



FCC RADIO TEST REPORT

FCC ID

: MSQ-AXHZ00

Equipment

: AX6600 Tri Band WiFi Router

Brand Name

: ASUS

Model Name

: RT-AX95Q, ZenWiFi XT8, ASUS ZenWiFi XT8, XT8,

ASUS ZenWiFi

Applicant

: ASUSTEK COMPUTER INC.

4F, No. 150, Li-Te Rd., Peitou, 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

Xuyen district, Vinh Phuc Province

Standard

: 47 CFR FCC Part 15.247

The product was received on May 15, 2019, and testing was started from May 15, 2019 and completed on Aug. 16, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

TEL: 886-3-656-9065

FAX: 886-3-656-9085

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History of this test report

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Report No.	Version	Description	Issued Date
FR951008AA	01	Initial issue of report	Aug. 28, 2019

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Summary of Test Result

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Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

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

Reviewed by: Sam Chen Report Producer: Viola Huang

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1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number	
2400-2483.5	b, g, n (HT20), VHT20, ax (HEW20)	2412-2462	1-11 [11]	
2400-2483.5	n (HT40), VHT40, ax (HEW40)	2422-2452	3-9 [7]	

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Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2TX
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT-20	20	2TX
2.4-2.4835GHz	802.11n HT20-BF	20	2TX
2.4-2.4835GHz	VHT-20	20	2TX
2.4-2.4835GHz	VHT20-BF	20	2TX
2.4-2.4835GHz	802.11ax HEW20	20	2TX
2.4-2.4835GHz	802.11ax HEW20-BF	20	2TX
2.4-2.4835GHz	802.11n HT-40	40	2TX
2.4-2.4835GHz	802.11n HT40-BF	40	2TX
2.4-2.4835GHz	VHT-40	40	2TX
2.4-2.4835GHz	VHT40-BF	40	2TX
2.4-2.4835GHz	802.11ax HEW40	40	2TX
2.4-2.4835GHz	802.11ax HEW40-BF	40	2TX

Note:

- 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- 11g, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

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1.1.2 Antenna Information

Set	Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
	1	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	2	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	3	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
'	4	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	5	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	6	PSA	RFDPA230508IMLB902	Dipole Antenna	I-PEX	
	1	M.gear	C660-510484-A	Dipole Antenna	I-PEX	Note 1
	2	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
2	3	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	4	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	5	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
	6	M.gear	C660-510484-A	Dipole Antenna	I-PEX	
3	7	YAGEO	ANT3216A063R2400A	Chip Antenna	N/A	

Note 1:

	Gain (dBi) - CDD mode for output power									
		Port				5GHz	5GHz	5GHz		
Set	Ant.	2.4G 2TX	5G 2TX	5G 4TX	Bluetooth 1TX	2.4GHz	Band 1	Band 3	Band 4	Bluetooth
	1	1	1	-	-	1.82	3.08	1	-	-
	2	2	2	-	-	1.82	3.08	-	-	-
1	3	-	-	2	-	-	-	2.22	2.23	-
1	4	-	-	3	-	-	-	2.22	2.23	-
	5	-	-	1	-	-	-	2.22	2.23	-
	6	-	-	4	-	-	-	2.22	2.23	-
	1	-	-	-	-	1.82	3.08	-	-	-
	2	-	-	-	-	1.82	3.08	-	-	-
2	3	-	-	-	-	-	-	2.22	2.23	-
2	4	-	-	-	-	-	-	2.22	2.23	-
	5	-	-	-	-	-	-	2.22	2.23	-
	6	-	-	-	-	-	-	2.22	2.23	-
3	1	-	-	-	1	-	-	-	-	2.02

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		Gain (dB	i) - Beamf	orming m	node for ou	tput pov	er & PS	D, CDE	mode	for P	SD	
		Port					ECU-	5G	Hz	5G	Hz	
Set	Ant.	2.4G 2TX	5G 2TX	5G 4TX	Bluetooth	2.4GHz	5GHz Band 1	Bar	nd 3	Bar	nd 4	Bluetooth
		2.46 217	3G 21X	3G 41X	1TX		Dallu I	4T1S	4T2S	4T1S	4T2S	
	1	1	1	-	-	4.70	5.99	-	ı	-	-	-
	2	2	2	-	-	4.70	5.99	-	-	-	-	-
1	3	-	ı	2	-	-	1	8.07	5.22	8.21	5.23	-
'	4	-	-	3	-	-	-	8.07	5.22	8.21	5.23	-
	5	-	-	1	-	-	-	8.07	5.22	8.21	5.23	-
	6	-	-	4	-	-	-	8.07	5.22	8.21	5.23	-
	1	-	1	-	-	4.70	5.99	-	-	-	-	-
	2	-	-	-	-	4.70	5.99	-	-	-	-	-
2	3	-	-	-	-	-	-	8.07	5.22	8.21	5.23	-
_	4	-	-	-	-	-	-	8.07	5.22	8.21	5.23	-
	5	-	-	-	-	-	-	8.07	5.22	8.21	5.23	-
	6	-	-	-	-	-	-	8.07	5.22	8.21	5.23	-

Note 2: The EUT has three sets of antennas and there are six antennas for set 1 and set 2.

Set 1~2 are the same antenna type. Only Set 1 antenna was selected to test and record in this report.

For 2.4GHz WLAN function (Radio 1)

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

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

Port 1 and port 2 could transmit/receive simultaneously.

For 5GHz Band 1 WLAN function (Radio 1)

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

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

Port 1 and port 2 could transmit/receive simultaneously.

For 5GHz Band 3~Band 4 WLAN function (Radio 2)

IEEE 802.11a/n/ac/ax mode (4TX/4RX):

Port 1, port 2, port 3 and port 4 can be used as transmitting/receiving antenna.

Port 1, port 2, port 3 and port 4 could transmit/receive simultaneously.

For Bluetooth function (Radio 3)

Only Port 1 can be used as transmitting/receiving antenna.

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1.1.3 Mode Test Duty Cycle

For 2T1S

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b	0.994	0.03	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.98	0.09	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ax HEW20-BF	0.974	0.11	1.148m	1k
802.11ax HEW40-BF	0.975	0.11	1.202m	1k

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For 2T2S

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11ax HEW20	0.982	0.08	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ax HEW40	0.981	0.08	n/a (DC>=0.98)	n/a (DC>=0.98)

NΙ	~ +~	
ıv	ω	

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

1.1.4 EUT Operational Condition

EUT Power Type	Fro	From Power Adapter					
Beamforming Function	\boxtimes	With beamforming		Without beamforming			
	For IEEE 802.11n/ac/VHT in 2.4GHz and IEEE 802.11n/ac/ax in 5GHz.						
Function	\boxtimes	Point-to-multipoint		Point-to-point			
Test Software Version	Mtool V3.1.0.3						

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

The five model names in the following table are all refer to the identical product.

Brand Name	Model Name	Description
	RT-AX95Q	
ASUS	ZenWiFi XT8	All the models are identical the different model names
	ASUS ZenWiFi XT8	All the models are identical, the different model names
	XT8	served as marketing strategy.
	ASUS ZenWiFi	

From the above models, model: RT-AX95Q was selected as representative model for the test and its data was recorded in this report.

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1.1.6 Table for SKU information

EUT No.	SKU No.	Brand Name	P/N
1	SKU 1	NETSWAP	NS773602 / NS771802
2	SKU 2	Mingtek	HN36201CG / HN18101CG

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1.1.7 Table for EUT supports functions

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

1.1.8 Table for radio information

Radio	2.4GHz	5GHz	Bluetooth
1	V	V (Band 1)	X
2	X	V (Band 3~Band 4)	X
3	X	Х	V

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1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

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- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D01 v02r01

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH02-CB	Owen Hsu	26.3~28.5°C / 56~60%	Jun. 21, 2019~Jul. 31, 2019
Radiated Below 1GHz	03CH05-CB	Eason Chen	27~28°C / 64~66%	Aug. 05, 2019~Aug. 13, 2019
Radiated Above 1GHz	03CH06-CB	Eason Chen	27.4~28.7°C / 61~65%	May 15, 2019~Jul. 31, 2019
AC Conduction	CO01-CB	Rick Yeh	25.1~26.1°C / 46.2~47.3%	Aug. 02, 2019~Aug. 16, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Power Density Measurement	2.4 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%

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2 Test Configuration of EUT

2.1 Test Channel Mode

For 2T1S

Mode	PowerSetting
802.11b_Nss1,(1Mbps)_2TX	-
2412MHz	112
2437MHz	112
2462MHz	110
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	88
2417MHz	95
2437MHz	110
2457MHz	96
2462MHz	90
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-
2412MHz	80
2417MHz	90
2437MHz	111
2457MHz	92
2462MHz	86
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-
2422MHz	73
2427MHz	78
2437MHz	91
2452MHz	84

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For 2T2S

Mode	PowerSetting
802.11ax HEW20_Nss2,(MCS0)_2TX	-
2412MHz	83
2417MHz	92
2437MHz	109
2457MHz	93
2462MHz	88
802.11ax HEW40_Nss2,(MCS0)_2TX	-
2422MHz	78
2427MHz	82
2437MHz	90
2452MHz	86

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Note:

- After evaluating, 802.11ax mode has been evaluated to be the worst case, so it was selected to test and record in this test report.
- There are two modes of EUT for 802.11n/ac/VHT 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	CTX	
1	EUT 1 + Radio 1_2.4G	
2	EUT 1 + Radio 1_5G Band 1	
3	EUT 1 + Radio 2_5G Band 3 + Band 4	
4	EUT 1 + Radio 3_Bluetooth	
For operating mode 3 is the worst case and it was record in this test report.		

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-	The Worst Case Mode for Following Conformance Tests		
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands		
Test Condition	Conducted measurement at transmit chains		

Th	The Worst Case Mode for Following Conformance Tests		
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in 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 1 + Radio 1_2.4G		
2	EUT 1 + Radio 1_5G Band 1		
3	EUT 1 + Radio 2_5G Band 3 + Band 4		
4	EUT 1 + Radio 3_Bluetooth		
Mode 2 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5 will follow this same test mode.			
5	EUT 2 + Radio 1_5G Band 1		
For operating mode 5 is the worst case and it was record in this test report.			
Operating Mode > 1GHz	CTX		
1	EUT 1 + Radio 1_2.4G		

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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_Radio 1 + WLAN 5GHz_Radio 1	
Refer to Appendix G for Radiated Emission Co-location.		

The Worst Case Mode for Following Conformance Tests			
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation			
Operating Mode			
1 WLAN 2.4GHz_Radio 1 + WLAN 5GHz_Radio 2 + Bluetooth_Radio 3 2 WLAN 5GHz_Radio 1 + WLAN 5GHz_Radio 2 + Bluetooth_Radio 3			
		Refer to Sporton Test Report No.: FA951008 for Co-location RF Exposure Evaluation.	

Note: The EUT can only use Y axis position.

2.3 EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

beamforming mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

- 1. During the test, the EUT operation to normal function.
- 2. Executed command fixed test channel under Telnet.
- 3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by WLAN AP and transmit duty cycle no less than 98%.

For Normal Link:

During the test, the EUT operation to normal function.

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2.4 Accessories

Accessories				
Equipment Name Brand Name Model Name Type Rating				Rating
Adapter	PI	AD2088320	010LF	INPUT: 100-240V ~ 50/60Hz, 0.8A OUTPUT: 19V, 1.75A
Other				
RJ-45 cable*1: Non-shielded, 1.5m				

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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	LAN NB	DELL	E6430	N/A

For Radiated (below 1GHz):

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

For RF Conducted and Radiated (above 1GHz):

(For non beamforming mode)

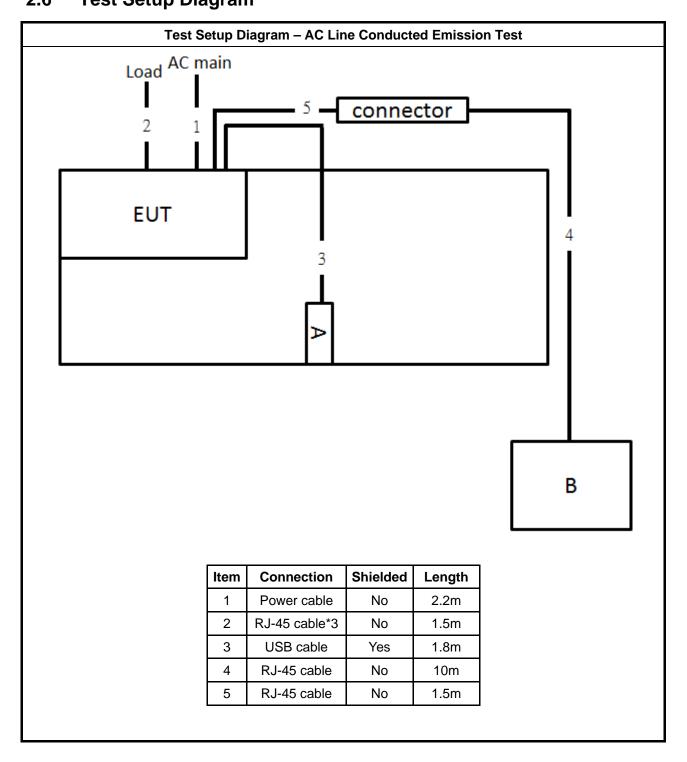
(1 (1)	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
Α	NB	DELL	E4300	N/A

(For beamforming mode)

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
Α	NB	DELL	E4300	N/A	
В	WLAN AP	ASUS	RT-AX88U	N/A	
С	NB	DELL	E4300	N/A	

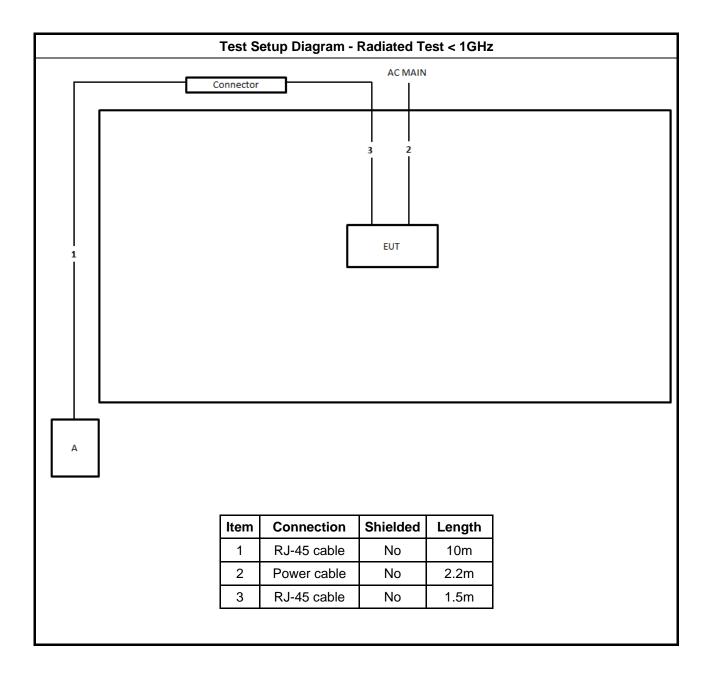
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2.6 Test Setup Diagram



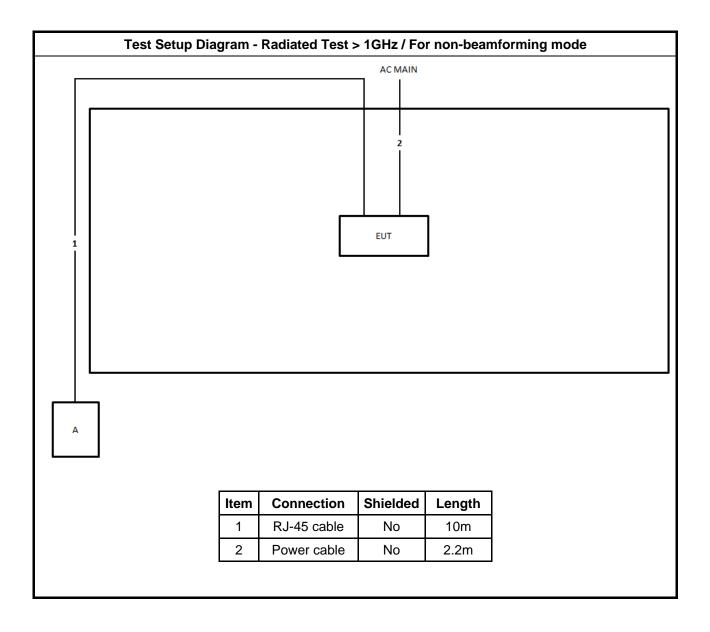
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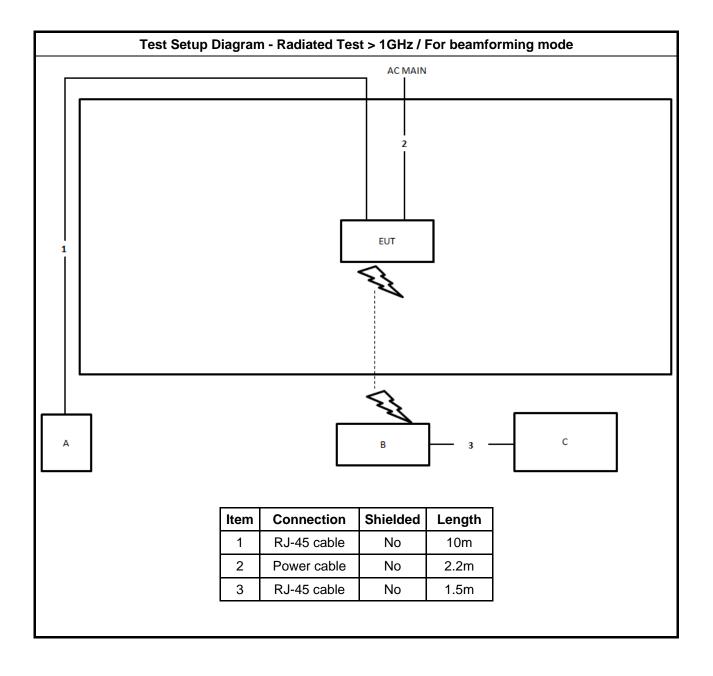


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3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit			
Frequency Emission (MHz) Quasi-Peak Average			
0.15-0.5	66 - 56 *	56 - 46 *	
0.5-5	56	46	
5-30	60	50	
Note 1: * Decreases with the logarithm of the frequency.			

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3.1.2 Measuring Instruments

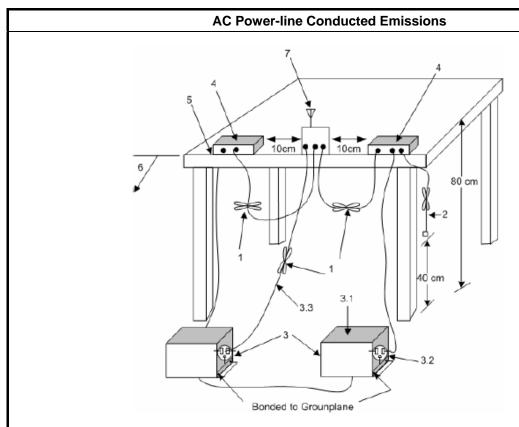
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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3.1.4 Test Setup



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.

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- 2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
- 3.1—All other equipment powered from additional LISN(s).
- 3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
- 3.3—LISN at least 80 cm from nearest part of EUT chassis.
- 4—Non-EUT components of EUT system being tested.
- 5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
- 6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
- 7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

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3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit		
Systems using digital modulation techniques:		
■ 6 dB bandwidth ≥ 500 kHz.		

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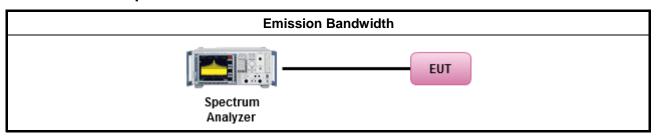
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

	Test Method				
•	For	the emission bandwidth shall be measured using one of the options below:			
	\boxtimes	Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.			
		Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.			
		Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.			

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit

- If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 30 dBm (1 W)
- Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 (G_{TX} 6)$ dBm
- Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 (G_{TX} 6)/3$ dBm
- Smart antenna system (SAS):
 - Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 (G_{TX} 6)/3$ dBm
 - Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 (G_{TX} 6)/3$ dBm
 - Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 (G_{TX} 6)/3 + 8$ dB dBm

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 \mathbf{P}_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, \mathbf{G}_{TX} = the maximum transmitting antenna directional gain in dBi.

3.3.2 Measuring Instruments

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

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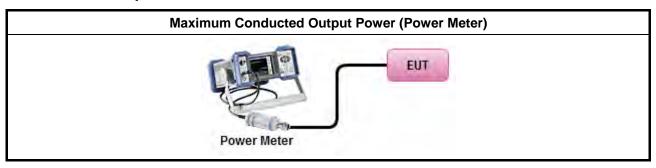
3.3.3 Test Procedures

		Test Method		
•	Max	imum Peak Conducted Output Power		
		Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).		
		Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).		
•	Max	imum Conducted Output Power		
	[duty	/ cycle ≥ 98% or external video / power trigger]		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)		
	duty	cycle < 98% and average over on/off periods with duty factor		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3		
		Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)		
	Measurement using a power meter (PM)			
	\boxtimes	Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).		
		Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).		
•	For	conducted measurement.		
	•	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.		
	•	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n \\ \text{(calculated in linear unit [mW] and transfer to log unit [dBm])} \\ \text{EIRP}_{total} = P_{total} + DG$		

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3.3.4 Test Setup



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3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit ■ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

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3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

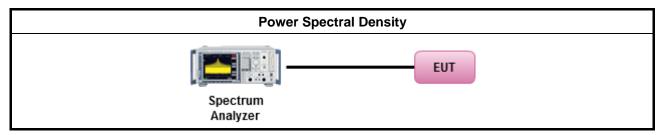
	Test Method							
•	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.							
	[duty cycle ≥ 98% or external video / power trigger]							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPSD-1.							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPSD-2.							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPSD-3.							
	duty cycle < 98% and average over on/off periods with duty factor							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPSD-1A. (alternative).							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPSD-2A. (alternative)							
	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPSD-3A. (alternative)							
•	For conducted measurement.							
	If The EUT supports multiple transmit chains using options given below:							
	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.							
	Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,							

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Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

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3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

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3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit					
RF output power procedure	Limit (dBc)				
Peak output power procedure	20				
Average output power procedure	30				

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- Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
- Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

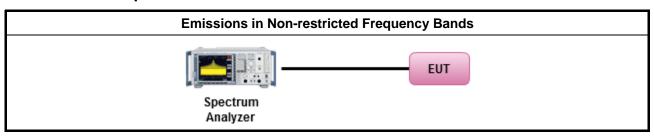
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method	
 Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands. 	

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

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3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit							
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)				
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300				
0.490~1.705	24000/F(kHz)	33.8 - 23	30				
1.705~30.0	30	29	30				
30~88	100	40	3				
88~216	150	43.5	3				
216~960	200	46	3				
Above 960 500		54	3				

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- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the ELIT
- Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.6.2 Measuring Instruments

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

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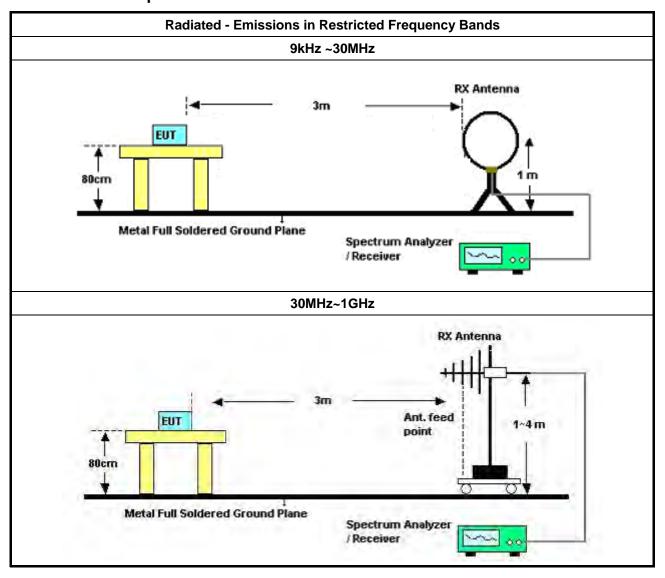
3.6.3 Test Procedures

		Test Method							
•	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].								
•	Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.								
•	For the transmitter unwanted emissions shall be measured using following options below:								
 Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands. 									
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle ≥98%).							
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).							
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW≥1/T).							
		Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.							
		Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.							
		Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.							
•	For	the transmitter band-edge emissions shall be measured using following options below:							
	•	Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.							
	 Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta metho band-edge measurements. 								
	•	Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).							
	•	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB							
	•	For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.							

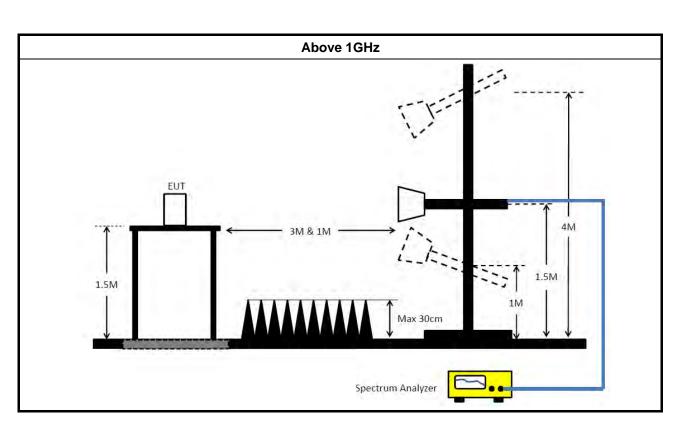
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3.6.4 Test Setup



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3.6.5 Measurement Results Calculation

The measured Level is calculated using:

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

3.6.6 Emissions in Restricted Frequency Bands (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

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4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-1 6-2	04083	150kHz ~ 100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 02, 2019	May 01, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 20, 2018	Jul. 19, 2019	Radiation (03CH06-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. 07, 2018	Jun. 06, 2019	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)
Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 03, 2018	Oct. 02, 2019	Radiation (03CH06-CB)
RF Cable-high	HUBER+ SUHNER	RG402	High Cable-05	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable-high	HUBER+ SUHNER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)

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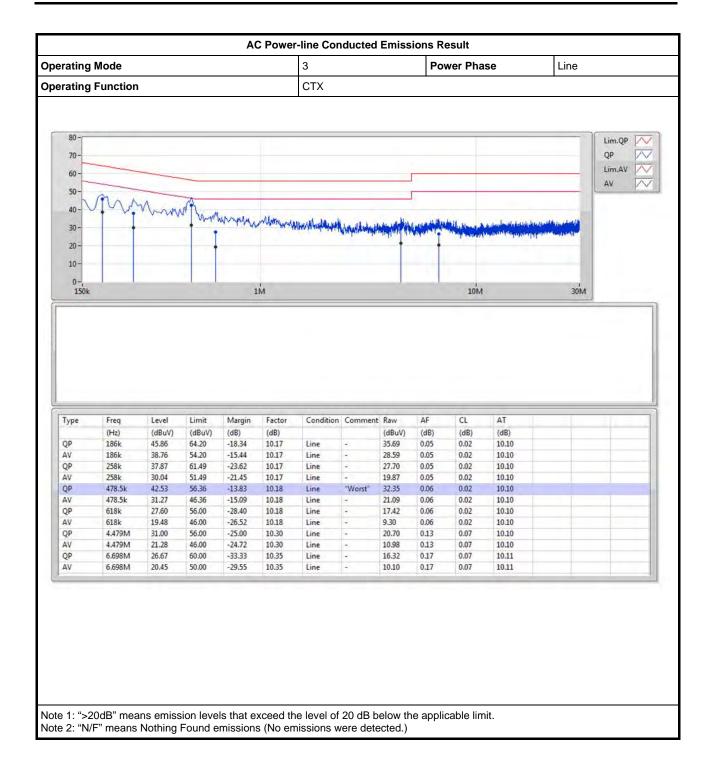
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (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	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 24, 2018	Oct. 23, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)

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

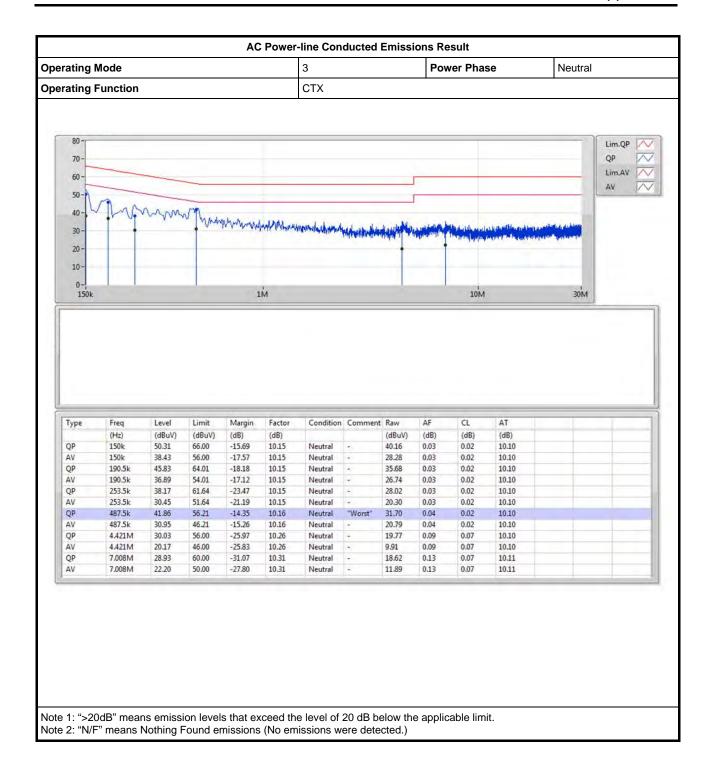
N.C.R. means Non-Calibration required.

