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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	**K7SF9K1117V2**

Product Name	AC1200 DB Wi-Fi Dual-Band AC+ Gigabit Router
Brand Name	belkin
Model No.	F9K1113v5
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. 29, 2016
Final Test Date	May 18, 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, ET Docket No. 13–49; FCC 16–24.**

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
FR4N1172-27AB	Rev. 01	Initial issue of report	Jun. 08, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	AC1200 DB Wi-Fi Dual-Band AC+ Gigabit Router
Brand Name	:	belkin
Model No.	:	F9K1113v5
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. 29, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	12.10 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	5.19 dB
4.5	15.407(a)	Power Spectral Density	Complies	20.17 dB
4.6	15.407(b)	Radiated Emissions	Complies	6.13 dB
4.7	15.407(b)	Band Edge Emissions	Complies	1.04 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	IEEE 802.11a: WLAN (1TX, 1RX) IEEE 802.11n/ac: WLAN (2TX, 2RX)
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%)	IEEE 802.11a: 25.62 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 19.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 40.09 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 81.62 MHz
Maximum Conducted Output Power	IEEE 802.11a: 23.11 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.53 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 22.25 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☐ With beamforming	☒ Without beamforming

Antenna and Band width

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

IEEE 11n/ac Spec.

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

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

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

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

3.2. Accessories

Power	Brand	Model	Rating
Adapter	LEI	MU18A2120150-A1	Input: 100-240V ~ 50/60Hz, 0.5A Output: 12V, 1.5A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	SERCOM	AC1200	PCB Antenna	I-PEX	3.71	4.03
2	SERCOM	AC1200	PCB Antenna	I-PEX	3.69	4.11

Note: The EUT has two Antennas.

<For 2.4GHz Band>

For IEEE 802.11b/g mode (1TX/1RX):

Only Chain 1 can be used as transmitting/receiving antenna.

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

Both Chain 1 and Chain 2 could transmit/receive simultaneously.

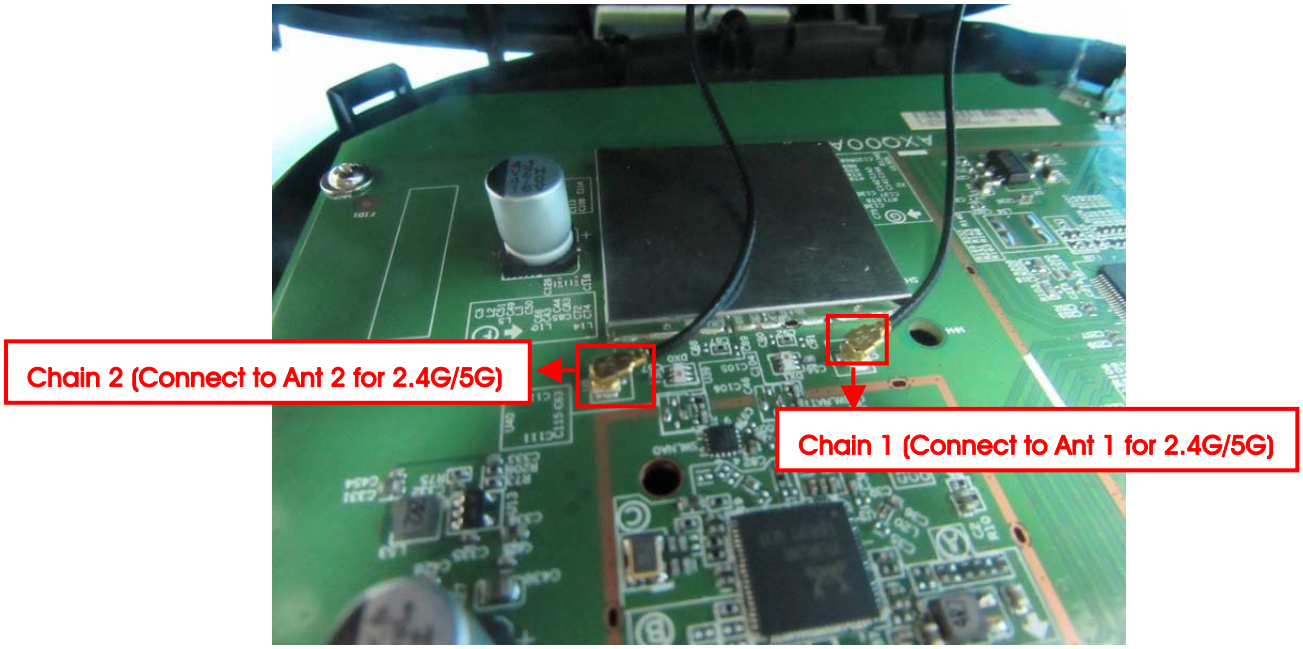
<For 5GHz Band>

For IEEE 802.11a mode (1TX/1RX):

Only Chain 1 can be used as transmitting/receiving antenna.

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

Both Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2
Power Spectral Density	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3
Band Edge Emission	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3
Frequency Stability	20 MHz	Band 4	-	157	1
	40 MHz	Band 4	-	151	1
	80 MHz	Band 4	-	155	1

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

2.The EUT can only be used at standing position.

The following test modes were performed for all tests:

For Co-location MPE Test:

The EUT could be applied with 2.4GHz WLAN function, 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA4N1172-27) test is added for simultaneously transmit between 2.4GHz WLAN function, 5GHz Band 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 Class II Change

This product is an extension of original one reported under Sporton project number: FR2O2519-03AB
Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Updating product information as below: a. Brand Name from "Belkin" to "belkin". b. Model No. from "F9K1113v4" to " F9K1113v5". c. Address from " 12045 East Waterfront Drive Playa Vista California 90094 United States" to " 12045 East Waterfront Drive, Playa Vista, CA 90094 ". 2. Removing an accessories is RJ-45 Cable*1, Non-Shielded, 1.2m.	Do not effect the test results.
3. Adding an adapter (Model No.: MU18A2120150-A1) 4. Changing the flash memory.	1. AC Power Line Conducted Emissions 2. Radiated Emissions Below 1GHz
5. Updating test rule of 5GHz band 4 to "15.407 (b)(4)(i) of New Rules (ET Docket No. 13–49; FCC 16–24)" from New Rules (ET Docket No.13–49; FCC 14-30).	1. 26dB Bandwidth and 99% Occupied Bandwidth 2. 6dB Spectrum Bandwidth 3. Maximum Conducted Output Power 4. Power Spectral Density 5. Radiated Emissions above 1GHz 6. Band Edge Emissions 7. Frequency Stability

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB <Below 1GHz>

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E4300	DoC
Flash Disk	Silicon Power	I-Series	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E6430	DoC
Flash Disk	Silicon Power	I-Series	DoC

For Test Site No: TH01-CB and 03CH01-CB <Above 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

3.9. Table for Parameters of Test Software Setting

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

Test Software Version	RTL819x 2.2.4-12/09/28					
Mode	Test Frequency (MHz)					
	5745 MHz	5785 MHz	5825 MHz	5755 MHz	5795 MHz	5775 MHz
802.11a	63	63	63	-	-	-
802.11ac MCS0/Nss1 VHT20	63/63	63/63	63/63	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	63/63	63/63	-
802.11ac MCS0/Nss1 VHT80	-	-	-	-	-	61/61

3.10. EUT Operation during Test

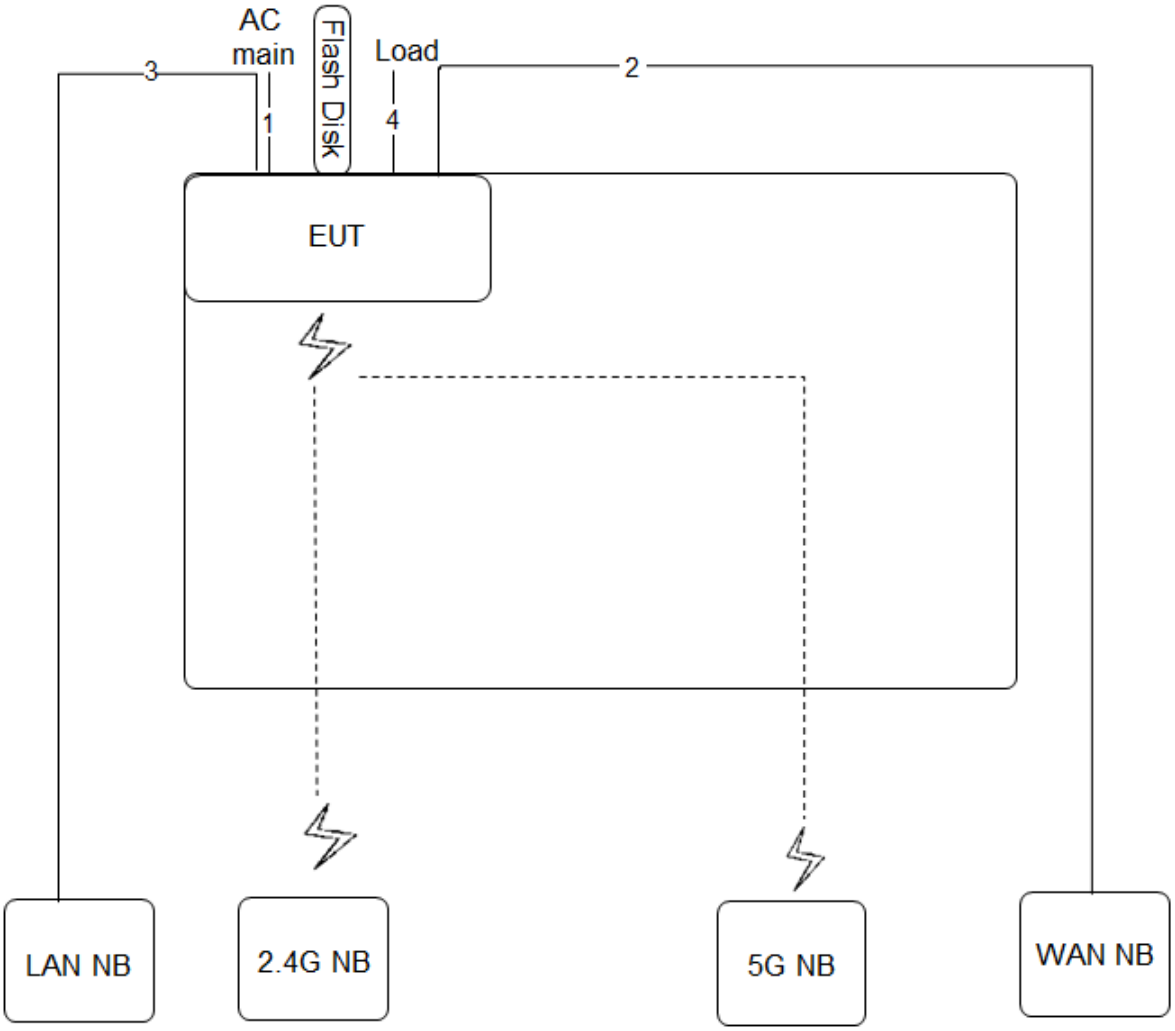
The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	1.000	1.000	100.00%	0.00	0.01
802.11ac MCS0/Nss1 VHT20	1.000	1.000	100.00%	0.00	0.01
802.11ac MCS0/Nss1 VHT40	1.000	1.000	100.00%	0.00	0.01
802.11ac MCS0/Nss1 VHT80	1.000	1.000	100.00%	0.00	0.01

