

Report No.: FR961308-02AB



# FCC RADIO TEST REPORT

FCC ID : 2AXJ4P9V2

Equipment : AC1200+AV1000 Whole Home Powerline Mesh Wi-Fi

System

**Brand Name** : tp-link

**Model Name** : Deco P9

Applicant : TP-Link Corporation Limited

> Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong

Manufacturer : TP-Link Corporation Limited

> Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hong Kong

Standard : 47 CFR FCC Part 15.407

The product was received on Sep. 08, 2020, and testing was started from Sep. 18, 2020 and completed on Dec. 10, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

TEL: 886-3-656-9065

FAX: 886-3-656-9085

Report Template No.: CB-A12\_1 Ver1.2

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: Jan. 04, 2021

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Photographs of EUT v01

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# History of this test report

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01	Initial issue of report	Jan. 04, 2021

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## **Summary of Test Result**

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Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.407(a)	Emission Bandwidth	PASS	-
3.3	15.407(a)	Maximum Conducted Output Power	PASS	-
3.4	15.407(a)	Peak Power Spectral Density	PASS	-
3.5	15.407(b)	Unwanted Emissions	PASS	-

## **Declaration of Conformity:**

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

#### **Comments and Explanations:**

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

Reviewed by: Sam Chen
Report Producer: Viola Huang

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# 1 General Description

## 1.1 Information

## 1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20), ac (VHT20)	5180-5240	36-48 [4]
5725-5850	a, 11 (11120), ac (111120)	5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5725-5850	11 (11140), ac (111140)	5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5725-5850	ac (viiio)	5775	155 [1]

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Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	2
5.15-5.25GHz	802.11n HT20	20	2
5.15-5.25GHz	802.11n HT20-BF	20	2
5.15-5.25GHz	802.11ac VHT20	20	2
5.15-5.25GHz	802.11ac VHT20-BF	20	2
5.15-5.25GHz	802.11n HT40	40	2
5.15-5.25GHz	802.11n HT40-BF	40	2
5.15-5.25GHz	802.11ac VHT40	40	2
5.15-5.25GHz	802.11ac VHT40-BF	40	2
5.15-5.25GHz	802.11ac VHT80	80	2
5.15-5.25GHz	802.11ac VHT80-BF	80	2
5.725-5.85GHz	802.11a	20	2
5.725-5.85GHz	802.11n HT20	20	2
5.725-5.85GHz	802.11n HT20-BF	20	2
5.725-5.85GHz	802.11ac VHT20	20	2
5.725-5.85GHz	802.11ac VHT20-BF	20	2
5.725-5.85GHz	802.11n HT40	40	2
5.725-5.85GHz	802.11n HT40-BF	40	2
5.725-5.85GHz	802.11ac VHT40	40	2
5.725-5.85GHz	802.11ac VHT40-BF	40	2
5.725-5.85GHz	802.11ac VHT80	80	2
5.725-5.85GHz	802.11ac VHT80-BF	80	2

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#### Note:

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40, VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.

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• BWch is the nominal channel bandwidth.

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### 1.1.2 Antenna Information

Ant.	2.4GHz	5GHz	Brand	Model Name	Antenna Type	Connector	Gain	(dBi)
Aiit.	Port	Port	Brand	Woder Name	Antenna Type	Connector	2.4GHz	5GHz
1	1	2	TP-LINK	N/A	Monopole Antenna	N/A	1.5	0.94
2	2	1	TP-LINK	N/A	Monopole Antenna	N/A	1.5	0.98

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Note: The above information was declared by manufacturer.

#### <For 2.4GHz Band>

#### For IEEE 802.11b/g/n mode (2TX/2RX)

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

Port 1 and Port 2 could transmit/receive simultaneously.

#### <For 5GHz Band>

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

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

Port 1 and Port 2 could transmit/receive simultaneously.

## 1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.971	0.13	2.065m	1k
802.11ac VHT20	0.987	0.06	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ac VHT40	0.974	0.11	2.437m	1k
802.11ac VHT80	0.948	0.23	1.149m	1k

Ν	ote	•

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

## 1.1.4 EUT Operational Condition

EUT Power Type	Internal power supply				
Beamforming Function	$\boxtimes$	With beamforming		Without beamforming	
bearmorning runction	The product has beamforming function for 11n/11ac in 5GHz.				
Function		Outdoor P2M	$\boxtimes$	Indoor P2M	
i diletion		Fixed P2P		Client	
<b>Test Software Version</b>	QPCT_V3.0.187.0				

Note: The above information was declared by manufacturer.

## 1.1.5 EUT Support Function

The EUT supports AP, Router, Mesh Function. After evaluation, only Router mode has been tested and recorded in the test report.

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## 1.2 Applicable Standards

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

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- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v02r01

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

## 1.3 Testing Location Information

Testing Location								
	HWA YA ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)							
		TEL	:	886-3-327-3456 FAX : 886-3-327-0973				
$\boxtimes$	JHUBEI	ADD	:	No.8, Ln. 724, Bo'ai St., Zhubei 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	TH03-CB	Jeff Wu	20.4~22°C / 28~29%	Dec. 08, 2020
Radiated (For Below 1GHz)	03CH03-CB	KJ Chang	23.5~24.1°C / 56~58%	Sep. 24, 2020~Dec. 10, 2020
Radiated (For Above 1GHz)	03CH03-CB	KJ Chang	24.3~26.2°C / 54~58%	Sep. 24, 2020~Dec. 10, 2020
Radiated (For co-location)	03CH03-CB	KJ Chang	23.5~24.1°C / 56~58%	Sep. 24, 2020~Dec. 10, 2020
AC Conduction	CO02-CB	GN Hou	22~23°C / 58~60%	Sep. 18, 2020

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

## 1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	5.0 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.9 dB	Confidence levels of 95%
Conducted Emission	2.8 dB	Confidence levels of 95%
Output Power Measurement	1.4 dB	Confidence levels of 95%
Power Density Measurement	2.8 dB	Confidence levels of 95%
Bandwidth Measurement	0.4%	Confidence levels of 95%

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# 2 Test Configuration of EUT

## 2.1 Test Channel Mode

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	22.5
5200MHz	24
5240MHz	24
5745MHz	24
5785MHz	24
5825MHz	23.5
802.11ac VHT20_Nss1,(MCS0)_2TX	-
5180MHz	23
5200MHz	24.5
5240MHz	24.5
5745MHz	24
5785MHz	24
5825MHz	24
802.11ac VHT40_Nss1,(MCS0)_2TX	-
5190MHz	19
5230MHz	23
5755MHz	23.5
5795MHz	25
802.11ac VHT80_Nss1,(MCS0)_2TX	-
5210MHz	17
5775MHz	21

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Mode	Power Setting
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-
5180MHz	23
5200MHz	24.5
5240MHz	24.5
5745MHz	24
5785MHz	24
5825MHz	24
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-
5190MHz	19
5230MHz	23
5755MHz	23.5
5795MHz	25
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-
5210MHz	17
5775MHz	21

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## Note:

The EUT supports beamforming and CDD modes, and the CDD mode is the worst case. Therefore, all
test items are evaluated in the report. The beamforming mode only evaluates the output power.

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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	Operating Mode Normal Link	
1 EUT PLC is Idle mode (without data transmit)		

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

The Worst Case Mode for Following Conformance Tests		
Tests Item Unwanted Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.	
Operating Mode < 1GHz   CTX		
1	EUT_2.4GHz	
2	EUT_5GHz	
For operating mode 2 is the worst case and it was record in this test report.		
Operating Mode > 1GHz	СТХ	
1	EUT_5GHz	

The Worst Case Mode for Following Conformance Tests			
Tests Item Simultaneous Transmission Analysis - Radiated Emission Co-location			
Test Condition Radiated measurement			
Operating Mode	Operating Mode Normal Link		
1 WLAN 2.4GHz + WLAN 5GHz			
Refer to Appendix F for Radiated Emission Co-location.			

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The Worst Case Mode for Following Conformance Tests			
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation			
Operating Mode			
1 WLAN 2.4GHz + WLAN 5GHz			
Refer to Sporton Test Report No.: FA961308-02 for Co-location RF Exposure Evaluation.			

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Note: The EUT can only use Y axis position.

## 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
Power cable, non-shielded, 1.5m	

## 2.5 Support Equipment

#### For AC Conduction:

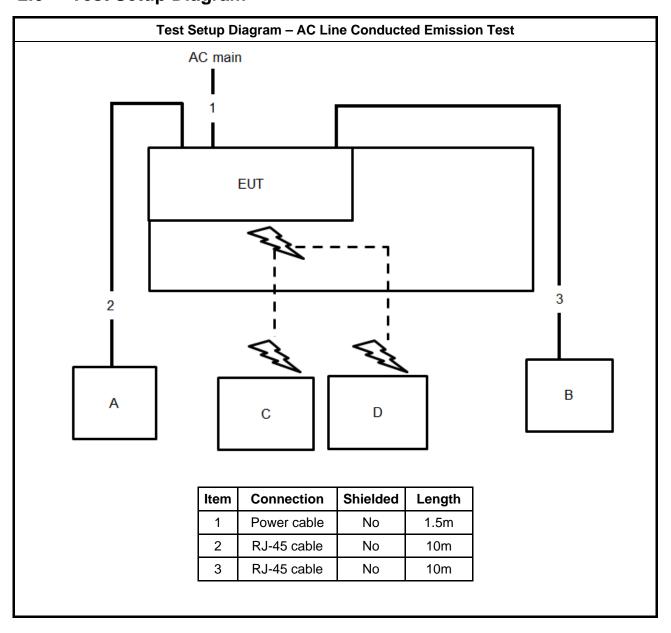
	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
Α	LAN NB	DELL	E6430	N/A
В	AP Router	ASUS	RP-N53	MSQ-RPN53
С	2.4G NB	DELL	E6430	N/A
D	5G NB	DELL	E6430	N/A

#### For Radiated and RF Conducted:

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

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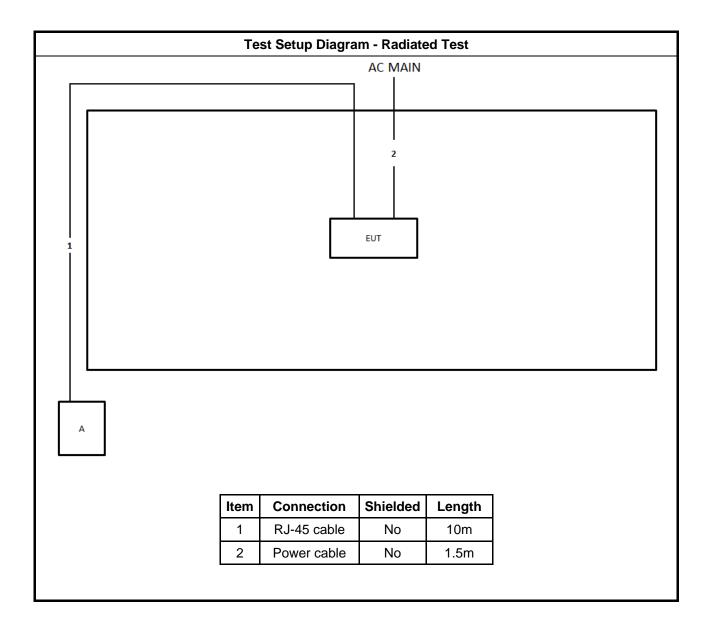
# 2.6 Test Setup Diagram



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## 3 Transmitter Test Result

## 3.1 AC Power-line Conducted Emissions

## 3.1.1 AC Power-line Conducted Emissions Limit

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

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## 3.1.2 Measuring Instruments

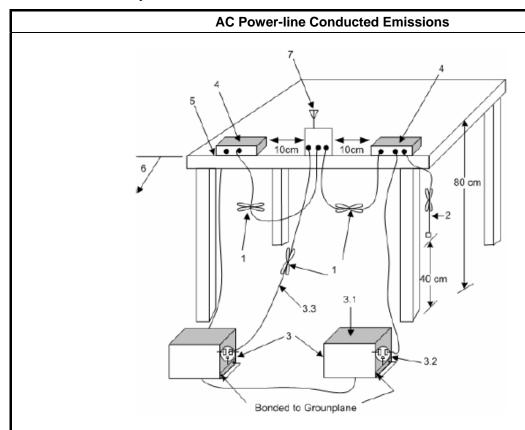
Refer a test equipment and calibration data table in this test report.

## 3.1.3 Test Procedures

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

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## 3.1.4 Test Setup



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

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

### 3.1.5 Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level
- b. Margin = -Limit + Level

#### 3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

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## 3.2 Emission Bandwidth

## 3.2.1 Emission Bandwidth Limit

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

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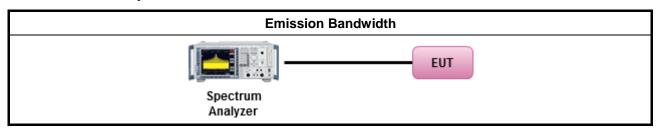
## 3.2.2 Measuring Instruments

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

#### 3.2.3 Test Procedures

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

## 3.2.4 Test Setup



## 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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# 3.3 Maximum Conducted Output Power

## 3.3.1 Maximum Conducted Output Power Limit

	Maximum Conducted Output Power Limit
UNI	I Devices
$\boxtimes$	For the 5.15-5.25 GHz band:
	Outdoor AP: the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 1 W. If $G_{TX}$ > 6 dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ . e.i.r.p. at any elevation angle above 30 degrees $\leq$ 125mW [21dBm]
	Indoor AP: the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$
	Point-to-point AP: the maximum conducted output power ( $P_{Out}$ ) shall not exceed the lesser of 1 W If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$ .
	■ Mobile or Portable Client: the maximum conducted output power (P <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 ( $P_{Out}$ ) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ .
	<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:
	■ 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>
	e = maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi.

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## 3.3.2 Measuring Instruments

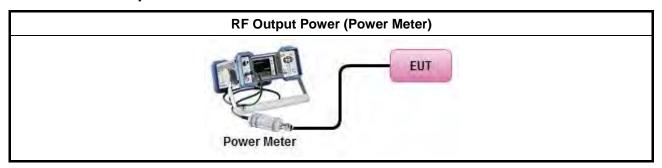
Refer a test equipment and calibration data table in this test report.

#### 3.3.3 Test Procedures

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

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## 3.3.4 Test Setup



## 3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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## 3.4 Peak Power Spectral Density

## 3.4.1 Peak Power Spectral Density Limit

	Peak Power Spectral Density Limit
UNI	I Devices
$\boxtimes$	For the 5.15-5.25 GHz band:
	<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 $P_{Out} = 17 - (G_{TX} - 23)$ .
	■ Mobile or Portable Client: the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – $(G_{TX} - 6)$
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – ( $G_{TX} - 6$ ).
	For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) $\leq$ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – ( $G_{TX} - 6$ ).
	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$ .
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-	LAN Devices
	For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.
	<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.
	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= $30 - (G_{TX} - 6)$ .
	<ul> <li>Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.</li> </ul>
pow	<b>SD</b> = peak power spectral density that he same method as used to determine the conducted output ver shall be used to determine the power spectral density. And power spectral density in dBm/MHz = the maximum transmitting antenna directional gain in dBi.

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## 3.4.2 Measuring Instruments

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

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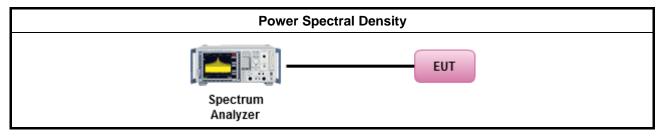
## 3.4.3 Test Procedures

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

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## 3.4.4 Test Setup



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## 3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

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## 3.5 Unwanted Emissions

#### 3.5.1 Transmitter Unwanted Emissions Limit

Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit								
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)					
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300					
0.490~1.705	24000/F(kHz)	33.8 - 23	30					
1.705~30.0	30	29	30					
30~88	100	40	3					
88~216	150	43.5	3					
216~960	200	46	3					
Above 960	500	54	3					

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

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

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

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

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linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

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#### 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

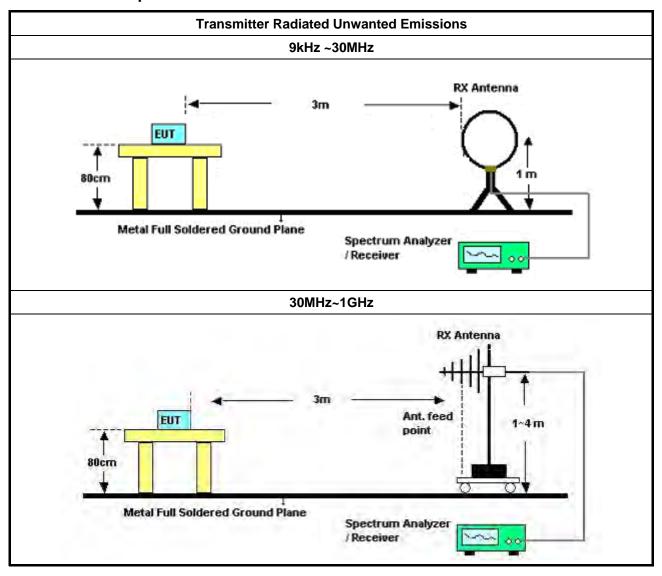
#### **Test Method**

- Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- For the transmitter unwanted emissions shall be measured using following options below:
  - Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
  - Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.
    - Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).
    - Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).
    - Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
    - Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
    - Refer as FCC KDB 789033, clause G)5) measurement procedure peak limit.
    - Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
- For radiated measurement.
  - Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
  - Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
  - Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
- The any unwanted emissions level shall not exceed the fundamental emission level.
- All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

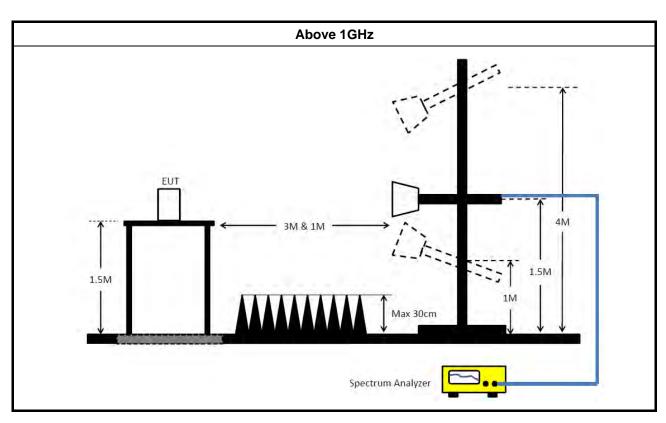
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## 3.5.4 Test Setup



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#### 3.5.5 **Measurement Results Calculation**

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

#### 3.5.6 Transmitter Unwanted Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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

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

#### 3.5.7 **Test Result of Transmitter Unwanted Emissions**

Refer as Appendix E

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# 4 Test Equipment and Calibration Data

Instrument	nent Brand Model No. Serial No. Characteristics		Calibration Date	Calibration Due Date	Remark		
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2019	Nov. 20, 2020	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Feb. 25, 2020	Feb. 24, 2021	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Mar. 10, 2020	Mar. 09, 2021	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 21, 2019	Oct. 20, 2020	Conduction (CO02-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Mar. 19, 2020	Mar. 18, 2021	Conduction (CO02-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH03-CB	30 MHz ~ 1 GHz	Jan. 29, 2020	Jan. 28, 2021	Radiation (03CH03-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH03-CB	1GHz ~18GHz 3m	May 28, 2020	May 27, 2021	Radiation (03CH03-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH03-CB)
Bilog Antenna with 6 dB attenuator	Schaffner	CBL6112B & N-6-06	2928 & AT-N0607	20MHz ~ 2GHz	Feb. 28, 2020	Feb. 27, 2021	Radiation (03CH03-CB)
Horn Antenna	ETS · Lindgren	3115	6821	750MHz~18GHz	Jan. 20, 2020	Jan. 19, 2021	Radiation (03CH03-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2020	Jul. 20, 2021	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8447D	2944A10259	9kHz ~ 1.3GHz	Jan. 15, 2020	Jan. 14, 2021	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8449B	3008A02097	1GHz ~ 26.5GHz	Jul. 03, 2020	Jun. 02, 2021	Radiation (03CH03-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 08, 2020	Jul. 07, 2021	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100019	9kHz ~ 40GHz	Jun. 09, 2020	Jun. 08, 2021	Radiation (03CH03-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH03-CB)
RF Cable-low	Woken	RG402	Low Cable-02+29	25MHz ~ 1GHz	Jul. 28, 2020	Jul. 27, 2021	Radiation (03CH03-CB)
RF Cable-low	Woken	RG402	Low Cable-02+29	30MHz ~ 1GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-20+29	1GHz ~ 18GHz	Jul. 28, 2020	Jul. 27, 2021	Radiation (03CH03-CB)

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Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-20+29	1GHz ~ 18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-29	1GHz ~ 18GHz	Jul. 28, 2020	Jul. 27, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-29	1GHz ~ 18GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH03-CB)
Signal Analyzer	R&S	FSV40	101903	9kHz ~ 40GHz	May 14, 2020	May 13, 2021	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1726195	300MHz~40GHz	Aug. 17, 2020	Aug. 16, 2021	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Aug. 17, 2020	Aug. 16, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz –18 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH03-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH03-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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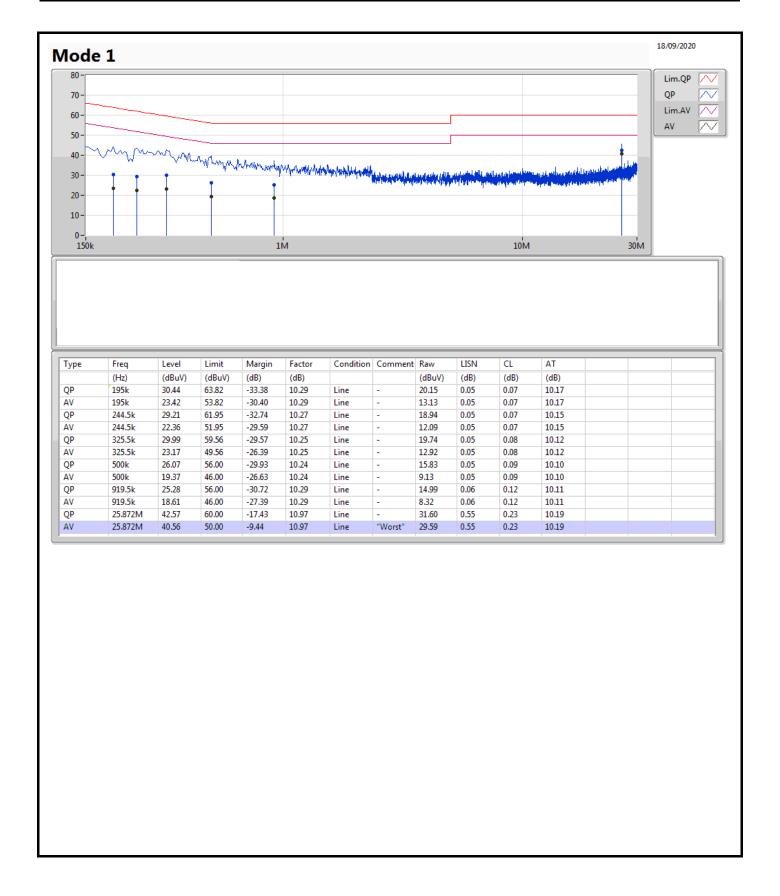
## Conducted Emissions at Powerline

Appendix A

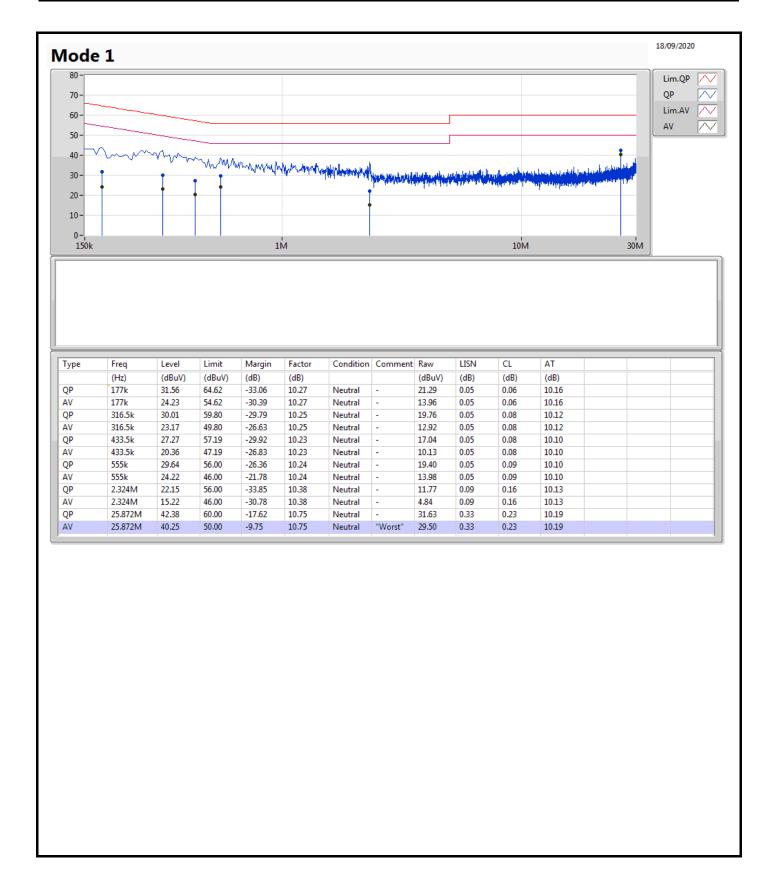
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	25.872M	40.56	50.00	-9.44	Line











Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
5.15-5.25GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	22.29M	16.582M	16M6D7W	19.8M	16.432M
802.11ac VHT20_Nss1,(MCS0)_2TX	22.38M	17.751M	17M8D7W	20.37M	17.661M
802.11ac VHT40_Nss1,(MCS0)_2TX	46.86M	36.102M	36M1D7W	39.96M	35.862M
802.11ac VHT80_Nss1,(MCS0)_2TX	84.12M	75.802M	75M8D7W	83.64M	75.682M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_2TX	16.05M	16.672M	16M7D7W	15.6M	16.552M
802.11ac VHT20_Nss1,(MCS0)_2TX	17.55M	17.811M	17M8D7W	16.5M	17.631M
802.11ac VHT40_Nss1,(MCS0)_2TX	35.64M	51.874M	51M9D7W	32.52M	36.042M
802.11ac VHT80_Nss1,(MCS0)_2TX	75.72M	75.922M	75M9D7W	74.4M	75.922M