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AC Power-line Conducted Emissions Result



AC Power-line Conducted Emissions Result





For 2T1S Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	7.075M	11.269M	11M3G1D	6.525M	10.47M
802.11g_Nss1,(6Mbps)_2TX	16.35M	17.241M	17M2D1D	16.325M	16.567M
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	19M	19.215M	19M2D1D	18.7M	18.966M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	37.6M	37.631M	37M6D1D	36.6M	37.431M

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

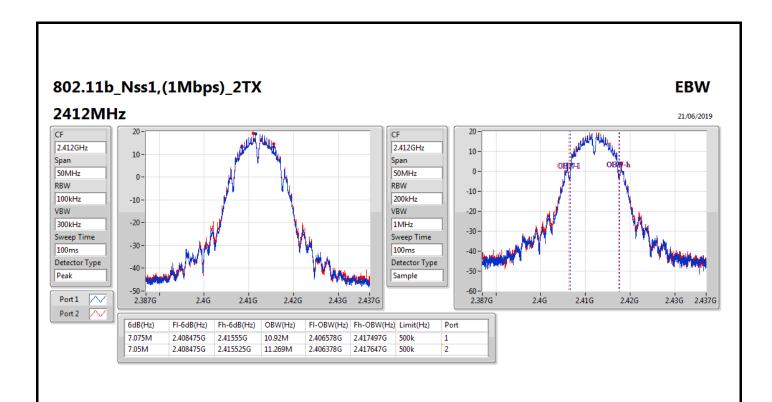


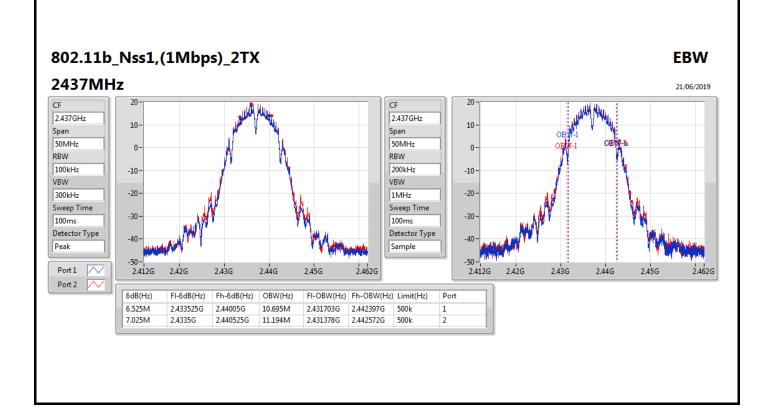
Result

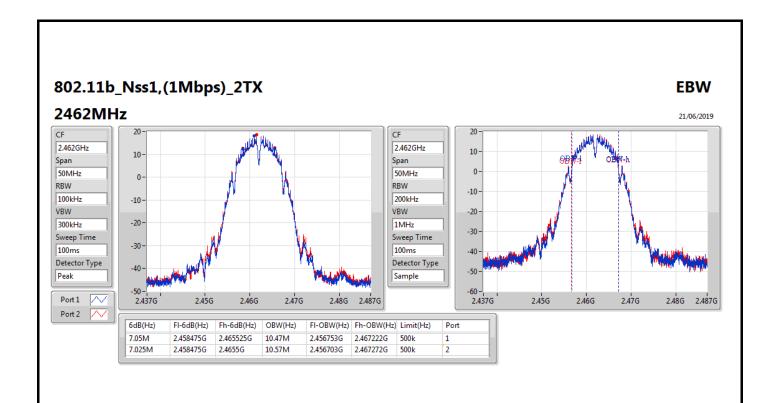
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	7.075M	10.92M	7.05M	11.269M
2437MHz	Pass	500k	6.525M	10.695M	7.025M	11.194M
2462MHz	Pass	500k	7.05M	10.47M	7.025M	10.57M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.325M	16.592M	16.35M	16.567M
2437MHz	Pass	500k	16.325M	16.767M	16.325M	17.241M
2462MHz	Pass	500k	16.325M	16.592M	16.35M	16.592M
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	18.925M	18.991M	19M	18.966M
2437MHz	Pass	500k	18.7M	19.115M	18.875M	19.215M
2462MHz	Pass	500k	18.95M	18.991M	18.95M	18.991M
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	37.3M	37.581M	36.6M	37.431M
2437MHz	Pass	500k	37.6M	37.631M	37.15M	37.631M
2452MHz	Pass	500k	37.6M	37.631M	37.4M	37.531M

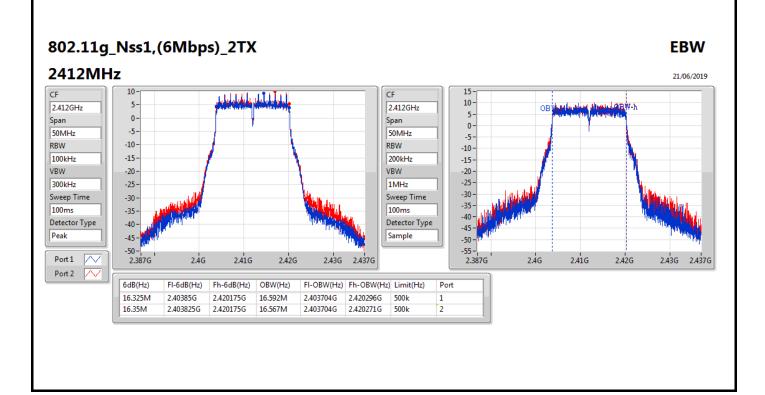
Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

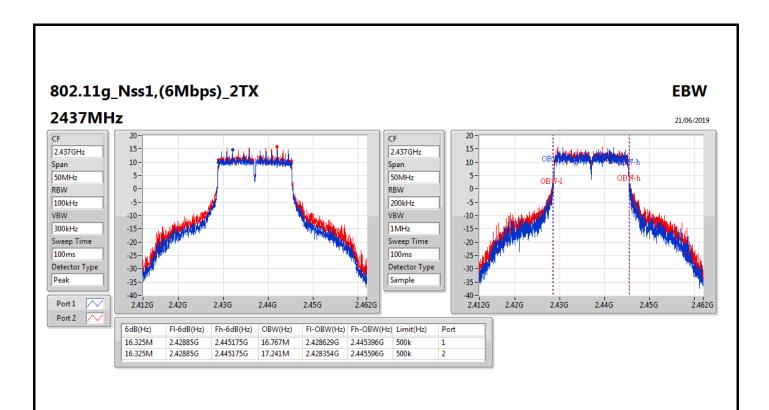
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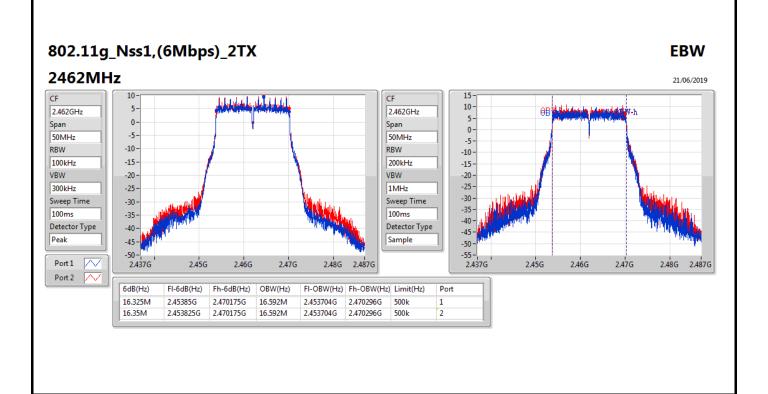


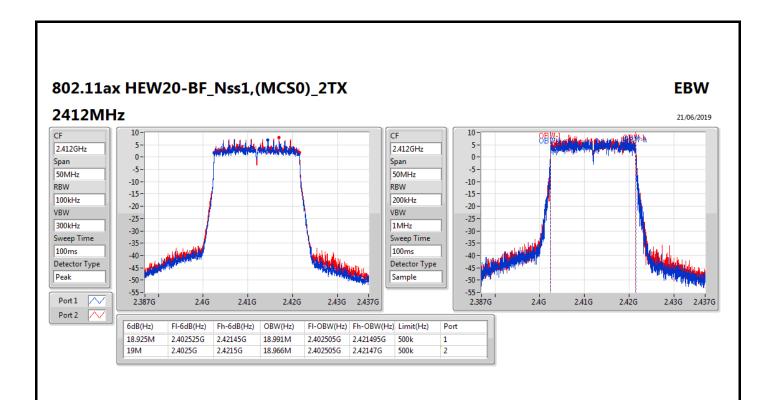


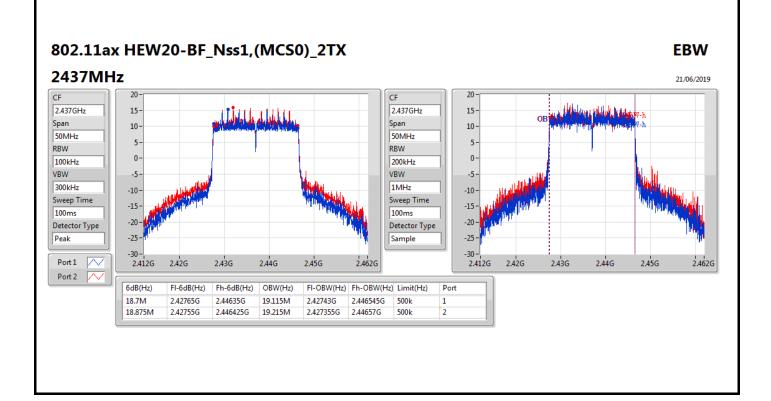


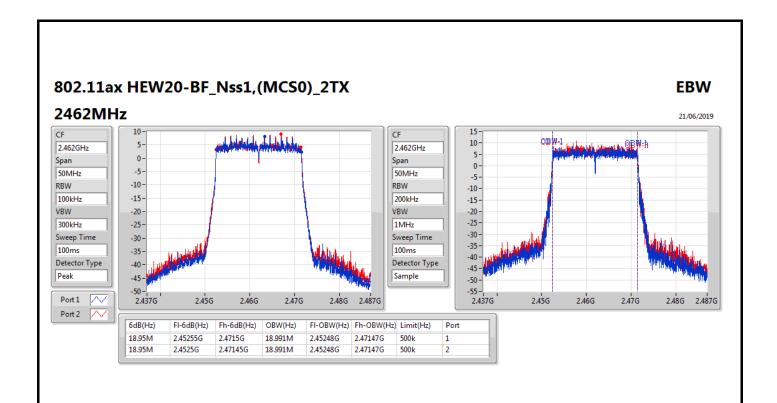


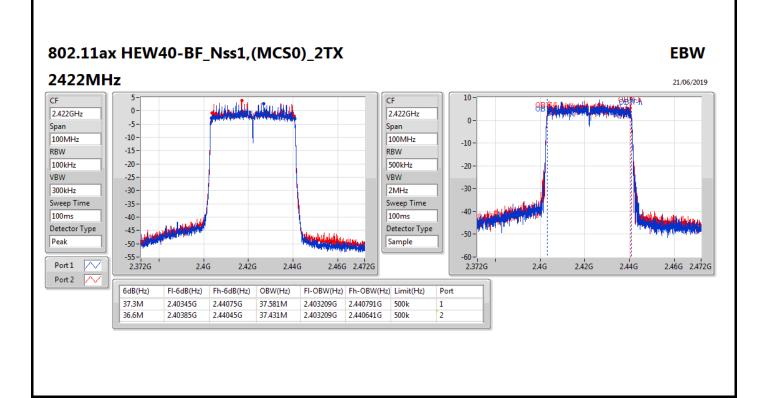


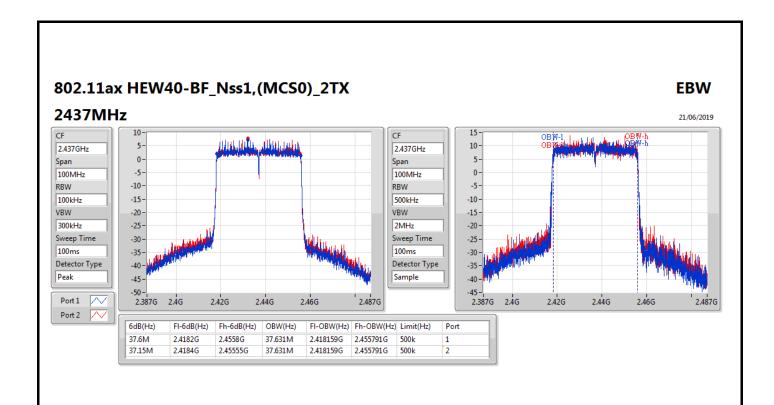


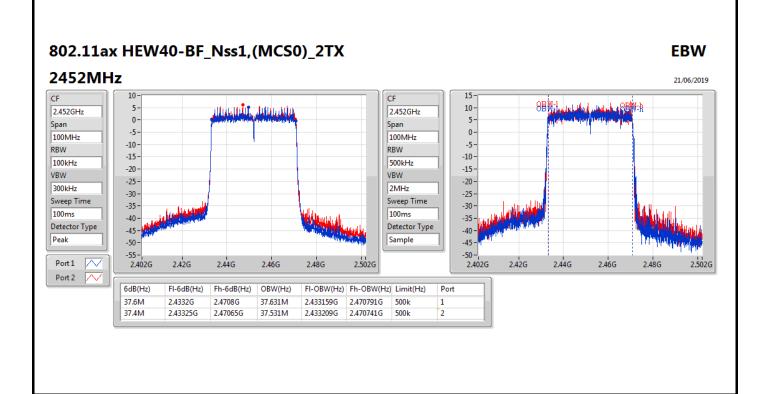














For 2T2S Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11ax HEW20_Nss2,(MCS0)_2TX	18.975M	19.14M	19M1D1D	18.85M	18.966M
802.11ax HEW40_Nss2,(MCS0)_2TX	37.6M	37.581M	37M6D1D	37M	37.531M

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



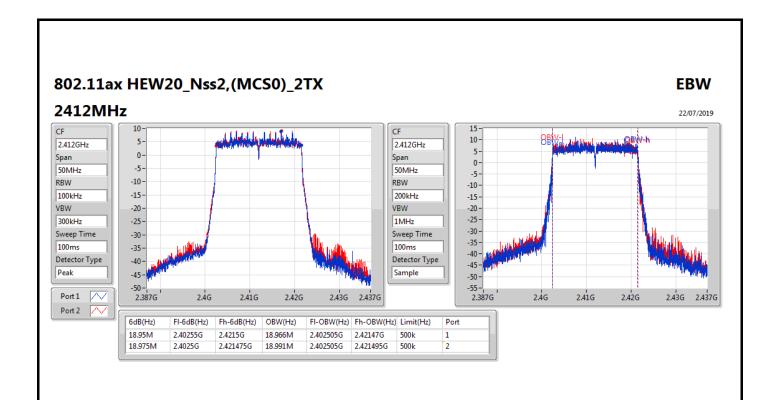
Result

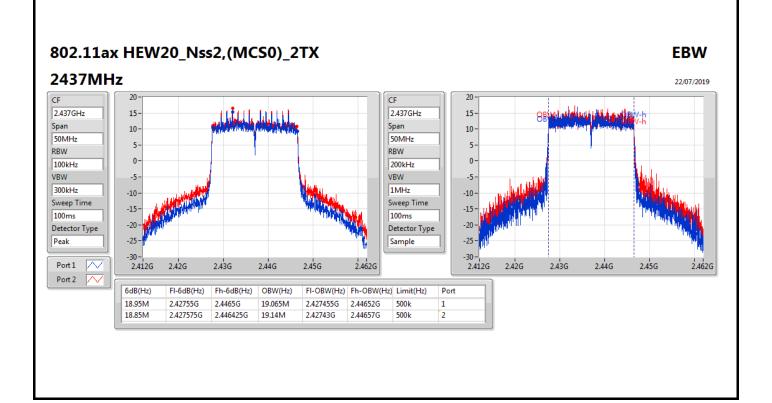
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	18.95M	18.966M	18.975M	18.991M
2437MHz	Pass	500k	18.95M	19.065M	18.85M	19.14M
2462MHz	Pass	500k	18.95M	19.015M	18.975M	18.991M
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	37.6M	37.581M	37.5M	37.531M
2437MHz	Pass	500k	37.3M	37.581M	37M	37.531M
2452MHz	Pass	500k	37.6M	37.531M	37.55M	37.531M

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

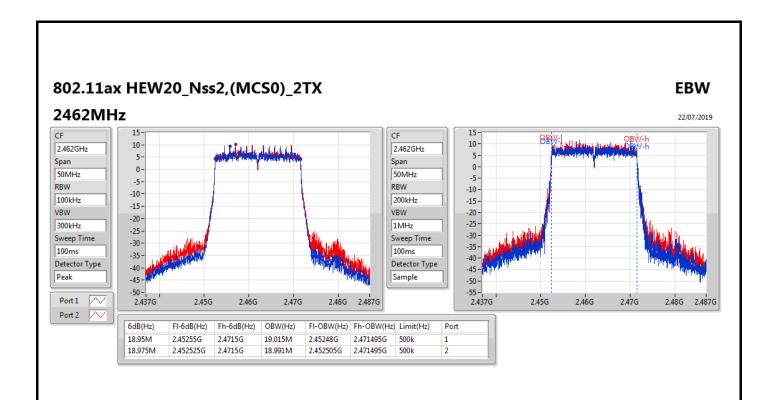


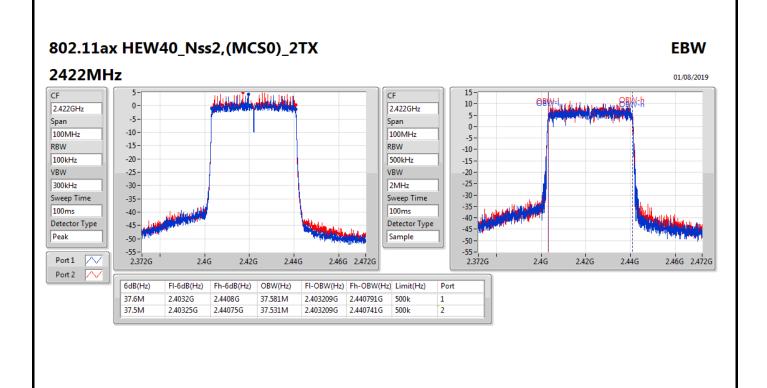




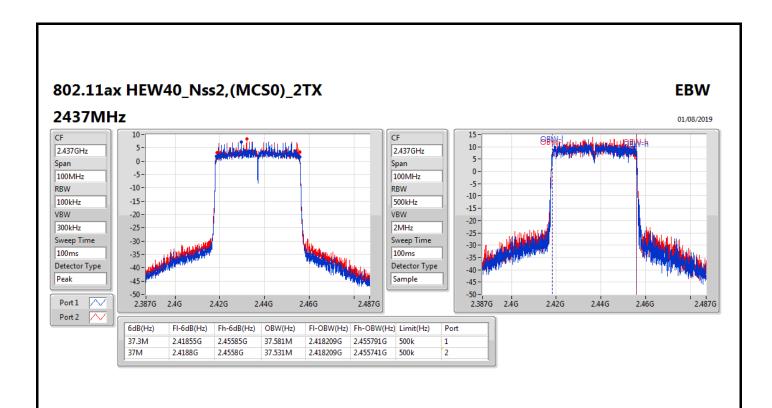


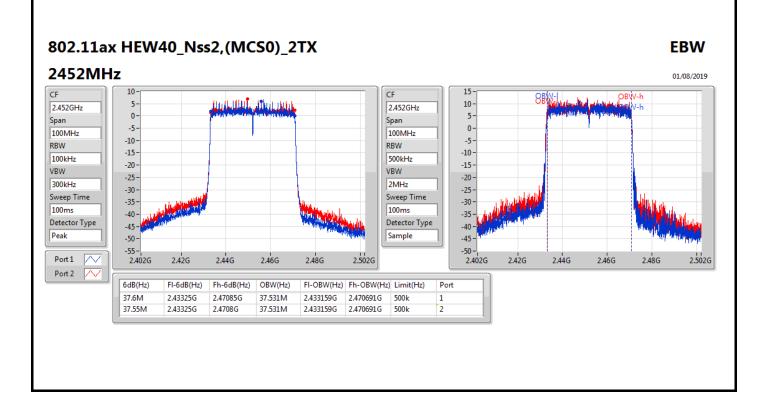
SPORTON LAB













For 2T1S Summary

Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	29.99	0.99770
802.11g_Nss1,(6Mbps)_2TX	29.51	0.89331
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	29.91	0.97949
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	25.04	0.31915



Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.82	26.73	27.22	29.99	30.00
2437MHz	Pass	1.82	26.38	26.88	29.65	30.00
2462MHz	Pass	1.82	25.92	26.07	29.01	30.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.82	21.01	21.60	24.33	30.00
2417MHz	Pass	1.82	23.09	23.51	26.32	30.00
2437MHz	Pass	1.82	26.16	26.81	29.51	30.00
2457MHz	Pass	1.82	23.11	23.42	26.28	30.00
2462MHz	Pass	1.82	21.08	21.80	24.47	30.00
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	=	•	•	=	-
2412MHz	Pass	4.70	19.16	19.77	22.49	30.00
2417MHz	Pass	4.70	22.05	22.41	25.24	30.00
2437MHz	Pass	4.70	26.61	27.17	29.91	30.00
2457MHz	Pass	4.70	22.10	22.63	25.38	30.00
2462MHz	Pass	4.70	20.00	20.84	23.45	30.00
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.70	17.48	18.05	20.78	30.00
2427MHz	Pass	4.70	18.72	19.00	21.87	30.00
2437MHz	Pass	4.70	21.85	22.21	25.04	30.00
2452MHz	Pass	4.70	19.97	20.62	23.32	30.00

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



For 2T2S Summary

Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11ax HEW20_Nss2,(MCS0)_2TX	29.90	0.97724
802.11ax HEW40_Nss2,(MCS0)_2TX	25.18	0.32961

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.82	20.34	20.70	23.53	30.00
2417MHz	Pass	1.82	22.80	23.55	26.20	30.00
2437MHz	Pass	1.82	26.56	27.20	29.90	30.00
2457MHz	Pass	1.82	22.85	23.40	26.14	30.00
2462MHz	Pass	1.82	21.06	21.77	24.44	30.00
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	1.82	18.95	19.48	22.23	30.00
2427MHz	Pass	1.82	20.16	20.45	23.32	30.00
2437MHz	Pass	1.82	21.90	22.42	25.18	30.00
2452MHz	Pass	1.82	20.47	21.23	23.88	30.00

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



Summary

Mode	PD
	(dBm/RBW)
2.4-2.4835GHz	·
802.11b_Nss1,(1Mbps)_2TX	7.08
802.11g_Nss1,(6Mbps)_2TX	4.17
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	2.96
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-3.46

RBW=3 kHz.

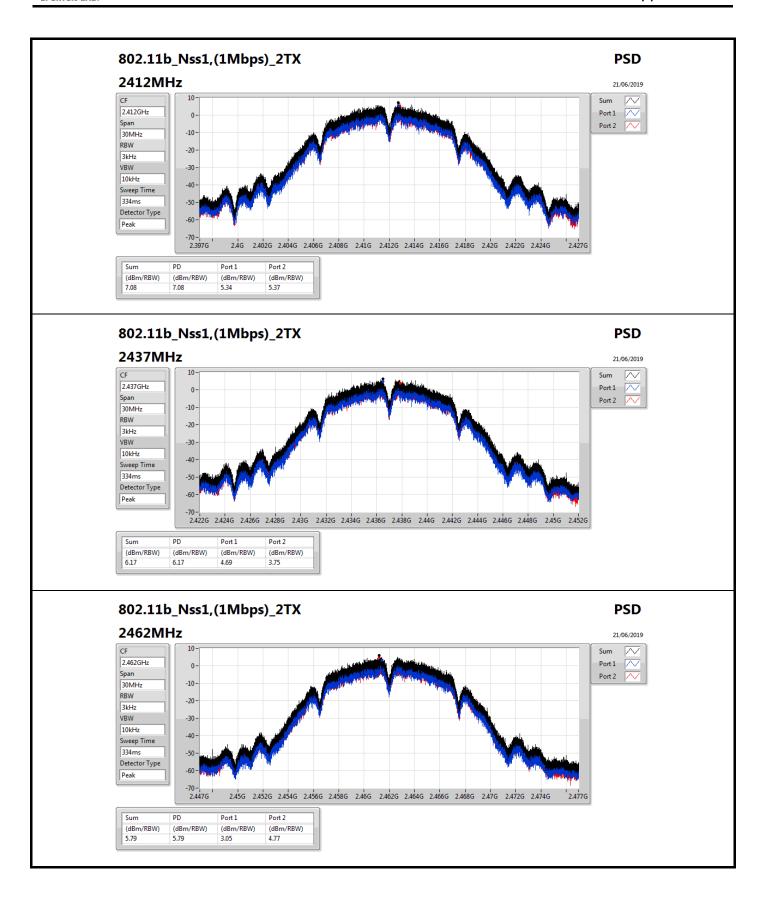


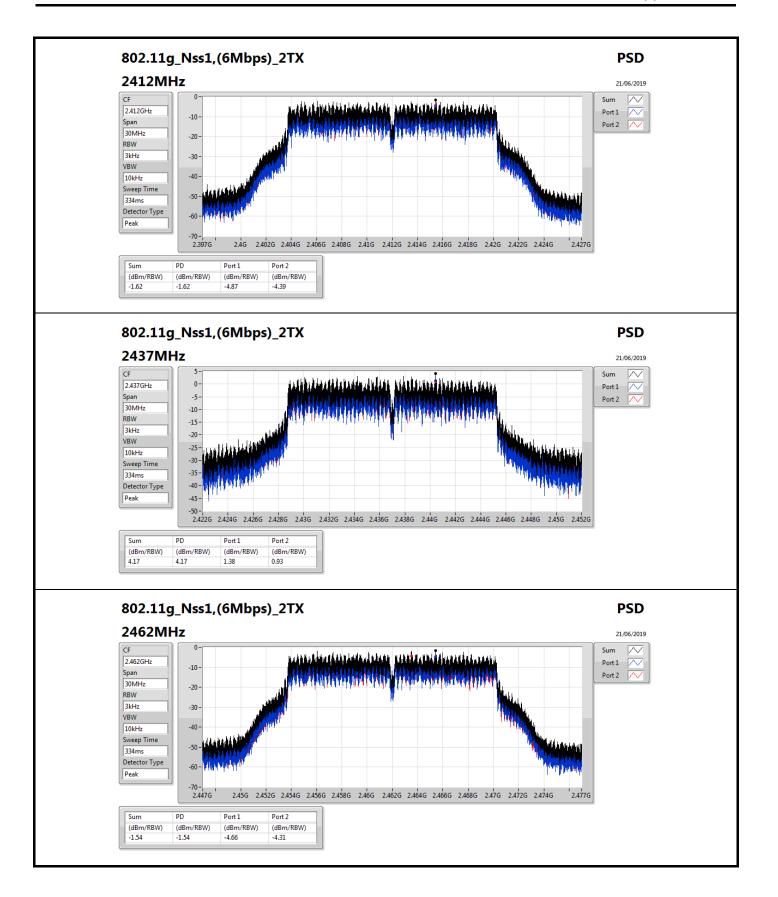
Result

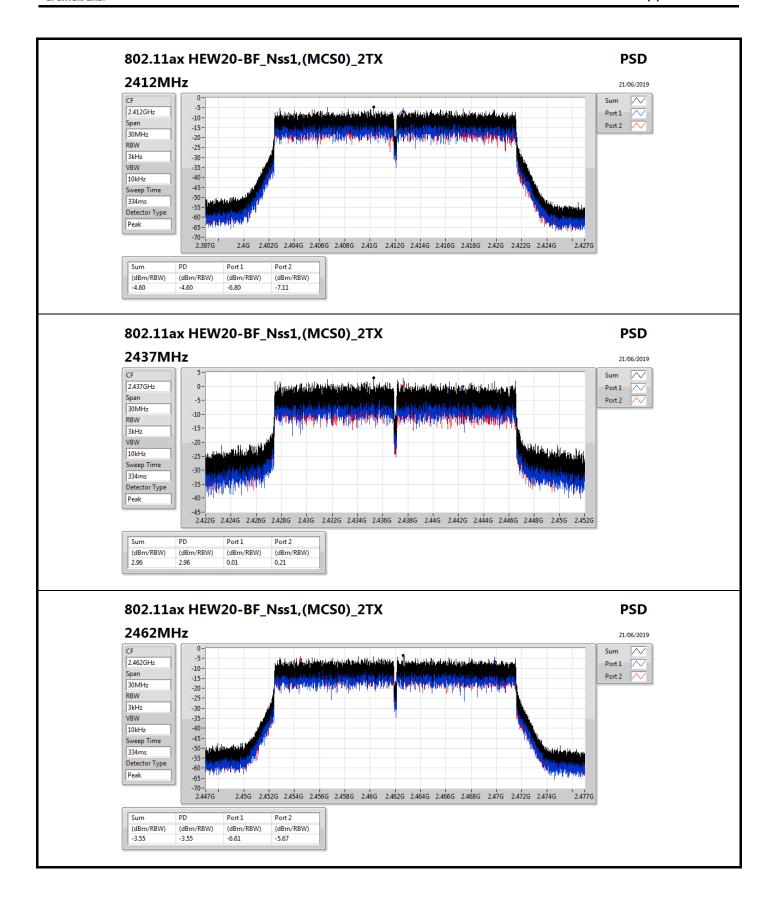
Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.70	5.34	5.37	7.08	8.00
2437MHz	Pass	4.70	4.69	3.75	6.17	8.00
2462MHz	Pass	4.70	3.05	4.77	5.79	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.70	-4.87	-4.39	-1.62	8.00
2437MHz	Pass	4.70	1.38	0.93	4.17	8.00
2462MHz	Pass	4.70	-4.66	-4.31	-1.54	8.00
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.70	-6.80	-7.11	-4.60	8.00
2437MHz	Pass	4.70	0.01	0.21	2.96	8.00
2462MHz	Pass	4.70	-6.61	-5.67	-3.55	8.00
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.70	-10.84	-9.44	-7.07	8.00
2437MHz	Pass	4.70	-6.13	-6.26	-3.46	8.00
2452MHz	Pass	4.70	-8.06	-7.30	-4.65	8.00

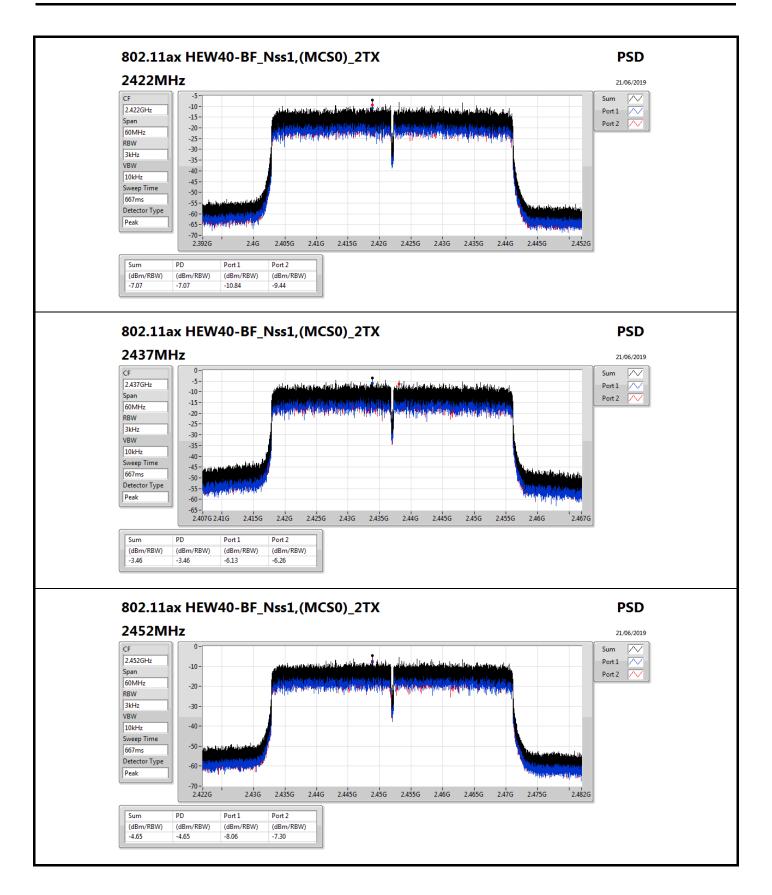
DG = Directional Gain; RBW=3 kHz;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;











For 2T2S Summary

Mode	PD (ID. (ID.))
2.4-2.4835GHz	(dBm/RBW)
802.11ax HEW20_Nss2,(MCS0)_2TX	-3.41
802.11ax HEW40_Nss2,(MCS0)_2TX	-3.53

RBW=3 kHz.

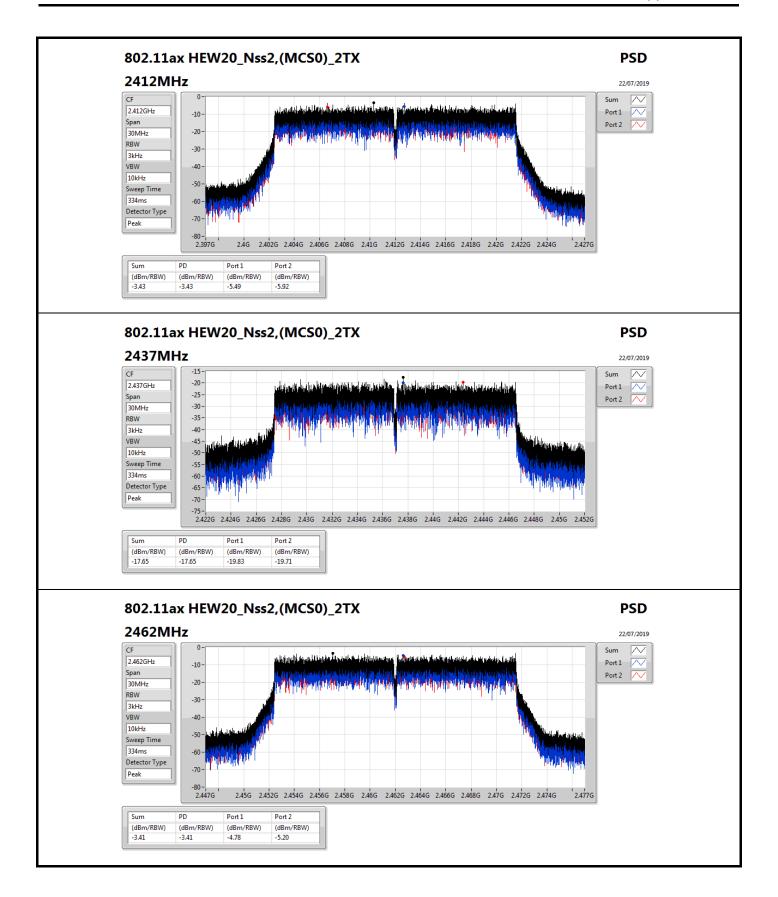


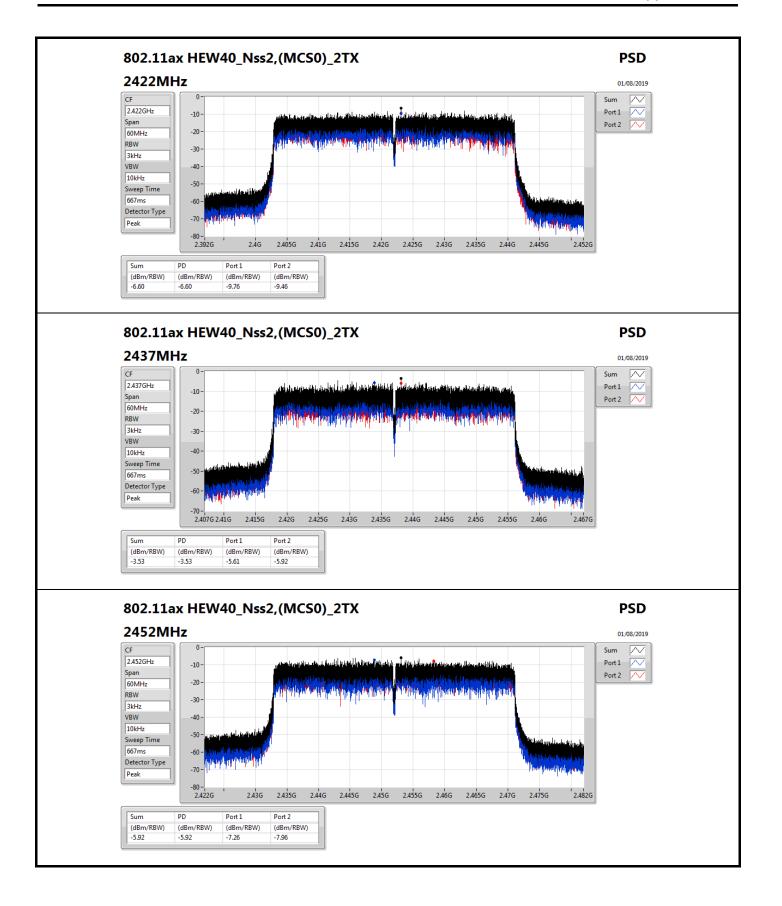
Appendix D.2 **PSD**

Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.82	-5.49	-5.92	-3.43	8.00
2437MHz	Pass	1.82	-19.83	-19.71	-17.65	8.00
2462MHz	Pass	1.82	-4.78	-5.20	-3.41	8.00
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	1.82	-9.76	-9.46	-6.60	8.00
2437MHz	Pass	1.82	-5.61	-5.92	-3.53	8.00
2452MHz	Pass	1.82	-7.26	-7.96	-5.92	8.00

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







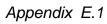
CSE(Non-restricted Band)

Appendix E.1

For 2T1S Summary

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	Pass	2.41298G	19.17	-10.83	2.30991G	-46.90	2.39898G	-27.31	2.48518G	-45.88	24.90167G	-45.39	2
802.11g_Nss1,(6Mbps)_2TX	Pass	2.43198G	15.74	-14.26	2.18088G	-49.76	2.3989G	-28.16	2.49772G	-48.32	17.69795G	-45.73	2
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	Pass	2.43202G	15.72	-14.28	2.03089G	-46.91	2.39794G	-32.55	2.48502G	-40.74	17.69514G	-45.07	2
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	Pass	2.43202G	7.68	-22.32	2.16199G	-48.67	2.39824G	-32.86	2.48442G	-40.70	17.6857G	-45.17	1



