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FCC RADIO TEST REPORT

Applicant's company	**PEGATRON CORPORATION**
Applicant Address	5F., NO. 76, LIGONG ST., BEITOU DISTRICT, TAIPEI CITY 112 Taiwan
FCC ID	**VUIDPC3941**
Manufacturer's company	**MAINTEK COMPUTER**
Manufacturer Address	233 Jinfeng Rd., Suzhou, Jiangsu, PRC

Product Name	Wireless Residential Voice Gateway
Brand Name	technicolor
Model No.	DPC3941T , DPC3941 , DPC3941XXXX (X can be 0-9, A-Z, a-z or blank)
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Nov. 19, 2015
Final Test Date	Dec. 08, 2015
Submission Type	Class II 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
FR3D1632-04AB	Rev. 01	Initial issue of report	May 12, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Wireless Residential Voice Gateway
Brand Name	:	technicolor
Model No.	:	DPC3941T , DPC3941 , DPC3941XXXX (X can be 0-9, A-Z, a-z or blank)
Applicant	:	PEGATRON CORPORATION
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 Nov. 19, 2015 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
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(e)	6dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.18 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.17 dB
4.5	15.407(b)	Radiated Emissions	Complies	1.01 dB
4.6	15.407(b)	Band Edge Emissions	Complies	0.04 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	Internal power supply
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	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 1: IEEE 802.11a: 19.54 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.93 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 4: IEEE 802.11a: 17.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 24.23 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 29.14 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.16 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 29.36 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 22.41 dBm Band 4: IEEE 802.11a: 29.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.82 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 27.44 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.60 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
Beamforming Function	☐ With beamforming	☒ Without beamforming
Operating Mode	☐ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Antenna and Band width

Antenna	Three (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)	3	MCS 0-23
802.11n (HT40)	3	MCS 0-23
802.11ac (VHT20)	3	MCS 0-9/Nss1-3
802.11ac (VHT40)	3	MCS 0-9/Nss1-3
802.11ac (VHT80)	3	MCS 0-9/Nss1-3

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

Power line*1, Non-shielded, 2m

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	P/N	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	Wanshih	WPB263	UC3WF10087	PCB Antenna	I-PEX	2.03	-
2	Wanshih	WPB265	UC3WF10089	PCB Antenna	I-PEX	1.73	-
3	Wanshih	WPB264	UC3WF10088	PCB Antenna	I-PEX	2.11	-
4	ACON	Cisco_DPC_3941	APP6P-701222	PCB Antenna	I-PEX	-	1.95
5	ACON	Cisco_DPC_3941	APP6P-701221	PCB Antenna	I-PEX	-	1.34
6	ACON	Cisco_DPC_3941	APP6P-701220	PCB Antenna	I-PEX		2.03

Note: The EUT has six antennas.

For 2.4GHz function:

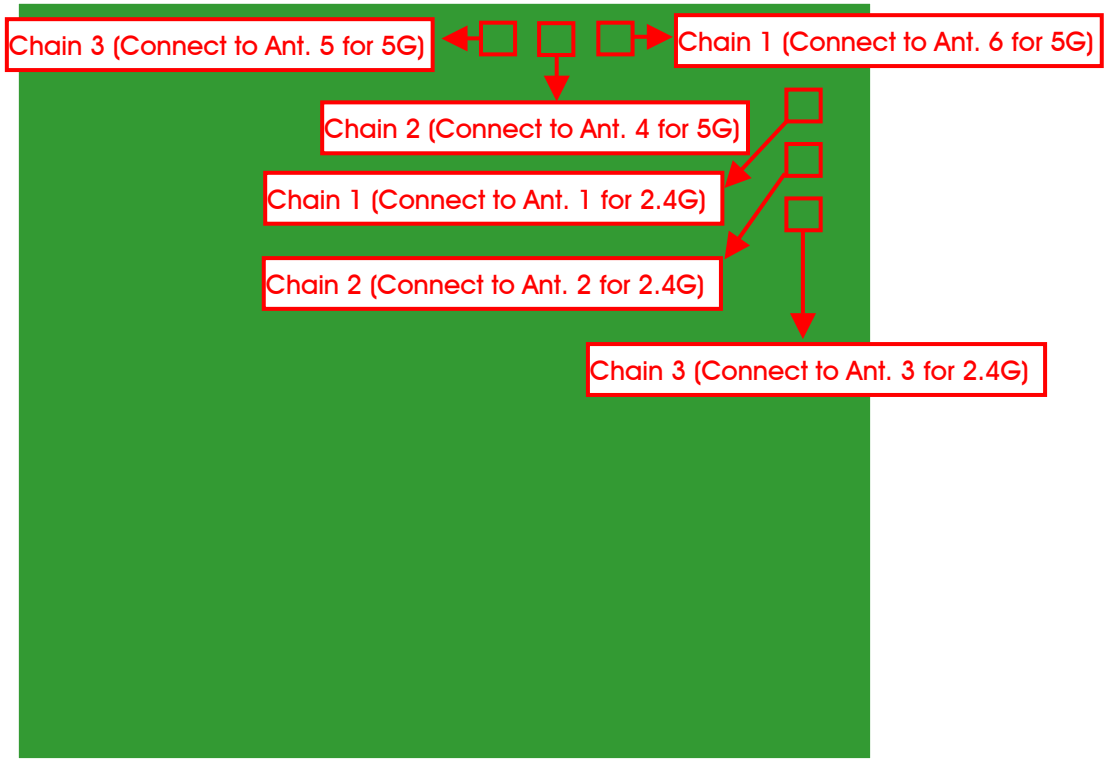
For IEEE 802.11b/g/n mode:

Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac mode (3TX/3RX):

Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 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 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
Power Spectral Density	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3
Radiated Emission Below 1GHz	CTX		-	-	-
Radiated Emission Above 1GHz	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3

Band Edge Emission	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
Frequency Stability	20 MHz	Band 1&4	-	40/157	1
	40 MHz	Band 1&4	-	38/151	1
	80 MHz	Band 1&4	-	42/155	1

Note: 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.

The following test modes were performed for all tests:

For Radiated Emission test (Below 1GHz):

Mode 1. EUT Yaxis 2.4G WLAN Function- CTX

Mode 2. EUT Yaxis 5G WLAN Function- CTX

Mode 1 is the worst case, so it was selected to record in this test report.

For Radiated Emission test (Above 1GHz):

Mode 1. EUT Yaxis - CTX

For Co-location MPE and Radiated Emission Co-location Test:

The EUT could be applied with 2.4GHz WLAN function, 5GHz WLAN function and DECT; therefore Co-location Maximum Permissible Exposure (Please refer to FA3D1632-04) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function, 5GHz WLAN function and DECT.

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 Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Multiple Listing

The EUT has three model names, which are identical to each other in all aspects except for the following table:

Model Name	Information of Tuner Chip	Remark
DPC3941	1. Mxl267, Upstream channels (24 x 8) 2. Mxl267D, Upstream channels (24 x 8)	Original
DPC3941T	1. Mxl267, Upstream channels (24 x 8) 2. Mxl267D, Upstream channels (24 x 8)	Original
DCP3941XXXX (X can be 0-9, A-Z, a-z or blank)	1. Mxl267, Upstream channels (24 x 8) 2. Mxl267D, Upstream channels (24 x 8)	New

Note:

1. The different model name of the tuner chip serves as marketing strategy
2. According to above, there is only model: DPC3941T were selected to test and record in the report as a result.

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR3D1632-01AA and FR3D1632-01AB

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

Modifications	Performance Checking
1. Adding a new tuner chip Mxl267D which is identical to the original tuner chip Mxl267. 2. Removing 3 antennas: (1. Brand: Wanshih, Model Name: WPB266; 2. Brand: Wanshih, Model Name: WPB268; 3. Brand: Wanshih, Model Name: WPB267). 3. Removing the tuner chip Mxl265 4. Changing 2.4GHz PA from P/N: SE2605L to P/N: SE2605L-RN due to changing of manufacturing process. 5. Changing the Brand name. 6. Adding a new model number DPC3941XXXX (X can be 0-9, A-Z, a-z or blank).	After evaluating, it is not necessary to re-test.
7. Changing the antenna location for tuner chip Mxl267.	1. Radiated Emissions 2. Band Edge Emissions
8. Updating 5 GHz Band 1 and Band 4 to FCC "New Rules" from "Old Rules".	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth 2. 6dB Spectrum Bandwidth 3. Maximum Conducted Output Power 4. Power Spectral Density 5. Radiated Emissions (above 1GHz) 6. Band Edge Emissions 7. Frequency Stability

3.9. Table for Supporting Units

For Test Site No: 03CH01-CB and TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

3.10. 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	ART (Cart Version4.9)					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	23.5	24	24.5	23	24.5	23
802.11ac MCS0/Nss1 VHT20	22.5	24	24.5	23	28.5	22.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	20		25		22.5	24.5
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	17.5				19.5	

3.11. EUT Operation during Test

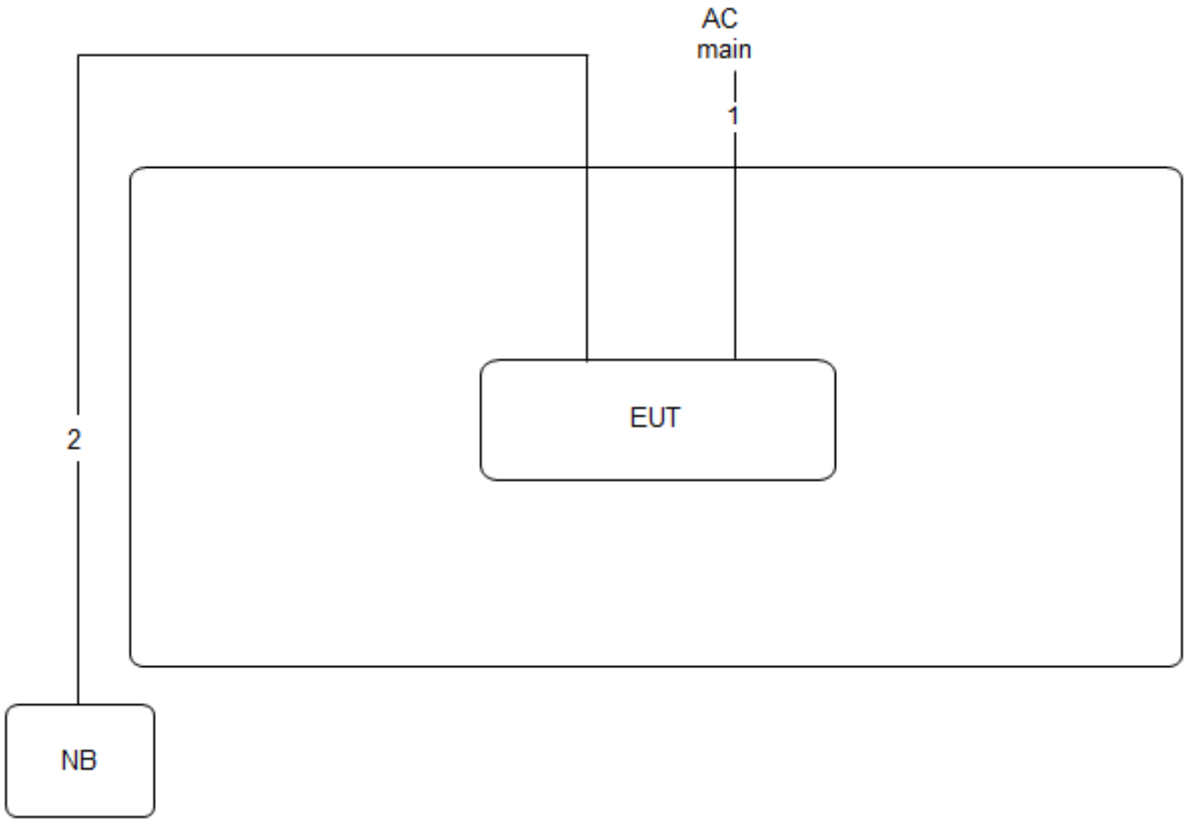
The EUT was programmed to be in continuously transmitting mode.

3.12. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.030	2.090	97.13%	0.13	0.49
802.11ac MCS0/Nss1 VHT20	1.890	1.950	96.92%	0.14	0.53
802.11ac MCS0/Nss1 VHT40	0.905	1.010	89.60%	0.48	1.10
802.11ac MCS0/Nss1 VHT80	0.460	0.516	89.15%	0.50	2.17

3.13. Test Configurations

3.13.1. Radiation Emissions Test Configuration



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

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 4.5.4.

