

Report No.: FR711841 Project No: CB10604255

FCC Test Report

Equipment **Media Terminal Adaptor**

Brand Name InnoMedia

Model No. MTA8328-1W/MTA8328-1WV

FCC ID 2ALCB-MTA-W-0000001

Standard : 47 CFR FCC Part 15.247

2400 MHz - 2483.5 MHz Operating Band

Point-to-multipoint: Point-to-point Function

: INNOMEDIA TECHNOLOGY INC Applicant

> 3RD FL HSINCHU SCIENCE-BASED INDUSTRIAL PARK 3 INDUSTRIAL E RD IX HSINCHU 300 TAIWAN

: LUEN HUEI ELECTRONICS CO.,LTD Manufacturer

17 Kuang Fu Rd., Hslnchu Industrial, Park

HsInchu, Taiwan, R.O.C

The product sample received on Jan. 19, 2017 and completely tested on May 02, 2017. 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.

Cliff Chang

SPORTON INTERNATIONAL INC.





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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
FR711841	Rev. 01	Initial issue of report	May 16, 2017

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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	1TX
2.4-2.4835GHz	802.11g	20	1TX
2.4-2.4835GHz	802.11n HT20	20	1TX
2.4-2.4835GHz	802.11n HT40	40	1TX

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.

1.1.2 Antenna Information

Ant.	Brand	Part No.	Antenna Type	Connector	Gain (dBi)
1	LYNwave	ALA150-052020-000000	PIFA Antenna	I-PEX	2.0

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)
802.11b	1	0
802.11g	1	0
802.11n HT20	0.915	0.386
802.11n HT40	0.997	0.013

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter
Beamforming Function	☐ With beamforming ☐ Without beamforming

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1.1.5 Table for Multiple Listing

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

Model Name	Wi-Fi	USB	Push Button	FXS port
MTA8328-1W	Υ	N	Y	1
MTA8328-1WV	Y	Y	Y	1

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Note: From the above models, model: MTA8328-1WV was selected as representative model for the test and its data was recorded in this report.

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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:

- 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	:	No. 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	TH01-CB	Serway Li	20°C / 60%	Mar. 03, 2017
Radiated Below 1 GHz	03CH01-CB	Zero Chen / Brain Chen Joy Tseng	22°C / 54%	May 02, 2017
Radiated Above 1GHz	03CH01-CB	Justin Lin / Mason Chen	22°C / 54%	Feb. 21, 2017~Mar. 03, 2017
AC Conduction	CO01-CB	Gavin Peng / Rick Yek	22°C / 61%	Apr. 24, 2017

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

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1.4 Measurement Uncertainty

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

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Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	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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2 Test Configuration of EUT

2.1 Test Channel Mode

Band	Power Setting
802.11b_(1Mbps)_1TX	-
2412MHz	55
2437MHz	53
2462MHz	51
802.11g_(6Mbps)_1TX	-
2412MHz	63
2437MHz	63
2462MHz	63
802.11n HT20_Nss1,(MCS0)_1TX	-
2412MHz	63
2437MHz	63
2462MHz	63
802.11n HT40_Nss1,(MCS0)_1TX	-
2422MHz	63
2437MHz	63
2452MHz	63

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2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests		
Tests Item	AC power-line conducted emissions	
Condition AC power-line conducted measurement for line and neutral		
Operating Mode Normal Link		
1	EUT + LAN + WAN + Phone + Adapter	
2	EUT + LAN + WIFI(2.4G) + Adapter	
3	EUT + LAN + WIFI(5G) + Adapter	
For operating mode 1 is the worst case and it was record in this test report.		

Th	e 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	e 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 at Z-axis + LAN + WAN + Phone + Adapter
2 EUT at Y-axis + LAN + WAN + Phone + Adapter	
Mode 1 has been evaluate follow this same test mode	ed to be the worst case between Mode 1~2, thus measurement for Mode 3~4 will
3	EUT at Z-axis + LAN + Wi-Fi(2.4G) + Adapter
4	EUT at Z-axis + LAN + Wi-Fi(5G) + Adapter
For operating mode 1 is th	e worst case and it was record in this test report.
Operating Mode > 1GHz	СТХ
	at Y axis and Z axis position for Radiated emission test, and the worst case was asurement will follow this same test configuration.
1	CTX-EUT at Y-axis + Adapter

Note: All the specification of test configurations and test modes were based on customer's request

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2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

			Accessories		
No.	Equipment Name	Brand Name	Model Name	Rating	
1	Adapter	AOEM	ADS012T-W120100	Input: 100-240V~50-60Hz 0.5A Output: 12V, 1.0A	
RJ-45 Cal	RJ-45 Cable*2, Non-Shielded, 1.8m				
RJ-11 Cab	ole*1, Non-Shiel	lded, 1.5m			

2.5 Support Equipment

For Test Site No: CO01-CB

		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB*2	DELL	E6430	DoC
2	Phone	SAMPO	HT-B 907WL	DoC
3	Flash disk	Silicon Power	I-Series	DoC

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

		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB*2	DELL	E4300	DoC
2	Phone	PHILIPS	M20	N/A

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

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

For Test Site No: TH01-CB

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

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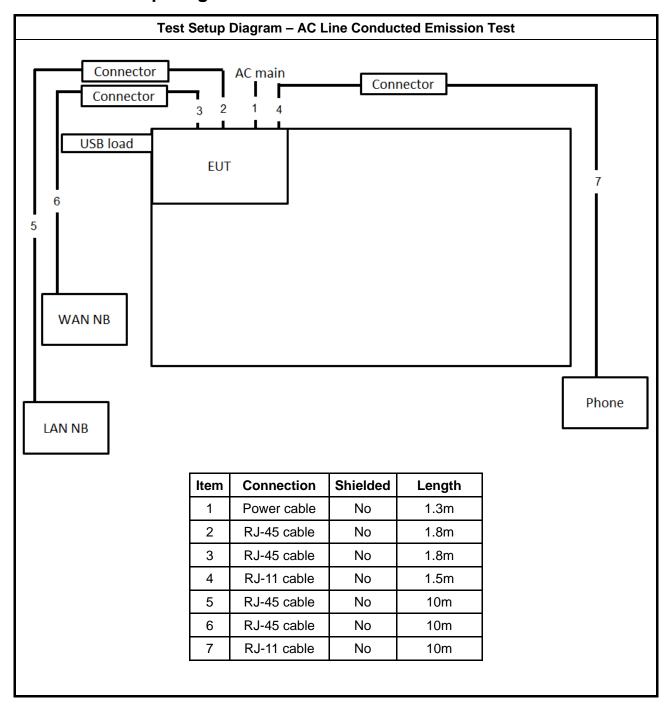
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Test Setup Diagram 2.6

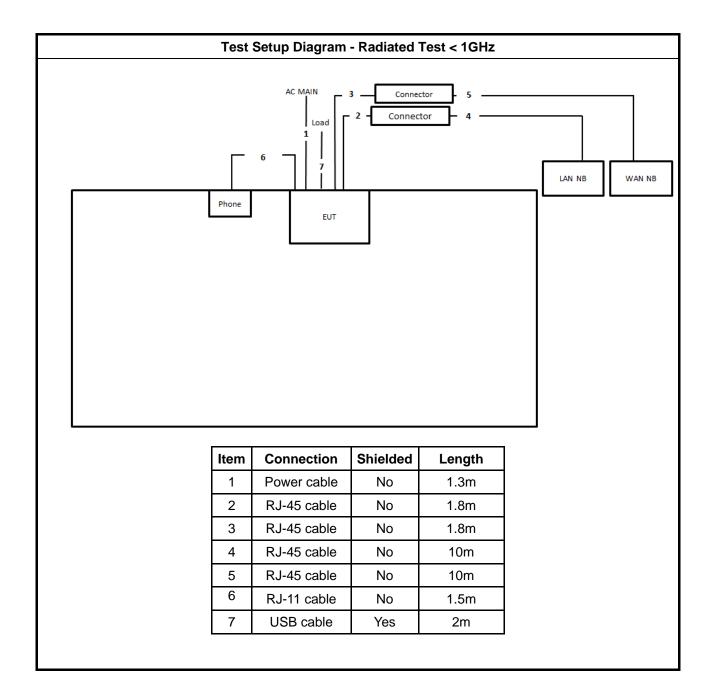


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Test Setup Diagram - Radiated Test > 1GHz AC Main EUT NB 1 Shielded Item Connection Length Power cable 1 No 1.3m 2 RJ-45 cable No 10m

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Transmitter Test Result 3

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

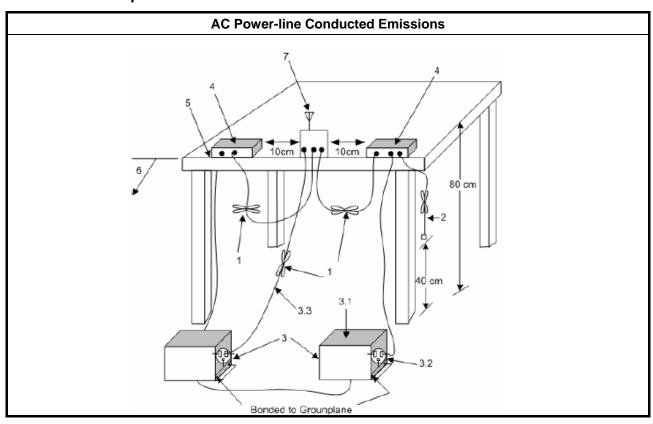
3.1.2 **Measuring Instruments**

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

3.1.3 Test Procedures

	Test Method
Refer as ANSI C63.10-20	3, clause 6.2 for AC power-line conducted emissions.

3.1.4 **Test Setup**



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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

Emission Bandwidth	Emission Bandwidth			
Spectrum Analyzer				

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 $P_{Out} = 30 (G_{TX} 6)/3 + 8dB$ 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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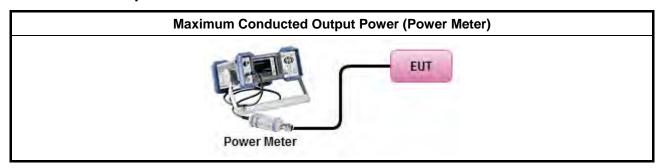
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3.3.3 Test Procedures

	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

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				
-	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).						
	\boxtimes	Refe	er as FCC KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).				
	[dut	y cycl	e ≥ 98% or external video / power trigger]				
		Refe	er as FCC KDB 558074, clause 10.3 Method AVGPSD-1 (spectral trace averaging).				
		Refe	er as FCC KDB 558074, clause 10.4 Method AVGPSD-2 (slow sweep speed)				
	duty	/ cycle	e < 98% and average over on/off periods with duty factor				
		Refe	er as FCC KDB 558074, clause 10.5 Method AVGPSD-1 Alt (spectral trace averaging).				
		Refe	er as FCC KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)				
•	For conducted measurement.						
	•	If Th	e 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, are measured at each output of the device at the required resolution bandwid maximum value (peak) of each spectrum is determined. These maximum values a summed mathematically in linear power units across the outputs. These operations a performed separately over frequency spans that have different out-of-band or semission 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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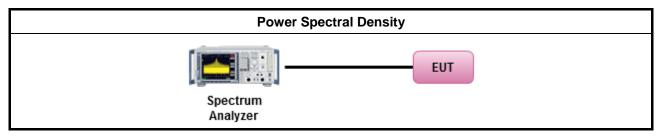
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3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

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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.

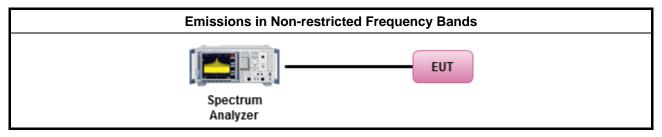
3.5.2 Measuring Instruments

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.

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 6.9.2.2 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 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 the 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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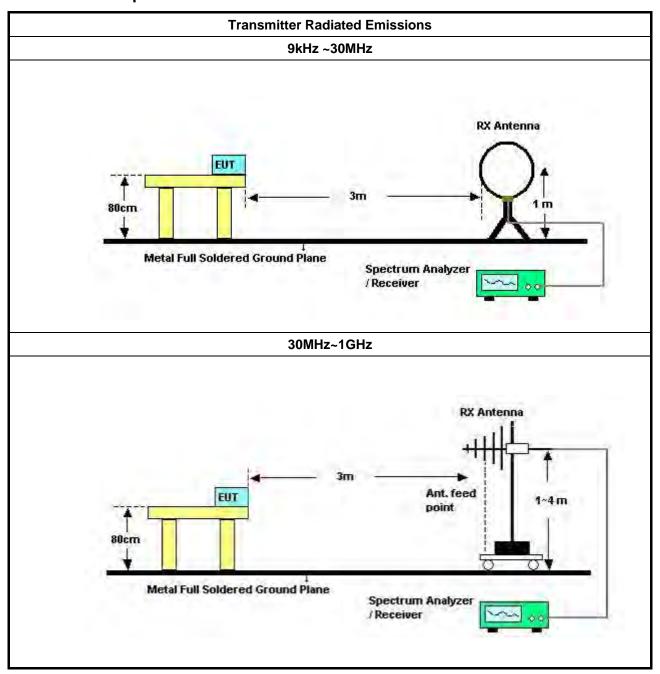
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Test Setup 3.6.4



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Spectrum Analyzer

Above 1GHz

AMAX 30cm

Spectrum Analyzer

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	Manufacture	Model No.	Sorial No.	Characteristics	Calibration Date	Domork
Instrument	Manufacturer	wodel No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 23, 2017	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 14, 2016	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 21, 2016	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 24, 2016	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 13, 2017	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 21, 2016	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 16, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-10-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)

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FCC Test Report

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)

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

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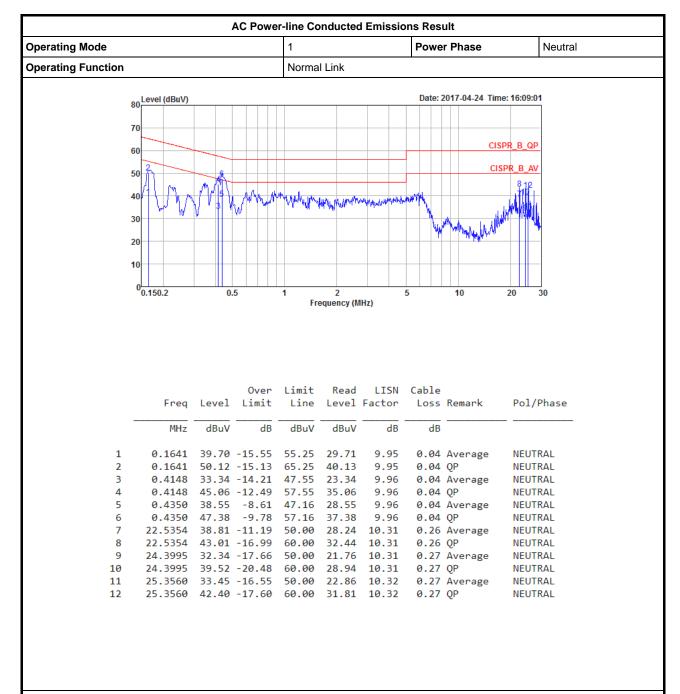
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[&]quot;*" Calibration Interval of instruments listed above is two years.

N.C.R means Non-Calibration required.

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AC Power-line Conducted Emissions Result

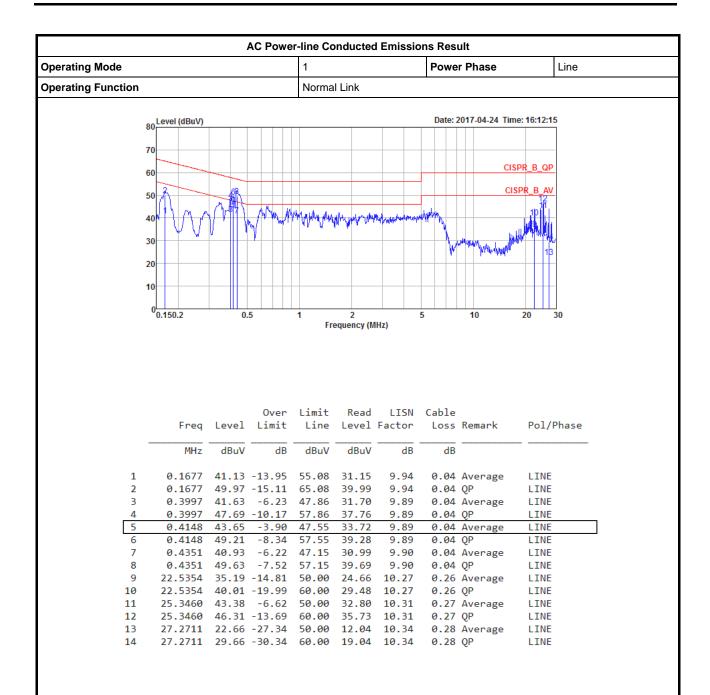


Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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



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.)