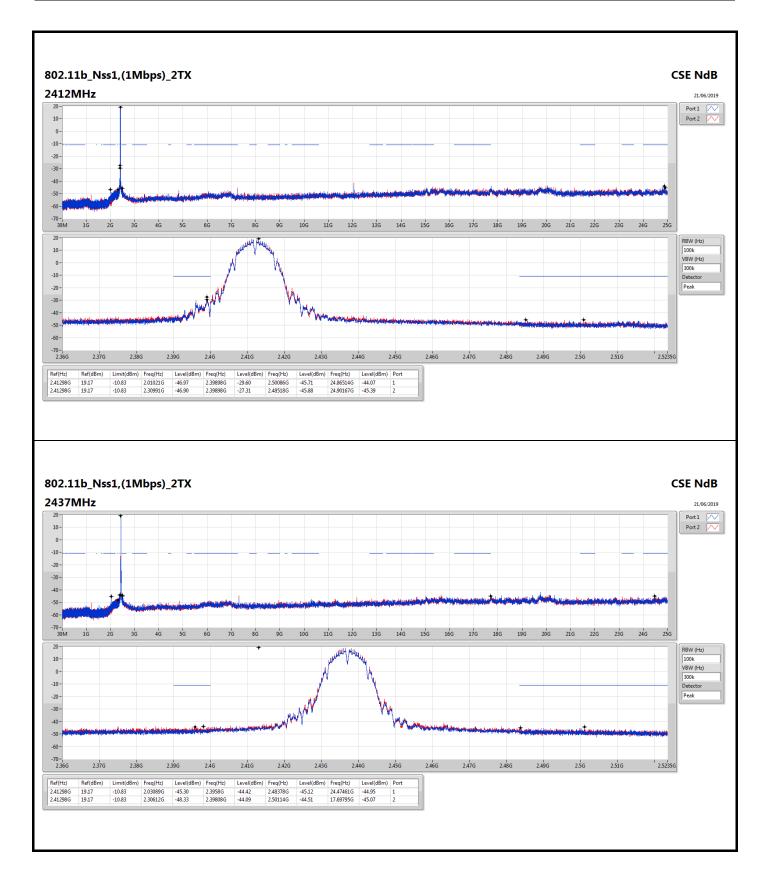




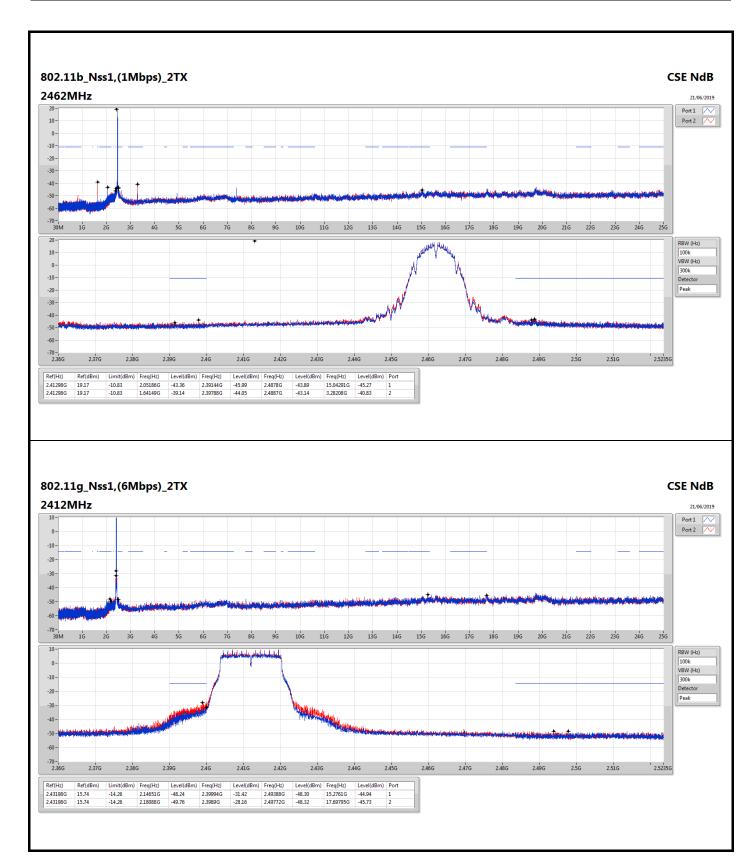
Result

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.41298G	19.17	-10.83	2.01021G	-46.97	2.39898G	-29.60	2.50086G	-45.71	24.86514G	-44.07	1
2412MHz	Pass	2.41298G	19.17	-10.83	2.30991G	-46.90	2.39898G	-27.31	2.48518G	-45.88	24.90167G	-45.39	2
2437MHz	Pass	2.41298G	19.17	-10.83	2.03089G	-45.30	2.3958G	-44.42	2.48378G	-45.12	24.47461G	-44.95	1
2437MHz	Pass	2.41298G	19.17	-10.83	2.30612G	-48.33	2.39808G	-44.09	2.50114G	-44.51	17.69795G	-45.07	2
2462MHz	Pass	2.41298G	19.17	-10.83	2.05186G	-43.36	2.39144G	-45.99	2.4878G	-43.89	15.04291G	-45.27	1
2462MHz	Pass	2.41298G	19.17	-10.83	1.64149G	-39.14	2.39788G	-44.05	2.4887G	-43.14	3.28208G	-40.83	2
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2412MHz	Pass	2.43198G	15.74	-14.26	2.14651G	-48.24	2.39994G	-31.42	2.49388G	-48.30	15.2761G	-44.94	1
2412MHz	Pass	2.43198G	15.74	-14.26	2.18088G	-49.76	2.3989G	-28.16	2.49772G	-48.32	17.69795G	-45.73	2
2437MHz	Pass	2.43198G	15.74	-14.26	2.03089G	-45.81	2.39914G	-38.48	2.48482G	-43.35	24.81738G	-45.87	1
2437MHz	Pass	2.43198G	15.74	-14.26	2.18583G	-46.07	2.39734G	-35.87	2.48448G	-40.48	14.71419G	-45.24	2
2462MHz	Pass	2.43198G	15.74	-14.26	2.05186G	-47.05	2.39824G	-47.55	2.48352G	-40.36	15.04572G	-45.79	1
2462MHz	Pass	2.43198G	15.74	-14.26	2.05186G	-48.37	2.39672G	-47.19	2.4839G	-36.43	3.28208G	-40.88	2
802.11ax HEW20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2412MHz	Pass	2.43202G	15.72	-14.28	2.1538G	-49.49	2.39888G	-37.08	2.49996G	-49.79	24.92976G	-44.30	1
2412MHz	Pass	2.43202G	15.72	-14.28	2.19952G	-50.71	2.39468G	-35.88	2.50058G	-49.33	15.05696G	-45.35	2
2437MHz	Pass	2.43202G	15.72	-14.28	2.03089G	-43.20	2.39794G	-34.10	2.48438G	-41.27	15.05134G	-45.58	1
2437MHz	Pass	2.43202G	15.72	-14.28	2.03089G	-46.91	2.39794G	-32.55	2.48502G	-40.74	17.69514G	-45.07	2
2462MHz	Pass	2.43202G	15.72	-14.28	2.05186G	-46.64	2.39784G	-48.47	2.48362G	-41.84	24.1487G	-45.13	1
2462MHz	Pass	2.43202G	15.72	-14.28	2.30175G	-48.51	2.39804G	-47.81	2.4836G	-39.62	3.28208G	-40.39	2
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2422MHz	Pass	2.43202G	7.68	-22.32	2.12506G	-50.11	2.3978G	-41.23	2.51078G	-49.50	17.68851G	-44.80	1
2422MHz	Pass	2.43202G	7.68	-22.32	2.15312G	-50.25	2.39864G	-41.14	2.48514G	-49.40	15.06624G	-45.59	2
2437MHz	Pass	2.43202G	7.68	-22.32	2.16199G	-48.67	2.39824G	-32.86	2.48442G	-40.70	17.6857G	-45.17	1
2437MHz	Pass	2.43202G	7.68	-22.32	2.30139G	-47.87	2.39804G	-33.21	2.48698G	-40.50	15.09709G	-44.85	2
2452MHz	Pass	2.43202G	7.68	-22.32	2.16113G	-49.56	2.39828G	-44.84	2.49014G	-41.59	14.99893G	-45.42	1
2452MHz	Pass	2.43202G	7.68	-22.32	2.16085G	-48.93	2.39948G	-45.64	2.4889G	-39.46	3.26745G	-39.99	2

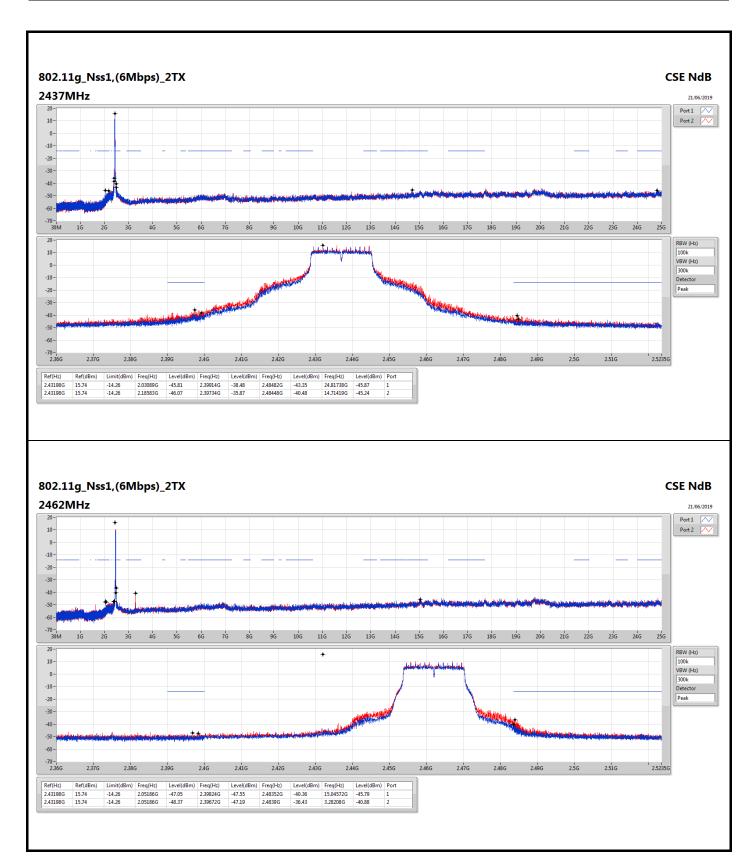




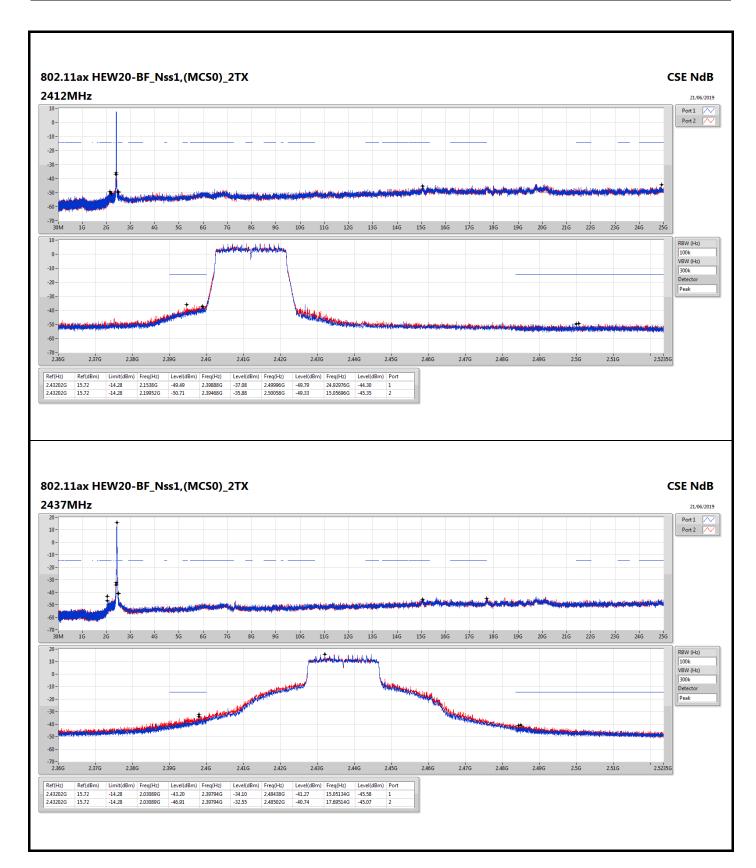




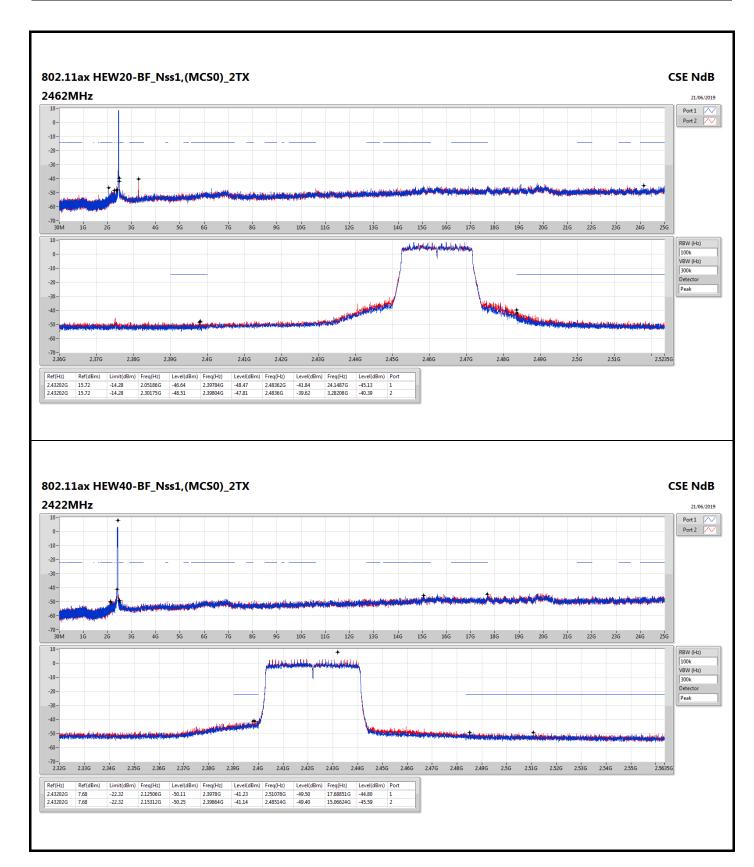




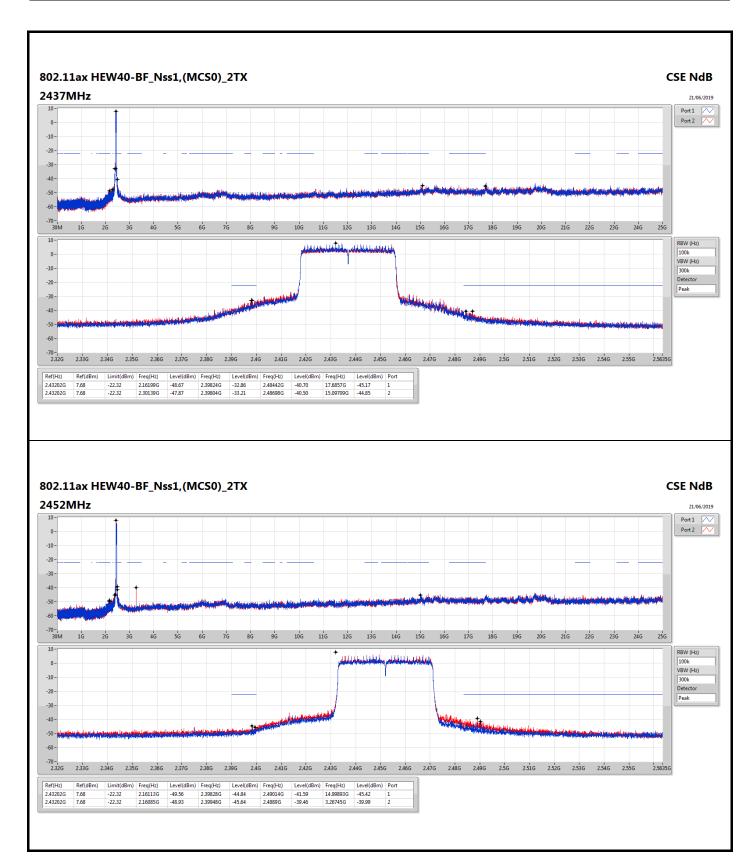














CSE(Non-restricted Band)

Appendix E.2

For 2T2S Summary

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW20_Nss2,(MCS0)_2TX	Pass	2.43198G	16.39	-13.61	2.18962G	-47.85	2.39642G	-32.74	2.49326G	-48.21	17.47318G	-43.81	2
802.11ax HEW40_Nss2,(MCS0)_2TX	Pass	2.43198G	8.27	-21.73	70.08M	-46.87	2.3996G	-32.40	2.48446G	-41.48	17.14723G	-46.14	1



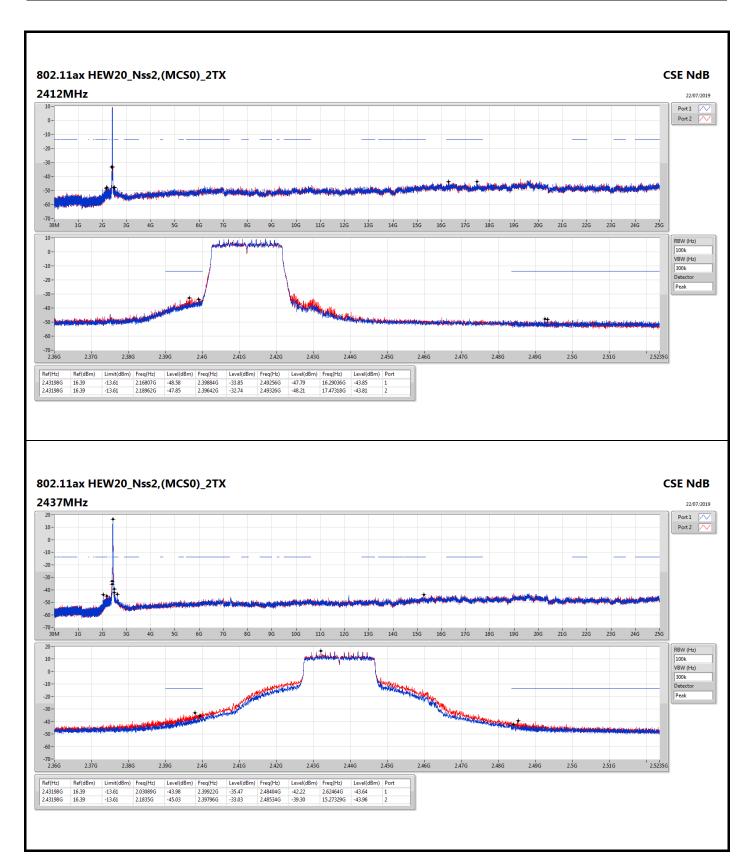
CSE(Non-restricted Band)

Appendix E.2

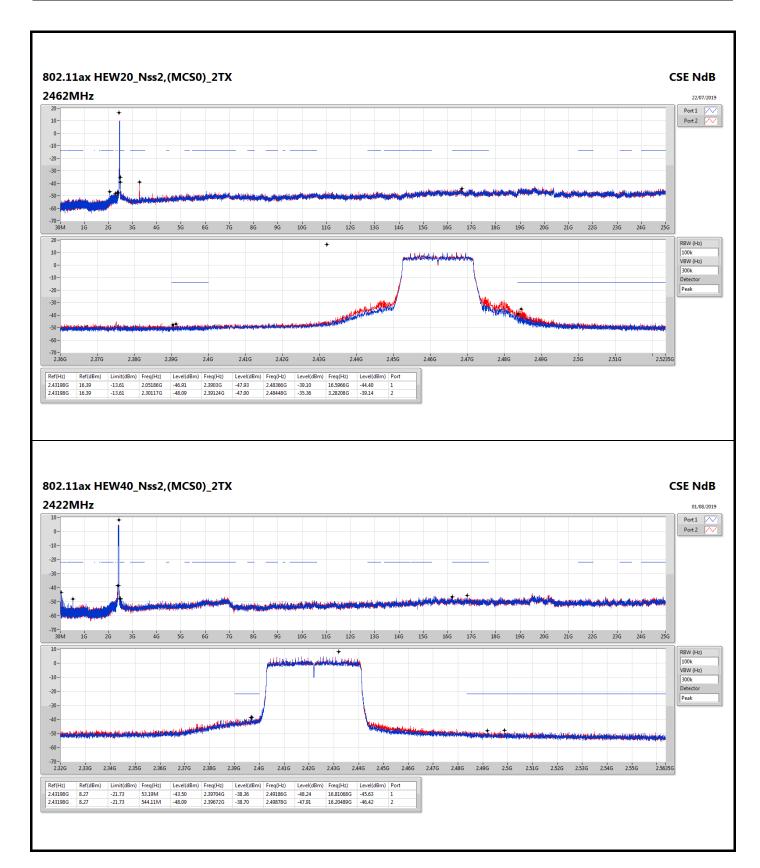
Result

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11ax HEW20_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43198G	16.39	-13.61	2.16807G	-48.58	2.39884G	-33.85	2.49256G	-47.79	16.29036G	-43.85	1
2412MHz	Pass	2.43198G	16.39	-13.61	2.18962G	-47.85	2.39642G	-32.74	2.49326G	-48.21	17.47318G	-43.81	2
2437MHz	Pass	2.43198G	16.39	-13.61	2.03089G	-43.98	2.39922G	-35.47	2.48404G	-42.22	2.62464G	-43.64	1
2437MHz	Pass	2.43198G	16.39	-13.61	2.1835G	-45.03	2.39796G	-33.03	2.48534G	-39.30	15.27329G	-43.96	2
2462MHz	Pass	2.43198G	16.39	-13.61	2.05186G	-46.91	2.3903G	-47.93	2.48366G	-39.10	16.5966G	-44.40	1
2462MHz	Pass	2.43198G	16.39	-13.61	2.30117G	-48.09	2.39124G	-47.00	2.48448G	-35.36	3.28208G	-39.14	2
802.11ax HEW40_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.43198G	8.27	-21.73	53.19M	-43.50	2.39704G	-38.36	2.49186G	-48.24	16.81068G	-45.63	1
2422MHz	Pass	2.43198G	8.27	-21.73	544.11M	-48.09	2.39672G	-38.70	2.49878G	-47.91	16.20489G	-46.42	2
2437MHz	Pass	2.43198G	8.27	-21.73	70.08M	-46.87	2.3996G	-32.40	2.48446G	-41.48	17.14723G	-46.14	1
2437MHz	Pass	2.43198G	8.27	-21.73	34.29M	-47.76	2.39952G	-33.10	2.48446G	-40.30	17.43049G	-46.73	2
2452MHz	Pass	2.43198G	8.27	-21.73	95.84M	-47.16	2.39852G	-45.30	2.48874G	-41.71	16.25818G	-46.34	1
2452MHz	Pass	2.43198G	8.27	-21.73	95.84M	-48.35	2.3994G	-43.49	2.49074G	-37.90	3.26745G	-39.62	2

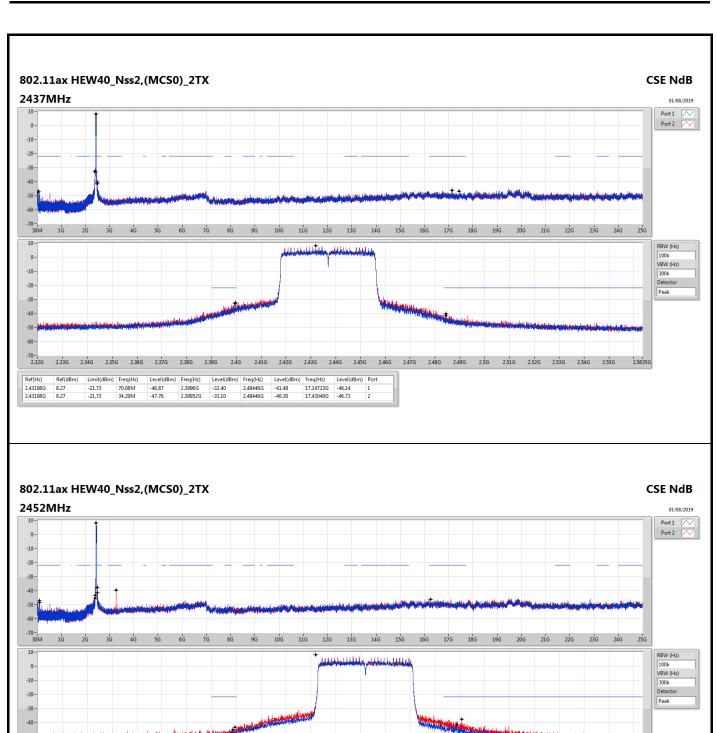












2.4G 2.41G 2.42G 2.43G 2.44G 2.45G 2.46G 2.47G 2.48G 2.49G 2.5G 2.51G 2.52G 2.53G 2.54G 2.55G

Level(dBm) Freq(Hz)

Level(dBm) Freq(Hz)

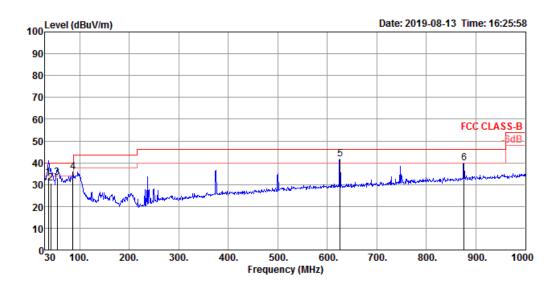
2.34G 2.35G 2.36G

2.37G 2.38G 2.39G

Level(dBm) Freq(Hz) -47.16 2.39852G -48.35 2.3994G



RSE below 1GHz Result									
Operating Mode	5	Vertical							
Operating Function	CTX								

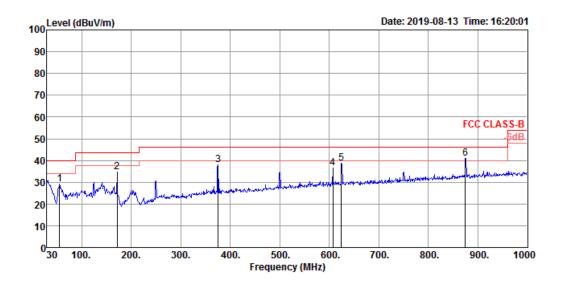


	Freq	Level	Limit Line					Preamp Factor		T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	36.79	33.30	40.00	-6.70	42.32	0.78	21.69	31.49	100	147	QP	VERTICAL
2	41.64	30.77	40.00	-9.23	42.64	0.86	18.81	31.54	100	348	QP	VERTICAL
3	54.25	33.32	40.00	-6.68	50.36	0.92	13.83	31.79	100	23	QP	VERTICAL
4	86.26	35.93	40.00	-4.07	52.13	1.16	14.51	31.87	125	72	Peak	VERTICAL
5	625.58	41.69	46.00	-4.31	45.63	3.28	25.21	32.43	100	220	Peak	VERTICAL
6	875.84	39.81	46.00	-6.19	40.79	3.92	27.50	32.40	100	158	Peak	VERTICAL

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



RSE below 1GHz Result									
Operating Mode	5	Horizontal							
Operating Function	СТХ								



	Freq	Level						Preamp Factor		T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	Cm	deg		
1	55.22	29.14	40.00	-10.86	46.40	0.92	13.62	31.80	300	250	Peak	HORIZONTAL
2	171.62	34.55	43.50	-8.95	48.86	1.67	15.94	31.92	200	65	Peak	HORIZONTAL
3	375.32	37.97	46.00	-8.03	45.75	2.51	21.88	32.17	100	221	Peak	HORIZONTAL
4	607.15	36.71	46.00	-9.29	40.75	3.30	25.00	32.34	100	355	Peak	HORIZONTAL
5	624.61	38.92	46.00	-7.08	42.86	3.28	25.21	32.43	125	87	Peak	HORIZONTAL
6	874.87	40.85	46.00	-5.15	41.83	3.92	27.50	32.40	100	304	Peak	HORIZONTAL

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



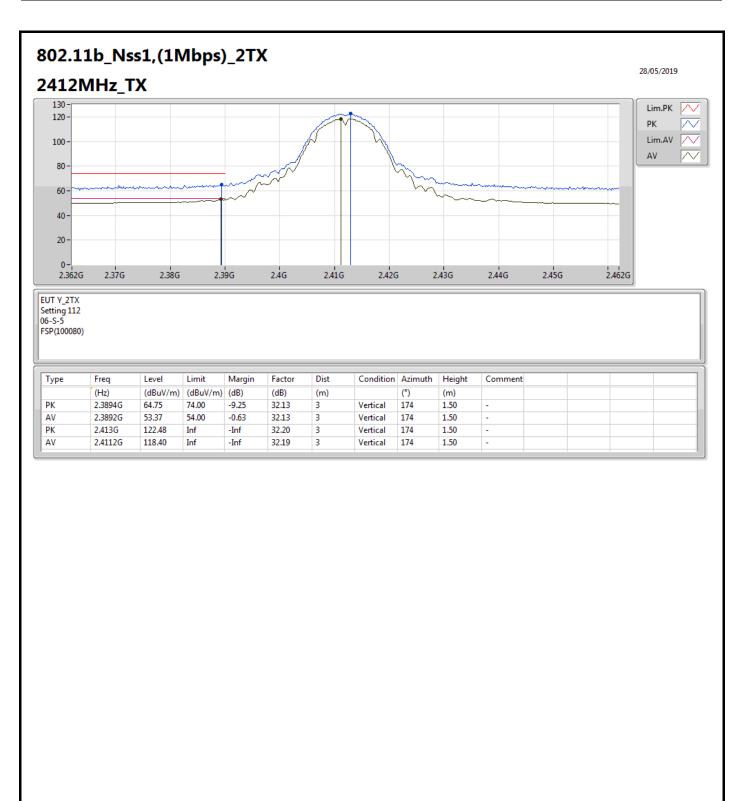
RSE TX above 1GHz

Appendix F.2

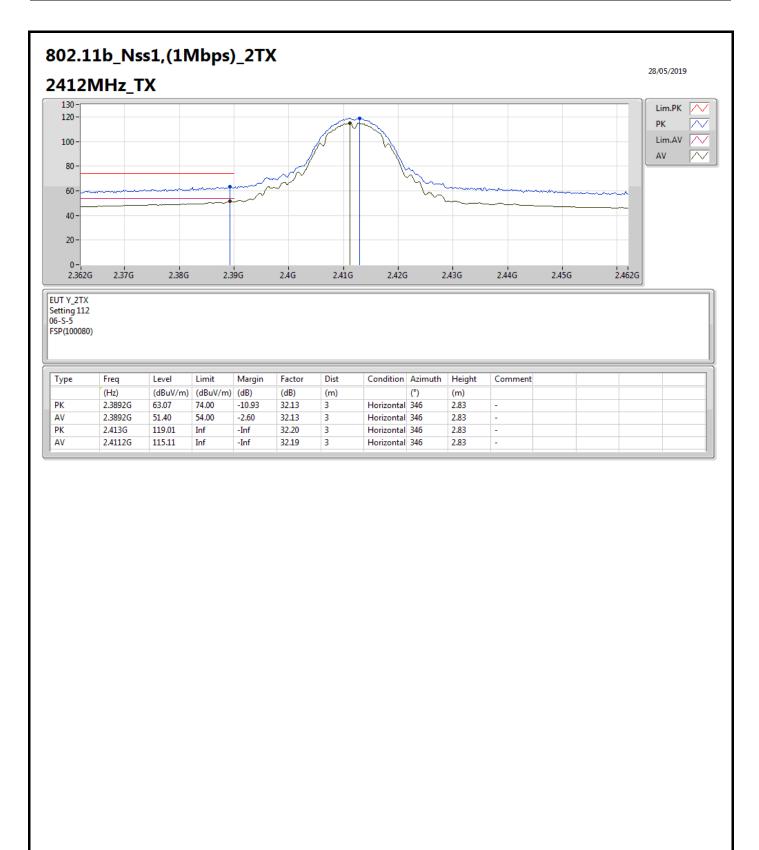
For 2T1S Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW40-BF_Nss1,(MCS0)_2TX	Pass	AV	2.3898G	53.94	54.00	-0.06	32.62	3	Vertical	218	1.71	-

