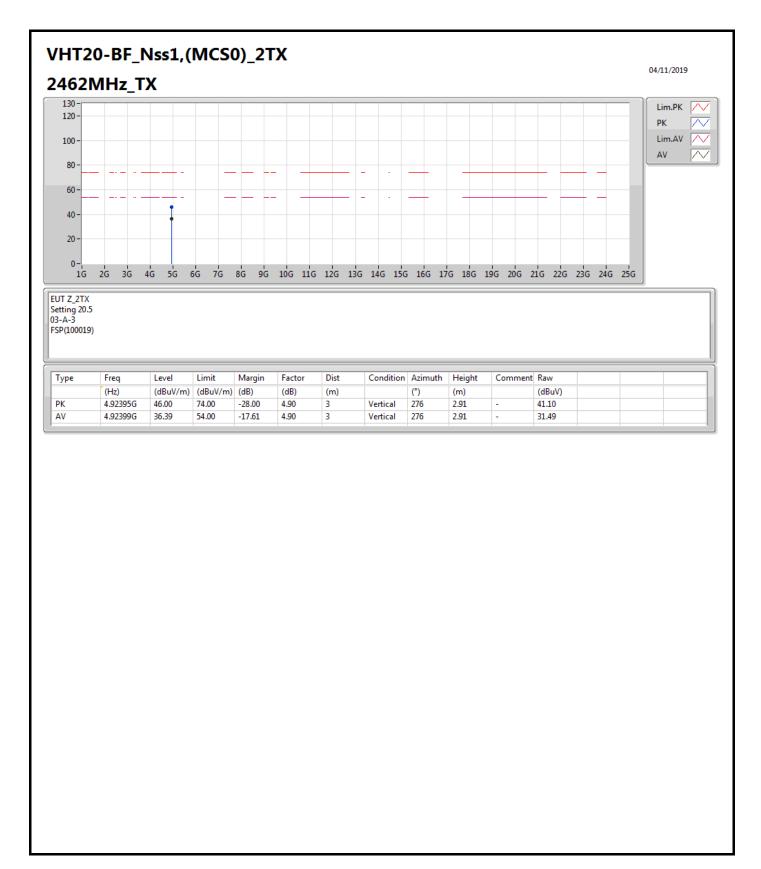
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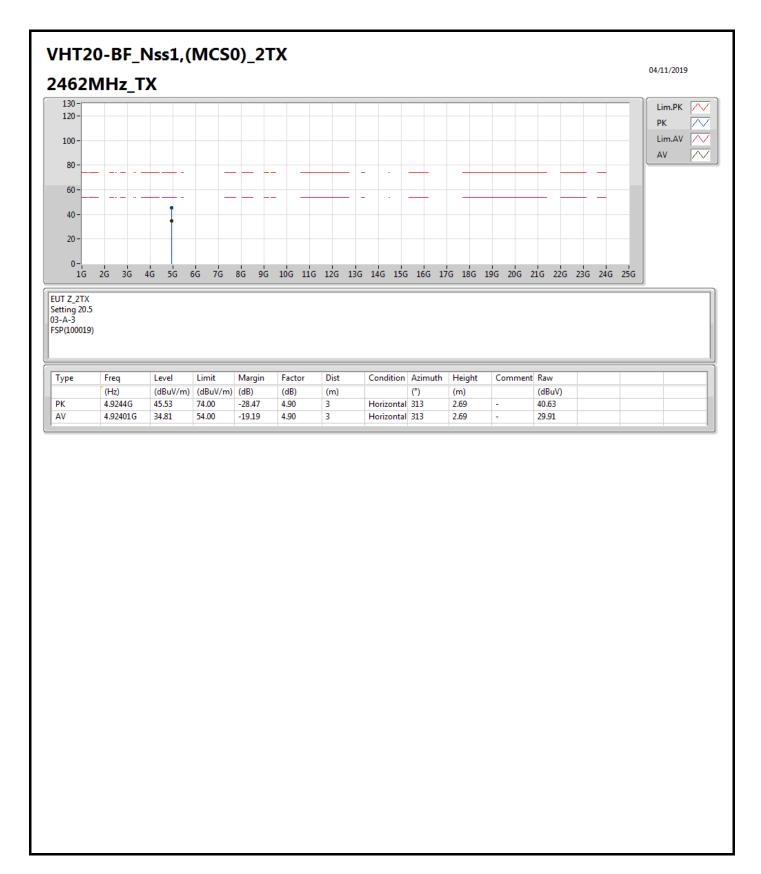
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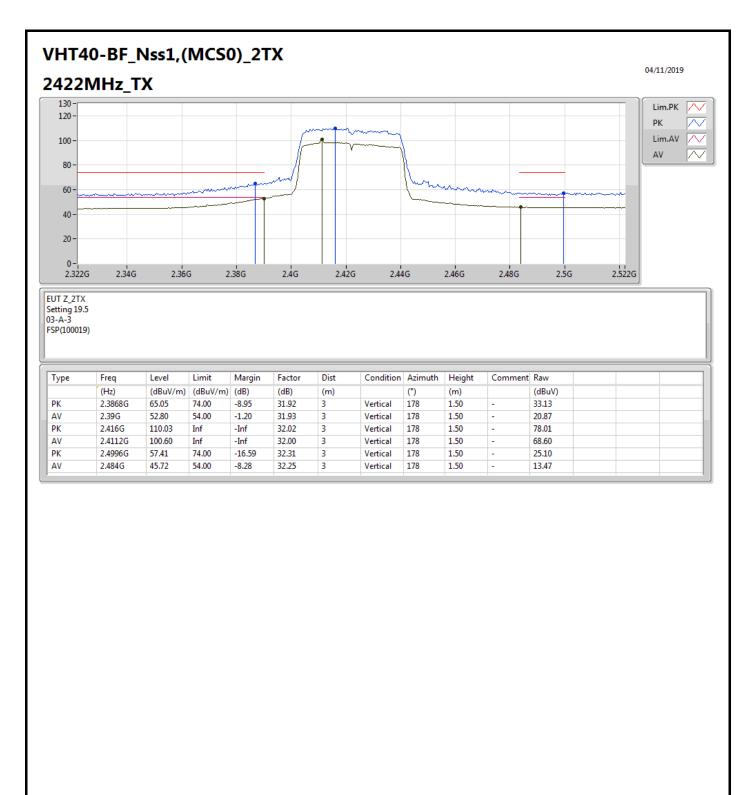
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