

Report No. : FR711841-01
Project No: CB10605078

# **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 15.407

Operating Band : 5150 MHz - 5250 MHz

5250 MHz - 5350 MHz 5470 MHz - 5725 MHz 5725 MHz - 5850 MHz

Applicant : INNOMEDIA TECHNOLOGY INC

3RD FL HSINCHU SCIENCE-BASED INDUSTRIAL PARK

3 INDUSTRIAL E RD IX HSINCHU 300 TAIWAN

Manufacturer : LUEN HUEI ELECTRONICS CO.,LTD

17 Kuang Fu Rd., Hslnchu Industrial, Park

HsInchu, Taiwan, R.O.C

Function : ☐ Outdoor; ☐ Indoor; ☐ Fixed P2P

Client

The product sample received on Apr. 12, 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.







# FCC Test Report

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# **Summary of Test Result**

Conformance Test Specifications					
Report Clause	Ref. Std. Clause	Description	Result		
1.1.2	15.203	Antenna Requirement	Complied		
3.1	15.207	AC Power-line Conducted Emissions C			
3.2	15.407(a)	Emission Bandwidth	Complied		
3.3	15.407(a)	Maximum Conducted Output Power	Complied		
3.4	15.407(a)	Peak Power Spectral Density	Complied		
3.5	15.407(b)	Unwanted Emissions	Complied		
3.6	15.407(g)	Frequency Stability	Complied		

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# **Revision History**

Report No.	Version	Description	Issued Date
FR711841-01	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
5150-5250	a, n (HT20)	5180-5240	36-48 [4]
5250-5350		5260-5320	52-64 [4]
5470-5725		5500-5700	100-140 [11]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40)	5190-5230	38-46 [2]
5250-5350		5270-5310	54-62 [2]
5470-5725		5510-5670	102-134 [5]
5725-5850		5755-5795	151-159 [2]

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	1TX
5.15-5.25GHz	802.11n HT20	20	1TX
5.15-5.25GHz	802.11n HT40	40	1TX
5.25-5.35GHz	802.11a	20	1TX
5.25-5.35GHz	802.11n HT20	20	1TX
5.25-5.35GHz	802.11n HT40	40	1TX
5.47-5.725GHz	802.11a	20	1TX
5.47-5.725GHz	802.11n HT20	20	1TX
5.47-5.725GHz	802.11n HT40	40	1TX
5.725-5.85GHz	802.11a	20	1TX
5.725-5.85GHz	802.11n HT20	20	1TX
5.725-5.85GHz	802.11n HT40	40	1TX

### Note:

- 11a, 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

Ant.	Brand	Part No.	Antenna Type	Connector	Gain (dBi)
1	LYNwave	ALA150-092031-000000	PIFA Antenna	I-PEX	3

# 1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)
802.11a	0.929	0.32
802.11n HT20	0.906	0.429
802.11n HT40	0.835	0.783

# 1.1.4 EUT Operational Condition

EUT Power Type From Power Adapter				
Beamforming Function	Mith beamforming ⊠ Without beamforming			Without beamforming
Weather Band	$\boxtimes$	With 5600~5650MHz		Without 5600~5650MHz

# 1.1.5 Table for Multiple Listing

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

Model Name	WiFi	USB	Push Button	FXS port
MTA8328-1W	Υ	N	Υ	1
MTA8328-1WV	Υ	Υ	Υ	1

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 789033 D02 v01r04
- FCC KDB 662911 D01 v02r01

# 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%	Apr. 20, 2017
Radiated Below 1GHz	03CH01-CB	Zero Chen / Brain Chen Joy Tseng	22°C / 54%	May 02, 2017
Radiated Above 1GHz	03CH01-CB	Zero Chen / Brain Chen Joy Tseng	22°C / 54%	Apr. 13, 2017~May 02, 2017
AC Conduction	CO01-CB	Gavin Peng / Rick Yeh	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)

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 <sup>-8</sup>	Confidence levels of 95%
Frequency Stability	6.06 x10 <sup>-8</sup>	Confidence levels of 95%

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2 Test Configuration of EUT

# 2.1 Test Channel Mode

Band	Power Setting
802.11a_(6Mbps)_1TX	-
5180MHz	63
5200MHz	63
5240MHz	63
5260MHz	63
5300MHz	63
5320MHz	56
5500MHz	33
5580MHz	63
5700MHz	34
5745MHz	63
5785MHz	63
5825MHz	63
802.11n HT20_Nss1,(MCS0)_1TX	-
5180MHz	63
5200MHz	63
5240MHz	63
5260MHz	63
5300MHz	63
5320MHz	54
5500MHz	33
5580MHz	60
5700MHz	16
5745MHz	63
5785MHz	63
5825MHz	63
802.11n HT40_Nss1,(MCS0)_1TX	-
5190MHz	35
5270MHz	50
5310MHz	26
5510MHz	11
5550MHz	28
5670MHz	21
5755MHz	17
5795MHz	26

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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.		

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-	The Worst Case Mode for Following Conformance Tests	
Tests Item	Emission Bandwidth Maximum Conducted Output Power Peak Power Spectral Density Frequency Stability	
Test Condition	Conducted measurement at transmit chains	

Th	The Worst Case Mode for Following Conformance Tests			
Tests Item	Unwanted Emissions			
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.			
Operating Mode < 1GHz	Normal Link			
1	EUT at Z axis + LAN + WAN + Phone + Adpater			
2	EUT at Y axis + LAN + WAN + Phone + Adpater			
Mode 1 has been evaluate follow this same test mode	ed to be the worst case among Mode 1~2, thus measurement for Mode 3~4 will			
3	EUT at Z axis + LAN + WIFI(2.4G) + Adapter			
4	EUT at Z axis + LAN + WIFI(5G) + Adapter			
For operating mode 1 is th	e worst case and it was record in this test report.			
Operating Mode > 1GHz	CTX			
· ·	t Y axis and Z axis position for Radiated emission test, and the worst case was			
found at Y axis. So the me	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 Cable*2, Non-Shielded, 1.8m				
RJ-11 Cable*1, Non-Shielded, 1.5m				

# 2.5 Support Equipment

For Test Site No: CO01-CB

	Support Equipment			
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 Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB*2	DELL	E6430	DoC
2	Phone	PHILIPS	M20	N/A

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

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

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For Test Site No: TH01-CB

	0101101101	Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
1	NB	DELL	E4300	DoC

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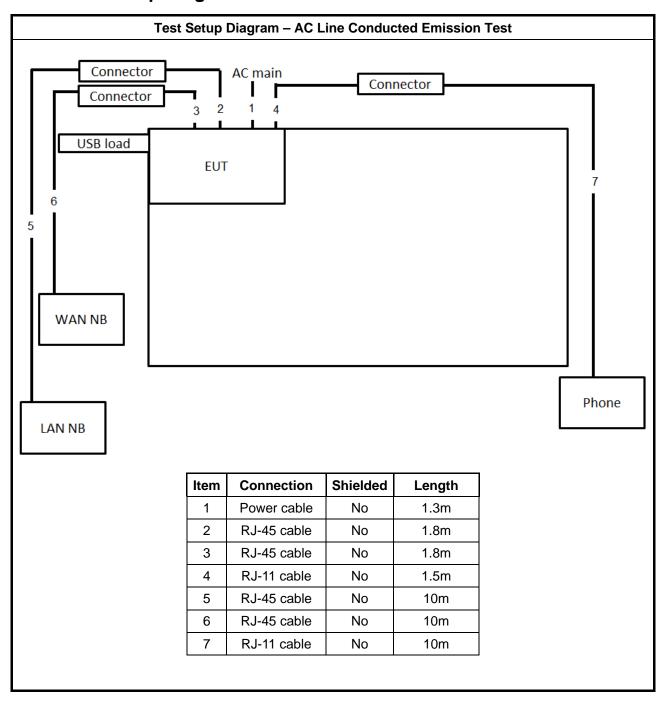
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#### **Test Setup Diagram** 2.6



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Test Setup Diagram - Radiated Test < 1GHz AC MAIN Connector Connector WAN NB LAN NB Phone Connection **Shielded** Item Length 1 Power cable No 1.3m 2 RJ-45 cable 1.8m No 3 RJ-45 cable No 1.8m 4 RJ-45 cable No 10m 5 RJ-45 cable No 10m 6 RJ-11 cable 1.5m No 7 USB cable 2m Yes

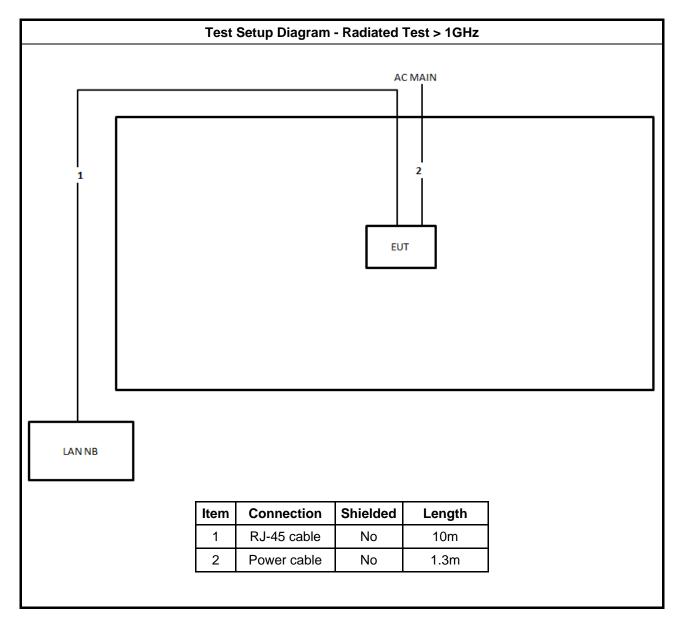
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**Transmitter Test Result** 3

#### 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

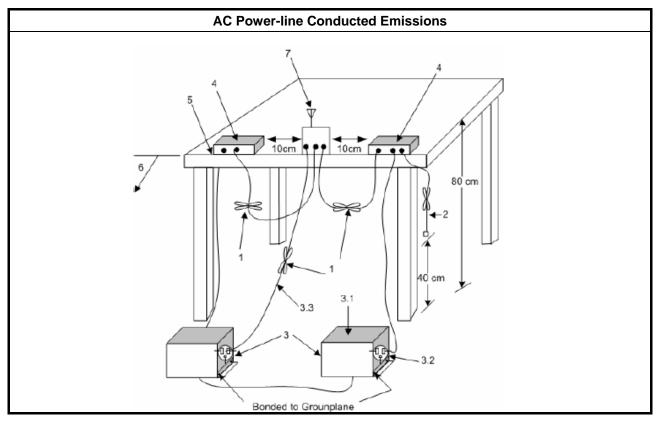
#### 3.1.2 **Measuring Instruments**

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

### 3.1.3 Test Procedures

	Test Method
$\boxtimes$	Refer as ANSI C63.10-2013, 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 Emission Bandwidth

### 3.2.1 Emission Bandwidth Limit

	Emission Bandwidth Limit			
UN	UNII Devices			
$\boxtimes$	For the 5.15-5.25 GHz band, N/A			
	For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.			
	For the 5.47-5.725 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.			
$\boxtimes$	For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.			
LE-	LAN Devices			
	For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.			
	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz			
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz			
	For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz.			

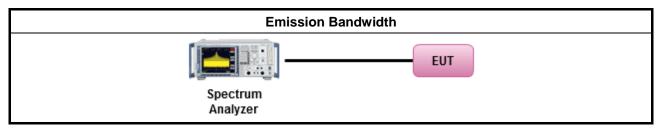
# 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

	Test Method					
•	For the emission bandwidth shall be measured using one of the options below:					
	$\boxtimes$	Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement.				
		Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.				
	$\boxtimes$	Refer as IC RSS-Gen, clause 4.6 for bandwidth testing.				

## 3.2.4 Test Setup



### 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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# 3.3 Maximum Conducted Output Power

# 3.3.1 Maximum Conducted Output Power Limit

	Maximum Conducted Output Power Limit
UNI	I Devices
$\boxtimes$	For the 5.15-5.25 GHz band:
	Outdoor AP: the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 1 W. If $G_{TX}$ > 6 dBi, then $P_{Out}$ = 30 - ( $G_{TX}$ - 6). e.i.r.p. at any elevation angle above 30 degrees $\leq$ 125mW [21dBm]
	Indoor AP: the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
	Point-to-point AP: the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 1 W If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$ .
	Mobile or Portable Client: the maximum conducted output power (P <sub>Out</sub> ) shall not exceed the lesser of 250 mW. If G <sub>TX</sub> > 6 dBi, then P <sub>Out</sub> = 24 - (G <sub>TX</sub> - 6).
	For the 5.25-5.35 GHz band, the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$ .
	For the 5.47-5.725 GHz band, the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX}$ > 6 dBi, then $P_{Out}$ = 24 – ( $G_{TX}$ – 6).
$\boxtimes$	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the maximum conducted output power (P <sub>Out</sub> ) shall not exceed the lesser of 1 W. If G <sub>TX</sub> > 6 dBi, then P <sub>Out</sub> = 30 − (G <sub>TX</sub> − 6).
	<ul> <li>Point-to-point systems (P2P): the maximum conducted output power (P<sub>Out</sub>) shall not exceed the lesser of 1 W.</li> </ul>
LE-	LAN Devices
	For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz
	For the 5.725-5.85 GHz band:
	<ul> <li>Point-to-multipoint systems (P2M): the maximum conducted output power (P<sub>Out</sub>) shall not exceed the lesser of 1 W. If G<sub>TX</sub> &gt; 6 dBi, then P<sub>Out</sub> = 30 - (G<sub>TX</sub> - 6).</li> </ul>
	<ul> <li>Point-to-point systems (P2P): the maximum conducted output power (P<sub>Out</sub>) shall not exceed the lesser of 1 W.</li> </ul>
	t = maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi.

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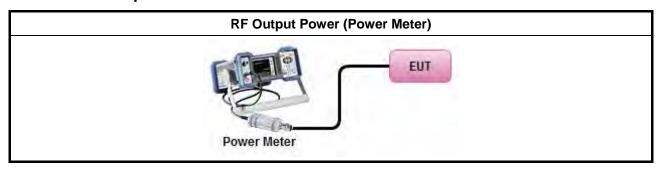
## 3.3.2 Measuring Instruments

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

#### 3.3.3 Test Procedures

	Test Method
•	Maximum Conducted Output Power
	Average over on/off periods with duty factor
	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
	Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
	Refer as FCC KDB 789033, clause E Method PM-G (using an RF average power meter).
•	For conducted measurement.
	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	■ If multiple transmit chains, EIRP calculation could be following as methods:  P <sub>total</sub> = P <sub>1</sub> + P <sub>2</sub> + + P <sub>n</sub> (calculated in linear unit [mW] and transfer to log unit [dBm])  EIRP <sub>total</sub> = P <sub>total</sub> + 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 Peak Power Spectral Density

# 3.4.1 Peak Power Spectral Density Limit

	Peak Power Spectral Density Limit
UN	II Devices
$\boxtimes$	For the 5.15-5.25 GHz band:
	<ul> <li>Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If G<sub>TX</sub> &gt; 6 dBi, then P<sub>Out</sub> = 17 - (G<sub>TX</sub> - 6).</li> </ul>
	Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$ .
	Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$ .
	<ul> <li>Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If G<sub>TX</sub> &gt; 6 dBi, then PPSD= 11 - (G<sub>TX</sub> - 6)</li> </ul>
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 $-$ ( $G_{TX} - 6$ ).
	For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – $(G_{TX} - 6)$ .
$\boxtimes$	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) $\leq$ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$ .
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-	LAN Devices
	For the 5.15-5.25 GHz band, the peak power spectral density (PPSD) $\leq$ 4 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) $\leq$ 10 dBm/MHz.
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) $\leq$ 17 dBm/MHz.
	<ul> <li>e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below:</li> <li>-13 dBW/MHz for 0° ≤ θ &lt; 8°; -13 - 0.716 (θ-8) dBW/MHz for 8° ≤ θ &lt; 40°</li> <li>-35.9 - 1.22 (θ-40) dBW/MHz for 40° ≤ θ ≤ 45°; -42 dBW/MHz for θ &gt; 45°</li> </ul>
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) $\leq$ 17 dBm/MHz.
	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$ .
	<ul> <li>Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.</li> </ul>
pow	SD = peak power spectral density that he same method as used to determine the conducted output ver shall be used to determine the power spectral density. And power spectral density in dBm/MHz = the maximum transmitting antenna directional gain in dBi.

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# 3.4.2 Measuring Instruments

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

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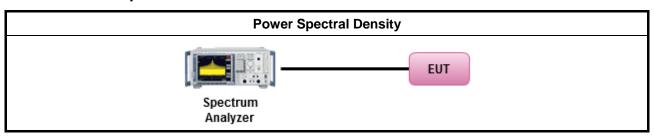
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3.4.3 Test Procedures

		Test Method
•	outp func	k power spectral density procedures that the same method as used to determine the conducted ut power shall be used to determine the peak power spectral density and use the peak search tion on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density be measured using below options:
		Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth
	[duty	v cycle ≥ 98% or external video / power trigger]
	$\boxtimes$	Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging).
		Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
	duty	cycle < 98% and average over on/off periods with duty factor
	$\boxtimes$	Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging).
		Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
•	For	conducted measurement.
	•	If the EUT supports multiple transmit chains using options given below:
		Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
		Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
		Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
	•	If multiple transmit chains, EIRP PPSD calculation could be following as methods: $ PPSD_{total} = PPSD_1 + PPSD_2 + \ldots + PPSD_n \\ (calculated in linear unit [mW] and transfer to log unit [dBm]) \\ EIRP_{total} = PPSD_{total} + DG $

# 3.4.4 Test Setup



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# 3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

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3.5 Unwanted Emissions

#### 3.5.1 Transmitter Radiated Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit							
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m) Measure Distance					
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.

	Un-restricted band emissions above 1GHz Limit					
Operating Band	Limit					
5.15 - 5.25 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]					
5.25 - 5.35 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]					
5.47 - 5.725 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]					
5.725 - 5.85 GHz	all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.					

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

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## 3.5.2 Measuring Instruments

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

### 3.5.3 Test Procedures

		Test Method
•	perf equ abo are be e dista	asurements may be performed at a distance other than the limit distance provided they are not formed in the near field and the emissions to be measured can be detected by the measurement ipment. Measurements shall not be performed at a distance greater than 30 m for frequencies ove 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less impractical. When performing measurements at a distance other than that specified, the results shall extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear ance for field-strength measurements, inverse of linear distance-squared for power-density assurements).
•	The	e average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
•	For	the transmitter unwanted emissions shall be measured using following options below:
	•	Refer as FCC KDB 789033, clause H)2) for unwanted emissions into non-restricted bands.
	•	Refer as FCC KDB 789033, clause H)1) for unwanted emissions into restricted bands.
		Refer as FCC KDB 789033, H)6) Method AD (Trace Averaging).
		Refer as FCC KDB 789033, H)6) Method VB (Reduced VBW).
		☐ 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 789033, clause H)5) measurement procedure peak limit.
		Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit.
•	For	radiated measurement.
	•	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	•	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	•	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
•	The	e any unwanted emissions level shall not exceed the fundamental emission level.

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

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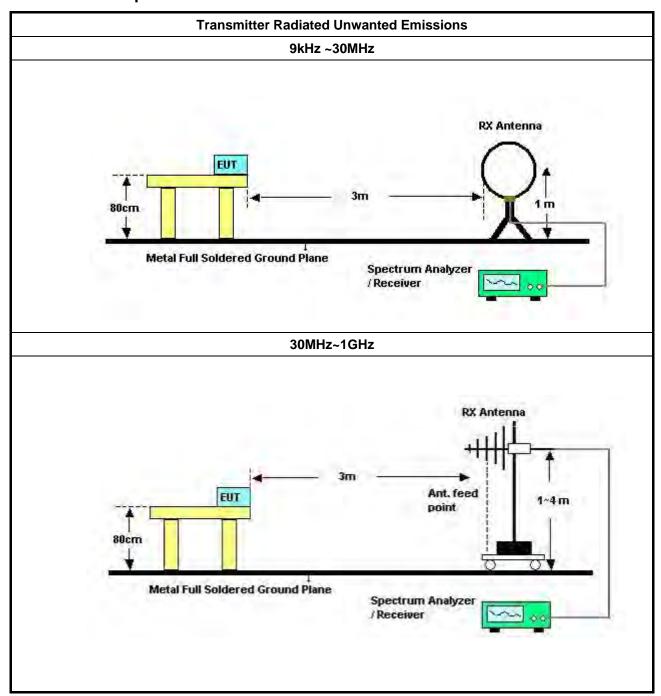
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#### **Test Setup** 3.5.4

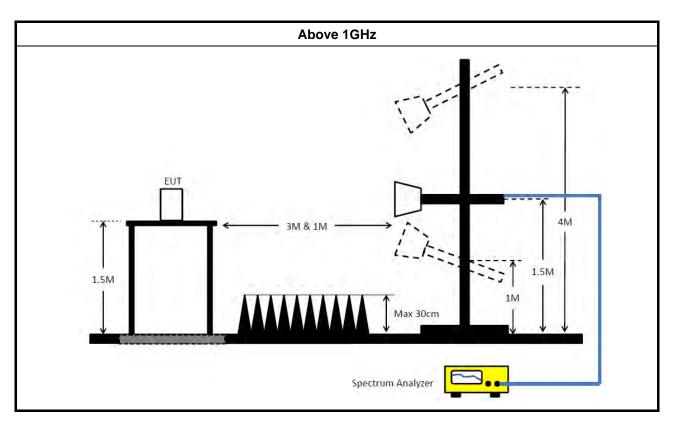


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# 3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

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

## 3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E

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# 3.6 Frequency Stability

#### 3.6.1 Frequency Stability Limit

#### **Frequency Stability Limit**

#### **UNII Devices**

 In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

#### **LE-LAN Devices**

N/A

#### IEEE Std. 802.11

■ The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band and ± 25 ppm maximum for the 2.4 GHz band.

#### 3.6.2 Measuring Instruments

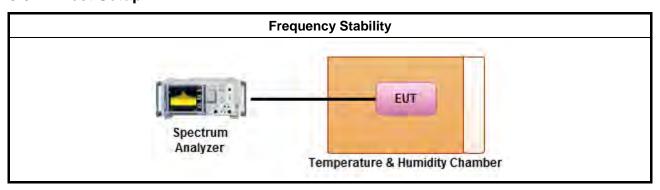
Refer a test equipment and calibration data table in this test report.

#### 3.6.3 Test Procedures

#### **Test Method**

- Refer as ANSI C63.10, clause 6.8 for frequency stability tests
  - Frequency stability with respect to ambient temperature
  - Frequency stability when varying supply voltage
  - Extreme temperature is 0°C~40°C.

### 3.6.4 Test Setup



### 3.6.5 Test Result of Frequency Stability

Refer as Appendix F

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# 4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model 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)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA91702 52	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)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 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)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 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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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.

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

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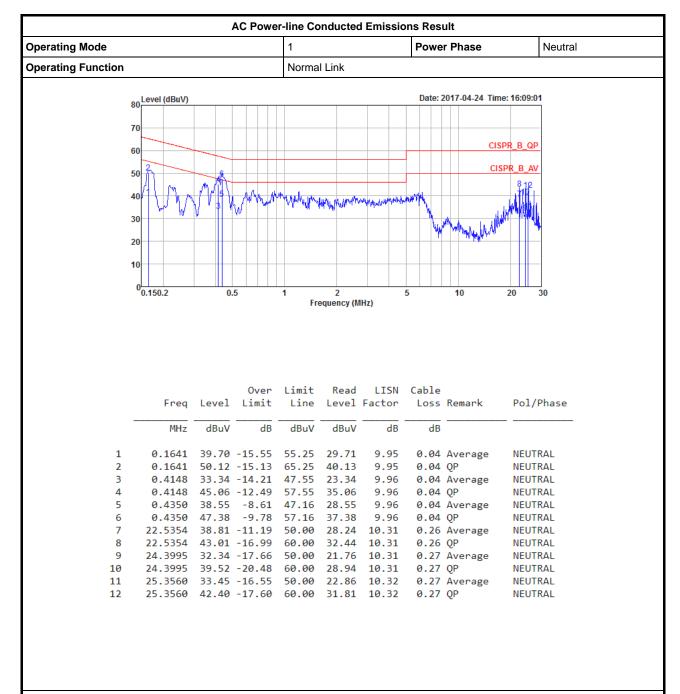
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<sup>&</sup>quot;\*" Calibration Interval of instruments listed above is two years.

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#### AC Power-line Conducted Emissions Result

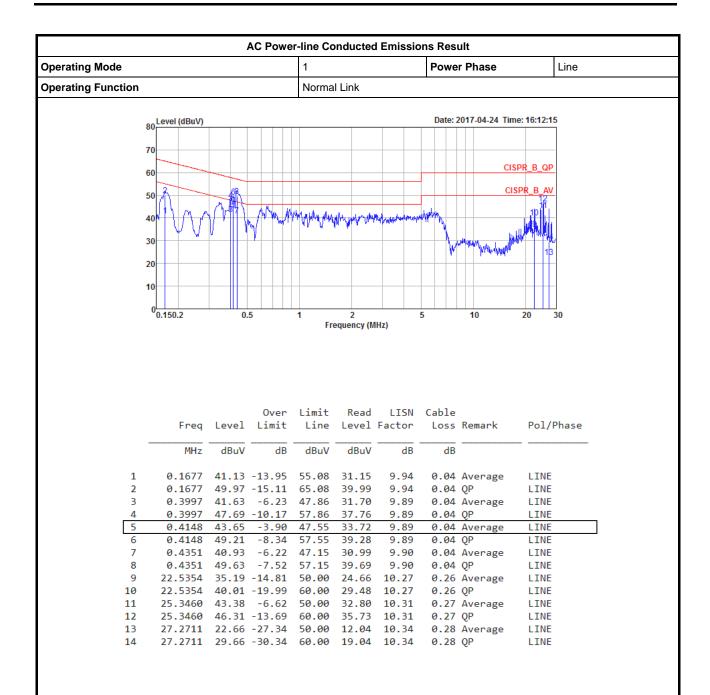


Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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.)



Appendix B EBW Result

**Summary** 

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
802.11a_(6Mbps)_1TX	-	-	-	-	-
5.15-5.25GHz	50M	21.289M	21M3D1D	49.825M	20.34M
5.25-5.35GHz	50M	34.558M	34M6D1D	49.925M	20.54M
5.47-5.725GHz	50M	38.556M	38M6D1D	49.5M	27.086M
5.725-5.85GHz	16.325M	41.104M	41M1D1D	16.325M	40.705M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-
5.15-5.25GHz	50M	19.64M	19M6D1D	49.95M	19.24M
5.25-5.35GHz	50M	33.983M	34M0D1D	49.95M	21.739M
5.47-5.725GHz	50M	39.68M	39M7D1D	50M	24.988M
5.725-5.85GHz	17.275M	41.304M	41M3D1D	16.9M	40.83M
802.11n HT40_Nss1,(MCS0)_1TX	=	-	-	-	-
5.15-5.25GHz	100M	72.614M	72M6D1D	100M	72.614M
5.25-5.35GHz	100M	73.263M	73M3D1D	97M	37.681M
5.47-5.725GHz	100M	73.913M	73M9D1D	97.3M	54.423M
5.725-5.85GHz	36.35M	72.014M	72M0D1D	36.25M	68.666M

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

Max-OBW = Maximum 99% occupied bandwidth;

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

Min-OBW = Minimum 99% occupied bandwidth;

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EBW Result Appendix B

#### Result

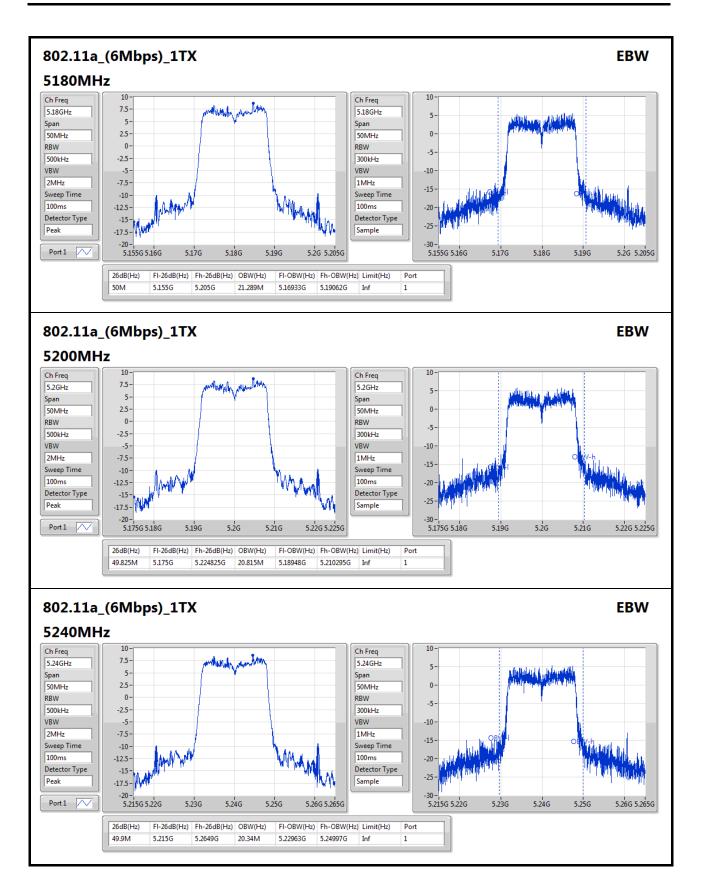
Mode	Result	Limit	Port 1-N dB	Port 1-OBW
		(Hz)	(Hz)	(Hz)
802.11a_(6Mbps)_1TX	-	-	-	-
5180MHz	Pass	Inf	50M	21.289M
5200MHz	Pass	Inf	49.825M	20.815M
5240MHz	Pass	Inf	49.9M	20.34M
5260MHz	Pass	Inf	49.925M	20.54M
5300MHz	Pass	Inf	50M	34.558M
5320MHz	Pass	Inf	50M	30.085M
5500MHz	Pass	Inf	49.5M	27.086M
5580MHz	Pass	Inf	50M	38.556M
5700MHz	Pass	Inf	50M	31.434M
5745MHz	Pass	500k	16.325M	40.705M
5785MHz	Pass	500k	16.325M	40.905M
5825MHz	Pass	500k	16.325M	41.104M
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-
5180MHz	Pass	Inf	50M	19.24M
5200MHz	Pass	Inf	49.975M	19.365M
5240MHz	Pass	Inf	49.95M	19.64M
5260MHz	Pass	Inf	49.95M	22.664M
5300MHz	Pass	Inf	50M	33.983M
5320MHz	Pass	Inf	50M	21.739M
5500MHz	Pass	Inf	50M	24.988M
5580MHz	Pass	Inf	50M	39.68M
5700MHz	Pass	Inf	50M	33.833M
5745MHz	Pass	500k	17.275M	40.83M
5785MHz	Pass	500k	17.125M	41.029M
5825MHz	Pass	500k	16.9M	41.304M
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-
5190MHz	Pass	Inf	100M	72.614M
5270MHz	Pass	Inf	97M	37.681M
5310MHz	Pass	Inf	100M	73.263M
5510MHz	Pass	Inf	100M	73.913M
5550MHz	Pass	Inf	97.3M	54.423M
5670MHz	Pass	Inf	98.35M	62.269M
5755MHz	Pass	500k	36.35M	72.014M
5795MHz	Pass	500k	36.25M	68.666M

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

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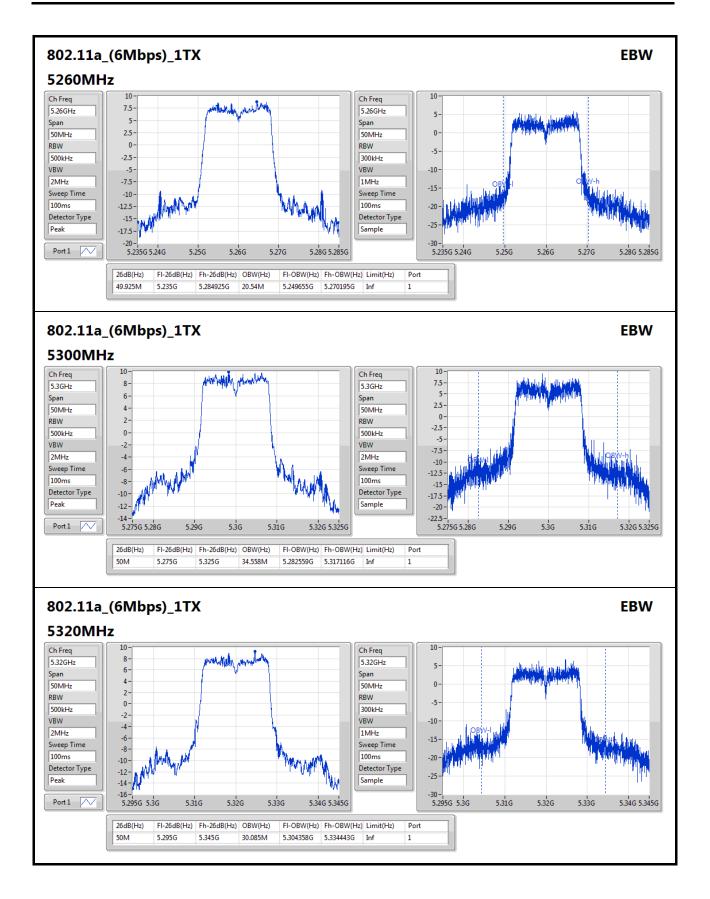
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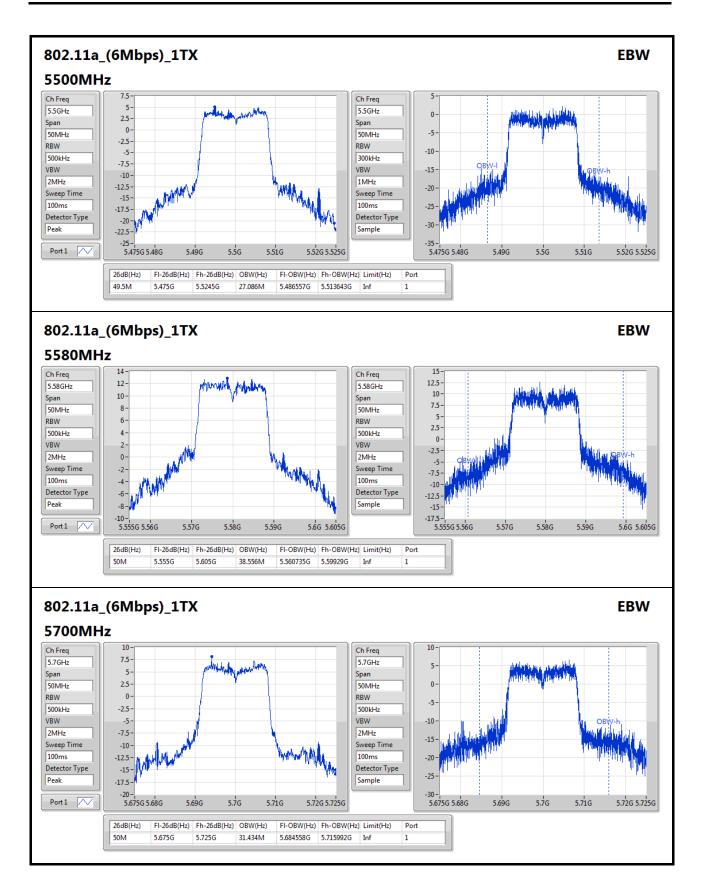


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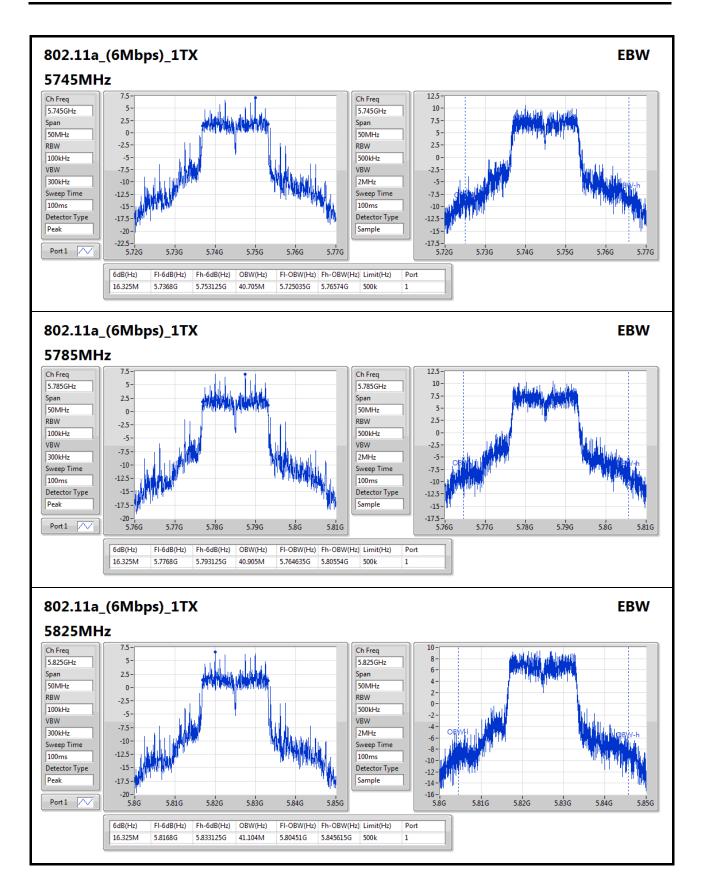






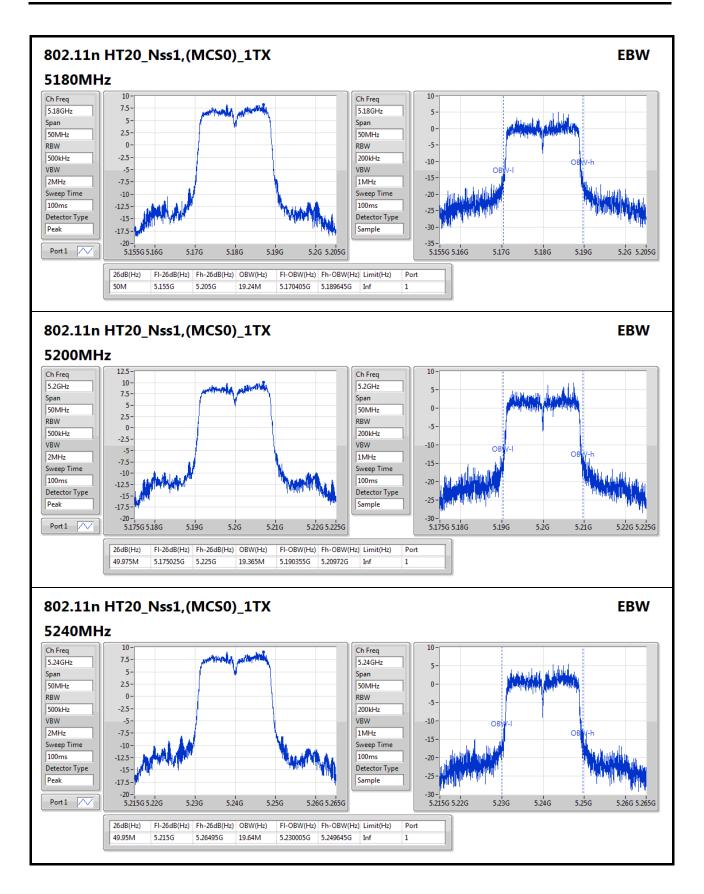
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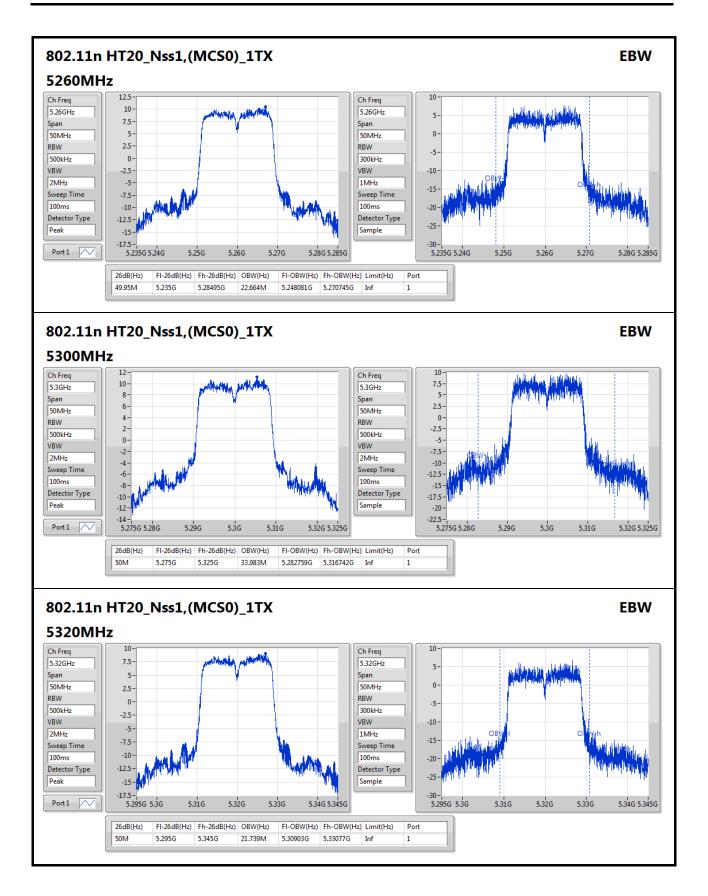