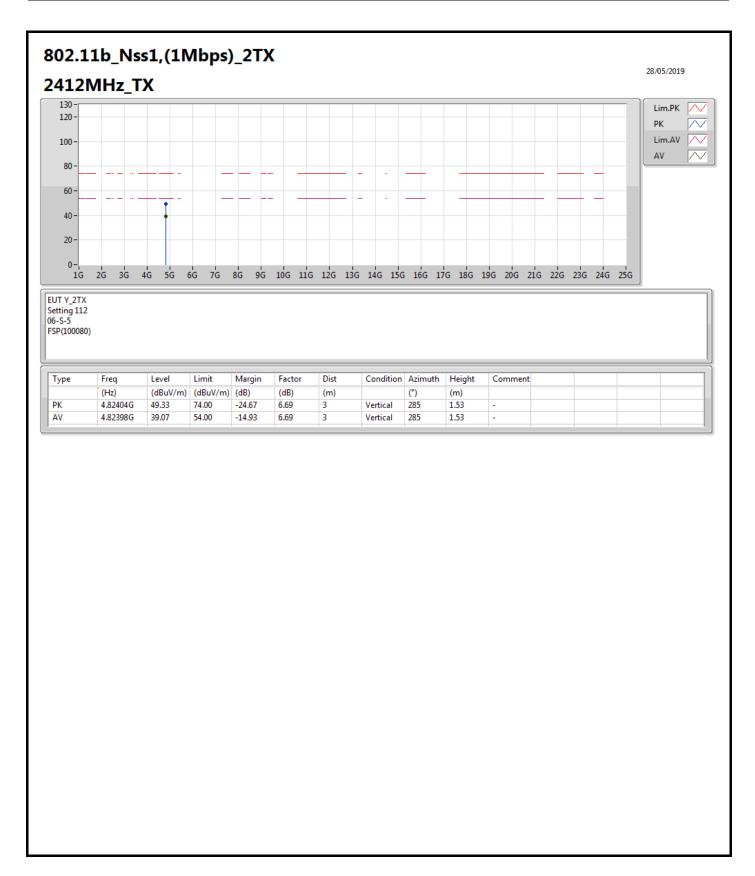




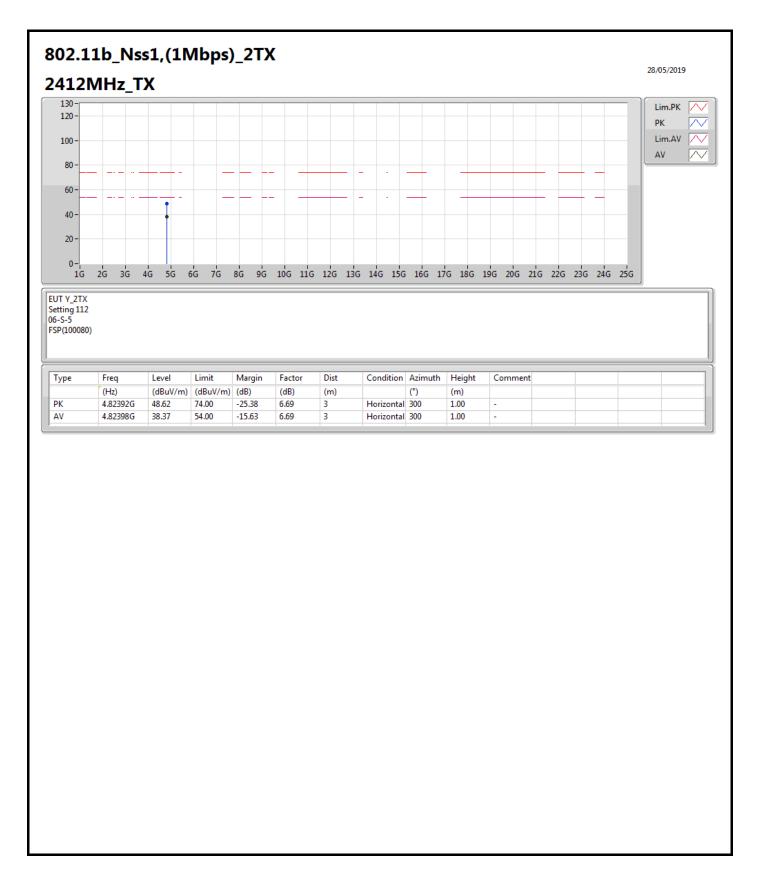




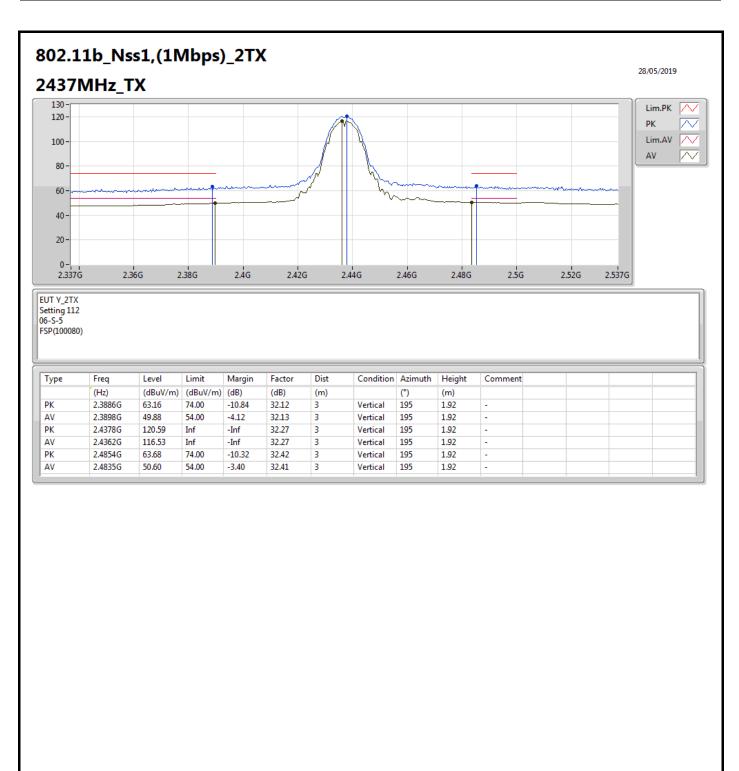




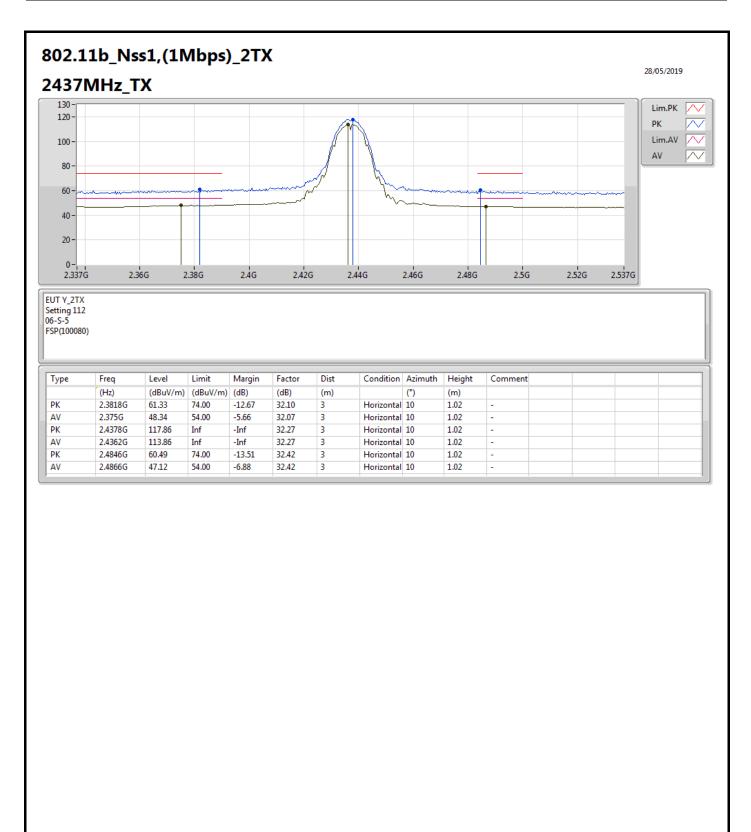




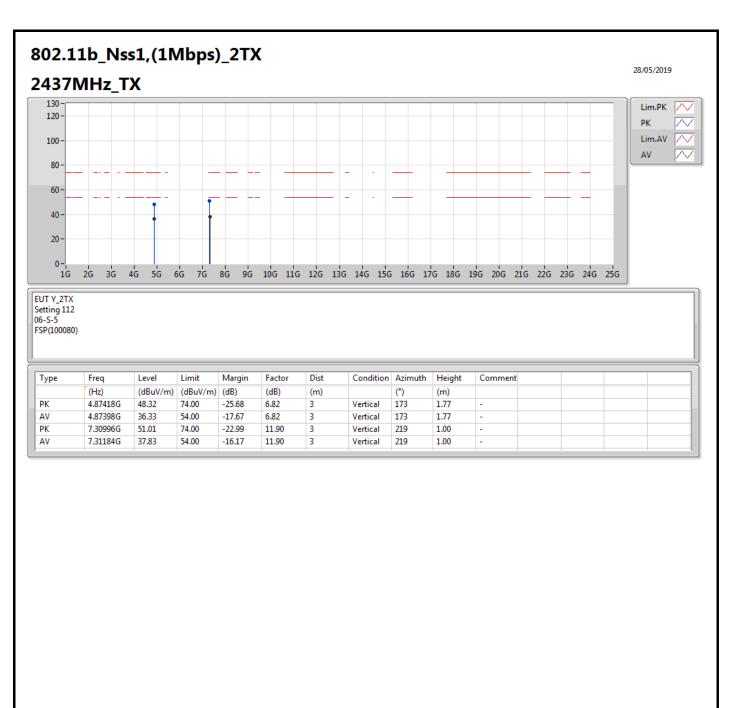




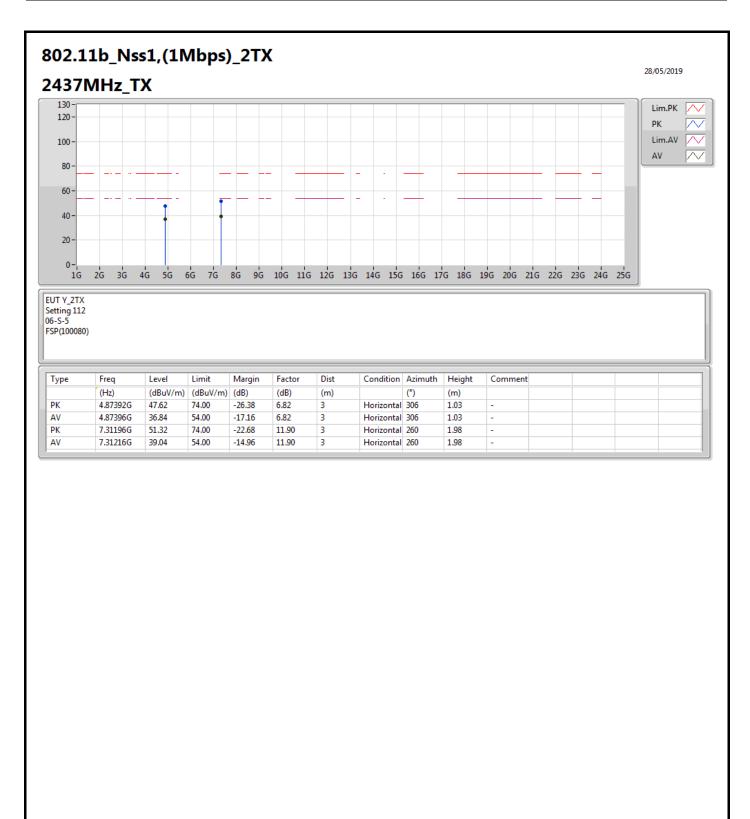




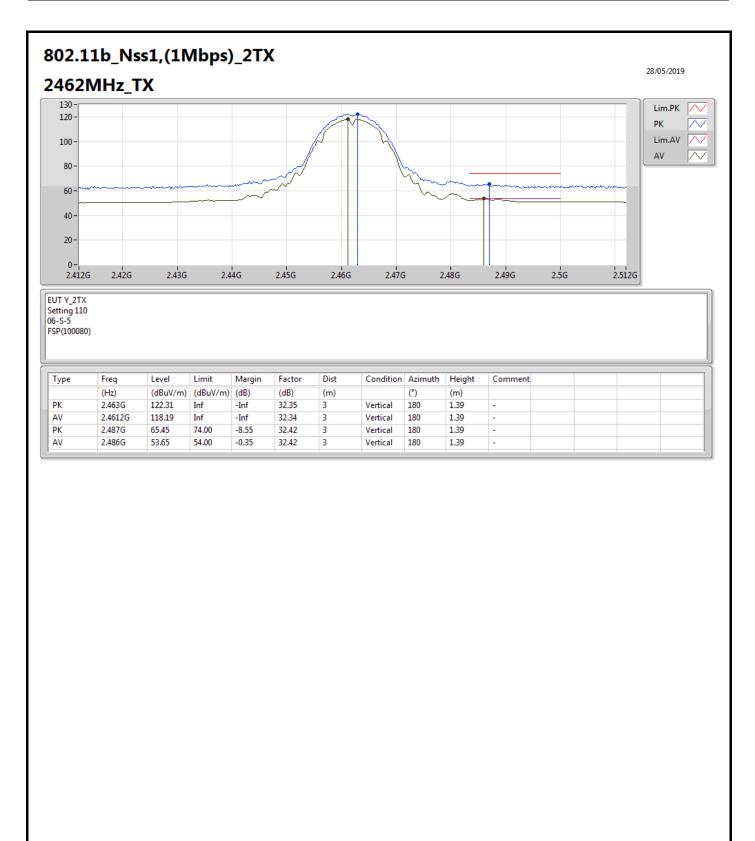




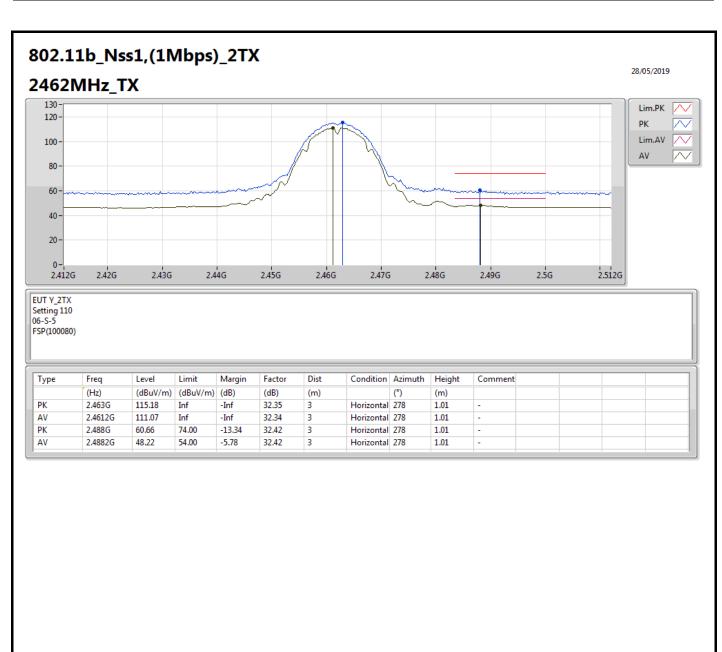




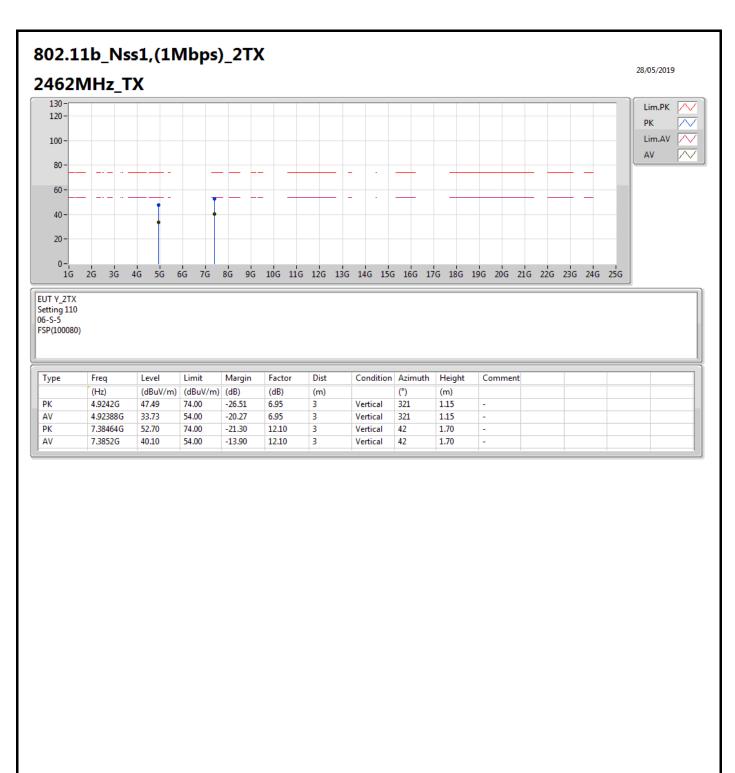




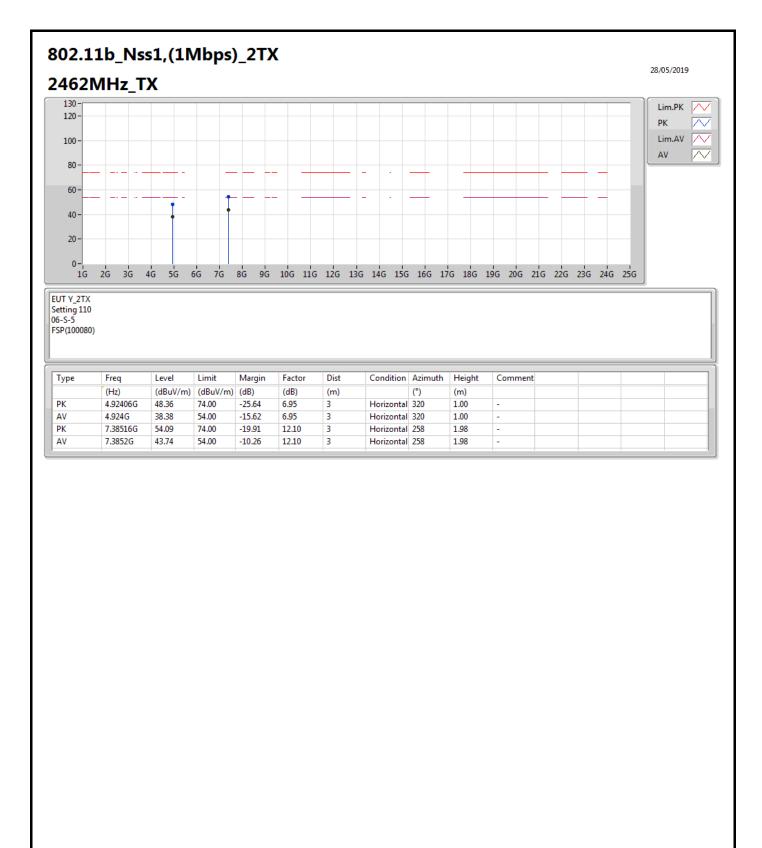




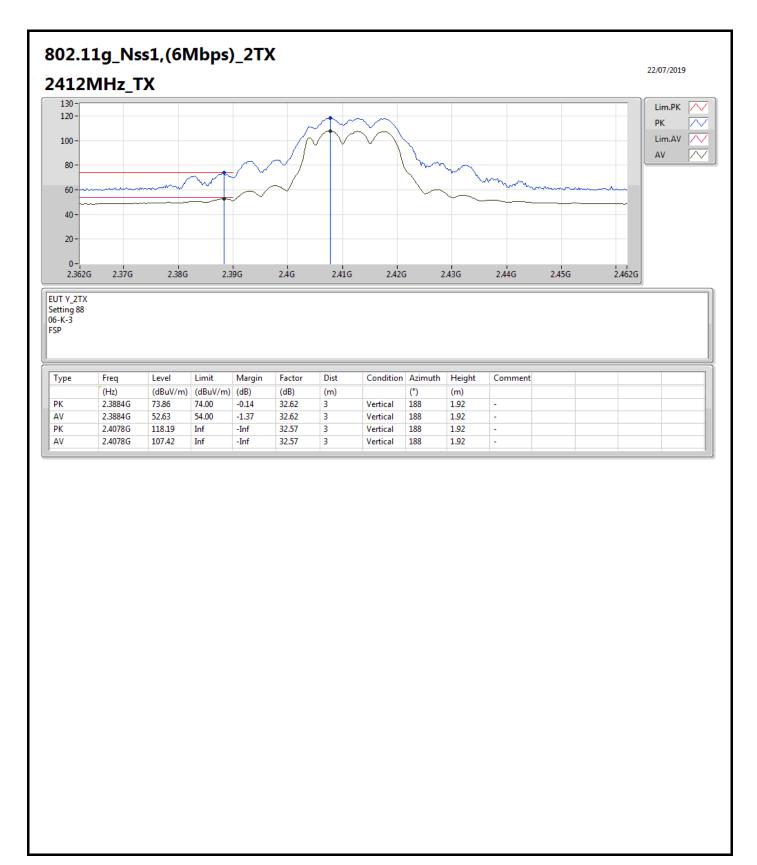




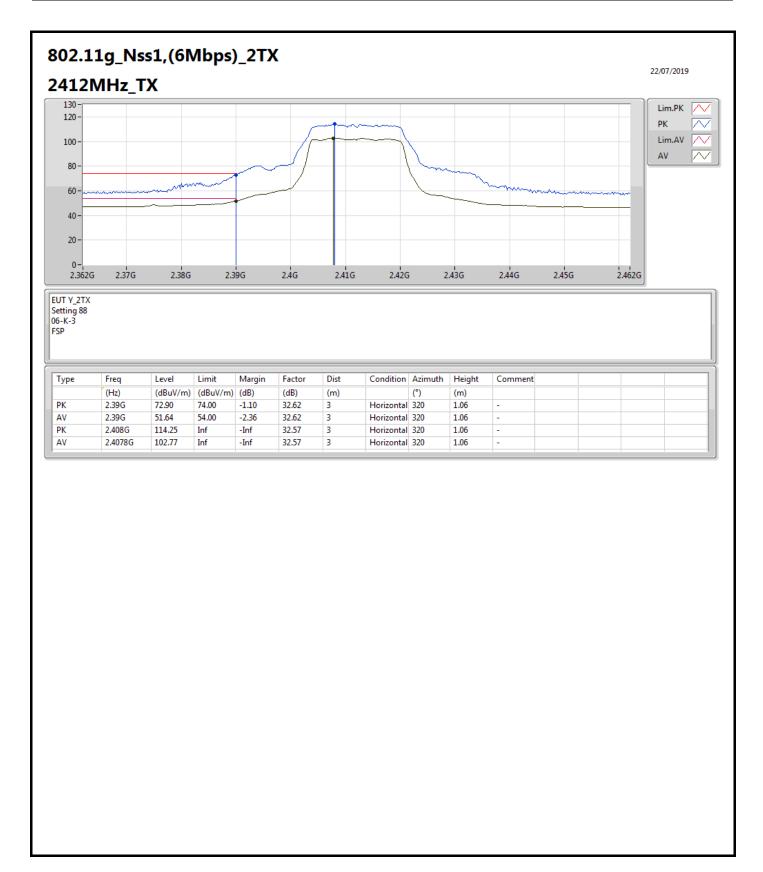




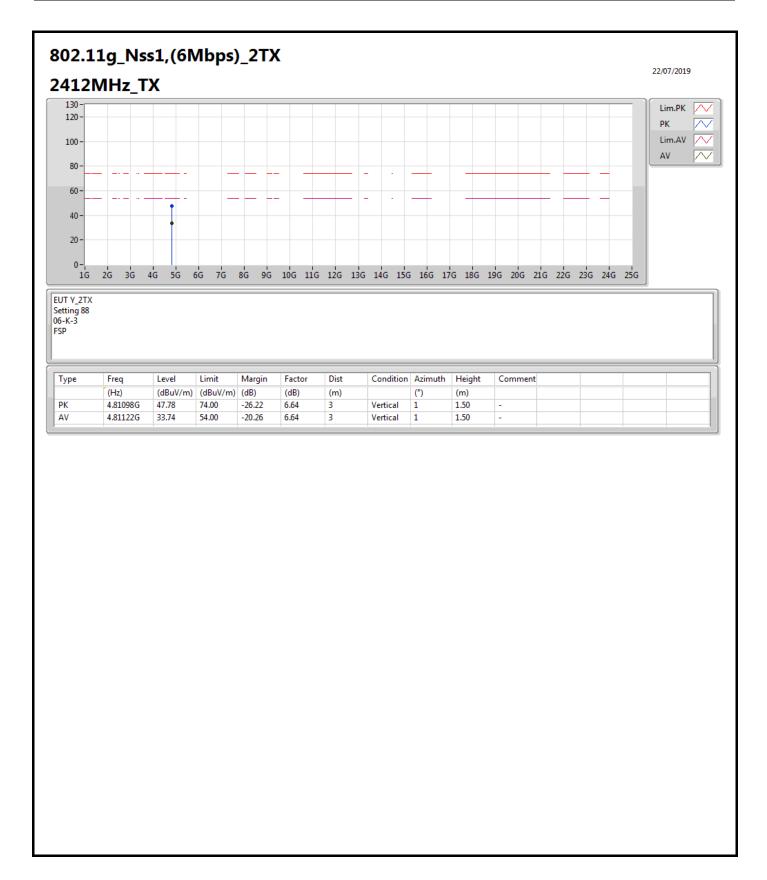




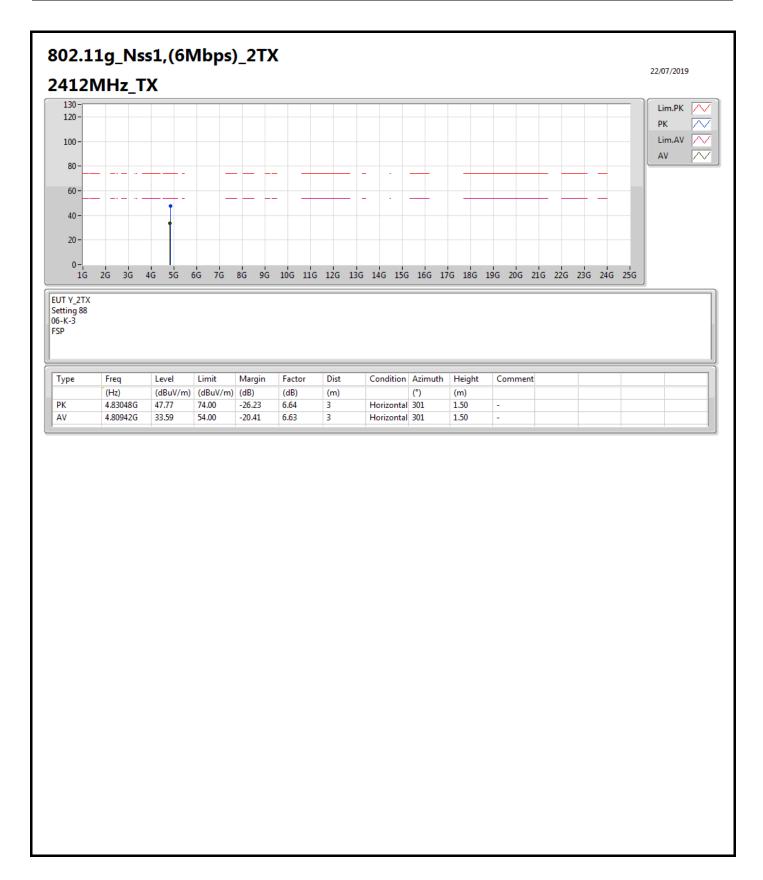




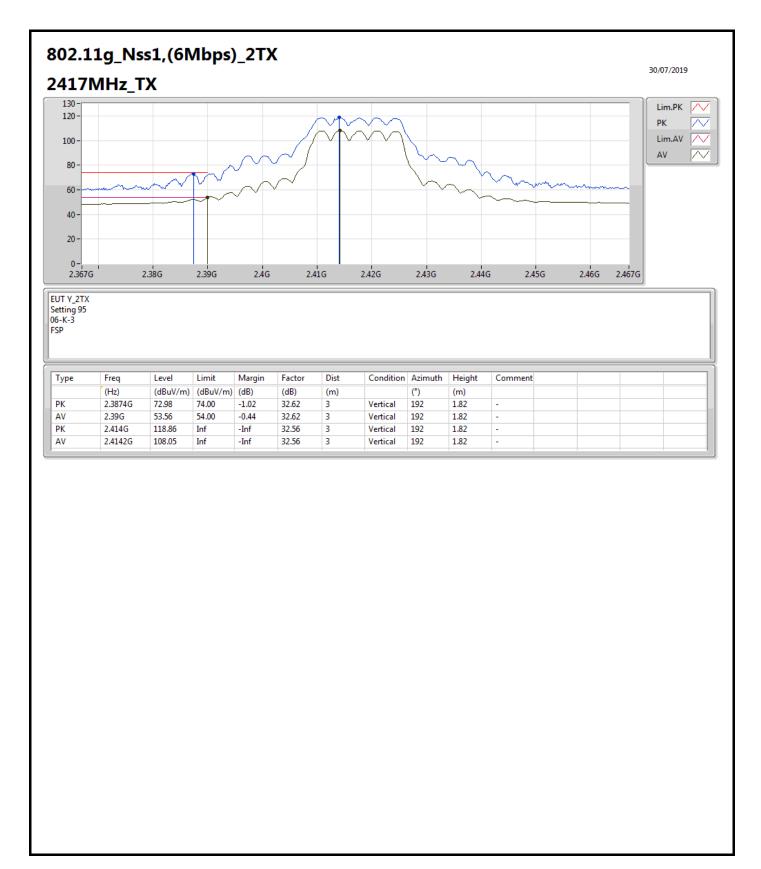




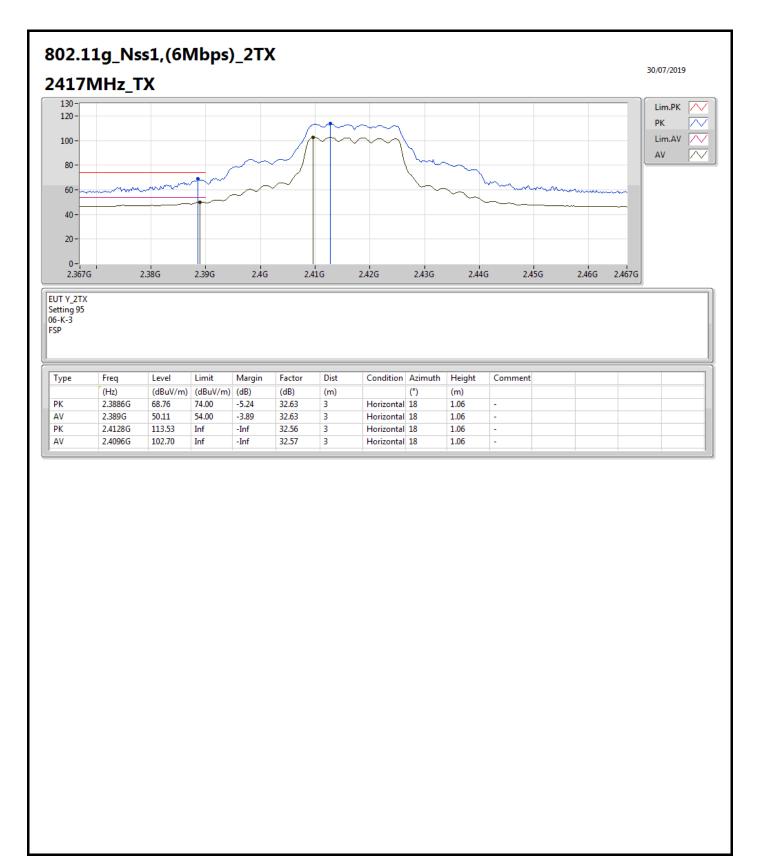




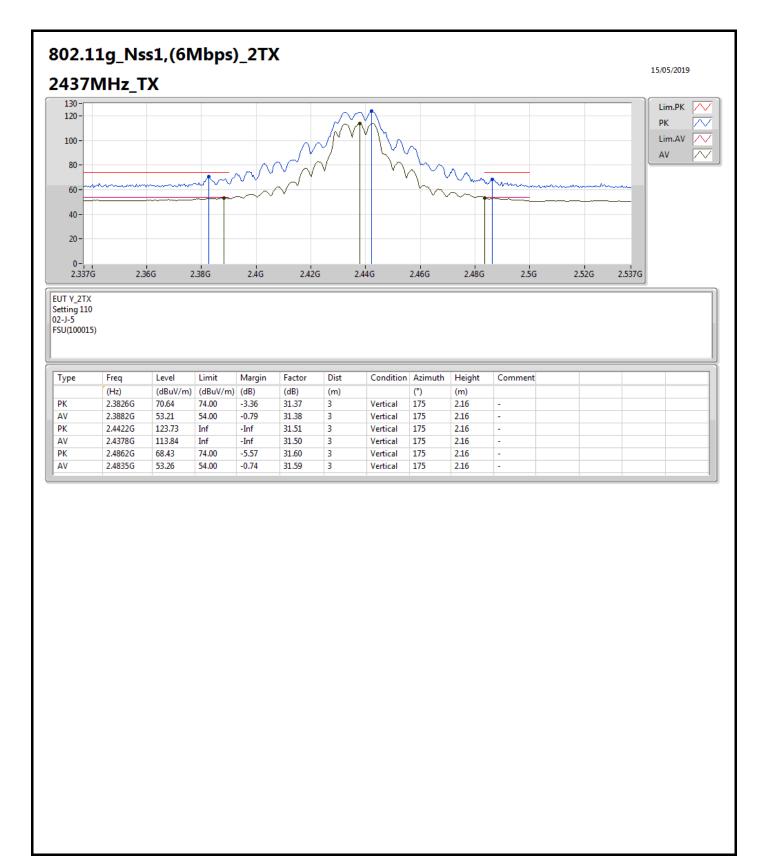




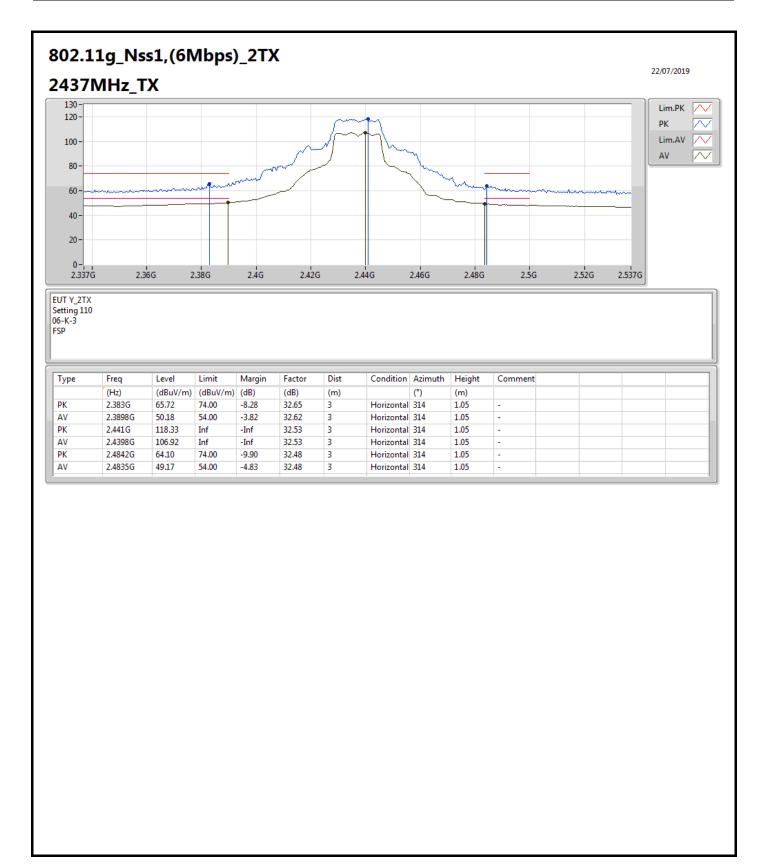




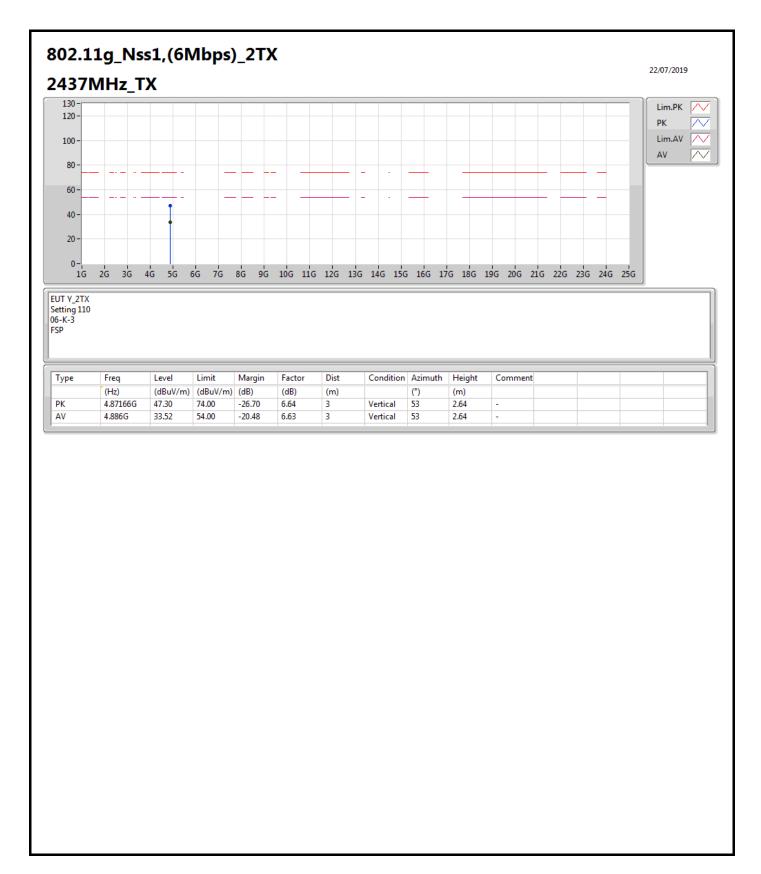




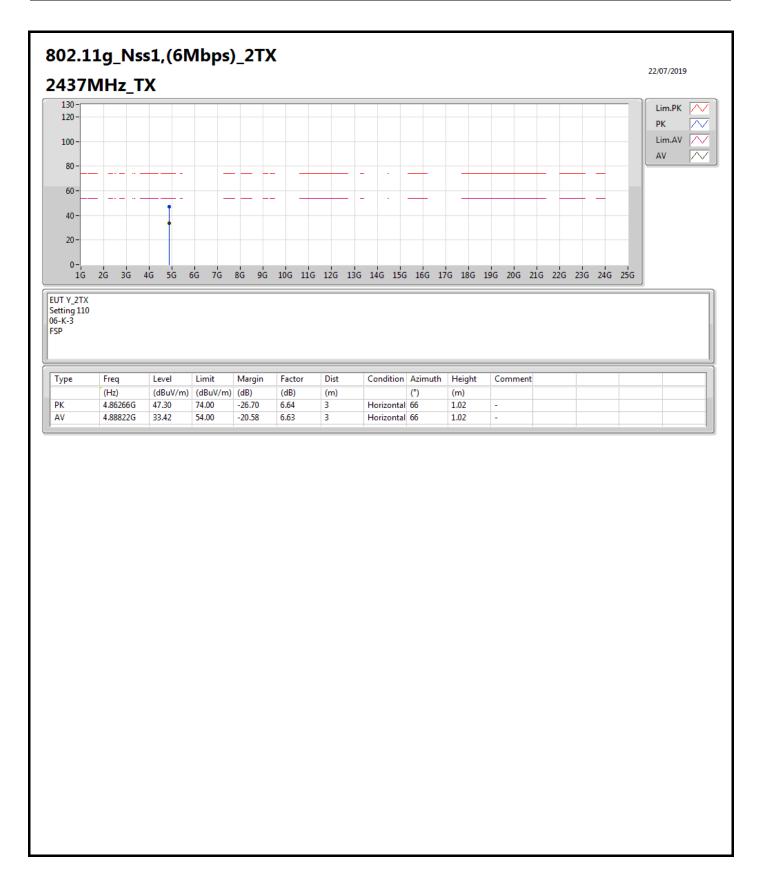




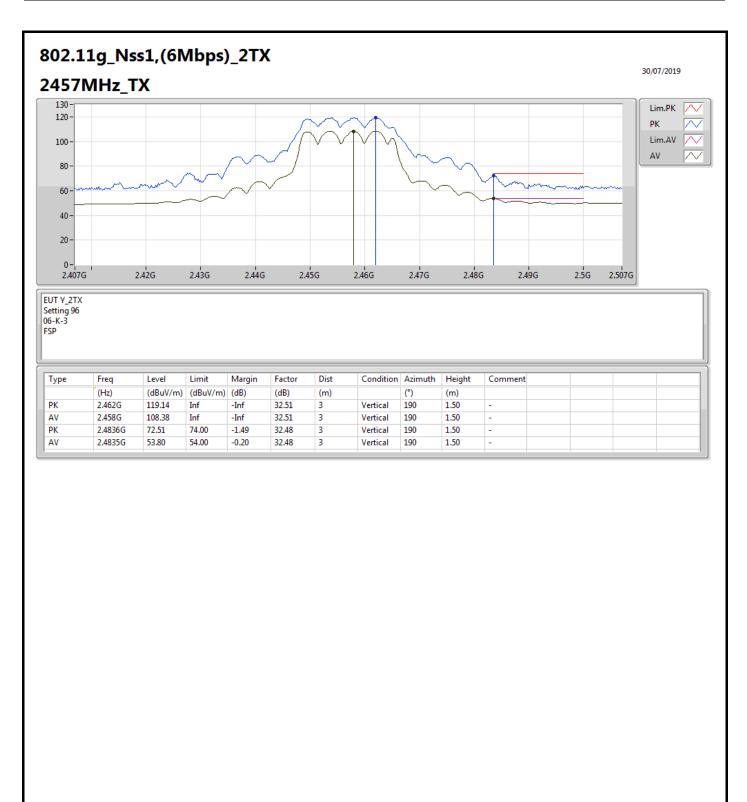




