FCC RADIO TEST REPORT

Applicant's company	**PEGATRON CORPORATION**
Applicant Address	5F No. 76, Ligong St.,Beitou District, Taipei City 112, Taiwan
FCC ID	**VUIDPC3929CA**
Manufacturer's company	**MAINTEK COMPUTER**
Manufacturer Address	233 Jinfeng Rd., Suzhou, Jiangsu, PRC

Product Name	Wireless cable modem
Brand Name	CISCO
Model No.	DPC3929XXXX (X=0~1 and A~Z or blank)
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	May 07, 2014
Final Test Date	Jun. 03, 2014
Submission Type	Original Equipment

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 General UNII Test Procedures Effective 2014 DR02-41759, KDB 662911 D01 v02r01, KDB644545 D01v01r02.**

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
FR453003AB	Rev. 01	Initial issue of report	Jun. 16, 2014

Certificate No.: CB10306008

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless cable modem
Brand Name	:	CISCO
Model No.	:	DPC3929XXXX (X=0~1 and A~Z or blank)
Applicant	:	PEGATRON CORPORATION
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on May 07, 2014 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	7.49 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(e)	6dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.4	15.407(a)	Maximum Conducted Output Power	Complies	4.37 dB
4.5	15.407(a)	Power Spectral Density	Complies	6.91 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.02 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.11 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Internal Power Supply and Li-ion battery
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
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: 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.80 MHz Band 4: 802.11ac MCS0/Nss1 (VHT20): 17.84 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz
Maximum Conducted Output Power	Band 1: 802.11ac MCS0/Nss1 (VHT20): 23.77 dBm ; 802.11ac MCS0/Nss1 (VHT40): 25.63 dBm ; 802.11ac MCS0/Nss1 (VHT80): 22.75 dBm Band 4: 802.11ac MCS0/Nss1 (VHT20): 23.65 dBm ; 802.11ac MCS0/Nss1 (VHT40): 23.86 dBm ; 802.11ac MCS0/Nss1 (VHT80): 19.99 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From Internal Power Supply and Li-ion battery
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9
Channel Band Width (99%)	Band 1: 24.16 MHz ; Band 4: 22.00 MHz
Maximum Conducted Output Power	Band 1: 23.74 dBm ; Band 4: 21.37 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

Antenna and Band width

Antenna	Single (TX)			Three (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)	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 support HT20 and HT40.

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support 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	CISCO P/N	Rating
Li-ion Battery	PEGATRON	PB020	35-4043873-01	7.2V – 2600mAh, 18Wh
Others				
Power Cable: Non-Shielded, 1.45m				
RJ-45 Cable: Non-Shielded, 1.2m				

3.3. Table for Filed Antenna

Ant.	Brand Holder	Model Name	P/N	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30035	PCB Antenna	I-PEX	1.94	-
2	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30036	PCB Antenna	I-PEX	4.21	2.50
3	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30037	PCB Antenna	I-PEX	4.21	2.55
4	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30038	PCB Antenna	I-PEX	-	2.38

Note: The EUT has four Antennas.

<For 2.4GHz Function>:

For IEEE 802.11n mode (3TX/3RX)

Chain 1, Chain 2 and Chain 3 can be used as transmitting/receiving antenna.

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

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

Only Chain 3 can be used as transmitting/receiving antenna.

<For 5GHz Function>:

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

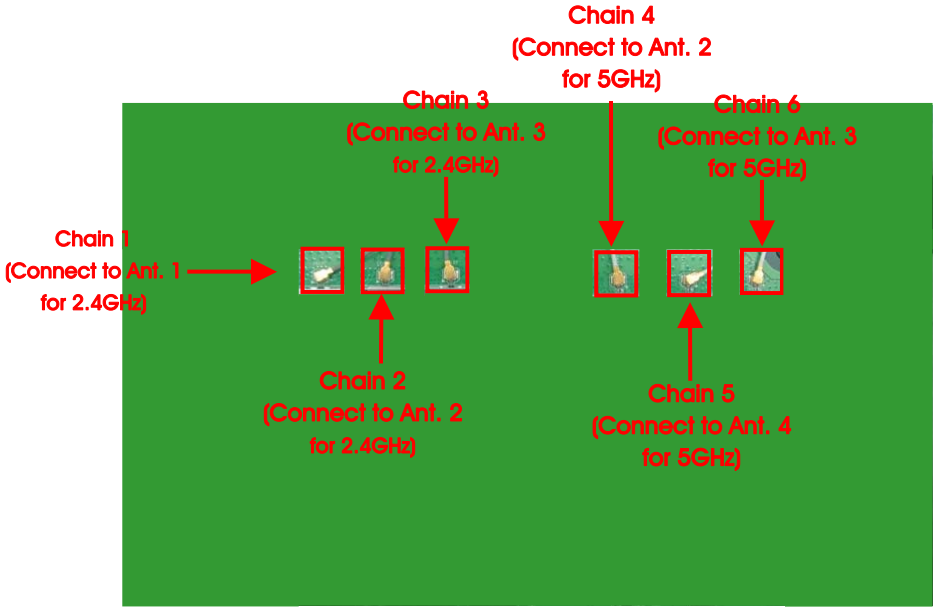
Chain 4, Chain 5 and Chain 6 can be used as transmitting/receiving antenna.

