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FCC RADIO TEST REPORT

Applicant's company	**Belkin International, Inc.**
Applicant Address	12045 East Waterfront Drive, Playa Vista, CA 90094
FCC ID	**K7SF9K1115V2**

Product Name	AC1750 DB Wi-Fi Dual-Band AC+ Gigabit Router ; AC1600 DB Wi-Fi Dual-Band AC + Gigabit Router
Brand Name	belkin
Model No.	F9K1115V2 ; F9K1119V1
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Feb. 24, 2016
Final Test Date	May 03, 2016
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

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4N1172-33AB	Rev. 01	Initial issue of report	Jun. 22, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	AC1750 DB WI-FI Dual-Band AC+ Gigabit Router ; AC1600 DB WI-FI Dual-Band AC + Gigabit Router
Brand Name	:	belkin
Model No.	:	F9K1115V2 ; F9K1119V1
Applicant	:	Belkin International, 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 Feb. 24, 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

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	15.207	AC Power Line Conducted Emissions	Complies	14.26 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(e)	6dB Spectrum Bandwidth	Complies	-
4.4	15.407(a)	Maximum Conducted Output Power	Complies	4.27 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.11 dB
4.6	15.407(b)	Radiated Emissions	Complies	3.23 dB
4.7	15.407(b)	Band Edge Emissions	Complies	1.03 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	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	From power adapter
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: 16.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.80 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 4: IEEE 802.11a: 17.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.70 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 25.73 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 25.69 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 25.49 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 16.93 dBm Band 4: IEEE 802.11a: 23.64 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.75 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.42 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.25 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
Operate Condition	☒ Indoor	☐ Outdoor

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	Brand	Model No.	Rating
Adapter	LEI	MU30-P120250-A1	INPUT: 100-240Vac, 50/60Hz, 0.8A OUTPUT: 12Vdc, 2.5A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	Airgain	N2420S -T10-B100S2	PCB Antenna	I-PEX	3.4	-
2	Airgain	N2420S -T10-W50S2	PCB Antenna	I-PEX	3.9	-
3	Airgain	N2420S -T10-G190S2	PCB Antenna	I-PEX	4.4	-
4	Airgain	N5x20B-T1-B150U	PCB Antenna	I-PEX	-	5.8
5	Airgain	N5x20B-T-G65U	PCB Antenna	I-PEX	-	5.3
6	Airgain	N5x20B-T-W85U	PCB Antenna	I-PEX	-	5.3

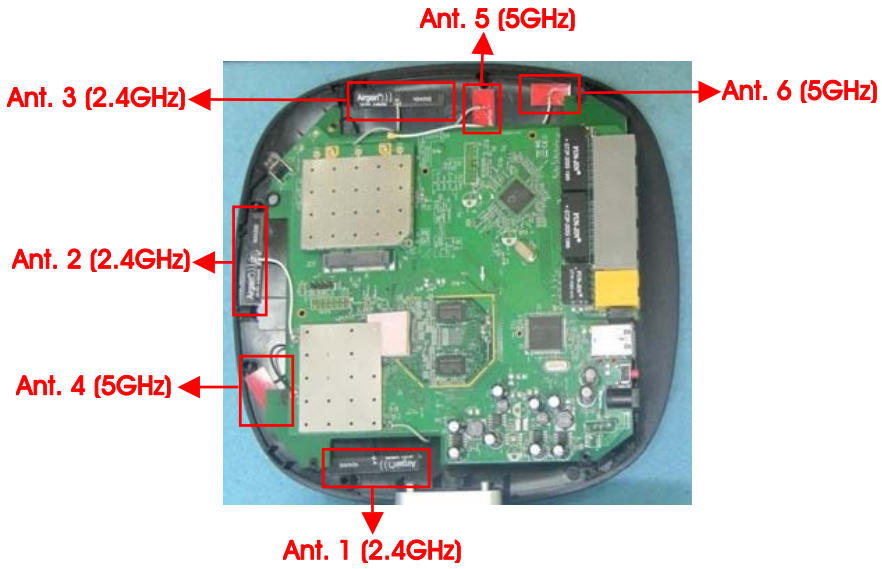
Note: The EUT has six antennas.

For 2.4GHz WLAN function (3TX/3RX):

Ant.1 and Ant.2 and Ant. 3 could transmit/receive simultaneously.

For 5GHz WLAN function (3TX/3RX):

Ant.4 and Ant.5 and Ant. 6 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	Ant.
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
Power Spectral Density	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	4+5+6
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	4+5+6
	11ac VHT40	Band 4	MCS0/Nss1	151/159	4+5+6
	11ac VHT80	Band 4	MCS0/Nss1	155	4+5+6
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6

Band Edge Emission	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157 /165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157 /165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
Frequency Stability	20 MHz	Band 1&4	-	40/157	4
	40 MHz	Band 1&4	-	38/151	4
	80 MHz	Band 1&4	-	42/155	4

Note: 1. The EUT can only be used at Y axis position.

2. 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 Co-location MPE test:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA4N1172-33) test is added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

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	-
CO01-CB	Conduction	Hsin Chu	TW0006	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 two equipment name and two model number which are identical to each other in all aspects except for the following table:

Equipment Name	Model No.	Description
AC1750 DB Wi-Fi Dual-Band AC+ Gigabit Router	F9K1115V2	All the models are identical, the different equipment name and model number served as marketing strategy.
AC1600 DB Wi-Fi Dual-Band AC + Gigabit Router	F9K1119V1	

From the above models, model: F9K1115V2 was selected as representative model for the test and its data was recorded in this report.

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR330737

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

Modifications	Performance Checking
1. Changing applicant's company to "Belkin International, Inc." from "Belkin International inc." 2. Changing applicant address to "12045 East Waterfront Drive, Playa Vista, CA 90094" from "12045 East Waterfront Drive, Playa Vista, CA 90094, USA" 3. Changing brand name to "belkin" from "Belkin". 4. Adding a new equipment name (Equipment name: AC1750 DB Wi-Fi Dual-Band AC+ Gigabit Router). 5. Adding a new model number (Model No.: F9K1119V1).	It does not need to test.
6. Adding a new adapter (Model No.: MU30-P120250-A1).	1. AC Power Line Conducted Emissions. 2. Radiated Emissions 9kHz~1GHz.
7. Updating radio test rule of 5GHz Band 1, 4 (5150~5250MHz, 5725~5850MHz) to "New Rules" from "Old Rules".	For 5GHz Band 1, 4: 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.
	For 5GHz Band 4 only: 6dB Spectrum Bandwidth.

3.9. Table for Supporting Units

For Test Site No: 03CH01-CB (below 1 GHz)

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
NB*2	Apple	Mac Book	DoC
Flash disk	Silicon	I-Series	DoC
HDD3.0	WD	WDBACY5000AWT	DoC

For Test Site No: 03CH01-CB (above 1 GHz) and TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E6430	DoC
Flash disk	Silicon	I-Series	DoC
HDD3.0	WD	WDBACY5000AWT	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	art2 ver4.6.78					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	19.5	21.5	21	15.5	17.5	16.5
802.11ac MCS0/Nss1 VHT20	19	21.5	21	16	17.5	16
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	17		21.5		14	17.5
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	13				11.5	

3.11. EUT Operation during Test

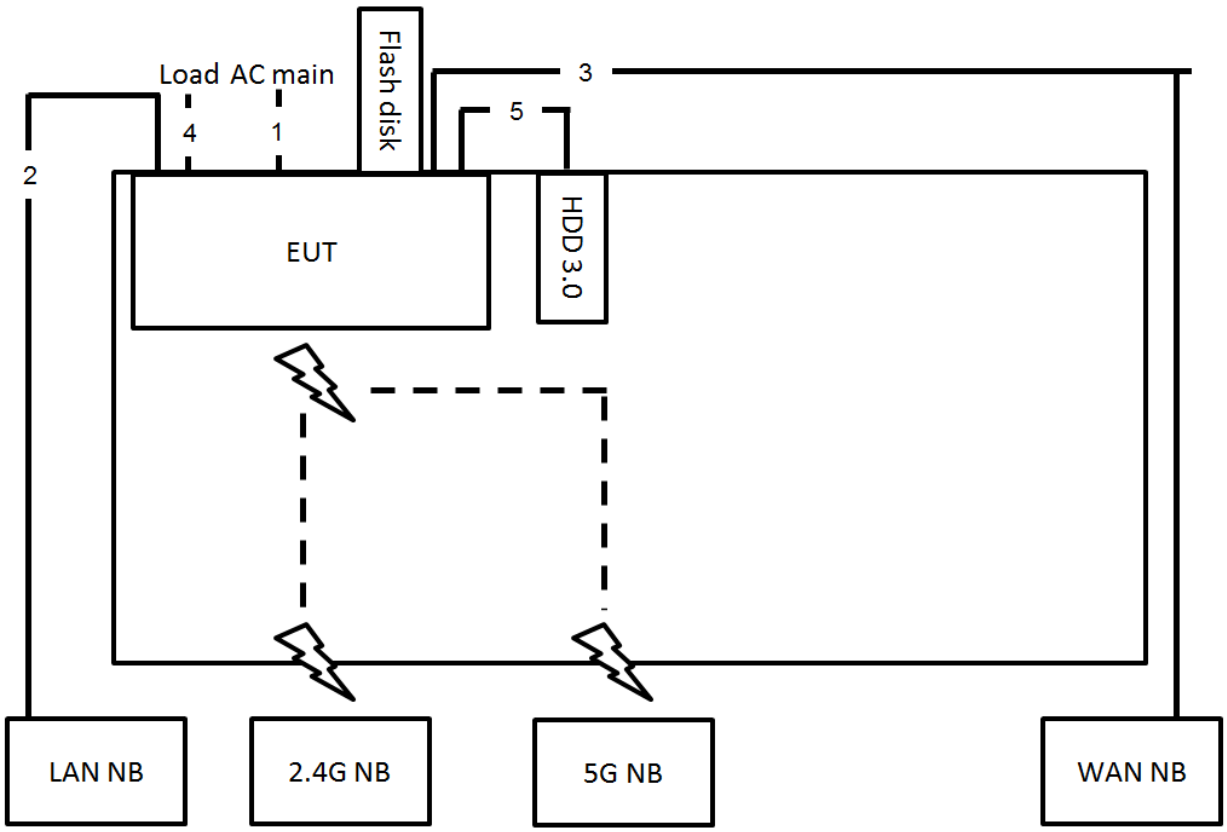
The EUT was programmed to be in continuously transmitting mode.

3.12. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.080	2.100	99.05	0.04	0.01
802.11ac MCS0/Nss1 VHT20	1.910	1.960	97.45	0.11	0.52
802.11ac MCS0/Nss1 VHT40	0.900	1.000	90.00	0.46	1.11
802.11ac MCS0/Nss1 VHT80	1.145	1.190	96.22	0.17	0.87

3.13. Test Configurations

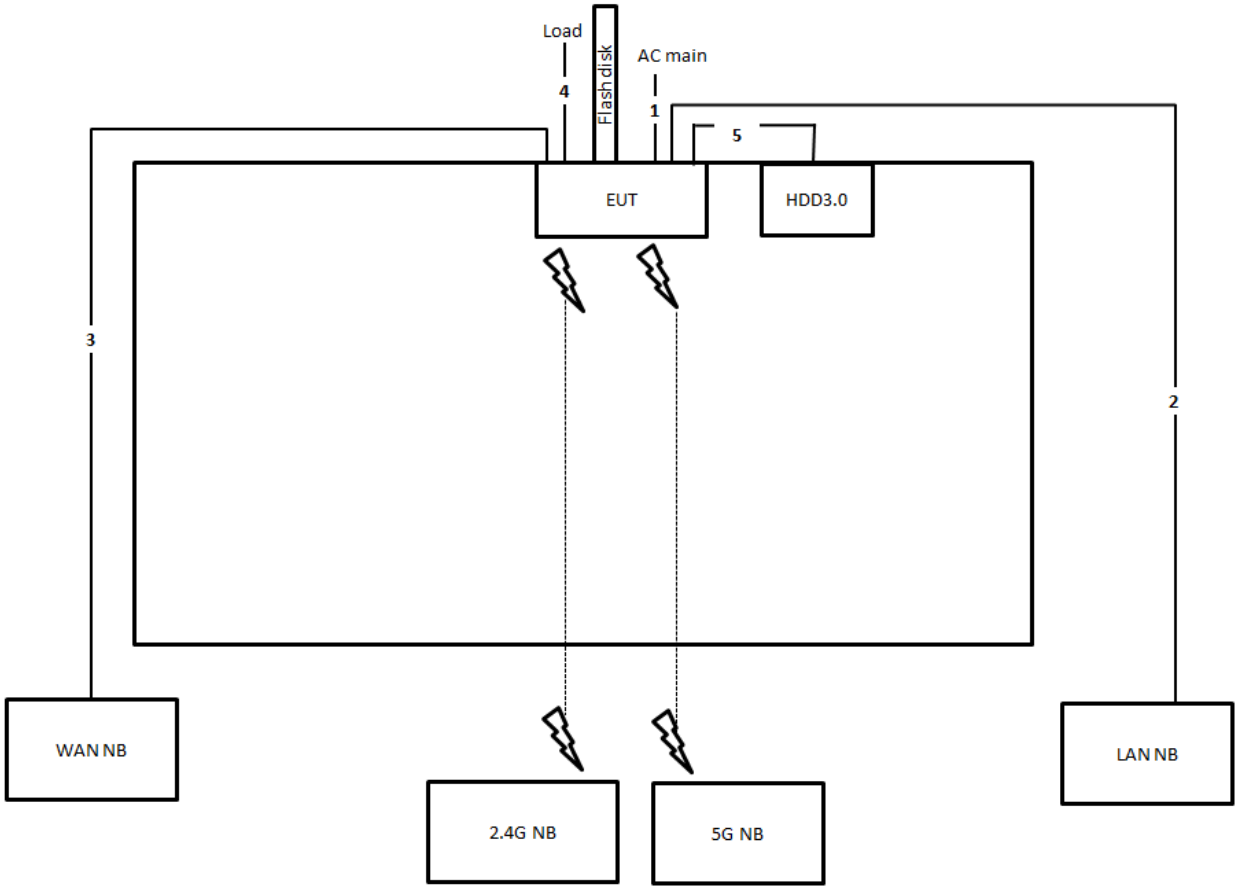
3.13.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1.5m
5	USB cable	Yes	0.2m

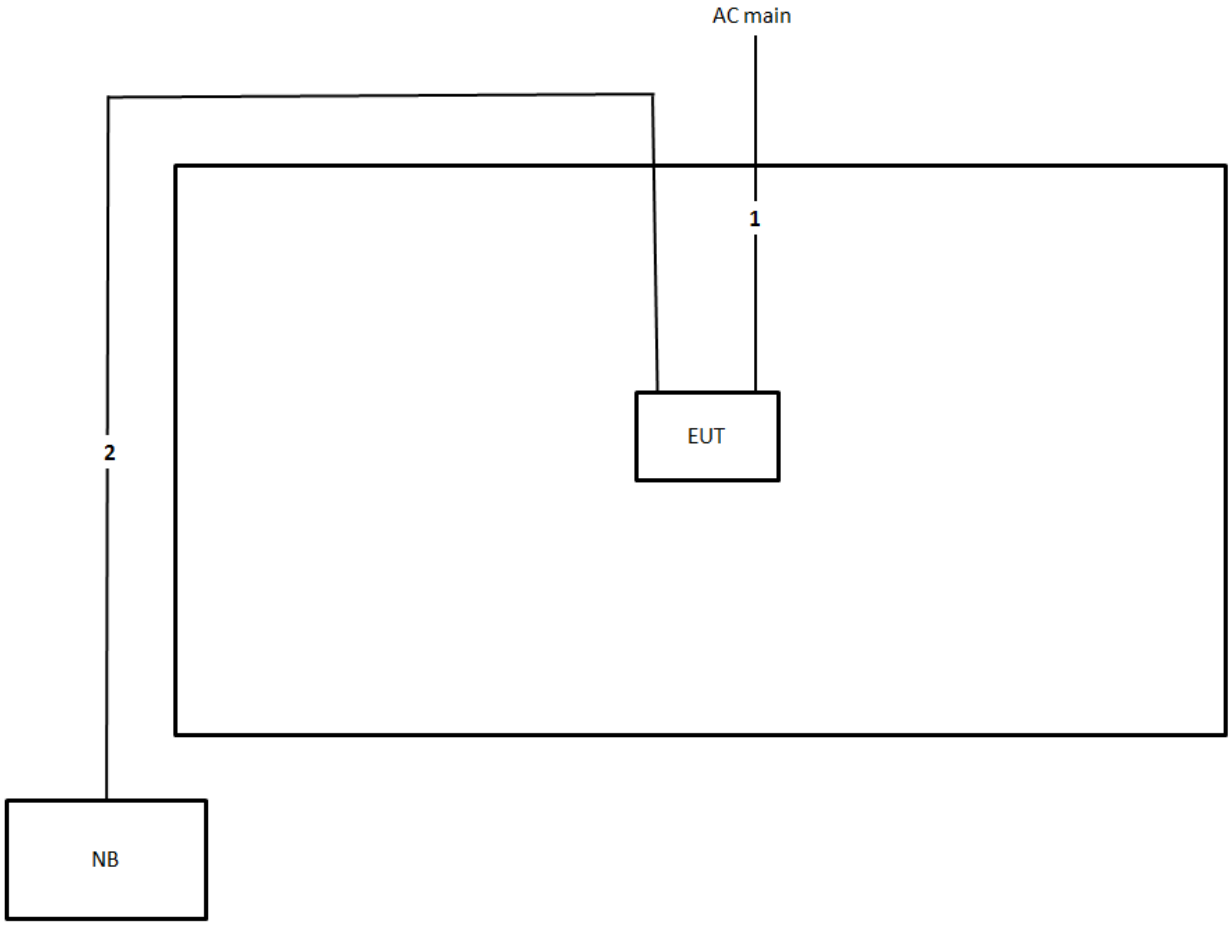
3.13.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1.5m
5	USB cable	Yes	0.8m

