FCC RADIO TEST REPORT

Report No. : FR781507-02



FCC RADIO TEST REPORT

FCC ID	: O2U-CH7469
Equipment	: Cable Modem
Brand Name	con
Model Name	: CH7469, CH7469XXXXX
	(Refer to section 1.1.5 for detail information).
Applicant	: COMPAL BROADBAND NETWORKS, INC.
	13F-1, No.1, Taiyuan 1st St., Zhubei City, Hsinchu County 30288, Taiwan, R.O.C.
Manufacturer	: COMPAL BROADBAND NETWORKS, INC.
	13F-1, No.1, Taiyuan 1st St., Zhubei City, Hsinchu County 30288, Taiwan, R.O.C.
Standard	: 47 CFR FCC Part 15.407

The product was received on May 13, 2020, and testing was started from Jun. 02, 2020 and completed on Jun. 11, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The 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.

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Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

TEL : 886-3-656-9065 FAX : 886-3-656-9085 Report Template No.: CB-A12_1 Ver1.2 Page Number : 1 of 27 Issued Date : Jun. 30, 2020 Report Version : 01



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Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FR781507-02	01	Initial issue of report	Jun. 30, 2020



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	-
3.1	15.407(a)	Emission Bandwidth	PASS	-
3.3	15.407(a)	Maximum Conducted Output Power	PASS	-
3.4	15.407(a)	Peak Power Spectral Density	PASS	-
3.5	15.407(b)	Unwanted Emissions	PASS	-

Declaration of Conformity:

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

Comments and Explanations:

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

Reviewed by: Sam Chen

Report Producer: Cindy Peng



1 General Description

1.1 Information

1.1.1 **RF General Information**

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5250-5350	a, n (HT20), ac (VHT20)	5260-5320	52-64 [4]
5470-5725		5500-5700	100-140 [11]
5250-5350	n (HT40), ac (VHT40)	5270-5310	54-62 [2]
5470-5725		5510-5670	102-134 [5]
5250-5350	ac (VHT80)	5290	58 [1]
5470-5725		5530-5610	106-122 [2]

Band	Mode	BWch (MHz)	Nant
5.25-5.35GHz	802.11a	20	4TX
5.25-5.35GHz	802.11n HT20	20	4TX
5.25-5.35GHz	802.11ac VHT20	20	4TX
5.25-5.35GHz	802.11n HT40	40	4TX
5.25-5.35GHz	802.11ac VHT40	40	4TX
5.25-5.35GHz	802.11ac VHT80	80	4TX
5.47-5.725GHz	802.11a	20	4TX
5.47-5.725GHz	802.11n HT20	20	4TX
5.47-5.725GHz	802.11ac VHT20	20	4TX
5.47-5.725GHz	802.11n HT40	40	4TX
5.47-5.725GHz	802.11ac VHT40	40	4TX
5.47-5.725GHz	802.11ac VHT80	80	4TX

Note:

• 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.



1.1.2 Antenna Information

For WLAN 5GHz Band 2~3:

Amt	Dort	Drend	Model Name Type Connector				Antenna Gain	Directional Gain (dBi)	
Ant.	Port	Brand	Model Name	Туре	e Connector	(dBi)	5GHz	5GHz	
							Band 2	Band 3	
1	1	CBN	1203000000001	Dipole	I-PEX	5.27			
2	2	CBN	1203000000000	Dipole	I-PEX	5.46	6.65	5.44	
3	3	CBN	1203000000053	Dipole	I-PEX	4.96	0.00	5.44	
4	4	CBN	120300000002	Dipole	I-PEX	4.63			

Note1: The above information was declared by manufacturer.

Note2: IEEE 802.11a/n/ac mode (4TX/4RX):

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.93	0.32	1.396m	1k
802.11ac VHT20	0.908	0.42	1.398m	1k
802.11ac VHT40	0.919	0.37	1.398m	1k
802.11ac VHT80	0.95	0.22	1.398m	1k

Note:

• DC is Duty Cycle.

DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From power adapter			
Beamforming Function		With beamforming	\boxtimes	Without beamforming
Weather Band		With 5600~5650MHz		Without 5600~5650MHz
Function		Outdoor P2M	\boxtimes	Indoor P2M
Function		Fixed P2P		Client
TPC Function		With TPC		
Test Software Version Telnet				

Note: The above information was declared by manufacturer.



1.1.5 Table for Multiple Listing

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

Model Name	Description				
CH7469	1. For marketing propose.				
CH7469XXXXX	2. The "X" in the model name could be defined as $0 \sim 9$, $A \sim Z$,"-" or blank.				

From the above models, model: CH7469 was selected as representative model for the test and its data was recorded in this report.



1.2 Applicable Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v02r01
- The following reference test guidance is not within the scope of accreditation of TAF.
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

	Testing Location							
	HWA YA	A YA ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)						
		TEL	:	886-3-327-3456 FAX : 886-3-327-0973				
\boxtimes	JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.				
	TEL : 886-3-656-9065 FAX : 886-3-656-9085							

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH03-CB	Lance Wu	25.3~25.8°C / 53~56%	Jun. 03, 2020
Radiated Below 1GHz	03CH05-CB	KJ Chang	25.6~26.8°C / 55~57%	Jun. 02, 2020~Jun. 10, 2020
Radiated Above 1GHz	03CH06-CB	KJ Chang	24.7~26.4°C / 53~58%	Jun. 02, 2020~Jun. 10, 2020
AC Conduction	CO01-CB	Deven Huang	21~22°C / 63~64%	Jun. 11, 2020

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

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

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



2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11a_Nss1,(6Mbps)_4TX	-
5260MHz	35/36/34/34
5300MHz	35/36/33/34
5320MHz	34/35/32/33
5500MHz	25/25/21/22
5580MHz	25/25/21/22
5700MHz	28/28/25/25
802.11ac VHT20_Nss1,(MCS0)_4TX	-
5260MHz	37/37/34/34
5300MHz	35/36/33/34
5320MHz	35/35/32/33
5500MHz	25/25/21/23
5580MHz	25/25/21/22
5700MHz	26/26/23/23
802.11ac VHT40_Nss1,(MCS0)_4TX	-
5270MHz	36/37/34/35
5310MHz	35/36/33/34
5510MHz	23/24/22/20
5550MHz	26/26/22/23
5670MHz	28/28/25/25
802.11ac VHT80_Nss1,(MCS0)_4TX	-
5290MHz	33/33/31/32
5530MHz	21/21/17/18
5610MHz	28/28/25/25



2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests		
Tests Item AC power-line conducted emissions		
Condition AC power-line conducted measurement for line and neutral		
Operating Mode CTX		
1	WLAN 5GHz	

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		

Th	The Worst Case Mode for Following Conformance Tests		
Tests Item	Unwanted Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	СТХ		
1	WLAN 5GHz		
Operating Mode > 1GHz	СТХ		

The Worst Case Mode for Following Conformance Tests		
Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation		
Operating Mode		
1 WLAN 2.4GHz + WLAN 5GHz		
Refer to Sporton Test Report No.: FA781507-02 for Co-location RF Exposure Evaluation.		

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



2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

	Accessories			
No.	No. Equipment Name Brand Name Model Name Rating		Rating	
1	Adapter	Frecom	F30L2-120250SPAU	INPUT: 100-240Vac, 0.8A, 50/60Hz OUTPUT: 12V, 5A

2.5 Support Equipment

For AC Conduction:

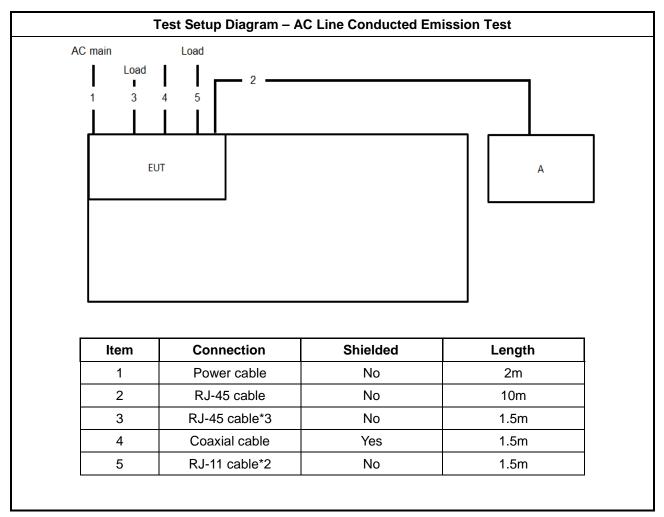
	Support Equipment			
No.	Equipment Brand Name Model Name FCC ID			
А	Notebook	DELL	E6430	N/A

For Radiated and RF Conducted:

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



2.6 Test Setup Diagram





			iagram - Radiated Test	
_				
			2	
1			EUT	
A				
Γ	ltem	Connection	Shielded	Length
Ē	1	RJ-45 cable	No	10m
		Power cable	No	2m



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.			