3.12. Test Configurations

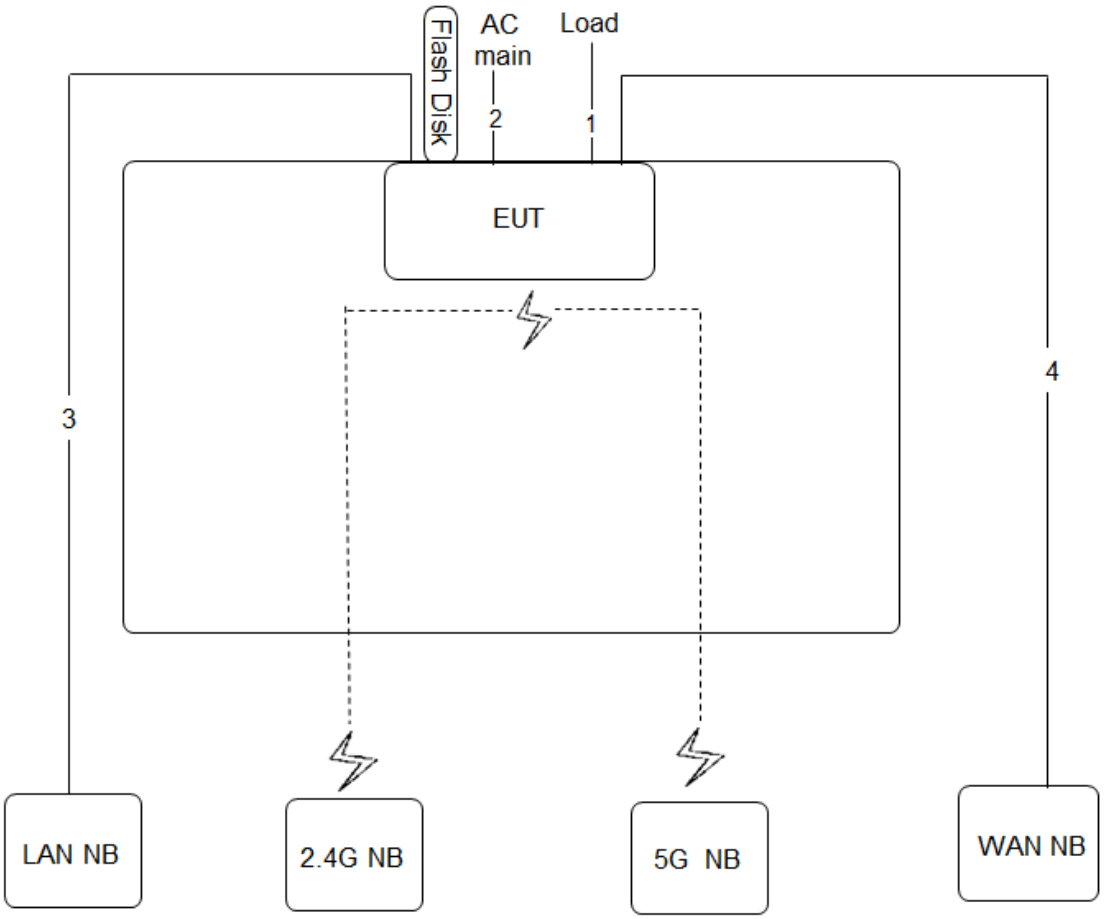
3.12.1. AC Power Line Conduction Emissions Test Configuration



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

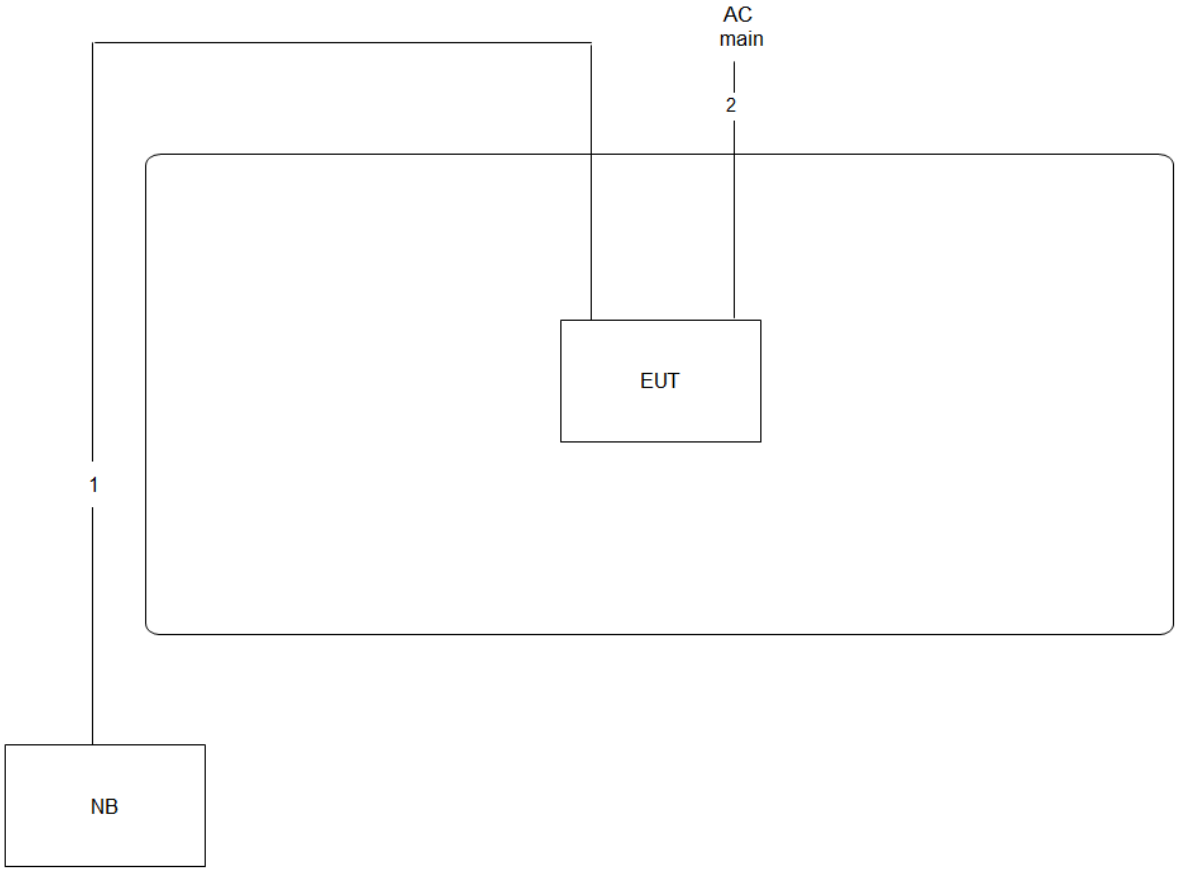
3.12.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz



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

Test Configuration: above 1GHz



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

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

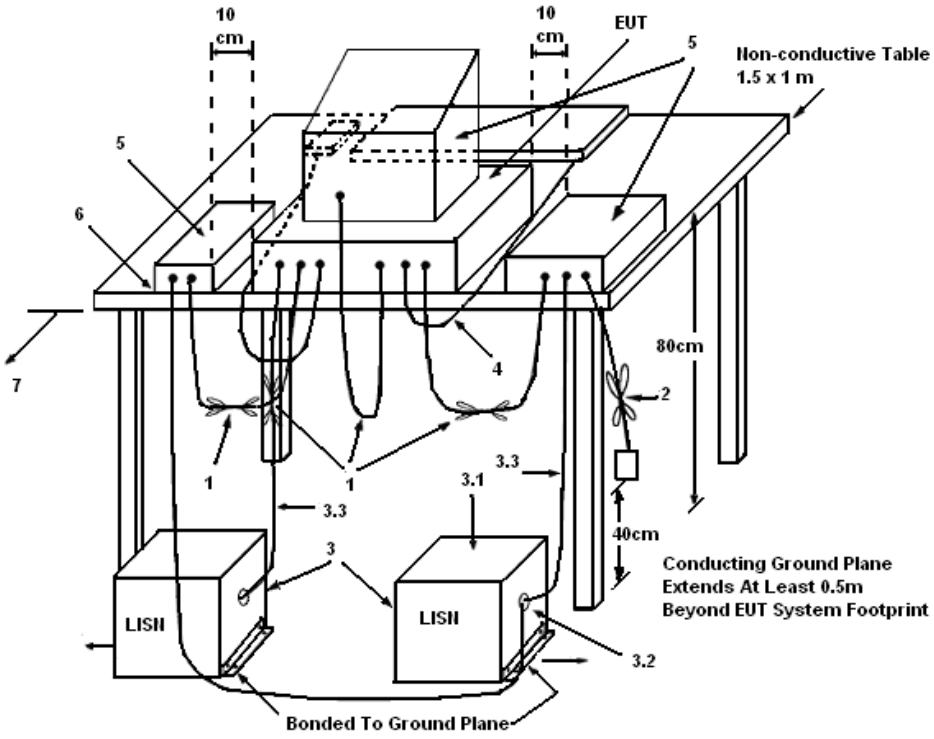
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

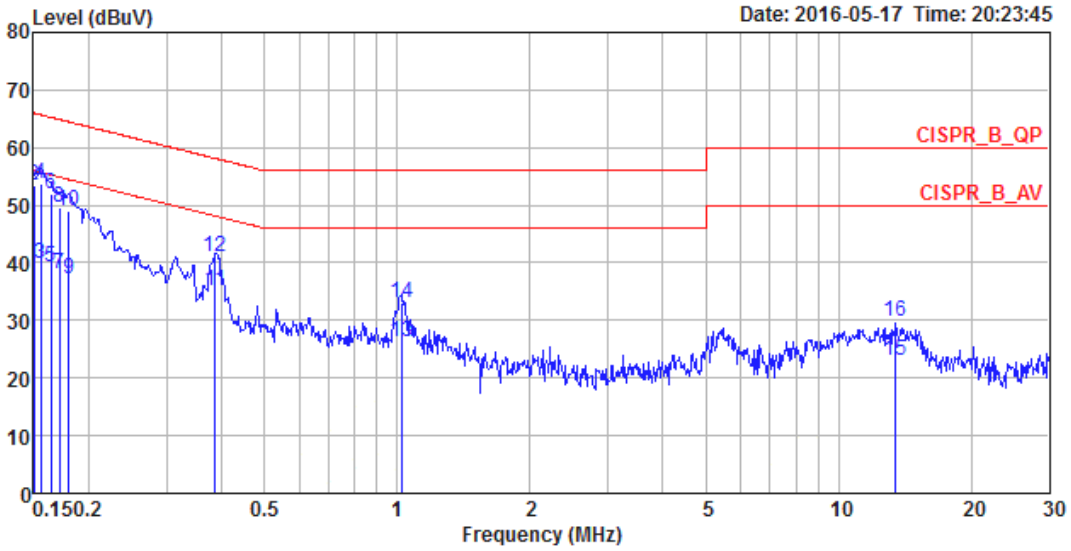
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