EBW Result Appendix B

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
802.11b_(1Mbps)_1TX	-	-	-	-	-
2.4-2.4835GHz	10.05M	15.217M	15M2G1D	10.025M	15.117M
802.11g_(6Mbps)_1TX	-	-	-	-	-
2.4-2.4835GHz	16.3M	16.692M	16M7D1D	16.275M	16.592M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2.4-2.4835GHz	17.55M	17.816M	17M8D1D	17.475M	17.741M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-
2.4-2.4835GHz	35.9M	36.332M	36M3D1D	35.65M	36.282M

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

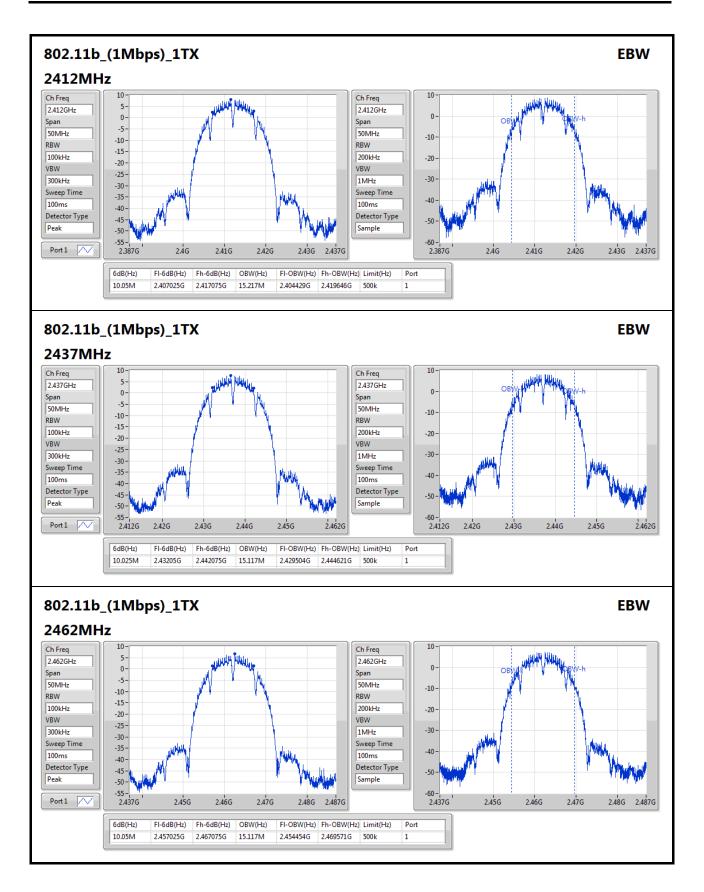
Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
802.11b_(1Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	10.05M	15.217M
2437MHz	Pass	500k	10.025M	15.117M
2462MHz	Pass	500k	10.05M	15.117M
802.11g_(6Mbps)_1TX	-	-	-	-
2412MHz	Pass	500k	16.3M	16.592M
2437MHz	Pass	500k	16.275M	16.617M
2462MHz	Pass	500k	16.3M	16.692M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
2412MHz	Pass	500k	17.55M	17.741M
2437MHz	Pass	500k	17.525M	17.791M
2462MHz	Pass	500k	17.475M	17.816M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
2422MHz	Pass	500k	35.9M	36.282M
2437MHz	Pass	500k	35.65M	36.282M
2452MHz	Pass	500k	35.7M	36.332M

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

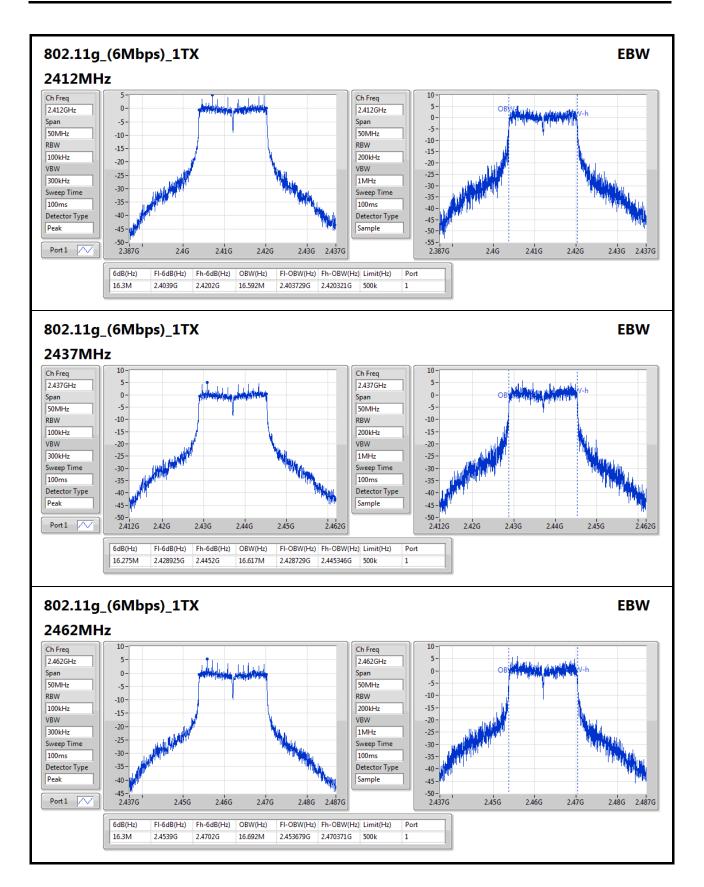
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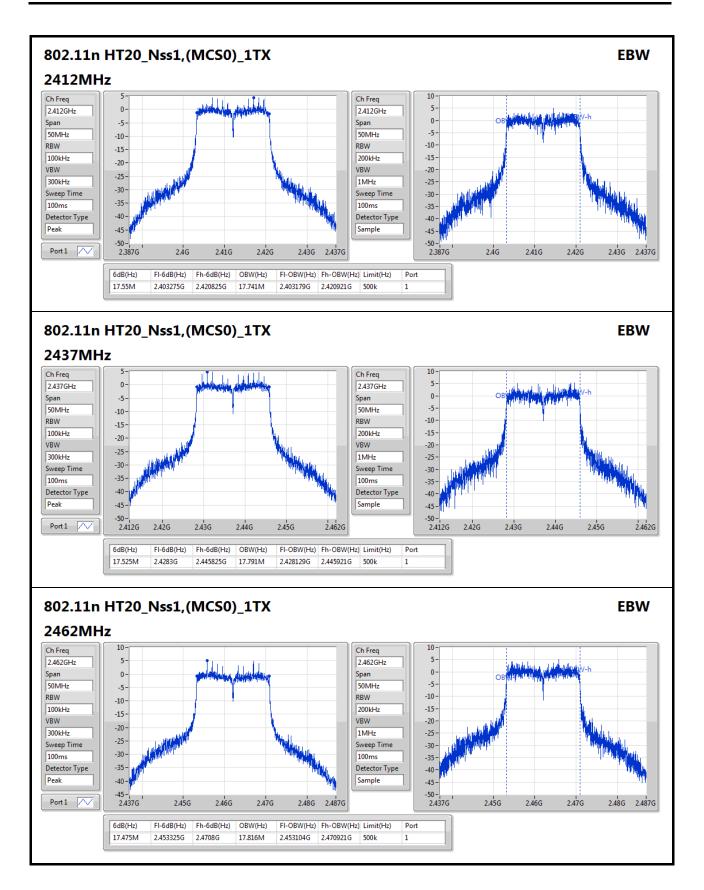




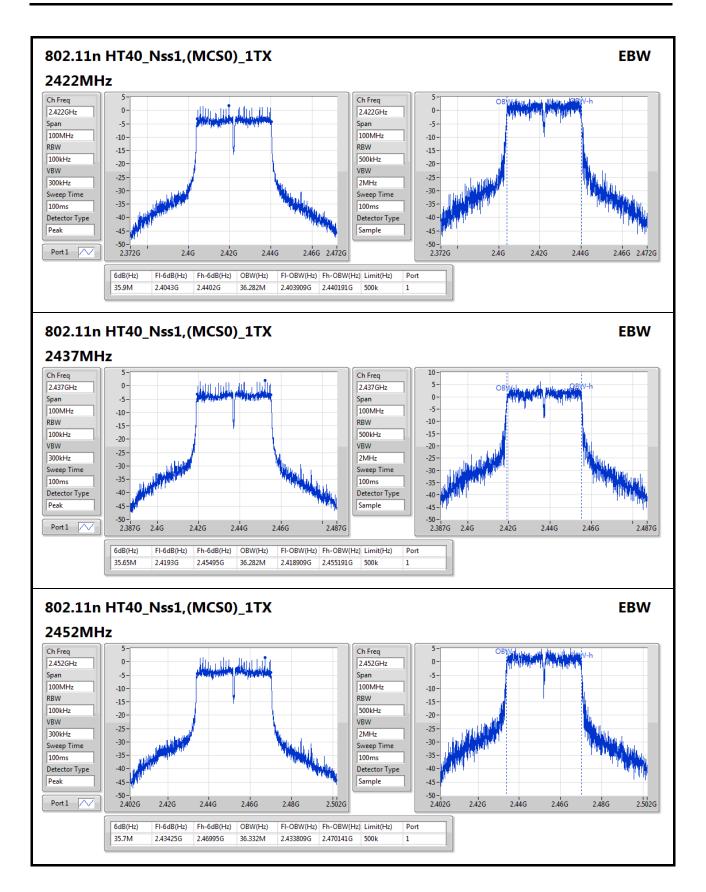














AV Power Result Appendix C

Summary

Mode	Total Power	Total Power	
	(dBm)	(W)	
802.11b_(1Mbps)_1TX	-	-	
2.4-2.4835GHz	16.51	0.04477	
802.11g_(6Mbps)_1TX	-	-	
2.4-2.4835GHz	14.67	0.02931	
802.11n HT20_Nss1,(MCS0)_1TX	-	-	
2.4-2.4835GHz	14.71	0.02958	
802.11n HT40_Nss1,(MCS0)_1TX	-	-	
2.4-2.4835GHz	14.58	0.02871	

Result

Mode	Result	DG	Port 1	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)
802.11b_(1Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	2.00	16.51	16.51	30.00
2437MHz	Pass	2.00	16.02	16.02	30.00
2462MHz	Pass	2.00	15.31	15.31	30.00
802.11g_(6Mbps)_1TX	-	-	-	-	-
2412MHz	Pass	2.00	14.59	14.59	30.00
2437MHz	Pass	2.00	14.67	14.67	30.00
2462MHz	Pass	2.00	14.66	14.66	30.00
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
2412MHz	Pass	2.00	14.55	14.55	30.00
2437MHz	Pass	2.00	14.71	14.71	30.00
2462MHz	Pass	2.00	14.65	14.65	30.00
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-
2422MHz	Pass	2.00	14.49	14.49	30.00
2437MHz	Pass	2.00	14.58	14.58	30.00
2452MHz	Pass	2.00	14.42	14.42	30.00

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



Appendix D **PSD Result**

Summary

Mode	PD
	(dBm/RBW)
802.11b_(1Mbps)_1TX	
2.4-2.4835GHz	-6.74
802.11g_(6Mbps)_1TX	-
2.4-2.4835GHz	-11.99
802.11n HT20_Nss1,(MCS0)_1TX	
2.4-2.4835GHz	-10.78
802.11n HT40_Nss1,(MCS0)_1TX	-
2.4-2.4835GHz	-13.33

RBW=3kHz.

Result

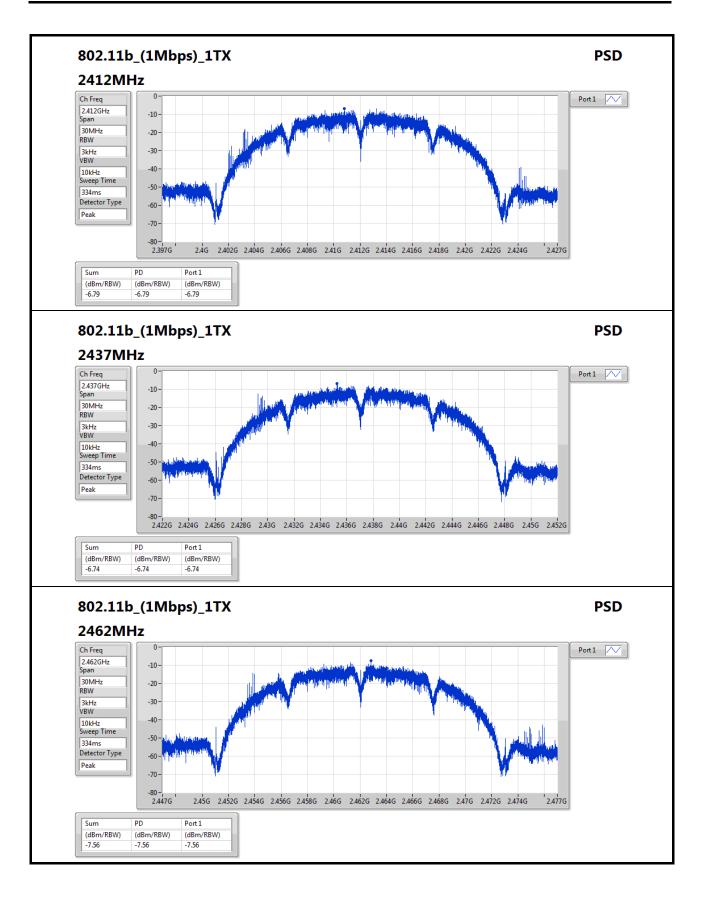
Mode	Result	DG	Port 1	PD	PD Limit	
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	
802.11b_(1Mbps)_1TX	-	-	-	-	-	
2412MHz	Pass	2.00	-6.79	-6.79	8.00	
2437MHz	Pass	2.00	-6.74	-6.74	8.00	
2462MHz	Pass	2.00	-7.56	-7.56	8.00	
802.11g_(6Mbps)_1TX	-	-	-	-	-	
2412MHz	Pass	2.00	-12.09	-12.09	8.00	
2437MHz	Pass	2.00	-11.99	-11.99	8.00	
2462MHz	Pass	2.00	-12.13	-12.13	8.00	
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	
2412MHz	Pass	2.00	-10.81	-10.81	8.00	
2437MHz	Pass	2.00	-10.78	-10.78	8.00	
2462MHz	Pass	2.00	-10.88	-10.88	8.00	
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	
2422MHz	Pass	2.00	-13.33	-13.33	8.00	
2437MHz	Pass	2.00	-13.38	-13.38	8.00	
2452MHz	Pass	2.00	-13.43	-13.43	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;

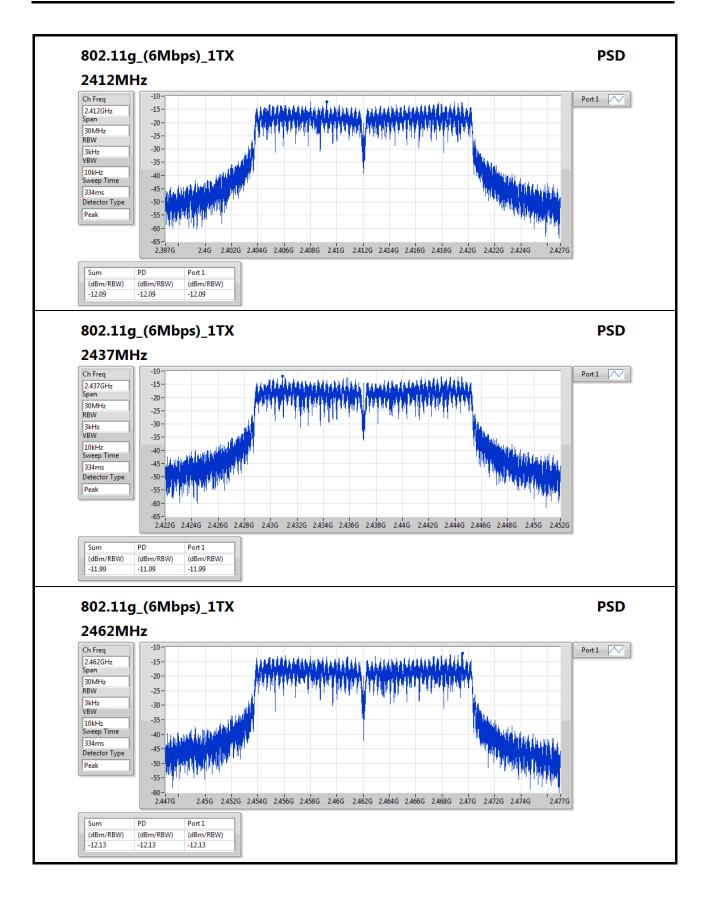
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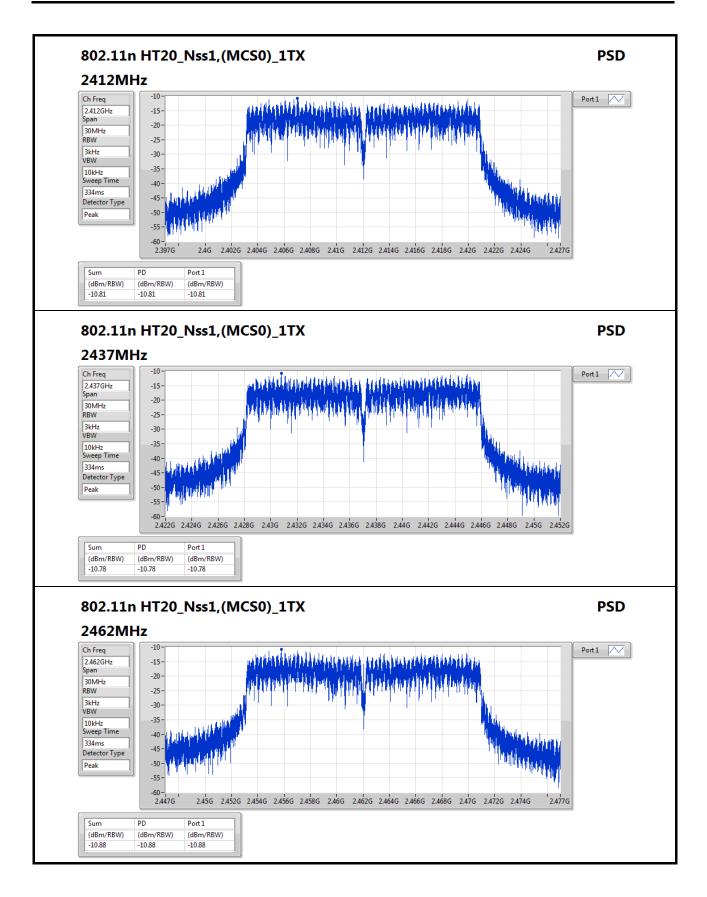