Chain 4, Chain 5 and Chain 6 could transmit/receive simultaneously.

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

Only Chain 6 can be used as transmitting/receiving antenna.

According to the above antennas, there are three antennas will transit simultaneously (one is Horizontal and the others are Vertical).



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	CTX		-	-	-
Max. Conducted Output Power	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
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	6
Power Spectral Density	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
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	6
26dB&6dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	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
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	6
Radiated Emission Below 1GHz	CTX		-	-	-
Radiated Emission Above 1GHz	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
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	6
Band Edge Emission	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

	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/ 157/165	6
Frequency Stability	Un-modulation		-	40	4+5+6

Note: VHT20/VHT40 covers HT20 / HT40, due to same modulation.

For Conducted Emission test:

Mode 1. EUT standing with 2.4GHz (CTX)

Mode 2. EUT standing with 5GHz (CTX)

Mode 2 is the worst case, so it was selected to record in this test report.

For Radiated Emission test <Below 1GHz>:

Mode 1. EUT standing with 2.4GHz (CTX)

Mode 2. EUT standing with 5GHz (CTX)

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

For Radiated Emission test <Above 1GHz>:

Mode 1. EUT standing (CTX)

For Radiated Emission Co-location Test:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Maximum Permissible Exposure (Please refer to Maximum Permissible Exposure Test Report: FA453003) and Co-location (please refer to Appendix B) tests are 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 Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Explanation

The difference for each model is shown as below:

Model Name	Description
DPC3929XXXX	X=0~1 and A~Z or blank

DPC3929CAD was selected as representative model for the test and its data was recorded in this report.

3.8. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6220	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	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.

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.0					
Frequency	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	80	72	76	78	84	78

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.0			
Frequency	5190 MHz	5230 MHz	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	78	88	68	85

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool 2.0.1.0	
Frequency	5210 MHz	5775 MHz
MCS0/Nss1 VHT80	77	71

Power Parameters of IEEE 802.11a

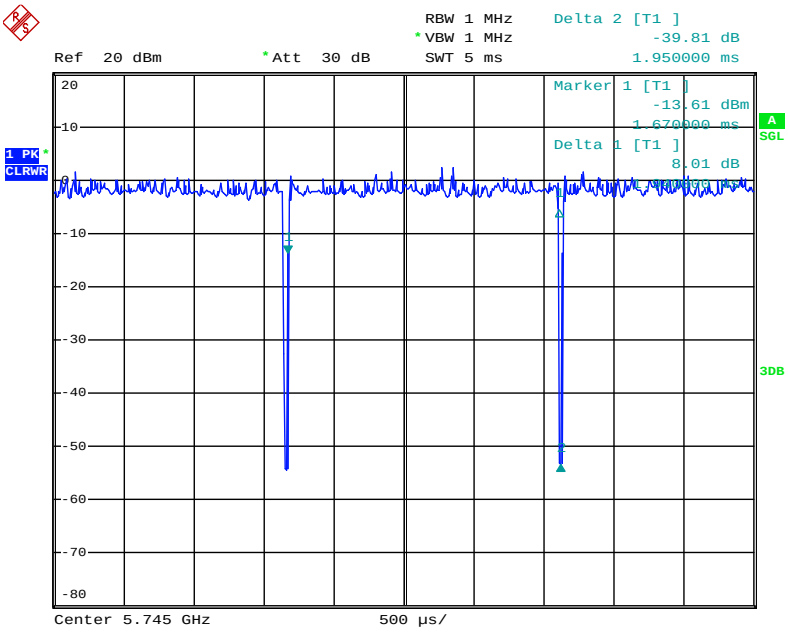
Test Software Version	Mtool 2.0.1.0					
Frequency	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	93	95	100	97	100	100