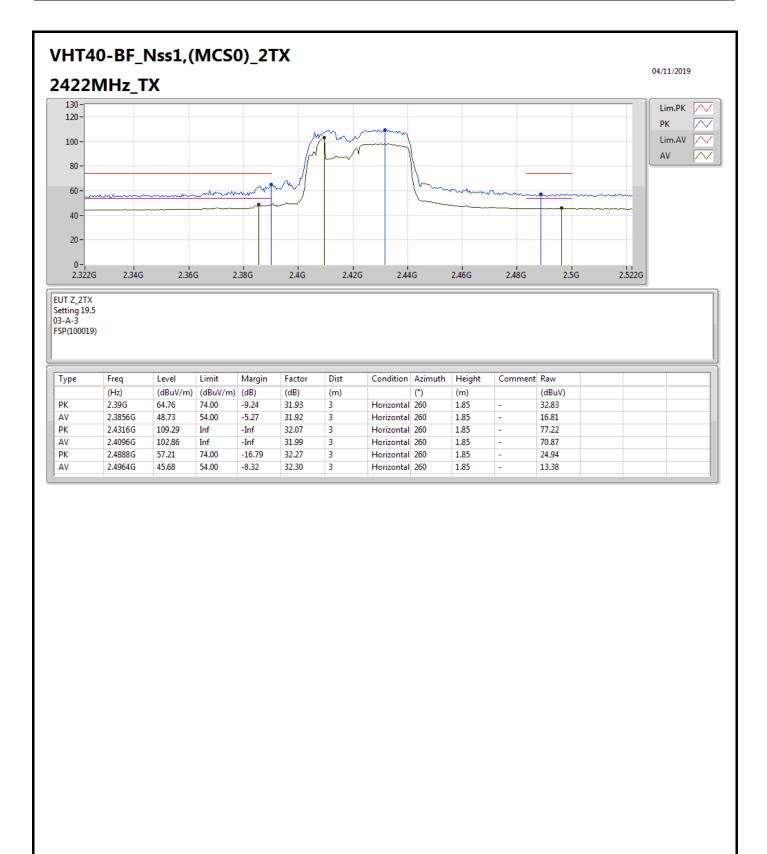
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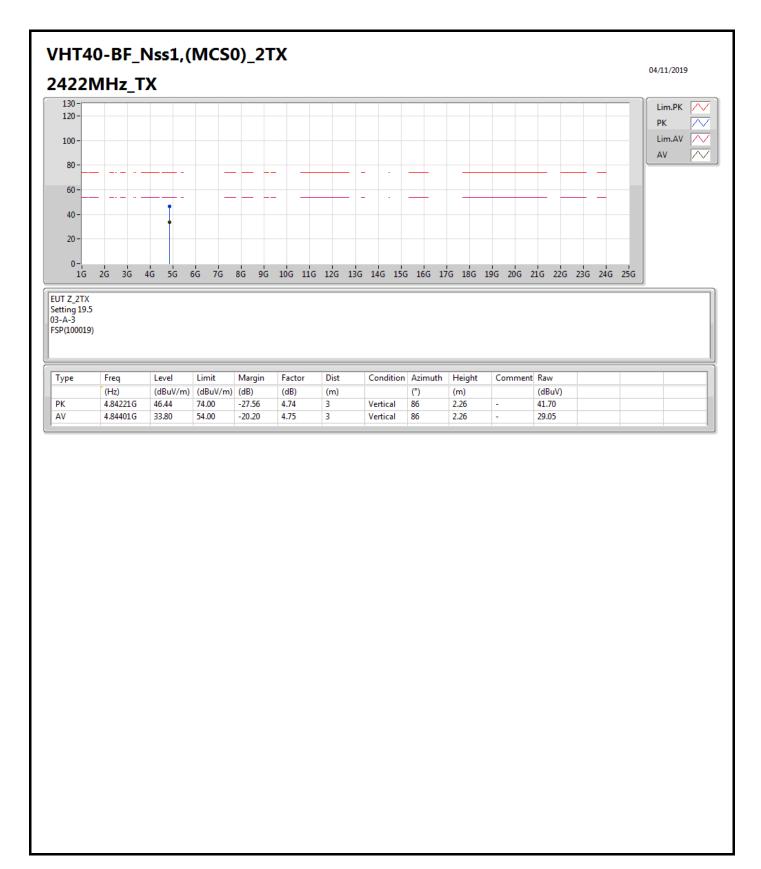
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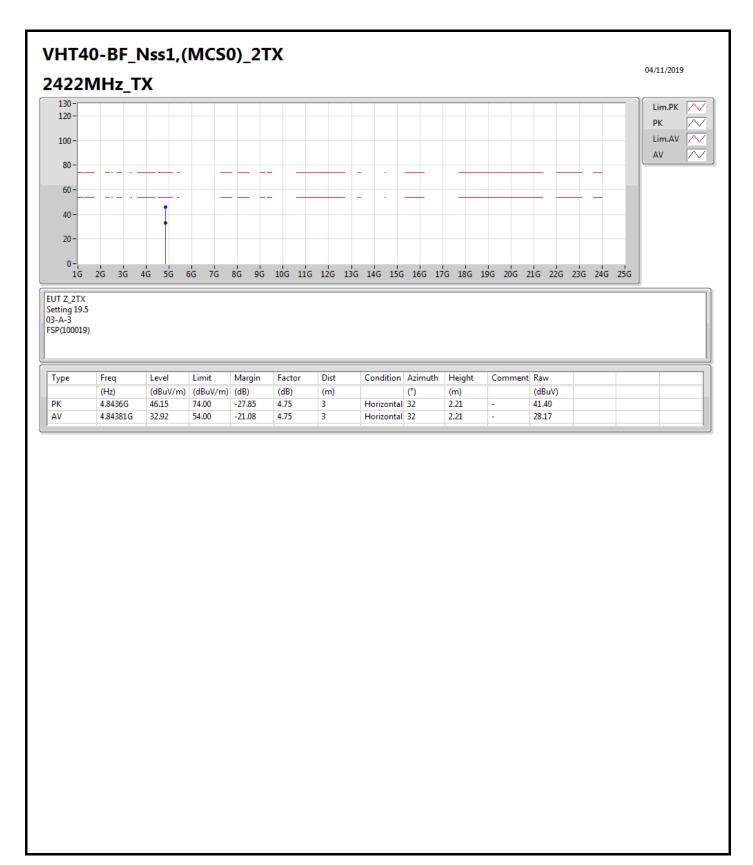
