FCC RADIO TEST REPORT

Report No. : FR961308AA



# FCC RADIO TEST REPORT

FCC ID	:	TE7P9	
Equipment	:	AC1200 + AV1000 Whole Home Powerline Mesh Wi-Fi System	
Brand Name		tp-link	
Model Name	• :	Deco P9	
Applicant	:	TP-Link Technologies Co., Ltd.	
		Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Nanshan, Shenzhen,China,518057	
Manufacture	er :	TP-Link Technologies Co., Ltd.	
		Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Nanshan, Shenzhen,China,518057	
Standard		47 CFR FCC Part 15.247	

The product was received on Jun. 17, 2019, and testing was started from Jul. 19, 2019 and completed on Aug. 23, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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

Approved by: Cliff Chang

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 Ver1.0



# **Table of Contents**

Histor	y of this test report	3
Summ	ary of Test Result	4
1	General Description	5
1.1	Information	5
1.2	Applicable Standards	7
1.3	Testing Location Information	7
1.4	Measurement Uncertainty	7
2	Test Configuration of EUT	8
2.1	Test Channel Mode	8
2.2	The Worst Case Measurement Configuration	9
2.3	EUT Operation during Test	10
2.4	Accessories	10
2.5	Support Equipment	10
2.6	Test Setup Diagram	11
3	Transmitter Test Result	13
3.1	AC Power-line Conducted Emissions	13
3.2	DTS Bandwidth	15
3.3	Maximum Conducted Output Power	16
3.4	Power Spectral Density	19
3.5	Emissions in Non-restricted Frequency Bands	21
3.6	Emissions in Restricted Frequency Bands	22
4	Test Equipment and Calibration Data	26
••	ndix A. Test Results of AC Power-line Conducted Emissions	
Appen	ndix B. Test Results of DTS Bandwidth	
Appen	ndix C. Test Results of Maximum Conducted Output Power	
Appen	ndix D. Test Results of Power Spectral Density	
Appen	ndix E. Test Results of Emissions in Non-restricted Frequency Bands	
Appen	ndix F. Test Results of Emissions in Restricted Frequency Bands	
Appen	ndix G. Test Results of Radiated Emission Co-location	
Appen	ndix H. Test Photos	
Photog	graphs of EUT v01	



# History of this test report

Report No.	Version	Description	Issued Date
FR961308AA	01	Initial issue of report	Sep. 09, 2019



# Summary of Test Result

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

#### **Declaration of Conformity:**

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

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

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

#### Reviewed by: Sam Chen

Report Producer: Wendy Pan



# **1** General Description

# 1.1 Information

### 1.1.1 RF General Information

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

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.11b	20	2TX
2.4-2.4835GHz	802.11g	20	2TX
2.4-2.4835GHz	802.11n HT20	20	2TX
2.4-2.4835GHz	802.11n HT40	40	2TX

Note:

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



#### 1.1.2 Antenna Information

Amt	Port		Brond	Model Name	Antonno Tuno	Connector	Gain	(dBi)
Ant.	2.4GHz	5GHz	Brand	Model Name	Antenna Type	Connector	2.4GHz	5GHz
1	2	1	tp-link	P9	Monopole	N/A	1.5	1
2	1	2	tp-link	P9	Monopole	N/A	1.5	1

Note: The above information was declared by manufacturer.

#### For 2.4GHz function:

#### 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 function:

#### 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
802.11b	0.997	0.01	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11g	0.978	0.1	2.031m	1k
802.11n HT20	0.976	0.11	1.894m	1k
802.11n HT40	0.963	0.16	932.5u	3k

Note:

• 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 for 802.11n/ac in 5GHz.		Without beamforming
Function	$\boxtimes$	Point-to-multipoint		Point-to-point
Test Software Version	cart.exe			

Note: The above information was declared by manufacturer.



# **1.2 Applicable Standards**

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 558074 D01 v05r02
- FCC KDB 662911 D01 v02r01
- 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, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL	:	886-3-656-9065 FAX : 886-3-656-9085			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH02-CB	Owen Hsu	24.4~26.9°C / 63~65%	Jul. 20, 2019 ~ Aug. 16, 2019
Radiated<1GHz	03CH05-CB	Stim Sung	25.4~27.3°C / 62~66%	Jul. 19, 2019 ~ Aug. 19, 2019
Radiated>1GHz	03CH06-CB	Stim Sung	24.7~26.5°C / 64~68%	Jul. 19, 2019 ~ Aug. 19, 2019
AC Conduction	CO02-CB	Peter Wu	23.5~24.7°C / 48~57%	Jul. 19, 2019 ~ Aug. 23, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

# **1.4 Measurement Uncertainty**

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

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



# 2 Test Configuration of EUT

# 2.1 Test Channel Mode

Mode	PowerSetting
802.11b_Nss1,(1Mbps)_2TX	-
2412MHz	23
2417MHz	25
2437MHz	28
2457MHz	22
2462MHz	21
802.11g_Nss1,(6Mbps)_2TX	-
2412MHz	19.5
2417MHz	21
2437MHz	26.5
2457MHz	20.5
2462MHz	18.5
802.11n HT20_Nss1,(MCS0)_2TX	-
2412MHz	19
2417MHz	20.5
2437MHz	26.5
2457MHz	21
2462MHz	18.5
802.11n HT40_Nss1,(MCS0)_2TX	-
2422MHz	16
2427MHz	18
2437MHz	20
2447MHz	18
2452MHz	17



# 2.2 The Worst Case Measurement Configuration

Th	ne 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 the PLC function with Idle mode (without data transmit)

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

Th	e Worst Case Mode for Following Conformance Tests
Tests Item	Emissions in Restricted Frequency Bands
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	СТХ
1	EUT CTX – WLAN 2.4GHz
2	EUT CTX – WLAN 5GHz
For operating mode 2 is th	e worst case and it was record in this test report.
Operating Mode > 1GHz	СТХ

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

Т	he 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 Re	port No.: FA961308 for Co-location RF Exposure Evaluation.
Note: The ELIT can only	a used at V avis

Note: The EUT can only be used at Y axis.



# 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

	Acces	sories	
Equipment Name	Brand Name	Model Name	Remark
Power cable*1	I-SHENG	SP-12N+IS-033C	Non-shielded,1.5m

# 2.5 Support Equipment

#### For AC Conduction:

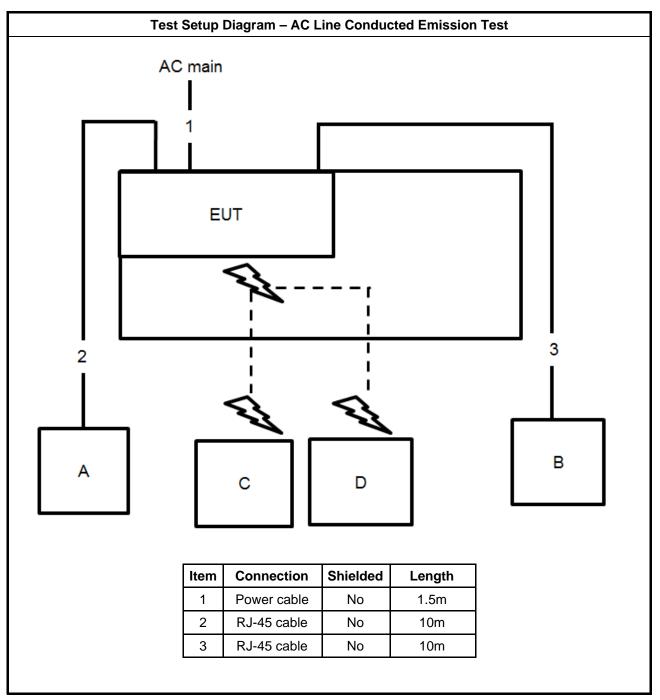
		Support Equ	ipment	
No.	Equipment	Brand Name	Model Name	FCC ID
А	LAN NB	DELL	E6430	N/A
В	AP Router	ASUS	RP-N53	MSQ-RPN53
С	2.4G NB	DELL	E6430	N/A
D	5G NB	DELL	E6430	N/A

#### For Radiated and RF Conducted::

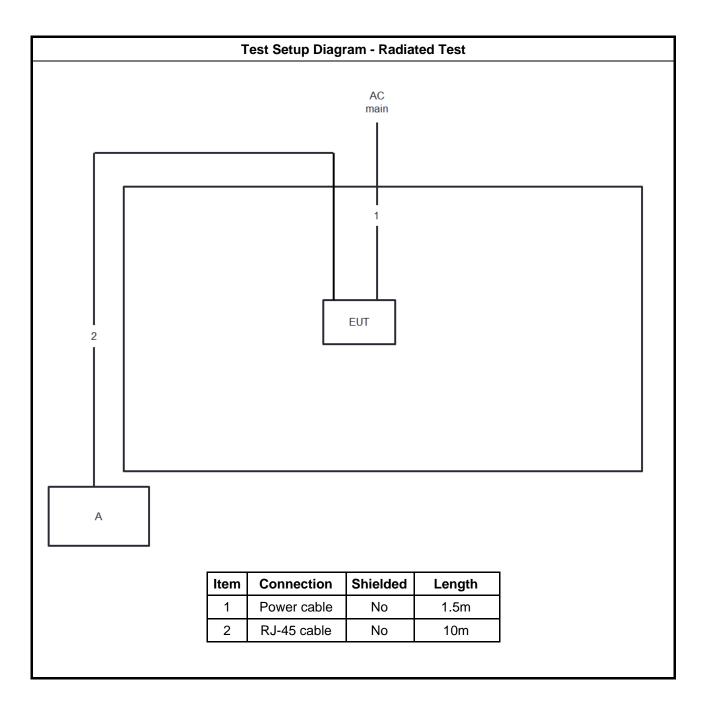
	Support Equipment			
No.	Equipment	Brand Name	Model Name	FCC ID
А	Notebook	DELL	E4300	N/A



# 2.6 Test Setup Diagram









# 3 Transmitter Test Result

# 3.1 AC Power-line Conducted Emissions

## 3.1.1 AC Power-line Conducted Emissions Limit

AC Powe	er-line Conducted Emissions I	_imit
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	of the frequency.	

# 3.1.2 Measuring Instruments

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

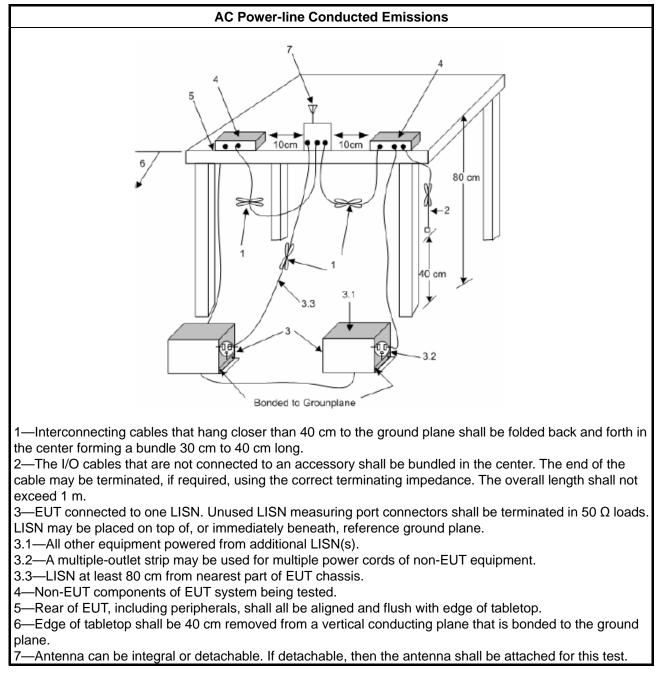
#### 3.1.3 Test Procedures

**Test Method** 

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



#### 3.1.4 Test Setup



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

Refer as Appendix A



# 3.2 DTS Bandwidth

#### 3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
<ul> <li>6 dB bandwidth ≥ 500 kHz.</li> </ul>

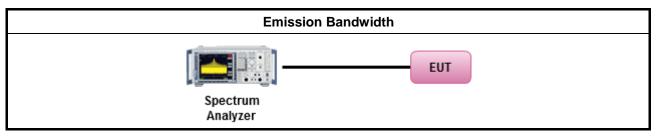
#### 3.2.2 Measuring Instruments

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

#### 3.2.3 Test Procedures

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

#### 3.2.4 Test Setup



## 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B



# 3.3 Maximum Conducted Output Power

#### 3.3.1 Maximum Conducted Output Power Limit

•	Point-to-multipoint systems	(P2M):	If $G_{TX} >$	6 dBi,	then P	$P_{Out} = 30 -$	- (G <sub>TX</sub> –	6) dBm
---	-----------------------------	--------	---------------	--------	--------	------------------	----------------------	--------

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

 $P_{Out}$  = maximum peak conducted output power or maximum conducted output power in dBm,  $G_{TX}$  = the maximum transmitting antenna directional gain in dBi.

#### 3.3.2 Measuring Instruments

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

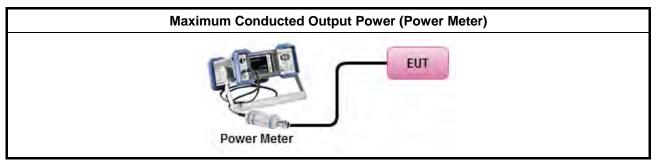


## 3.3.3 Test Procedures

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



# 3.4 **Power Spectral Density**

#### 3.4.1 Power Spectral Density Limit

Power Spectral Density Limit

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

#### 3.4.2 Measuring Instruments

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

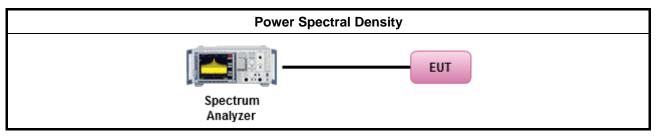
#### 3.4.3 Test Procedures

	Test Method								
•	outp the c conc of th	k power spectral density procedures that the same method as used to determine the conducted ut power. If maximum peak conducted output power was measured to demonstrate compliance to butput power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum ducted output power was measured to demonstrate compliance to the output power limit, then one he average PSD procedures shall be used, as applicable based on the following criteria (the peak procedure is also an acceptable option).							
	$\boxtimes$	Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.2 Method PKPSD.							
	[duty	/ cycle ≥ 98% or external video / power trigger]							
		Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.3 Method AVGPSD-1.							
		Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.5 Method AVGPSD-2.							
		Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.7 Method AVGPSD-3.							
	duty	cycle < 98% and average over on/off periods with duty factor							
		Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.4 Method AVGPSD-1A. (alternative).							
		Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.6 Method AVGPSD-2A. (alternative)							
		Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10.8 Method AVGPSD-3A. (alternative)							
-	For	conducted measurement.							
	•	If The EUT supports multiple transmit chains using options given below:							
		Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.							
		Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,							
TEL	886-3	3-656-9065 Page Number : 19 of 27							



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.

## 3.4.4 Test Setup



## 3.4.5 Test Result of Power Spectral Density

Refer as Appendix D



# 3.5 Emissions in Non-restricted Frequency Bands

#### 3.5.1 Emissions in Non-restricted Frequency Bands Limit

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

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

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

#### 3.5.2 Measuring Instruments

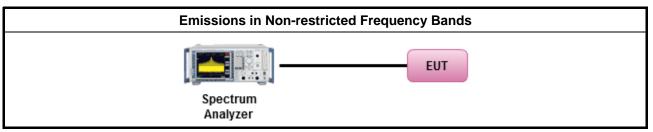
Refer a test equipment and calibration data table in this test report.