3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

IEEE 802.11ac MCS0/Nss1 VHT20



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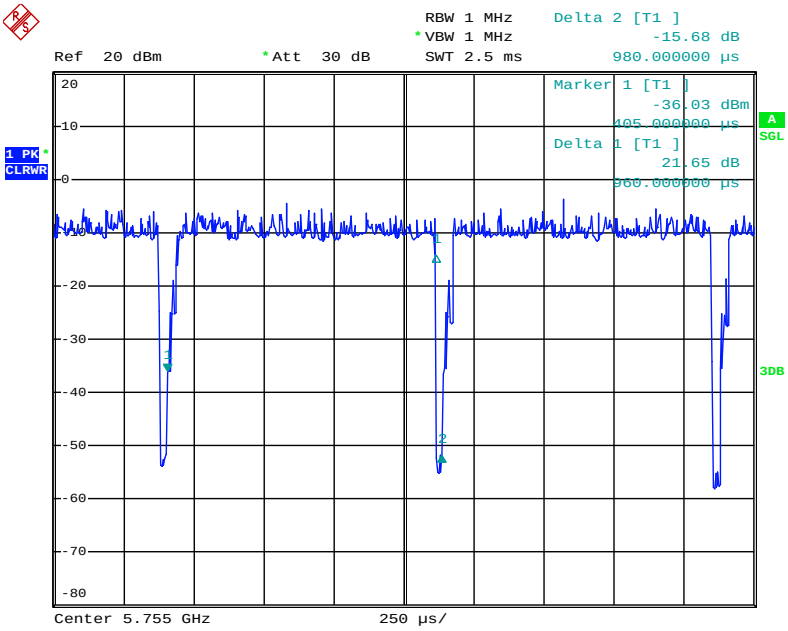
IEEE 802.11ac MCS0/Nss1 VHT40



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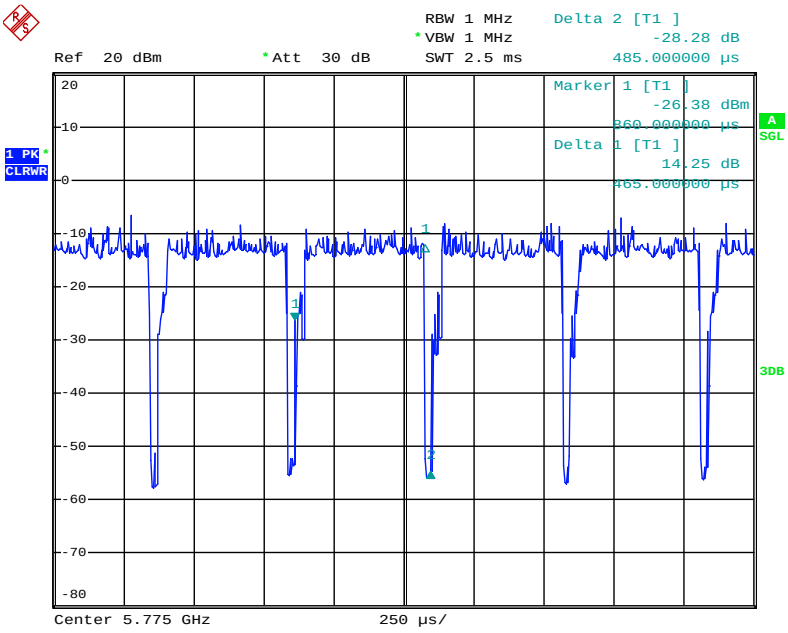
IEEE 802.11ac MCS0/Nss1 VHT80



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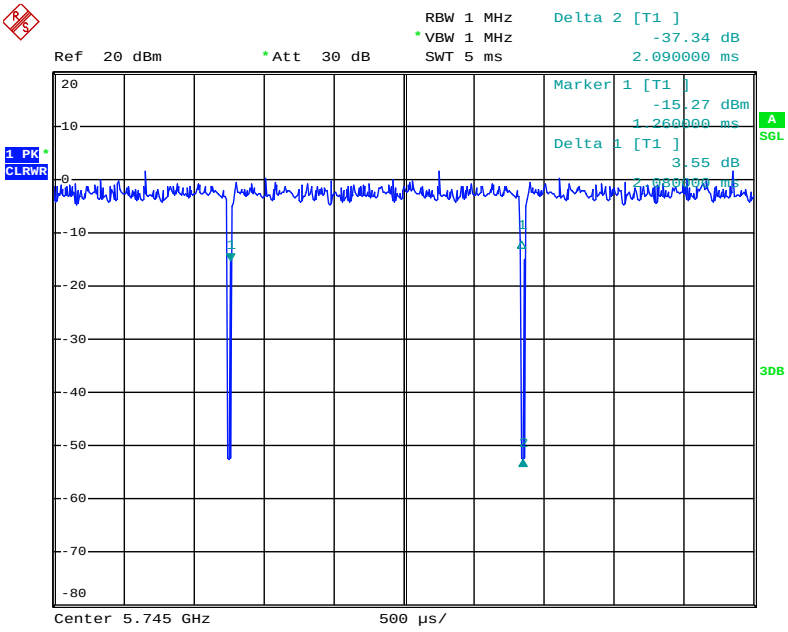
IEEE 802.11a



