

FCC Test Report

FCC ID : UDX-60082010
Equipment : Network Camera
Brand Name : CISCO
Model Name : MV32-HW
**Applicant/
Manufacturer** : Cisco Systems
170 West Tasman Drive
San Jose, California. 95134
United States
Standard : 47 CFR FCC Part 15.407

The product was received on May 24, 2018, and testing was started from Oct. 24, 2018 and completed on Oct. 26, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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



Table of Contents

HISTORY OF THIS TEST REPORT3

SUMMARY OF TEST RESULT4

1 GENERAL DESCRIPTION5

1.1 Information.....5

1.2 Testing Applied Standards8

1.3 Testing Location Information8

1.4 Measurement Uncertainty8

2 TEST CONFIGURATION OF EUT.....9

2.1 Test Condition9

2.2 Test Channel Mode9

2.3 The Worst Case Measurement Configuration11

2.4 Support Equipment.....12

2.5 Test Setup Diagram13

3 TRANSMITTER TEST RESULT14

3.1 AC Power-line Conducted Emissions14

3.2 Emission Bandwidth15

3.3 Maximum Conducted Output Power16

3.4 Peak Power Spectral Density.....18

3.5 Unwanted Emissions.....20

3.6 Test Equipment and Calibration Data25

APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS

APPENDIX B. TEST RESULTS OF EMISSION BANDWIDTH

APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER

APPENDIX D. TEST RESULTS OF PEAK POWER SPECTRAL DENSITY

APPENDIX E. TEST RESULTS OF UNWANTED EMISSIONS

APPENDIX F. TEST RESULTS OF RADIATED EMISSION CO-LOCATION

TEST SETUP PHOTOS V01

PHOTOGRAPHS OF EUT V01



Summary of Test Result

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

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and explanations:
None

Reviewed by: Sam Chen

Report Producer: Ann Hou



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]
5250-5350		5260-5320	52-64 [4]
5470-5725		5500-5700	100-140 [11]
Straddle 5720		5720	144 [1]
5725-5850		5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5250-5350		5270-5310	54-62 [2]
5470-5725		5510-5670	102-134 [5]
Straddle 5710		5710	142 [1]
5725-5850		5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5250-5350		5290	58 [1]
5470-5725		5530-5610	106-122 [2]
Straddle 5690		5690	138 [1]
5725-5850		5775	155 [1]

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	1TX
5.25-5.35GHz	802.11a	20	1TX
5.47-5.725GHz	802.11a	20	1TX
5.725-5.85GHz	802.11a	20	1TX
5.15-5.25GHz	802.11n HT20	20	1TX
5.25-5.35GHz	802.11n HT20	20	1TX
5.47-5.725GHz	802.11n HT20	20	1TX
5.725-5.85GHz	802.11n HT20	20	1TX
5.15-5.25GHz	802.11ac VHT20	20	1TX
5.25-5.35GHz	802.11ac VHT20	20	1TX
5.47-5.725GHz	802.11ac VHT20	20	1TX
5.725-5.85GHz	802.11ac VHT20	20	1TX
5.15-5.25GHz	802.11ac VHT40	40	1TX



Band	Mode	BWch (MHz)	Nant
5.25-5.35GHz	802.11ac VHT40	40	1TX
5.47-5.725GHz	802.11ac VHT40	40	1TX
5.725-5.85GHz	802.11ac VHT40	40	1TX
5.15-5.25GHz	802.11ac VHT80	80	1TX
5.25-5.35GHz	802.11ac VHT80	80	1TX
5.47-5.725GHz	802.11ac VHT80	80	1TX
5.725-5.85GHz	802.11ac VHT80	80	1TX

Note:

- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ VHT20, VHT40, VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	ARISTOTLE	RFA-25-AP628-P1-U	PIFA Antenna	I-PEX
2	ARISTOTLE	RFA-25-AP628-P2-U	Dipole Antenna	I-PEX

Ant.	Port	Gain (dBi)		
		2.4G	5G	BT
1	1	-2.22	-1.69	-2.22
2	2	-1.4	-1.36	-

For 2.4 GHz function:

For IEEE 802.11b/g/n mode (1TX/1RX)

The EUT support diversity function, Ant. 1 or Ant. 2 can be used as transmitting/receiving antenna.

For 5 GHz function:

For IEEE 802.11a/n/ac mode (1TX/1RX)

The EUT support diversity function, Ant. 1 or Ant. 2 can be used as transmitting/receiving antenna.

For Bluetooth function:

For Bluetooth mode (1TX/1RX)

Only Ant. 1 can be used as transmitting/receiving antenna.

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From PoE		
EUT Function	<input type="checkbox"/> Outdoor	<input checked="" type="checkbox"/> Indoor	
	<input type="checkbox"/> Fixed P2P	<input type="checkbox"/> Client	
TPC Function	<input checked="" type="checkbox"/> TPC	<input type="checkbox"/> TPC	
Beamforming Function	<input type="checkbox"/> With beamforming	<input checked="" type="checkbox"/> Without beamforming	
Weather Band	<input checked="" type="checkbox"/> With 5600~5650MHz	<input type="checkbox"/> Without 5600~5650MHz	
Type of EUT			
<input checked="" type="checkbox"/>	Stand-alone		
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device)		
	Combined Equipment - Brand Name / Model No.: ...		
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems)		
	Host System - Brand Name / Model No.: ...		
<input type="checkbox"/>	Other:		

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.872	0.595	1.366m	1k
802.11ac VHT20	0.833	0.794	978.125u	3k
802.11ac VHT40	0.712	1.475	493.125u	3k
802.11ac VHT80	0.555	2.557	250.625u	10k

1.2 Testing Applied Standards

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

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

1.3 Testing Location Information

Testing Location				
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
		TEL : 886-3-327-3456	FAX : 886-3-327-0973	
Test site Designation No. TW1190 with FCC.				
<input type="checkbox"/>	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)		
		TEL : 886-3-656-9065	FAX : 886-3-656-9085	
Test site Designation No. TW0006 with FCC.				

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Dexter	25°C / 59%	24/Oct/2018
Radiated	03CH09-HY	Andy	23.9°C / 61%	24/Oct/2018
AC Conduction	CO04-HY	Andy	23.7°C / 61%	26/Oct/2018

1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
TnomVnom	Tnom	20°C
-	Vnom	110V

2.2 Test Channel Mode

Test Software Version	QRCT V3.0.93.0
-----------------------	----------------

Mode	PowerSetting
802.11a_Nss1,(6Mbps)_1TX(Port2)	-
5180MHz	19
5200MHz	21
5240MHz	21
5260MHz	21
5300MHz	21
5320MHz	19
5500MHz	15.5
5580MHz	21
5700MHz	15.5
5720MHz Straddle 5.47-5.725GHz	21
5720MHz Straddle 5.725-5.85GHz	21
5745MHz	21
5785MHz	21
5825MHz	21
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	-
5180MHz	18.5
5200MHz	21
5240MHz	21
5260MHz	21
5300MHz	21
5320MHz	18.5
5500MHz	16
5580MHz	21






Mode	PowerSetting
5700MHz	15
5720MHz Straddle 5.47-5.725GHz	21
5720MHz Straddle 5.725-5.85GHz	21
5745MHz	21
5785MHz	21
5825MHz	21
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	-
5190MHz	16.5
5230MHz	21
5270MHz	21
5310MHz	16
5510MHz	16.5
5550MHz	20
5670MHz	17.5
5710MHz Straddle 5.47-5.725GHz	21
5710MHz Straddle 5.725-5.85GHz	21
5755MHz	21
5795MHz	21
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	-
5210MHz	15.5
5290MHz	15
5530MHz	15
5610MHz	18.5
5690MHz Straddle 5.47-5.725GHz	21
5690MHz Straddle 5.725-5.85GHz	21
5775MHz	20.5

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	PoE Mode_PIFA Antenna
2	PoE Mode_Dipole Antenna

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

The Worst Case Mode for Following Conformance Tests			
Tests Item	Unwanted Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	PoE Mode_PIFA Antenna		
2	PoE Mode_Dipole Antenna		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V (Mode 1)	V (Mode 2)

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	Normal Link
1	Bluetooth+WLAN 2.4GHz
2	Bluetooth+WLAN 5GHz

Refer to Sporton Test Report No.: FA851627 for Co-location RF Exposure Evaluation and Appendix F for Radiated Emission Co-location.

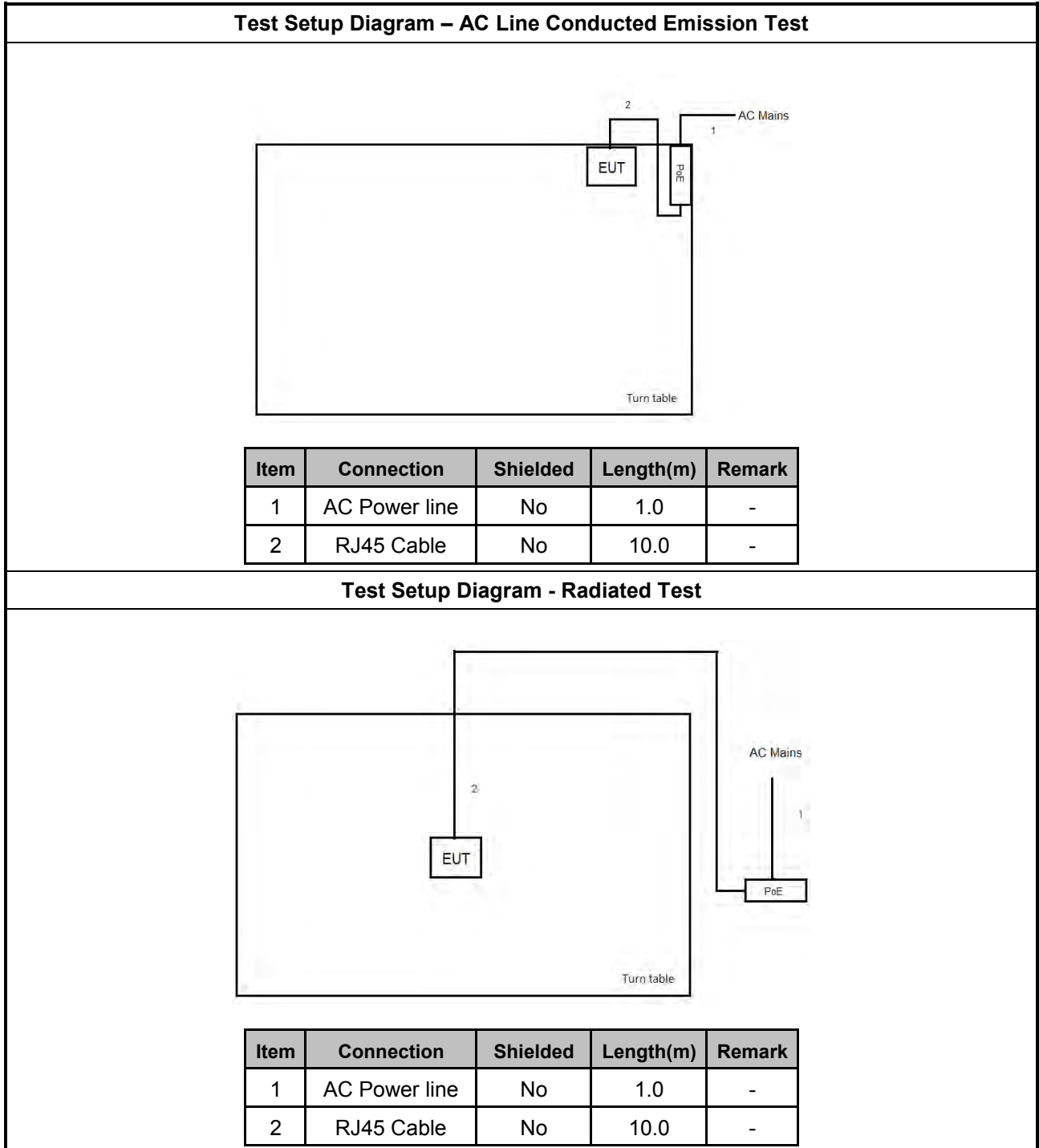


2.4 Support Equipment

Support Equipment – RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	AC Power Source	GW	APS-9102	N/A

Support Equipment – Radiated Emission and AC Conduction				
No.	Equipment	Brand Name	Model Name	FCC ID
1	PoE (Client Provide)	CISCO	MA-INJ-4	N/A

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

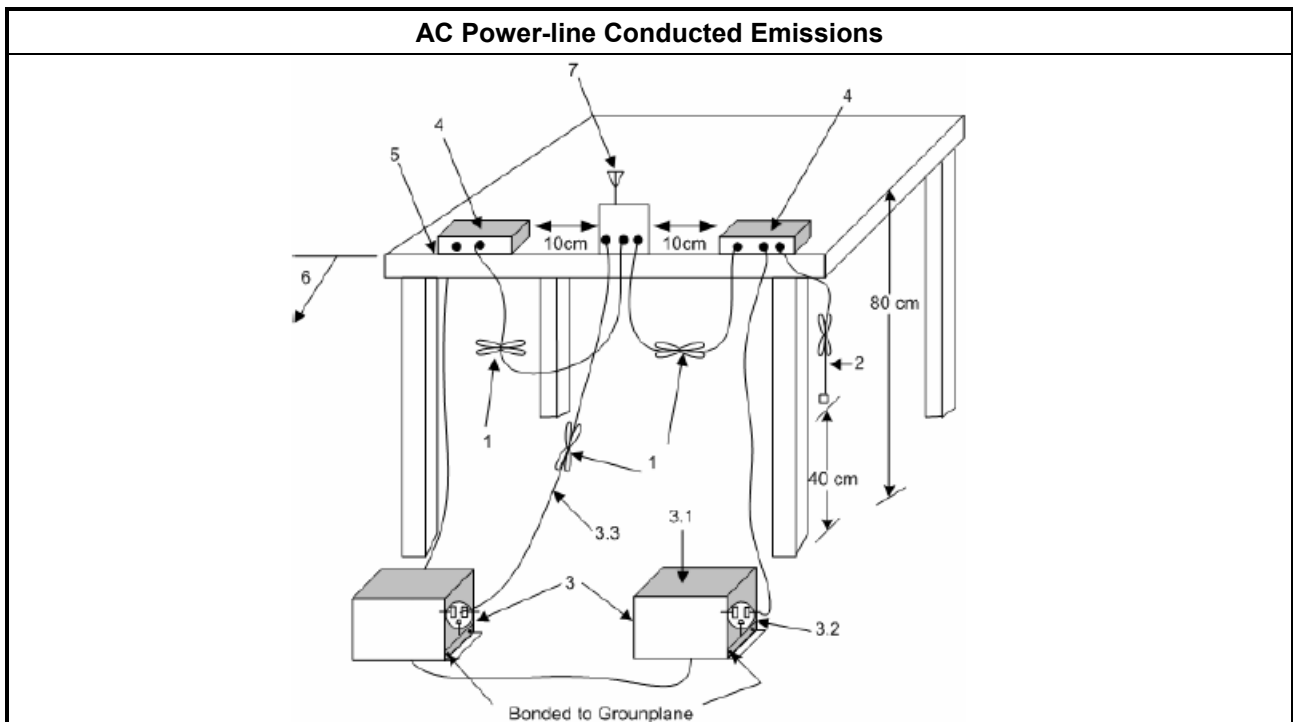
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
<input checked="" type="checkbox"/> Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit	
UNII Devices	
<input checked="" type="checkbox"/>	For the 5.15-5.25 GHz band, N/A
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	For the 5.725-5.85 GHz band, 6 dB emission bandwidth \geq 500kHz.

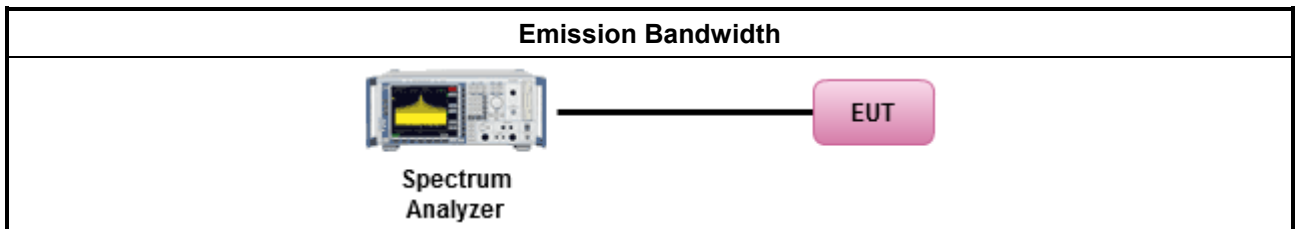
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ For the emission bandwidth shall be measured using one of the options below: 	
<input checked="" type="checkbox"/>	Refer as KDB 789033, clause C for EBW and clause D for OBW measurement.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
<input type="checkbox"/>	Refer as IC RSS-Gen, clause 6.7 for bandwidth testing.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
UNII Devices	
<input checked="" type="checkbox"/> For the 5.15-5.25 GHz band:	
	<ul style="list-style-type: none"> ▪ 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 $P_{Out} = 24 - (G_{TX} - 6)$.
<input checked="" type="checkbox"/> For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.725-5.85 GHz band:	
	<ul style="list-style-type: none"> ▪ 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.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

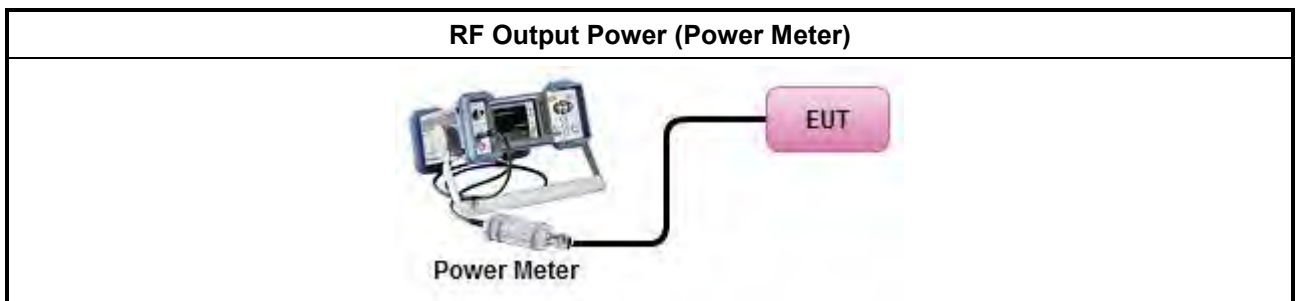
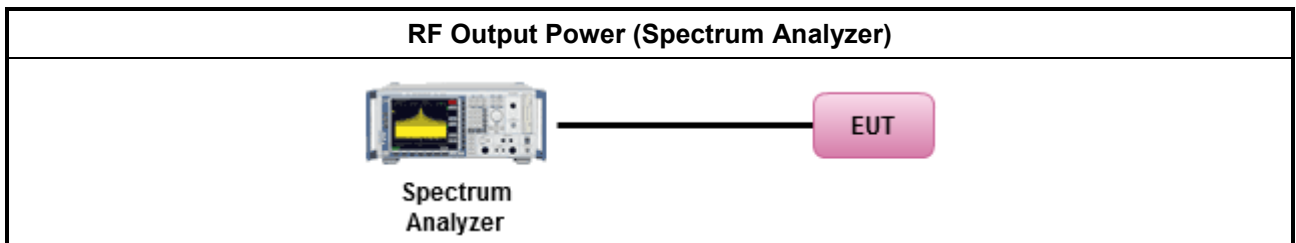
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> Maximum Conducted Output Power 	
	Duty cycle \geq 98%
<input type="checkbox"/>	Refer as KDB 789033, clause E Method SA-2 (spectral trace averaging).
	Duty cycle $<$ 98%
<input checked="" type="checkbox"/>	Refer as 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	
<input checked="" type="checkbox"/>	Refer as KDB 789033, clause E Method PM (using an RF average power meter).
<ul style="list-style-type: none"> For conducted measurement. 	
	<ul style="list-style-type: none"> If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	<ul style="list-style-type: none"> If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (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

3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

Peak Power Spectral Density Limit	
UNII Devices	
<input checked="" type="checkbox"/> For the 5.15-5.25 GHz band:	
	<ul style="list-style-type: none"> ▪ 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 $PPSD = 11 - (G_{TX} - 6)$.
<input checked="" type="checkbox"/> For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
<input checked="" type="checkbox"/> For the 5.725-5.85 GHz band:	
	<ul style="list-style-type: none"> ▪ 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.
<p>PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz</p> <p>G_{TX} = the maximum transmitting antenna directional gain in dBi.</p>	

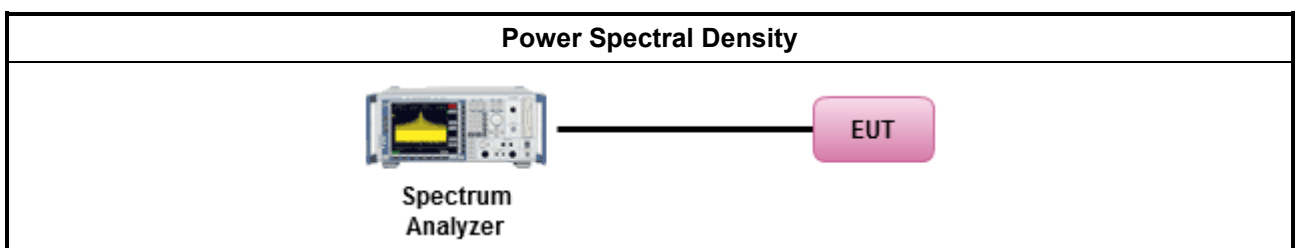
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options: 	
<input type="checkbox"/>	Refer as 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%	
<input type="checkbox"/>	Refer as KDB 789033, clause E Method SA-2 (spectral trace averaging).
Duty cycle < 98%	
<input checked="" type="checkbox"/>	Refer as KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
<ul style="list-style-type: none"> ▪ For conducted measurement. 	
<ul style="list-style-type: none"> ▪ If the EUT supports multiple transmit chains using options given below: 	
	<ul style="list-style-type: none"> ▪ Measure and sum the spectra across the outputs. Refer as 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.
	<ul style="list-style-type: none"> ▪ If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$

3.4.4 Test Setup



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

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.

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



Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.85 GHz	5.650-5700 GHz: e.i.r.p. -27 ~ 10 dBm [68.2 ~ 105.2 dBuV/m@3m] 5.700-5720 GHz: e.i.r.p. 10 ~ 15.6 dBm [105.2 ~ 110.8 dBuV/m@3m] 5.720-5725 GHz: e.i.r.p. 15.6 ~ 27 dBm [110.8 ~ 122.2 dBuV/m@3m] 5.850-5.855 GHz: e.i.r.p. 27 ~ 15.6 dBm [122.2 ~ 110.8 dBuV/m@3m] 5.855-5.875 GHz: e.i.r.p. 15.6 ~ 10 dBm [110.8 ~ 105.2 dBuV/m@3m] 5.875-5.925 GHz: e.i.r.p. 10 ~ -27 dBm [105.2 ~ 68.2dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
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).	

