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FCC RADIO TEST REPORT

Applicant's company	**Cambium Networks Inc.**
Applicant Address	3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA
FCC ID	**Z8H89FT0023**
Manufacturer's company	**Joy Technology (Shen Zhen) Co. Ltd**
Manufacturer Address	Shangpai, Shangwu, Aiqun Rd., Heng Keng Industrial, Shiyan Town, Shenzhen Guangdong China

Product Name	cnPilot Outdoor E500
Brand Name	Cambium Networks
Model No.	cnPilot Outdoor E500
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Mar. 10, 2016
Final Test Date	May 09, 2016
Submission Type	Class III Change

Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a/ac of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r02, KDB662911 D01 v02r01, KDB644545 D03 v01.**

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR570719-07	Rev. 01	Initial issue of report.	May 12, 2016
FR570719-07	Rev. 02	1. Changing the product name to “cnPilot Outdoor E500” from “cnPilot™ Outdoor E500”. 2. Changing the model number to “cnPilot Outdoor E500” from “cnPilot™ Outdoor E500”.	May 23, 2016
FR570719-07	Rev. 03	Revising the description of Class III Change.	Jun. 16, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	cnPilot Outdoor E500
Brand Name	:	Cambium Networks
Model No.	:	cnPilot Outdoor E500
Applicant	:	Cambium Networks Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Mar. 10, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.2	15.407(a)	Maximum Conducted Output Power	Complies	0.07 dB
4.3	15.407(a)	Power Spectral Density	Complies	0.03 dB
4.4	15.407(b)	Radiated Emissions	Complies	6.60 dB
4.5	15.407(b)	Band Edge Emissions	Complies	0.01 dB
4.6	15.407(g)	Frequency Stability	Complies	-
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From PoE
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	15 for 20MHz bandwidth ; 7 for 40MHz bandwidth 3 for 80MHz bandwidth
Channel Band Width (99%)	**For P to P and P to M mode:** Band 2: IEEE 802.11a: 17.02 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.41 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz Band 3: IEEE 802.11a: 16.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz
Maximum Conducted Output Power	**For P to P and P to M mode:** Band 2: IEEE 802.11a: 22.19 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 22.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.85 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.10 dBm Band 3: IEEE 802.11a: 22.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 22.15 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.79 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.91 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☒ With 5600~5650MHz	☐ Without 5600~5650MHz
Beamforming Function	☐ With beamforming	☒ Without beamforming
Operate Condition	☐ Indoor	☒ Outdoor

Antenna and Band width

Antenna	Two (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X
IEEE 802.11n	V	V	X
IEEE 802.11ac	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40.

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80.

Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

Wall-mounted rack*1

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	LYNWAVE	120300000183A	Embedded	I-PEX	5.27	-
2	LYNWAVE	120300000184A	Embedded	I-PEX	5.37	-
3	LYNWAVE	120300000185A	Embedded	I-PEX	-	5.01
4	LYNWAVE	120300000186A	Embedded	I-PEX	-	4.92

Note: The EUT has four antennas.

For 2.4GHz function:

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

Chain 1 and Chain 2 can be used as transmitting/receiving antenna.

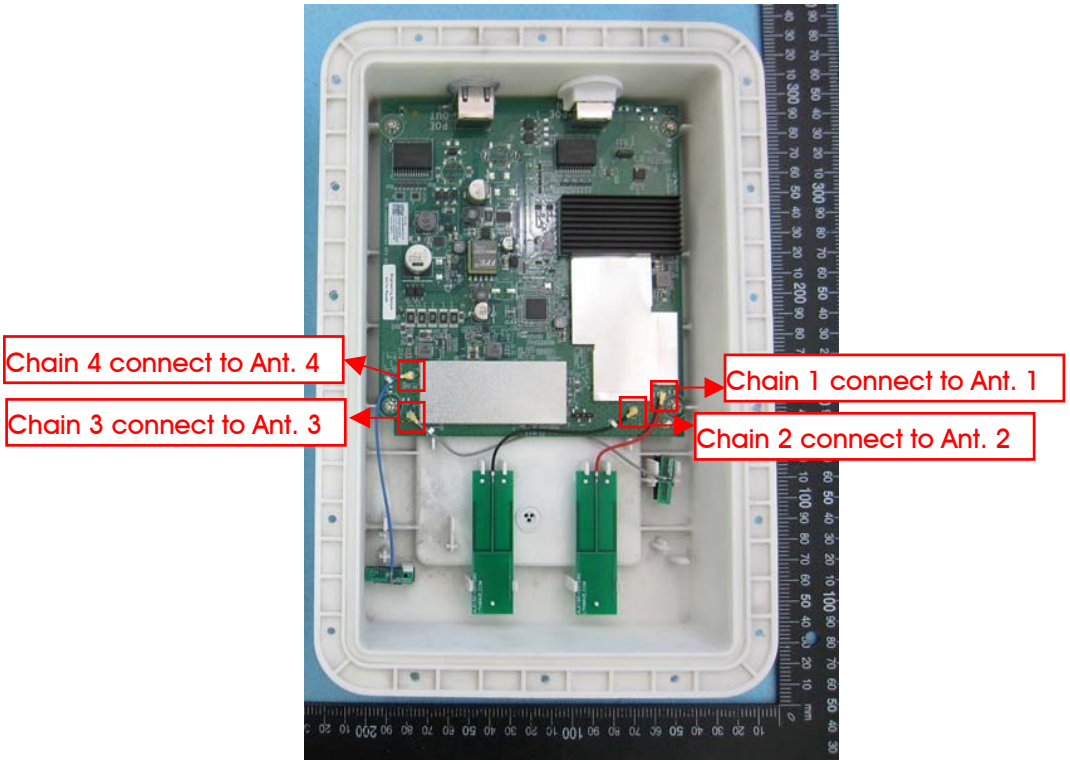
Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz function:

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

Chain 3 and Chain 4 can be used as transmitting/receiving antenna.

Chain 3 and Chain 4 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140.

For 40MHz bandwidth systems, use Channel 54, 62, 102, 110, 118, 126, 134.

For 80MHz bandwidth systems, use Channel 58, 106, 122.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	120	5600 MHz
	102	5510 MHz	122	5610 MHz
	104	5520 MHz	124	5620 MHz
	106	5530 MHz	126	5630 MHz
	108	5540 MHz	128	5640 MHz
	110	5550 MHz	132	5660 MHz
	112	5560 MHz	134	5670 MHz
	116	5580 MHz	136	5680 MHz
	118	5590 MHz	140	5700 MHz

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	3+4
Power Spectral Density	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	3+4
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	3+4
Radiated Emission Above 1GHz	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	3+4
Band Edge Emission	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	3+4
Frequency Stability	20 MHz	Band 2-3	-	60/116	3
	40 MHz	Band 2-3	-	62/110	3
	80 MHz	Band 2-3	-	58/106	3

Note: 1. VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

2. PoE information as below, and the PoE is for measurement only, would not be marketed.

Power	Brand	Model
PoE	Cambium Networks	NET-P30-56IN

The following test modes were performed for all tests:

For Radiated Emission Above 1GHz test:

The EUT was performed at Y axis and Z axis position for Radiated emission above 1GHz test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.

3.6. Table for Testing Locations

Test Site Location					
Address:	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 Site No.	**Site Category**	**Location**	**FCC Designation No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.7. Table for Class III Change

This product is an extension of original one reported under Sporton project number: FR570719-06

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding 5GHz band 2, band 3 (5250~5350 MHz, 5470~5725 MHz) for this device.	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth. 2. Maximum Conducted Output Power. 3. Power Spectral Density. 4. Radiated Emission Above 1GHz. 5. Band Edge Emissions. 6. Frequency Stability.

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
PoE	Cambium Networks	NET-P30-56IN	DoC

3.9. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Software Version	DOS					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	19.5	19.5	19.5	18.5	19.5	20
802.11ac MCS0/Nss1 VHT20	19.5	19.5	19.5	18.5	19.5	20
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	22	20	18	21.5	22	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz		5610 MHz	
	15.5		15		22	

3.10. EUT Operation during Test

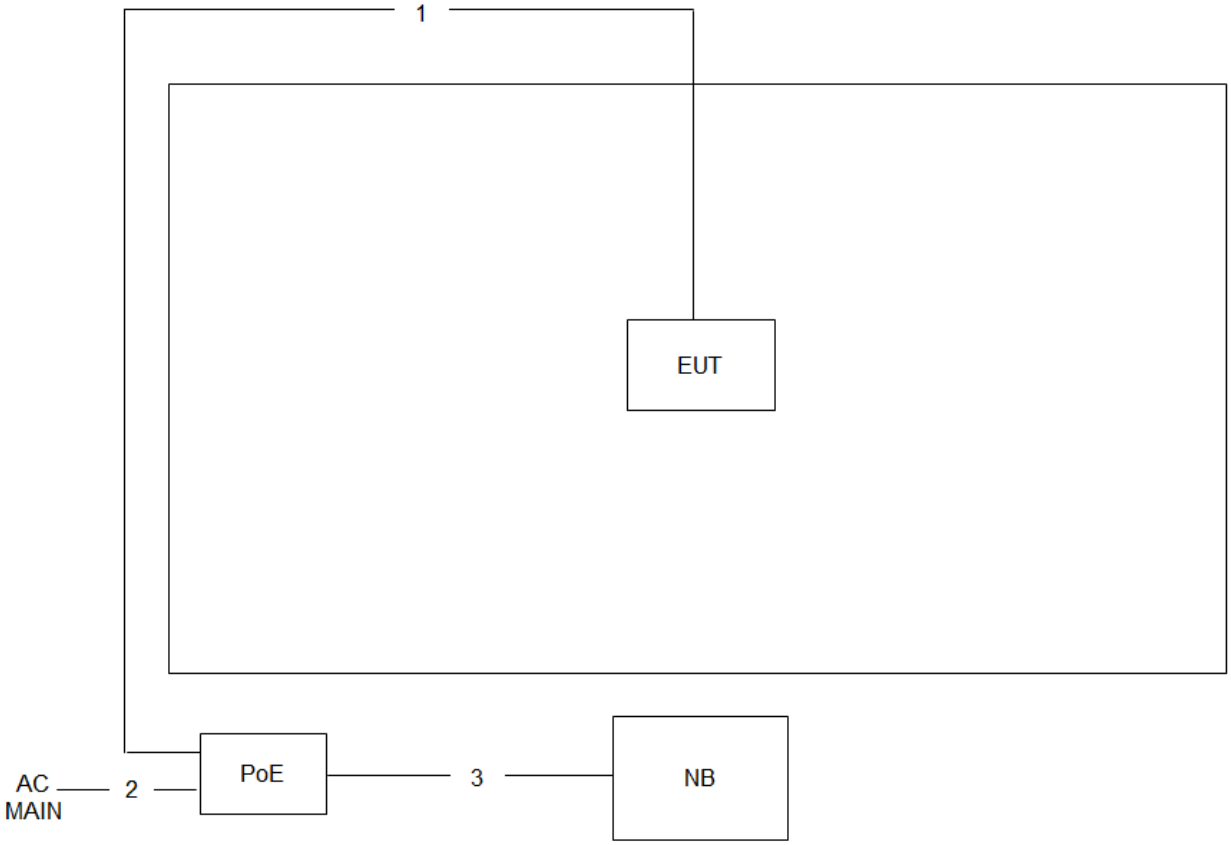
The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.017	2.078	97.07	0.13	0.50
802.11ac MCS0/Nss1 VHT20	1.887	1.948	96.87	0.14	0.53
802.11ac MCS0/Nss1 VHT40	0.918	0.994	92.35	0.35	1.09
802.11ac MCS0/Nss1 VHT80	0.450	0.513	87.72	0.57	2.22

3.12. Test Configurations

3.12.1. Radiation Emissions Test Configuration



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	0.65m
3	RJ-45 cable	No	1.5m

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

4.1.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

26dB Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RBW	Approximately 1% of the emission bandwidth
VBW	VBW > RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	**Setting**
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold

4.1.3. Test Procedures

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.1.4. Test Setup Layout

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of 26dB Bandwidth and 99% Occupied Bandwidth

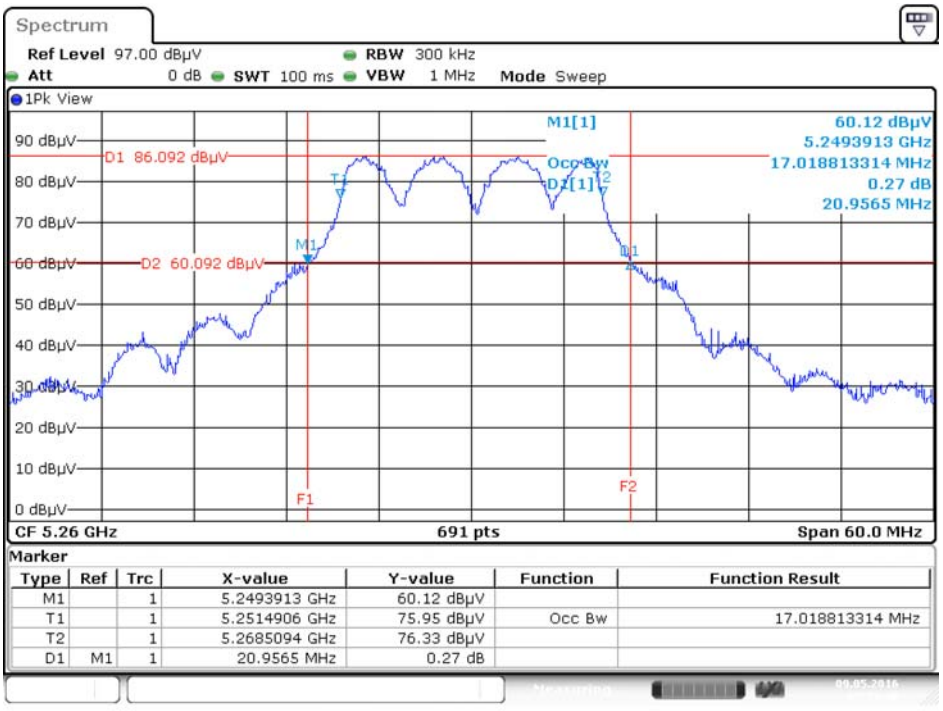
Temperature	22.2°C	Humidity	56%
Test Engineer	Andy Tsai		

For P to P and P to M mode:

