

1190



FCC RADIO TEST REPORT

FCC ID

: Z8H89FT0057

Equipment

: Wireless Access Point

Brand Name

: Cambium Networks

Model Name

: REG-XV2-2

Applicant

: Cambium Networks Inc.

3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA

Manufacturer

: Cambium Networks, Ltd.

Ashburton, TQ13 7UP, UK

Standard

· 47 CFR FCC Part 15 407

The product was received on May 13, 2020, and testing was started from May 13, 2020 and completed on Jun. 13, 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

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History of this test report

Report No.: FR9D1603-01AB

Report No.	Version	Description	Issued Date
FR9D1603-01AB	01	Initial issue of report	Jul. 02, 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	-

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:

- 1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
- 2. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen
Report Producer: 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

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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
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, VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, modulation.
- HEW20, HEW40, HEW80 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- BWch is the nominal channel bandwidth.

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1.1.2 Antenna Information

Ant	Port	Brand	Medal Name	Antonno Tyro	Connector	Gain	(dBi)
Ant.	Port	Brand	Model Name	Antenna Type	Connector	2.4GHz	5GHz
1	1	Accton	120G00000240A	PIFA Antenna	I-PEX	5.45	6.28
2	2	Accton	120G00000240A	PIFA Antenna	I-PEX	4.44	6.08

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Note1: The above information was declared by manufacturer.

Note2: The EUT has two antennas.

<For 2.4GHz Function>

For IEEE 802.11b/g/n/VHT/ax mode (2TX, 2RX):

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

Ant. 1(Port 1) and Ant. 2(Port 2) could transmit/receive simultaneously.

<For 5GHz Band Function>

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

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

Ant. 1(Port 1) and Ant. 2(Port 2) could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.951	0.22	1.978m	1k
802.11ax HEW20	0.935	0.29	5.448m	300
802.11ax HEW20-BF	0.975	0.11	1.765m	1k
802.11ax HEW40	0.945	0.25	5.448m	300
802.11ax HEW40-BF	0.916	0.38	1.766m	1k
802.11ax HEW80	0.957	0.19	5.448m	300
802.11ax HEW80-BF	0.963	0.16	1.69m	1k

Note:

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

1.1.4 EUT Operational Condition

EUT Power Type	From PoE					
Poomforming Function	\boxtimes	With beamforming		Without beamforming		
Beamforming Function	The product has beamforming function for n/VHT/ax in 2.4G and n/ac/ax in 5G.					
Function		Outdoor P2M	\boxtimes	Indoor P2M		
runction	Fixed P2P Client		Client			
Test Software Version	Non-beamforming:QRCT(Version 4.0.00134.0) Beamforming:Telnet					

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 789033 D02 v02r01

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

- 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	TH02-CB	Lance Wu	23.1~25.3°C / 61~62%	May 19, 2020~Jun. 13, 2020
Radiated (below 1GHz test)	03CH06-CB	Paul Chen	23.3~24.5°C / 60~63%	May 13, 2020
Radiated (above 1GHz test)	03CH01-CB	Brian Sun	23~25.1°C / 58~62%	May 14, 2020~Jun. 12, 2020
AC Conduction	CO01-CB	GN Hou	21~23°C / 64~66%	May 13, 2020

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	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	23.5
5200MHz	23.5
5240MHz	24
5745MHz	27
5785MHz	27
5825MHz	27
802.11ax HEW20_Nss1,(MCS0)_2TX	-
5180MHz	24
5200MHz	25
5240MHz	25
5745MHz	27
5785MHz	27
5825MHz	27
802.11ax HEW40_Nss1,(MCS0)_2TX	-
5190MHz	23
5230MHz	25.5
5755MHz	27
5795MHz	26.5
802.11ax HEW80_Nss1,(MCS0)_2TX	-
5210MHz	23
5775MHz	24.5
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
5180MHz	26
5200MHz	26
5240MHz	26
5745MHz	26
5785MHz	26
5825MHz	26
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
5190MHz	26
5230MHz	26
5755MHz	26
5795MHz	26
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-
5210MHz	25.5

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Mode	Power Setting	
5775MHz	26	

Note:

• There are two functions of EUT, one is beamforming function, and the other is non-beamforming function for 802.11 n/VHT/ax in 2.4G and n/ac/ax in 5G. All test results were recorded in the 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 Normal Link			
1	EUT		

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The 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	СТХ	

The Worst Case Mode for Following Conformance Tests			
Tests Item	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	Normal Link		
1	EUT in Z axis		
2	EUT in Y axis		
For operating mode 1 is th	e worst case and it was record in this test report.		
Operating Mode > 1GHz	СТХ		
1	EUT in Z axis		
2	EUT in Y axis		
Mode 2 has been evaluated to be the worst case after evaluating. Consequently, measurement will follow			

Mode 2 has been evaluated to be the worst case after evaluating. Consequently, measurement will follow this same test mode.

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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			
There are two modes of EUT, one is Place EUT in Y axis, and the other is Place EUT in Z axis. Place EUT in Y axis generated the worst test result for Radiated emission above 1GHz test, thus the measurement for Radiated emission co-location test will follow this same test configuration.			
1 EUT in Y axis-WLAN 2.4GHz+WLAN 5GHz			
Refer to Appendix F 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		
1 WLAN 2.4GHz+WLAN 5GHz		
Refer to Sporton Test Report No.: FA9D1603-01 for Co-location RF Exposure Evaluation.		

Note: PoE information as below:

The EUT was powered by PoE, and the PoE was for measurement only, would not be marked.

Support Unit	Brand	Model
PoE	Cambium	NET-P60-56IN

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 "Telnet" 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

N/A

2.5 Support Equipment

For AC Conduction:

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	PoE	Cambium	NET-P60-56IN	N/A	
В	2.5G PC	DELL	T3400	N/A	
С	2.4G NB	DELL	E6430	N/A	
D	5G NB	DELL	E6430	N/A	
Е	Flash disk3.0	Transcend	JetFlash-700	N/A	

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For Radiated (below 1GHz):

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
Α	2.5G PC	DELL	T3400	N/A
В	2.4G NB	DELL	E4300	N/A
С	5G NB	DELL	E4300	N/A
D	PoE	Cambium	NET-P60-56IN	N/A
Е	Flash disk3.0	Transcend	JetFlash-700	N/A

For Radiated (above 1GHz) and RF Conducted:

For non-beamforming mode:

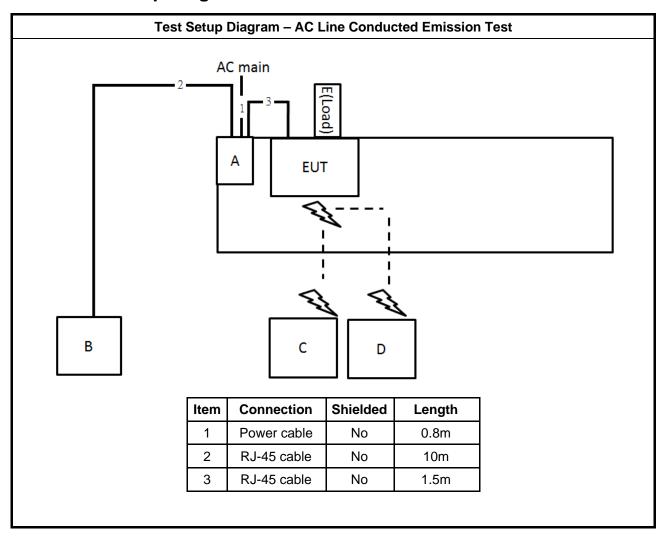
Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID				
Α	PoE	Cambium	NET-P60-56IN	N/A	
В	NB	DELL	E4300	N/A	

For beamforming mode:

Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID				
Α	PoE	Cambium	NET-P60-56IN	N/A	
В	NB	DELL	E4300	N/A	
С	RX Device	Accton	Jaguar	N/A	
D	NB	DELL	E4300	N/A	

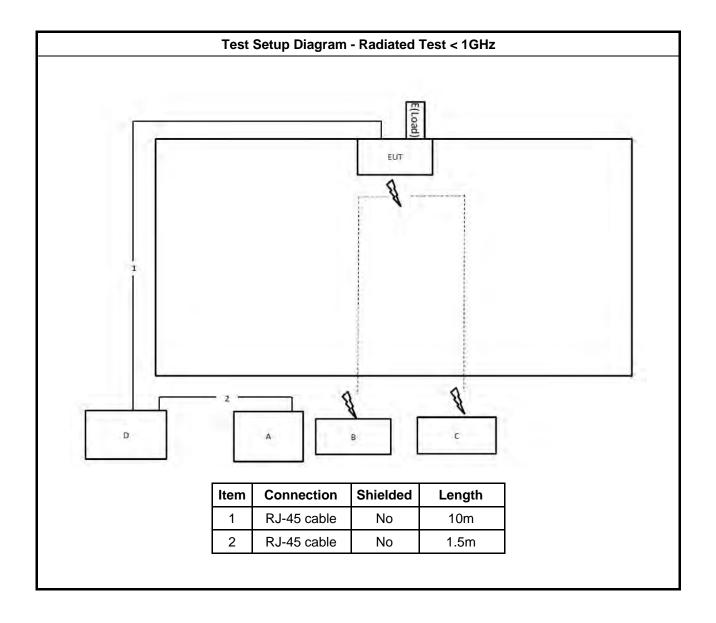
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2.6 Test Setup Diagram

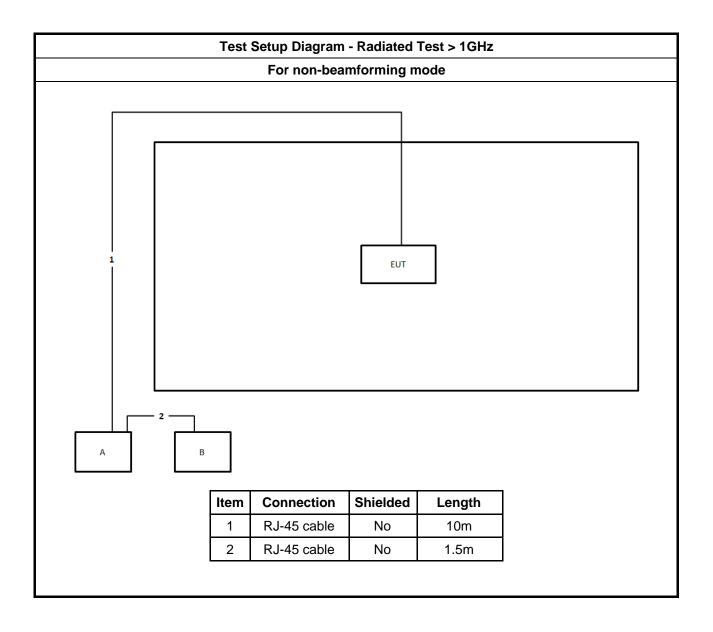


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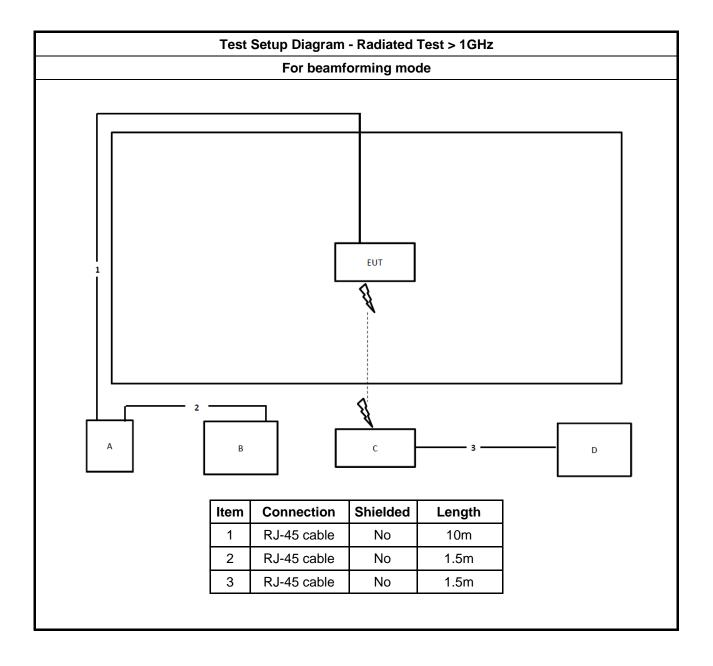
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3 Transmitter Test Result

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

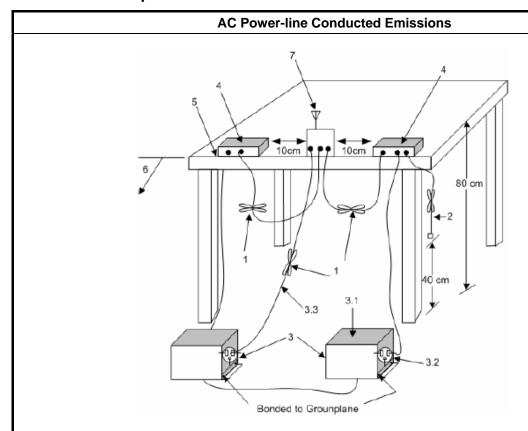
Refer a test equipment and calibration data table in this test report.

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 Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- b. Margin = Limit + (Read Level + LISN Factor + Cable Loss)

3.1.6 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	UNII 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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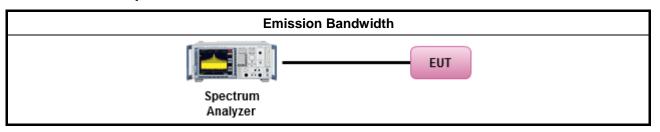
3.2.2 Measuring Instruments

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						
UNII 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, = the maximum transmitting antenna directional gain in dBi.						

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3.3.2 Measuring Instruments

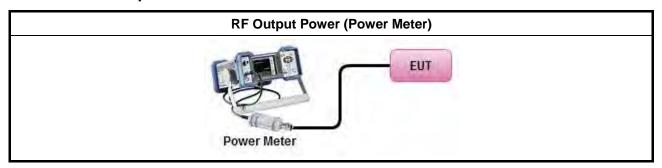
Refer a test equipment and calibration data table in this test report.

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)							
	Wideband RF power meter and average over on/off periods with duty factor							
	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	UNII 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) ≤ 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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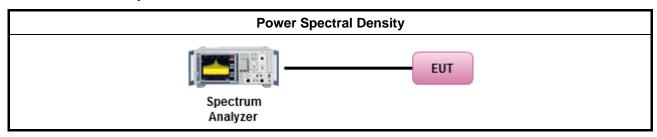
3.4.3 Test Procedures

		Test Method							
	outp func	k power spectral density procedures that the same method as used to determine the conducted ut 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 I 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	/ 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				
⊠ 5.15 - 5.25 GHz	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.

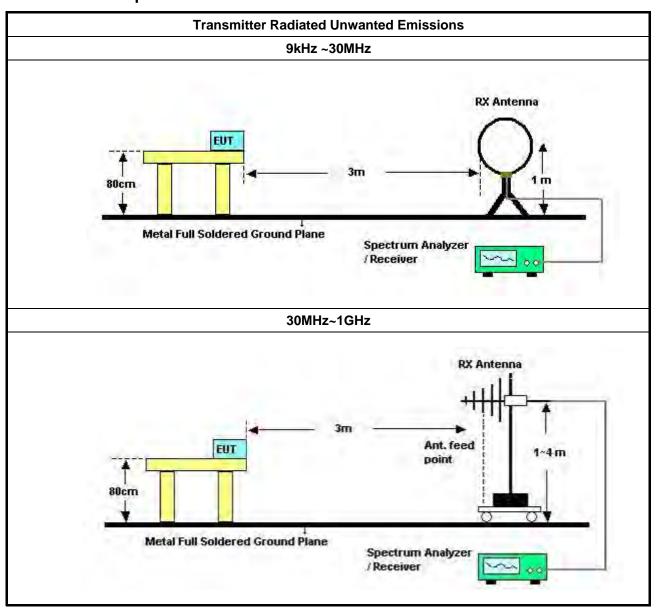
3.5.3 Test Procedures

Test Method

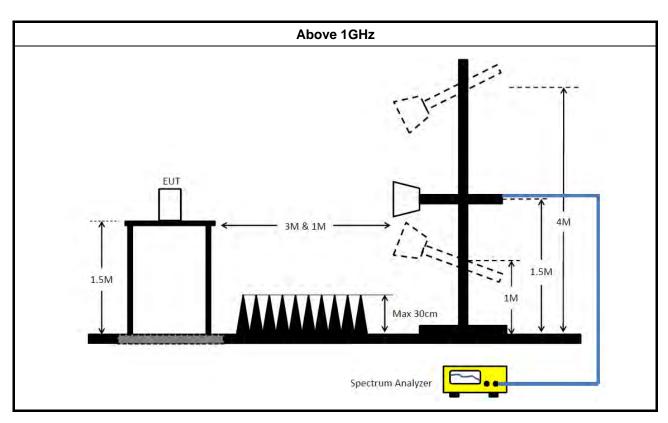
- Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, 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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: 01

3.5.5 **Measurement Results Calculation**

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor (if applicable) = Level.

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.

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	My52260123	9kHz ~ 8.45GHz	Feb. 26, 2020	Feb. 25, 2021	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50- 16-2	04083	150kHz ~ 100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Feb. 25, 2020	Feb. 24, 2021	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Pulse Limiter	Rohde& Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Jan. 31, 2020	Jan. 30, 2021	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Aug. 03, 2019	Aug. 02, 2020	Radiation (03CH06-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	Apr. 28, 2020	Apr. 27, 2021	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH06-CB)
RF Cable-low	HUBER+SUH NER	RG402	Low Cable-05+24	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
Horn Antenna	ETS-LINDGRE N	3115	00075790	750MHz ~ 18GHz	Nov. 04, 2019	Nov. 03, 2020	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2020	Jan. 07, 2021	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Apr. 16, 2020	Apr. 15, 2021	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)

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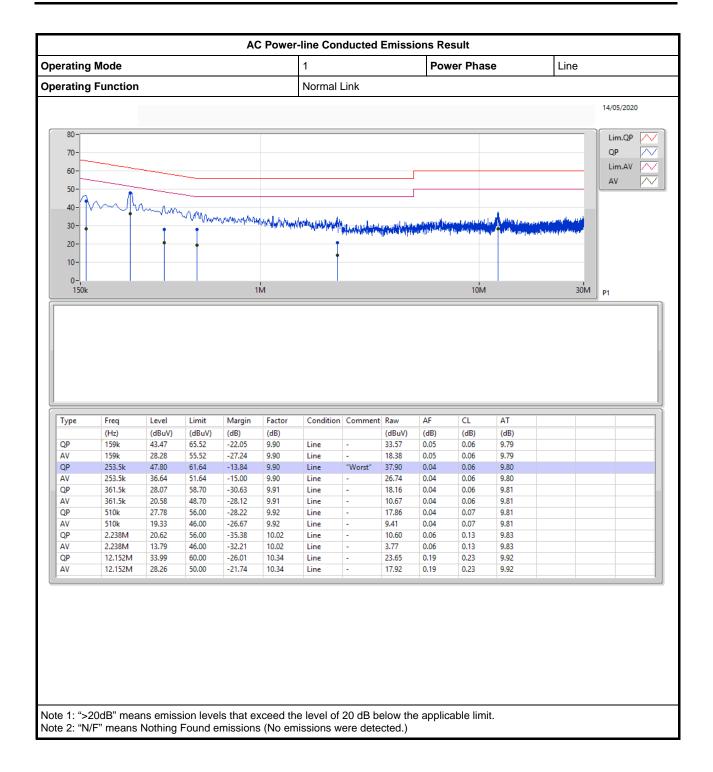
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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 02, 2019	Jul. 01, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~ 40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~ 40GHz	Sep. 11, 2019	Sep. 10, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz– 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz– 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz– 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz– 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz- 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH02-CB)

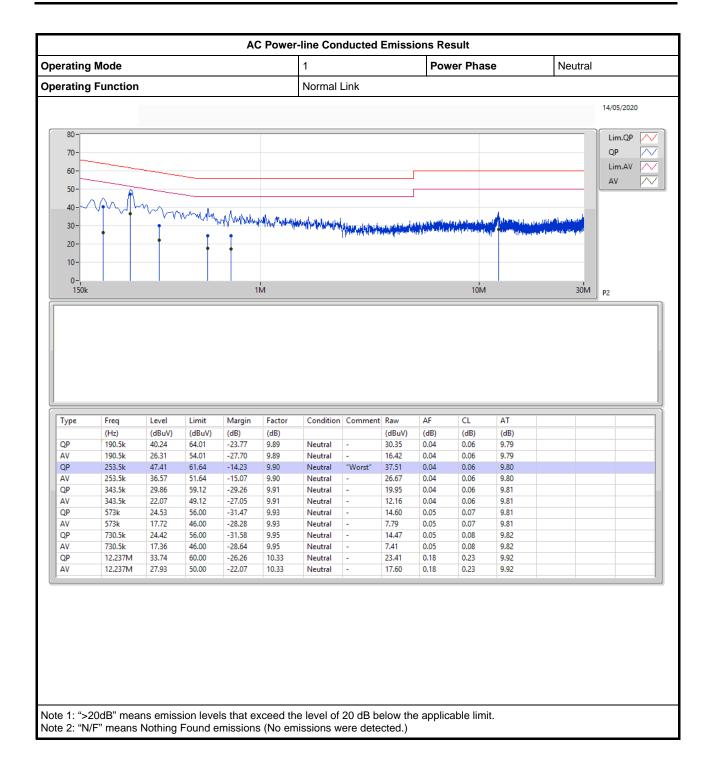
Note: Calibration Interval of instruments listed above is one year. NCR means Non-Calibration required.

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AC Power-line Conducted Emissions Result



AC Power-line Conducted Emissions Result





Appendix B.1 **EBW**

For non-beamforming mode: **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	20.82M	16.432M	16M4D1D	20.22M	16.372M
802.11ax HEW20_Nss1,(MCS0)_2TX	21.99M	18.951M	19M0D1D	21.48M	18.891M
802.11ax HEW40_Nss1,(MCS0)_2TX	42.18M	37.841M	37M8D1D	40.86M	37.721M
802.11ax HEW80_Nss1,(MCS0)_2TX	82.56M	77.121M	77M1D1D	82.44M	77.001M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	16.29M	17.511M	17M5D1D	15.27M	16.732M
802.11ax HEW20_Nss1,(MCS0)_2TX	18.6M	19.1M	19M1D1D	17.13M	18.981M
802.11ax HEW40_Nss1,(MCS0)_2TX	37.8M	38.501M	38M5D1D	37.2M	37.961M
802.11ax HEW80_Nss1,(MCS0)_2TX	77.76M	77.241M	77M2D1D	66.96M	77.121M

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;
Max-OBW = Maximum99% 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;



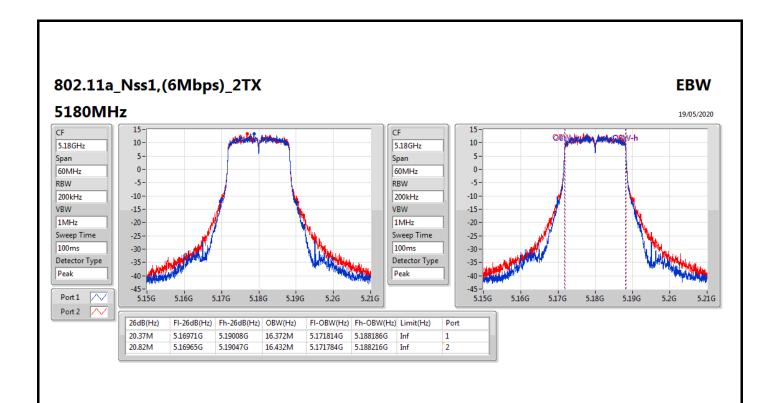
EBW Appendix B.1

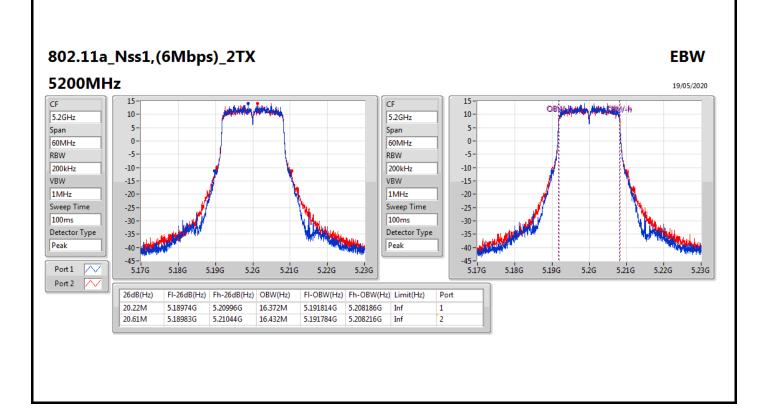
Result

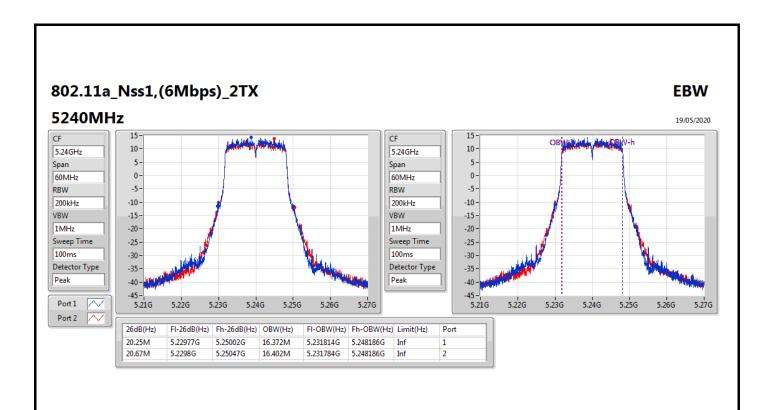
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	20.37M	16.372M	20.82M	16.432M
5200MHz	Pass	Inf	20.22M	16.372M	20.61M	16.432M
5240MHz	Pass	Inf	20.25M	16.372M	20.67M	16.402M
5745MHz	Pass	500k	16.29M	16.822M	16.29M	16.732M
5785MHz	Pass	500k	15.78M	16.822M	15.27M	16.792M
5825MHz	Pass	500k	16.02M	17.511M	15.99M	16.762M
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	21.6M	18.921M	21.99M	18.951M
5200MHz	Pass	Inf	21.81M	18.891M	21.72M	18.951M
5240MHz	Pass	Inf	21.48M	18.921M	21.69M	18.921M
5745MHz	Pass	500k	18.12M	19.01M	17.28M	18.981M
5785MHz	Pass	500k	18.18M	19.04M	17.13M	19.04M
5825MHz	Pass	500k	18.6M	19.1M	18M	18.981M
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	40.86M	37.721M	41.1M	37.781M
5230MHz	Pass	Inf	41.28M	37.781M	42.18M	37.841M
5755MHz	Pass	500k	37.8M	38.501M	37.68M	38.321M
5795MHz	Pass	500k	37.74M	38.081M	37.2M	37.961M
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	82.44M	77.121M	82.56M	77.001M
5775MHz	Pass	500k	77.76M	77.121M	66.96M	77.241M

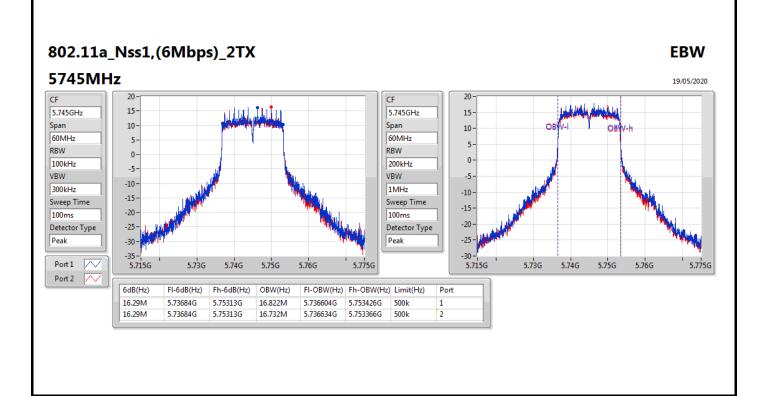
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

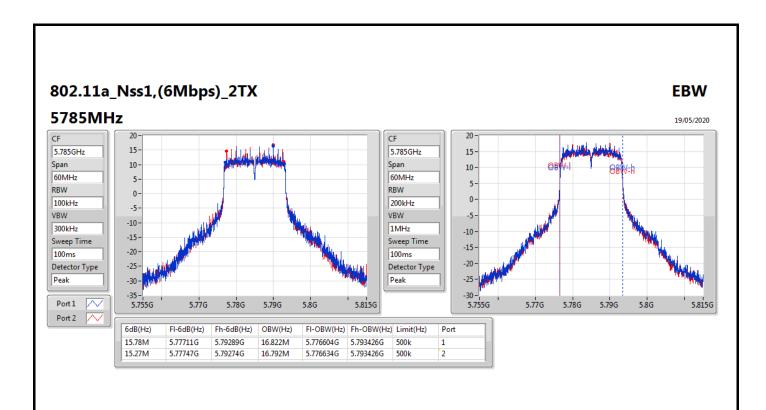
EBW Appendix B.1

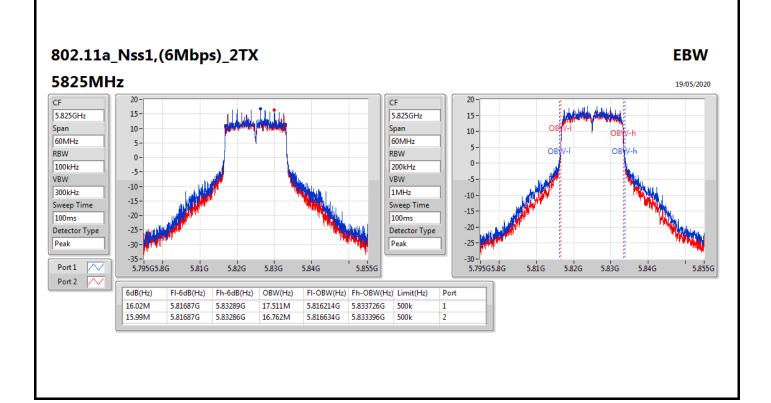


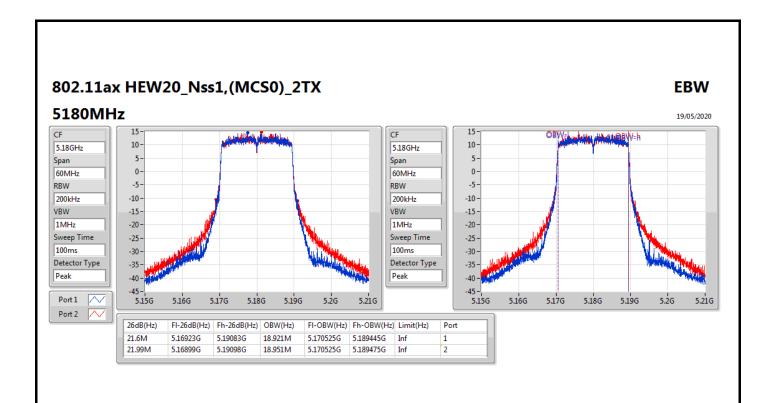


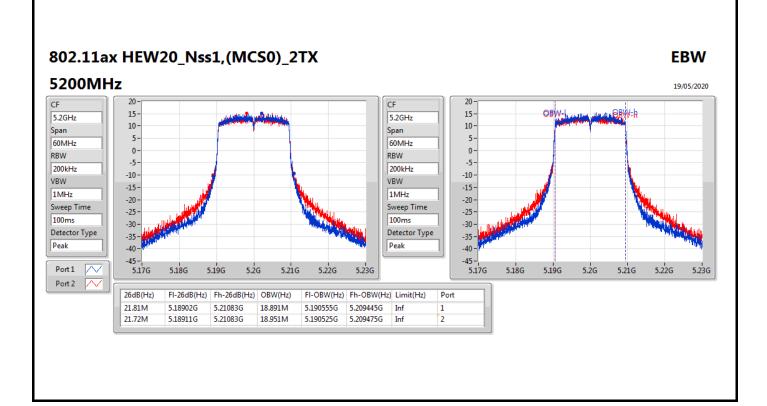


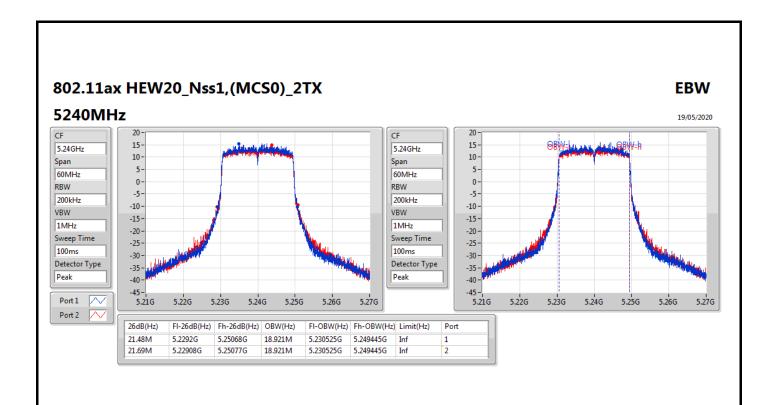


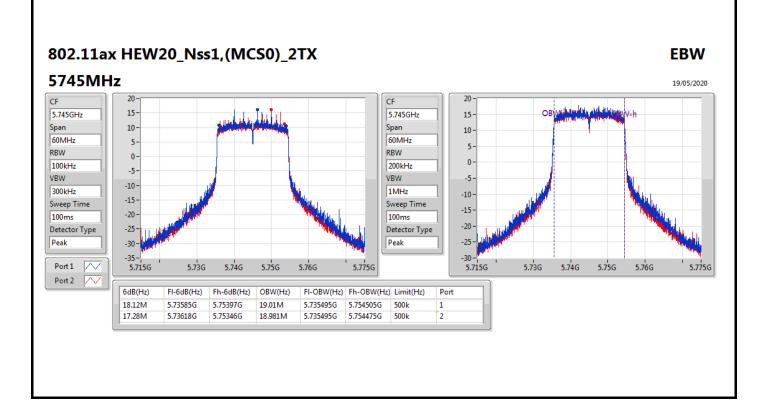


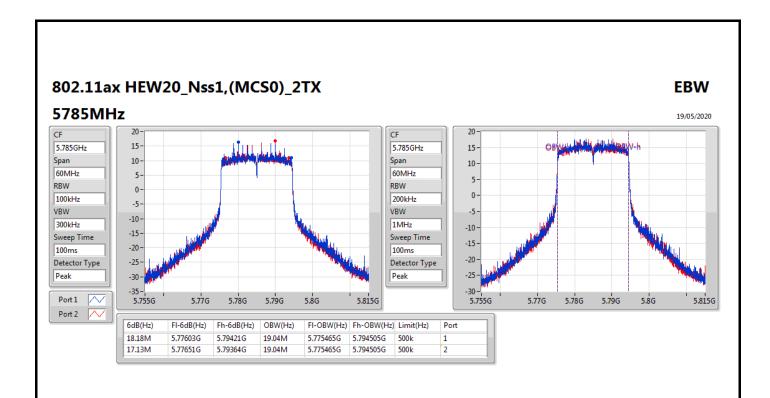


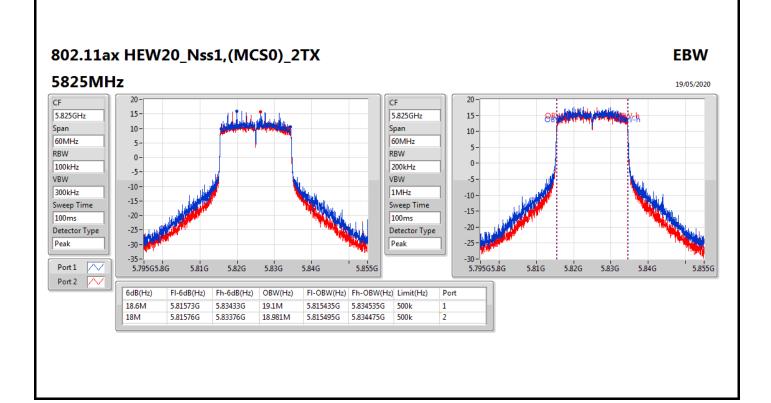


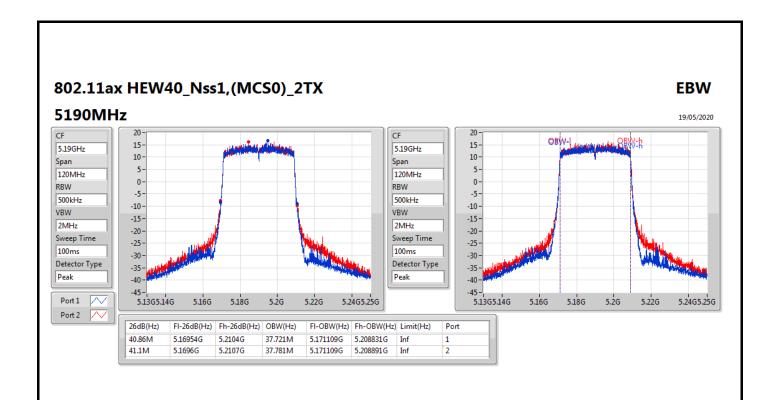


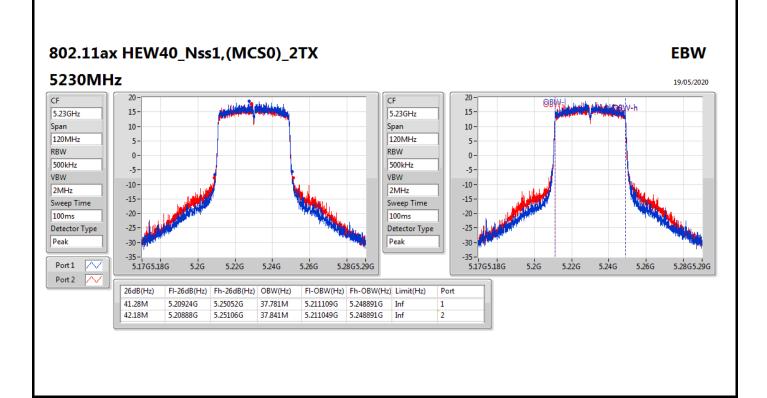


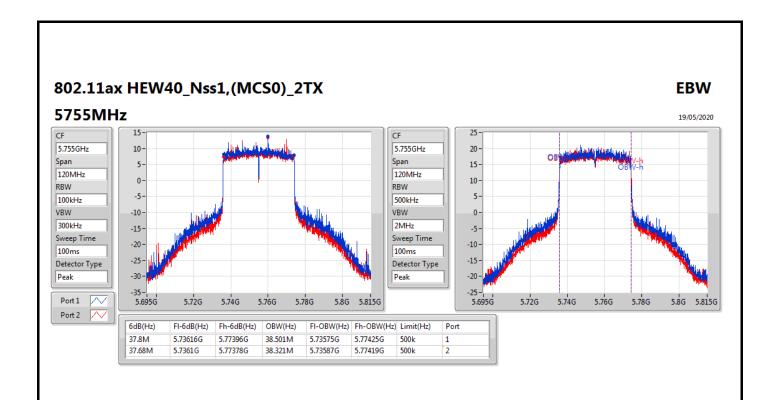


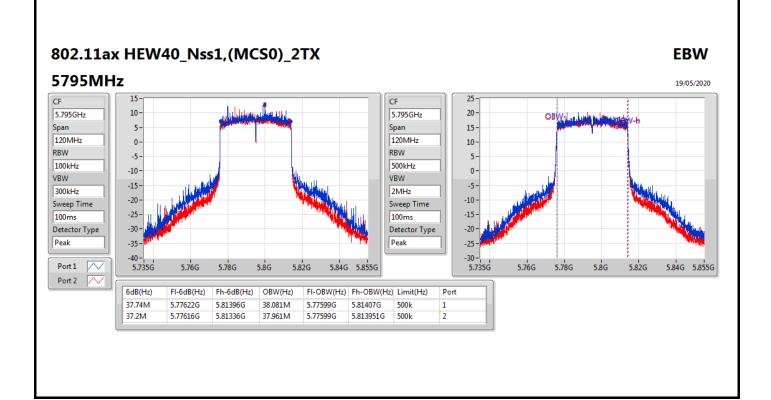


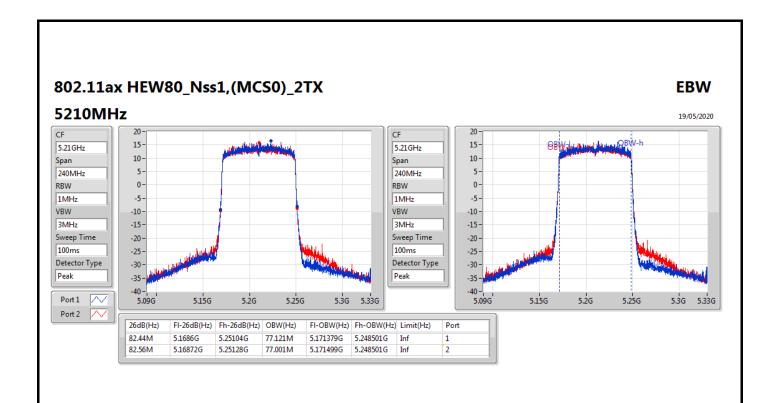


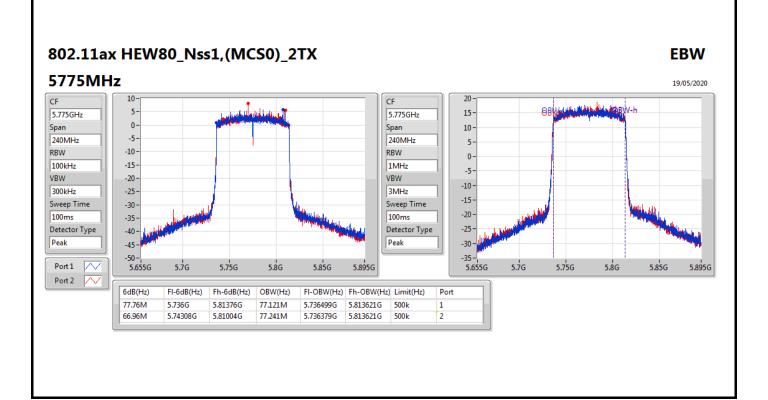














Appendix B.2 **EBW**

For beamforming mode: **Summary**

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
5.15-5.25GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	21.93M	18.921M	18M9D1D	20.64M	18.891M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	41.4M	37.781M	37M8D1D	40.74M	37.661M
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	81.24M	77.001M	77M0D1D	80.76M	76.882M
5.725-5.85GHz	-	-	-	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	18.78M	18.891M	18M9D1D	16.92M	18.891M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	37.5M	37.841M	37M8D1D	35.4M	37.661M
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	75.12M	76.882M	76M9D1D	74.52M	76.762M