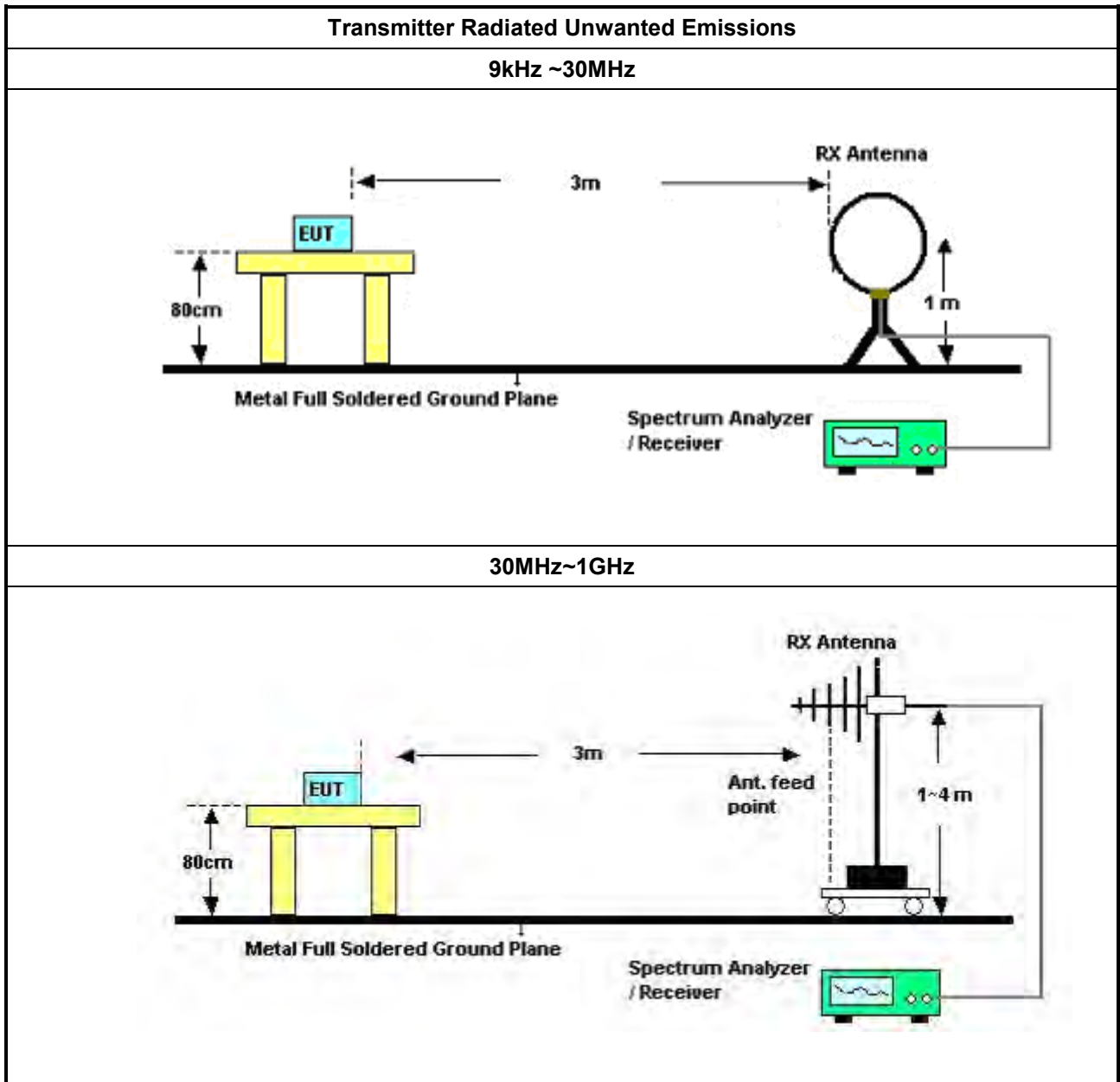
3.5.2 Measuring Instruments

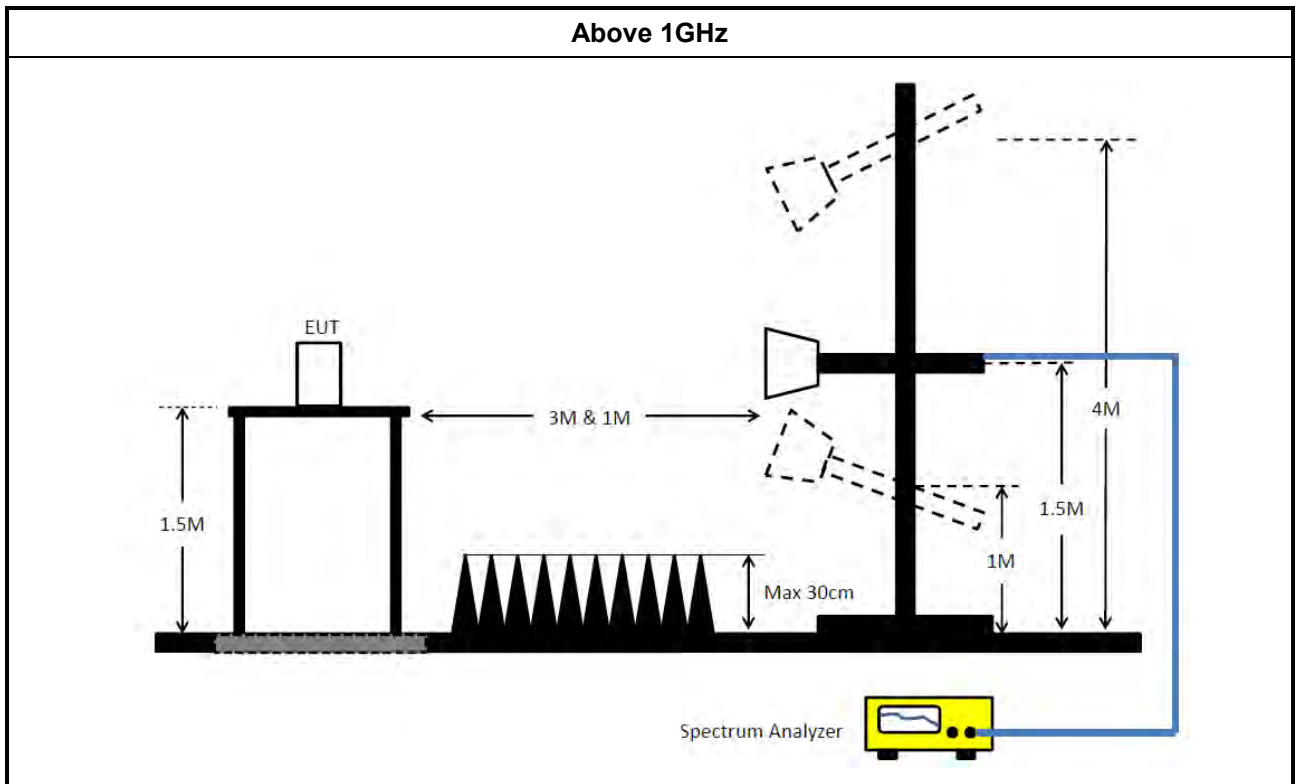
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ 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). 	
<ul style="list-style-type: none"> ▪ The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. 	
<ul style="list-style-type: none"> ▪ For the transmitter unwanted emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ Refer as KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
	<ul style="list-style-type: none"> ▪ Refer as KDB 789033, clause G)1) for unwanted emissions into restricted bands.
	<input checked="" type="checkbox"/> Refer as KDB 789033, G)6) Method VB (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW.
	<input checked="" type="checkbox"/> Refer as KDB 789033, clause G)5) (ANSI C63.10, clause 4.1.4.2.2), measurement procedure peak limit.
<ul style="list-style-type: none"> ▪ For radiated measurement. 	
	<ul style="list-style-type: none"> ▪ Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
	<ul style="list-style-type: none"> ▪ Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
	<ul style="list-style-type: none"> ▪ Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
<ul style="list-style-type: none"> ▪ The any unwanted emissions level shall not exceed the fundamental emission level. 	
<ul style="list-style-type: none"> ▪ All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported. 	

3.5.4 Test Setup





3.5.5 Transmitter Unwanted Emissions (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB 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 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	23/Apr/2018	22/Apr/2019
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	14/Jun/2018	13/Jun/2019
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	10/May/2018	09/May/2019
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	27/Apr/2018	26/Apr/2019
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	31/Jul/2018	30/Jul/2019
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30MHz~1GHz	02/Oct/2018	03/Oct/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	30/Apr/2018	29/Apr/2019
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170614	18GHz~40GHz	09/Feb/2018	08/Feb/2019
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	24/Aug/2018	23/Aug/2019
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	29/Mar/2018	28/Mar/2019
RF Cable-R03m	Jye Bao	RG142	CB031	9kHz ~ 1GHz	1/Feb/2018	31/Jan/2019
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	SN 556626/4 + 556627	1GHz ~ 40GHz	14/Mar/2018	13/Mar/2019



Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	18/Jul/2018	17/Jul/2019
Power Sensor	Anritsu	MA2411B	1339407	300MHz ~ 40GHz	06/Nov/2017	05/Nov/2018
Power Meter	Anritsu	ML2495A	1517010	300MHz ~ 40GHz	06/Nov/2017	05/Nov/2018
RF Cable-1.5m	HUBER+SUHNER	SUCOFLEX_104	MY12585/4	30MHz ~ 26.5GHz	26/Jan/2018	25/Jan/2019
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10710/4	30MHz ~ 26.5GHz	26/Jan/2018	25/Jan/2019
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	26/Jan/2018	25/Jan/2019
Signal Generator	R&S	SMB100A	175727	100kHz~40GHz	26/Oct/2017	25/Oct/2018



AC Power-line Conducted Emissions Result																																																																																																																																	
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AC Power-line Conducted Emissions Result																																																																																																																																	
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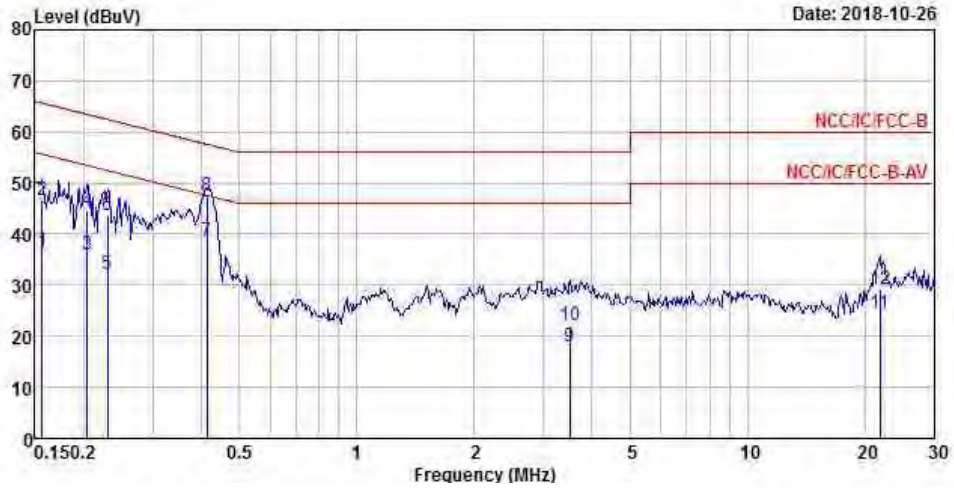


AC Power-line Conducted Emissions Result																																																																																																																																	
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Operating Function	PoE Mode_Dipole Antenna																																																																																																																																
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<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Freq</th> <th>Level</th> <th>Over Limit</th> <th>Limit Line</th> <th>Read Level</th> <th>LISN Factor</th> <th>Cable Loss</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV</th> <th>dB</th> <th>dBuV</th> <th>dBuV</th> <th>dB</th> <th>dB</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>0.16</td><td>33.87</td><td>-21.78</td><td>55.65</td><td>24.20</td><td>9.63</td><td>0.04</td><td>Average</td></tr> <tr><td>2</td><td>0.16</td><td>45.45</td><td>-20.20</td><td>65.65</td><td>35.78</td><td>9.63</td><td>0.04</td><td>QP</td></tr> <tr><td>3</td><td>0.18</td><td>37.43</td><td>-17.16</td><td>54.59</td><td>27.79</td><td>9.62</td><td>0.02</td><td>Average</td></tr> <tr><td>4</td><td>0.18</td><td>44.30</td><td>-20.29</td><td>64.59</td><td>34.66</td><td>9.62</td><td>0.02</td><td>QP</td></tr> <tr><td>5</td><td>0.20</td><td>35.32</td><td>-18.30</td><td>53.62</td><td>25.70</td><td>9.62</td><td>0.00</td><td>Average</td></tr> <tr><td>6</td><td>0.20</td><td>42.81</td><td>-20.81</td><td>63.62</td><td>33.19</td><td>9.62</td><td>0.00</td><td>QP</td></tr> <tr><td>7 MAX</td><td>0.41</td><td>37.50</td><td>-18.09</td><td>47.59</td><td>27.79</td><td>9.61</td><td>0.10</td><td>Average</td></tr> <tr><td>8</td><td>0.41</td><td>46.29</td><td>-11.30</td><td>57.59</td><td>36.58</td><td>9.61</td><td>0.10</td><td>QP</td></tr> <tr><td>9</td><td>3.80</td><td>20.15</td><td>-25.85</td><td>46.00</td><td>10.43</td><td>9.64</td><td>0.08</td><td>Average</td></tr> <tr><td>10</td><td>3.80</td><td>24.39</td><td>-31.61</td><td>56.00</td><td>14.67</td><td>9.64</td><td>0.08</td><td>QP</td></tr> <tr><td>11</td><td>22.06</td><td>22.54</td><td>-27.46</td><td>50.00</td><td>12.72</td><td>9.71</td><td>0.11</td><td>Average</td></tr> <tr><td>12</td><td>22.06</td><td>27.28</td><td>-32.72</td><td>60.00</td><td>17.46</td><td>9.71</td><td>0.11</td><td>QP</td></tr> </tbody> </table>					Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark		MHz	dBuV	dB	dBuV	dBuV	dB	dB		1	0.16	33.87	-21.78	55.65	24.20	9.63	0.04	Average	2	0.16	45.45	-20.20	65.65	35.78	9.63	0.04	QP	3	0.18	37.43	-17.16	54.59	27.79	9.62	0.02	Average	4	0.18	44.30	-20.29	64.59	34.66	9.62	0.02	QP	5	0.20	35.32	-18.30	53.62	25.70	9.62	0.00	Average	6	0.20	42.81	-20.81	63.62	33.19	9.62	0.00	QP	7 MAX	0.41	37.50	-18.09	47.59	27.79	9.61	0.10	Average	8	0.41	46.29	-11.30	57.59	36.58	9.61	0.10	QP	9	3.80	20.15	-25.85	46.00	10.43	9.64	0.08	Average	10	3.80	24.39	-31.61	56.00	14.67	9.64	0.08	QP	11	22.06	22.54	-27.46	50.00	12.72	9.71	0.11	Average	12	22.06	27.28	-32.72	60.00	17.46	9.71	0.11	QP
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<p>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.)</p>																																																																																																																																	



AC Power-line Conducted Emissions Result

Operating Mode	2	Power Phase	Line
Operating Function	PoE Mode_Dipole Antenna		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	36.70	-18.95	55.65	27.04	9.62	0.04	Average
2	0.16	46.71	-18.94	65.65	37.05	9.62	0.04	QP
3	0.20	36.11	-17.34	53.45	26.49	9.62	0.00	Average
4	0.20	44.67	-18.78	63.45	35.05	9.62	0.00	QP
5	0.23	32.24	-20.20	52.44	22.60	9.62	0.02	Average
6	0.23	43.67	-18.77	62.44	34.03	9.62	0.02	QP
7 MAX	0.41	38.60	-8.99	47.59	28.89	9.61	0.10	Average
8	0.41	47.62	-9.97	57.59	37.91	9.61	0.10	QP
9	3.51	18.11	-27.89	46.00	8.41	9.63	0.07	Average
10	3.51	22.18	-33.82	56.00	12.48	9.63	0.07	QP
11	21.83	24.45	-25.55	50.00	14.74	9.59	0.12	Average
12	21.83	29.21	-30.79	60.00	19.50	9.59	0.12	QP

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.)

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
5.15-5.25GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	41.475M	17.366M	17M4D1D	26.1M	16.642M
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	44.35M	18.491M	18M5D1D	22.8M	17.791M
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	80.65M	37.181M	37M2D1D	43.45M	36.032M
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	84.5M	75.062M	75M1D1D	84.5M	75.062M
5.25-5.35GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	43.4M	18.041M	18M0D1D	39.125M	16.667M
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	46.3M	19.29M	19M3D1D	29.675M	17.816M
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	80.8M	38.581M	38M6D1D	43.75M	36.082M
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	84.6M	75.162M	75M2D1D	84.6M	75.162M
5.47-5.725GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	43.25M	18.116M	18M1D1D	22.375M	14.528M
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	45.825M	19.44M	19M4D1D	22.425M	14.858M
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	79.5M	36.732M	36M7D1D	43.25M	33.513M
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	141M	74.963M	75M0D1D	84.1M	72.189M
5.725-5.85GHz	-	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	16.35M	17.766M	17M8D1D	3.16M	11.794M
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	17.575M	18.541M	18M5D1D	3.72M	12.414M
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	35.25M	37.981M	38M0D1D	3.08M	26.727M
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	73.8M	75.462M	75M5D1D	2.86M	37.321M

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;



Result

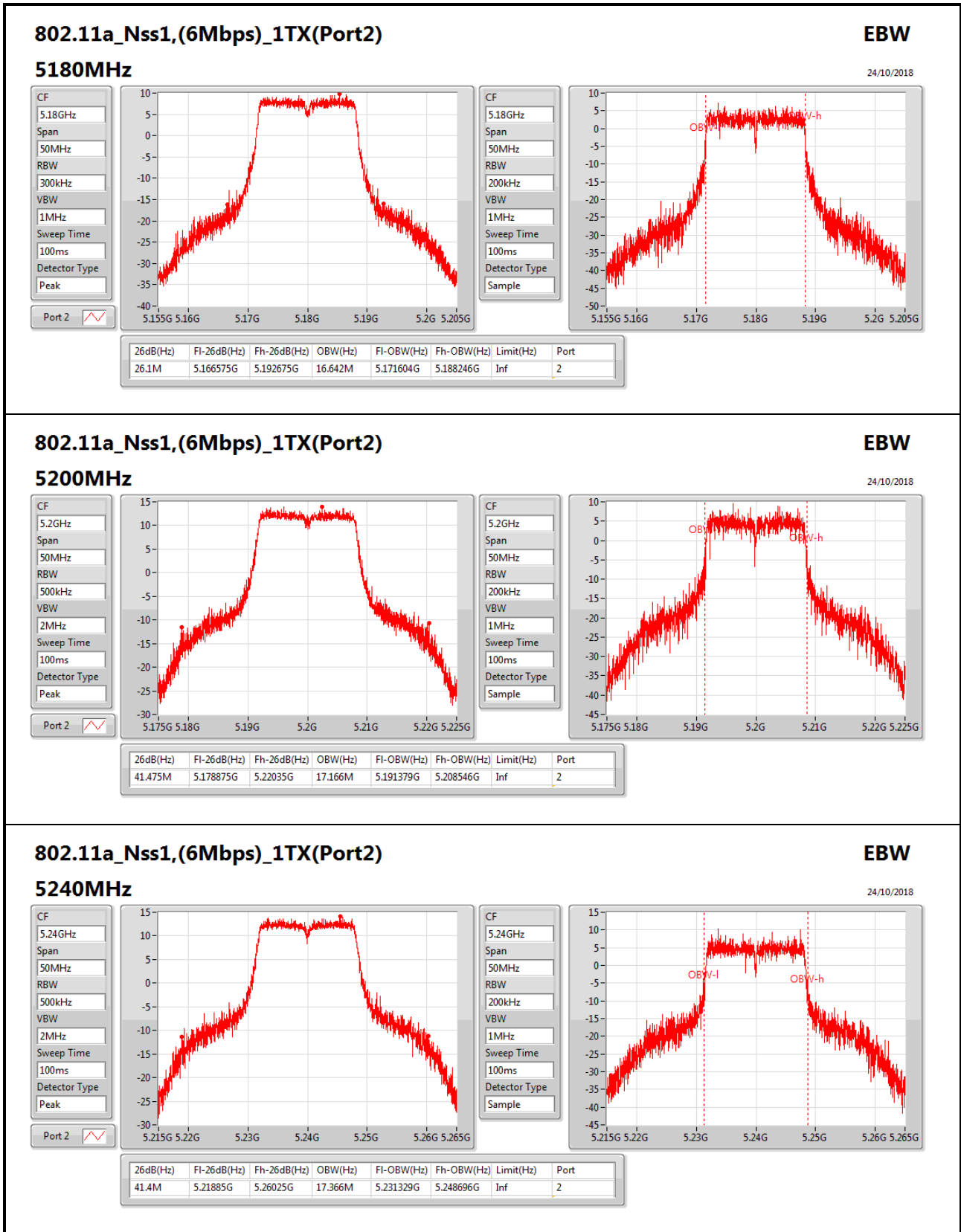
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
802.11a_Nss1,(6Mbps)_1TX(Port2)	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	Inf			26.1M	16.642M
5200MHz_TnomVnom	Pass	Inf			41.475M	17.166M
5240MHz_TnomVnom	Pass	Inf			41.4M	17.366M
5260MHz_TnomVnom	Pass	Inf			42.325M	17.291M
5300MHz_TnomVnom	Pass	Inf			43.4M	18.041M
5320MHz_TnomVnom	Pass	Inf			39.125M	16.667M
5500MHz_TnomVnom	Pass	Inf			22.375M	16.592M
5580MHz_TnomVnom	Pass	Inf			43.25M	18.116M
5700MHz_TnomVnom	Pass	Inf			22.7M	16.592M
5720MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	Inf			25.59M	14.528M
5720MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	500k			3.16M	11.794M
5745MHz_TnomVnom	Pass	500k			16.325M	17.766M
5785MHz_TnomVnom	Pass	500k			16.3M	17.541M
5825MHz_TnomVnom	Pass	500k			16.35M	17.266M
802.11ac_VHT20_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	Inf			22.8M	17.791M
5200MHz_TnomVnom	Pass	Inf			43.625M	18.241M
5240MHz_TnomVnom	Pass	Inf			44.35M	18.491M
5260MHz_TnomVnom	Pass	Inf			44.425M	18.316M
5300MHz_TnomVnom	Pass	Inf			46.3M	19.29M
5320MHz_TnomVnom	Pass	Inf			29.675M	17.816M
5500MHz_TnomVnom	Pass	Inf			22.5M	17.716M
5580MHz_TnomVnom	Pass	Inf			45.825M	19.44M
5700MHz_TnomVnom	Pass	Inf			22.425M	17.791M
5720MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	Inf			26.835M	14.858M
5720MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	500k			3.72M	12.414M
5745MHz_TnomVnom	Pass	500k			17.575M	18.541M
5785MHz_TnomVnom	Pass	500k			17.55M	18.341M
5825MHz_TnomVnom	Pass	500k			17.575M	18.166M
802.11ac_VHT40_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-
5190MHz_TnomVnom	Pass	Inf			43.45M	36.032M
5230MHz_TnomVnom	Pass	Inf			80.65M	37.181M
5270MHz_TnomVnom	Pass	Inf			80.8M	38.581M
5310MHz_TnomVnom	Pass	Inf			43.75M	36.082M
5510MHz_TnomVnom	Pass	Inf			43.25M	36.032M
5550MHz_TnomVnom	Pass	Inf			79.5M	36.732M
5670MHz_TnomVnom	Pass	Inf			47.4M	36.132M
5710MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	Inf			55.545M	33.513M
5710MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	500k			3.08M	26.727M
5755MHz_TnomVnom	Pass	500k			35.25M	37.981M
5795MHz_TnomVnom	Pass	500k			35.1M	37.381M
802.11ac_VHT80_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-
5210MHz_TnomVnom	Pass	Inf			84.5M	75.062M

