

: 01

Report No.: FR040722AB



FCC RADIO TEST REPORT

FCC ID : MSQ-RTAXIA00

Equipment : Dual Band Wi-Fi Router

Brand Name : ASUS

Model Name : RT-AX68U

Applicant : ASUSTeK COMPUTER INC.

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

Manufacturer (1) : Compal Networking (KunShan) Co., LTD.

No. 520, Nanbang Rd., Economic & Technical

Development Zone Kunshan, Jiangsu Province China

Manufacturer (2) : ARCADYAN TECHNOLOGY (VIETNAM) CO., LTD.

Ba Thien Industrial Park, Ba Hien commune, Binh

Xuven district, Vinh Phuc Province

Standard : 47 CFR FCC Part 15.407

The product was received on Apr. 07, 2020, and testing was started from Apr. 08, 2020 and completed on Jul. 23, 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 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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History of this test report

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Report No.	Version	Description	Issued Date
FR040722AB	01	Initial issue of report	Jul. 31, 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:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen Report Producer: Viola Huang

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1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20), ac (VHT20),	5180-5240	36-48 [4]
5725-5850	ax (HEW20)	5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40),	5190-5230	38-46 [2]
5725-5850	ax (HEW40)	5755-5795	151-159 [2]
5150-5250	ac (VHT80), ax (HEW80)	5210	42 [1]
5725-5850	ac (viiioo), ax (iic vvoo)	5775	155 [1]

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	3
5.15-5.25GHz	802.11n HT20	20	3
5.15-5.25GHz	802.11n HT20-BF	20	3
5.15-5.25GHz	802.11ac VHT20	20	3
5.15-5.25GHz	802.11ac VHT20-BF	20	3
5.15-5.25GHz	802.11ax HEW20	20	3
5.15-5.25GHz	802.11ax HEW20-BF	20	3
5.15-5.25GHz	802.11n HT40	40	3
5.15-5.25GHz	802.11n HT40-BF	40	3
5.15-5.25GHz	802.11ac VHT40	40	3
5.15-5.25GHz	802.11ac VHT40-BF	40	3
5.15-5.25GHz	802.11ax HEW40	40	3
5.15-5.25GHz	802.11ax HEW40-BF	40	3
5.15-5.25GHz	802.11ac VHT80	80	3
5.15-5.25GHz	802.11ac VHT80-BF	80	3
5.15-5.25GHz	802.11ax HEW80	80	3
5.15-5.25GHz	802.11ax HEW80-BF	80	3
5.725-5.85GHz	802.11a	20	3
5.725-5.85GHz	802.11n HT20	20	3
5.725-5.85GHz	802.11n HT20-BF	20	3
5.725-5.85GHz	802.11ac VHT20	20	3
5.725-5.85GHz	802.11ac VHT20-BF	20	3
5.725-5.85GHz	802.11ax HEW20	20	3
5.725-5.85GHz	802.11ax HEW20-BF	20	3
5.725-5.85GHz	802.11n HT40	40	3

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Band	Mode	BWch (MHz)	Nant
5.725-5.85GHz	802.11n HT40-BF	40	3
5.725-5.85GHz	802.11ac VHT40	40	3
5.725-5.85GHz	802.11ac VHT40-BF	40	3
5.725-5.85GHz	802.11ax HEW40	40	3
5.725-5.85GHz	802.11ax HEW40-BF	40	3
5.725-5.85GHz	802.11ac VHT80	80	3
5.725-5.85GHz	802.11ac VHT80-BF	80	3
5.725-5.85GHz	802.11ax HEW80	80	3
5.725-5.85GHz	802.11ax HEW80-BF	80	3

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, 1024QAM 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

Set	Ant.	Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)
	1	1	M.gear	C660-510507-A	Dipole Antenna	I-PEX	
1	2	2	M.gear	C660-510508-A	Dipole Antenna	I-PEX	
	3	3	M.gear	C660-510510-A	Dipole Antenna	I-PEX	
	1	1	PSA	RFDPA140813IMLB701	Dipole Antenna	I-PEX	
2	2	2	PSA	RFDPA140806IMLB701	Dipole Antenna	I-PEX	Note 1
	3	3	PSA	RFDPA140805IMLB701	Dipole Antenna	I-PEX	
	1	1	Airgain	M03ASACB-B1X175BU	Dipole Antenna	I-PEX	
3	2	2	Airgain	M03ASACB-HSR3-B1X105BU	Dipole Antenna	I-PEX	
	3	3	Airgain	M03ASACB-HSY3-B1X95BU	Dipole Antenna	I-PEX	

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Note 1:

Set	Ant.	Port	Gain	(dBi)
Set	Ant.	Port	2.4GHz	5GHz
	1	1	1.69	1.89
1	2	2	1.70	1.70
	3	3	1.71	1.86
	1	1	1.68	1.84
2	2	2	1.69	1.70
	3	3	1.66	1.81
	1	1	1.48	1.47
3	2	2	1.70	0.80
	3	3	1.30	0.80

Note 2: The above information was declared by manufacturer.

Note 3: The EUT has two set of antenna and each set has three antennas. There are the same type, so only the highest gain set 1 antenna was selected to test and record in this report.

For 2.4GHz function:

IEEE 802.11b/g/n/VHT/ax (3TX/3RX):

Port 1, Port 2 and Port 3 can be used as transmitting/receiving antenna.

Port 1, Port 2 and Port 3 could transmit/receive simultaneously.

For 5GHz function:

IEEE 802.11a/n/ac/ax (3TX/3RX):

Port 1, Port 2 and Port 3 can be used as transmitting/receiving antenna.

Port 1, Port 2 and Port 3 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_Nss1,(6Mbps)_3TX	0.976	0.11	4.069m	300
802.11ax HEW80_Nss3,(MCS0)_3TX	0.927	0.33	397.5u	3k
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	0.951	0.22	2.932m	1k
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	0.96	0.18	4.365m	300
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	0.957	0.19	4.144m	300
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	0.926	0.33	4.834m	300

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NΙ	Oto:	•
ıv	uic.	

- 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 11n/VHT/11ax in 2.4GHz and 11n/11ac/11ax in 5GHz.				
Function		Outdoor P2M		Indoor P2M	
i dilotion		Fixed P2P		Client	
Test Software Version Non beamforming mode: Mtool V3.2.0.0 Beamforming mode: Telnet			V3.2.0.0		

Note: The above information was declared by manufacturer.

1.1.5 Table for EUT supports functions

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

Note: After evaluating, there are only AP Router and Mesh were selected to test and record in the 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

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	Serway Li	23.4~24.4°C / 59~63%	May 12, 2020
Radiated below 1GHz	03CH05-CB	Stim Sung	32.1~33.3°C / 42~45%	Jun. 30, 2020
Radiated above 1GHz	03CH02-CB	Stim Sung	23.9~24.5°C / 52~23%	Apr. 08, 2020 ~ May 18, 2020
reducted above 10112	03CH06-CB	Stim Sung	24.2~24.5°C / 52~53%	Apr. 08, 2020 ~ May 18, 2020
Radiated above 1GHz (For co-location)	03CH02-CB	JN Du	25.8~26.7°C / 59~61%	Jul. 23, 2020
AC Conduction	CO01-CB	Ryo Fan	21~22°C / 60~61%	Jun. 19, 2020

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

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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)

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Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.6 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)_3TX	-
5180MHz	94
5200MHz	98
5240MHz	99
5745MHz	102
5785MHz	103
5825MHz	104
802.11ax HEW80_Nss3,(MCS0)_3TX	-
5210MHz	83
5775MHz	93
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-
5180MHz	84
5200MHz	97
5240MHz	97
5745MHz	98
5785MHz	98
5825MHz	99
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-
5190MHz	81
5230MHz	97
5755MHz	98
5795MHz	98
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	-
5210MHz	83
5775MHz	97
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	-
5210MHz	83
5775MHz	92

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Note:

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

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2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests				
Tests Item AC power-line conducted emissions				
Condition AC power-line conducted measurement for line and neutral				
Operating Mode Normal Link				
1 AP Router mode-EUT + Adapter 1 + Antenna Set 1				
2 AP Router mode-EUT + Adapter 2 + Antenna Set 1				
Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 ~ 4 will follow this same test mode.				
3	Mesh mode-EUT_2.4GHz + Adapter 2 + Antenna Set 1			
4 Mesh mode-EUT_5GHz + Adapter 2 + Antenna Set 1				
For operating mode 2 is the worst case and it was record in this test report.				

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Т	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		
1	EUT + Antenna Set 1		

The 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	EUT_2.4GHz + Adapter 1 + Antenna Set 1			
2	EUT_2.4GHz + Adapter 2 + Antenna Set 1			
Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will fo this same test mode.				
3	EUT_5GHz + Adapter 2 + Antenna Set 1			
For operating mode 2 is the worst case and it was record in this test report.				
Operating Mode > 1GHz	CTX			
1	EUT + Antenna Set 1			

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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				
1 WLAN 2.4GHz + WLAN 5GHz - EUT + Antenna Set 1				
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- EUT + Antenna Set 1			
Refer to Sporton Test Report No.: FA040722 for Co-location RF Exposure Evaluation.				

Note: The EUT can only use Y axis position.

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2.3 EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

beamforming mode:

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%.

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For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

and Name	Model Name	Rating				
DELTA	ADP-33AW Y	Input: 100-240V ~ 1.0A, 50-60Hz Output: 19.0V, 1.75A 33.0W				
PI	AD2131320	Input: 100-240V ~ 50/60Hz 0.8A Output: 19.0V, 1.75A 33.0W				
Others						
ı	PI ed, 1.5m	Others				

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2.5 Support Equipment

For AC Conduction:

Support Equipment							
No.	Equipment	Brand Name	Model Name	FCC ID			
Α	HDD3.0	WD	WDBACY5000AWT	N/A			
В	LAN1 NB	DELL	E6430	N/A			
С	LAN4 NB	DELL	E6430	N/A			
D	2.4G NB	DELL	E6430	N/A			
Е	5G NB	DELL	E6430	N/A			
F	HDD3.0	WD	WDBACY5000AWT	N/A			
G	WAN NB	DELL	T3400	N/A			

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For Radiated (below 1GHz) and RF Conducted:

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

For Radiated (above 1GHz):

For non beamforming mode

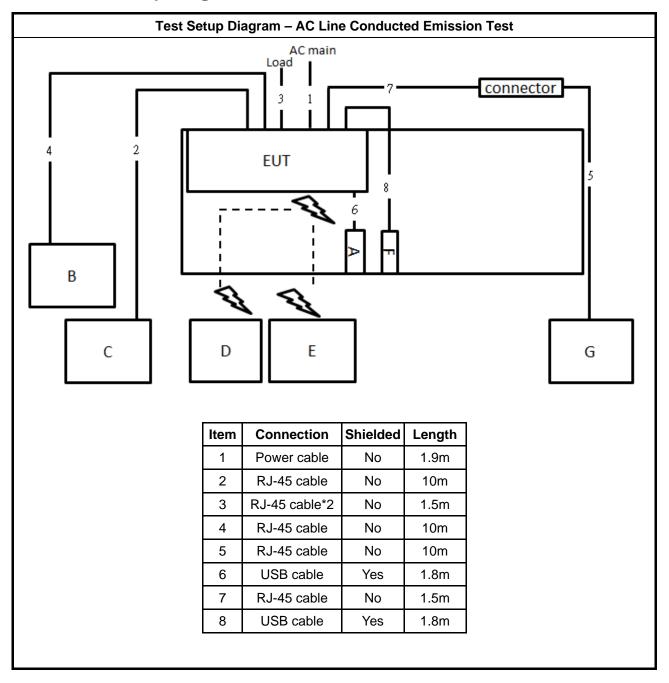
	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
Α	Notebook	DELL	E4300	N/A

For beamforming mode

	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
Α	Notebook	DELL	E4300	N/A
В	RX Device	ASUS	RT-AX82U	N/A
С	Notebook	DELL	E4300	N/A

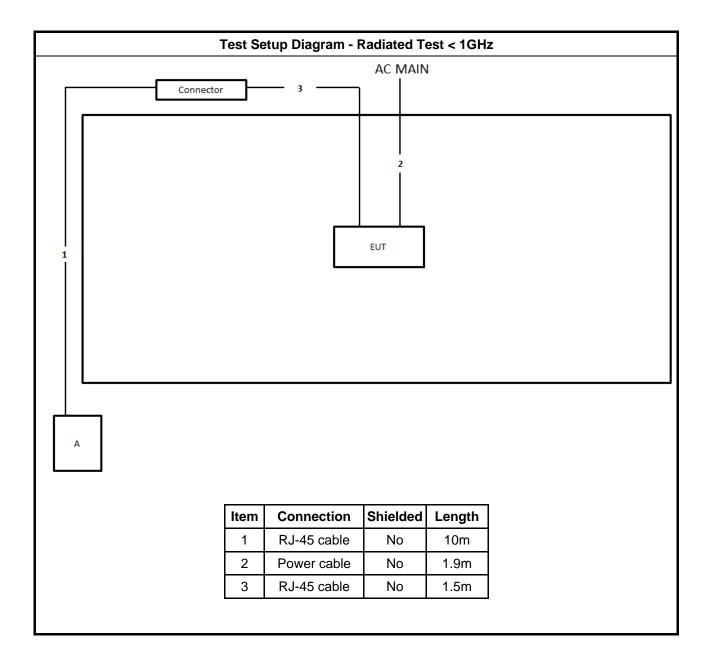
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2.6 Test Setup Diagram

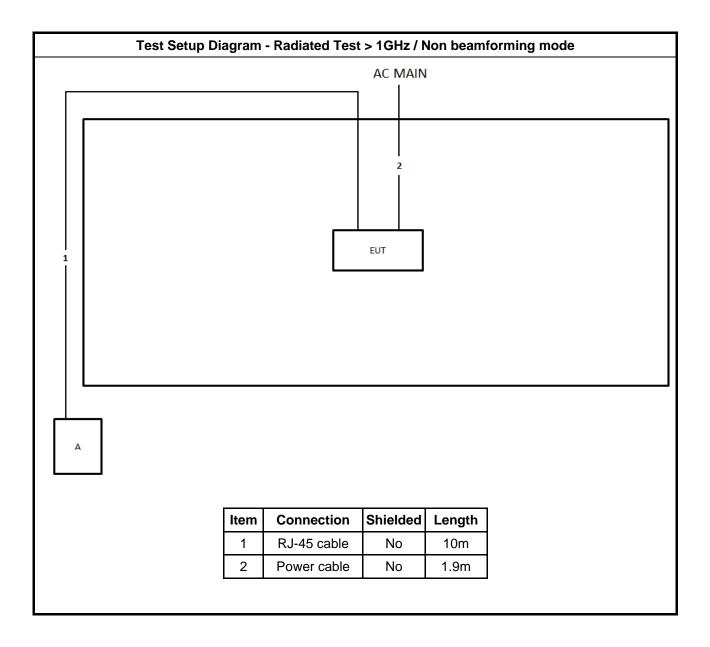


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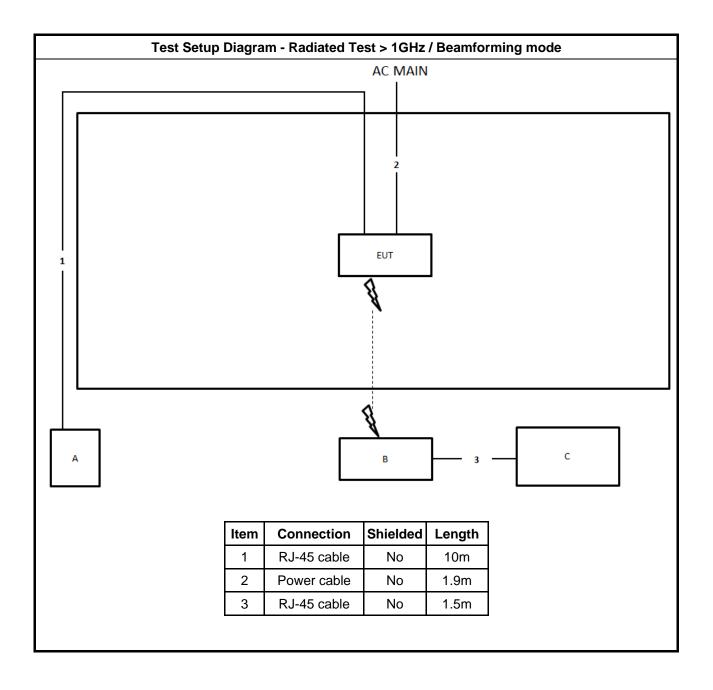
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3 Transmitter Test Result

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

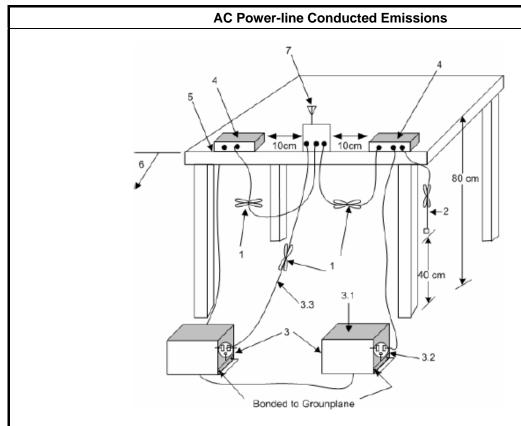
Refer a test equipment and calibration data table in this test report.

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	JNII 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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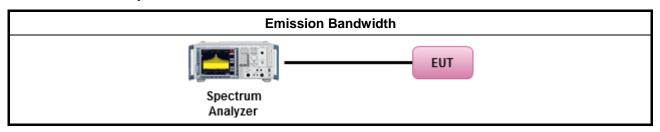
3.2.2 Measuring Instruments

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:		
	\boxtimes	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	I 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 \leq 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.
	e = maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi.

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3.3.2 Measuring Instruments

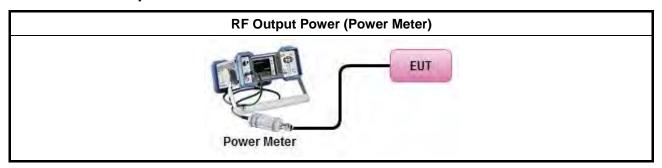
Refer a test equipment and calibration data table in this test report.

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	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) \leq 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).
	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) ≤ 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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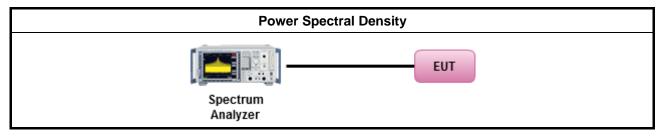
3.4.3 Test Procedures

	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.

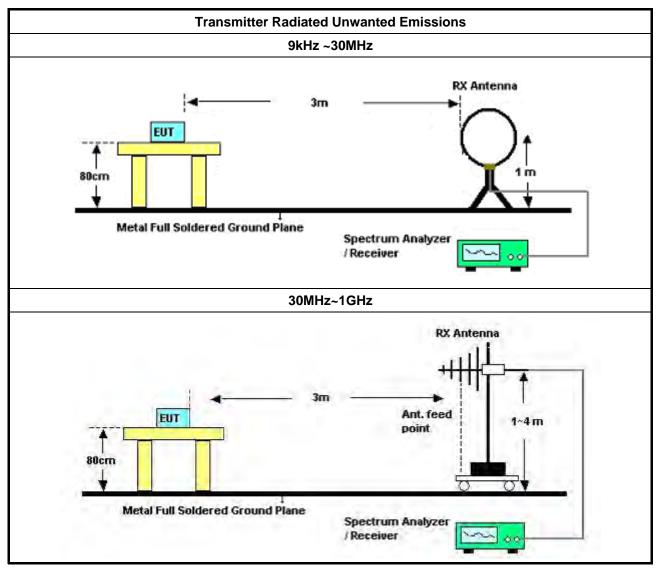
3.5.3 Test Procedures

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.

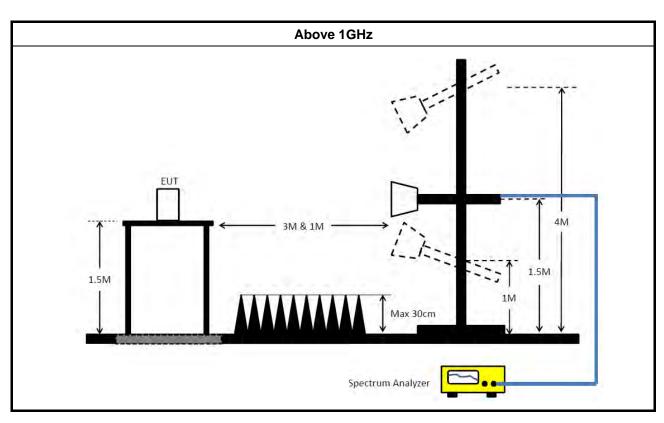
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3.5.4 Test Setup



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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)
Pulse Limiter	Rohde& Schwarz	ESH3-Z2	100430	9kHz ~ 30MHz	Jan. 31, 2020	Jan. 30, 2021	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 20, 2020	May 19, 2021	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	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 27, 2020	Mar. 26, 2021	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 28, 2020	Apr. 27, 2021	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 13, 2020	May 12, 2021	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
Horn Antenna	EMCO	3115	9610-4976	1GHz ~ 18GHz	Apr. 24, 2019	Apr. 23, 2020	Radiation (03CH02-CB)
Horn Antenna	EMCO	3115	9610-4976	1GHz ~ 18GHz	Apr. 21, 2020	Apr. 20, 2021	Radiation (03CH02-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 27, 2019	Jun. 26, 2020	Radiation (03CH02-CB)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 11, 2020	Jun. 10, 2021	Radiation (03CH02-CB)
Pre-Amplifier	Agilent	83017A	MY39501305	1GHz ~ 26.5GHz	Aug. 21, 2019	Aug. 20, 2020	Radiation (03CH02-CB)
Pre-Amplifier	Agilent	83017A	MY39501305	1GHz ~ 26.5GHz	Jul. 13, 2020	Jul. 12, 2021	Radiation (03CH02-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH02-CB)
Amplifier	-	-	TF-130N-R1	18GHz ~ 40GHz	Jun. 19, 2020	Jun. 18, 2021	Radiation (03CH02-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 2020	Radiation (03CH02-CB)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
High Cable	Woken	RG402	High Cable-18	1GHz ~ 18GHz Oct. 07, 2019		Oct. 06, 2020	Radiation (03CH02-CB)
High Cable	Woken	RG402	High Cable-18+19	1GHz ~ 18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH02-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	18GHz ~ 40 GHz		Radiation (03CH02-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH02-CB)
Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 17, 2019	Jul. 16, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 08, 2019	May 07, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 07, 2020	May 06, 2021	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUH NER	RG402	High Cable-05	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUH NER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-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.