Test Configuration: above 1GHz



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

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product that is designed to connect to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

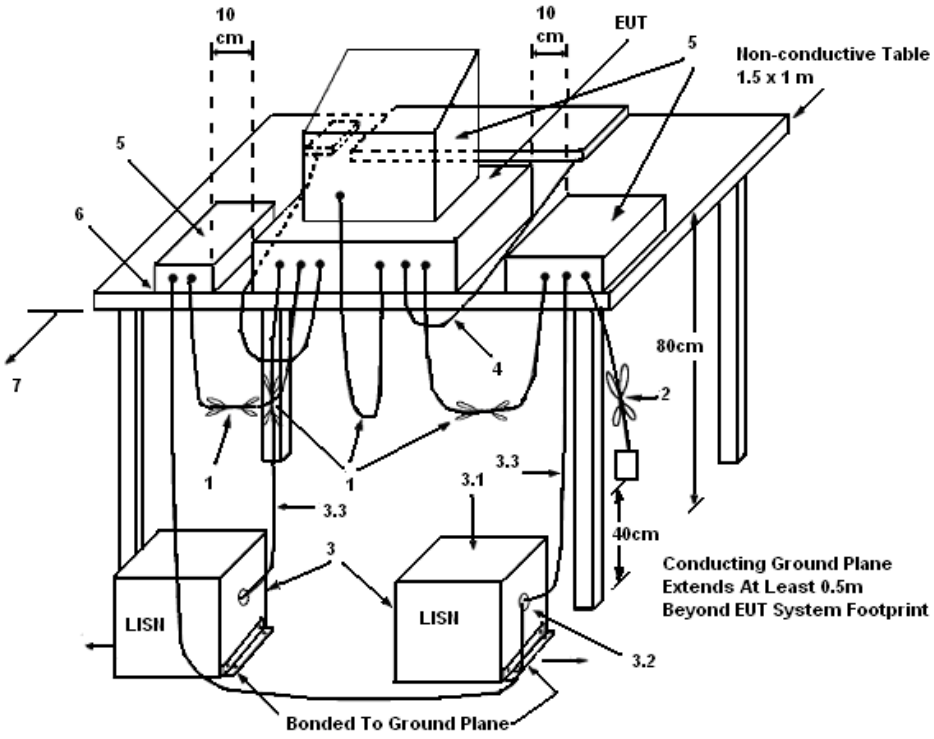
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

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

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

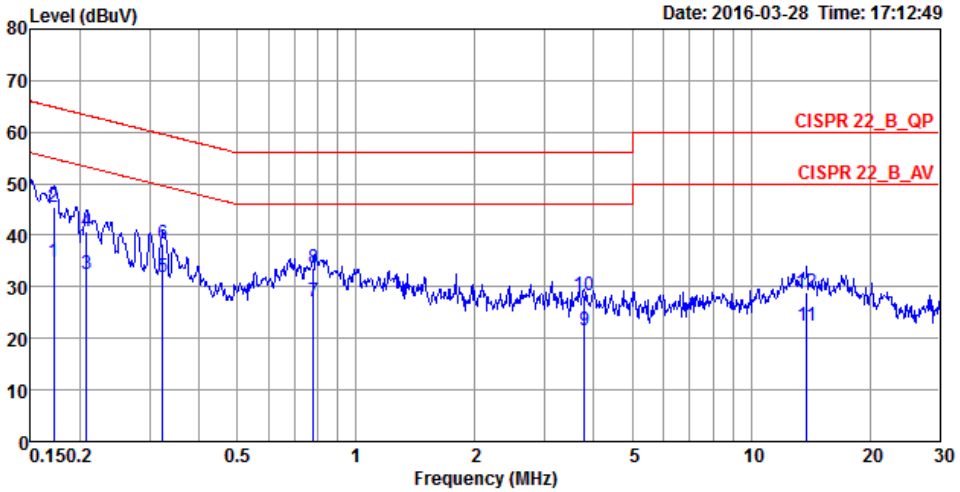
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

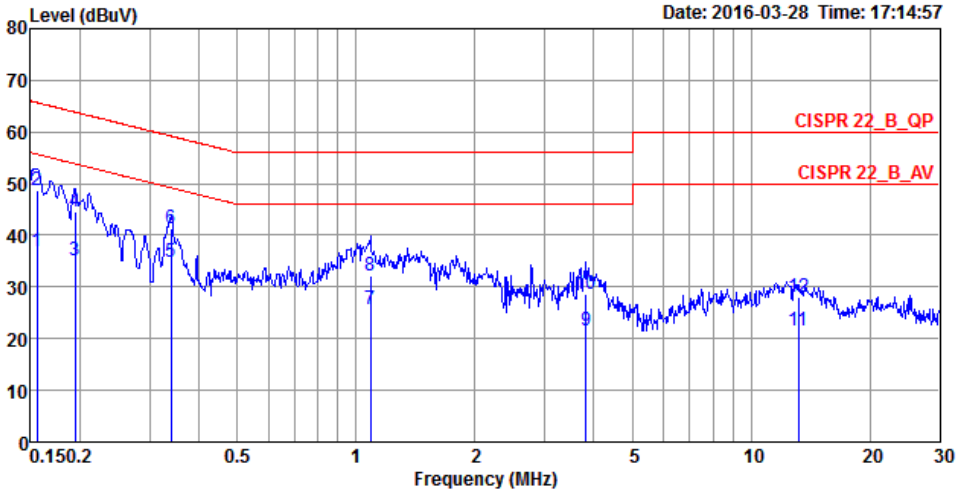
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25°C	Humidity	58%
Test Engineer	Edison Lin	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Remark	Cable Loss	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		dB	
1	0.1712	34.98	-19.92	54.90	24.86	9.96	Average	0.16	LINE
2	0.1712	45.48	-19.42	64.90	35.36	9.96	QP	0.16	LINE
3	0.2072	32.51	-20.81	53.32	22.38	9.95	Average	0.18	LINE
4	0.2072	40.84	-22.48	63.32	30.71	9.95	QP	0.18	LINE
5	0.3234	31.75	-17.87	49.62	21.57	9.99	Average	0.19	LINE
6	0.3234	38.35	-21.27	59.62	28.17	9.99	QP	0.19	LINE
7	0.7793	27.12	-18.88	46.00	16.89	10.04	Average	0.19	LINE
8	0.7793	33.69	-22.31	56.00	23.46	10.04	QP	0.19	LINE
9	3.7794	21.64	-24.36	46.00	11.21	10.11	Average	0.32	LINE
10	3.7794	28.44	-27.56	56.00	18.01	10.11	QP	0.32	LINE
11	13.8411	22.33	-27.67	50.00	11.69	10.21	Average	0.43	LINE
12	13.8411	29.06	-30.94	60.00	18.42	10.21	QP	0.43	LINE

Temperature	25°C	Humidity	58%
Test Engineer	Edison Lin	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Remark	Cable Loss	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		dB	
1	0.1557	36.89	-18.80	55.69	26.77	9.96	Average	0.16	NEUTRAL
2	0.1557	48.78	-16.91	65.69	38.66	9.96	QP	0.16	NEUTRAL
3	0.1945	35.16	-18.68	53.84	25.02	9.96	Average	0.18	NEUTRAL
4	0.1945	44.48	-19.36	63.84	34.34	9.96	QP	0.18	NEUTRAL
5	0.3392	34.96	-14.26	49.22	24.80	9.97	Average	0.19	NEUTRAL
6	0.3392	41.36	-17.86	59.22	31.20	9.97	QP	0.19	NEUTRAL
7	1.0881	25.57	-20.43	46.00	15.40	9.97	Average	0.20	NEUTRAL
8	1.0881	32.32	-23.68	56.00	22.15	9.97	QP	0.20	NEUTRAL
9	3.8196	21.49	-24.51	46.00	11.15	10.02	Average	0.32	NEUTRAL
10	3.8196	28.62	-27.38	56.00	18.28	10.02	QP	0.32	NEUTRAL
11	13.1966	21.50	-28.50	50.00	10.88	10.20	Average	0.42	NEUTRAL
12	13.1966	28.16	-31.84	60.00	17.54	10.20	QP	0.42	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

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 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

4.2.3. 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%.

4.2.4. Test Setup Layout

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

This test setup layout is the same as that shown in section 4.6.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

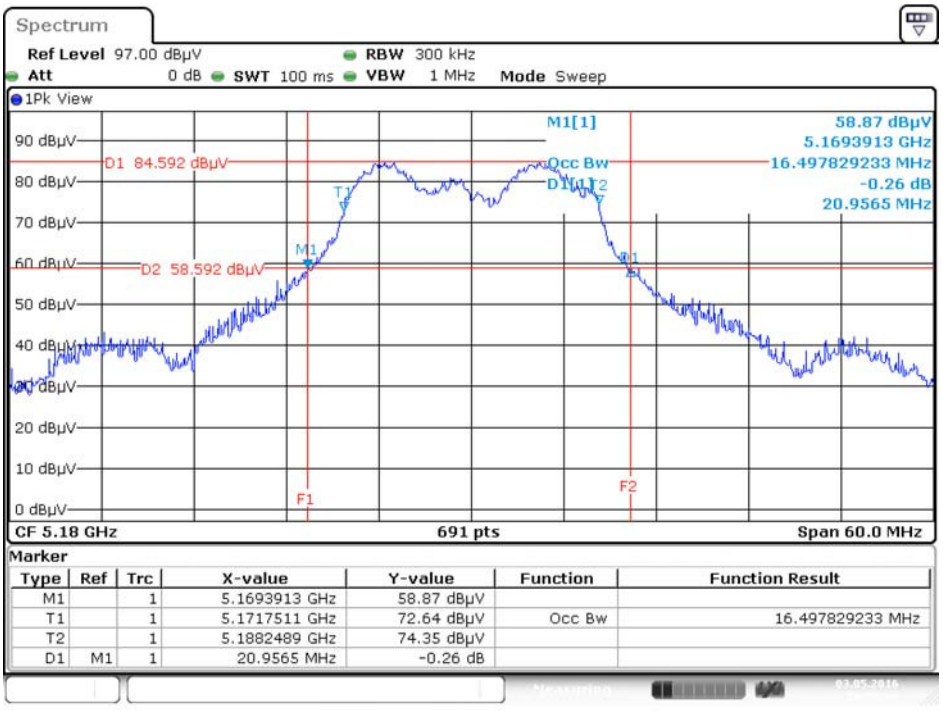
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai		

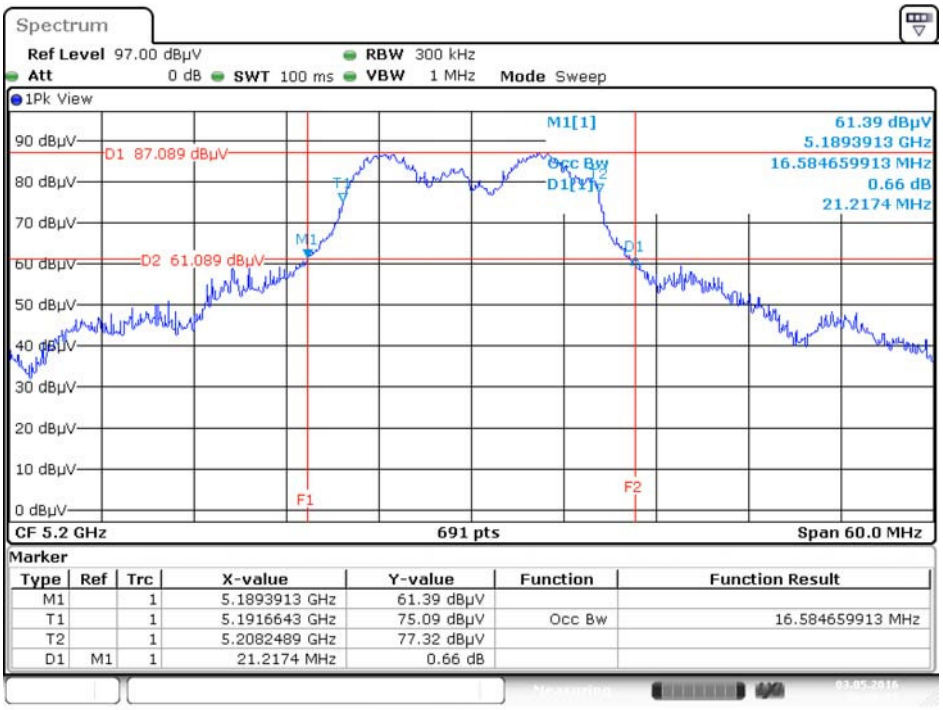
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	20.96	16.50
	5200 MHz	21.22	16.59
	5240 MHz	20.78	16.93
	5745 MHz	20.17	16.24
	5785 MHz	22.17	17.19
	5825 MHz	20.44	16.32
802.11ac MCS0/Nss1 VHT20	5180 MHz	20.35	17.19
	5200 MHz	21.57	17.80
	5240 MHz	20.44	17.28
	5745 MHz	23.74	18.67
	5785 MHz	19.91	17.28
	5825 MHz	23.39	18.76
802.11ac MCS0/Nss1 VHT40	5190 MHz	43.04	36.04
	5230 MHz	46.23	36.76
	5755 MHz	41.45	35.46
	5795 MHz	42.03	35.89
802.11ac MCS0/Nss1 VHT80	5210 MHz	84.06	75.25
	5775 MHz	87.25	76.70

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5180 MHz



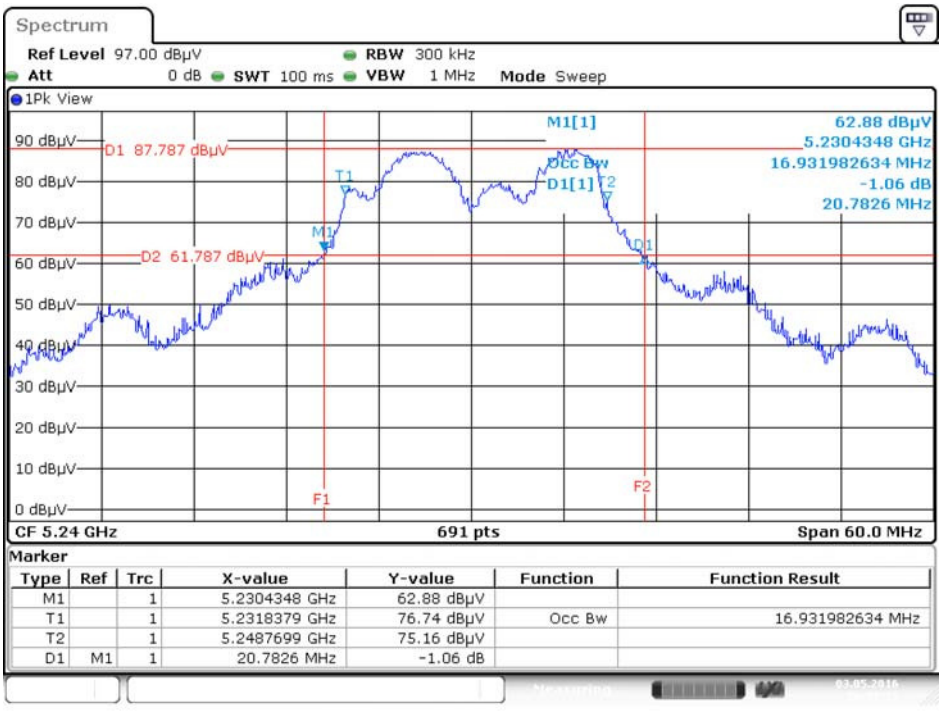
Date: 3.MAY.2016 20:55:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5200 MHz