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

**Max-OBW** = Maximum99% occupied bandwidth;

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

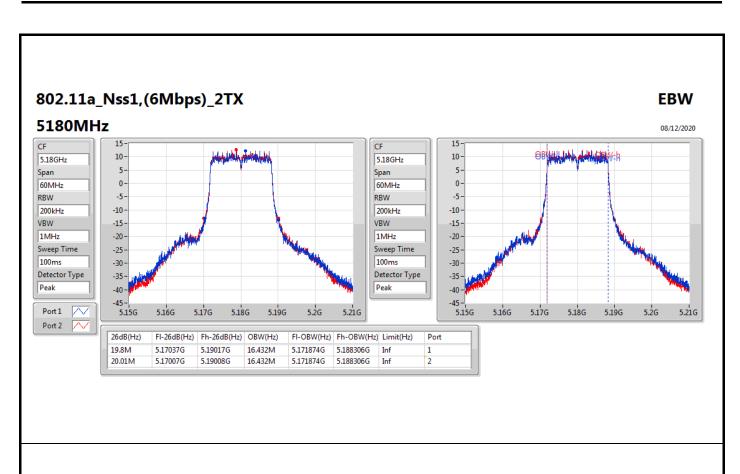
**Min-OBW** = Minimum 99% occupied bandwidth;

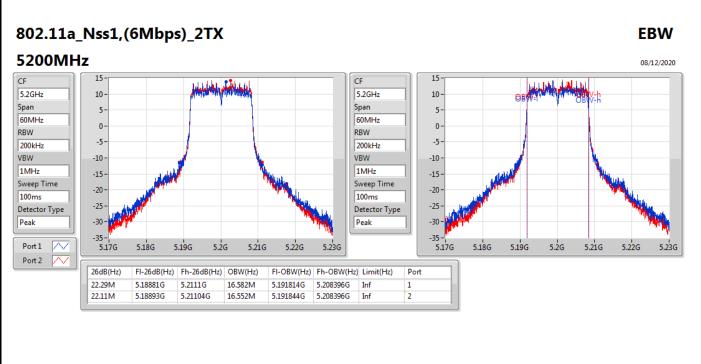


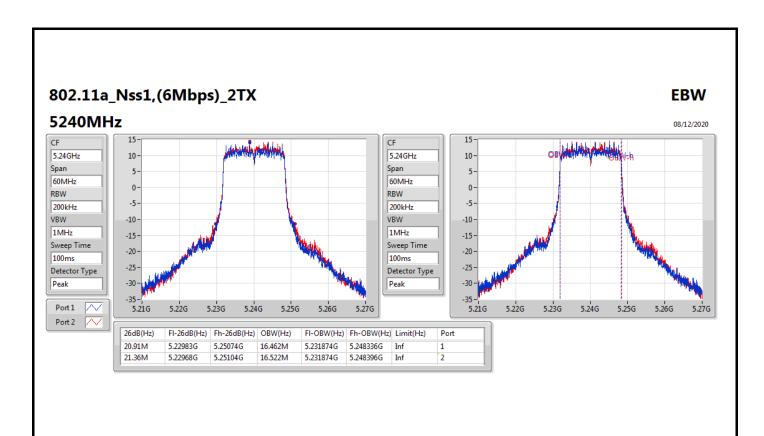
#### Result

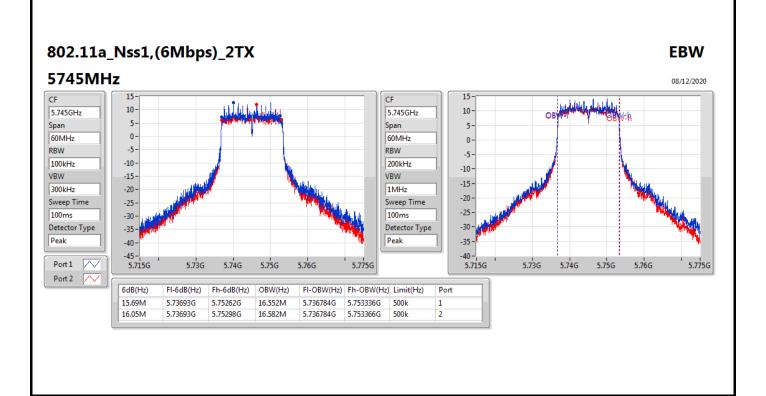
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	19.8M	16.432M	20.01M	16.432M
5200MHz	Pass	Inf	22.29M	16.582M	22.11M	16.552M
5240MHz	Pass	Inf	20.91M	16.462M	21.36M	16.522M
5745MHz	Pass	500k	15.69M	16.552M	16.05M	16.582M
5785MHz	Pass	500k	16.05M	16.672M	15.69M	16.582M
5825MHz	Pass	500k	16.02M	16.612M	15.6M	16.582M
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	20.37M	17.661M	21.03M	17.661M
5200MHz	Pass	Inf	21.81M	17.721M	22.38M	17.751M
5240MHz	Pass	Inf	21.54M	17.661M	21.78M	17.691M
5745MHz	Pass	500k	16.92M	17.751M	16.5M	17.661M
5785MHz	Pass	500k	17.55M	17.811M	16.53M	17.661M
5825MHz	Pass	500k	16.92M	17.631M	17.22M	17.691M
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	39.96M	35.862M	40.14M	35.982M
5230MHz	Pass	Inf	44.22M	35.982M	46.86M	36.102M
5755MHz	Pass	500k	34.98M	36.042M	32.52M	36.042M
5795MHz	Pass	500k	35.64M	51.874M	33.96M	36.282M
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	84.12M	75.682M	83.64M	75.802M
5775MHz	Pass	500k	74.4M	75.922M	75.72M	75.922M

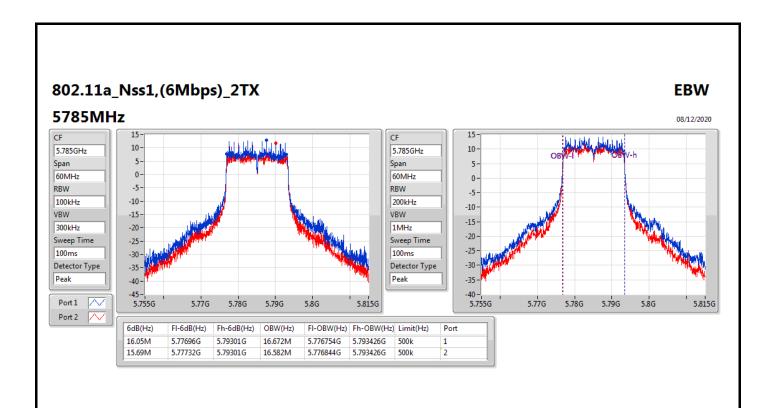
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

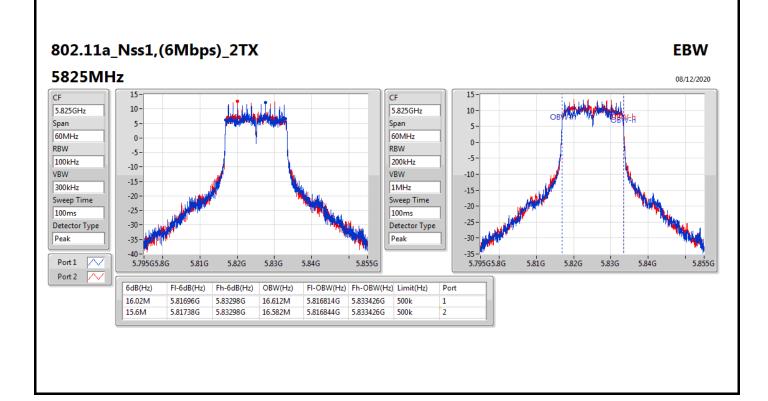


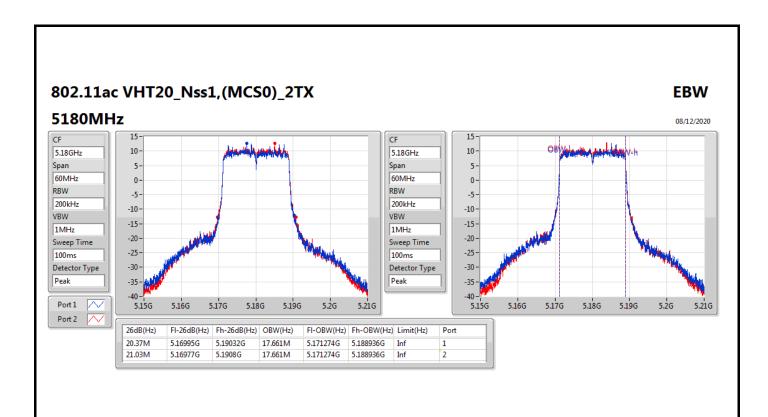


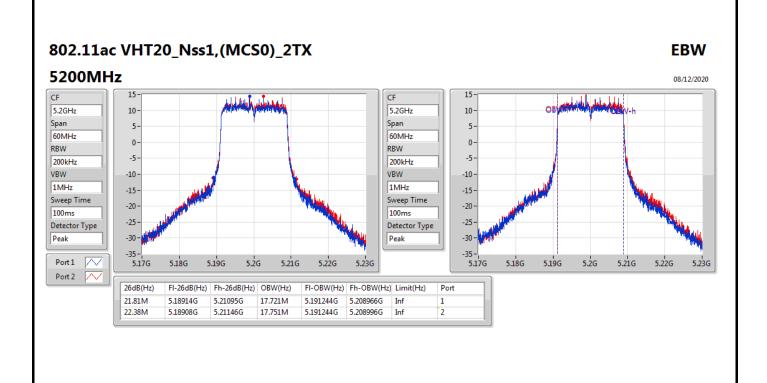


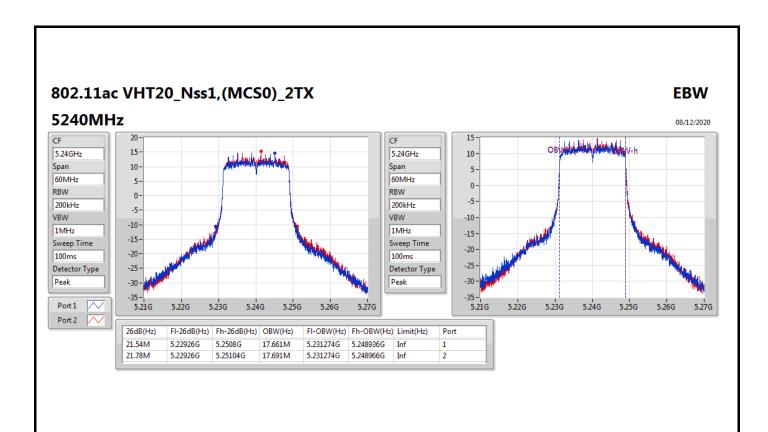


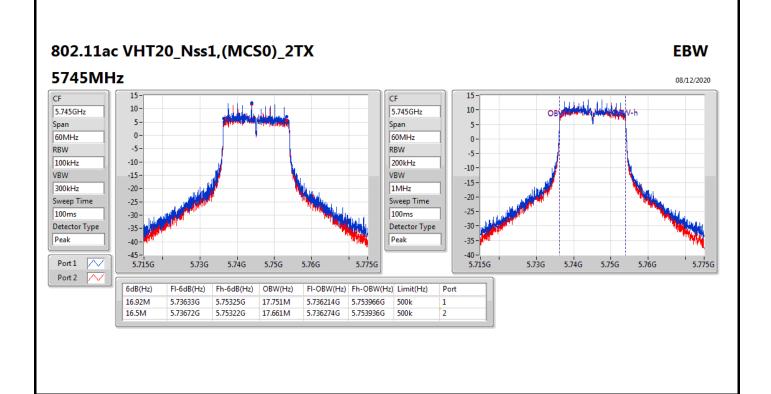


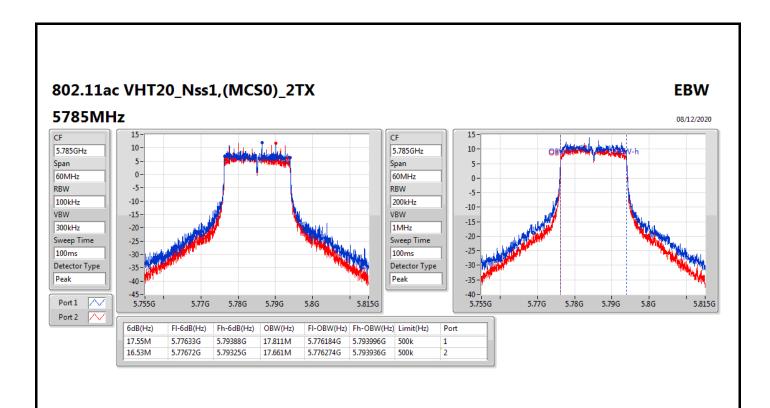


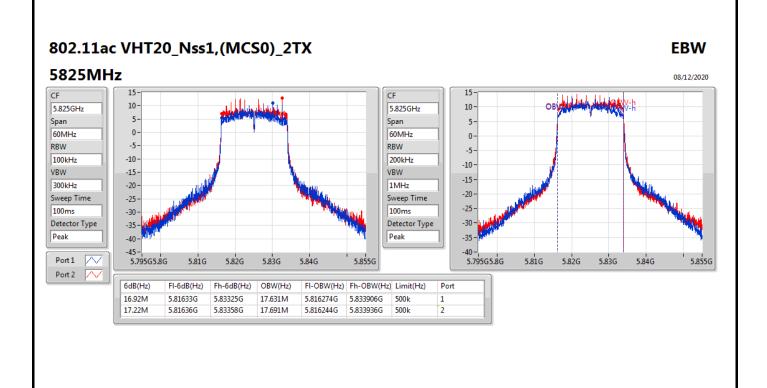




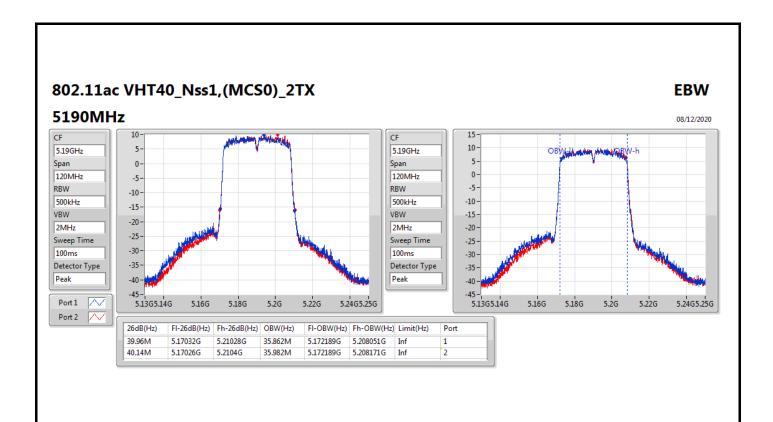


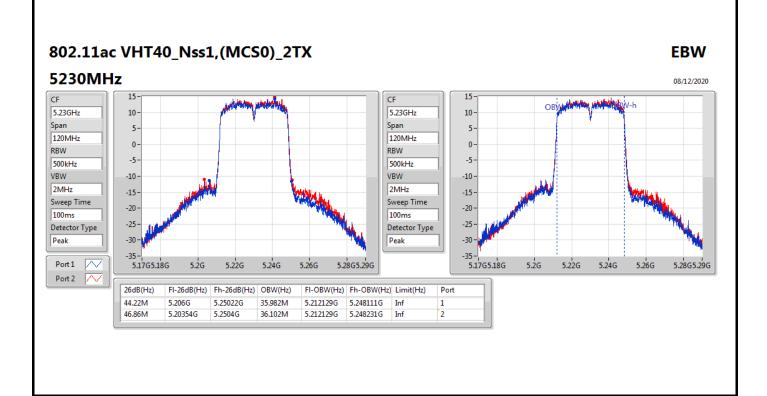


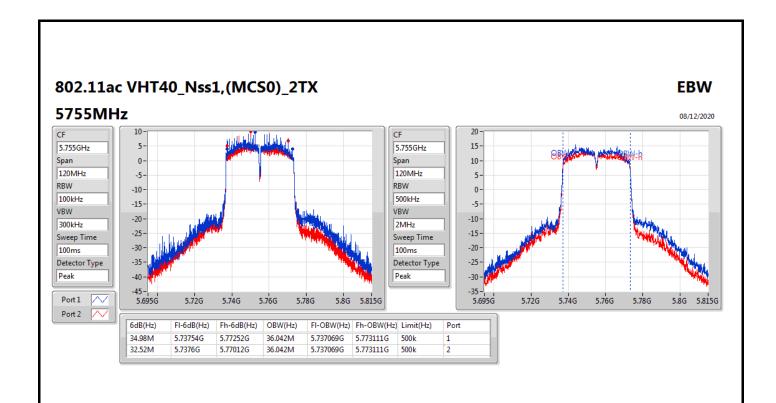


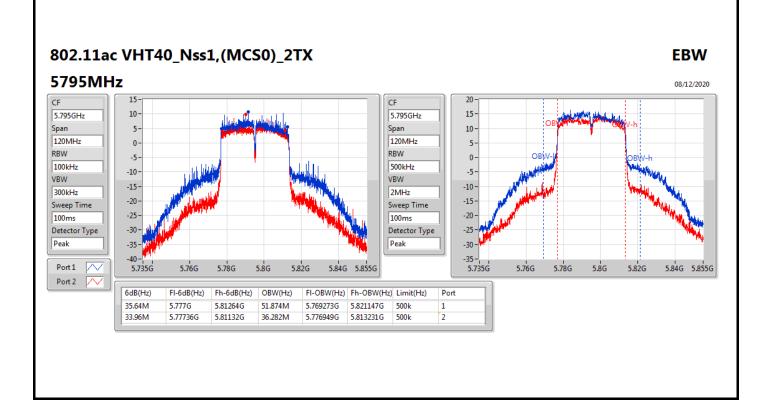


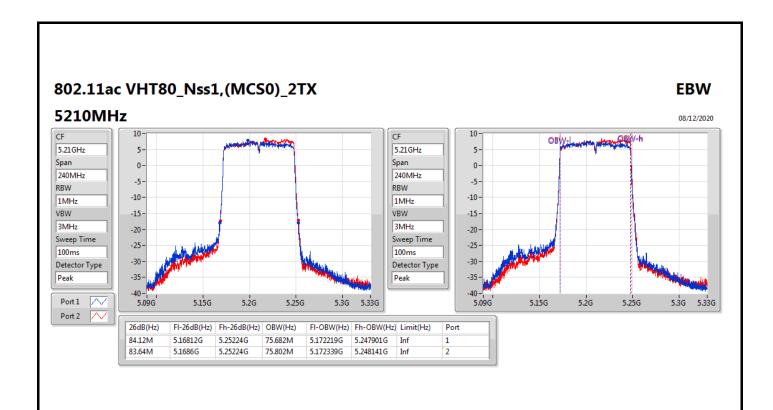
: 8 of 11

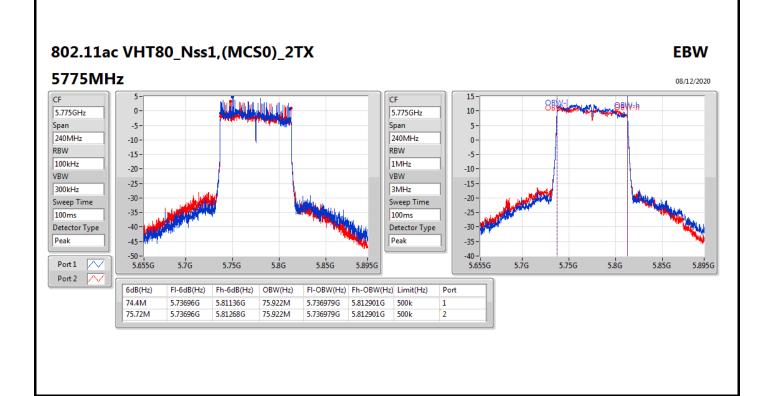














**Summary** 

Mode	Total Power	Total Power
	(dBm)	(W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	27.02	0.50350
802.11ac VHT20_Nss1,(MCS0)_2TX	27.35	0.54325
802.11ac VHT40_Nss1,(MCS0)_2TX	26.73	0.47098
802.11ac VHT80_Nss1,(MCS0)_2TX	20.43	0.11041
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	26.36	0.43251
802.11ac VHT20_Nss1,(MCS0)_2TX	26.36	0.43251
802.11ac VHT40_Nss1,(MCS0)_2TX	27.78	0.59979
802.11ac VHT80_Nss1,(MCS0)_2TX	23.90	0.24547



### Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	0.98	22.27	22.62	25.46	30.00
5200MHz	Pass	0.98	23.76	24.09	26.94	30.00
5240MHz	Pass	0.98	23.79	24.22	27.02	30.00
5745MHz	Pass	0.98	23.30	22.84	26.09	30.00
5785MHz	Pass	0.98	23.82	22.82	26.36	30.00
5825MHz	Pass	0.98	22.60	22.93	25.78	30.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	0.98	22.49	22.86	25.69	30.00
5200MHz	Pass	0.98	24.02	24.61	27.34	30.00
5240MHz	Pass	0.98	24.10	24.56	27.35	30.00
5745MHz	Pass	0.98	22.65	22.20	25.44	30.00
5785MHz	Pass	0.98	23.47	22.36	25.96	30.00
5825MHz	Pass	0.98	22.73	23.90	26.36	30.00
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	0.98	19.51	19.82	22.68	30.00
5230MHz	Pass	0.98	23.43	23.99	26.73	30.00
5755MHz	Pass	0.98	24.09	22.99	26.59	30.00
5795MHz	Pass	0.98	25.30	24.16	27.78	30.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	0.98	17.00	17.80	20.43	30.00
5775MHz	Pass	0.98	21.16	20.61	23.90	30.00

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



**Summary** 

Mode	Total Power	Total Power		
	(dBm)	(W)		
5.15-5.25GHz	-	-		
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	27.35	0.54325		
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	26.73	0.47098		
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	20.43	0.11041		
5.725-5.85GHz	-	-		
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	26.36	0.43251		
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	27.78	0.59979		
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	23.90	0.24547		



#### Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ac VHT20-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	3.97	22.49	22.86	25.69	30.00
5200MHz	Pass	3.97	24.02	24.61	27.34	30.00
5240MHz	Pass	3.97	24.10	24.56	27.35	30.00
5745MHz	Pass	3.97	22.65	22.20	25.44	30.00
5785MHz	Pass	3.97	23.47	22.36	25.96	30.00
5825MHz	Pass	3.97	22.73	23.90	26.36	30.00
802.11ac VHT40-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	3.97	19.51	19.82	22.68	30.00
5230MHz	Pass	3.97	23.43	23.99	26.73	30.00
5755MHz	Pass	3.97	24.09	22.99	26.59	30.00
5795MHz	Pass	3.97	25.30	24.16	27.78	30.00
802.11ac VHT80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	3.97	17.00	17.80	20.43	30.00
5775MHz	Pass	3.97	21.16	20.61	23.90	30.00

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



**Summary** 

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	·
802.11a_Nss1,(6Mbps)_2TX	13.70
802.11ac VHT20_Nss1,(MCS0)_2TX	13.67
802.11ac VHT40_Nss1,(MCS0)_2TX	10.25
802.11ac VHT80_Nss1,(MCS0)_2TX	0.82
5.725-5.85GHz	
802.11a_Nss1,(6Mbps)_2TX	11.37
802.11ac VHT20_Nss1,(MCS0)_2TX	11.07
802.11ac VHT40_Nss1,(MCS0)_2TX	9.50
802.11ac VHT80_Nss1,(MCS0)_2TX	3.11

