



FCC RADIO TEST REPORT

FCC ID : MSQ-RTAXJE01

Equipment : AX1800 Dual Band WiFi Router

Brand Name : ASUS

Model Name : XD4N,RP-AX1800,XD4RV2

Applicant : ASUSTeK COMPUTER INC.

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

Manufacturer (1): Datamax Electronics (DongGuan) Co., Ltd.

Niu Shan Foreign Economic Industrial Park, Dong Cheng

District, Dong Guan City, Guang Dong, China

Manufacturer (2): Lukisen Electronic Corp.

3F., No. 236, Boai St., Shulin Dist., New Taipei City 23845, Taiwan

Manufacturer (3): Kentec Inc.

No. 5, Tzu-Chiang 1st Rd. Chungli Industrial Zone, Taoyuan

City, Taiwan

Standard : 47 CFR FCC Part 15.407

The product was received on Dec. 24, 2019, and testing was started from Dec. 25, 2019 and completed on Mar. 20, 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.)

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Report Template No.: CB-A12_1 Ver1.0

Issued Date : Apr. 09, 2020

Report Version : 01

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Photographs of EUT v01

Appendix G. Test Photos

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Appendix F. Test Results of Radiated Emission Co-location

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History of this test report

Report No. : FR021444AB

Report No.	Version	Description	Issued Date
FR021444AB	01	Initial issue of report	Apr. 09, 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	15.407(a)	Emission Bandwidth	PASS	-
3.3	15.407(a)	Maximum Conducted Output Power	PASS	-
3.4 15.407(a) Peak Power Spectral Density			PASS	-
3.5	15.407(b)	Unwanted Emissions	PASS	-
Note: Refe	erence to Sport	on Project No.: 9N1802	•	

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: Vicky 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
5150-5250	a, n (HT20), ac (VHT20), ax (HEW20)	5180-5240	36-48 [4]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40), ax (HEW40)	5190-5230	38-46 [2]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80), ax (HEW80)	5210	42 [1]
5725-5850		5775	155 [1]

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	2TX
5.15-5.25GHz	802.11n (HT20)	20	2TX
5.15-5.25GHz	802.11n (HT20)-BF	20	2TX
5.15-5.25GHz	802.11ac VHT20	20	2TX
5.15-5.25GHz	802.11ac VHT20-BF	20	2TX
5.15-5.25GHz	802.11ax HEW20	20	2TX
5.15-5.25GHz	802.11ax HEW20-BF	20	2TX
5.15-5.25GHz	802.11n (HT40)	40	2TX
5.15-5.25GHz	802.11n (HT40)-BF	40	2TX
5.15-5.25GHz	802.11ac VHT40	40	2TX
5.15-5.25GHz	802.11ac VHT40-BF	40	2TX
5.15-5.25GHz	802.11ax HEW40	40	2TX
5.15-5.25GHz	802.11ax HEW40-BF	40	2TX
5.15-5.25GHz	802.11ac VHT80	80	2TX
5.15-5.25GHz	802.11ac VHT80-BF	80	2TX
5.15-5.25GHz	802.11ax HEW80	80	2TX
5.15-5.25GHz	802.11ax HEW80-BF	80	2TX
5.725-5.85GHz	802.11a	20	2TX
5.725-5.85GHz	802.11n (HT20)	20	2TX
5.725-5.85GHz	802.11n (HT20)-BF	20	2TX
5.725-5.85GHz	802.11ac VHT20	20	2TX
5.725-5.85GHz	802.11ac VHT20-BF	20	2TX
5.725-5.85GHz	802.11ax HEW20	20	2TX
5.725-5.85GHz	802.11ax HEW20-BF	20	2TX
5.725-5.85GHz	802.11n (HT40)	40	2TX
5.725-5.85GHz	802.11n (HT40)-BF	40	2TX
5.725-5.85GHz	802.11ac VHT40	40	2TX
5.725-5.85GHz	802.11ac VHT40-BF	40	2TX
5.725-5.85GHz	802.11ax HEW40	40	2TX
5.725-5.85GHz	802.11ax HEW40-BF	40	2TX

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5.725-5.85GHz	802.11ac VHT80	80	2TX
5.725-5.85GHz	802.11ac VHT80-BF	80	2TX
5.725-5.85GHz	802.11ax HEW80	80	2TX
5.725-5.85GHz	802.11ax HEW80-BF	80	2TX

Note:

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- HEW20, HEW40, HEW80 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM 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

Set	Ant	Port	Brand	Part number	Type			lated Ga	in (dBi)	Correla	ated Gair	n (dBi)						
Set	AIII.	Port	Dialiu	Part number	Type	·	2.4GHz	5GHz B1	5GHz B4	2.4GHz	5GHz B1	5GHz B4						
1	1	1	WHA YU	C660-510493-A (SRF20191786)	Dipole	I-PEX	0.69	0.88	1.22	3.68	3.85	4.08						
	2	2	WHA YU	C660-510494-A (SRF20191787)	Dipole	I-PEX	0.69	0.88	1.22	3.68	3.85	4.08						
Set	Ant.	Dort	Prond	Port number	Brand Part number		rand Bort number Type				Type Connector		Uncorrelated Gain (dBi)			Correlated Gain (dBi)		
Set	AIII.	FUIT	Brand	Part number	туре	Connector	2.4GHz	5GHz B1	5GHz B4	2.4GHz	5GHz B1	5GHz B4						
2	1	1	WALSIN	RFDPA210608IM LB902	Dipole	I-PEX	0.65	0.65	0.71	3.57	3.39	3.05						
	2	2	WALSIN	RFDPA210606IM LB902	Dipole	I-PEX	0.65	0.65	0.71	3.57	3.39	3.05						

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Note1: The above information was declared by manufacturer.

Note2: For WLAN Function (2TX/2RX):

The WLAN 2.4GHz supports the b, g, n, VHT, ax, and the WLAN 5GHz supports the a, n, VHT, ax. There are two set antenna for WLAN Function use, and each set contains two antennas.

Because Set 1 antenna & Set 2 antenna are the same type antennas, only the higher gain antenna "Set 1 antenna" was tested.

Port 1 and Port 2 could transmit/receive simultaneously.

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1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.989	0.05	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ax HEW20	0.986	0.06	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ax HEW20-BF	0.936	0.29	3.214m	1k
802.11ax HEW40	0.989	0.05	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ax HEW40-BF	0.931	0.31	4.365m	300
802.11ax HEW80	0.985	0.07	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ax HEW80-BF	0.973	0.12	7.961m	300

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NI	∩ t	Δ.

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

1.1.4 EUT Operational Condition

EUT Power Type	From power adapter					
	\boxtimes	With beamforming		Without beamforming		
Beamforming Function	The product has beamforming function for n/VHT/ax in 2.4GHz and n/ac/ax in 5GHz.					
Function		Outdoor P2M	\boxtimes	Indoor P2M		
runction		Fixed P2P		Client		
Test Software Version	accessMTool (3.1.0.3)					

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT Supports Functions

Function	Support Type		
AP Router	Master		
Bridge	Client without radar detection		
Repeater	Master		
Mesh	Master		

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1.1.6 Table for Multiple Listing

1. There are four EUTs, the difference as following:

БИТ	Amount of LAN Port	2.4G PA		
EUT	Amount of LAN Port	Brand Name	Model Name	
1	2	Qorvo	QPF4206B	
2	2	Skyworks	SKY85337	
3	1	Qorvo	QPF4206B	
4	1	Skyworks	SKY85337	

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From the above, EUT 1 (for All test Items) and EUT 2 (for Unwanted Emissions below 1GHz and Co-location RF Exposure Evaluation tests) was selected as representative model for the test and its data was recorded in this report.

2. The EUT has three model names which are identical to each other in all aspects except for the following table:

Model Name	Description
XD4N	
RP-AX1800	There is nothing different for two model names, just for different marketing use.
XD4RV2	

From the above models, model: XD4N was selected as representative model for the test and its data was recorded in this report.

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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 789033 D02 v02r01
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

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	TH01-CB	Owen Hsu	17.4~18.4°C / 57~62%	Jan. 07, 2020~Feb. 04, 2020
Radiated	03CH05-CB	Cola Fan	21.8~23.3°C / 51~55%	Dec. 25, 2019~Mar. 20, 2020
AC Conduction	CO01-CB	Max Lin	21~22°C / 58~59%	Jan. 21, 2020~Mar. 11, 2020

Test site Designation No. TW0006 with FCC

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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Test site registered number IC 4086D with Industry Canada.

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	100
5200MHz	109
5240MHz	110
5745MHz	110
5785MHz	110
5825MHz	111
802.11ax HEW20_Nss2,(MCS0)_2TX	-
5180MHz	94
5200MHz	108
5240MHz	109
5745MHz	109
5785MHz	109
5825MHz	110
802.11ax HEW40_Nss2,(MCS0)_2TX	-
5190MHz	83
5230MHz	106
5755MHz	106
5795MHz	106
802.11ax HEW80_Nss2,(MCS0)_2TX	-
5210MHz	85
5775MHz	97
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	96
5200MHz	108
5240MHz	109
5745MHz	109
5785MHz	109
5825MHz	110
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	81
5230MHz	106
5755MHz	106

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Mode	Power Setting
5795MHz	106
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	85
5775MHz	98

Note:

• There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for n/VHT/ax in 2.4GHz and n/ac/ax in 5GHz. Both modes have been tested and recorded in this test report

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2.2 The Worst Case Measurement Configuration

Tł	ne Worst Case Mode for Following Conformance Tests
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	СТХ
1	WLAN 2.4GHz - EUT 1 + Adapter 1
2	WLAN 2.4GHz - EUT 1 + Adapter 2
Mode 2 has been evaluate follow this same test mode	ted to be the worst case between Mode 1~2, thus measurement for Mode 3 will e.
3	WLAN 5GHz - EUT 1 + Adapter 2
For operating mode 3 is the	ne worst case and it was record in this test report.

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Т	he Worst Case Mode for Following Conformance Tests
Tests Item	Emission Bandwidth Maximum Conducted Output Power Peak Power Spectral Density
Test Condition	Conducted measurement at transmit chains
Operating Mode	
1	EUT 1

Th	e Worst Case Mode for Following Conformance Tests	
Tests Item	Unwanted Emissions	
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	CTX	
1	WLAN 2.4GHz - EUT 1 + Adapter 1	
2	WLAN 2.4GHz - EUT 1 + Adapter 2	
Mode 2 has been evaluate follow this same test mode	ed to be the worst case between Mode 1~2, thus measurement for Mode 3 will at	
3	WLAN 5GHz - EUT 1 + Adapter 2	
Mode 2 has been evaluate this same test mode.	Mode 2 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow his same test mode.	
4	WLAN 2.4GHz - EUT 2 + Adapter 2	
For operating mode 2 is th	e worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX	
1	EUT 1	

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Th	The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated Emission Co-location	
Test Condition	Radiated measurement	
Operating Mode	Normal Link	
	EUT 1" generated the worst test result for Unwanted Emissions unintentional below 1GHz test, thus the leasurement for Radiated Emission Co-location test will follow this same test configuration.	
1	WLAN 2.4GHz + WLAN 5GHz - EUT 1	
Refer to Appendix F for Ra	adiated Emission Co-location.	

Т	he Worst Case Mode for Following Conformance Tests
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz - EUT 1
2	WLAN 2.4GHz + WLAN 5GHz - EUT 2
Refer to Sporton Test Rep	port No.: FA021444 for Co-location RF Exposure Evaluation.

Note: The EUT can only be used at Y axis position.

2.3 EUT Operation during Test

For CTX Mode:

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated 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%.

For Normal Link:

During the test, the EUT operation to normal function.

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2.4 Accessories

Accessories				
No.	Power	Brand	Model	Rating
1 Adapter 1 LEI	LEL	MU18B1120150-A1	INPUT: 100-240V ~ 50/60Hz, 0.6A	
	LEI		OUTPUT: 12V, 1.5A	
2 Adapter	A double a O	0 5)/5		INPUT: 100-240V ~ 50/60Hz, 0.6A
	Adapter 2 DVE	DSA-18PFR-12 FUS 120150	OUTPUT: 12V, 1.5A, 18.0W	
No.			Other	
3	RJ-45 cable*1: Non-shielded, 2m			

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2.5 Support Equipment

For AC Conduction:

	Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID		
Α	LAN NB	DELL	E6430	N/A		

For RF Conducted, Radiated (below 1GHz) and Radiated (above 1GHz) - Non-beamforming mode:

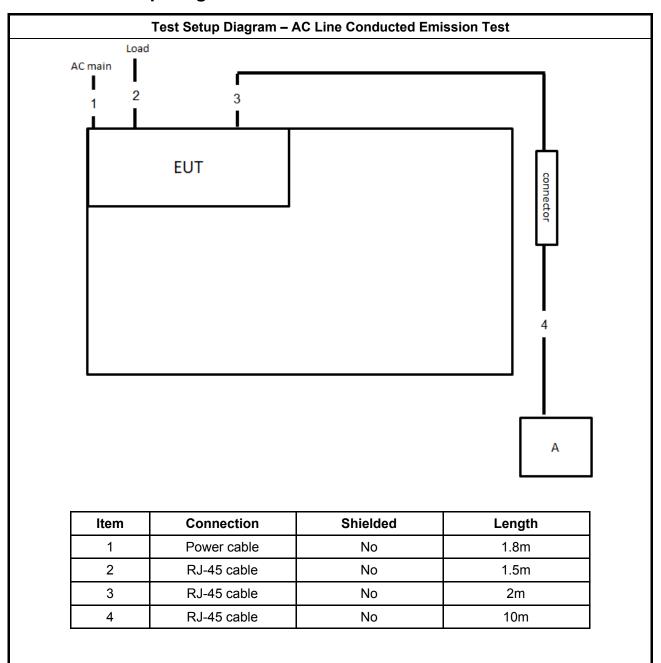
Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	Notebook	DELL	E4300	N/A	

For Radiated (above 1GHz) - Beamforming mode:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
Α	Notebook	DELL	E4300	N/A
В	RX Device	ASUS	AX88U	MSQ-RTAXHP00
С	Notebook	DELL	E4300	N/A

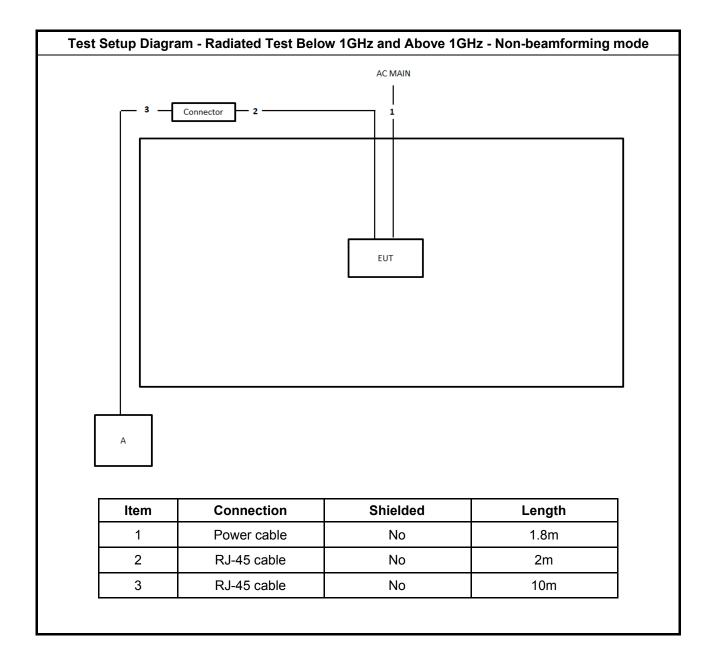
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2.6 Test Setup Diagram

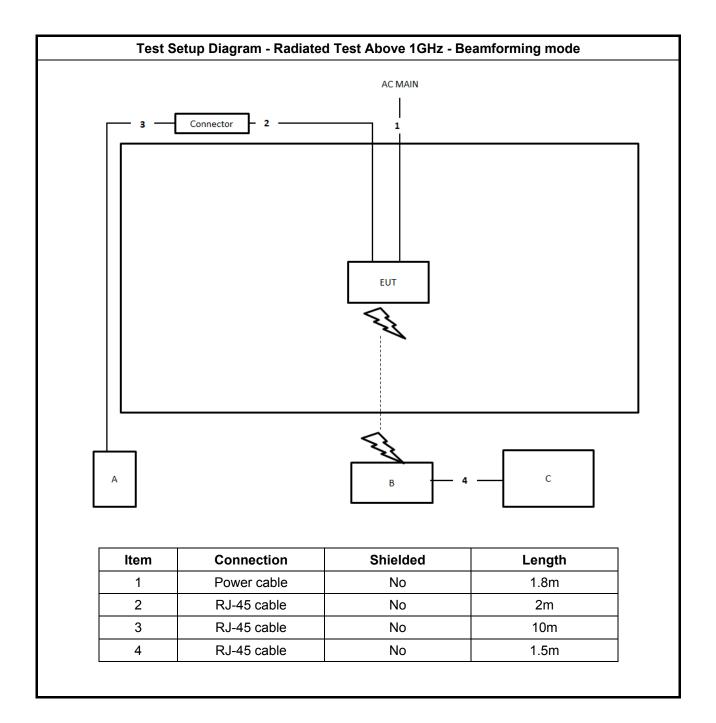


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3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit			
Frequency Emission (MHz)	Quasi-Peak	Average	
0.15-0.5	66 - 56 *	56 - 46 *	
0.5-5	56	46	
5-30	60	50	

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3.1.2 Measuring Instruments

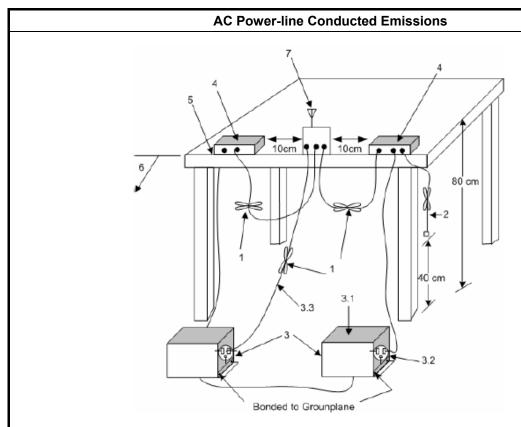
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

	Test Method
\boxtimes	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 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

	Emission Bandwidth Limit				
UN	II Devices				
\boxtimes	For the 5.15-5.25 GHz band, N/A				
	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.				
	For the $5.47-5.725$ GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.				
\boxtimes	For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.				
LE-	LAN Devices				
	For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.				
	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz				
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz				
	For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.				

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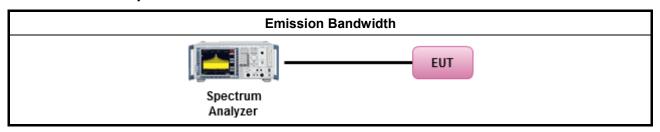
3.2.2 Measuring Instruments

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:				
	Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement.				
	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.				
	Refer as IC RSS-Gen, clause 4.6 for 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
UNI	II Devices
\boxtimes	For the 5.15-5.25 GHz band:
	 Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 - (G_{TX} - 6). e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm]
	 Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 − (G_{TX} − 6)
	 Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W If G_{TX} > 23 dBi, then P_{Out} = 30 – (G_{TX} – 23).
	Mobile or Portable Client: the maximum conducted output power (P _{Out}) shall not exceed the lesser of 250 mW. If G _{TX} > 6 dBi, then P _{Out} = 24 – (G _{TX} – 6).
	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If G_{TX} > 6 dBi, then P_{Out} = 24 – (G_{TX} – 6).
	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If G_{TX} > 6 dBi, then P_{Out} = 24 – (G_{TX} – 6).
\boxtimes	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the maximum conducted output power (P _{Out}) shall not exceed the lesser of 1 W. If G _{TX} > 6 dBi, then P _{Out} = 30 − (G _{TX} − 6).
	 Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
LE-	LAN Devices
	For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
	For the 5.725-5.85 GHz band:
	 Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6).
	 Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
	t = maximum conducted output power in dBm, t = the maximum transmitting antenna directional gain in dBi.

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3.3.2 Measuring Instruments

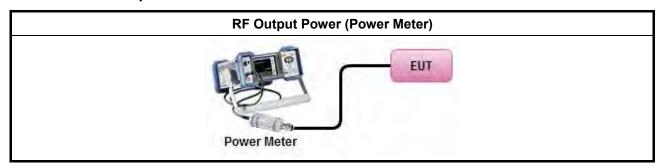
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

	Test Method				
•	Maximum Conducted Output Power				
	Average over on/off periods with duty factor				
	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).				
	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)				
l	Wideband RF power meter and average over on/off periods with duty factor				
<u> </u>	Refer as FCC KDB 789033, clause E Method PM-G (using an 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} = P₁ + P₂ + + 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



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

	Peak Power Spectral Density Limit				
UNI	I Devices				
\boxtimes	For the 5.15-5.25 GHz band:				
	 Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If G_{TX} > 6 dBi, then P_{Out} = 17 – (G_{TX} – 6). 				
	Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.				
	■ Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$.				
	Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If G _{TX} > 6 dBi, then PPSD= 11 – (G _{TX} – 6)				
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} >$ 6 dBi, then PPSD= 11 – ($G_{TX} -$ 6).				
	For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} >$ 6 dBi, then PPSD= 11 – $(G_{TX} - 6)$.				
\boxtimes	For the 5.725-5.85 GHz band:				
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) \leq 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$.				
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.				
LE-	LAN Devices				
	For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.				
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.				
	 e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for 0° ≤ θ < 8°; -13 − 0.716 (θ-8) dBW/MHz for 8° ≤ θ < 40° -35.9 − 1.22 (θ-40) dBW/MHz for 40° ≤ θ ≤ 45°; -42 dBW/MHz for θ > 45° 				
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz.				
	For the 5.725-5.85 GHz band:				
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) \leq 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$.				
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.				
pow	SD = peak power spectral density that he same method as used to determine the conducted output ver shall be used to determine the power spectral density. And power spectral density in dBm/MHz = the maximum transmitting antenna directional gain in dBi.				

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3.4.2 Measuring Instruments

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

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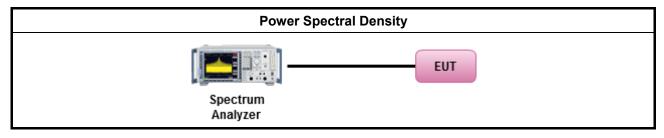
3.4.3 Test Procedures

		Test Method
•	outp func	c power spectral density procedures that the same method as used to determine the conducted out power shall be used to determine the peak power spectral density and use the peak search tion on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density be measured using below options:
		Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths $<$ 1 MHz provided that the results are integrated over 1 MHz bandwidth
	[duty	v cycle ≥ 98% or external video / power trigger]
	\boxtimes	Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).
		Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
	duty	cycle < 98% and average over on/off periods with duty factor
	\boxtimes	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
		Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
•	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,
		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.
	•	If multiple transmit chains, EIRP PPSD calculation could be following as methods: $ PPSD_{total} = PPSD_1 + PPSD_2 + + PPSD_n $ (calculated in linear unit [mW] and transfer to log unit [dBm]) $ EIRP_{total} = PPSD_{total} + DG $

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3.4.4 Test Setup



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3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

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3.5 Unwanted Emissions

3.5.1 Transmitter Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz 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.

Un-restricted band emissions above 1GHz Limit					
Operating Band	Limit				
	e.i.r.p27 dBm [68.2 dBuV/m@3m]				
☐ 5.25 - 5.35 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]				
☐ 5.47 - 5.725 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]				
⊠ 5.725 - 5.85 GHz	all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.				

Note 1: 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

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linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

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3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

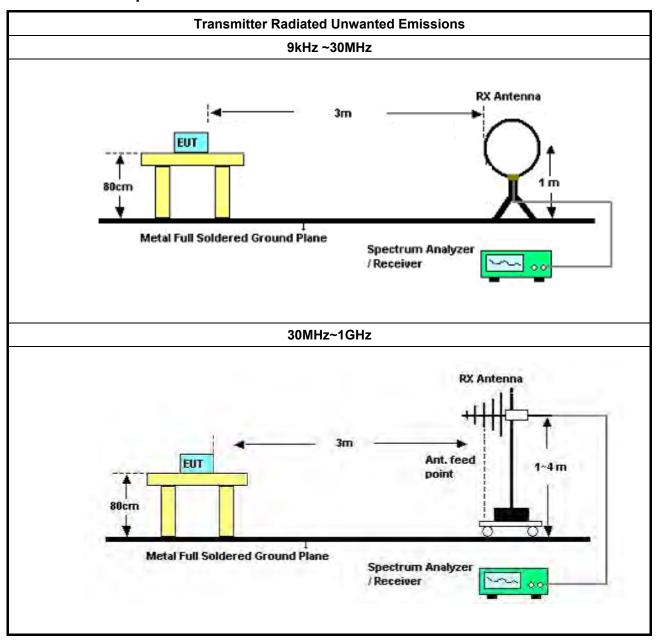
Test Method

- 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. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. 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).
- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- For the transmitter unwanted emissions shall be measured using following options below:
 - Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
 - Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.
 - Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).
 - Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).
 - 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 789033, clause G)5) measurement procedure peak limit.
 - Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
- For radiated measurement.
 - Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
 - Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
 - Refer as ANSI C63.10. clause 6.6 for radiated emissions above 1GHz.
- The any unwanted emissions level shall not exceed the fundamental emission level.
- All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

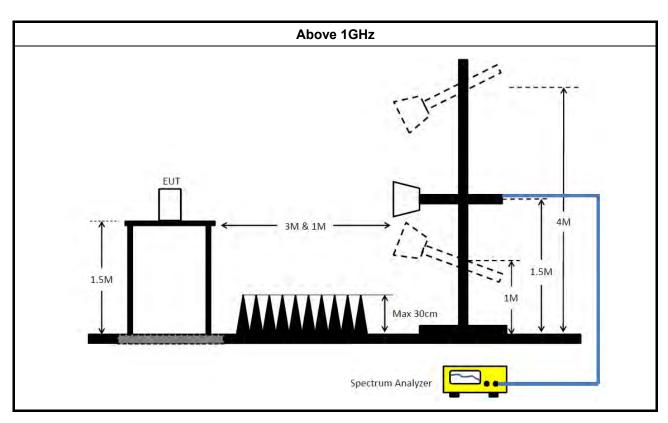
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3.5.4 Test Setup



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3.5.5 Measurement Results Calculation

The measured Level is calculated using:

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

3.5.6 Transmitter Unwanted Emissions (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.

3.5.7 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E

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4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	MY54130031	9kHz ~ 8.45GHz	SHz Nov. 08, 2019 Nov. 07		Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50- 16-2	04083	150kHz ~ 100MHz Dec. 25, 2019 Dec. 24		Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2019	Nov. 20, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBE CK	BBHA9120D	BBHA 9120D-1291	1GHz~18GHz	Oct. 05, 2019	Oct. 04, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 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)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 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)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)

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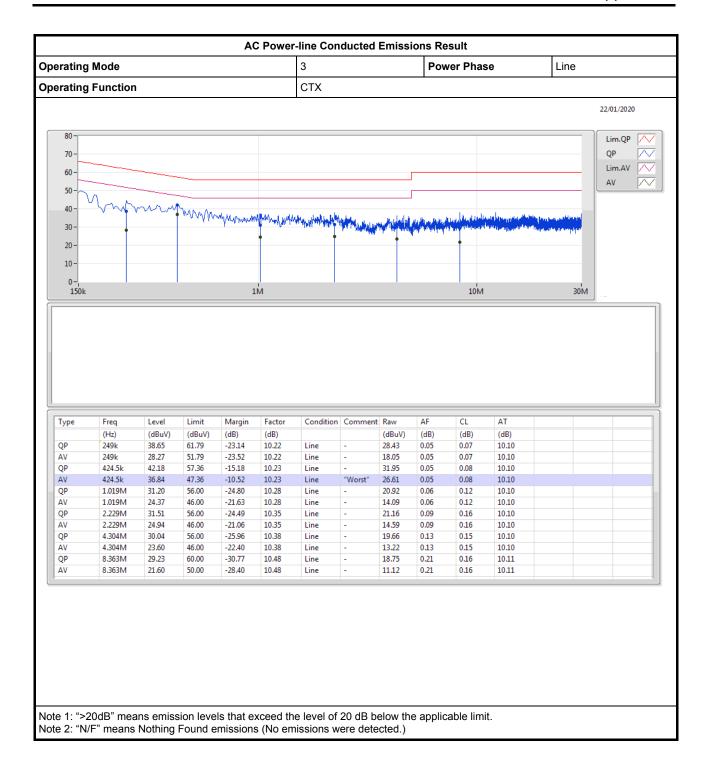
Report Version : 01

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-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. 18, 2019	Nov. 17, 2020	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH01-CB)

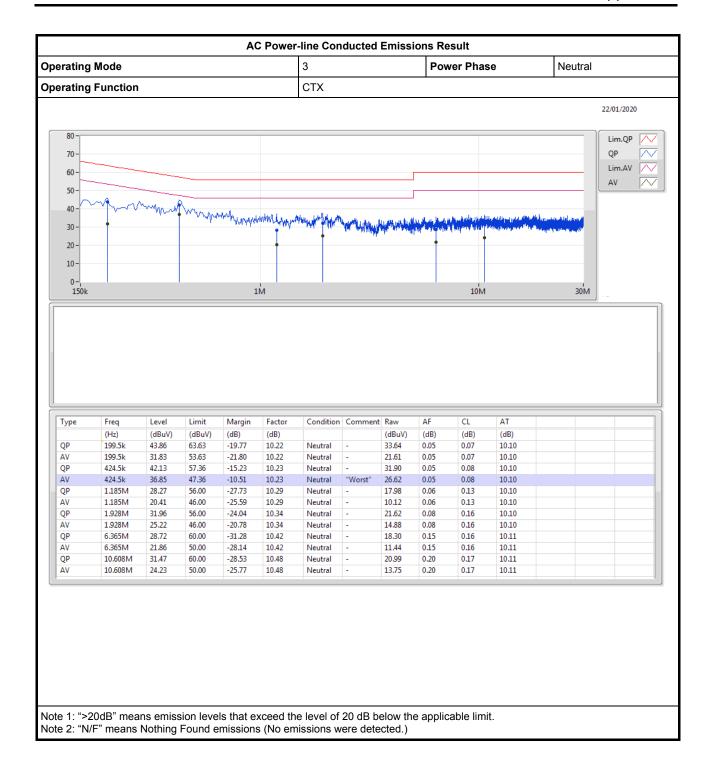
Note: Calibration Interval of instruments listed above is one year. N.C.R. means Non-Calibration required.

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AC Power-line Conducted Emissions Result



AC Power-line Conducted Emissions Result





Appendix B **EBW Result**

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
5.15-5.25GHz	-	-	-	-	=
802.11a_Nss1,(6Mbps)_2TX	34.95M	19.46M	19M5D1D	22.83M	16.882M
802.11ax HEW20_Nss2,(MCS0)_2TX	39.21M	19.97M	20M0D1D	21.81M	19.07M
802.11ax HEW40_Nss2,(MCS0)_2TX	74.64M	38.381M	38M4D1D	39.9M	37.601M
802.11ax HEW80_Nss2,(MCS0)_2TX	81.6M	77.121M	77M1D1D	81.6M	77.121M
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	38.91M	19.94M	19M9D1D	22.8M	19.07M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	75.24M	38.021M	38M0D1D	39.96M	37.481M
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	81.72M	77.121M	77M1D1D	81.48M	77.121M
5.725-5.85GHz	-	-	-	-	=
802.11a_Nss1,(6Mbps)_2TX	16.32M	23.808M	23M8D1D	16.29M	18.471M
802.11ax HEW20_Nss2,(MCS0)_2TX	18.87M	22.879M	22M9D1D	18.24M	20.06M
802.11ax HEW40_Nss2,(MCS0)_2TX	37.32M	44.678M	44M7D1D	36.9M	38.921M
802.11ax HEW80_Nss2,(MCS0)_2TX	76.44M	77.481M	77M5D1D	75.96M	77.361M
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	18.75M	25.787M	25M8D1D	18.21M	19.91M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	37.56M	49.115M	49M1D1D	36.54M	38.621M
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	76.44M	77.601M	77M6D1D	75.96M	77.481M

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Max-OBW = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

Page No.



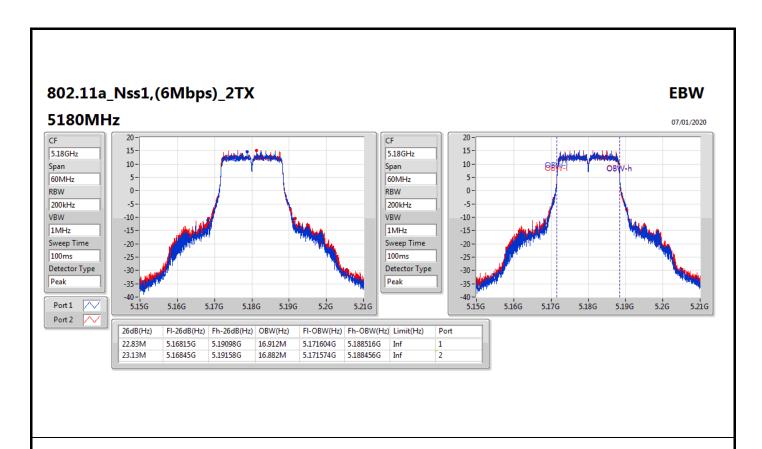
Result

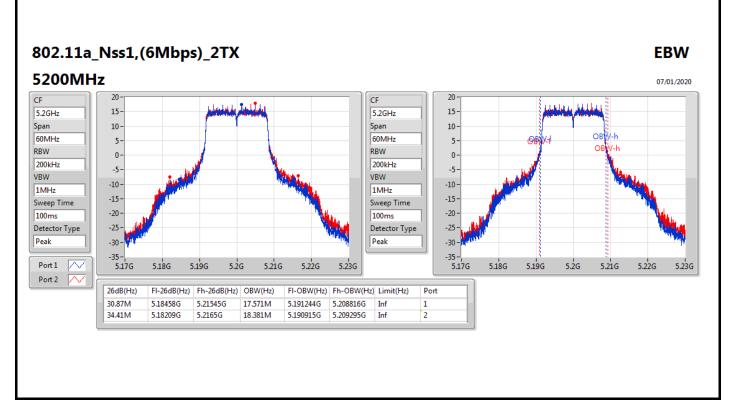
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	22.83M	16.912M	23.13M	16.882M
5200MHz	Pass	Inf	30.87M	17.571M	34.41M	18.381M
5240MHz	Pass	Inf	34.53M	17.991M	34.95M	19.46M
5745MHz	Pass	500k	16.29M	19.13M	16.29M	22.249M
5785MHz	Pass	500k	16.29M	19.91M	16.32M	20.39M
5825MHz	Pass	500k	16.29M	18.471M	16.29M	23.808M
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	21.81M	19.1M	22.05M	19.07M
5200MHz	Pass	Inf	37.2M	19.58M	38.76M	19.43M
5240MHz	Pass	Inf	39.21M	19.97M	36.84M	19.37M
5745MHz	Pass	500k	18.24M	20.06M	18.66M	20.24M
5785MHz	Pass	500k	18.33M	22.579M	18.63M	22.879M
5825MHz	Pass	500k	18.72M	22.069M	18.87M	20.39M
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	39.9M	37.601M	40.14M	37.661M
5230MHz	Pass	Inf	74.64M	38.381M	73.2M	38.021M
5755MHz	Pass	500k	37.32M	38.921M	37.32M	42.399M
5795MHz	Pass	500k	37.14M	43.778M	36.9M	44.678M
802.11ax HEW80_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	81.6M	77.121M	81.6M	77.121M
5775MHz	Pass	500k	75.96M	77.361M	76.44M	77.481M
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	22.98M	19.07M	22.8M	19.1M
5200MHz	Pass	Inf	36.54M	19.43M	38.91M	19.94M
5240MHz	Pass	Inf	36.48M	19.49M	38.85M	19.82M
5745MHz	Pass	500k	18.75M	19.91M	18.45M	22.279M
5785MHz	Pass	500k	18.3M	20.09M	18.57M	20.42M
5825MHz	Pass	500k	18.51M	19.94M	18.21M	25.787M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	40.02M	37.481M	39.96M	37.541M
5230MHz	Pass	Inf	73.14M	37.901M	75.24M	38.021M
5755MHz	Pass	500k	37.56M	45.517M	36.54M	49.115M
5795MHz	Pass	500k	36.96M	38.621M	37.38M	38.681M
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	81.72M	77.121M	81.48M	77.121M
5775MHz	Pass	500k	76.44M	77.481M	75.96M	77.601M

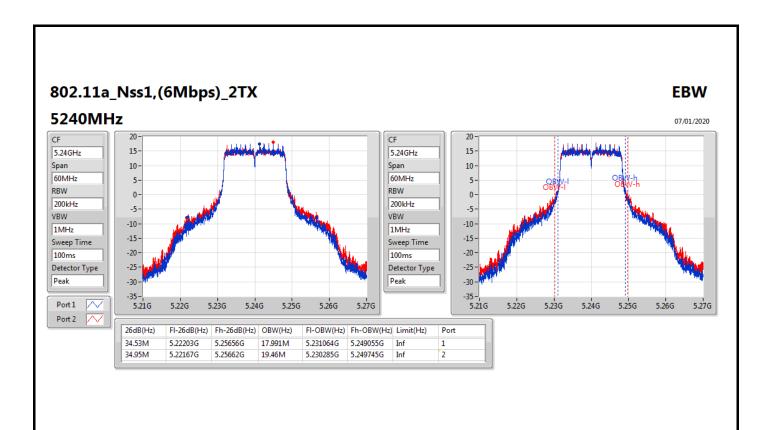
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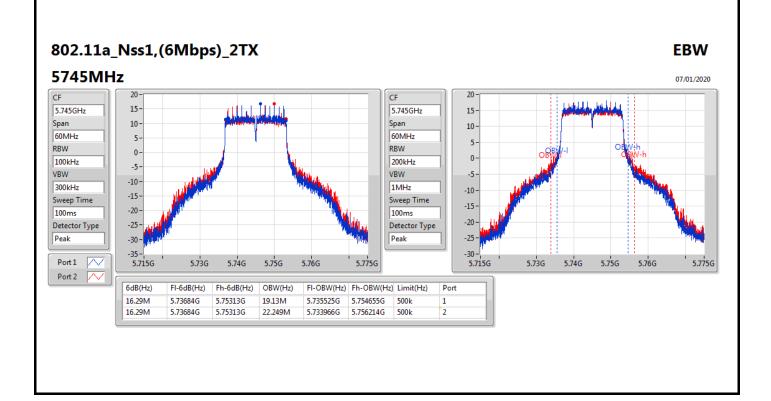
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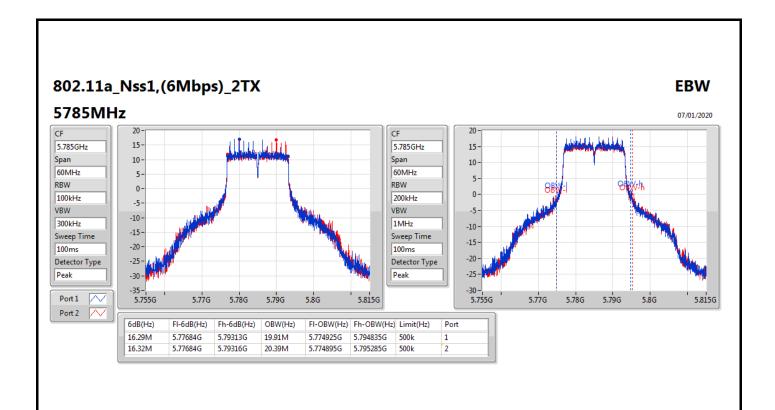
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