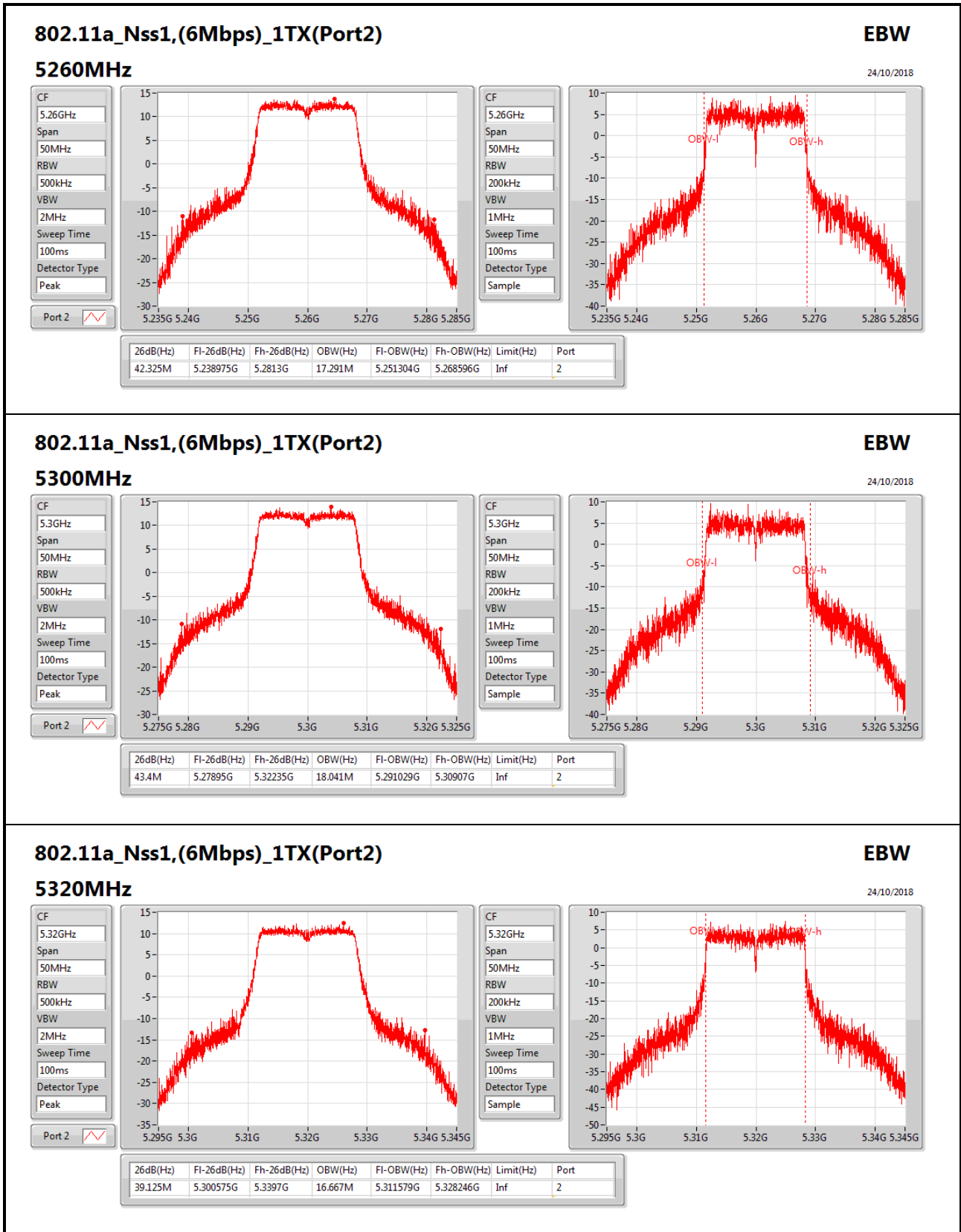


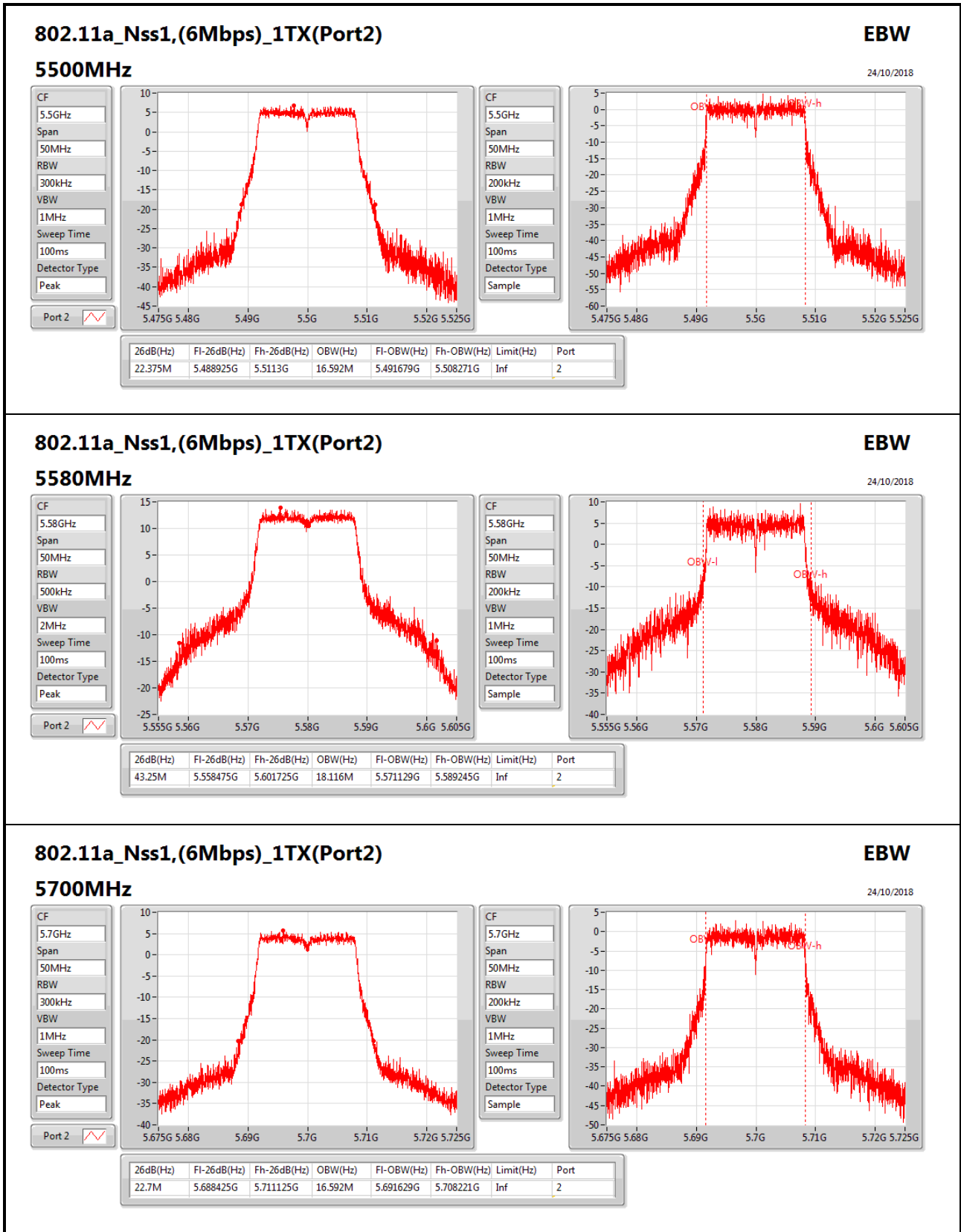
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)	Port 2-N dB (Hz)	Port 2-OBW (Hz)
5290MHz_TnomVnom	Pass	Inf			84.6M	75.162M
5530MHz_TnomVnom	Pass	Inf			84.1M	74.663M
5610MHz_TnomVnom	Pass	Inf			141M	74.963M
5690MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	Inf			108.15M	72.189M
5690MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	500k			2.86M	37.321M
5775MHz_TnomVnom	Pass	500k			73.8M	75.462M

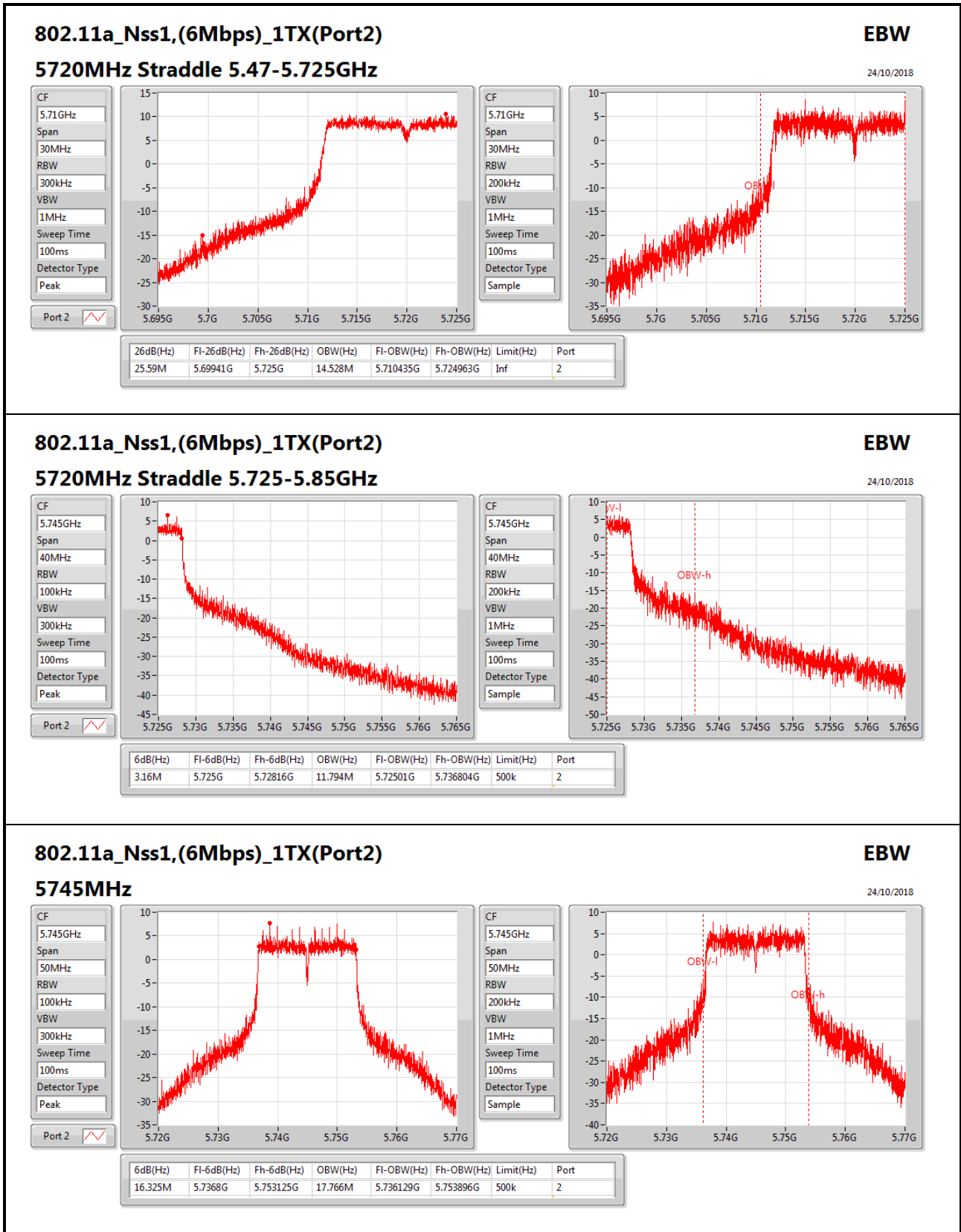
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band

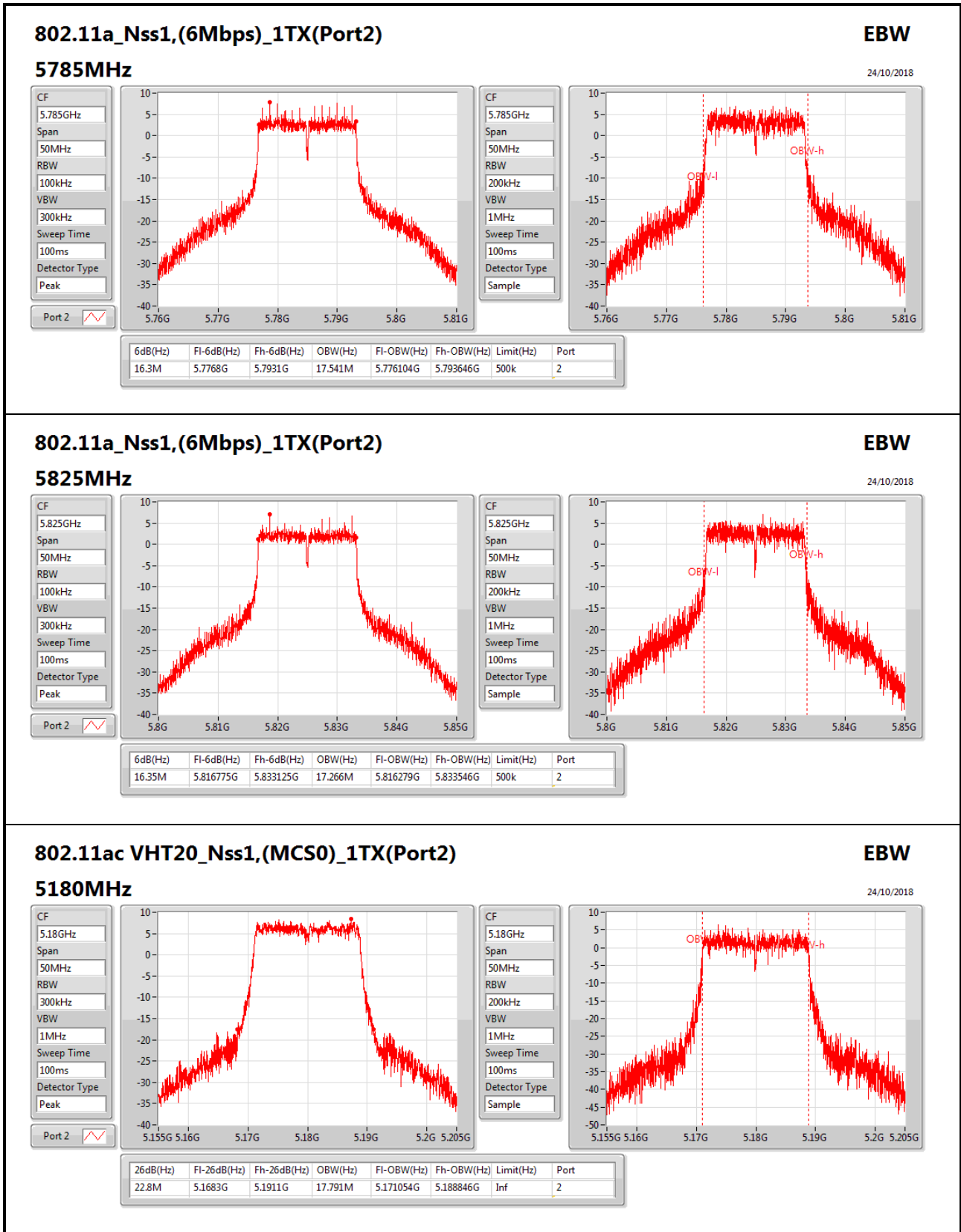
Port X-OBW = Port X 99% occupied bandwidth;