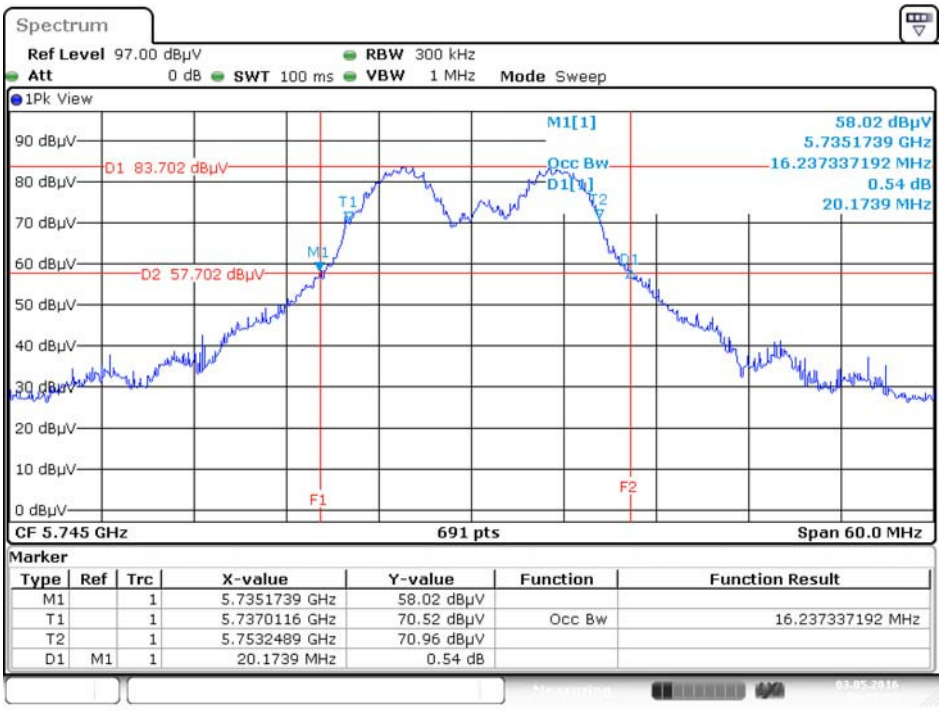
Date: 3.MAY.2016 20:56:31

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5240 MHz



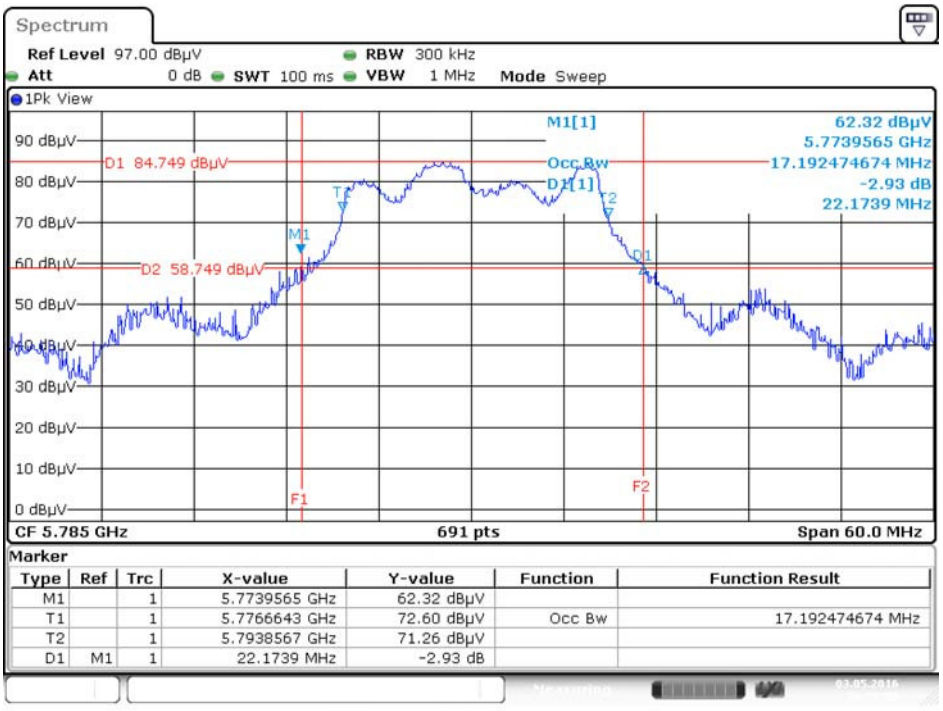
Date: 3.MAY.2016 20:57:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5745 MHz



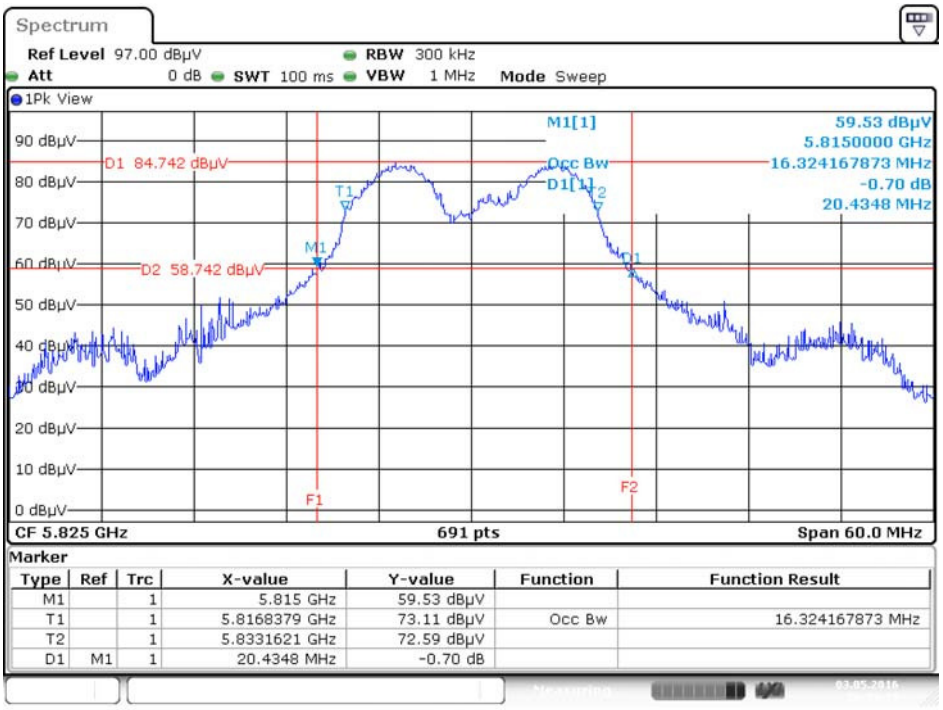
Date: 3.MAY.2016 20:57:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5785 MHz



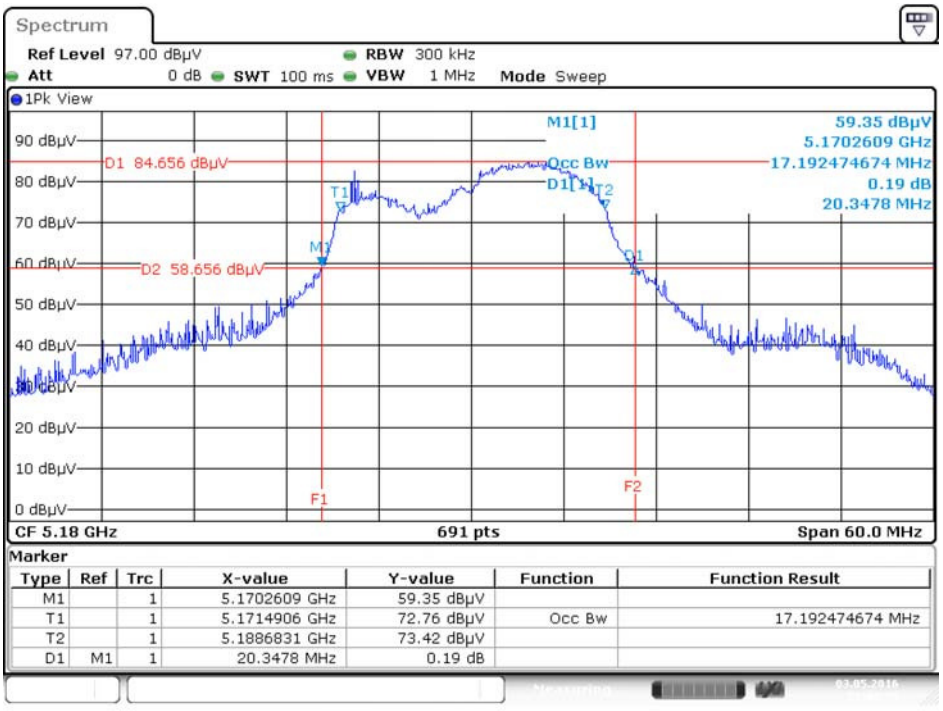
Date: 3.MAY.2016 20:58:30

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5825 MHz



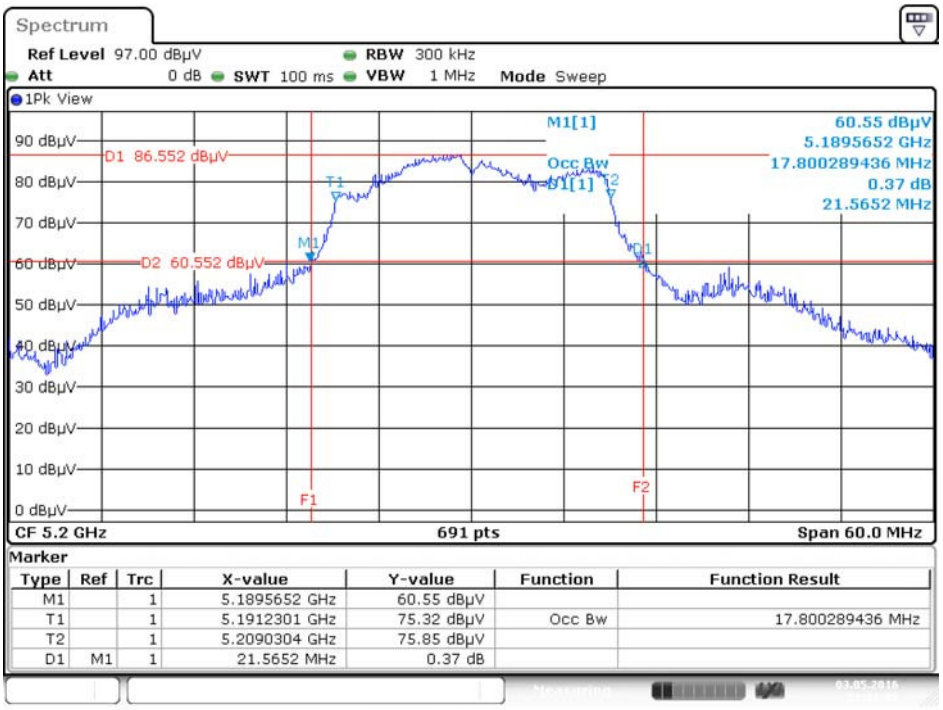
Date: 3.MAY.2016 20:59:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5180 MHz



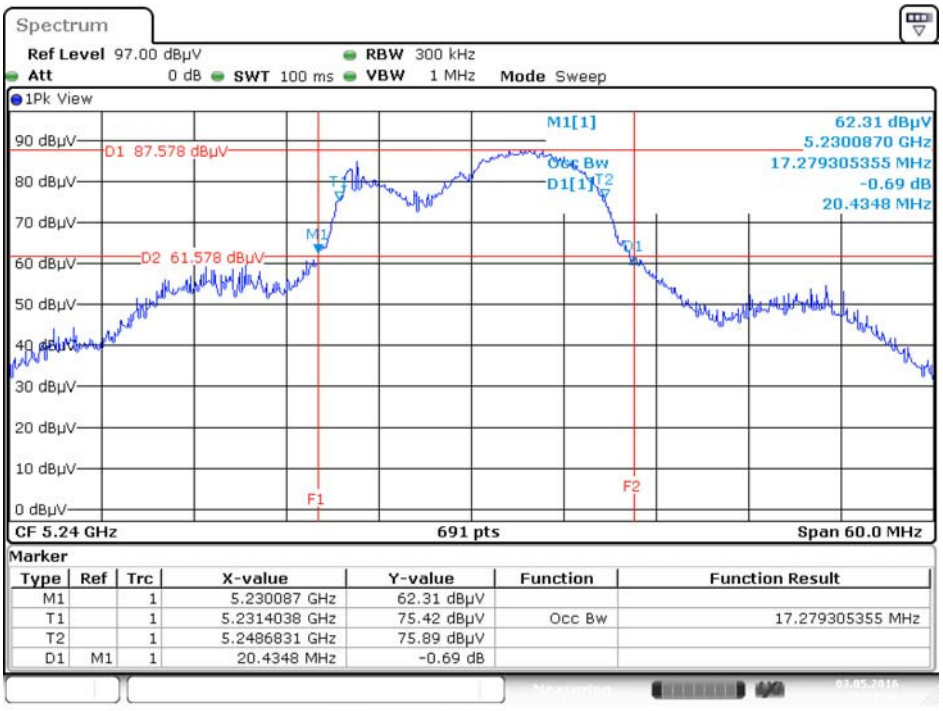
Date: 3.MAY.2016 21:00:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5200 MHz



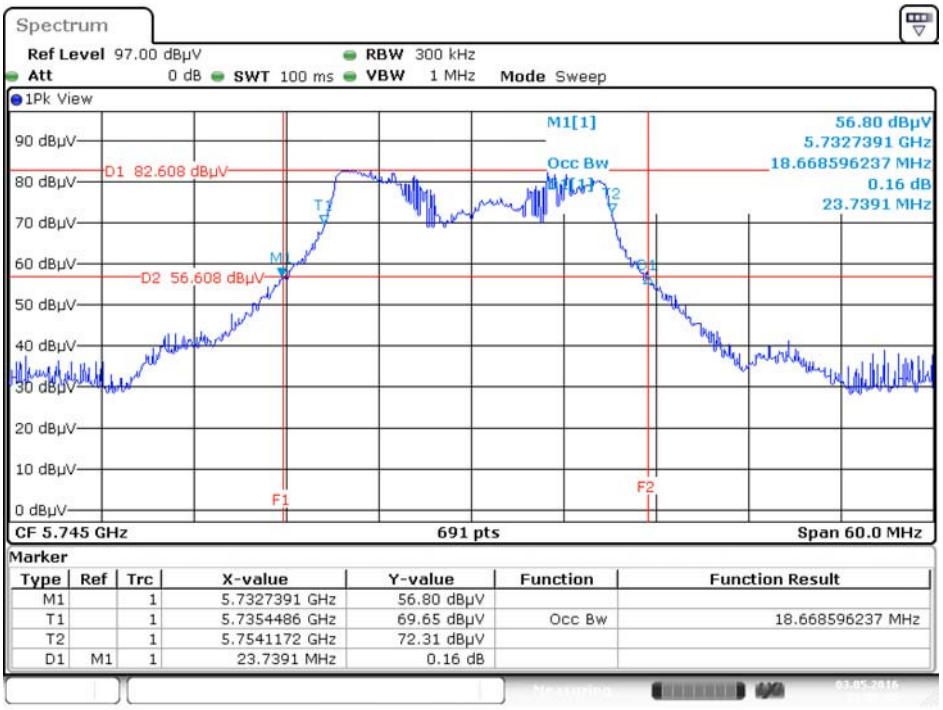
Date: 3.MAY.2016 21:01:17

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5240 MHz



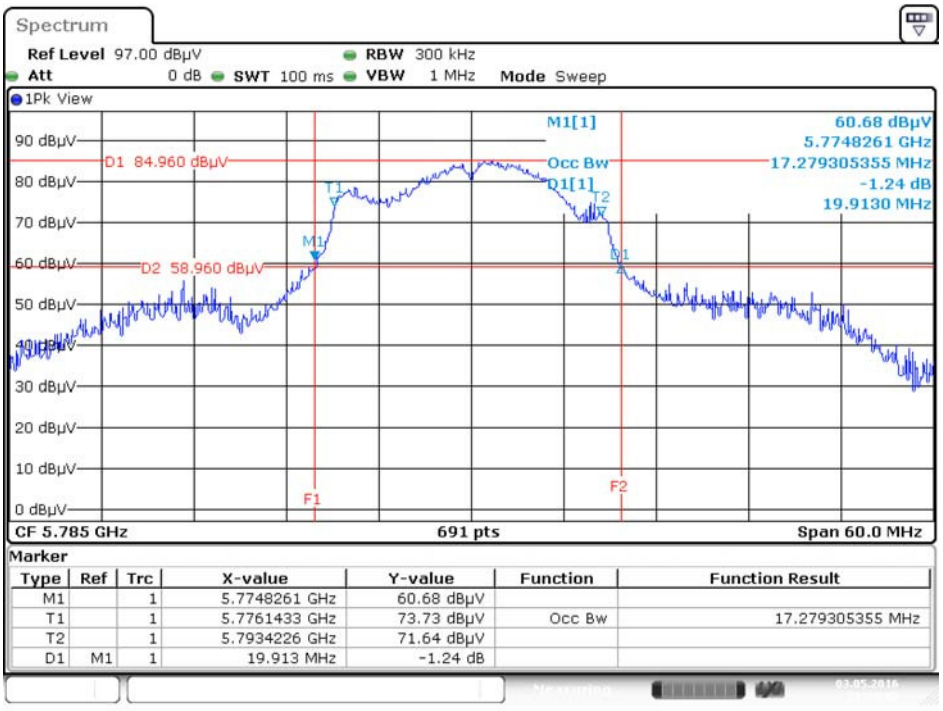
Date: 3.MAY.2016 21:01:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5745 MHz