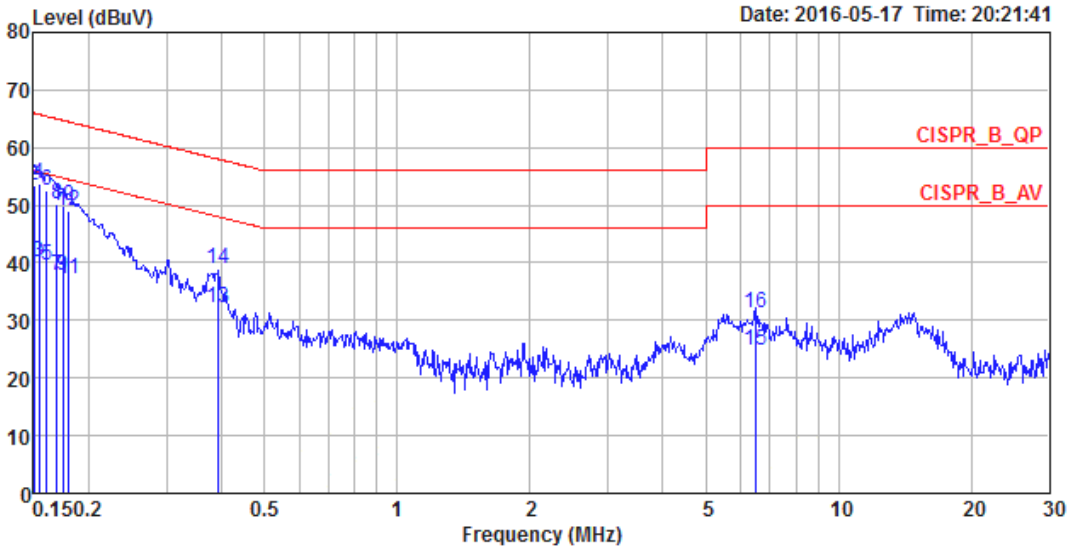
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	22°C	Humidity	66%
Test Engineer	Deven Huang	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1500	39.87	-16.13	56.00	29.83	10.02	0.02	LINE	Average
2	0.1500	53.32	-12.68	66.00	43.28	10.02	0.02	LINE	QP
3	0.1557	39.72	-15.97	55.69	29.68	10.02	0.02	LINE	Average
4	0.1557	53.59	-12.10	65.69	43.55	10.02	0.02	LINE	QP
5	0.1641	39.20	-16.05	55.25	29.16	10.02	0.02	LINE	Average
6	0.1641	51.87	-13.38	65.25	41.83	10.02	0.02	LINE	QP
7	0.1712	37.94	-16.96	54.90	27.90	10.02	0.02	LINE	Average
8	0.1712	49.67	-15.23	64.90	39.63	10.02	0.02	LINE	QP
9	0.1806	37.31	-17.15	54.46	27.37	9.92	0.02	LINE	Average
10	0.1806	48.93	-15.53	64.46	38.99	9.92	0.02	LINE	QP
11	0.3872	35.24	-12.88	48.12	25.28	9.92	0.04	LINE	Average
12	0.3872	41.14	-16.98	58.12	31.18	9.92	0.04	LINE	QP
13	1.0211	26.20	-19.80	46.00	16.21	9.94	0.05	LINE	Average
14	1.0211	33.00	-23.00	56.00	23.01	9.94	0.05	LINE	QP
15	13.4080	23.12	-26.88	50.00	12.67	10.20	0.25	LINE	Average
16	13.4080	29.85	-30.15	60.00	19.40	10.20	0.25	LINE	QP

Temperature	22°C	Humidity	66%
Test Engineer	Deven Huang	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1500	39.76	-16.24	56.00	29.72	10.02	0.02	NEUTRAL	Average
2	0.1500	53.34	-12.66	66.00	43.30	10.02	0.02	NEUTRAL	QP
3	0.1540	40.25	-15.53	55.78	30.21	10.02	0.02	NEUTRAL	Average
4	0.1540	53.64	-12.14	65.78	43.60	10.02	0.02	NEUTRAL	QP
5	0.1607	39.54	-15.89	55.43	29.50	10.02	0.02	NEUTRAL	Average
6	0.1607	52.66	-12.77	65.43	42.62	10.02	0.02	NEUTRAL	QP
7	0.1694	37.71	-17.28	54.99	27.67	10.02	0.02	NEUTRAL	Average
8	0.1694	50.28	-14.71	64.99	40.24	10.02	0.02	NEUTRAL	QP
9	0.1749	37.80	-16.92	54.72	27.86	9.92	0.02	NEUTRAL	Average
10	0.1749	49.80	-14.92	64.72	39.86	9.92	0.02	NEUTRAL	QP
11	0.1806	37.07	-17.39	54.46	27.13	9.92	0.02	NEUTRAL	Average
12	0.1806	48.99	-15.47	64.46	39.05	9.92	0.02	NEUTRAL	QP
13	0.3914	32.24	-15.79	48.03	22.28	9.92	0.04	NEUTRAL	Average
14	0.3914	38.94	-19.09	58.03	28.98	9.92	0.04	NEUTRAL	QP
15	6.4882	24.66	-25.34	50.00	14.47	10.06	0.13	NEUTRAL	Average
16	6.4882	31.41	-28.59	60.00	21.22	10.06	0.13	NEUTRAL	QP

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

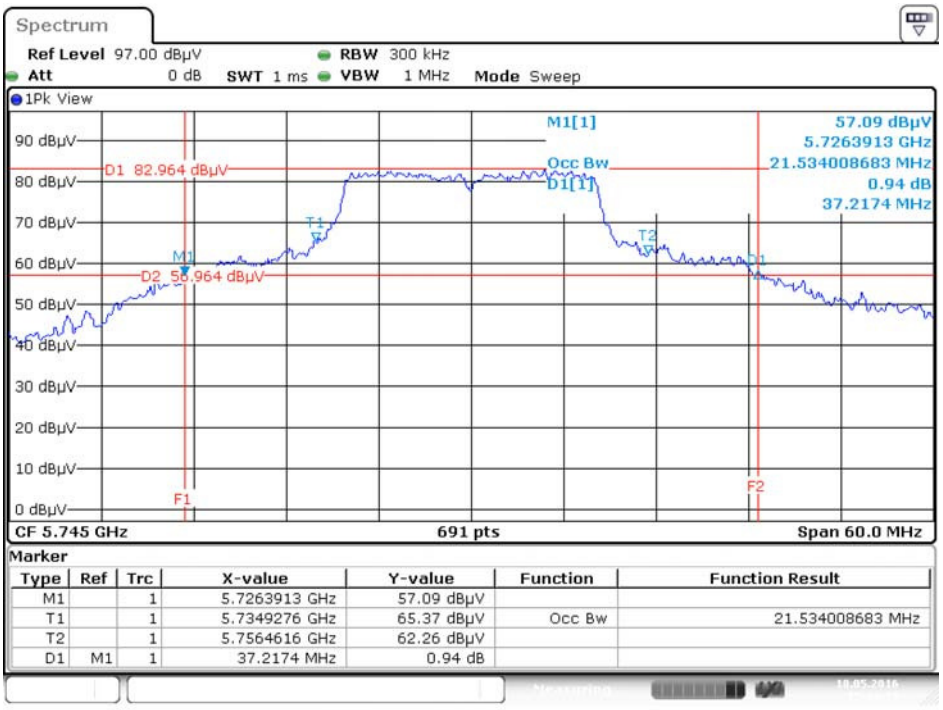
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	45%
Test Engineer	Akina Chiu		

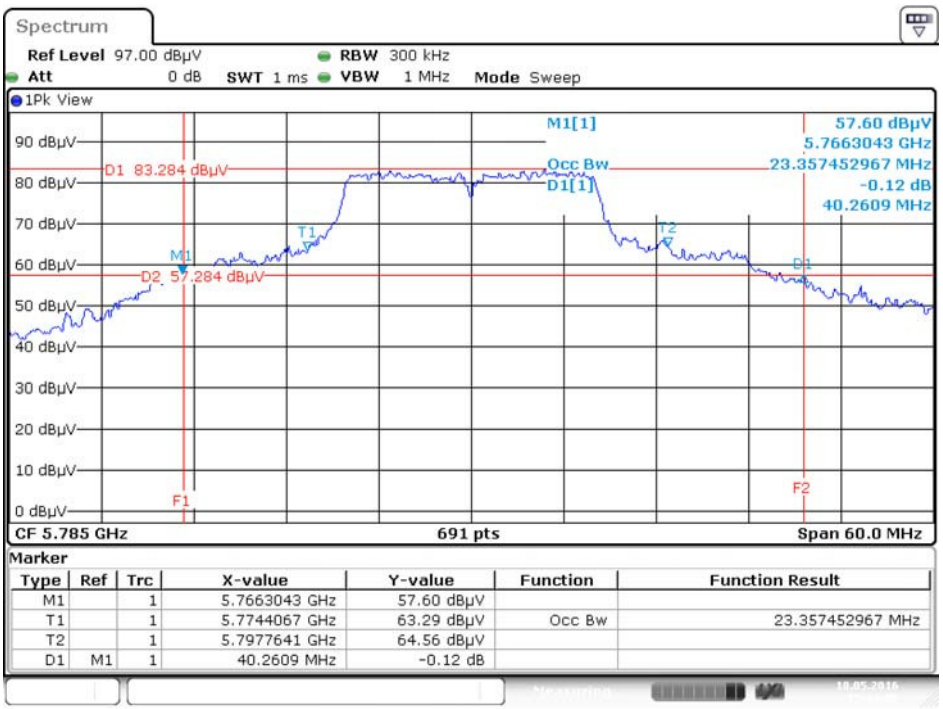
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5745 MHz	37.22	21.53
	5785 MHz	40.26	23.36
	5825 MHz	41.48	25.62
802.11ac MCS0/Nss1 VHT20	5745 MHz	37.65	18.93
	5785 MHz	38.26	19.62
	5825 MHz	39.48	19.71
802.11ac MCS0/Nss1 VHT40	5755 MHz	74.64	38.21
	5795 MHz	80.73	40.09
802.11ac MCS0/Nss1 VHT80	5775 MHz	167.83	81.62