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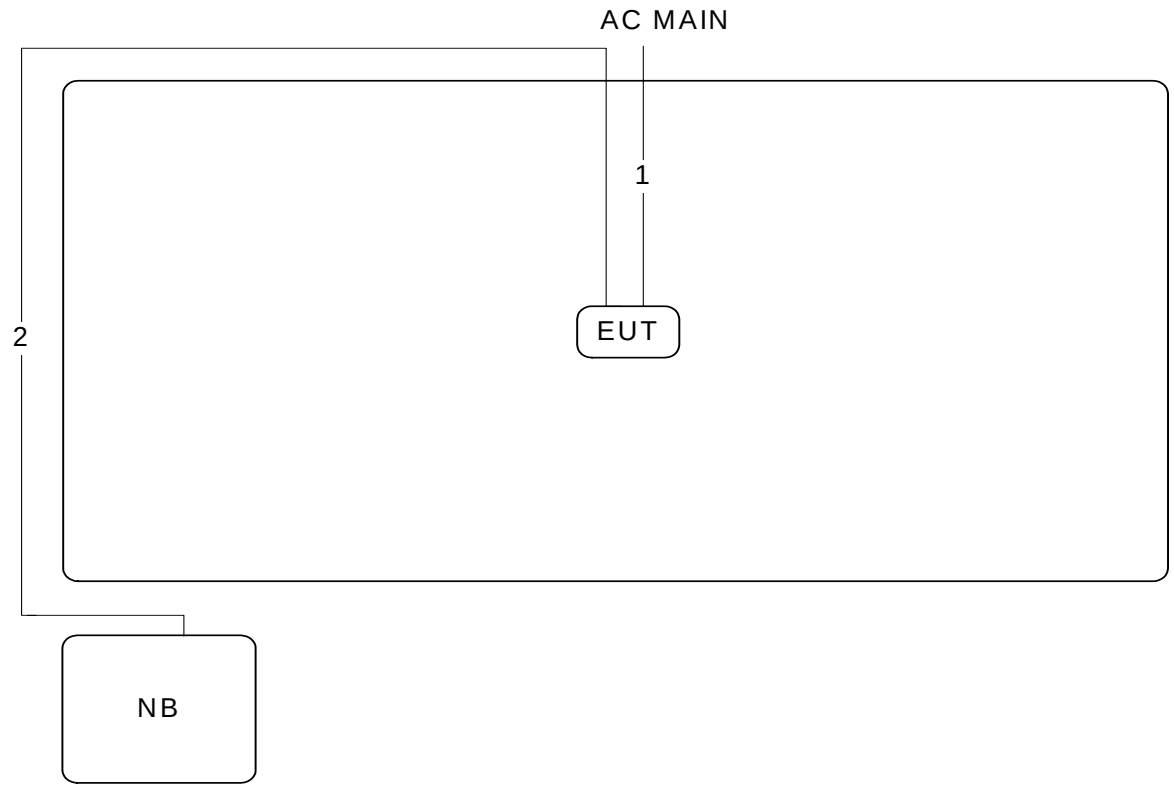
3.12. Test Configurations

3.12.1. AC Power Line Conduction Emissions and Radiation Emissions Test Test Configuration



Item	Connection	Shielded	Length(m)
1	Power Cable	No	1.45m
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

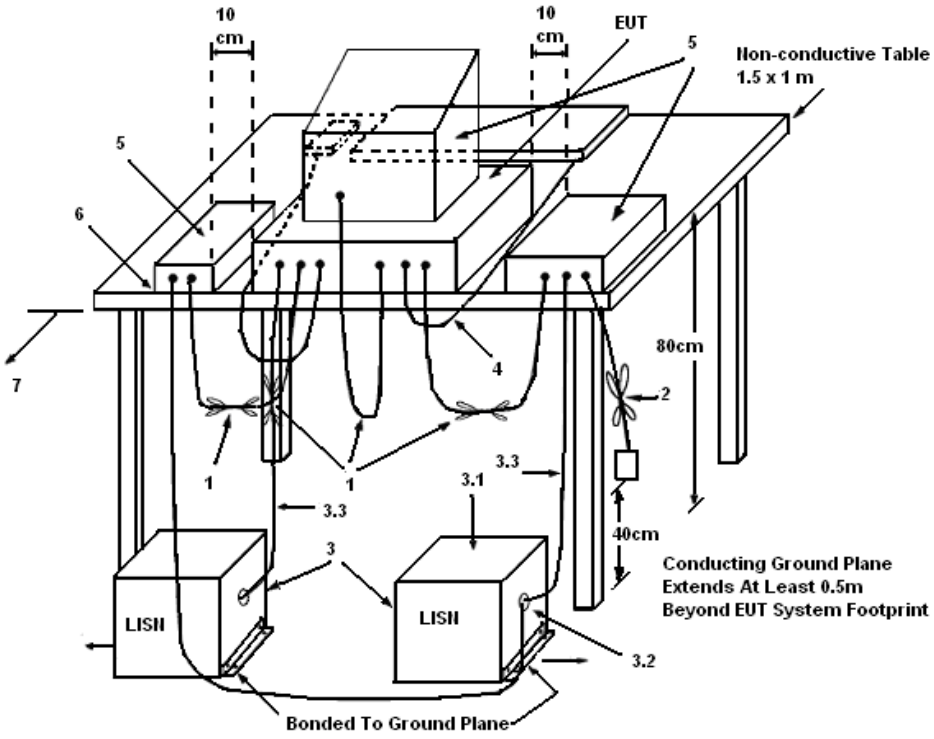
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