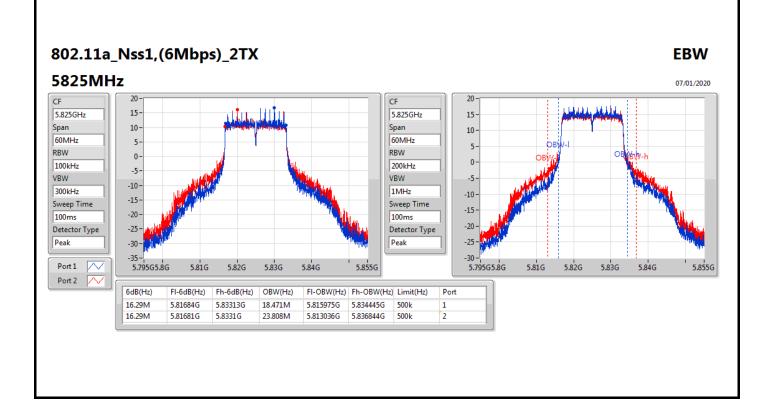


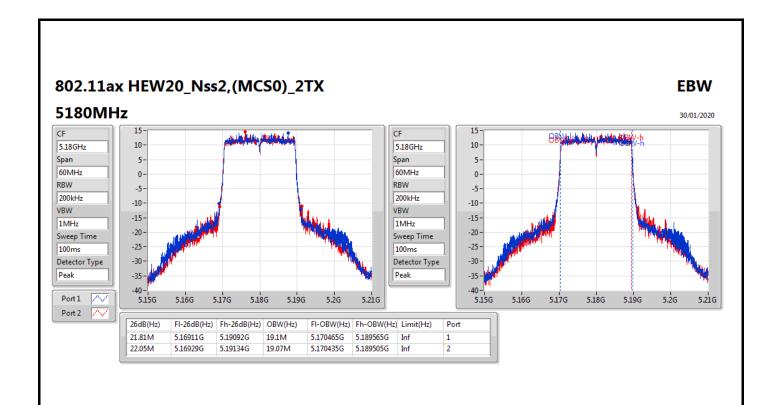


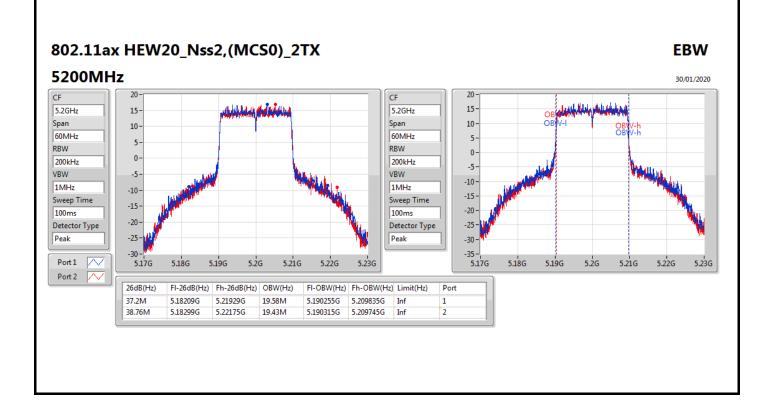


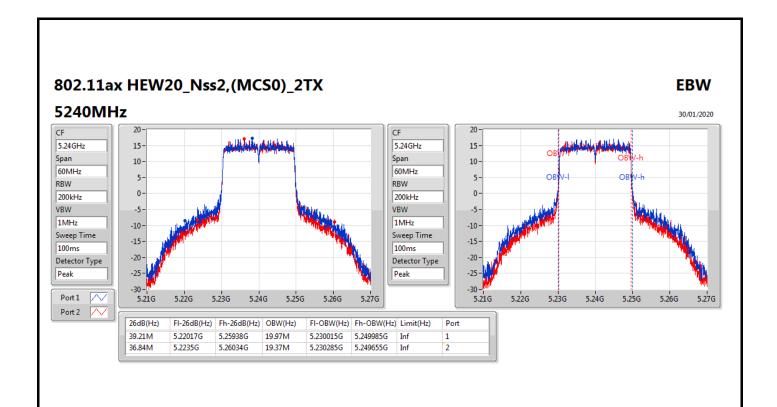


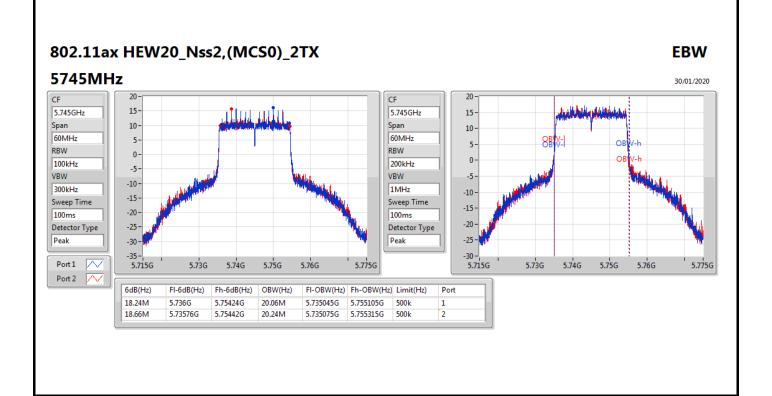


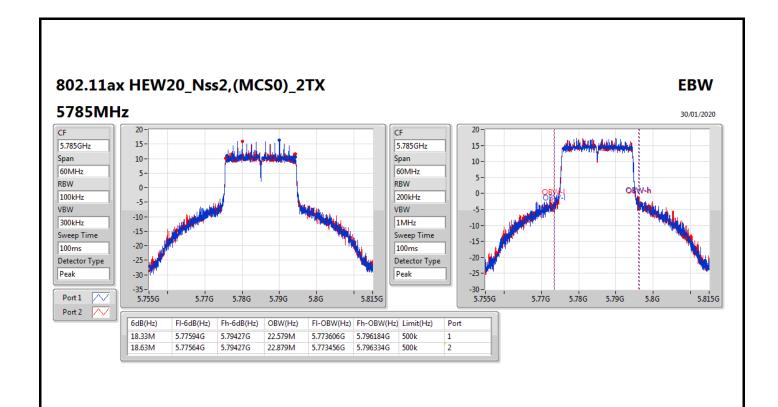


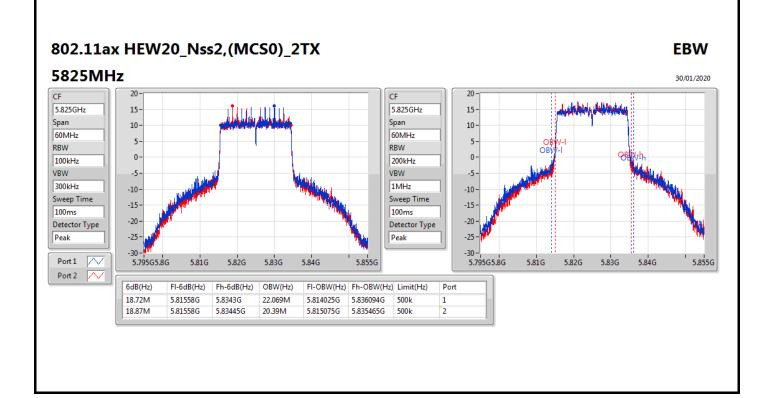


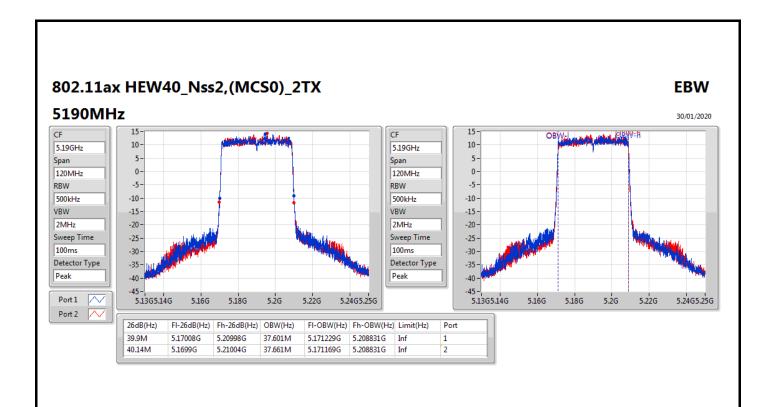


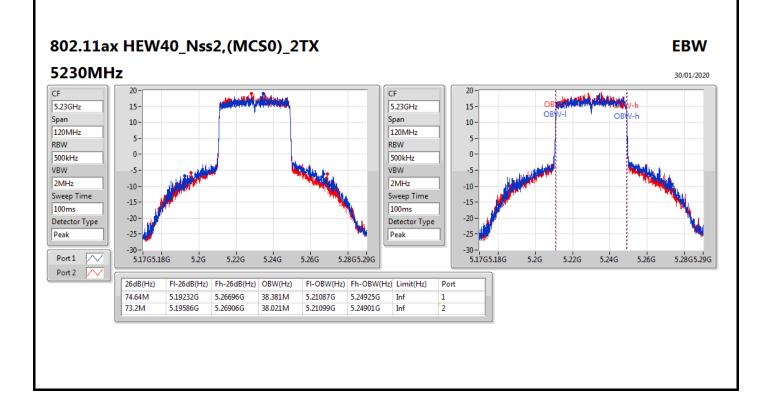


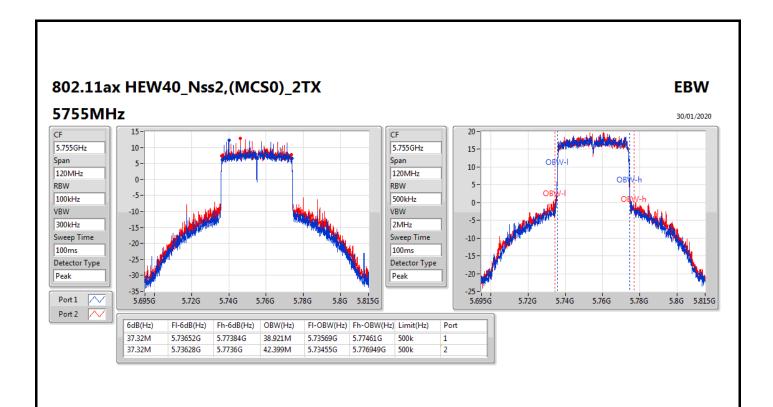


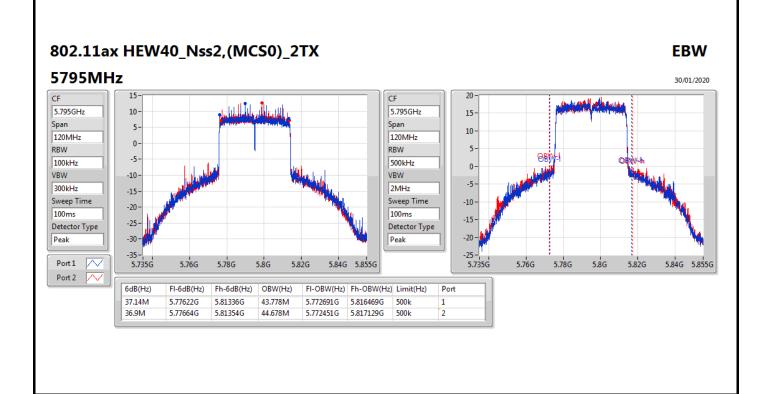


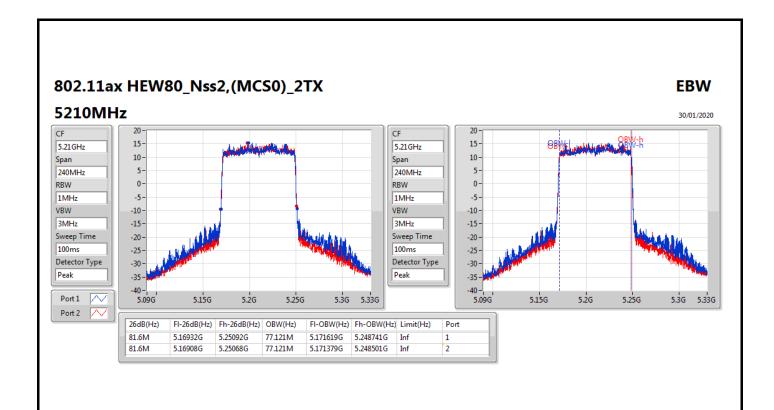


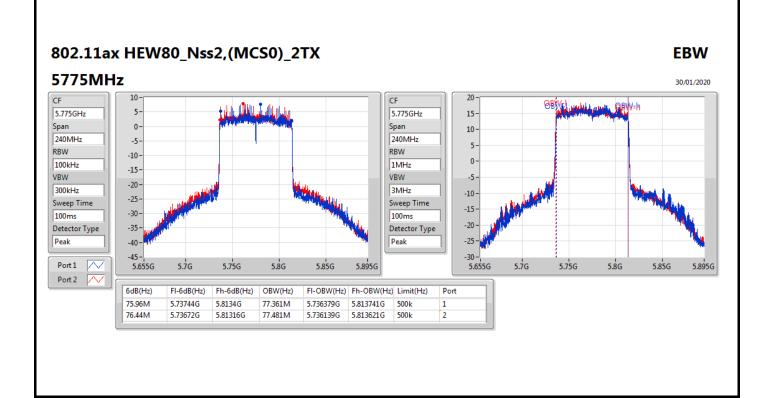


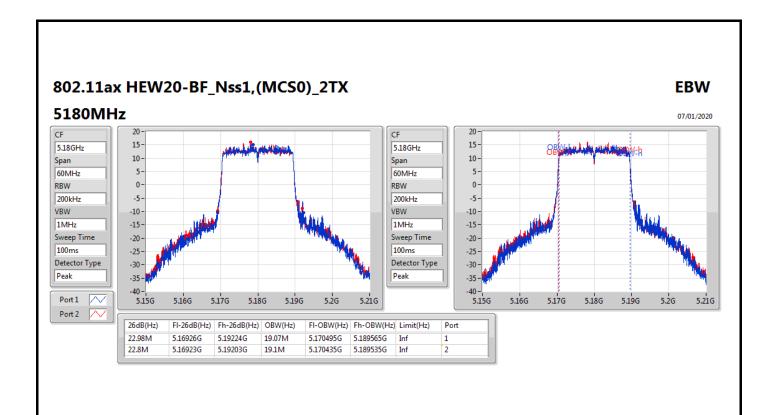


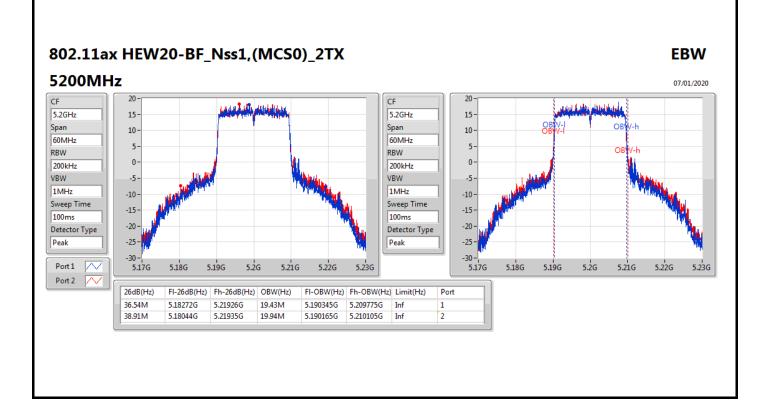


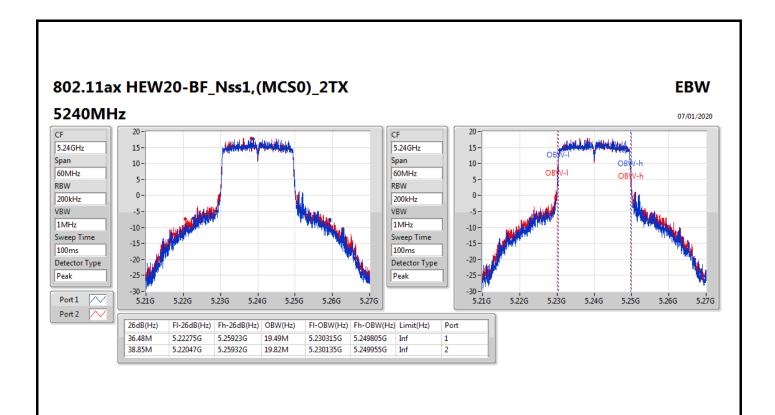


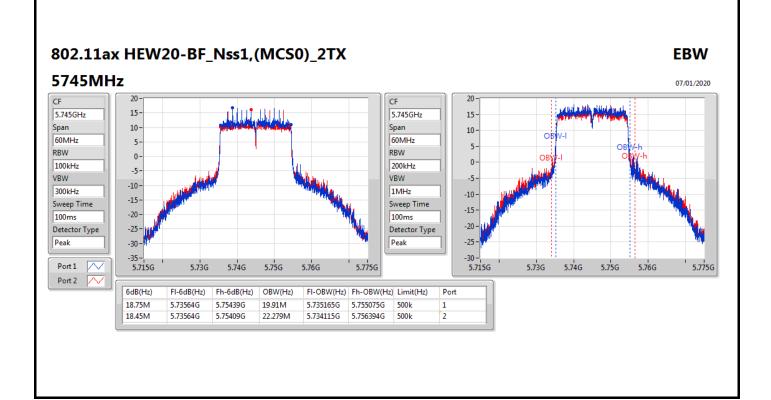


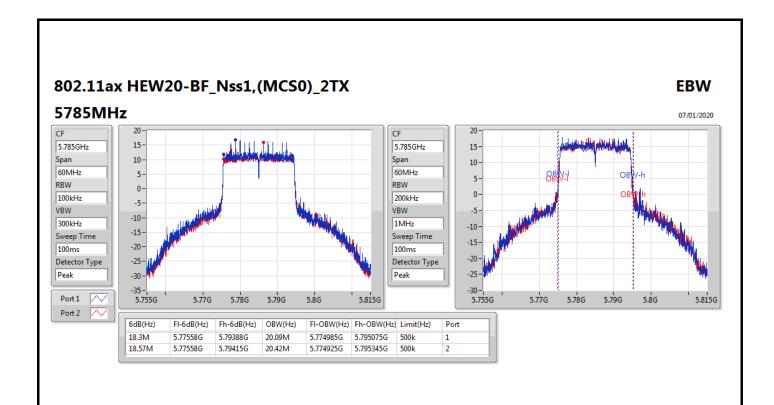


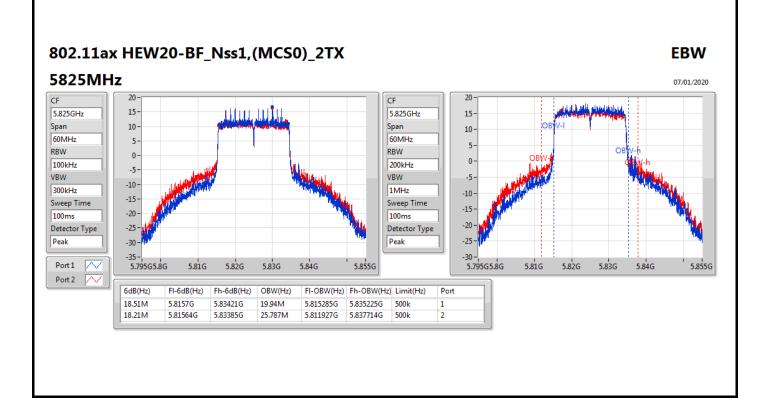


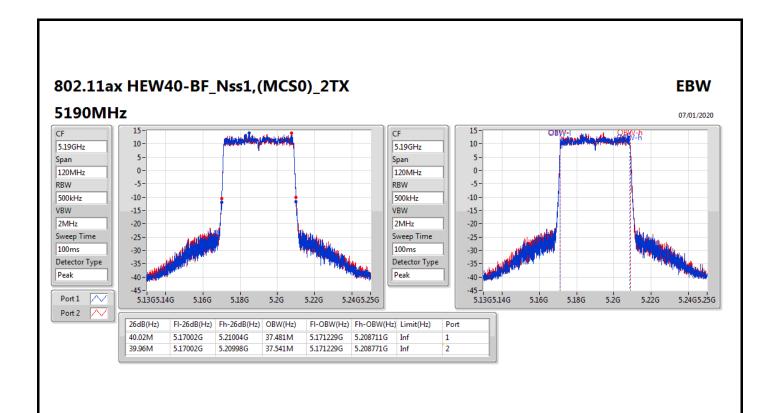


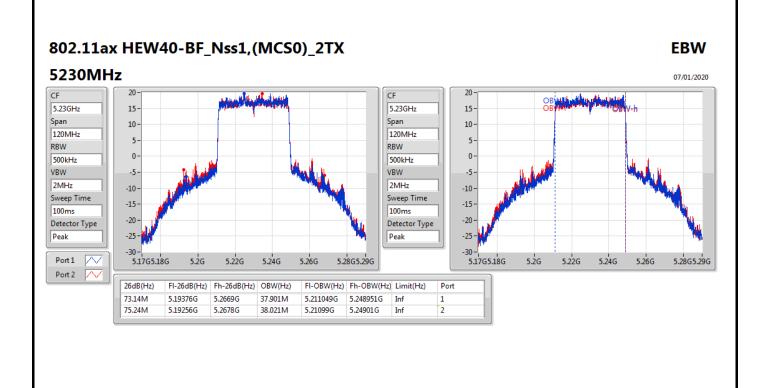


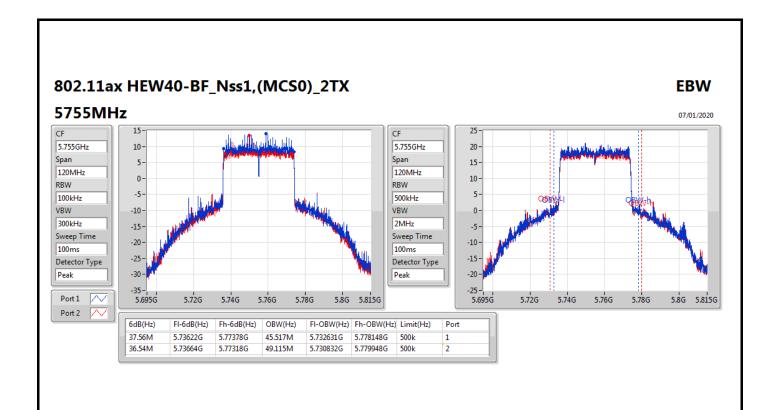


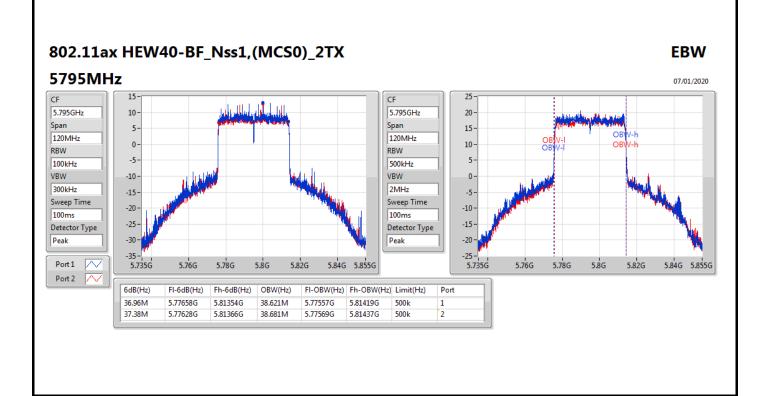


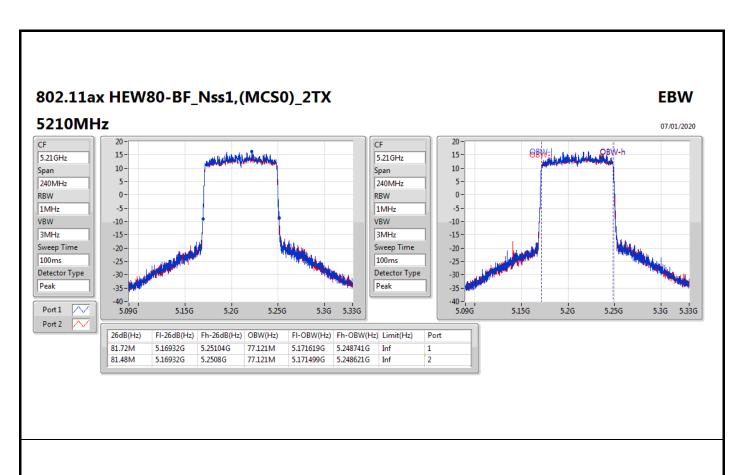


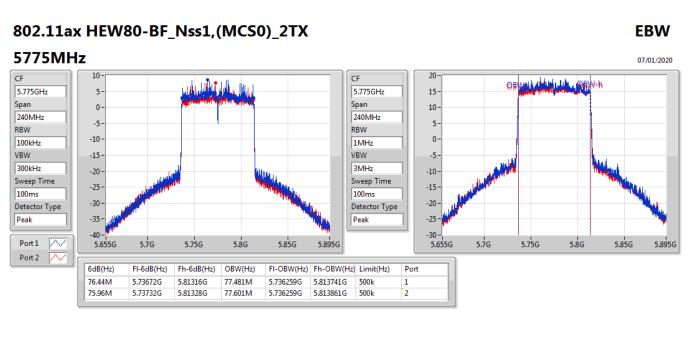














Appendix C



Summary

Mode	Total Power	Total Power
	(dBm)	(W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	29.80	0.95499
802.11ax HEW20_Nss2,(MCS0)_2TX	29.88	0.97275
802.11ax HEW40_Nss2,(MCS0)_2TX	29.54	0.89950
802.11ax HEW80_Nss2,(MCS0)_2TX	25.37	0.34435
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	29.92	0.98175
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	29.40	0.87096
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	25.06	0.32063
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	29.81	0.95719
802.11ax HEW20_Nss2,(MCS0)_2TX	29.95	0.98855
802.11ax HEW40_Nss2,(MCS0)_2TX	29.96	0.99083
802.11ax HEW80_Nss2,(MCS0)_2TX	28.03	0.63533
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	29.98	0.99541
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	29.96	0.99083
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	27.77	0.59841



Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	0.88	24.77	24.88	27.84	30.00
5200MHz	Pass	0.88	26.68	26.88	29.79	30.00
5240MHz	Pass	0.88	26.68	26.89	29.80	30.00
5745MHz	Pass	1.22	26.94	26.66	29.81	30.00
5785MHz	Pass	1.22	26.83	26.75	29.80	30.00
5825MHz	Pass	1.22	26.90	26.63	29.78	30.00
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	0.88	24.06	23.86	26.97	30.00
5200MHz	Pass	0.88	26.84	26.87	29.87	30.00
5240MHz	Pass	0.88	26.85	26.89	29.88	30.00
5745MHz	Pass	1.22	26.87	26.77	29.83	30.00
5785MHz	Pass	1.22	27.01	26.87	29.95	30.00
5825MHz	Pass	1.22	26.83	26.97	29.91	30.00
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	0.88	21.60	21.52	24.57	30.00
5230MHz	Pass	0.88	26.36	26.69	29.54	30.00
5755MHz	Pass	1.22	26.88	26.89	29.90	30.00
5795MHz	Pass	1.22	26.91	26.98	29.96	30.00
802.11ax HEW80_Nss2,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	0.88	22.20	22.51	25.37	30.00
5775MHz	Pass	1.22	24.91	25.12	28.03	30.00
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	3.85	24.26	24.39	27.34	30.00
5200MHz	Pass	3.85	26.78	27.03	29.92	30.00
5240MHz	Pass	3.85	26.76	26.89	29.84	30.00
5745MHz	Pass	4.08	27.13	26.80	29.98	30.00
5785MHz	Pass	4.08	26.93	26.83	29.89	30.00
5825MHz	Pass	4.08	26.87	26.71	29.80	30.00
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	3.85	20.86	20.74	23.81	30.00
5230MHz	Pass	3.85	26.49	26.28	29.40	30.00
5755MHz	Pass	4.08	27.34	26.51	29.96	30.00
5795MHz	Pass	4.08	27.01	26.63	29.83	30.00
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	3.85	22.08	22.01	25.06	30.00
5775MHz	Pass	4.08	25.00	24.51	27.77	30.00

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



Summary

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	
802.11a_Nss1,(6Mbps)_2TX	16.88
802.11ax HEW20_Nss2,(MCS0)_2TX	15.78
802.11ax HEW40_Nss2,(MCS0)_2TX	12.77
802.11ax HEW80_Nss2,(MCS0)_2TX	5.82
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	16.75
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	13.52
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	6.08
5.725-5.85GHz	-
802.11a_Nss1,(6Mbps)_2TX	15.45
802.11ax HEW20_Nss2,(MCS0)_2TX	14.52
802.11ax HEW40_Nss2,(MCS0)_2TX	11.83
802.11ax HEW80_Nss2,(MCS0)_2TX	6.97
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	15.32
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	12.58
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	7.45

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

Page No.



Appendix D **PSD Result**

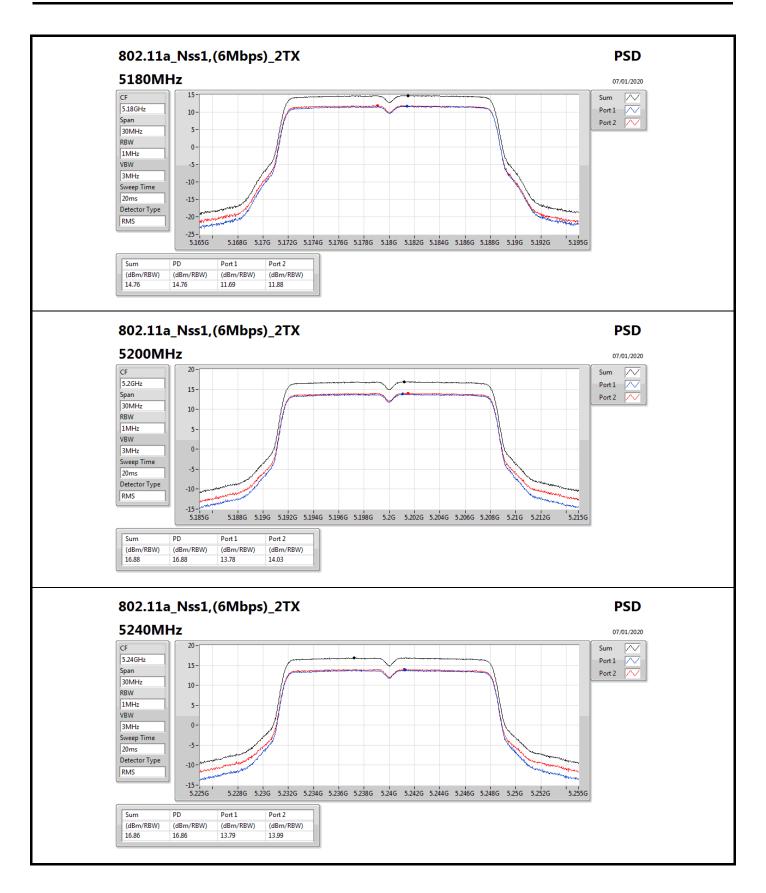
Result

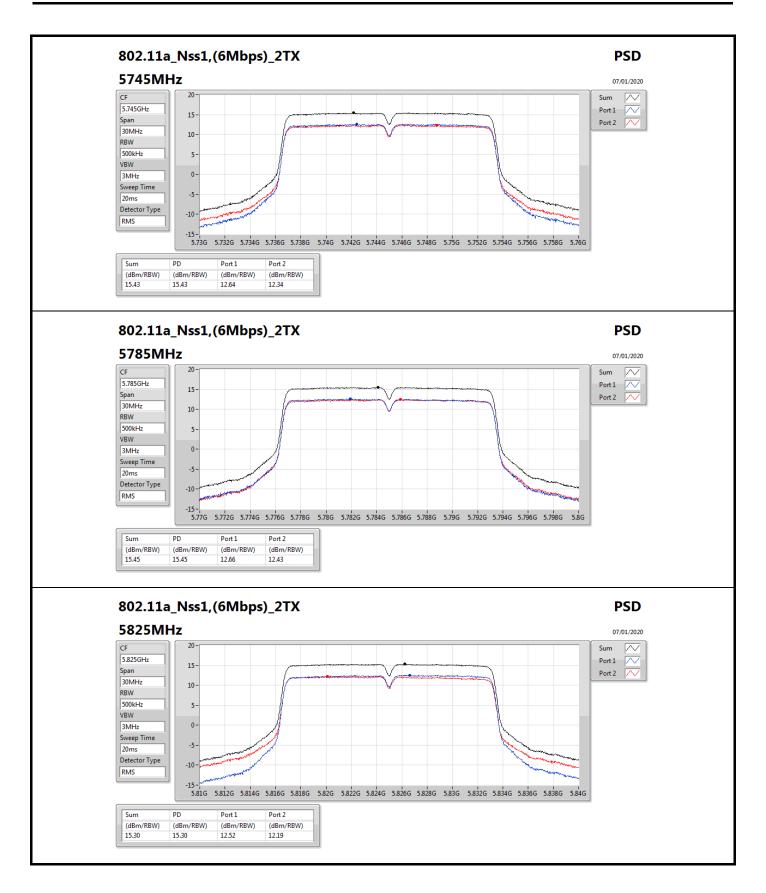
Mode	Result	DG	DG Port 1		PD	PD Limit	
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	
5180MHz	Pass	3.85	11.69	11.88	14.76	17.00	
5200MHz	Pass	3.85	13.78	14.03	16.88	17.00	
5240MHz	Pass	3.85	13.79	13.99	16.86	17.00	
5745MHz	Pass	4.08	12.64	12.34	15.43	30.00	
5785MHz	Pass	4.08	12.66	12.43	15.45	30.00	
5825MHz	Pass	4.08	12.52	12.19	15.30	30.00	
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-	
5180MHz	Pass	3.85	10.05	9.86	12.93	17.00	
5200MHz	Pass	3.85	12.91	12.50	15.67	17.00	
5240MHz	Pass	3.85	12.94	12.60	15.78	17.00	
5745MHz	Pass	4.08	11.62	11.50	14.52	30.00	
5785MHz	Pass	4.08	11.49	11.25	14.36	30.00	
5825MHz	Pass	4.08	11.48	11.52	14.43	30.00	
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-	
5190MHz	Pass	3.85	4.82	4.87	7.80	17.00	
5230MHz	Pass	3.85	9.66	9.93	12.77	17.00	
5755MHz	Pass	4.08	8.79	8.84	11.83	30.00	
5795MHz	Pass	4.08	8.59	8.63	11.54	30.00	
802.11ax HEW80_Nss2,(MCS0)_2TX	-	-	-	-	-	-	
5210MHz	Pass	3.85	2.73	2.98	5.82	17.00	
5775MHz	Pass	4.08	3.89	4.12	6.97	30.00	
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5180MHz	Pass	3.85	11.23	11.41	14.27	17.00	
5200MHz	Pass	3.85	13.67	13.87	16.75	17.00	
5240MHz	Pass	3.85	13.59	13.82	16.68	17.00	
5745MHz	Pass	4.08	12.50	12.25	15.32	30.00	
5785MHz	Pass	4.08	12.37	12.22	15.28	30.00	
5825MHz	Pass	4.08	12.42	12.06	15.16	30.00	
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5190MHz	Pass	3.85	4.86	4.80	7.81	17.00	
5230MHz	Pass	3.85	10.59	10.49	13.52	17.00	
5755MHz	Pass	4.08	9.88	9.33	12.58	30.00	
5795MHz	Pass	4.08	9.54	9.24	12.37	30.00	
802.11ax HEW80-BF_Nss1,(MCS0)_2TX		-	-	-	-	-	
5210MHz	Pass	3.85	3.22	2.99	6.08	17.00	
5775MHz	Pass	4.08	4.94	4.02	7.45	30.00	

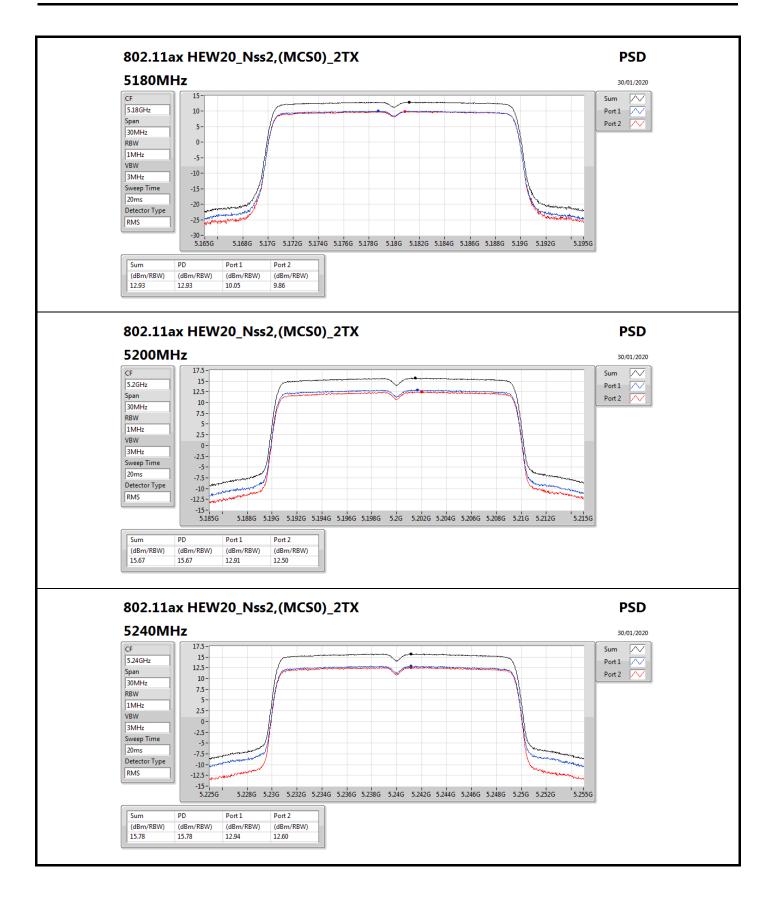
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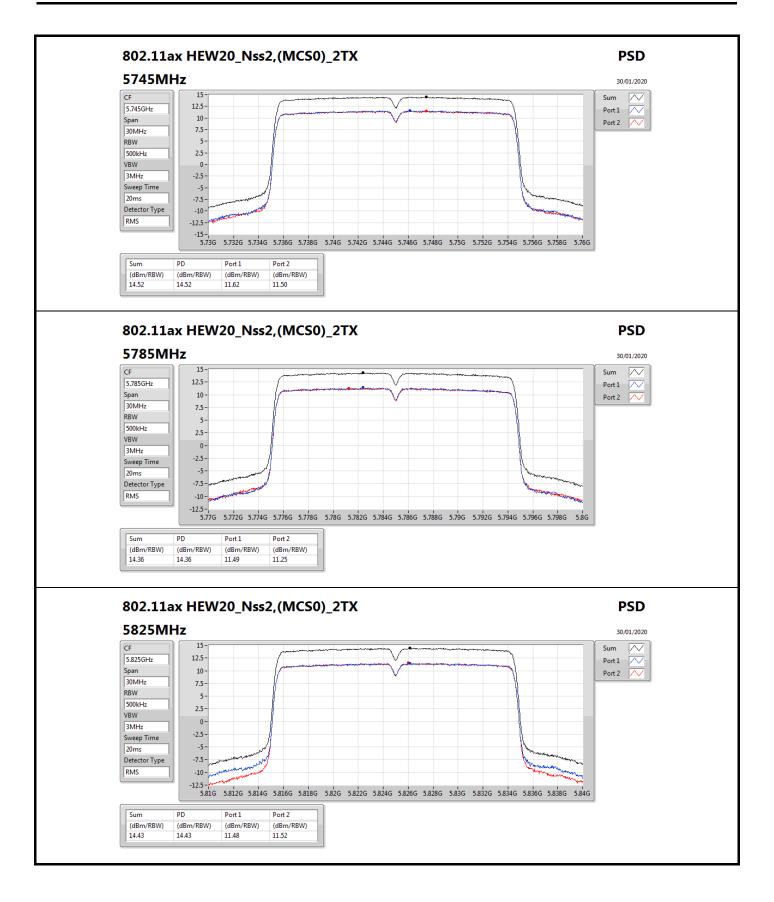
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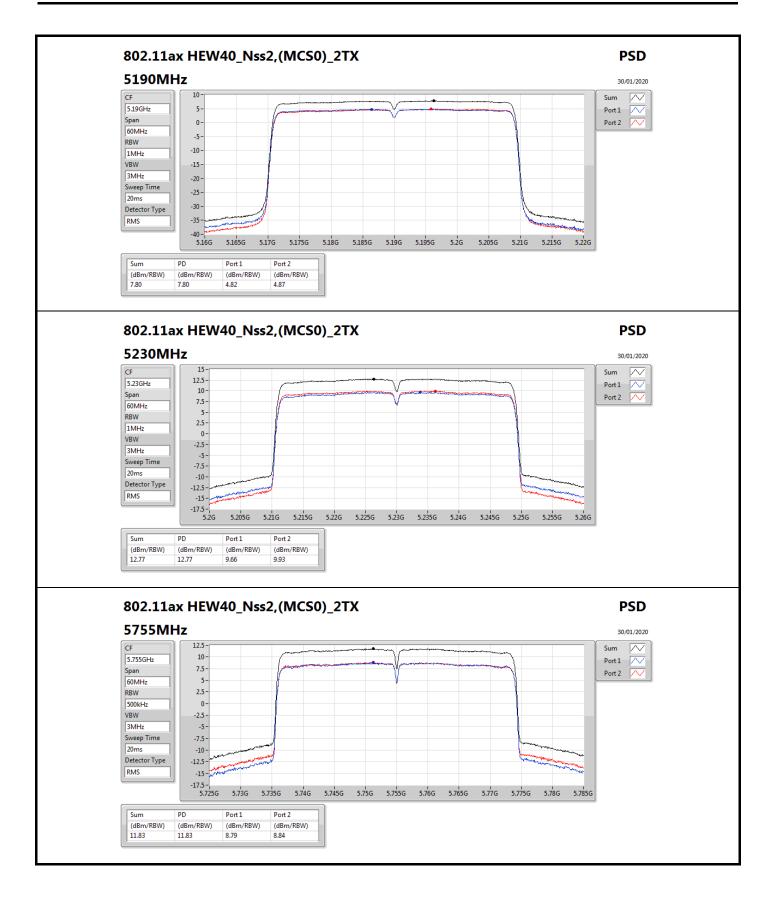
DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