#### 3.5.3 Test Procedures

Test Method

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

#### 3.5.4 Test Setup



## 3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E



# 3.6 Emissions in Restricted Frequency Bands

## 3.6.1 Emissions in Restricted Frequency Bands Limit

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

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

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

## 3.6.2 Measuring Instruments

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

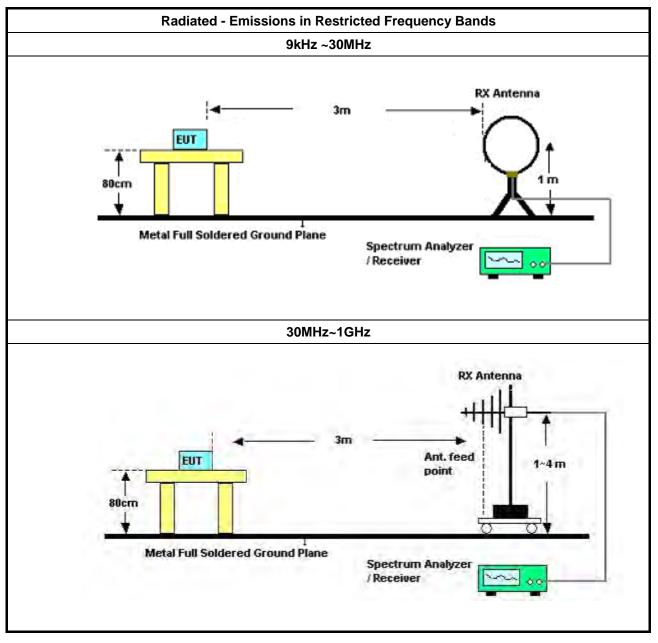


## 3.6.3 Test Procedures

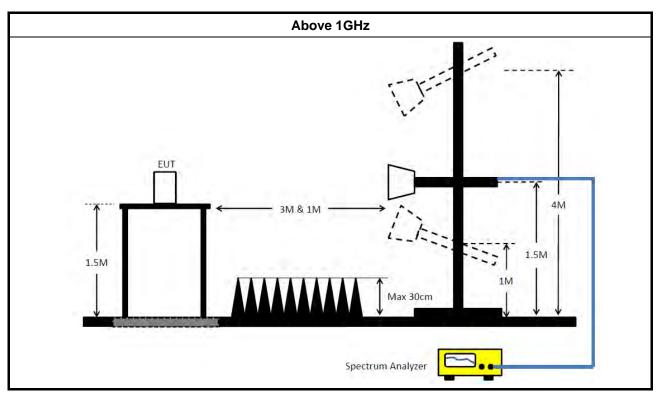
	Test Method
•	The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].
•	Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
•	For the transmitter unwanted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



# 3.6.4 Test Setup







#### 3.6.5 Measurement Results Calculation

The measured Level is calculated using:

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

## 3.6.6 Emissions in Restricted Frequency Bands (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 10 harmonic or 40 GHz, whichever is appropriate.

## 3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F



#### **Test Equipment and Calibration Data** 4

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2018	Nov. 20, 2019	Conduction (CO02-CB
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 05, 2018	Nov. 04, 2019	Conduction (CO02-CB
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2019	Jan. 15, 2020	Conduction (CO02-CB
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Nov. 06, 2018	Nov. 05, 2019	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 02, 2019	May 01, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 17, 2019	Jul. 16, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 08, 2019	May 07, 2020	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 03, 2018	Oct. 02, 2019	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUH NER	RG402	High Cable-05	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUH NER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)

: Sep. 09, 2019

Report Version : 01

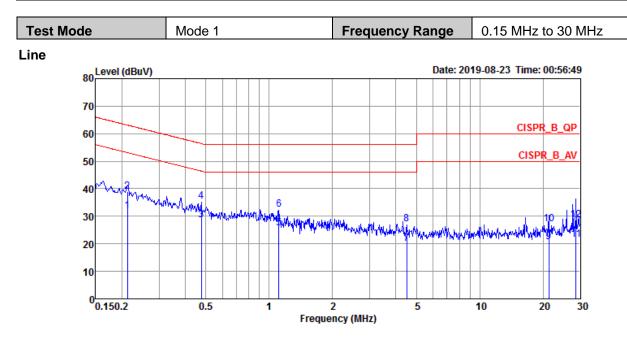


Instrument	nstrument Manufacturer Model No. Serial No.		Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	101027	9kHz~40GHz	Jul. 02, 2019	Jul. 01, 2020	Conducted (TH02-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Sep. 03, 2018	Sep. 02, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-01	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-02	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-3	1 GHz – 26.5 GHz	Oct. 24, 2018	Oct. 23, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-04	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)
RF Cable-high	Woken	RG402	High Cable-05	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH02-CB)

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

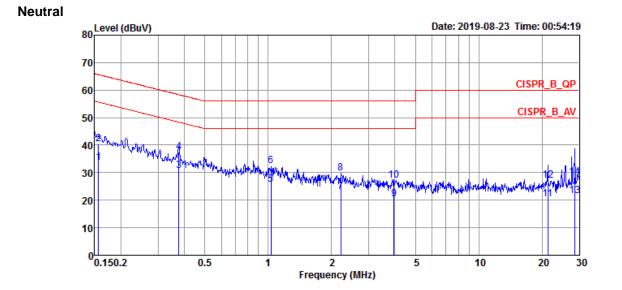
N.C.R. means Non-Calibration required.





	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.2128	32.03	-21.07	53.10	21.86	10.15	0.02	Average	LINE
2	0.2128	38.89	-24.21	63.10	28.72	10.15	0.02	QP	LINE
3	0.4761	28.61	-17.80	46.41	18.43	10.16	0.02	Average	LINE
4	0.4761	35.36	-21.05	56.41	25.18	10.16	0.02	QP	LINE
5	1.1114	25.63	-20.37	46.00	15.44	10.17	0.02	Average	LINE
6	1.1114	32.43	-23.57	56.00	22.24	10.17	0.02	QP	LINE
7	4.5015	20.20	-25.80	46.00	9.90	10.23	0.07	Average	LINE
8	4.5015	27.07	-28.93	56.00	16.77	10.23	0.07	QP	LINE
9	21.2596	20.53	-29.47	50.00	9.98	10.41	0.14	Average	LINE
10	21.2596	27.15	-32.85	60.00	16.60	10.41	0.14	QP	LINE
11	28.6030	21.65	-28.35	50.00	10.92	10.50	0.23	Average	LINE
12	28.6030	28.51	-31.49	60.00	17.78	10.50	0.23	QP	LINE





	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1565		-22.06	55.65	23.44	10.13		Average	NEUTRAL
2	0.1565		-25.33	65.65	30.17	10.13	0.02	-	NEUTRAL
3	0.3771	30.60	-17.74	48.34	20.44	10.14	0.02	Average	NEUTRAL
4	0.3771	37.44	-20.90	58.34	27.28	10.14	0.02	QP	NEUTRAL
5	1.0320	25.63	-20.37	46.00	15.47	10.14	0.02	Average	NEUTRAL
6	1.0320	32.41	-23.59	56.00	22.25	10.14	0.02	QP	NEUTRAL
7	2.2132	23.16	-22.84	46.00	12.95	10.16	0.05	Average	NEUTRAL
8	2.2132	29.78	-26.22	56.00	19.57	10.16	0.05	QP	NEUTRAL
9	3.9639	20.31	-25.69	46.00	10.06	10.18	0.07	Average	NEUTRAL
10	3.9639	27.10	-28.90	56.00	16.85	10.18	0.07	QP	NEUTRAL
11	21.2596	20.45	-29.55	50.00	9.95	10.36	0.14	Average	NEUTRAL
12	21.2596	27.21	-32.79	60.00	16.71	10.36	0.14	QP	NEUTRAL
13	28.6030	21.67	-28.33	50.00	11.00	10.44	0.23	Average	NEUTRAL
14	28.6030	28.30	-31.70	60.00	17.63	10.44	0.23		NEUTRAL



#### Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW	
	(Hz)	(Hz)		(Hz)	(Hz)	
2.4-2.4835GHz	-	-	-	-	-	
802.11b_Nss1,(1Mbps)_2TX	10.075M	15.217M	15M2G1D	9.55M	13.843M	
802.11g_Nss1,(6Mbps)_2TX	15.025M	17.916M	17M9D1D	13.825M	16.192M	
802.11n HT20_Nss1,(MCS0)_2TX	15.075M	18.316M	18M3D1D	11.975M	17.341M	
802.11n HT40_Nss1,(MCS0)_2TX	31.3M	35.832M	35M8D1D	26.25M	35.732M	

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



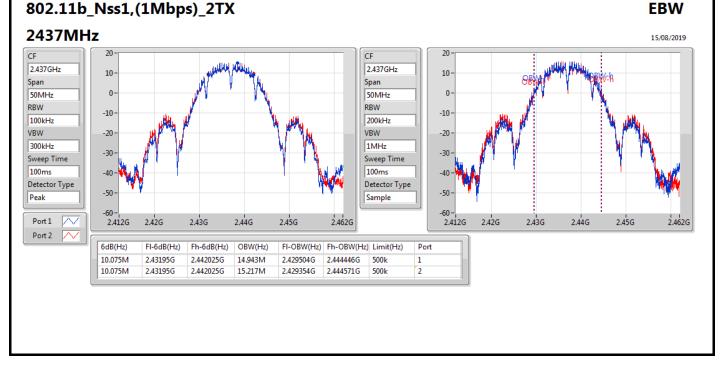
#### Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	10.025M	13.918M	10M	13.918M
2437MHz	Pass	500k	10.075M	14.943M	10.075M	15.217M
2462MHz	Pass	500k	9.55M	13.843M	9.975M	13.918M
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	14.95M	16.217M	14.975M	16.192M
2437MHz	Pass	500k	14.275M	17.391M	15.025M	17.916M
2462MHz	Pass	500k	15.025M	16.192M	13.825M	16.192M
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	500k	15.075M	17.341M	13.8M	17.341M
2437MHz	Pass	500k	11.975M	17.891M	13.85M	18.316M
2462MHz	Pass	500k	13.7M	17.366M	15M	17.341M
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	500k	27.6M	35.732M	31.25M	35.832M
2437MHz	Pass	500k	26.25M	35.732M	31.25M	35.832M
2452MHz	Pass	500k	31.25M	35.832M	31.3M	35.782M

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



#### 802.11b\_Nss1,(1Mbps)\_2TX **EBW** 2412MHz 15/08/2019 CF 20 CF 20 2.412GHz 2.412GHz 10-10-Span W-h Span 8 0-0-50MHz 50MHz RBW RBW -10 --10 200kHz 100kHz VBW -20 -VBW -20 -300kHz 1MHz -30 --30 Sweep Time Sweep Time 100ms 100ms -40 -40 Detector Type Detector Type -50 -50 Peak Sample -60· -60 $\overline{}$ 2.387G 2.4G 2.387G 2.4G 2.41G Port 1 2.41G 2.42G 2.42G 2.43G 2.43G 2.437G 2.437G Port 2 6dB(Hz) FI-6dB(Hz) Fh-6dB(Hz) OBW(Hz) FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz) Port 10.025M 2.40695G 2.416975G 13.918M 2.405028G 2.418947G 500k 1 10M 2.407G 2.417G 13.918M 2.405028G 2.418947G 500k 2



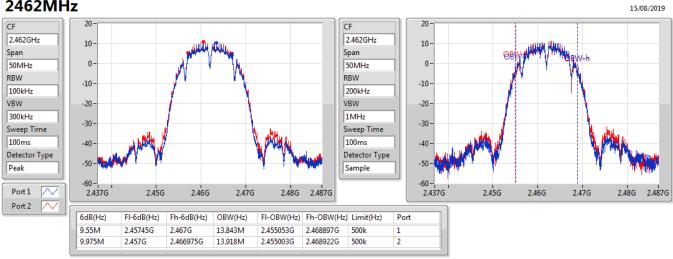


# 802.11b\_Nss1,(1Mbps)\_2TX



EBW

#### 2462MHz

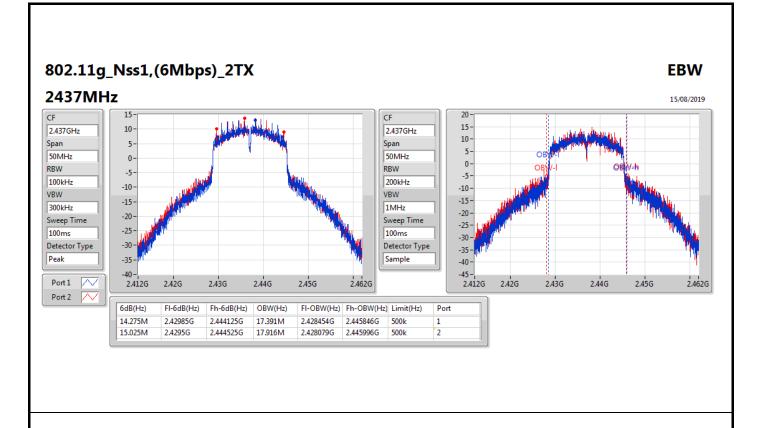


# 802.11g\_Nss1,(6Mbps)\_2TX

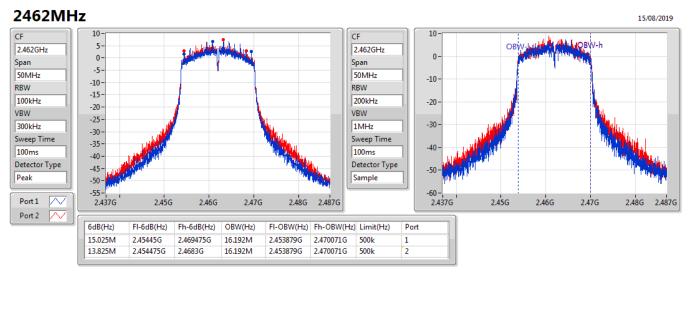
#### 2412MHz 15/08/2019 10 10 CF CF ⊖BW; 5-5-ورداقته وأفا 2.412GHz 2.412GHz ₩-h 0-0-Span Span -5--5-50MHz 50MHz -10--10-RBW RBW -15--15-100kHz 200kHz -20 --20 -VBW VBW -25--25-300kHz 1MHz -30 --30 -Sweep Time Sweep Time -35 --35 -100ms 100ms -40 --40 -Detector Type Detector Type -45 -45-Peak Sample -50 --50 --55 -55-Port 1 2.4G 2.41G 2.42G 2.43G 2.437G 2.387G 2.4G 2.41G 2.42G 2.43G 2.437G 2.387G Port 2 6dB(Hz) FI-6dB(Hz) Fh-6dB(Hz) OBW(Hz) FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz) Port 2.40455G 2.4195G 16.217M 14.95M 2.403879G 2.420096G 500k 1 14.975M 2.404525G 2.4195G 16.192M 2.403879G 2.420071G 500k 2

EBW





# 802.11g\_Nss1,(6Mbps)\_2TX



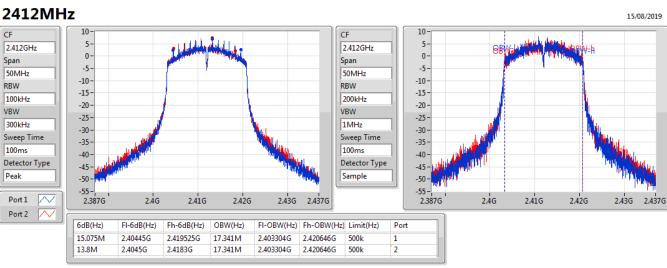
SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory.

EBW

EBW



# 802.11n HT20\_Nss1,(MCS0)\_2TX



# 802.11n HT20\_Nss1,(MCS0)\_2TX

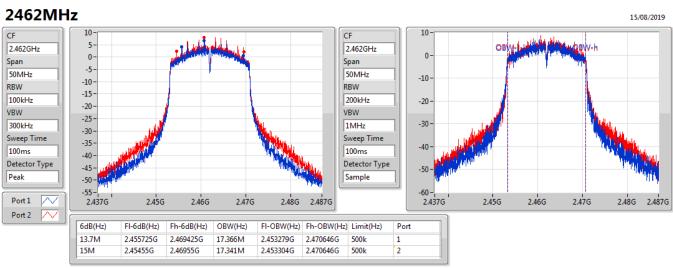
#### 2437MHz 15/08/2019 15 15 CF CF 10-2.437GHz 10-2.437GHz 5-Span Span 5-50MHz 50MHz 0-0-RBW RBW -5--5-100kHz 200kHz -10 -VBW -10 -VBW -15-300kHz 1MHz -15--20 Sweep Time Sweep Time -20 --25 100ms 100ms -25 Detector Type -30 Detector Type Peak -30 Sample -35 -35 -40 Port 1 $\sim$ 2.42G 2.44G 2.45G 2.462G 2.42G 2.43G 2.412G 2.43G 2.412G 2.44G 2.45G 2.462G Port 2 6dB(Hz) FI-6dB(Hz) Fh-6dB(Hz) OBW(Hz) FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz) Port 2.43135G 2.443325G 2.445921G 11.975M 17.891M 2.428029G 500k 1 13.85M 2.429425G 2.443275G 18.316M 2.427705G 2.44602G 500k 2

**EBW** 

EBW



# 802.11n HT20\_Nss1,(MCS0)\_2TX



# 802.11n HT40\_Nss1,(MCS0)\_2TX

#### 2422MHz 15/08/2019 10 CF CF 0-2.422GHz 2.422GHz OBW-I OBW-h 0--5-Span Span -10 -100MHz 100MHz -10 -15-RBW RBW -20 -100kHz 500kHz -20 · -25-VBW VBW -30 --30 -300kHz 2MHz -35-Sweep Time Sweep Time -40 --40 100ms 100ms -45-Detector Type Detector Type -50 -**50** · Peak Sample -55 --60 --**60** · Port 1 $\overline{}$ 2.4G 2.42G 2.44G 2.46G 2.472G 2.372G 2.4G 2.42G 2.44G 2.46G 2.472G Port 2 6dB(Hz) FI-6dB(Hz) Fh-6dB(Hz) OBW(Hz) FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz) Port 2.4057G 2.4333G 35.732M 2.404109G 2.439841G 27.6M 500k 1 31.25M 2.4057G 2.43695G 35.832M 2.404059G 2.439891G 500k 2

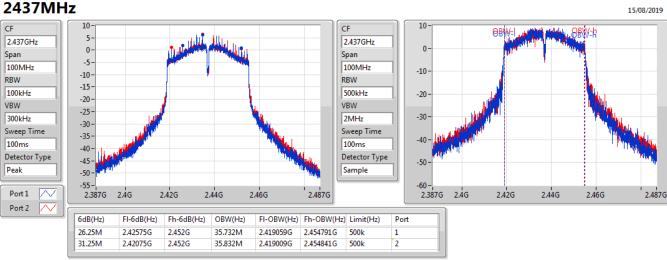
SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory.