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

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

Report Template No.: CB-A12_1 Ver1.2

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: Jul. 31, 2020 Issued Date

Report Version : 01

Report No.: FR040722AB



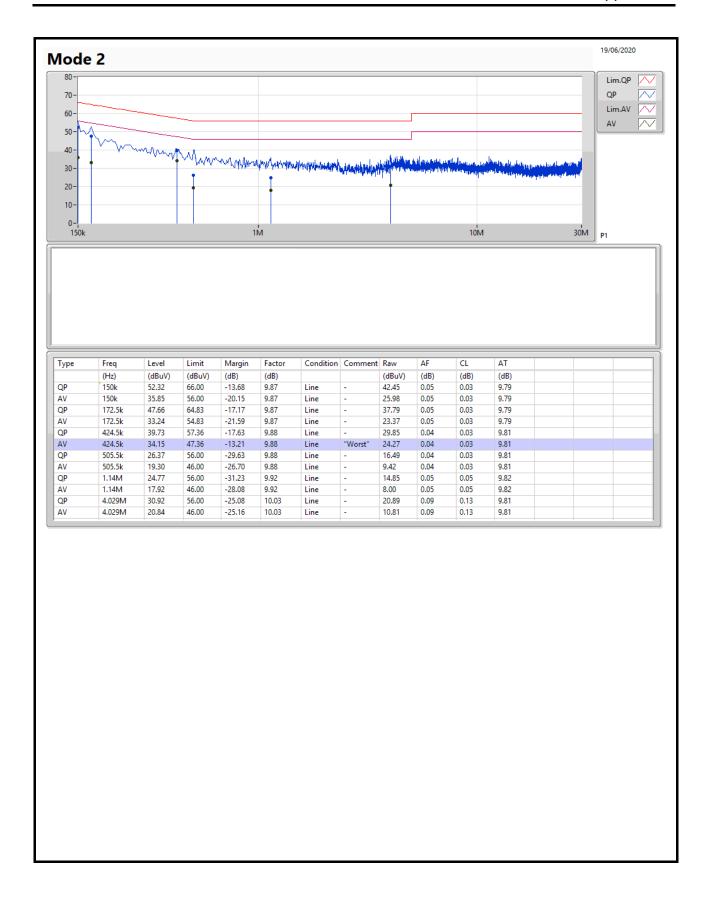
AC Power Port Conducted Emission Result

Appendix A

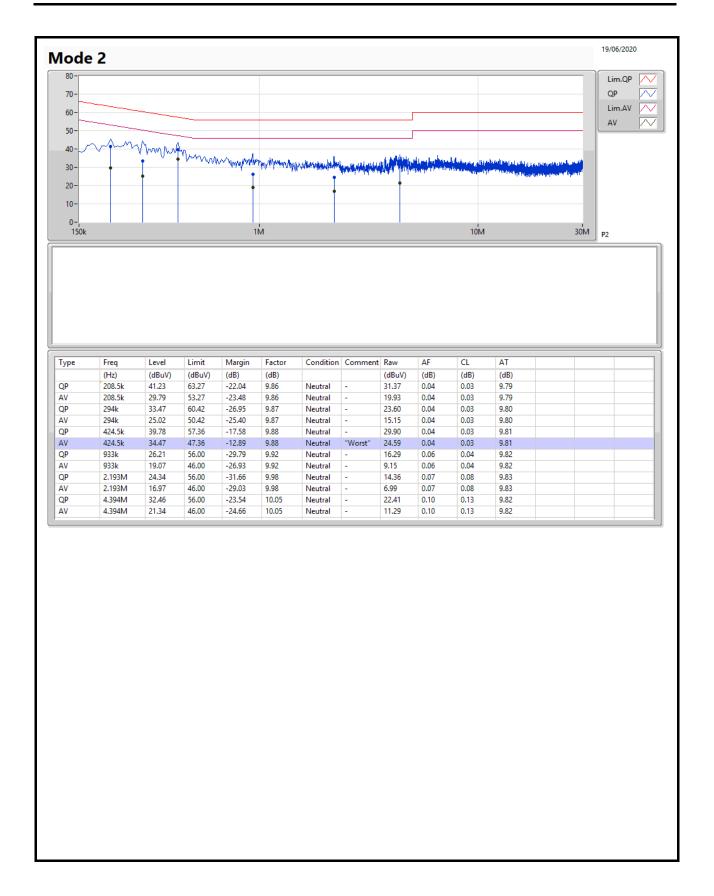
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Condition
			(Hz)	(dBuV)	(dBuV)	(dB)	(dB)	
Mode 2	Pass	AV	424.5k	34.47	47.36	-12.89	9.88	Neutral











Appendix B **EBW**

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)_3TX	22.89M	16.942M	16M9D1D	21.12M	16.702M
802.11ax HEW80_Nss3,(MCS0)_3TX	81.24M	77.361M	77M4D1D	81.12M	77.001M
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	23.4M	19.16M	19M2D1D	21.33M	19.07M
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	40.32M	37.661M	37M7D1D	39.84M	37.481M
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	81.36M	76.762M	76M8D1D	81.24M	76.642M
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	81.72M	77.121M	77M1D1D	81.12M	76.882M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_3TX	16.53M	17.481M	17M5D1D	16.26M	17.091M
802.11ax HEW80_Nss3,(MCS0)_3TX	75.72M	77.601M	77M6D1D	75.12M	77.241M
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	18.93M	19.22M	19M2D1D	18.6M	19.16M
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	37.5M	37.841M	37M8D1D	36.96M	37.661M
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	76.32M	77.241M	77M2D1D	75.12M	77.121M
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	77.76M	77.361M	77M4D1D	75.72M	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;

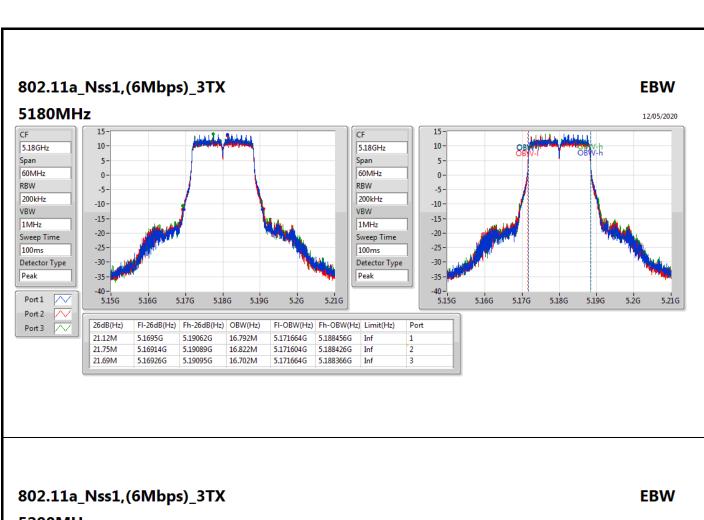
Min-OBW = Minimum 99% occupied bandwidth;

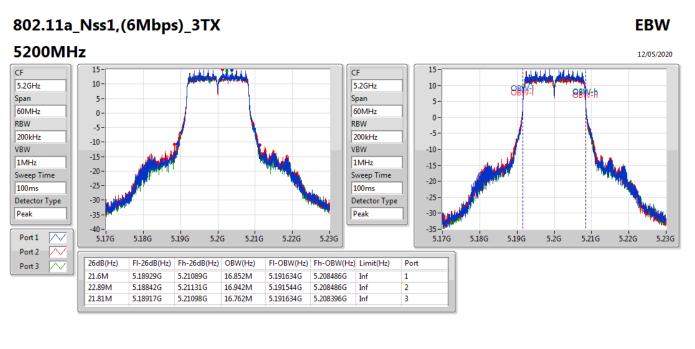


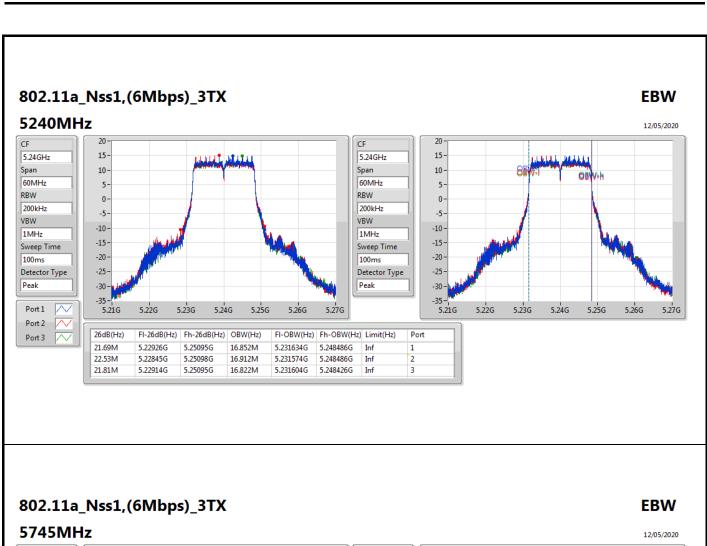
Result

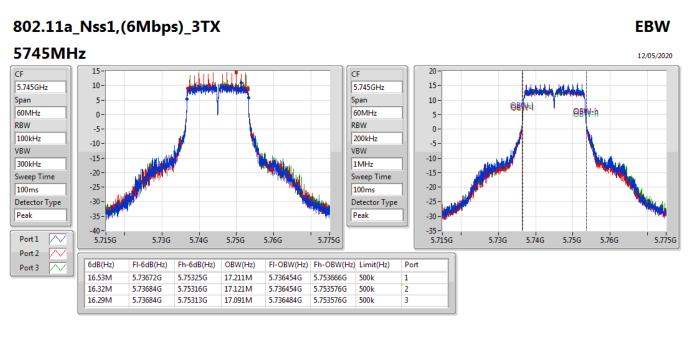
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW	Port 3-N dB	Port 3-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11a_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.12M	16.792M	21.75M	16.822M	21.69M	16.702M
5200MHz	Pass	Inf	21.6M	16.852M	22.89M	16.942M	21.81M	16.762M
5240MHz	Pass	Inf	21.69M	16.852M	22.53M	16.912M	21.81M	16.822M
5745MHz	Pass	500k	16.53M	17.211M	16.32M	17.121M	16.29M	17.091M
5785MHz	Pass	500k	16.29M	17.451M	16.29M	17.211M	16.32M	17.181M
5825MHz	Pass	500k	16.26M	17.481M	16.32M	17.481M	16.26M	17.391M
802.11ax HEW80_Nss3,(MCS0)_3TX	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.24M	77.001M	81.12M	77.001M	81.24M	77.361M
5775MHz	Pass	500k	75.12M	77.361M	75.12M	77.241M	75.72M	77.601M
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-
5180MHz	Pass	Inf	21.33M	19.07M	21.42M	19.07M	21.54M	19.07M
5200MHz	Pass	Inf	23.4M	19.13M	22.89M	19.16M	22.95M	19.16M
5240MHz	Pass	Inf	22.74M	19.13M	23.28M	19.13M	22.92M	19.16M
5745MHz	Pass	500k	18.6M	19.22M	18.93M	19.16M	18.87M	19.19M
5785MHz	Pass	500k	18.87M	19.16M	18.9M	19.16M	18.78M	19.19M
5825MHz	Pass	500k	18.9M	19.19M	18.87M	19.19M	18.87M	19.22M
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-
5190MHz	Pass	Inf	40.2M	37.541M	39.84M	37.481M	39.96M	37.541M
5230MHz	Pass	Inf	40.32M	37.661M	39.96M	37.601M	40.2M	37.601M
5755MHz	Pass	500k	36.96M	37.841M	37.5M	37.721M	37.32M	37.661M
5795MHz	Pass	500k	37.08M	37.841M	37.08M	37.661M	37.26M	37.721M
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.24M	76.642M	81.24M	76.762M	81.36M	76.642M
5775MHz	Pass	500k	76.08M	77.241M	75.12M	77.121M	76.32M	77.241M
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	-	-	-	-	-	-	-	-
5210MHz	Pass	Inf	81.12M	76.882M	81.36M	77.121M	81.72M	77.121M
5775MHz	Pass	500k	75.72M	77.121M	75.96M	77.241M	77.76M	77.361M

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;









Port 2

Port 3

6dB(Hz)

16.26M

16.32M

16.26M

FI-6dB(Hz) Fh-6dB(Hz)

5.8331G

5.83313G

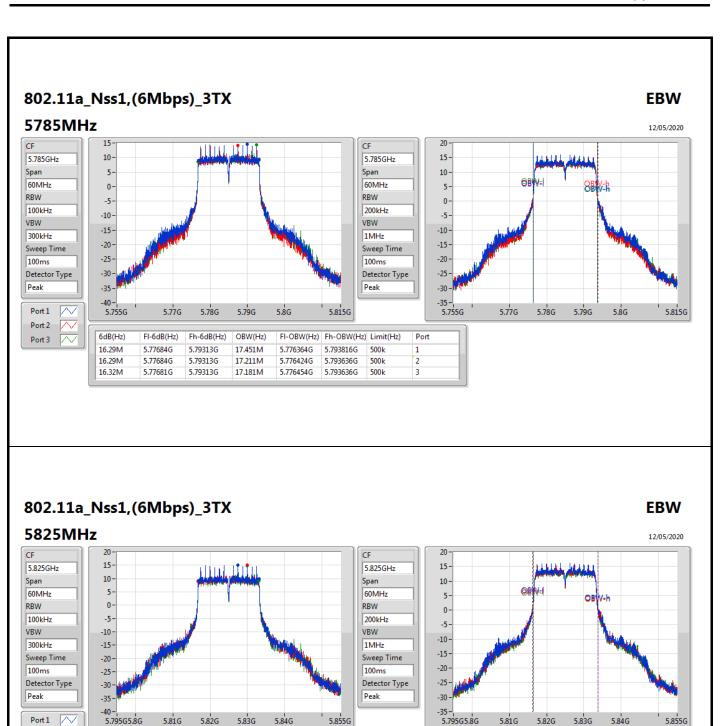
5.83313G

5.81684G

5.81681G

5.81687G

EBW Appendix B



OBW(Hz)

17.481M

17.481M

17.391M

FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz)

5.833846G

5.833786G

5.833786G

500k

500k

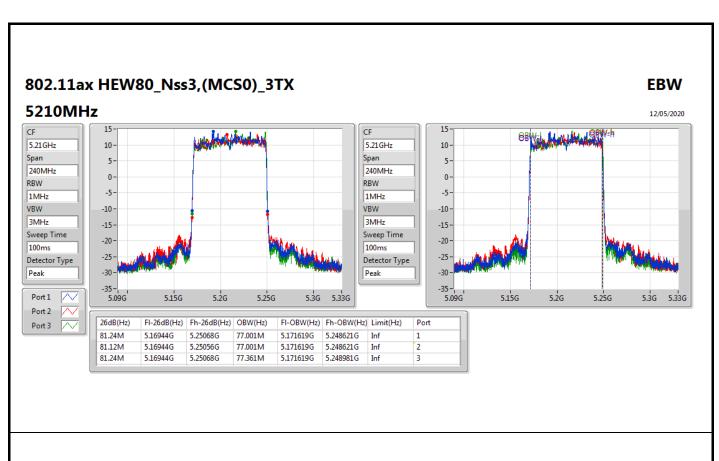
500k

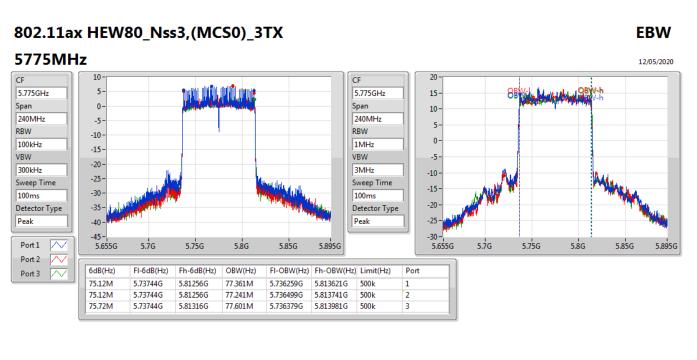
5.816364G

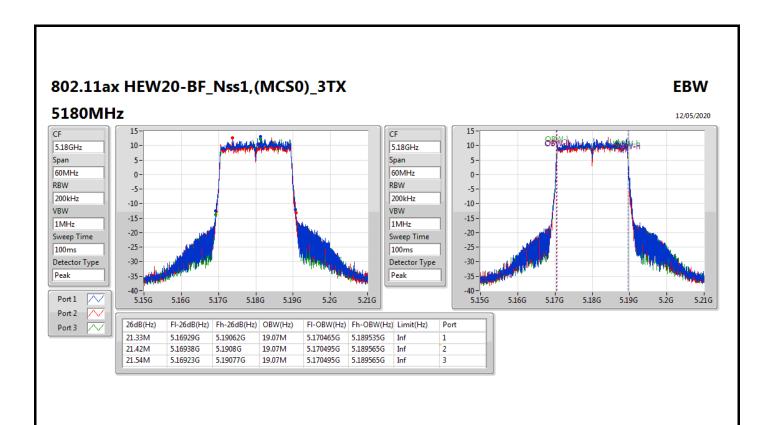
5.816304G

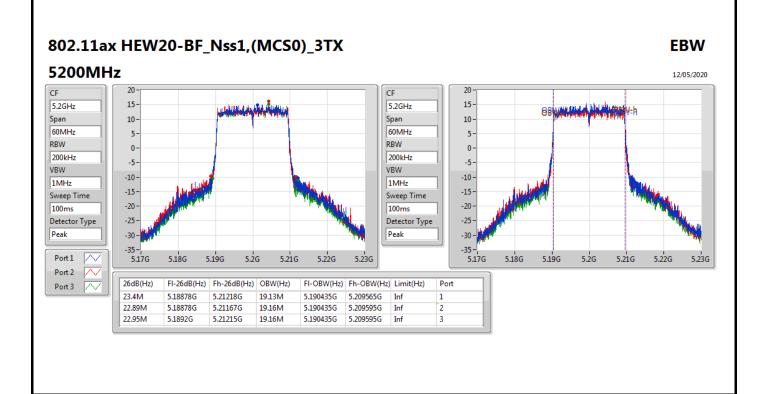
5.816394G

Port

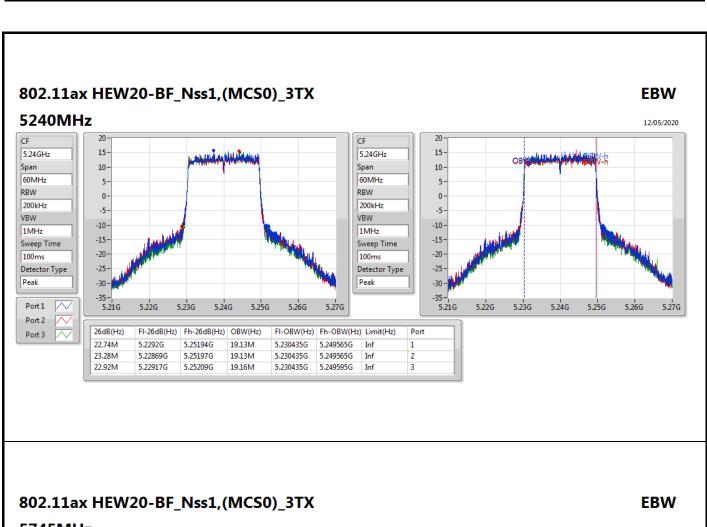


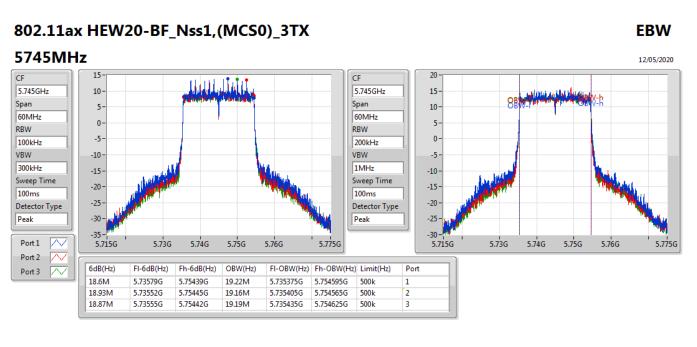


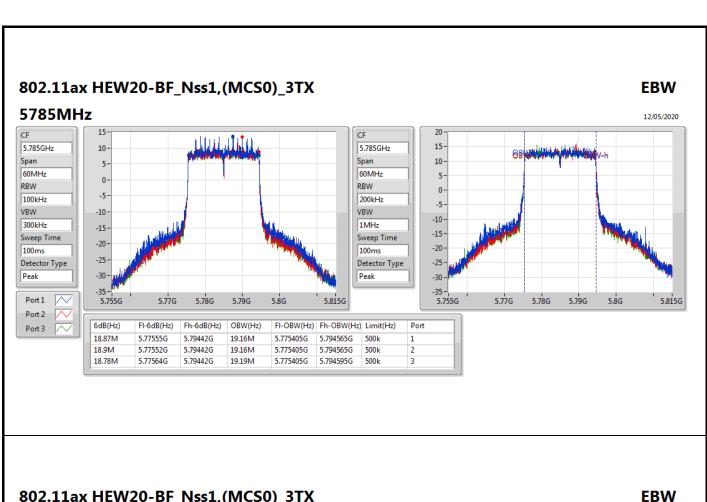


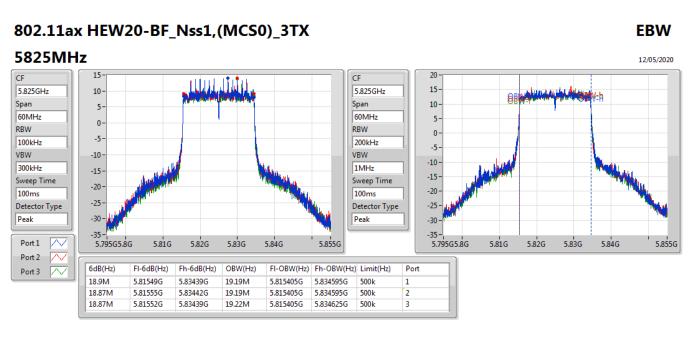


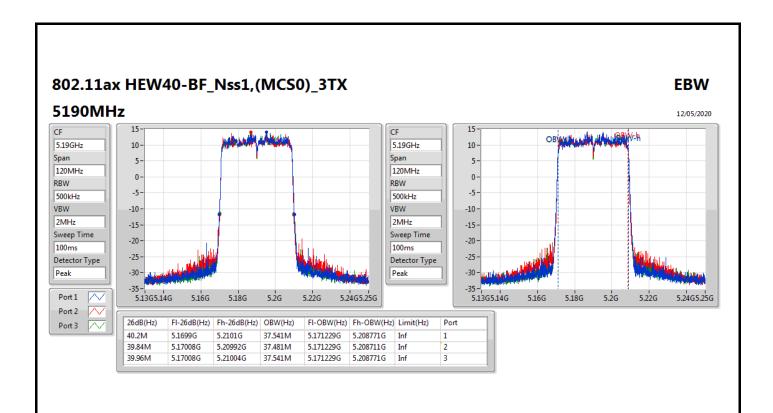
: 7 of 13

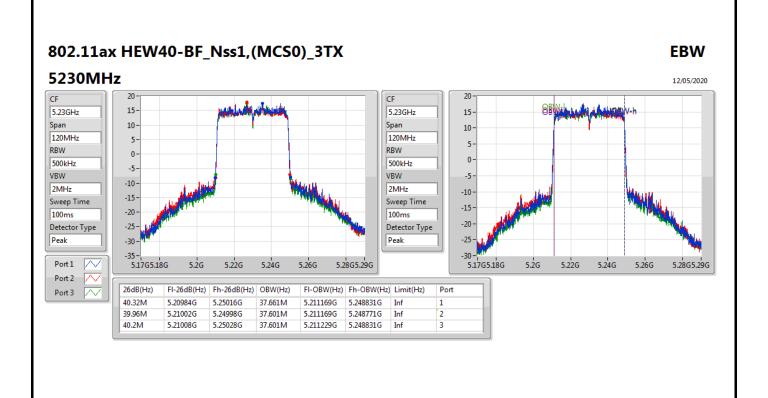


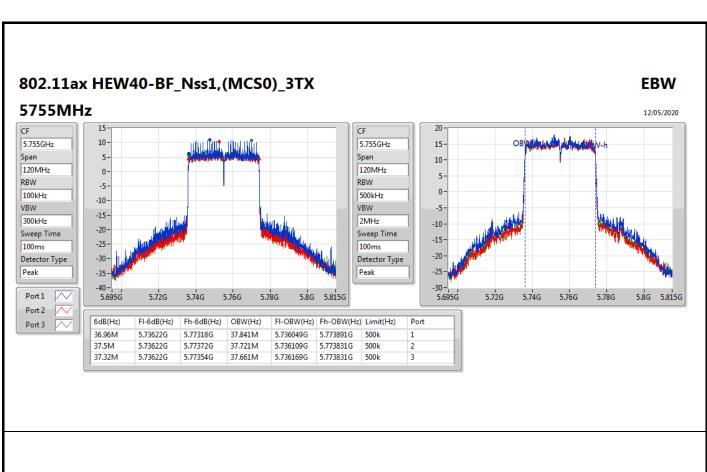


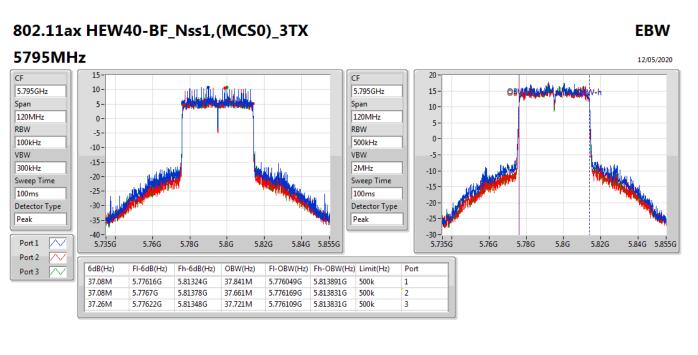


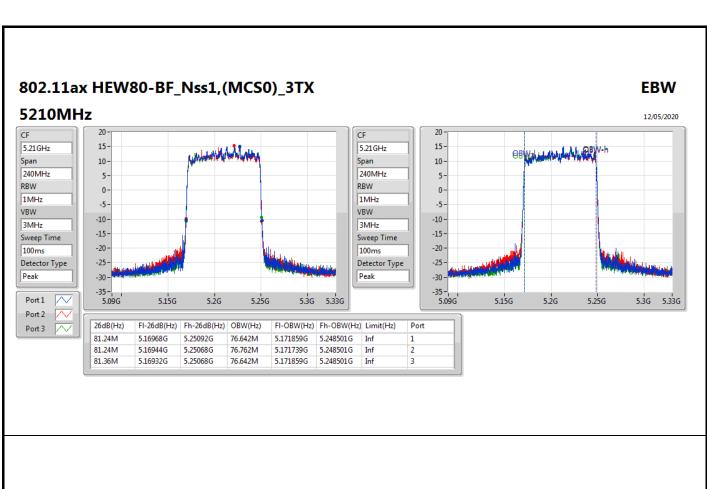


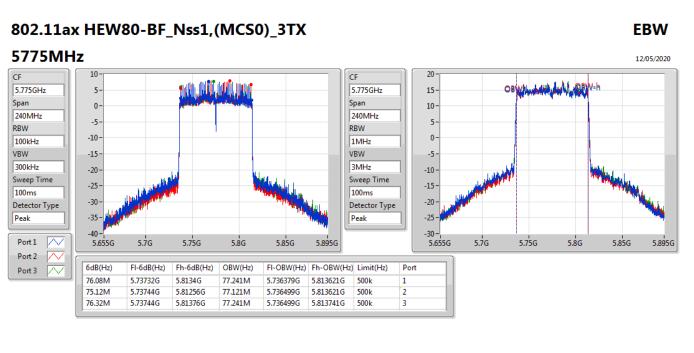


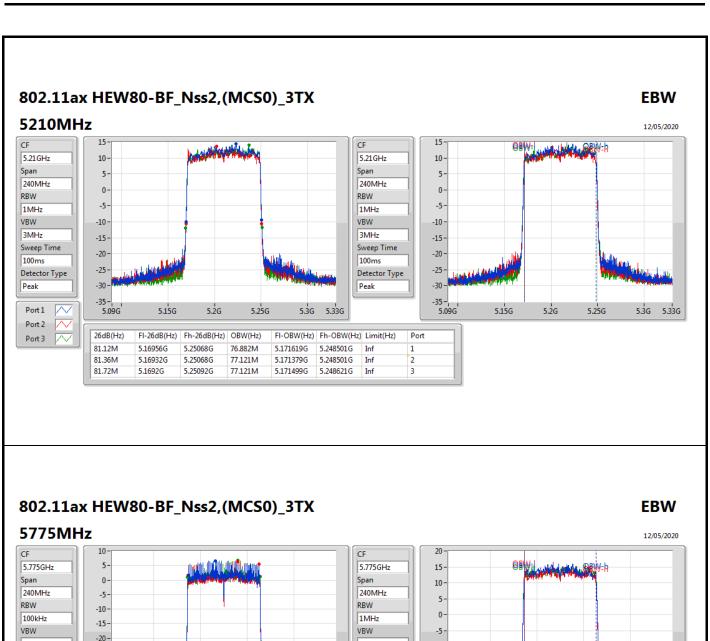


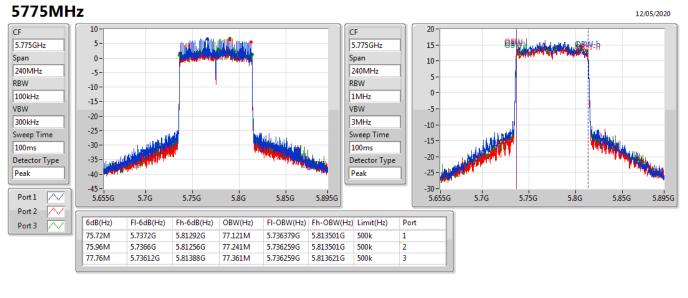














Average Power Appendix C

Summary

Mode	Total Power	Total Power		
	(dBm)	(W)		
5.15-5.25GHz	-	-		
802.11a_Nss1,(6Mbps)_3TX	29.35	0.86099		
802.11ax HEW80_Nss3,(MCS0)_3TX	25.96	0.39446		
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	29.28	0.84723		
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	29.32	0.85507		
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	25.98	0.39628		
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	25.96	0.39446		
5.725-5.85GHz	-	-		
802.11a_Nss1,(6Mbps)_3TX	29.97	0.99312		
802.11ax HEW80_Nss3,(MCS0)_3TX	28.11	0.64714		
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	29.39	0.86896		
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	29.39	0.86896		
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	29.06	0.80538		
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	27.92	0.61944		