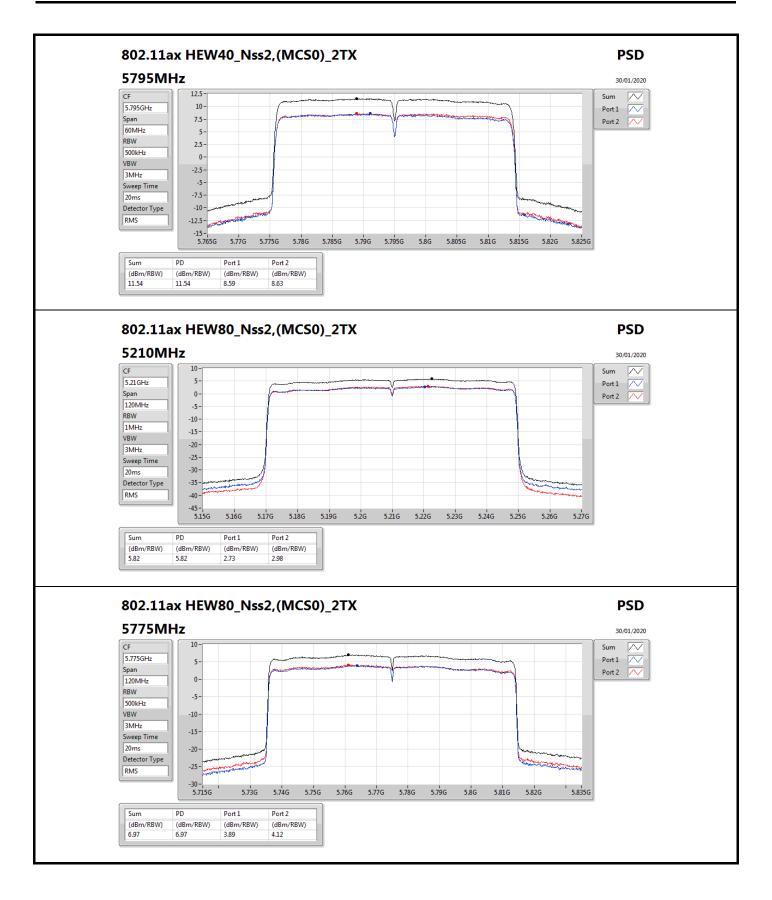


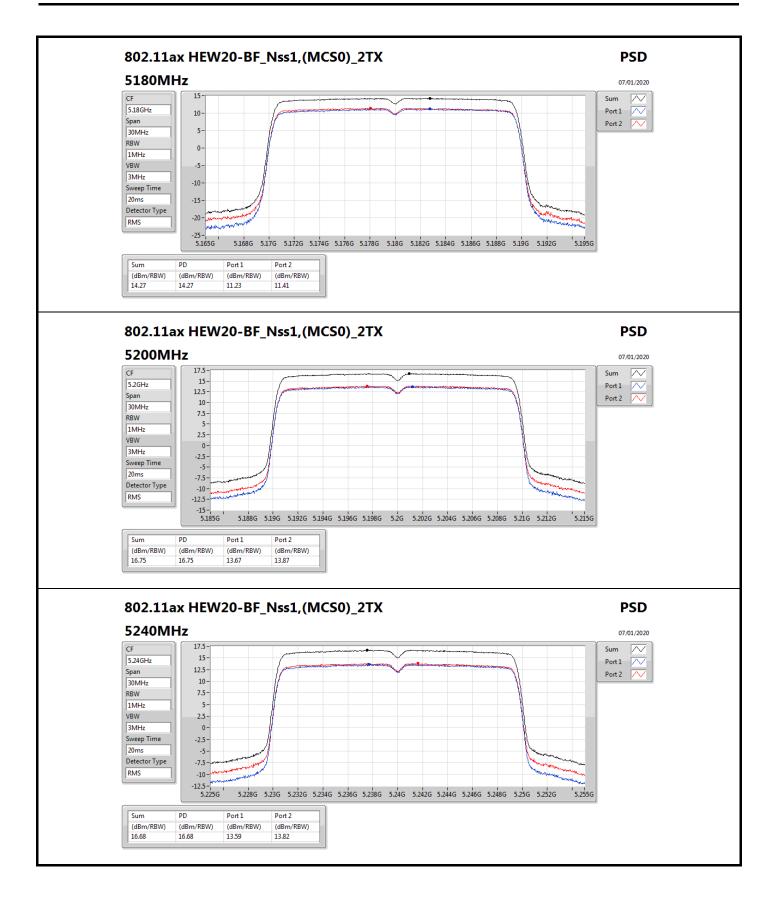


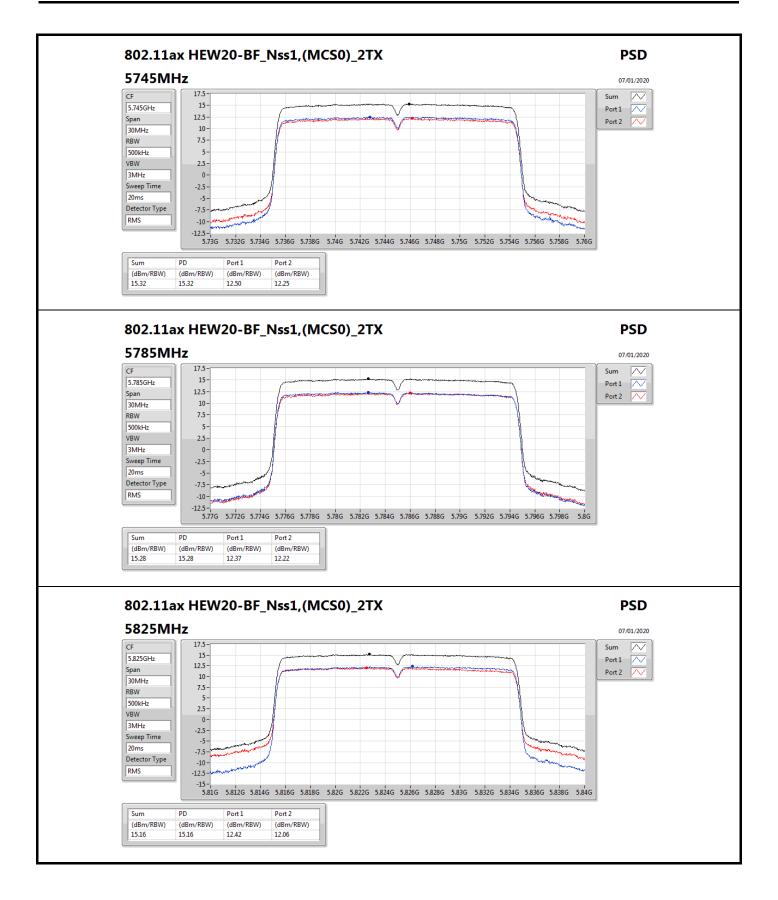


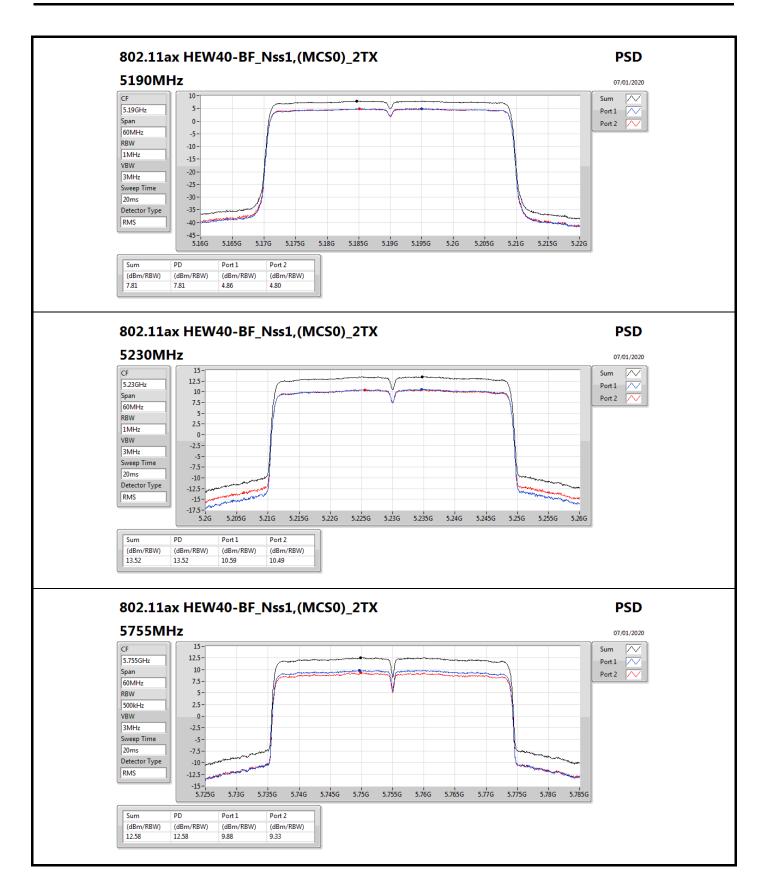


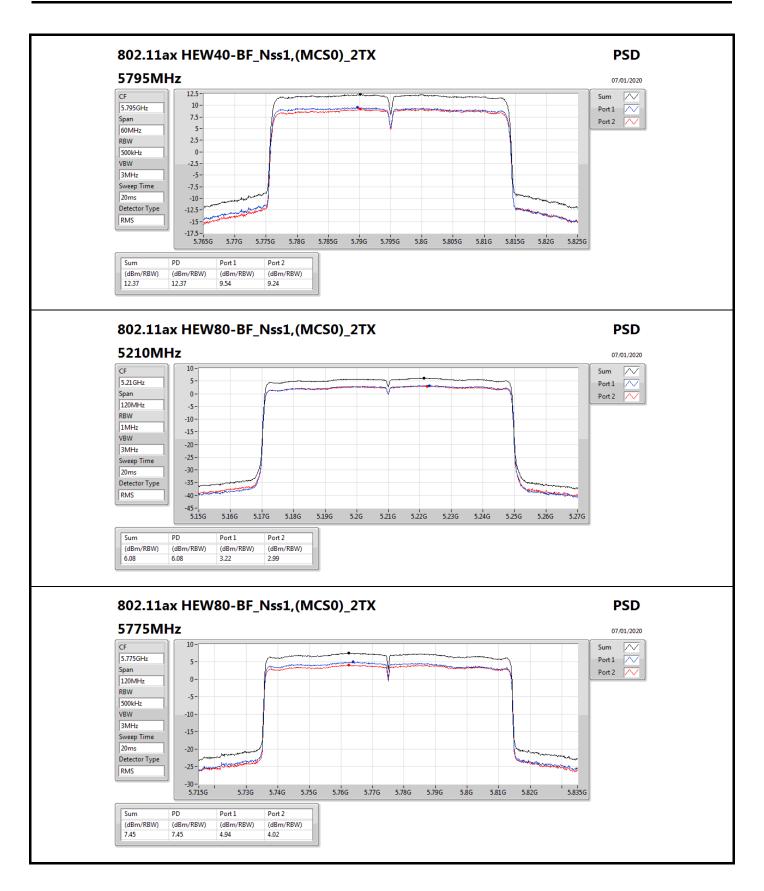


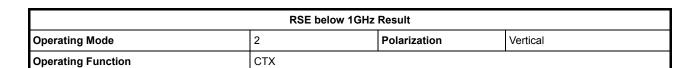


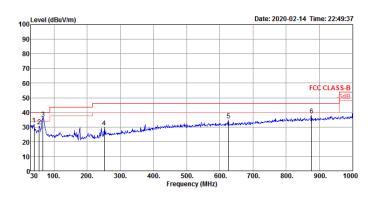










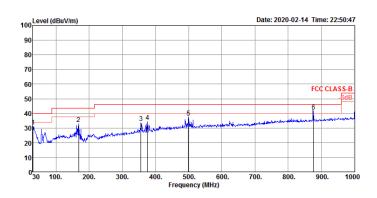


Freq		Level	Limit Line	Over Limit				Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
-	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	39.70	31.73	40.00	-8.27	42.45	0.83	19.96	31.51	100	40	Peak	VERTICAL
2	55.22	30.47	40.00	-9.53	47.73	0.92	13.62	31.80	200	0	Peak	VERTICAL
3	66.86	35.81	40.00	-4.19	54.07	1.01	12.60	31.87	145	155	QP	VERTICAL
4	251.16	29.92	46.00	-16.08	40.92	2.04	18.99	32.03	100	13	Peak	VERTICAL
5	625.58	34.64	46.00	-11.36	38.58	3.28	25.21	32.43	300	163	Peak	VERTICAL
6	875.84	38.12	46.00	-7.88	39.10	3.92	27.50	32.40	125	192	Peak	VERTICAL

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)



RSE below 1GHz Result									
Operating Mode	2	2 Polarization							
Operating Function	CTX								



	Freq	Level	Limit Line	Over Limit				Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.97	30.88	40.00	-9.12	36.64	0.69	25.11	31.56	200	75	Peak	HORIZONTAL
2	168.71	32.70	43.50	-10.80	46.88	1.66	16.06	31.90	200	108	Peak	HORIZONTAL
3	355.92	33.76	46.00	-12.24	42.10	2.47	21.34	32.15	150	133	Peak	HORIZONTAL
4	375.32	34.39	46.00	-11.61	42.17	2.51	21.88	32.17	100	239	Peak	HORIZONTAL
5	499.48	37.18	46.00	-8.82	42.93	2.93	23.80	32.48	150	129	Peak	HORIZONTAL
6	875.84	41.47	46.00	-4.53	42.45	3.92	27.50	32.40	100	203	Peak	HORIZONTAL

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)



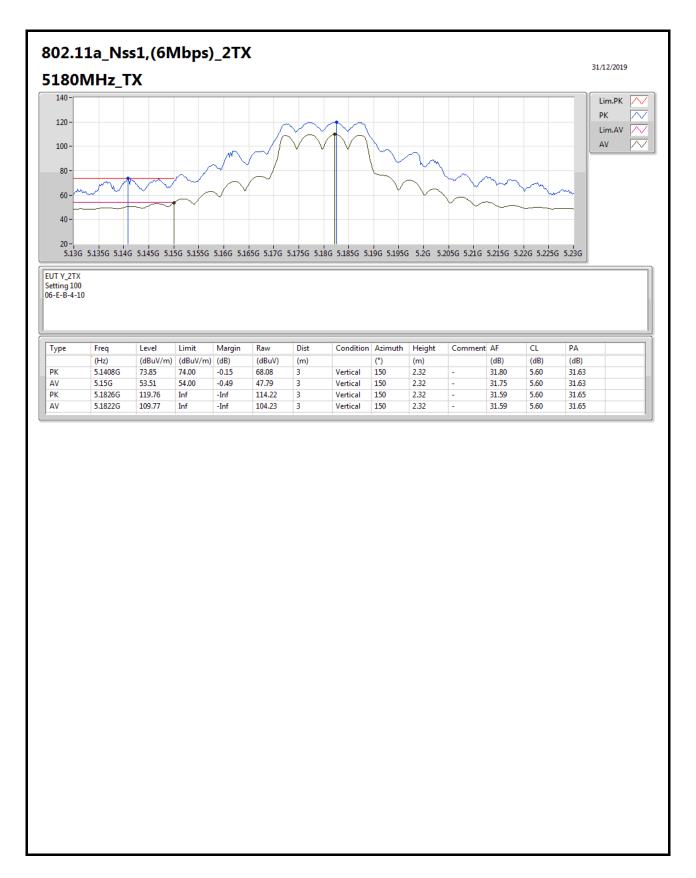
RSE TX above 1GHz Result

Appendix E.2

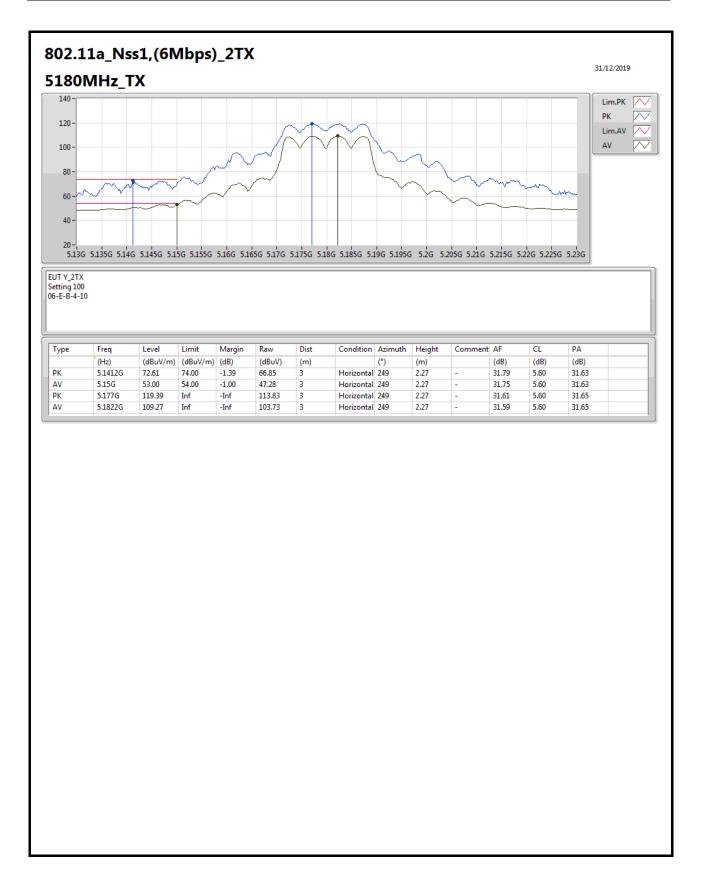
Summary

	Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
				(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5	5.15-5.25GHz	-	-	•	-	-	-	-	-	-	-	-
802.11ax HE	EW40_Nss2,(MCS0)_2TX	Pass	AV	5.1496G	53.99	54.00	-0.01	3	Horizontal	245	2.53	-

