

Report No.: FR741722-10AB



FCC RADIO TEST REPO

FCC ID : PPQ-WP8333V5

Equipment : 802.11ac Tri Band PoE Access Point

Brand Name : LITE-ON, WatchGuard

Model Name : WP8333V5, C-110, AP325

Applicant : LITE-ON Technology Corp.

Bldg. C, 90, Chien 1 Rd., Chung-Ho, New Taipei

City, 23585 Taiwan

Manufacturer (1) : Lite-On Network Communication (Dongguan)

Limited

30#Keji Rd., Yin Hu Industrial Area, Qingxi Town, Dong Guan City, Guangdong, China

Manufacturer (2) : LITE-ON Technology Corp. Networking Plant

No. 101, Neihuan N. Rd., Nanzi Processing Export,

Nanzi Dist., Kaohsiung City 811, Taiwan

Standard : 47 CFR FCC Part 15.407

The product was received on Nov. 11, 2019, and testing was started from Nov. 11, 2019 and completed on Dec. 26, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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History of this test report

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Report No.	Version	Description	Issued Date
FR741722-10AB	01	Initial issue of report	Jan. 02, 2020
FR741722-10AB	01	 Modifying the typing error section 2.5 Support Equipment and section 2.6 Test Setup Diagramfor Radiated (above 1GHz) power supply. Modifying the typing error section 2.6 Test Setup Diagram for Radiated Test < 1GHz item 2 and 4 RJ-45 cable length:1.5m. 	Jan. 08, 2020

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Summary of Test Result

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

Declaration of Conformity:

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

Comments and Explanations:

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

Reviewed by: Sam Chen
Report Producer: Wendy Pan

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1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20), ac (VHT20),	5180-5240	36-48 [4]
5725-5850	a, 11 (11120), ao (111120),	5745-5825	149-165 [5]
5150-5250	n (HT40), ac (VHT40)	5190-5230	38-46 [2]
5725-5850	11 (11140), ac (111140)	5755-5795	151-159 [2]
5150-5250	ac (VHT80)	5210	42 [1]
5725-5850	40 (************************************	5775	155 [1]

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

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.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

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1.1.2 Antenna Information

Set	Ant.	Port	Brand	P/N	Antenna Type	Connector	Radio
	1	1	LYNwave	MLX19X-126AA1-A	PIFA Antenna	I-PEX	R1
	2	2	LYNwave	MLX19X-126AA1-A	PIFA Antenna	I-PEX	R1
	3	1	LYNwave	MLX19X-126AA1-A	PIFA Antenna	I-PEX	R2
1	4	2	LYNwave	MLX19X-126AA1-A	PIFA Antenna	I-PEX	R2
	5	1	LYNwave	MLX19X-126AA1-A	PCB Antenna	I-PEX	R4
	6	1	LYNwave	MLX19X-126AA1-A	PCB Antenna	I-PEX	R3
	7	2	LYNwave	MLX19X-126AA1-A	PCB Antenna	I-PEX	R3

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				Gain (dBi)			
Ant.	Radio 1	Rad	lio 2		Radio 3		Radio 4
Ant.	WLAN	WLAN	WLAN	WLAN	WLAN	WLAN	Ded at a sett
	2.4GHz	5GHz B1	5GHz B4	2.4GHz	5GHz B1	5GHz B4	Buletooth
1	6.3	-	-	-	-	-	-
2	6.5	-	-	-	-	-	-
3	-	5.6	5.9	-	-	-	-
4	-	5.6	4.6	-	-	-	-
5	-	-	-	-	-	-	2.1
6	ı	-	-	6.5	4.7	6.0	-
7	-	-	-	6.5	4.8	5.5	-

Note: The above information was declared by manufacturer.

The EUT contain Radio 3 (2.4G)/(5G) RF module (Model Name: WM862FEMD / FCC ID:

PQ-WM862FEMD).

For 2.4GHz function:

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

Radio 1

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

Radio 3

Ant. 6 and Ant. 7 could transmit/receive simultaneously.

For 5GHz function:

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

Radio 2 (For Band 1/Band 4)

Ant. 3 and Ant. 4 could transmit/receive simultaneously.

Radio 3 (For Band 1/Band 4)

Ant. 6 and Ant. 7 could transmit/receive simultaneously.

For Bluetooth function:

For bluetooth mode (1TX/1RX)

Only Ant. 5 can be used as transmitting/receiving antenna.

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1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
802.11a	0.964	0.16	2.066m	1k
802.11ac VHT20	0.985	0.07	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11ac VHT40	0.971	0.13	2.44m	1k
802.11ac VHT80	0.94	0.27	1.15m	1k

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

1.1.4 EUT Operational Condition

EUT Power Type	From Power Adapter or PoE			
Beamforming Function		☐ With beamforming ☐ Without beamforming		
Function		Outdoor P2M	\boxtimes	Indoor P2M
		Fixed P2P		Client
Test Software Version	QRCT V3.0.210			

Note: The above information was declared by manufacturer.

1.1.5 Table for Multiple Listing

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

Brand Name	Model Name	Description			
LITE-ON	WP8333V5	All the models are identical, the difference model for difference brand			
WatchGuard	C-110, AP325	served as marketing strategy.			

From the above models, model: AP325 was selected as representative model for the test and its data was recorded in this report.

1.1.6 Table for Explanation of Flash

Brand name	Model name	Flash
winbond	25Q256JVFQ	32M+32M

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1.2 Applicable Standards

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

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- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v02r01
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01
- FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Owen Hsu	23.2~24.4°C / 60~62%	Nov. 26, 2019 ~ Dec. 13, 2019
Radiated < 1GHz	03CH05-CB	Eason Chen	23.7~24°C / 60~62%	Nov. 25, 2019 ~ Nov. 26, 2019
Radiated > 1GHz	03CH06-CB	Eason Chen	25.3~25.9°C / 55~58%	Nov. 11, 2019 ~ Dec. 26, 2019
AC Conduction	CO02-CB	Rick Yeh	20~21°C / 49~50%	Dec. 03, 2019 ~ Dec. 04, 2019

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%

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2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	Power Setting
802.11a_Nss1,(6Mbps)_2TX	-
5180MHz	21
5200MHz	21
5240MHz	21
5745MHz	24
5785MHz	24
5825MHz	24
802.11ac VHT20_Nss1,(MCS0)_2TX	-
5180MHz	21
5200MHz	21
5240MHz	22
5745MHz	24
5785MHz	24
5825MHz	24
802.11ac VHT40_Nss1,(MCS0)_2TX	-
5190MHz	19.5
5230MHz	22
5755MHz	24
5795MHz	24
802.11ac VHT80_Nss1,(MCS0)_2TX	-
5210MHz	18.5
5775MHz	21.5

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Note:VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for HT20 and HT40 are the same or lower than VHT20 and VHT40.

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2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests			
Tests Item AC power-line conducted emissions			
Condition	AC power-line conducted measurement for line and neutral		
Operating Mode Normal Link			
1	EUT - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter		
2 EUT - R1 (2.4G) + R2 (5G) + R3 (5G) + R4 (BT) + Adapter			
For operating mode 1 is the worst case and it was record in this test report.			

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Т	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	Normal Link			
1	1 EUT in Z axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter			
2 EUT in Y axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + Adapter				
Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.				
3	3 EUT in Y axis - R1 (2.4G) + R2 (5G) + R3 (5G) + R4 (BT) + Adapter			
Mode 2 has been evaluate this same test mode.	d to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow			
4	EUT in Y axis - R1 (2.4G) + R2 (5G) + R3 (2.4G) + R4 (BT) + PoE			
For operating mode 4 is the worst case and it was record in this test report.				
Operating Mode > 1GHz CTX				
The EUT was performed at X axis, Y axis and Z axis and the worst case was found at X axis. So the measurement will follow this same test configuration.				

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The Worst Case Mode for Following Conformance Tests				
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation			
Operating Mode				
1	WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + WLAN 2.4GHz (Radio 3) + Bluetooth (Radio 4)			
2	WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + WLAN 5GHz (Radio 3) + Bluetooth (Radio 4)			
Refer to Sporton Test Report No.: FA741722-10 for Co-location RF Exposure Evaluation.				

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Note: The PoE and Adapter were for measurement only, would not be marketed.