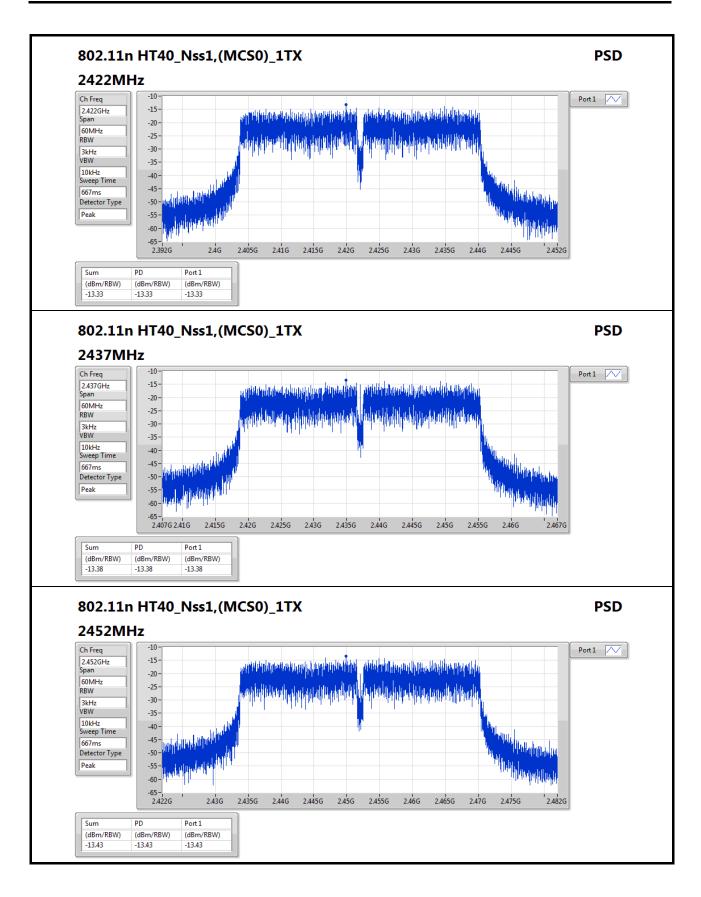
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CSE 20dB/30dB Down Result

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)	
802.11n HT2	20_Nss1,(MCS0)_1TX		-	-	-	-	-	-		-	-	-	-	-
2.4	l-2.4835GHz	Pass	2.432064G	5.08	-24.92	2.300585G	-55.86	2.398G	-26.03	2.49566G	-53.62	2.537548G	-52.49	1

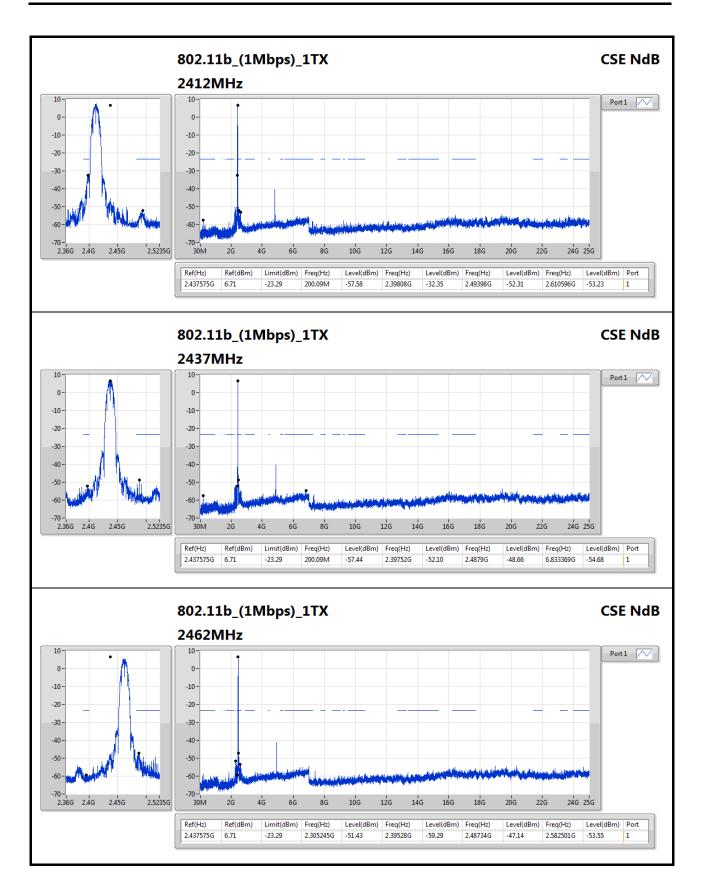
Result

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_(1Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.437575G	6.71	-23.29	200.09M	-57.58	2.39808G	-32.35	2.49398G	-52.31	2.610596G	-53.23	1
2437MHz	Pass	2.437575G	6.71	-23.29	200.09M	-57.44	2.39752G	-52.10	2.4879G	-48.66	6.833369G	-54.68	1
2462MHz	Pass	2.437575G	6.71	-23.29	2.305245G	-51.43	2.39528G	-59.29	2.48734G	-47.14	2.582501G	-53.55	1
802.11g_(6Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.430728G	4.69	-25.31	2.300585G	-54.79	2.39672G	-27.59	2.48614G	-52.66	2.537548G	-54.00	1
2437MHz	Pass	2.430728G	4.69	-25.31	2.309905G	-54.36	2.39296G	-49.39	2.48774G	-47.87	2.562834G	-53.60	1
2462MHz	Pass	2.430728G	4.69	-25.31	2.30641G	-55.84	2.39704G	-55.53	2.48374G	-36.03	2.534738G	-51.51	1
802.11n HT20_Nss1,(MCS0)_1TX		-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.432064G	5.08	-24.92	2.300585G	-55.86	2.398G	-26.03	2.49566G	-53.62	2.537548G	-52.49	1
2437MHz	Pass	2.432064G	5.08	-24.92	2.309905G	-55.15	2.39056G	-47.81	2.4851G	-47.25	2.548786G	-53.77	1
2462MHz	Pass	2.432064G	5.08	-24.92	2.30175G	-56.27	2.39304G	-56.45	2.48358G	-34.03	2.52631G	-50.78	1
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2422MHz	Pass	2.440748G	1.89	-28.11	2.19405G	-59.82	2.39344G	-30.67	2.48414G	-47.94	6.969468G	-52.75	1
2437MHz	Pass	2.440748G	1.89	-28.11	903.635M	-60.01	2.39664G	-36.81	2.48942G	-41.17	2.569109G	-54.88	1
2452MHz	Pass	2.440748G	1.89	-28.11	30M	-59.91	2.39584G	-47.74	2.48942G	-30.29	6.240281G	-53.36	1

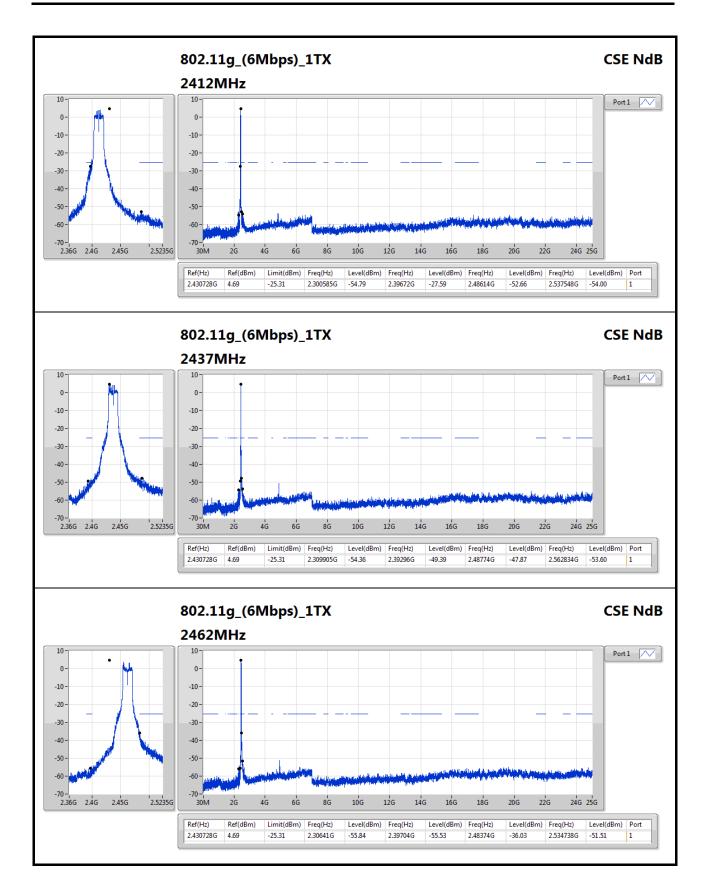
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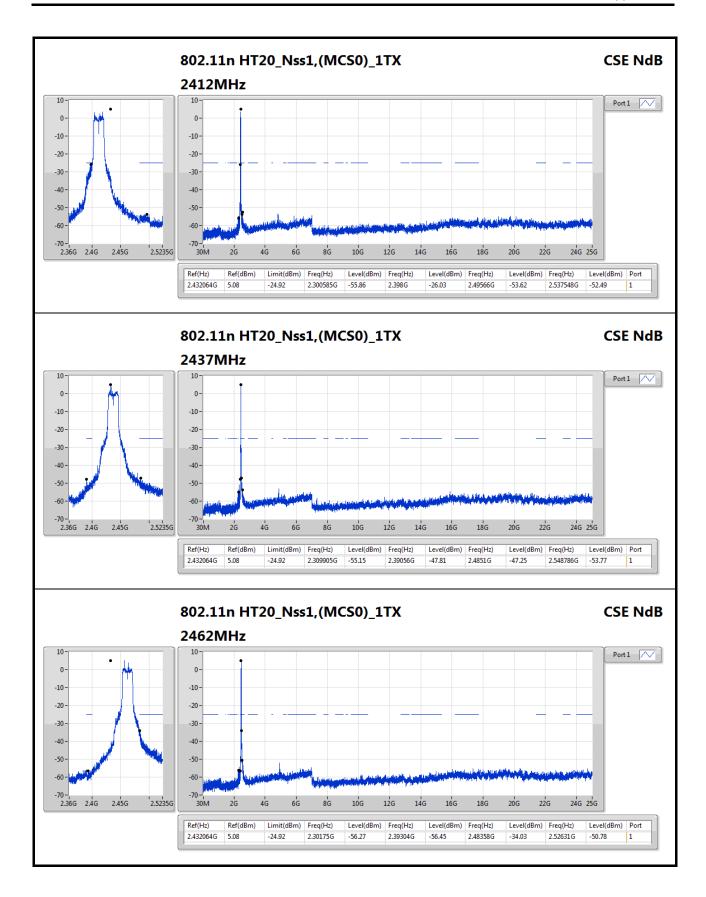




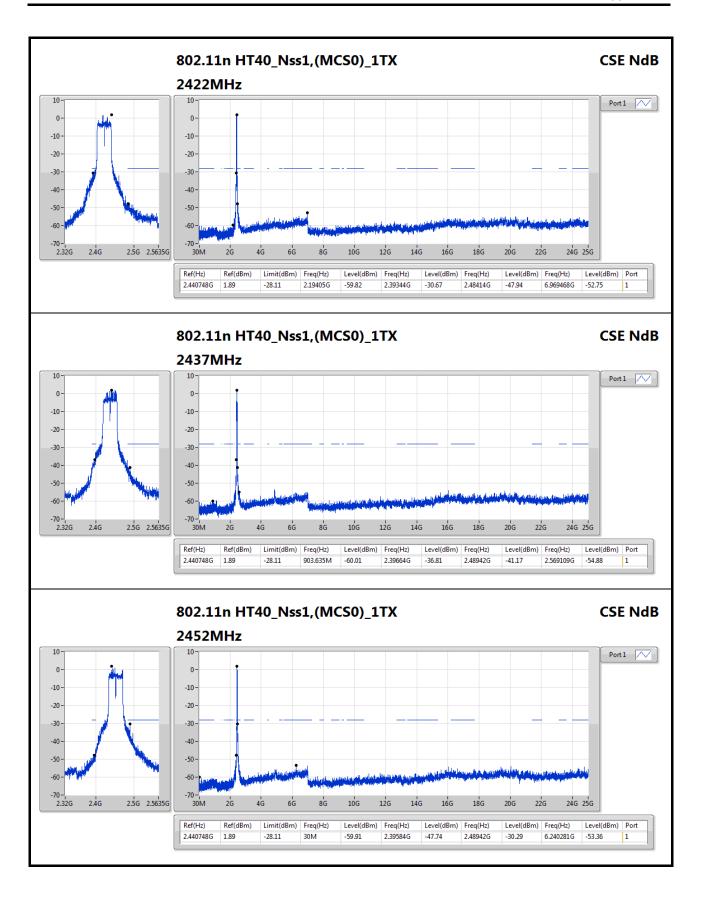
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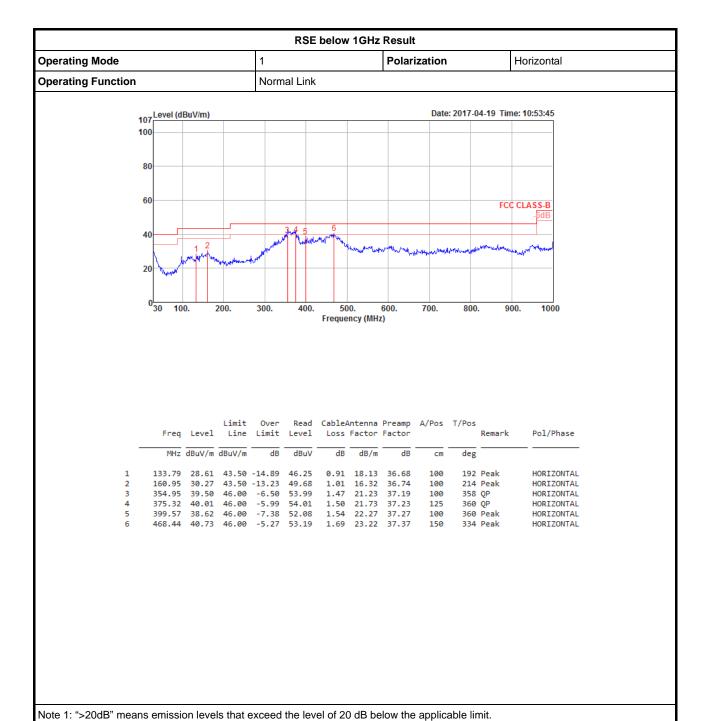