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



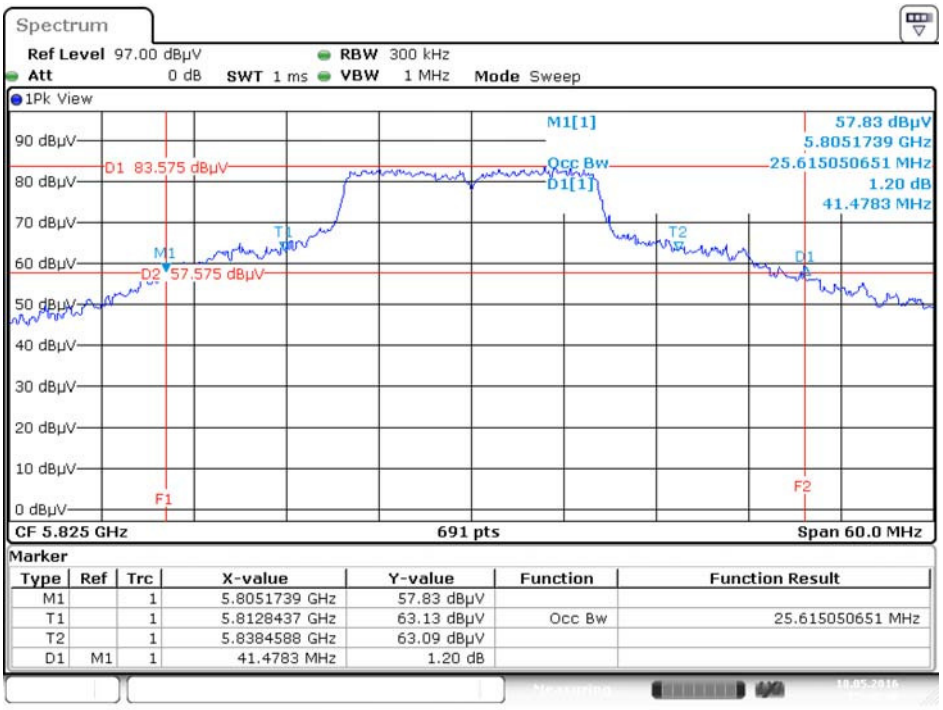
Date: 18.MAY.2016 15:44:14

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



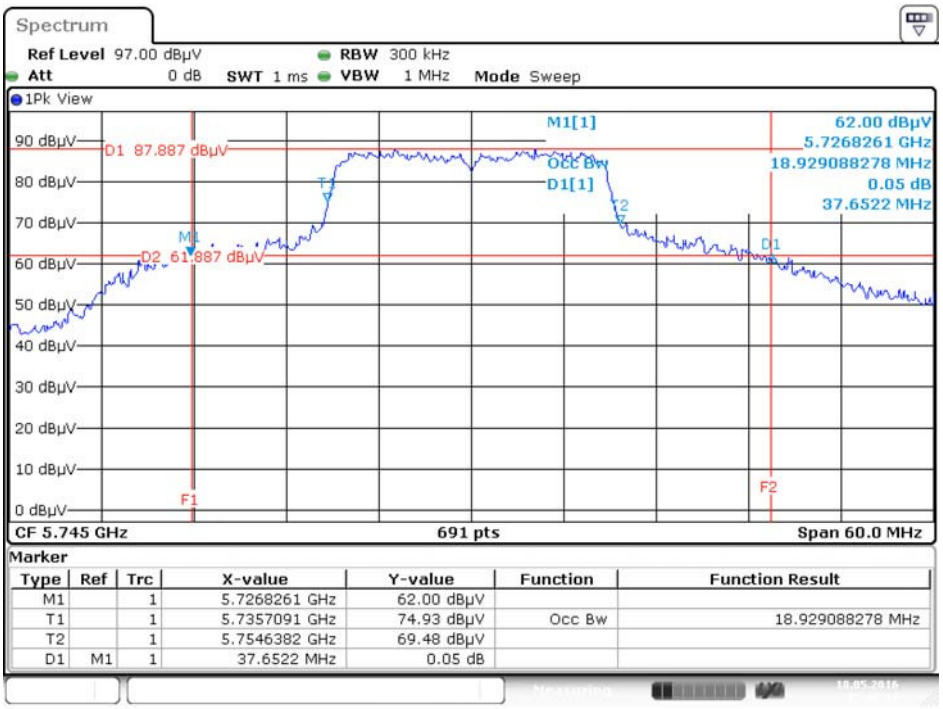
Date: 18.MAY.2016 15:44:57

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



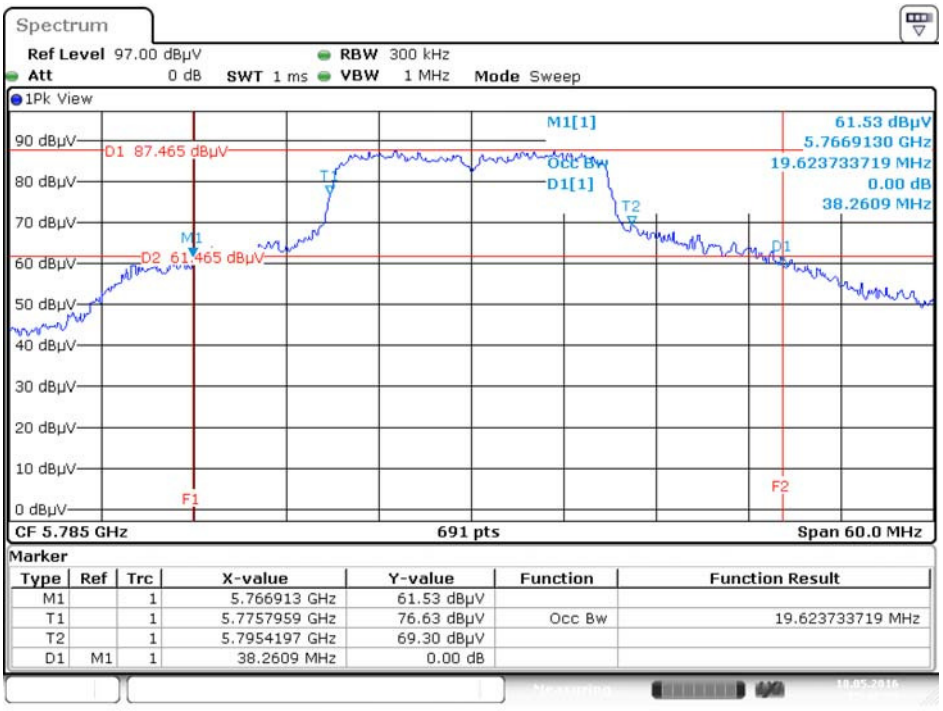
Date: 18.MAY.2016 15:45:39

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



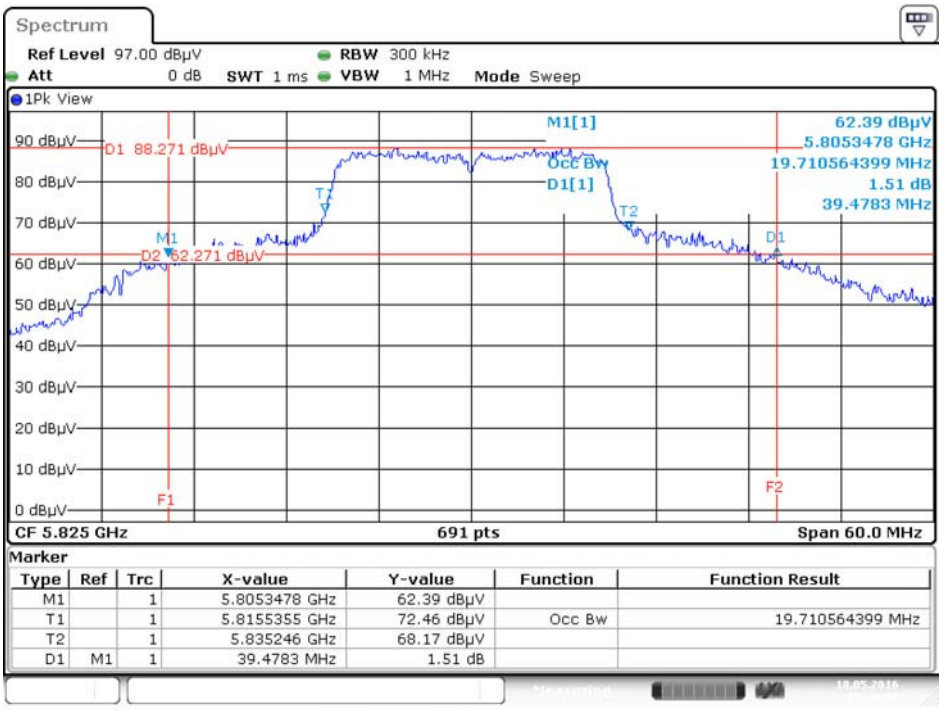
Date: 18.MAY.2016 15:47:10

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



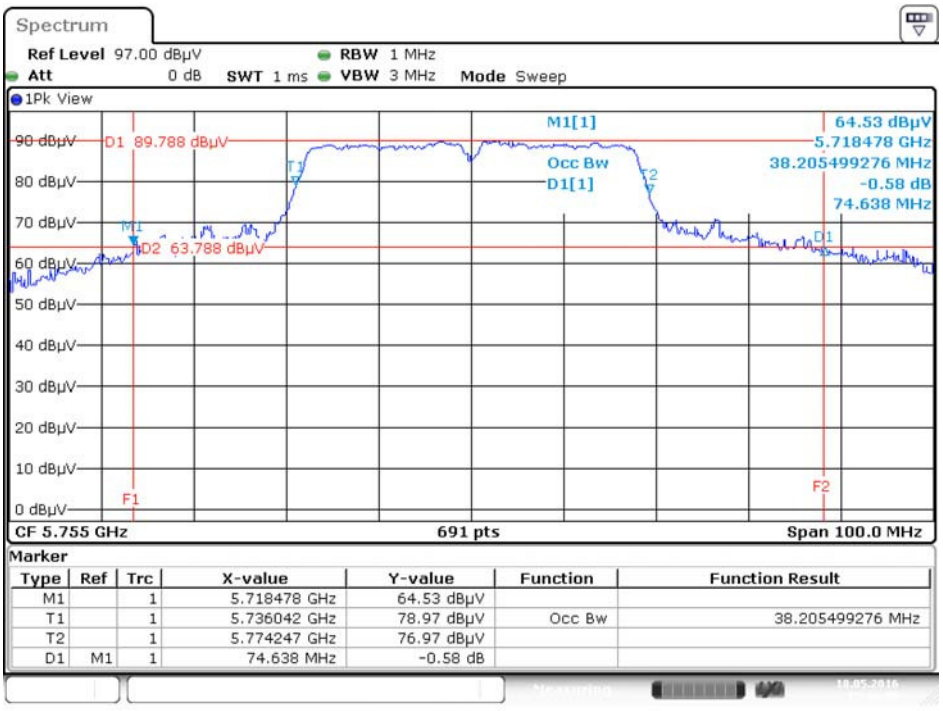
Date: 18.MAY.2016 15:47:53

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



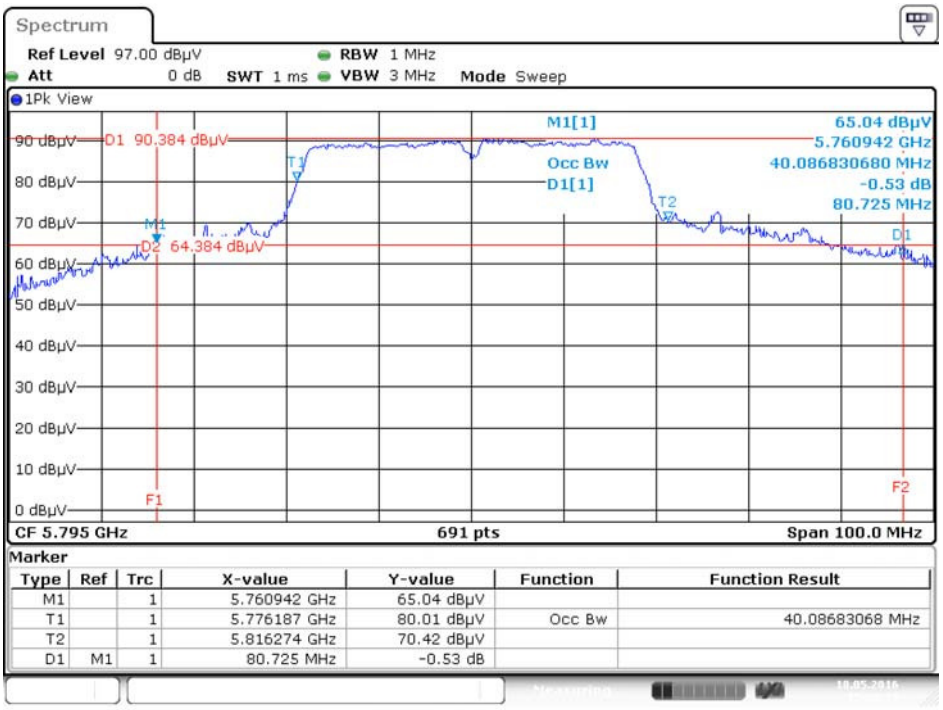
Date: 18.MAY.2016 15:48:30

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



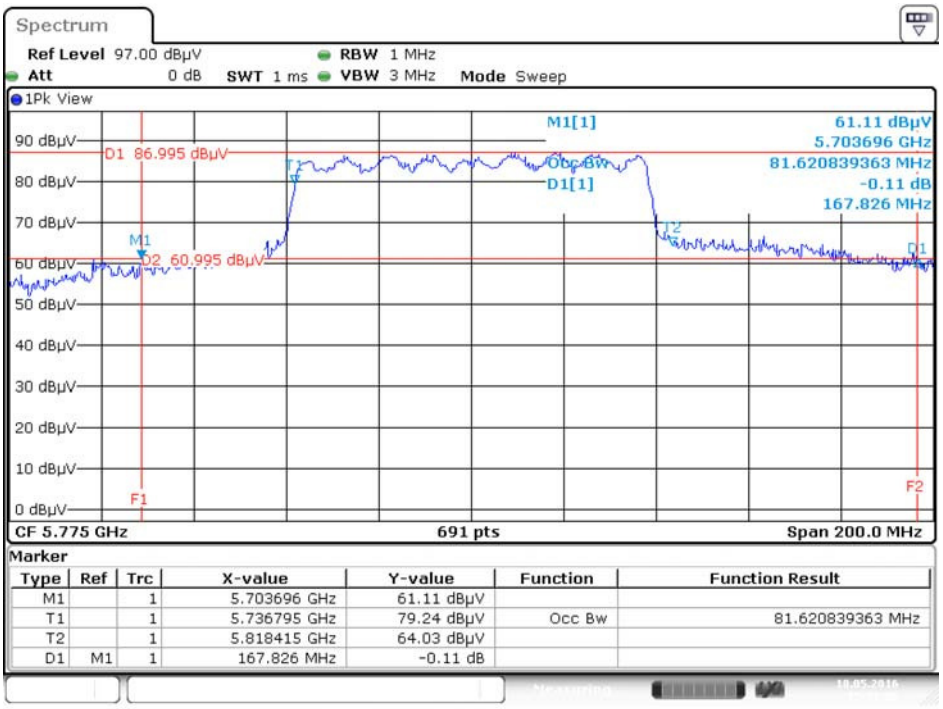