The PoE and Adapter information as below:

Support Unit	Brand	Model Number	
PoE	Ruckus	740-64214-001	
Adapter	APD	WB-18D12FU	

2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

N/A

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2.5 Support Equipment

For AC Conduction:

	Support Equipment						
No.	Equipment	Brand Name	Model Name	FCC ID			
Α	Flash disk3.0	Transcend	639205 7755	N/A			
В	Notebook	DELL	E6430	N/A			
С	Notebook	DELL	E6430	N/A			
D	Notebook	DELL	E6430	N/A			
Е	Notebook	DELL	E6430	N/A			
F	BT Device	LITE-ON	WP8333V5	PPQ-WP8333V5			
G	Notebook	DELL	E6430	N/A			
Н	LAN2 NB	DELL	E6430	N/A			
I	Adapter	APD	WA-24Q12FU	N/A			

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For Radiated (below 1GHz):

	Support Equipment						
No.	Equipment	Brand Name	Model Name	FCC ID			
Α	Notebook	DELL	E4300	N/A			
В	Notebook	DELL	E4300	N/A			
С	Notebook	DELL	E4300	N/A			
D	Notebook	DELL	E4300	N/A			
Е	Notebook	DELL	E4300	N/A			
F	BT Device	WatchGuard	C-110	PPQ-WP8333V5			
G	Flash disk3.0	Silicon Power	B06	N/A			
Н	PoE	Ruckus	740-64214-001	N/A			

For Radiated (above 1GHz):

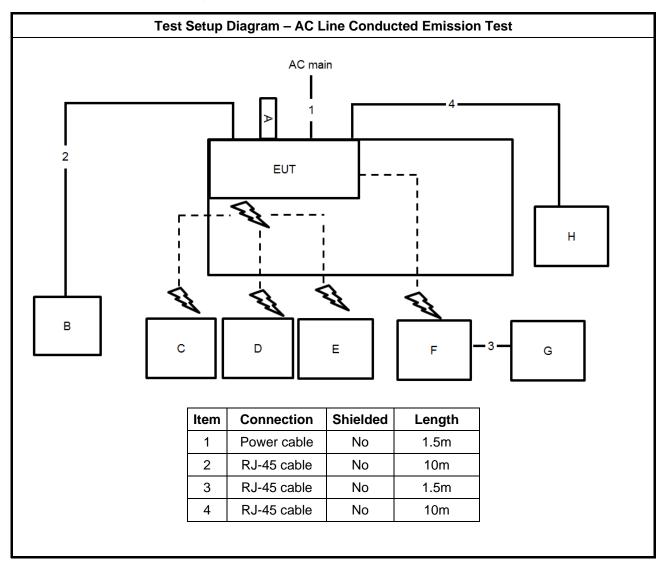
Support Equipment							
No.	No. Equipment Brand Name Model Name FCC ID						
Α	Notebook	DELL	E4300	N/A			
В	PoE	Ruckus	740-64214-001	N/A			

For RF Conducted:

Support Equipment						
No.	Equipment	Brand Name Model Name		FCC ID		
Α	A Notebook DELL		E4300	N/A		
В	AC Adapter	APD	WB-18D12FU	N/A		

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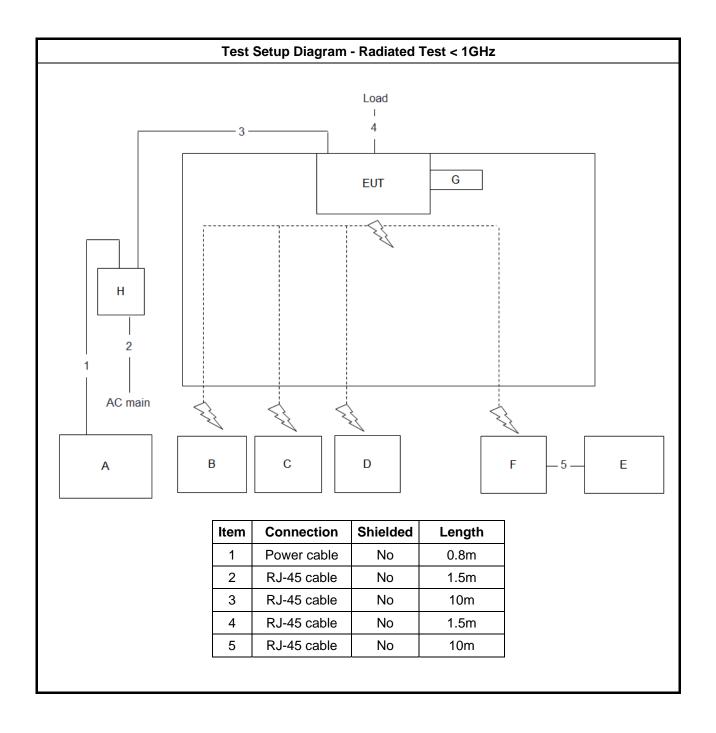
2.6 Test Setup Diagram



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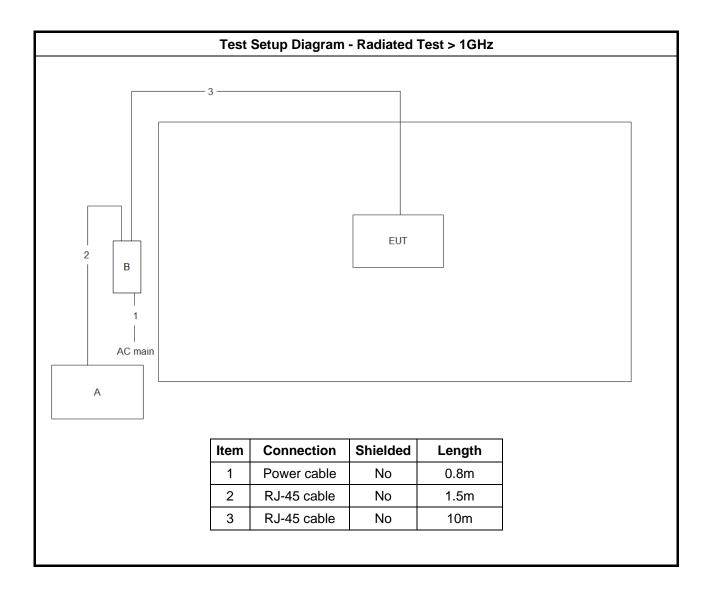
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3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

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3.1.2 Measuring Instruments

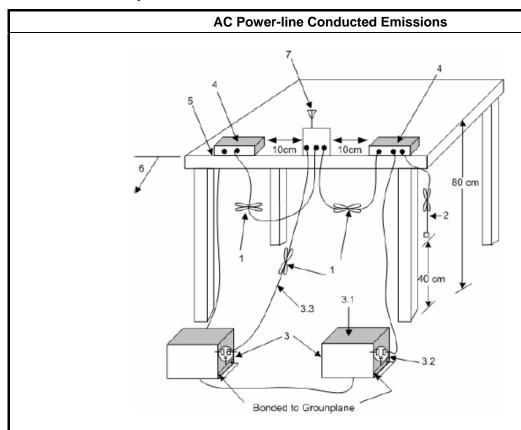
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

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3.1.4 Test Setup



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

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

3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

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3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

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

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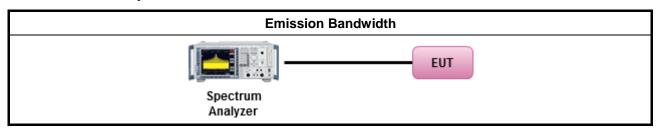
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

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3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

	Maximum Conducted Output Power Limit					
UNI	JNII Devices					
\boxtimes	For the 5.15-5.25 GHz band:					
	 Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 - (G_{TX} - 6). e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm] 					
	Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$					
	Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$.					
	Mobile or Portable Client: the maximum conducted output power (P _{Out}) shall not exceed the lesser of 250 mW. If G _{TX} > 6 dBi, then P _{Out} = 24 - (G _{TX} - 6).					
	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.					
	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If G_{TX} > 6 dBi, then P_{Out} = 24 – (G_{TX} – 6).					
\boxtimes	For the 5.725-5.85 GHz band:					
	 Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 - (G_{TX} - 6). 					
	 Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. 					
LE-	LAN Devices					
	For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.					
	For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz					
	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz					
	For the 5.725-5.85 GHz band:					
	 Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 - (G_{TX} - 6). 					
	 Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. 					
	t = maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi.					

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3.3.2 Measuring Instruments

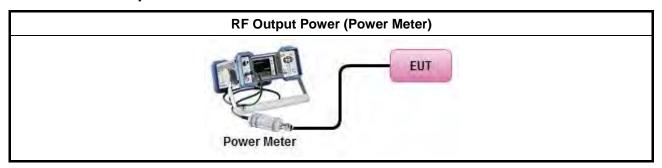
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

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

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3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

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3.4 Peak Power Spectral Density

3.4.1 Peak Power Spectral Density Limit

	Peak Power Spectral Density Limit					
UNI	UNII Devices					
\boxtimes	For the 5.15-5.25 GHz band:					
	• Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.					
	Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$.					
	Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$.					
	■ Mobile or Portable Client: the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – $(G_{TX} - 6)$					
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – ($G_{TX} - 6$).					
	For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} > 6$ dBi, then PPSD= 11 – ($G_{TX} - 6$).					
	For the 5.725-5.85 GHz band:					
	Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$.					
	Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.					
LE-	LAN Devices					
	For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.					
	For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.					
	 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) \leq 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$.					
	 Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. 					
pow	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 G_{Tx} = the maximum transmitting antenna directional gain in dBi.					