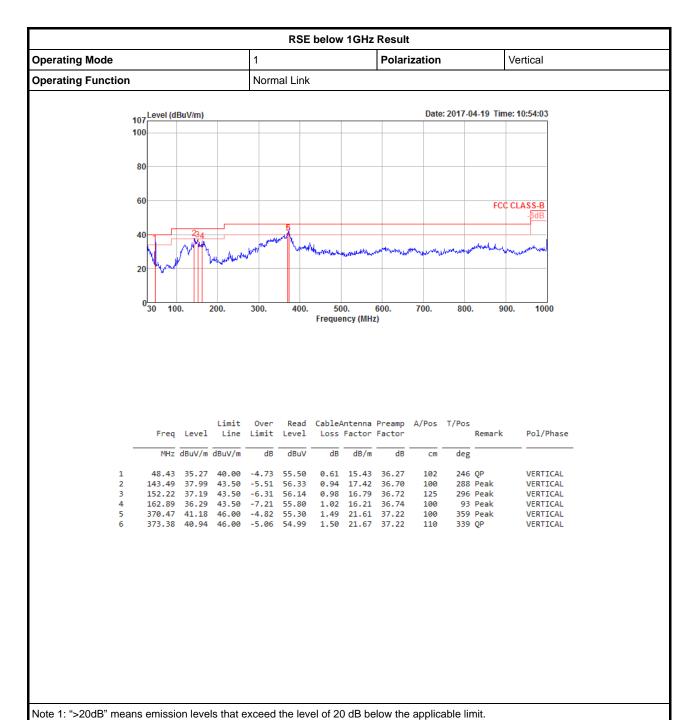




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Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)





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



RSE TX above 1GHz Result

Appendix F.2

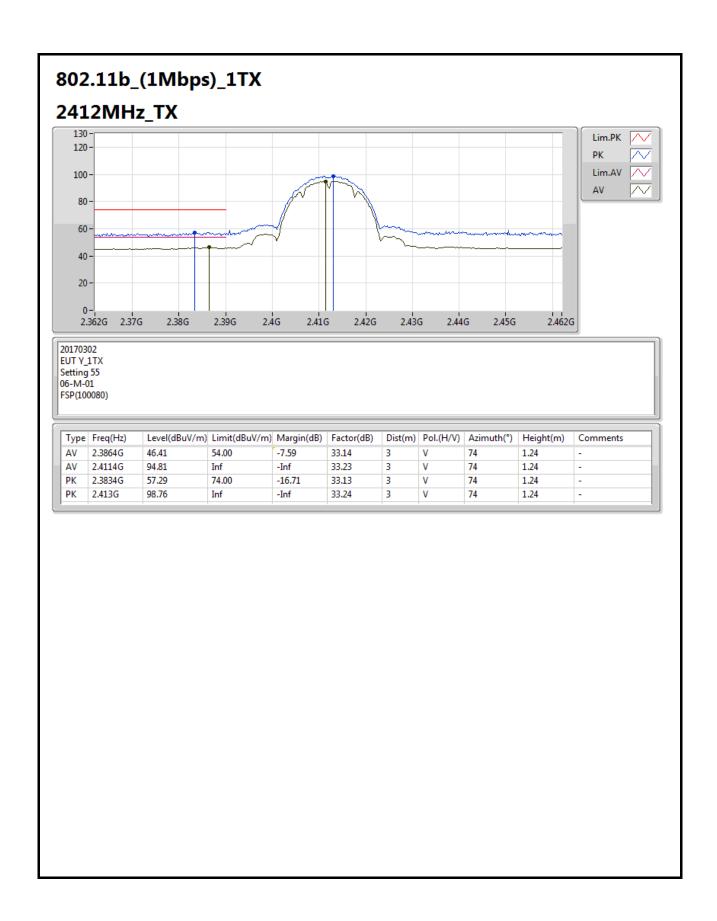
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth	Height (m)	Comments
802.11b_(1Mbps)_1TX	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	4.92412G	53.97	54.00	-0.03	6.85	3	Н	308	1.00	-

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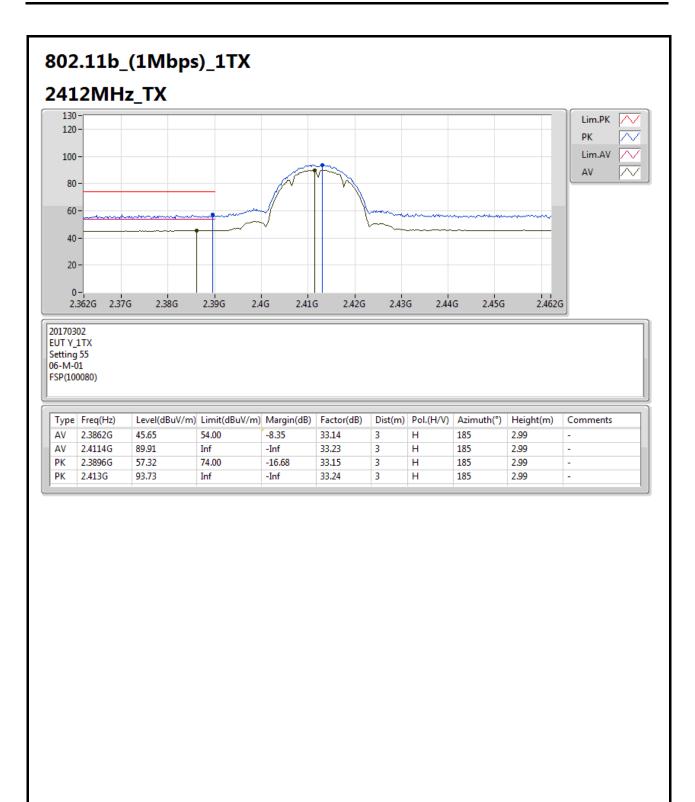




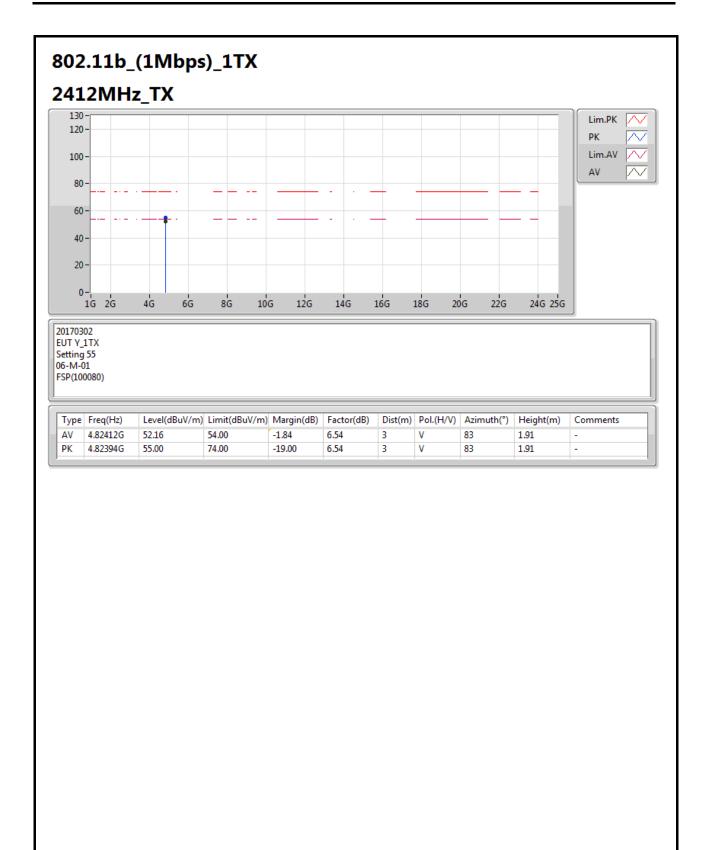
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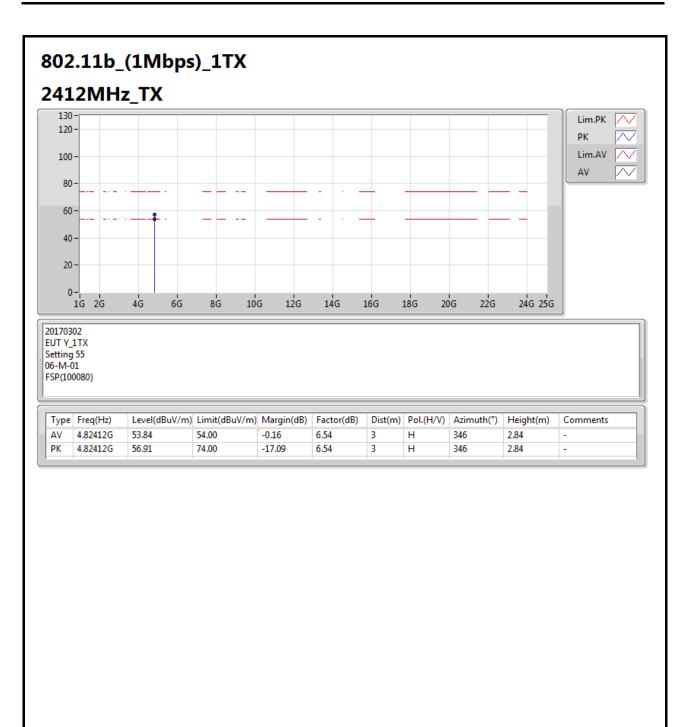




