



Project No: CB10603273

5GHz Wi-Fi Radio FCC Test Report

Equipment : Norton Core Secure WiFi Router

Brand Name : Norton Core

Model No. : 517

FCC ID : 2AI6F-517

Standard : 47 CFR FCC Part 15.407

Operating Band : 5150 MHz - 5250 MHz

5725 MHz - 5850 MHz

Applicant : Symantec Corporation

350 Ellis Street Mountain View, CA 94043 United States

Manufacturer : CyberTAN Technology Inc.

No. 99, Park Avenue III, Science-based Industrial Park,

Hsinchu, 308 Taiwan

Function : ☐ Outdoor; ☐ Indoor; ☐ Fixed P2P

Client

The product sample received on Aug. 18, 2016 and completely tested on Mar. 14, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

Cliff Chang

SPORTON INTERNATIONAL INC.





SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No.

: 1 of 32

Report Version

: Rev. 01

Issued Date

: Mar. 31, 2017



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information	5
1.2	Testing Applied Standards	8
1.3	Testing Location Information	8
1.4	Measurement Uncertainty	8
2	TEST CONFIGURATION OF EUT	9
2.1	Test Channel Mode	9
2.2	The Worst Case Measurement Configuration	11
2.3	EUT Operation during Test	12
2.4	Accessories	13
2.5	Support Equipment	13
2.6	Test Setup Diagram	14
3	TRANSMITTER TEST RESULT	18
3.1	AC Power-line Conducted Emissions	18
3.2	Emission Bandwidth	20
3.3	Maximum Conducted Output Power	21
3.4	Peak Power Spectral Density	23
3.5	Unwanted Emissions	
3.6	Frequency Stability	30
4	TEST EQUIPMENT AND CALIBRATION DATA	31
APPI	ENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPI	ENDIX B. TEST RESULTS OF EMISSION BANDWIDTH	
APPI	ENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPI	ENDIX D. TEST RESULTS OF PEAK POWER SPECTRAL DENSITY	
APPI	ENDIX E. TEST RESULTS OF UNWANTED EMISSIONS	
APPI	ENDIX F. TEST RESULTS OF FREQUENCY STABILITY	
APPI	ENDIX G. TEST RESULTS OF RADIATED EMISSION CO-LOCATION	
APPI	ENDIX H. TEST PHOTOS	
PHO	TOGRAPHS OF EUT V01	

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 2 of 32 Report Version : Rev. 01

Issued Date

: Rev. 01 : Mar. 31, 2017



Summary of Test Result

	Conformance Test Specifications						
Report Clause	Ref. Std. Clause	Description	Result				
1.1.3	15.203	Antenna Requirement	Complied				
3.1	15.207	AC Power-line Conducted Emissions	Complied				
3.2	15.407(a)	Emission Bandwidth	Complied				
3.3	15.407(a)	Maximum Conducted Output Power	Complied				
3.4	15.407(a)	Peak Power Spectral Density	Complied				
3.5	15.407(b)	Unwanted Emissions	Complied				
3.6	15.407(g)	Frequency Stability	Complied				

 SPORTON INTERNATIONAL INC.
 Page

 TEL: 886-3-3273456
 Repo

 FAX: 886-3-3270973
 Issue

FCC ID: 2AI6F-517

Page No. : 3 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017



Revision History

Version	Description	Issued Date
Rev. 01	Initial issue of report	Mar. 31, 2017
	Rev. 01	Rev. 01 Initial issue of report

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No.
Report Version
Issued Date

: 4 of 32 : Rev. 01 : Mar. 31, 2017



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		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5725-5850		5775	155 [1]

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	4
5.15-5.25GHz	802.11ac VHT20	20	4
5.15-5.25GHz	802.11ac VHT40	40	4
5.15-5.25GHz	802.11ac VHT80	80	4
5.15-5.25GHz	802.11a-BF	20	4
5.15-5.25GHz	802.11ac VHT20-BF	20	4
5.15-5.25GHz	802.11ac VHT40-BF	40	4
5.15-5.25GHz	802.11ac VHT80-BF	80	4
5.725-5.85GHz	802.11a	20	4
5.725-5.85GHz	802.11ac VHT20	20	4
5.725-5.85GHz	802.11ac VHT40	40	4
5.725-5.85GHz	802.11ac VHT80	80	4
5.725-5.85GHz	802.11a-BF	20	4
5.725-5.85GHz	802.11ac VHT20-BF	20	4
5.725-5.85GHz	802.11ac VHT40-BF	40	4
5.725-5.85GHz	802.11ac VHT80-BF	80	4

Note:

- 5.2G/5.2G-I(IC) is the 5.2GHz Band (5.15-5.25GHz).
- 5.8G/5.8G-I(IC) is the 5.8GHz Band (5.725-5.850GHz).
- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM 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.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 5 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



1.1.2 Table for 80+80 MHz Mode

Туре	Channel No. Frequency	
1	42+155	5210+5775 MHz

Report No.: FR681620AB

1.1.3 Antenna Information

		Model Name		Connect	Gain (dBi)			
Ant.	Brand	P/N	Antenna Type	or	2.4GHz	5GHz B1	5GHz B4	ВТ
1	Airgain	M2410DCR-UV-G1XST125BU	Dual-band Dipole	I-PEX	1.5	2.3	3.3	-
2	Airgain	M2410DCR-UV-B1XST135BU	Dual-band Dipole	I-PEX	1.5	2.3	3.3	-
3	Airgain	M2410DCR-UV-A1XST115BU	Dual-band Dipole	I-PEX	1.5	2.3	3.3	-
4	Airgain	M2410DCR-UV-G1XST125BU	Dual-band Dipole	I-PEX	1.5	2.3	3.3	-
5	PSA	RFMTA271200NNAB003	PIFA Antenna	N/A		-	-	2.54

Note: The EUT has five antennas.

Ant.1 = Chain 1(port 1), Ant.2 = Chain 2(port 2), Ant.3 = Chain 3(port 3), Ant.4 = Chain 4(port 4), Ant.5 = Chain 5(port 1).

For WLAN function (4TX, 4RX):

Chain 1 ~ Chain 4 can be used as transmitting/receiving antenna.

Chain 1 ~ Chain 4 could transmit/receive simultaneously.

For Bluetooth function (1TX, 1RX):

Only Chain 5 can be used as transmitting/receiving functions.

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)
802.11a-BF	0.938	0.278
802.11ac VHT20-BF	0.922	0.353
802.11ac VHT40-BF	0.903	0.443
802.11ac VHT80-BF	0.916	0.381
802.11ac VHT80+80-BF	0.38	4.202

1.1.5 EUT Operational Condition

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

Note: The product has beamforming function for 802.11a/g/n/ac in 2.4GHz and 5GHz.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 6 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



1.1.6 Table for Multiple Listing

The EUT has two exterior which are identical to each other in all aspects except for the following table:

Brand Name	Model Name	EUT	Color
Norton Core	F17	1	Granite Gray
	Core 517 -	2	Titanium Gold

 SPORTON INTERNATIONAL INC.
 Page No.
 : 7 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



Testing Applied Standards 1.2

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v01r03
- FCC KDB 644545 D03 v01
- FCC KDB 662911 D01 v02r01

Testing Location Information 1.3

	Testing Location						
	HWA YA ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.						
		TEL	:	886-3-327-3456 FAX : 886-3-318-0055			
\boxtimes	JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL	:	886-3-656-9065 FAX : 886-3-656-9085			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	TH01-CB Serway Li		Mar. 07, 2017 Mar. 08, 2017
Radiated	03CH01-CB	Zero Chen, Nyle, Chang, Justin Lin	22°C / 54%	Dec. 26, 2016 Mar. 14, 2017
AC Conduction	CO01-CB	Ryo Fan	23°C / 61%	Dec. 28, 2016

Test site Designation No. TW0006 with FCC

Measurement Uncertainty 1.4

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74 x10 ⁻⁸	Confidence levels of 95%
Frequency Stability	6.06 x10 ⁻⁸	Confidence levels of 95%

SPORTON INTERNATIONAL INC. Page No. : 8 of 32 TEL: 886-3-3273456 Report Version FAX: 886-3-3270973

FCC ID: 2AI6F-517

: Rev. 01 Issued Date : Mar. 31, 2017

Report No.: FR681620AB

Test site registered number IC 4086D with Industry Canada.



2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11a-BF_Nss1_4TX	-
5180MHz	22
5200MHz	22
5240MHz	21.5
5745MHz	21
5785MHz	21
5825MHz	21
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-
5180MHz	22
5200MHz	22
5240MHz	22
5745MHz	21
5785MHz	20.5
5825MHz	20.5
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-
5190MHz	20.5
5230MHz	21
5755MHz	20.5
5795MHz	20.5
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-
5210MHz	20
5775MHz	21
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-
5180MHz	24
5200MHz	24
5240MHz	24
5745MHz	24
5785MHz	24
5825MHz	24
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-
5190MHz	20
5230MHz	23
5755MHz	24
5795MHz	24
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-
5210MHz	21
5775MHz	23
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 9 of 32

Report Version : Rev. 01

Issued Date : Mar. 31, 2017



Mode	Power Setting	
#5210MHz,5775MHz	27	
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	
5210MHz,#5775MHz	27	
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	
#5210MHz,5775MHz	28	
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	
5210MHz,#5775MHz	28	

 SPORTON INTERNATIONAL INC.
 Page No.
 : 10 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item AC power-line conducted emissions			
Condition	Condition AC power-line conducted measurement for line and neutral		
Operating Mode Normal Link			

Report No.: FR681620AB

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

Th	The Worst Case Mode for Following Conformance Tests		
Tests Item Unwanted Emissions			
Test Condition Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used regardless of spatial multiplexing MIMO configuration), the radiated test be performed with highest antenna gain of each antenna type.			
Operating Mode < 1GHz Normal Link			
Operating Mode > 1GHz	CTX		

The Worst Case Mode for Following Conformance Tests				
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation				
Operating Mode	Operating Mode			
1	1 Bluetooth+WLAN 2.4GHz+WLAN 5GHz			
Refer to Sporton Test Report No.: FA681620 for Co-location RF Exposure Evaluation.				

Note: 1. There are two modes one is beamforming mode, and the other is non-beamforming mode, after evaluating, beamforming mode has been evaluated to be the worst case, so it was selected to test and record in this test report.

3. The EUT can only be used at Z axis position.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 11 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017

^{2.} VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.



2.3 EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

- 1. During the test, the EUT operation to normal function.
- 2. Executed command fixed test channel under DOS.
- 3. Executed "Lantest.exe" to link with the remote workstation to transmit and receive packet by RX Device and transmit duty cycle no less 98%.

For Normal Link:

During the test, the EUT operation to normal function.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 12 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



2.4 Accessories

Accessories				
Equipment Name Brand Name Model Name Rating				
Adapter	Delta	ADP-360DW B2A	Input: 100-120V ~ 60Hz 0.9A Output: 12V, 3.0A	
RJ-45 cable*1: Non-shielded 1.8m				

Report No.: FR681620AB

2.5 Support Equipment

For Test Site No: CO01-CB

	Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID					
1	NB*4	DELL	E6430	DoC		
2	iPhone 4	Apple	A1332	BCG-E2380a		
3	Flash Disk3.0*2	ADATA	C103	DoC		

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

	Support Equipment					
No.	No. Equipment Brand Name Model Name FCC ID					
1	NB*2	DELL	E4300	DoC		
2	NB*2	Apple	Mac Book	DoC		
3	iPhone 4	Apple	A1332	BCG-E2380a		
4	Flash Disk3.0*2	Silicon Power	B06	DoC		

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

<For Non-Beamforming Mode>

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

<For Beamforming Mode>

	Support Equipment				
No.	No. Equipment Brand Name Model Name FCC ID				
1	NB*2	DELL	E4300	DoC	
3	Client	Norton	Rover	N/A	

For Test Site No: TH01-CB

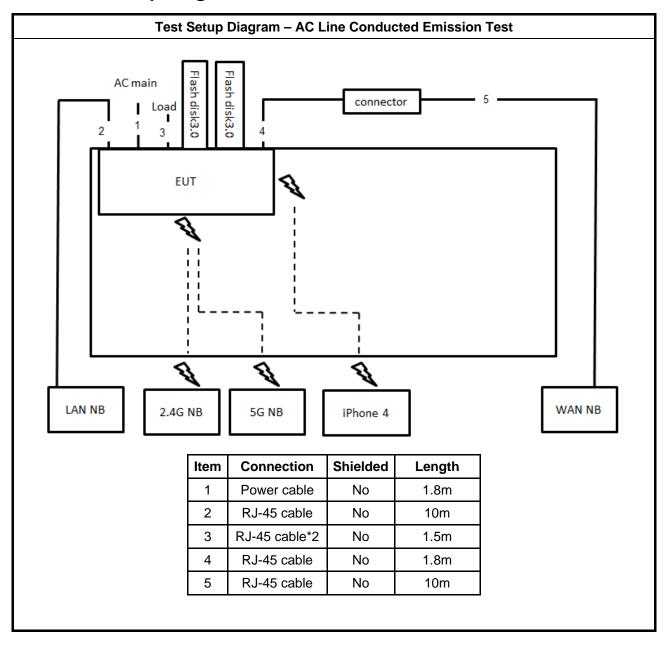
	Support Equipment					
No. Equipment		Brand Name	Model Name	FCC ID		
1	NB	DELL	E4300	DoC		

 SPORTON INTERNATIONAL INC.
 Page No.
 : 13 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

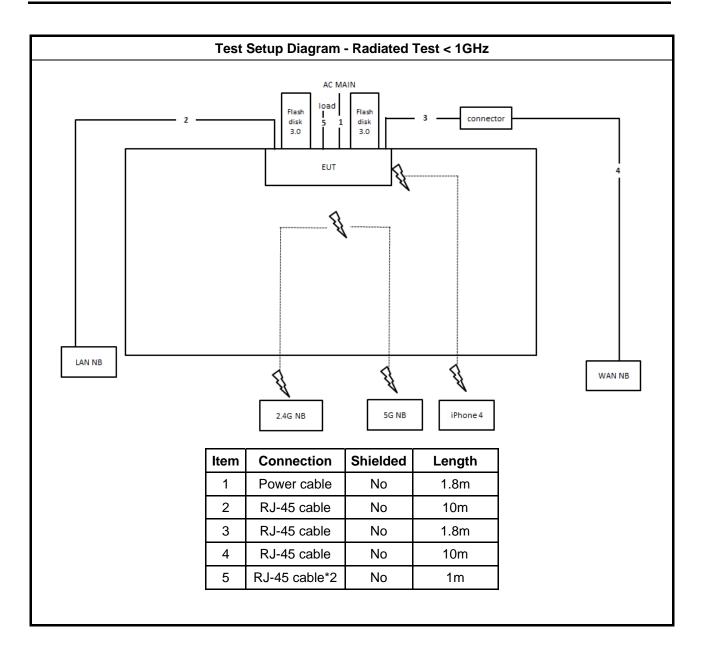
 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017

2.6 Test Setup Diagram

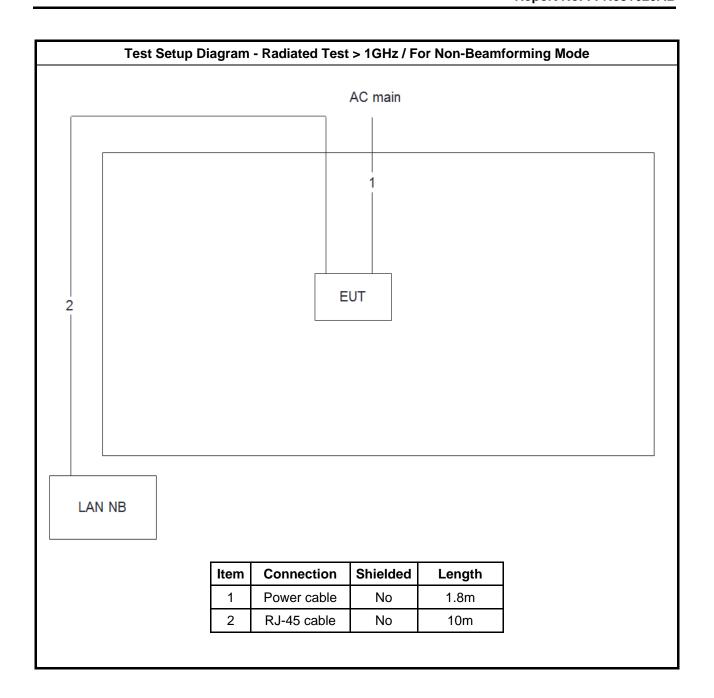


TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 14 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017



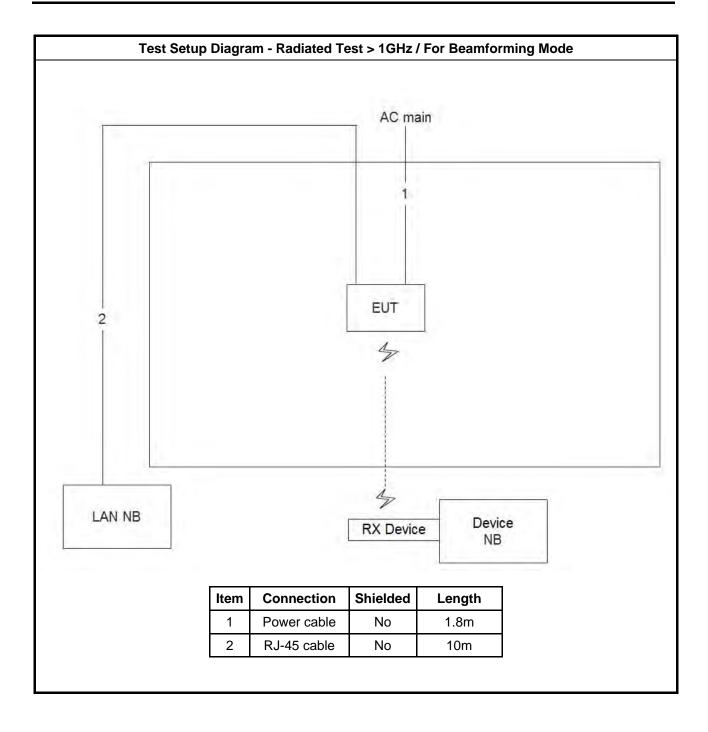


TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 15 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017



TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2AI6F-517 Page No. : 16 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017





TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2AI6F-517 Page No. : 17 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017

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		

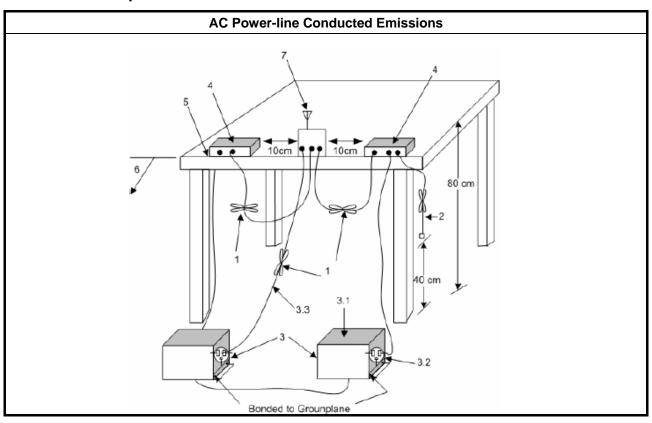
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



 SPORTON INTERNATIONAL INC.
 Page No.
 : 18 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

 SPORTON INTERNATIONAL INC.
 Page No.
 : 19 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

	Emission Bandwidth Limit				
UNI	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.				

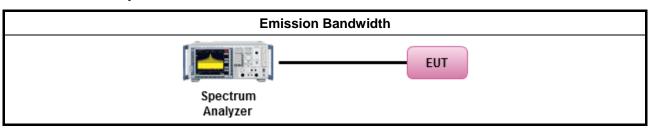
3.2.2 Measuring Instruments

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

 SPORTON INTERNATIONAL INC.
 Page No.
 : 20 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



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_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
	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 $P_{Out} = 30 - (G_{TX} - 6)$.
	Point-to-point systems (P2P): the maximum conducted output power (P _{Out}) shall not exceed the lesser of 1 W.
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_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$.
	Point-to-point systems (P2P): the maximum conducted output power (P _{Out}) shall not exceed the lesser of 1 W.
	= maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi.

 SPORTON INTERNATIONAL INC.
 Page No.
 : 21 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



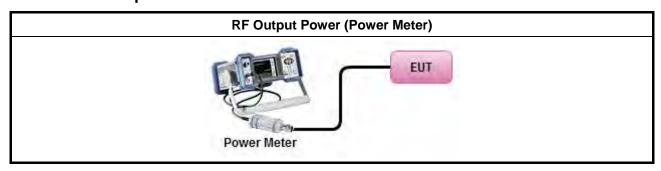
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

 SPORTON INTERNATIONAL INC.
 Page No.
 : 22 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

	Peak Power Spectral Density Limit
UNI	II Devices
\boxtimes	For the 5.15-5.25 GHz band:
	 Outdoor 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).
	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) ≤ 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 – ($G_{TX} - 6$).
\boxtimes	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) \leq 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$.
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-	LAN Devices
	For the 5.15-5.25 GHz band, the peak power spectral density (PPSD) \leq 4 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) \leq 10 dBm/MHz.
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) \leq 17 dBm/MHz.
	 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: -13 dBW/MHz for 0° ≤ θ < 8°; -13 - 0.716 (θ-8) dBW/MHz for 8° ≤ θ < 40° -35.9 - 1.22 (θ-40) dBW/MHz for 40° ≤ θ ≤ 45°; -42 dBW/MHz for θ > 45°
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz and the e.i.r.p. peak power spectral density (PPSD) \leq 17 dBm/MHz.
	For the 5.725-5.85 GHz band:
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= 30 – ($G_{TX} - 6$).
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
pow	SD = peak power spectral density that he same method as used to determine the conducted output ver shall be used to determine the power spectral density. And power spectral density in dBm/MHz = the maximum transmitting antenna directional gain in dBi.

3.4.2 Measuring Instruments

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

 SPORTON INTERNATIONAL INC.
 Page No.
 : 23 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

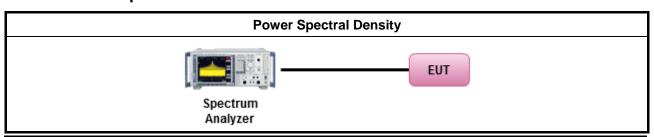
 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.4.3 Test Procedures

		Test Method
•	outp func	k power spectral density procedures that the same method as used to determine the conducted ut power shall be used to determine the peak power spectral density and use the peak search tion on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density be measured using below options:
		Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth
	[duty	/ 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
		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 $

3.4.4 Test Setup



SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 24 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

 SPORTON INTERNATIONAL INC.
 Page No.
 : 25 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.5 Unwanted Emissions

3.5.1 Transmitter Radiated Unwanted Emissions Limit

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

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

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

 SPORTON INTERNATIONAL INC.
 Page No.
 : 26 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.5.2 Measuring Instruments

has no need to be reported.

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 H)2) for unwanted emissions into non-restricted bands. Refer as FCC KDB 789033, clause H)1) for unwanted emissions into restricted bands. Refer as FCC KDB 789033, H)6) Method AD (Trace Averaging). Refer as FCC KDB 789033, H)6) Method VB (Reduced VBW). Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time. Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. Refer as FCC KDB 789033, clause H)5) measurement procedure peak limit. Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit. For radiated measurement. Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m. Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m. Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz. The 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

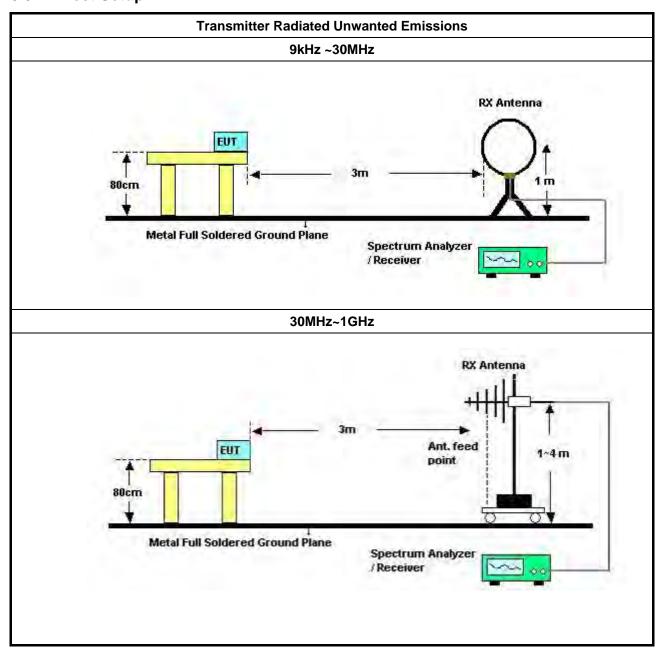
 SPORTON INTERNATIONAL INC.
 Page No.
 : 27 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

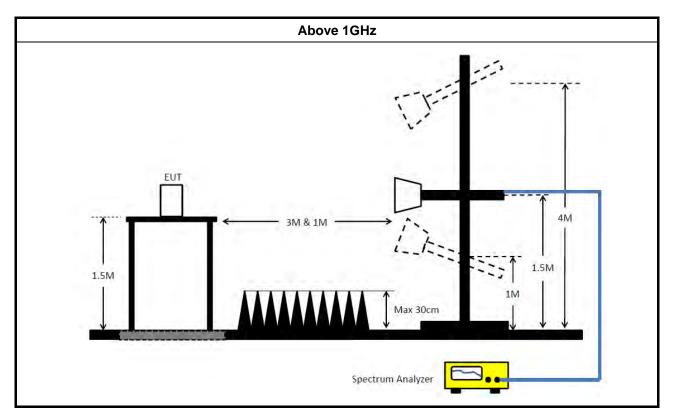
 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



3.5.4 Test Setup



TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2AI6F-517 Page No. : 28 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017



3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

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

3.5.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E



3.6 Frequency Stability

3.6.1 Frequency Stability Limit

Frequency Stability Limit

UNII Devices

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

LE-LAN Devices

N/A

IEEE Std. 802.11

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

3.6.2 Measuring Instruments

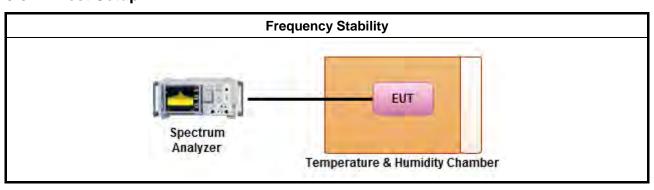
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method

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

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

Refer as Appendix F

 SPORTON INTERNATIONAL INC.
 Page No.
 : 30 of 32

 TEL: 886-3-3273456
 Report Version
 : Rev. 01

 FAX: 886-3-3270973
 Issued Date
 : Mar. 31, 2017



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 2016	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16- 2	04083	150kHz ~ 100MHz	Dec. 14, 2016	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 21, 2016	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 24, 2016	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 21, 2016	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 16, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-10-7	N/A	N/A	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)

SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 31 of 32
Report Version : Rev. 01
Issued Date : Mar. 31, 2017



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark	
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Conducted (TH01-CB)	
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)	
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)	
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)	
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)	
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)	
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)	
Power Sensor	Agilent	U2021XA	MY53410002	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)	
Power Sensor	Agilent	U2021XA	MY54320014	50MHz~18GHz	Apr. 20, 2016	Conducted (TH01-CB)	
Power Sensor	Agilent	U2021XA	MY54320015	50MHz~18GHz	Apr. 20, 2016	Conducted (TH01-CB)	

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

N.C.R means Non-Calibration required.

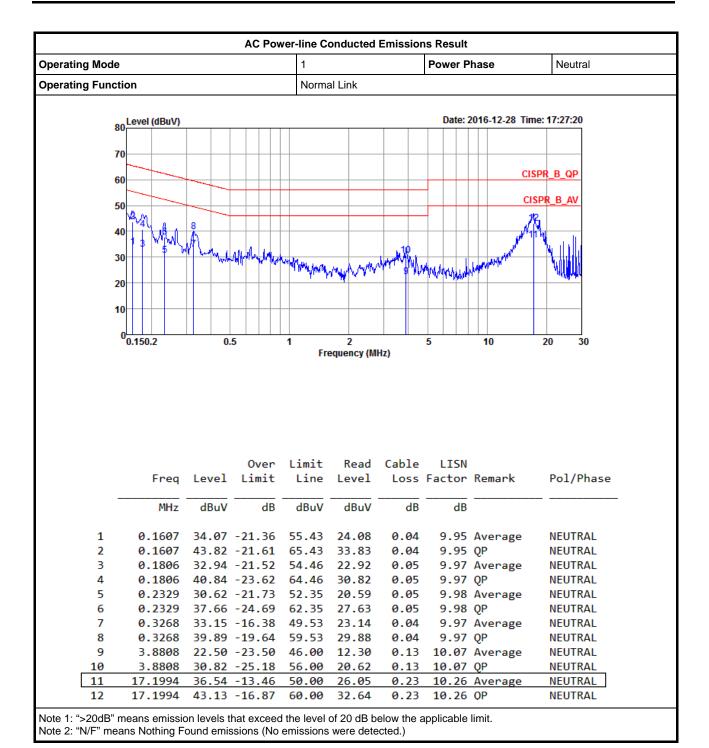
SPORTON INTERNATIONAL INC.

TEL: 886-3-3273456 FAX: 886-3-3270973 FCC ID: 2Al6F-517 Page No. : 32 of 32
Report Version : Rev. 01

Issued Date : Mar. 31, 2017

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

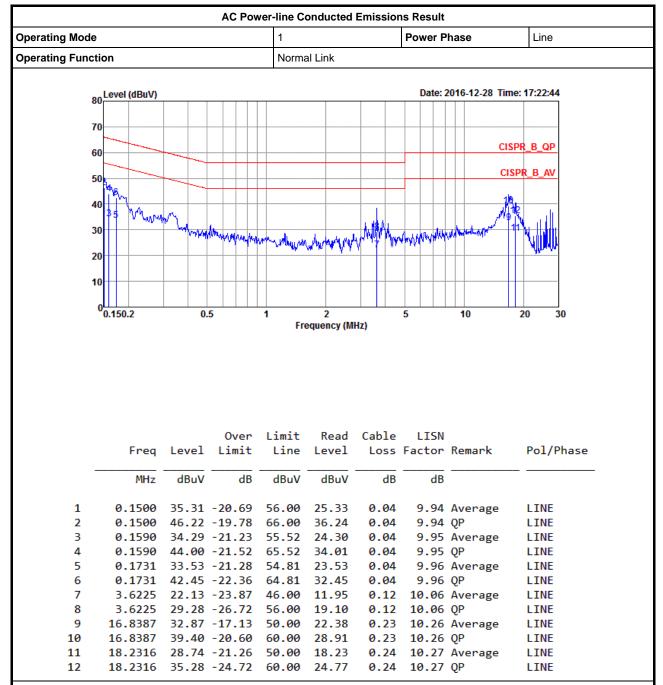
AC Power-line Conducted Emissions Result



SPORTON INTERNATIONAL INC. Page No. : 1 of 2

TEL: 886-3-327-3456 FAX: 886-3-327-0973

AC Power-line Conducted Emissions Result



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

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



Appendix B.1 EBW Result

For 802.11a/11ac VHT20/11ac VHT40/11ac VHT80 Mode Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW	
	(Hz)	(Hz)		(Hz)	(Hz)	
802.11a-BF_Nss1_4TX	-	-	-	-	-	
5.15-5.25GHz	19.95M	16.442M	16M4D1D	19.025M	16.392M	
5.725-5.85GHz	16.35M	16.442M	16M4D1D	16.3M	16.392M	
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	
5.15-5.25GHz	20.75M	17.616M	17M6D1D	20.3M	17.591M	
5.725-5.85GHz	17.575M	17.641M	17.641M 17M6D1D 17.15M		17.591M	
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	
5.15-5.25GHz	40.1M	35.932M	35M9D1D	39.4M	35.882M	
5.725-5.85GHz	35.3M	35.982M	36M0D1D	35.05M	35.882M	
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	
5.15-5.25GHz	83.6M	75.862M	75M9D1D	83.3M	75.662M	
5.725-5.85GHz	76.3M	75.862M	75M9D1D	75.6M	75.662M	
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-	-	=	-	-	
5.15-5.25GHz	37.575M	18.191M	18M2D1D	29.775M	17.866M	
5.725-5.85GHz	17.6M	18.316M	18M3D1D 17.55M		17.816M	
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	
5.15-5.25GHz	48.2M	36.482M	36M5D1D	43.15M	36.232M	
5.725-5.85GHz	36.35M	36.482M	36M5D1D	36.3M	36.332M	
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	
5.15-5.25GHz	88.6M	76.162M	76M2D1D	86.4M	75.862M	
5.725-5.85GHz	76.5M	76.162M	76M2D1D	75.6M	76.062M	

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

Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : 1 of 12



EBW Result Appendix B.1

Result

Mode	Result	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW	Port 3-N dB	Port 3-OBW	Port 4-N dB	Port 4-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11a-BF_Nss1_4TX	-	-	-	-	-	-	-	-	-
5180MHz	Pass	19.875M	16.417M	19.65M	16.392M	19.025M	16.392M	19.5M	16.417M
5200MHz	Pass	19.825M	16.442M	19.575M	16.417M	19.25M	16.392M	19.55M	16.417M
5240MHz	Pass	19.95M	16.417M	19.55M	16.392M	19.025M	16.392M	19.85M	16.417M
5745MHz	Pass	16.325M	16.417M	16.3M	16.417M	16.35M	16.417M	16.325M	16.392M
5785MHz	Pass	16.325M	16.442M	16.3M	16.417M	16.3M	16.417M	16.325M	16.392M
5825MHz	Pass	16.325M	16.442M	16.3M	16.417M	16.3M	16.392M	16.325M	16.417M
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-
5180MHz	Pass	20.675M	17.616M	20.45M	17.591M	20.65M	17.591M	20.45M	17.591M
5200MHz	Pass	20.75M	17.616M	20.475M	17.591M	20.625M	17.591M	20.3M	17.591M
5240MHz	Pass	20.725M	17.616M	20.4M	17.591M	20.6M	17.591M	20.5M	17.591M
5745MHz	Pass	17.55M	17.616M	17.325M	17.591M	17.55M	17.591M	17.525M	17.591M
5785MHz	Pass	17.55M	17.616M	17.15M	17.591M	17.175M	17.641M	17.525M	17.591M
5825MHz	Pass	17.2M	17.616M	17.55M	17.641M	17.55M	17.616M	17.575M	17.591M
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-
5190MHz	Pass	40.1M	35.932M	39.95M	35.882M	39.8M	35.932M	39.4M	35.932M
5230MHz	Pass	40.1M	35.932M	40.05M	35.932M	39.85M	35.932M	39.4M	35.932M
5755MHz	Pass	35.1M	35.932M	35.1M	35.882M	35.05M	35.932M	35.1M	35.882M
5795MHz	Pass	35.05M	35.932M	35.3M	35.932M	35.05M	35.982M	35.3M	35.982M
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-
5210MHz	Pass	83.4M	75.862M	83.6M	75.862M	83.6M	75.662M	83.3M	75.662M
5775MHz	Pass	75.6M	75.762M	76.3M	75.862M	76.3M	75.662M	76.3M	75.762M
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-
5180MHz	Pass	30.975M	17.966M	34.05M	17.916M	29.775M	17.866M	31.025M	17.891M
5200MHz	Pass	33.025M	18.066M	34.025M	17.941M	29.925M	17.891M	30.95M	17.891M
5240MHz	Pass	37.575M	18.191M	35.5M	18.041M	35.075M	17.991M	36M	17.966M
5745MHz	Pass	17.6M	18.041M	17.575M	17.816M	17.6M	17.816M	17.55M	17.966M
5785MHz	Pass	17.6M	17.941M	17.55M	17.841M	17.6M	17.891M	17.55M	18.041M
5825MHz	Pass	17.575M	18.016M	17.575M	17.941M	17.575M	17.991M	17.6M	18.316M
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-
5190MHz	Pass	45.25M	36.282M	43.15M	36.332M	43.45M	36.382M	43.3M	36.232M
5230MHz	Pass	48.2M	36.332M	43.45M	36.332M	44.2M	36.482M	43.9M	36.282M
5755MHz	Pass	36.35M	36.432M	36.35M	36.382M	36.35M	36.432M	36.3M	36.332M
5795MHz	Pass	36.35M	36.382M	36.35M	36.382M	36.35M	36.382M	36.35M	36.482M
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-	-
5210MHz	Pass	88.6M	75.962M	87.4M	76.162M	87M	75.862M	86.4M	76.162M
5775MHz	Pass	76.3M	76.062M	76.1M	76.162M	75.6M	76.062M	76.5M	76.062M

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;