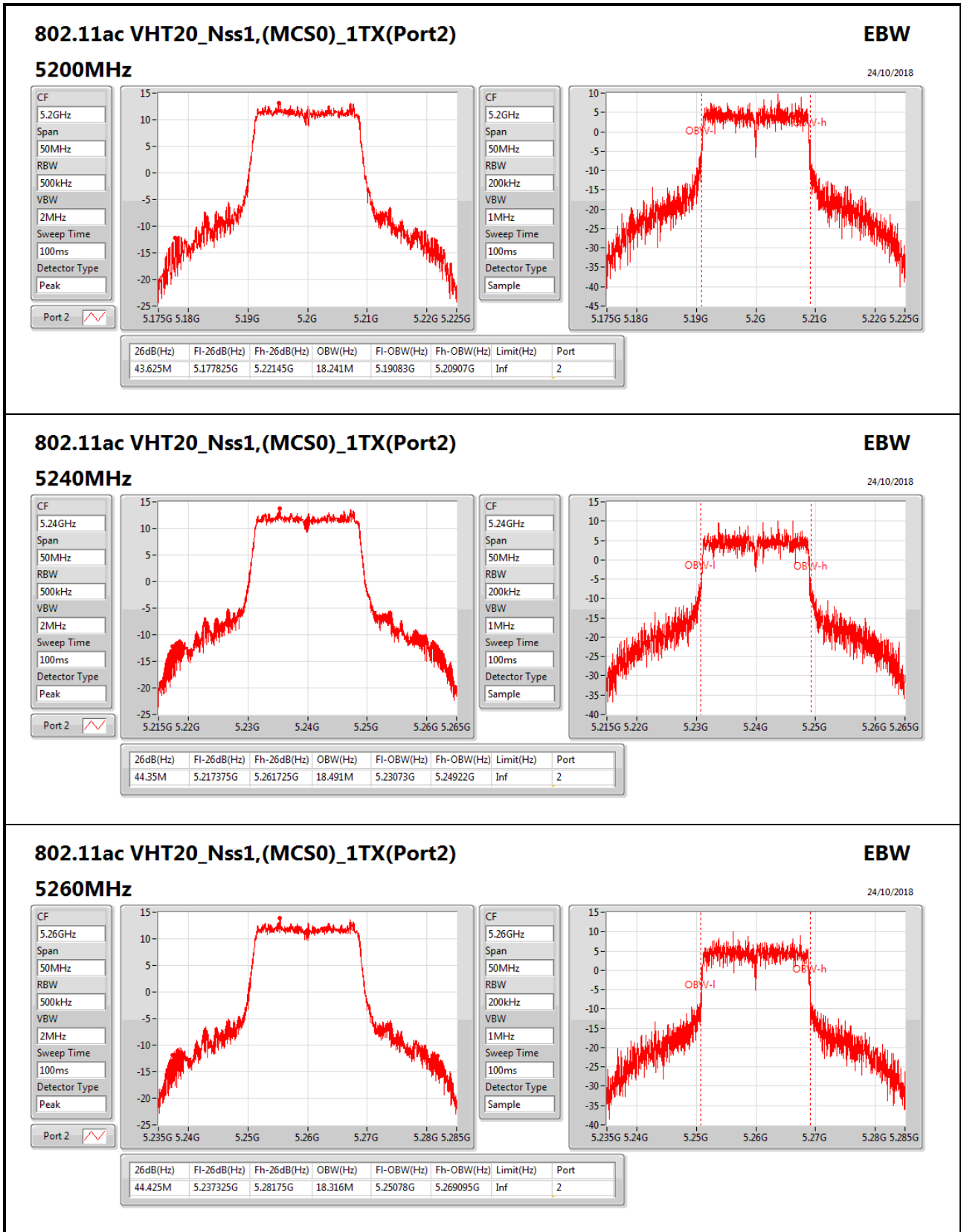


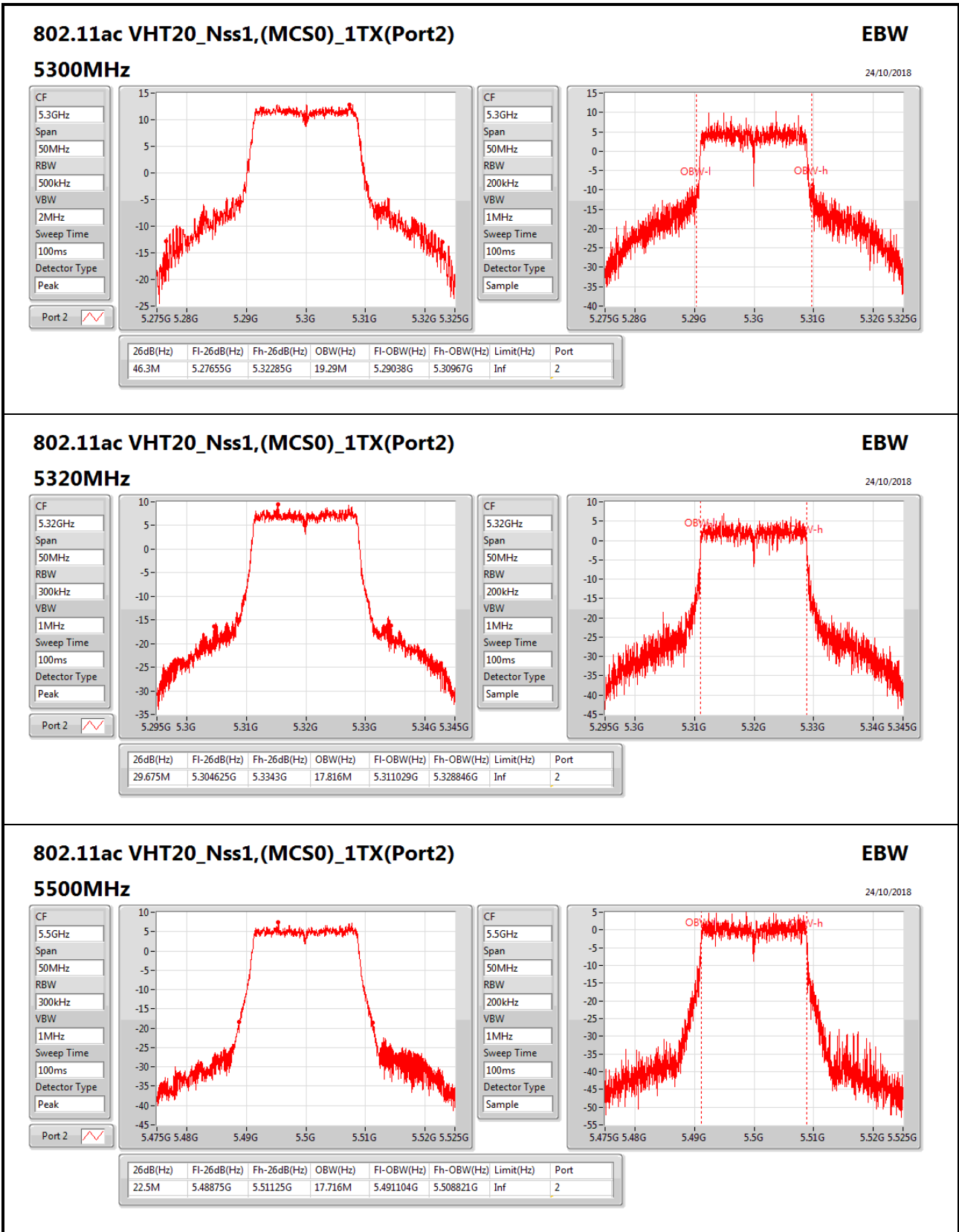


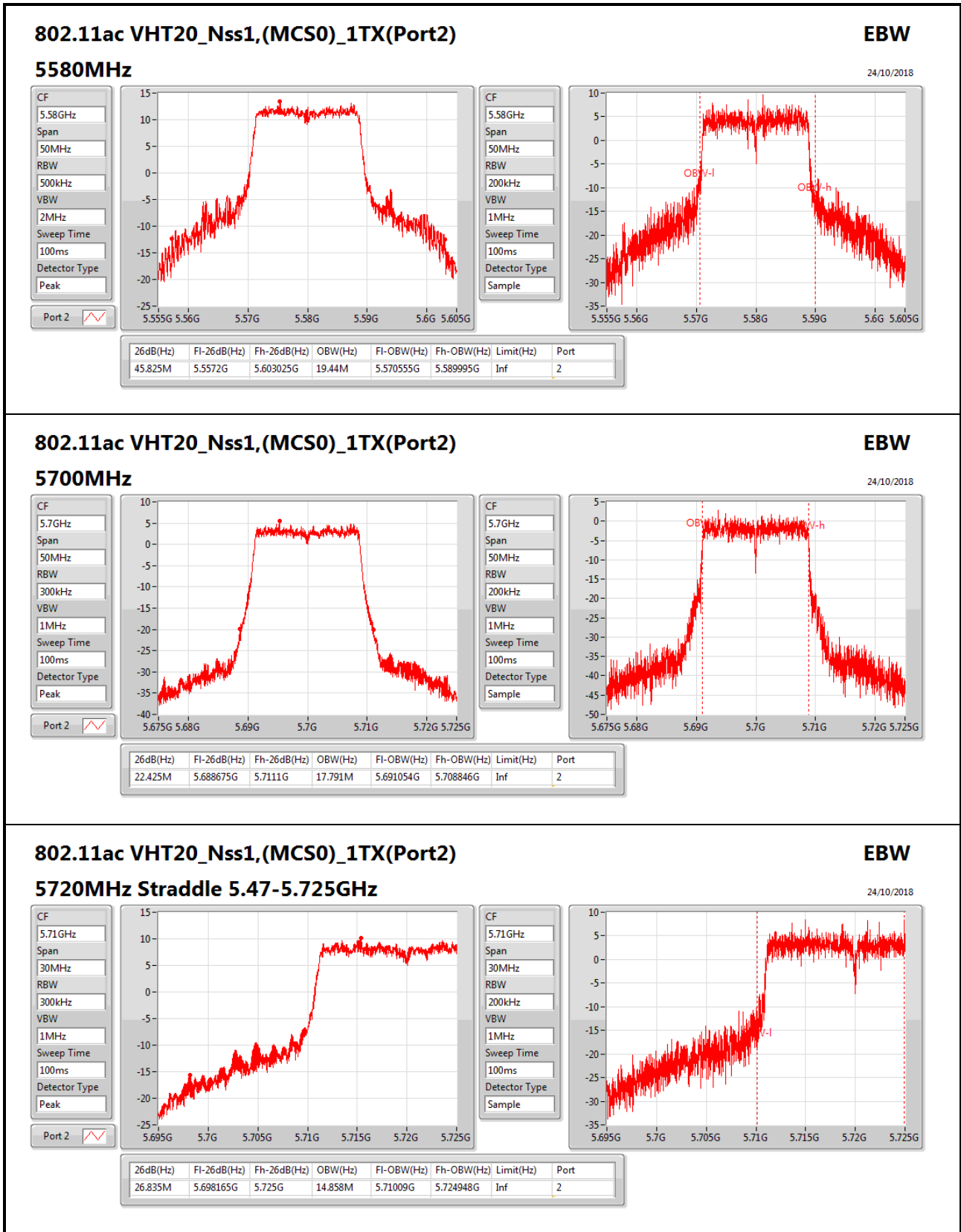


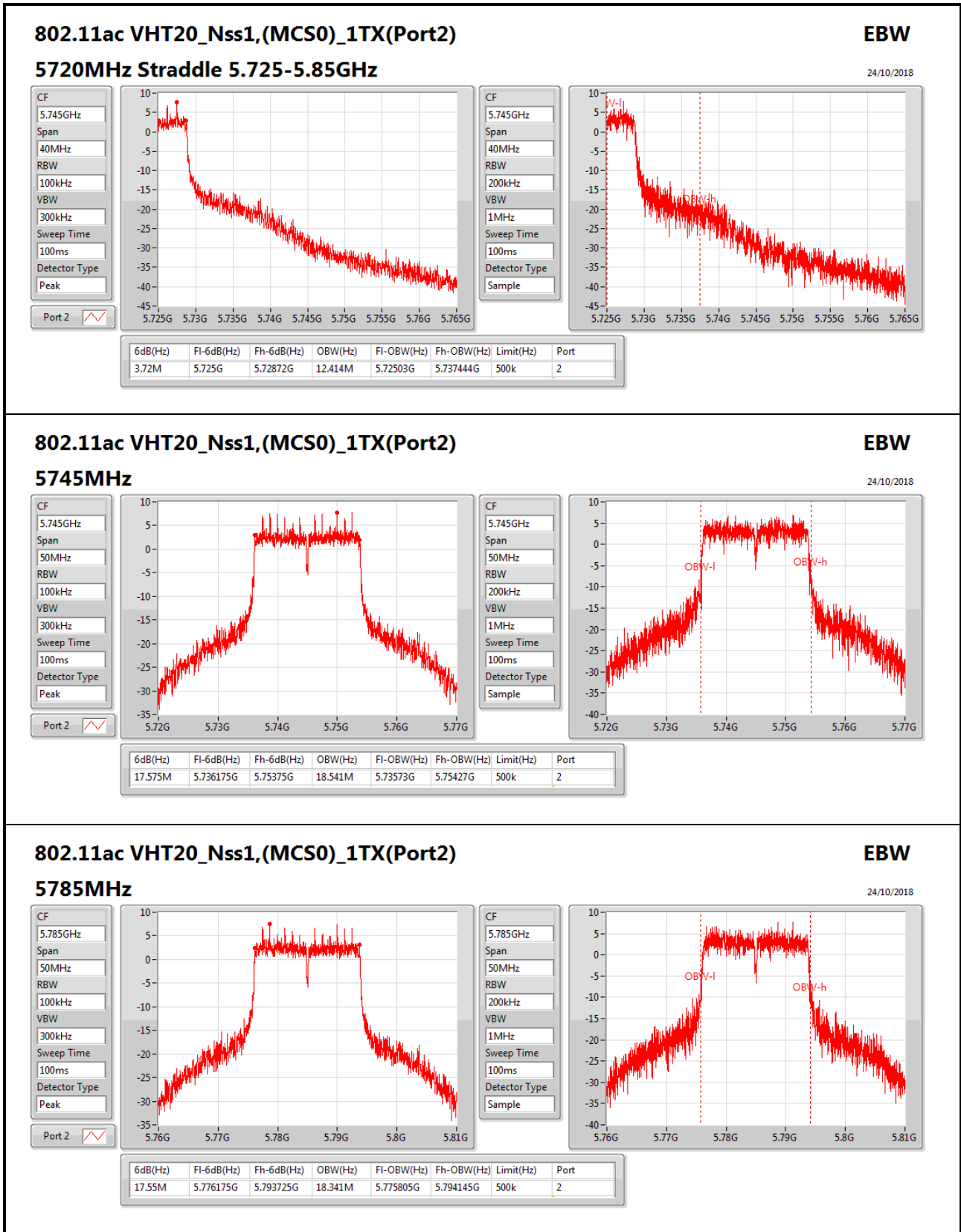


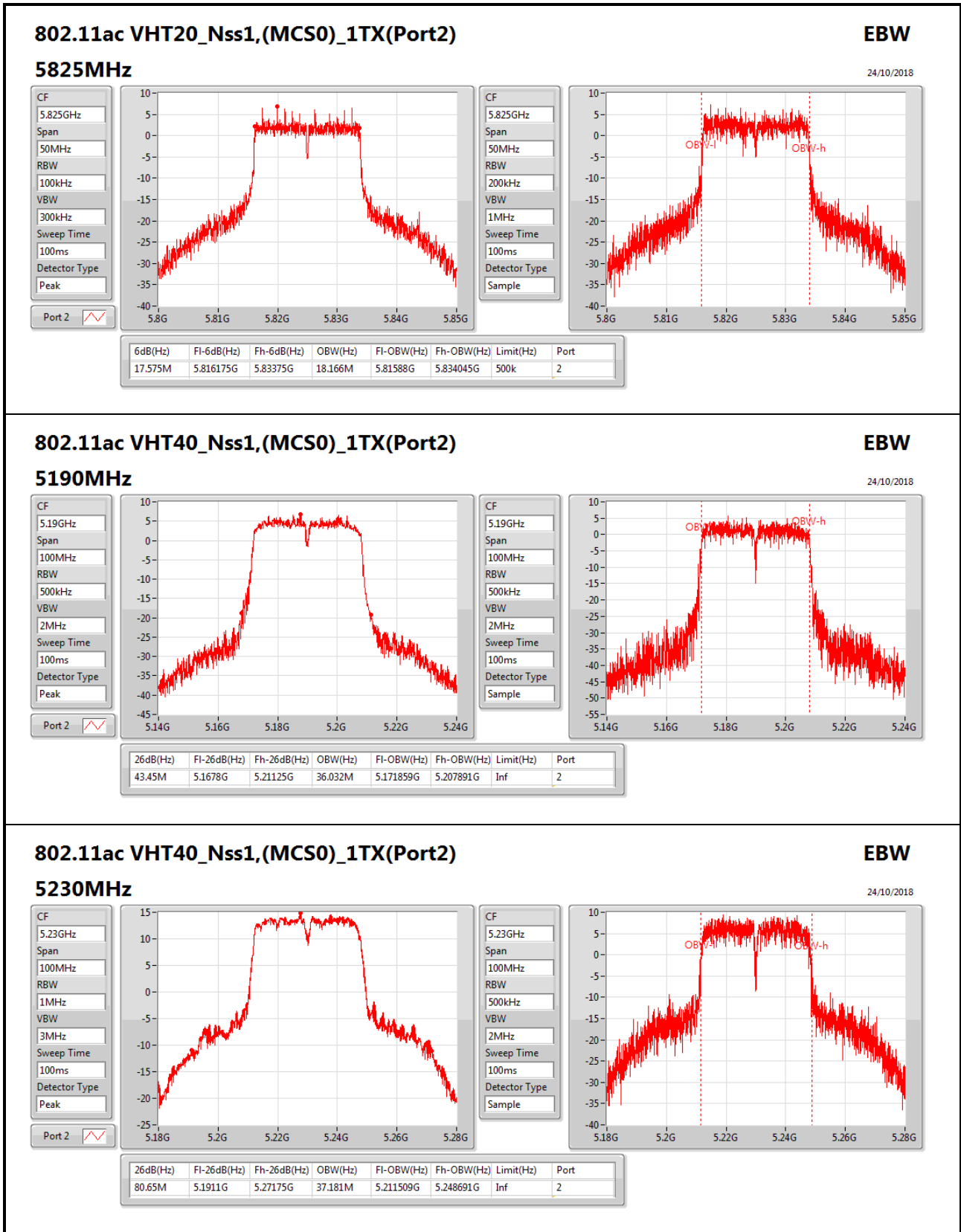


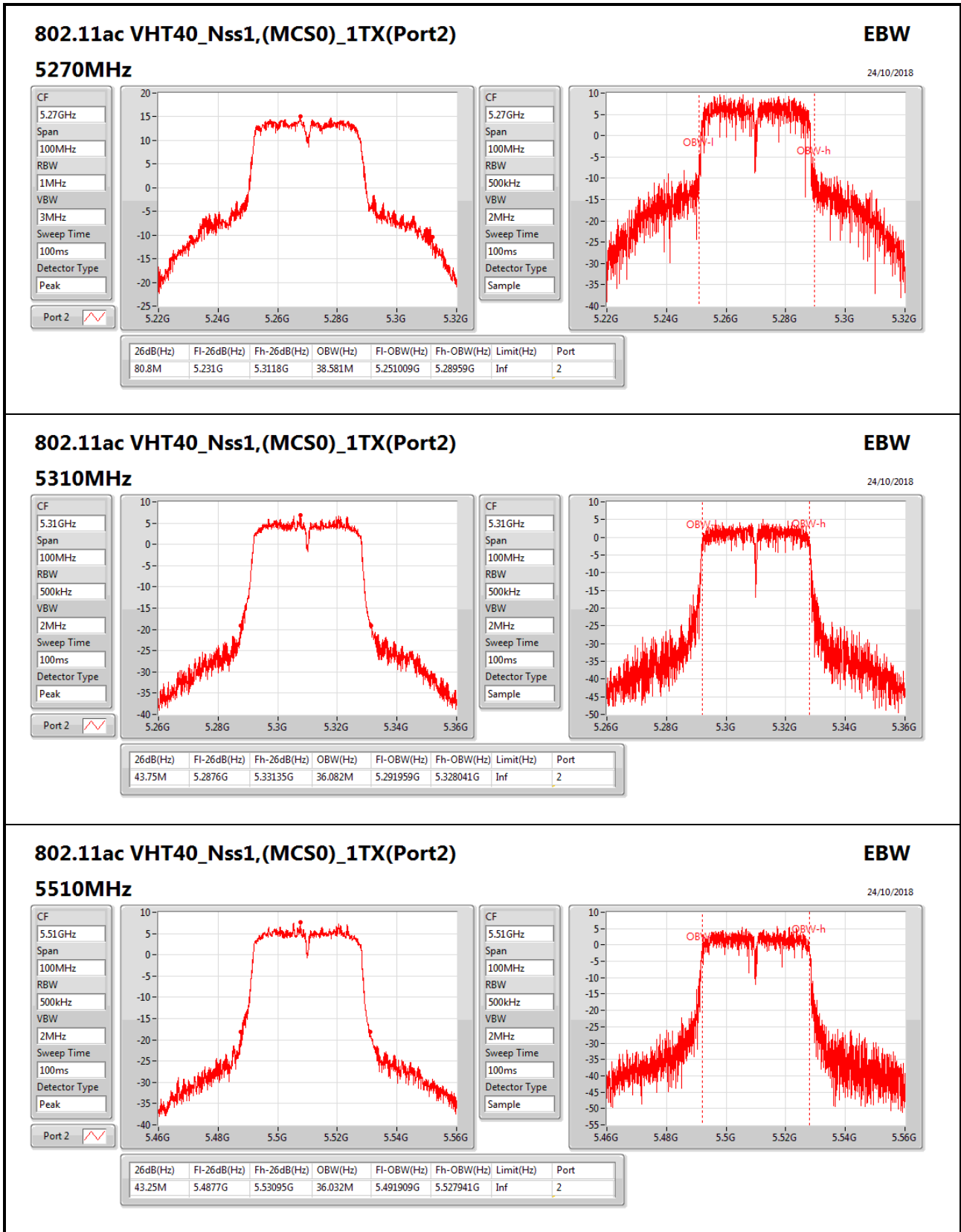


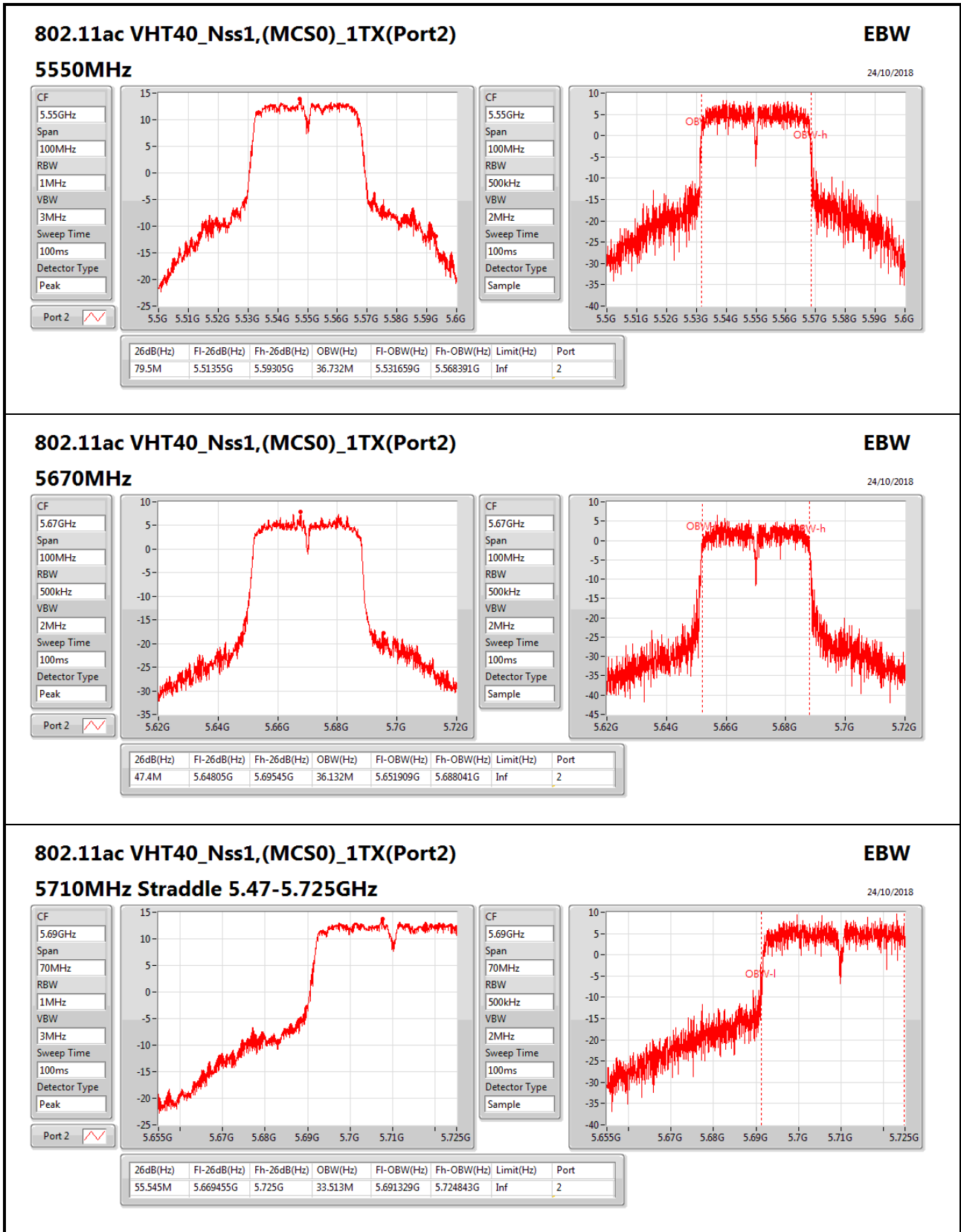


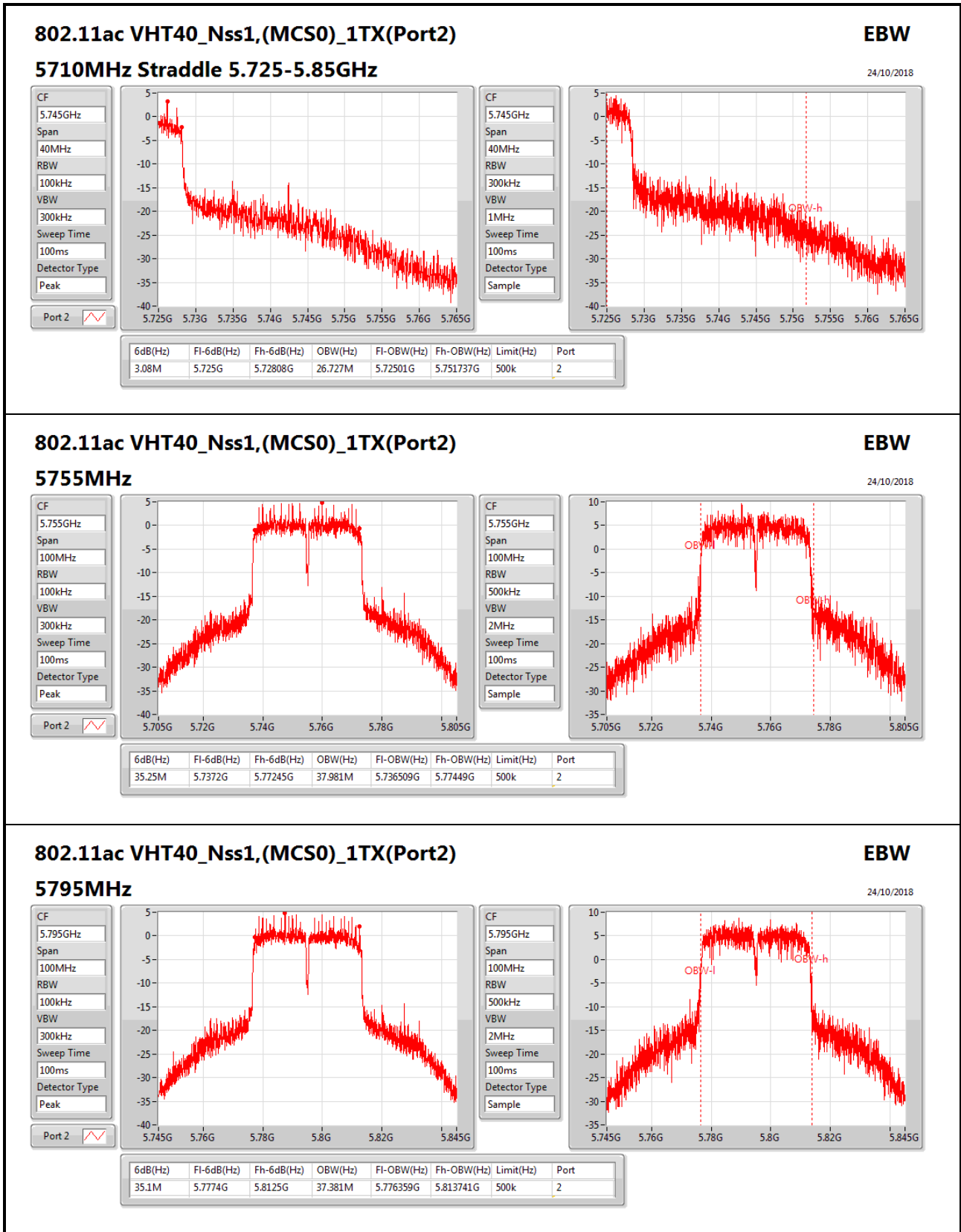


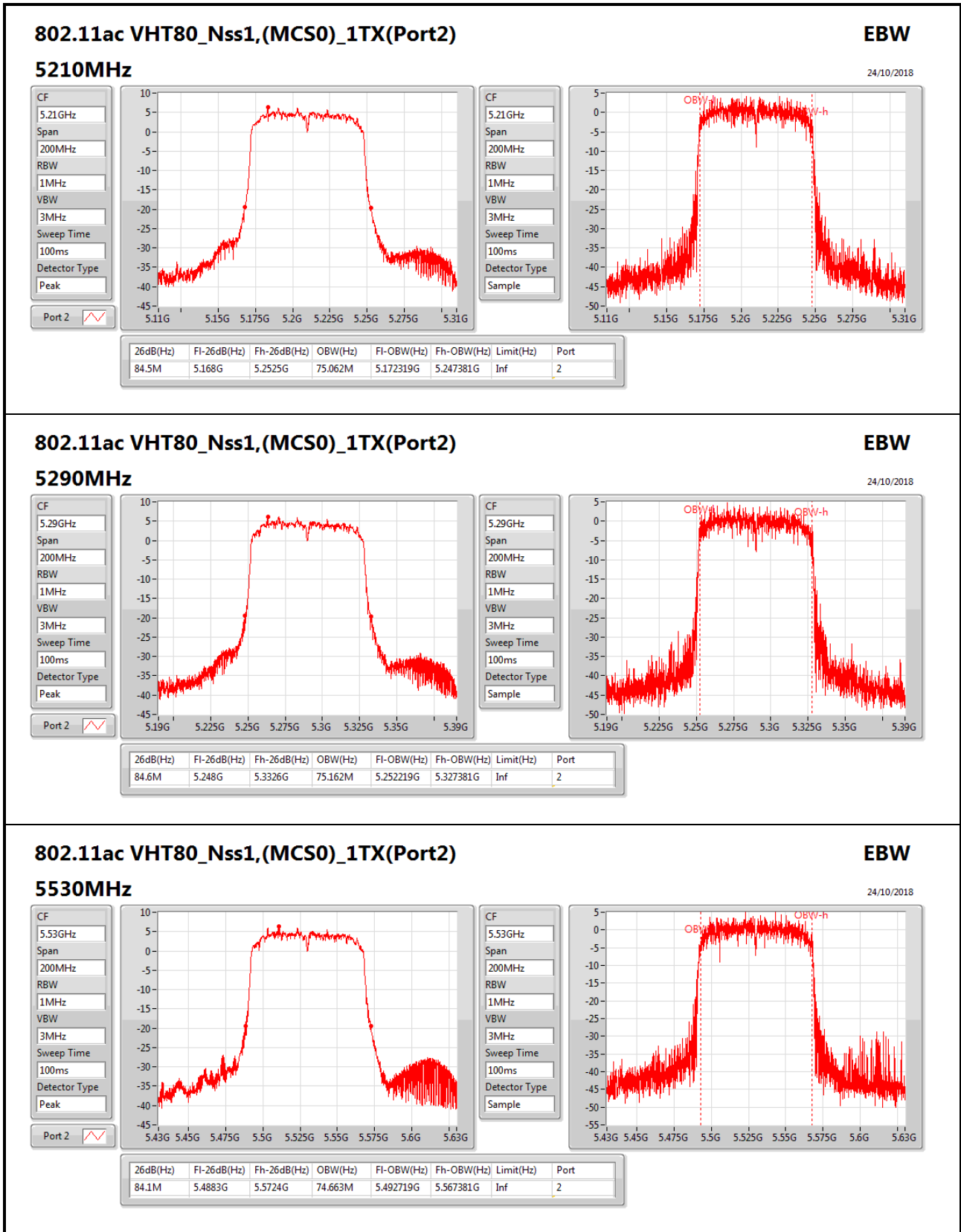


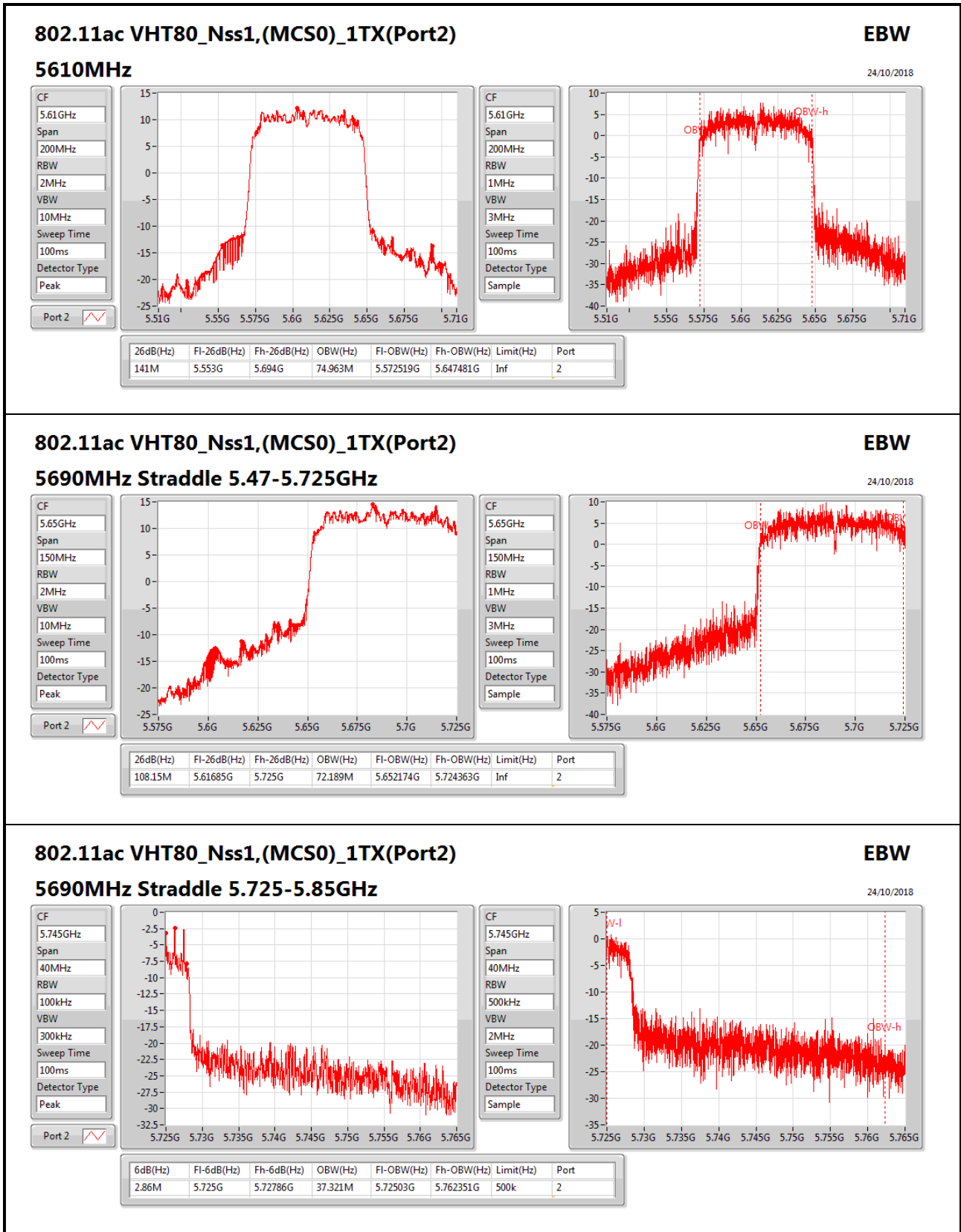












802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)