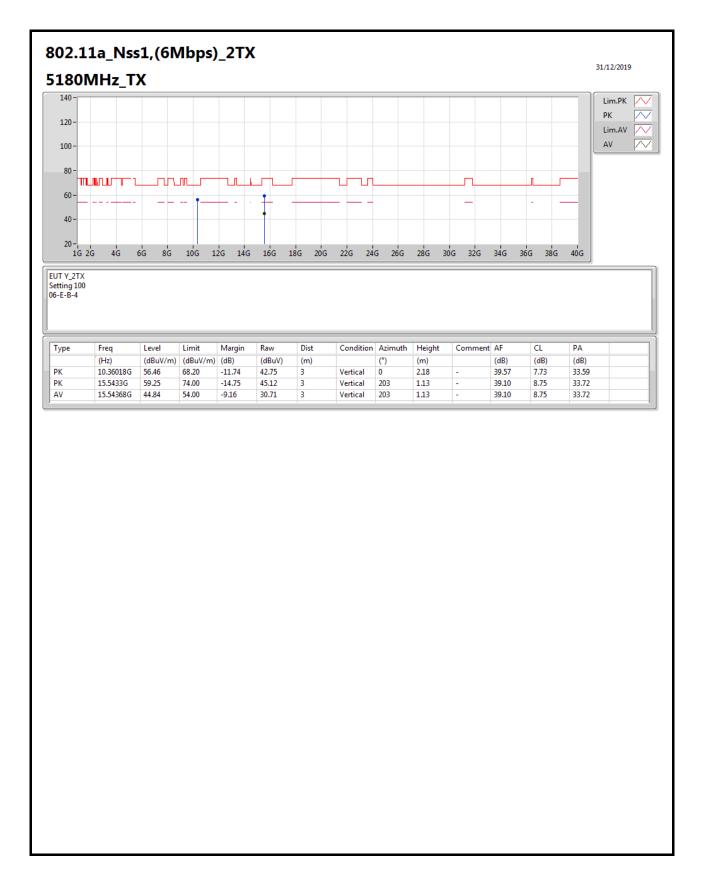




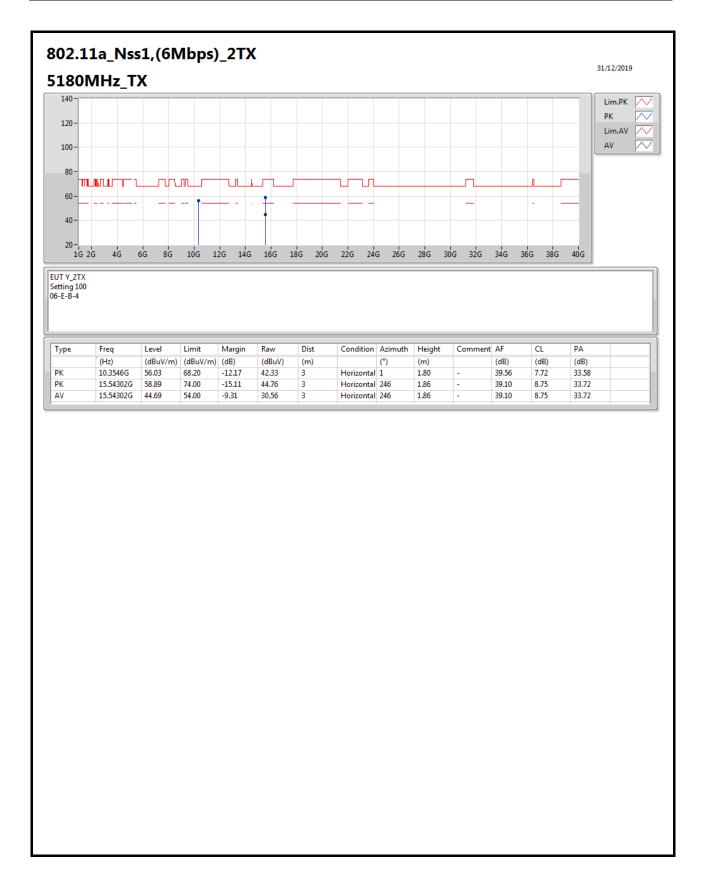




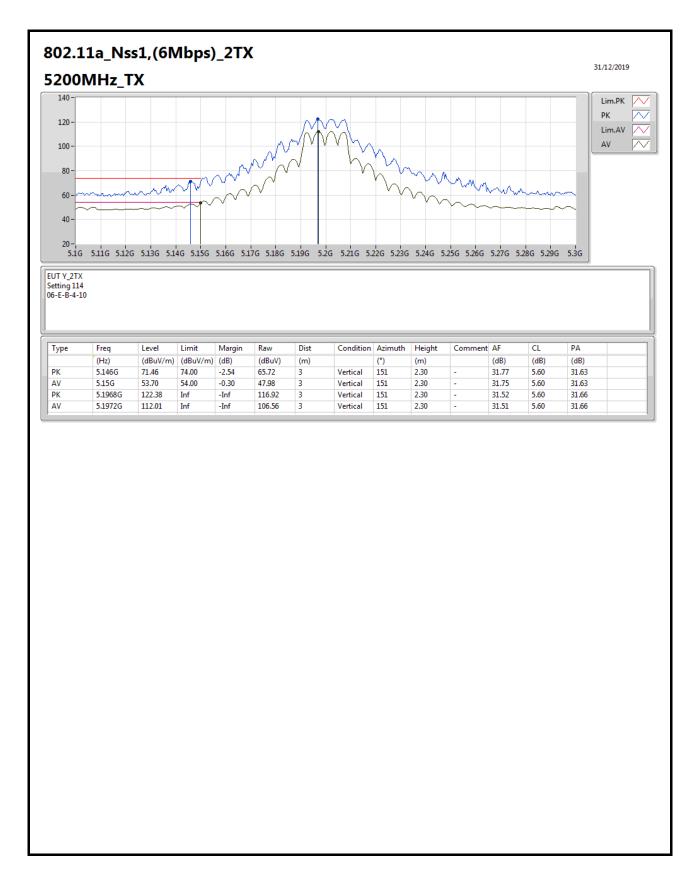




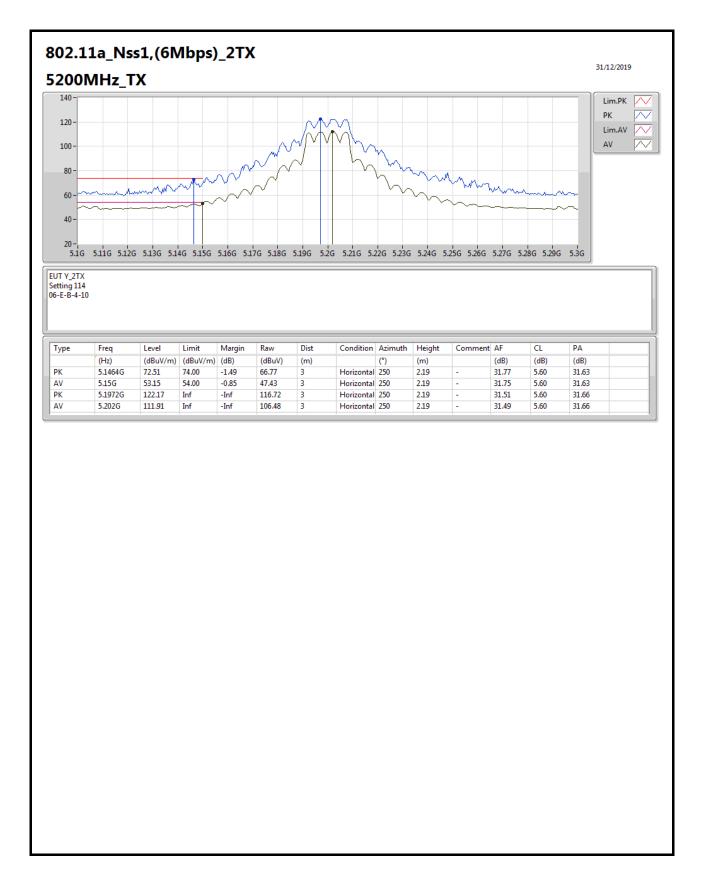




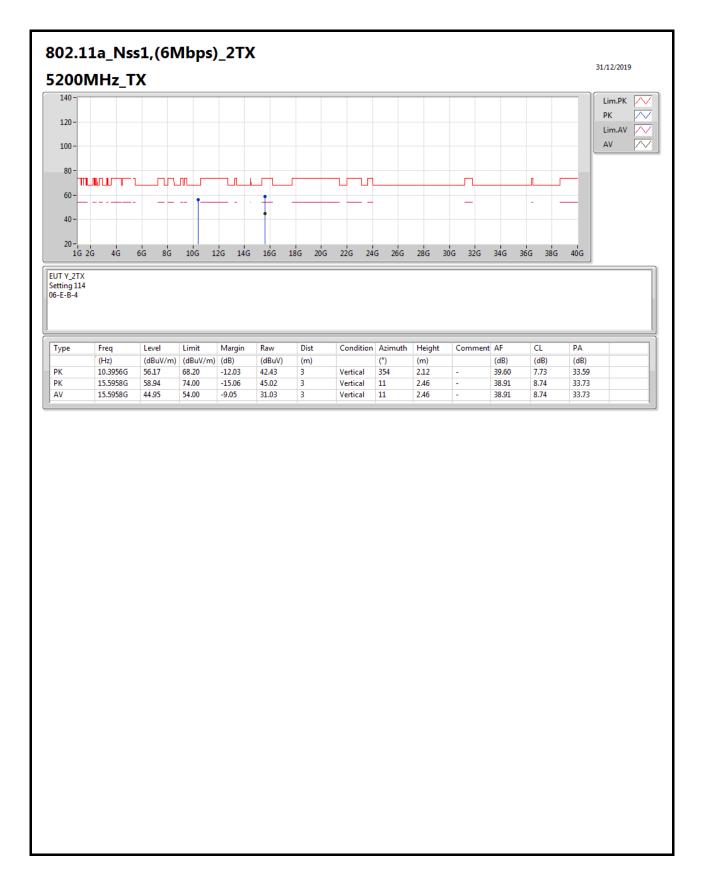




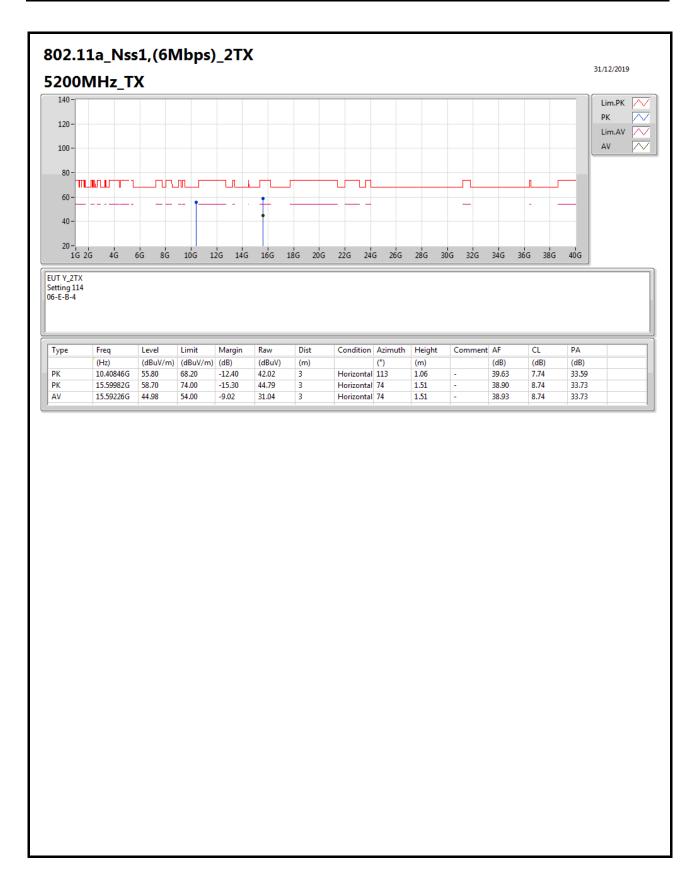




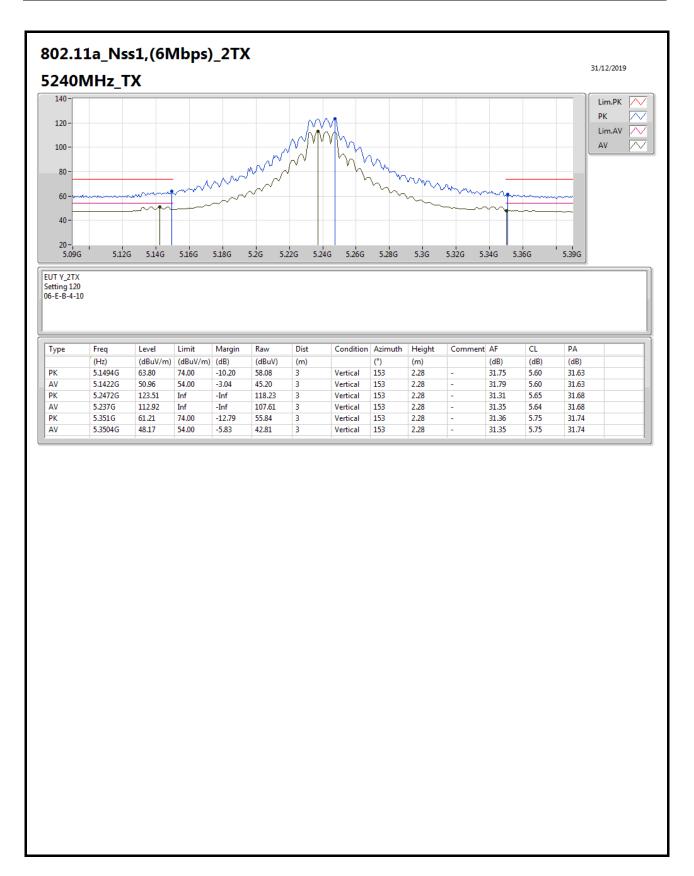




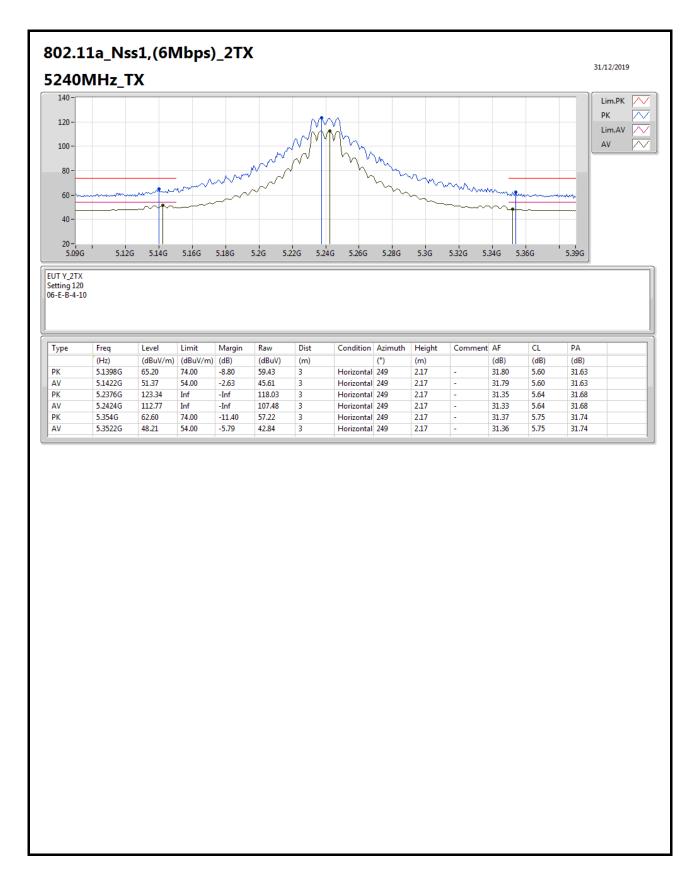




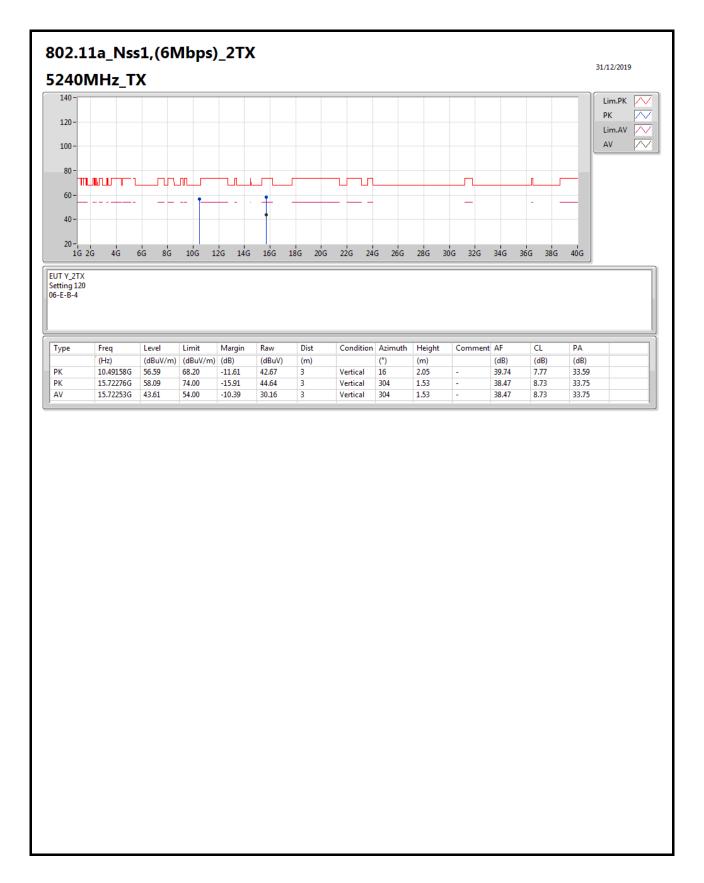




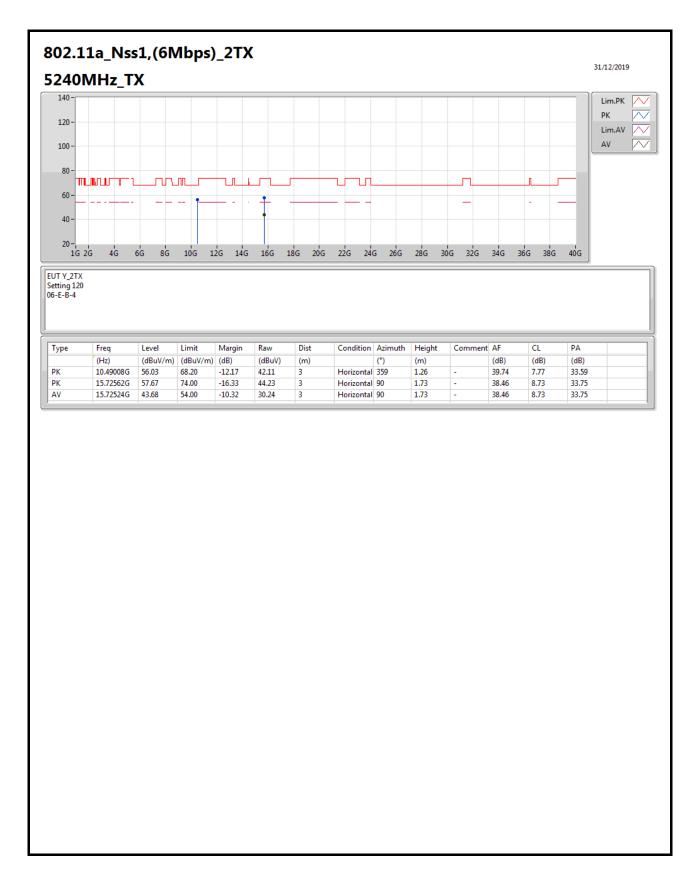




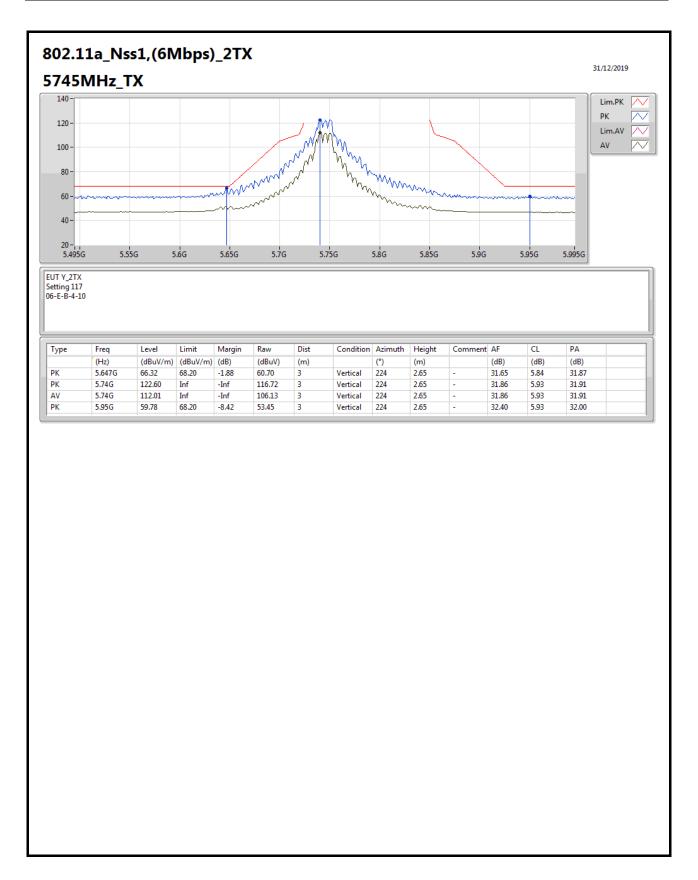




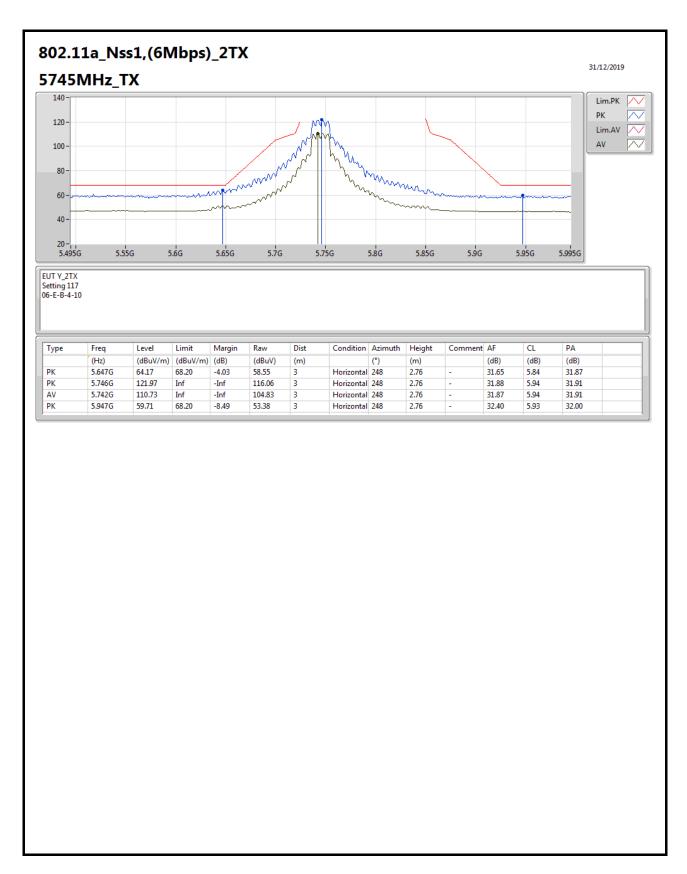




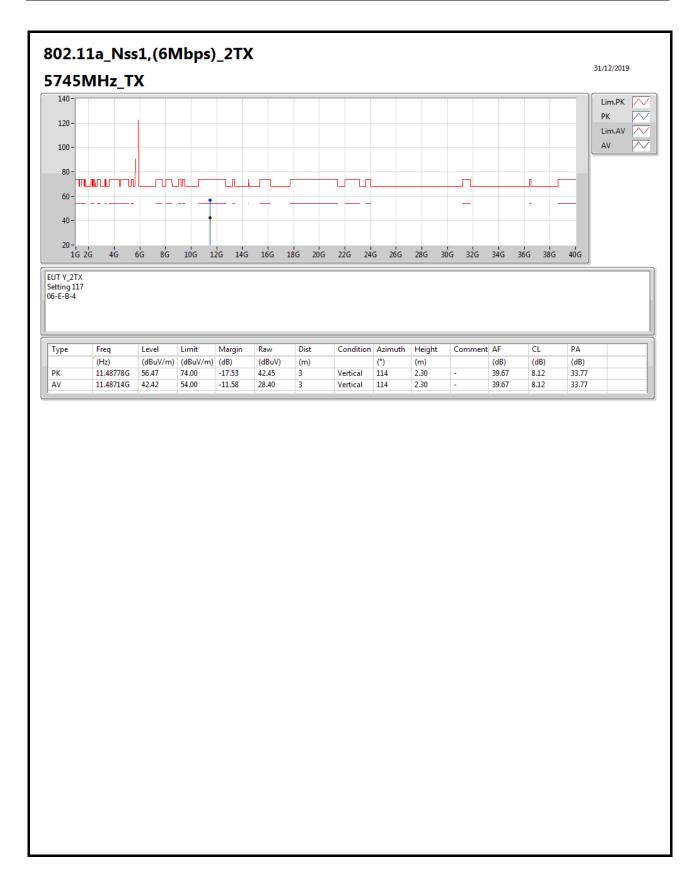




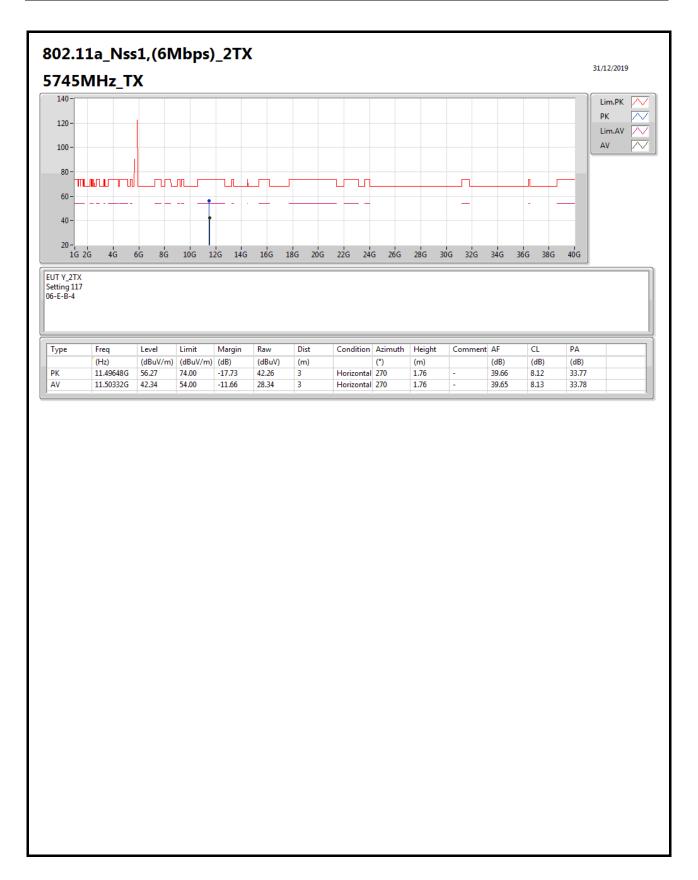




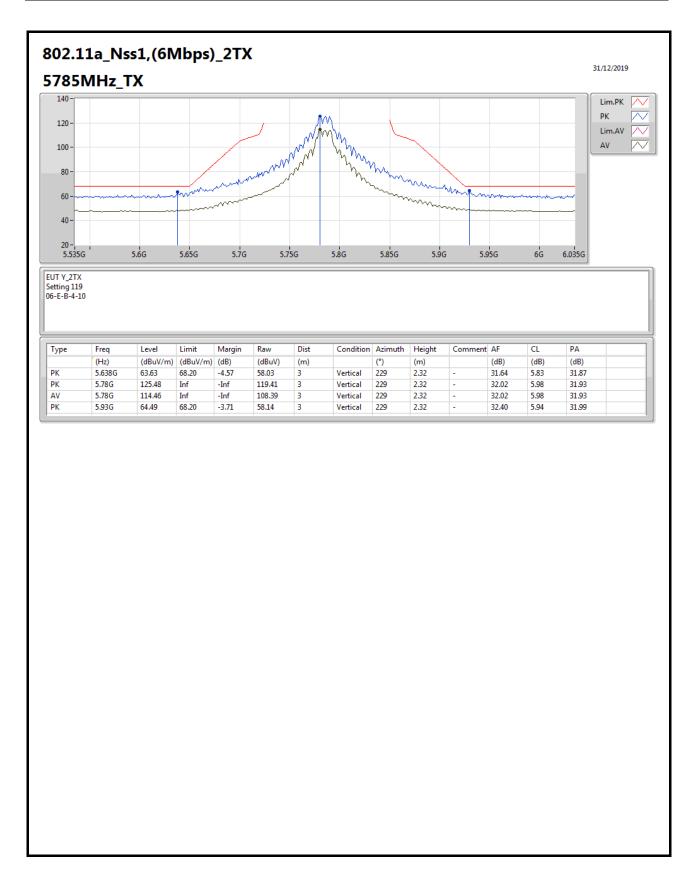




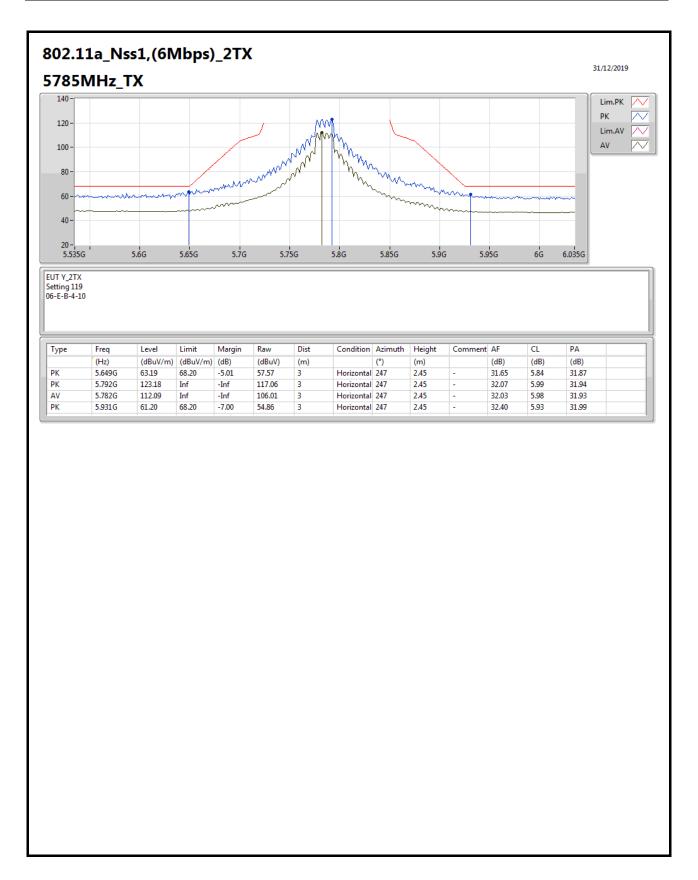




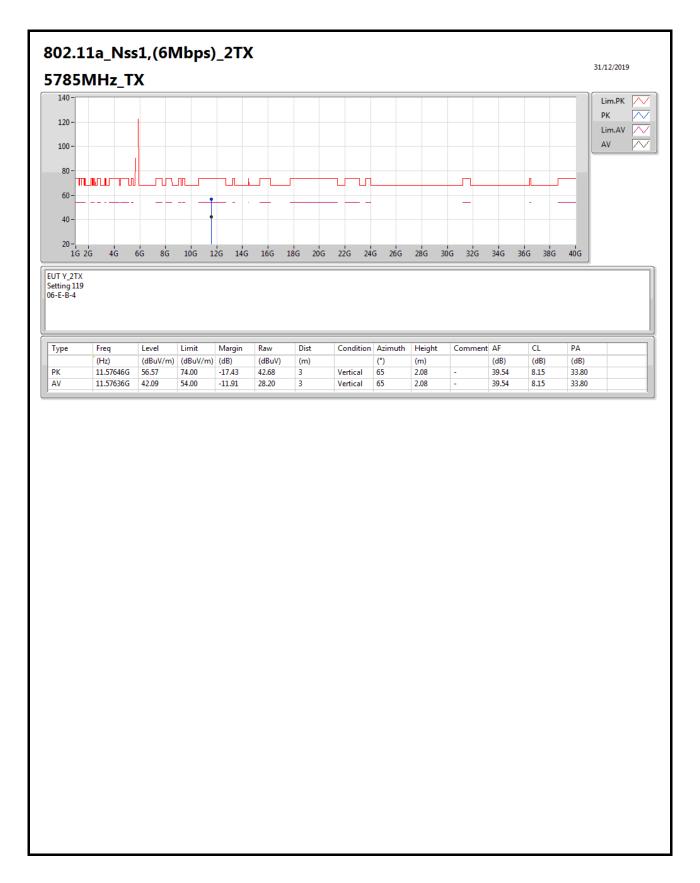




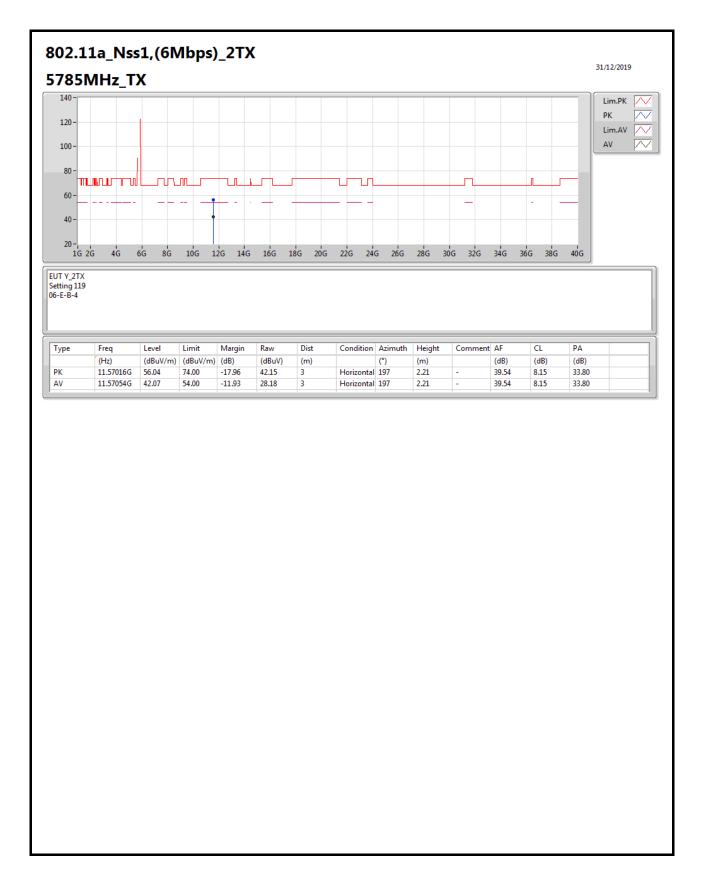




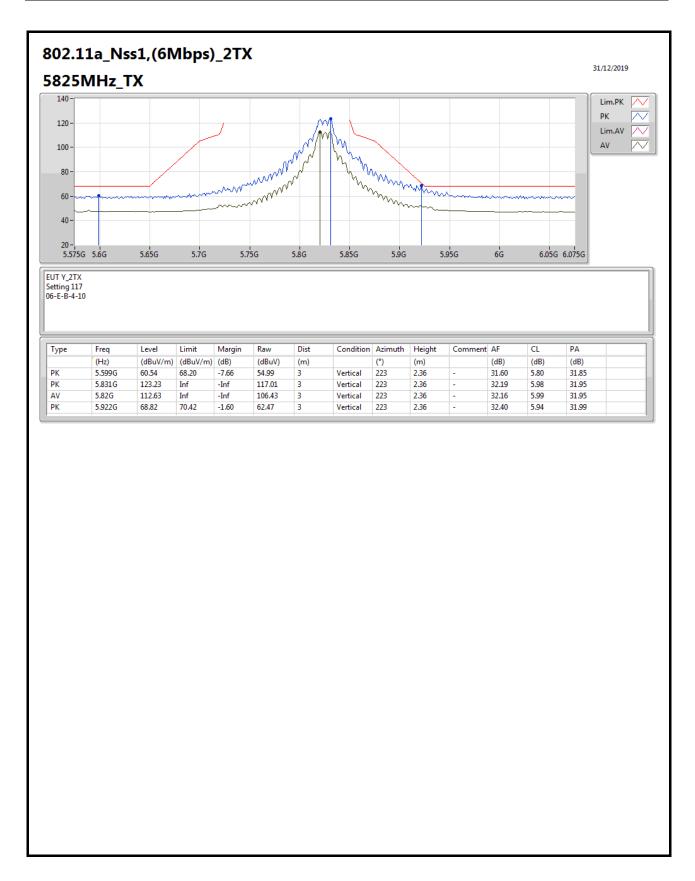




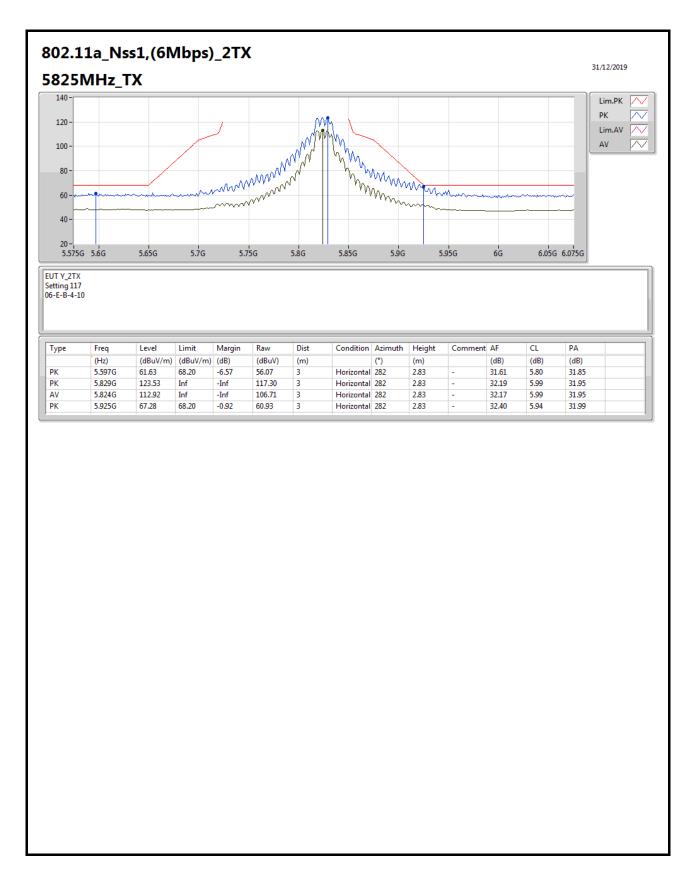




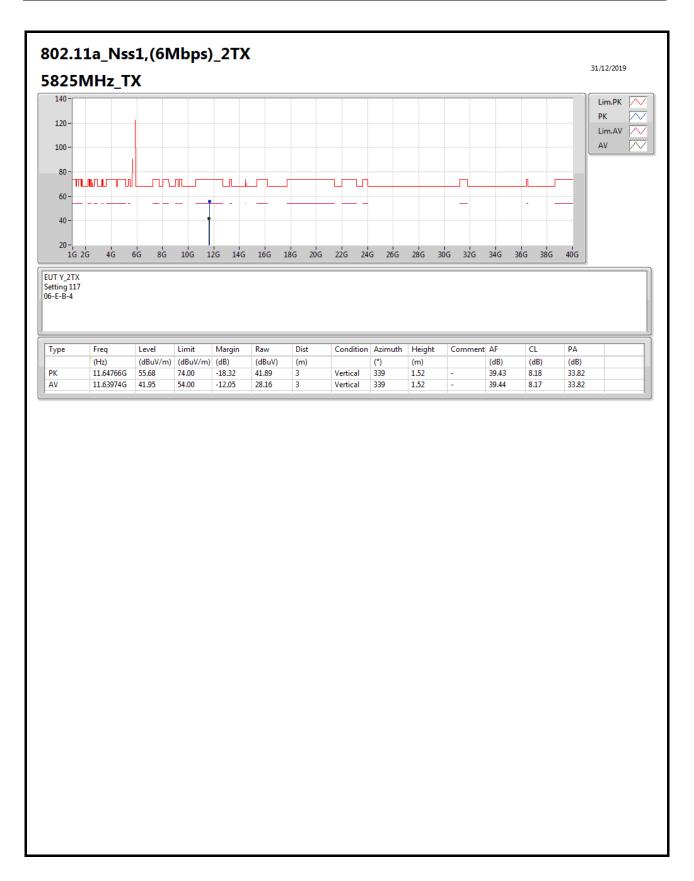




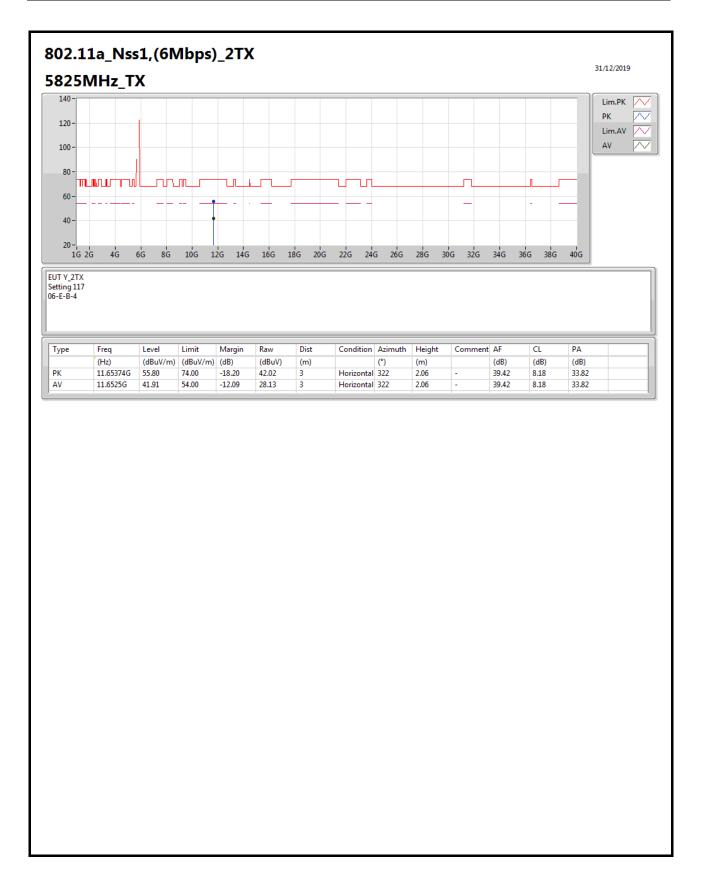




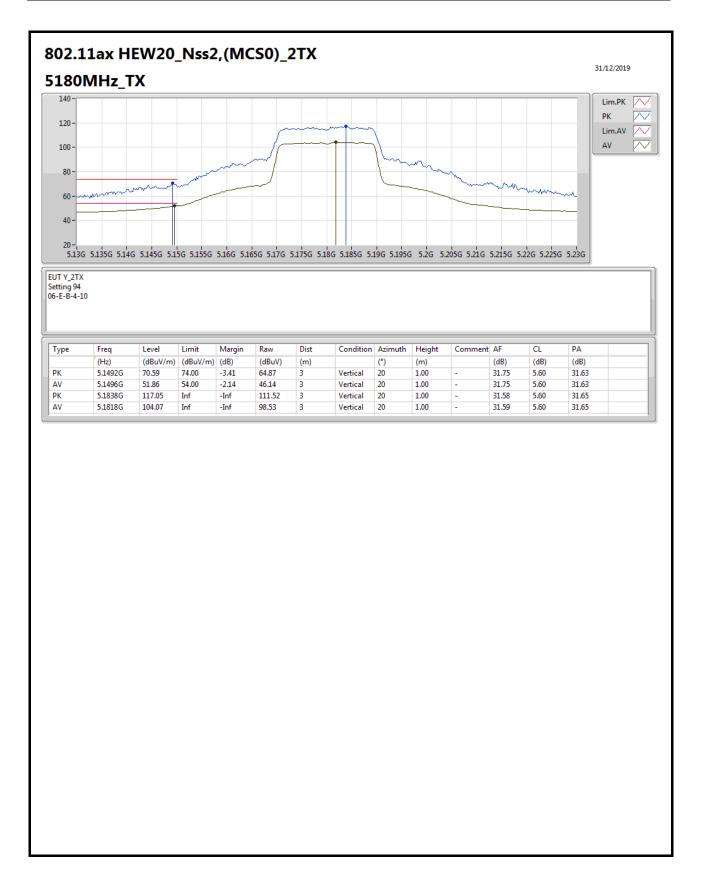




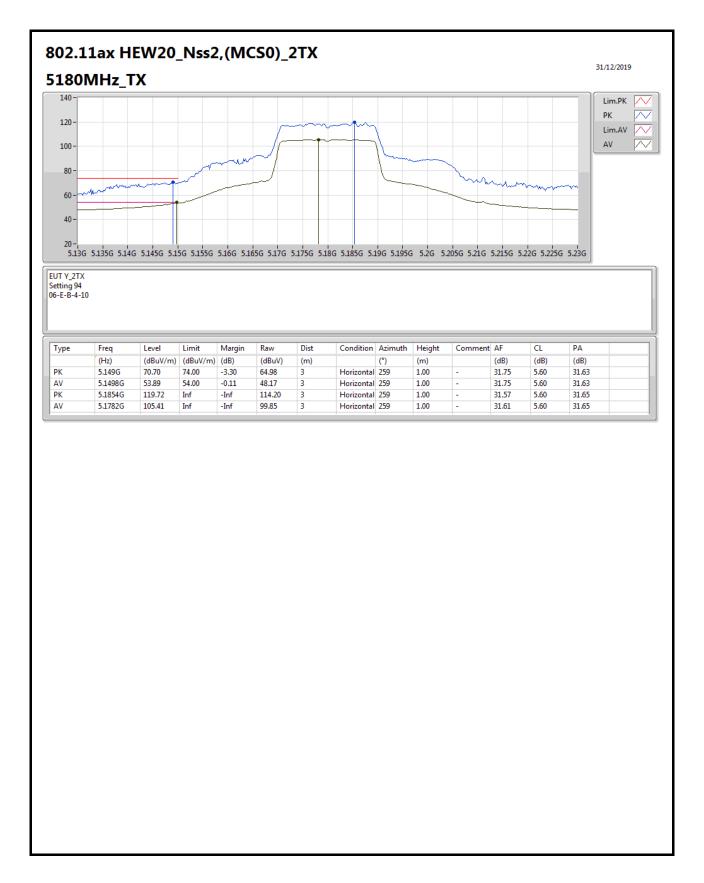




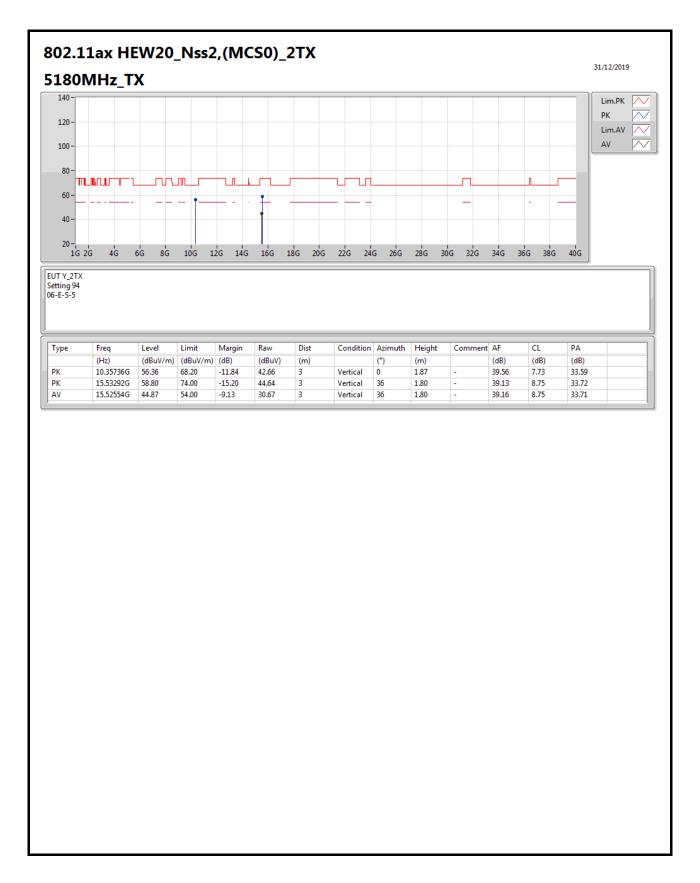




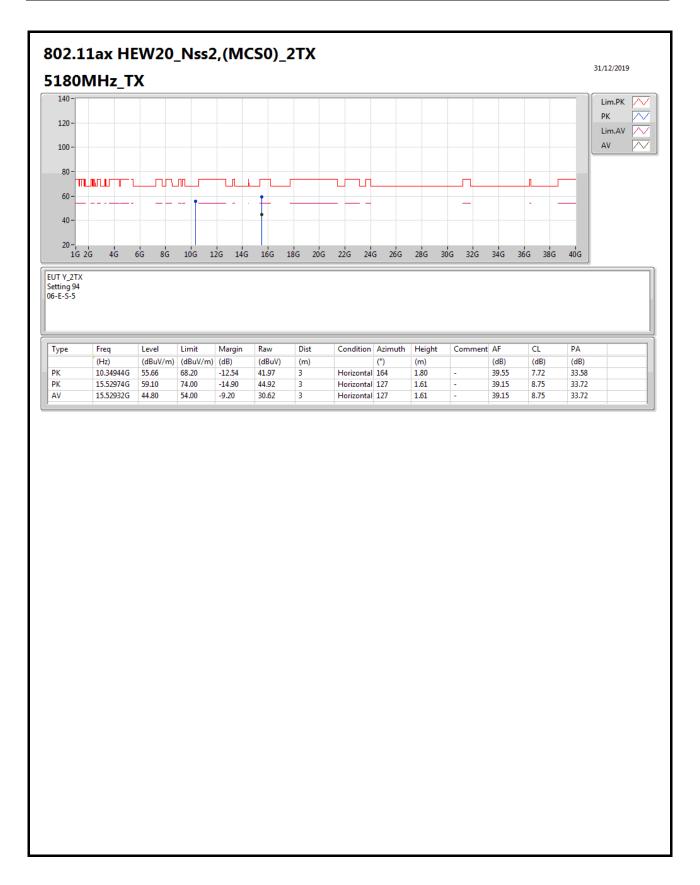