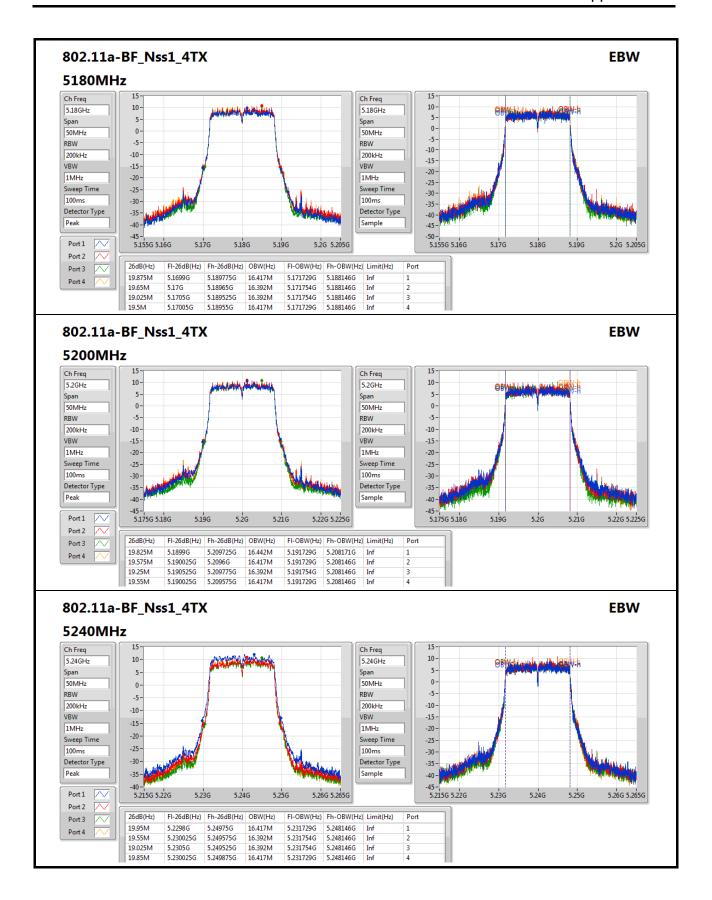
Page No. : 2 of 12

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-327-0973

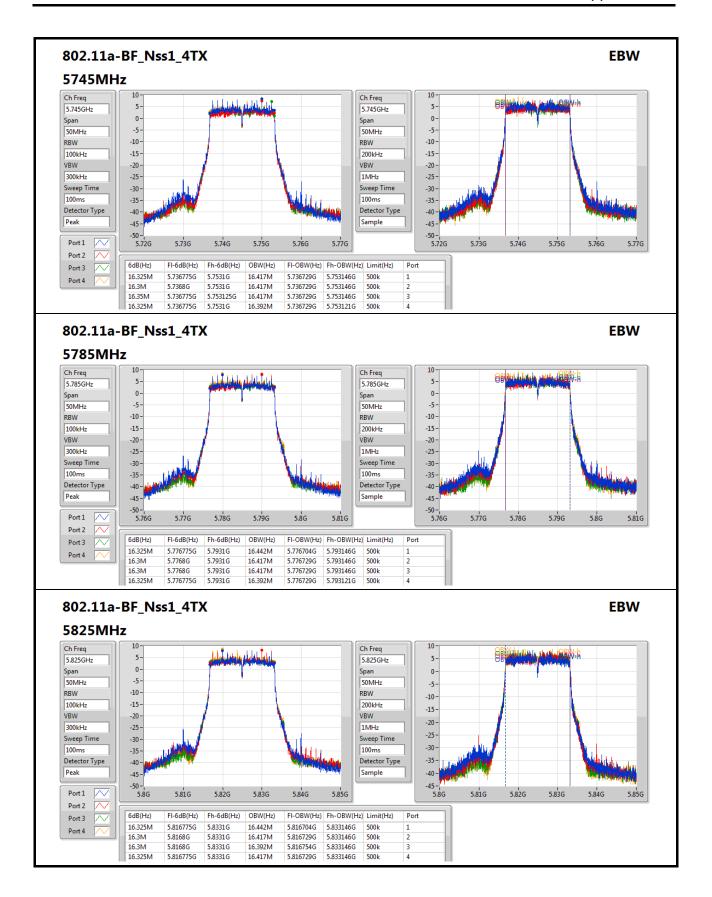
Page No. : 3 of 12



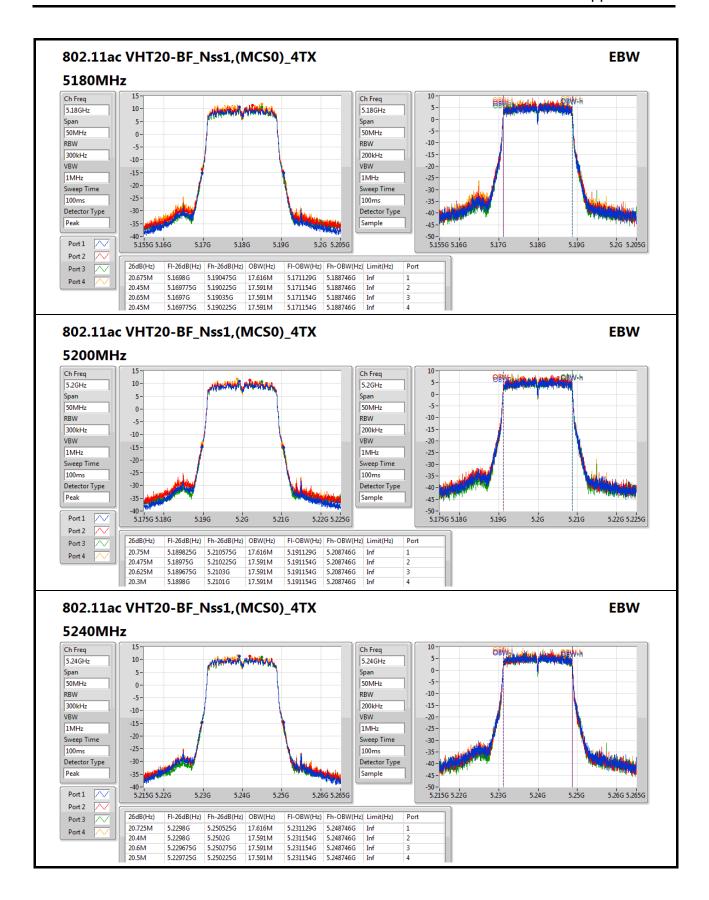


Page No. : 4 of 12

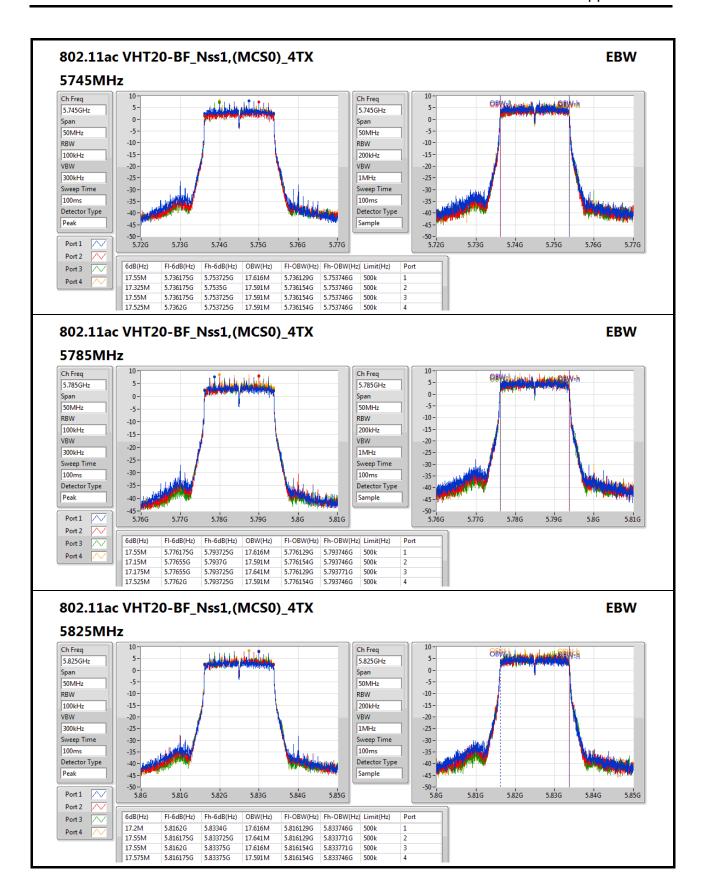




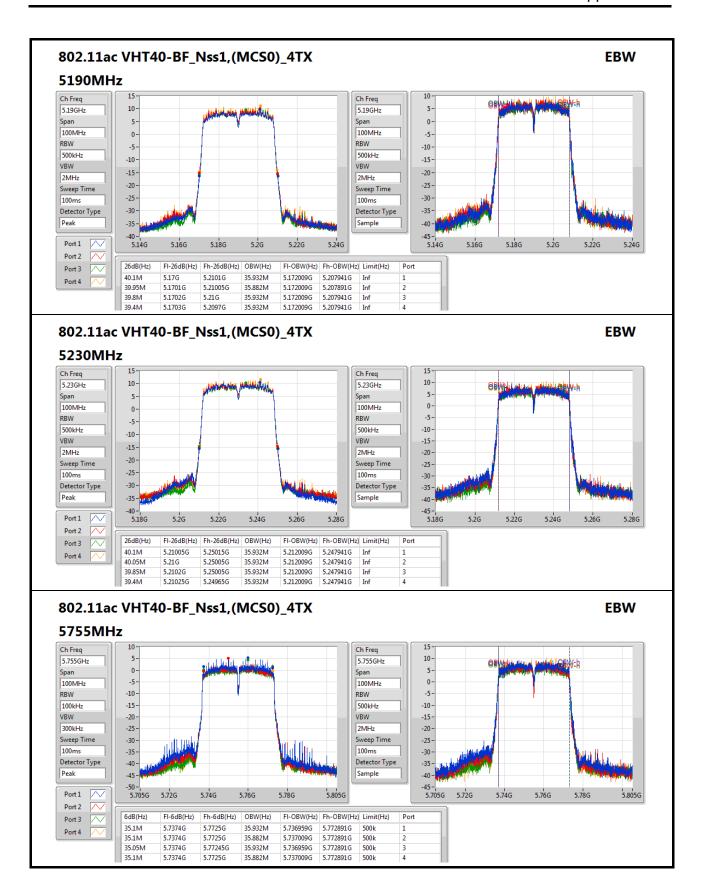
Page No. : 5 of 12



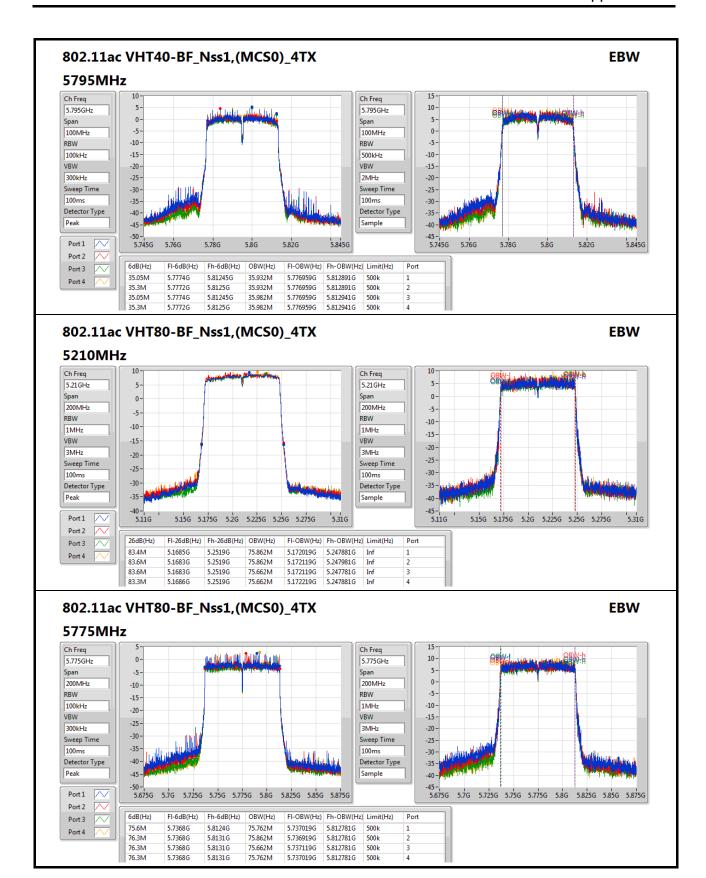
Page No. : 6 of 12



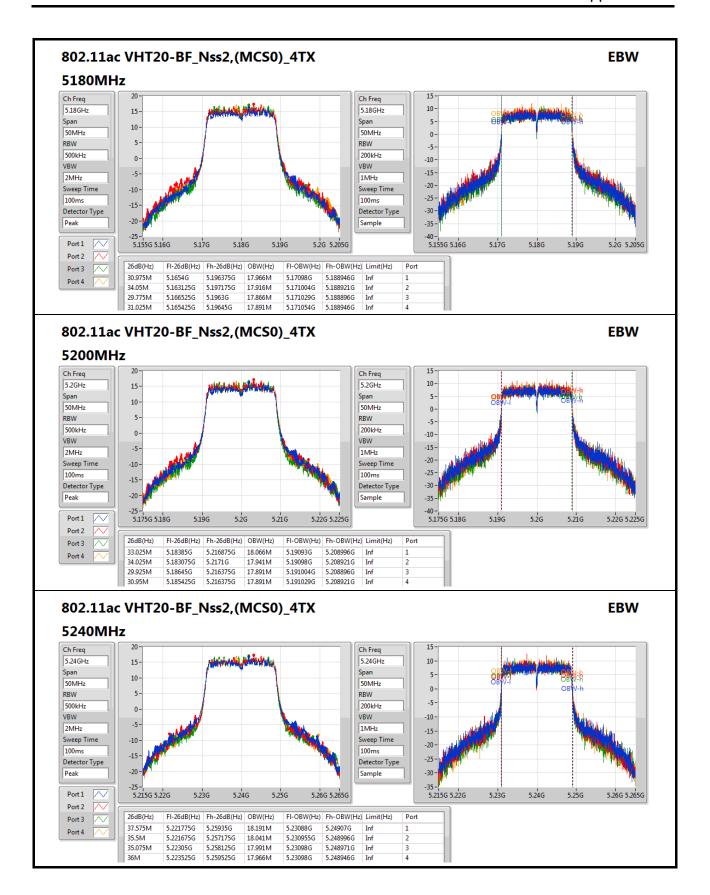
Page No. : 7 of 12



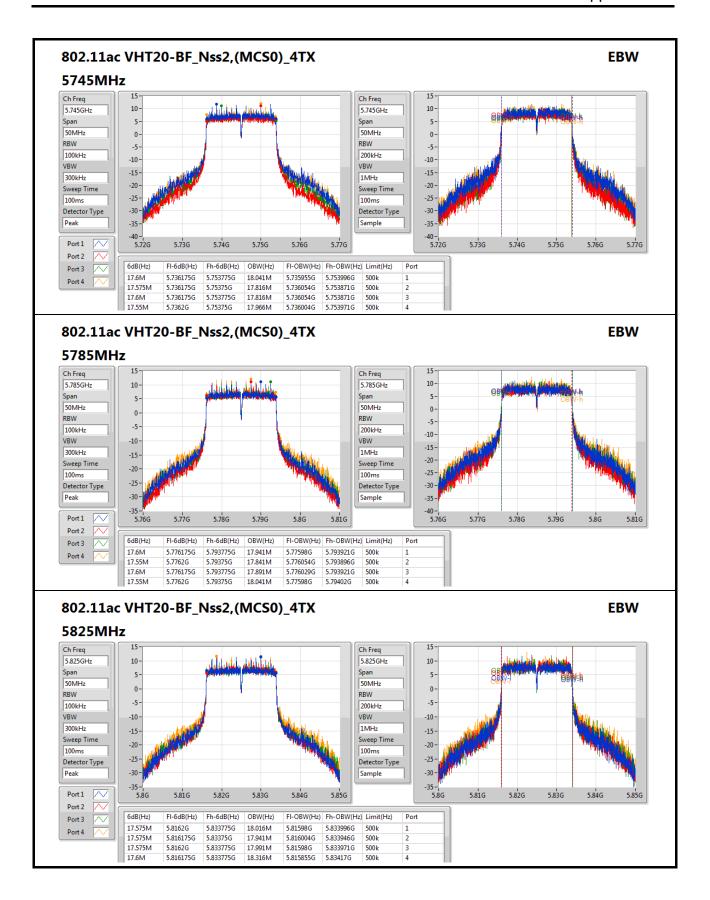
Page No. : 8 of 12



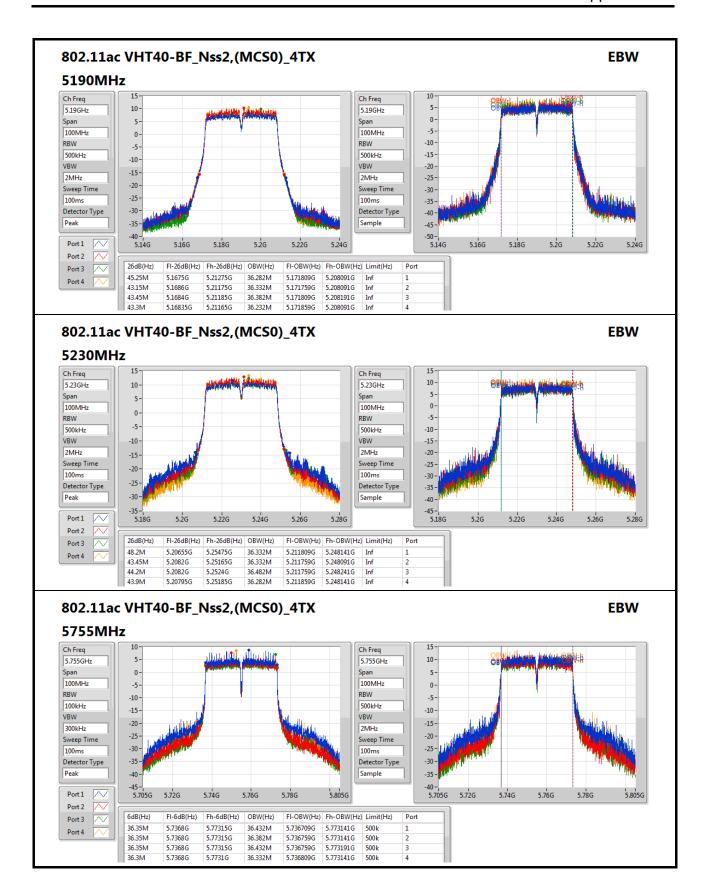
Page No. : 9 of 12



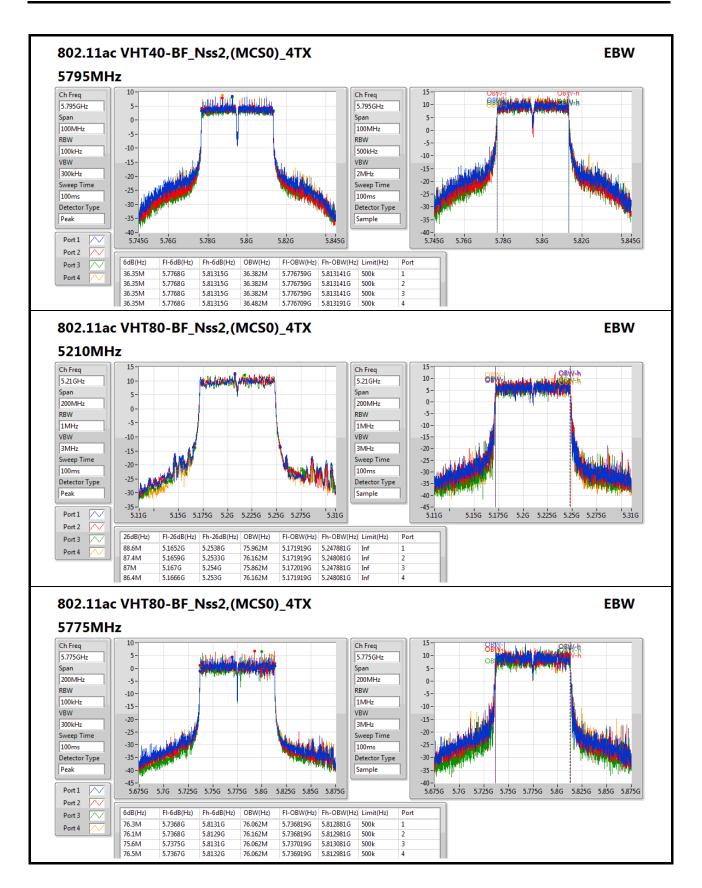
Page No. : 10 of 12



Page No. : 11 of 12



EBW Result Appendix B.1



Page No. : 12 of 12



Appendix B.2 EBW Result

For 802.11 VHT80+80 Mode **Summary**

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW
	(Hz)	(Hz)		(Hz)	(Hz)
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-
5.15-5.25GHz	83.8M	75.862M	75M9D1D	82M	75.762M
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-
5.725-5.85GHz	73.6M	75.762M	75M8D1D	67.2M	75.562M
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-
5.15-5.25GHz	84.2M	75.862M	75M9D1D	83.6M	75.862M
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-
5.725-5.85GHz	73M	75.962M	76M0D1D	16.3M	75.662M

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

Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Min-OBW = Minimum 99% occupied bandwidth;

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : 1 of 4



EBW Result Appendix B.2

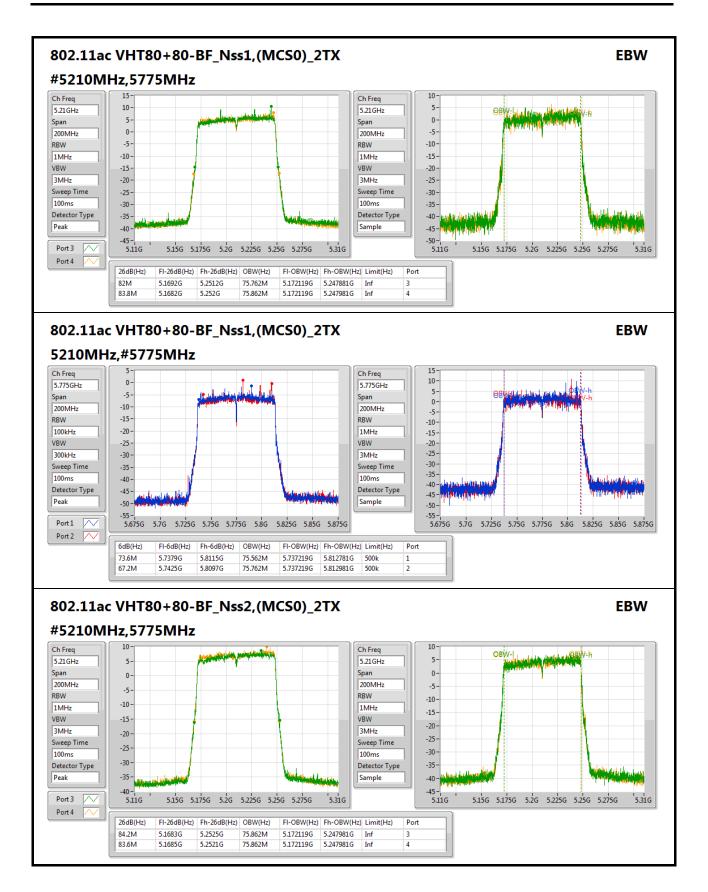
Result

Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW	Port 3-N dB	Port 3-OBW	Port 4-N dB	Port 4-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	=	-	-	-	-	-	-
#5210MHz,5775MHz	Pass	Inf					82M	75.762M	83.8M	75.862M
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-
5210MHz,#5775MHz	Pass	500k	73.6M	75.562M	67.2M	75.762M				
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	=	-	-	-	-	-	-	-
#5210MHz,5775MHz	Pass	Inf					84.2M	75.862M	83.6M	75.862M
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-
5210MHz,#5775MHz	Pass	500k	16.3M	75.662M	73M	75.962M				

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;

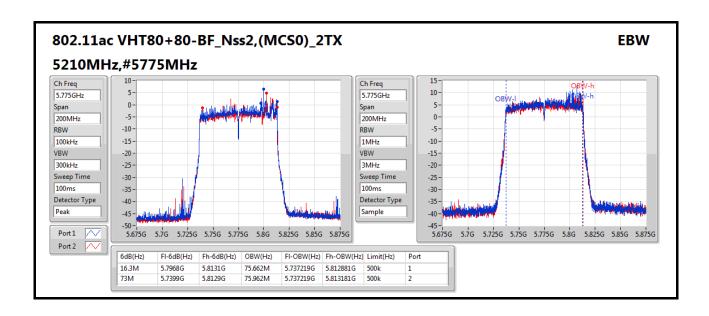
SPORTON INTERNATIONAL INC. Page No. : 2 of 4

Page No. : 3 of 4



SPORTON INTERNATIONAL INC.

Page No. : 4 of 4





For 802.11a/11ac VHT20/11ac VHT40/11ac VHT80 Mode Summary

Mode	Total Power	Total Power	EIRP	EIRP
	(dBm)	(W)	(dBm)	(W)
802.11a-BF_Nss1_4TX	-	-	-	-
5.15-5.25GHz	27.66	0.58345	35.99	3.97192
5.725-5.85GHz	26.63	0.46026	35.95	3.93550
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	27.64	0.58076	35.96	3.94457
5.725-5.85GHz	26.66	0.46345	35.98	3.96278
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	27.65	0.58210	35.97	3.95367
5.725-5.85GHz	26.66	0.46345	35.98	3.96278
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	25.76	0.37670	34.08	2.55859
5.725-5.85GHz	26.55	0.45186	35.87	3.86367
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	29.94	0.98628	35.25	3.34965
5.725-5.85GHz	29.62	0.91622	35.93	3.91742
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	29.38	0.86696	34.69	2.94442
5.725-5.85GHz	29.64	0.92045	35.95	3.93550
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-	-	-	-
5.15-5.25GHz	26.81	0.47973	32.12	1.62930
5.725-5.85GHz	28.51	0.70958	34.82	3.03389

SPORTON INTERNATIONAL INC.



Result

Mode	Result	DG	Total Power	Power Limit	Port 1	Port 2	Port 3	Port 4
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a-BF_Nss1_4TX	-	-	-	-	-	-	-	-
5180MHz	Pass	8.32	27.55	27.68	21.03	21.49	21.81	21.74
5200MHz	Pass	8.32	27.66	27.68	21.15	21.76	21.85	21.78
5240MHz	Pass	8.32	27.65	27.68	21.28	21.72	21.83	21.66
5745MHz	Pass	9.32	26.35	26.68	20.01	20.36	20.49	20.45
5785MHz	Pass	9.32	26.56	26.68	20.08	20.65	20.77	20.63
5825MHz	Pass	9.32	26.63	26.68	20.05	20.69	20.81	20.85
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5180MHz	Pass	8.32	27.51	27.68	21.07	21.56	21.74	21.55
5200MHz	Pass	8.32	27.54	27.68	21.12	21.61	21.71	21.63
5240MHz	Pass	8.32	27.64	27.68	21.47	21.57	21.89	21.52
5745MHz	Pass	9.32	26.36	26.68	20.02	20.45	20.38	20.49
5785MHz	Pass	9.32	26.53	26.68	20.11	20.32	20.45	21.08
5825MHz	Pass	9.32	26.66	26.68	20.14	20.91	20.69	20.76
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	i
5190MHz	Pass	8.32	26.73	27.68	20.07	20.52	21.15	21.03
5230MHz	Pass	8.32	27.65	27.68	21.45	21.57	21.66	21.82
5755MHz	Pass	9.32	26.66	26.68	20.13	20.81	20.85	20.74
5795MHz	Pass	9.32	26.48	26.68	20.02	20.68	20.43	20.67
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5210MHz	Pass	8.32	25.76	27.68	19.34	19.91	19.82	19.85
5775MHz	Pass	9.32	26.55	26.68	20.03	20.65	20.93	20.47
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
5180MHz	Pass	5.31	29.30	30.00	22.72	23.19	23.61	23.54
5200MHz	Pass	5.31	29.61	30.00	23.12	23.58	23.88	23.75
5240MHz	Pass	5.31	29.94	30.00	23.65	24.02	24.21	23.76
5745MHz	Pass	6.31	29.62	29.69	23.17	23.83	23.64	23.71
5785MHz	Pass	6.31	29.62	29.69	23.09	23.74	23.85	23.68
5825MHz	Pass	6.31	29.61	29.69	23.03	23.88	23.69	23.72
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
5190MHz	Pass	5.31	25.86	30.00	19.42	19.64	20.08	20.17
5230MHz	Pass	5.31	29.38	30.00	23.59	23.67	23.23	22.91
5755MHz	Pass	6.31	29.33	29.69	23.03	23.45	23.39	23.36
5795MHz	Pass	6.31	29.64	29.69	23.01	23.87	23.61	23.93
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-
5210MHz	Pass	5.31	26.81	30.00	20.49	20.73	21.08	20.84
5775MHz	Pass	6.31	28.51	29.69	22.02	22.63	22.55	22.74

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



For 802.11 VHT80+80 Mode Summary

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	=
5.15-5.25GHz	24.55	0.28510	29.86	0.96828
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-
5.725-5.85GHz	25.05	0.31989	31.36	1.36773
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-
5.15-5.25GHz	25.56	0.35975	27.86	0.61094
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-
5.725-5.85GHz	25.77	0.37757	29.07	0.80724

SPORTON INTERNATIONAL INC.

Page No. : 1 of 2



Result

Mode	Result	DG	Total Power	Power Limit	Port 1	Port 2	Port 3	Port 4
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
#5210MHz,5775MHz	Pass	5.31	24.55	30.00			21.47	21.61
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-
5210MHz,#5775MHz	Pass	6.31	25.05	29.69	22.17	21.91		
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-	-
#5210MHz,5775MHz	Pass	2.30	25.56	30.00			22.58	22.51
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-	-
5210MHz,#5775MHz	Pass	3.30	25.77	30.00	23.05	22.45		

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

SPORTON INTERNATIONAL INC. Page No. : 2 of 2



SPORTON LAB.

Appendix D.1

For 802.11a/11ac VHT20/11ac VHT40/11ac VHT80 Mode **Summary**

Mode	PD
	(dBm/RBW)
802.11a-BF_Nss1_4TX	-
5.15-5.25GHz	14.44
5.725-5.85GHz	13.16
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-
5.15-5.25GHz	14.32
5.725-5.85GHz	13.04
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-
5.15-5.25GHz	11.46
5.725-5.85GHz	10.13
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-
5.15-5.25GHz	6.74
5.725-5.85GHz	7.49
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-
5.15-5.25GHz	16.79
5.725-5.85GHz	16.14
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-
5.15-5.25GHz	13.17
5.725-5.85GHz	13.15
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	·
5.15-5.25GHz	7.65
5.725-5.85GHz	9.27

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

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : 1 of 12



Appendix D.1 **PSD Result**

Result

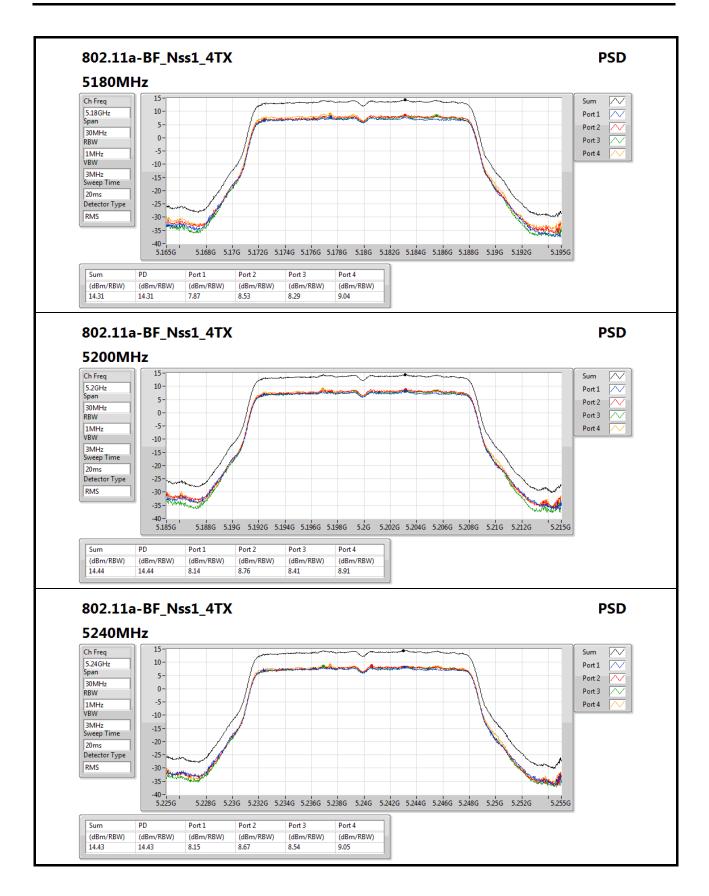
Mode	DG	PD	PD Limit	Port 1	Port 2	Port 3	Port 4
	(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a-BF_Nss1_4TX	-	-	-	-	-	-	-
5180MHz	8.32	14.31	14.68	7.87	8.53	8.29	9.04
5200MHz	8.32	14.44	14.68	8.14	8.76	8.41	8.91
5240MHz	8.32	14.43	14.68	8.15	8.67	8.54	9.05
5745MHz	9.32	12.88	26.68	7.55	6.81	6.87	7.89
5785MHz	9.32	12.95	26.68	7.08	7.23	7.23	8.09
5825MHz	9.32	13.16	26.68	7.05	7.52	7.53	8.31
802.11ac VHT20-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-
5180MHz	8.32	14.18	14.68	8.00	8.74	8.23	9.36
5200MHz	8.32	14.22	14.68	8.26	8.88	8.29	9.23
5240MHz	8.32	14.32	14.68	8.34	8.96	8.37	9.55
5745MHz	9.32	12.72	26.68	7.72	6.59	6.68	7.91
5785MHz	9.32	12.91	26.68	7.38	7.06	7.05	8.20
5825MHz	9.32	13.04	26.68	7.26	7.62	7.19	7.94
802.11ac VHT40-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-
5190MHz	8.32	10.51	14.68	4.52	5.01	4.56	5.13
5230MHz	8.32	11.46	14.68	5.36	5.81	5.57	5.83
5755MHz	9.32	10.13	26.68	4.66	3.80	3.57	4.95
5795MHz	9.32	9.92	26.68	4.26	3.92	3.87	4.56
802.11ac VHT80-BF_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-
5210MHz	8.32	6.74	14.68	0.86	1.24	0.72	1.48
5775MHz	9.32	7.49	26.68	2.03	1.54	1.26	2.28
802.11ac VHT20-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-
5180MHz	5.31	16.05	17.00	9.99	10.79	10.04	10.97
5200MHz	5.31	16.41	17.00	10.20	10.99	10.49	11.18
5240MHz	5.31	16.79	17.00	10.71	11.26	10.96	11.50
5745MHz	6.31	16.07	29.69	10.72	10.23	10.29	11.48
5785MHz	6.31	16.14	29.69	10.37	10.03	10.03	11.15
5825MHz	6.31	16.02	29.69	10.23	10.48	10.34	11.34
802.11ac VHT40-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-
5190MHz	5.31	9.64	17.00	3.55	4.40	3.86	4.31
5230MHz	5.31	13.17	17.00	7.28	8.08	7.11	7.81
5755MHz	6.31	12.83	29.69	7.54	7.11	6.58	7.51
5795MHz	6.31	13.15	29.69	7.32	7.60	7.23	8.03
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-
5210MHz	5.31	7.65	17.00	1.62	2.04	2.00	2.76
5775MHz	6.31	9.27	29.69	3.55	3.15	3.48	4.16

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

SPORTON INTERNATIONAL INC.

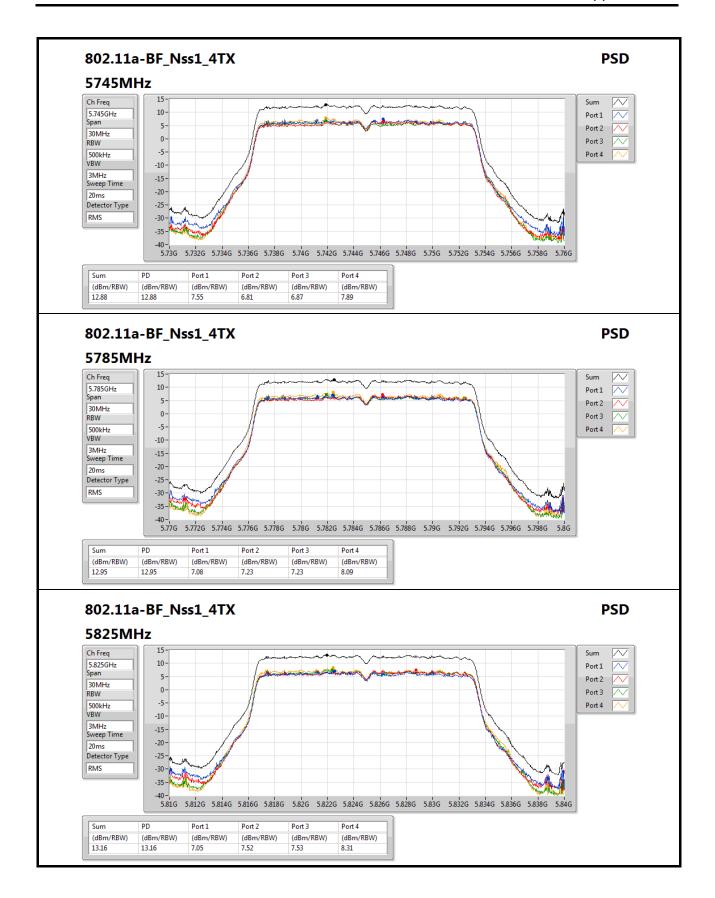
TEL: 886-3-327-3456 FAX: 886-3-327-0973 Page No. : 2 of 12



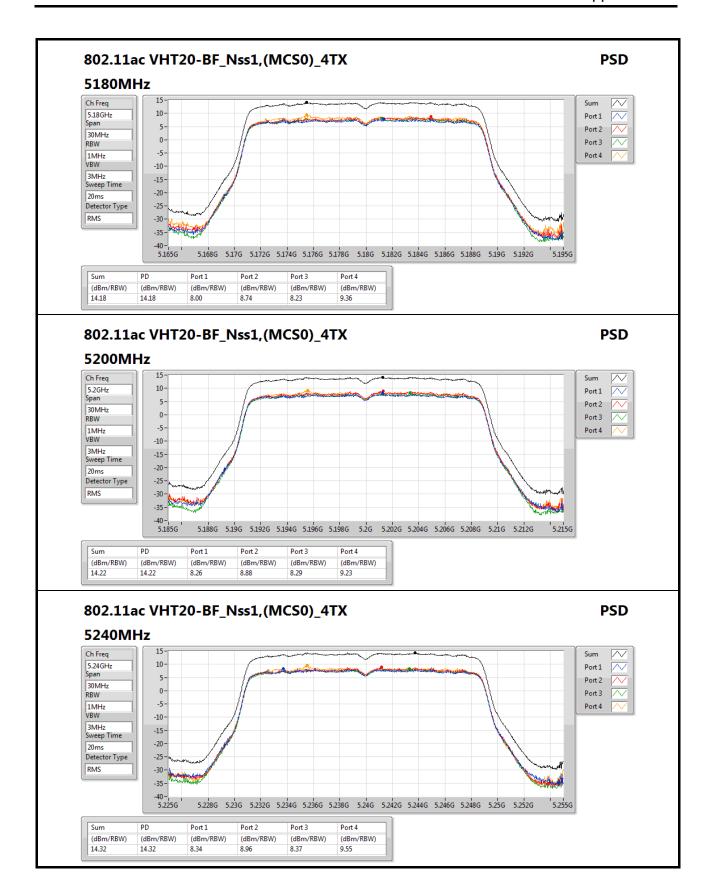


Page No. : 4 of 12



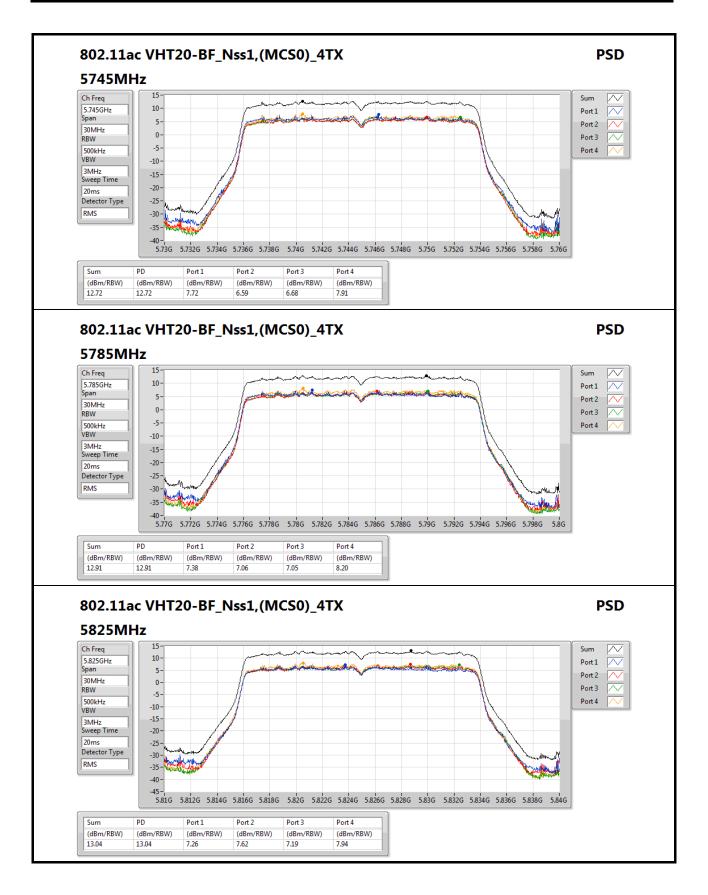


Page No. : 5 of 12



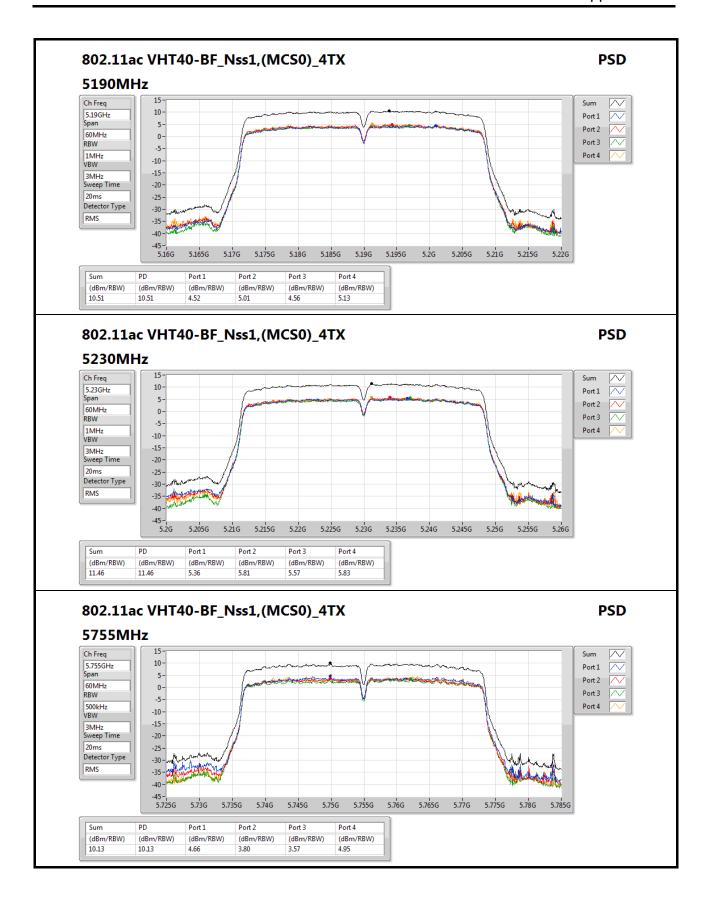
SPORTON INTERNATIONAL INC.

PSD Result

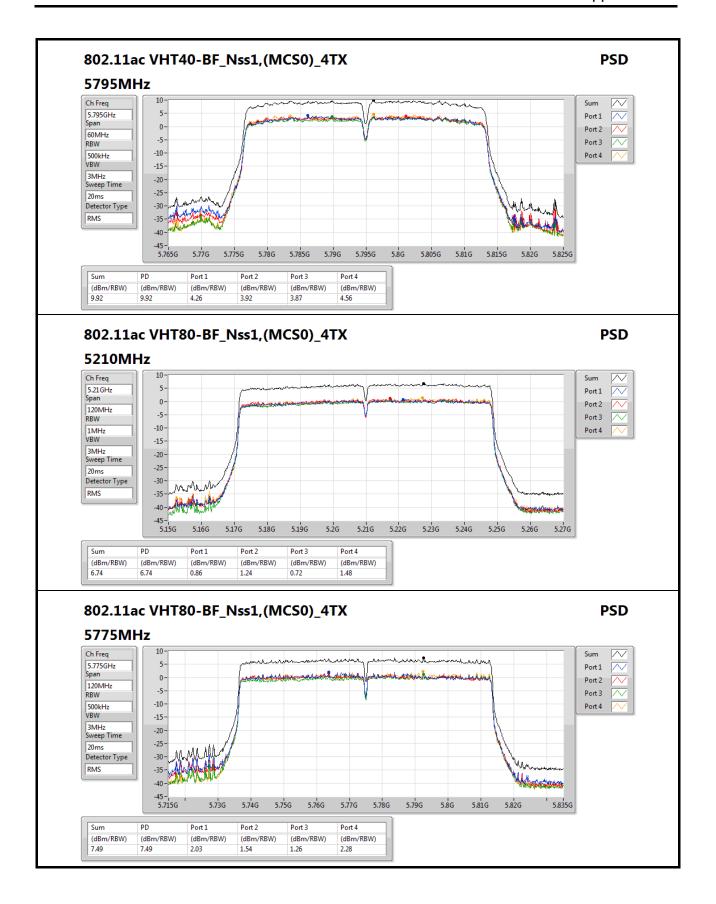


SPORTON INTERNATIONAL INC.

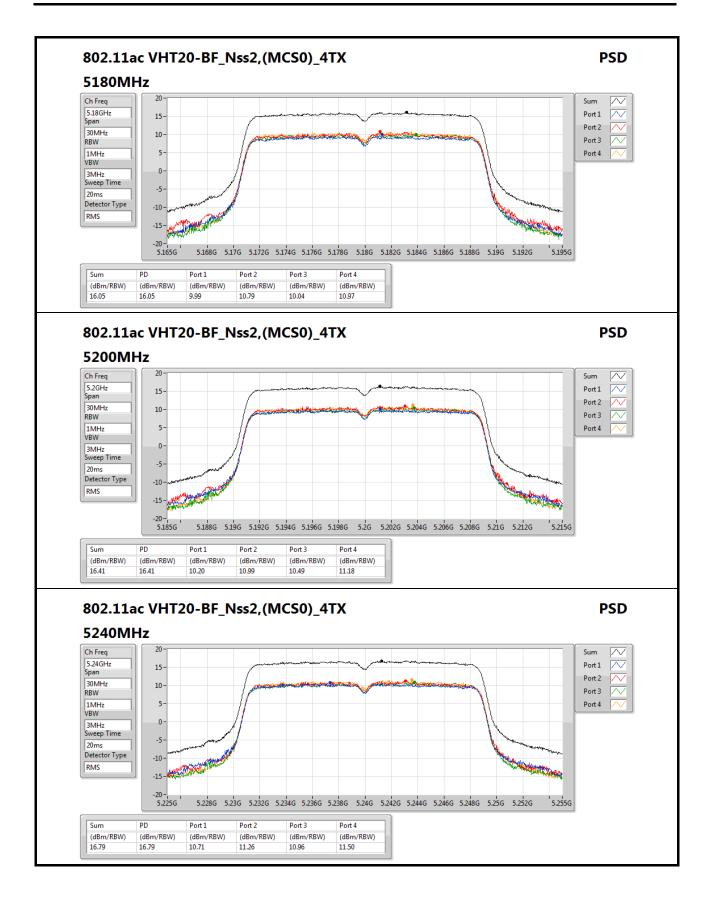
Page No. : 7 of 12



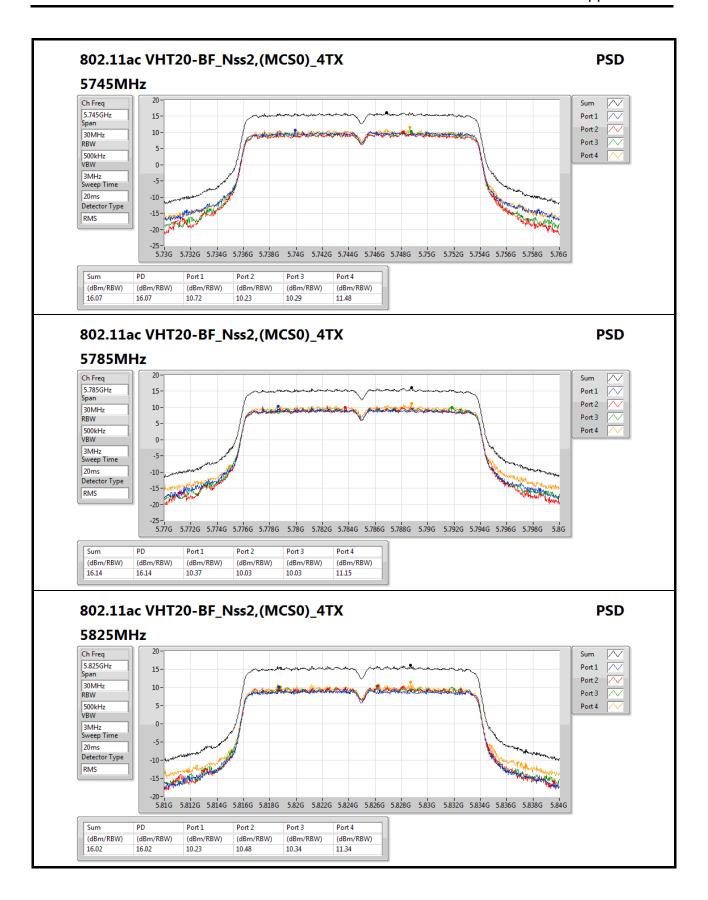




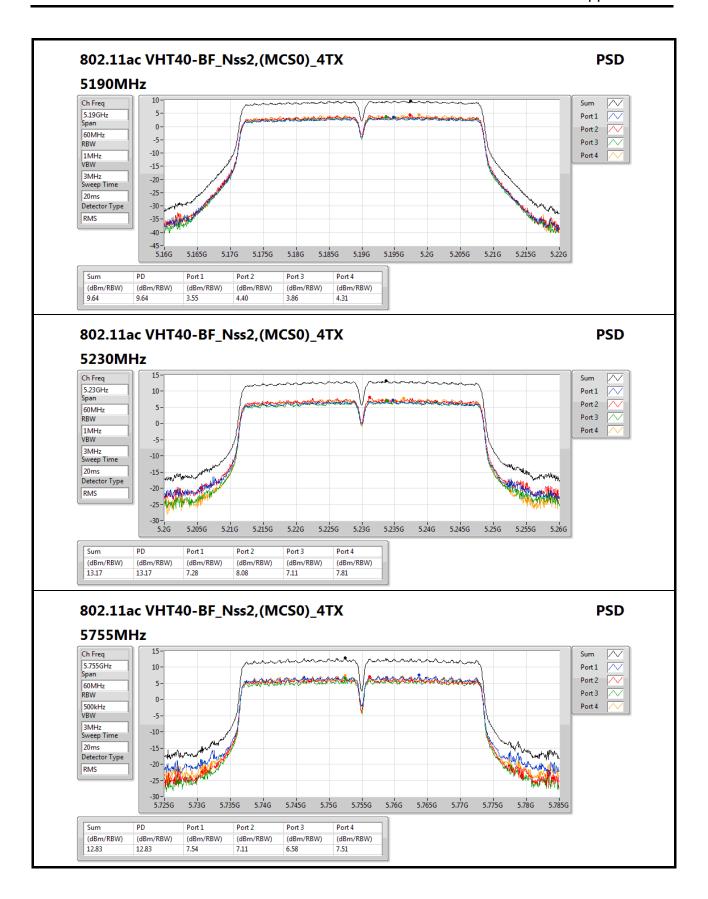




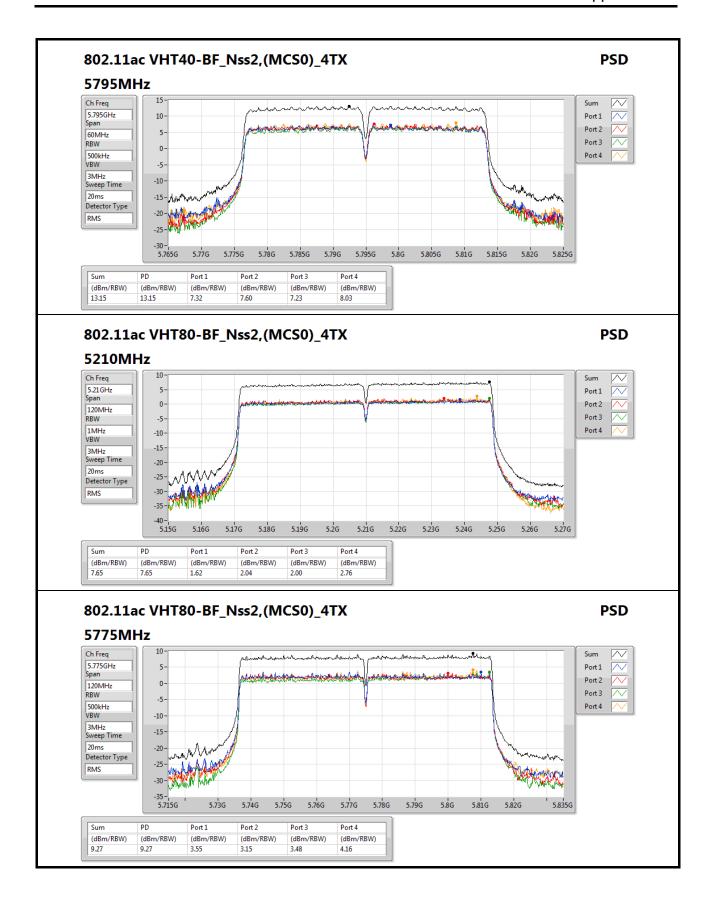














PSD Result Appendix D.2

Page No. : 1 of 4

For 802.11 VHT80+80 Mode Summary

Mode	PD
	(dBm/RBW)
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-
5.15-5.25GHz	-1.11
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-
5.725-5.85GHz	-2.53
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-
5.15-5.25GHz	-0.64
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-
5.725-5.85GHz	-1.02

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

SPORTON INTERNATIONAL INC.



Appendix D.2 **PSD Result**

Page No. : 2 of 4

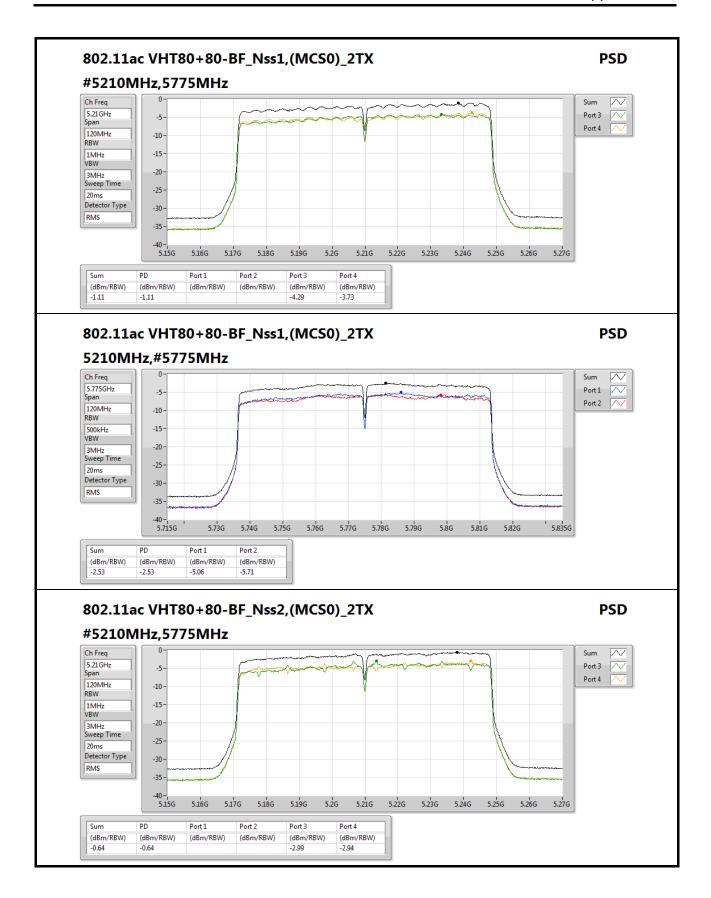
Result

Mode	DG	PD	PD Limit	Port 1	Port 2	Port 3	Port 4
	(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-
#5210MHz,5775MHz	5.31	-1.11	17.00			-4.29	-3.73
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-
5210MHz,#5775MHz	6.31	-2.53	29.69	-5.06	-5.71		
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-
#5210MHz,5775MHz	2.30	-0.64	17.00			-2.99	-2.94
802.11ac VHT80+80-BF_Nss2,(MCS0)_2TX	-	-	-	-	-	-	-
5210MHz,#5775MHz	3.30	-1.02	30.00	-2.51	-3.58		

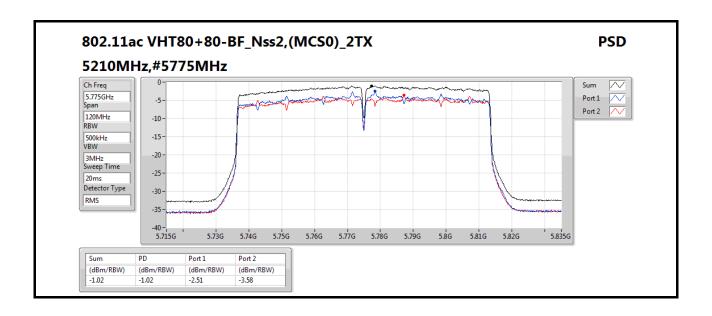
SPORTON INTERNATIONAL INC.