Appendix B

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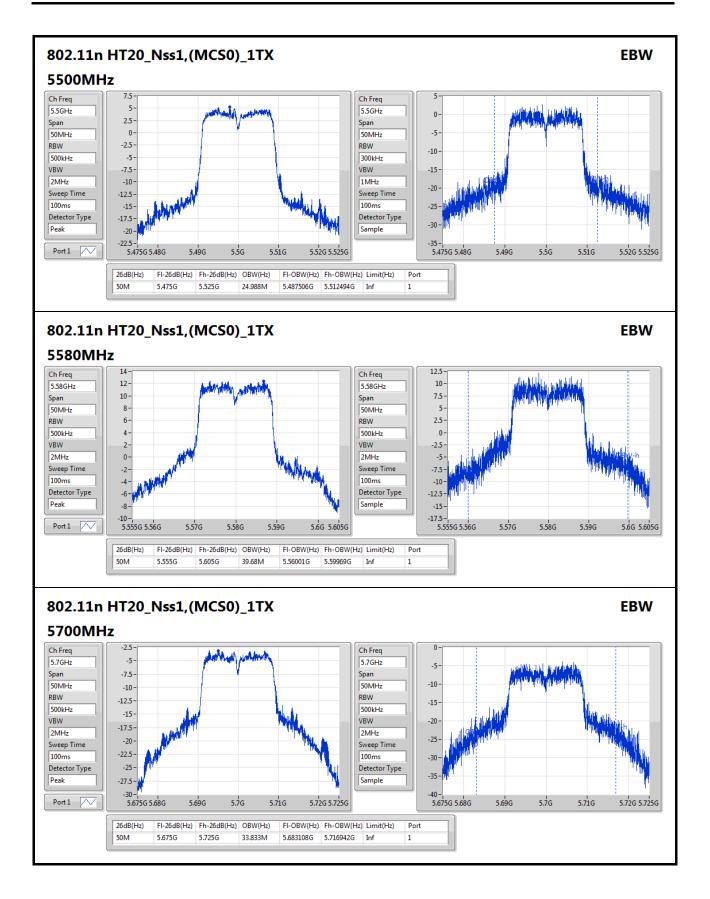


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Appendix B

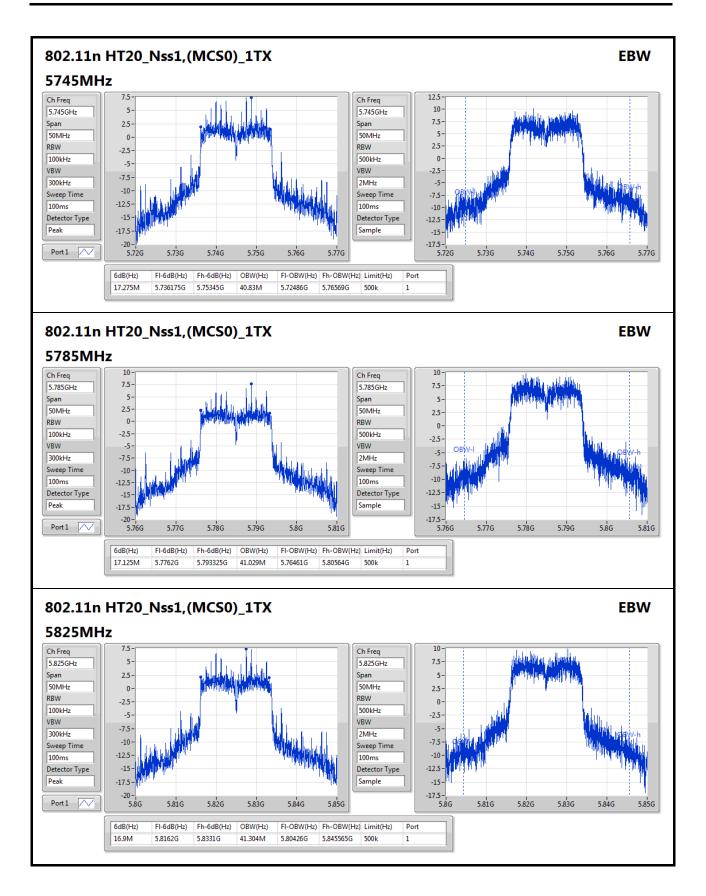
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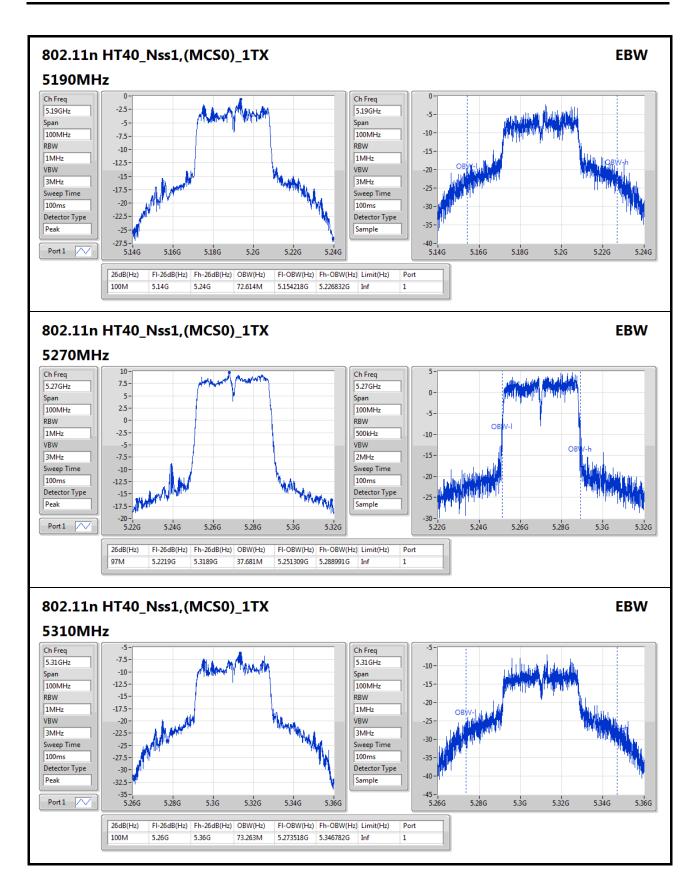


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Appendix B

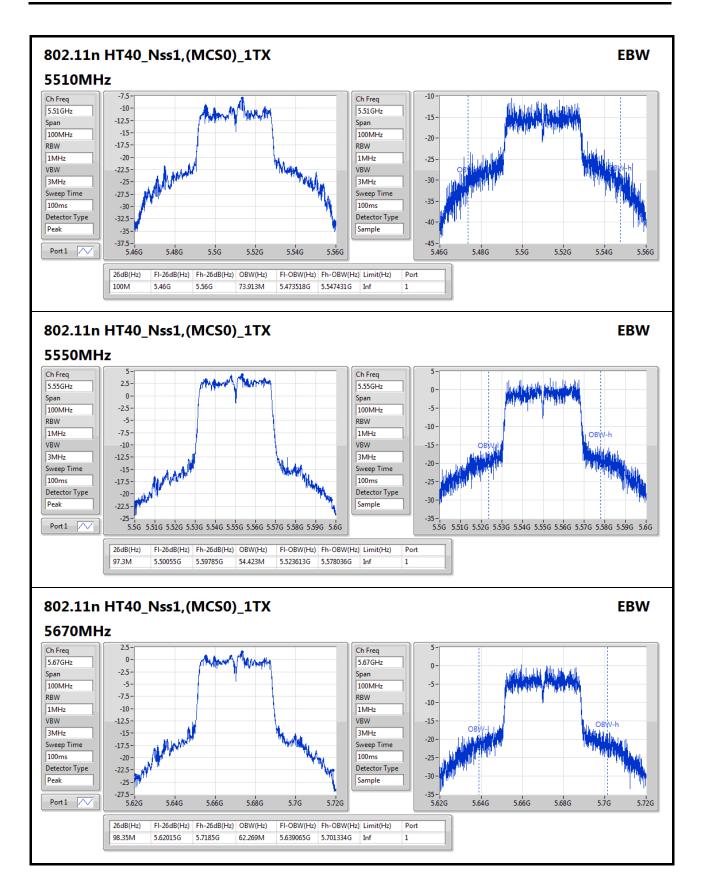
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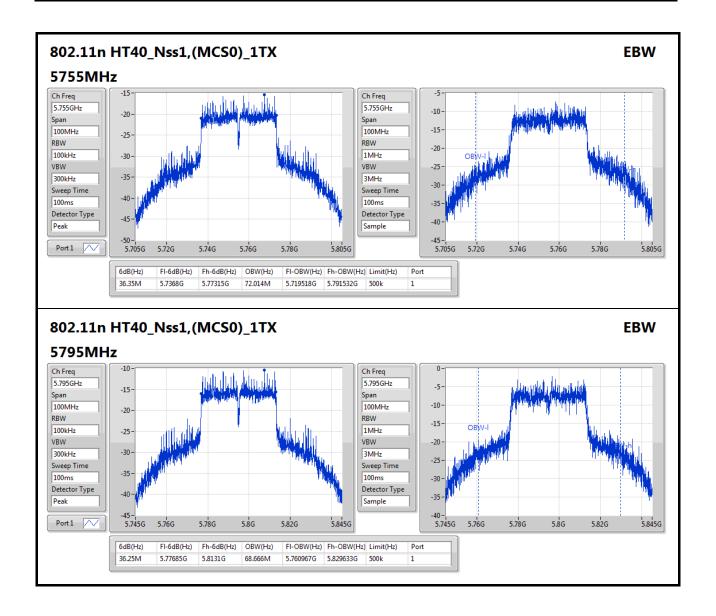
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Power Result Appendix C

**Summary** 

Mode	Total Power	Total Power			
	(dBm)	(W)			
802.11a_(6Mbps)_1TX	-	-			
5.15-5.25GHz	16.46	0.04426			
5.25-5.35GHz	17.02	0.05035			
5.47-5.725GHz	19.01	0.07962			
5.725-5.85GHz	17.06	0.05082			
802.11n HT20_Nss1,(MCS0)_1TX	-	-			
5.15-5.25GHz	16.86	0.04853			
5.25-5.35GHz	17.85	0.06095			
5.47-5.725GHz	18.85	0.07674			
5.725-5.85GHz	16.94	0.04943			
802.11n HT40_Nss1,(MCS0)_1TX	-	-			
5.15-5.25GHz	-2.93	0.00051			
5.25-5.35GHz	13.02	0.02004			
5.47-5.725GHz	9.54	0.00899			
5.725-5.85GHz	1.51	0.00142			



Power Result Appendix C

## Result

Mode	Result	DG	Port 1	Total Power	Power Limit	
		(dBi)	(dBm)	(dBm)	(dBm)	
802.11a_(6Mbps)_1TX	-	-	-	-	-	
5180MHz	Pass	3.00	15.81	15.81	30.00	
5200MHz	Pass	3.00	15.86	15.86	30.00	
5240MHz	Pass	3.00	16.46	16.46	30.00	
5260MHz	Pass	3.00	16.76	16.76	23.98	
5300MHz	Pass	3.00	17.02	17.02	23.98	
5320MHz	Pass	3.00	16.13	16.13	23.98	
5500MHz	Pass	3.00	11.94	11.94	23.98	
5580MHz	Pass	3.00	19.01	19.01	23.98	
5700MHz	Pass	3.00	14.32	14.32	23.98	
5745MHz	Pass	3.00	17.06	17.06	30.00	
5785MHz	Pass	3.00	17.05	17.05	30.00	
5825MHz	Pass	3.00	16.89	16.89	30.00	
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	
5180MHz	Pass	3.00	15.31	15.31	30.00	
5200MHz	Pass	3.00	16.86	16.86	30.00	
5240MHz	Pass	3.00	16.56	16.56	30.00	
5260MHz	Pass	3.00	17.85	17.85	23.98	
5300MHz	Pass	3.00	17.57	17.57	23.98	
5320MHz	Pass	3.00	16.17	16.17	23.98	
5500MHz	Pass	3.00	12.14	12.14	23.98	
5580MHz	Pass	3.00	18.85	18.85	23.98	
5700MHz	Pass	3.00	2.73	2.73	23.98	
5745MHz	Pass	3.00	16.94	16.94	30.00	
5785MHz	Pass	3.00	16.93	16.93	30.00	
5825MHz	Pass	3.00	16.87	16.87	30.00	
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	
5190MHz	Pass	3.00	-2.93	-2.93	30.00	
5270MHz	Pass	3.00	13.02	13.02	23.98	
5310MHz	Pass	3.00	-3.58	-3.58	23.98	
5510MHz	Pass	3.00	-5.29	-5.29	23.98	
5550MHz	Pass	3.00	9.54	9.54	23.98	
5670MHz	Pass	3.00	6.23	6.23	23.98	
5755MHz	Pass	3.00	-5.77	-5.77	30.00	
5795MHz	Pass	3.00	1.51	1.51	30.00	

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

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PSD Result Appendix D

Summary

Mode	PD					
	(dBm/RBW)					
802.11a_(6Mbps)_1TX	-					
5.15-5.25GHz	3.31					
5.25-5.35GHz	3.88					
5.47-5.725GHz	5.85					
5.725-5.85GHz	3.26					
802.11n HT20_Nss1,(MCS0)_1TX	-					
5.15-5.25GHz	3.73					
5.25-5.35GHz	4.56					
5.47-5.725GHz	5.61					
5.725-5.85GHz	2.73					
802.11n HT40_Nss1,(MCS0)_1TX						
5.15-5.25GHz	-13.10					
5.25-5.35GHz	-3.04					
5.47-5.725GHz	-6.53					
5.725-5.85GHz	-14.98					

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

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Appendix D **PSD** Result

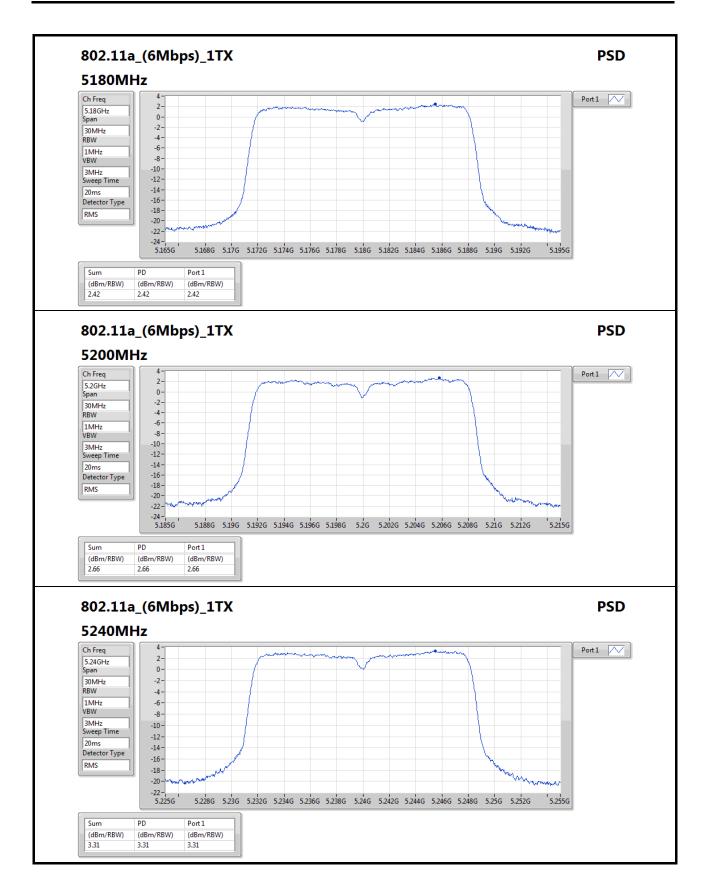
## Result

Mode	Result	DG Port 1		PD	PD Limit	
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	
802.11a_(6Mbps)_1TX	-	-	-	-	-	
5180MHz	Pass	3.00	2.42	2.42	17.00	
5200MHz	Pass	3.00	2.66	2.66	17.00	
5240MHz	Pass	3.00	3.31	3.31	17.00	
5260MHz	Pass	3.00	3.58	3.58	11.00	
5300MHz	Pass	3.00	3.88	3.88	11.00	
5320MHz	Pass	3.00	2.97	2.97	11.00	
5500MHz	Pass	3.00	-1.27	-1.27	11.00	
5580MHz	Pass	3.00	5.85	5.85	11.00	
5700MHz	Pass	3.00	1.18	1.18	11.00	
5745MHz	Pass	3.00	3.26	3.26	30.00	
5785MHz	Pass	3.00	3.19	3.19	30.00	
5825MHz	Pass	3.00	2.81	2.81	30.00	
802.11n HT20_Nss1,(MCS0)_1TX	-	-	-	-	-	
5180MHz	Pass	3.00	2.04	2.04	17.00	
5200MHz	Pass	3.00	3.73	3.73	17.00	
5240MHz	Pass	3.00	3.39	3.39	17.00	
5260MHz	Pass	3.00	4.56	4.56	11.00	
5300MHz	Pass	3.00	4.31	4.31	11.00	
5320MHz	Pass	3.00	2.81	2.81	11.00	
5500MHz	Pass	3.00	-1.15	-1.15	11.00	
5580MHz	Pass	3.00	5.61	5.61	11.00	
5700MHz	Pass	3.00	-10.74	-10.74	11.00	
5745MHz	Pass	3.00	2.73	2.73	30.00	
5785MHz	Pass	3.00	2.70	2.70	30.00	
5825MHz	Pass	3.00	2.67	2.67	30.00	
802.11n HT40_Nss1,(MCS0)_1TX	-	-	-	-	-	
5190MHz	Pass	3.00	-13.10	-13.10	17.00	
5270MHz	Pass	3.00	-3.04	-3.04	11.00	
5310MHz	Pass	3.00	-19.59	-19.59	11.00	
5510MHz	Pass	3.00	-21.37	-21.37	11.00	
5550MHz	Pass	3.00	-6.53	-6.53	11.00	
5670MHz	Pass	3.00	-9.86	-9.86	11.00	
5755MHz	Pass	3.00	-21.56	-21.56	30.00	
5795MHz	Pass	3.00	-14.98	-14.98	30.00	

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

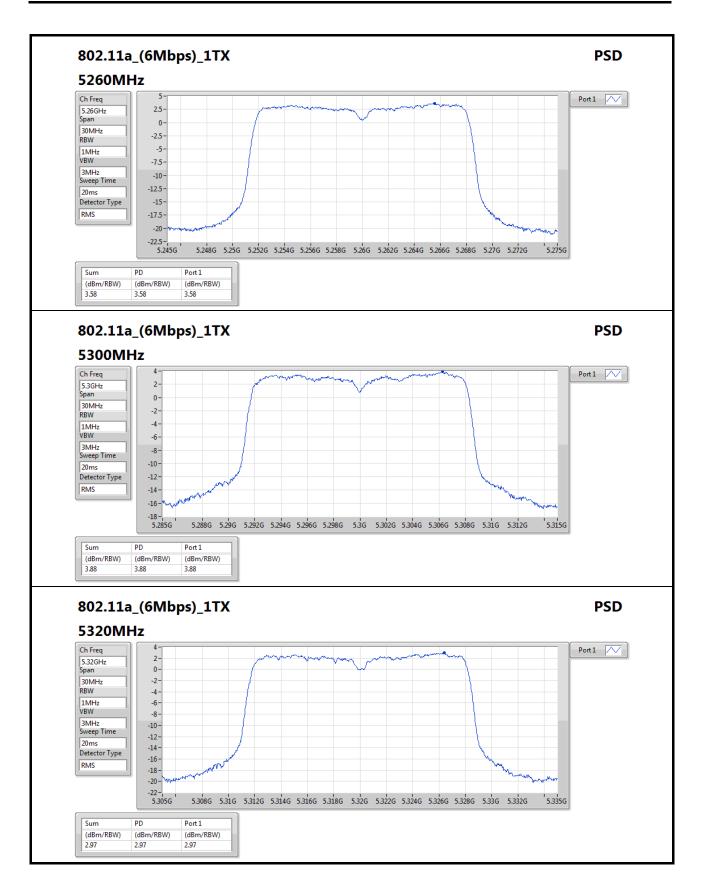
SPORTON INTERNATIONAL INC.



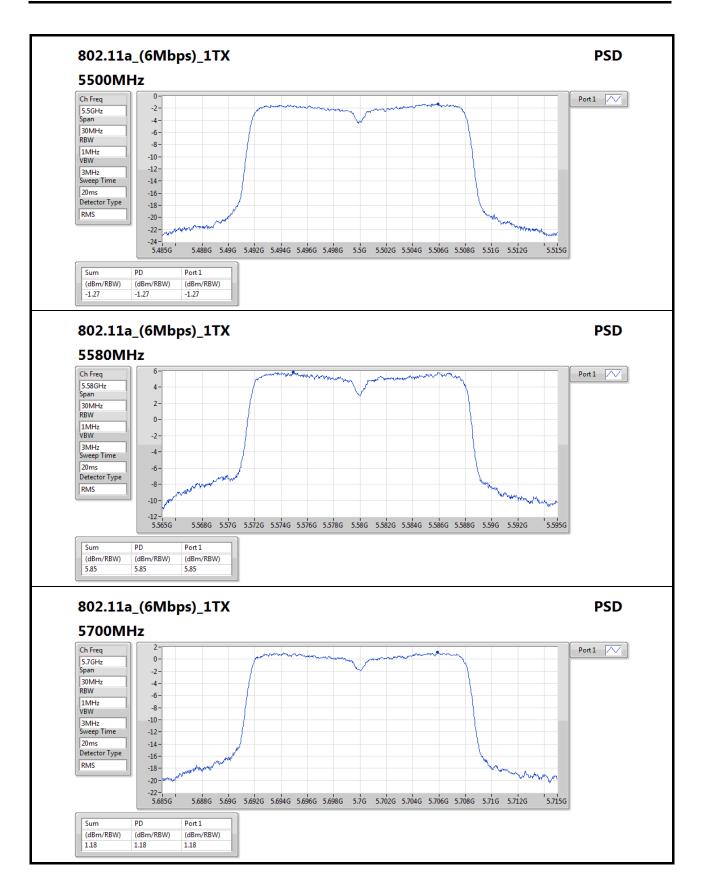


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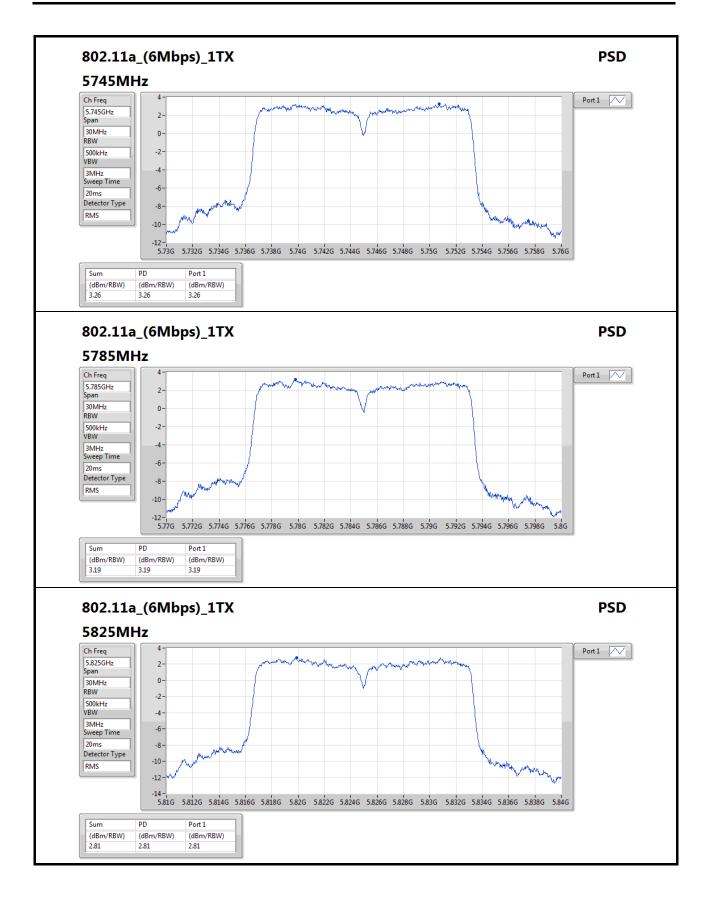




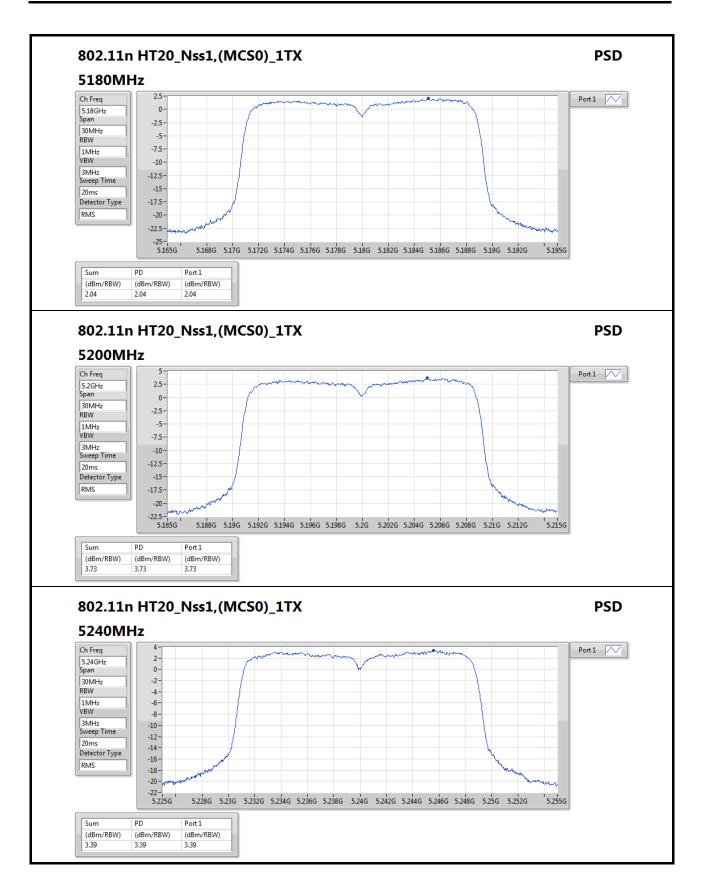






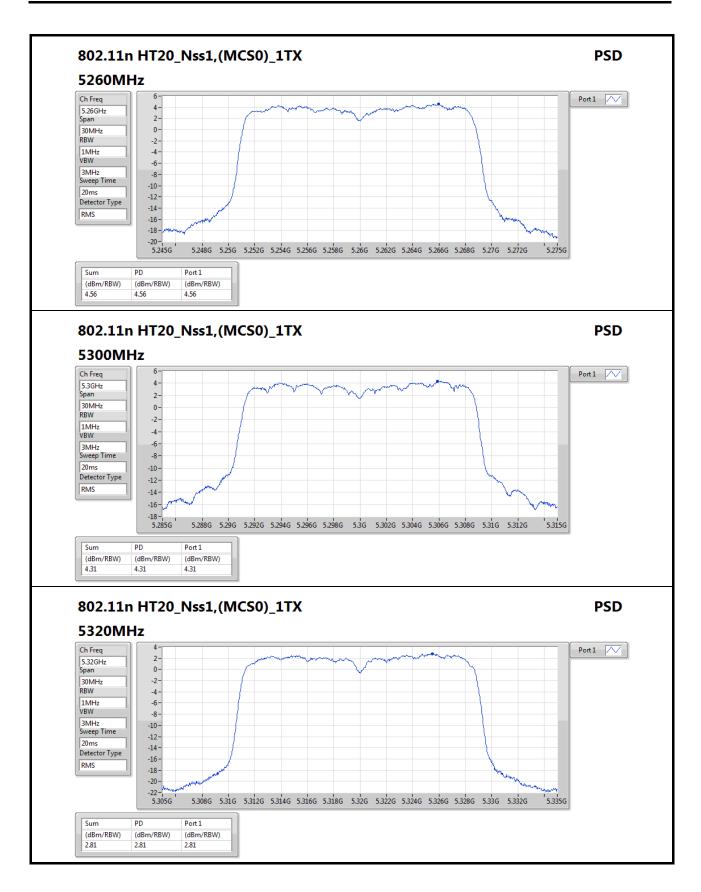




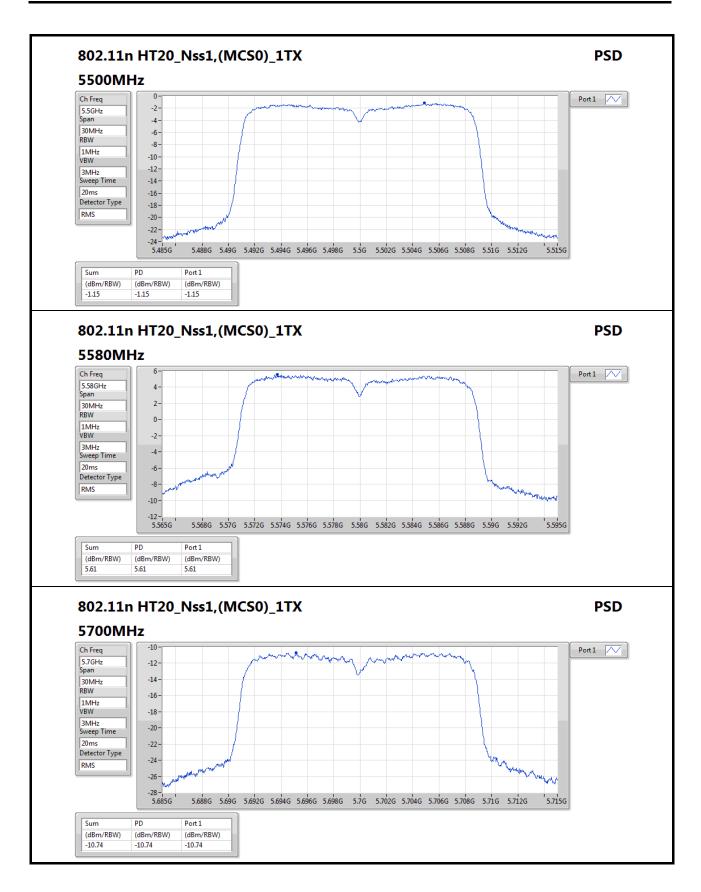


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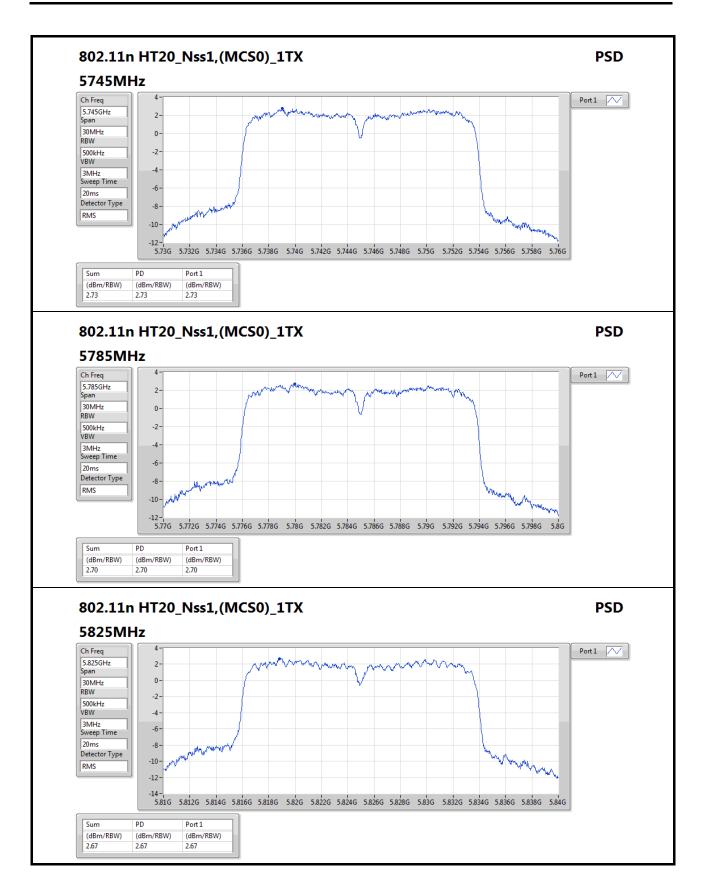






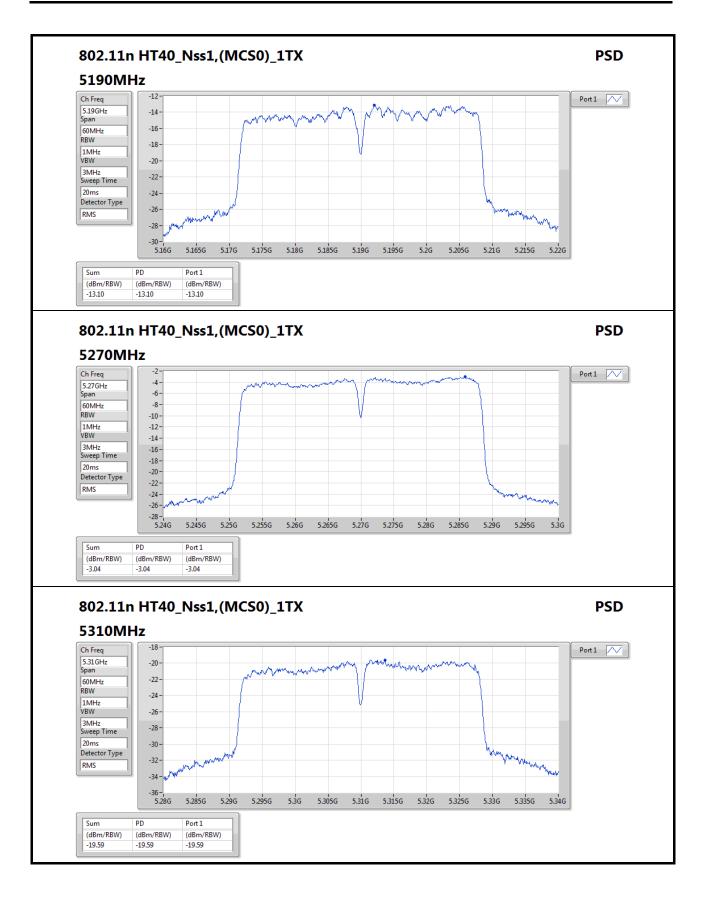




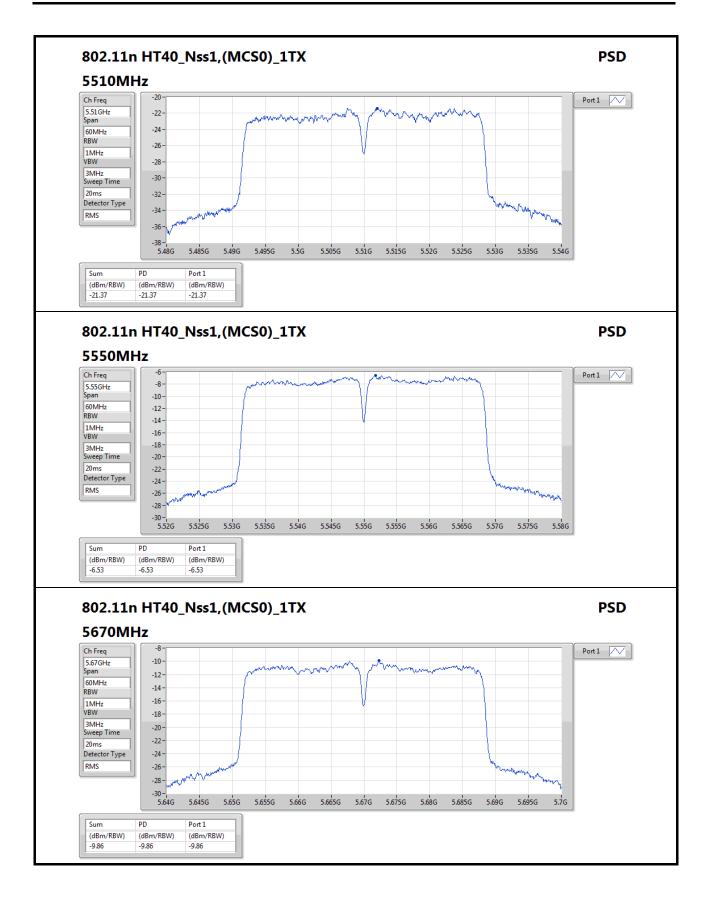


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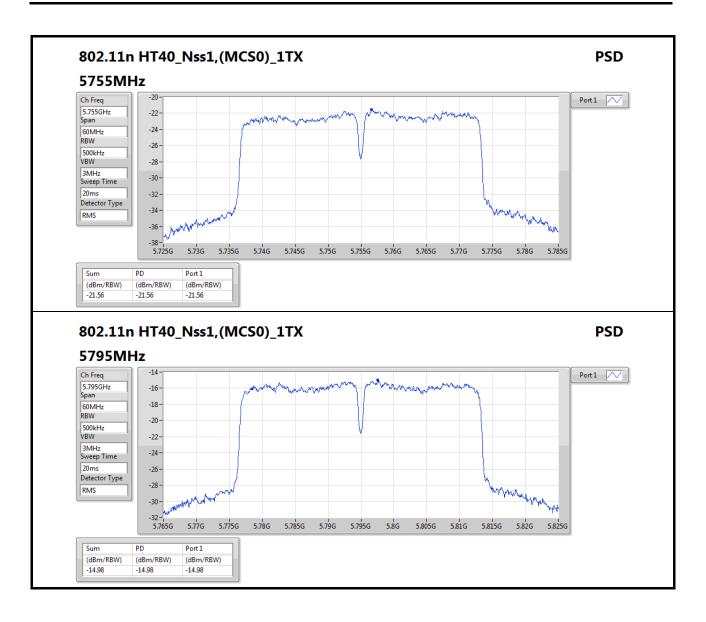


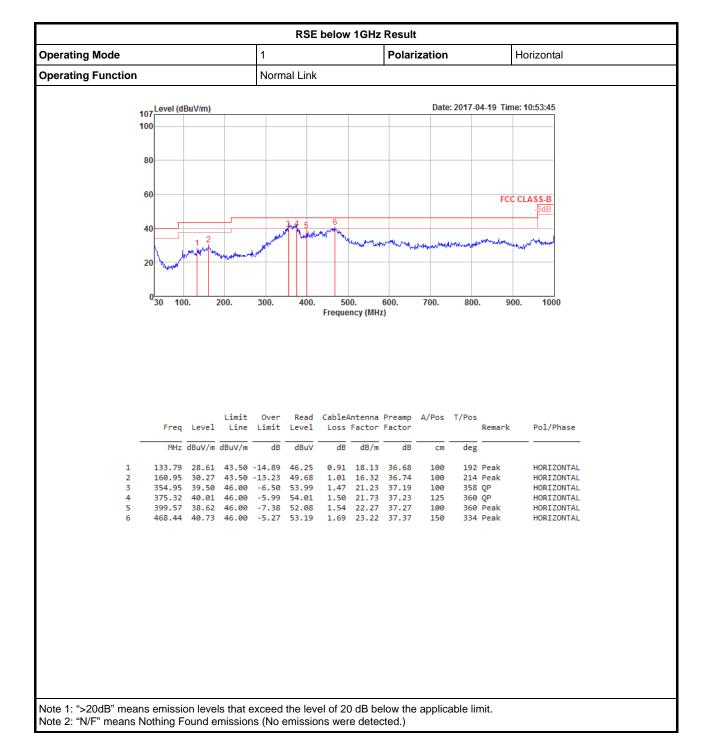






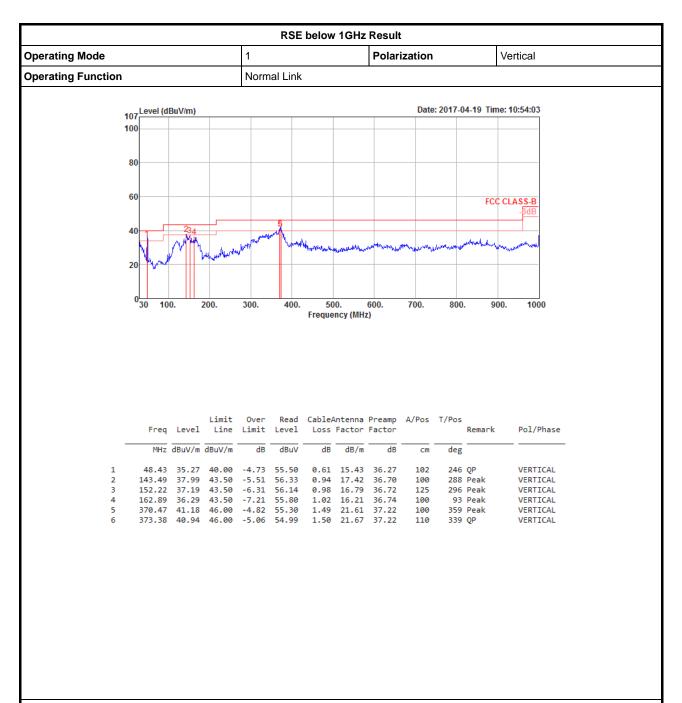






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Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

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



## RSE TX above 1GHz Result

Appendix E.2

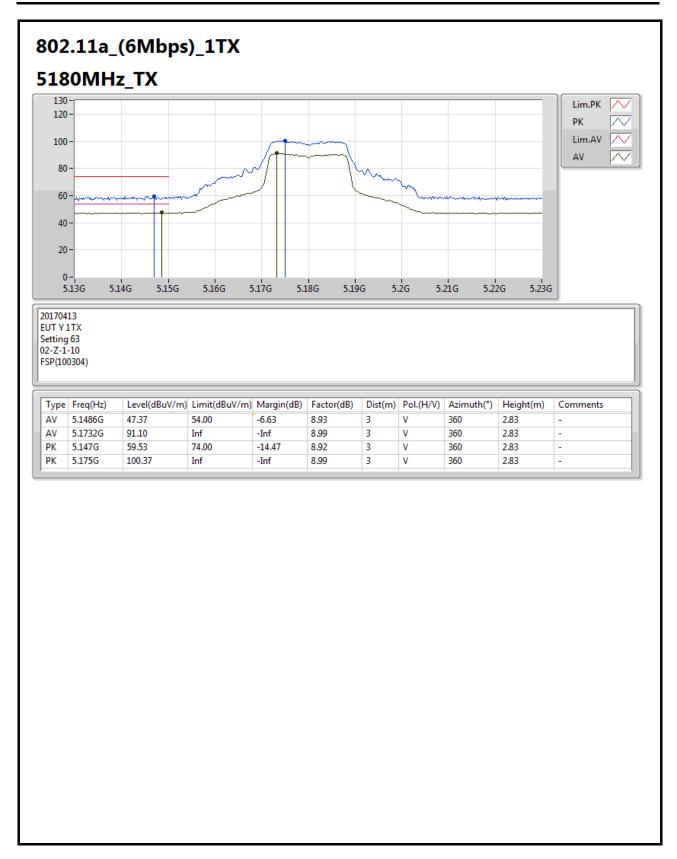
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**Summary** 

Mode	Result	Туре	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth	Height (m)	Comments
802.11a_(6Mbps)_1TX	-	-	-	-	-	-	-	-	-	-		-
5.25-5.35GHz	Pass	PK	5.3502G	73.99	74.00	-0.01	9.34	3	Н	349	1.71	-

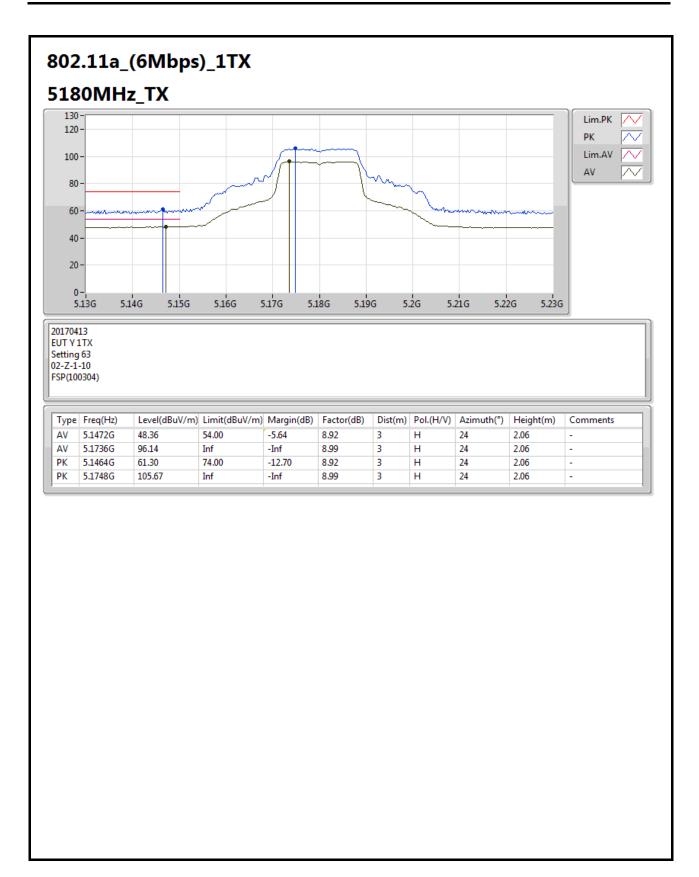
SPORTON INTERNATIONAL INC.