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3.4.2 Measuring Instruments

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

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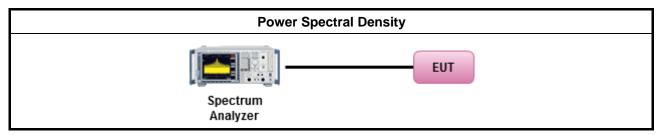
3.4.3 Test Procedures

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

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3.4.4 Test Setup



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3.4.5 Test Result of Peak Power Spectral Density

Refer as Appendix D

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3.5 Unwanted Emissions

3.5.1 Transmitter Unwanted Emissions Limit

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

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- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.
- Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

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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.			

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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.

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3.5.3 Test Procedures

Test Method

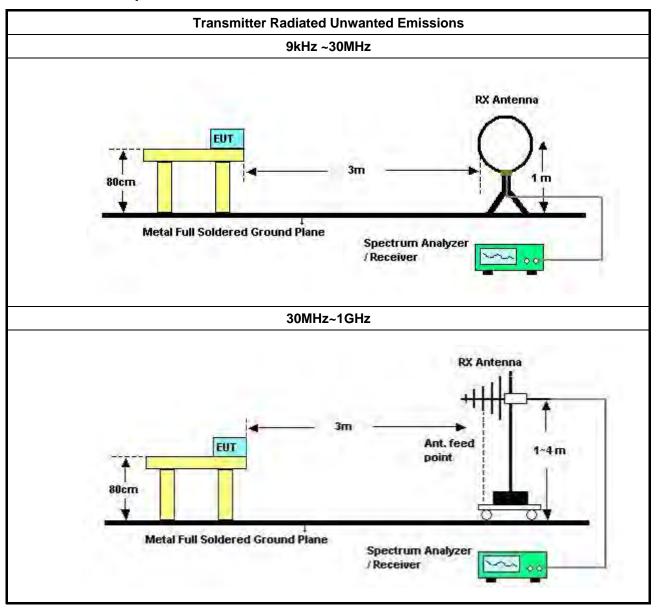
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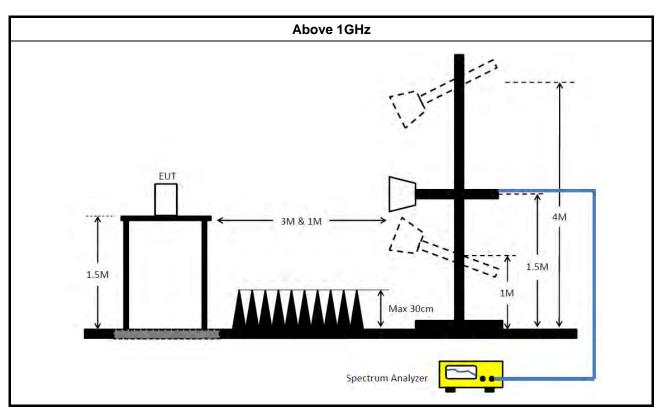
- Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz,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

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3.5.4 Test Setup





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3.5.5 Measurement Results Calculation

The measured Level is calculated using:

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

3.5.6 Transmitter Unwanted Emissions (Below 30MHz)

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

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

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

3.5.7 Test Result of Transmitter Unwanted Emissions

Refer as Appendix E

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4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
					Date	Due Date	
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2019	Nov. 20, 2020	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Oct. 30, 2019	Oct. 29, 2020	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2019	Jan. 15, 2020	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 21, 2019	Oct. 20, 2020	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESE & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	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 15, 2019	May 14, 2020	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	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 08, 2019	May 07, 2020	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUH NER	RG402	High Cable-05	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUH NER	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	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH01-CB)

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Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 18, 2019	Nov. 17, 2020	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)

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

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

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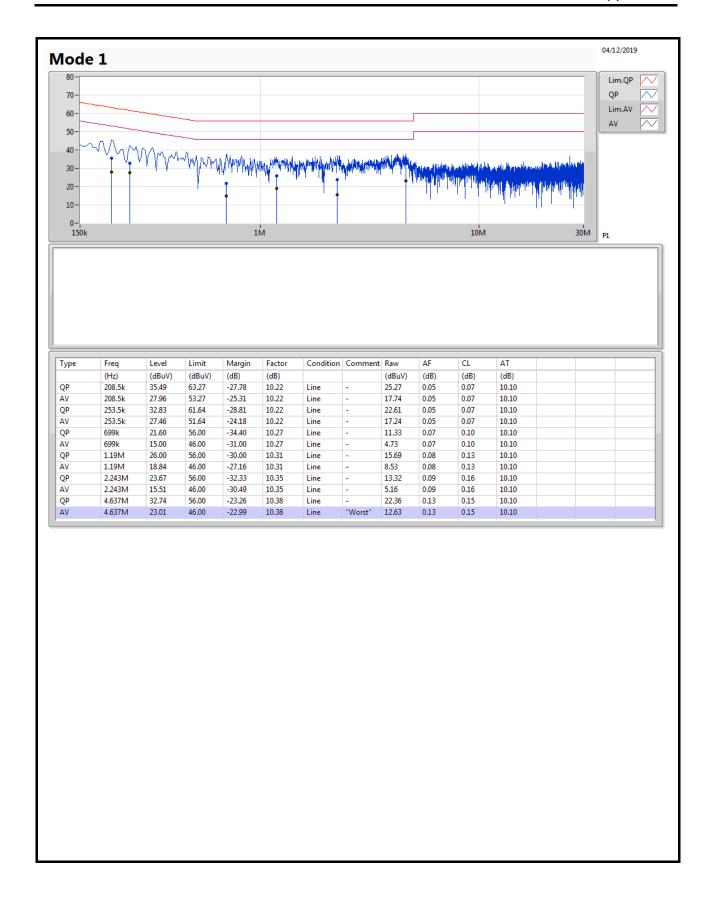
AC Power Port Conducted Emission Result

Appendix A

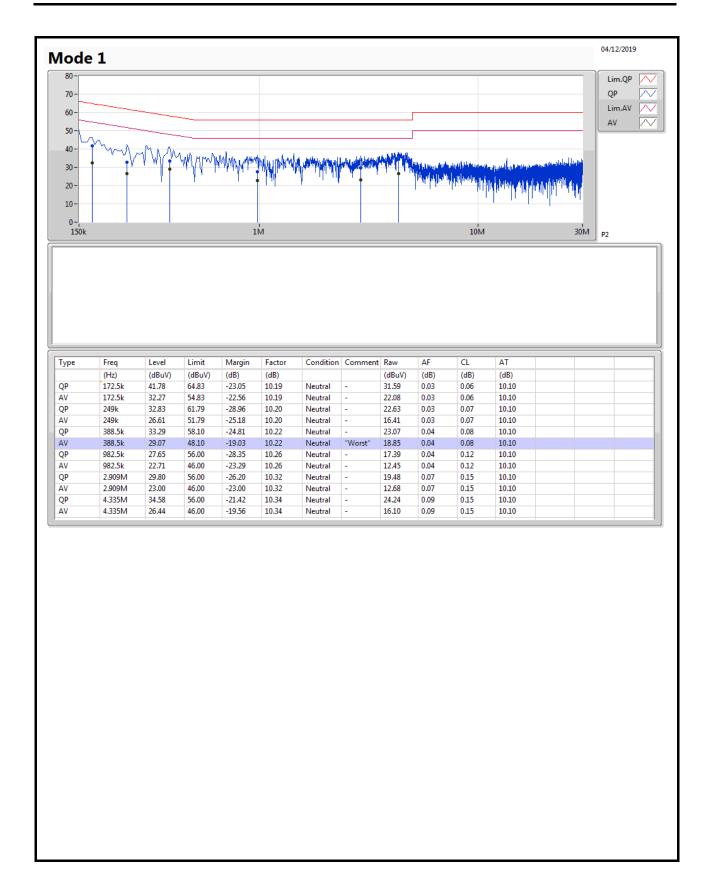
Summary

Mode	Result	Туре	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition
Mode 1	Pass	AV	388.5k	29.07	48.10	-19.03	10.22	Neutral