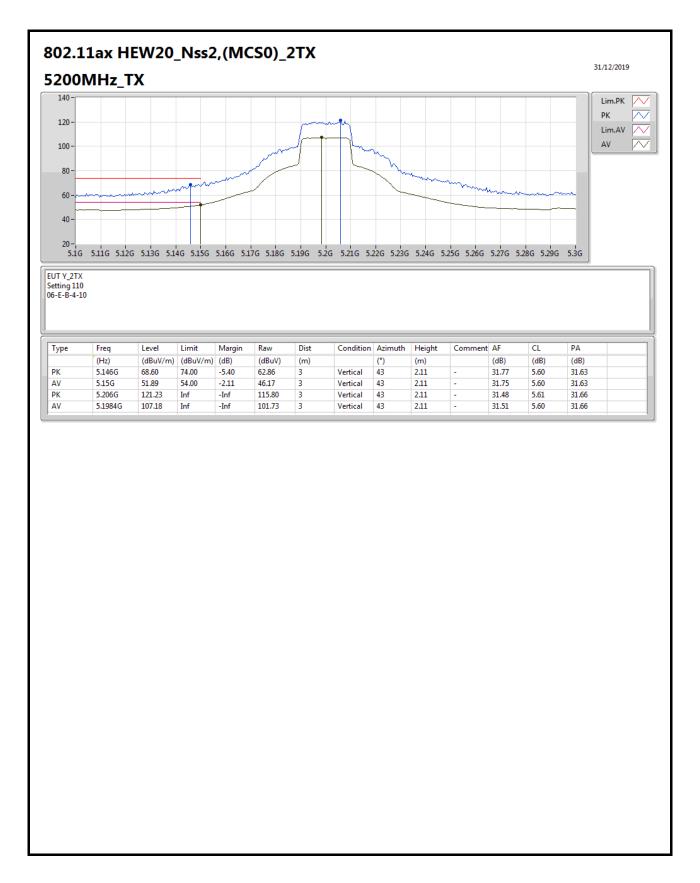




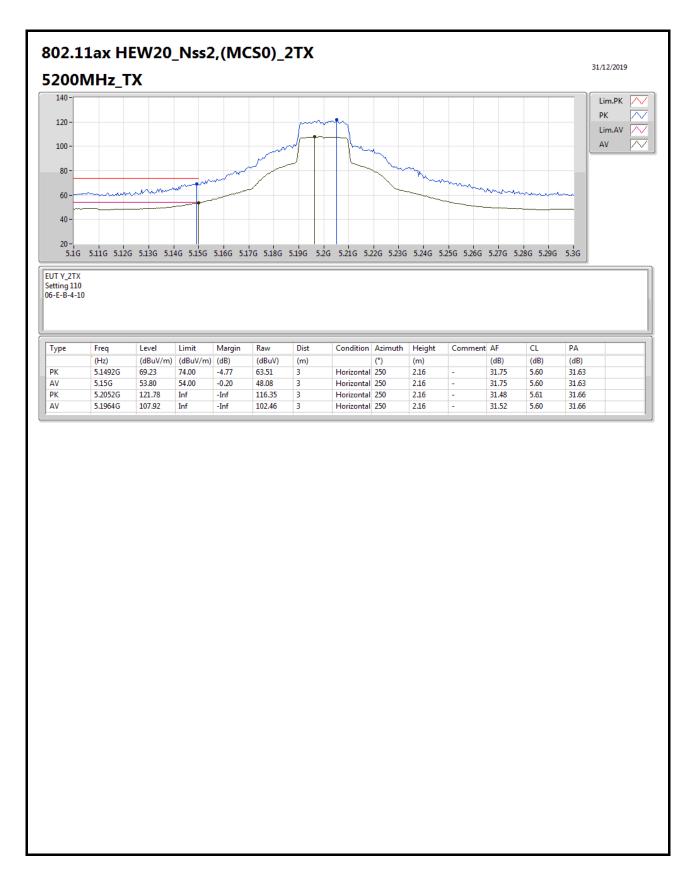




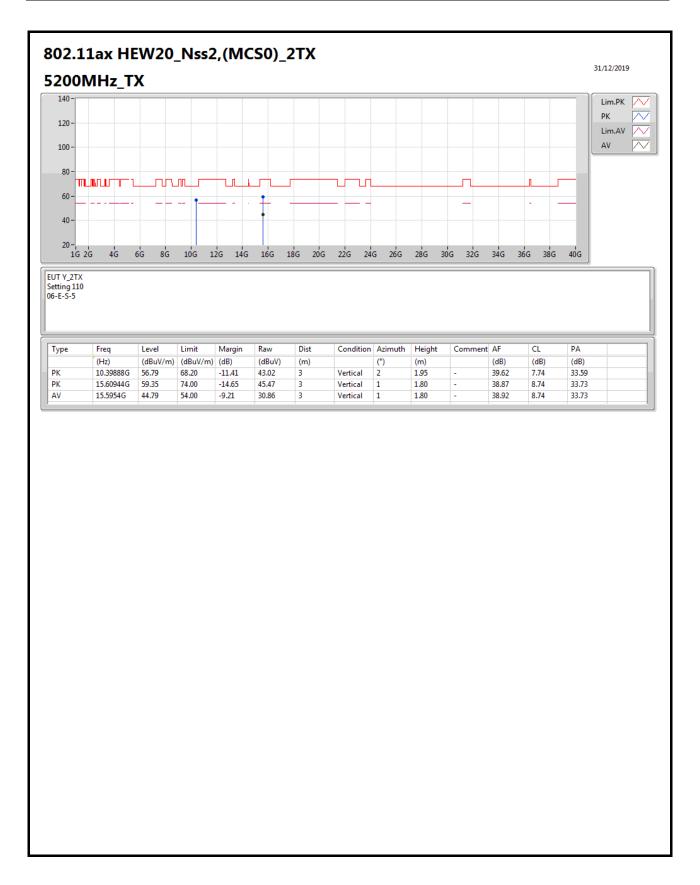




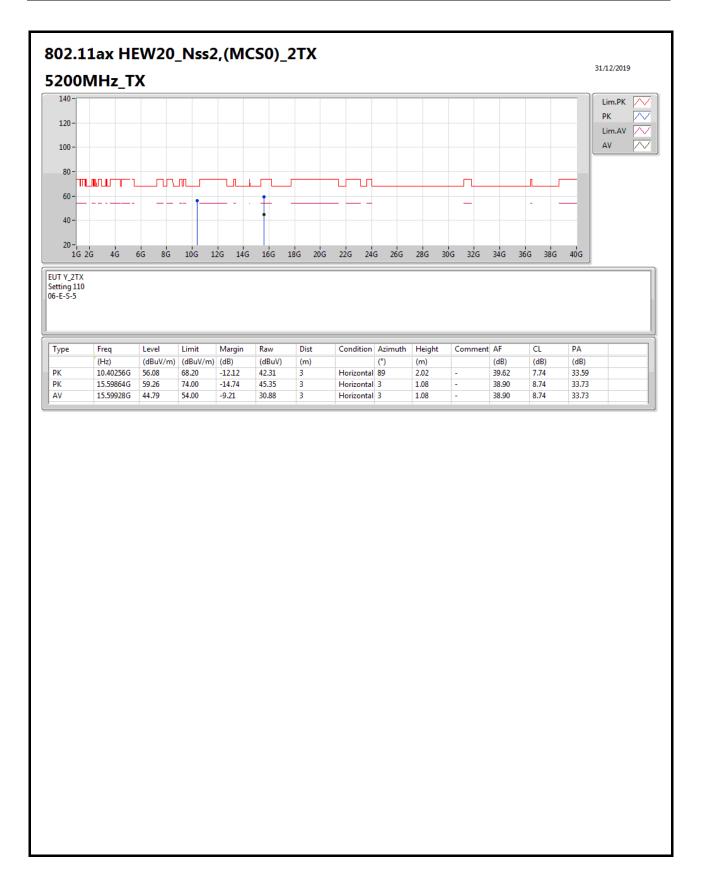




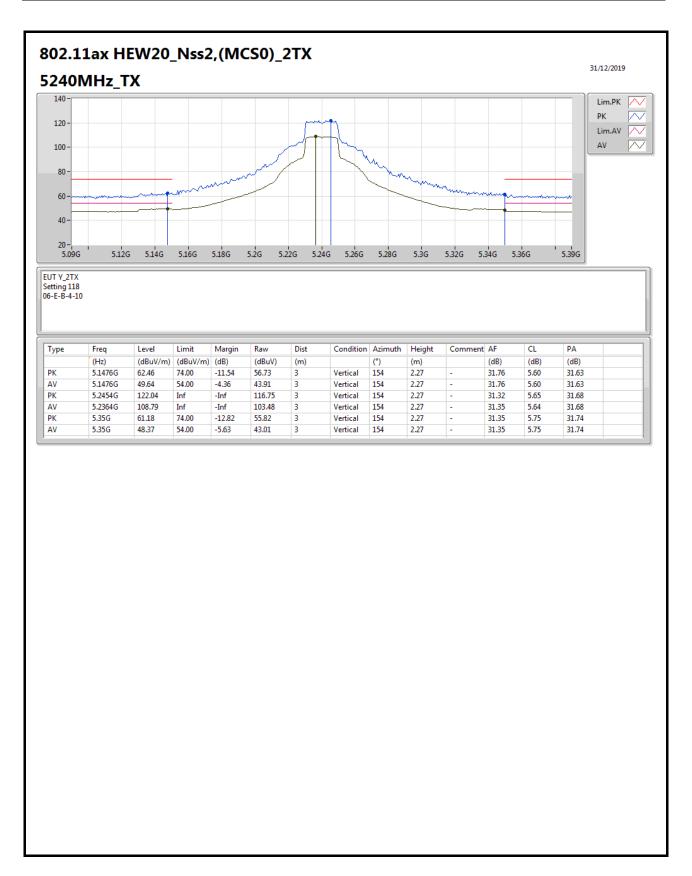




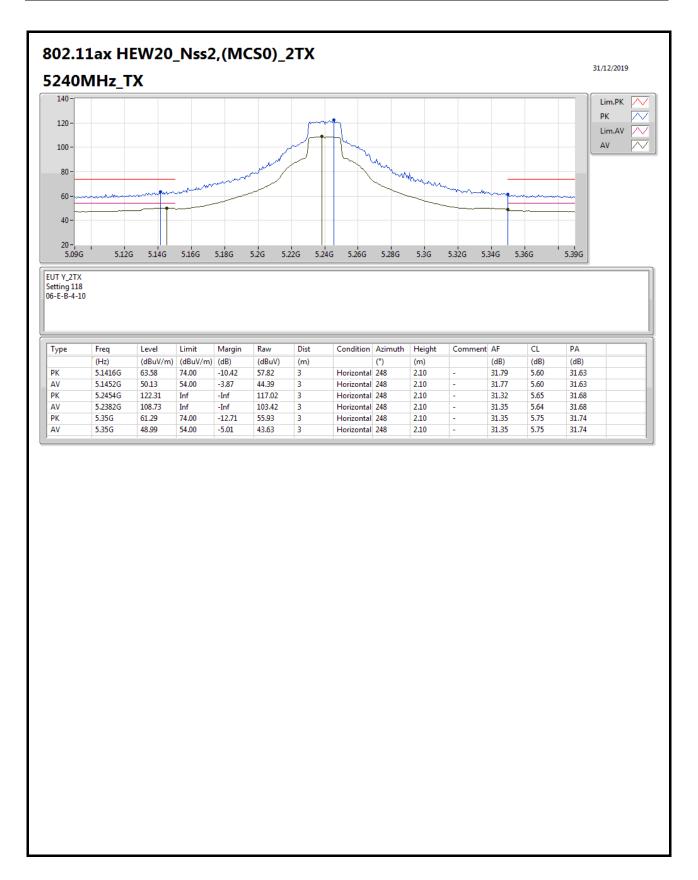




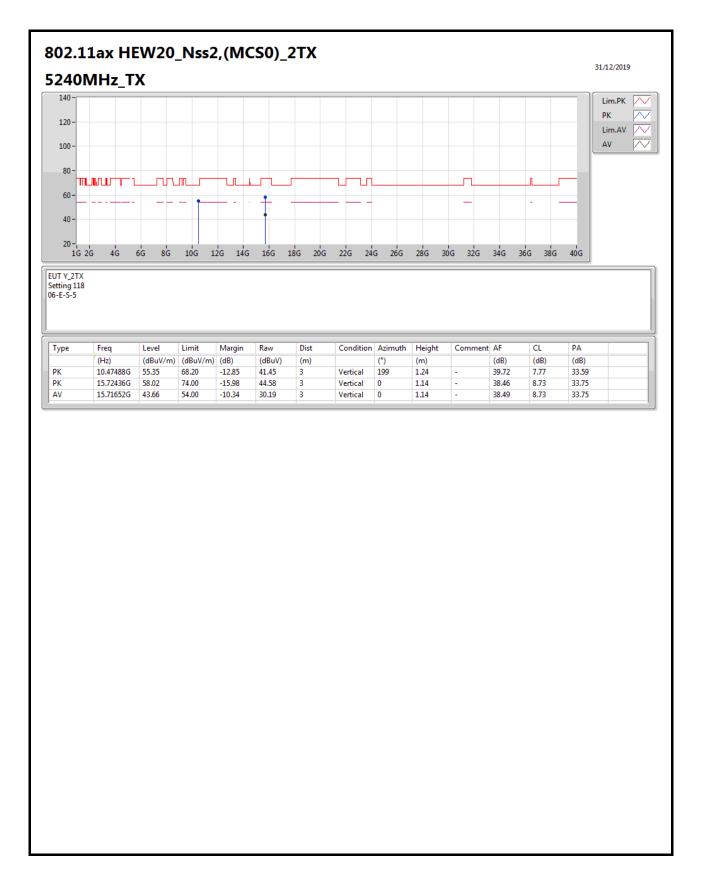




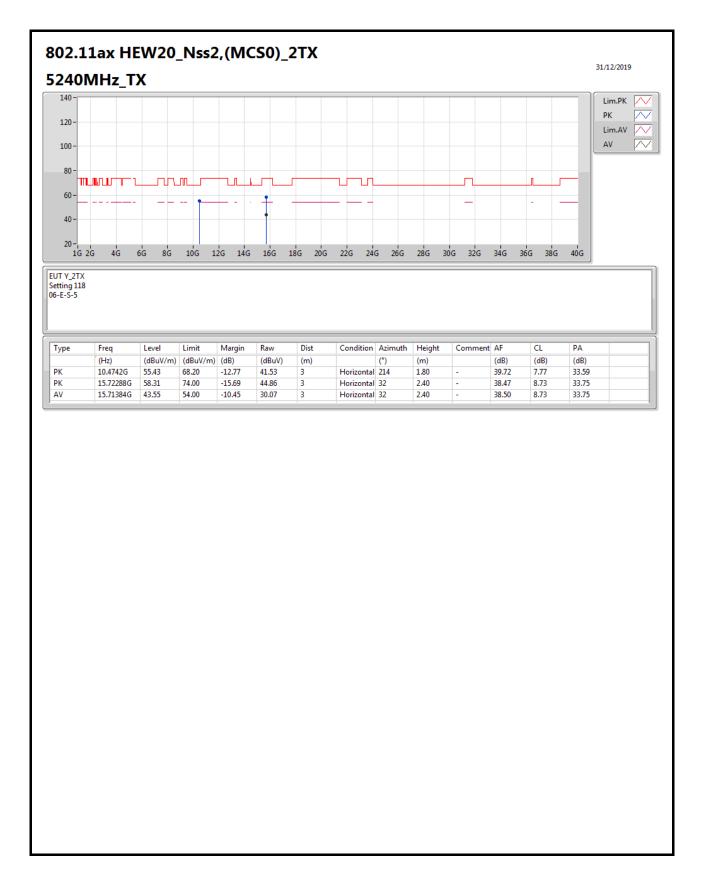




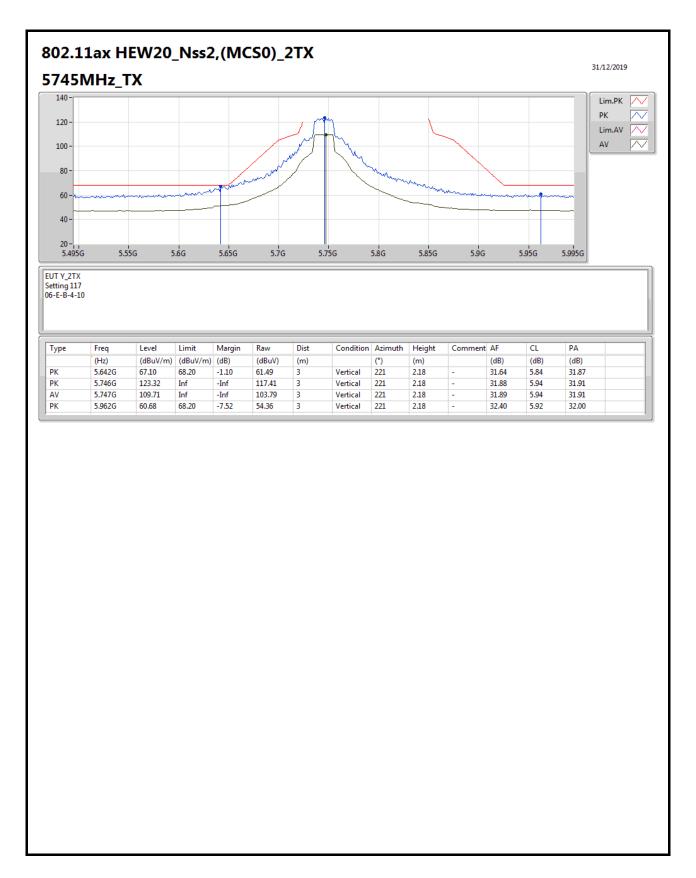




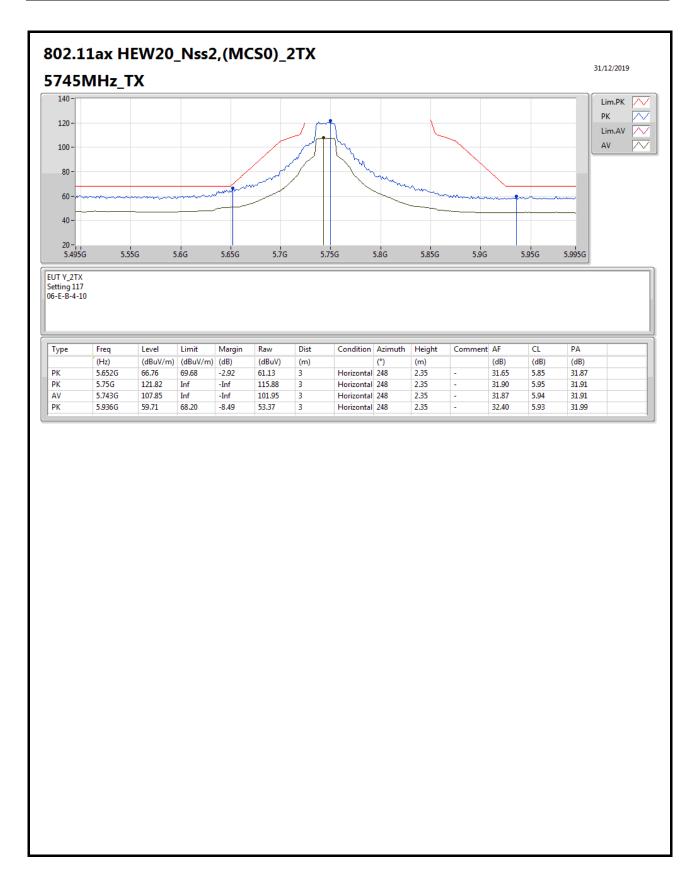




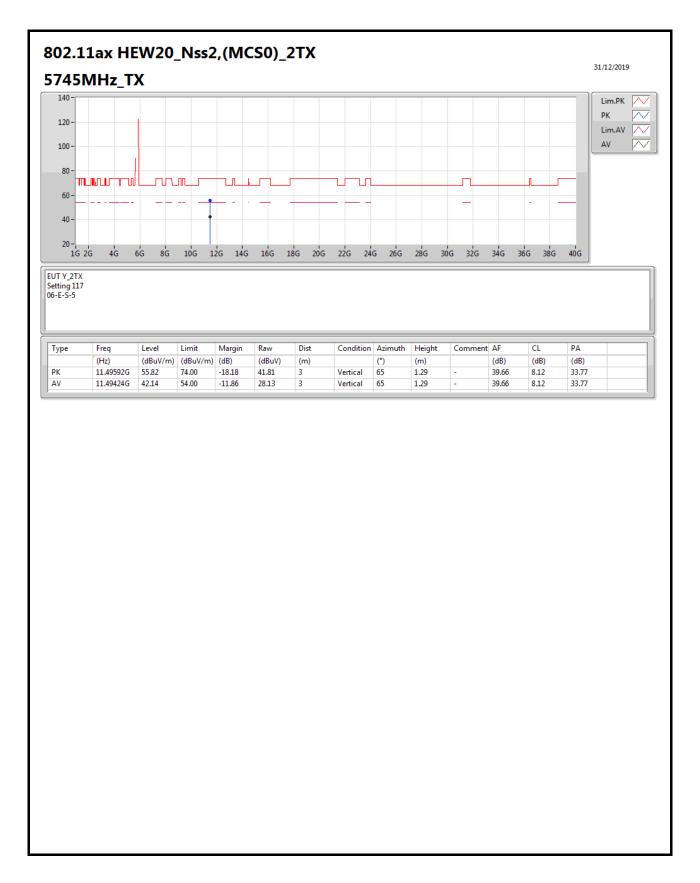




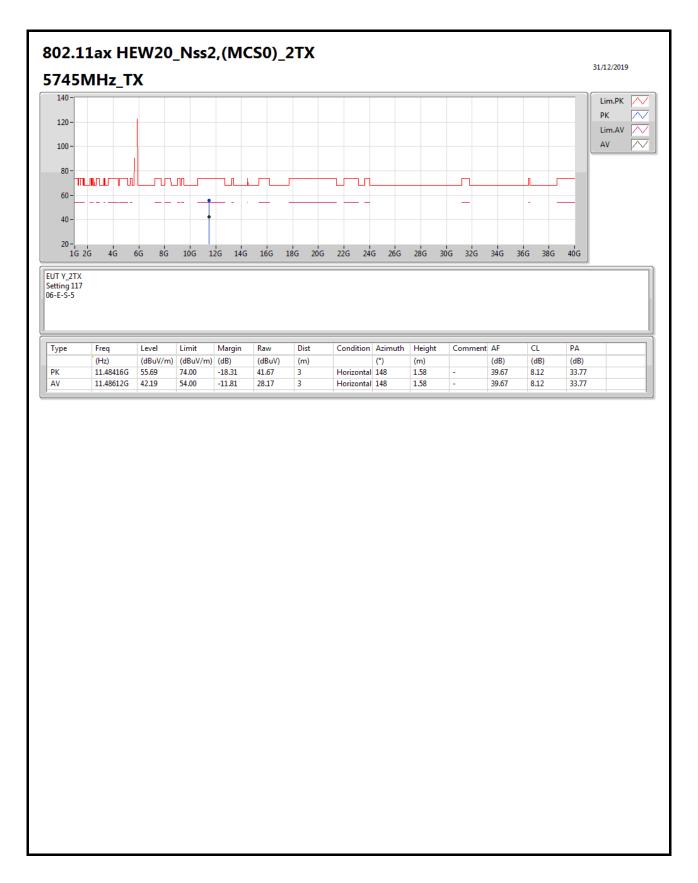




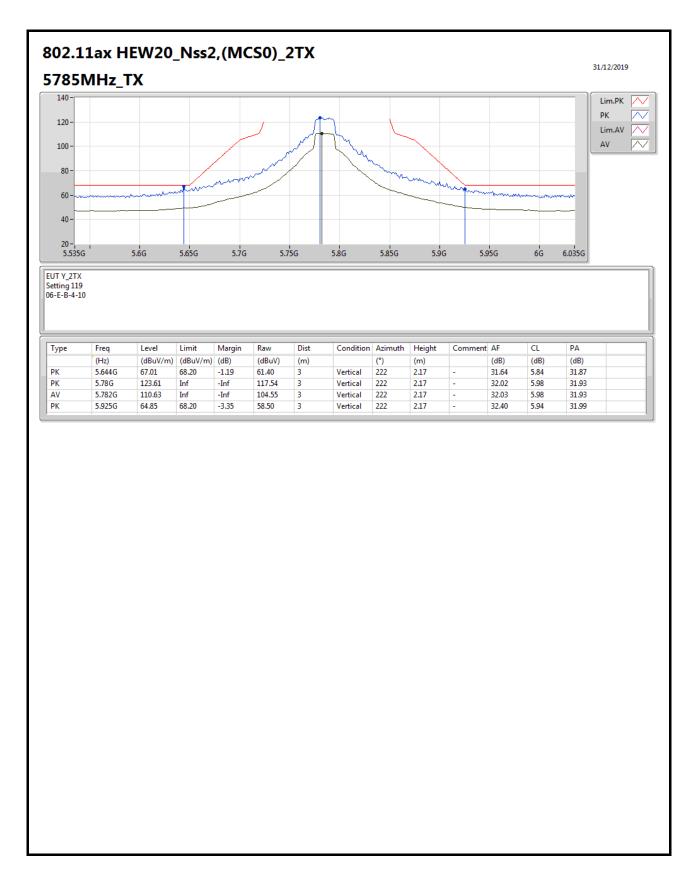




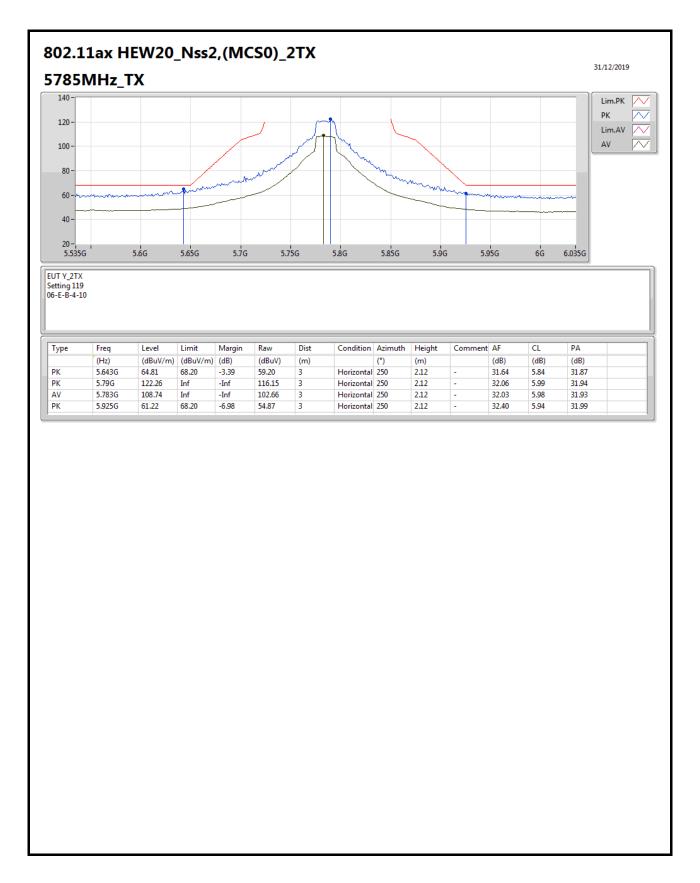




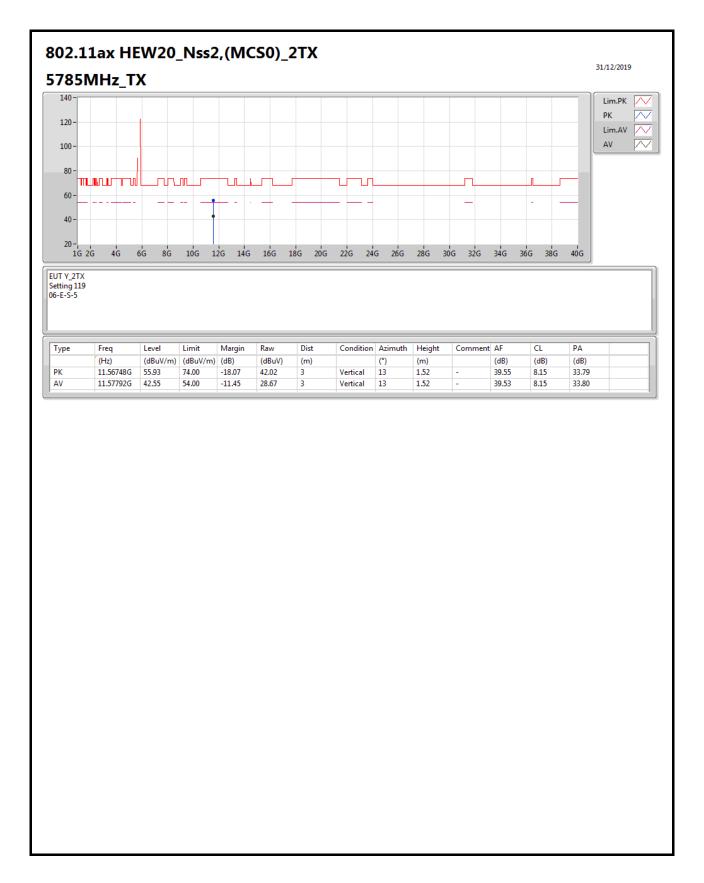




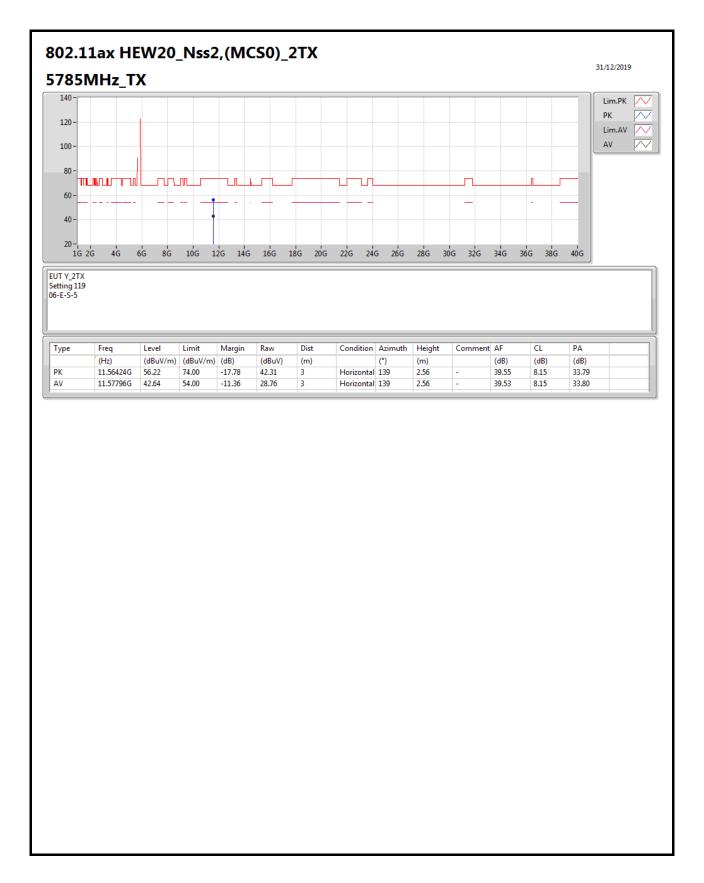




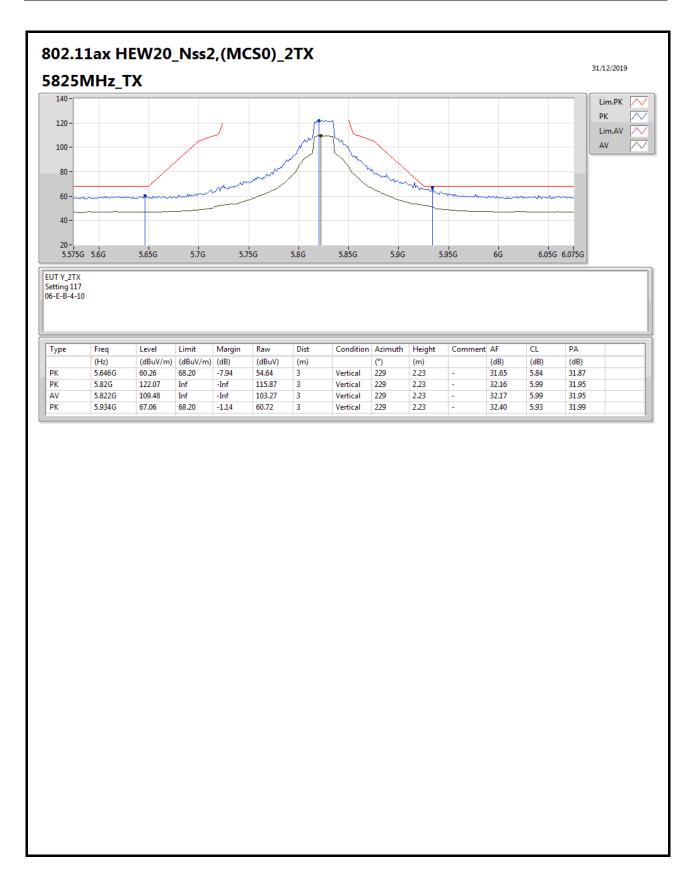




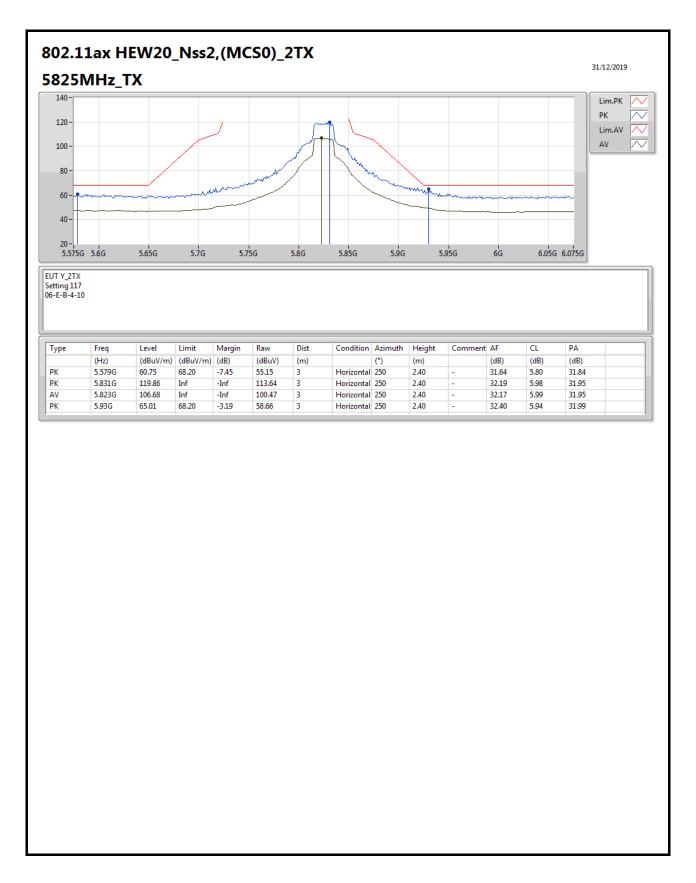




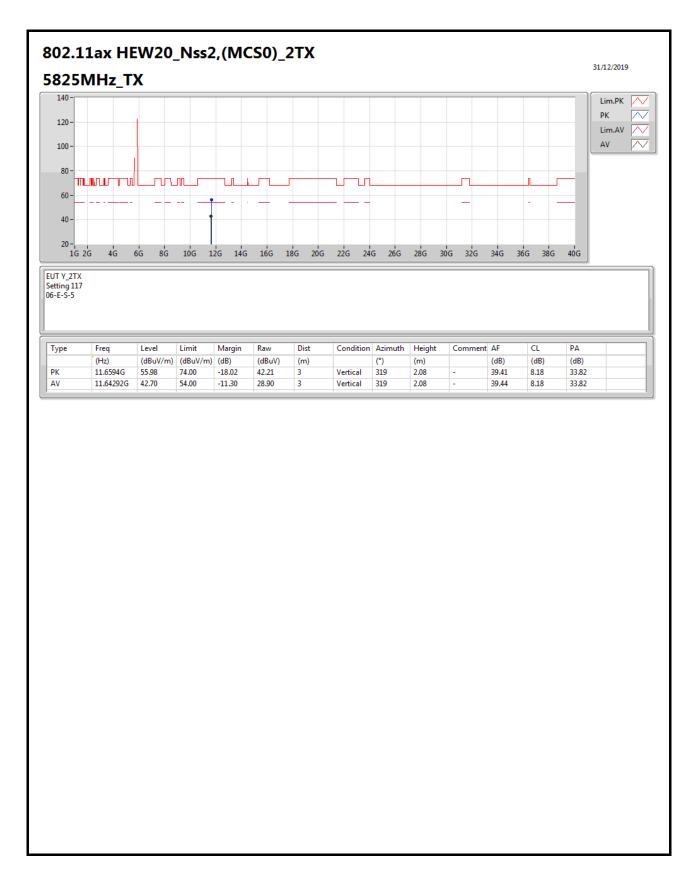




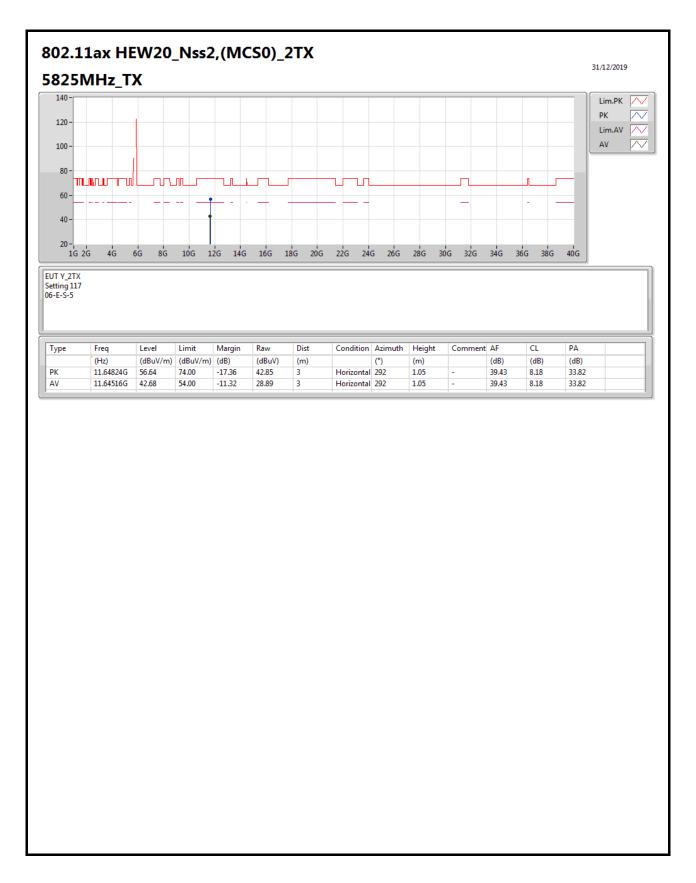




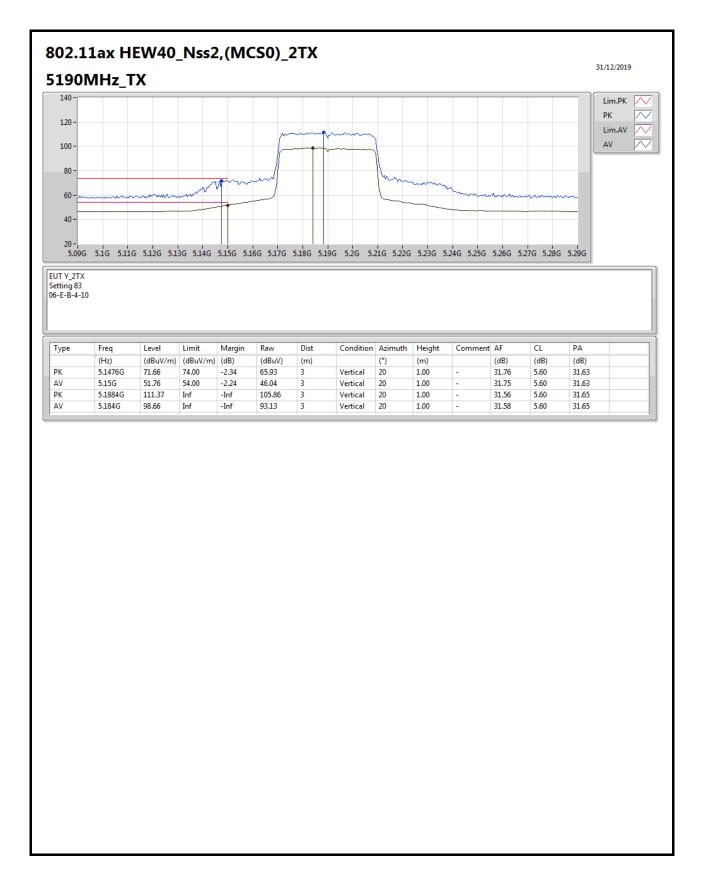




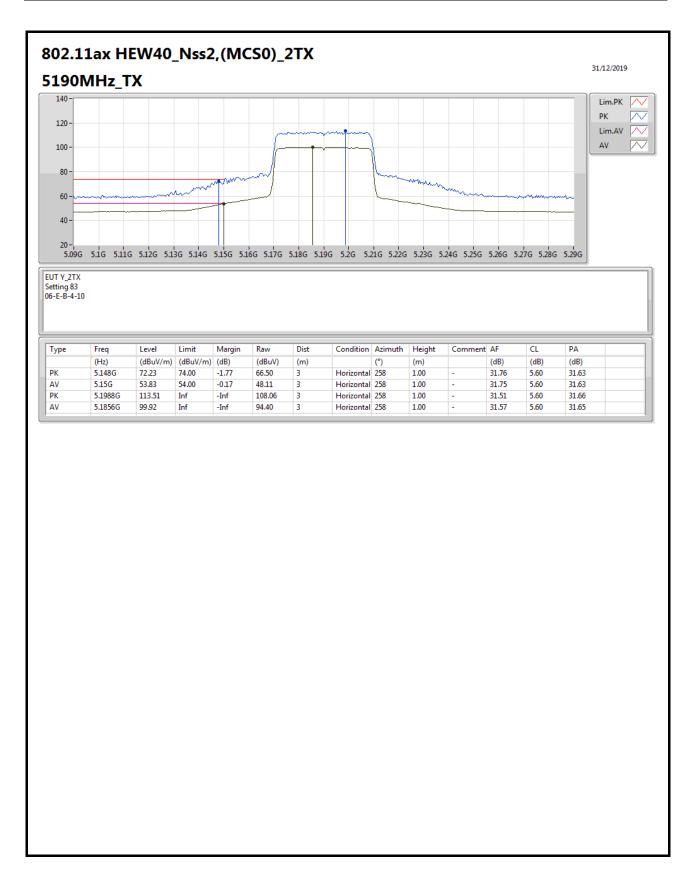




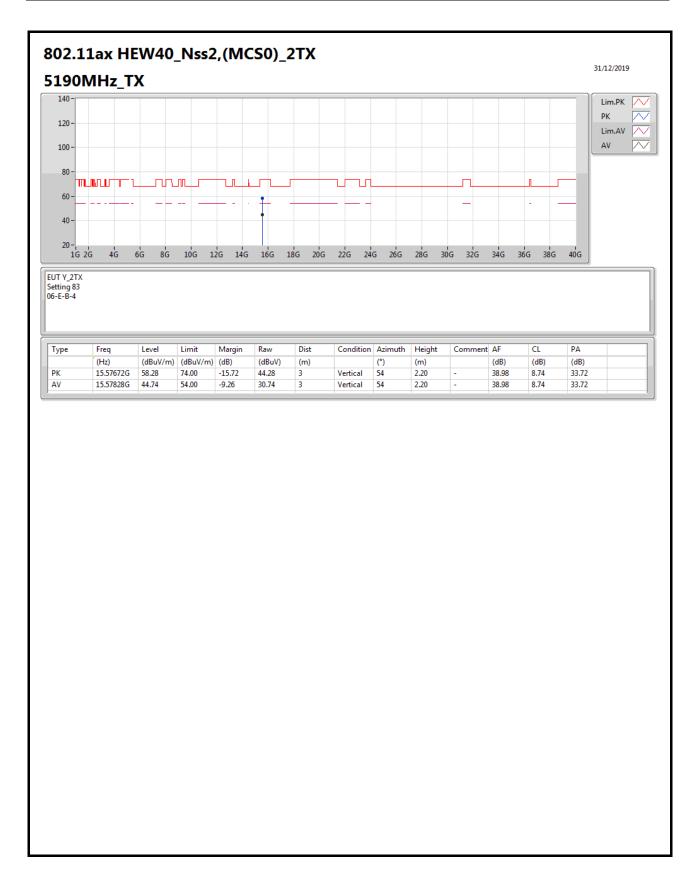




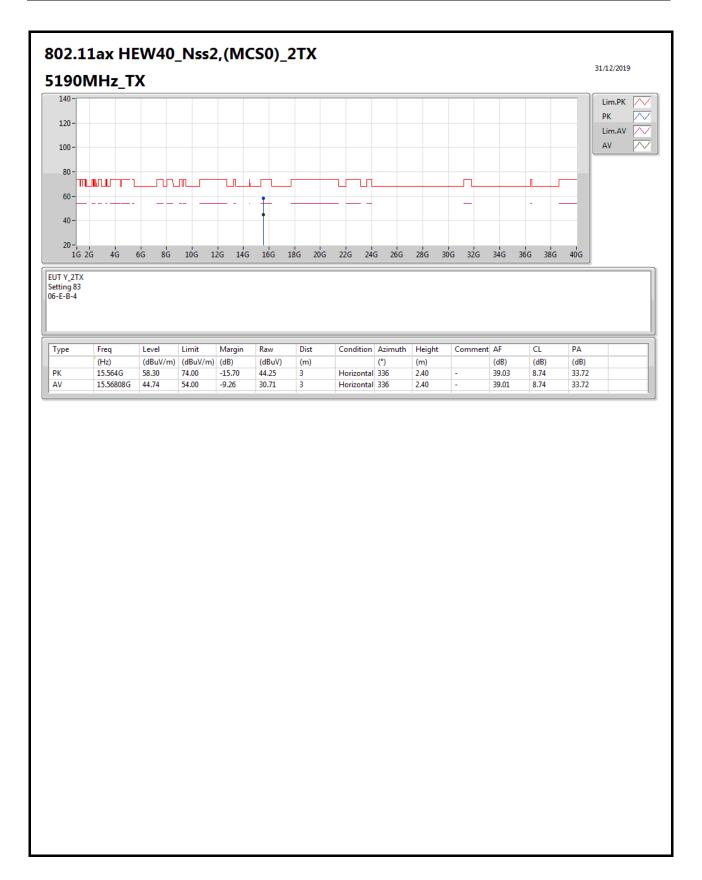




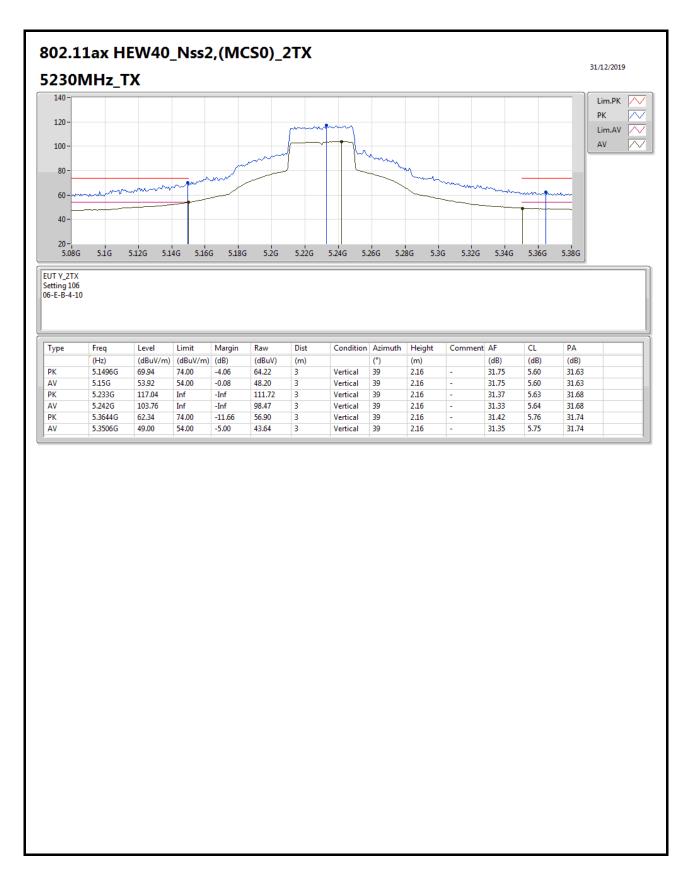




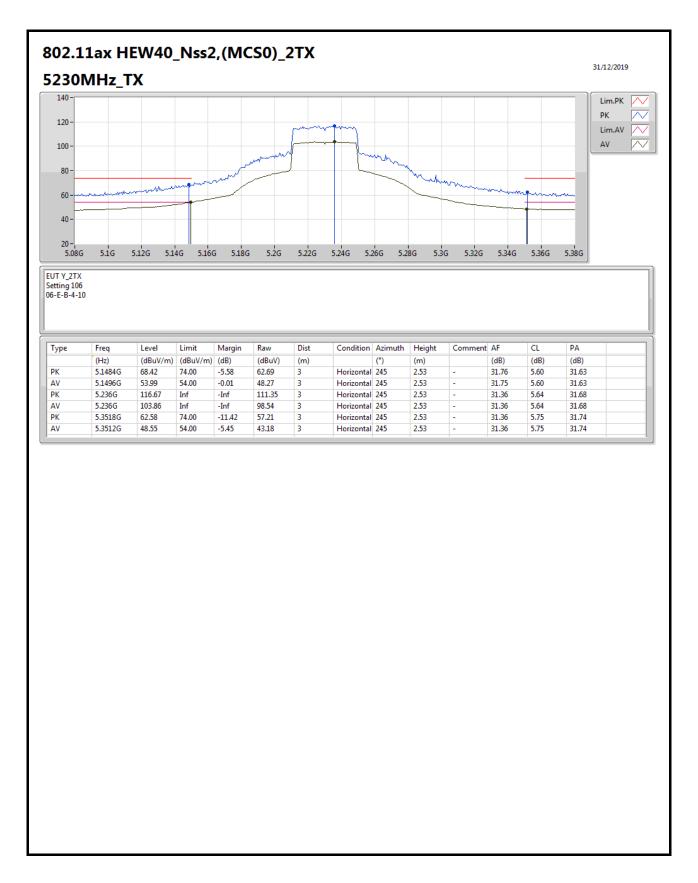




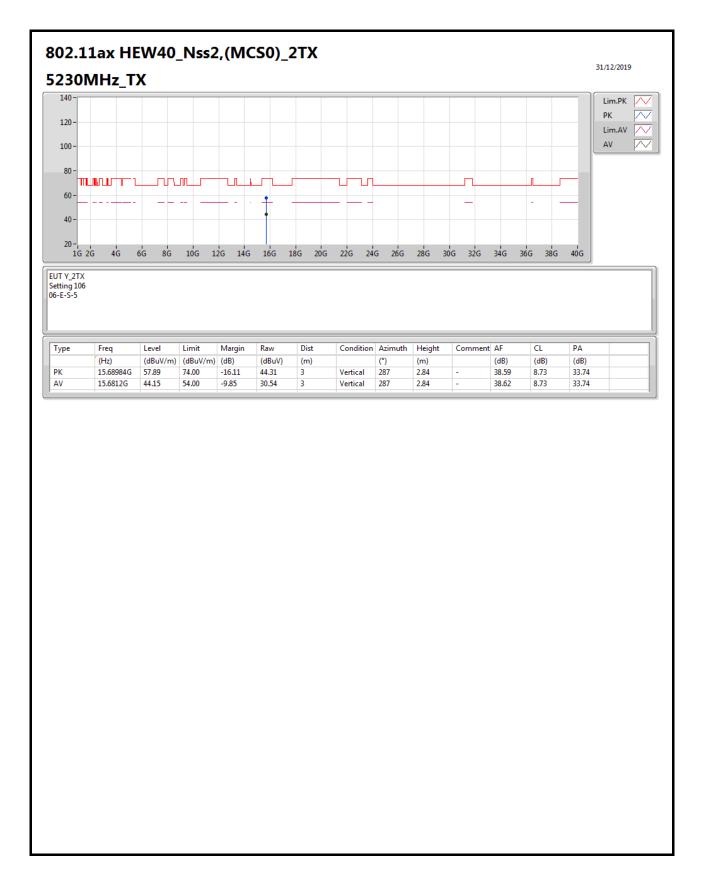