Note 1. Deoleases with the logarithm of the frequ

3.1.2 Measuring Instruments

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

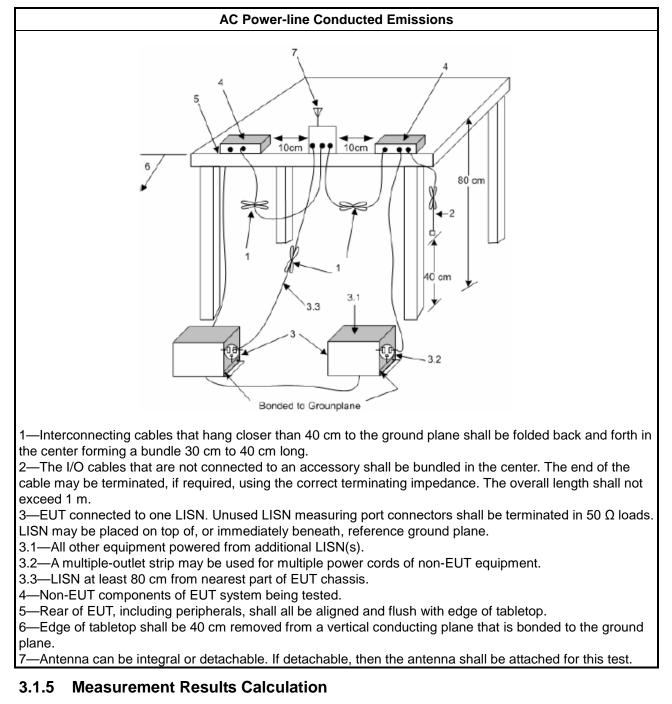
3.1.3 Test Procedures

Test Method

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



3.1.4 Test Setup



The measured Level is calculated using:

- a. Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- b. Margin = Limit + (Read Level + LISN Factor + Cable Loss)

3.1.6 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			
UN	II Devices			
	For the 5.15-5.25 GHz band, N/A			
\boxtimes	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.			
\boxtimes	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.			
	For the 5.725-5.85 GHz band, 6 dB emission bandwidth \geq 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 \geq 500kHz.			
	2. Measuring Instruments			

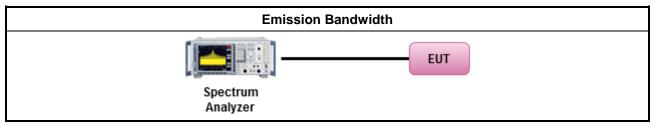
3.2.2 Measuring Instruments

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:					
	\square	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



3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

	Maximum Conducted Output Power Limit					
UN	I Devices					
	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 ≤ 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). 					
\boxtimes	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 $P_{Out} = 24 - (G_{TX} - 6)$.					
\boxtimes	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 $P_{Out} = 24 - (G_{TX} - 6)$.					
	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. 					
	t = maximum conducted output power in dBm, = 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						
•	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} = P₁ + P₂ + + P_n (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP_{total} = P_{total} + DG 						

3.3.4 Test Setup

RF Output Power (Power Meter)	
EUT Power Meter	

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
UNI	I Devices
	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)
\boxtimes	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).
\boxtimes	For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If G _{TX} > 6 dBi, then PPSD= 11 - (G _{TX} - 6).
	For the 5.725-5.85 GHz band:
	 Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If G_{TX} > 6 dBi, then PPSD= 30 - (G_{TX} - 6).
	 Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-	LAN Devices
	For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) \leq 10 dBm/MHz.
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 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.
	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.

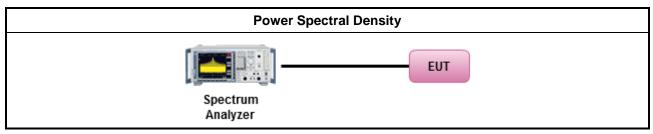


3.4.3 Test Procedures

	Test Method								
•	Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:								
	Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth								
	[duty	/ cycle ≥ 98% or external video / power trigger]							
	\square	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							
	\square	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



3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D



3.5 Unwanted Emissions

3.5.1 Transmitter Unwanted Emissions Limit

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

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

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

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

Un-restricted band emissions above 1GHz Limit						
Operating Band	Limit					
🔲 5.15 - 5.25 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]					
🛛 5.25 - 5.35 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]					
🔀 5.47 - 5.725 GHz	e.i.r.p27 dBm [68.2 dBuV/m@3m]					
☐ 5.725 - 5.85 GHz	all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.					
Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of						

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

3.5.2 **Measuring Instruments**

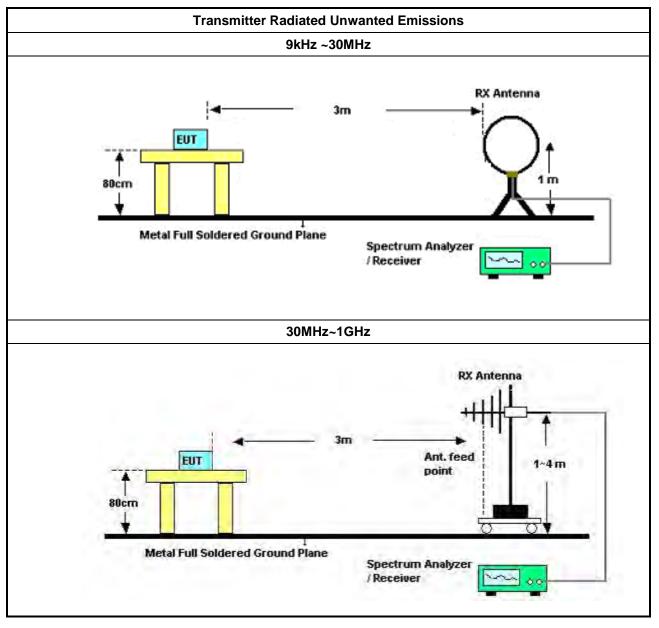
Refer a test equipment and calibration data table in this test report.

3.5.3 **Test Procedures**

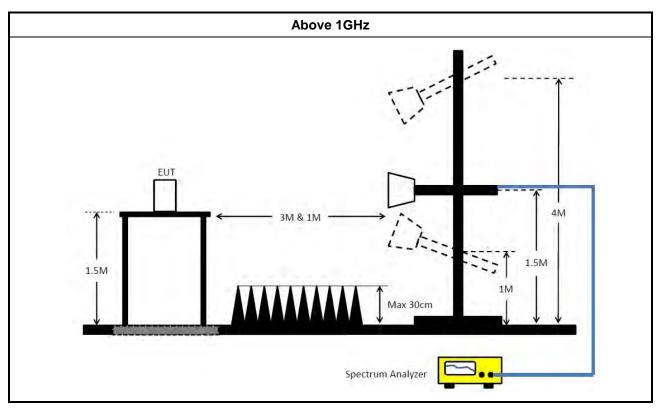
		Test Method				
•	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies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



3.5.4 Test Setup







3.5.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Čable Loss + Read Level - Preamp Factor (if applicable) = Level.