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

Max-OBW = Maximum99% occupied bandwidth;

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

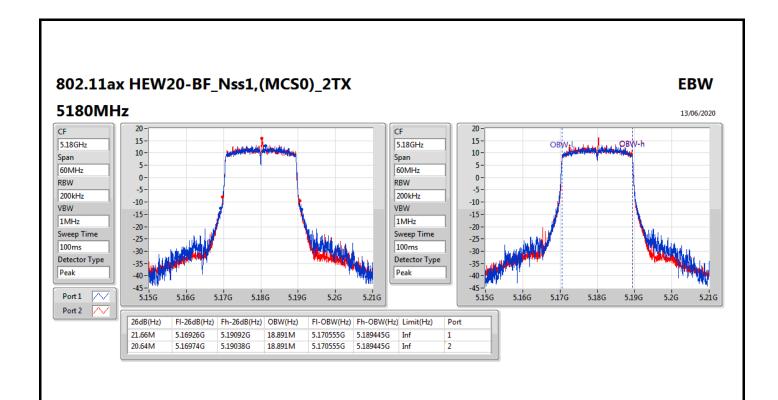
Min-OBW = Minimum 99% occupied bandwidth;

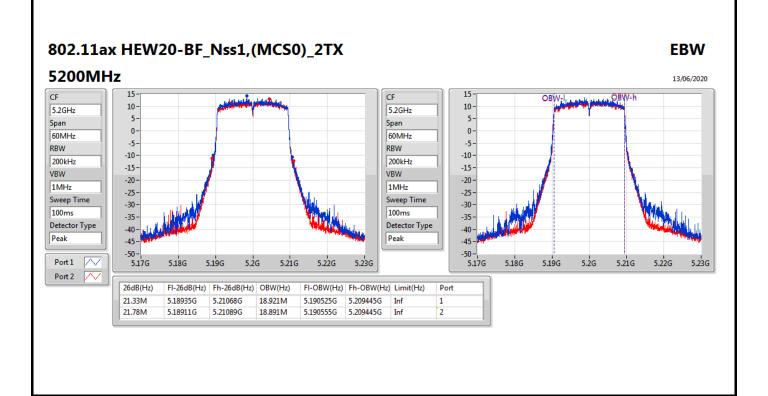


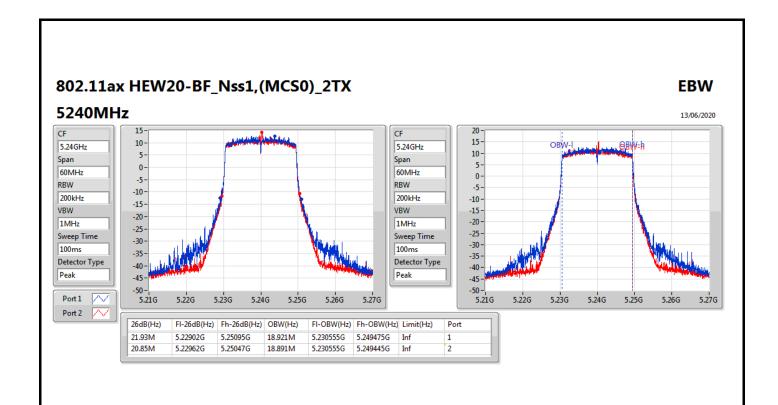
Result

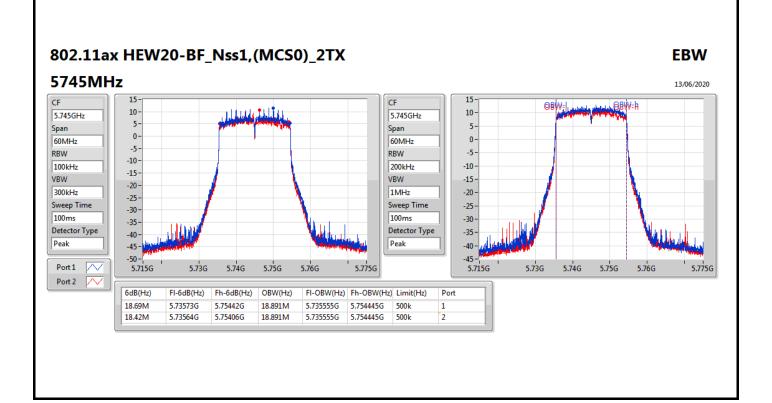
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	21.66M	18.891M	20.64M	18.891M
5200MHz	Pass	Inf	21.33M	18.921M	21.78M	18.891M
5240MHz	Pass	Inf	21.93M	18.921M	20.85M	18.891M
5745MHz	Pass	500k	18.69M	18.891M	18.42M	18.891M
5785MHz	Pass	500k	18.18M	18.891M	18.78M	18.891M
5825MHz	Pass	500k	17.79M	18.891M	16.92M	18.891M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	41.4M	37.661M	40.98M	37.781M
5230MHz	Pass	Inf	41.34M	37.781M	40.74M	37.721M
5755MHz	Pass	500k	35.64M	37.661M	35.4M	37.721M
5795MHz	Pass	500k	37.5M	37.781M	37.38M	37.841M
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	81.24M	77.001M	80.76M	76.882M
5775MHz	Pass	500k	74.52M	76.762M	75.12M	76.882M

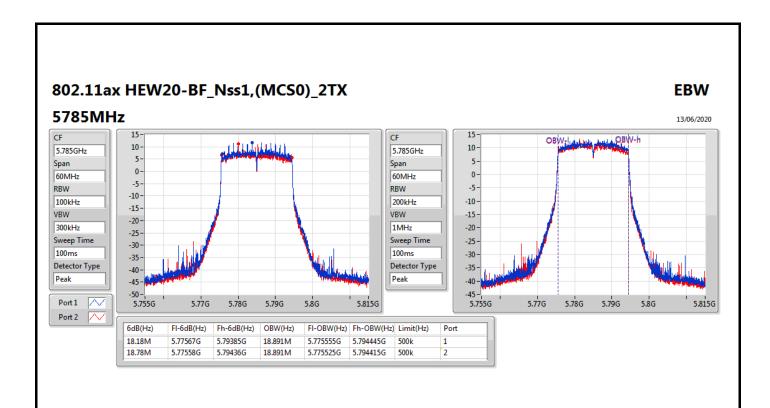
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

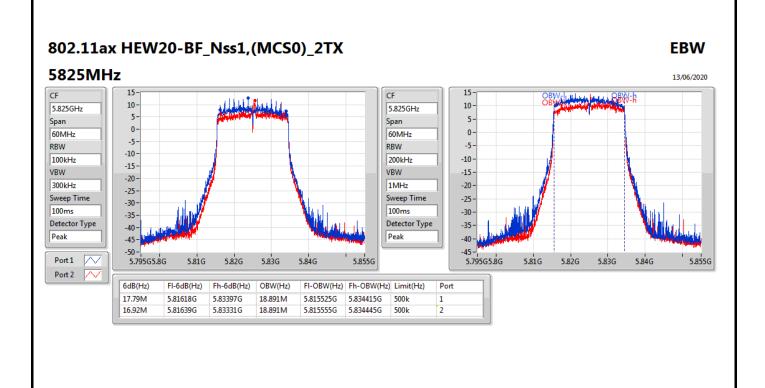


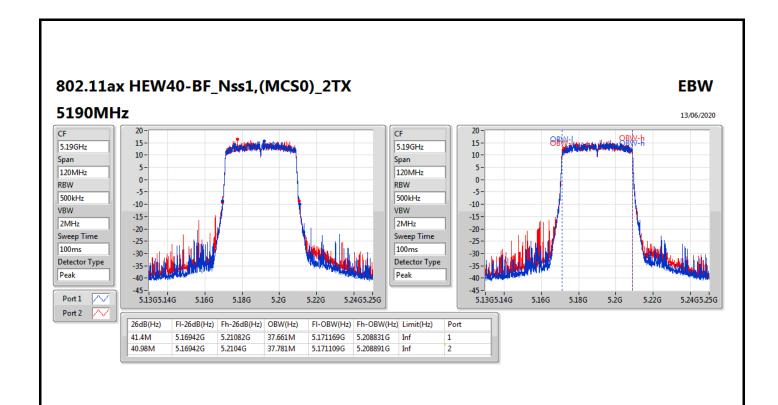


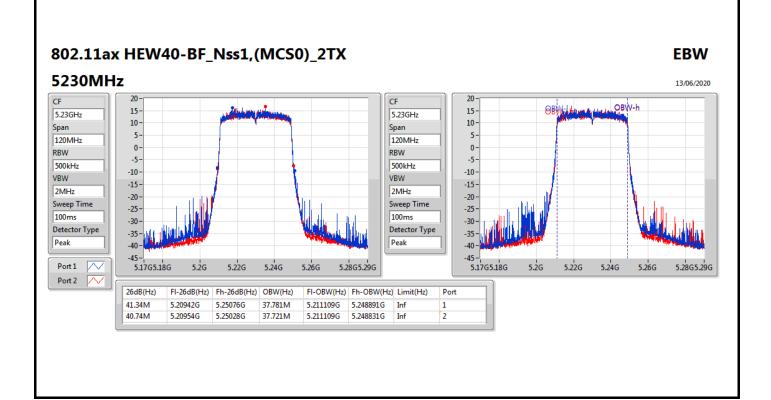


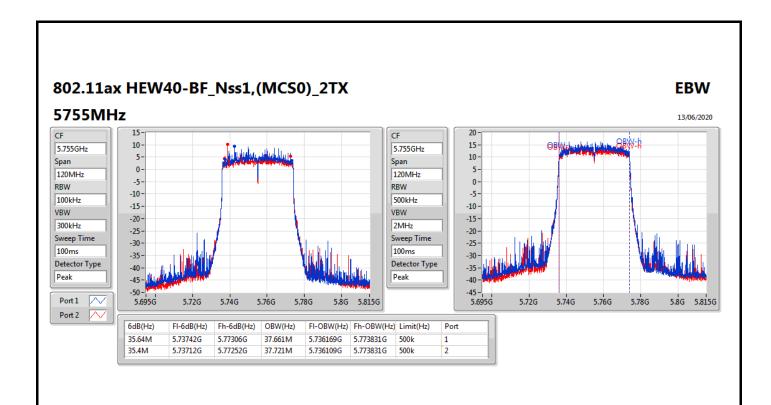


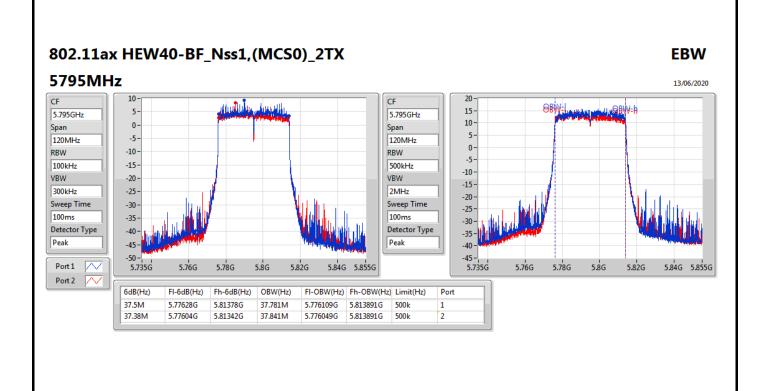


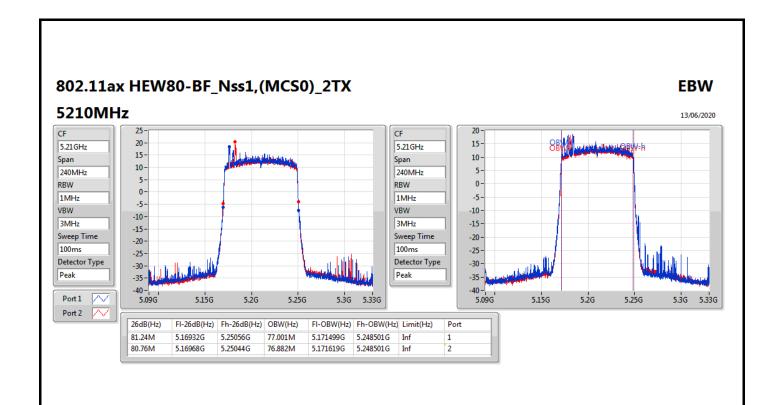


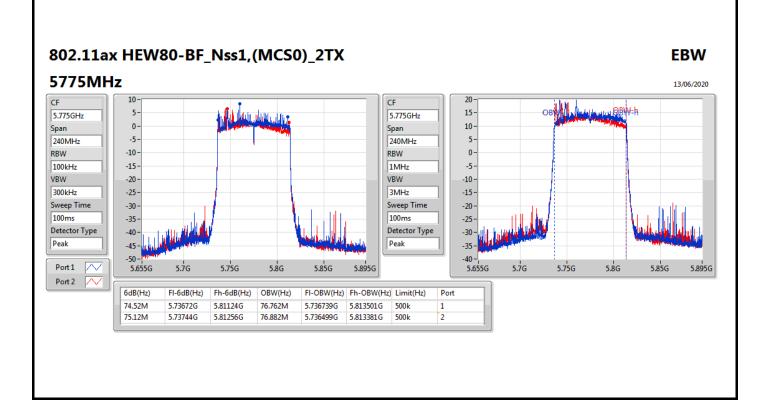














For non-beamforming mode: Summary

Mode	Total Power	Total Power
	(dBm)	(W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	26.37	0.43351
802.11ax HEW20_Nss1,(MCS0)_2TX	26.92	0.49204
802.11ax HEW40_Nss1,(MCS0)_2TX	27.70	0.58884
802.11ax HEW80_Nss1,(MCS0)_2TX	25.01	0.31696
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	29.68	0.92897
802.11ax HEW20_Nss1,(MCS0)_2TX	29.30	0.85114
802.11ax HEW40_Nss1,(MCS0)_2TX	29.51	0.89331
802.11ax HEW80_Nss1,(MCS0)_2TX	26.77	0.47534



Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	6.28	23.06	23.46	26.27	29.72
5200MHz	Pass	6.28	23.21	23.18	26.21	29.72
5240MHz	Pass	6.28	23.51	23.21	26.37	29.72
5745MHz	Pass	6.28	26.67	26.52	29.61	29.72
5785MHz	Pass	6.28	26.57	26.54	29.57	29.72
5825MHz	Pass	6.28	26.90	26.43	29.68	29.72
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	6.28	23.00	23.27	26.15	29.72
5200MHz	Pass	6.28	24.09	23.73	26.92	29.72
5240MHz	Pass	6.28	24.08	23.61	26.86	29.72
5745MHz	Pass	6.28	26.32	26.19	29.27	29.72
5785MHz	Pass	6.28	26.37	26.21	29.30	29.72
5825MHz	Pass	6.28	26.40	26.05	29.24	29.72
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	6.28	22.29	22.55	25.43	29.72
5230MHz	Pass	6.28	24.90	24.46	27.70	29.72
5755MHz	Pass	6.28	26.78	26.21	29.51	29.72
5795MHz	Pass	6.28	26.46	25.96	29.23	29.72
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	6.28	22.15	21.84	25.01	29.72
5775MHz	Pass	6.28	23.85	23.67	26.77	29.72

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



For beamforming mode: Summary

Mode	Total Power	Total Power
	(dBm)	(W)
5.15-5.25GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	25.50	0.35481
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	25.68	0.36983
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	24.26	0.26669
5.725-5.85GHz	-	-
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	25.08	0.32211
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	25.35	0.34277
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	25.02	0.31769

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	9.19	22.39	22.58	25.50	26.81
5200MHz	Pass	9.19	22.58	21.86	25.25	26.81
5240MHz	Pass	9.19	22.23	21.43	24.86	26.81
5745MHz	Pass	9.19	22.03	21.36	24.72	26.81
5785MHz	Pass	9.19	22.47	21.63	25.08	26.81
5825MHz	Pass	9.19	23.06	20.73	25.06	26.81
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	9.19	22.63	22.70	25.68	26.81
5230MHz	Pass	9.19	22.68	22.21	25.46	26.81
5755MHz	Pass	9.19	22.64	21.69	25.20	26.81
5795MHz	Pass	9.19	22.92	21.66	25.35	26.81
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	9.19	21.34	21.15	24.26	26.81
5775MHz	Pass	9.19	22.32	21.67	25.02	26.81

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



For non-beamforming mode: Summary

Sullillary	
Mode	PD
	(dBm/RBW)
5.15-5.25GHz	·
802.11a_Nss1,(6Mbps)_2TX	13.78
802.11ax HEW20_Nss1,(MCS0)_2TX	13.68
802.11ax HEW40_Nss1,(MCS0)_2TX	11.76
802.11ax HEW80_Nss1,(MCS0)_2TX	6.05
5.725-5.85GHz	·
802.11a_Nss1,(6Mbps)_2TX	15.61
802.11ax HEW20_Nss1,(MCS0)_2TX	14.47
802.11ax HEW40_Nss1,(MCS0)_2TX	11.86
802.11ax HEW80_Nss1,(MCS0)_2TX	6.19

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

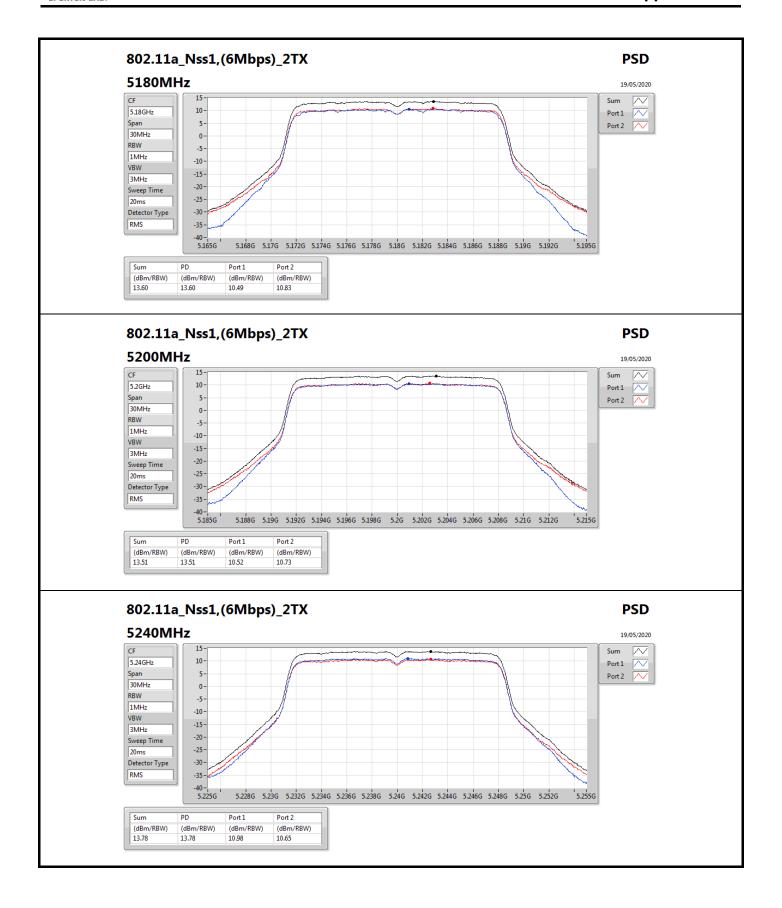


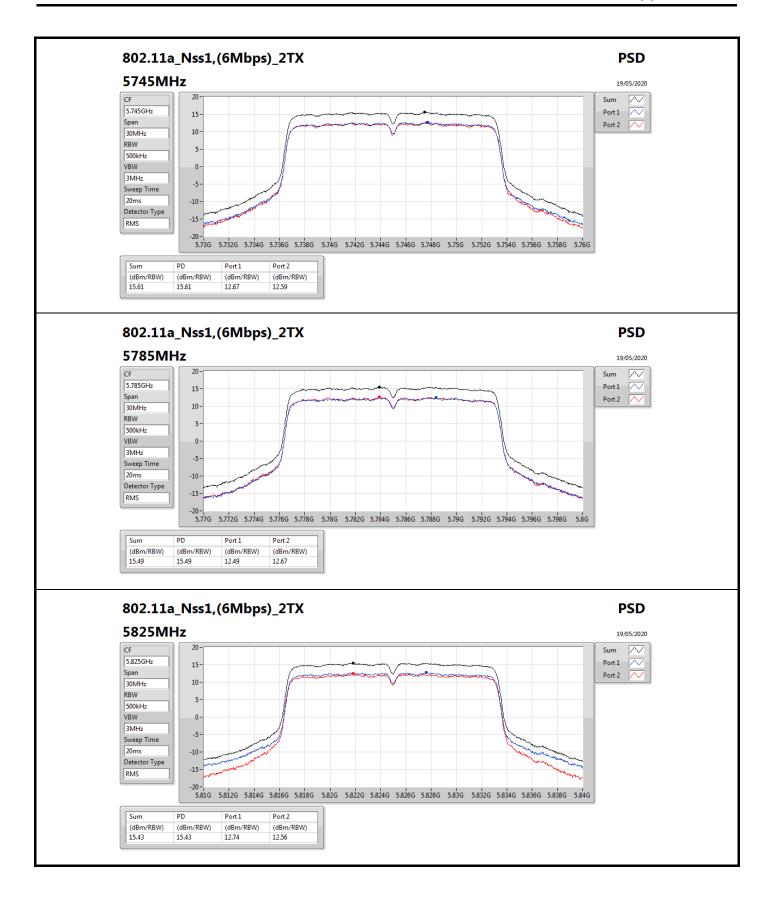
Appendix D.1 **PSD**

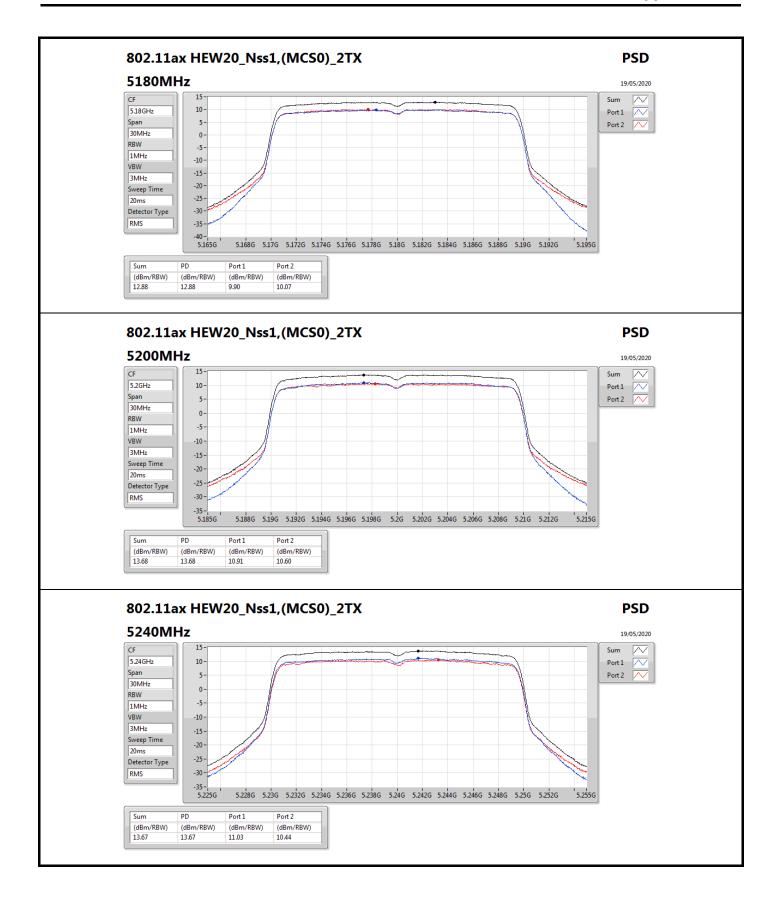
Result

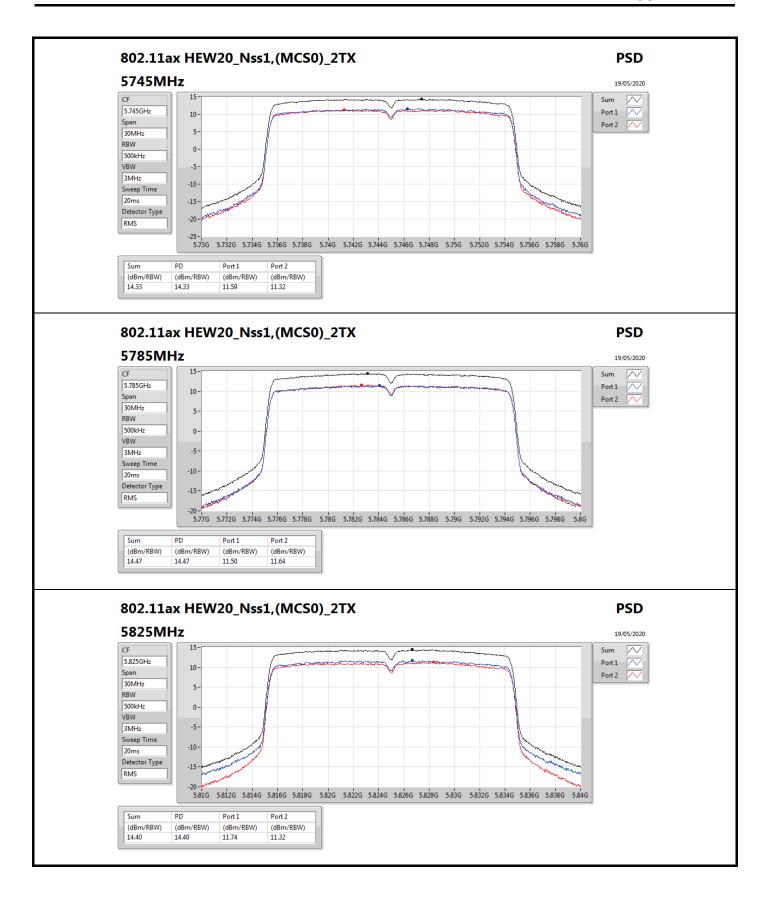
Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	9.19	10.49	10.83	13.60	13.81
5200MHz	Pass	9.19	10.52	10.73	13.51	13.81
5240MHz	Pass	9.19	10.98	10.65	13.78	13.81
5745MHz	Pass	9.19	12.67	12.59	15.61	26.81
5785MHz	Pass	9.19	12.49	12.67	15.49	26.81
5825MHz	Pass	9.19	12.74	12.56	15.43	26.81
802.11ax HEW20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	9.19	9.90	10.07	12.88	13.81
5200MHz	Pass	9.19	10.91	10.60	13.68	13.81
5240MHz	Pass	9.19	11.03	10.44	13.67	13.81
5745MHz	Pass	9.19	11.59	11.32	14.33	26.81
5785MHz	Pass	9.19	11.50	11.64	14.47	26.81
5825MHz	Pass	9.19	11.74	11.32	14.40	26.81
802.11ax HEW40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	9.19	6.16	6.36	9.13	13.81
5230MHz	Pass	9.19	9.05	8.50	11.76	13.81
5755MHz	Pass	9.19	9.16	8.73	11.86	26.81
5795MHz	Pass	9.19	8.80	8.34	11.53	26.81
802.11ax HEW80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	9.19	3.09	3.07	6.05	13.81
5775MHz	Pass	9.19	3.16	3.39	6.19	26.81

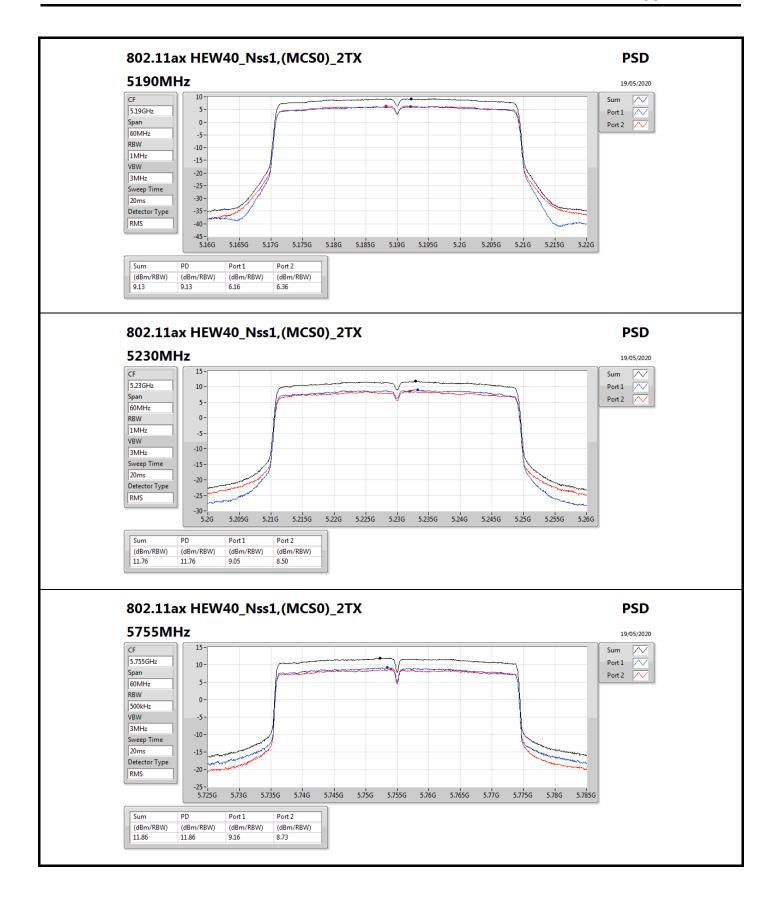
DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

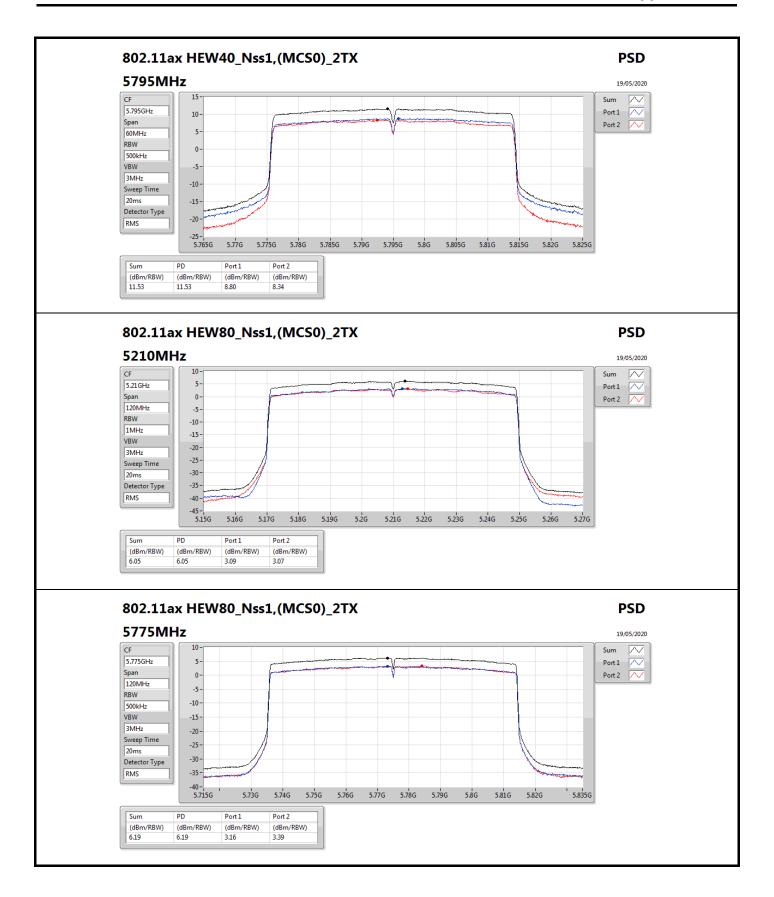














For beamforming mode: Summary

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	•
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	11.48
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	9.08
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	4.89
5.725-5.85GHz	·
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	9.87
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	7.34
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	6.75

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

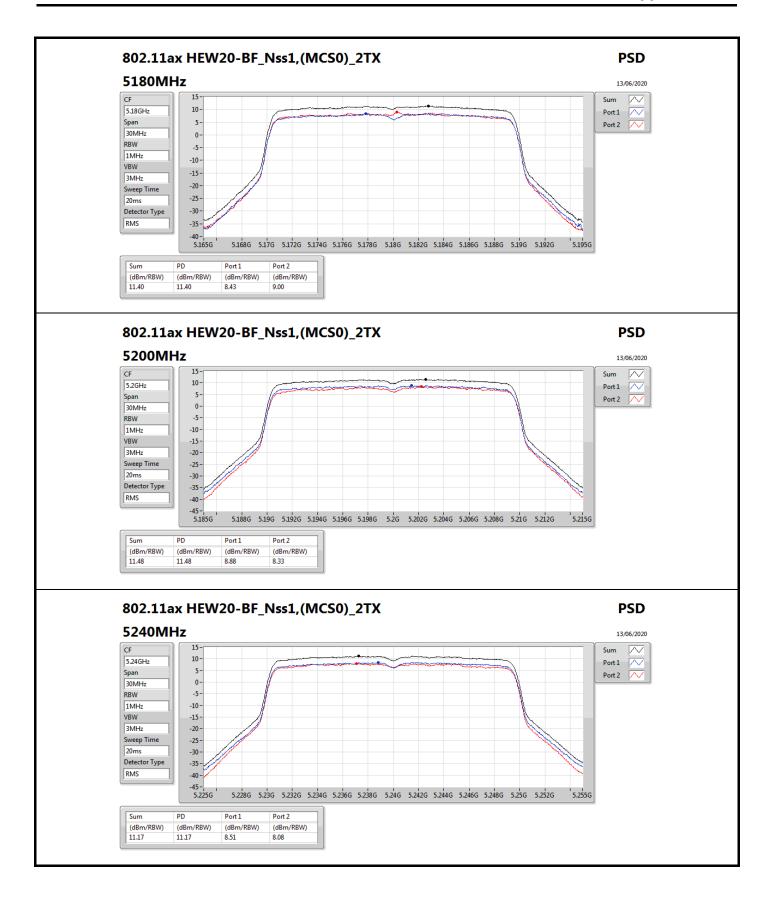


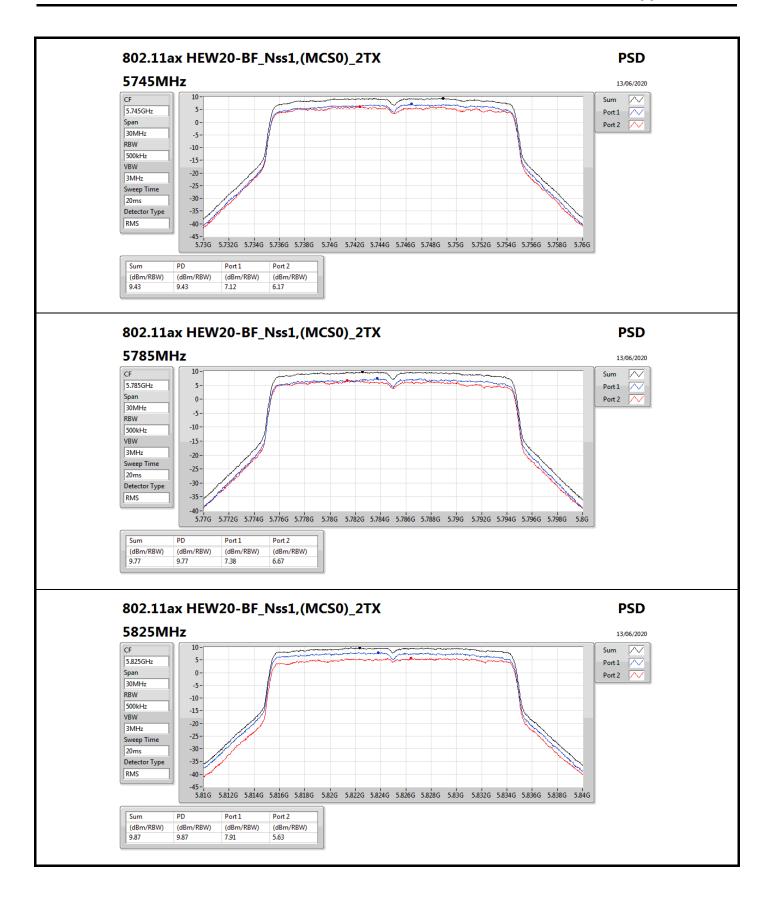
Appendix D.2 **PSD**

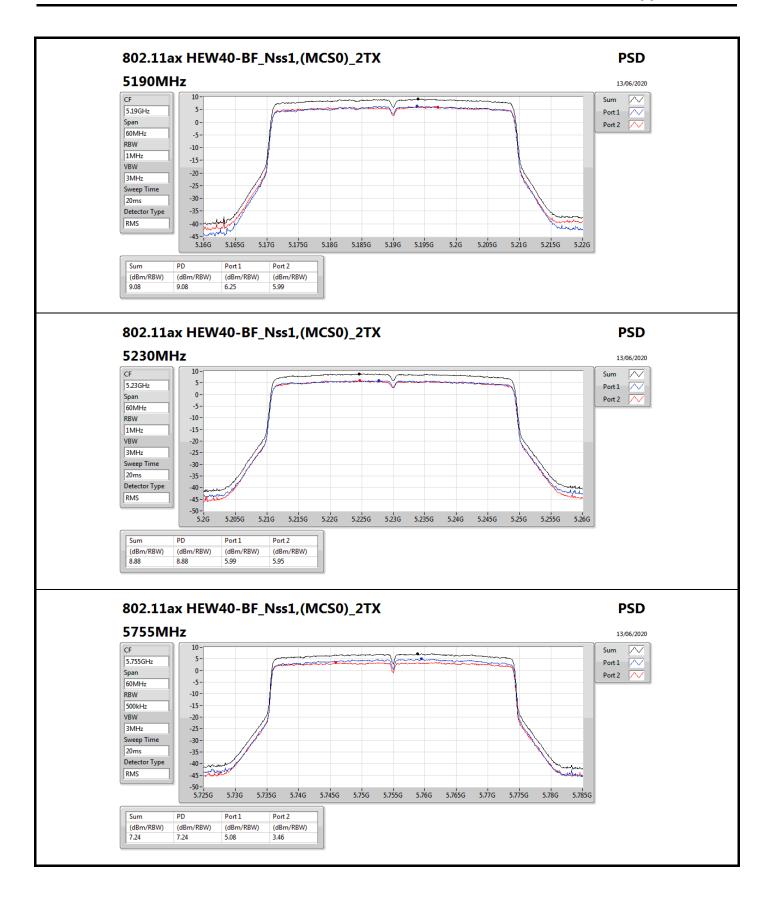
Result

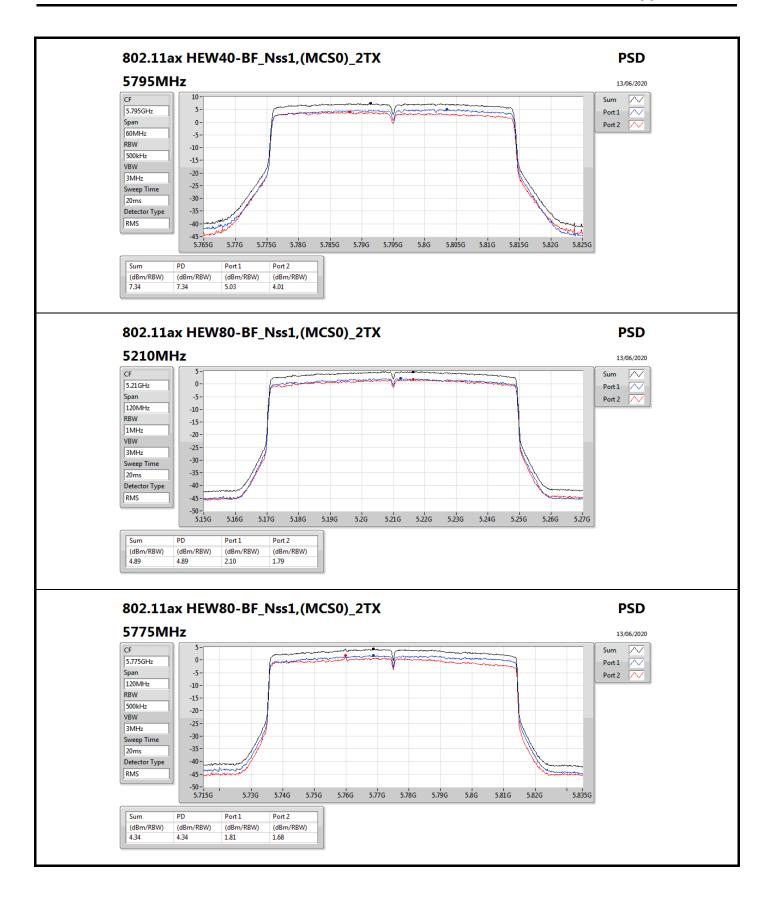
Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	9.19	8.43	9.00	11.40	13.81
5200MHz	Pass	9.19	8.88	8.33	11.48	13.81
5240MHz	Pass	9.19	8.51	8.08	11.17	13.81
5745MHz	Pass	9.19	7.12	6.17	9.43	26.81
5785MHz	Pass	9.19	7.38	6.67	9.77	26.81
5825MHz	Pass	9.19	7.91	5.63	9.87	26.81
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	9.19	6.25	5.99	9.08	13.81
5230MHz	Pass	9.19	5.99	5.95	8.88	13.81
5755MHz	Pass	9.19	5.08	3.46	7.24	26.81
5795MHz	Pass	9.19	5.03	4.01	7.34	26.81
802.11ax HEW80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	9.19	2.10	1.79	4.89	13.81
5775MHz	Pass	9.19	5.73	1.05	6.75	26.81