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

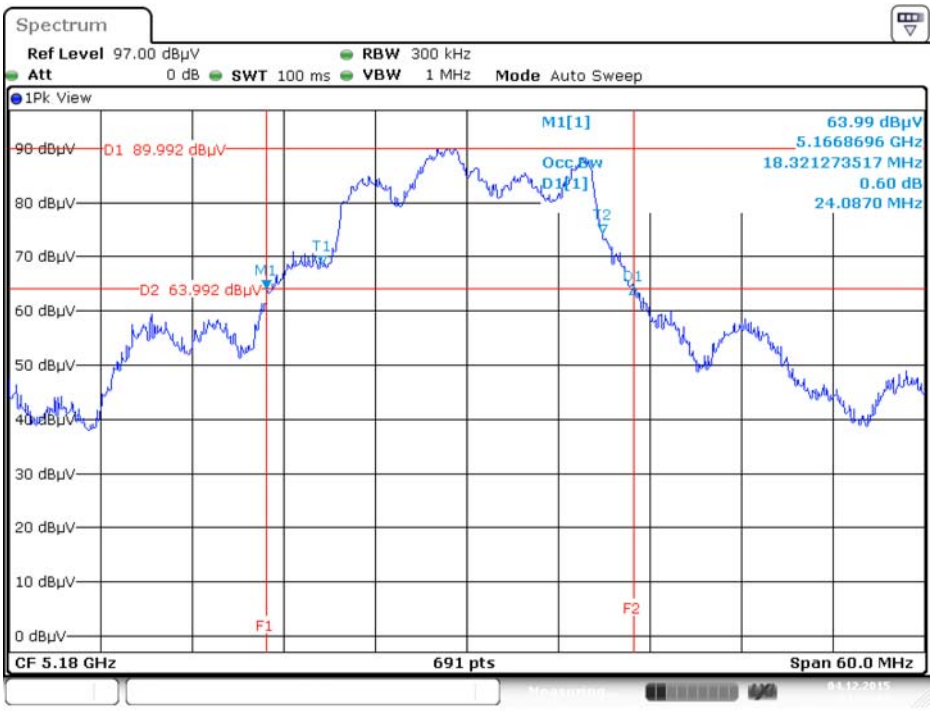
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25℃	Humidity	45%
Test Engineer	Lucas Huang		

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	24.09	18.32
	5200 MHz	24.78	16.93
	5240 MHz	31.57	19.54
	5745 MHz	19.57	16.24
	5785 MHz	26.78	17.11
	5825 MHz	23.83	17.71
802.11ac MCS0/Nss1 VHT20	5180 MHz	24.43	18.41
	5200 MHz	26.00	18.93
	5240 MHz	29.74	17.45
	5745 MHz	19.39	16.67
	5785 MHz	35.74	24.23
	5825 MHz	23.13	17.54
802.11ac MCS0/Nss1 VHT40	5190 MHz	41.16	35.75
	5230 MHz	44.49	37.05
	5755 MHz	45.07	36.76
	5795 MHz	50.15	35.89
802.11ac MCS0/Nss1 VHT80	5210 MHz	81.45	75.25
	5775 MHz	83.19	75.83

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



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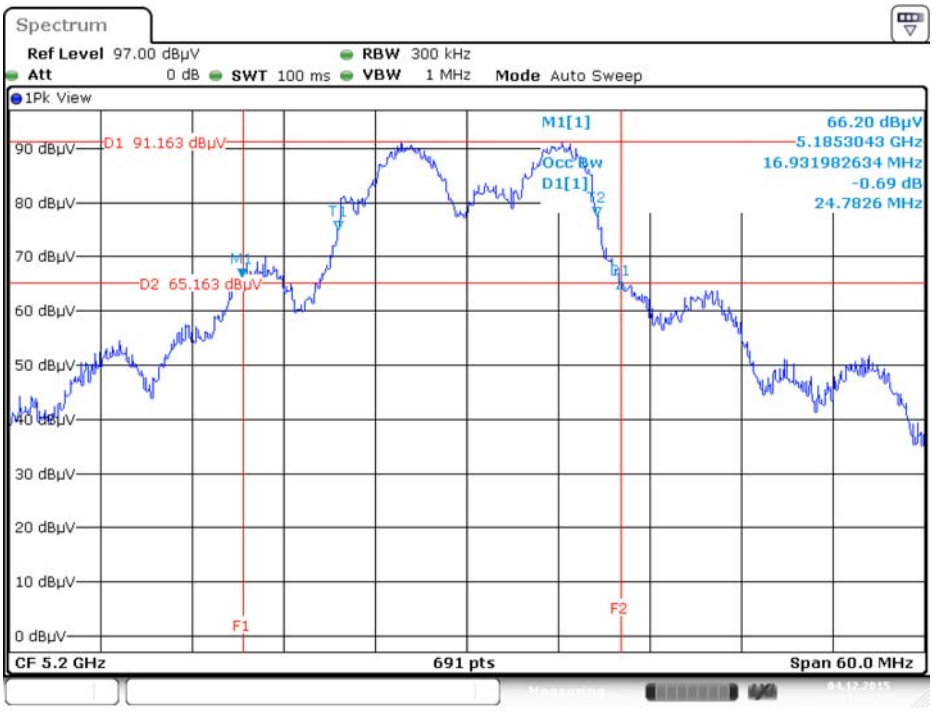
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



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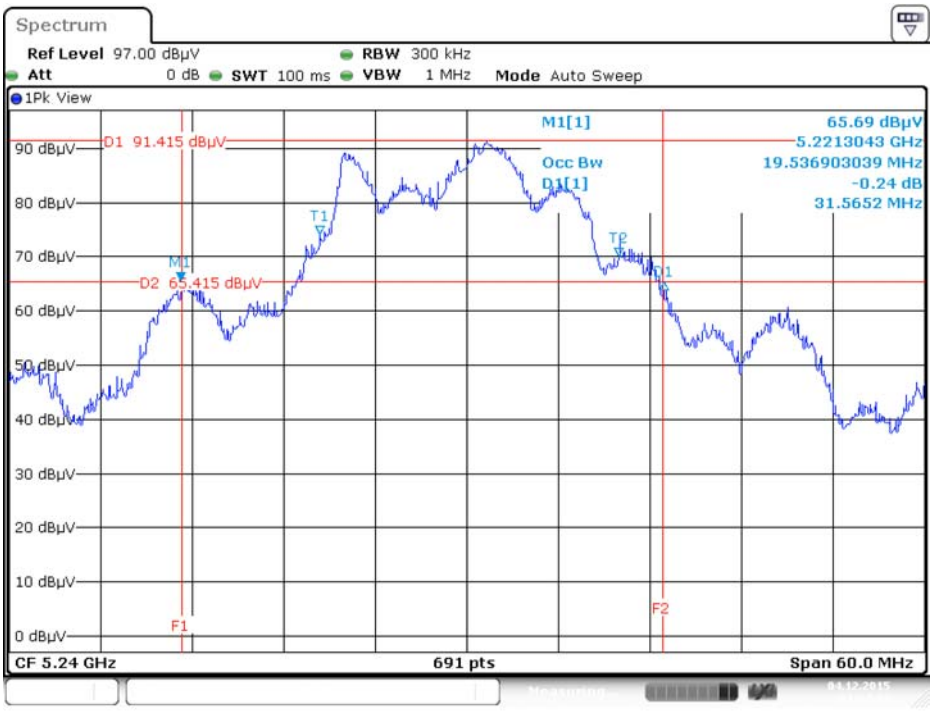
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



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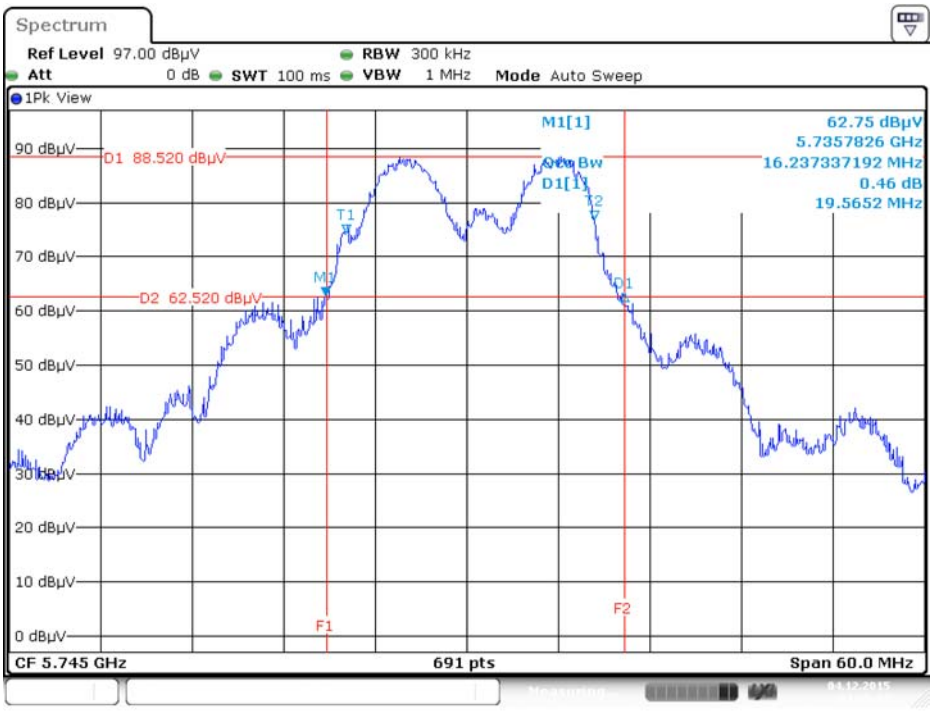
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5745 MHz



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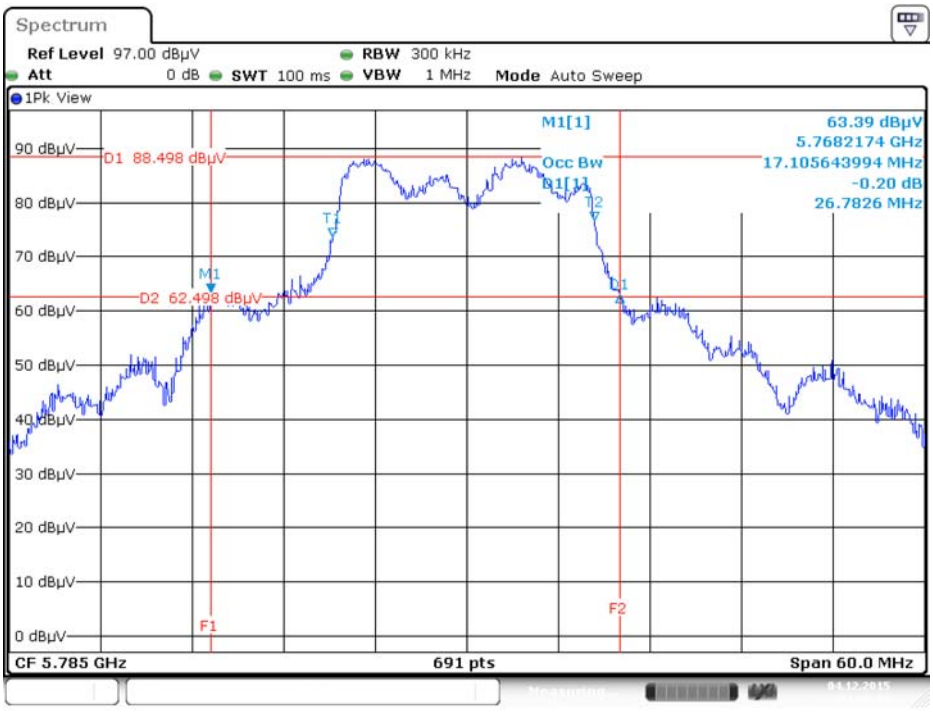
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



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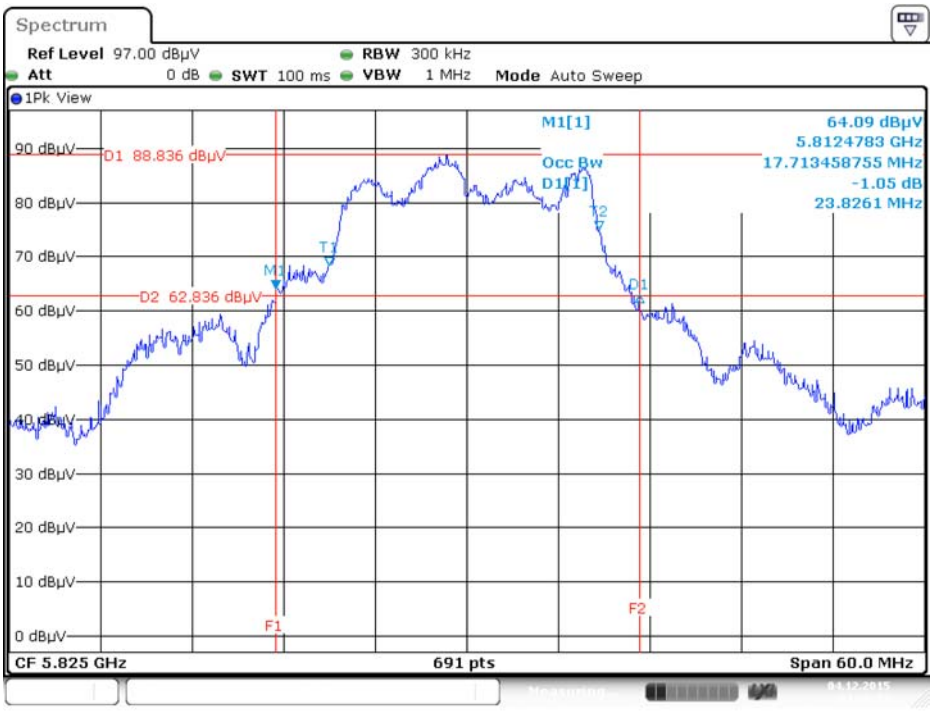
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5825 MHz



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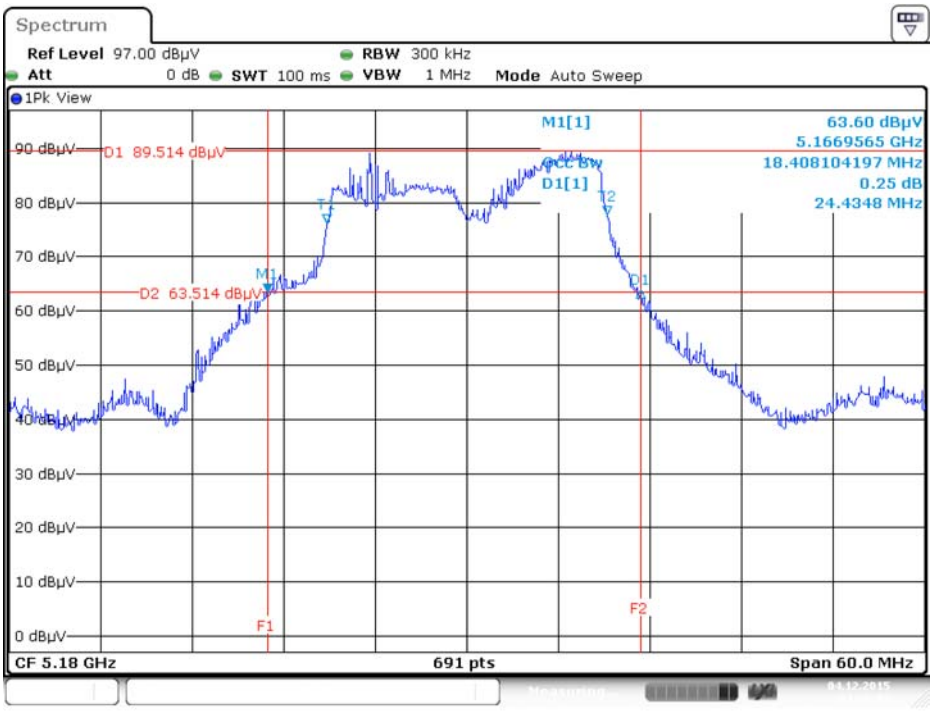
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



