

Report No. : FR7D2029AA

Project No: CB10702186

FCC Test Report

Equipment : AC3000 Tri-Band Wireless Gigabit Dual-WAN VPN

SMB Router

Brand Name : TRENDnet

Model No. : TEW-829DRU

FCC ID : XU8TEW829DRU

Standard : 47 CFR FCC Part 15.247

Operating Band : 2400 MHz - 2483.5 MHz

Function : | Point-to-multipoint; | Point-to-point

Applicant : TRENDnet, Inc.

20675 Manhattan, Place, Torrance, CA, 90501

The product sample received on Dec. 20, 2017 and completely tested on Feb. 09, 2018. We, SPORTON, 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., the test report shall not be reproduced except in full.

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Summary of Test Result

	Conformance Test Specifications								
Report Clause	Ref. Std. Clause	Description	Limit	Result					
1.1.2	15.203	Antenna Requirement	FCC 15.203	Complied					
3.1	15.207	AC Power-line Conducted Emissions	FCC 15.207	Complied					
3.2	15.247(a)	DTS Bandwidth	≥500kHz	Complied					
3.3	15.247(b)	Maximum Conducted Output Power	Power [dBm]:30	Complied					
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]:8	Complied					
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	Non-Restricted Bands: > 30 dBc	Complied					
3.6	15.247(d)	Emissions in Restricted Frequency Bands	Restricted Bands: FCC 15.209	Complied					

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Revision History

Report No.	Version	Description	Issued Date
FR7D2029AA	Rev. 01	Initial issue of report	Feb. 21, 2018

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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)	2412-2462	1-11 [11]
2400-2483.5	n (HT40)	2422-2452	3-9 [7]

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 HT20	20	2TX
2.4-2.4835GHz	802.11n HT20-BF	20	2TX
2.4-2.4835GHz	2.4-2.4835GHz 802.11n HT40		2TX
2.4-2.4835GHz	2.4-2.4835GHz 802.11n HT40-BF		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.
- 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

A :::4	2.4G	5G B1	5G B4	Drand	Madal Name	Antonno Timo	Commonton	Coin (dDi)	
Ant.	Port	Port	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
1	1	-	1	WHA YU	C732-510011-A	Dipole Antenna	Reversed-SMA		
2	2	-	2	WHA YU	C732-510011-A	Dipole Antenna	Reversed-SMA		
3	-	1	-	WHA YU	C732-510011-A	Dipole Antenna	Reversed-SMA	Note1	
4	-	2	-	WHA YU	C732-510011-A	Dipole Antenna	Reversed-SMA		
5	-	3	-	WHA YU	C732-510011-A	Dipole Antenna	Reversed-SMA		
6	-	4	-	WHA YU	C732-510011-A	Dipole Antenna	Reversed-SMA		

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Note 1:

Ant.	2.4G	5G B1	5G B4	C	ain (dB	i)	Cab	ole loss	(dB)	Tru	e Gain (dBi)
Ant.	Port	Port	Port	2.4G	5G B1	5G B4	2.4G	5G B1	5G B4	2.4G	5G B1	5G B4
1	1	-	1	2.9	4.4	4.4	2.5	2.5	2.5	0.4	1.9	1.9
2	2	-	2	2.9	4.4	4.4	2.5	2.5	2.5	0.4	1.9	1.9
3	-	1	-	2.9	4.4	4.4	2.5	2.5	2.5	0.4	1.9	1.9
4	-	2	-	2.9	4.4	4.4	2.5	2.5	2.5	0.4	1.9	1.9
5	-	3	-	2.9	4.4	4.4	2.5	2.5	2.5	0.4	1.9	1.9
6	-	4	-	2.9	4.4	4.4	2.5	2.5	2.5	0.4	1.9	1.9

Note 2: B1=Band 1, B4=Band 4, Connect to reverse SMA to execute the conducted measurement.

Note 3: The EUT has six antennas.

<For 2.4GHz Band / For Radio 1>

For IEEE 802.11b/g/n 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 / For Radio 2>

For IEEE 802.11a/n/ac 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 5GHz Band 4 / For Radio 3>

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

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

Port 1 and Port 2 could transmit/receive simultaneously.

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1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11b	0.992	0.035	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.963	0.164	2.068m	1k
802.11n HT20	0.988	0.052	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11n HT20-BF	0.93	0.315	1.751m	1k
802.11n HT40	0.967	0.146	2.43m	1k
802.11n HT40-BF	0.91	0.41	1.75m	1k

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1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter					
Beamforming Function	\boxtimes	With beamforming function for 802.11n in 2.4GHz/5GHz and 802.11ac in 5GHz.		Without beamforming		
Test Software Version For non-beamforming mode: QRCT Versi For beamforming mode: PUTTY.EXE			sion3	3.0.210.0		

1.1.5 Table for Radio type

Radio No.	function	Chip brand Name
Radio 1	2.4GHz	IPQ4019
Radio 2	5GHz Band 1	QCA9984
Radio 3	5GHz Band 4	IPQ4019

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1.2 Testing Applied 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 v04
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01

1.3 Testing Location Information

	Testing Location									
	HWA YA	ADD	:	o. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.						
		TEL	:	886-3-327-3456 FAX : 886-3-318-0055						
\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	RF Conducted TH01-CB Stim Sung & Brian Sun & Paul Chen & Ron Huang		25°C / 55%	Jan. 05, 2018 ~ Feb. 09, 2018	
Radiated	03CH01-CB	Jay Luo & Zero Chen & Cola Fan & Eason Chen	22°C / 54%	Dec. 29, 2017 ~ Feb. 09, 2018	
AC Conduction	AC Conduction CO01-CB Max L		24°C / 56%	Jan. 03, 2018	

Test site Designation No. TW0006 with FCC.

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74 x10 ⁻⁸	Confidence levels of 95%

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Test site registered number IC 4086D with Industry Canada.



2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11b_Nss1,(1Mbps)_2TX	-
2412MHz	21
2417MHz	21
2422MHz	21.5
2427MHz	21.5
2432MHz	23.5
2437MHz	23.5
2442MHz	23.5
2447MHz	22.5
2452MHz	22.5
2457MHz	22
2462MHz	19.5
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	15
2417MHz	17
2422MHz	18.5
2427MHz	20
2432MHz	21.5
2437MHz	21.5
2442MHz	20.5
2447MHz	20
2452MHz	18
2457MHz	16
2462MHz	14
802.11n HT20_Nss1,(MCS0)_2TX	-
2412MHz	15
2417MHz	17
2422MHz	18.5
2427MHz	19.5
2432MHz	21
2437MHz	21.5
2442MHz	20
2447MHz	19.5
2452MHz	17
2457MHz	16
2462MHz	12.5
802.11n HT40_Nss1,(MCS0)_2TX	-
2422MHz	13.5

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Mode	Power Setting
2427MHz	14
2432MHz	14.5
2437MHz	15
2442MHz	13
2447MHz	12
2452MHz	12
802.11n HT20-BF_Nss1,(MCS0)_2TX	-
2412MHz	16
2417MHz	19
2422MHz	19
2427MHz	21
2432MHz	22.5
2437MHz	22.5
2447MHz	22.5
2452MHz	22.5
2457MHz	20
2462MHz	19
802.11n HT40-BF_Nss1,(MCS0)_2TX	-
2422MHz	16
2427MHz	15
2432MHz	16
2437MHz	18.5
2442MHz	18
2447MHz	17.5
2452MHz	16.5

Note:

• There are two modes of EUT for 802.11n in 2.4GHz/5GHz and 802.11ac in 5GHz. One is beamforming mode, and the other is non-beamforming mode. Both modes have been tested and recorded in this test report.

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2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item	Tests Item AC power-line conducted emissions		
Condition AC power-line conducted measurement for line and neutral			
Operating Mode Normal Link			
1 EUT with Adapter 1			
2	2 EUT with Adapter 2		
Mode 1 generated the worst test result, so it was recorded in this report.			

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		
1	EUT with Adapter 1	

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	Normal Link			
1	EUT with Adapter 1 in Z axis			
2	EUT with Adapter 1 in X axis			
Mode 1 has been evaluate this same test mode.	d to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow			
3	EUT with Adapter 2 in Z axis			
Mode 1 generated the wor	st test result, so it was recorded in this report.			
	CTX			
Operating Mode > 1GHz	The EUT was performed at Z axis and X axis position for Radiated emission above 1GHz test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.			
1	EUT with Adapter 1 in Z axis			

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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			
	Normal Link		
Operating Mode The EUT was performed at Z axis and X axis position for Radiated emission above 1GHz test, and the worst case was found at Z axis. So the measure will follow this same test configuration.			
1	EUT in Z axis - Radio 1 (WLAN 2.4GHz) + Radio 3 (WLAN 5GHz Band 4)		
Refer to Appendix G for Radiated Emission Co-location.			

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The Worst Case Mode for Following Conformance Tests			
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation			
Operating Mode			
EUT in Z axis - Radio 1 (WLAN 2.4GHz) + Radio 2 (WLAN 5GHz Band 1) Radio 3 (WLAN 5GHz Band 4)			
Refer to Sporton Test Report No.: FA7D2029 for Co-location RF Exposure Evaluation.			

Note: The console port can not be used by end user. It is generally used for updating FW by applicant.

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 PUTTY.EXE.
- 3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by RX Device and transmit duty cycle no less than 98%.

For Normal Link:

During the test, the EUT operation to normal function.

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2.4 Accessories

Accessories				
Equipment Name	Brand Name	Model Name	Rating	
Adapter 1	AMIGO	AMS157-1203000FU	Input: 100-240V~50/60Hz, 1A Output: 12V, 3.0A	
Adapter 2	UMEC	UP0361K-12PA	Input: 100-240V~50/60Hz, 1A MAX Output: +12V, 3A, 36W MAX	
		Other		
Bracket *2				
Console cable*1, Non-Shielded, 1.5m				
RJ-45 cable*1, Non-Shielded, 1.5m				

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Note1: The power adapter does not affect the test result of RF tests, so DTS Bandwidth, Maximum Conducted Output Power, Power Spectral Density, Emissions in Non-restricted Frequency Bands and Radiated measurement above 1GHz only test adapter 1 and recorded in this report.

Note2: All adapters test for AC power-line conducted emissions and Radiated measurement below 1GHz.

2.5 Support Equipment

For Test Site No: CO01-CB

Support Equipment					
No. Equipment Brand Name Model Name FCC ID					
1	NB*6	DELL	E6430	DoC	
2	Flash disk3.0	Transcend	JetFlash-700	DoC	

For Test Site No: 03CH01-CB (below 1GHz)

Support Equipment						
No.	No. Equipment Brand Name Model Name FCC ID					
1	NB*4	DELL	E4300	DoC		
2	NB*2	Apple	Mac Book	DoC		
3	Flash disk3.0	Transcend	JetFlash-700	DoC		

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For Test Site No: 03CH01-CB (above 1GHz)

For non-beamforming mode

Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID				
1	NB	DELL	E4300	DoC	

For beamforming mode

Support Equipment					
No.	Equipment	Brand Name	Model Name	FCC ID	
1	NB*2	DELL	E4300	DoC	
2	RX Device	TRENDnet	WRT-C92Q	N/A	

For Test Site No: TH01-CB

	Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID	
1	NB	DELL	E4300	DoC	

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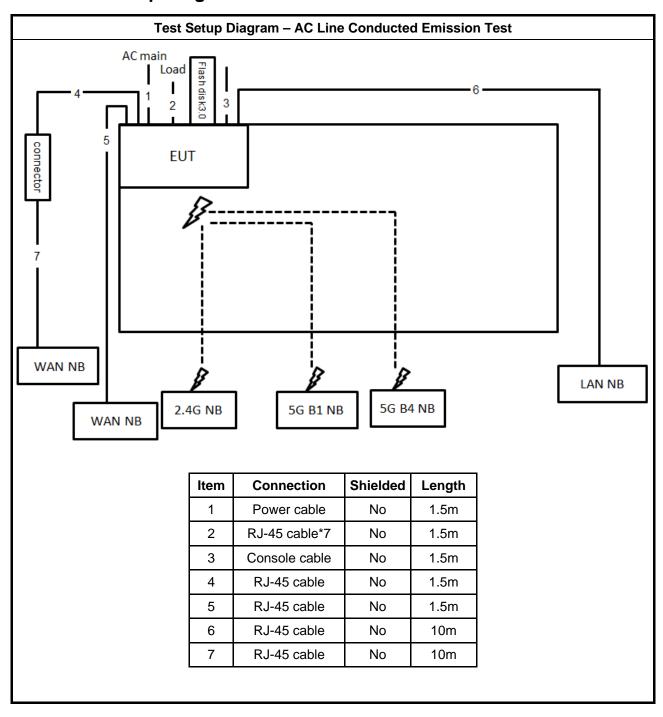
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2.6 Test Setup Diagram



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Test Setup Diagram - Radiated Test < 1GHz AC MAIN Load Flash disk 3.0 EUT Ø LAN NB WANNB WANNB 2.4G NB 5G NB 5G NB Item Connection **Shielded** Length Power cable 1 No 1.5m 2 RJ-45 cable No 10m 3 RJ-45 cable No 10m RJ-45 cable 4 No 10m RJ-45 cable*7 No 1.5m 5

RJ-45 cable

Console cable

No

No

1.5m

1.5m

6

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Test Setup Diagram - Radiated Test > 1GHz / For non-beamforming mode AC MAIN EUT LAN NB

Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.5m

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Test Setup Diagram - Radiated Test > 1GHz / For beamforming mode AC MAIN EUT Device NB **RX Device** LAN NB Item Connection Shielded Length RJ-45 cable 10m No 2 Power cable No 1.5m

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3

RJ-45 cable

No

10m

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3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

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3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

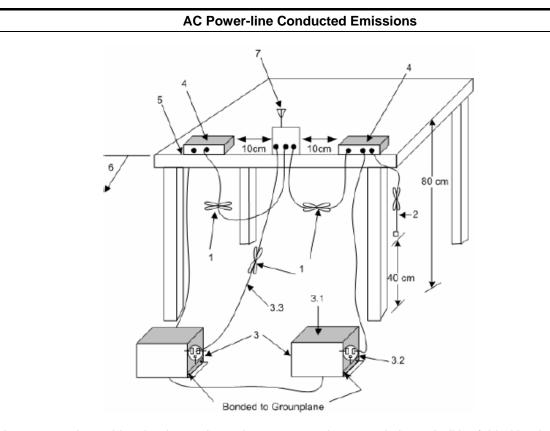
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3.1.4 Test Setup



- 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.
- 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.			

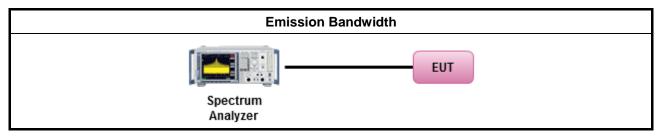
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

	Test Method			
•	For the emission bandwidth shall be measured using one of the options below:			
	Refer as FCC KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.			
	Refer as FCC KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.			
	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.			

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit

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

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

3.3.2 Measuring Instruments

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

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3.3.3 Test Procedures

	Test Method
•	Maximum Peak Conducted Output Power
	Refer as FCC KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
	☐ Refer as FCC KDB 558074, clause 9.1.2 Option 2 (peak power meter for VBW ≥ DTS BW)
•	Maximum Conducted Output Power
	[duty cycle ≥ 98% or external video / power trigger]
	Refer as FCC KDB 558074, clause 9.2.2.2 Method AVGSA-1 (spectral trace averaging).
	Refer as FCC KDB 558074, clause 9.2.2.3 Method AVGSA-1 Alt. (slow sweep speed)
	duty cycle < 98% and average over on/off periods with duty factor
	Refer as FCC KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	Refer as FCC KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	Refer as FCC KDB 558074, clause 9.2.3 Method AVGPM-G (using an RF average power meter).
	Refer as FCC KDB 558074, clause 9.1.2 PKPM1 Peak power meter method.
•	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 + + P _n (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP _{total} = P _{total} + DG

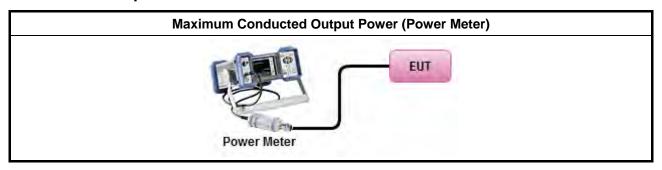
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3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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3.4 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
•	outputhe or conduction	power spectral density procedures that the same method as used to determine the conducted at power. If maximum peak conducted output power was measured to demonstrate compliance to utput power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum ucted output power was measured to demonstrate compliance to the output power limit, then one a average PSD procedures shall be used, as applicable based on the following criteria (the peak procedure is also an acceptable option).
	\boxtimes	Refer as FCC KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).
	[duty	cycle ≥ 98% or external video / power trigger]
		Refer as FCC KDB 558074, clause 10.3 Method AVGPSD-1 (spectral trace averaging).
		Refer as FCC KDB 558074, clause 10.4 Method AVGPSD-2 (slow sweep speed)
	duty	cycle < 98% and average over on/off periods with duty factor
		Refer as FCC KDB 558074, clause 10.5 Method AVGPSD-1 Alt (spectral trace averaging).
		Refer as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)
•	For c	onducted 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

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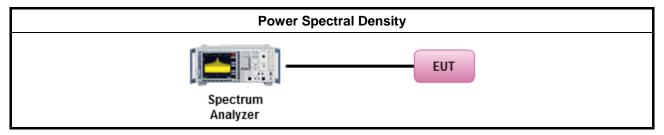
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3.4.4 **Test Setup**



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 (dB)	
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.

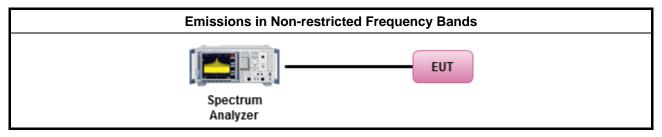
3.5.2 Measuring Instruments

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 11 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		

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

3.6.2 Measuring Instruments

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

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3.6.3 Test Procedures

Test Method									
•	The	average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].							
•		er as ANSI C63.10, clause 6.9.2.2 band-edge testing shall be performed at the lowest frequency and highest frequency channel within the allowed operating band.							
•	For t	he transmitter unwanted emissions shall be measured using following options below:							
	•	Refer as FCC KDB 558074, clause 12 for unwanted emissions into restricted bands.							
		☐ Refer as FCC KDB 558074, clause 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)							
		Refer as FCC KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).							
		Refer as FCC KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).							
		☐ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.							
		Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.							
		Refer as FCC KDB 558074, clause 12.2.4 measurement procedure peak limit.							
•	For t	he transmitter band-edge emissions shall be measured using following options below:							
_	 Refer as FCC KDB 558074 clause 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 13.2 (ANSI C63.10, clause 6.9.3) for marker-delta method for band-edge measurements.							
	•	Refer as FCC KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).							
•	For	conducted and cabinet radiation measurement, refer as FCC KDB 558074, clause 12.2.2.							
	•	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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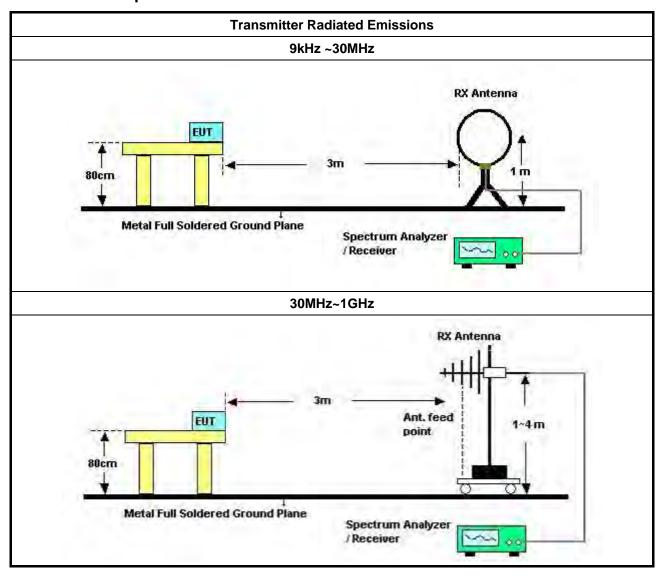
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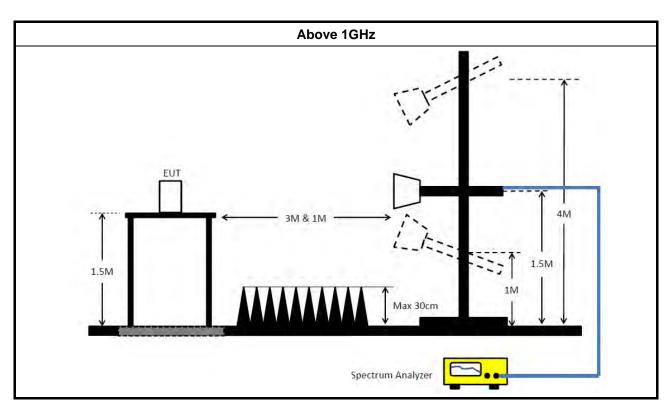


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Test Setup 3.6.4



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3.6.5 Transmitter Radiated Unwanted Emissions (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.

3.6.6 Test Result of Transmitter Radiated Unwanted Emissions

Refer as Appendix F

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4 Test Equipment and Calibration Data

Instrument	ment Manufacturer Model No. Serial		Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 23, 2017	Jan. 22, 2018	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50- 16-2	04083	150kHz ~ 100MHz	Dec. 20, 2017	Dec. 19, 2018	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 29, 2017	Dec. 28, 2018	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 23, 2017	May 22, 2018	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2017	Aug. 29, 2018	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Mar. 15, 2018*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 20, 2017	Nov. 19, 2018	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 05, 2017	Jul. 04, 2018	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2017	May 01, 2018	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Jan. 15, 2018	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 09, 2018	Jan. 08, 2019	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35- HG	1864479	18GHz ~ 40GHz	Jul. 10, 2017	Jul. 09, 2018	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 23, 2017	Nov. 22, 2018	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 06, 2017	May 05, 2018	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Cable-high Woken High Cable-16+17 N/A		1 GHz ~ 18 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)	
RF Cable-high	ole-high Woken High Cable-40G#1 N/A		N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 11, 2017	Oct. 10, 2018	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 21, 2017	Dec. 20, 2018	Conducted (TH01-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-06	1 GHz – 26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 11, 2017	Oct. 10, 2018	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 20, 2017	Nov. 19, 2018	Conducted (TH01-CB)

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

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

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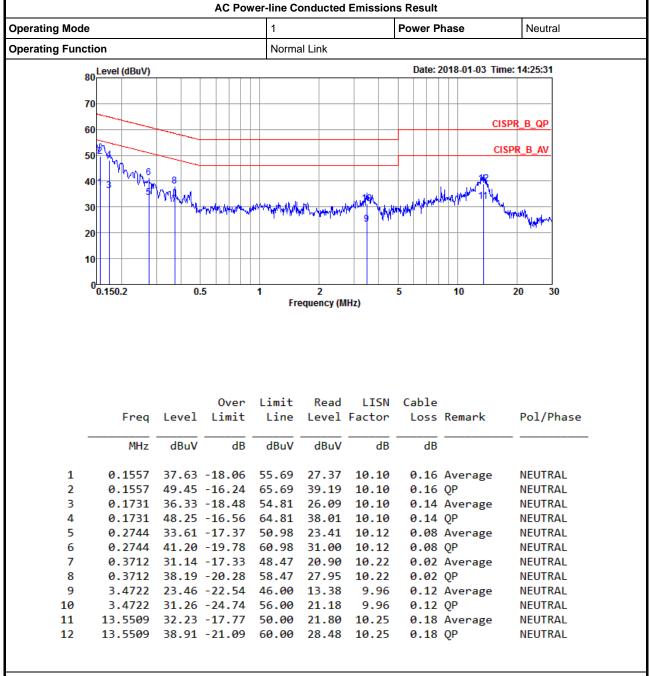
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[&]quot;*" Calibration Interval of instruments listed above is two years.

AC Power-line Conducted Emissions Result

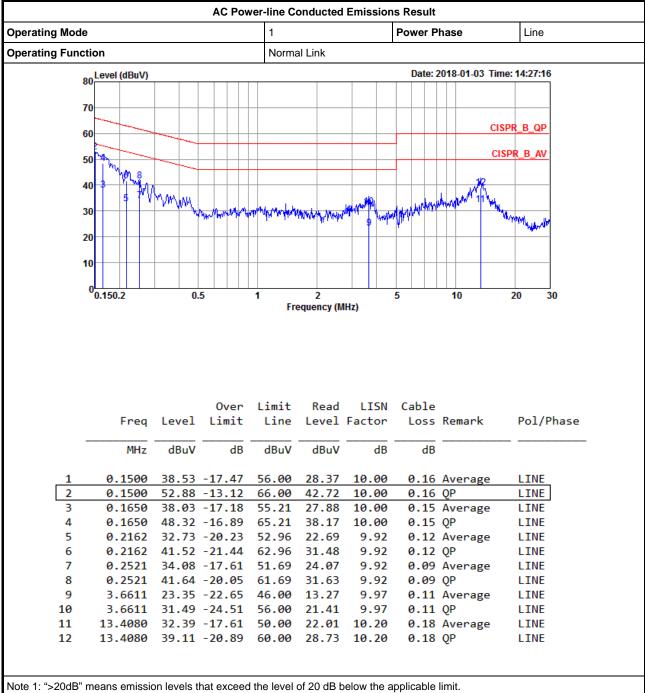


Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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

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AC Power-line Conducted Emissions Result



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

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EBW Result Appendix B

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
2.4-2.4835GHz	-	-	-	-	-
802.11b_Nss1,(1Mbps)_2TX	9.125M	15.517M	15M5G1D	7.55M	13.118M
802.11g_Nss1,(6Mbps)_2TX	16.35M	19.14M	19M1D1D	15.925M	16.417M
802.11n HT20_Nss1,(MCS0)_2TX	17.6M	19.915M	19M9D1D	17.175M	17.591M
802.11n HT40_Nss1,(MCS0)_2TX	35.3M	36.032M	36M0D1D	33.75M	35.882M
802.11n HT20-BF_Nss1,(MCS0)_2TX	17.4M	17.666M	17M7D1D	16.85M	17.616M
802.11n HT40-BF_Nss1,(MCS0)_2TX	35.55M	36.032M	36M0D1D	30.05M	35.932M

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

Result	ı			1	1	<u> </u>
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	8.55M	13.643M	7.55M	13.468M
2437MHz	Pass	500k	9.125M	15.517M	9.1M	15.092M
2462MHz	Pass	500k	8.525M	13.518M	8.05M	13.118M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.3M	16.417M	16.3M	16.417M
2437MHz	Pass	500k	16.275M	19.14M	15.925M	17.566M
2462MHz	Pass	500k	16.325M	16.417M	16.35M	16.417M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	17.55M	17.616M	17.6M	17.591M
2437MHz	Pass	500k	17.55M	19.915M	17.175M	18.391M
2462MHz	Pass	500k	17.55M	17.591M	17.575M	17.591M
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	35M	35.982M	35.25M	35.932M
2437MHz	Pass	500k	33.85M	36.032M	35.25M	35.932M
2452MHz	Pass	500k	35.3M	35.882M	33.75M	35.932M
802.11n HT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	16.85M	17.616M	17.275M	17.616M
2437MHz	Pass	500k	17.4M	17.641M	17.375M	17.666M
2462MHz	Pass	500k	16.95M	17.616M	17.25M	17.616M
802.11n HT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	30.05M	35.932M	34.45M	36.032M
2437MHz	Pass	500k	35.55M	35.982M	33.9M	36.032M
2452MHz	Pass	500k	34.2M	35.932M	35.2M	35.932M

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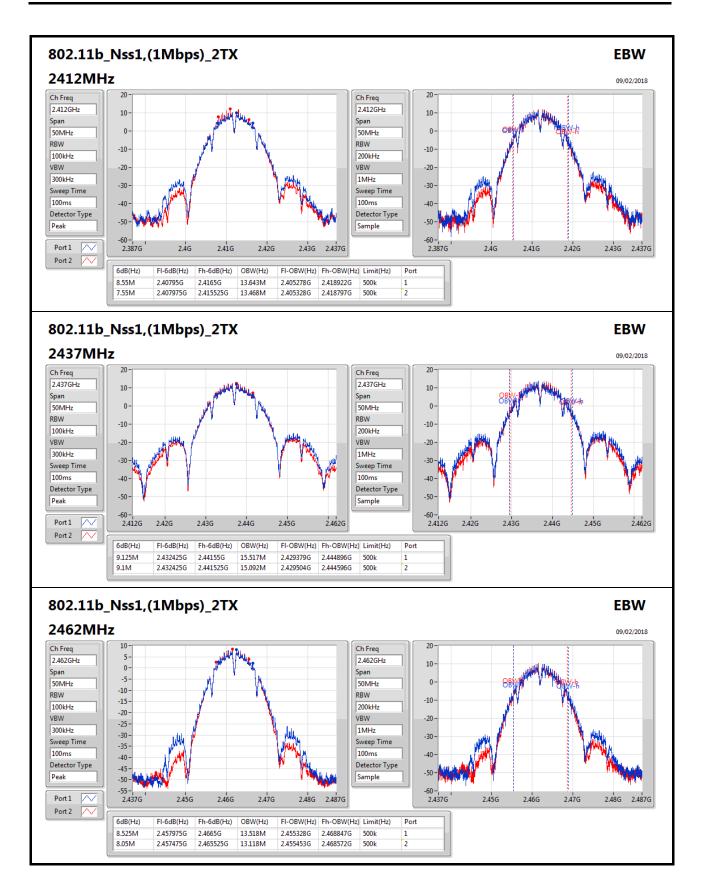
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Port X-N dB = Port X 6dB down bandwidth; Port X-OBW = Port X 99% occupied bandwidth;

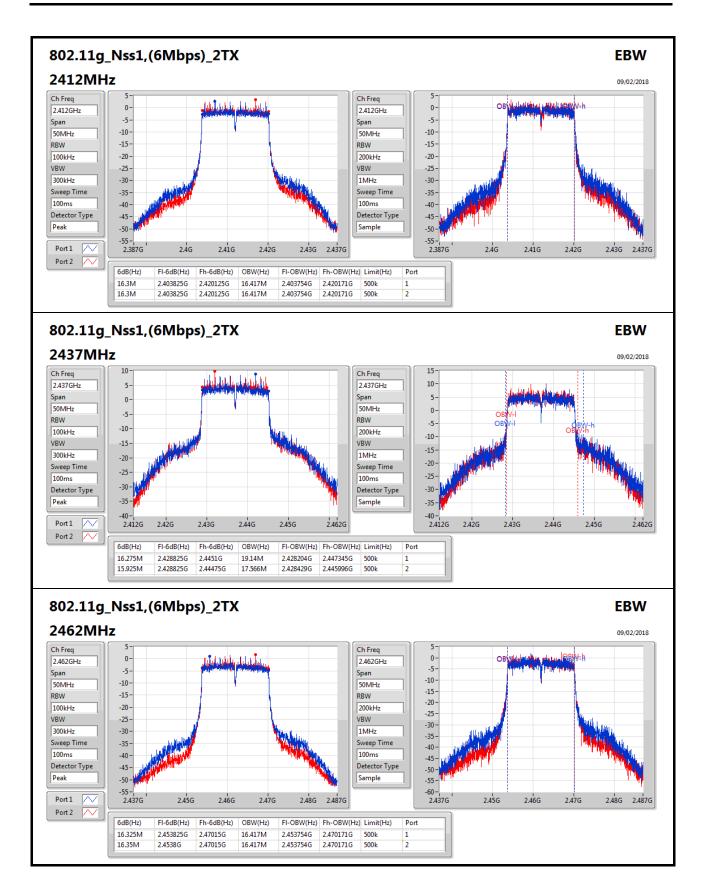
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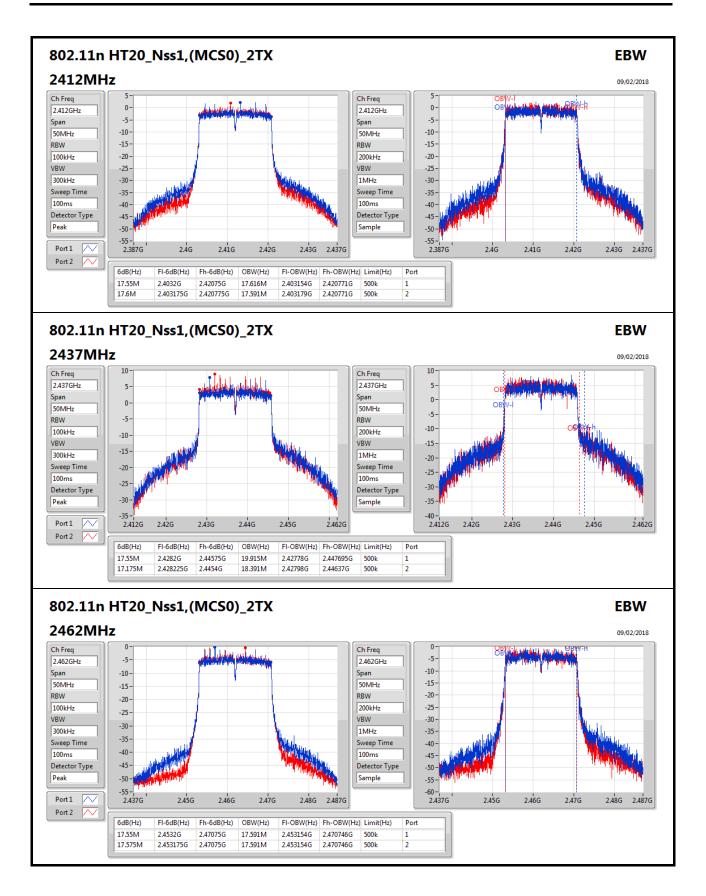