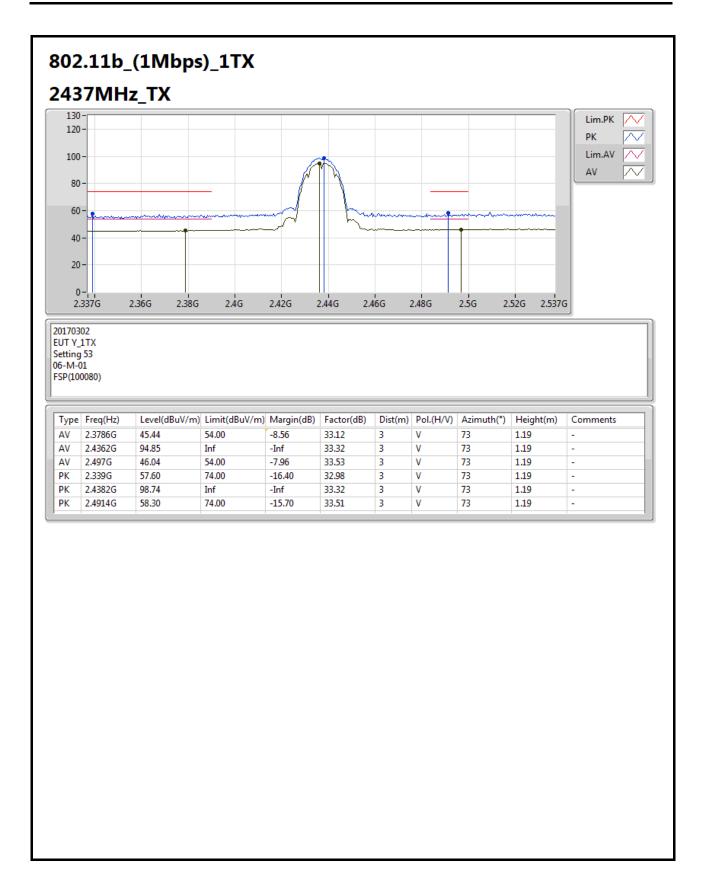




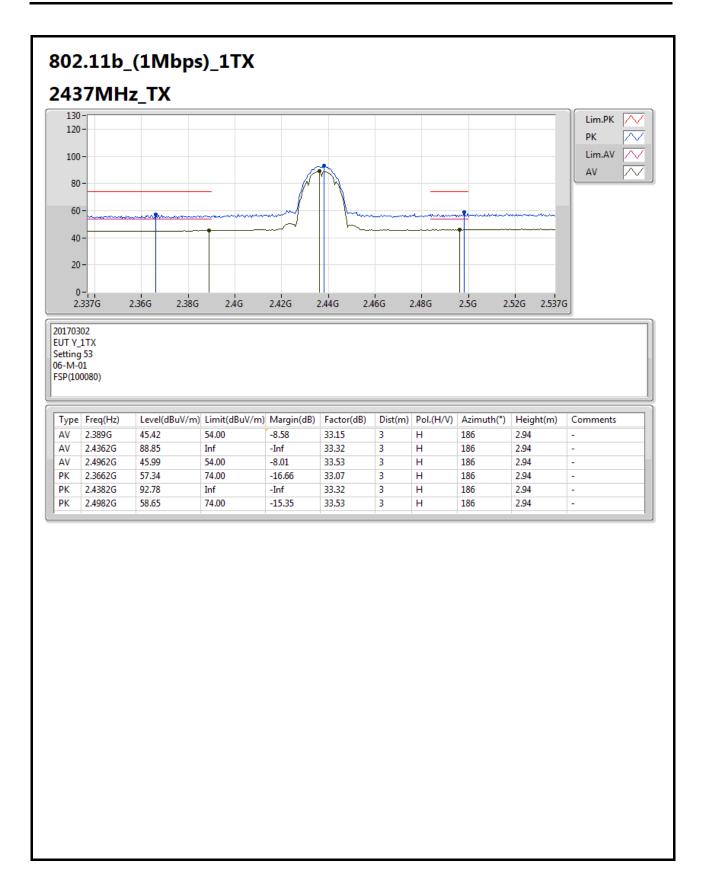




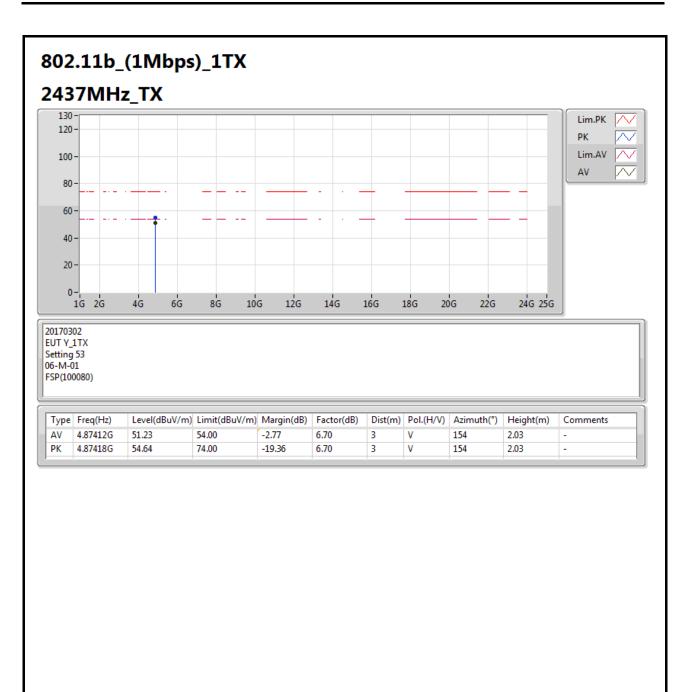




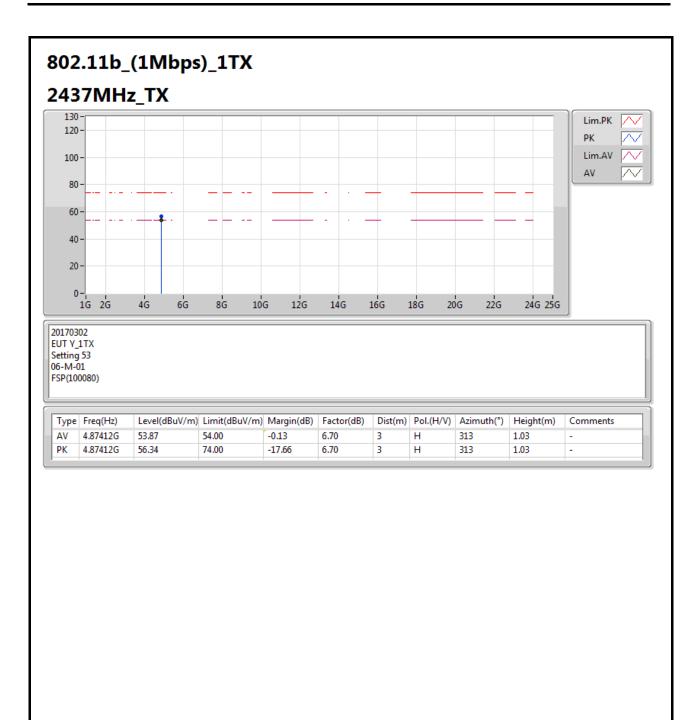




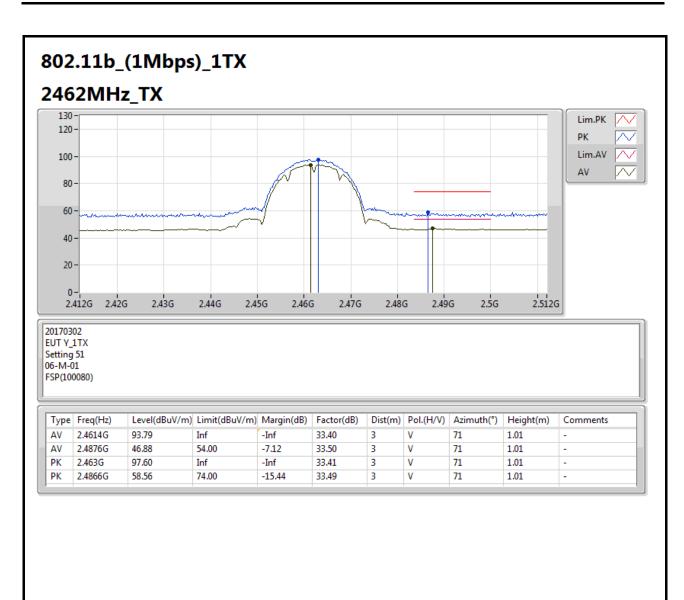




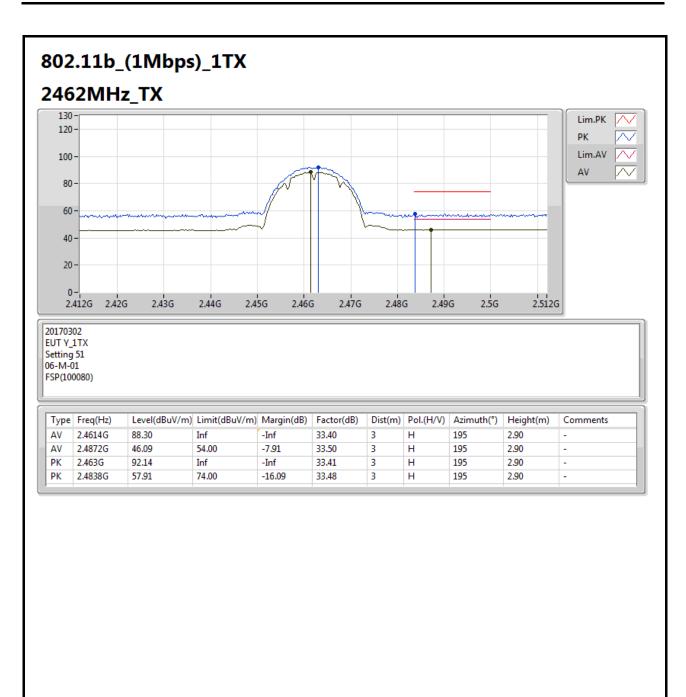




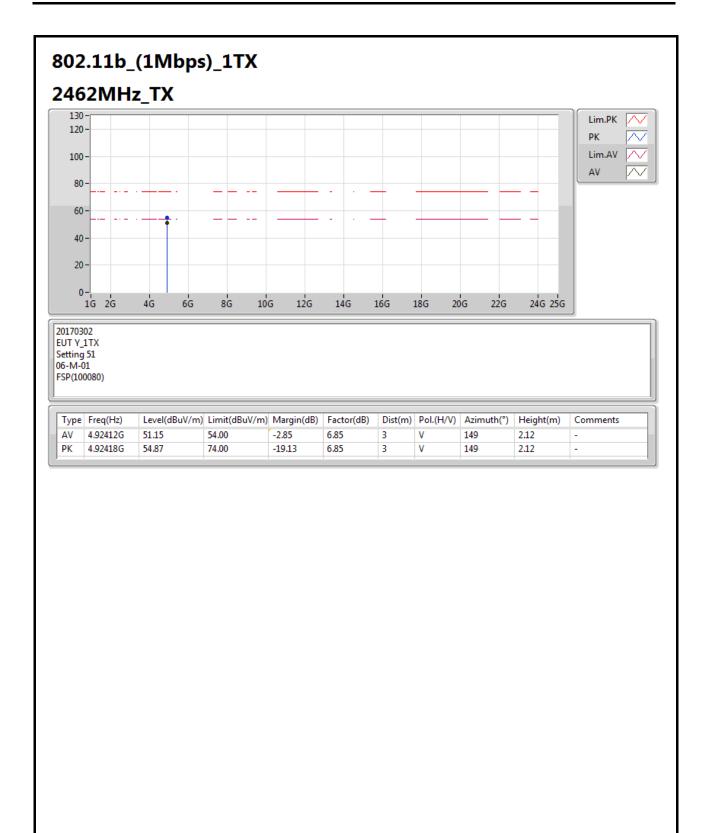




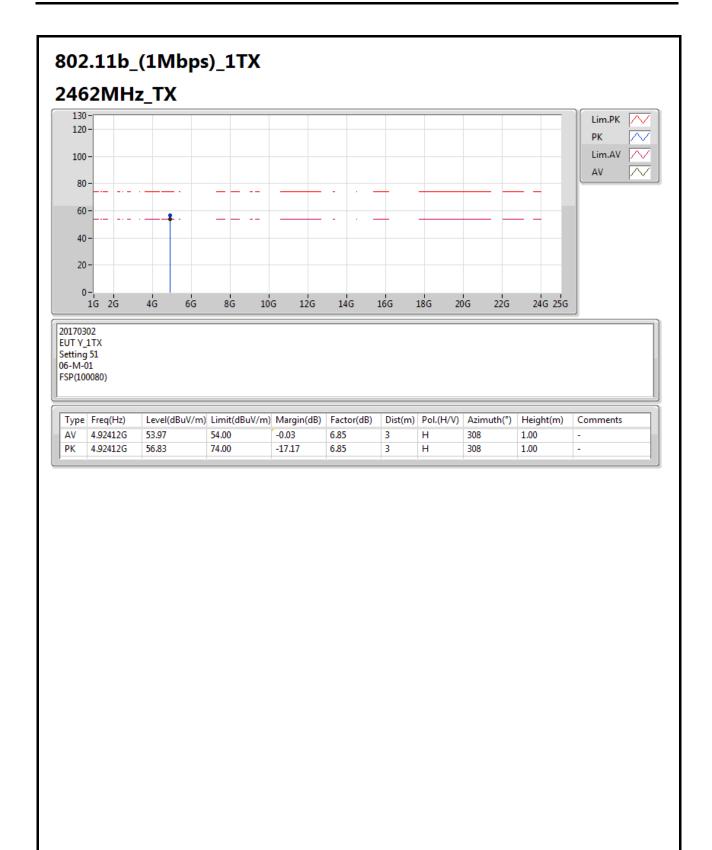




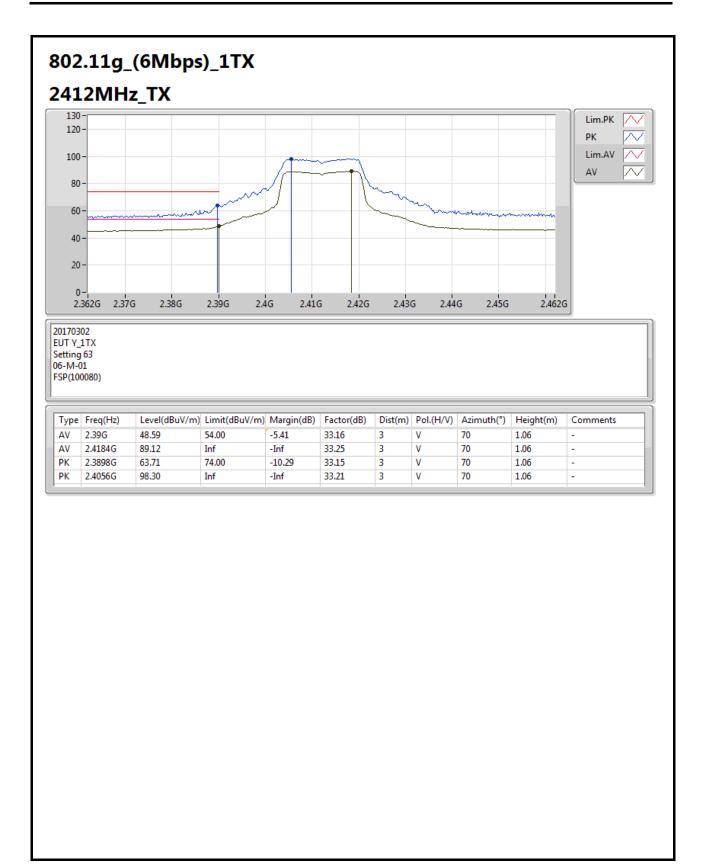




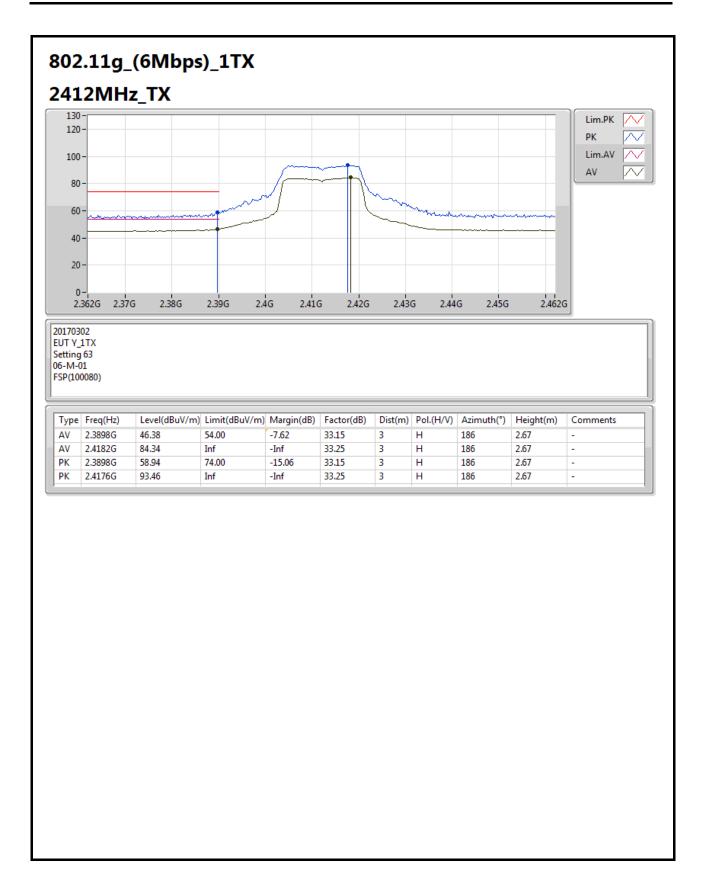




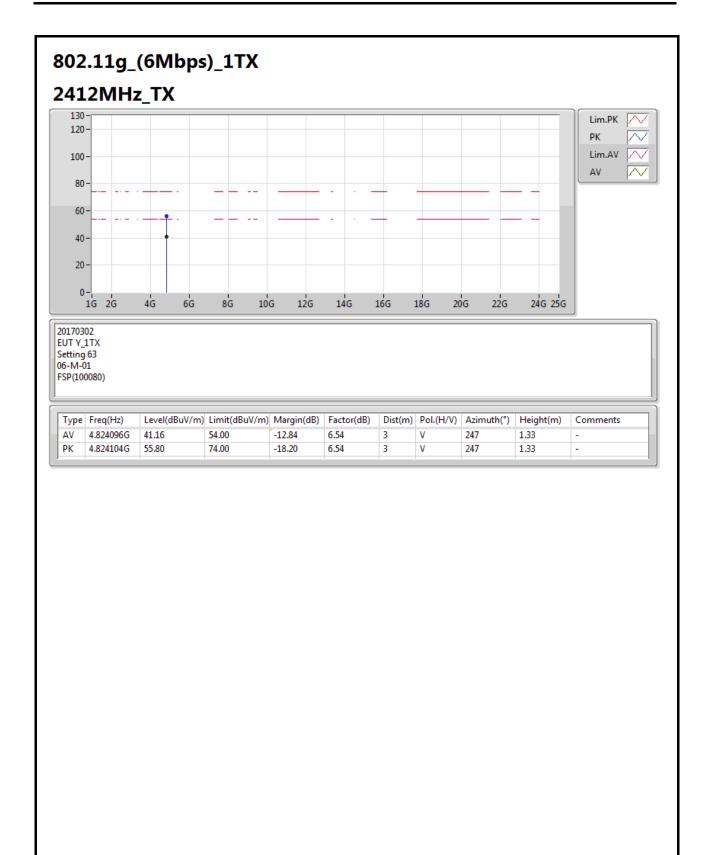