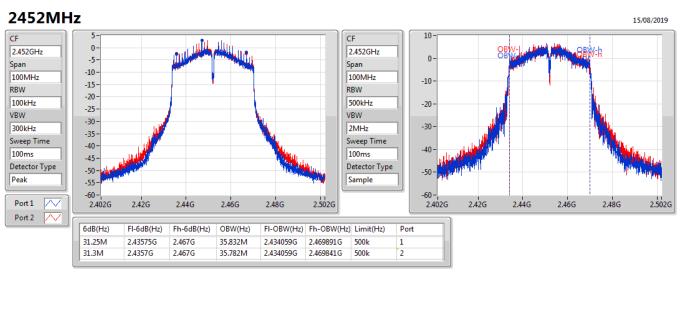




EBW



## 802.11n HT40\_Nss1,(MCS0)\_2TX





### Summary

Mode	Total Power	Total Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
802.11b_Nss1,(1Mbps)_2TX	28.77	0.75336
802.11g_Nss1,(6Mbps)_2TX	27.70	0.58884
802.11n HT20_Nss1,(MCS0)_2TX	27.42	0.55208
802.11n HT40_Nss1,(MCS0)_2TX	22.26	0.16827



#### Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.50	22.46	22.31	25.40	30.00
2417MHz	Pass	1.50	23.77	23.82	26.81	30.00
2437MHz	Pass	1.50	25.73	25.78	28.77	30.00
2457MHz	Pass	1.50	21.25	21.81	24.55	30.00
2462MHz	Pass	1.50	20.38	20.96	23.69	30.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.50	18.87	19.13	22.01	30.00
2417MHz	Pass	1.50	20.21	20.29	23.26	30.00
2437MHz	Pass	1.50	24.67	24.71	27.70	30.00
2457MHz	Pass	1.50	20.46	20.57	23.53	30.00
2462MHz	Pass	1.50	18.08	18.69	21.41	30.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	1.50	18.43	18.36	21.41	30.00
2417MHz	Pass	1.50	19.54	19.99	22.78	30.00
2437MHz	Pass	1.50	24.36	24.45	27.42	30.00
2457MHz	Pass	1.50	20.14	20.61	23.39	30.00
2462MHz	Pass	1.50	18.18	18.83	21.53	30.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	1.50	14.92	15.05	18.00	30.00
2427MHz	Pass	1.50	16.81	17.20	20.02	30.00
2437MHz	Pass	1.50	19.15	19.34	22.26	30.00
2447MHz	Pass	1.50	17.18	17.37	20.29	30.00
2452MHz	Pass	1.50	16.43	16.40	19.43	30.00

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



### Summary

Mode	PD
	(dBm/RBW)
2.4-2.4835GHz	
802.11b_Nss1,(1Mbps)_2TX	3.34
802.11g_Nss1,(6Mbps)_2TX	1.47
802.11n HT20_Nss1,(MCS0)_2TX	1.42
802.11n HT40_Nss1,(MCS0)_2TX	-6.96

RBW=3 kHz.



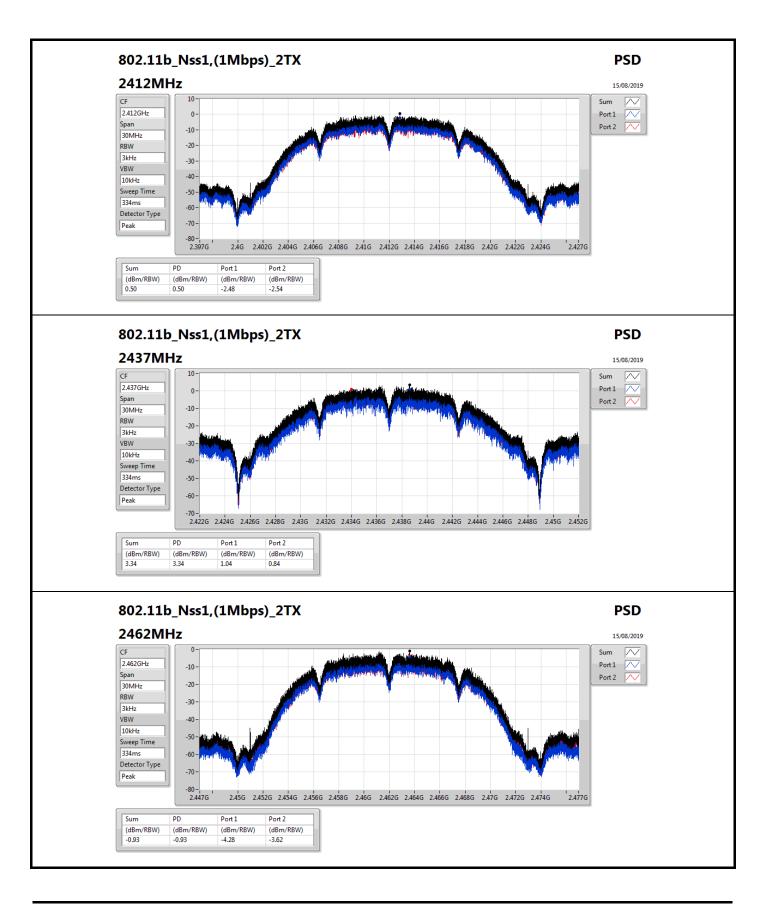
### Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	-2.48	-2.54	0.50	8.00
2437MHz	Pass	4.51	1.04	0.84	3.34	8.00
2462MHz	Pass	4.51	-4.28	-3.62	-0.93	8.00
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	-5.04	-5.57	-3.26	8.00
2437MHz	Pass	4.51	0.43	0.24	1.47	8.00
2462MHz	Pass	4.51	-5.81	-6.63	-4.27	8.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2412MHz	Pass	4.51	-6.78	-7.81	-5.57	8.00
2437MHz	Pass	4.51	-0.40	0.04	1.42	8.00
2462MHz	Pass	4.51	-6.39	-6.28	-3.68	8.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
2422MHz	Pass	4.51	-13.07	-11.87	-10.75	8.00
2437MHz	Pass	4.51	-8.25	-8.05	-6.96	8.00
2452MHz	Pass	4.51	-11.48	-10.15	-8.58	8.00

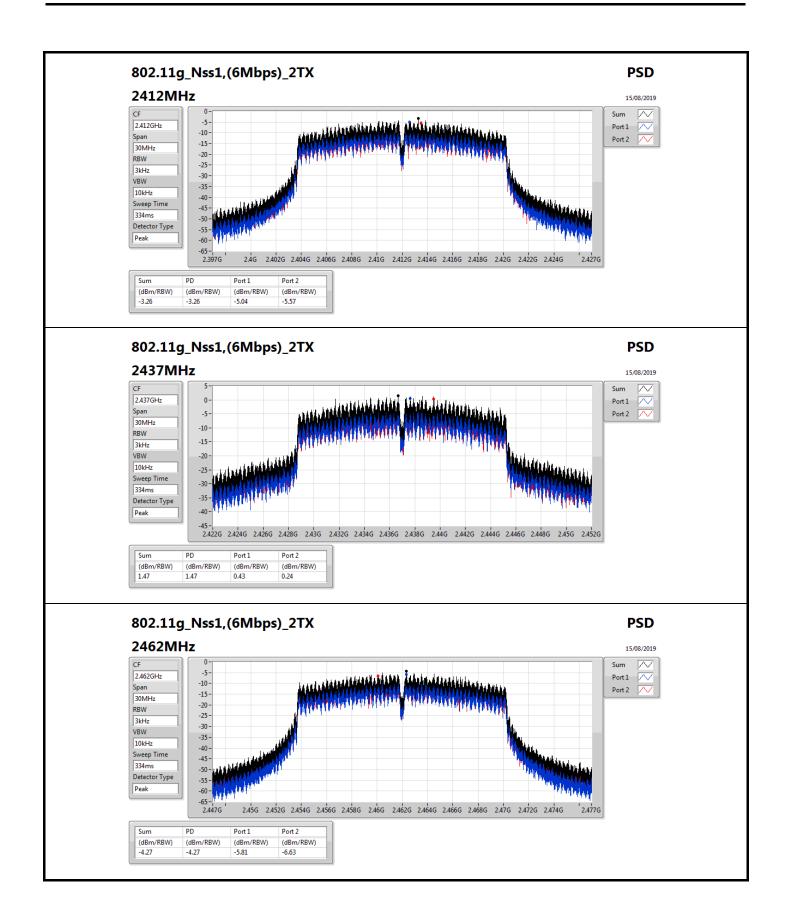
**DG** = Directional Gain; RBW=3 kHz;

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

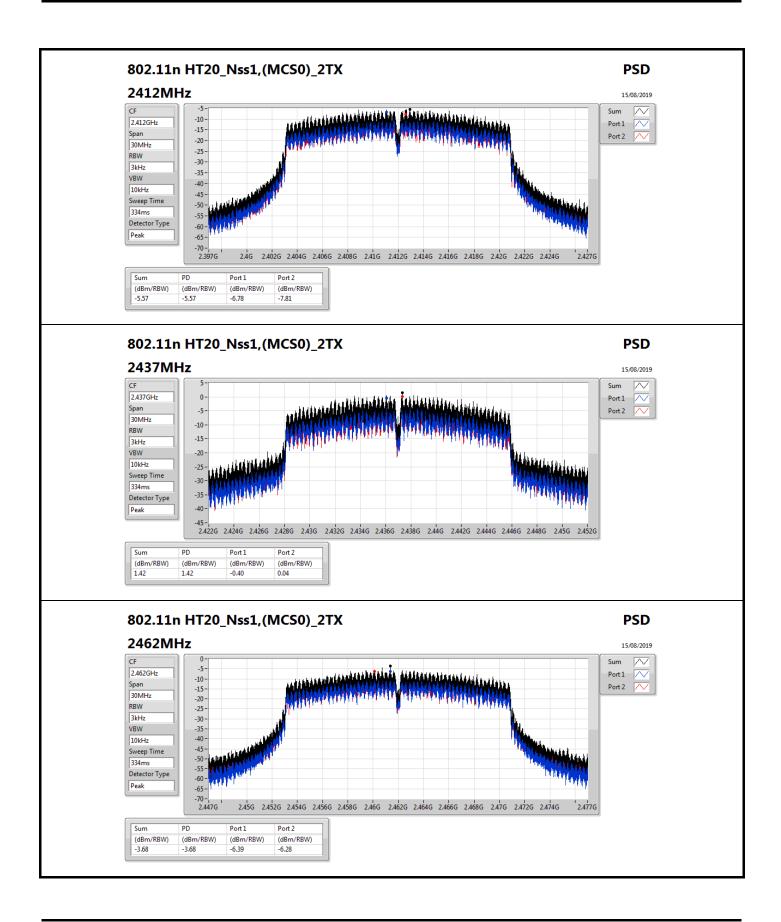




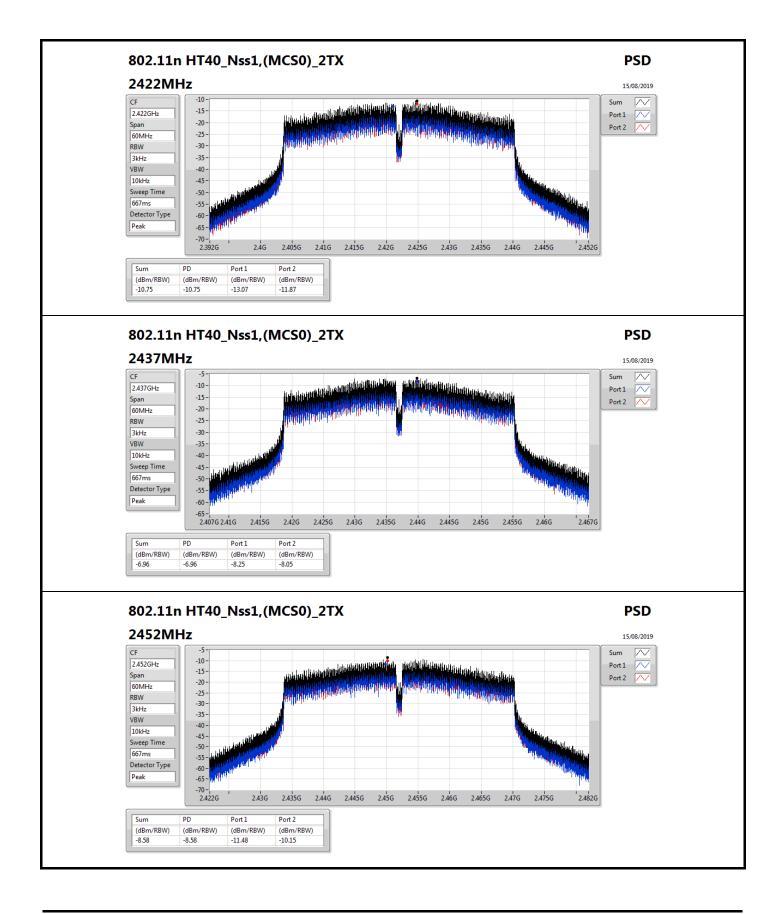














## Appendix E

### Summary

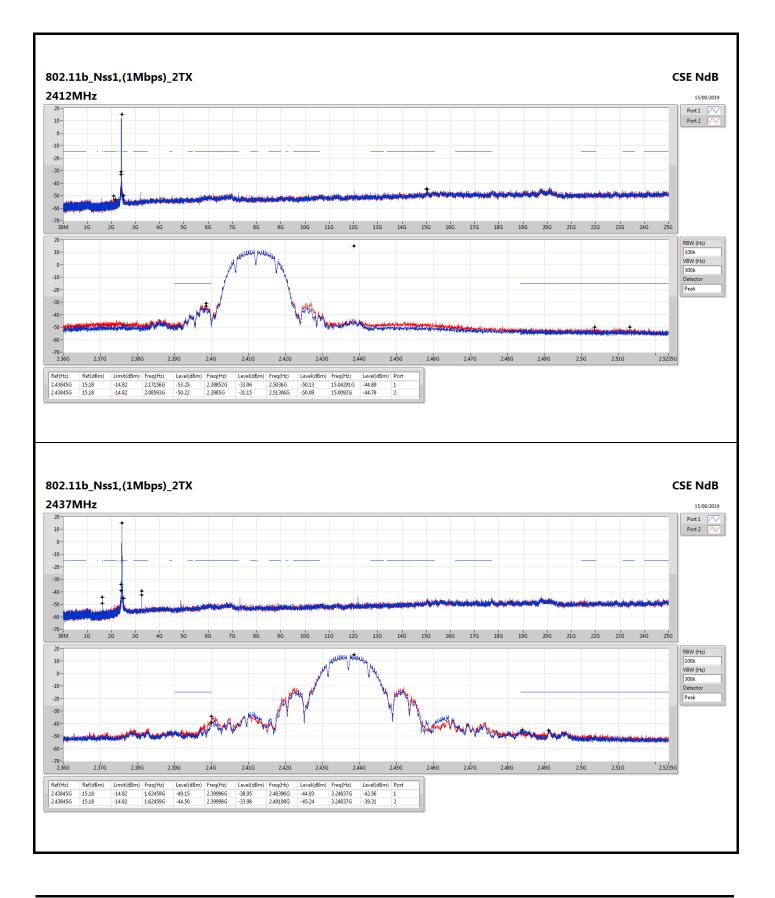
Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	
802.11b_Nss1,(1Mbps)_2TX	Pass	2.43845G	15.18	-14.82	2.08593G	-50.22	2.3985G	-31.15	2.51306G	-50.09	15.0092G	-44.78	2
802.11g_Nss1,(6Mbps)_2TX	Pass	2.4357G	13.73	-16.27	2.08506G	-51.50	2.39886G	-25.20	2.48962G	-50.25	24.84828G	-44.91	2
802.11n HT20_Nss1,(MCS0)_2TX	Pass	2.4395G	13.62	-16.38	2.30029G	-52.96	2.39922G	-28.71	2.49448G	-50.43	15.04572G	-45.41	2
802.11n HT40_Nss1,(MCS0)_2TX	Pass	2.43449G	6.34	-23.66	2.11533G	-53.22	2.39952G	-31.04	2.51534G	-52.28	15.29621G	-45.77	1