EBW Appendix B

Summary

Mode	Max-N dB	Max-OBW	ITU-Code	Min-N dB	Min-OBW	
	(Hz)	(Hz)		(Hz)	(Hz)	
5.15-5.25GHz	-	-	-	-	-	
802.11a_Nss1,(6Mbps)_2TX	19.11M	16.402M	16M4D1D	18.93M	16.372M	
802.11ac VHT20_Nss1,(MCS0)_2TX	20.1M	17.601M	17M6D1D	19.83M	17.571M	
802.11ac VHT40_Nss1,(MCS0)_2TX	39.78M	35.922M	35M9D1D	39.42M	35.862M	
802.11ac VHT80_Nss1,(MCS0)_2TX	83.28M	75.682M	75M7D1D	83.28M	75.682M	
5.725-5.85GHz	-	-	-	-	-	
802.11a_Nss1,(6Mbps)_2TX	16.35M	16.582M	16M6D1D	16.35M	16.462M	
802.11ac VHT20_Nss1,(MCS0)_2TX	17.61M	17.691M	17M7D1D	17.55M	17.601M	
802.11ac VHT40_Nss1,(MCS0)_2TX	35.4M	36.222M	36M2D1D	34.92M	36.102M	
802.11ac VHT80_Nss1,(MCS0)_2TX	75.72M	75.562M	75M6D1D	75.6M	75.562M	

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;



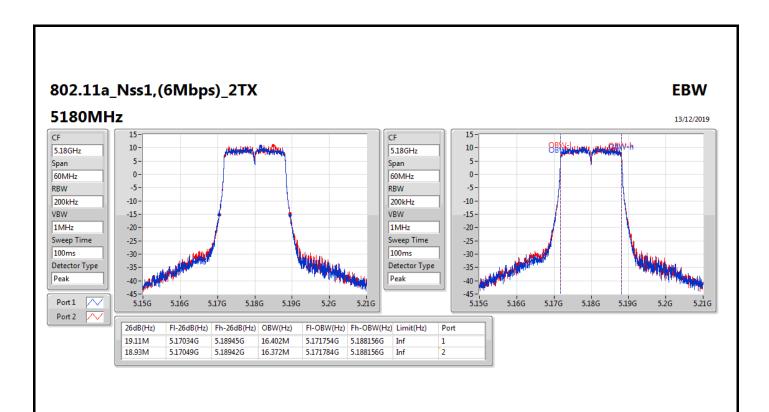
EBW Appendix B

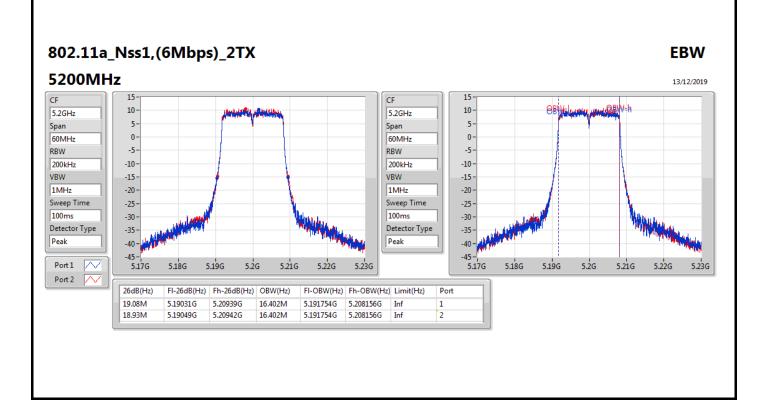
Result

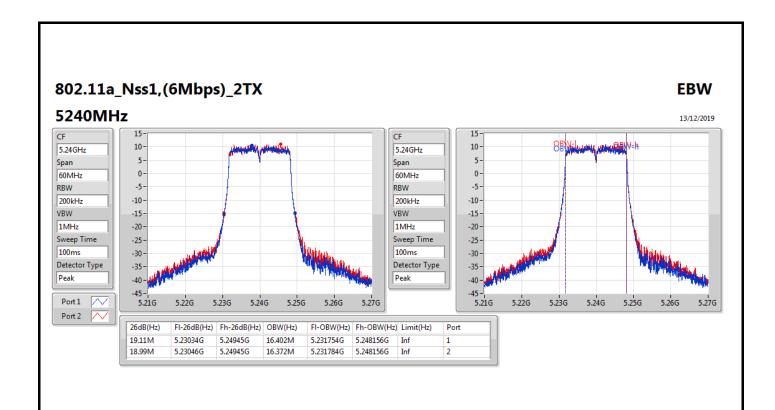
Mode	Result	Limit	Port 1-N dB	Port 1-OBW	Port 2-N dB	Port 2-OBW
		(Hz)	(Hz)	(Hz)	(Hz)	(Hz)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	19.11M	16.402M	18.93M	16.372M
5200MHz	Pass	Inf	19.08M	16.402M	18.93M	16.402M
5240MHz	Pass	Inf	19.11M	16.402M	18.99M	16.372M
5745MHz	Pass	500k	16.35M	16.522M	16.35M	16.462M
5785MHz	Pass	500k	16.35M	16.582M	16.35M	16.492M
5825MHz	Pass	500k	16.35M	16.522M	16.35M	16.462M
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	Inf	19.92M	17.601M	19.83M	17.571M
5200MHz	Pass	Inf	19.92M	17.601M	19.98M	17.571M
5240MHz	Pass	Inf	19.95M	17.601M	20.1M	17.571M
5745MHz	Pass	500k	17.58M	17.631M	17.61M	17.631M
5785MHz	Pass	500k	17.58M	17.691M	17.55M	17.631M
5825MHz	Pass	500k	17.61M	17.661M	17.58M	17.601M
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	Inf	39.42M	35.862M	39.42M	35.862M
5230MHz	Pass	Inf	39.66M	35.922M	39.78M	35.922M
5755MHz	Pass	500k	35.28M	36.162M	34.92M	36.102M
5795MHz	Pass	500k	35.28M	36.222M	35.4M	36.102M
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5210MHz	Pass	Inf	83.28M	75.682M	83.28M	75.682M
5775MHz	Pass	500k	75.72M	75.562M	75.6M	75.562M

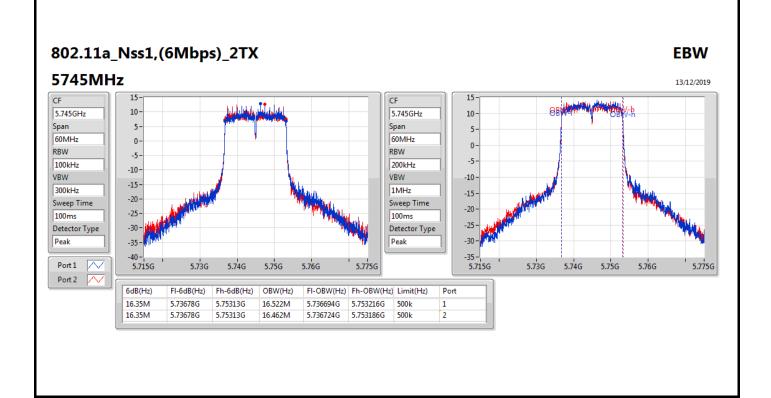
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