Date: 18.MAY.2016 15:50:00

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



Date: 18.MAY.2016 15:50:39

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



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

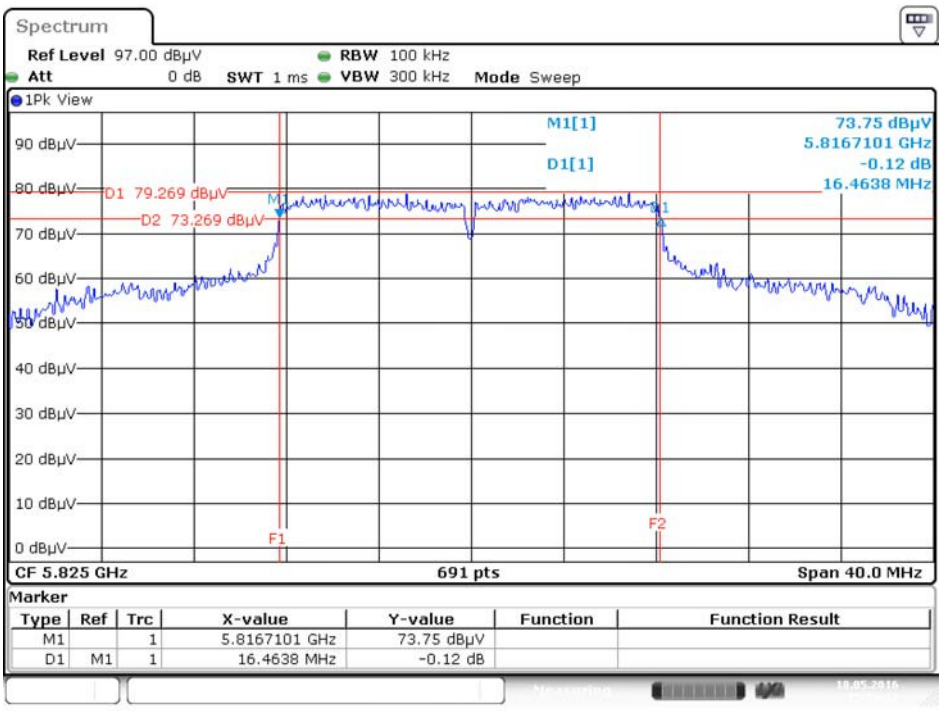
Temperature	25°C	Humidity	45%
Test Engineer	Akina Chiu		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.52	500	Complies
	5785 MHz	16.52	500	Complies
	5825 MHz	16.46	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.68	500	Complies
	5785 MHz	17.62	500	Complies
	5825 MHz	17.62	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.41	500	Complies
	5795 MHz	36.41	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	76.52	500	Complies

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

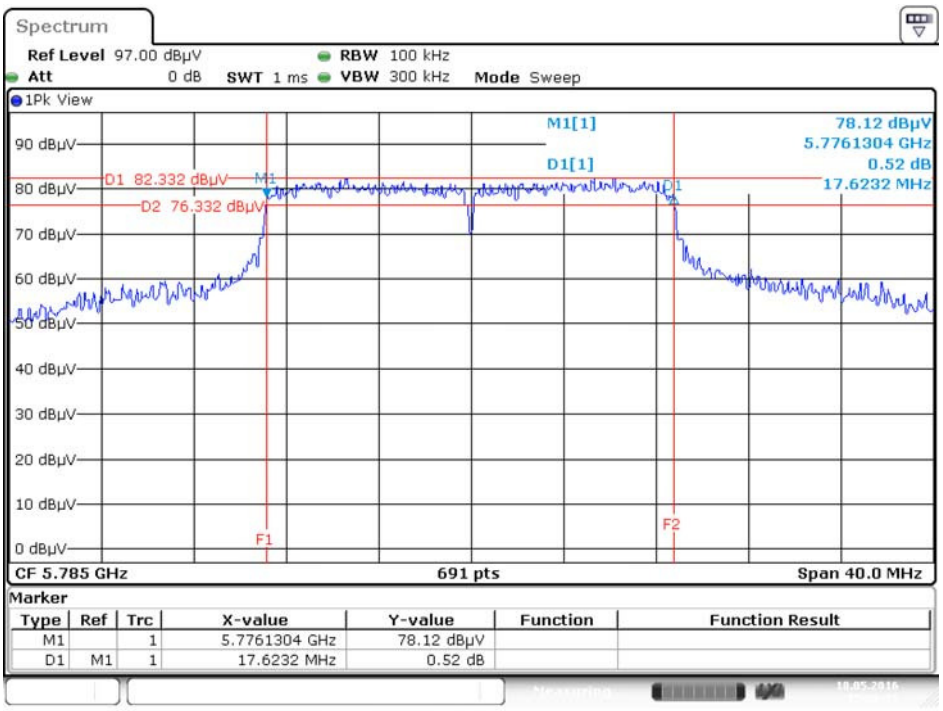
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 58255 MHz