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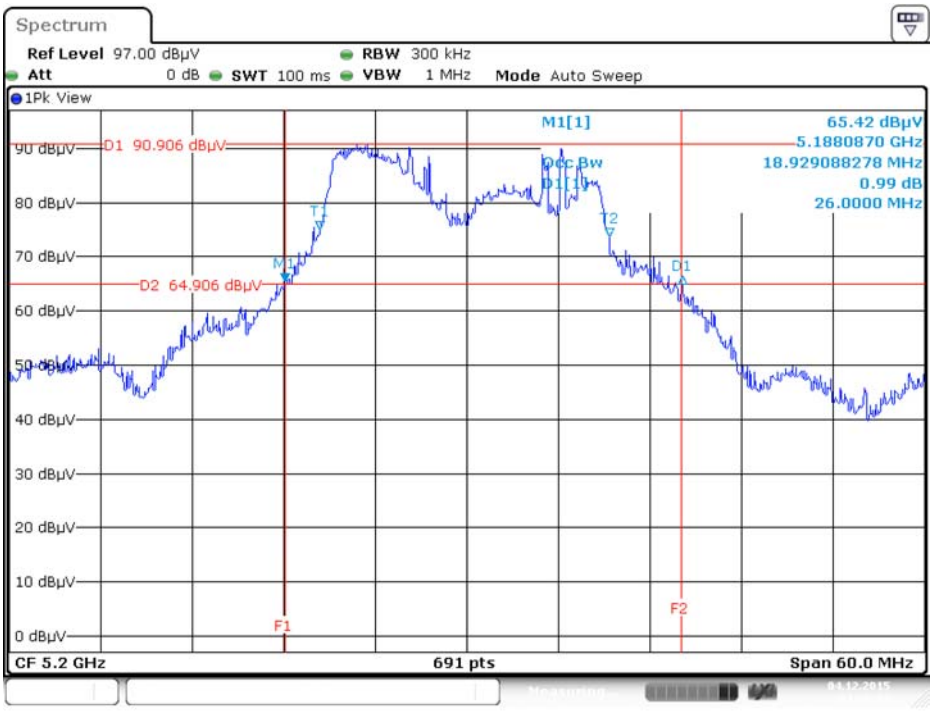
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



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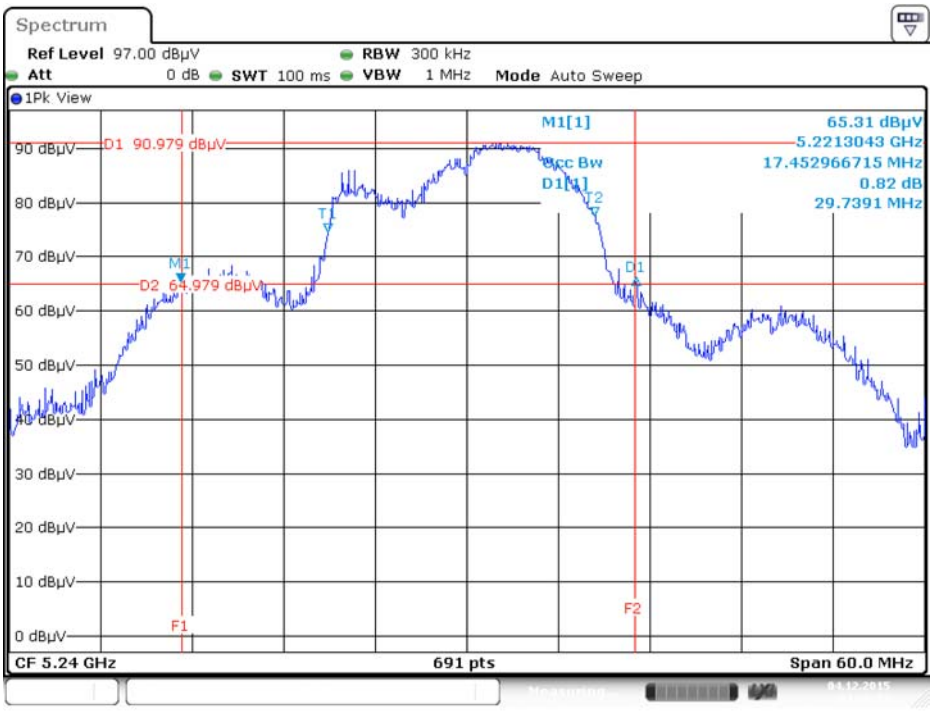
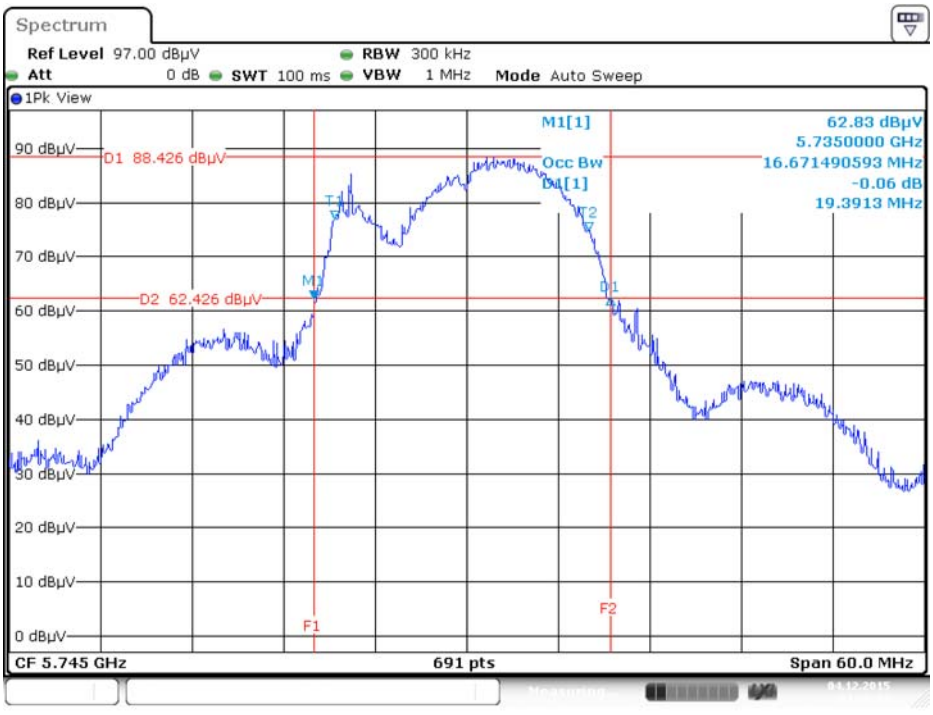
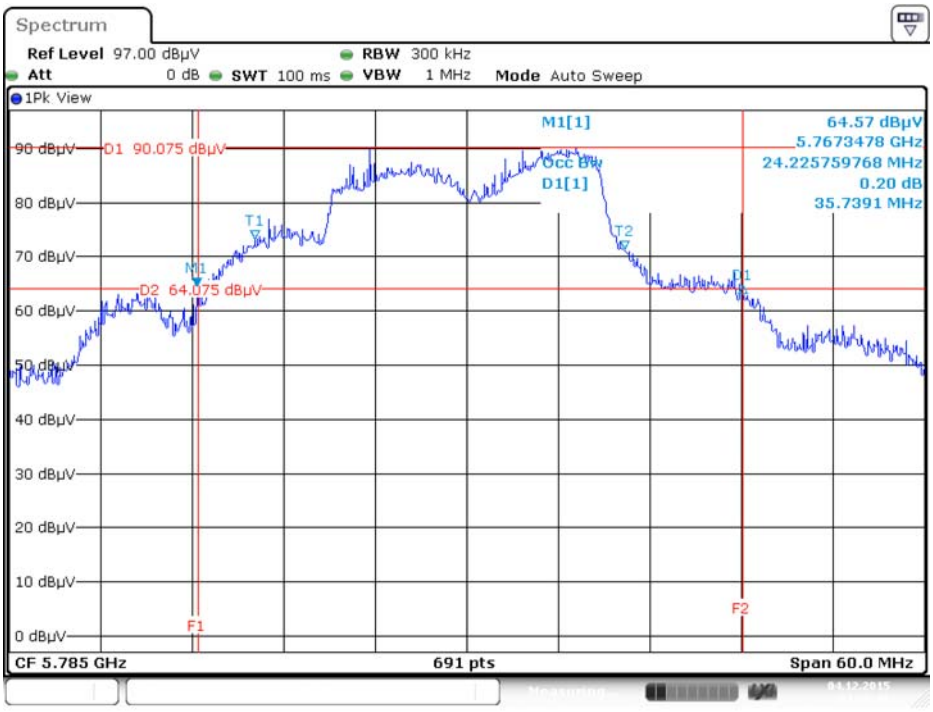
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5745 MHz

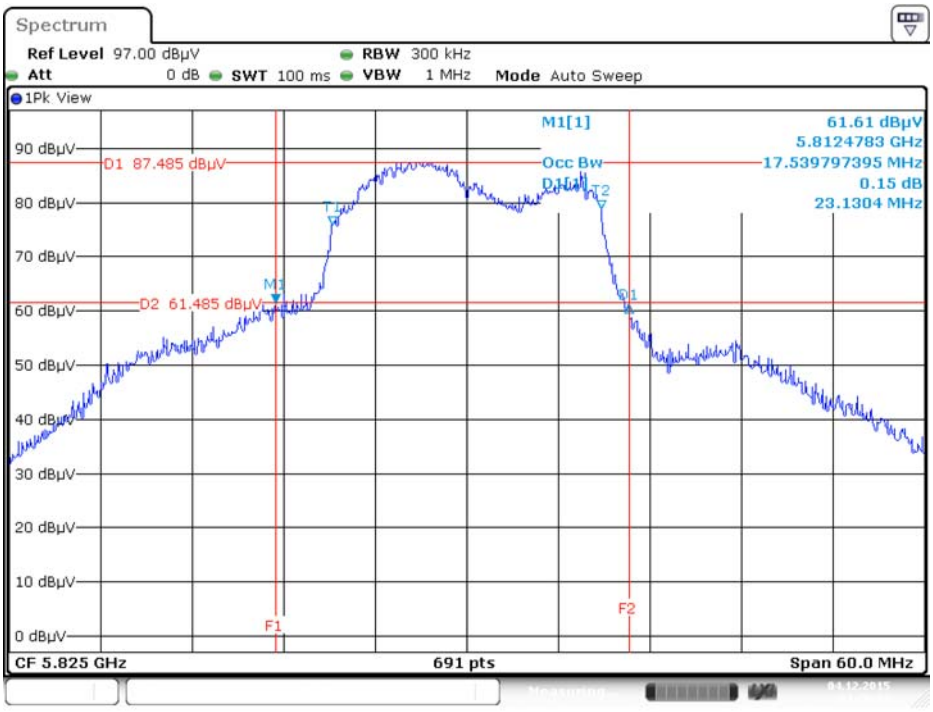


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



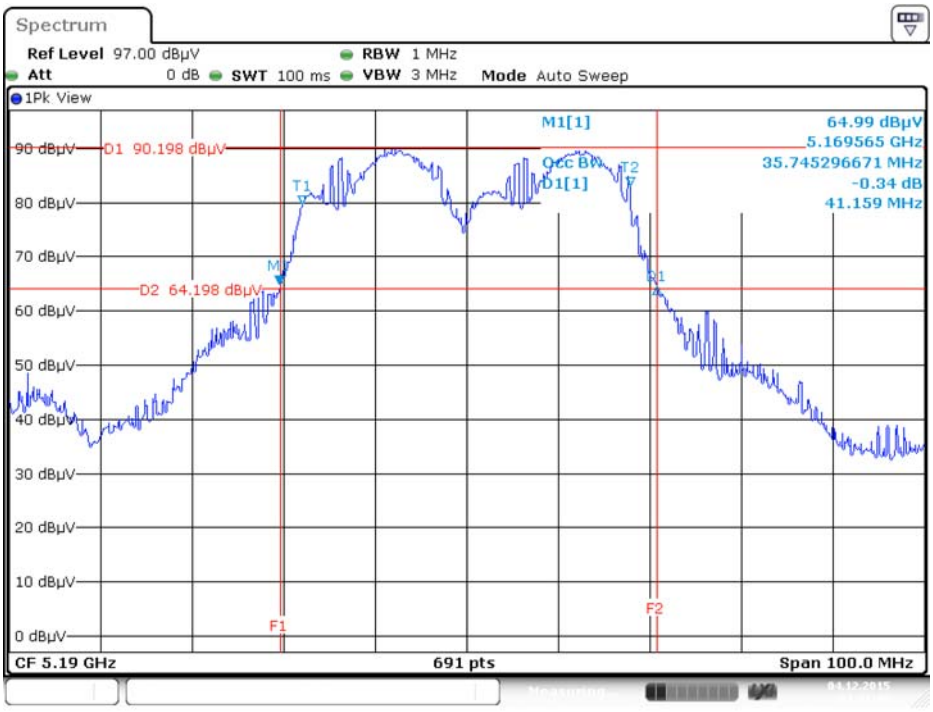
Date: 4.DEC.2015 01:39:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5825 MHz