Average Power Appendix C

Result

Mode	Result	DG	Port 1	Port 2	Port 3	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-
5180MHz	Pass	1.89	23.62	23.26	23.77	28.33	30.00
5200MHz	Pass	1.89	24.56	24.24	24.33	29.15	30.00
5240MHz	Pass	1.89	24.75	24.38	24.60	29.35	30.00
5745MHz	Pass	1.89	25.09	24.94	25.16	29.84	30.00
5785MHz	Pass	1.89	25.25	25.17	25.13	29.95	30.00
5825MHz	Pass	1.89	25.31	25.22	25.05	29.97	30.00
802.11ax HEW80_Nss3,(MCS0)_3TX	-	-	-	-	-	-	-
5210MHz	Pass	1.82	21.47	21.09	20.98	25.96	30.00
5775MHz	Pass	1.82	23.52	23.32	23.17	28.11	30.00
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
5180MHz	Pass	6.59	21.68	21.29	21.45	26.25	29.41
5200MHz	Pass	6.59	24.66	24.47	24.39	29.28	29.41
5240MHz	Pass	6.59	24.69	24.43	24.28	29.24	29.41
5745MHz	Pass	6.59	24.58	24.74	24.52	29.39	29.41
5785MHz	Pass	6.59	24.63	24.70	24.36	29.34	29.41
5825MHz	Pass	6.59	24.55	24.62	24.16	29.22	29.41
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
5190MHz	Pass	6.59	21.11	20.67	20.91	25.67	29.41
5230MHz	Pass	6.59	24.83	24.36	24.43	29.32	29.41
5755MHz	Pass	6.59	24.85	24.58	24.40	29.39	29.41
5795MHz	Pass	6.59	24.73	24.42	24.35	29.27	29.41
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
5210MHz	Pass	6.59	21.41	21.06	21.15	25.98	29.41
5775MHz	Pass	6.59	24.31	24.19	24.36	29.06	29.41
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	-	-	-	-	-	-	-
5210MHz	Pass	4.06	21.34	21.09	21.12	25.96	30.00
5775MHz	Pass	4.06	23.25	23.02	23.18	27.92	30.00

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



Summary

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	
802.11a_Nss1,(6Mbps)_3TX	16.21
802.11ax HEW80_Nss3,(MCS0)_3TX	7.04
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	15.80
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	13.06
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	7.21
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	7.11
5.725-5.85GHz	
802.11a_Nss1,(6Mbps)_3TX	15.48
802.11ax HEW80_Nss3,(MCS0)_3TX	7.66
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	14.50
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	11.62
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	8.57
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	7.54

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



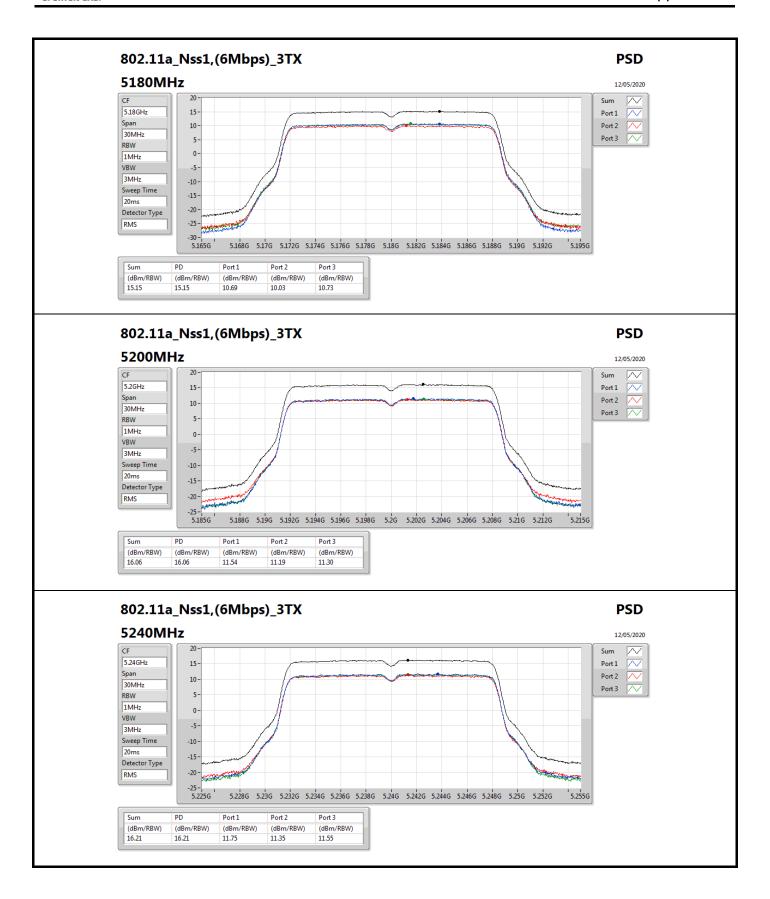
Appendix D **PSD**

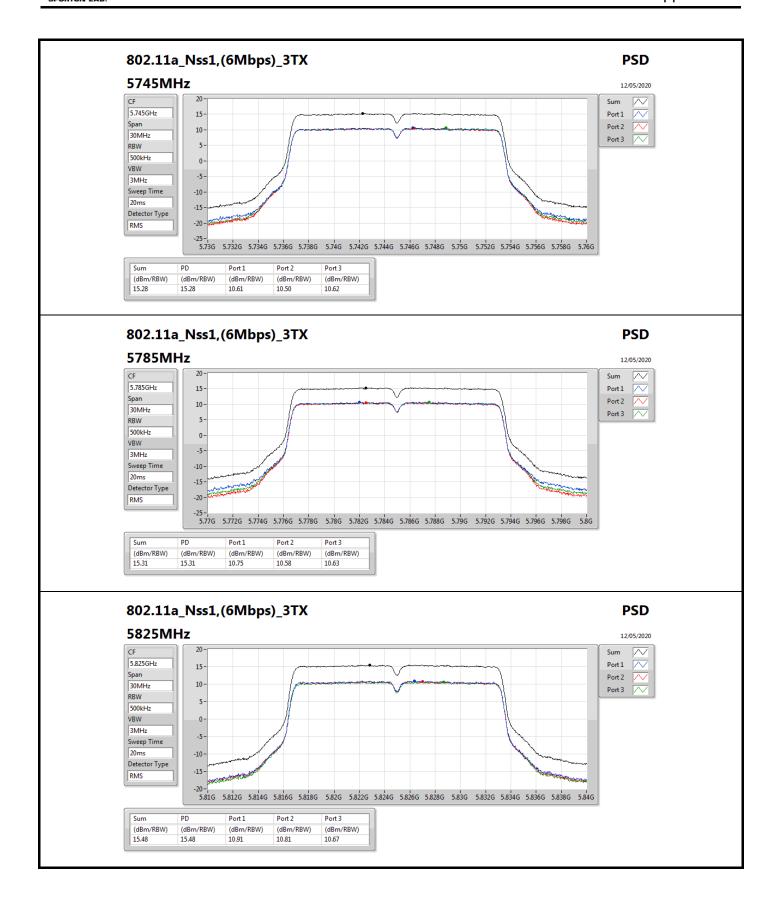
Result

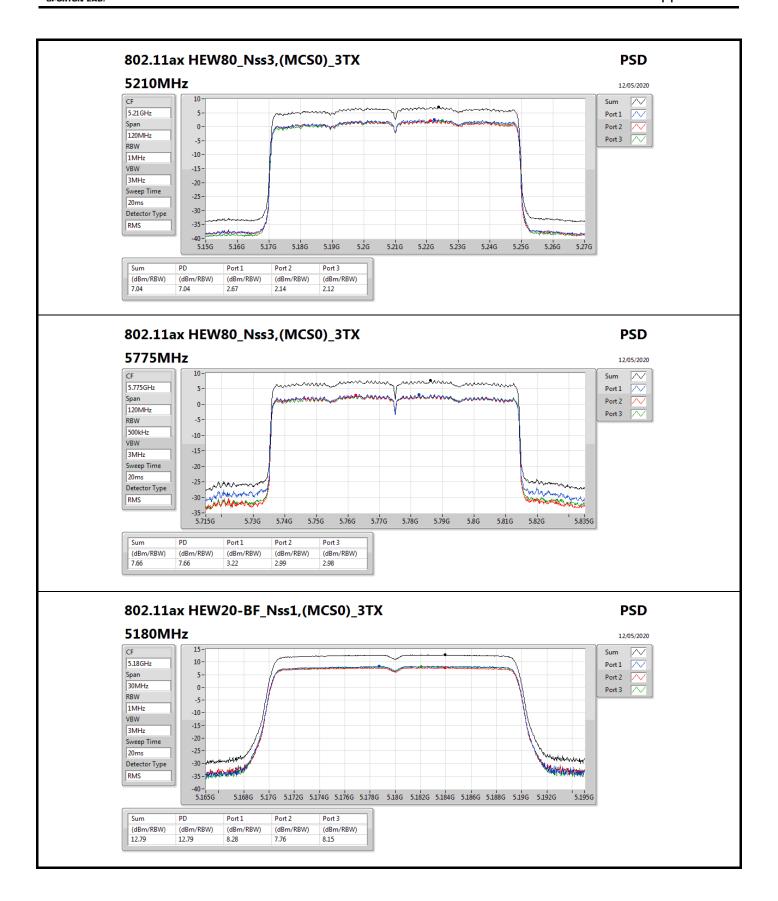
Mode	Result	DG	Port 1	Port 2	Port 3	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_3TX	-	-	-	-	-	-	-
5180MHz	Pass	6.59	10.69	10.03	10.73	15.15	16.41
5200MHz	Pass	6.59	11.54	11.19	11.30	16.06	16.41
5240MHz	Pass	6.59	11.75	11.35	11.55	16.21	16.41
5745MHz	Pass	6.59	10.61	10.50	10.62	15.28	29.41
5785MHz	Pass	6.59	10.75	10.58	10.63	15.31	29.41
5825MHz	Pass	6.59	10.91	10.81	10.67	15.48	29.41
802.11ax HEW80_Nss3,(MCS0)_3TX	-	-	-	-	-	-	-
5210MHz	Pass	1.82	2.67	2.14	2.12	7.04	17.00
5775MHz	Pass	1.82	3.22	2.99	2.98	7.66	30.00
802.11ax HEW20-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
5180MHz	Pass	6.59	8.28	7.76	8.15	12.79	16.41
5200MHz	Pass	6.59	11.28	11.03	10.99	15.80	16.41
5240MHz	Pass	6.59	11.18	10.93	11.02	15.76	16.41
5745MHz	Pass	6.59	9.89	9.77	9.67	14.47	29.41
5785MHz	Pass	6.59	9.69	9.63	9.49	14.33	29.41
5825MHz	Pass	6.59	9.90	9.81	9.60	14.50	29.41
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
5190MHz	Pass	6.59	4.82	4.42	4.76	9.42	16.41
5230MHz	Pass	6.59	8.63	8.23	8.27	13.06	16.41
5755MHz	Pass	6.59	7.07	6.87	6.86	11.62	29.41
5795MHz	Pass	6.59	6.92	6.77	6.70	11.47	29.41
802.11ax HEW80-BF_Nss1,(MCS0)_3TX	-	-	-	-	-	-	-
5210MHz	Pass	6.59	2.54	2.31	2.55	7.21	16.41
5775MHz	Pass	6.59	3.86	3.92	4.00	8.57	29.41
802.11ax HEW80-BF_Nss2,(MCS0)_3TX	-	-	-	-	-	-	-
5210MHz	Pass	3.65	3.04	2.25	2.36	7.11	17.00
5775MHz	Pass	3.65	3.36	2.67	3.13	7.54	30.00

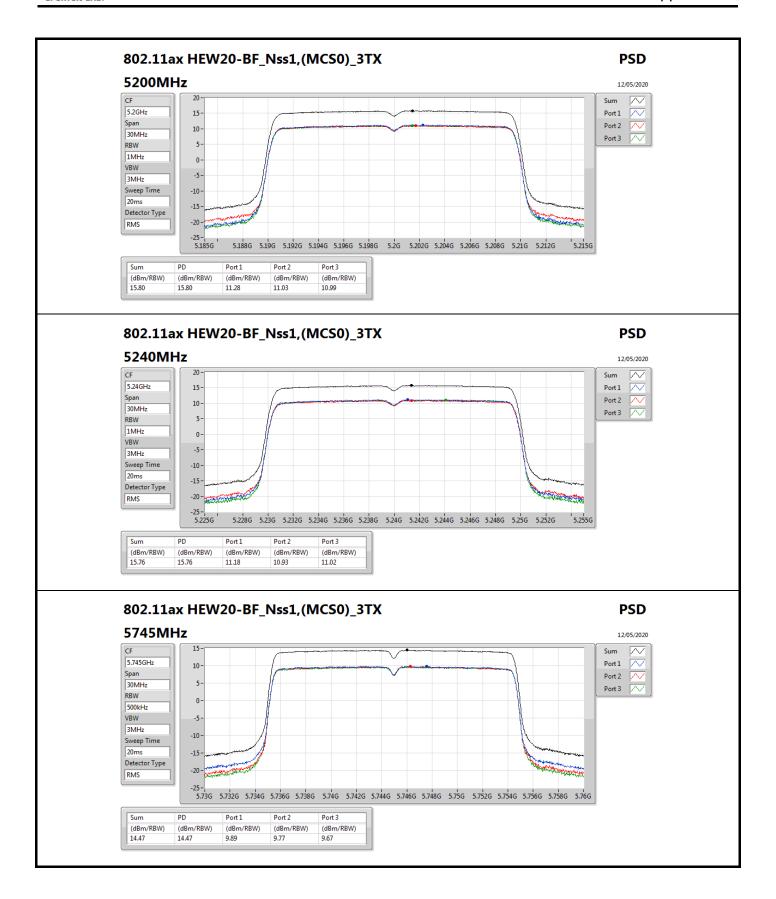
Page No. : 2 of 10

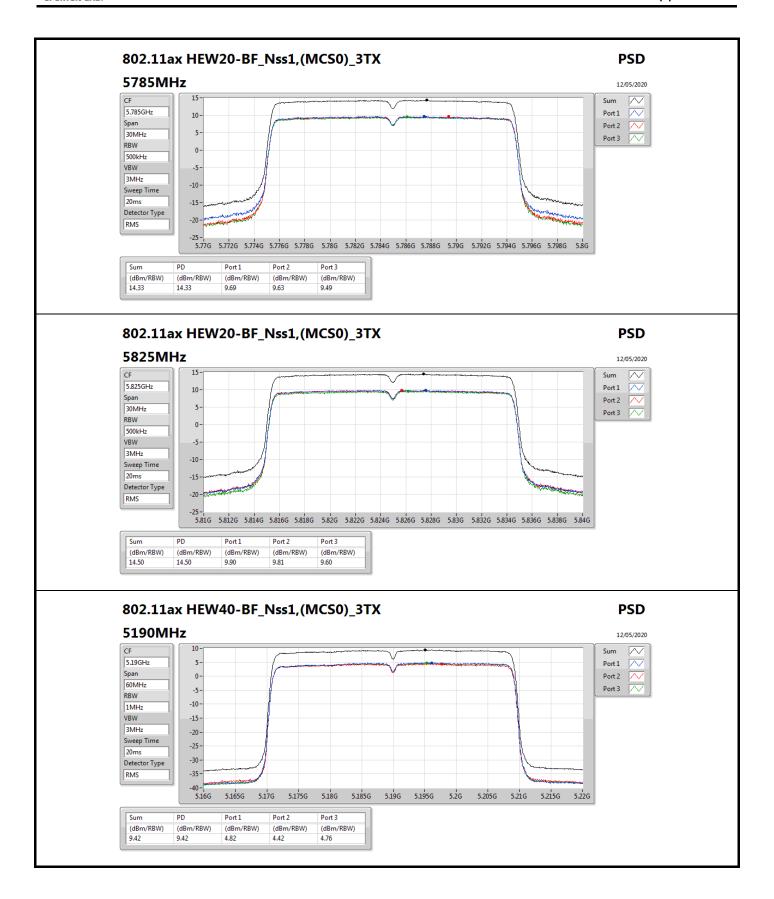
DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

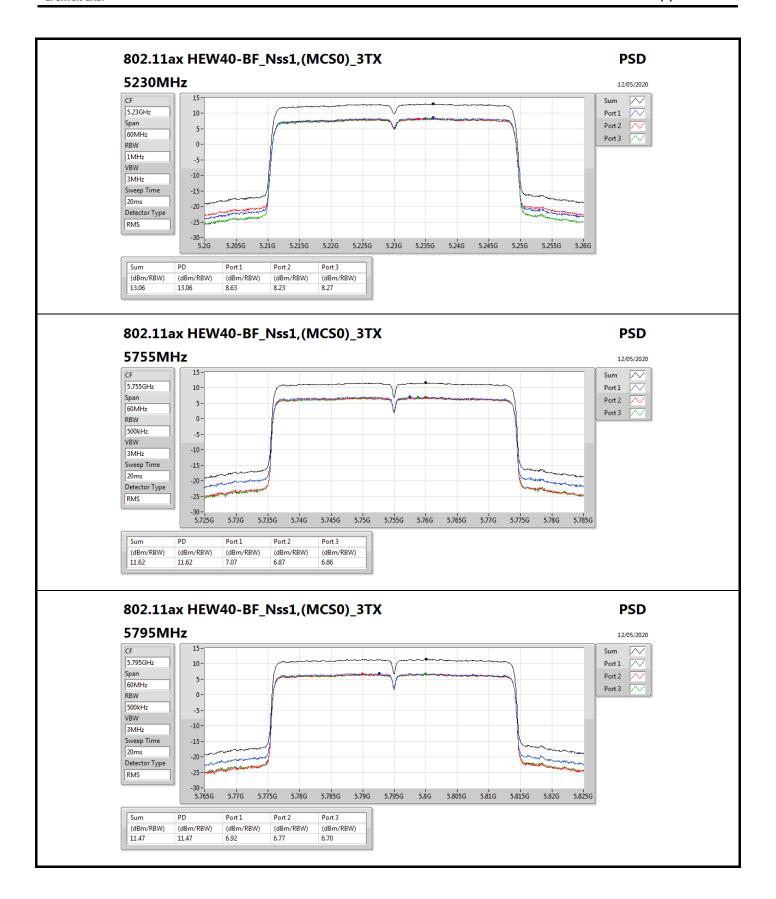


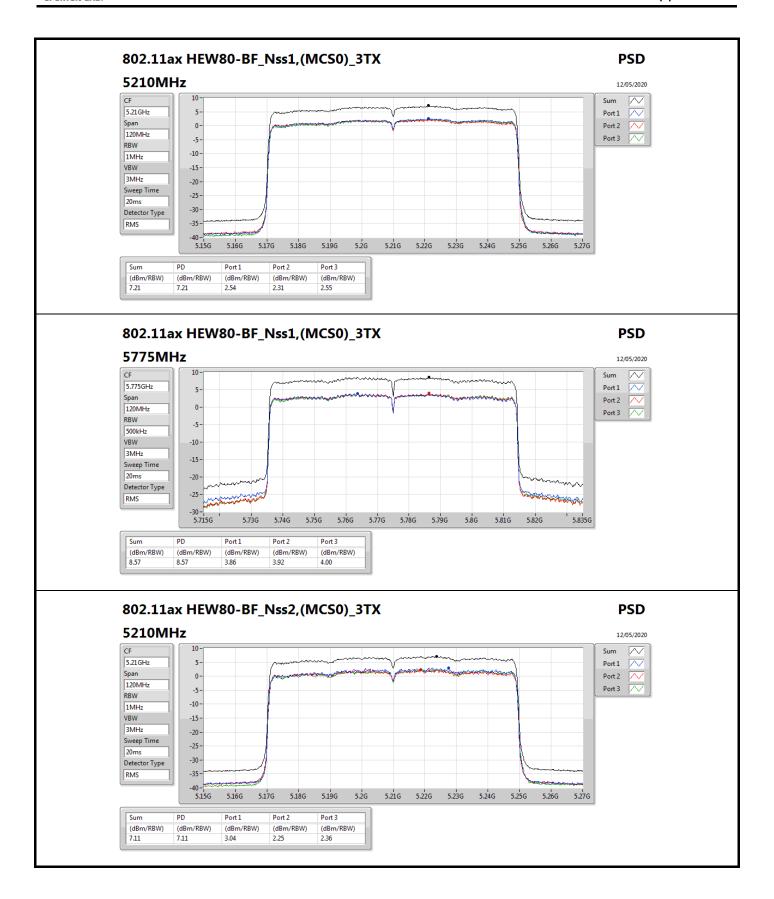


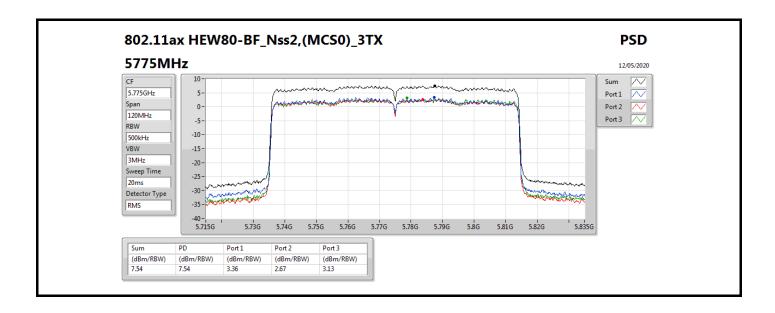














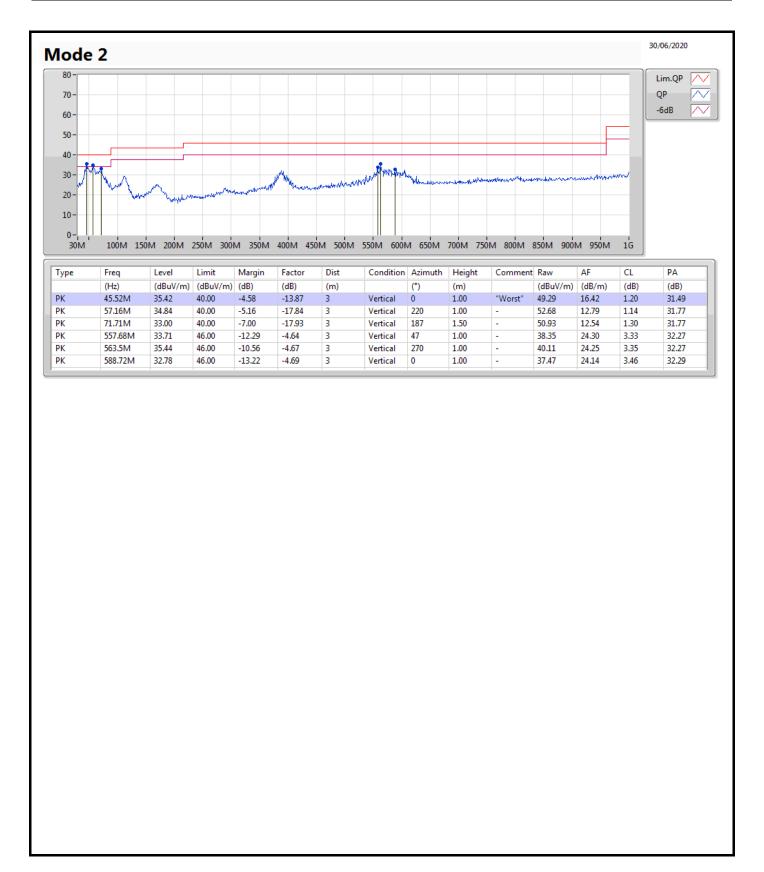
Radiated Emissions below 1GHz

Appendix E.1

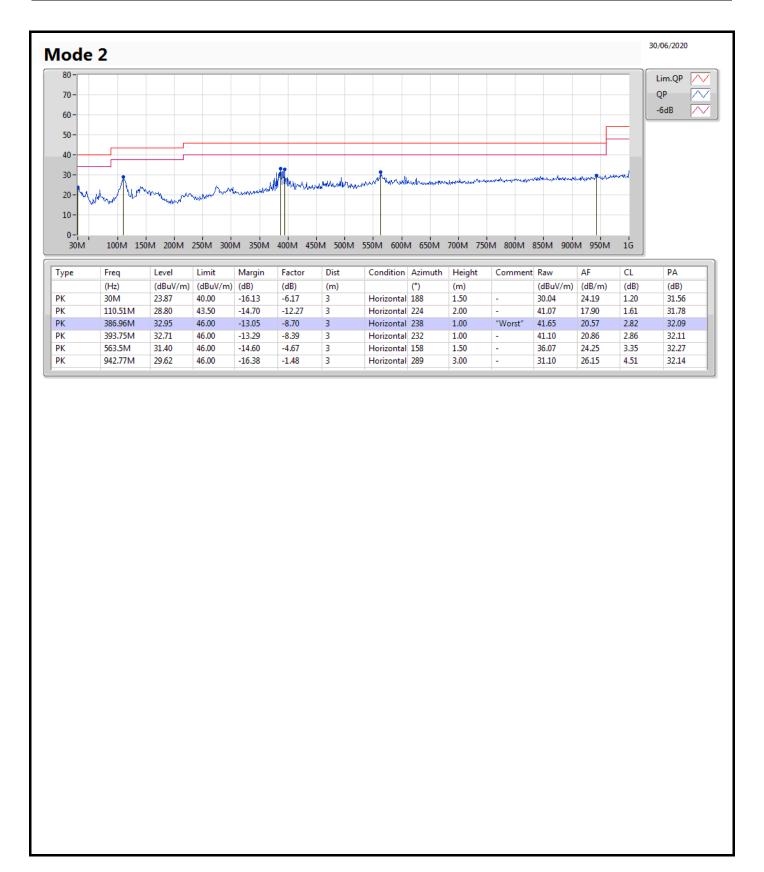
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 2	Pass	PK	45.52M	35.42	40.00	-4.58	Vertical