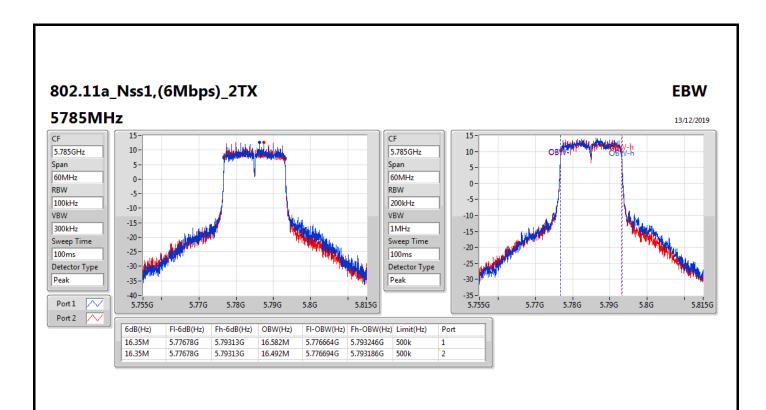
EBW Appendix B

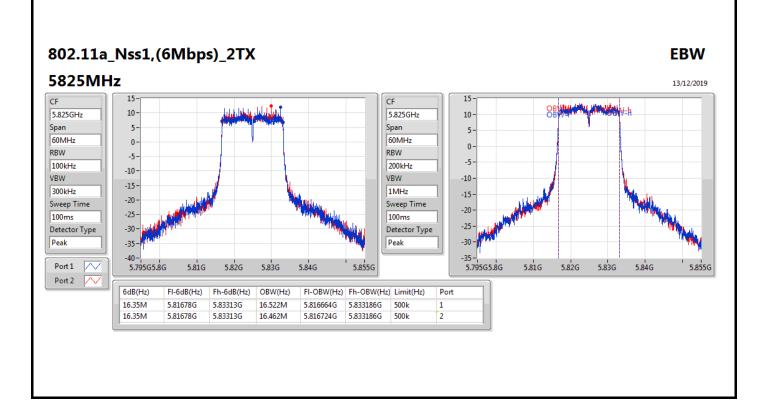


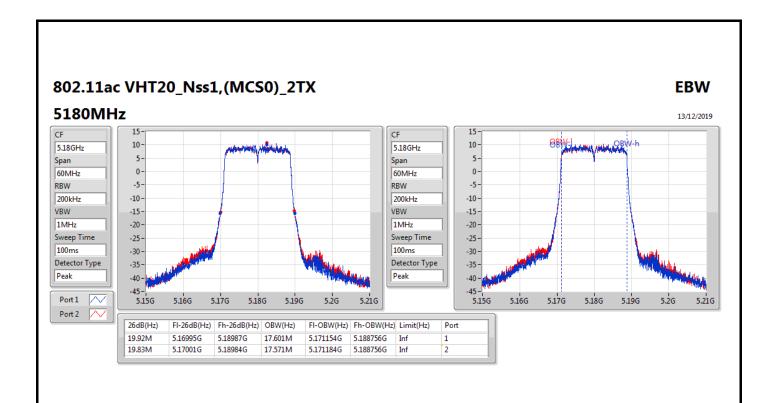


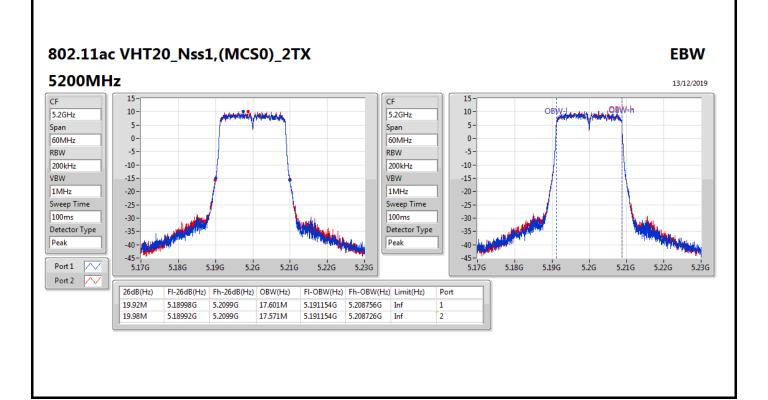


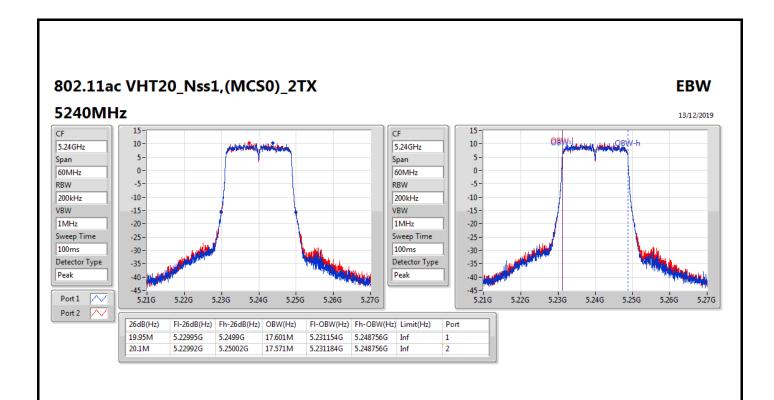


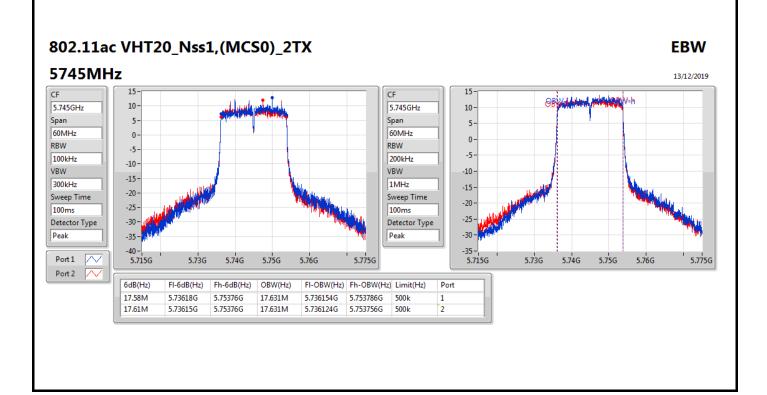


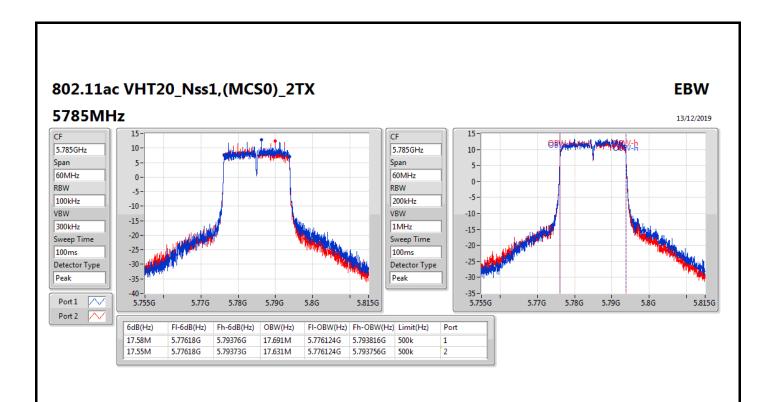


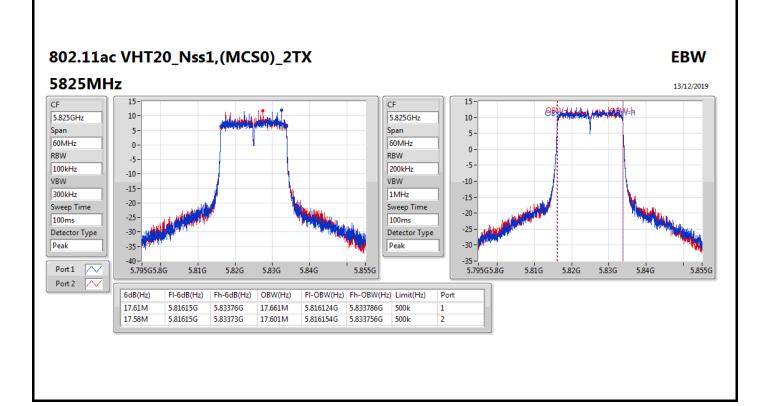


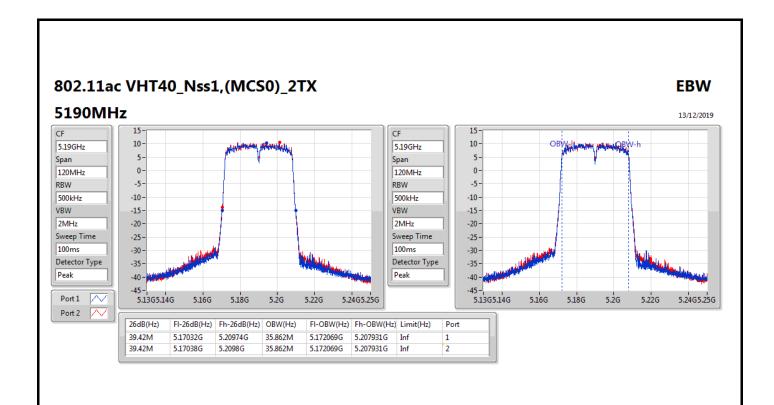


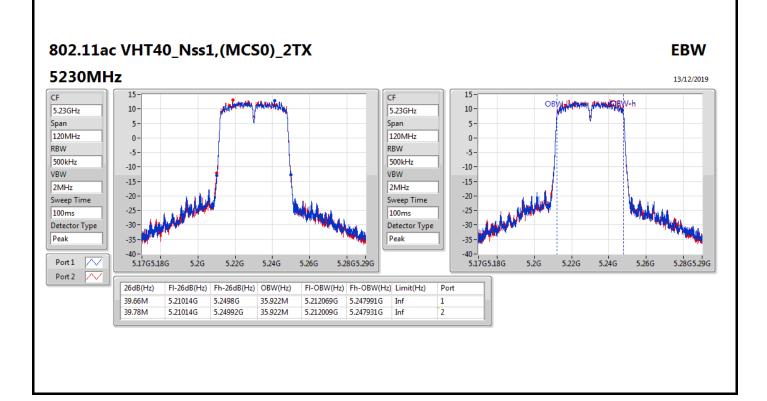


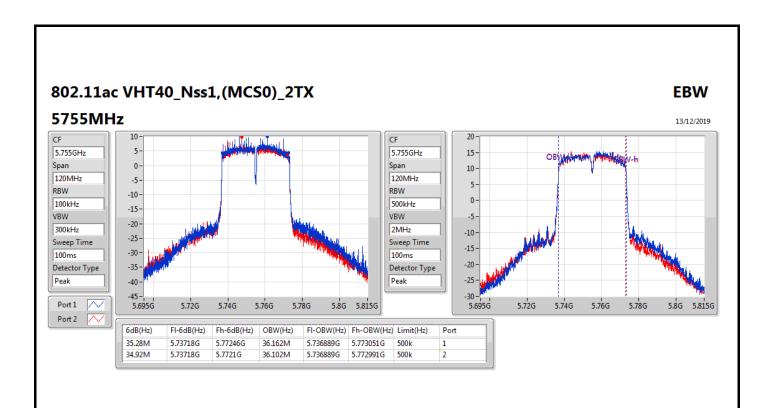


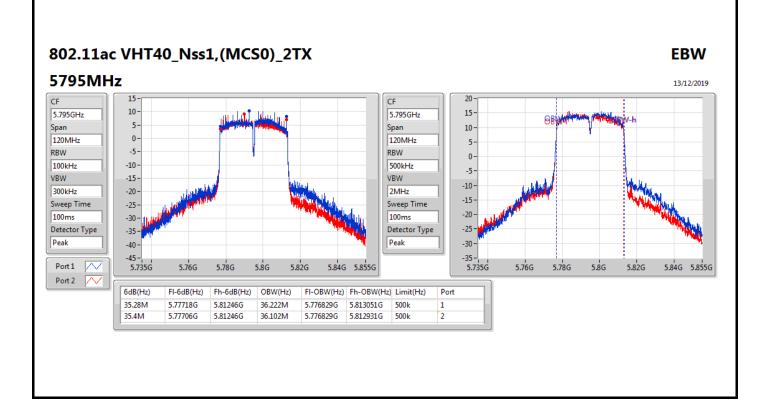


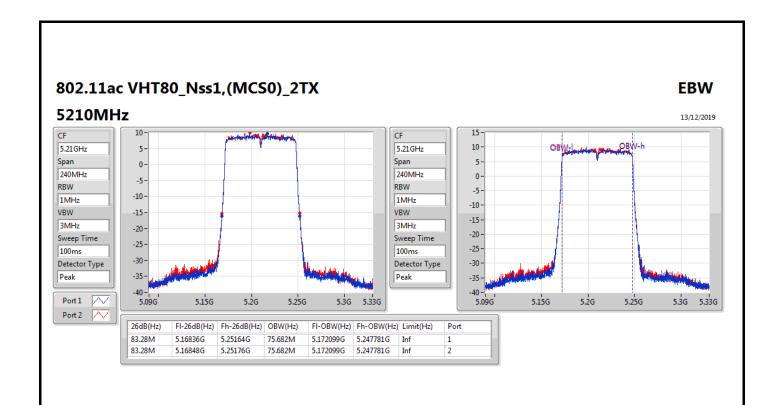


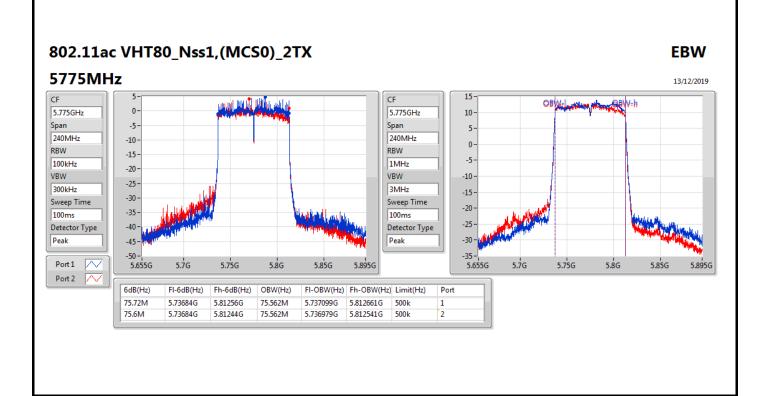














Average Power Appendix C

Summary

Mode	Total Power	Total Power		
	(dBm)	(W)		
5.15-5.25GHz	-	-		
802.11a_Nss1,(6Mbps)_2TX	24.50	0.28184		
802.11ac VHT20_Nss1,(MCS0)_2TX	24.72	0.29648		
802.11ac VHT40_Nss1,(MCS0)_2TX	25.72	0.37325		
802.11ac VHT80_Nss1,(MCS0)_2TX	21.99	0.15812		
5.725-5.85GHz	-	-		
802.11a_Nss1,(6Mbps)_2TX	27.75	0.59566		
802.11ac VHT20_Nss1,(MCS0)_2TX	27.77	0.59841		
802.11ac VHT40_Nss1,(MCS0)_2TX	27.92	0.61944		
802.11ac VHT80_Nss1,(MCS0)_2TX	25.23	0.33343		

Average Power Appendix C

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit	
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)	
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	
5180MHz	Pass	5.60	21.34	21.53	24.45	30.00	