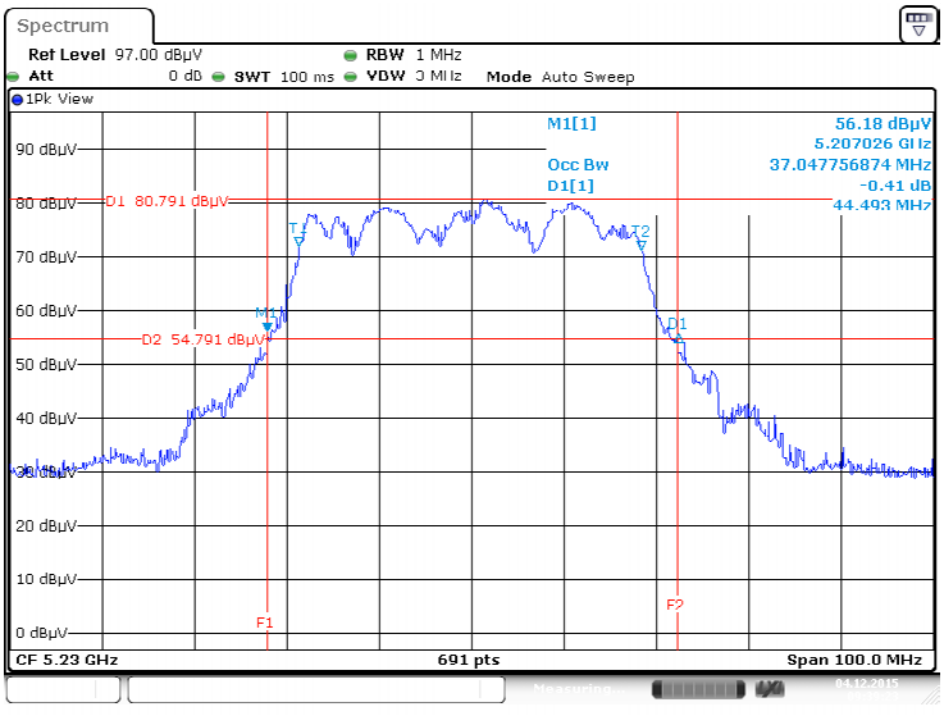
Date: 4.DEC.2015 01:40:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



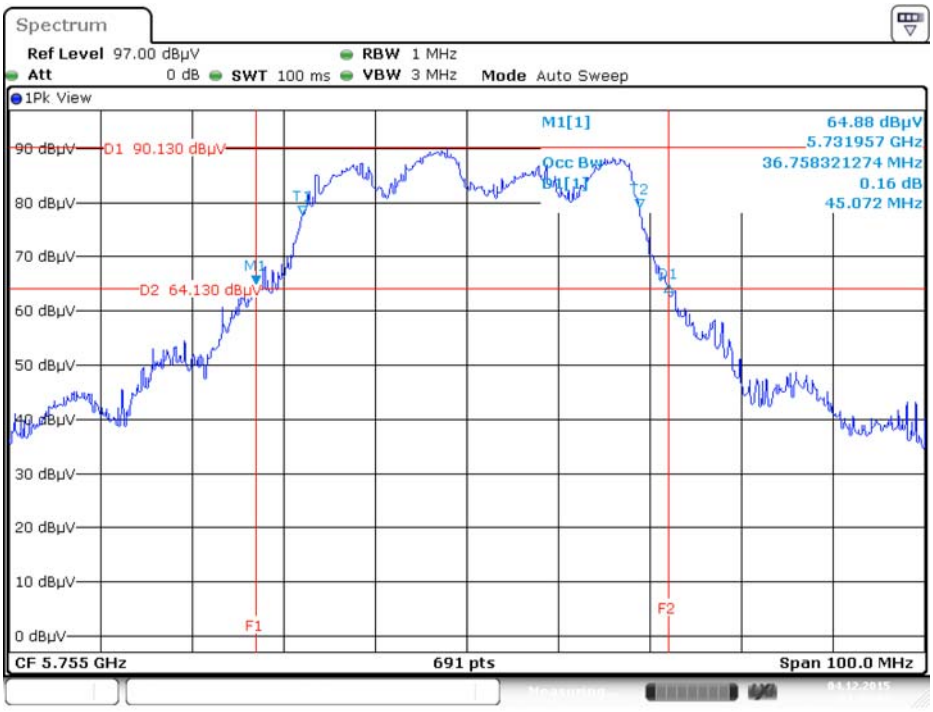
Date: 4.DEC.2015 01:41:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



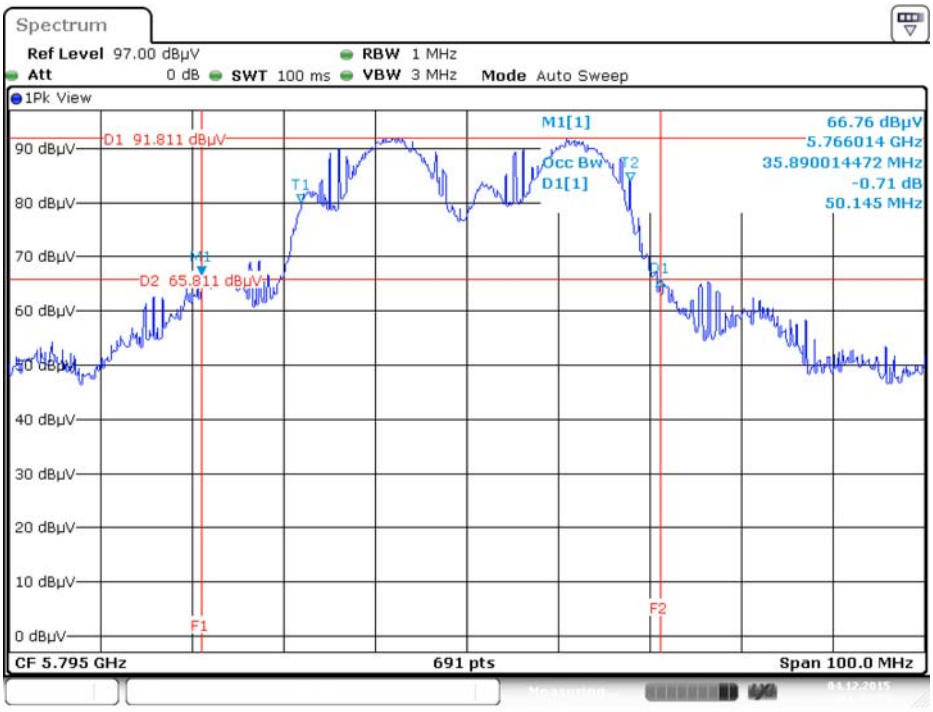
Date: 4.DEC.2015 09:39:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5755 MHz



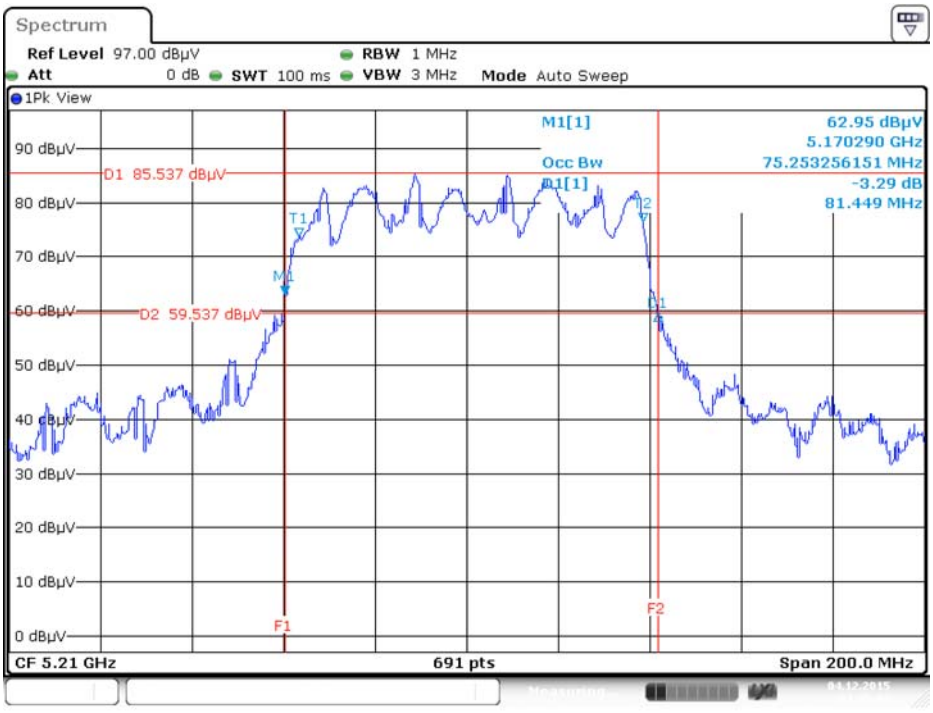
Date: 4.DEC.2015 01:43:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5795 MHz



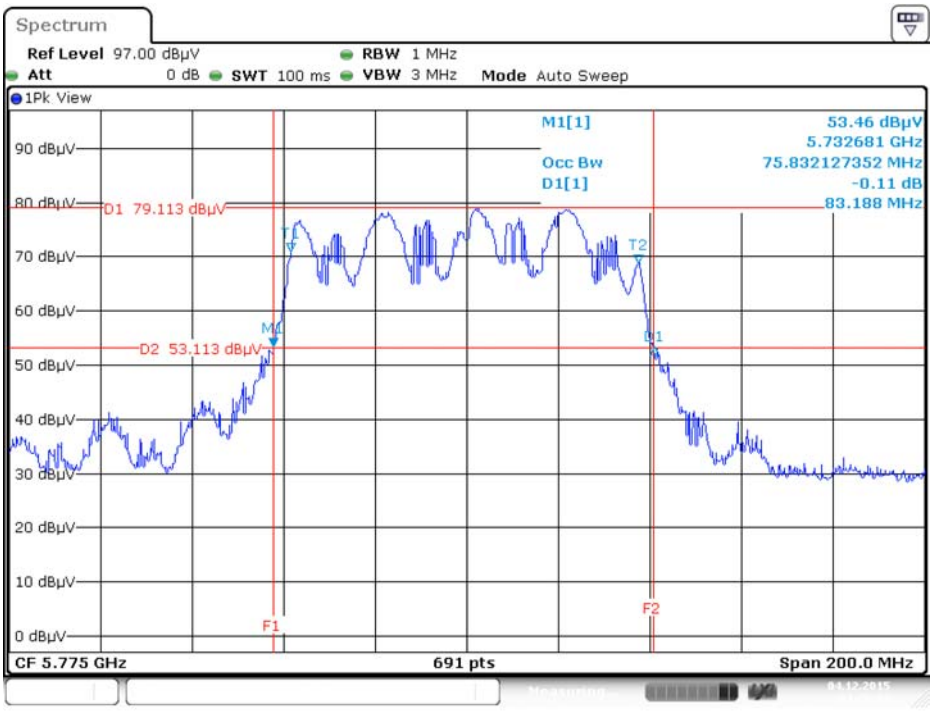
Date: 4.DEC.2015 01:43:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5210 MHz



Date: 4.DEC.2015 01:45:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5775 MHz



Date: 4.DEC.2015 01:46:01

4.2. 6dB Spectrum Bandwidth Measurement

4.2.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

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 spectrum analyzer.

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.2.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.5.4.

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 6dB Spectrum Bandwidth

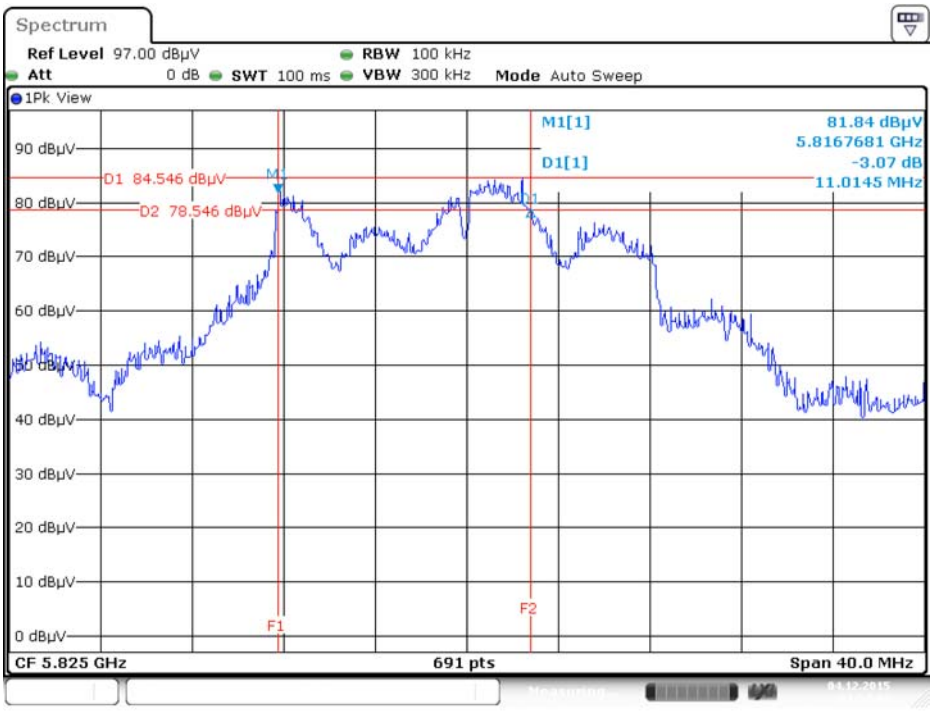
Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.29	500	Complies
	5785 MHz	12.52	500	Complies
	5825 MHz	11.01	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.35	500	Complies
	5785 MHz	15.71	500	Complies
	5825 MHz	16.35	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	33.97	500	Complies
	5795 MHz	30.73	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	70.73	500	Complies