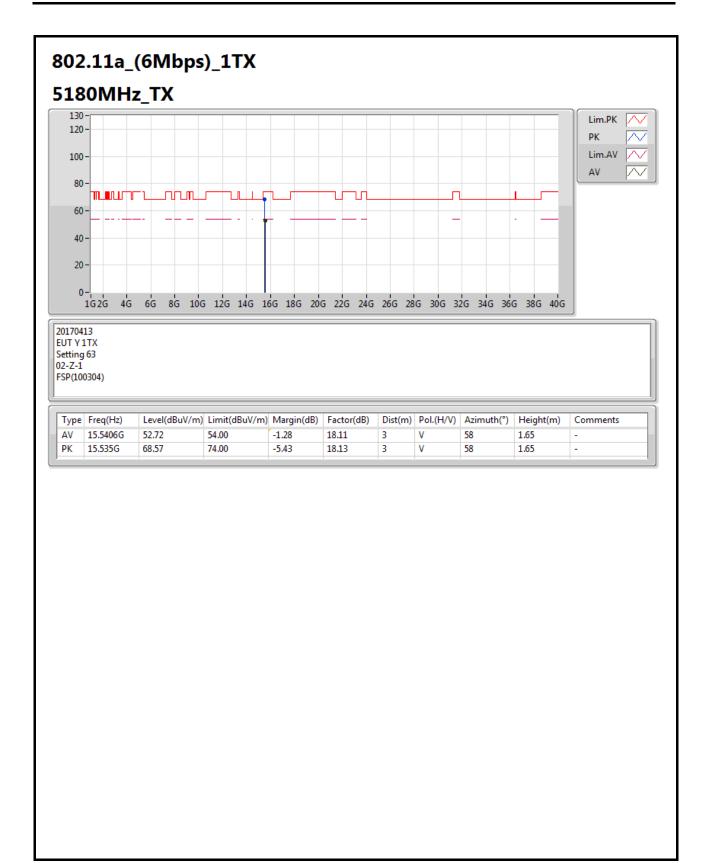


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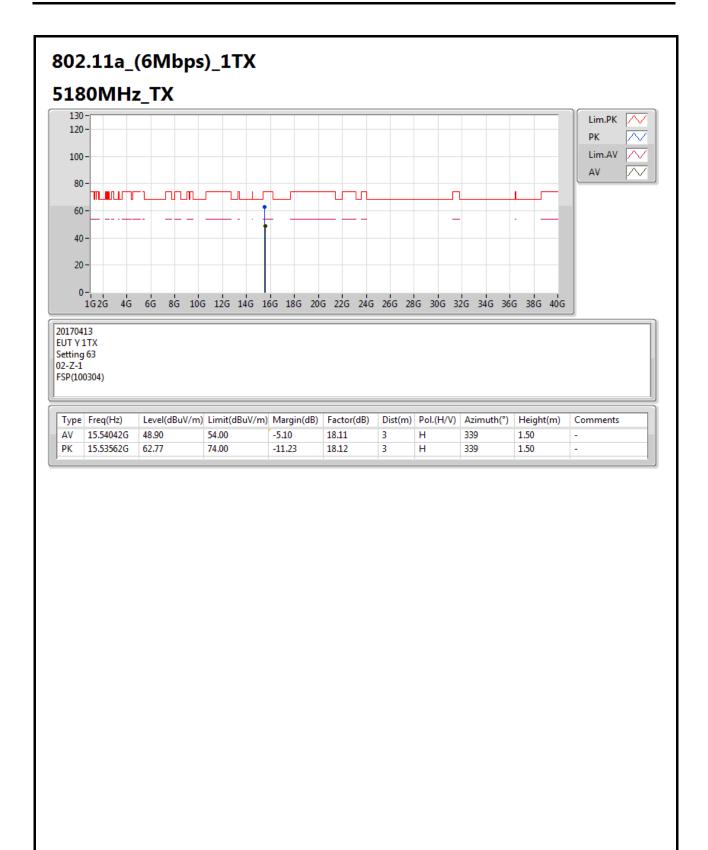






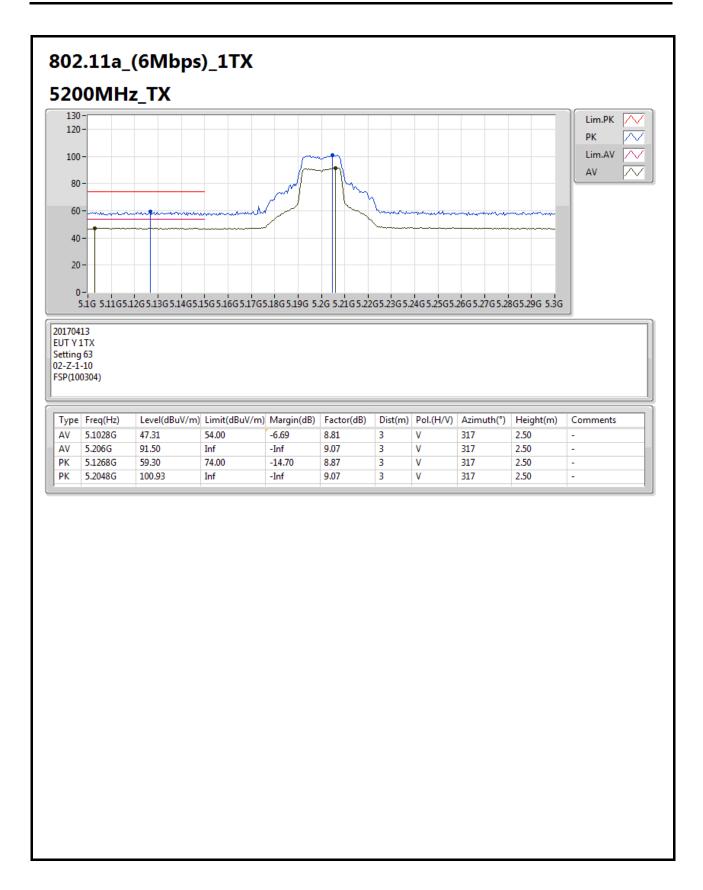






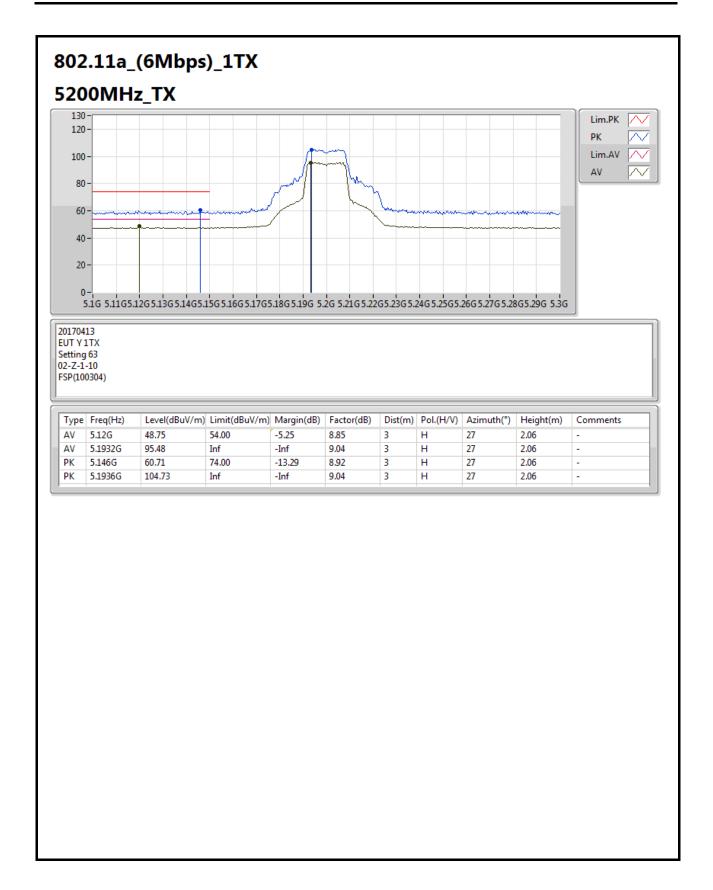
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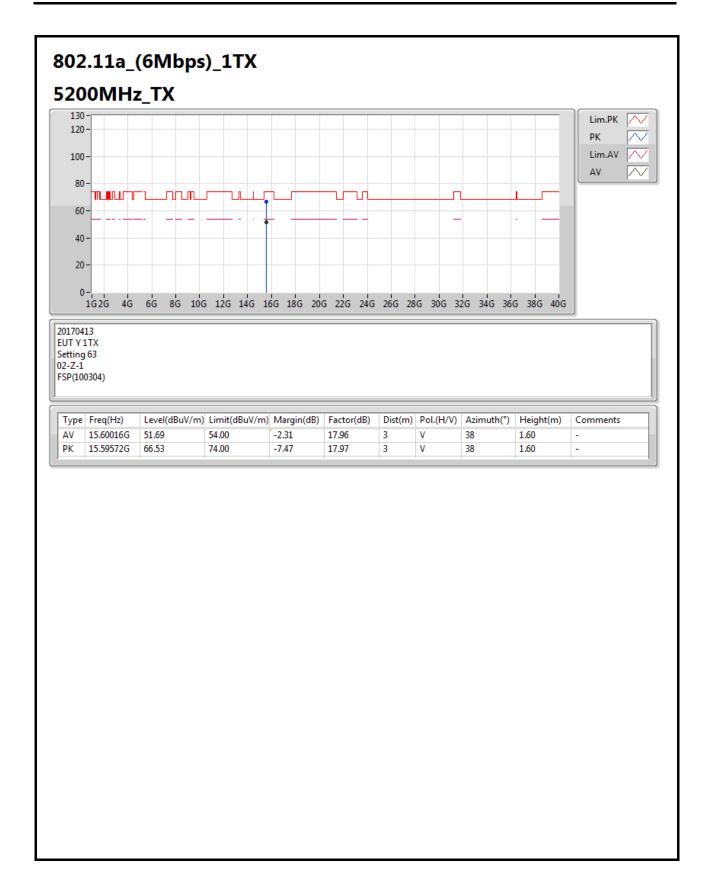


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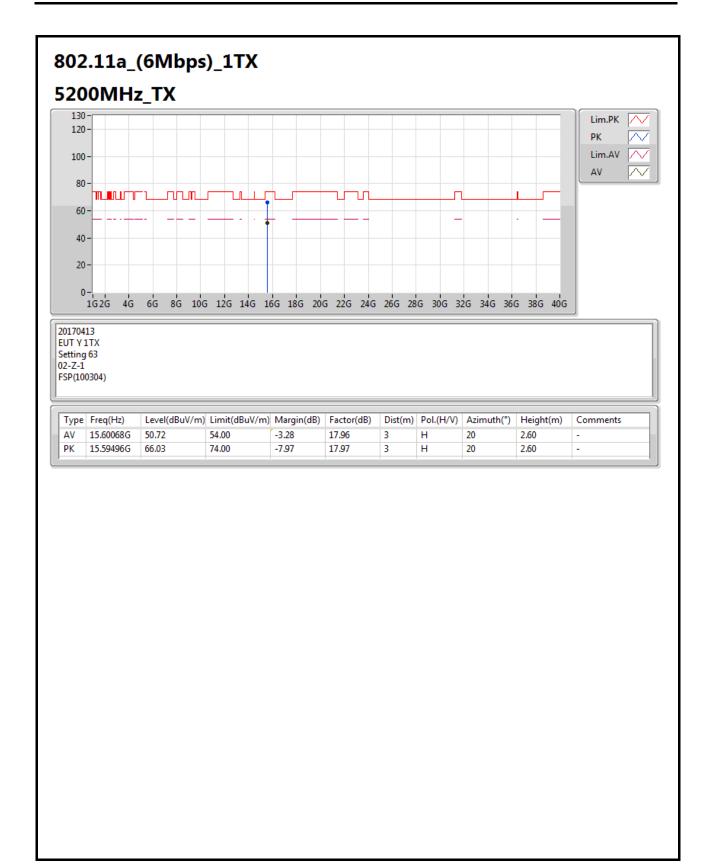






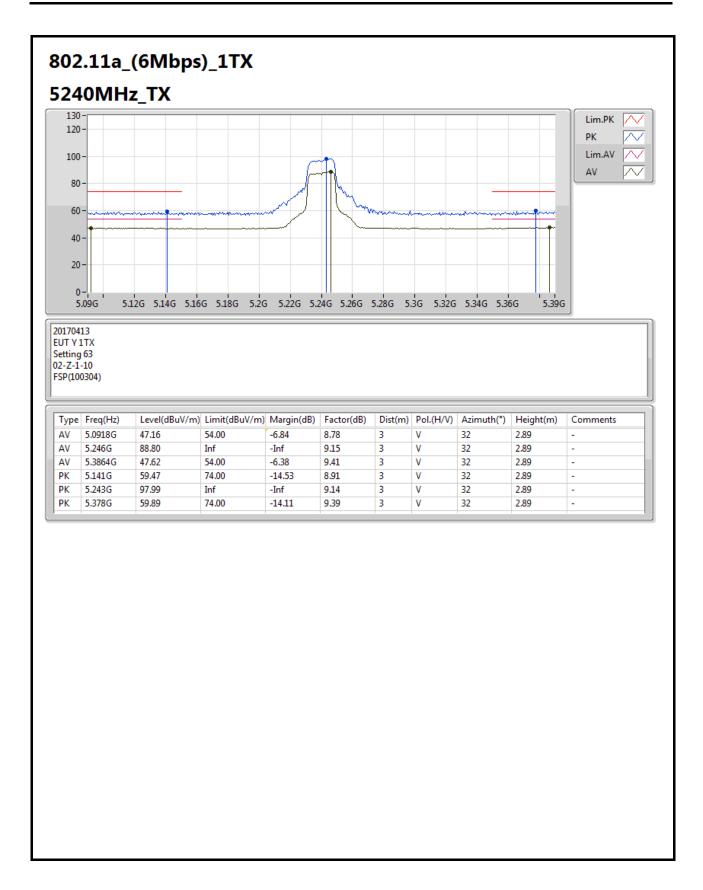






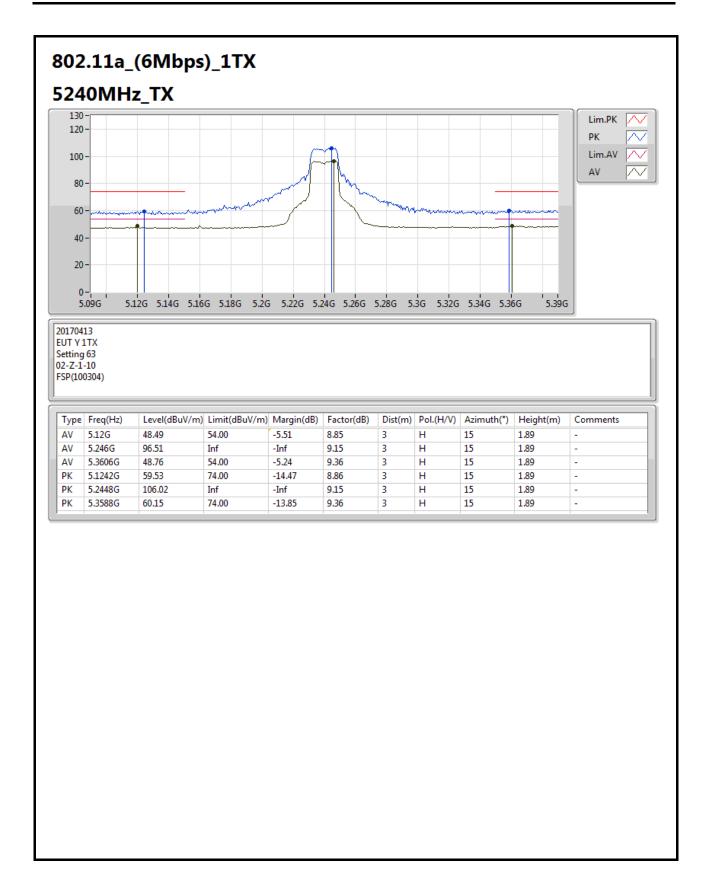
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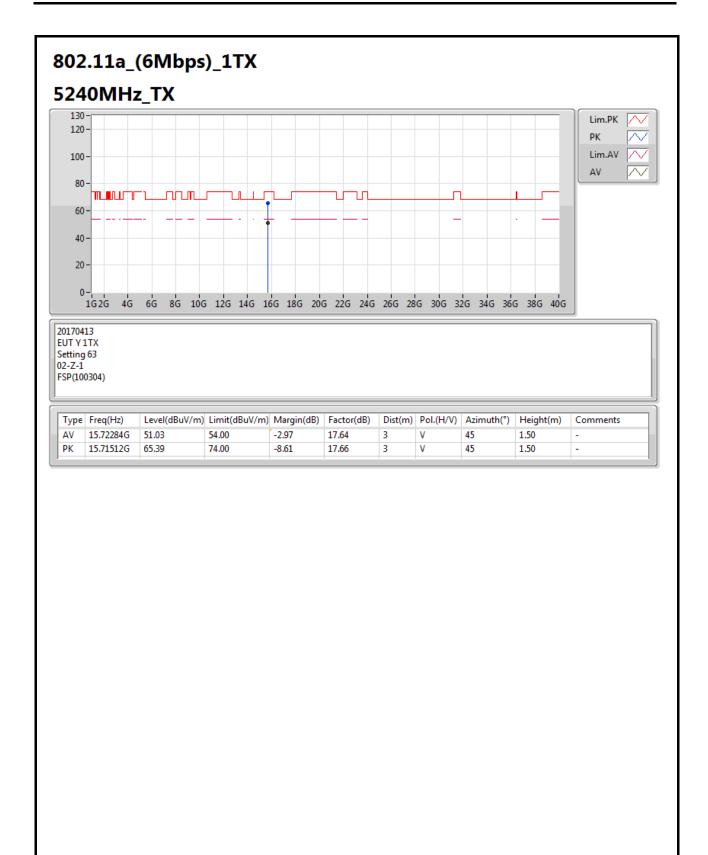


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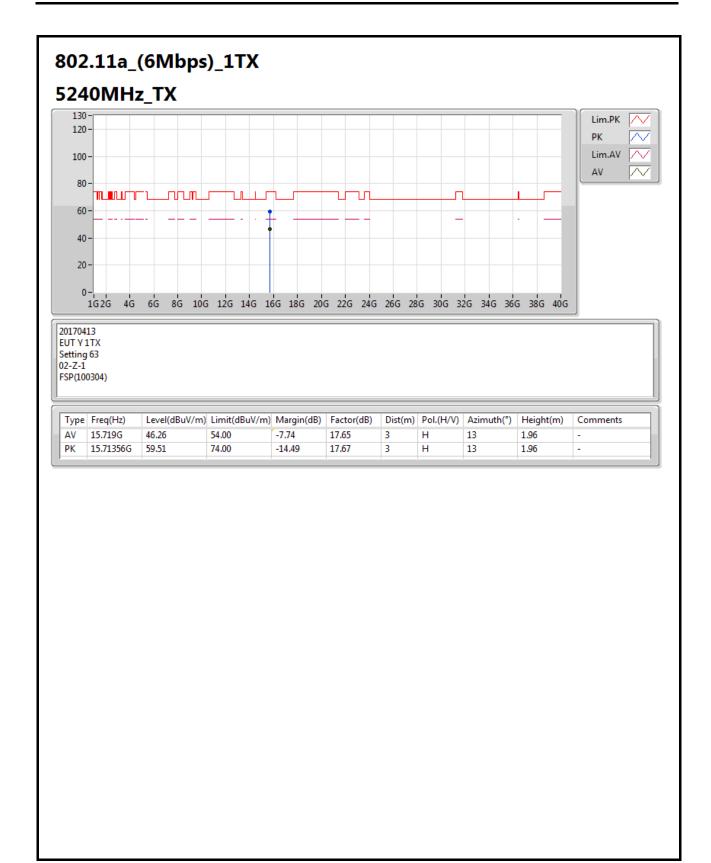




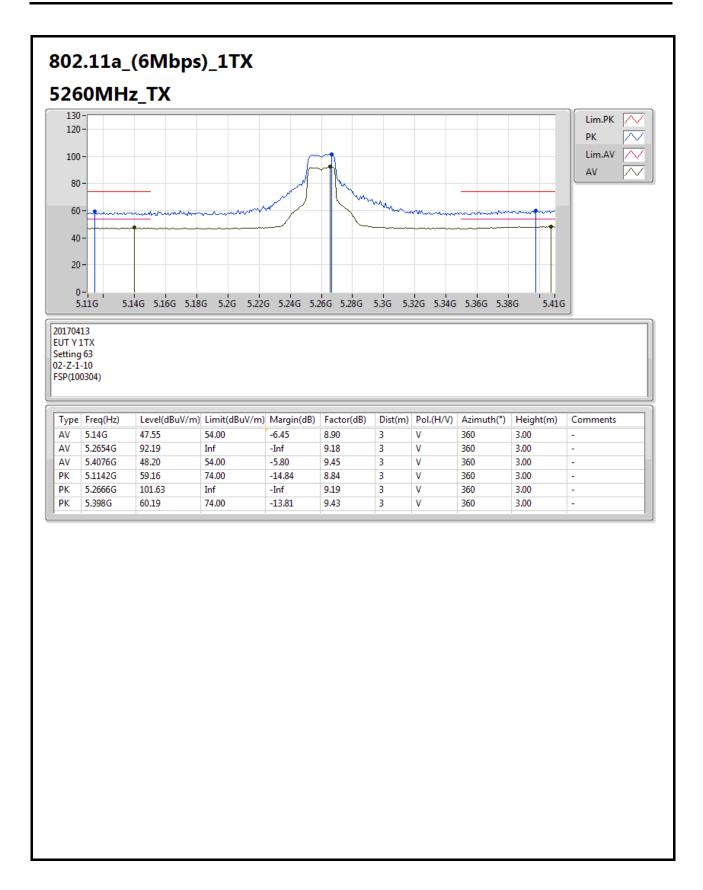




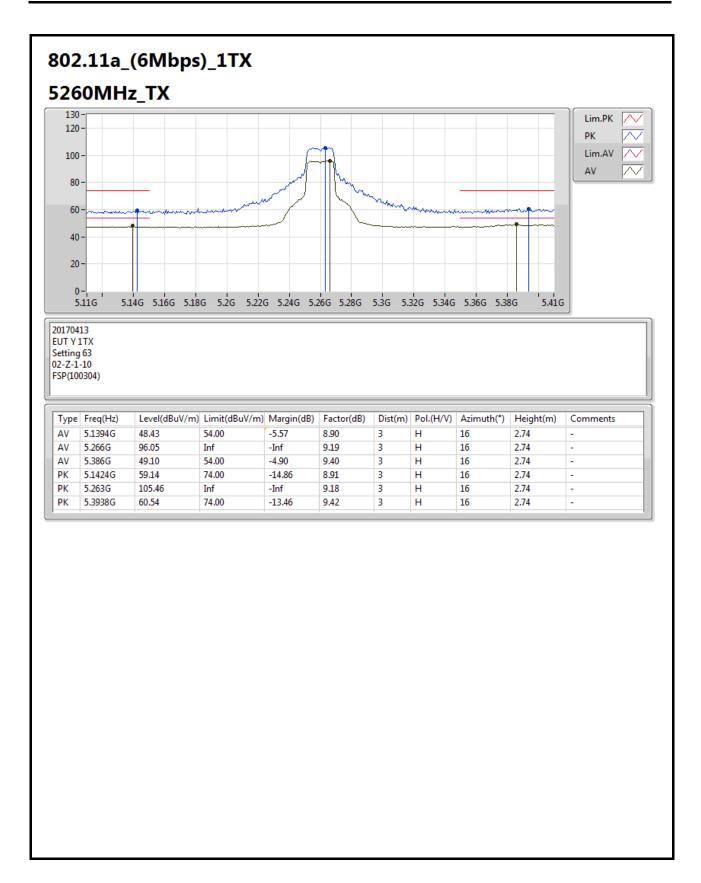




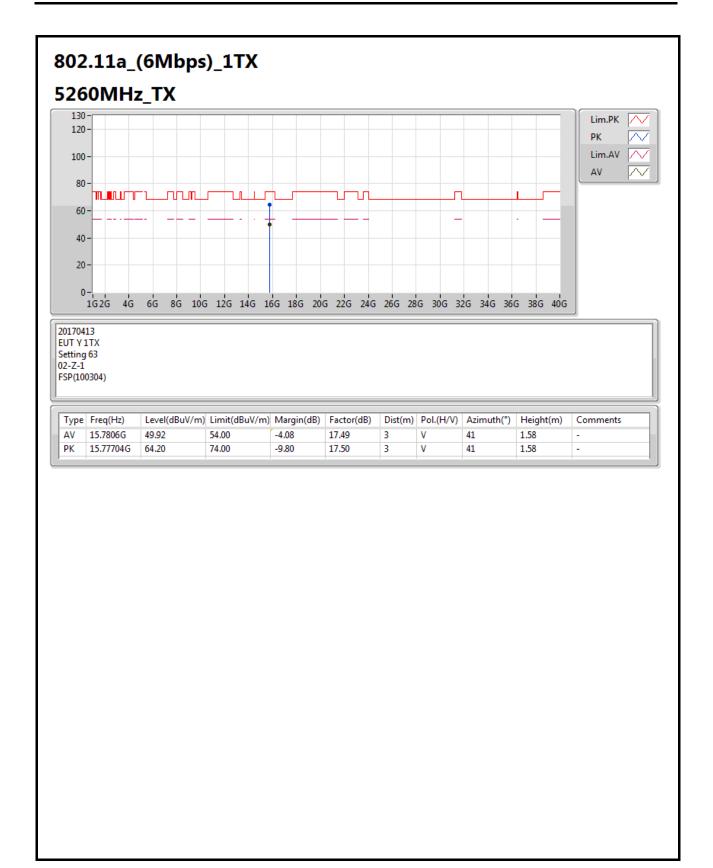




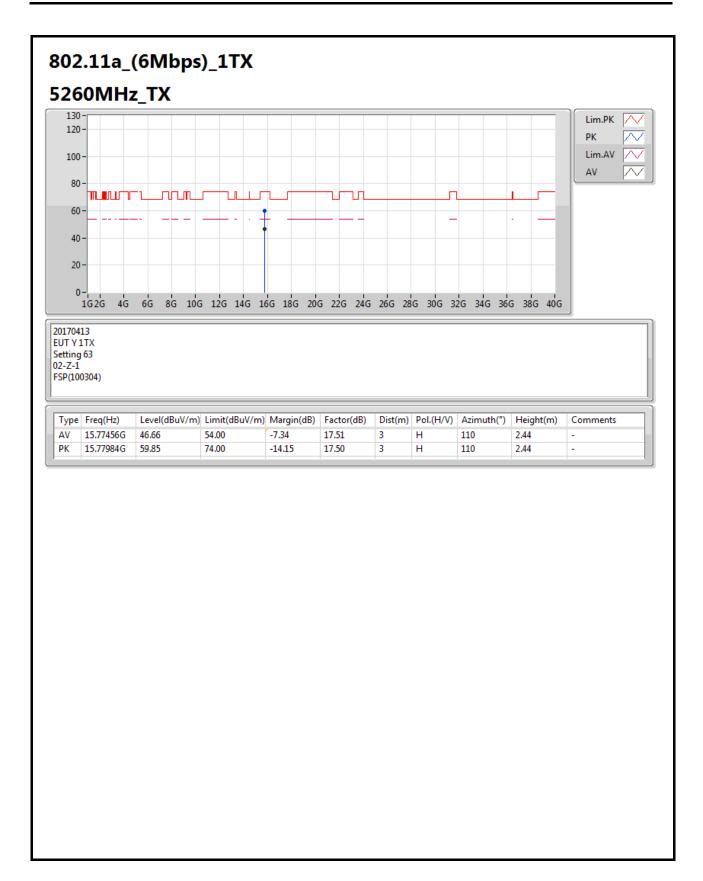




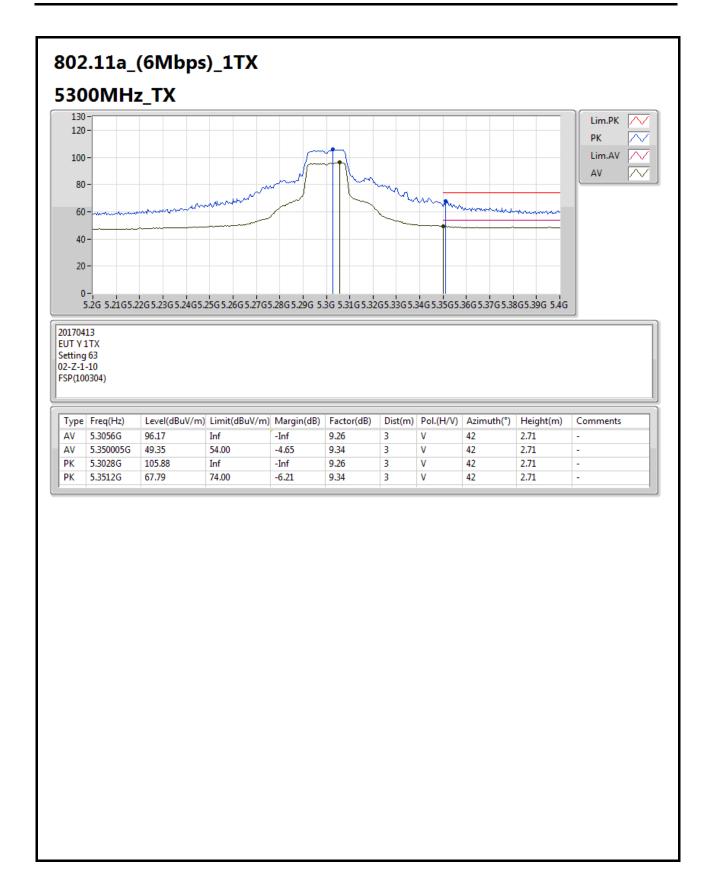






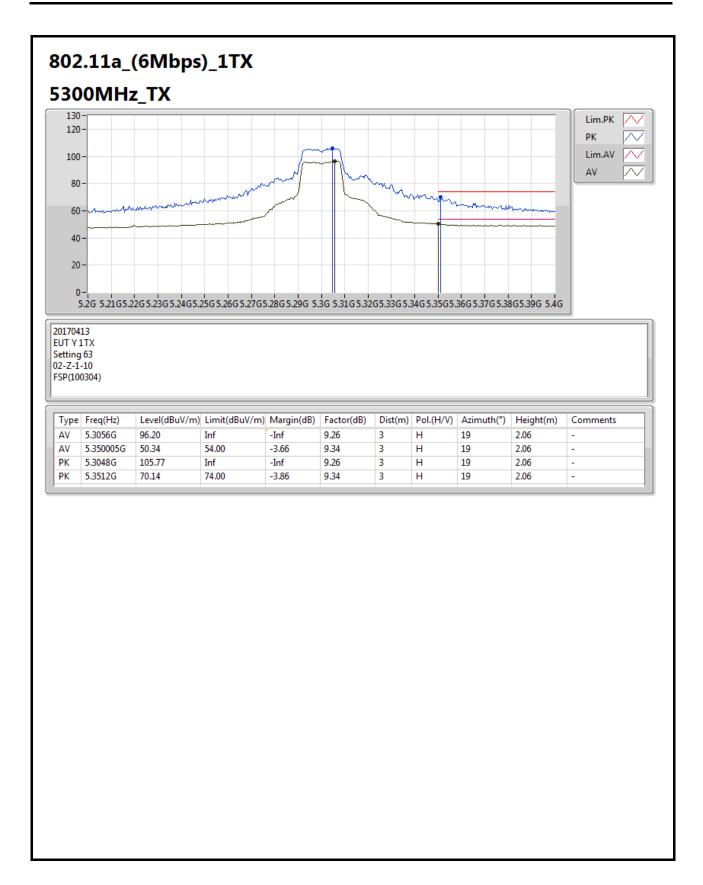






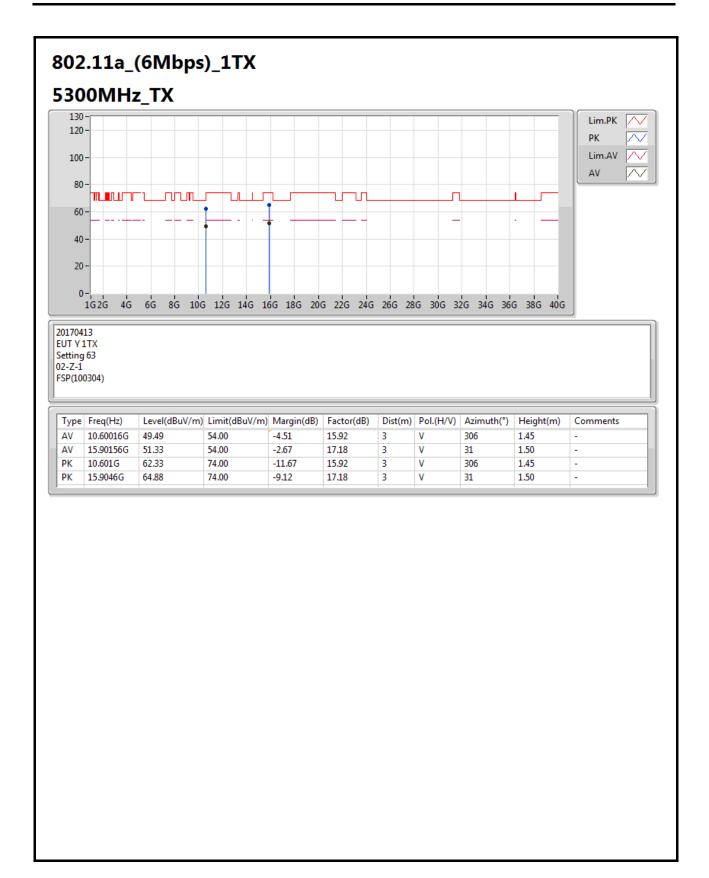
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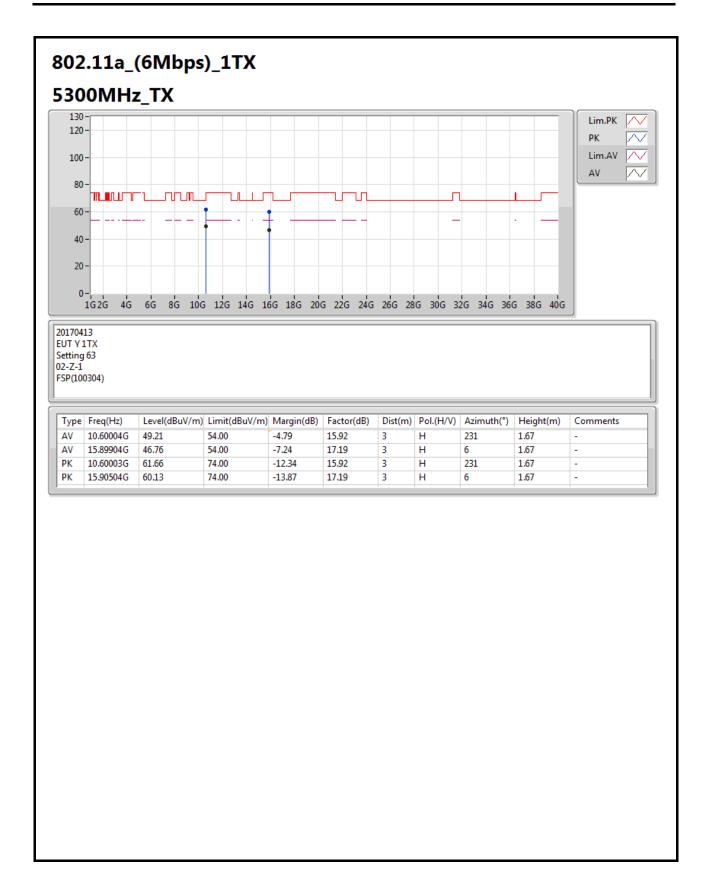


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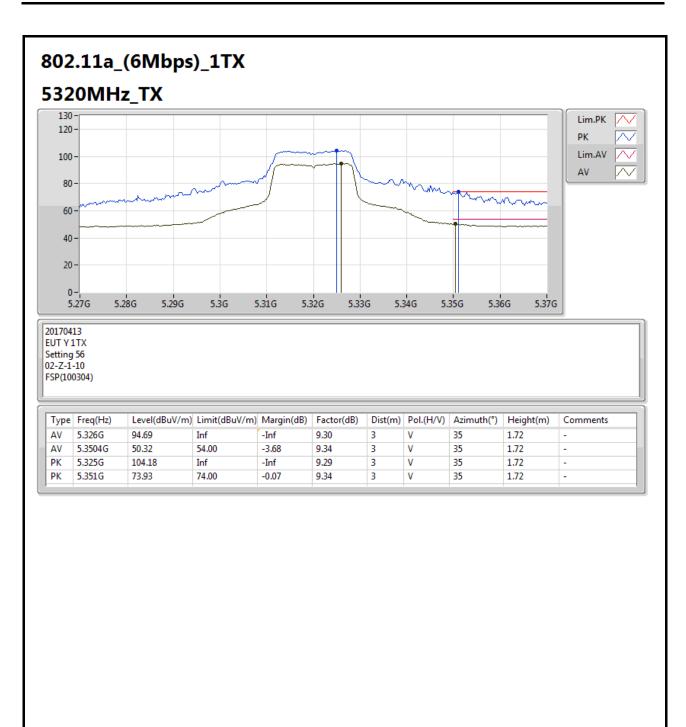