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

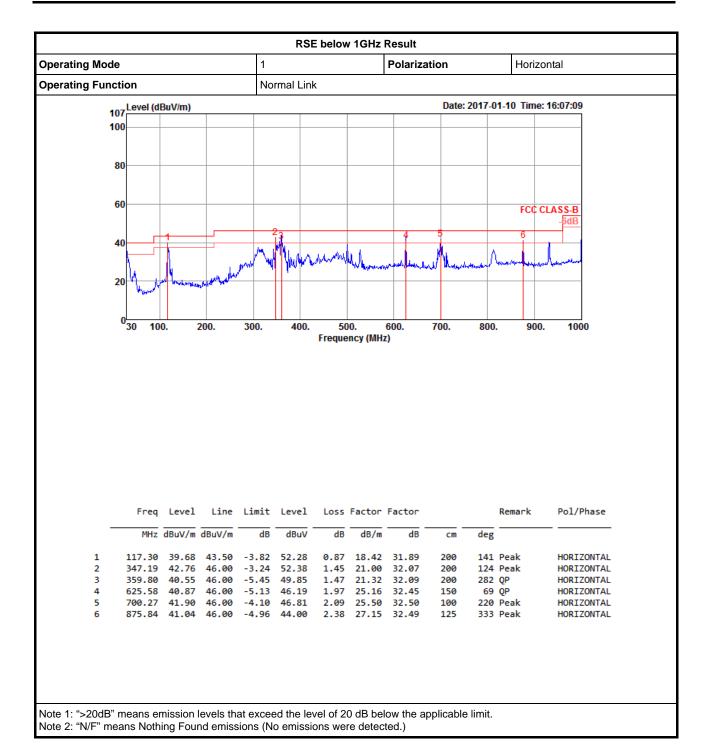






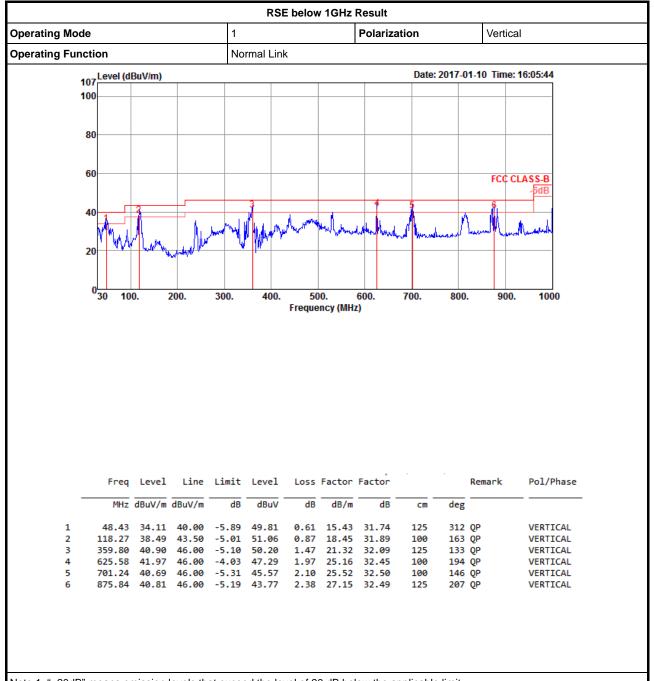






SPORTON INTERNATIONAL INC. Page No. : 1 of 2





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

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



RSE TX above 1GHz Result

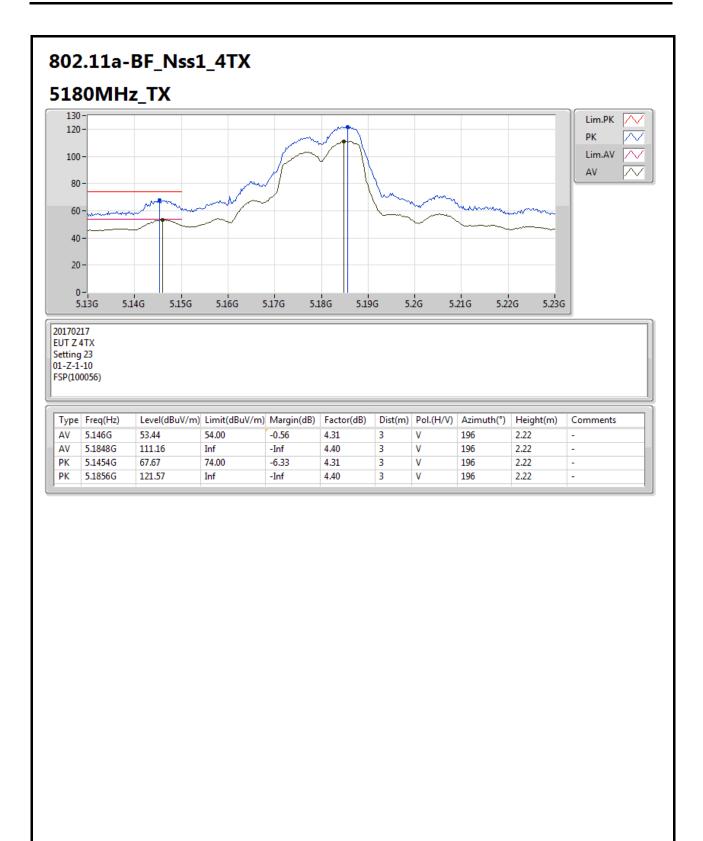
Appendix E.2

For 802.11a/11ac VHT20/11ac VHT40/11ac VHT80 Mode Summary

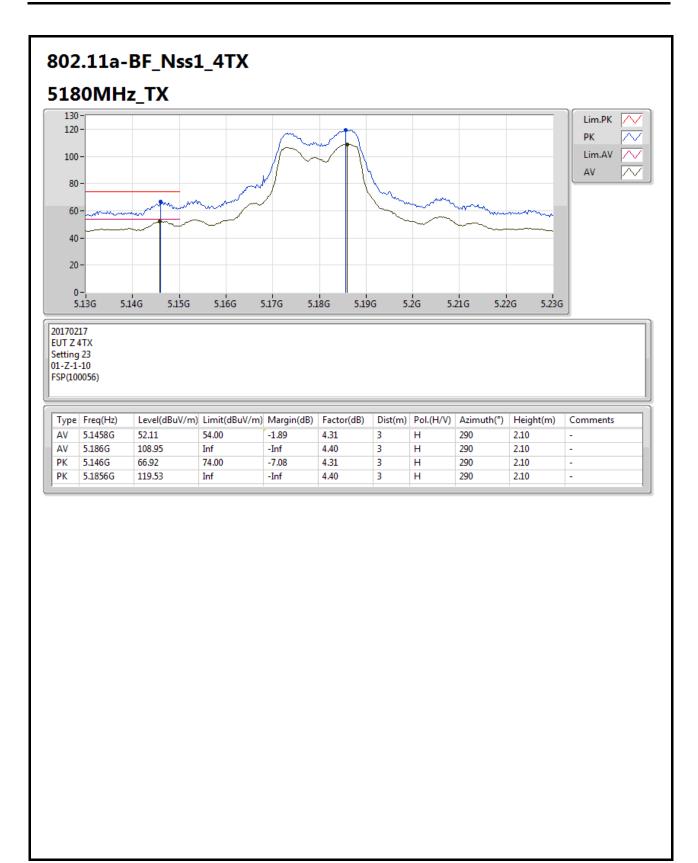
Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Pol.	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)	(H/V)	(°)	(m)	
802.11ac VHT80-BF_Nss2,(MCS0)_4TX	-	-	-	-	-	-	-	-		-		-
5.15-5.25GHz	Pass	AV	5.149995G	53.49	54.00	-0.51	4.32	3	V	144	1.76	-

SPORTON INTERNATIONAL INC. Page No. : 1 of 121

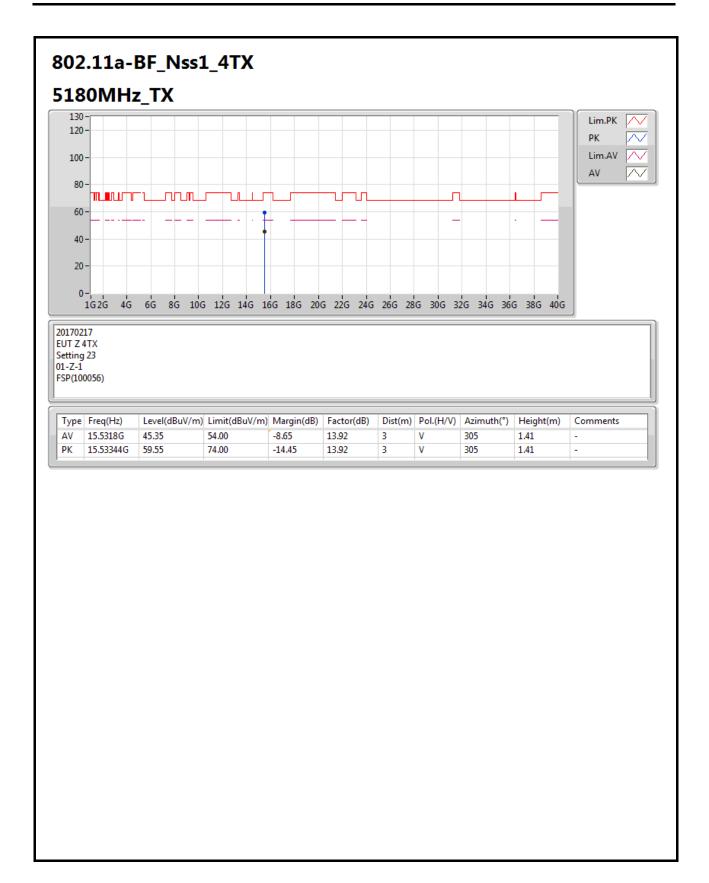






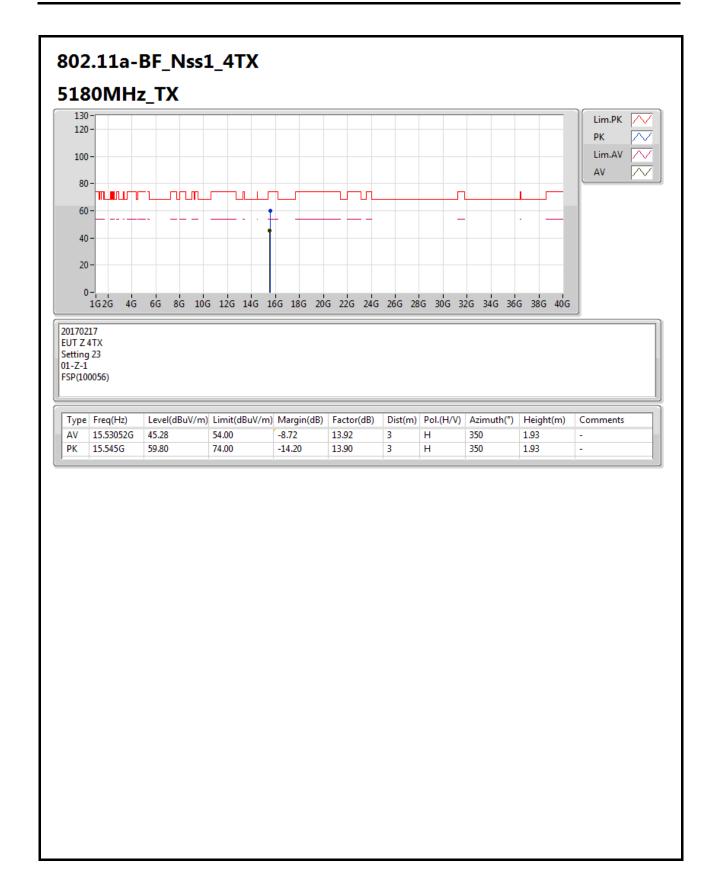






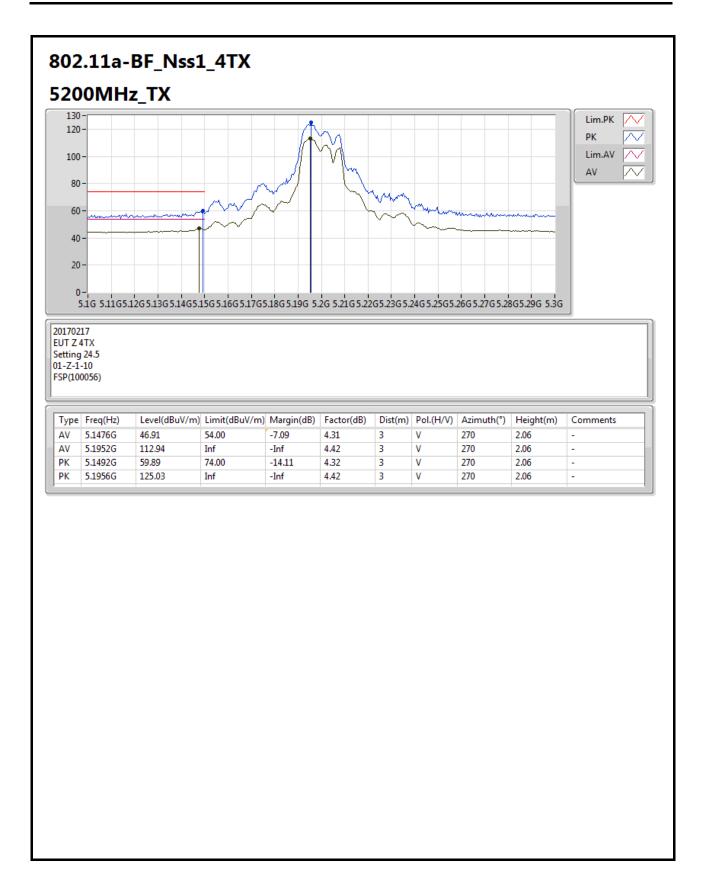
Page No. : 5 of 121





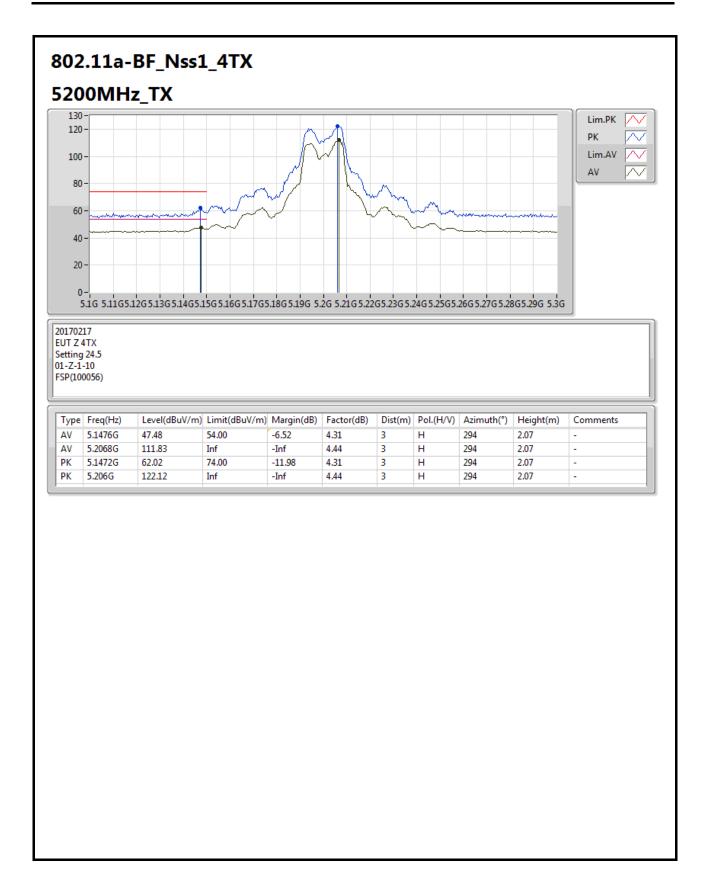
Page No. : 6 of 121





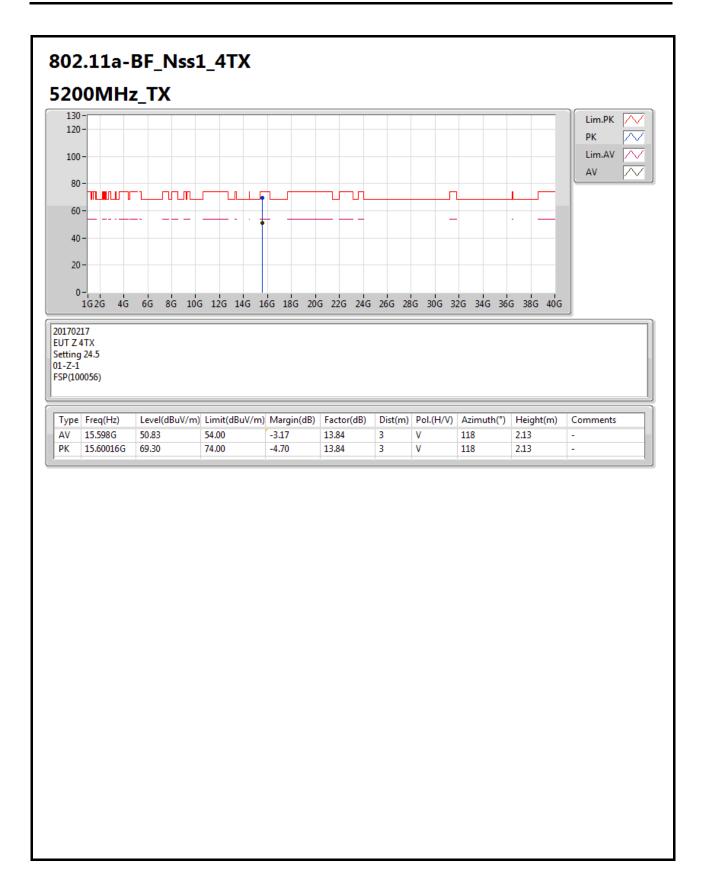
Page No. : 7 of 121



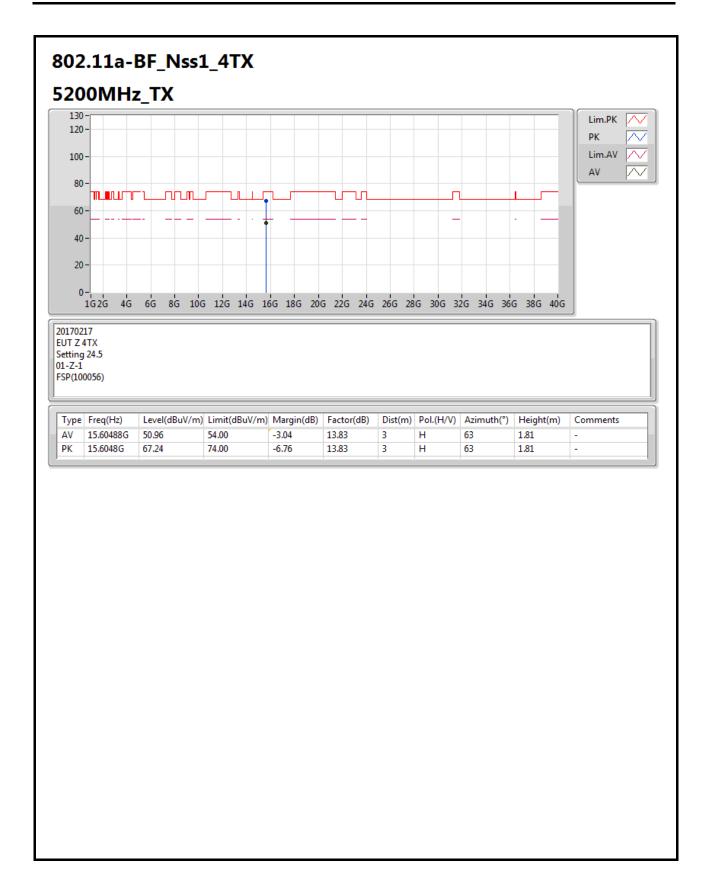


Page No. : 8 of 121

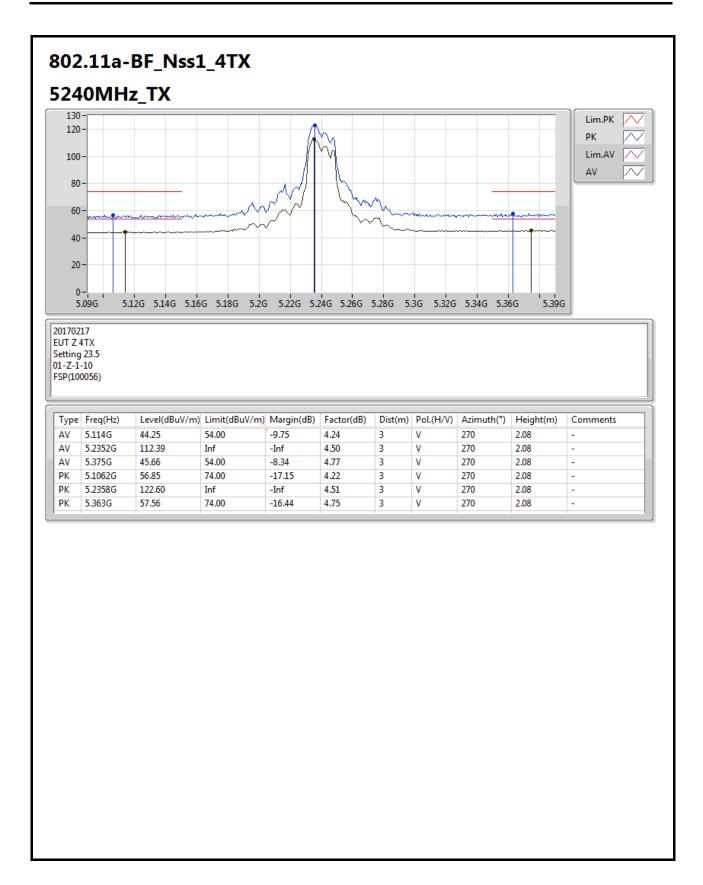






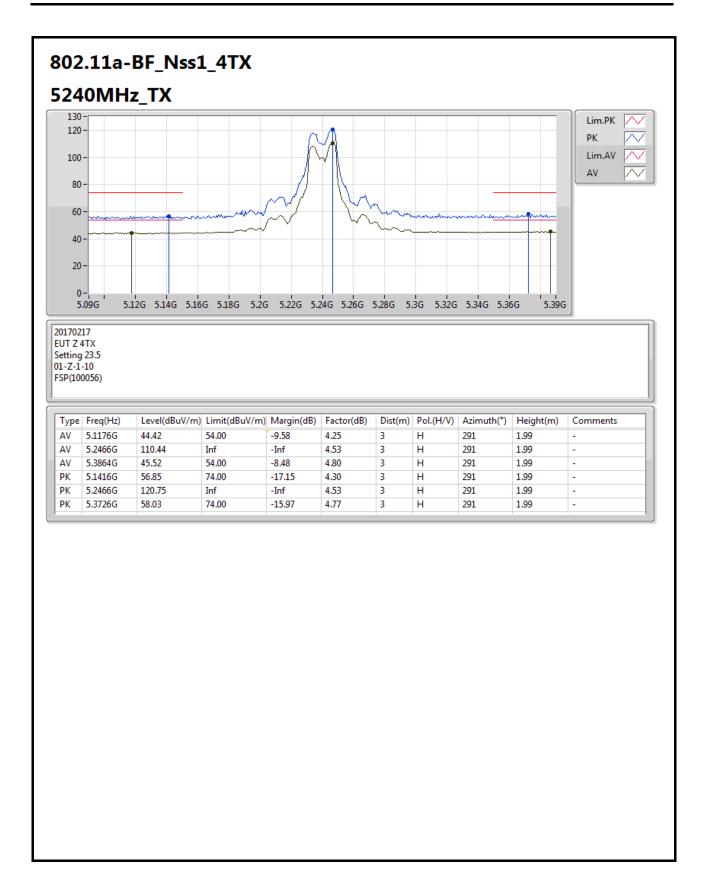






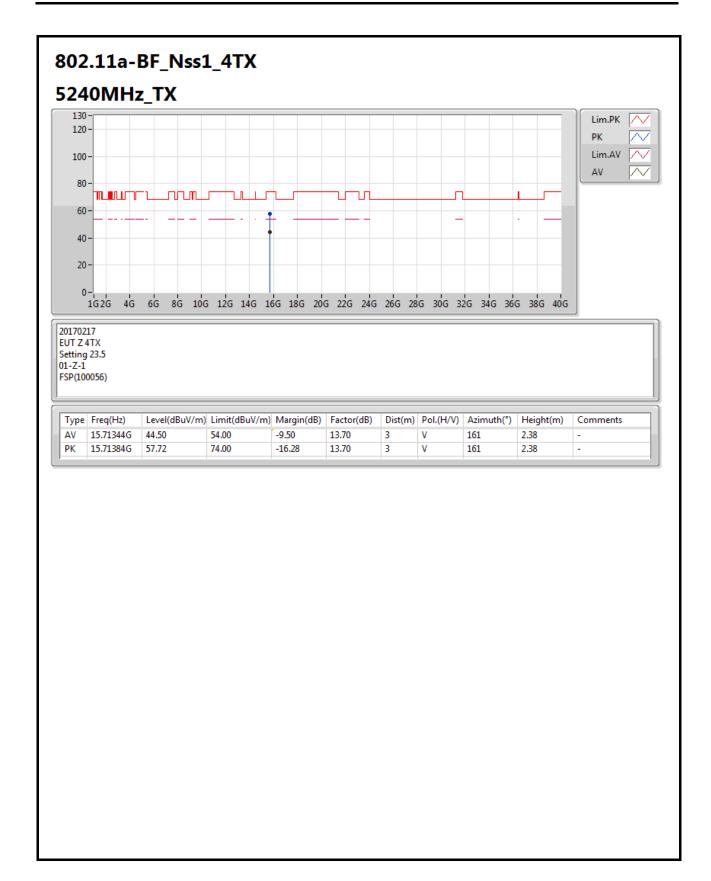
Page No. : 11 of 121



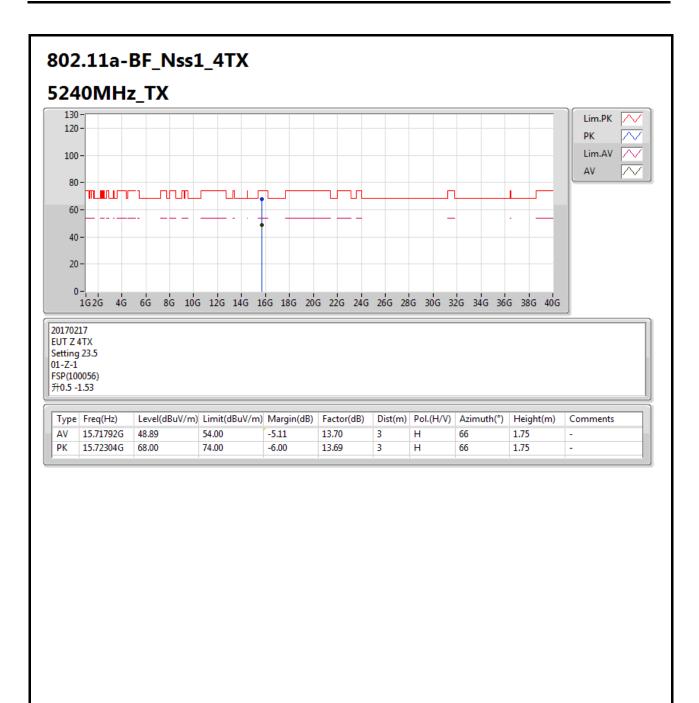


Page No. : 12 of 121

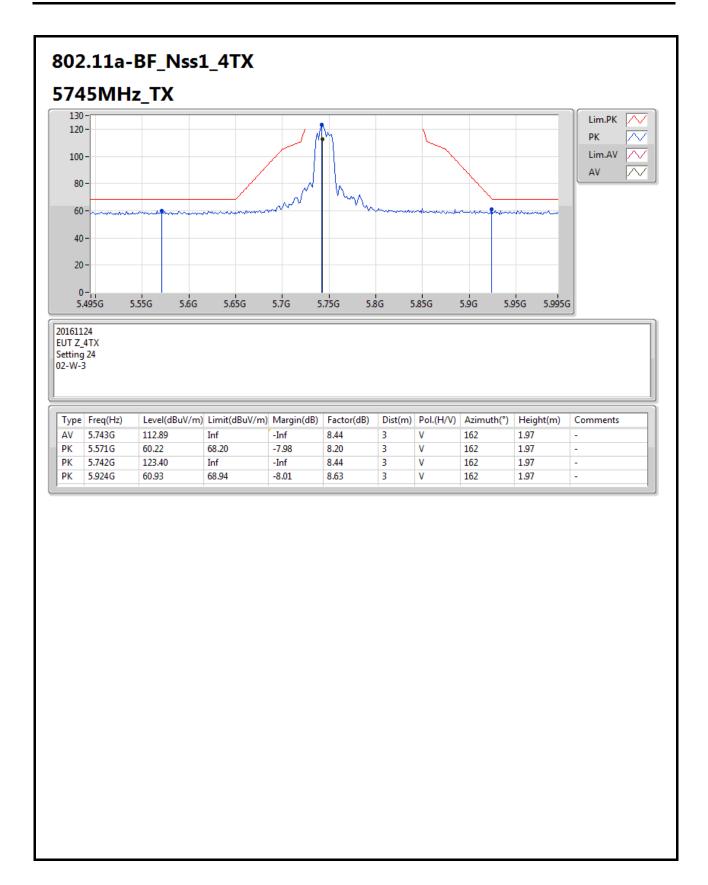






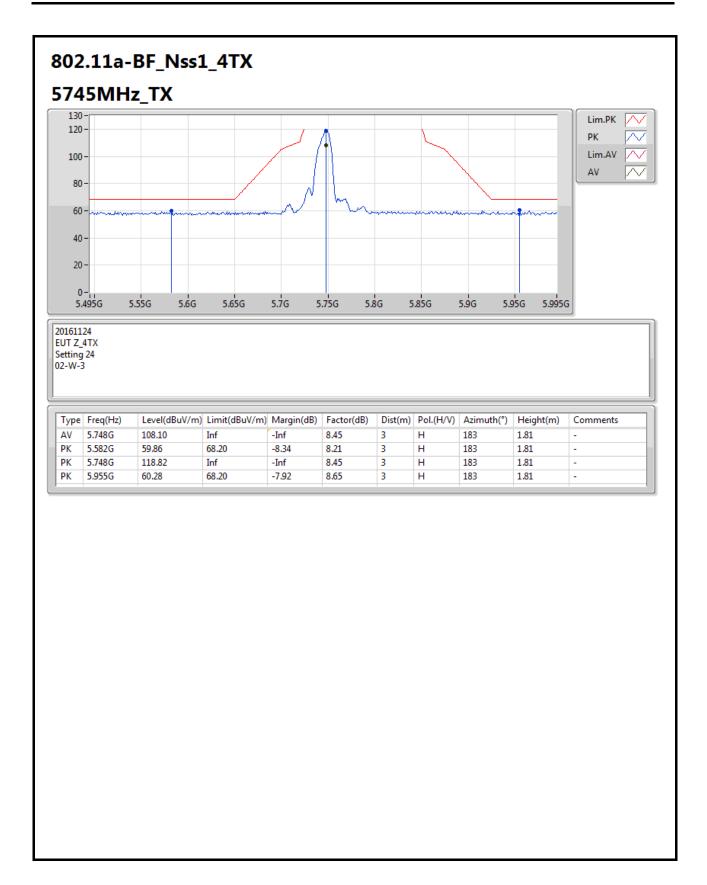




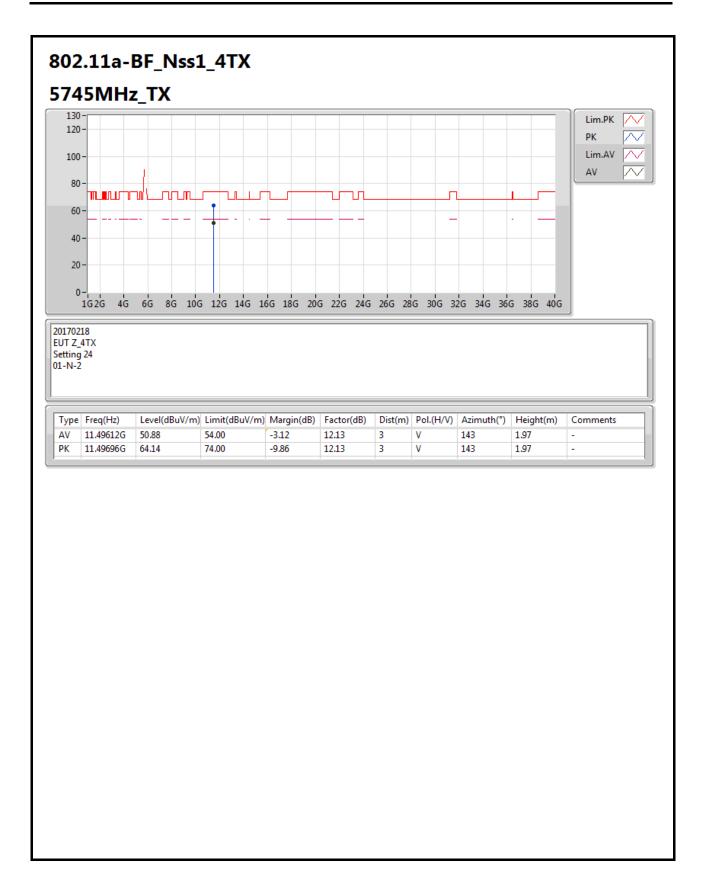


Page No. : 15 of 121

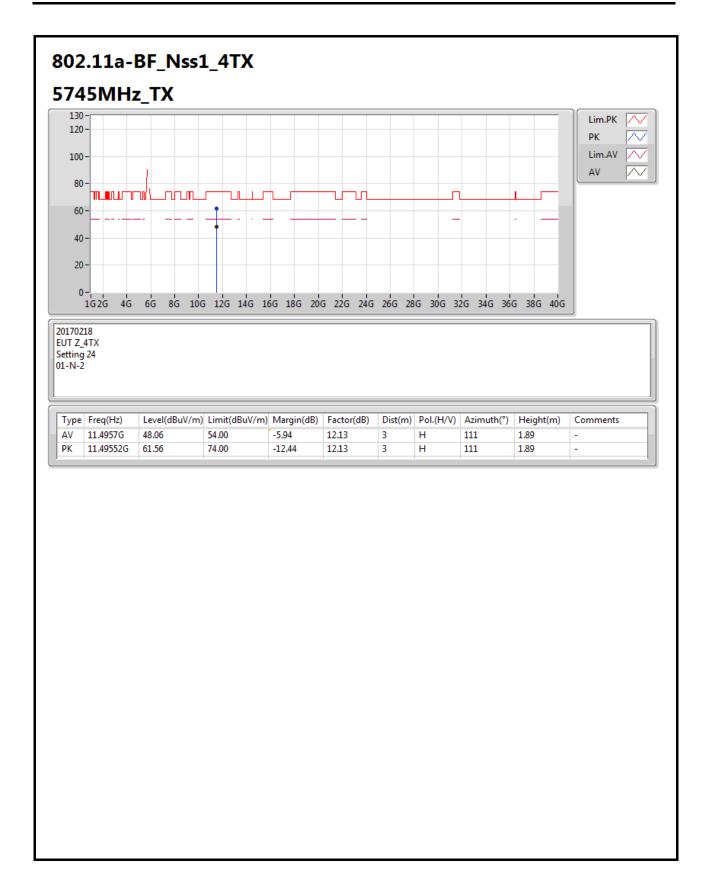




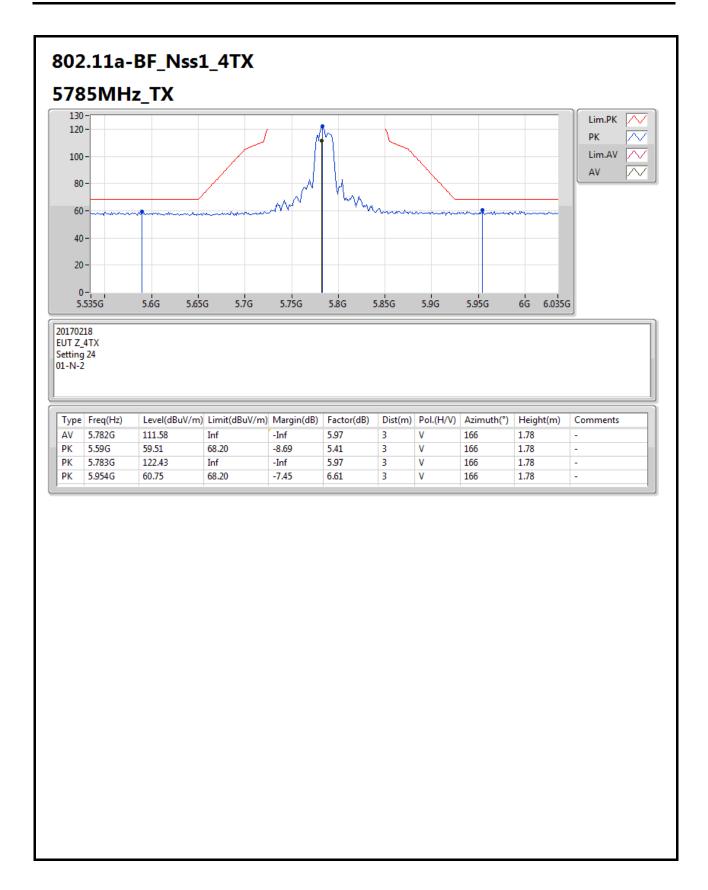




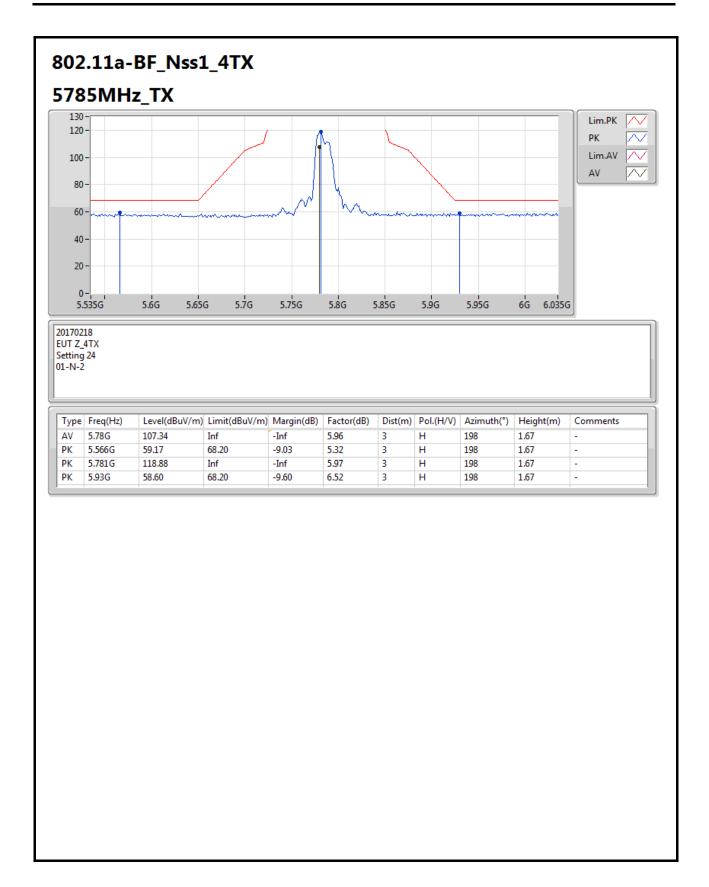




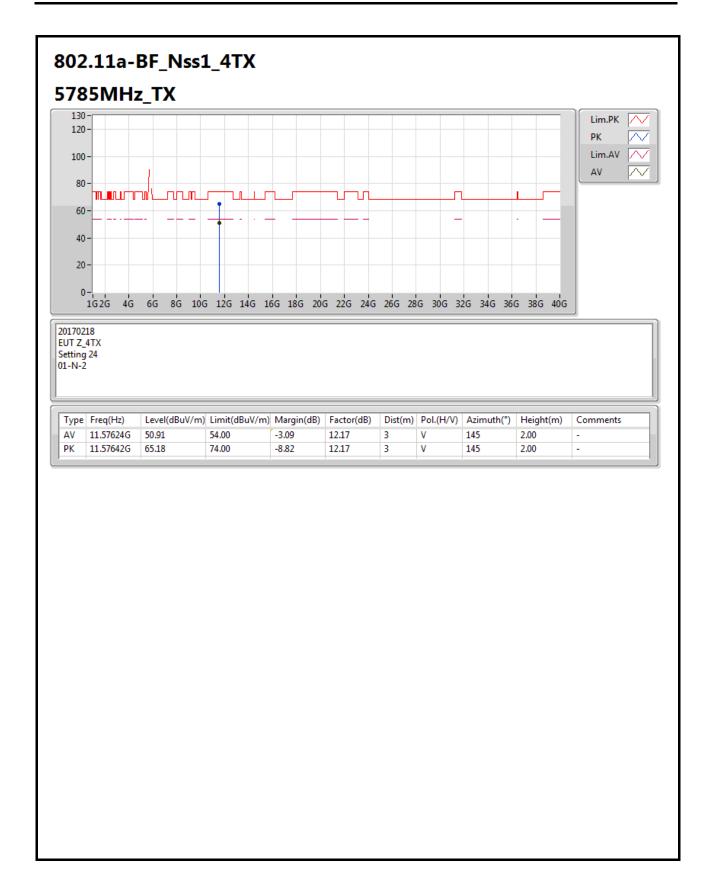






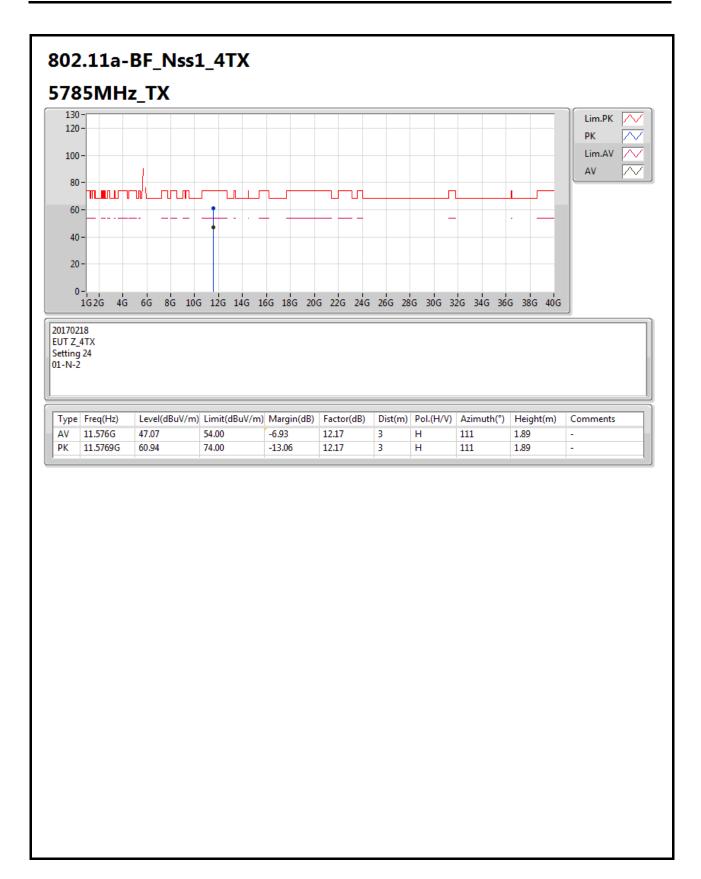






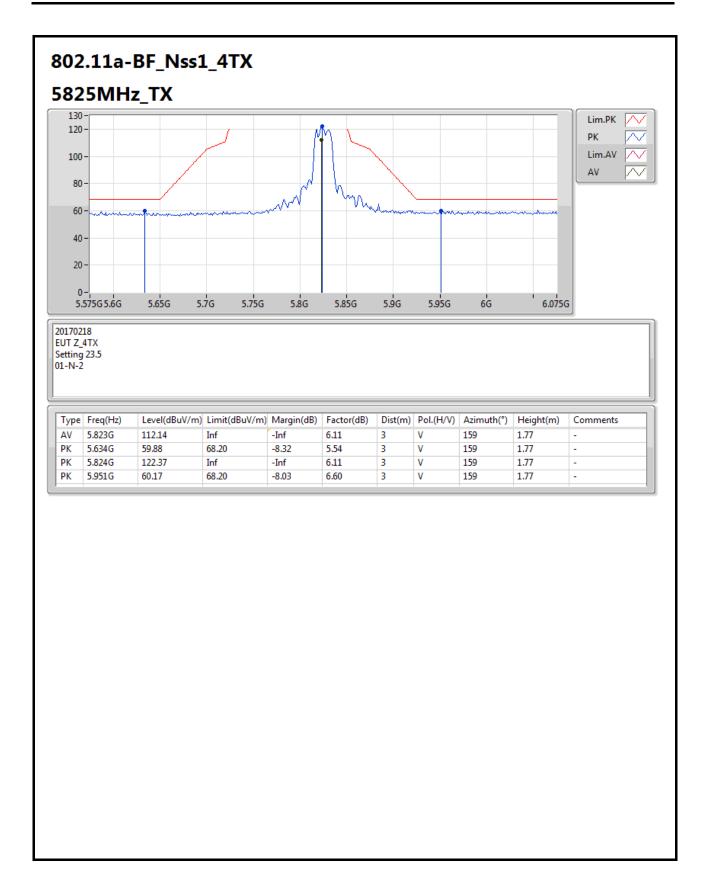
SPORTON INTERNATIONAL INC.