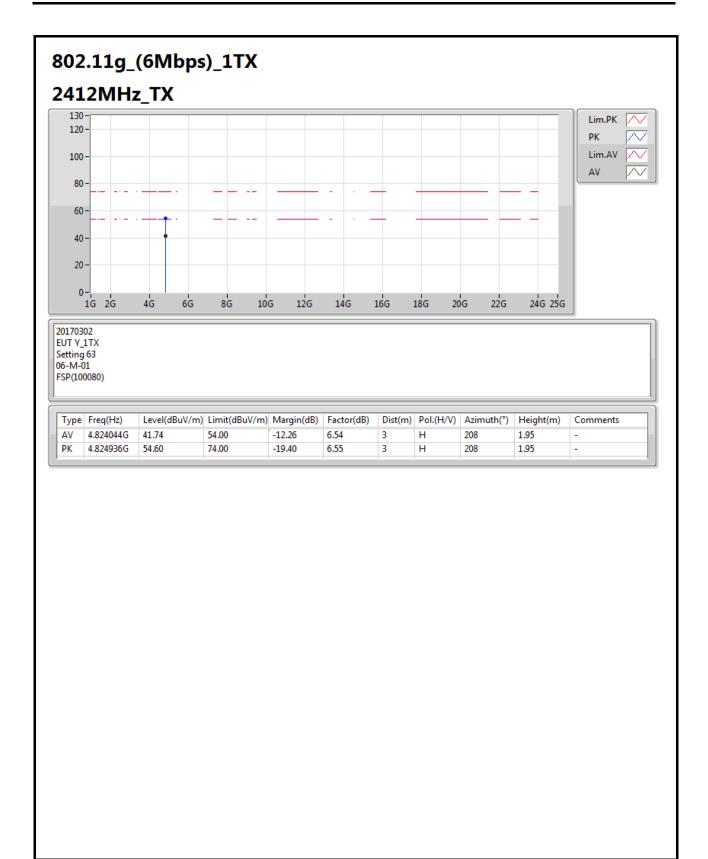




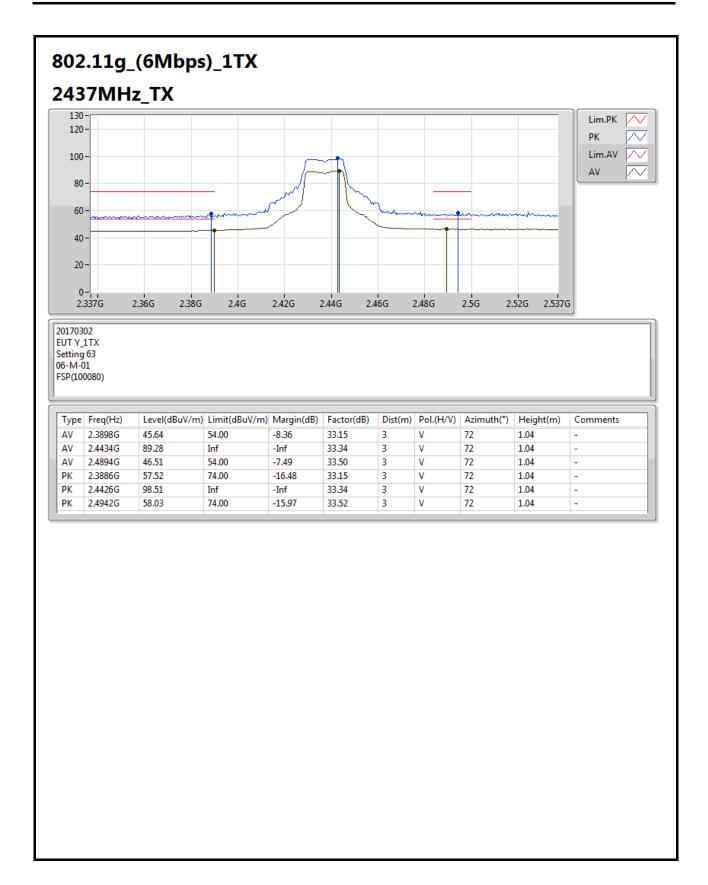




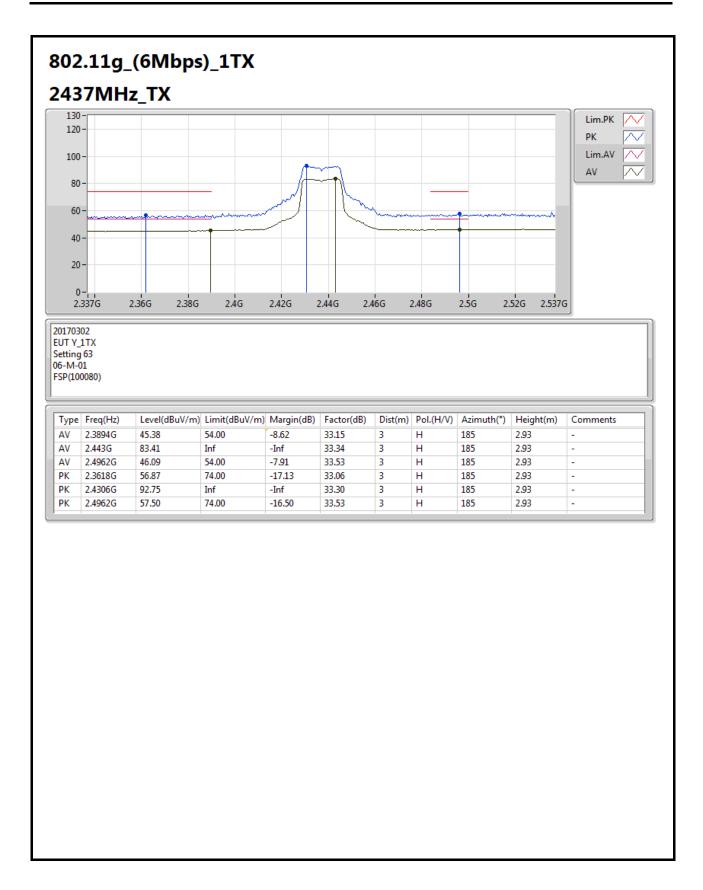




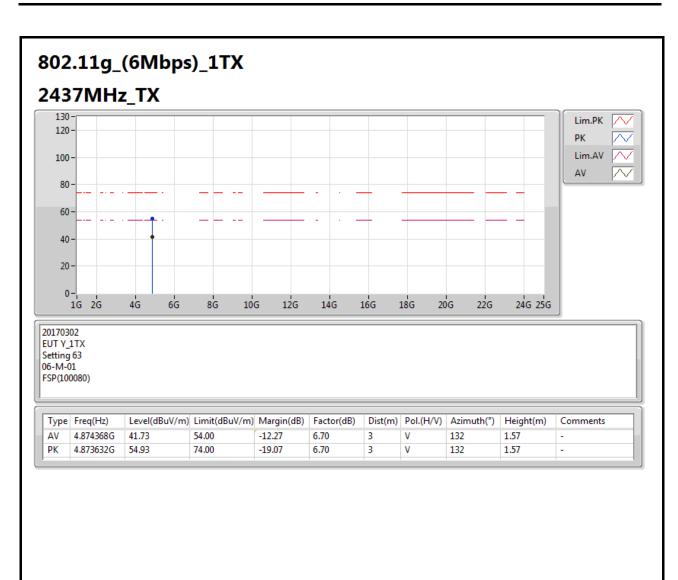




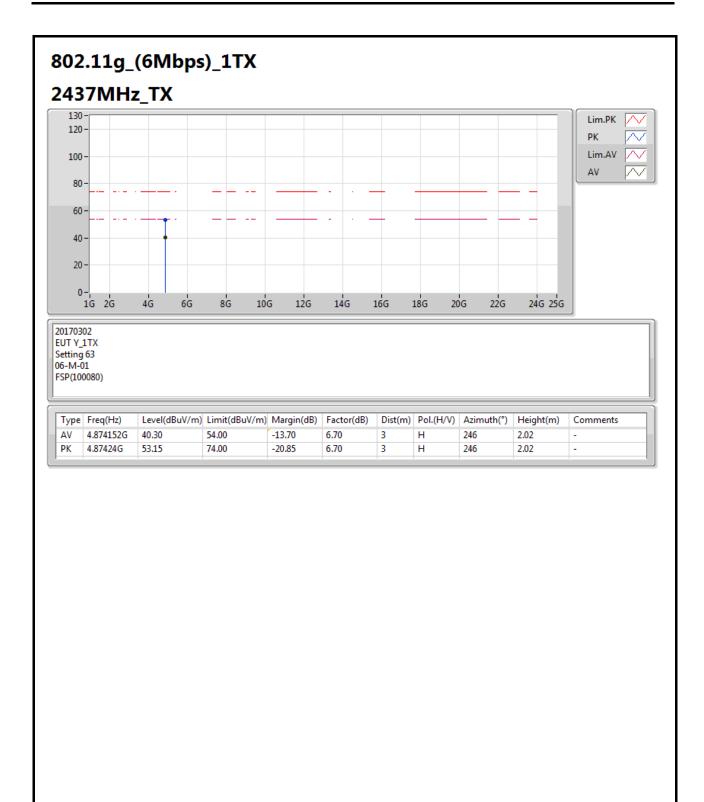




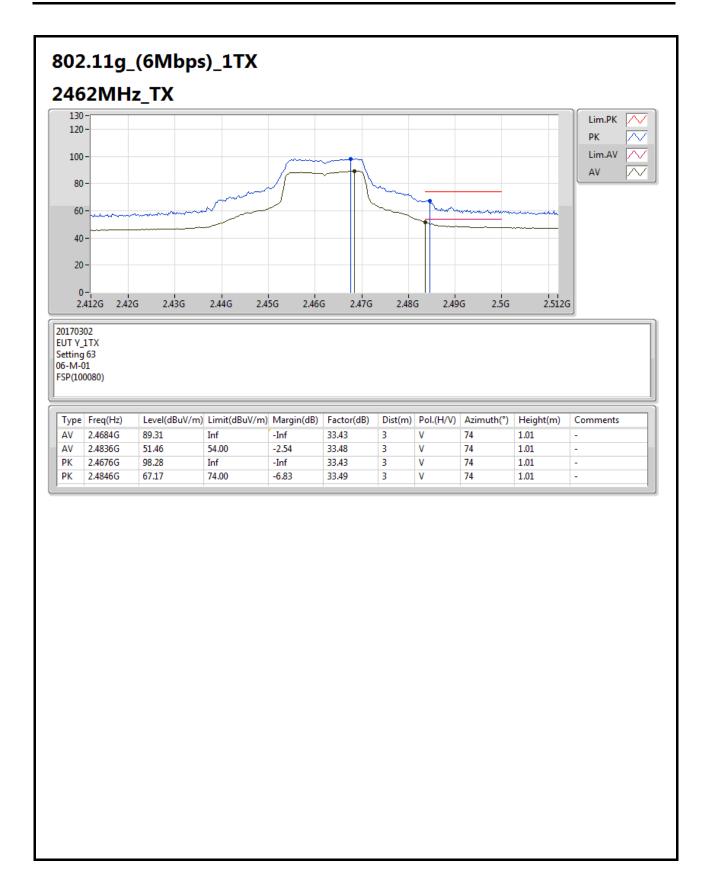




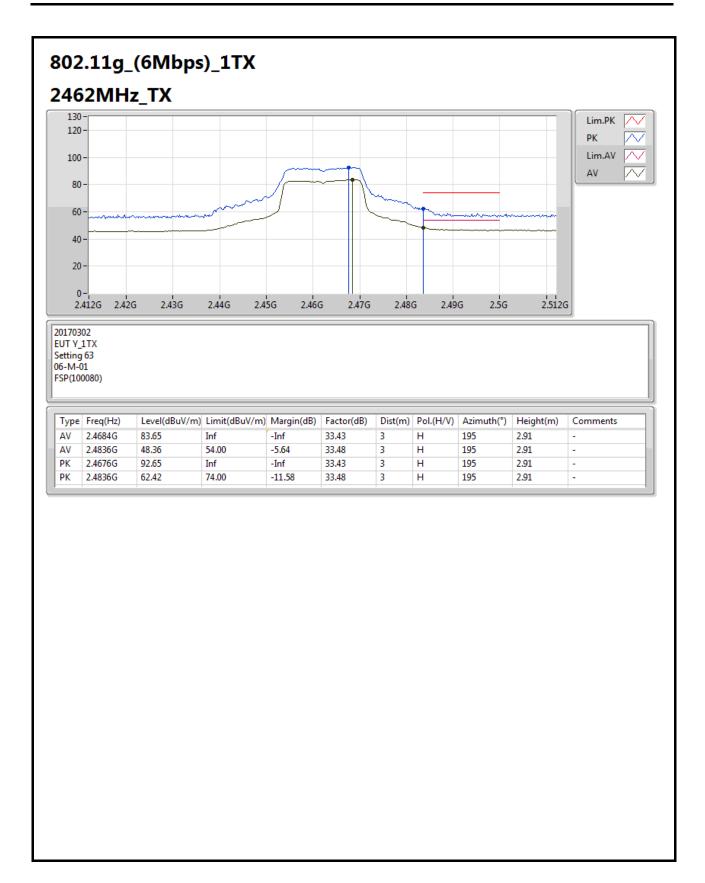




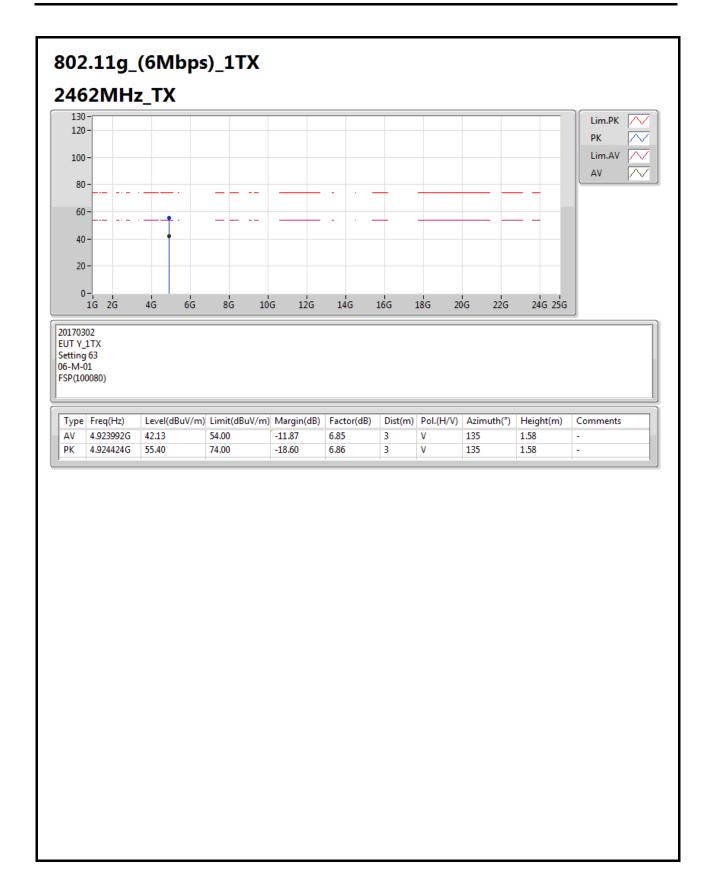




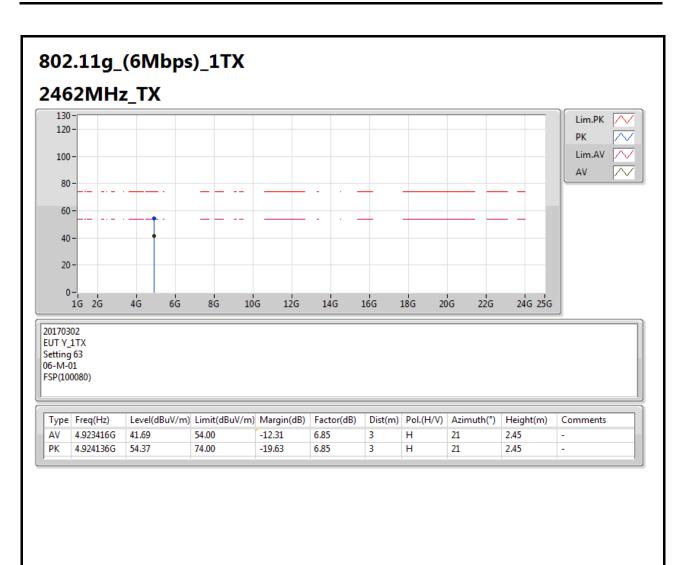




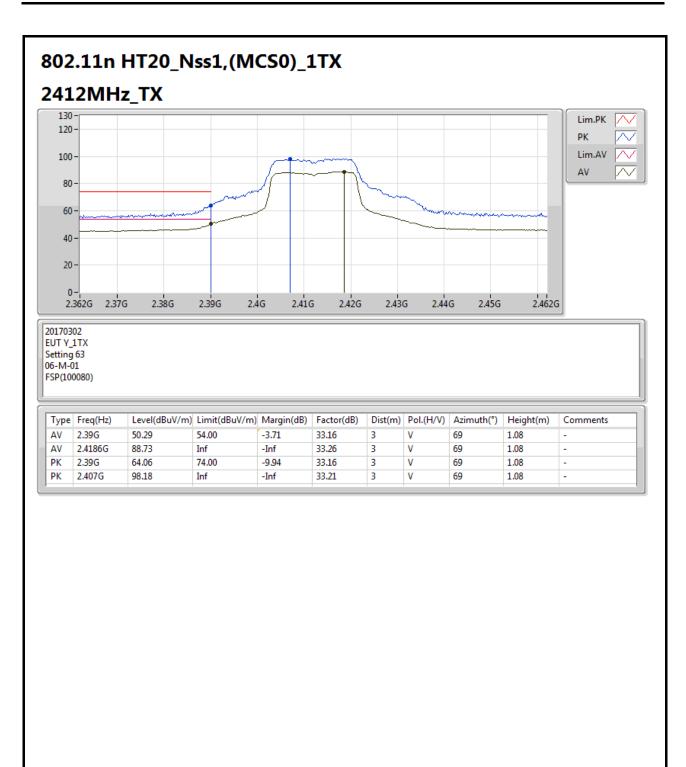




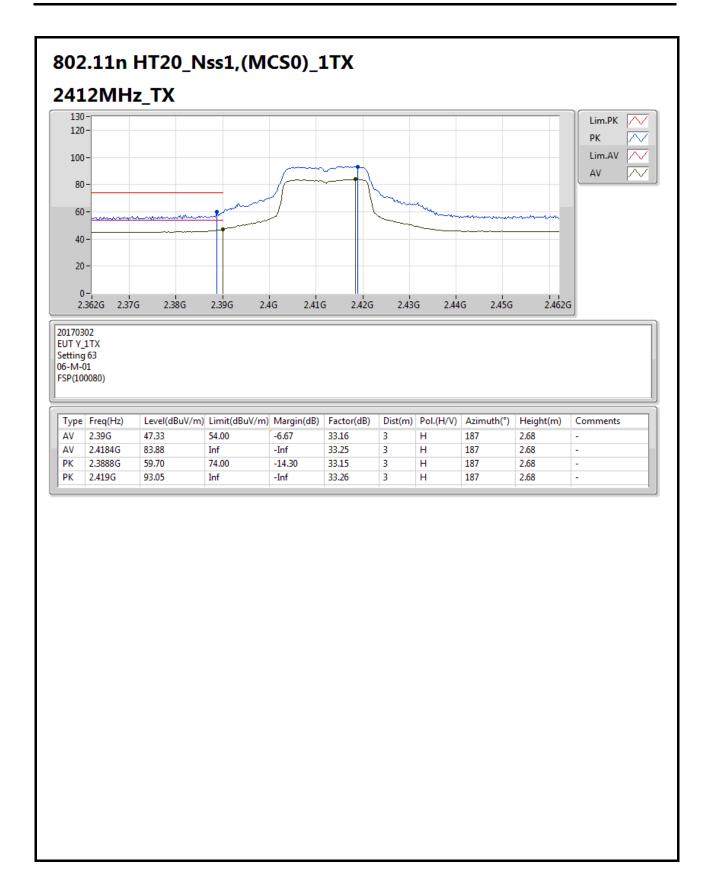