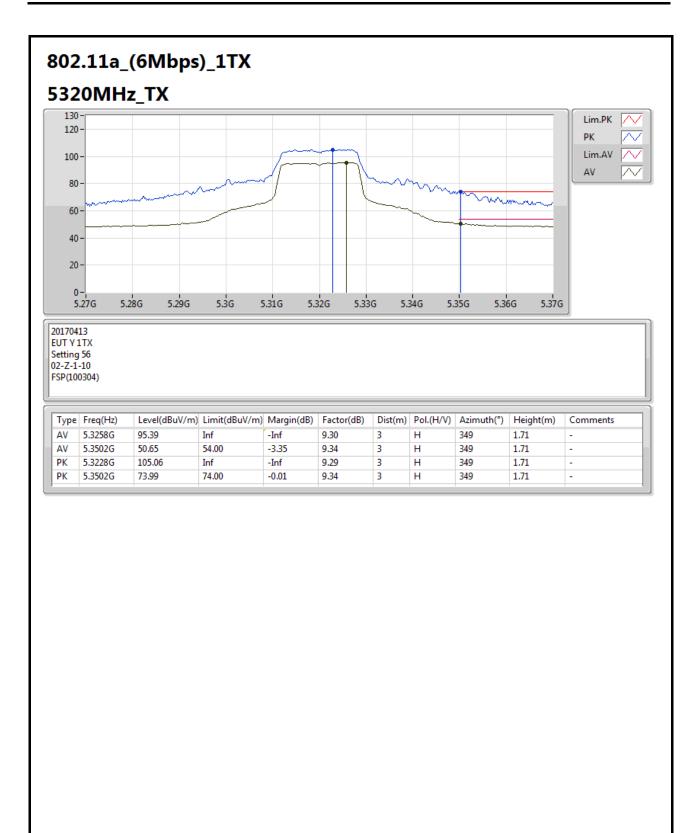






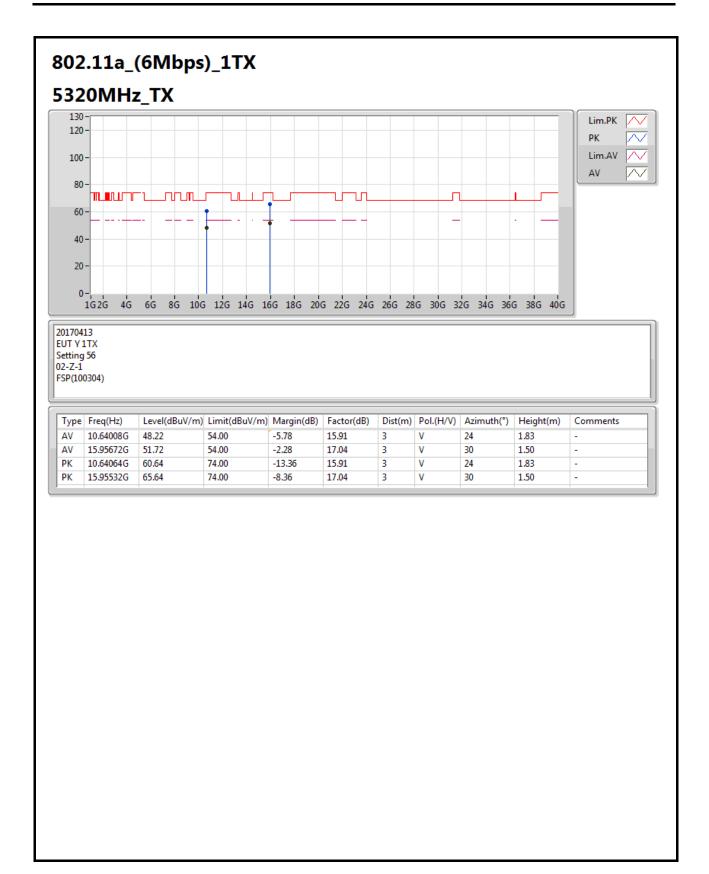






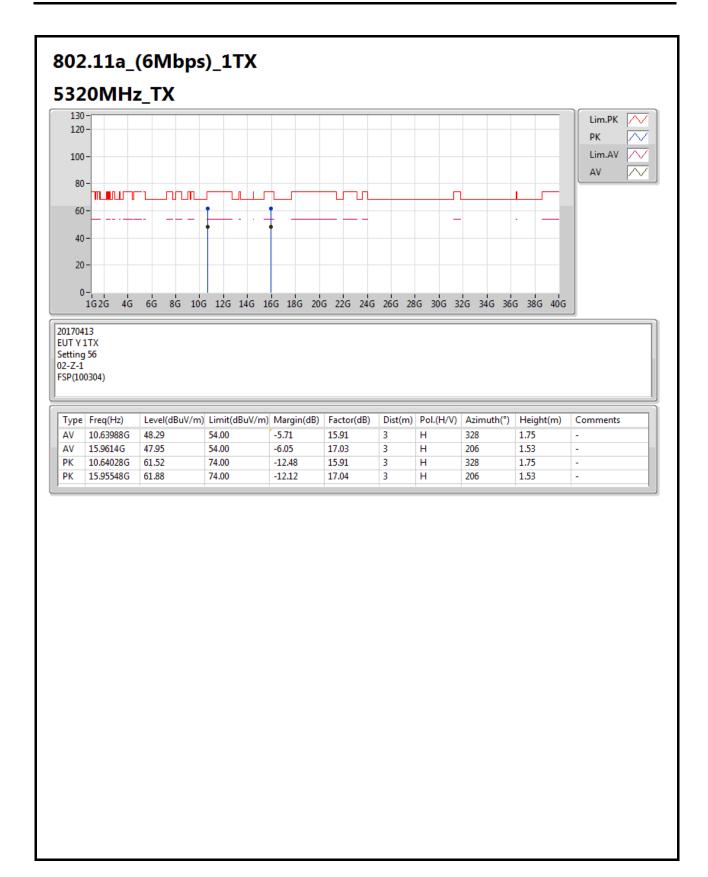
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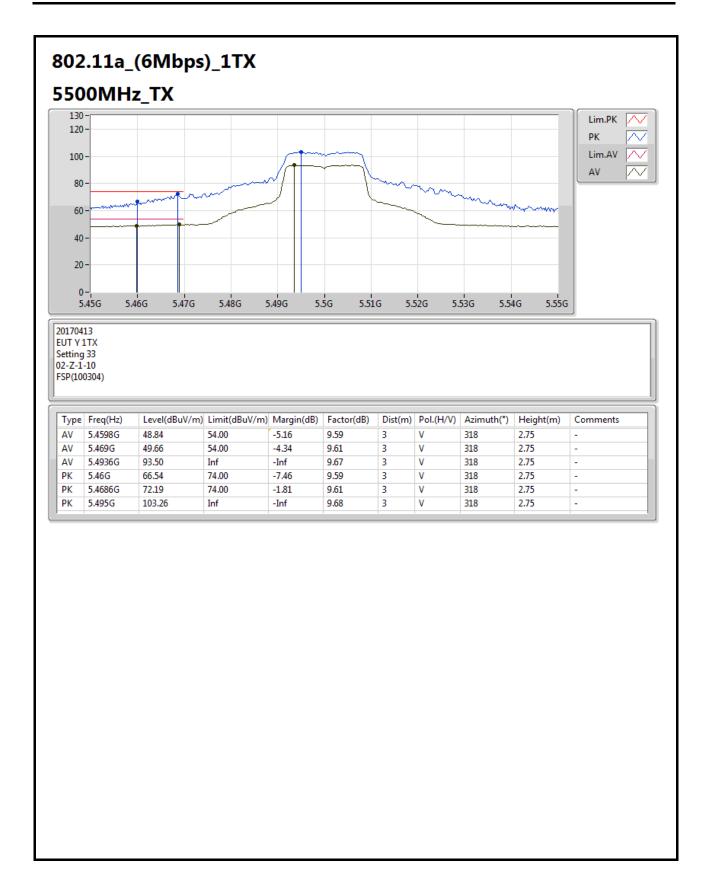


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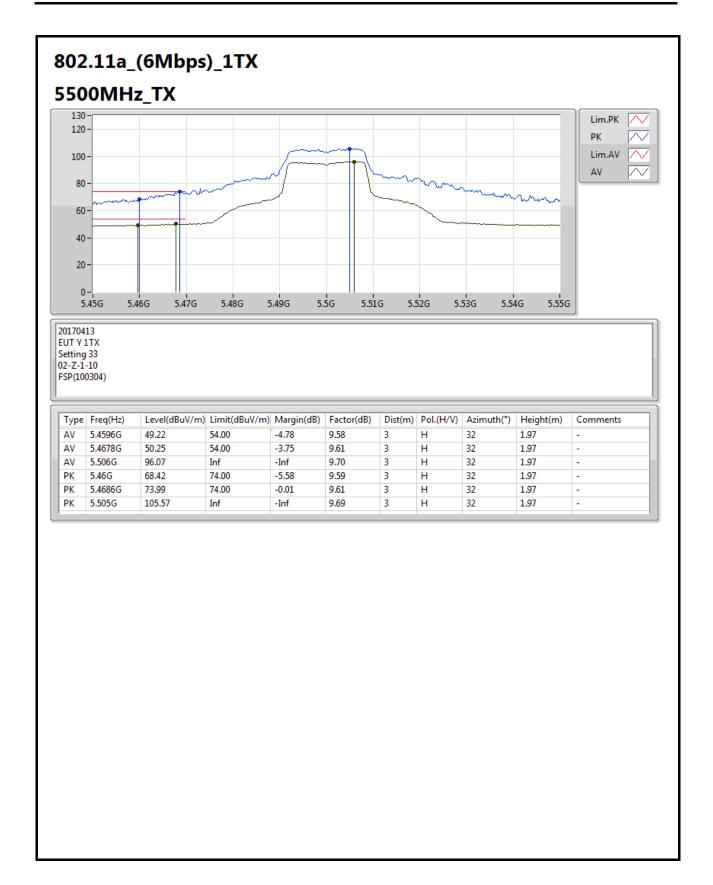




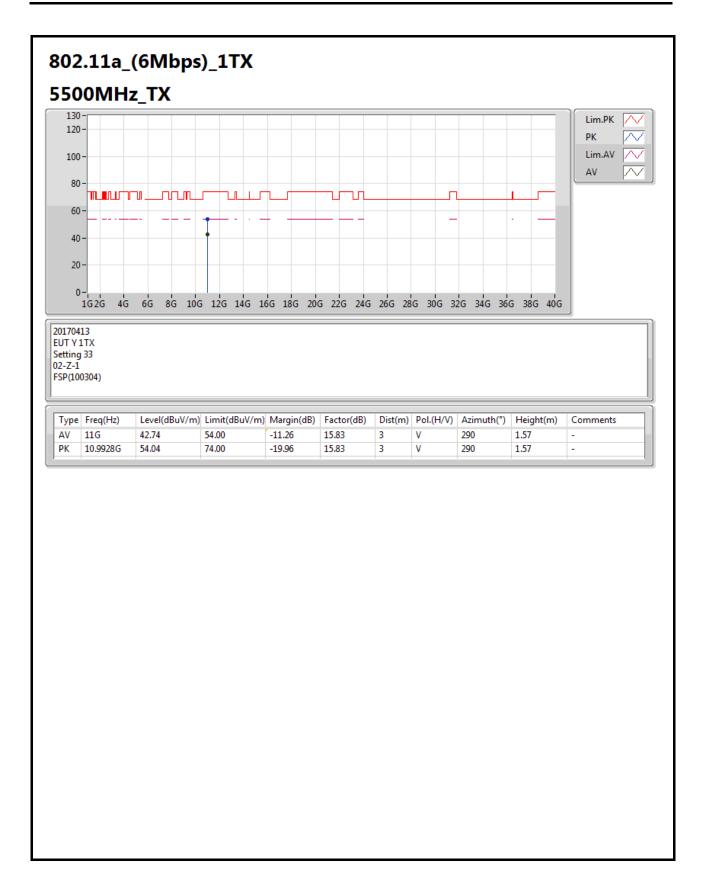




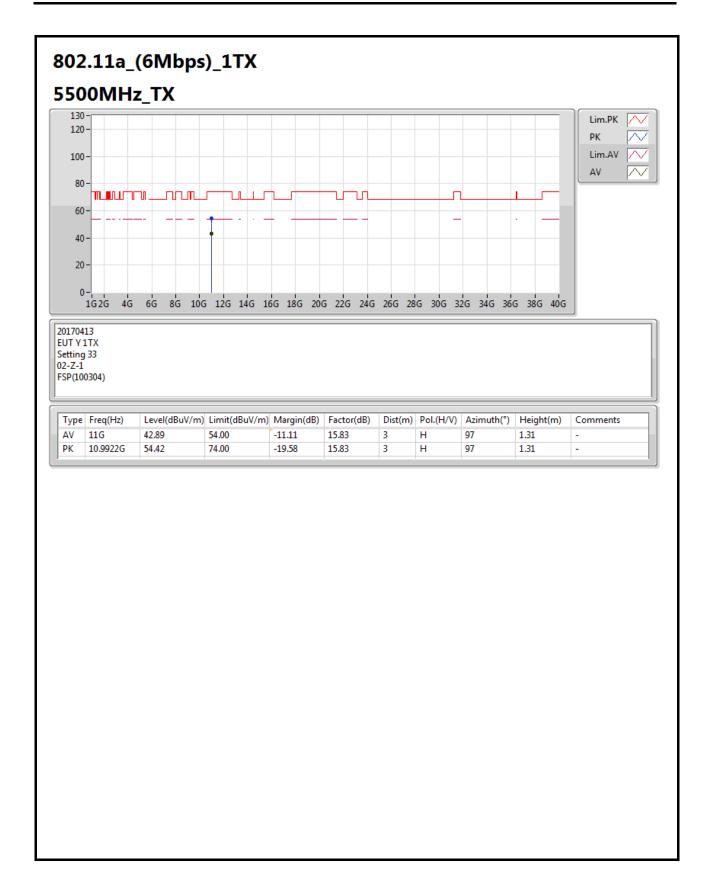




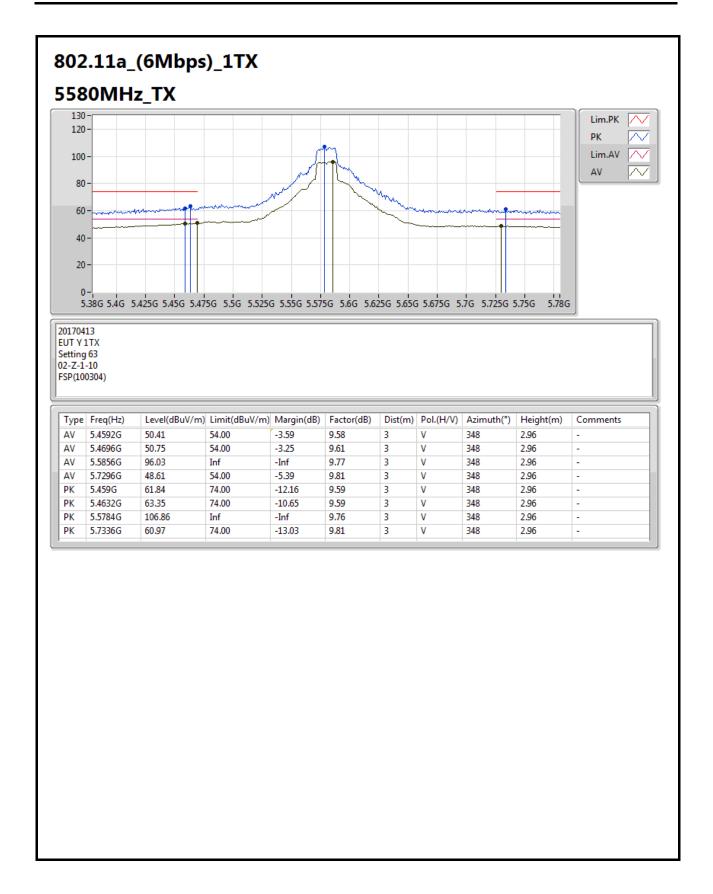




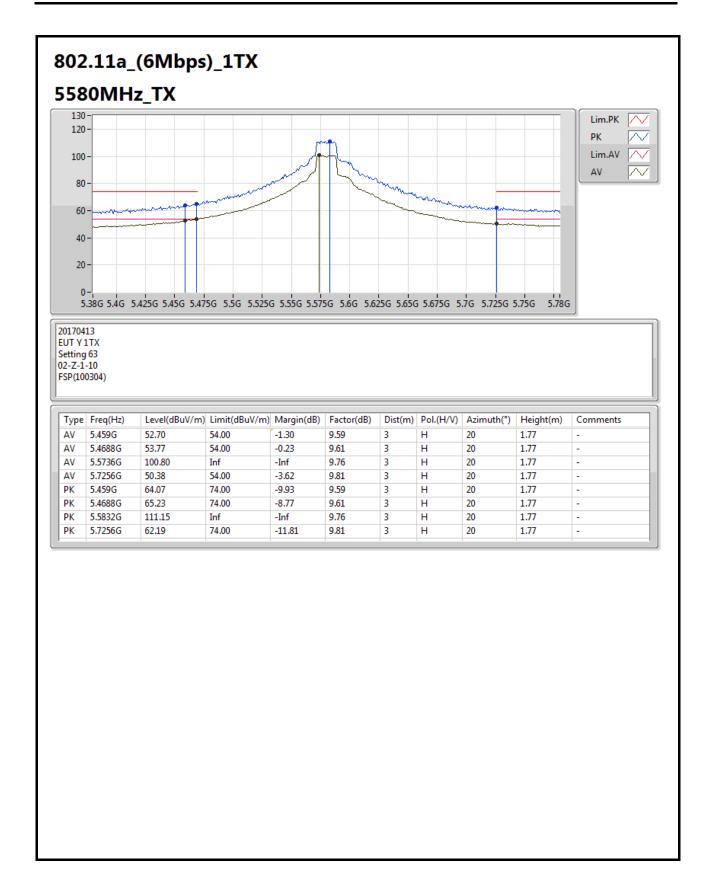




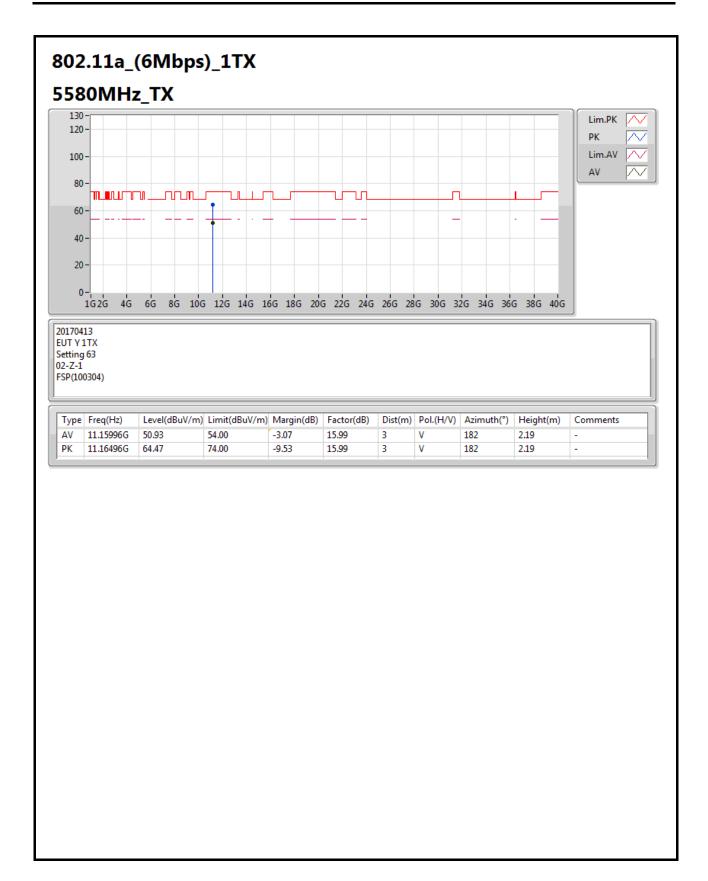




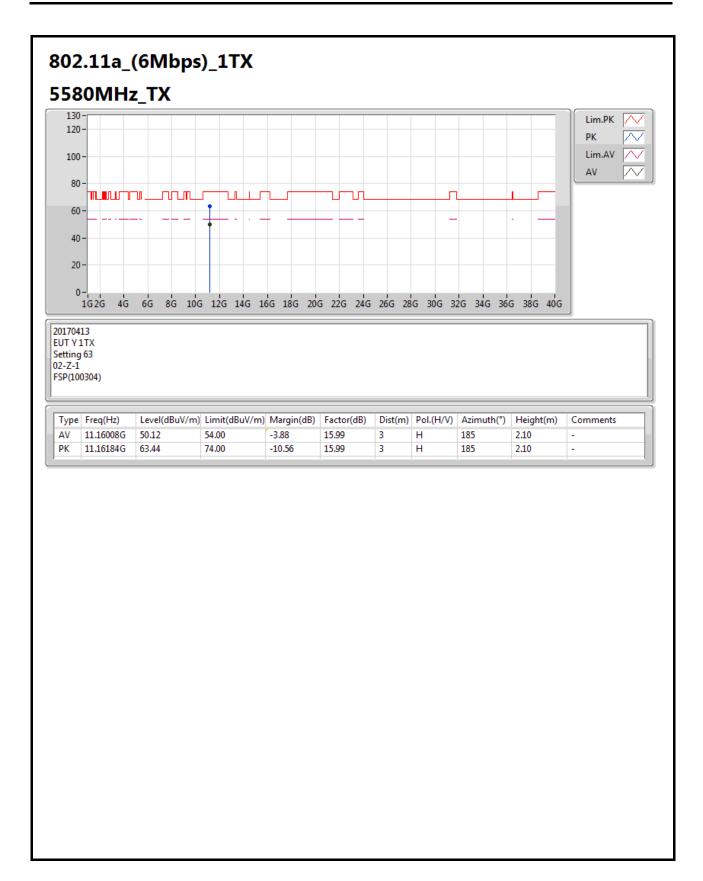






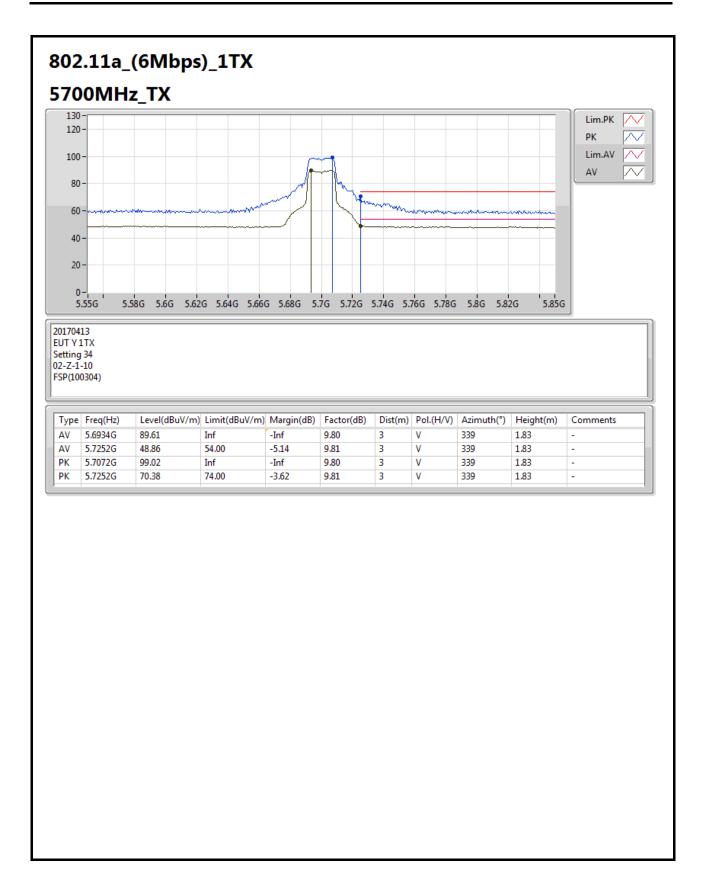




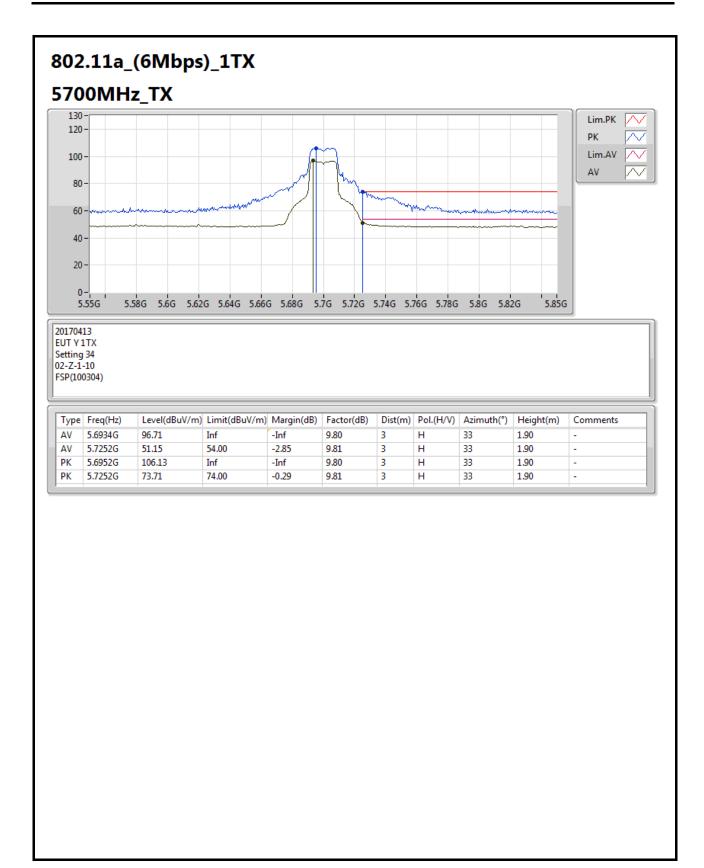


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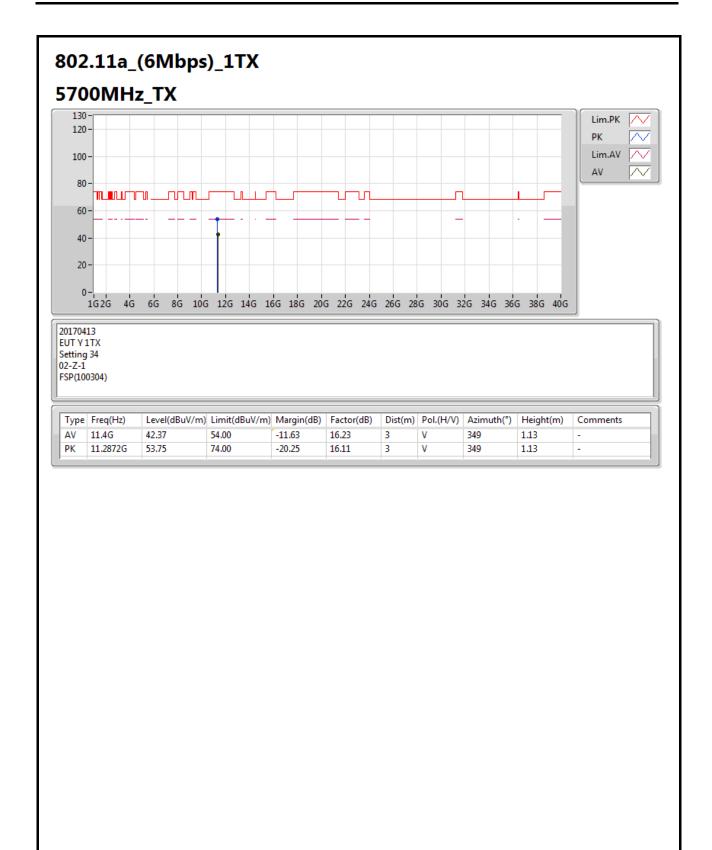