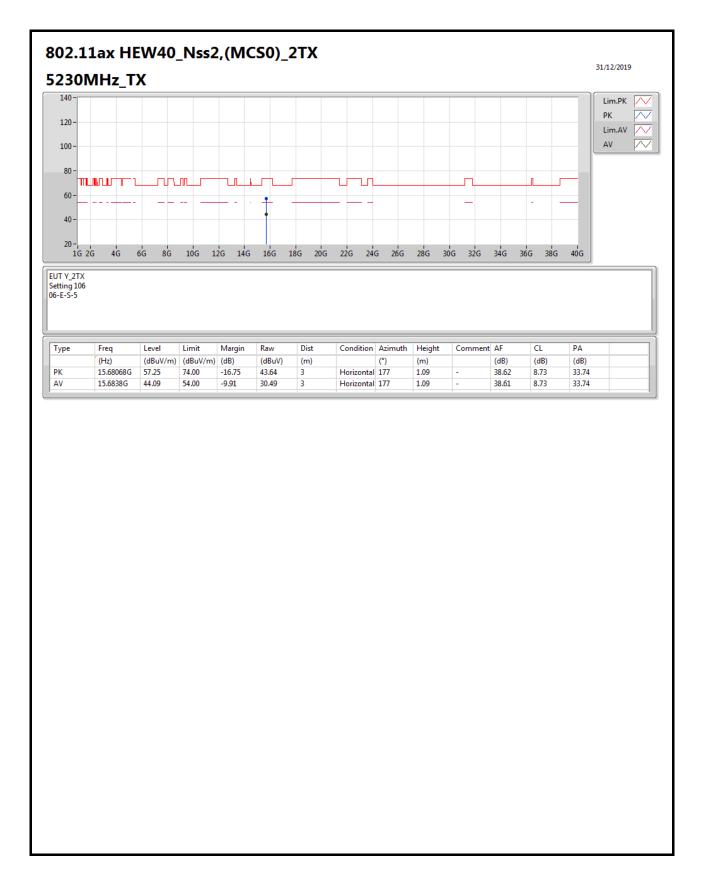




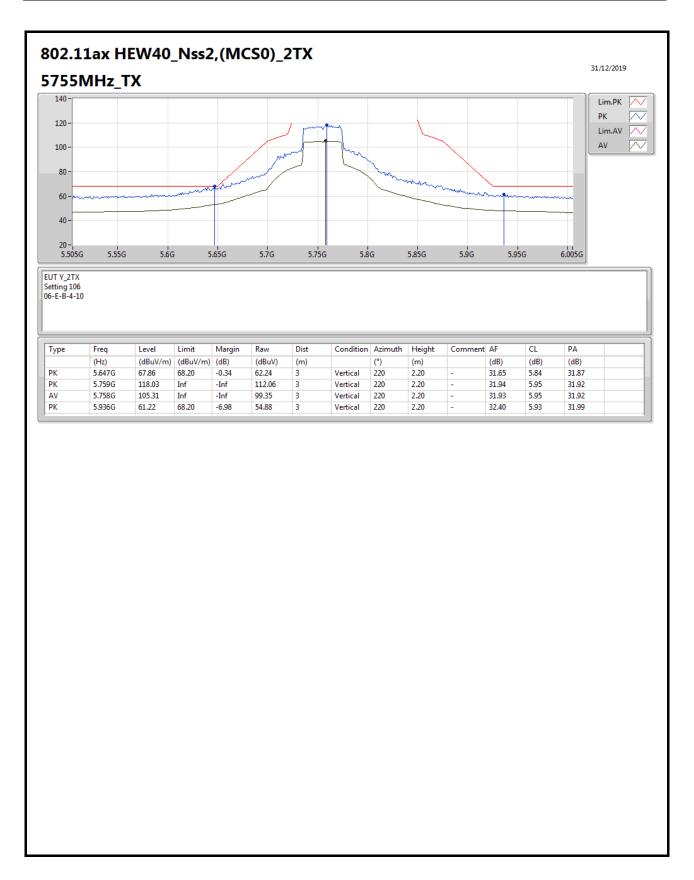




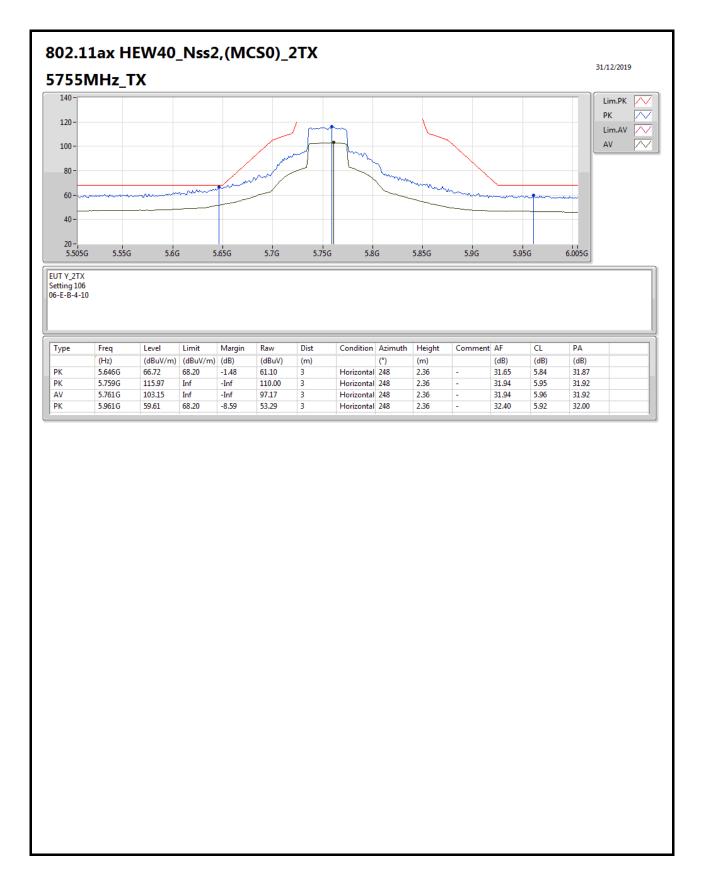




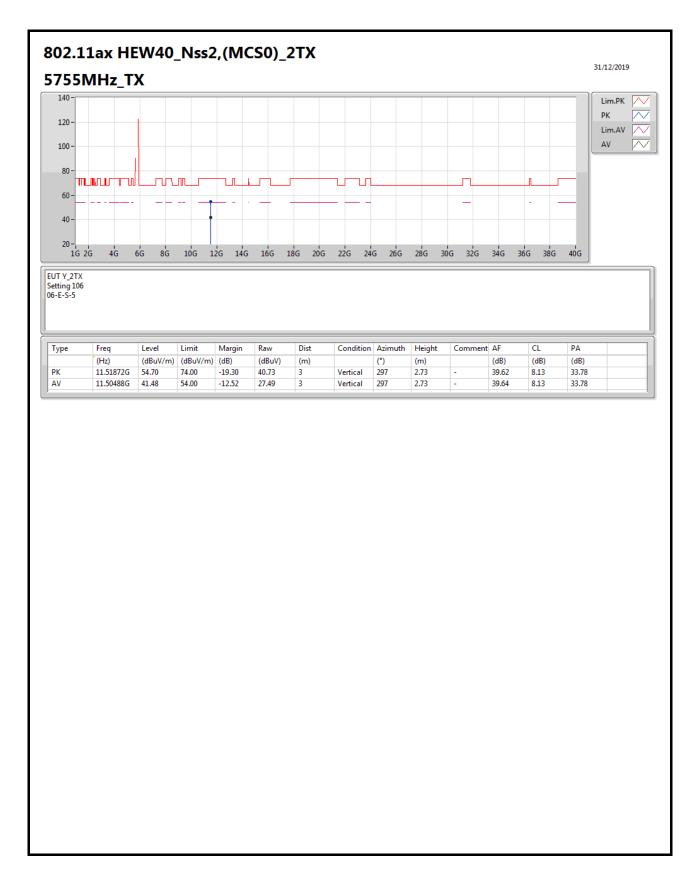




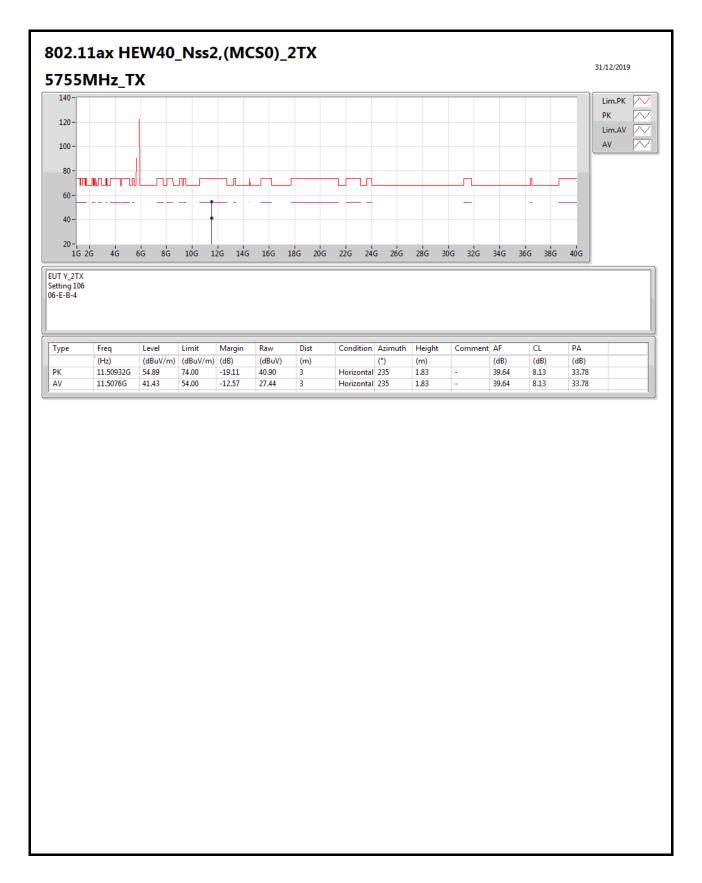




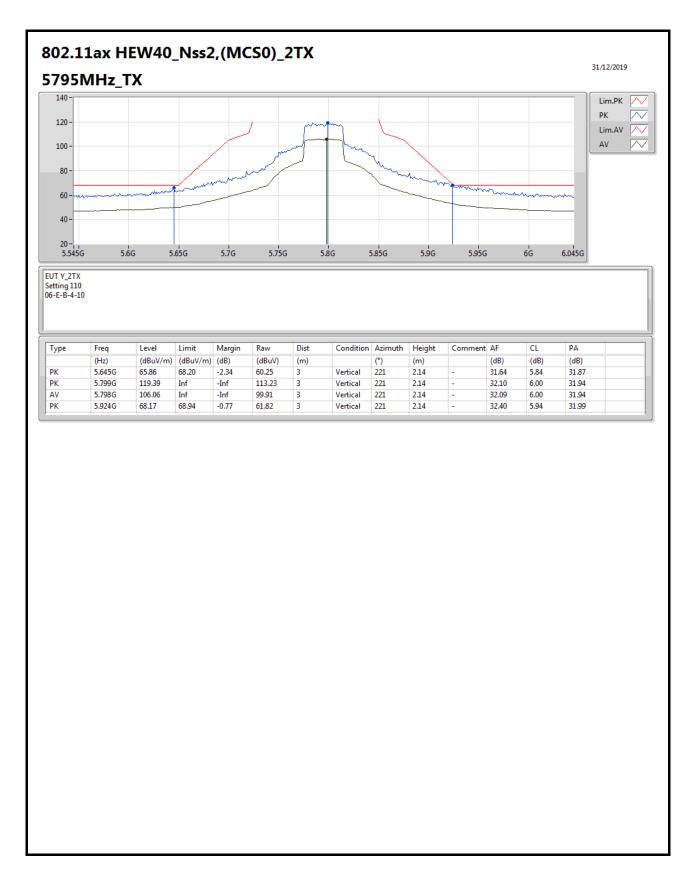




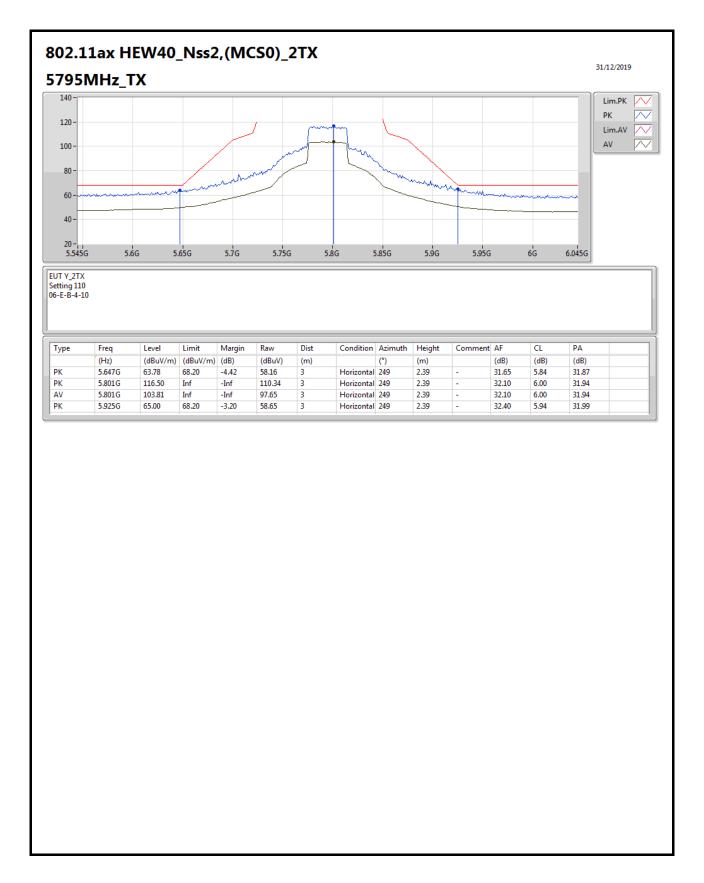




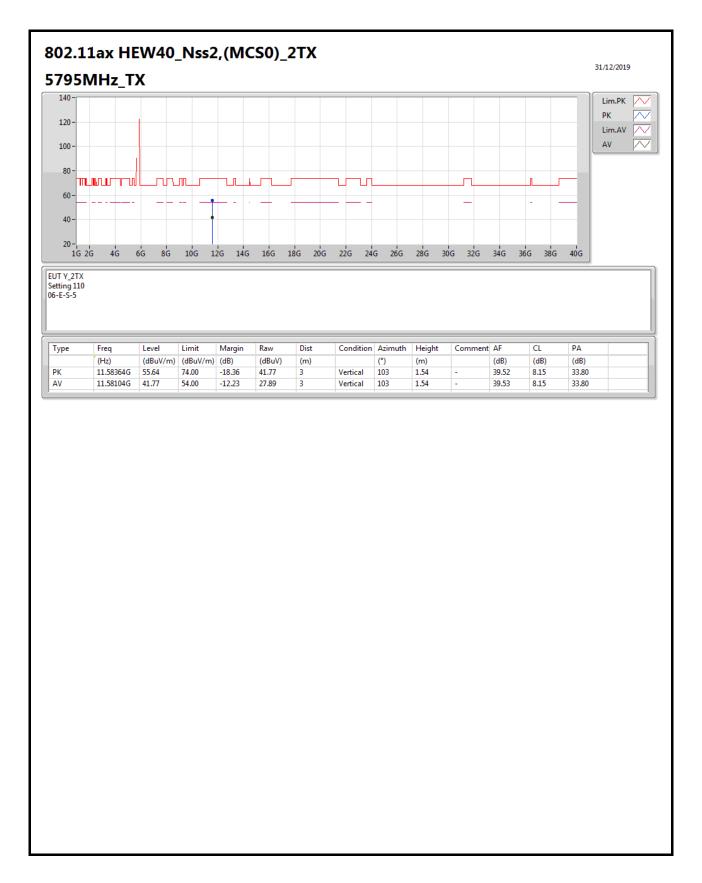




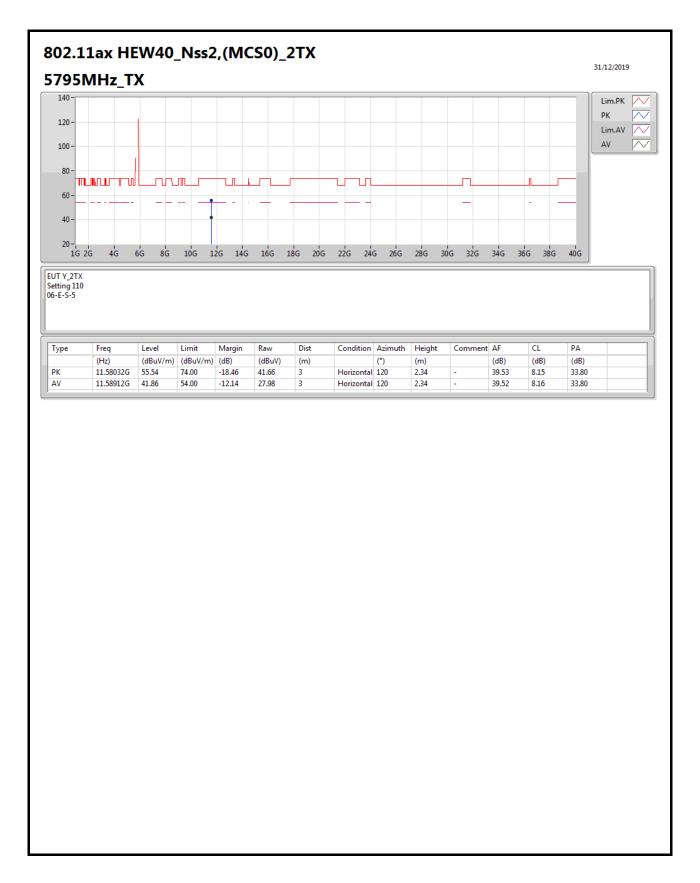




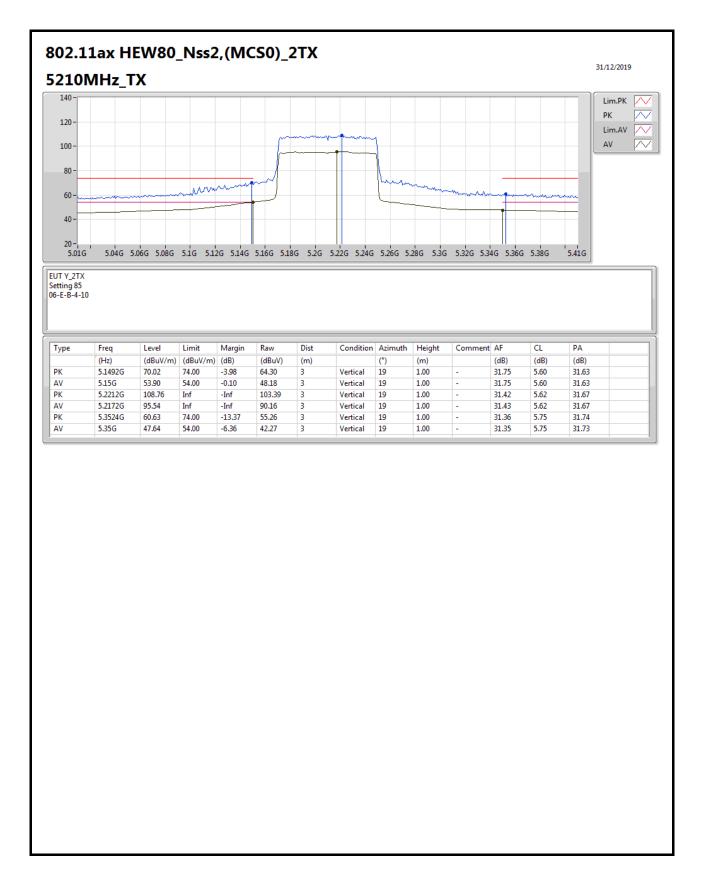




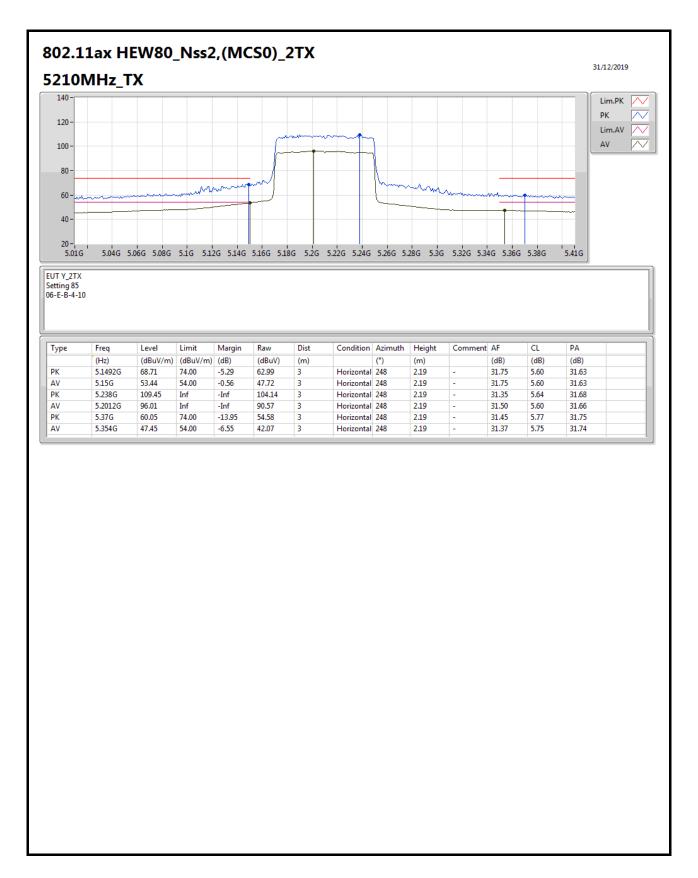




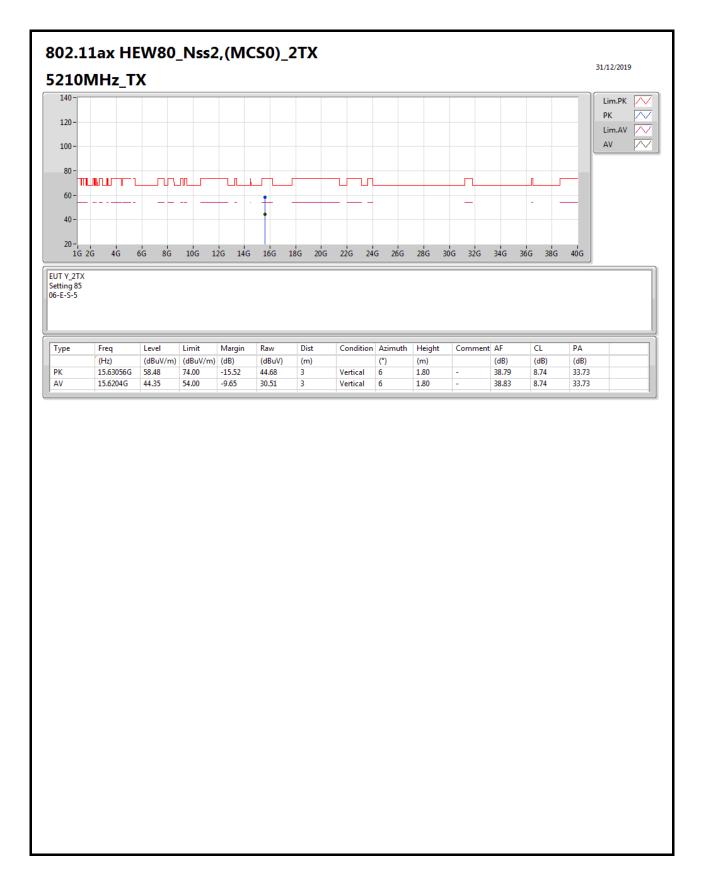




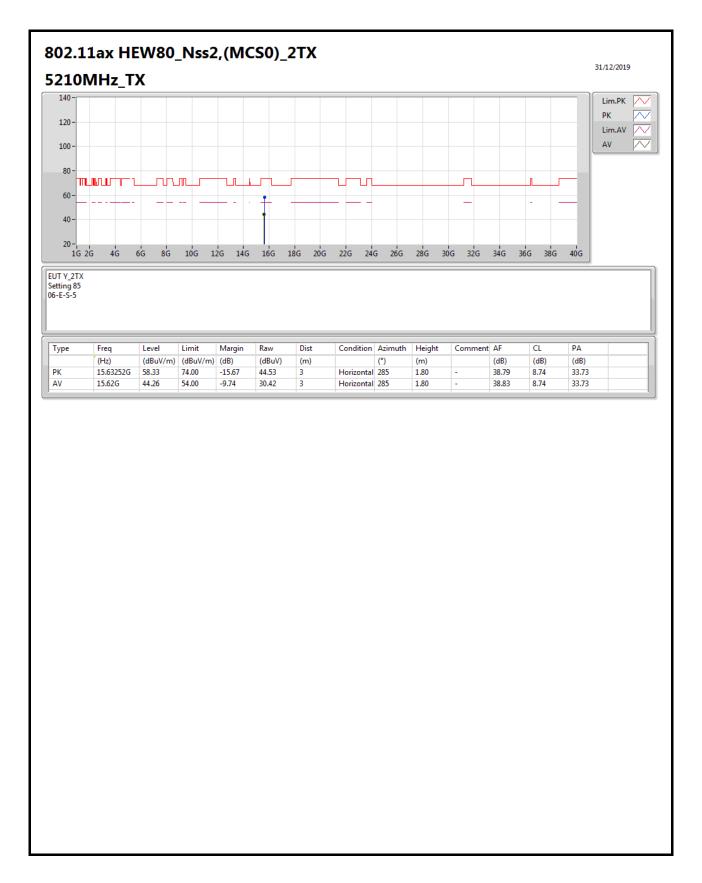




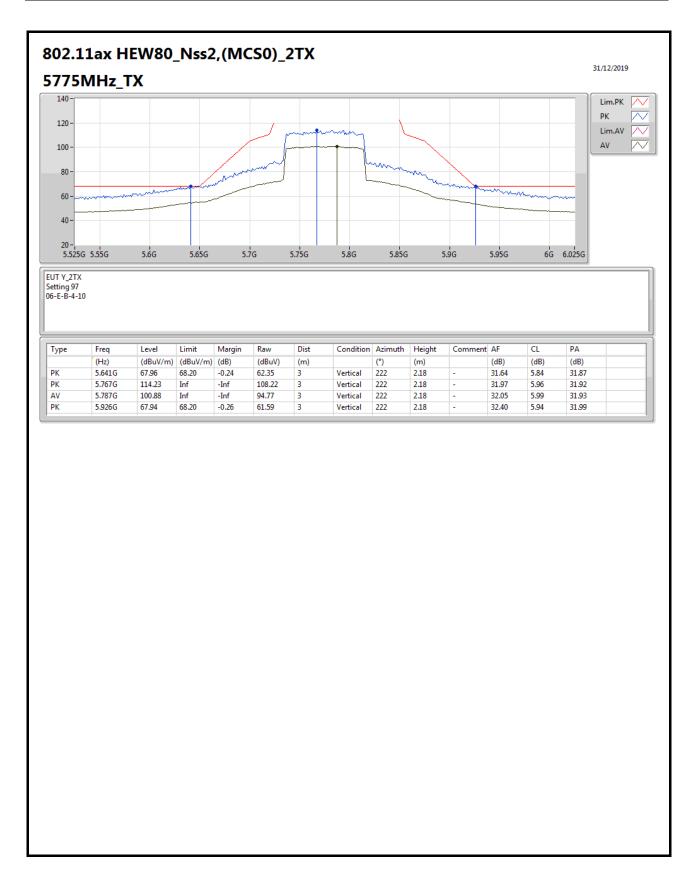




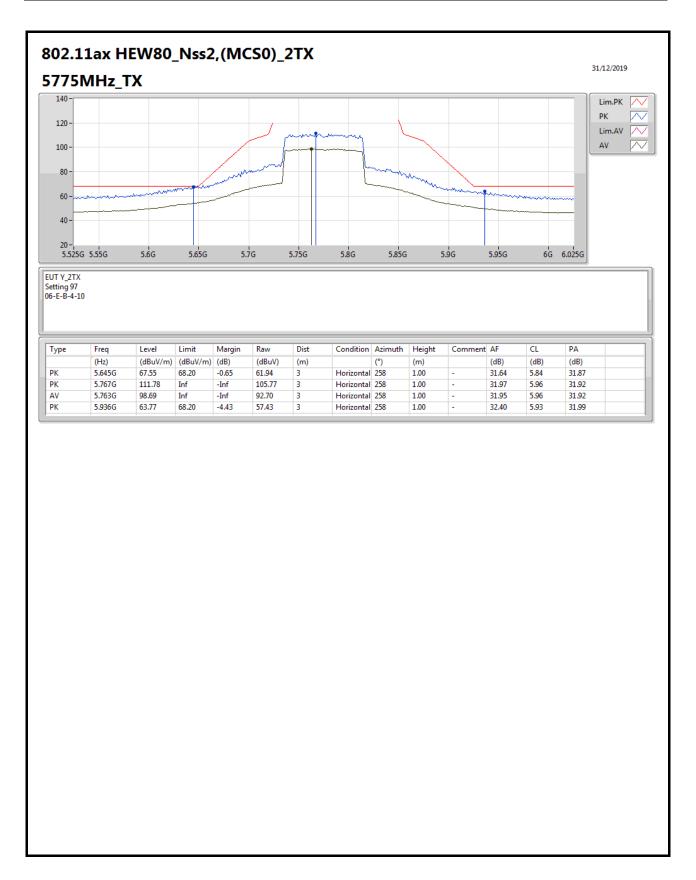




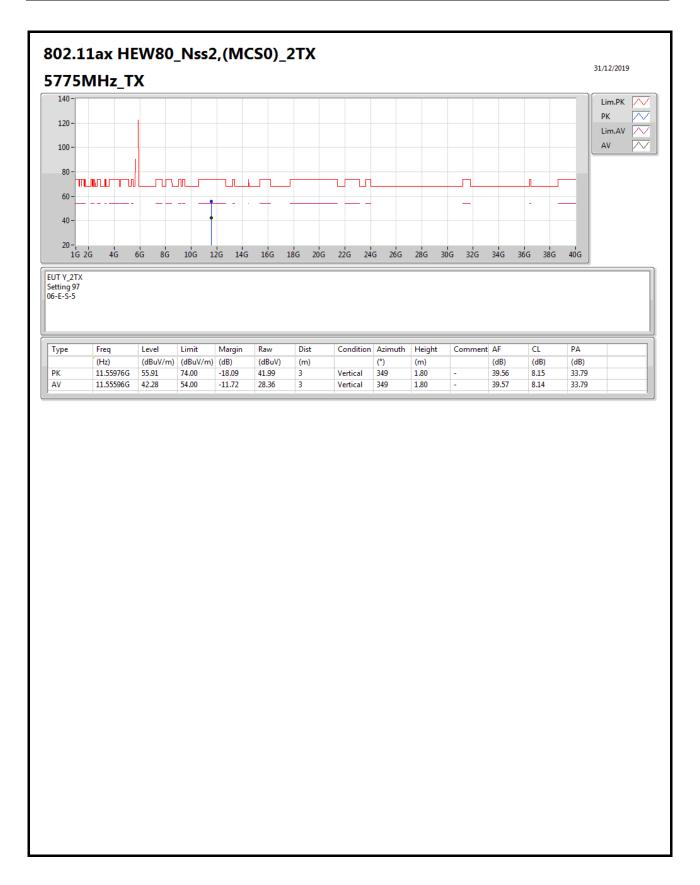




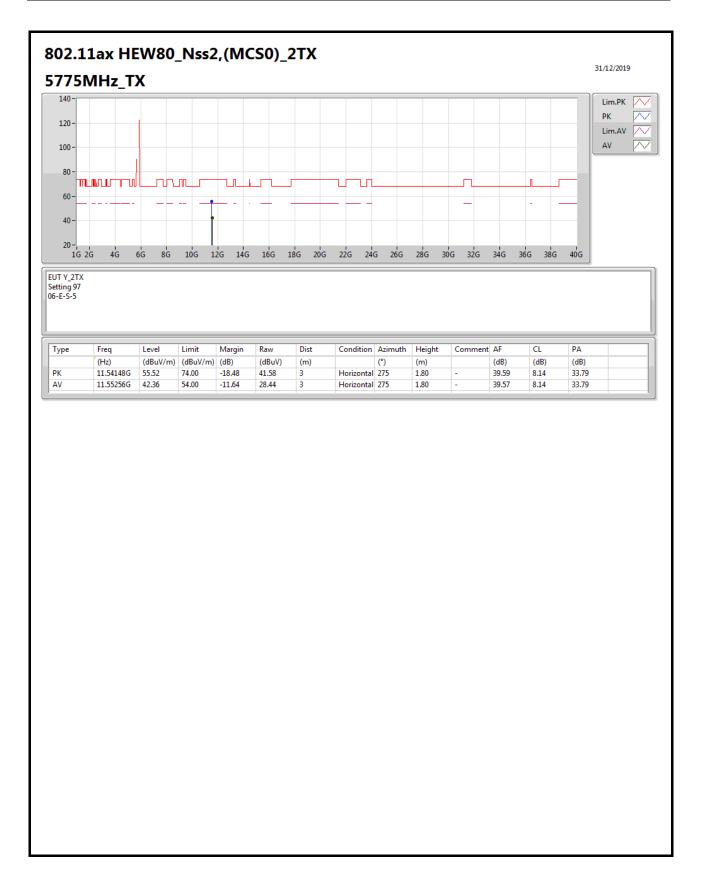




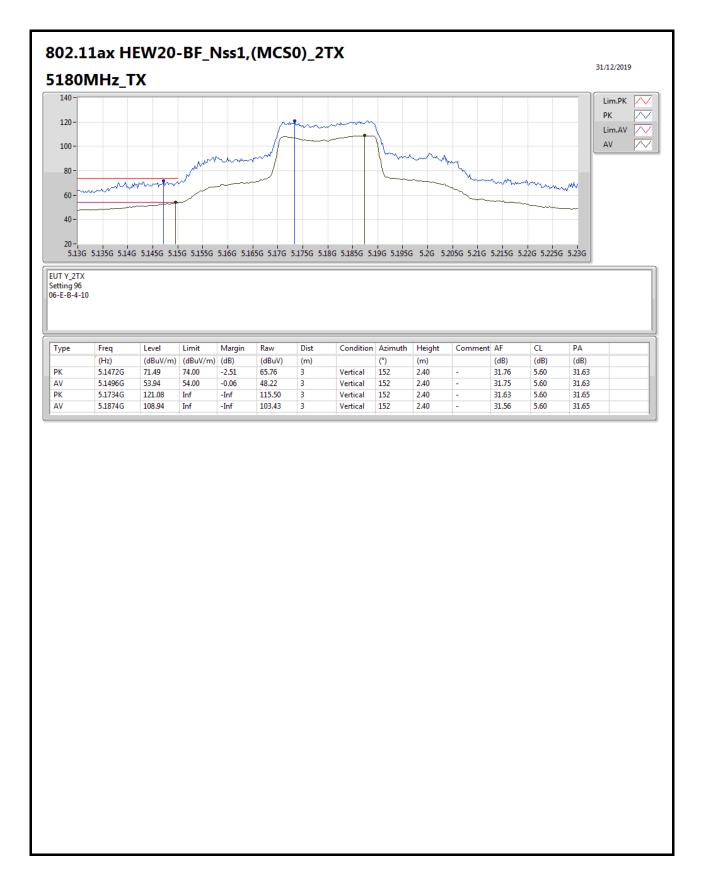




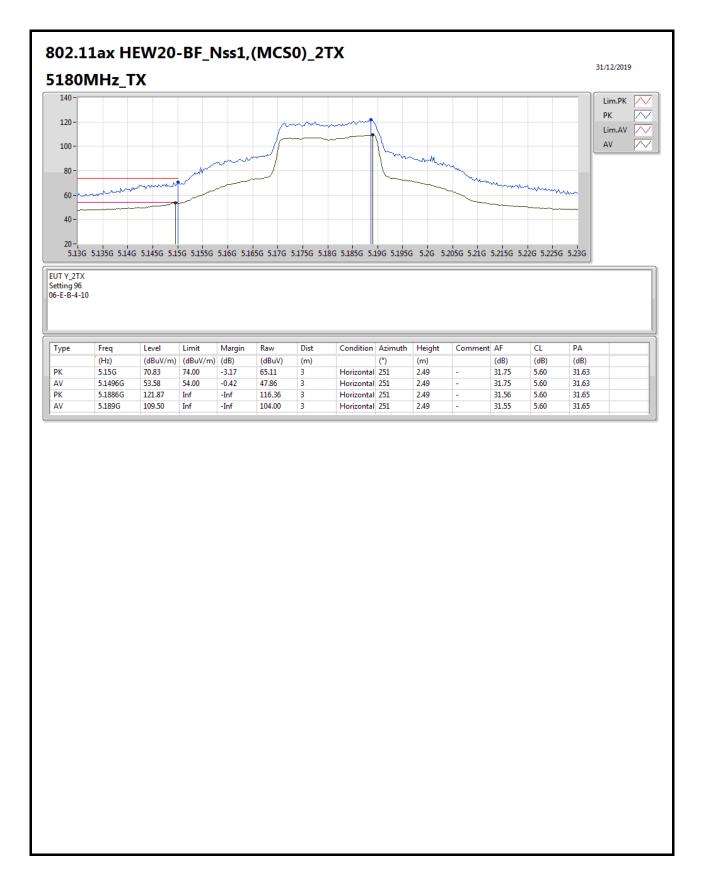




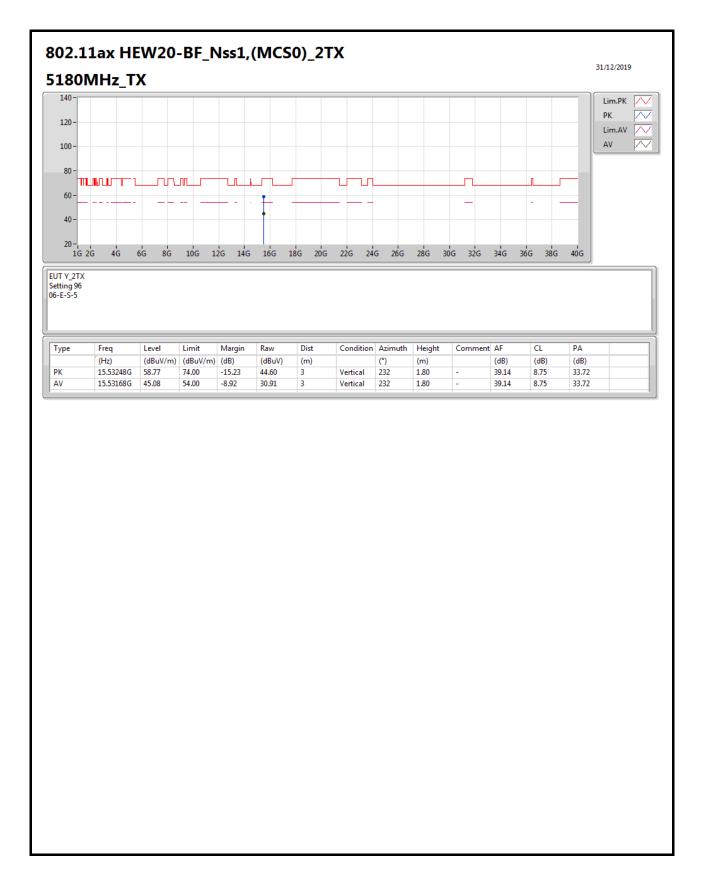




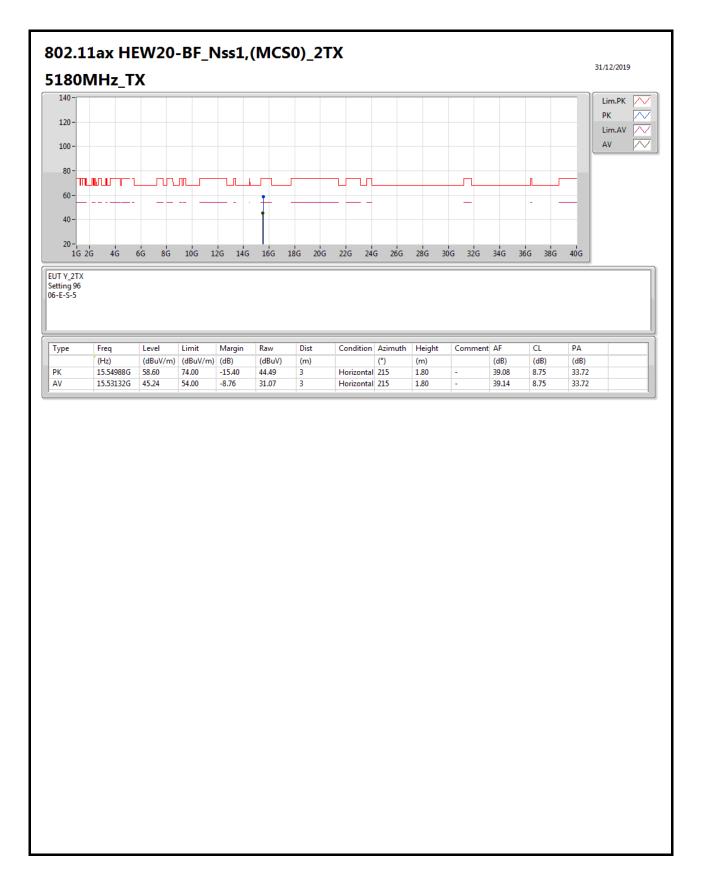




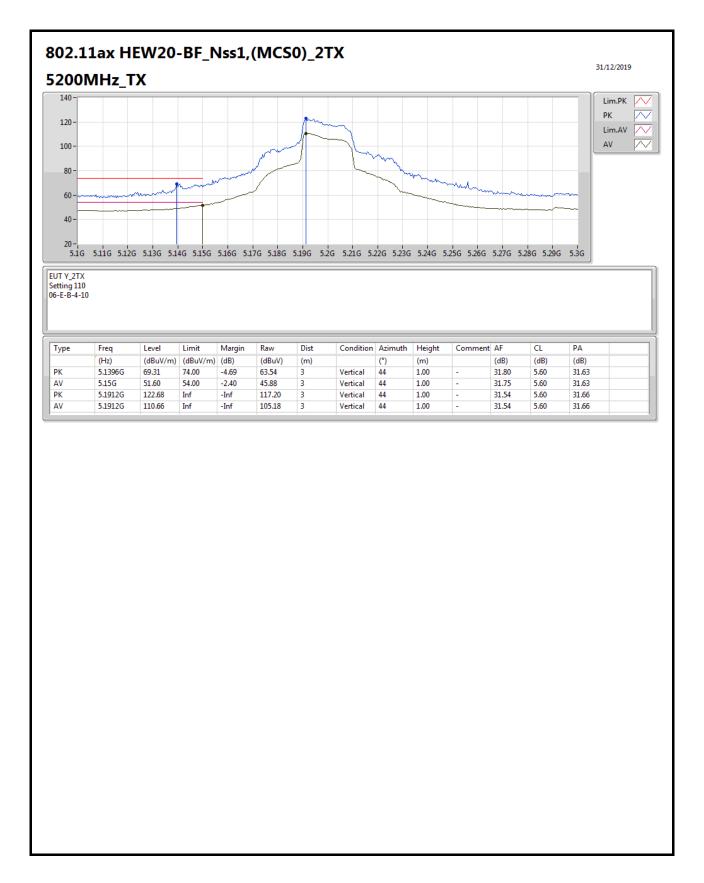




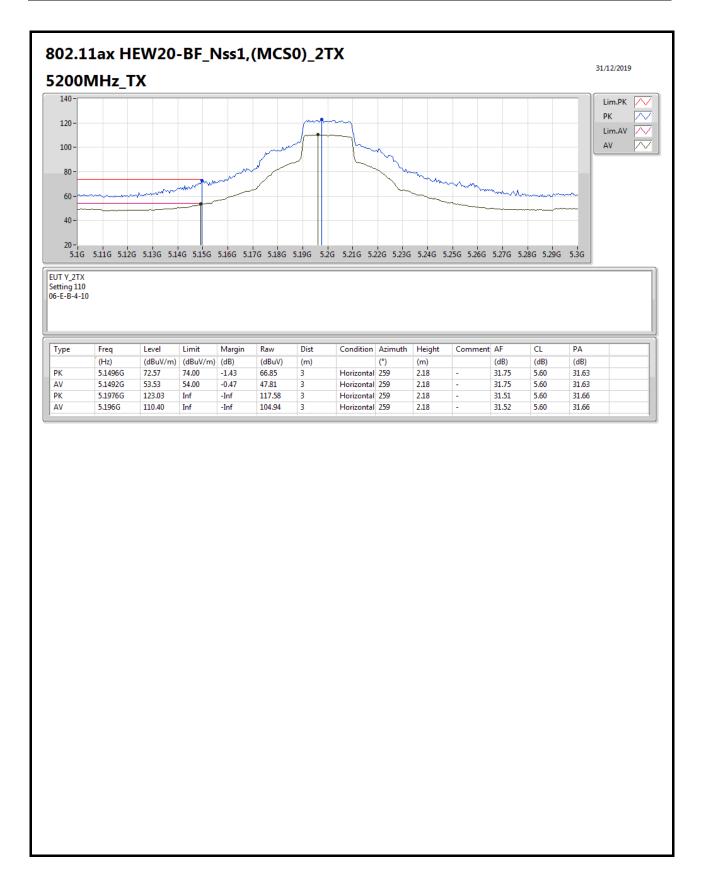




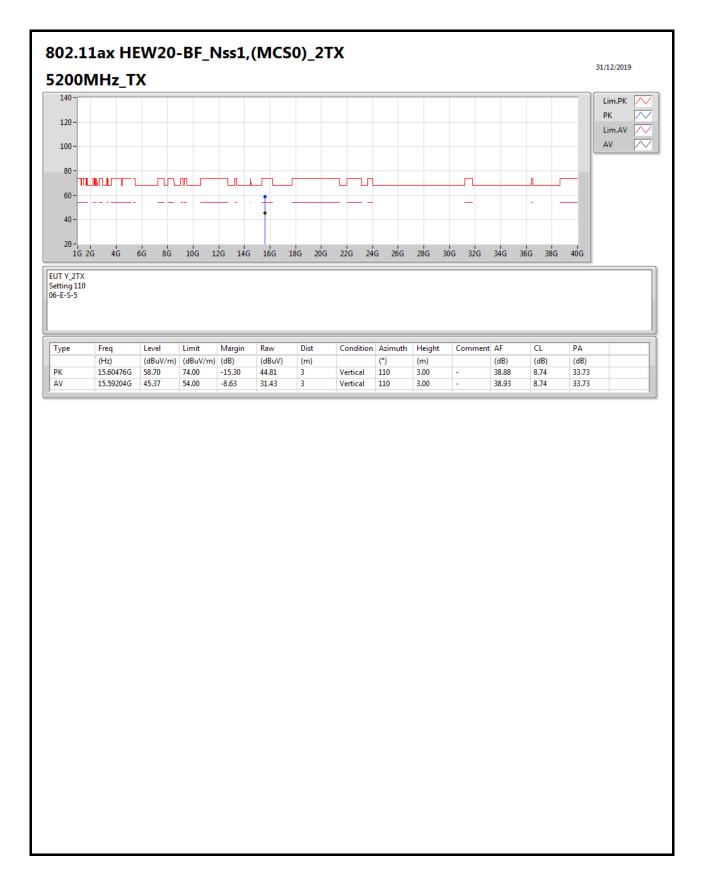




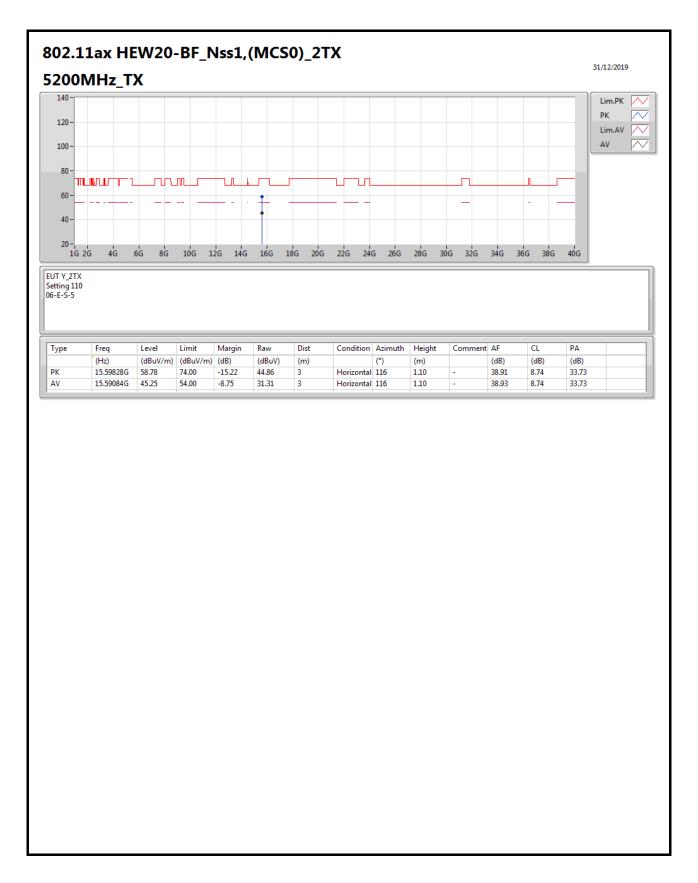




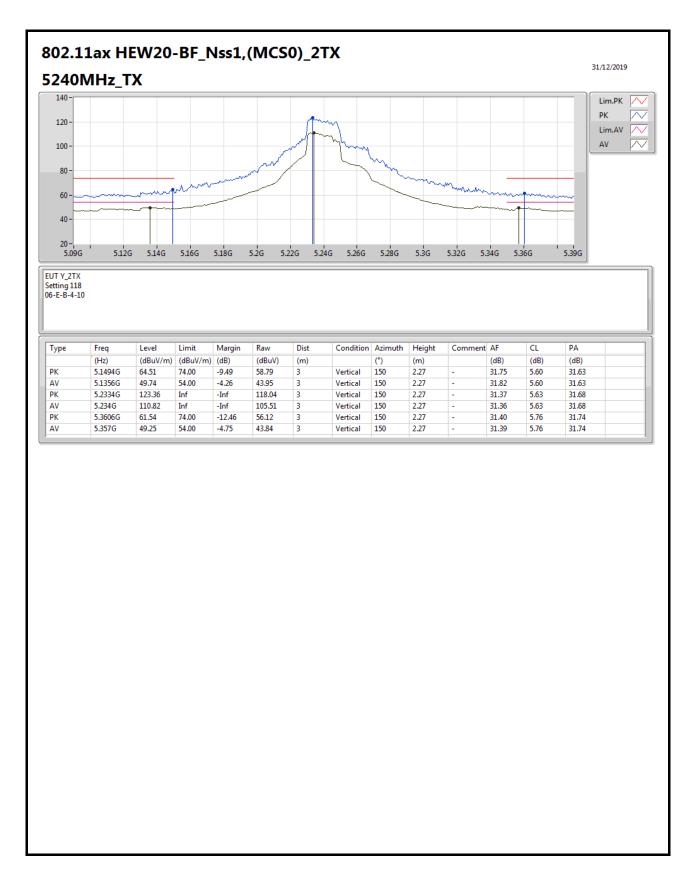