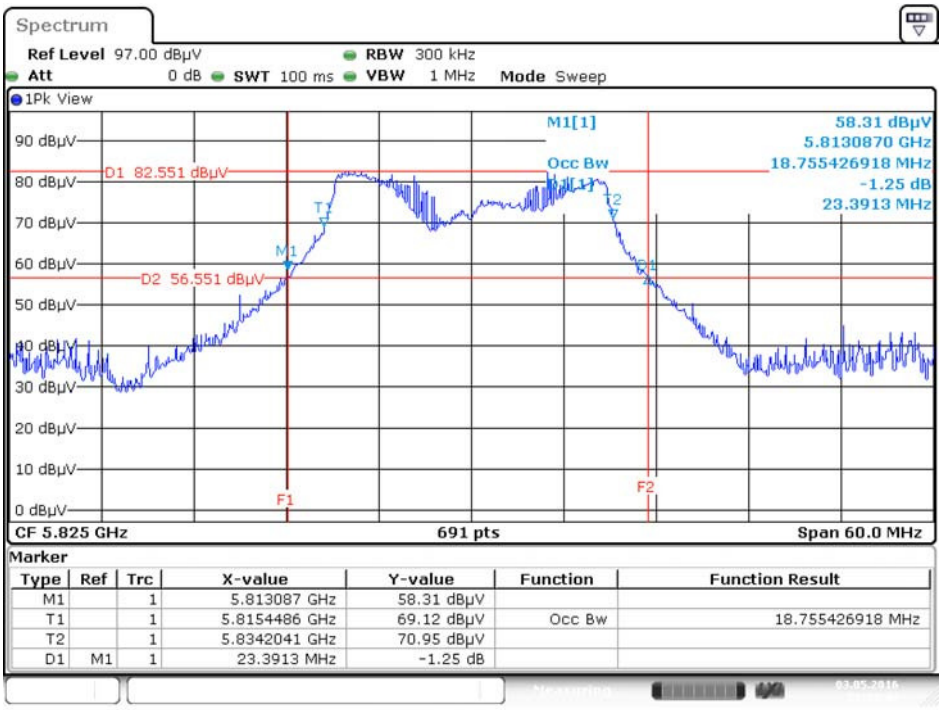
Date: 3.MAY.2016 21:02:28

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5785 MHz



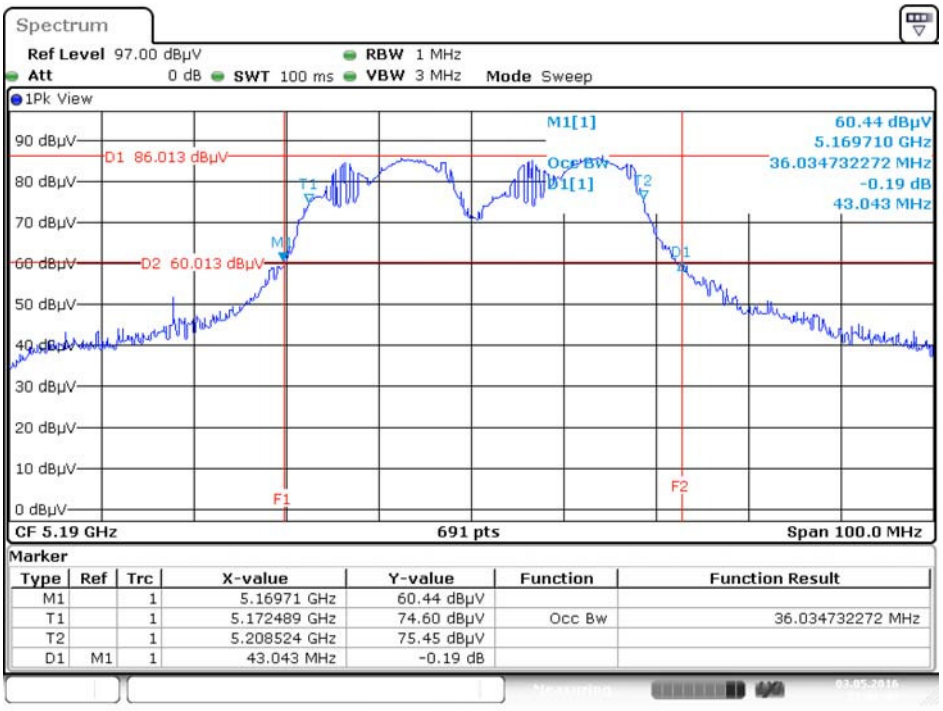
Date: 3.MAY.2016 21:03:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5825 MHz



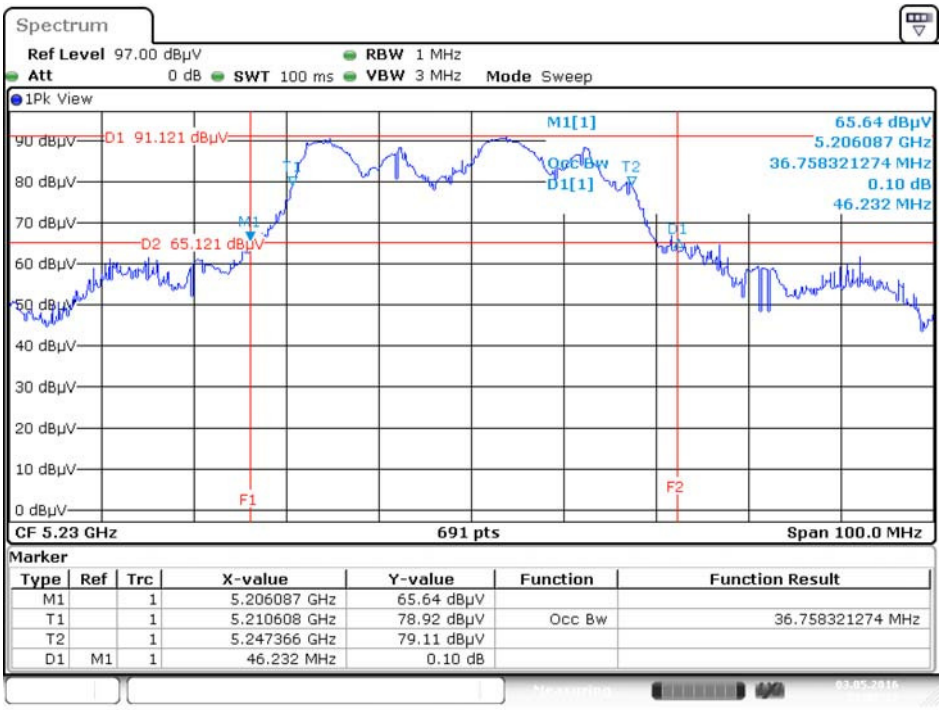
Date: 3.MAY.2016 21:03:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5190 MHz



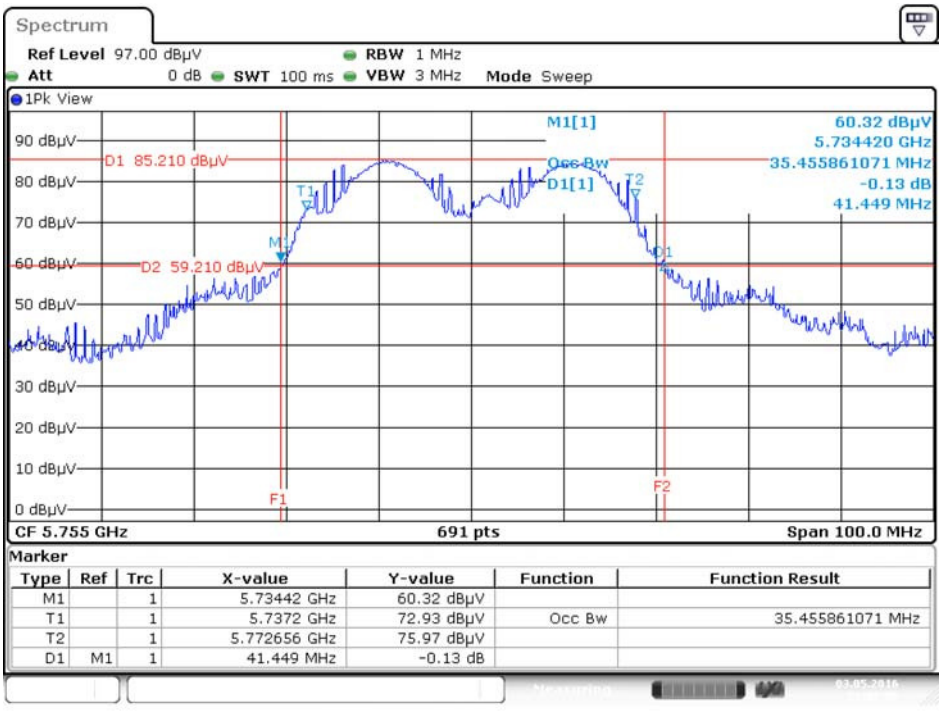
Date: 3.MAY.2016 21:06:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5230 MHz



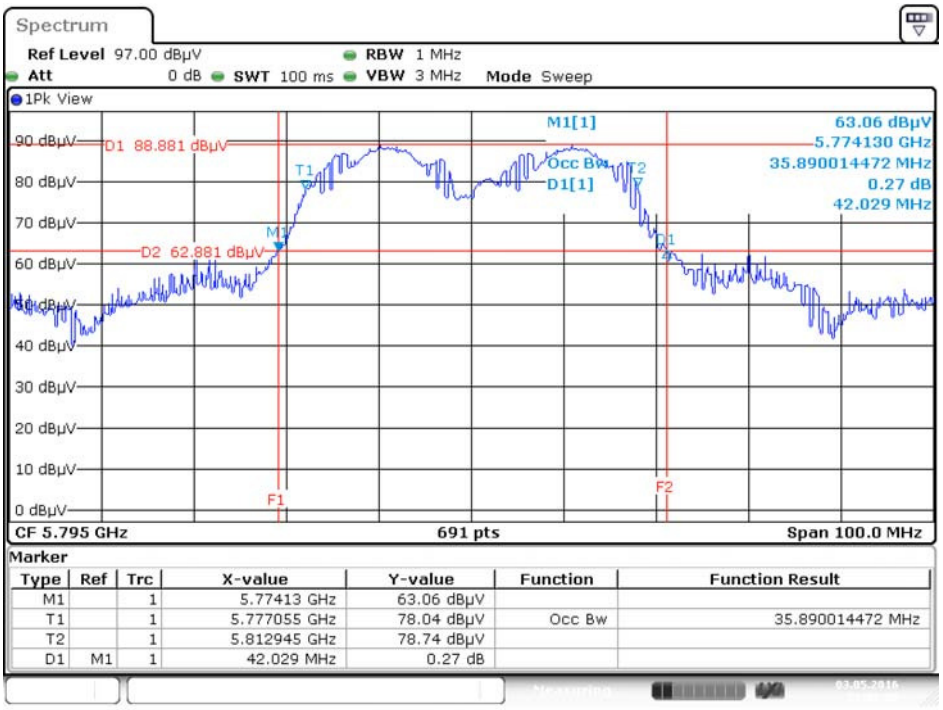
Date: 3.MAY.2016 21:07:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5755 MHz



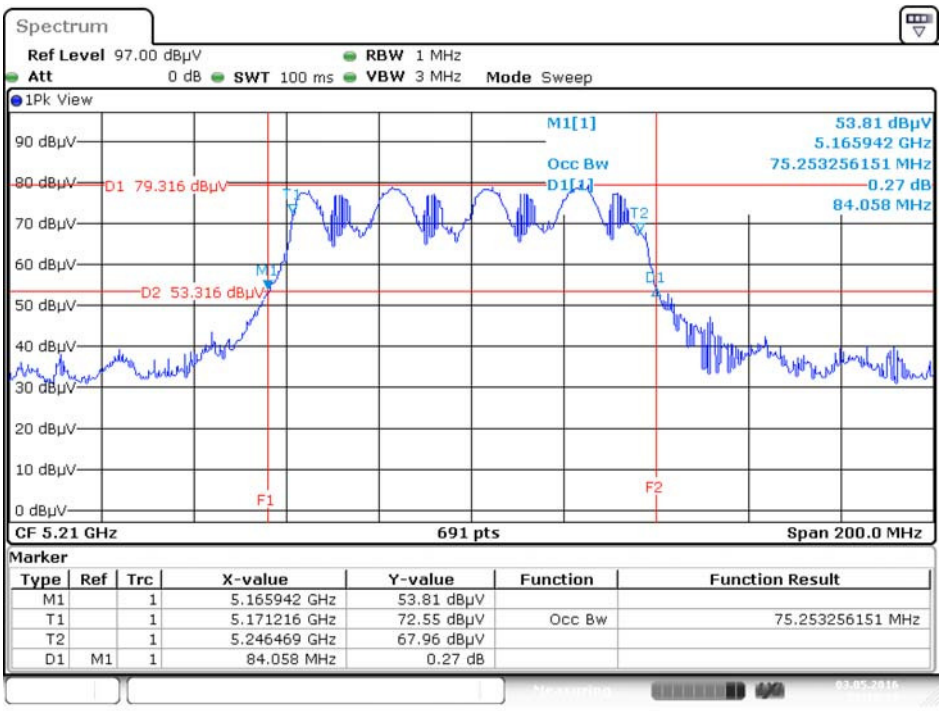
Date: 3.MAY.2016 21:07:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5795 MHz



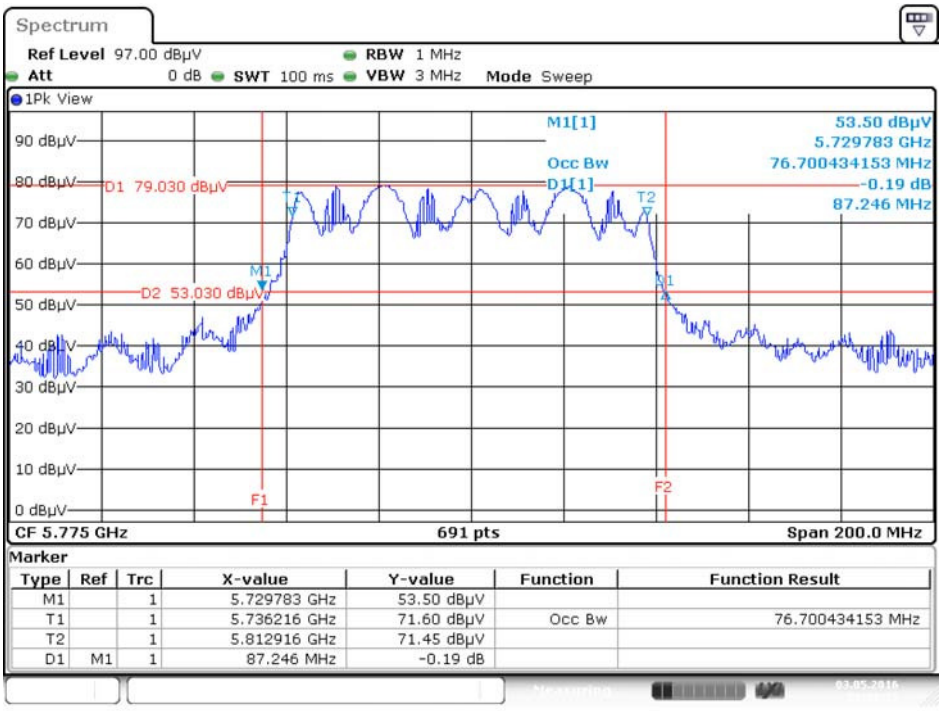
Date: 3.MAY.2016 21:08:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 + Ant. 5 + Ant. 6 / 5210 MHz



Date: 3.MAY.2016 21:10:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 + Ant. 5 + Ant. 6 / 5775 MHz



Date: 3.MAY.2016 21:11:20

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

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 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

4.3.3. 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.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.6.4.