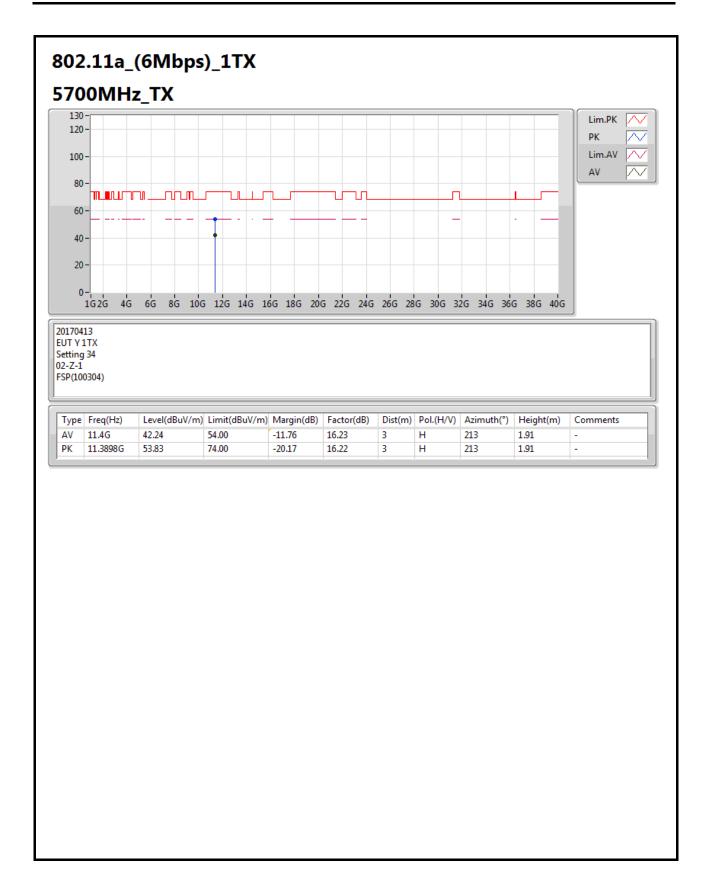




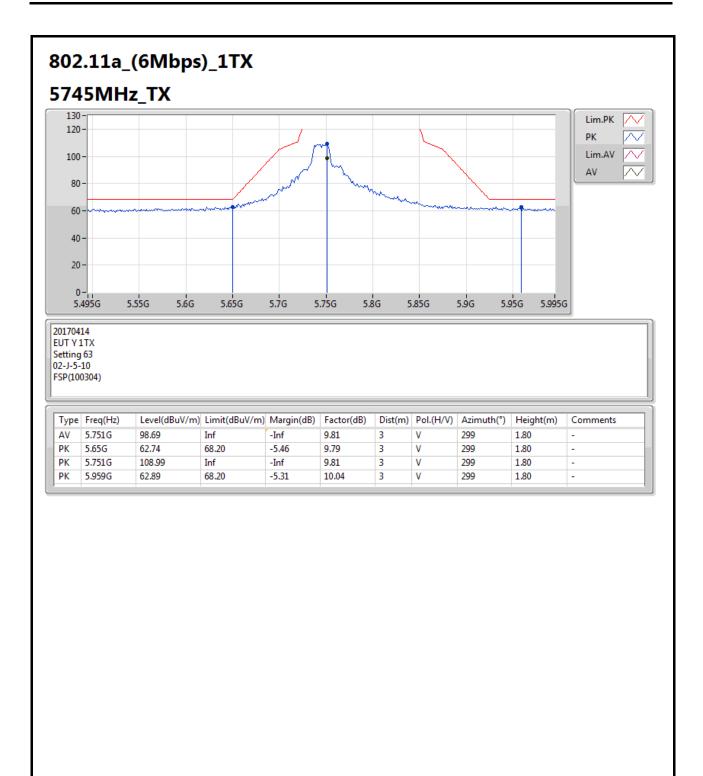




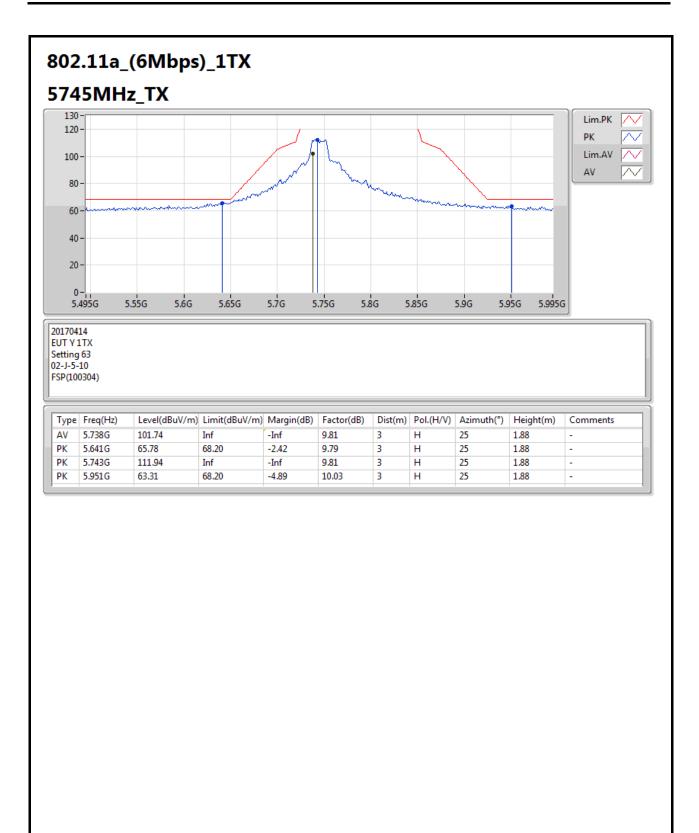




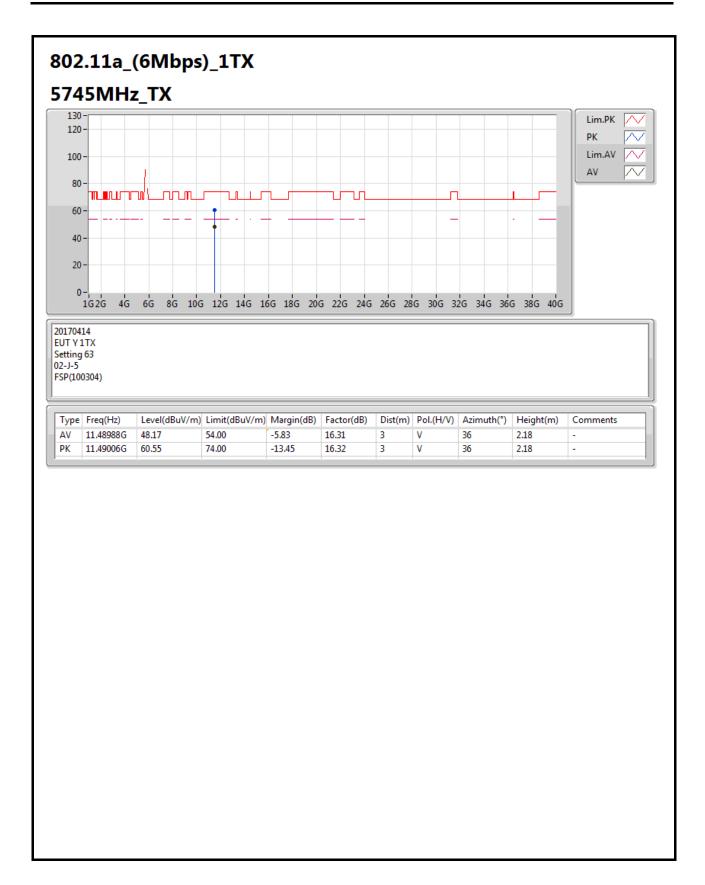




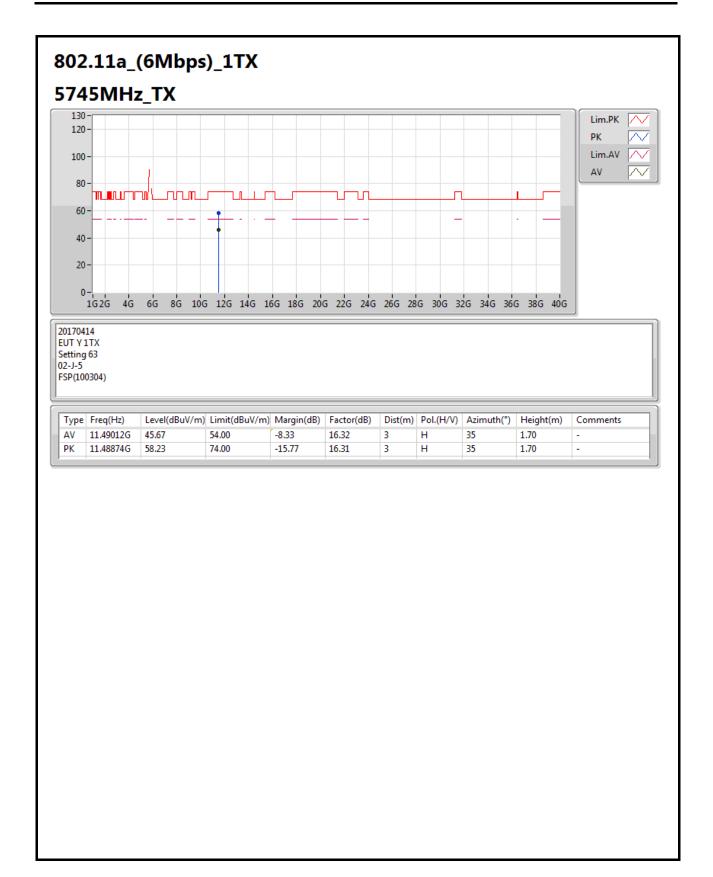




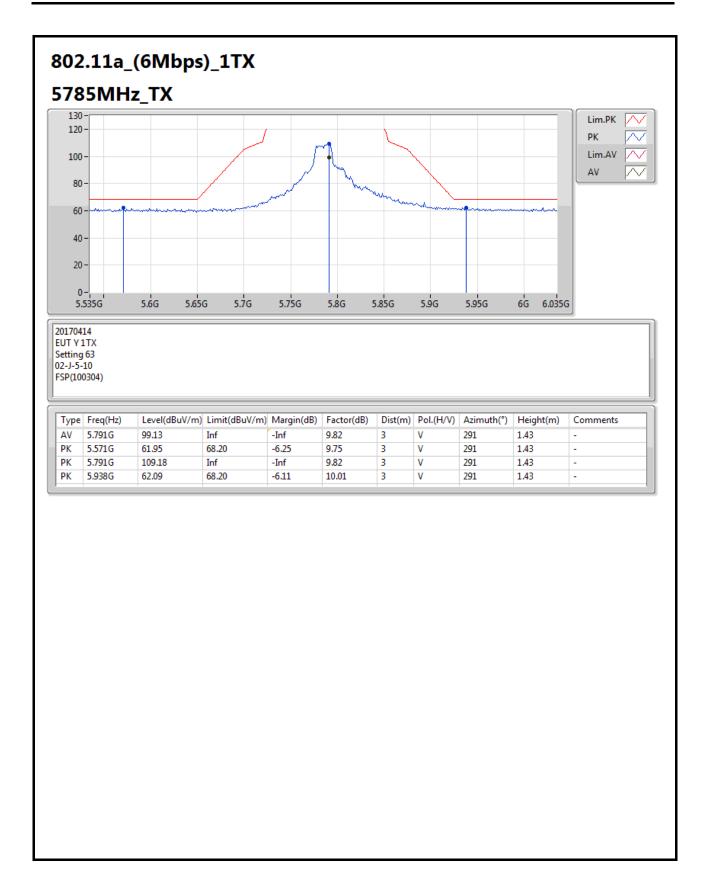




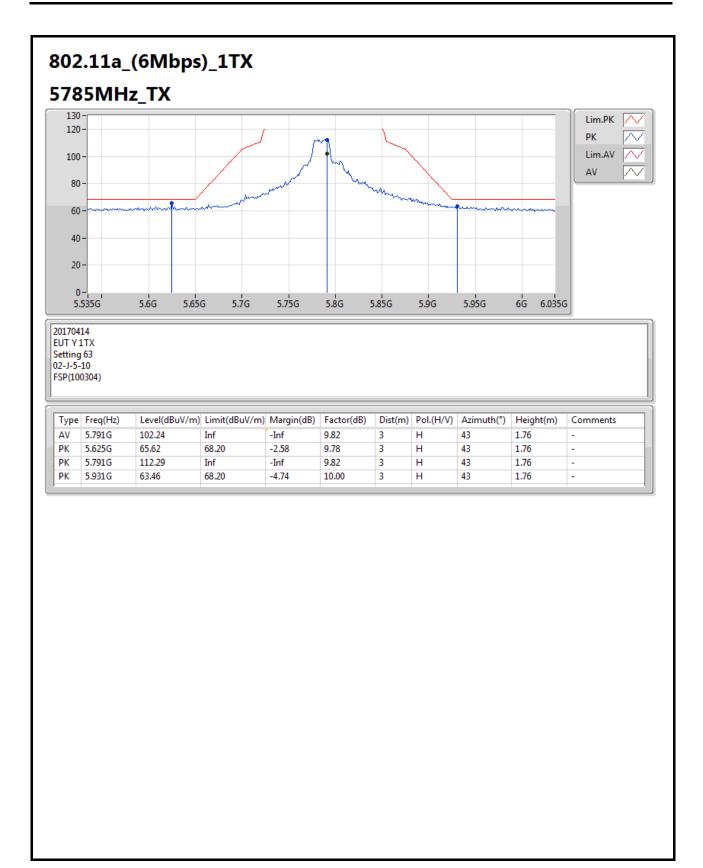




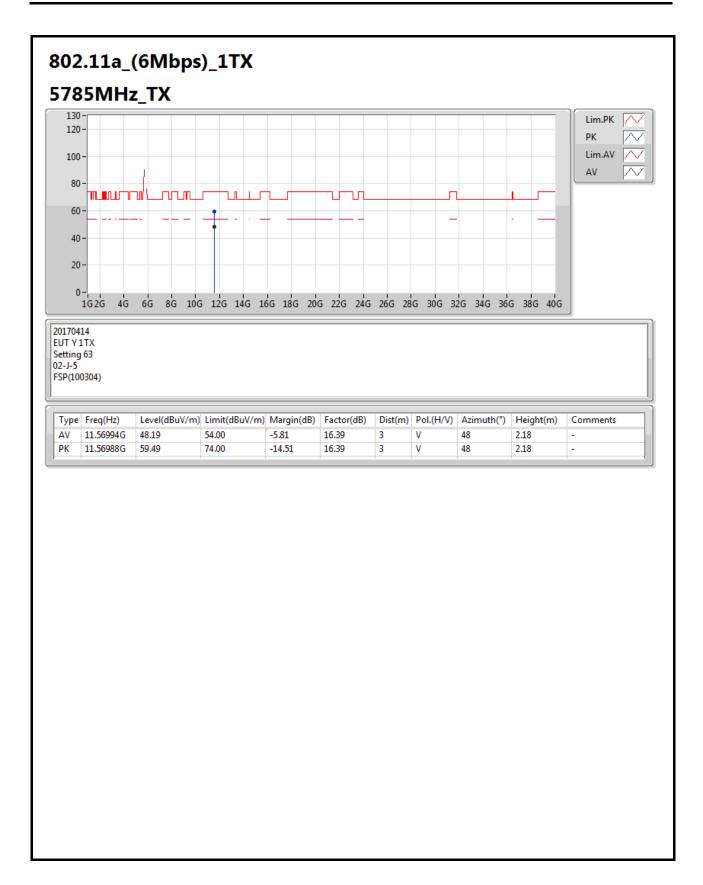




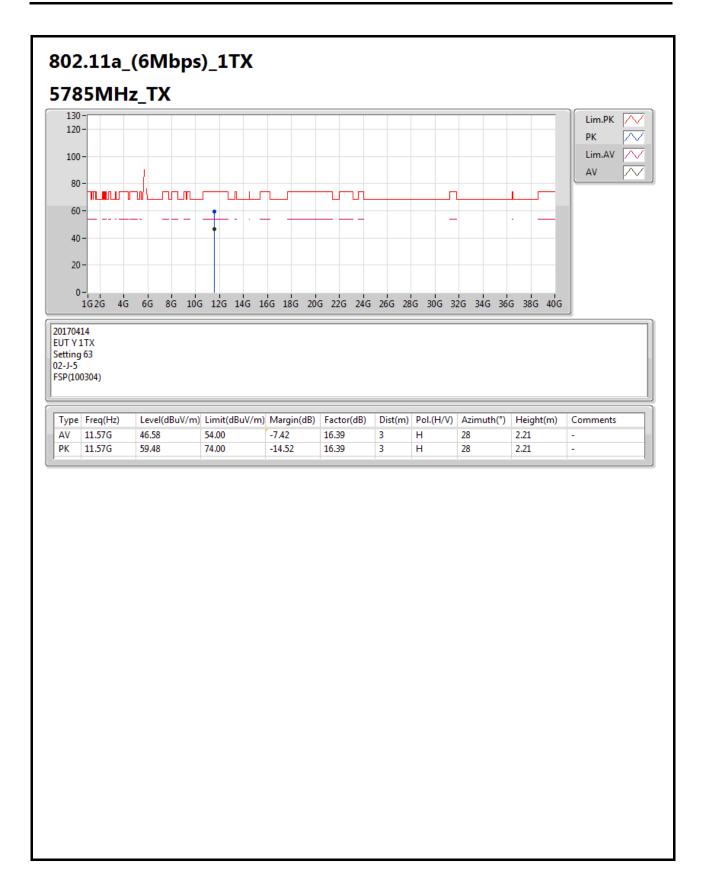






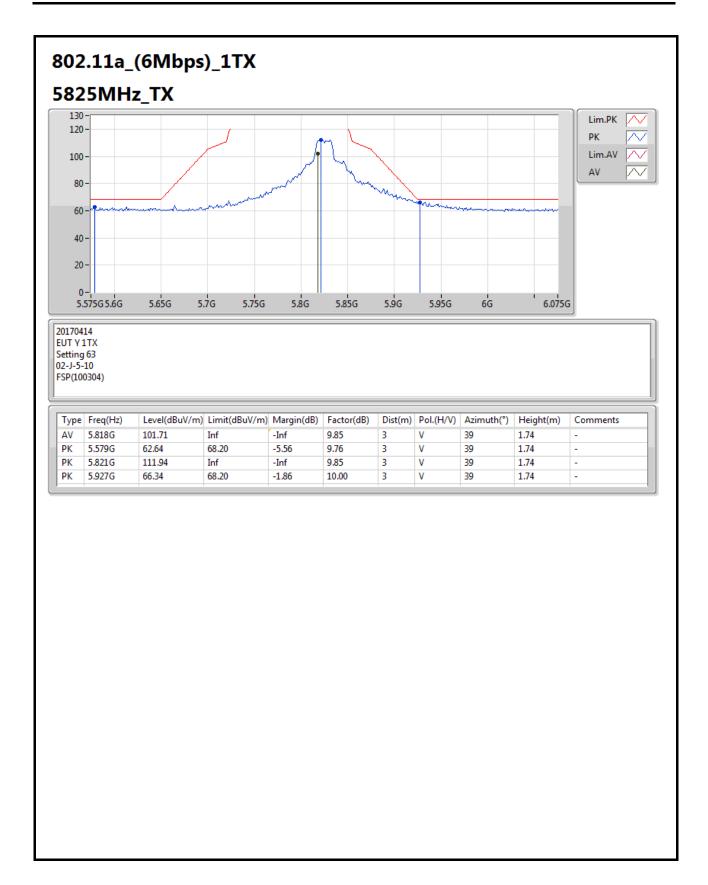






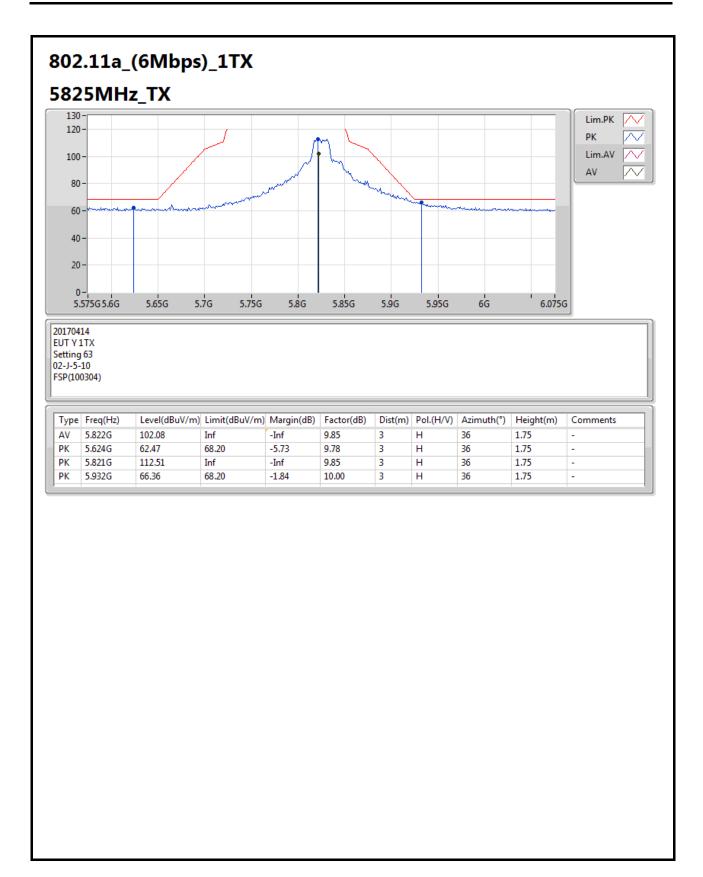
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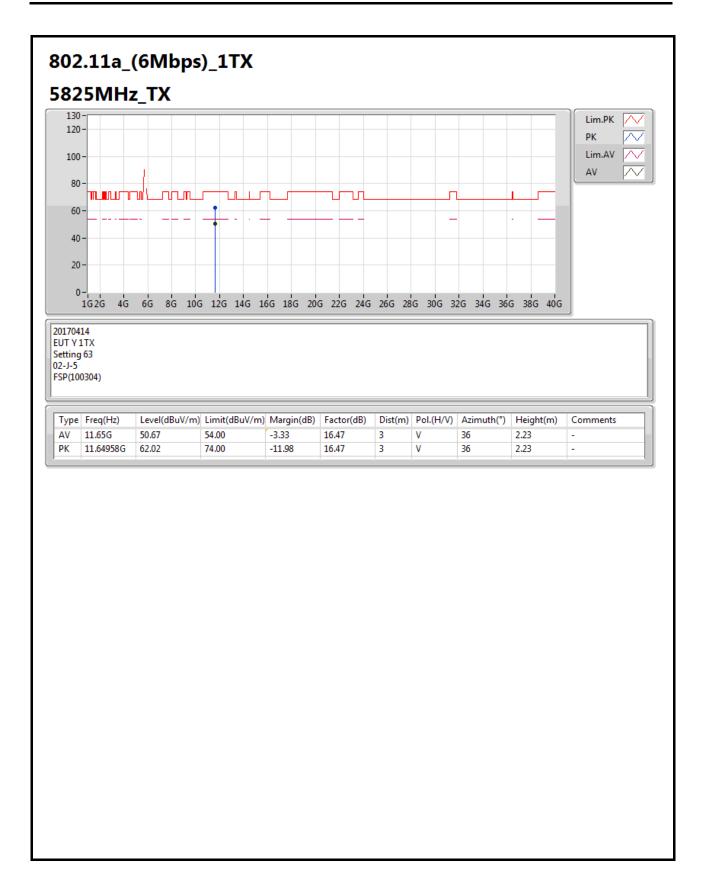


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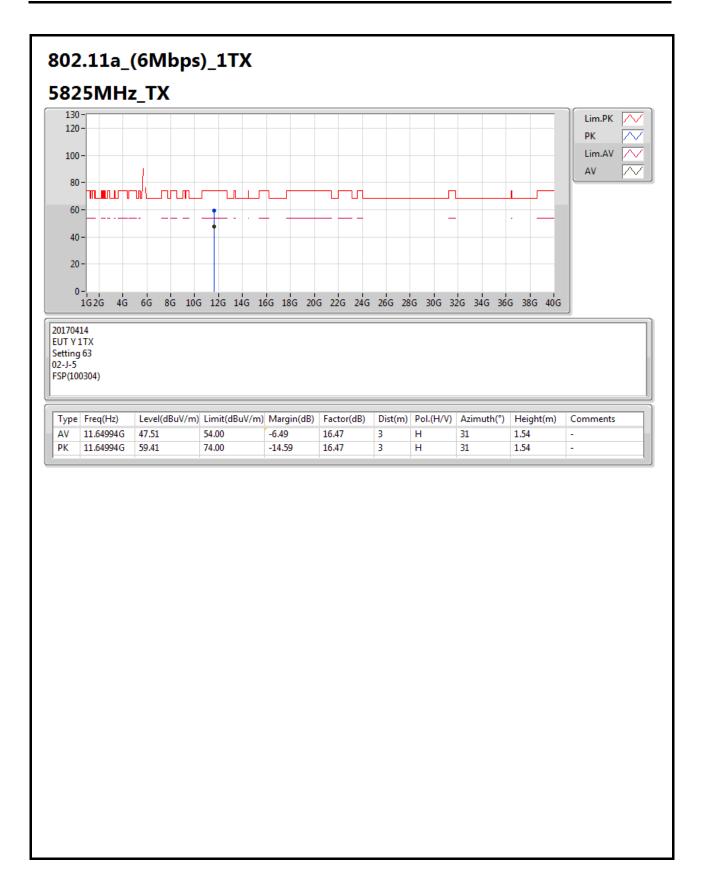




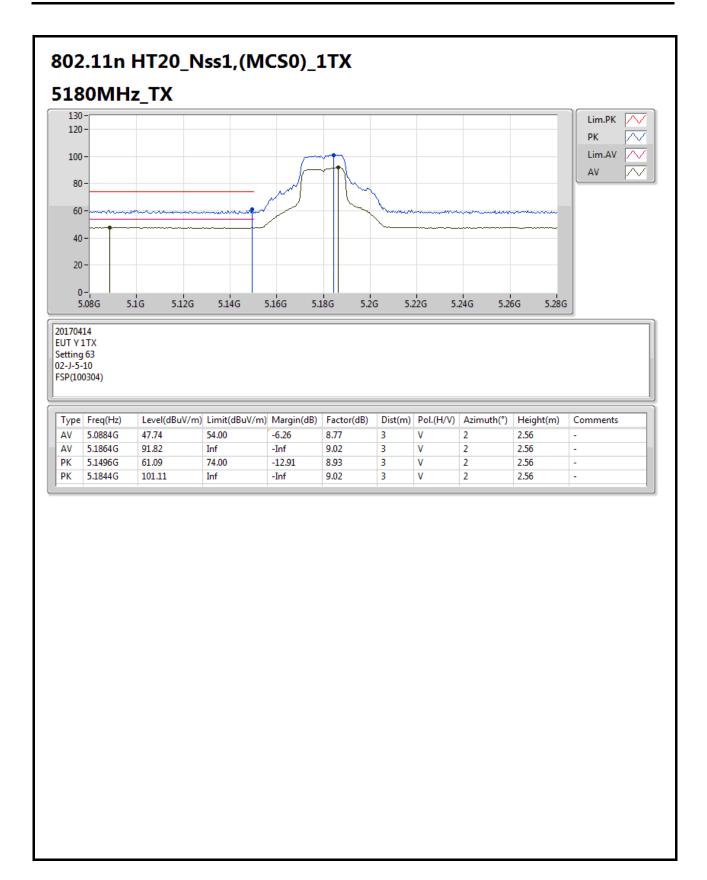






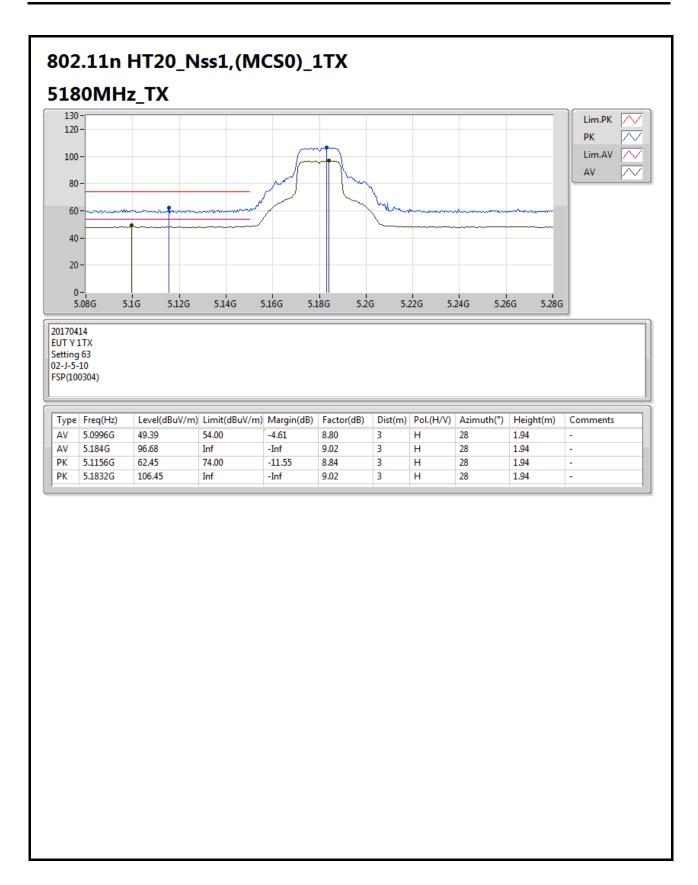




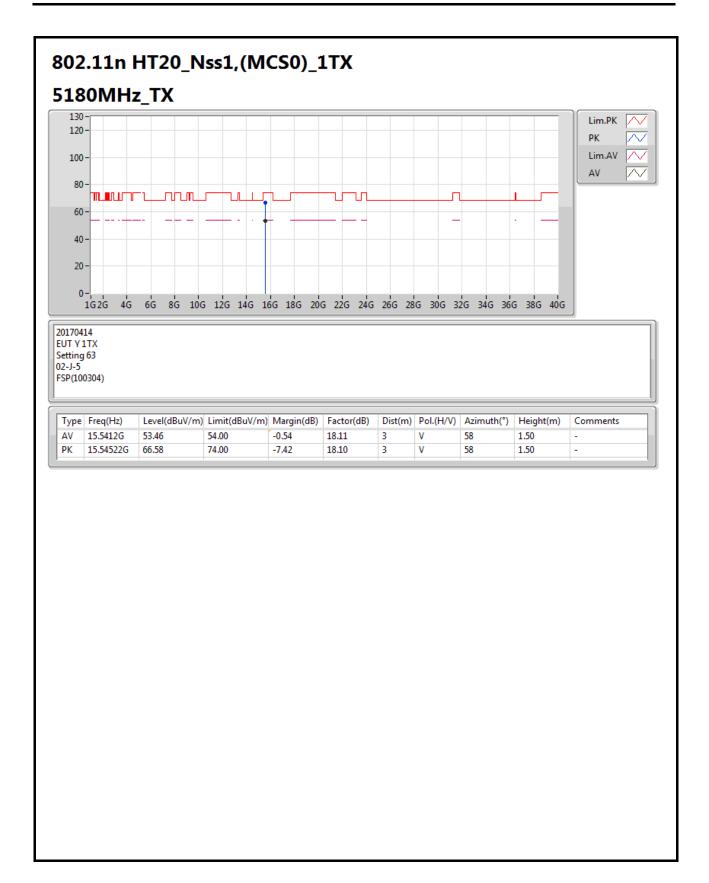


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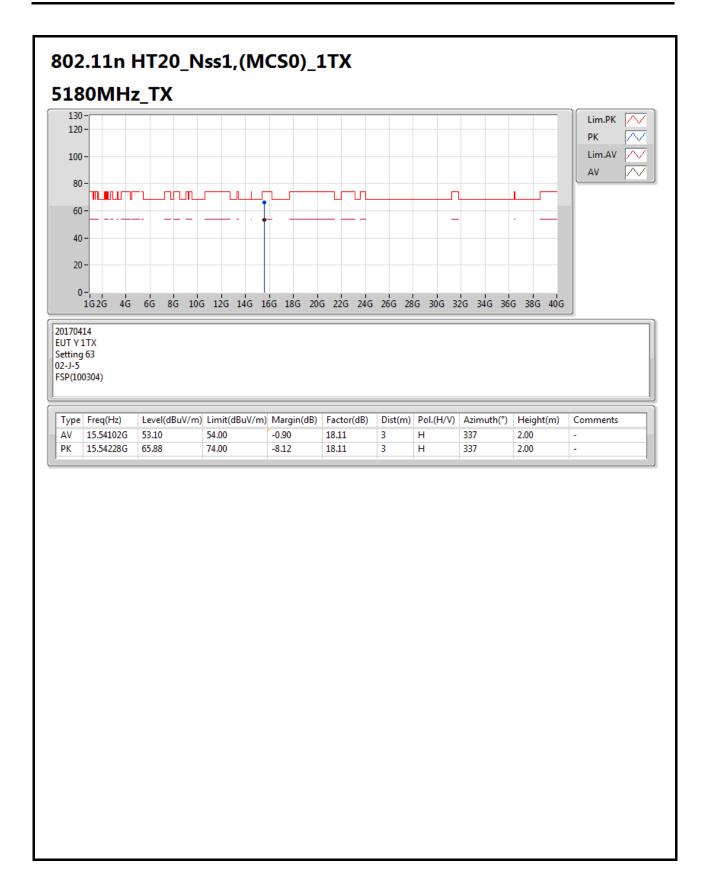






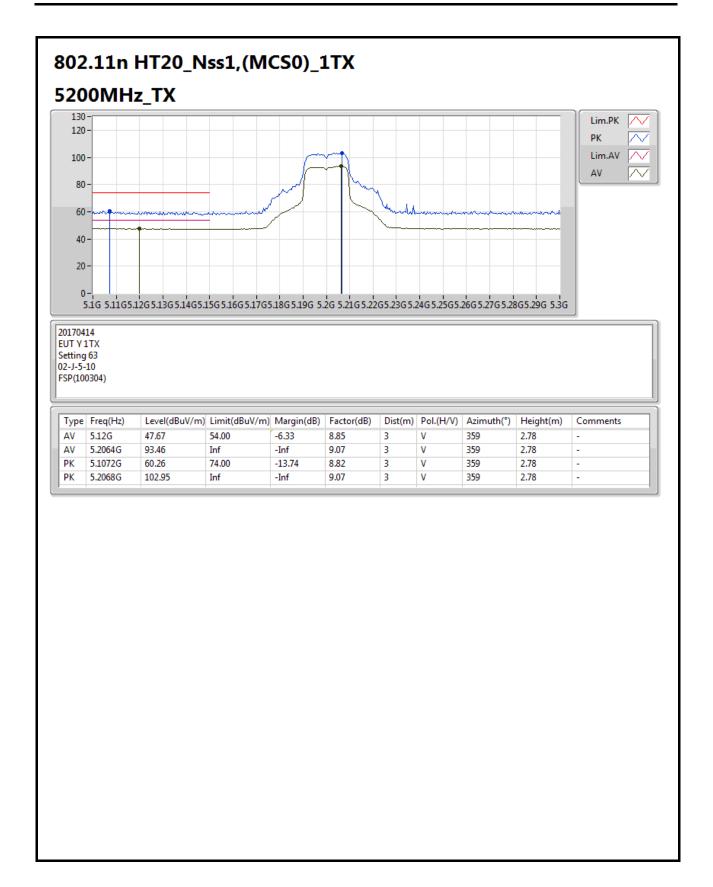






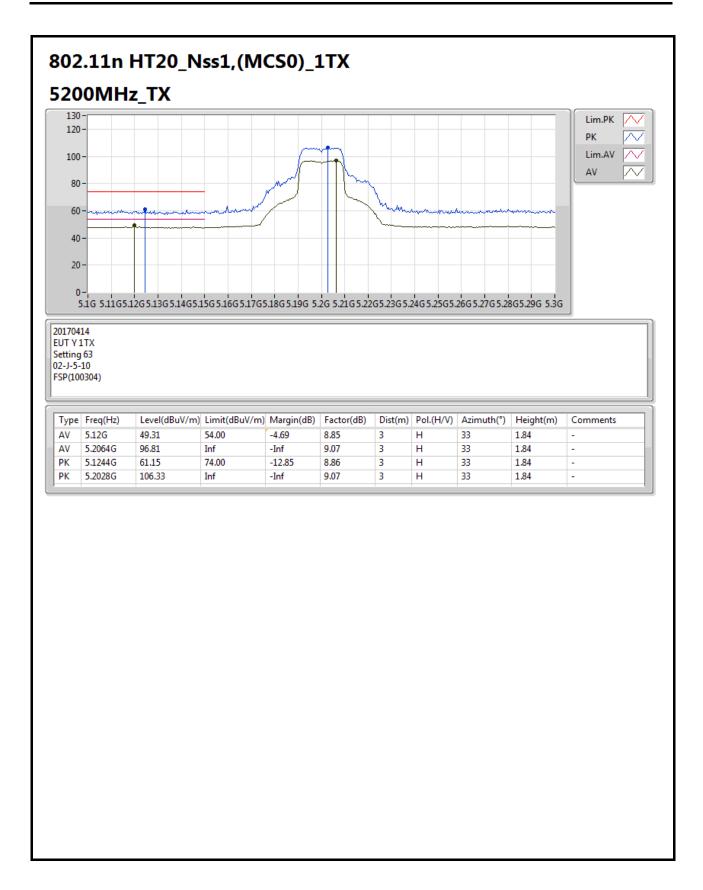
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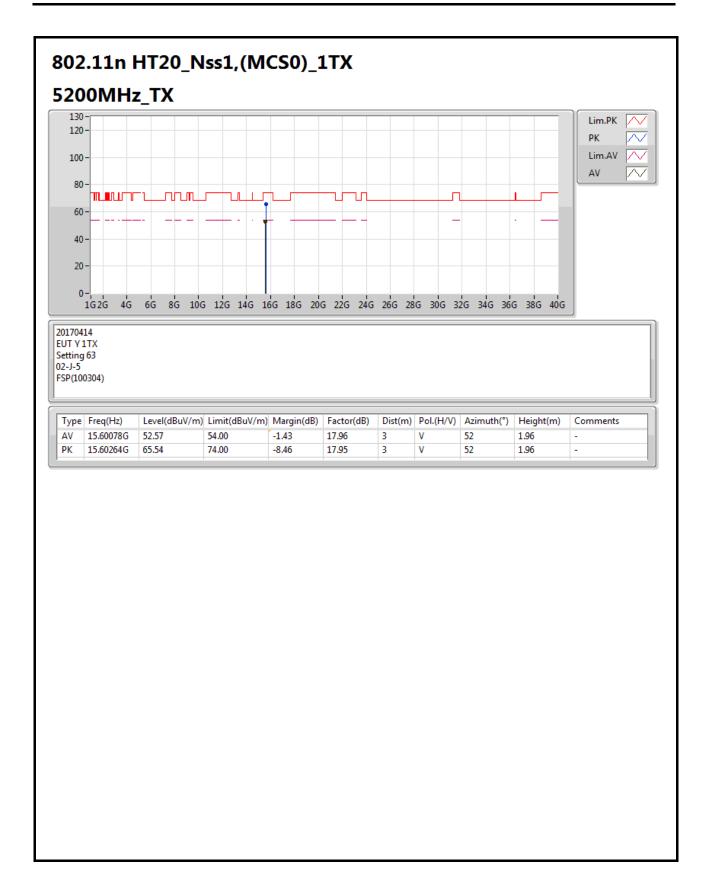


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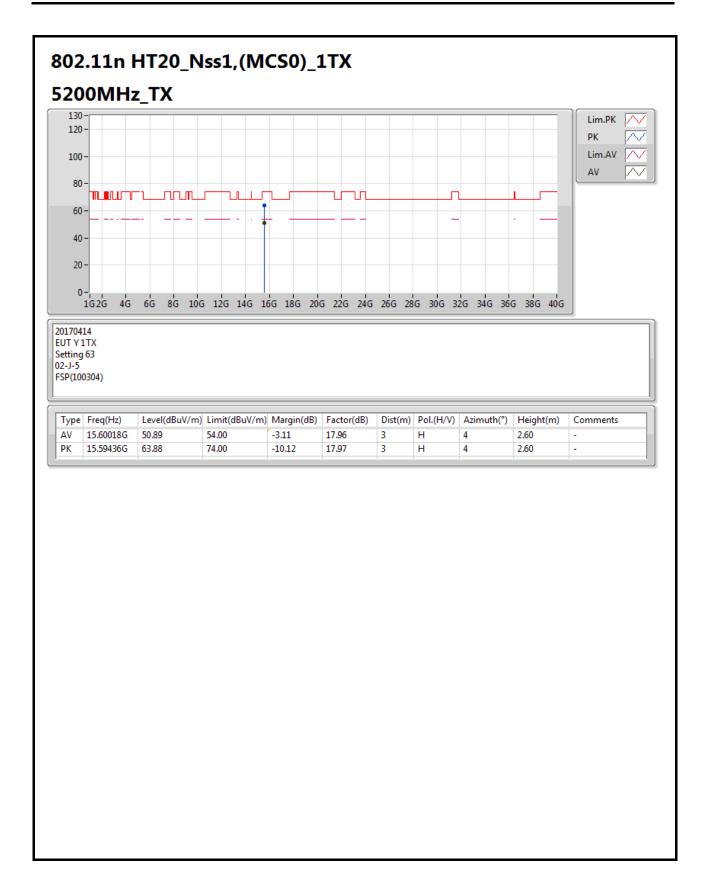








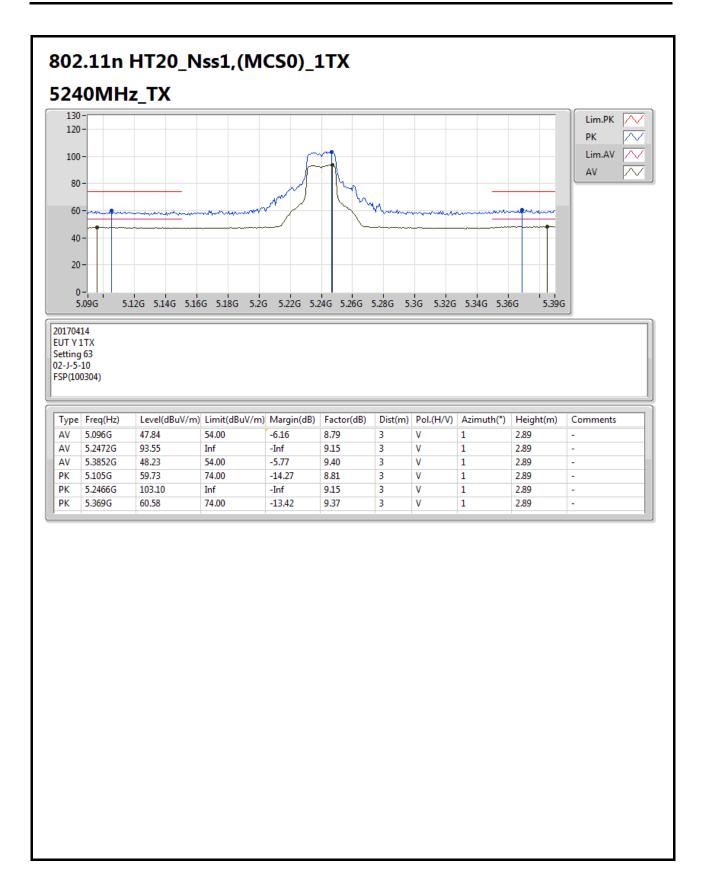




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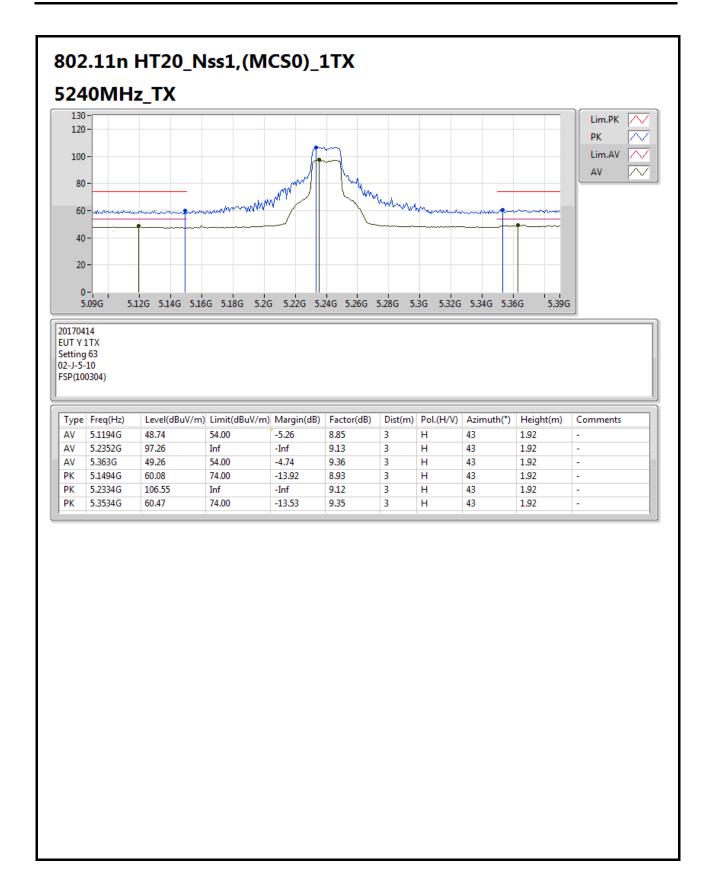
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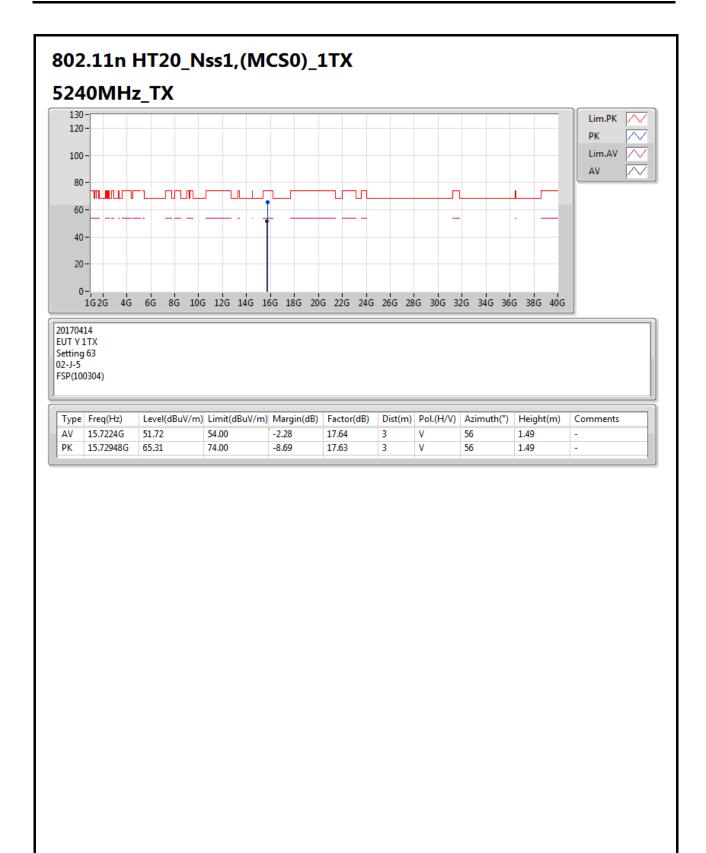


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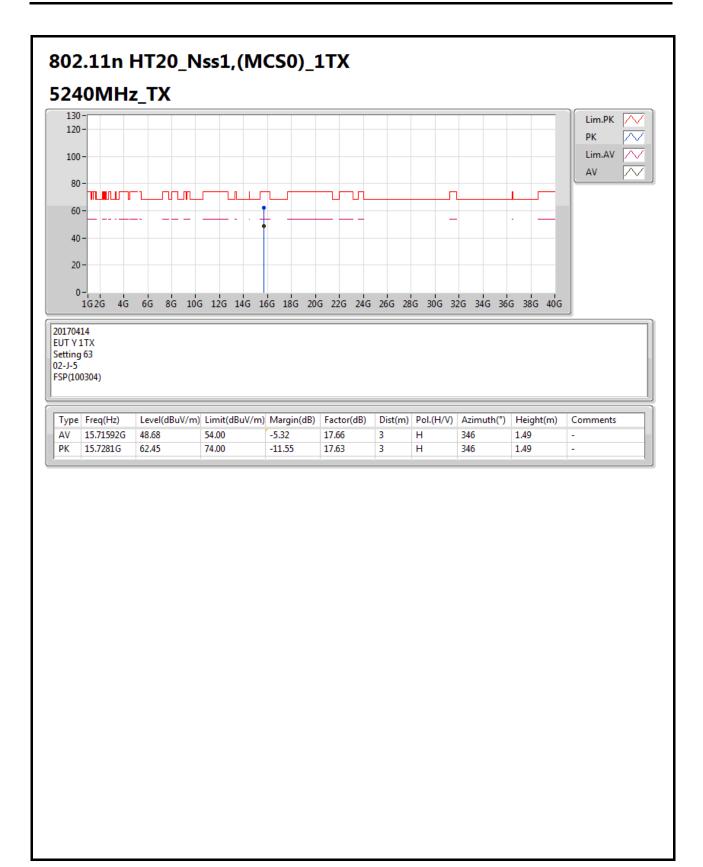






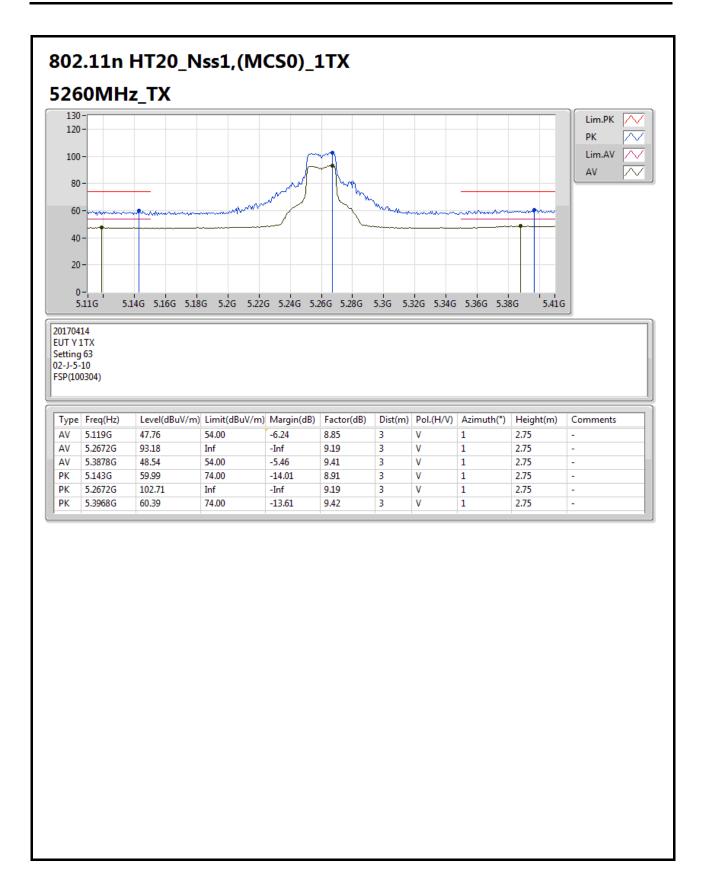




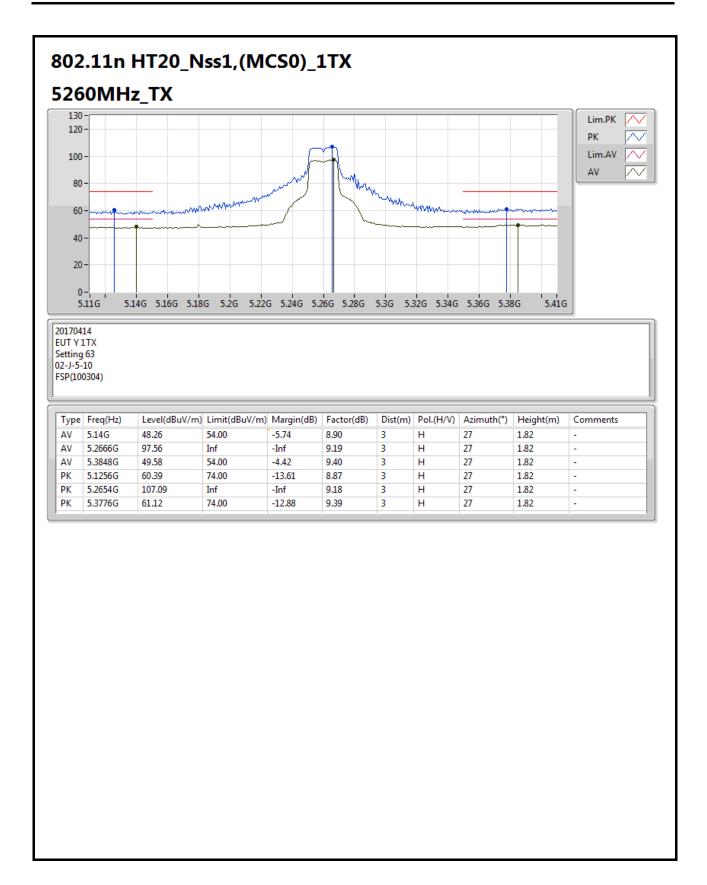


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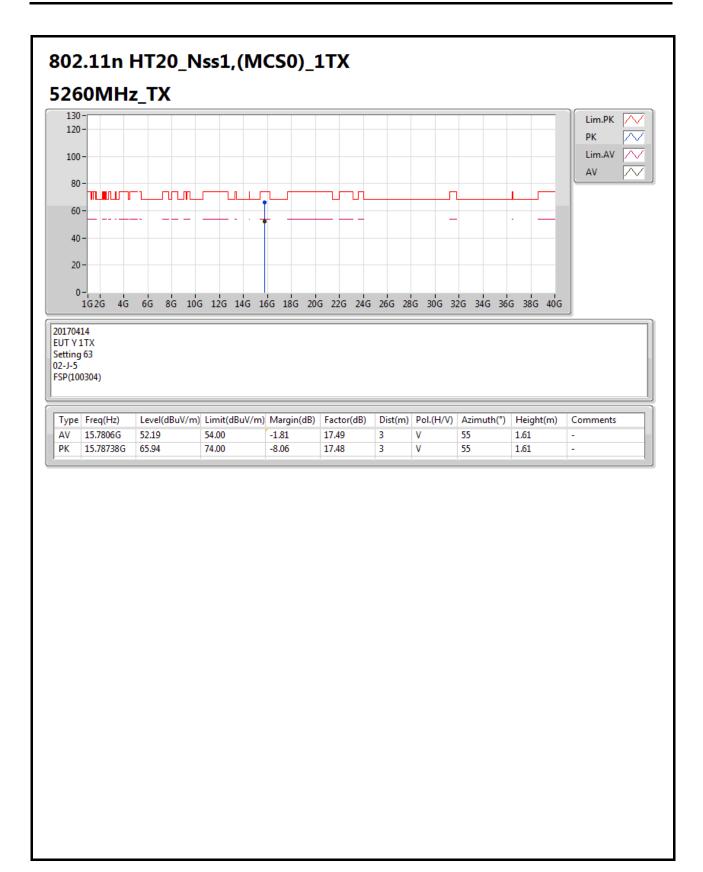