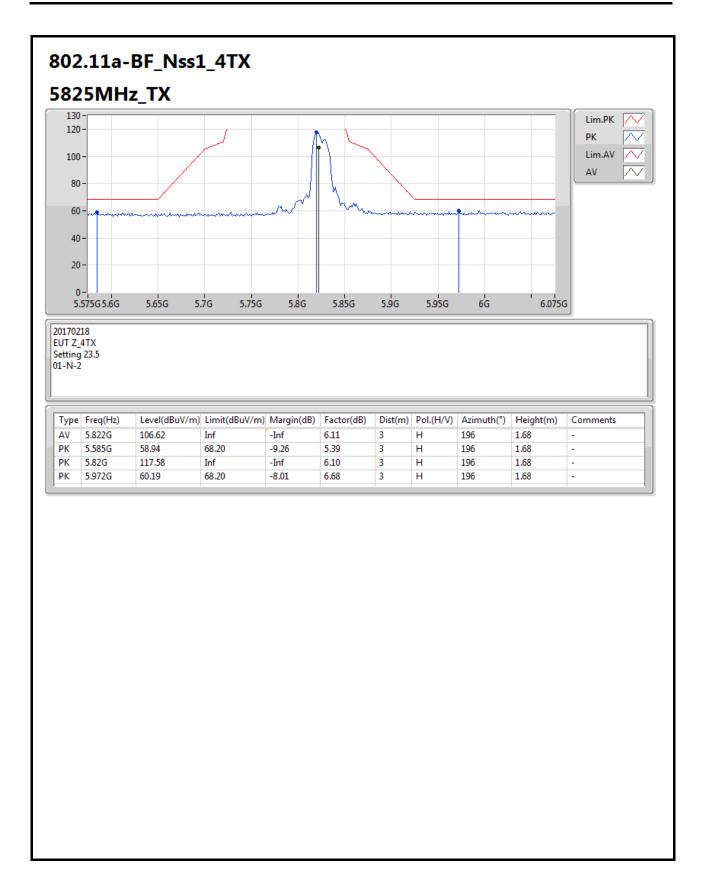


Page No. : 21 of 121

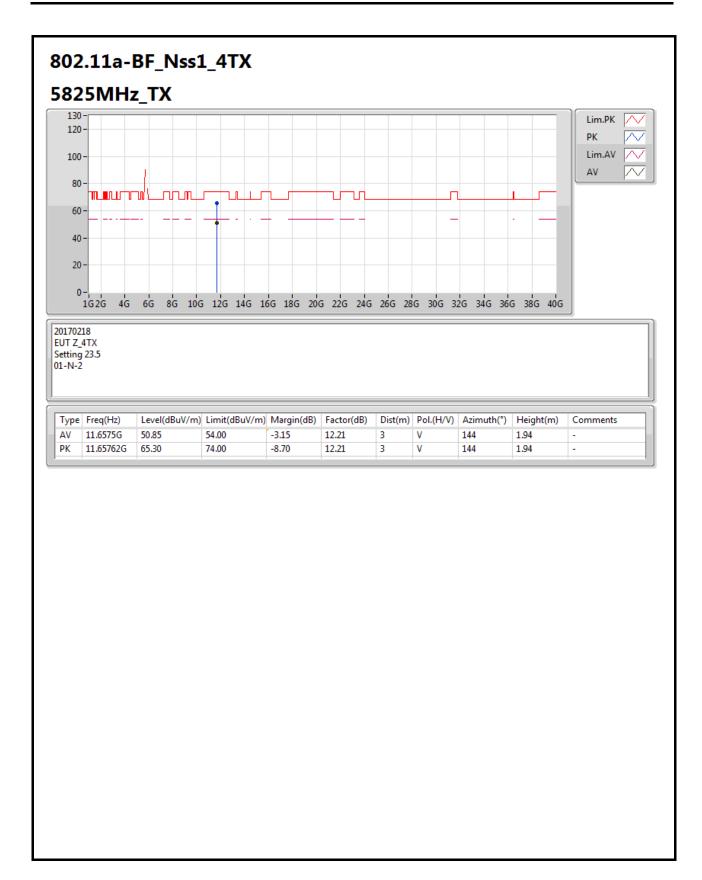




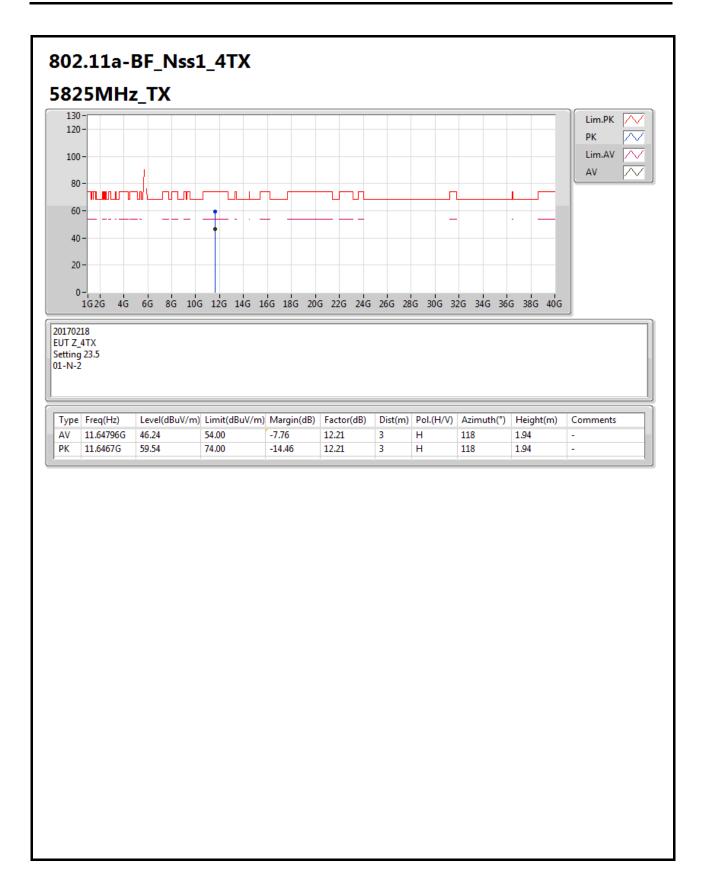




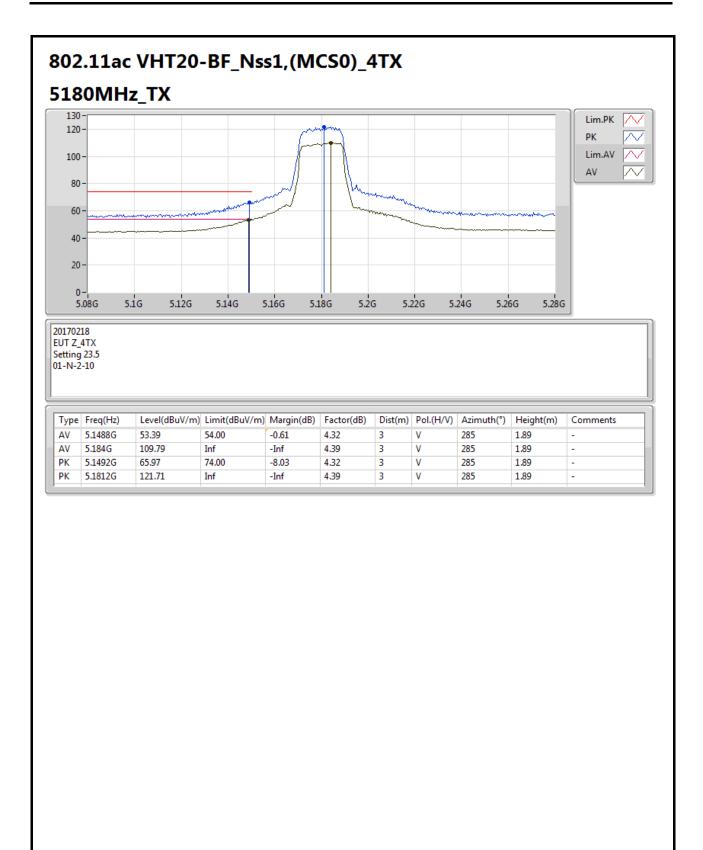




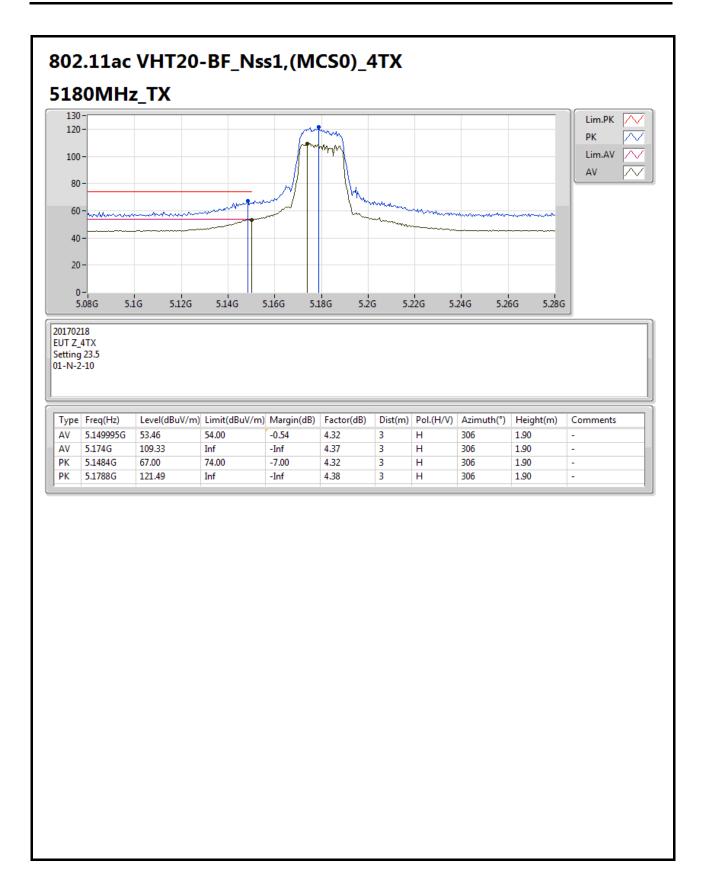






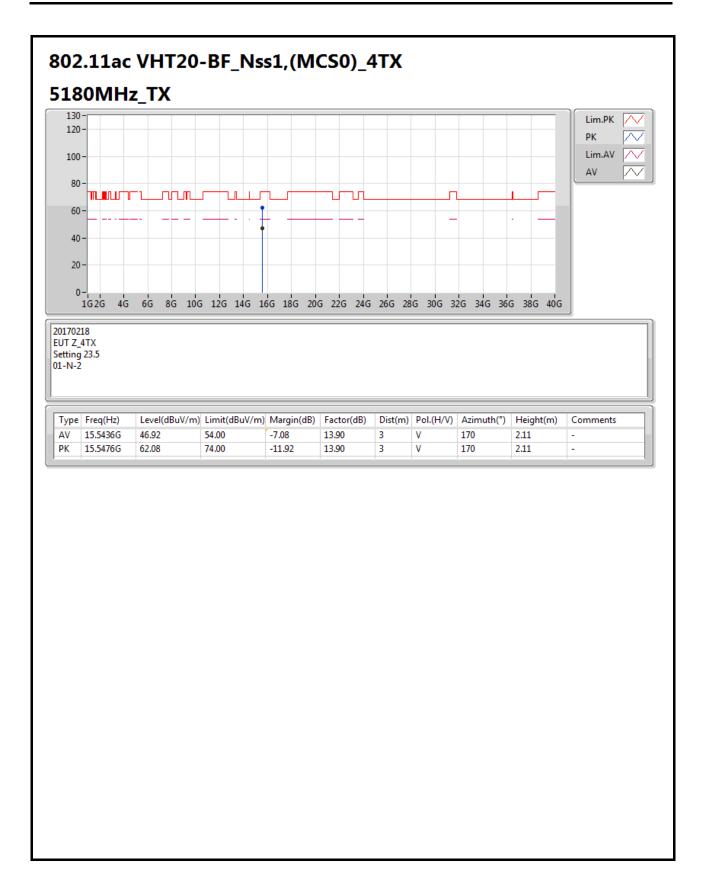




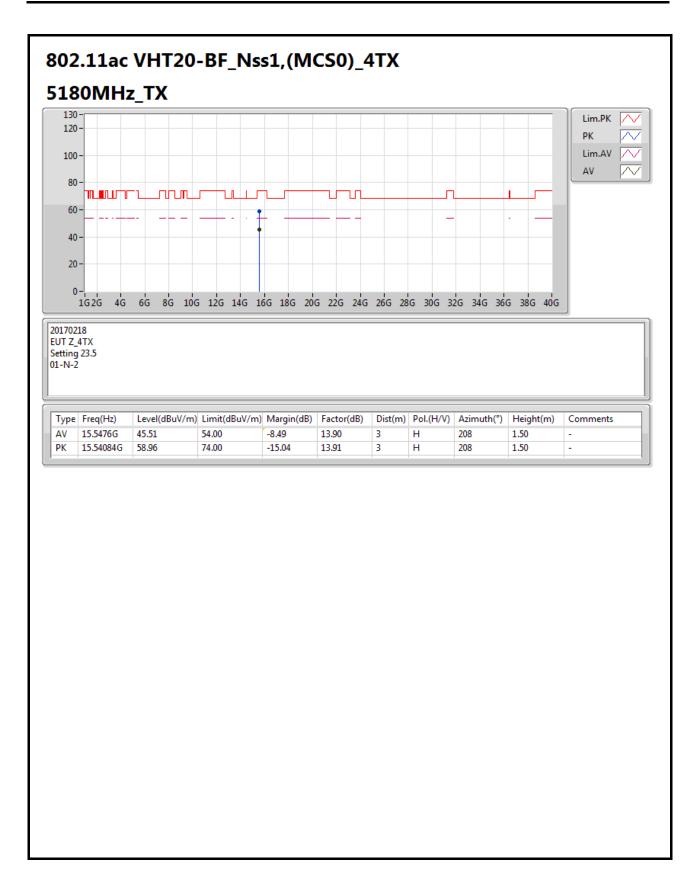


Page No. : 28 of 121

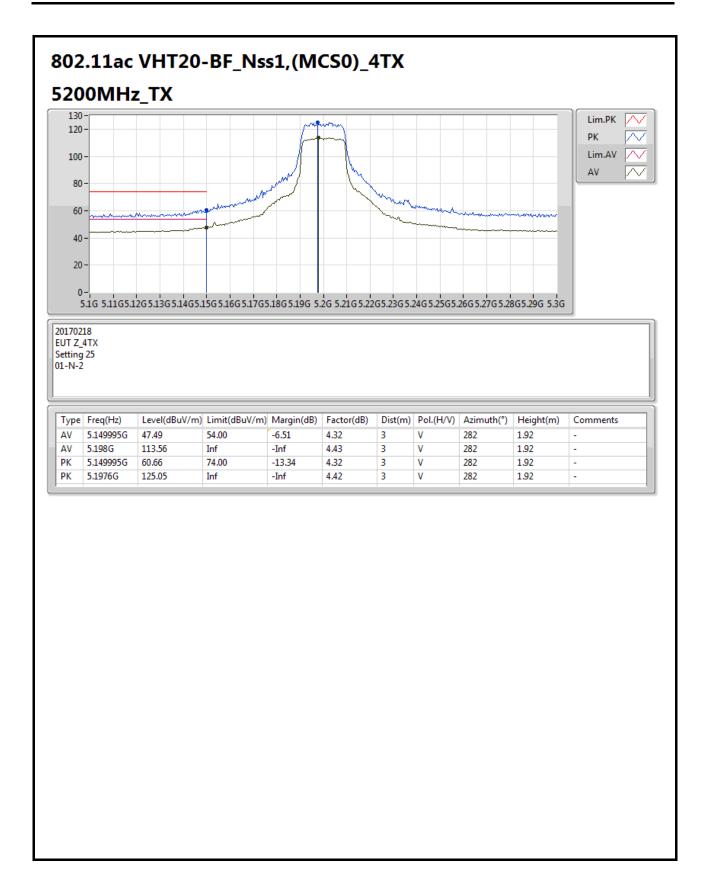




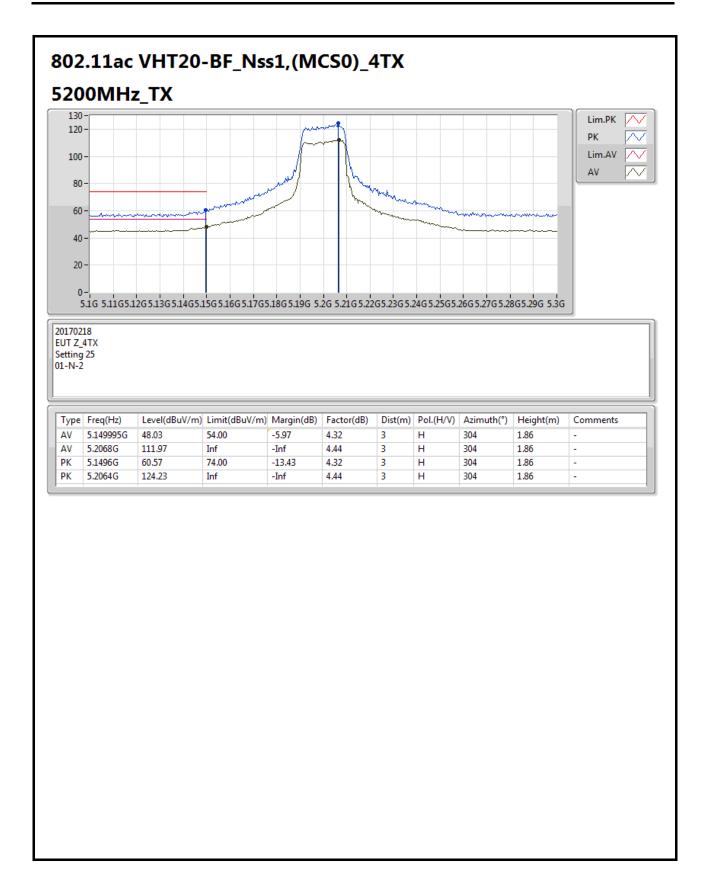




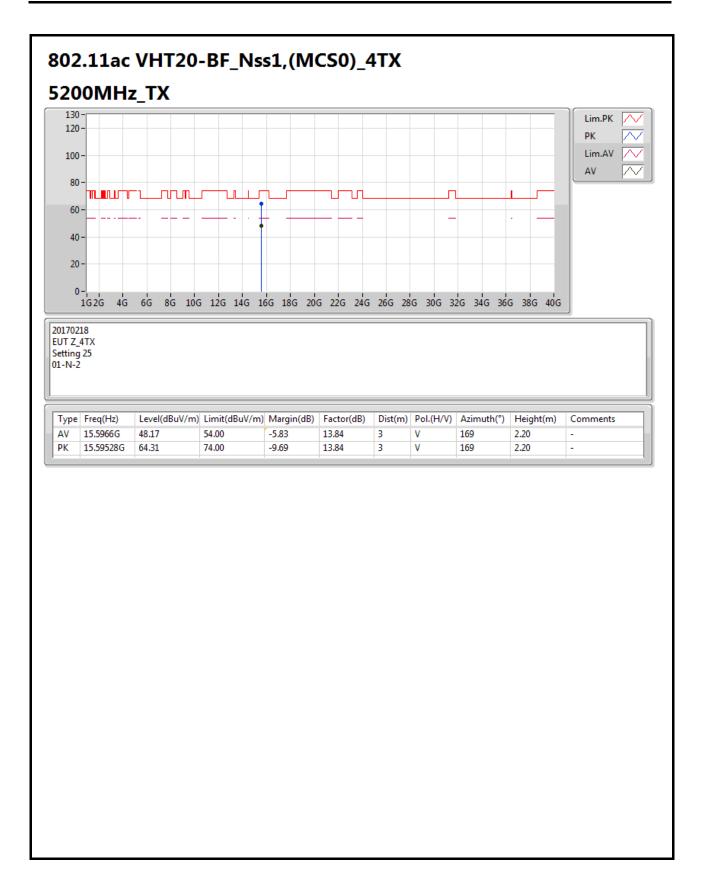




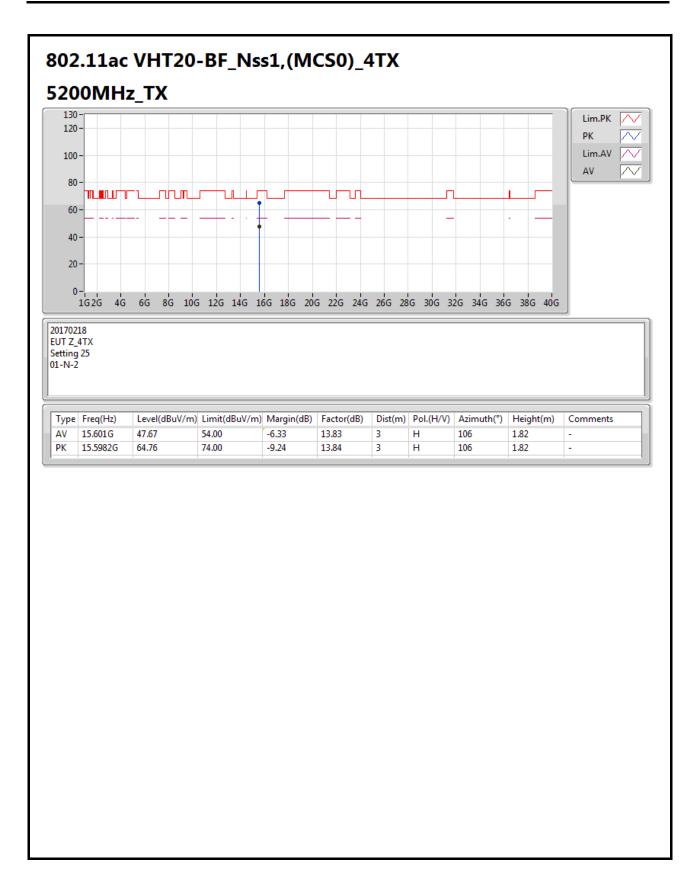




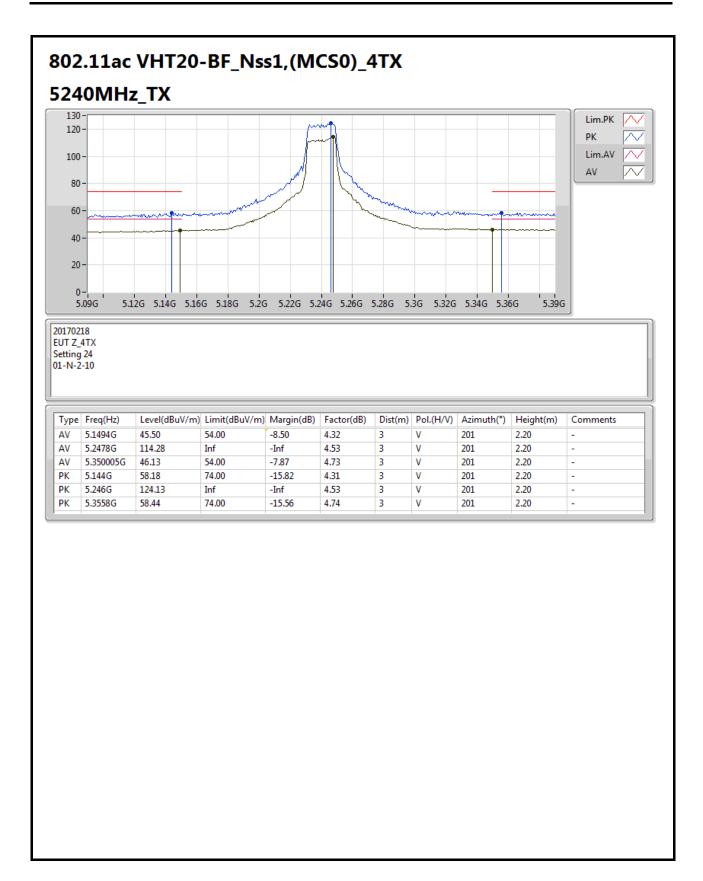




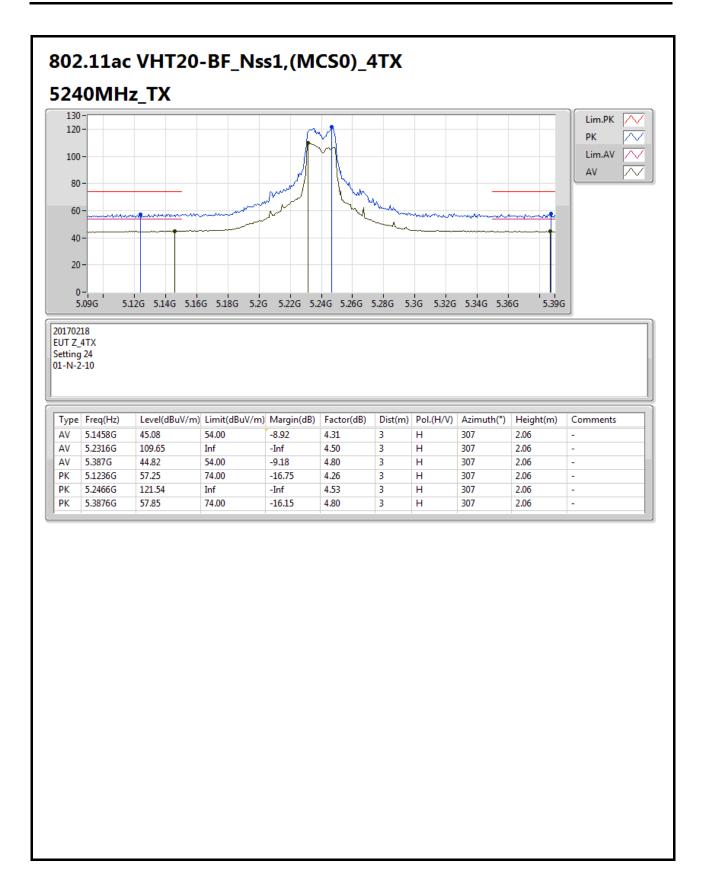




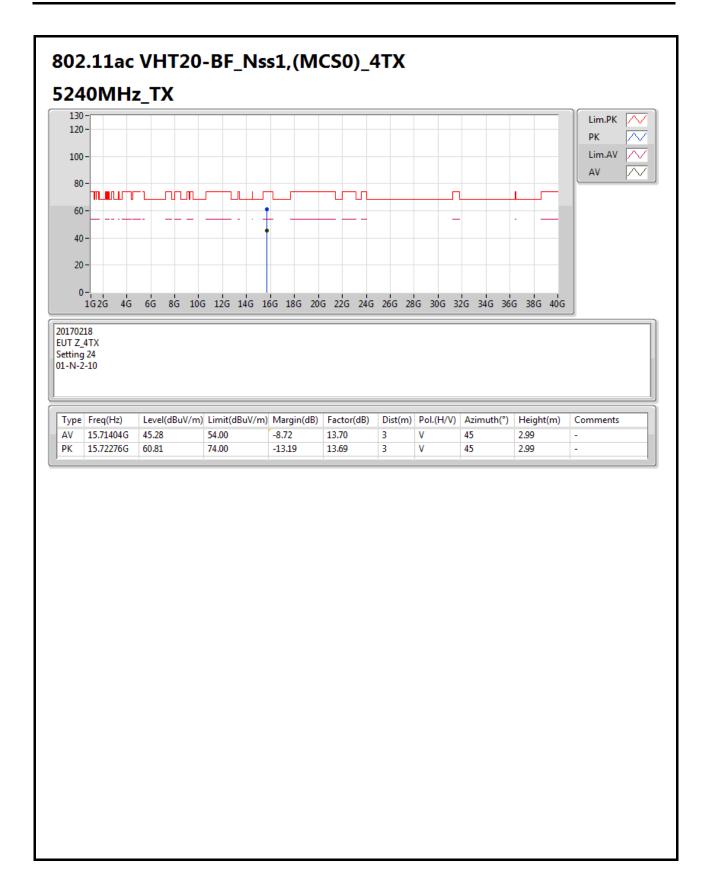




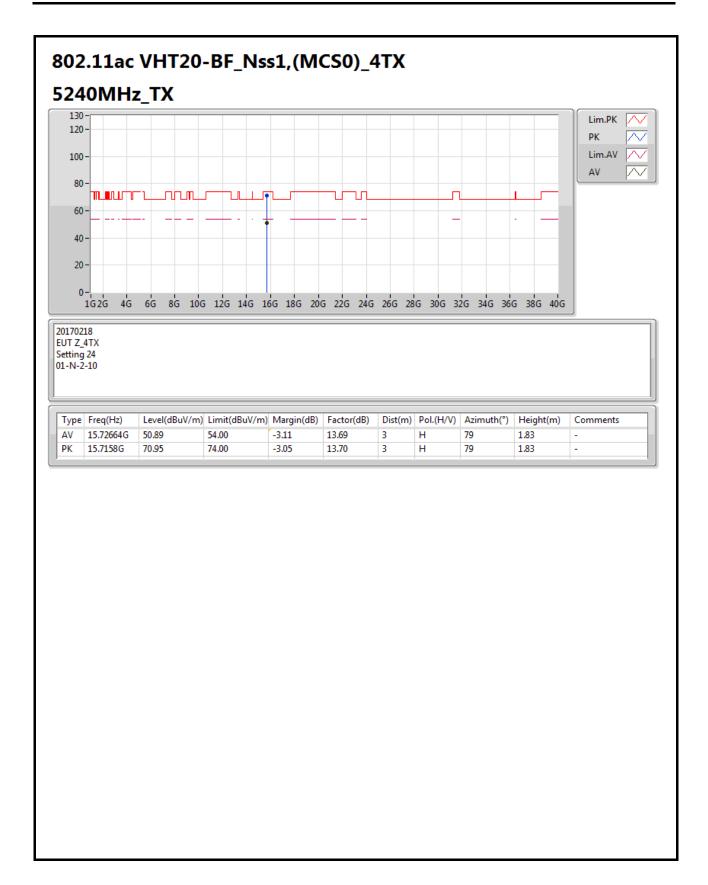






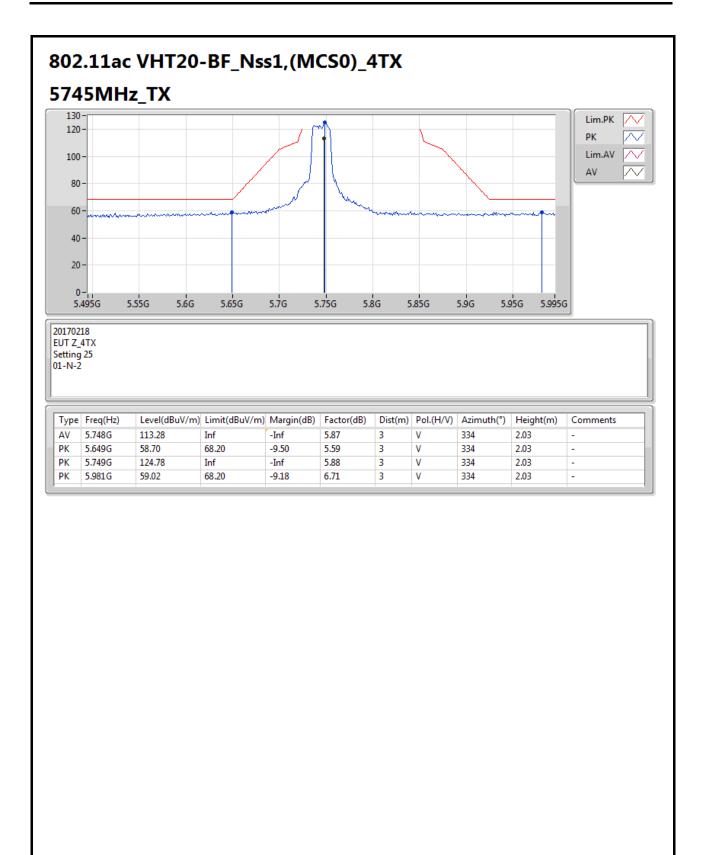






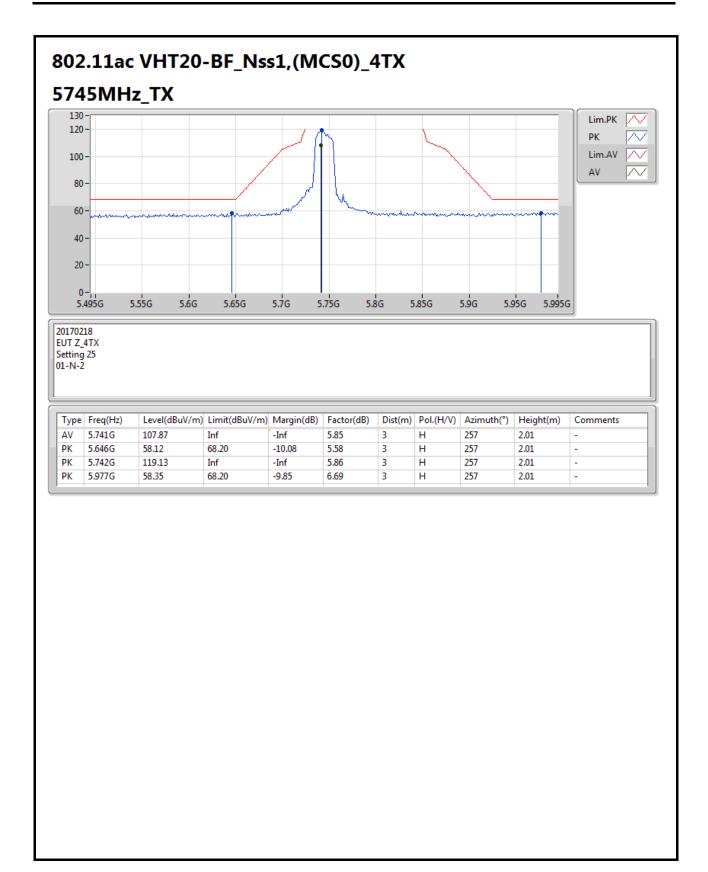
SPORTON INTERNATIONAL INC.