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	20.96	17.02
	5300 MHz	21.65	15.98
	5320 MHz	21.13	17.02
	5500 MHz	21.04	16.06
	5580 MHz	20.78	16.06
	5700 MHz	20.70	15.98
802.11ac MCS0/Nss1 VHT20	5260 MHz	23.04	18.32
	5300 MHz	23.13	18.41
	5320 MHz	23.04	18.41
	5500 MHz	23.39	18.32
	5580 MHz	23.83	18.32
	5700 MHz	23.30	18.32
802.11ac MCS0/Nss1 VHT40	5270 MHz	45.51	37.63
	5310 MHz	45.36	37.77
	5510 MHz	45.94	37.77
	5550 MHz	45.51	37.77
	5670 MHz	46.09	37.77
802.11ac MCS0/Nss1 VHT80	5290 MHz	82.03	75.54
	5530 MHz	81.74	75.54
	5610 MHz	84.64	75.83

For P to P and P to M mode:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5260 MHz



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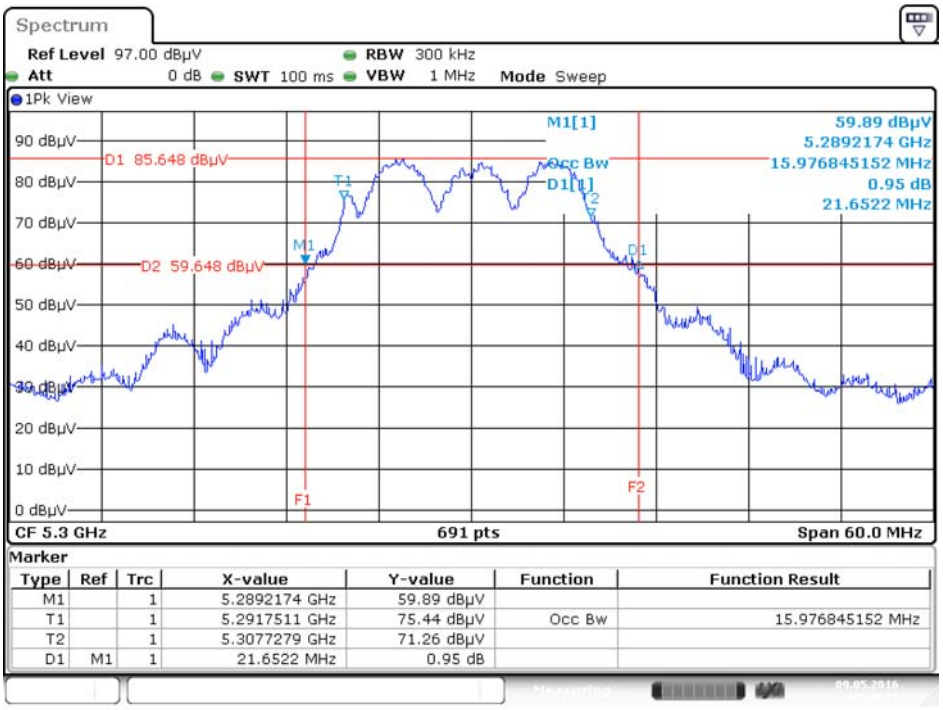
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5300 MHz



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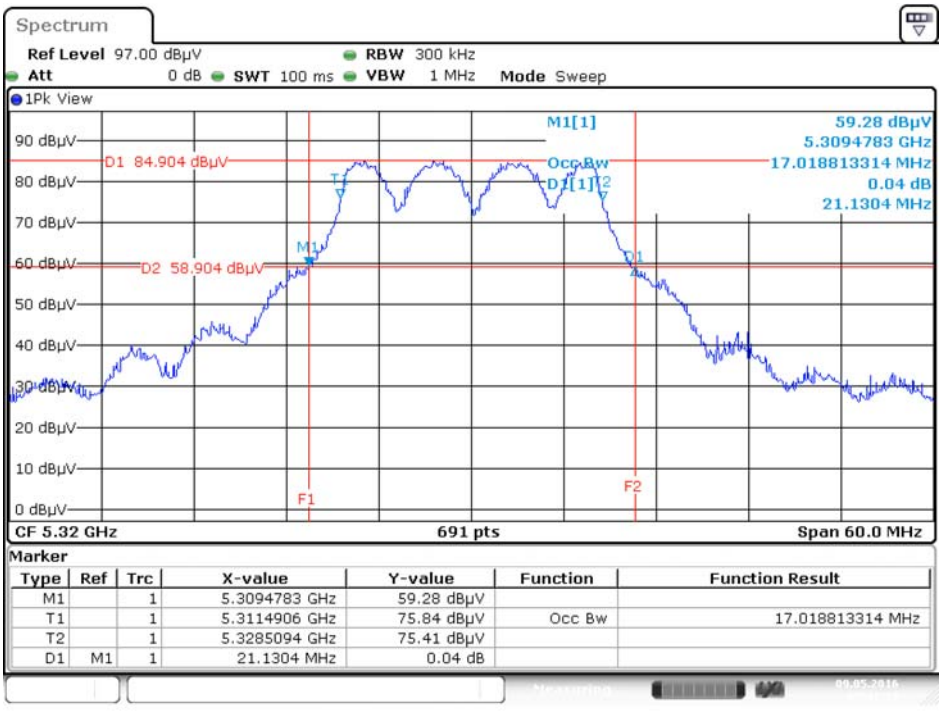
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5320 MHz



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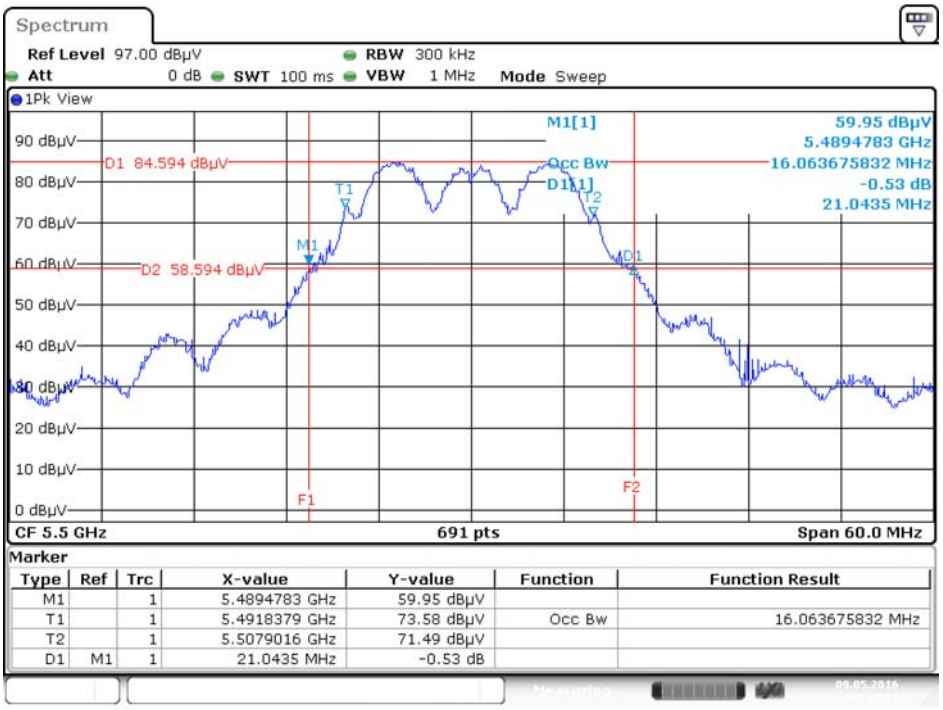
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5500 MHz



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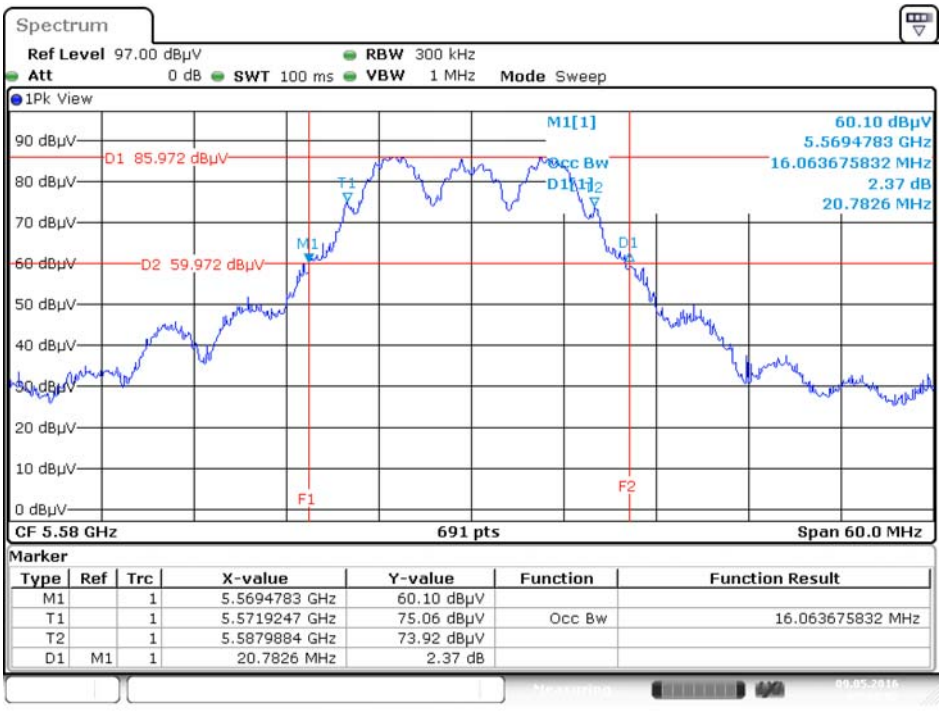
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5580 MHz



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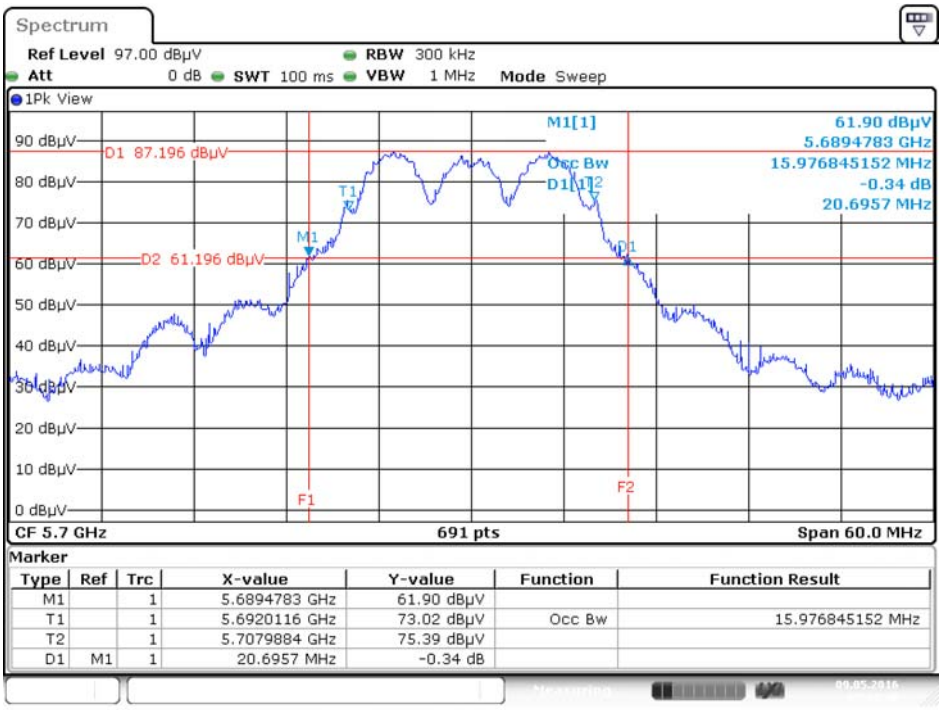
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5700 MHz



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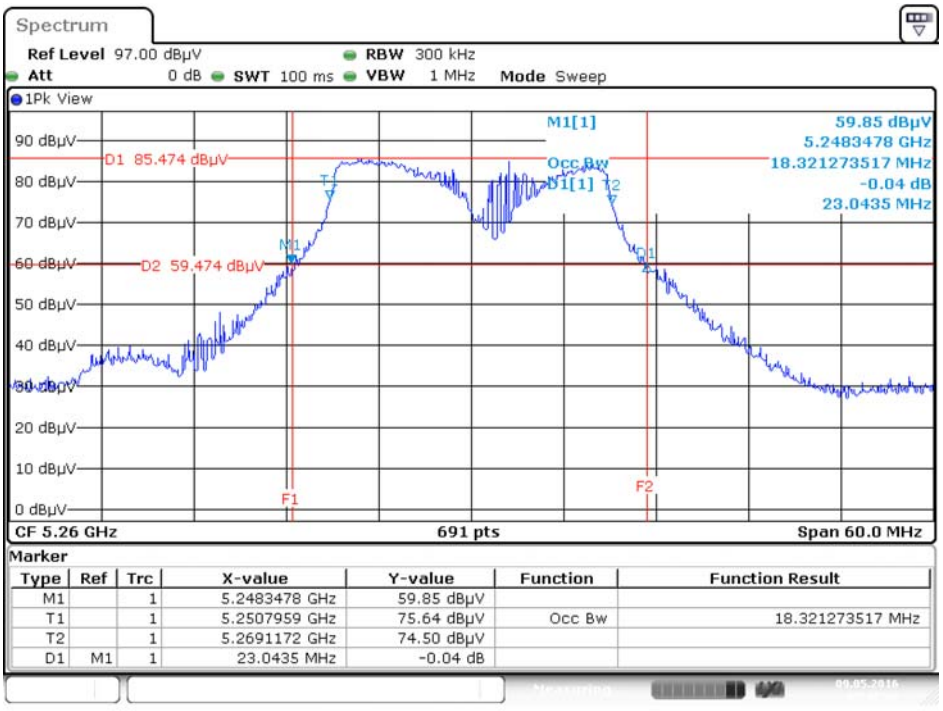
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5260 MHz