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

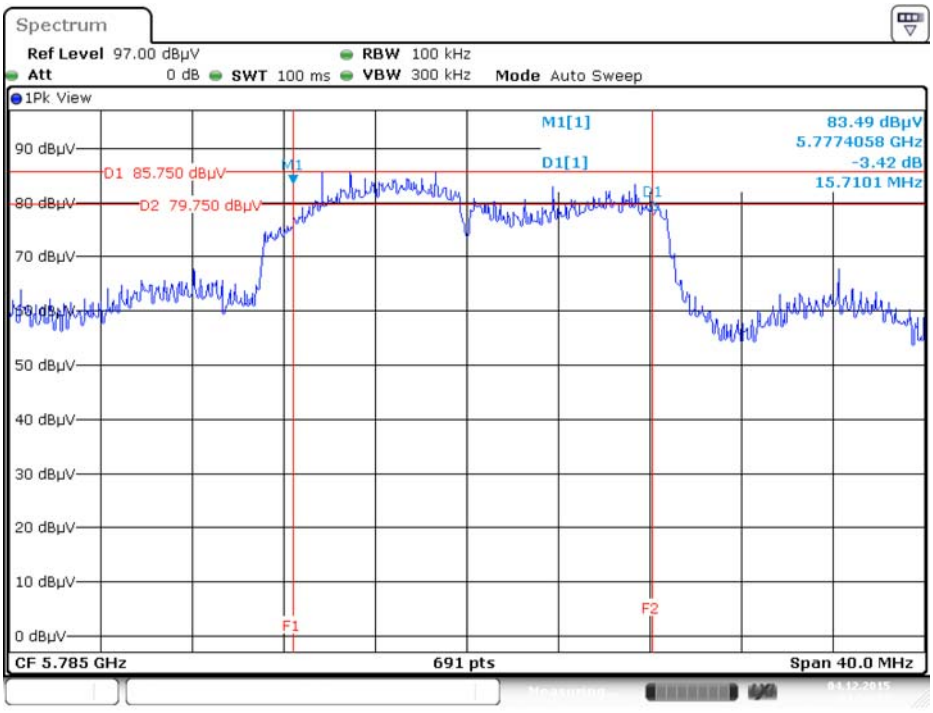
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5825 MHz



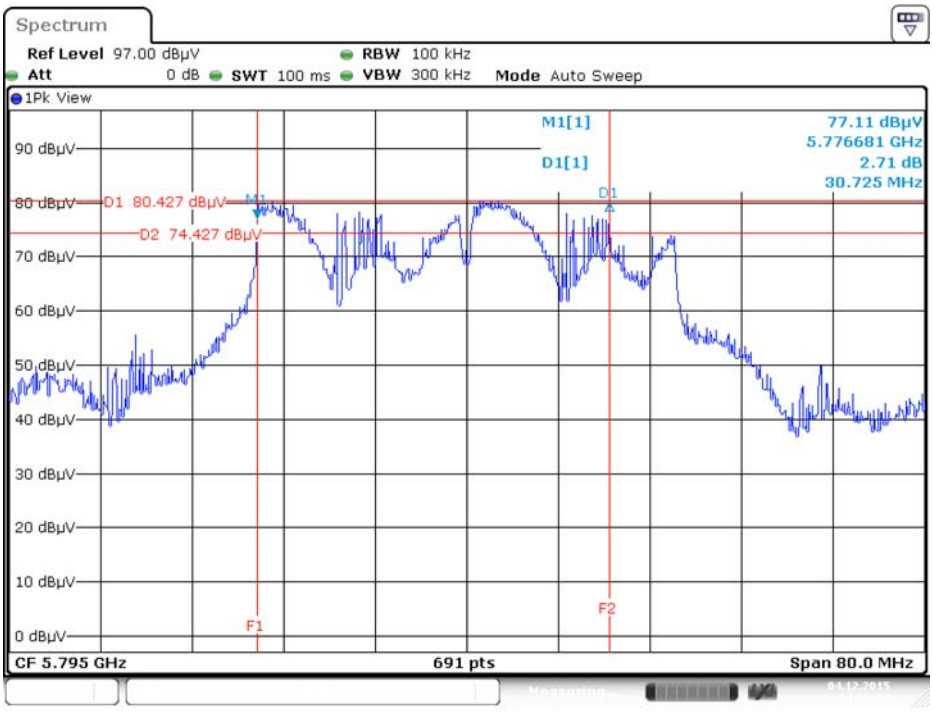
Date: 4.DEC.2015 01:54:09

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



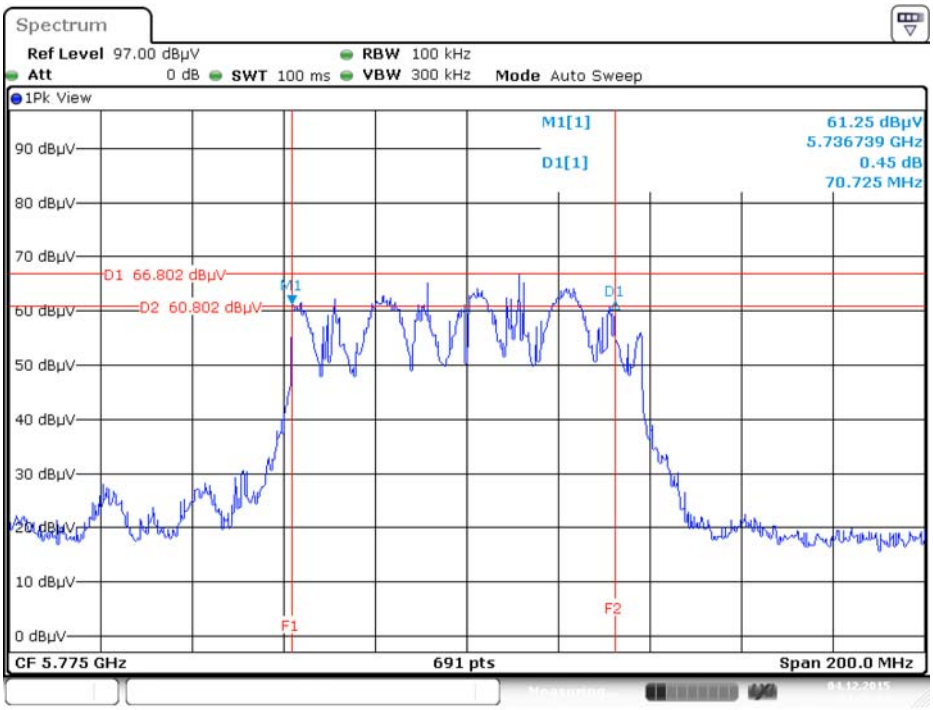
Date: 4.DEC.2015 01:52:28

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5795MHz



Date: 4.DEC.2015 01:50:21

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5775 MHz



Date: 4.DEC.2015 01:48:21

4.3. Maximum Conducted Output Power Measurement

4.3.1. Limit

Frequency Band			Limit
☒	5.15~5.25 GHz		
	Operating Mode		
	☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
	☒	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.
	☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
	☐	Mobile and portable client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.

☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

4.3.2. Measuring Instruments and Setting

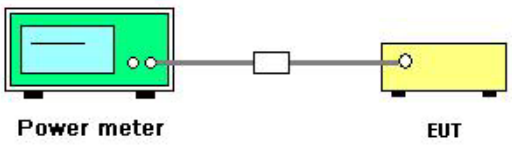
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.3.3. 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.

4.3.4. 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 Maximum Conducted Output Power

Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang	Test Date	Dec. 04, 2015

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11a	5180 MHz	22.89	24.25	23.92	28.50	30.00	Complies
	5200 MHz	23.66	24.38	24.30	28.90	30.00	Complies
	5240 MHz	23.84	24.65	24.57	29.14	30.00	Complies
	5745 MHz	21.46	21.67	21.89	26.45	30.00	Complies
	5785 MHz	25.47	24.89	24.73	29.81	30.00	Complies
	5825 MHz	23.06	23.13	23.46	27.99	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.34	22.97	23.05	27.57	30.00	Complies
	5200 MHz	23.57	24.21	24.33	28.82	30.00	Complies
	5240 MHz	24.26	24.69	24.21	29.16	30.00	Complies
	5745 MHz	21.71	21.36	21.94	26.45	30.00	Complies
	5785 MHz	25.12	24.96	25.07	29.82	30.00	Complies
	5825 MHz	21.11	21.83	22.39	26.58	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	19.37	20.37	20.36	24.83	30.00	Complies
	5230 MHz	24.32	24.83	24.60	29.36	30.00	Complies
	5755 MHz	21.47	21.31	21.44	26.18	30.00	Complies
	5795 MHz	23.03	22.44	22.52	27.44	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	17.12	18.18	17.55	22.41	30.00	Complies
	5775 MHz	19.09	18.66	18.73	23.60	30.00	Complies

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

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

4.4. Power Spectral Density Measurement

4.4.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

Frequency Band			Limit
☒	5.15~5.25 GHz		
	Operating Mode		
	☐	Outdoor access point	17 dBm/MHz
	☒	Indoor access point	17 dBm/MHz
	☐	Fixed point-to-point access points	17 dBm/MHz
	☐	Mobile and portable client devices	11 dBm/MHz
☒	5.725~5.85 GHz		30 dBm/500kHz

4.4.2. Measuring Instruments and Setting

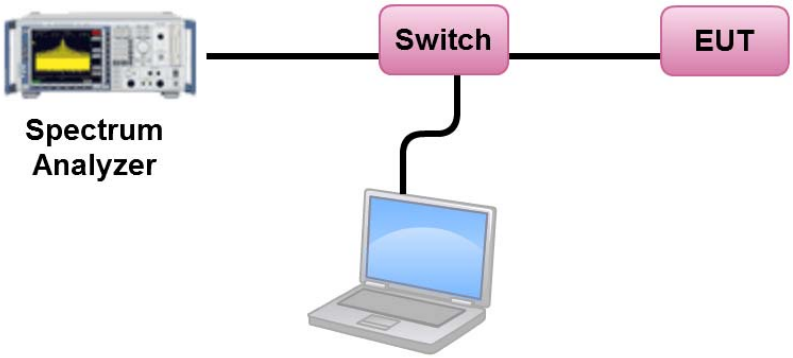
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

4.4.3. 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 (a) Measure and sum the spectra across the outputs.
4. When measuring 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 Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.
5. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

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. Test Result of Power Spectral Density

Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang		

Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	15.42	16.20	Complies
40	5200 MHz	15.90	16.20	Complies
48	5240 MHz	16.03	16.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.80dBi, so limit 17-(6.80-6)=16.20 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	13.38	-3.01	10.37	29.20	Complies
157	5785 MHz	16.66	-3.01	13.65	29.20	Complies
165	5825 MHz	14.91	-3.01	11.90	29.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.80dBi, so limit 30-(6.80-6)=29.20 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	14.53	16.20	Complies
40	5200 MHz	15.81	16.20	Complies
48	5240 MHz	16.07	16.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.80dBi, so limit 17-(6.80-6)=16.20 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	13.20	-3.01	10.19	29.20	Complies
157	5785 MHz	16.63	-3.01	13.62	29.20	Complies
165	5825 MHz	13.42	-3.01	10.41	29.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.80dBi, so limit 30-(6.80-6)=29.20 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	8.61	16.20	Complies
46	5230 MHz	13.18	16.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.80dBi, so limit 17-(6.80-6)=16.20 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	10.10	-3.01	7.09	29.20	Complies
159	5795 MHz	11.21	-3.01	8.20	29.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ 6.80dBi, so limit 30-(6.80-6)=29.20 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	3.36	16.20	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ 6.80dBi, so limit 17-(6.80-6)=16.20 dBm/MHz.

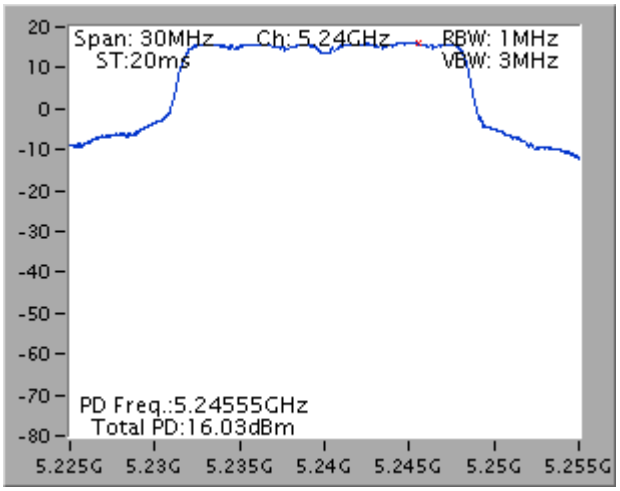
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	4.47	-3.01	1.46	29.20	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ 6.80dBi, so limit 30-(6.80-6)=29.20 dBm/500kHz.

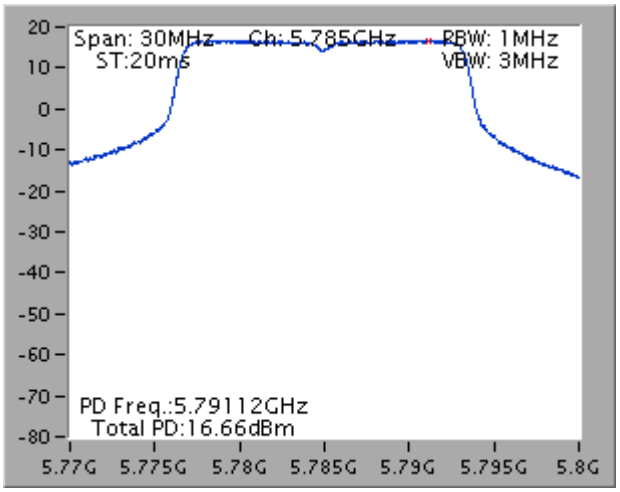
Note: All the test values were listed in the report.