5200MHz	Pass	5.60	21.39	21.59	24.50	30.00	
5240MHz	Pass	5.60	21.32	21.65	24.50	30.00	
5745MHz	Pass	5.90	24.74	24.45	27.61	30.00	
5785MHz	Pass	5.90	24.83	24.64	27.75	30.00	
5825MHz	Pass	5.90	24.21	24.41	27.32	30.00	
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5180MHz	Pass	5.60	21.48	21.67	24.59	30.00	
5200MHz	Pass	5.60	21.43	21.75	24.60	30.00	
5240MHz	Pass	5.60	21.61	21.81	24.72	30.00	
5745MHz	Pass	5.90	24.83	24.56	27.71	30.00	
5785MHz	Pass	5.90	24.87	24.65	27.77	30.00	
5825MHz	Pass	5.90	24.35	24.49	27.43	30.00	
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5190MHz	Pass	5.60	20.22	20.25	23.25	30.00	
5230MHz	Pass	5.60	22.70	22.71	25.72	30.00	
5755MHz	Pass	5.90	25.06	24.68	27.88	30.00	
5795MHz	Pass	5.90	25.16	24.65	27.92	30.00	
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5210MHz	Pass	5.60	18.87	19.09	21.99	30.00	
5775MHz	Pass	5.90	22.53	21.89	25.23	30.00	

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



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Summary

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	·
802.11a_Nss1,(6Mbps)_2TX	11.67
802.11ac VHT20_Nss1,(MCS0)_2TX	11.09
802.11ac VHT40_Nss1,(MCS0)_2TX	9.35
802.11ac VHT80_Nss1,(MCS0)_2TX	2.37
5.725-5.85GHz	·
802.11a_Nss1,(6Mbps)_2TX	13.23
802.11ac VHT20_Nss1,(MCS0)_2TX	12.77
802.11ac VHT40_Nss1,(MCS0)_2TX	10.28
802.11ac VHT80_Nss1,(MCS0)_2TX	4.47