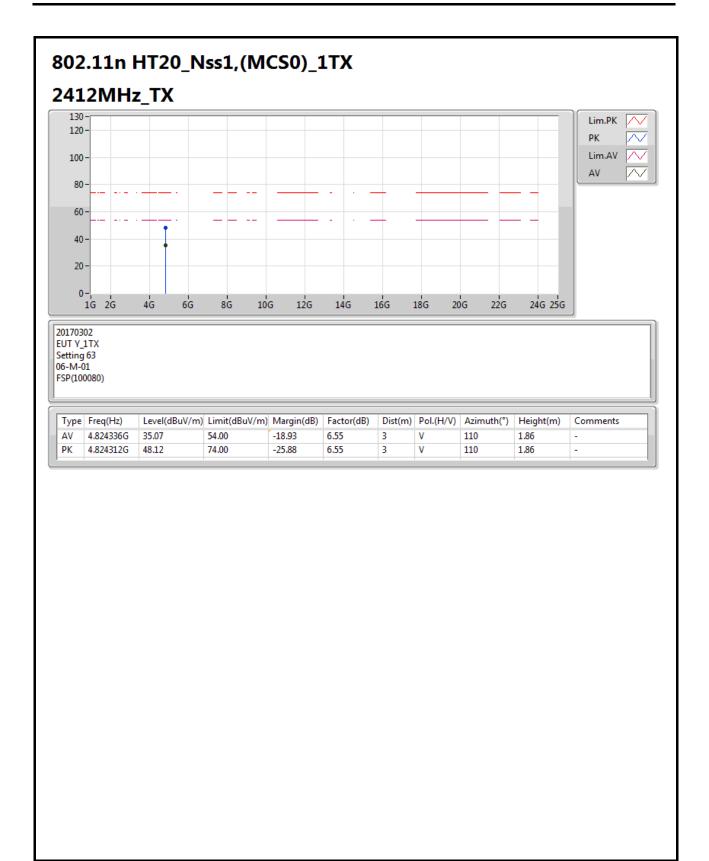




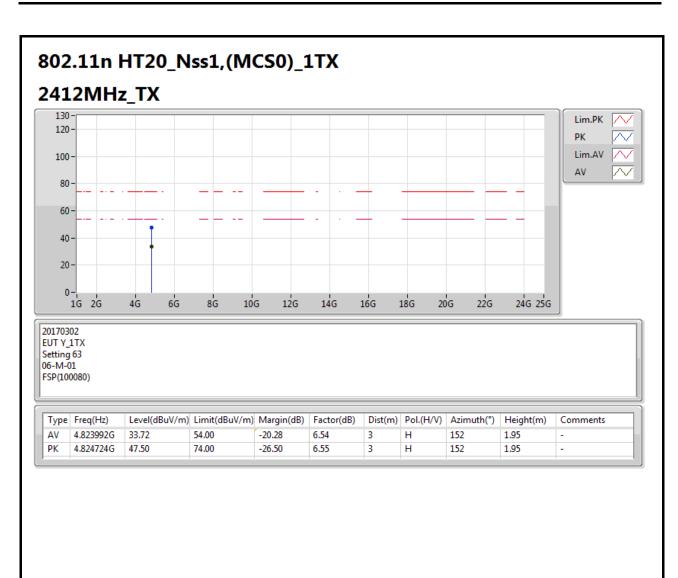




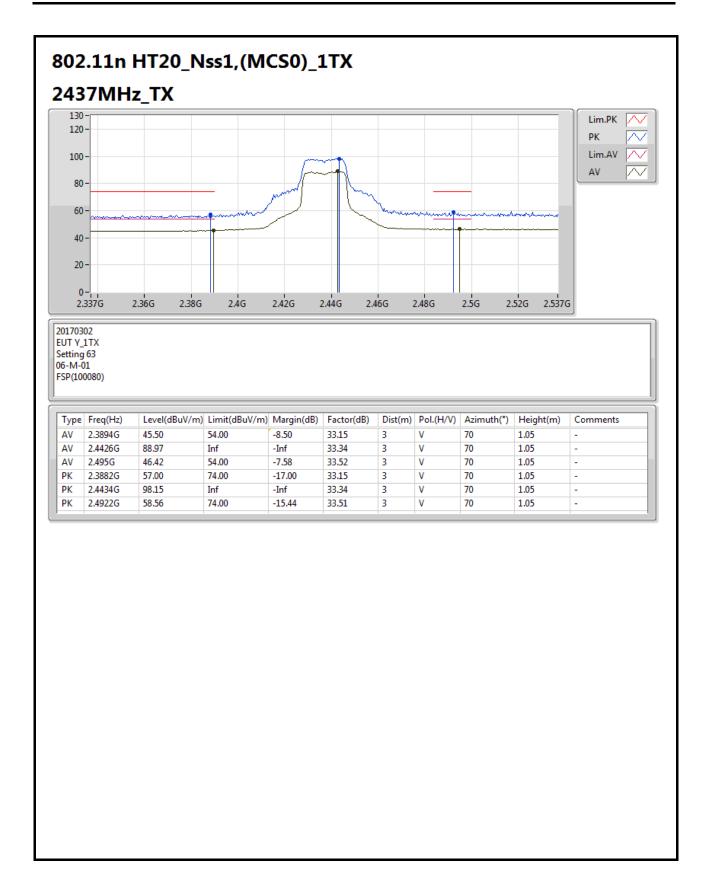




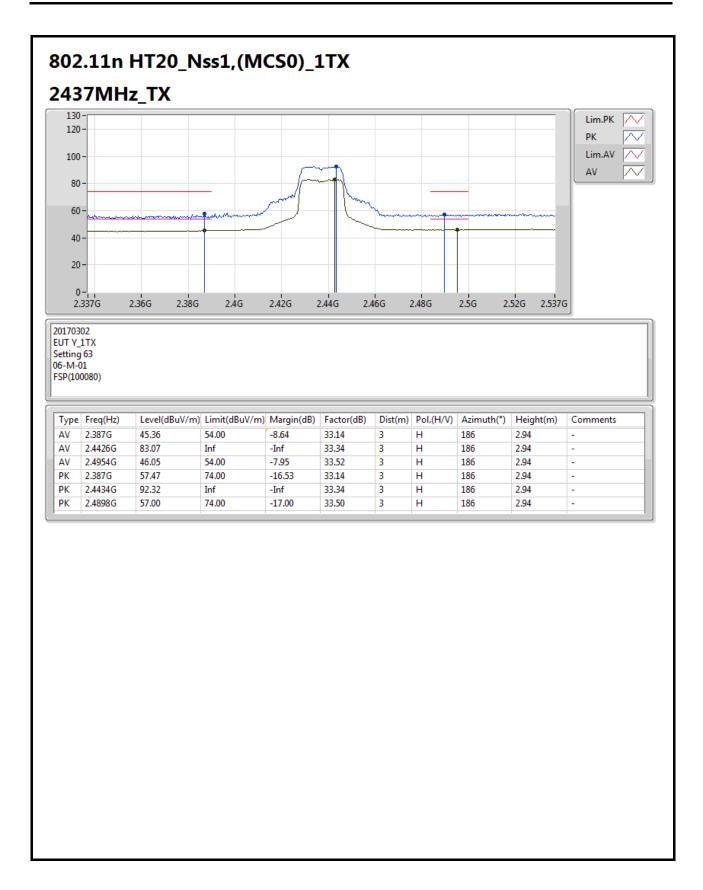








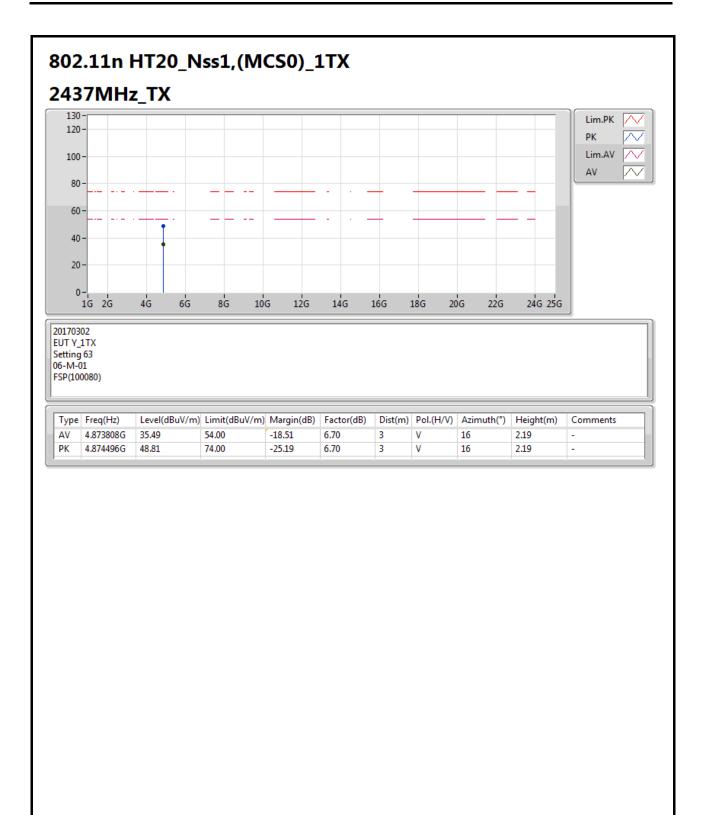




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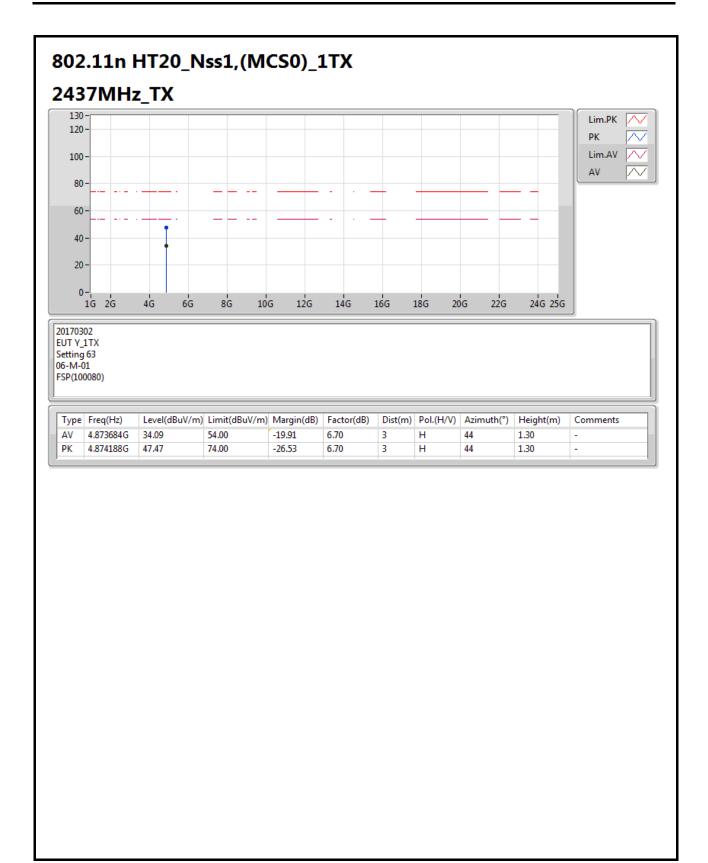




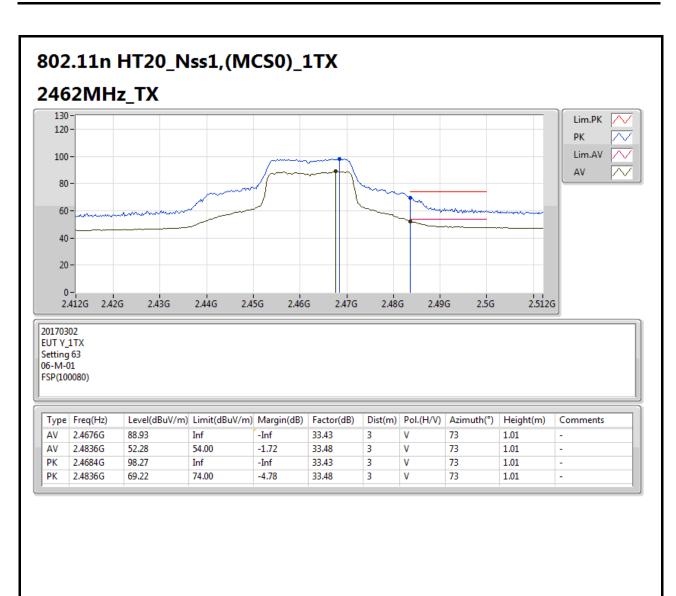
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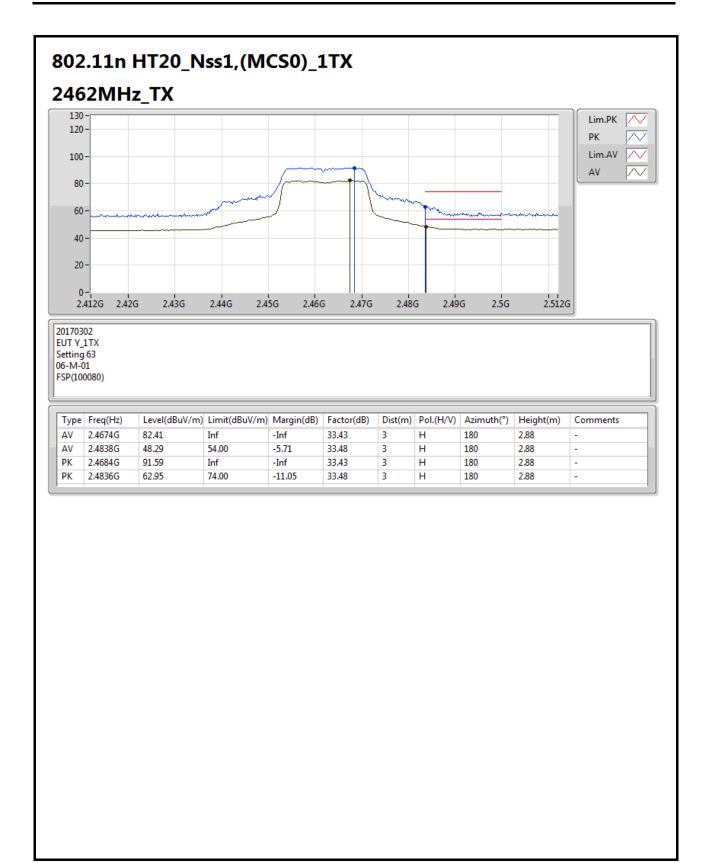