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

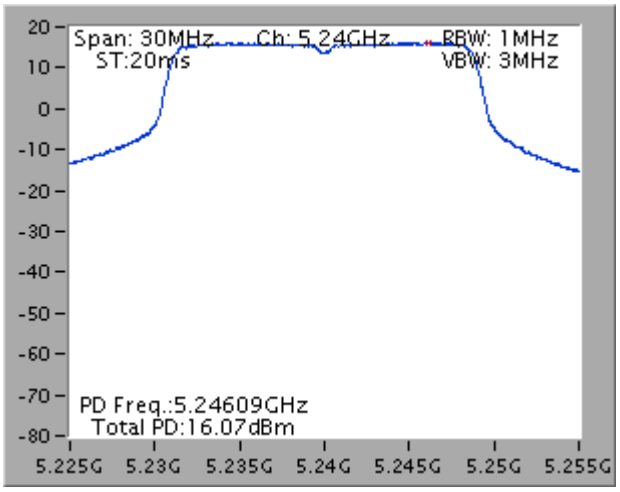
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



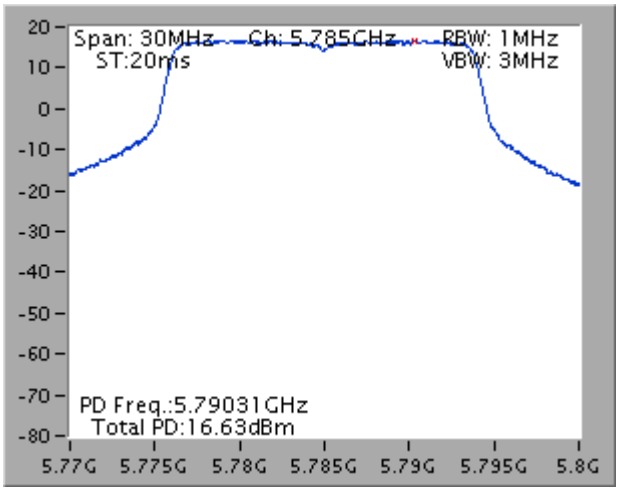
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



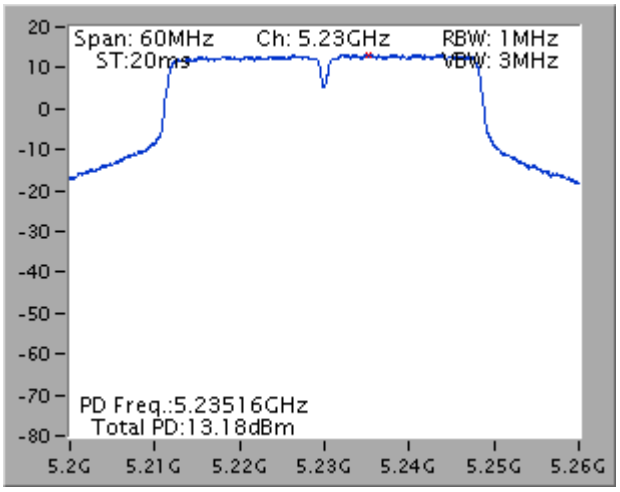
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



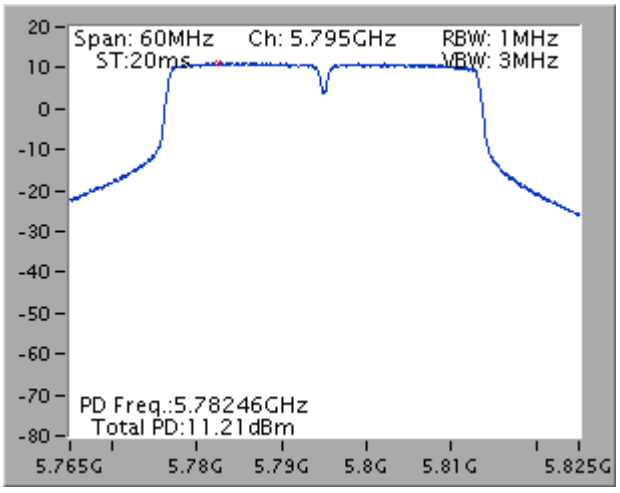
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



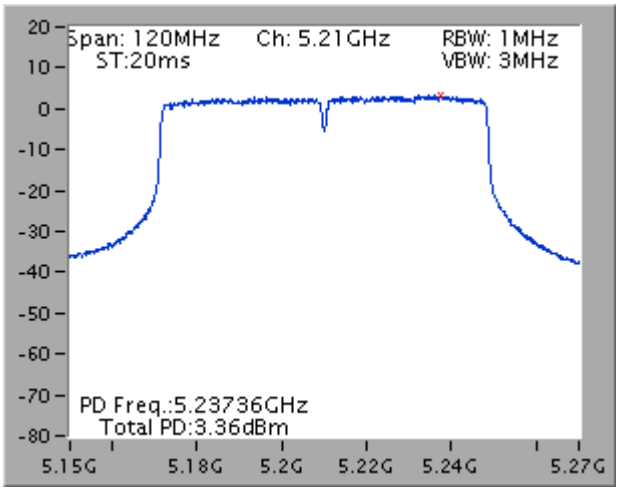
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



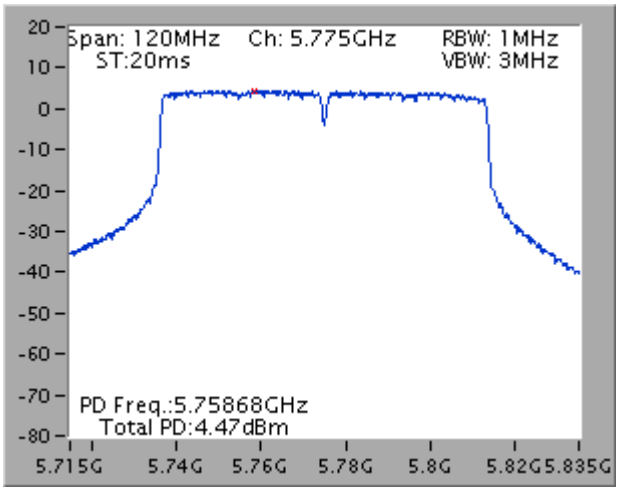
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5775 MHz



4.5. Radiated Emissions Measurement

4.5.1. Limit

For transmitters operating in the 5.15-5.25 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 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions 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 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

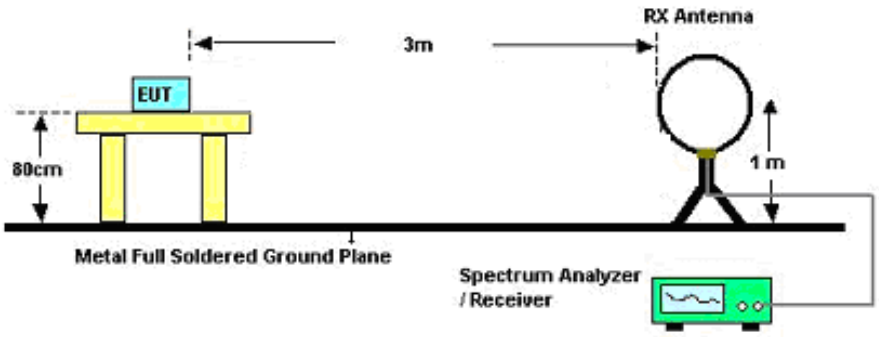
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

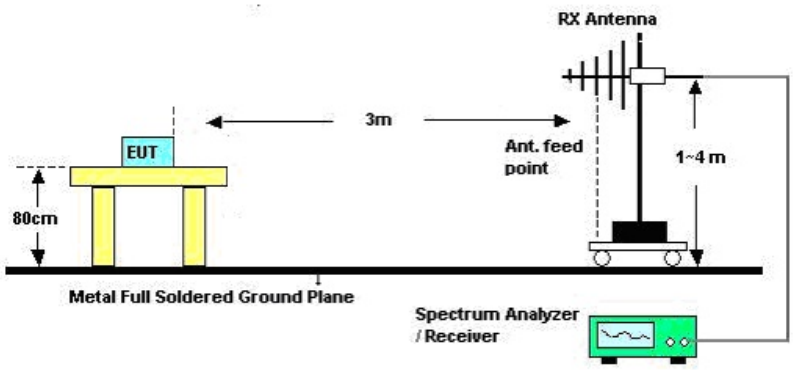
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting 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.

4.5.4. Test Setup Layout

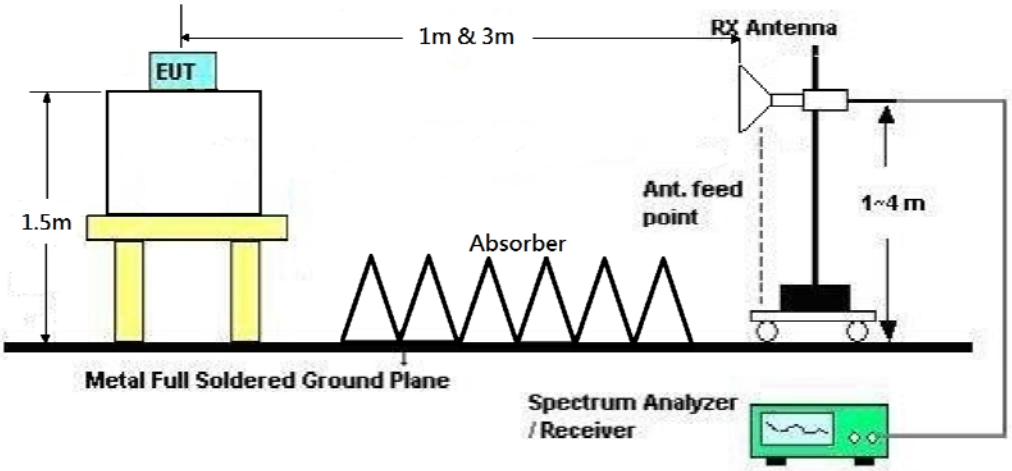
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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. Results of Radiated Emissions (9kHz~30MHz)

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	CTX
Test Date	Dec. 08, 2015		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

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

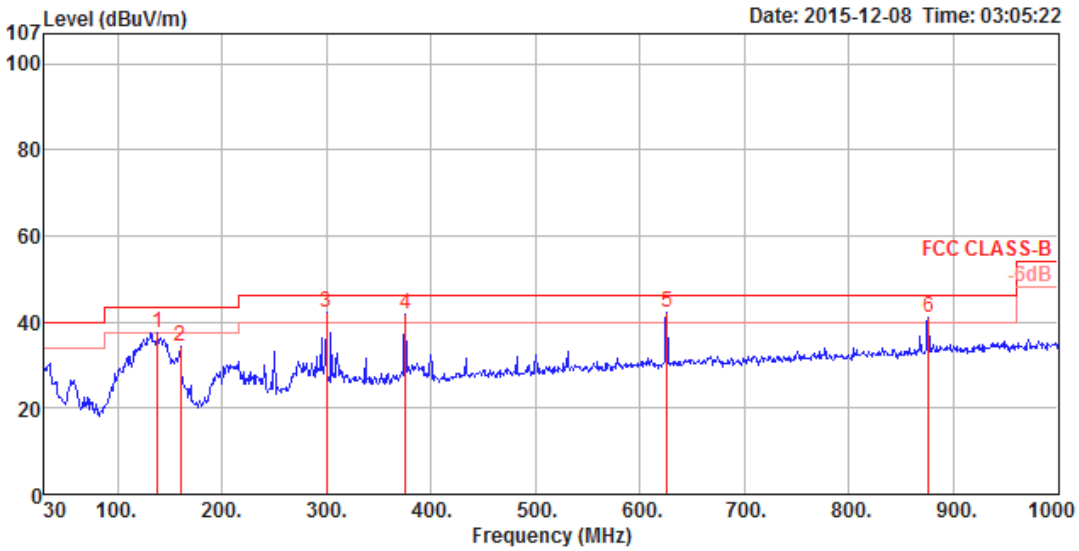
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.5.8. Results of Radiated Emissions (30MHz~1GHz)

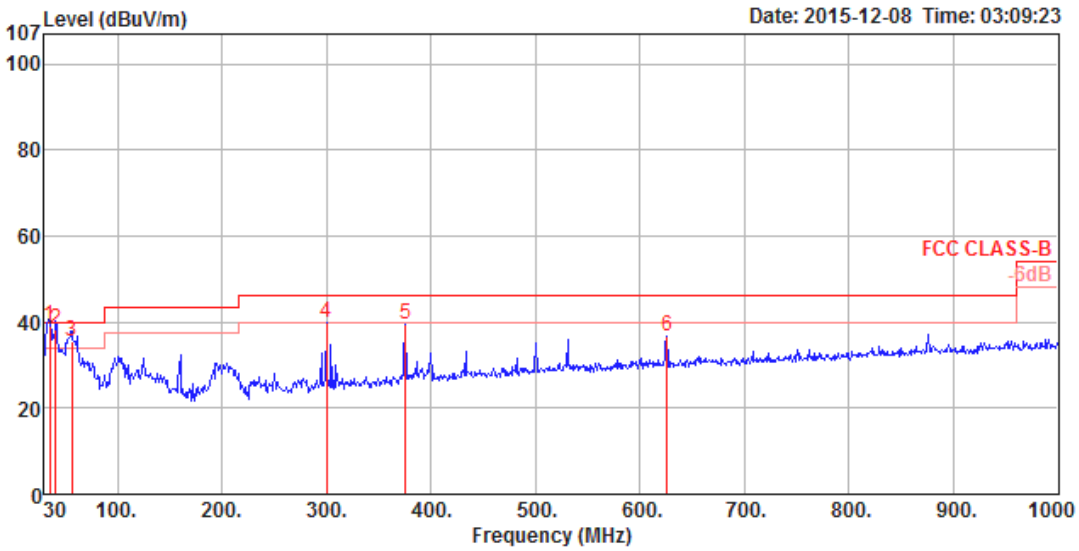
Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	CTX

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	138.64	37.47	43.50	-6.03	56.45	1.43	32.56	12.15	HORIZONTAL	121	200	Peak
2	159.98	34.31	43.50	-9.19	54.52	1.55	32.56	10.80	HORIZONTAL	254	150	Peak
3	299.66	42.34	46.00	-3.66	58.93	2.05	32.52	13.88	HORIZONTAL	145	100	Peak
4	375.32	42.05	46.00	-3.95	56.42	2.24	32.54	15.93	HORIZONTAL	240	100	Peak
5	625.58	42.20	46.00	-3.80	52.72	2.89	32.67	19.26	HORIZONTAL	293	125	Peak
6	875.84	40.93	46.00	-5.07	48.18	3.34	31.99	21.40	HORIZONTAL	344	100	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	34.85	38.99	40.00	-1.01	53.65	0.81	32.64	17.17	VERTICAL	190	100	QP
2	40.67	38.37	40.00	-1.63	56.38	0.95	32.63	13.67	VERTICAL	22	100	QP
3	56.19	35.61	40.00	-4.39	59.64	0.99	32.62	7.60	VERTICAL	1	100	QP
4	299.66	39.92	46.00	-6.08	56.51	2.05	32.52	13.88	VERTICAL	119	100	Peak
5	375.32	39.41	46.00	-6.59	53.78	2.24	32.54	15.93	VERTICAL	283	150	Peak
6	625.58	36.54	46.00	-9.46	47.06	2.89	32.67	19.26	VERTICAL	218	150	Peak

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.