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 6dB Spectrum Bandwidth

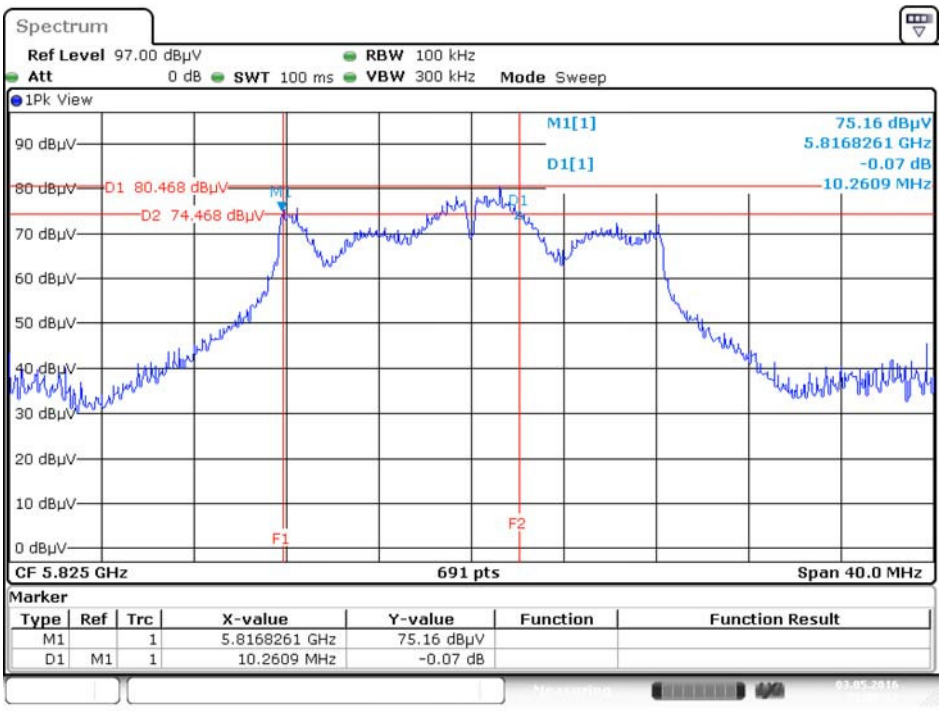
Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	10.43	500	Complies
	5785 MHz	15.59	500	Complies
	5825 MHz	10.26	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	15.42	500	Complies
	5785 MHz	15.42	500	Complies
	5825 MHz	16.46	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	32.46	500	Complies
	5795 MHz	35.13	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	71.59	500	Complies

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

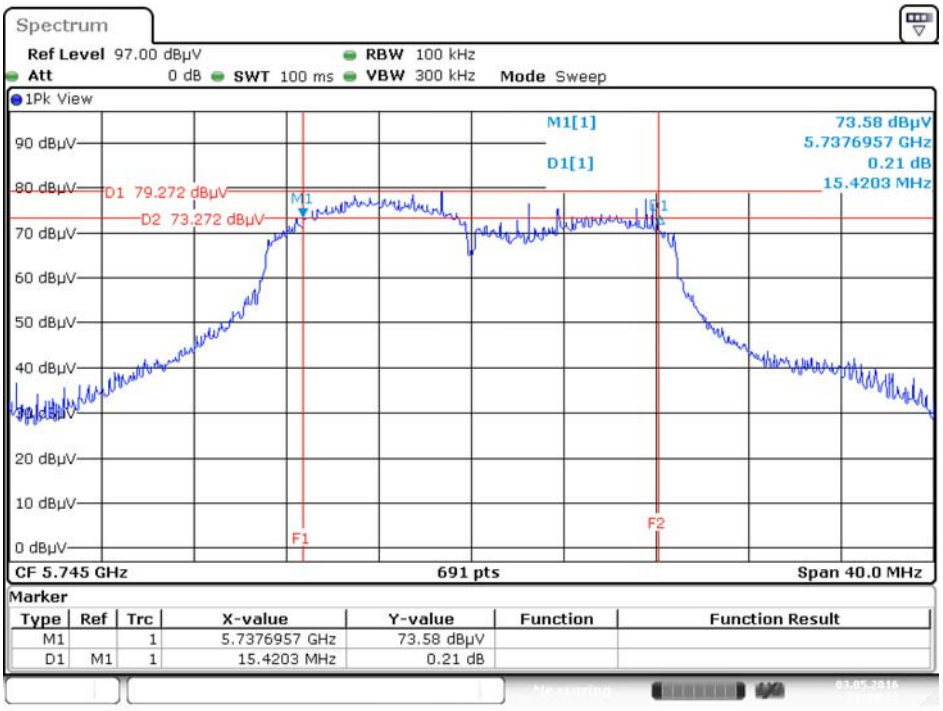
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5825 MHz



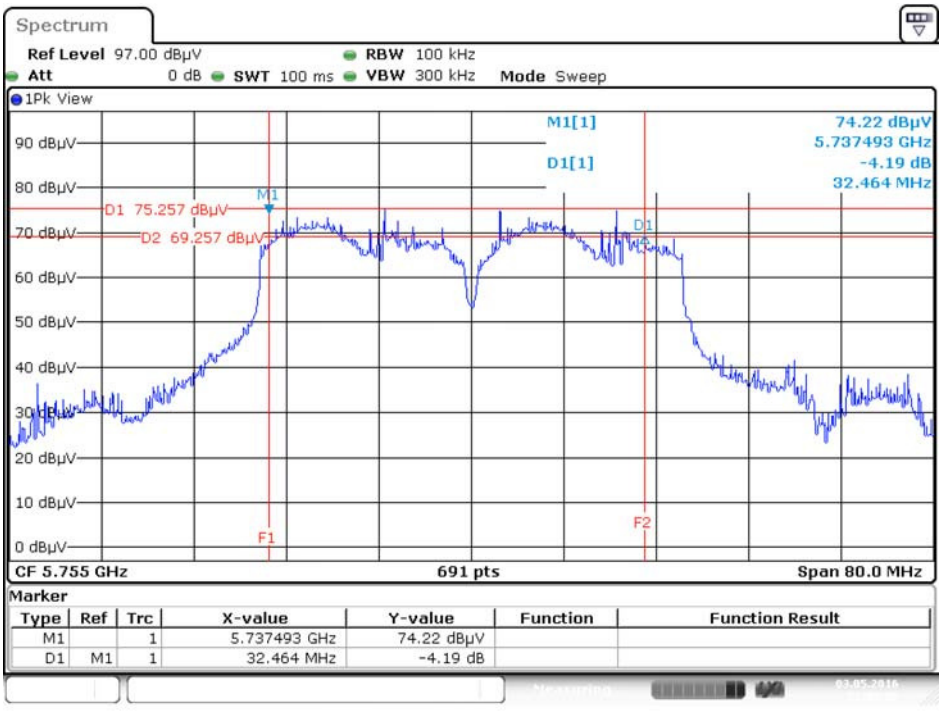
Date: 3.MAY.2016 22:02:37

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5745 MHz



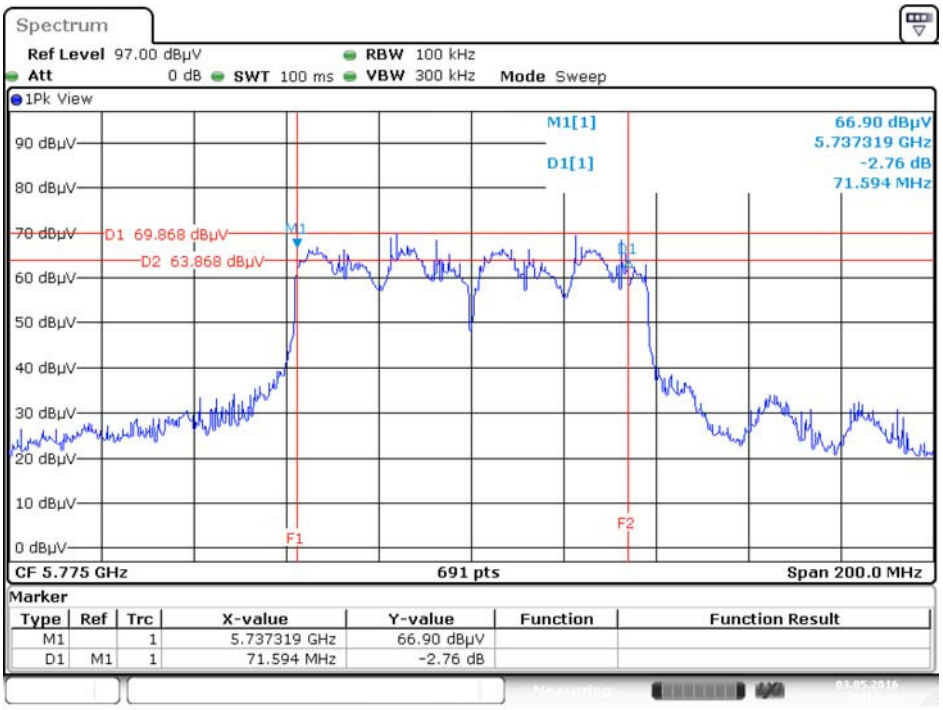
Date: 3.MAY.2016 22:03:21

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5755 MHz



Date: 3.MAY.2016 22:05:07

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 + Ant. 5 + Ant. 6 / 5775 MHz



Date: 3.MAY.2016 21:14:44

4.4. Maximum Conducted Output Power Measurement

4.4.1. 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.

4.4.2. Measuring Instruments and Setting

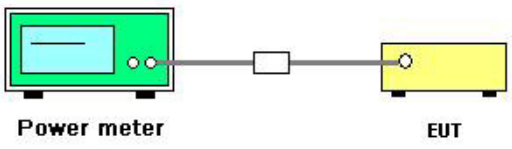
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. 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.

4.4.4. 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 Maximum Conducted Output Power

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai	Test Date	May 03, 2016

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6	Total		
802.11a	5180 MHz	17.22	19.37	18.67	23.28	30.00	Complies
	5200 MHz	19.74	22.07	20.74	25.73	30.00	Complies
	5240 MHz	20.16	21.89	20.40	25.66	30.00	Complies
	5745 MHz	15.73	16.74	16.28	21.04	30.00	Complies
	5785 MHz	17.59	19.57	19.21	23.64	30.00	Complies
	5825 MHz	15.55	18.61	17.72	22.24	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	16.65	18.97	18.11	22.78	30.00	Complies
	5200 MHz	19.78	21.71	21.06	25.69	30.00	Complies
	5240 MHz	20.12	21.89	20.44	25.66	30.00	Complies
	5745 MHz	16.23	17.22	17.21	21.68	30.00	Complies
	5785 MHz	17.72	19.78	19.19	23.75	30.00	Complies
	5825 MHz	15.02	18.05	16.94	21.61	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	14.47	16.78	15.71	20.53	30.00	Complies
	5230 MHz	19.75	21.65	20.53	25.49	30.00	Complies
	5755 MHz	14.23	15.58	14.76	19.66	30.00	Complies
	5795 MHz	17.95	19.08	18.84	23.42	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	11.17	13.09	12.01	16.93	30.00	Complies
	5775 MHz	11.55	13.37	12.33	17.25	30.00	Complies

4.5. Power Spectral Density Measurement

4.5.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.4.1.

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

4.5.2. Measuring Instruments and Setting

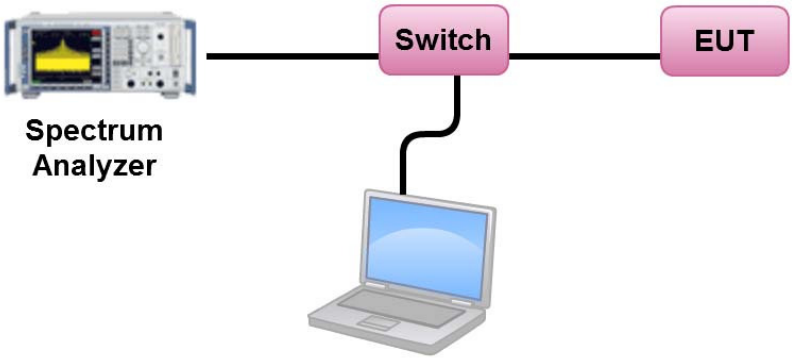
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	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.	

4.5.3. 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. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



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 Power Spectral Density

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai	Test Date	May 03, 2016

Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.16	12.76	Complies
40	5200 MHz	12.63	12.76	Complies
48	5240 MHz	12.65	12.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=17 – (10.24 – 6)=12.76MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	7.83	-3.01	4.82	25.76	Complies
157	5785 MHz	10.57	-3.01	7.56	25.76	Complies
165	5825 MHz	9.09	-3.01	6.08	25.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=30 – (10.24 – 6)=25.76 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	9.69	12.76	Complies
40	5200 MHz	12.62	12.76	Complies
48	5240 MHz	12.62	12.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=17 – (10.24 – 6)=12.76MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	8.58	-3.01	5.57	25.76	Complies
157	5785 MHz	10.62	-3.01	7.61	25.76	Complies
165	5825 MHz	8.48	-3.01	5.47	25.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=30 – (10.24 – 6)=25.76 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	4.34	12.76	Complies
46	5230 MHz	9.32	12.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=17 – (10.24 – 6)=12.76MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	3.52	-3.01	0.51	25.76	Complies
159	5795 MHz	7.24	-3.01	4.23	25.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=30 – (10.24 – 6)=25.76 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-2.18	12.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=17 – (10.24 – 6)=12.76MHz.

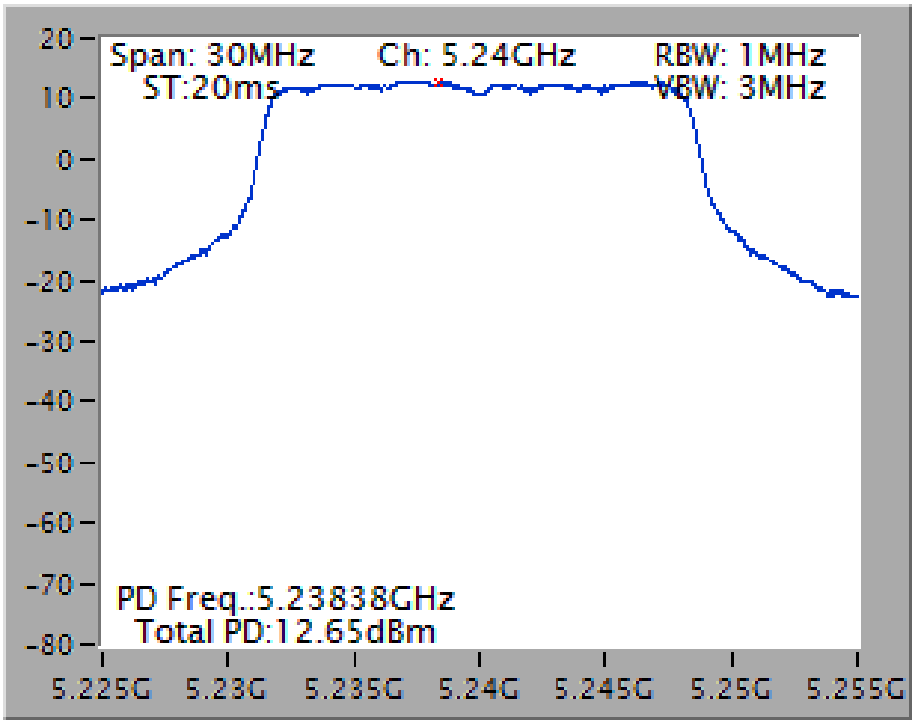
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-1.86	-3.01	-4.87	25.76	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.24dBi >6dBi, so limit=30 – (10.24 – 6)=25.76 dBm/500kHz.