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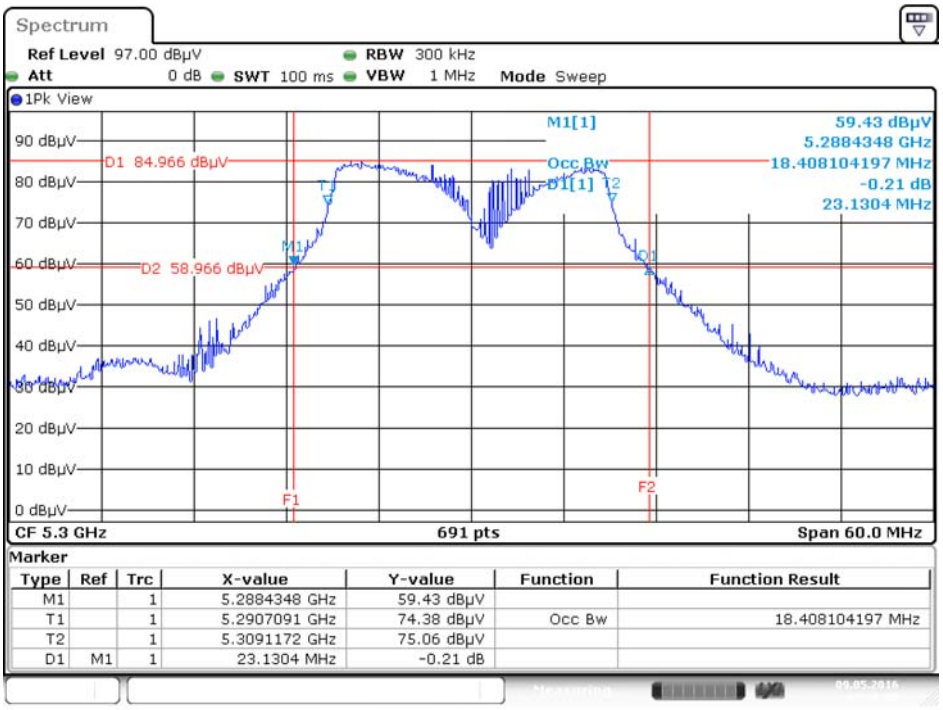

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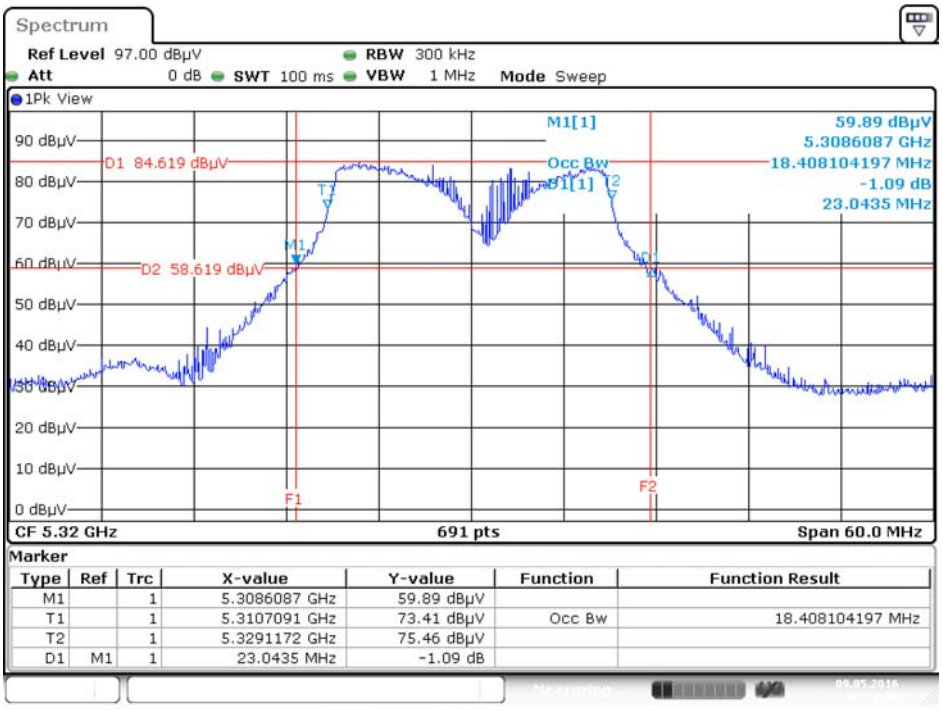
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5320 MHz



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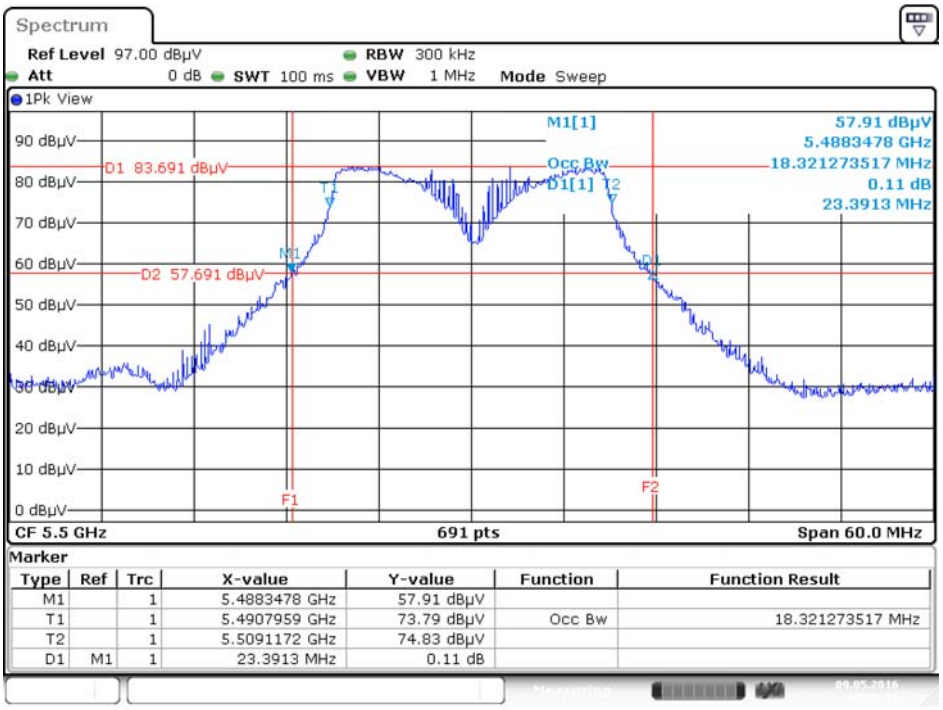
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5500 MHz



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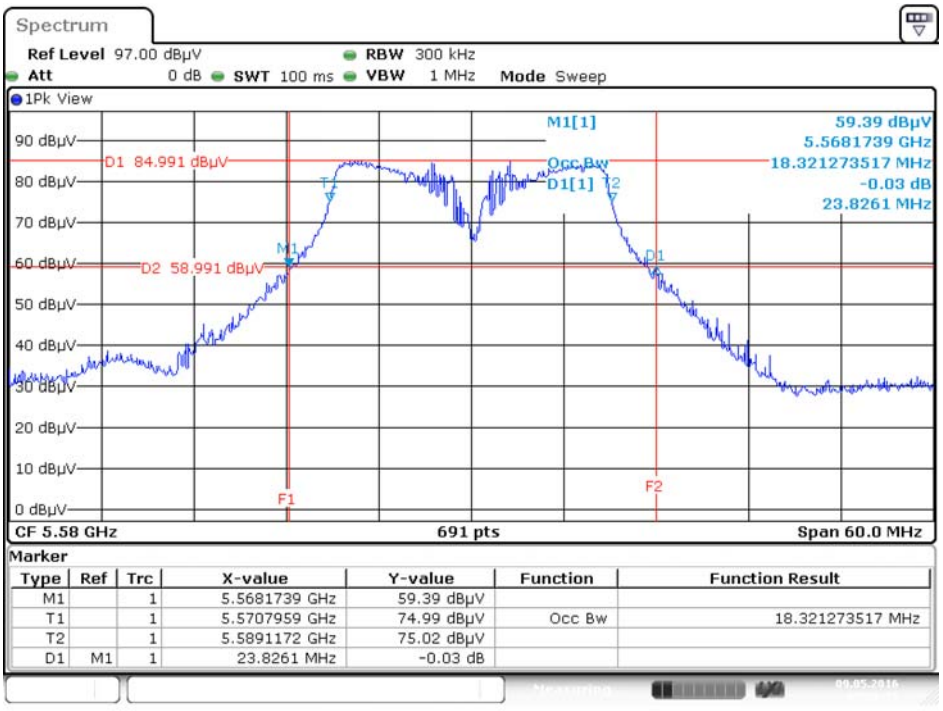
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5580 MHz



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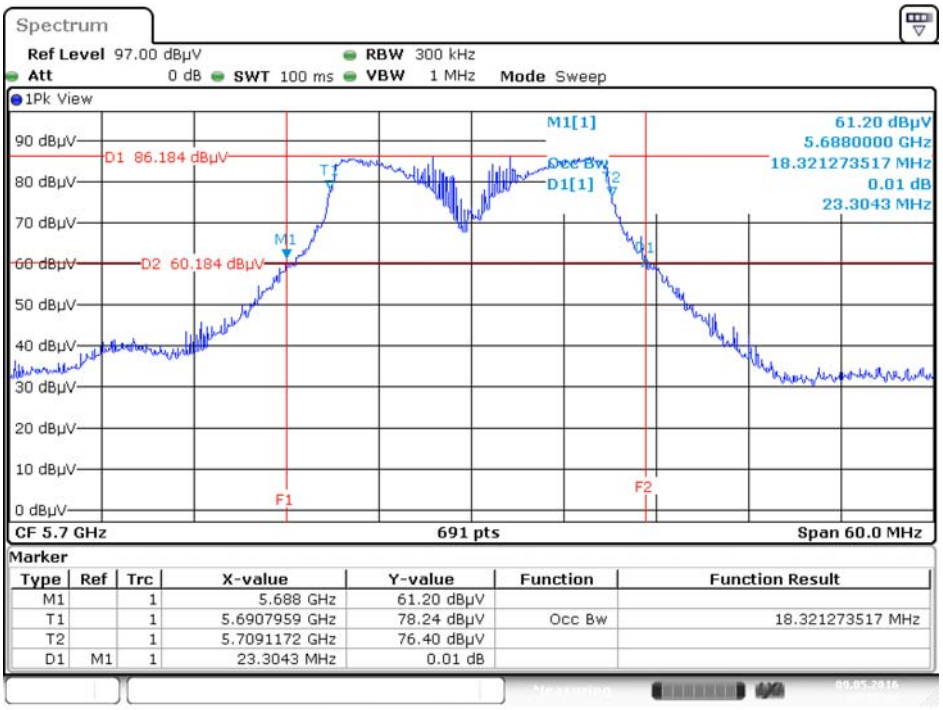
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5700 MHz



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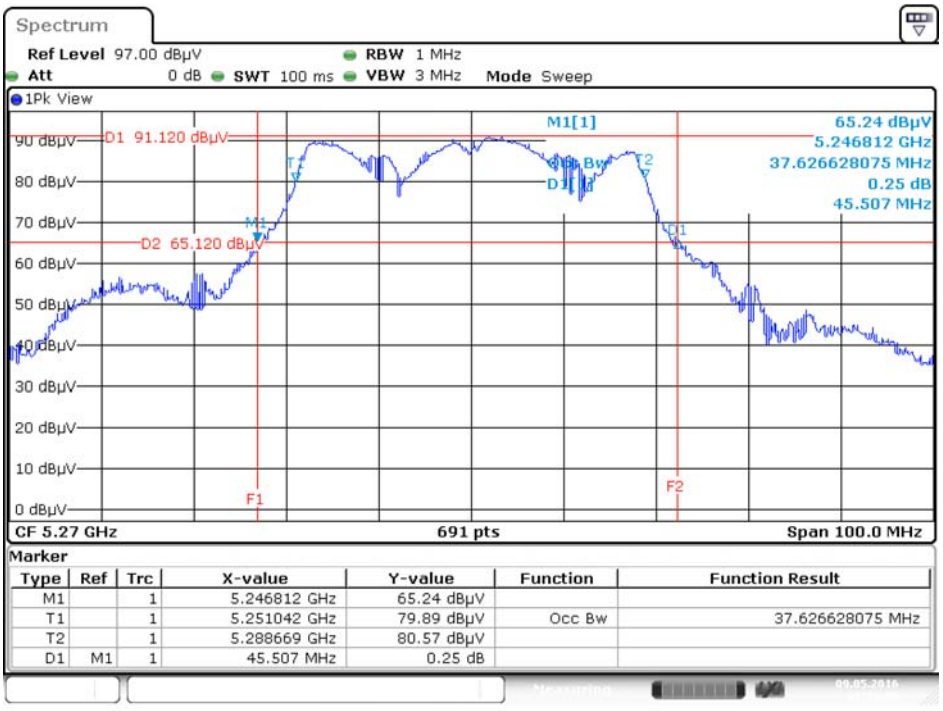
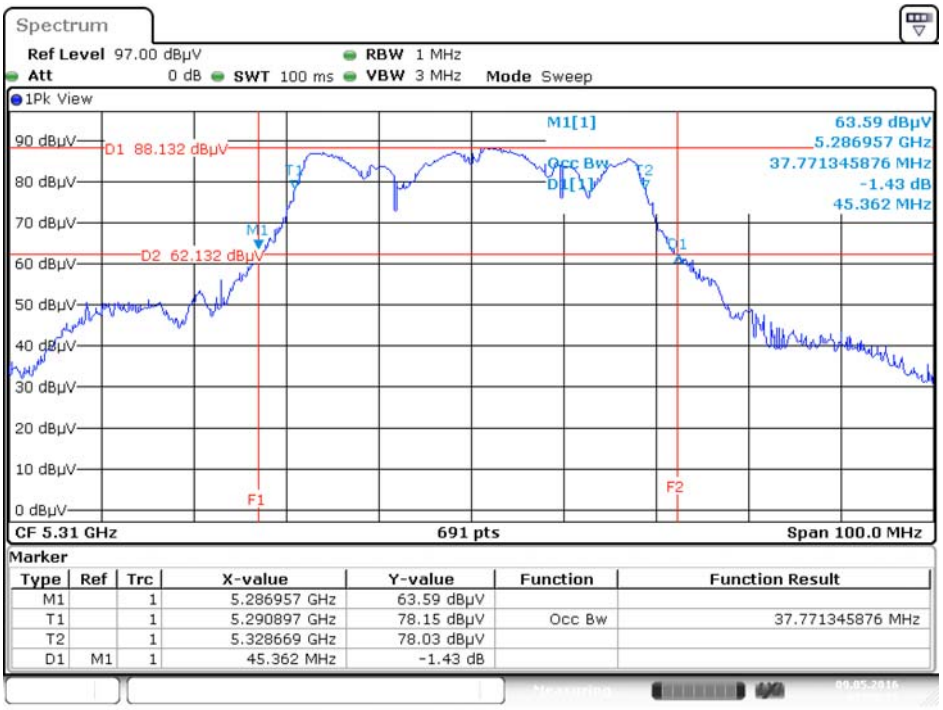
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5270 MHz