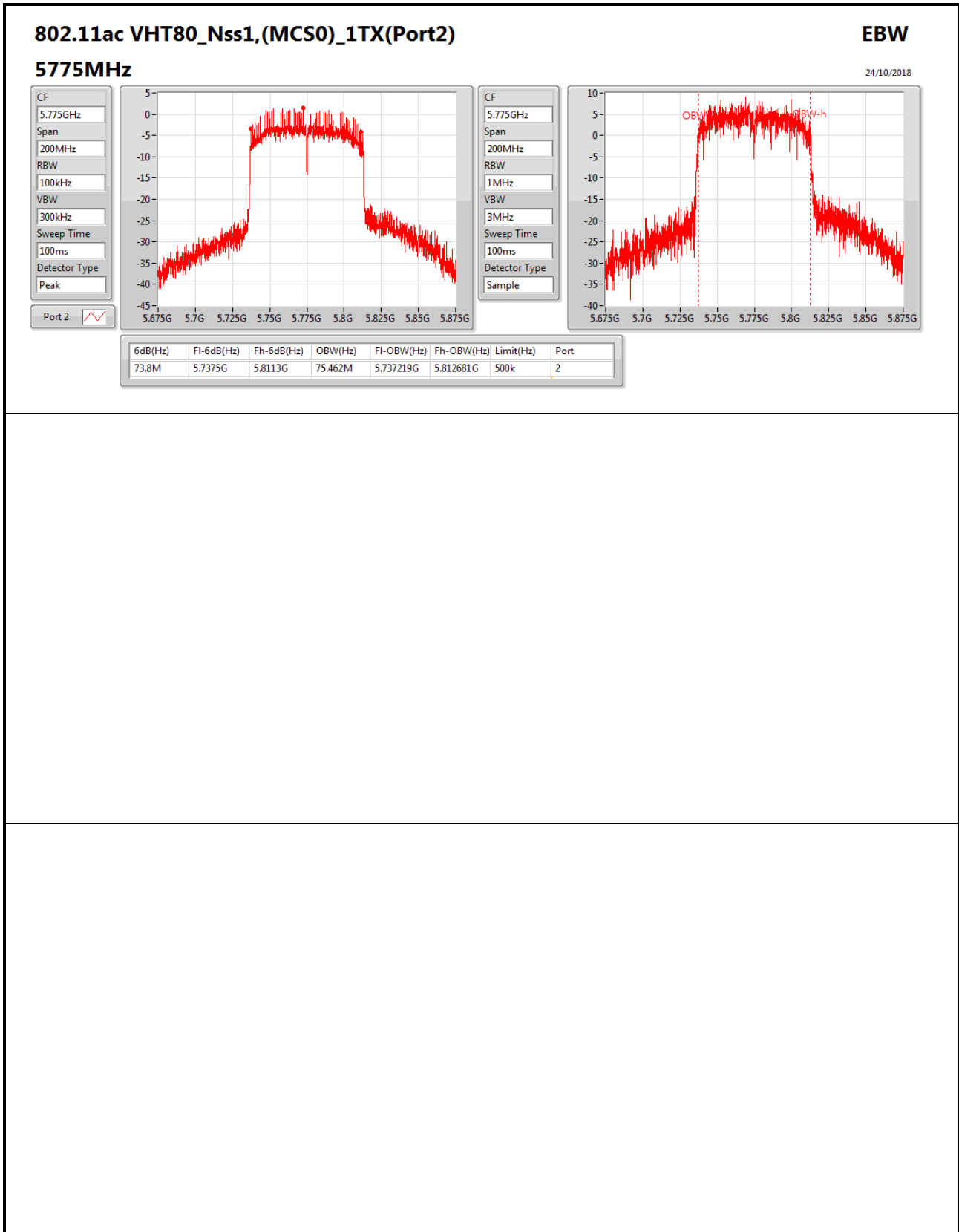
5690MHz Straddle 5.725-5.85GHz

EBW

24/10/2018

CF: 5.745GHz
Span: 40MHz
RBW: 100kHz
VBW: 300kHz
Sweep Time: 100ms
Detector Type: Peak

CF: 5.745GHz
Span: 40MHz
RBW: 500kHz
VBW: 2MHz
Sweep Time: 100ms
Detector Type: Sample





Summary

Mode	Total Power (dBm)	Total Power (W)	EIRP (dBm)	EIRP (W)
5.15-5.25GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	19.73	0.09397	18.37	0.06871
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	19.68	0.09290	18.32	0.06792
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	19.78	0.09506	18.42	0.06950
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	13.56	0.02270	12.20	0.01660
5.25-5.35GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	19.70	0.09333	18.34	0.06823
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	19.70	0.09333	18.34	0.06823
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	19.93	0.09840	18.57	0.07194
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	13.28	0.02128	11.92	0.01556
5.47-5.725GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	19.58	0.09078	18.22	0.06637
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	19.60	0.09120	18.24	0.06668
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	19.23	0.08375	17.87	0.06124
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	19.21	0.08337	17.85	0.06095
5.725-5.85GHz	-	-	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	18.37	0.06871	17.01	0.05023
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	18.39	0.06902	17.03	0.05047
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	18.66	0.07345	17.30	0.05370
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	18.41	0.06934	17.05	0.05070



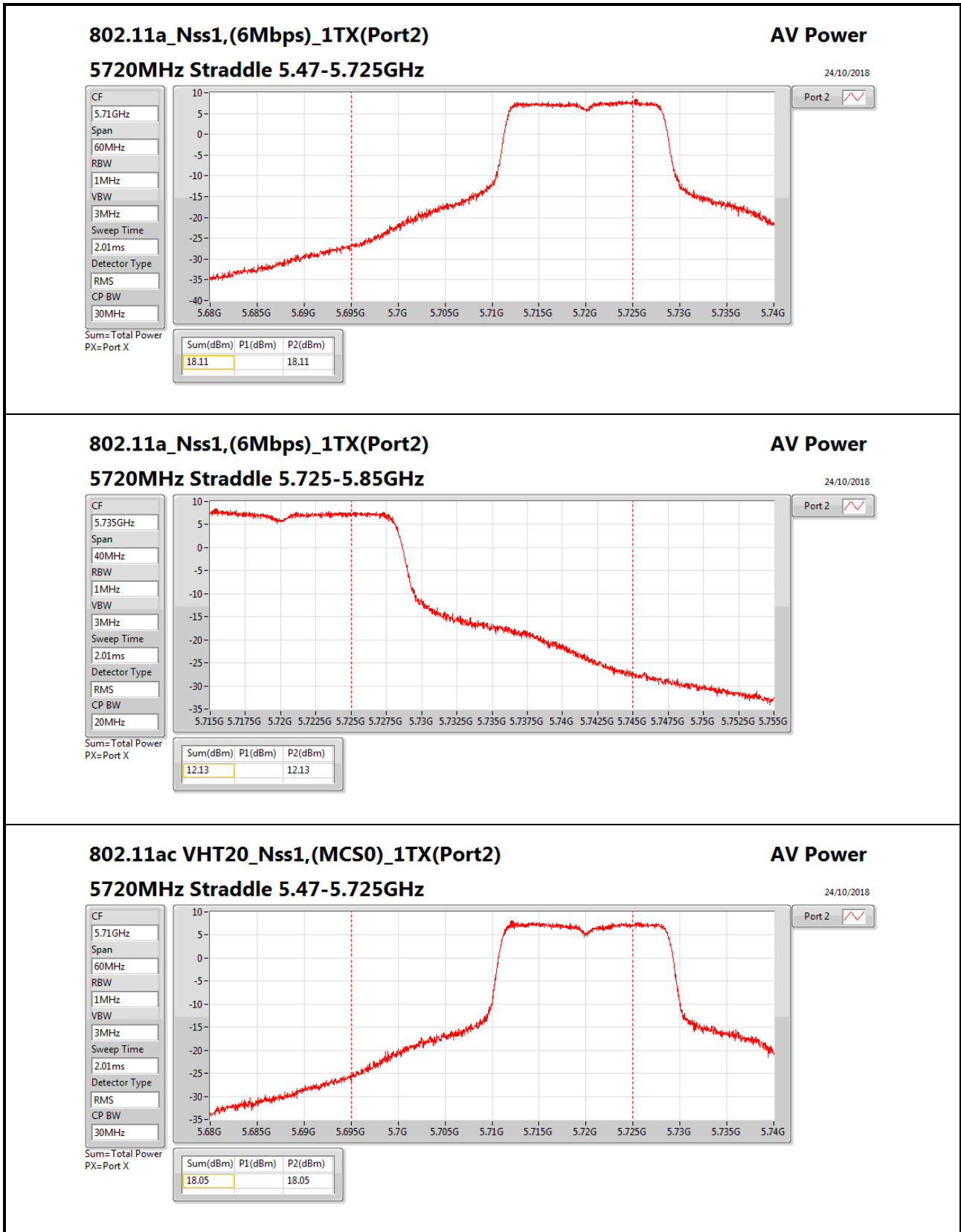
Result

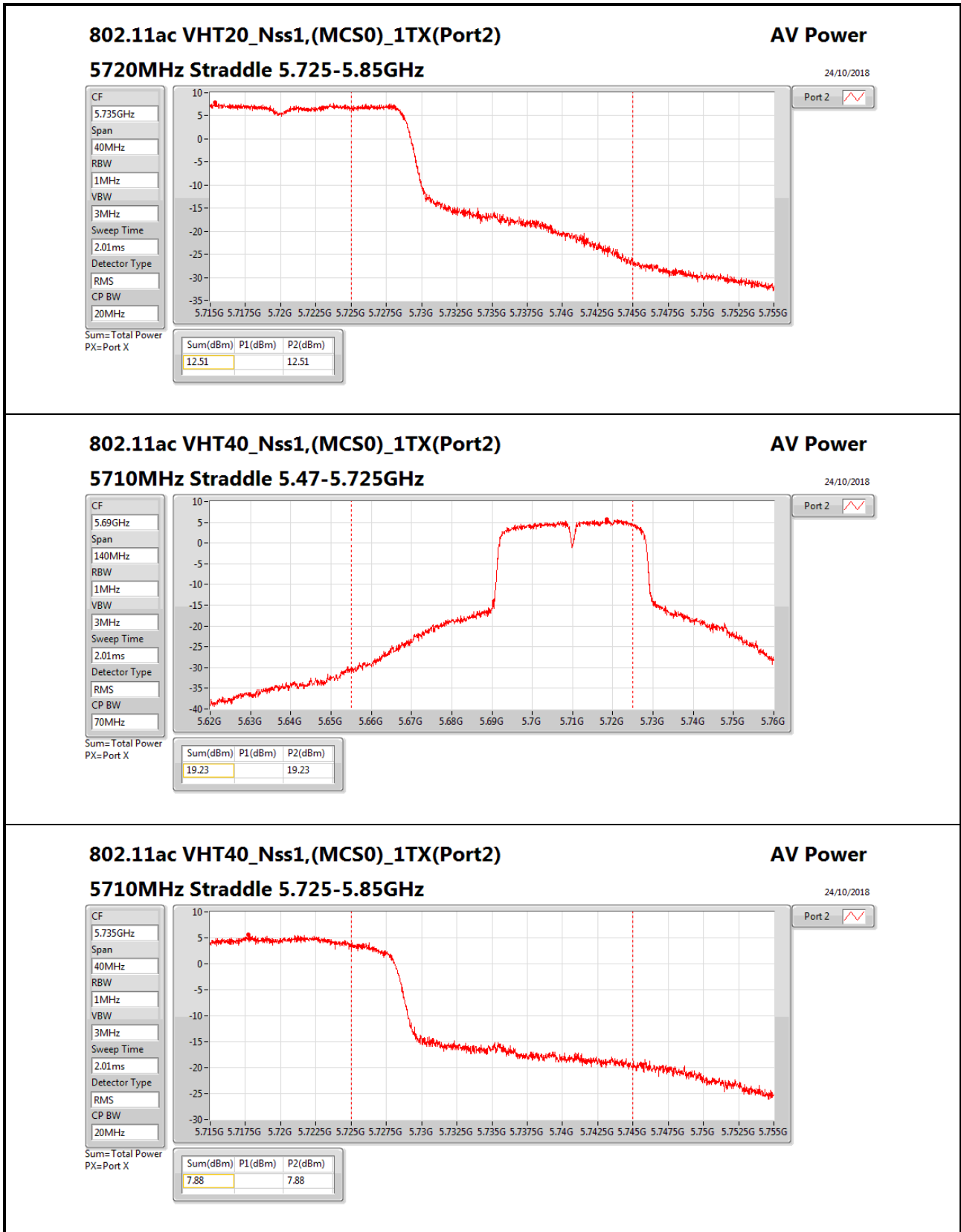
Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.11a_Nss1,(6Mbps)_1TX(Port2)	-	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	-1.36		17.71	17.71	24.00	16.35	30.00
5200MHz_TnomVnom	Pass	-1.36		19.46	19.46	24.00	18.10	30.00
5240MHz_TnomVnom	Pass	-1.36		19.73	19.73	24.00	18.37	30.00
5260MHz_TnomVnom	Pass	-1.36		19.70	19.70	24.00	18.34	30.00
5300MHz_TnomVnom	Pass	-1.36		19.48	19.48	24.00	18.12	30.00
5320MHz_TnomVnom	Pass	-1.36		18.00	18.00	24.00	16.64	30.00
5500MHz_TnomVnom	Pass	-1.36		14.99	14.99	24.00	13.63	30.00
5580MHz_TnomVnom	Pass	-1.36		19.58	19.58	24.00	18.22	30.00
5700MHz_TnomVnom	Pass	-1.36		13.66	13.66	24.00	12.30	30.00
5720MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		18.11	18.11	24.00	16.75	30.00
5720MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		12.13	12.13	30.00	10.77	36.00
5745MHz_TnomVnom	Pass	-1.36		18.37	18.37	30.00	17.01	36.00
5785MHz_TnomVnom	Pass	-1.36		18.29	18.29	30.00	16.93	36.00
5825MHz_TnomVnom	Pass	-1.36		17.77	17.77	30.00	16.41	36.00
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	-1.36		16.81	16.81	24.00	15.45	30.00
5200MHz_TnomVnom	Pass	-1.36		19.39	19.39	24.00	18.03	30.00
5240MHz_TnomVnom	Pass	-1.36		19.68	19.68	24.00	18.32	30.00
5260MHz_TnomVnom	Pass	-1.36		19.70	19.70	24.00	18.34	30.00
5300MHz_TnomVnom	Pass	-1.36		19.52	19.52	24.00	18.16	30.00
5320MHz_TnomVnom	Pass	-1.36		17.50	17.50	24.00	16.14	30.00
5500MHz_TnomVnom	Pass	-1.36		15.54	15.54	24.00	14.18	30.00
5580MHz_TnomVnom	Pass	-1.36		19.60	19.60	24.00	18.24	30.00
5700MHz_TnomVnom	Pass	-1.36		13.38	13.38	24.00	12.02	30.00
5720MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		18.05	18.05	24.00	16.69	30.00
5720MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		12.51	12.51	30.00	11.15	36.00
5745MHz_TnomVnom	Pass	-1.36		18.39	18.39	30.00	17.03	36.00
5785MHz_TnomVnom	Pass	-1.36		18.22	18.22	30.00	16.86	36.00
5825MHz_TnomVnom	Pass	-1.36		17.53	17.53	30.00	16.17	36.00
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-	-	-
5190MHz_TnomVnom	Pass	-1.36		15.19	15.19	24.00	13.83	30.00
5230MHz_TnomVnom	Pass	-1.36		19.78	19.78	24.00	18.42	30.00
5270MHz_TnomVnom	Pass	-1.36		19.93	19.93	24.00	18.57	30.00
5310MHz_TnomVnom	Pass	-1.36		15.01	15.01	24.00	13.65	30.00
5510MHz_TnomVnom	Pass	-1.36		15.67	15.67	24.00	14.31	30.00
5550MHz_TnomVnom	Pass	-1.36		18.75	18.75	24.00	17.39	30.00
5670MHz_TnomVnom	Pass	-1.36		15.67	15.67	24.00	14.31	30.00
5710MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		19.23	19.23	24.00	17.87	30.00
5710MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		7.88	7.88	30.00	6.52	36.00
5755MHz_TnomVnom	Pass	-1.36		18.66	18.66	30.00	17.30	36.00
5795MHz_TnomVnom	Pass	-1.36		18.27	18.27	30.00	16.91	36.00
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-	-	-
5210MHz_TnomVnom	Pass	-1.36		13.56	13.56	24.00	12.20	30.00

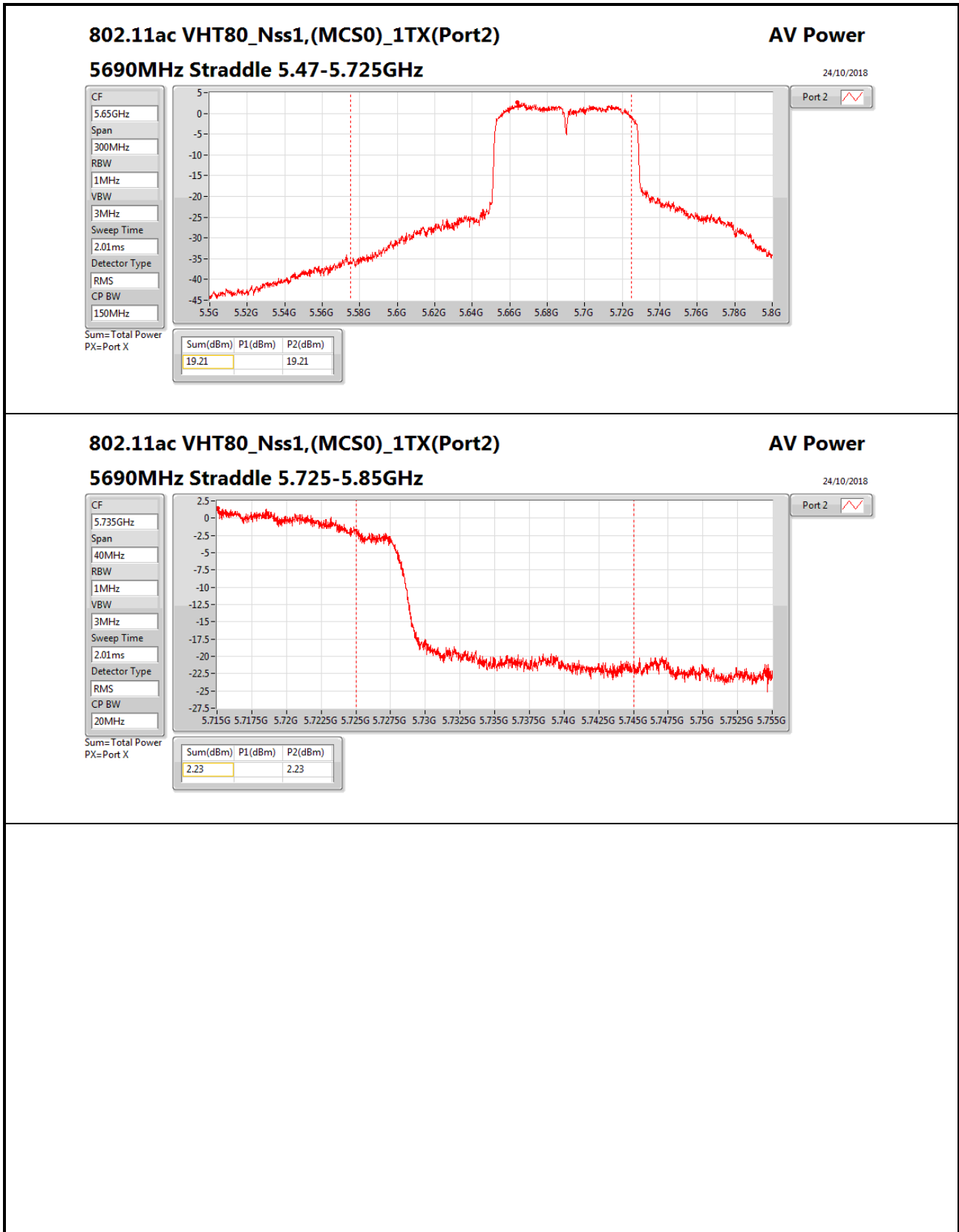


Mode	Result	DG (dBi)	Port 1 (dBm)	Port 2 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
5290MHz_TnomVnom	Pass	-1.36		13.28	13.28	24.00	11.92	30.00
5530MHz_TnomVnom	Pass	-1.36		13.27	13.27	24.00	11.91	30.00
5610MHz_TnomVnom	Pass	-1.36		16.11	16.11	24.00	14.75	30.00
5690MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		19.21	19.21	24.00	17.85	30.00
5690MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		2.23	2.23	30.00	0.87	36.00
5775MHz_TnomVnom	Pass	-1.36		18.41	18.41	30.00	17.05	36.00