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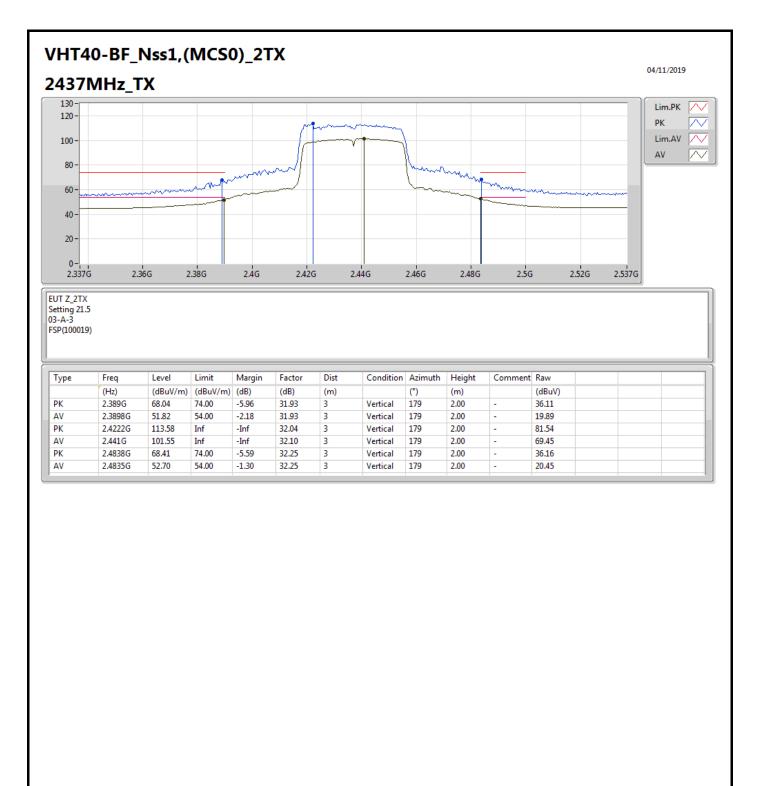
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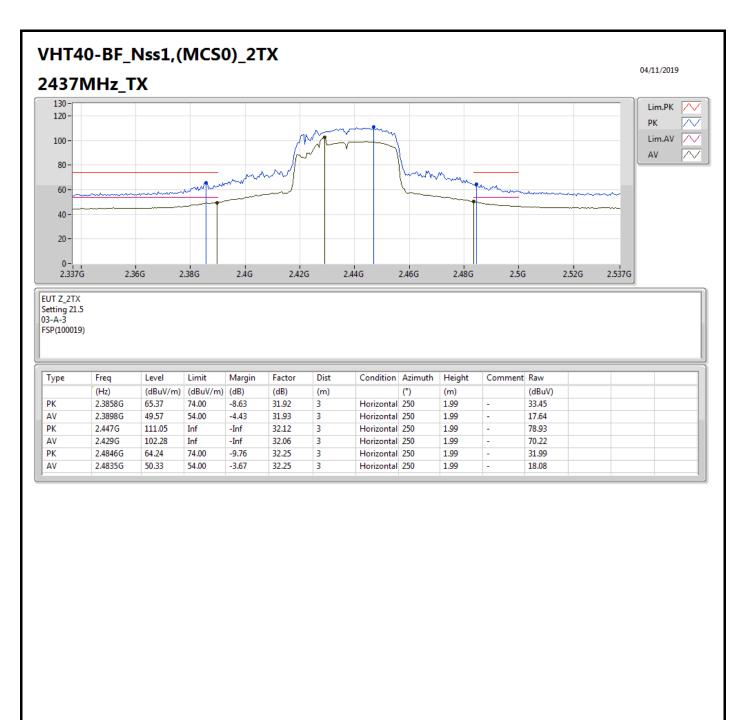
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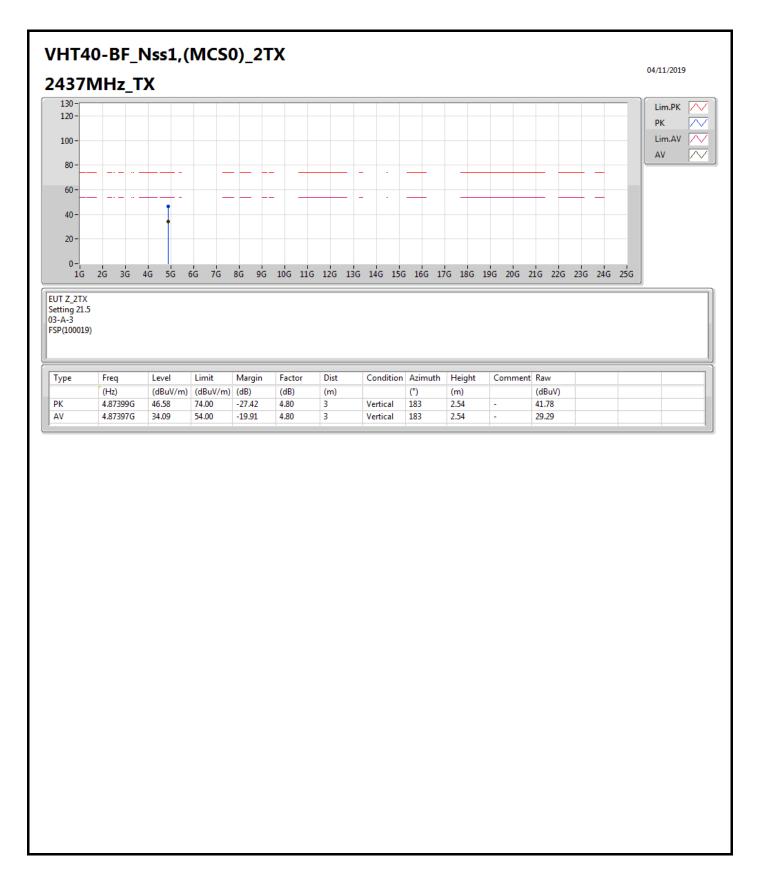