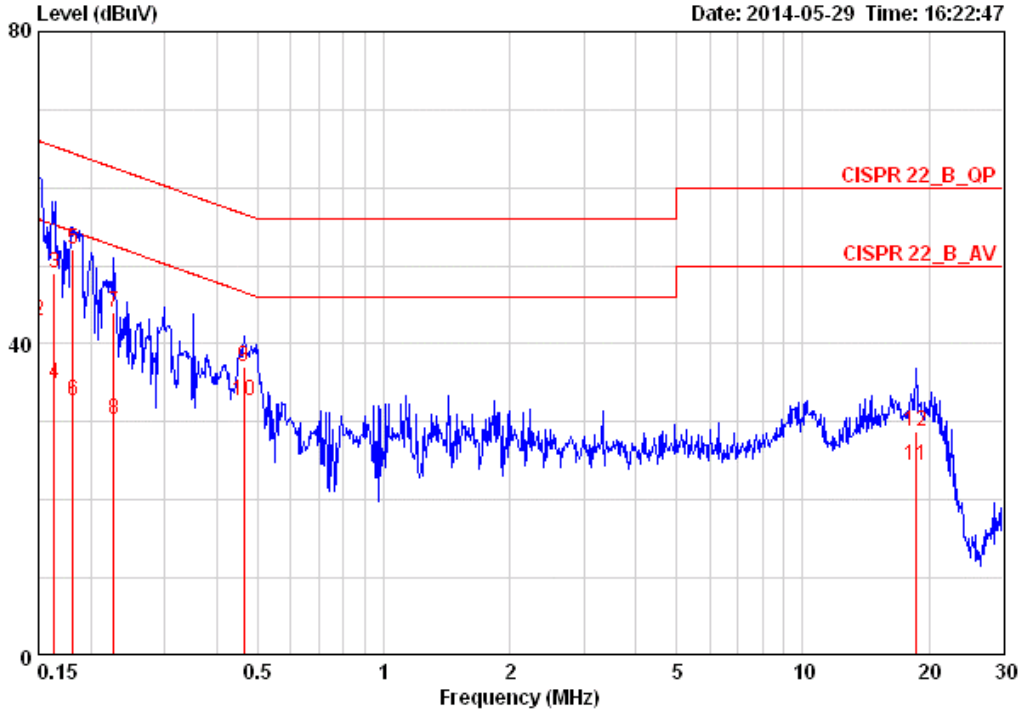
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