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



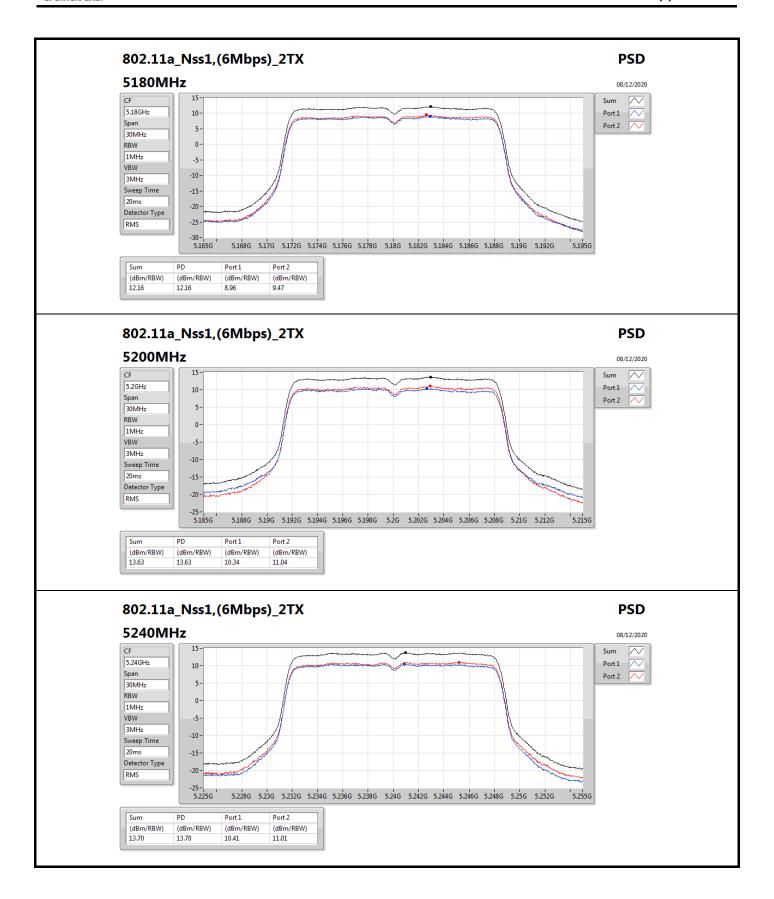
Appendix D **PSD** 

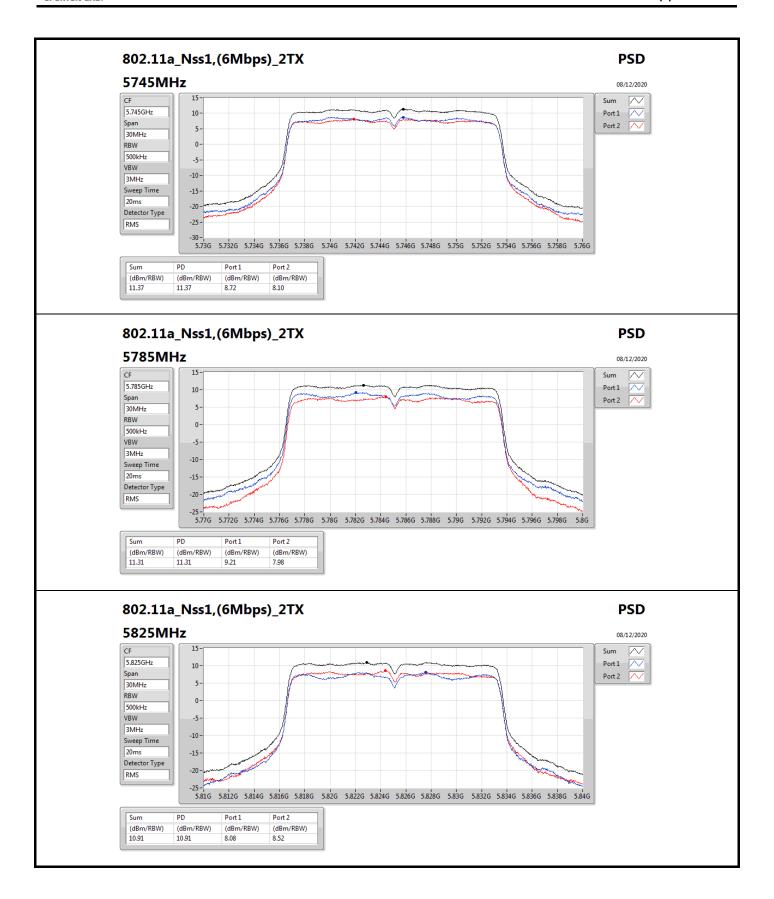
#### Result

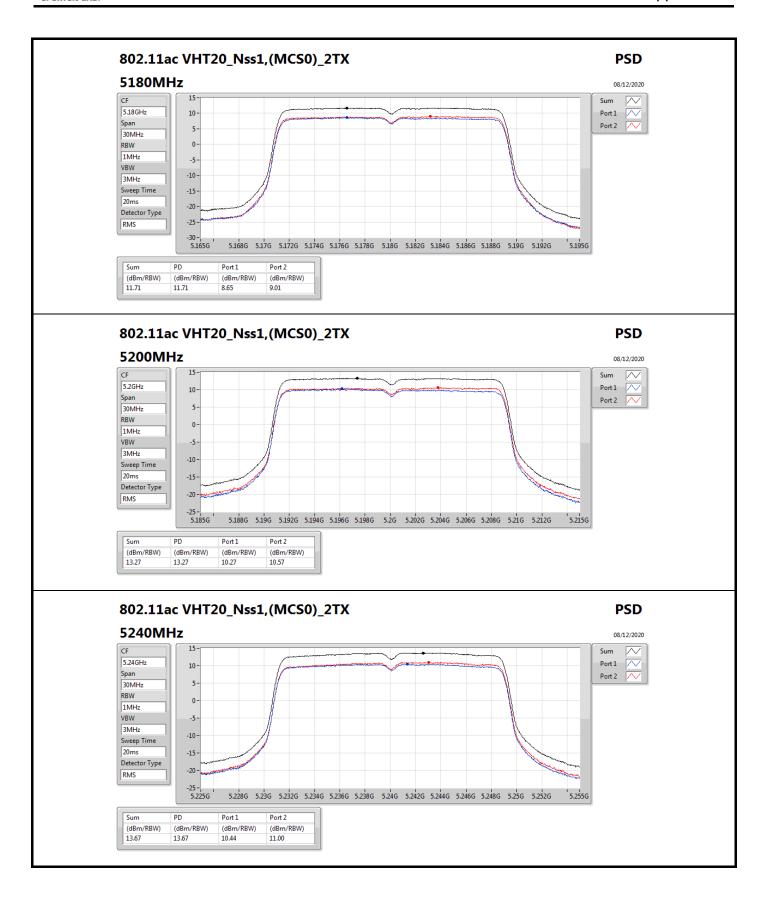
Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	3.97	8.96	9.47	12.16	17.00
5200MHz	Pass	3.97	10.34	11.04	13.63	17.00
5240MHz	Pass	3.97	10.41	11.01	13.70	17.00
5745MHz	Pass	3.97	8.72	8.10	11.37	30.00
5785MHz	Pass	3.97	9.21	7.98	11.31	30.00
5825MHz	Pass	3.97	8.08	8.52	10.91	30.00
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	3.97	8.65	9.01	11.71	17.00
5200MHz	Pass	3.97	10.27	10.57	13.27	17.00
5240MHz	Pass	3.97	10.44	11.00	13.67	17.00
5745MHz	Pass	3.97	7.62	7.14	10.26	30.00
5785MHz	Pass	3.97	8.27	7.15	10.58	30.00
5825MHz	Pass	3.97	7.94	8.48	11.07	30.00
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	3.97	3.15	3.37	6.22	17.00
5230MHz	Pass	3.97	6.94	7.64	10.25	17.00
5755MHz	Pass	3.97	6.50	5.43	8.89	30.00
5795MHz	Pass	3.97	7.50	6.13	9.50	30.00
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	3.97	-2.47	-1.65	0.82	17.00
5775MHz	Pass	3.97	0.87	-0.25	3.11	30.00

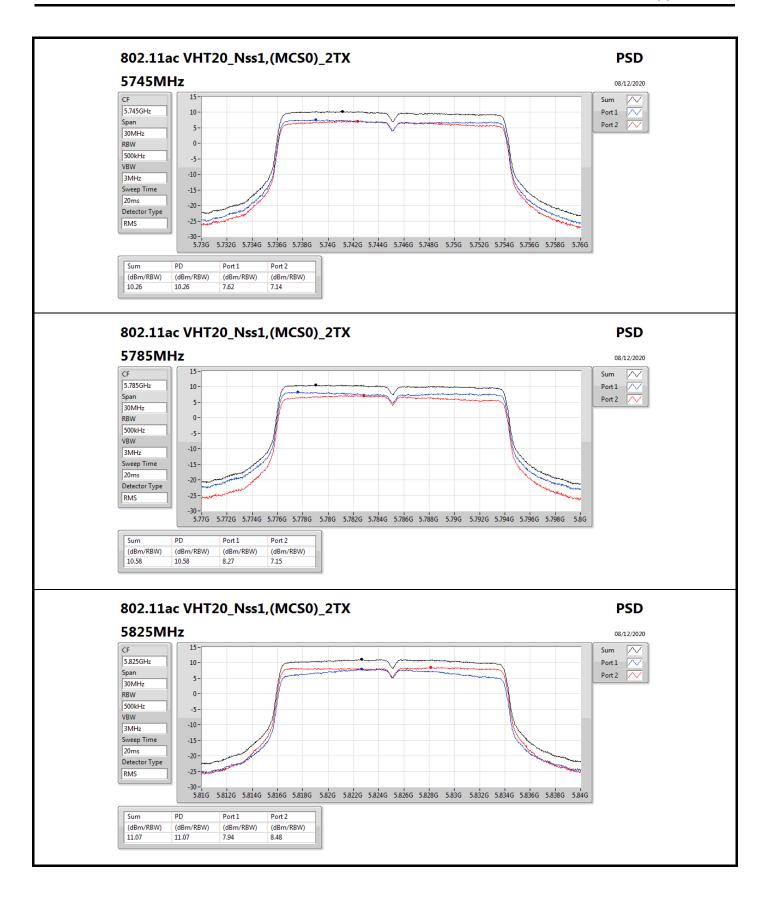
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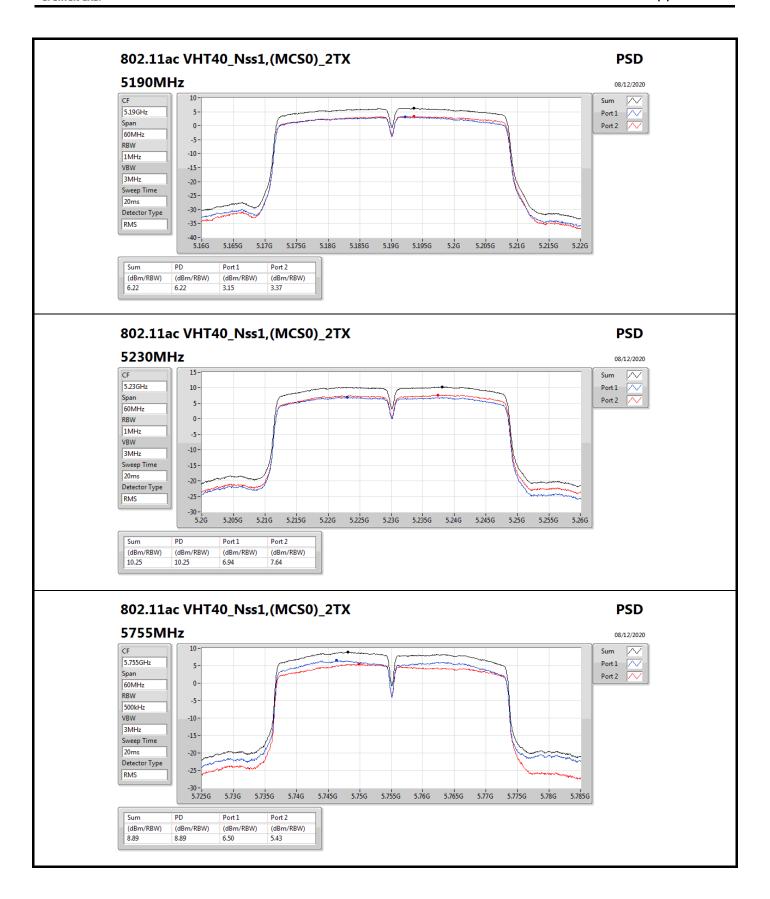
DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

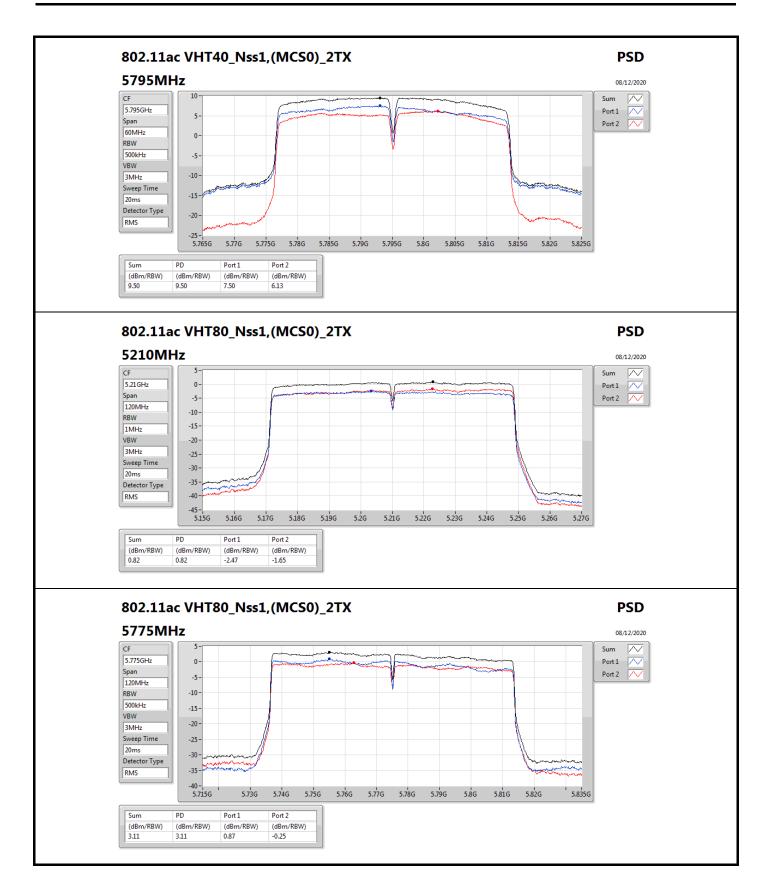














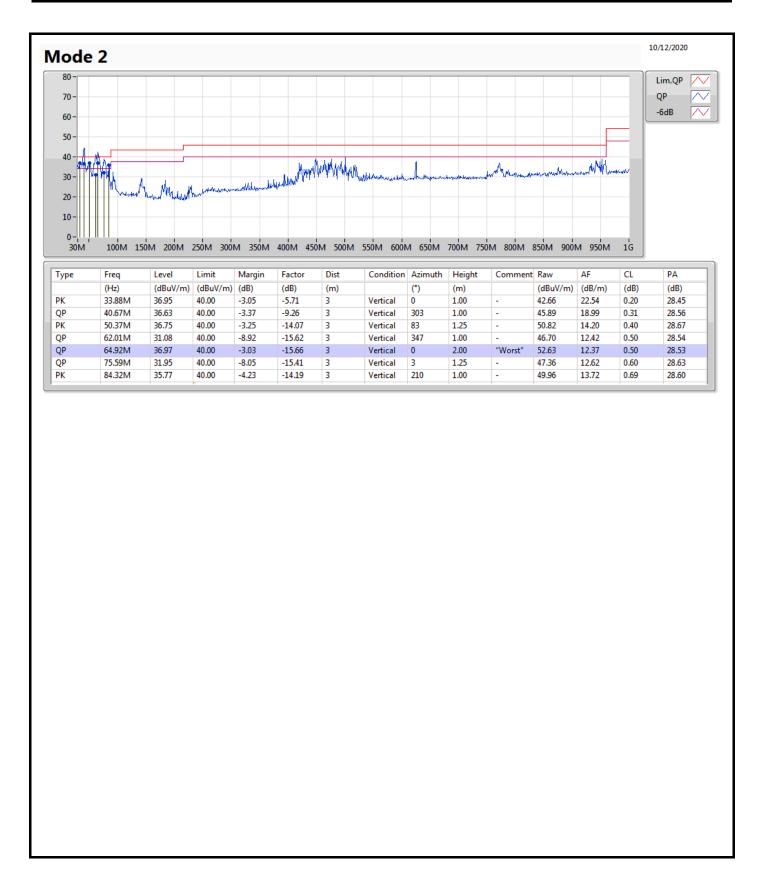
# Radiated Emissions below 1GHz

Appendix E.1

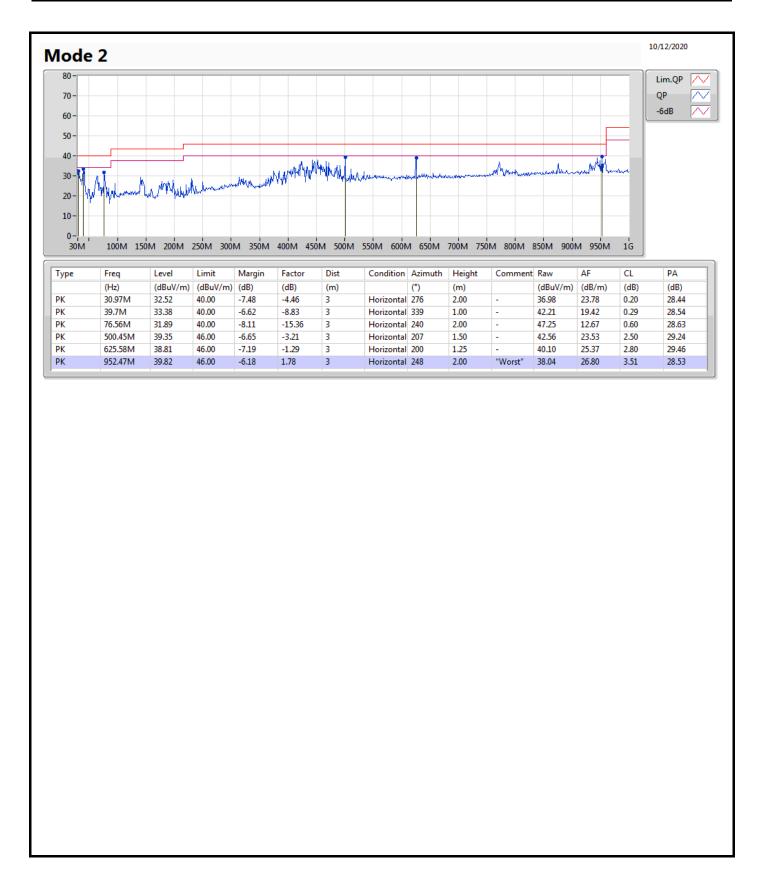
Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Condition
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	
Mode 2	Pass	QP	64.92M	36.97	40.00	-3.03	Vertical











## RSE TX above 1GHz

Appendix E.2

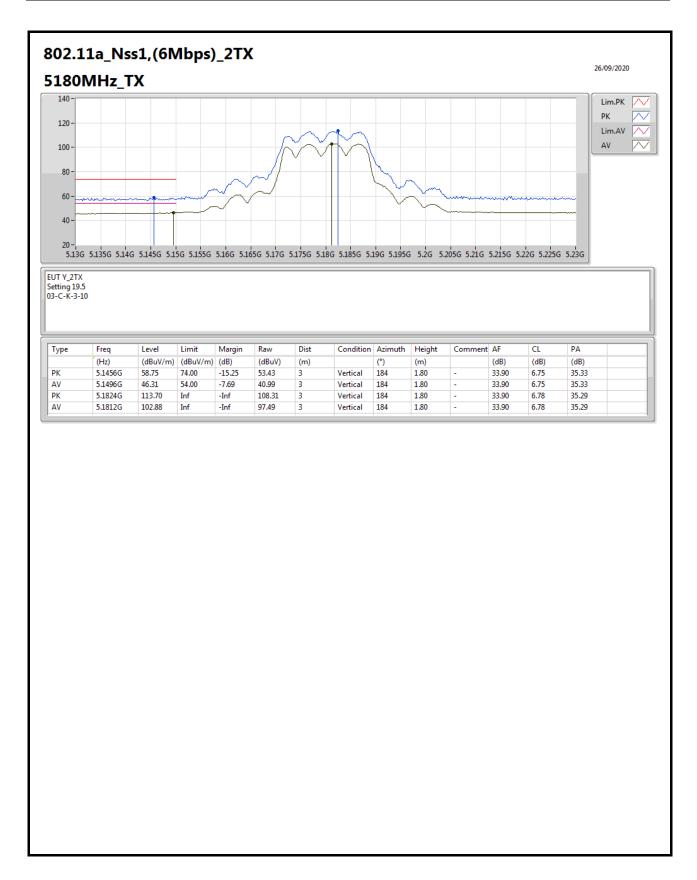
Page No. : 1 of 73

**Summary** 

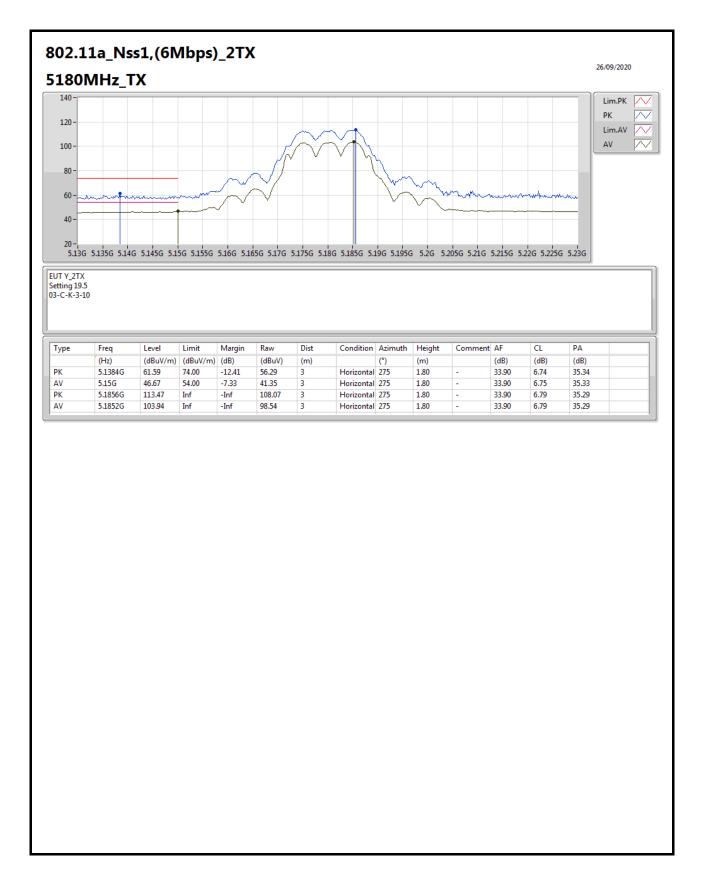
Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.15-5.25GHz	-	-	-	-	-	-	-	-	-	-	-
802.11ac VHT80_Nss1,(MCS0)_2TX	Pass	AV	5.145G	53.99	54.00	-0.01	3	Horizontal	274	1.80	-

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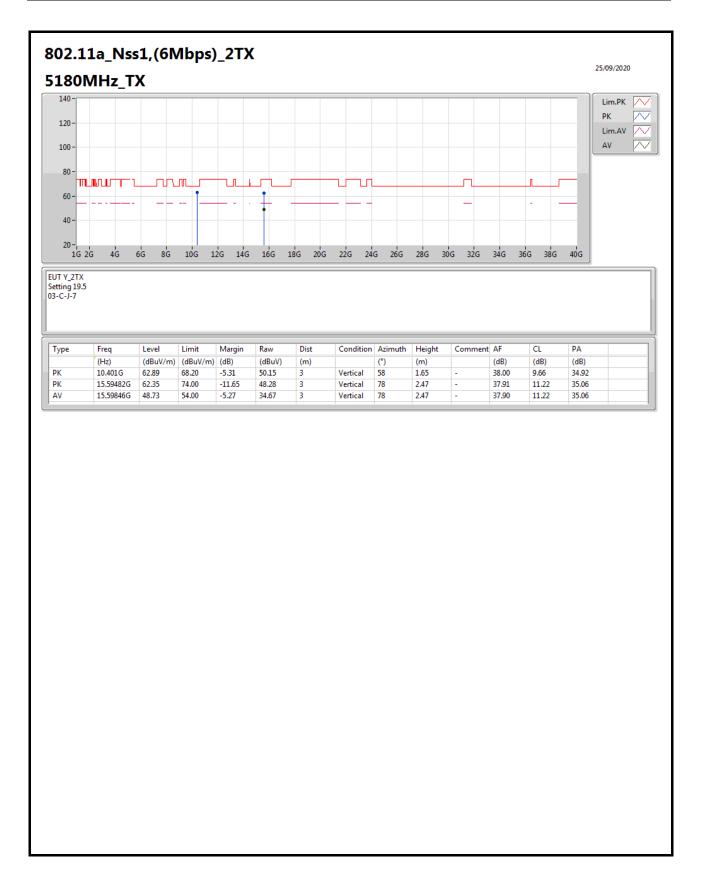






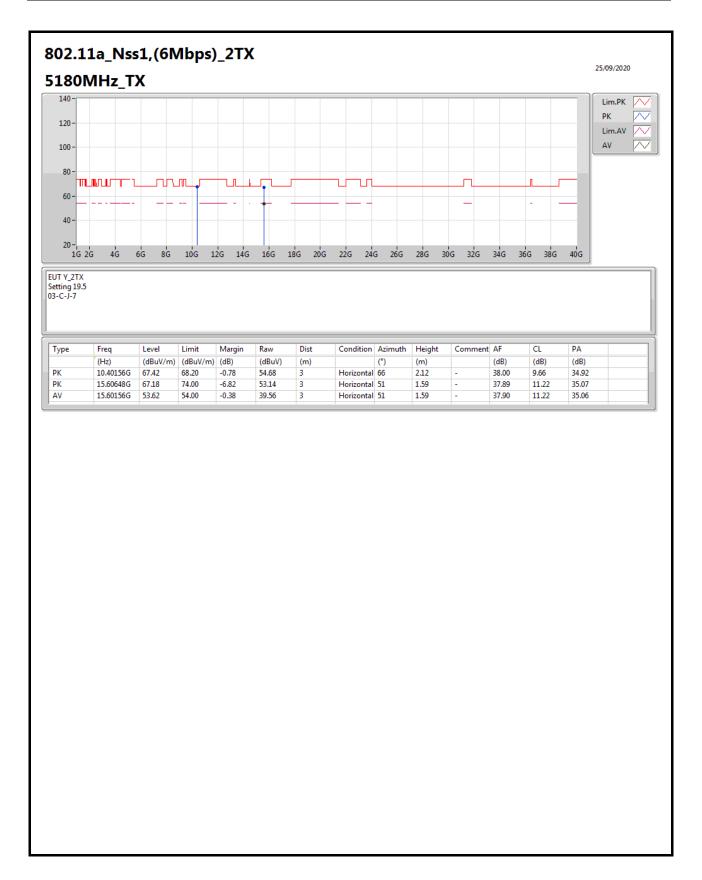




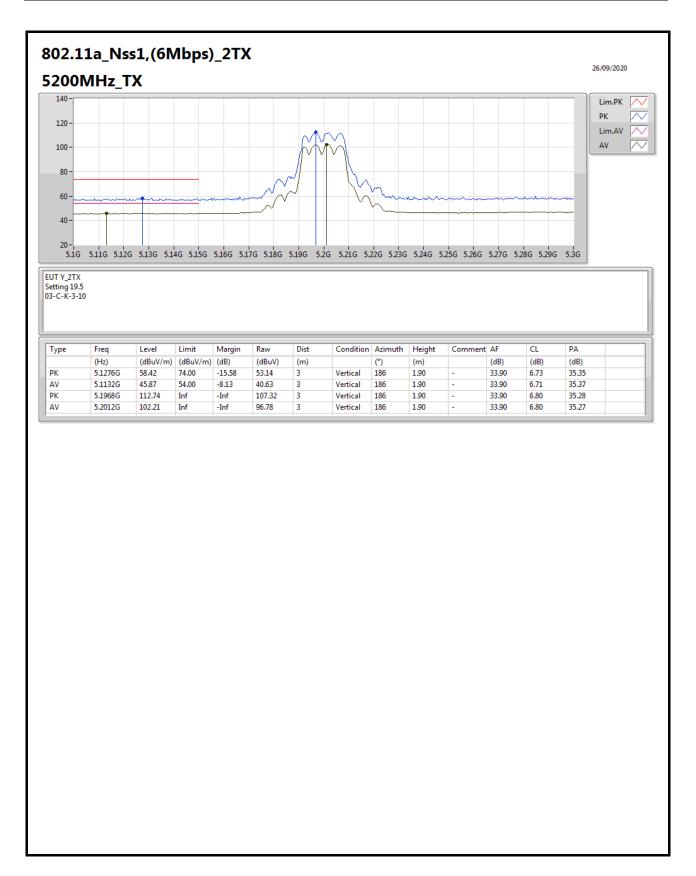


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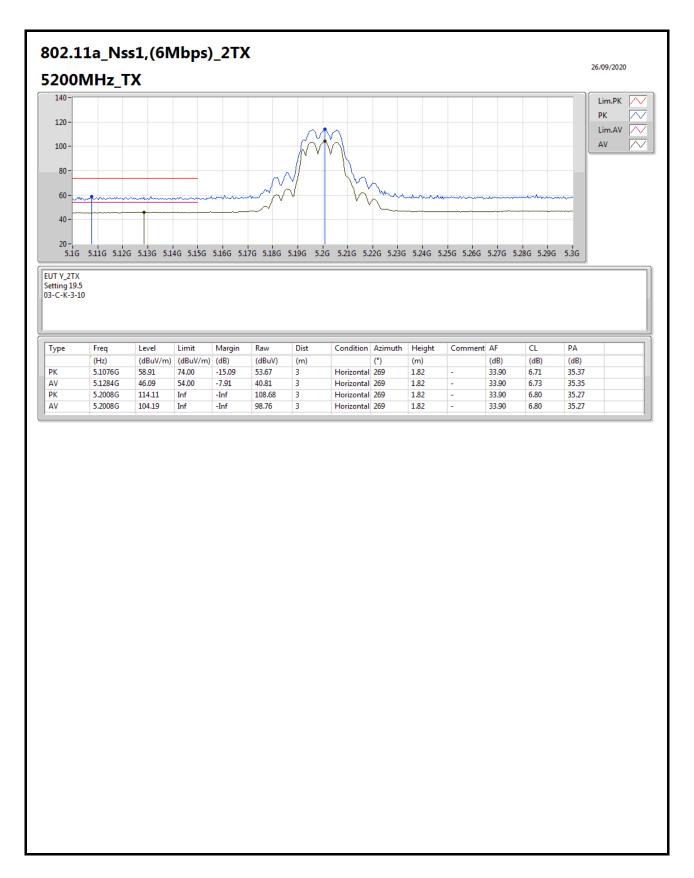