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;

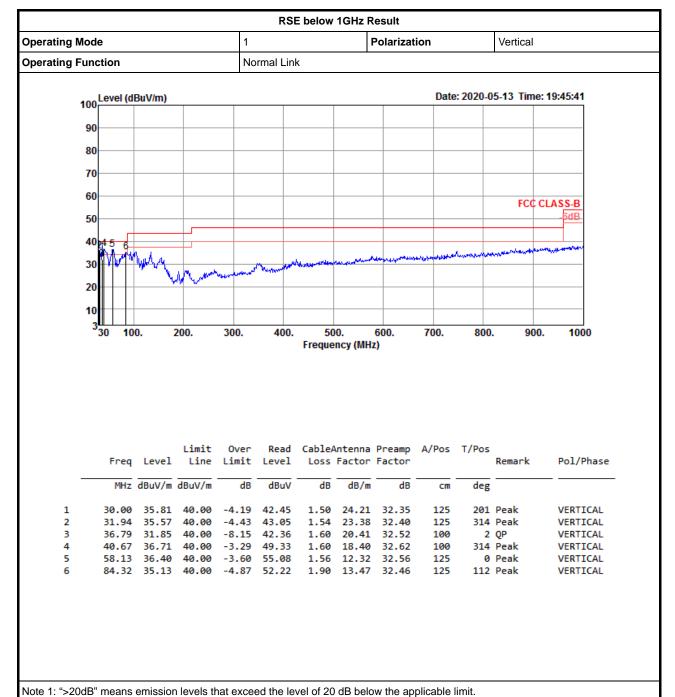






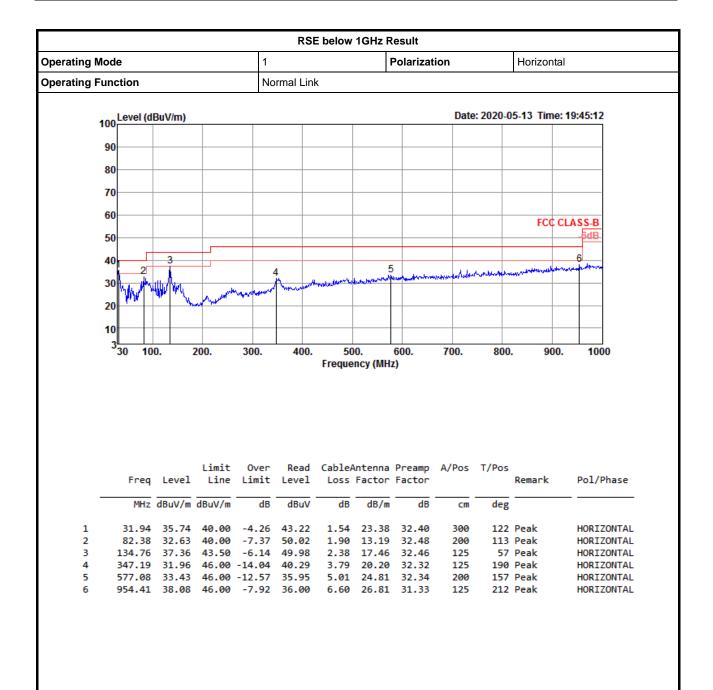






Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)





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

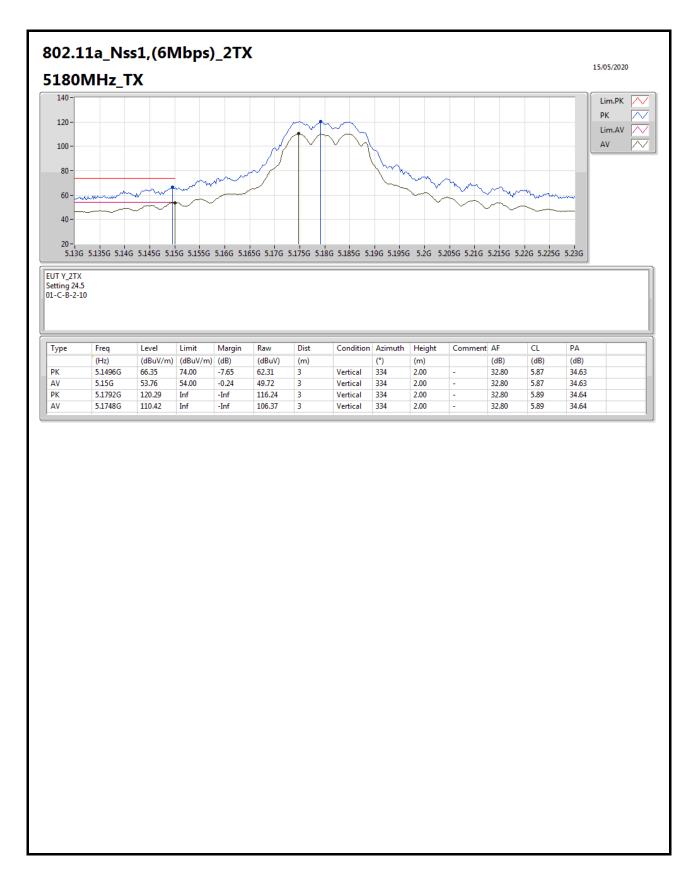
Appendix E.2

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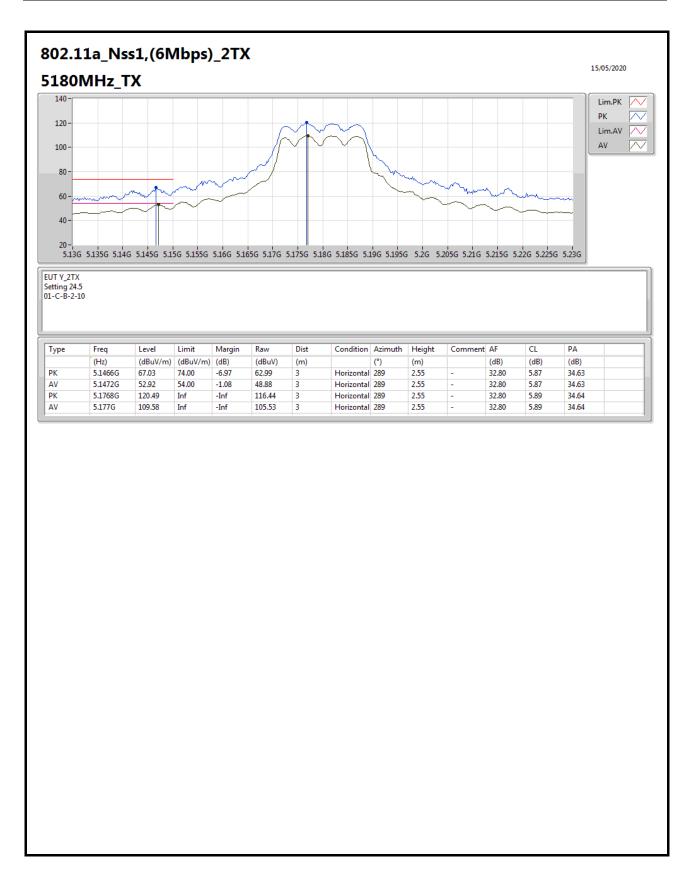
For non-beamforming mode: Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.725-5.85GHz	-		•	-	-	-	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	Pass	PK	17.4785G	68.17	68.20	-0.03	3	Horizontal	64	2.21	-



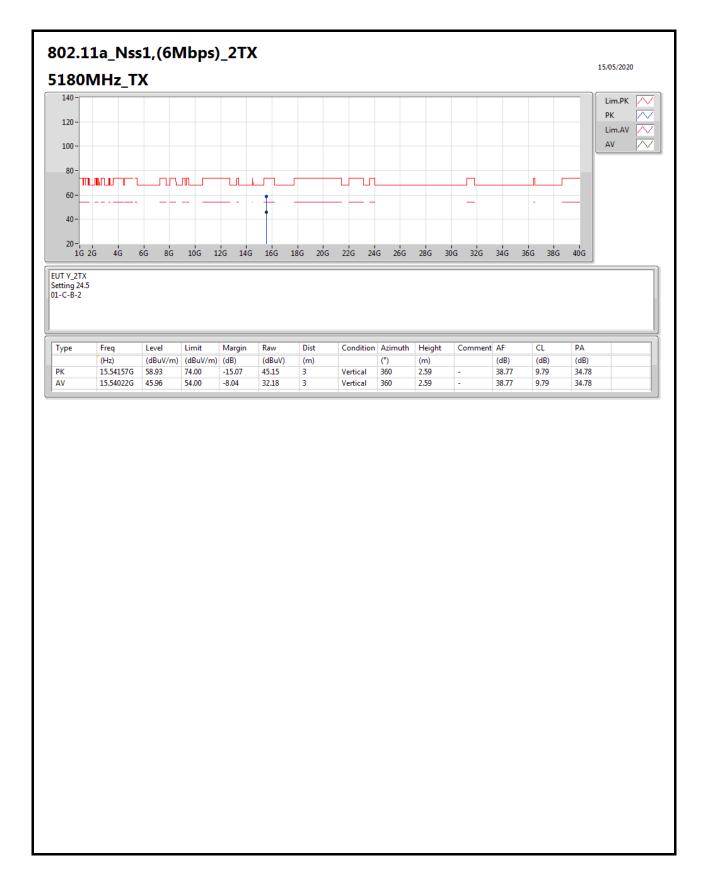






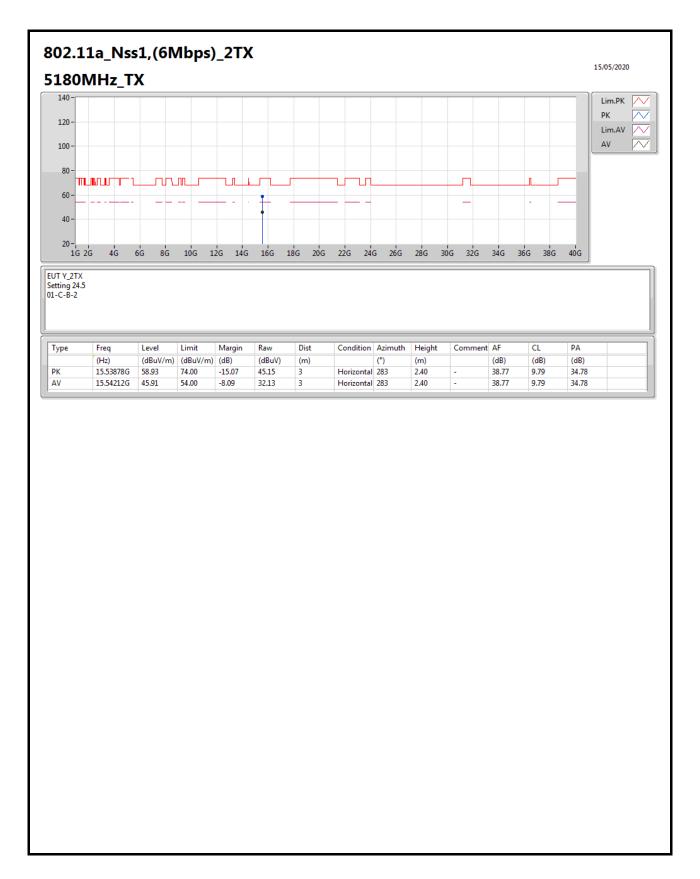
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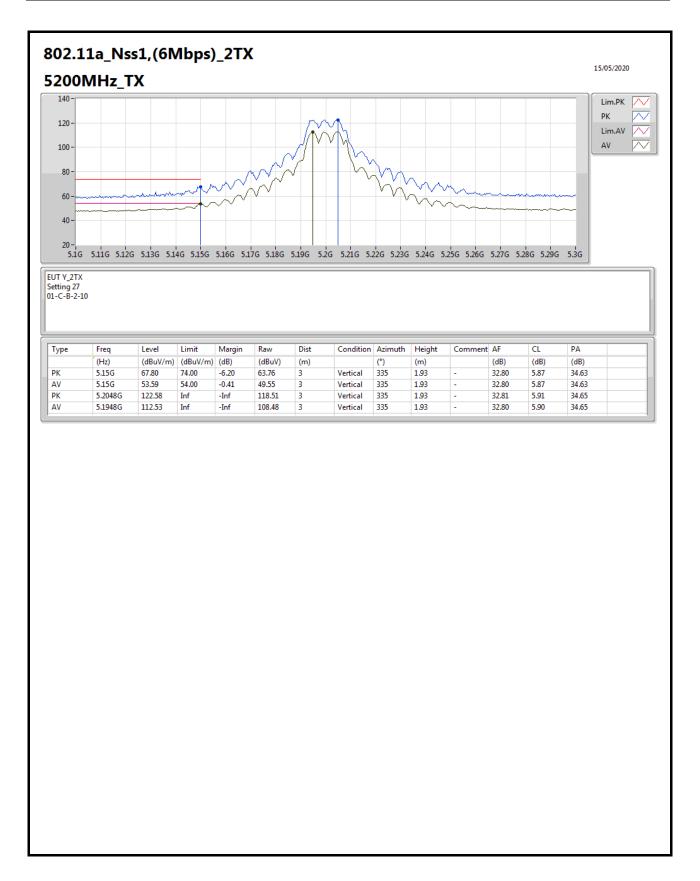


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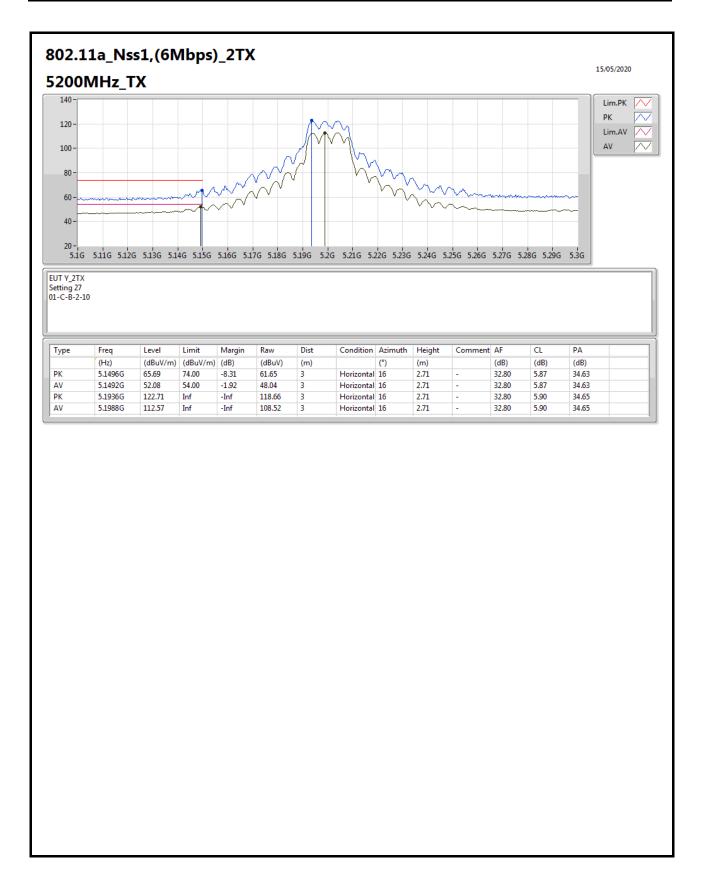




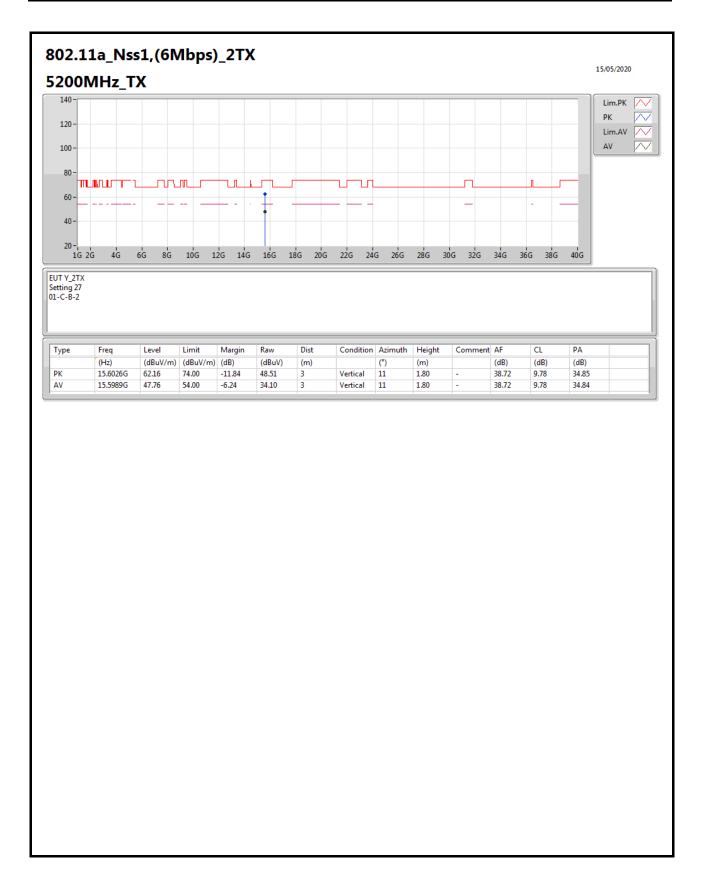




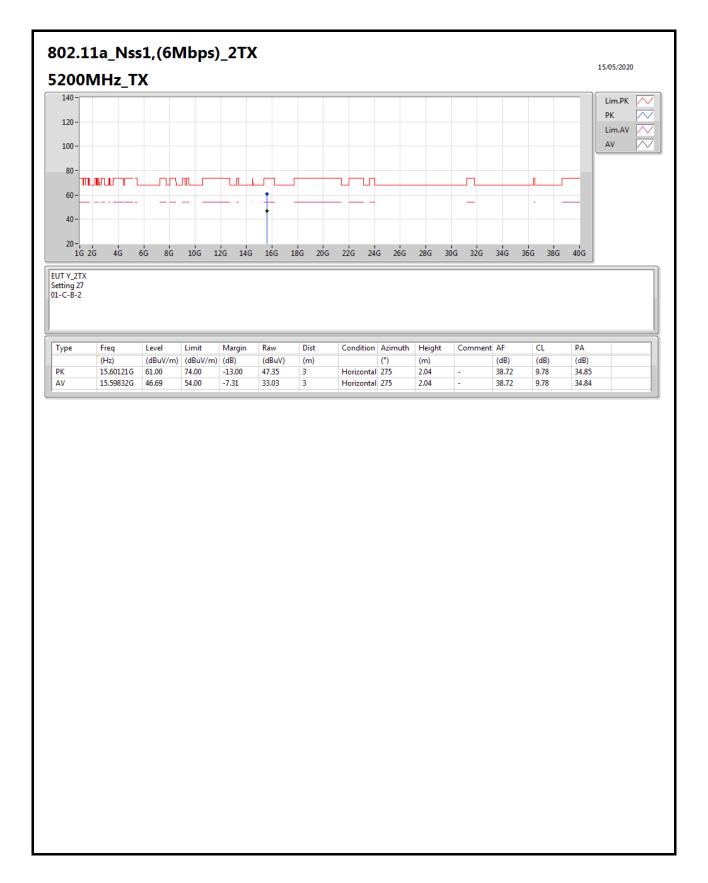




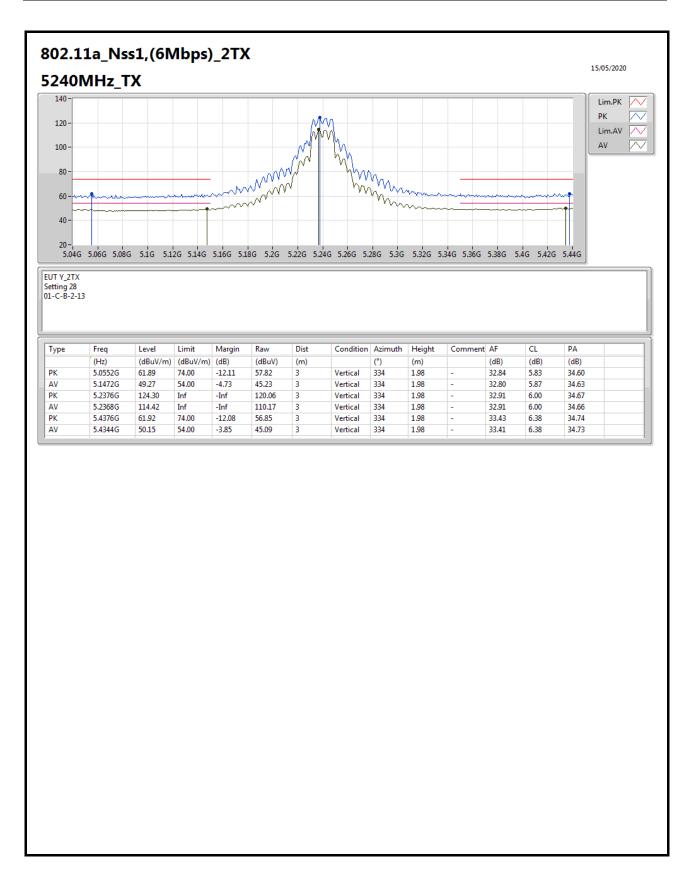




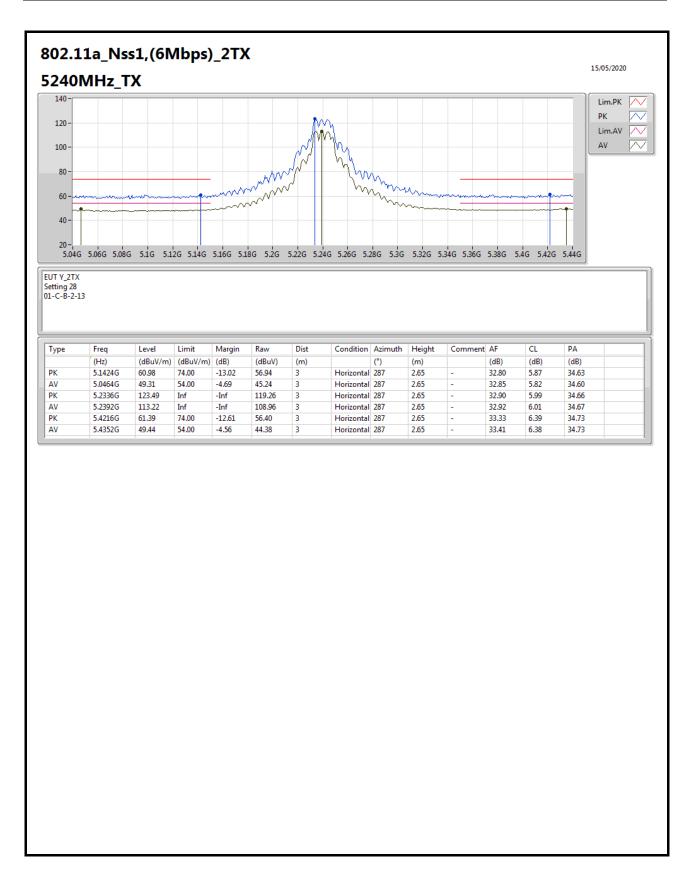




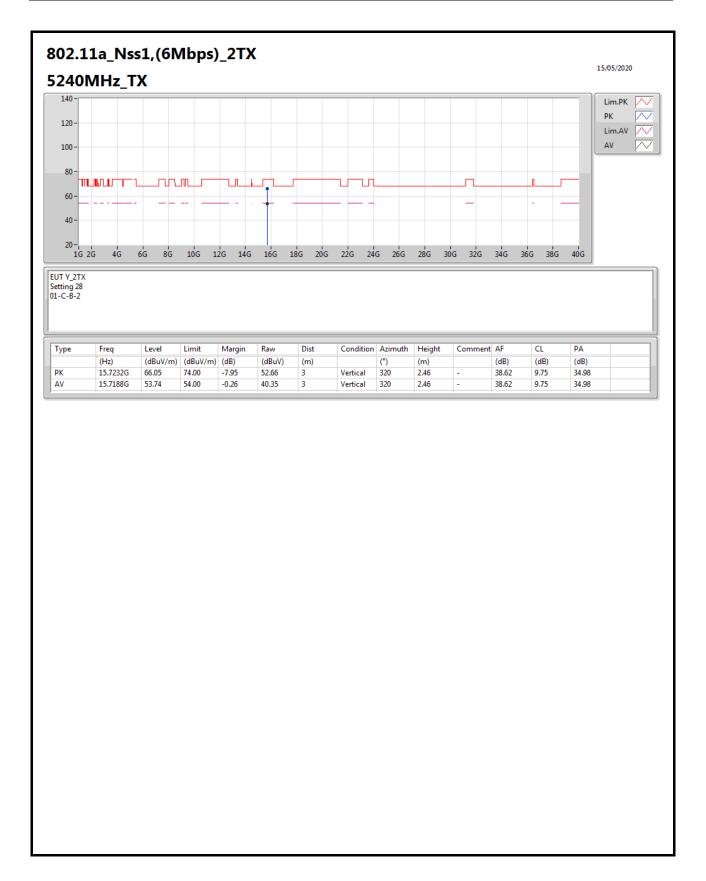




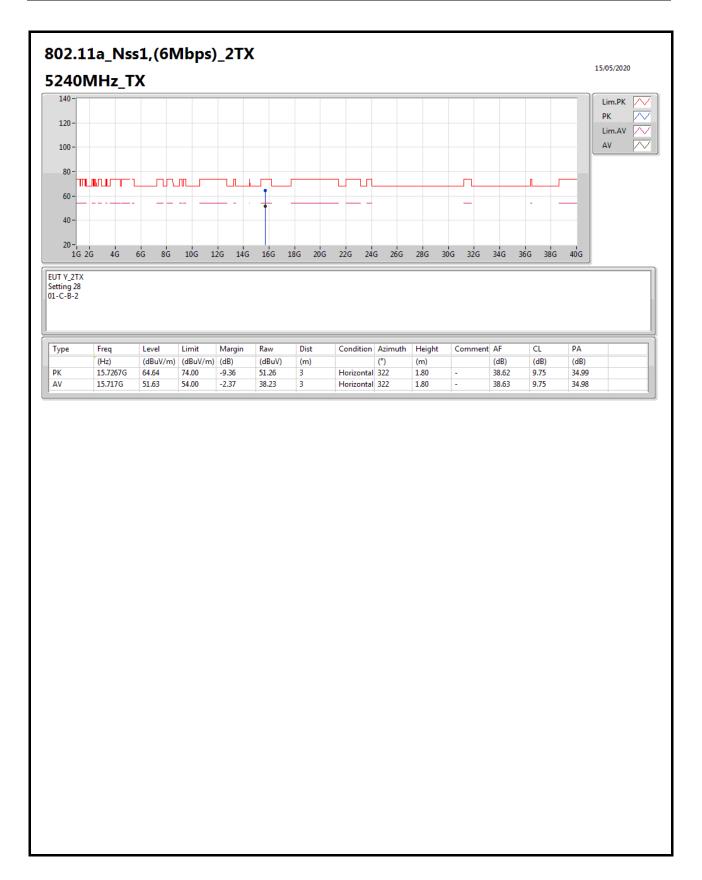




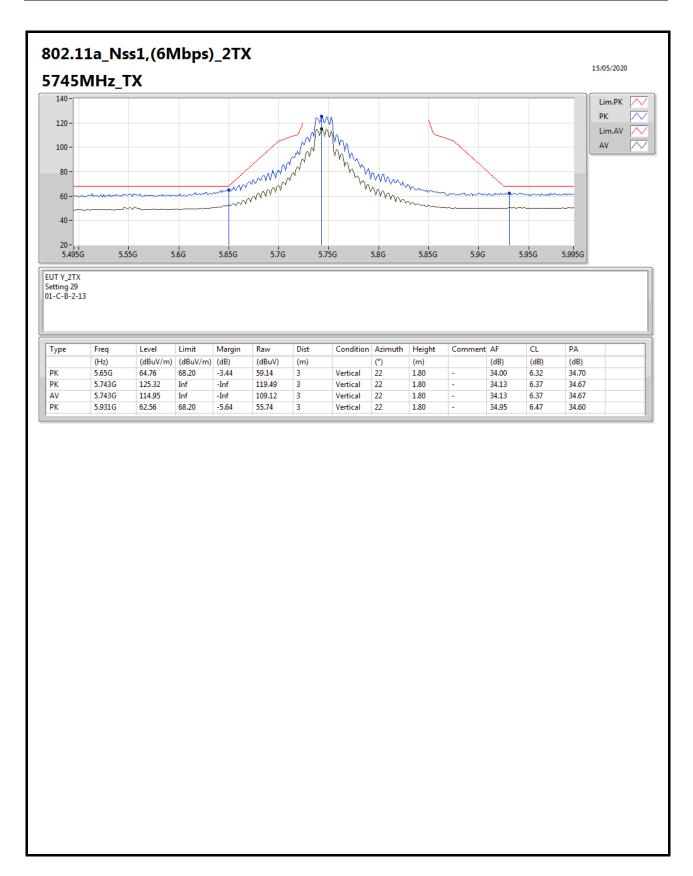




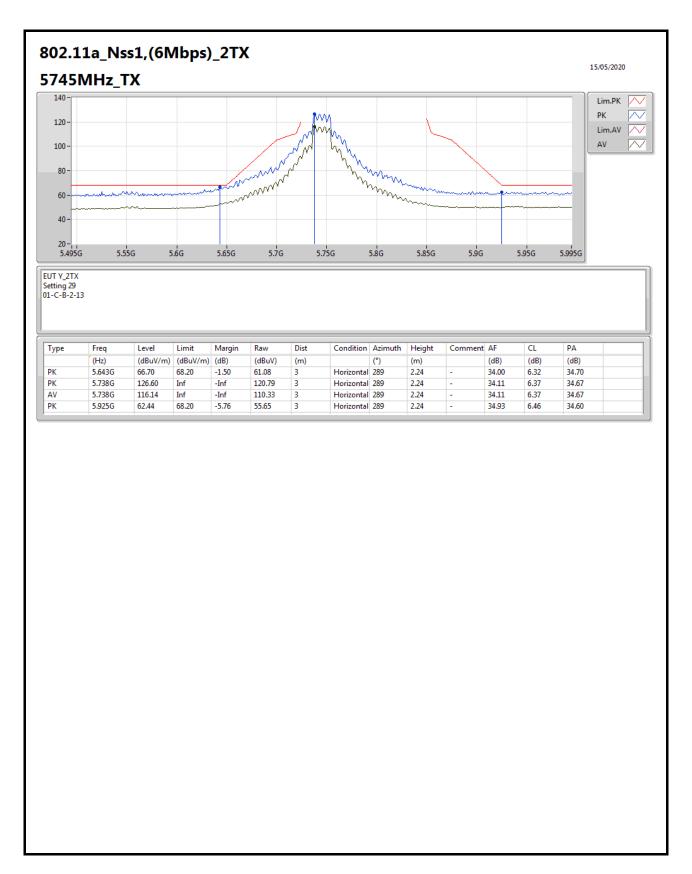




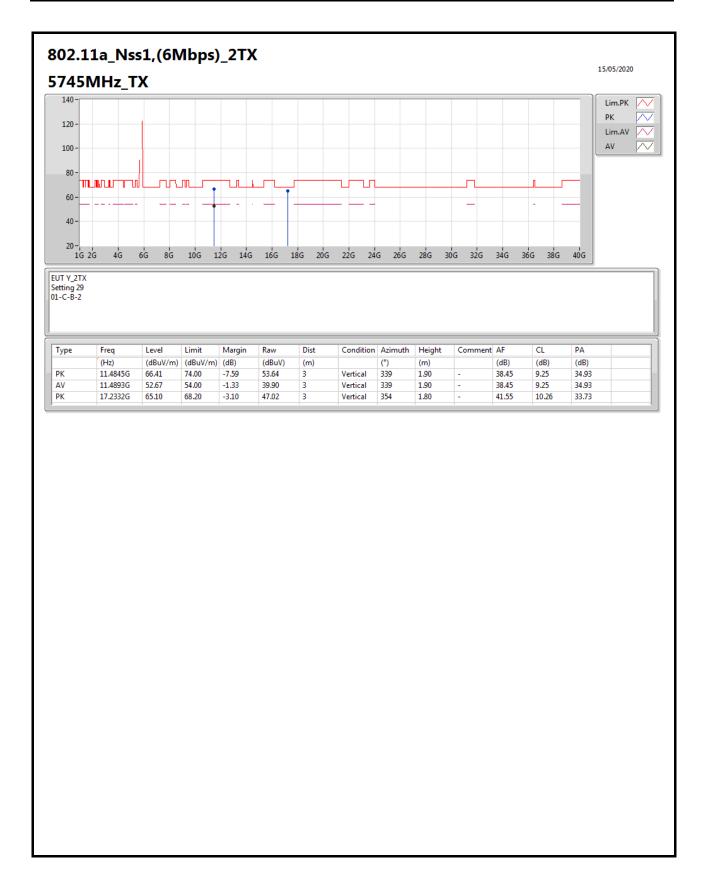






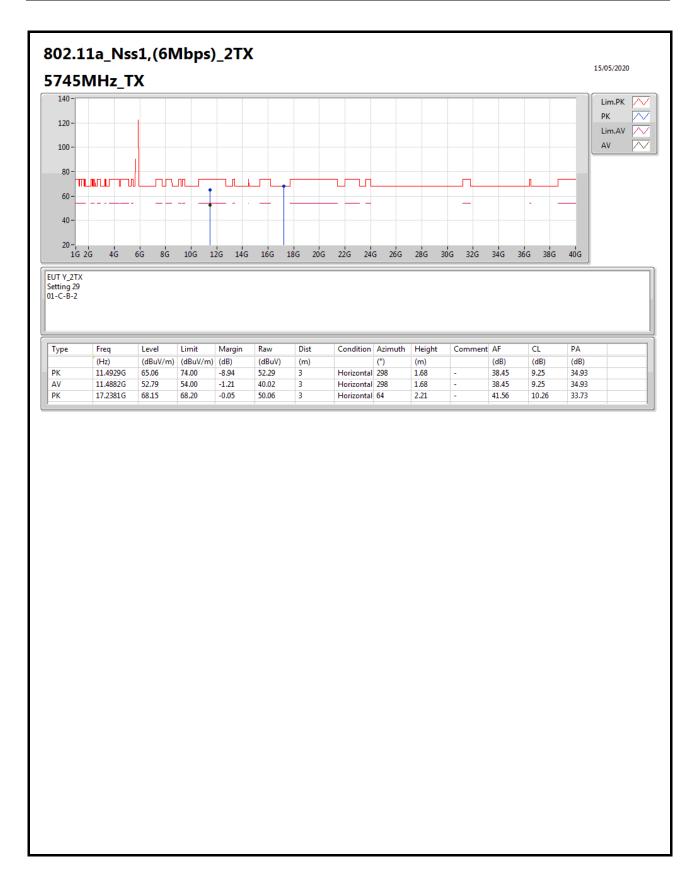




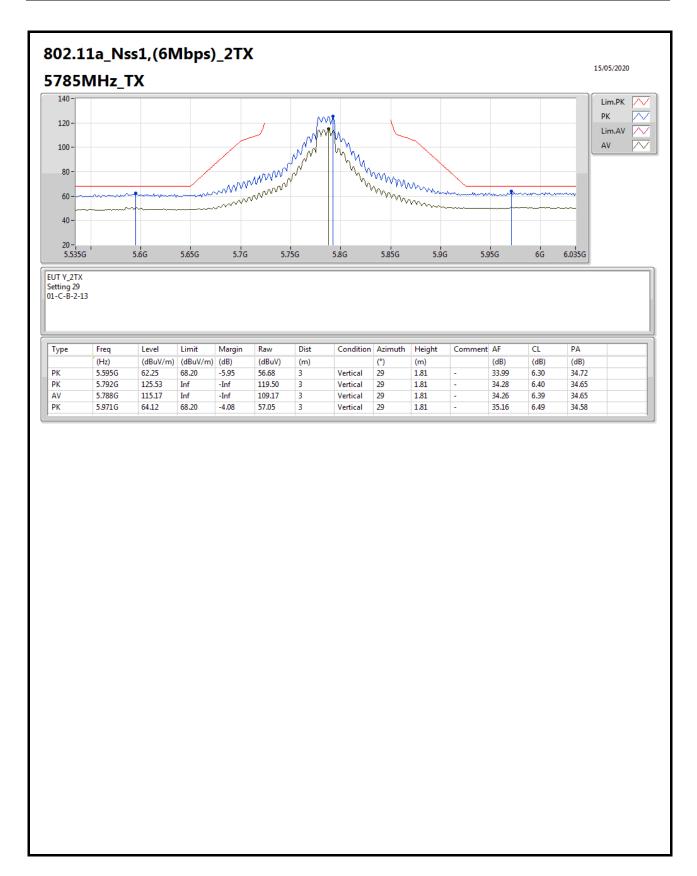


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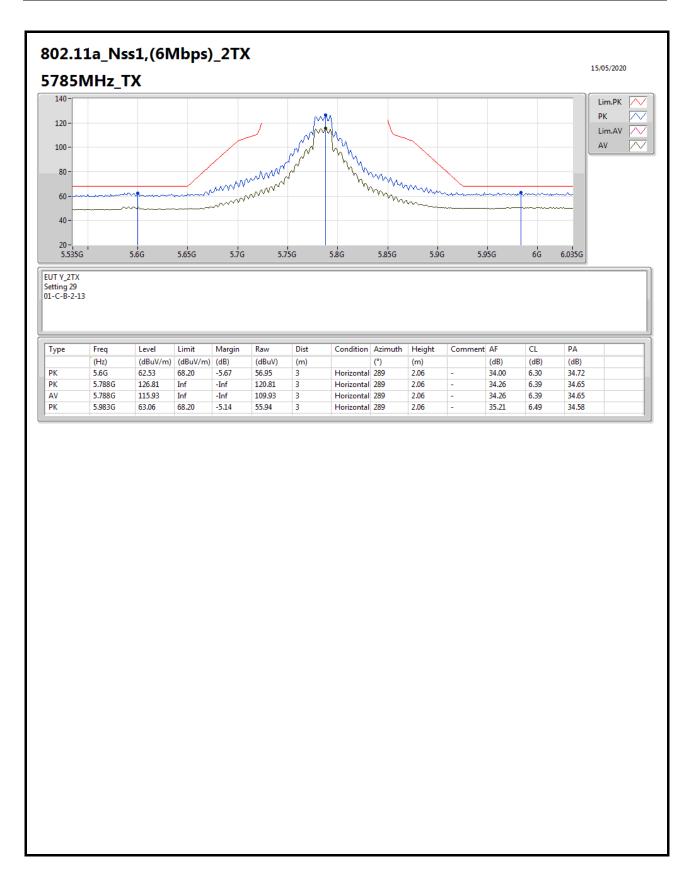