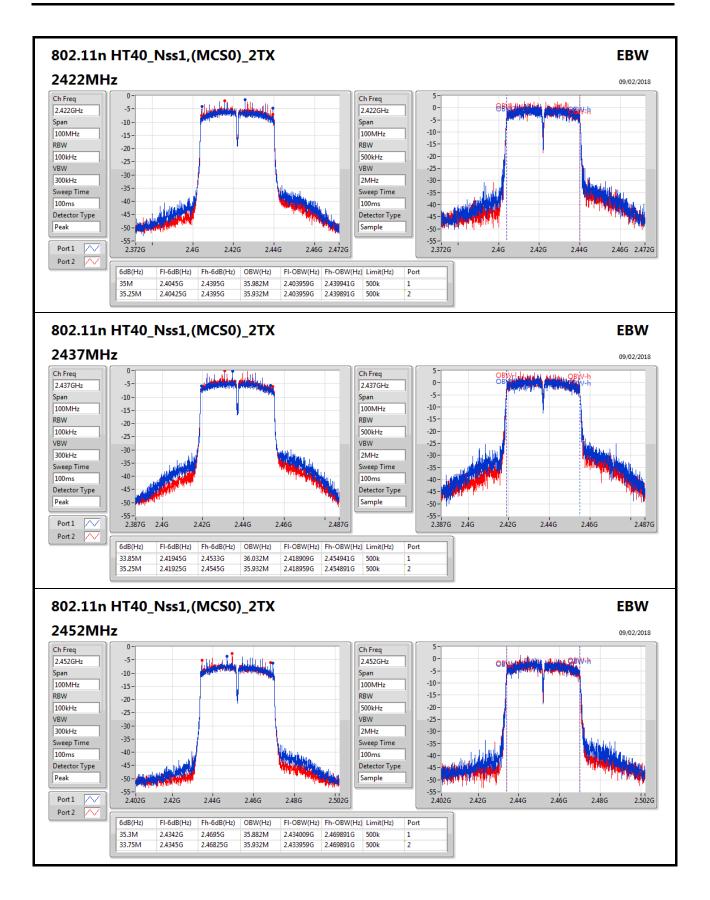




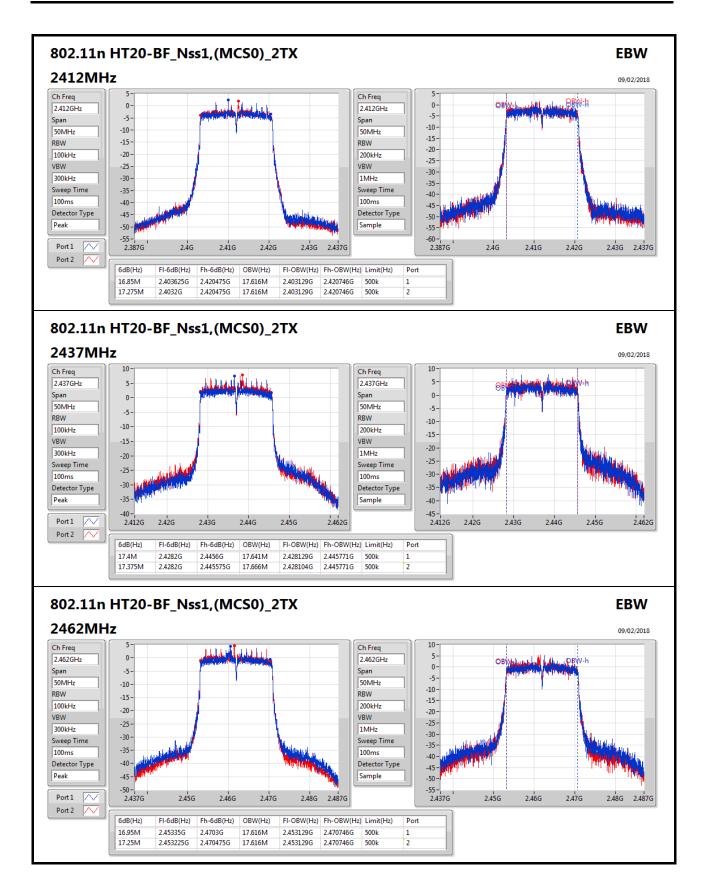




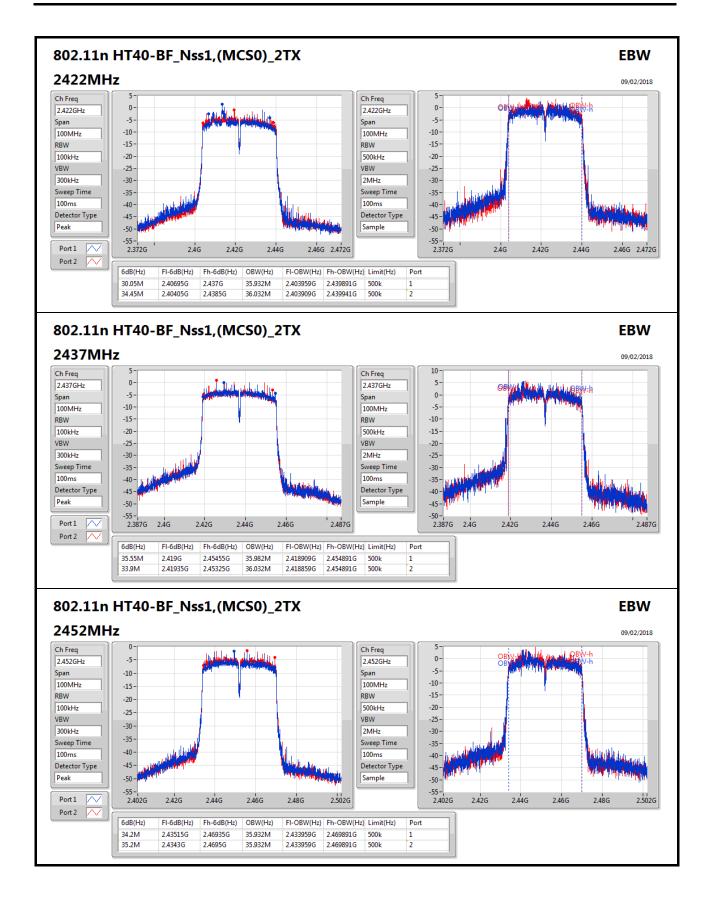














AV Power Result Appendix C

Summary

Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	25.49	0.35400
802.11g_Nss1,(6Mbps)_2TX	23.37	0.21727
802.11n HT20_Nss1,(MCS0)_2TX	23.38	0.21777
802.11n HT40_Nss1,(MCS0)_2TX	17.81	0.06039
802.11n HT20-BF_Nss1,(MCS0)_2TX	21.51	0.14158
802.11n HT40-BF_Nss1,(MCS0)_2TX	18.07	0.06412

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit	
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	
2412MHz	Pass	2.90	19.91	20.39	23.17	30.00	
2417MHz	Pass	2.90	20.01	20.33	23.18	30.00	
2422MHz	Pass	2.90	20.37	20.51	23.45	30.00	
2427MHz	Pass	2.90	20.25	20.74	23.51	30.00	
2432MHz	Pass	2.90	22.22	22.72	25.49	30.00	
2437MHz	Pass	2.90	22.05	22.70	25.40	30.00	
2442MHz	Pass	2.90	22.15	22.60	25.39	30.00	
2447MHz	Pass	2.90	21.17	21.55	24.37	30.00	
2452MHz	Pass	2.90	21.30	21.46	24.39	30.00	
2457MHz	Pass	2.90	20.75	21.13	23.95	30.00	
2462MHz	Pass	2.90	18.32	18.60	21.47	30.00	
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	
2412MHz	Pass	2.90	14.53	14.96	17.76	30.00	
2417MHz	Pass	2.90	16.52	16.84	19.69	30.00	
2422MHz	Pass	2.90	17.60	18.19	20.92	30.00	
2427MHz	Pass	2.90	18.89	19.55	22.24	30.00	
2432MHz	Pass	2.90	20.11	20.60	23.37	30.00	
2437MHz	Pass	2.90	20.02 20.55		23.30	30.00	
2442MHz	Pass	2.90	19.38	19.68	22.54	30.00	
2447MHz	Pass	2.90	18.78	18.96	21.88	30.00	
2452MHz	Pass	2.90	17.03	17.52	20.29	30.00	
2457MHz	Pass	2.90	15.28	15.72	18.52	30.00	
2462MHz	Pass	2.90	12.74	13.84	16.34	30.00	
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
2412MHz	Pass	2.90	14.61	15.02	17.83	30.00	
2417MHz	Pass	2.90	16.58	16.95	19.78	30.00	
2422MHz	Pass	2.90	17.72	18.31	21.04	30.00	
2427MHz	Pass	2.90	18.56	19.16	21.88	30.00	
2432MHz	Pass	2.90	19.77	20.11	22.95	30.00	
2437MHz	Pass	2.90	20.03	20.68	23.38	30.00	
2442MHz	Pass	2.90	18.80	19.30	22.07	30.00	
2447MHz	Pass	2.90	18.46	18.80	21.64	30.00	
2452MHz	Pass	2.90	16.31	16.64	19.49	30.00	

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AV Power Result Appendix C

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
2457MHz	Pass	2.90	15.33	15.81	18.59	30.00
2462MHz	Pass	2.90	12.13	12.04	15.10	30.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	2.90	13.18	13.62	16.42	30.00
2427MHz	Pass	2.90	13.75	14.14	16.96	30.00
2432MHz	Pass	2.90	14.22	14.58	17.41	30.00
2437MHz	Pass	2.90	14.56	15.03	17.81	30.00
2442MHz	Pass	2.90	12.71	13.02	15.88	30.00
2447MHz	Pass	2.90	11.67	11.89	14.79	30.00
2452MHz	Pass	2.90	11.79	11.81	14.81	30.00
802.11n HT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.91	12.61	12.94	15.79	30.00
2417MHz	Pass	5.91	15.68	16.16	18.94	30.00
2422MHz	Pass	5.91	15.57	16.15	18.88	30.00
2427MHz	Pass	5.91	17.61	18.09	20.87	30.00
2432MHz	Pass	5.91	18.31	18.68	21.51	30.00
2437MHz	Pass	5.91	18.16	18.43	21.31	30.00
2447MHz	Pass	5.91	18.26	18.57	21.43	30.00
2452MHz	Pass	5.91	18.25	18.49	21.38	30.00
2457MHz	Pass	5.91	16.29	16.78	19.55	30.00
2462MHz	Pass	5.91	15.52	15.83	18.69	30.00
802.11n HT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	5.91	12.82	13.63	16.25	30.00
2427MHz	Pass	5.91	11.73	11.97	14.86	30.00
2432MHz	Pass	5.91	12.79	13.45	16.14	30.00
2437MHz	Pass	5.91	14.81	15.29	18.07	30.00
2442MHz	Pass	5.91	14.73	15.18	17.97	30.00
2447MHz	Pass	5.91	13.73	13.82	16.79	30.00
2452MHz	Pass	5.91	12.748	13.71	16.27	30.00

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

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PSD Result Appendix D

Summary

Mode	PD
	(dBm/RBW)
2.4-2.4835GHz	-
802.11b_Nss1,(1Mbps)_2TX	-4.08
802.11g_Nss1,(6Mbps)_2TX	-6.08
802.11n HT20_Nss1,(MCS0)_2TX	-5.18
802.11n HT40_Nss1,(MCS0)_2TX	-12.33
802.11n HT20-BF_Nss1,(MCS0)_2TX	-4.84
802.11n HT40-BF_Nss1,(MCS0)_2TX	-8.48

RBW=3kHz.

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	5.91	-8.67	-8.89	-5.79	8.00
2437MHz	Pass	5.91	-7.38	-6.02	-4.08	8.00
2462MHz	Pass	5.91	-10.34	-10.73	-7.86	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.91	-13.85	-13.34	-11.36	8.00
2437MHz	Pass	5.91	-8.40	-7.77	-6.08	8.00
2462MHz	Pass	5.91	-15.24	-13.83	-12.91	8.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.91	-14.05	-13.02	-11.19	8.00
2437MHz	Pass	5.91	-8.47	-6.22	-5.18	8.00
2462MHz	Pass	5.91	-16.53	-16.28	-13.56	8.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	5.91	-16.15	-16.28	-13.88	8.00
2437MHz	Pass	5.91	-14.97	-14.58	-12.33	8.00
2452MHz	Pass	5.91	-17.90	-19.23	-15.77	8.00
802.11n HT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	5.91	-12.57	-13.26	-11.49	8.00
2437MHz	Pass	5.91	-6.05	-6.26	-4.84	8.00
2462MHz	Pass	5.91	-9.93	-10.84	-8.76	8.00
802.11n HT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	5.91	-13.82	-14.32	-12.93	8.00
2437MHz	Pass	5.91	-11.30	-10.79	-10.29	8.00
2452MHz	Pass	5.91	-15.89	-8.73	-8.48	8.00

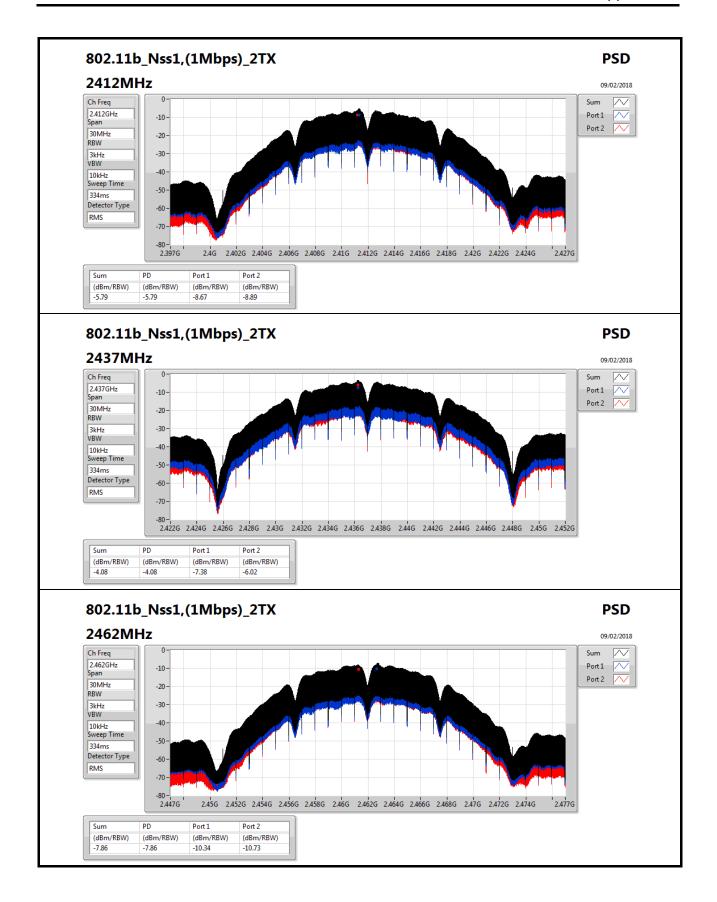
DG = Directional Gain; RBW=3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

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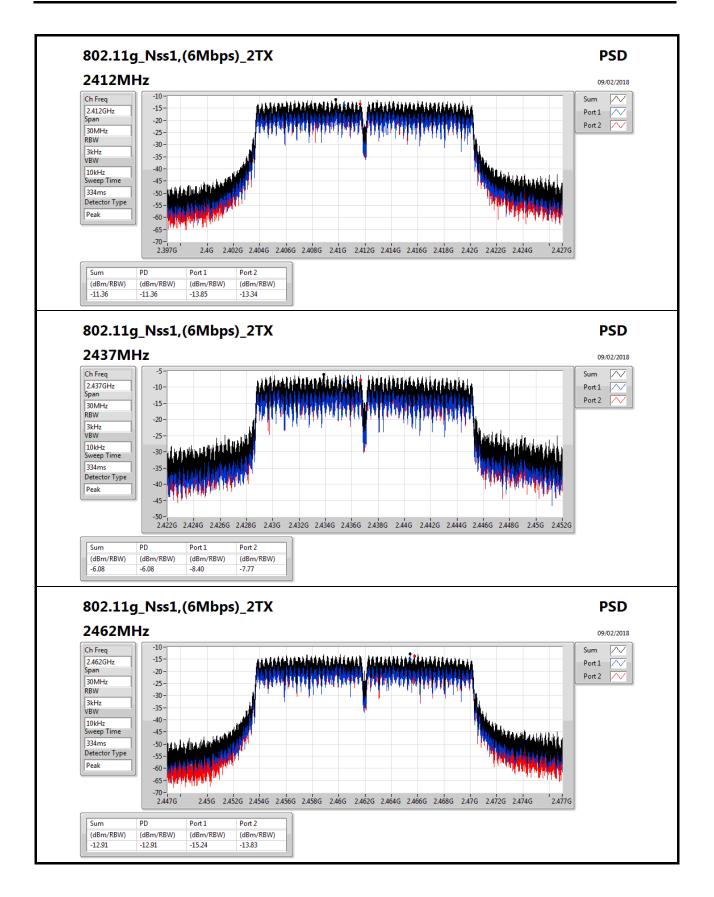
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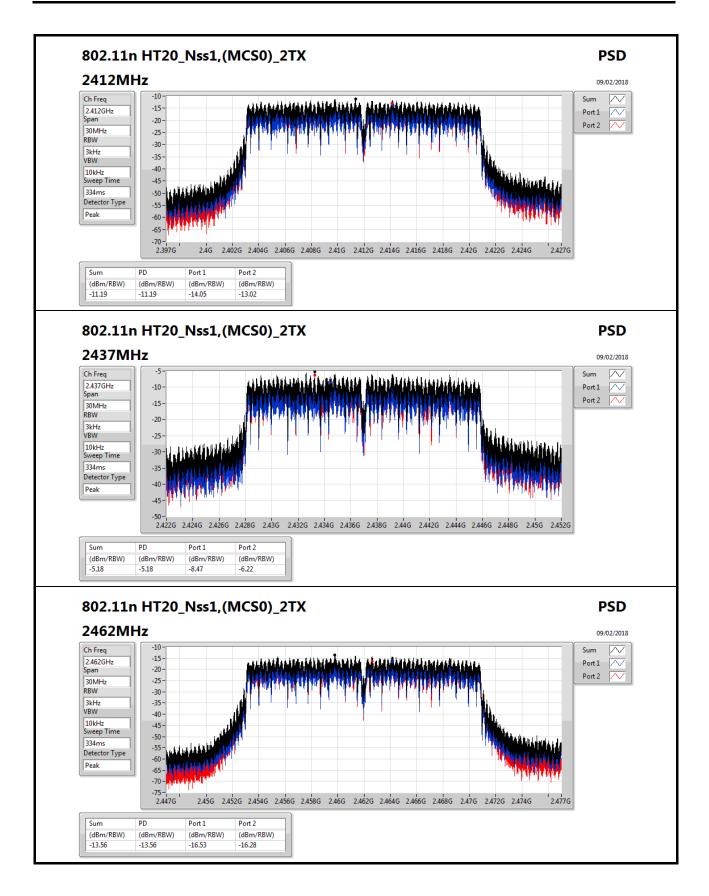
PSD Result



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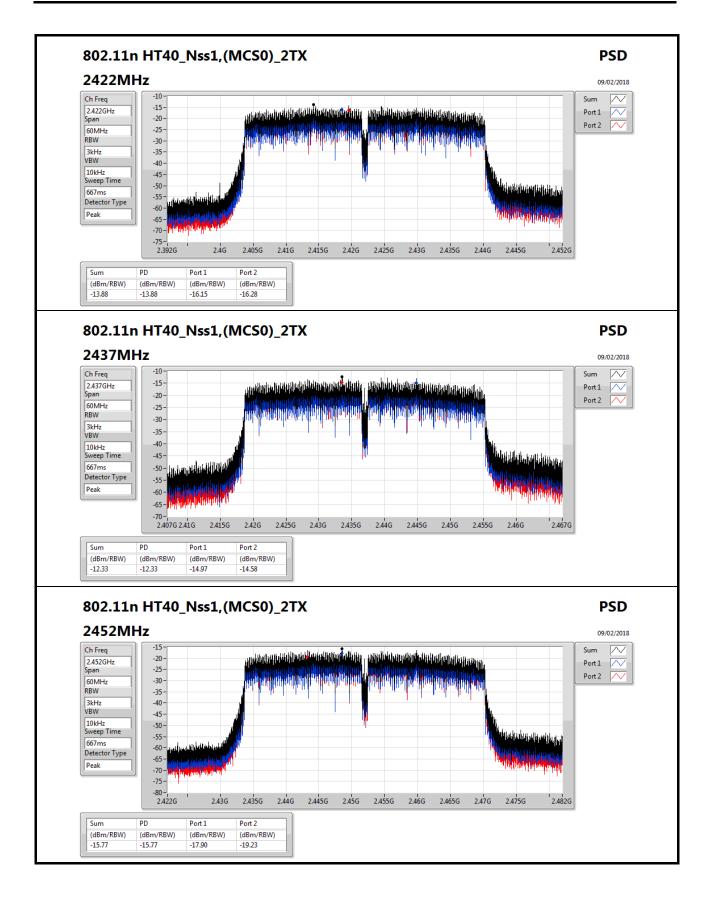




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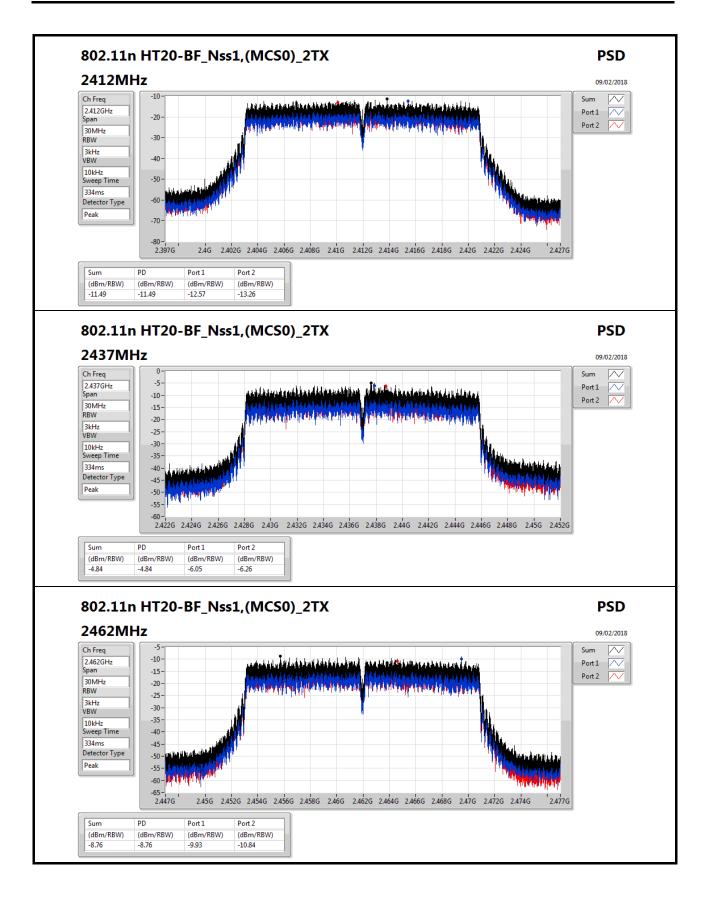




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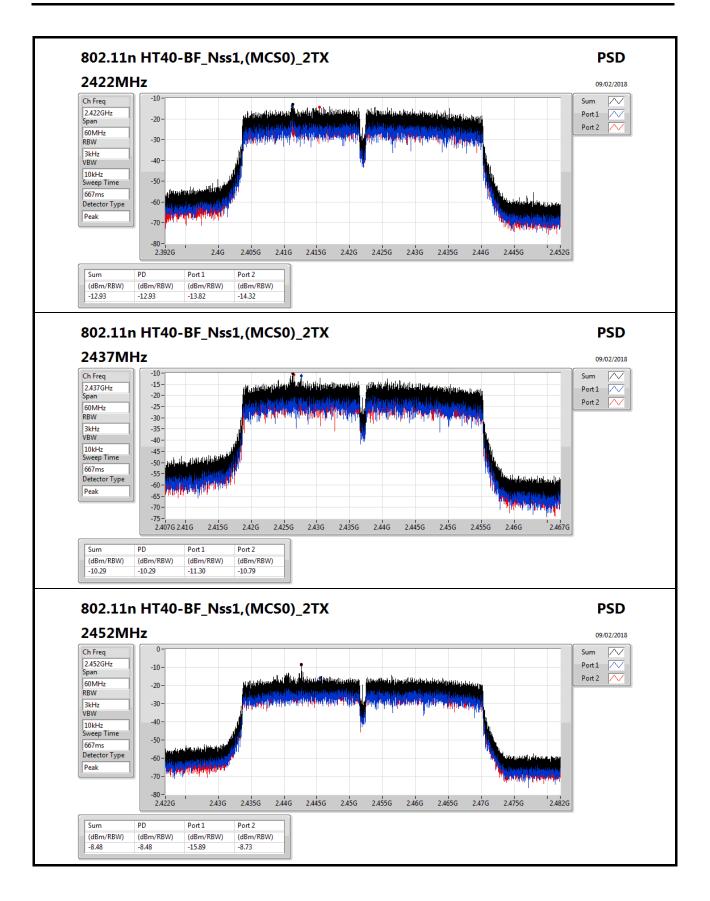
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CSE Non-restricted Band Result

Appendix E

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	2.437408G	12.42	-17.58	1.89167G	-59.67	2.39848G	-26.81	2.49598G	-57.78	7.235136G	-38.43	1
802.11g_Nss1,(6Mbps)_2TX	Pass	2.431897G	9.67	-20.33	2.30408G	-55.49	2.3992G	-31.64	2.49598G	-54.63	7.232327G	-47.16	1
802.11n HT20_Nss1,(MCS0)_2TX	Pass	2.438243G	8.72	-21.28	2.30408G	-55.54	2.39952G	-30.66	2.49598G	-53.77	7.235136G	-48.59	1
802.11n HT40_Nss1,(MCS0)_2TX	Pass	2.429392G	0.15	-29.85	2.305115G	-56.30	2.39776G	-38.73	2.55998G	-54.18	7.249924G	-51.54	1
802.11n HT20-BF_Nss1,(MCS0)_2TX	Pass	2.441917G	6.79	-23.21	2.30408G	-56.58	2.39992G	-52.10	2.48446G	-40.19	24.387515G	-52.82	1
802.11n HT40-BF_Nss1,(MCS0)_2TX	Pass	2.431396G	1.04	-28.96	2.30397G	-56.28	2.39952G	-34.20	2.48398G	-49.58	24.357755G	-53.93	1

Result

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Por
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.437408G	12.42	-17.58	1.89167G	-59.67	2.39848G	-26.81	2.49598G	-57.78	7.235136G	-38.43	1
2412MHz	Pass	2.437408G	12.42	-17.58	2.307575G	-60.48	2.39848G	-31.48	2.49598G	-57.48	7.232327G	-37.75	2
2437MHz	Pass	2.437408G	12.42	-17.58	1.624885G	-56.69	2.39752G	-46.36	2.48542G	-49.62	16.680885G	-52.20	1
2437MHz	Pass	2.437408G	12.42	-17.58	2.307575G	-59.51	2.39696G	-45.87	2.48542G	-51.32	16.613456G	-52.16	2
2462MHz	Pass	2.437408G	12.42	-17.58	1.641195G	-58.46	2.39992G	-57.56	2.48846G	-48.60	17.335514G	-51.91	1
2462MHz	Pass	2.437408G	12.42	-17.58	1.869535G	-60.35	2.39184G	-56.97	2.48742G	-51.23	16.742696G	-51.37	í
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2412MHz	Pass	2.431897G	9.67	-20.33	2.30408G	-55.49	2.3992G	-31.64	2.49598G	-54.63	7.232327G	-47.16	1
2412MHz	Pass	2.431897G	9.67	-20.33	2.30641G	-58.19	2.39912G	-34.54	2.49598G	-55.51	7.237946G	-46.03	2
2437MHz	Pass	2.431897G	9.67	-20.33	2.30408G	-55.96	2.39976G	-38.59	2.48566G	-45.27	16.383072G	-51.82	1
2437MHz	Pass	2.431897G	9.67	-20.33	2.30408G	-58.24	2.3976G	-41.41	2.48566G	-45.63	16.290356G	-52.23	2
2462MHz	Pass	2.431897G	9.67	-20.33	2.30408G	-59.12	2.39992G	-52.97	2.48358G	-43.50	16.669647G	-51.73	,
2462MHz	Pass	2.431897G	9.67	-20.33	2.067585G	-59.72	2.3928G	-56.60	2.48398G	-49.21	16.411167G	-52.26	
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-		*	-		-	*	-	-	-	
2412MHz	Pass	2.438243G	8.72	-21.28	2.30408G	-55.54	2.39952G	-30.66	2.49598G	-53.77	7.235136G	-48.59	
2412MHz	Pass	2.438243G	8.72	-21.28	2.30408G	-58.41	2.39952G	-34.42	2.49598G	-56.81	7.223898G	-47.25	
2437MHz	Pass	2.438243G	8.72	-21.28	2.30408G	-55.07	2.39952G	-35.36	2.48478G	-42.49	16.383072G	-52.46	
2437MHz	Pass	2.438243G	8.72	-21.28	2.30408G	-58.09	2.39952G	-41.46	2.48446G	-43.64	24.592613G	-51.78	:
2462MHz	Pass	2.438243G	8.72	-21.28	2.30408G	-57.72	2.39768G	-56.36	2.48382G	-43.74	16.399929G	-52.15	
2462MHz	Pass	2.438243G	8.72	-21.28	2.167775G	-59.99	2.39936G	-56.60	2.48382G	-49.57	16.739886G	-52.13	
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2422MHz	Pass	2.429392G	0.15	-29.85	2.305115G	-56.30	2.39776G	-38.73	2.55998G	-54.18	7.249924G	-51.54	
2422MHz	Pass	2.429392G	0.15	-29.85	2.305115G	-59.36	2.39984G	-41.80	2.49598G	-55.14	16.678863G	-51.88	
2437MHz	Pass	2.429392G	0.15	-29.85	2.305115G	-58.77	2.3992G	-39.60	2.48414G	-44.18	16.404016G	-51.54	
2437MHz	Pass	2.429392G	0.15	-29.85	2.30626G	-58.61	2.39984G	-44.21	2.48446G	-45.93	16.712518G	-52.74	:
2452MHz	Pass	2.429392G	0.15	-29.85	2.305115G	-58.46	2.3992G	-53.78	2.4843G	-40.31	16.712518G	-51.87	
2452MHz	Pass	2.429392G	0.15	-29.85	2.30397G	-59.61	2.39904G	-53.89	2.48414G	-45.84	16.743368G	-52.06	
802.11n HT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2412MHz	Pass	2.441917G	6.79	-23.21	2.30408G	-56.57	2.39944G	-41.60	2.49598G	-56.10	24.362229G	-53.83	
2412MHz	Pass	2.441917G	6.79	-23.21	2.30408G	-57.25	2.39968G	-40.31	2.49598G	-56.10	6.962609G	-53.33	
2437MHz	Pass	2.441917G	6.79	-23.21	2.30408G	-57.47	2.39824G	-41.27	2.48374G	-49.65	24.047558G	-52.66	
2437MHz	Pass	2.441917G	6.79	-23.21	2.30874G	-58.16	2.3992G	-41.26	2.48526G	-50.37	24.047558G	-53.97	
2462MHz	Pass	2.441917G	6.79	-23.21	2.30408G	-56.58	2.39992G	-52.10	2.48446G	-40.19	24.387515G	-52.82	
2462MHz	Pass	2.441917G	6.79	-23.21	860.645M	-58.34	2.39824G	-53.30	2.48358G	-42.95	24.797712G	-53.79	
802.11n HT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	
2422MHz	Pass	2.431396G	1.04	-28.96	944.855M	-58.40	2.39584G	-37.30	2.56014G	-54.54	24.312882G	-53.03	

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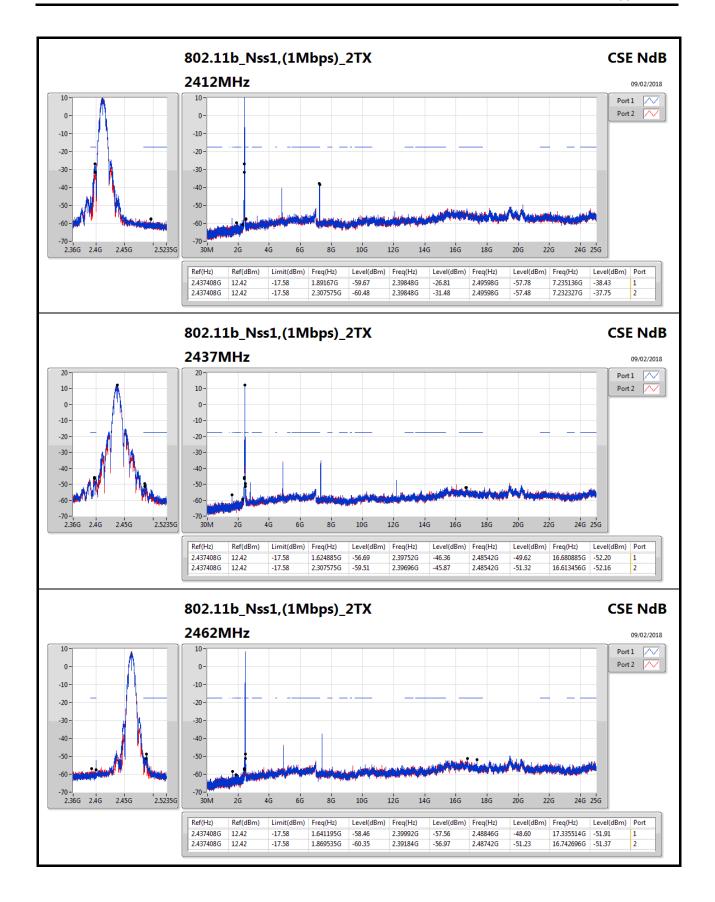
CSE Non-restricted Band Result

Appendix E

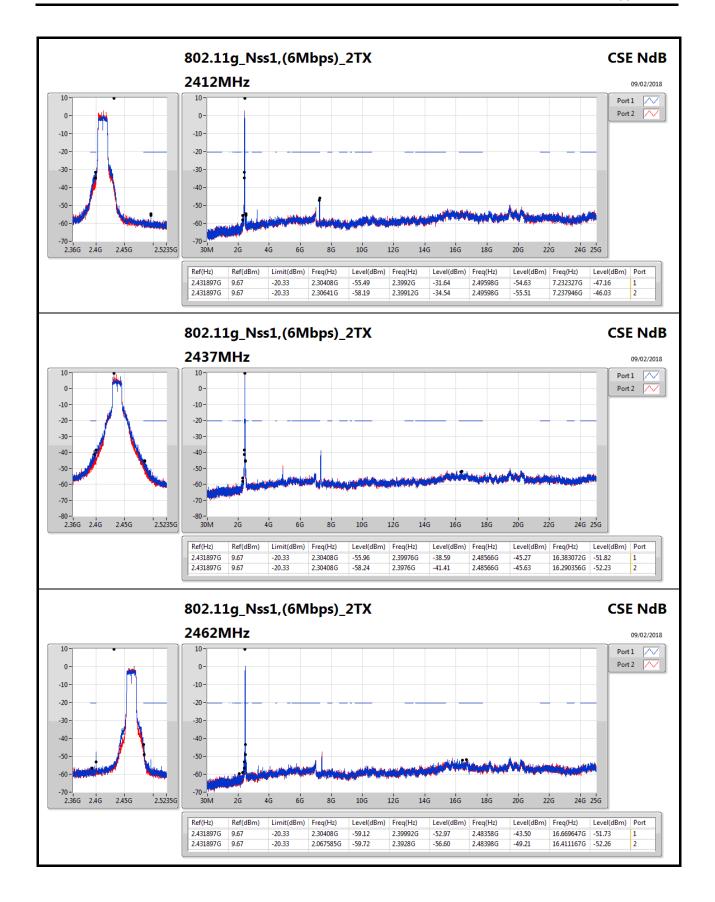
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2422MHz	Pass	2.431396G	1.04	-28.96	2.30855G	-59.14	2.39712G	-38.22	2.49582G	-55.39	6.997513G	-52.90	2
2437MHz	Pass	2.431396G	1.04	-28.96	2.30397G	-56.28	2.39952G	-34.20	2.48398G	-49.58	24.357755G	-53.93	1
2437MHz	Pass	2.431396G	1.04	-28.96	2.305115G	-55.96	2.39984G	-40.23	2.48366G	-50.84	6.918986G	-54.08	2
2452MHz	Pass	2.431396G	1.04	-28.96	909.36M	-59.06	2.39792G	-52.21	2.48638G	-45.98	23.443468G	-53.41	1
2452MHz	Pass	2.431396G	1.04	-28.96	870.43M	-59.37	2.39808G	-48.78	2.48366G	-46.73	6.980686G	-53.26	2