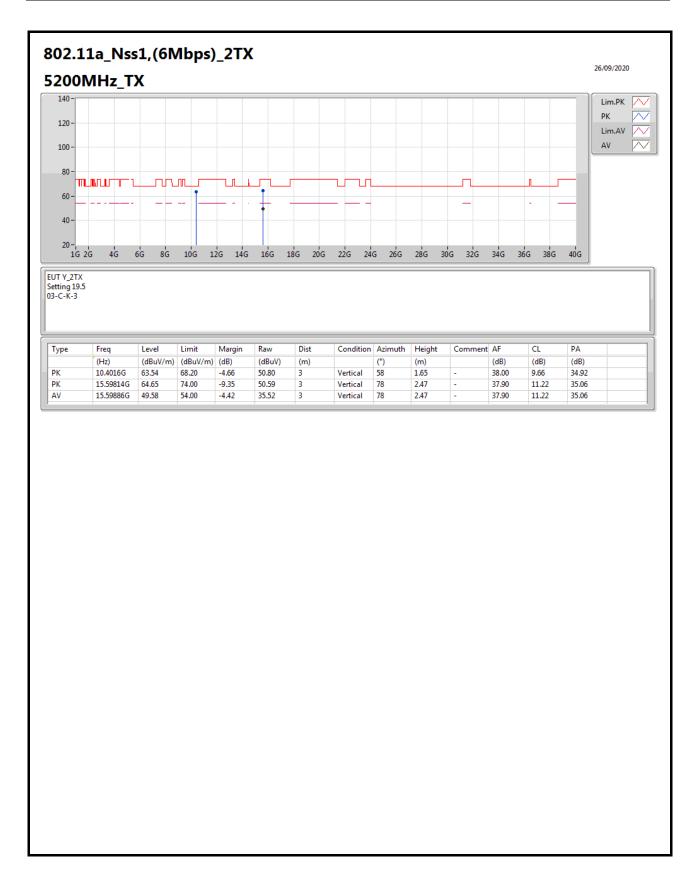


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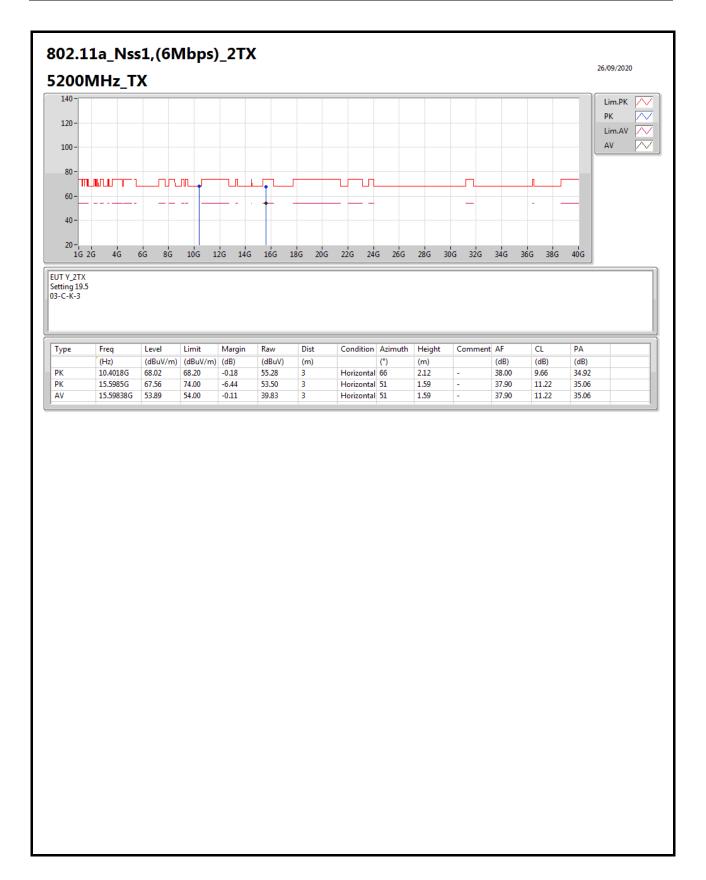




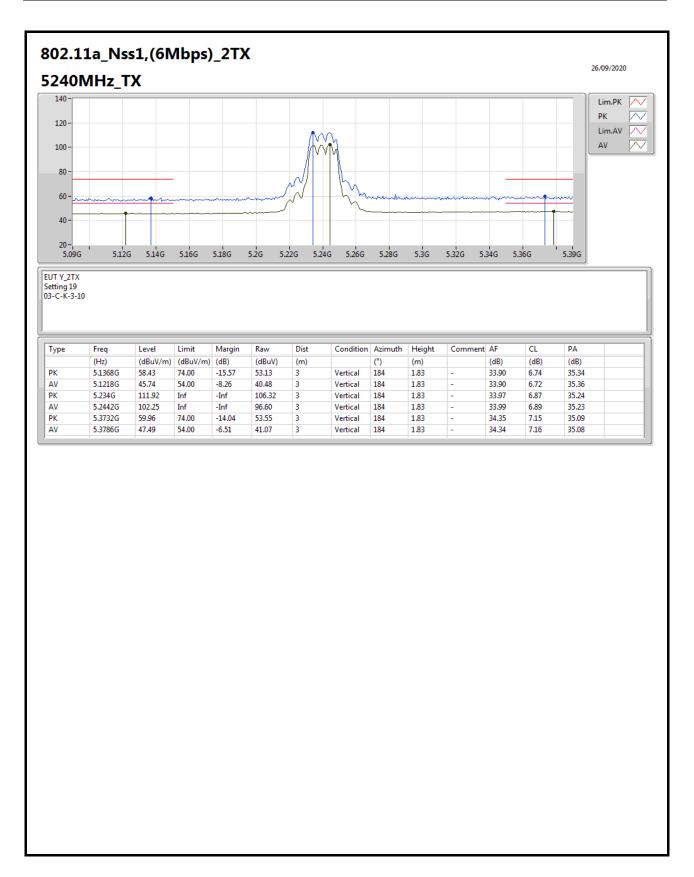


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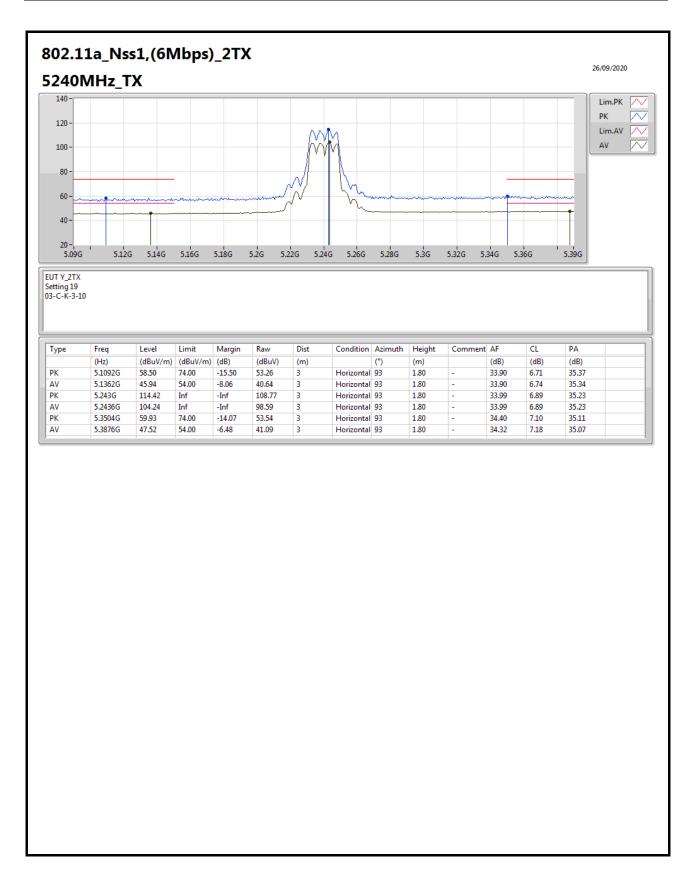






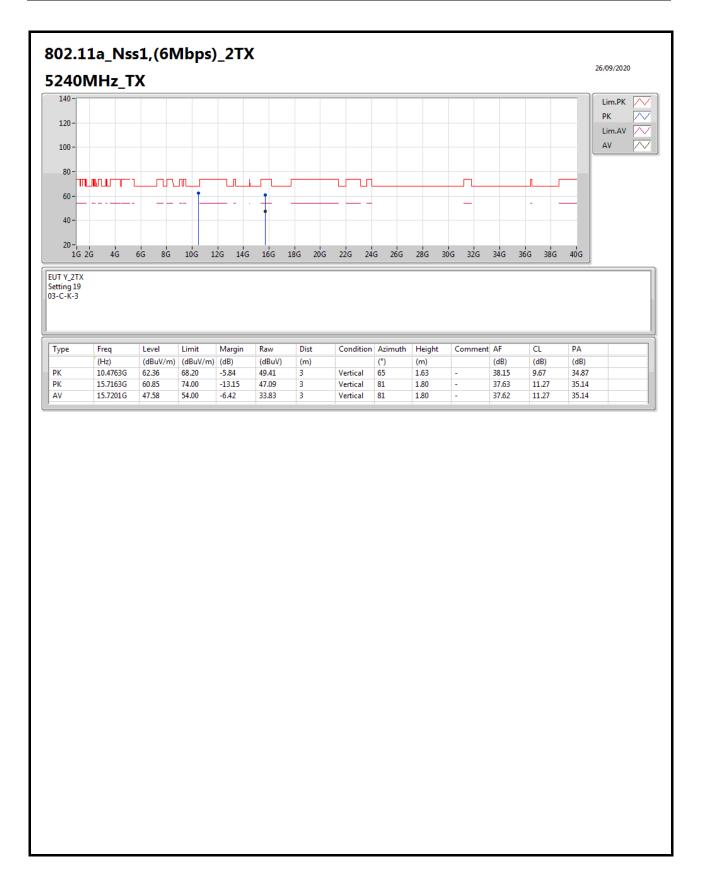




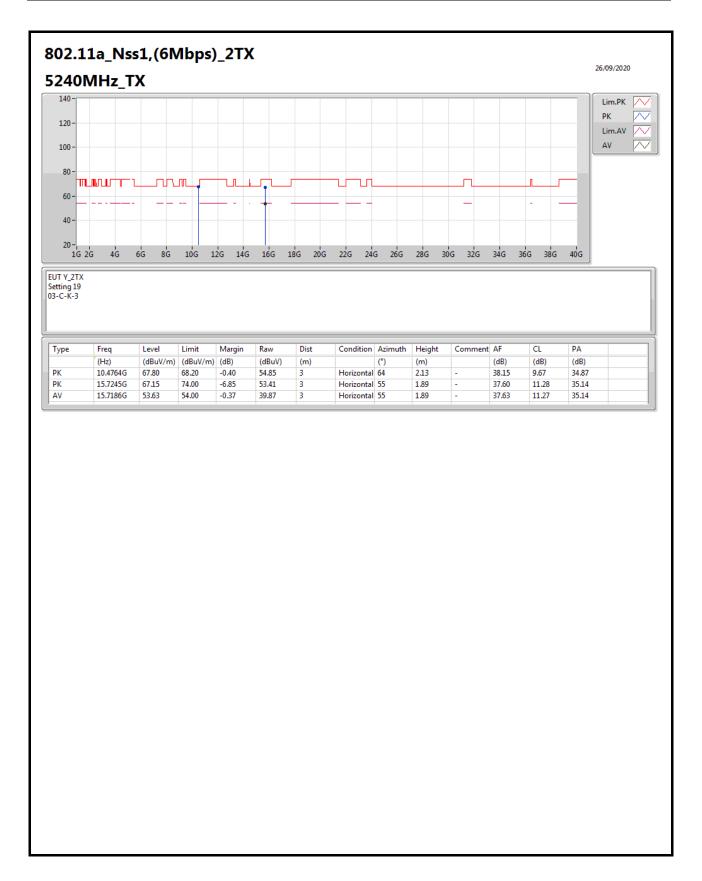


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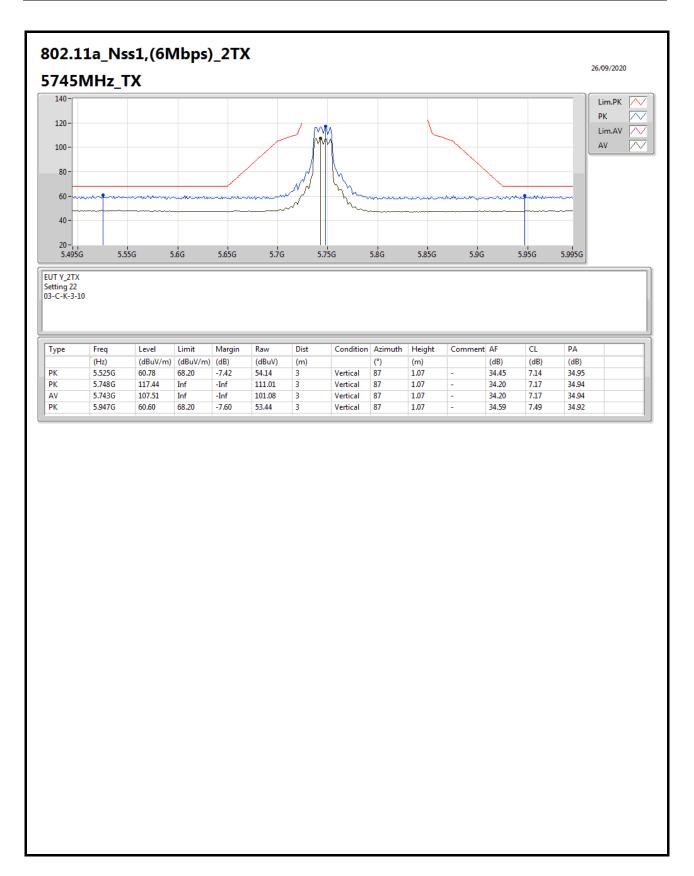






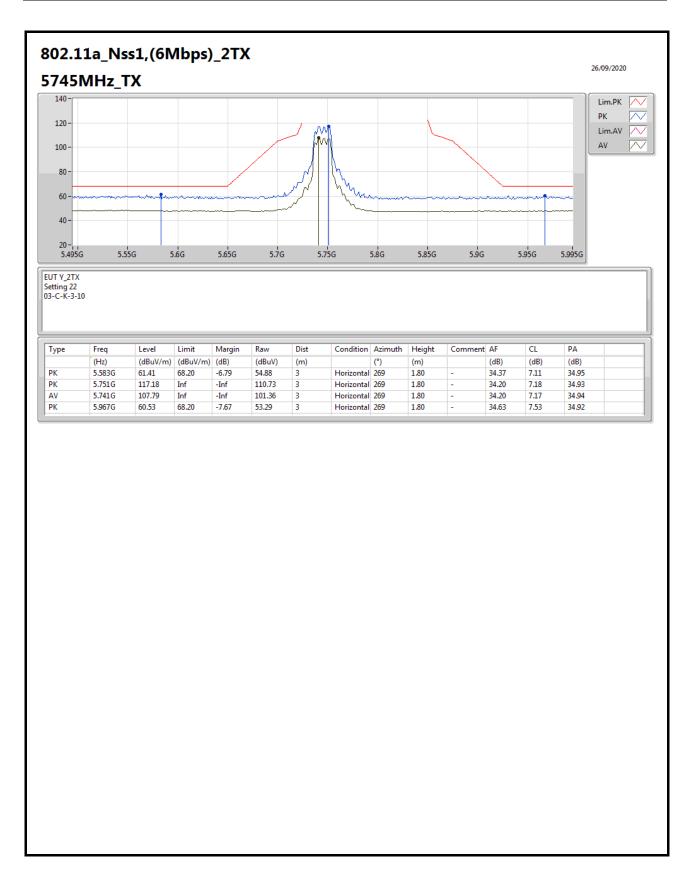






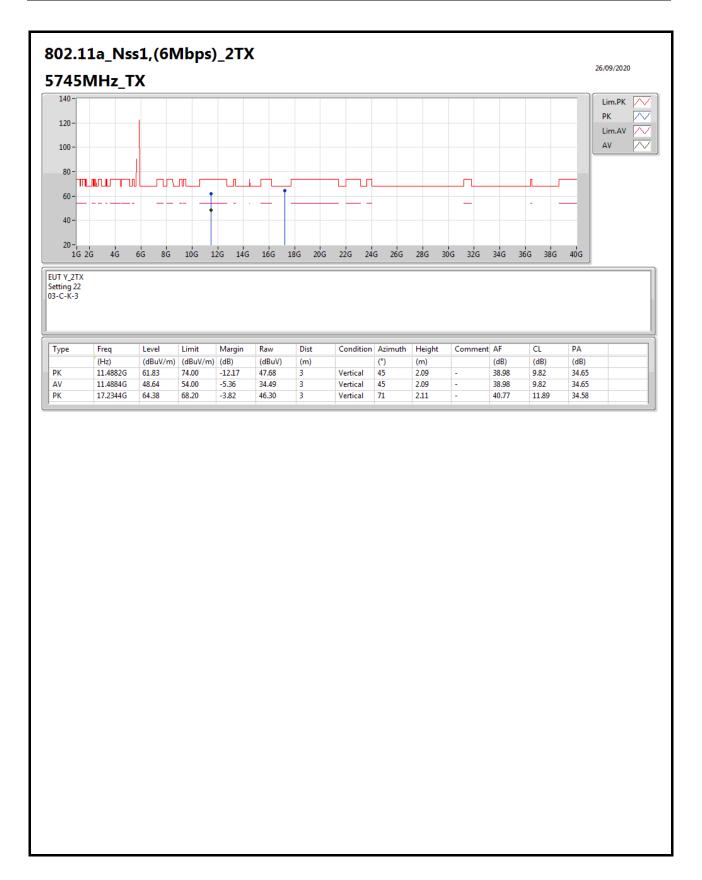
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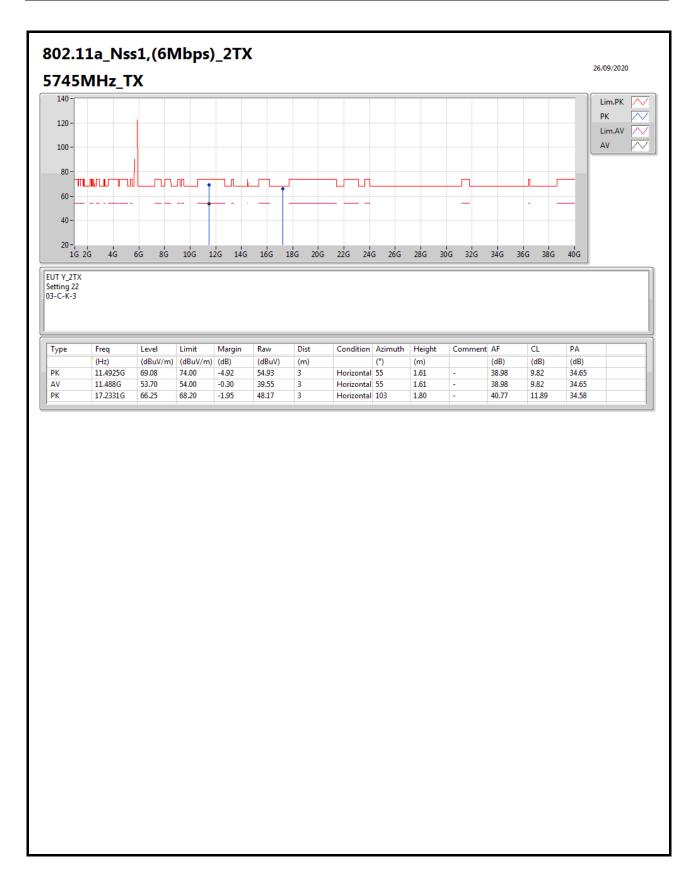
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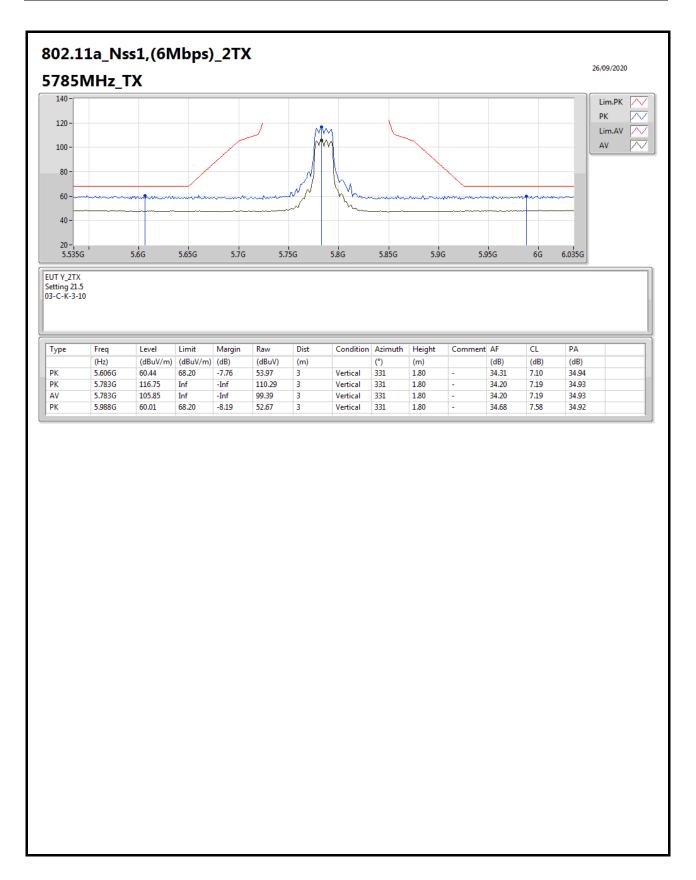


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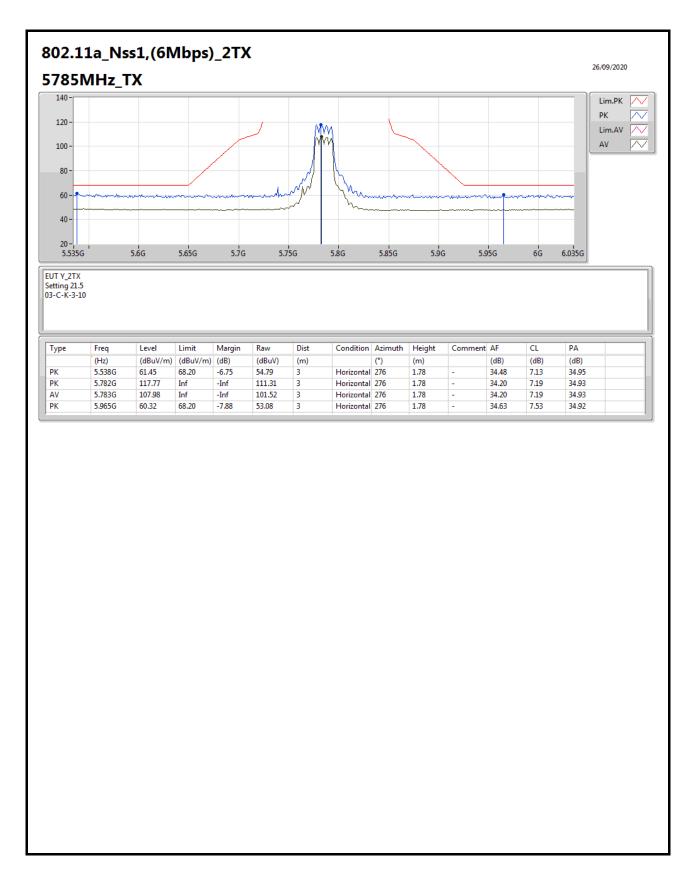