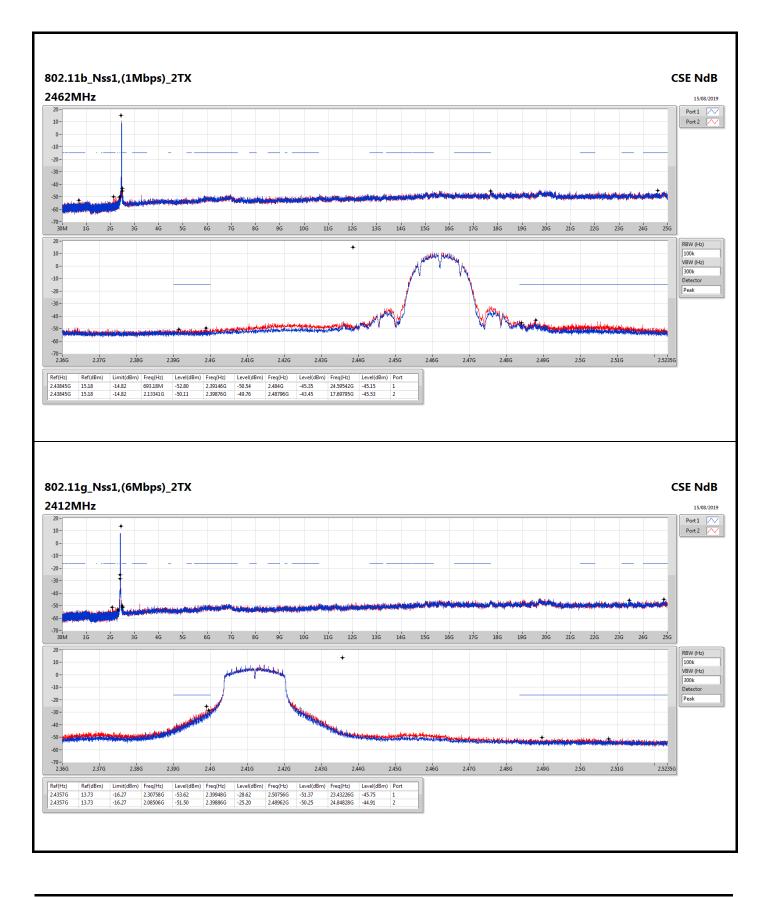
## Result

Mode	Result	Ref	Ref	Limit	Freq	Level	Freq	Level	Freq	Level	Freq	Level	Port
		(Hz)	(dBm)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	(Hz)	(dBm)	
802.11b_Nss1,(1Mbps)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.43845G	15.18	-14.82	2.17156G	-53.25	2.39852G	-33.06	2.5036G	-50.13	15.04291G	-44.89	1
2412MHz	Pass	2.43845G	15.18	-14.82	2.08593G	-50.22	2.3985G	-31.15	2.51306G	-50.09	15.0092G	-44.78	2
2437MHz	Pass	2.43845G	15.18	-14.82	1.62459G	-49.15	2.39996G	-38.95	2.48396G	-44.93	3.24837G	-42.56	1
2437MHz	Pass	2.43845G	15.18	-14.82	1.62459G	-44.50	2.39998G	-33.98	2.49108G	-45.24	3.24837G	-39.31	2
2462MHz	Pass	2.43845G	15.18	-14.82	693.18M	-52.80	2.39146G	-50.54	2.484G	-45.35	24.59542G	-45.15	1
2462MHz	Pass	2.43845G	15.18	-14.82	2.13341G	-50.11	2.39876G	-49.76	2.48796G	-43.45	17.69795G	-45.53	2
802.11g_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	-	-	-		-	-	-
2412MHz	Pass	2.4357G	13.73	-16.27	2.30758G	-53.62	2.39948G	-28.62	2.50756G	-51.37	23.43226G	-45.75	1
2412MHz	Pass	2.4357G	13.73	-16.27	2.08506G	-51.50	2.39886G	-25.20	2.48962G	-50.25	24.84828G	-44.91	2
2437MHz	Pass	2.4357G	13.73	-16.27	2.30059G	-50.55	2.39702G	-38.69	2.4866G	-43.80	14.95581G	-45.05	1
2437MHz	Pass	2.4357G	13.73	-16.27	2.30554G	-49.78	2.39824G	-37.93	2.48378G	-44.30	3.24837G	-39.74	2
2462MHz	Pass	2.4357G	13.73	-16.27	878.7M	-53.82	2.39446G	-50.44	2.48538G	-44.41	15.02886G	-45.50	1
2462MHz	Pass	2.4357G	13.73	-16.27	2.13108G	-51.97	2.3996G	-50.43	2.48408G	-45.19	17.69514G	-44.33	2
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-	-
2412MHz	Pass	2.4395G	13.62	-16.38	2.30961G	-52.08	2.3989G	-30.77	2.49546G	-51.03	17.6839G	-45.19	1
2412MHz	Pass	2.4395G	13.62	-16.38	2.30029G	-52.96	2.39922G	-28.71	2.49448G	-50.43	15.04572G	-45.41	2
2437MHz	Pass	2.4395G	13.62	-16.38	2.30088G	-50.57	2.39924G	-37.44	2.48408G	-44.18	3.24837G	-45.01	1
2437MHz	Pass	2.4395G	13.62	-16.38	2.11535G	-49.66	2.39914G	-36.59	2.48544G	-43.29	3.24837G	-40.96	2
2462MHz	Pass	2.4395G	13.62	-16.38	939.87M	-52.90	2.39098G	-50.94	2.48352G	-46.08	15.32949G	-45.34	1
2462MHz	Pass	2.4395G	13.62	-16.38	2.1369G	-51.72	2.39512G	-50.01	2.48446G	-42.52	24.84828G	-45.27	2
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-		-	-	-
2422MHz	Pass	2.43449G	6.34	-23.66	2.11533G	-53.22	2.39952G	-31.04	2.51534G	-52.28	15.29621G	-45.77	1
2422MHz	Pass	2.43449G	6.34	-23.66	705.84M	-53.23	2.3986G	-32.38	2.50806G	-51.74	24.89062G	-45.57	2
2437MHz	Pass	2.43449G	6.34	-23.66	2.30311G	-53.47	2.39956G	-40.65	2.48574G	-47.44	24.83173G	-45.79	1
2437MHz	Pass	2.43449G	6.34	-23.66	2.08585G	-52.25	2.39948G	-38.78	2.48418G	-45.54	17.67168G	-45.04	2
2452MHz	Pass	2.43449G	6.34	-23.66	2.16457G	-53.11	2.39332G	-51.11	2.48422G	-44.64	24.99439G	-45.23	1
2452MHz	Pass	2.43449G	6.34	-23.66	2.17602G	-53.36	2.39572G	-49.11	2.48422G	-41.96	16.44328G	-45.64	2

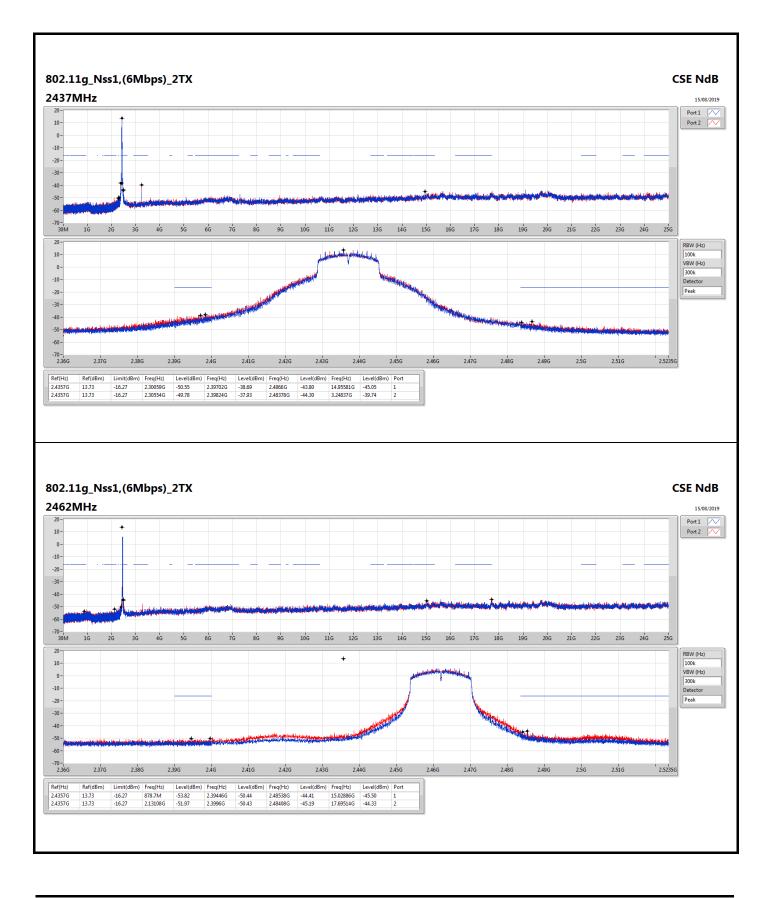




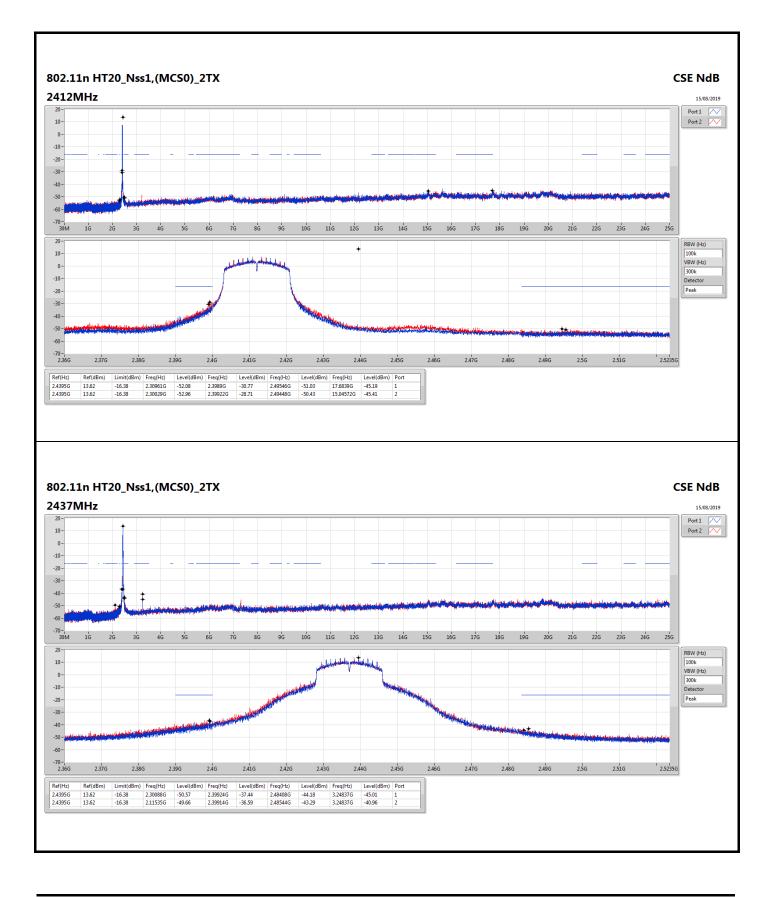




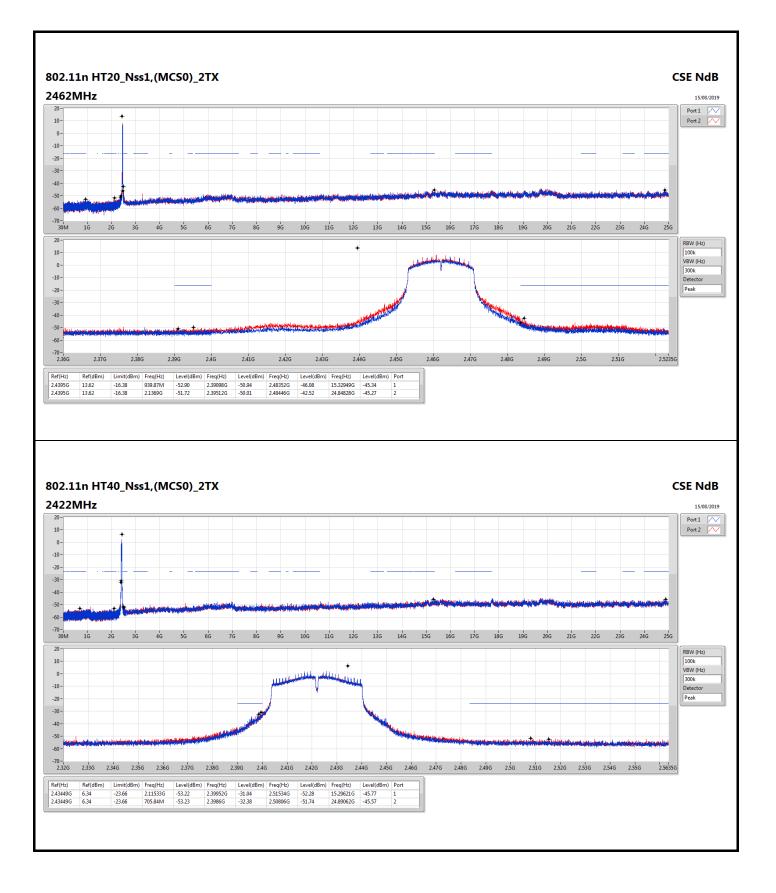




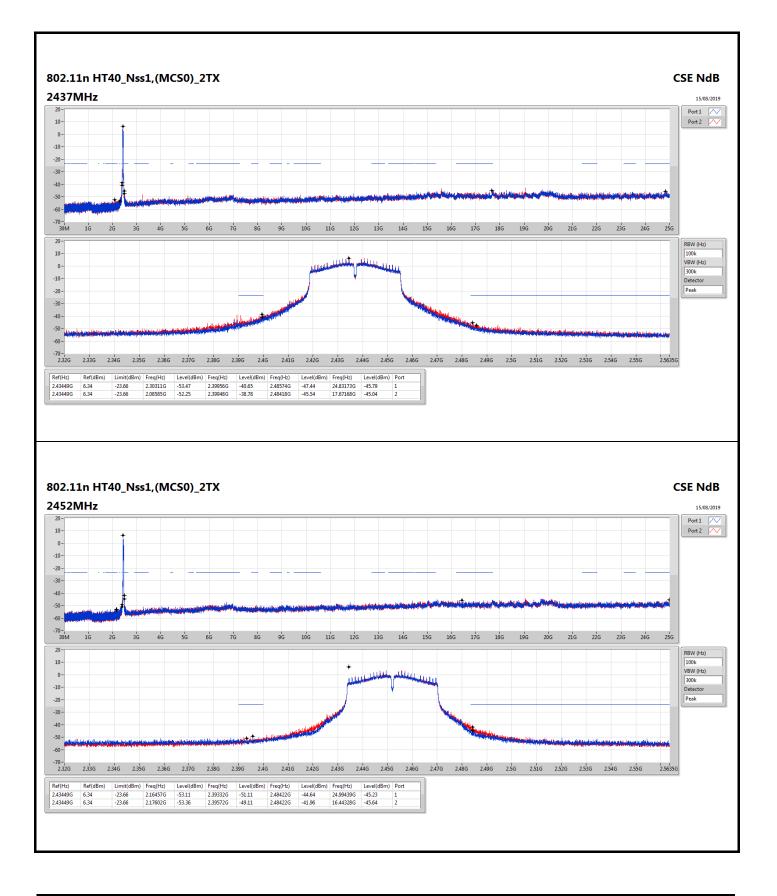




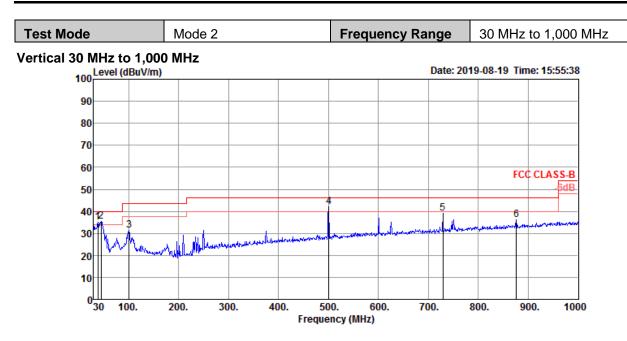






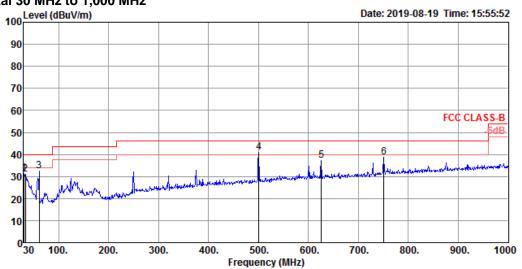






	Freq	Level		Over Limit						T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	38.73	35.19	40.00	-4.81	45.37	0.81	20.51	31.50	100	243	Peak	VERTICAL
2	44.55	35.33	40.00	-4.67	48.78	0.89	17.25	31.59	100	123	Peak	VERTICAL
3	100.81	31.22	43.50	-12.28	44.68	1.31	17.22	31.99	125	329	Peak	VERTICAL
4	500.45	42.04	46.00	-3.96	47.75	2.94	23.83	32.48	100	253	Peak	VERTICAL
5	729.37	39.03	46.00	-6.97	41.89	3.57	25.96	32.39	100	120	Peak	VERTICAL
6	875.84	36.12	46.00	-9.88	37.10	3.92	27.50	32.40	100	197	Peak	VERTICAL