3.5.6 Emissions in Restricted Frequency Bands (Below 30MHz)

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

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

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

3.5.7 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E



4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Feb. 26, 2020	Feb. 25, 2021	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-5 0-16-2	04083	150kHz ~ 100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Feb. 25, 2020	Feb. 24, 2021	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 20, 2020	May 19, 2021	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 27, 2020	Mar. 26, 2021	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 28, 2020	Apr. 27, 2021	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Aug. 15, 2019	Aug. 14, 2020	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	LOW Cable-04+23	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 17, 2019	Jul. 16, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917050 7	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 07, 2020	May 06, 2021	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35- HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHN ER	RG402	High Cable-05	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHN ER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Nov. 01, 2019	Oct. 31, 2020	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1726195	300MHz~40GHz	Aug. 13, 2019	Aug. 12, 2020	Conducted (TH03-CB)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Aug. 13, 2019	Aug. 12, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)

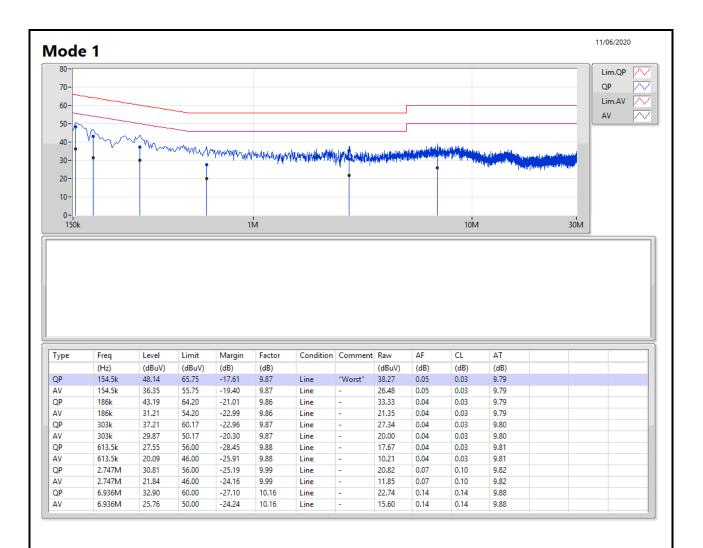
Note: Calibration Interval of instruments listed above is one year.

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

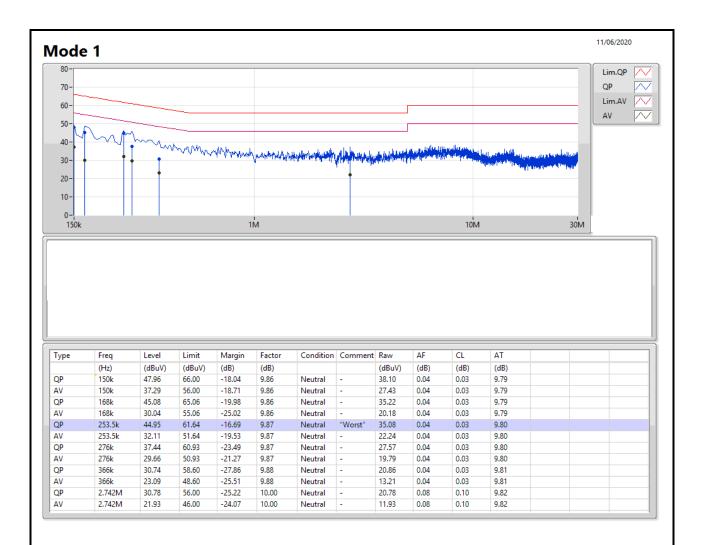


	Cammary								
Mode Result		Result	Туре	Freq	Level	Limit	Margin	Factor	Condition
				(Hz)	(dBuV)	(dBuV)	(dB)	(dB)	
	Mode 1	Pass	QP	253.5k	44.95	61.64	-16.69	9.87	Neutral











Summarv

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW	
	(Hz)	(Hz)		(Hz)	(Hz)	
5.25-5.35GHz	-	-	-	-	-	
802.11a_Nss1,(6Mbps)_4TX	20.22M	16.612M	16M6D1D	19.89M	16.522M	
802.11ac VHT20_Nss1,(MCS0)_4TX	20.46M	17.601M	17M6D1D	20.25M	17.571M	
802.11ac VHT40_Nss1,(MCS0)_4TX	41.04M	36.522M	36M5D1D	40.68M	36.342M	
802.11ac VHT80_Nss1,(MCS0)_4TX	82.08M	75.922M	75M9D1D	81M	75.682M	
5.47-5.725GHz	-	-	-	-	-	
802.11a_Nss1,(6Mbps)_4TX	20.16M	16.672M	16M7D1D	19.92M	16.522M	
802.11ac VHT20_Nss1,(MCS0)_4TX	20.46M	17.631M	17M6D1D	20.16M	17.571M	
802.11ac VHT40_Nss1,(MCS0)_4TX	41.16M	36.462M	36M5D1D	40.44M	36.342M	
802.11ac VHT80_Nss1,(MCS0)_4TX	89.88M	76.042M	76M0D1D	81.12M	75.682M	

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

Max-OBW = Maximum99% occupied bandwidth; Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band; Min-OBW = Minimum 99% occupied bandwidth;



Appendix B

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)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-	-	-
5260MHz	Pass	Inf	20.16M	16.552M	20.07M	16.612M	20.16M	16.612M	19.89M	16.552M
5300MHz	Pass	Inf	19.98M	16.582M	20.13M	16.612M	20.04M	16.552M	20.04M	16.552M
5320MHz	Pass	Inf	19.89M	16.582M	20.22M	16.582M	20.04M	16.612M	19.98M	16.522M
5500MHz	Pass	Inf	20.07M	16.522M	19.92M	16.612M	20.16M	16.582M	20.04M	16.612M
5580MHz	Pass	Inf	19.98M	16.552M	20.04M	16.642M	20.16M	16.642M	20.1M	16.582M
5700MHz	Pass	Inf	20.13M	16.522M	20.04M	16.672M	20.1M	16.582M	20.1M	16.582M
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5260MHz	Pass	Inf	20.34M	17.571M	20.34M	17.571M	20.4M	17.601M	20.25M	17.571M
5300MHz	Pass	Inf	20.43M	17.601M	20.28M	17.571M	20.34M	17.601M	20.34M	17.571M
5320MHz	Pass	Inf	20.28M	17.601M	20.46M	17.601M	20.46M	17.601M	20.34M	17.571M
5500MHz	Pass	Inf	20.46M	17.571M	20.46M	17.601M	20.28M	17.601M	20.31M	17.571M
5580MHz	Pass	Inf	20.37M	17.571M	20.34M	17.601M	20.31M	17.631M	20.28M	17.571M
5700MHz	Pass	Inf	20.34M	17.601M	20.34M	17.631M	20.43M	17.631M	20.16M	17.571M
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5270MHz	Pass	Inf	40.98M	36.462M	40.98M	36.522M	40.86M	36.402M	40.68M	36.402M
5310MHz	Pass	Inf	41.04M	36.462M	40.98M	36.402M	40.8M	36.402M	40.68M	36.342M
5510MHz	Pass	Inf	41.1M	36.402M	40.86M	36.402M	40.8M	36.402M	41.04M	36.402M
5550MHz	Pass	Inf	41.16M	36.462M	40.98M	36.402M	40.74M	36.462M	40.44M	36.342M
5670MHz	Pass	Inf	40.92M	36.402M	40.98M	36.402M	40.98M	36.342M	40.8M	36.342M
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-	-	-
5290MHz	Pass	Inf	81M	75.682M	81.84M	75.802M	82.08M	75.922M	81.36M	75.802M
5530MHz	Pass	Inf	81.48M	75.682M	81.84M	75.802M	81.96M	75.922M	81.12M	75.802M
5610MHz	Pass	Inf	81.24M	75.682M	87.36M	75.922M	89.88M	76.042M	81.36M	75.922M

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



Sweep Time

Detector Type

100ms

Peak

Port 1

Port 2

Port 3

Port 4

-30·

-35

-40 -

-45

-50

5.27G

26dB(Hz)

19.98M

20.13M

20.04M

20.04M

5.28G

5.29001G

5.28992G

5.2901G

5.28992G

5.29G

FI-26dB(Hz) Fh-26dB(Hz) OBW(Hz)

5.30999G

5.31005G

5.31014G

5.30996G

5.3G

5.31G

16.582M

16.612M

16.552M

16.552M

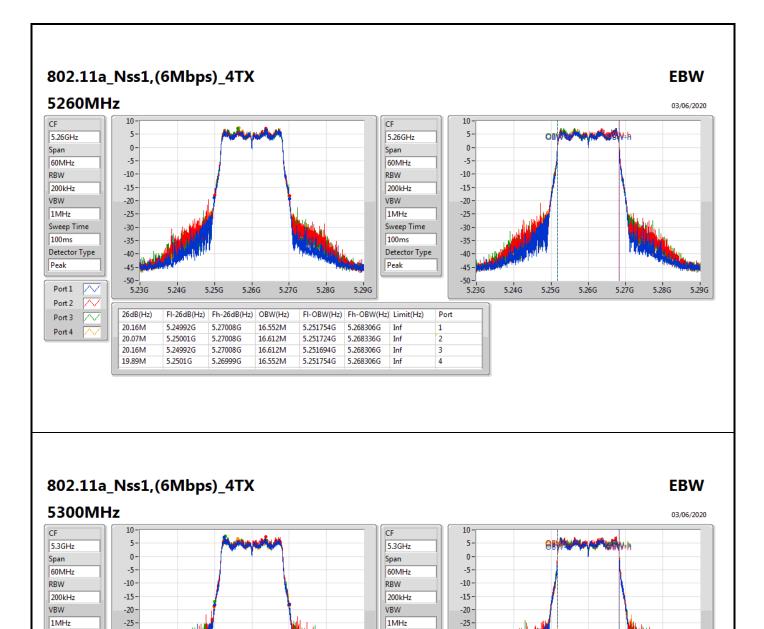
5.32G

5.291724G

5.291724G

5.291724G

5.291754G



Sweep Time

Detector Type

100ms

Peak

Inf

Inf

Inf

Inf

5.33G

FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz)