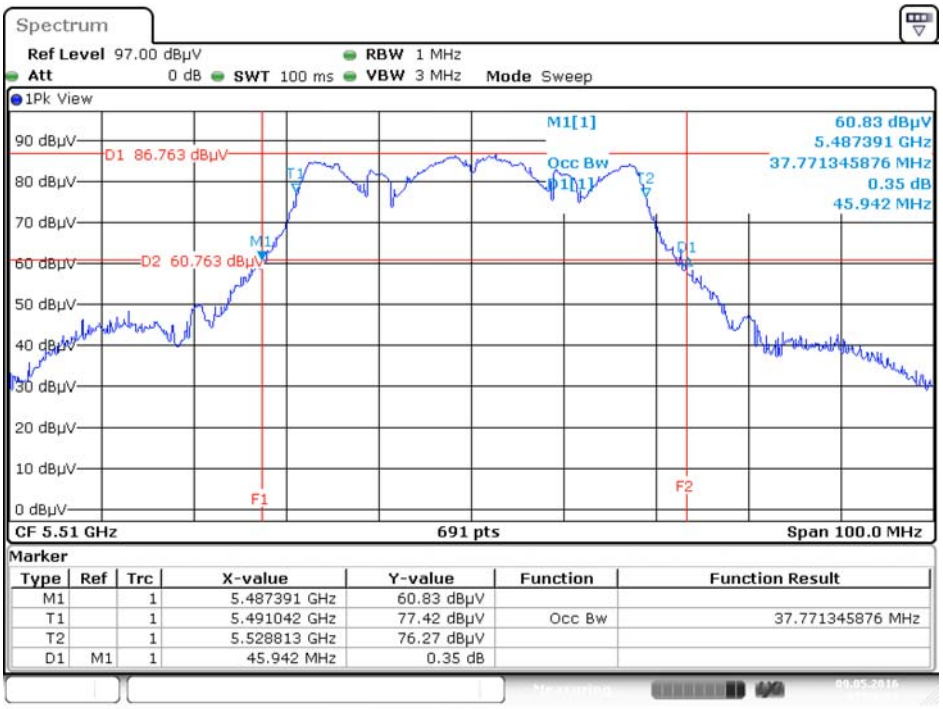
Date: 9.MAY.2016 07:54:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5310 MHz



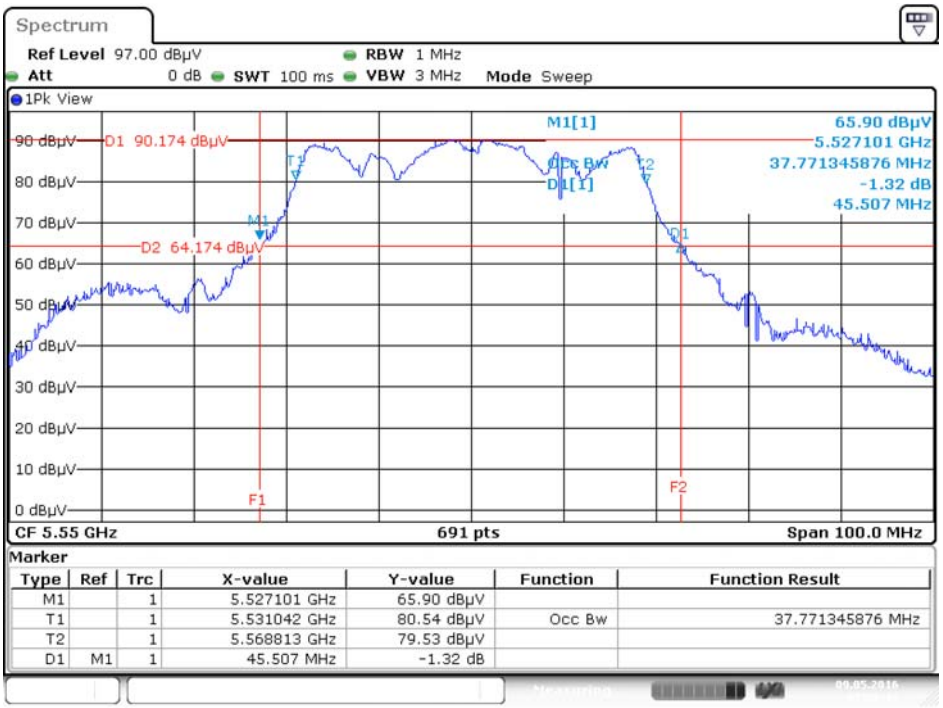
Date: 9.MAY.2016 07:55:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5510 MHz



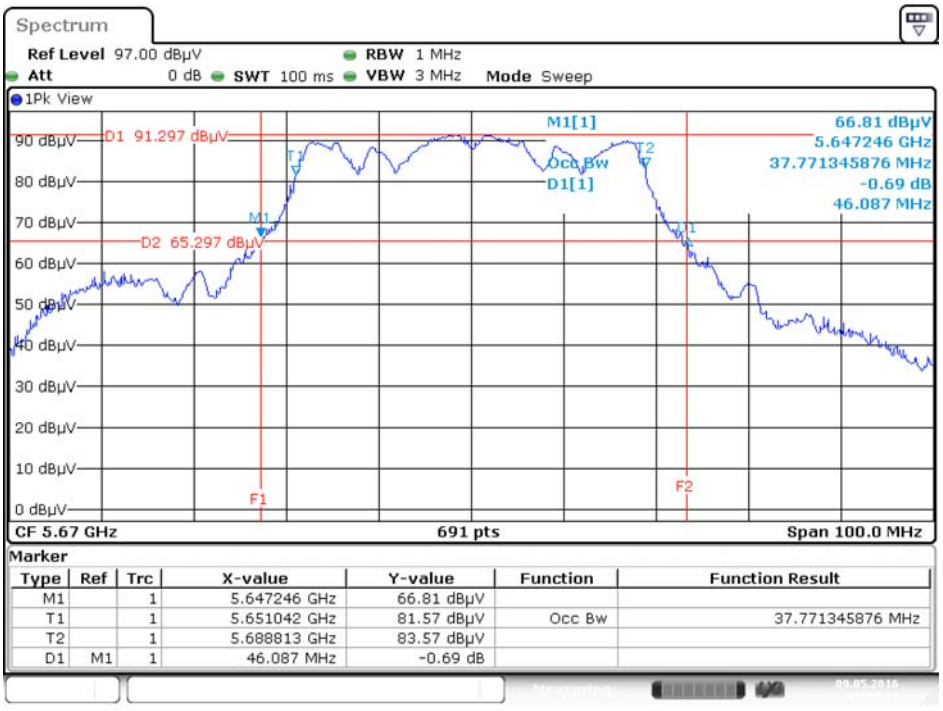
Date: 9.MAY.2016 07:56:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5550 MHz



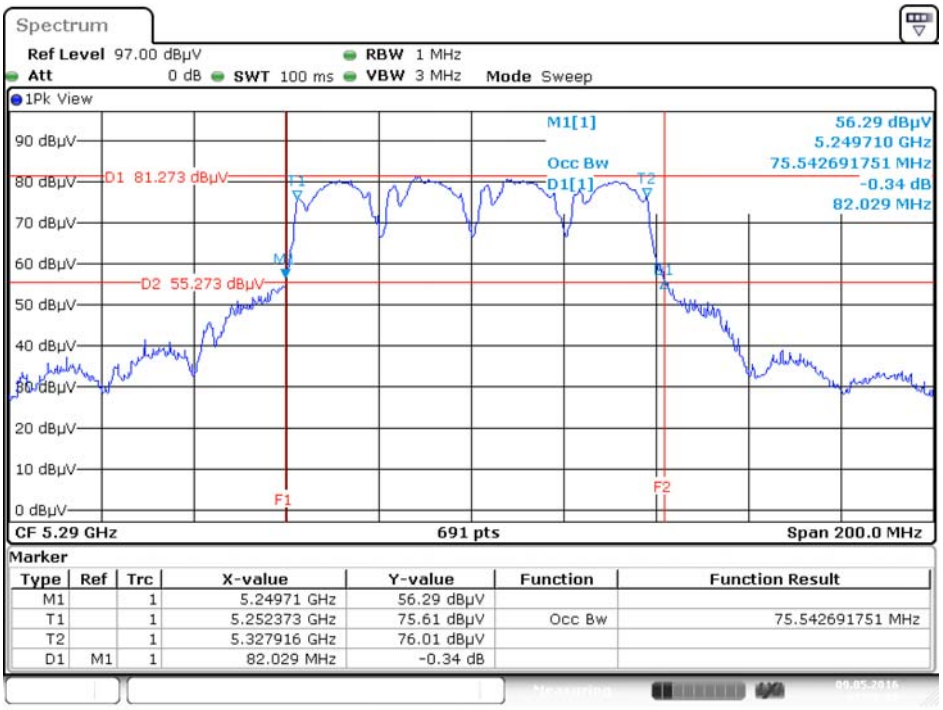
Date: 9.MAY.2016 07:56:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5670 MHz



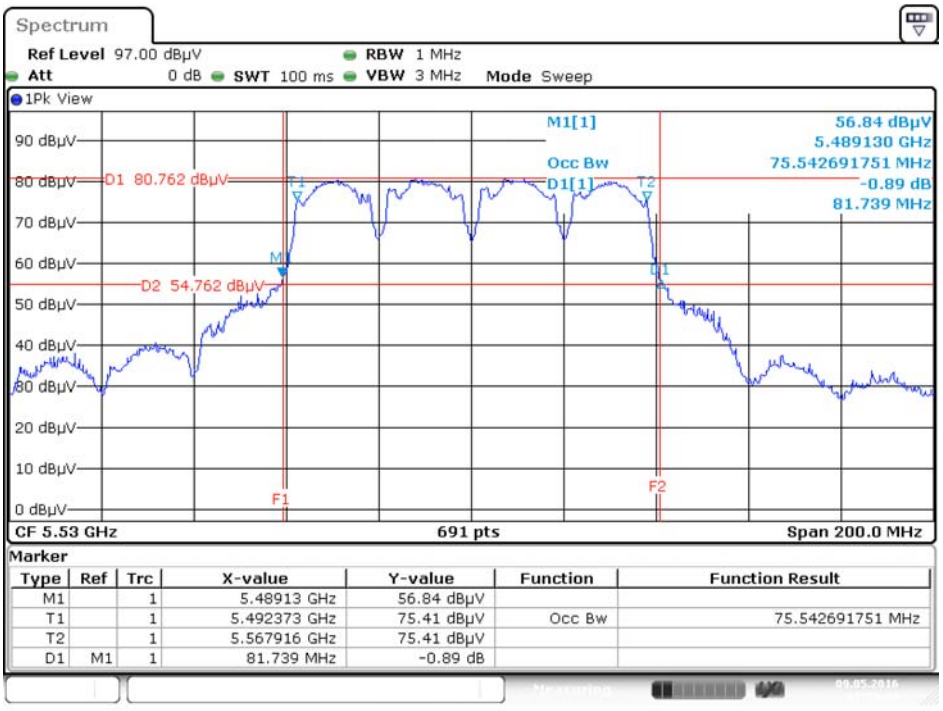
Date: 9.MAY.2016 07:57:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 + Chain 4 / 5290 MHz



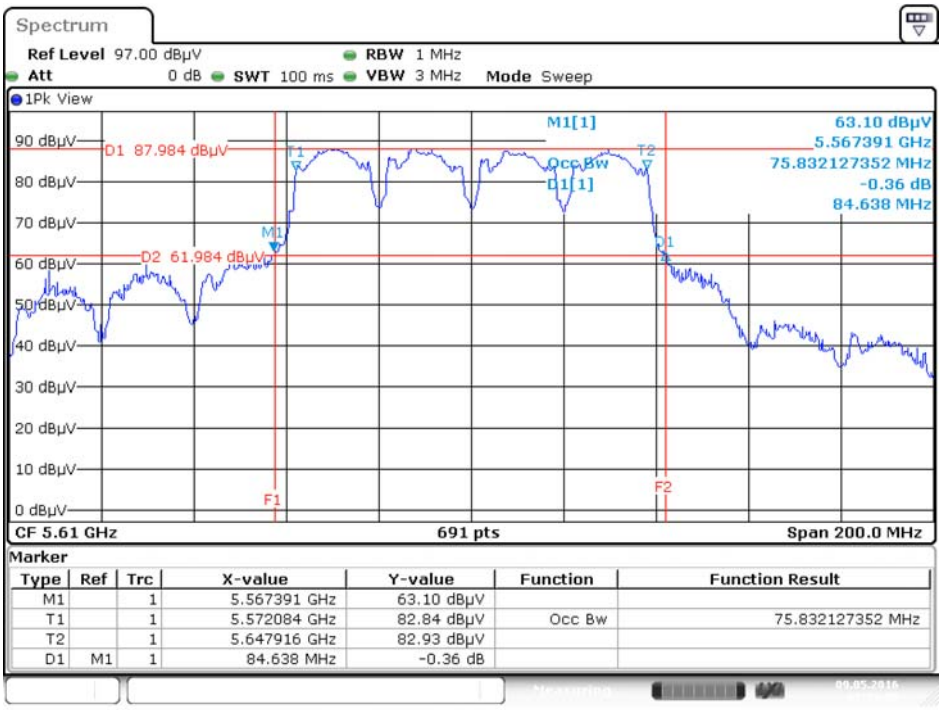
Date: 9.MAY.2016 07:58:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 + Chain 4 / 5530 MHz



Date: 9.MAY.2016 07:59:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 + Chain 4 / 5610 MHz



Date: 9.MAY.2016 08:00:00

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

Frequency Band		Limit
☒	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☒	5.470-5.725 GHz	

4.2.2. Measuring Instruments and Setting

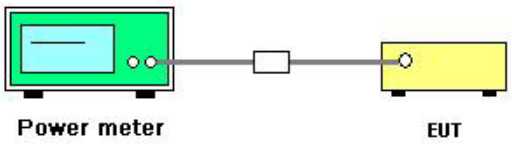
Please refer to section 5 of equipments list in this report The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems,add every result of the values by mathematic formula.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	22.2°C	Humidity	56%
Test Engineer	Andy Tsai	Test Date	May 09, 2016

For P to P and P to M mode:

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
802.11a	5260 MHz	19.15	19.21	22.19	23.98	Complies
	5300 MHz	19.12	19.08	22.11	23.98	Complies
	5320 MHz	18.91	19.02	21.98	23.98	Complies
	5500 MHz	19.26	18.81	22.05	23.98	Complies
	5580 MHz	19.18	19.27	22.24	23.98	Complies
	5700 MHz	19.17	19.39	22.29	23.98	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	19.21	19.34	22.29	23.98	Complies
	5300 MHz	19.07	18.92	22.01	23.98	Complies
	5320 MHz	18.93	18.89	21.92	23.98	Complies
	5500 MHz	19.25	18.77	22.03	23.98	Complies
	5580 MHz	19.03	19.24	22.15	23.98	Complies
	5700 MHz	19.05	19.19	22.13	23.98	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	20.71	20.97	23.85	23.98	Complies
	5310 MHz	18.63	18.56	21.61	23.98	Complies
	5510 MHz	17.38	16.76	20.09	23.98	Complies
	5550 MHz	20.52	20.74	23.64	23.98	Complies
	5670 MHz	20.51	21.04	23.79	23.98	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	14.16	14.02	17.10	23.98	Complies
	5530 MHz	14.21	13.88	17.06	23.98	Complies
	5610 MHz	20.76	21.04	23.91	23.98	Complies

4.3. Power Spectral Density Measurement

4.3.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.2.1.