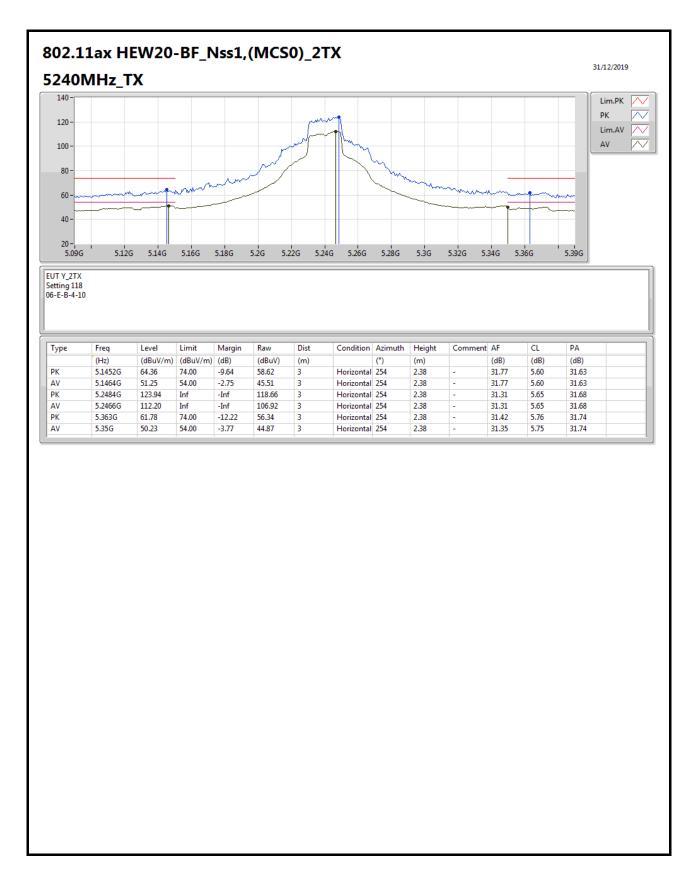




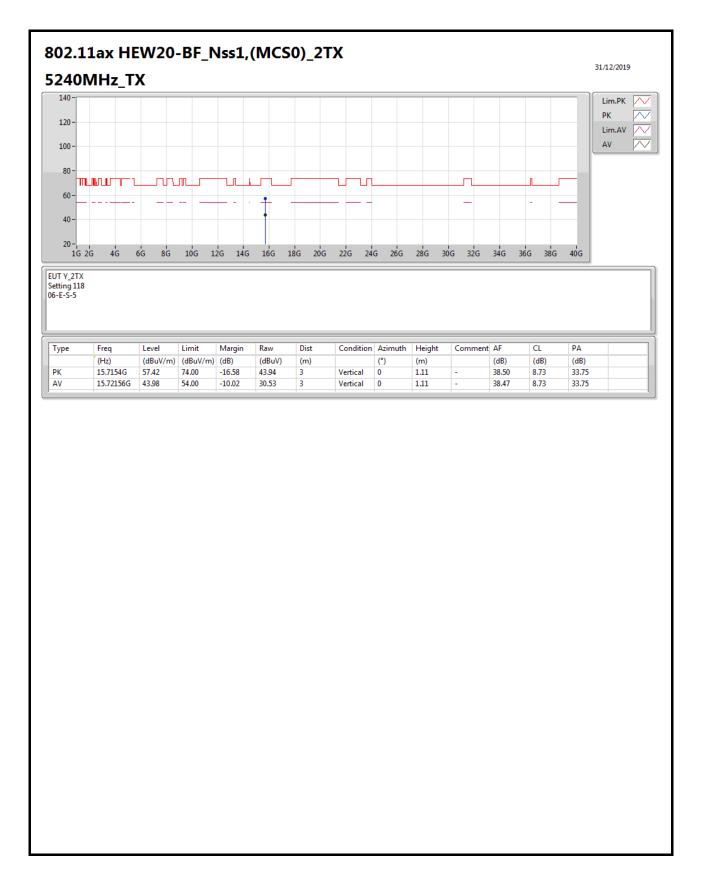




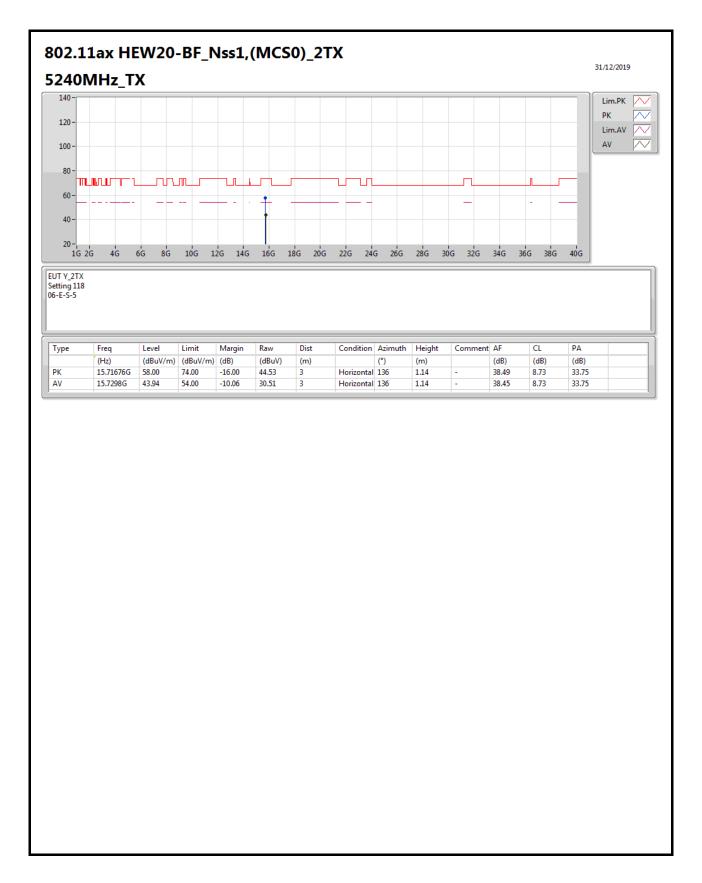




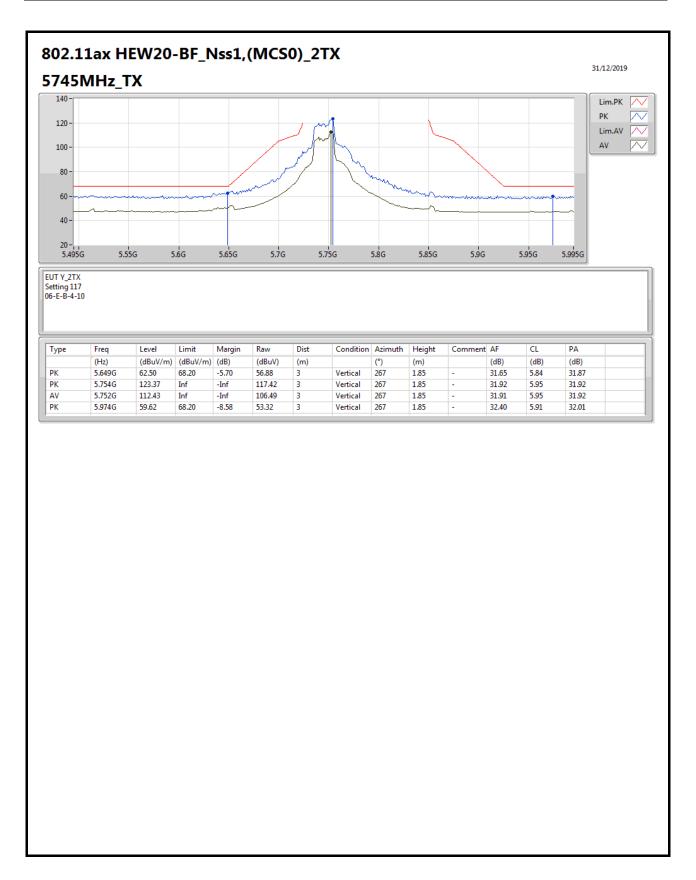




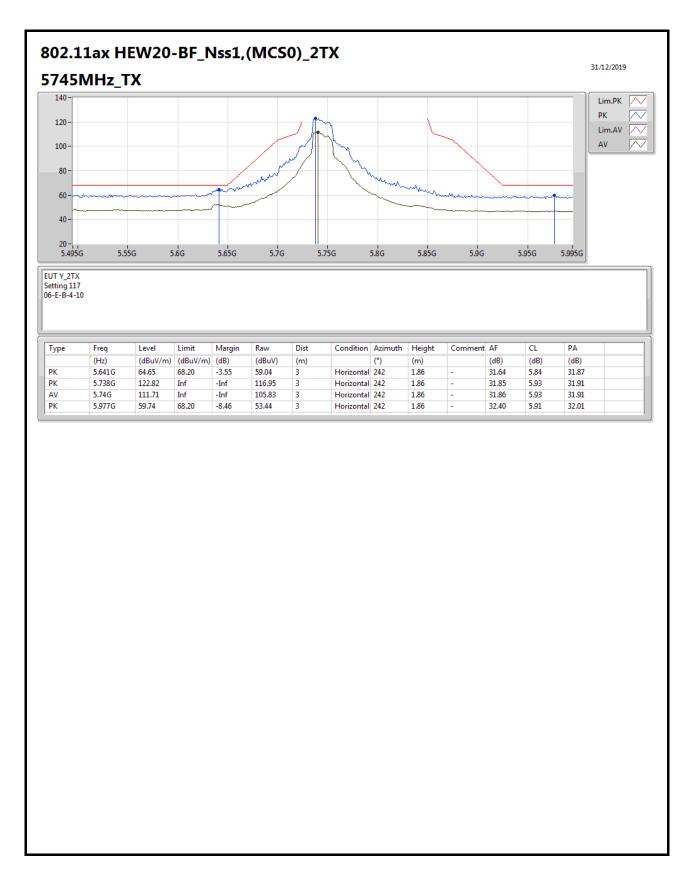




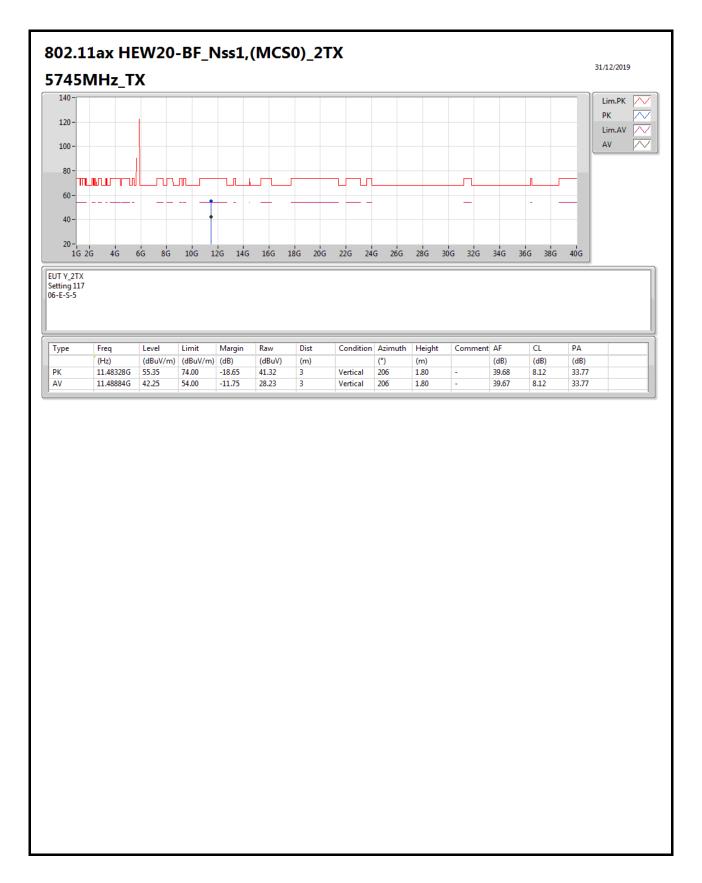




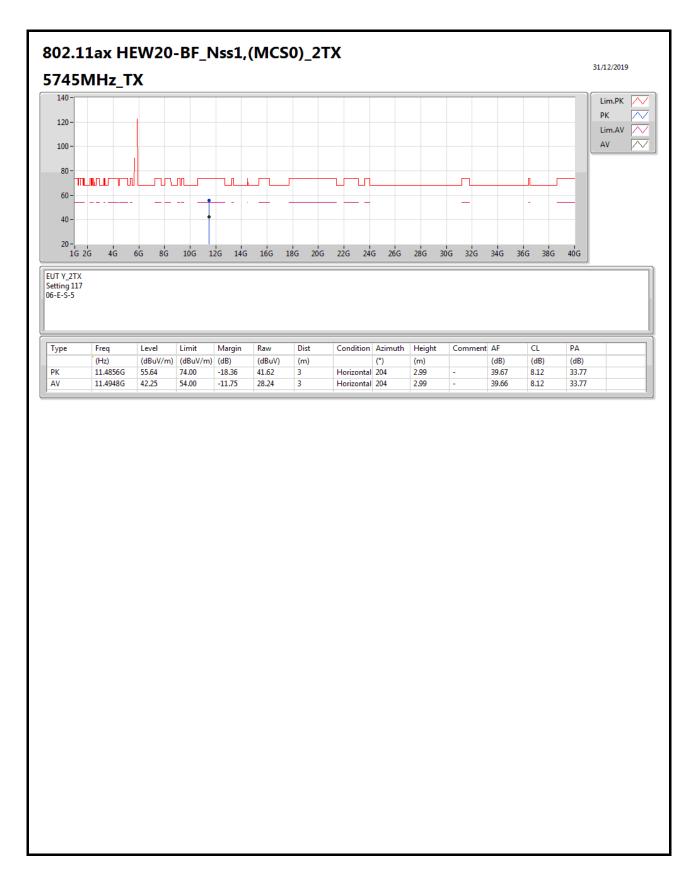




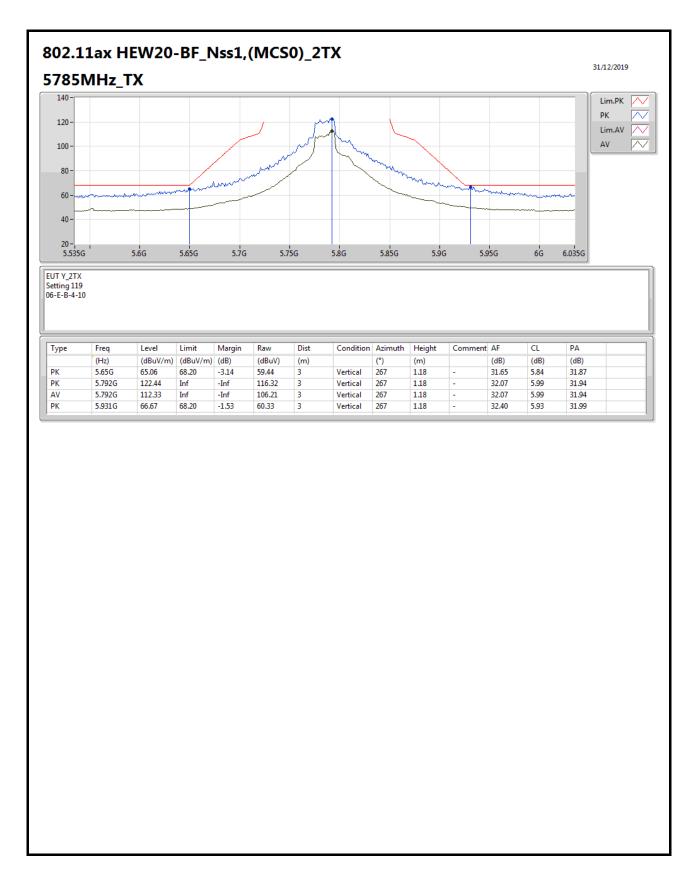




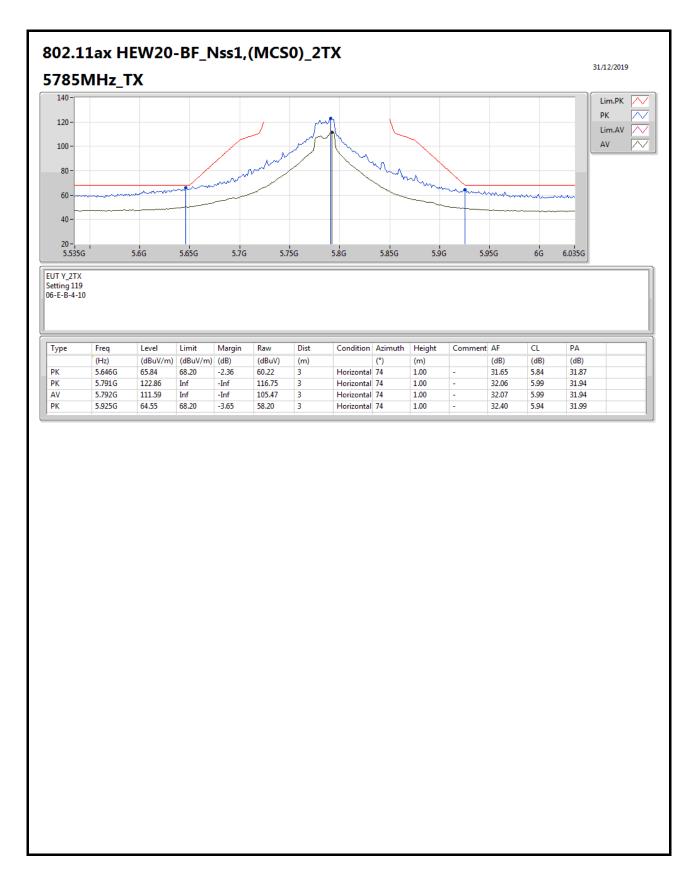




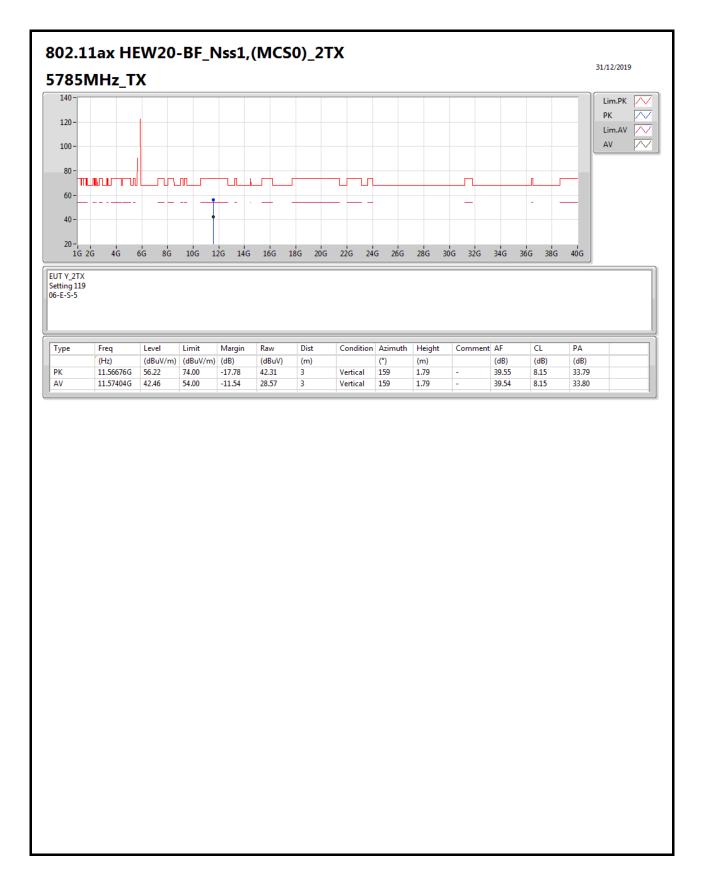




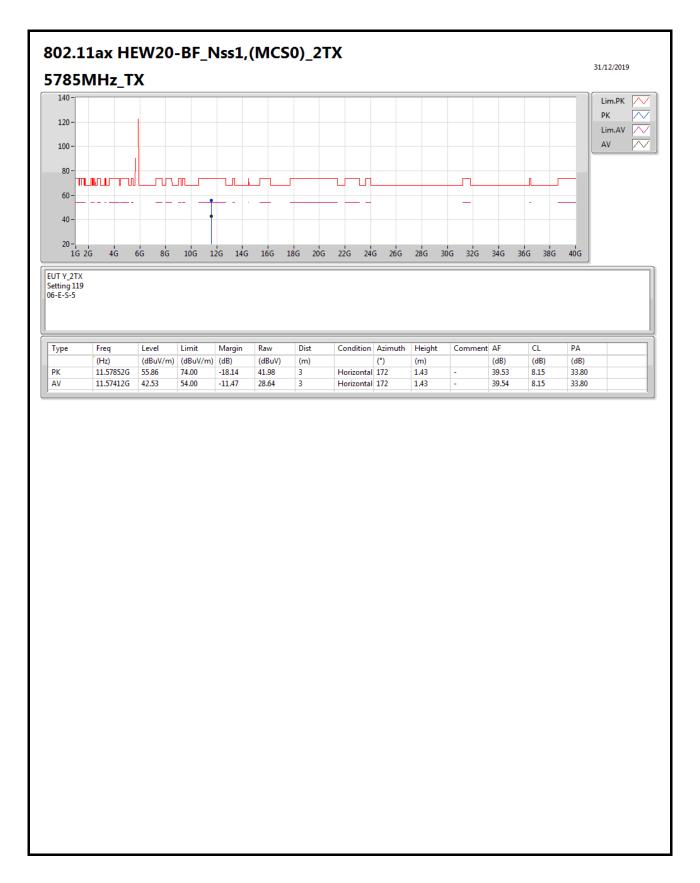




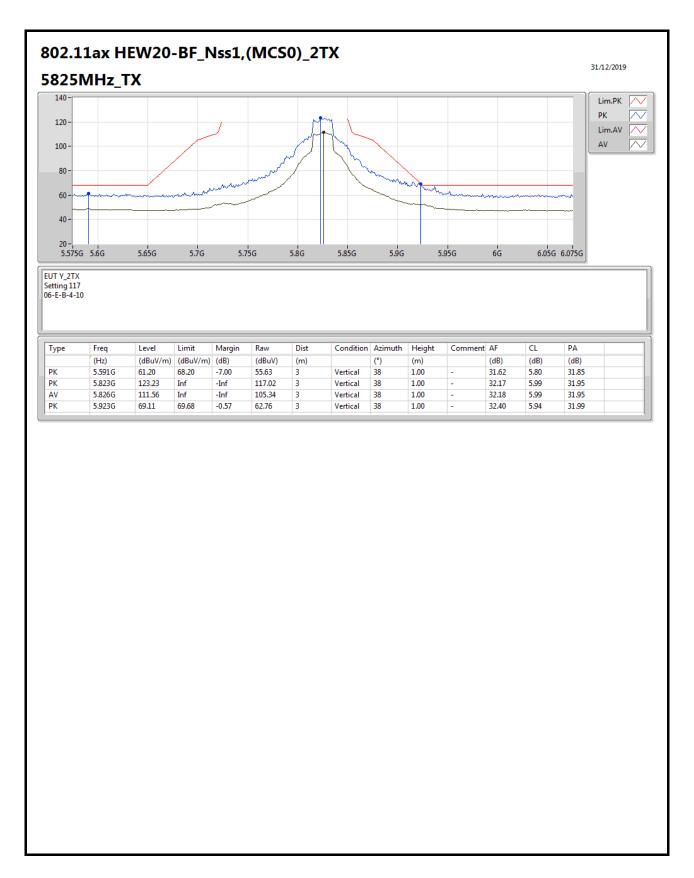




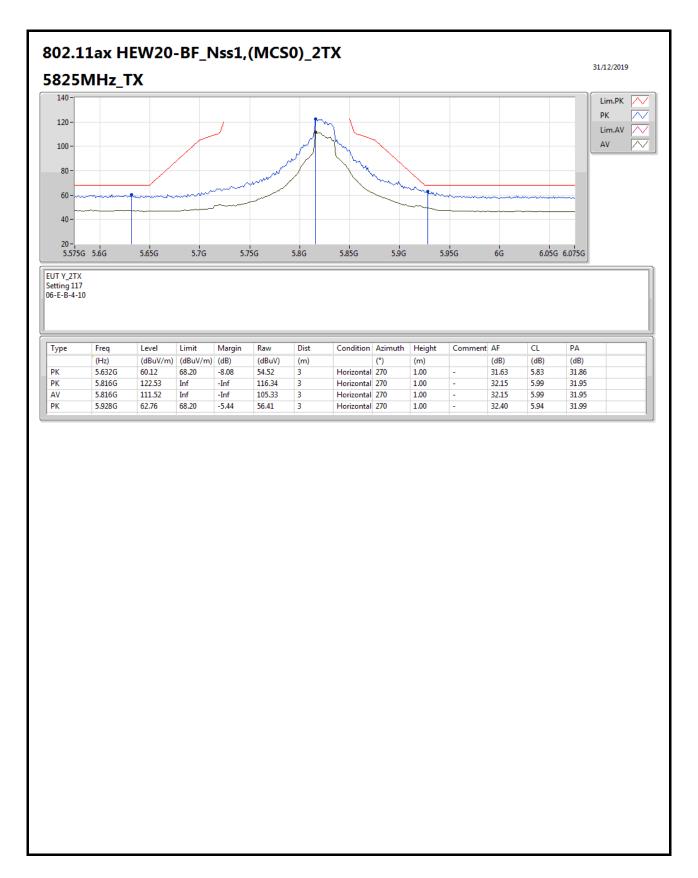




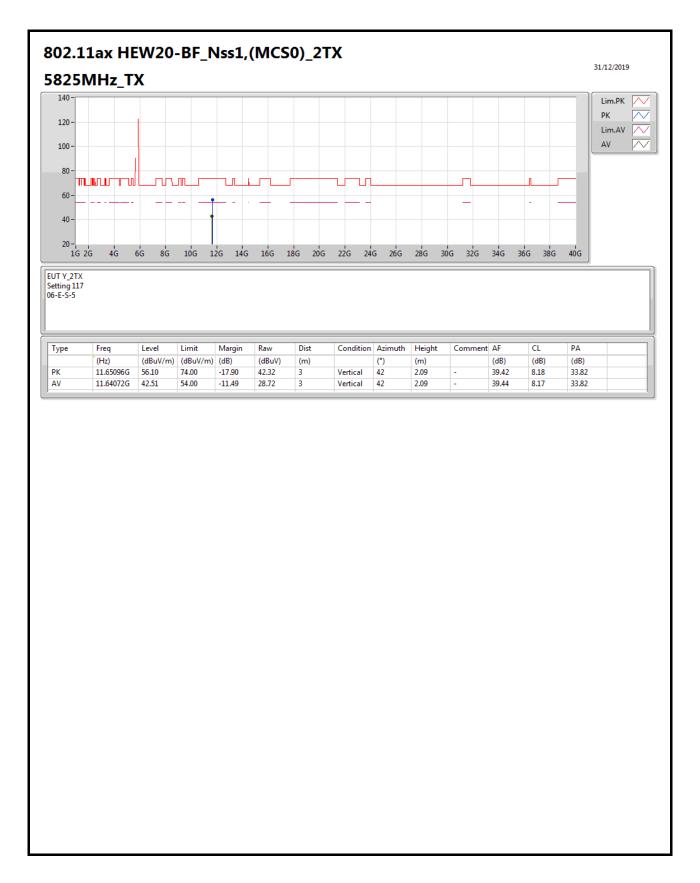




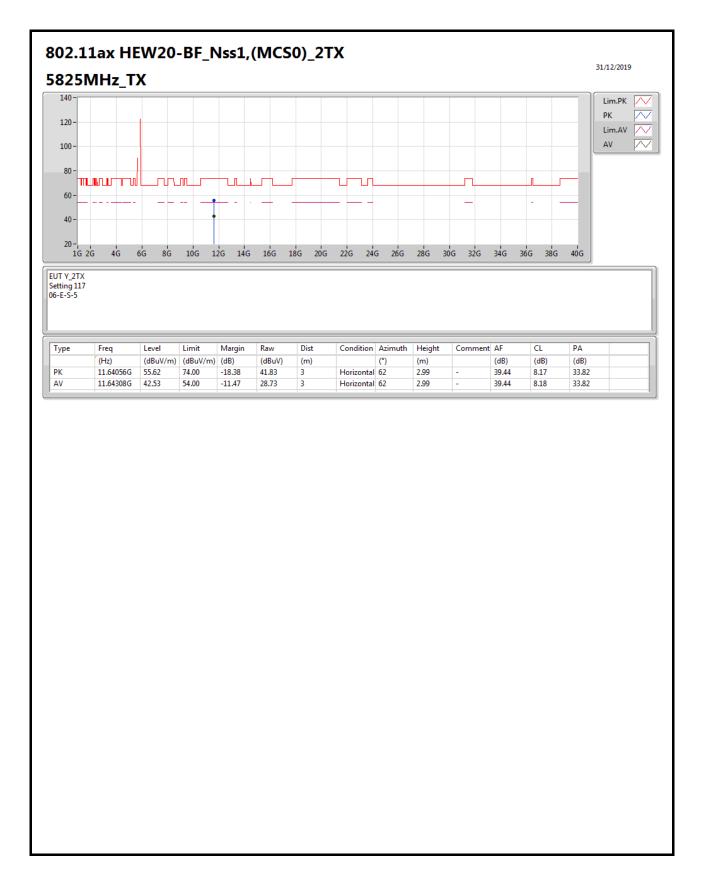




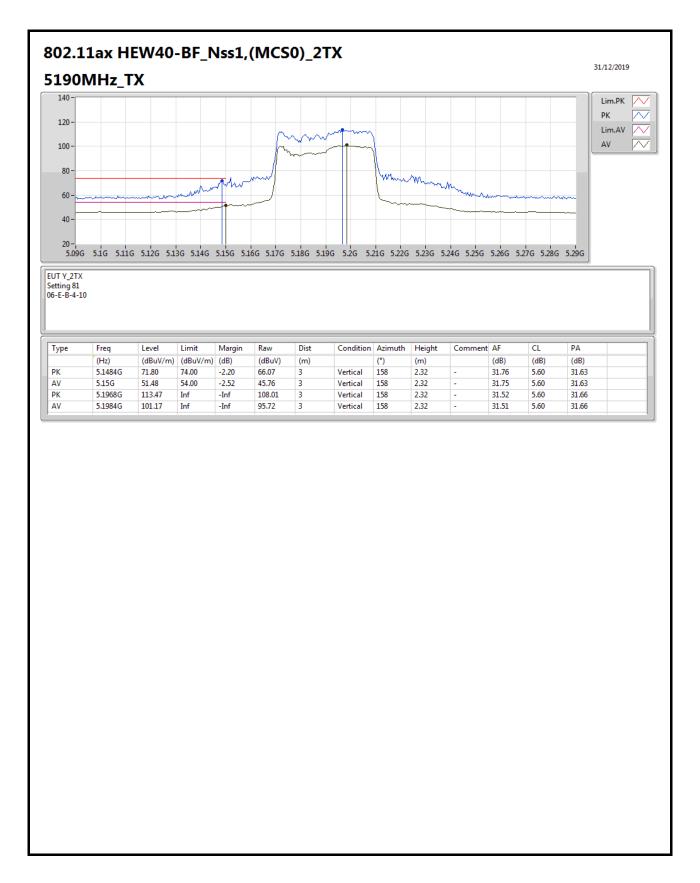




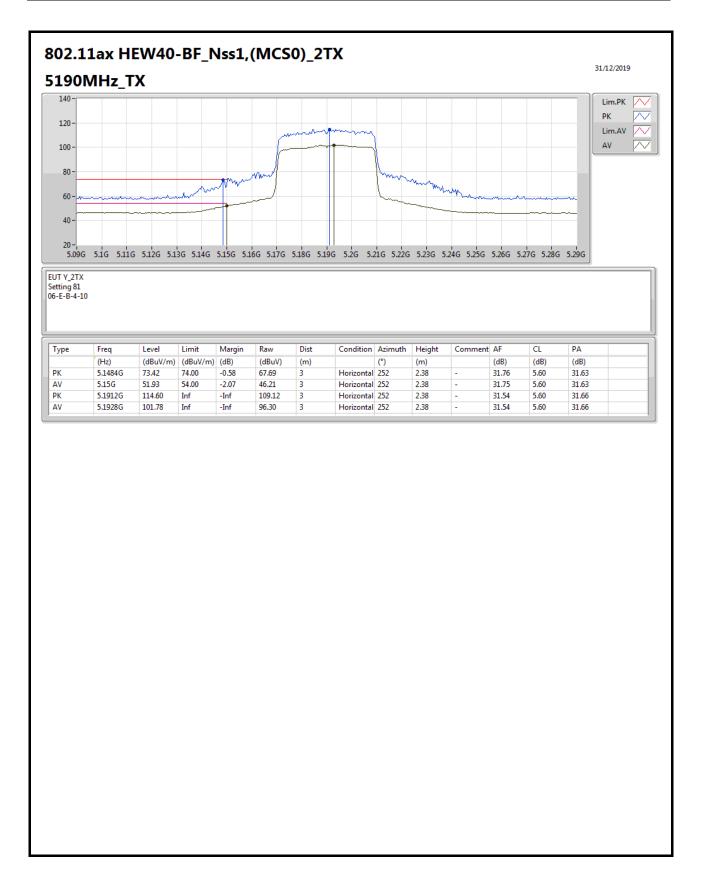




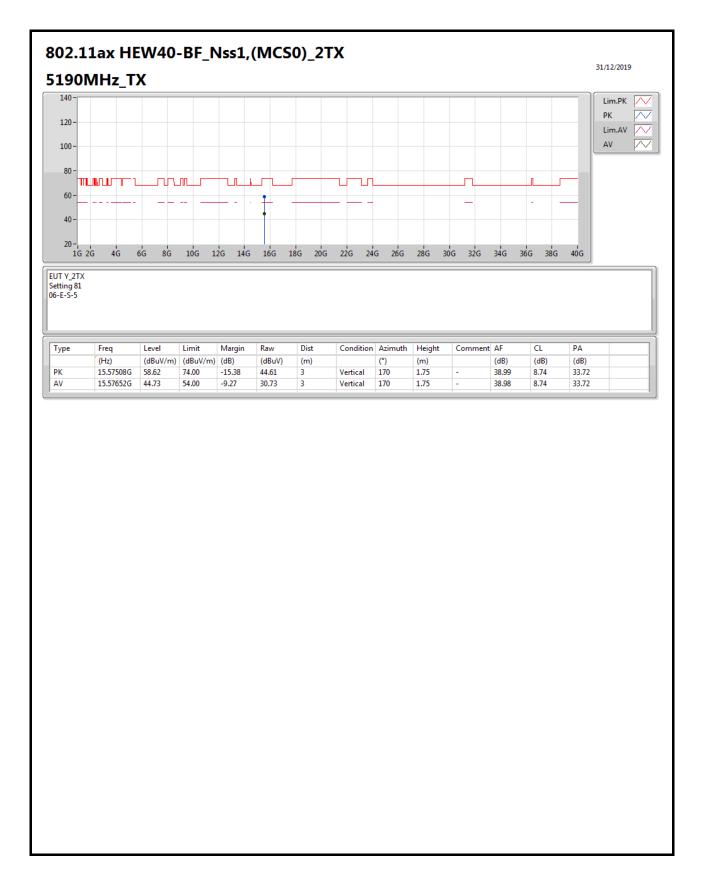




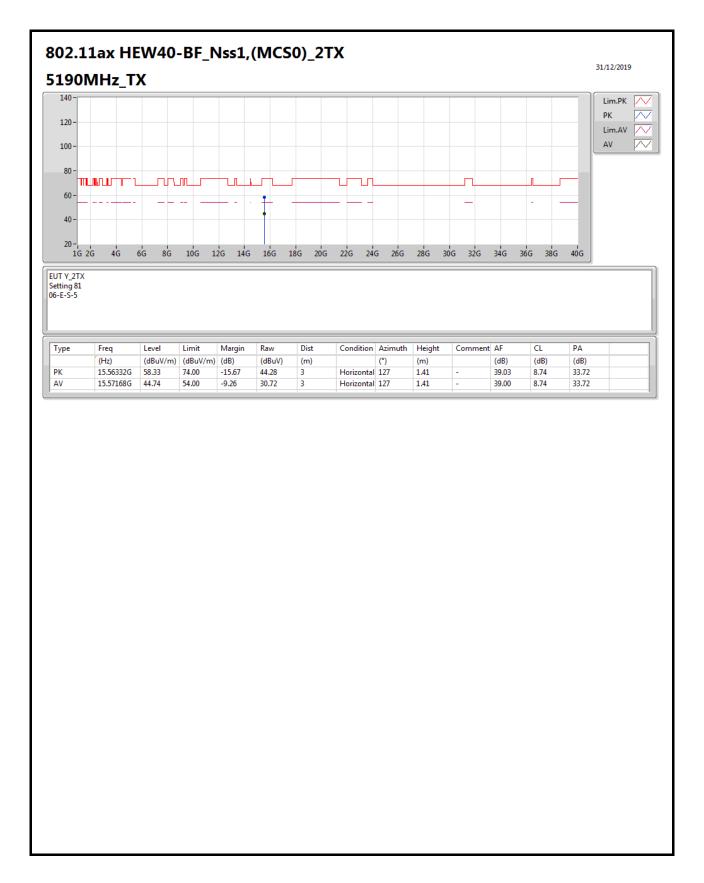




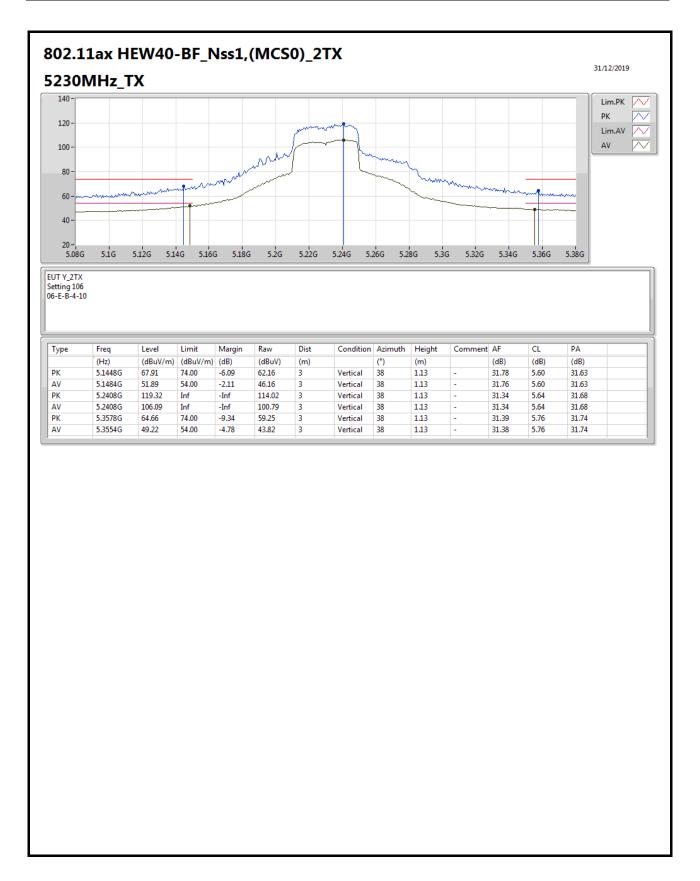




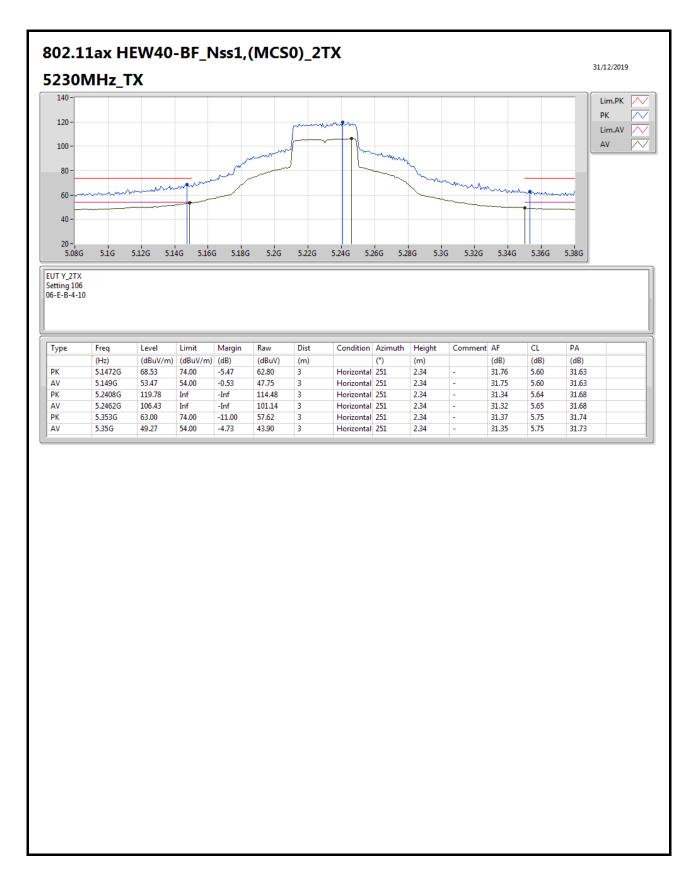




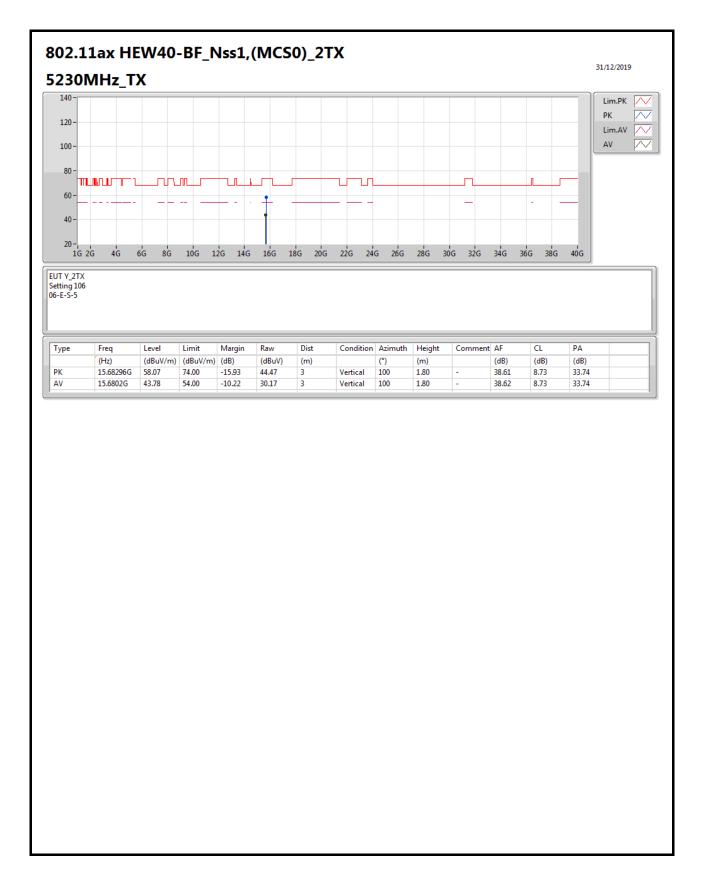




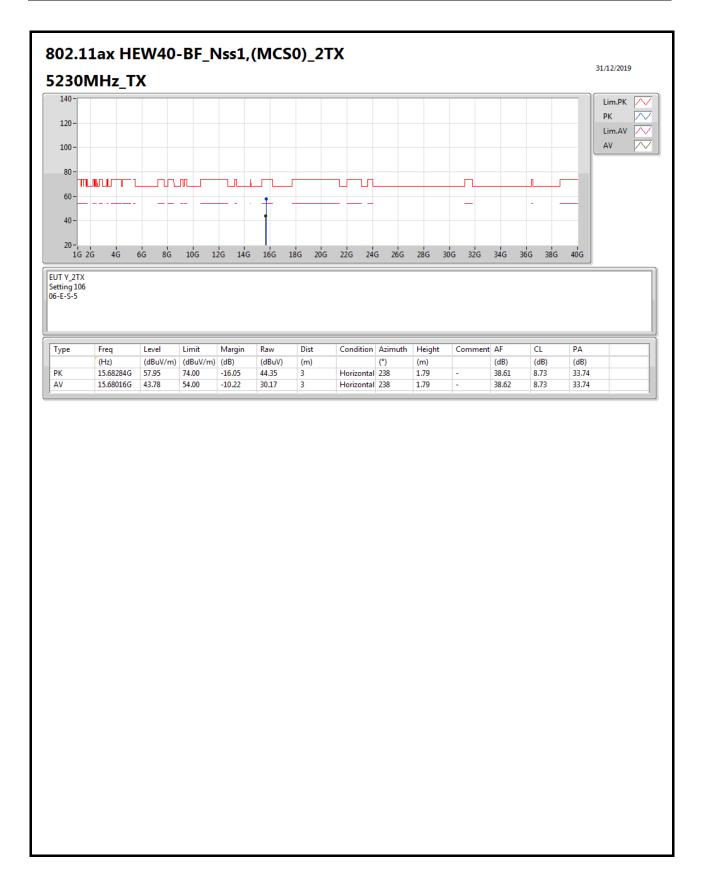




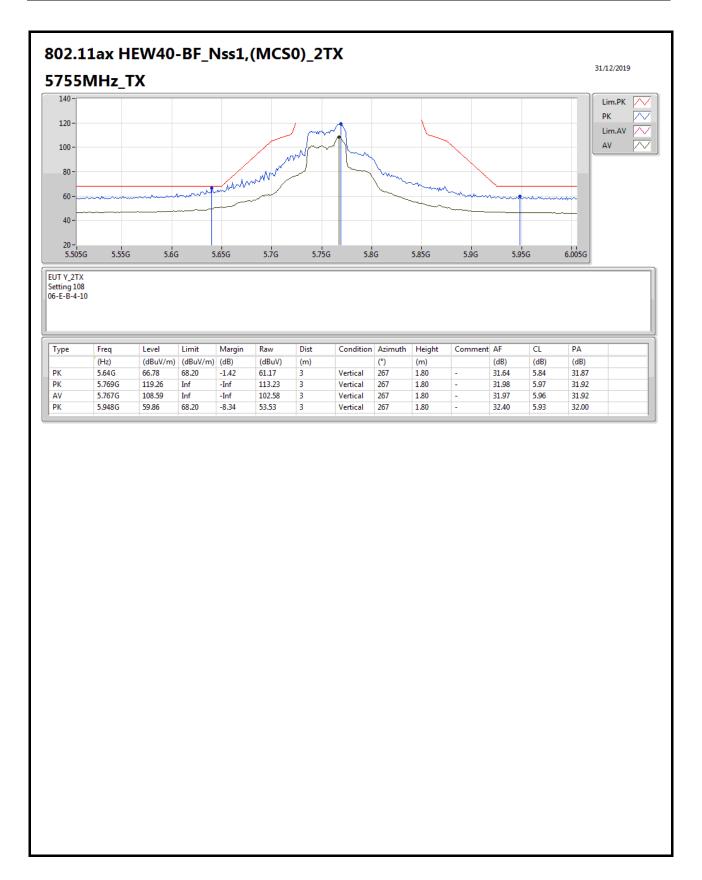




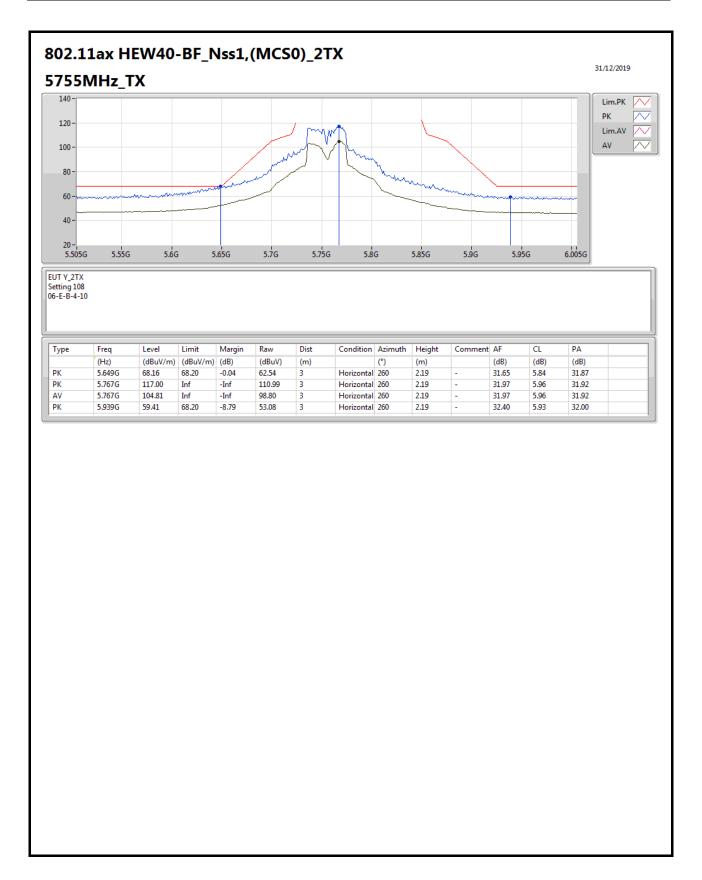




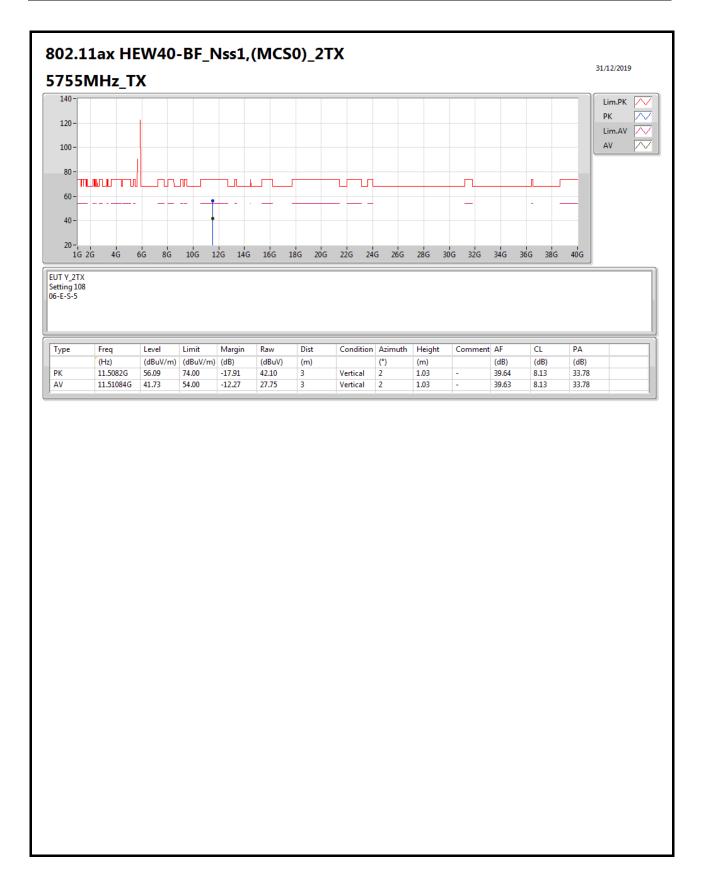




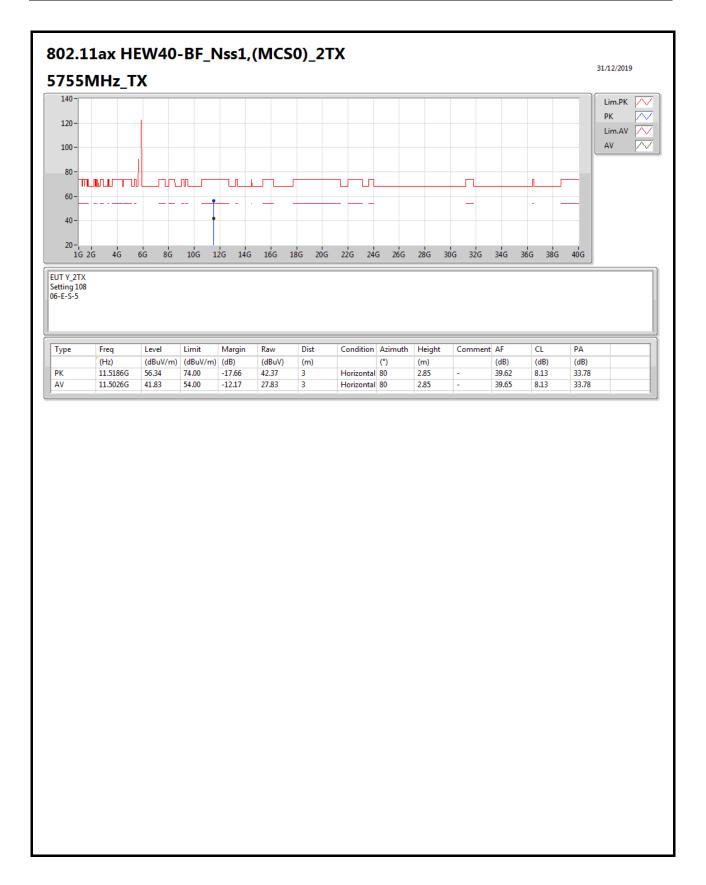