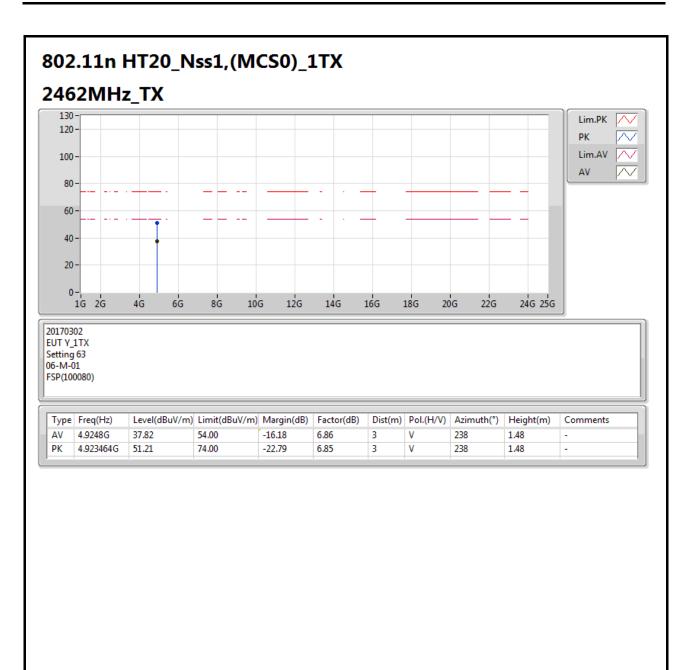




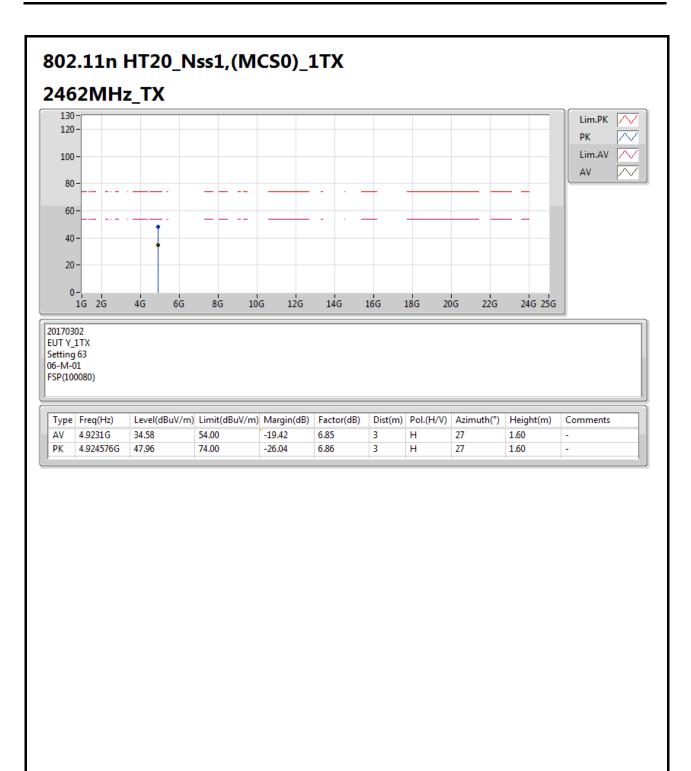




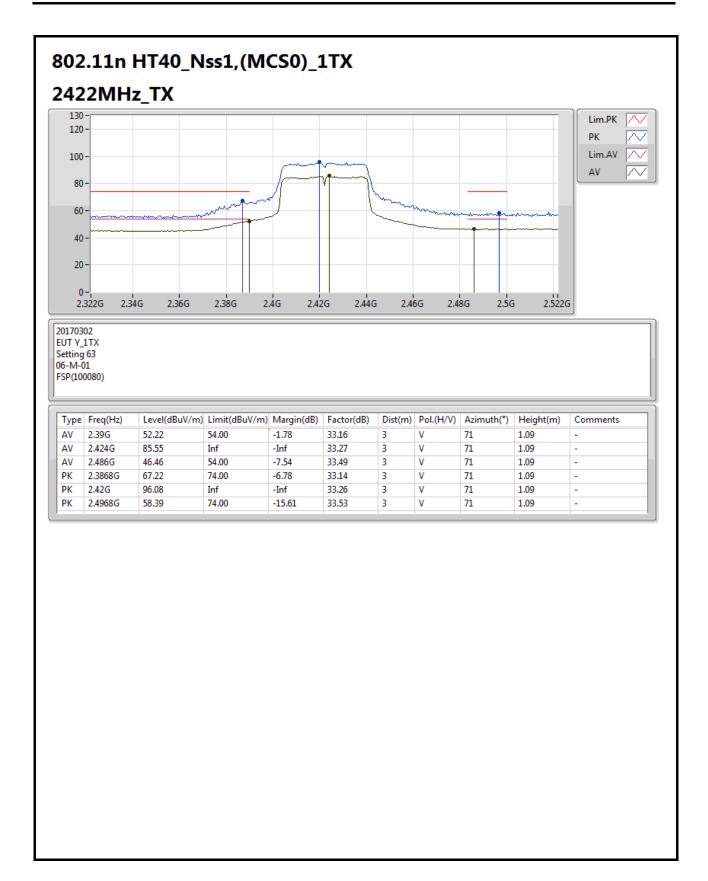




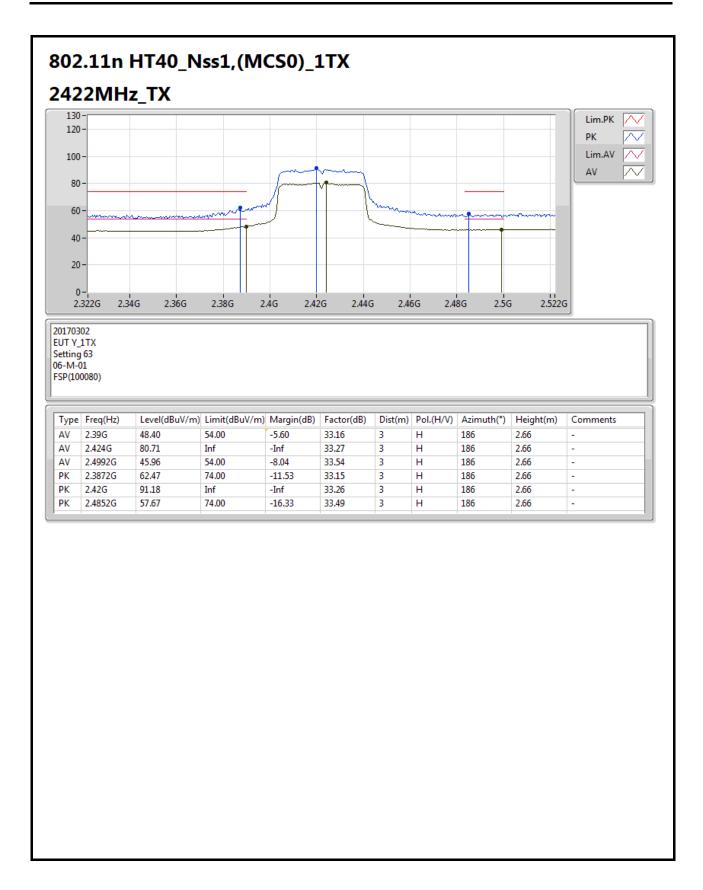








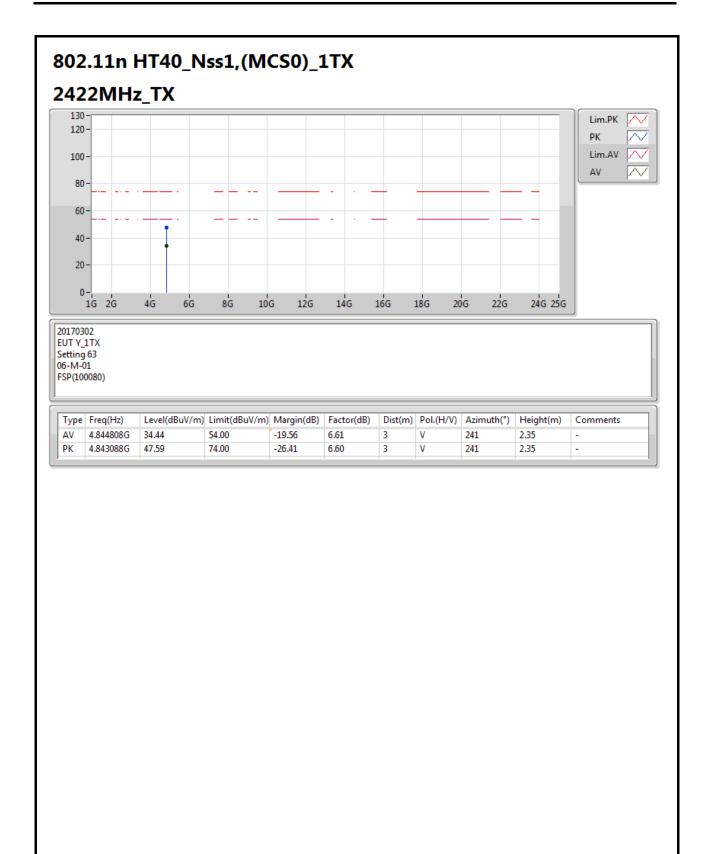




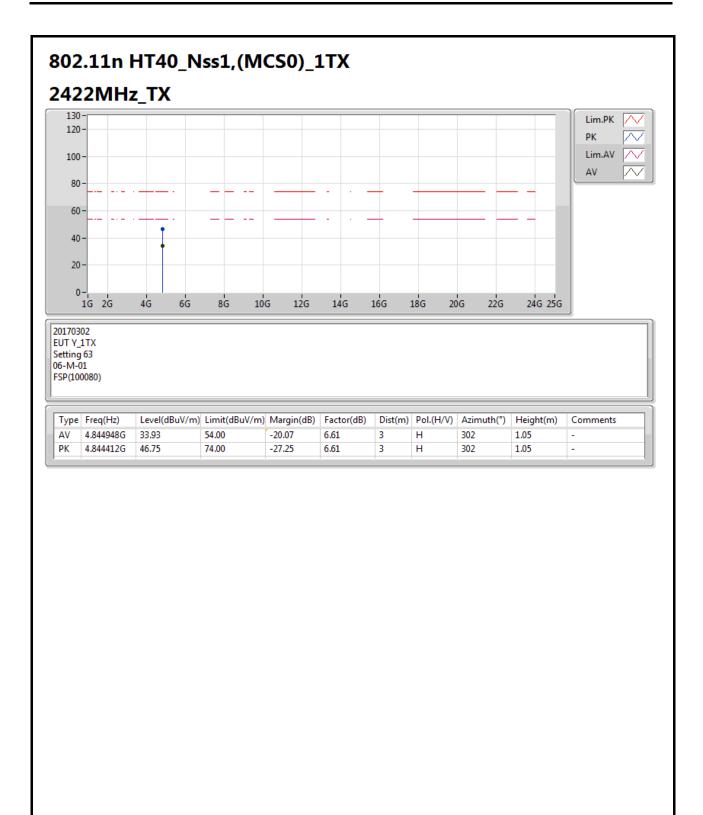
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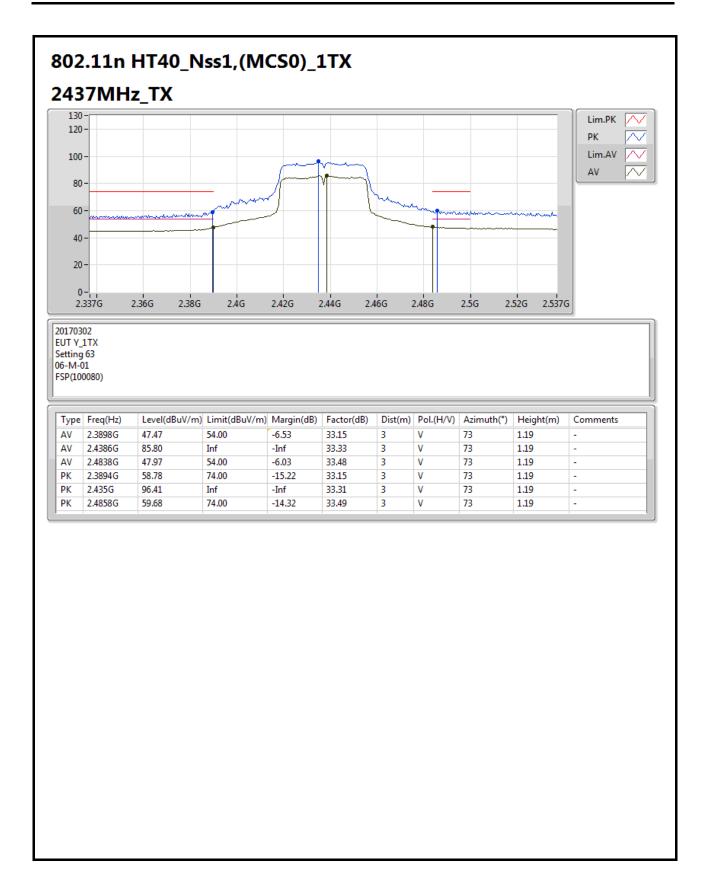




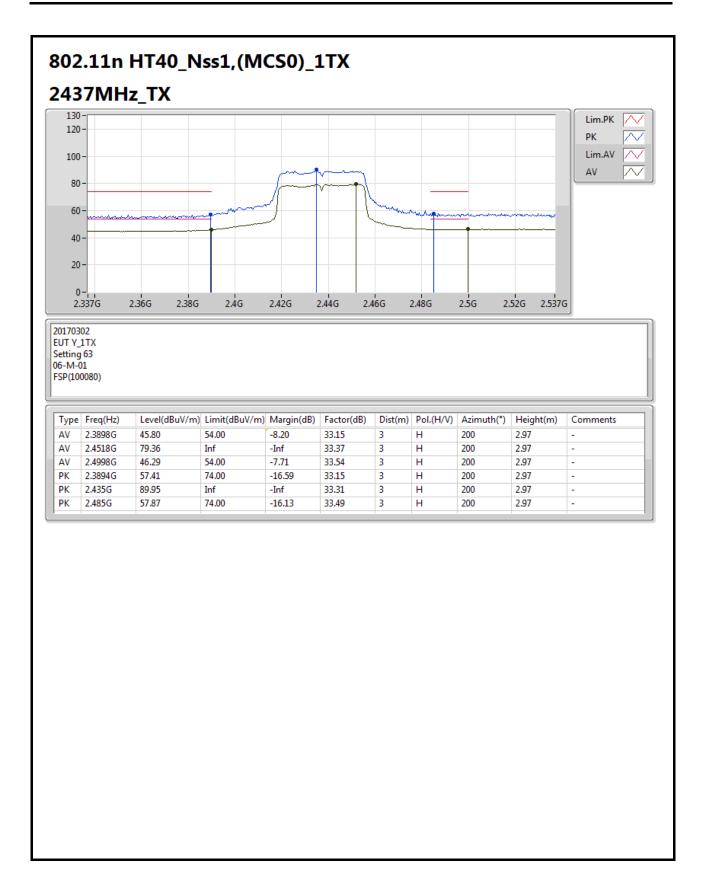




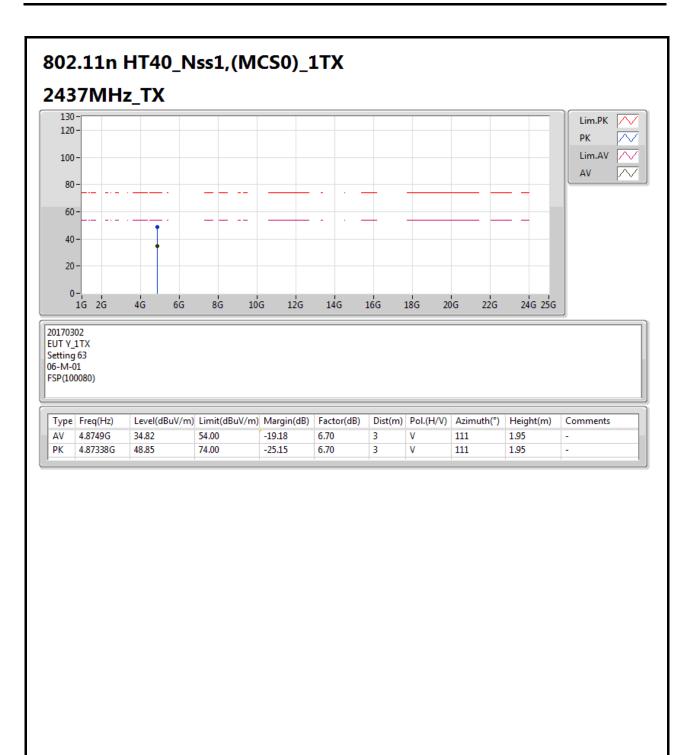




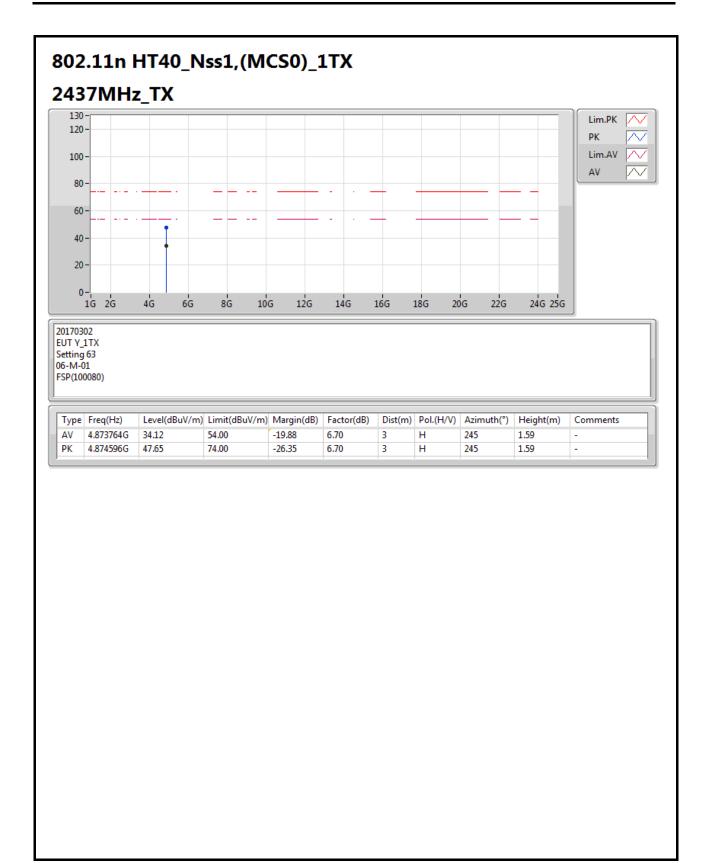








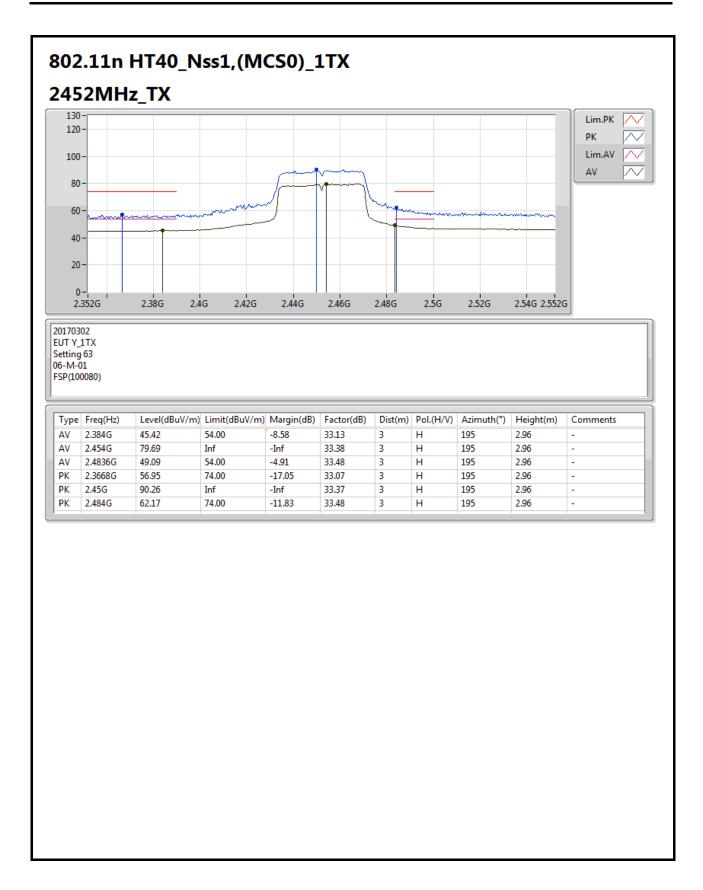












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