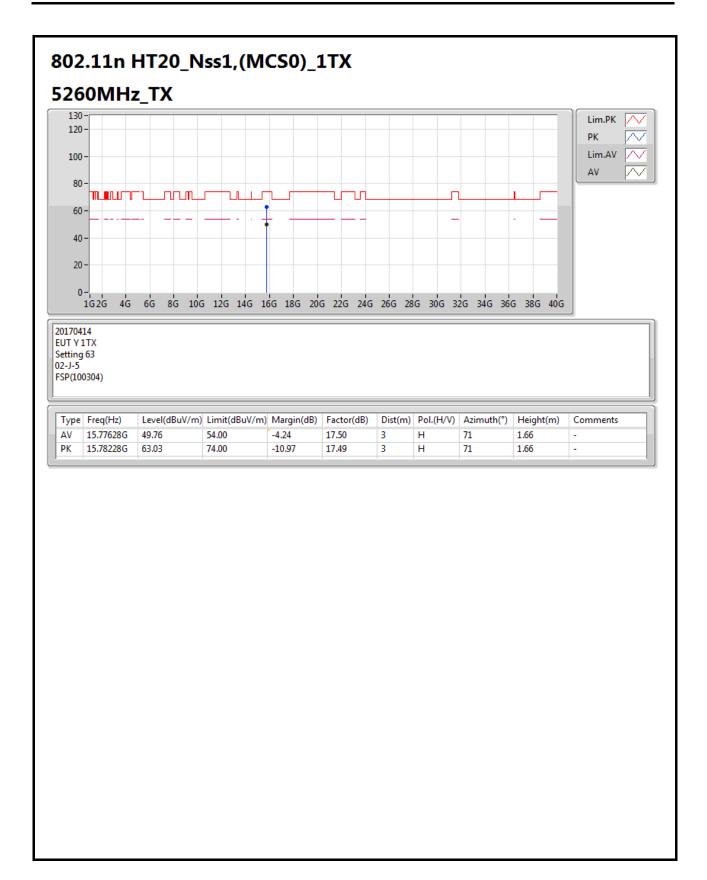




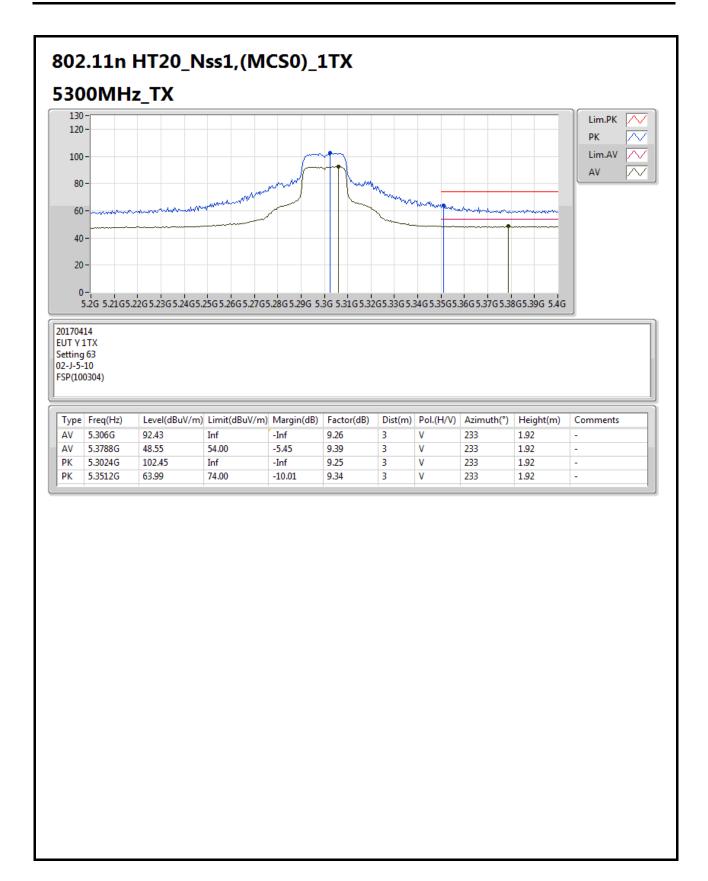




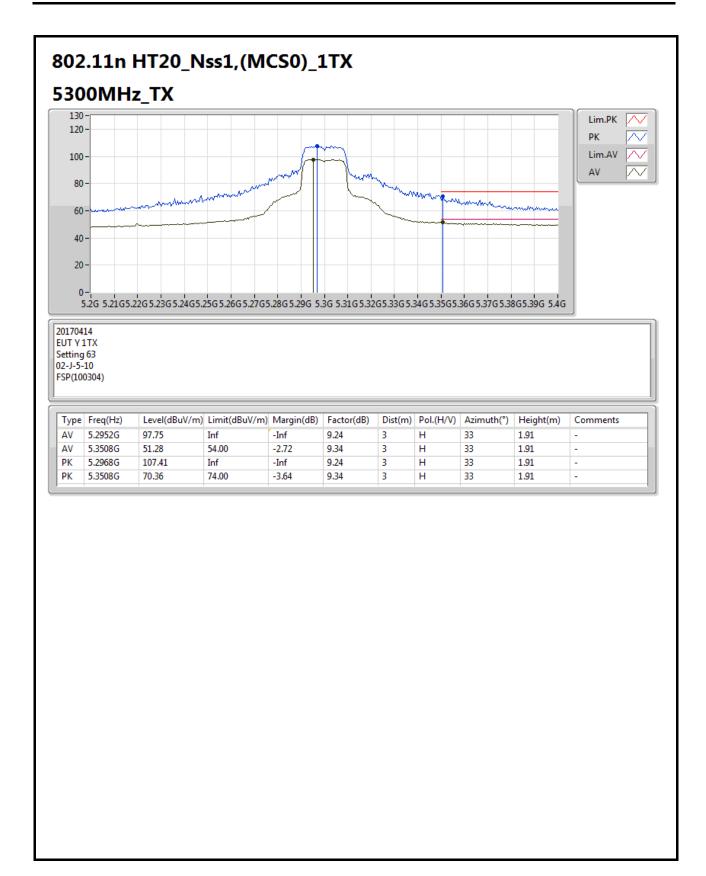




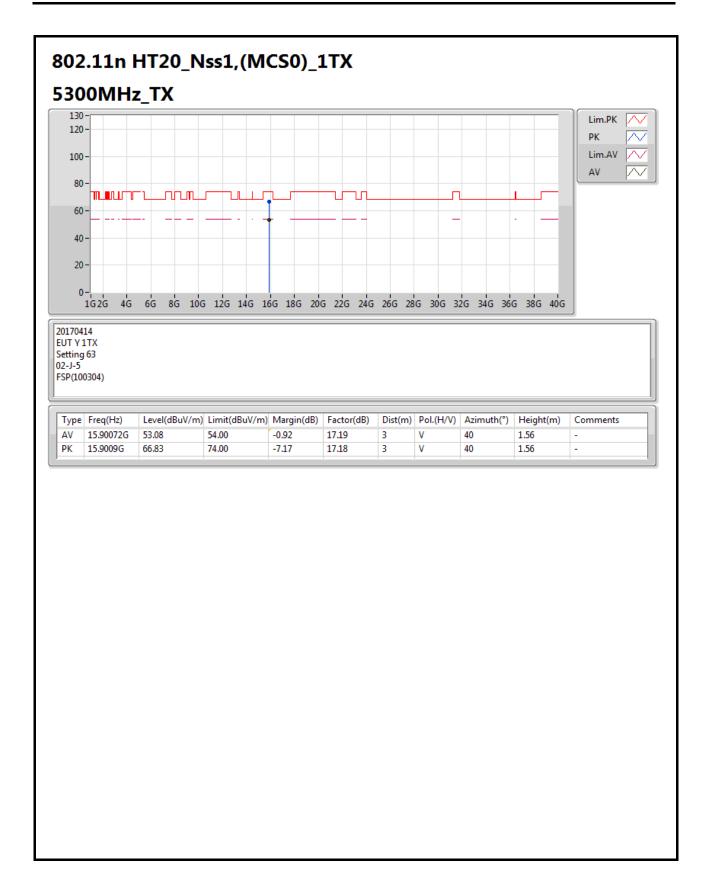






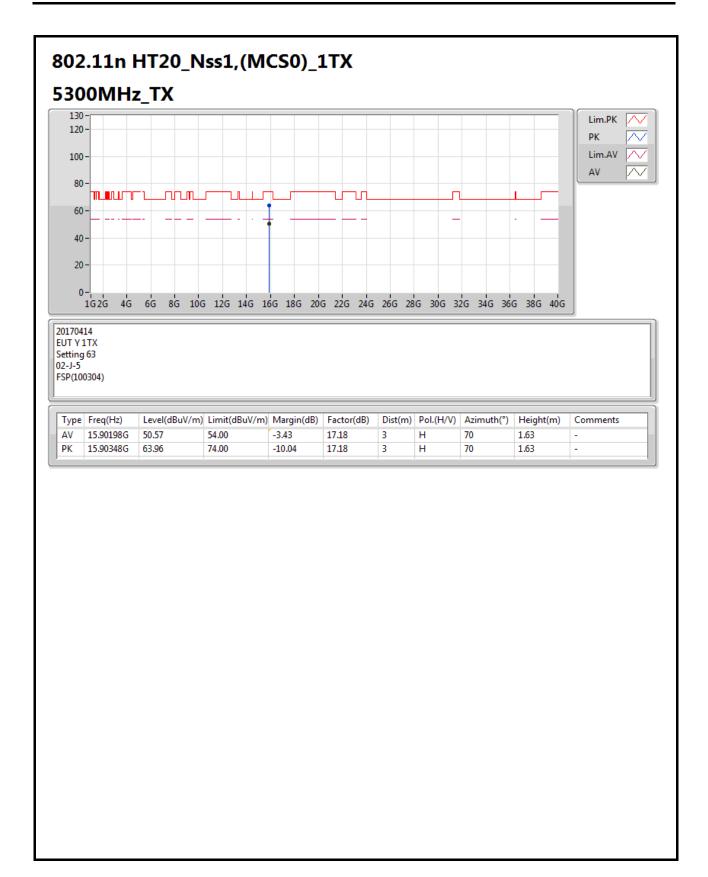




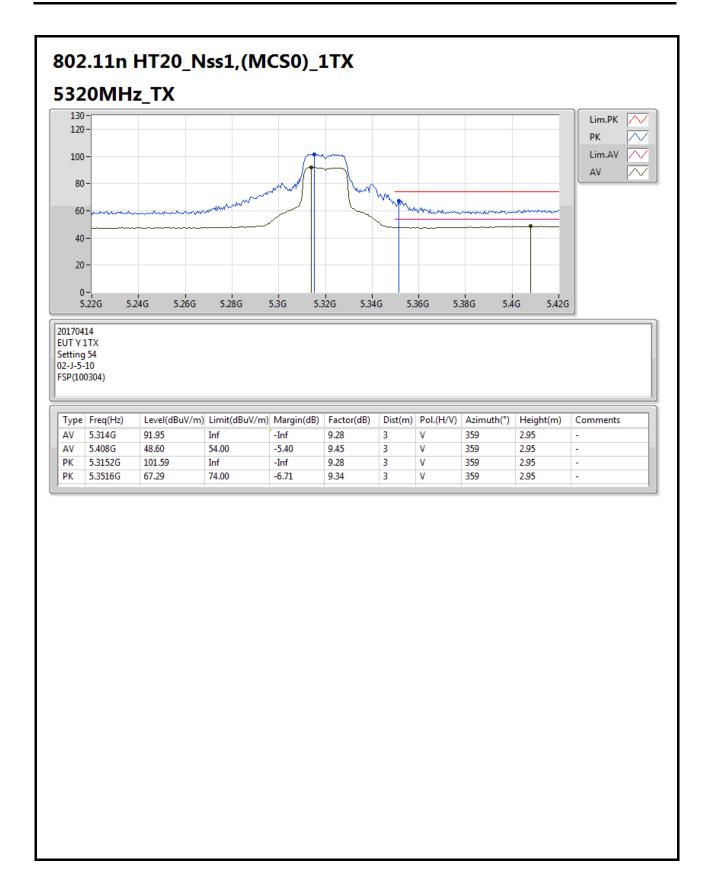


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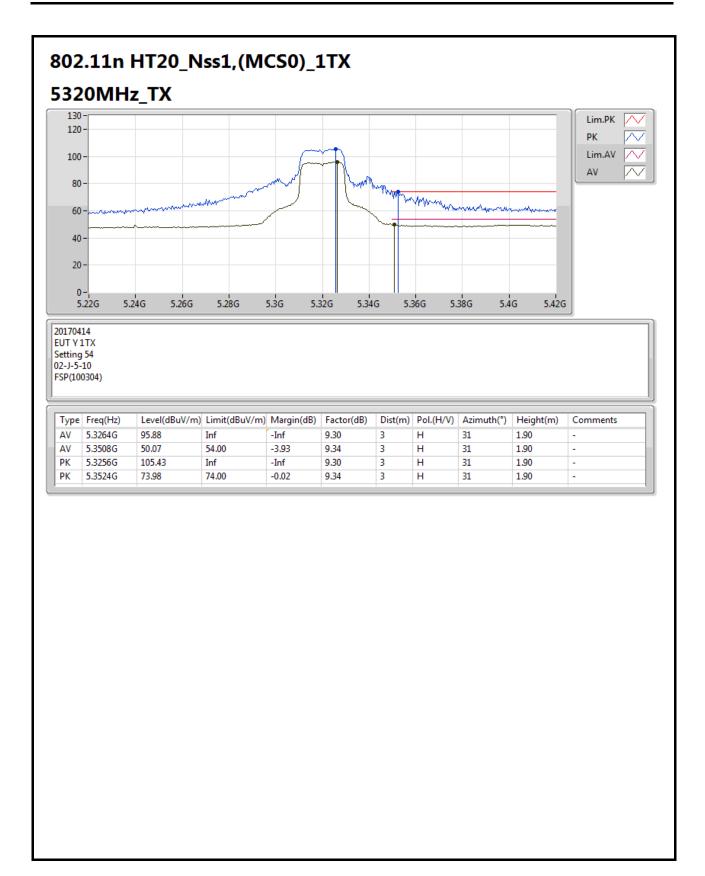




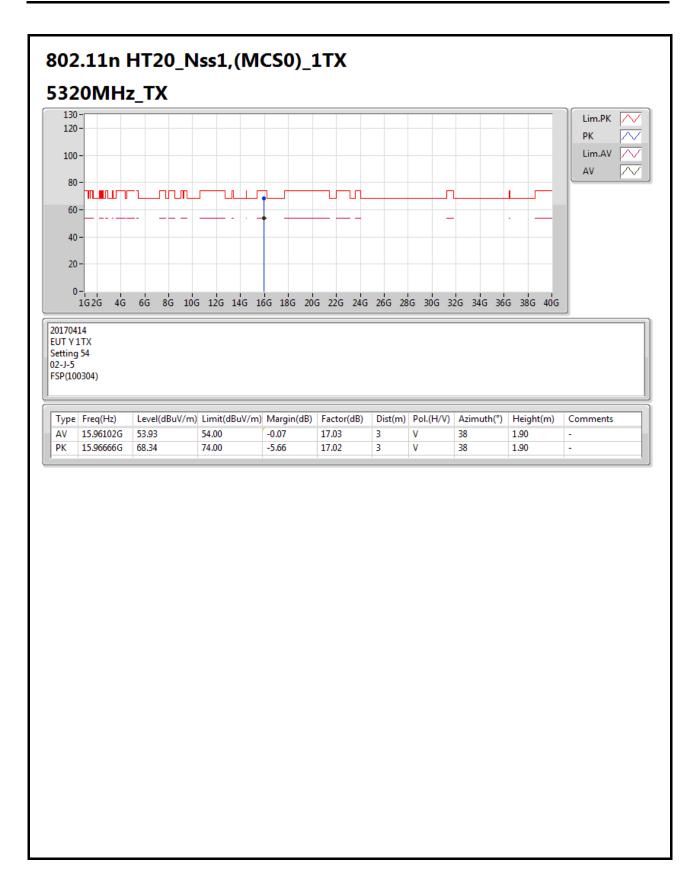


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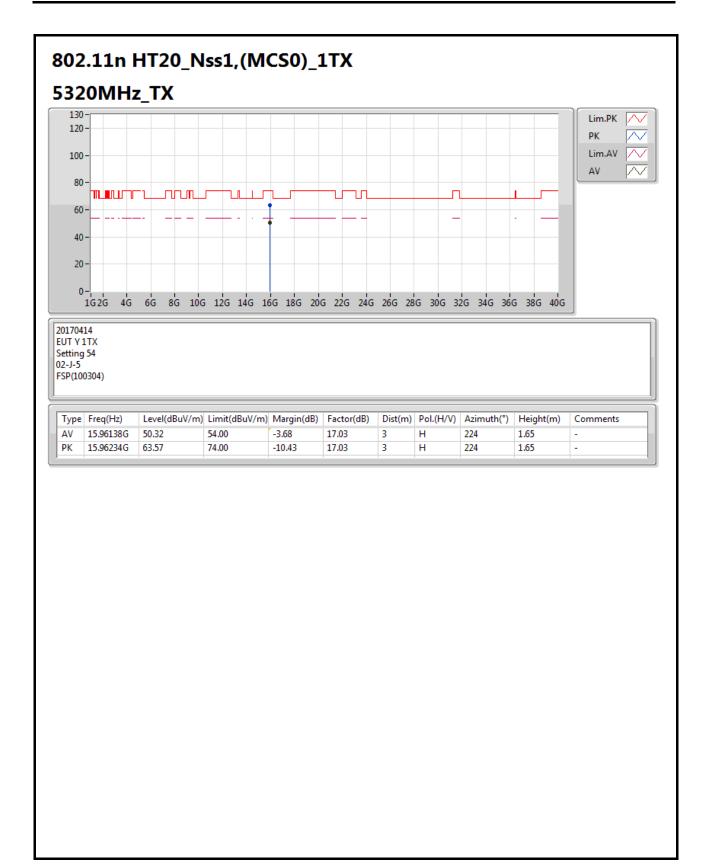






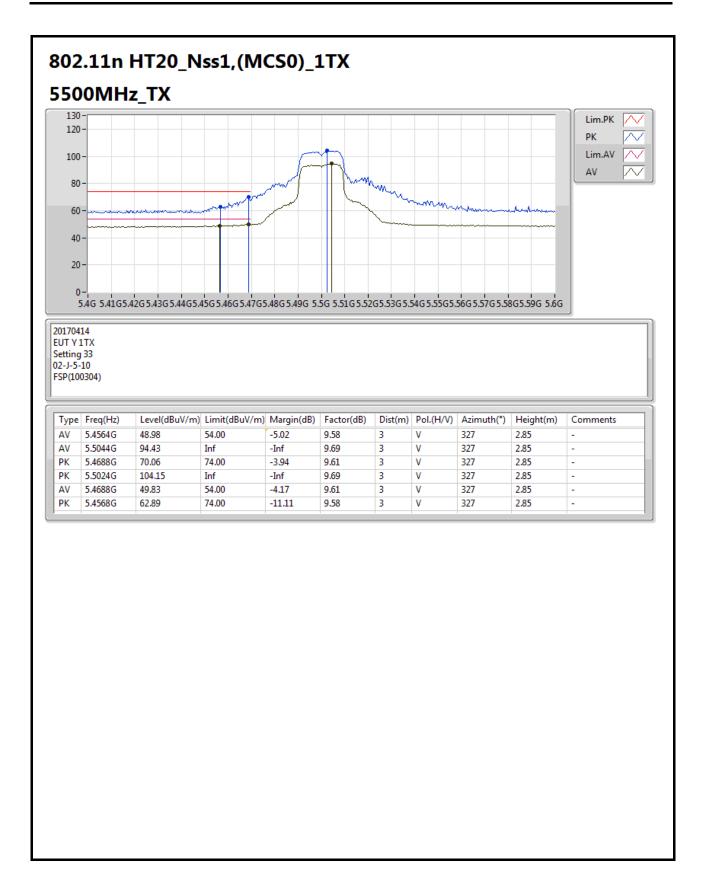






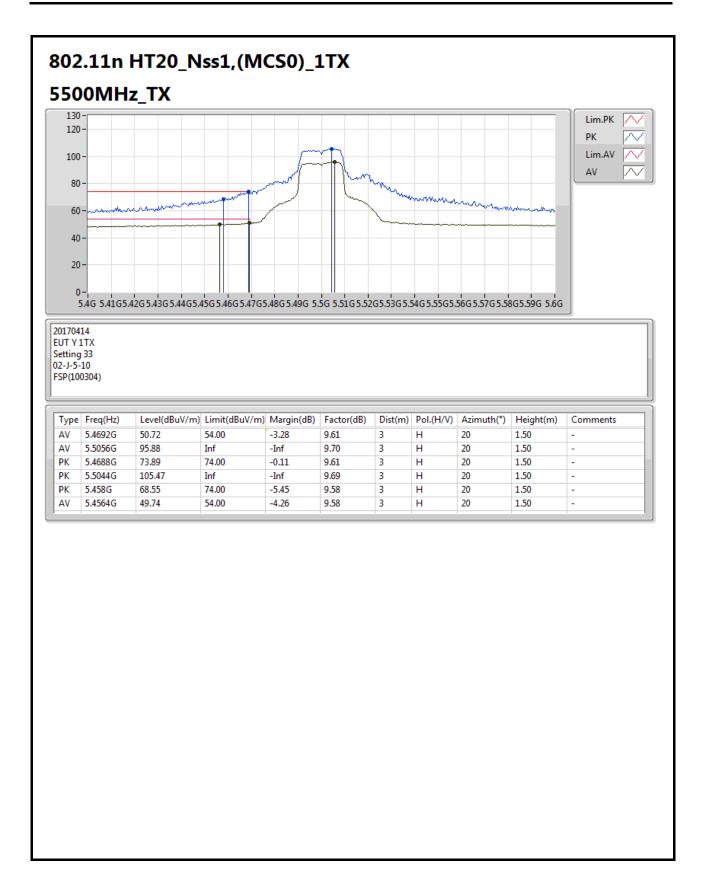
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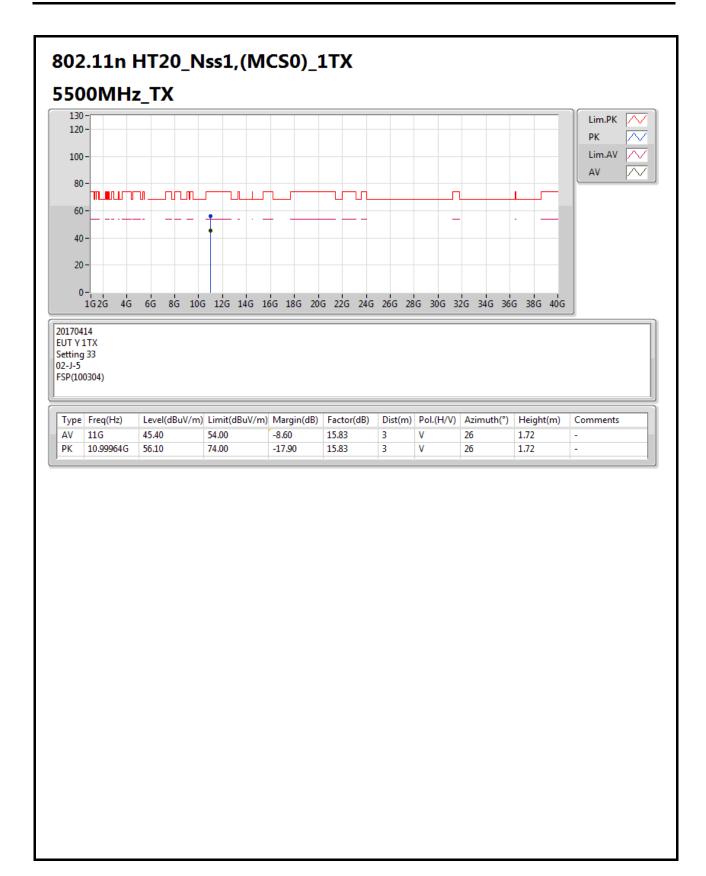


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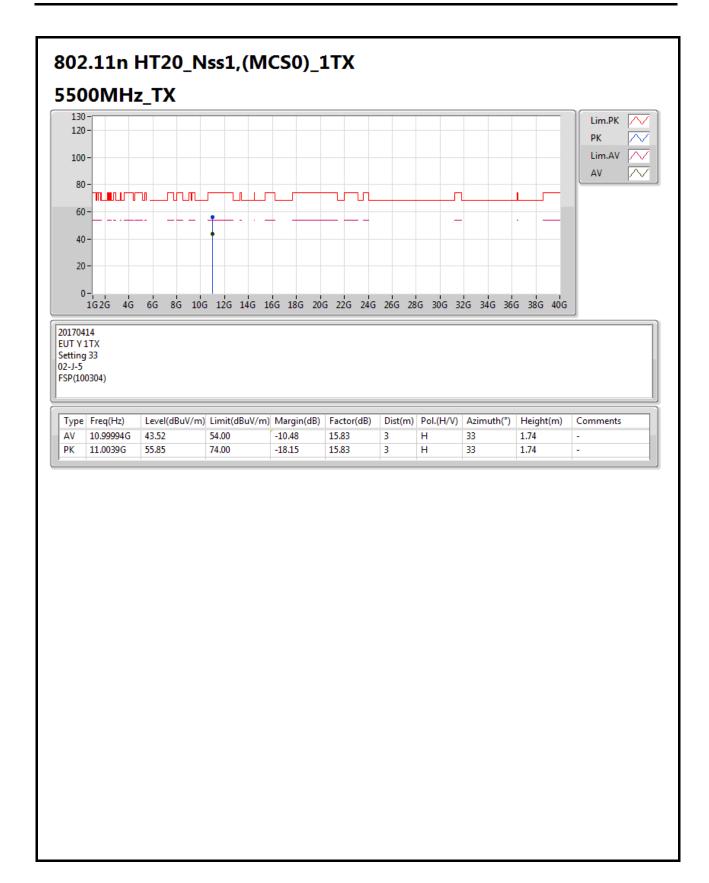




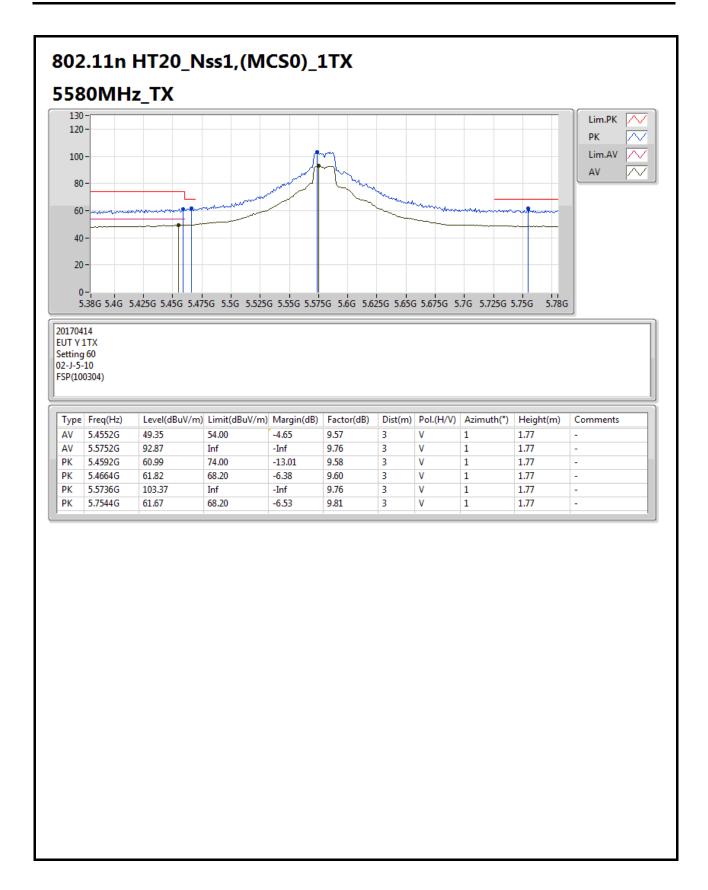




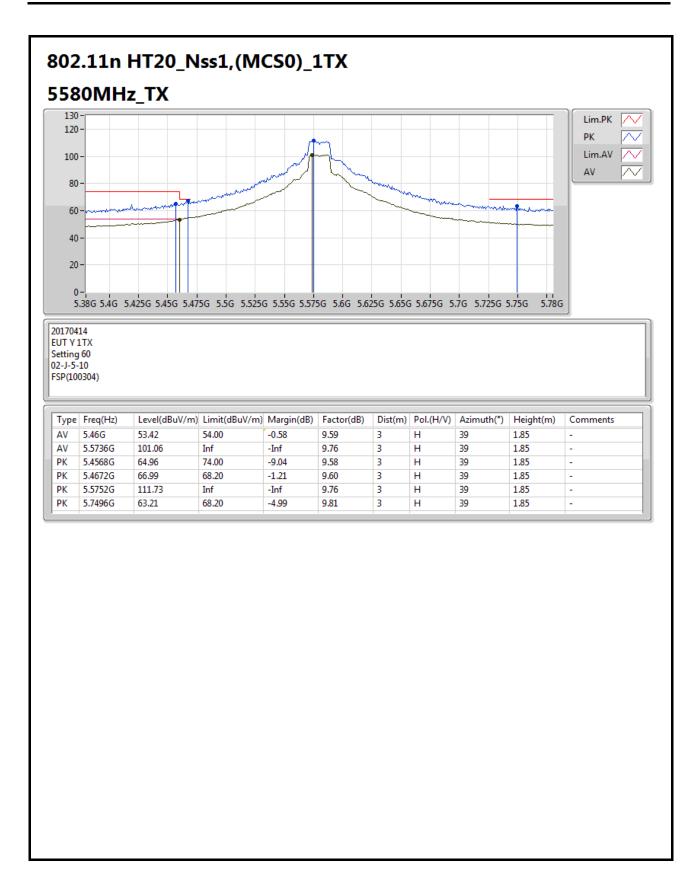




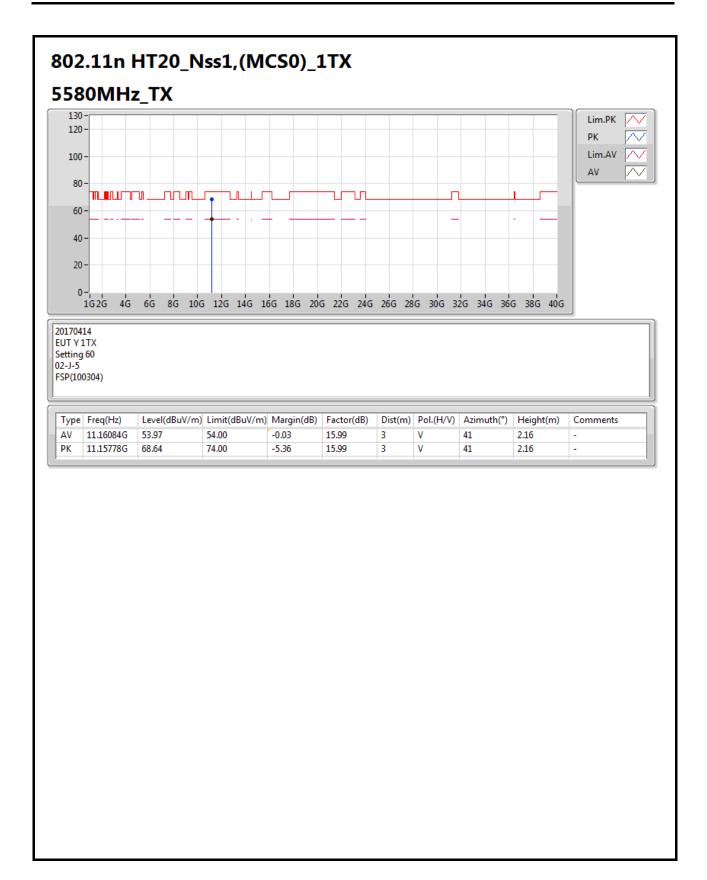




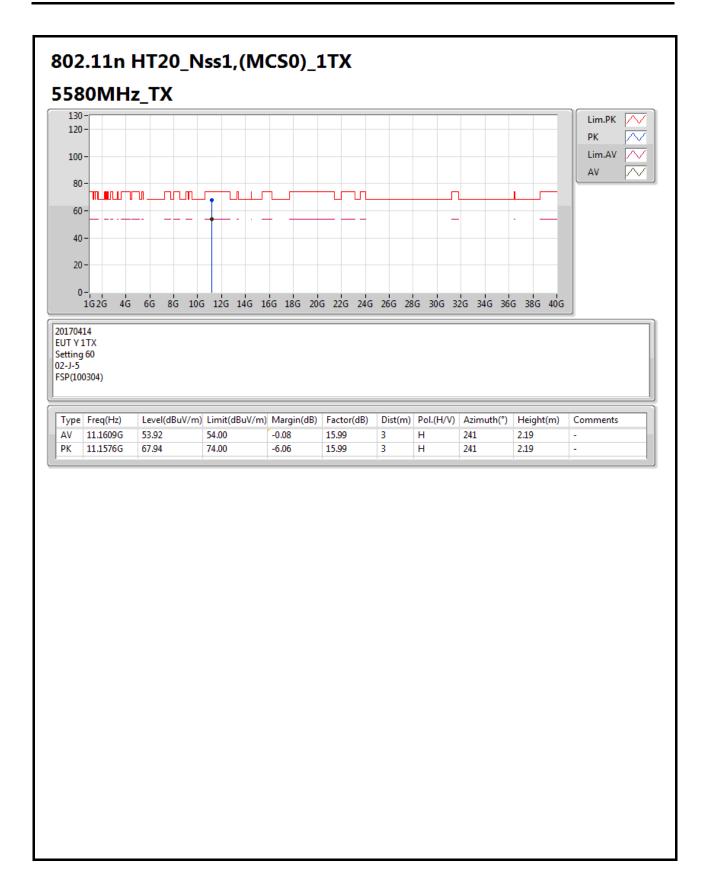










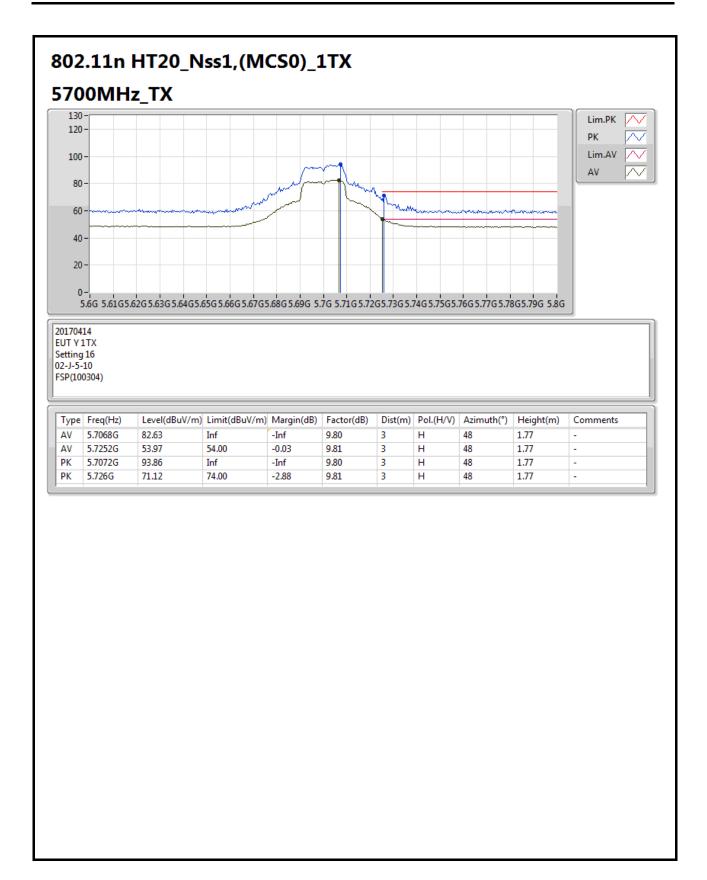


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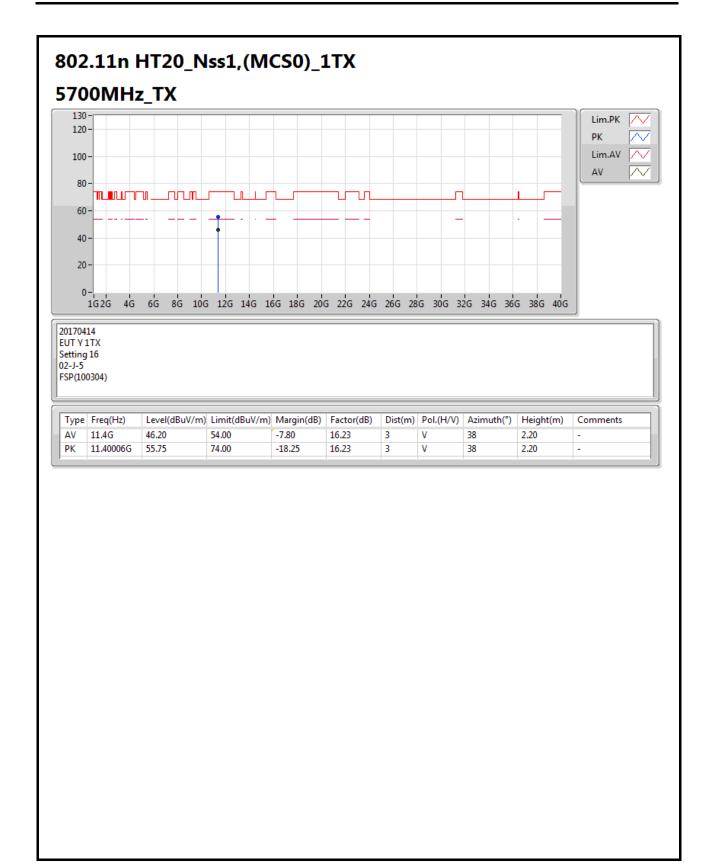






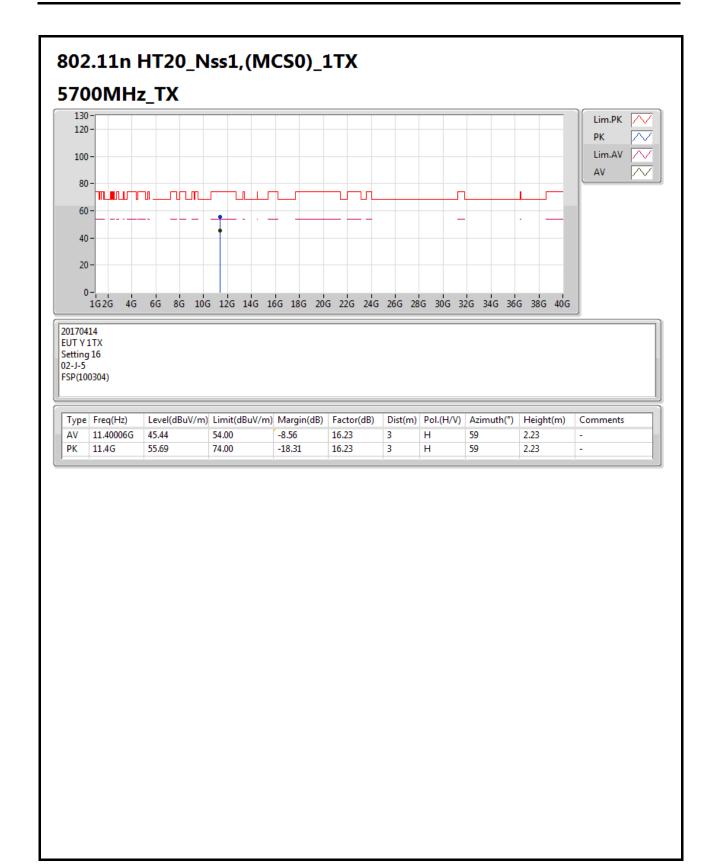




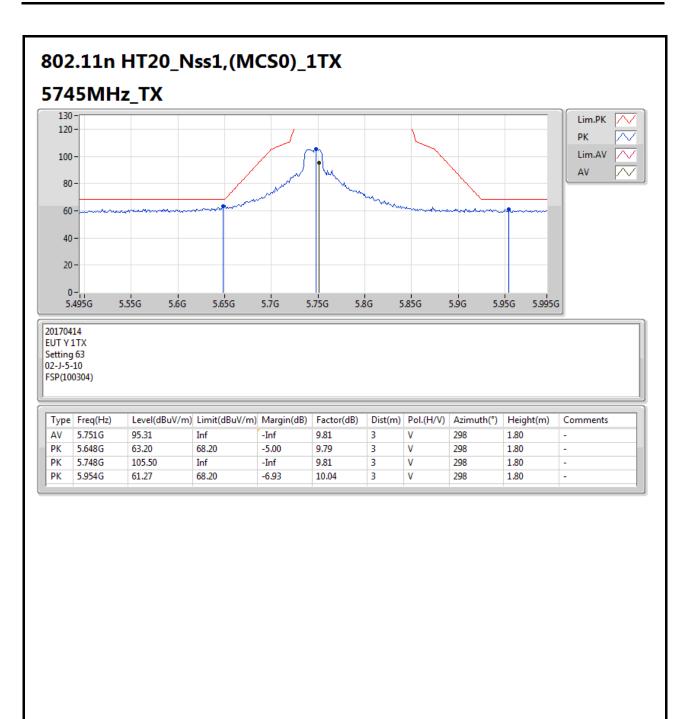


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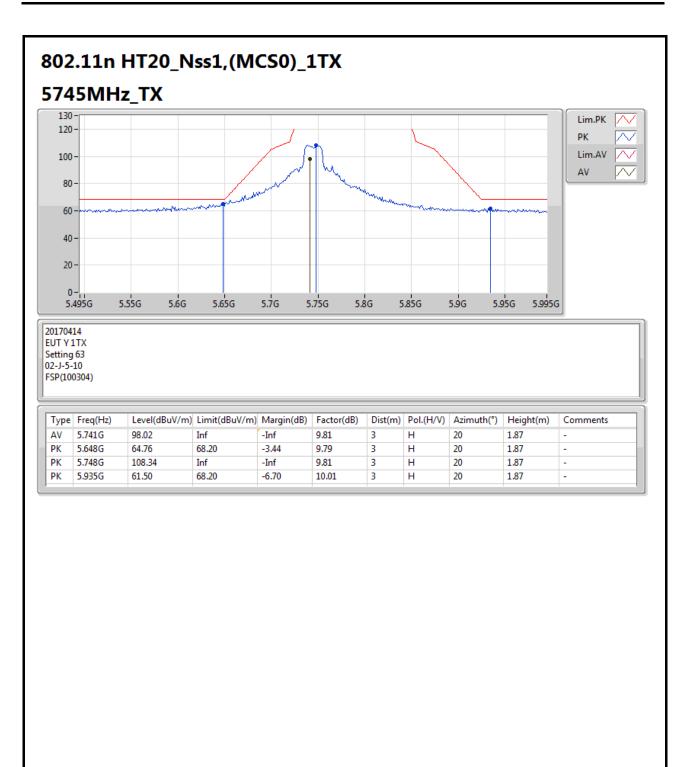