RSE TX above 1GHz

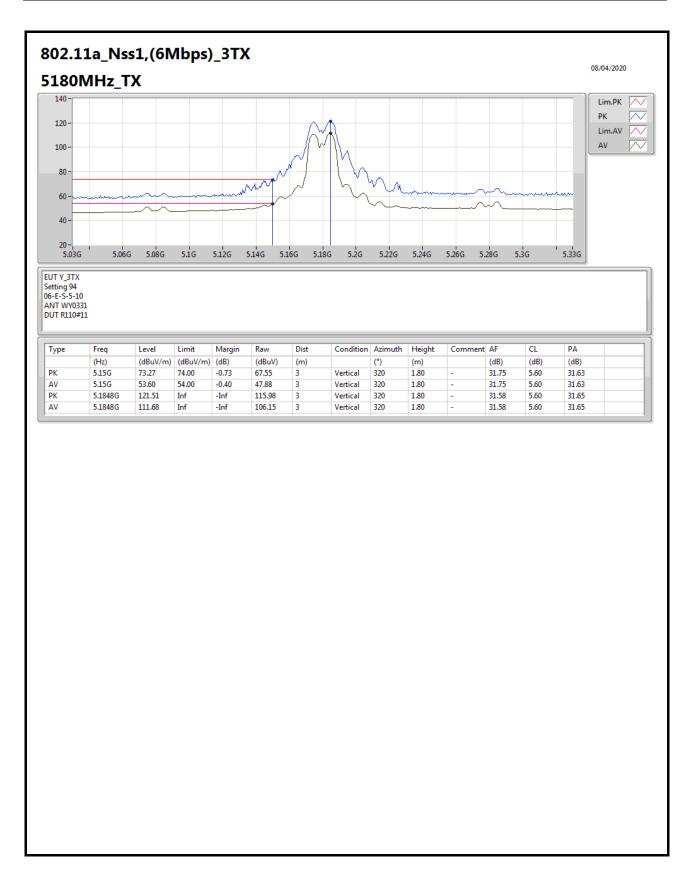
Appendix E.2

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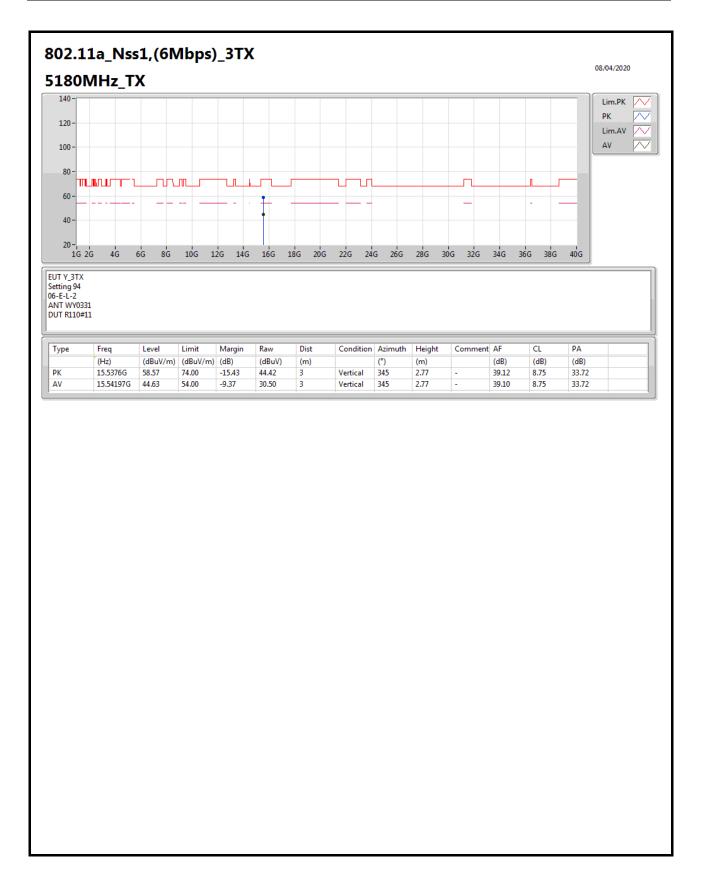
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.15-5.25GHz	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW40-BF_Nss1,(MCS0)_3TX	Pass	AV	5.1498G	53.95	54.00	-0.05	3	Vertical	235	1.80	-

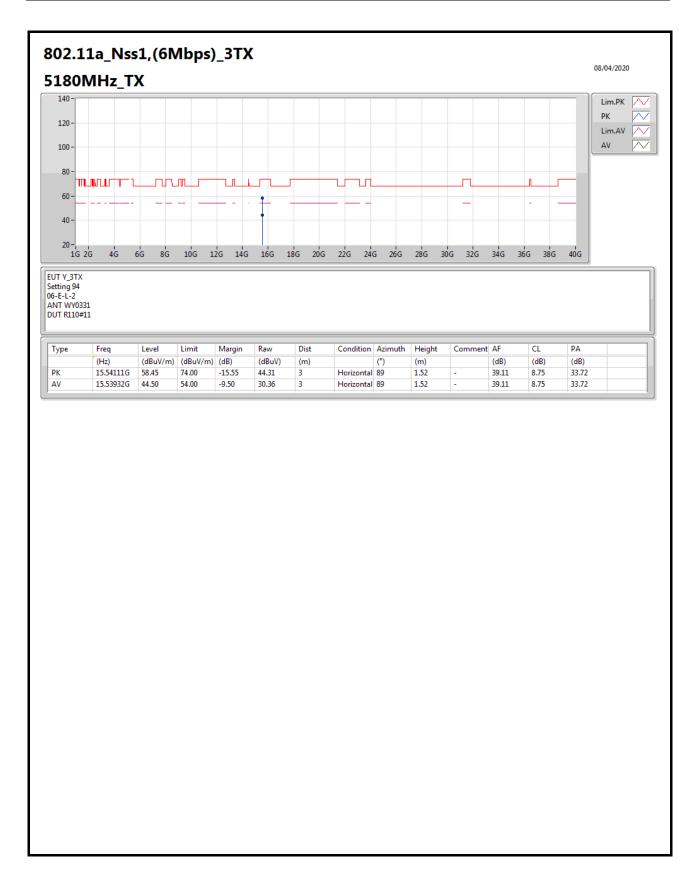




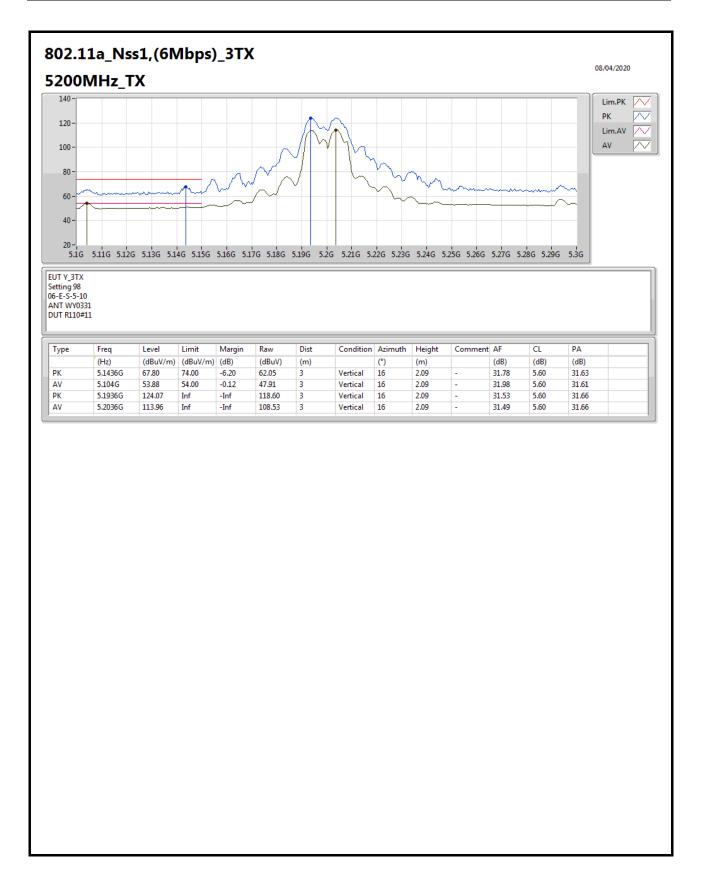




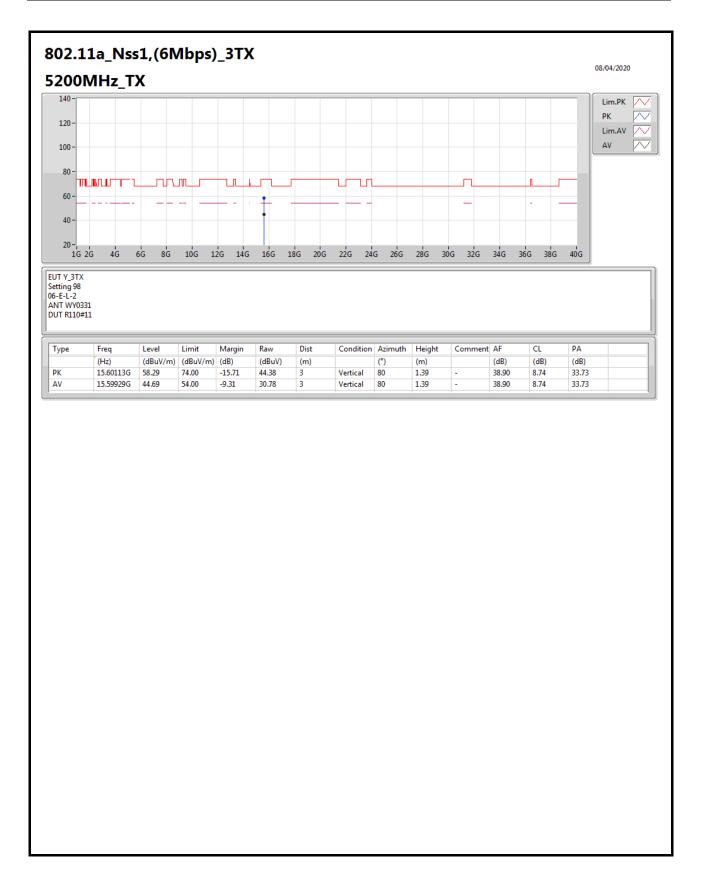




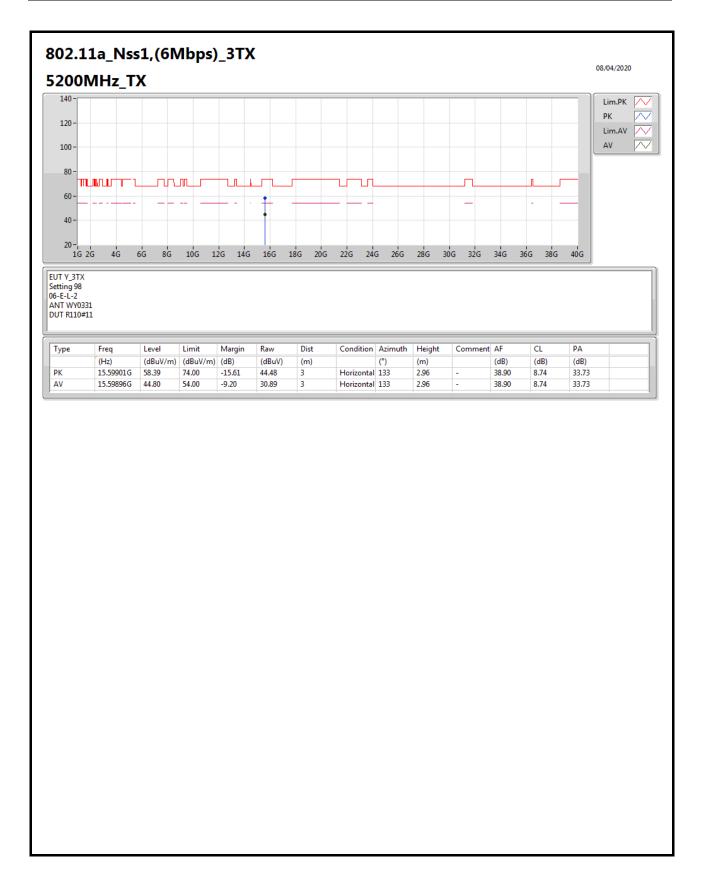




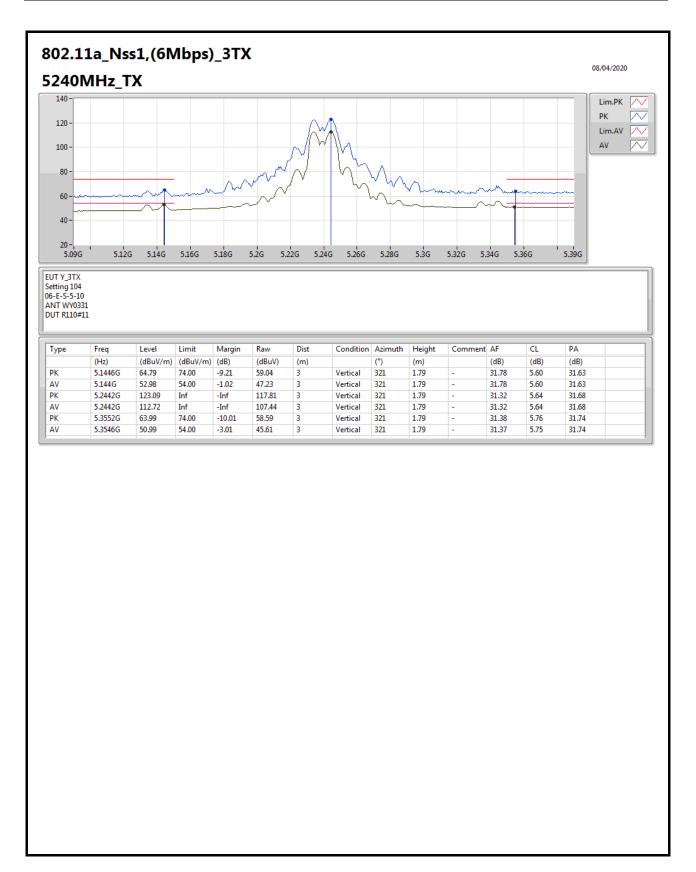




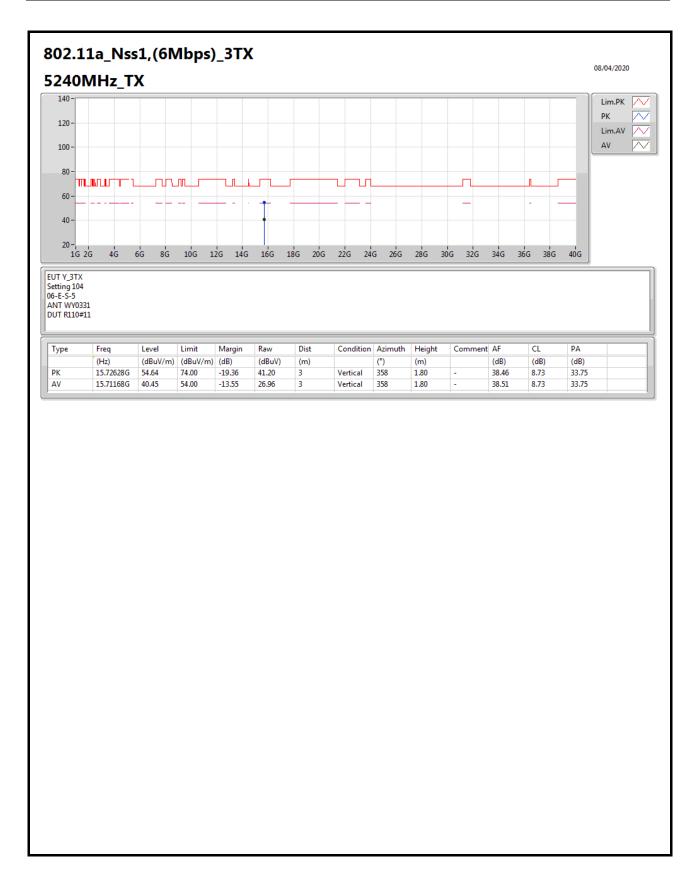






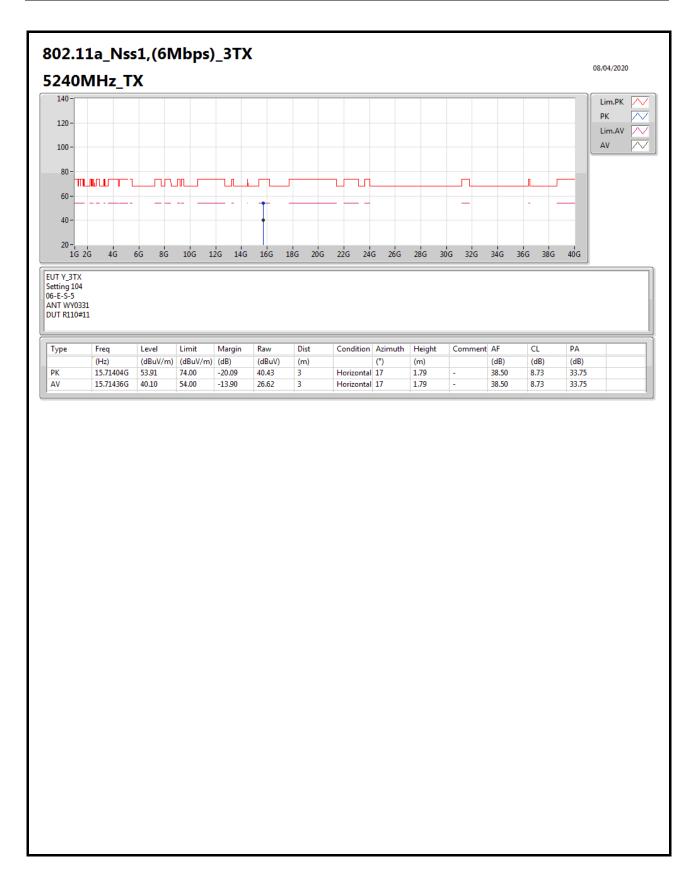




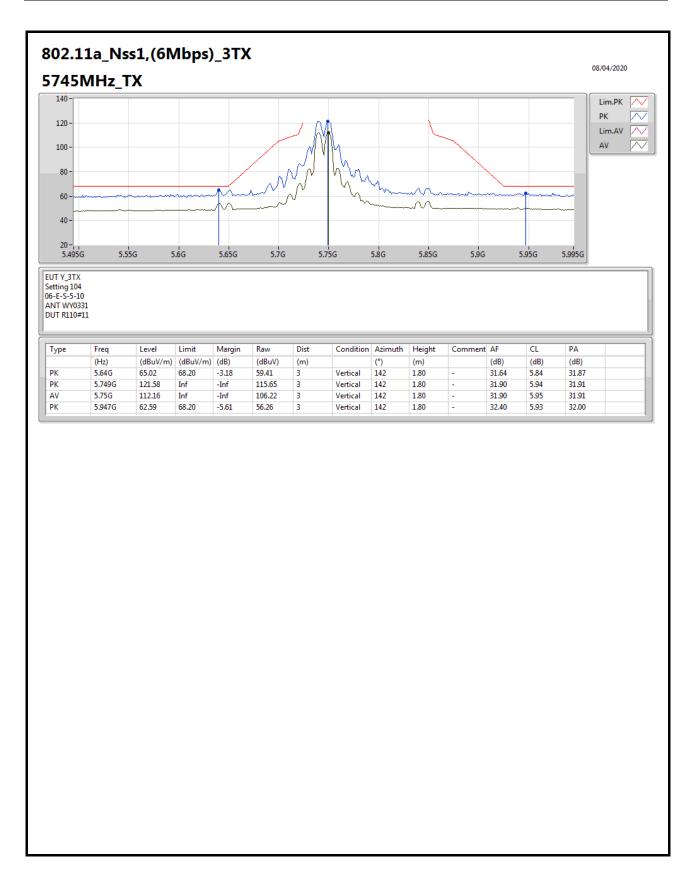


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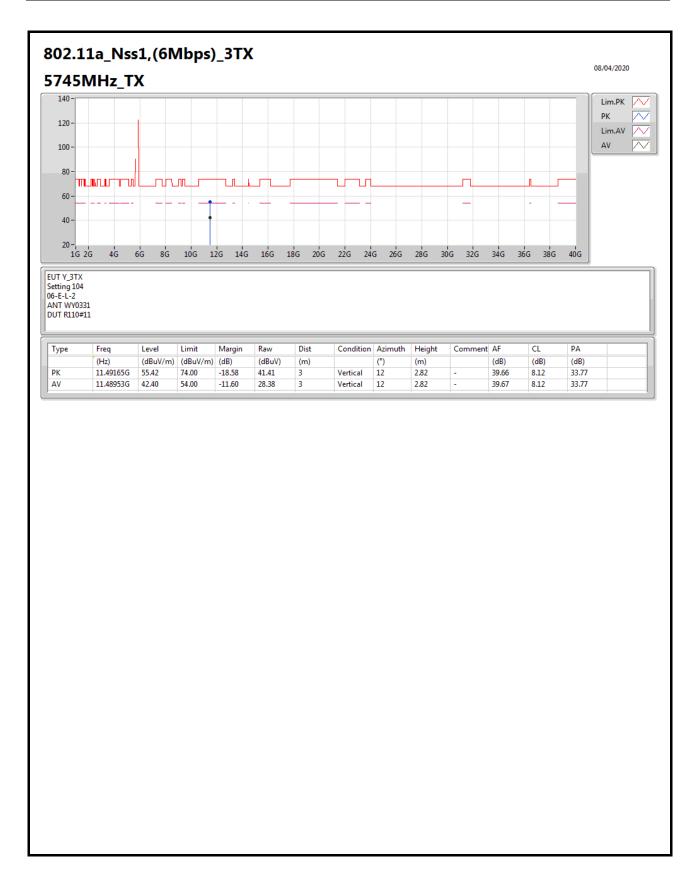






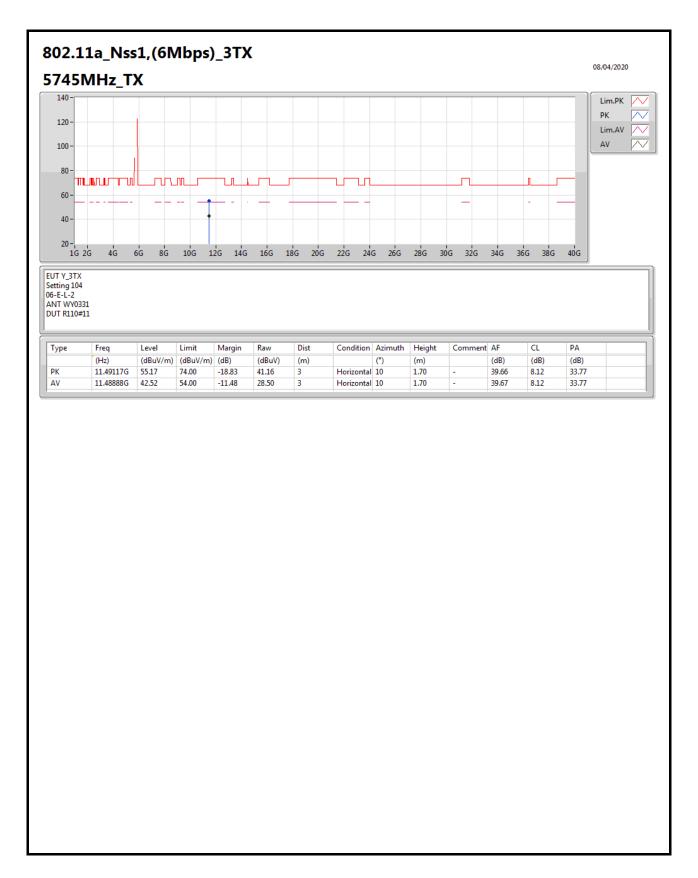




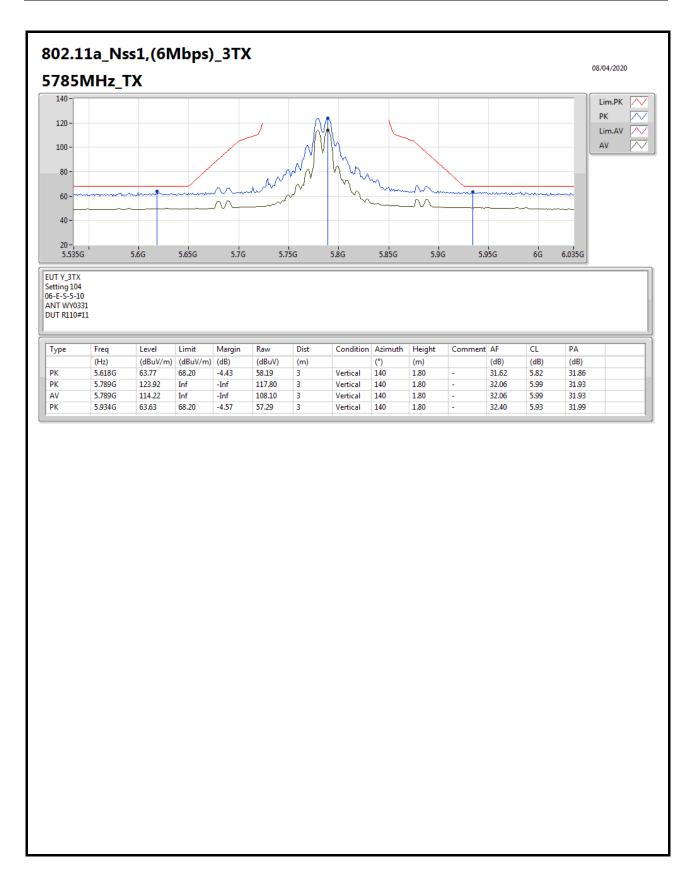


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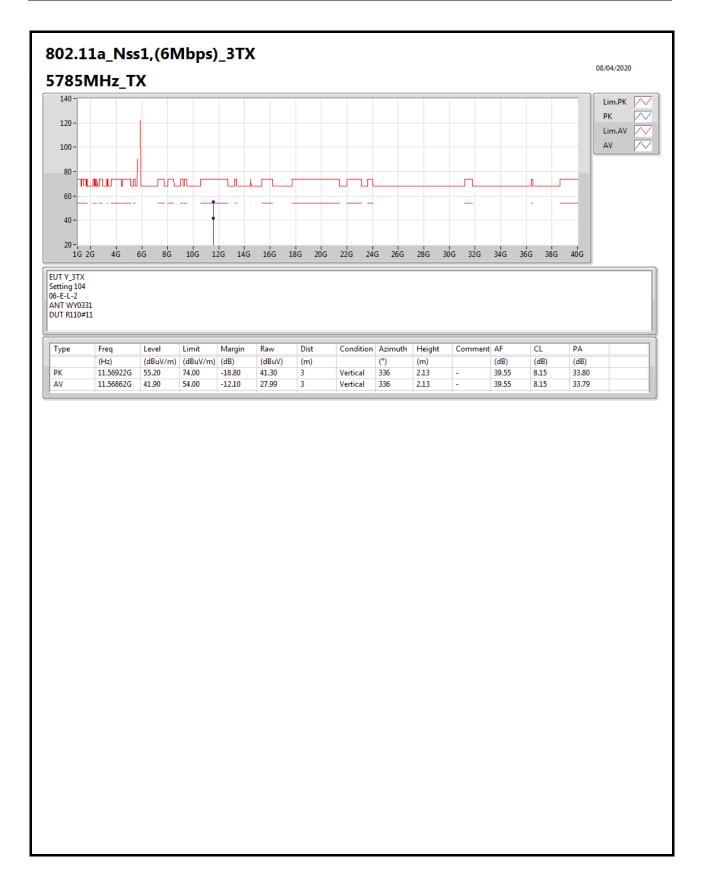