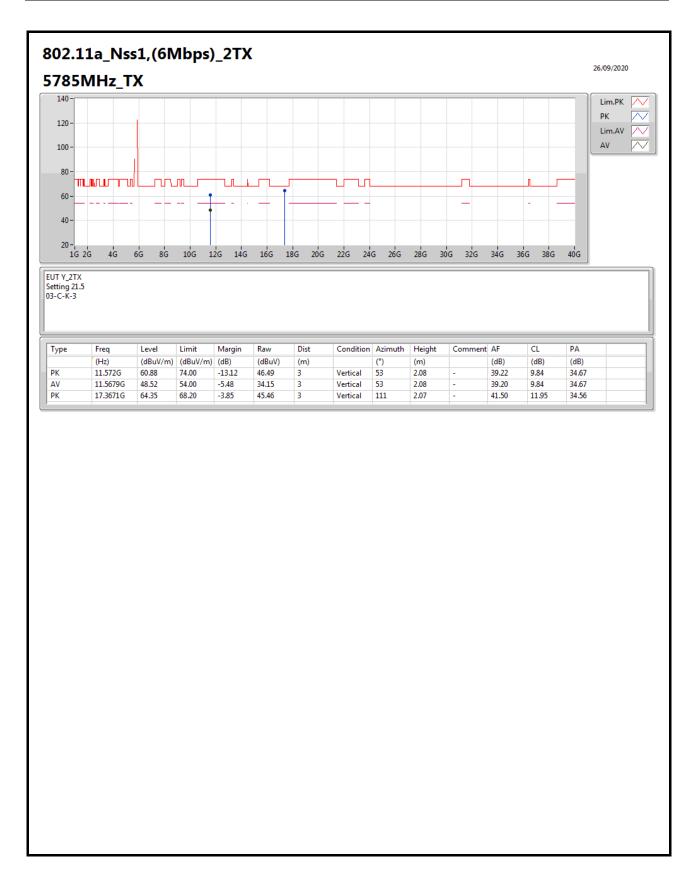




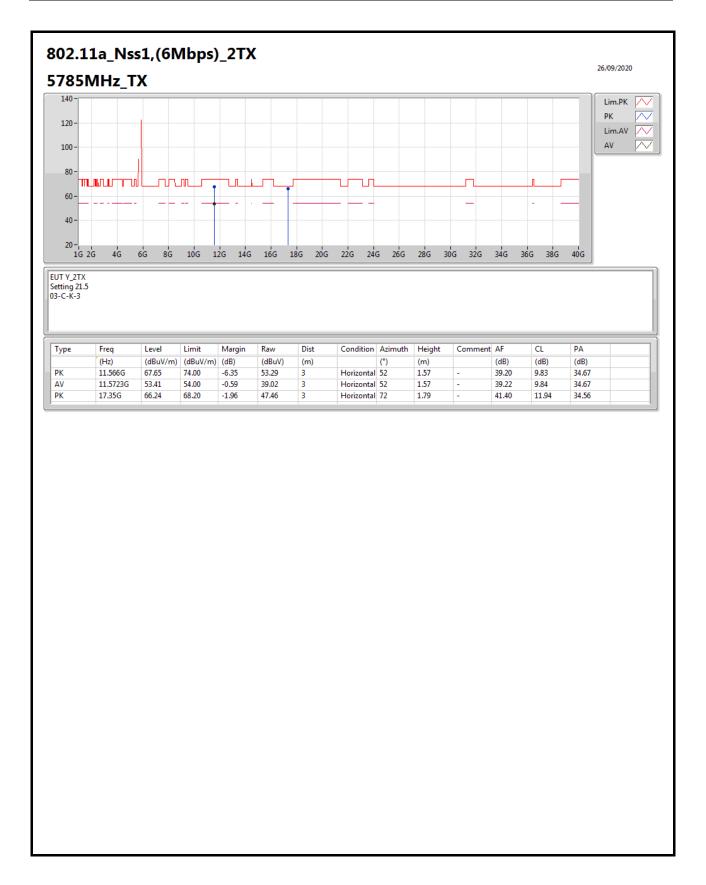




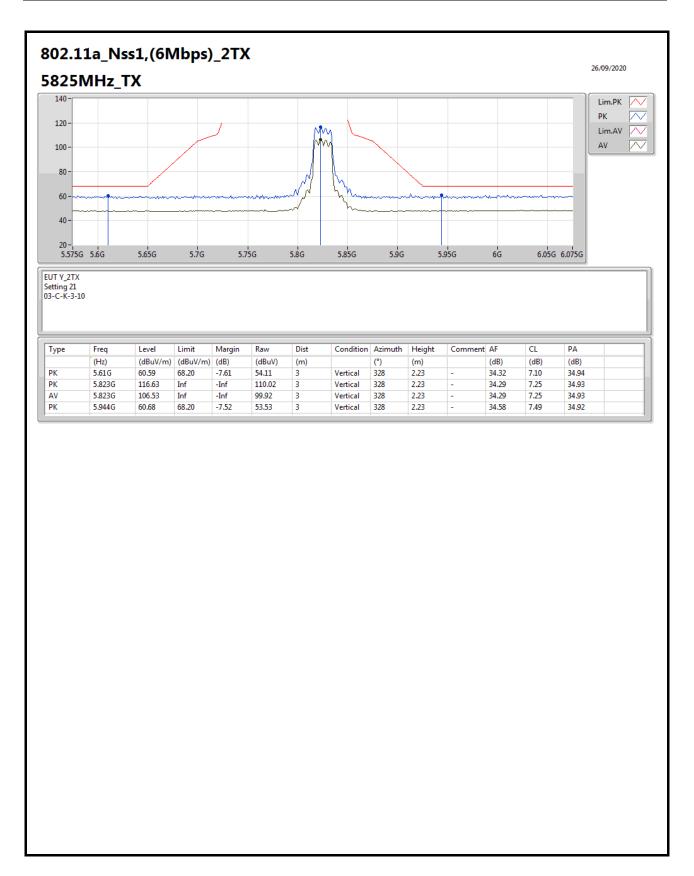




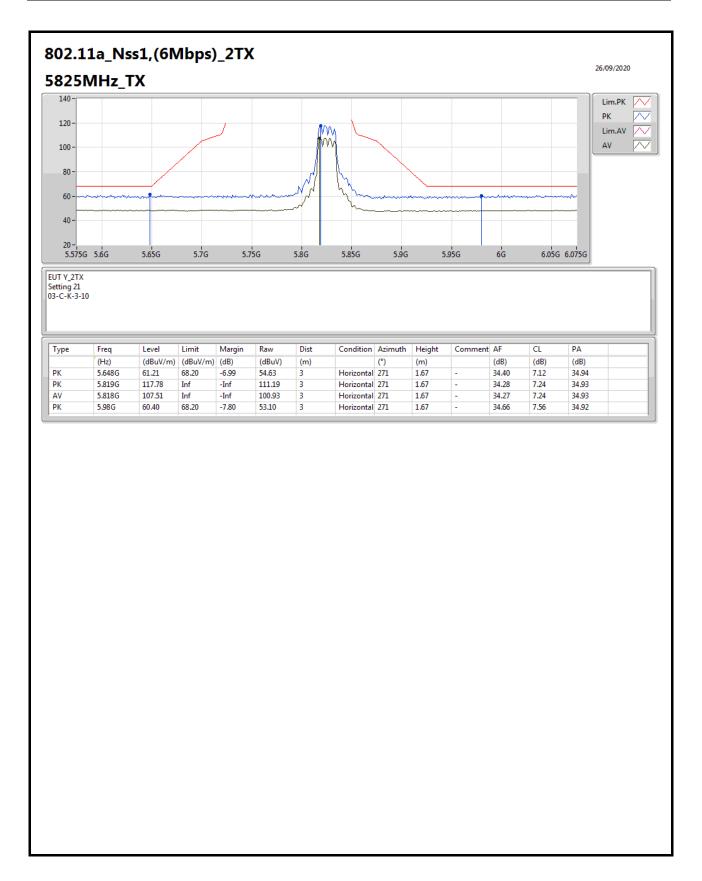




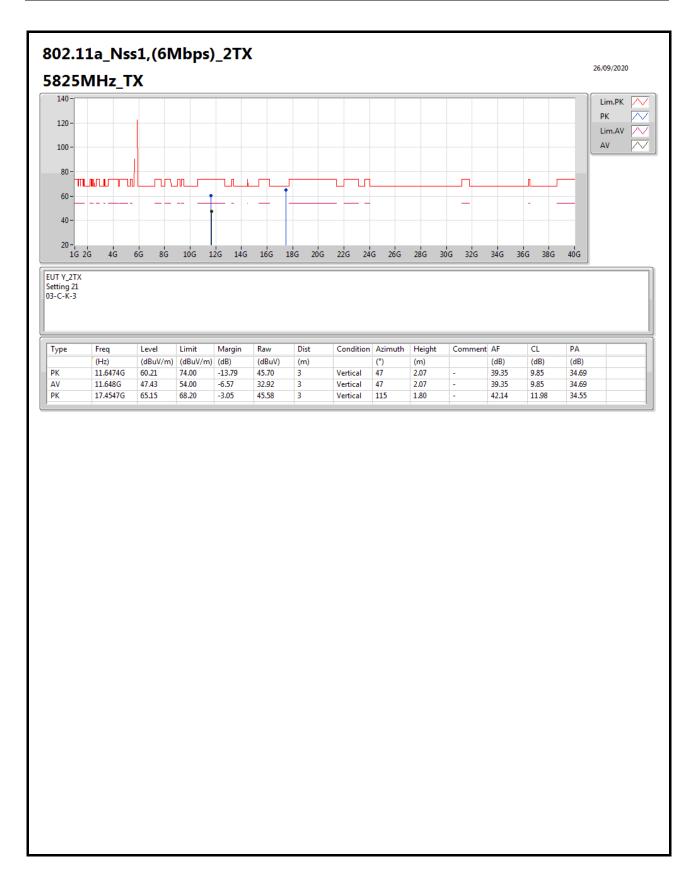




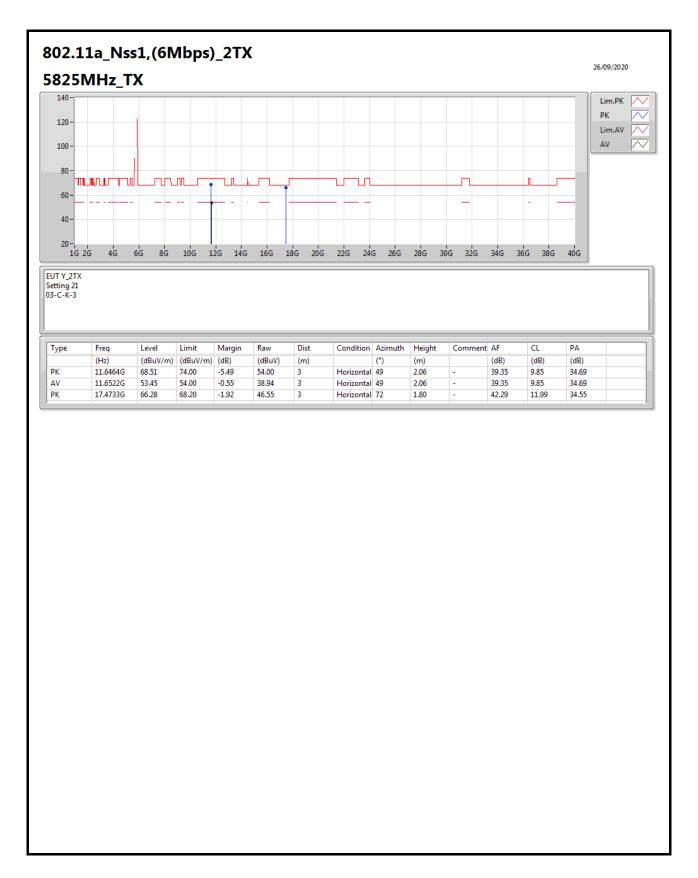




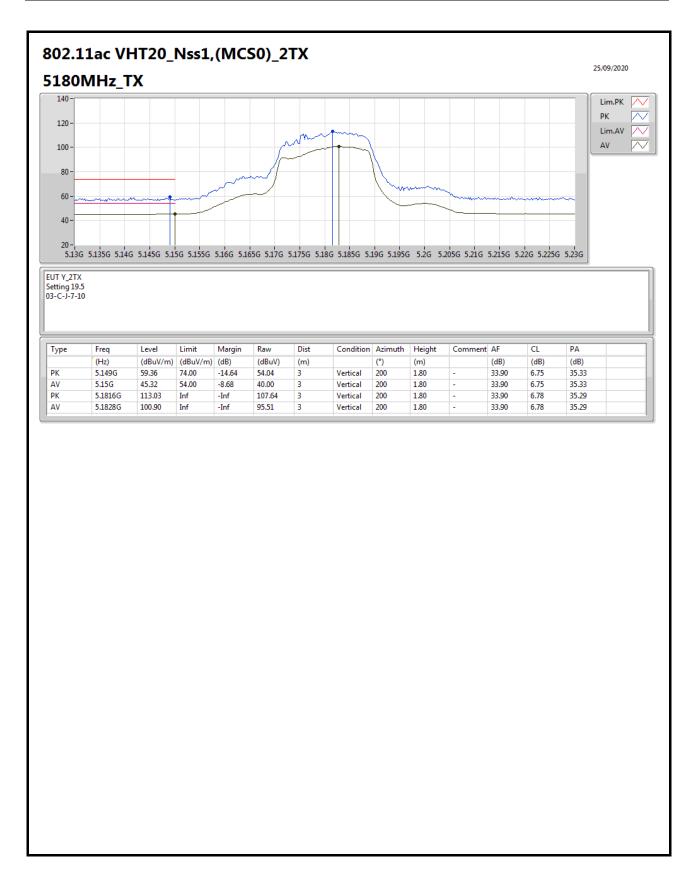




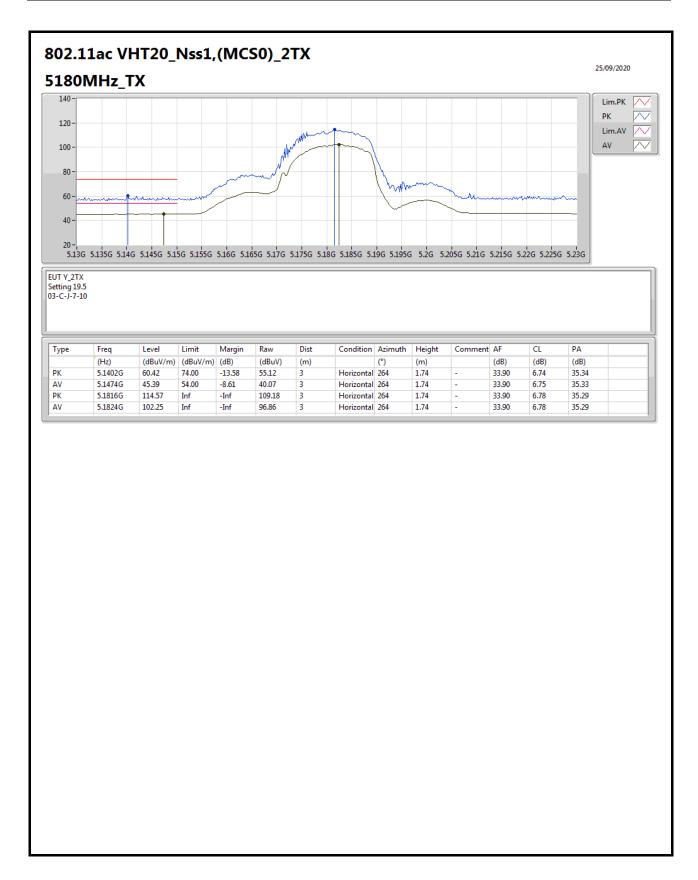




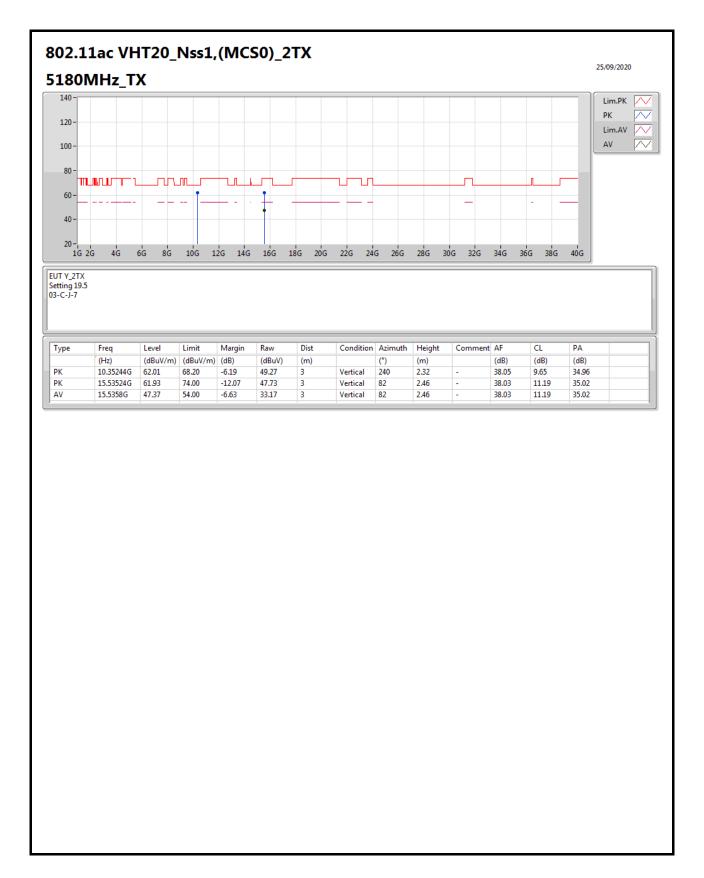






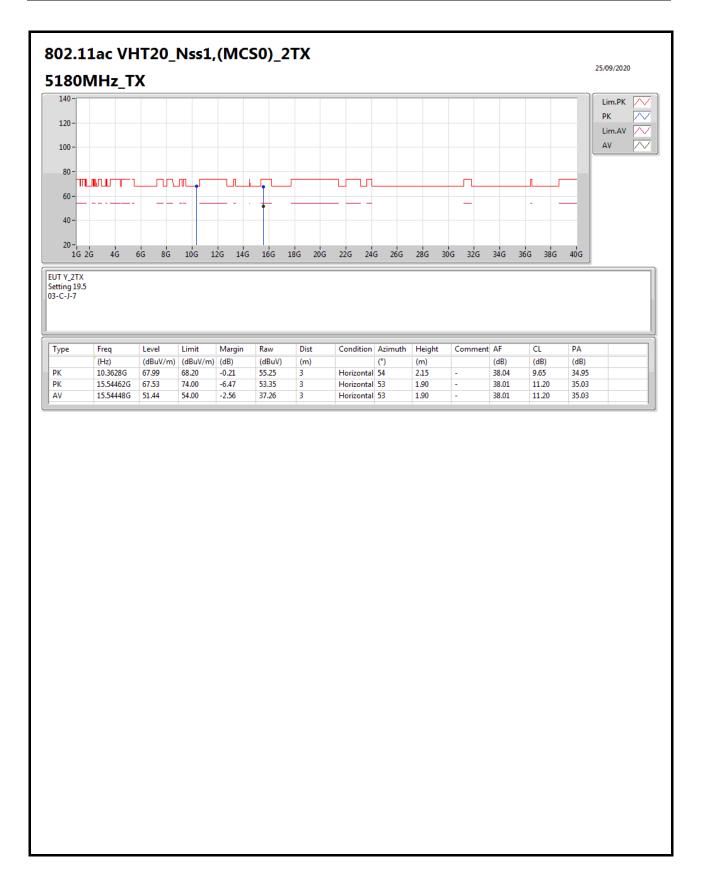






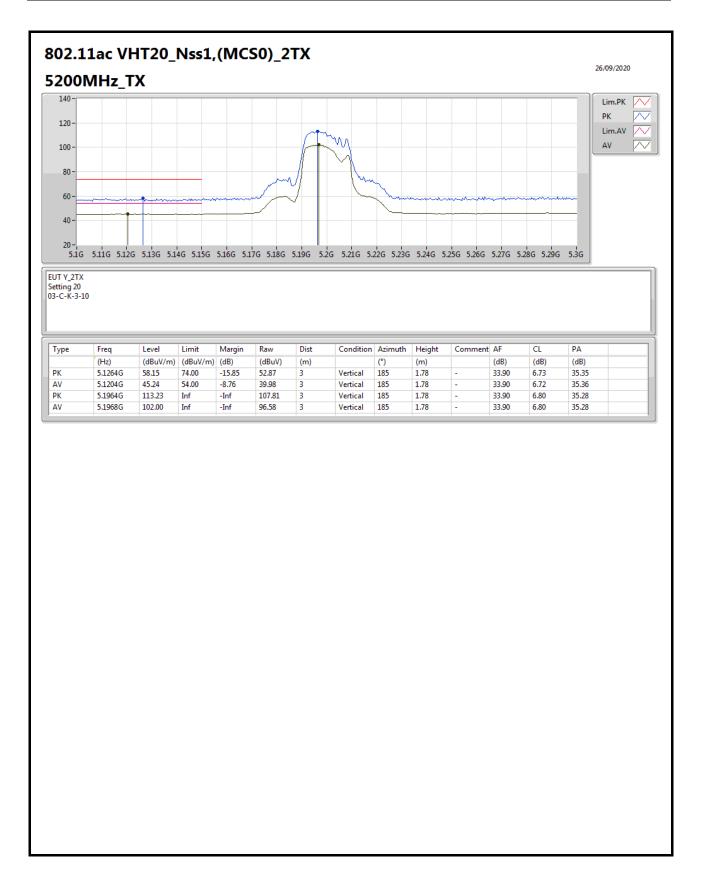
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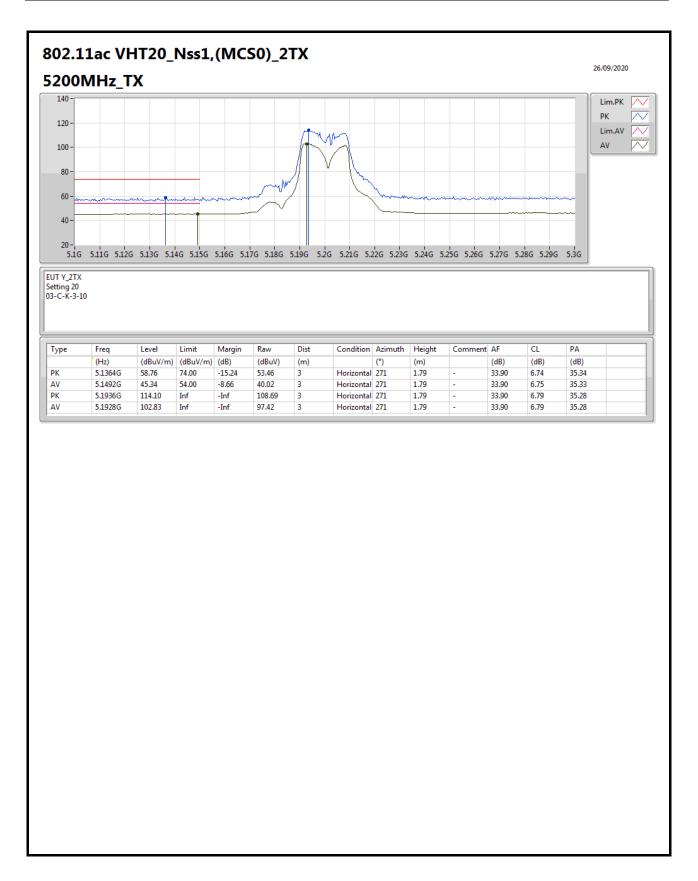


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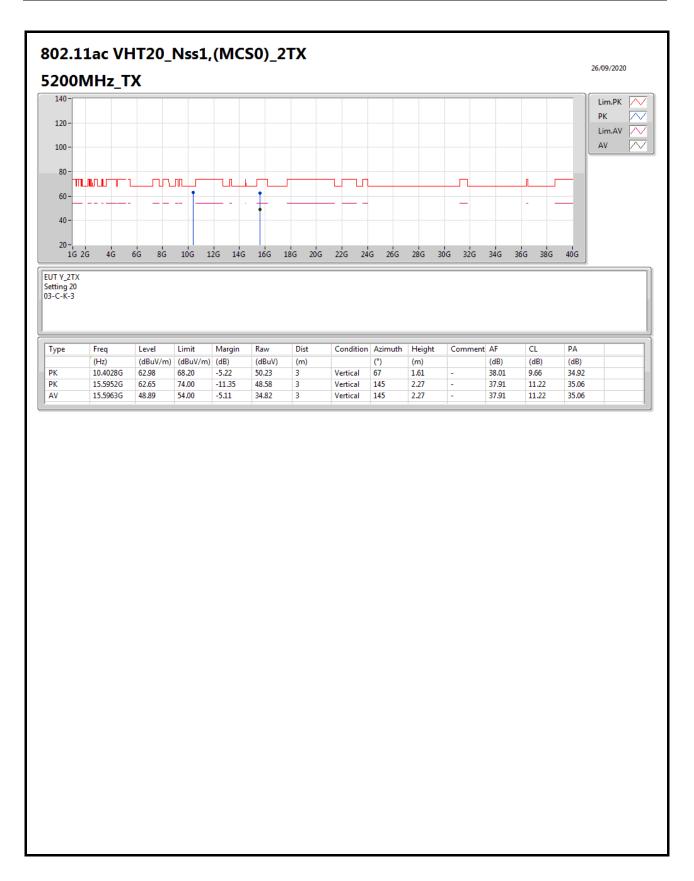