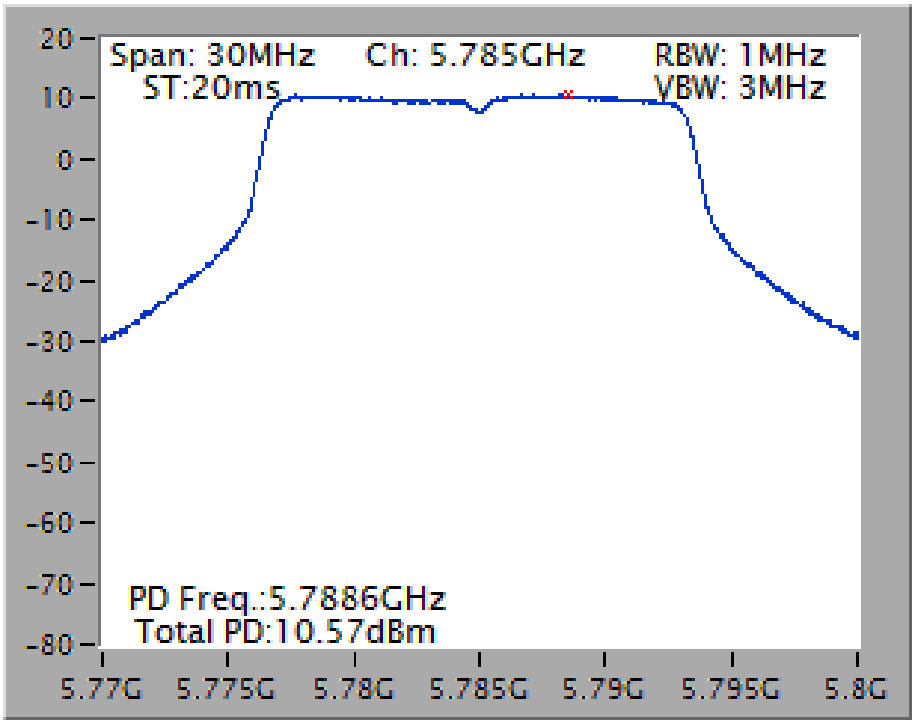
Note: All the test values were listed in the report.

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

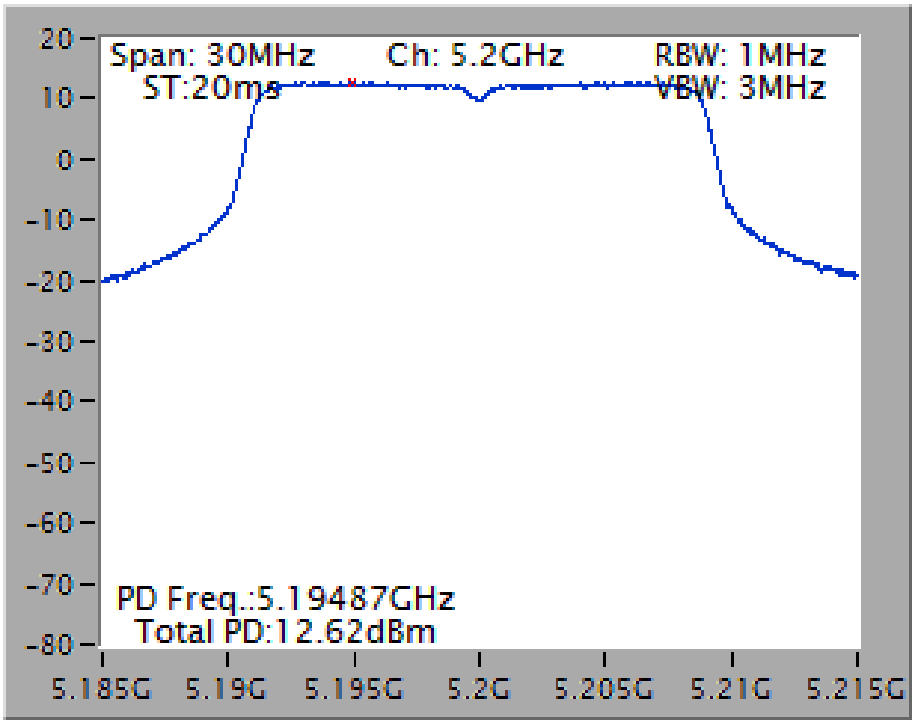
Power Density Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5240 MHz



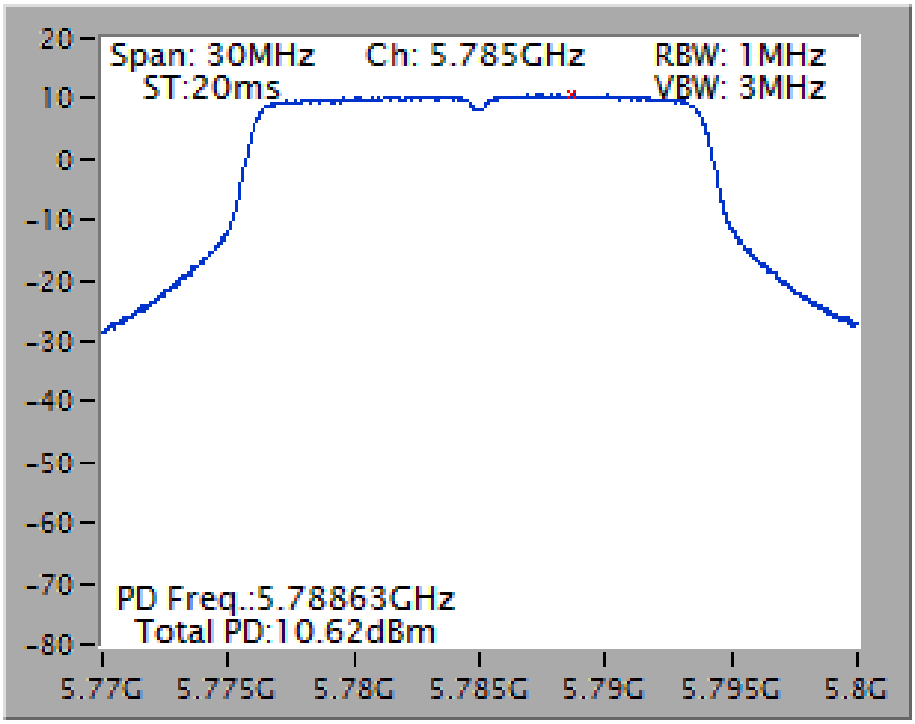
Power Density Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5785 MHz



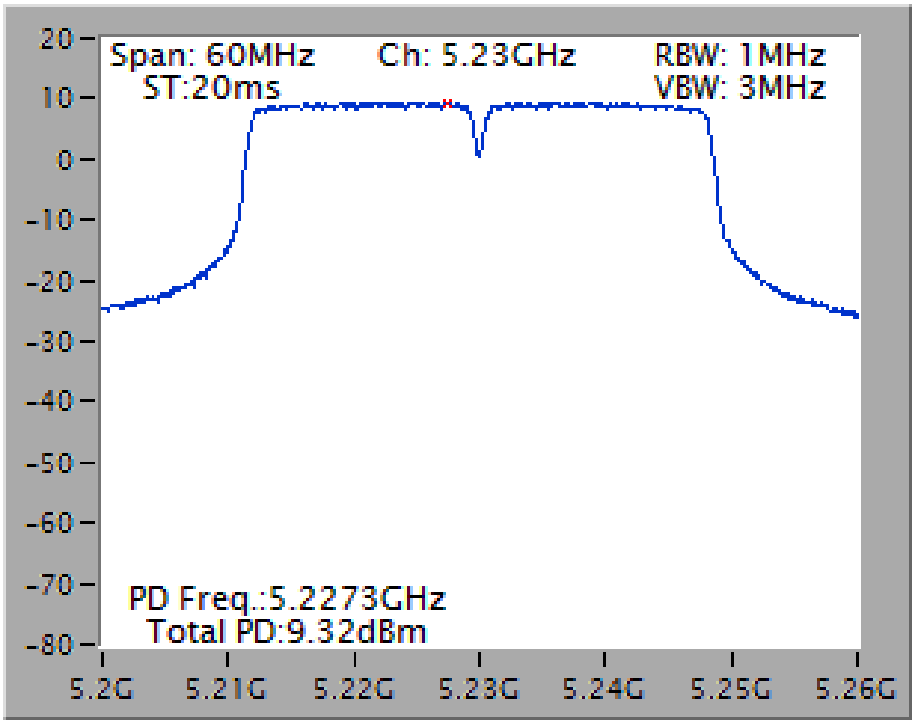
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5200 MHz



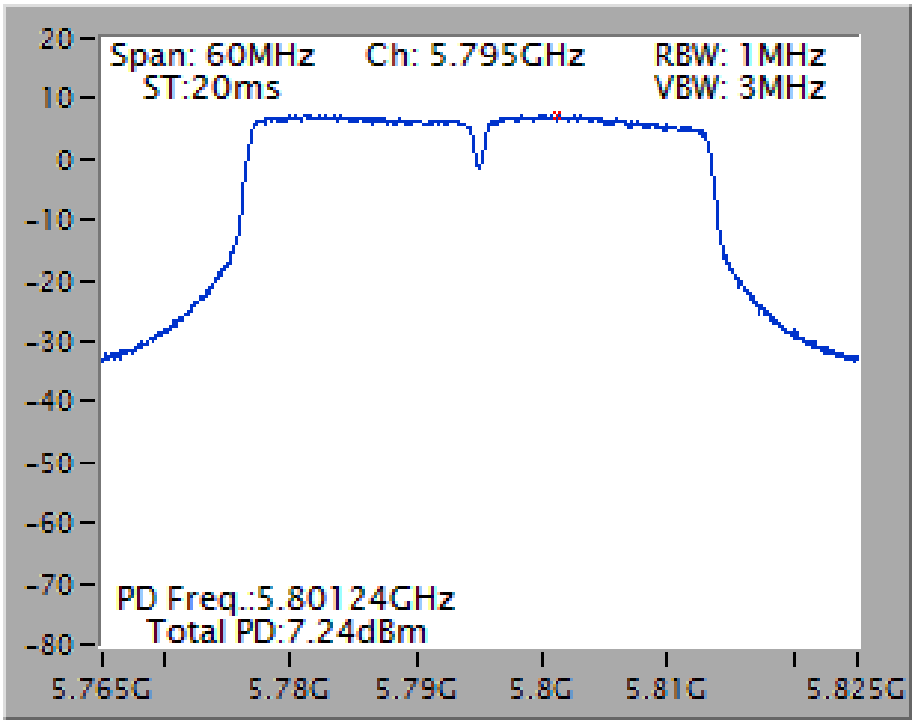
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 + Ant. 5 + Ant. 6 / 5785 MHz



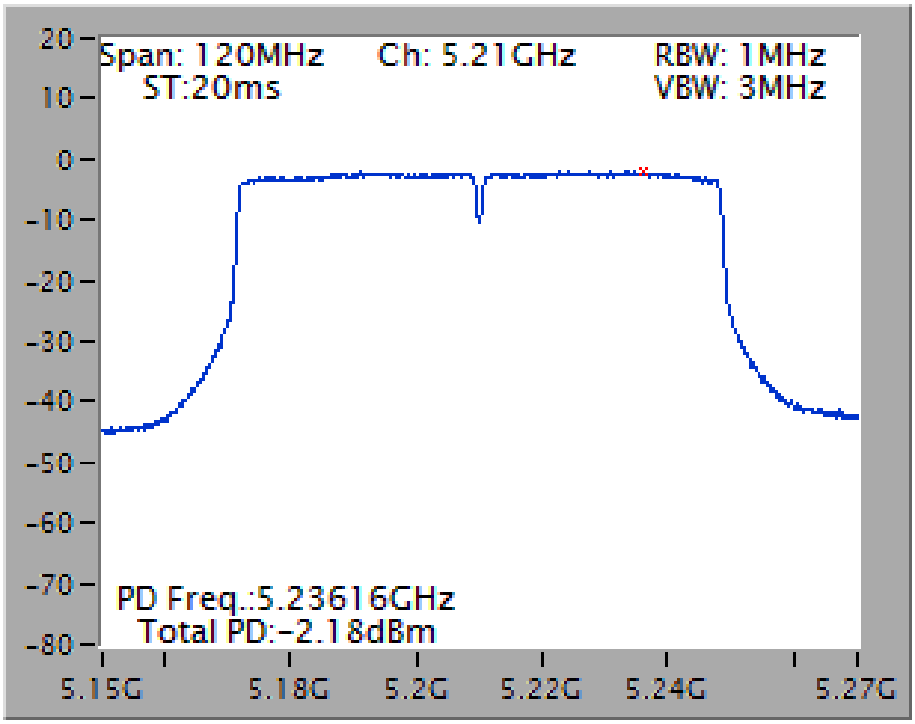
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5230 MHz



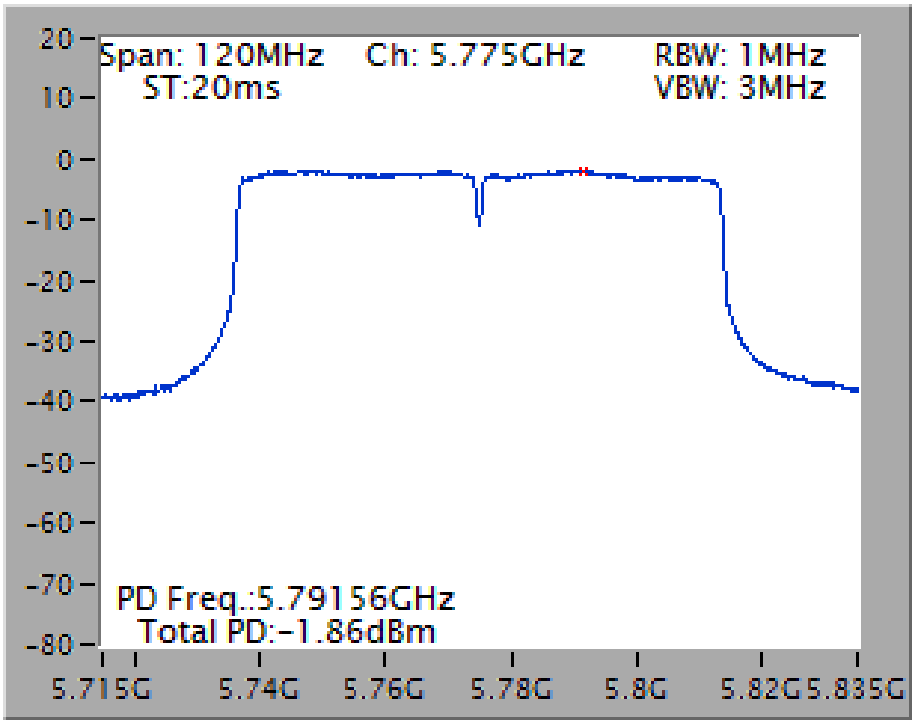
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 + Ant. 5 + Ant. 6 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 + Ant. 5 + Ant. 6 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 + Ant. 5 + Ant. 6 / 5775 MHz



4.6. Radiated 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 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

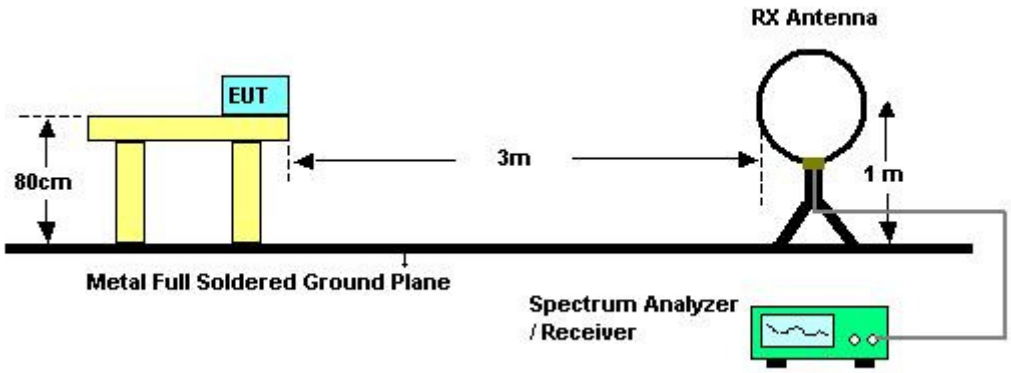
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