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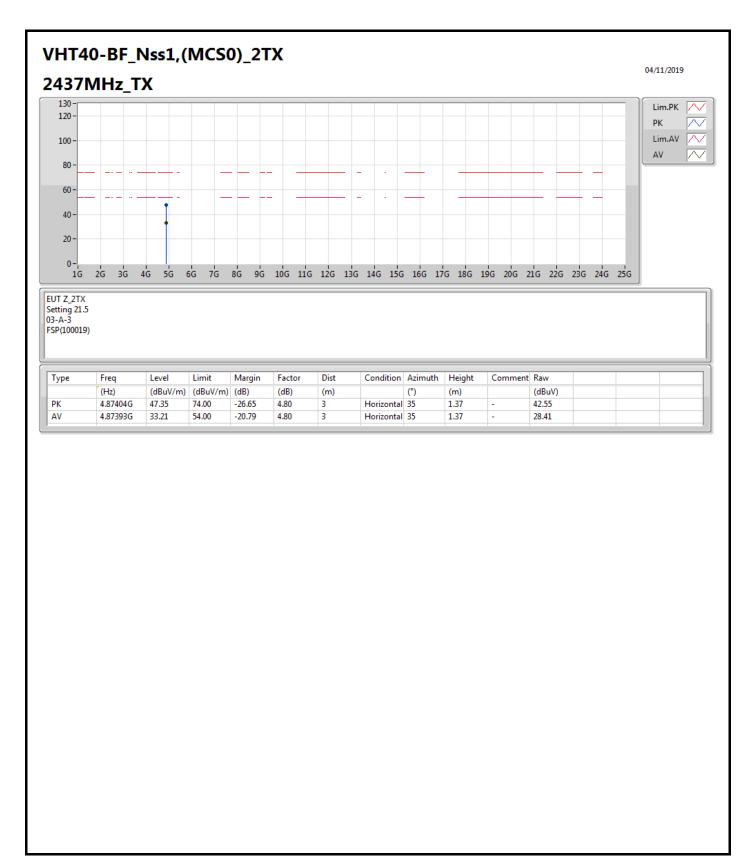
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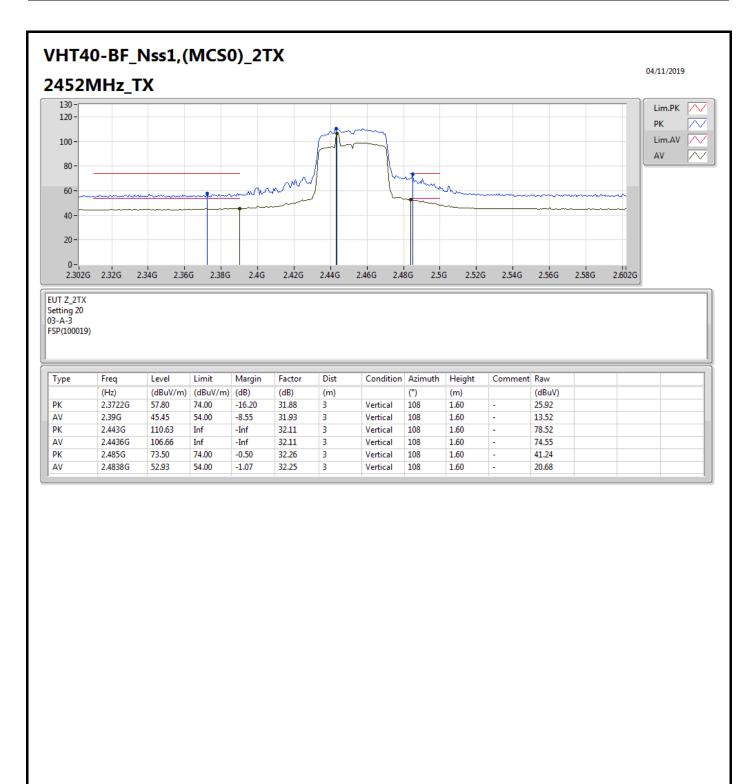
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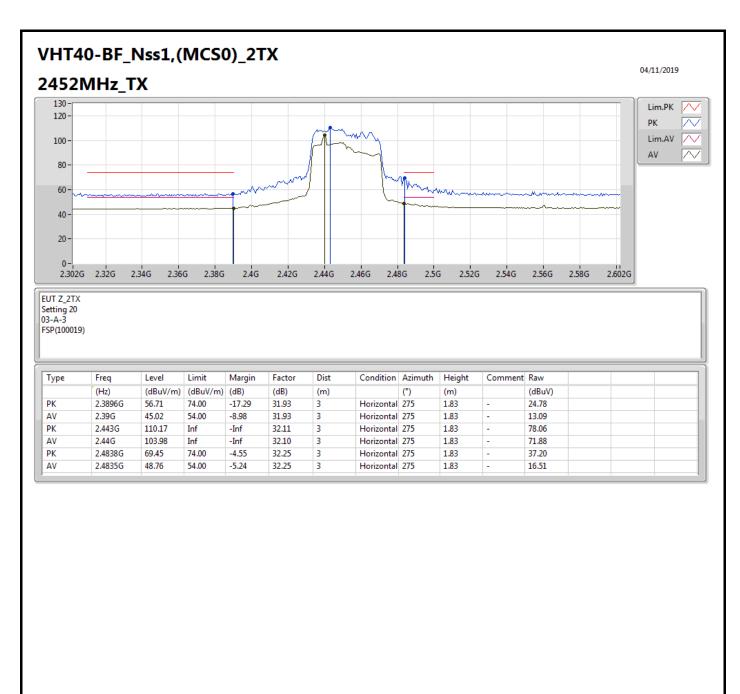