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









Summary

Mode	PD (dBm/RBW)	EIRP PD (dBm/RBW)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	7.21	5.85
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	7.00	5.64
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	4.66	3.30
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	-4.07	-5.43
5.25-5.35GHz	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	7.25	5.89
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	7.04	5.68
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	4.96	3.60
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	-4.35	-5.71
5.47-5.725GHz	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	6.98	5.62
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	6.77	5.41
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	3.70	2.34
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	0.66	-0.70
5.725-5.85GHz	-	-
802.11a_Nss1,(6Mbps)_1TX(Port2)	4.40	3.04
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	4.23	2.87
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	2.07	0.71
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	-1.59	-2.95

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



Result

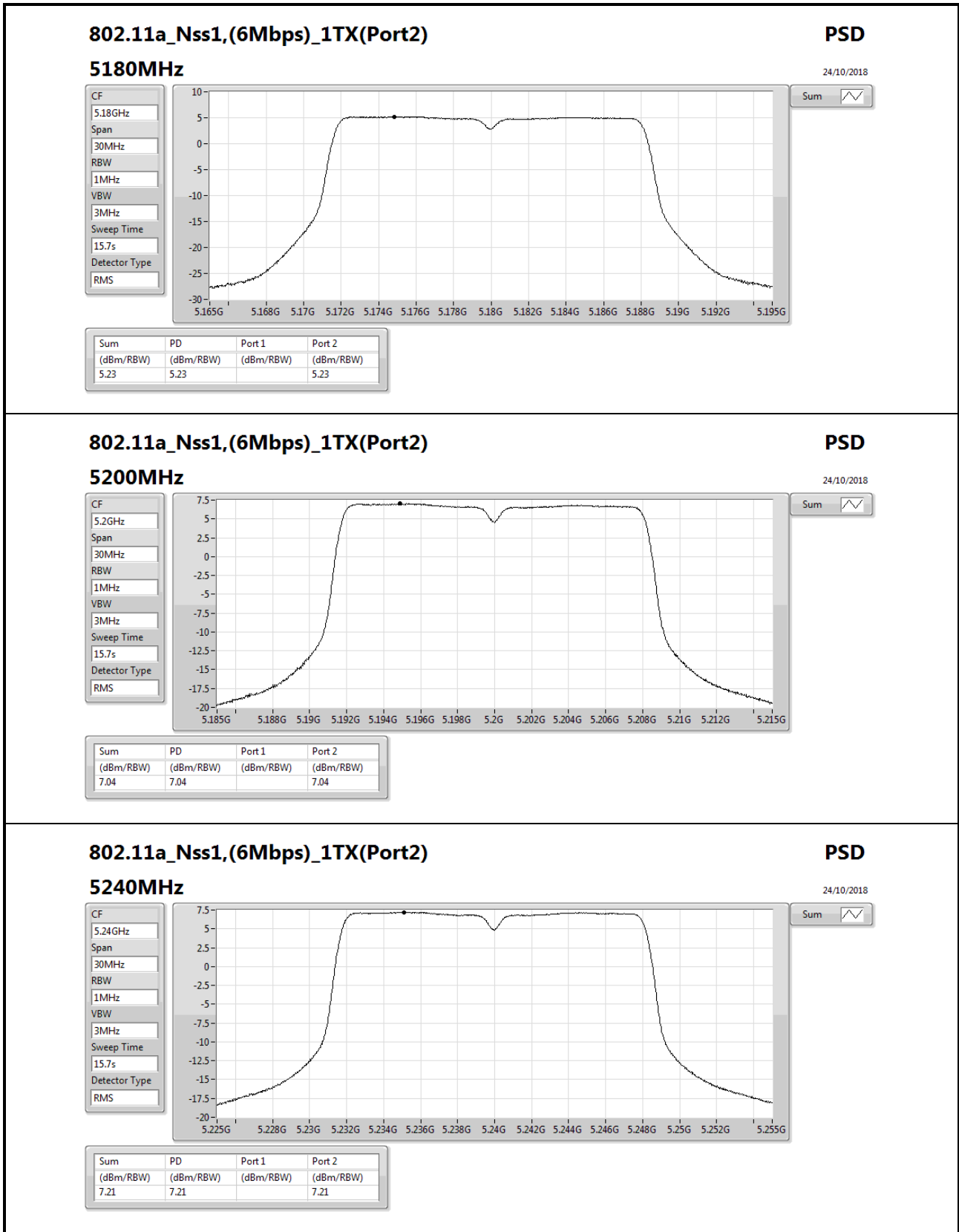
Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)	EIRP PD (dBm/RBW)	EIRP PD Limit (dBm/RBW)
802.11a_Nss1,(6Mbps)_1TX(Port2)	-	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	-1.36		5.23	5.23	11.00	3.87	17.00
5200MHz_TnomVnom	Pass	-1.36		7.04	7.04	11.00	5.68	17.00
5240MHz_TnomVnom	Pass	-1.36		7.21	7.21	11.00	5.85	17.00
5260MHz_TnomVnom	Pass	-1.36		7.25	7.25	11.00	5.89	17.00
5300MHz_TnomVnom	Pass	-1.36		7.07	7.07	11.00	5.71	17.00
5320MHz_TnomVnom	Pass	-1.36		5.52	5.52	11.00	4.16	17.00
5500MHz_TnomVnom	Pass	-1.36		2.43	2.43	11.00	1.07	17.00
5580MHz_TnomVnom	Pass	-1.36		6.98	6.98	11.00	5.62	17.00
5700MHz_TnomVnom	Pass	-1.36		1.36	1.36	11.00	0.00	17.00
5720MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		5.96	5.96	11.00	4.60	17.00
5720MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		4.35	4.35	30.00	2.99	36.00
5745MHz_TnomVnom	Pass	-1.36		4.40	4.40	30.00	3.04	36.00
5785MHz_TnomVnom	Pass	-1.36		4.30	4.30	30.00	2.94	36.00
5825MHz_TnomVnom	Pass	-1.36		3.73	3.73	30.00	2.37	36.00
802.11ac VHT20_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-	-	-
5180MHz_TnomVnom	Pass	-1.36		4.14	4.14	11.00	2.78	17.00
5200MHz_TnomVnom	Pass	-1.36		6.71	6.71	11.00	5.35	17.00
5240MHz_TnomVnom	Pass	-1.36		7.00	7.00	11.00	5.64	17.00
5260MHz_TnomVnom	Pass	-1.36		7.04	7.04	11.00	5.68	17.00
5300MHz_TnomVnom	Pass	-1.36		6.81	6.81	11.00	5.45	17.00
5320MHz_TnomVnom	Pass	-1.36		4.79	4.79	11.00	3.43	17.00
5500MHz_TnomVnom	Pass	-1.36		2.83	2.83	11.00	1.47	17.00
5580MHz_TnomVnom	Pass	-1.36		6.77	6.77	11.00	5.41	17.00
5700MHz_TnomVnom	Pass	-1.36		0.67	0.67	11.00	-0.69	17.00
5720MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		5.77	5.77	11.00	4.41	17.00
5720MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		4.11	4.11	30.00	2.75	36.00
5745MHz_TnomVnom	Pass	-1.36		4.23	4.23	30.00	2.87	36.00
5785MHz_TnomVnom	Pass	-1.36		4.08	4.08	30.00	2.72	36.00
5825MHz_TnomVnom	Pass	-1.36		3.49	3.49	30.00	2.13	36.00
802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-	-	-
5190MHz_TnomVnom	Pass	-1.36		0.24	0.24	11.00	-1.12	17.00
5230MHz_TnomVnom	Pass	-1.36		4.66	4.66	11.00	3.30	17.00
5270MHz_TnomVnom	Pass	-1.36		4.96	4.96	11.00	3.60	17.00
5310MHz_TnomVnom	Pass	-1.36		-0.07	-0.07	11.00	-1.43	17.00
5510MHz_TnomVnom	Pass	-1.36		0.44	0.44	11.00	-0.92	17.00
5550MHz_TnomVnom	Pass	-1.36		3.70	3.70	11.00	2.34	17.00
5670MHz_TnomVnom	Pass	-1.36		0.49	0.49	11.00	-0.87	17.00
5710MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		3.62	3.62	11.00	2.26	17.00
5710MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		0.77	0.77	30.00	-0.59	36.00
5755MHz_TnomVnom	Pass	-1.36		2.07	2.07	30.00	0.71	36.00
5795MHz_TnomVnom	Pass	-1.36		1.82	1.82	30.00	0.46	36.00
802.11ac VHT80_Nss1,(MCS0)_1TX(Port2)	-	-	-	-	-	-	-	-
5210MHz_TnomVnom	Pass	-1.36		-4.07	-4.07	11.00	-5.43	17.00

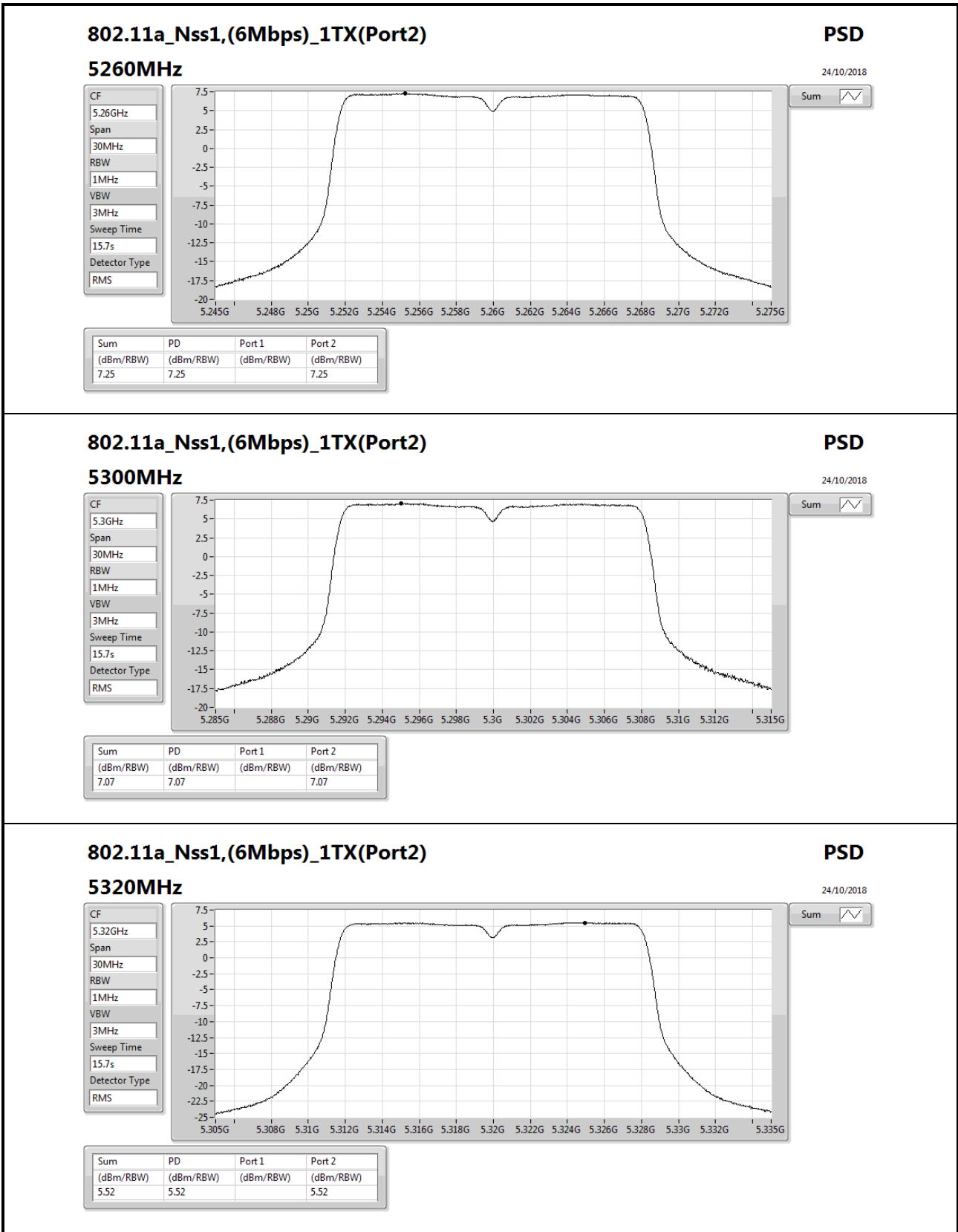


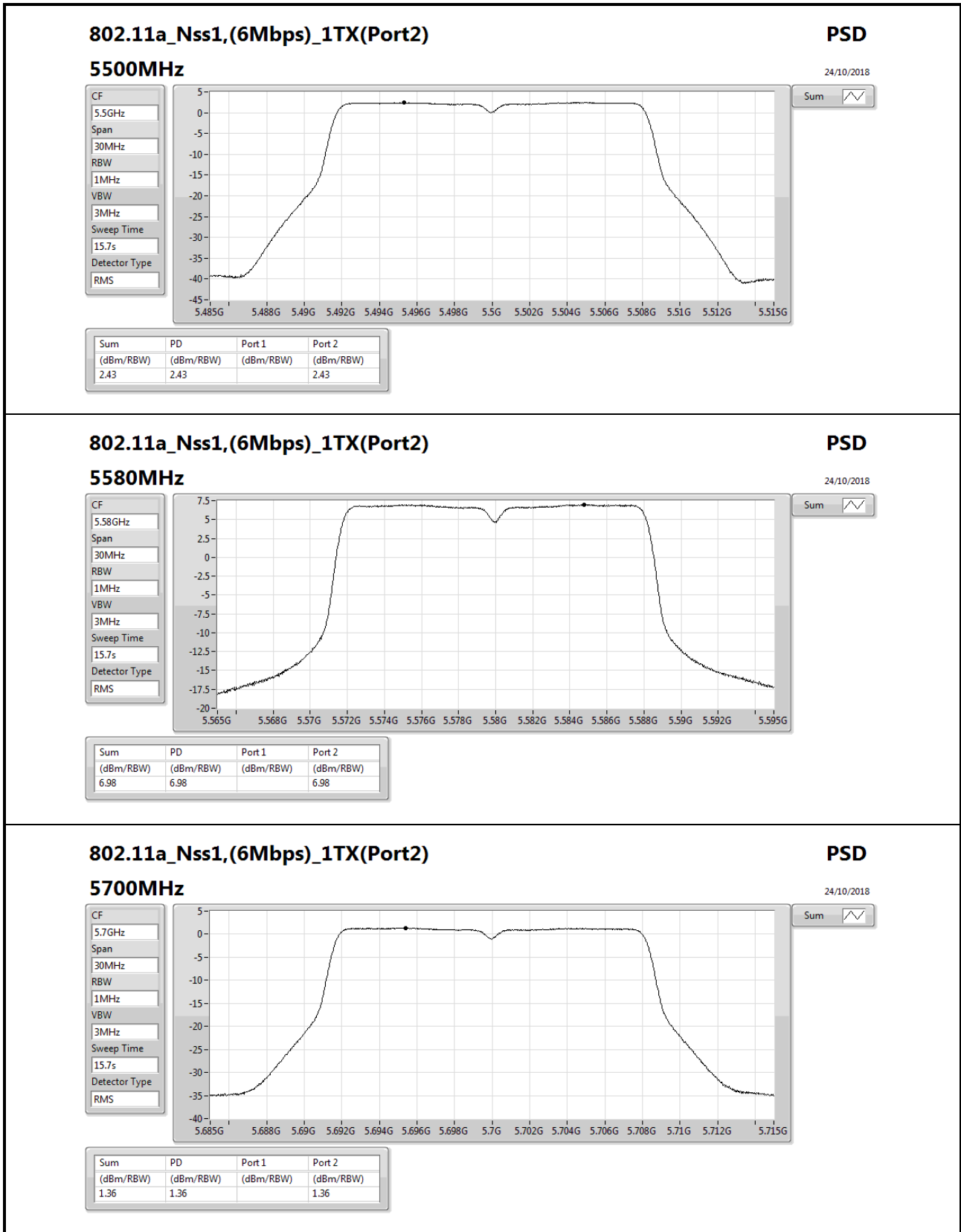
Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	Port 2 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)	EIRP PD (dBm/RBW)	EIRP PD Limit (dBm/RBW)
5290MHz_TnomVnom	Pass	-1.36		-4.35	-4.35	11.00	-5.71	17.00
5530MHz_TnomVnom	Pass	-1.36		-4.21	-4.21	11.00	-5.57	17.00
5610MHz_TnomVnom	Pass	-1.36		-1.25	-1.25	11.00	-2.61	17.00
5690MHz Straddle 5.47-5.725GHz_TnomVnom	Pass	-1.36		0.66	0.66	11.00	-0.70	17.00
5690MHz Straddle 5.725-5.85GHz_TnomVnom	Pass	-1.36		-4.53	-4.53	30.00	-5.89	36.00
5775MHz_TnomVnom	Pass	-1.36		-1.59	-1.59	30.00	-2.95	36.00

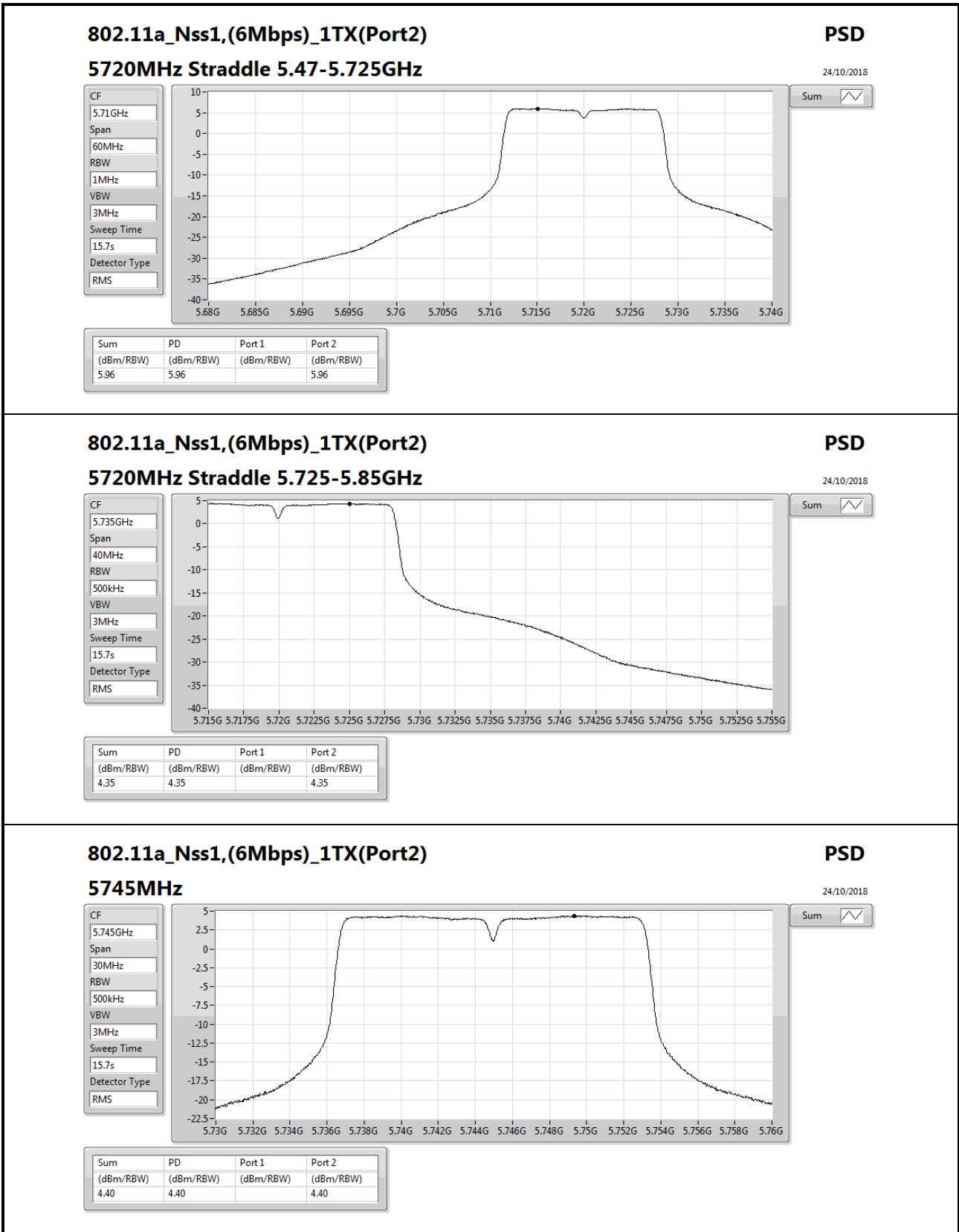
DG = Directional Gain; **RBW** = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

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









802.11a_Nss1,(6Mbps)_1TX(Port2)