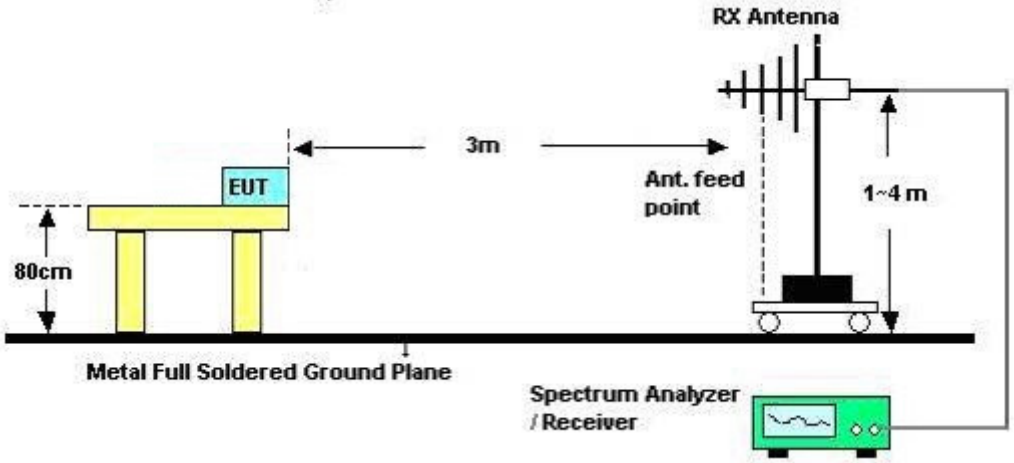
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

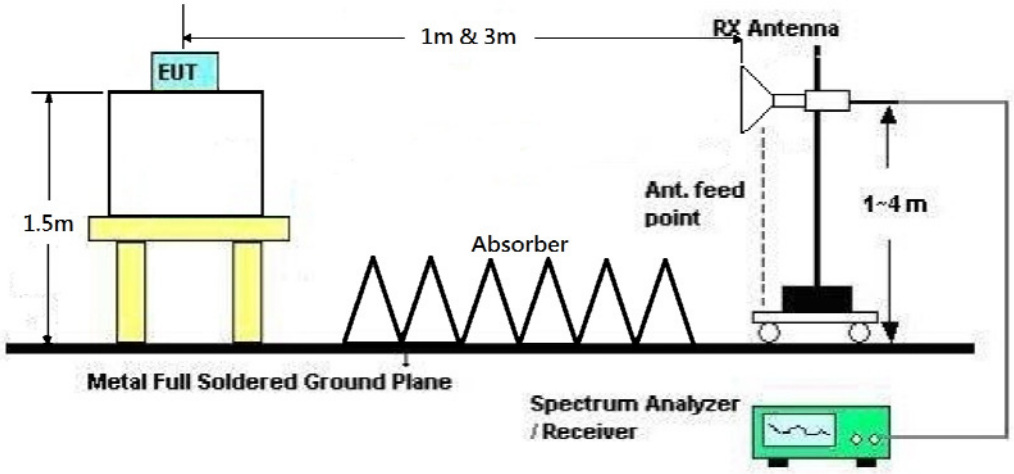
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	Normal Link
Test Date	Mar. 26, 2016		

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.

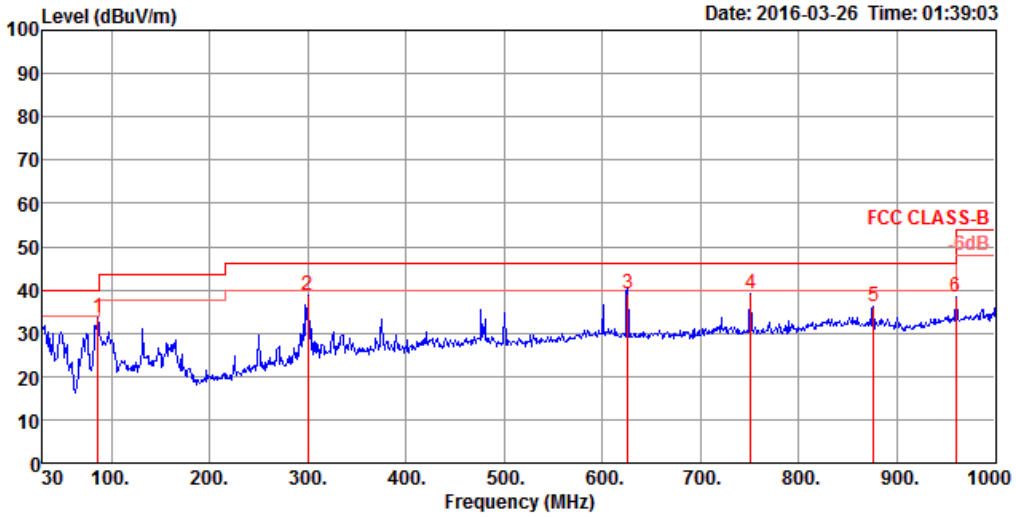
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

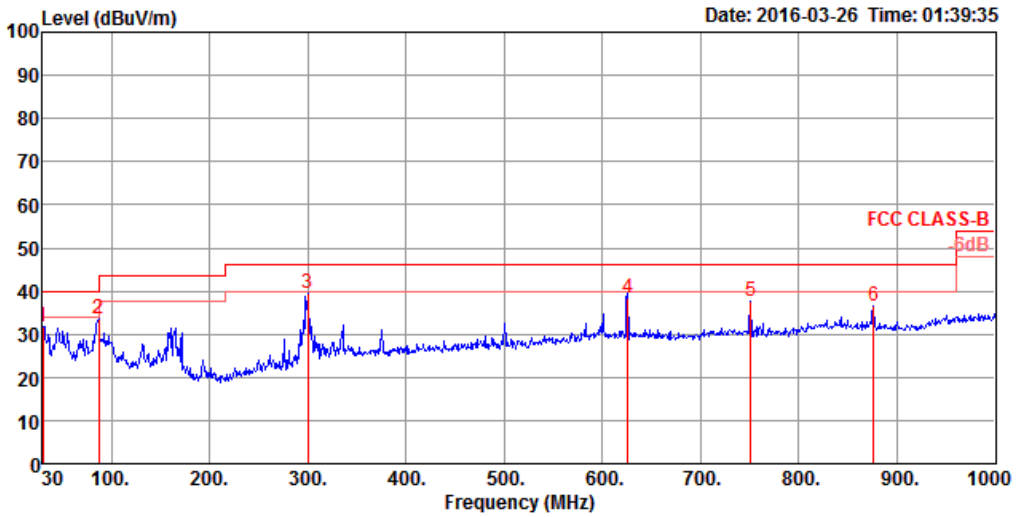
Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	Normal Link

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	86.26	33.75	40.00	-6.25	50.52	0.81	14.81	32.39	150	2	Peak	HORIZONTAL
2	299.66	38.86	46.00	-7.14	49.68	1.48	19.98	32.28	100	305	Peak	HORIZONTAL
3	625.58	39.25	46.00	-6.75	43.72	2.16	25.77	32.40	150	302	QP	HORIZONTAL
4	750.71	39.27	46.00	-6.73	42.80	2.37	26.40	32.30	150	94	Peak	HORIZONTAL
5	875.84	36.21	46.00	-9.79	37.97	2.55	27.55	31.86	250	90	Peak	HORIZONTAL
6	960.23	38.41	54.00	-15.59	38.71	2.69	28.20	31.19	100	164	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.00	31.67	40.00	-8.33	37.98	0.49	25.60	32.40	125	157	Peak	VERTICAL
2	87.23	33.59	40.00	-6.41	50.19	0.81	14.98	32.39	250	360	Peak	VERTICAL
3	299.66	39.64	46.00	-6.36	50.46	1.48	19.98	32.28	200	151	Peak	VERTICAL
4	625.58	38.50	46.00	-7.50	42.97	2.16	25.77	32.40	100	96	QP	VERTICAL
5	750.71	37.46	46.00	-8.54	40.99	2.37	26.40	32.30	100	130	Peak	VERTICAL
6	875.84	36.56	46.00	-9.44	38.32	2.55	27.55	31.86	125	143	Peak	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB 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.

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 36 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15538.91	60.47	74.00	-13.53	43.78	13.38	38.45	35.14	150	327	Peak	HORIZONTAL
2	15539.69	47.43	54.00	-6.57	30.74	13.38	38.45	35.14	150	327	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15537.91	60.55	74.00	-13.45	43.86	13.38	38.45	35.14	150	36	Peak	VERTICAL
2	15539.49	47.29	54.00	-6.71	30.60	13.38	38.45	35.14	150	36	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 40 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15600.92	48.77	54.00	-5.23	32.24	13.38	38.34	35.19	143	58	Average	HORIZONTAL
2	15601.96	62.47	74.00	-11.53	45.94	13.38	38.34	35.19	143	58	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.49	64.78	74.00	-9.22	48.17	13.38	38.39	35.16	157	75	Peak	VERTICAL
2	15599.90	49.41	54.00	-4.59	32.80	13.38	38.39	35.16	157	75	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 48 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15720.25	62.56	74.00	-11.44	46.18	13.39	38.23	35.24	138	130	Peak	HORIZONTAL
2	15720.37	48.69	54.00	-5.31	32.31	13.39	38.23	35.24	138	130	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15718.80	48.82	54.00	-5.18	32.44	13.39	38.23	35.24	145	89	Average	VERTICAL
2	15719.11	63.52	74.00	-10.48	47.14	13.39	38.23	35.24	145	89	Peak	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 149 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.66	60.52	74.00	-13.48	44.82	10.75	39.70	34.75	286	265	Peak	HORIZONTAL
2	11489.73	46.69	54.00	-7.31	30.99	10.75	39.70	34.75	286	265	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.35	47.72	54.00	-6.28	32.02	10.75	39.70	34.75	201	20	Average	VERTICAL
2	11490.36	61.77	74.00	-12.23	46.07	10.75	39.70	34.75	201	20	Peak	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 157 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.50	50.77	54.00	-3.23	35.12	10.76	39.65	34.76	129	158	Average	HORIZONTAL
2	11569.90	63.97	74.00	-10.03	48.32	10.76	39.65	34.76	129	158	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.30	66.26	74.00	-7.74	50.61	10.76	39.65	34.76	195	24	Peak	VERTICAL
2	11569.50	50.39	54.00	-3.61	34.74	10.76	39.65	34.76	195	24	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.93	48.35	54.00	-5.65	32.76	10.77	39.59	34.77	227	262	Average	HORIZONTAL
2	11648.43	61.42	74.00	-12.58	45.83	10.77	39.59	34.77	227	262	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.61	62.31	74.00	-11.69	46.72	10.77	39.59	34.77	265	10	Peak	VERTICAL
2	11649.73	48.55	54.00	-5.45	32.96	10.77	39.59	34.77	265	10	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15539.81	46.79	54.00	-7.21	30.10	13.38	38.45	35.14	150	252	Average	HORIZONTAL
2	15539.99	59.75	74.00	-14.25	43.06	13.38	38.45	35.14	150	252	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15537.67	59.50	74.00	-14.50	42.81	13.38	38.45	35.14	150	218	Peak	VERTICAL
2	15538.31	46.71	54.00	-7.29	30.02	13.38	38.45	35.14	150	218	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15598.95	47.63	54.00	-6.37	31.02	13.38	38.39	35.16	148	52	Average	HORIZONTAL
2	15599.25	60.76	74.00	-13.24	44.15	13.38	38.39	35.16	148	52	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15601.56	62.81	74.00	-11.19	46.28	13.38	38.34	35.19	155	89	Peak	VERTICAL
2	15601.87	48.67	54.00	-5.33	32.14	13.38	38.34	35.19	155	89	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15719.99	59.79	74.00	-14.21	43.41	13.39	38.23	35.24	153	271	Peak	HORIZONTAL
2	15722.28	46.11	54.00	-7.89	29.73	13.39	38.23	35.24	153	271	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15719.56	63.52	74.00	-10.48	47.14	13.39	38.23	35.24	169	14	Peak	VERTICAL
2	15720.55	48.22	54.00	-5.78	31.84	13.39	38.23	35.24	169	14	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11487.76	47.46	54.00	-6.54	31.76	10.75	39.70	34.75	224	275	Average	HORIZONTAL
2	11488.73	60.51	74.00	-13.49	44.81	10.75	39.70	34.75	224	275	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11488.81	61.78	74.00	-12.22	46.08	10.75	39.70	34.75	203	324	Peak	VERTICAL
2	11490.19	47.96	54.00	-6.04	32.26	10.75	39.70	34.75	203	324	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.20	64.56	74.00	-9.44	48.91	10.76	39.65	34.76	129	155	Peak	HORIZONTAL
2	11569.30	50.49	54.00	-3.51	34.84	10.76	39.65	34.76	129	155	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.90	49.98	54.00	-4.02	34.33	10.76	39.65	34.76	192	17	Average	VERTICAL
2	11570.80	63.11	74.00	-10.89	47.46	10.76	39.65	34.76	192	17	Peak	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11648.67	60.12	74.00	-13.88	44.53	10.77	39.59	34.77	227	144	Peak	HORIZONTAL
2	11649.11	46.73	54.00	-7.27	31.14	10.77	39.59	34.77	227	144	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.72	48.09	54.00	-5.91	32.50	10.77	39.59	34.77	227	326	Average	VERTICAL
2	11648.13	62.42	74.00	-11.58	46.83	10.77	39.59	34.77	227	326	Peak	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15569.00	59.84	74.00	-14.16	43.23	13.38	38.39	35.16	150	316	Peak	HORIZONTAL
2	15571.12	46.40	54.00	-7.60	29.79	13.38	38.39	35.16	150	316	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15568.86	59.17	74.00	-14.83	42.56	13.38	38.39	35.16	150	283	Peak	VERTICAL
2	15570.34	46.39	54.00	-7.61	29.78	13.38	38.39	35.16	150	283	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15688.04	46.71	54.00	-7.29	30.25	13.39	38.28	35.21	150	254	Average	HORIZONTAL
2	15691.66	60.66	74.00	-13.34	44.28	13.39	38.23	35.24	150	254	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15690.40	60.30	74.00	-13.70	43.84	13.39	38.28	35.21	150	216	Peak	VERTICAL
2	15690.57	46.79	54.00	-7.21	30.33	13.39	38.28	35.21	150	216	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11509.28	43.72	54.00	-10.28	28.02	10.75	39.70	34.75	150	298	Average	HORIZONTAL
2	11510.45	57.02	74.00	-16.98	41.32	10.75	39.70	34.75	150	298	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11507.95	56.58	74.00	-17.42	40.88	10.75	39.70	34.75	150	257	Peak	VERTICAL
2	11509.23	43.52	54.00	-10.48	27.82	10.75	39.70	34.75	150	257	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11587.59	47.02	54.00	-6.98	31.41	10.76	39.62	34.77	227	263	Average	HORIZONTAL
2	11588.14	61.64	74.00	-12.36	46.03	10.76	39.62	34.77	227	263	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11589.08	48.06	54.00	-5.94	32.45	10.76	39.62	34.77	203	2	Average	VERTICAL
2	11590.53	61.77	74.00	-12.23	46.16	10.76	39.62	34.77	203	2	Peak	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15628.38	46.48	54.00	-7.52	29.95	13.38	38.34	35.19	150	25	Average	HORIZONTAL
2	15629.05	59.49	74.00	-14.51	42.96	13.38	38.34	35.19	150	25	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15627.74	59.73	74.00	-14.27	43.20	13.38	38.34	35.19	150	58	Peak	VERTICAL
2	15630.75	46.34	54.00	-7.66	29.81	13.38	38.34	35.19	150	58	Average	VERTICAL

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11547.69	43.73	54.00	-10.27	28.07	10.75	39.67	34.76	150	90	Average	HORIZONTAL
2	11547.84	57.52	74.00	-16.48	41.86	10.75	39.67	34.76	150	90	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11548.11	43.76	54.00	-10.24	28.10	10.75	39.67	34.76	150	131	Average	VERTICAL
2	11548.28	56.70	74.00	-17.30	41.04	10.75	39.67	34.76	150	131	Peak	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.

4.7. Band Edge Emissions Measurement

4.7.1. 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

4.7.2. 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	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

4.7.3. Test Procedures

1. The test procedure is the same as section 4.6.3.

4.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.6.4.