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

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15539.10	59.22	74.00	-14.78	44.06	12.49	38.39	35.72	132	159	HORIZONTAL	Peak
2	15543.90	47.22	54.00	-6.78	32.06	12.49	38.39	35.72	132	159	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15535.80	59.29	74.00	-14.71	44.13	12.49	38.39	35.72	164	252	VERTICAL	Peak
2	15544.20	47.27	54.00	-6.73	32.11	12.49	38.39	35.72	164	252	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15597.44	46.67	54.00	-7.33	31.50	12.52	38.38	35.73	178	180	HORIZONTAL	Average
2	15604.06	60.29	74.00	-13.71	45.10	12.55	38.37	35.73	178	180	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15595.78	46.53	54.00	-7.47	31.36	12.52	38.38	35.73	140	287	VERTICAL	Average
2	15601.84	59.28	74.00	-14.72	44.09	12.55	38.37	35.73	140	287	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15639.46	46.23	54.00	-7.77	31.04	12.55	38.37	35.73	166	234	HORIZONTAL	Average
2	15644.18	58.93	74.00	-15.07	43.74	12.55	38.37	35.73	166	234	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15638.04	58.56	74.00	-15.44	43.37	12.55	38.37	35.73	187	292	VERTICAL	Peak
2	15642.36	46.14	54.00	-7.86	30.95	12.55	38.37	35.73	187	292	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11487.00	58.52	74.00	-15.48	42.71	10.94	39.20	34.33	274	94	HORIZONTAL	Peak
2	11487.60	46.29	54.00	-7.71	30.48	10.94	39.20	34.33	274	94	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11487.20	60.59	74.00	-13.41	44.78	10.94	39.20	34.33	177	78	VERTICAL	Peak
2	11487.80	48.86	54.00	-5.14	33.05	10.94	39.20	34.33	177	78	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11571.20	49.30	54.00	-4.70	33.54	10.98	39.15	34.37	220	84	HORIZONTAL	Average
2	11571.50	60.72	74.00	-13.28	44.96	10.98	39.15	34.37	220	84	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.50	52.66	54.00	-1.34	36.90	10.98	39.15	34.37	178	75	VERTICAL	Average
2	11571.20	63.65	74.00	-10.35	47.89	10.98	39.15	34.37	178	75	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.10	46.30	54.00	-7.70	30.61	11.01	39.09	34.41	142	222	HORIZONTAL	Average
2	11664.70	56.16	74.00	-17.84	40.49	11.03	39.07	34.43	142	222	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.20	60.82	74.00	-13.18	45.13	11.01	39.09	34.41	134	74	VERTICAL	Peak
2	11649.30	49.84	54.00	-4.16	34.15	11.01	39.09	34.41	134	74	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15539.10	47.12	54.00	-6.88	31.96	12.49	38.39	35.72	169	207	HORIZONTAL	Average
2	15539.90	58.61	74.00	-15.39	43.45	12.49	38.39	35.72	169	207	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15541.32	58.96	74.00	-15.04	43.80	12.49	38.39	35.72	159	175	VERTICAL	Peak
2	15542.56	46.85	54.00	-7.15	31.69	12.49	38.39	35.72	159	175	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15596.38	59.18	74.00	-14.82	44.01	12.52	38.38	35.73	174	230	HORIZONTAL	Peak
2	15601.46	46.68	54.00	-7.32	31.49	12.55	38.37	35.73	174	230	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15598.10	58.40	74.00	-15.60	43.23	12.52	38.38	35.73	145	129	VERTICAL	Peak
2	15599.72	46.44	54.00	-7.56	31.27	12.52	38.38	35.73	145	129	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15717.24	58.66	74.00	-15.34	43.46	12.60	38.35	35.75	134	302	HORIZONTAL	Peak
2	15724.24	45.65	54.00	-8.35	30.45	12.60	38.35	35.75	134	302	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15718.20	45.65	54.00	-8.35	30.45	12.60	38.35	35.75	190	145	VERTICAL	Average
2	15721.12	58.58	74.00	-15.42	43.38	12.60	38.35	35.75	190	145	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.40	45.75	54.00	-8.25	29.94	10.94	39.20	34.33	134	188	HORIZONTAL	Average
2	11492.30	57.57	74.00	-16.43	41.76	10.94	39.20	34.33	134	188	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11491.00	44.81	54.00	-9.19	29.00	10.94	39.20	34.33	286	177	VERTICAL	Average
2	11494.40	56.56	74.00	-17.44	40.75	10.94	39.20	34.33	286	177	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.50	60.01	74.00	-13.99	44.25	10.98	39.15	34.37	253	85	HORIZONTAL	Peak
2	11572.90	47.93	54.00	-6.07	32.17	10.98	39.15	34.37	253	85	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11568.50	52.23	54.00	-1.77	36.47	10.98	39.15	34.37	106	84	VERTICAL	Average
2	11569.20	63.85	74.00	-10.15	48.09	10.98	39.15	34.37	106	84	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11648.00	46.70	54.00	-7.30	31.01	11.01	39.09	34.41	248	88	HORIZONTAL	Average
2	11649.20	57.45	74.00	-16.55	41.76	11.01	39.09	34.41	248	88	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.70	57.81	74.00	-16.19	42.12	11.01	39.09	34.41	110	296	VERTICAL	Peak
2	11649.90	46.74	54.00	-7.26	31.05	11.01	39.09	34.41	110	296	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15670.28	58.93	74.00	-15.07	43.74	12.57	38.36	35.74	165	206	HORIZONTAL	Peak
2	15673.34	45.54	54.00	-8.46	30.35	12.57	38.36	35.74	165	206	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15669.64	45.73	54.00	-8.27	30.54	12.57	38.36	35.74	171	154	VERTICAL	Average
2	15673.78	59.02	74.00	-14.98	43.83	12.57	38.36	35.74	171	154	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15688.14	58.01	74.00	-15.99	42.82	12.57	38.36	35.74	148	240	HORIZONTAL	Peak
2	15691.64	45.77	54.00	-8.23	30.56	12.60	38.35	35.74	148	240	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15686.70	45.53	54.00	-8.47	30.34	12.57	38.36	35.74	177	168	VERTICAL	Average
2	15690.48	57.86	74.00	-16.14	42.67	12.57	38.36	35.74	177	168	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11512.30	44.49	54.00	-9.51	28.70	10.94	39.20	34.35	187	215	HORIZONTAL	Average
2	11513.40	56.13	74.00	-17.87	40.34	10.94	39.20	34.35	187	215	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11502.20	44.40	54.00	-9.60	28.59	10.94	39.20	34.33	153	144	VERTICAL	Average
2	11509.00	56.85	74.00	-17.15	41.06	10.94	39.20	34.35	153	144	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11592.50	44.46	54.00	-9.54	28.74	10.99	39.12	34.39	152	331	HORIZONTAL	Average
2	11592.80	57.85	74.00	-16.15	42.13	10.99	39.12	34.39	152	331	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11590.60	43.94	54.00	-10.06	28.22	10.99	39.12	34.39	164	244	VERTICAL	Average
2	11591.90	56.57	74.00	-17.43	40.85	10.99	39.12	34.39	164	244	VERTICAL	Peak

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15629.98	57.94	74.00	-16.06	42.75	12.55	38.37	35.73	110	232	HORIZONTAL	Peak
2	15632.10	45.82	54.00	-8.18	30.63	12.55	38.37	35.73	110	232	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15627.16	58.83	74.00	-15.17	43.64	12.55	38.37	35.73	187	122	VERTICAL	Peak
2	15627.66	46.14	54.00	-7.86	30.95	12.55	38.37	35.73	187	122	VERTICAL	Average

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 25, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11545.60	56.17	74.00	-17.83	40.39	10.96	39.17	34.35	121	178	HORIZONTAL	Peak
2	11554.80	43.71	54.00	-10.29	27.95	10.98	39.15	34.37	121	178	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11548.10	56.78	74.00	-17.22	41.02	10.96	39.17	34.37	162	271	VERTICAL	Peak
2	11552.30	44.17	54.00	-9.83	28.41	10.98	39.15	34.37	162	271	VERTICAL	Average

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.

4.6. Band Edge Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.15-5.25 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 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions 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

4.6.2. 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	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

4.6.3. Test Procedures

The test procedure is the same as section 4.5.3.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

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 transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 19, 2015 ~ Nov. 22, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.00	53.96	54.00	-0.04	47.89	7.24	33.17	34.34	176	203	VERTICAL	Average
2	5148.20	72.21	74.00	-1.79	66.14	7.24	33.17	34.34	176	203	VERTICAL	Peak
3	5187.00	115.89			109.66	7.32	33.25	34.34	176	203	VERTICAL	Peak
4	5187.40	105.44			99.21	7.32	33.25	34.34	176	203	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5147.20	70.43	74.00	-3.57	64.36	7.24	33.17	34.34	146	348	HORIZONTAL	Peak
2	5148.40	53.68	54.00	-0.32	47.61	7.24	33.17	34.34	146	348	HORIZONTAL	Average
3	5198.40	105.38			99.15	7.32	33.25	34.34	146	348	HORIZONTAL	Average
4	5198.80	116.84			110.61	7.32	33.25	34.34	146	348	HORIZONTAL	Peak

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5146.40	57.72	74.00	-16.28	51.65	7.24	33.17	34.34	142	349	HORIZONTAL	Peak
2	5150.00	44.80	54.00	-9.20	38.73	7.24	33.17	34.34	142	349	HORIZONTAL	Average
3	5238.20	104.32			97.96	7.36	33.34	34.34	142	349	HORIZONTAL	Average
4	5238.20	115.51			109.15	7.36	33.34	34.34	142	349	HORIZONTAL	Peak
5	5350.00	46.02	54.00	-7.98	39.35	7.46	33.53	34.32	142	349	HORIZONTAL	Average
6	5350.00	59.38	74.00	-14.62	52.71	7.46	33.53	34.32	142	349	HORIZONTAL	Peak

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 20, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5712.20	67.64	68.20	-0.56	59.71	7.88	34.41	34.36	137	183	VERTICAL	Peak
2	5723.40	73.45	78.20	-4.75	65.49	7.87	34.45	34.36	137	183	VERTICAL	Peak
3	5742.00	105.33			97.33	7.86	34.50	34.36	137	183	VERTICAL	Average
4	5742.40	115.82			107.82	7.86	34.50	34.36	137	183	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5745 MHz.

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5712.60	61.24	68.20	-6.96	53.31	7.88	34.41	34.36	144	203	VERTICAL	Peak
2	5725.00	67.75	78.20	-10.45	59.79	7.87	34.45	34.36	144	203	VERTICAL	Peak
3	5789.00	116.78			108.67	7.85	34.64	34.38	144	203	VERTICAL	Peak
4	5789.80	106.40			98.29	7.85	34.64	34.38	144	203	VERTICAL	Average
5	5850.00	64.35	78.20	-13.85	56.12	7.84	34.78	34.39	144	203	VERTICAL	Peak
6	5870.20	63.06	68.20	-5.14	54.79	7.83	34.83	34.39	144	203	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5818.00	104.10			95.94	7.85	34.69	34.38	142	201	VERTICAL	Average
2	5818.00	114.74			106.58	7.85	34.69	34.38	142	201	VERTICAL	Peak
3	5857.60	72.45	78.20	-5.75	64.18	7.83	34.83	34.39	142	201	VERTICAL	Peak
4	5860.40	67.93	68.20	-0.27	59.66	7.83	34.83	34.39	142	201	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5825 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 22, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5150.00	53.34	54.00	-0.66	47.27	7.24	33.17	34.34	146	202	VERTICAL	Average
2	5150.00	68.12	74.00	-5.88	62.05	7.24	33.17	34.34	146	202	VERTICAL	Peak
3	5175.60	114.65			108.47	7.29	33.23	34.34	146	202	VERTICAL	Peak
4	5176.00	104.61			98.43	7.29	33.23	34.34	146	202	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.80	71.47	74.00	-2.53	65.40	7.24	33.17	34.34	193	340	VERTICAL	Peak
2	5146.00	53.40	54.00	-0.60	47.33	7.24	33.17	34.34	193	340	VERTICAL	Average
3	5204.40	107.53			101.26	7.33	33.28	34.34	193	340	VERTICAL	Average
4	5205.20	118.19			111.92	7.33	33.28	34.34	193	340	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.20	57.05	74.00	-16.95	50.98	7.24	33.17	34.34	149	201	VERTICAL	Peak
2	5150.00	45.22	54.00	-8.78	39.15	7.24	33.17	34.34	149	201	VERTICAL	Average
3	5235.20	106.52			100.16	7.36	33.34	34.34	149	201	VERTICAL	Average
4	5235.80	116.77			110.41	7.36	33.34	34.34	149	201	VERTICAL	Peak
5	5350.00	46.63	54.00	-7.37	39.96	7.46	33.53	34.32	149	201	VERTICAL	Average
6	5350.60	59.10	74.00	-14.90	52.43	7.46	33.53	34.32	149	201	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 20, 2015 ~ Nov. 25, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5713.40	67.90	68.20	-0.30	59.97	7.88	34.41	34.36	150	183	VERTICAL	Peak
2	5725.00	77.32	78.20	-0.88	69.36	7.87	34.45	34.36	150	183	VERTICAL	Peak
3	5752.60	111.16			103.17	7.86	34.50	34.37	150	183	VERTICAL	Peak
4	5753.00	100.81			92.82	7.86	34.50	34.37	150	183	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5745 MHz.