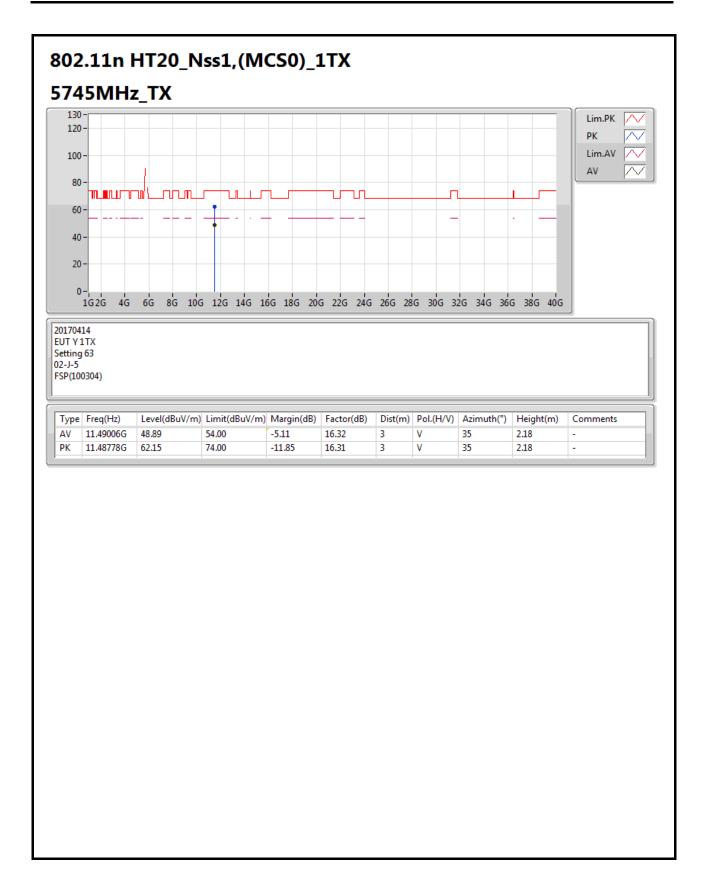




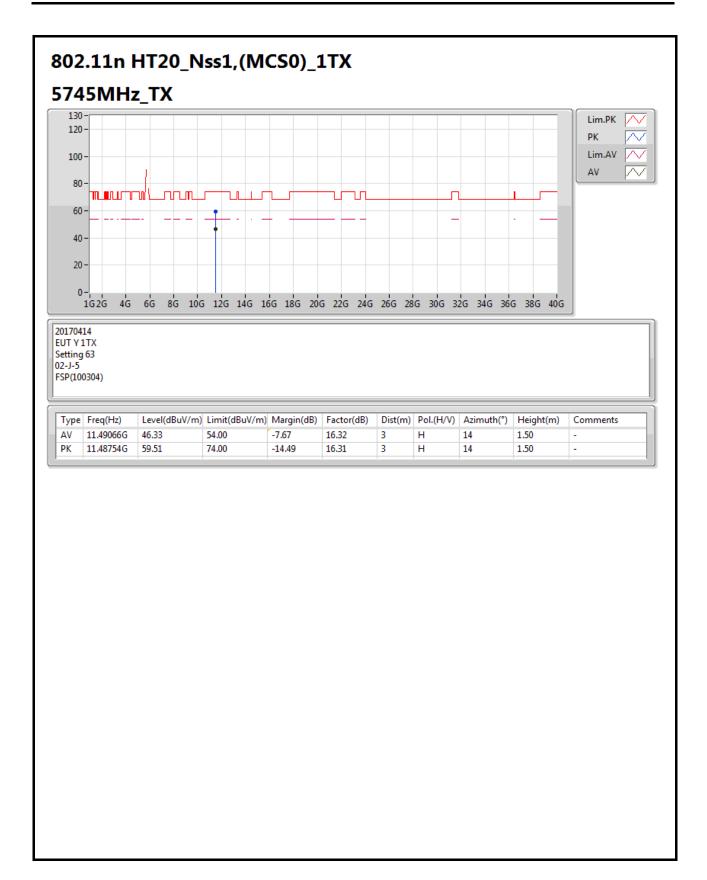


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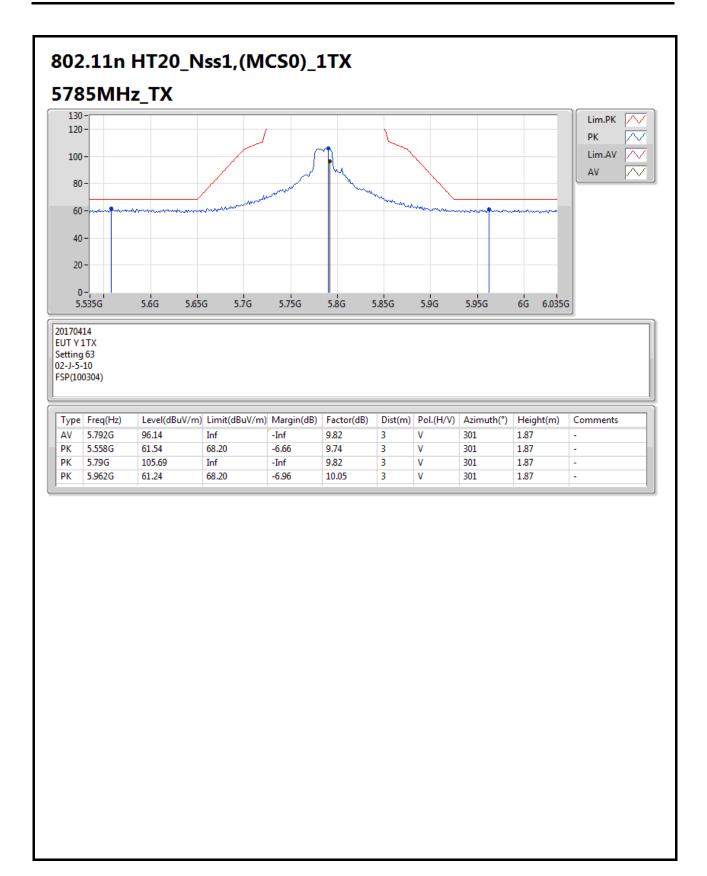




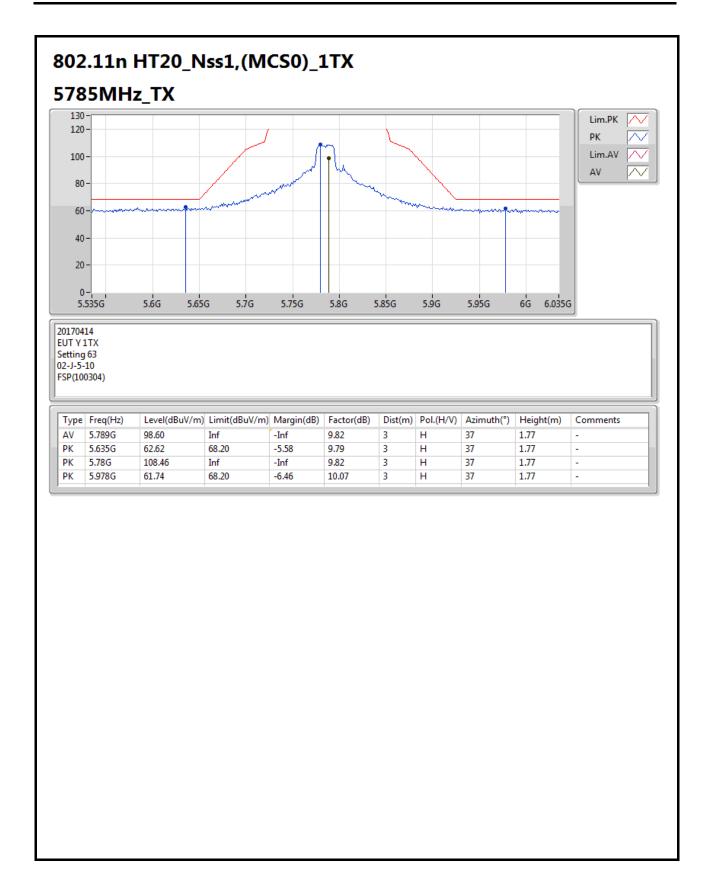






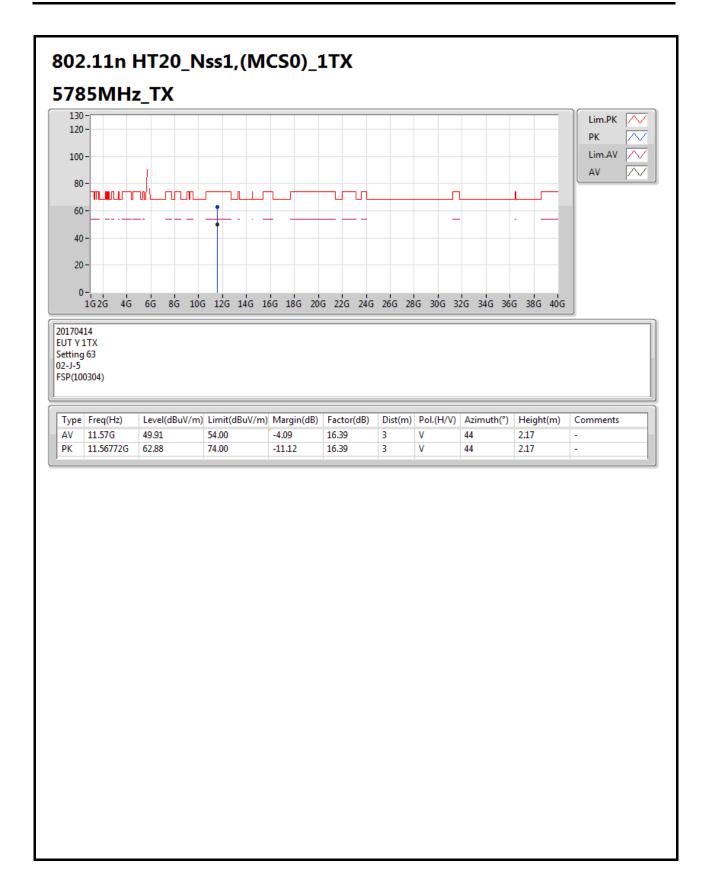




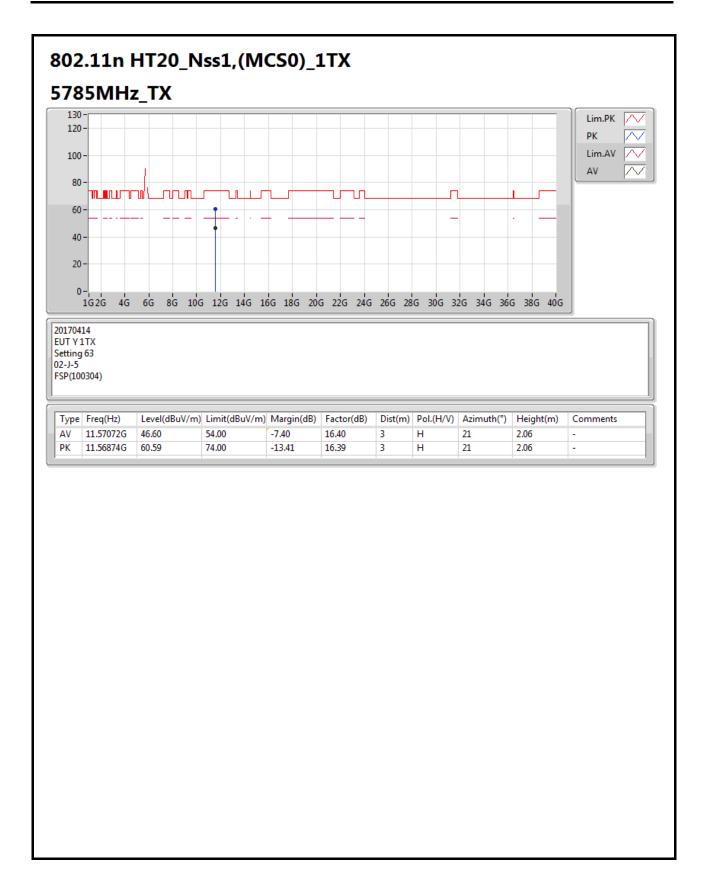


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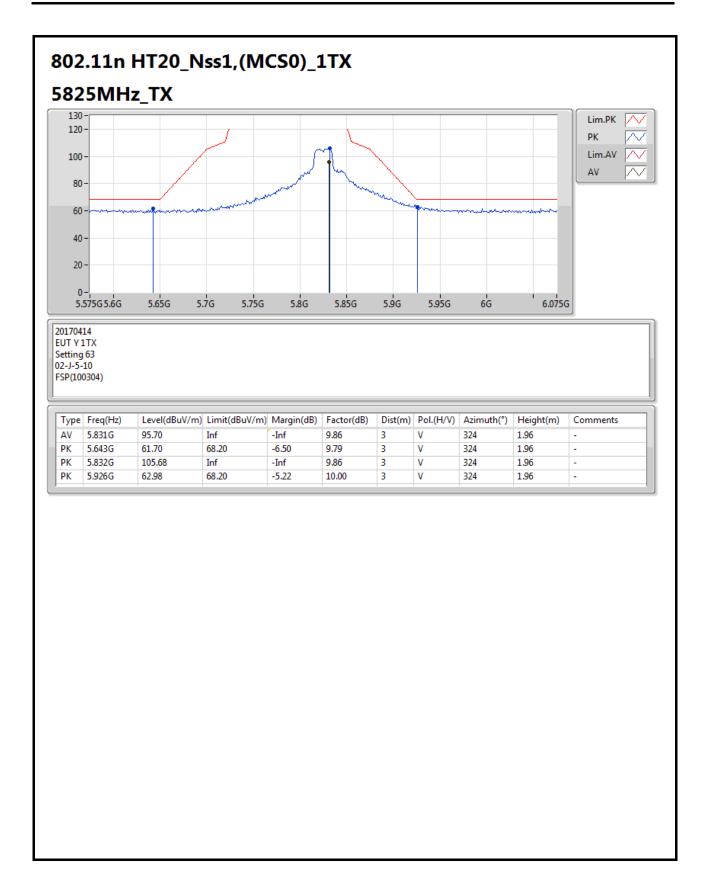




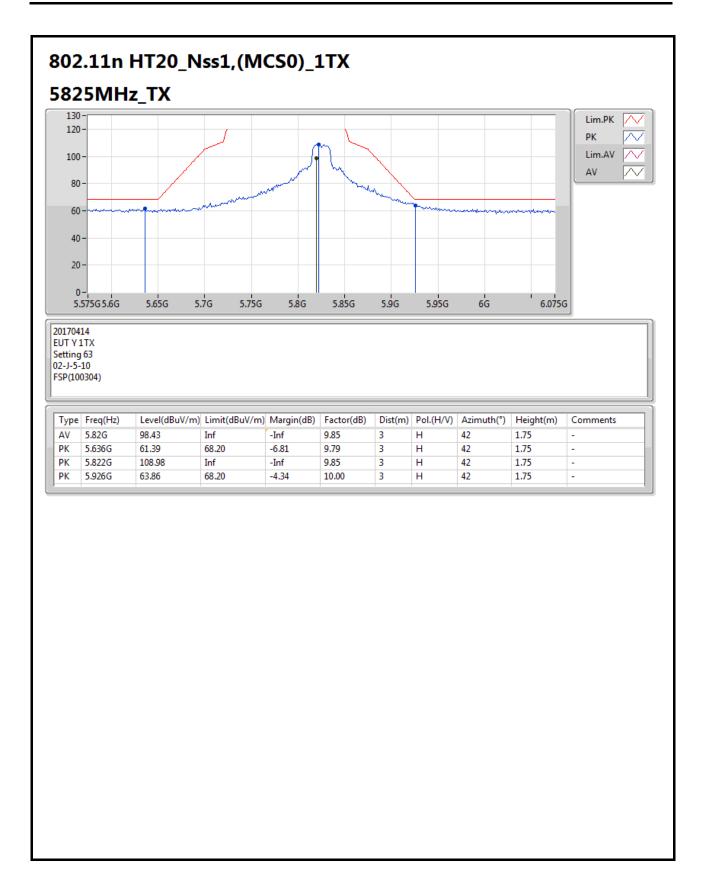




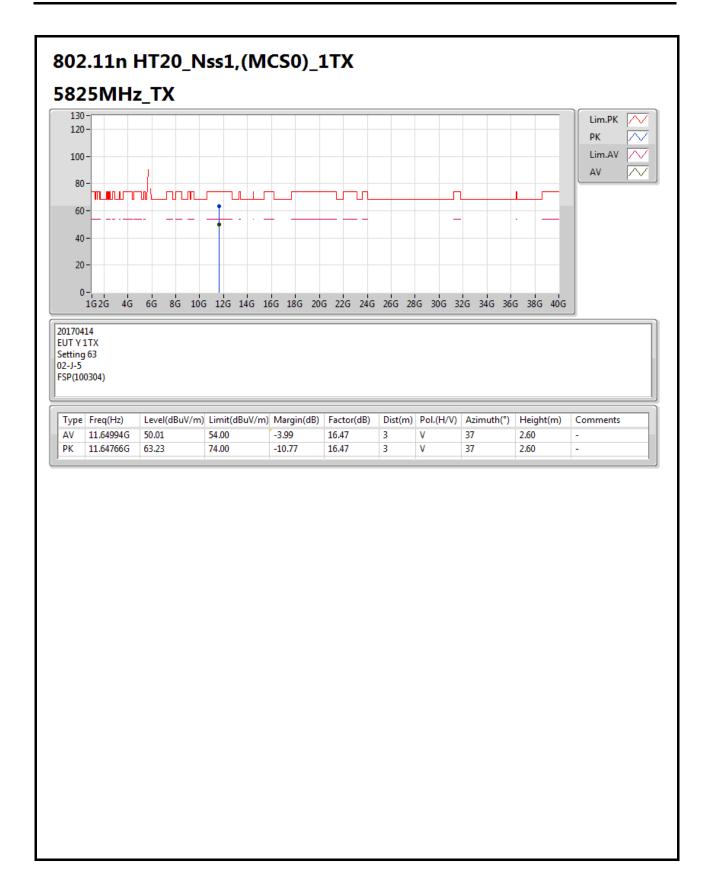






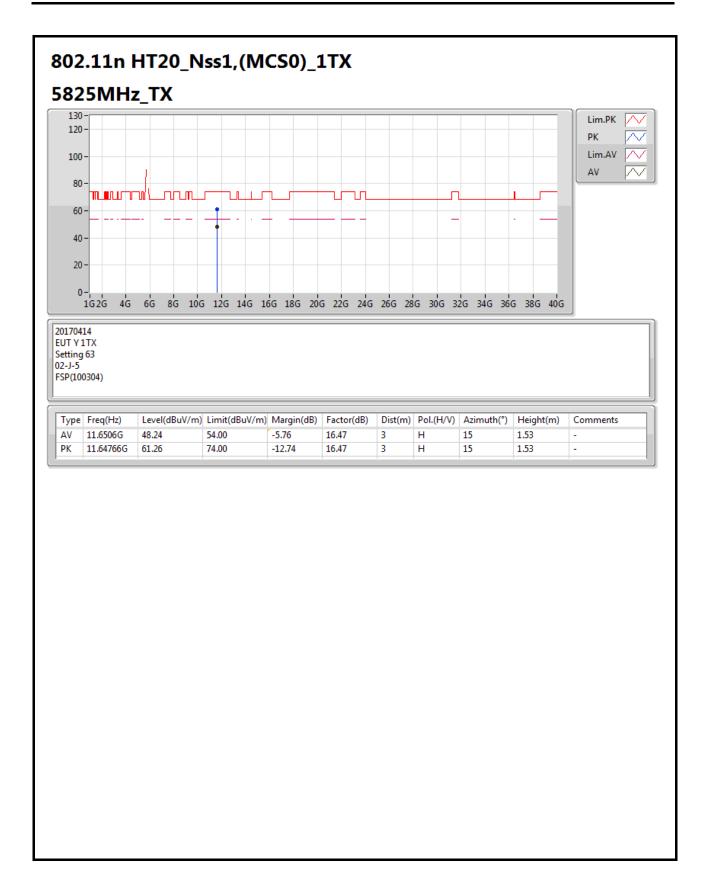




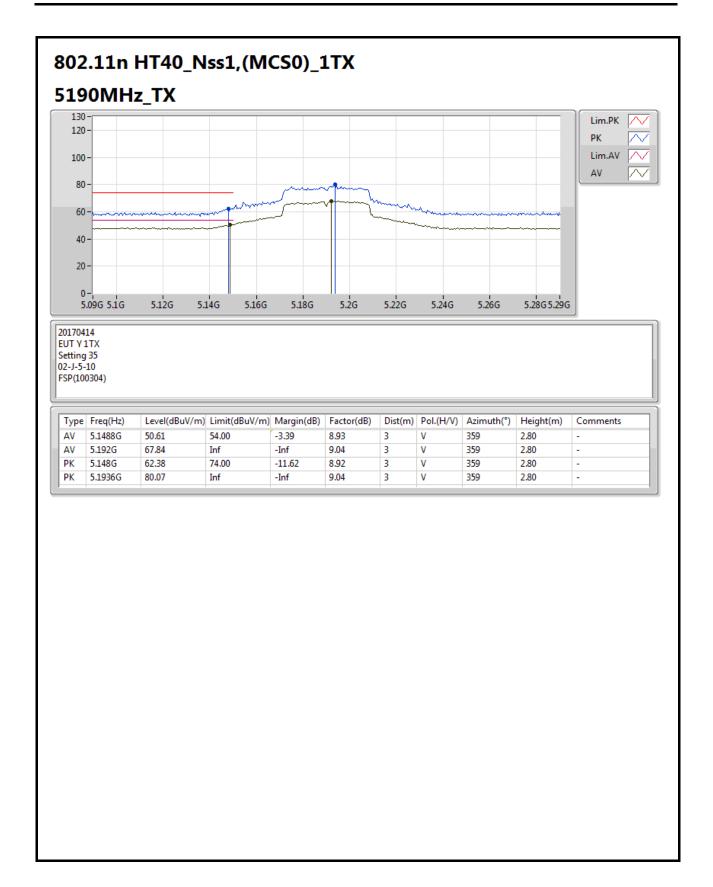


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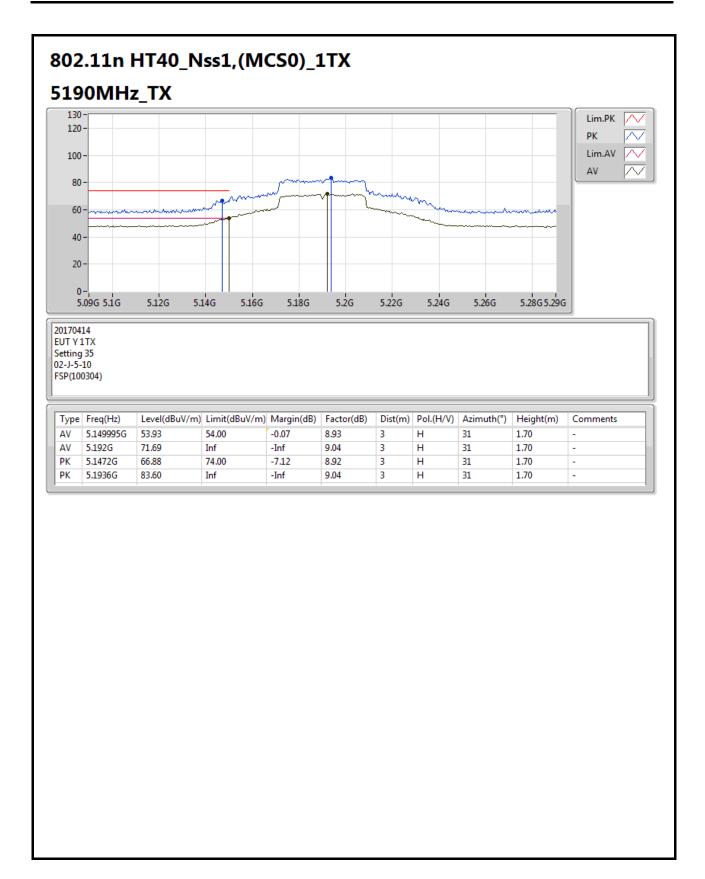




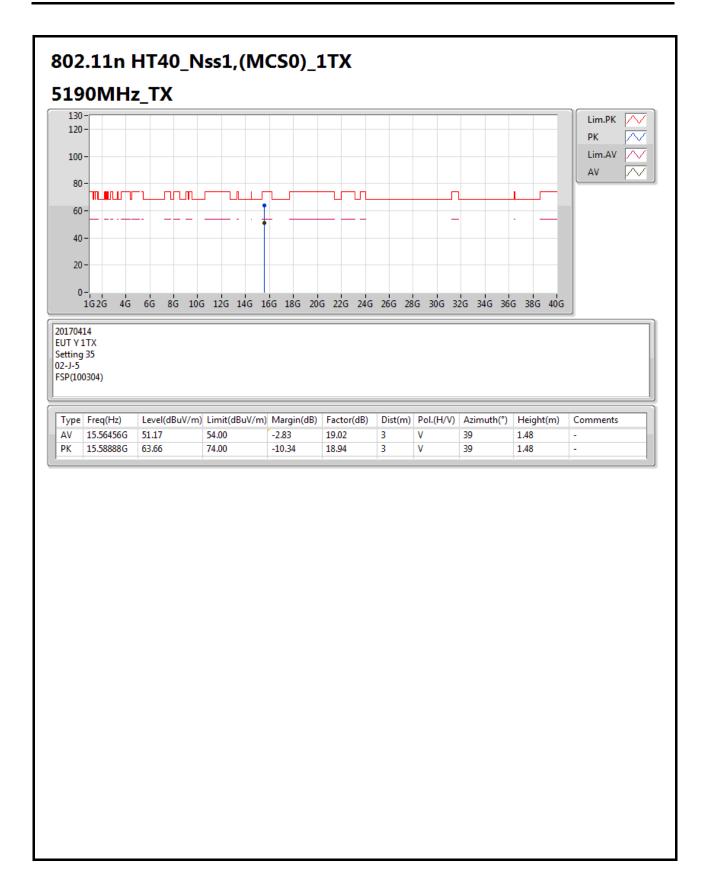








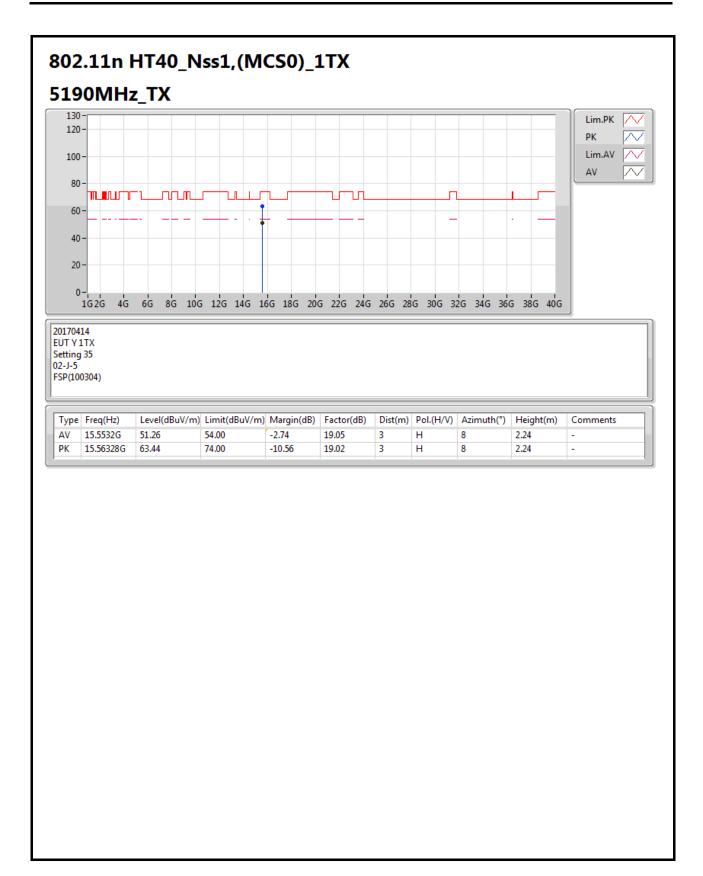




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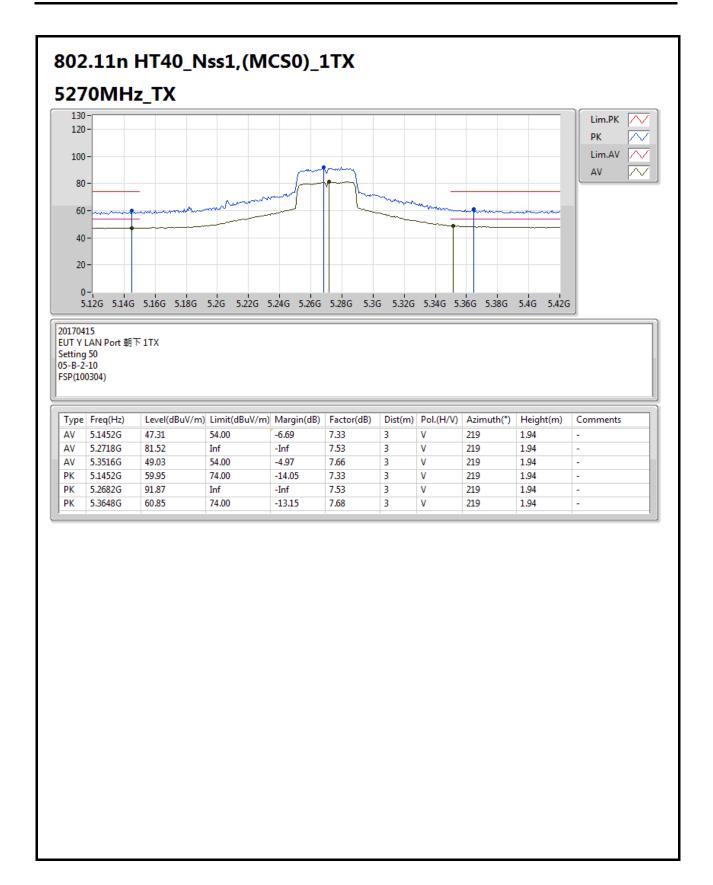
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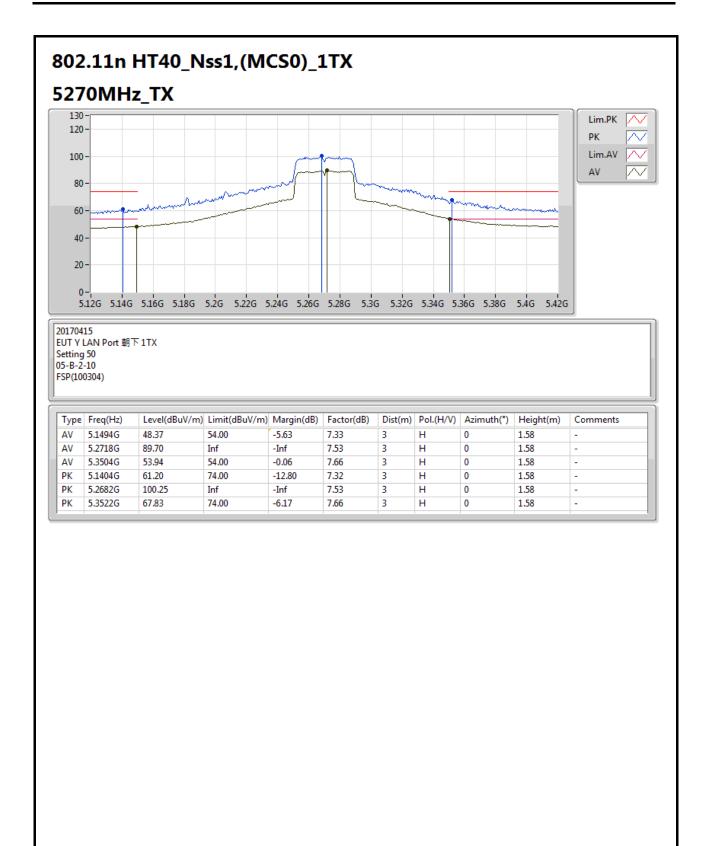


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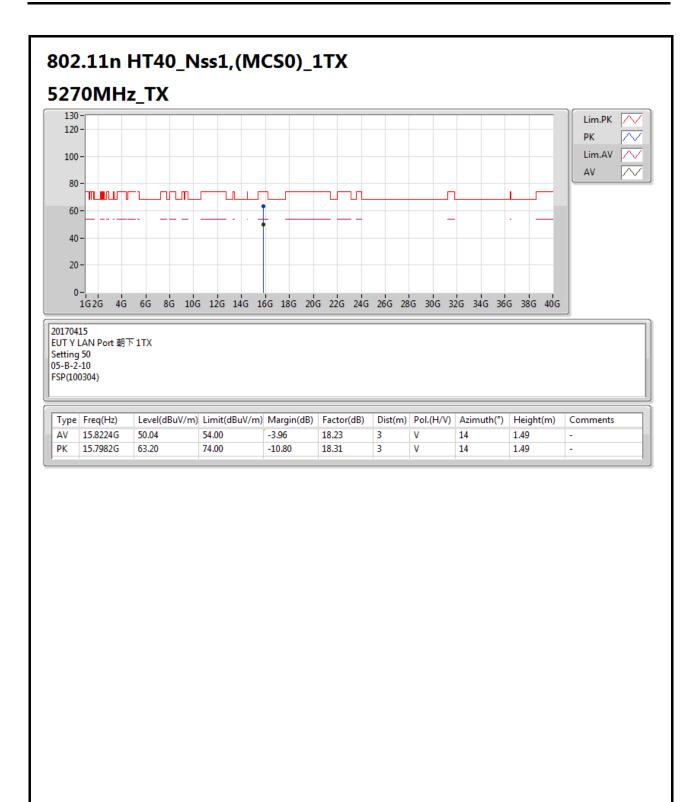






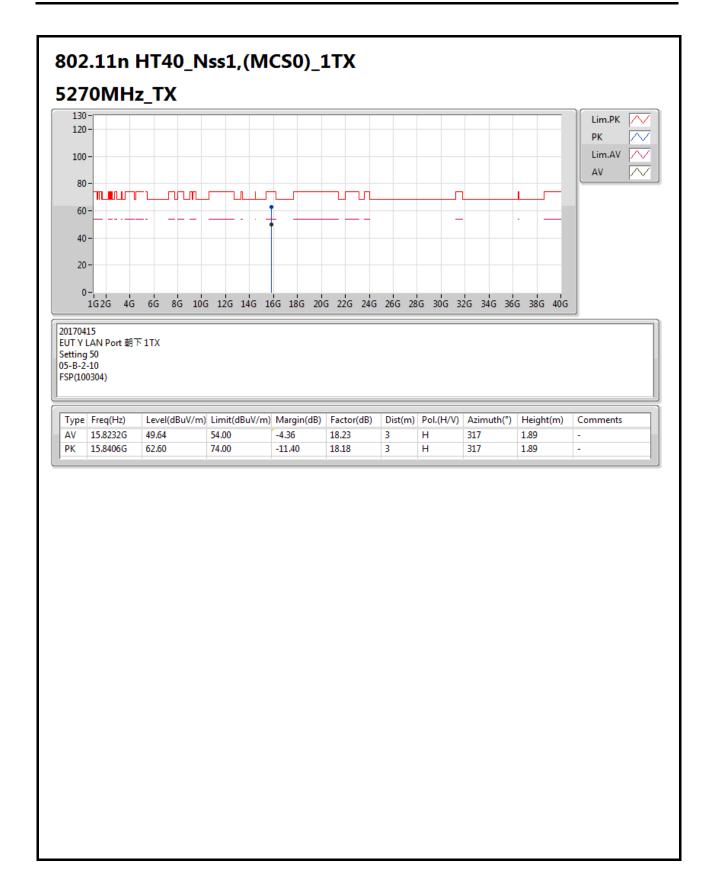






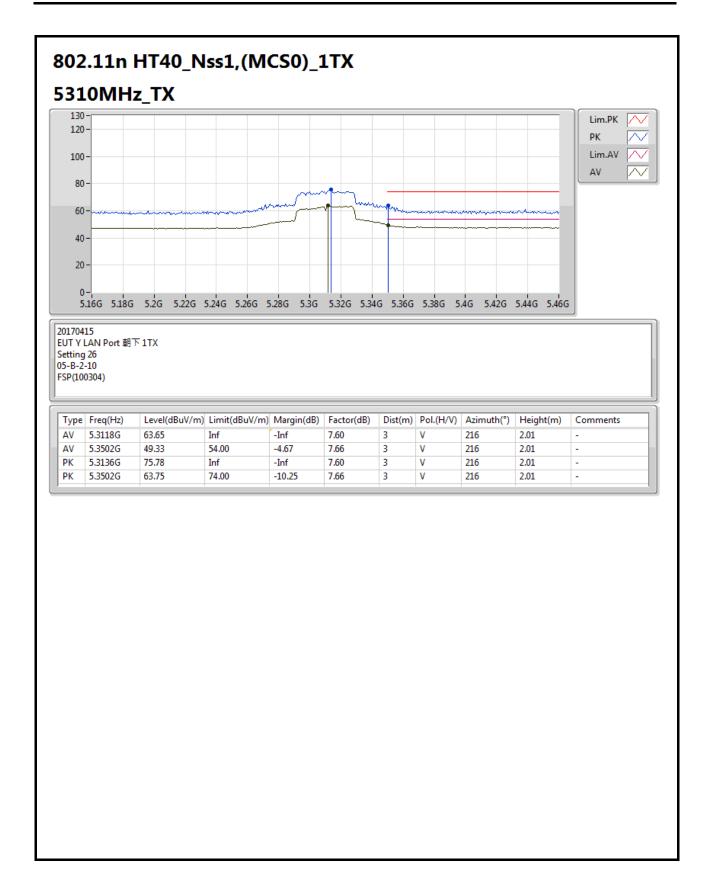
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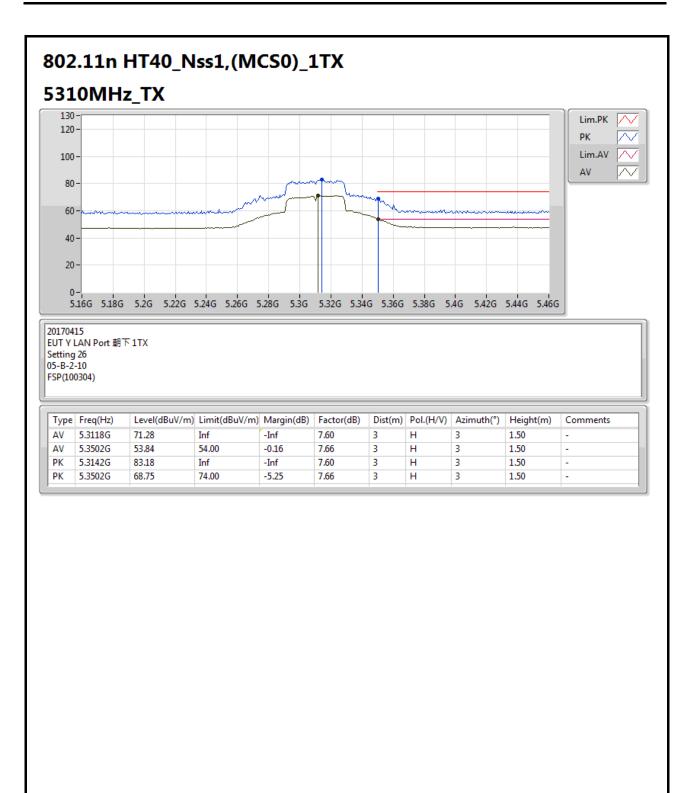


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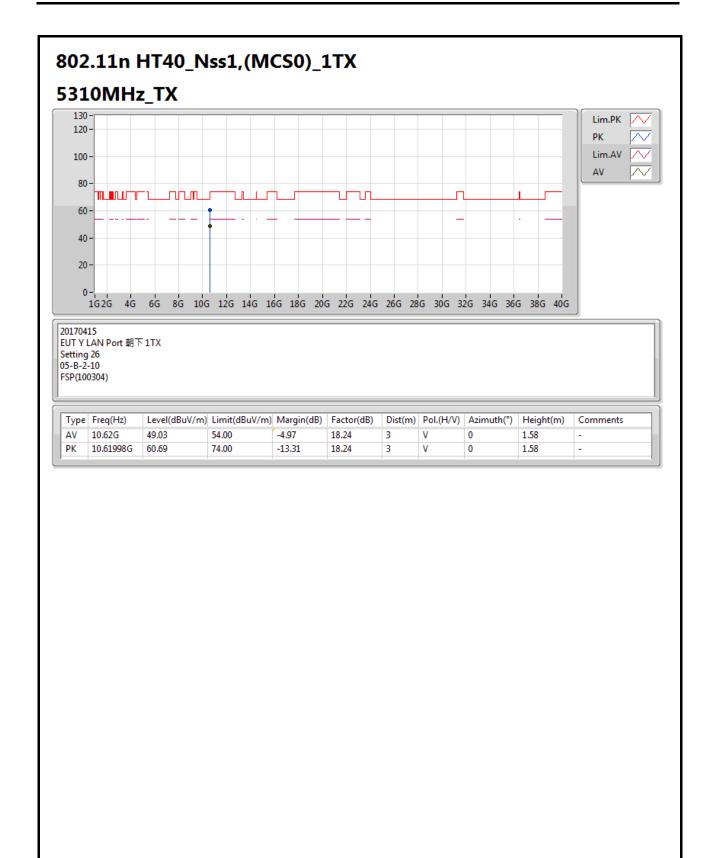