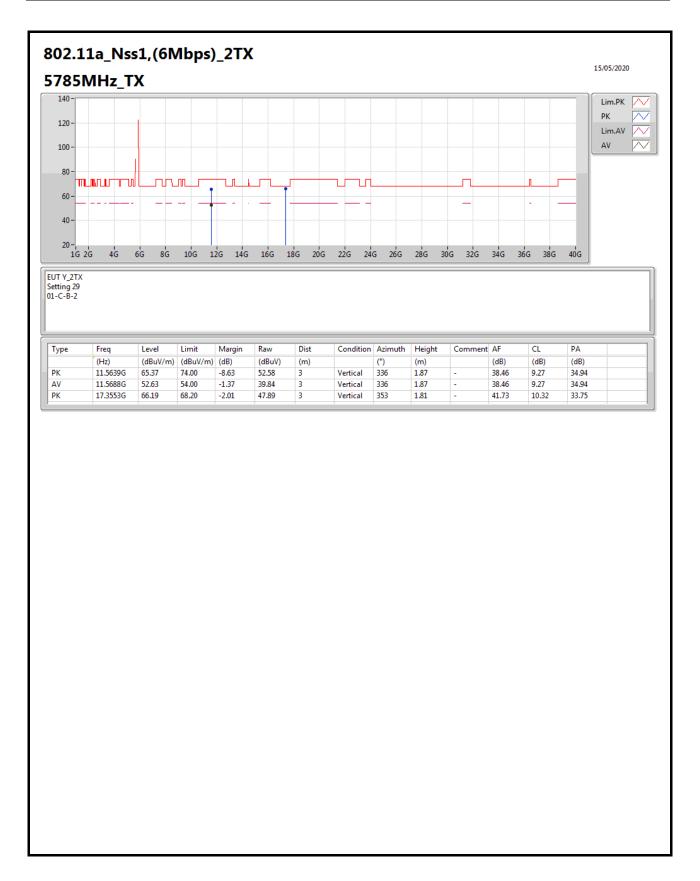




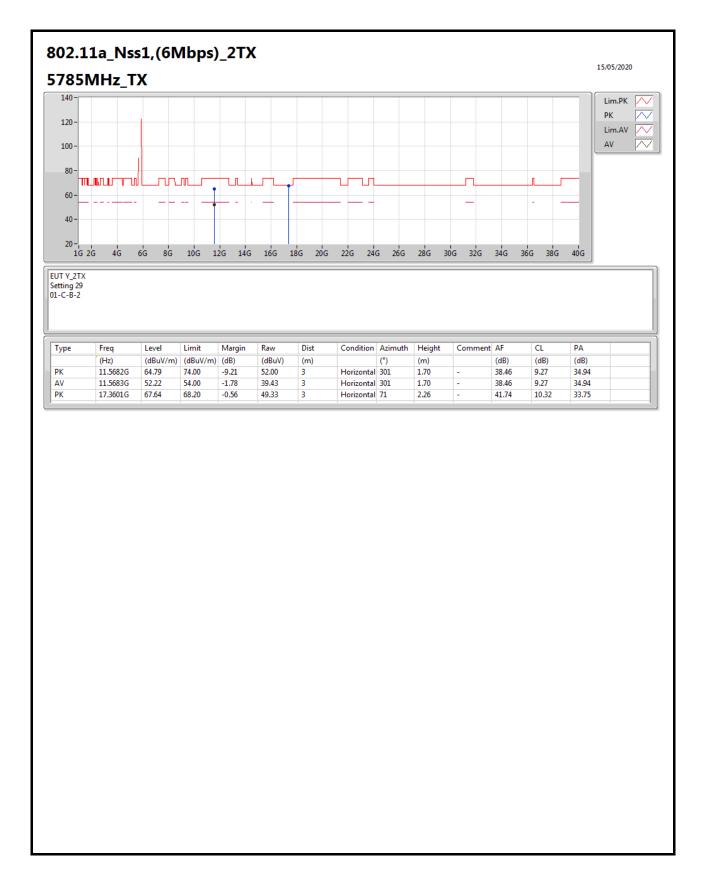


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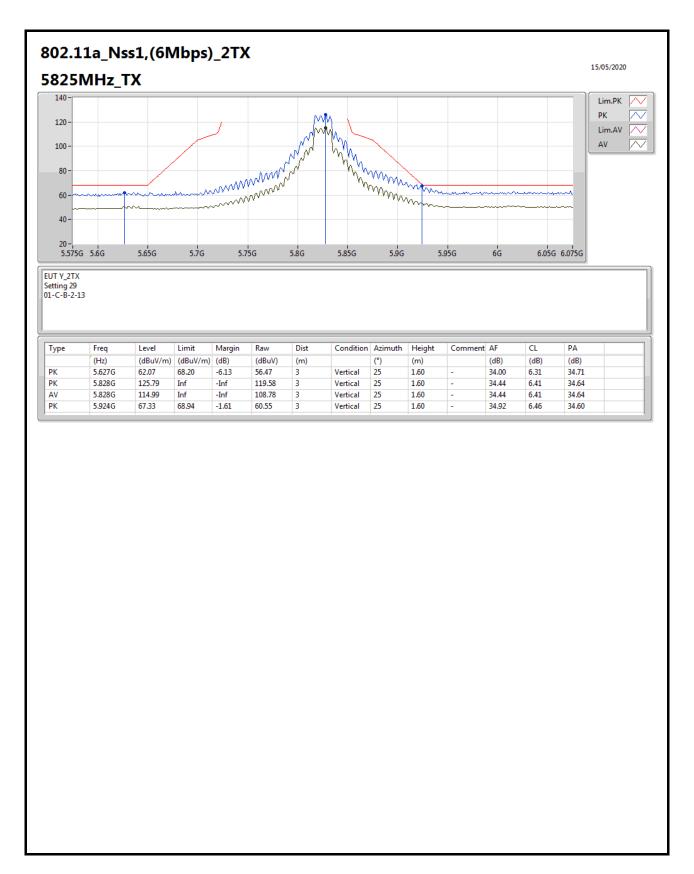




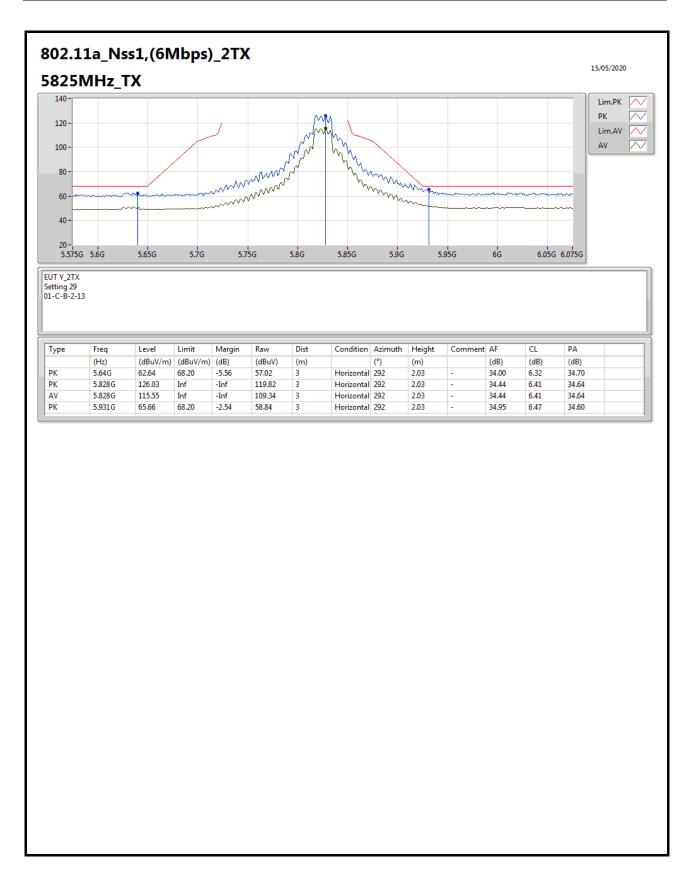




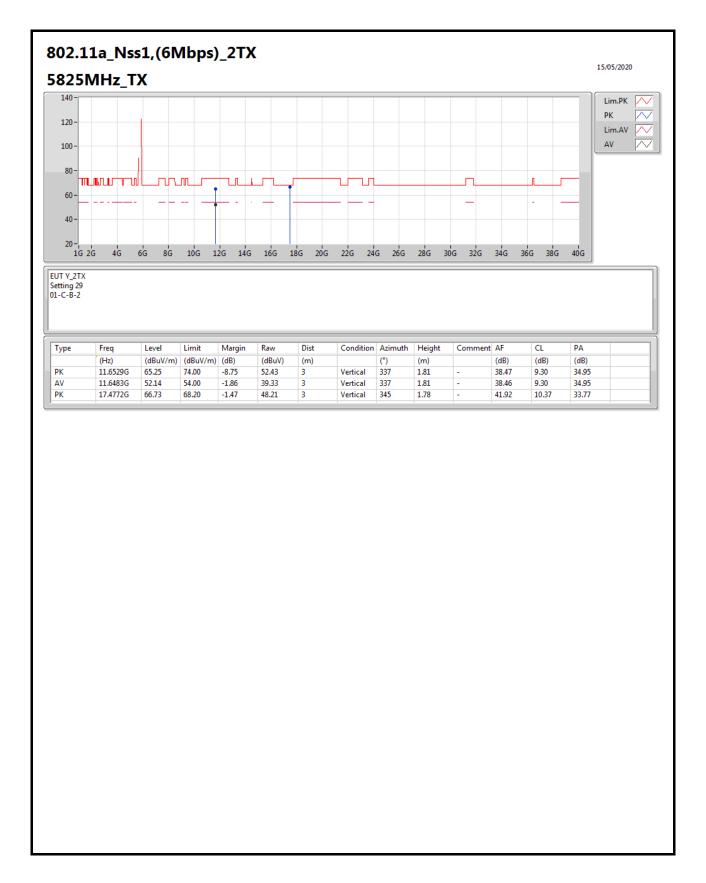






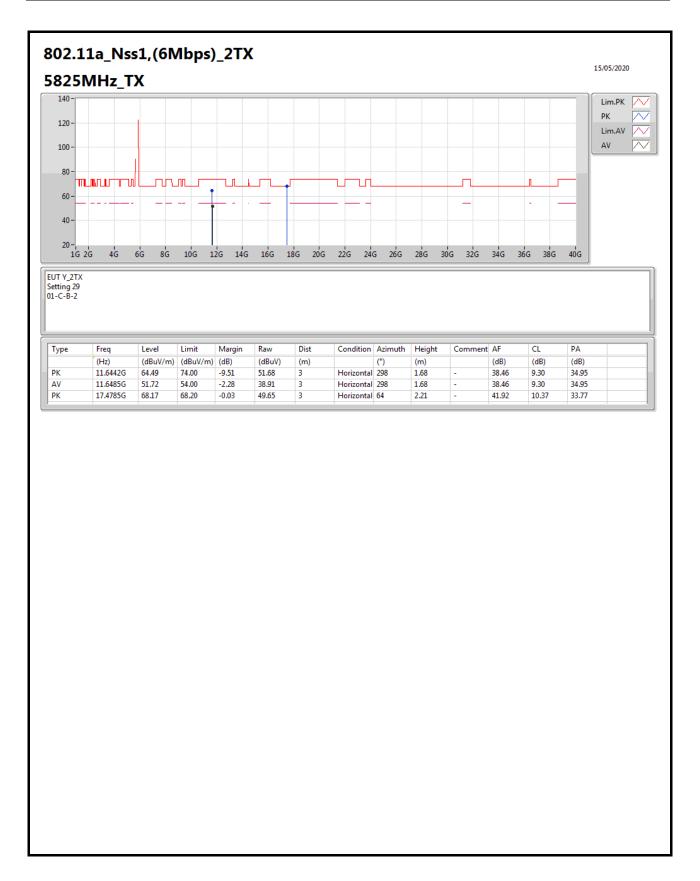




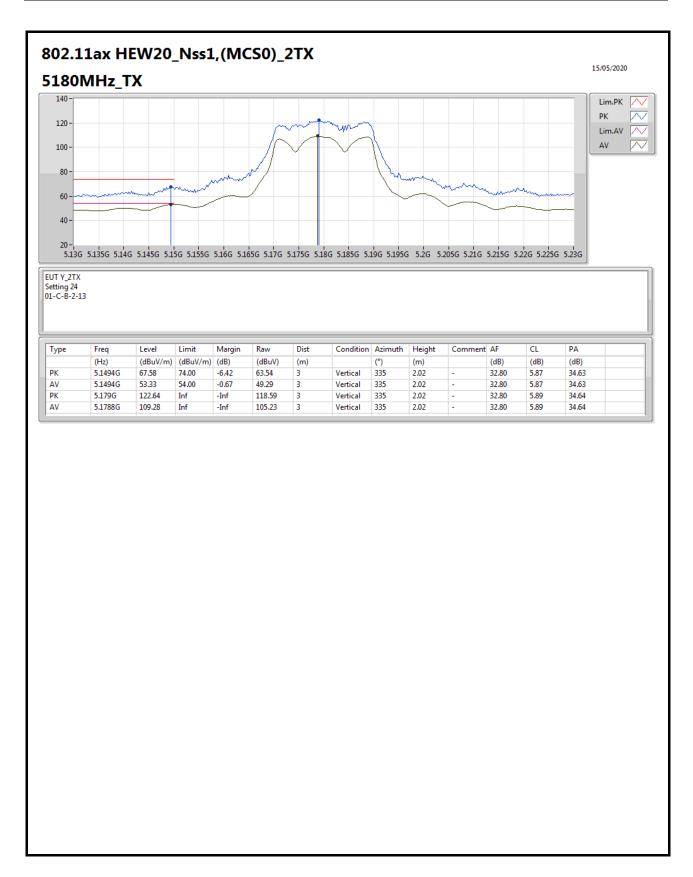


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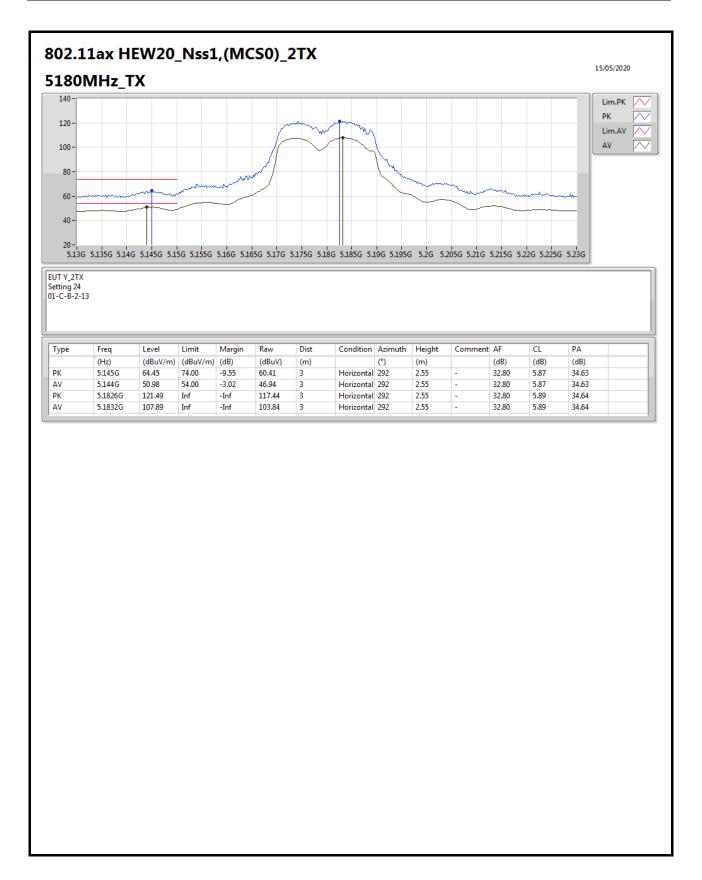




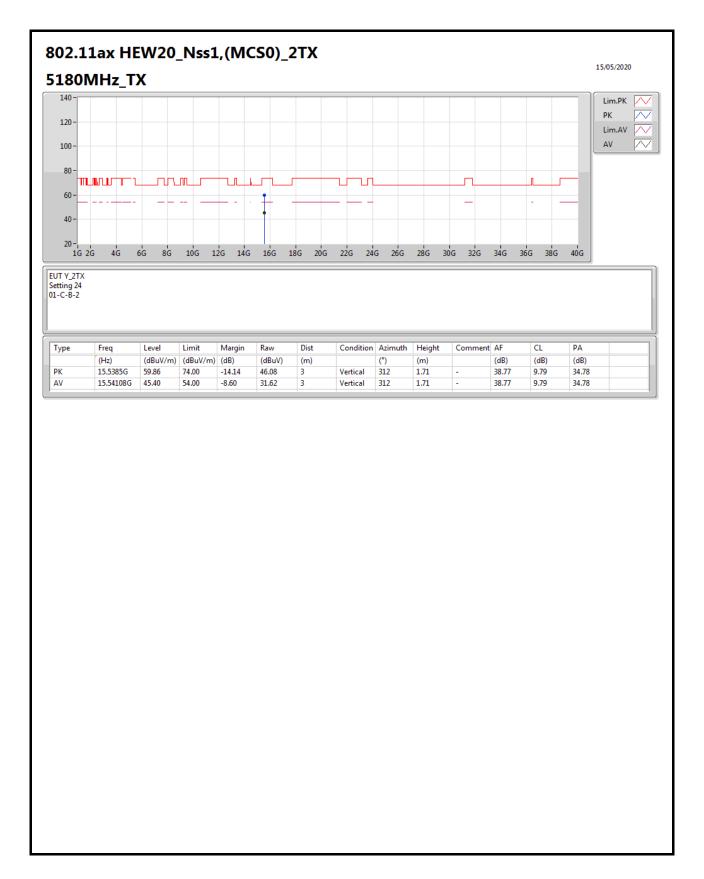


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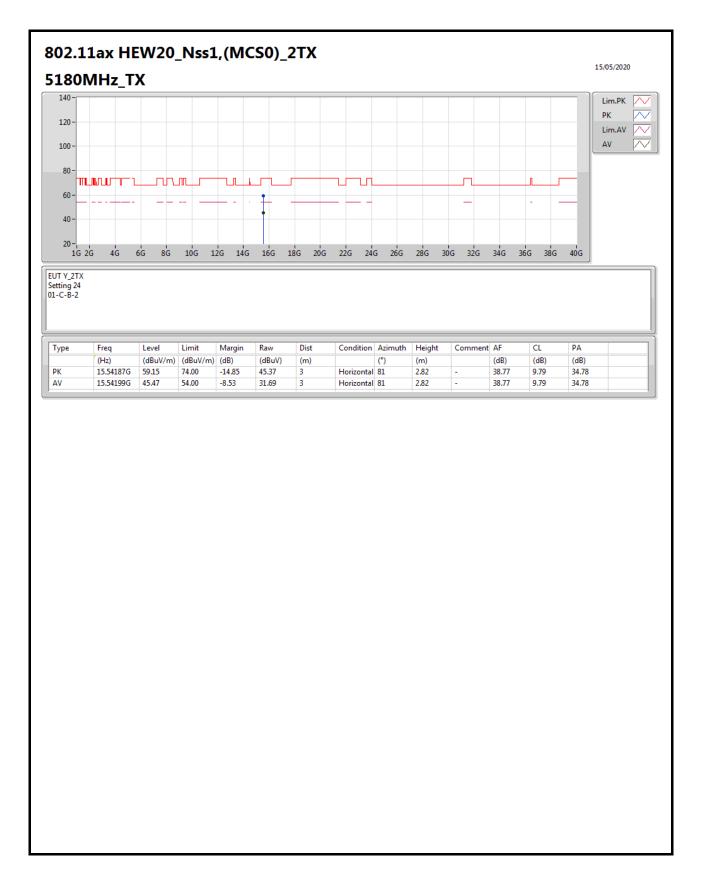




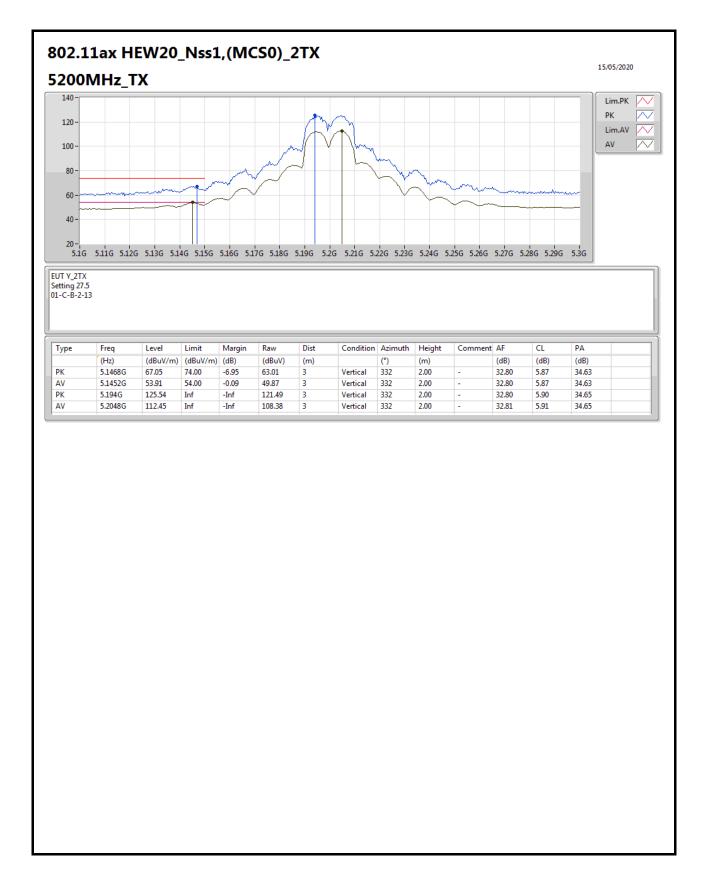


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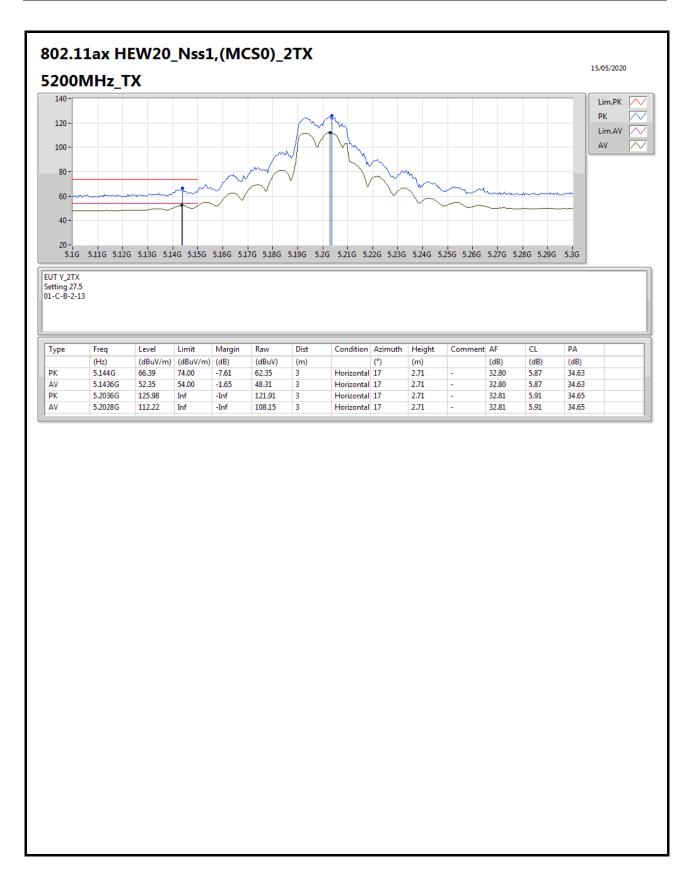




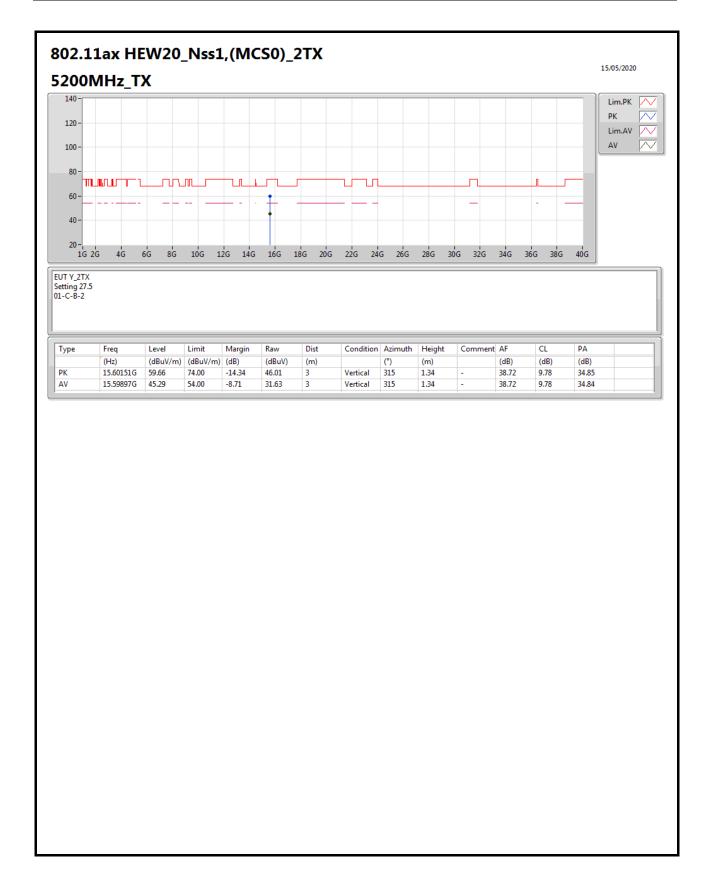






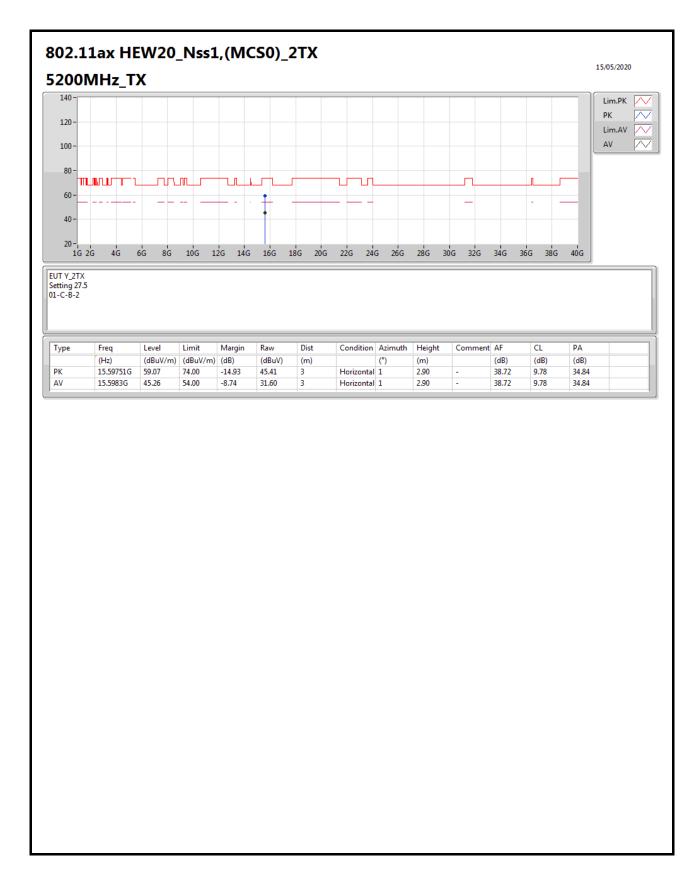




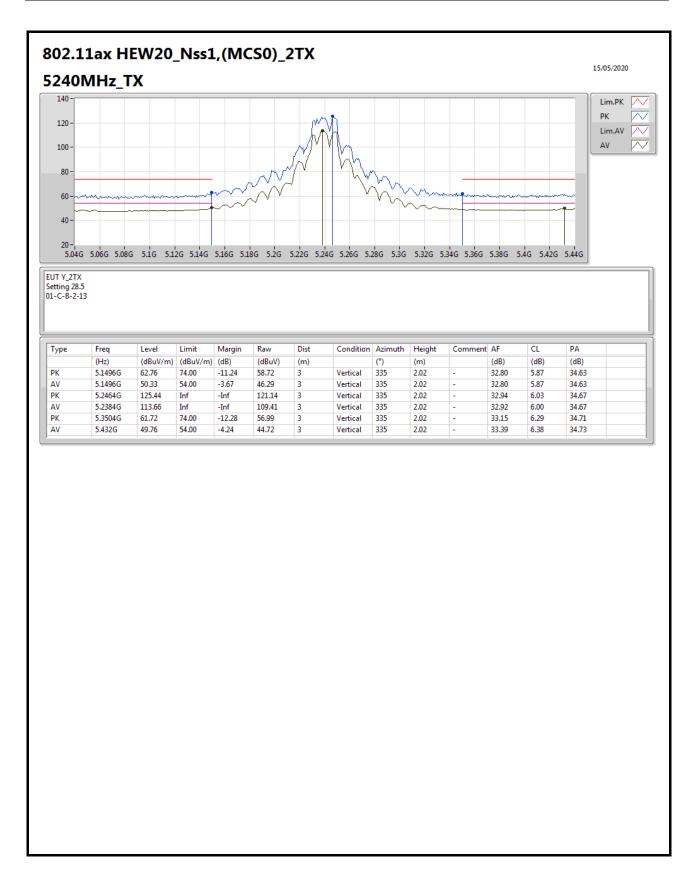


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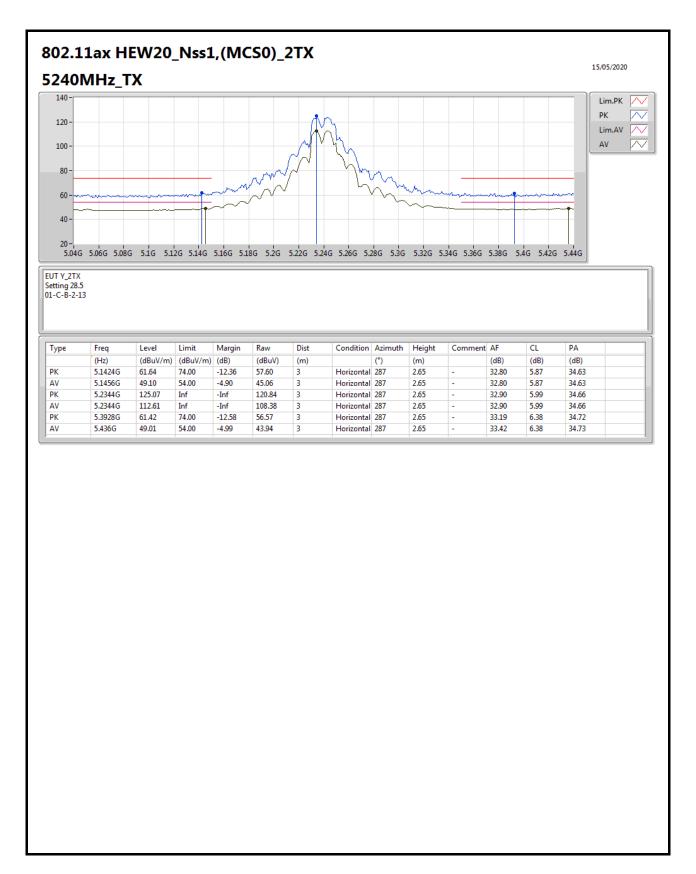




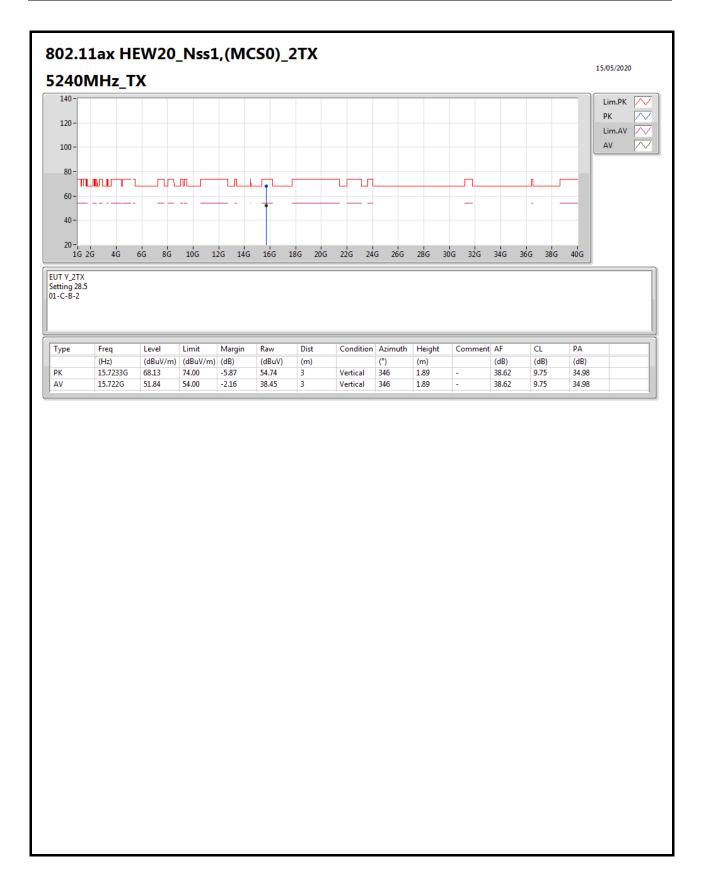




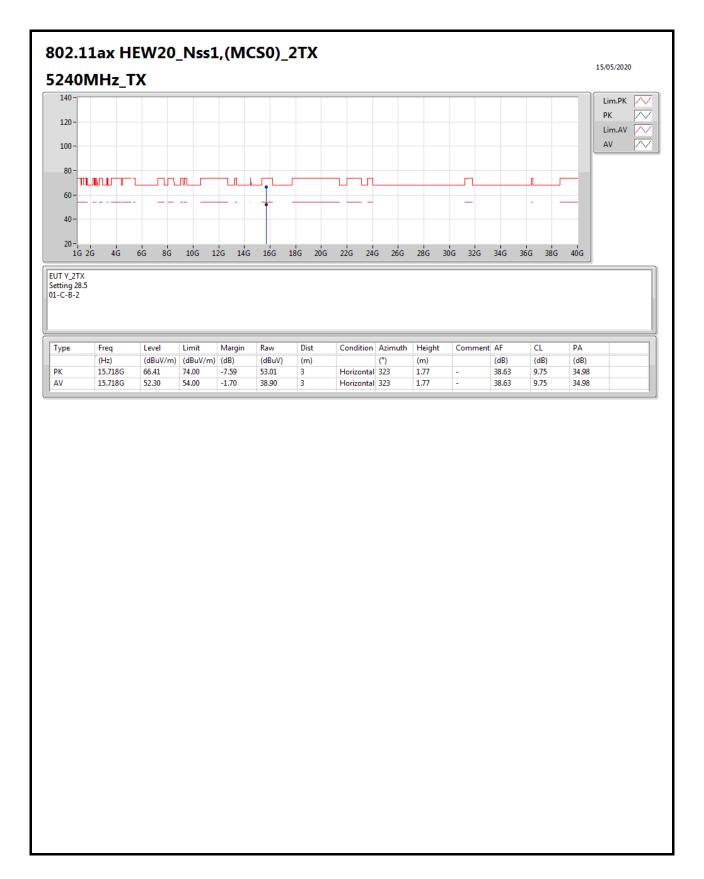




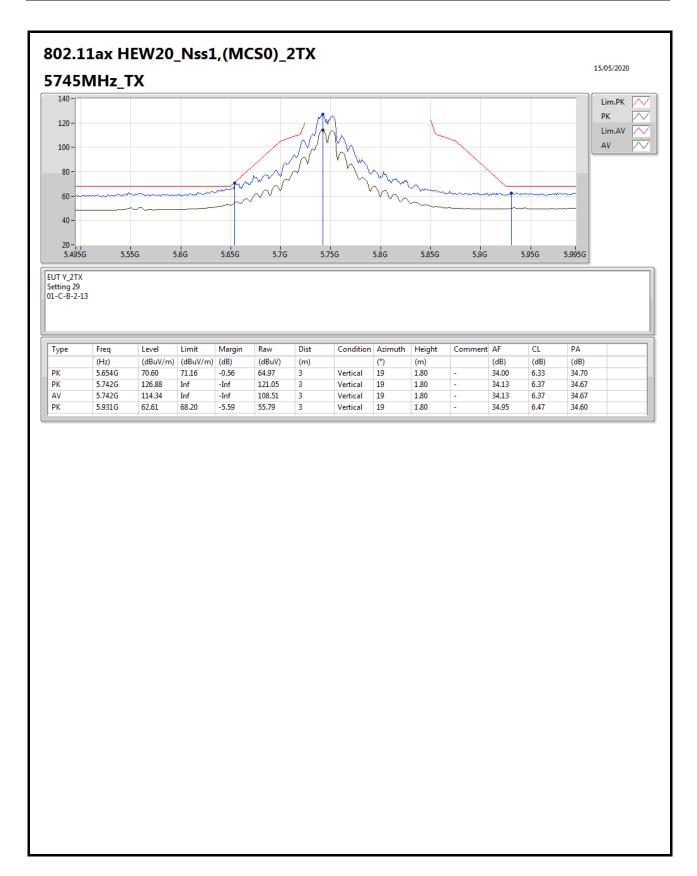




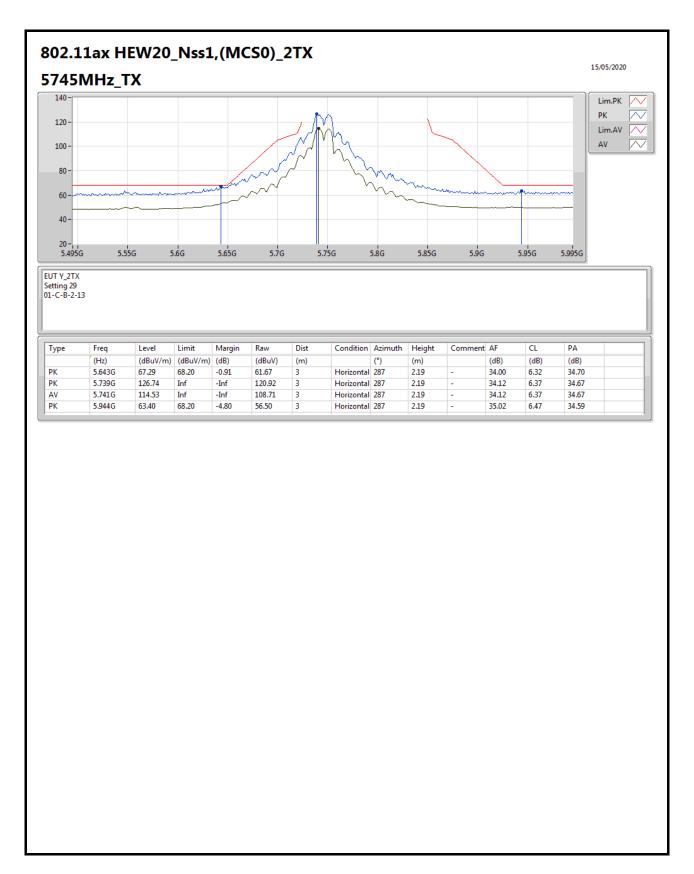






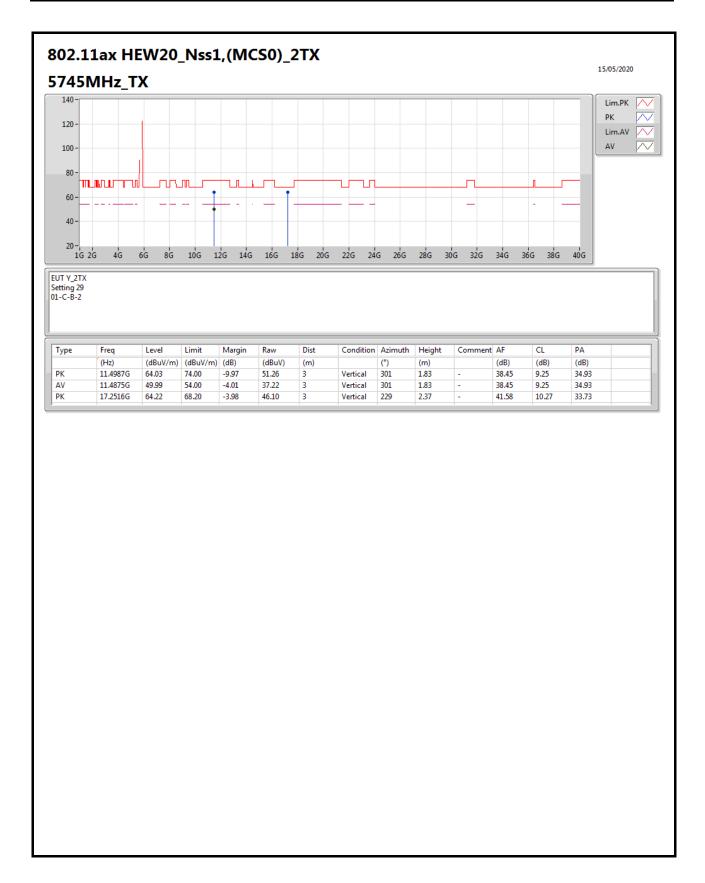




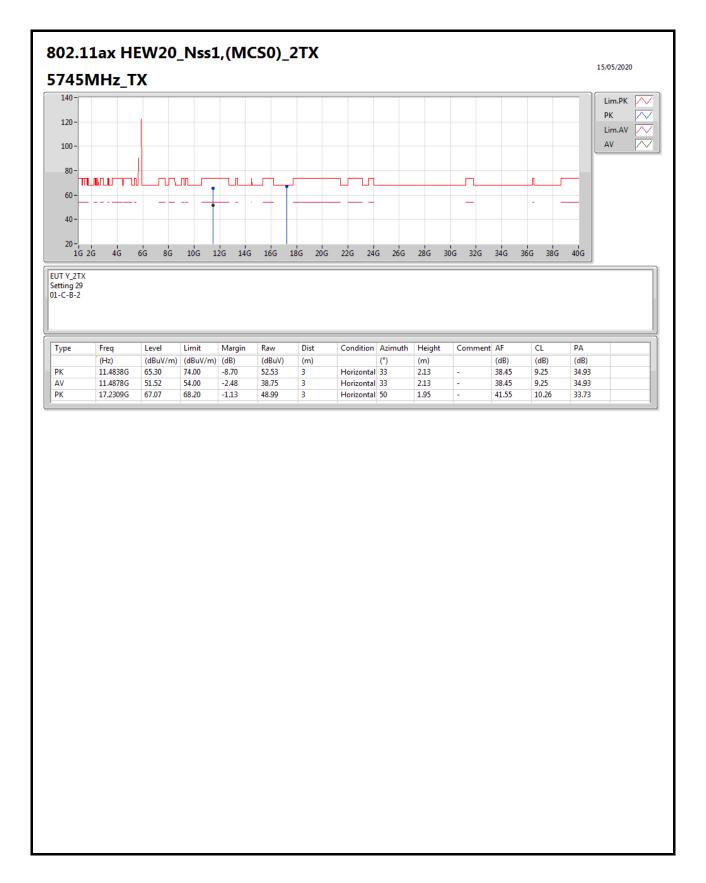


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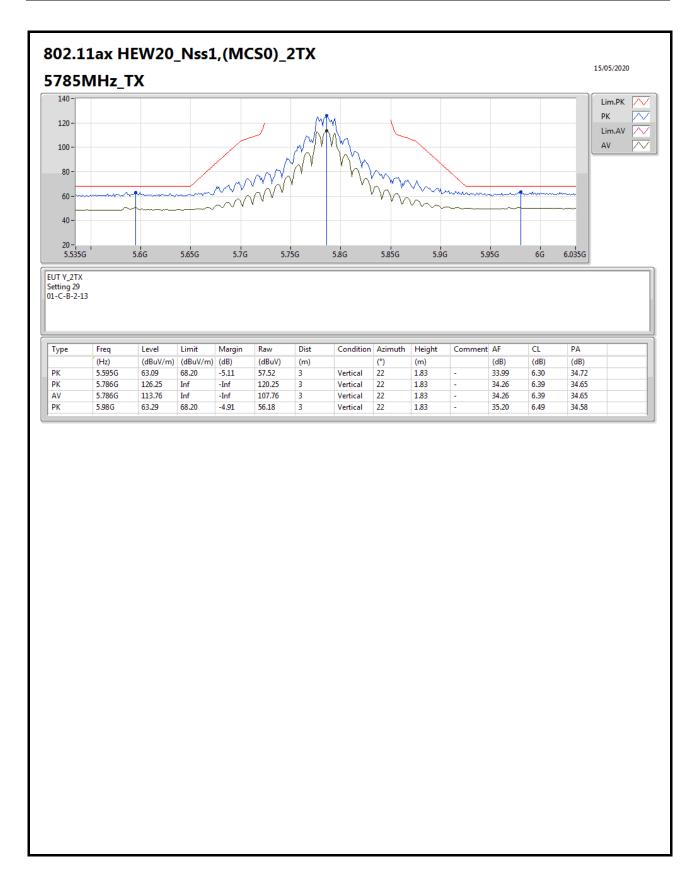