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



Appendix D **PSD**

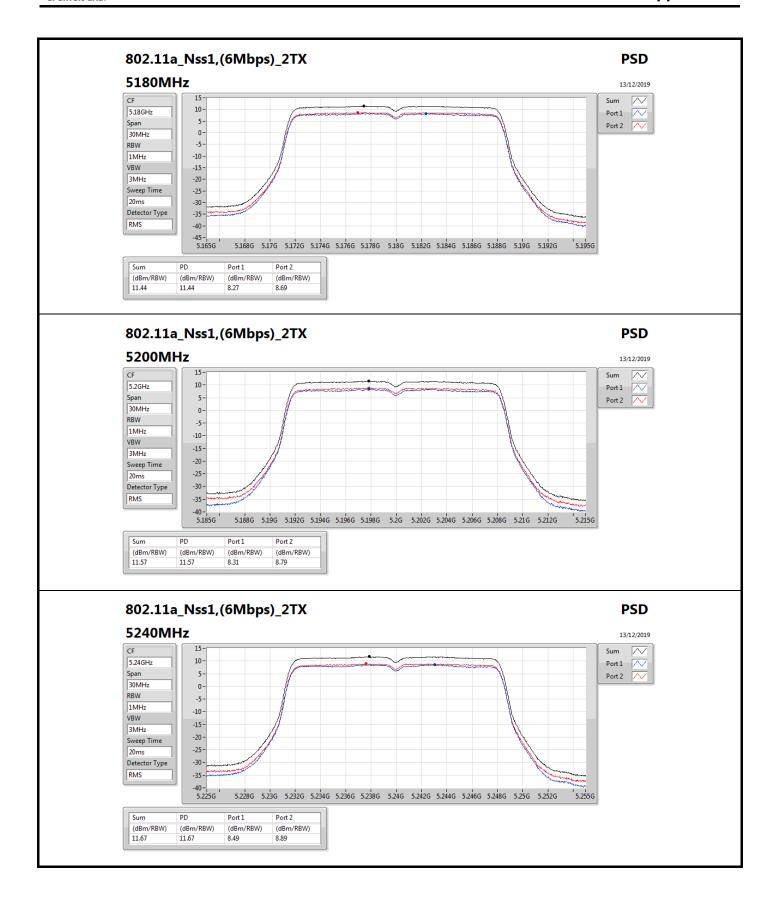
Result

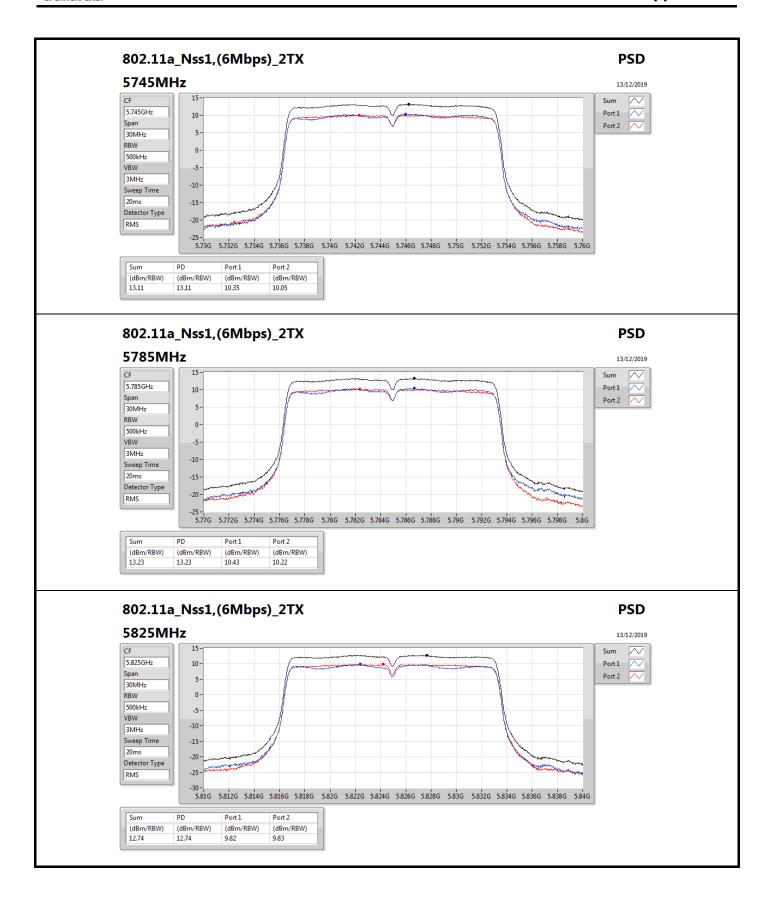
Mode	Result	DG	Port 1	Port 2	PD	PD Limit	
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-	
5180MHz	Pass	8.61	8.27	8.69	11.44	14.39	
5200MHz	Pass	8.61	8.31	8.79	11.57	14.39	
5240MHz	Pass	8.61	8.49	8.89	11.67	14.39	
5745MHz	Pass	8.28	10.35	10.05	13.11	27.72	
5785MHz	Pass	8.28	10.43	10.22	13.23	27.72	
5825MHz	Pass	8.28	9.82	9.83	12.74	27.72	
802.11ac VHT20_Nss1,(MCS0)_2TX	-	-	-	8.10 8.12	- 10.94 10.95	-	
5180MHz	Pass	8.61	7.94 7.85			14.39	
5200MHz	Pass	8.61				14.39 14.39	
5240MHz	Pass	8.61	8.04	8.18	11.09		
5745MHz	Pass	8.28	10.22	9.51	12.76	27.72	
5785MHz	Pass	8.28	10.09	9.65	12.77	27.72	
5825MHz	Pass	8.28	9.27	9.28	12.16	27.72	
802.11ac VHT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5190MHz	Pass	8.61	3.96	4.04	6.91	14.39	
5230MHz	Pass	8.61	6.49	6.38	9.35	14.39	
5755MHz	Pass	8.28	7.72	6.93	10.28	27.72	
5795MHz	Pass	8.28	7.79	6.99	10.15	27.72	
802.11ac VHT80_Nss1,(MCS0)_2TX	-	-	-	-	-	-	
5210MHz	Pass	8.61	-0.54	-0.57	2.37	14.39	
5775MHz	Pass	8.28	2.11	0.84	4.47	27.72	

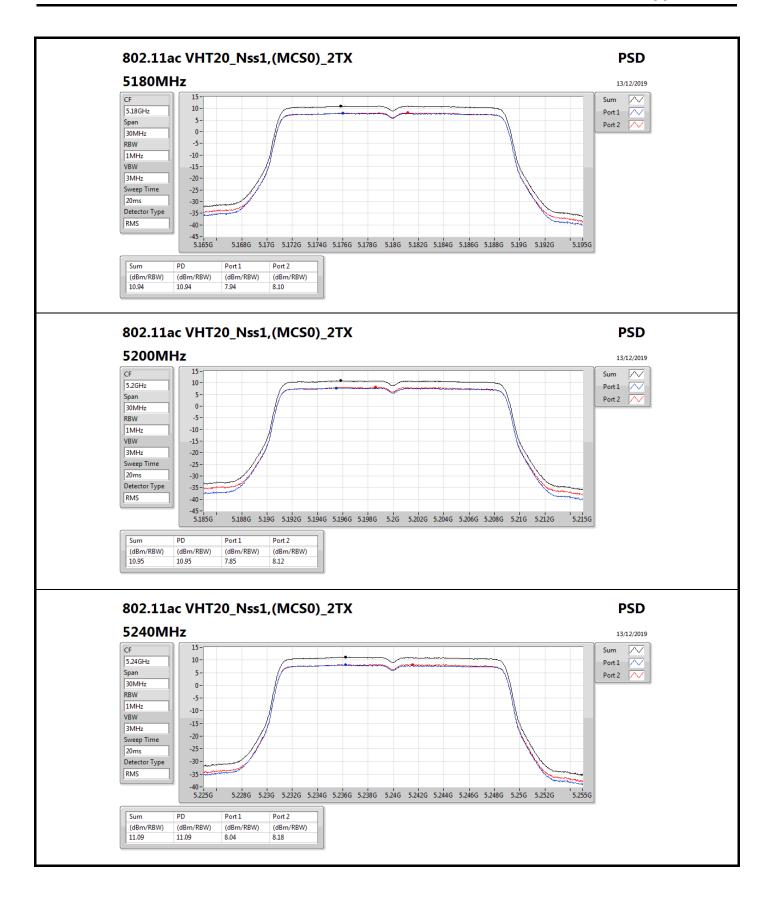
Page No.