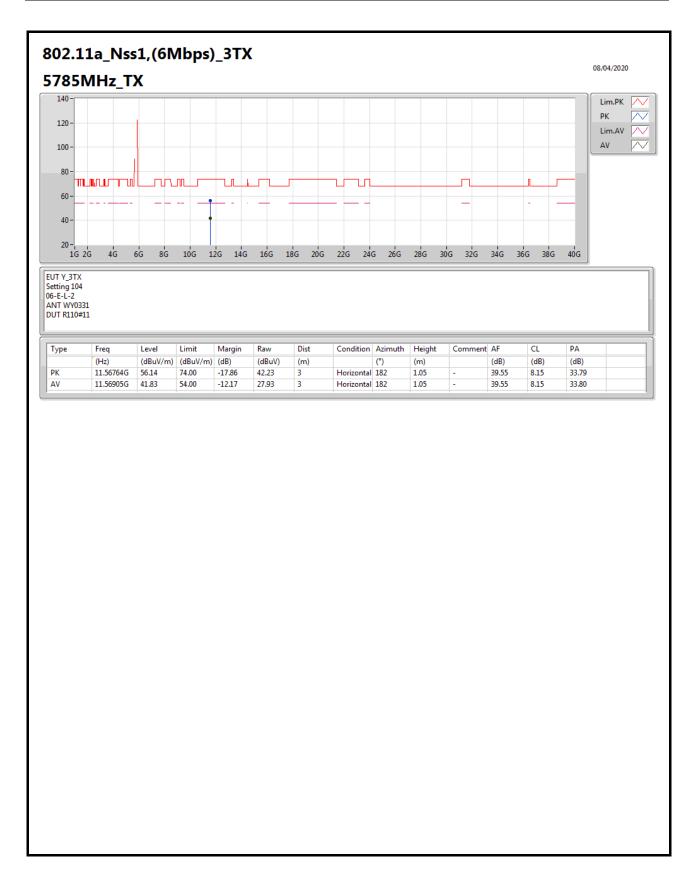


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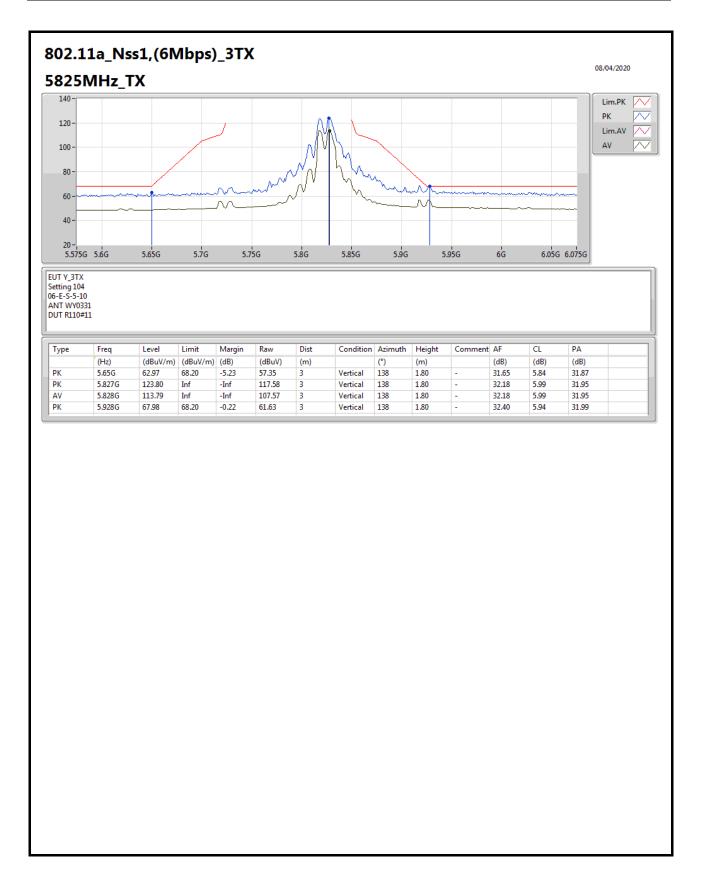






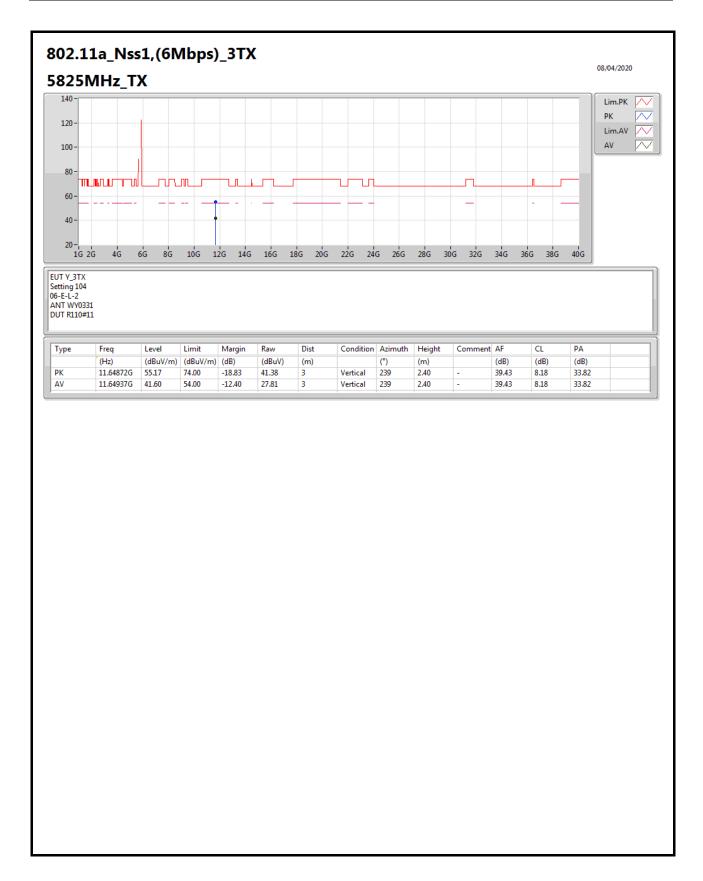
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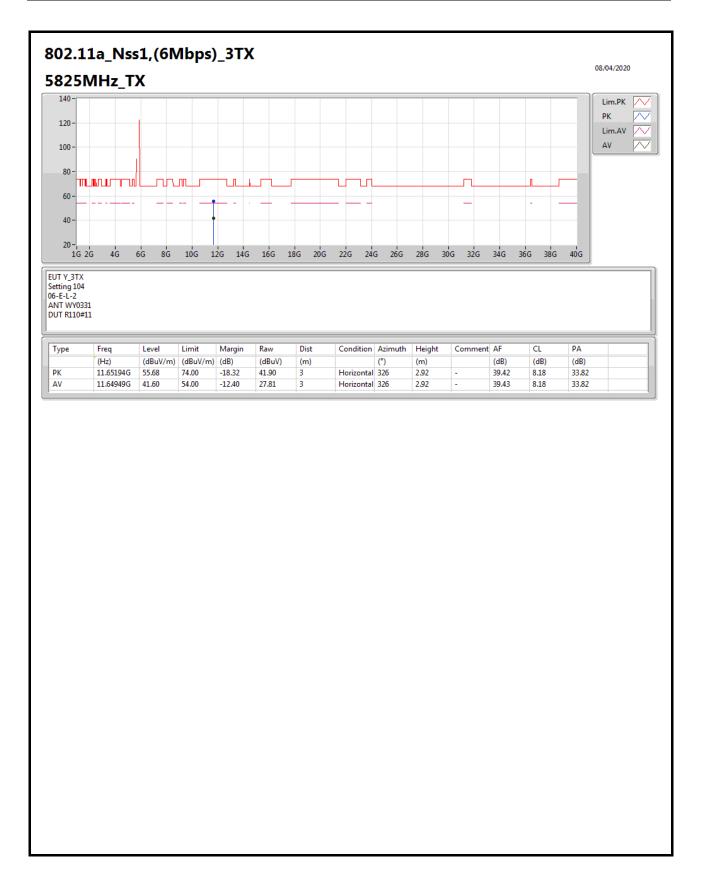
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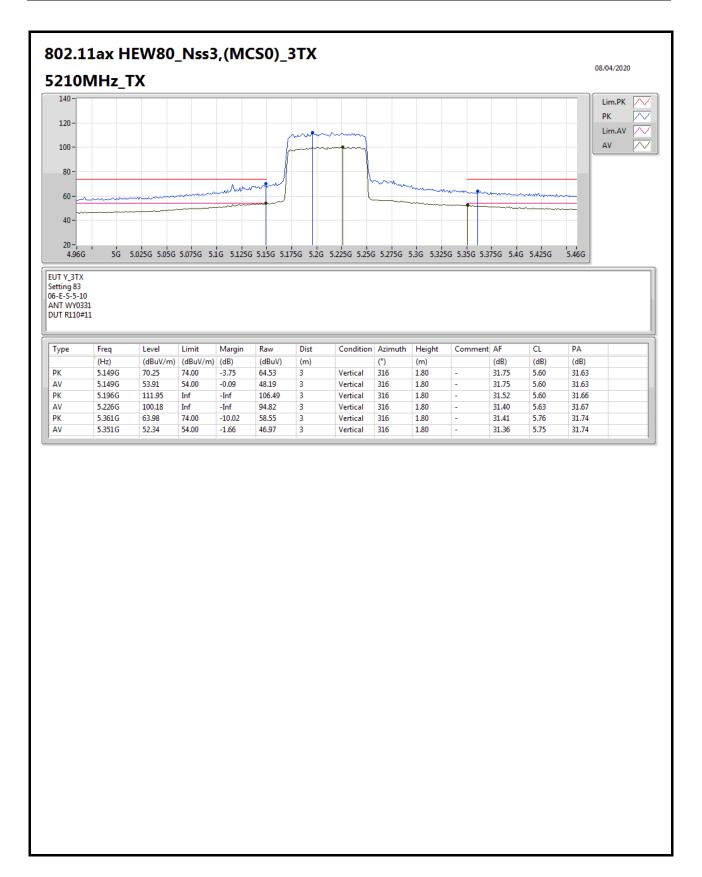


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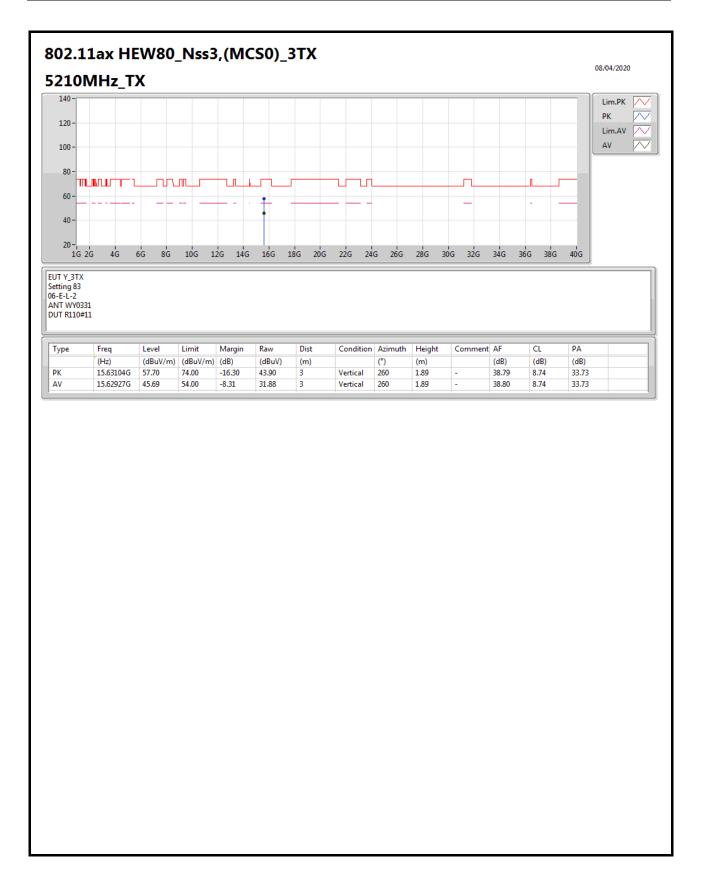




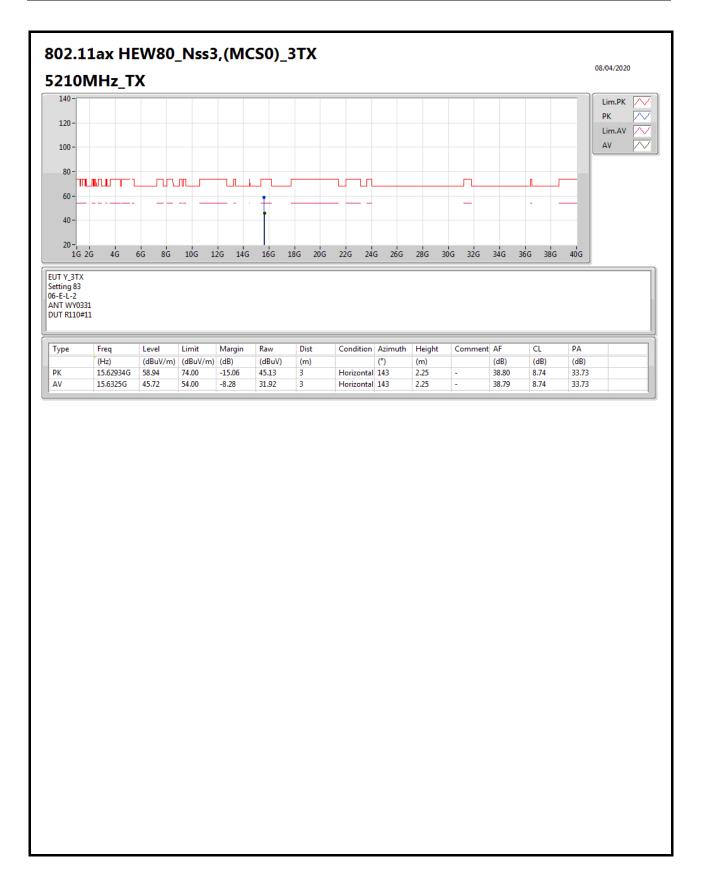




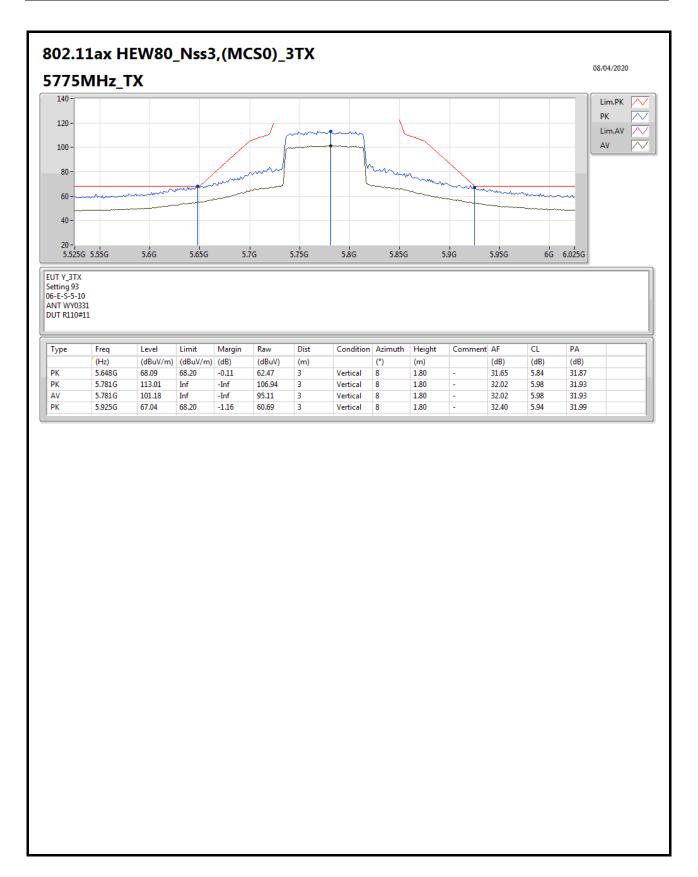




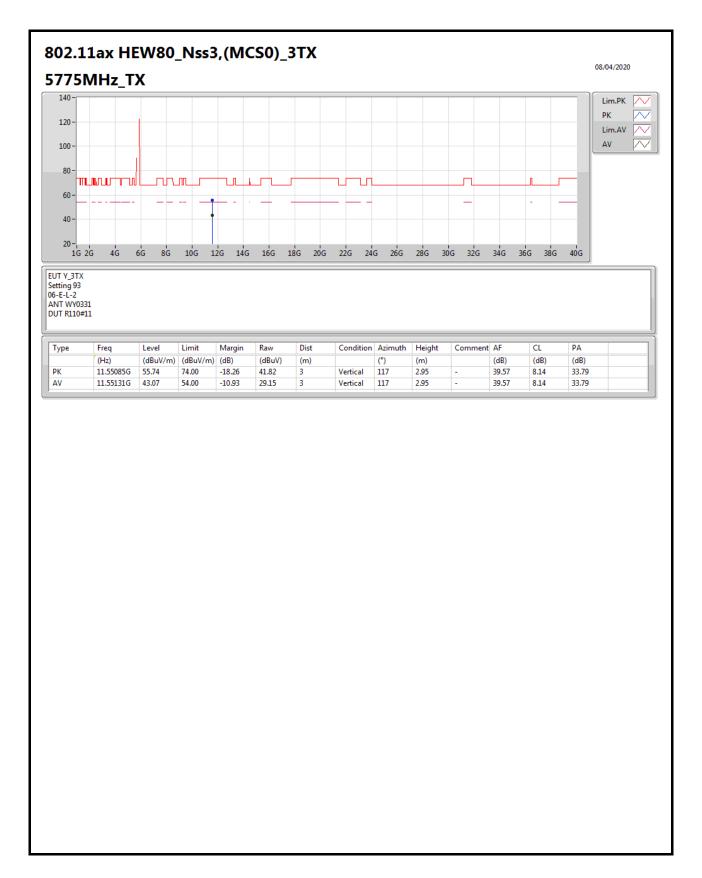




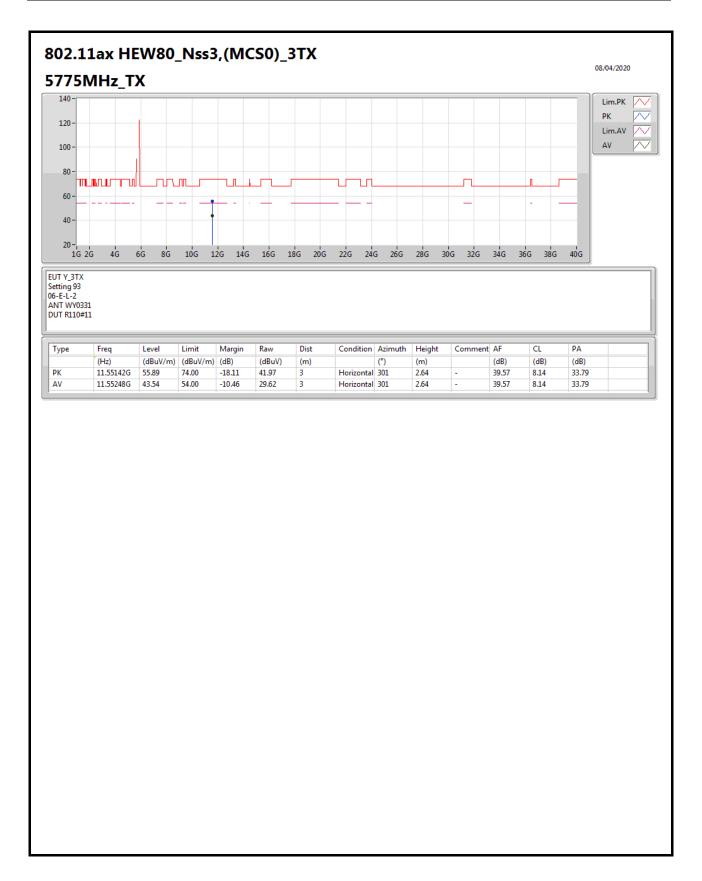




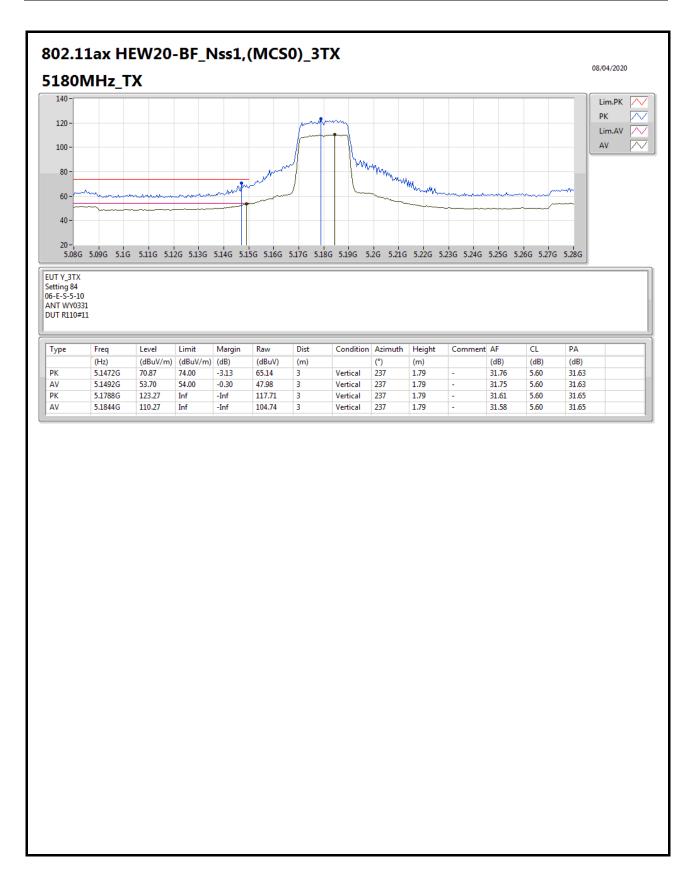






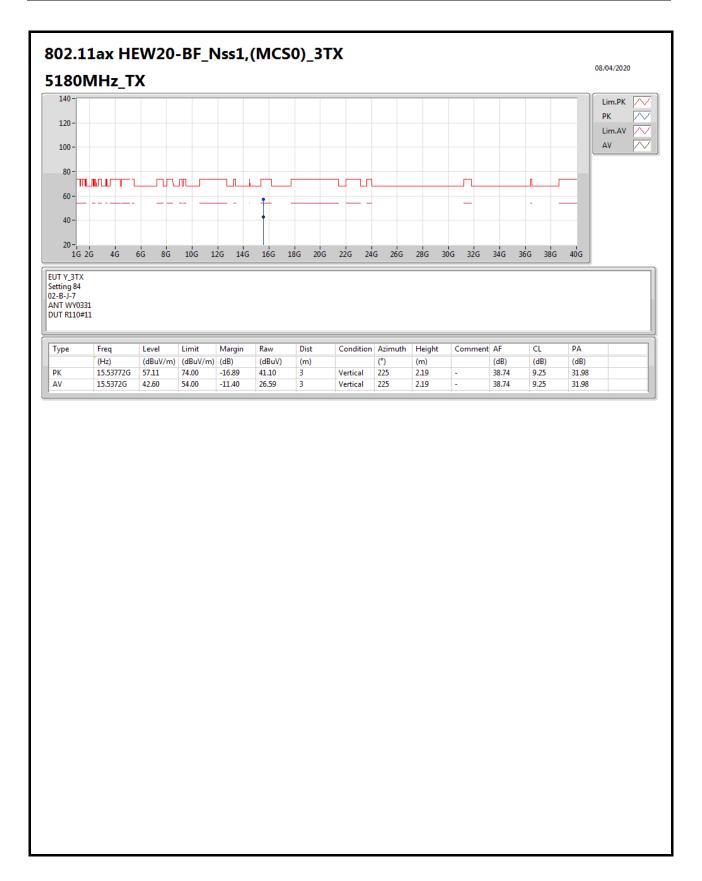






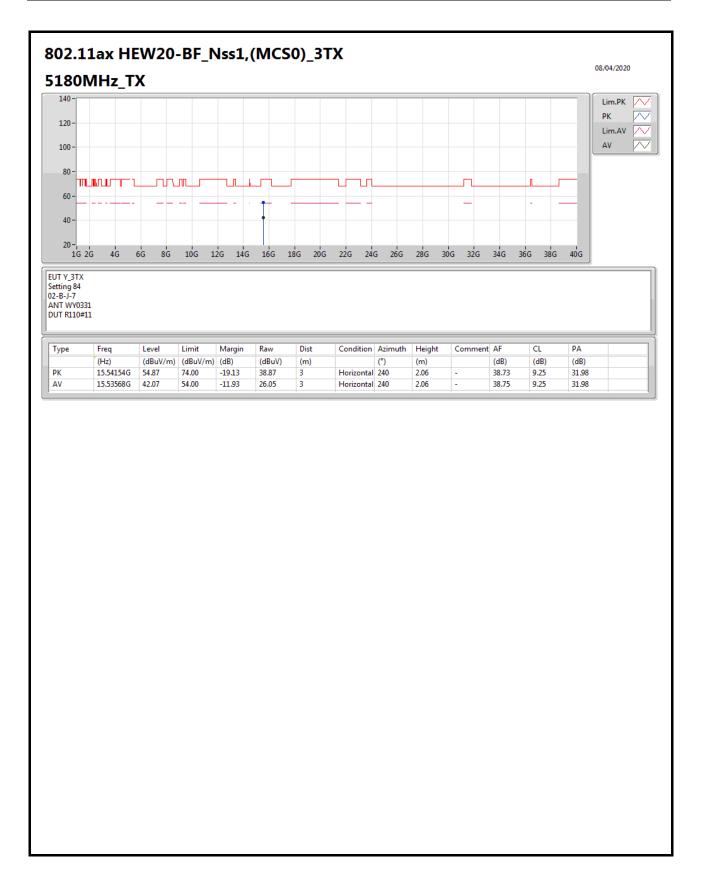
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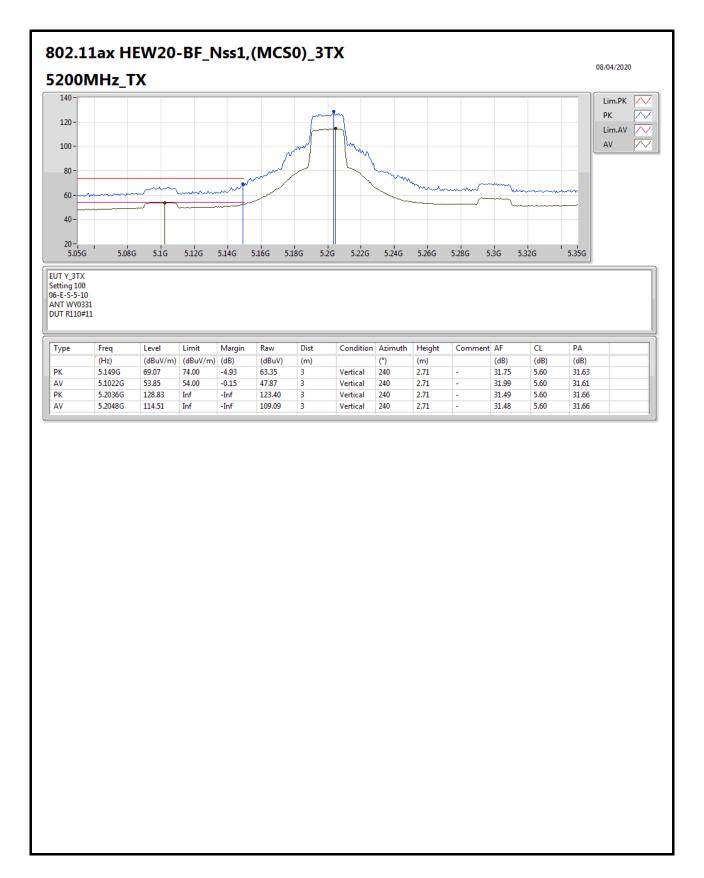