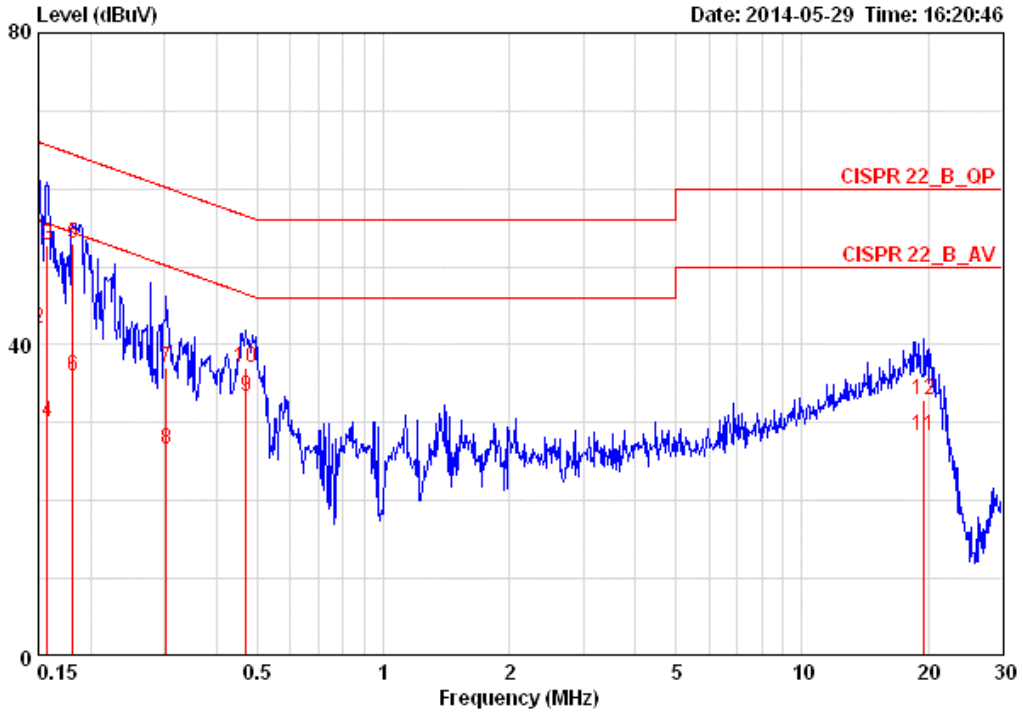
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	51%
Test Engineer	Hank Huang	Phase	Line
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1 @	0.15000	58.32	-7.68	66.00	0.08	58.08	0.16	LINE	QP
2	0.15000	42.90	-13.10	56.00	0.08	42.66	0.16	LINE	AVERAGE
3	0.16327	49.02	-16.28	65.30	0.08	48.78	0.16	LINE	QP
4	0.16327	34.78	-20.52	55.30	0.08	34.54	0.16	LINE	AVERAGE
5	0.18152	52.17	-12.24	64.42	0.08	51.93	0.16	LINE	QP
6	0.18152	32.67	-21.74	54.42	0.08	32.43	0.16	LINE	AVERAGE
7	0.22676	44.14	-18.43	62.57	0.08	43.89	0.17	LINE	QP
8	0.22676	30.26	-22.31	52.57	0.08	30.01	0.17	LINE	AVERAGE
9	0.46367	37.03	-19.59	56.63	0.08	36.77	0.18	LINE	QP
10	0.46367	32.74	-13.88	46.63	0.08	32.48	0.18	LINE	AVERAGE
11	18.622	24.33	-25.67	50.00	0.35	23.49	0.49	LINE	AVERAGE
12	18.622	28.78	-31.22	60.00	0.35	27.94	0.49	LINE	QP

Temperature	24°C	Humidity	51%
Test Engineer	Hank Huang	Phase	Neutral
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1 @	0.15000	58.51	-7.49	66.00	0.08	58.27	0.16	NEUTRAL	QP
2	0.15000	41.97	-14.03	56.00	0.08	41.73	0.16	NEUTRAL	AVERAGE
3	0.15733	52.78	-12.82	65.60	0.08	52.54	0.16	NEUTRAL	QP
4	0.15733	30.09	-25.51	55.60	0.08	29.85	0.16	NEUTRAL	AVERAGE
5	0.18152	53.06	-11.35	64.42	0.08	52.82	0.16	NEUTRAL	QP
6	0.18152	36.01	-18.40	54.42	0.08	35.77	0.16	NEUTRAL	AVERAGE
7	0.30348	36.95	-23.20	60.15	0.09	36.69	0.17	NEUTRAL	QP
8	0.30348	26.65	-23.50	50.15	0.09	26.39	0.17	NEUTRAL	AVERAGE
9	0.47110	33.30	-13.19	46.49	0.09	33.03	0.18	NEUTRAL	AVERAGE
10	0.47110	37.16	-19.33	56.49	0.09	36.89	0.18	NEUTRAL	QP
11	19.532	28.23	-21.77	50.00	0.35	27.38	0.51	NEUTRAL	AVERAGE
12	19.532	32.93	-27.07	60.00	0.35	32.08	0.51	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 Deviation

There is no deviation with the original standard.

4.2.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

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

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	21.92	17.92
40	5200 MHz	20.48	17.92
48	5240 MHz	20.64	17.92

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

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	38.40	36.48
46	5230 MHz	59.52	36.48

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

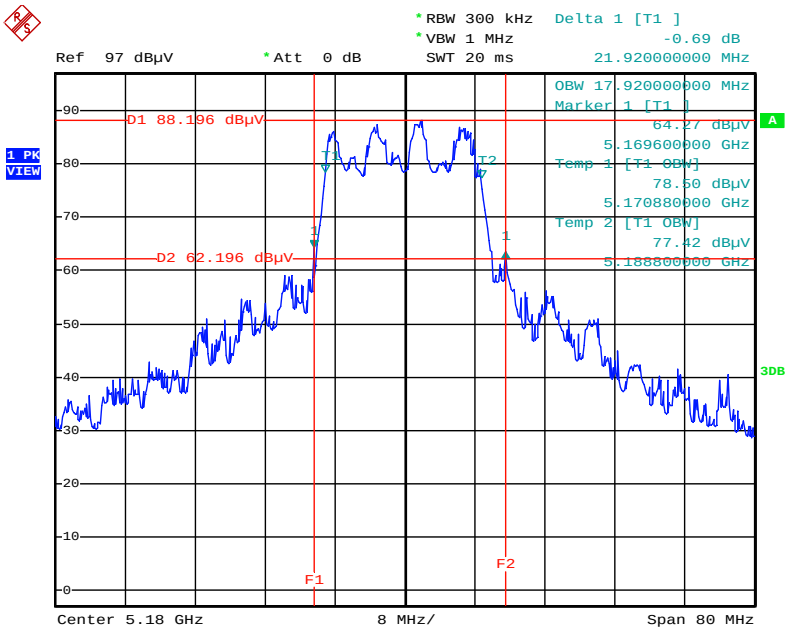
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
42	5210 MHz	81.28	76.80