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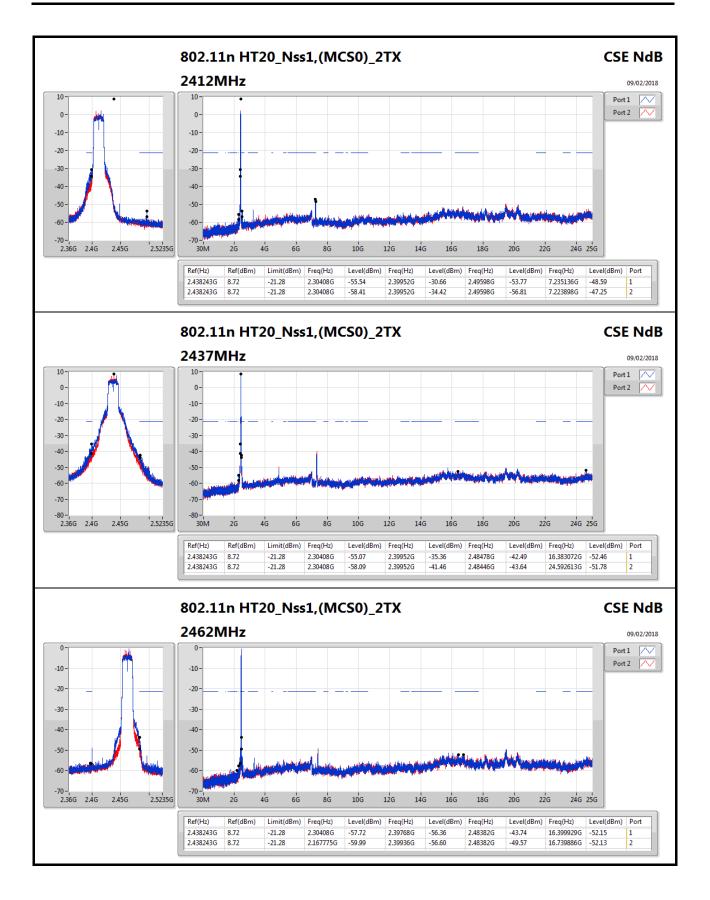




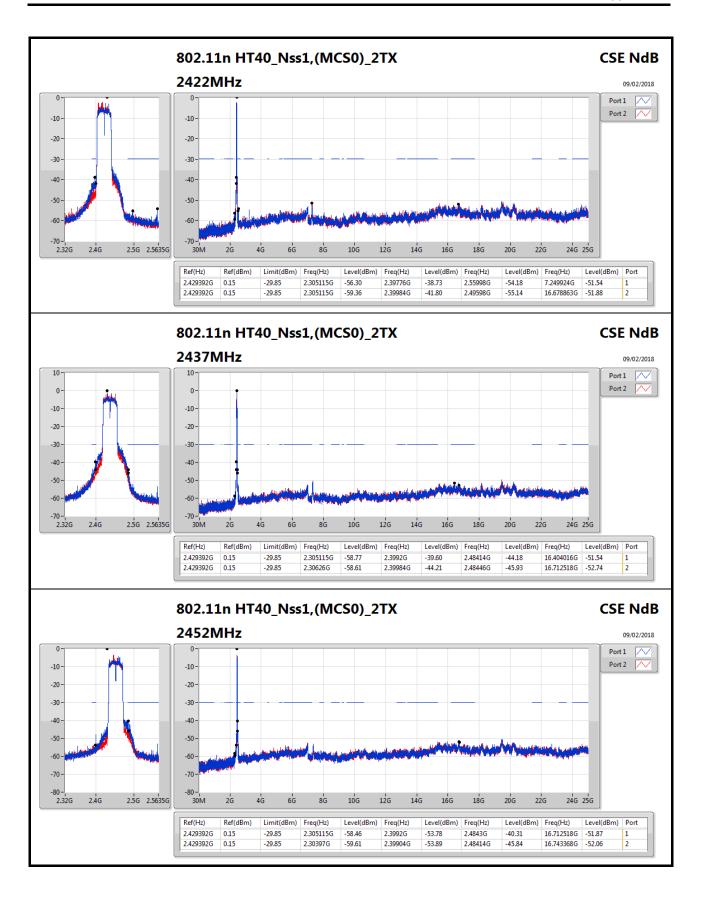




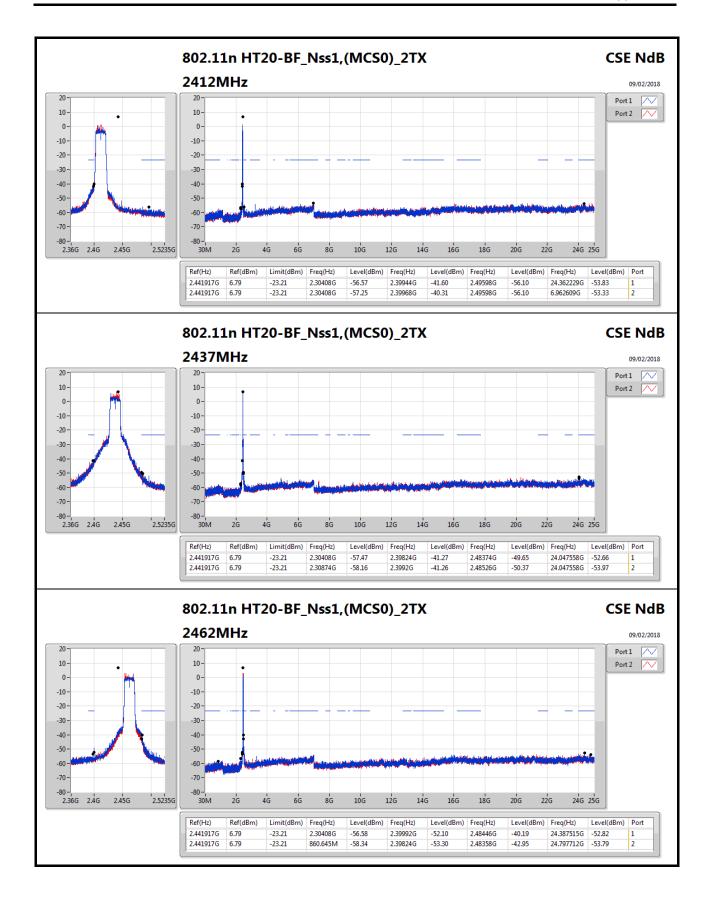




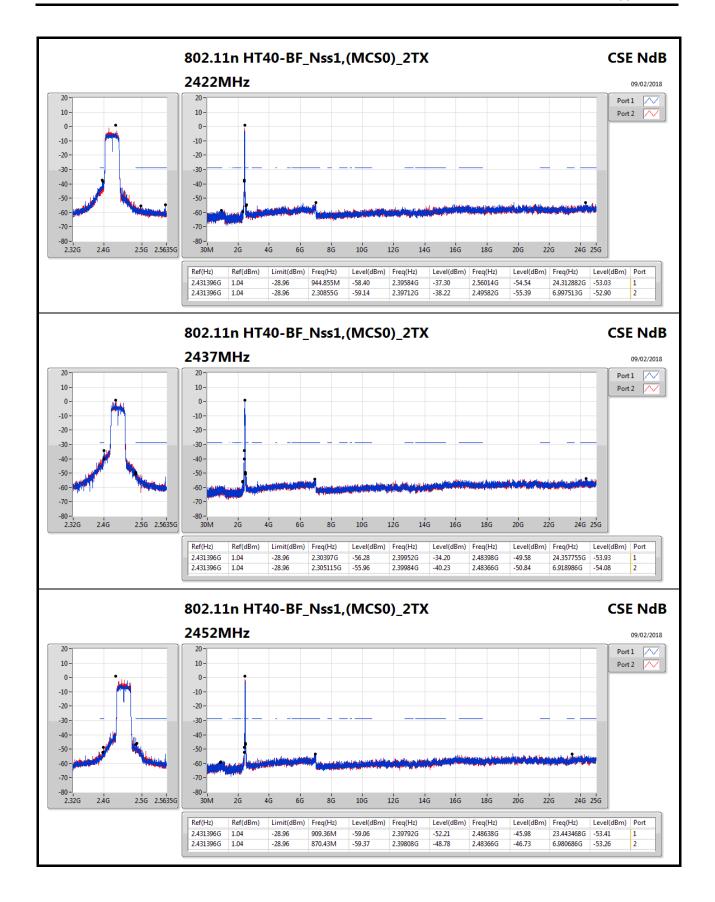








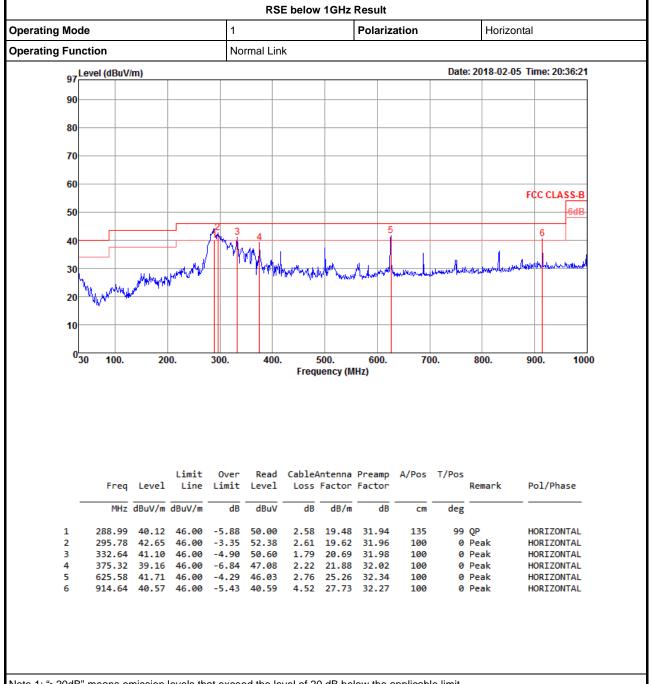




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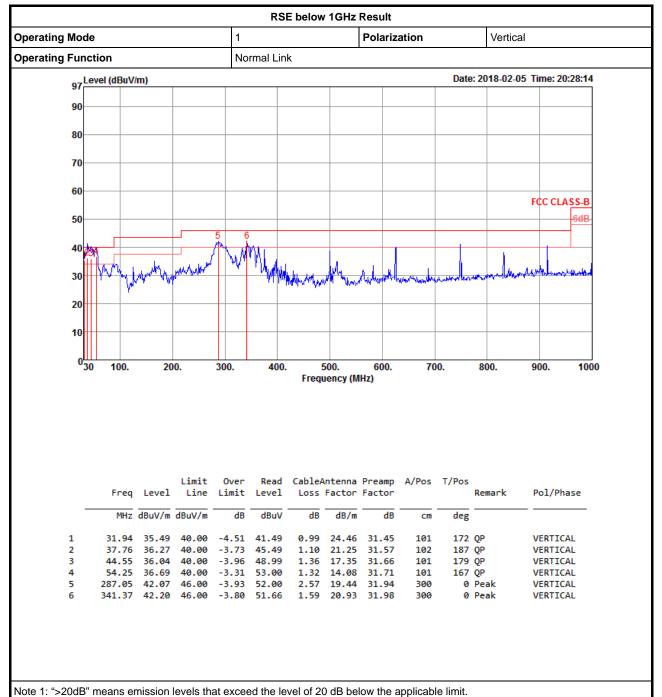




Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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





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



RSE TX above 1GHz Result

Appendix F.2

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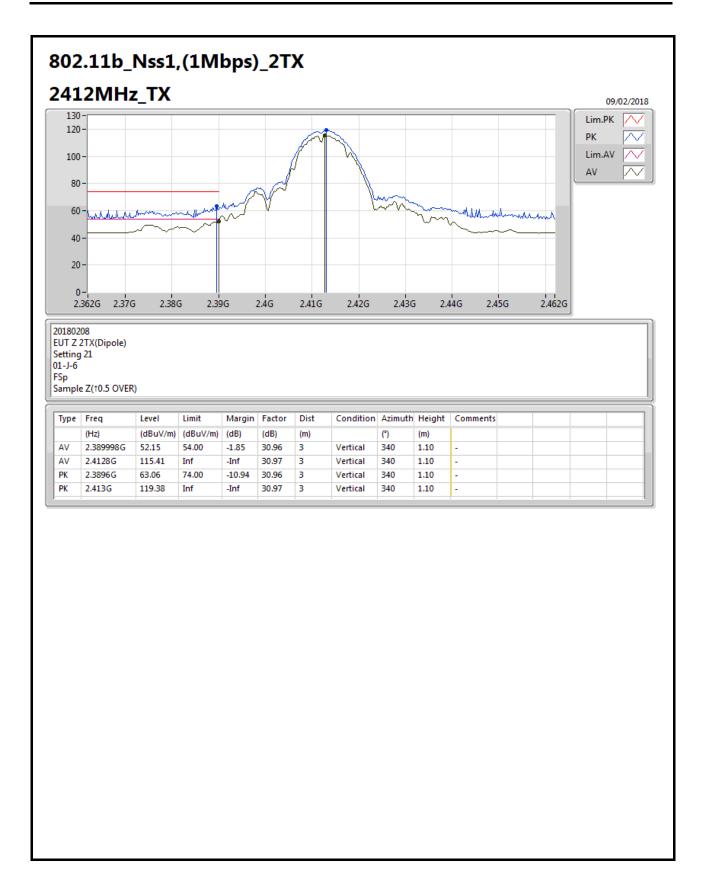
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11n HT40_Nss1,(MCS0)_2TX	Pass	AV	2.3898G	53.98	54.00	-0.02	30.96	3	Vertical	339	1.26	-

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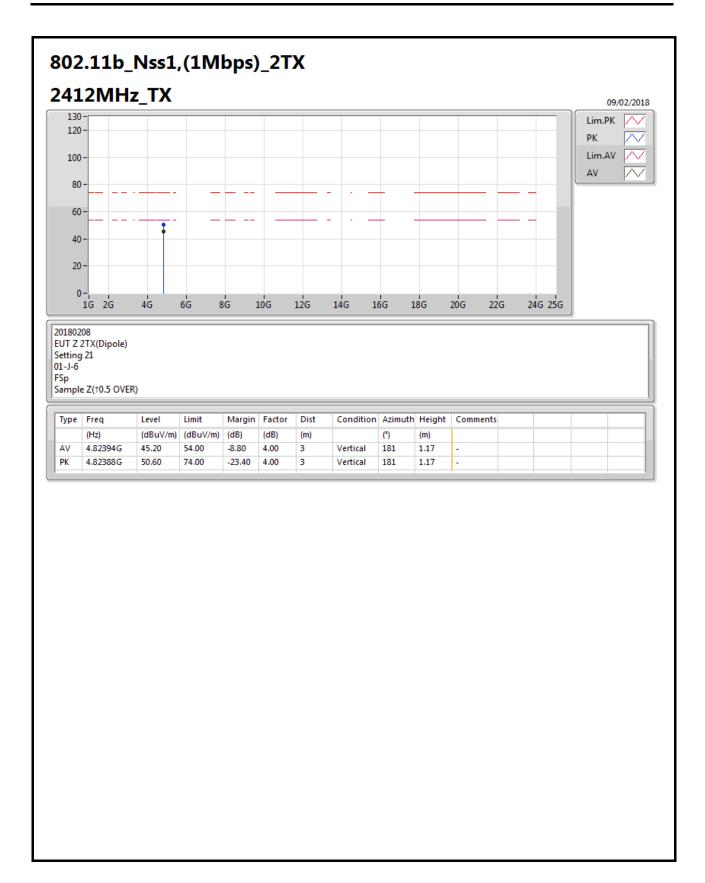
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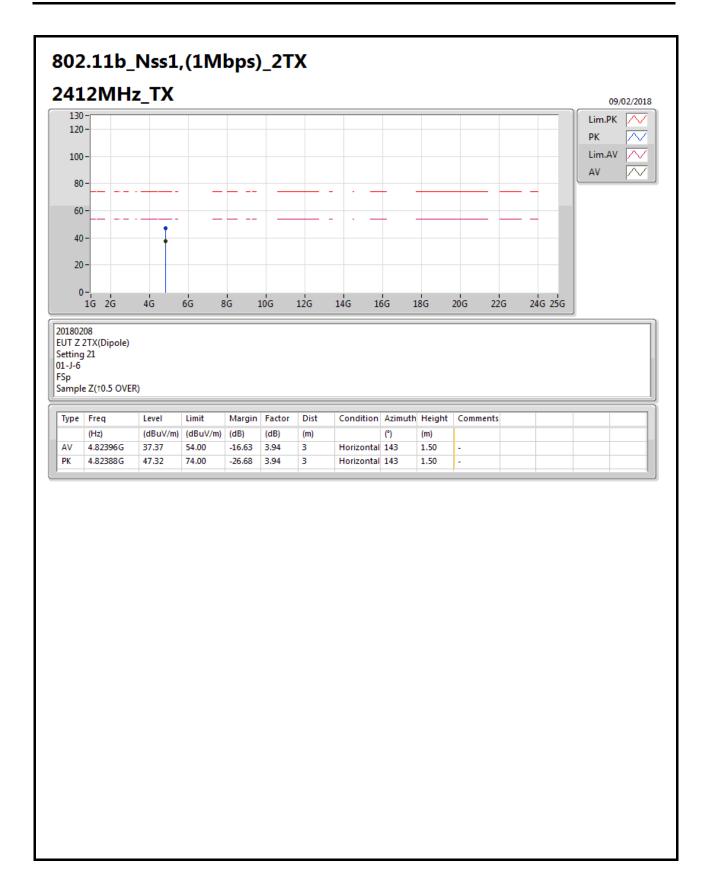
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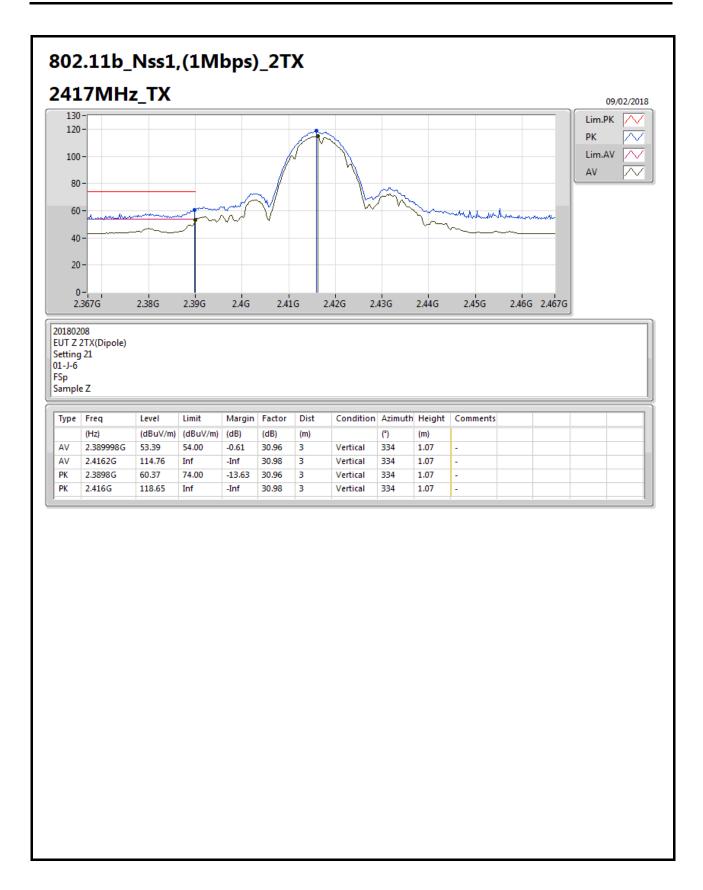
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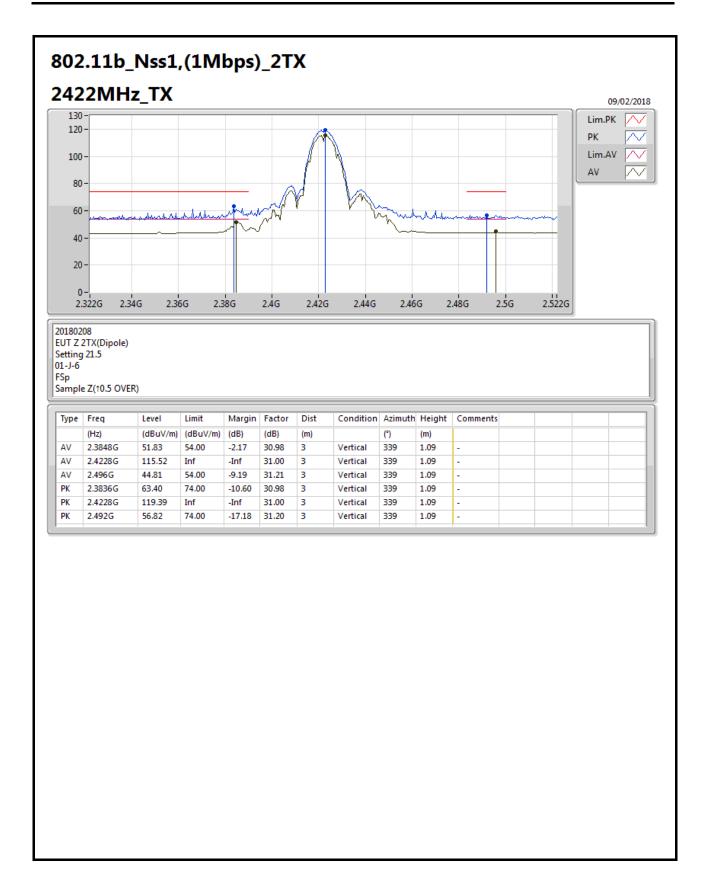


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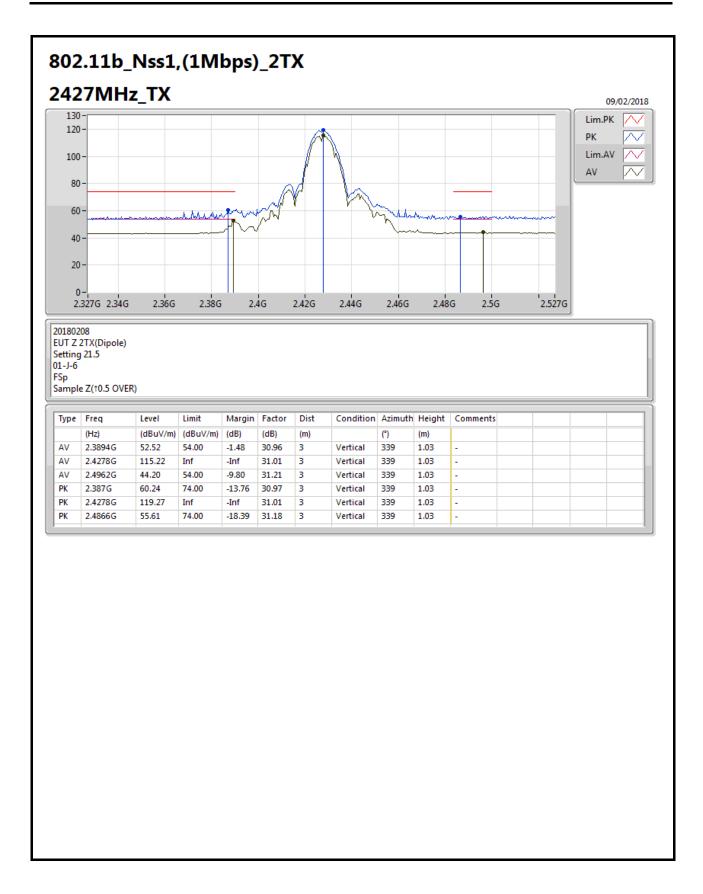






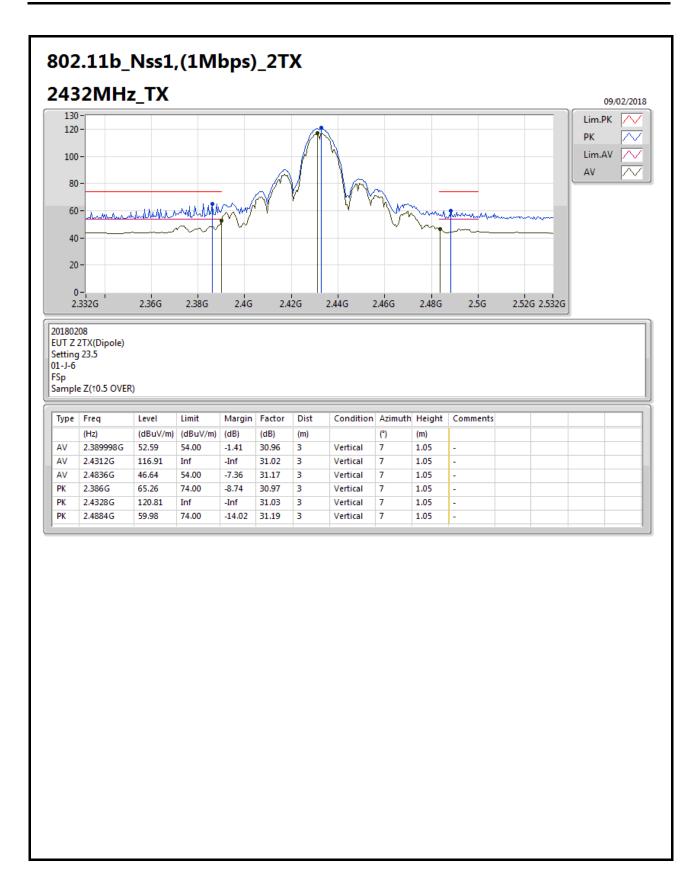






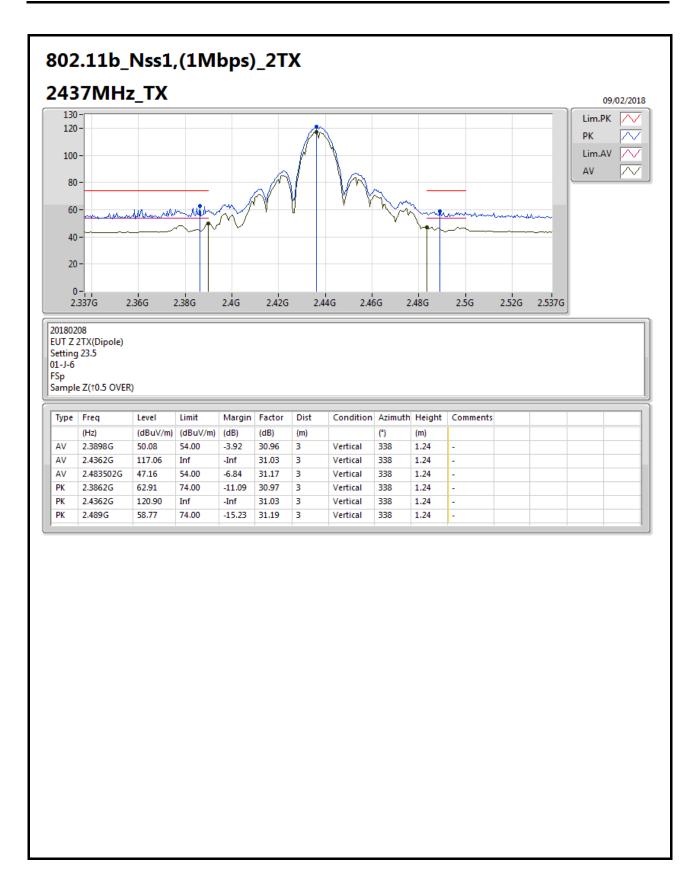
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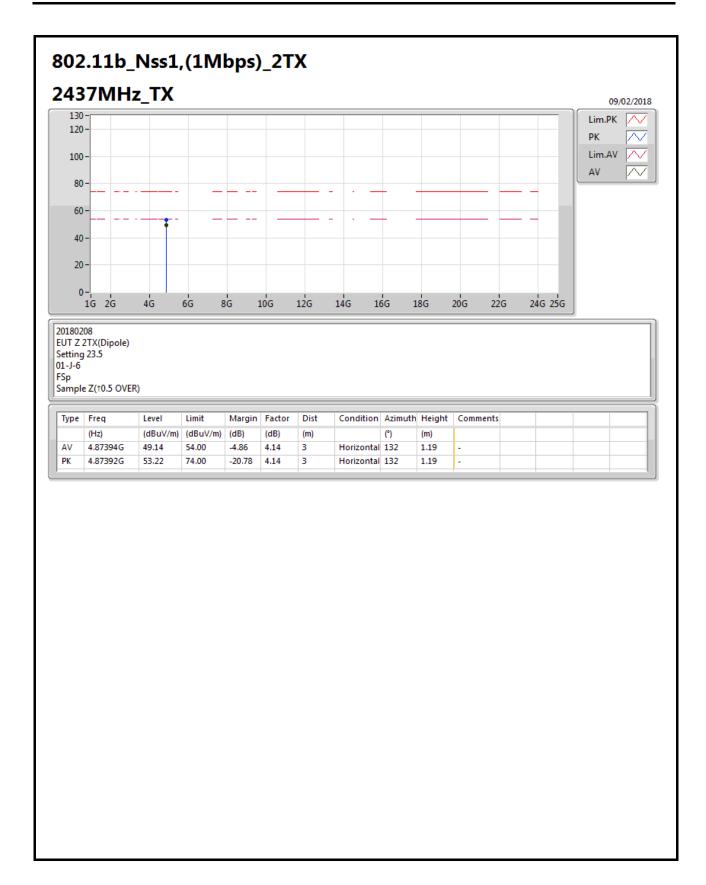
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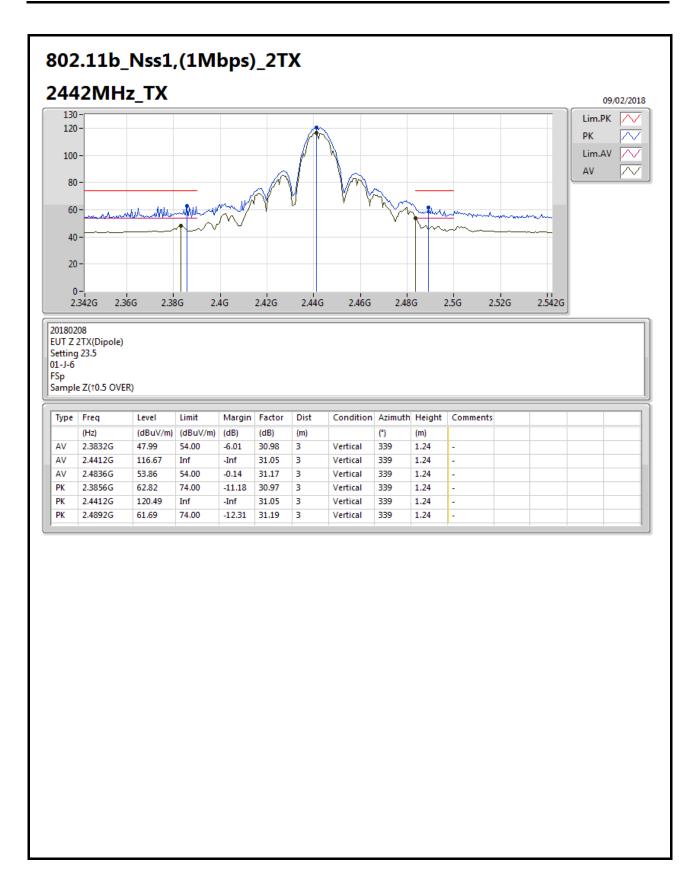
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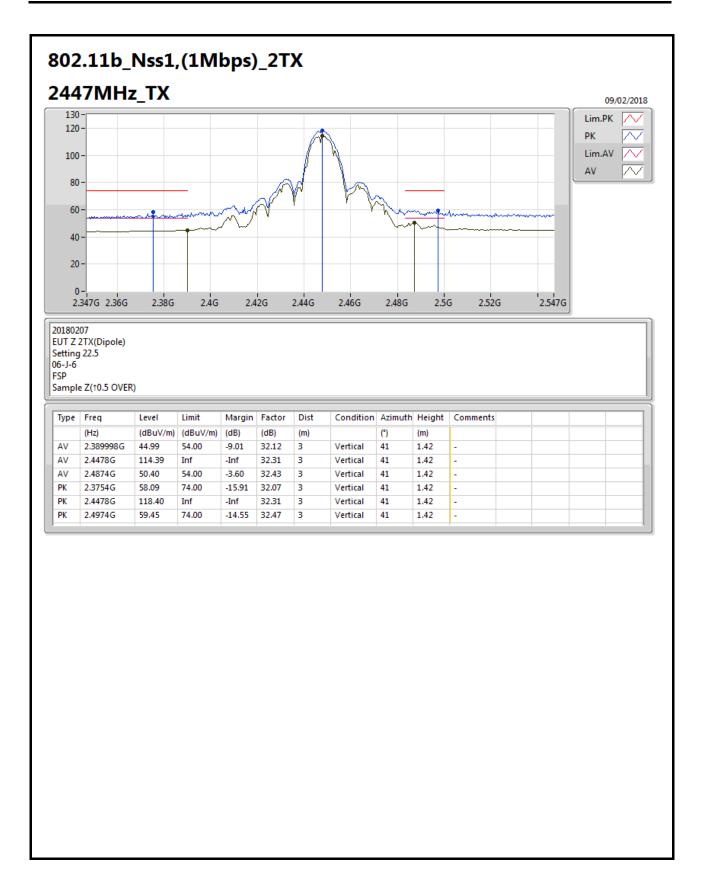


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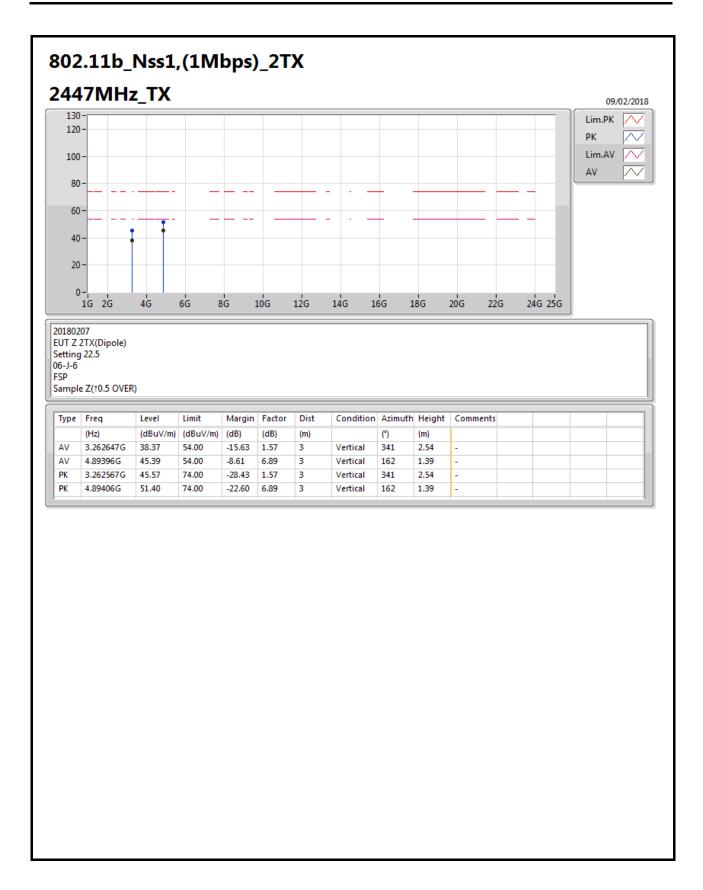