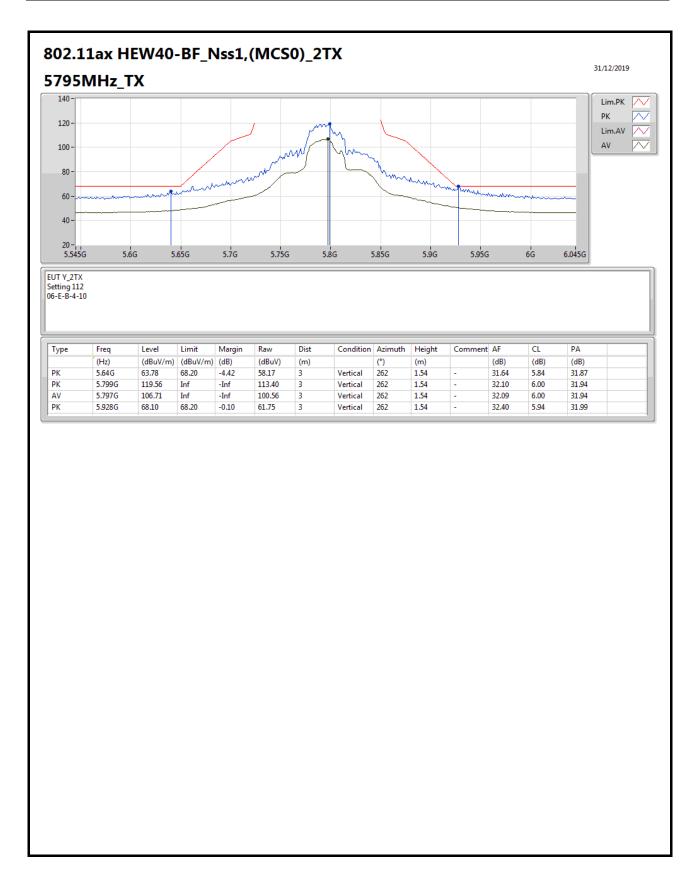




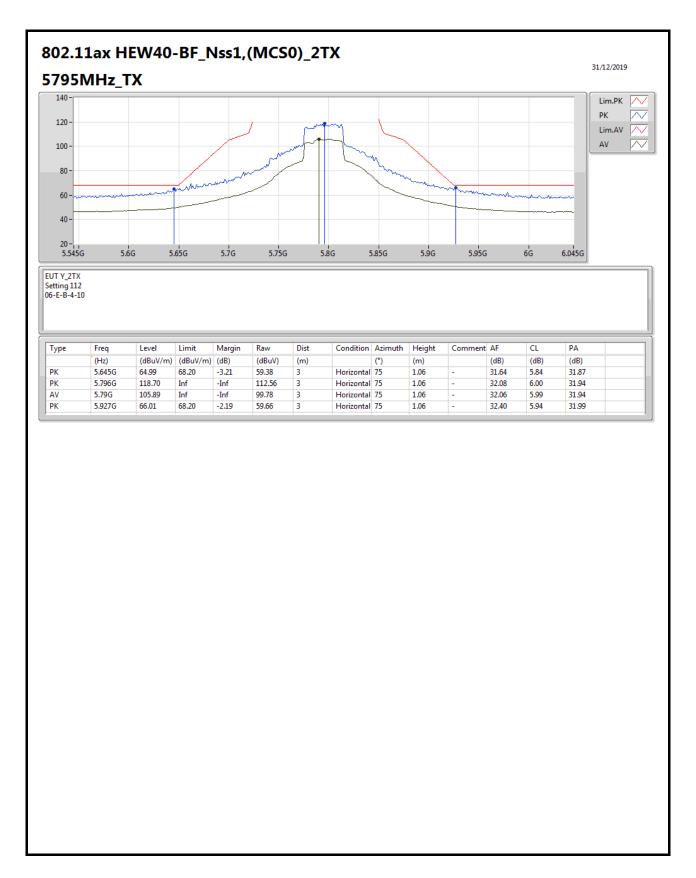




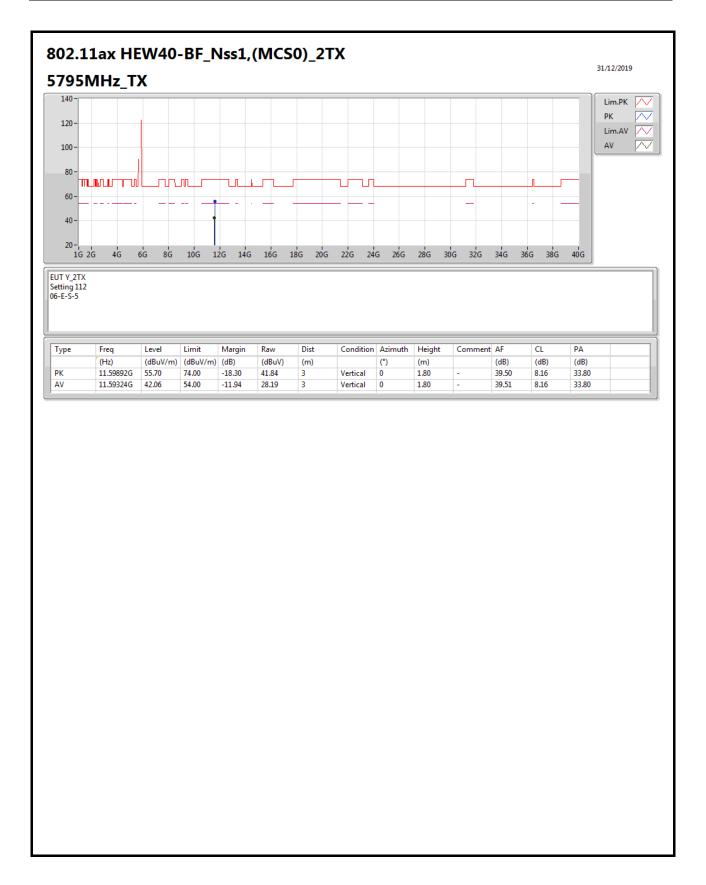




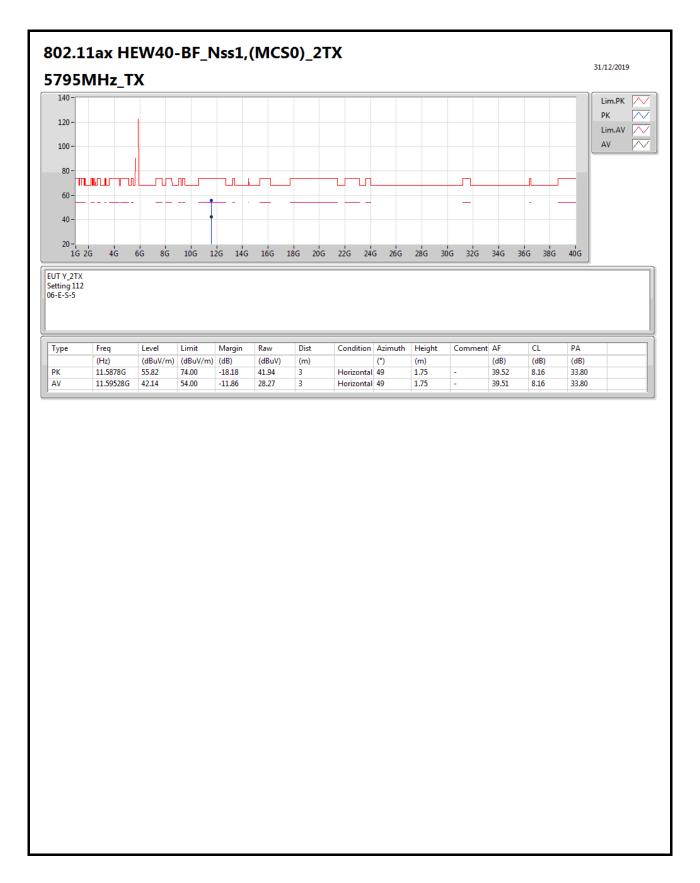




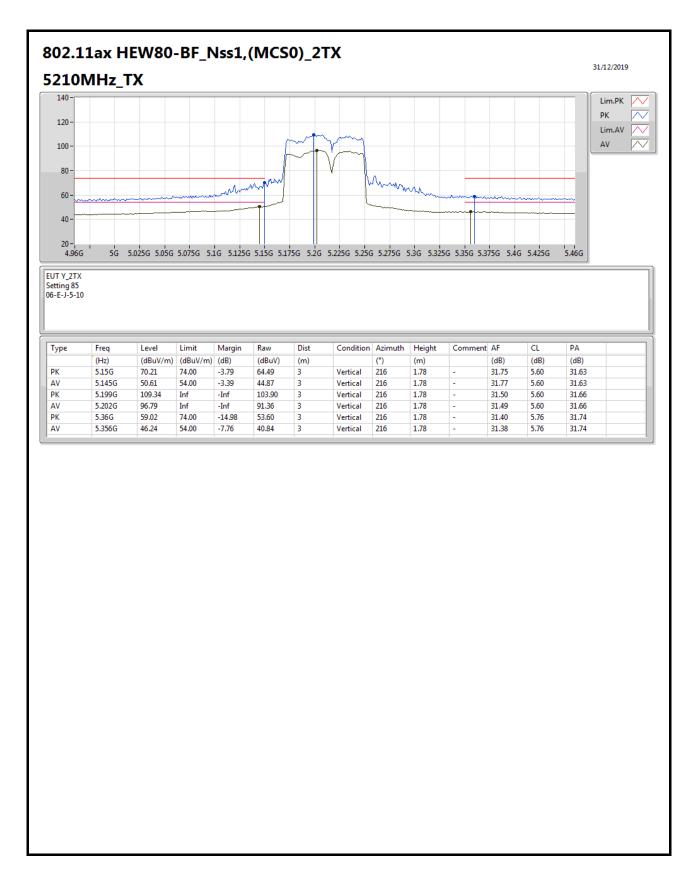




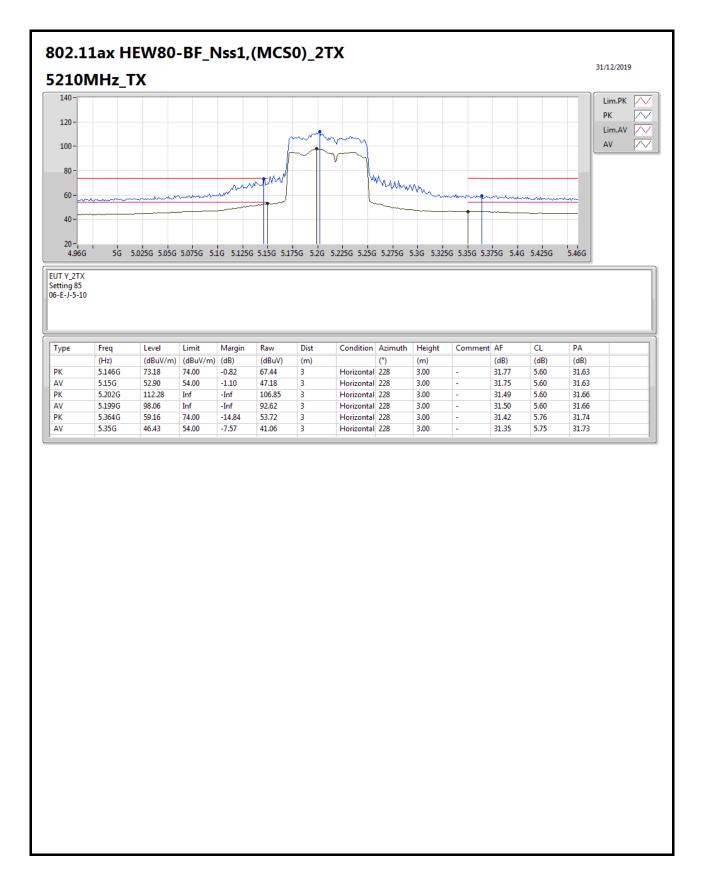




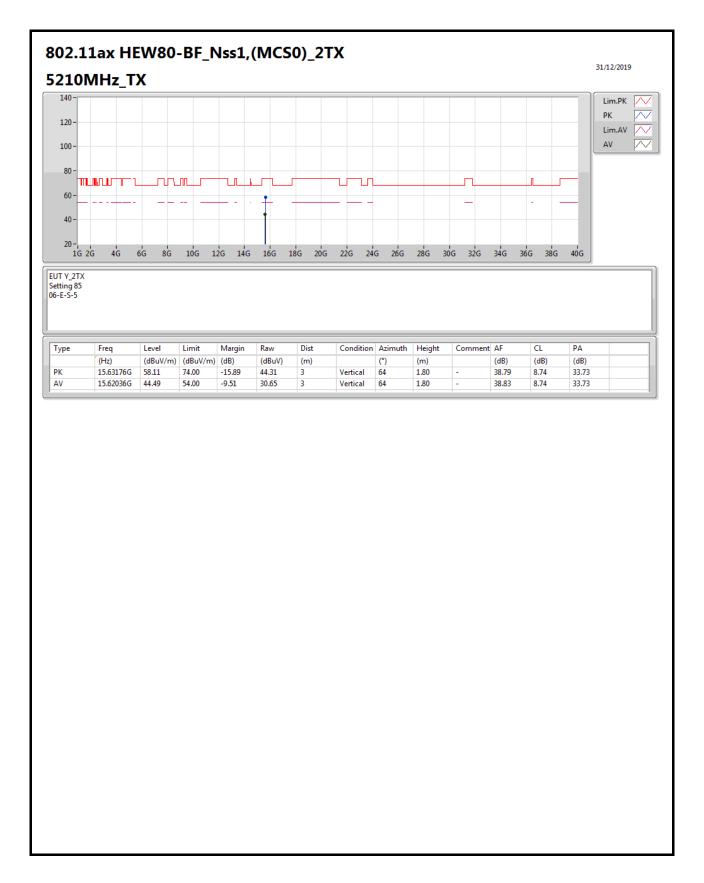




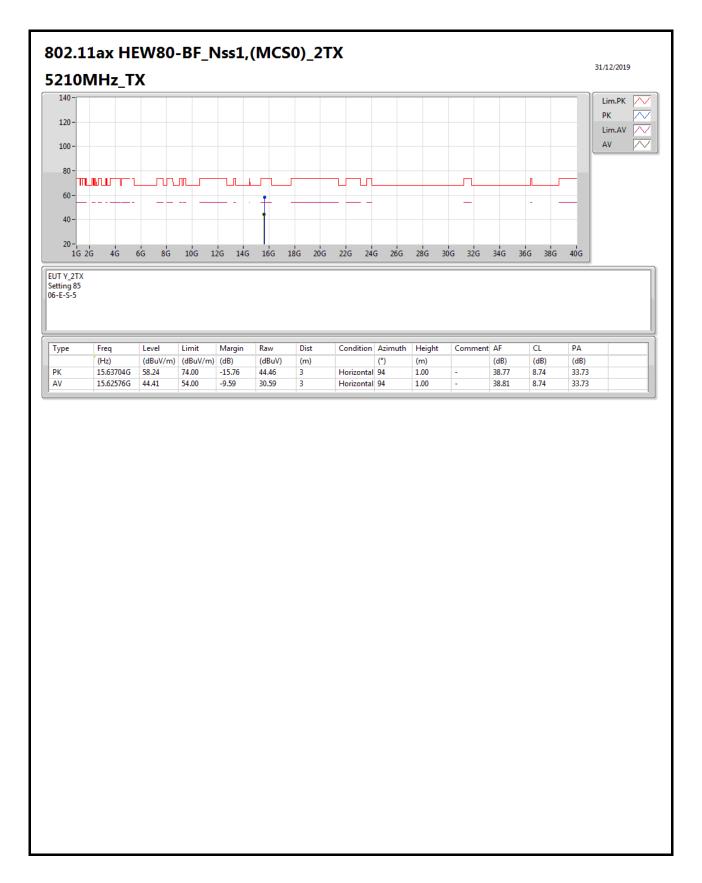




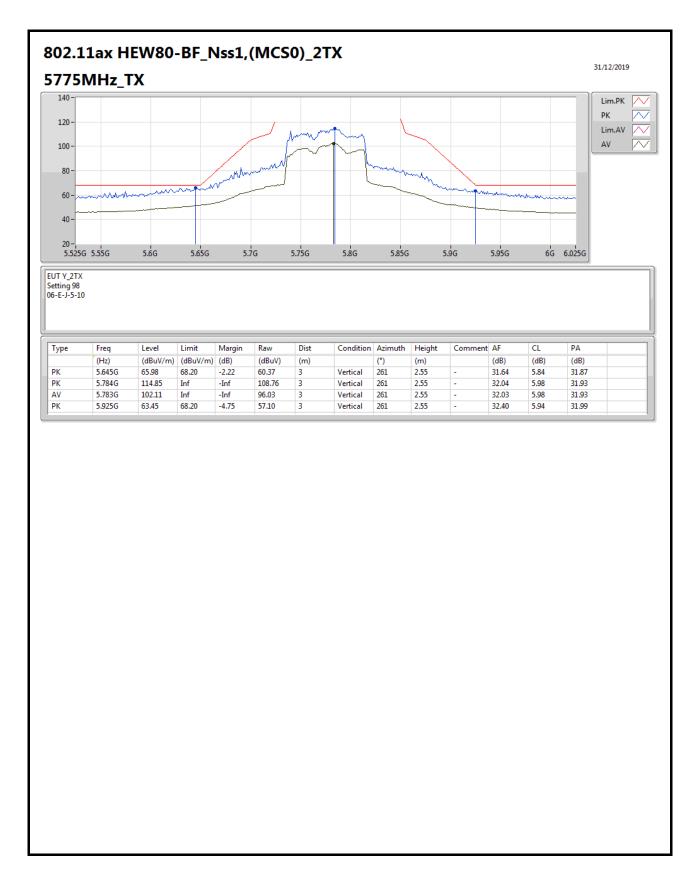




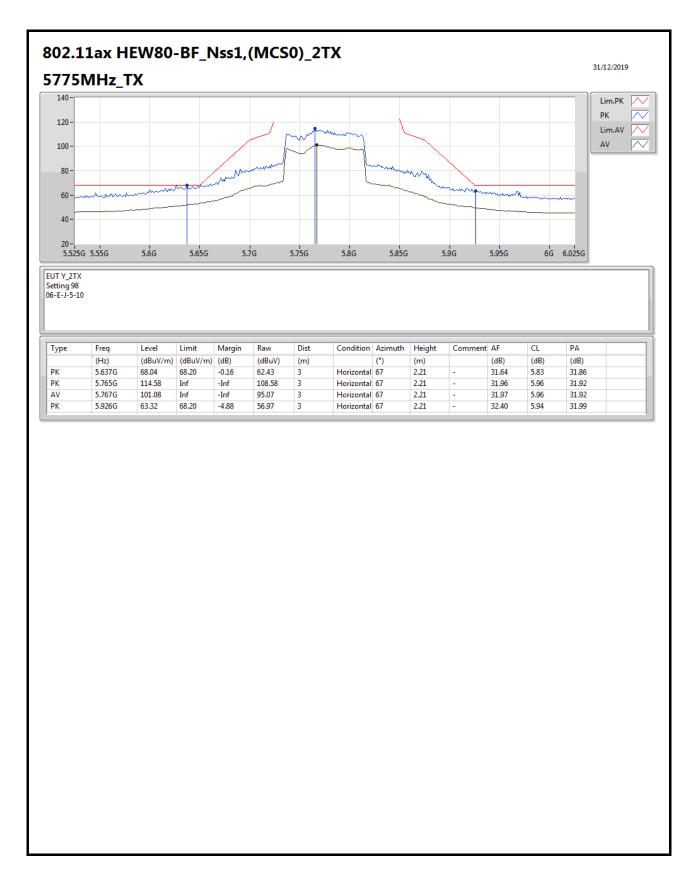




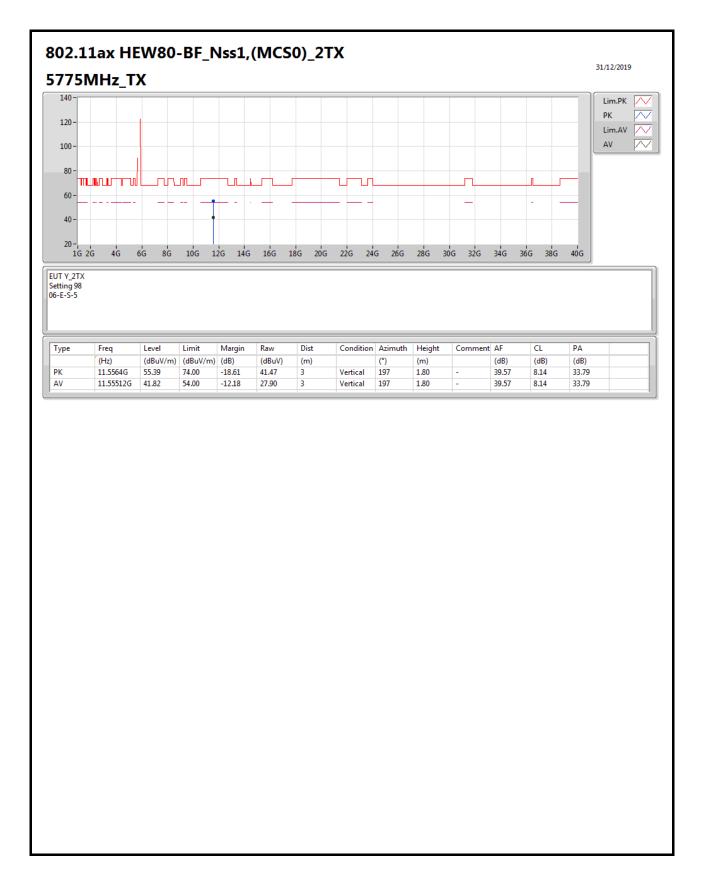




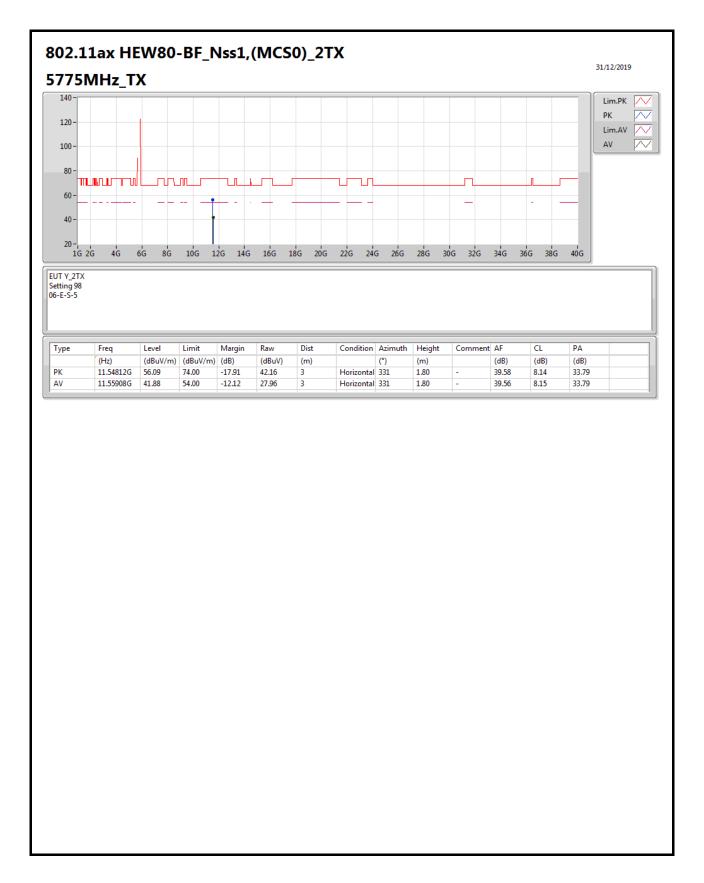








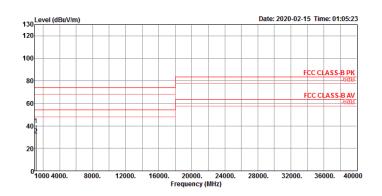




Operating Function



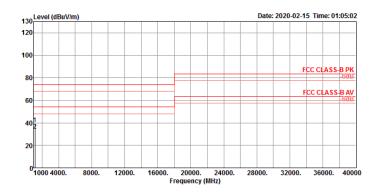
Normal Link



	Freq	Level		Over Limit						T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	1130.85	40.87	74.00	-33.13	49.93	2.85	24.90	36.81	124	152	Peak	HORIZONTAL
2	1131.05	31.87	54.00	-22.13	40.93	2.85	24.90	36.81	124	152	Average	HORIZONTAL



RSE Co-location Result									
Operating Mode	1	Polarization							
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	1130.77	39.01	74.00	-34.99	48.07	2.85	24.90	36.81	154	214	Peak	VERTICAL
2	1133.96	33.01	54.00	-20.99	42.07	2.85	24.90	36.81	154	214	Average	VERTICAL