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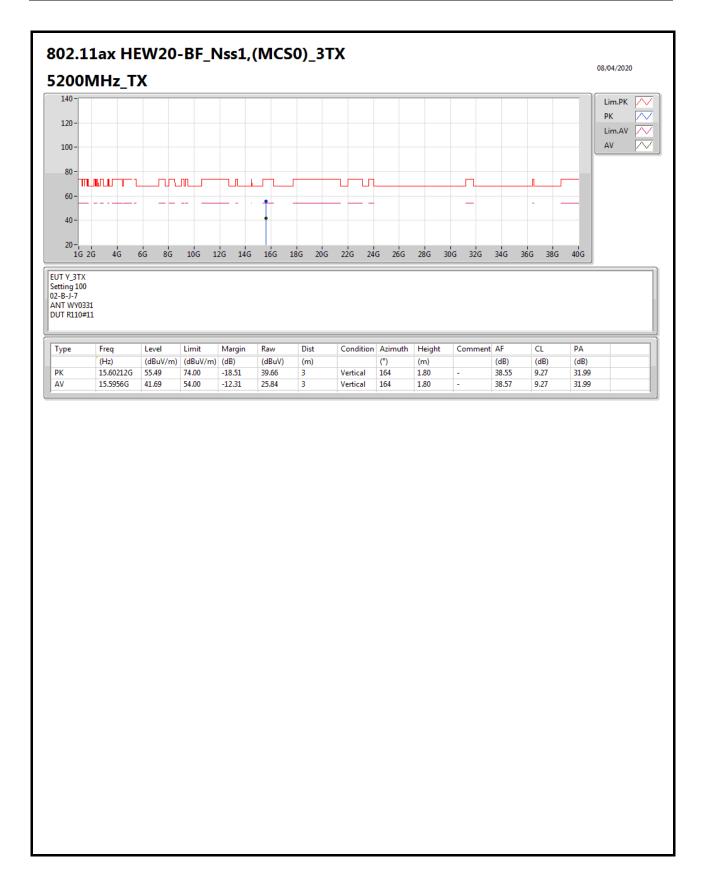




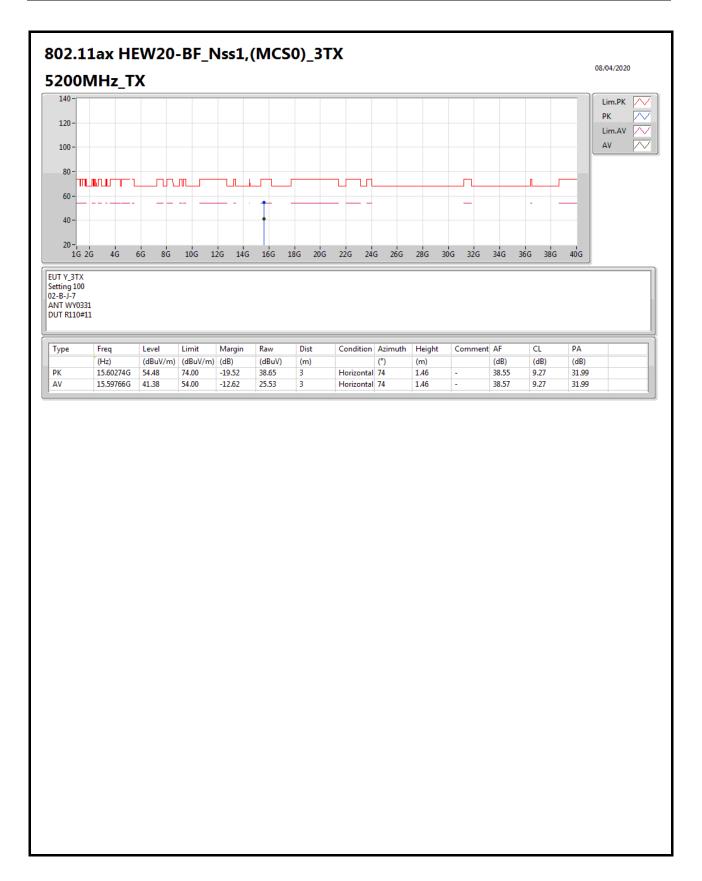




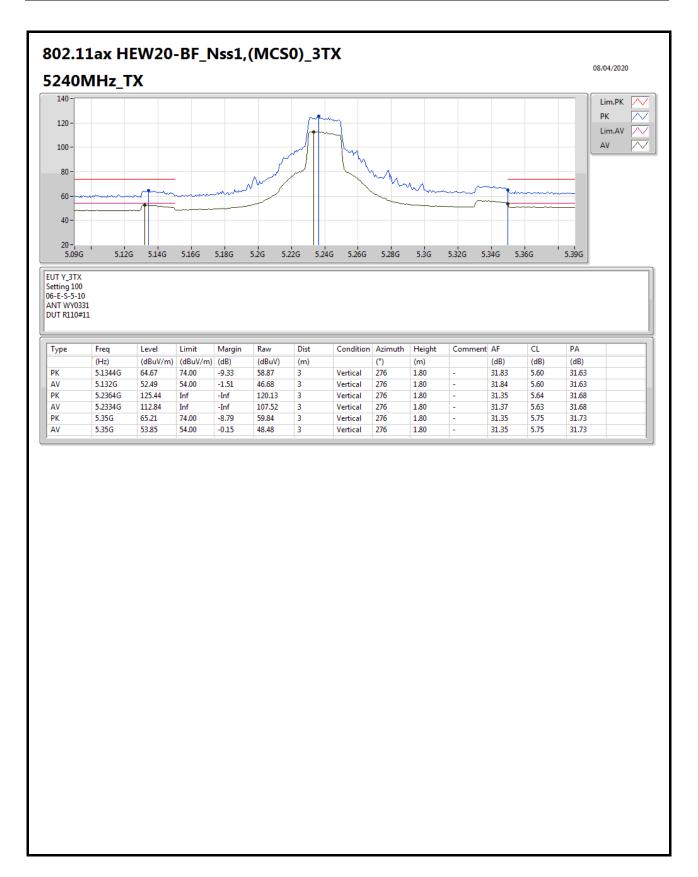




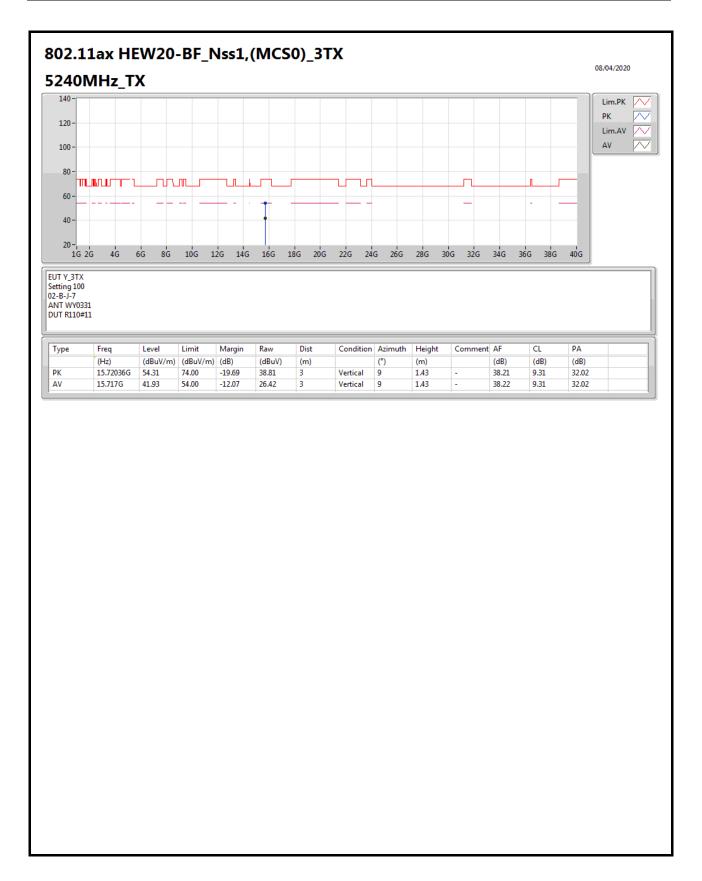




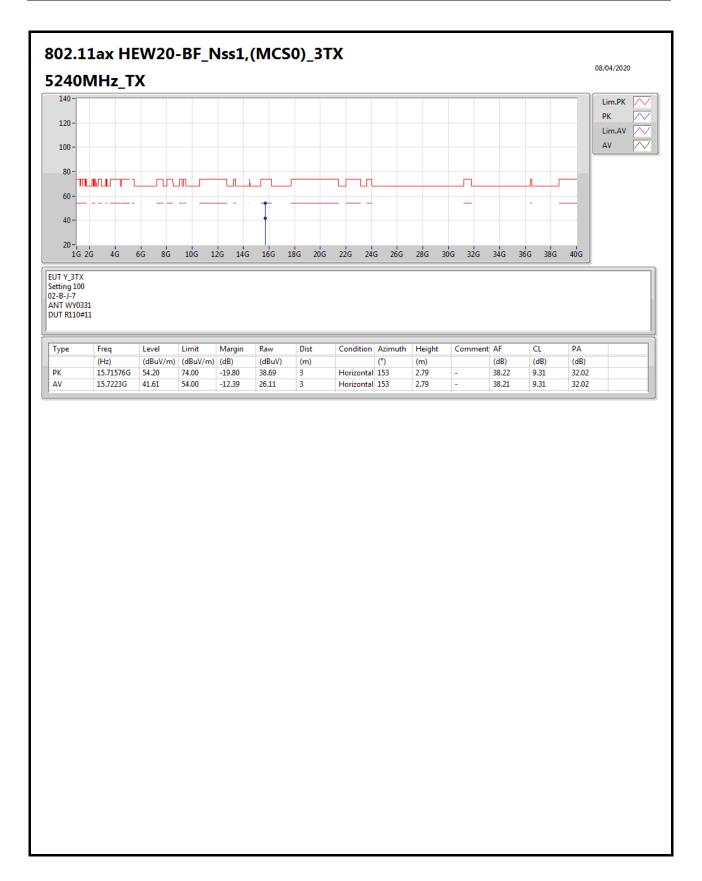




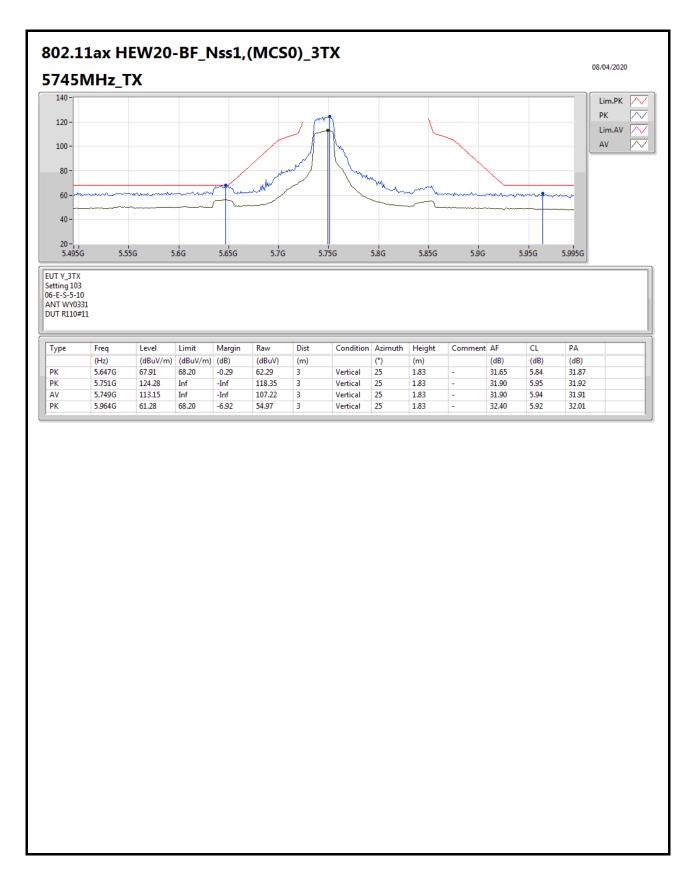




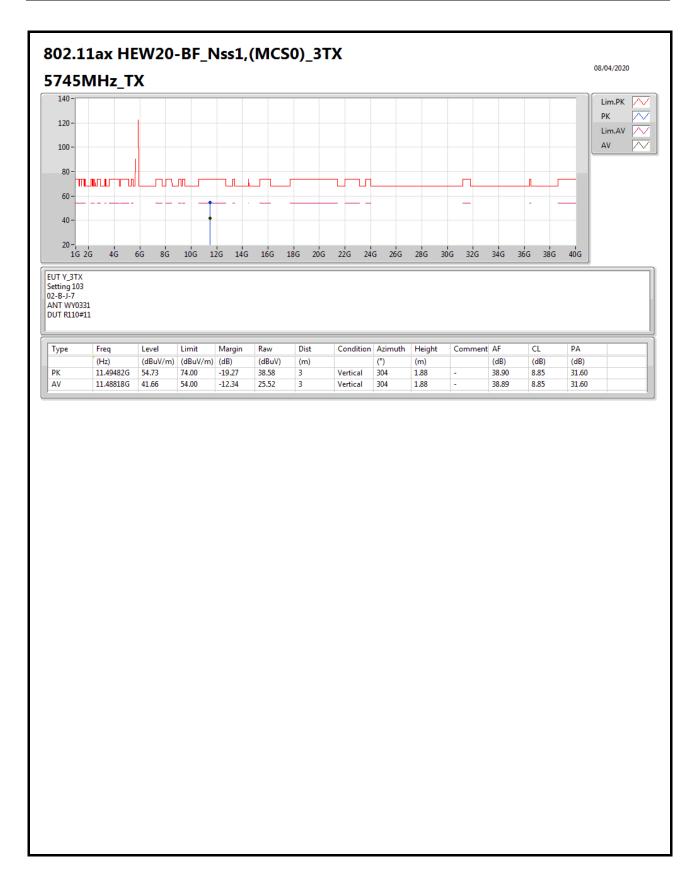






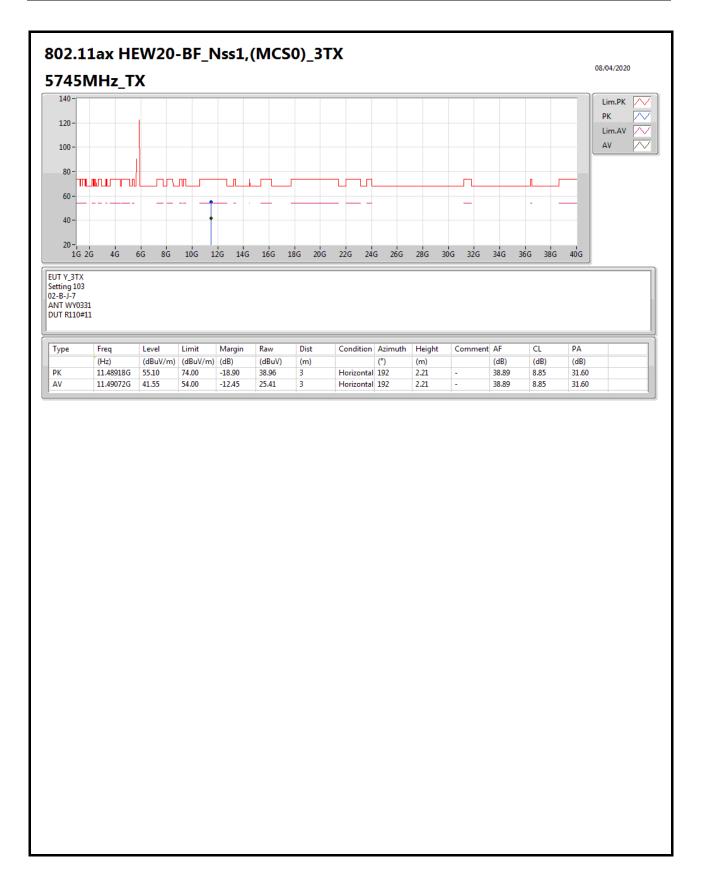




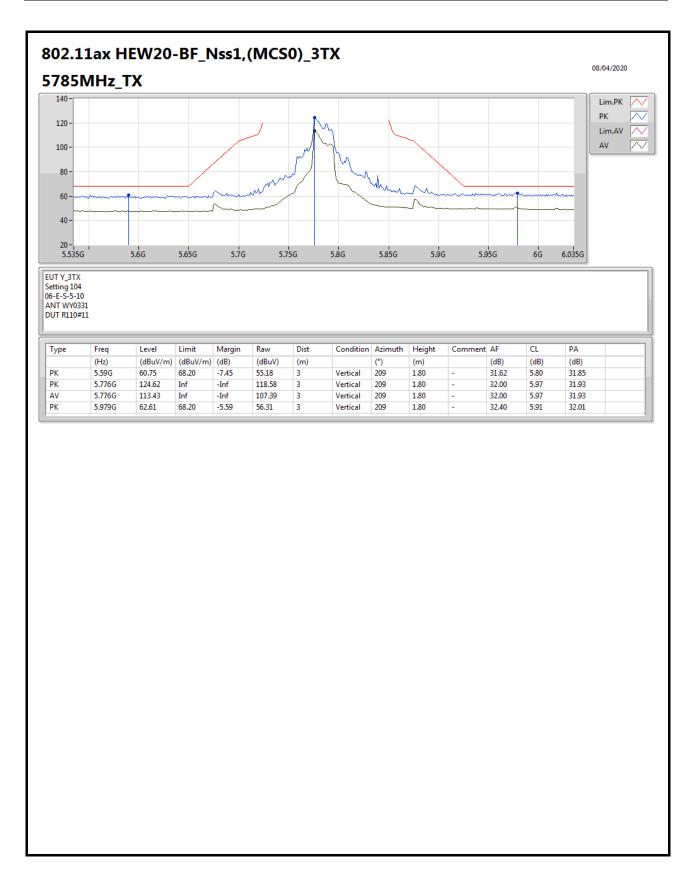


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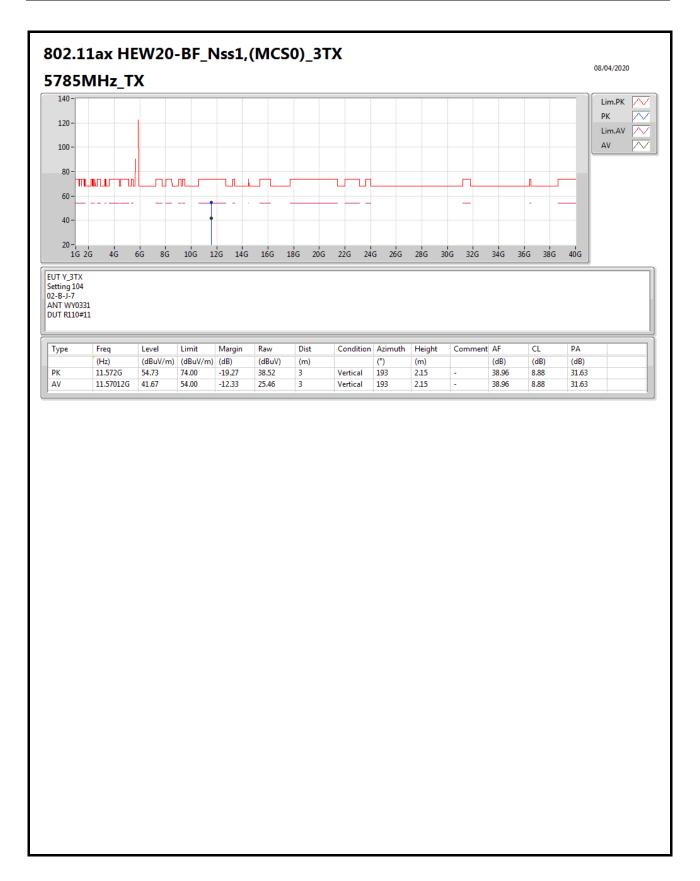