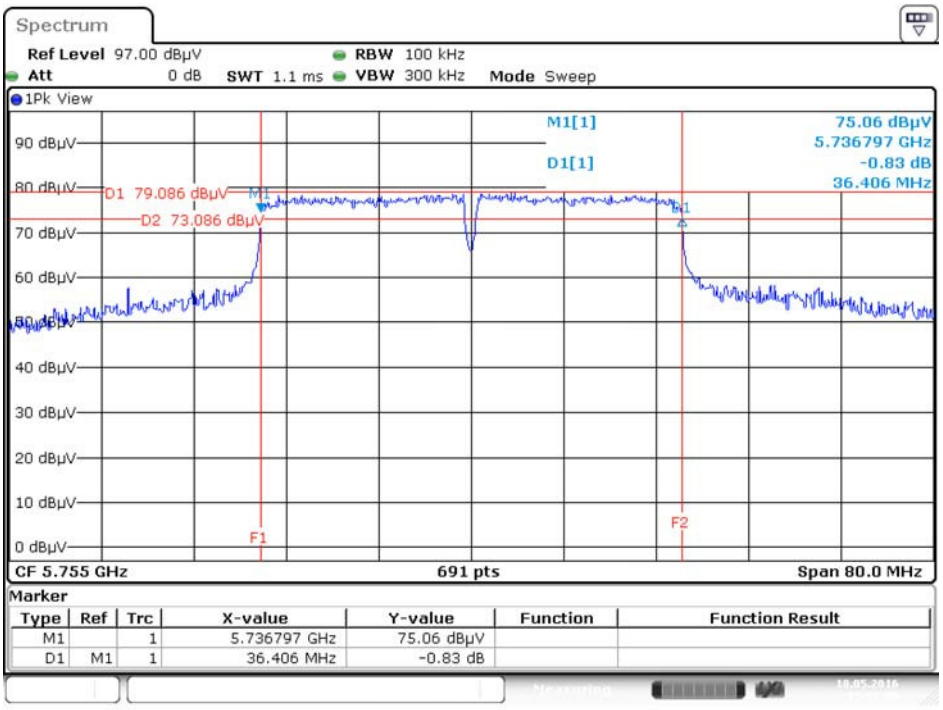
Date: 18.MAY.2016 15:54:37

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



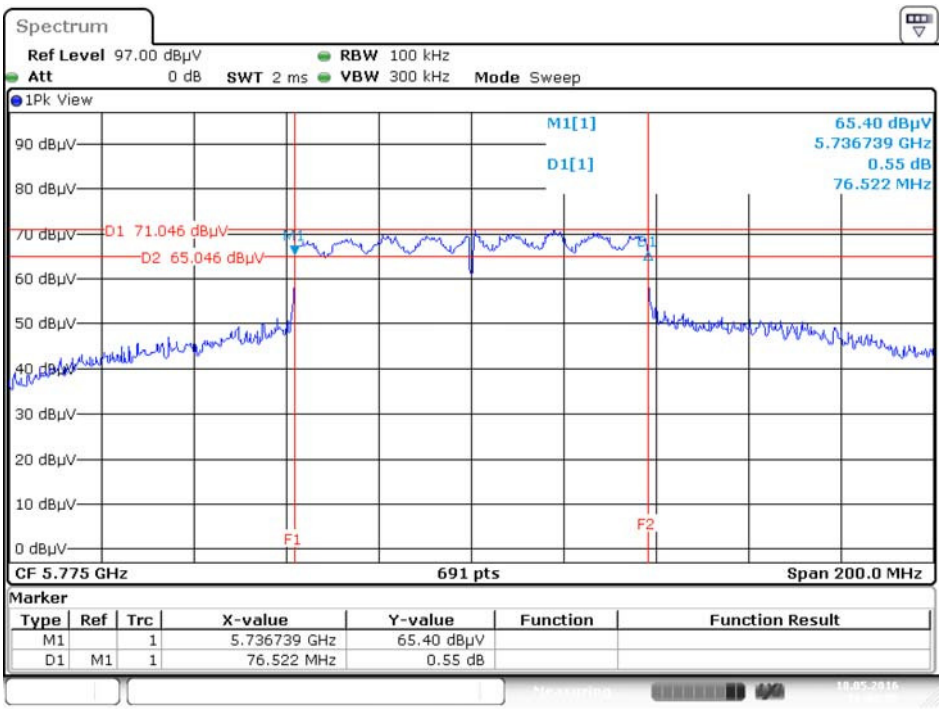
Date: 18.MAY.2016 15:56:51

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5755MHz



Date: 18.MAY.2016 15:57:58

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



Date: 18.MAY.2016 16:00:58

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

Frequency Band		Limit
☒	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

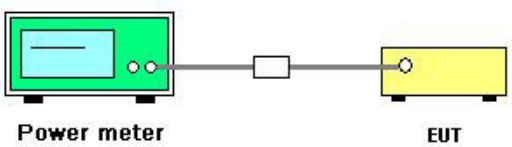
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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	25°C	Humidity	45%
Test Engineer	Akina Chiu	Test Date	May 18, 2016

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
802.11a	5745 MHz	23.02	30.00	Complies
	5785 MHz	23.11	30.00	Complies
	5825 MHz	23.08	30.00	Complies

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11ac MCS0/Nss1 VHT20	5745 MHz	21.72	21.55	24.65	30.00	Complies
	5785 MHz	21.78	21.43	24.62	30.00	Complies
	5825 MHz	21.88	21.71	24.81	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	20.24	20.37	23.32	30.00	Complies
	5795 MHz	20.64	20.40	23.53	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	19.37	19.10	22.25	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
☒	5.725~5.85 GHz	30 dBm/500kHz

4.5.2. Measuring Instruments and Setting

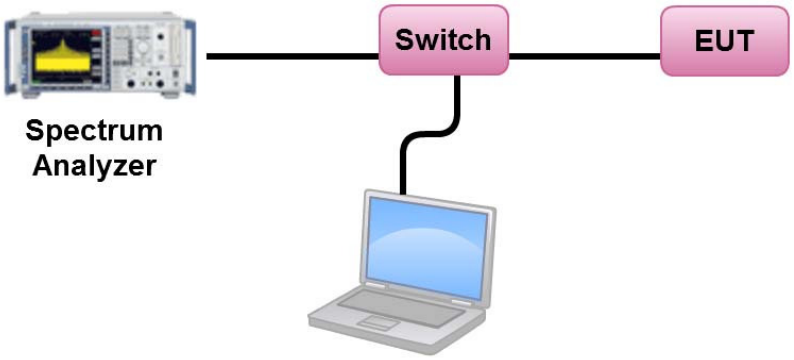
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	25°C	Humidity	45%
Test Engineer	Akina Chiu		

Configuration IEEE 802.11a / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	9.94	-3.01	6.93	30.00	Complies
157	5785 MHz	10.06	-3.01	7.05	30.00	Complies
165	5825 MHz	10.01	-3.01	7.00	30.00	Complies

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

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	11.60	-3.01	8.59	28.92	Complies
157	5785 MHz	11.53	-3.01	8.52	28.92	Complies
165	5825 MHz	11.76	-3.01	8.75	28.92	Complies

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

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	7.22	-3.01	4.21	28.92	Complies
159	5795 MHz	7.48	-3.01	4.47	28.92	Complies

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

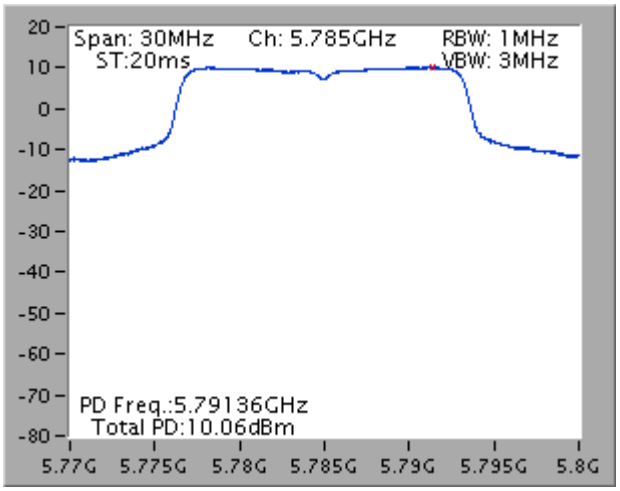
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	3.19	-3.01	0.18	28.92	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.08dBi, So limit=30-(7.08-6)=28.92 dBm/500kHz.

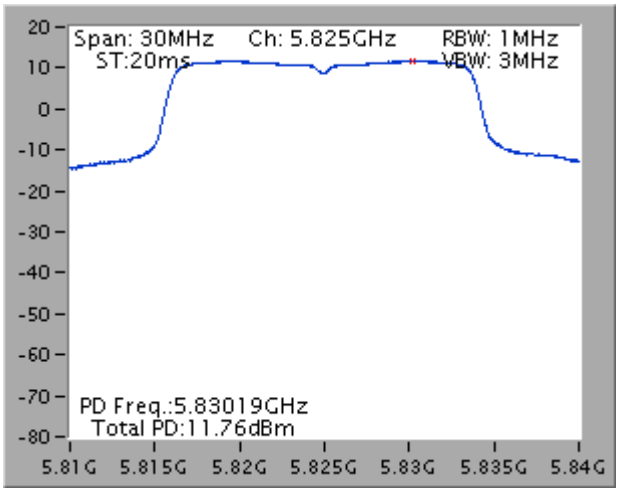
Note: All the test values were listed in the report.

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

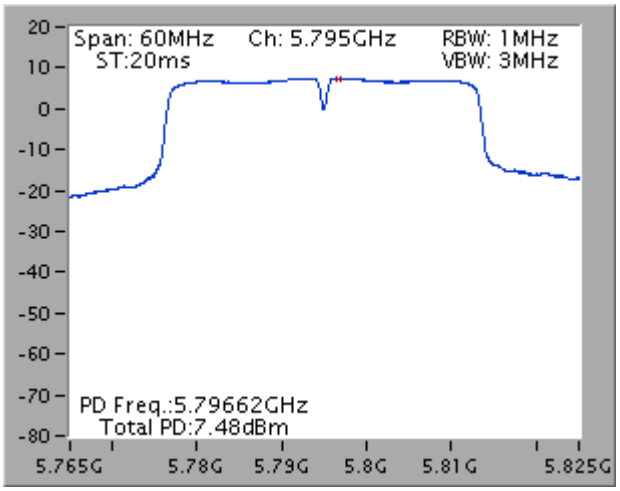
Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



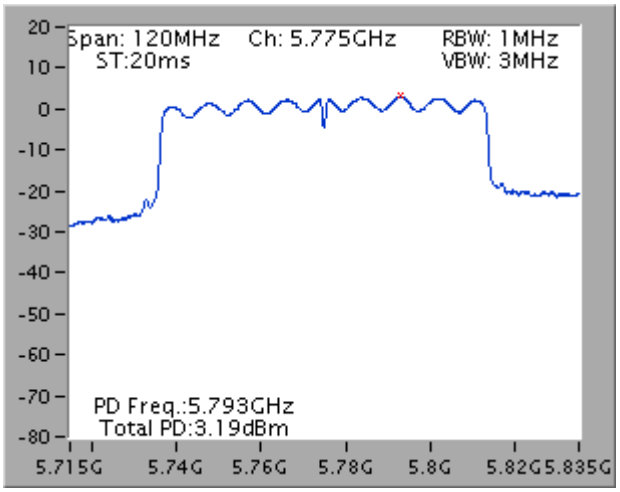
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5825 MHz