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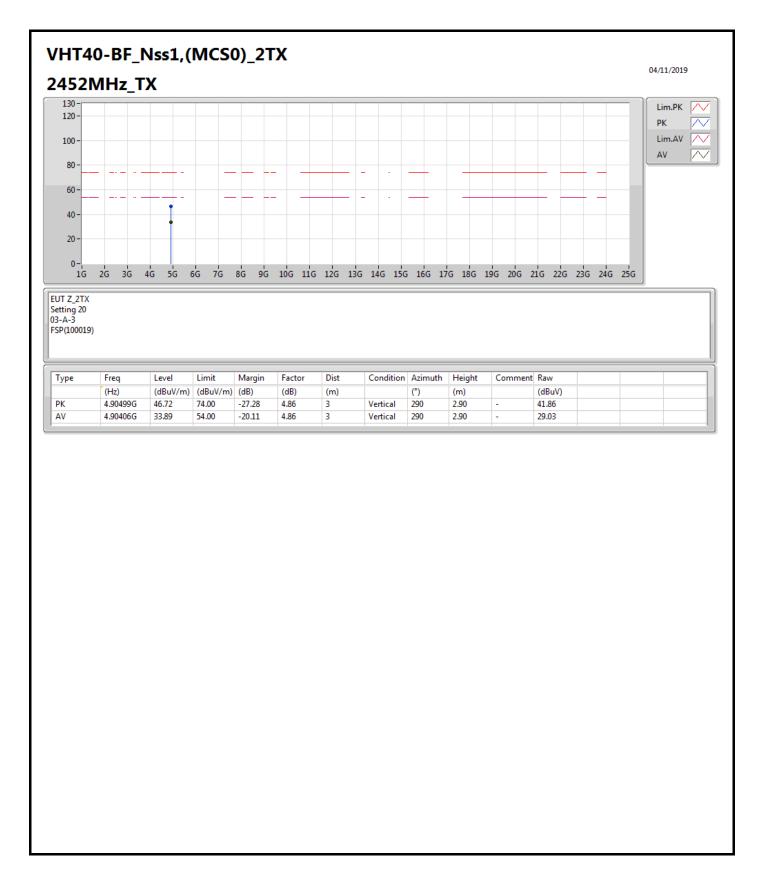
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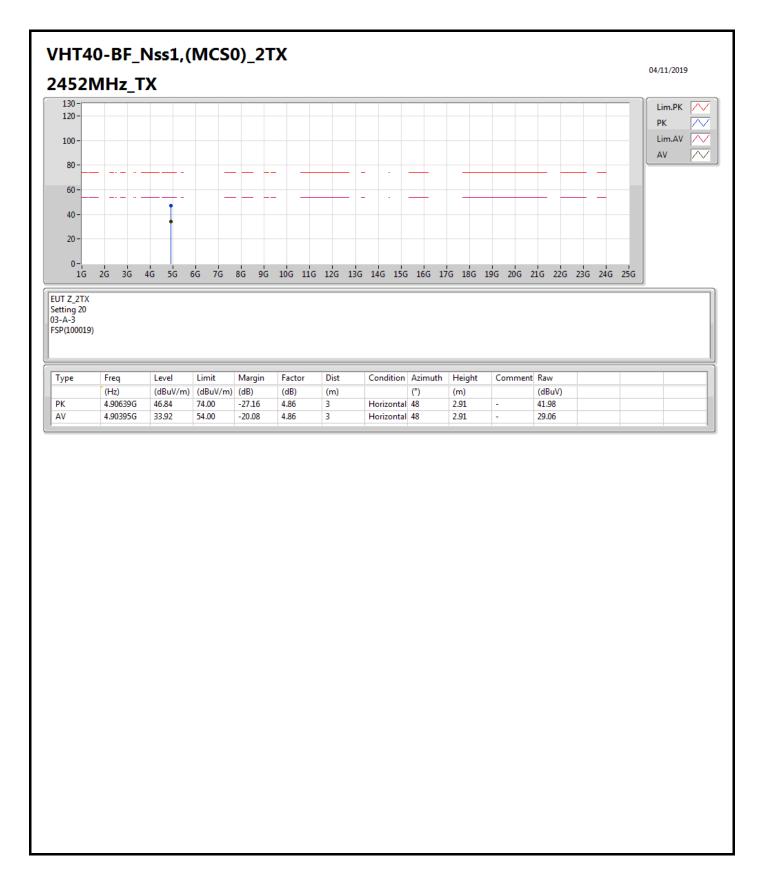
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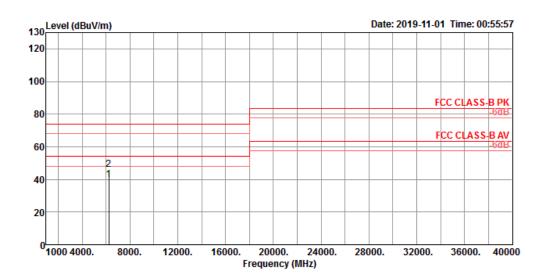