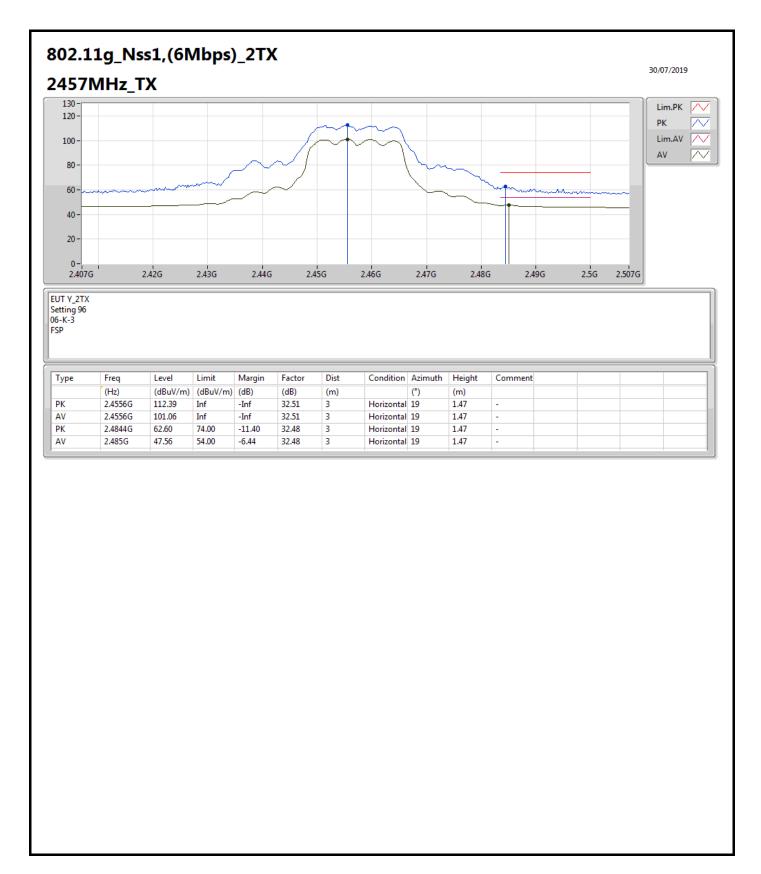




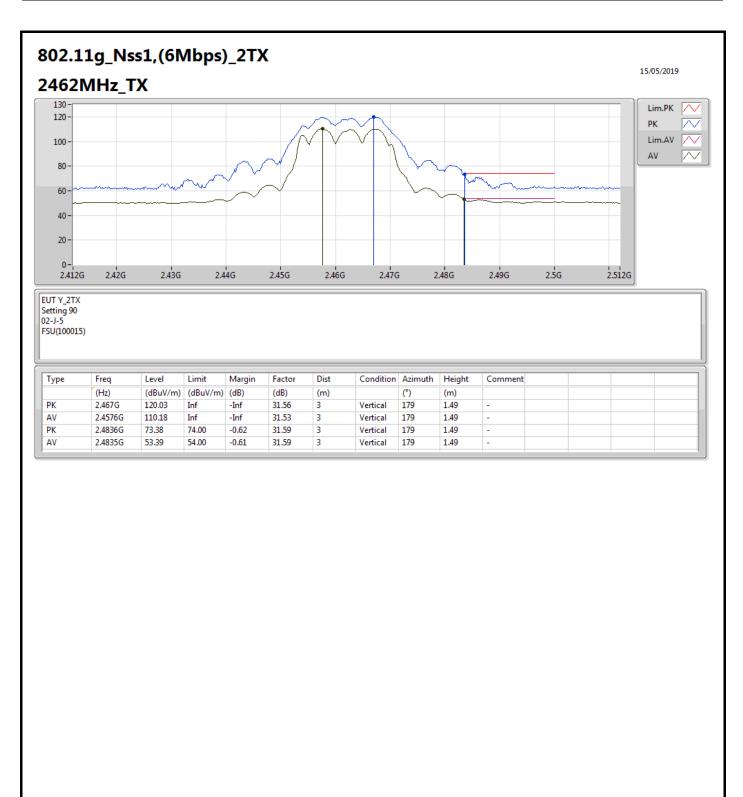




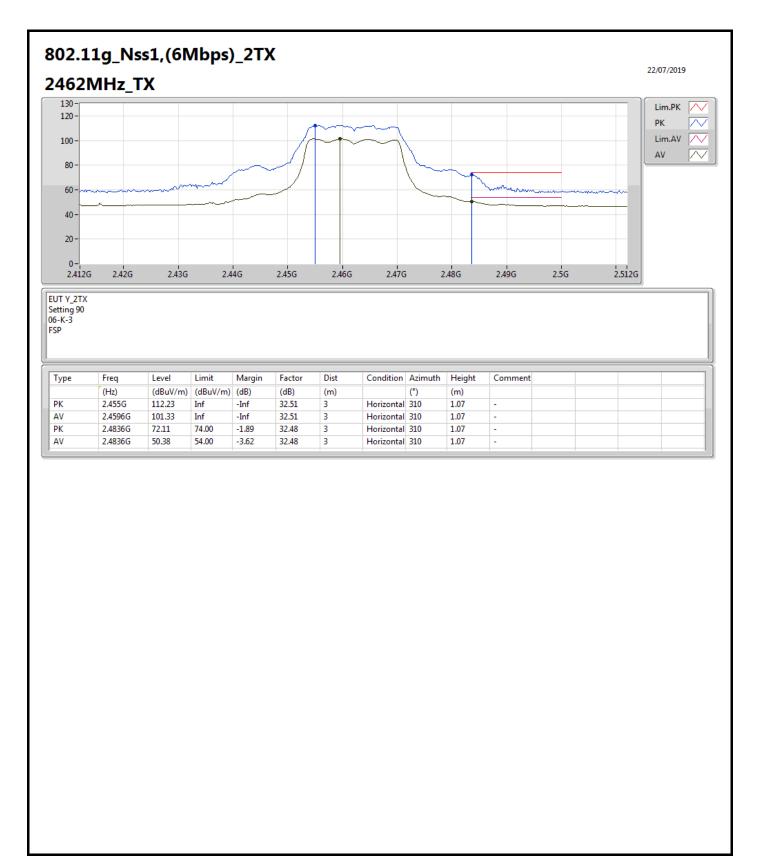




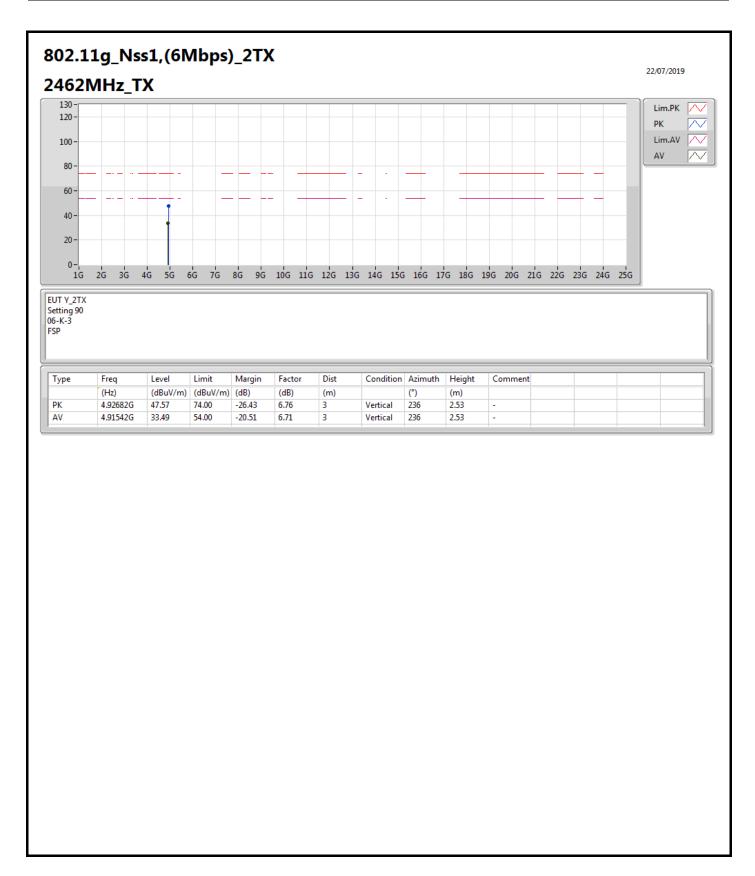




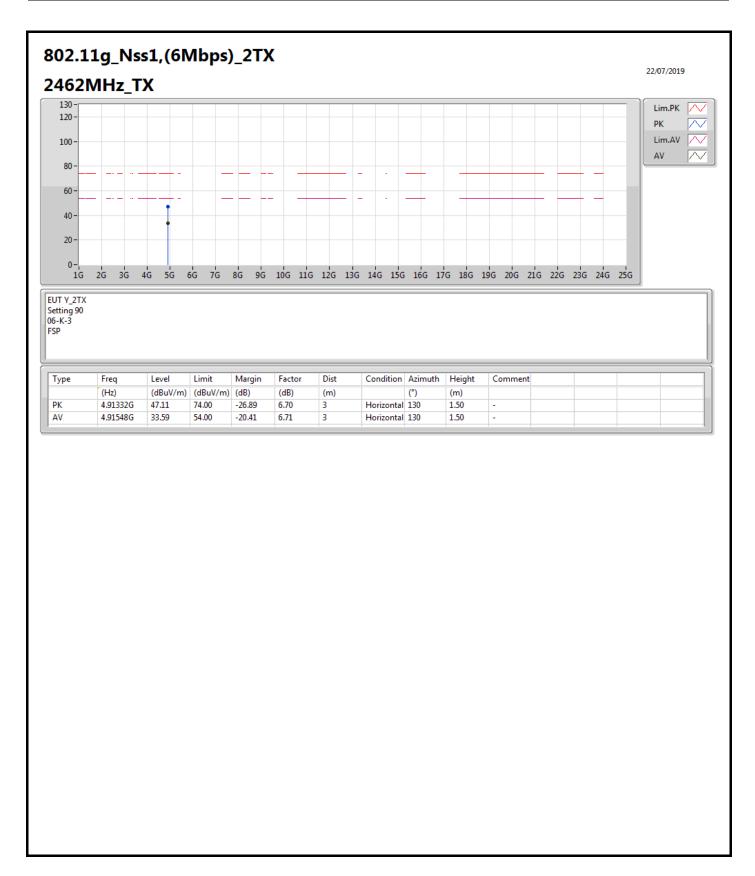




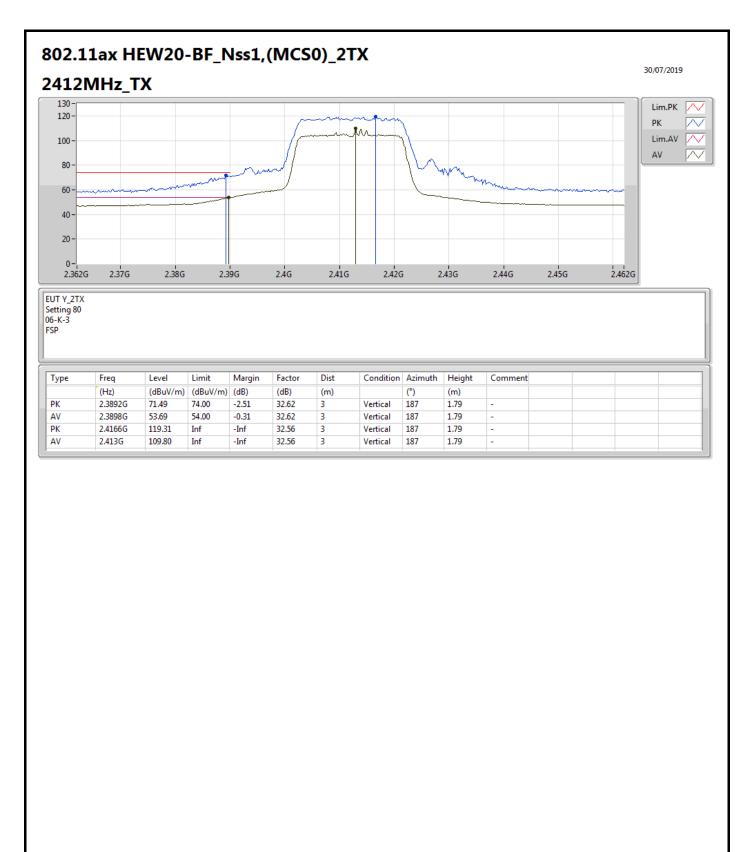




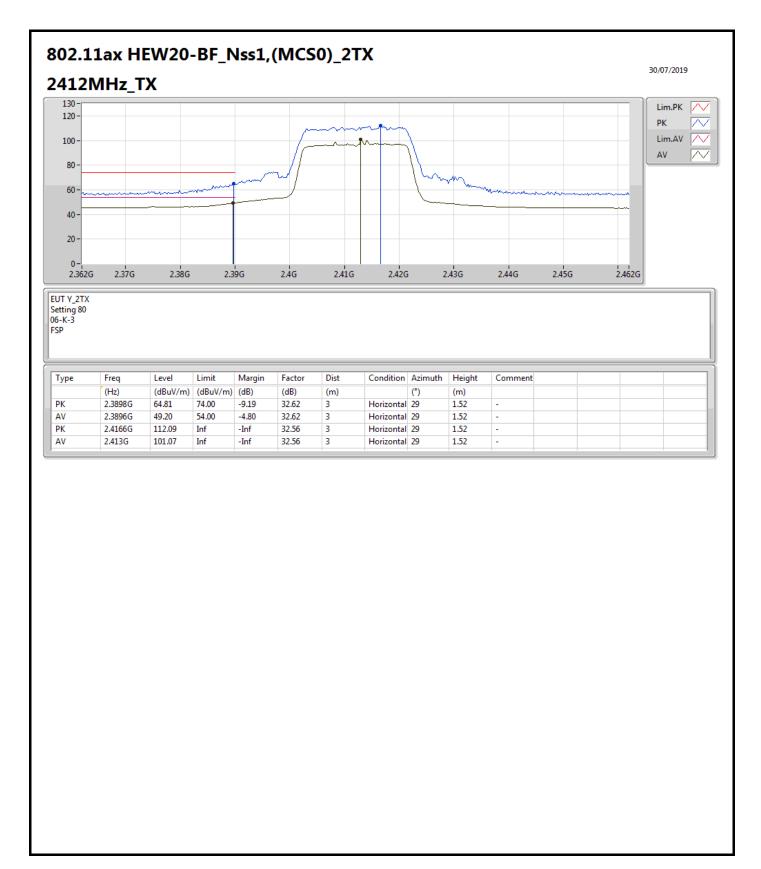




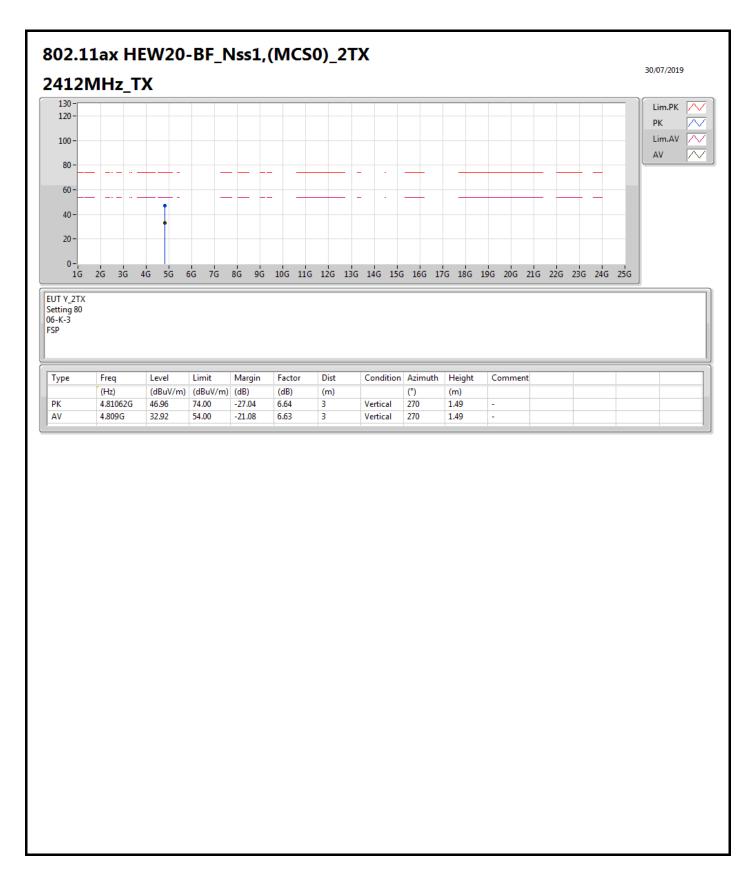




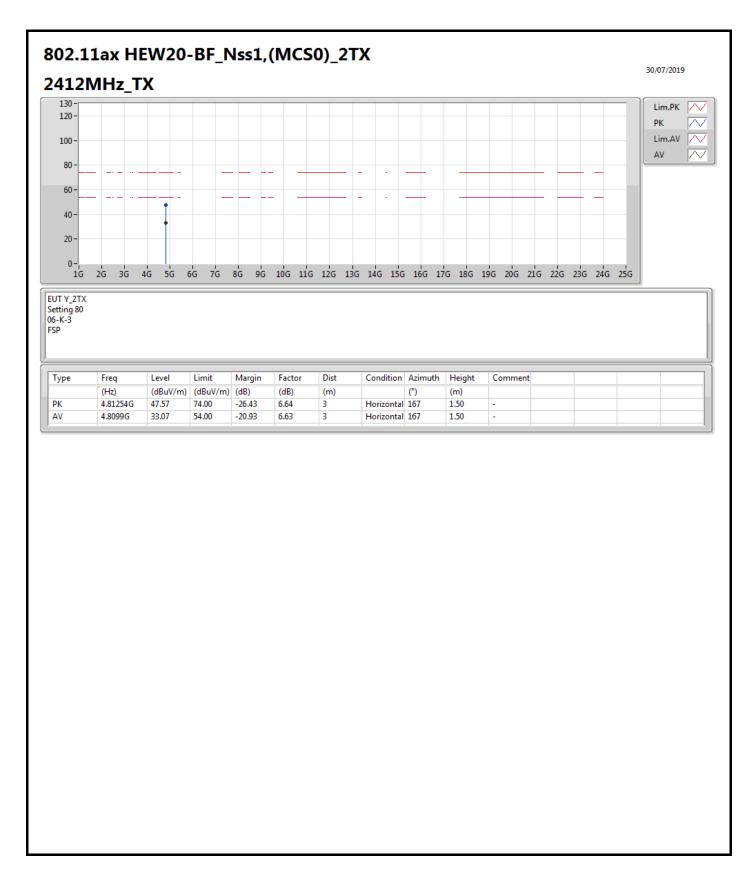




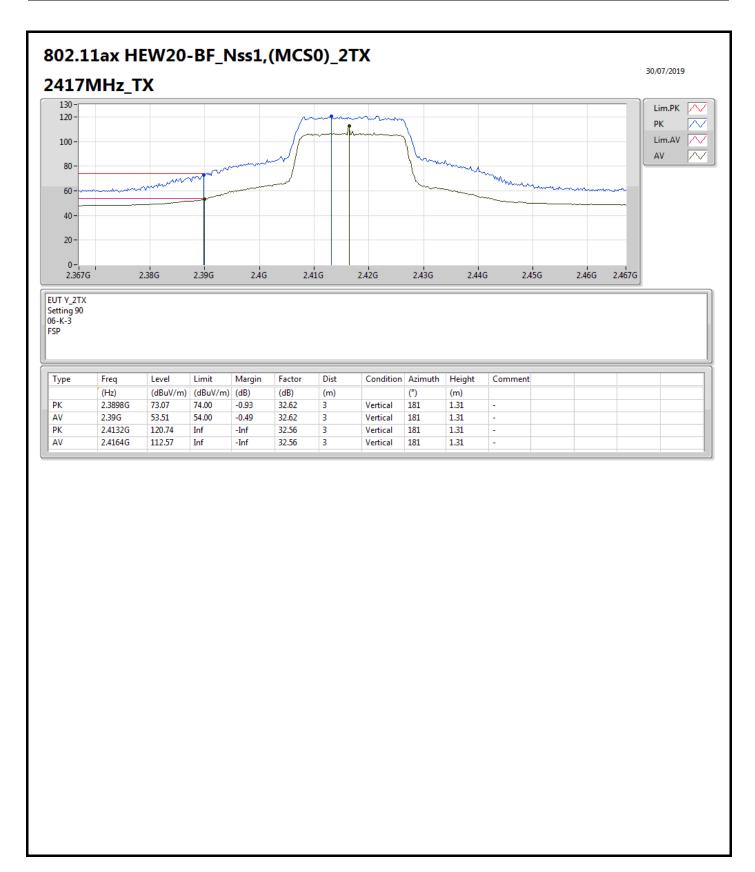




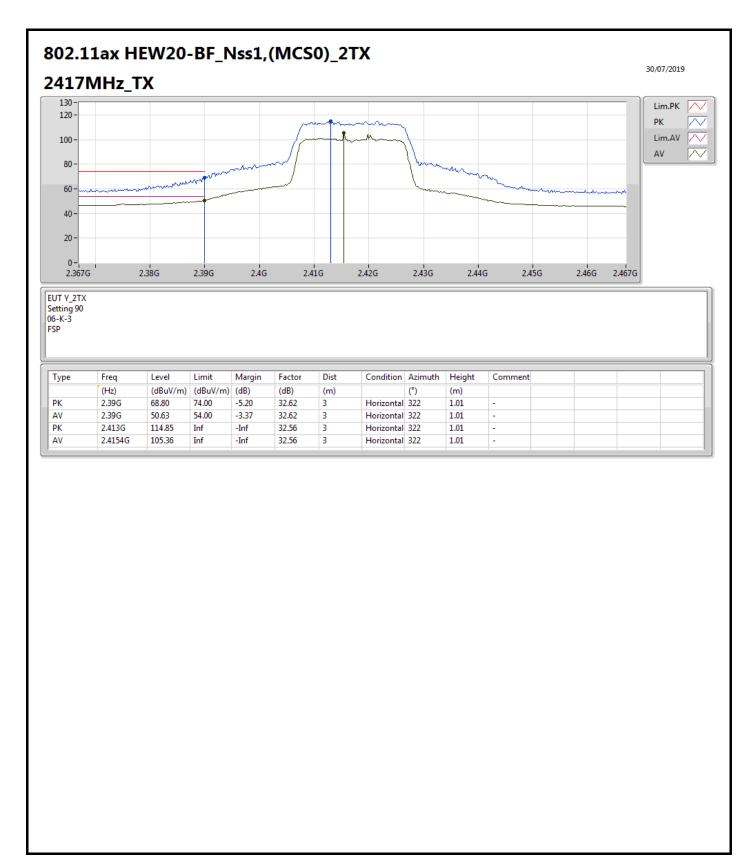




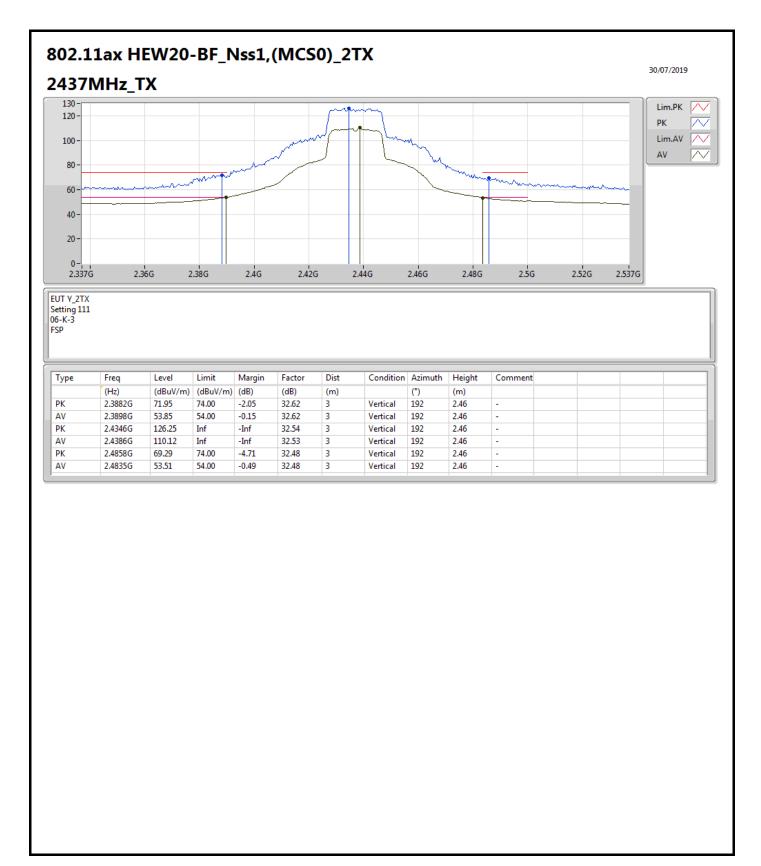




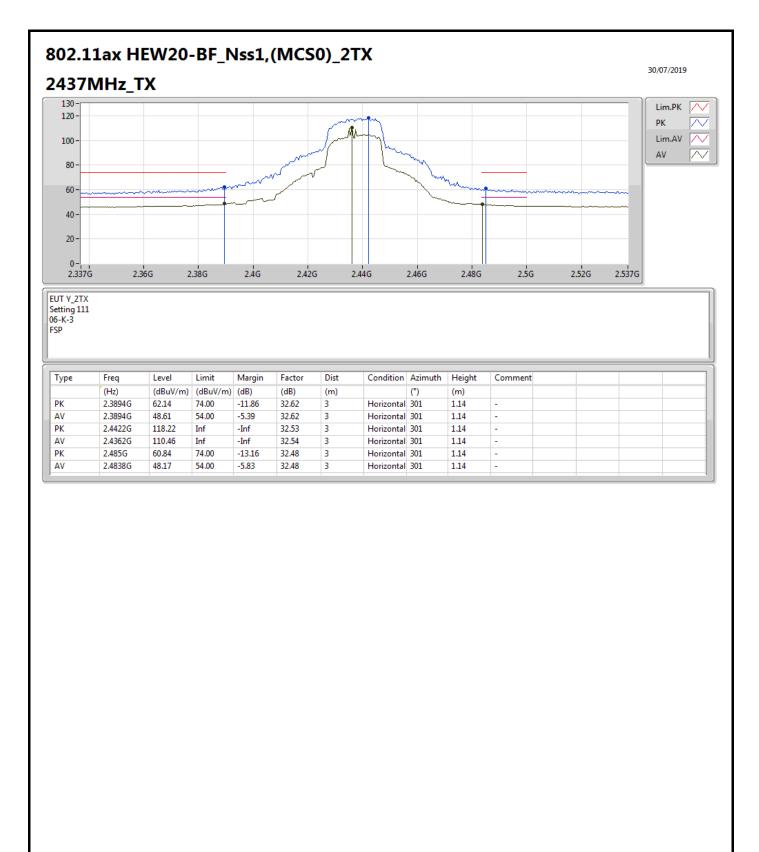




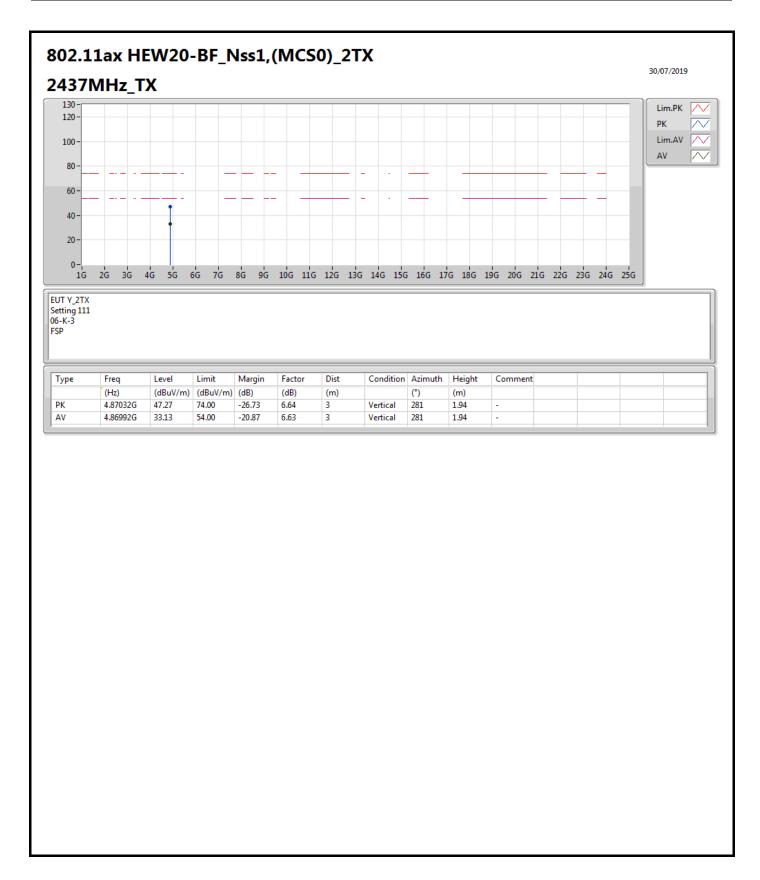




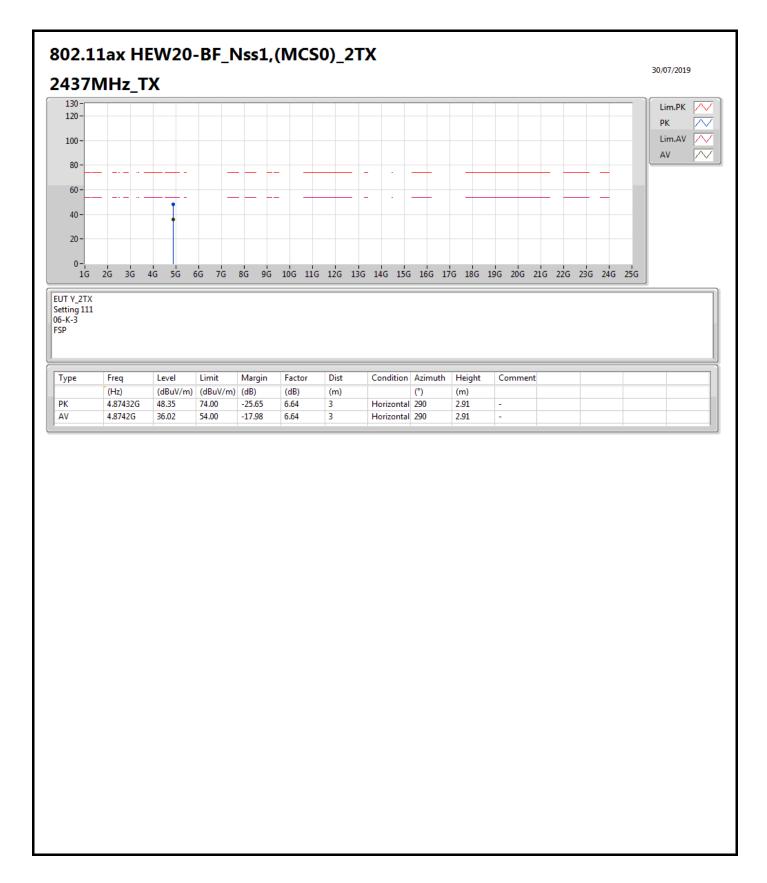




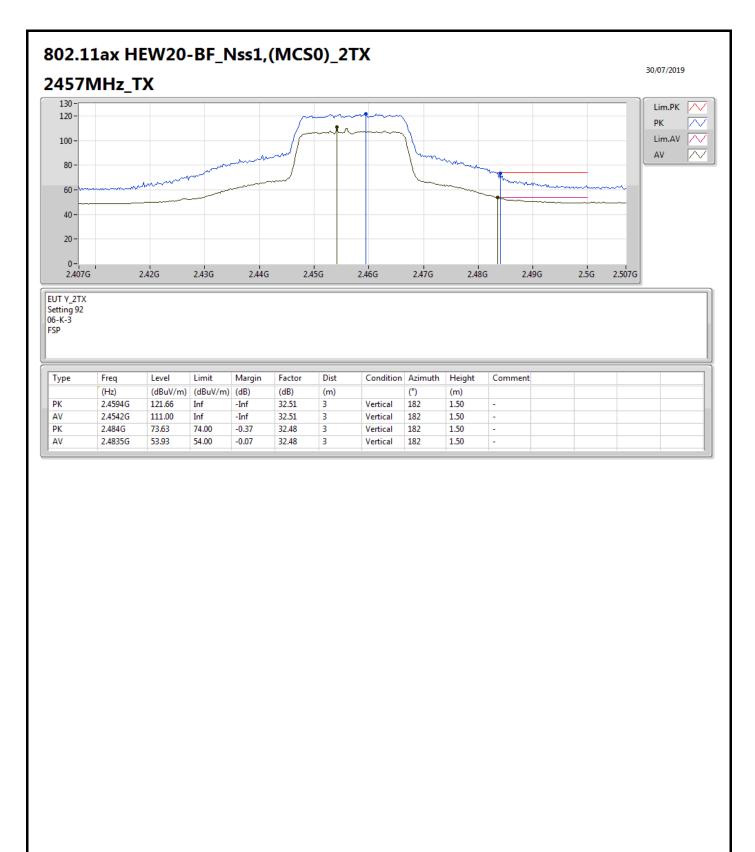




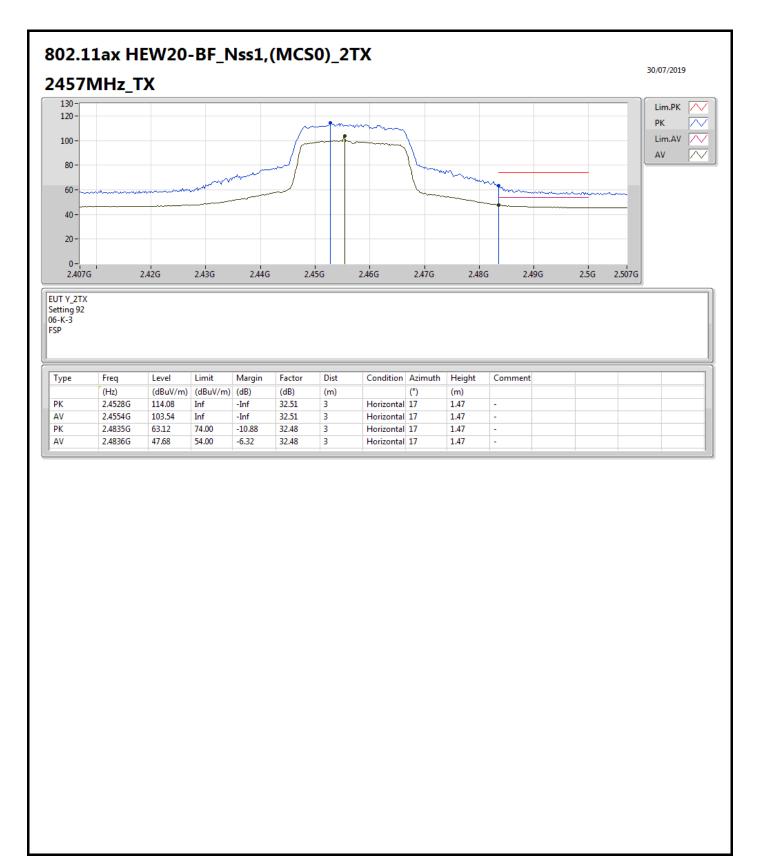




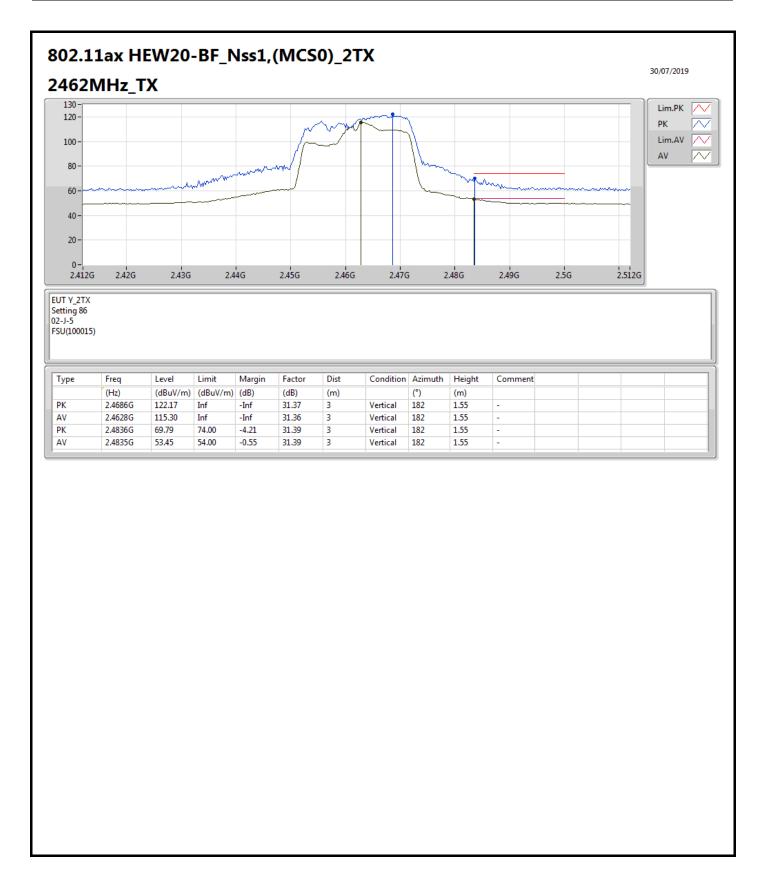




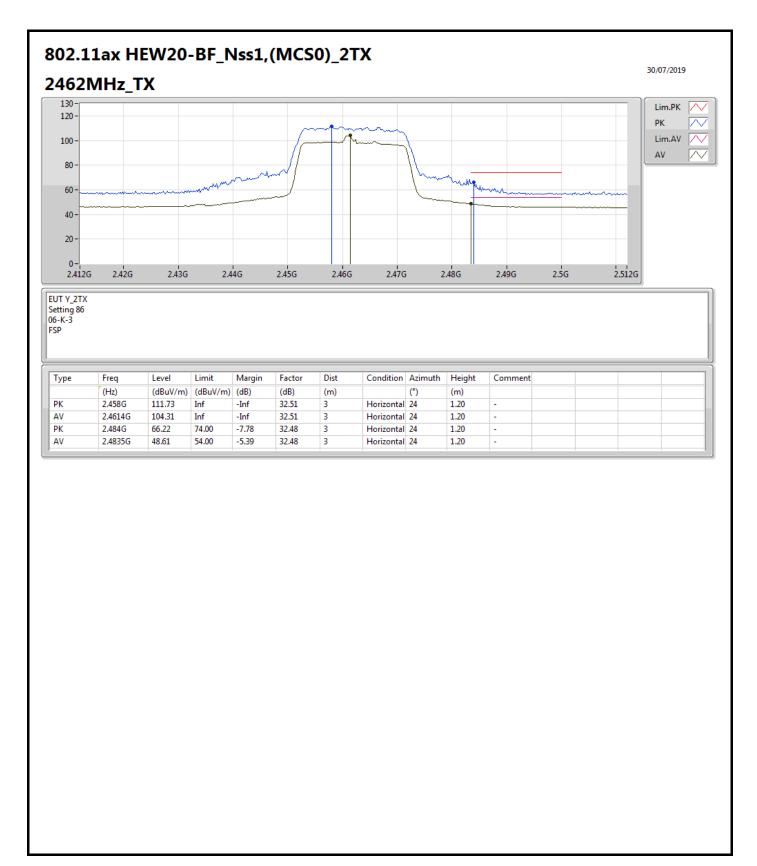




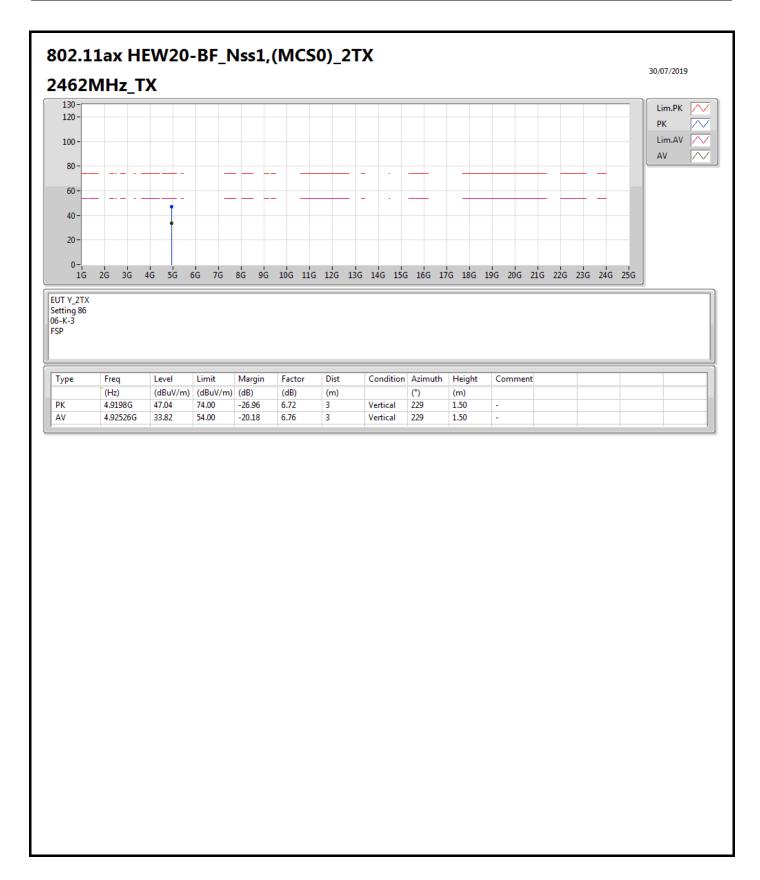