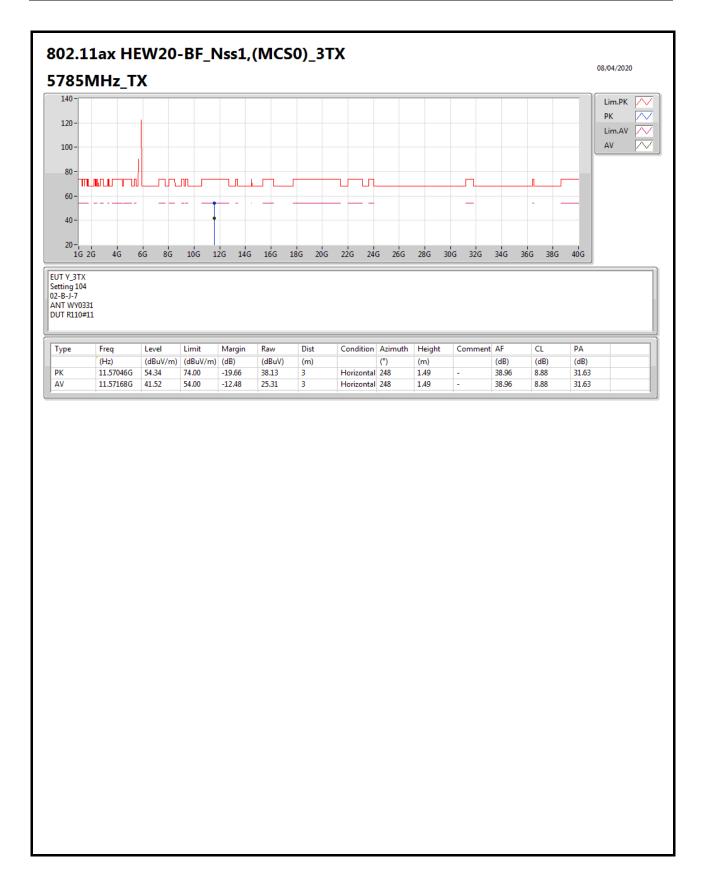




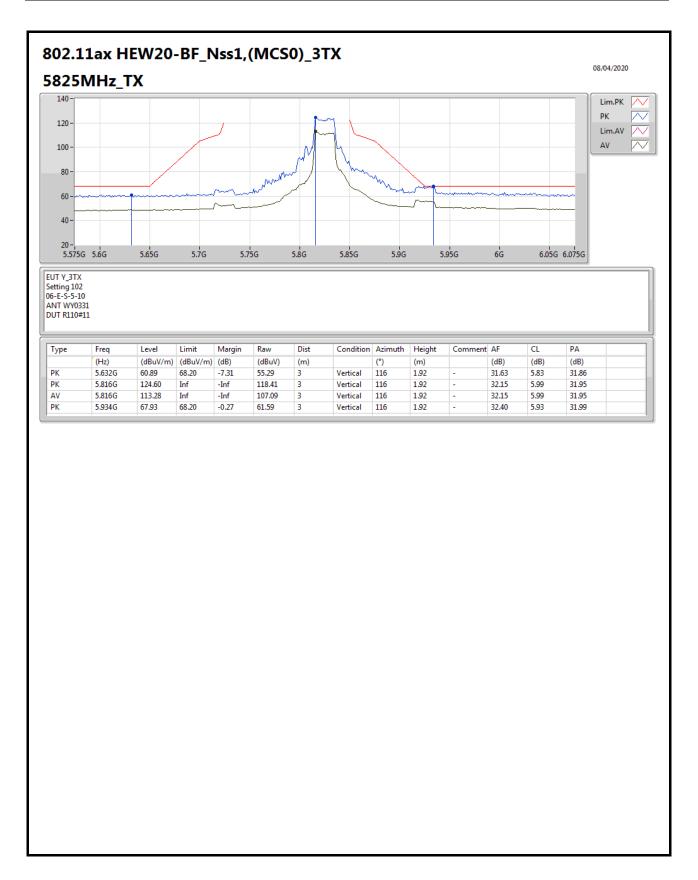


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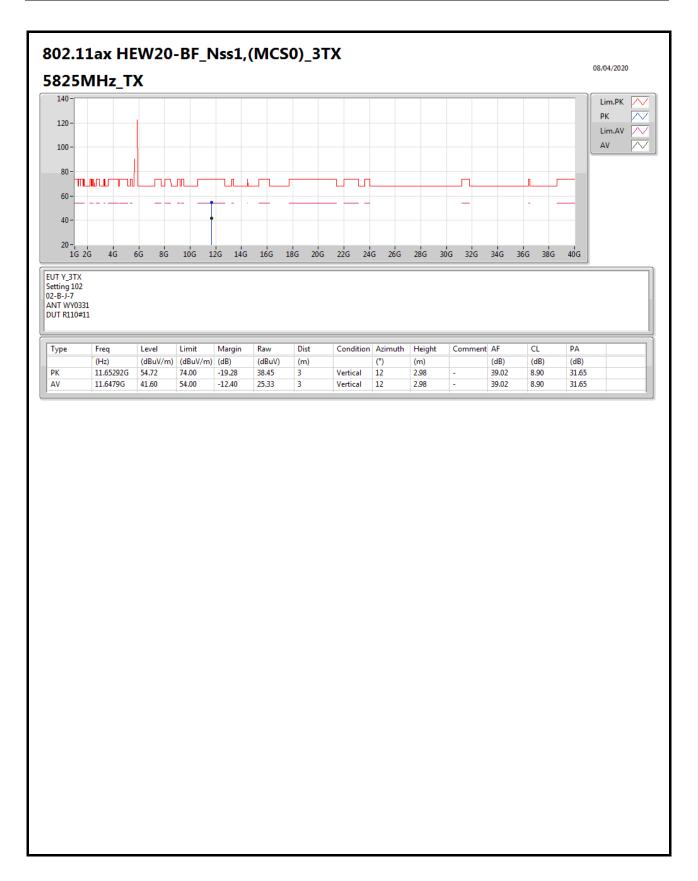






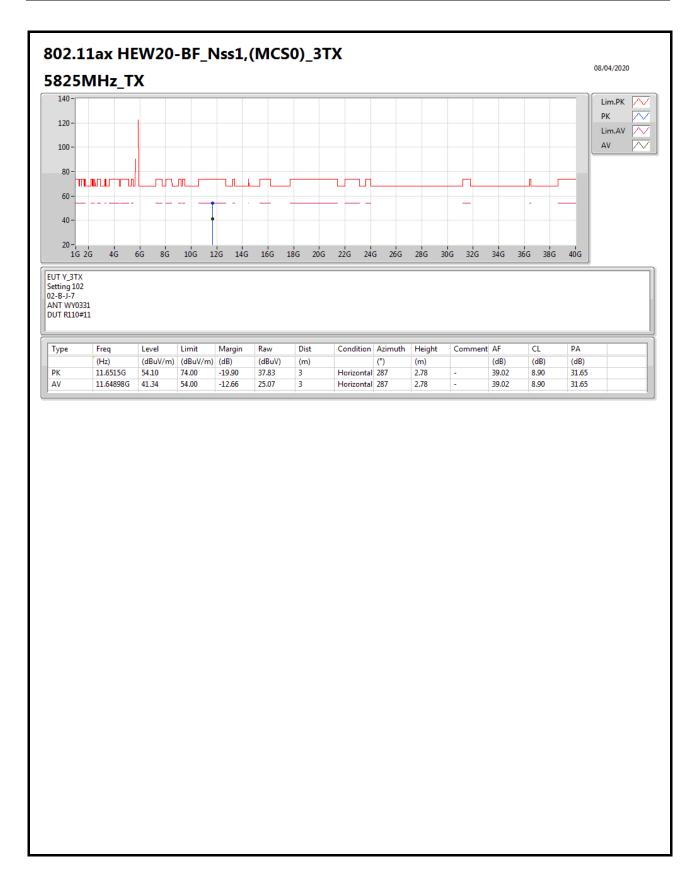




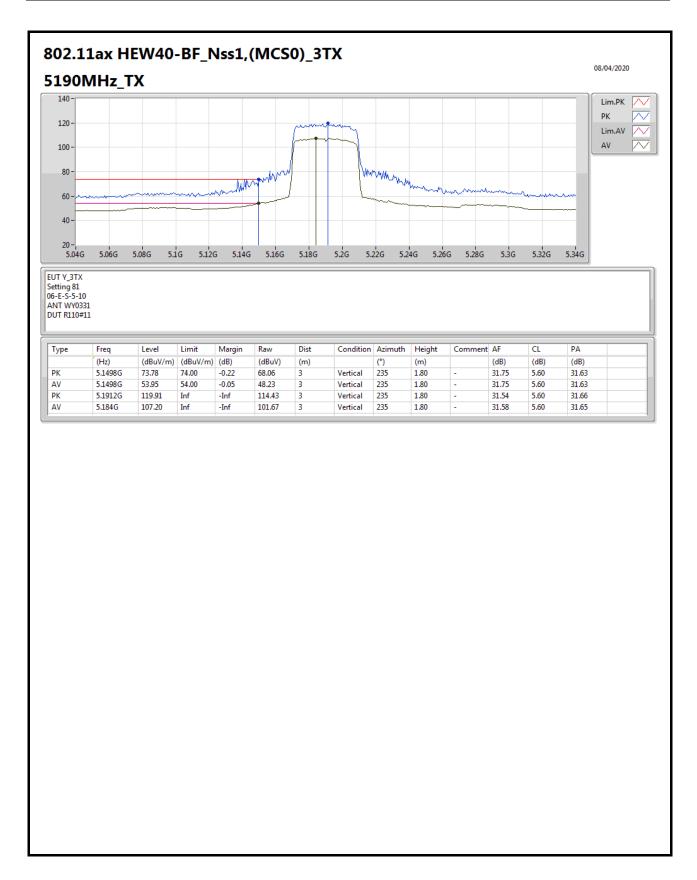


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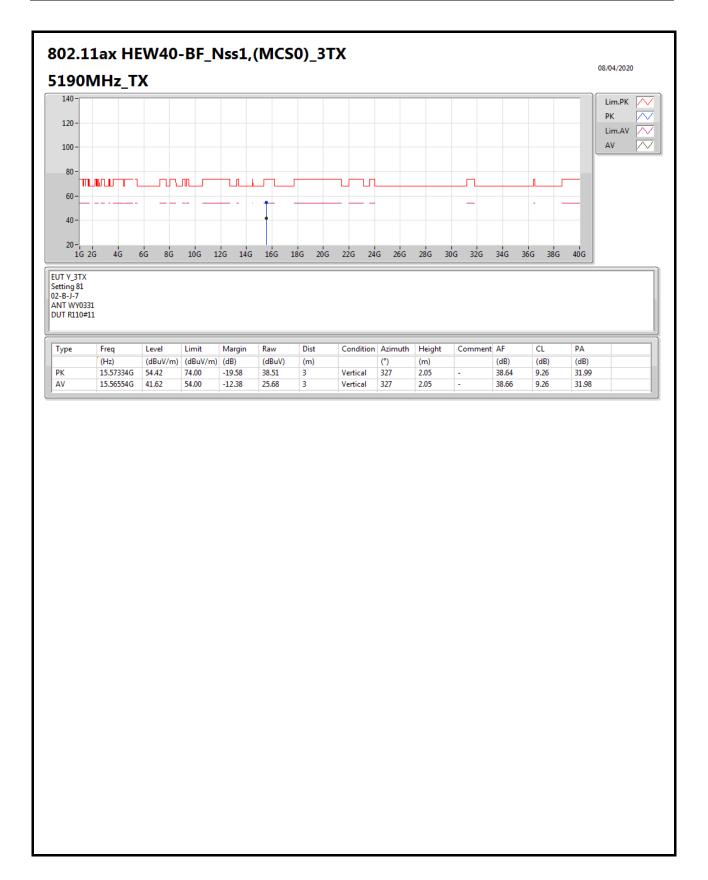






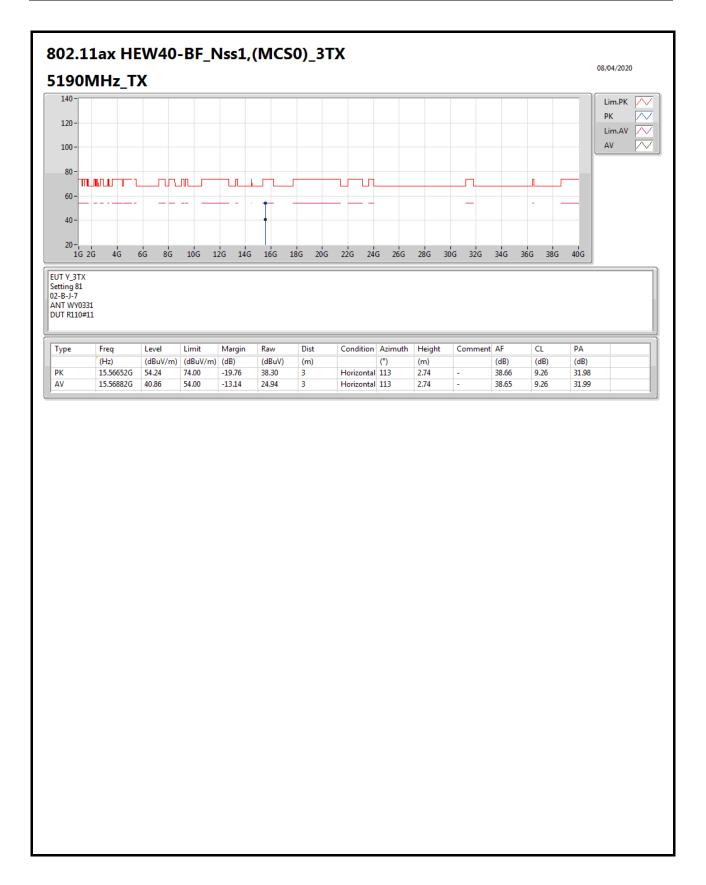
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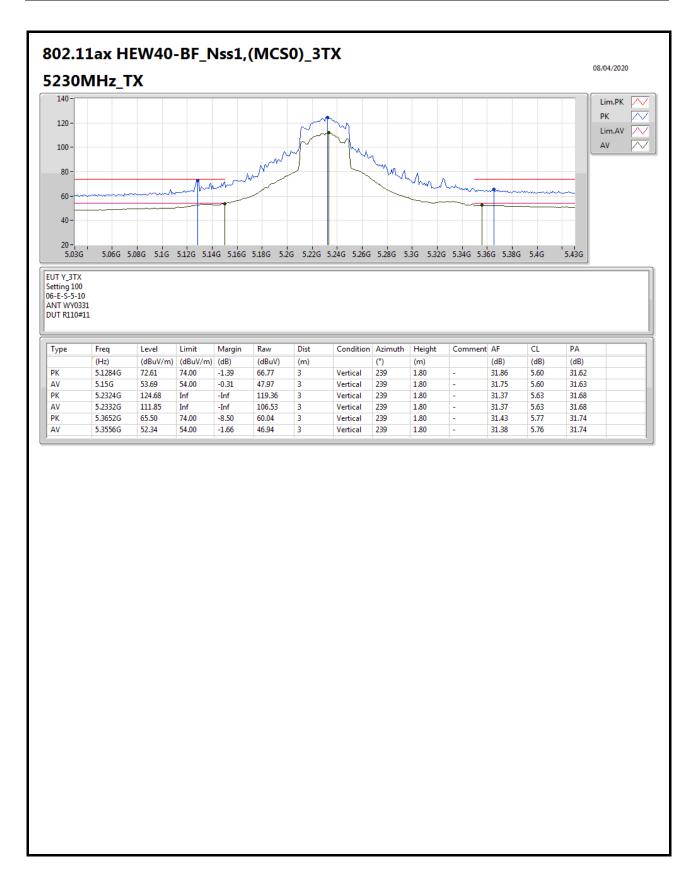


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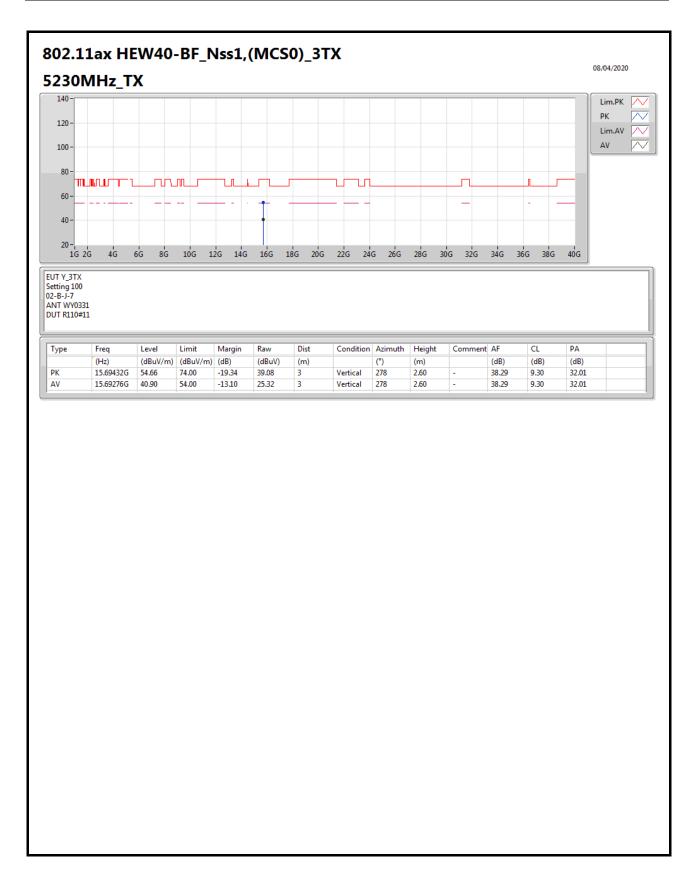






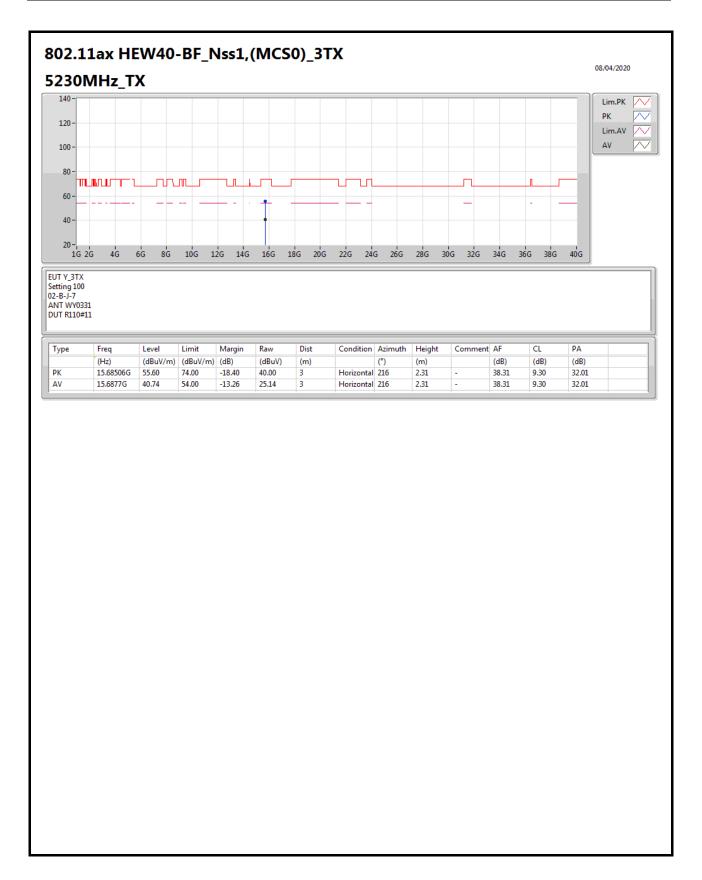
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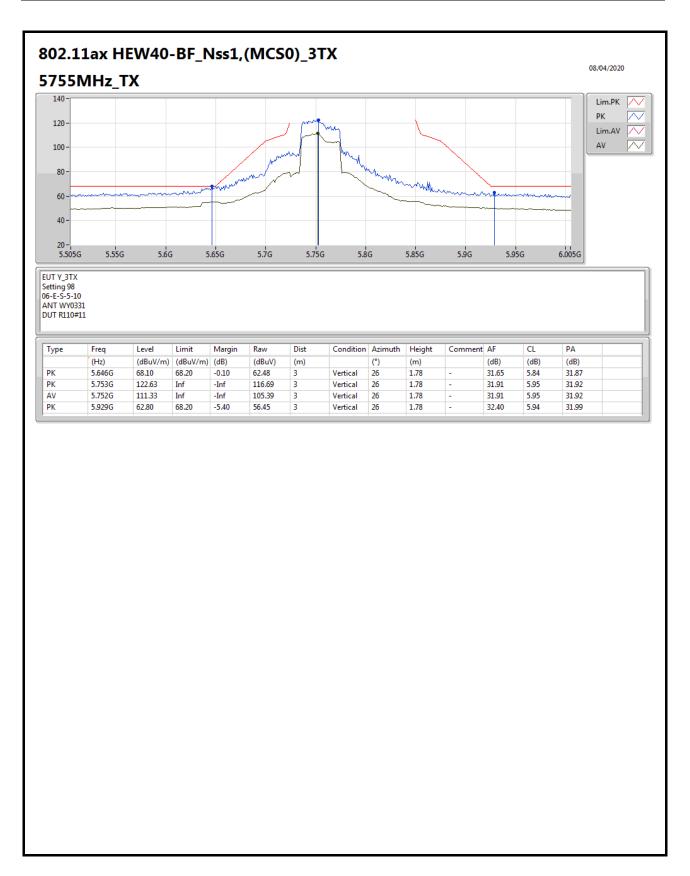
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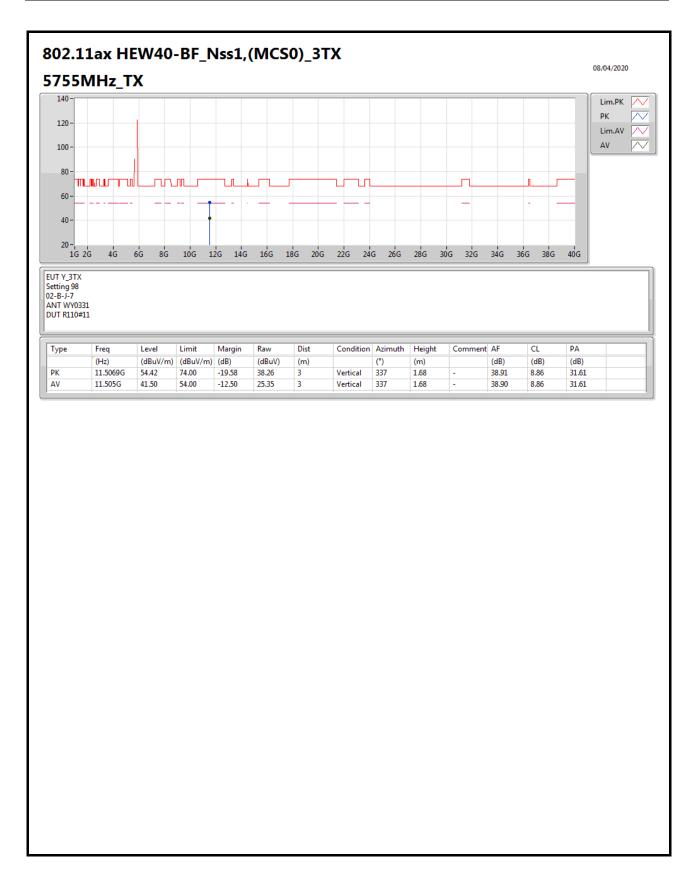
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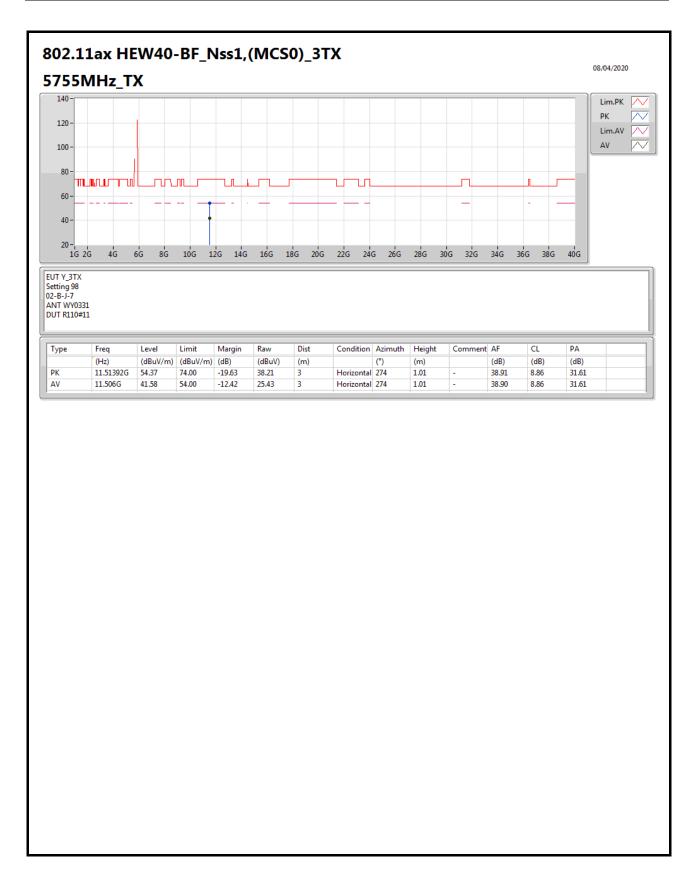
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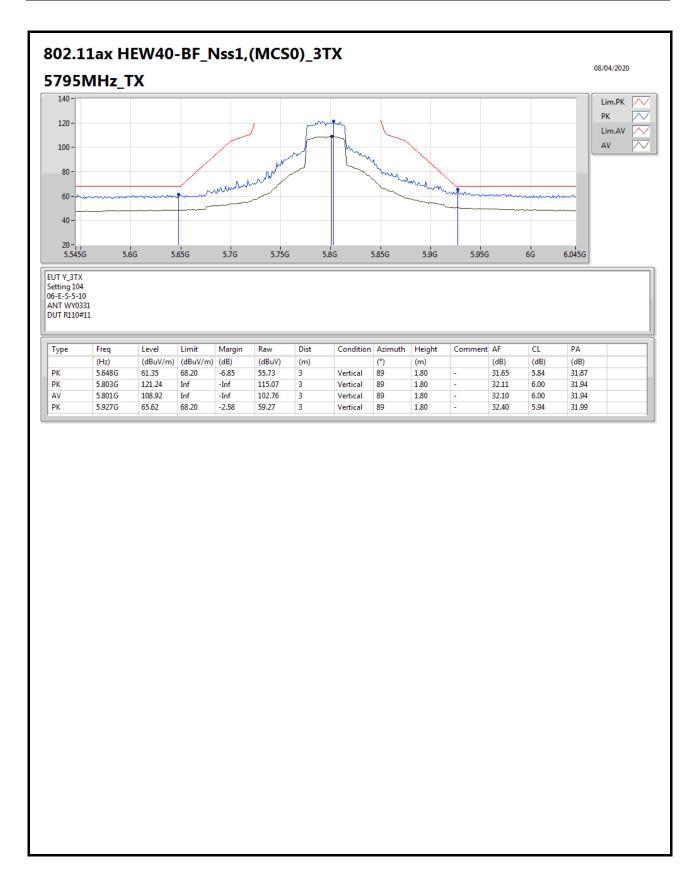
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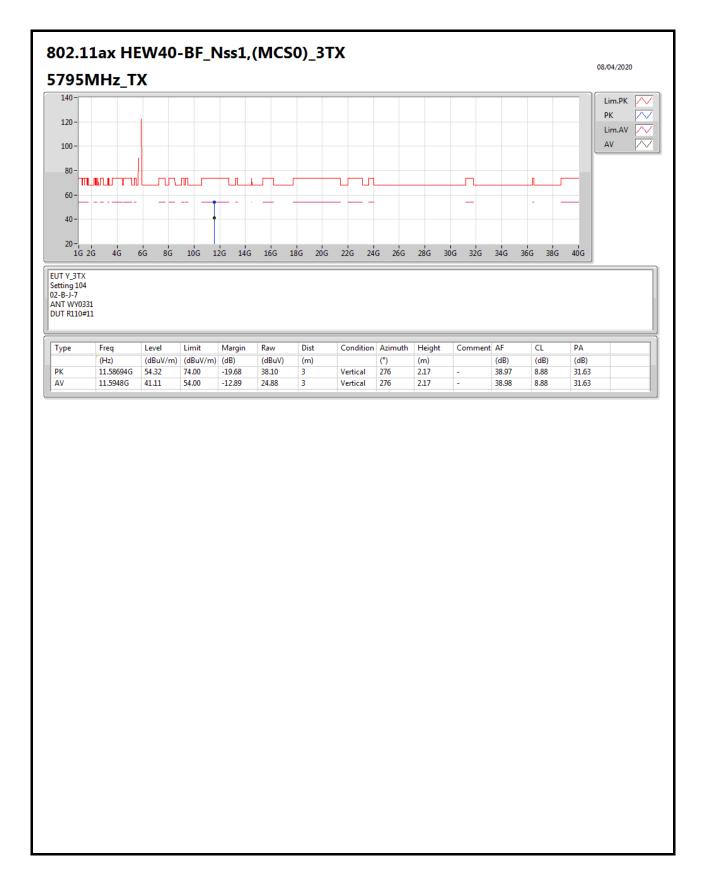
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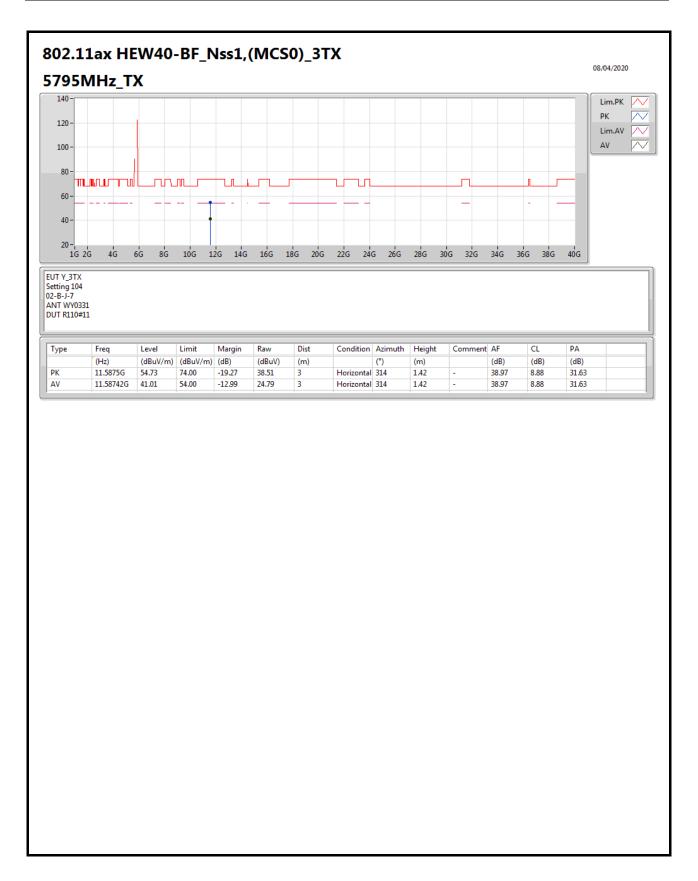
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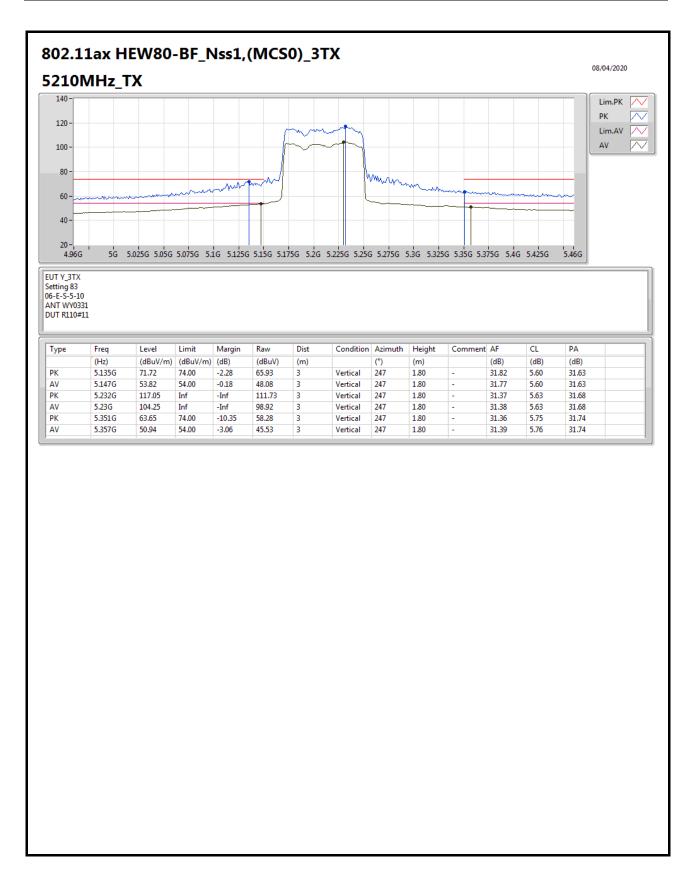
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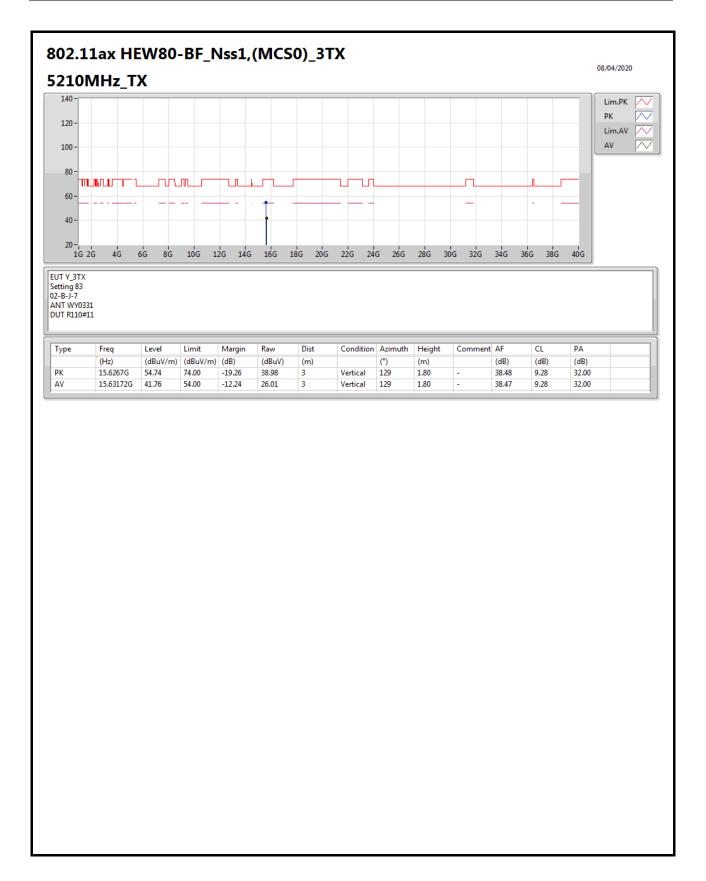
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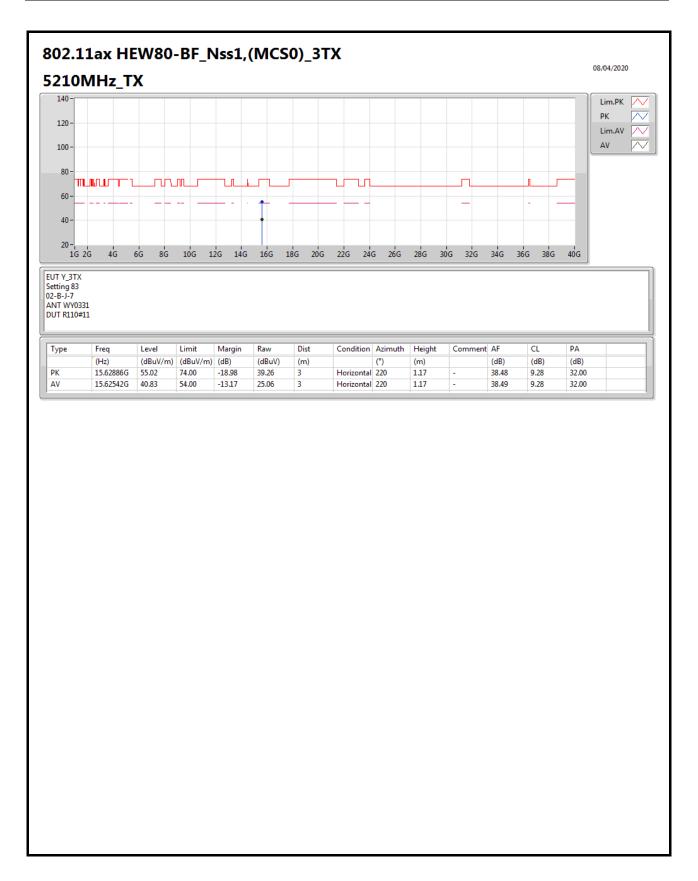
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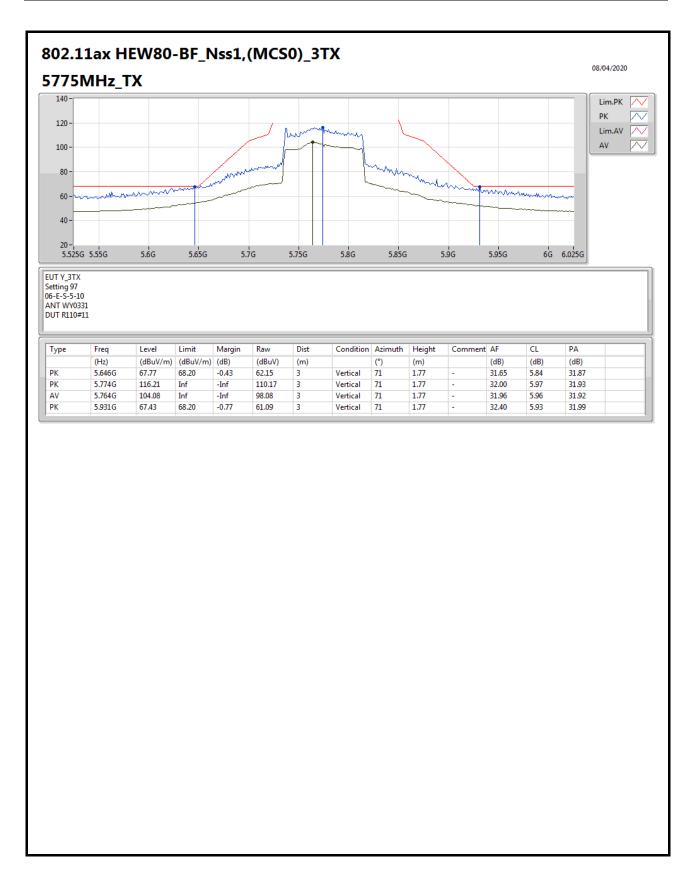