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Chain 6

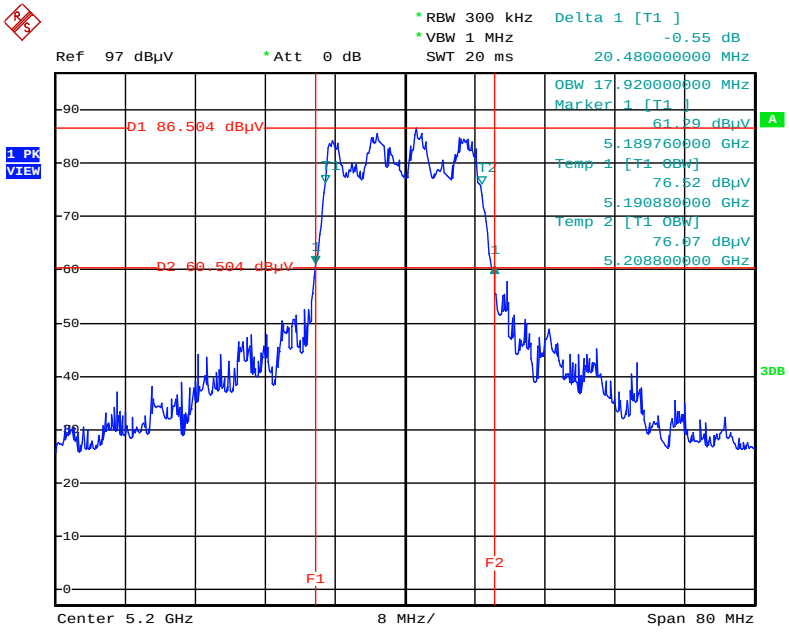
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	33.28	17.92
40	5200 MHz	34.40	18.40
48	5240 MHz	38.40	24.16