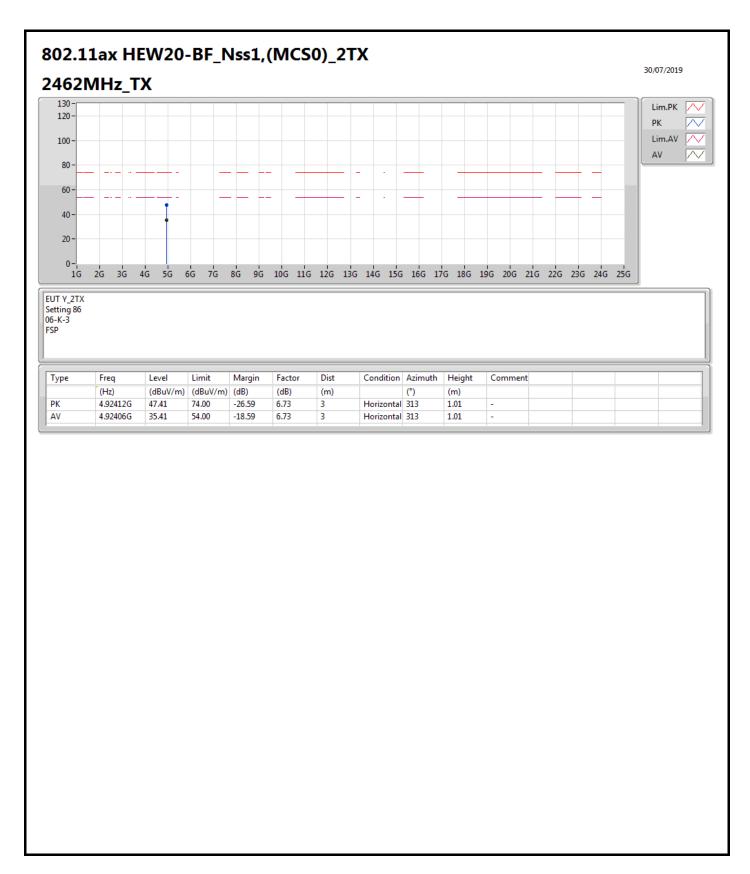




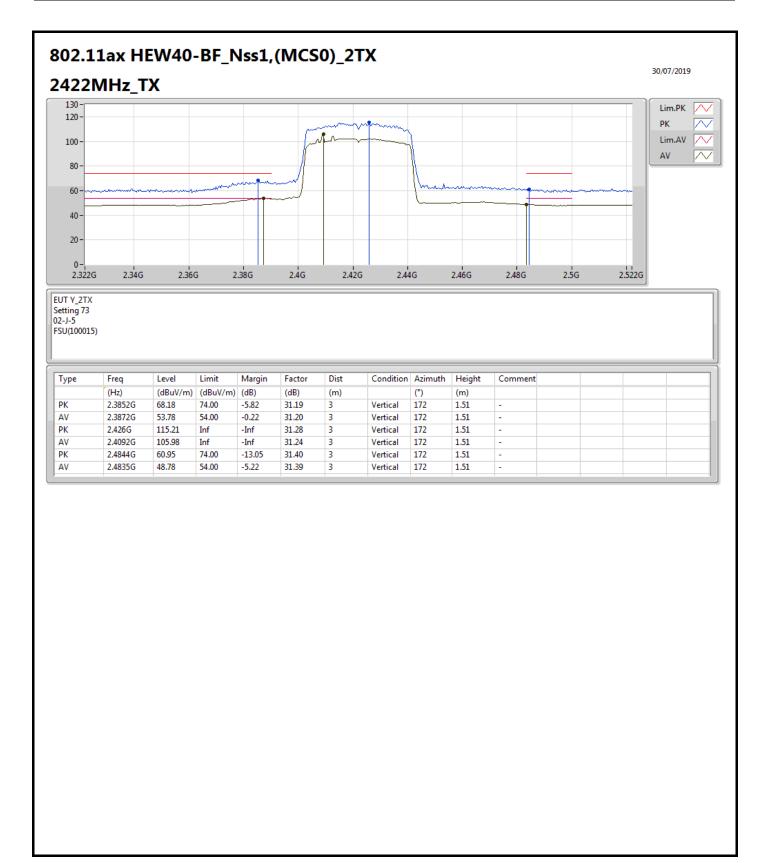




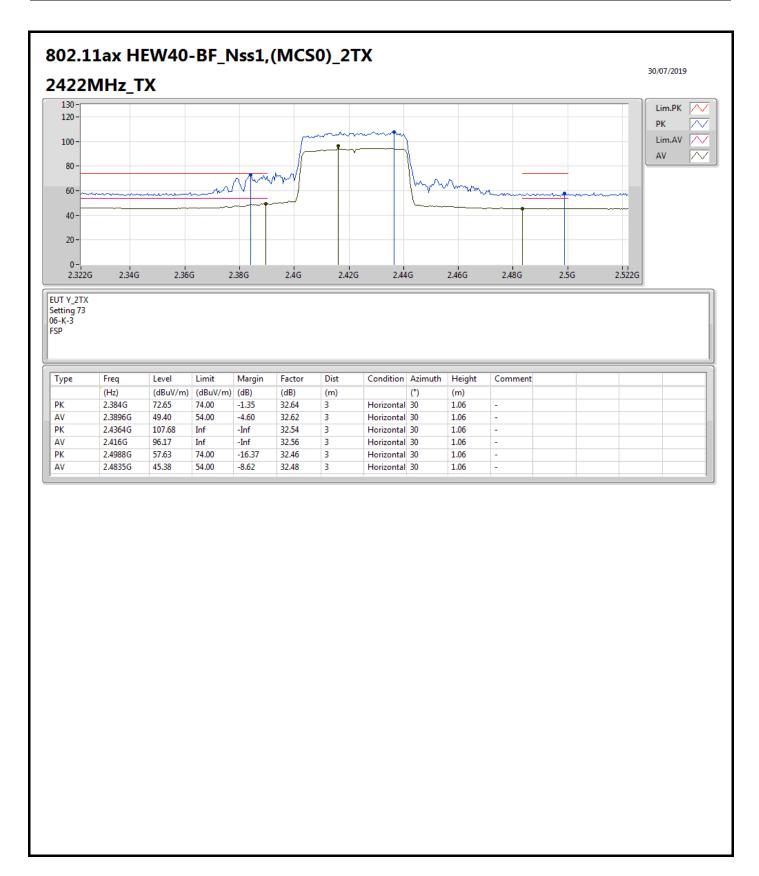




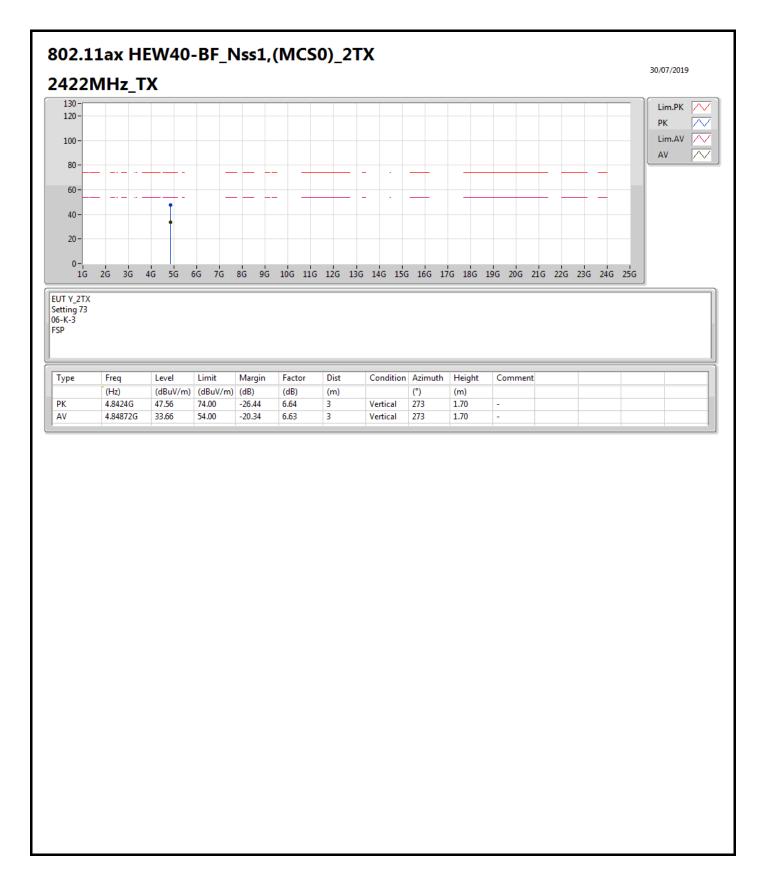




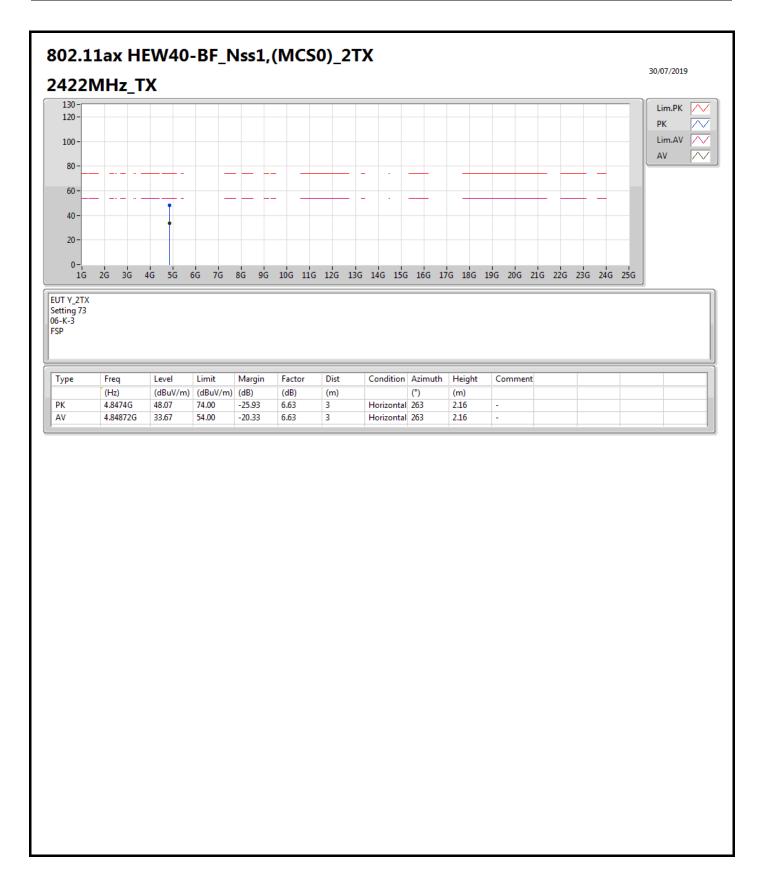




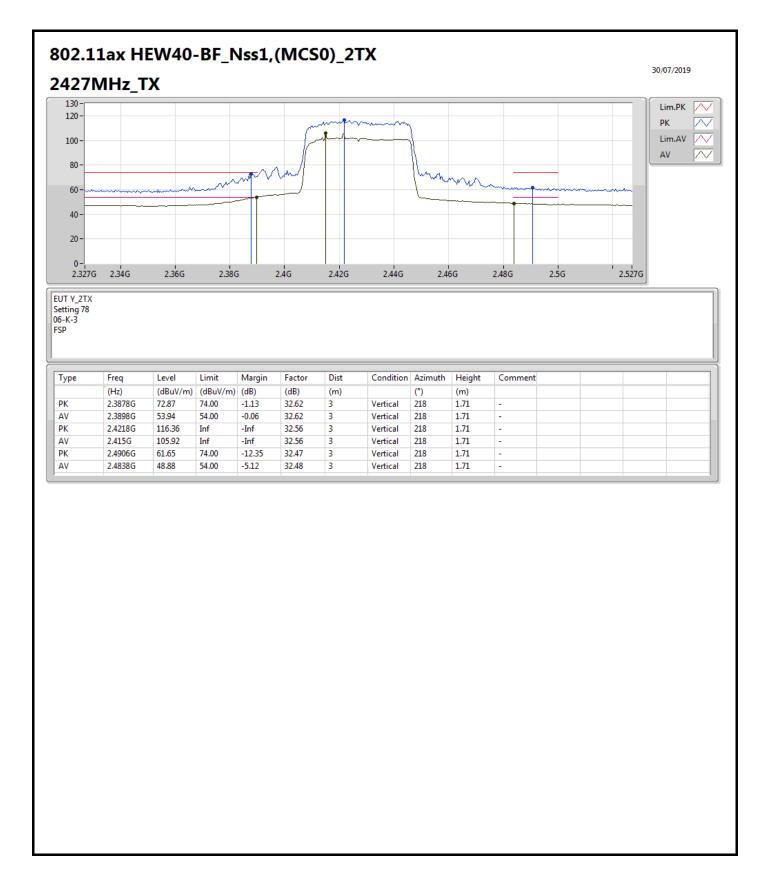




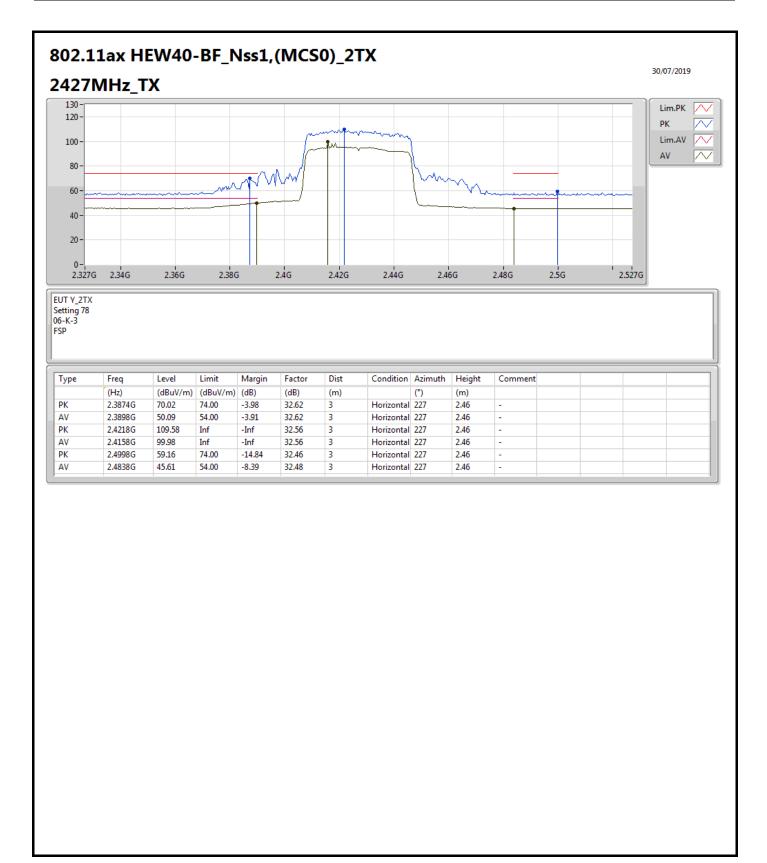




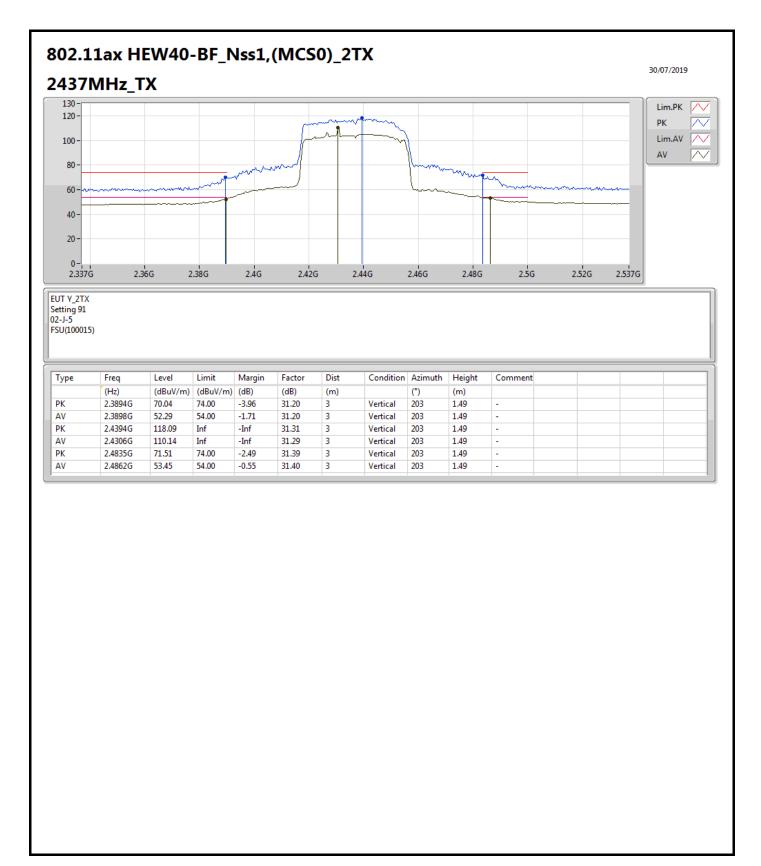




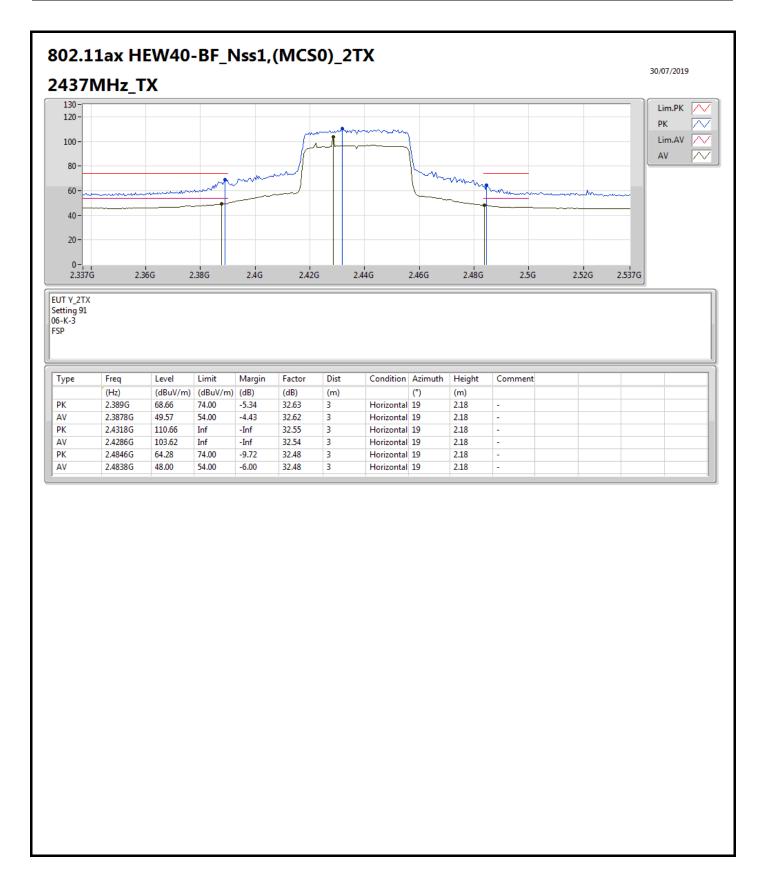




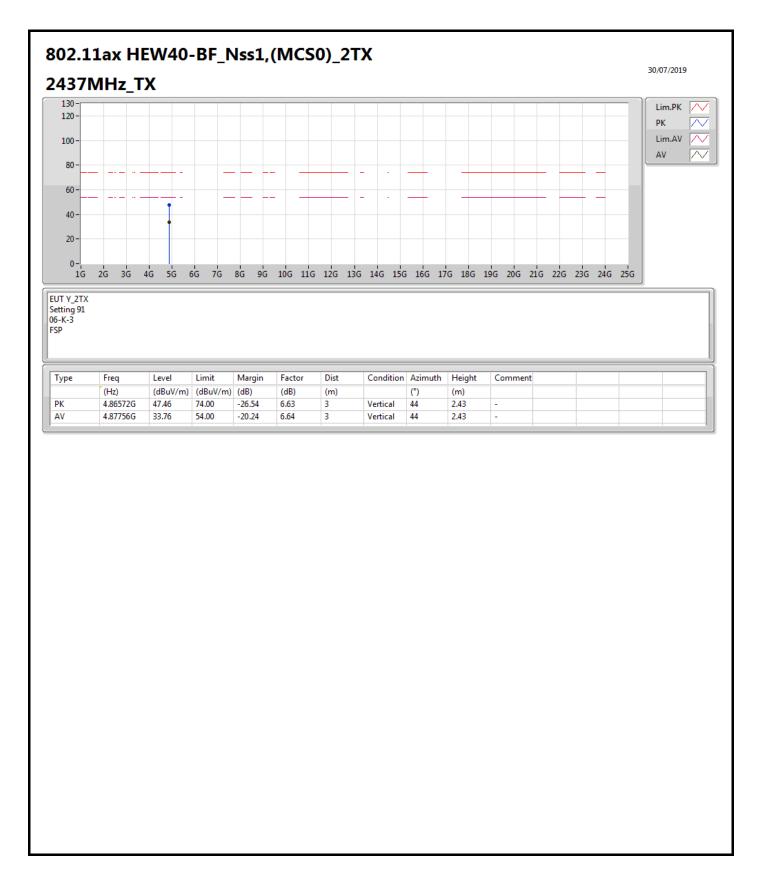




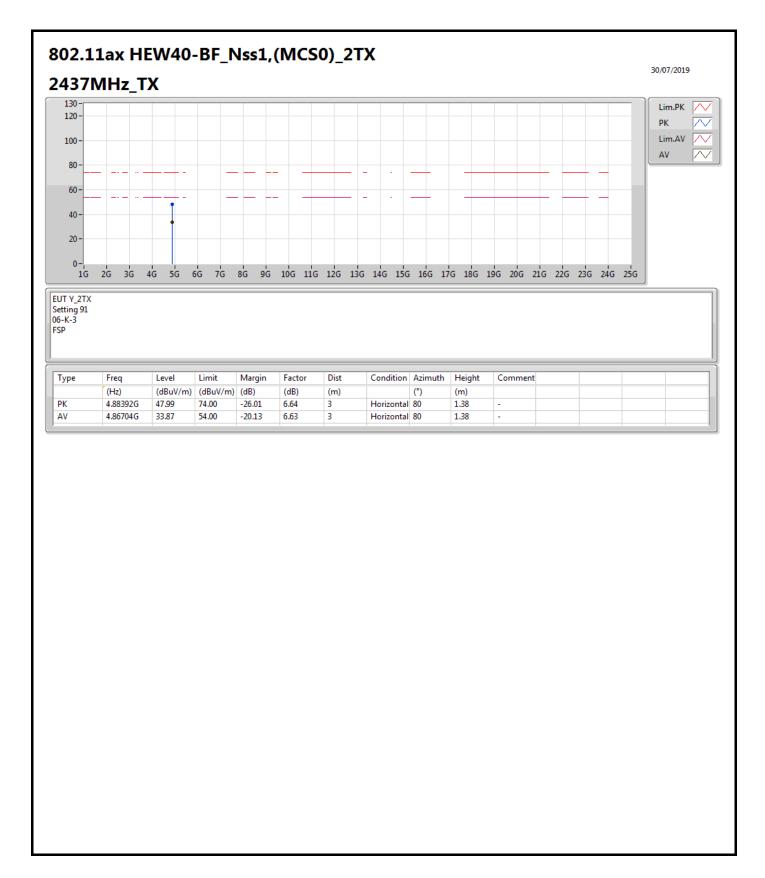




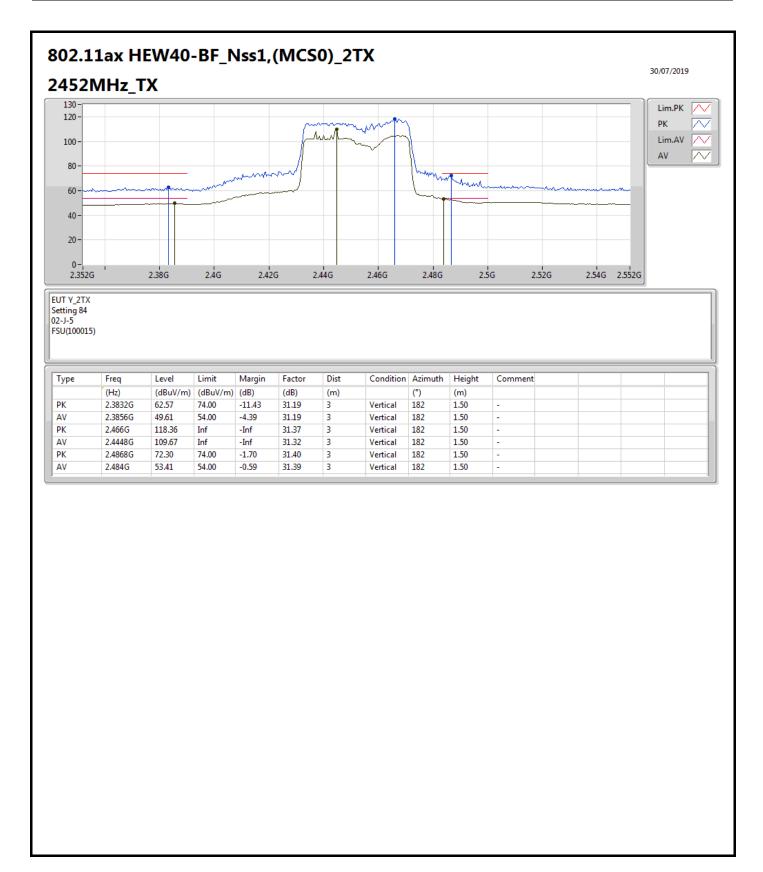




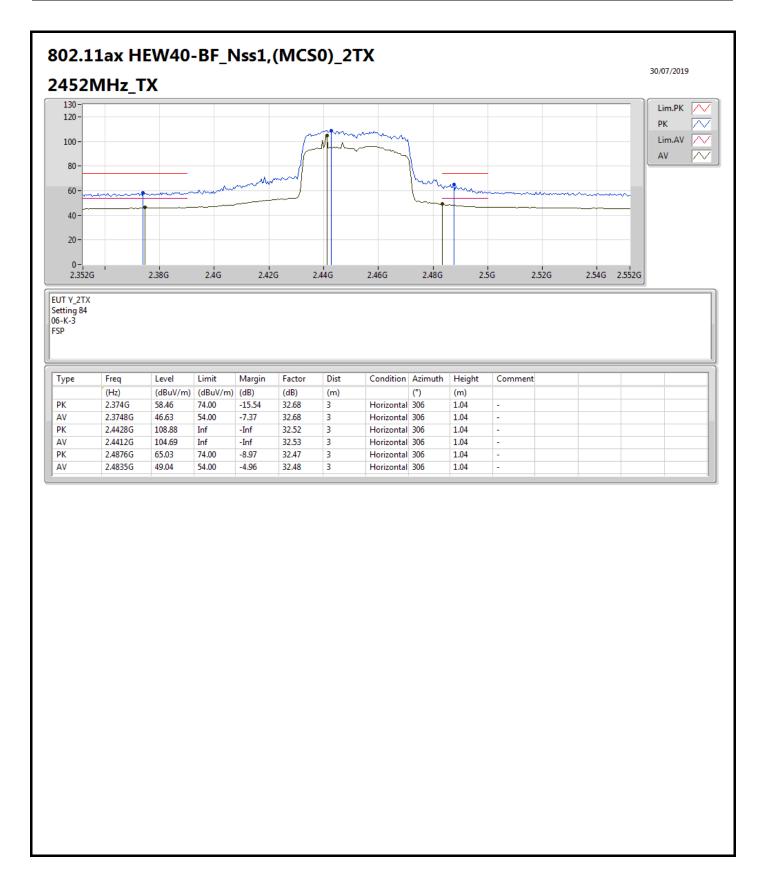




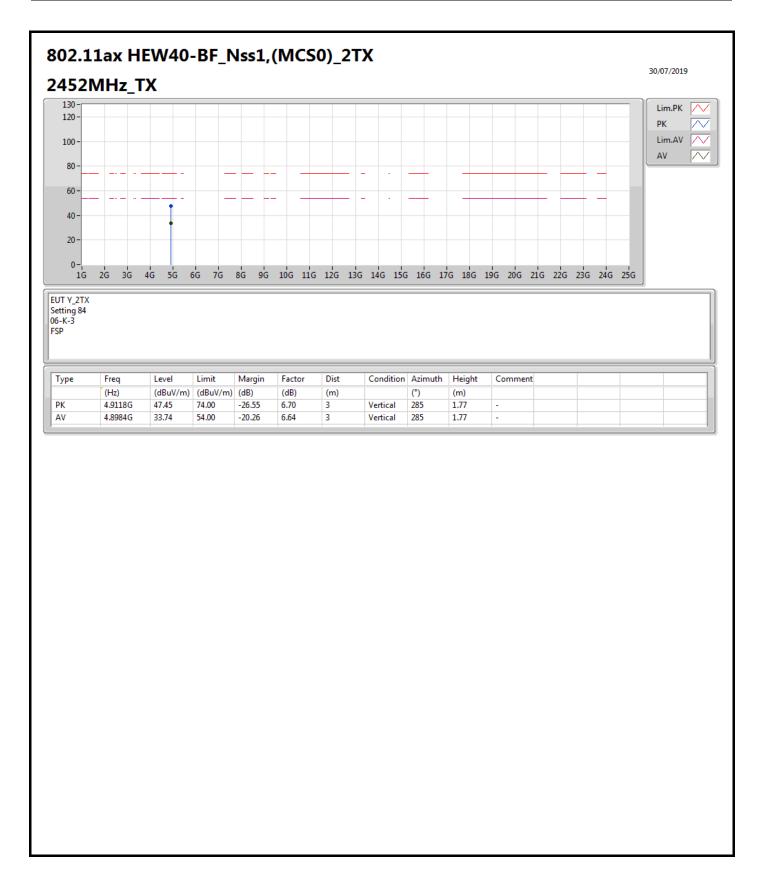




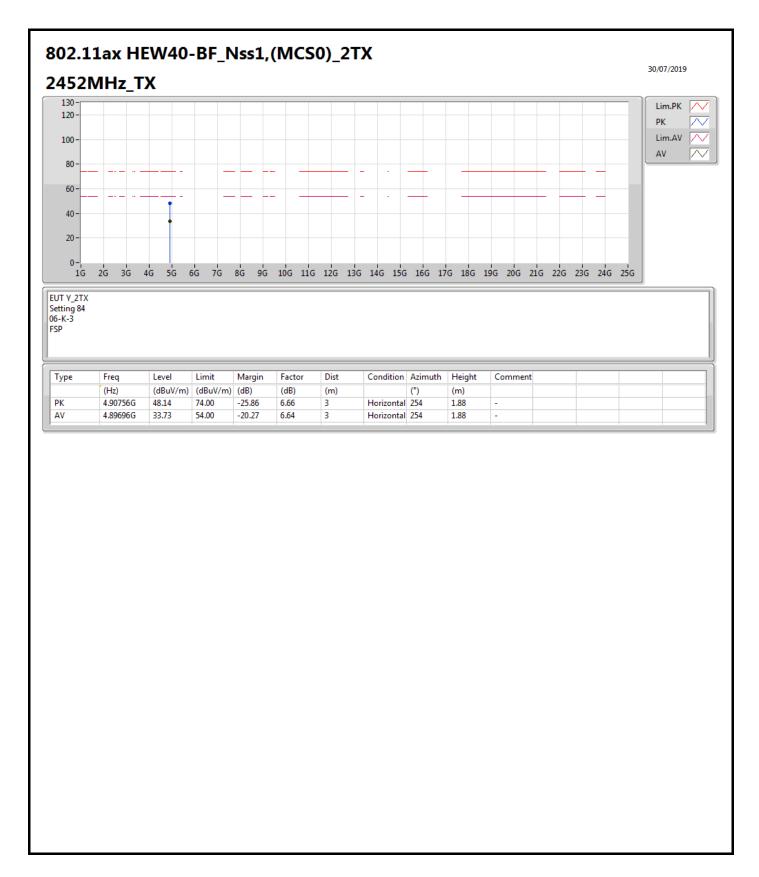














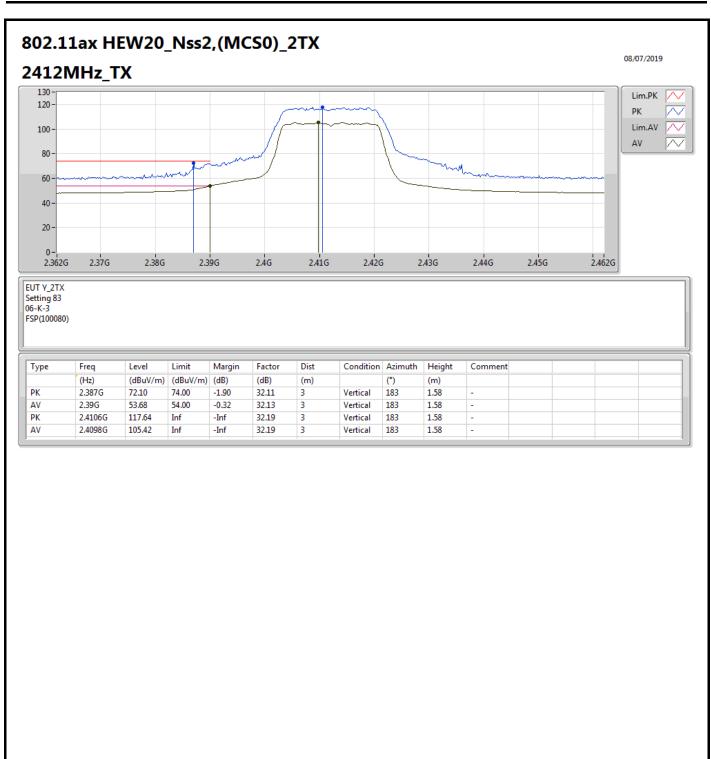
RSE TX above 1GHz

Appendix F.3

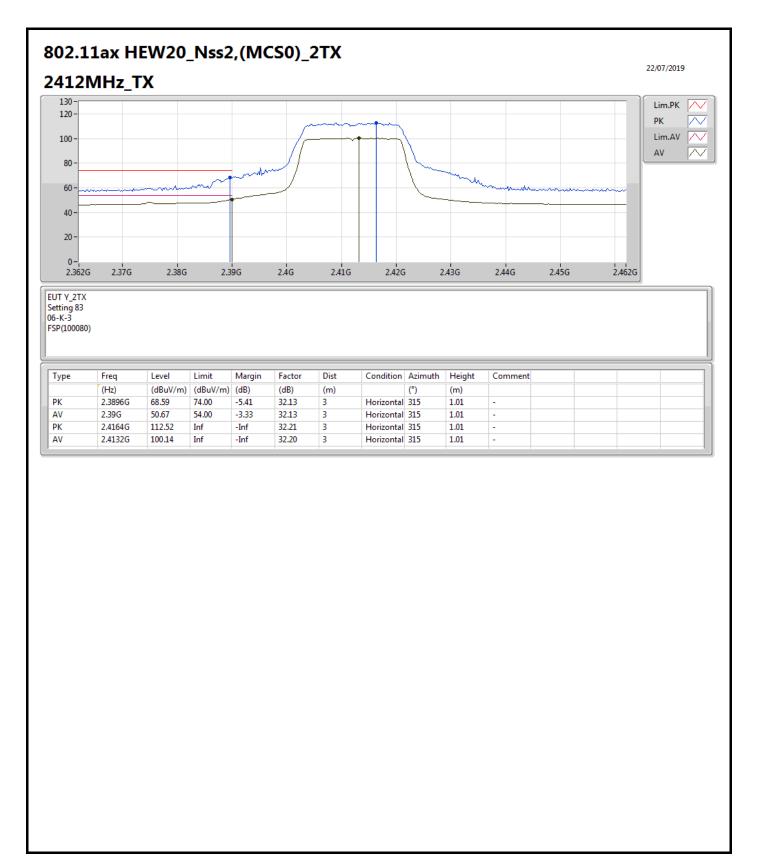
For 2T2S Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11ax HEW40_Nss2,(MCS0)_2TX	Pass	AV	2.3898G	53.98	54.00	-0.02	32.62	3	Vertical	191	1.58	-