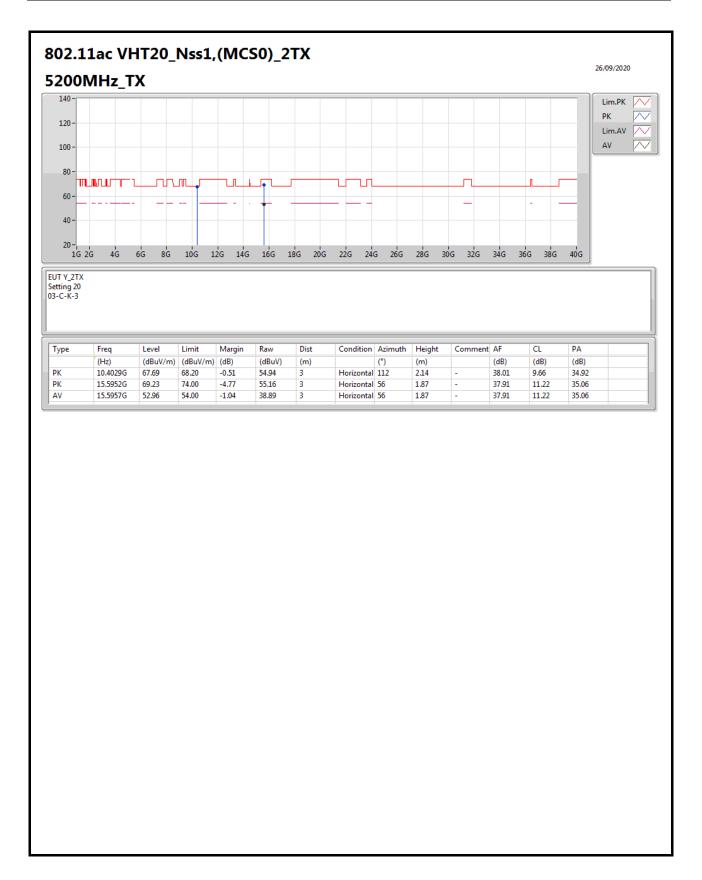




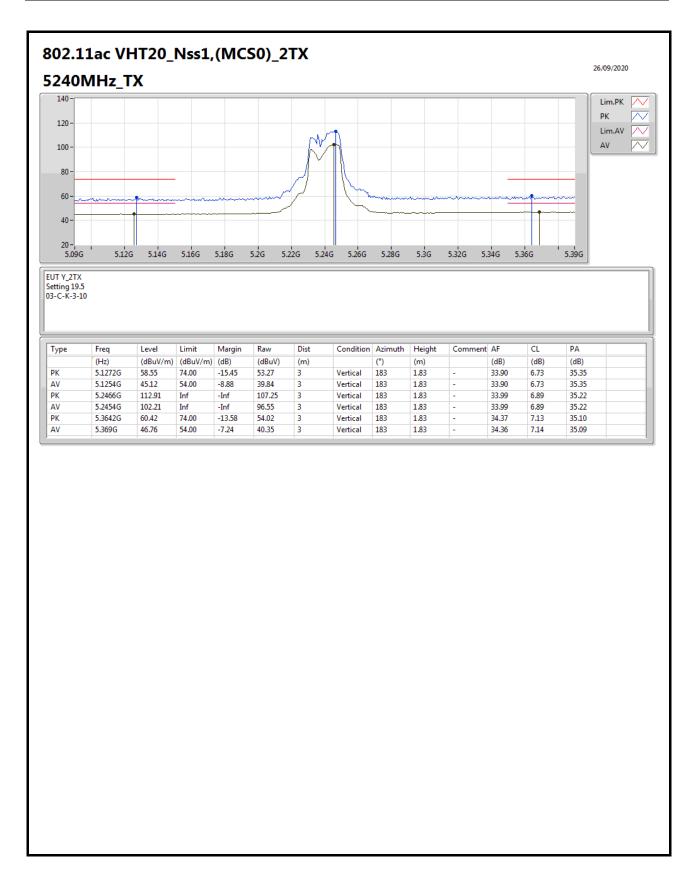




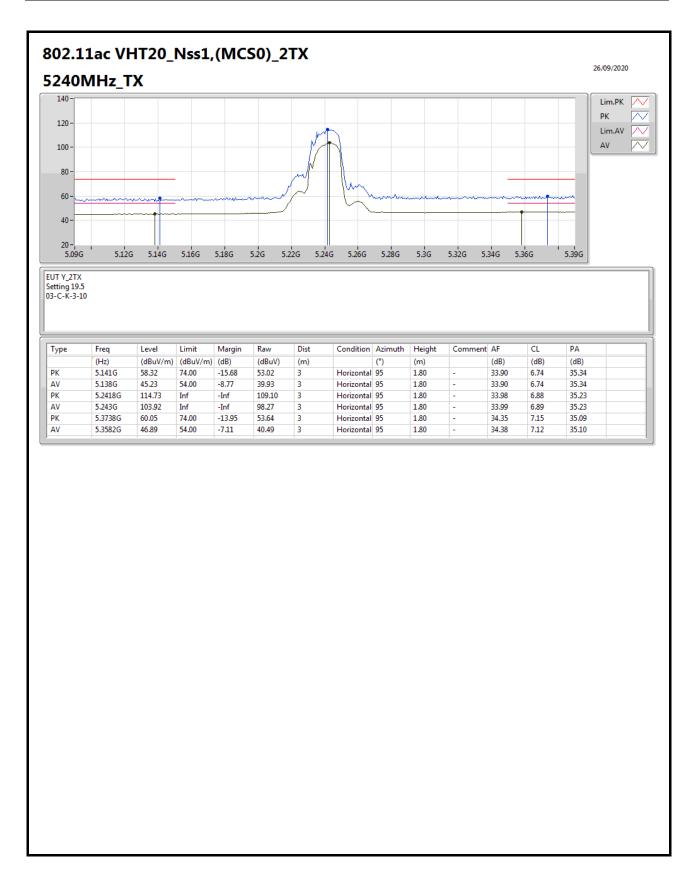




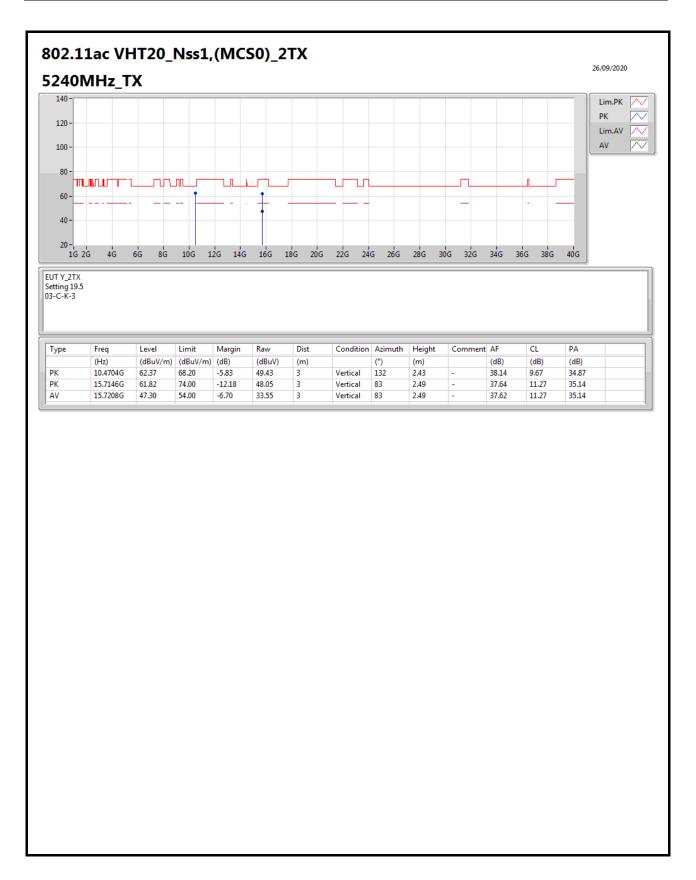




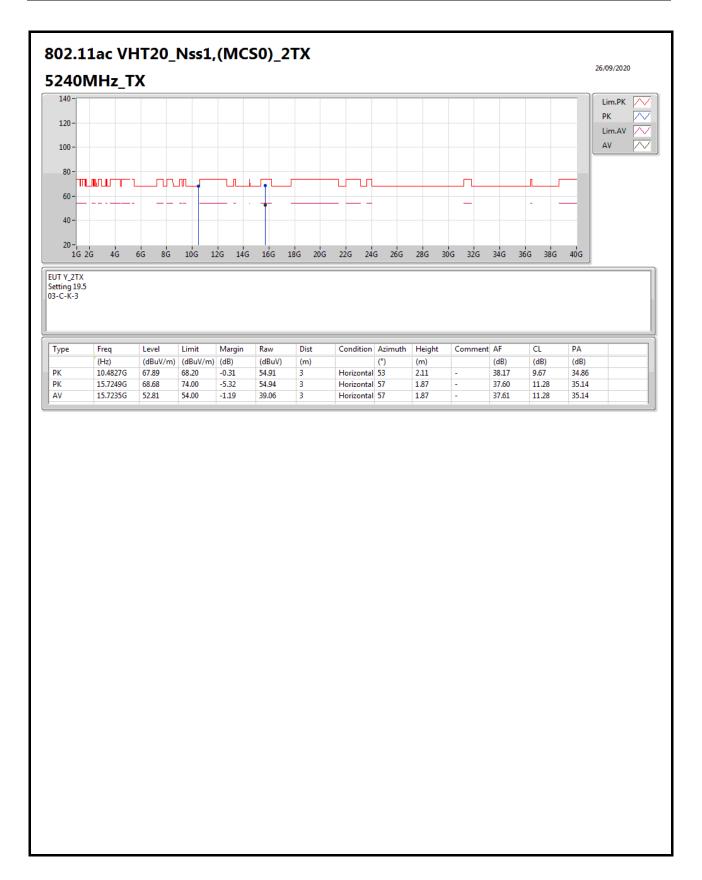




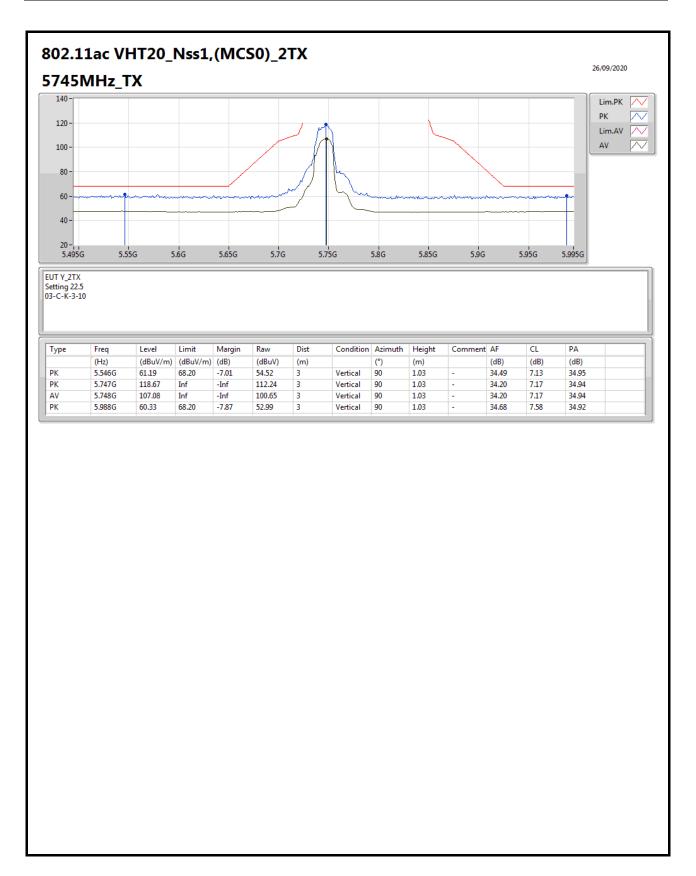




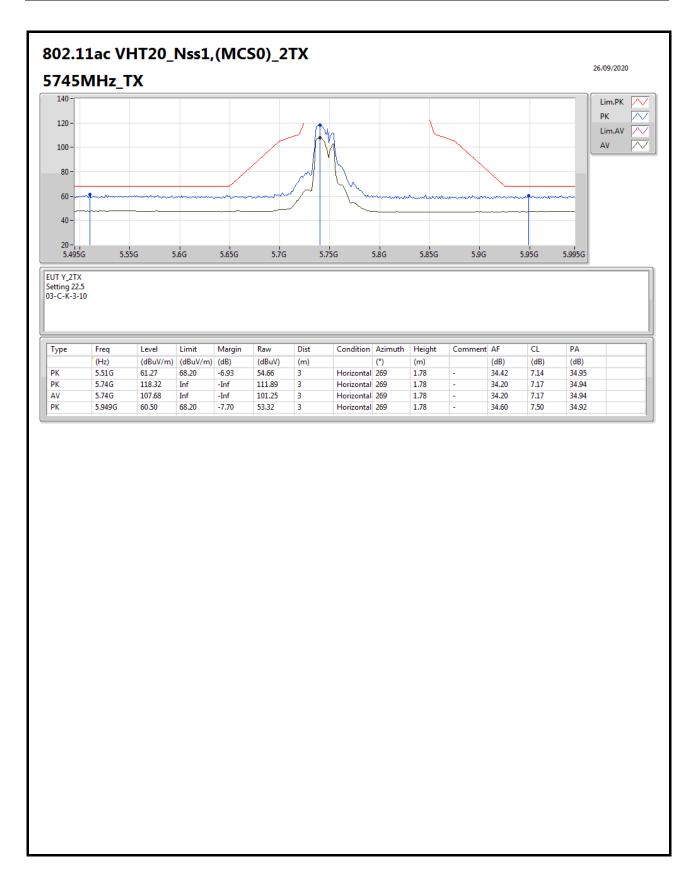






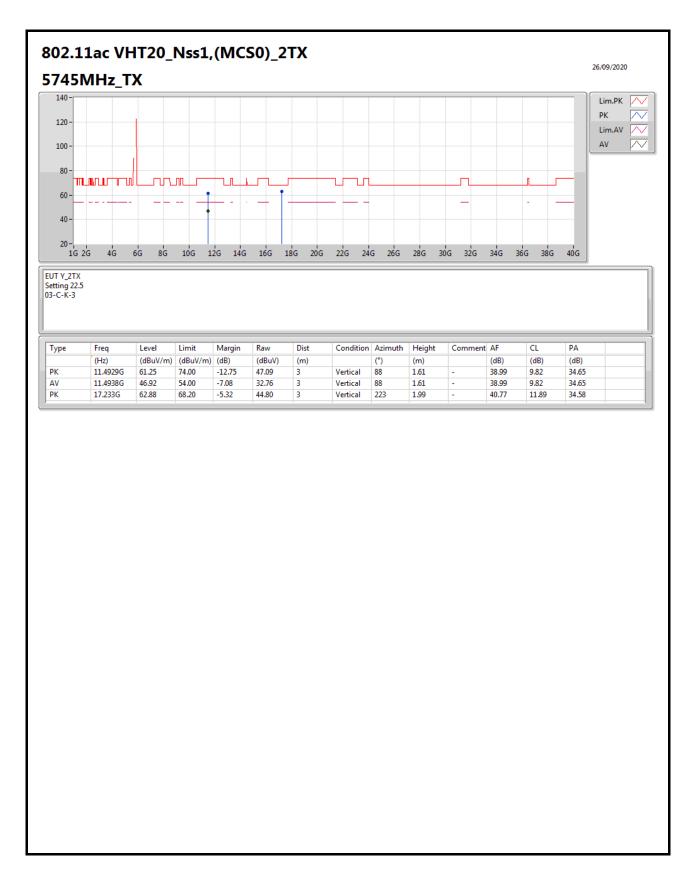






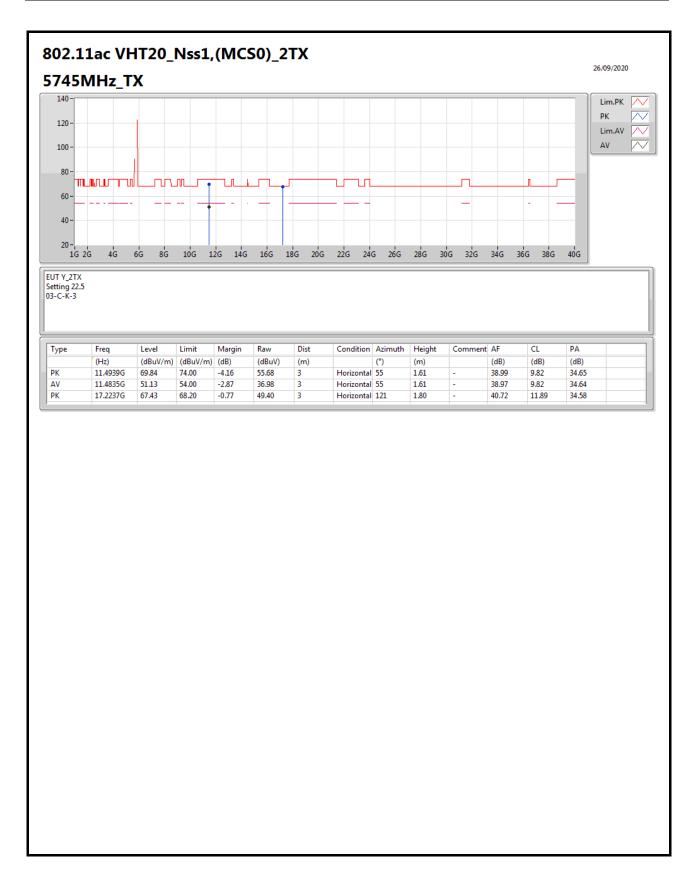
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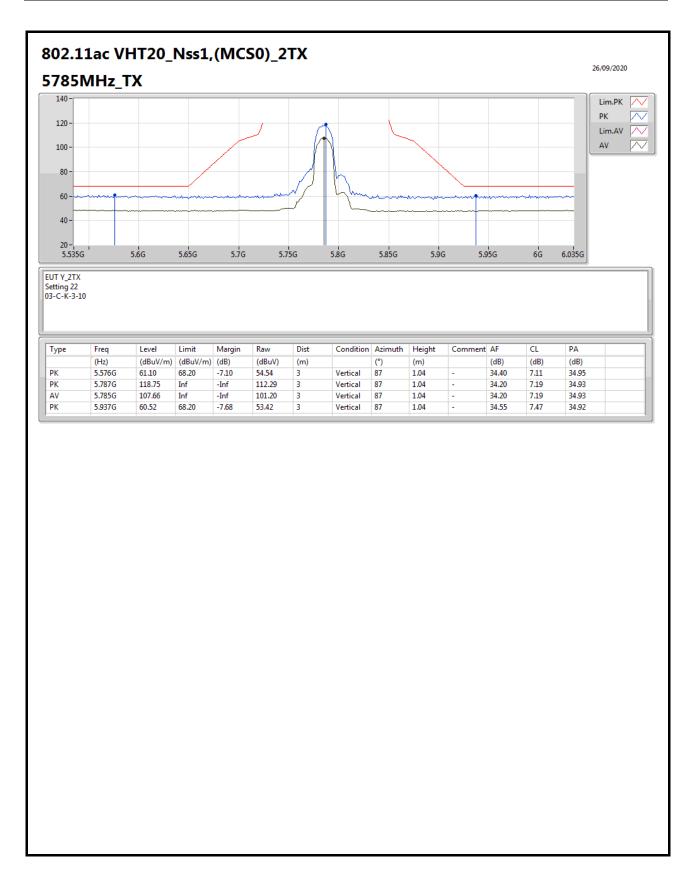


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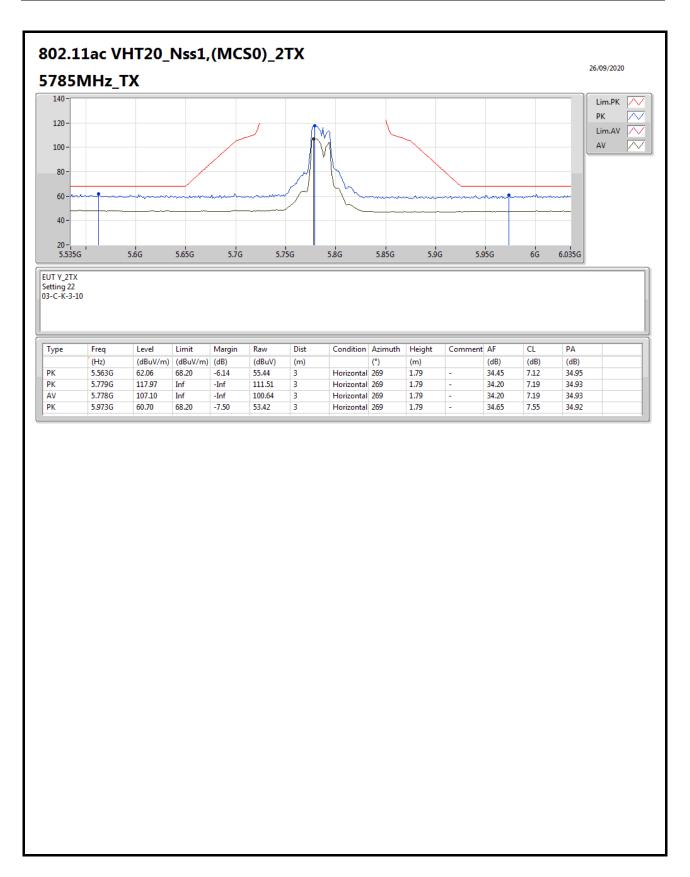




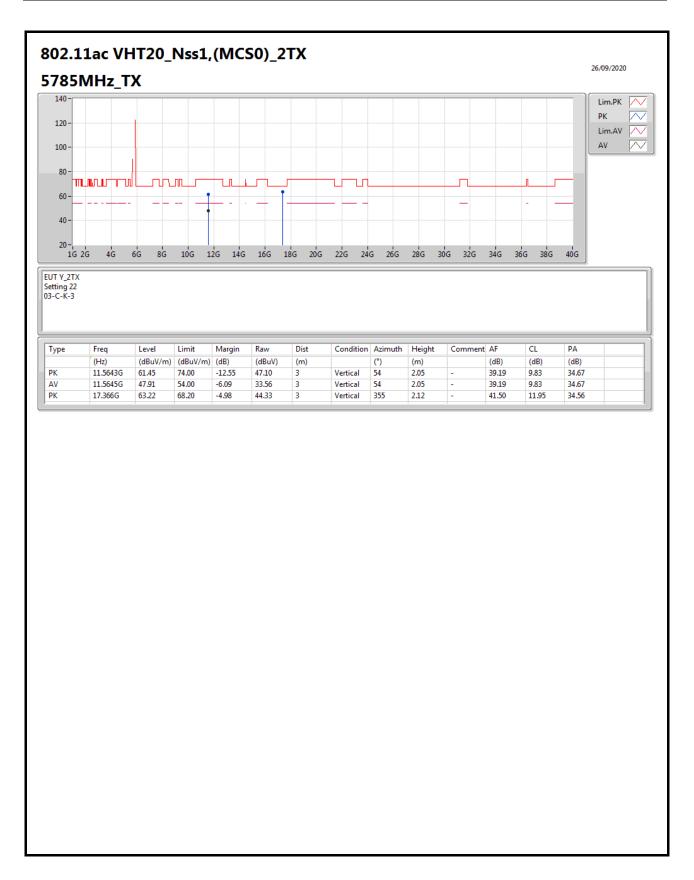




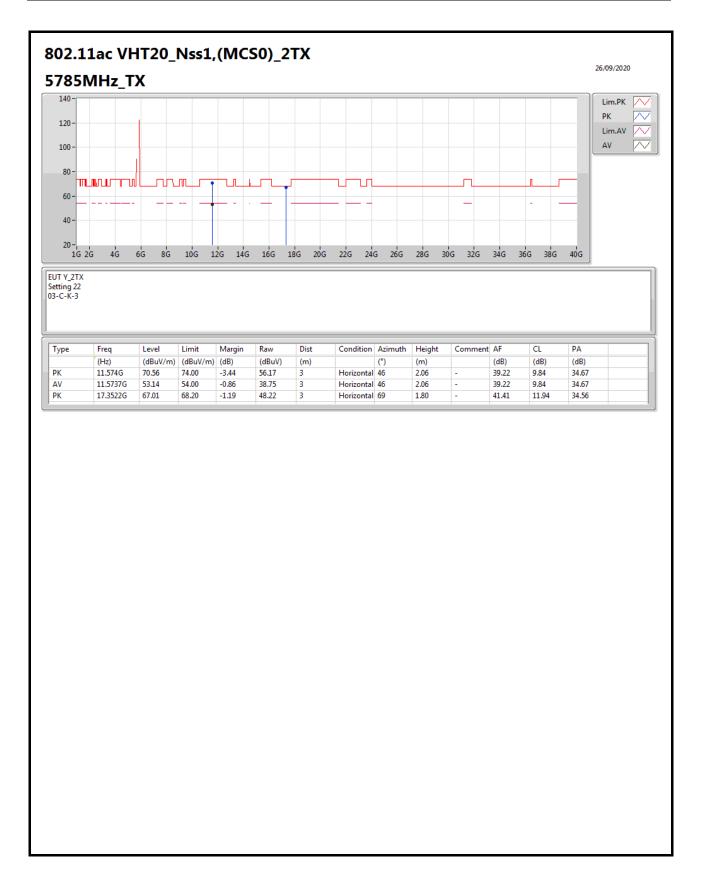






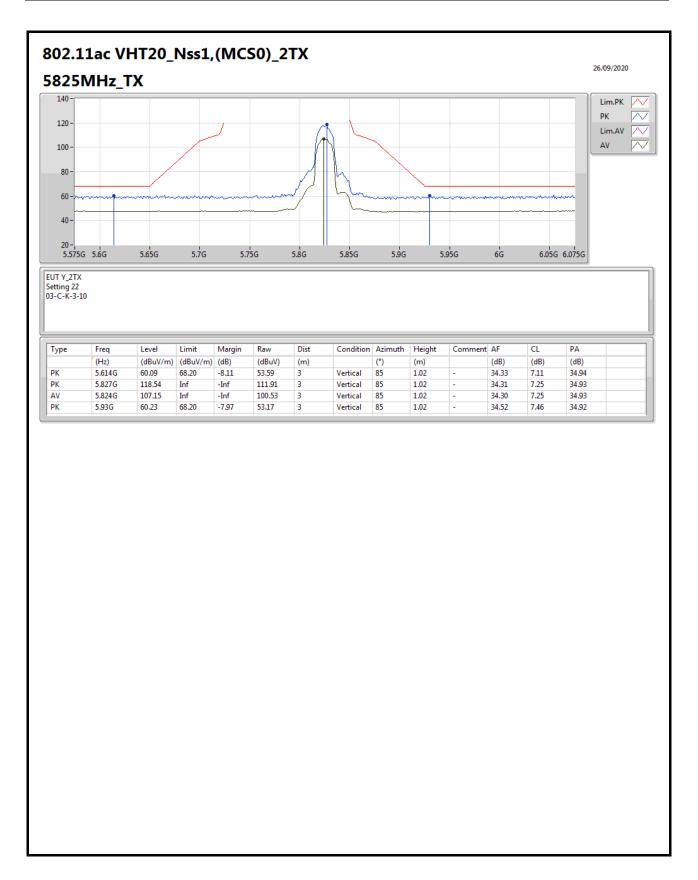




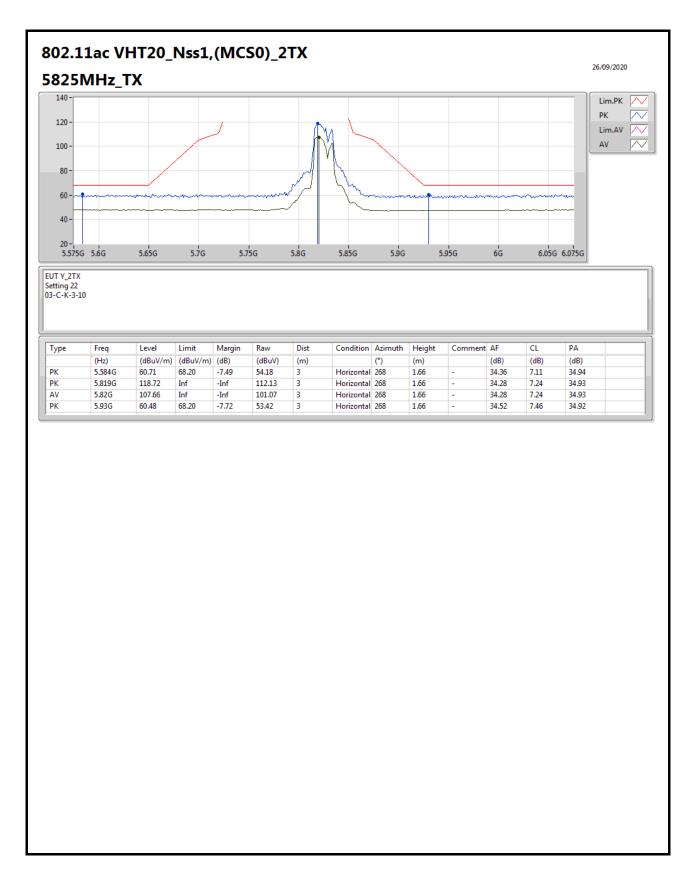


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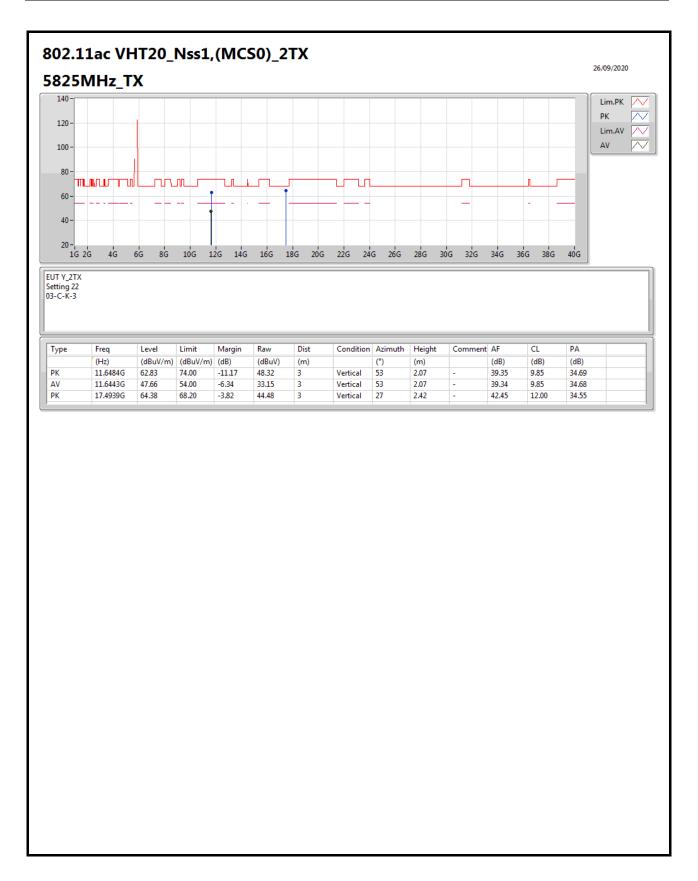