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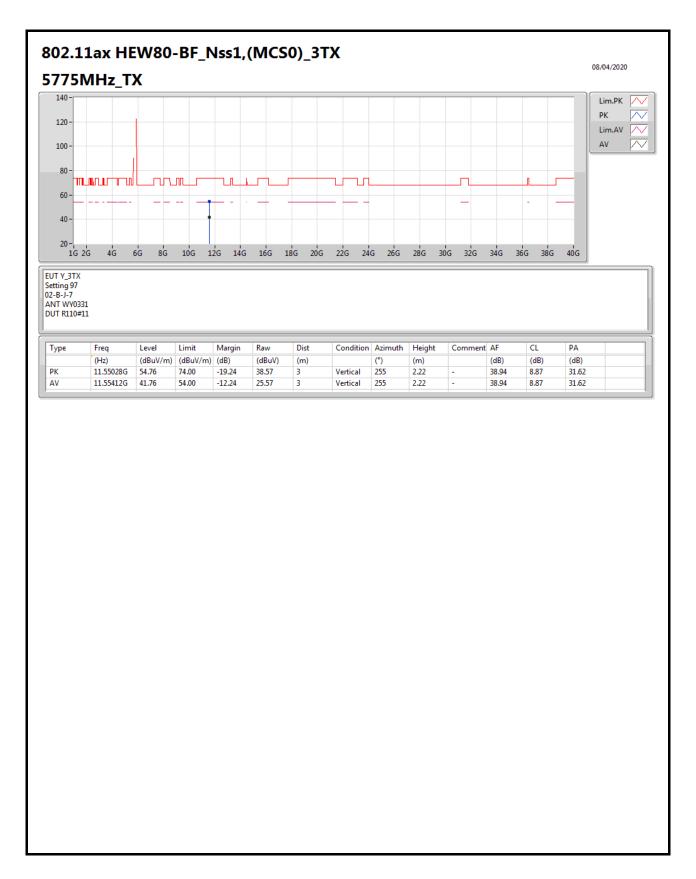




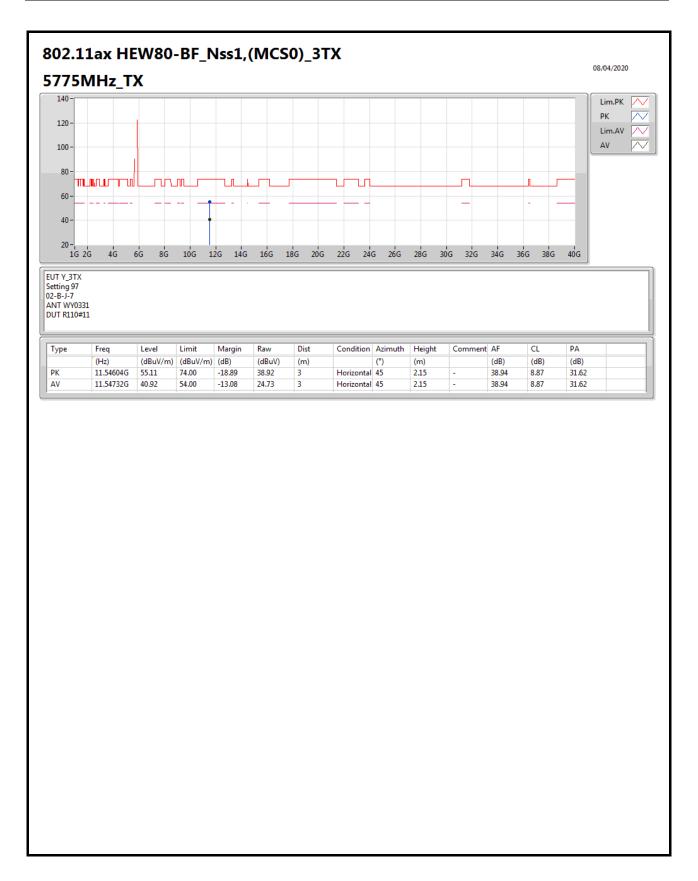




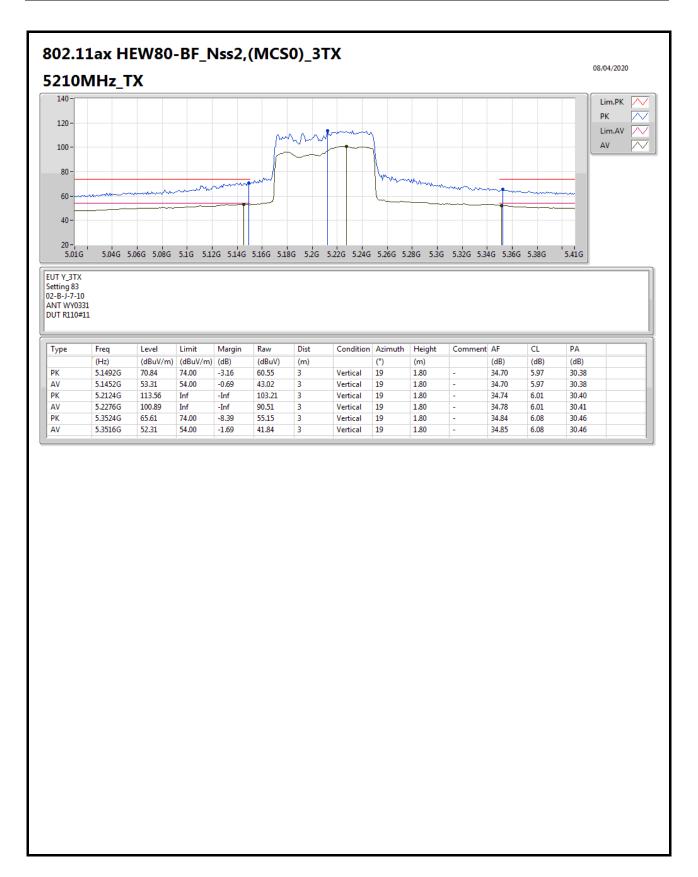






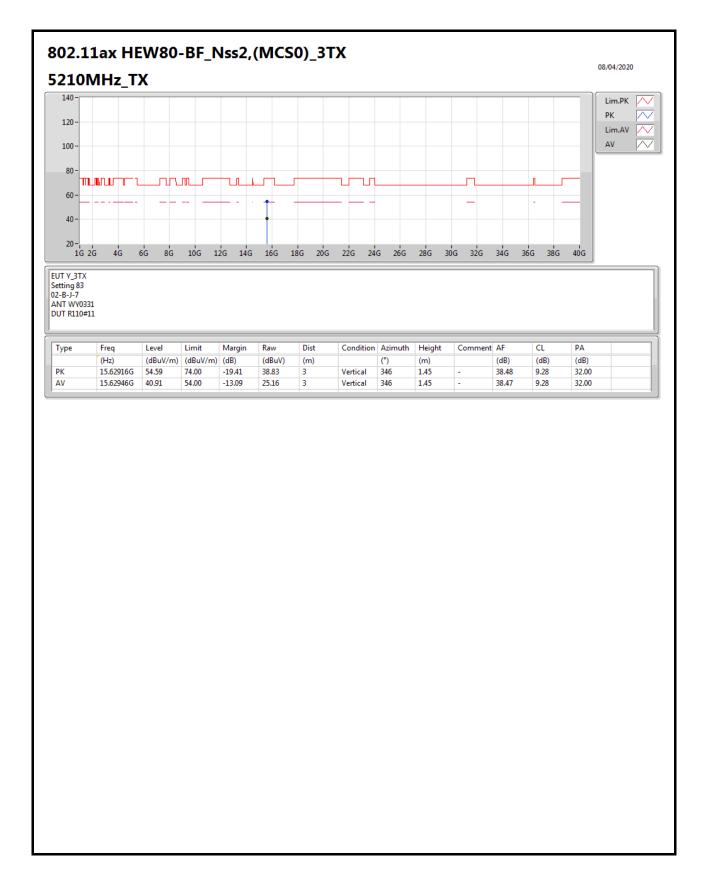




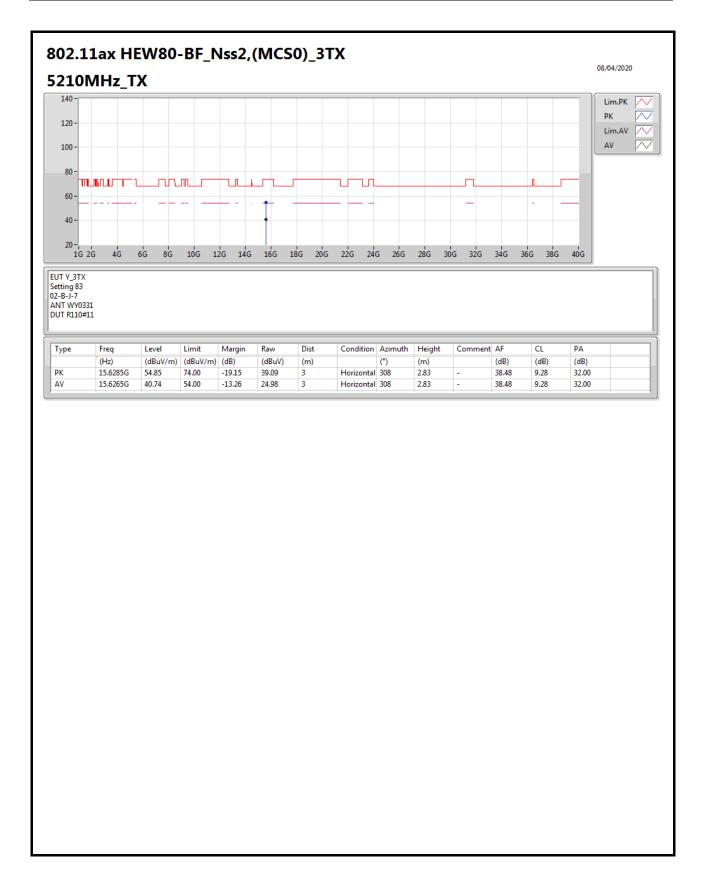


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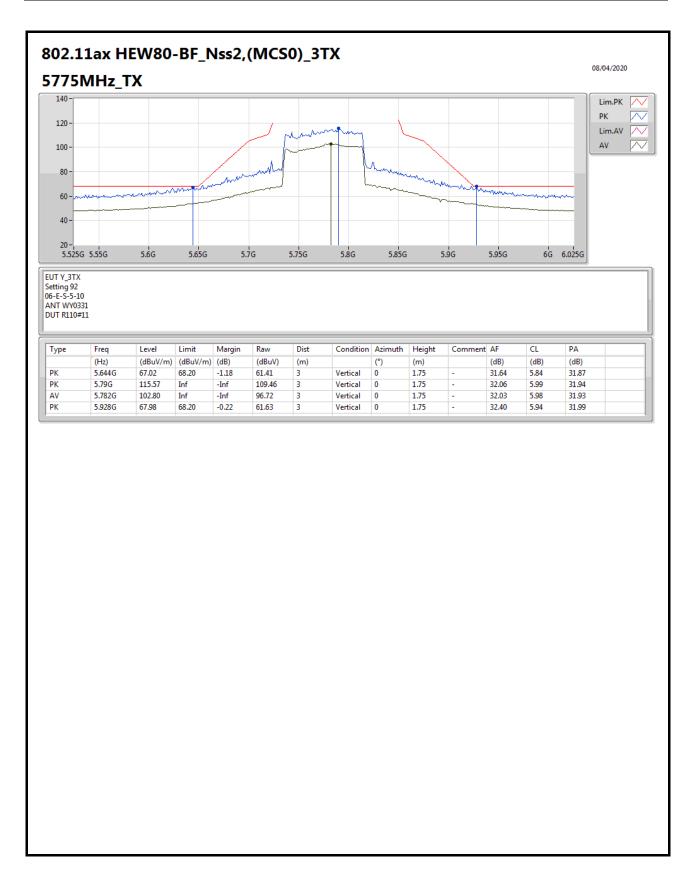




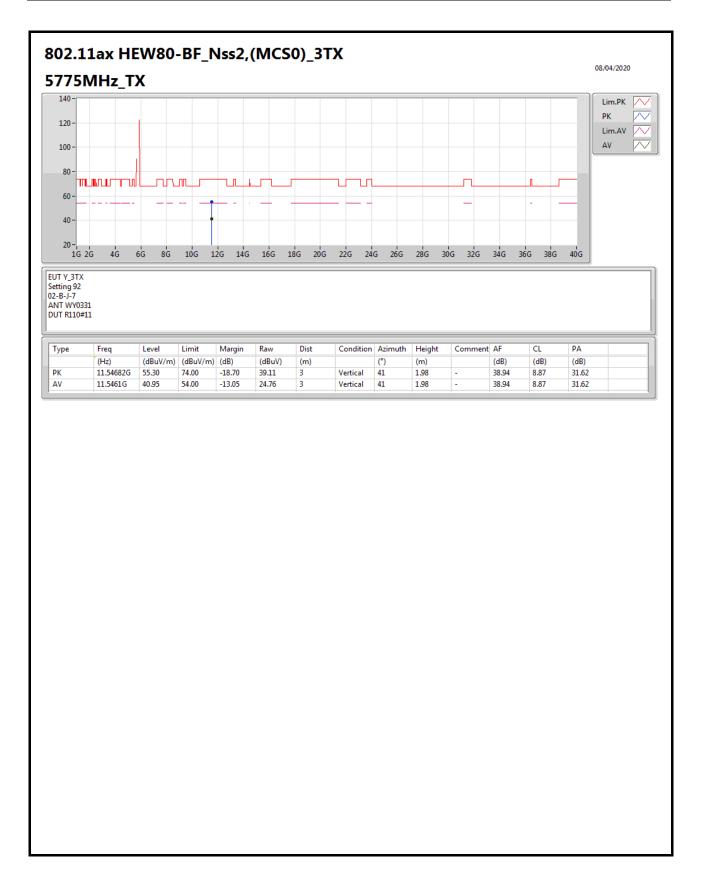




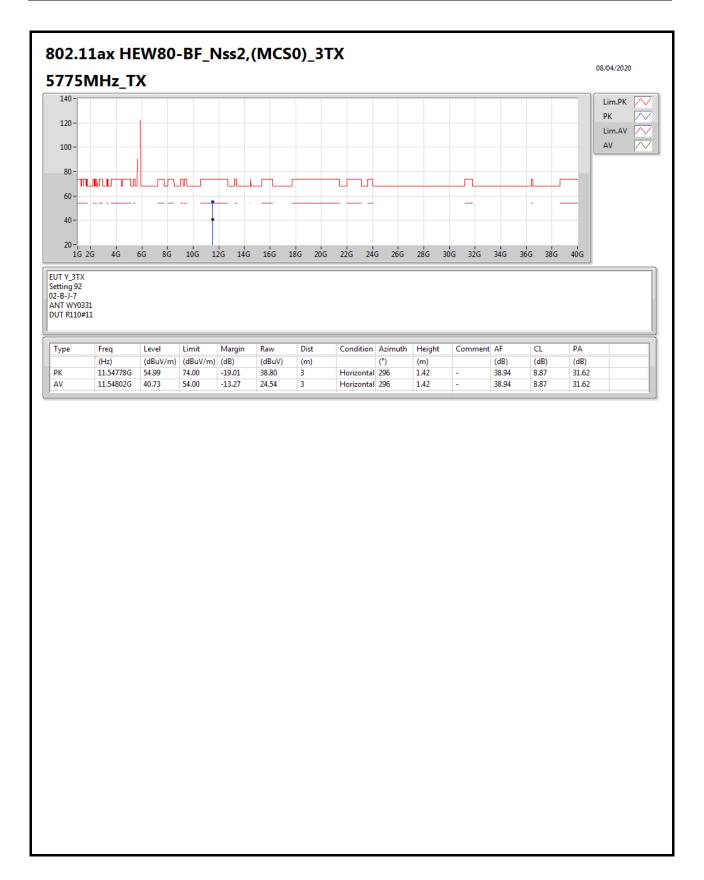














Radiated Emission Co-location

Appendix F

Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Condition
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	
Mode 1	Pass	AV	2.076G	29.70	54.00	-24.30	Horizontal