5745MHz

PSD

24/10/2018

CF

5.745GHz

Span

30MHz

RBW

500kHz

VBW

3MHz

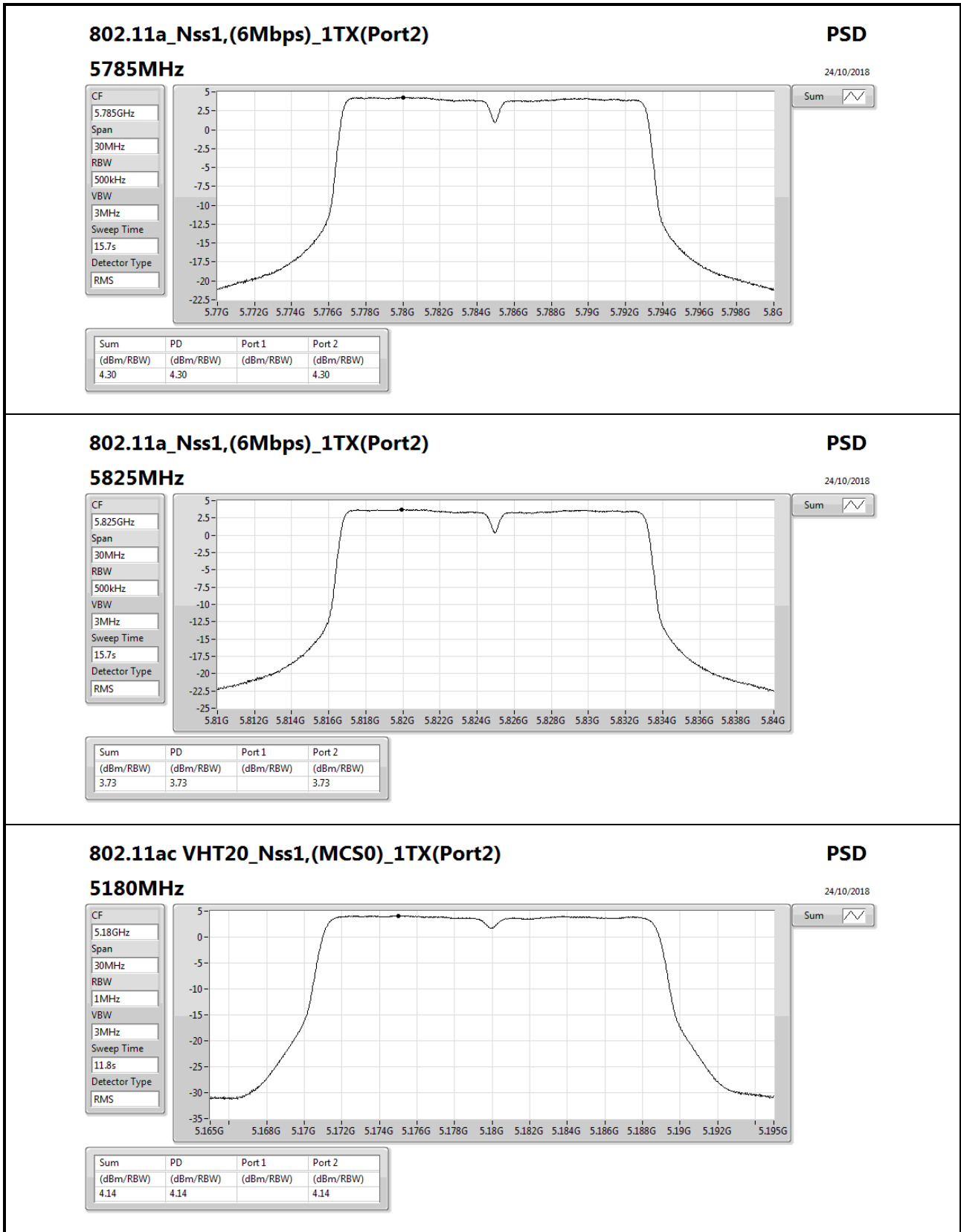
Sweep Time

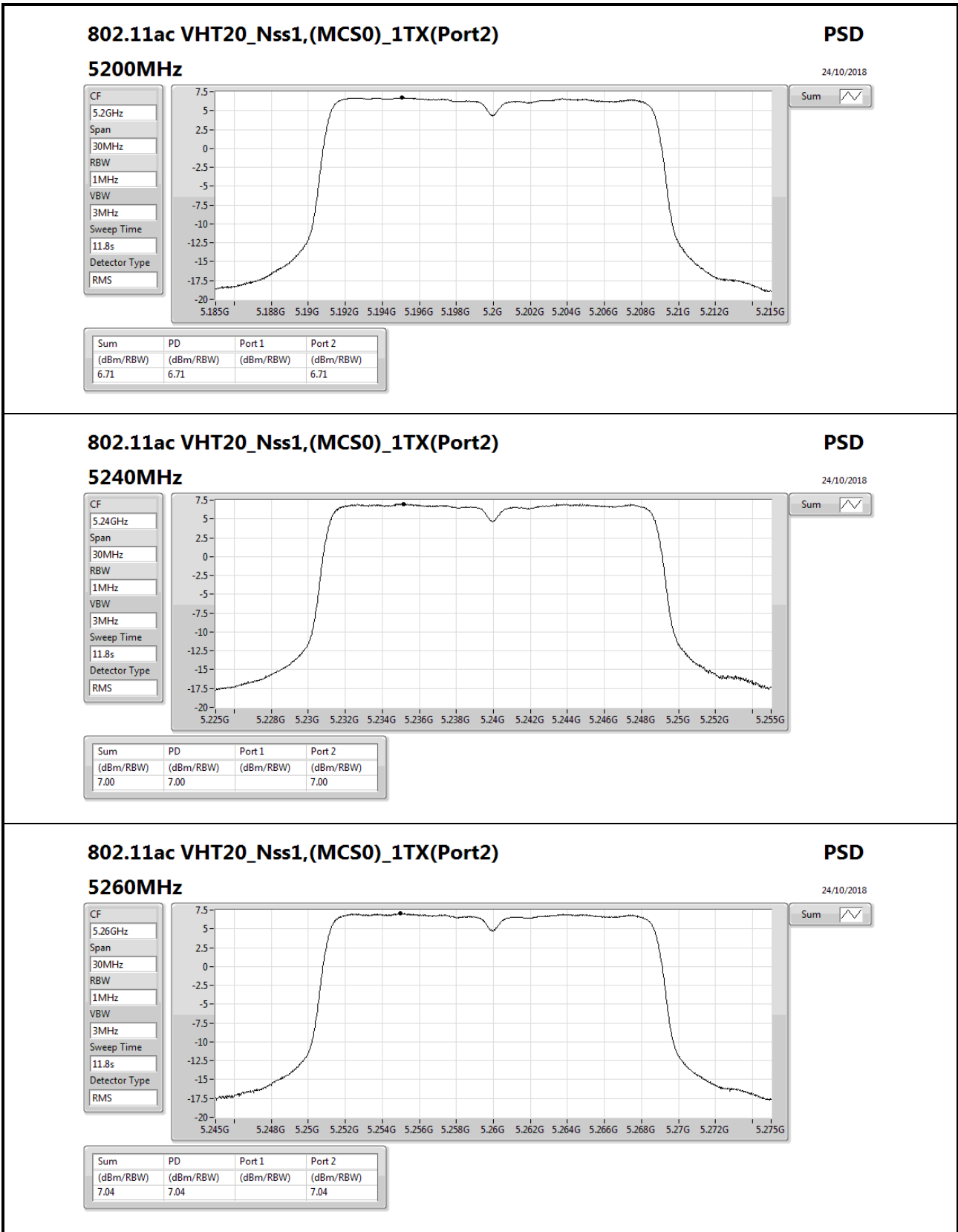
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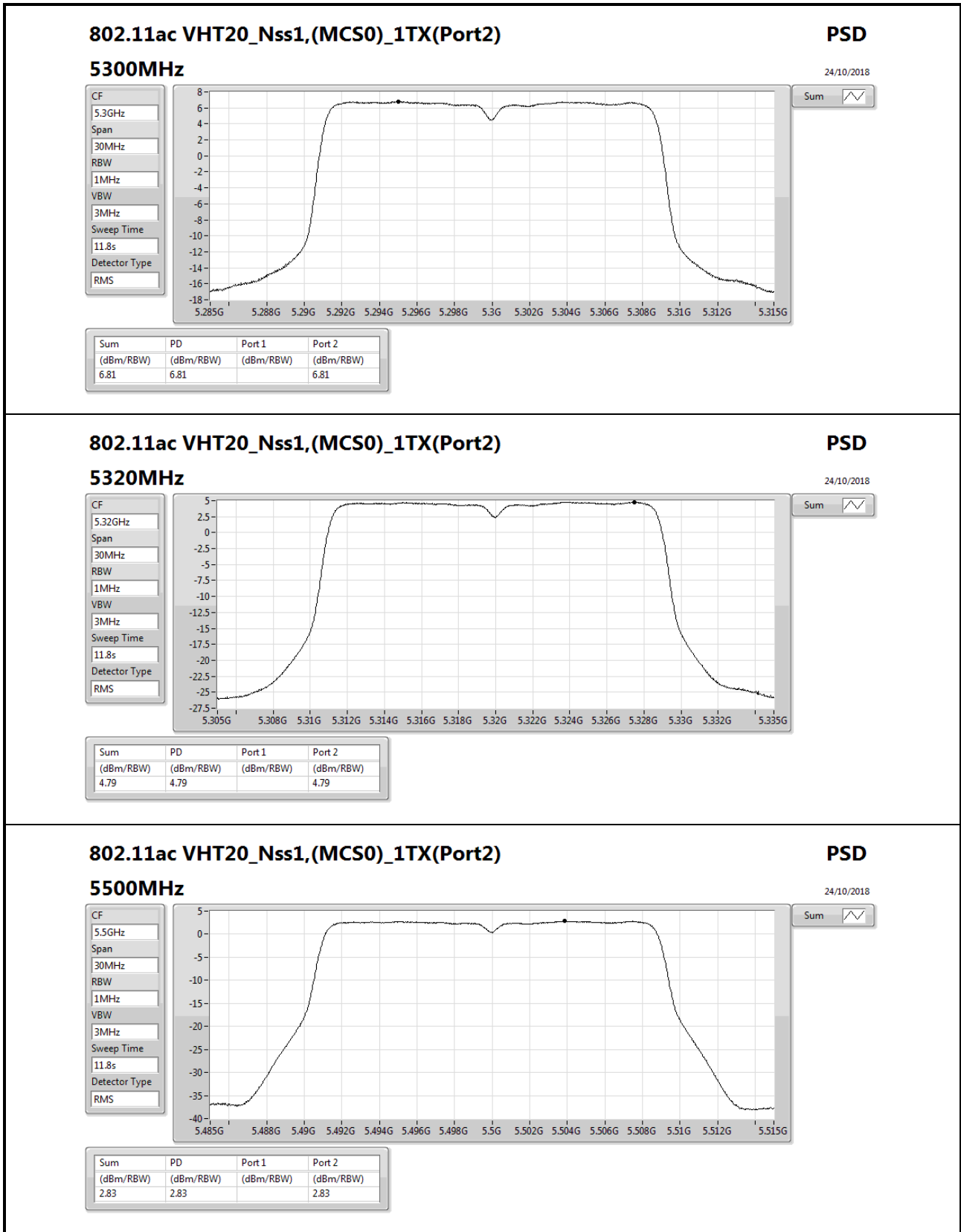
Detector Type

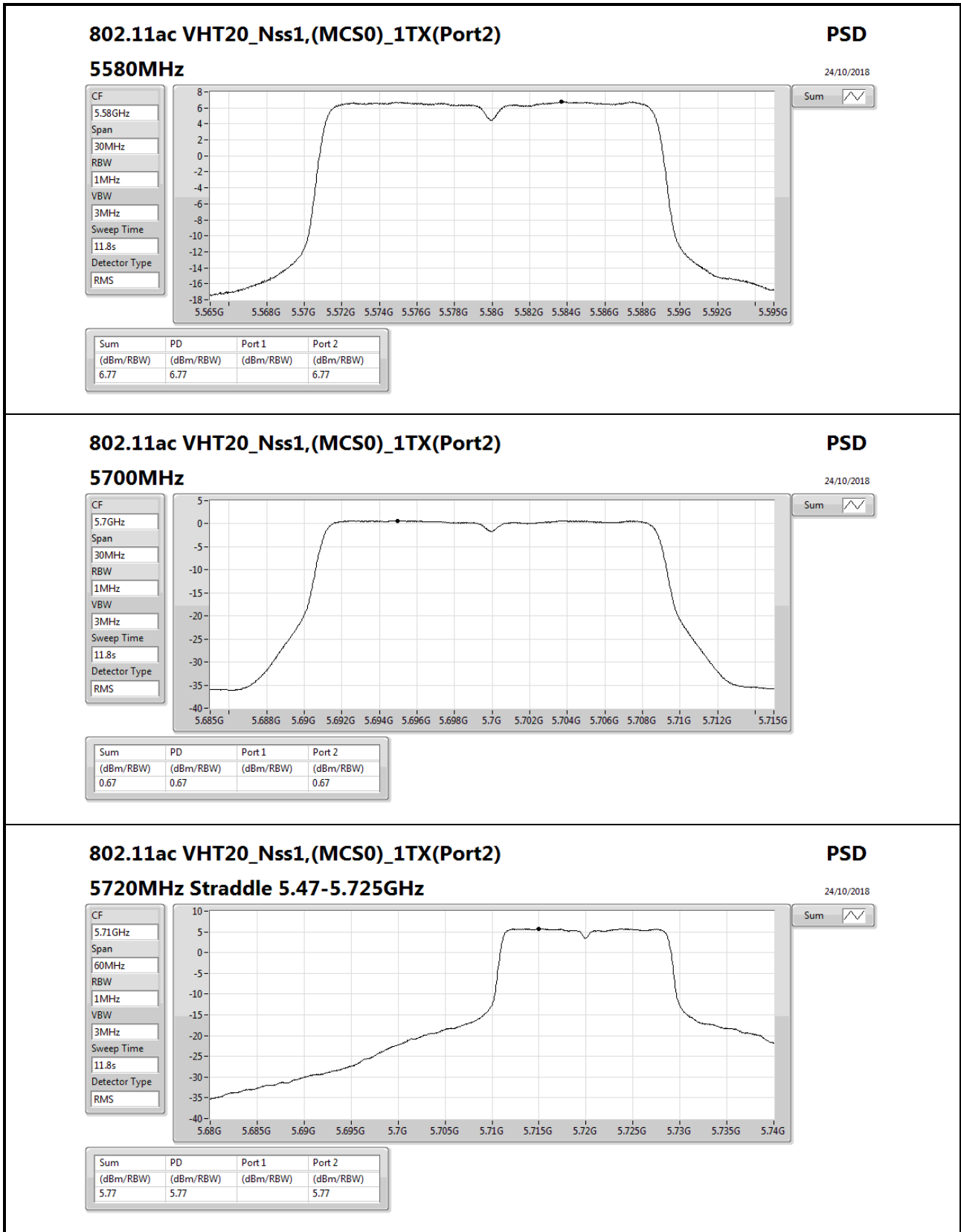
RMS

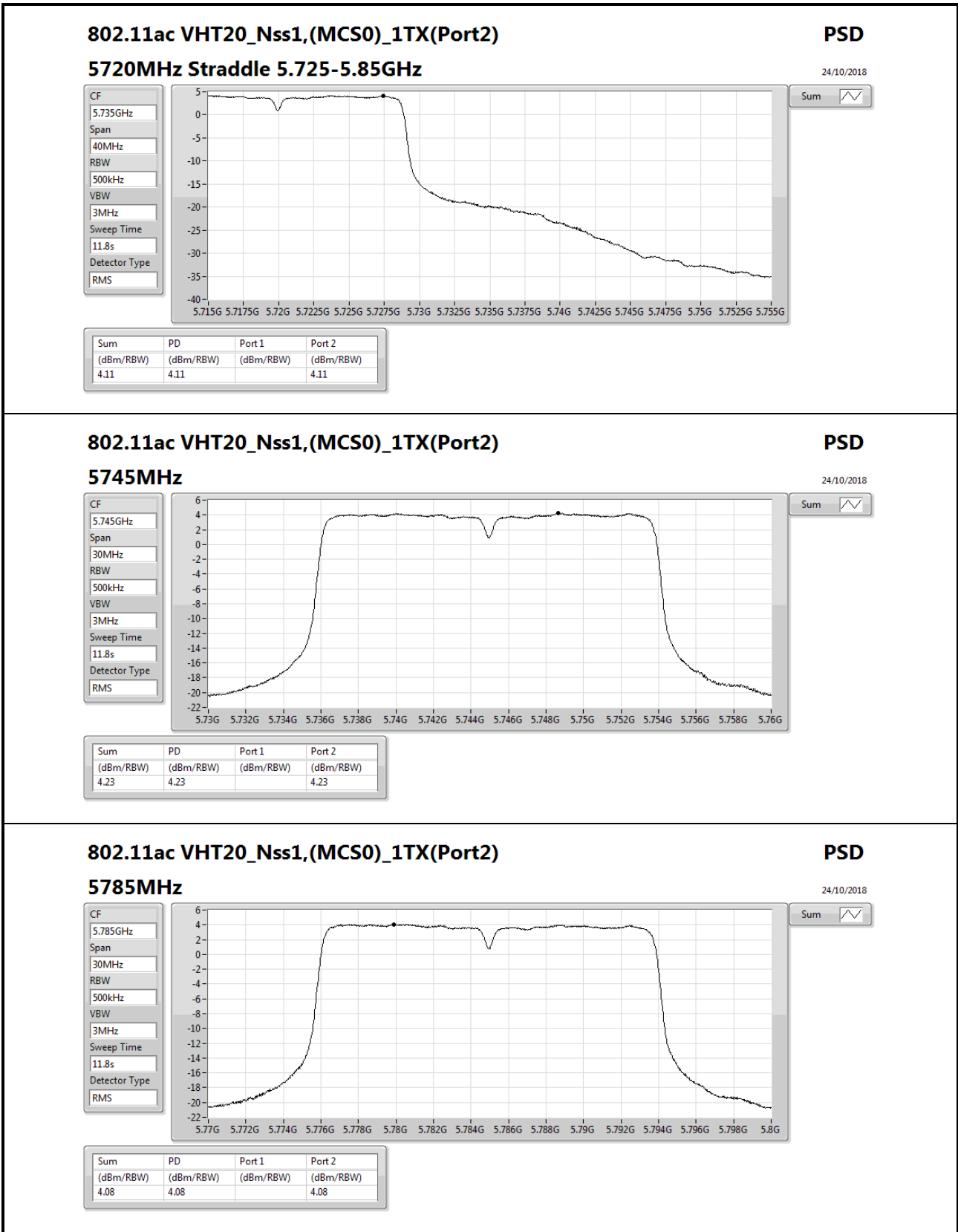
Sum

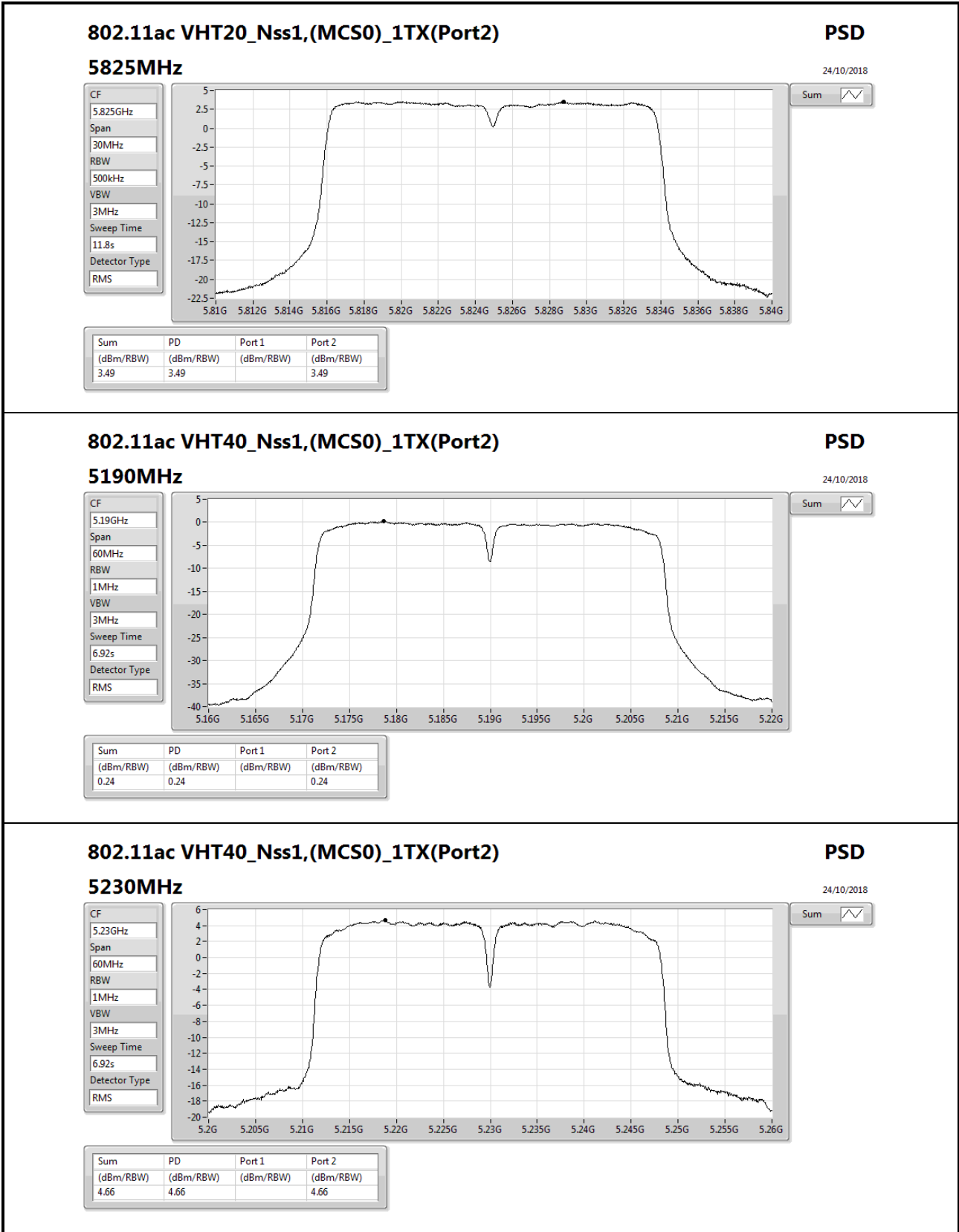


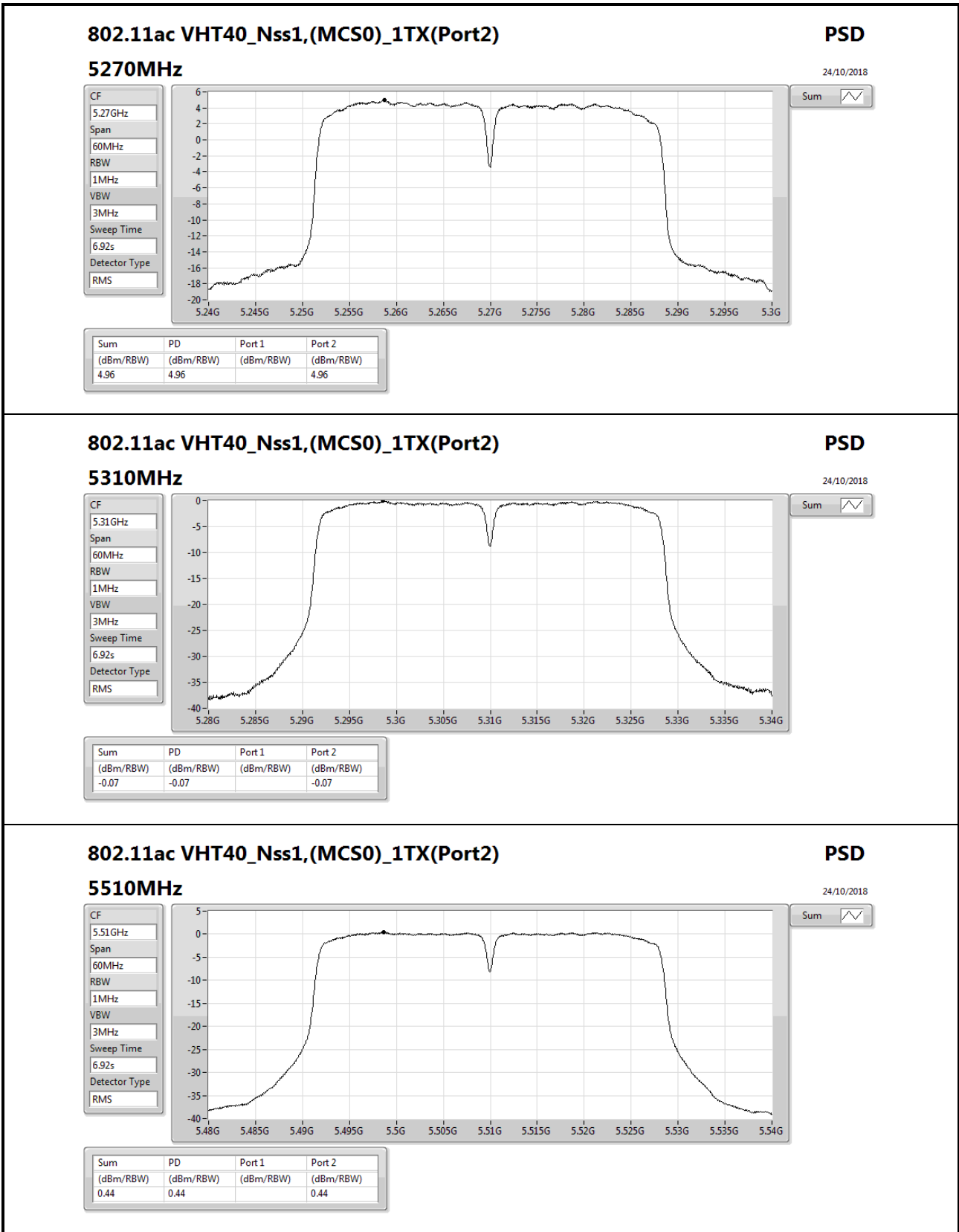












802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)