5.308306G

5 308336G

5.308276G

5.308306G

-30

-35

-40

-45 · -50 ·

Port

1

2

3

4

5.27G

5.28G

5.29G

5.3G

5.31G

5.32G

5.33G





-10 -

-15-

-20

-25 -

-30-

-35

-40

-45 -

-50-5.47G

26dB(Hz)

20.07M

19.92M

20.16M

20.04M

5.48G

5.48998G

5.4901G

5.48995G

5.49004G

5.49G

FI-26dB(Hz) Fh-26dB(Hz) OBW(Hz)

5.51005G

5.51002G

5.51011G

5.51008G

5.5G

5.51G

16.522M

16.612M

16.582M

16.612M

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

5.52G

5.491754G

5.491724G

5.491724G

5.491724G

RBW

200kHz VBW

1MHz

100ms

Peak

Port 1

Port 2

Port 3

Port 4

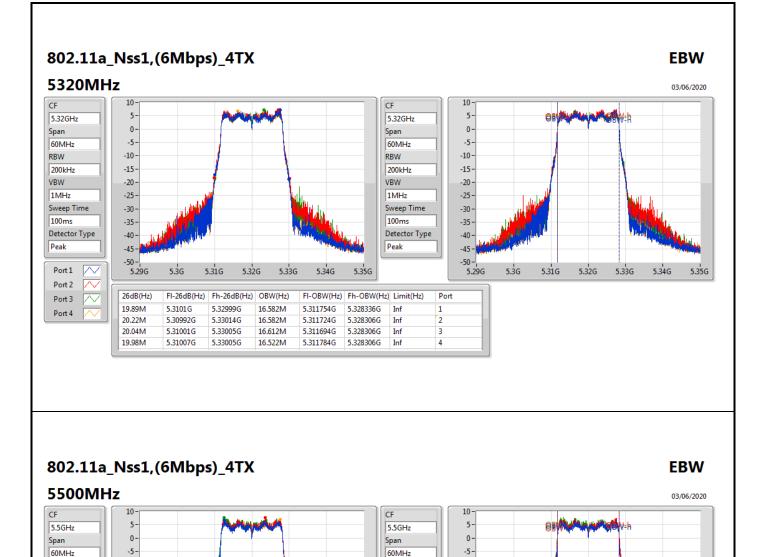
Sweep Time

Detector Type

 \sim

 $\overline{\vee}$

 $\overline{\sim}$



RBW

VBW

1MHz

100ms

Peak

Inf

Inf

Inf

Inf

5.53G

FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz)

5.508276G

5.508336G

5.508306G

5.508336G

Sweep Time

Detector Type

200kHz

-10-

-15-

-20

-25

-30

-35

-40

-45 -

Port

1

2

3

4

-50 -5.47G

5.48G

5.49G

5.5G

5.51G

5.52G

5.53G



EBW

03/06/2020



-15-

-20 -

-25 -

-30 -

-35 -

-40

-45 -

-50

5.55G

26dB(Hz)

19.98M

20.04M

20.16M

20.1M

5.56G

5.56998G

5.56995G

5.56992G

5.56995G

5.57G

FI-26dB(Hz) Fh-26dB(Hz) OBW(Hz)

5.58996G

5.58999G

5.59008G

5.59005G

5.58G

5.59G

16.552M

16.642M

16.642M

16.582M

5.6G

5.571724G

5.571694G

5.571664G

5.571724G

200kHz

VBW

1MHz

100ms

Peak

Port 1

Port 2

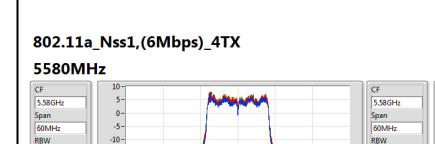
Port 3

Port 4

 \sim

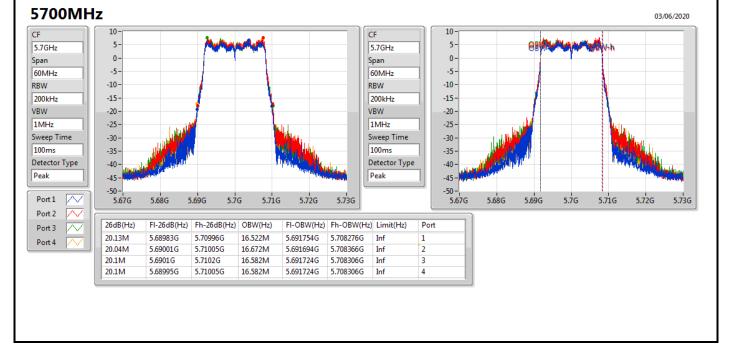
Sweep Time

Detector Type









10

5-

0-

-5-

-10

-15-

-20-

-25

-30

-35-

-40

-45

-50

Port

2

3

4

5.55G

5.56G

200kHz

VBW

1MHz

100ms

Peak

Inf

Inf

Inf

Inf

5.61G

FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz)