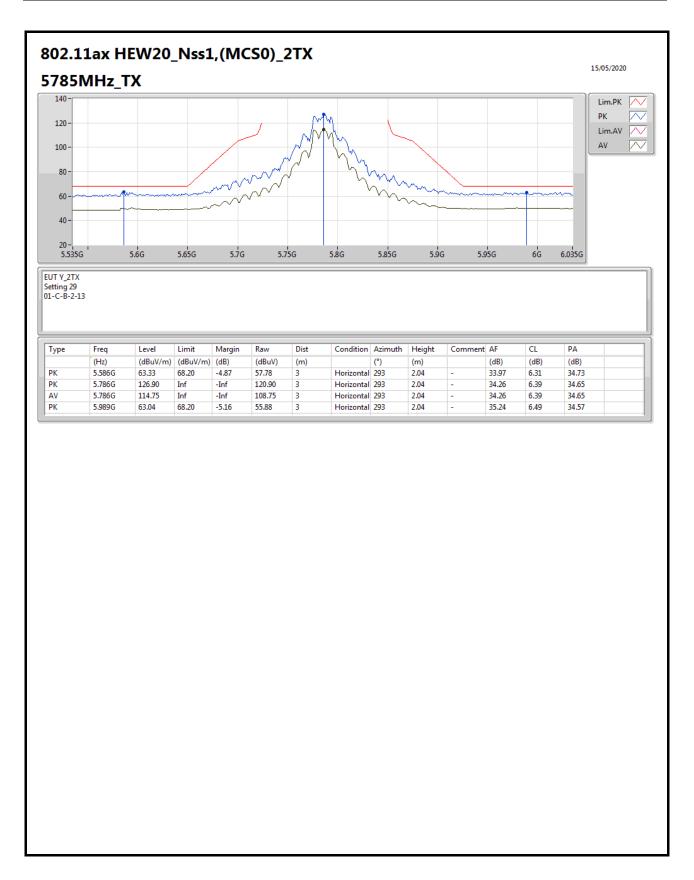


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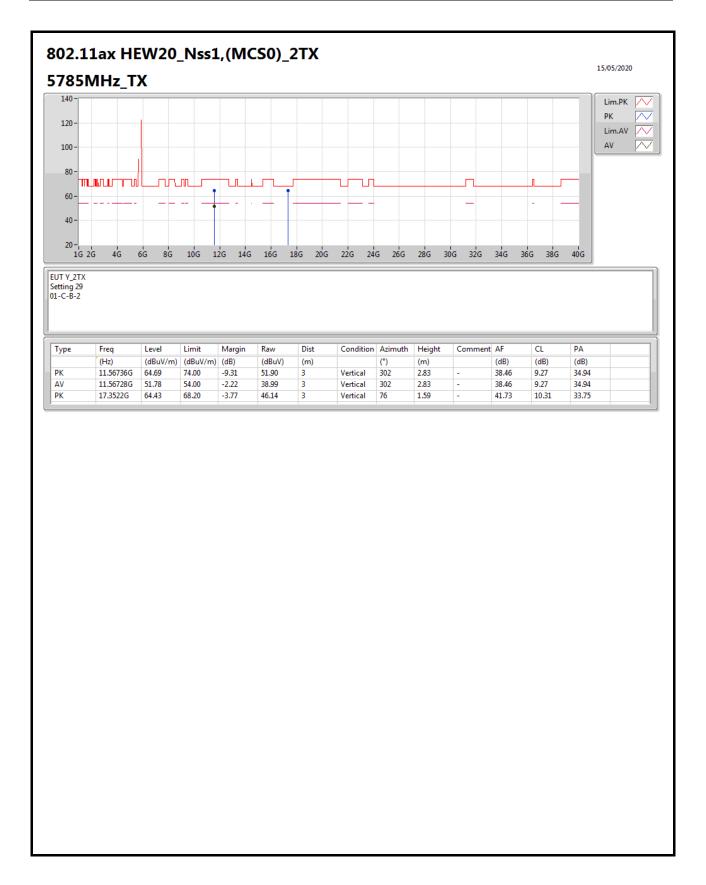




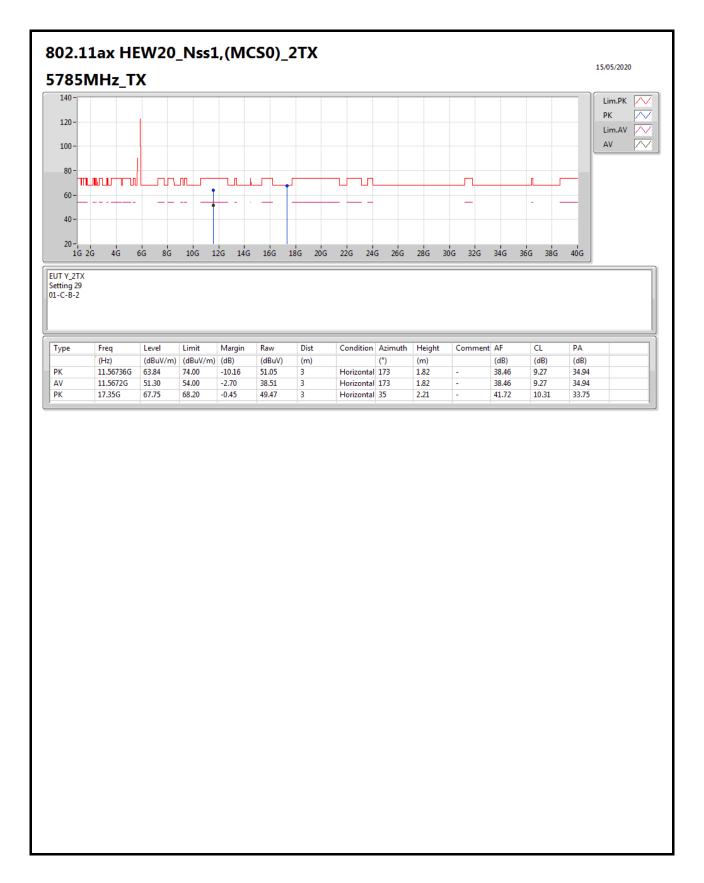




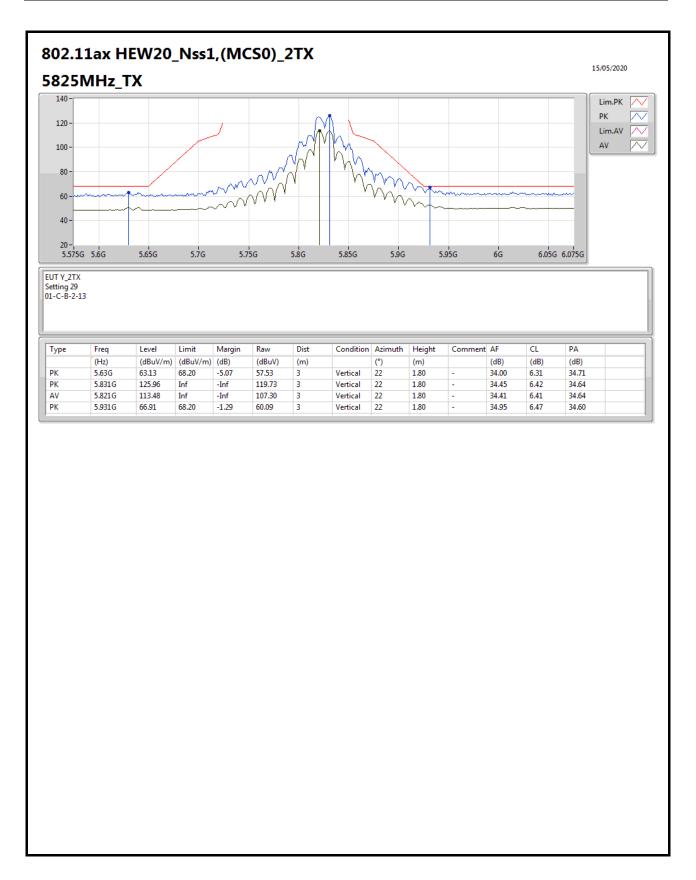




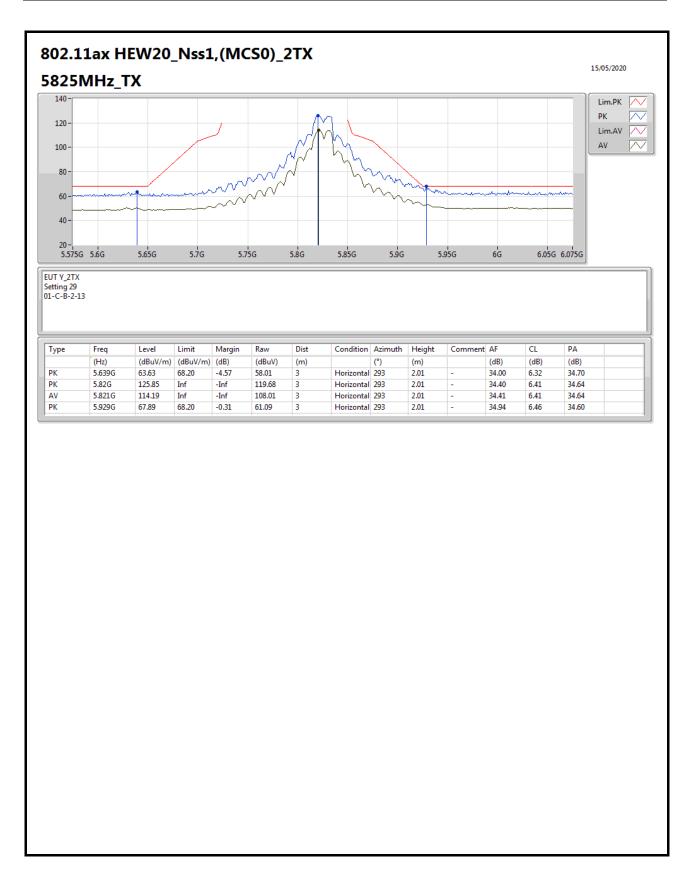






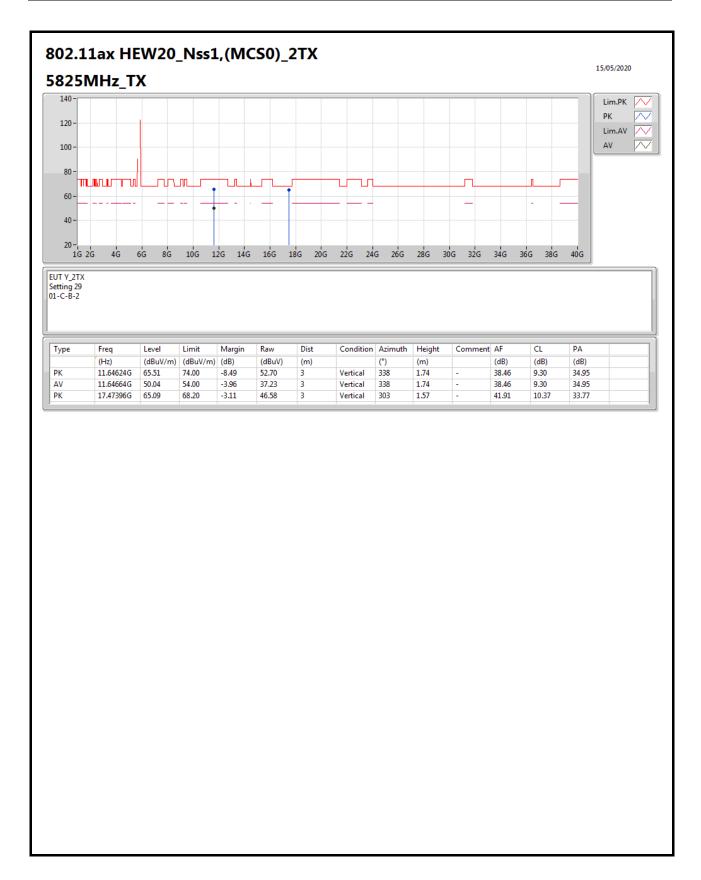






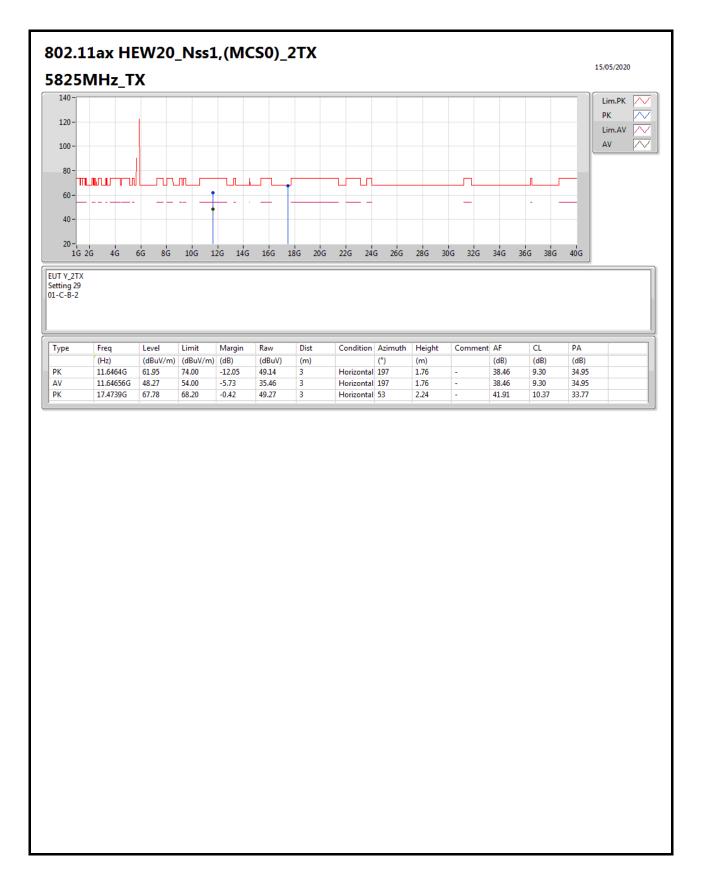
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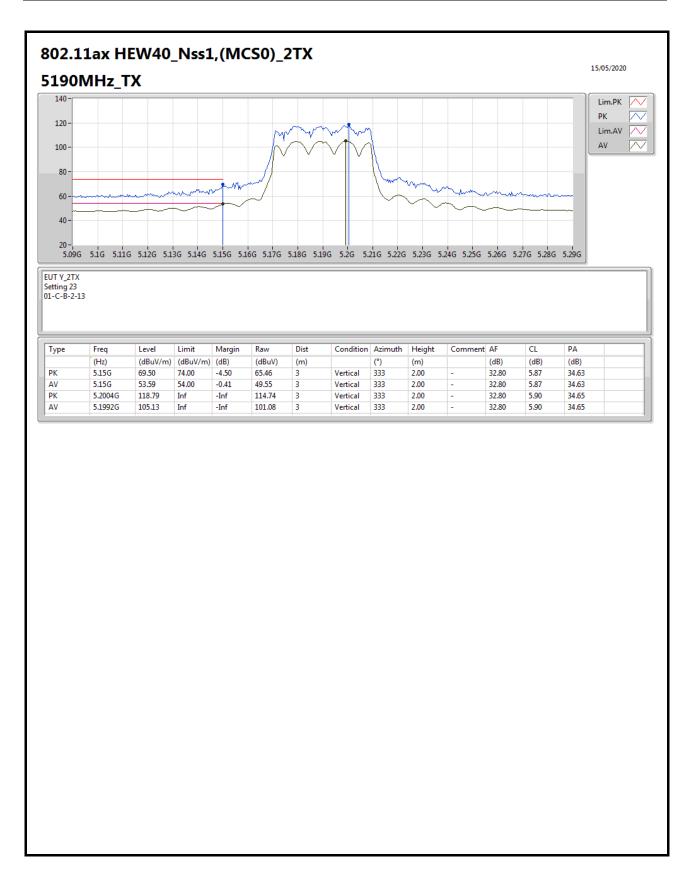
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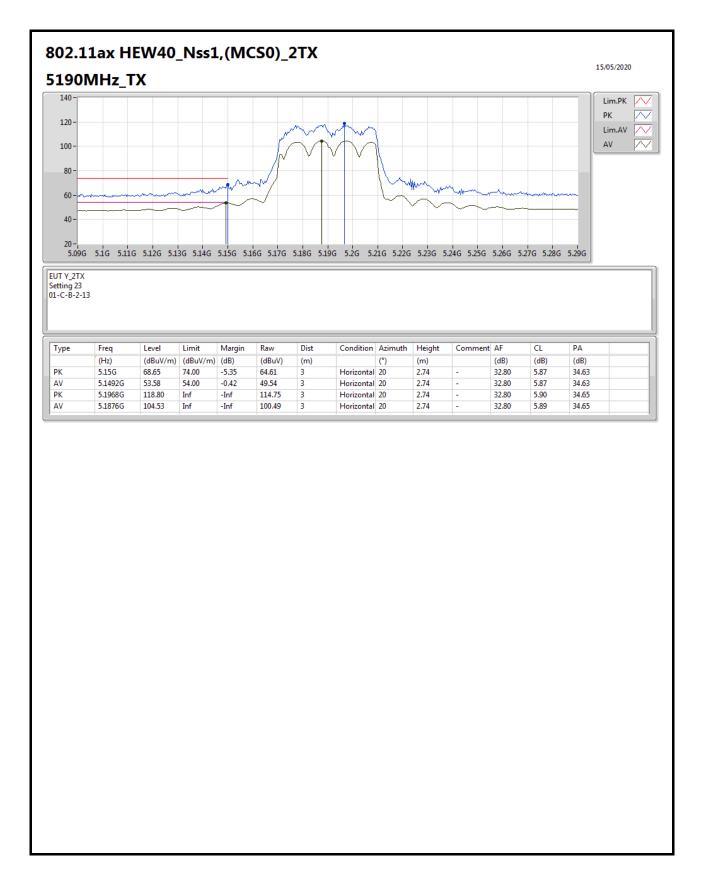


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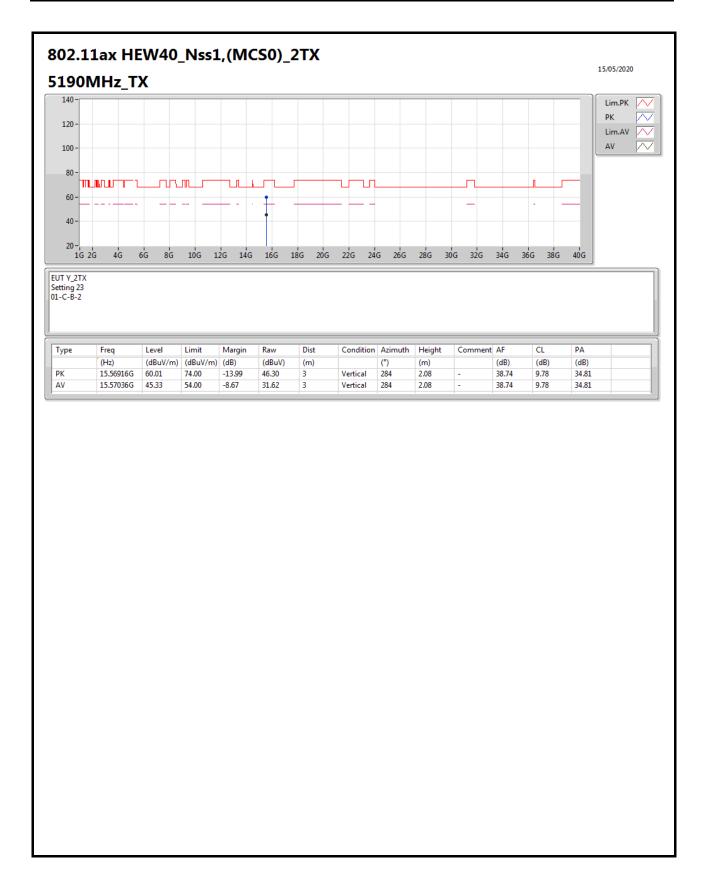






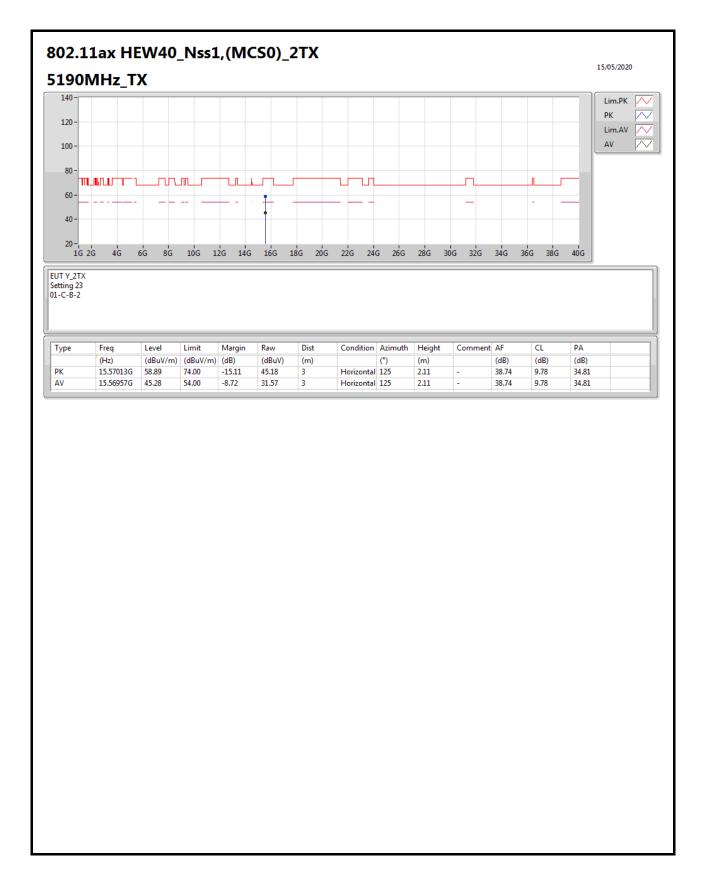




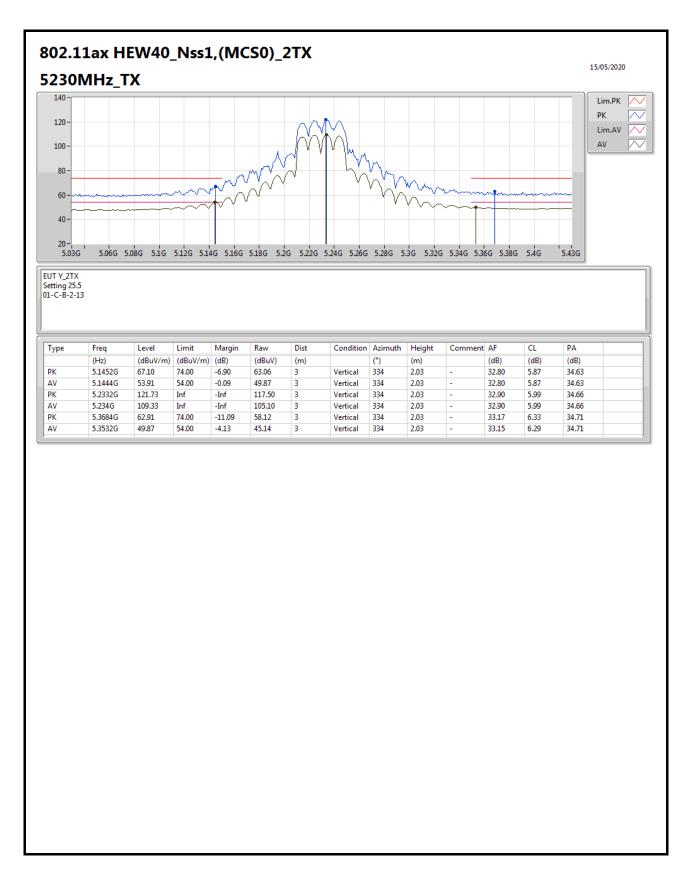


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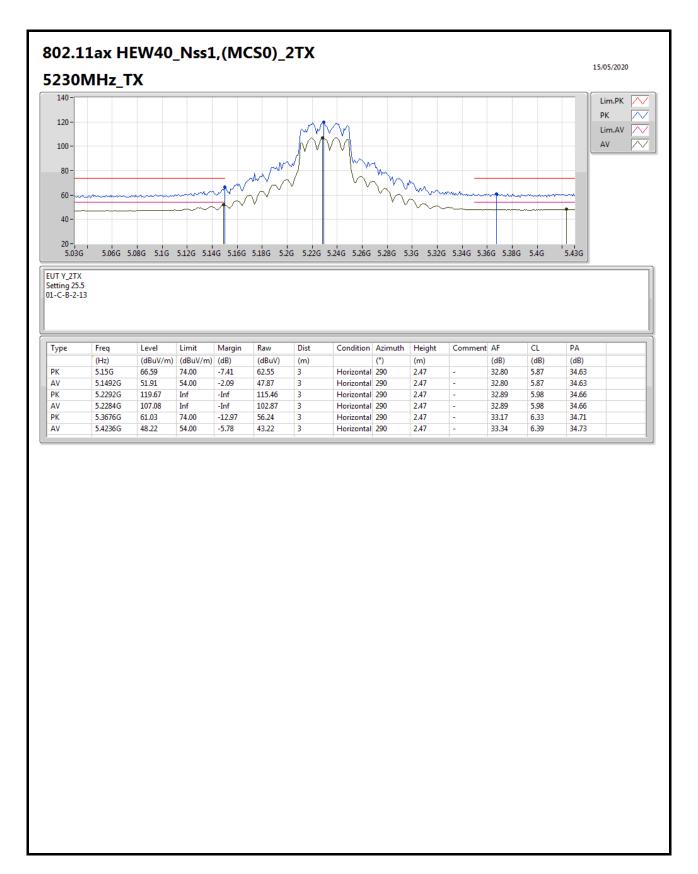






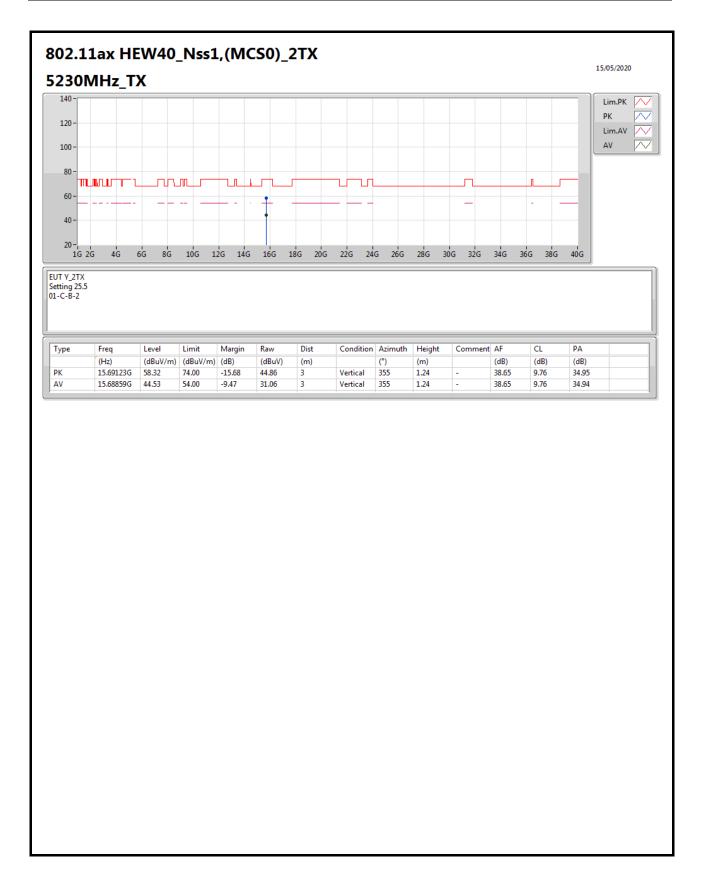
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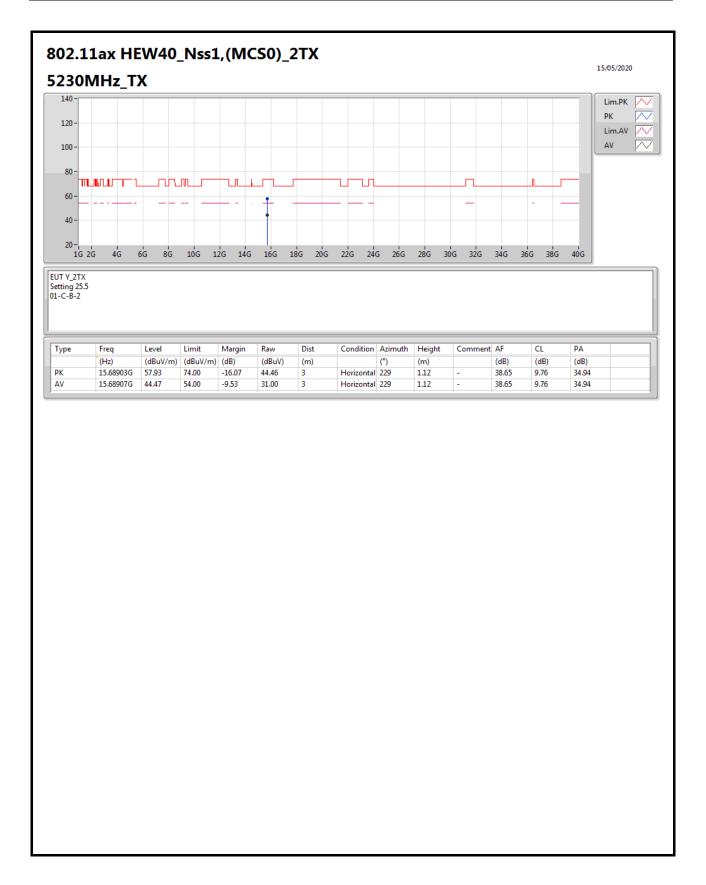
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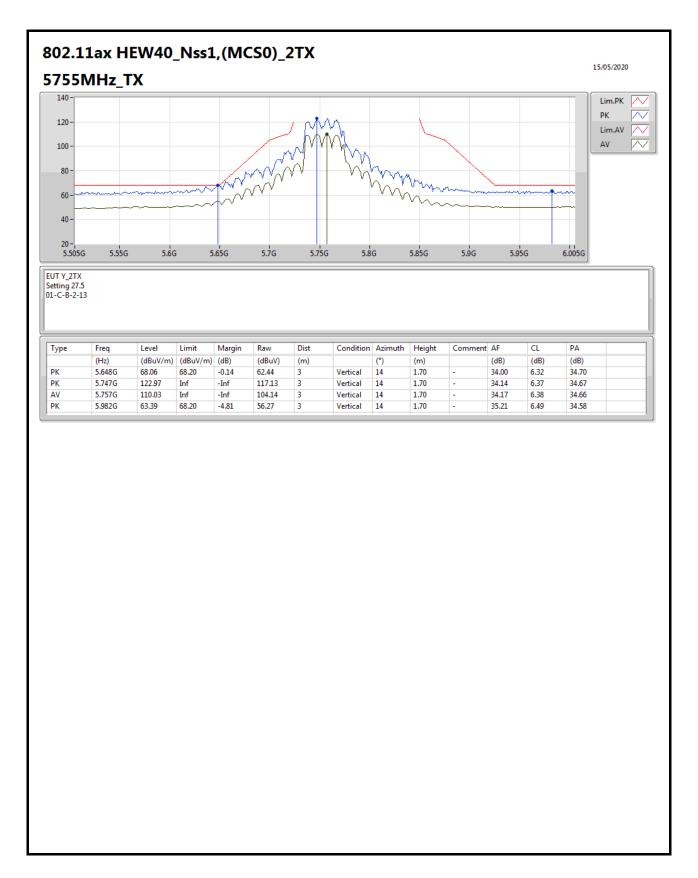
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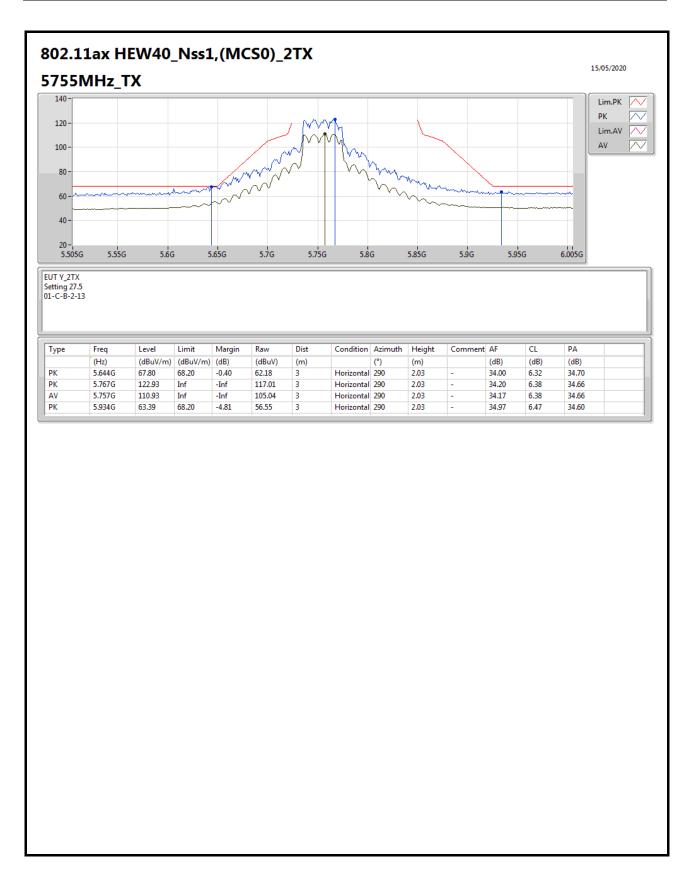


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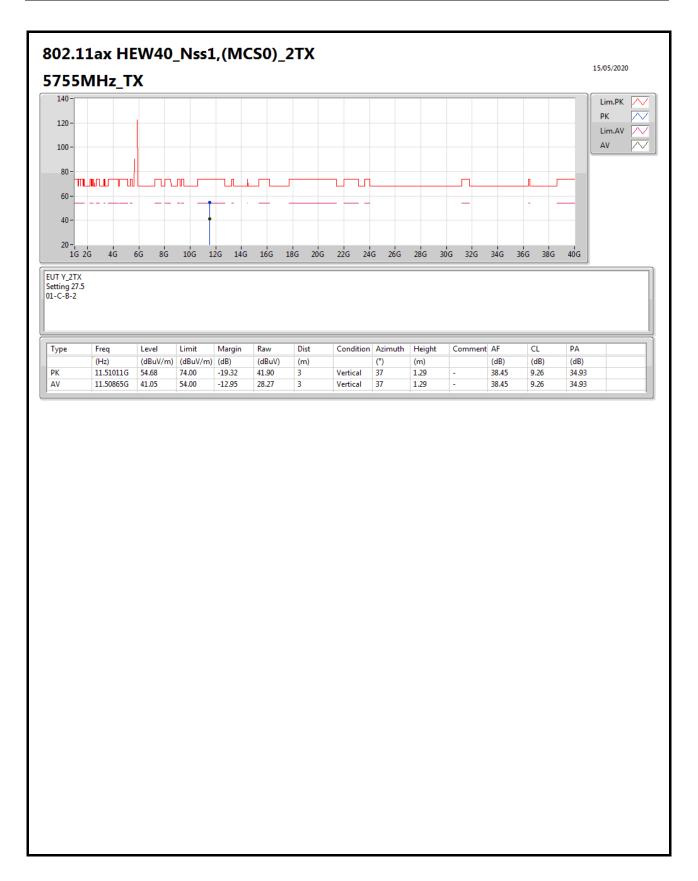