Frequency Band		Limit
☒	5.25-5.35 GHz	11 dBm/MHz
☒	5.470-5.725 GHz	11 dBm/MHz

4.3.2. Measuring Instruments and Setting

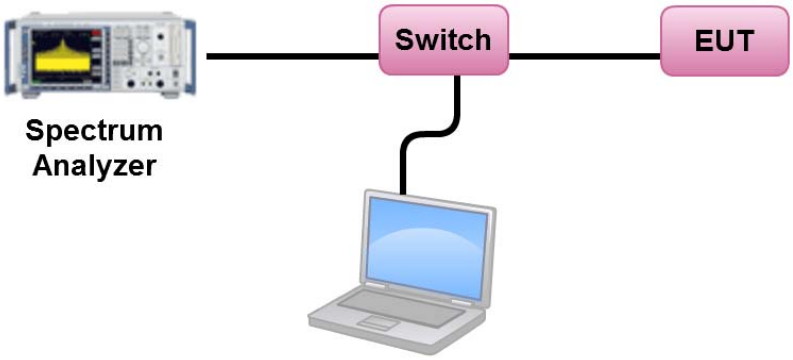
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz
VBW	3000 kHz
Detector	RMS
Trace	AVERAGE
Sweep Time	Auto
Trace Average	100 times

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	22.2°C	Humidity	56%
Test Engineer	Andy Tsai	Test Date	May 09, 2016

For P to P and P to M mode:

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11a	5260 MHz	8.90	9.02	Complies
	5300 MHz	8.79	9.02	Complies
	5320 MHz	8.64	9.02	Complies
	5500 MHz	8.73	9.02	Complies
	5580 MHz	8.97	9.02	Complies
	5700 MHz	8.97	9.02	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	8.99	9.02	Complies
	5300 MHz	8.70	9.02	Complies
	5320 MHz	8.63	9.02	Complies
	5500 MHz	8.74	9.02	Complies
	5580 MHz	8.86	9.02	Complies
	5700 MHz	8.85	9.02	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	7.60	9.02	Complies
	5310 MHz	5.43	9.02	Complies
	5510 MHz	3.92	9.02	Complies
	5550 MHz	7.45	9.02	Complies
	5670 MHz	7.67	9.02	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	-2.08	9.02	Complies
	5530 MHz	-2.09	9.02	Complies
	5610 MHz	4.75	9.02	Complies

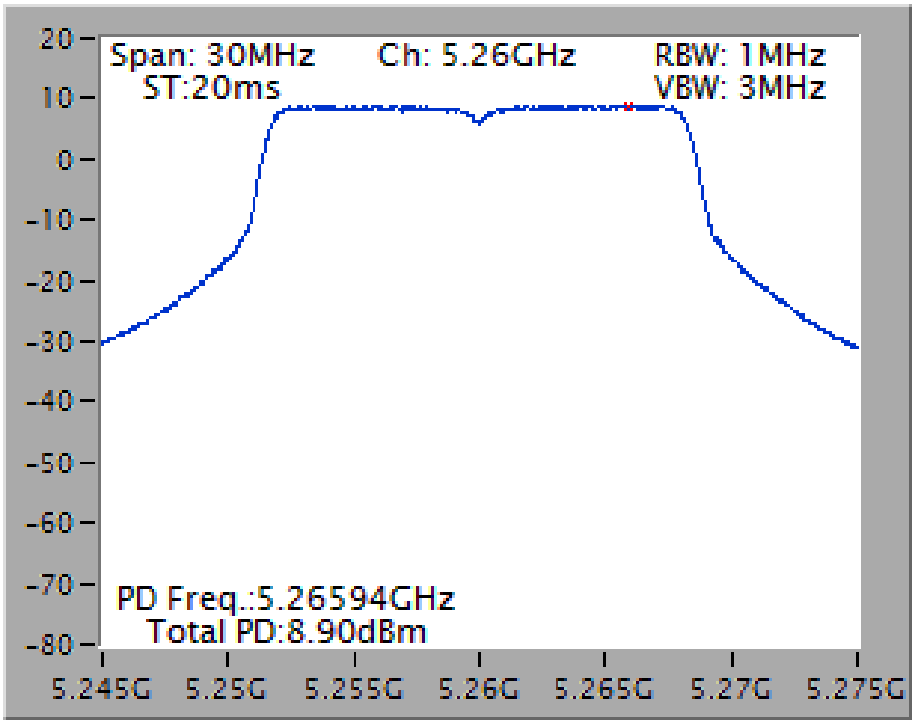
Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.98dBi >6dBi, so limit=11 – (7.98 – 6)=9.02dBm/MHz.

Note: All the test values were listed in the report.

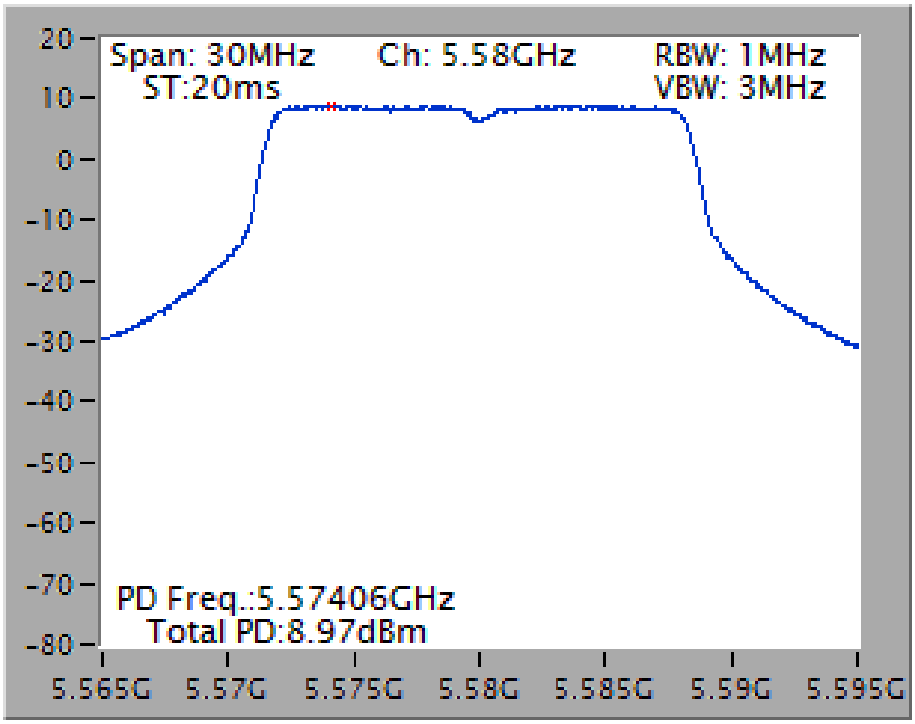
For plots, only the channel with worse result was shown.

For P to P and P to M mode:

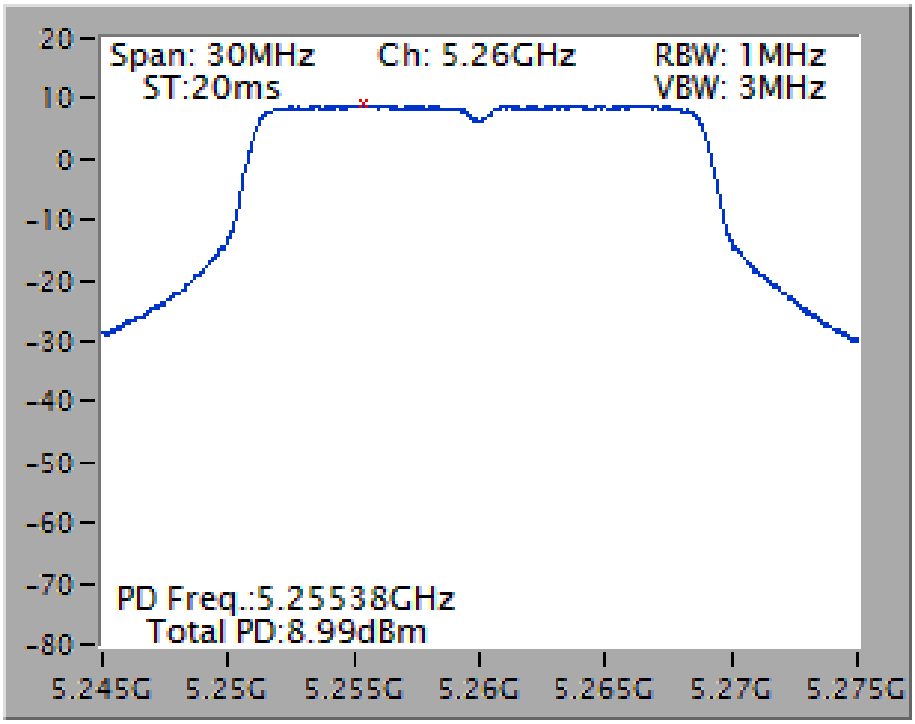
Power Density Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5260 MHz



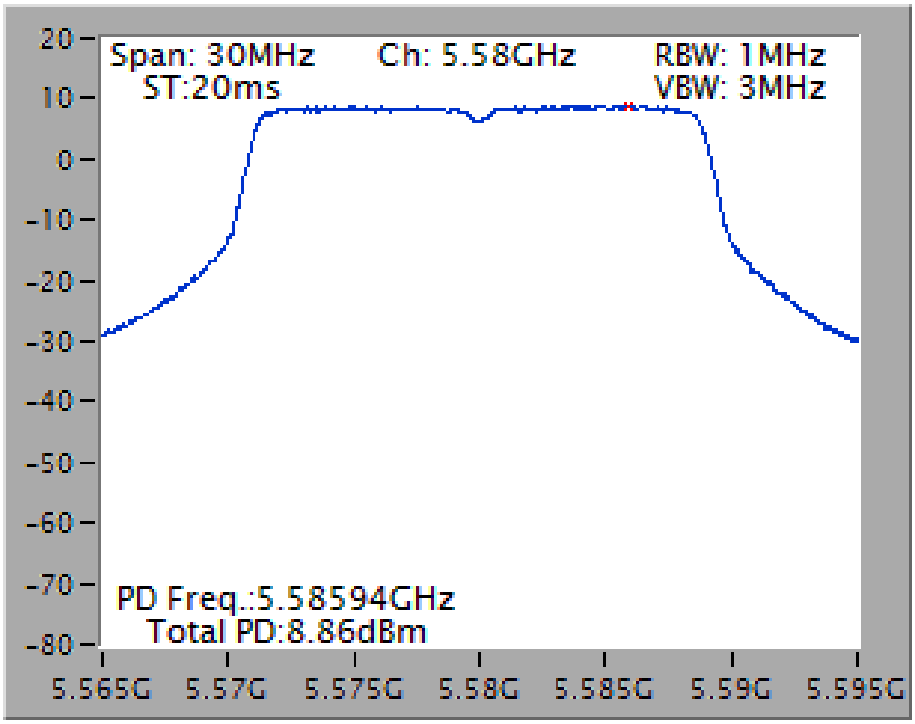
Power Density Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5580 MHz



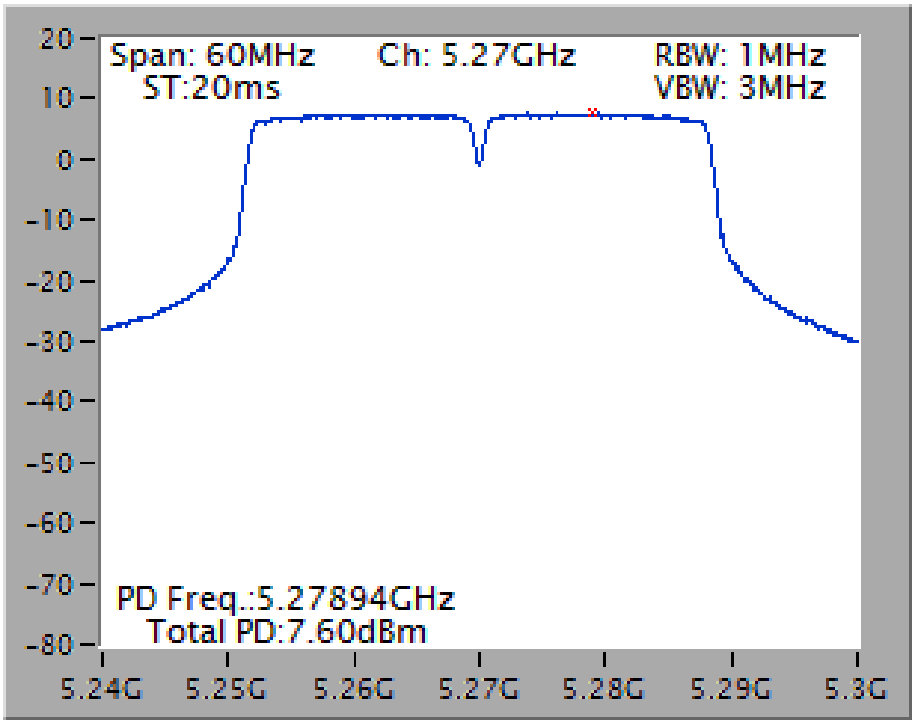
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5260 MHz