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 transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 36, 40, 48 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 07, 2016		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5147.80	51.03	54.00	-2.97	43.61	7.48	34.85	34.91	214	270	Average	VERTICAL
2	5147.80	72.44	74.00	-1.56	65.02	7.48	34.85	34.91	214	270	Peak	VERTICAL
3	5177.60	104.61			97.16	7.48	34.88	34.91	214	270	Average	VERTICAL
4	5177.80	116.90			109.45	7.48	34.88	34.91	214	270	Peak	VERTICAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.60	70.87	74.00	-3.13	63.45	7.48	34.85	34.91	225	258	Peak	VERTICAL
2	5150.00	52.63	54.00	-1.37	45.21	7.48	34.85	34.91	225	258	Average	VERTICAL
3	5200.80	107.69			100.22	7.48	34.90	34.91	225	258	Average	VERTICAL
4	5200.80	119.60			112.13	7.48	34.90	34.91	225	258	Peak	VERTICAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.20	62.14	74.00	-11.86	54.72	7.48	34.85	34.91	208	270	Peak	VERTICAL
2	5150.00	48.49	54.00	-5.51	41.07	7.48	34.85	34.91	208	270	Average	VERTICAL
3	5237.00	121.69			114.16	7.50	34.94	34.91	208	270	Peak	VERTICAL
4	5237.60	108.89			101.36	7.50	34.94	34.91	208	270	Average	VERTICAL
5	5350.00	48.87	54.00	-5.13	41.17	7.56	35.05	34.91	208	270	Average	VERTICAL
6	5350.00	60.95	74.00	-13.05	53.25	7.56	35.05	34.91	208	270	Peak	VERTICAL

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11a CH 149, 157, 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 07, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5712.80	49.01	54.00	-4.99	40.90	7.81	35.24	34.94	208	9	Average	VERTICAL
2	5714.20	71.11	74.00	-2.89	63.00	7.81	35.24	34.94	208	9	Peak	VERTICAL
3	5724.20	77.14	78.20	-1.06	69.04	7.79	35.25	34.94	208	9	Peak	VERTICAL
4	5742.40	115.64			107.56	7.77	35.25	34.94	208	9	Peak	VERTICAL
5	5742.80	102.93			94.85	7.77	35.25	34.94	208	9	Average	VERTICAL

Item 4, 5 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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5713.00	60.38	74.00	-13.62	52.27	7.81	35.24	34.94	225	289	Peak	HORIZONTAL
2	5715.00	47.47	54.00	-6.53	39.36	7.81	35.24	34.94	225	289	Average	HORIZONTAL
3	5722.60	60.85	78.20	-17.35	52.75	7.79	35.25	34.94	225	289	Peak	HORIZONTAL
4	5791.00	104.72			96.70	7.71	35.26	34.95	225	289	Average	HORIZONTAL
5	5791.40	115.46			107.44	7.71	35.26	34.95	225	289	Peak	HORIZONTAL
6	5855.20	61.84	78.20	-16.36	53.73	7.80	35.27	34.96	225	289	Peak	HORIZONTAL
7	5860.00	48.24	54.00	-5.76	40.11	7.82	35.27	34.96	225	289	Average	HORIZONTAL
8	5865.20	60.80	74.00	-13.20	52.67	7.82	35.27	34.96	225	289	Peak	HORIZONTAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5819.00	100.28			92.23	7.74	35.26	34.95	223	266	Average	HORIZONTAL
2	5819.00	112.89			104.84	7.74	35.26	34.95	223	266	Peak	HORIZONTAL
3	5850.60	77.14	78.20	-1.06	69.03	7.80	35.27	34.96	223	266	Peak	HORIZONTAL
4	5860.00	71.07	74.00	-2.93	62.94	7.82	35.27	34.96	223	266	Peak	HORIZONTAL
5	5860.40	48.94	54.00	-5.06	40.81	7.82	35.27	34.96	223	266	Average	HORIZONTAL

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 07, 2016		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5147.60	51.97	54.00	-2.03	44.55	7.48	34.85	34.91	240	258	Average	VERTICAL
2	5148.20	72.34	74.00	-1.66	64.92	7.48	34.85	34.91	240	258	Peak	VERTICAL
3	5185.40	106.31			98.86	7.48	34.88	34.91	240	258	Average	VERTICAL
4	5186.00	116.84			109.39	7.48	34.88	34.91	240	258	Peak	VERTICAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.00	70.73	74.00	-3.27	63.31	7.48	34.85	34.91	225	271	Peak	VERTICAL
2	5149.60	52.90	54.00	-1.10	45.48	7.48	34.85	34.91	225	271	Average	VERTICAL
3	5192.40	108.45			100.98	7.48	34.90	34.91	225	271	Average	VERTICAL
4	5205.20	119.68			112.19	7.49	34.91	34.91	225	271	Peak	VERTICAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.40	48.96	54.00	-5.04	41.54	7.48	34.85	34.91	218	270	Average	VERTICAL
2	5149.40	61.51	74.00	-12.49	54.09	7.48	34.85	34.91	218	270	Peak	VERTICAL
3	5232.20	109.05			101.52	7.50	34.94	34.91	218	270	Average	VERTICAL
4	5245.40	119.72			112.19	7.50	34.94	34.91	218	270	Peak	VERTICAL
5	5351.80	49.17	54.00	-4.83	41.47	7.56	35.05	34.91	218	270	Average	VERTICAL
6	5351.80	61.77	74.00	-12.23	54.07	7.56	35.05	34.91	218	270	Peak	VERTICAL

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 07, 2016 / Apr. 08, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.40	67.93	74.00	-6.07	59.82	7.81	35.24	34.94	218	2	Peak	VERTICAL
2	5712.60	49.09	54.00	-4.91	40.98	7.81	35.24	34.94	218	2	Average	VERTICAL
3	5724.80	76.88	78.20	-1.32	68.78	7.79	35.25	34.94	218	2	Peak	VERTICAL
4	5746.60	103.07			94.99	7.77	35.25	34.94	218	2	Average	VERTICAL
5	5749.00	113.42			105.34	7.77	35.25	34.94	218	2	Peak	VERTICAL

Item 4, 5 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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5714.60	47.61	54.00	-6.39	39.50	7.81	35.24	34.94	223	284	Average	HORIZONTAL
2	5715.00	59.00	74.00	-15.00	50.89	7.81	35.24	34.94	223	284	Peak	HORIZONTAL
3	5721.40	60.60	78.20	-17.60	52.49	7.81	35.24	34.94	223	284	Peak	HORIZONTAL
4	5777.00	102.87			94.83	7.73	35.26	34.95	223	284	Average	HORIZONTAL
5	5779.80	113.81			105.77	7.73	35.26	34.95	223	284	Peak	HORIZONTAL
6	5850.00	61.28	78.20	-16.92	53.17	7.80	35.27	34.96	223	284	Peak	HORIZONTAL
7	5860.40	48.23	54.00	-5.77	40.10	7.82	35.27	34.96	223	284	Average	HORIZONTAL
8	5860.80	60.80	74.00	-13.20	52.67	7.82	35.27	34.96	223	284	Peak	HORIZONTAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5831.40	104.24			96.15	7.77	35.27	34.95	195	1	Average	VERTICAL
2	5833.00	114.84			106.75	7.77	35.27	34.95	195	1	Peak	VERTICAL
3	5853.60	76.92	78.20	-1.28	68.81	7.80	35.27	34.96	195	1	Peak	VERTICAL
4	5860.00	48.90	54.00	-5.10	40.77	7.82	35.27	34.96	195	1	Average	VERTICAL
5	5861.00	68.34	74.00	-5.66	60.21	7.82	35.27	34.96	195	1	Peak	VERTICAL

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5145.00	52.21	54.00	-1.79	44.79	7.48	34.85	34.91	226	271	Average	VERTICAL
2	5148.00	65.27	74.00	-8.73	57.85	7.48	34.85	34.91	226	271	Peak	VERTICAL
3	5184.00	109.91			102.46	7.48	34.88	34.91	226	271	Peak	VERTICAL
4	5205.00	100.51			93.02	7.49	34.91	34.91	226	271	Average	VERTICAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5145.00	51.65	54.00	-2.35	44.23	7.48	34.85	34.91	244	277	Average	VERTICAL
2	5147.00	65.28	74.00	-8.72	57.86	7.48	34.85	34.91	244	277	Peak	VERTICAL
3	5225.00	114.25			106.73	7.50	34.93	34.91	244	277	Peak	VERTICAL
4	5226.00	105.43			97.91	7.50	34.93	34.91	244	277	Average	VERTICAL

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

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	52.46	54.00	-1.54	44.35	7.81	35.24	34.94	226	280	Average	HORIZONTAL
2	5715.00	68.20	74.00	-5.80	60.09	7.81	35.24	34.94	226	280	Peak	HORIZONTAL
3	5723.00	72.30	78.20	-5.90	64.20	7.79	35.25	34.94	226	280	Peak	HORIZONTAL
4	5757.00	97.33			89.28	7.75	35.25	34.95	226	280	Average	HORIZONTAL
5	5758.00	106.93			98.88	7.75	35.25	34.95	226	280	Peak	HORIZONTAL

Item 4, 5 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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5789.00	102.61			94.59	7.71	35.26	34.95	225	283	Average	HORIZONTAL
2	5790.00	112.22			104.20	7.71	35.26	34.95	225	283	Peak	HORIZONTAL
3	5853.00	76.50	78.20	-1.70	68.39	7.80	35.27	34.96	225	283	Peak	HORIZONTAL
4	5860.00	52.00	54.00	-2.00	43.87	7.82	35.27	34.96	225	283	Average	HORIZONTAL
5	5862.00	71.14	74.00	-2.86	63.01	7.82	35.27	34.96	225	283	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5795 MHz.

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	Apr. 08, 2016		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.00	52.23	54.00	-1.77	44.81	7.48	34.85	34.91	220	263	Average	VERTICAL
2	5149.00	67.56	74.00	-6.44	60.14	7.48	34.85	34.91	220	263	Peak	VERTICAL
3	5227.00	104.12			96.60	7.50	34.93	34.91	220	263	Peak	VERTICAL
4	5228.00	94.86			87.34	7.50	34.93	34.91	220	263	Average	VERTICAL

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	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5704.00	52.72	54.00	-1.28	44.60	7.82	35.24	34.94	225	266	Average	HORIZONTAL
2	5714.00	65.28	74.00	-8.72	57.17	7.81	35.24	34.94	225	266	Peak	HORIZONTAL
3	5724.00	69.83	78.20	-8.37	61.73	7.79	35.25	34.94	225	266	Peak	HORIZONTAL
4	5763.00	91.02			82.97	7.75	35.25	34.95	225	266	Average	HORIZONTAL
5	5782.00	100.69			92.65	7.73	35.26	34.95	225	266	Peak	HORIZONTAL
6	5851.00	67.21	78.20	-10.99	59.10	7.80	35.27	34.96	225	266	Peak	HORIZONTAL
7	5861.00	52.97	54.00	-1.03	44.84	7.82	35.27	34.96	225	266	Average	HORIZONTAL
8	5864.00	68.02	74.00	-5.98	59.89	7.82	35.27	34.96	225	266	Peak	HORIZONTAL

Item 4, 5 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

4.8. Frequency Stability Measurement

4.8.1. 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).

4.8.2. Measuring Instruments and Setting

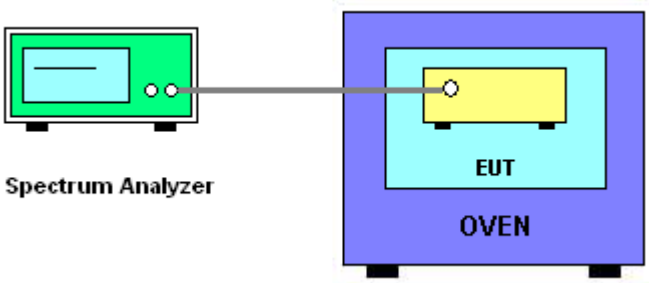
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. 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 0°C~40°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	22.2°C	Humidity	57%
Test Engineer	Andy Tsai	Test Date	May 03, 2016

Mode: 20 MHz / Ant. 4

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9917	5199.9908	5199.9903	5199.9899
110.00	5199.9914	5199.9912	5199.9905	5199.9898
93.50	5199.9909	5199.9905	5199.9904	5199.9899
Max. Deviation (MHz)	0.0091	0.0095	0.0097	0.0102
Max. Deviation (ppm)	1.75	1.82	1.86	1.96
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9900	5199.9899	5199.9891	5199.9888
10	5199.9904	5199.9902	5199.9894	5199.9892
20	5199.9914	5199.9912	5199.9908	5199.9903
30	5199.9936	5199.9933	5199.9931	5199.9921
40	5199.9948	5199.9946	5199.9940	5199.9933
Max. Deviation (MHz)	0.0151	0.0152	0.0159	0.0163
Max. Deviation (ppm)	2.90	2.92	3.05	3.13
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9917	5784.9915	5784.9907	5784.9898
110.00	5784.9914	5784.9912	5784.9909	5784.9907
93.50	5784.9910	5784.9901	5784.9900	5784.9899
Max. Deviation (MHz)	0.0090	0.0099	0.0100	0.0102
Max. Deviation (ppm)	1.55	1.71	1.73	1.76
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9890	5784.9882	5784.9876	5784.9870
10	5784.9898	5784.9888	5784.9880	5784.9878
20	5784.9914	5784.9912	5784.9905	5784.9900
30	5784.9936	5784.9927	5784.9925	5784.9918
40	5784.9949	5784.9942	5784.9932	5784.9925
Max. Deviation (MHz)	0.0133	0.0138	0.0148	0.0149
Max. Deviation (ppm)	2.30	2.38	2.55	2.57
Result	Complies			

Mode: 40 MHz / Ant. 4

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9923	5189.9918	5189.9909	5189.9903
110.00	5189.9914	5189.9905	5189.9895	5189.9885
93.50	5189.9912	5189.9907	5189.9901	5189.9896
Max. Deviation (MHz)	0.0088	0.0095	0.0105	0.0115
Max. Deviation (ppm)	1.69	1.83	2.02	2.21
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5189.9891	5189.9888	5189.9882	5189.9872
10	5189.9895	5189.9886	5189.9879	5189.9870
20	5189.9914	5189.9909	5189.9908	5189.9907
30	5189.9936	5189.9935	5189.9925	5189.9918
40	5189.9940	5189.9933	5189.9929	5189.9923
Max. Deviation (MHz)	0.0129	0.0137	0.0146	0.0150
Max. Deviation (ppm)	2.48	2.64	2.81	2.89
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9924	5754.9919	5754.9913	5754.9911
110.00	5754.9914	5754.9906	5754.9903	5754.9896
93.50	5754.9911	5754.9901	5754.9891	5754.9883
Max. Deviation (MHz)	0.0089	0.0099	0.0109	0.0117
Max. Deviation (ppm)	1.54	1.72	1.89	2.03
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9892	5754.9886	5754.9885	5754.9877
10	5754.9908	5754.9900	5754.9894	5754.9891
20	5754.9914	5754.9912	5754.9911	5754.9905
30	5754.9936	5754.9935	5754.9933	5754.9929
40	5754.9944	5754.9941	5754.9932	5754.9930
Max. Deviation (MHz)	0.0148	0.0150	0.0159	0.0168
Max. Deviation (ppm)	2.57	2.60	2.76	2.92
Result	Complies			

Mode: 80 MHz / Ant. 4

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9923	5209.9918	5209.9917	5209.9908
110.00	5209.9914	5209.9912	5209.9904	5209.9897
93.50	5209.9904	5209.9902	5209.9893	5209.9889
Max. Deviation (MHz)	0.0096	0.0098	0.0107	0.0111
Max. Deviation (ppm)	1.84	1.88	2.05	2.13
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9885	5209.9878	5209.9871	5209.9864
10	5209.9898	5209.9896	5209.9891	5209.9884
20	5209.9914	5209.9906	5209.9904	5209.9899
30	5209.9936	5209.9931	5209.9922	5209.9921
40	5209.9946	5209.9938	5209.9936	5209.9933
Max. Deviation (MHz)	0.0141	0.0151	0.0155	0.0165
Max. Deviation (ppm)	2.70	2.89	2.97	3.16
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9922	5774.9921	5774.9912	5774.9905
110.00	5774.9914	5774.9909	5774.9903	5774.9893
93.50	5774.9906	5774.9902	5774.9894	5774.9884
Max. Deviation (MHz)	0.0094	0.0098	0.0106	0.0116
Max. Deviation (ppm)	1.62	1.69	1.83	2.01
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9885	5774.9880	5774.9870	5774.9869
10	5774.9897	5774.9888	5774.9878	5774.9875
20	5774.9914	5774.9907	5774.9906	5774.9897
30	5774.9936	5774.9929	5774.9920	5774.9910
40	5774.9941	5774.9931	5774.9925	5774.9918
Max. Deviation (MHz)	0.0164	0.0167	0.0172	0.0181
Max. Deviation (ppm)	2.84	2.89	2.97	3.13
Result	Complies			

4.9. Antenna Requirements

4.9.1. 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.

4.9.2. 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
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 0216	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 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	Mar. 15, 2016	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)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	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)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	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.

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

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
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%