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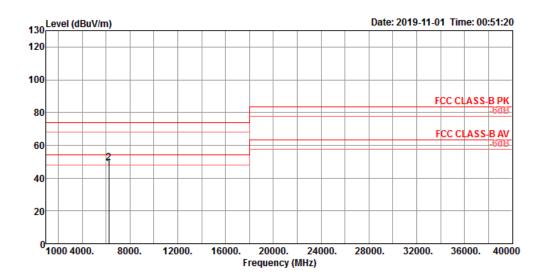
RSE Co-location Result								
Operating Mode	1	Polarization	Horizontal					
Operating Function	Normal Link							



	Freq	Level		Over Limit					-	T/Pos		Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	6249.90	39.74	54.00	-14.26	36.27	6.13	32.90	35.56	196	271	Average	HORIZONTAL
2	6249.90	46.09	74.00	-27.91	42.62	6.13	32.90	35.56	196	271	Peak	HORIZONTAL



RSE Co-location Result								
Operating Mode	1	Polarization	Vertical					
Operating Function	Normal Link							



	Freq	Level						Preamp Factor		T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	6249.90	45.90	54.00	-8.10	42.43	6.13	32.90	35.56	100	176	Average	VERTICAL
2	6249.90	49.55	74.00	-24.45	46.08	6.13	32.90	35.56	100	176	Peak	VERTICAL