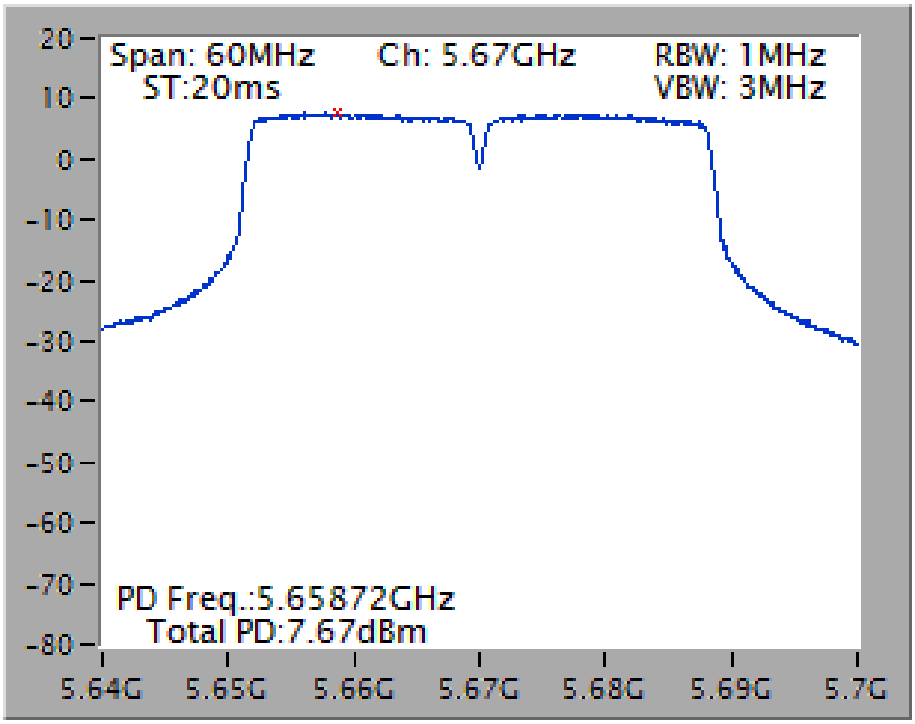
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4 / 5580 MHz



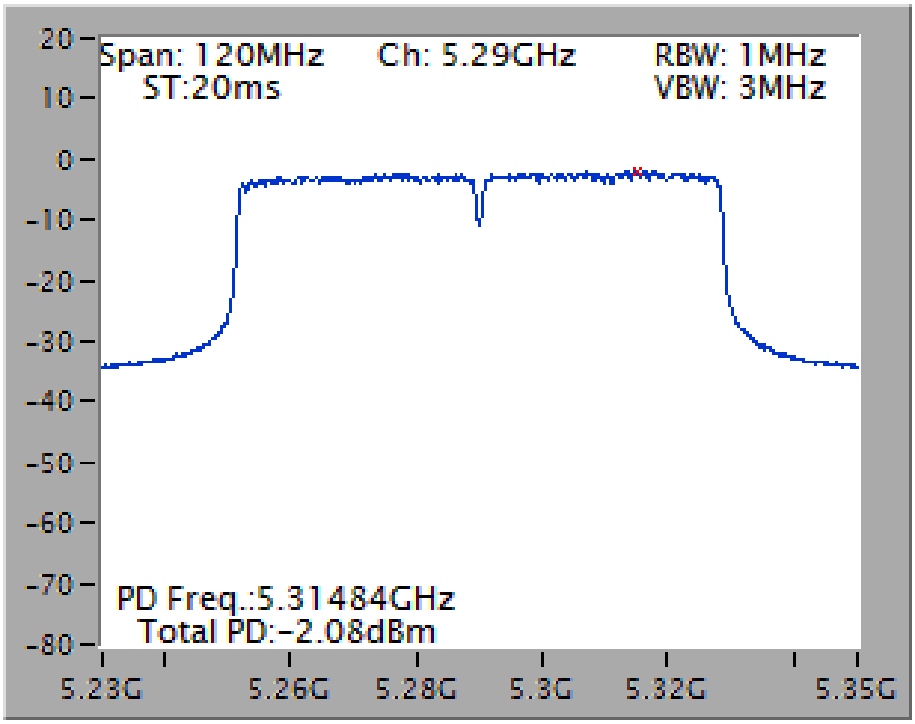
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5270 MHz



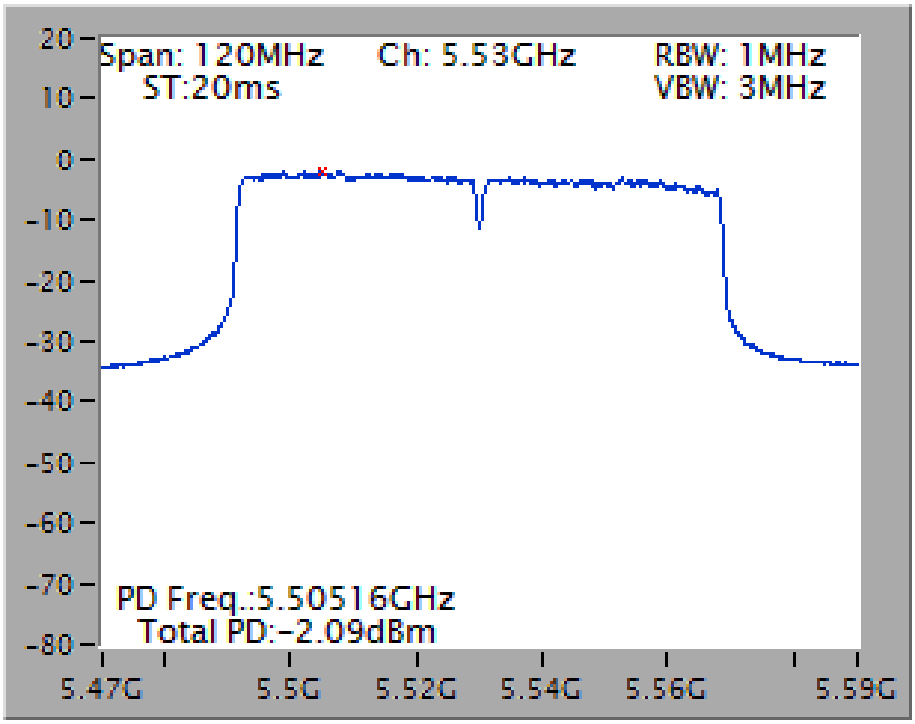
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4 / 5670 MHz



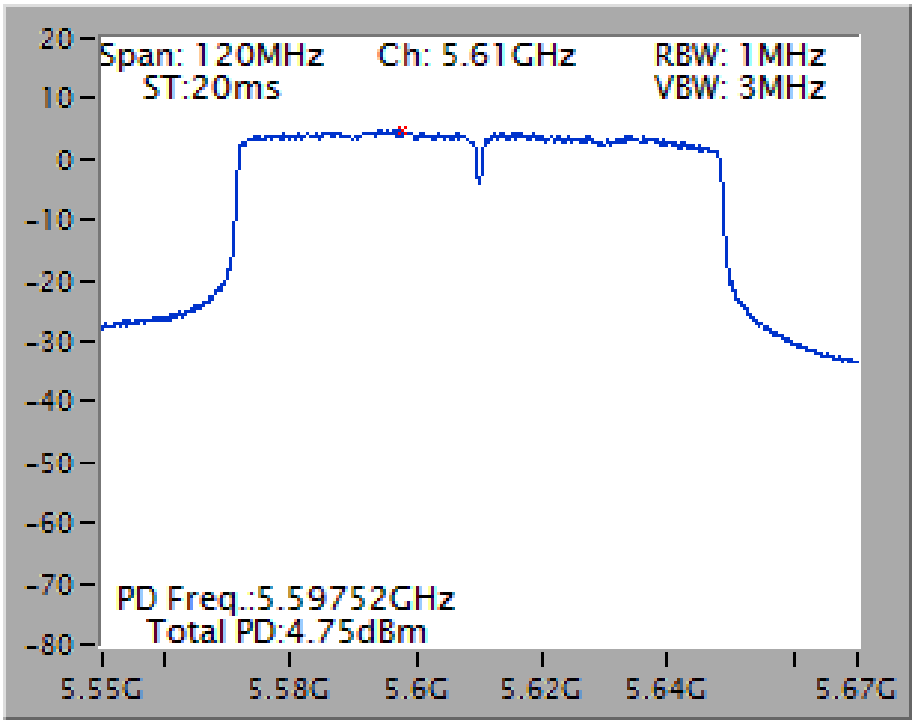
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 + Chain 4 / 5290 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 + Chain 4 / 5530 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 + Chain 4 / 5610 MHz



4.4. Radiated Emissions Measurement

4.4.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.4.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

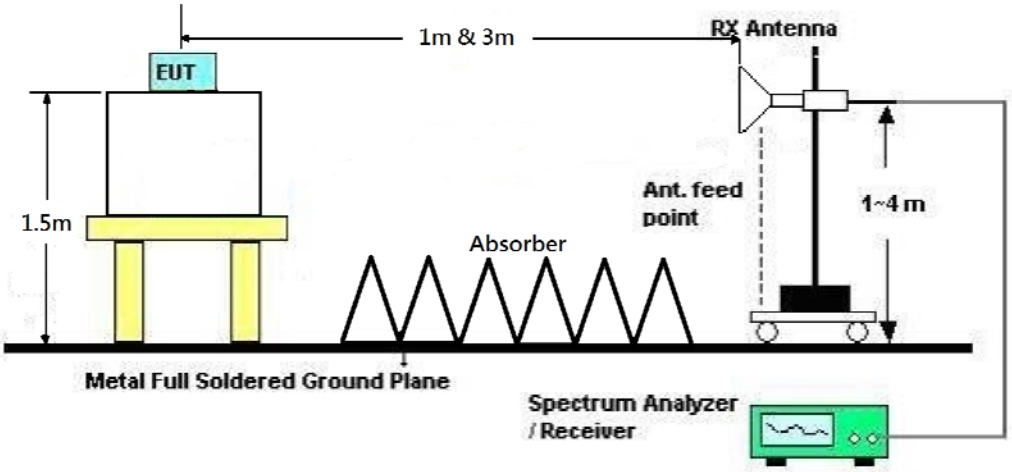
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Results for Radiated Emissions (1GHz~40GHz)