5.588276G

5.588336G

5.588306G

5.588306G

Sweep Time

Detector Type

OB

5.57G

5.58G

5.59G

5.6G

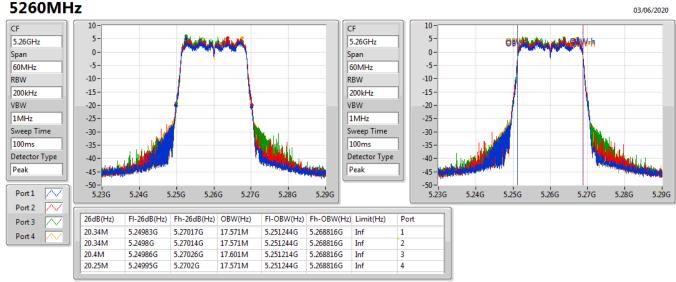
5.61G



EBW

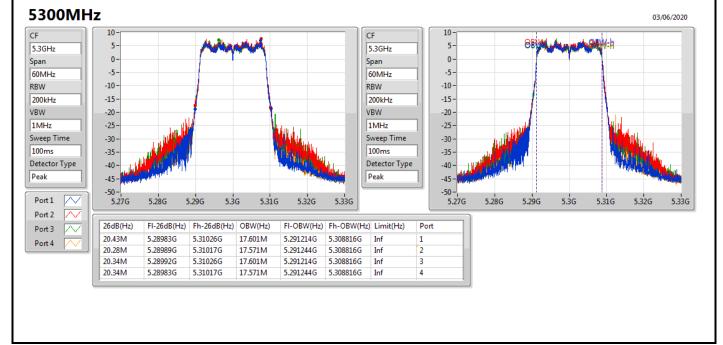


802.11ac VHT20_Nss1,(MCS0)_4TX



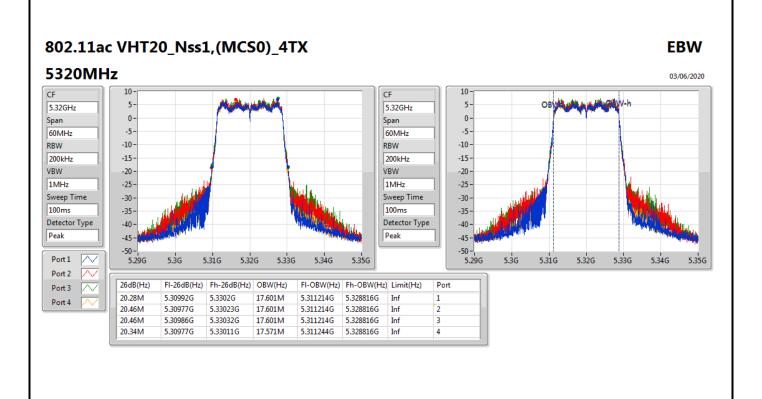
802.11ac VHT20_Nss1,(MCS0)_4TX

EBW

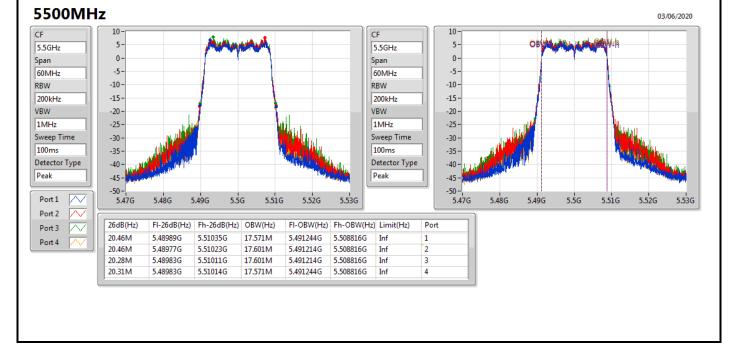






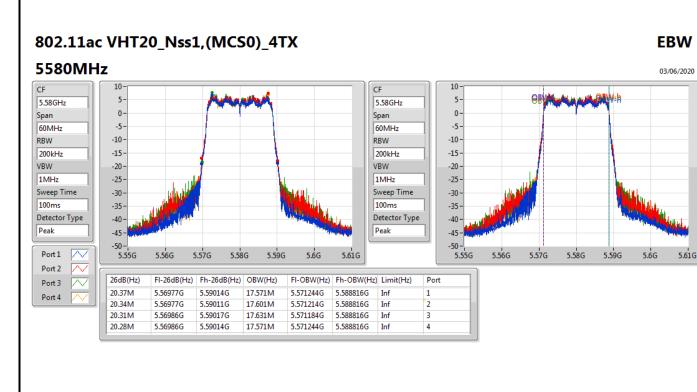


802.11ac VHT20_Nss1,(MCS0)_4TX

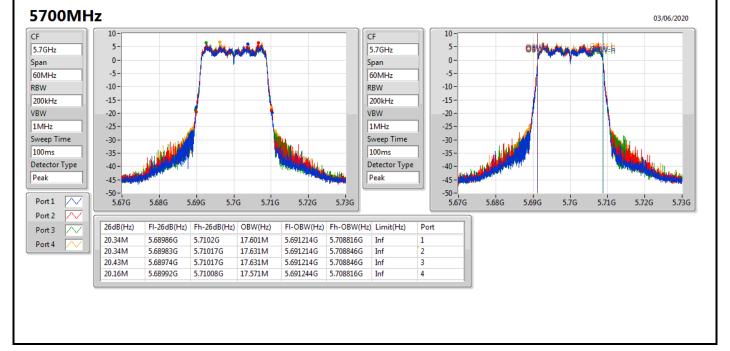






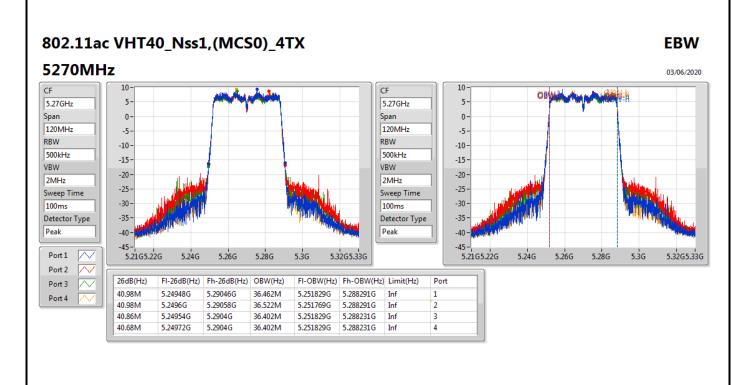


802.11ac VHT20_Nss1,(MCS0)_4TX

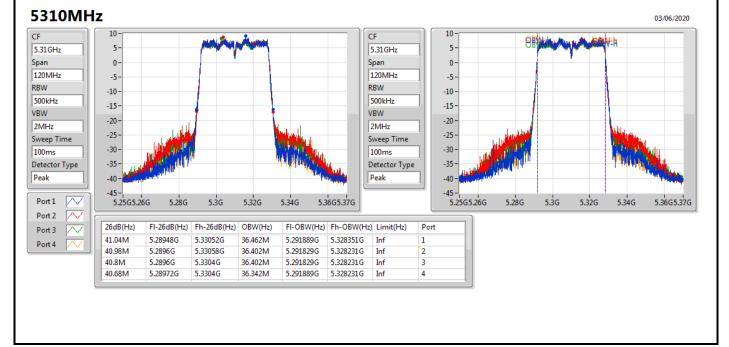






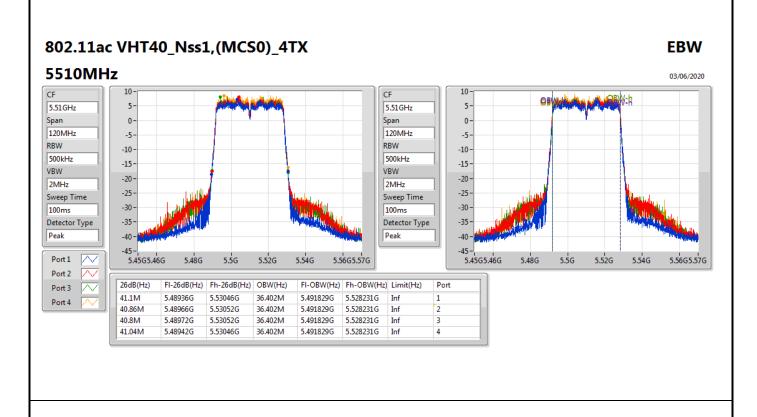


802.11ac VHT40_Nss1,(MCS0)_4TX

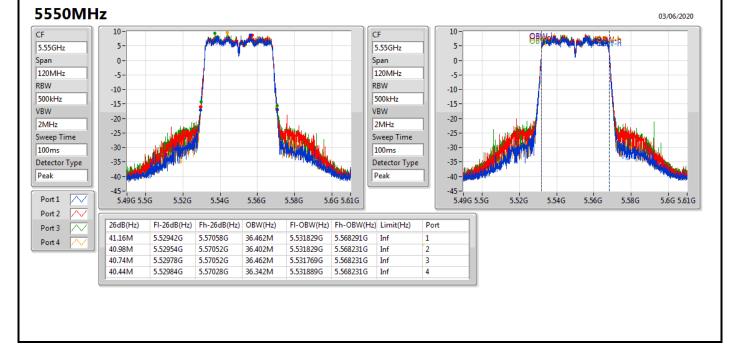






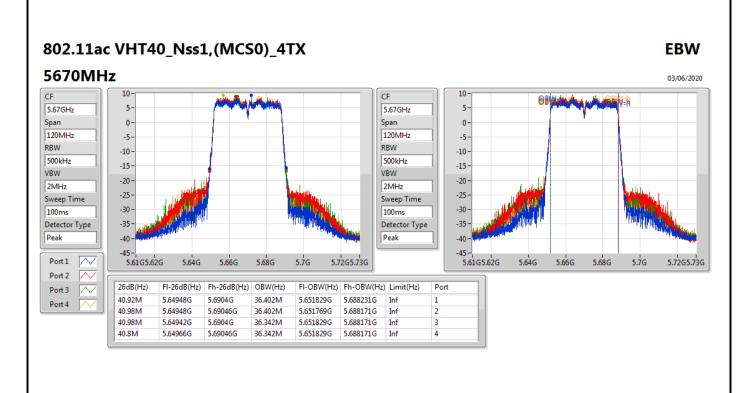


802.11ac VHT40_Nss1,(MCS0)_4TX

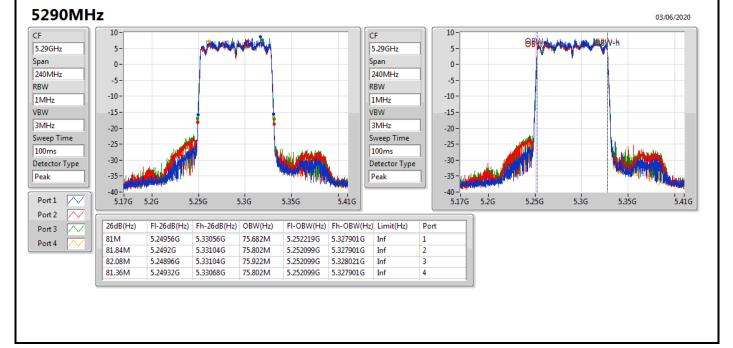






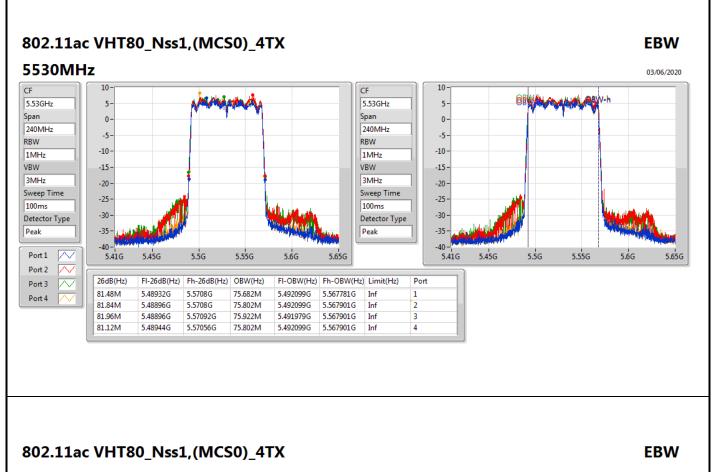


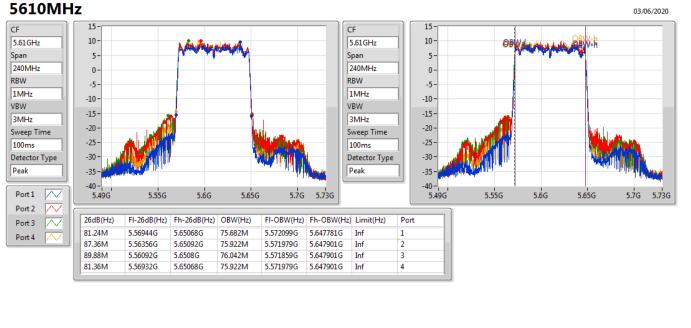
802.11ac VHT80_Nss1,(MCS0)_4TX













Summary

Mode	Total Power	Total Power
	(dBm)	(W)
5.25-5.35GHz	-	-
802.11a_Nss1,(6Mbps)_4TX	23.57	0.22751
802.11ac VHT20_Nss1,(MCS0)_4TX	23.77	0.23823
802.11ac VHT40_Nss1,(MCS0)_4TX	23.61	0.22961
802.11ac VHT80_Nss1,(MCS0)_4TX	21.92	0.15560
5.47-5.725GHz	-	-
802.11a_Nss1,(6Mbps)_4TX	23.53	0.22542
802.11ac VHT20_Nss1,(MCS0)_4TX	23.42	0.21979
802.11ac VHT40_Nss1,(MCS0)_4TX	23.66	0.23227
802.11ac VHT80_Nss1,(MCS0)_4TX	23.64	0.23121



Appendix C

Result

Mode	Result	DG	Port 1	Port 2	Port 3	Port 4	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-
5260MHz	Pass	5.46	17.12	17.42 17.87	17.41 17.57	17.68 17.37	23.43	23.98