## Horizontal 30 MHz to 1,000 MHz

	Freq	Level	Limit Line					Preamp Factor		T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.97	31.45	40.00	-8.55	37.21	0.69	25.11	31.56	300	357	Peak	HORIZONTAL
2	33.88	30.82	40.00	-9.18	38.19	0.74	23.39	31.50	100	86	Peak	HORIZONTAL
3	61.04	32.30	40.00	-7.70	50.55	1.00	12.60	31.85	200	267	Peak	HORIZONTAL
4	500.45	41.11	46.00	-4.89	46.82	2.94	23.83	32.48	150	102	Peak	HORIZONTAL
5	625.58	37.18	46.00	-8.82	41.12	3.28	25.21	32.43	125	125	Peak	HORIZONTAL
6	750.71	38.77	46.00	-7.23	41.26	3.64	26.20	32.33	100	196	Peak	HORIZONTAL

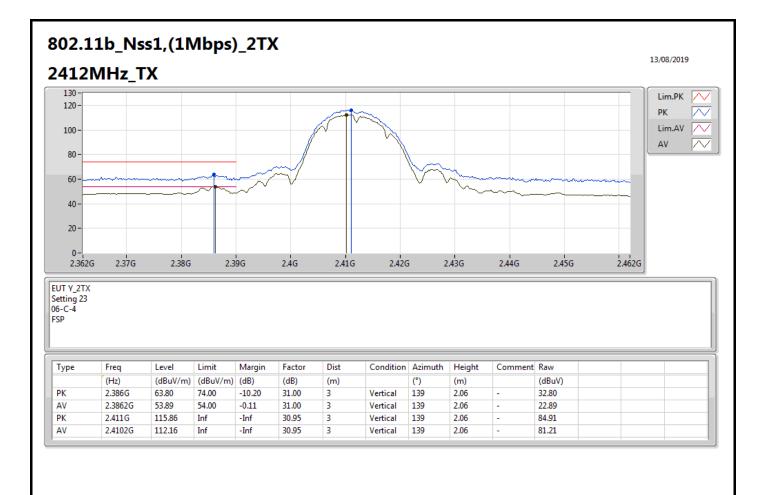


# Appendix F.2

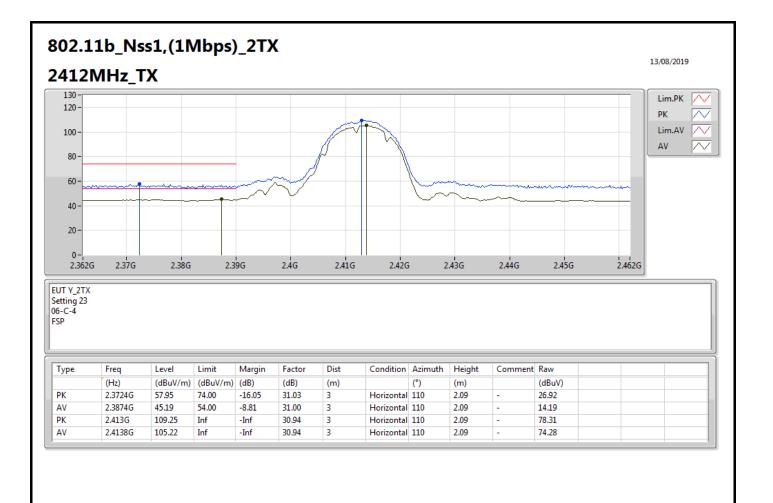
## Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11g_Nss1,(6Mbps)_2TX	Pass	AV	2.3886G	53.95	54.00	-0.05	30.99	3	Vertical	128	2.20	-



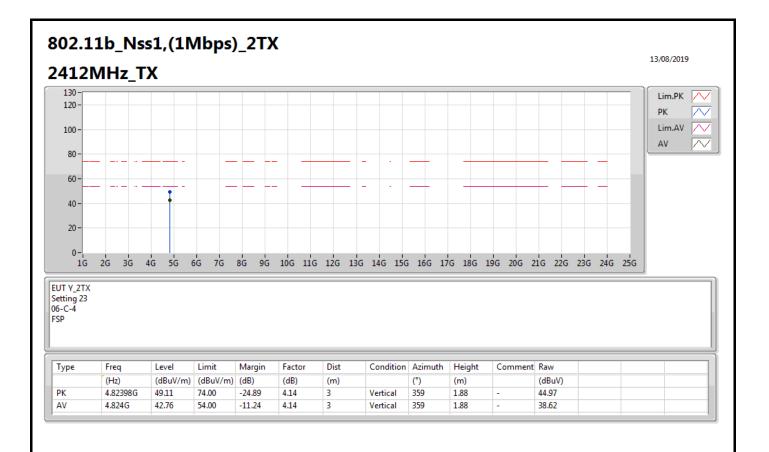






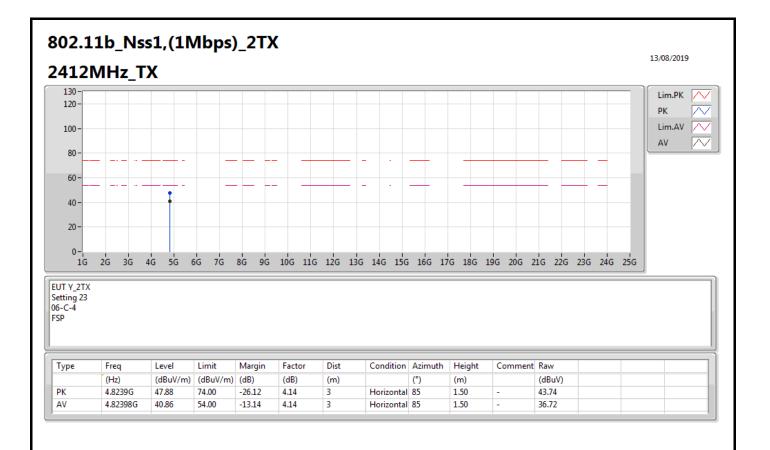
















## 802.11b\_Nss1,(1Mbps)\_2TX





13/08/2019

Lim.PK

РК

AV

2.46G

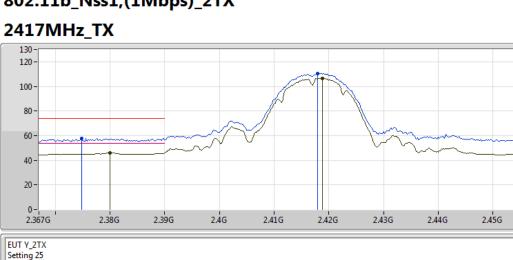
2.467G

 $\sim$ 

 $\sim$ Lim.AV 📈



# 802.11b\_Nss1,(1Mbps)\_2TX

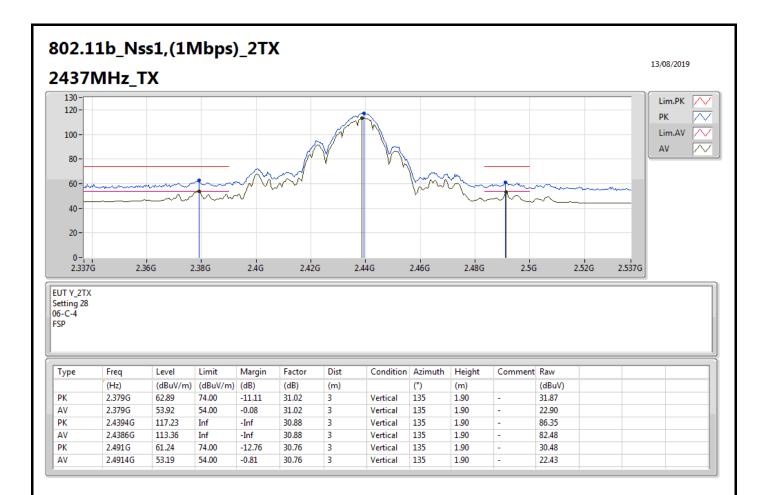


Setting 25 06-C-4 FSP

Туре	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)		
PK	2.3748G	57.68	74.00	-16.32	31.03	3	Horizontal	62	2.08	-	26.65		
AV	2.38G	46.04	54.00	-7.96	31.02	3	Horizontal	62	2.08	-	15.02		
PK	2.418G	110.59	Inf	-Inf	30.93	3	Horizontal	62	2.08	-	79.66		
AV	2.4188G	106.65	Inf	-Inf	30.92	3	Horizontal	62	2.08	-	75.73		