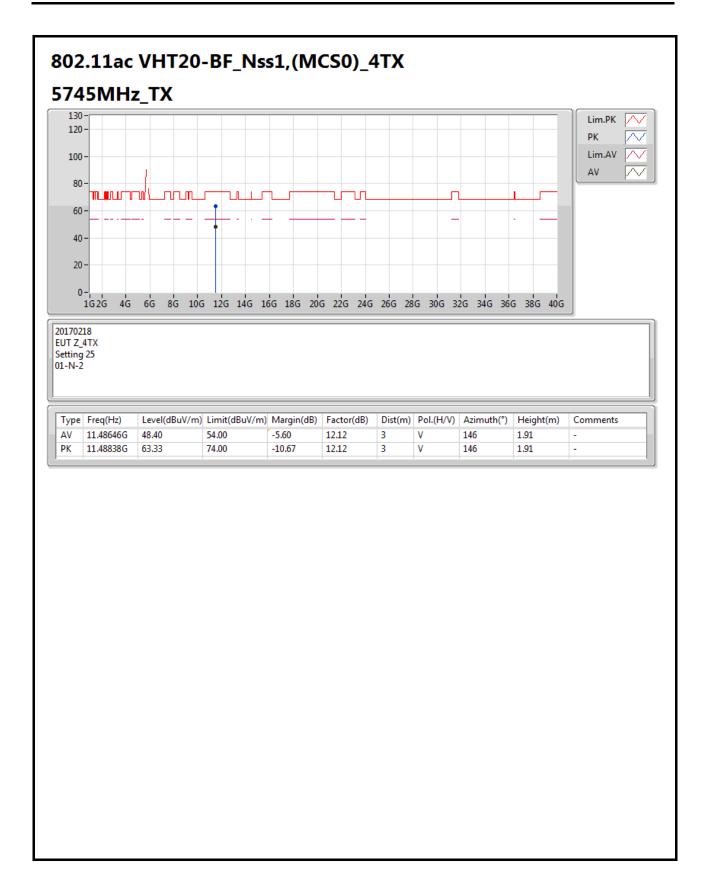


Page No. : 39 of 121

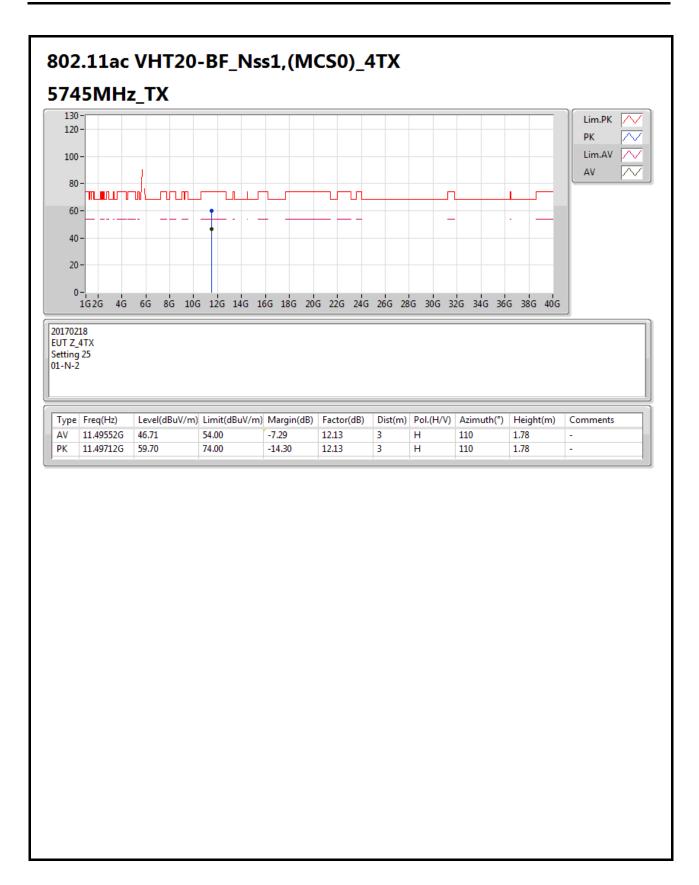




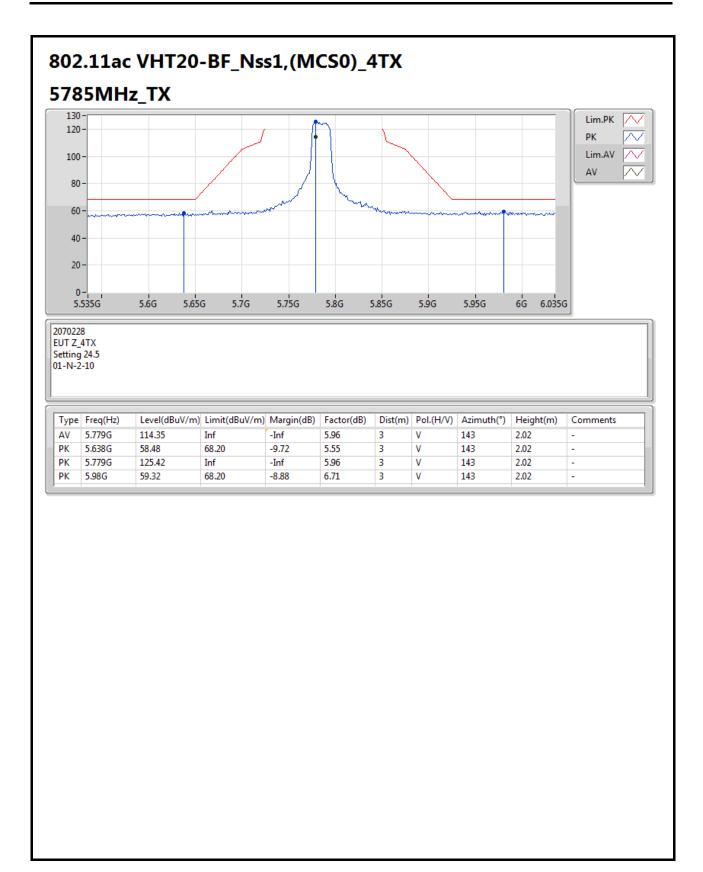




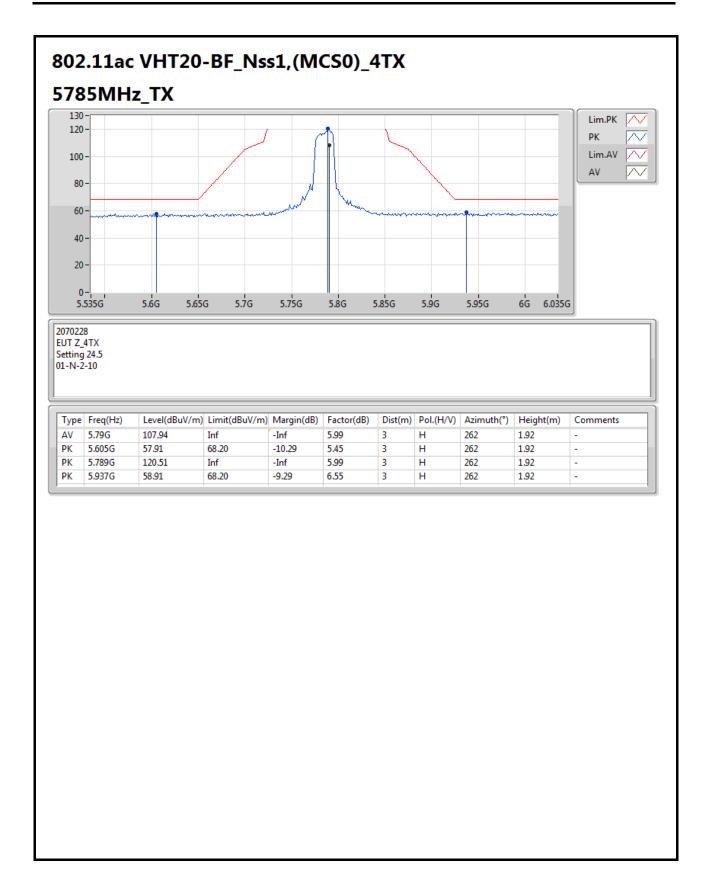




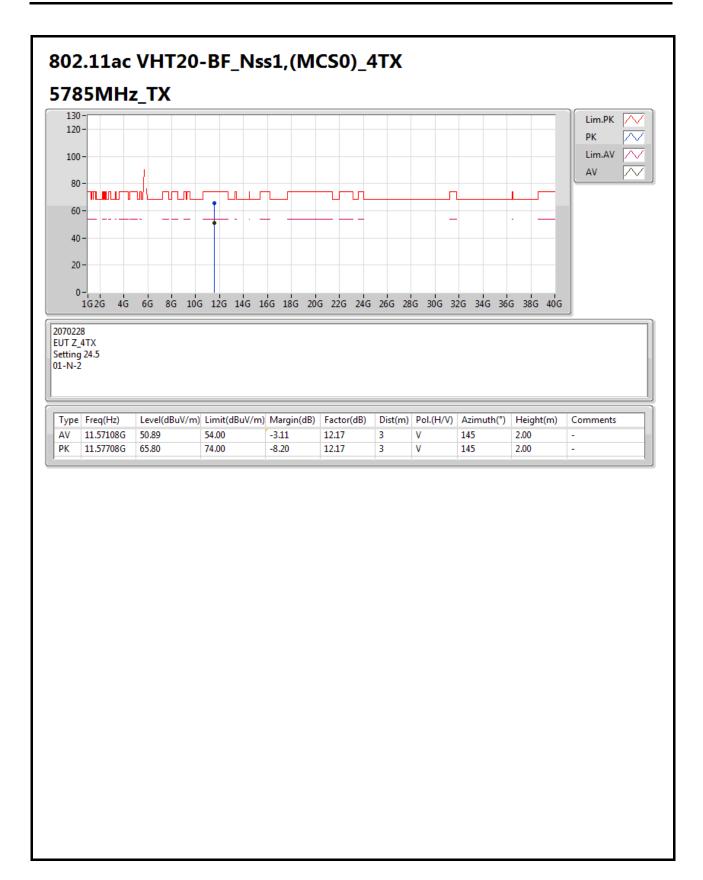




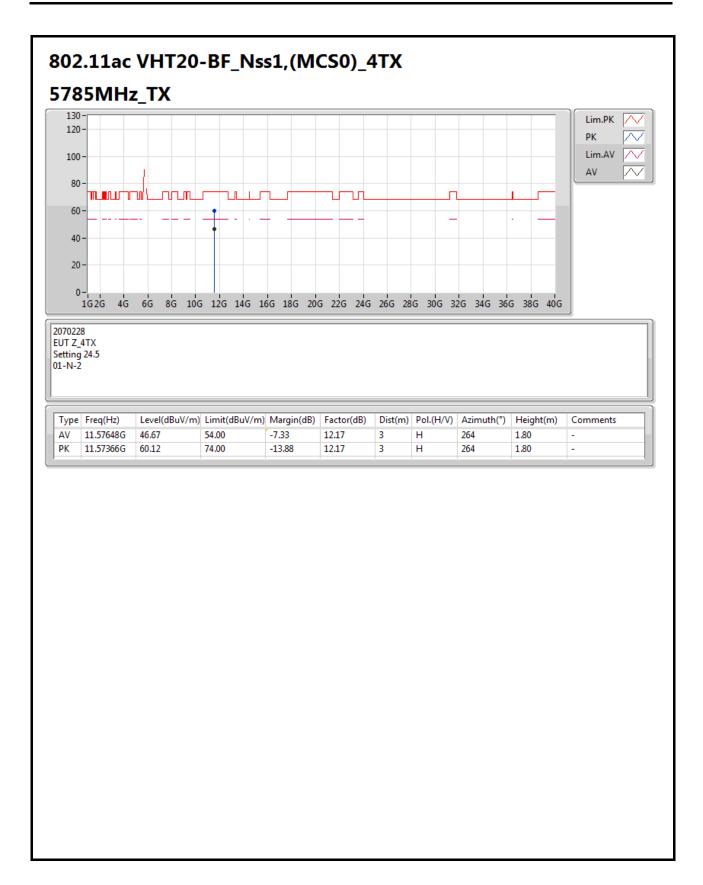




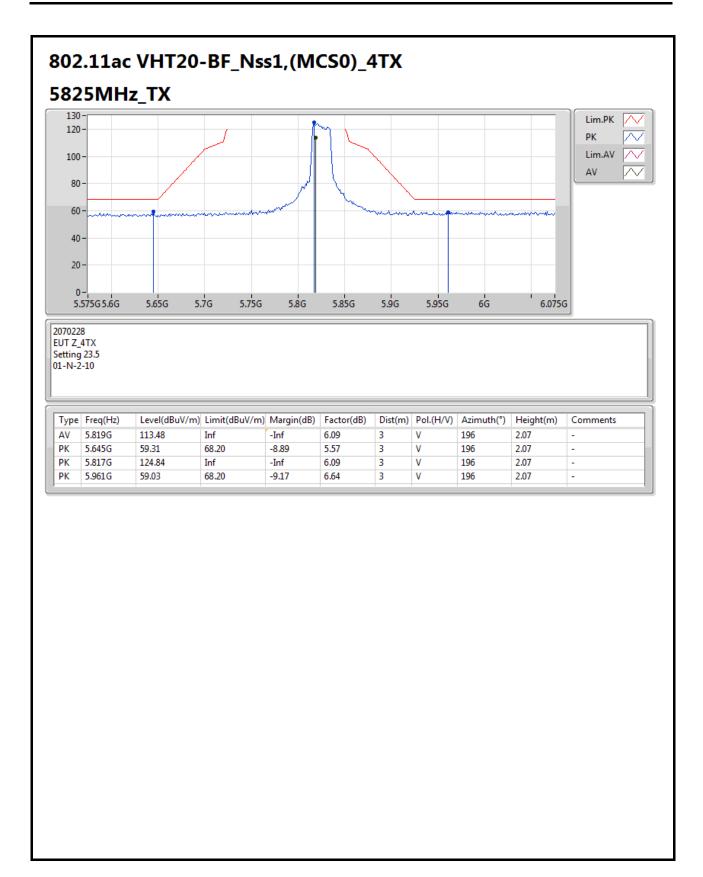




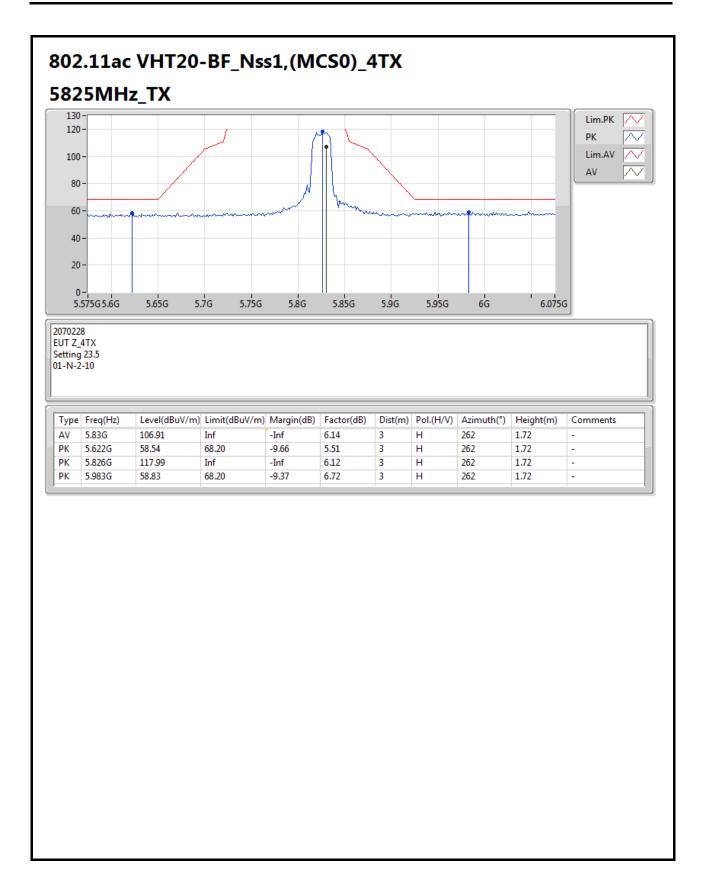




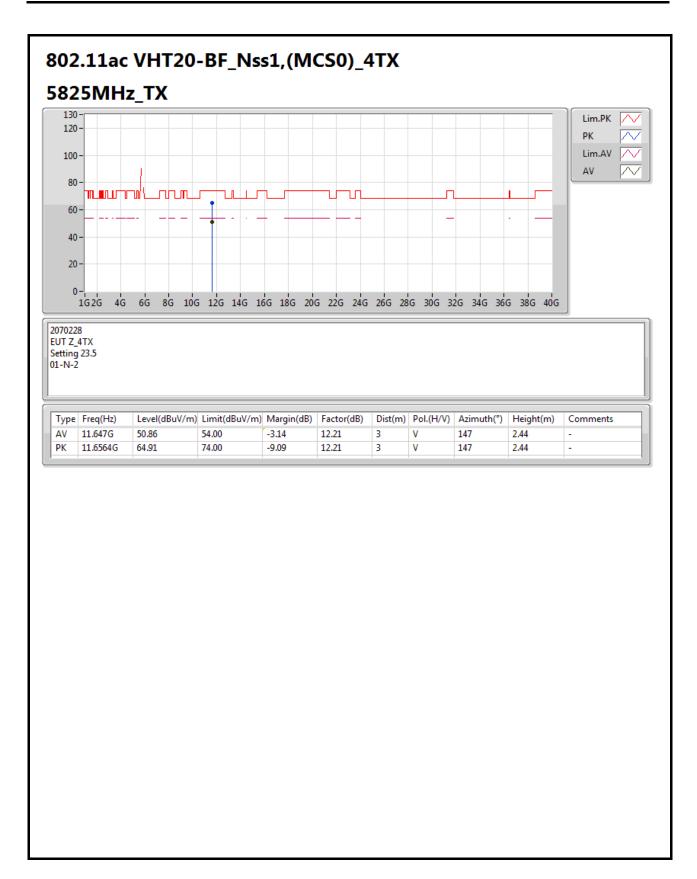






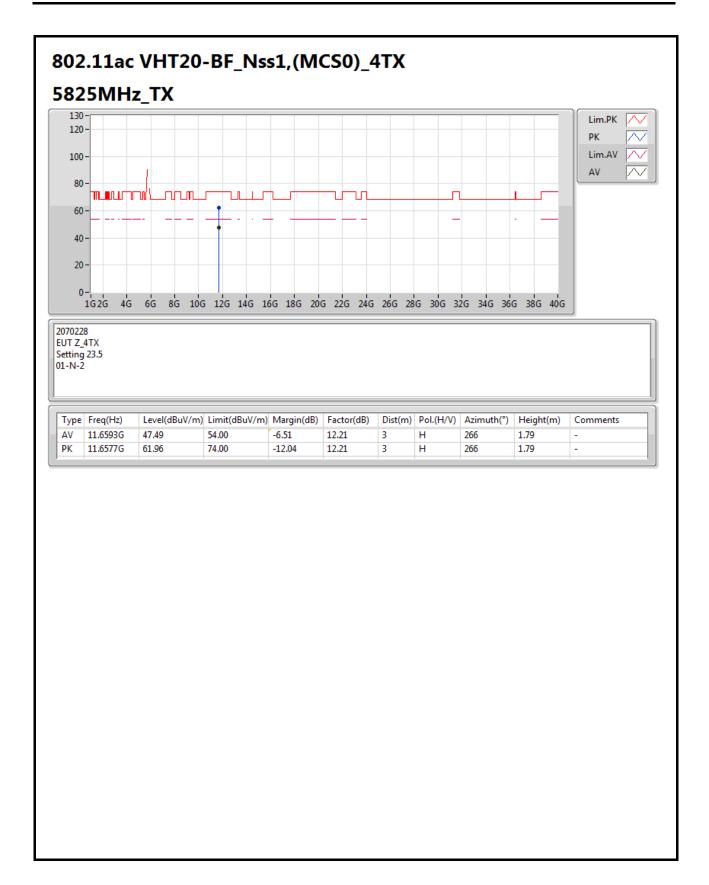






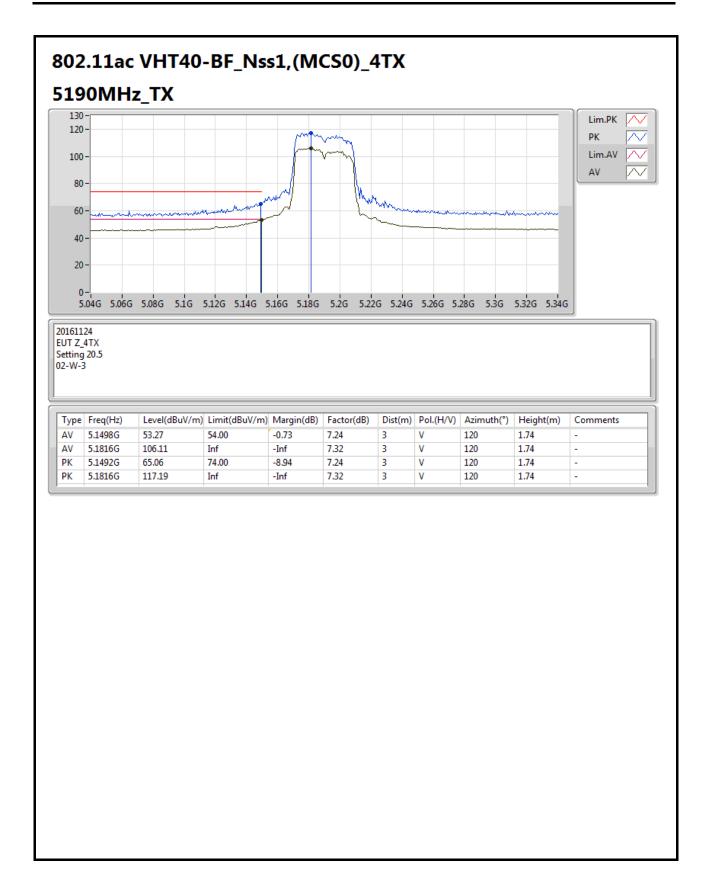
Page No. : 49 of 121



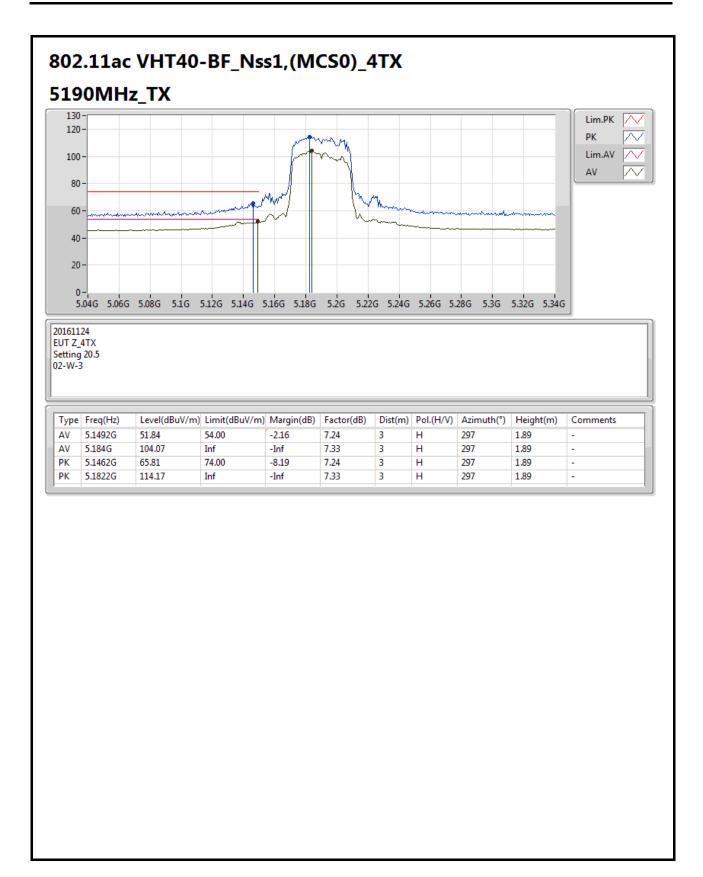


Page No. : 50 of 121

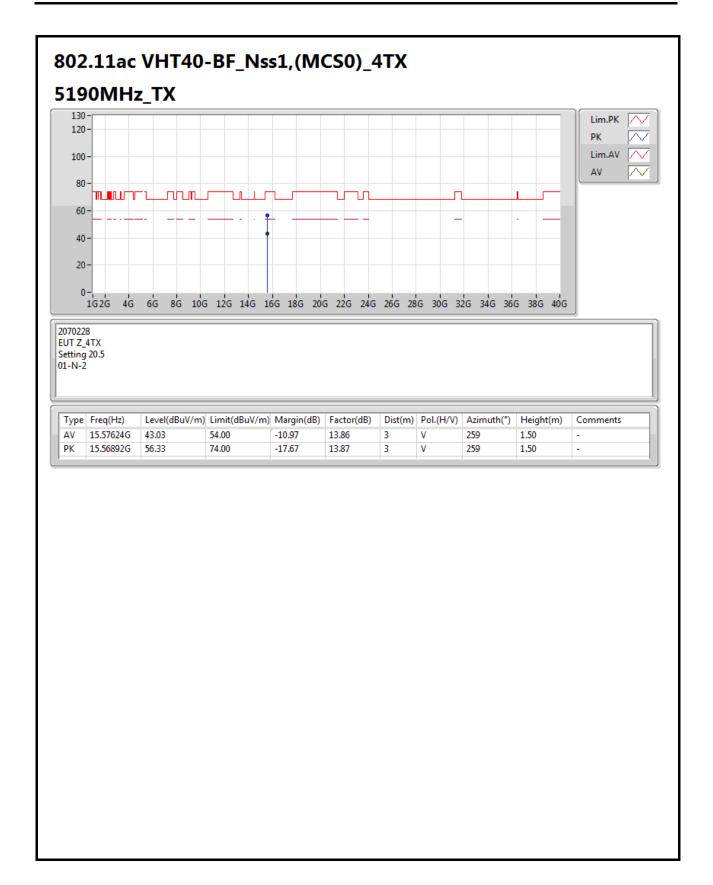








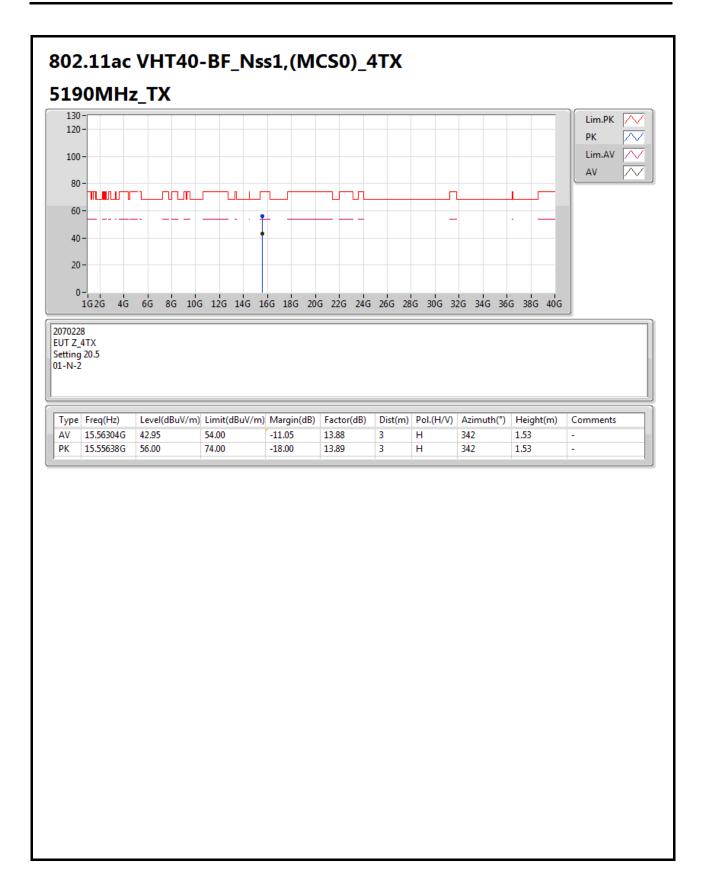




SPORTON INTERNATIONAL INC.

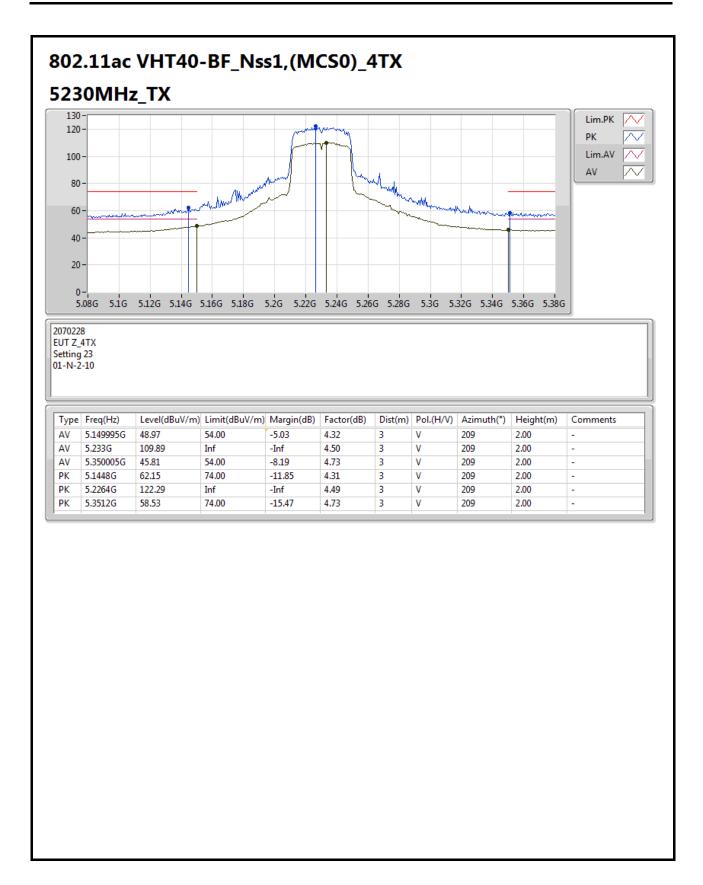
Page No. : 53 of 121



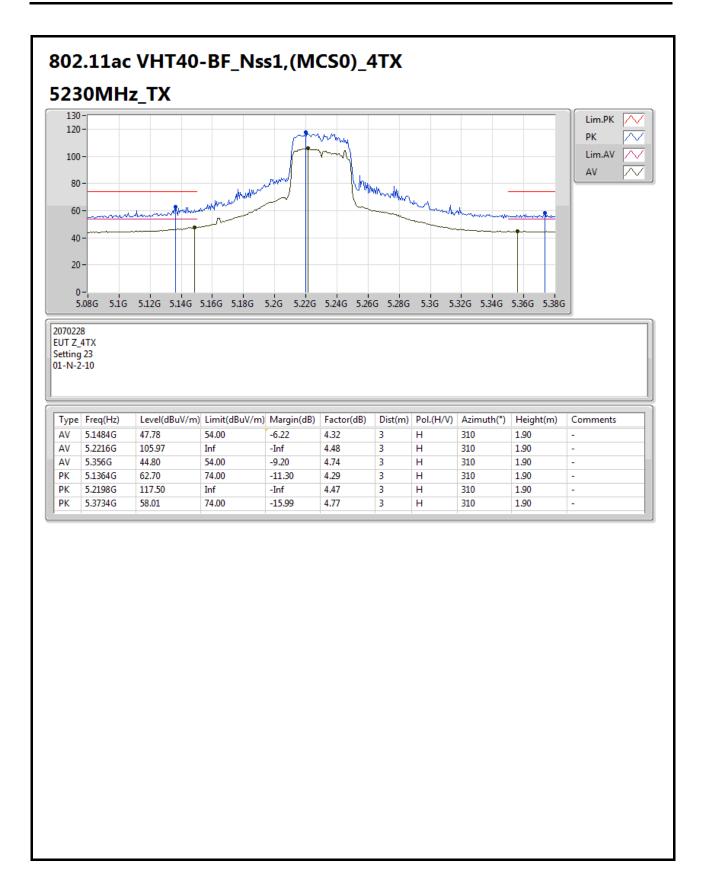


Page No. : 54 of 121

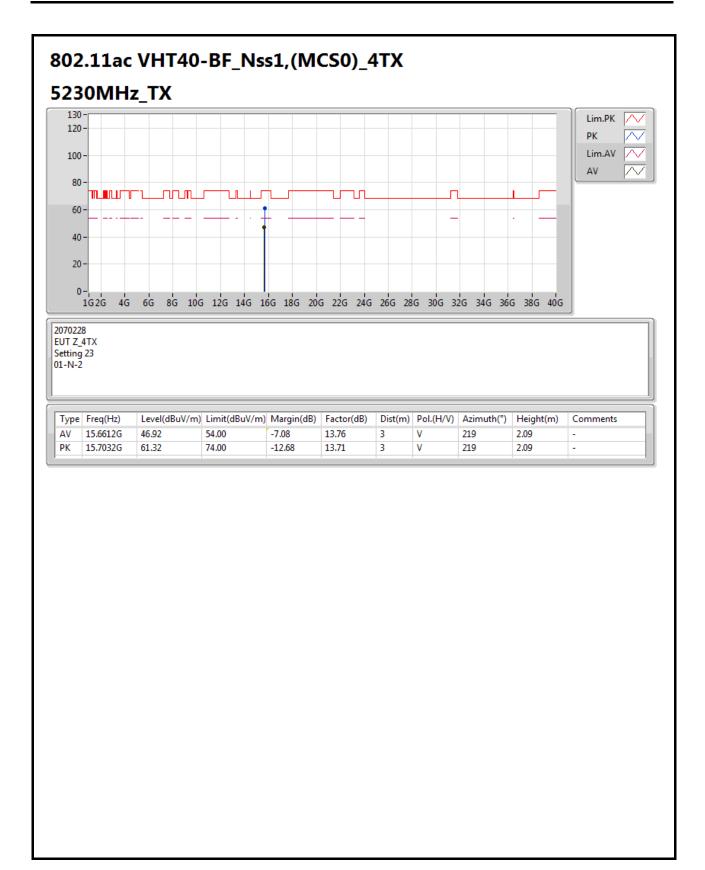




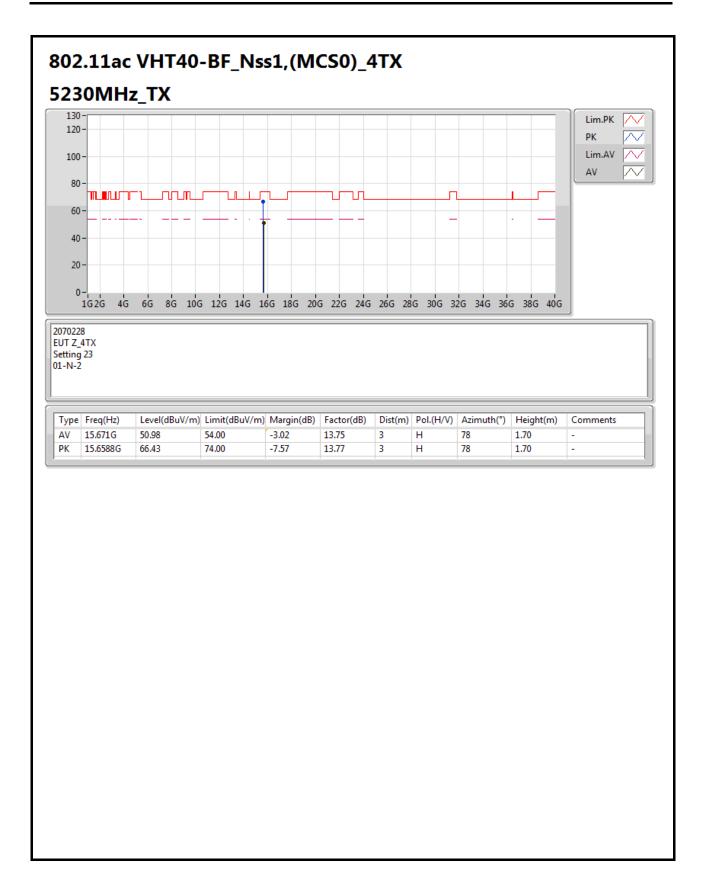




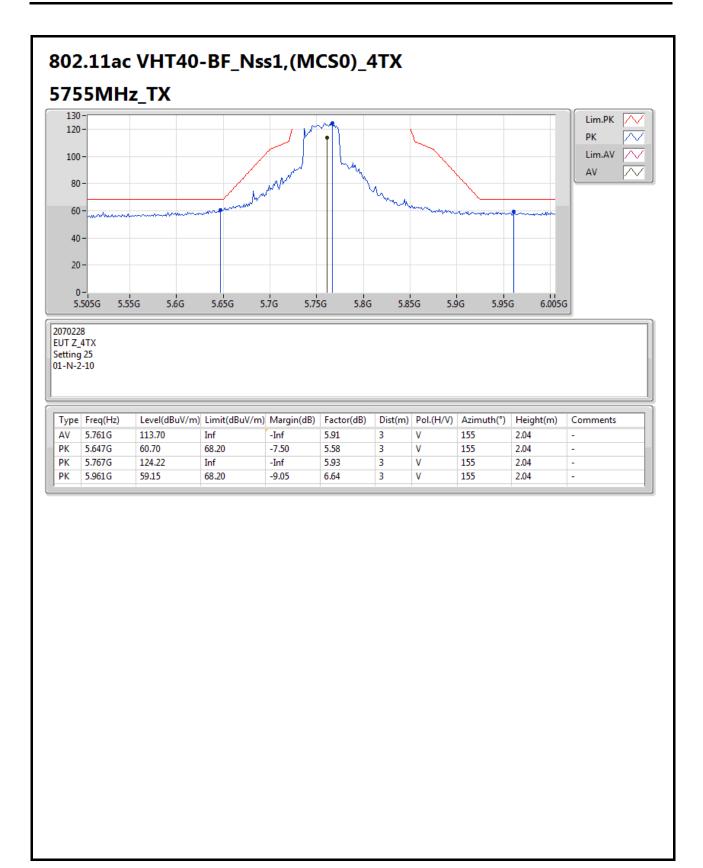




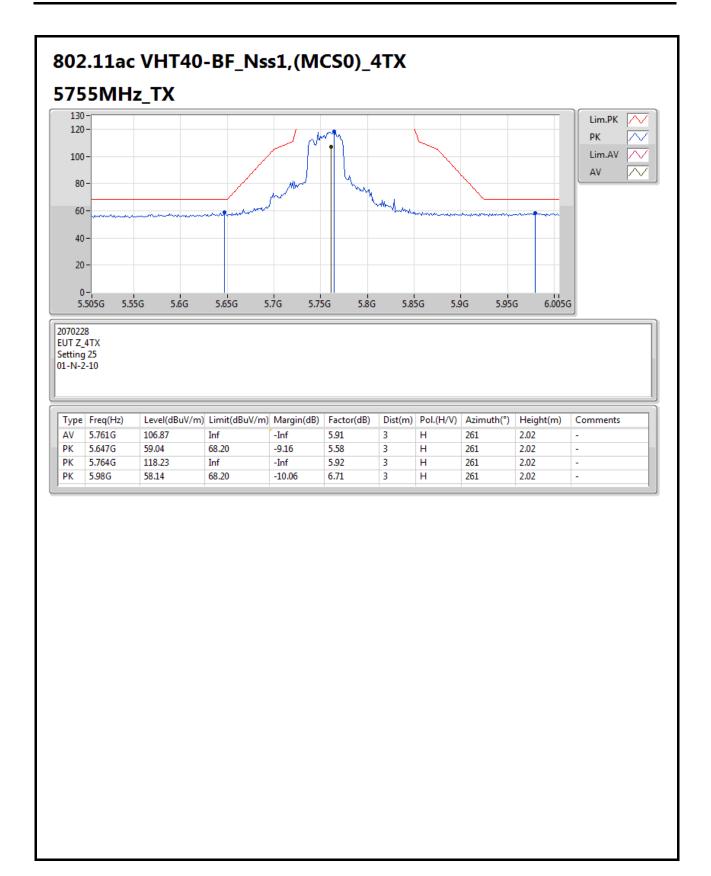




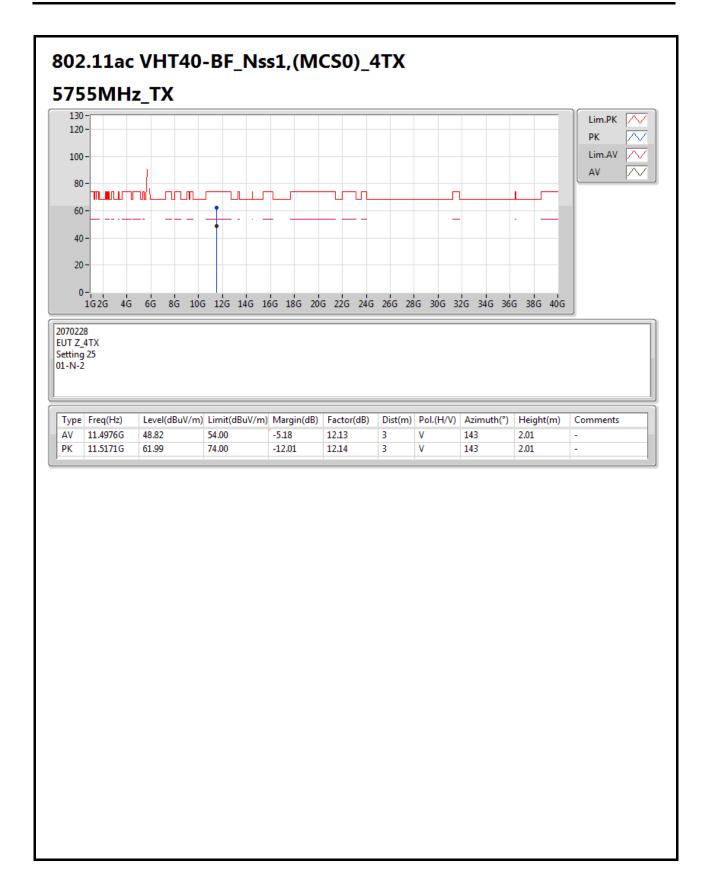






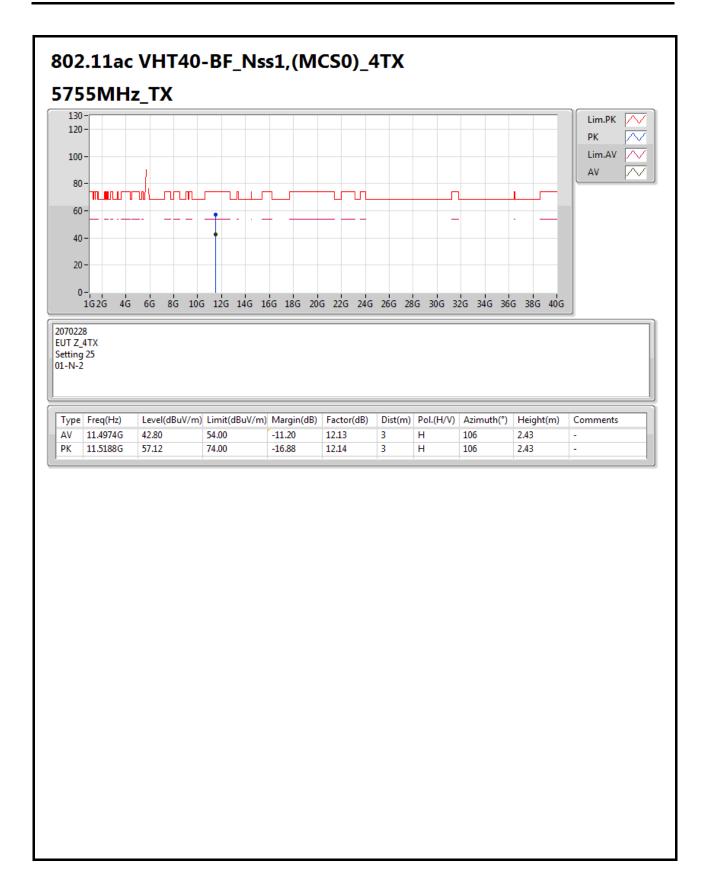






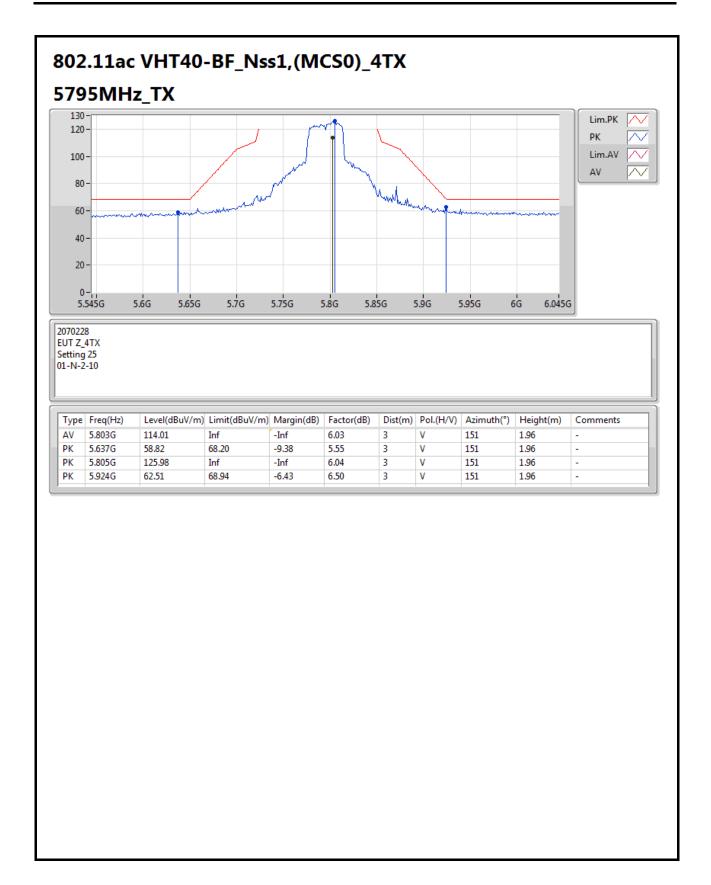
SPORTON INTERNATIONAL INC.





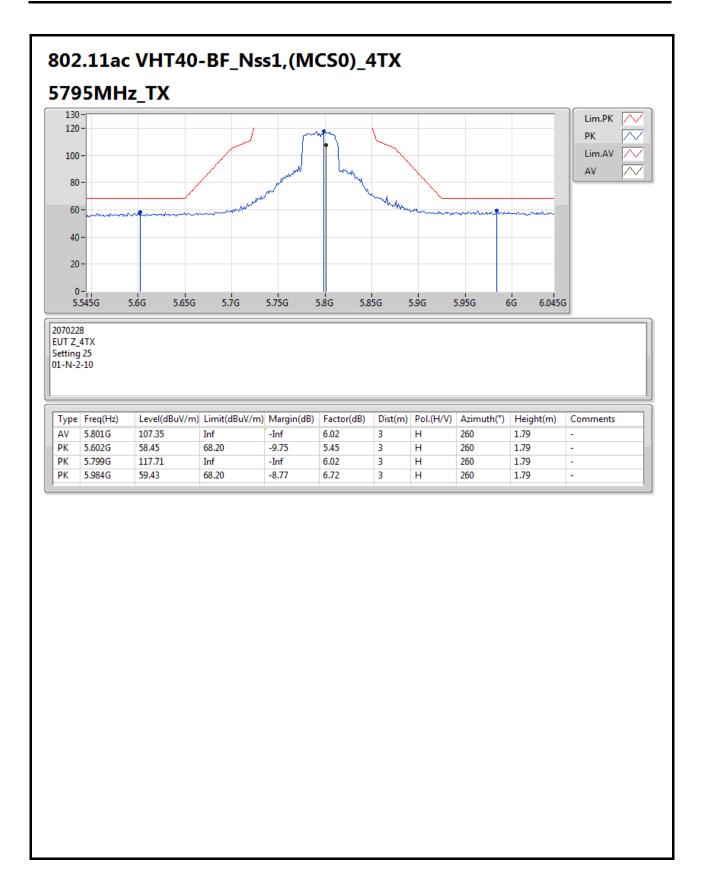
Page No. : 62 of 121



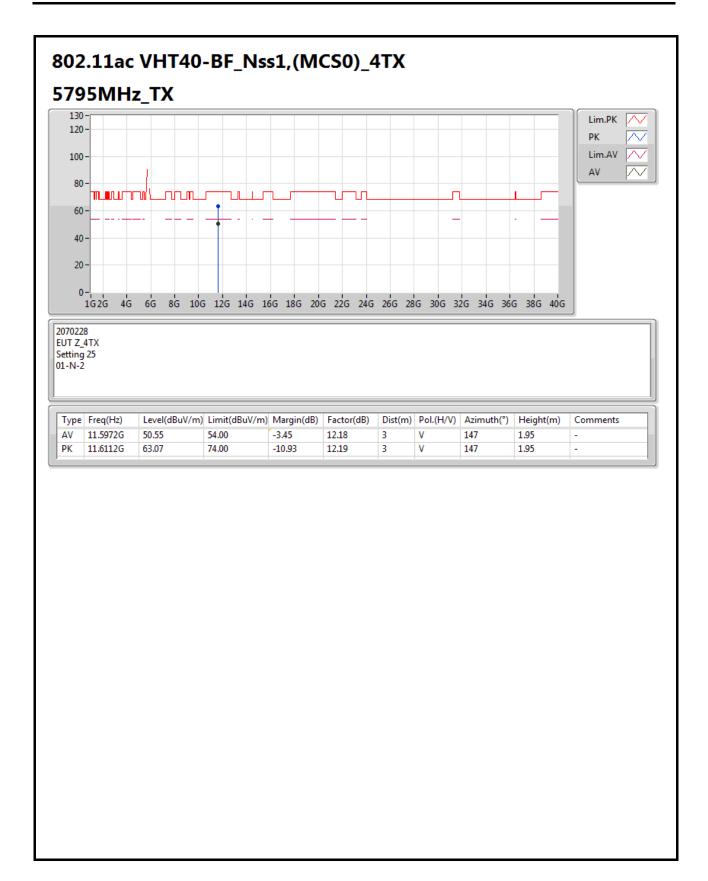


Page No. : 63 of 121

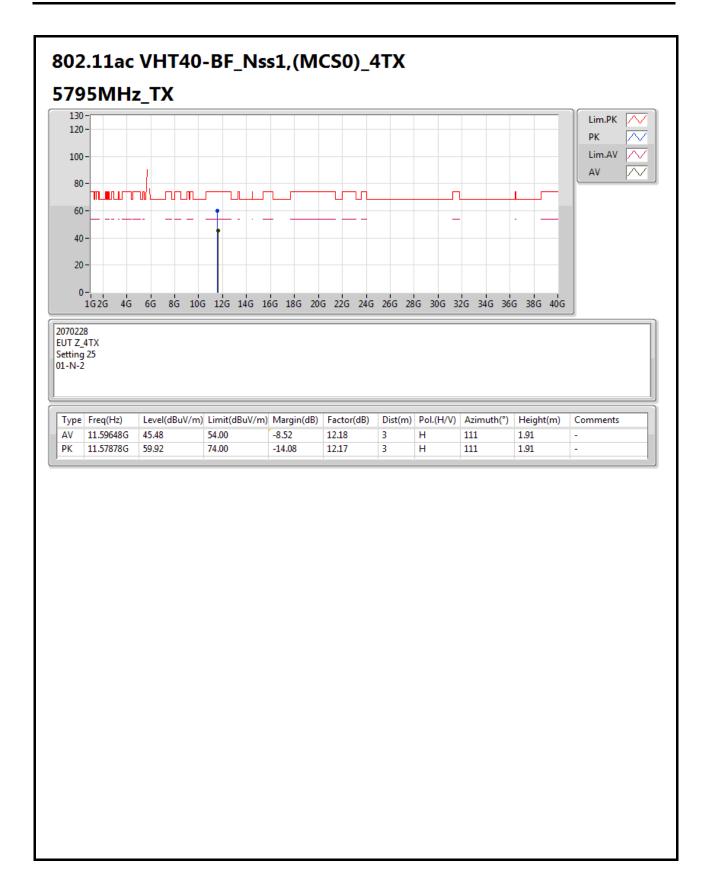






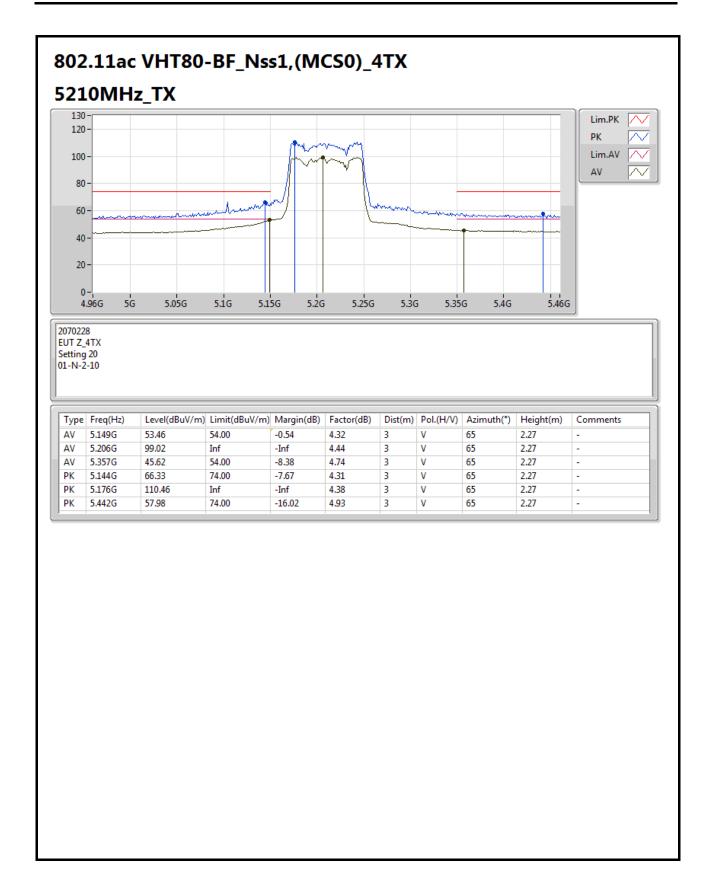




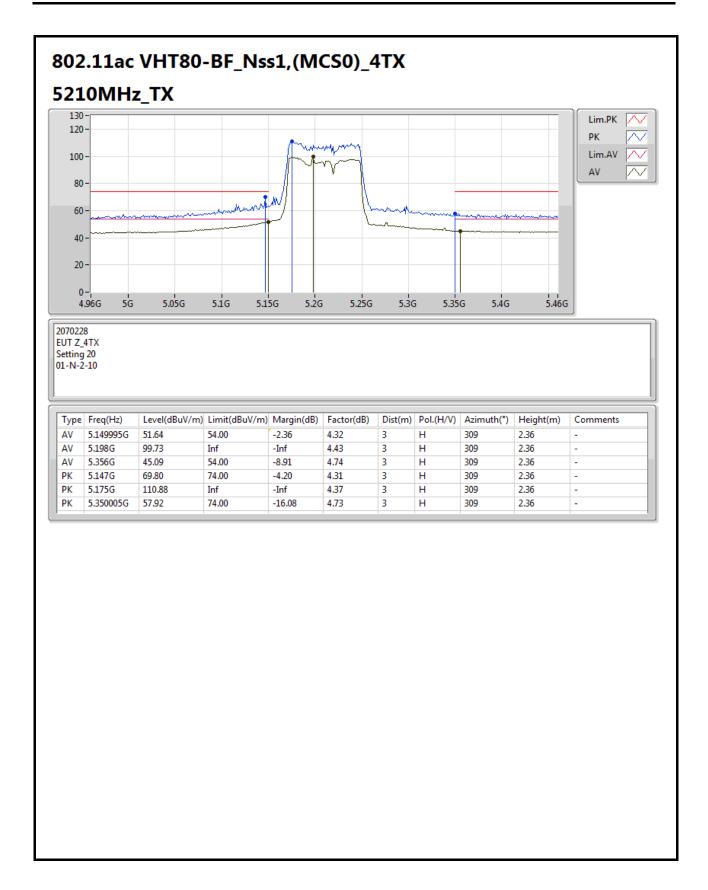


Page No. : 66 of 121

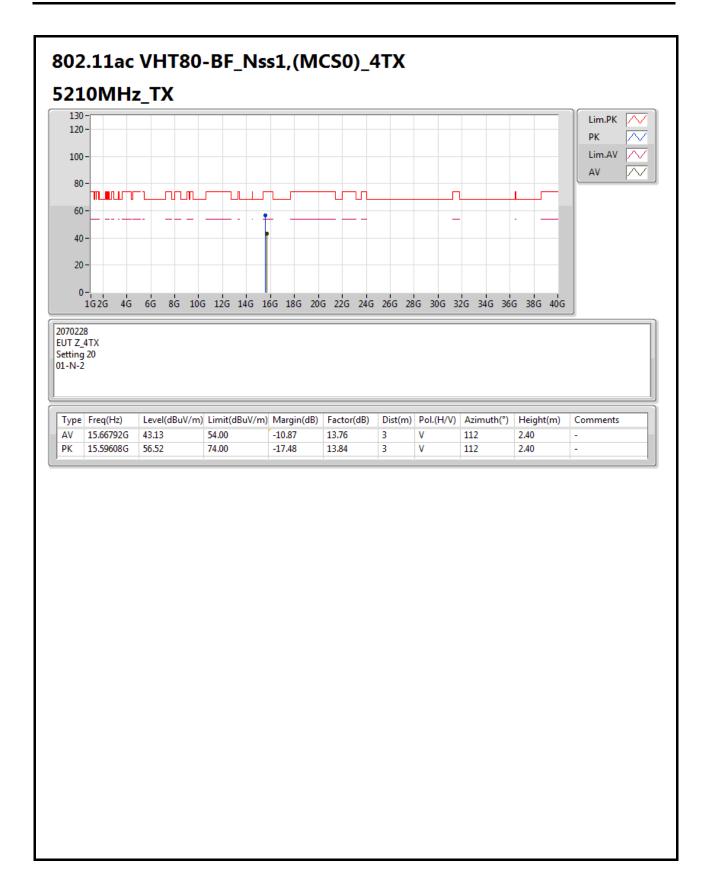








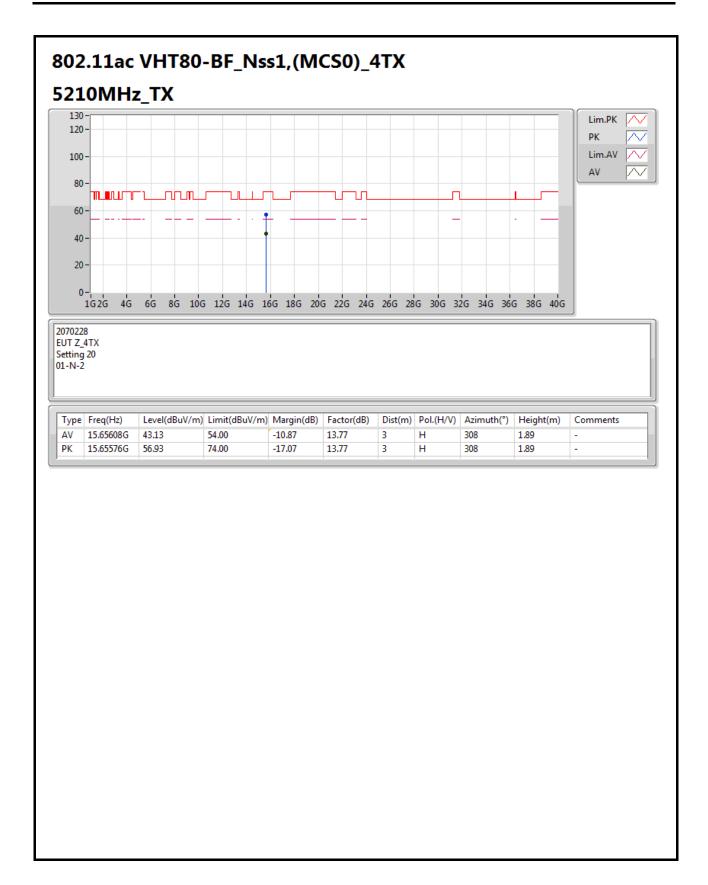




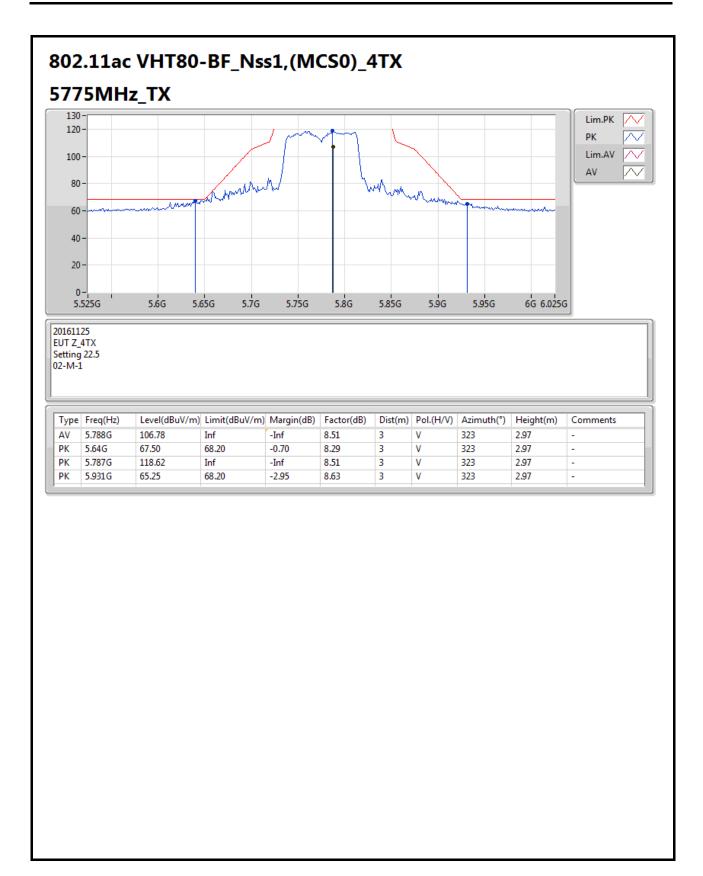
SPORTON INTERNATIONAL INC.