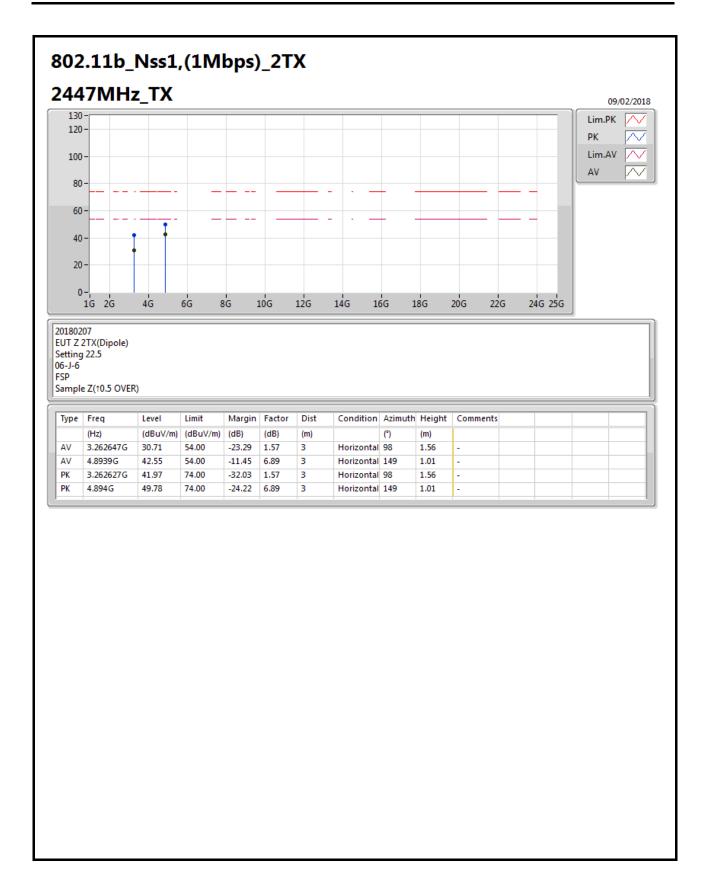




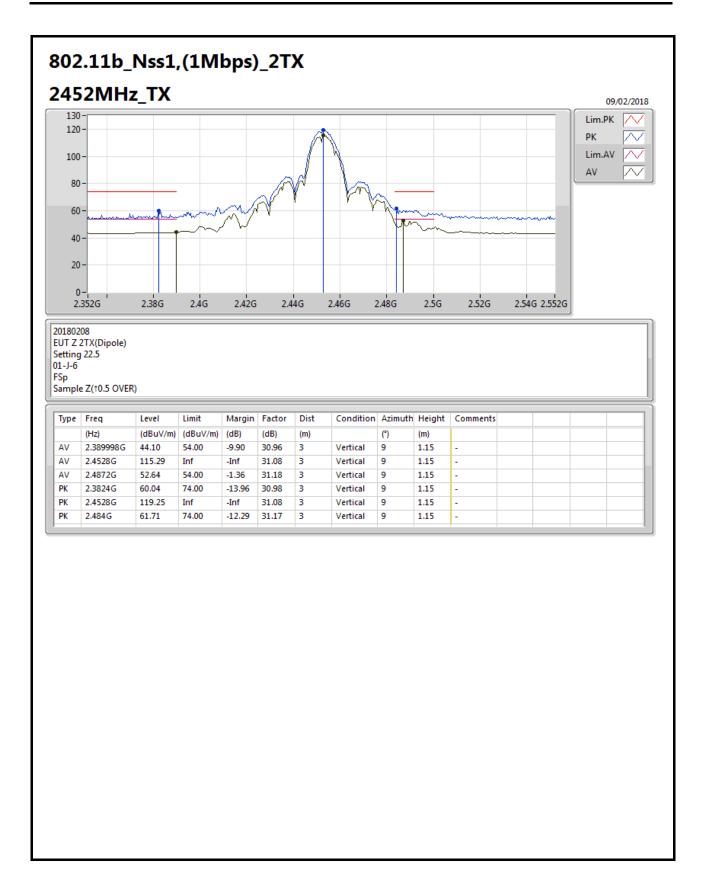






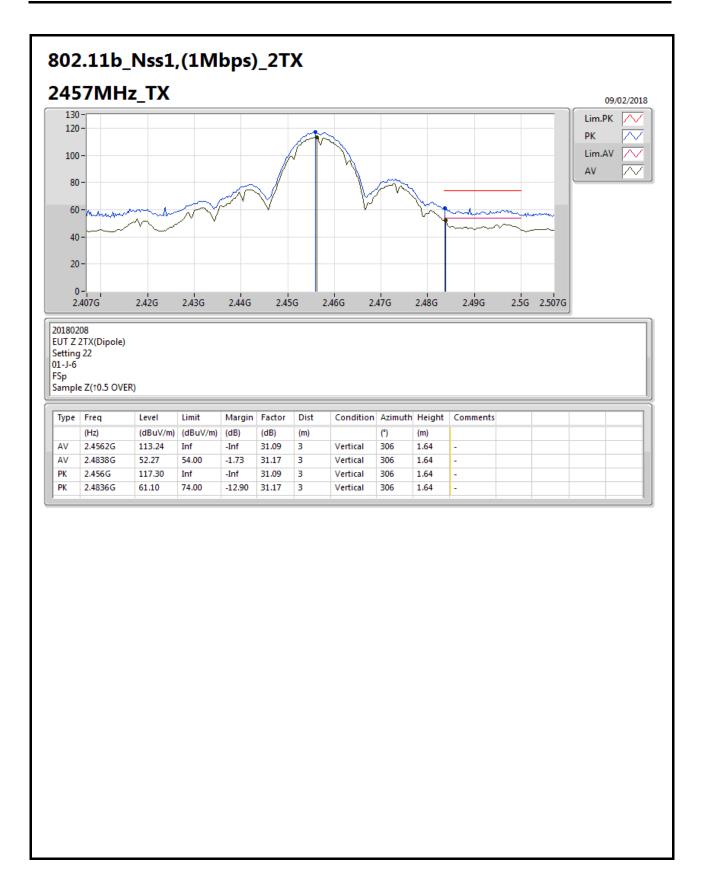




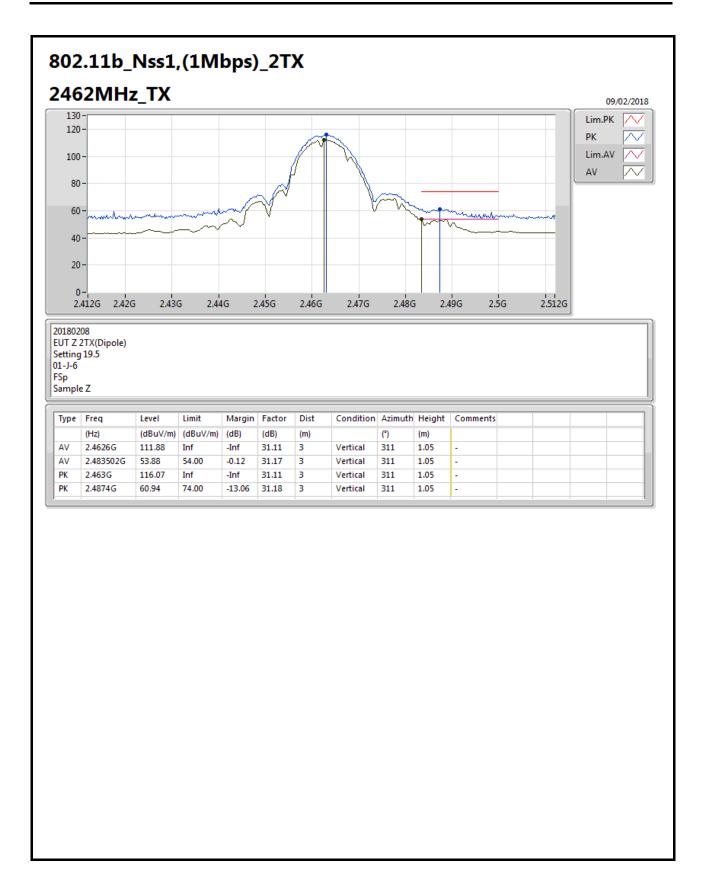


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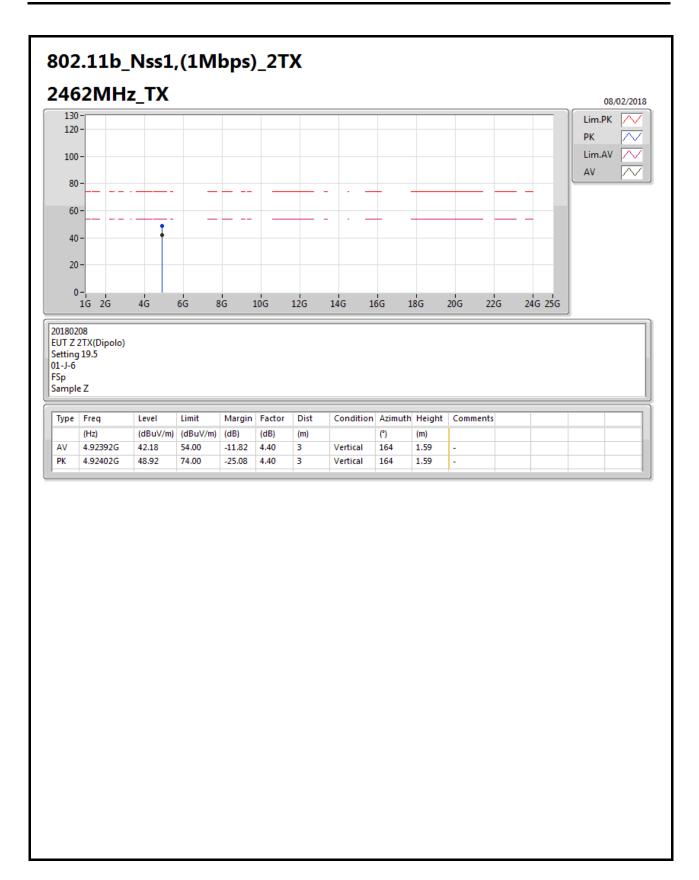




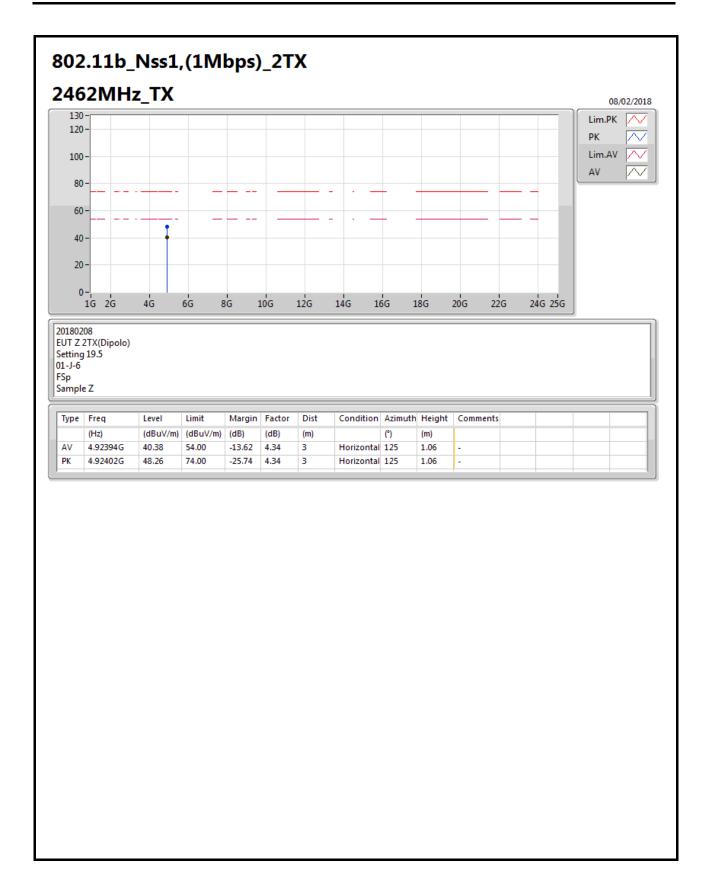




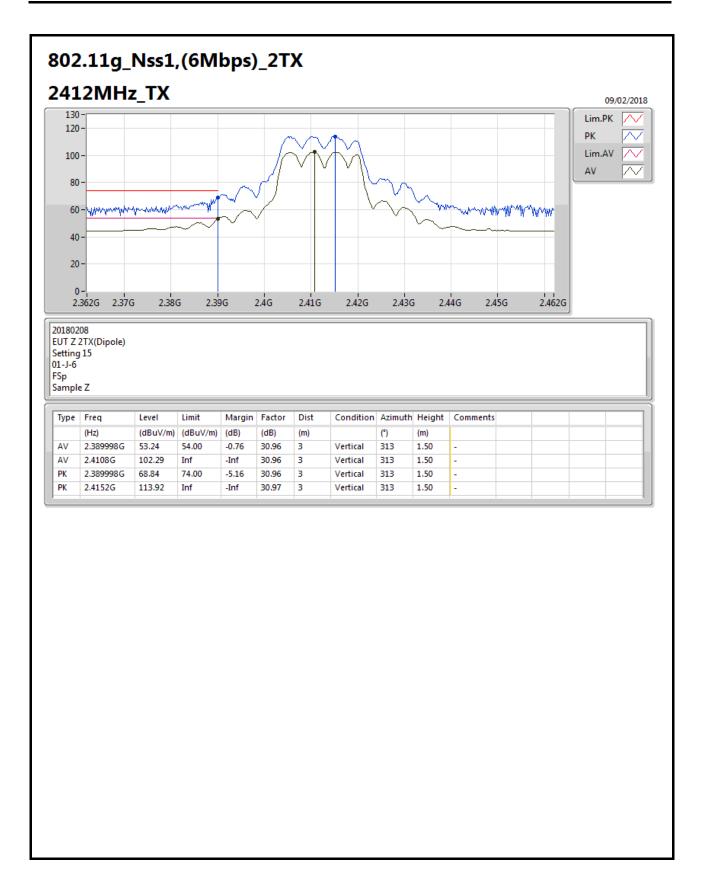






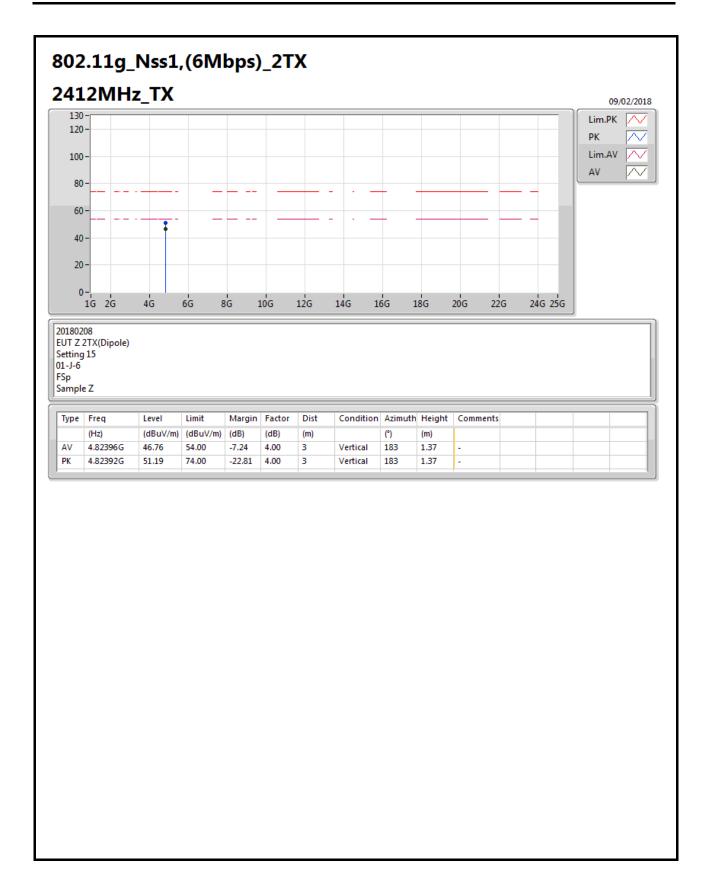




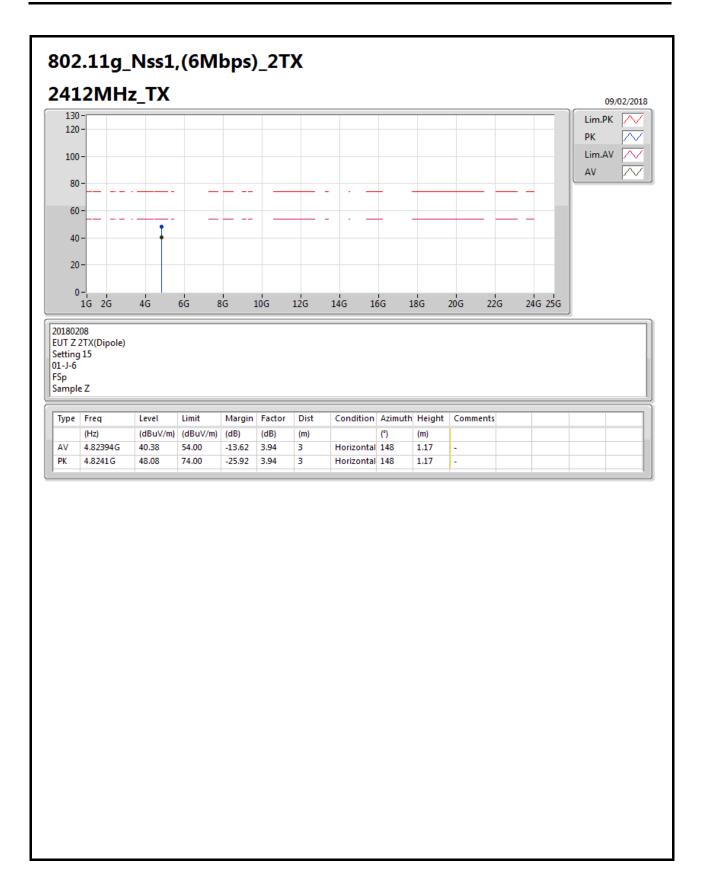


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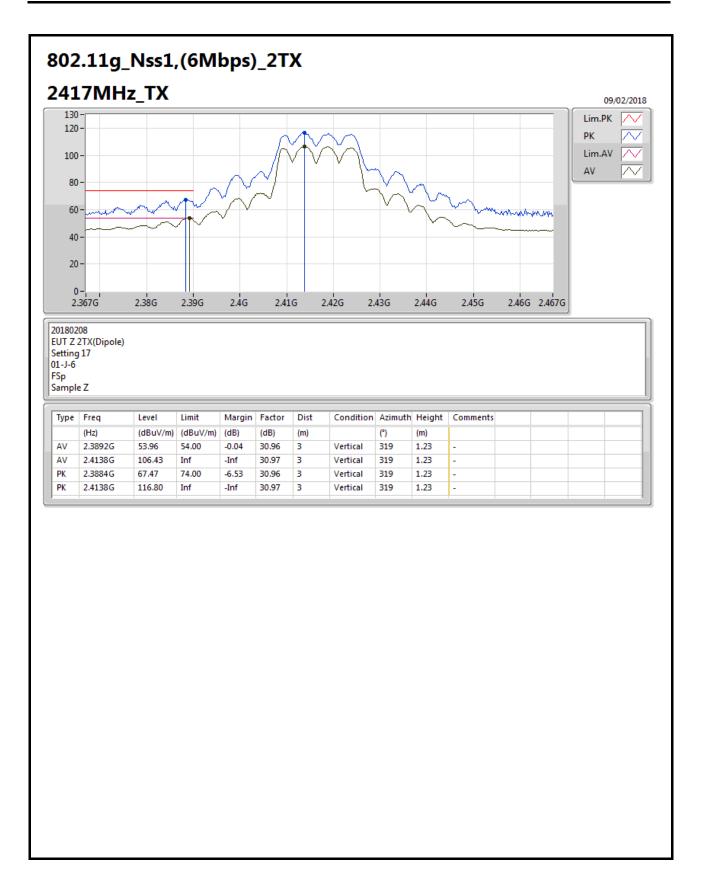




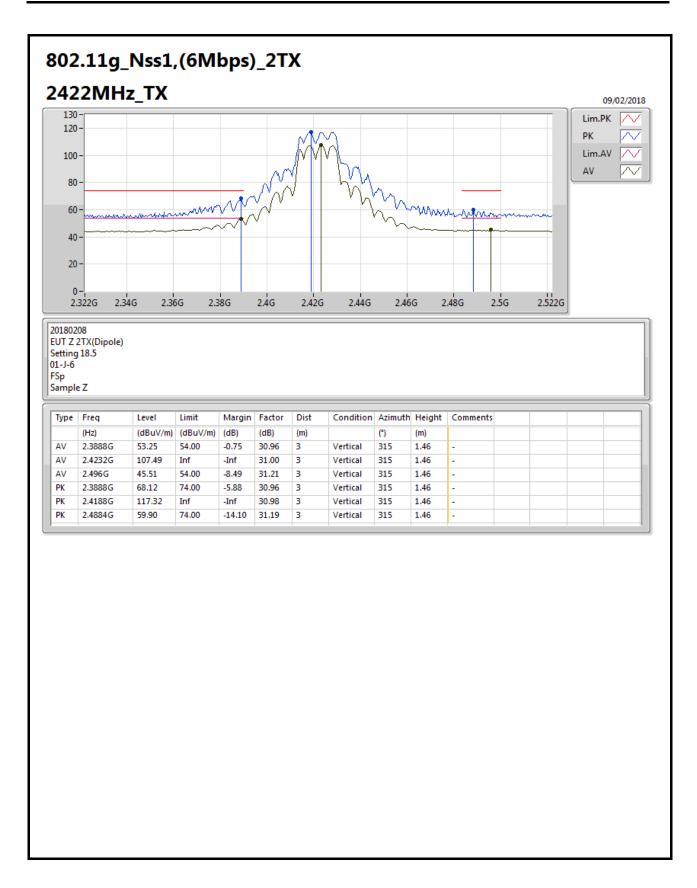


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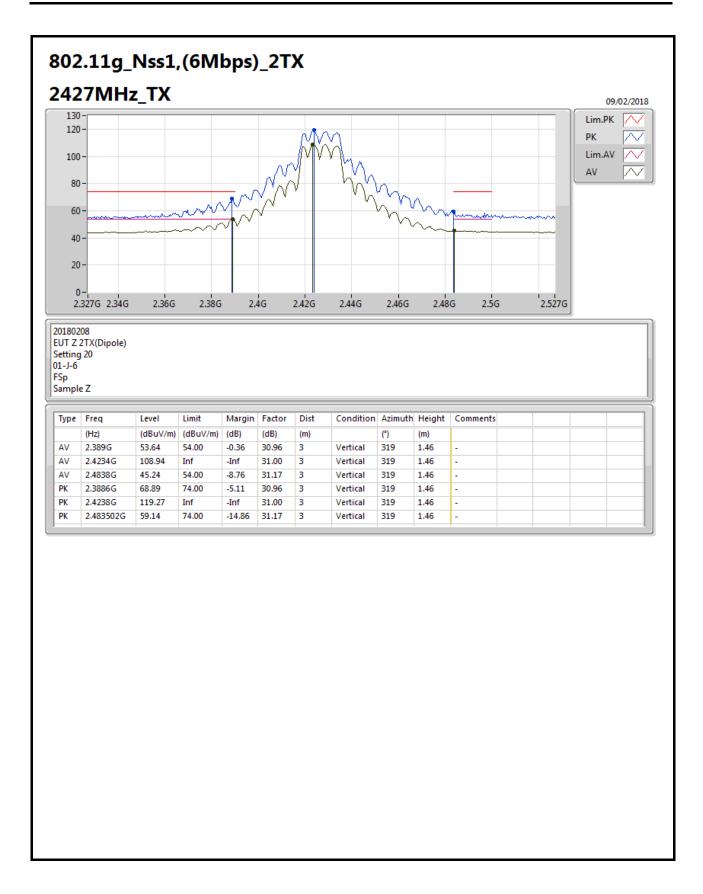






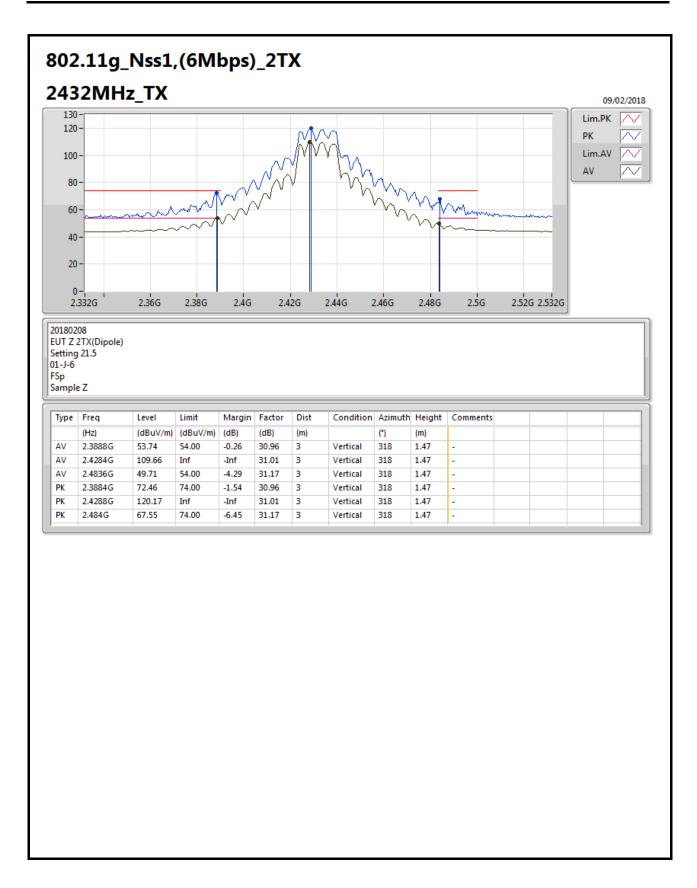




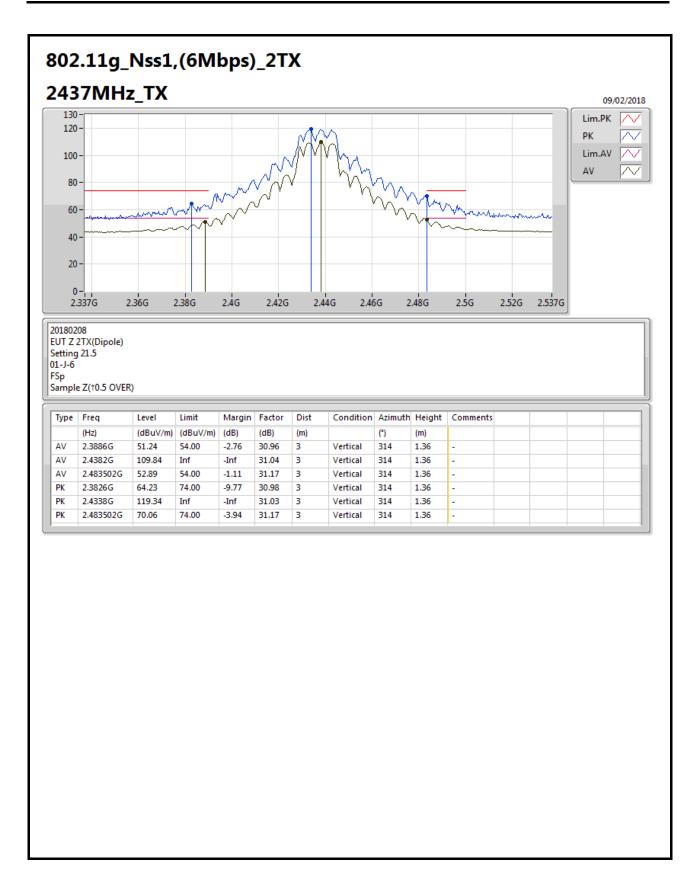


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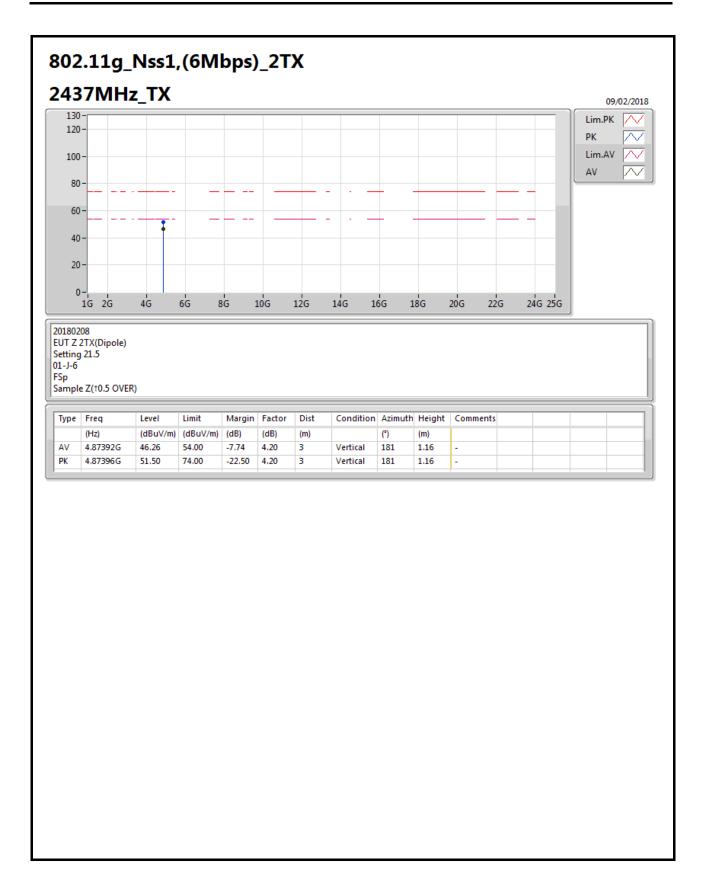










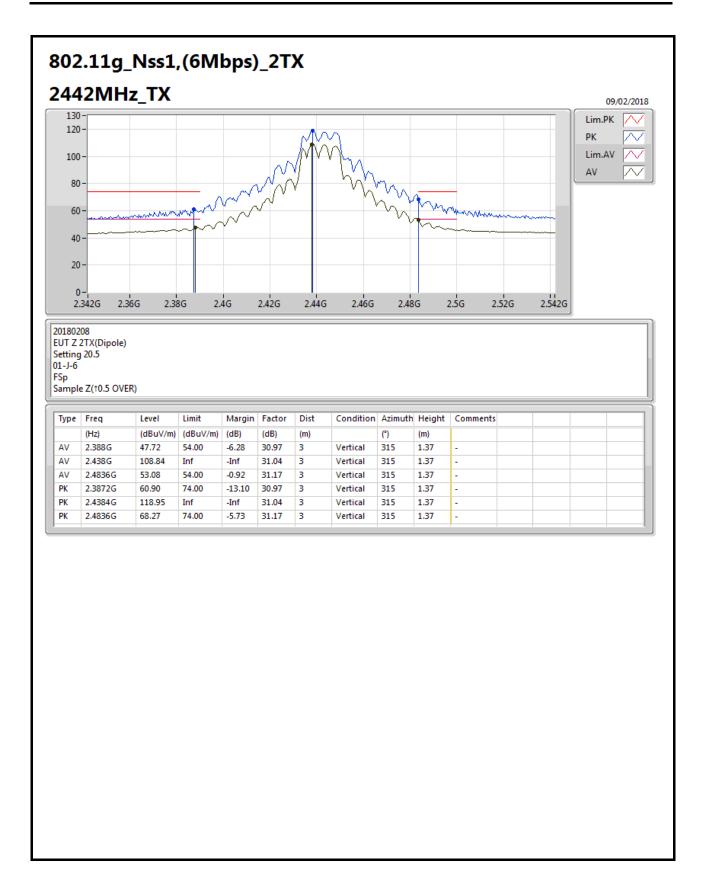




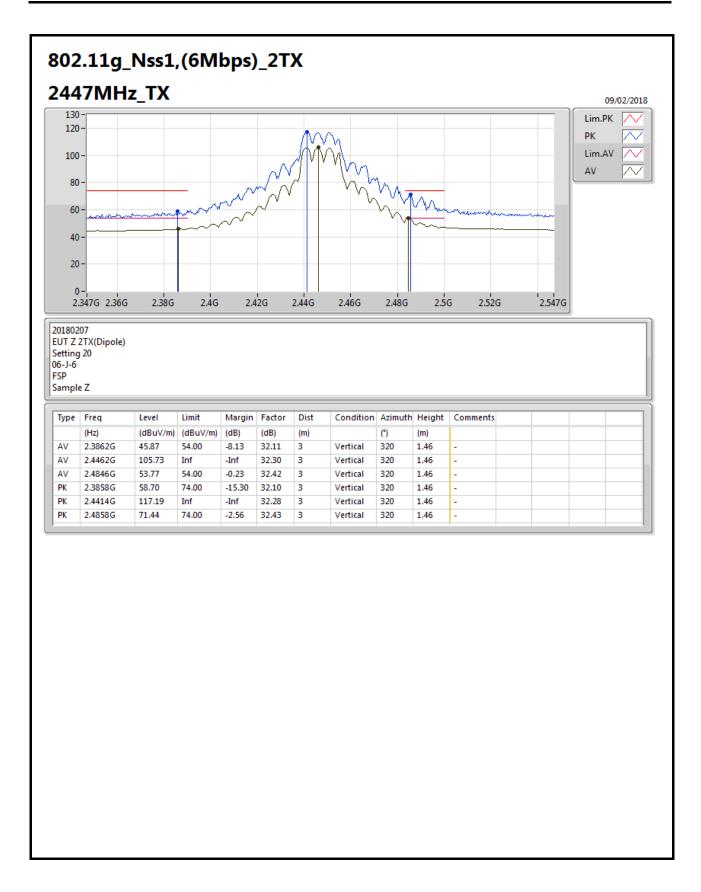


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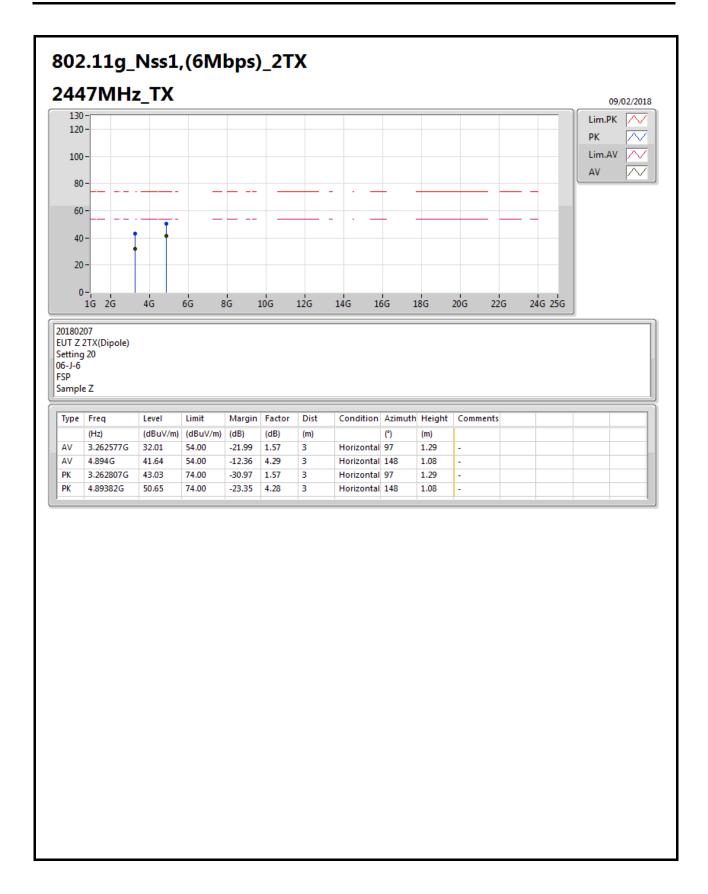