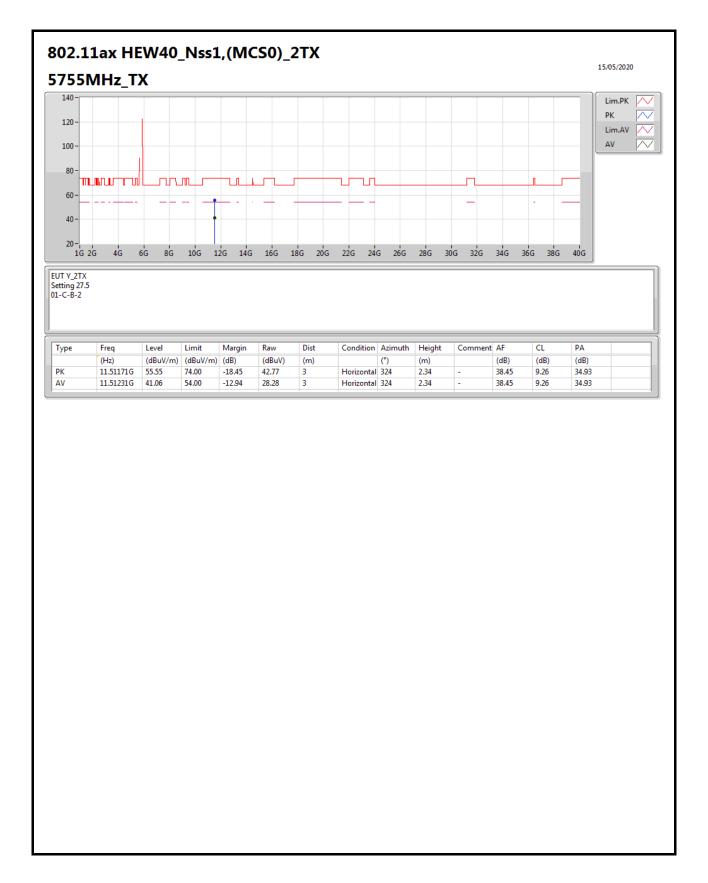






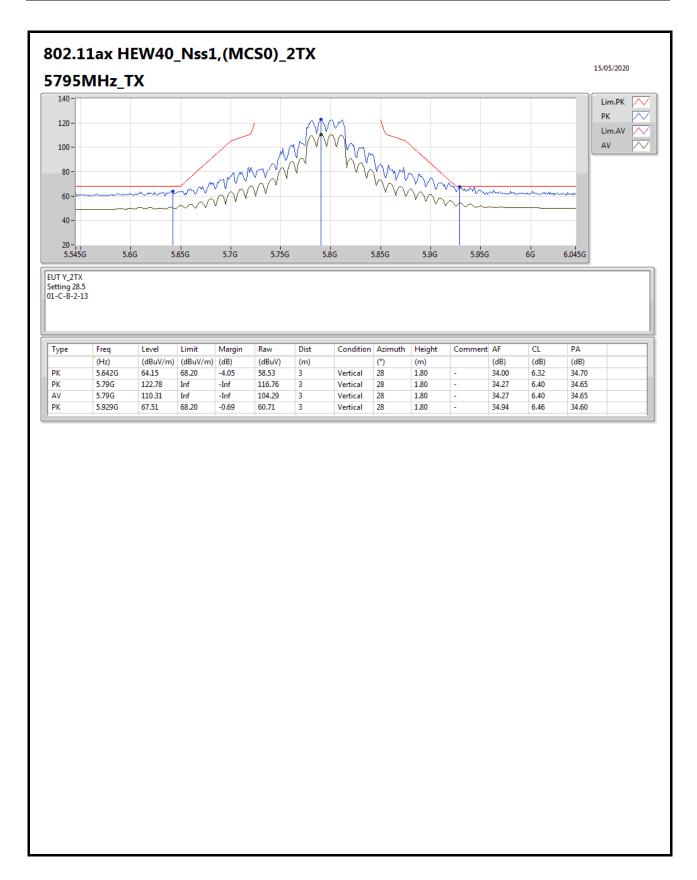




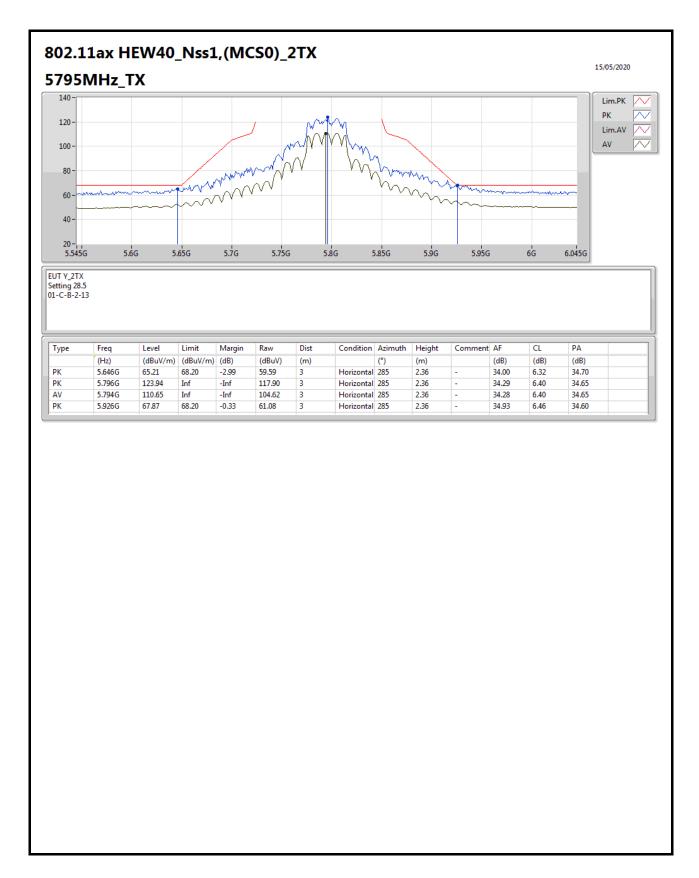


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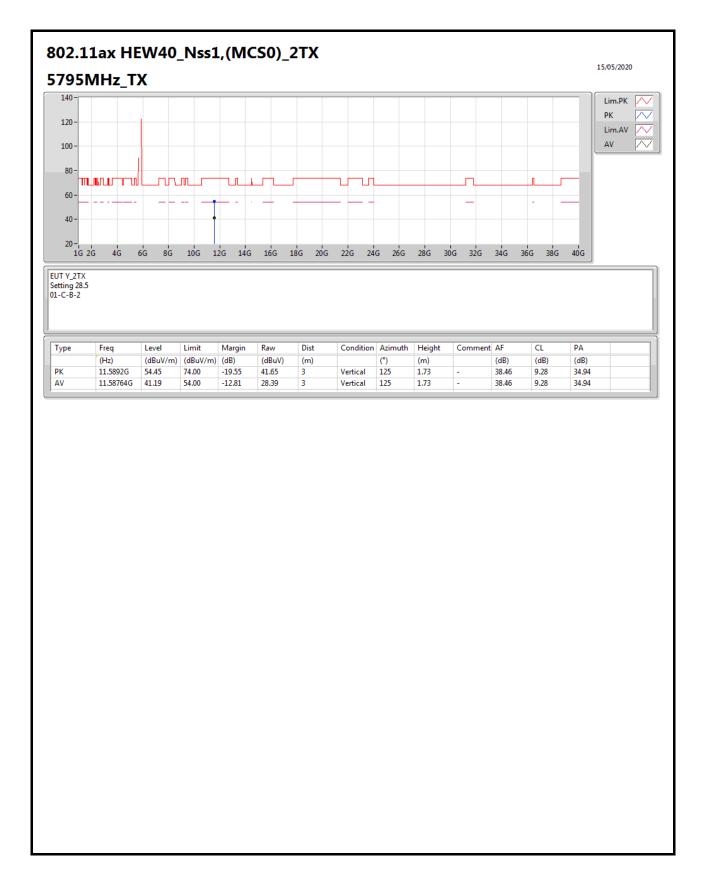




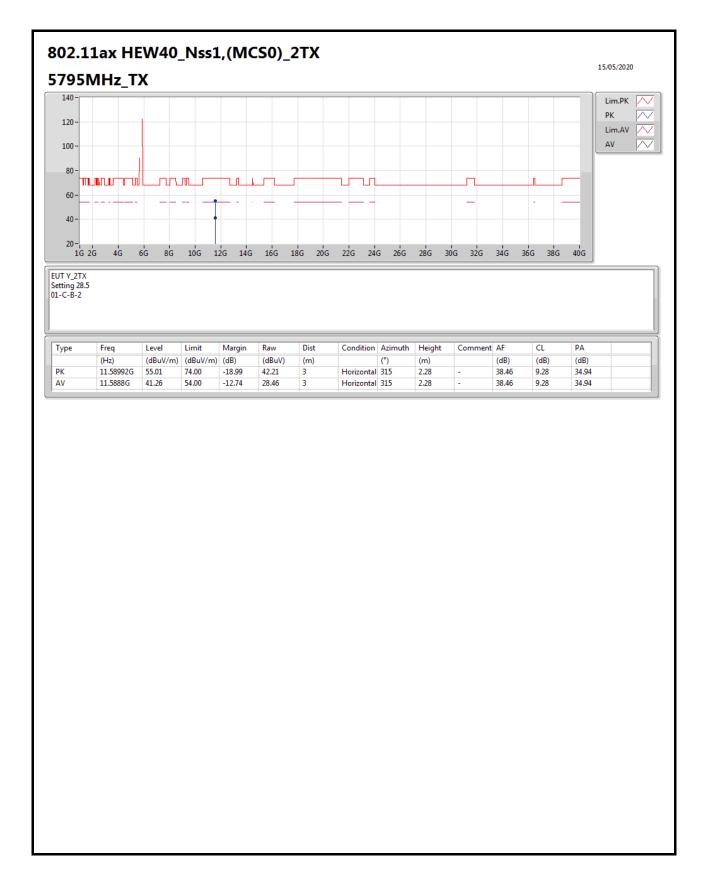




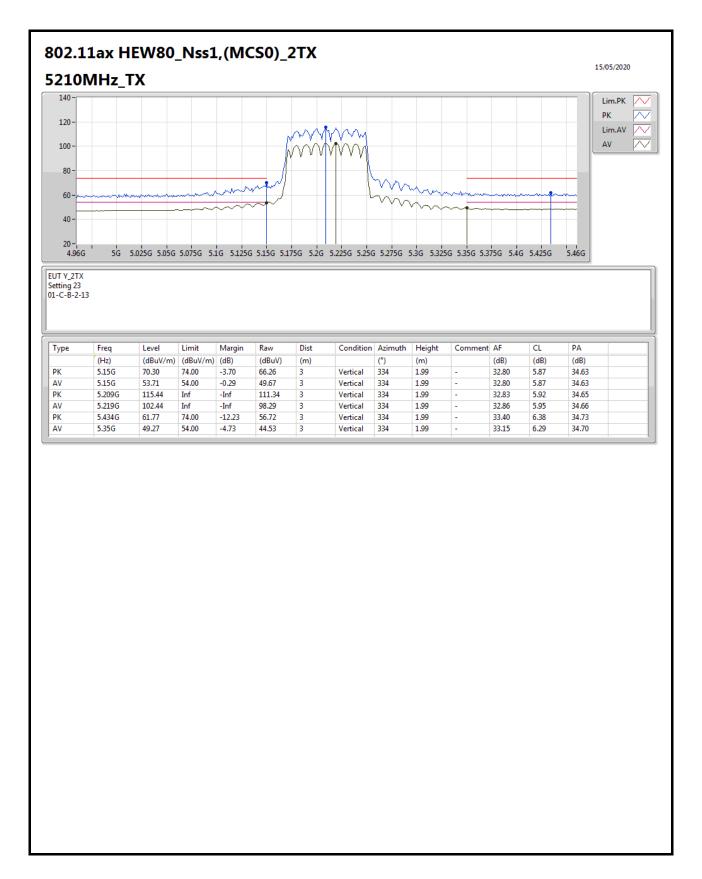




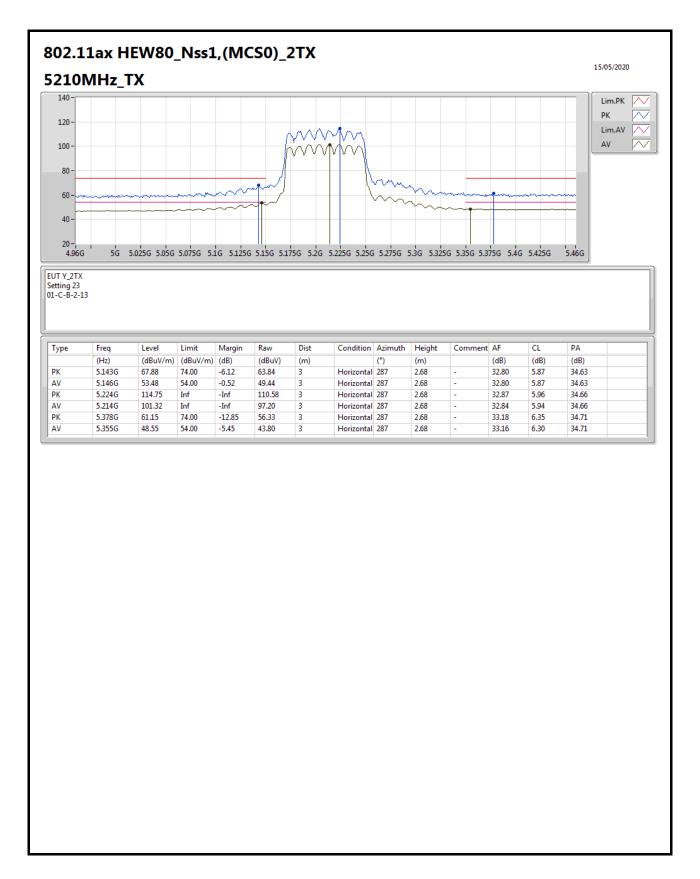




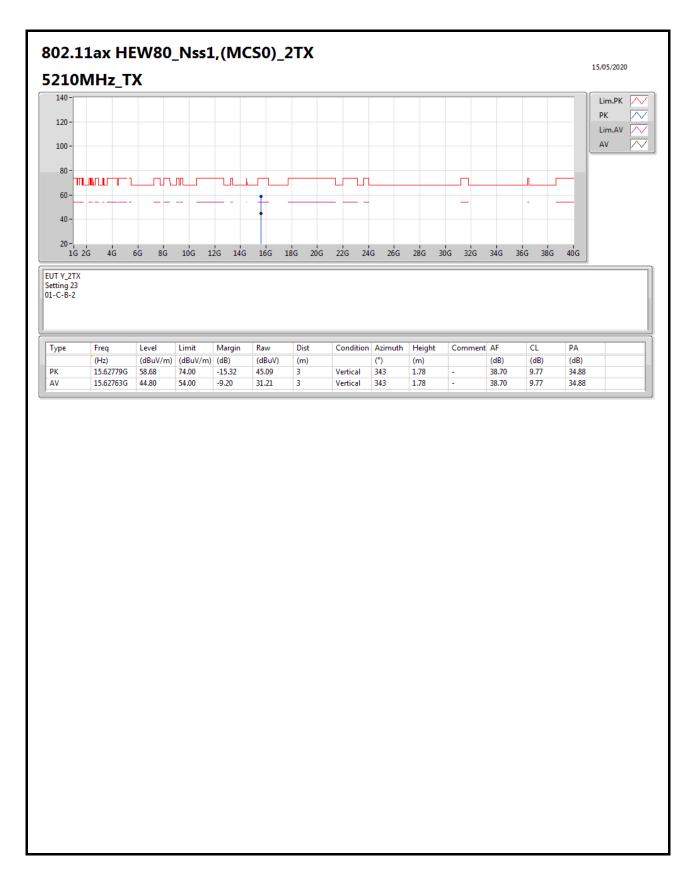






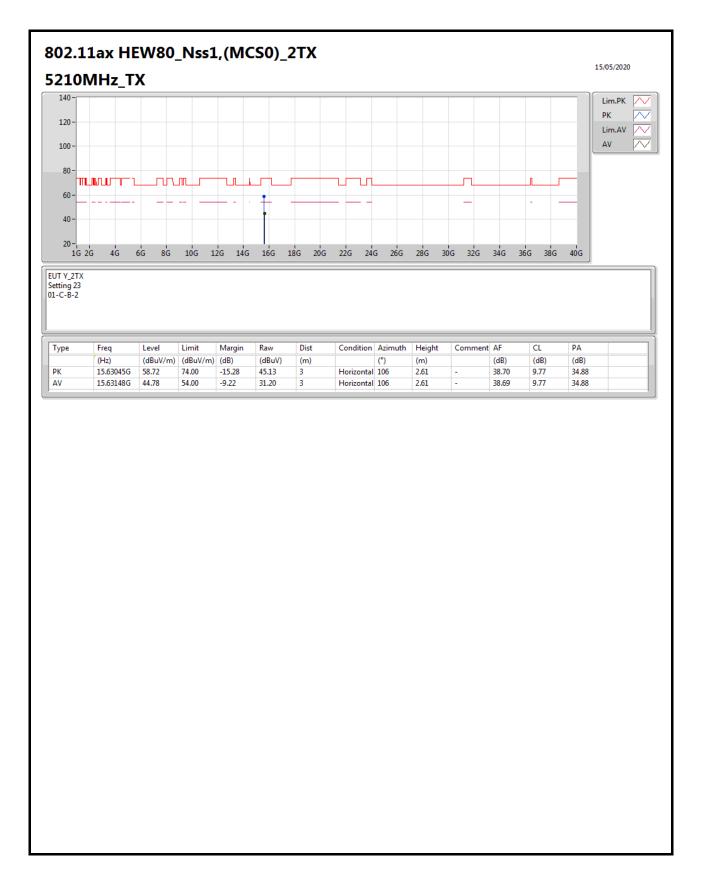




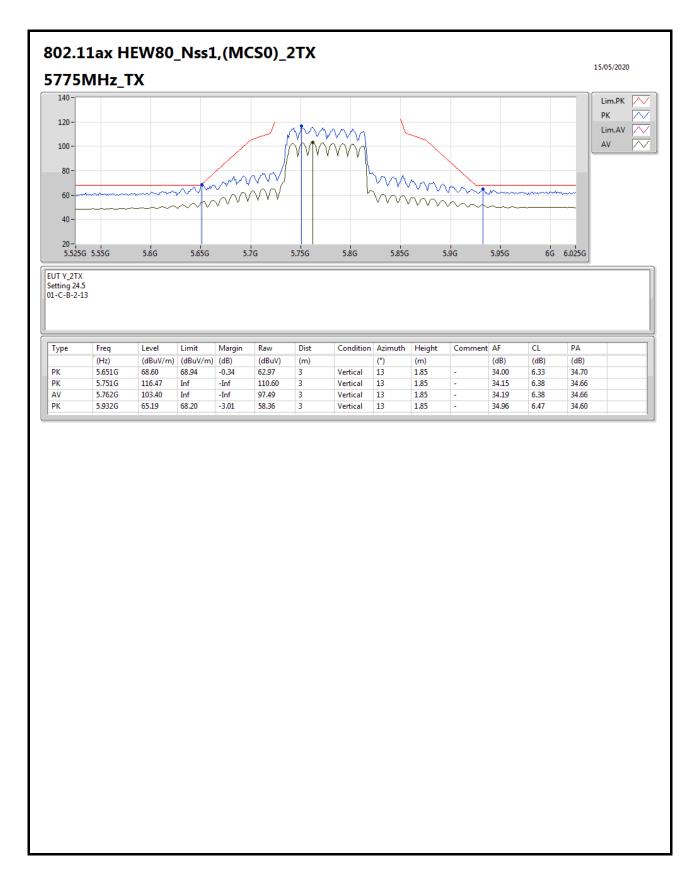


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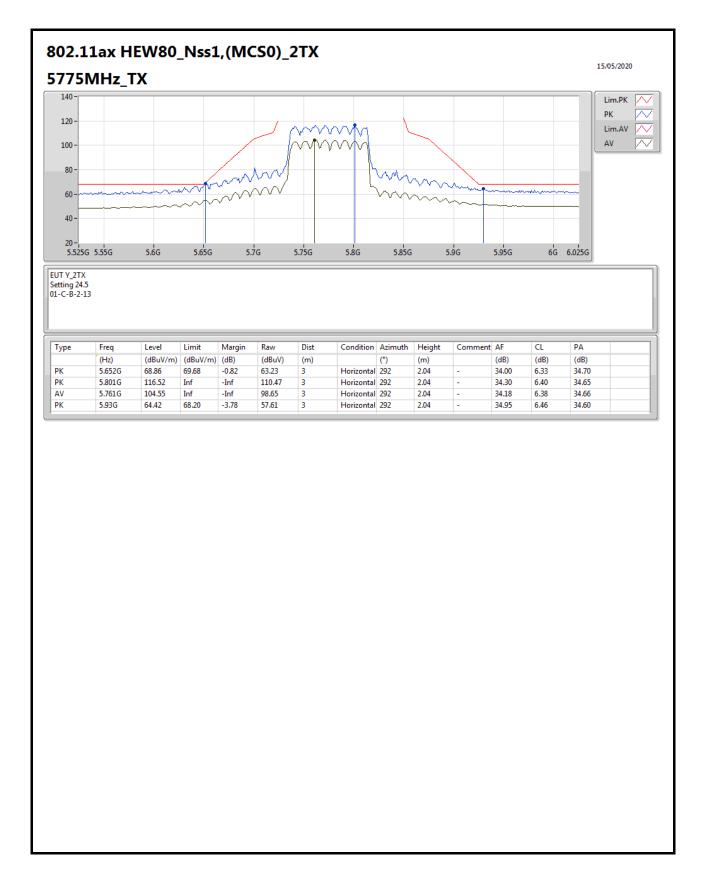






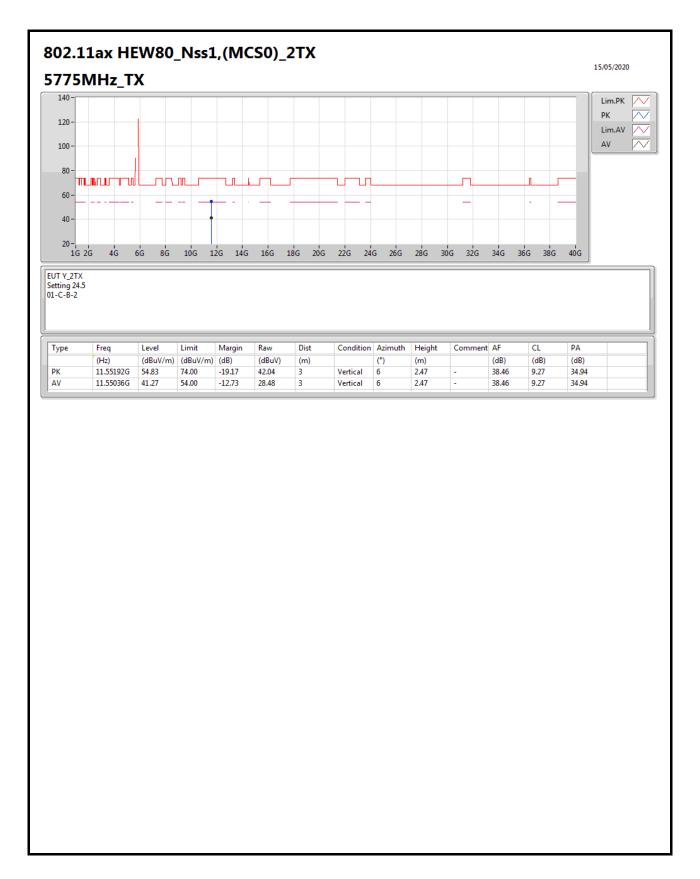






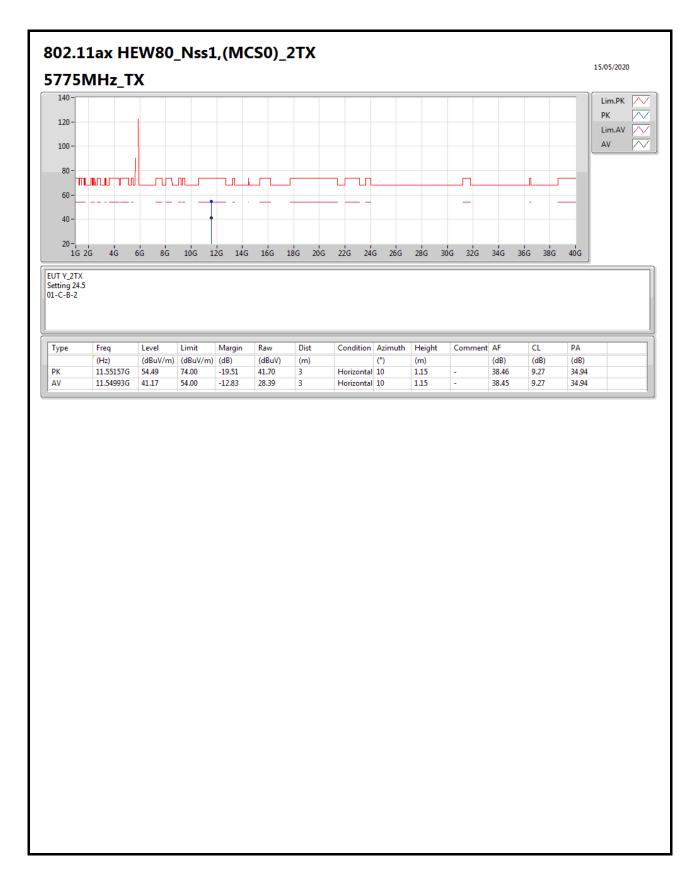
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RSE TX above 1GHz

Appendix E.3

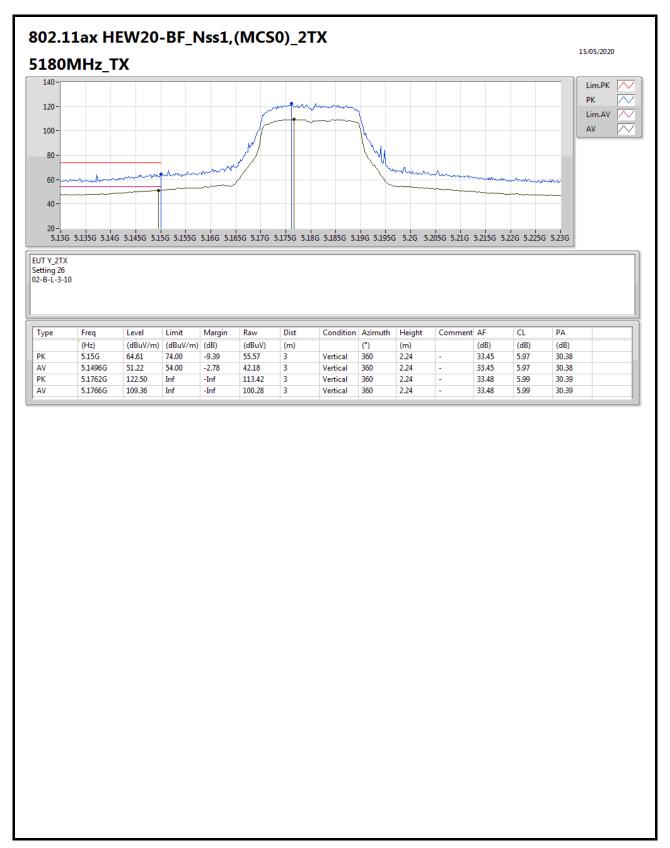
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For beamforming mode:

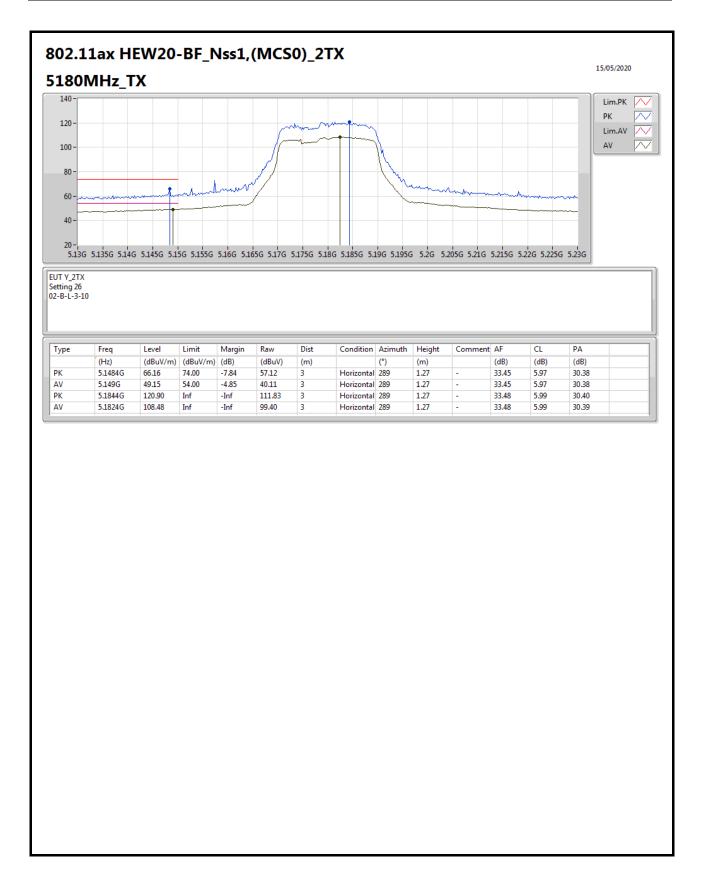
Summary

	Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
				(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.15-5.25GHz		-		•	-	-	-	-	-	-	-	-
802.11ax HEW40-BF_Nss1,(MCS0)_2TX		Pass	AV	5.1492G	51.47	54.00	-2.53	3	Vertical	302	1.19	-