Page No. : 69 of 121

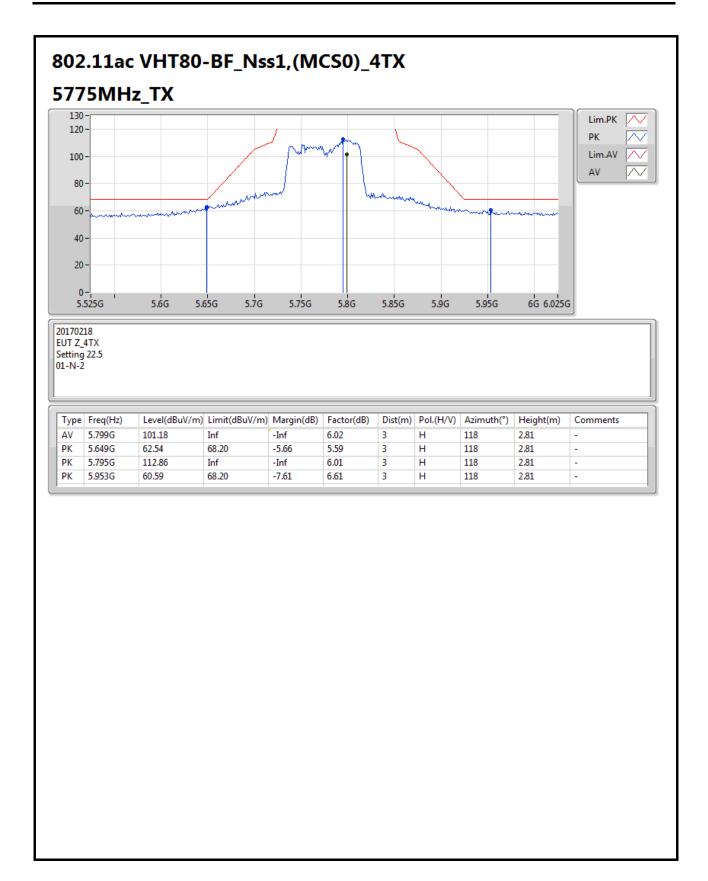




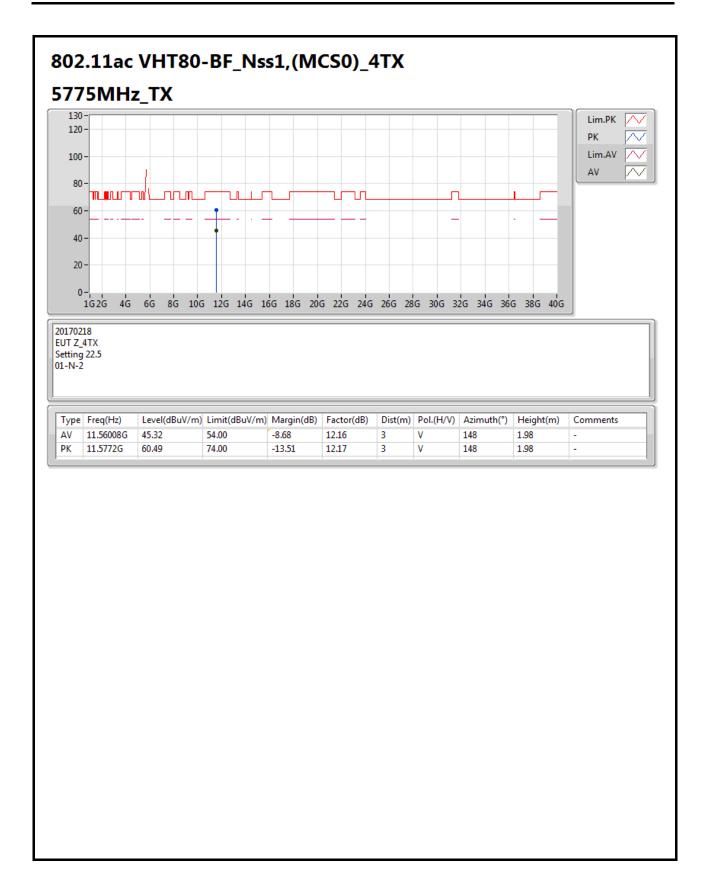




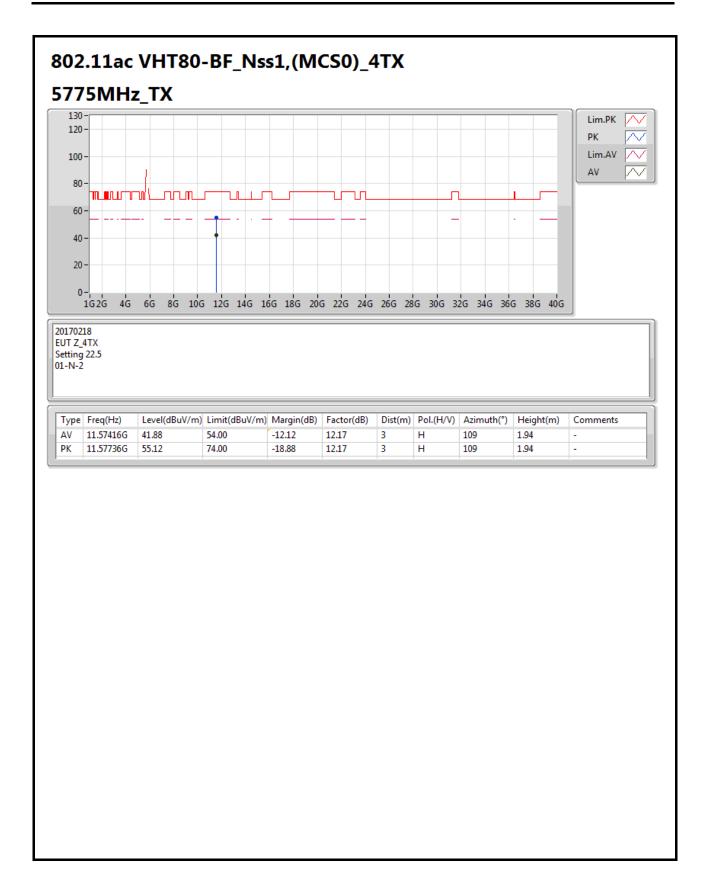






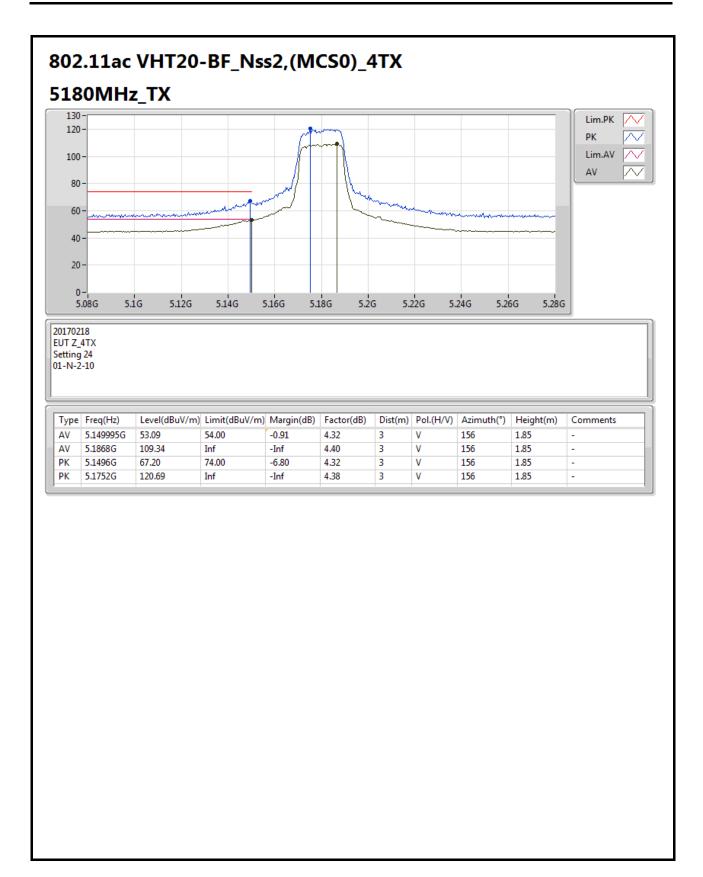




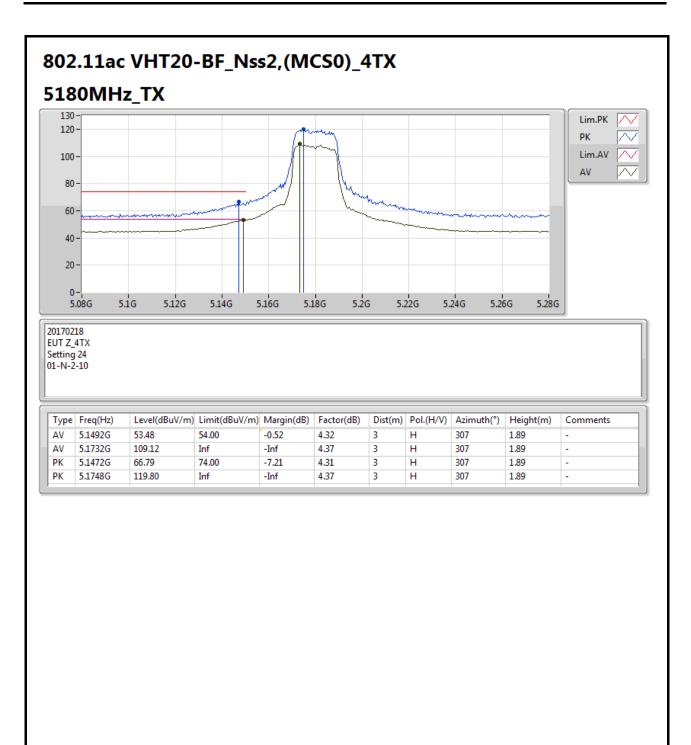


Page No. : 74 of 121

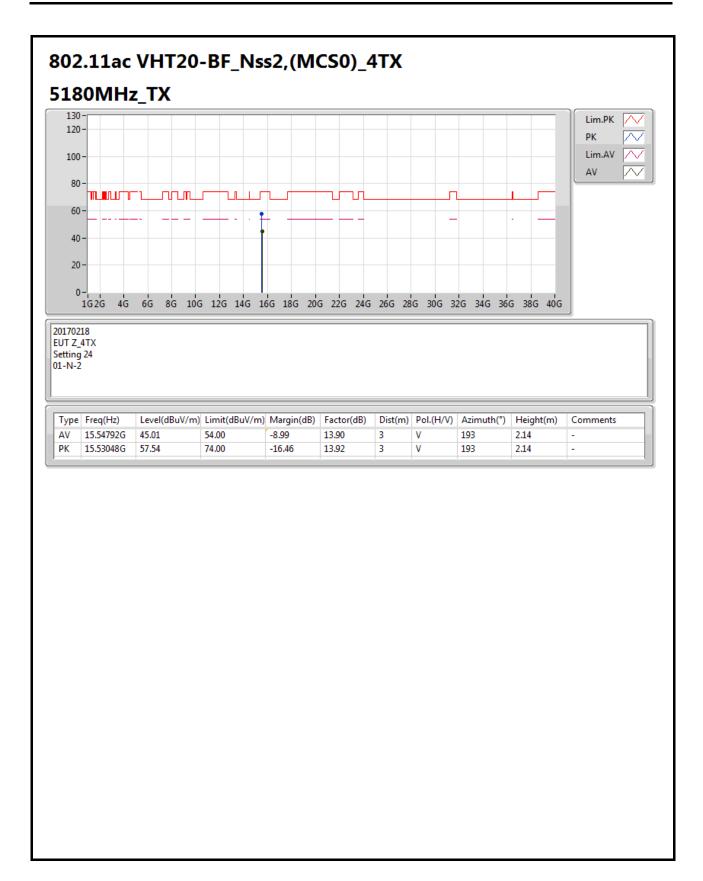




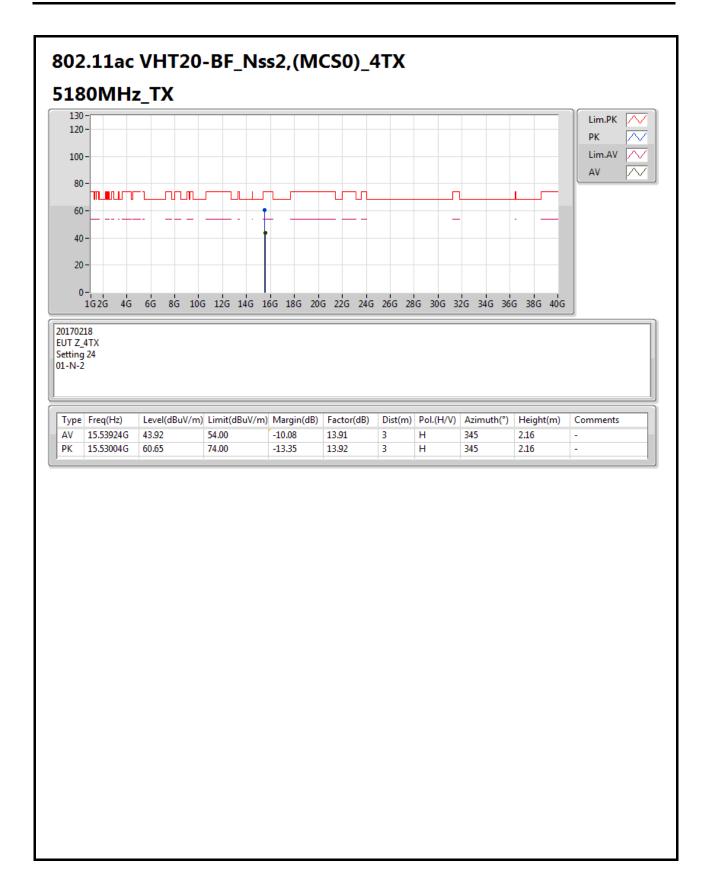




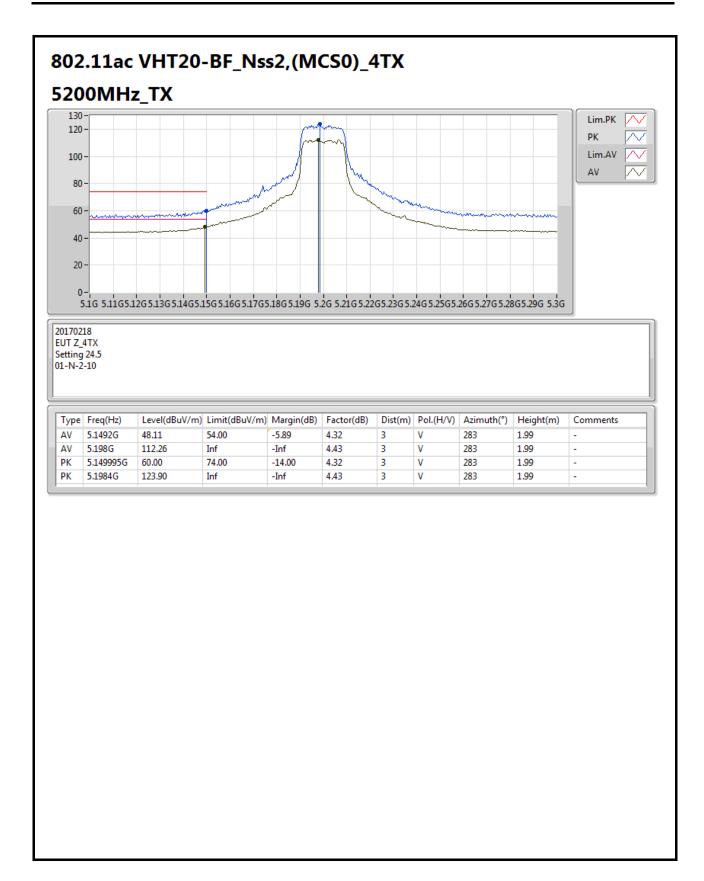




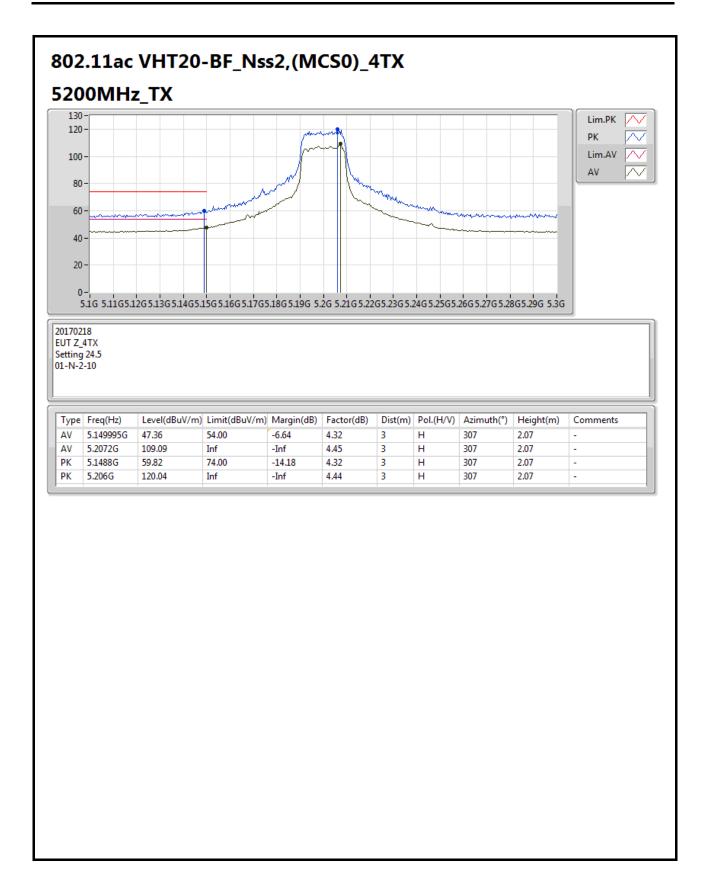




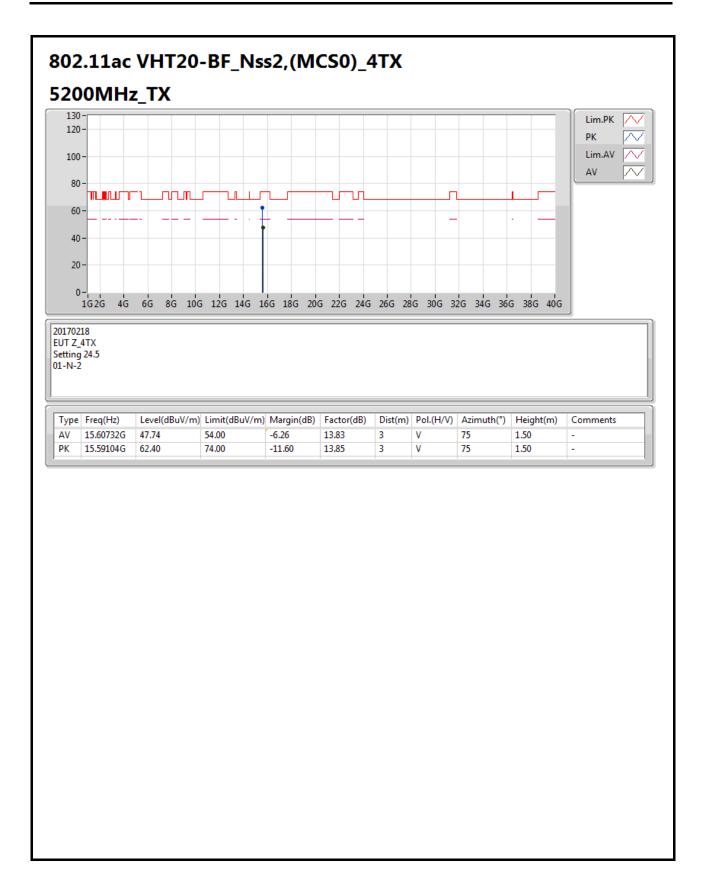




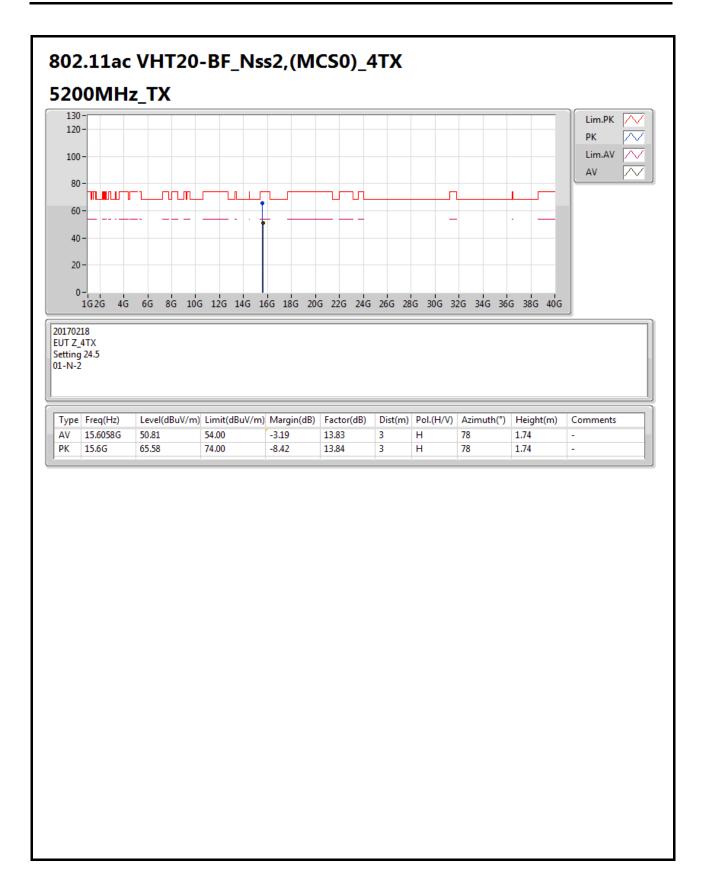




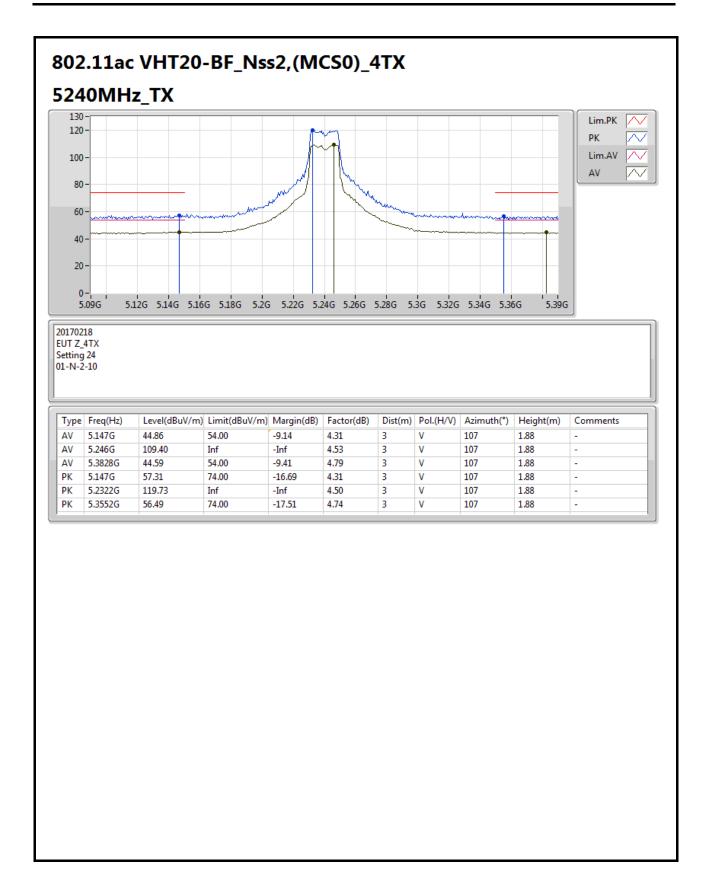




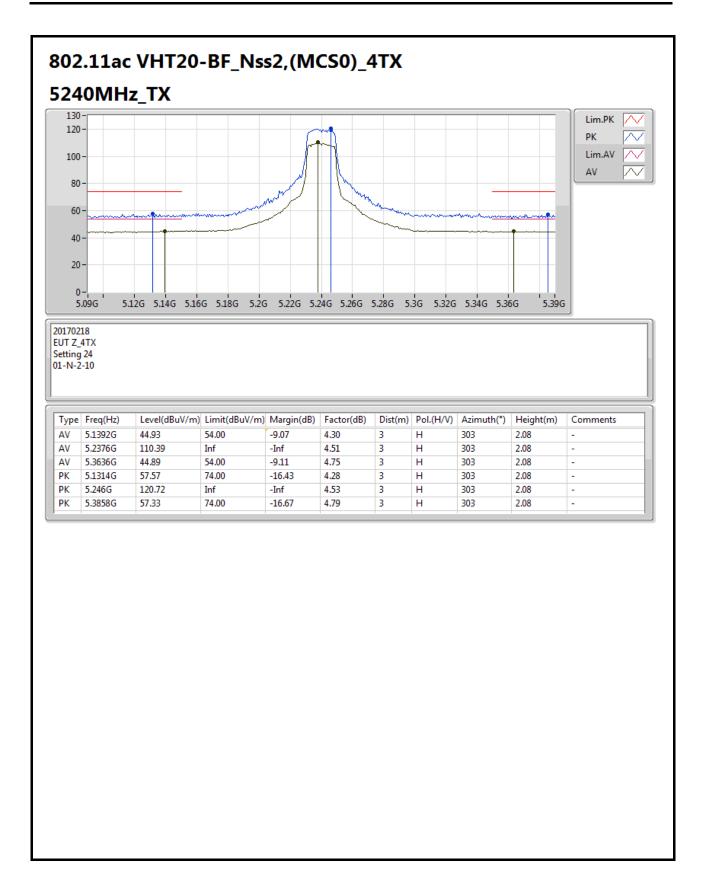




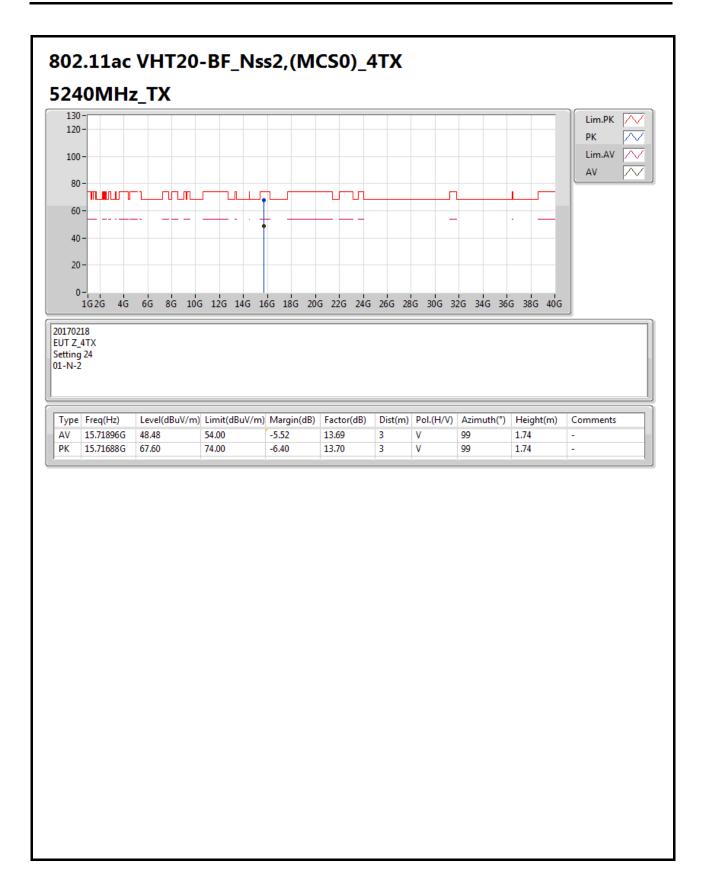






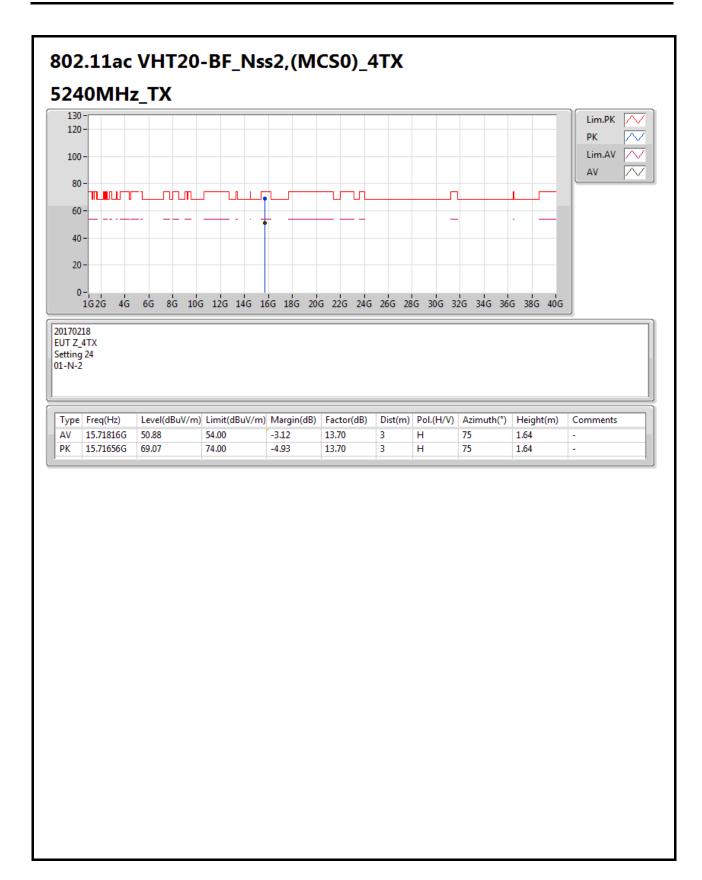






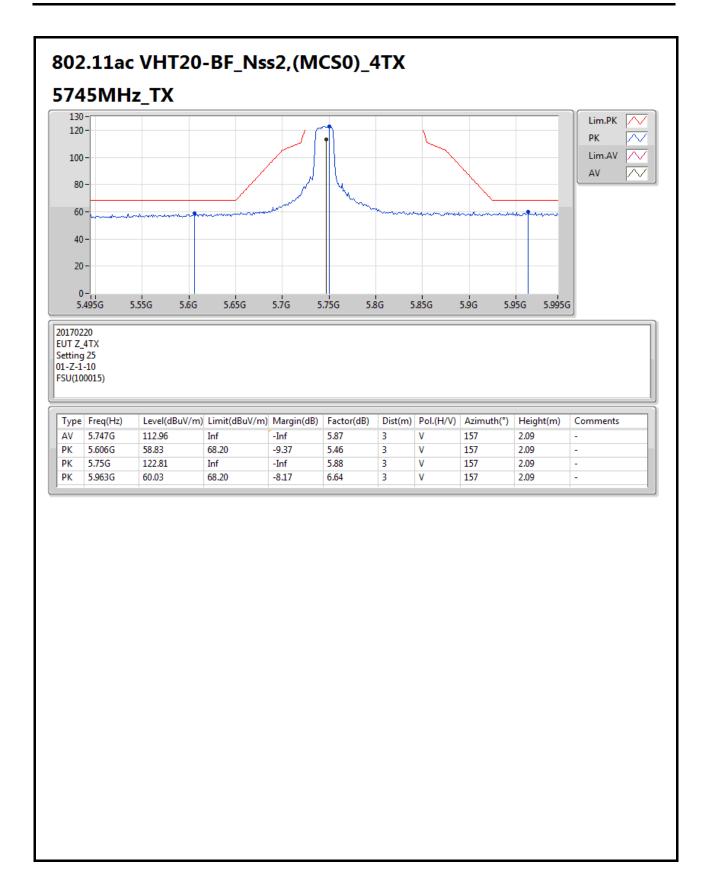
Page No. : 85 of 121



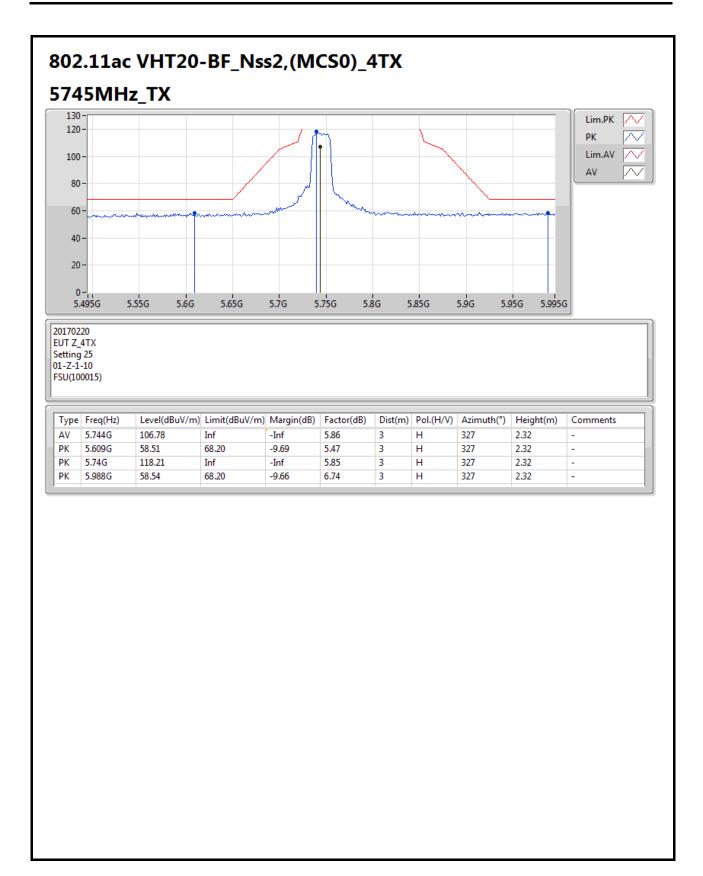


Page No. : 86 of 121

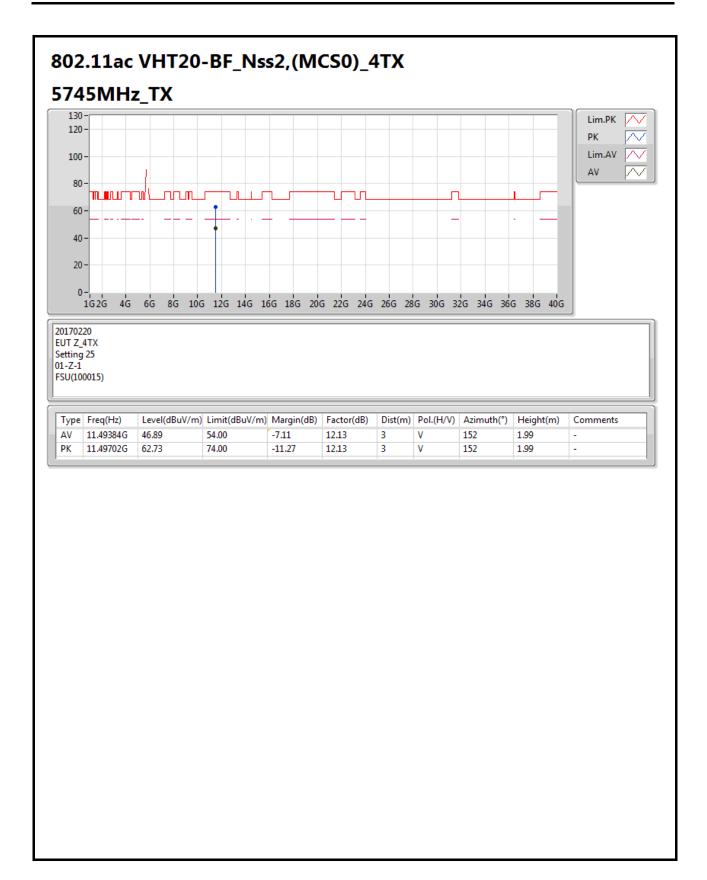




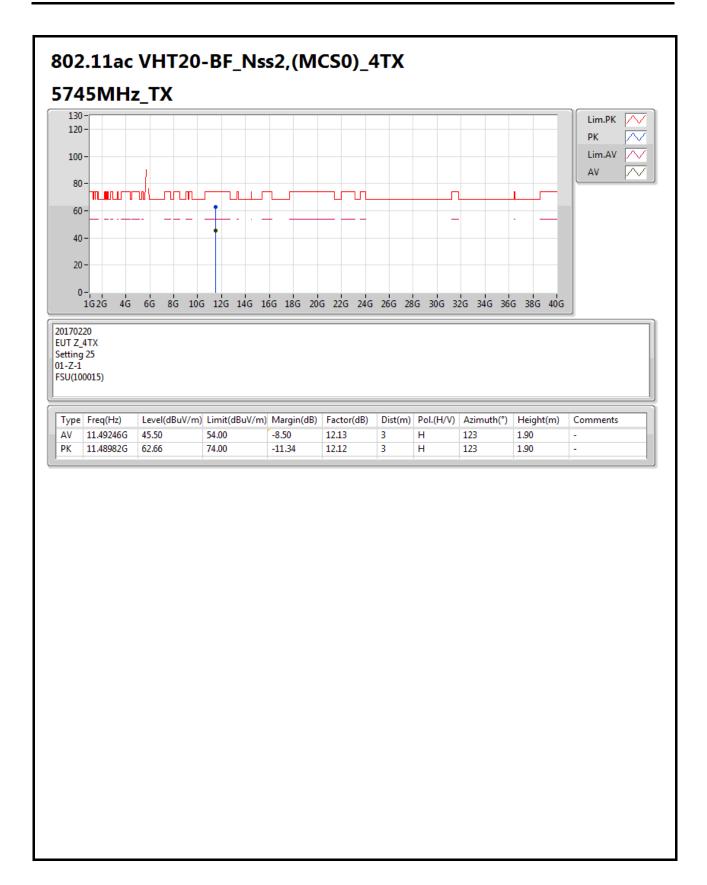






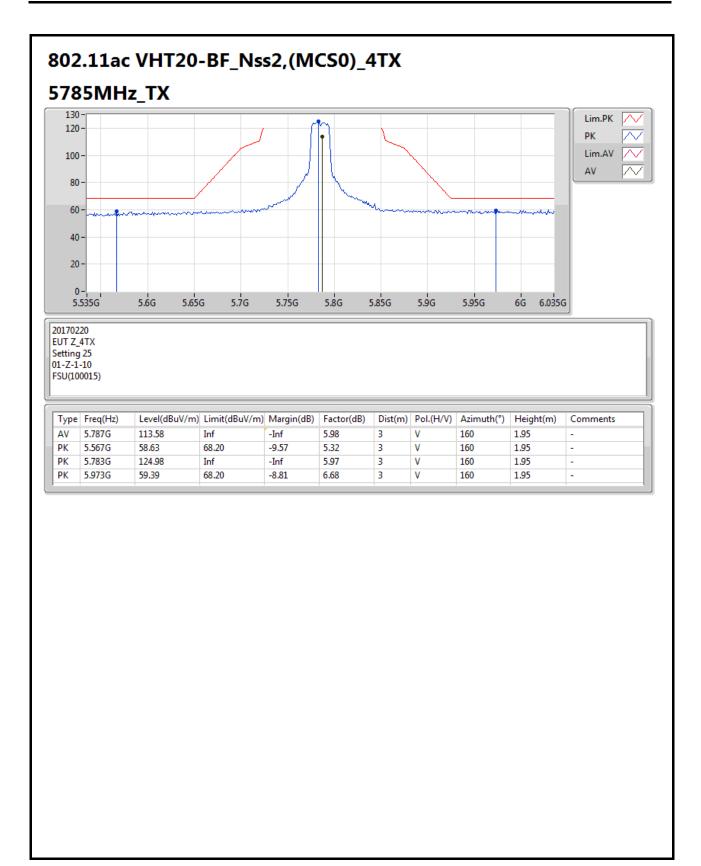






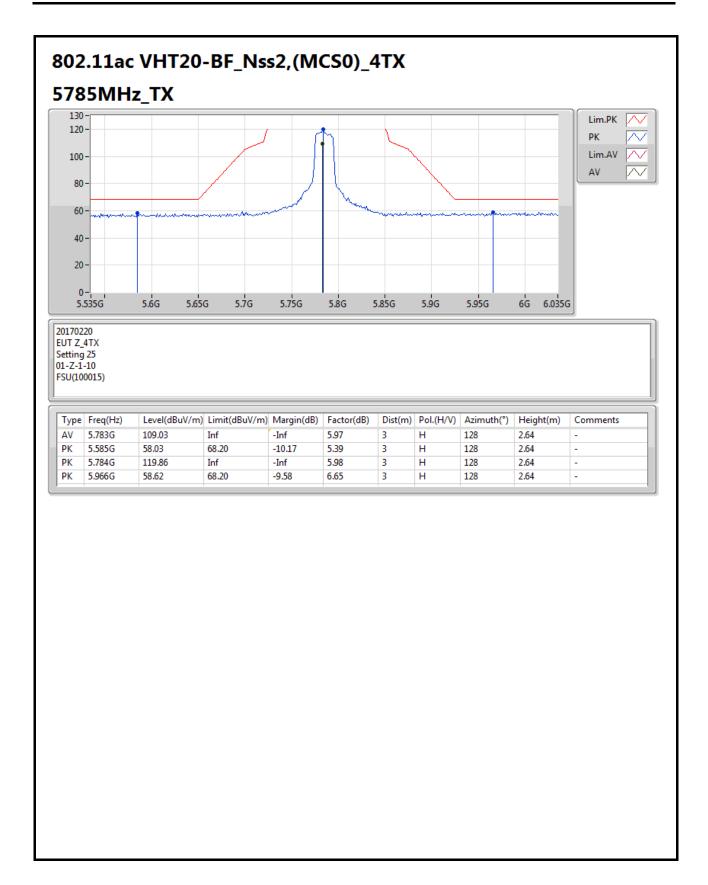
SPORTON INTERNATIONAL INC.



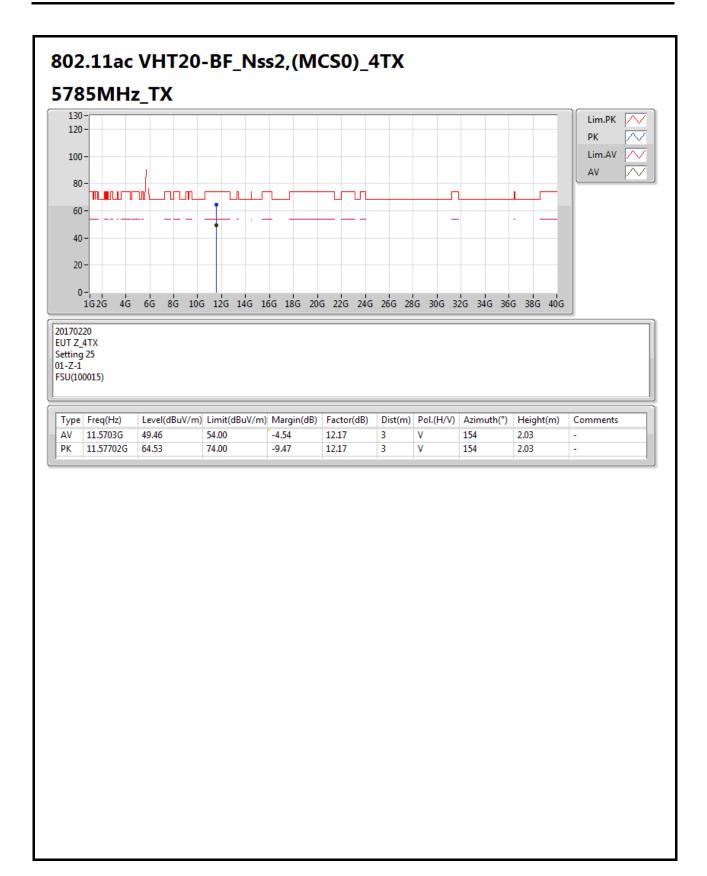


Page No. : 91 of 121

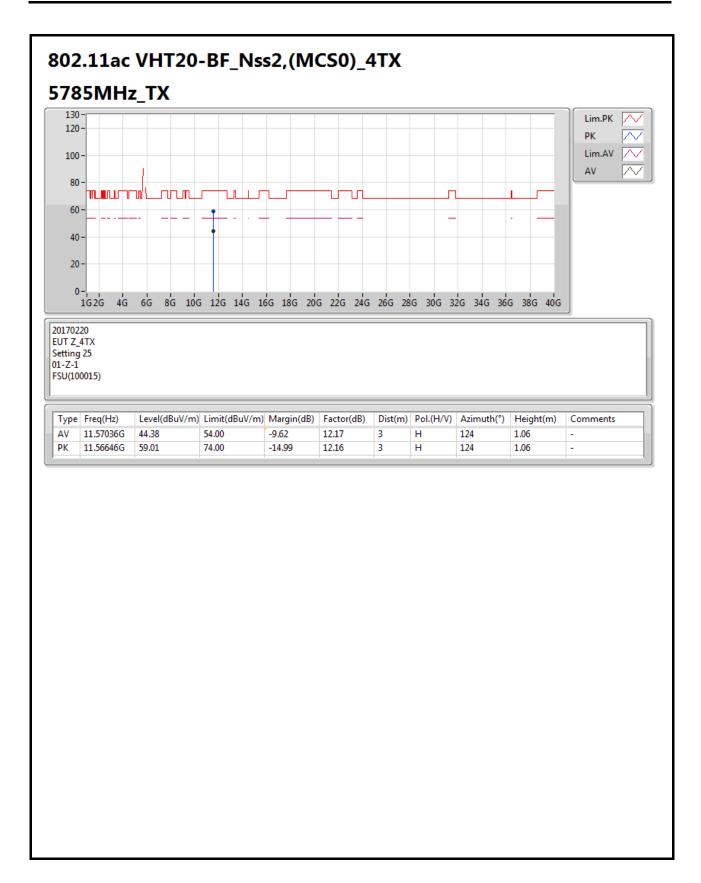








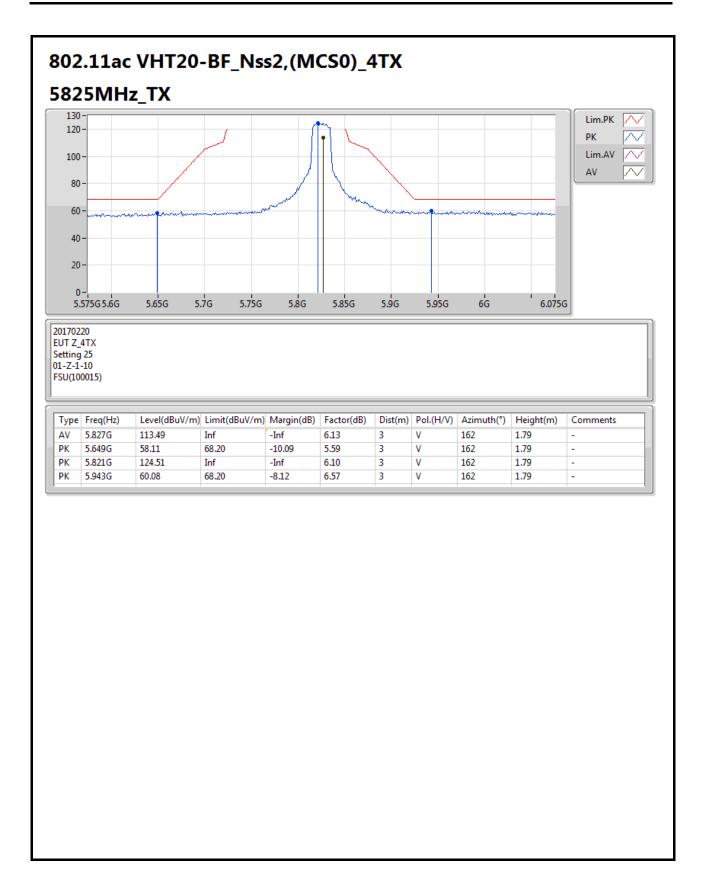




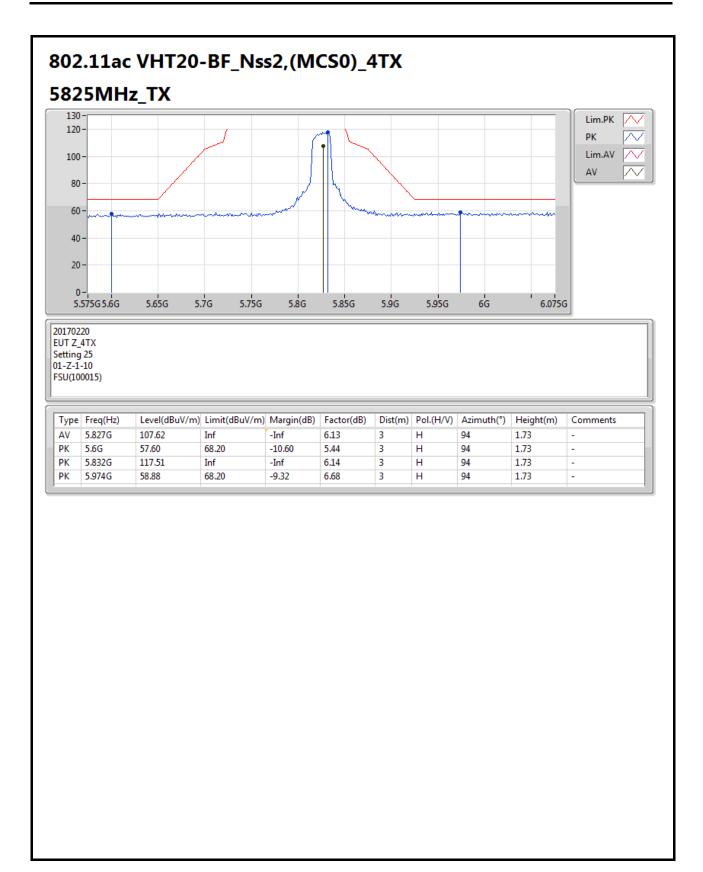
SPORTON INTERNATIONAL INC.