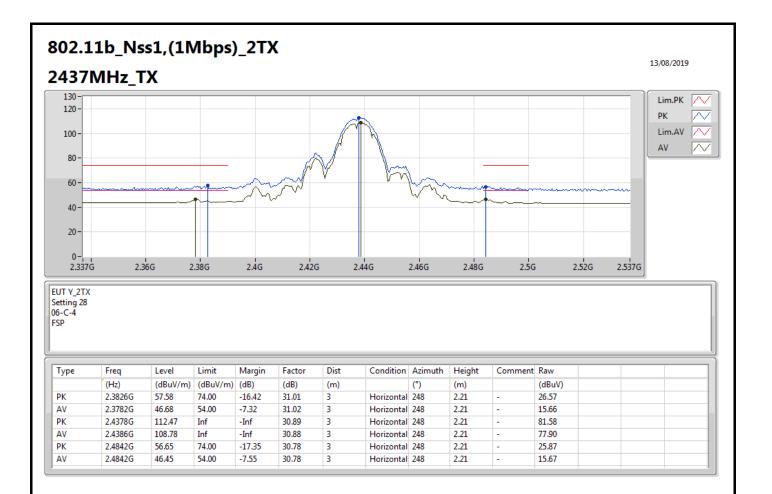






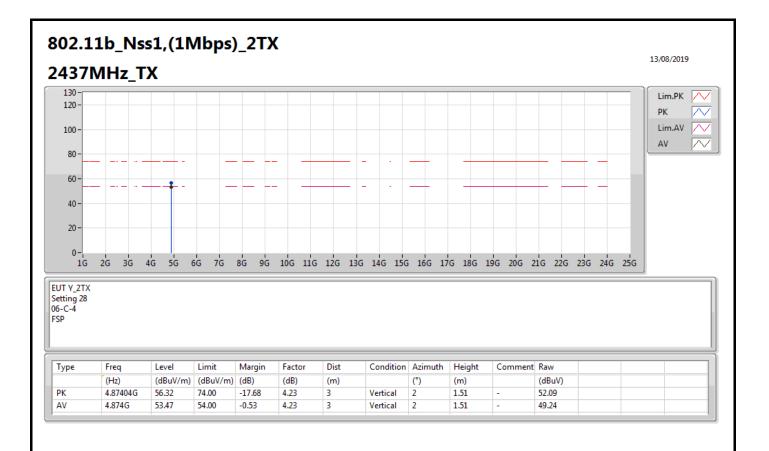






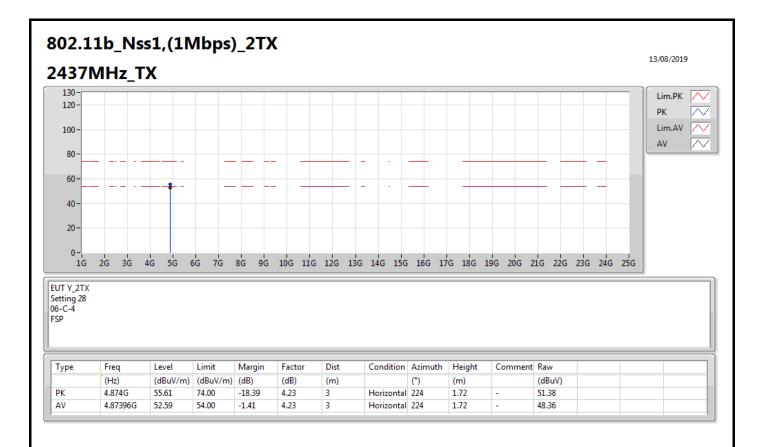






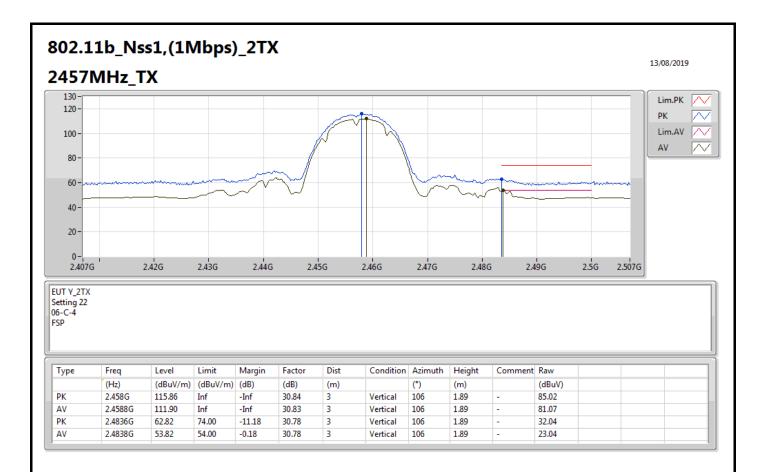








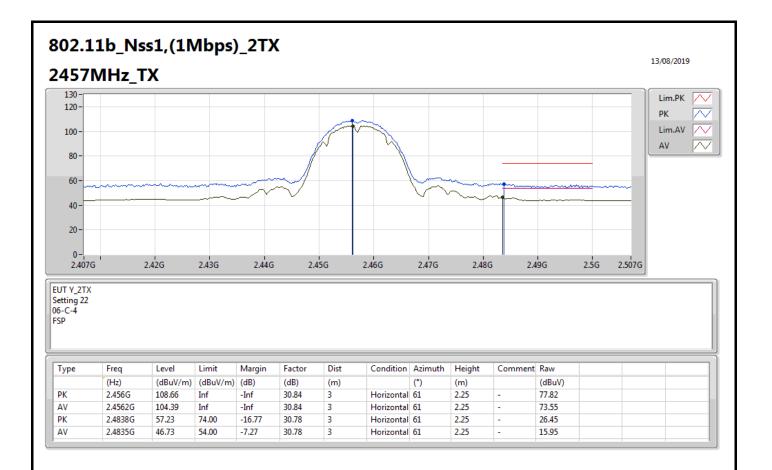






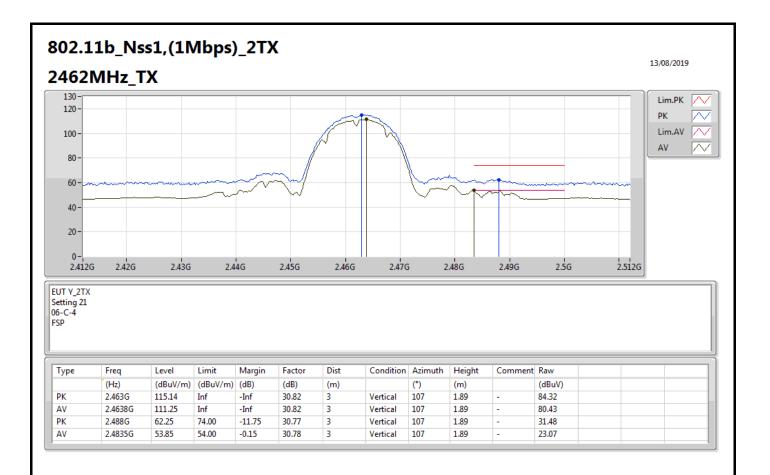




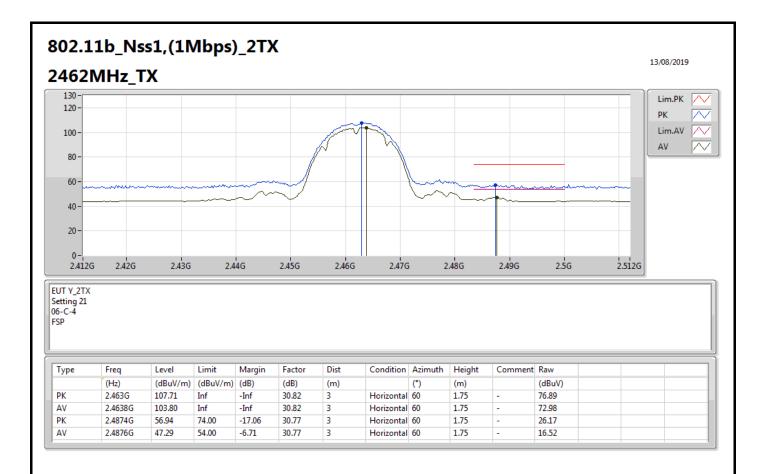






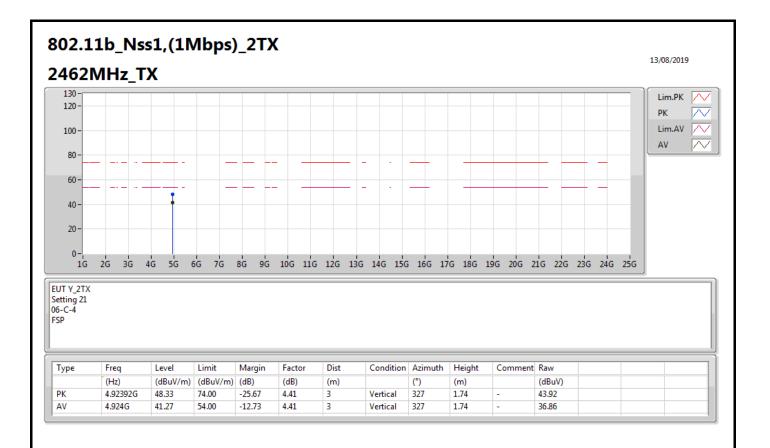






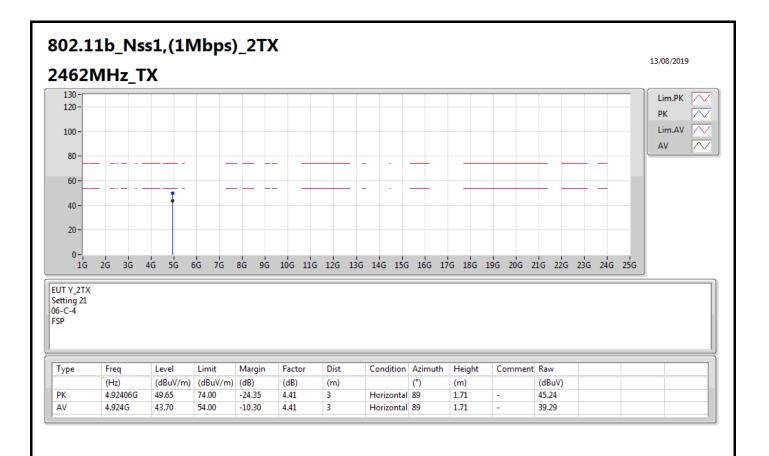






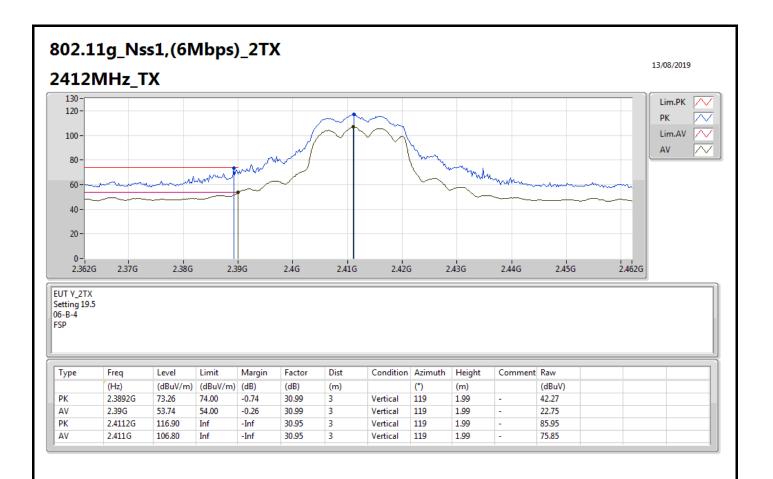




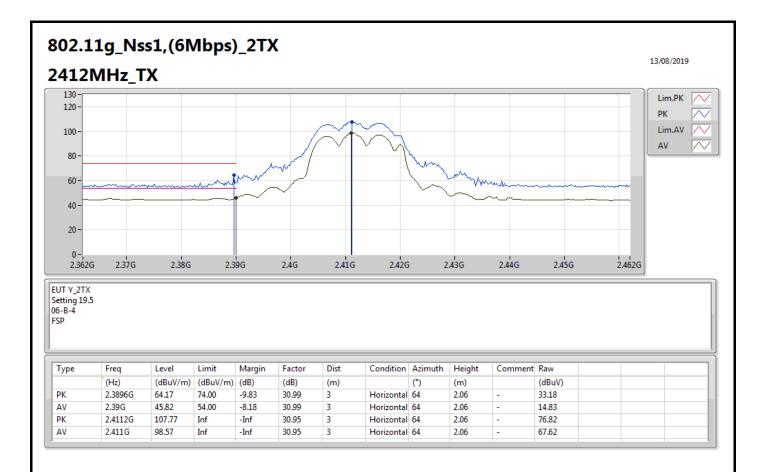






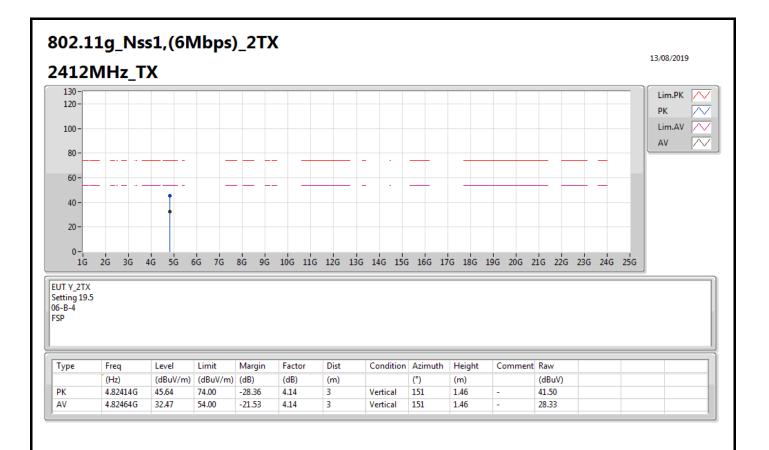






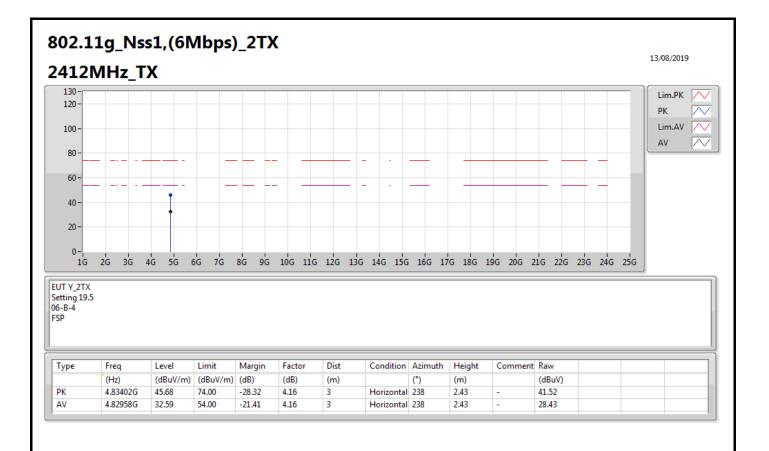






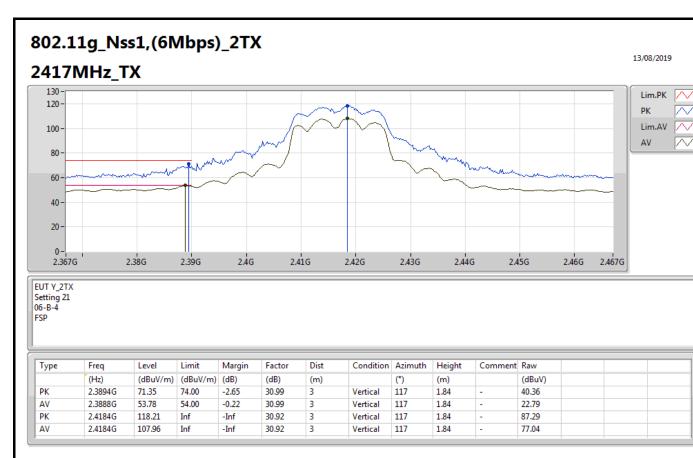






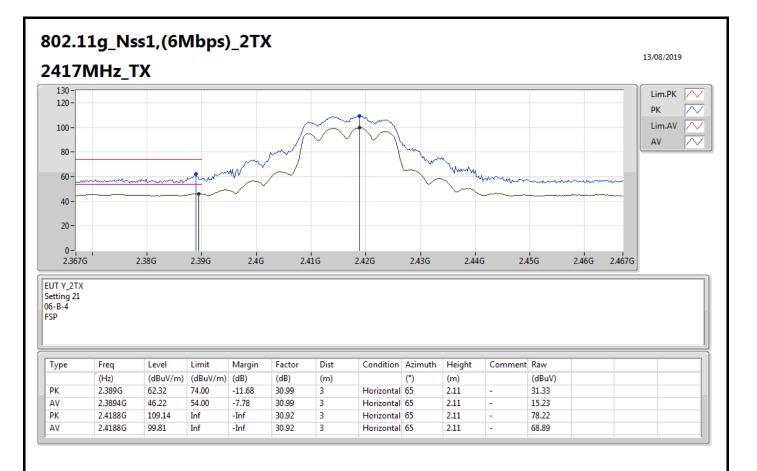






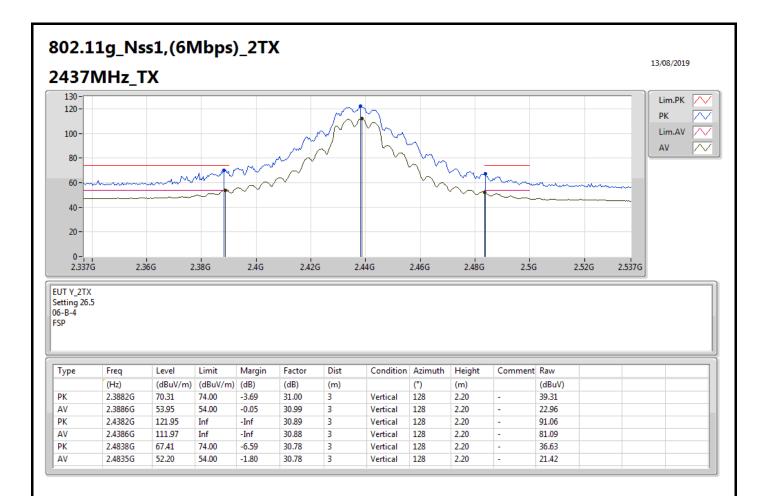