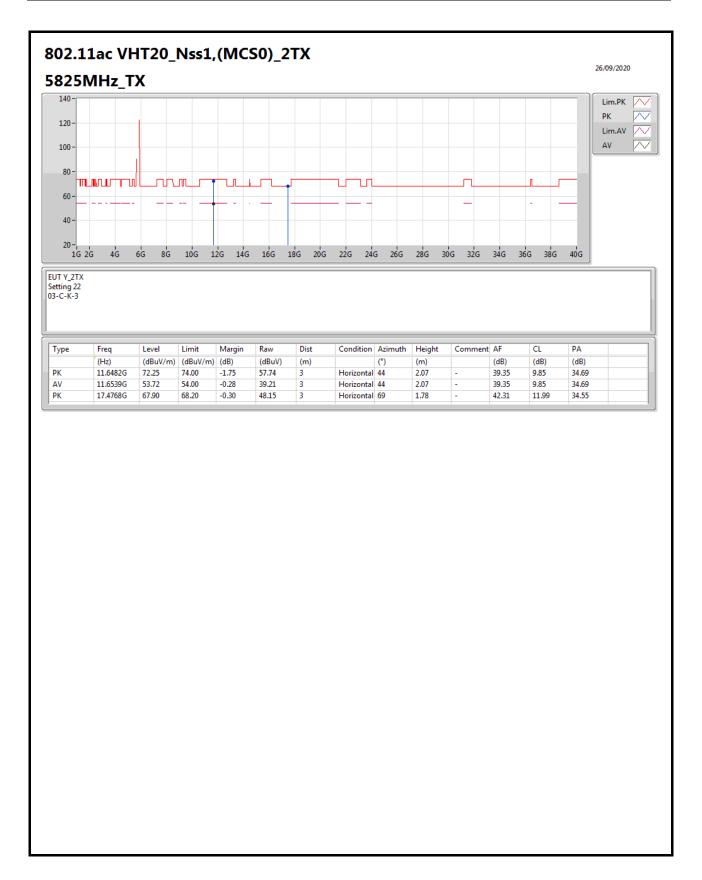
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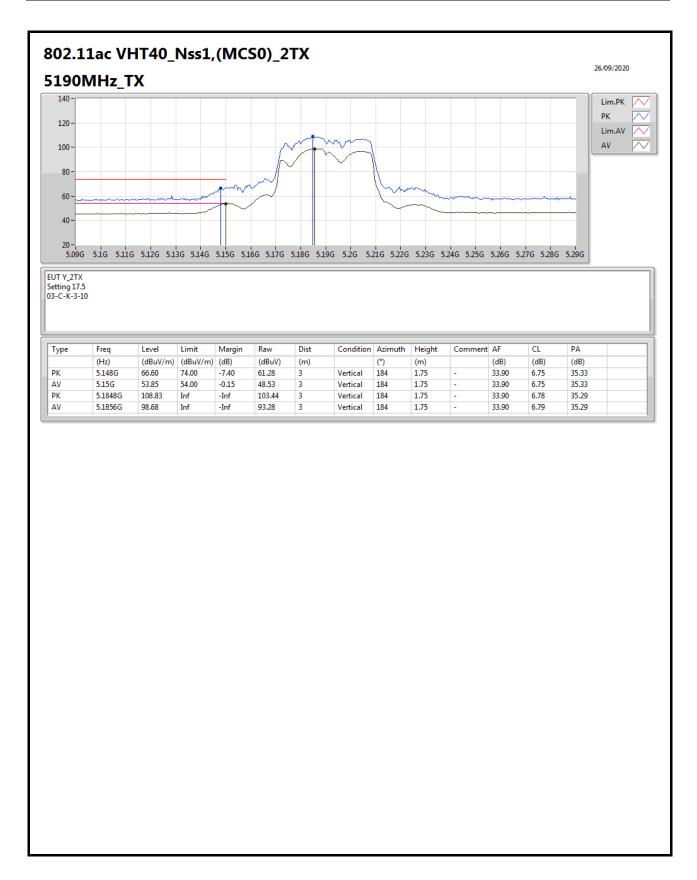
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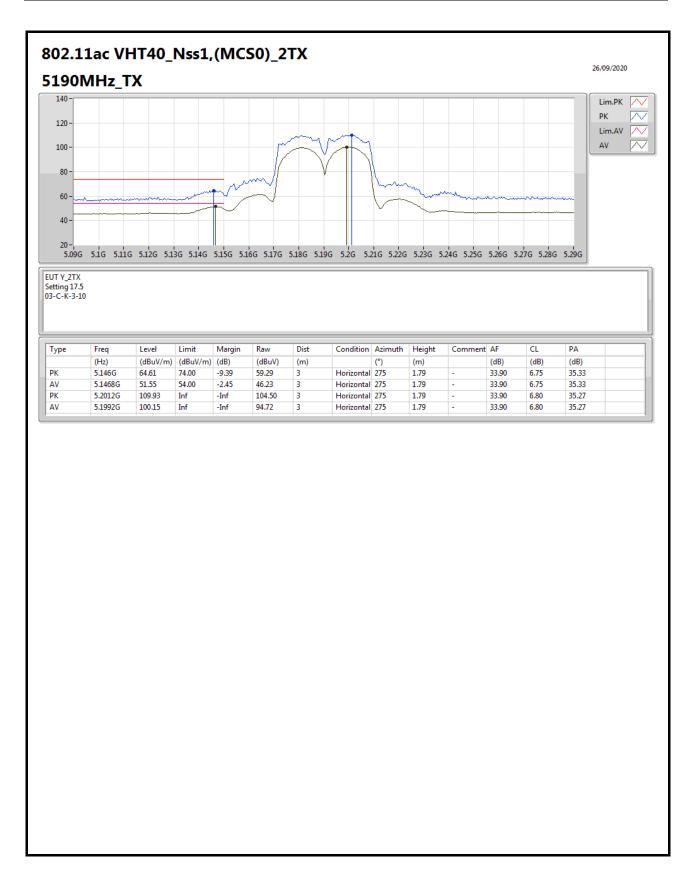


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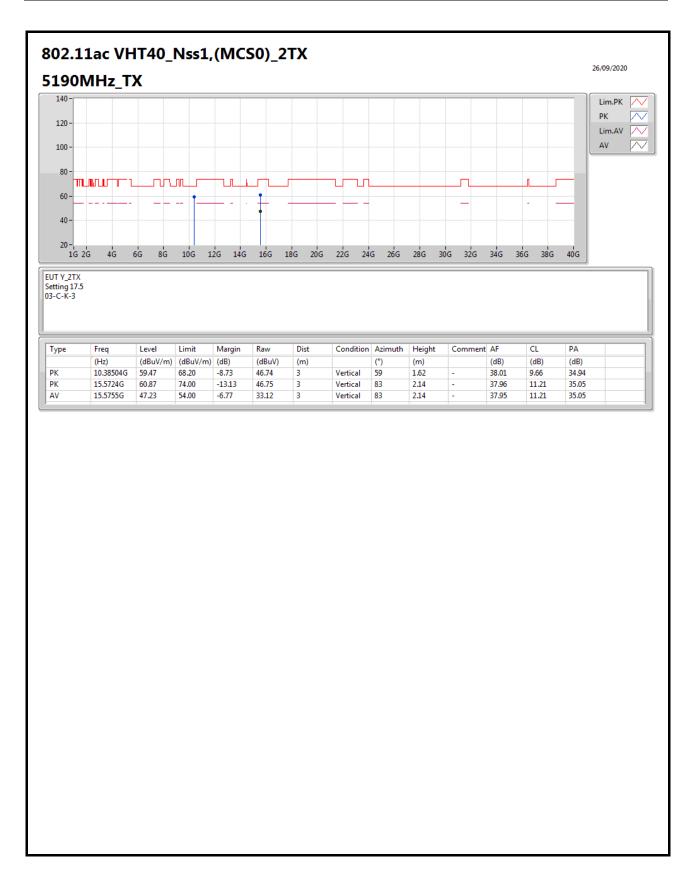






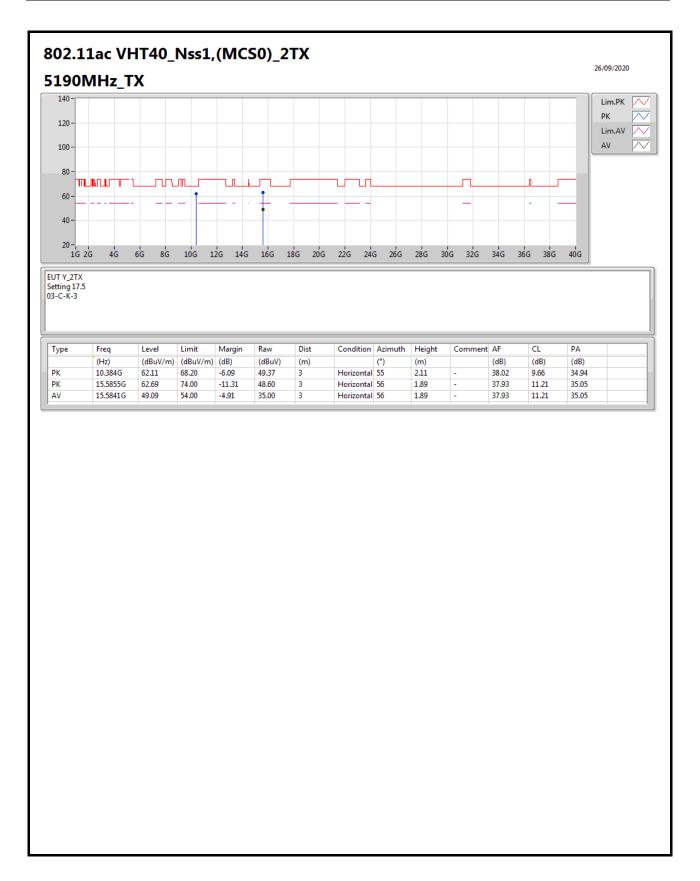
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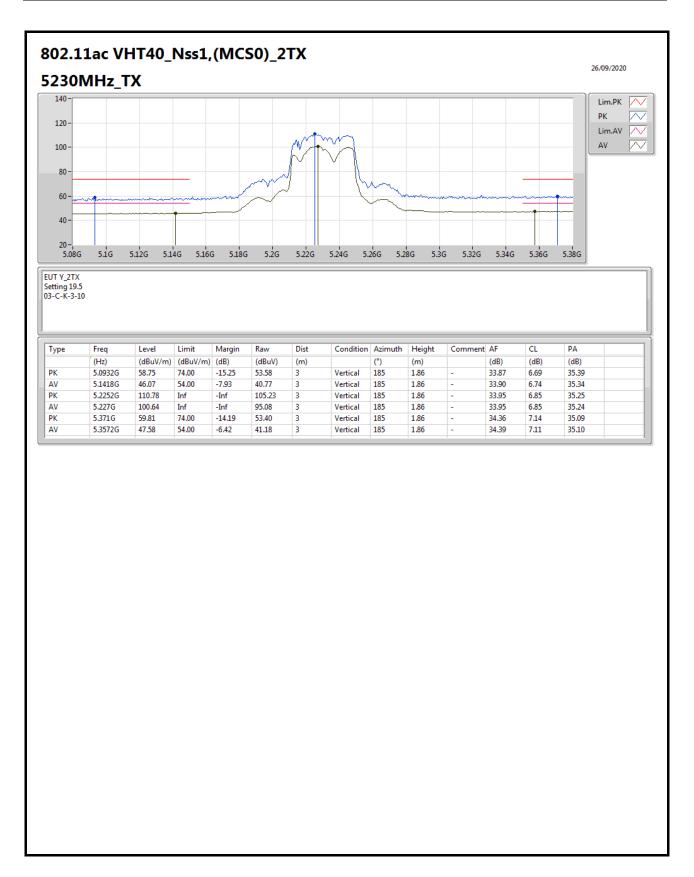
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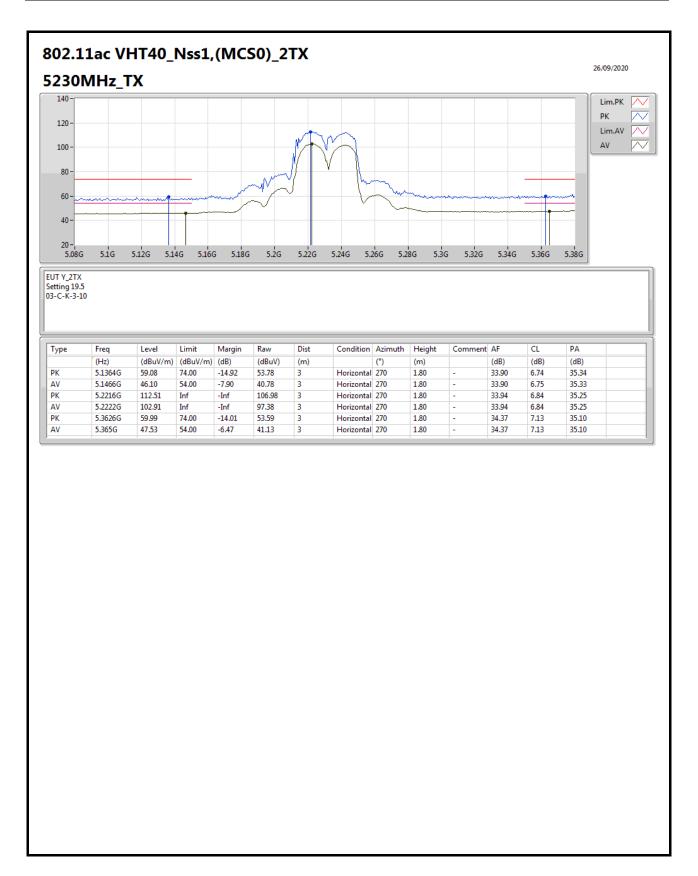
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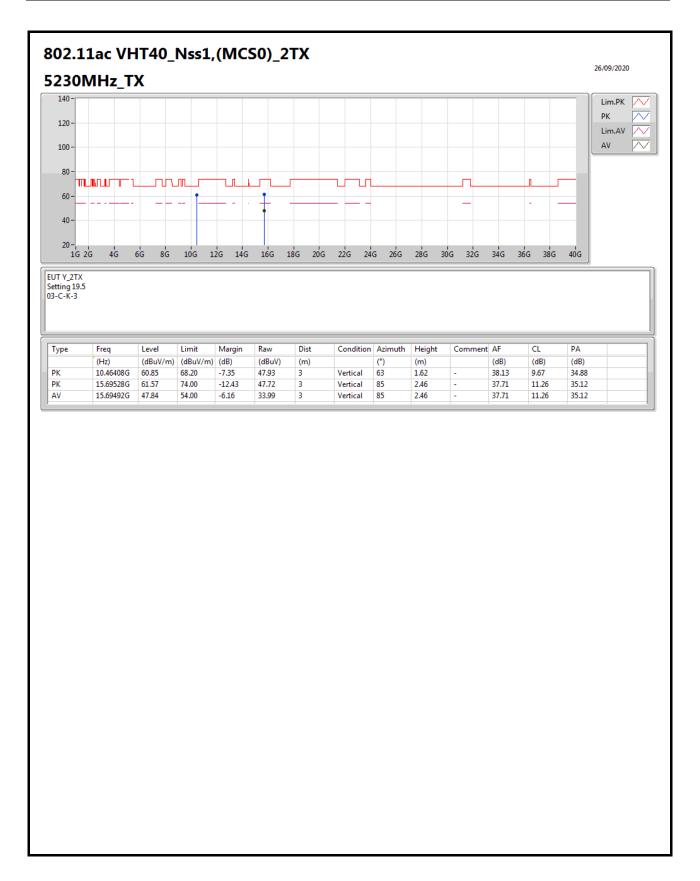
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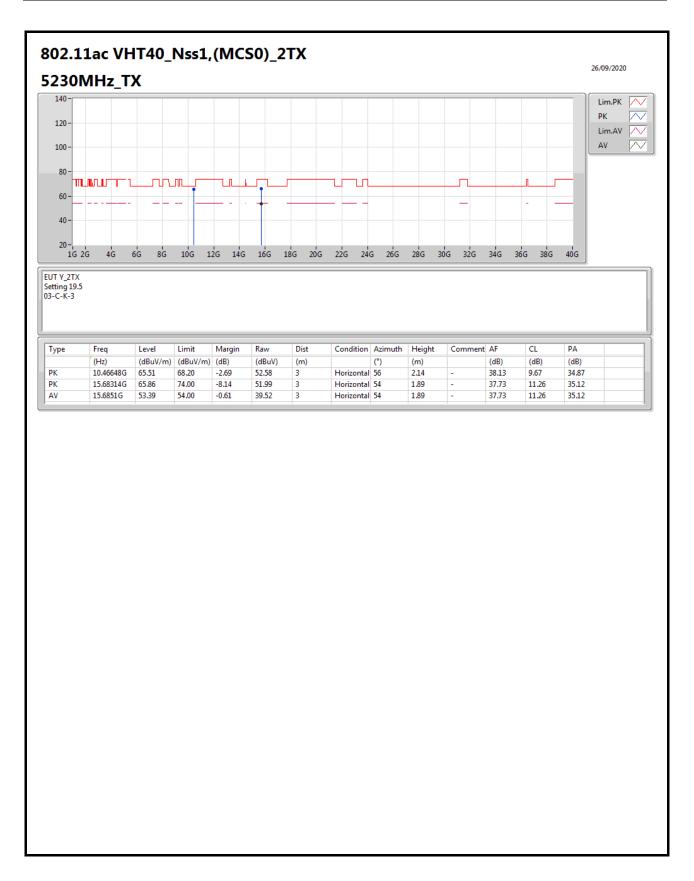
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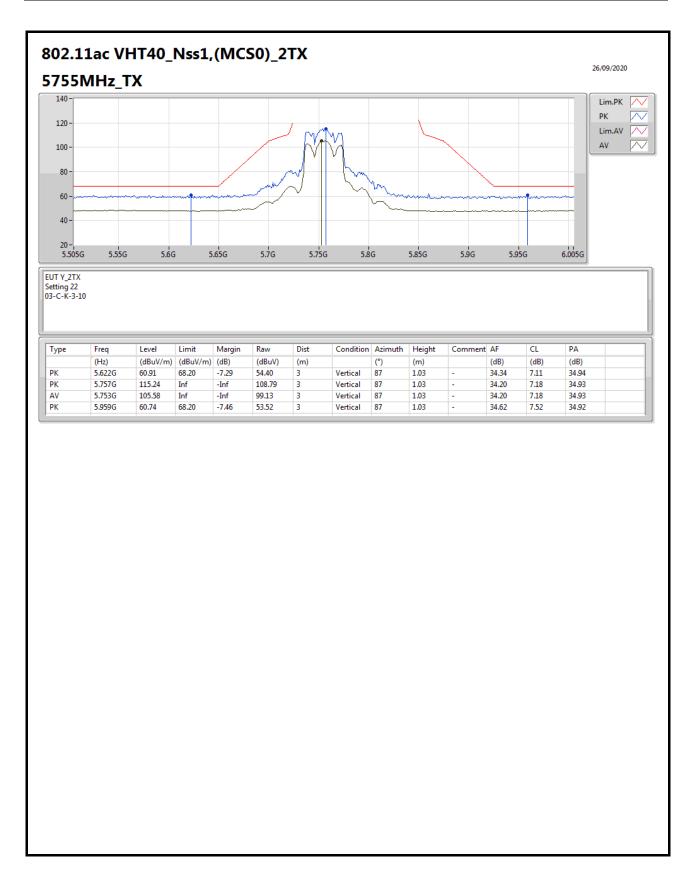


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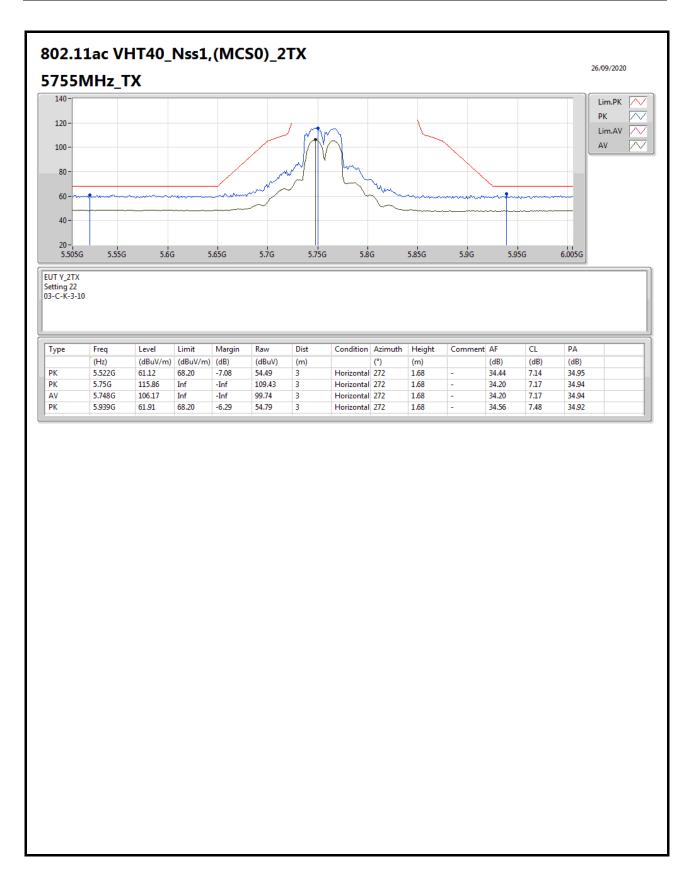