5300MHz	Pass	5.46	17.36				23.57	23.98
5320MHz	Pass	5.46	17.17	17.62	17.39	17.18	23.36	23.98
5500MHz	Pass	5.46	17.03	17.63	17.94	17.38	23.53	23.98
5580MHz	Pass	5.46	16.81	17.24	17.36	17.15	23.17	23.98
5700MHz	Pass	5.46	16.83	17.46	17.24	17.45	23.27	23.98
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5260MHz	Pass	5.46	17.12	17.89	18.38	17.52	23.77	23.98
5300MHz	Pass	5.46	17.27	17.69	17.49	17.25	23.45	23.98
5320MHz	Pass	5.46	17.05	17.43	17.75 17.03		23.35	23.98
5500MHz	Pass	5.46	16.95	17.54	17.80	17.28	23.42	23.98
5580MHz	Pass	5.46	16.64	17.28	17.22	17.06	23.08	23.98
5700MHz	Pass	5.46	15.97	16.40	16.21	16.68	22.34	23.98
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5270MHz	Pass	5.46	17.53	17.84	17.55	17.44	23.61	23.98
5310MHz	Pass	5.46	17.33	17.78	17.39	17.16	23.44	23.98
5510MHz	Pass	5.46	15.81	16.93	17.01	17.61	22.91	23.98
5550MHz	Pass	5.46	17.11	17.89	17.84	17.49	23.61	23.98
5670MHz	Pass	5.46	17.14	17.82	17.72	17.83	23.66	23.98
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5290MHz	Pass	5.46	15.86	15.82	16.03	15.87	21.92	23.98
5530MHz	Pass	5.46	14.38	15.60	15.76	14.81	21.19	23.98
5610MHz	Pass	5.46	16.87	17.97	17.78	17.77	23.64	23.98

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



PSD Result

Summary

Mode	PD
	(dBm/RBW)
5.25-5.35GHz	-
802.11a_Nss1,(6Mbps)_4TX	10.72
802.11ac VHT20_Nss1,(MCS0)_4TX	10.90
802.11ac VHT40_Nss1,(MCS0)_4TX	7.50
802.11ac VHT80_Nss1,(MCS0)_4TX	1.88
5.47-5.725GHz	· ·
802.11a_Nss1,(6Mbps)_4TX	10.83
802.11ac VHT20_Nss1,(MCS0)_4TX	10.62
802.11ac VHT40_Nss1,(MCS0)_4TX	7.55
802.11ac VHT80_Nss1,(MCS0)_4TX	4.17