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



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



4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

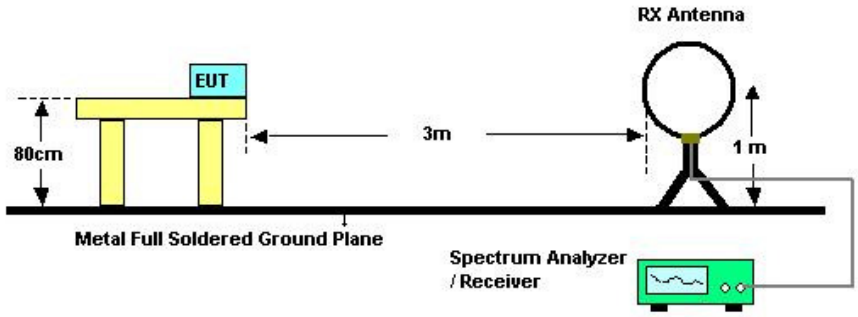
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

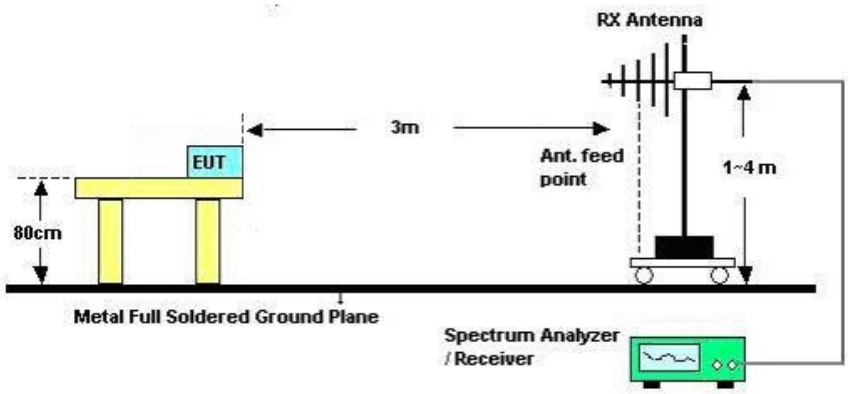
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

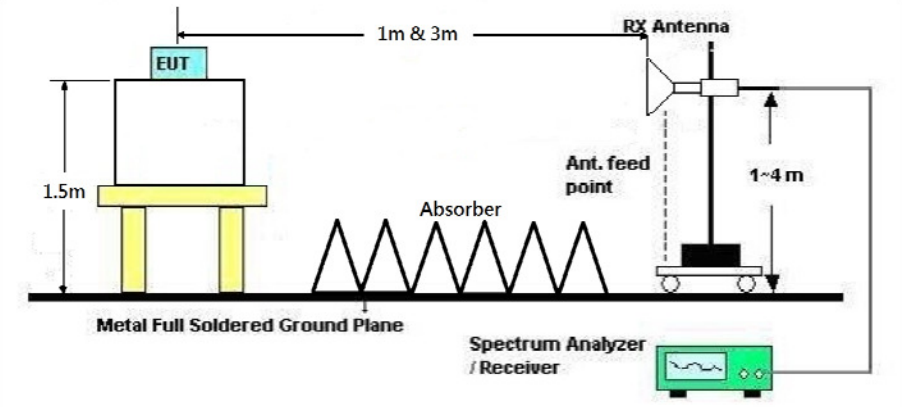
For Radiated Emissions: 9kHz ~30MHz



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°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	Normal Link
Test Date	May 16, 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 20 dB below the permissible value has no need to be reported.

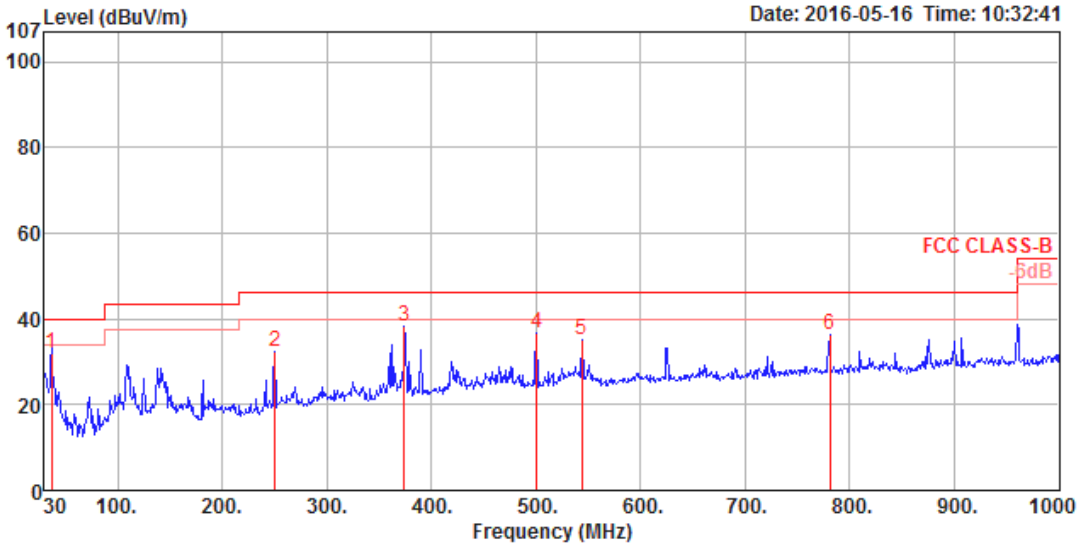
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

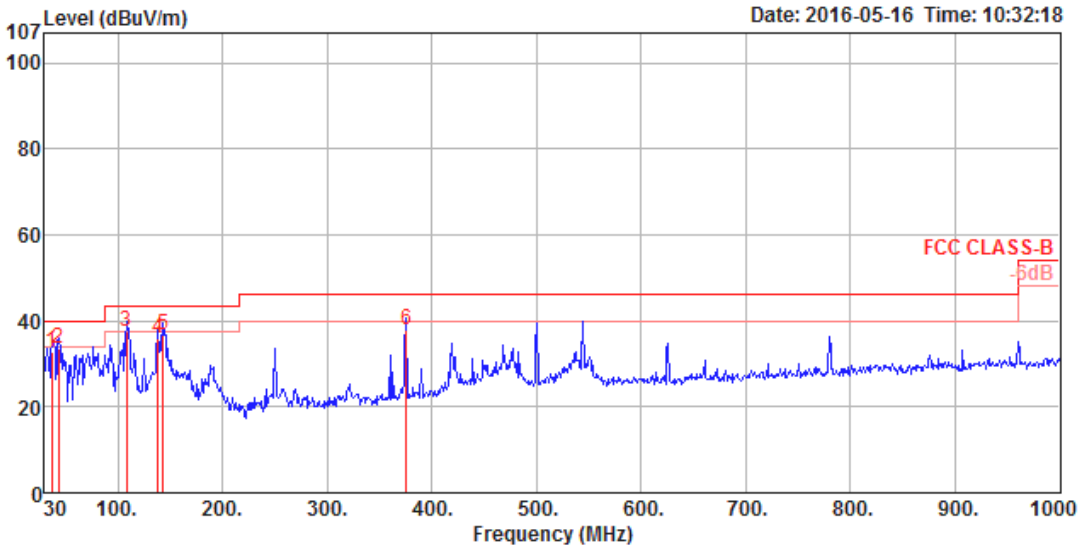
Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	Normal Link

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	36.79	31.87	40.00	-8.13	42.51	0.61	21.39	32.64	125	0	QP	HORIZONTAL
2	250.19	32.52	46.00	-13.48	44.89	1.56	18.60	32.53	100	78	Peak	HORIZONTAL
3	374.35	38.27	46.00	-7.73	47.32	1.89	21.60	32.54	100	162	Peak	HORIZONTAL
4	500.45	36.76	46.00	-9.24	43.46	2.18	23.73	32.61	100	243	Peak	HORIZONTAL
5	544.10	35.31	46.00	-10.69	41.28	2.29	24.39	32.65	100	10	Peak	HORIZONTAL
6	780.78	36.41	46.00	-9.59	39.70	2.73	26.41	32.43	125	111	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	36.79	32.94	40.00	-7.06	43.58	0.61	21.39	32.64	100	27	QP	VERTICAL
2	43.58	33.37	40.00	-6.63	47.88	0.67	17.45	32.63	125	3	QP	VERTICAL
3	108.57	37.37	43.50	-6.13	51.27	1.03	17.64	32.57	100	224	QP	VERTICAL
4	138.64	35.88	43.50	-7.62	49.63	1.16	17.65	32.56	100	217	QP	VERTICAL
5	143.49	36.71	43.50	-6.79	50.78	1.17	17.32	32.56	100	224	QP	VERTICAL
6	375.32	37.95	46.00	-8.05	46.96	1.90	21.63	32.54	125	215	QP	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.