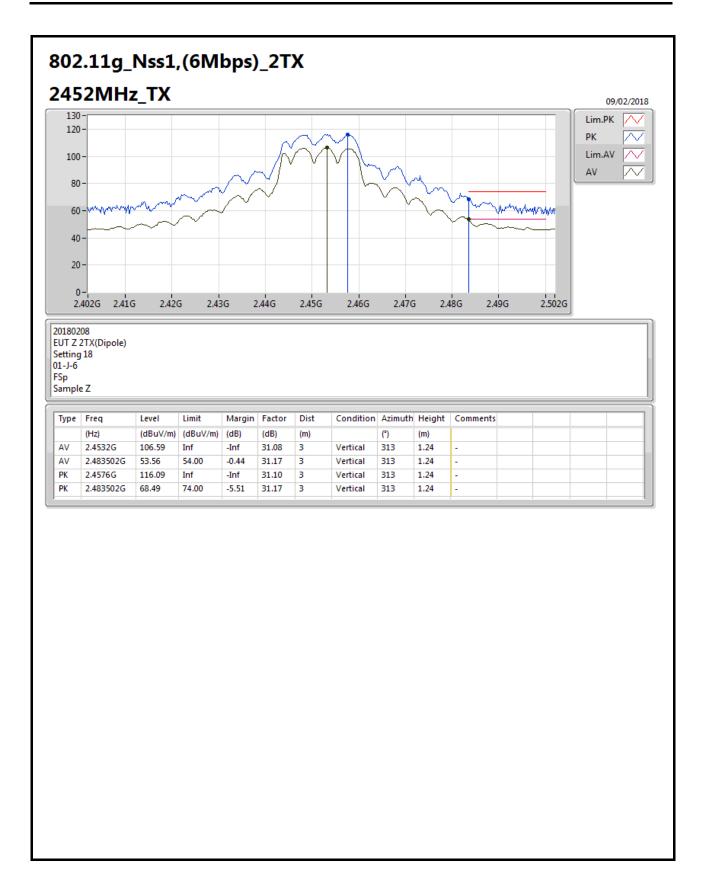




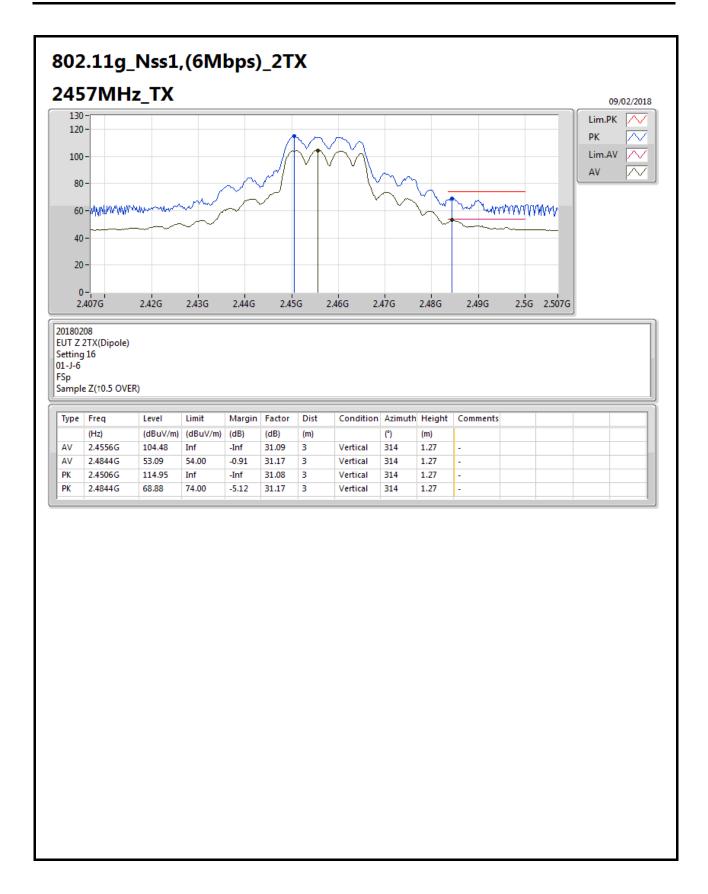


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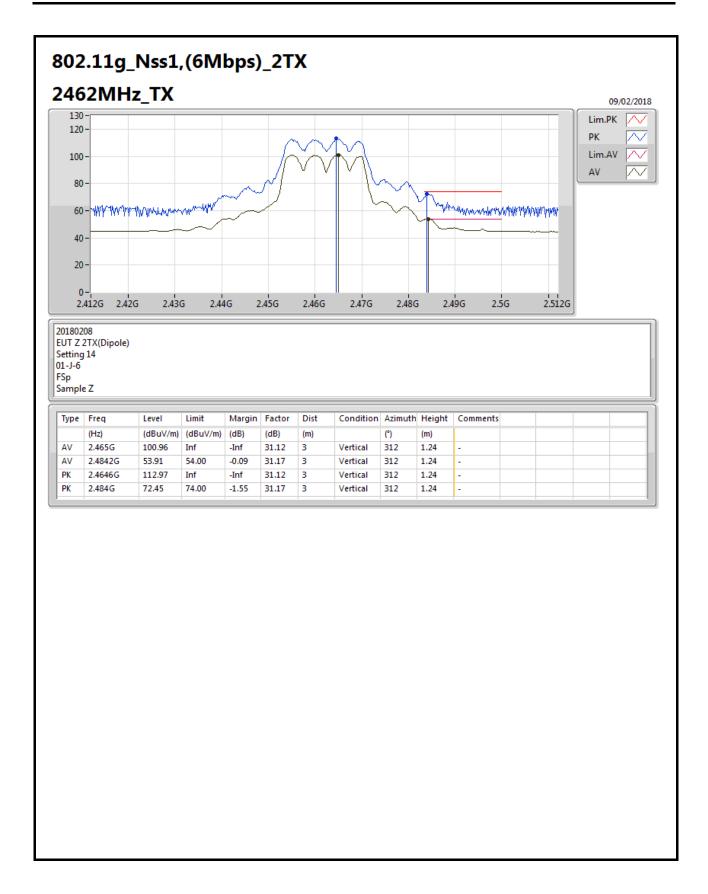




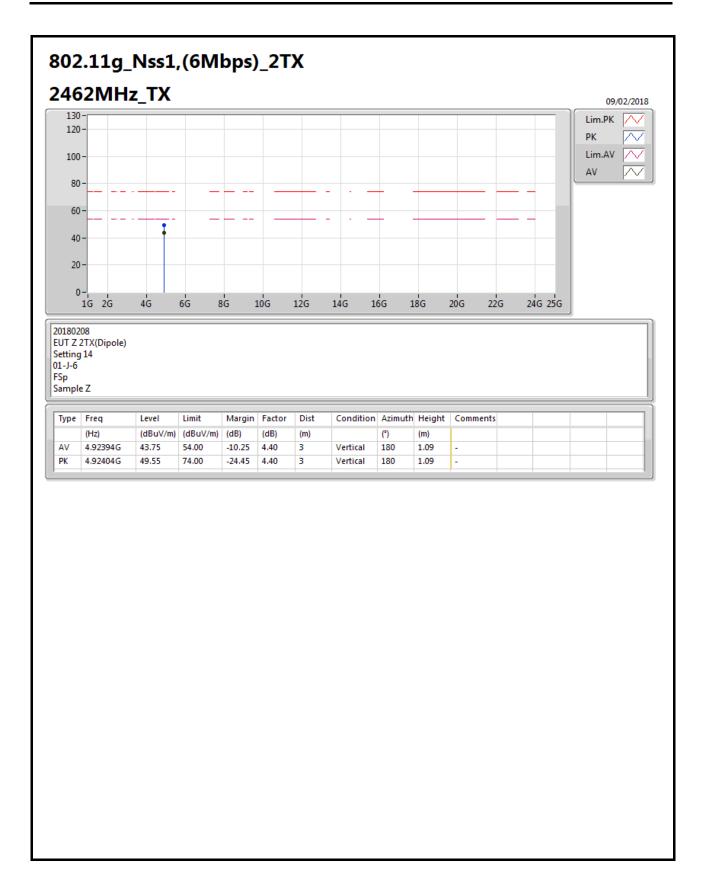
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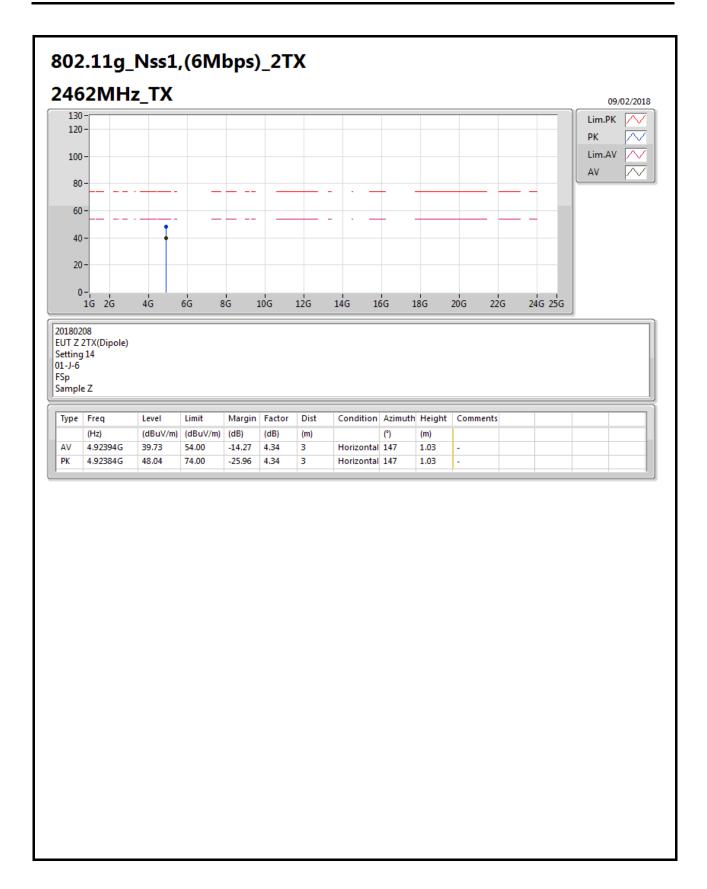




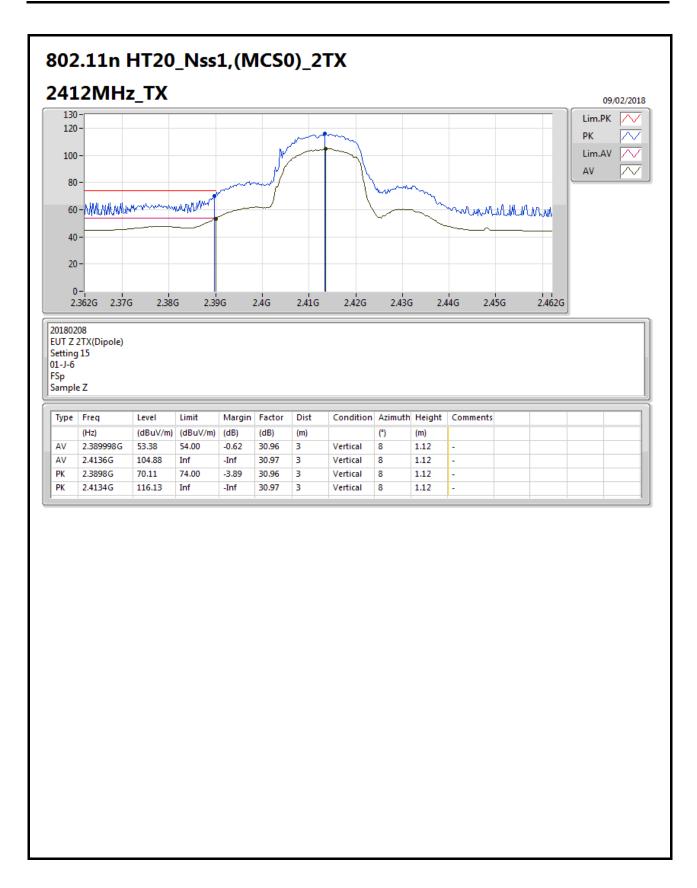




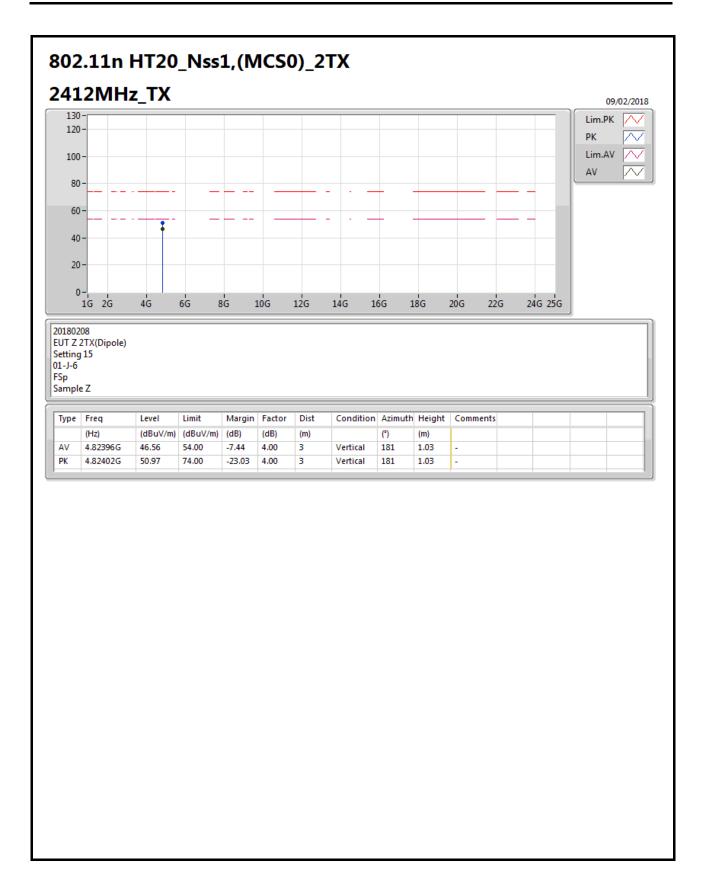




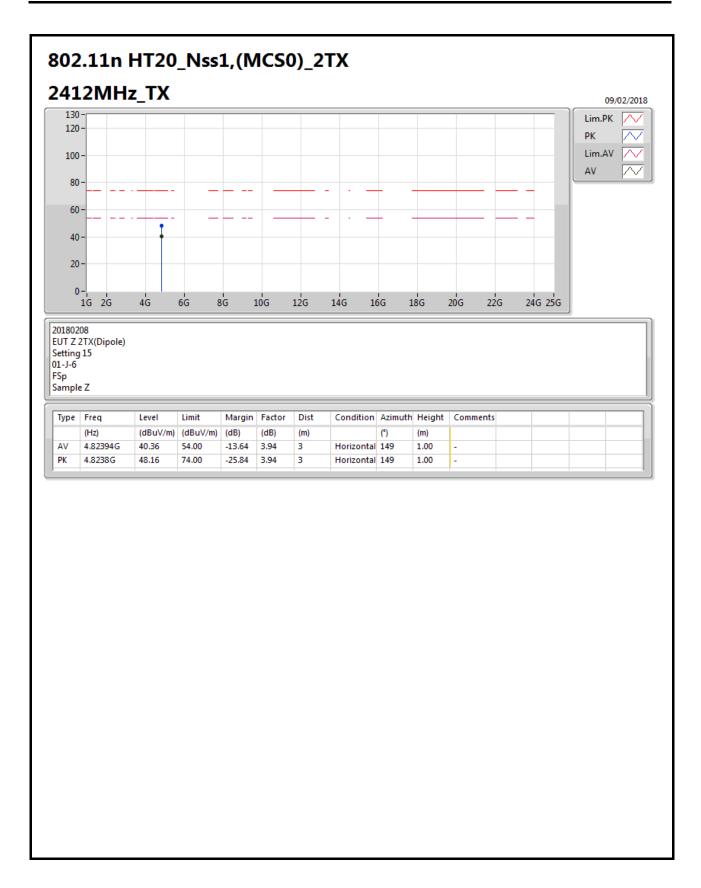






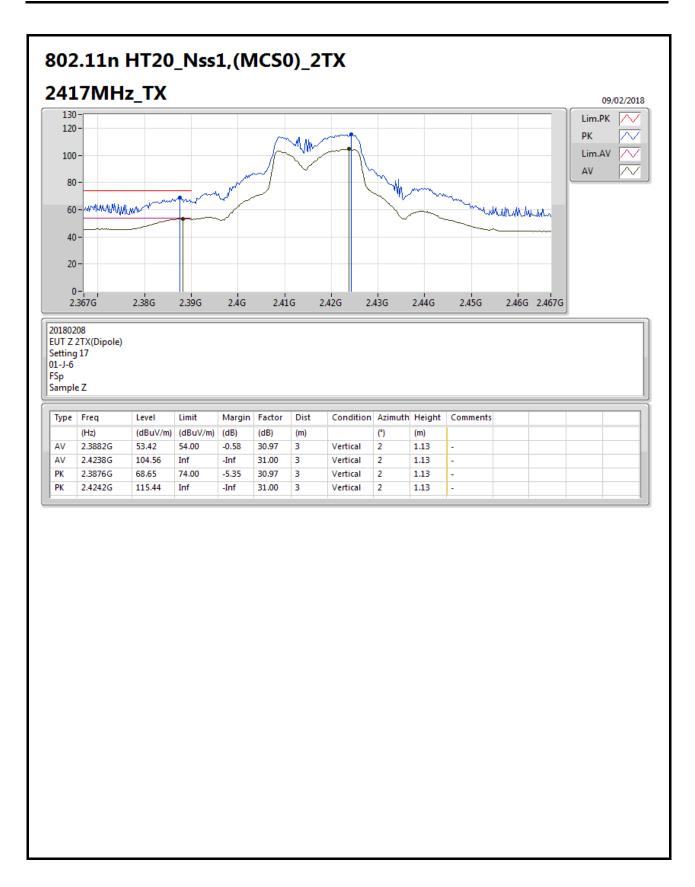




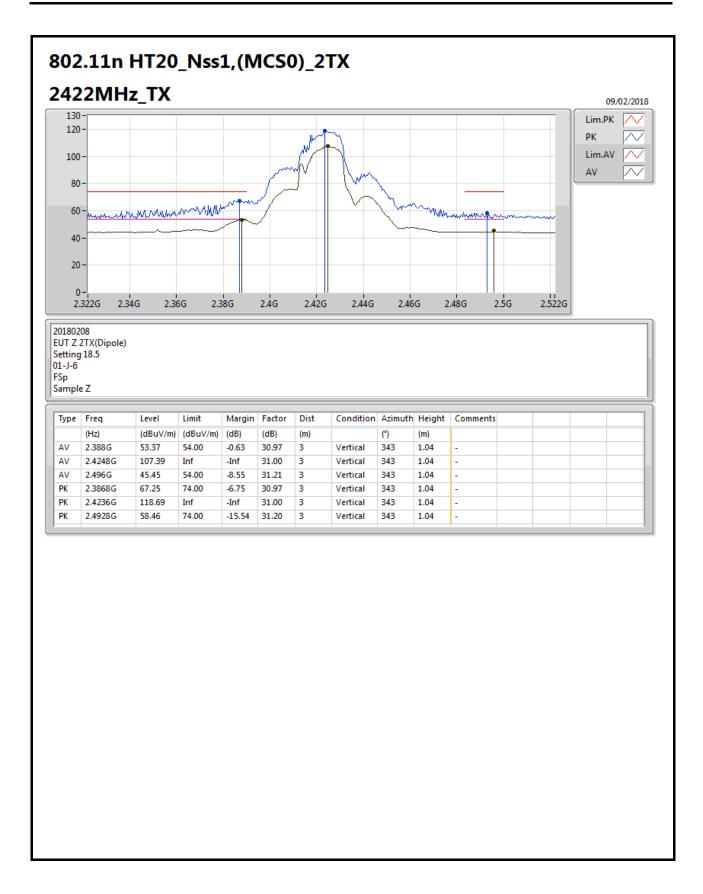


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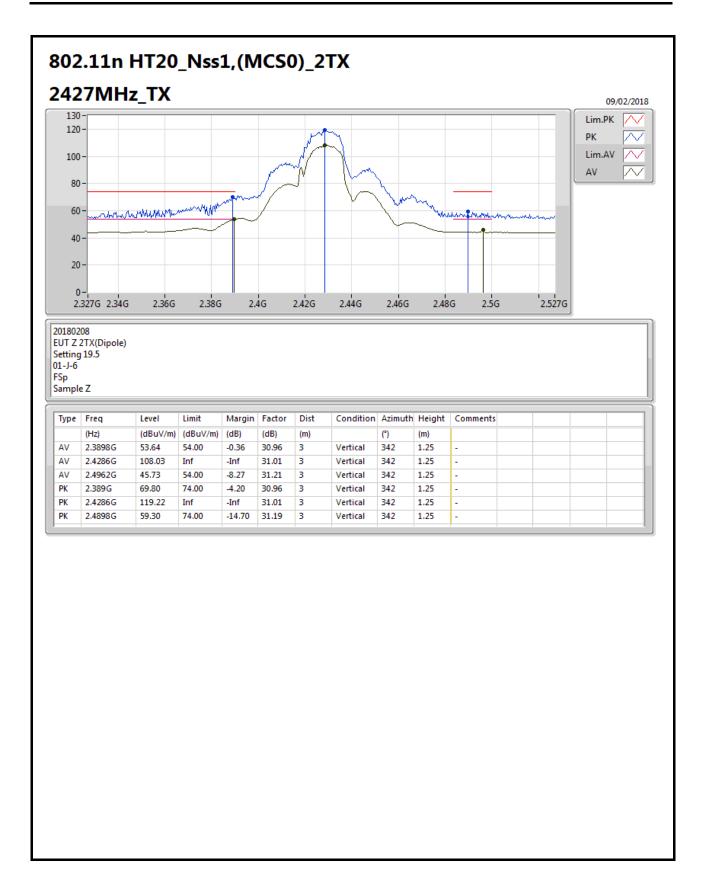






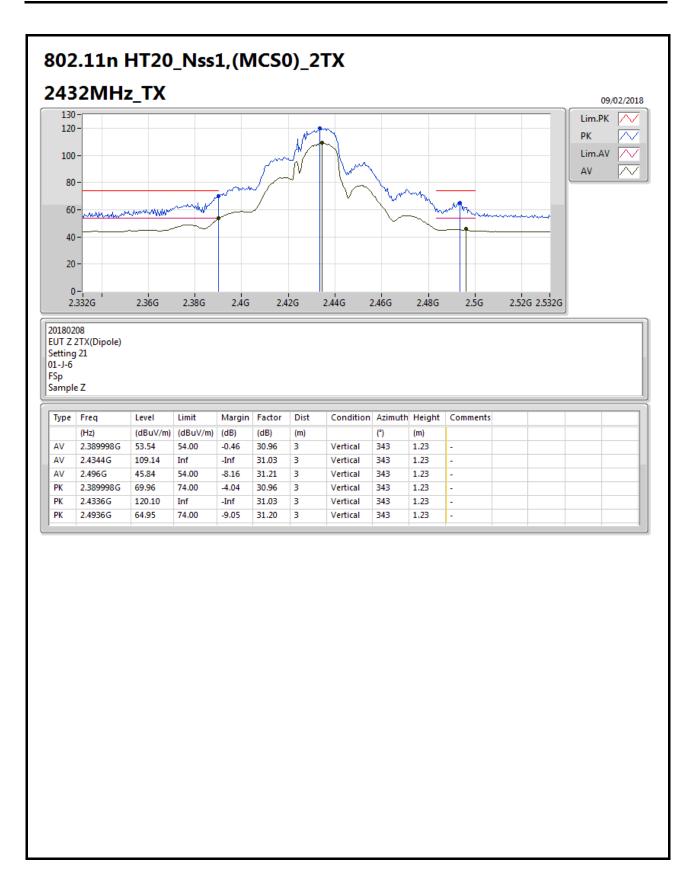






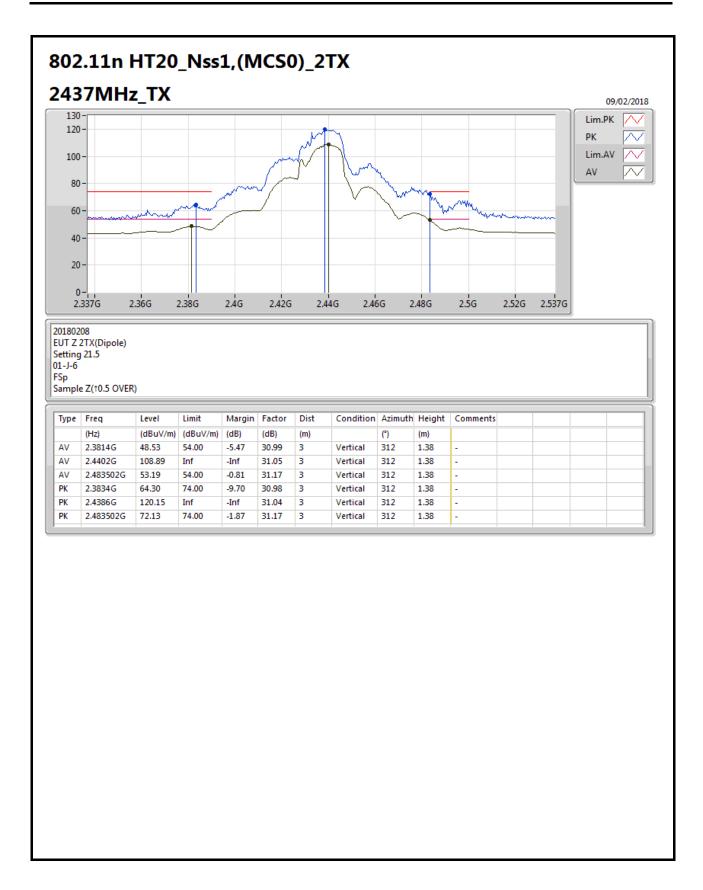
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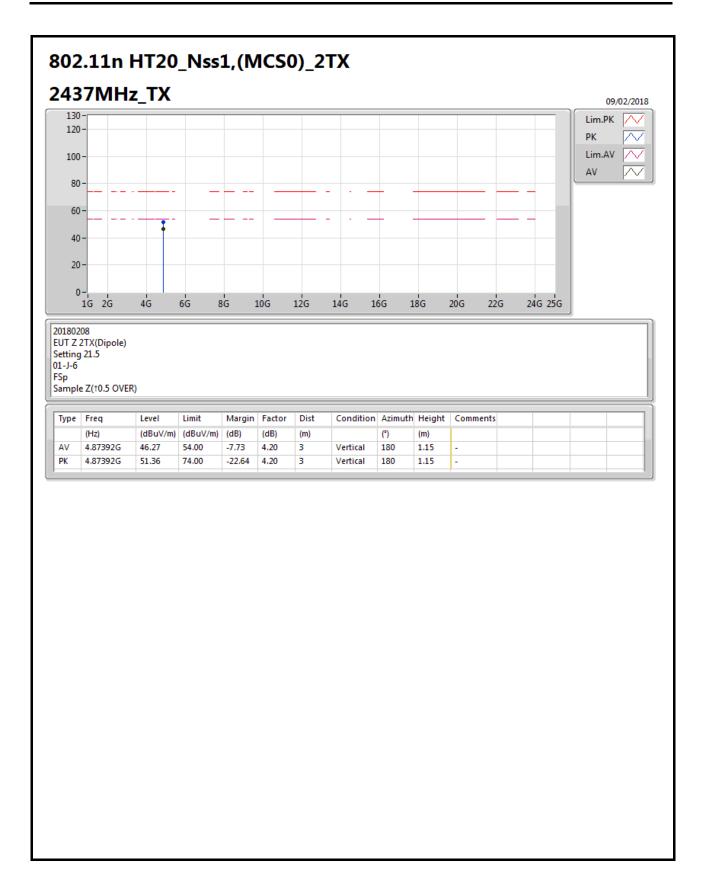


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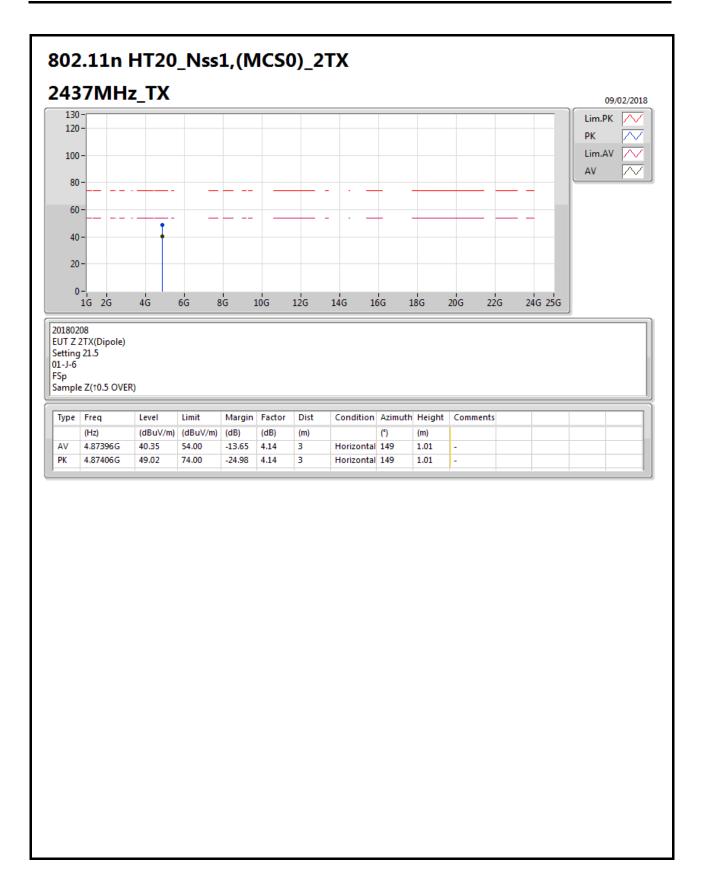