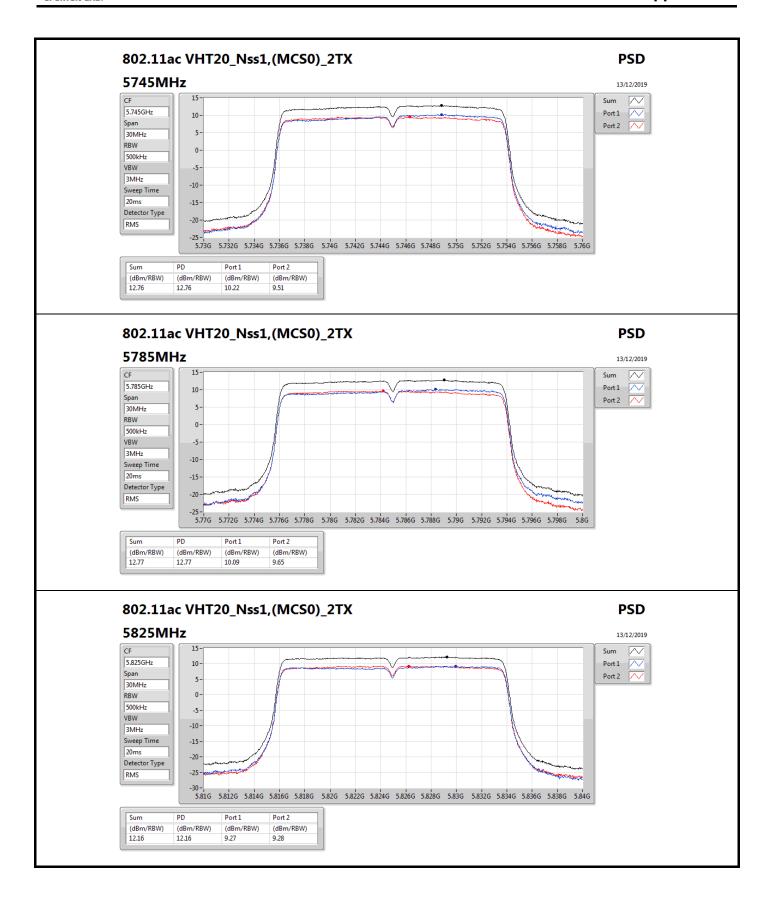
: 2 of 8

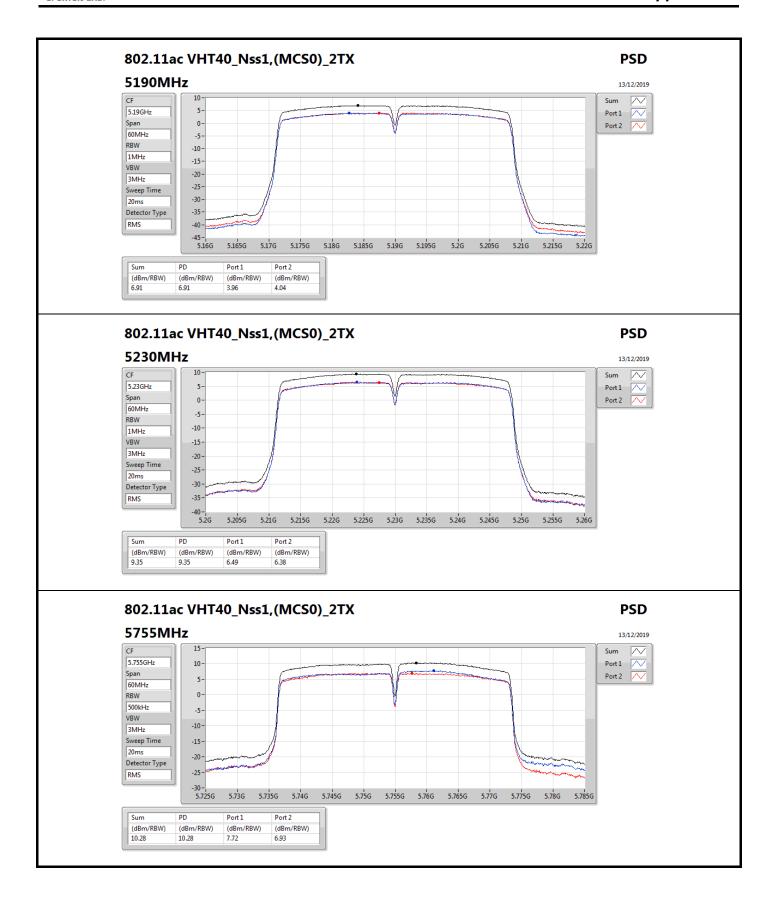
DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

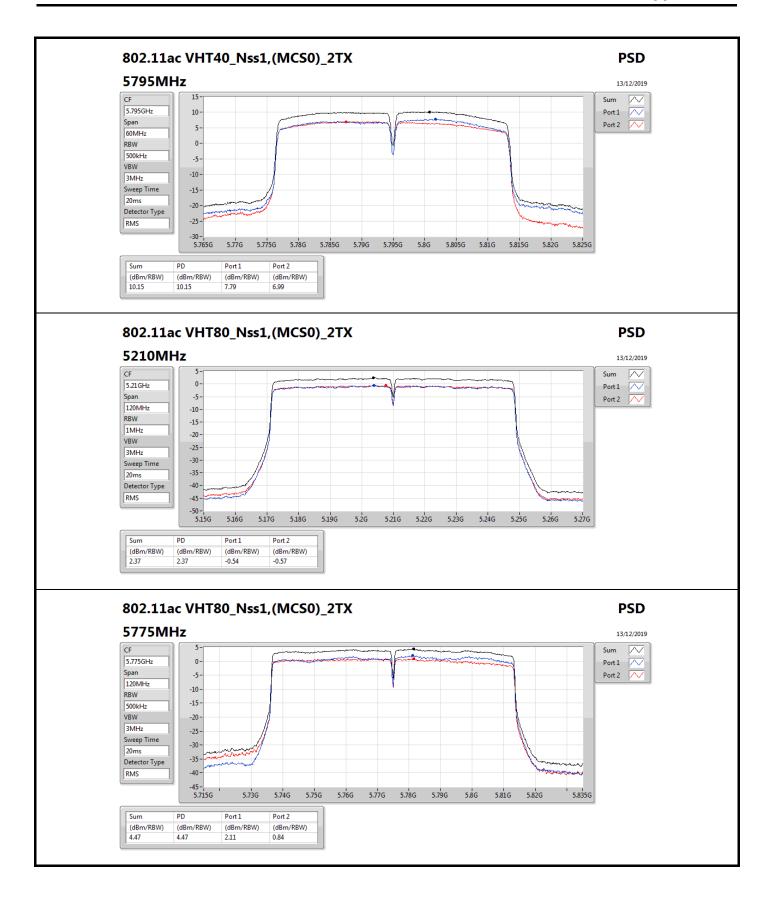










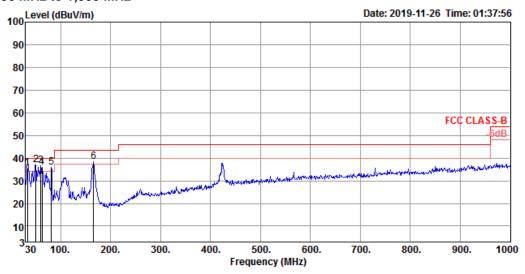




Radiated Emission below 1GHz Result

Test Mode Mode 4 Frequency Range 30 MHz to 1,000 MHz

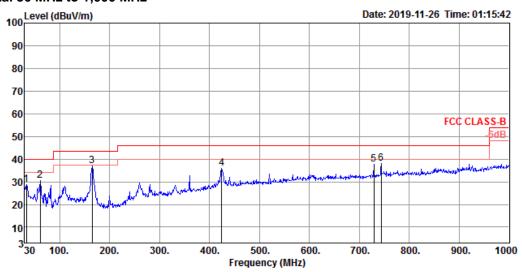
Vertical 30 MHz to 1,000 MHz



	Freq	Level	Limit						A/Pos	1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	33.88	35.68	40.00	-4.32	45.10	1.08	21.94	32.44	110	108	QP	VERTICAL
2	50.37	36.96	40.00	-3.04	54.53	1.32	13.83	32.72	300	304	Peak	VERTICAL
3	60.07	36.66	40.00	-3.34	55.58	1.44	12.16	32.52	100	11	Peak	VERTICAL
4	62.98	35.76	40.00	-4.24	54.75	1.48	12.00	32.47	100	174	Peak	VERTICAL
5	81.41	36.04	40.00	-3.96	53.98	1.68	12.87	32.49	100	91	Peak	VERTICAL
6	165.80	38.32	43.50	-5.18	52.69	2.38	15.70	32.45	100	36	Peak	VERTICAL



Horizontal 30 MHz to 1,000 MHz



	Freq	Level		Limit					A/Pos	1/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		_
1	33.88	28.85	40.00	-11.15	38.27	1.08	21.94	32.44	100	360	Peak	HORIZONTAL
2	61.04	30.65	40.00	-9.35	49.59	1.45	12.11	32.50	200	93	Peak	HORIZONTAL
3	164.83	37.06	43.50	-6.44	51.40	2.38	15.74	32.46	200	93	Peak	HORIZONTAL
4	424.79	36.10	46.00	-9.90	41.92	4.03	22.41	32.26	100	106	Peak	HORIZONTAL
5	729.37	37.75	46.00	-8.25	39.47	5.39	25.09	32.20	150	255	Peak	HORIZONTAL
6	743.92	38.14	46.00	-7.86	39.48	5.45	25.31	32.10	150	224	Peak	HORIZONTAL



RSE TX above 1GHz

Appendix E.2

Summary

Mode	Result	Туре	Freq	Level	Limit	Margin	Dist	Condition	Azimuth	Height	Comments
			(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(m)		(°)	(m)	
5.15-5.25GHz	-	-	-	-	-	-	-	-	-	-	-
802.11ac VHT80_Nss1,(MCS0)_2TX	Pass	AV	5.138G	53.35	54.00	-0.65	3	Vertical	22	1.80	-

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