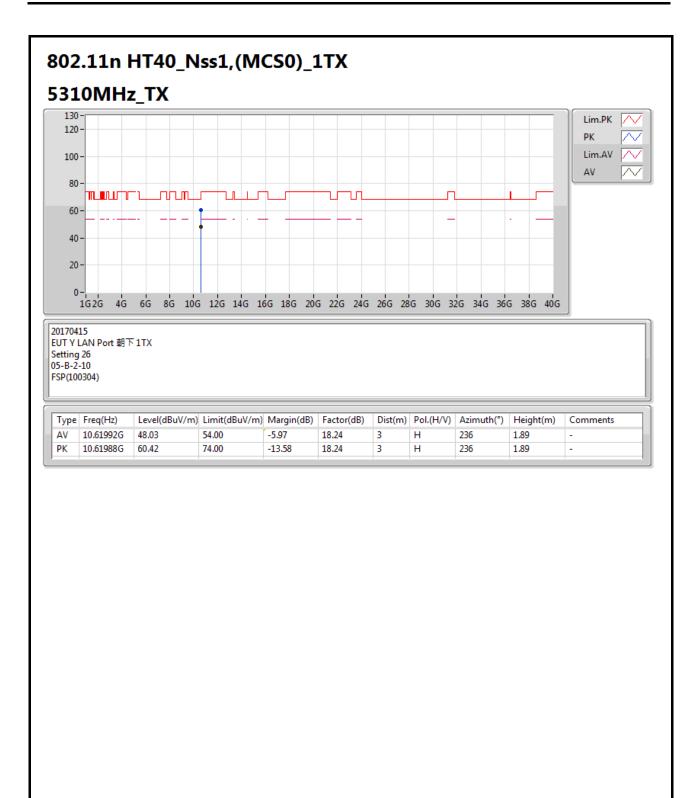




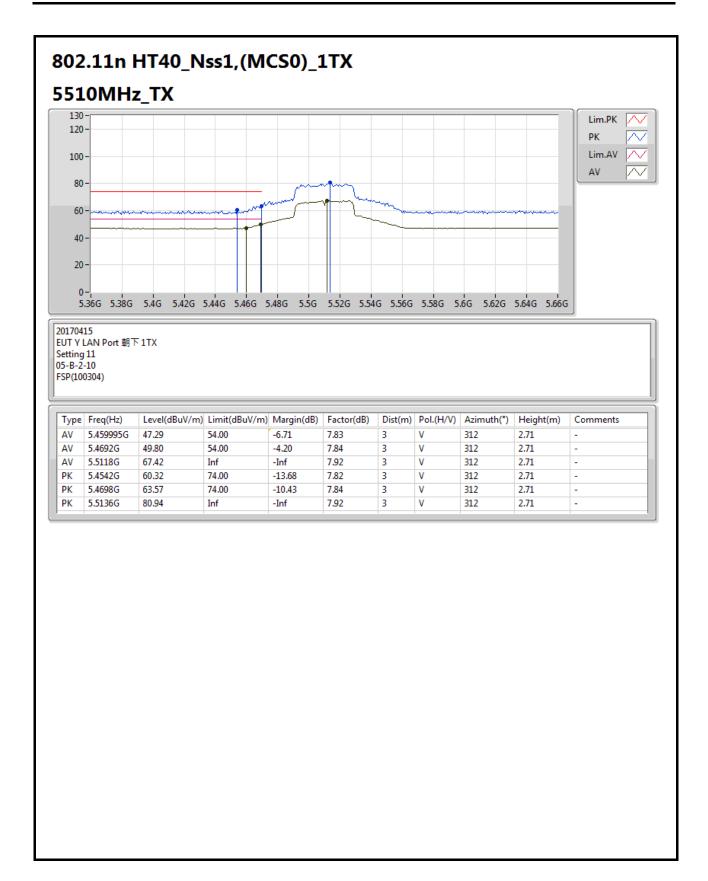






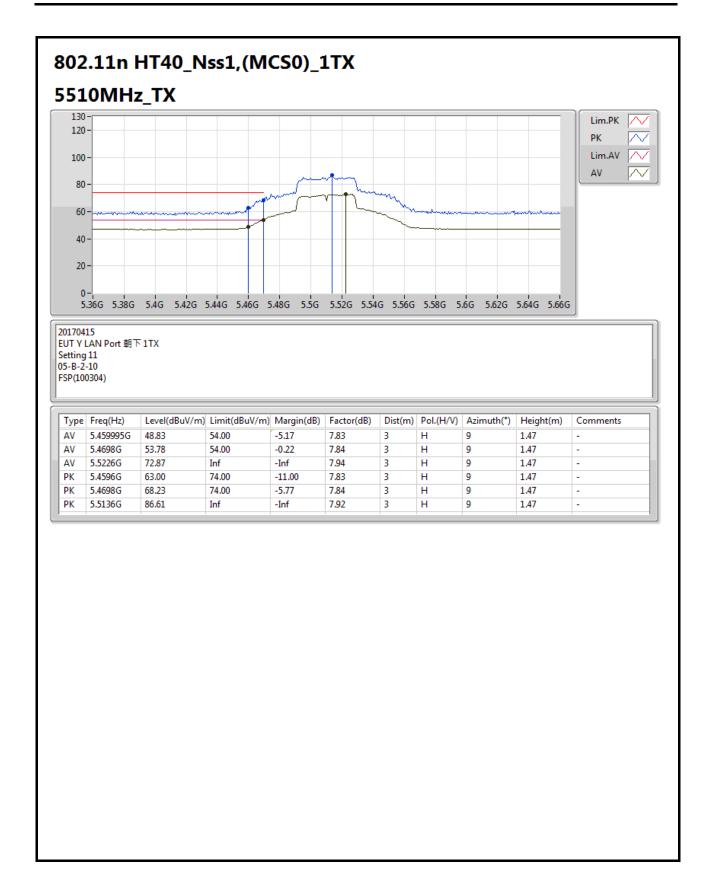






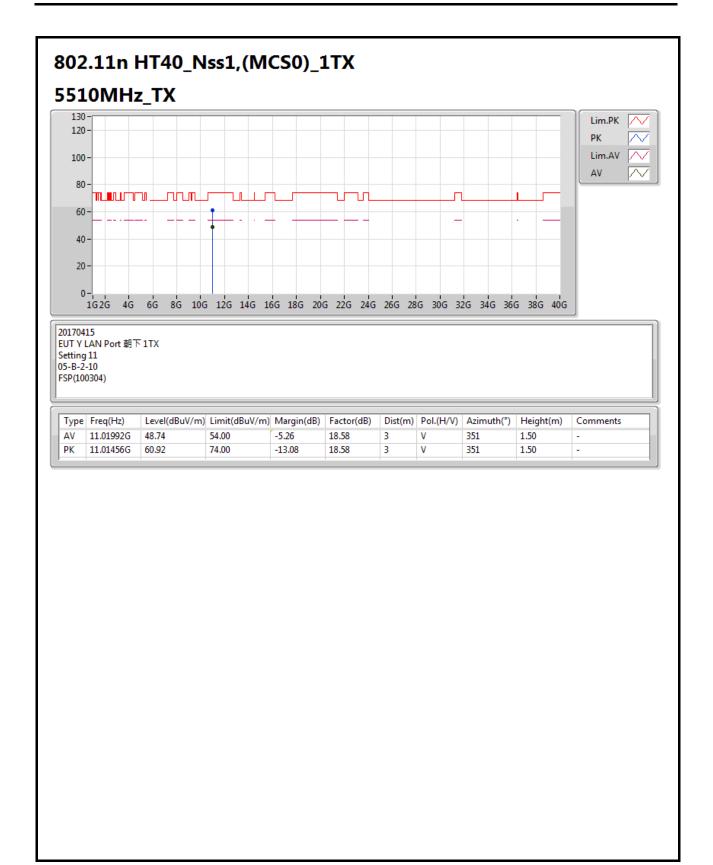
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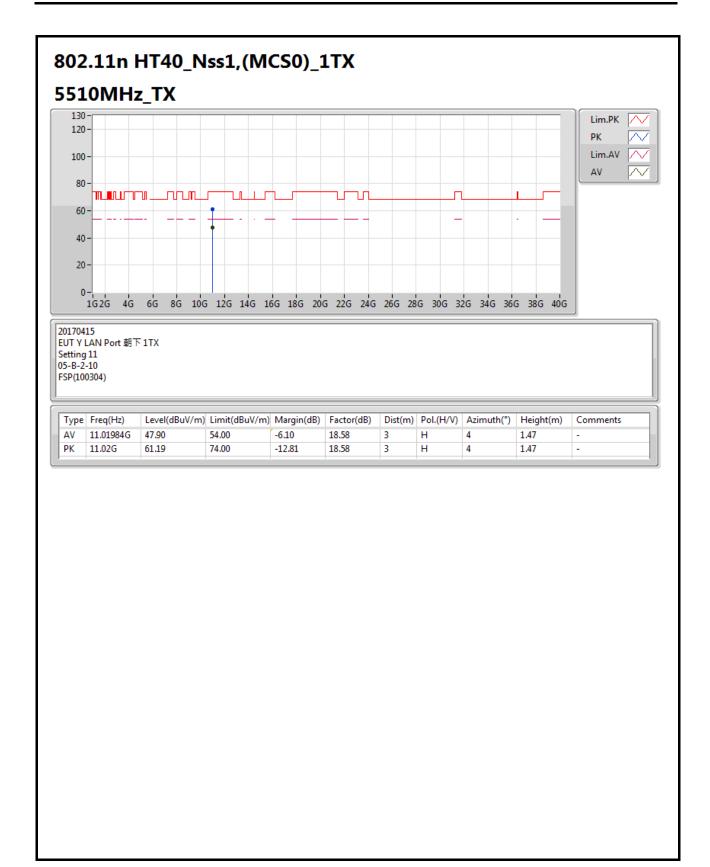
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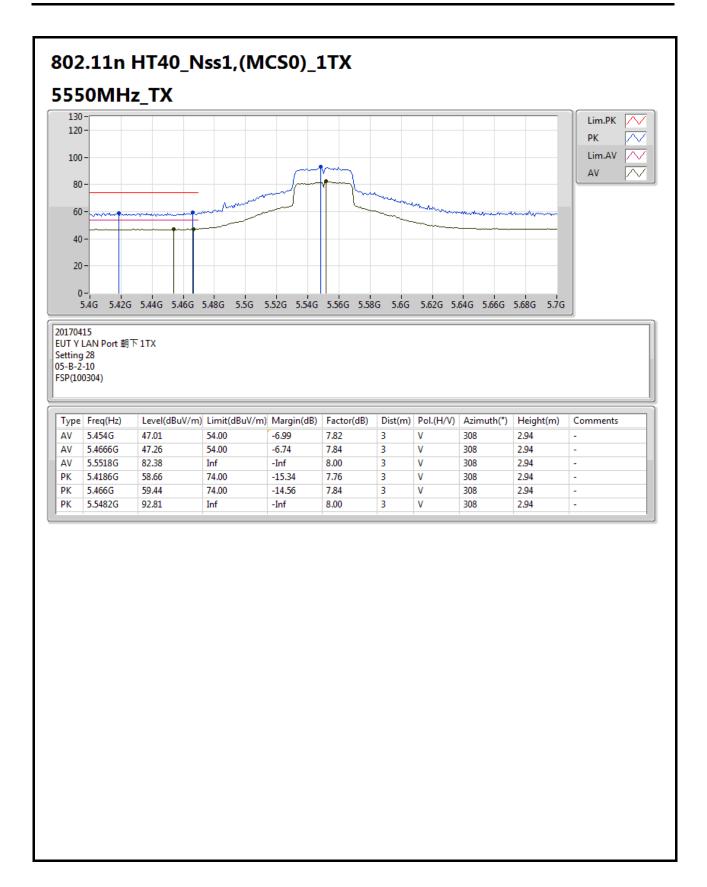


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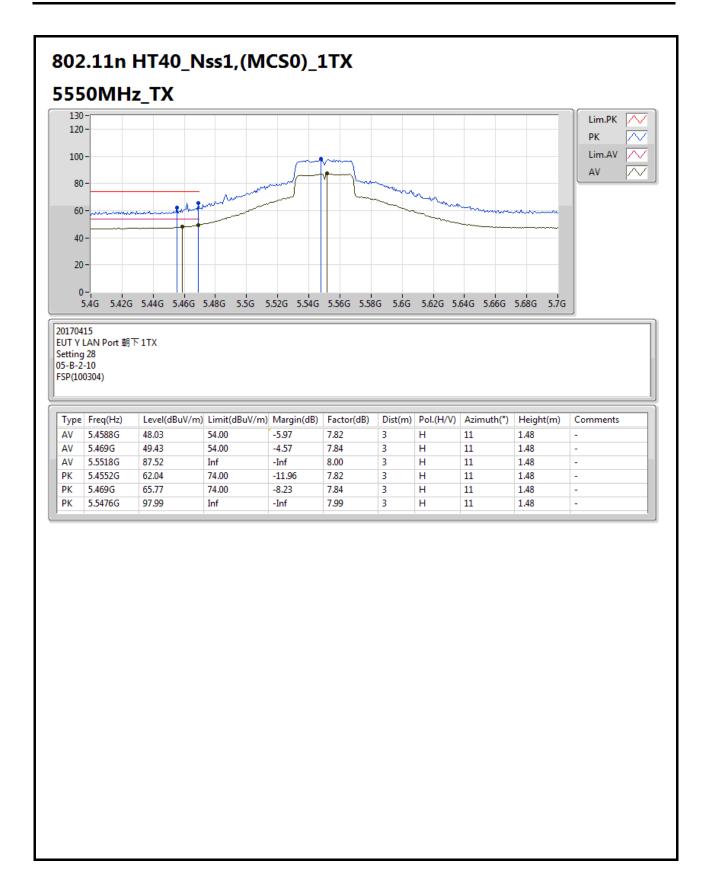




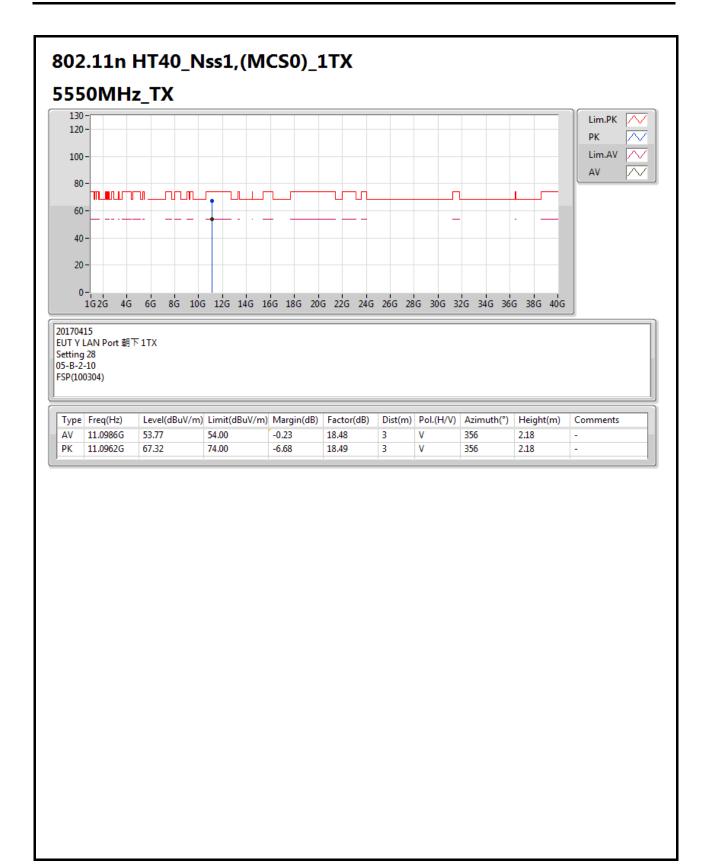


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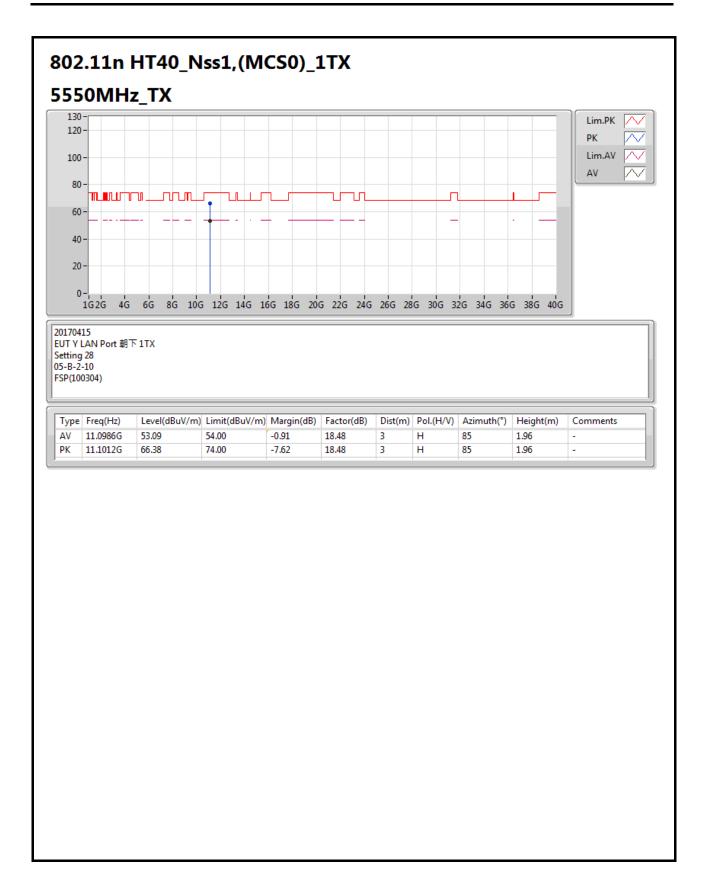




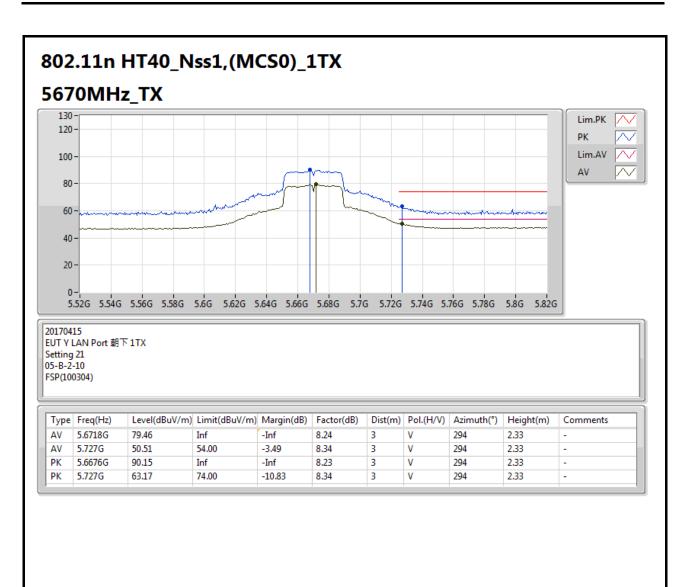






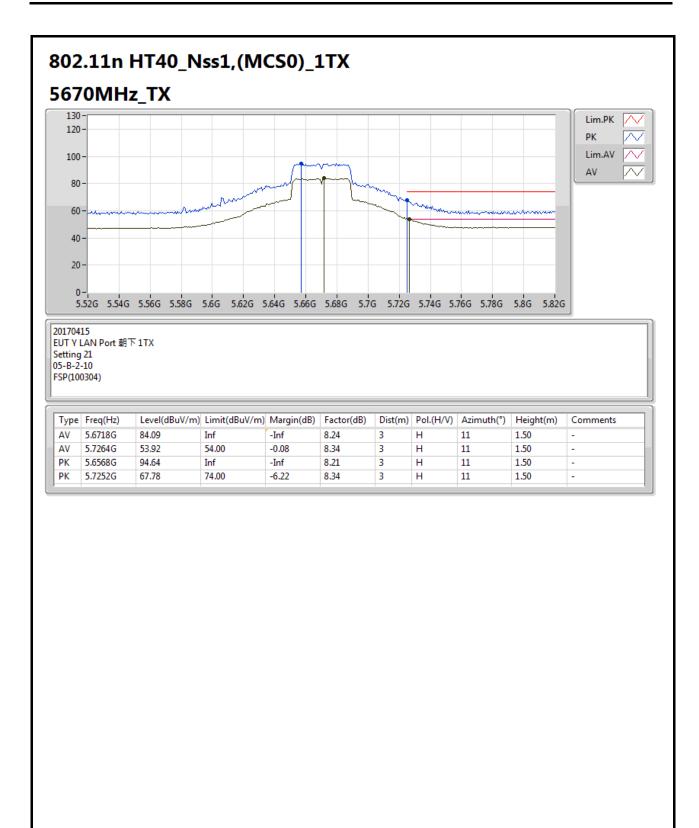




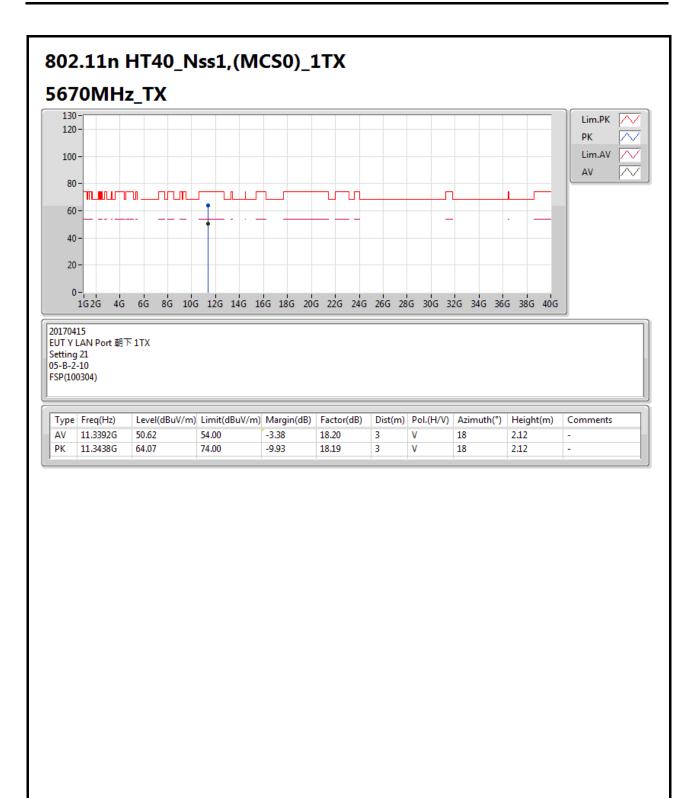


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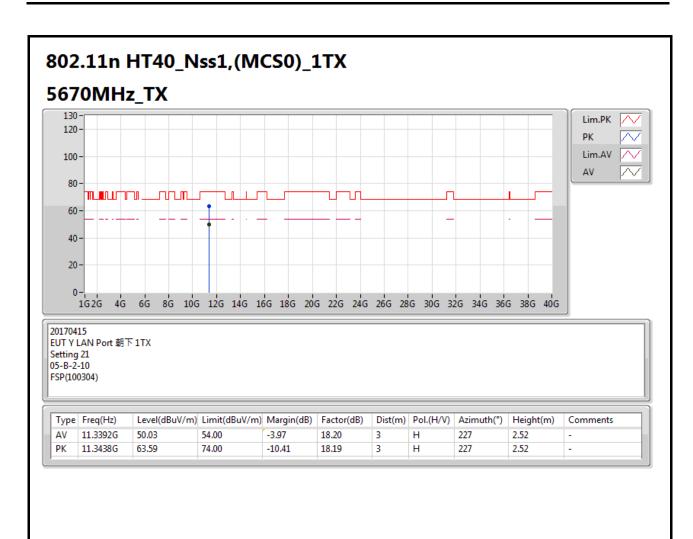




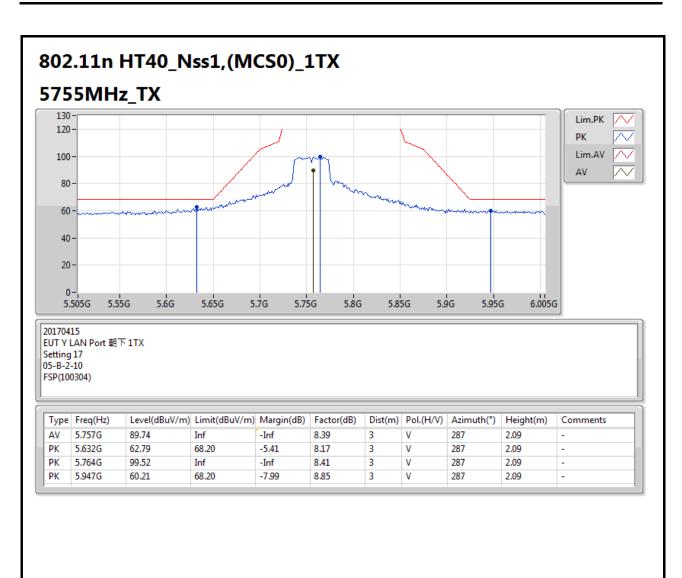




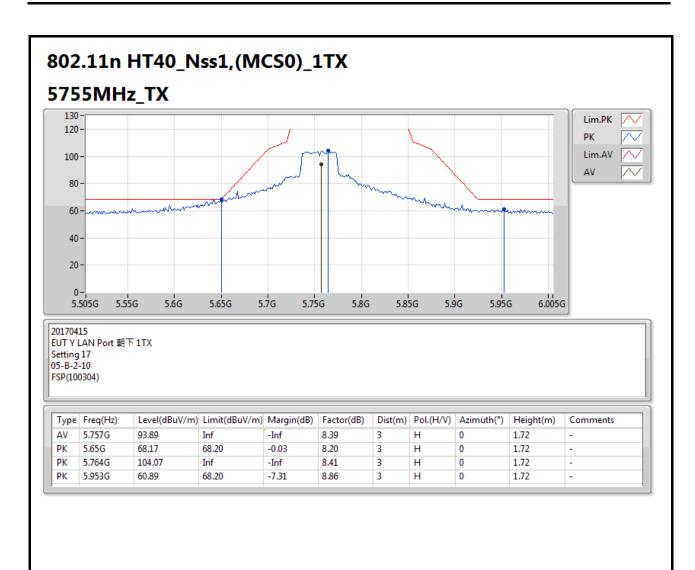




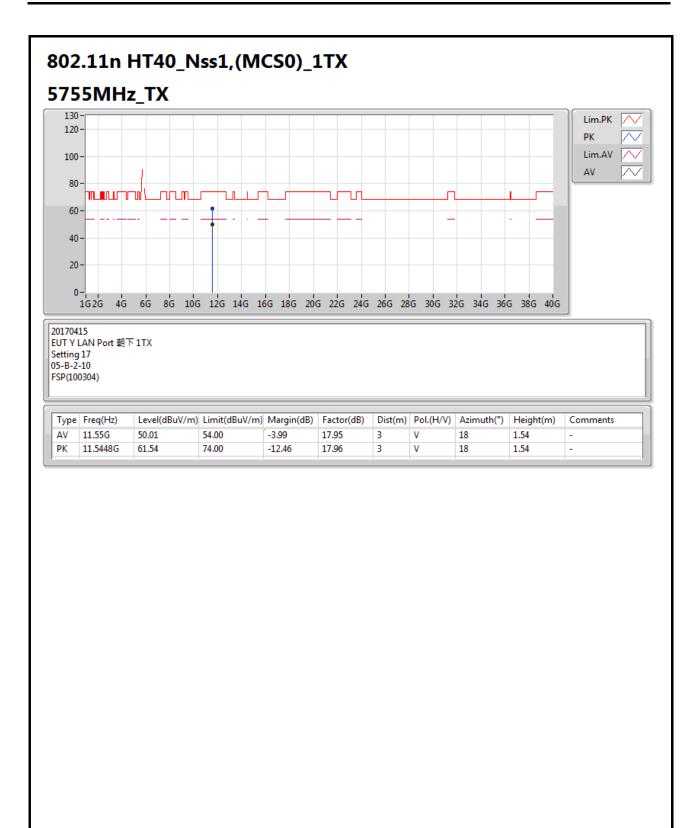






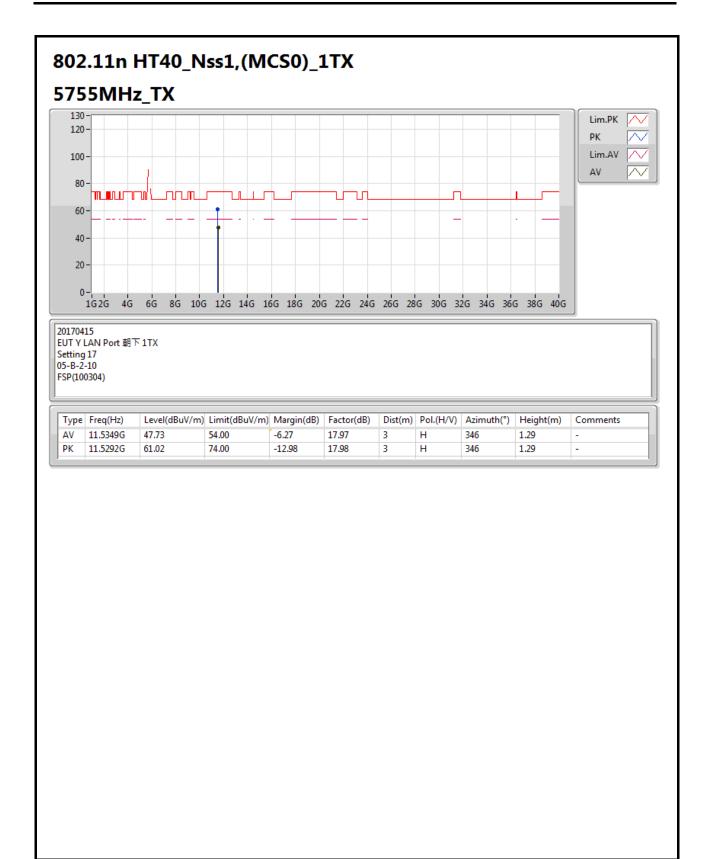




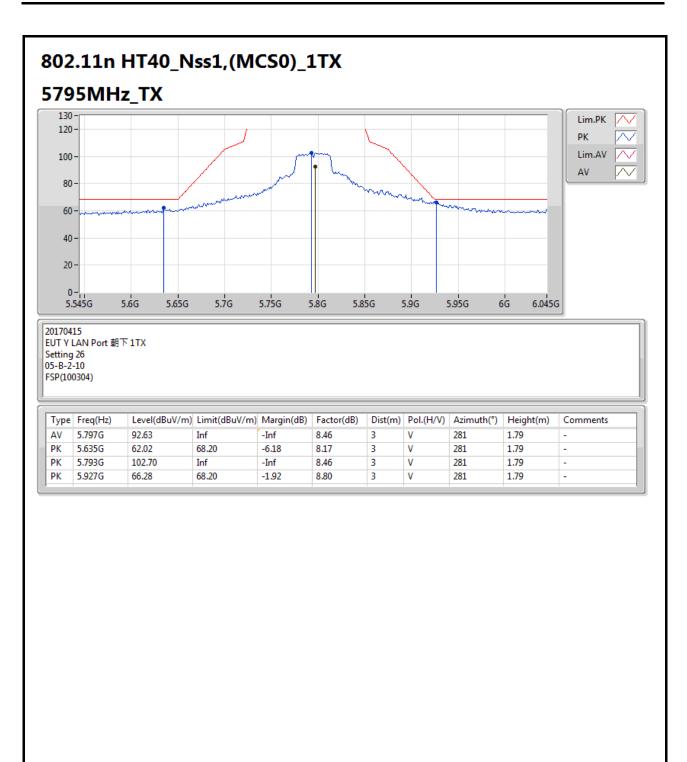


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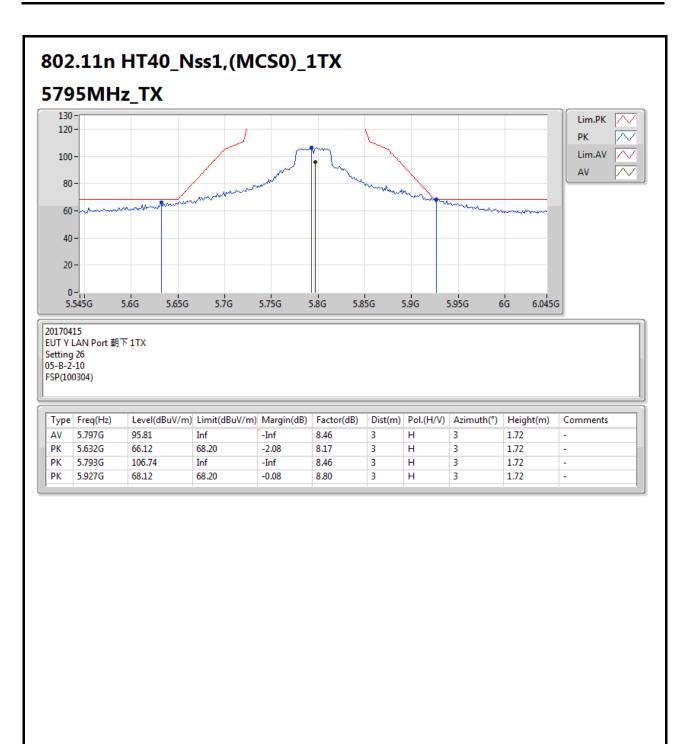




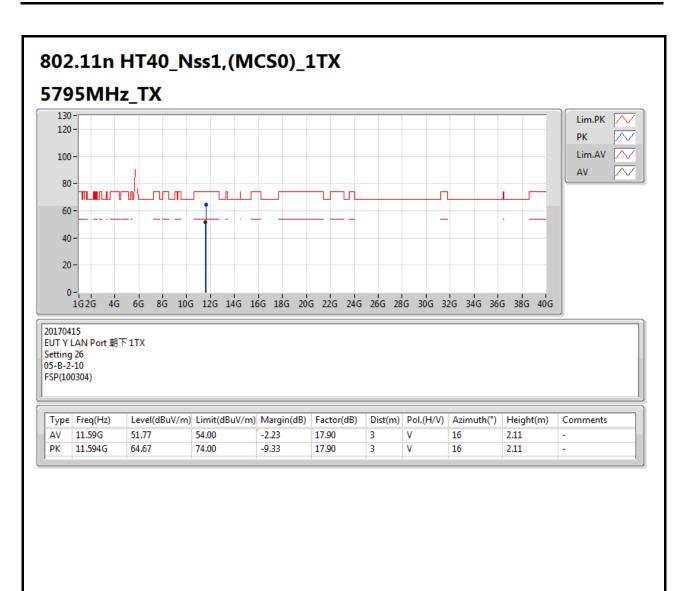




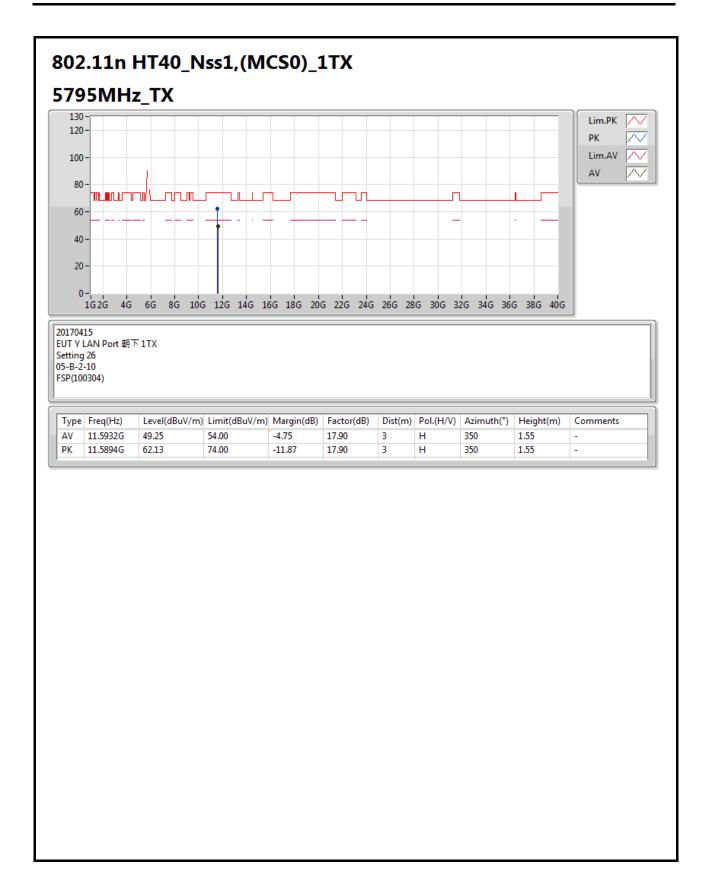














FS Result Appendix F

Mode: 20 MHz / Ant 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
() ()	5200 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9636	5199.9629	5199.9626	5199.9620
110.00	5199.9626	5199.9620	5199.9613	5199.9605
93.50	5199.9618	5199.9608	5199.9602	5199.9597
Max. Deviation (MHz)	0.0382	0.0392	0.0398	0.0403
Max. Deviation (ppm)	7.35	7.54	7.65	7.75
Result		Pa	ass	

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz) 5200 MHz			
(%)				
(°C)	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9648	5199.9642	5199.9641	5199.9638
10	5199.9634	5199.9624	5199.9621	5199.9616
20	5199.9626	5199.9621	5199.9612	5199.9604
30	5199.9609	5199.9608	5199.9598	5199.9594
40	5199.9608	5199.9599	5199.9596	5199.9589
Max. Deviation (MHz)	0.0392	0.0401	0.0404	0.0411
Max. Deviation (ppm)	7.54	7.71	7.77	7.90
Result		Pa	ass	

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
0.0	5300 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5299.9634	5299.9631	5299.9624	5299.9615
110.00	5299.9626	5299.9617	5299.9609	5299.9607
93.50	5299.9617	5299.9613	5299.9604	5299.9600
Max. Deviation (MHz)	0.0383	0.0387	0.0396	0.0400
Max. Deviation (ppm)	7.23	7.30	7.47	7.55
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(%)		5300	MHz	
(℃)	0 Minute	2 Minute	5 Minute	10 Minute
0	5299.9647	5299.9643	5299.9635	5299.9631
10	5299.9639	5299.9637	5299.9636	5299.9634
20	5299.9626	5299.9619	5299.9614	5299.9609
30	5299.9609	5299.9605	5299.9601	5299.9598
40	5299.9593	5299.9590	5299.9584	5299.9578
Max. Deviation (MHz)	0.0407	0.0410	0.0416	0.0422
Max. Deviation (ppm)	7.68	7.74	7.85	7.96
Result	Pass			

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**FS Result** Appendix F

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
0.0	5580 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5579.9635	5579.9634	5579.9625	5579.9615
110.00	5579.9626	5579.9624	5579.9615	5579.9607
93.50	5579.9617	5579.9608	5579.9605	5579.9596
Max. Deviation (MHz)	0.0383	0.0392	0.0395	0.0404
Max. Deviation (ppm)	6.86	7.03	7.08	7.24
Result		Pass		

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)				
(°C)		5580 MHz			
(0)	0 Minute	2 Minute	5 Minute	10 Minute	
0	5579.9647	5579.9637	5579.9631	5579.9623	
10	5579.9633	5579.9626	5579.9622	5579.9615	
20	5579.9626	5579.9619	5579.9612	5579.9609	
30	5579.9609	5579.9604	5579.9602	5579.9595	
40	5579.9595	5579.9587	5579.9584	5579.9581	
Max. Deviation (MHz)	0.0405	0.0413	0.0416	0.0419	
Max. Deviation (ppm)	7.26	7.40	7.46	7.51	
Result		Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)		5785	MHz	
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9627	5784.9622	5784.9620	5784.9612
110.00	5784.9626	5784.9617	5784.9616	5784.9607
93.50	5784.9617	5784.9608	5784.9605	5784.9602
Max. Deviation (MHz)	0.0383	0.0392	0.0395	0.0398
Max. Deviation (ppm)	6.62	6.78	6.83	6.88
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)		5785	MHz	
(0)	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9663	5784.9662	5784.9661	5784.9659
10	5784.9644	5784.9638	5784.9628	5784.9619
20	5784.9626	5784.9618	5784.9617	5784.9607
30	5784.9609	5784.9605	5784.9599	5784.9591
40	5784.9594	5784.9588	5784.9586	5784.9585
Max. Deviation (MHz)	0.0406	0.0412	0.0414	0.0415
Max. Deviation (ppm)	7.02	7.12	7.16	7.17
Result		Pa	ass	

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Appendix F FS Result

Mode: 40 MHz / Ant 1 Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)				
(\)()	5190 MHz				
(V)	0 Minute	2 Minute	5 Minute	10 Minute	
126.50	5189.9632	5189.9623	5189.9613	5189.9604	
110.00	5189.9626	5189.9620	5189.9615	5189.9612	
93.50	5189.9625	5189.9618	5189.9611	5189.9607	
Max. Deviation (MHz)	0.0375	0.0382	0.0389	0.0396	
Max. Deviation (ppm)	7.23	7.36	7.50	7.63	
Result		Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)				
(°C)		5190 MHz			
(℃)	0 Minute	2 Minute	5 Minute	10 Minute	
0	5189.9637	5189.9632	5189.9624	5189.9618	
10	5189.9636	5189.9626	5189.9622	5189.9613	
20	5189.9626	5189.9625	5189.9624	5189.9615	
30	5189.9609	5189.9602	5189.9596	5189.9591	
40	5189.9602	5189.9594	5189.9587	5189.9579	
Max. Deviation (MHz)	0.0398	0.0406	0.0413	0.0421	
Max. Deviation (ppm)	7.67	7.82	7.96	8.11	
Result		Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
() ()	5310 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5309.9629	5309.9627	5309.9624	5309.9622
110.00	5309.9626	5309.9617	5309.9615	5309.9614
93.50	5309.9620	5309.9612	5309.9603	5309.9600
Max. Deviation (MHz)	0.0380	0.0388	0.0397	0.0400
Max. Deviation (ppm)	7.16	7.31	7.48	7.53
Result		Pa	ass	

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5310 MHz			
(℃)	0 Minute	2 Minute	5 Minute	10 Minute
0	5309.9655	5309.9645	5309.9637	5309.9633
10	5309.9639	5309.9631	5309.9623	5309.9616
20	5309.9626	5309.9624	5309.9623	5309.9619
30	5309.9609	5309.9601	5309.9591	5309.9588
40	5309.9594	5309.9584	5309.9574	5309.9569
Max. Deviation (MHz)	0.0406	0.0416	0.0426	0.0431
Max. Deviation (ppm)	7.65	7.83	8.02	8.12
Result	Pass			

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**FS Result** Appendix F

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5549.9629	5549.9625	5549.9620	5549.9614
110.00	5549.9626	5549.9622	5549.9616	5549.9607
93.50	5549.9622	5549.9621	5549.9616	5549.9612
Max. Deviation (MHz)	0.0378	0.0379	0.0384	0.0393
Max. Deviation (ppm)	6.81	6.83	6.92	7.08
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz) 5550 MHz			
(℃)				
	0 Minute	2 Minute	5 Minute	10 Minute
0	5549.9642	5549.9637	5549.9634	5549.9633
10	5549.9631	5549.9622	5549.9617	5549.9609
20	5549.9626	5549.9624	5549.9615	5549.9606
30	5549.9609	5549.9602	5549.9597	5549.9587
40	5549.9602	5549.9592	5549.9590	5549.9585
Max. Deviation (MHz)	0.0398	0.0408	0.0410	0.0415
Max. Deviation (ppm)	7.17	7.35	7.39	7.48
Result	Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz) 5755 MHz			
(V)				
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9633	5754.9625	5754.9621	5754.9611
110.00	5754.9626	5754.9618	5754.9616	5754.9613
93.50	5754.9617	5754.9613	5754.9612	5754.9604
Max. Deviation (MHz)	0.0383	0.0387	0.0388	0.0396
Max. Deviation (ppm)	6.66	6.72	6.74	6.88
Result	Pass			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
(°C)	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9647	5754.9638	5754.9633	5754.9630
10	5754.9634	5754.9624	5754.9616	5754.9612
20	5754.9626	5754.9617	5754.9613	5754.9610
30	5754.9609	5754.9602	5754.9594	5754.9588
40	5754.9605	5754.9603	5754.9599	5754.9590
Max. Deviation (MHz)	0.0395	0.0398	0.0406	0.0412
Max. Deviation (ppm)	6.86	6.92	7.05	7.16
Result	Pass			

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