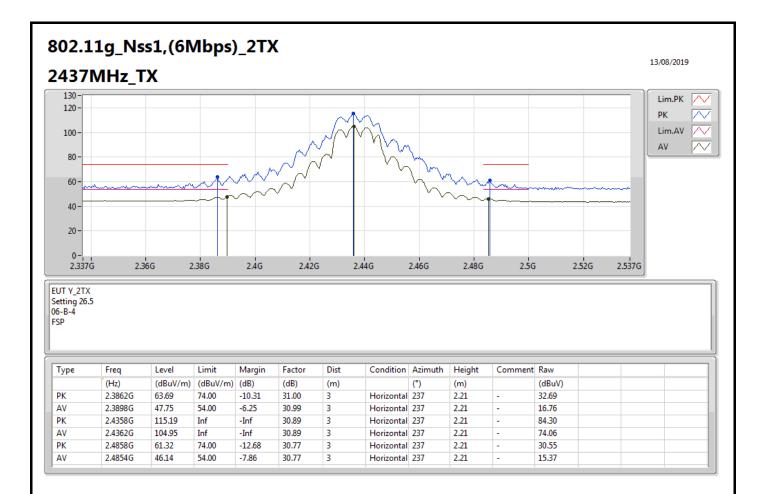






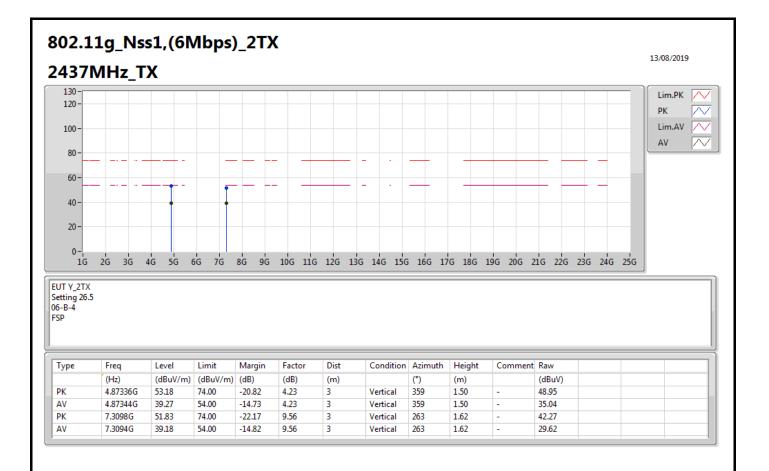






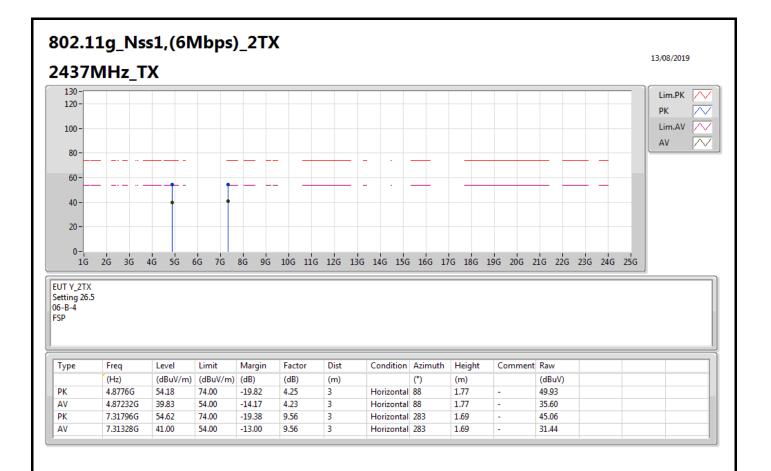






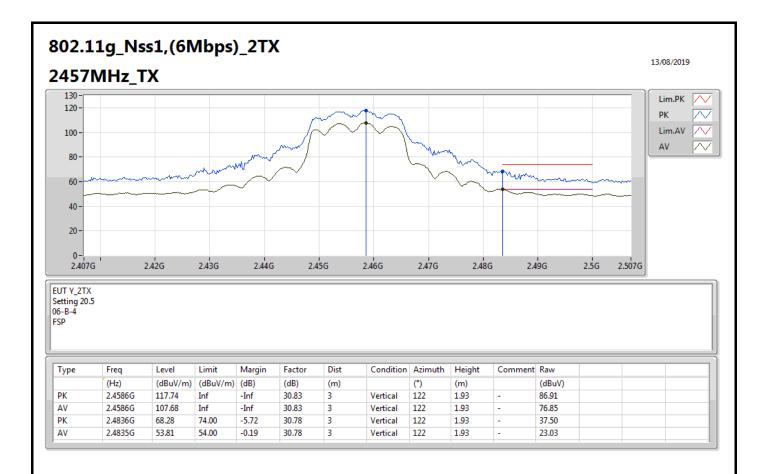






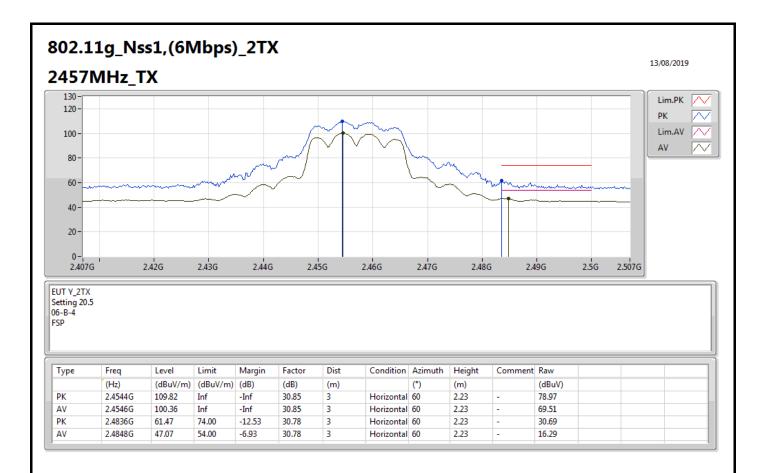






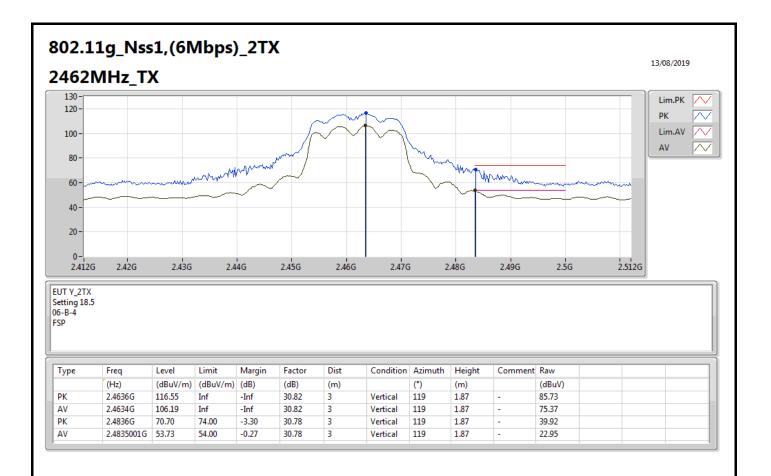






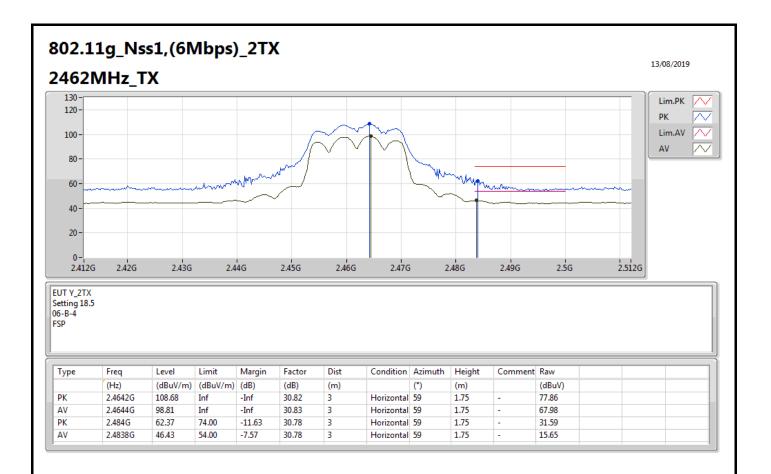






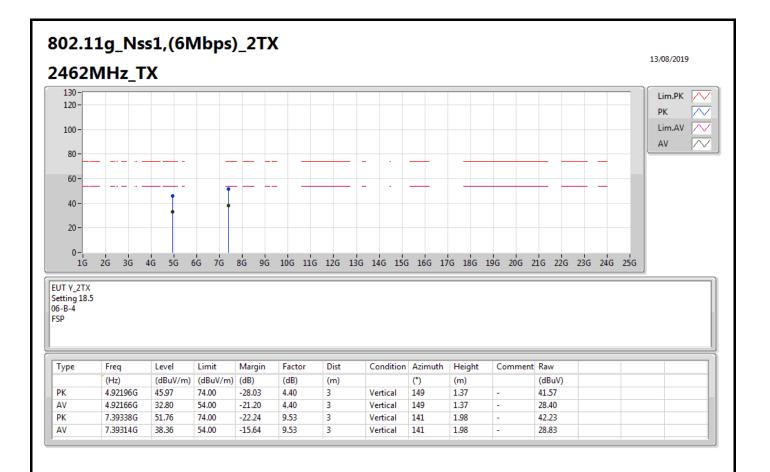






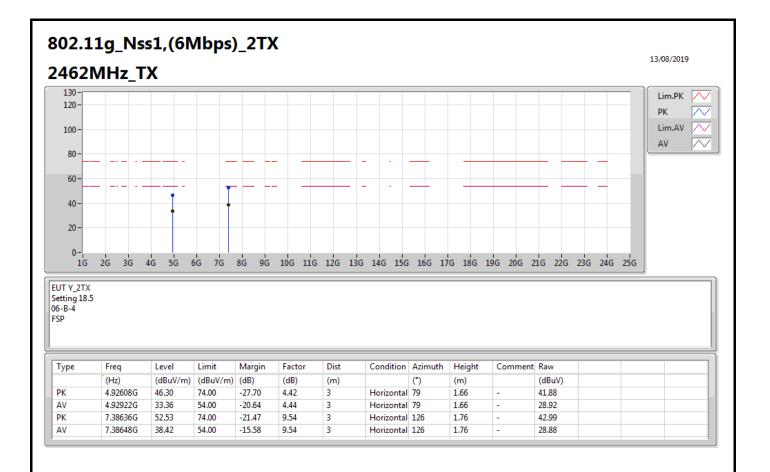




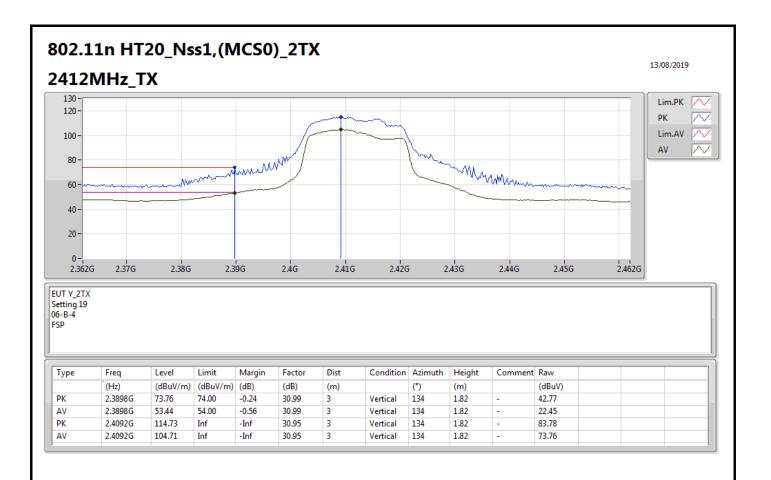




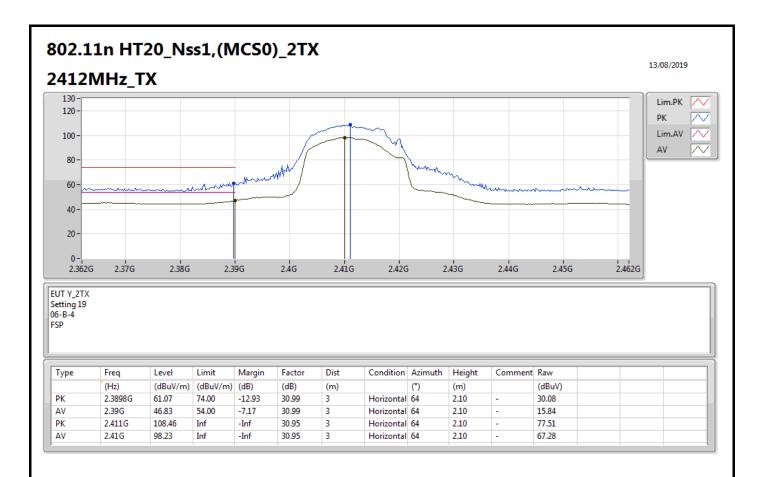




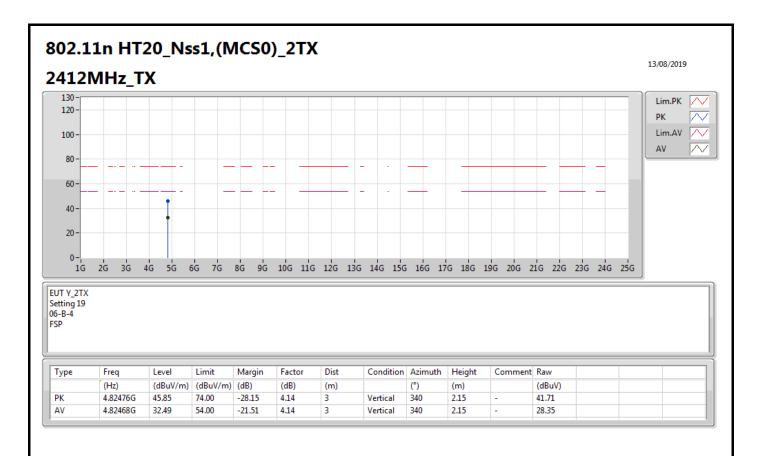




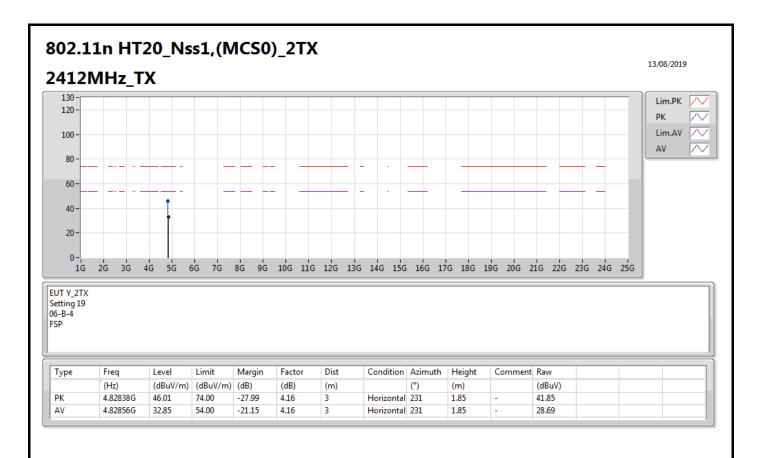




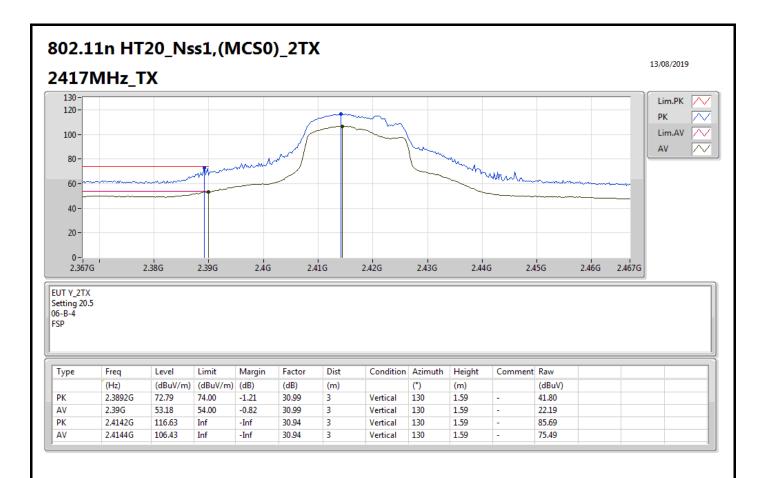




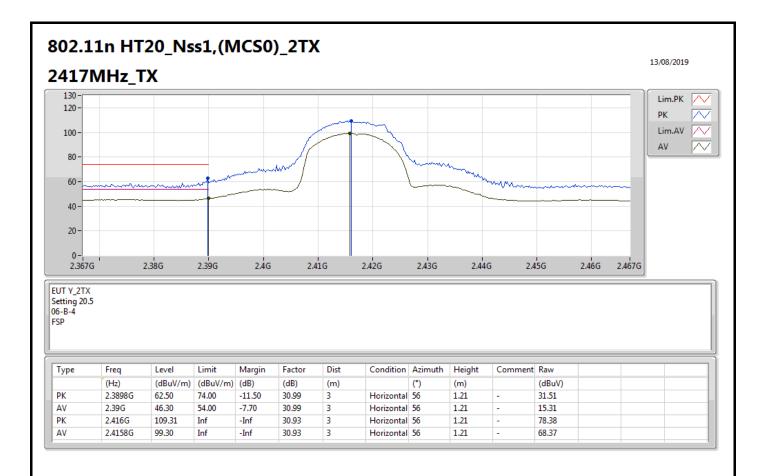




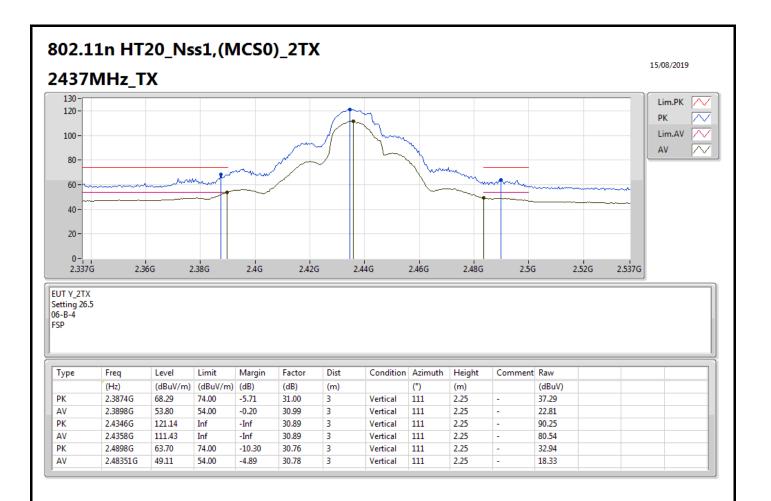