5510MHz

PSD

24/10/2018

CF

5.51GHz

Span

60MHz

RBW

1MHz

VBW

3MHz

Sweep Time

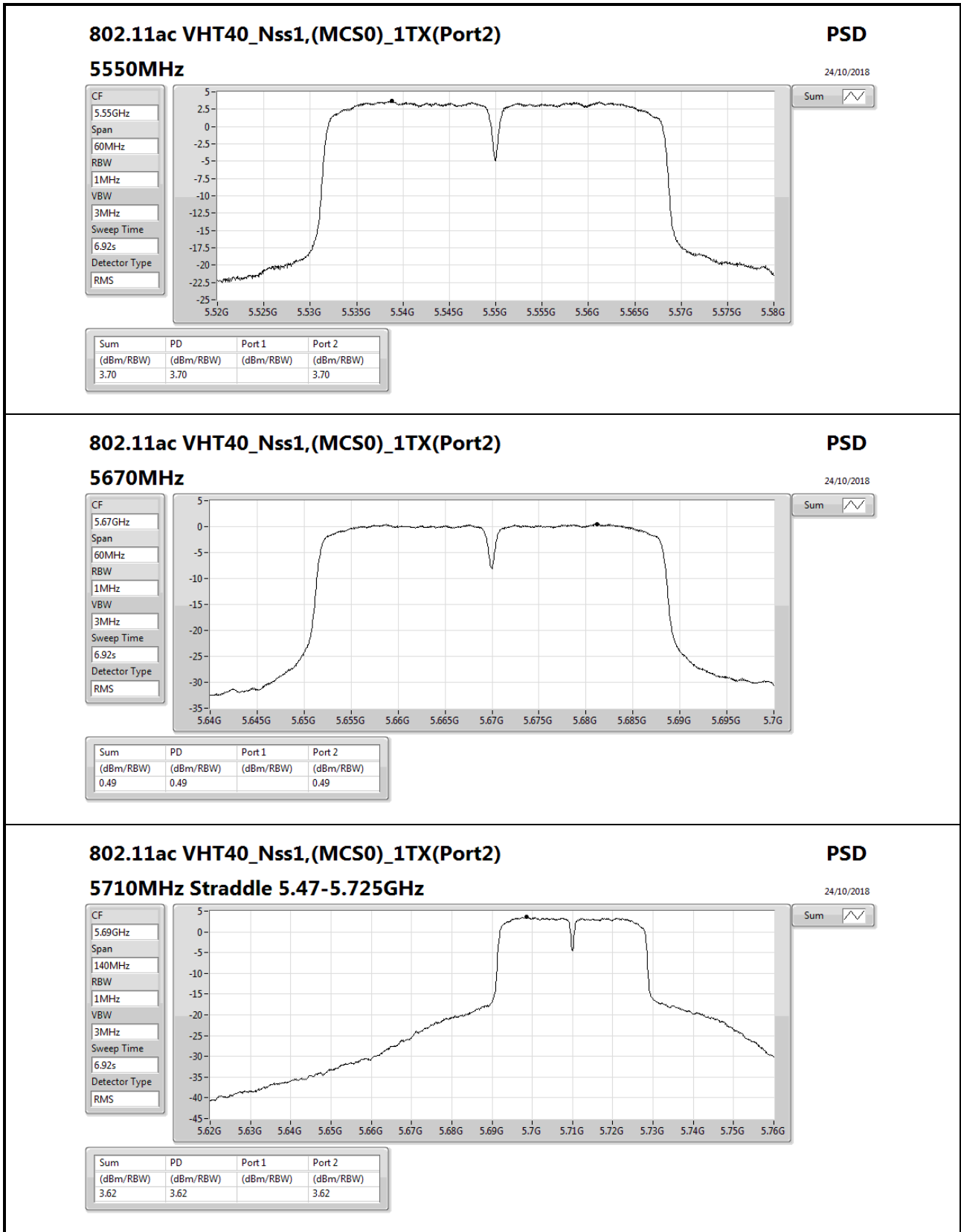
6.92s

Detector Type

RMS

Sum

Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
0.44	0.44		0.44



802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)

5710MHz Straddle 5.47-5.725GHz

PSD

24/10/2018

CF

5.69GHz

Span

140MHz

RBW

1MHz

VBW

3MHz

Sweep Time

6.92s

Detector Type

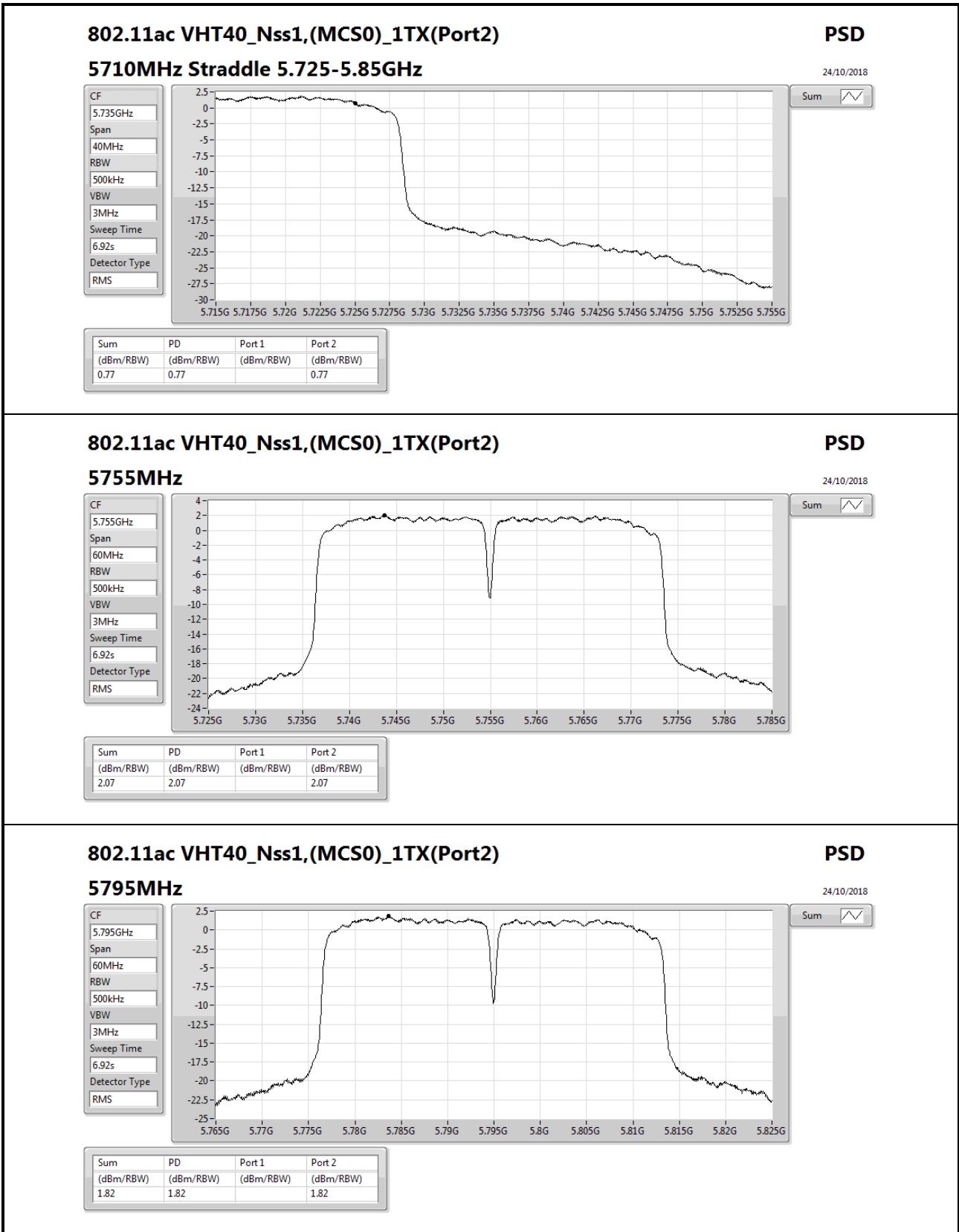
RMS



Sum



Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
3.62	3.62		3.62



802.11ac VHT40_Nss1,(MCS0)_1TX(Port2)

5795MHz

PSD

24/10/2018

CF

5.795GHz

Span

60MHz

RBW

500kHz

VBW

3MHz

Sweep Time

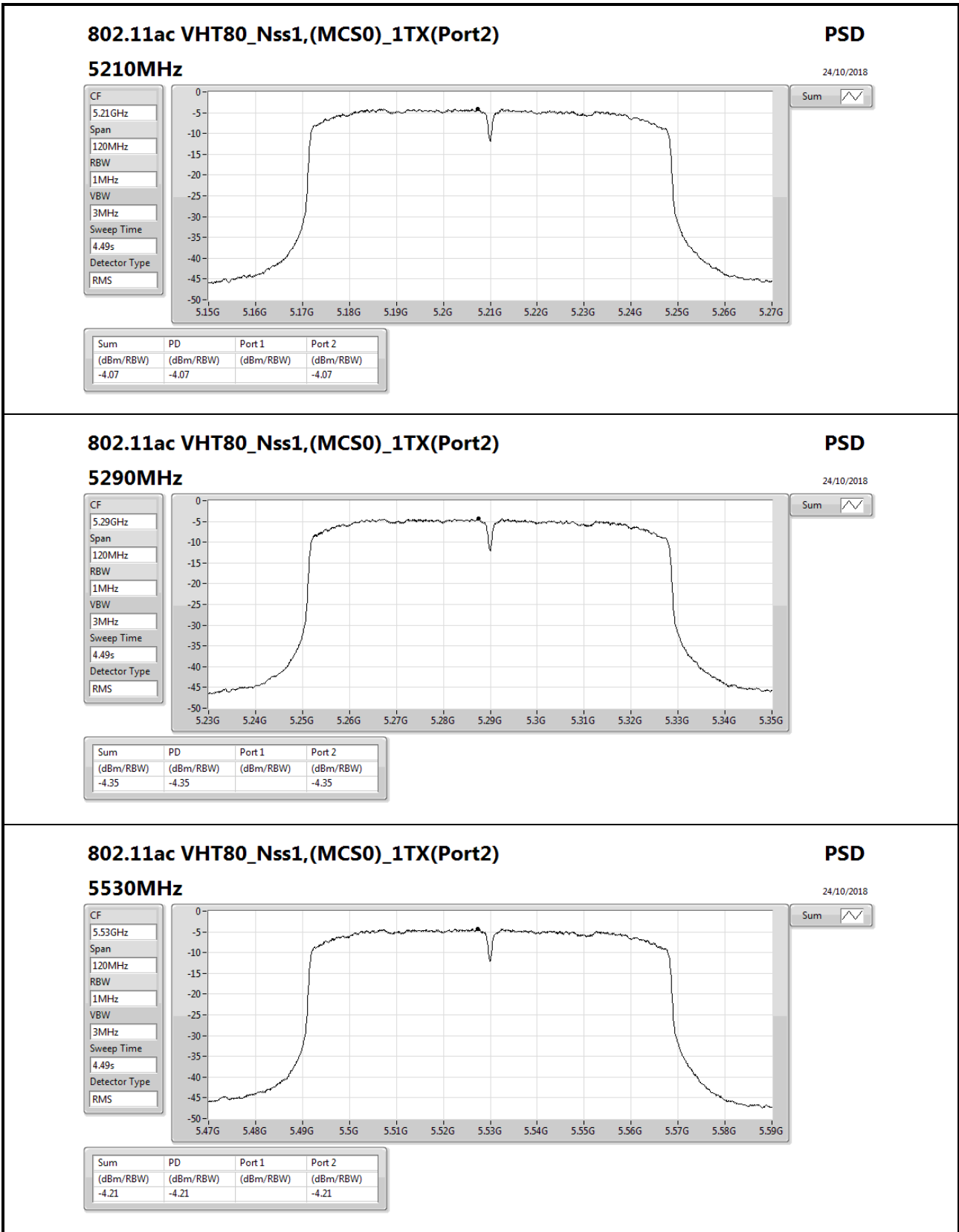
6.92s

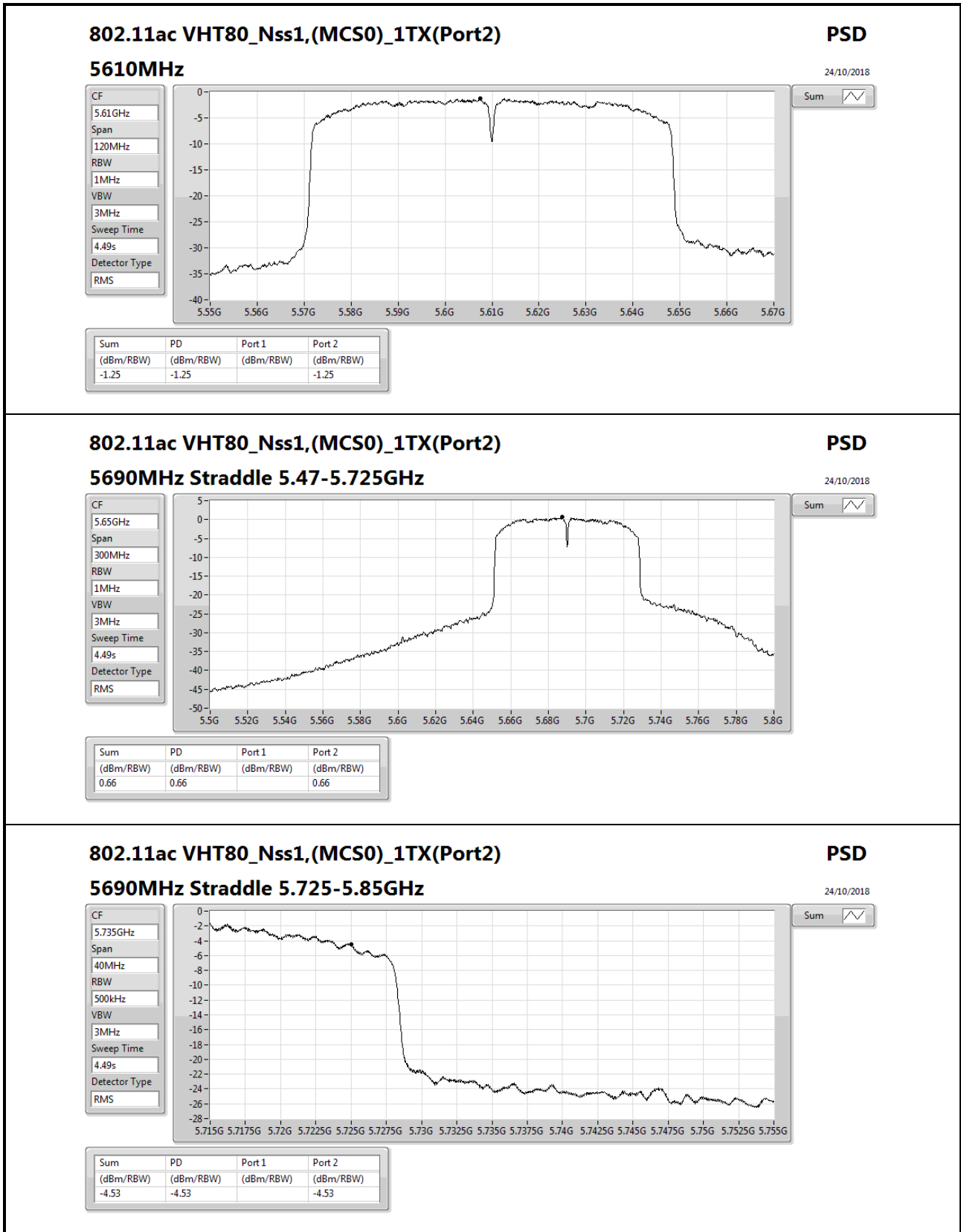
Detector Type

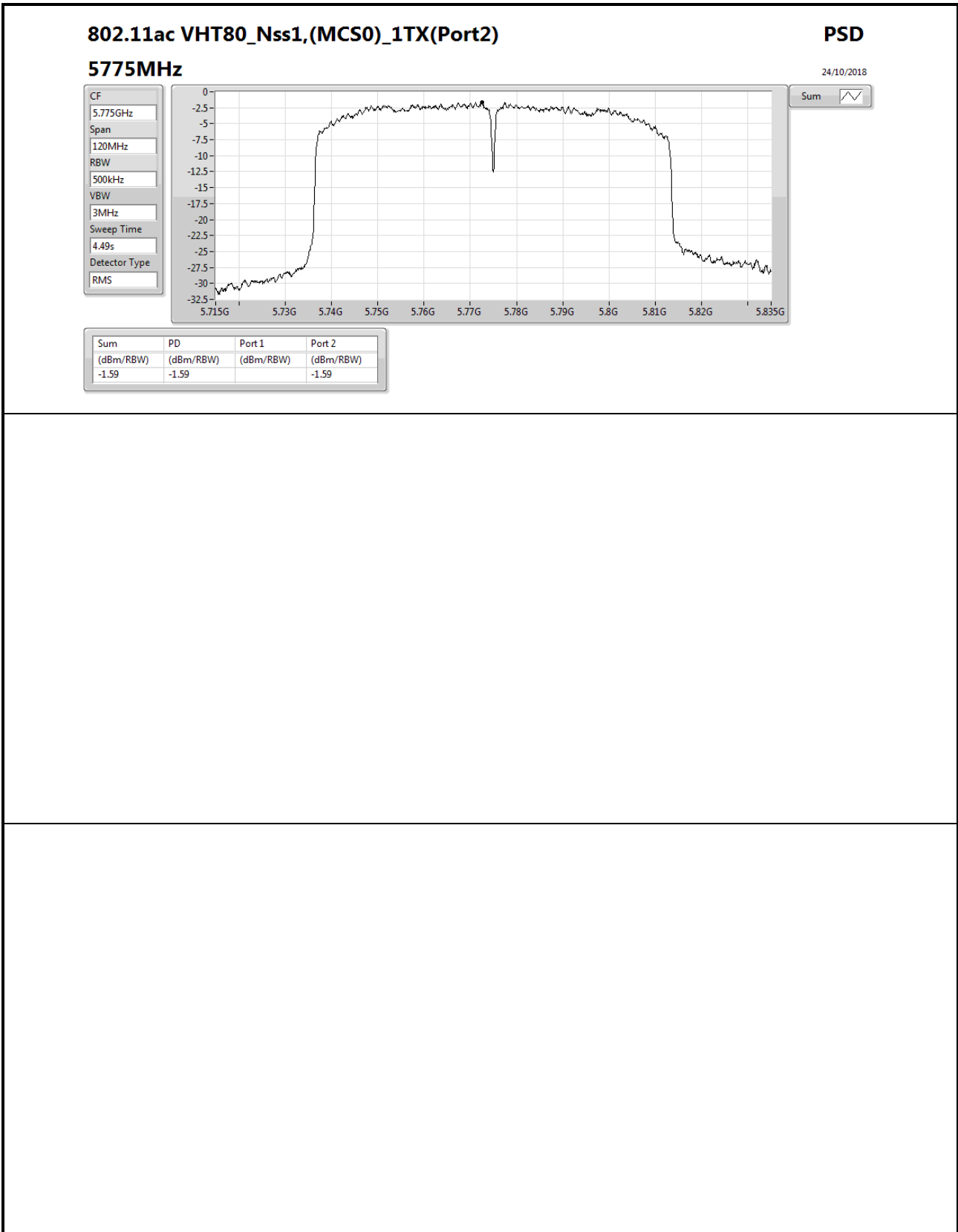
RMS

Sum

Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
1.82	1.82		1.82









Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
5.725-5.85GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.11ac VHT80_Nss1,(MCS0)_1TX(Port1)	Pass	QP	43.58M	35.43	40.00	-4.57	-20.25	3	Vertical	182	1.58	-



Result

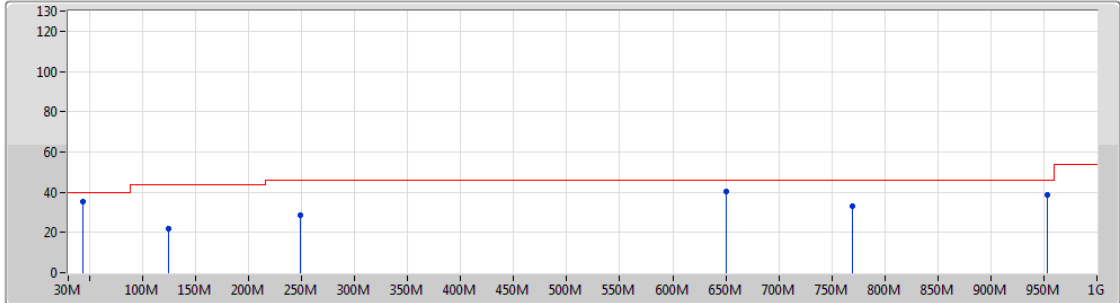
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
802.11ac VHT80_Nss1,(MCS0)_1TX(Port1)	-	-	-	-	-	-	-	-	-	-	-	-
5775MHz	Pass	PK	125.06M	22.03	43.50	-21.47	-19.21	3	Vertical	360	1.00	-
5775MHz	Pass	PK	249.22M	28.66	46.00	-17.34	-17.26	3	Vertical	360	1.00	-
5775MHz	Pass	PK	650.8M	40.09	46.00	-5.91	-9.96	3	Vertical	360	1.00	-
5775MHz	Pass	PK	769.14M	33.04	46.00	-12.96	-8.20	3	Vertical	360	1.00	-
5775MHz	Pass	PK	953.44M	38.61	46.00	-7.39	-4.71	3	Vertical	360	1.00	-
5775MHz	Pass	QP	43.58M	35.43	40.00	-4.57	-20.25	3	Vertical	182	1.58	-
5775MHz	Pass	PK	43.58M	22.75	40.00	-17.25	-20.25	3	Horizontal	0	1.00	-
5775MHz	Pass	PK	121.18M	25.55	43.50	-17.95	-19.26	3	Horizontal	0	1.00	-
5775MHz	Pass	PK	249.22M	31.24	46.00	-14.76	-17.26	3	Horizontal	0	1.00	-
5775MHz	Pass	PK	621.7M	35.24	46.00	-10.76	-10.27	3	Horizontal	0	1.00	-
5775MHz	Pass	PK	650.8M	40.06	46.00	-5.94	-9.96	3	Horizontal	0	1.00	-
5775MHz	Pass	PK	769.14M	33.88	46.00	-12.12	-8.20	3	Horizontal	0	1.00	-



802.11ac VHT80_Nss1,(MCS0)_1TX(Port1)

24/10/2018

5775MHz_PoE



Legend for the spectrum plot:

- Lim.PK
- PK
- Lim.AV
- AV

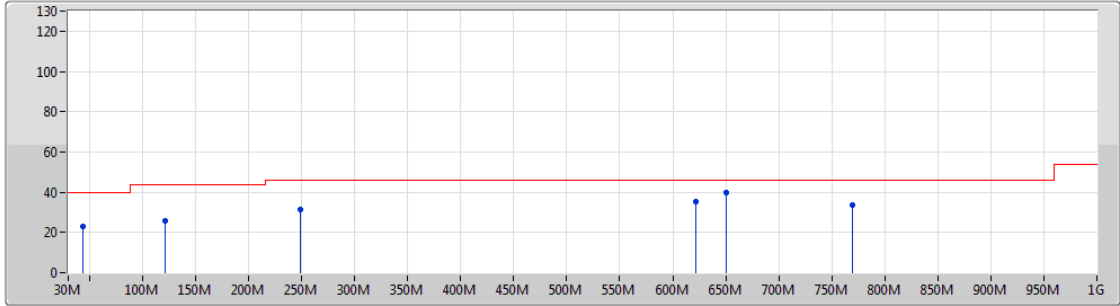
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	125.06M	22.03	43.50	-21.47	-19.21	3	Vertical	360	1.00	-
PK	249.22M	28.66	46.00	-17.34	-17.26	3	Vertical	360	1.00	-
PK	650.8M	40.09	46.00	-5.91	-9.96	3	Vertical	360	1.00	-
PK	769.14M	33.04	46.00	-12.96	-8.20	3	Vertical	360	1.00	-
PK	953.44M	38.61	46.00	-7.39	-4.71	3	Vertical	360	1.00	-
QP	43.58M	35.43	40.00	-4.57	-20.25	3	Vertical	182	1.58	-



802.11ac VHT80_Nss1,(MCS0)_1TX(Port1)

24/10/2018

5775MHz_PoE



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	43.58M	22.75	40.00	-17.25	-20.25	3	Horizontal	0	1.00	-
PK	121.18M	25.55	43.50	-17.95	-19.26	3	Horizontal	0	1.00	-
PK	249.22M	31.24	46.00	-14.76	-17.26	3	Horizontal	0	1.00	-
PK	621.7M	35.24	46.00	-10.76	-10.27	3	Horizontal	0	1.00	-
PK	650.8M	40.06	46.00	-5.94	-9.96	3	Horizontal	0	1.00	-
PK	769.14M	33.88	46.00	-12.12	-8.20	3	Horizontal	0	1.00	-