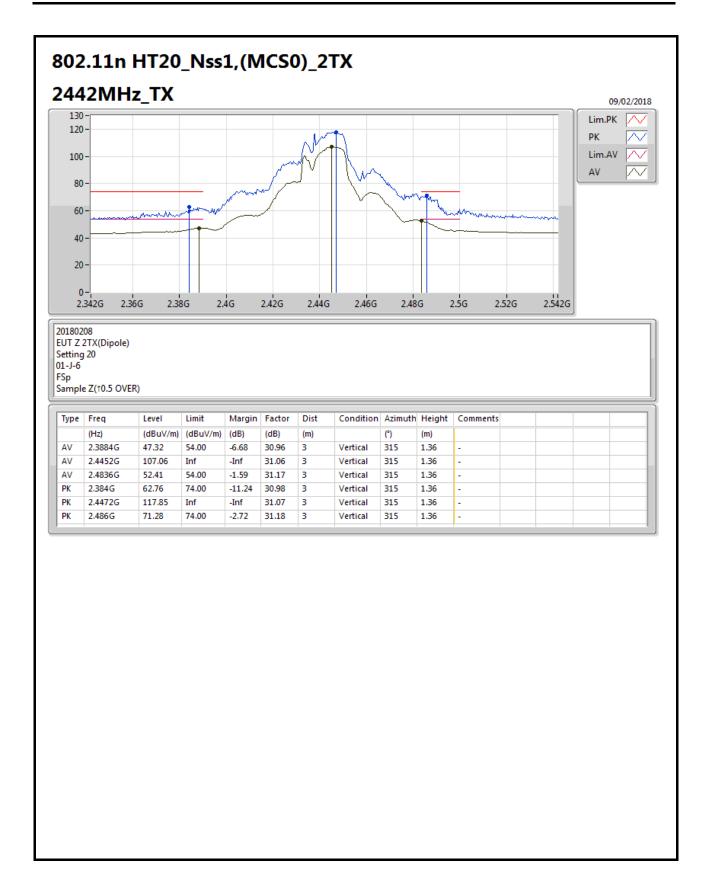
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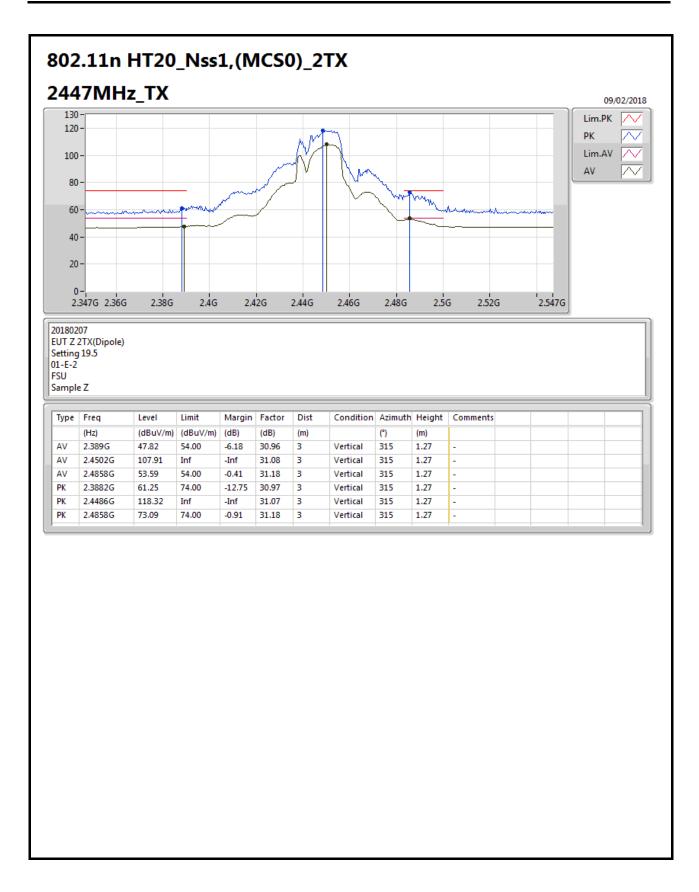
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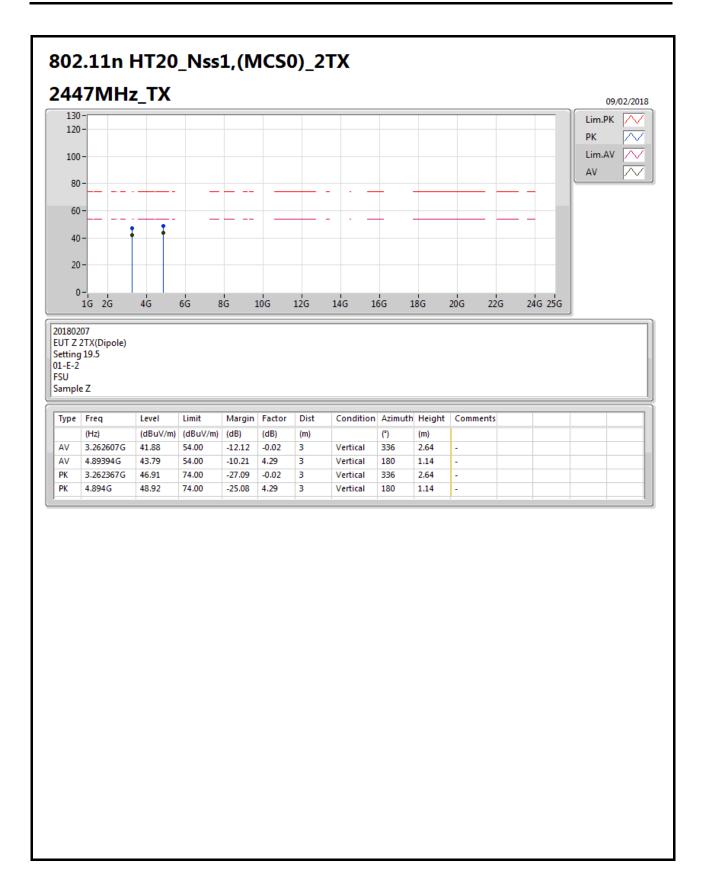
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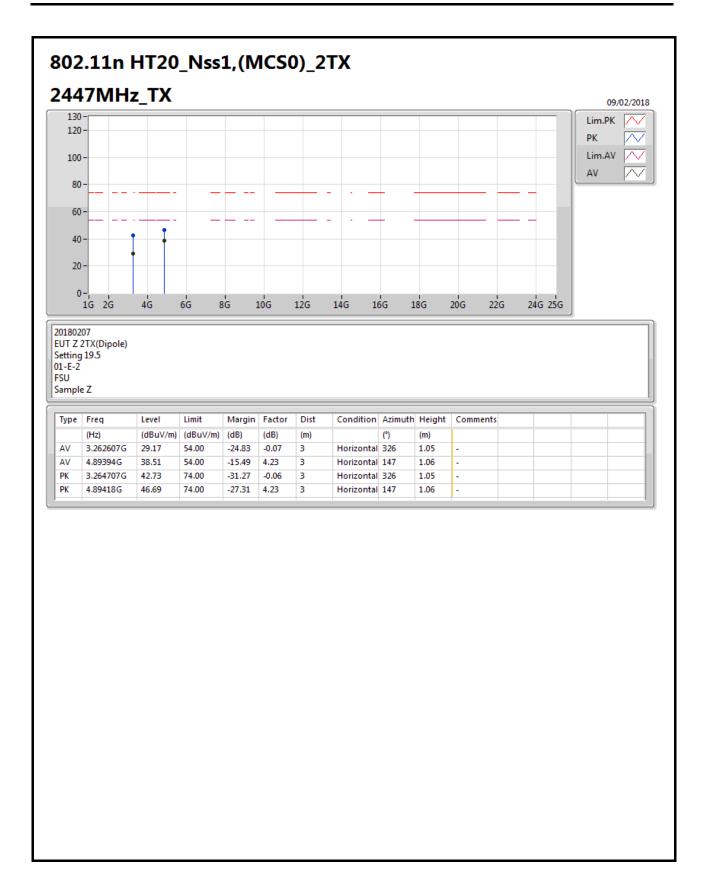
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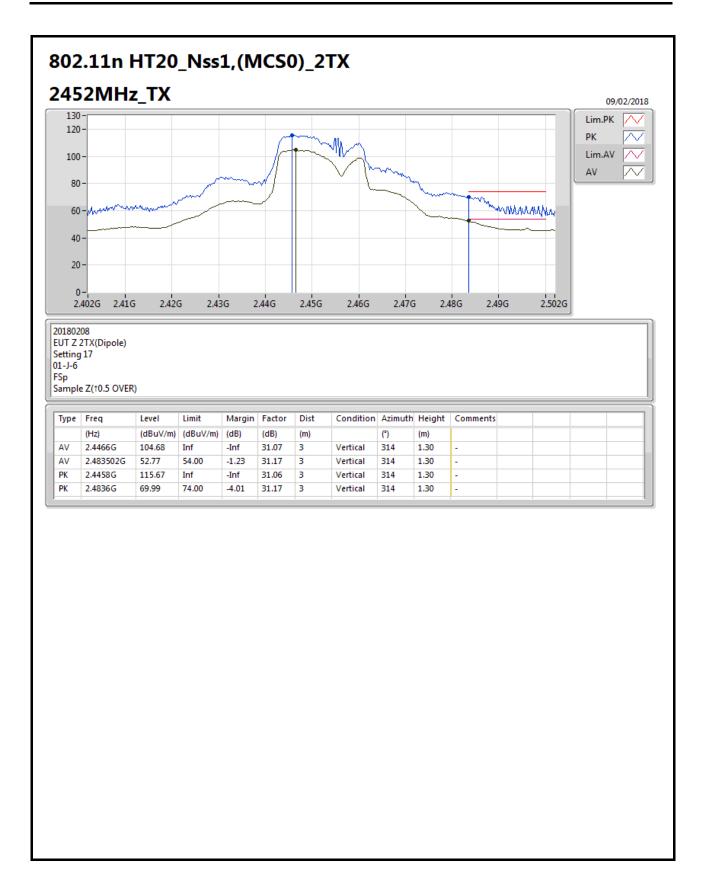
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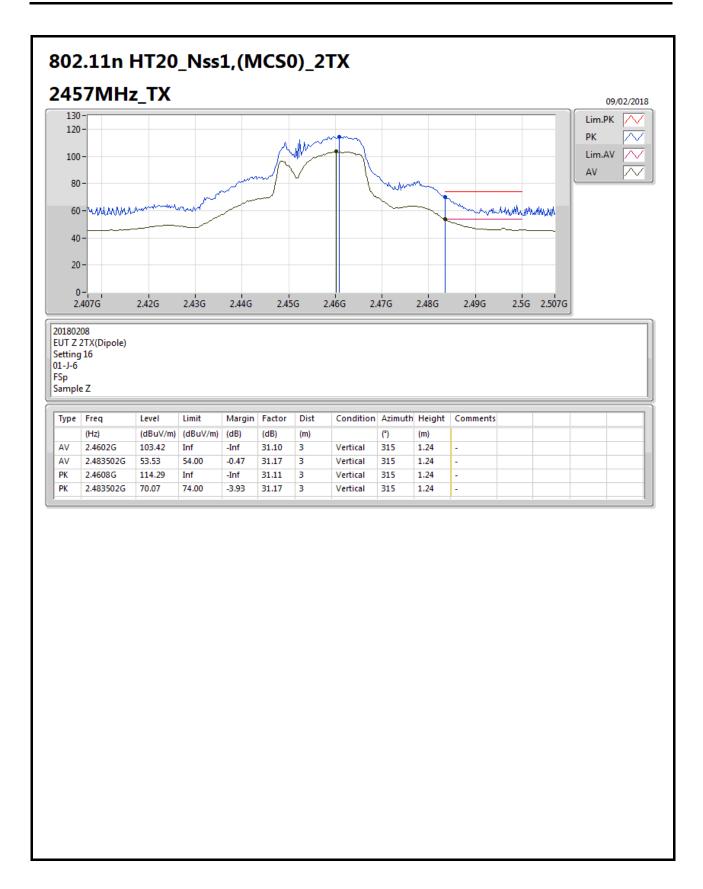
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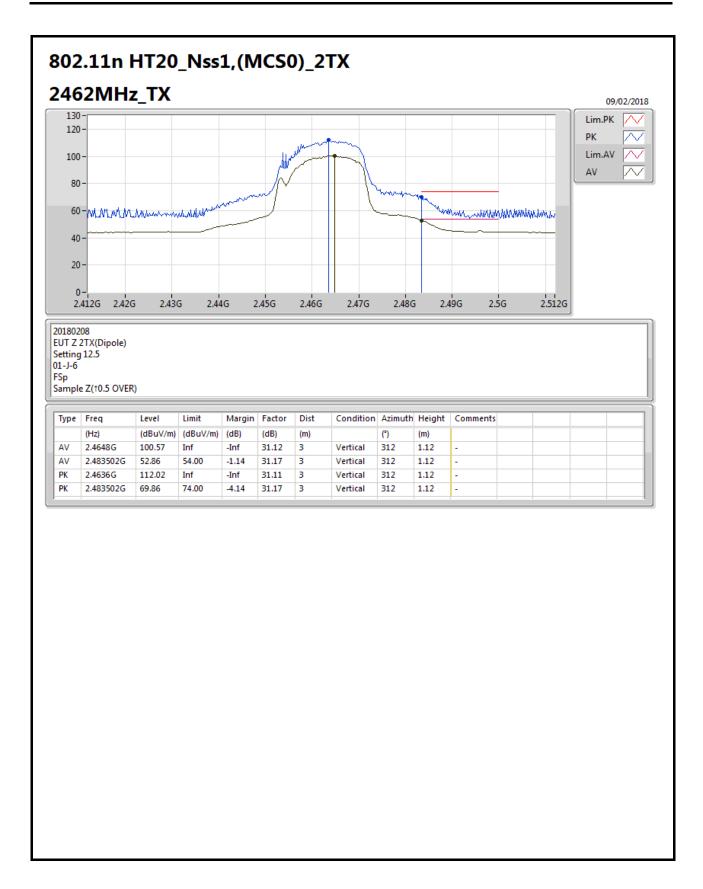
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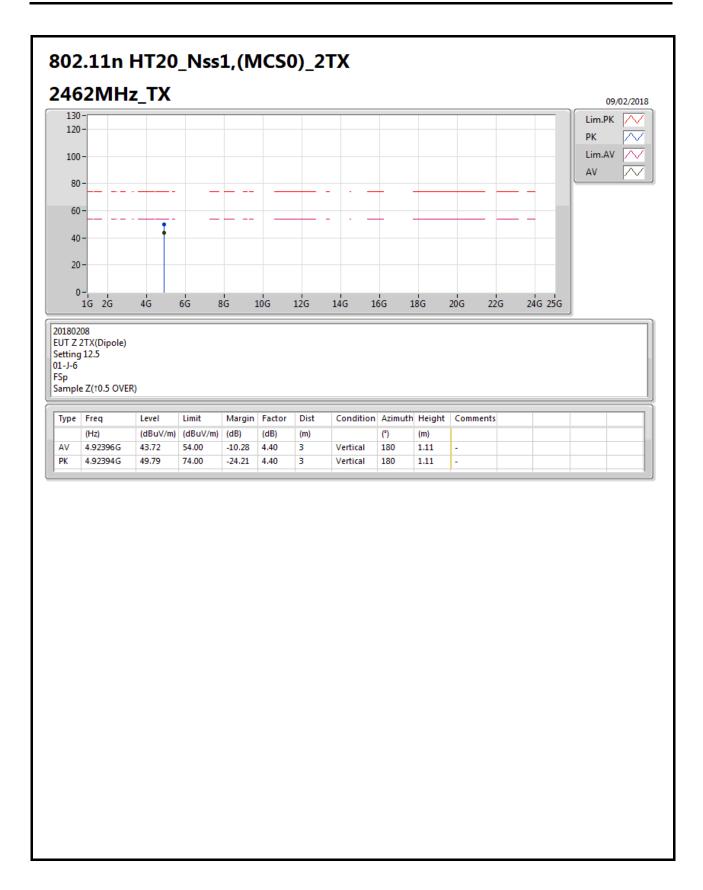
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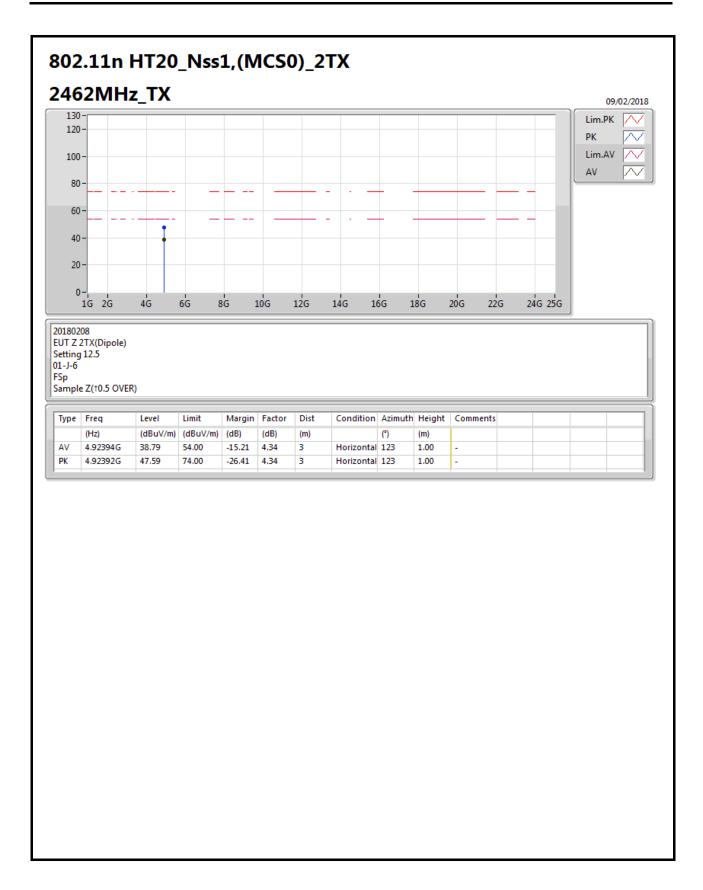
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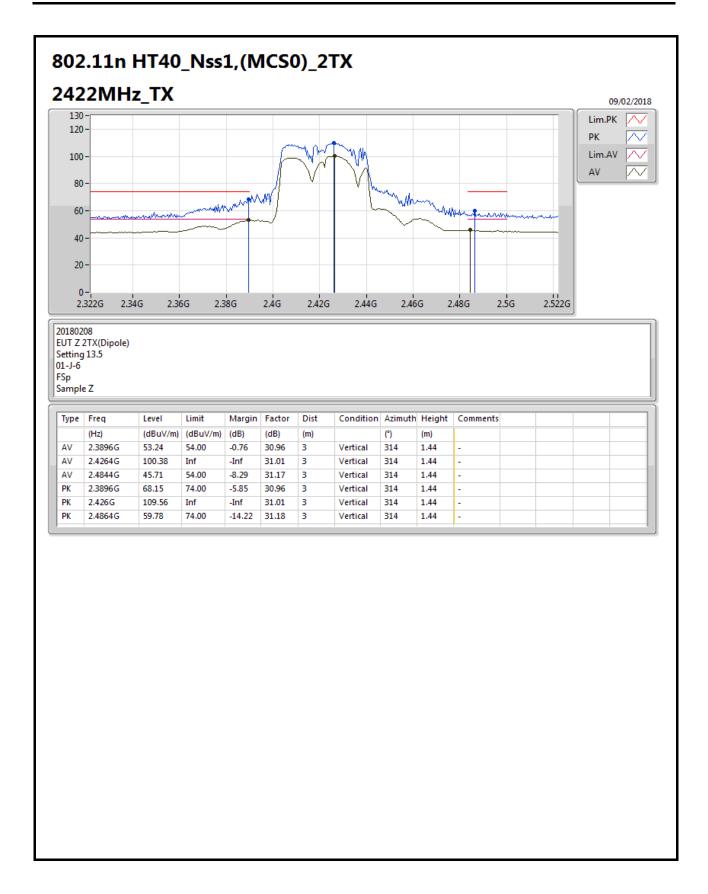


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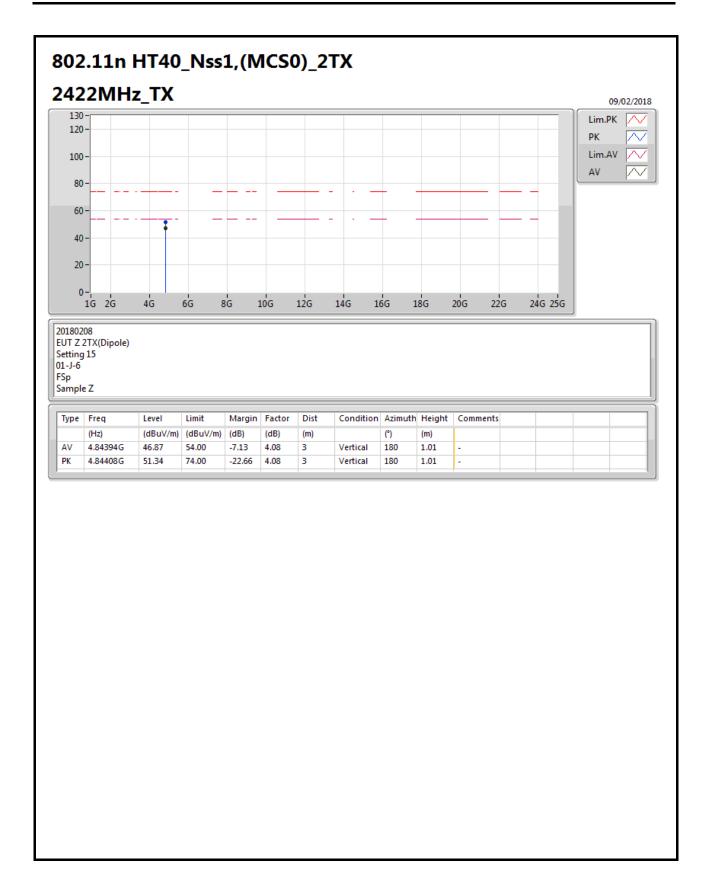






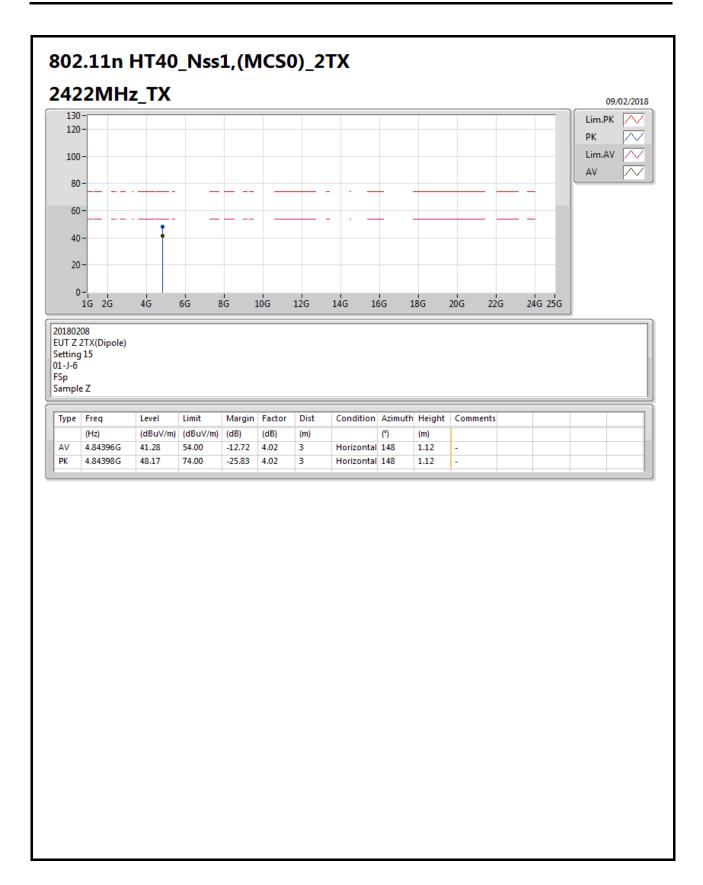
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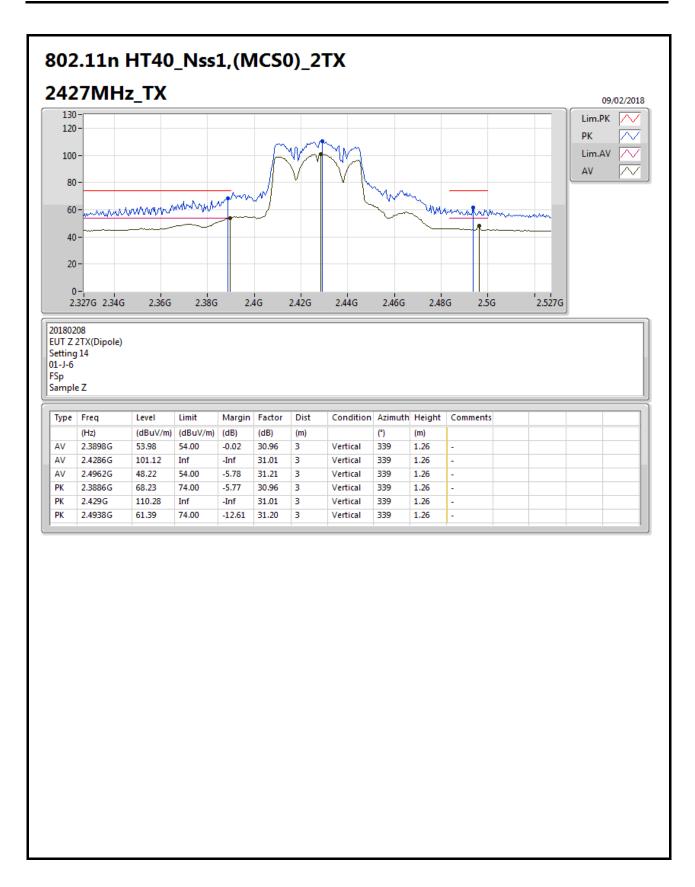


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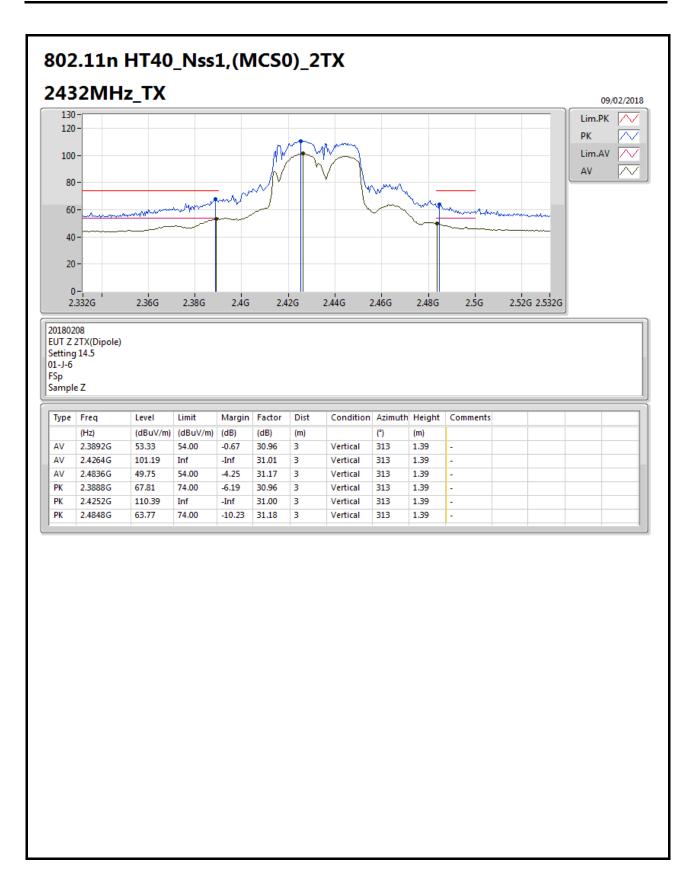






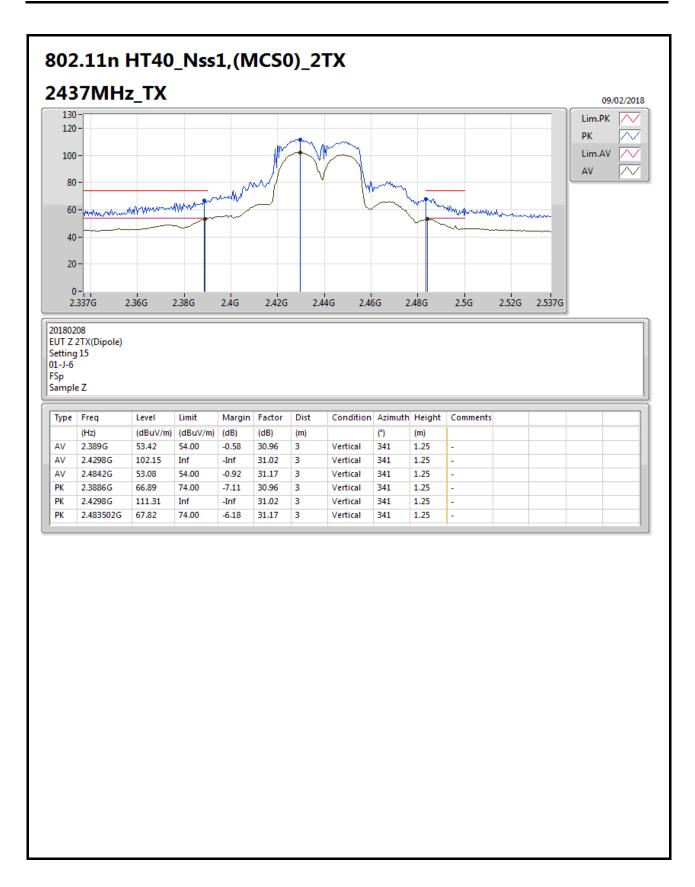






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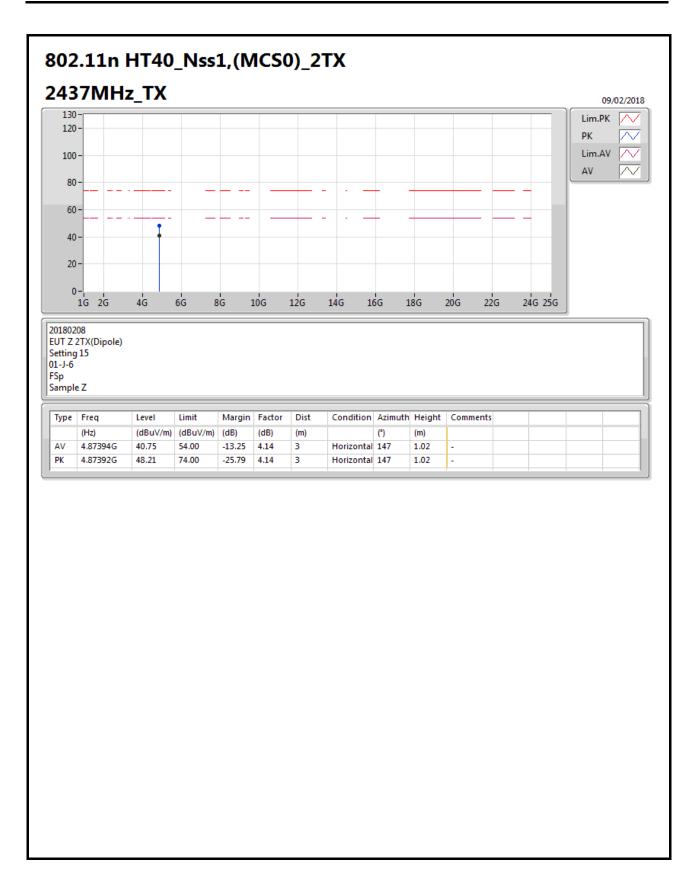


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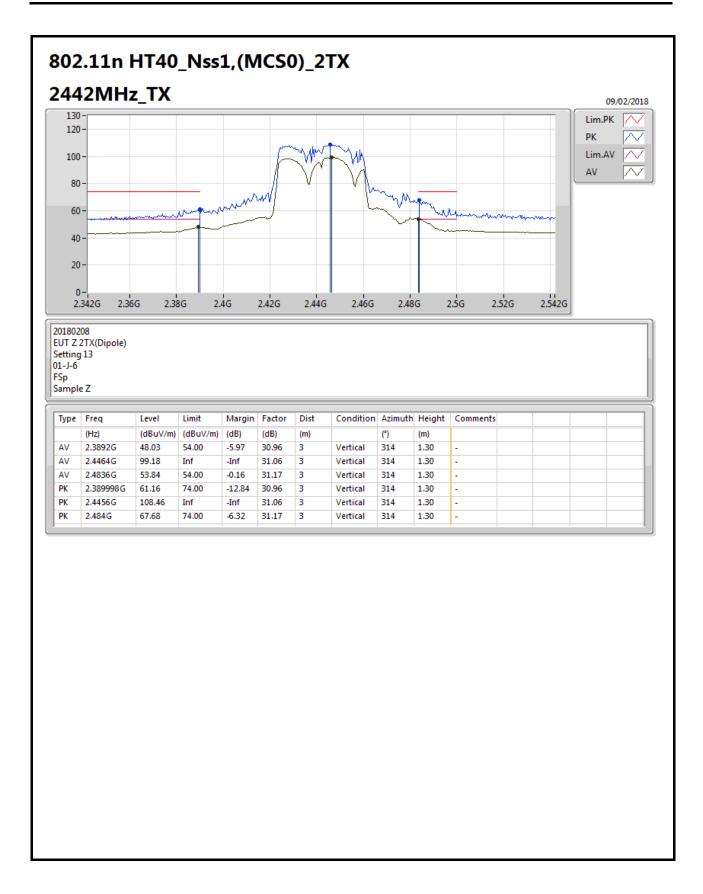




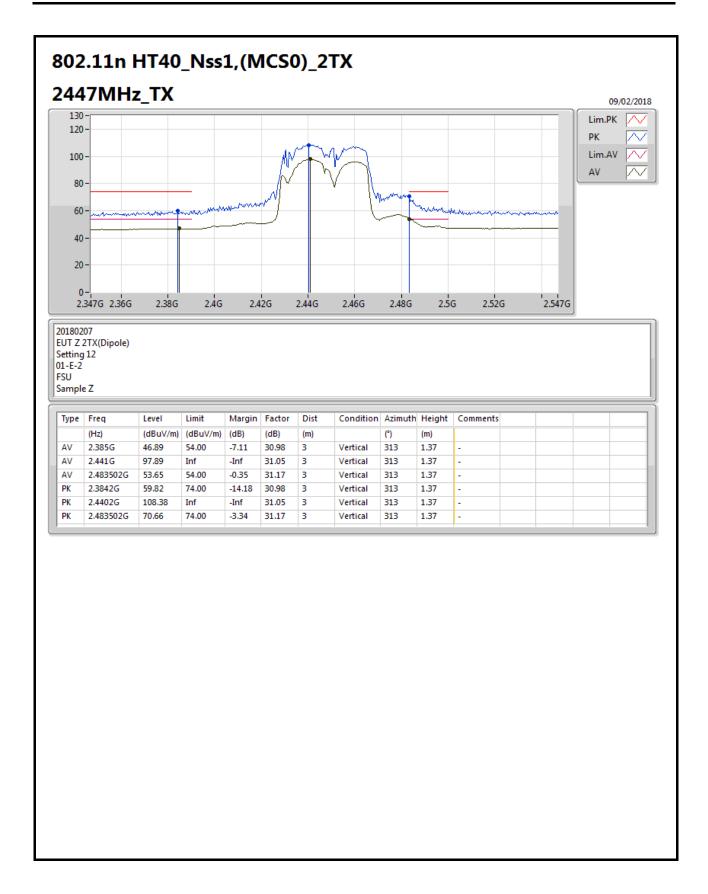






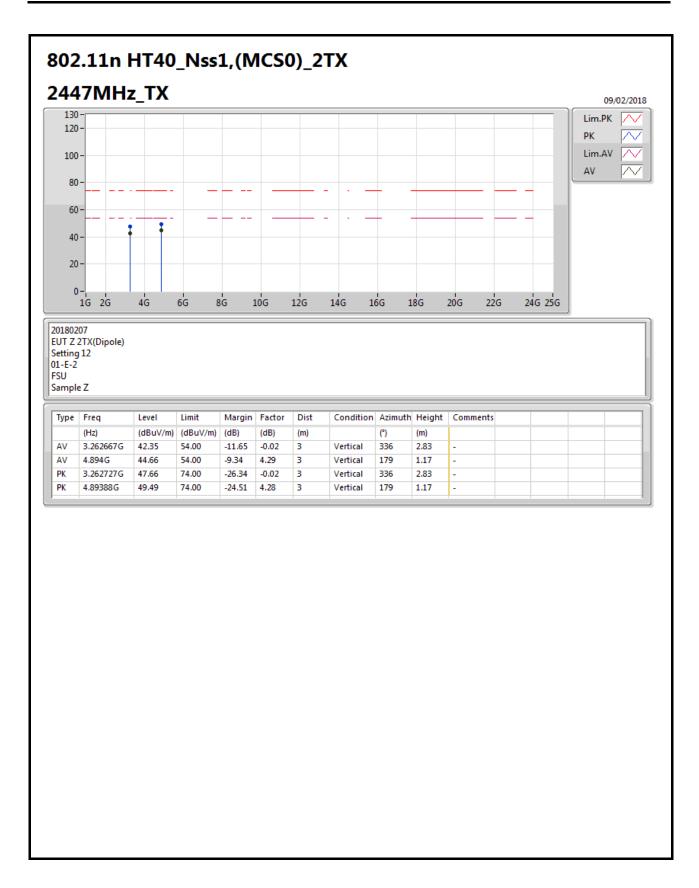






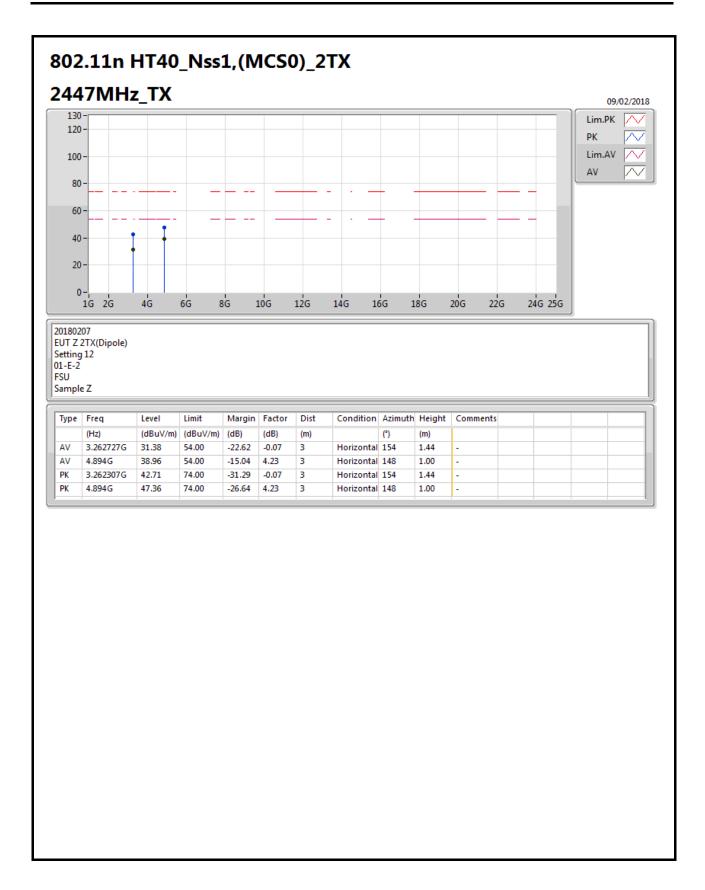
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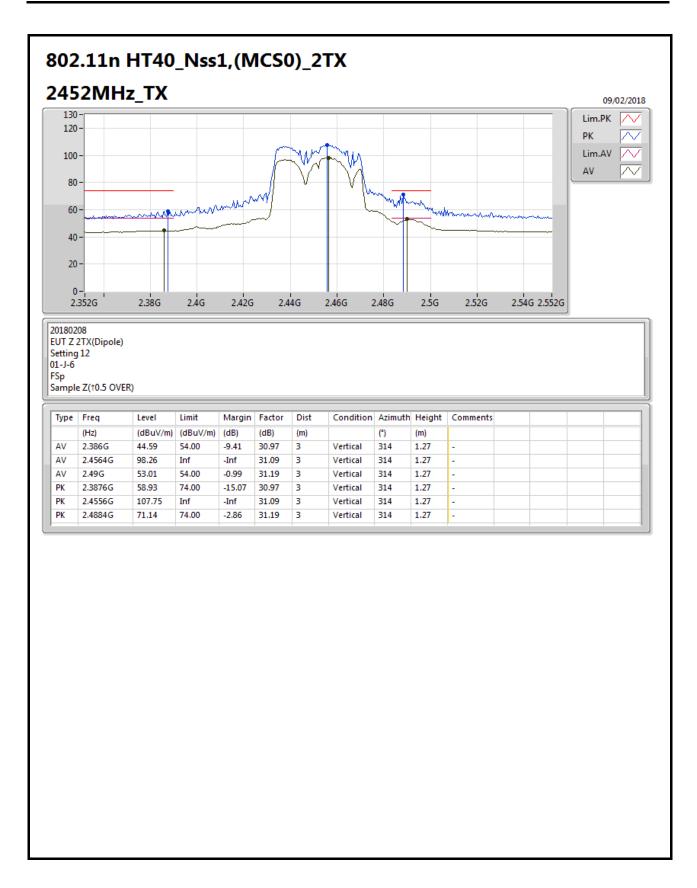
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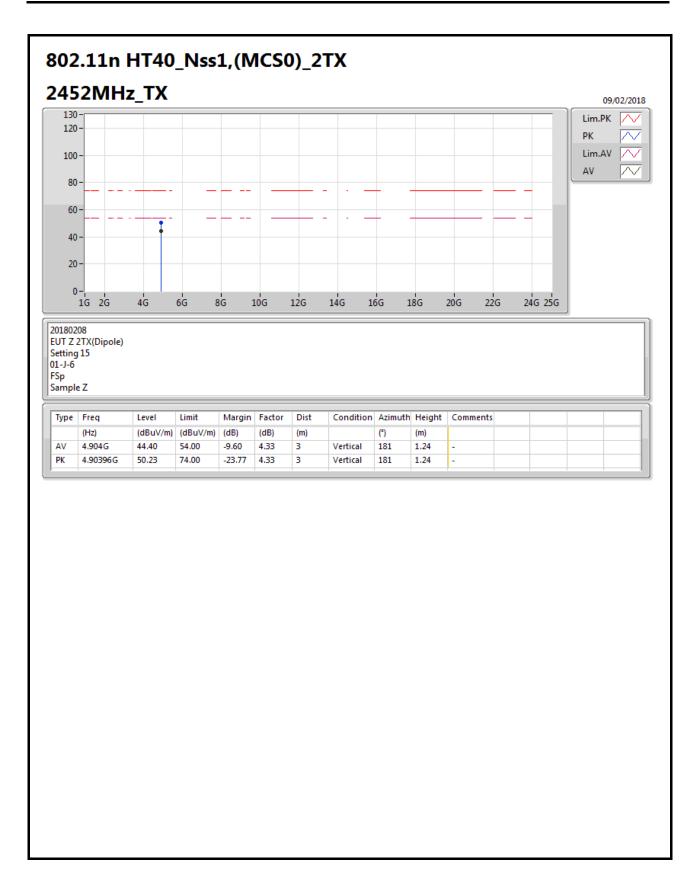