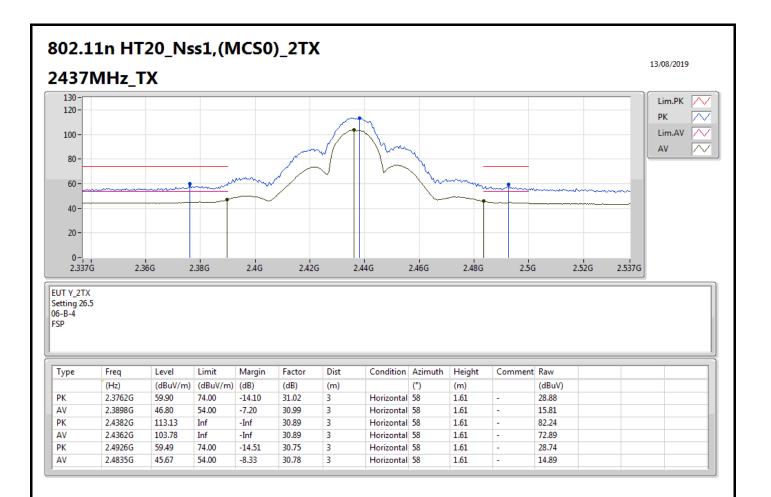




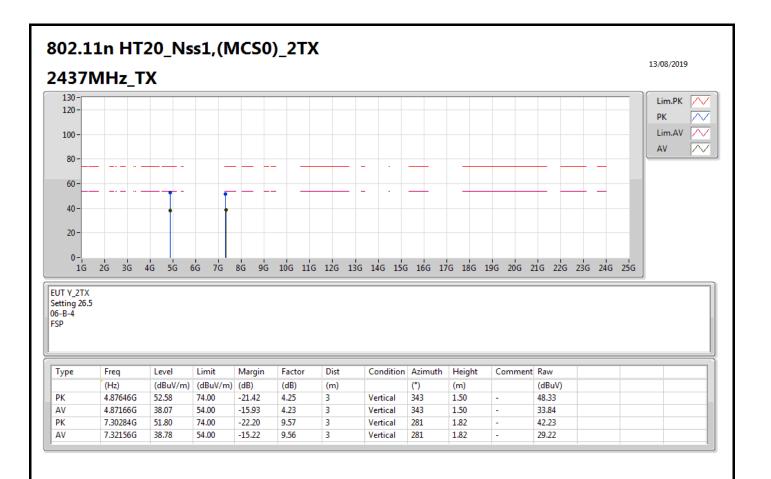




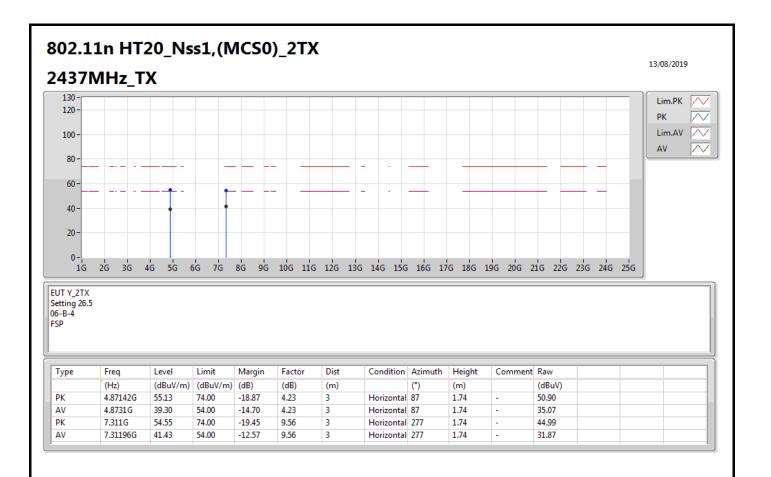




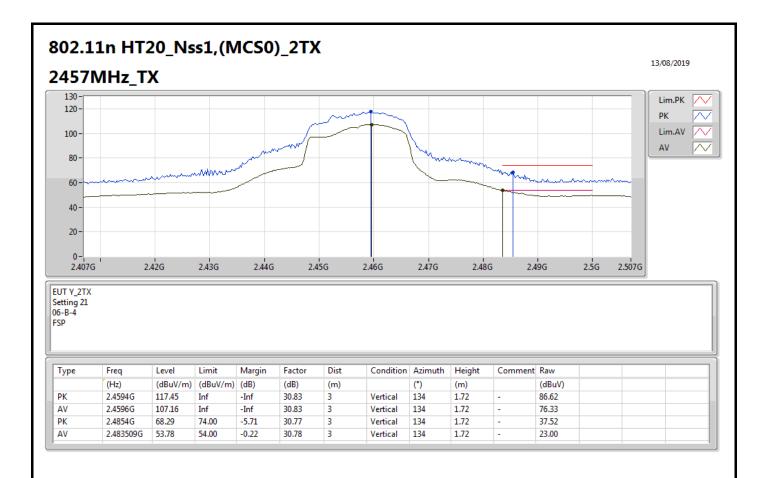






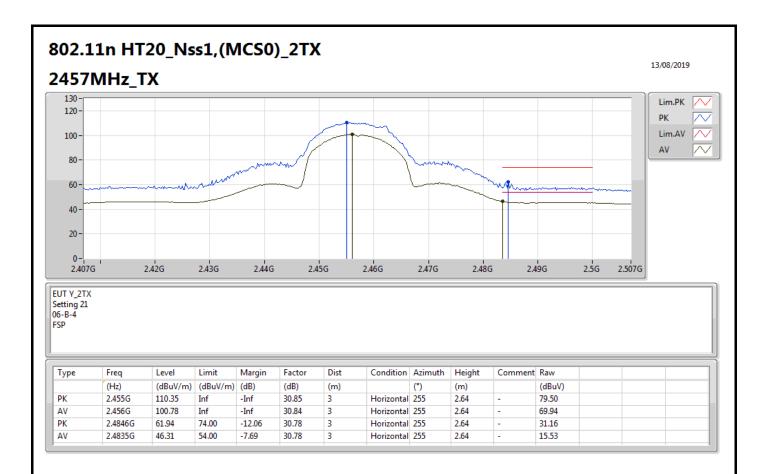




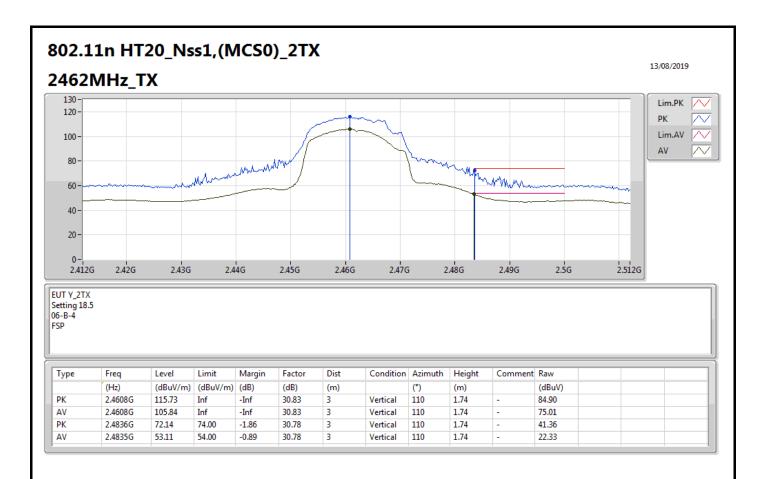




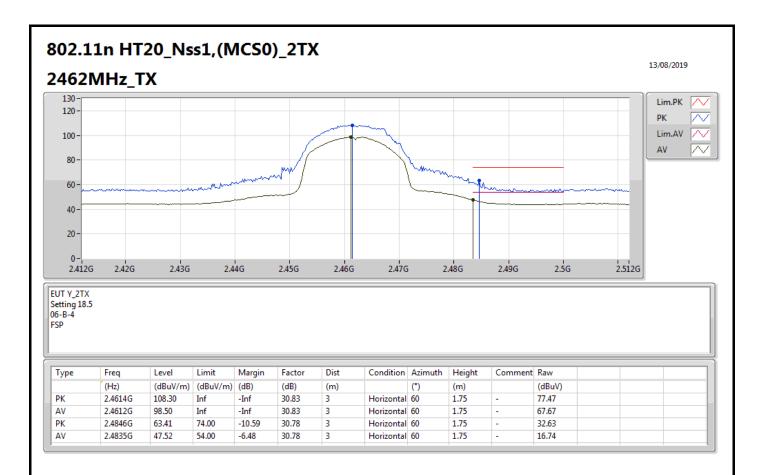




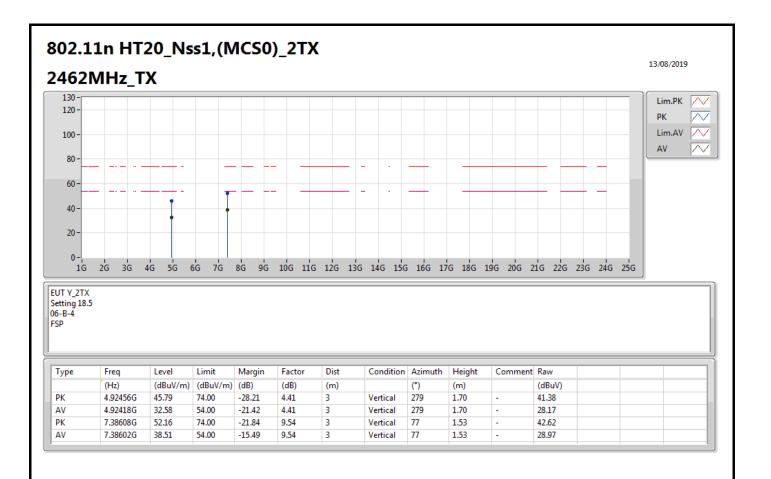




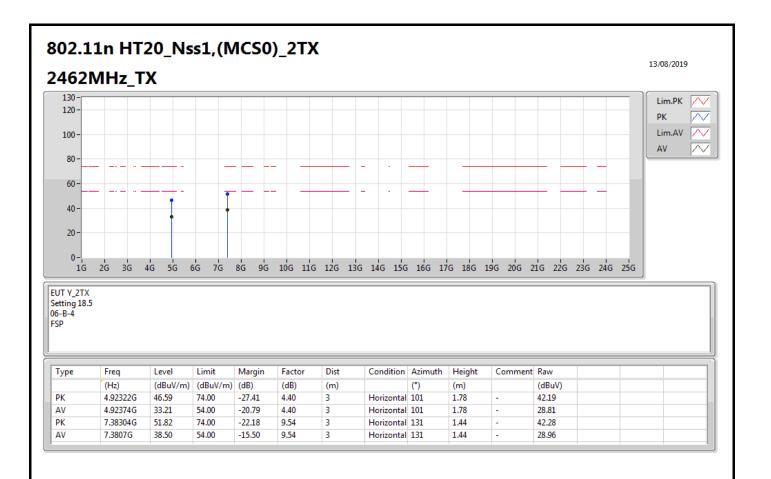




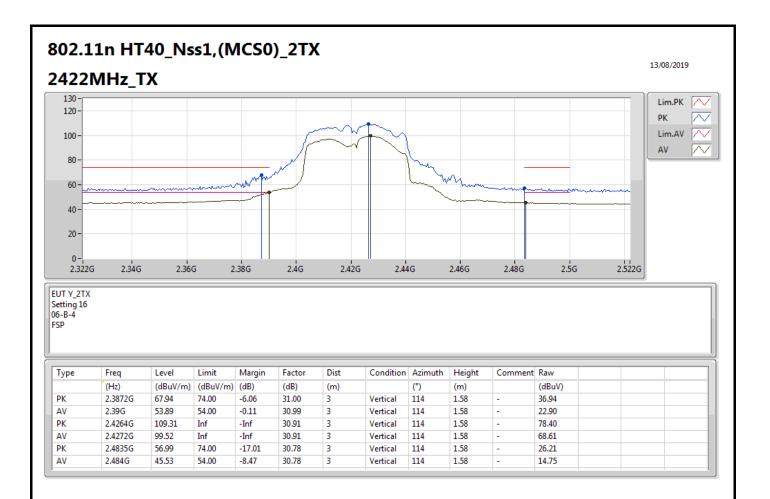




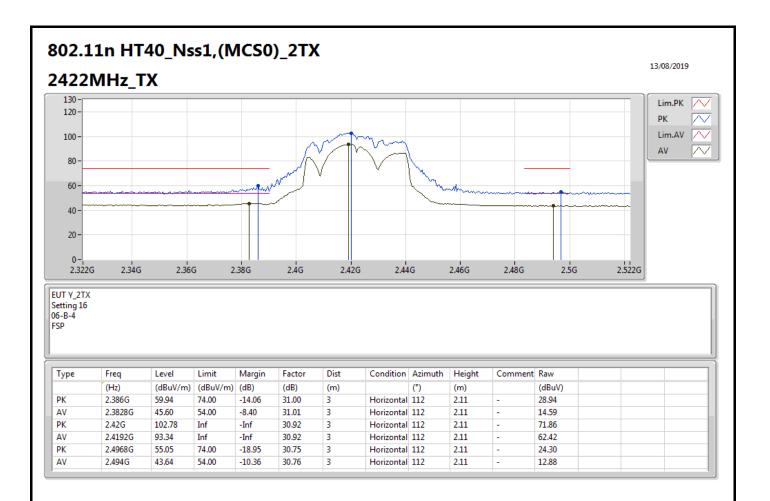




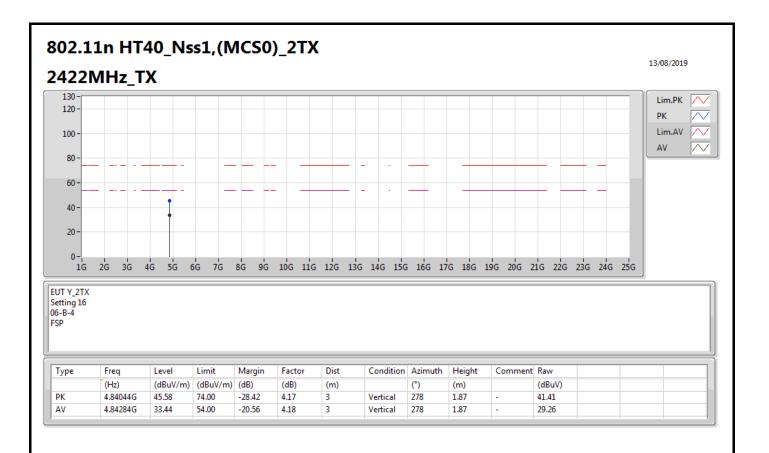




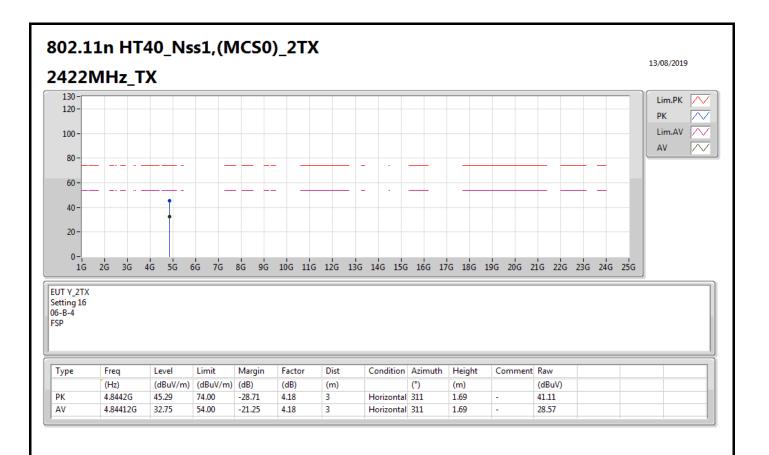




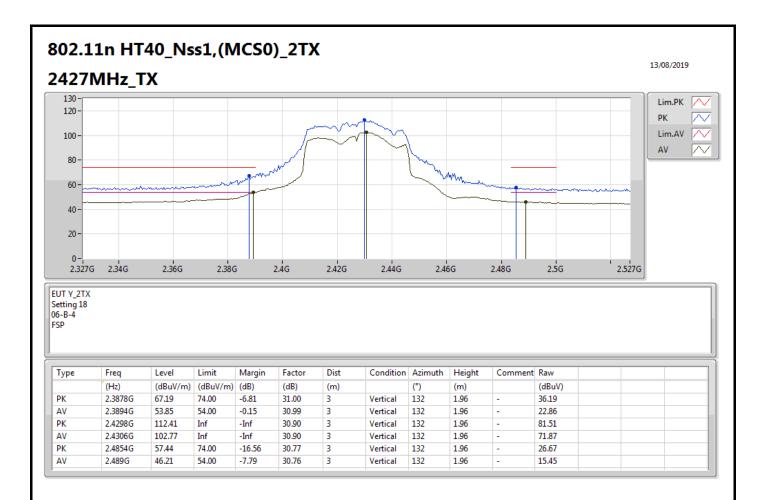




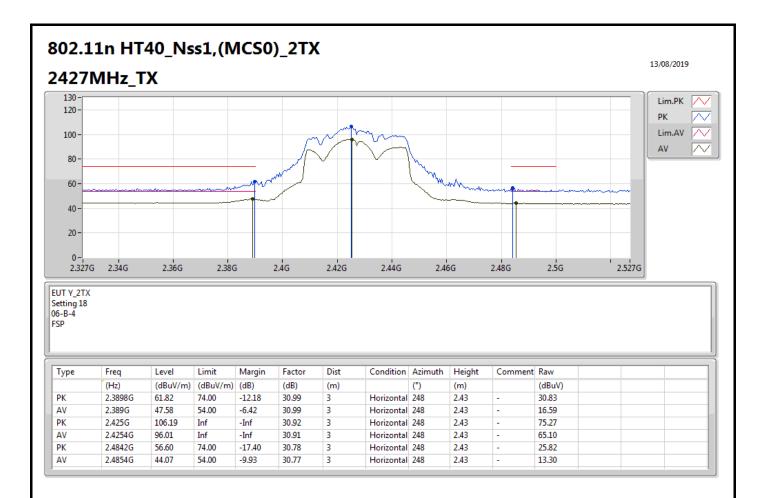




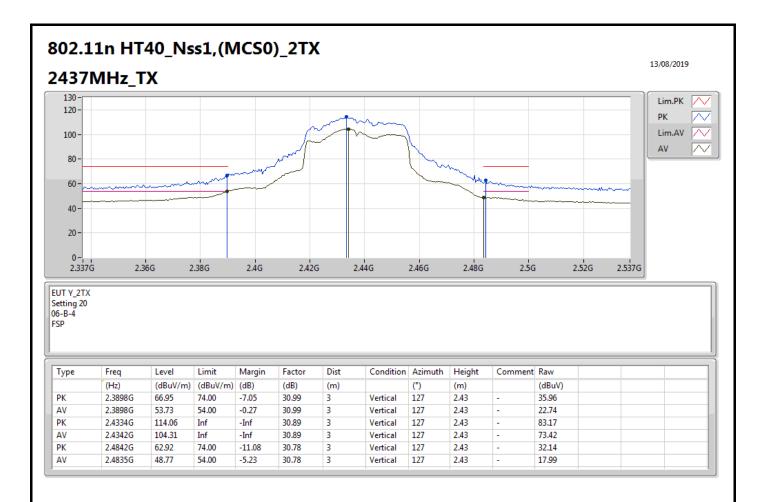














RSE TX above 1GHz