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5714.60	68.06	68.20	-0.14	60.13	7.88	34.41	34.36	100	195	VERTICAL	Peak
2	5717.80	70.88	78.20	-7.32	62.95	7.88	34.41	34.36	100	195	VERTICAL	Peak
3	5717.80	70.88	78.20	-7.32	62.95	7.88	34.41	34.36	100	195	VERTICAL	Peak
4	5792.20	105.36			97.25	7.85	34.64	34.38	100	195	VERTICAL	Average
5	5792.20	120.36			112.25	7.85	34.64	34.38	100	195	VERTICAL	Peak
6	5854.20	71.06	78.20	-7.14	62.83	7.84	34.78	34.39	100	195	VERTICAL	Peak
7	5860.00	66.49	68.20	-1.71	58.22	7.83	34.83	34.39	100	195	VERTICAL	Peak

Item 4, 5 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5819.40	103.52			95.36	7.85	34.69	34.38	140	170	VERTICAL	Average
2	5820.60	113.31			105.15	7.85	34.69	34.38	140	170	VERTICAL	Peak
3	5857.00	73.54	78.20	-4.66	65.27	7.83	34.83	34.39	140	170	VERTICAL	Peak
4	5860.20	67.95	68.20	-0.25	59.68	7.83	34.83	34.39	140	170	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5825 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 22, 2015		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5150.00	53.56	54.00	-0.44	47.49	7.24	33.17	34.34	143	205	VERTICAL	Average
2	5150.00	67.31	74.00	-6.69	61.24	7.24	33.17	34.34	143	205	VERTICAL	Peak
3	5193.60	109.05			102.82	7.32	33.25	34.34	143	205	VERTICAL	Peak
4	5194.40	99.43			93.20	7.32	33.25	34.34	143	205	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5147.80	65.58	74.00	-8.42	59.51	7.24	33.17	34.34	152	351	HORIZONTAL	Peak
2	5149.60	50.60	54.00	-3.40	44.53	7.24	33.17	34.34	152	351	HORIZONTAL	Average
3	5225.80	110.87			104.55	7.35	33.31	34.34	152	351	HORIZONTAL	Peak
4	5227.00	100.70			94.38	7.35	33.31	34.34	152	351	HORIZONTAL	Average

Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 22, 2015		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5709.80	68.00	68.20	-0.20	60.07	7.88	34.41	34.36	148	175	VERTICAL	Peak
2	5722.20	74.37	78.20	-3.83	66.41	7.87	34.45	34.36	148	175	VERTICAL	Peak
3	5749.00	100.06			92.07	7.86	34.50	34.37	148	175	VERTICAL	Average
4	5750.20	110.00			102.01	7.86	34.50	34.37	148	175	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5755 MHz.

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	61.52	68.20	-6.68	53.59	7.88	34.41	34.36	149	206	VERTICAL	Peak
2	5720.60	66.15	78.20	-12.05	58.22	7.88	34.41	34.36	149	206	VERTICAL	Peak
3	5784.60	101.21			93.14	7.86	34.59	34.38	149	206	VERTICAL	Average
4	5784.60	111.26			103.19	7.86	34.59	34.38	149	206	VERTICAL	Peak
5	5858.00	68.17	78.20	-10.03	59.90	7.83	34.83	34.39	149	206	VERTICAL	Peak
6	5860.00	67.24	68.20	-0.96	58.97	7.83	34.83	34.39	149	206	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5795 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 22, 2015		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5140.00	66.20	74.00	-7.80	60.17	7.22	33.15	34.34	141	201	VERTICAL	Peak
2	5142.00	53.70	54.00	-0.30	47.63	7.24	33.17	34.34	141	201	VERTICAL	Average
3	5202.00	92.93			86.66	7.33	33.28	34.34	141	201	VERTICAL	Average
4	5215.00	103.42			97.15	7.33	33.28	34.34	141	201	VERTICAL	Peak
5	5391.00	47.72	54.00	-6.28	40.93	7.50	33.61	34.32	141	201	VERTICAL	Average
6	5443.00	59.97	74.00	-14.03	53.01	7.59	33.69	34.32	141	201	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5210 MHz.

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.00	68.03	68.20	-0.17	60.10	7.88	34.41	34.36	146	203	VERTICAL	Peak
2	5723.00	75.01	78.20	-3.19	67.05	7.87	34.45	34.36	146	203	VERTICAL	Peak
3	5751.00	94.29			86.30	7.86	34.50	34.37	146	203	VERTICAL	Average
4	5764.00	107.74			99.70	7.86	34.55	34.37	146	203	VERTICAL	Peak
5	5851.00	61.61	78.20	-16.59	53.38	7.84	34.78	34.39	146	203	VERTICAL	Peak
6	5862.00	60.81	68.20	-7.39	52.54	7.83	34.83	34.39	146	203	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5775 MHz.

Note:

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

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

4.7. Frequency Stability Measurement

4.7.1. 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).

4.7.2. Measuring Instruments and Setting

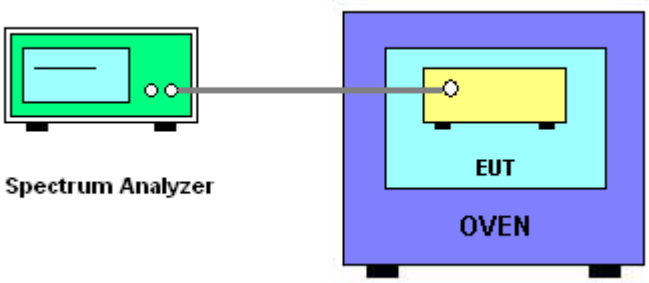
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.7.3. 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 -20°C~50°C.

4.7.4. Test Setup Layout



4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

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

4.7.7. Test Result of Frequency Stability

Temperature	25°C	Humidity	45%
Test Engineer	Lucas Huang	Test Date	Dec. 04, 2015

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9873	5199.9863	5199.9859	5199.9850
110.00	5199.9864	5199.9863	5199.9857	5199.9855
93.50	5199.9860	5199.9855	5199.9854	5199.9847
Max. Deviation (MHz)	**0.0140**	**0.0145**	**0.0146**	**0.0153**
Max. Deviation (ppm)	**2.69**	**2.79**	**2.81**	**2.94**
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5199.9915	5199.9908	5199.9899	5199.9889
-10	5199.9904	5199.9896	5199.9888	5199.9883
0	5199.9886	5199.9883	5199.9873	5199.9868
10	5199.9872	5199.9863	5199.9862	5199.9861
20	5199.9864	5199.9863	5199.9854	5199.9852
30	5199.9852	5199.9846	5199.9836	5199.9831
40	5199.9843	5199.9836	5199.9833	5199.9823
50	5199.9832	5199.9824	5199.9822	5199.9820
Max. Deviation (MHz)	**0.0168**	**0.0176**	**0.0178**	**0.0180**
Max. Deviation (ppm)	**3.23**	**3.38**	**3.42**	**3.46**
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9866	5784.9864	5784.9858	5784.9852
110.00	5784.9864	5784.9859	5784.9854	5784.9847
93.50	5784.9861	5784.9859	5784.9852	5784.9850
Max. Deviation (MHz)	**0.0139**	**0.0141**	**0.0148**	**0.0153**
Max. Deviation (ppm)	**2.40**	**2.44**	**2.56**	**2.64**
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5784.9903	5784.9894	5784.9886	5784.9876
-10	5784.9898	5784.9892	5784.9887	5784.9879
0	5784.9882	5784.9875	5784.9874	5784.9870
10	5784.9869	5784.9864	5784.9856	5784.9855
20	5784.9864	5784.9863	5784.9853	5784.9851
30	5784.9852	5784.9848	5784.9847	5784.9846
40	5784.9851	5784.9845	5784.9841	5784.9837
50	5784.9837	5784.9828	5784.9823	5784.9813
Max. Deviation (MHz)	**0.0163**	**0.0172**	**0.0177**	**0.0187**
Max. Deviation (ppm)	**2.82**	**2.97**	**3.06**	**3.23**
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9866	5189.9859	5189.9849	5189.9846
110.00	5189.9864	5189.9860	5189.9856	5189.9846
93.50	5189.9862	5189.9855	5189.9854	5189.9846
Max. Deviation (MHz)	**0.0138**	**0.0145**	**0.0151**	**0.0154**
Max. Deviation (ppm)	**2.66**	**2.79**	**2.91**	**2.97**
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5189.9890	5189.9884	5189.9880	5189.9872
-10	5189.9886	5189.9877	5189.9876	5189.9875
0	5189.9877	5189.9872	5189.9866	5189.9859
10	5189.9868	5189.9865	5189.9862	5189.9855
20	5189.9864	5189.9862	5189.9857	5189.9849
30	5189.9852	5189.9851	5189.9841	5189.9833
40	5189.9843	5189.9837	5189.9833	5189.9824
50	5189.9827	5189.9823	5189.9819	5189.9813
Max. Deviation (MHz)	**0.0173**	**0.0177**	**0.0181**	**0.0187**
Max. Deviation (ppm)	**3.33**	**3.41**	**3.49**	**3.60**
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9867	5754.9863	5754.9859	5754.9854
110.00	5754.9864	5754.9863	5754.9857	5754.9856
93.50	5754.9855	5754.9848	5754.9843	5754.9836
Max. Deviation (MHz)	**0.0145**	**0.0152**	**0.0157**	**0.0164**
Max. Deviation (ppm)	**2.52**	**2.64**	**2.73**	**2.85**
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5754.9906	5754.9902	5754.9895	5754.9888
-10	5754.9896	5754.9887	5754.9882	5754.9876
0	5754.9879	5754.9874	5754.9868	5754.9866
10	5754.9870	5754.9864	5754.9854	5754.9853
20	5754.9864	5754.9862	5754.9856	5754.9854
30	5754.9852	5754.9850	5754.9843	5754.9837
40	5754.9833	5754.9827	5754.9818	5754.9813
50	5754.9830	5754.9824	5754.9815	5754.9810
Max. Deviation (MHz)	**0.0170**	**0.0176**	**0.0185**	**0.0190**
Max. Deviation (ppm)	**2.95**	**3.06**	**3.21**	**3.30**
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9868	5209.9858	5209.9854	5209.9849
110.00	5209.9864	5209.9855	5209.9854	5209.9850
93.50	5209.9857	5209.9853	5209.9852	5209.9842
Max. Deviation (MHz)	**0.0143**	**0.0147**	**0.0148**	**0.0158**
Max. Deviation (ppm)	**2.74**	**2.82**	**2.84**	**3.03**
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5209.9904	5209.9899	5209.9890	5209.9888
-10	5209.9884	5209.9878	5209.9875	5209.9874
0	5209.9879	5209.9878	5209.9874	5209.9871
10	5209.9865	5209.9862	5209.9856	5209.9852
20	5209.9864	5209.9862	5209.9854	5209.9848
30	5209.9852	5209.9842	5209.9837	5209.9827
40	5209.9832	5209.9823	5209.9819	5209.9813
50	5209.9824	5209.9816	5209.9814	5209.9811
Max. Deviation (MHz)	**0.0176**	**0.0184**	**0.0186**	**0.0189**
Max. Deviation (ppm)	**3.38**	**3.53**	**3.57**	**3.63**
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9866	5774.9860	5774.9855	5774.9854
110.00	5774.9864	5774.9855	5774.9854	5774.9847
93.50	5774.9854	5774.9846	5774.9836	5774.9827
Max. Deviation (MHz)	**0.0146**	**0.0154**	**0.0164**	**0.0173**
Max. Deviation (ppm)	**2.53**	**2.67**	**2.84**	**3.00**
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5774.9929	5774.9919	5774.9917	5774.9907
-10	5774.9909	5774.9900	5774.9892	5774.9890
0	5774.9893	5774.9888	5774.9880	5774.9875
10	5774.9884	5774.9882	5774.9880	5774.9872
20	5774.9864	5774.9859	5774.9857	5774.9850
30	5774.9852	5774.9848	5774.9842	5774.9833
40	5774.9835	5774.9825	5774.9816	5774.9809
50	5774.9825	5774.9822	5774.9812	5774.9808
Max. Deviation (MHz)	**0.0175**	**0.0178**	**0.0188**	**0.0192**
Max. Deviation (ppm)	**3.03**	**3.08**	**3.26**	**3.32**
Result	Complies			

4.8. Antenna Requirements

4.8.1. 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.

4.8.2. 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
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
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	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 21, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 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)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 12, 2014	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)
RF Cable-high	Woken	RG402	High Cable-6	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.

"*" Calibration Interval of instruments listed above is two years.

N.C.R means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%