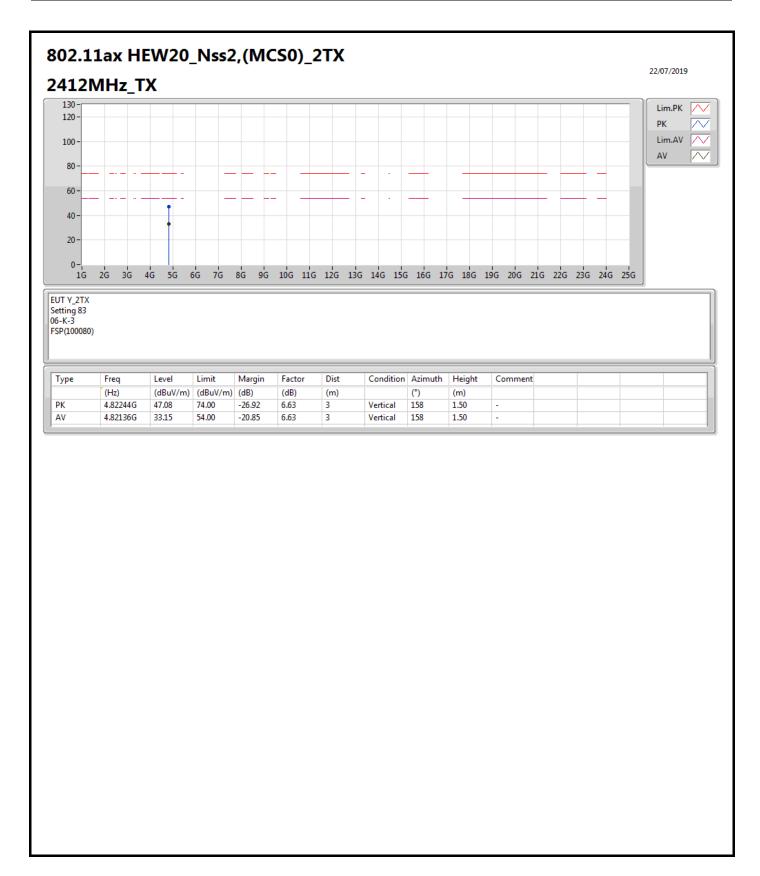




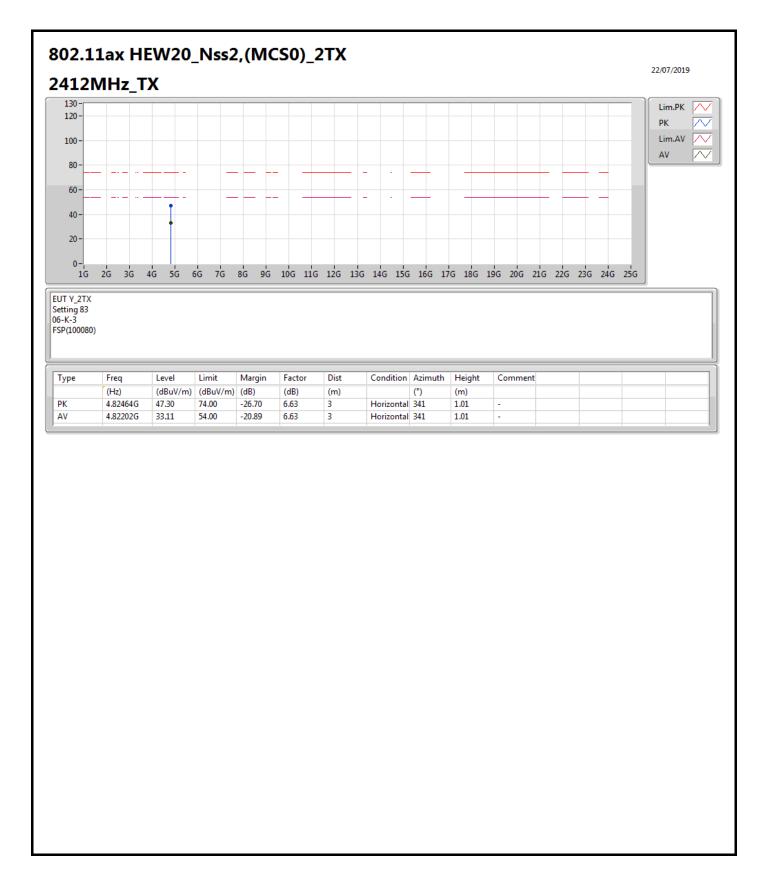








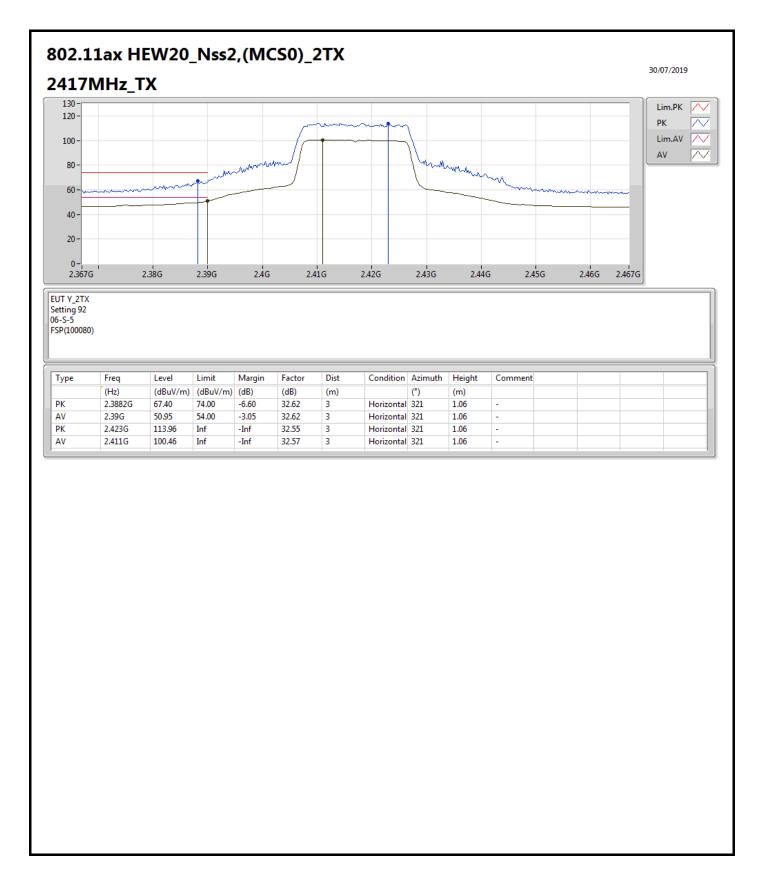




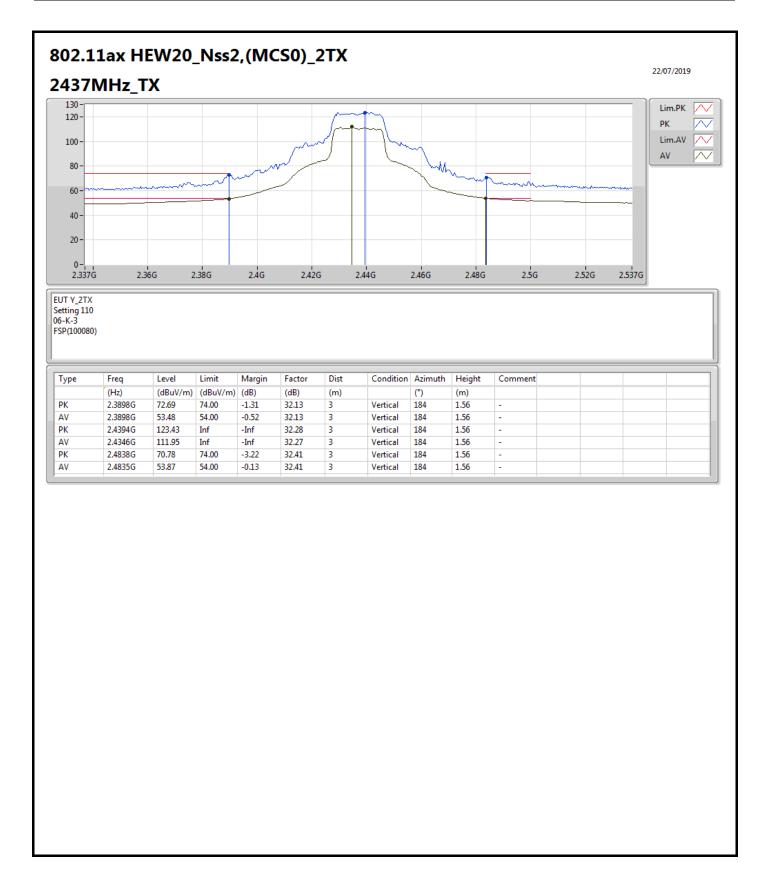




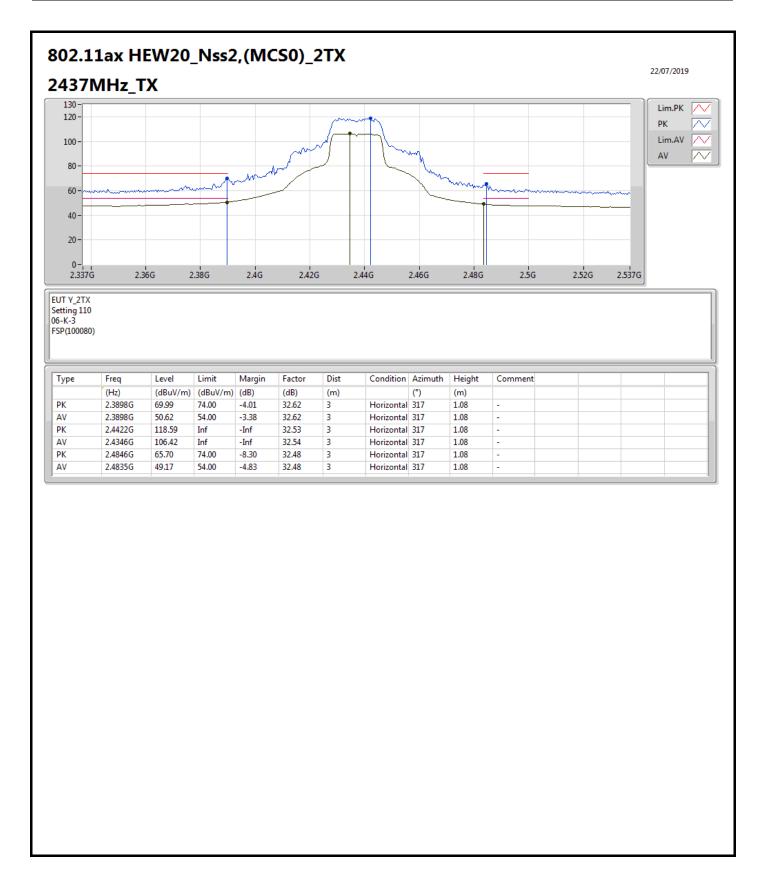




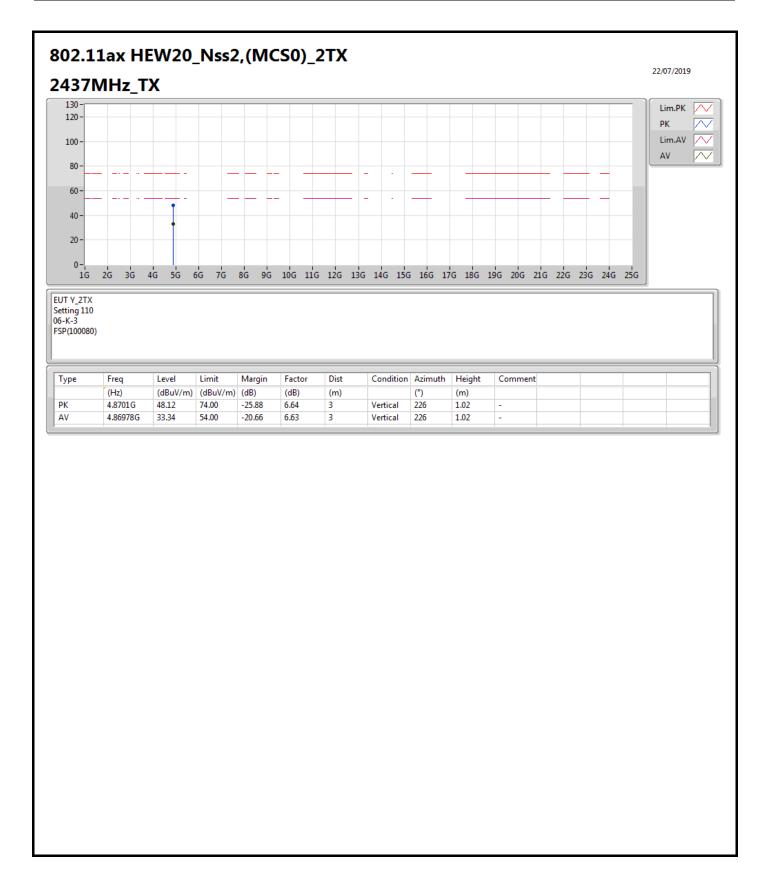




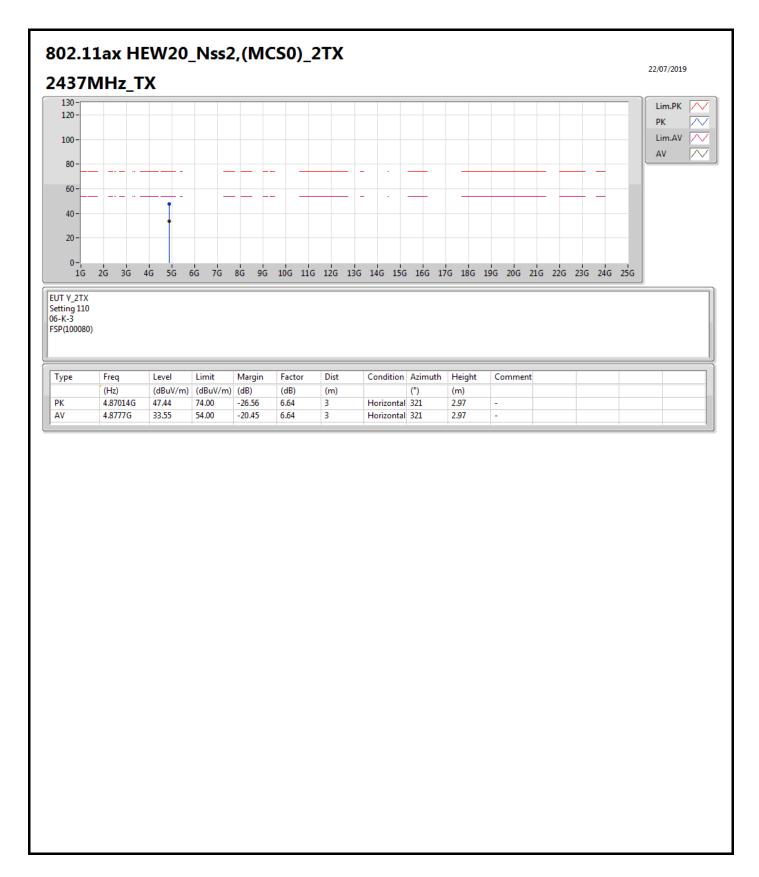




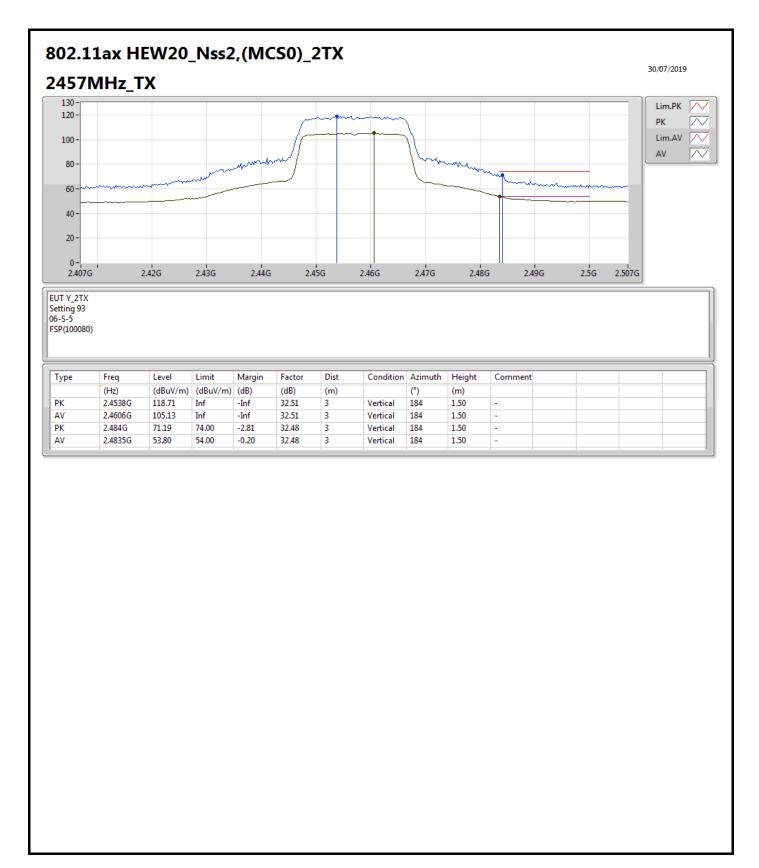








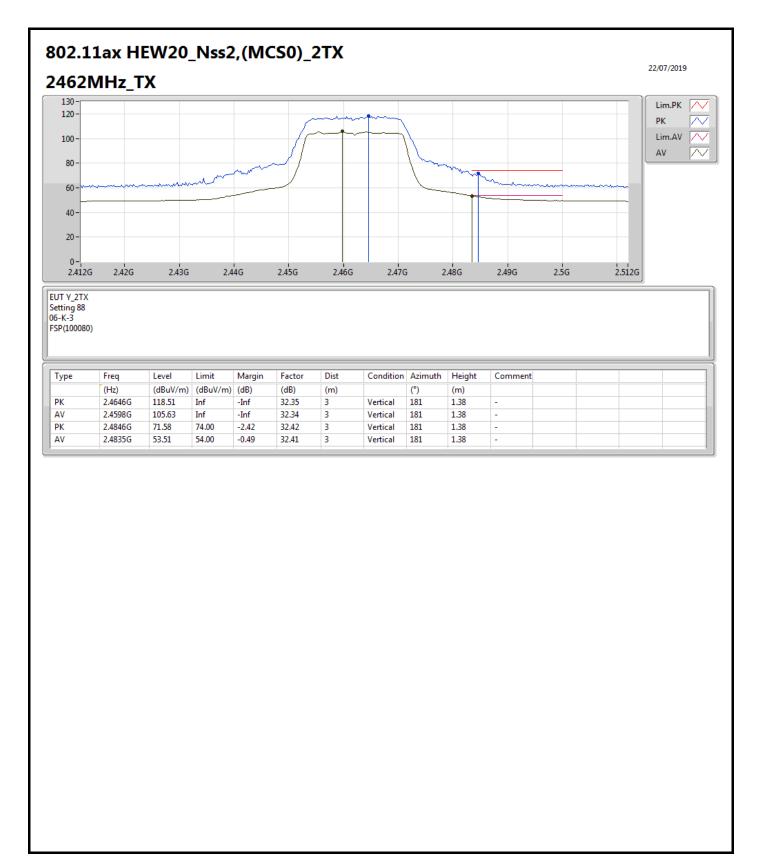




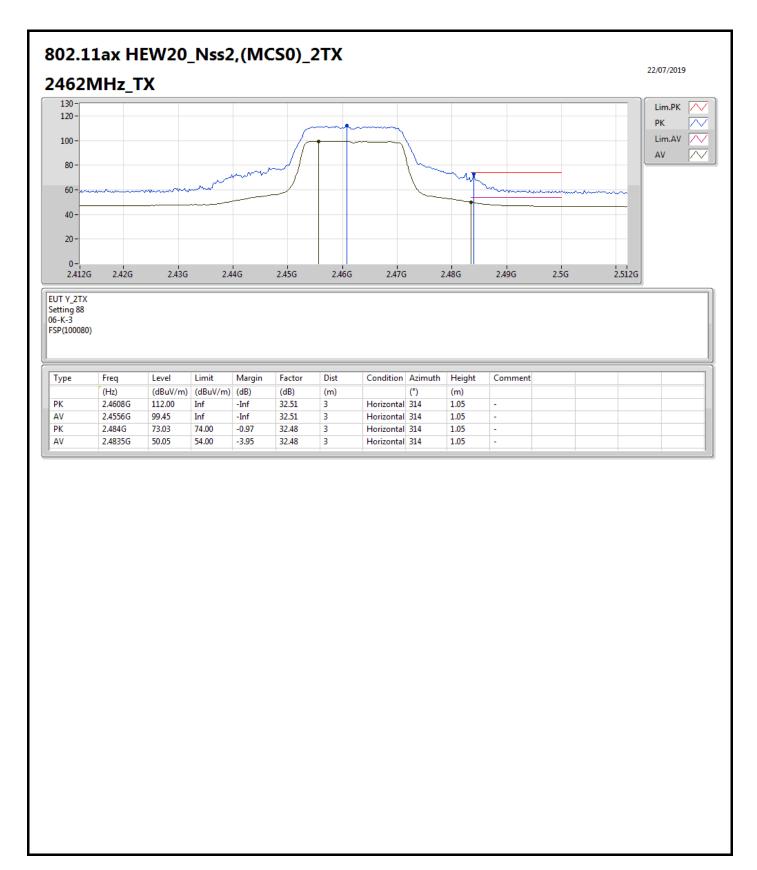




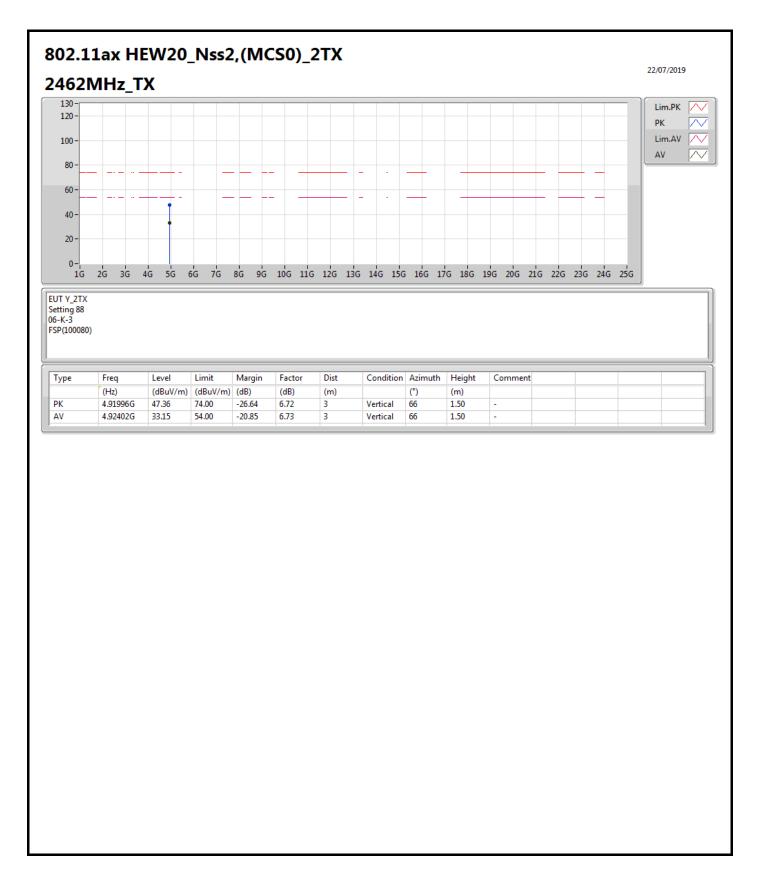




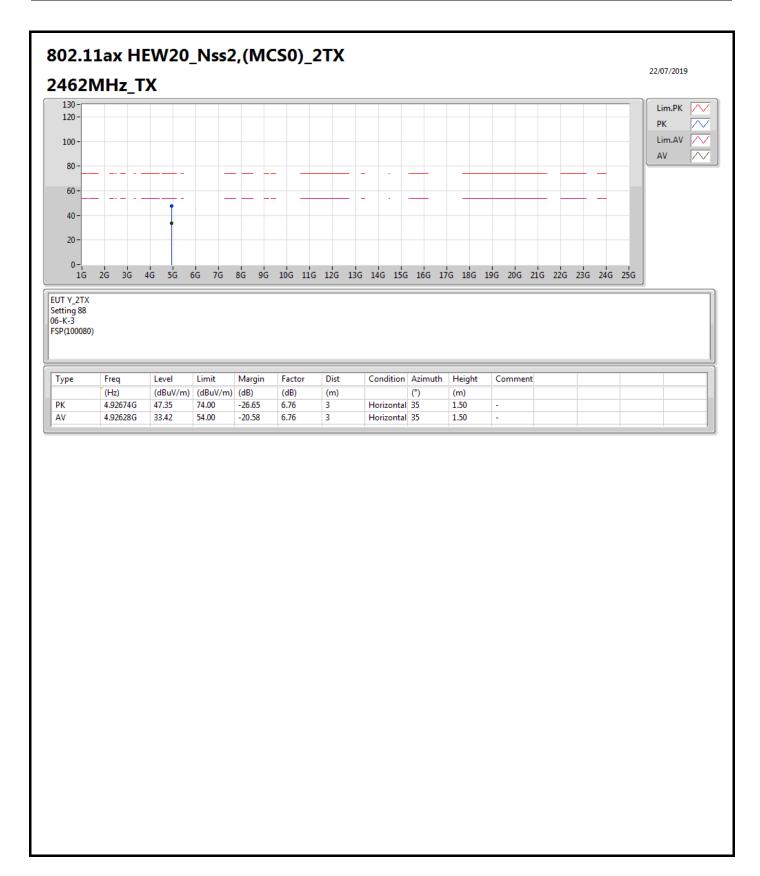




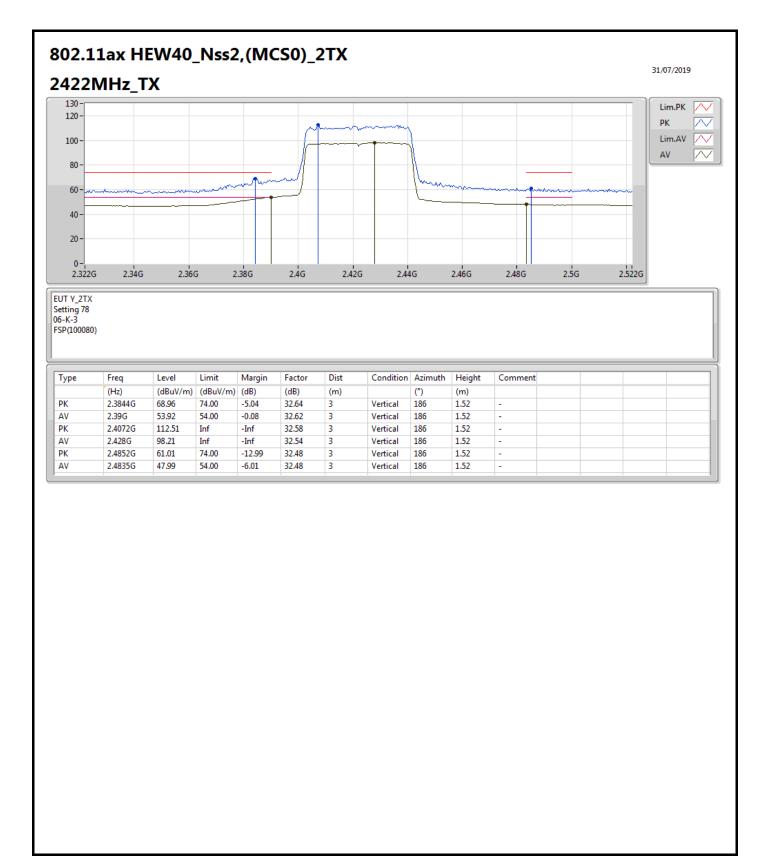




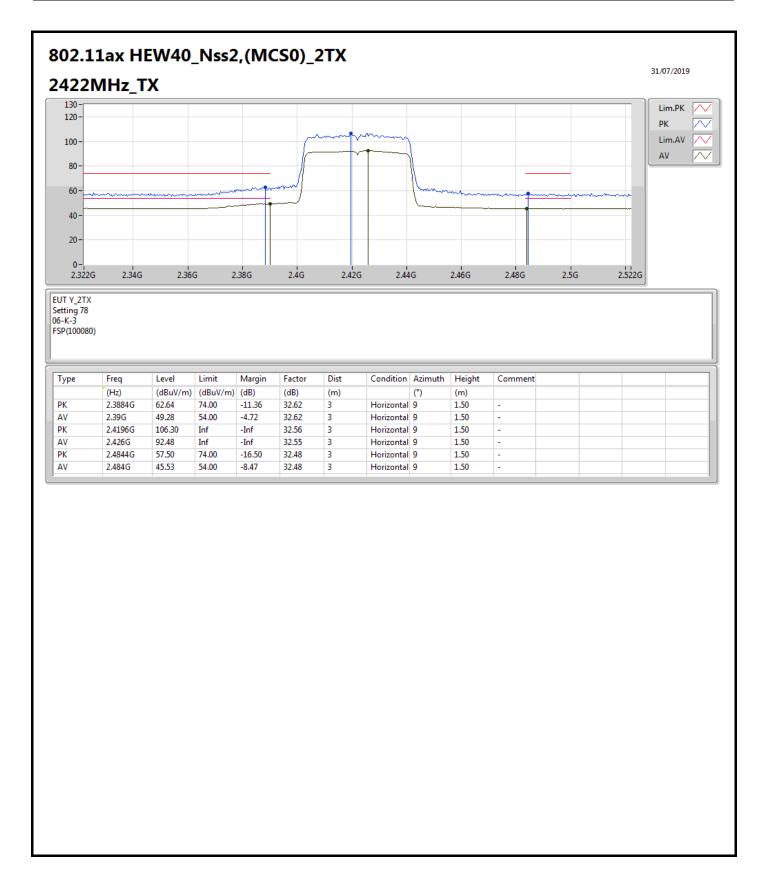




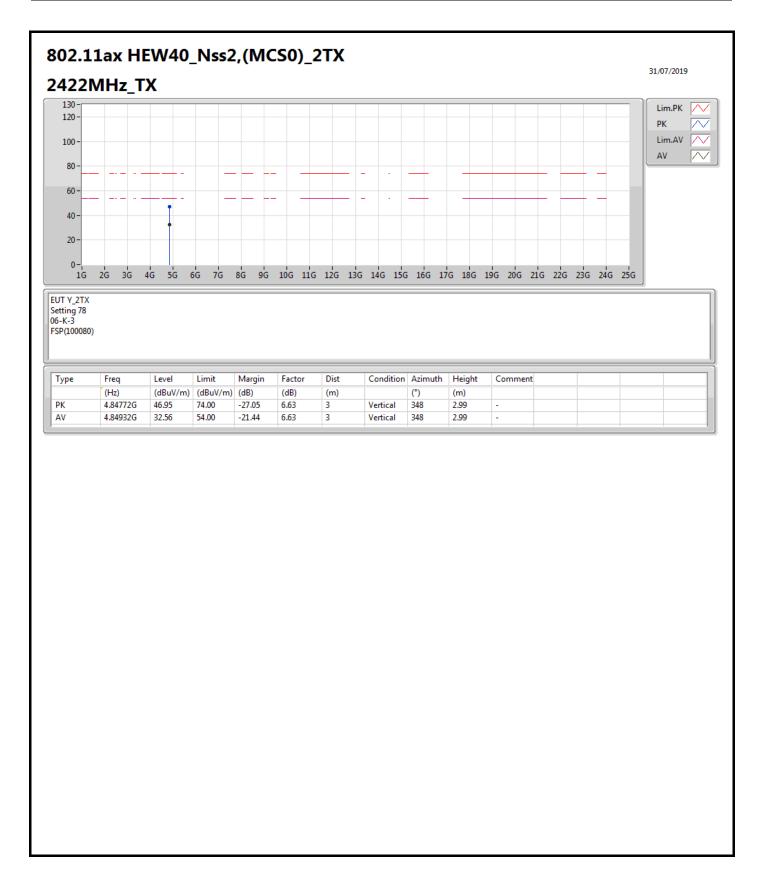




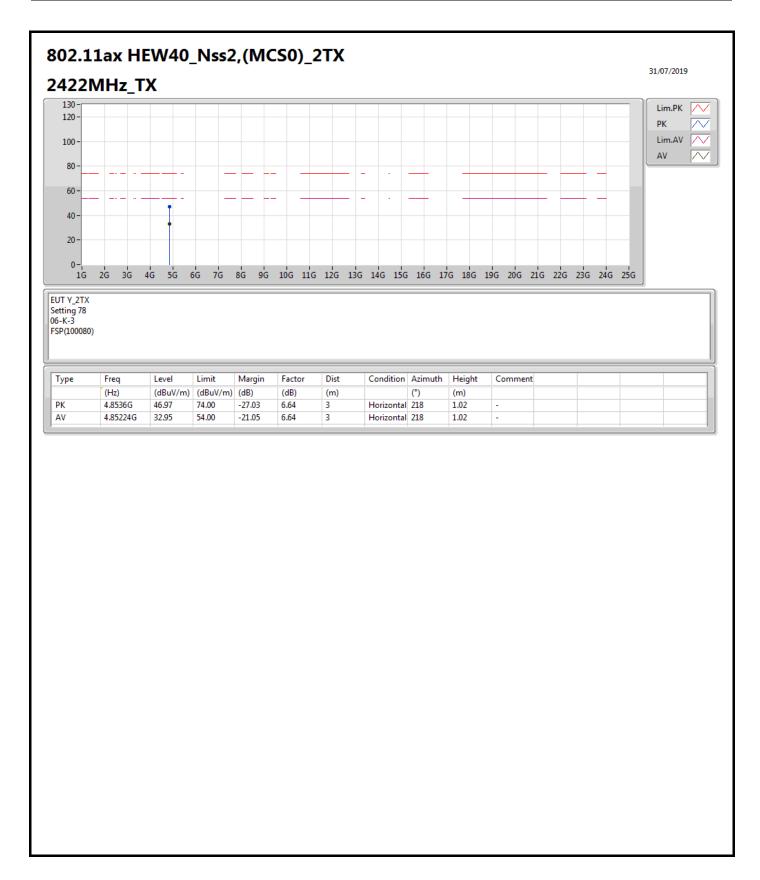




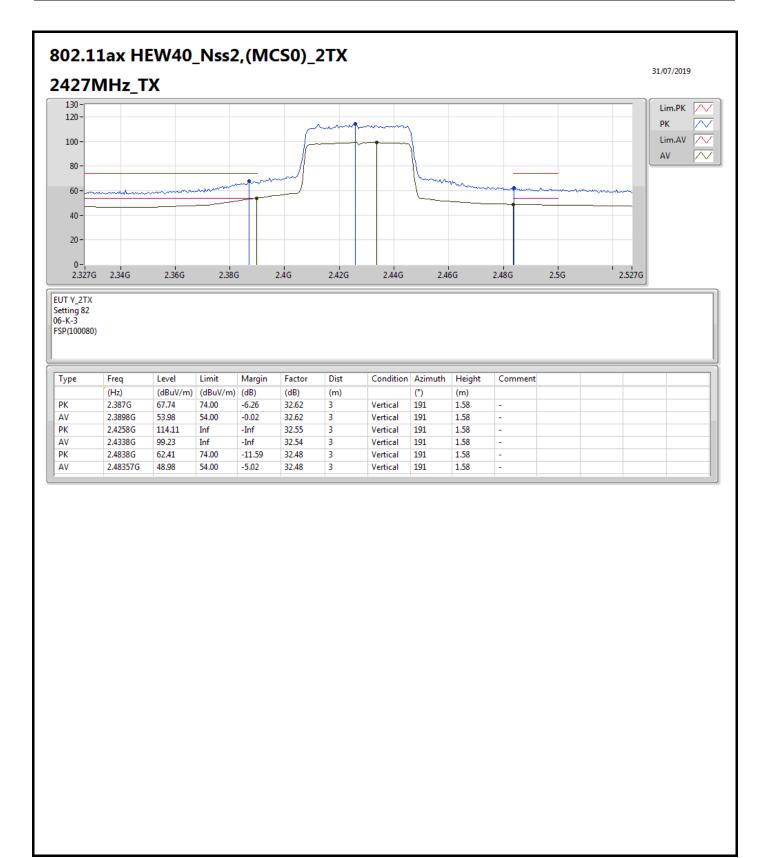




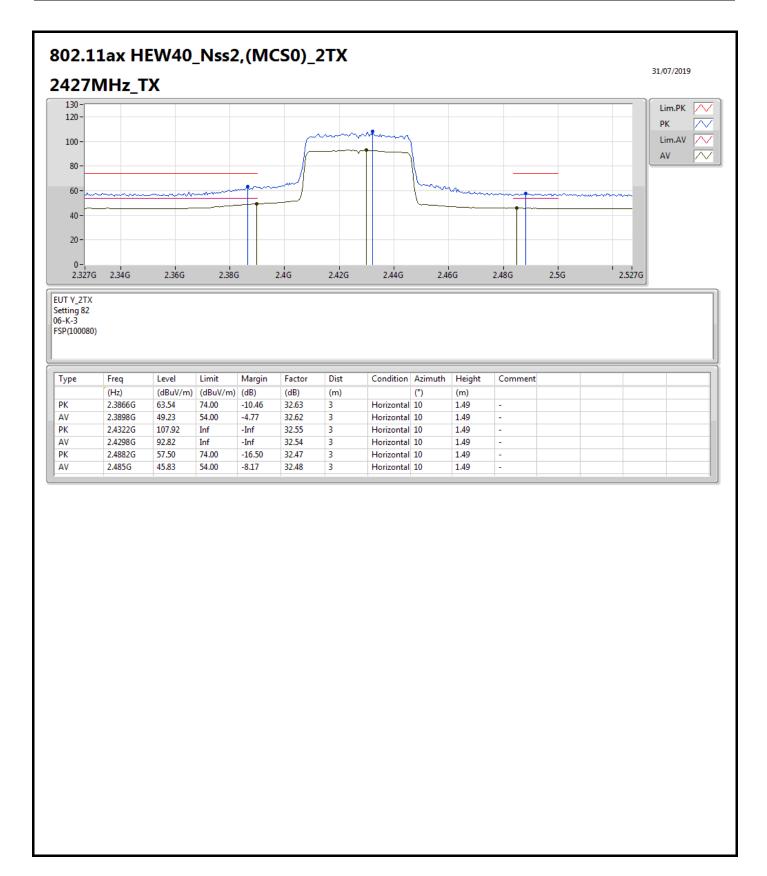




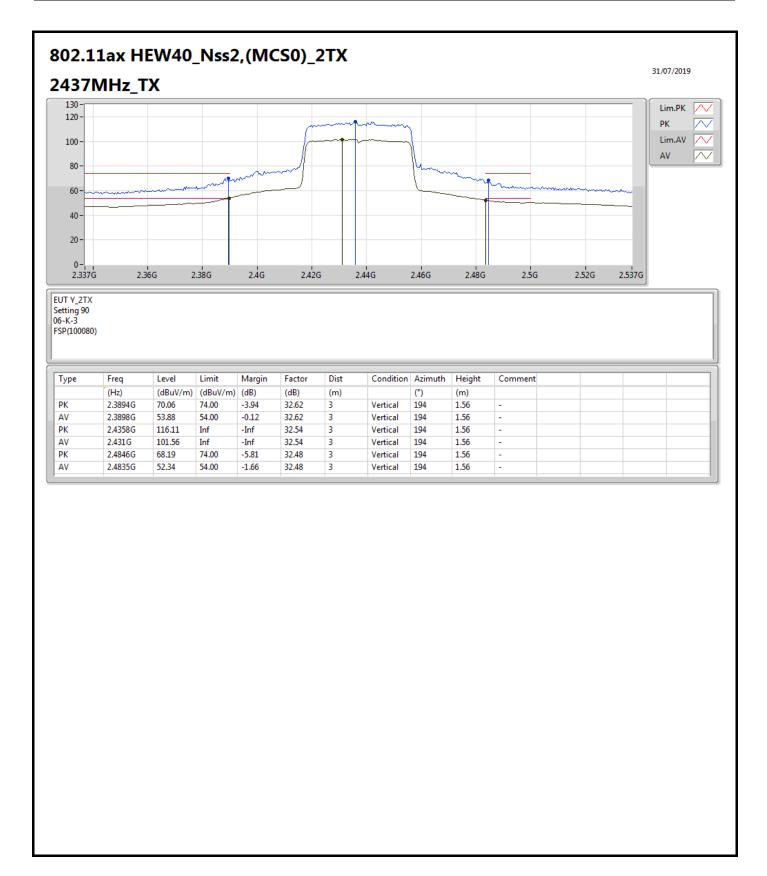




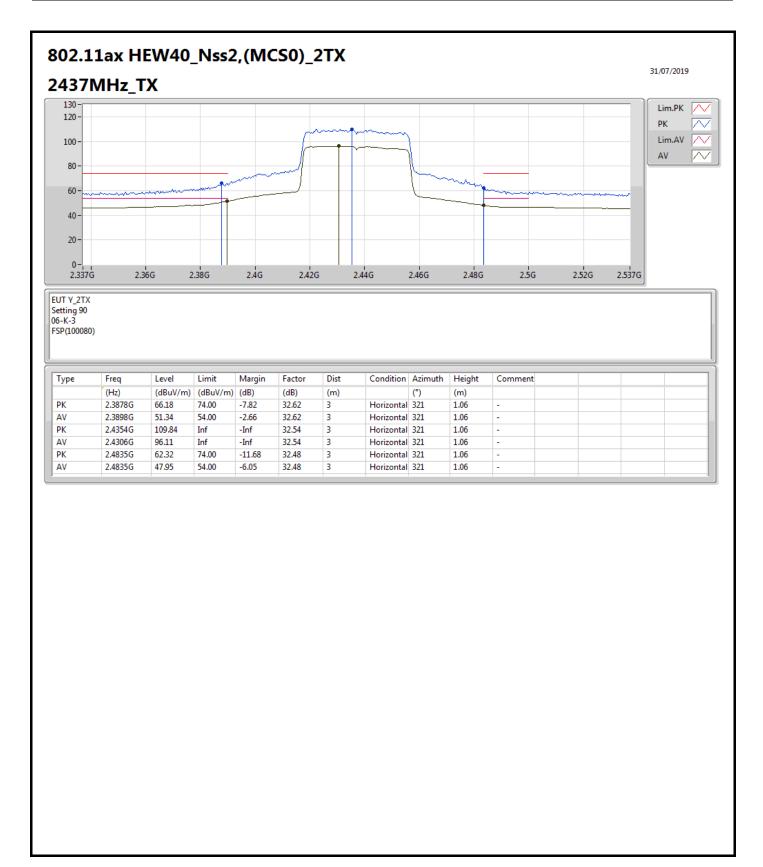




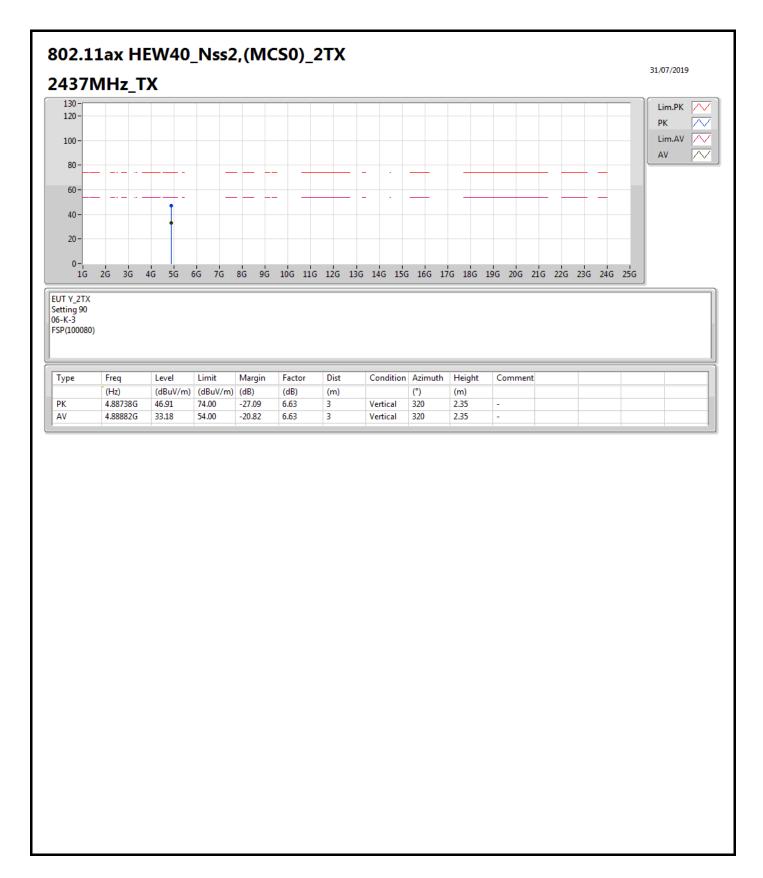