Page No. : 94 of 121



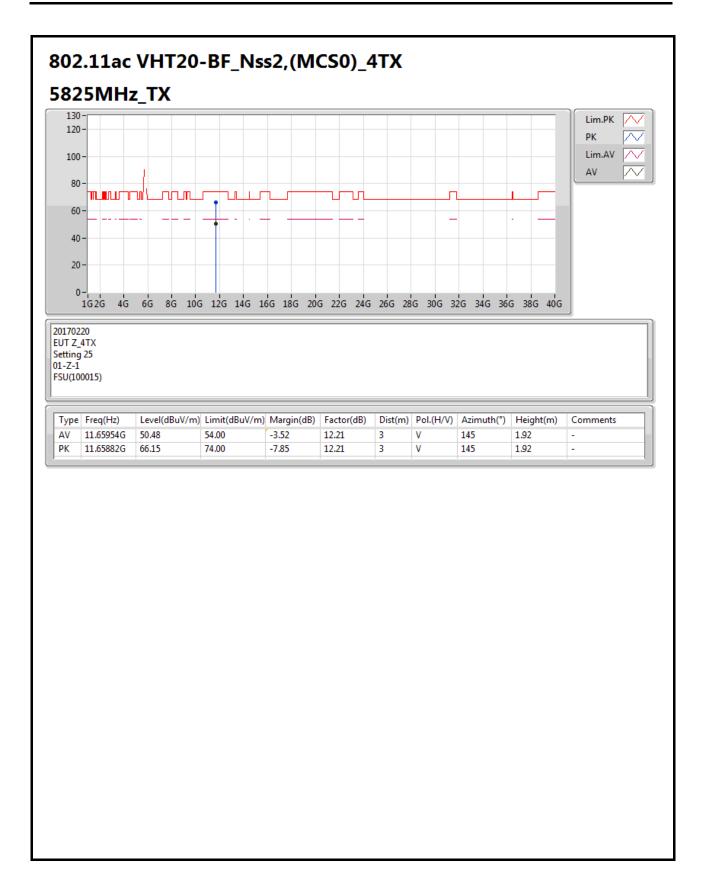




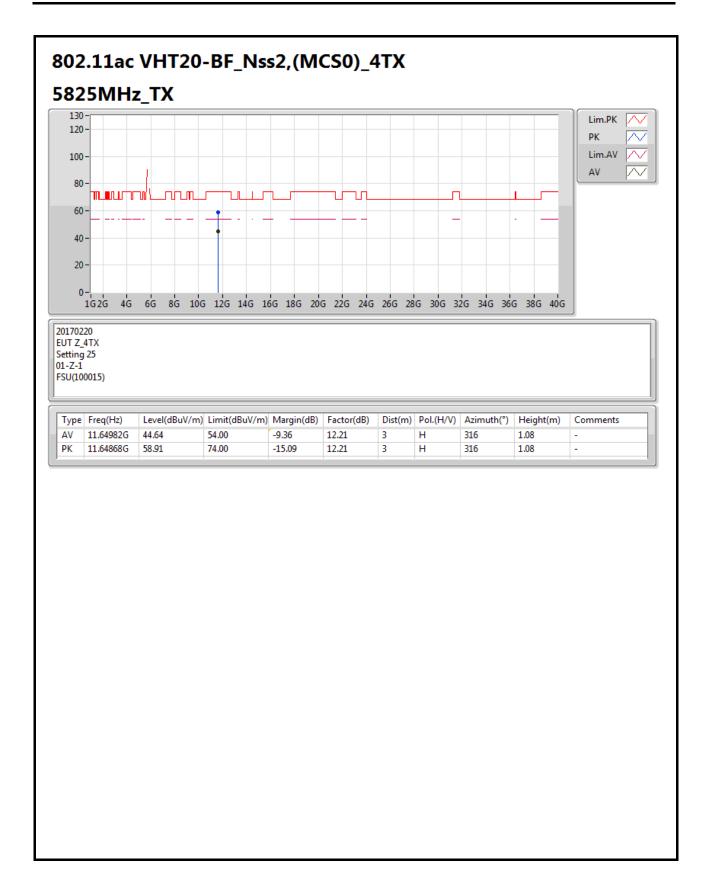


Page No. : 96 of 121

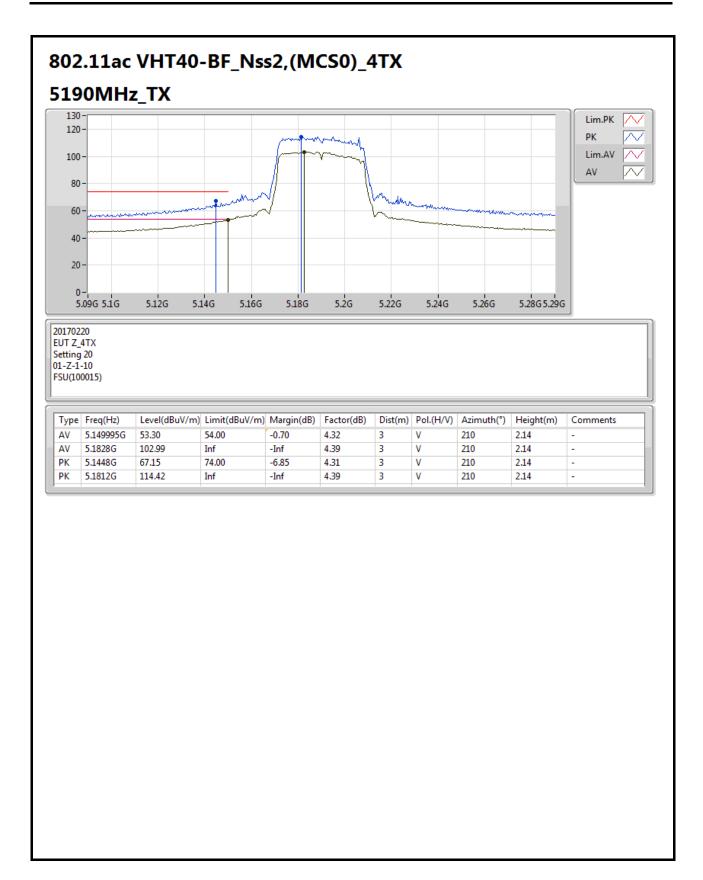




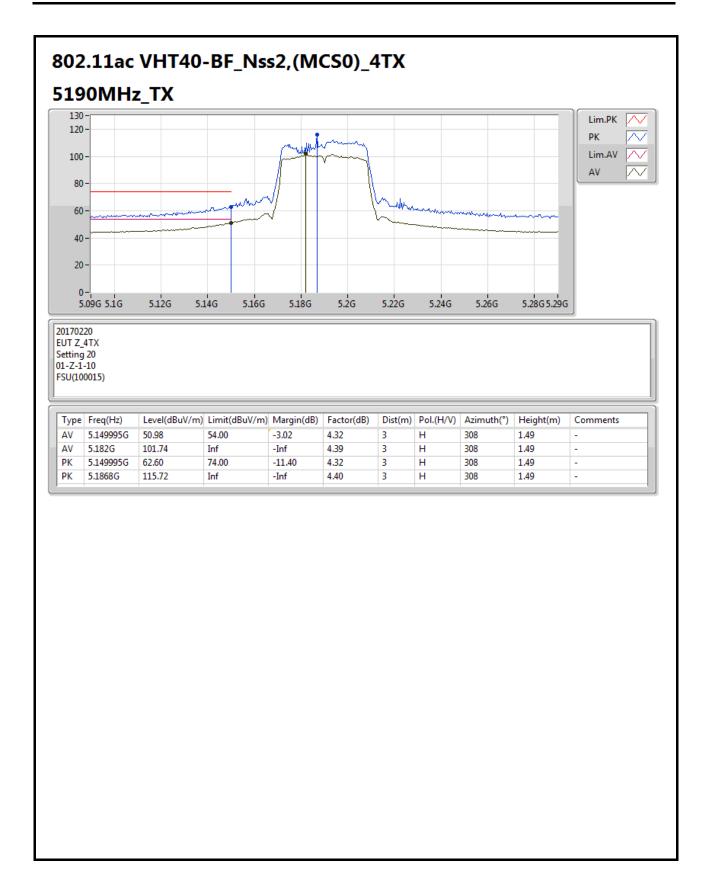








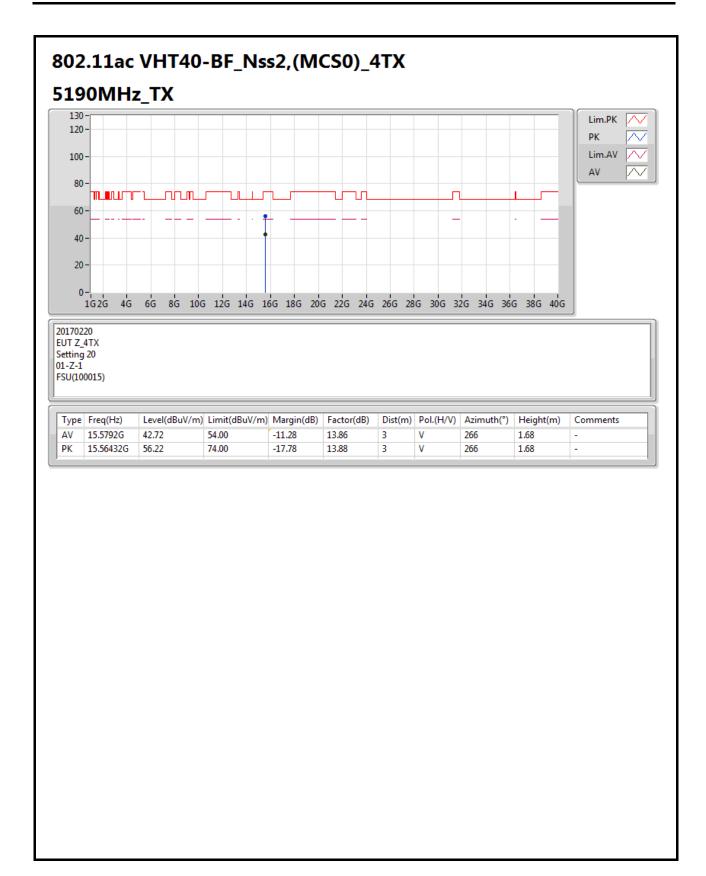




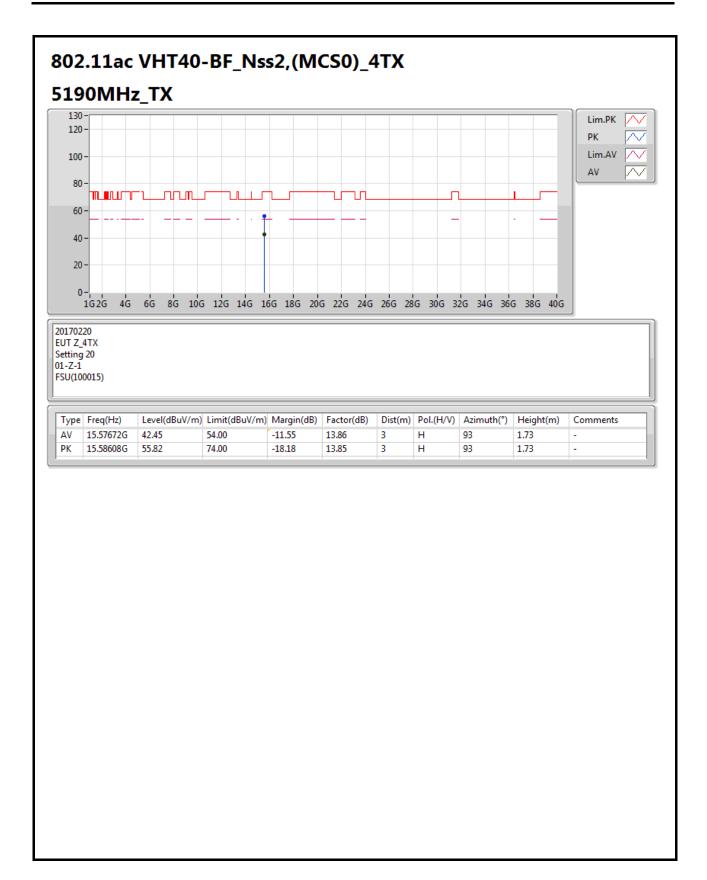
SPORTON INTERNATIONAL INC.

Page No. : 100 of 121



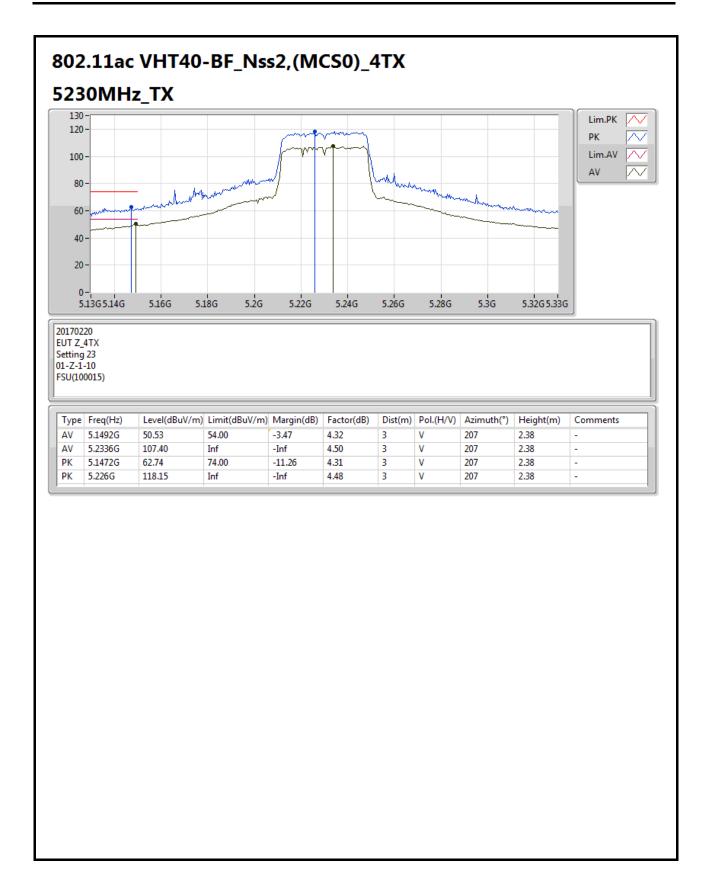




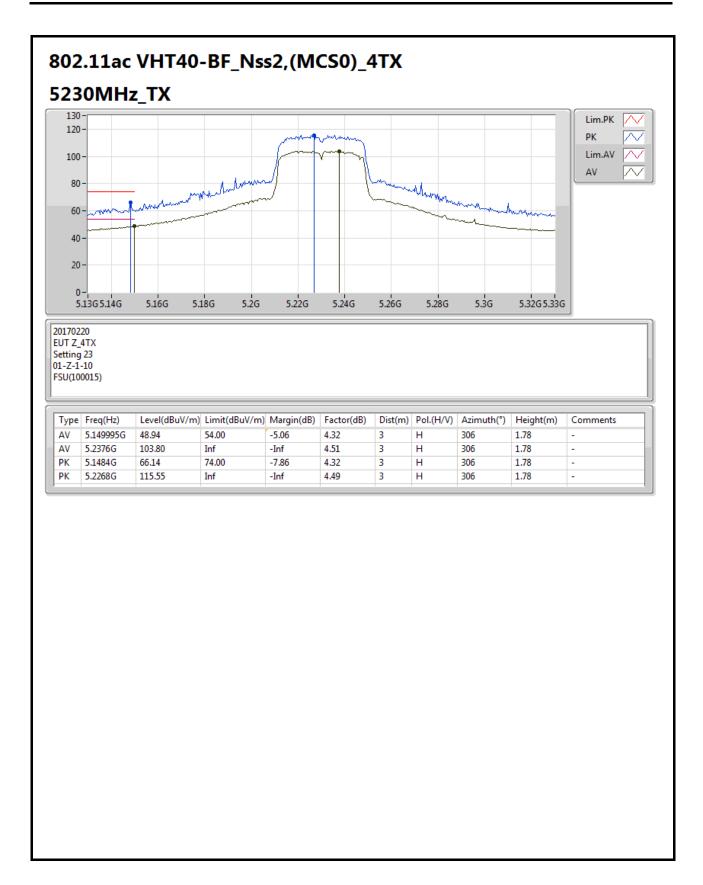


Page No. : 102 of 121

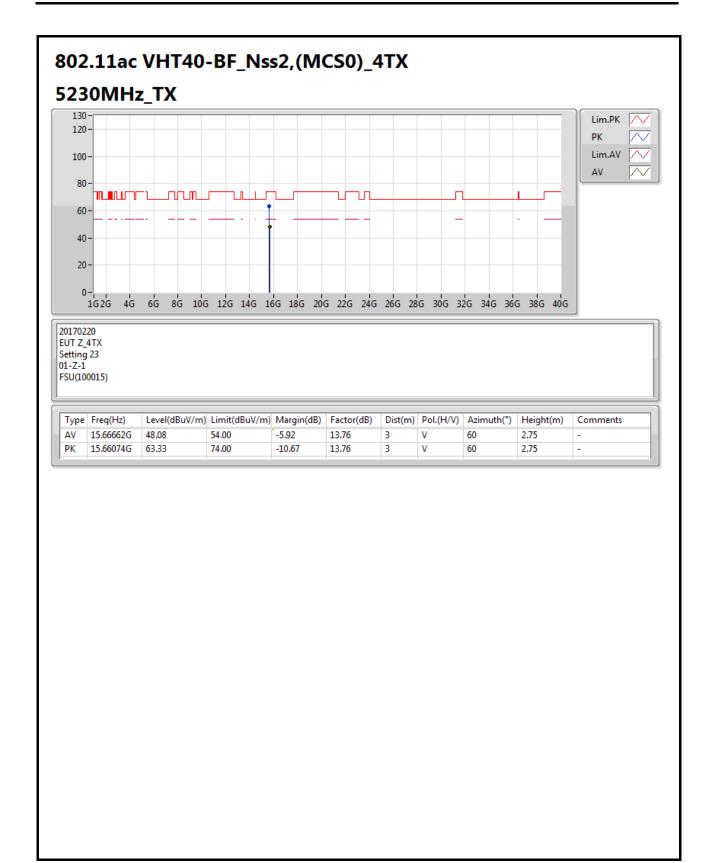






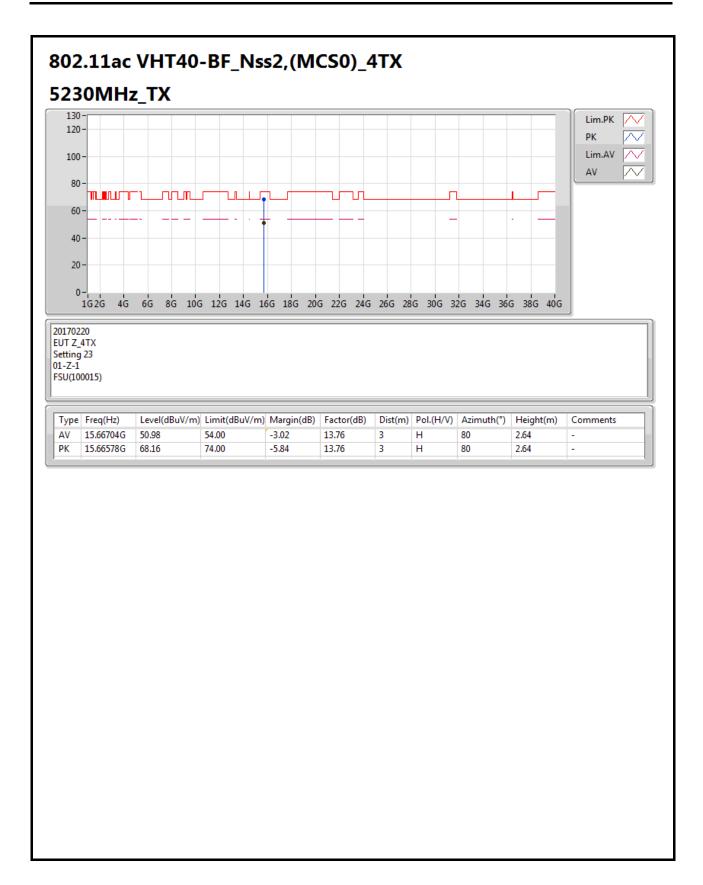




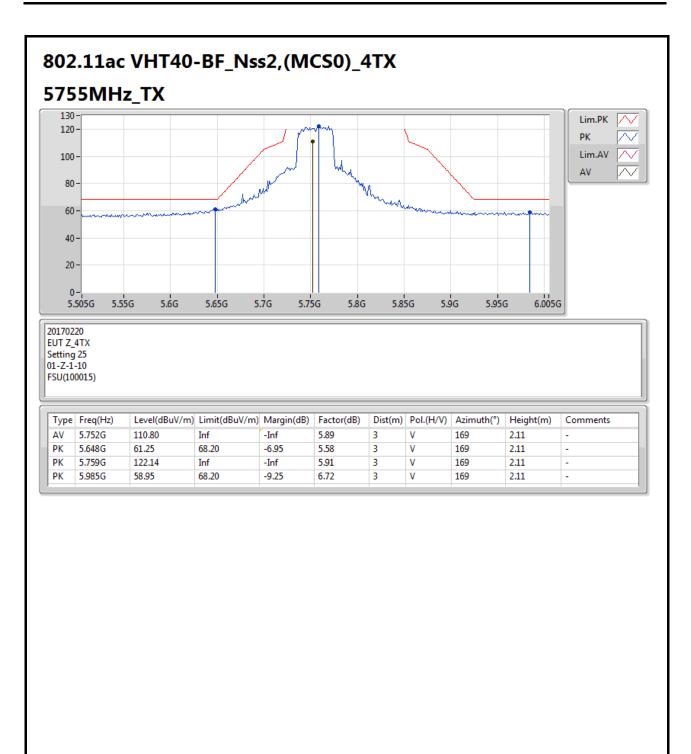


Page No. : 105 of 121

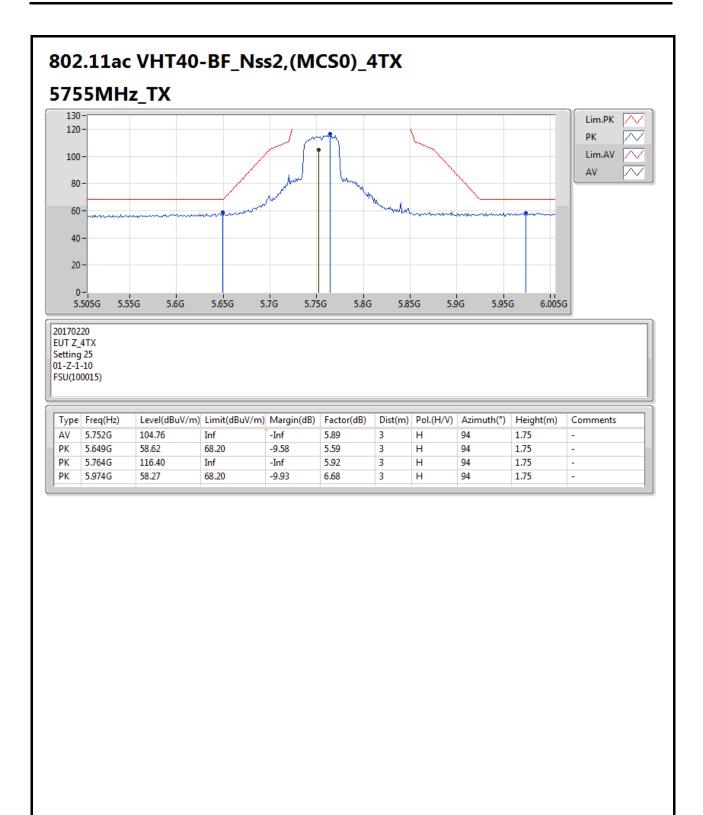




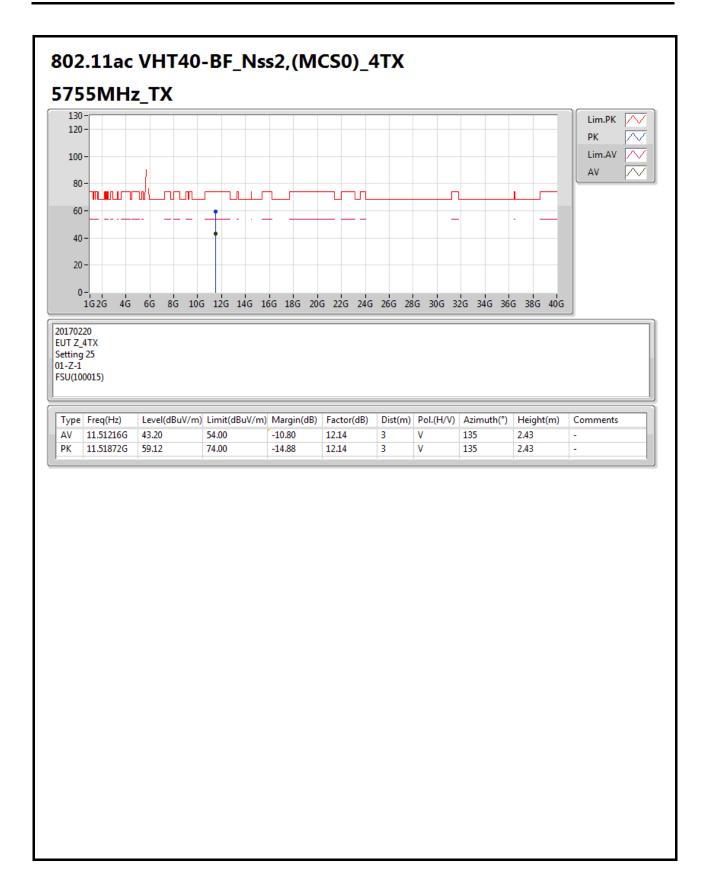




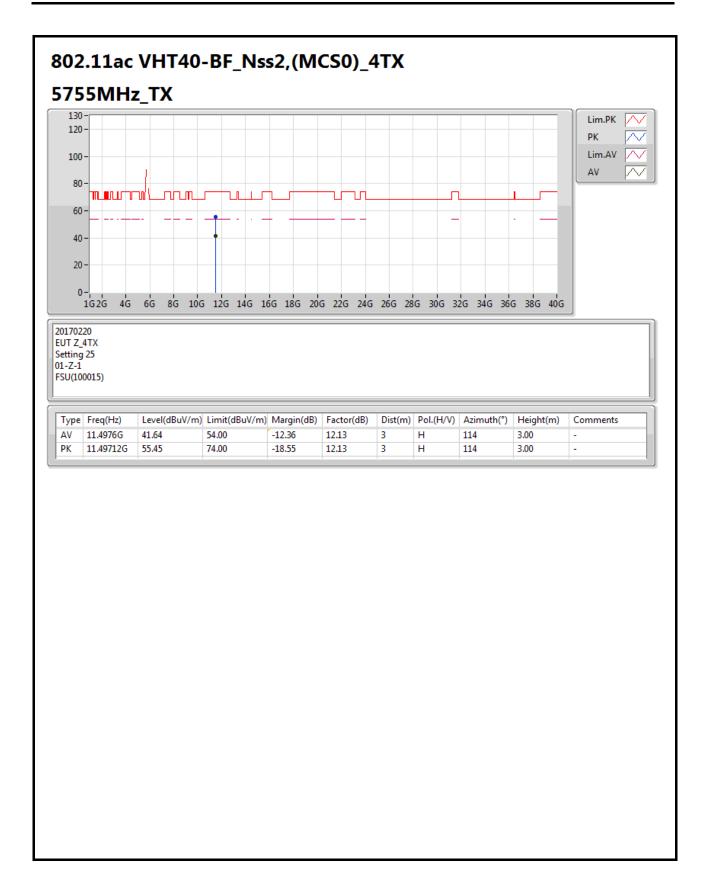






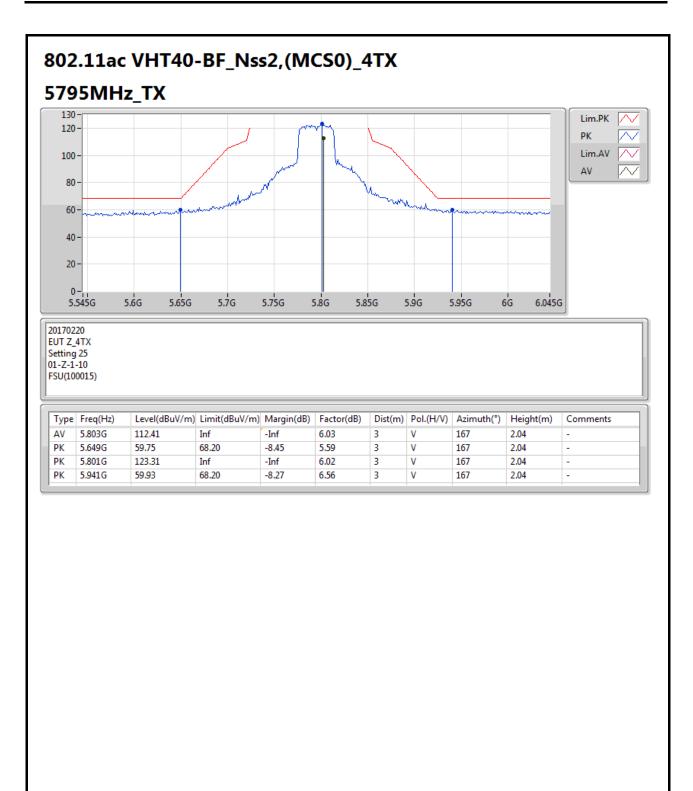




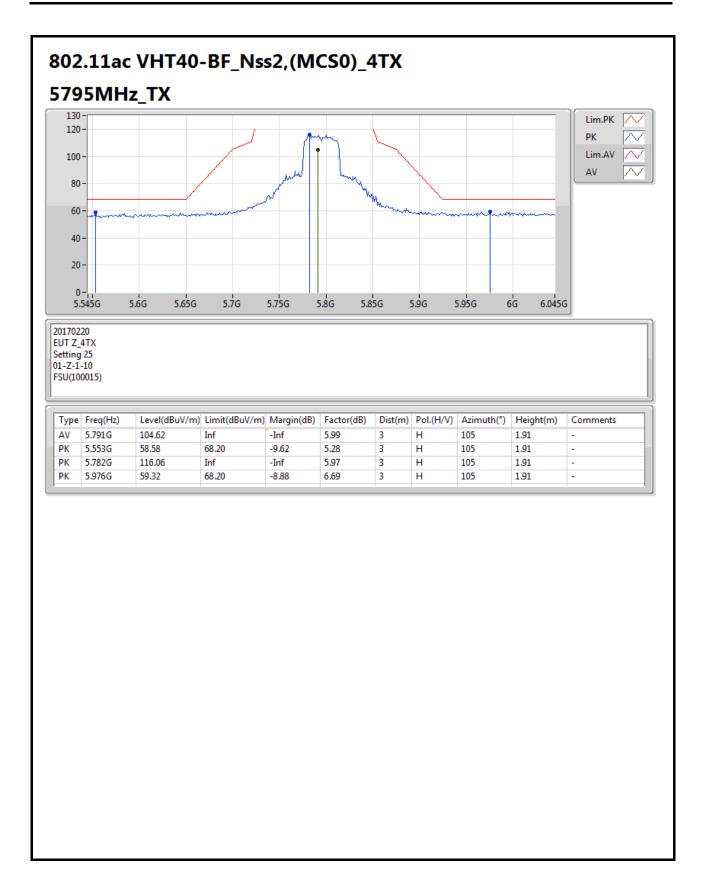


SPORTON INTERNATIONAL INC.



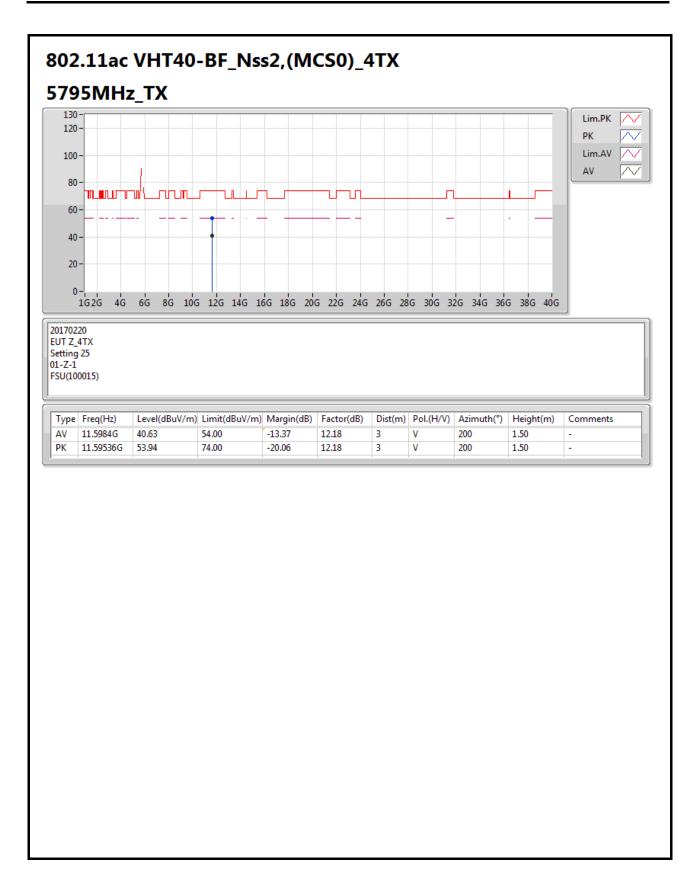




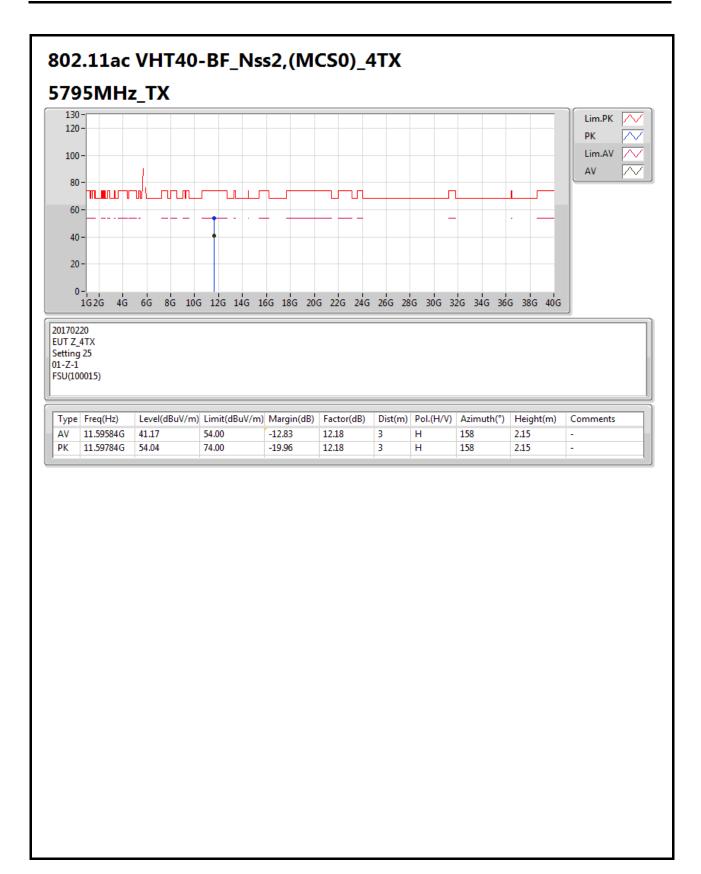


Page No. : 112 of 121









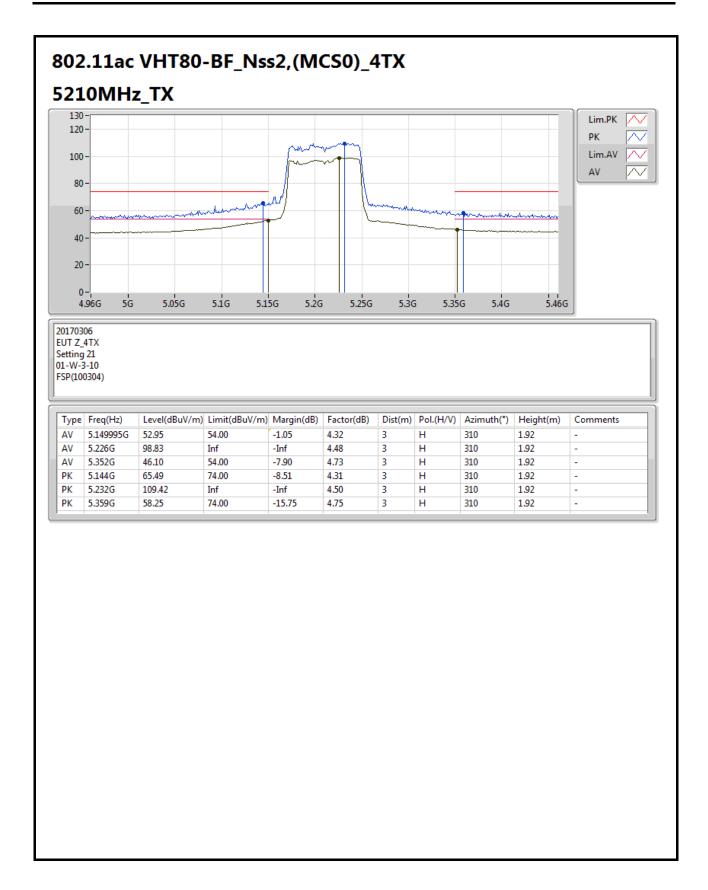
Page No. : 114 of 121





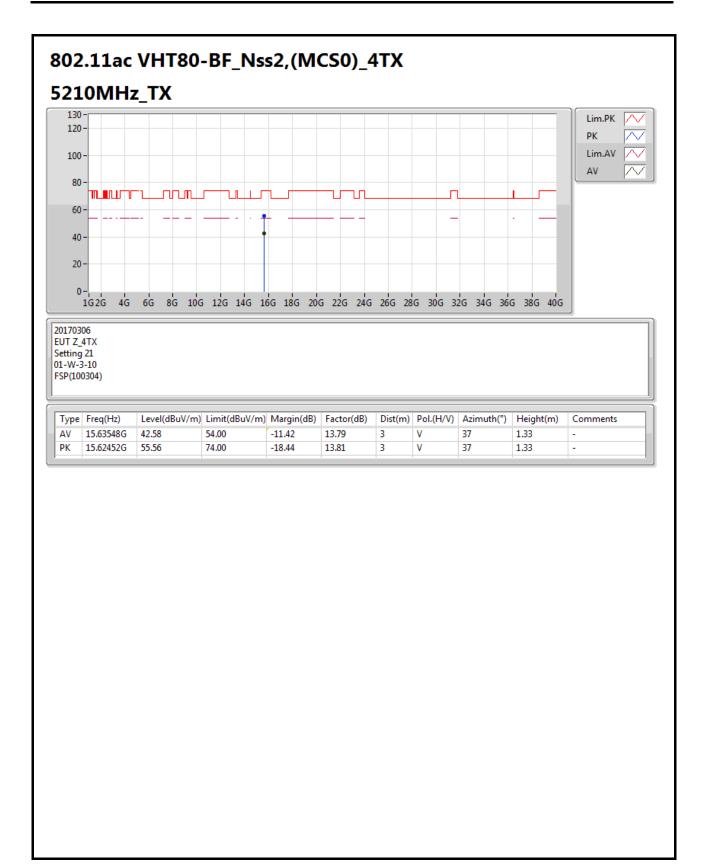
Page No. : 115 of 121



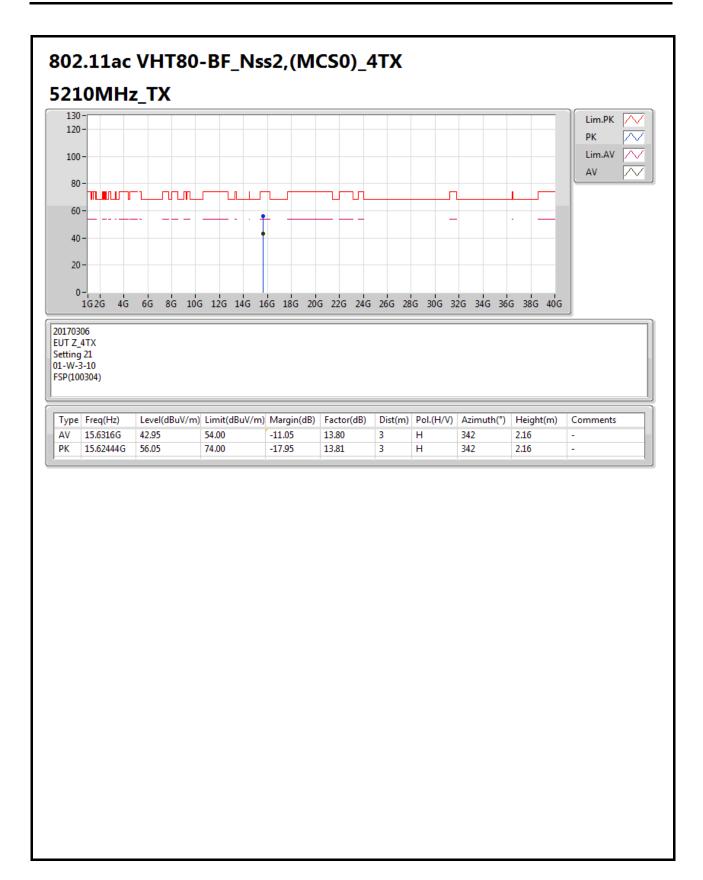


Page No. : 116 of 121

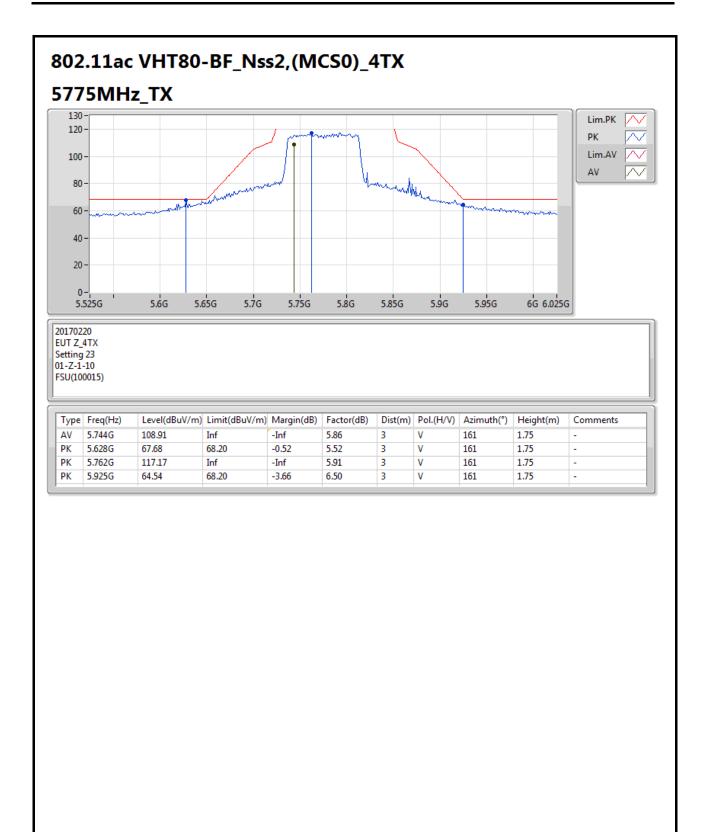






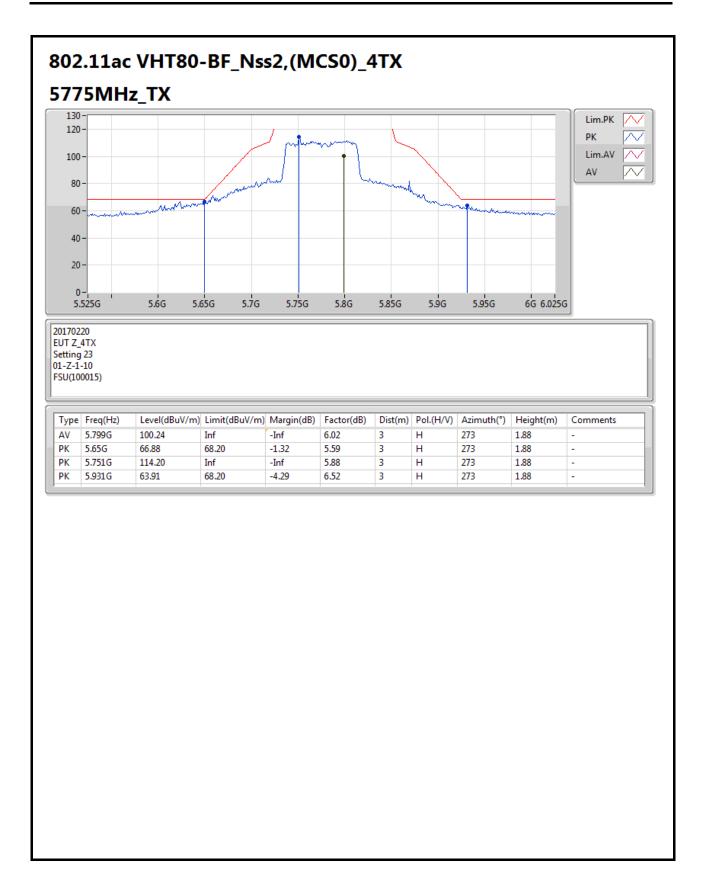






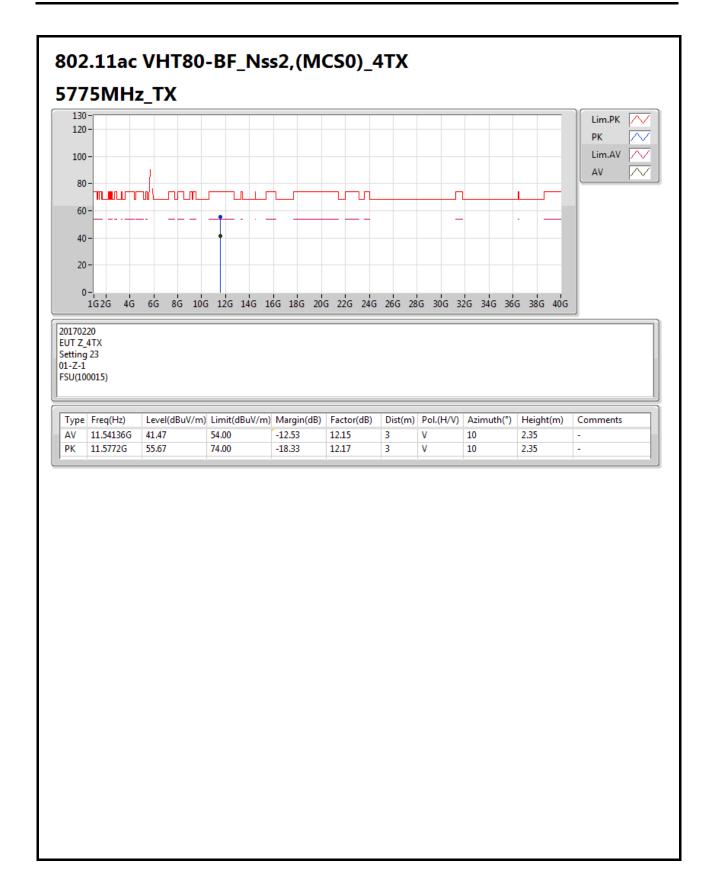
Page No. : 119 of 121



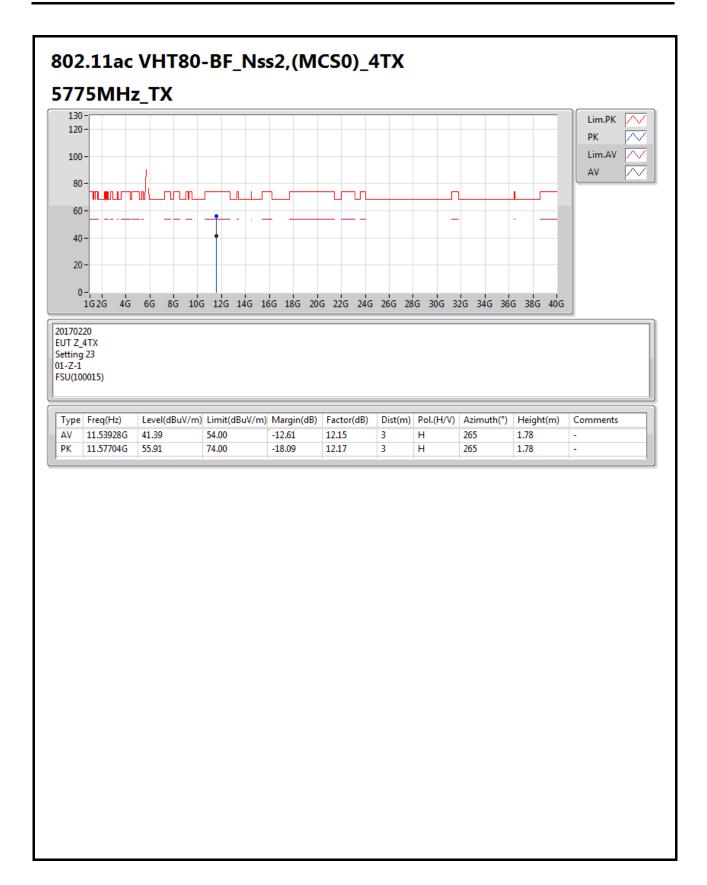


Page No. : 120 of 121









SPORTON INTERNATIONAL INC.