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

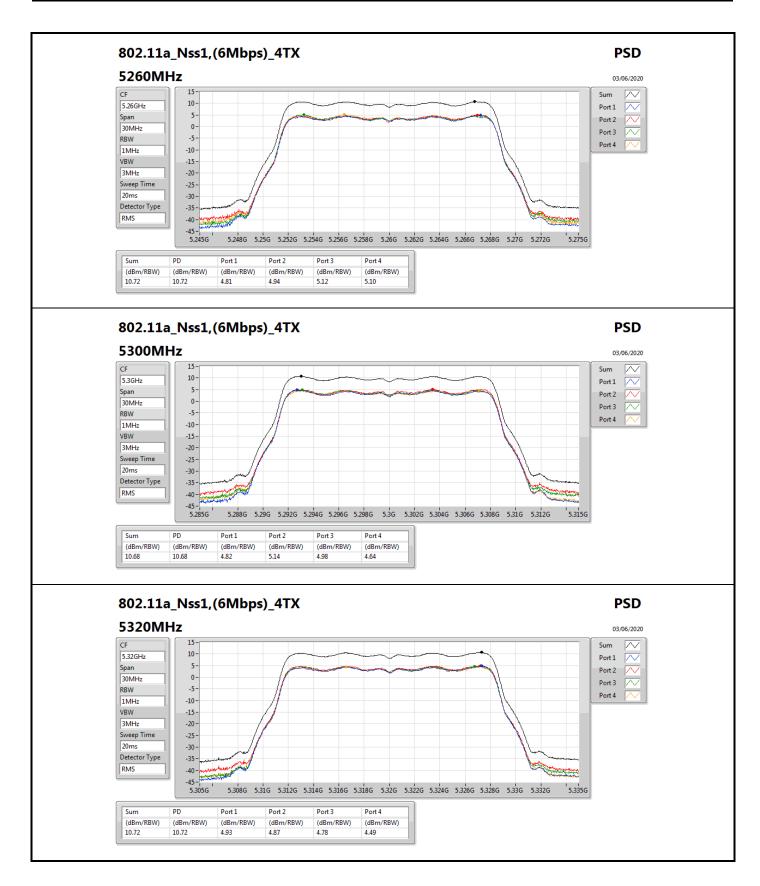


Result

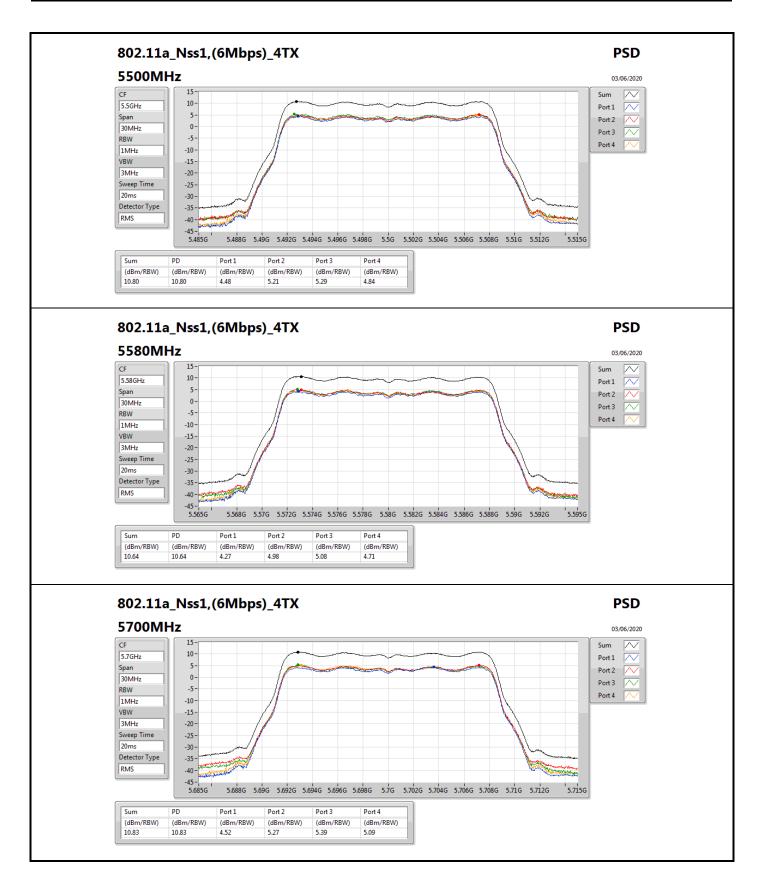
Mode	Result	DG	Port 1	Port 2	Port 3	Port 4	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_4TX	-	-	-	-	-	-	-	-
5260MHz	Pass	6.05	4.81	4.94 5.14	5.12 4.98	5.10	10.72 10.68	10.95 10.95
5300MHz	Pass	6.05	4.82			4.64		
5320MHz	Pass	6.05	4.93	4.87	4.78	4.49	10.72	10.95
5500MHz	Pass	5.44	4.48	5.21	5.29	4.84	10.80	11.00
5580MHz	Pass	5.44	4.27	4.98	5.08	4.71	10.64	11.00
5700MHz	Pass	5.44	4.52	5.27	5.39	5.09	10.83	11.00
802.11ac VHT20_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5260MHz	Pass	6.05	4.51	5.28	5.80	4.86	10.90	10.95
5300MHz	Pass	6.05	4.50	4.94	4.79	4.44	10.55	10.95
5320MHz	Pass	6.05	4.36	4.61	4.99	4.28	10.41	10.95
5500MHz	Pass	5.44	4.38	4.86	5.10	4.57	10.62	11.00
5580MHz	Pass	5.44	4.31	5.05	4.92	4.48	10.61	11.00
5700MHz	Pass	5.44	3.57	3.85	3.72	4.49	9.72	11.00
802.11ac VHT40_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5270MHz	Pass	6.05	1.54	2.11	1.89	1.30	7.50	10.95
5310MHz	Pass	6.05	1.34	1.83	1.40	1.19	7.27	10.95
5510MHz	Pass	5.44	-0.13	0.93	1.03	1.68	6.74	11.00
5550MHz	Pass	5.44	1.25	2.19	2.13	1.52	7.54	11.00
5670MHz	Pass	5.44	1.13	2.07	2.02	1.92	7.55	11.00
802.11ac VHT80_Nss1,(MCS0)_4TX	-	-	-	-	-	-	-	-
5290MHz	Pass	6.05	-3.92	-3.60	-3.79	-3.80	1.88	10.95
5530MHz	Pass	5.44	-5.24	-4.05	-4.04	-4.97	1.19	11.00
5610MHz	Pass	5.44	-2.60	-1.22	-1.23	-1.99	4.17	11.00