Temperature	22.2°C	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 52 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15773.48	47.32	54.00	-6.68	32.40	11.29	38.48	34.85	201	200	Average	HORIZONTAL
2	15773.64	59.68	74.00	-14.32	44.76	11.29	38.48	34.85	201	200	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15776.72	46.57	54.00	-7.43	31.65	11.29	38.48	34.85	105	200	Average	VERTICAL
2	15778.24	59.32	74.00	-14.68	44.40	11.29	38.48	34.85	105	200	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 60 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10590.28	55.13	74.00	-18.87	41.84	9.74	38.50	34.95	112	232	Peak	HORIZONTAL
2	10599.60	45.42	54.00	-8.58	32.13	9.74	38.50	34.95	112	232	Average	HORIZONTAL
3	15903.28	47.16	54.00	-6.84	32.11	11.32	38.67	34.94	161	239	Average	HORIZONTAL
4	15908.92	59.92	74.00	-14.08	44.87	11.32	38.67	34.94	161	239	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10590.24	42.42	54.00	-11.58	29.13	9.74	38.50	34.95	189	223	Average	VERTICAL
2	10603.36	55.10	74.00	-18.90	41.81	9.74	38.50	34.95	189	223	Peak	VERTICAL
3	15893.20	59.63	74.00	-14.37	44.58	11.32	38.67	34.94	144	228	Peak	VERTICAL
4	15905.52	46.97	54.00	-7.03	31.92	11.32	38.67	34.94	144	228	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 64 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10632.20	55.18	74.00	-18.82	41.88	9.73	38.50	34.93	271	200	Peak	HORIZONTAL
2	10638.12	41.93	54.00	-12.07	28.63	9.73	38.50	34.93	271	200	Average	HORIZONTAL
3	15959.48	59.88	74.00	-14.12	44.79	11.33	38.74	34.98	285	199	Peak	HORIZONTAL
4	15968.28	47.18	54.00	-6.82	32.02	11.34	38.80	34.98	285	199	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10633.16	42.15	54.00	-11.85	28.85	9.73	38.50	34.93	352	217	Average	VERTICAL
2	10637.72	54.09	74.00	-19.91	40.79	9.73	38.50	34.93	352	217	Peak	VERTICAL
3	15964.24	47.21	54.00	-6.79	32.12	11.33	38.74	34.98	336	211	Average	VERTICAL
4	15969.44	59.28	74.00	-14.72	44.12	11.34	38.80	34.98	336	211	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 100 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.32	42.10	54.00	-11.90	28.58	9.68	38.50	34.66	276	209	Average	HORIZONTAL
2	11006.24	54.91	74.00	-19.09	41.39	9.68	38.50	34.66	276	209	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11001.40	54.49	74.00	-19.51	40.97	9.68	38.50	34.66	316	215	Peak	VERTICAL
2	11008.92	41.93	54.00	-12.07	28.41	9.68	38.50	34.66	316	215	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 116 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11153.72	56.72	74.00	-17.28	43.21	9.66	38.50	34.65	131	243	Peak	HORIZONTAL
2	11159.28	44.80	54.00	-9.20	31.29	9.66	38.50	34.65	131	243	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11160.24	42.06	54.00	-11.94	28.55	9.66	38.50	34.65	15	228	Average	VERTICAL
2	11167.08	54.07	74.00	-19.93	40.56	9.66	38.50	34.65	15	228	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 140 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11392.80	42.68	54.00	-11.32	29.18	9.63	38.50	34.63	28	237	Average	HORIZONTAL
2	11405.60	54.98	74.00	-19.02	41.48	9.63	38.50	34.63	28	237	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11394.40	55.59	74.00	-18.41	42.09	9.63	38.50	34.63	78	227	Peak	VERTICAL
2	11397.84	42.52	54.00	-11.48	29.02	9.63	38.50	34.63	78	227	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15772.44	59.95	74.00	-14.05	45.03	11.29	38.48	34.85	27	226	Peak	HORIZONTAL
2	15778.88	47.15	54.00	-6.85	32.23	11.29	38.48	34.85	27	226	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15772.00	46.90	54.00	-7.10	31.98	11.29	38.48	34.85	84	244	Average	VERTICAL
2	15774.40	60.52	74.00	-13.48	45.60	11.29	38.48	34.85	84	244	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10591.28	42.11	54.00	-11.89	28.82	9.74	38.50	34.95	55	250	Average	HORIZONTAL
2	10594.68	55.44	74.00	-18.56	42.15	9.74	38.50	34.95	55	250	Peak	HORIZONTAL
3	15895.48	59.90	74.00	-14.10	44.85	11.32	38.67	34.94	37	250	Peak	HORIZONTAL
4	15900.36	47.13	54.00	-6.87	32.08	11.32	38.67	34.94	37	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10593.12	42.31	54.00	-11.69	29.02	9.74	38.50	34.95	169	250	Average	VERTICAL
2	10604.36	54.92	74.00	-19.08	41.61	9.74	38.50	34.93	169	250	Peak	VERTICAL
3	15908.48	47.40	54.00	-6.60	32.35	11.32	38.67	34.94	132	250	Average	VERTICAL
4	15909.76	60.00	74.00	-14.00	44.95	11.32	38.67	34.94	132	250	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10631.24	54.97	74.00	-19.03	41.67	9.73	38.50	34.93	98	250	Peak	HORIZONTAL
2	10632.36	41.86	54.00	-12.14	28.56	9.73	38.50	34.93	98	250	Average	HORIZONTAL
3	15957.44	60.10	74.00	-13.90	45.01	11.33	38.74	34.98	56	250	Peak	HORIZONTAL
4	15962.96	46.78	54.00	-7.22	31.69	11.33	38.74	34.98	56	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10631.48	55.49	74.00	-18.51	42.19	9.73	38.50	34.93	135	250	Peak	VERTICAL
2	10638.56	42.24	54.00	-11.76	28.91	9.73	38.50	34.90	135	250	Average	VERTICAL
3	15959.36	59.35	74.00	-14.65	44.26	11.33	38.74	34.98	37	250	Peak	VERTICAL
4	15963.84	46.79	54.00	-7.21	31.70	11.33	38.74	34.98	37	250	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10990.40	41.69	54.00	-12.31	28.18	9.69	38.50	34.68	130	250	Average	HORIZONTAL
2	11005.00	54.65	74.00	-19.35	41.13	9.68	38.50	34.66	130	250	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11001.24	56.14	74.00	-17.86	42.62	9.68	38.50	34.66	133	250	Peak	VERTICAL
2	11004.68	41.64	54.00	-12.36	28.12	9.68	38.50	34.66	133	250	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11161.76	55.20	74.00	-18.80	41.69	9.66	38.50	34.65	128	250	Peak	HORIZONTAL
2	11162.72	42.99	54.00	-11.01	29.48	9.66	38.50	34.65	128	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11158.68	54.85	74.00	-19.15	41.34	9.66	38.50	34.65	94	250	Peak	VERTICAL
2	11164.00	41.68	54.00	-12.32	28.17	9.66	38.50	34.65	94	250	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11393.84	54.98	74.00	-19.02	41.48	9.63	38.50	34.63	67	250	Peak	HORIZONTAL
2	11395.96	42.26	54.00	-11.74	28.76	9.63	38.50	34.63	67	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11390.32	55.00	74.00	-19.00	41.50	9.63	38.50	34.63	47	250	Peak	VERTICAL
2	11390.48	42.35	54.00	-11.65	28.85	9.63	38.50	34.63	47	250	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15811.28	58.93	74.00	-15.07	43.93	11.30	38.55	34.85	32	250	Peak	HORIZONTAL
2	15818.36	46.72	54.00	-7.28	31.76	11.30	38.55	34.89	32	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15801.24	58.39	74.00	-15.61	43.39	11.30	38.55	34.85	58	250	Peak	VERTICAL
2	15815.20	45.78	54.00	-8.22	30.78	11.30	38.55	34.85	58	250	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10612.88	42.20	54.00	-11.80	28.89	9.74	38.50	34.93	84	250	Average	HORIZONTAL
2	10623.44	54.26	74.00	-19.74	40.96	9.73	38.50	34.93	84	250	Peak	HORIZONTAL
3	15934.24	60.37	74.00	-13.63	45.28	11.33	38.74	34.98	146	250	Peak	HORIZONTAL
4	15937.16	47.16	54.00	-6.84	32.07	11.33	38.74	34.98	146	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10611.08	54.64	74.00	-19.36	41.33	9.74	38.50	34.93	174	242	Peak	VERTICAL
2	10612.80	41.96	54.00	-12.04	28.65	9.74	38.50	34.93	174	242	Average	VERTICAL
3	15922.00	46.96	54.00	-7.04	31.87	11.33	38.74	34.98	181	250	Average	VERTICAL
4	15924.44	60.38	74.00	-13.62	45.29	11.33	38.74	34.98	181	250	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11011.80	54.73	74.00	-19.27	41.21	9.68	38.50	34.66	165	243	Peak	HORIZONTAL
2	11026.00	41.95	54.00	-12.05	28.43	9.68	38.50	34.66	165	243	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11018.88	41.82	54.00	-12.18	28.30	9.68	38.50	34.66	120	238	Average	VERTICAL
2	11029.96	55.24	74.00	-18.76	41.72	9.68	38.50	34.66	120	238	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11090.04	42.35	54.00	-11.65	28.83	9.67	38.50	34.65	89	223	Average	HORIZONTAL
2	11091.96	55.65	74.00	-18.35	42.13	9.67	38.50	34.65	89	223	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11097.00	42.09	54.00	-11.91	28.57	9.67	38.50	34.65	128	230	Average	VERTICAL
2	11105.20	55.03	74.00	-18.97	41.51	9.67	38.50	34.65	128	230	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11336.08	54.73	74.00	-19.27	41.22	9.64	38.50	34.63	80	193	Peak	HORIZONTAL
2	11347.72	42.42	54.00	-11.58	28.91	9.64	38.50	34.63	80	193	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11338.60	55.40	74.00	-18.60	41.89	9.64	38.50	34.63	24	150	Peak	VERTICAL
2	11348.88	42.37	54.00	-11.63	28.86	9.64	38.50	34.63	24	150	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15873.20	46.43	54.00	-7.57	31.45	11.31	38.61	34.94	174	227	Average	HORIZONTAL
2	15876.04	59.19	74.00	-14.81	44.14	11.32	38.67	34.94	174	227	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15870.76	46.17	54.00	-7.83	31.19	11.31	38.61	34.94	222	235	Average	VERTICAL
2	15876.80	58.71	74.00	-15.29	43.66	11.32	38.67	34.94	222	235	Peak	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11051.36	55.47	74.00	-18.53	41.95	9.68	38.50	34.66	229	250	Peak	HORIZONTAL
2	11064.28	42.52	54.00	-11.48	29.01	9.67	38.50	34.66	229	250	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11056.04	55.56	74.00	-18.44	42.04	9.68	38.50	34.66	192	246	Peak	VERTICAL
2	11069.04	42.38	54.00	-11.62	28.86	9.67	38.50	34.65	192	246	Average	VERTICAL

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Chain 3 + Chain 4
Test Date	Apr. 07, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11210.40	42.02	54.00	-11.98	28.50	9.66	38.50	34.64	333	218	Average	HORIZONTAL
2	11214.44	55.02	74.00	-18.98	41.50	9.66	38.50	34.64	333	218	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11213.00	54.20	74.00	-19.80	40.68	9.66	38.50	34.64	271	247	Peak	VERTICAL
2	11217.36	41.81	54.00	-12.19	28.29	9.66	38.50	34.64	271	247	Average	VERTICAL

Note:

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

Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

4.5. Band Edge Emissions Measurement

4.5.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for Peak

4.5.3. Test Procedures

1. The test procedure is the same as section 4.4.3.

4.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.4.4.

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Temperature	22.2°C	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain 3 + Chain 4
Test Date	Mar. 31, 2016		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5258.20	113.16			106.23	7.94	33.46	34.47	26	254	Average	HORIZONTAL
2	5263.00	122.73			115.79	7.93	33.48	34.47	26	254	Peak	HORIZONTAL
3	5381.80	62.02	74.00	-11.98	54.99	7.87	33.63	34.47	26	254	Peak	HORIZONTAL
4	5388.40	50.14	54.00	-3.86	43.10	7.86	33.65	34.47	26	254	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5294.80	112.73			105.77	7.91	33.52	34.47	35	249	Average	HORIZONTAL
2	5304.00	122.25			115.29	7.91	33.52	34.47	35	249	Peak	HORIZONTAL
3	5350.00	53.72	54.00	-0.28	46.71	7.89	33.59	34.47	35	249	Average	HORIZONTAL
4	5350.40	68.69	74.00	-5.31	61.68	7.89	33.59	34.47	35	249	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5316.00	109.19			102.20	7.91	33.55	34.47	29	247	Average	HORIZONTAL
2	5316.40	118.61			111.62	7.91	33.55	34.47	29	247	Peak	HORIZONTAL
3	5350.80	53.75	54.00	-0.25	46.74	7.89	33.59	34.47	29	247	Average	HORIZONTAL
4	5352.80	66.01	74.00	-7.99	59.00	7.89	33.59	34.47	29	247	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 100, 116, 140 / Chain 3 + Chain 4
Test Date	Mar. 31, 2016		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5460.00	64.23	74.00	-9.77	57.07	7.89	33.74	34.47	27	248	Peak	HORIZONTAL
2	5460.00	51.92	54.00	-2.08	44.76	7.89	33.74	34.47	27	248	Average	HORIZONTAL
3	5469.60	69.06	74.00	-4.94	61.87	7.90	33.76	34.47	27	248	Peak	HORIZONTAL
4	5470.00	53.71	54.00	-0.29	46.52	7.90	33.76	34.47	27	248	Average	HORIZONTAL
5	5495.60	119.31			112.07	7.91	33.80	34.47	27	248	Peak	HORIZONTAL
6	5495.60	109.48			102.24	7.91	33.80	34.47	27	248	Average	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5388.80	50.72	54.00	-3.28	43.68	7.86	33.65	34.47	23	243	Average	HORIZONTAL
2	5434.40	63.34	74.00	-10.66	56.21	7.88	33.72	34.47	23	243	Peak	HORIZONTAL
3	5462.00	62.61	74.00	-11.39	55.45	7.89	33.74	34.47	23	243	Peak	HORIZONTAL
4	5468.40	50.57	54.00	-3.43	43.38	7.90	33.76	34.47	23	243	Average	HORIZONTAL
5	5574.40	122.18			114.72	7.94	34.00	34.48	23	243	Peak	HORIZONTAL
6	5574.40	112.02			104.56	7.94	34.00	34.48	23	243	Average	HORIZONTAL
7	5728.80	49.39	54.00	-4.61	41.54	7.87	34.50	34.52	23	243	Average	HORIZONTAL
8	5732.80	61.02	74.00	-12.98	53.17	7.87	34.50	34.52	23	243	Peak	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5694.40	116.37			108.59	7.89	34.40	34.51	76	245	Peak	HORIZONTAL
2	5694.40	107.07			99.29	7.89	34.40	34.51	76	245	Average	HORIZONTAL
3	5725.00	53.99	54.00	-0.01	46.13	7.87	34.50	34.51	76	245	Average	HORIZONTAL
4	5729.60	68.39	74.00	-5.61	60.54	7.87	34.50	34.52	76	245	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 3 + Chain 4
Test Date	Apr. 06, 2016		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5140.60	48.30	54.00	-5.70	41.60	7.88	33.29	34.47	34	255	Average	HORIZONTAL
2	5144.20	61.35	74.00	-12.65	54.61	7.90	33.31	34.47	34	255	Peak	HORIZONTAL
3	5266.00	113.03			106.09	7.93	33.48	34.47	34	255	Average	HORIZONTAL
4	5267.80	123.58			116.64	7.93	33.48	34.47	34	255	Peak	HORIZONTAL
5	5354.80	49.48	54.00	-4.52	42.46	7.88	33.61	34.47	34	255	Average	HORIZONTAL
6	5371.00	62.55	74.00	-11.45	55.52	7.87	33.63	34.47	34	255	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5306.40	113.18			106.22	7.91	33.52	34.47	36	264	Average	HORIZONTAL
2	5306.80	122.59			115.63	7.91	33.52	34.47	36	264	Peak	HORIZONTAL
3	5350.00	53.66	54.00	-0.34	46.65	7.89	33.59	34.47	36	264	Average	HORIZONTAL
4	5350.40	67.40	74.00	-6.60	60.39	7.89	33.59	34.47	36	264	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5314.80	119.33			112.34	7.91	33.55	34.47	34	259	Peak	HORIZONTAL
2	5316.00	109.18			102.19	7.91	33.55	34.47	34	259	Average	HORIZONTAL
3	5353.60	53.76	54.00	-0.24	46.75	7.89	33.59	34.47	34	259	Average	HORIZONTAL
4	5354.00	68.18	74.00	-5.82	61.17	7.89	33.59	34.47	34	259	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Chain 3 + Chain 4
Test Date	Apr. 06, 2016		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5452.00	65.62	74.00	-8.38	58.46	7.89	33.74	34.47	32	254	Peak	HORIZONTAL
2	5457.20	50.98	54.00	-3.02	43.82	7.89	33.74	34.47	32	254	Average	HORIZONTAL
3	5470.00	69.72	74.00	-4.28	62.53	7.90	33.76	34.47	32	254	Peak	HORIZONTAL
4	5470.00	53.78	54.00	-0.22	46.59	7.90	33.76	34.47	32	254	Average	HORIZONTAL
5	5492.80	108.54			101.33	7.90	33.78	34.47	32	254	Average	HORIZONTAL
6	5494.80	118.82			111.61	7.90	33.78	34.47	32	254	Peak	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5430.40	63.89	74.00	-10.11	56.80	7.87	33.69	34.47	24	248	Peak	HORIZONTAL
2	5452.80	50.14	54.00	-3.86	42.98	7.89	33.74	34.47	24	248	Average	HORIZONTAL
3	5466.80	49.93	54.00	-4.07	42.74	7.90	33.76	34.47	24	248	Average	HORIZONTAL
4	5467.60	62.20	74.00	-11.80	55.01	7.90	33.76	34.47	24	248	Peak	HORIZONTAL
5	5574.40	122.26			114.80	7.94	34.00	34.48	24	248	Peak	HORIZONTAL
6	5575.20	112.35			104.84	7.94	34.05	34.48	24	248	Average	HORIZONTAL
7	5726.40	61.12	74.00	-12.88	53.27	7.87	34.50	34.52	24	248	Peak	HORIZONTAL
8	5739.20	49.05	54.00	-4.95	41.16	7.86	34.55	34.52	24	248	Average	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5706.40	115.96			108.14	7.88	34.45	34.51	75	246	Peak	HORIZONTAL
2	5706.40	105.68			97.86	7.88	34.45	34.51	75	246	Average	HORIZONTAL
3	5725.00	68.72	74.00	-5.28	60.86	7.87	34.50	34.51	75	246	Peak	HORIZONTAL
4	5725.00	53.80	54.00	-0.20	45.94	7.87	34.50	34.51	75	246	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	22.2℃	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 3 + Chain 4
Test Date	Apr. 06, 2016		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5267.60	118.59			111.65	7.93	33.48	34.47	36	269	Peak	HORIZONTAL
2	5268.20	108.80			101.86	7.93	33.48	34.47	36	269	Average	HORIZONTAL
3	5350.00	67.13	74.00	-6.87	60.12	7.89	33.59	34.47	36	269	Peak	HORIZONTAL
4	5350.00	53.82	54.00	-0.18	46.81	7.89	33.59	34.47	36	269	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5270 MHz.