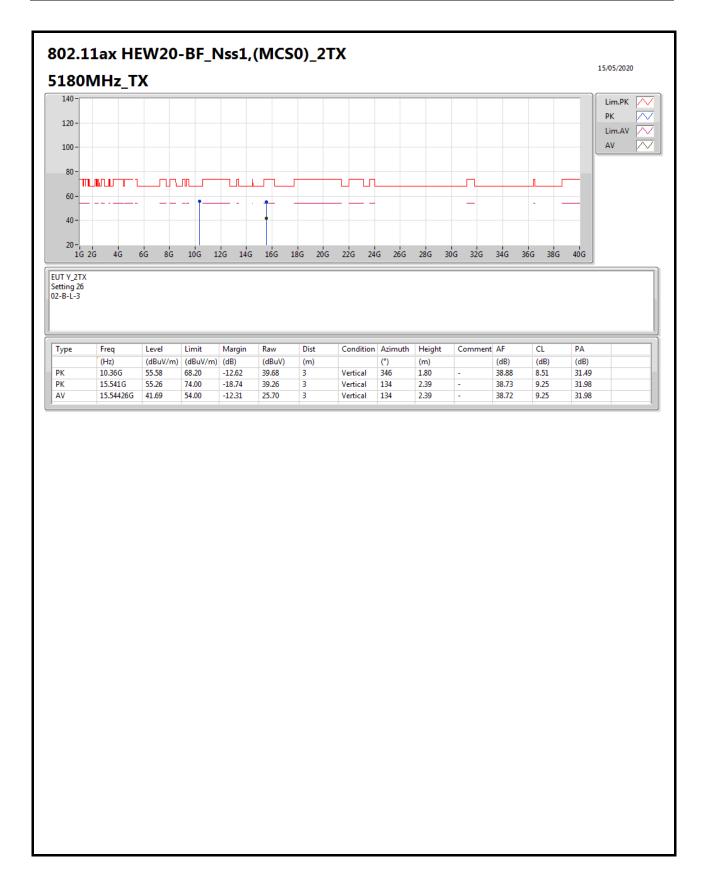




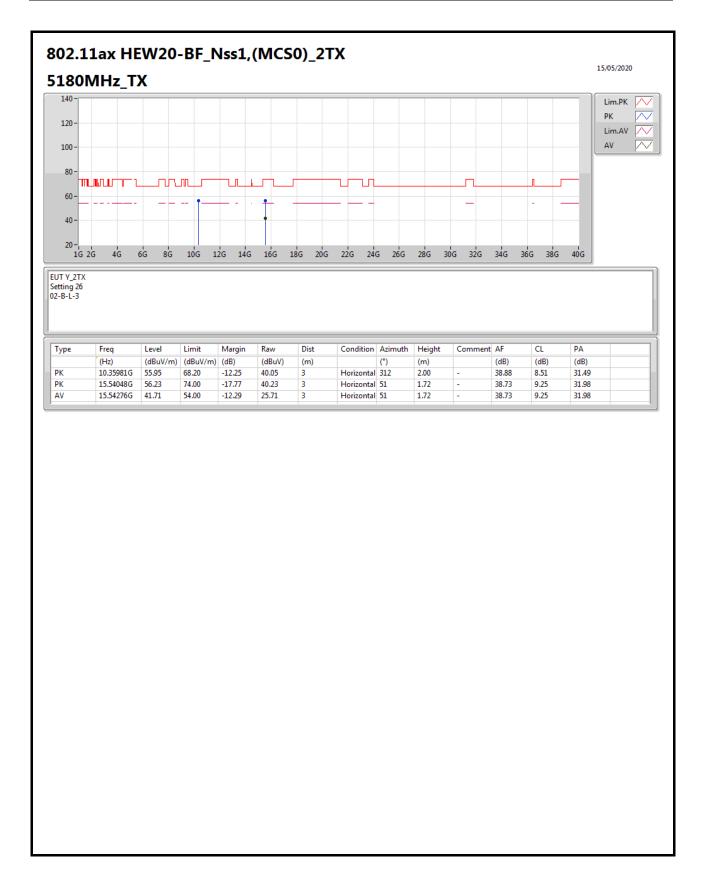




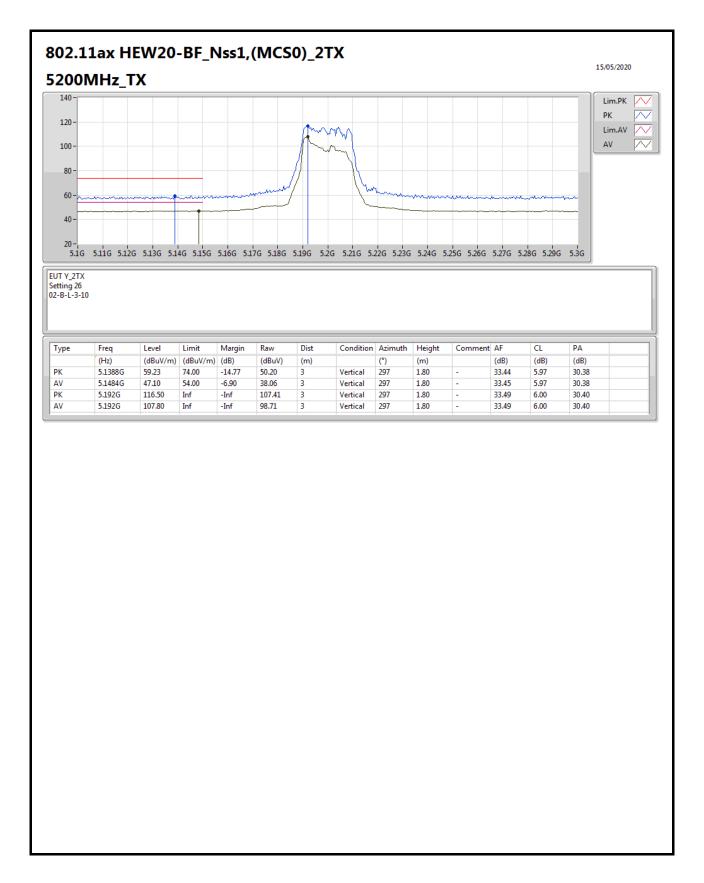




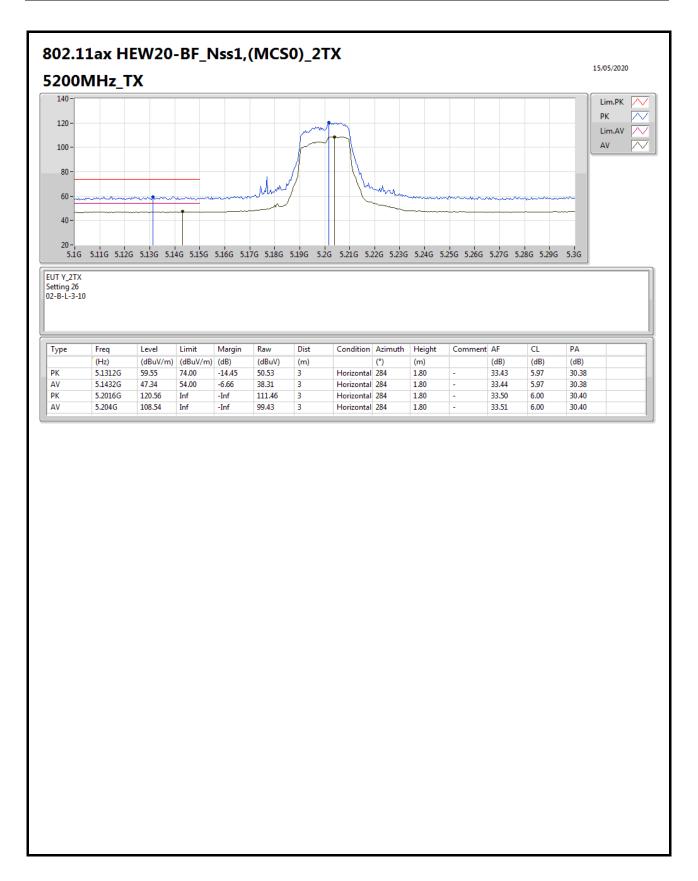




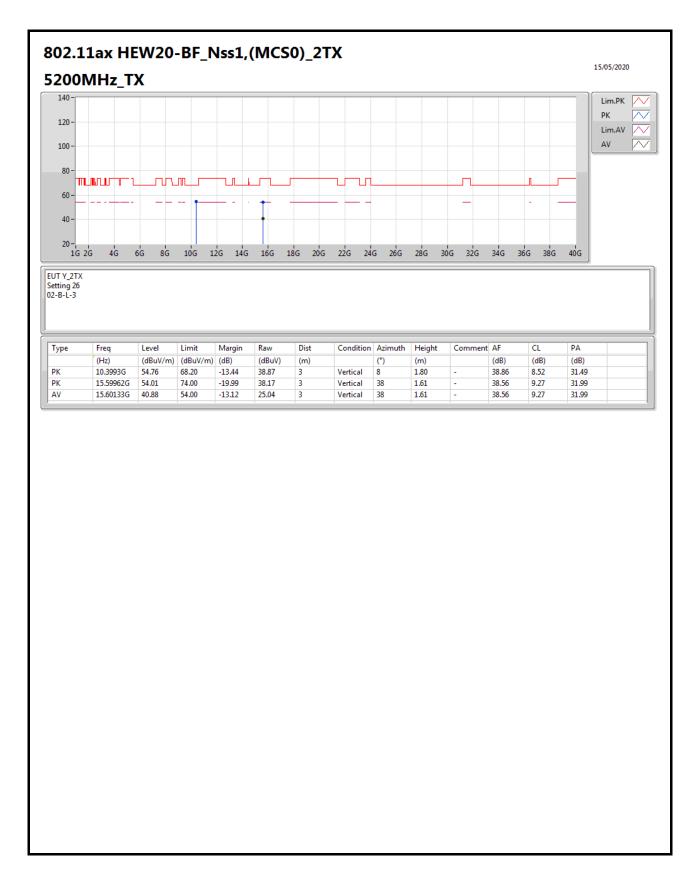




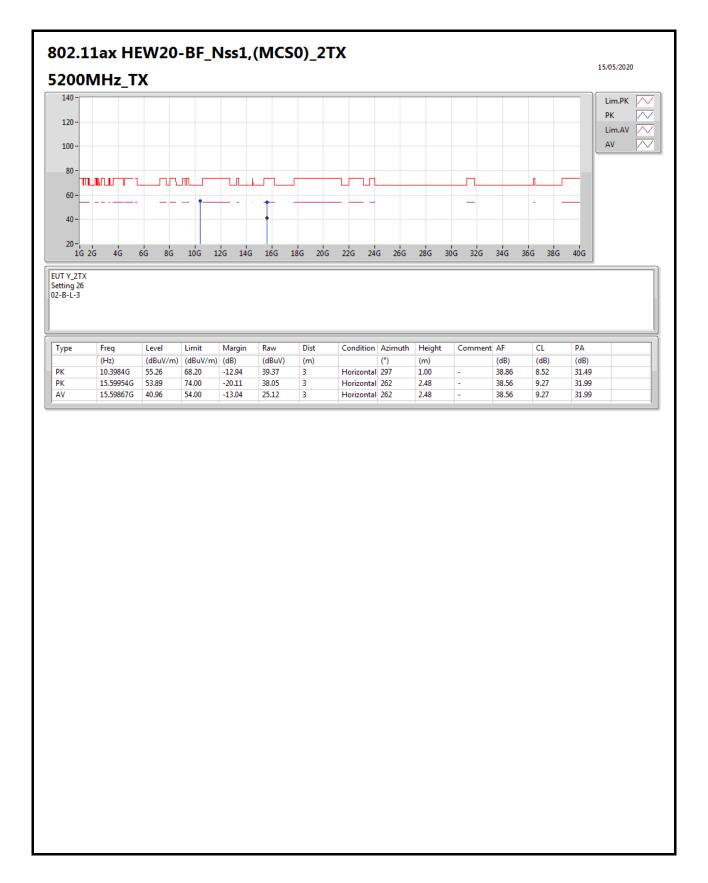




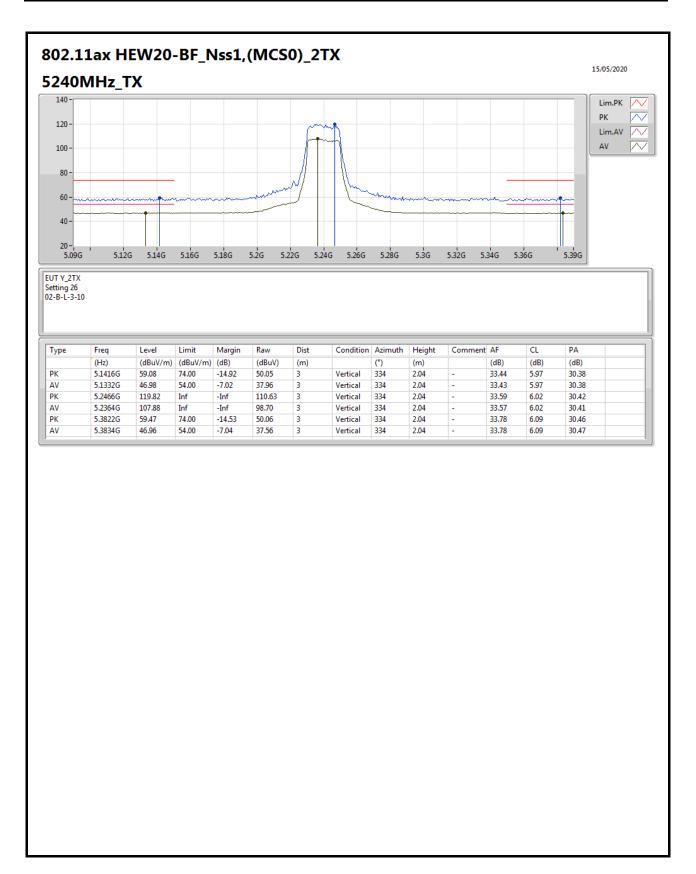




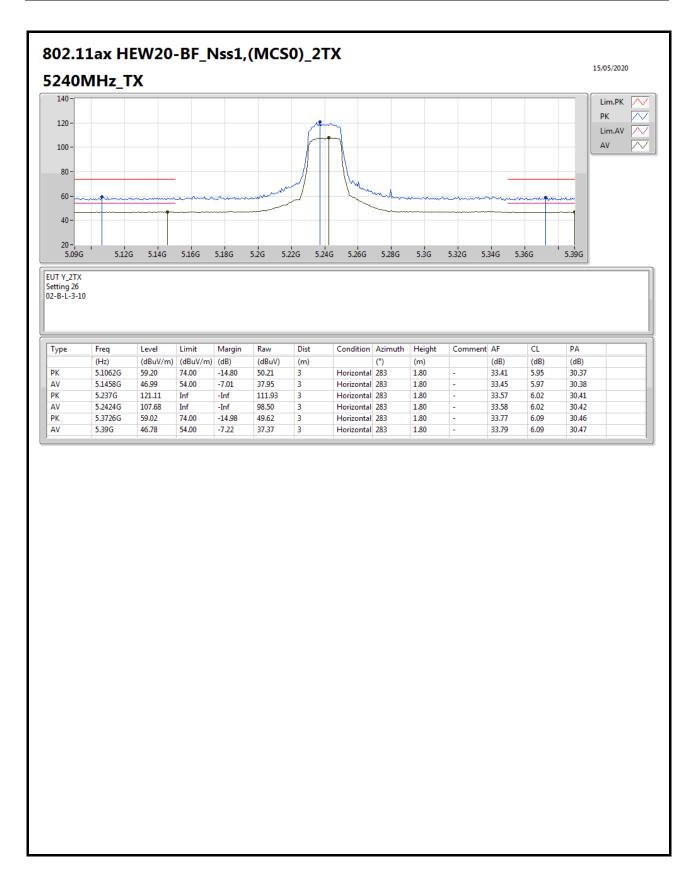




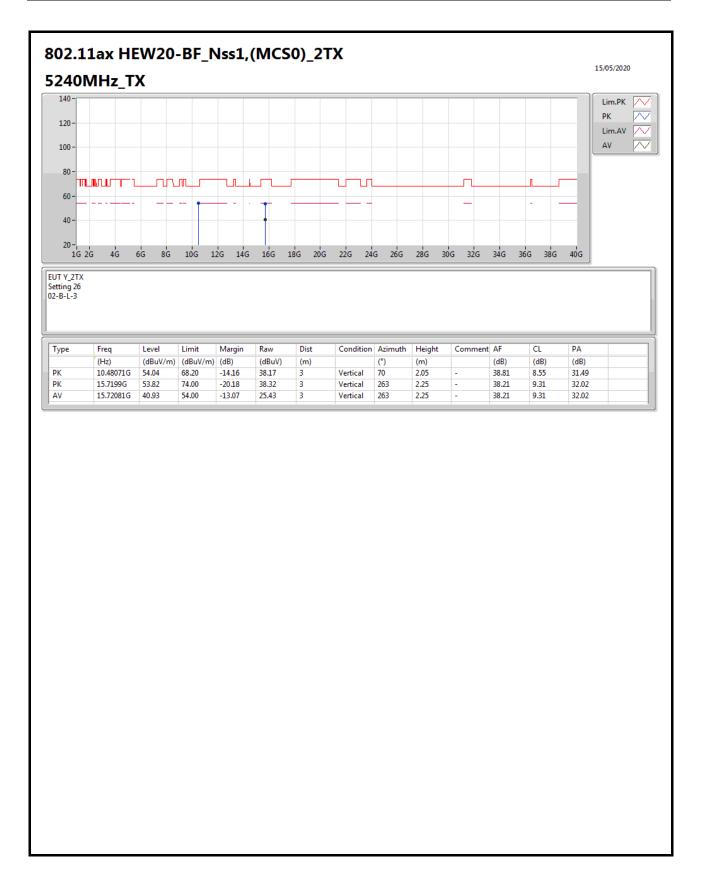




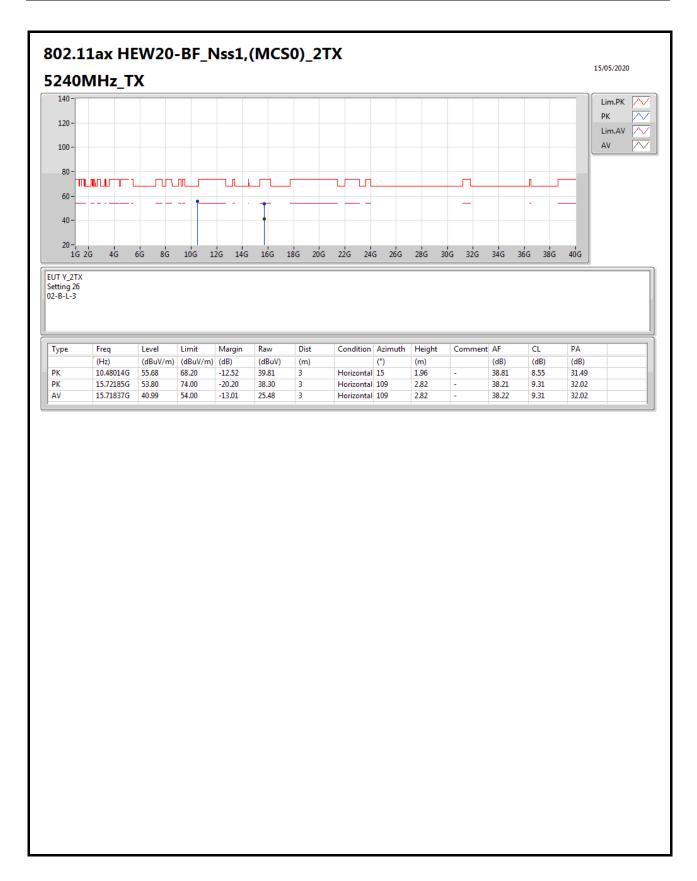




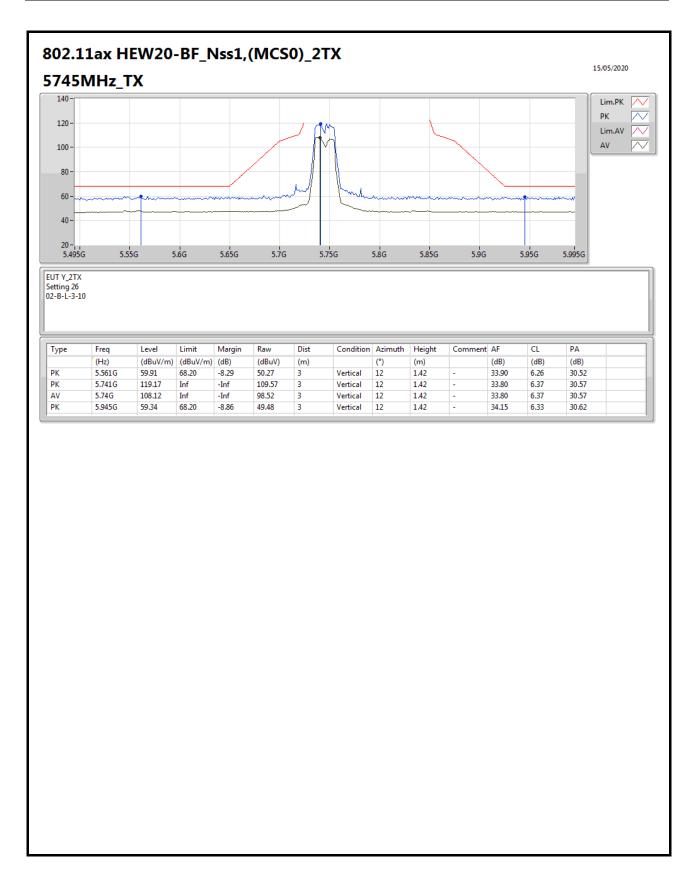






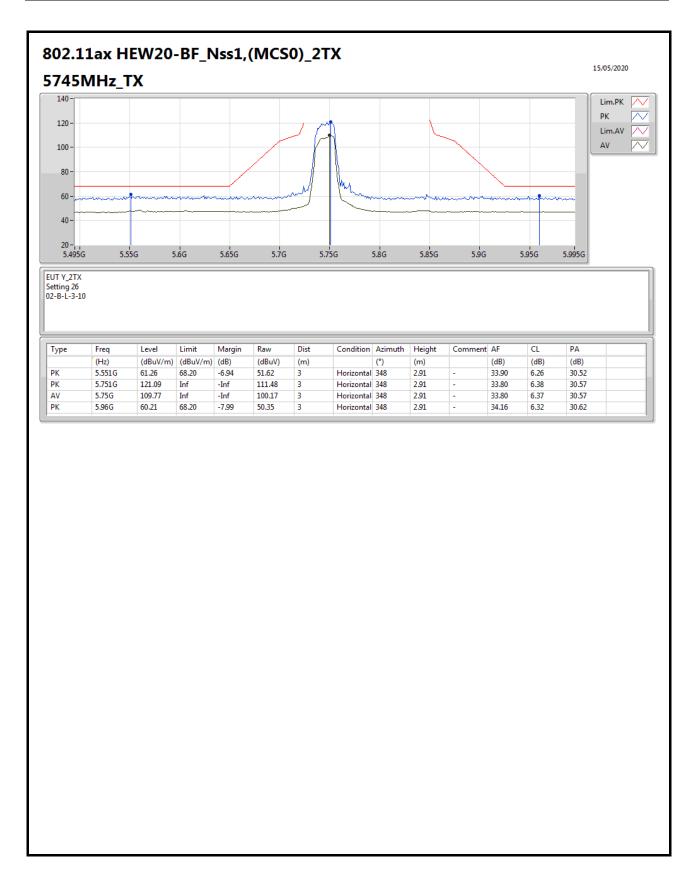






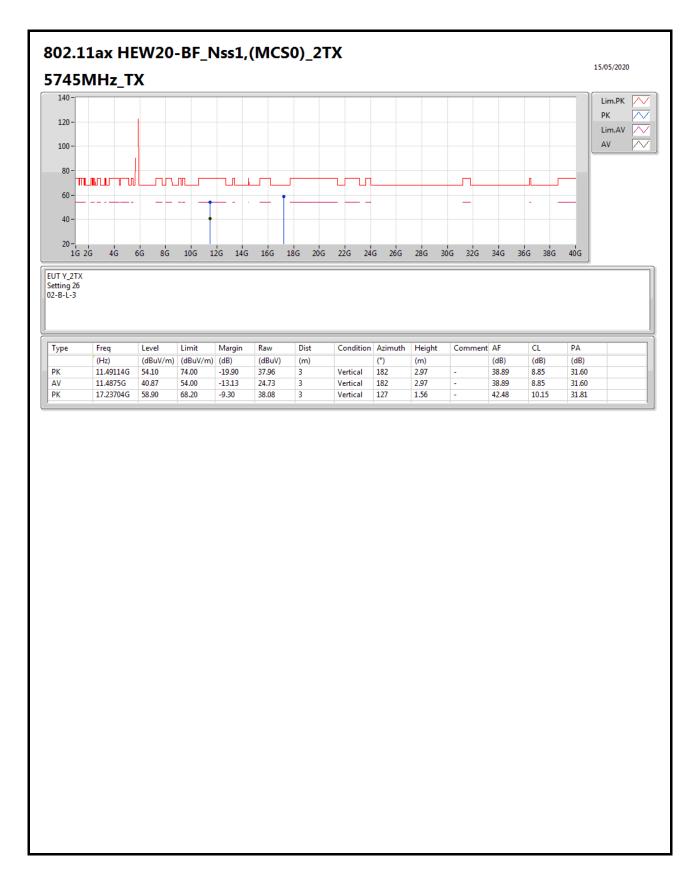
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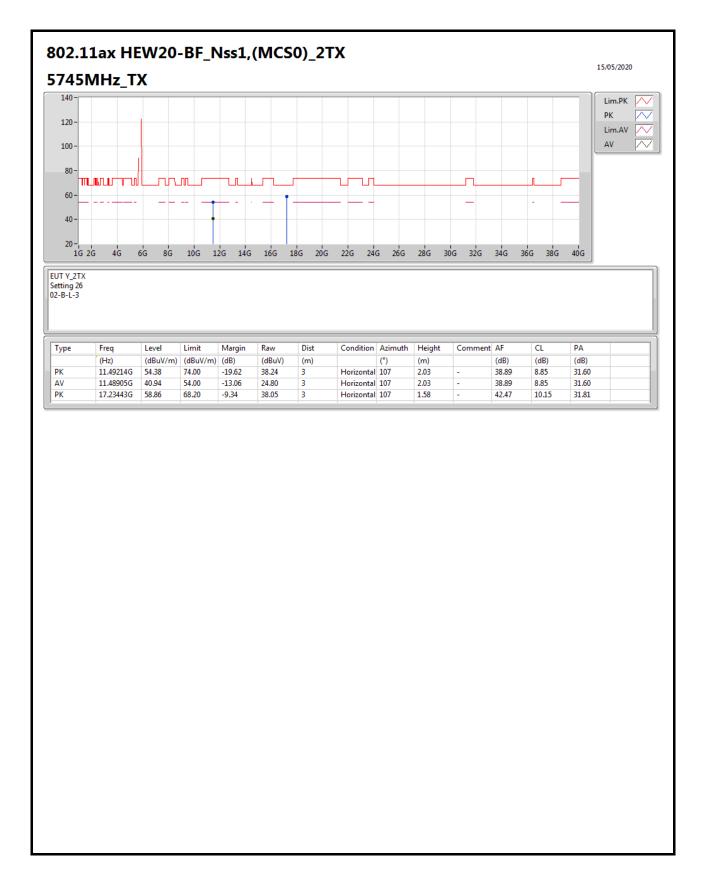


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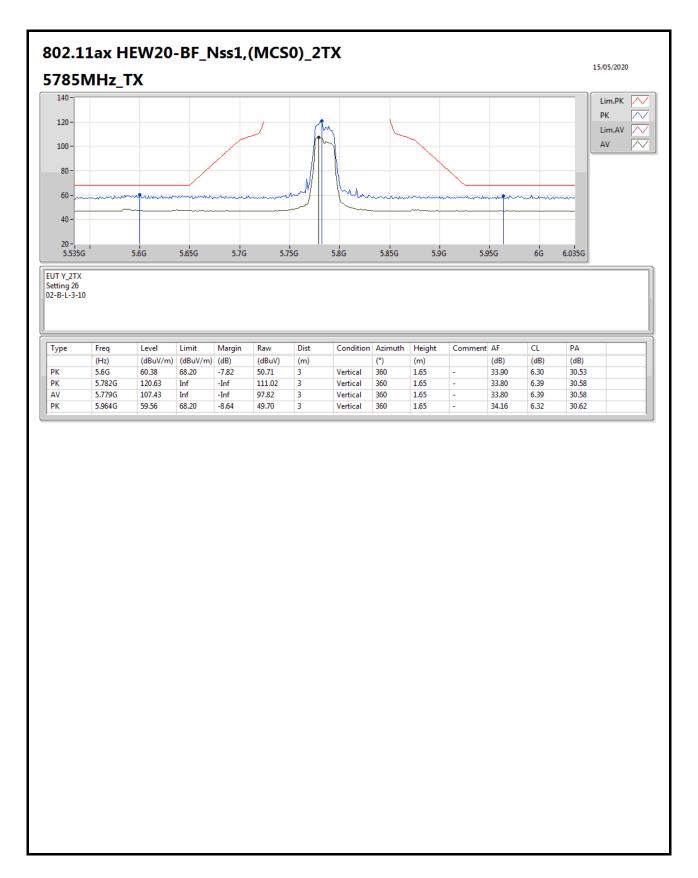




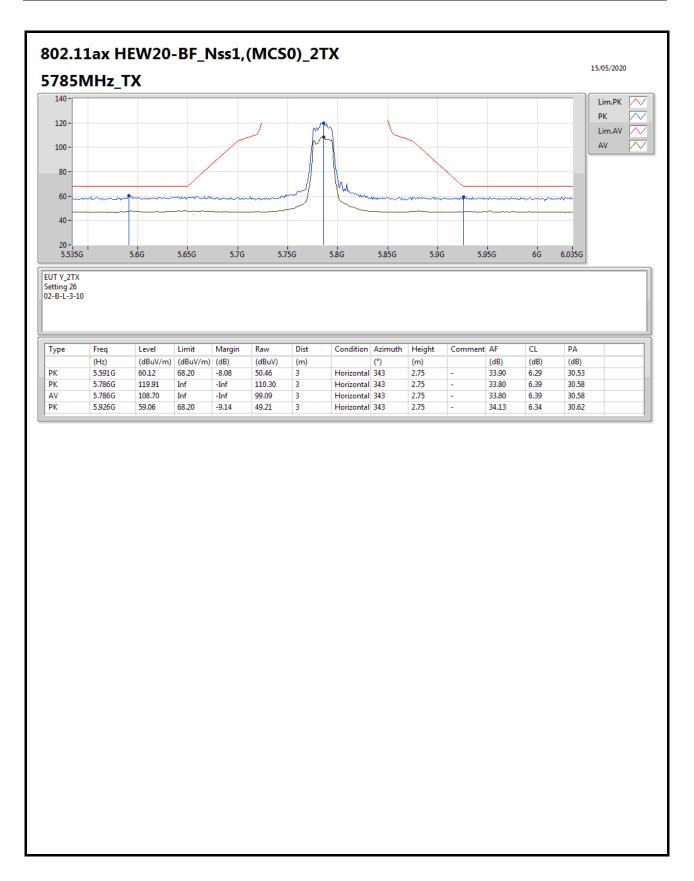


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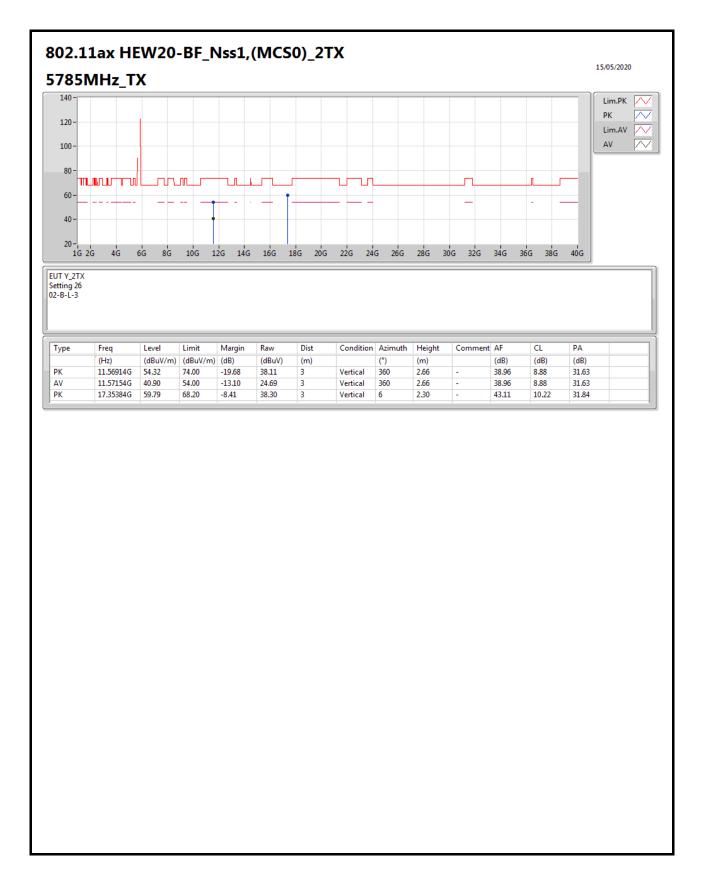