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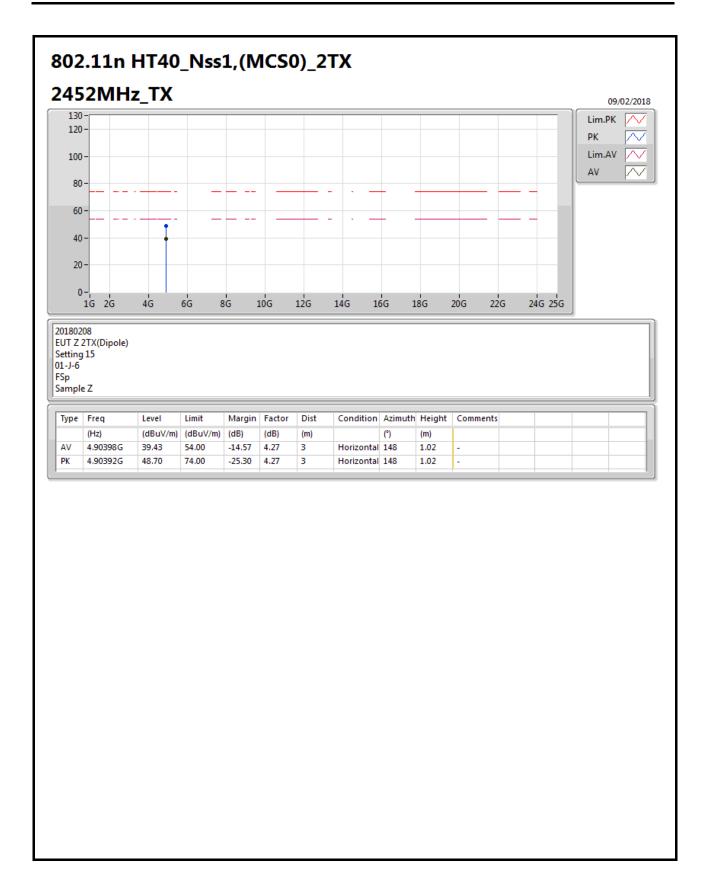




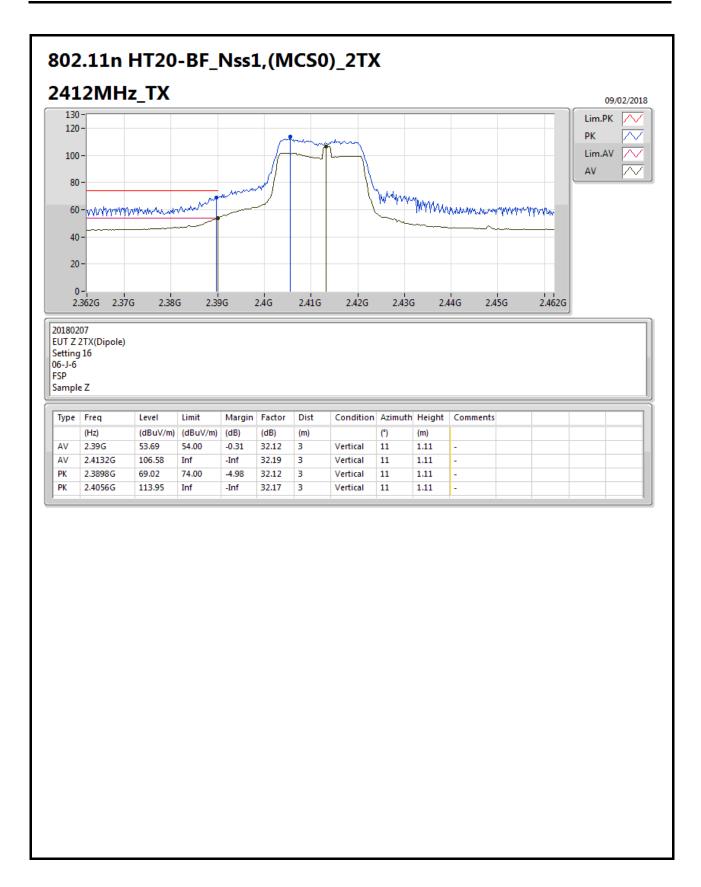


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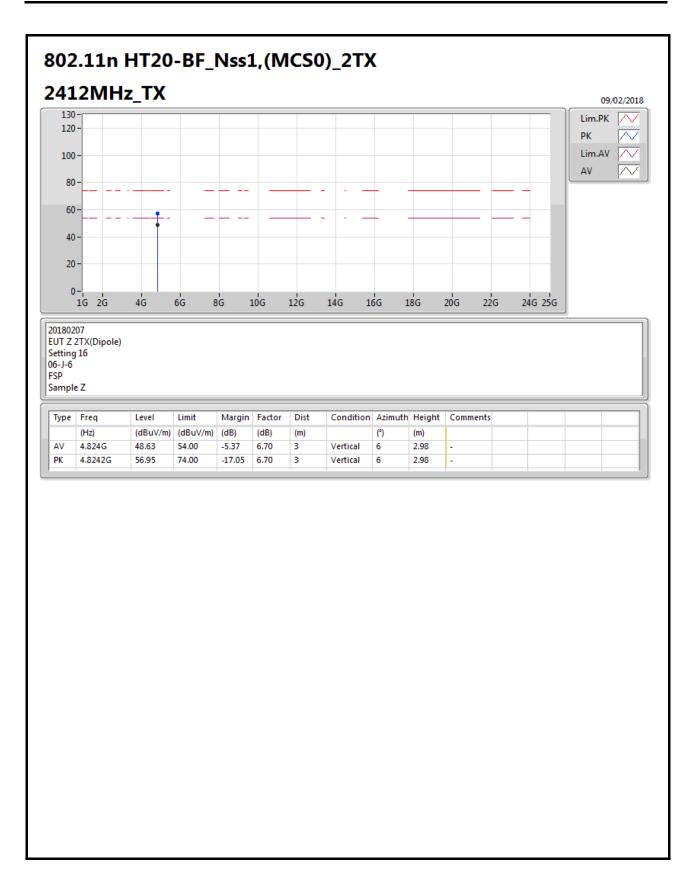












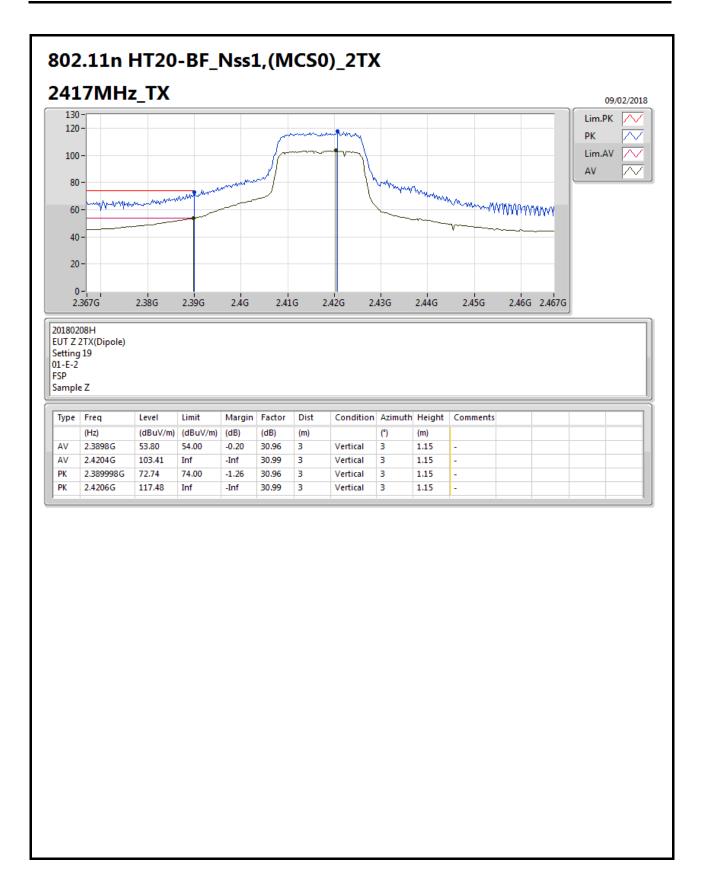
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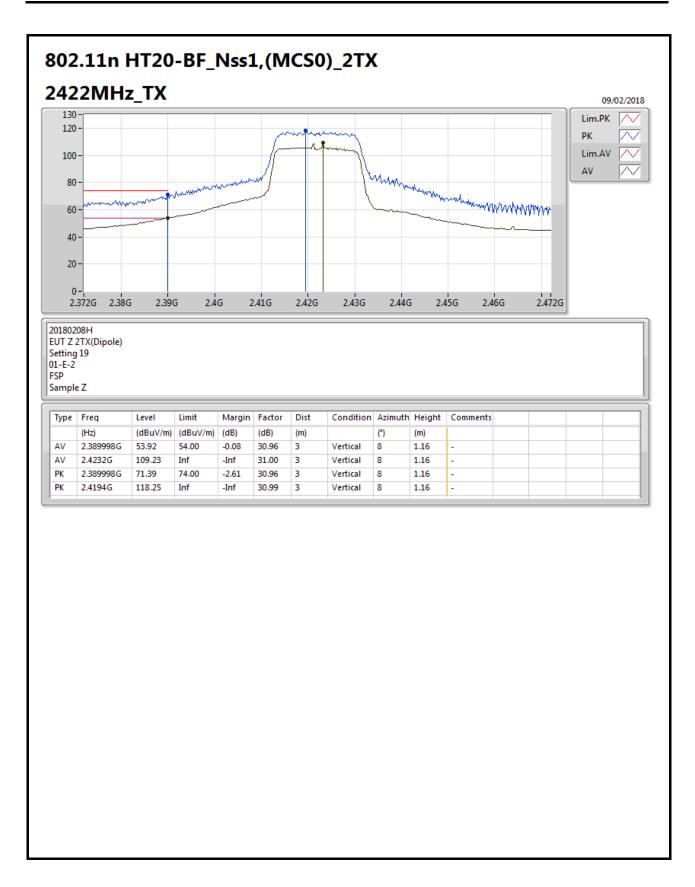
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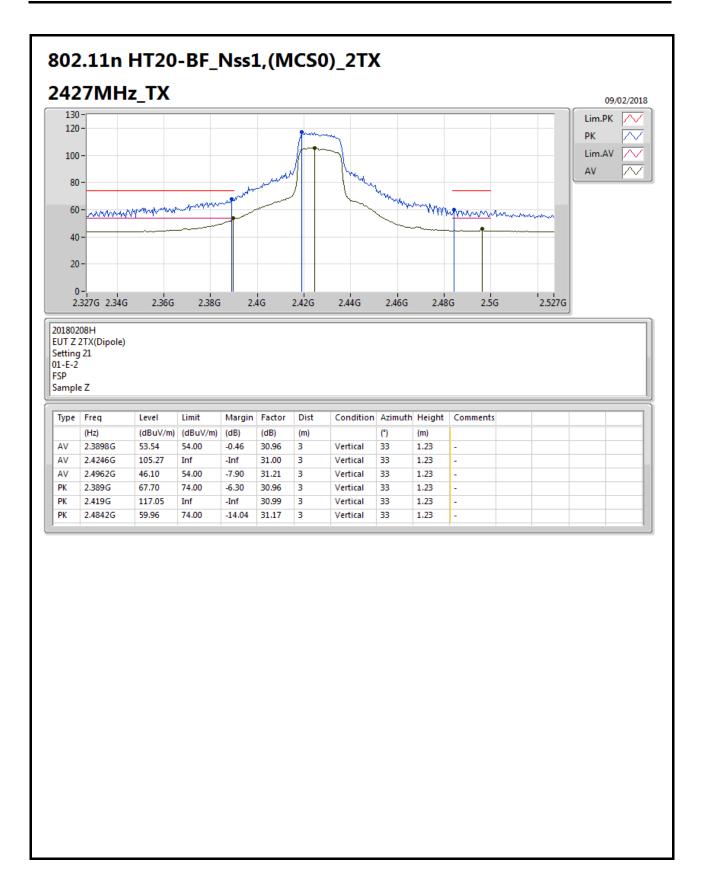


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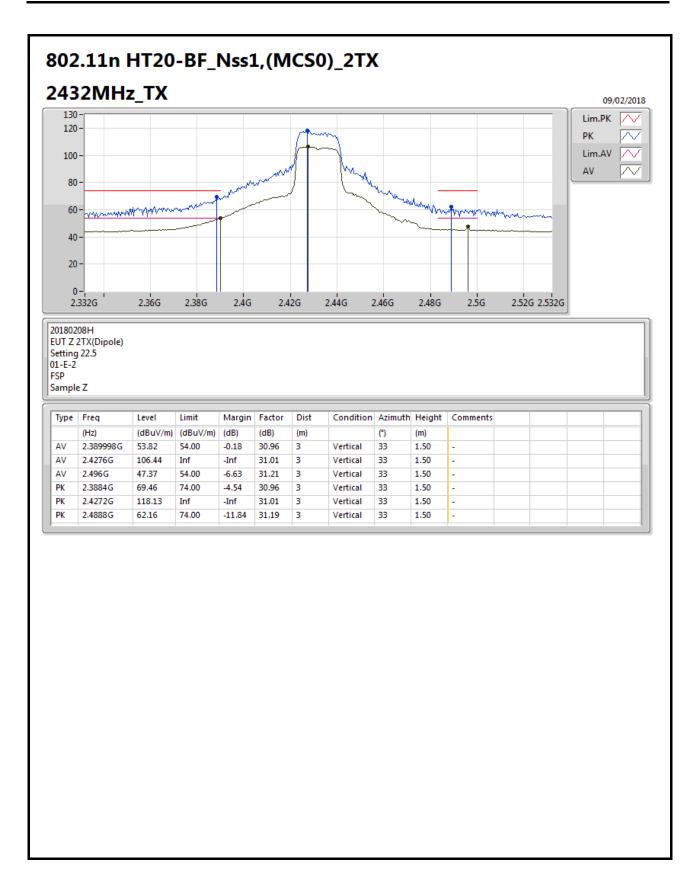




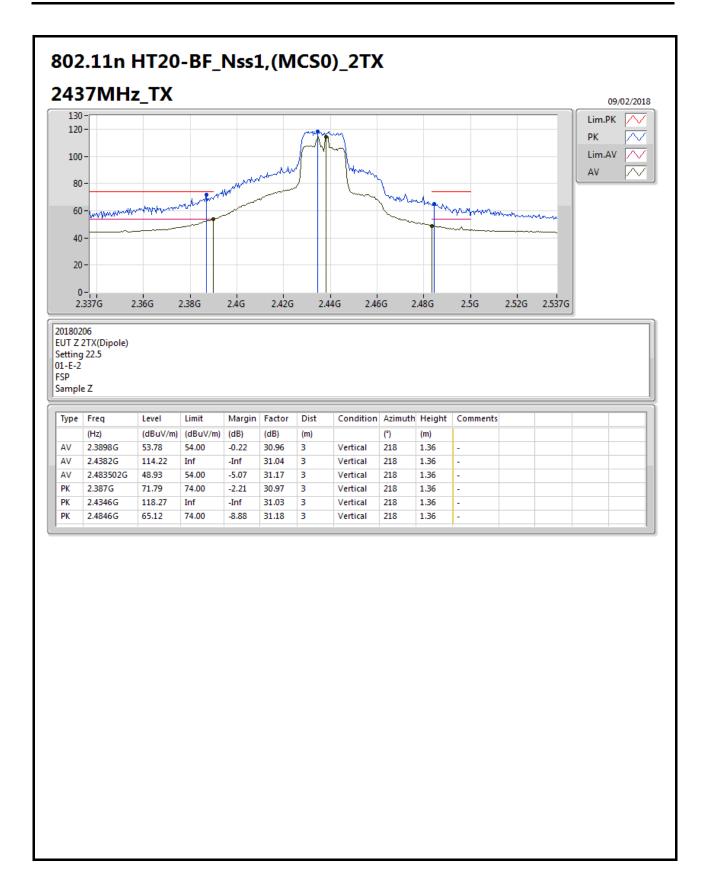




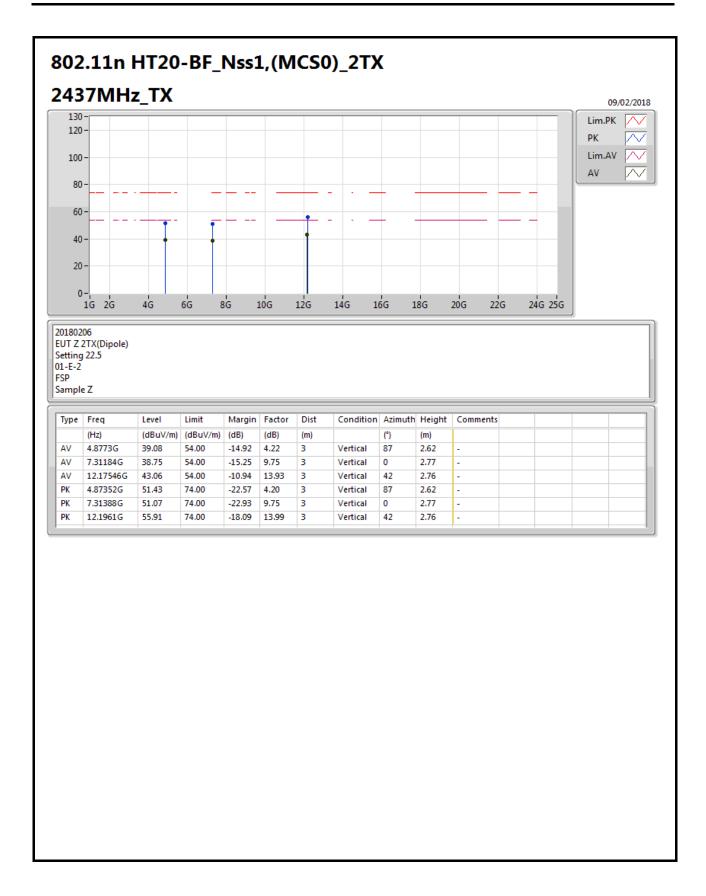










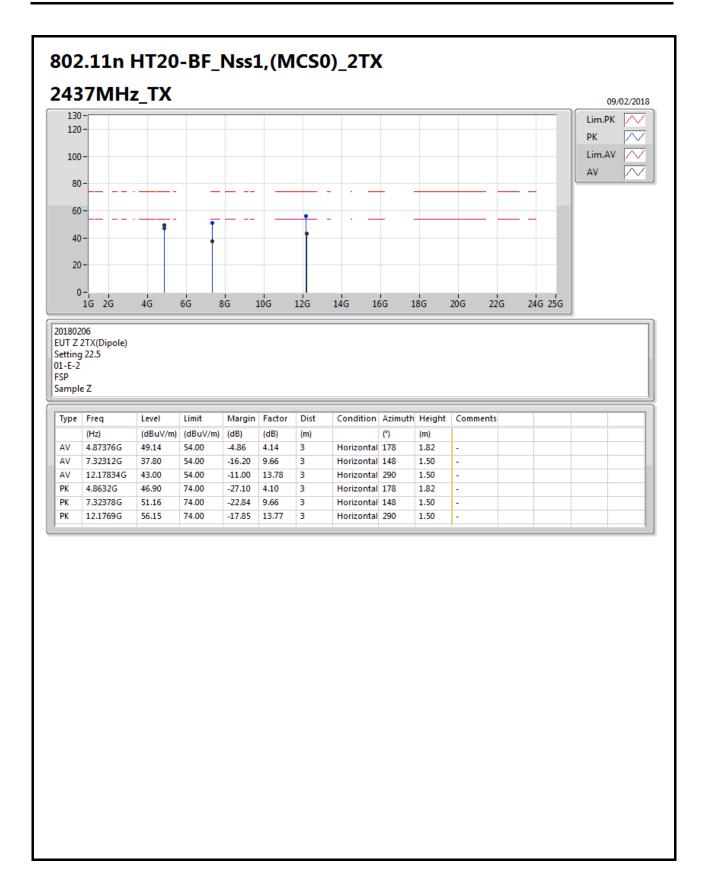


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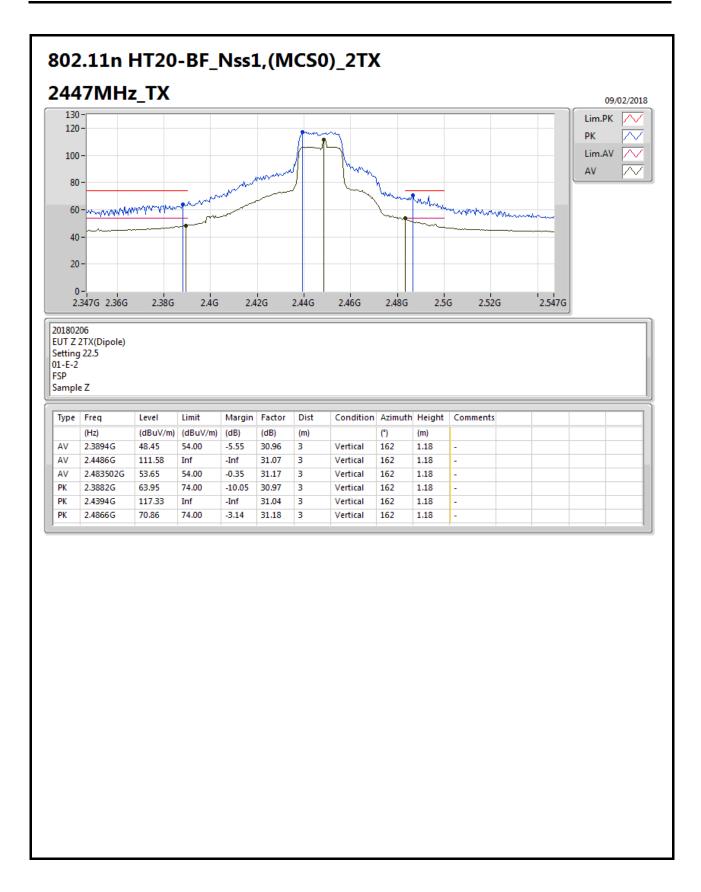
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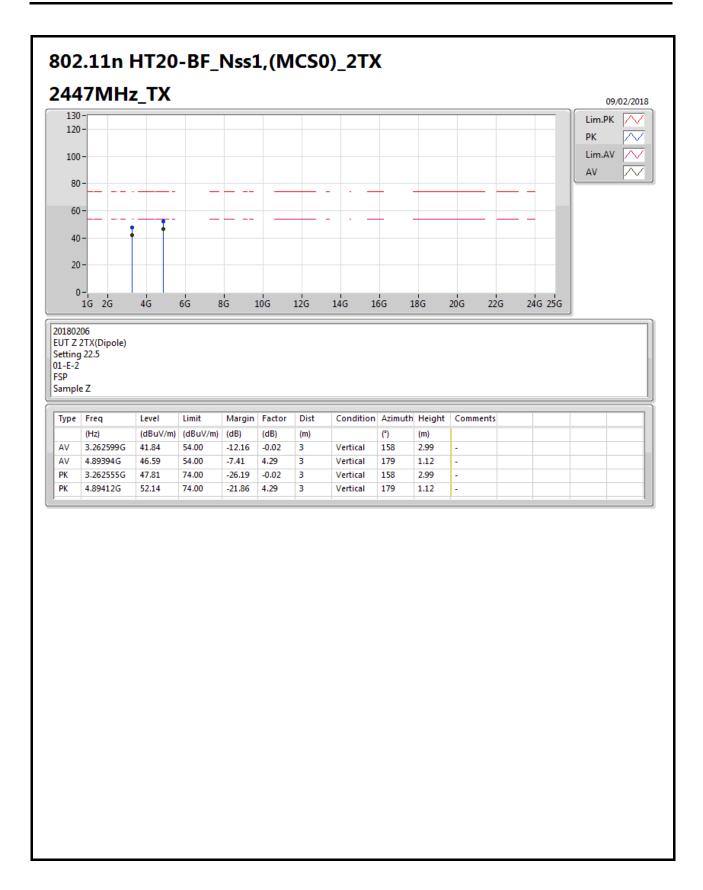




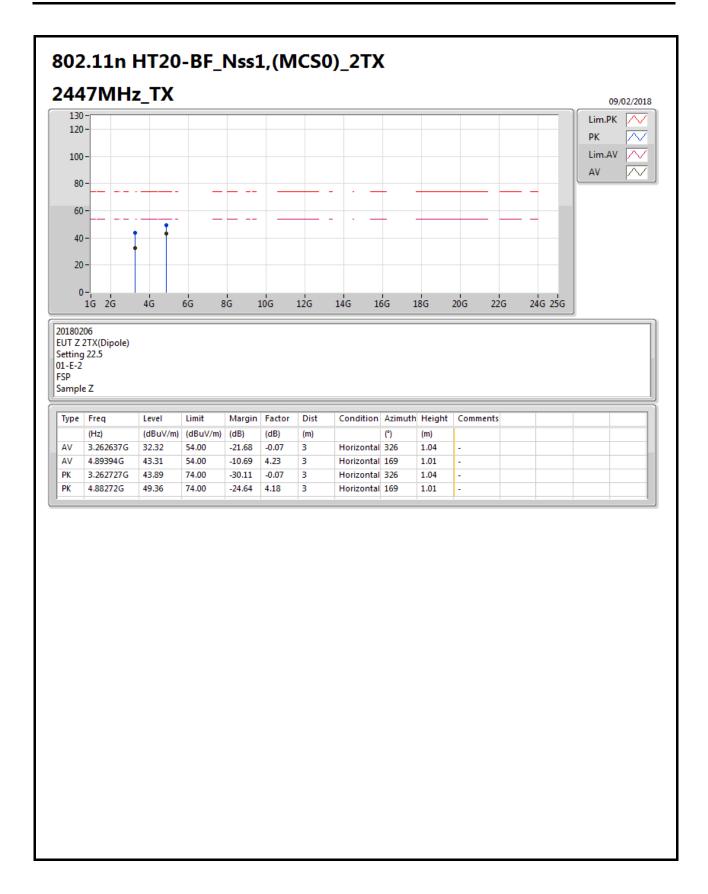








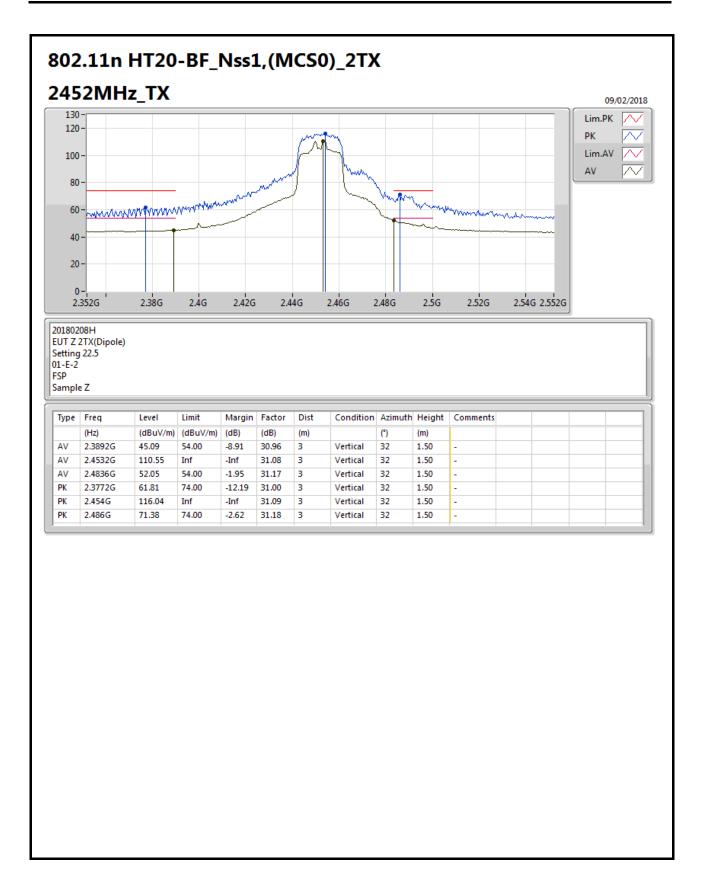




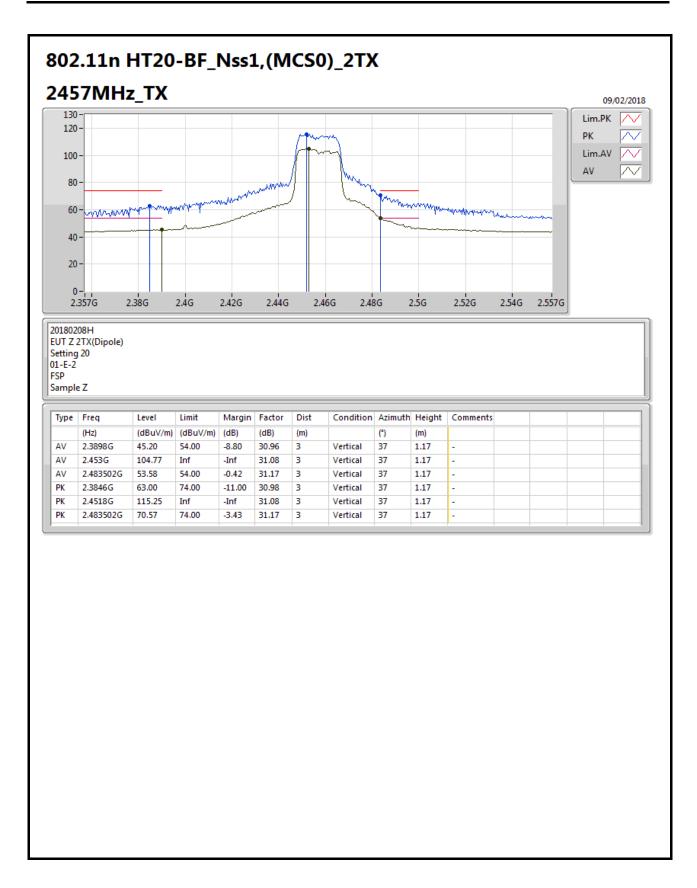
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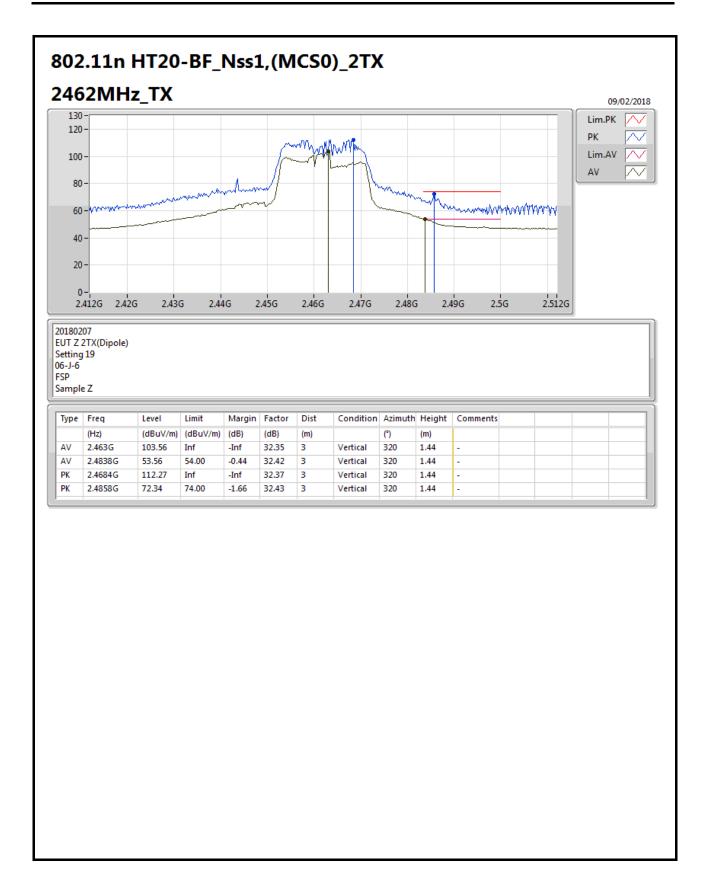