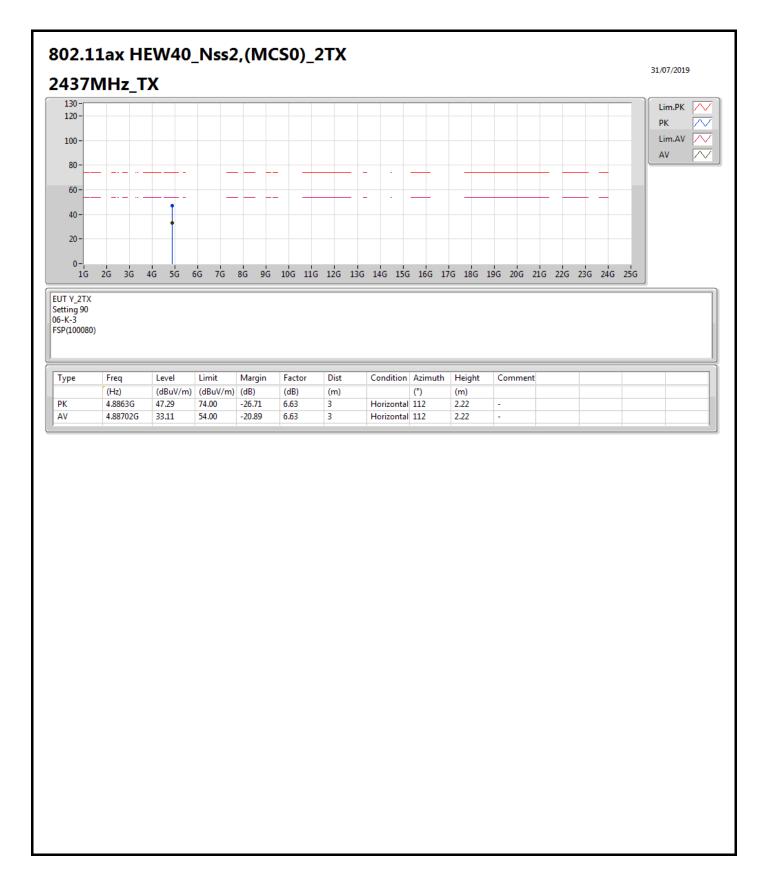








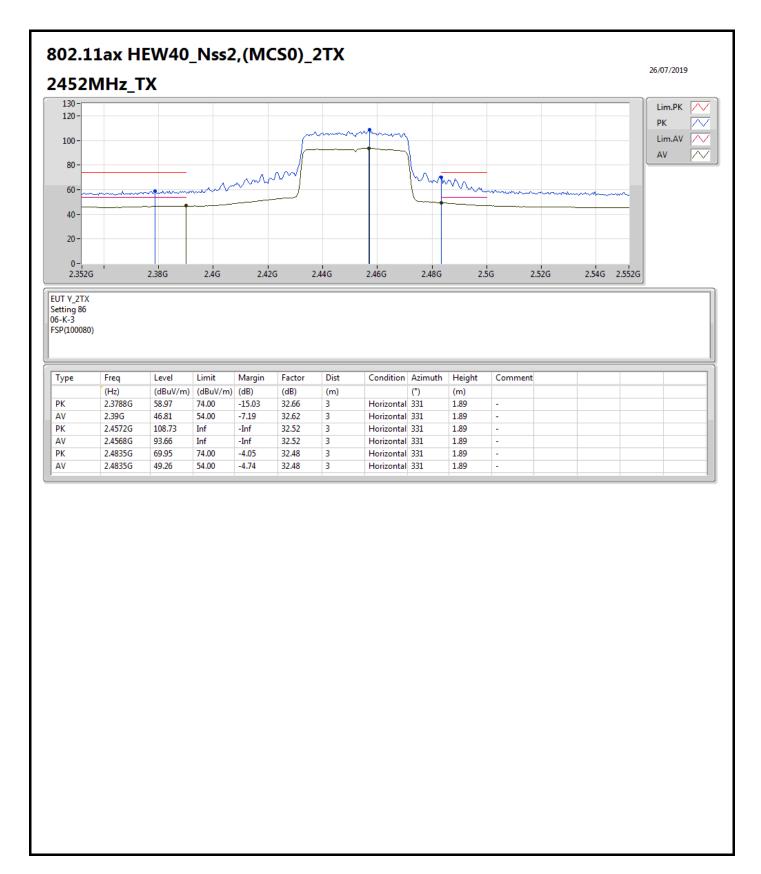




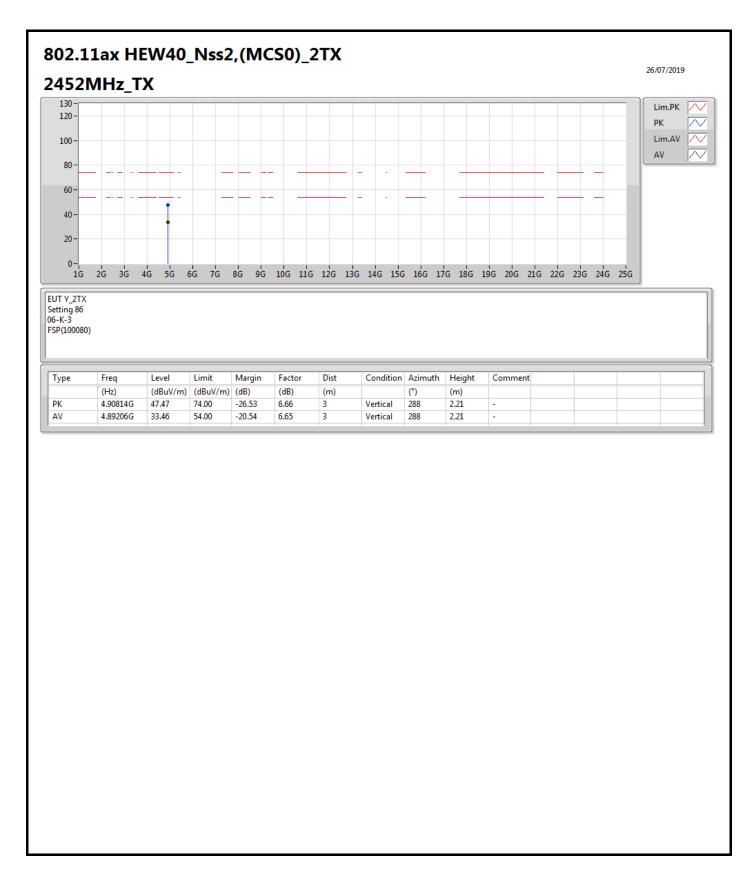




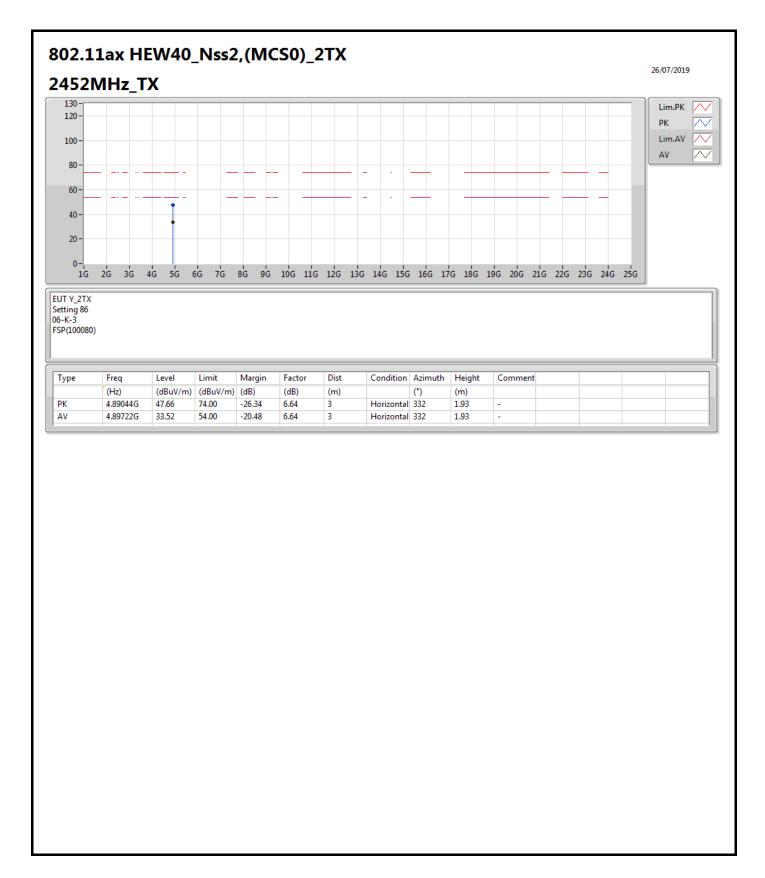






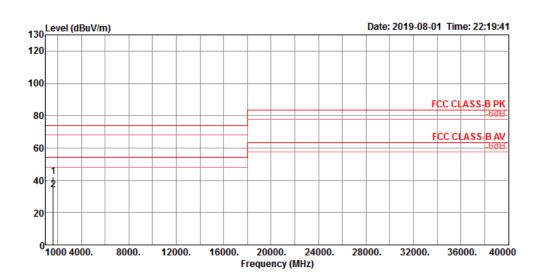








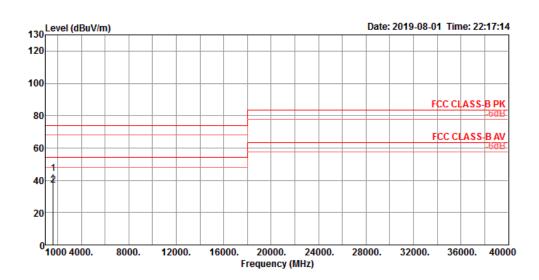
RSE Co-location Result								
Operating Mode	1	Polarization	Horizontal					
Operating Function	Normal Link							



	Freq	Level				CableAntenna Preamp Loss Factor Factor				T/Pos		Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg			
1	1624.92	42.37	74.00	-31.63	50.75	3.22	25.35	36.95	123	163	Peak	HORIZONTAL	
2	1625.00	33.96	54.00	-20.04	42.34	3.22	25.35	36.95	123	163	Average	HORTZONTAL	



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



		Freq	Level						Preamp Factor		T/Pos Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
_	1	1624.90	44.02	74.00	-29.98	52.40	3.22	25.35	36.95	102	196 Peak	VERTICAL
	2	1625.00	37.11	54.00	-16.89	45.49	3.22	25.35	36.95	102	196 Average	VERTICAL