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

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11a CH 149 / Chain 1
Test Date	May 14, 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	11488.99	44.27	54.00	-9.73	27.90	11.60	40.00	35.23	100	348	Average	HORIZONTAL
2	11489.30	57.65	74.00	-16.35	41.28	11.60	40.00	35.23	100	348	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	11488.97	57.97	74.00	-16.03	41.60	11.60	40.00	35.23	100	359	Peak	VERTICAL
2	11489.49	44.29	54.00	-9.71	27.92	11.60	40.00	35.23	100	359	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11a CH 157 / Chain 1
Test Date	May 14, 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	11567.65	44.92	54.00	-9.08	28.64	11.64	39.87	35.23	100	315	Average	HORIZONTAL
2	11568.09	57.77	74.00	-16.23	41.49	11.64	39.87	35.23	100	315	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	11570.38	44.83	54.00	-9.17	28.55	11.64	39.87	35.23	100	334	Average	VERTICAL
2	11572.24	58.66	74.00	-15.34	42.38	11.64	39.87	35.23	100	334	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11a CH 165 / Chain 1
Test Date	May 14, 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	11648.00	45.35	54.00	-8.65	29.15	11.69	39.73	35.22	100	276	Average	HORIZONTAL
2	11651.64	58.42	74.00	-15.58	42.26	11.71	39.67	35.22	100	276	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	11648.94	45.42	54.00	-8.58	29.22	11.69	39.73	35.22	100	301	Average	VERTICAL
2	11650.15	58.36	74.00	-15.64	42.16	11.69	39.73	35.22	100	301	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2
Test Date	May 14, 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	11489.57	44.47	54.00	-9.53	28.10	11.60	40.00	35.23	100	249	Average	HORIZONTAL
2	11491.18	58.33	74.00	-15.67	41.96	11.60	40.00	35.23	100	249	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	11489.32	57.72	74.00	-16.28	41.35	11.60	40.00	35.23	100	272	Peak	VERTICAL
2	11490.16	45.15	54.00	-8.85	28.78	11.60	40.00	35.23	100	272	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2
Test Date	May 14, 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	11567.84	58.51	74.00	-15.49	42.23	11.64	39.87	35.23	100	172	Peak	HORIZONTAL
2	11570.45	45.16	54.00	-8.84	28.88	11.64	39.87	35.23	100	172	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	11569.23	44.95	54.00	-9.05	28.67	11.64	39.87	35.23	100	180	Average	VERTICAL
2	11569.57	58.44	74.00	-15.56	42.16	11.64	39.87	35.23	100	180	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2
Test Date	May 14, 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	11649.22	59.24	74.00	-14.76	43.04	11.69	39.73	35.22	100	136	Peak	HORIZONTAL
2	11651.77	45.55	54.00	-8.45	29.39	11.71	39.67	35.22	100	136	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	11648.94	45.46	54.00	-8.54	29.26	11.69	39.73	35.22	100	168	Average	VERTICAL
2	11649.02	58.83	74.00	-15.17	42.63	11.69	39.73	35.22	100	168	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2
Test Date	May 14, 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	11509.58	57.64	74.00	-16.36	41.27	11.60	40.00	35.23	100	112	Peak	HORIZONTAL
2	11511.00	44.72	54.00	-9.28	28.35	11.60	40.00	35.23	100	112	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	11507.96	58.22	74.00	-15.78	41.85	11.60	40.00	35.23	100	127	Peak	VERTICAL
2	11509.37	44.84	54.00	-9.16	28.47	11.60	40.00	35.23	100	127	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2
Test Date	May 14, 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	11589.16	44.92	54.00	-9.08	28.67	11.67	39.80	35.22	100	96	Average	HORIZONTAL
2	11590.13	58.24	74.00	-15.76	41.99	11.67	39.80	35.22	100	96	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	11589.71	44.97	54.00	-9.03	28.72	11.67	39.80	35.22	100	102	Average	VERTICAL
2	11592.48	58.23	74.00	-15.77	41.98	11.67	39.80	35.22	100	102	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	May 14, 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	11547.80	45.21	54.00	-8.79	28.89	11.62	39.93	35.23	100	78	Average	HORIZONTAL
2	11548.22	58.58	74.00	-15.42	42.26	11.62	39.93	35.23	100	78	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	11550.90	45.02	54.00	-8.98	28.74	11.64	39.87	35.23	100	87	Average	VERTICAL
2	11551.58	58.56	74.00	-15.44	42.28	11.64	39.87	35.23	100	87	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

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

4.7.1. 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

4.7.2. Test Procedures

The test procedure is the same as section 4.6.3.

4.7.3. Test Setup Layout

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

4.7.4. Test Deviation

There is no deviation with the original standard.

4.7.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.6. Test Result of Band Edge and Fundamental Emissions

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1
Test Date	May 14, 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	5635.00	60.32	68.20	-7.88	53.71	7.63	31.96	32.98	136	110	Peak	HORIZONTAL
2	5738.00	101.64			94.86	7.71	32.08	33.01	136	110	Average	HORIZONTAL
3	5739.00	111.40			104.58	7.73	32.10	33.01	136	110	Peak	HORIZONTAL
4	5938.00	59.36	68.20	-8.84	52.31	7.82	32.32	33.09	136	110	Peak	HORIZONTAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5550.00	59.40	68.20	-8.80	52.93	7.55	31.86	32.94	132	103	Peak	HORIZONTAL
2	5779.00	111.38			104.51	7.76	32.14	33.03	132	103	Peak	HORIZONTAL
3	5792.00	101.75			94.85	7.77	32.16	33.03	132	103	Average	HORIZONTAL
4	5937.00	59.15	68.20	-9.05	52.10	7.82	32.32	33.09	132	103	Peak	HORIZONTAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5608.00	60.38	68.20	-7.82	53.79	7.61	31.94	32.96	100	81	Peak	VERTICAL
2	5819.00	101.75			94.83	7.78	32.18	33.04	100	81	Peak	VERTICAL
3	5820.00	91.81			84.89	7.78	32.18	33.04	100	81	Average	VERTICAL
4	5978.00	59.93	68.20	-8.27	52.82	7.83	32.38	33.10	100	81	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2
Test Date	May 14, 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	5618.00	58.87	68.20	-9.33	52.29	7.61	31.94	32.97	143	99	Peak	HORIZONTAL
2	5740.00	98.77			91.95	7.73	32.10	33.01	143	99	Average	HORIZONTAL
3	5740.00	108.11			101.29	7.73	32.10	33.01	143	99	Peak	HORIZONTAL
4	5973.00	59.61	68.20	-8.59	52.52	7.83	32.36	33.10	143	99	Peak	HORIZONTAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5572.00	58.65	68.20	-9.55	52.15	7.57	31.88	32.95	104	110	Peak	VERTICAL
2	5790.00	102.38			95.48	7.77	32.16	33.03	104	110	Average	VERTICAL
3	5791.00	111.48			104.58	7.77	32.16	33.03	104	110	Peak	VERTICAL
4	5998.00	60.44	68.20	-7.76	53.31	7.84	32.40	33.11	104	110	Peak	VERTICAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5620.00	58.97	68.20	-9.23	52.39	7.61	31.94	32.97	188	129	Peak	VERTICAL
2	5819.00	103.19			96.27	7.78	32.18	33.04	188	129	Average	VERTICAL
3	5819.00	112.27			105.35	7.78	32.18	33.04	188	129	Peak	VERTICAL
4	5981.00	59.44	68.20	-8.76	52.33	7.83	32.38	33.10	188	129	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2
Test Date	May 14, 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	5628.00	59.17	68.20	-9.03	52.55	7.63	31.96	32.97	173	126	Peak	VERTICAL
2	5753.00	109.22			102.41	7.73	32.10	33.02	173	126	Peak	VERTICAL
3	5757.00	99.90			93.06	7.74	32.12	33.02	173	126	Average	VERTICAL
4	5931.00	59.78	68.20	-8.42	52.72	7.82	32.32	33.08	173	126	Peak	VERTICAL

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5633.00	58.11	68.20	-10.09	51.49	7.63	31.96	32.97	129	105	Peak	HORIZONTAL
2	5793.00	107.11			100.21	7.77	32.16	33.03	129	105	Peak	HORIZONTAL
3	5797.00	97.36			90.46	7.77	32.16	33.03	129	105	Average	HORIZONTAL
4	6020.00	59.65	68.20	-8.55	52.45	7.86	32.46	33.12	129	105	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Stim Song, Lucke Hsieh	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	May 14, 2016		

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	5649.00	62.16	68.20	-6.04	55.52	7.64	31.98	32.98	104	110	Peak	VERTICAL
2	5793.00	92.89			85.99	7.77	32.16	33.03	104	110	Average	VERTICAL
3	5793.00	102.78			95.88	7.77	32.16	33.03	104	110	Peak	VERTICAL
4	5928.00	67.16	68.20	-1.04	60.10	7.82	32.32	33.08	104	110	Peak	VERTICAL

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

Note:

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

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

4.8. 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

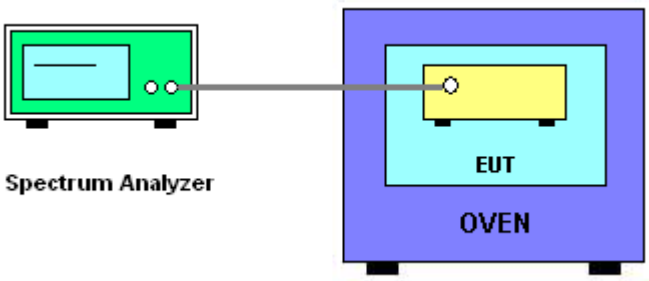
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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
8. Extreme temperature is -30°C~50°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	25°C	Humidity	45%
Test Engineer	Akina Chiu	Test Date	May 18, 2016

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9350	5784.9348	5784.9342	5784.9336
110.00	5784.9349	5784.9342	5784.9336	5784.9334
93.50	5784.9347	5784.9344	5784.9335	5784.9329
Max. Deviation (MHz)	0.0653	0.0658	0.0665	0.0671
Max. Deviation (ppm)	11.29	11.38	11.50	11.60
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5784.9428	5784.9423	5784.9419	5784.9418
-20	5784.9412	5784.9403	5784.9396	5784.9392
-10	5784.9394	5784.9386	5784.9378	5784.9375
0	5784.9374	5784.9367	5784.9359	5784.9358
10	5784.9364	5784.9355	5784.9349	5784.9342
20	5784.9349	5784.9347	5784.9337	5784.9331
30	5784.9325	5784.9322	5784.9315	5784.9311
40	5784.9318	5784.9316	5784.9308	5784.9300
50	5784.9298	5784.9295	5784.9291	5784.9282
Max. Deviation (MHz)	0.0702	0.0705	0.0709	0.0718
Max. Deviation (ppm)	12.13	12.19	12.26	12.41
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9352	5754.9345	5754.9335	5754.9329
110.00	5754.9349	5754.9341	5754.9338	5754.9336
93.50	5754.9339	5754.9334	5754.9325	5754.9315
Max. Deviation (MHz)	0.0661	0.0666	0.0675	0.0685
Max. Deviation (ppm)	11.49	11.58	11.73	11.91
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5754.9394	5754.9388	5754.9386	5754.9380
-20	5754.9391	5754.9388	5754.9381	5754.9378
-10	5754.9387	5754.9383	5754.9378	5754.9374
0	5754.9378	5754.9376	5754.9374	5754.9373
10	5754.9359	5754.9352	5754.9345	5754.9338
20	5754.9349	5754.9346	5754.9338	5754.9331
30	5754.9325	5754.9319	5754.9315	5754.9307
40	5754.9323	5754.9322	5754.9316	5754.9307
50	5754.9306	5754.9303	5754.9300	5754.9299
Max. Deviation (MHz)	0.0694	0.0697	0.0700	0.0701
Max. Deviation (ppm)	12.06	12.11	12.16	12.18
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9356	5774.9350	5774.9340	5774.9330
110.00	5774.9349	5774.9342	5774.9335	5774.9325
93.50	5774.9342	5774.9335	5774.9328	5774.9326
Max. Deviation (MHz)	0.0658	0.0665	0.0672	0.0675
Max. Deviation (ppm)	11.40	11.52	11.64	11.69
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5774.9392	5774.9390	5774.9380	5774.9373
-20	5774.9381	5774.9376	5774.9368	5774.9367
-10	5774.9369	5774.9368	5774.9366	5774.9361
0	5774.9364	5774.9358	5774.9351	5774.9348
10	5774.9363	5774.9357	5774.9347	5774.9343
20	5774.9349	5774.9339	5774.9330	5774.9323
30	5774.9325	5774.9322	5774.9313	5774.9305
40	5774.9311	5774.9303	5774.9302	5774.9298
50	5774.9293	5774.9284	5774.9276	5774.9267
Max. Deviation (MHz)	0.0707	0.0716	0.0724	0.0733
Max. Deviation (ppm)	12.24	12.40	12.54	12.69
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)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	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)
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	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%