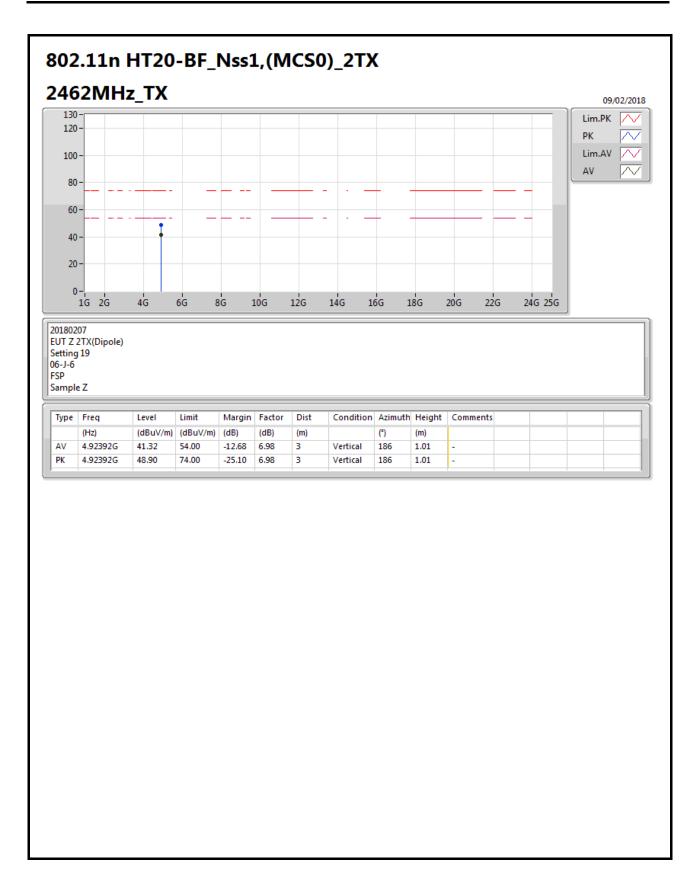
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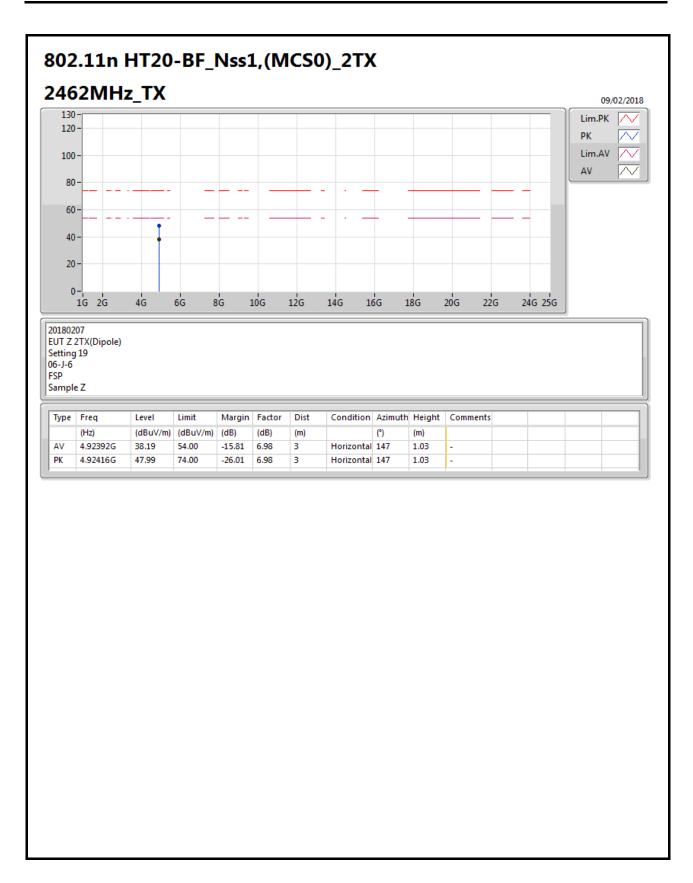
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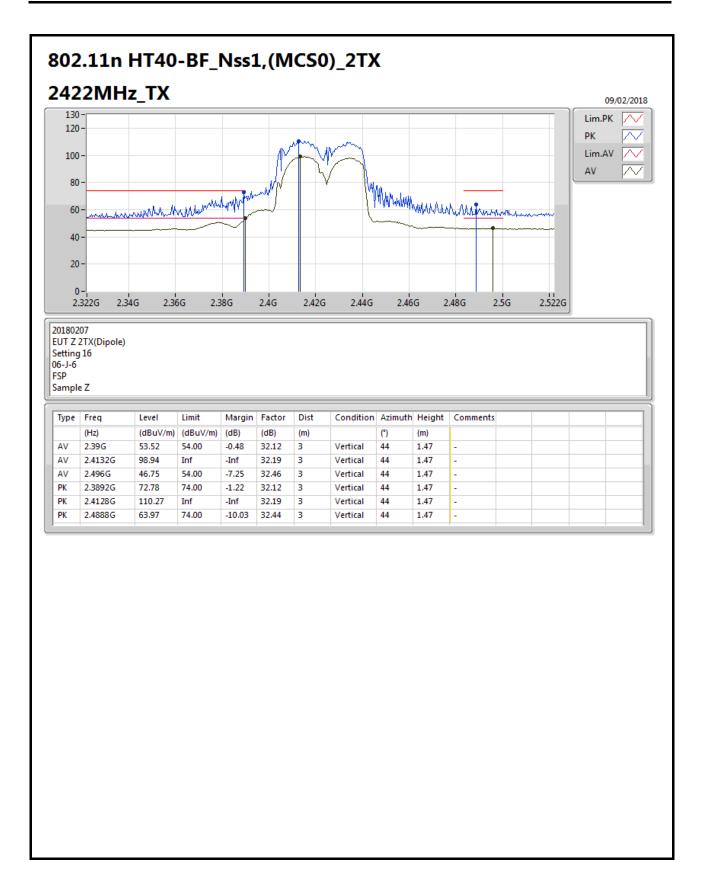


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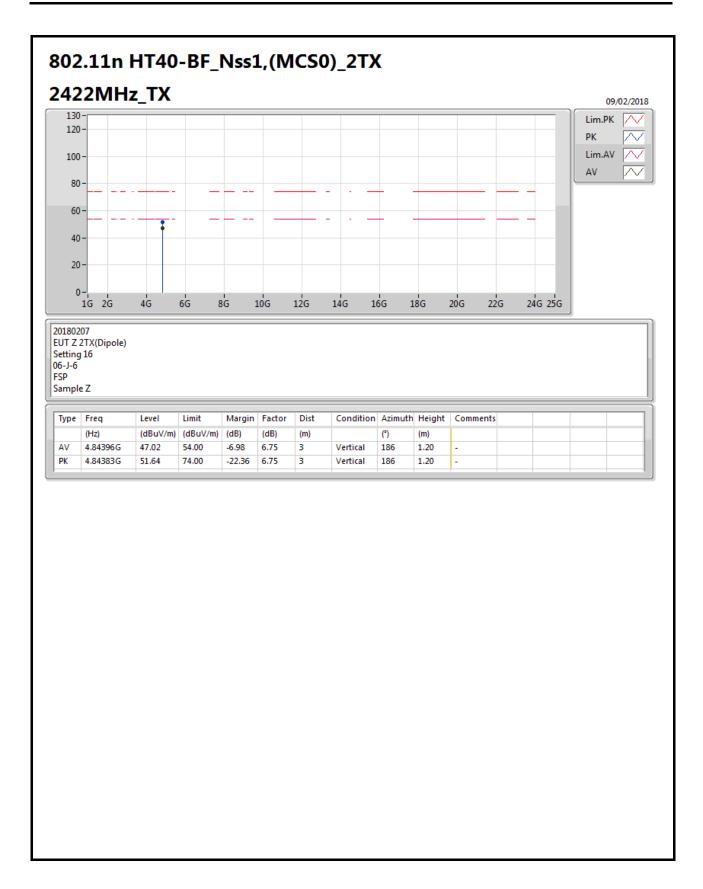




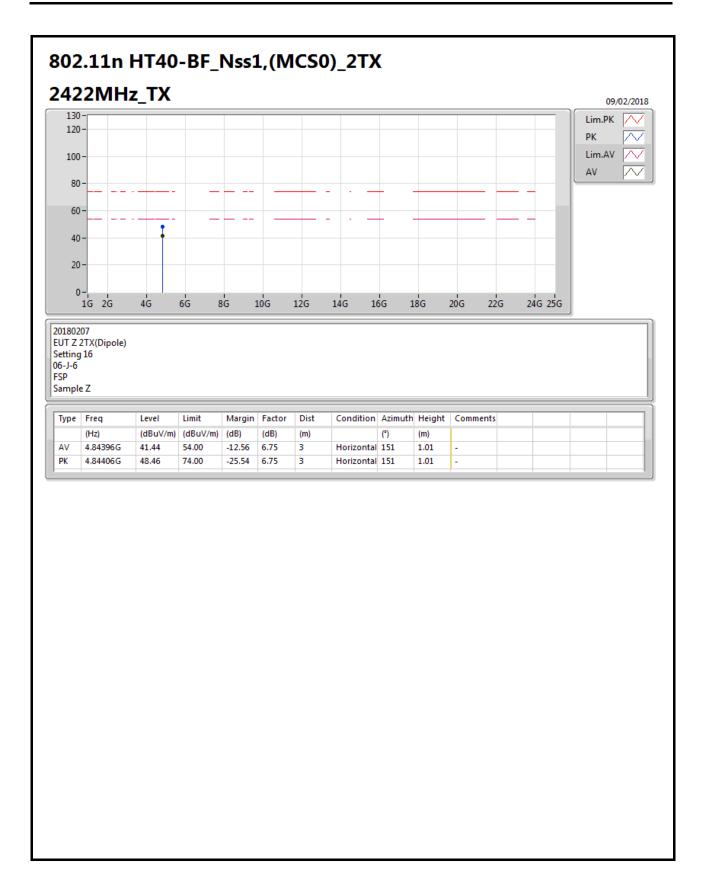


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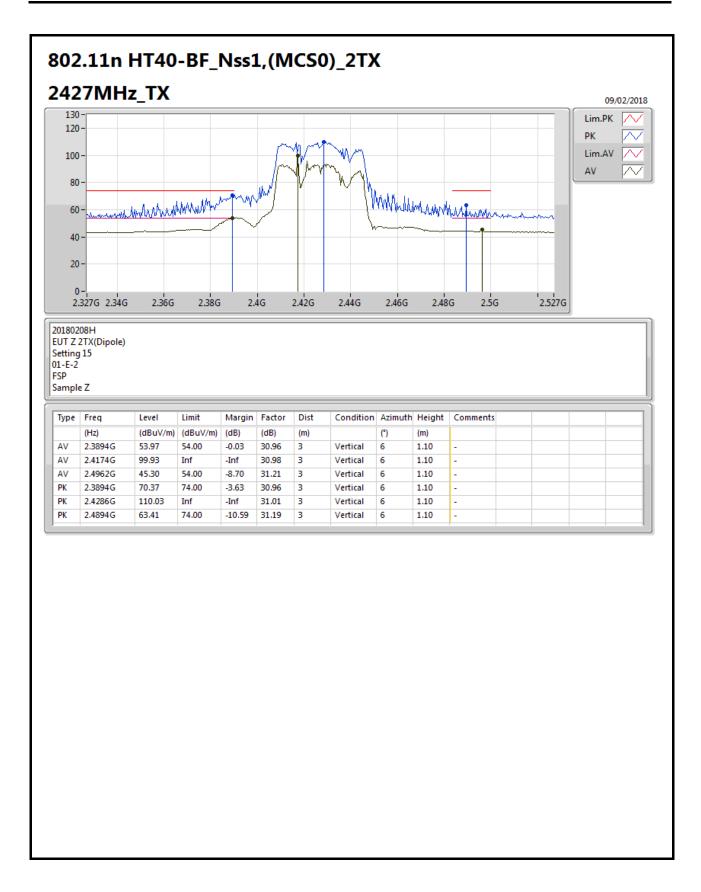




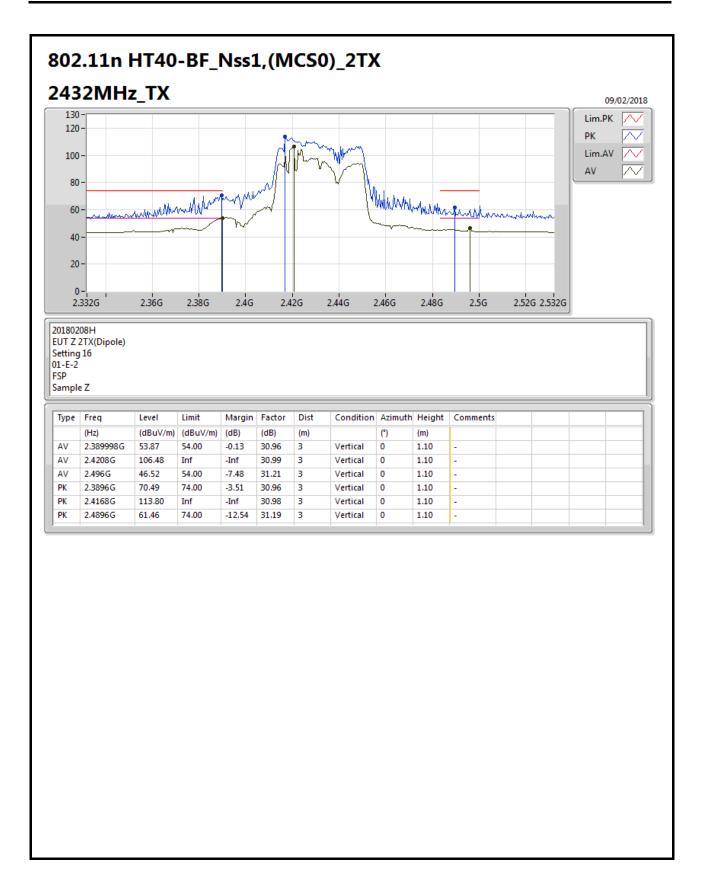






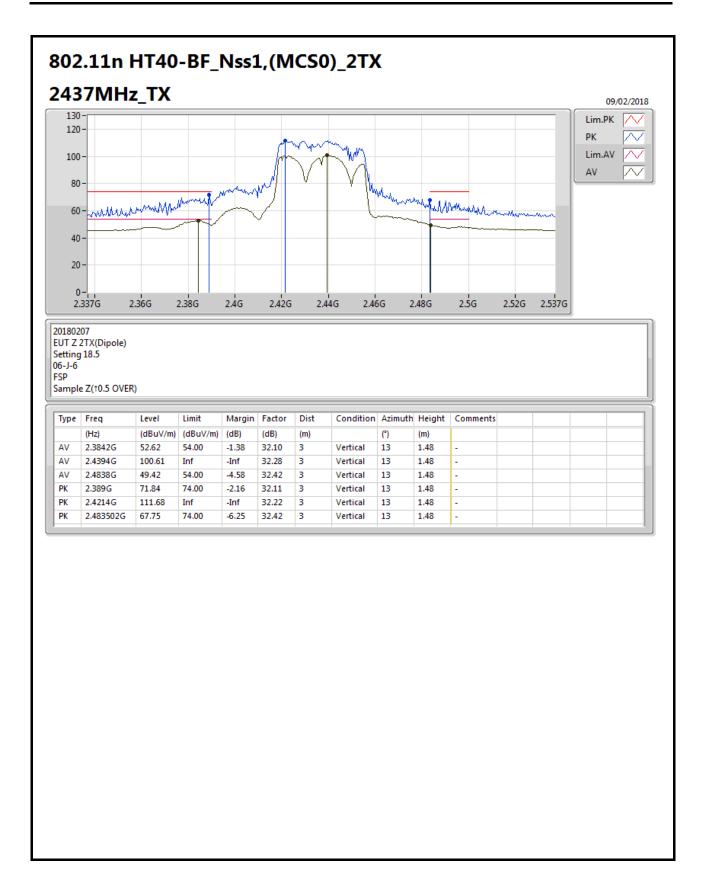






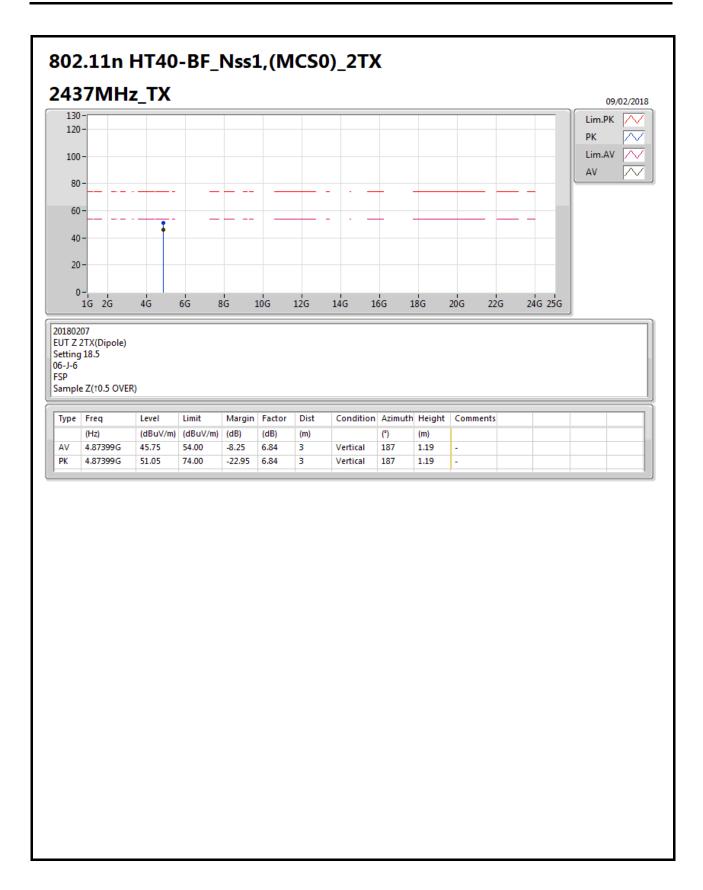
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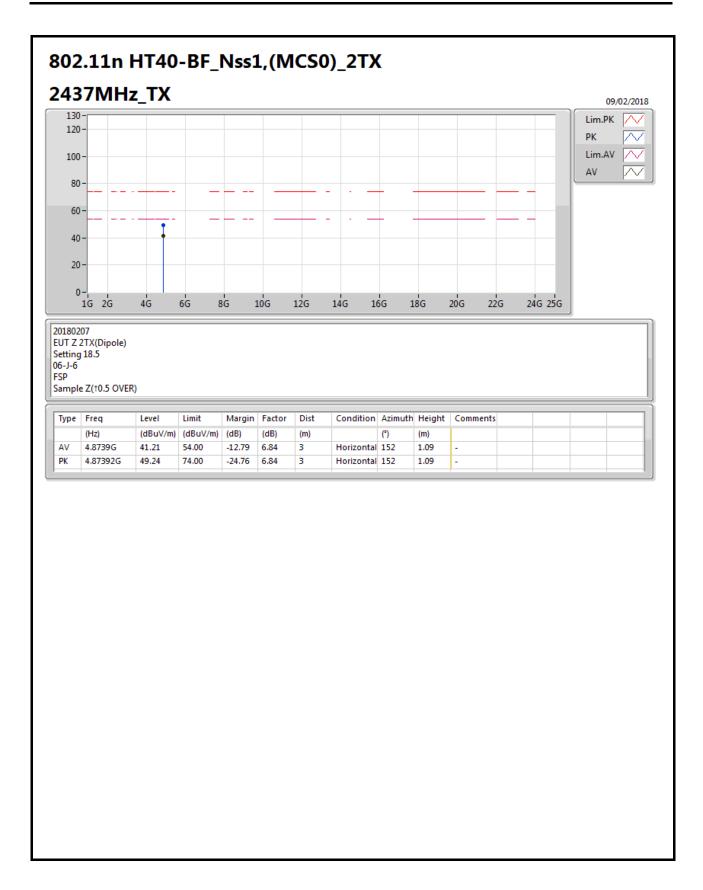


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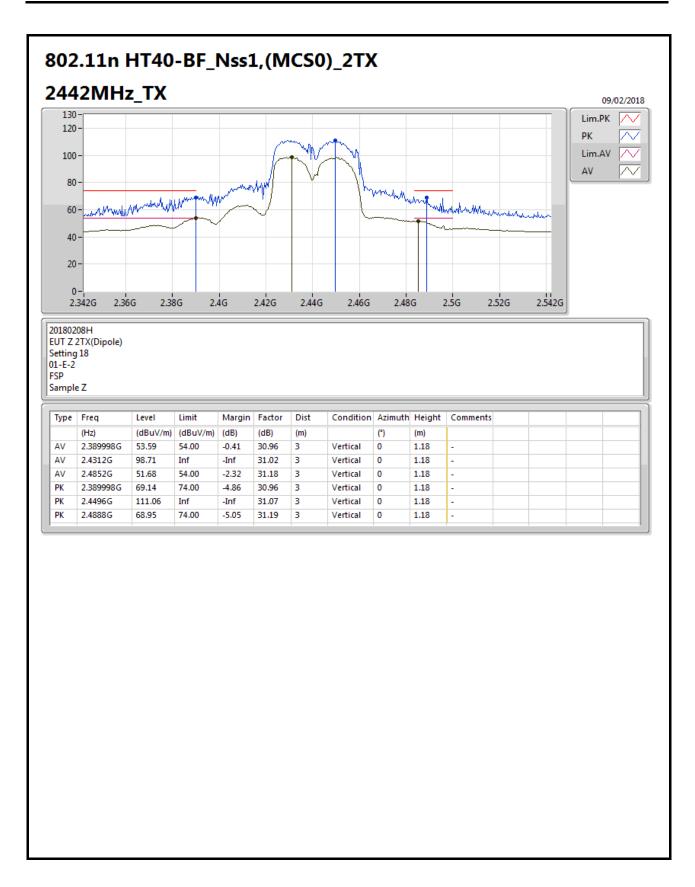




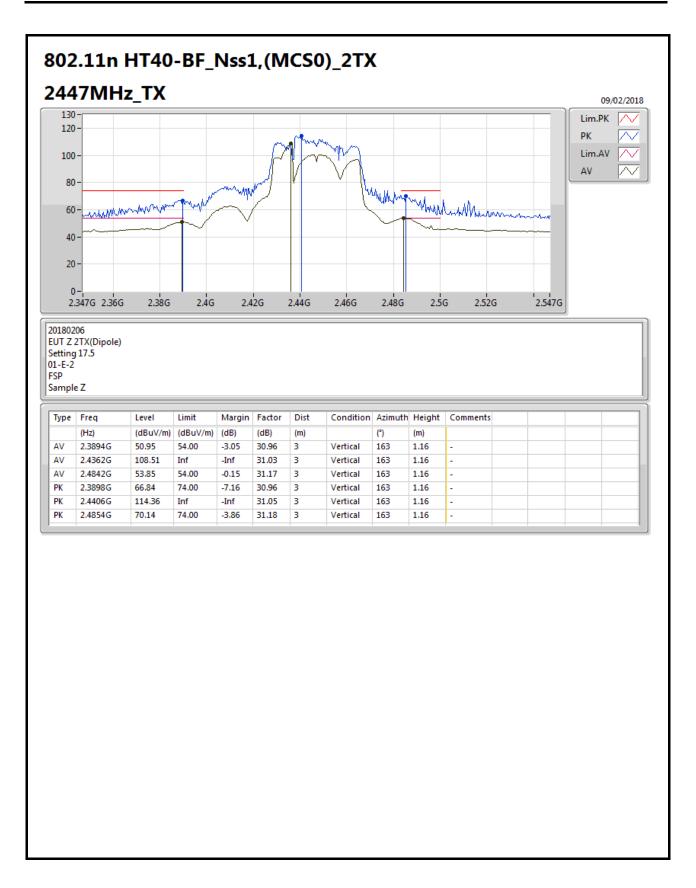






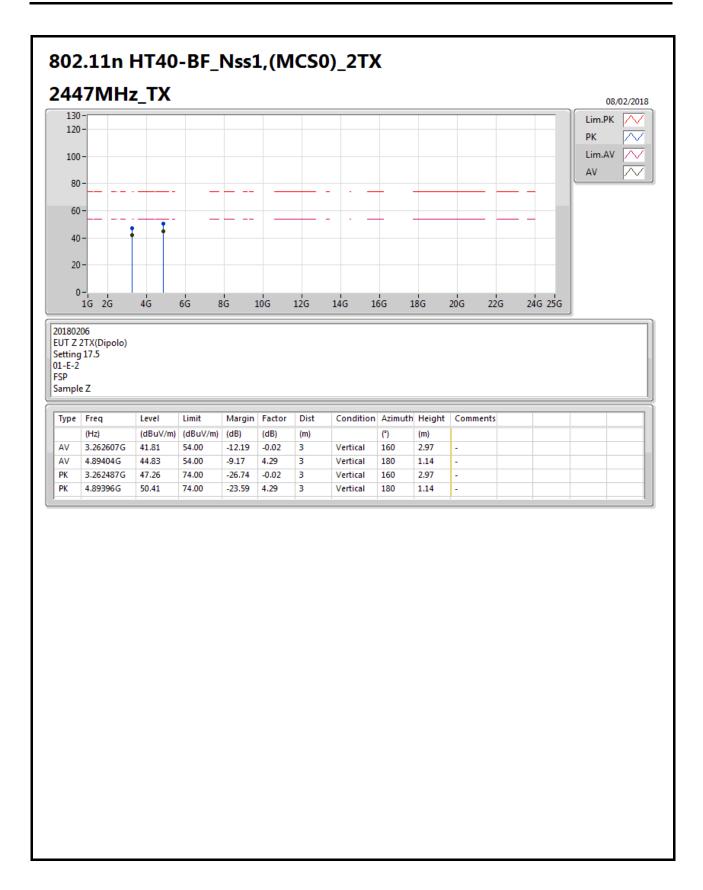




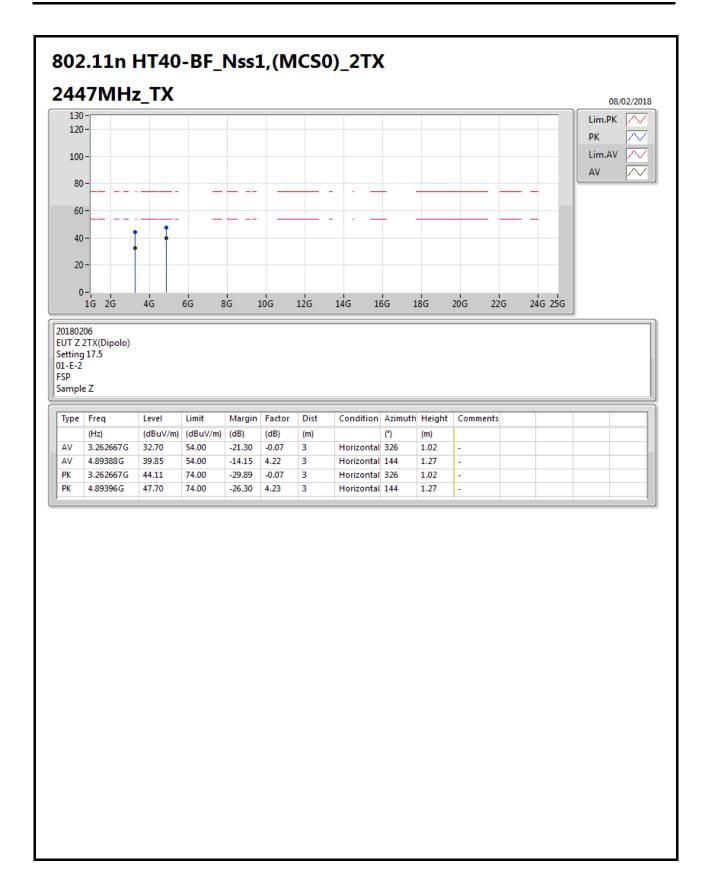


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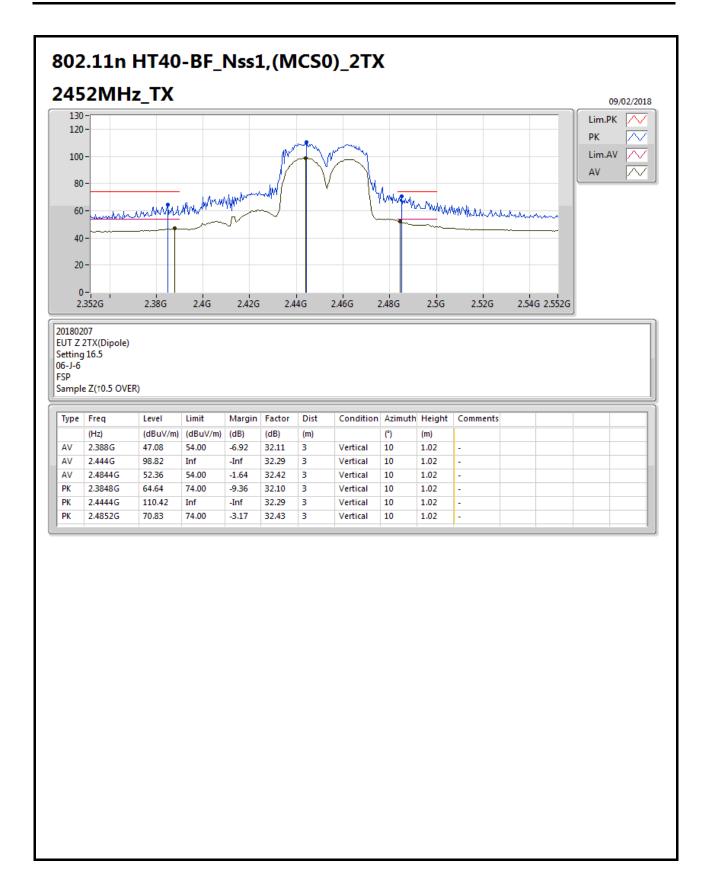






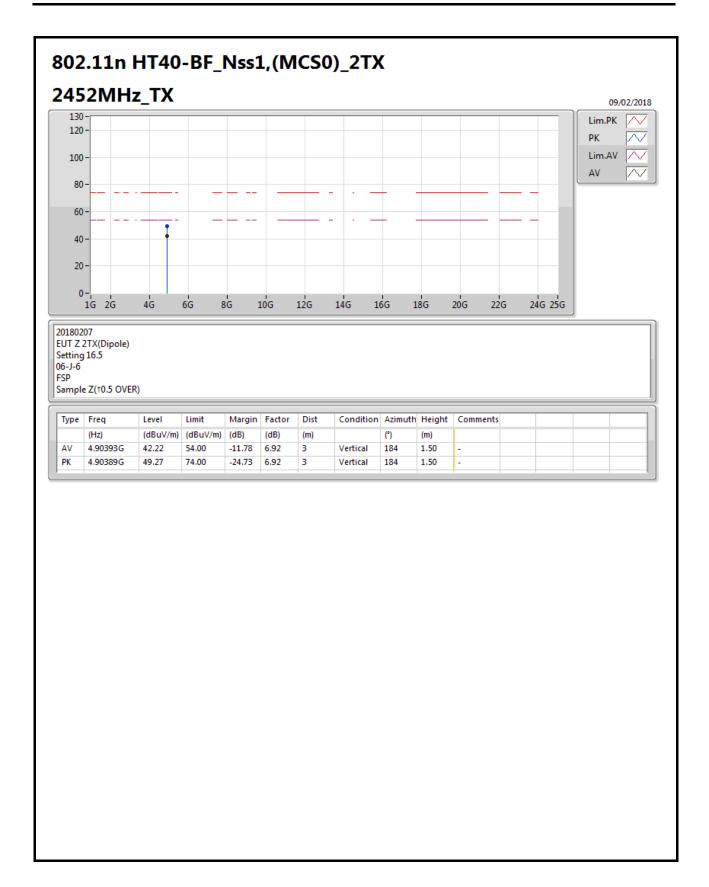
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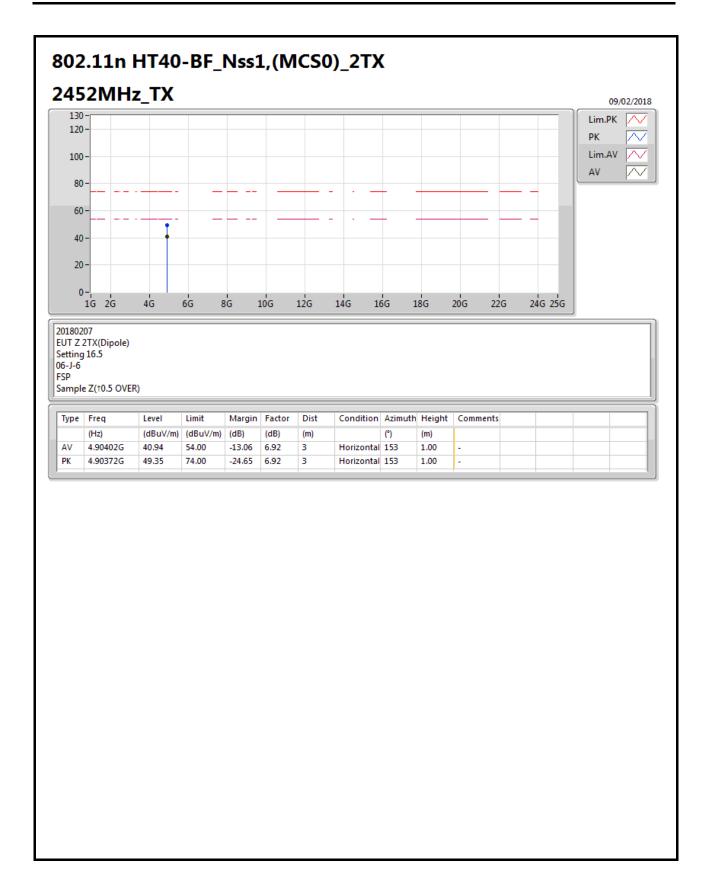
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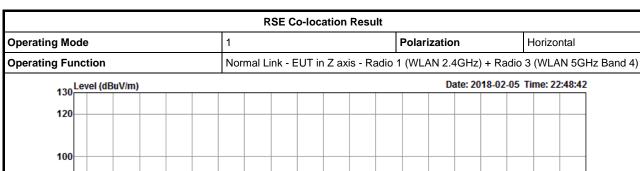


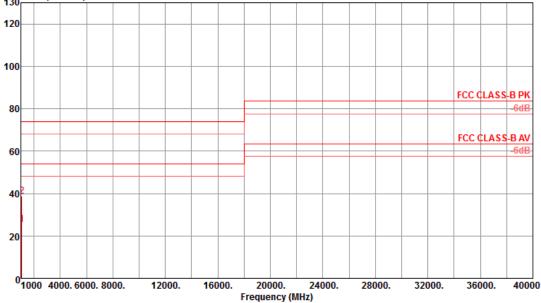
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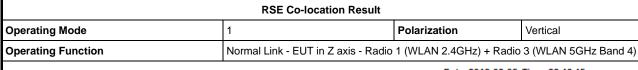


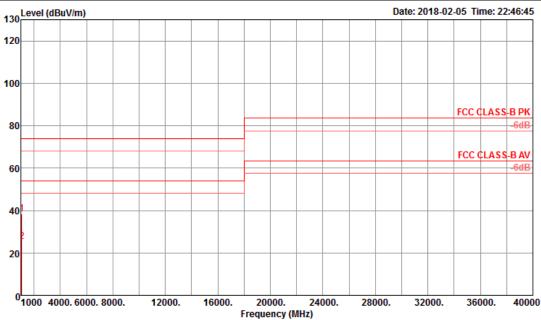


		Freq	Level						Preamp Factor		T/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
	1	1075.81	25.43	54.00	-28.57	34.55	2.65	23.88	35.65	124	181	Average	HORIZONTAL
•	2	1076.19	38.78	74.00	-35.22	47.90	2.65	23.88	35.65	124	181	Peak	HORIZONTAL

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	Freq	Level		Over Limit					-	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg			
1	1076.05	38.49	74.00	-35.51	47.61	2.65	23.88	35.65	113	118	Peak	VERTICAL	
2	1076.39	25.22	54.00	-28.78	34.34	2.65	23.88	35.65	113	118	Average	VERTICAL	

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