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

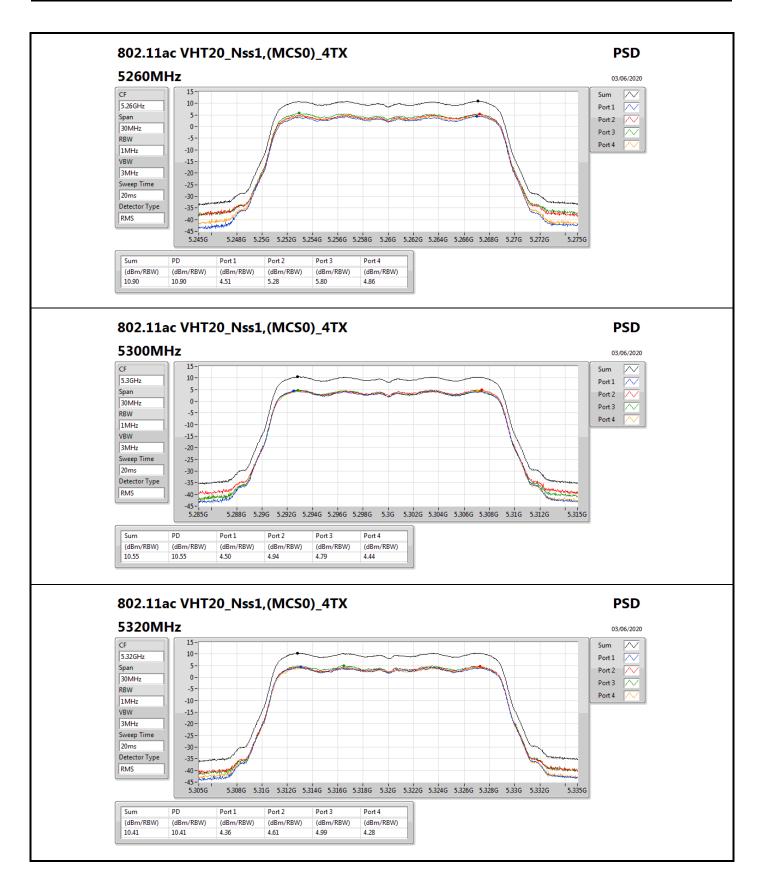




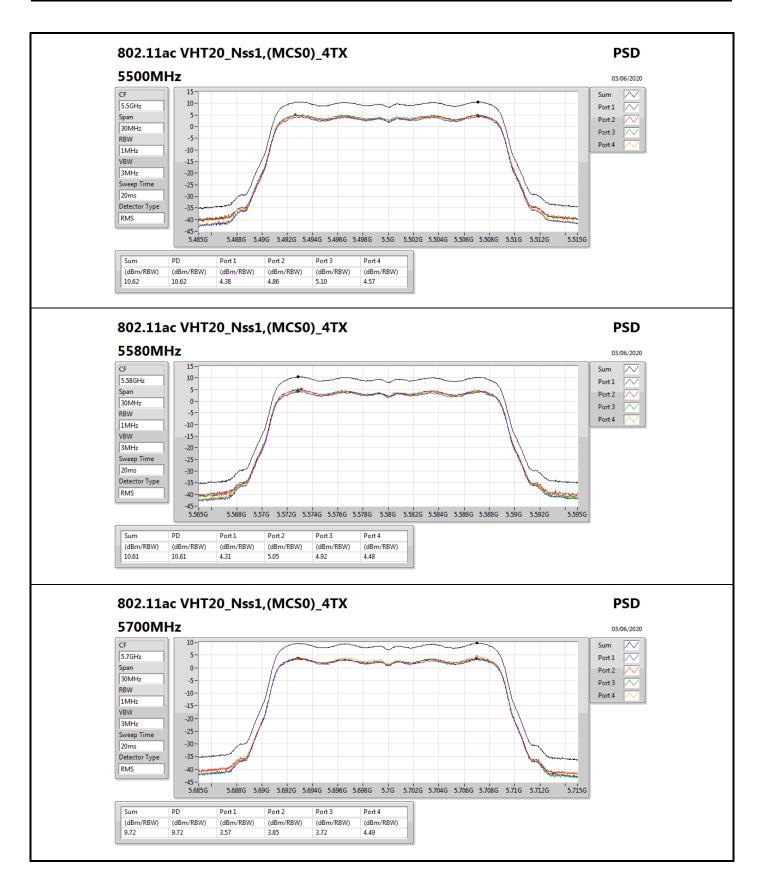




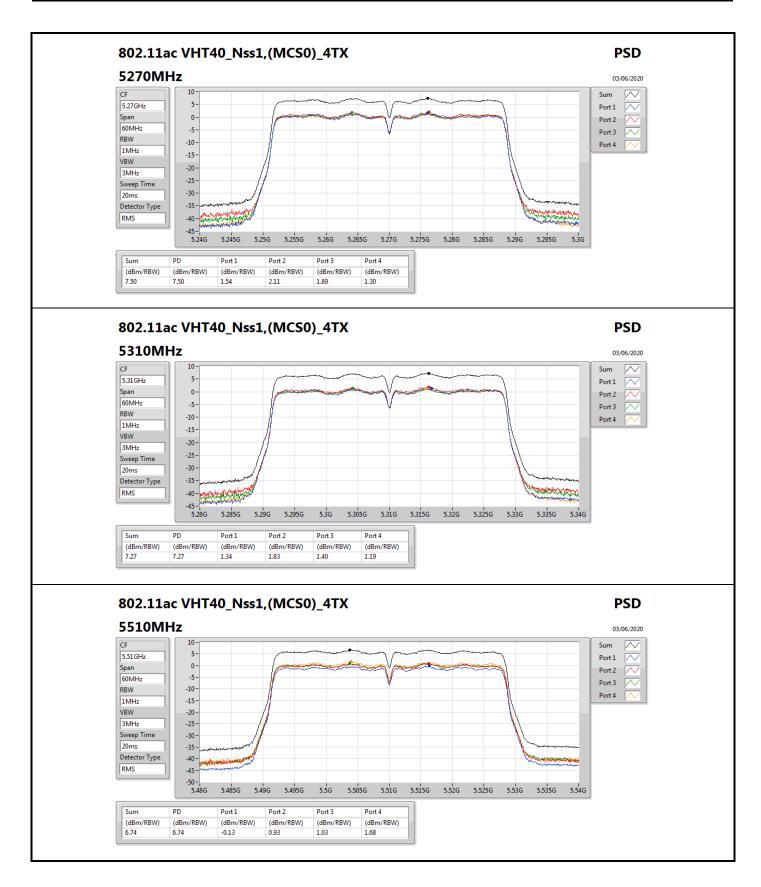




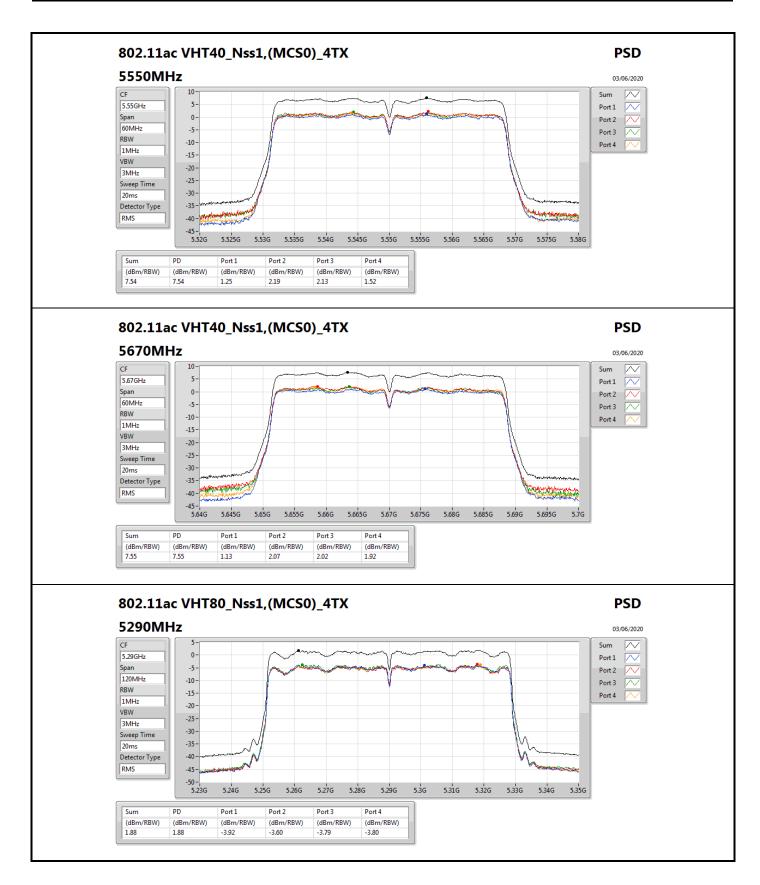




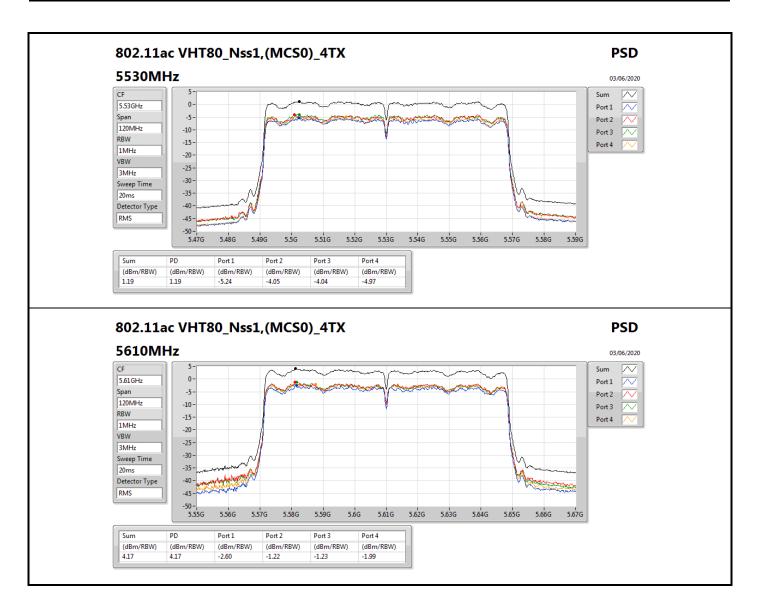










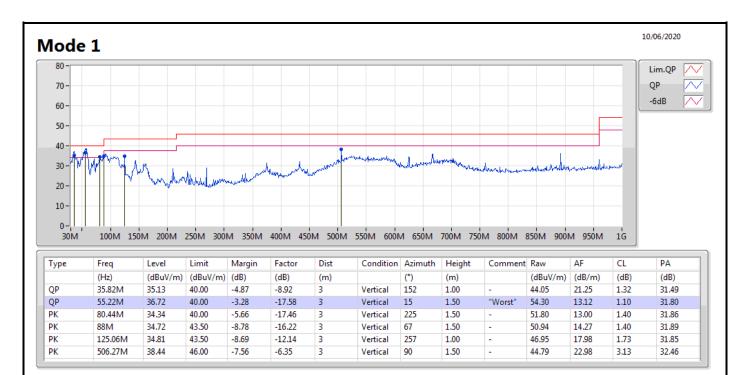




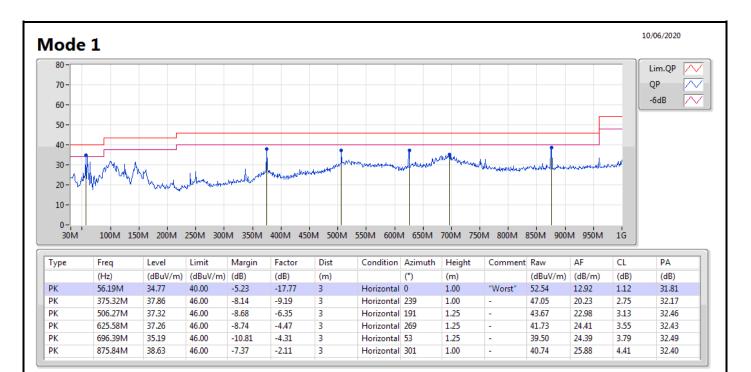
Appendix E.1

Summary							-
Mode	Result	Туре	Freq	Level	Limit	Margin	Condition
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	
Mode 1	Pass	QP	55.22M	36.72	40.00	-3.28	Vertical











Appendix E.2

Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.25-5.35GHz	-	-	-	-	-	-	-	-	-	-	-
802.11ac VHT20_Nss1,(MCS0)_4TX	Pass	AV	15.78306G	53.92	54.00	-0.08	3	Vertical	43	1.99	-



Appendix E.2