RSE TX above 1GHz Result

Appendix E.3

Page No. : 1 of 17

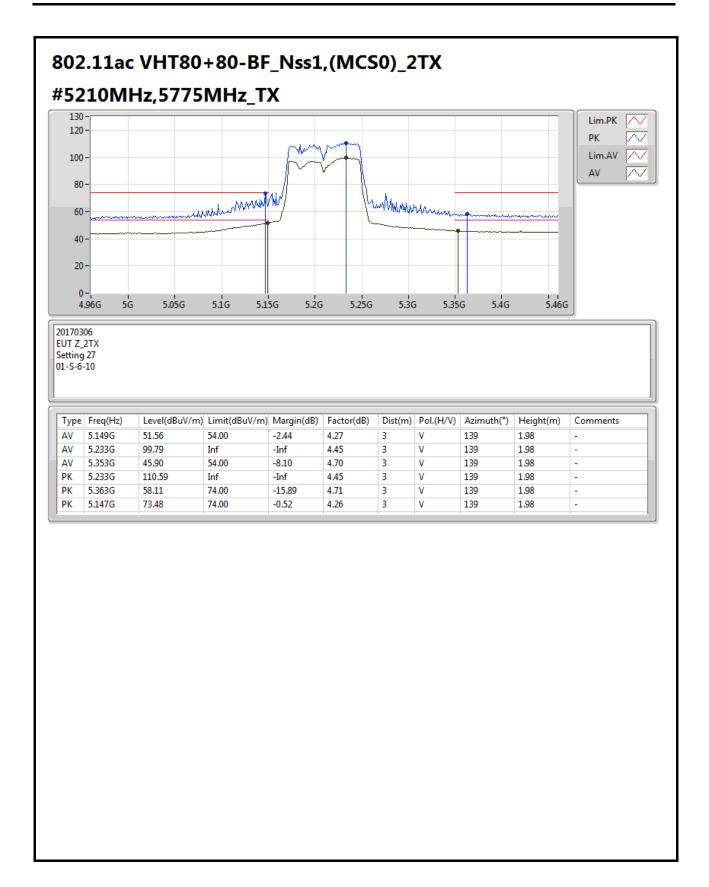
For 802.11 VHT80+80 Mode Summary

Odiffillar y												
Mode	Result	Туре	Freq	Level	Limit	Margin	Factor	Dist	Pol.	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)	(H/V)	(°)	(m)	
802.11ac VHT80+80-BF_Nss1,(MCS0)_2TX	-	-	-	-	-	-	-	-	-	-	-	-
5.15-5.25GHz	Pass	PK	5.147G	73.48	74.00	-0.52	4.26	3	٧	139	1.98	-

SPORTON INTERNATIONAL INC.

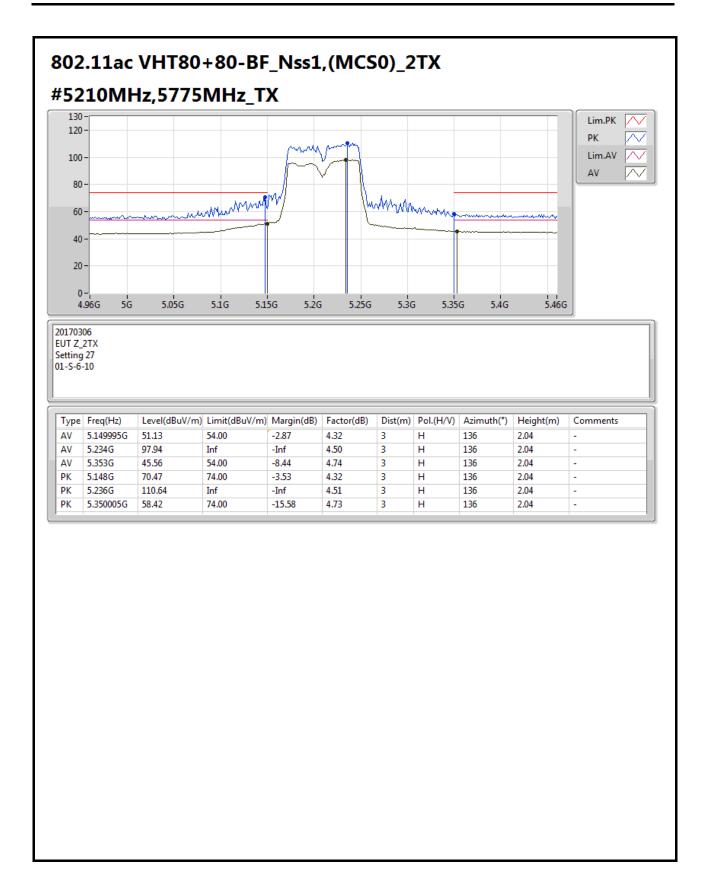
Page No. : 2 of 17





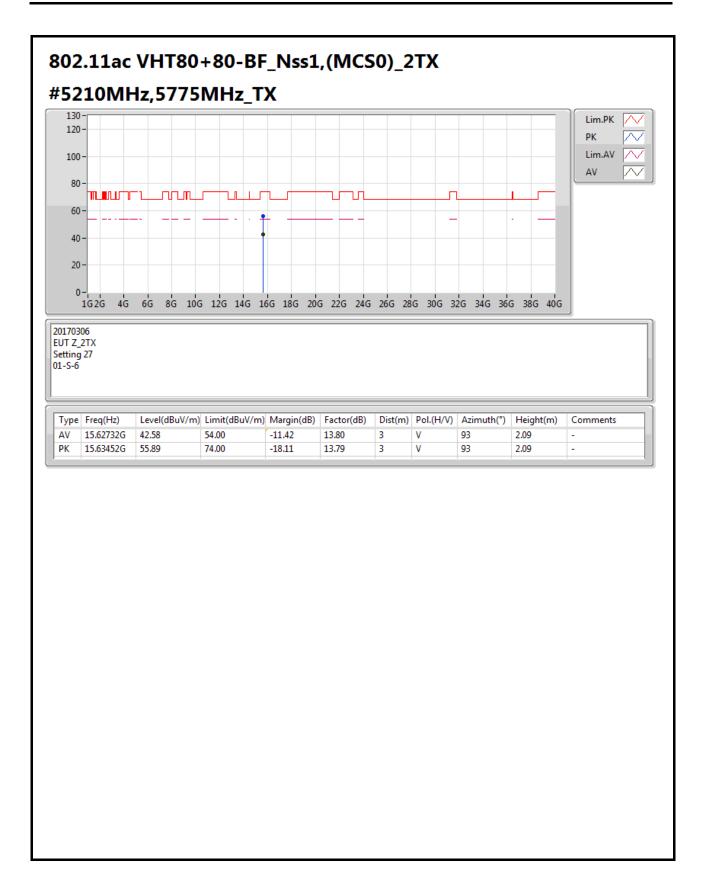
Page No. : 3 of 17





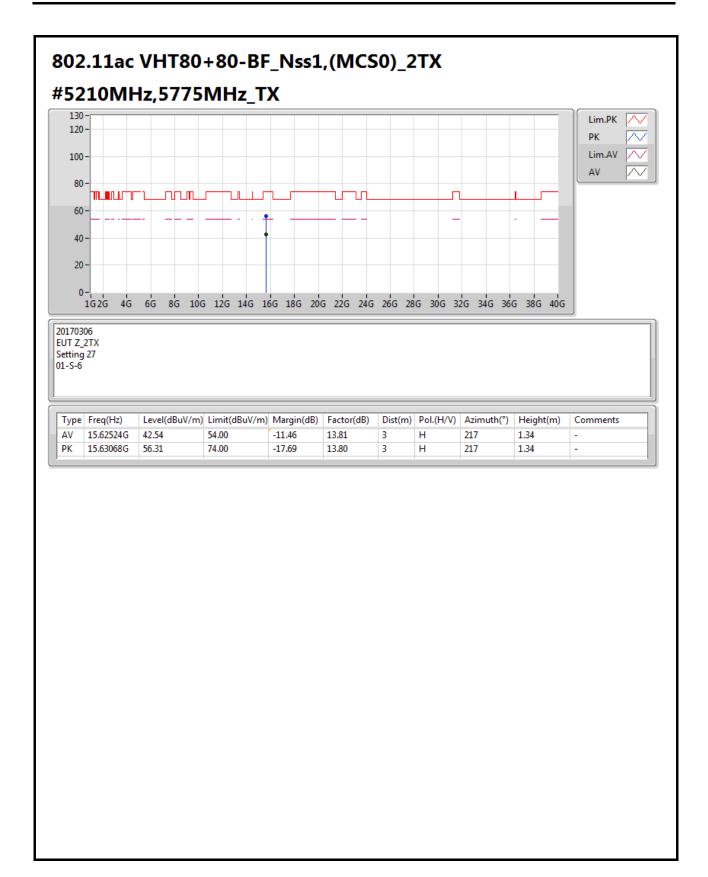
Page No. : 4 of 17



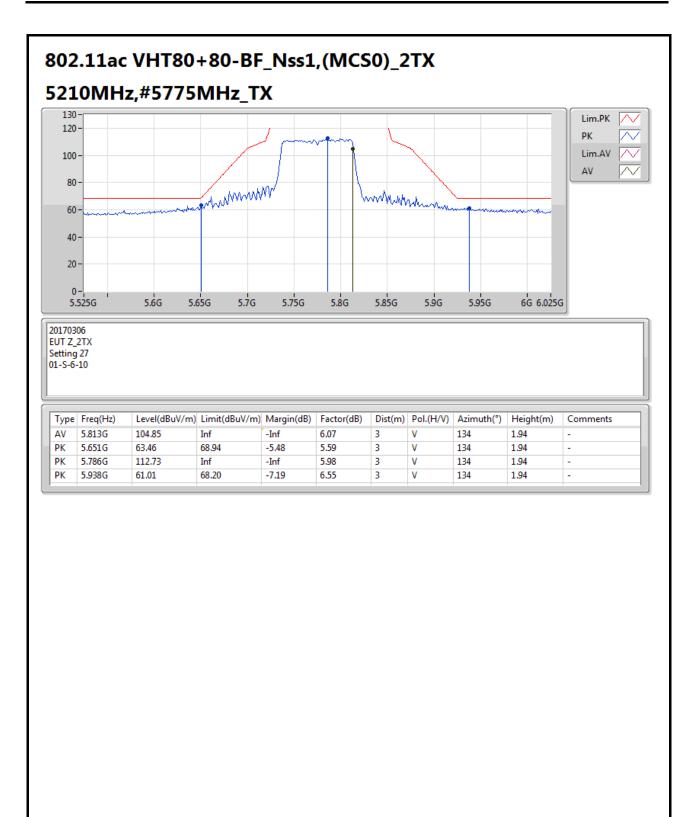


Page No. : 5 of 17



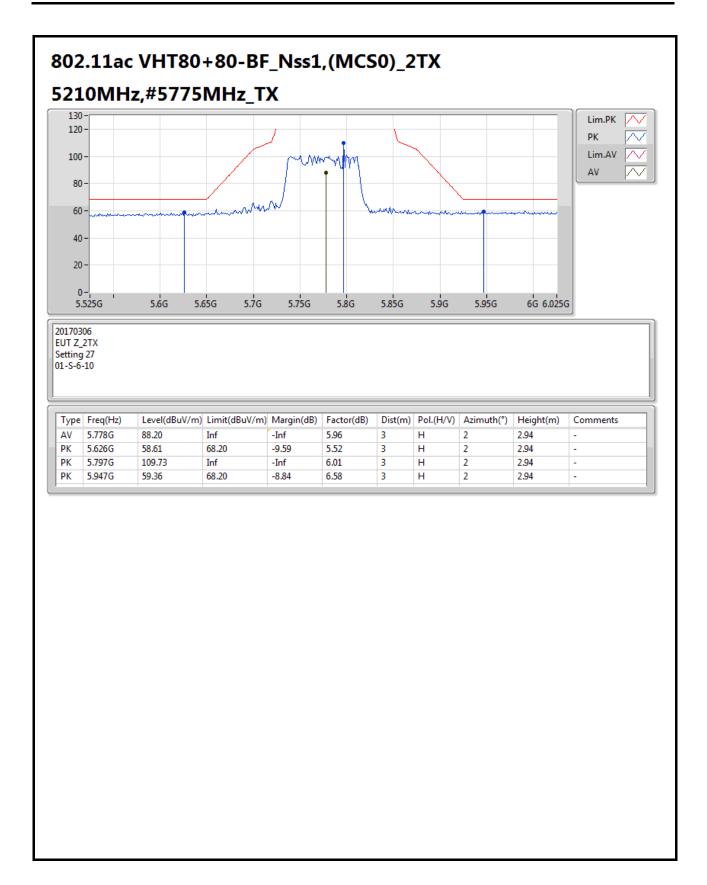




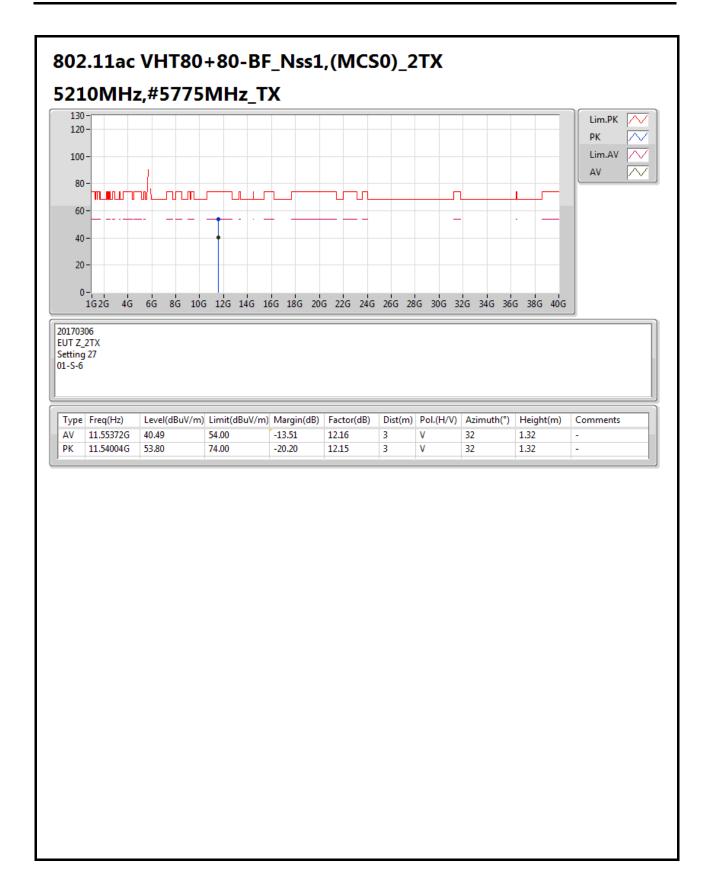


Page No. : 7 of 17



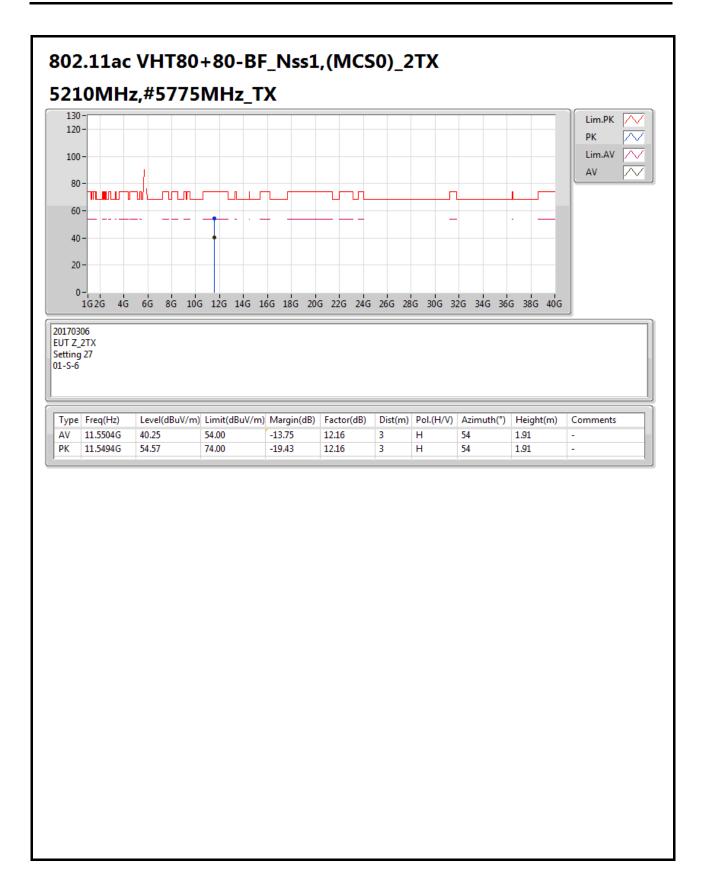




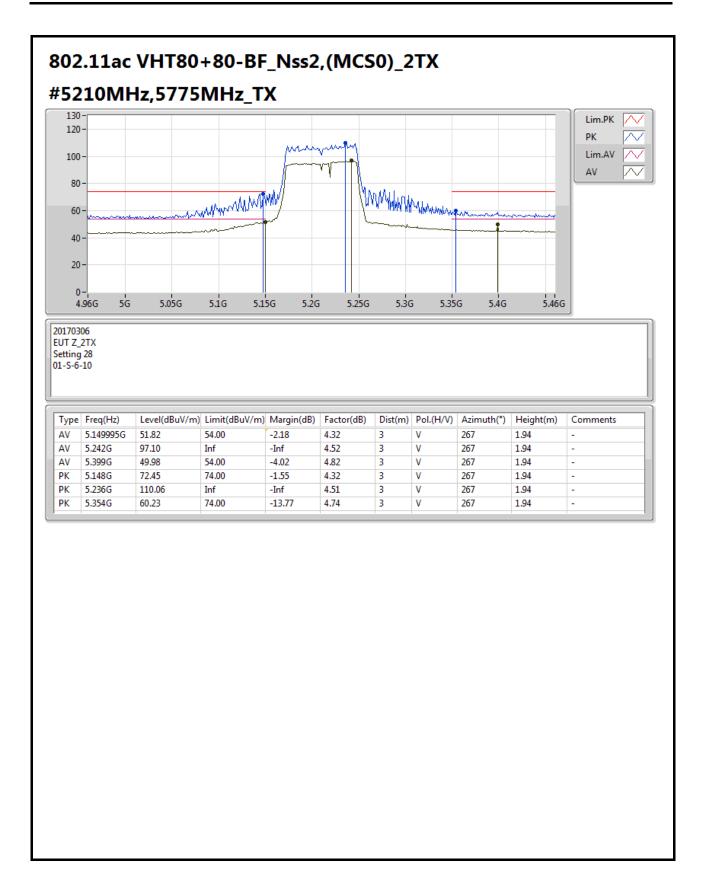


Page No. : 9 of 17

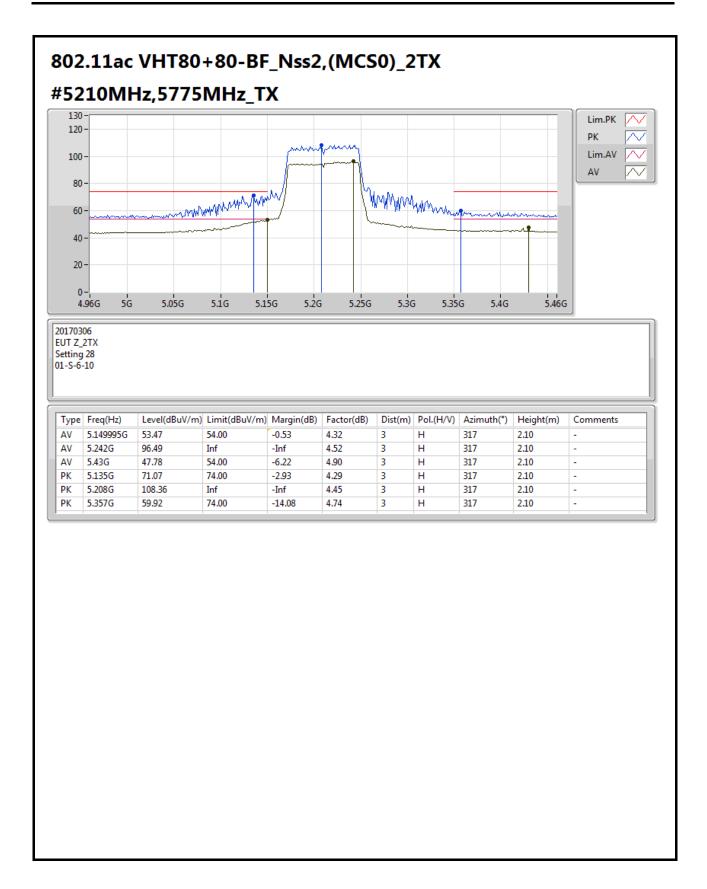




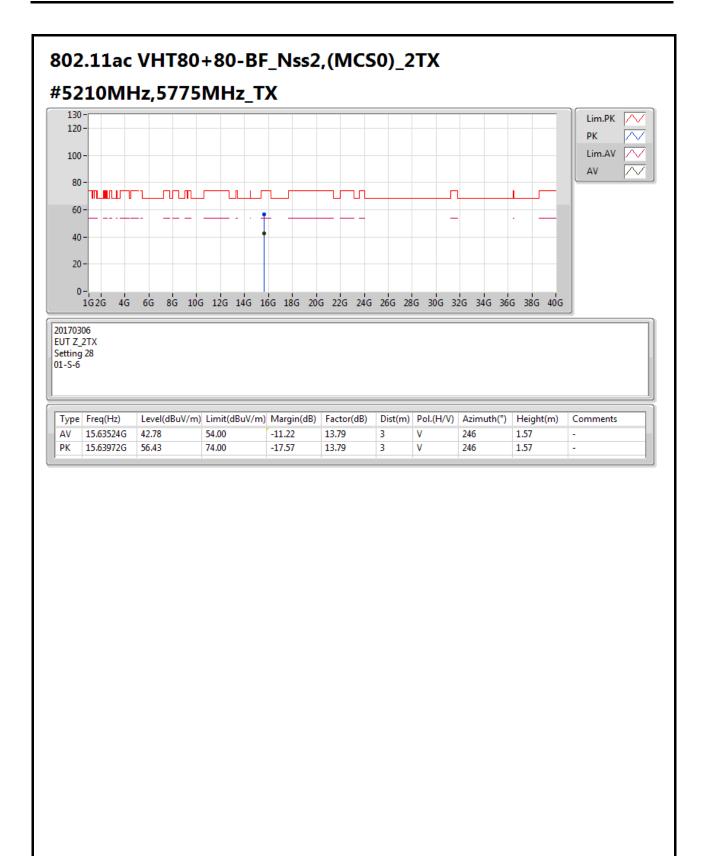






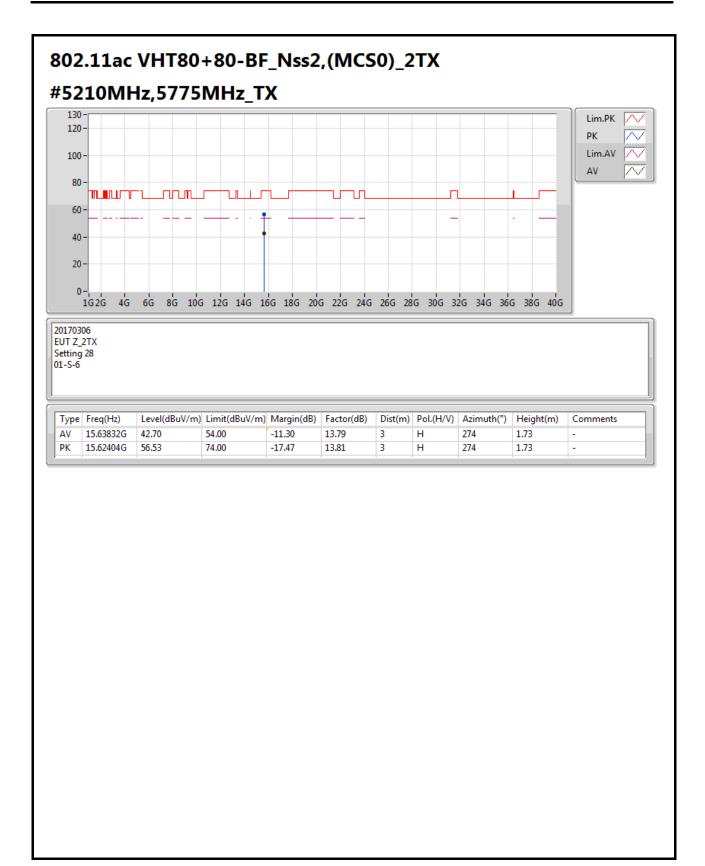






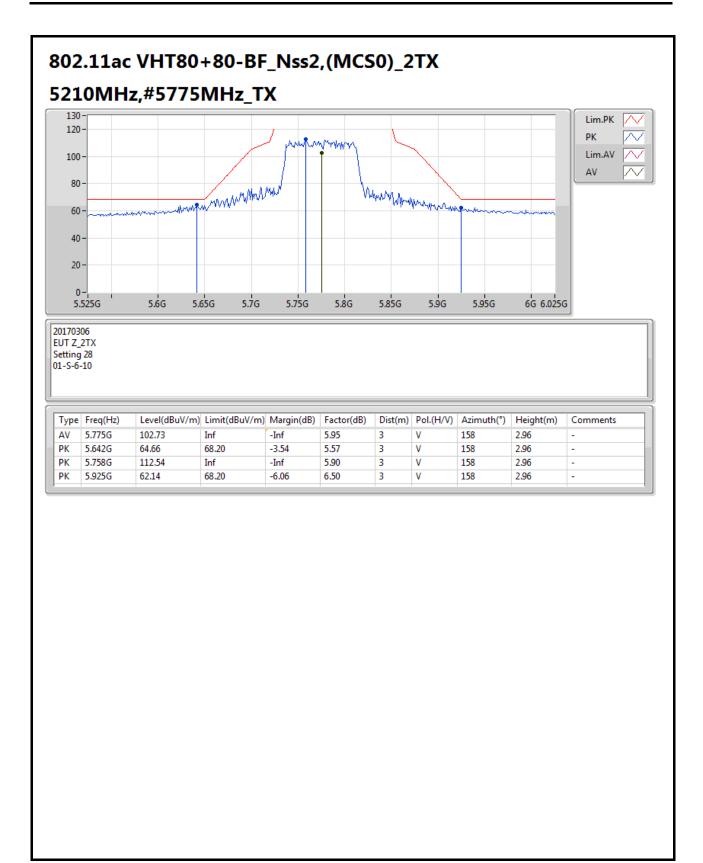
Page No. : 13 of 17





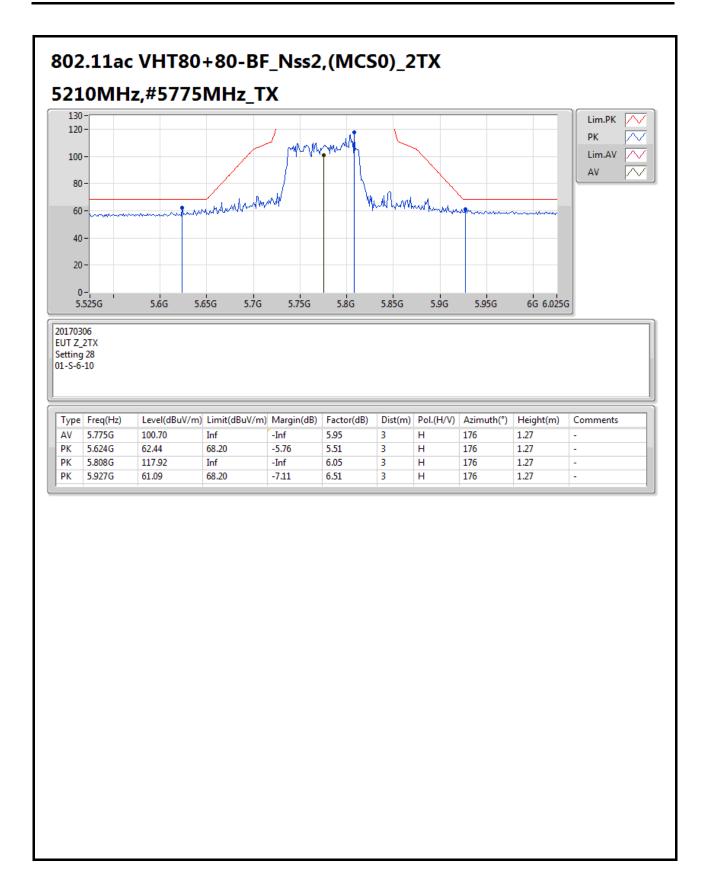
Page No. : 14 of 17



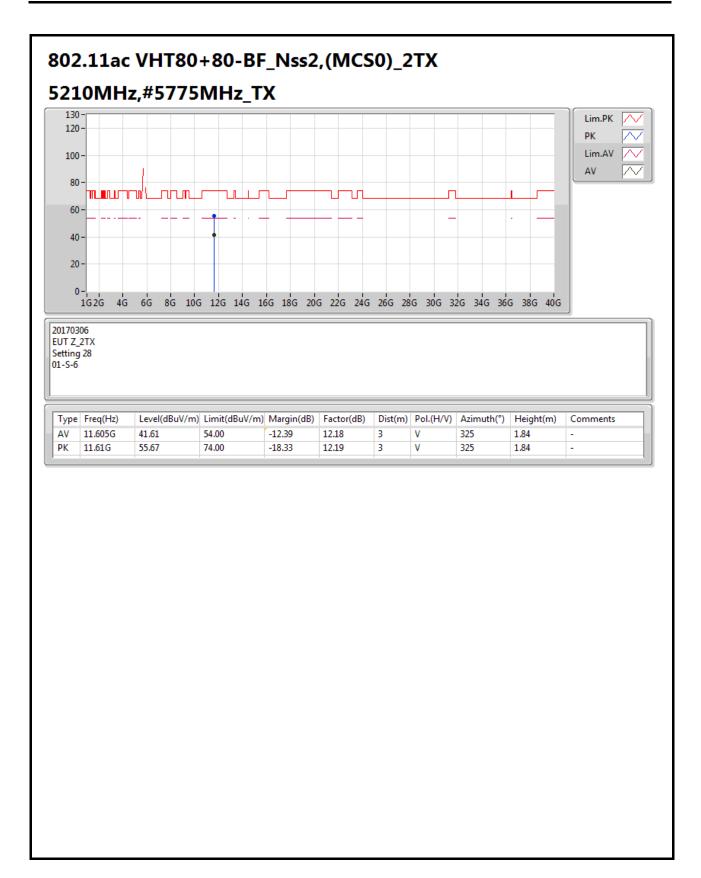


Page No. : 15 of 17





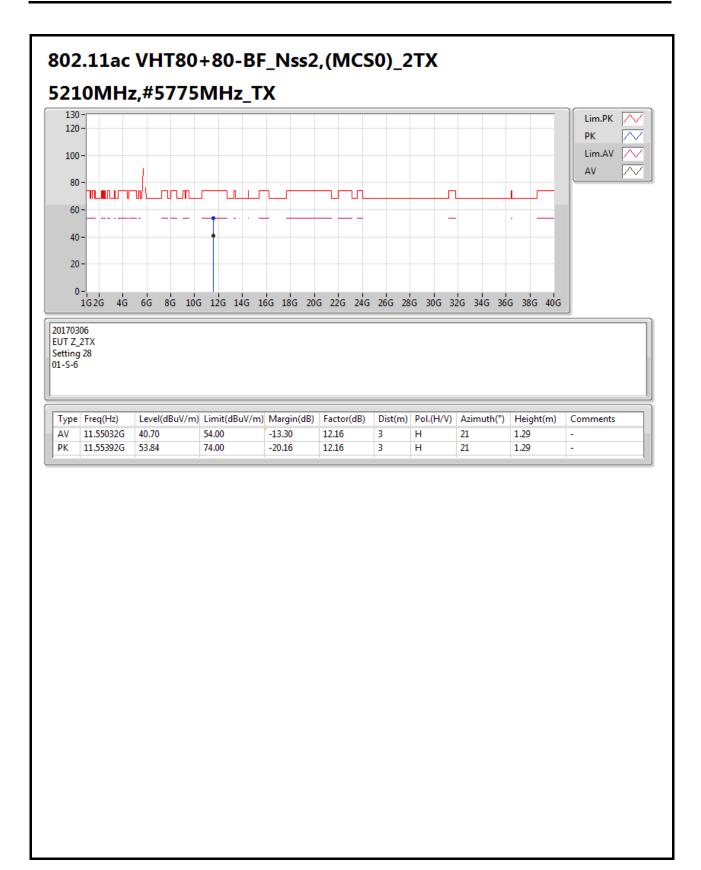




Page No. : 16 of 17

Page No. : 17 of 17







FS Result Appendix F

Mode: 20 MHz / Chain 2 Voltage vs. Frequency Stability

Voltage		Measurement Frequency (MHz)					
() ()		5200 MHz					
(V)	0 Minute	2 Minute	5 Minute	10 Minute			
126.50	5199.9597	5199.9589	5199.9587	5199.9583			
110.00	5199.9596	5199.9591	5199.9583	5199.9581			
93.50	5199.9591	5199.9586	5199.9577	5199.9575			
Max. Deviation (MHz)	0.0409	0.0414	0.0423	0.0425			
Max. Deviation (ppm)	7.87	7.96	8.13	8.17			
Result		Pass					

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)				
(°C)		5200	MHz		
(℃)	0 Minute	2 Minute	5 Minute	10 Minute	
0	5199.9628	5199.9621	5199.9613	5199.9603	
10	5199.9609	5199.9605	5199.9600	5199.9591	
20	5199.9596	5199.9594	5199.9588	5199.9585	
30	5199.9592	5199.9588	5199.9578	5199.9571	
40	5199.9586	5199.9578	5199.9572	5199.9563	
Max. Deviation (MHz)	0.0414	0.0422	0.0428	0.0437	
Max. Deviation (ppm)	7.96	8.12	8.23	8.40	
Result		Pass			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)					
0.0	5785 MHz					
(V)	0 Minute	2 Minute	5 Minute	10 Minute		
126.50	5784.9603	5784.9602	5784.9601	5784.9600		
110.00	5784.9596	5784.9586	5784.9580	5784.9572		
93.50	5784.9593	5784.9583	5784.9578	5784.9573		
Max. Deviation (MHz)	0.0407	0.0417	0.0422	0.0428		
Max. Deviation (ppm)	7.04	7.21	7.29	7.40		
Result	Pass					

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)				
(°C)		5785	MHz		
(C)	0 Minute	2 Minute	5 Minute	10 Minute	
0	5784.9630	5784.9624	5784.9623	5784.9616	
10	5784.9613	5784.9604	5784.9596	5784.9587	
20	5784.9596	5784.9586	5784.9581	5784.9573	
30	5784.9592	5784.9591	5784.9585	5784.9580	
40	5784.9577	5784.9574	5784.9567	5784.9559	
Max. Deviation (MHz)	0.0423	0.0426	0.0433	0.0441	
Max. Deviation (ppm)	7.31	7.36	7.48	7.62	
Result	Pass				

SPORTON INTERNATIONAL INC. Page No. : 1 of 3



FS Result Appendix F

Mode: 40 MHz / Chain 2 Voltage vs. Frequency Stability

Voltage		Measurement Frequency (MHz)					
00		5190 MHz					
(V)	0 Minute	2 Minute	5 Minute	10 Minute			
126.50	5189.9597	5189.9593	5189.9588	5189.9580			
110.00	5189.9596	5189.9586	5189.9582	5189.9578			
93.50	5189.9587	5189.9582	5189.9576	5189.9573			
Max. Deviation (MHz)	0.0413	0.0418	0.0424	0.0427			
Max. Deviation (ppm)	7.96	8.05	8.17	8.23			
Result		Pa	ass				

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)					
(°C)	5190 MHz					
(℃)	0 Minute	2 Minute	5 Minute	10 Minute		
0	5189.9623	5189.9618	5189.9610	5189.9604		
10	5189.9612	5189.9608	5189.9601	5189.9598		
20	5189.9596	5189.9591	5189.9585	5189.9583		
30	5189.9592	5189.9588	5189.9582	5189.9577		
40	5189.9584	5189.9578	5189.9573	5189.9565		
Max. Deviation (MHz)	0.0416	0.0422	0.0427	0.0435		
Max. Deviation (ppm)	8.02	8.13	8.23	8.38		
Result	Pass					

Voltage vs. Frequency Stability

Voltage		Measurement Frequency (MHz)				
(V)		5755	5 MHz			
(V)	0 Minute	2 Minute	5 Minute	10 Minute		
126.50	5754.9601	5754.9593	5754.9592	5754.9588		
110.00	5754.9596	5754.9594	5754.9586	5754.9579		
93.50	5754.9587	5754.9583	5754.9576	5754.9568		
Max. Deviation (MHz)	0.0413	0.0417	0.0424	0.0432		
Max. Deviation (ppm)	7.18	7.25	7.37	7.51		
Result		Pass				

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)					
(°C)	5755 MHz					
(℃)	0 Minute	2 Minute	5 Minute	10 Minute		
0	5754.9632	5754.9625	5754.9621	5754.9613		
10	5754.9614	5754.9610	5754.9600	5754.9594		
20	5754.9596	5754.9592	5754.9585	5754.9580		
30	5754.9592	5754.9584	5754.9578	5754.9575		
40	5754.9582	5754.9574	5754.9564	5754.9555		
Max. Deviation (MHz)	0.0418	0.0426	0.0436	0.0445		
Max. Deviation (ppm)	7.26	7.40	7.58	7.73		
Result	Pass					

SPORTON INTERNATIONAL INC. Page No. : 2 of 3



FS Result Appendix F

Mode: 80 MHz / Chain 2 Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)				
00		5210) MHz		
(V)	0 Minute	2 Minute	5 Minute	10 Minute	
126.50	5209.9597	5209.9596	5209.9588	5209.9581	
110.00	5209.9596	5209.9588	5209.9582	5209.9572	
93.50	5209.9588	5209.9583	5209.9574	5209.9566	
Max. Deviation (MHz)	0.0412	0.0417	0.0426	0.0434	
Max. Deviation (ppm)	7.91	8.00	8.18	8.33	
Result		Pass			

Temperature vs. Frequency Stability

Temperature		Measurement Frequency (MHz)				
(°C)		5210 MHz				
(℃)	0 Minute	2 Minute	5 Minute	10 Minute		
0	5209.9629	5209.9627	5209.9620	5209.9612		
10	5209.9610	5209.9605	5209.9596	5209.9591		
20	5209.9596	5209.9587	5209.9583	5209.9578		
30	5209.9592	5209.9586	5209.9576	5209.9572		
40	5209.9584	5209.9575	5209.9570	5209.9560		
Max. Deviation (MHz)	0.0416	0.0425	0.0430	0.0440		
Max. Deviation (ppm)	7.98	8.16	8.25	8.45		
Result		Pass				

Voltage vs. Frequency Stability

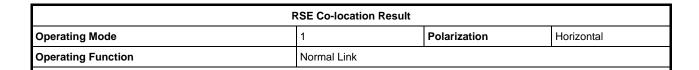
Voltage	Measurement Frequency (MHz)					
()()	5775 MHz					
(V)	0 Minute	2 Minute	5 Minute	10 Minute		
126.50	5774.9606	5774.9598	5774.9597	5774.9591		
110.00	5774.9596	5774.9589	5774.9582	5774.9573		
93.50	5774.9590	5774.9587	5774.9580	5774.9578		
Max. Deviation (MHz)	0.0410	0.0413	0.0420	0.0427		
Max. Deviation (ppm)	7.10	7.15	7.27	7.39		
Result		Pass				

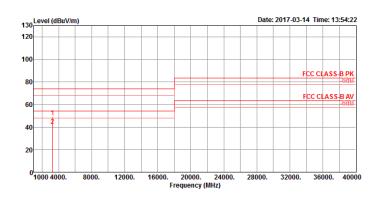
Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)								
(°C)	5775 MHz								
(℃)	0 Minute	2 Minute	5 Minute	10 Minute					
0	5774.9601	5774.9596	5774.9595	5774.9594					
10	5774.9599	5774.9594	5774.9590	5774.9580					
20	5774.9596	5774.9590	5774.9585	5774.9576					
30	5774.9592	5774.9584	5774.9582	5774.9581					
40	5774.9574	5774.9573	5774.9570	5774.9560					
Max. Deviation (MHz)	0.0426	0.0427	0.0430	0.0440					
Max. Deviation (ppm)	7.38	7.39	7.45	7.62					
Result	Pass								

SPORTON INTERNATIONAL INC. Page No. : 3 of 3

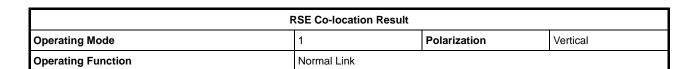


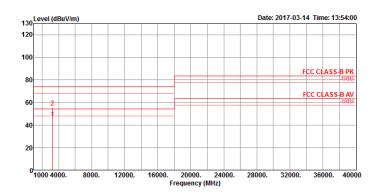




	Freq	Level				Loss Factor				1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		_
1	3262.62										Peak	HORIZONTAL
2	3262.66	41.26	54.00	-12.74	53.72	6.48	29.90	48.84	161	134	Average	HORIZONTAL

SPORTON INTERNATIONAL INC. Page No. : 1 of 2





	Freq	Level		Over Limit						T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		_
1	3262.61	45.98	54.00	-8.02	58.44	6.48	29.90	48.84	176	149	Average	VERTICAL
2	3262 63	55 44	74 00	-18 56	67 90	6 48	29 90	48 84	176	149	Peak	VERTICAL

SPORTON INTERNATIONAL INC. Page No. : 2 of 2