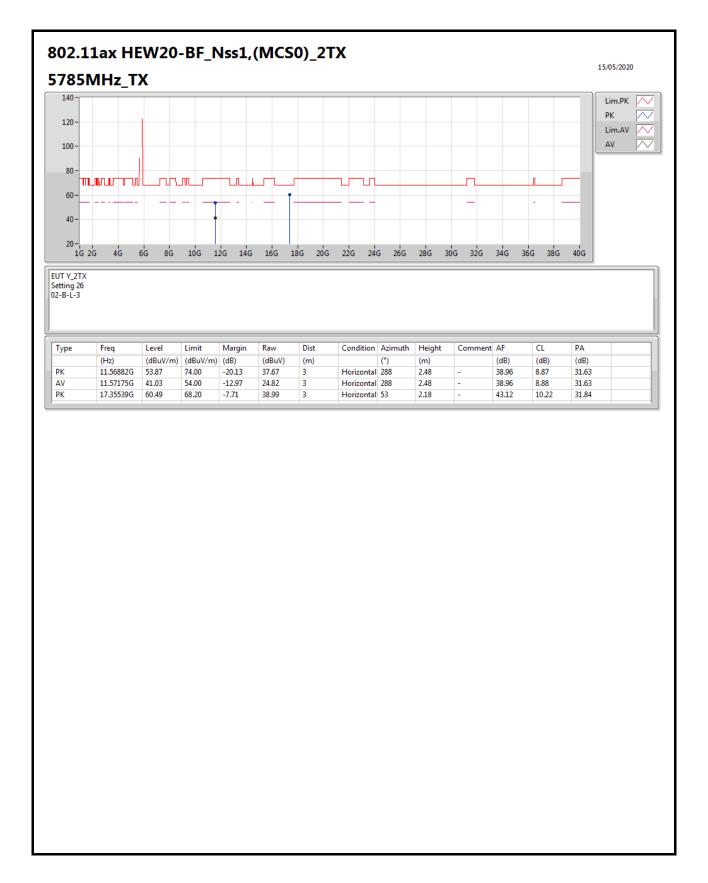




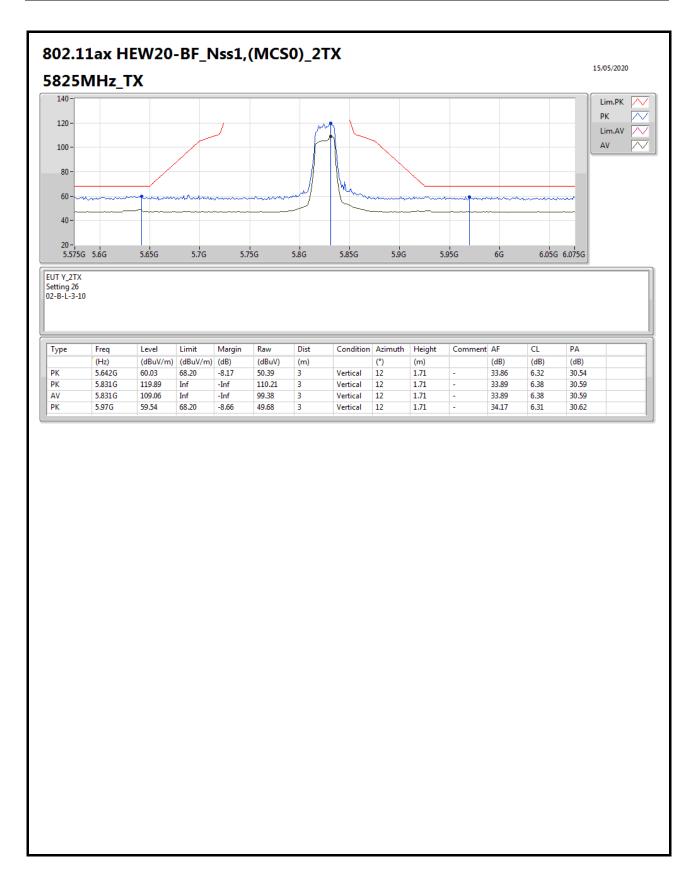




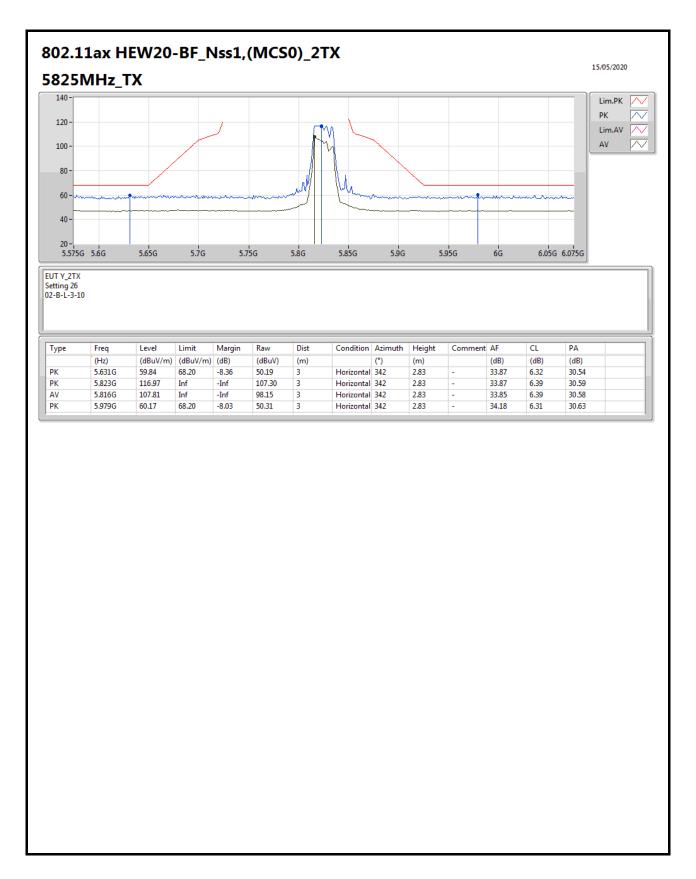




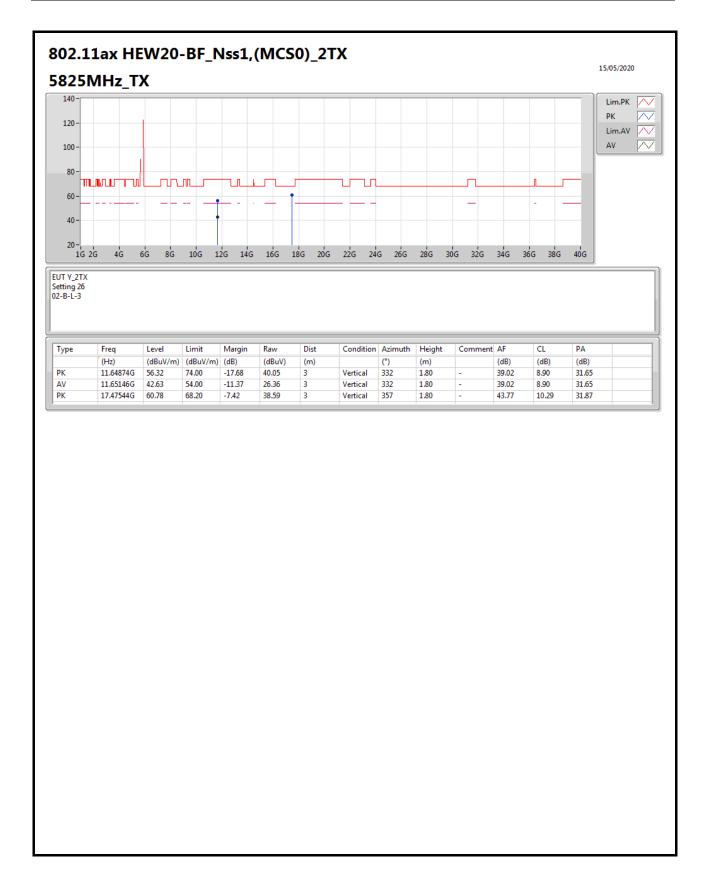




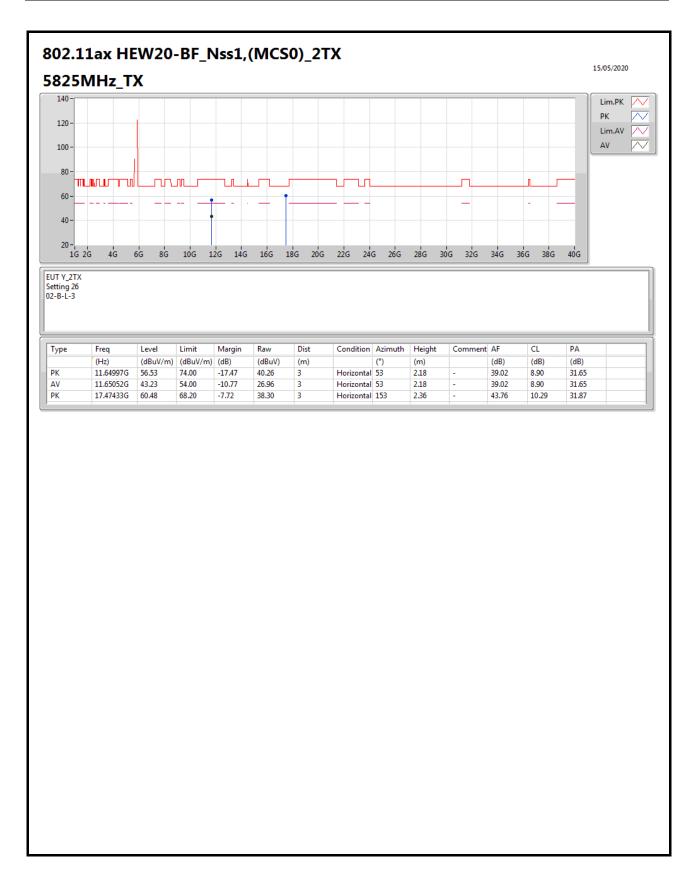




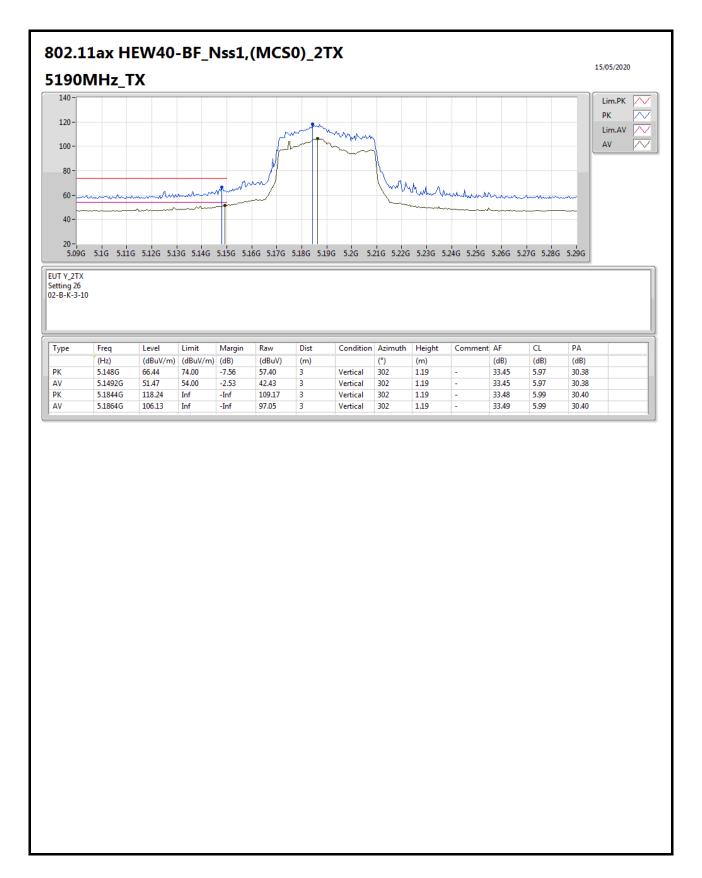




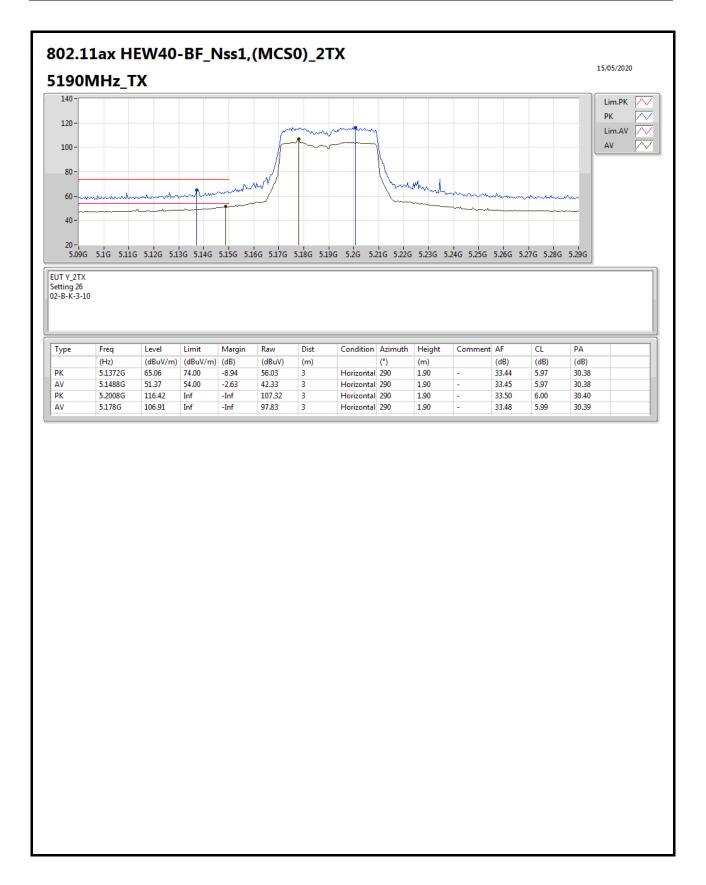




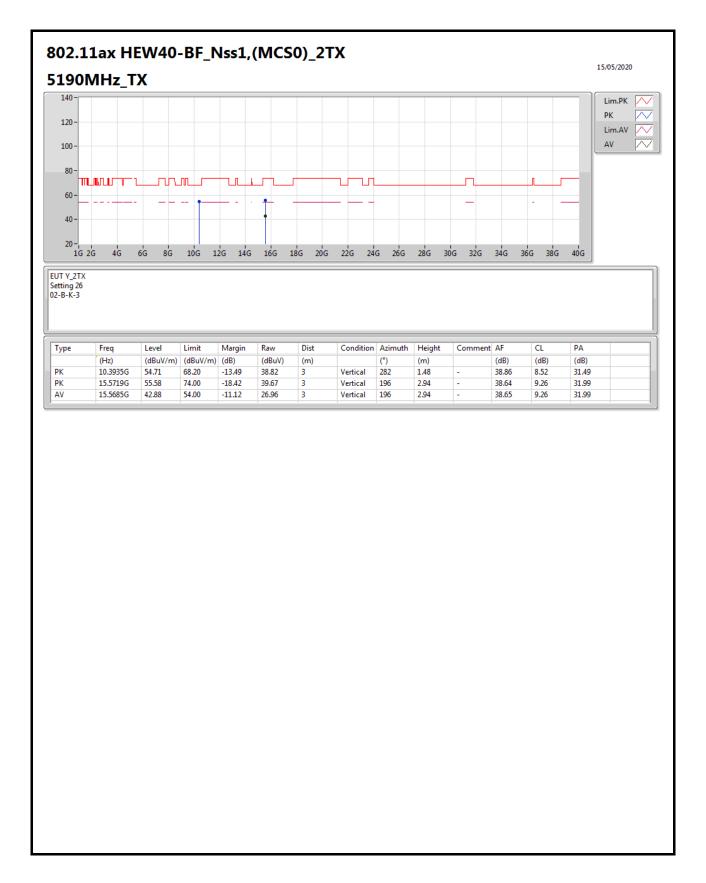




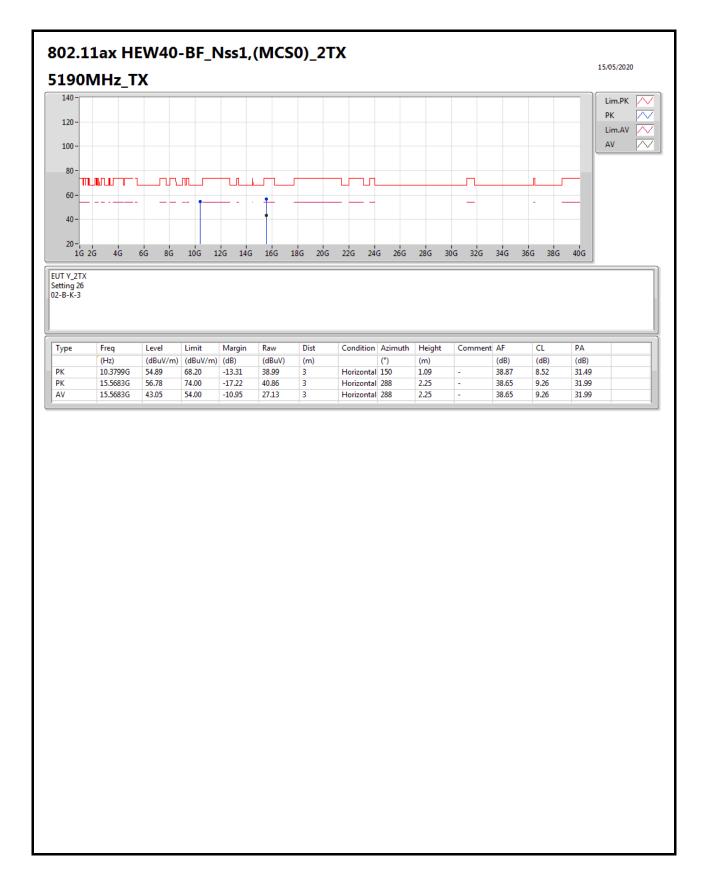




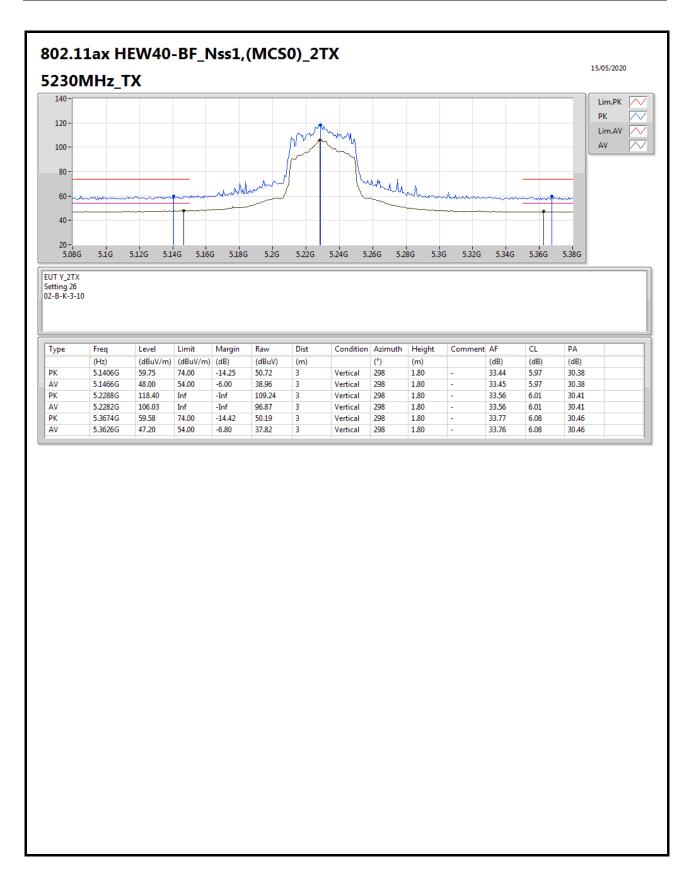




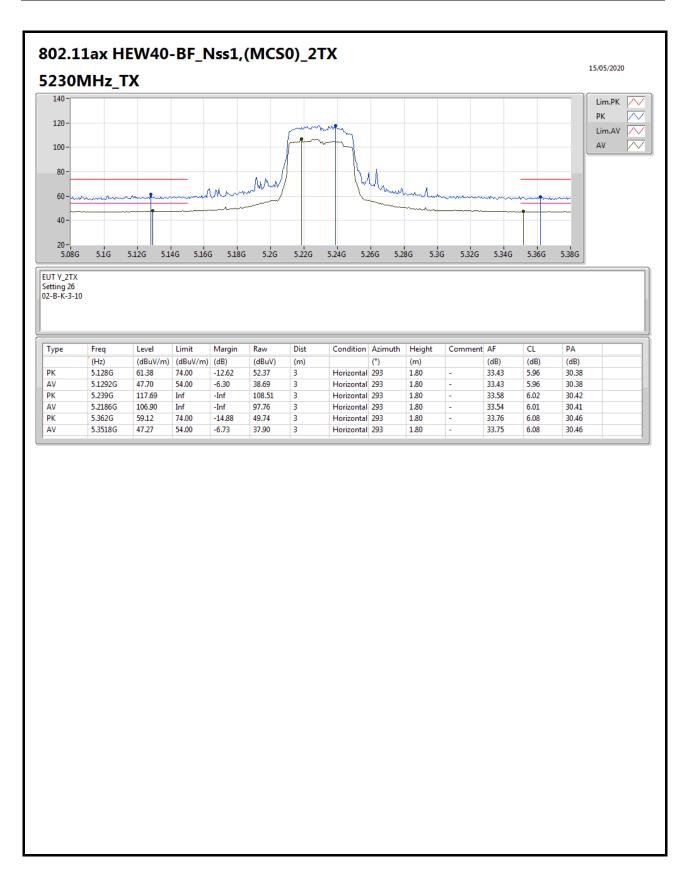




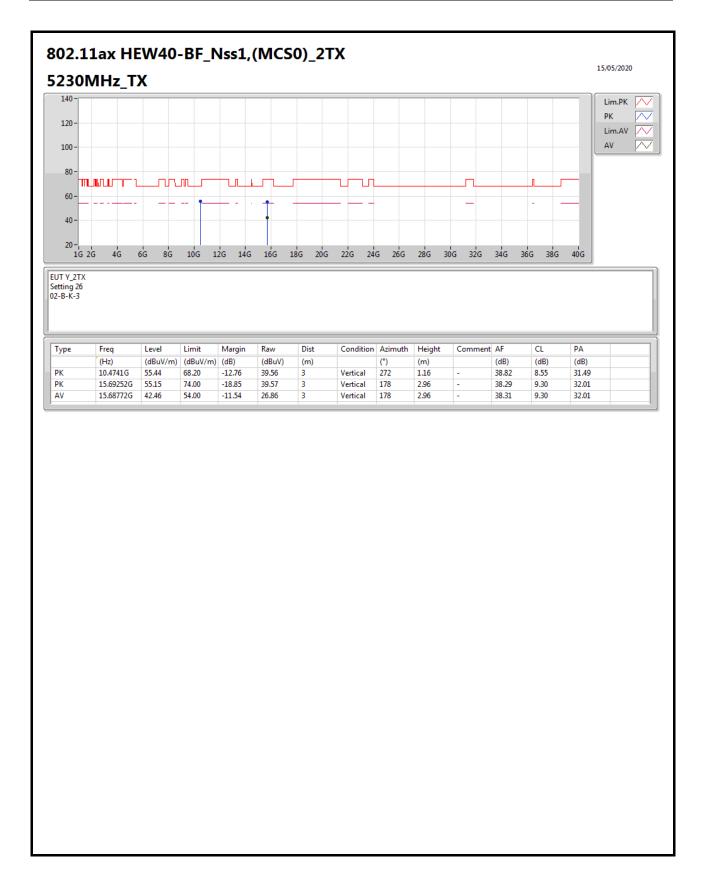




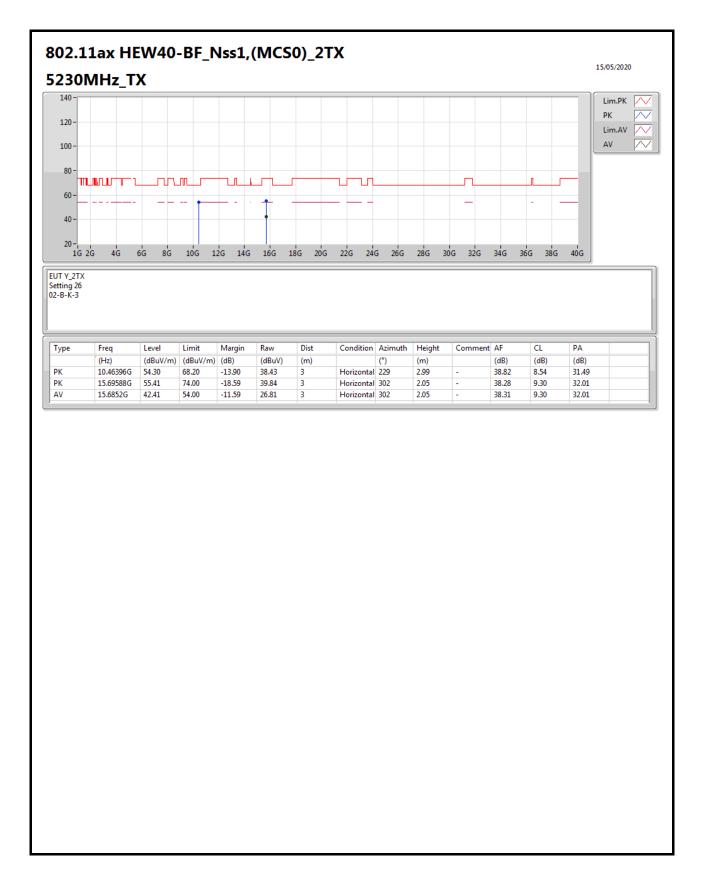




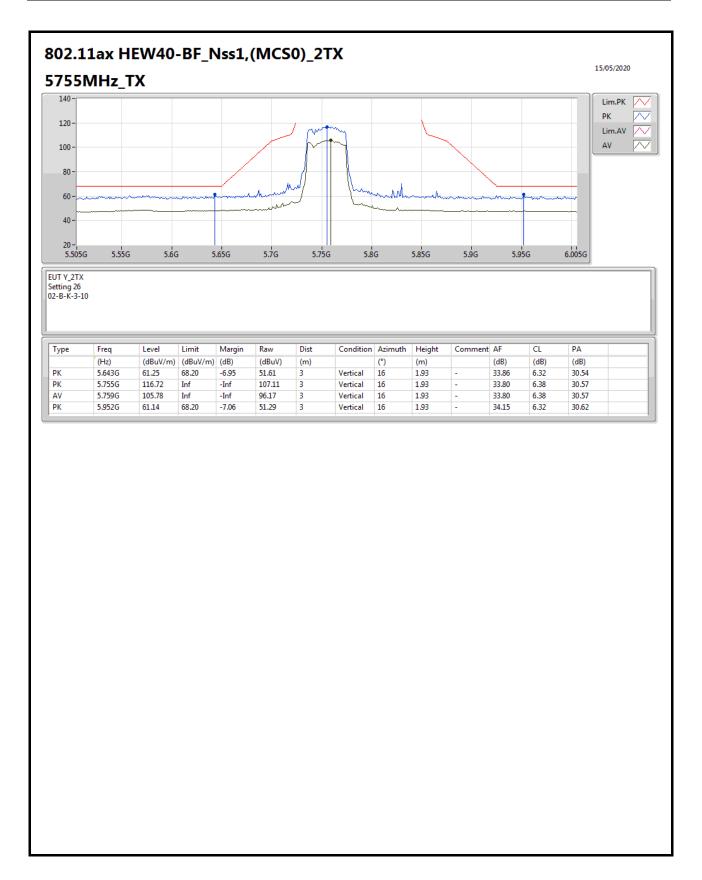




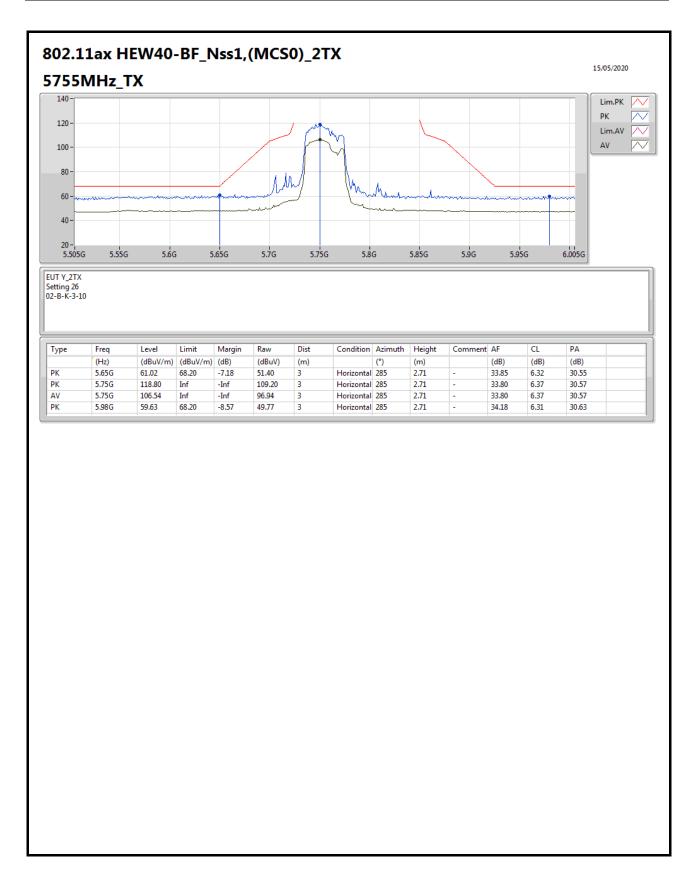




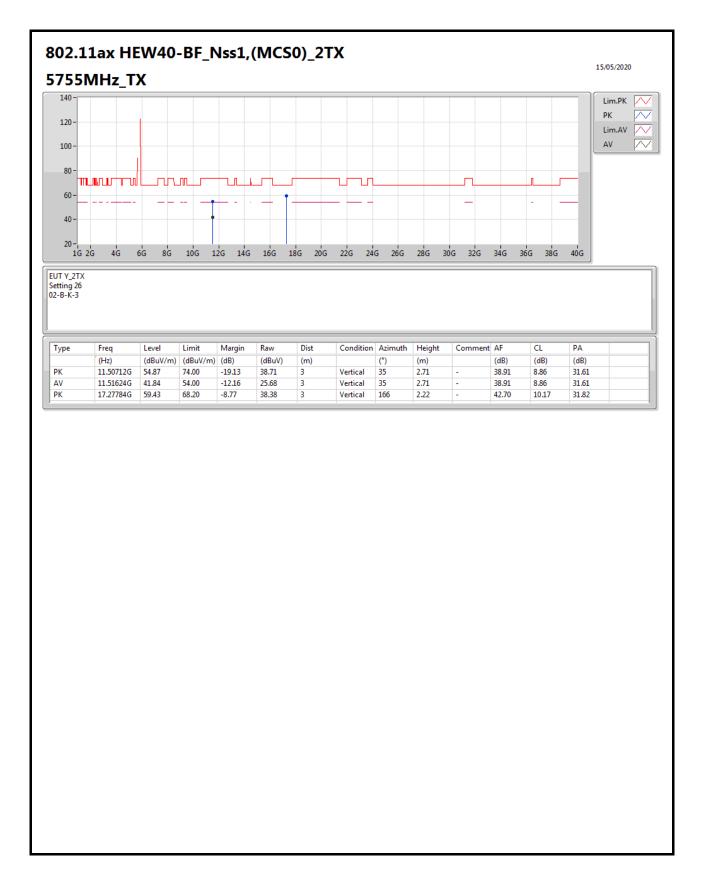




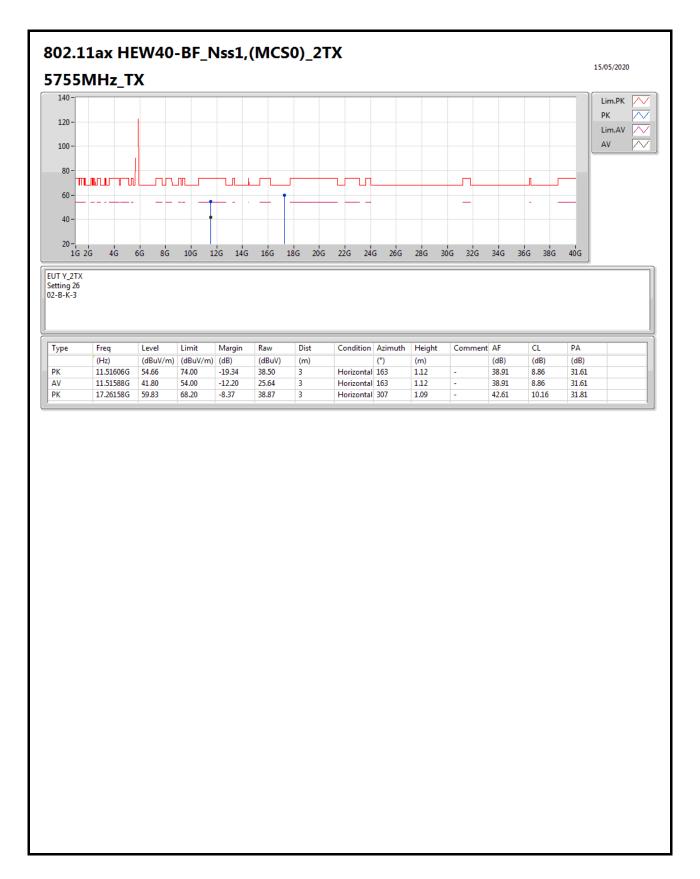




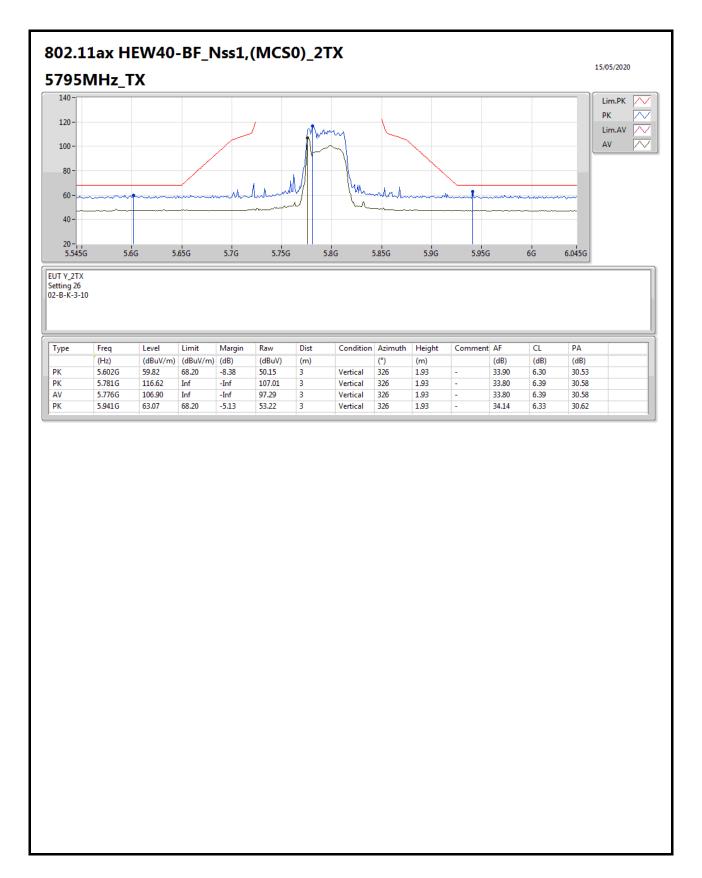




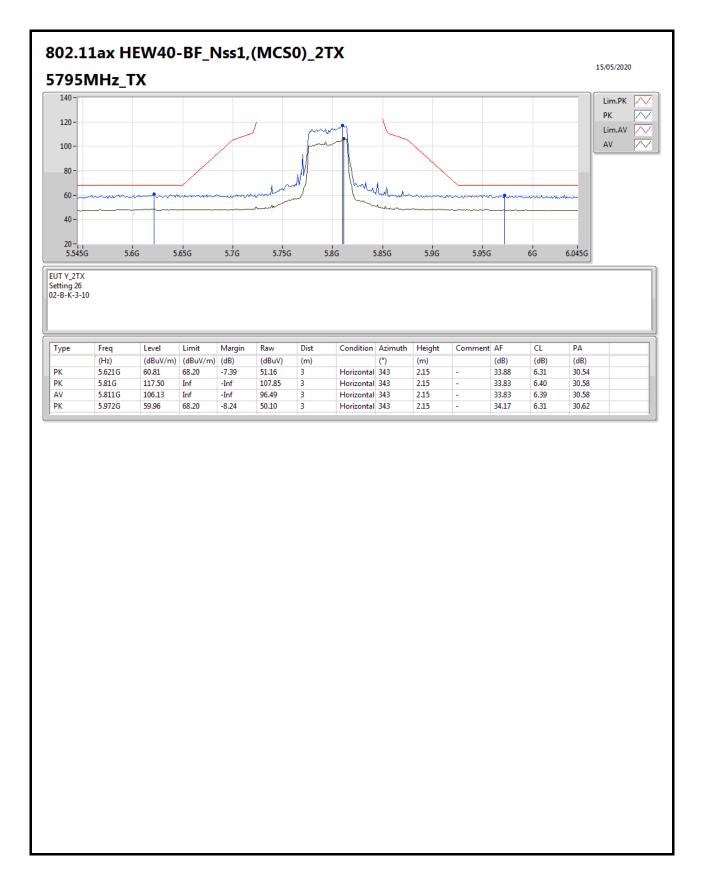






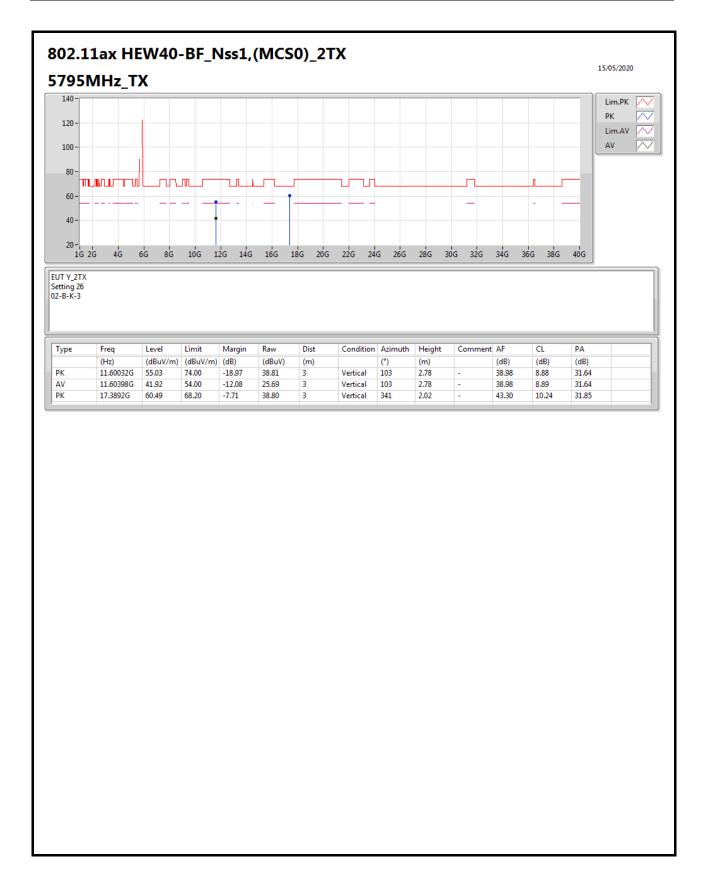




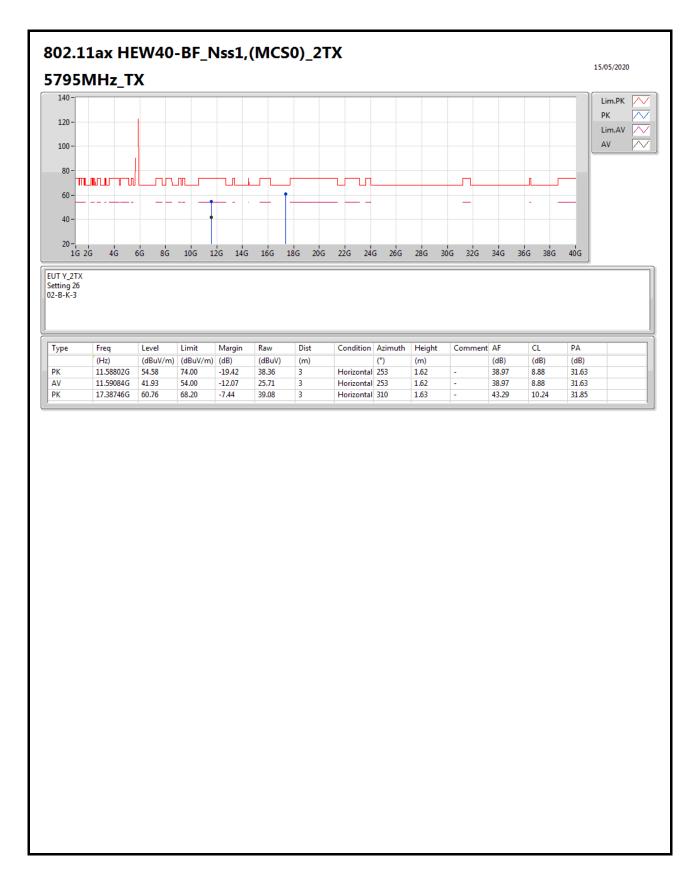


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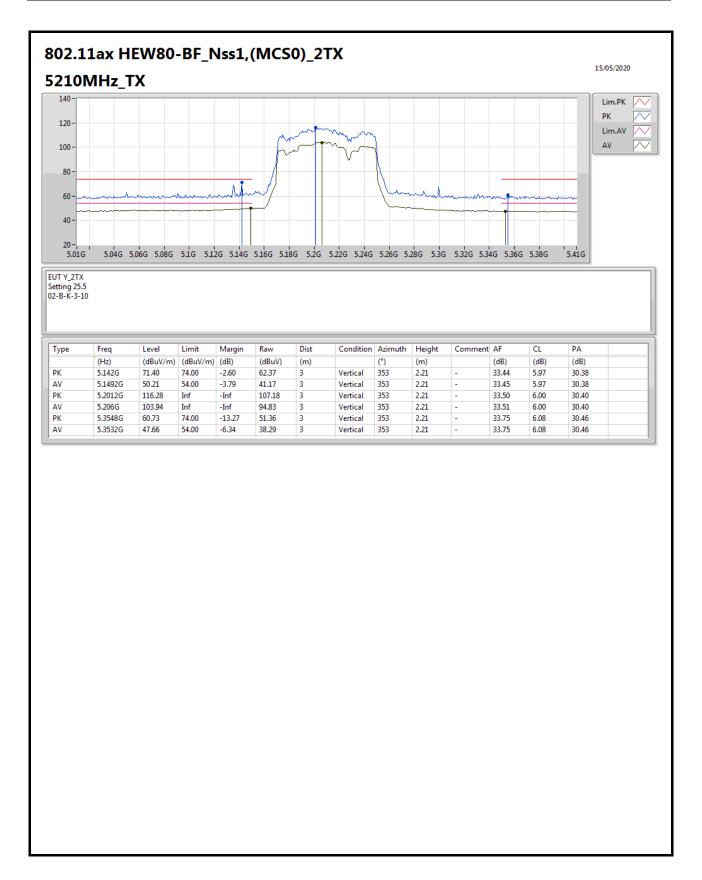




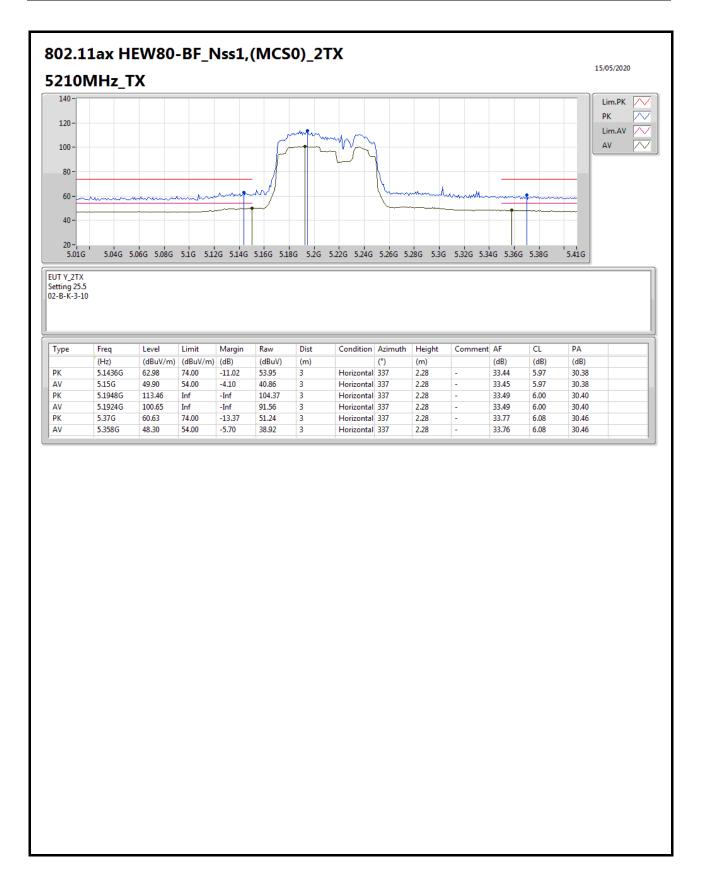




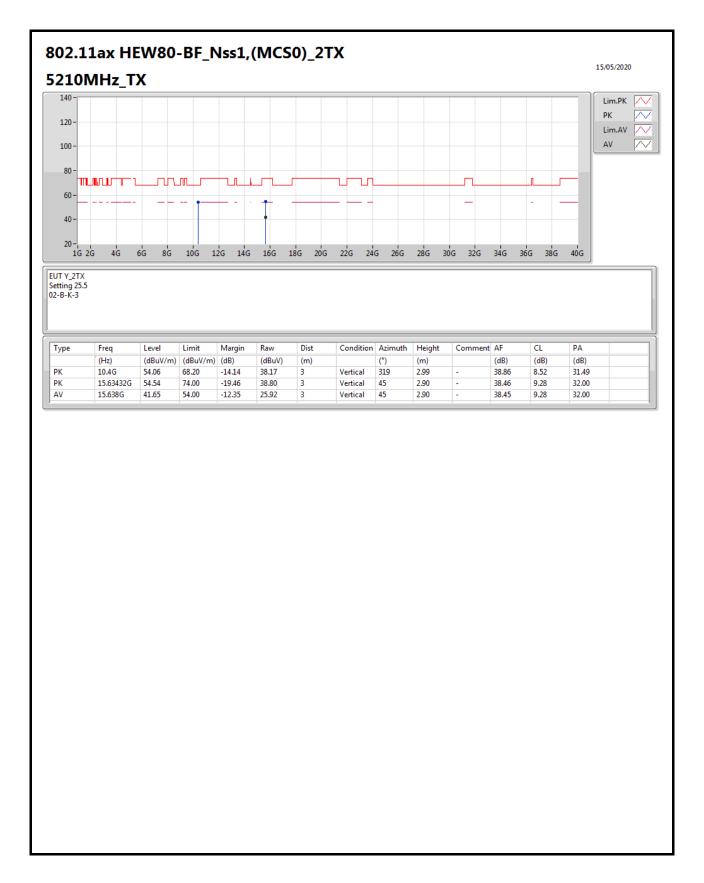




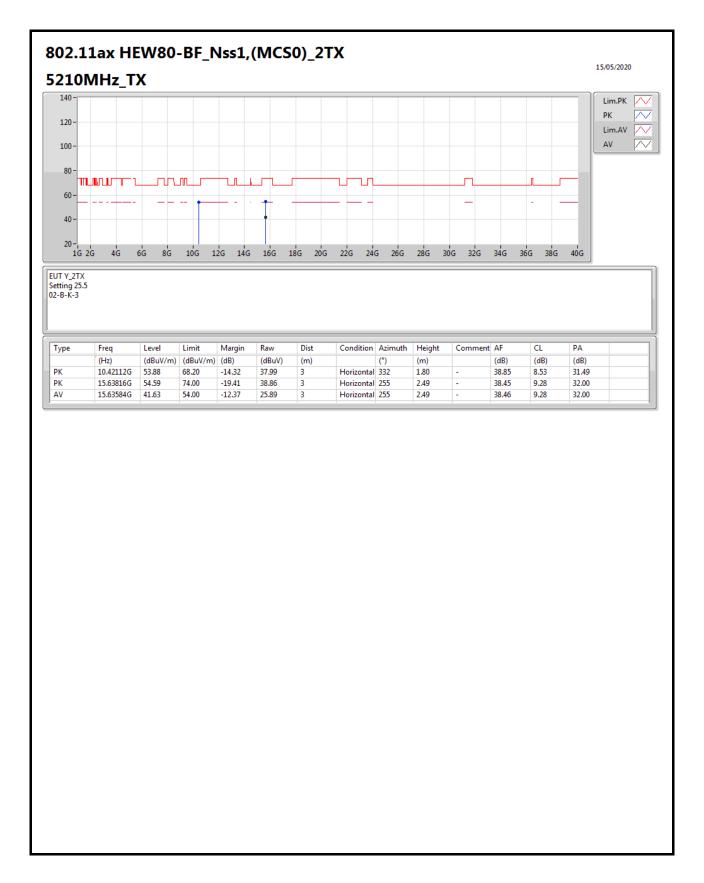






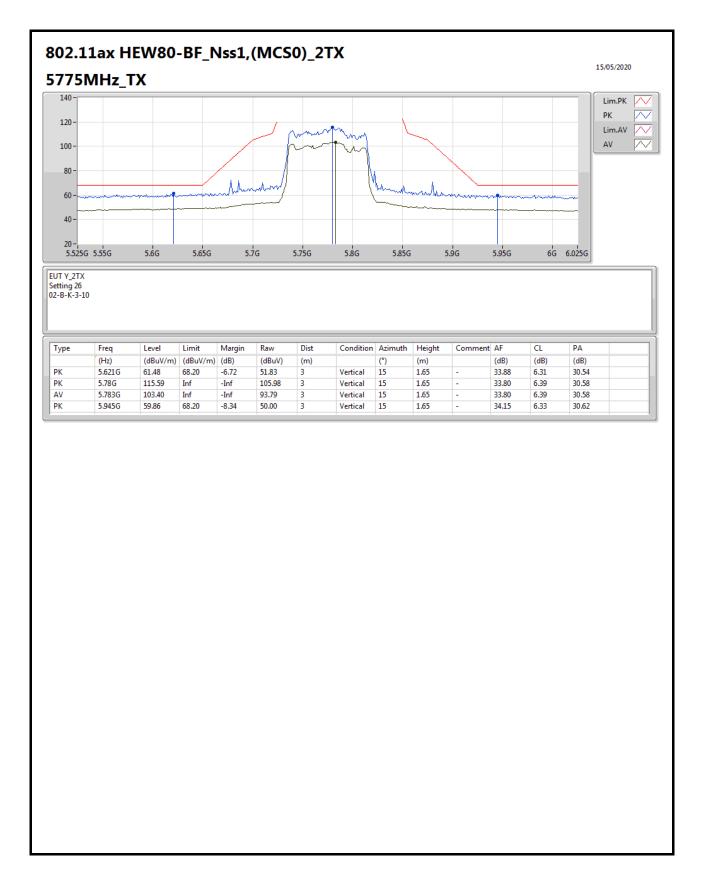




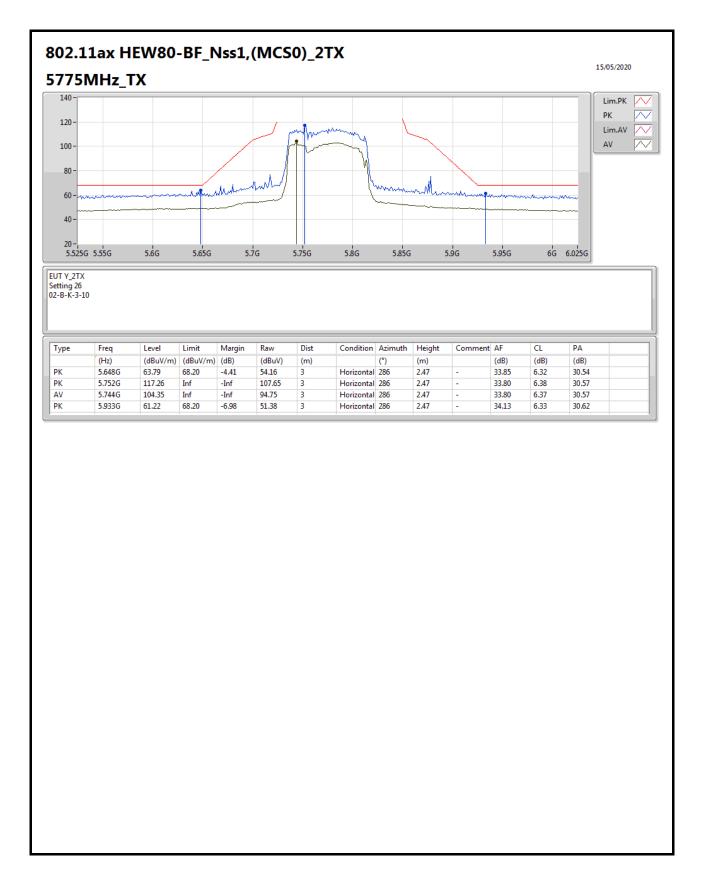


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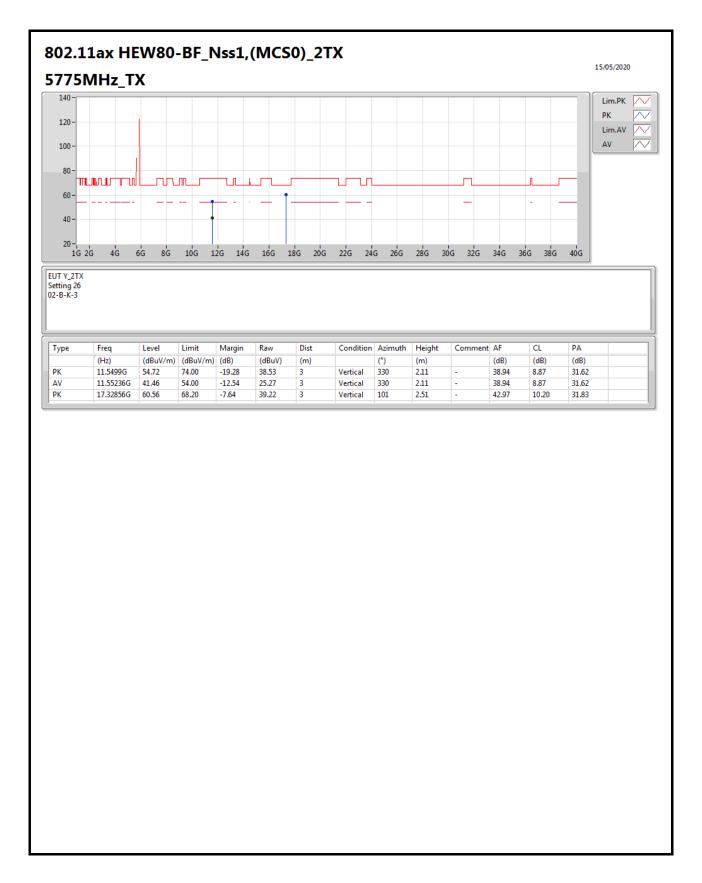




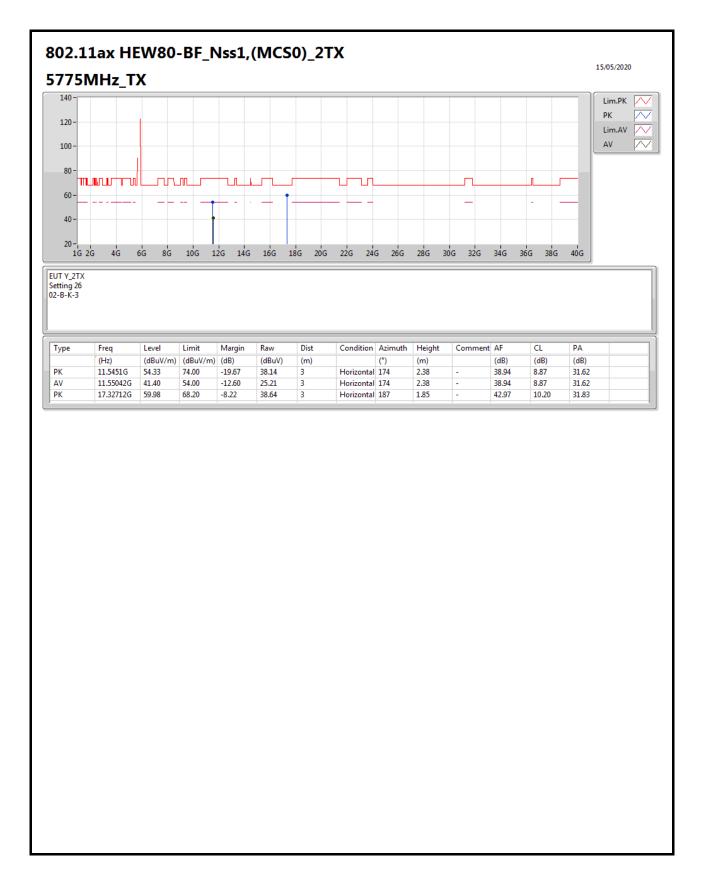




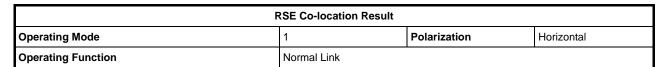


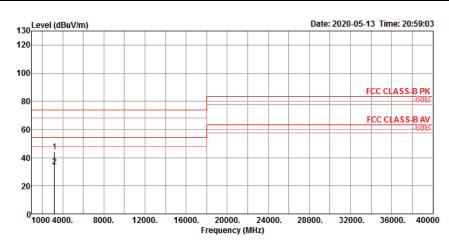






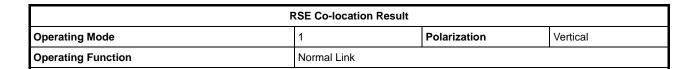


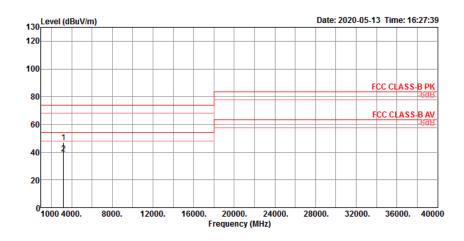




	Freq	Level				Loss Factor				1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 2	3186.12 3186.41										Peak Average	HORIZONTAL HORIZONTAL







		Freq	Level		Over Limit						T/Pos Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
_	1	3186.02	46.83	74.00	-27.17	46.25	4.50	28.84	32.76	207	162 Peak	VERTICAL
L	2	3186.62	38.63	54.00	-15.37	38.05	4.50	28.84	32.76	207	162 Average	VERTICAL