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5306.40	103.49			96.53	7.91	33.52	34.47	36	266	Average	HORIZONTAL
2	5308.40	113.04			106.05	7.91	33.55	34.47	36	266	Peak	HORIZONTAL
3	5350.00	67.05	74.00	-6.95	60.04	7.89	33.59	34.47	36	266	Peak	HORIZONTAL
4	5350.00	53.81	54.00	-0.19	46.80	7.89	33.59	34.47	36	266	Average	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5310 MHz.

Temperature	22.2°C	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Chain 3 + Chain 4
Test Date	Apr. 06, 2016		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5459.00	66.14	74.00	-7.86	58.98	7.89	33.74	34.47	28	256	Peak	HORIZONTAL
2	5460.00	52.44	54.00	-1.56	45.28	7.89	33.74	34.47	28	256	Average	HORIZONTAL
3	5465.00	53.80	54.00	-0.20	46.61	7.90	33.76	34.47	28	256	Average	HORIZONTAL
4	5466.20	70.12	74.00	-3.88	62.93	7.90	33.76	34.47	28	256	Peak	HORIZONTAL
5	5499.80	111.76			104.52	7.91	33.80	34.47	28	256	Peak	HORIZONTAL
6	5501.00	100.38			93.14	7.91	33.80	34.47	28	256	Average	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5510 MHz.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5447.00	51.20	54.00	-2.80	44.07	7.88	33.72	34.47	25	252	Average	HORIZONTAL
2	5454.00	63.87	74.00	-10.13	56.71	7.89	33.74	34.47	25	252	Peak	HORIZONTAL
3	5468.00	53.94	54.00	-0.06	46.75	7.90	33.76	34.47	25	252	Average	HORIZONTAL
4	5469.00	68.92	74.00	-5.08	61.73	7.90	33.76	34.47	25	252	Peak	HORIZONTAL
5	5546.00	108.61			101.21	7.93	33.95	34.48	25	252	Average	HORIZONTAL
6	5548.00	118.41			111.01	7.93	33.95	34.48	25	252	Peak	HORIZONTAL
7	5727.00	48.64	54.00	-5.36	40.79	7.87	34.50	34.52	25	252	Average	HORIZONTAL
8	5729.00	60.36	74.00	-13.64	52.51	7.87	34.50	34.52	25	252	Peak	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5550 MHz.

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5661.20	104.87			97.16	7.91	34.30	34.50	334	237	Average	HORIZONTAL
2	5662.00	115.05			107.34	7.91	34.30	34.50	334	237	Peak	HORIZONTAL
3	5726.00	53.71	54.00	-0.29	45.85	7.87	34.50	34.51	334	237	Average	HORIZONTAL
4	5728.00	69.18	74.00	-4.82	61.33	7.87	34.50	34.52	334	237	Peak	HORIZONTAL

Temperature	22.2°C	Humidity	56%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Chain 3 + Chain 4
Test Date	Apr. 06, 2016 / Apr. 07, 2016		

Channel 58

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5106.00	47.72	54.00	-6.28	41.12	7.82	33.25	34.47	32	264	Average	HORIZONTAL
2	5116.40	60.11	74.00	-13.89	53.46	7.85	33.27	34.47	32	264	Peak	HORIZONTAL
3	5297.20	105.54			98.58	7.91	33.52	34.47	32	264	Peak	HORIZONTAL
4	5314.80	94.89			87.90	7.91	33.55	34.47	32	264	Average	HORIZONTAL
5	5353.20	53.90	54.00	-0.10	46.89	7.89	33.59	34.47	32	264	Average	HORIZONTAL
6	5354.00	67.96	74.00	-6.04	60.95	7.89	33.59	34.47	32	264	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5290 MHz.

Channel 106

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5455.60	53.86	54.00	-0.14	46.70	7.89	33.74	34.47	23	253	Average	HORIZONTAL
2	5458.80	66.76	74.00	-7.24	59.60	7.89	33.74	34.47	23	253	Peak	HORIZONTAL
3	5460.80	65.48	74.00	-8.52	58.32	7.89	33.74	34.47	23	253	Peak	HORIZONTAL
4	5460.80	53.14	54.00	-0.86	45.98	7.89	33.74	34.47	23	253	Average	HORIZONTAL
5	5516.40	94.14			86.84	7.92	33.85	34.47	23	253	Average	HORIZONTAL
6	5517.20	106.26			98.96	7.92	33.85	34.47	23	253	Peak	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

Channel 122

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5578.00	102.67			95.16	7.94	34.05	34.48	25	248	Average	HORIZONTAL
2	5597.20	114.28			106.72	7.95	34.10	34.49	25	248	Peak	HORIZONTAL
3	5734.00	53.63	54.00	-0.37	45.78	7.87	34.50	34.52	25	248	Average	HORIZONTAL
4	5735.60	66.22	74.00	-7.78	58.37	7.87	34.50	34.52	25	248	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5610 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

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

4.6. Frequency Stability Measurement

4.6.1. Limit

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

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

4.6.2. Measuring Instruments and Setting

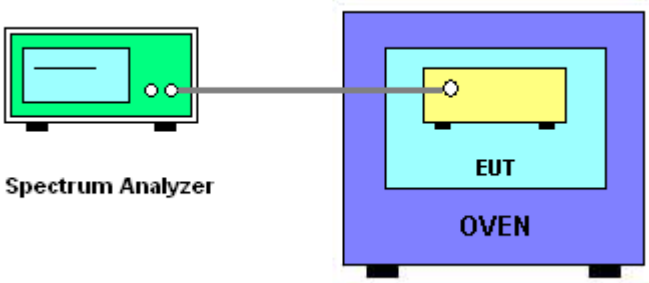
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10 kHz
Sweep Time	Auto

4.6.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is -40°C~70°C.

4.6.4. Test Setup Layout



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

4.6.7. Test Result of Frequency Stability

Temperature	22.2°C	Humidity	56%
Test Engineer	Andy Tsai	Test Date	May 09, 2016

Mode: 20 MHz / Chain 3

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5299.9789	5299.9783	5299.9776	5299.9772
110.00	5299.9783	5299.9773	5299.9767	5299.9761
93.50	5299.9775	5299.9766	5299.9761	5299.9753
Max. Deviation (MHz)	0.0225	0.0234	0.0239	0.0247
Max. Deviation (ppm)	4.25	4.42	4.51	4.66
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5299.9837	5299.9827	5299.9826	5299.9818
-30	5299.9837	5299.9827	5299.9826	5299.9818
-20	5299.9836	5299.9829	5299.9821	5299.9812
-10	5299.9824	5299.9814	5299.9812	5299.9808
0	5299.9805	5299.9799	5299.9796	5299.9788
10	5299.9797	5299.9791	5299.9783	5299.9773
20	5299.9783	5299.9782	5299.9773	5299.9764
30	5299.9782	5299.9776	5299.9770	5299.9769
40	5299.9774	5299.9769	5299.9761	5299.9757
50	5299.9760	5299.9751	5299.9741	5299.9734
60	5299.9760	5299.9751	5299.9741	5299.9734
70	5299.9760	5299.9751	5299.9741	5299.9734
Max. Deviation (MHz)	0.0240	0.0249	0.0259	0.0266
Max. Deviation (ppm)	4.52	4.69	4.88	5.01
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5579.9765	5579.9761	5579.9758	5579.9749
110.00	5579.9761	5579.9760	5579.9754	5579.9747
93.50	5579.9759	5579.9754	5579.9745	5579.9741
Max. Deviation (MHz)	0.0241	0.0246	0.0255	0.0259
Max. Deviation (ppm)	4.32	4.41	4.57	4.64
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5579.9733	5579.9723	5579.9721	5579.9717
-30	5579.9716	5579.9708	5579.9703	5579.9693
-20	5579.9734	5579.9730	5579.9720	5579.9716
-10	5579.9739	5579.9738	5579.9732	5579.9728
0	5579.9749	5579.9744	5579.9736	5579.9729
10	5579.9754	5579.9745	5579.9744	5579.9741
20	5579.9761	5579.9759	5579.9757	5579.9747
30	5579.9820	5579.9817	5579.9812	5579.9804
40	5579.9825	5579.9818	5579.9808	5579.9802
50	5579.9833	5579.9830	5579.9826	5579.9822
60	5579.9844	5579.9843	5579.9835	5579.9826
70	5579.9829	5579.9819	5579.9811	5579.9810
Max. Deviation (MHz)	0.0284	0.0292	0.0297	0.0307
Max. Deviation (ppm)	5.09	5.23	5.32	5.50
Result	Complies			

Mode: 40 MHz / Chain 3

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5309.9805	5309.9801	5309.9792	5309.9785
110.00	5309.9800	5309.9796	5309.9795	5309.9790
93.50	5309.9795	5309.9793	5309.9787	5309.9784
Max. Deviation (MHz)	0.0205	0.0207	0.0213	0.0216
Max. Deviation (ppm)	3.85	3.89	4.01	4.06
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5309.9873	5309.9867	5309.9861	5309.9859
-30	5309.9864	5309.9859	5309.9854	5309.9853
-20	5309.9853	5309.9844	5309.9839	5309.9833
-10	5309.9838	5309.9828	5309.9818	5309.9817
0	5309.9823	5309.9818	5309.9817	5309.9812
10	5309.9819	5309.9809	5309.9806	5309.9803
20	5309.9800	5309.9797	5309.9788	5309.9784
30	5309.9792	5309.9789	5309.9785	5309.9784
40	5309.9781	5309.9777	5309.9768	5309.9766
50	5309.9775	5309.9770	5309.9766	5309.9756
60	5309.9769	5309.9762	5309.9753	5309.9748
70	5309.9763	5309.9753	5309.9748	5309.9744
Max. Deviation (MHz)	0.0237	0.0247	0.0252	0.0256
Max. Deviation (ppm)	4.47	4.66	4.75	4.83
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5549.9794	5549.9788	5549.9778	5549.9775
110.00	5549.9790	5549.9780	5549.9779	5549.9776
93.50	5549.9786	5549.9784	5549.9780	5549.9774
Max. Deviation (MHz)	0.0214	0.0220	0.0222	0.0226
Max. Deviation (ppm)	3.85	3.96	3.99	4.07
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5549.9833	5549.9829	5549.9827	5549.9818
-30	5549.9848	5549.9839	5549.9834	5549.9830
-20	5549.9831	5549.9824	5549.9815	5549.9813
-10	5549.9828	5549.9822	5549.9814	5549.9812
0	5549.9815	5549.9811	5549.9810	5549.9802
10	5549.9802	5549.9801	5549.9793	5549.9787
20	5549.9790	5549.9788	5549.9783	5549.9780
30	5549.9692	5549.9690	5549.9686	5549.9683
40	5549.9676	5549.9669	5549.9662	5549.9657
50	5549.9672	5549.9663	5549.9653	5549.9644
60	5549.9675	5549.9667	5549.9657	5549.9648
70	5549.9661	5549.9653	5549.9650	5549.9644
Max. Deviation (MHz)	0.0328	0.0337	0.0347	0.0356
Max. Deviation (ppm)	5.92	6.08	6.26	6.42
Result	Complies			

Mode: 80 MHz / Chain 3

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5289.9806	5289.9803	5289.9797	5289.9790
110.00	5289.9800	5289.9799	5289.9798	5289.9789
93.50	5289.9797	5289.9788	5289.9786	5289.9780
Max. Deviation (MHz)	0.0203	0.0212	0.0214	0.0220
Max. Deviation (ppm)	3.83	4.00	4.04	4.15
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5289.9850	5289.9842	5289.9840	5289.9836
-30	5289.9835	5289.9829	5289.9822	5289.9814
-20	5289.9831	5289.9824	5289.9822	5289.9819
-10	5289.9814	5289.9813	5289.9811	5289.9801
0	5289.9810	5289.9809	5289.9802	5289.9800
10	5289.9802	5289.9801	5289.9791	5289.9785
20	5289.9800	5289.9791	5289.9788	5289.9786
30	5289.9779	5289.9769	5289.9763	5289.9754
40	5289.9778	5289.9777	5289.9767	5289.9757
50	5289.9762	5289.9758	5289.9750	5289.9744
60	5289.9775	5289.9773	5289.9763	5289.9754
70	5289.9770	5289.9765	5289.9756	5289.9748
Max. Deviation (MHz)	0.0238	0.0242	0.0250	0.0256
Max. Deviation (ppm)	4.50	4.57	4.72	4.84
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5529.9839	5529.9831	5529.9821	5529.9815
110.00	5529.9831	5529.9824	5529.9815	5529.9808
93.50	5529.9822	5529.9816	5529.9811	5529.9803
Max. Deviation (MHz)	0.0178	0.0184	0.0189	0.0197
Max. Deviation (ppm)	3.21	3.32	3.41	3.56
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5529.9876	5529.9872	5529.9868	5529.9865
-30	5529.9879	5529.9870	5529.9863	5529.9856
-20	5529.9867	5529.9866	5529.9859	5529.9855
-10	5529.9866	5529.9859	5529.9854	5529.9851
0	5529.9862	5529.9854	5529.9853	5529.9852
10	5529.9845	5529.9839	5529.9831	5529.9823
20	5529.9831	5529.9821	5529.9818	5529.9813
30	5529.9790	5529.9787	5529.9783	5529.9776
40	5529.9783	5529.9779	5529.9774	5529.9770
50	5529.9771	5529.9768	5529.9761	5529.9753
60	5529.9779	5529.9771	5529.9765	5529.9762
70	5529.9780	5529.9778	5529.9770	5529.9767
Max. Deviation (MHz)	0.0229	0.0232	0.0239	0.0247
Max. Deviation (ppm)	4.14	4.20	4.32	4.47
Result	Complies			

4.7. Antenna Requirements

4.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%