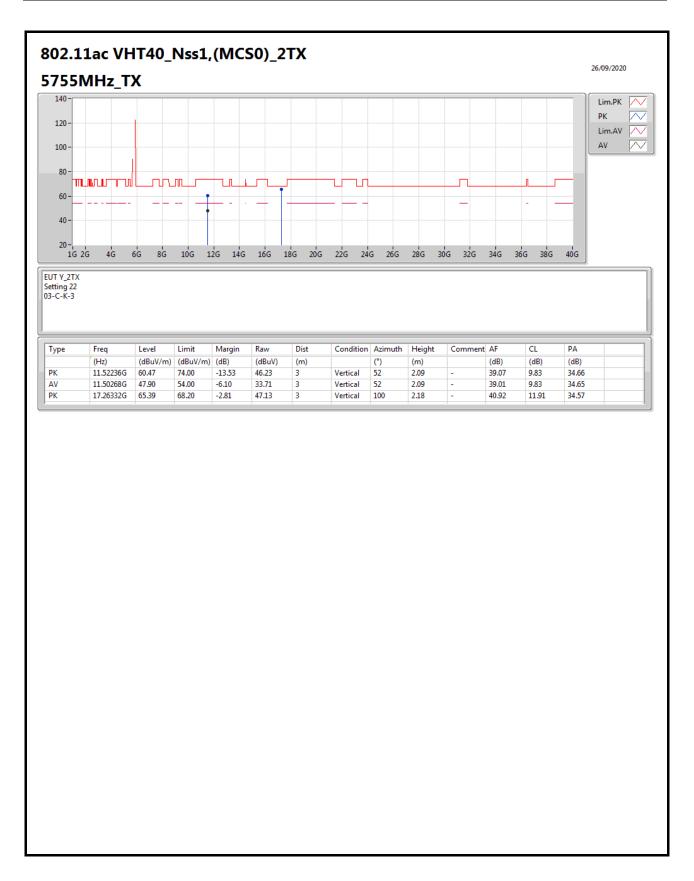




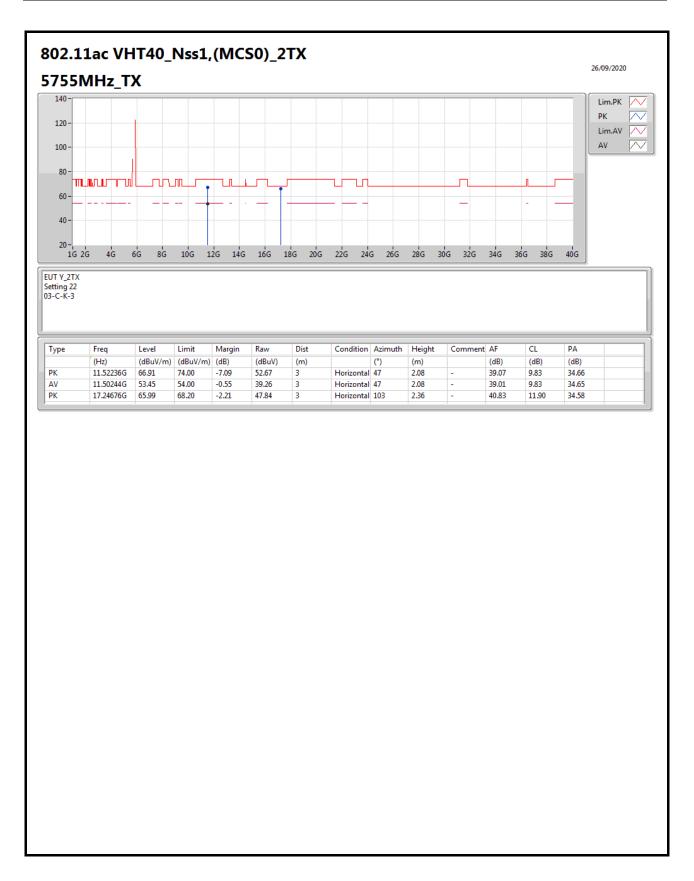






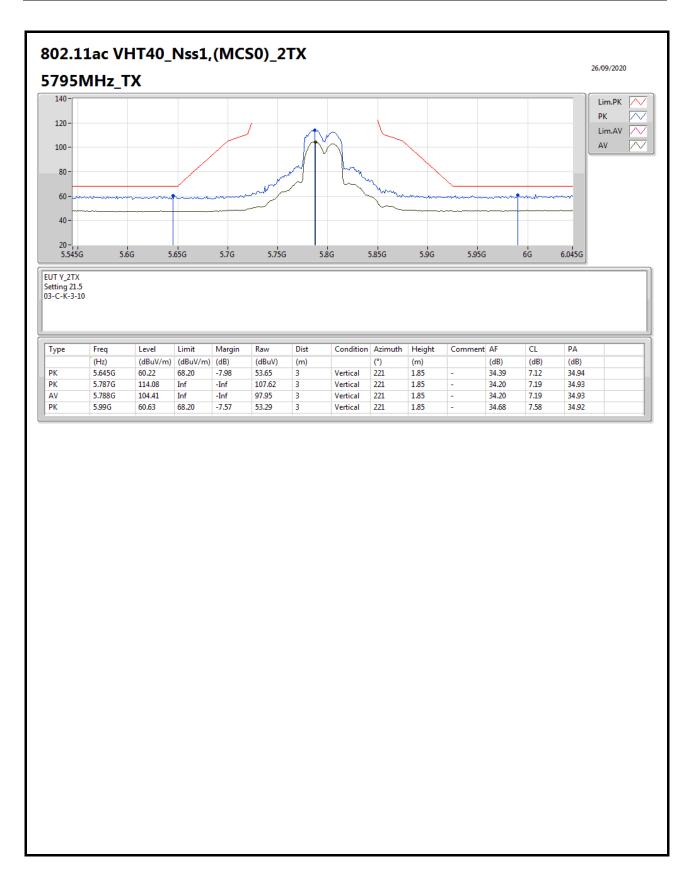




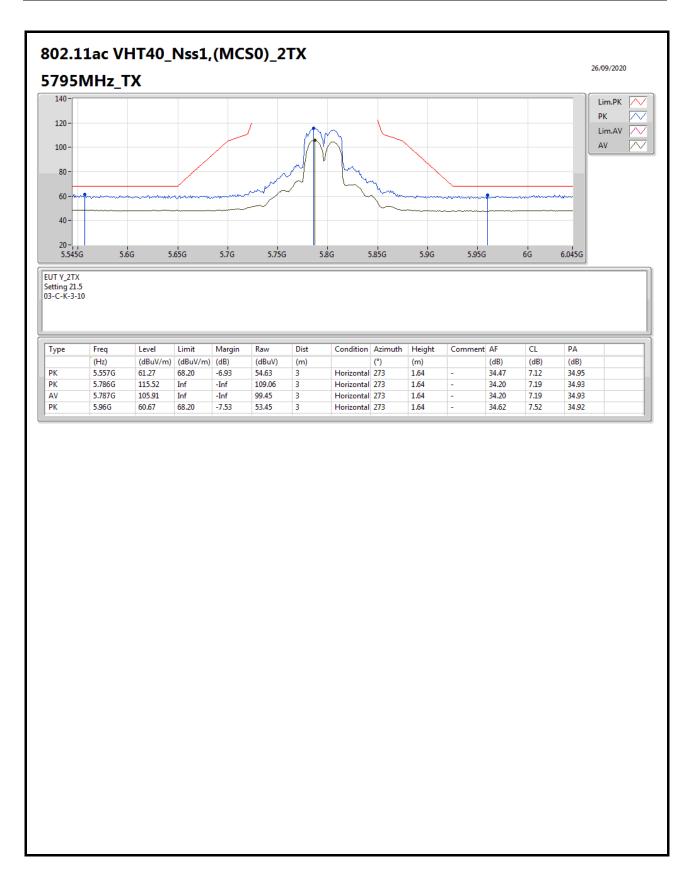


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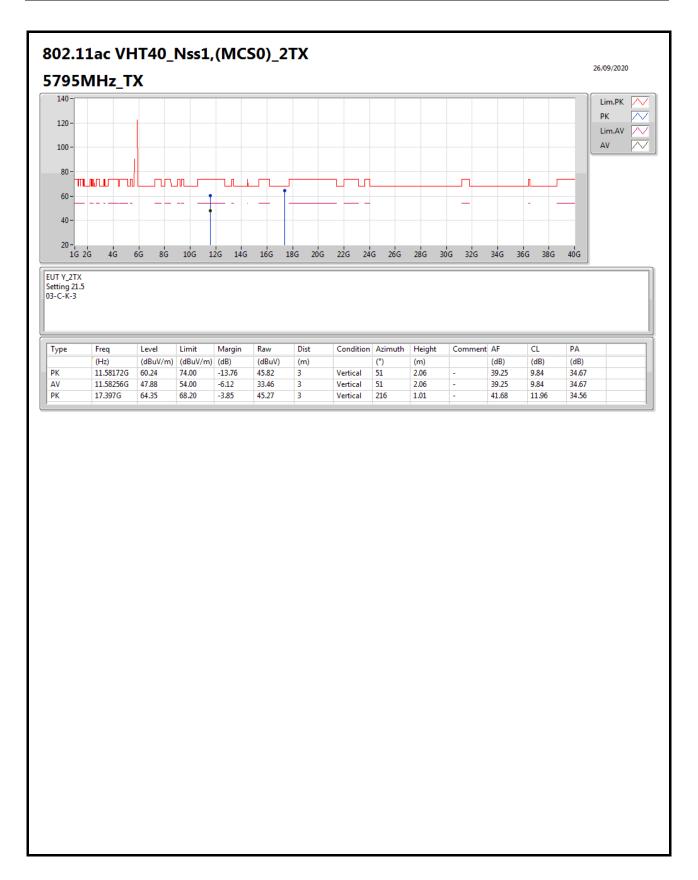






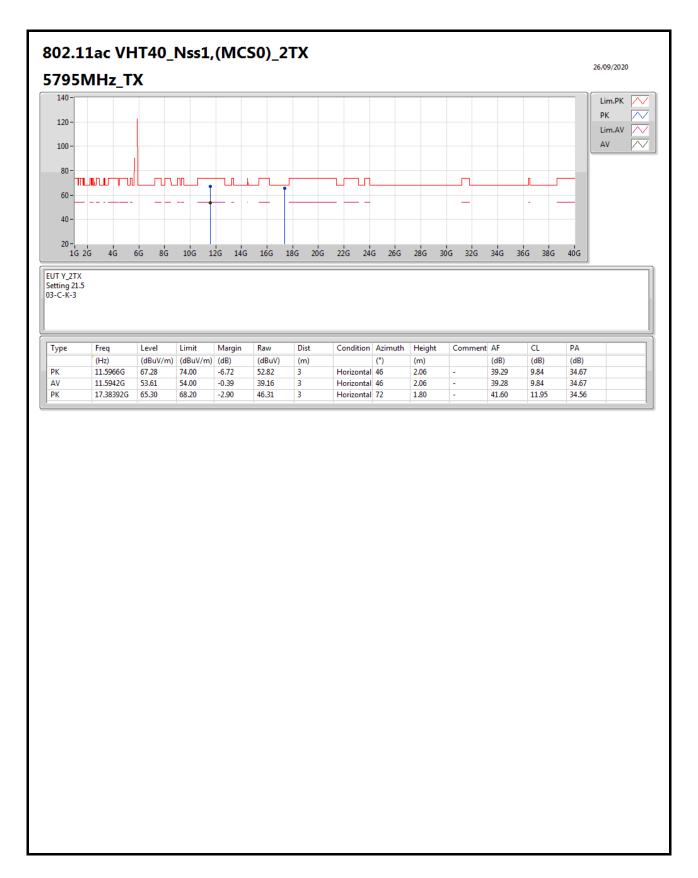




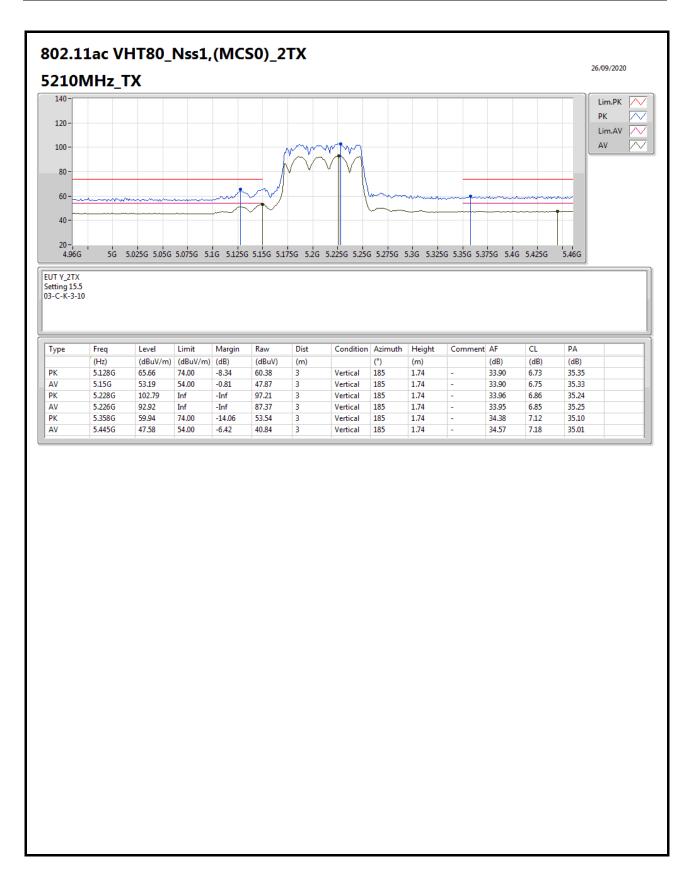


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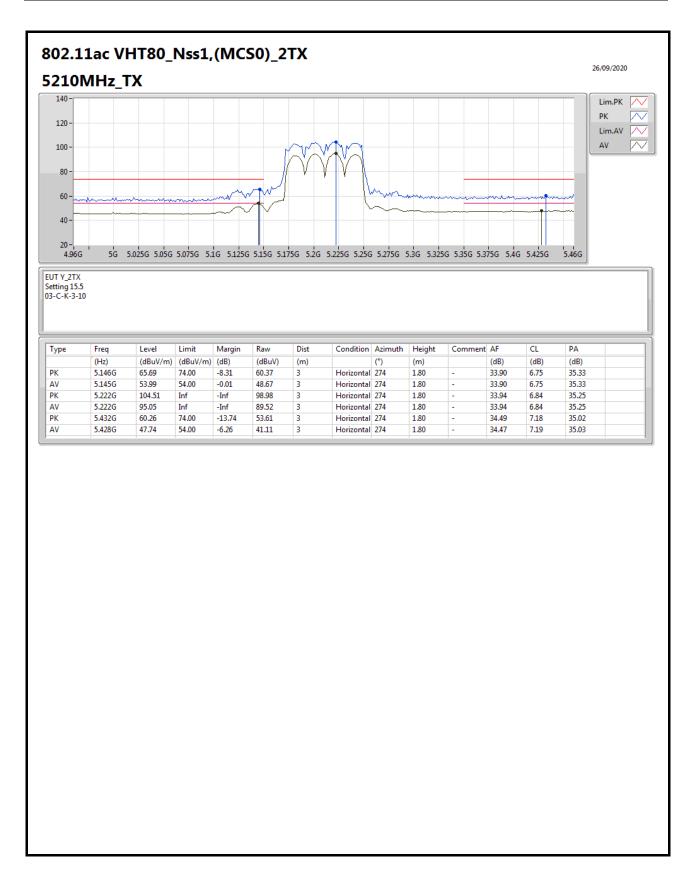




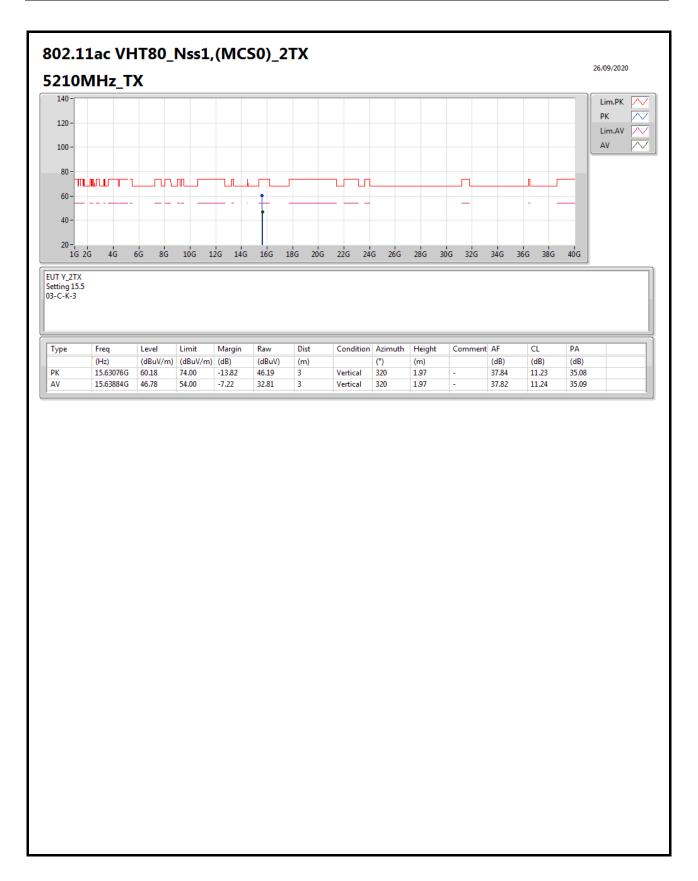






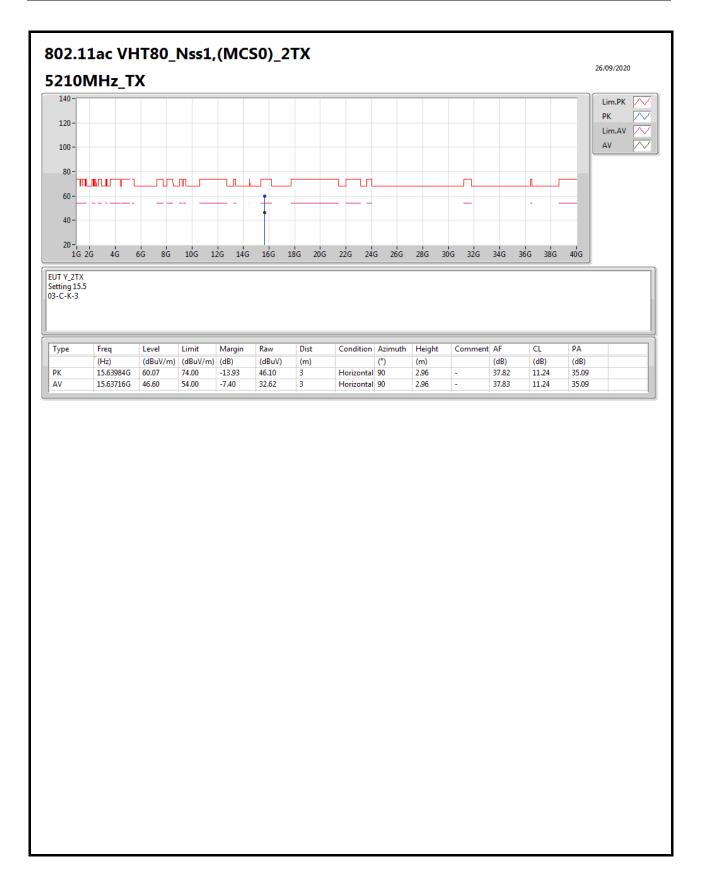




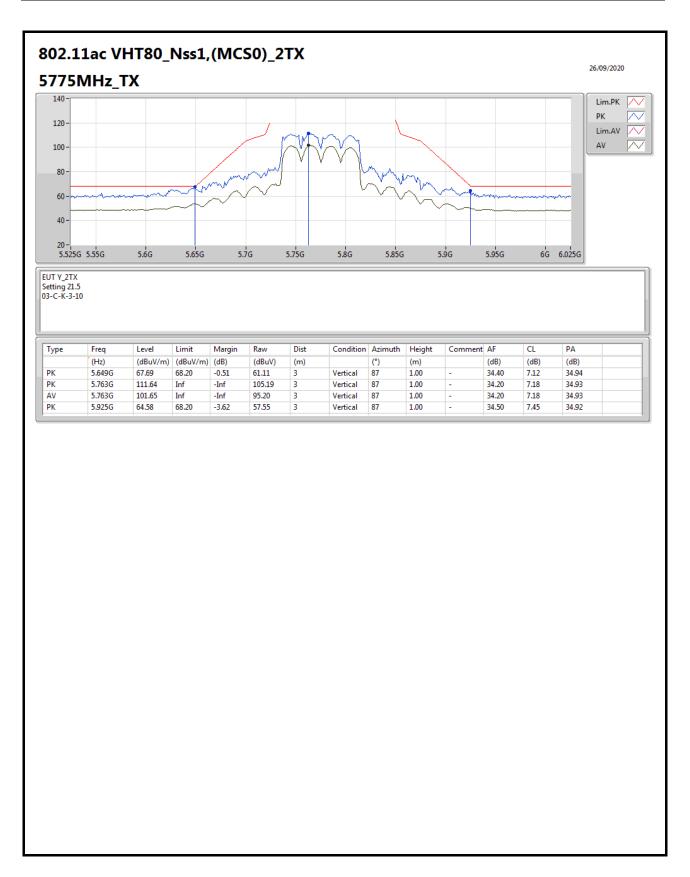


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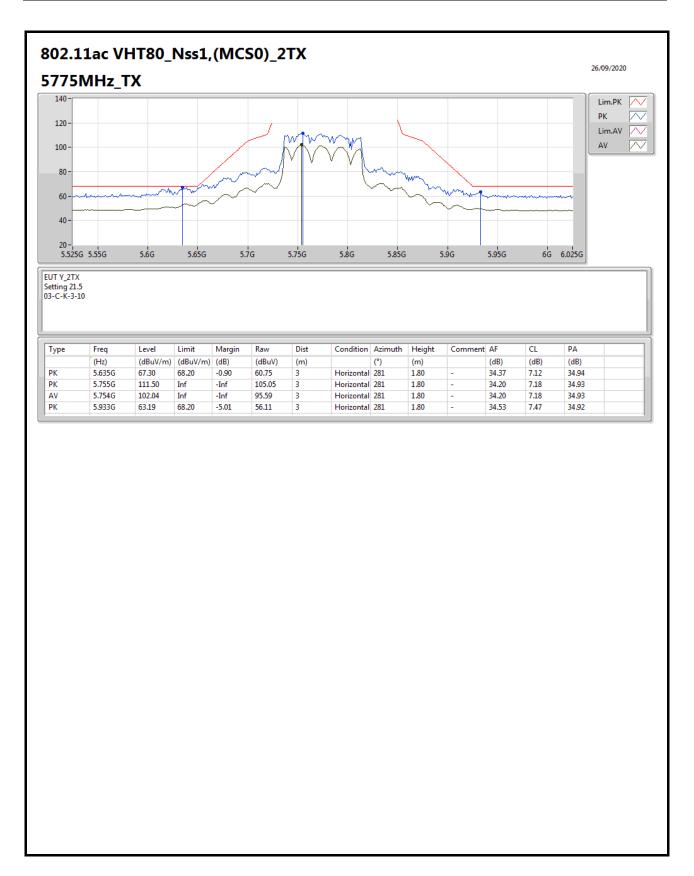






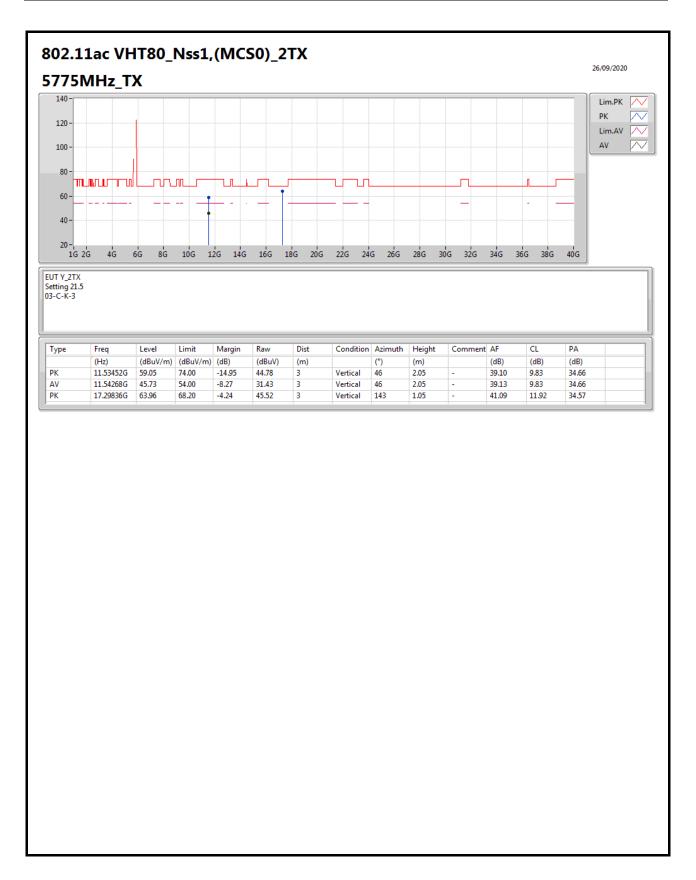






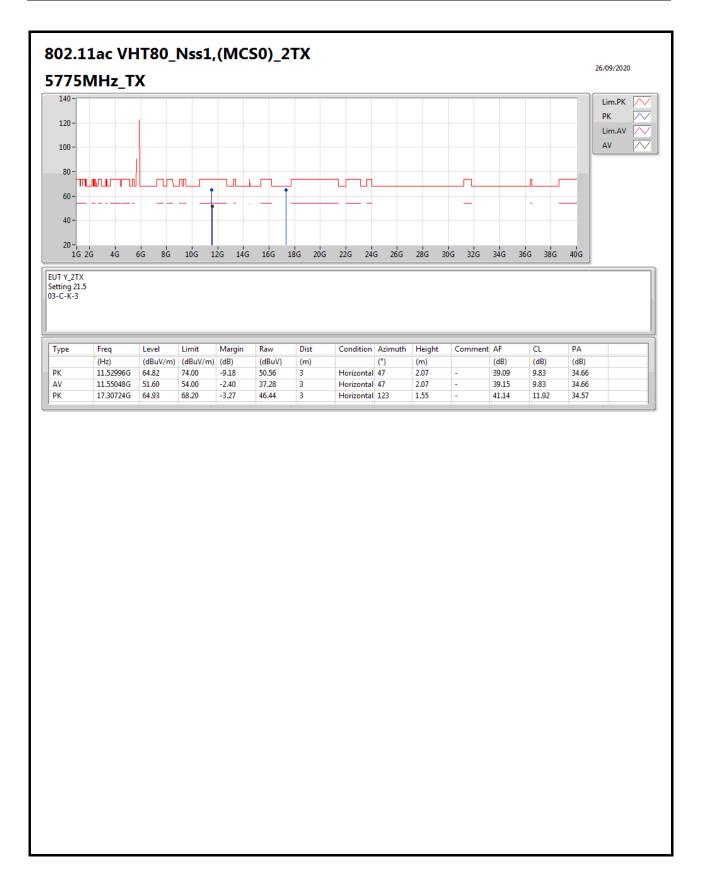
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## Radiated Emissions above 1GHz

Appendix F

Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Condition
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	
Mode 1	Pass	AV	1.62465G	44.75	54.00	-9.25	Vertical