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



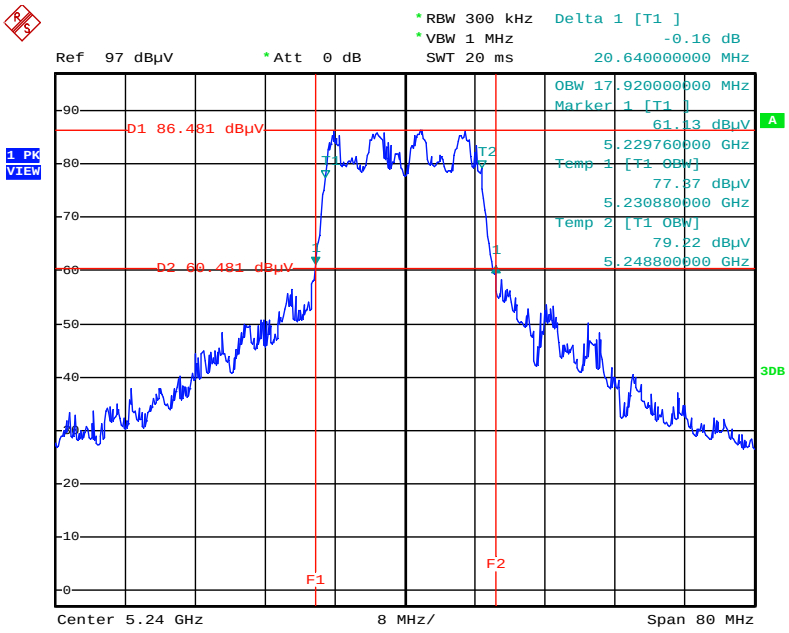
Date: 22.MAY.2014 17:44:31

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



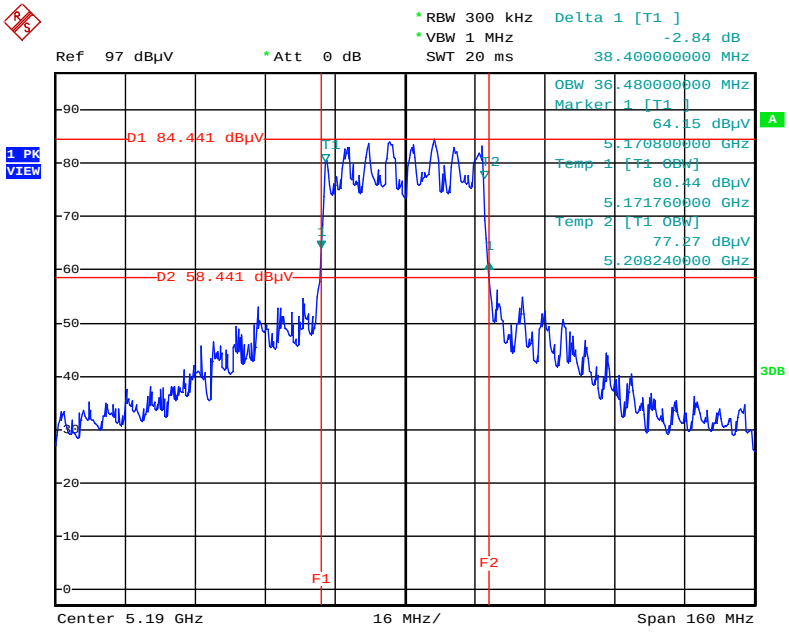
Date: 22.MAY.2014 17:45:15

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



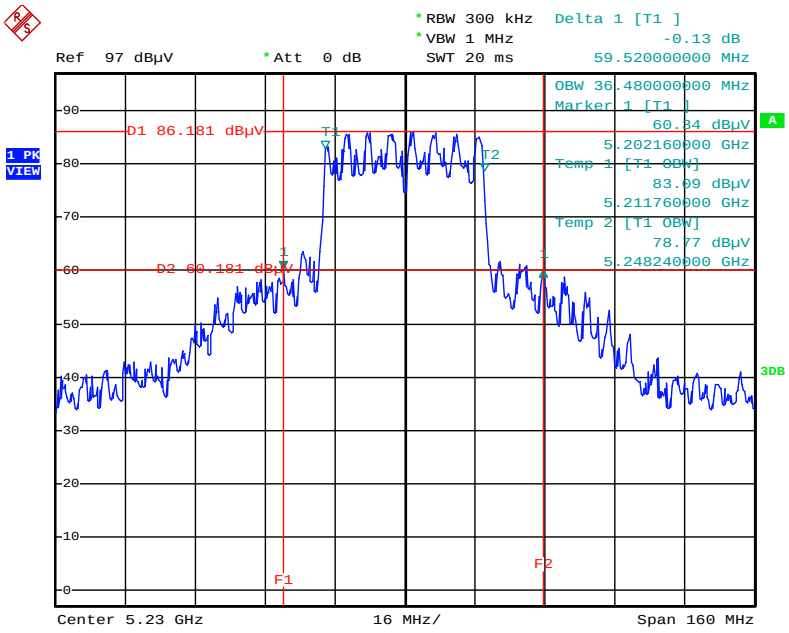
Date: 22.MAY.2014 17:45:51

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



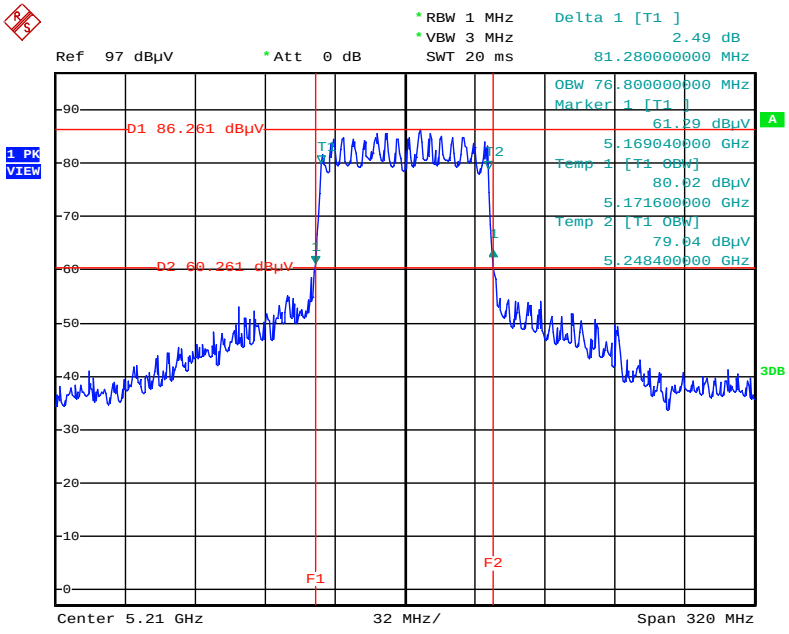
Date: 22.MAY.2014 17:43:07

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



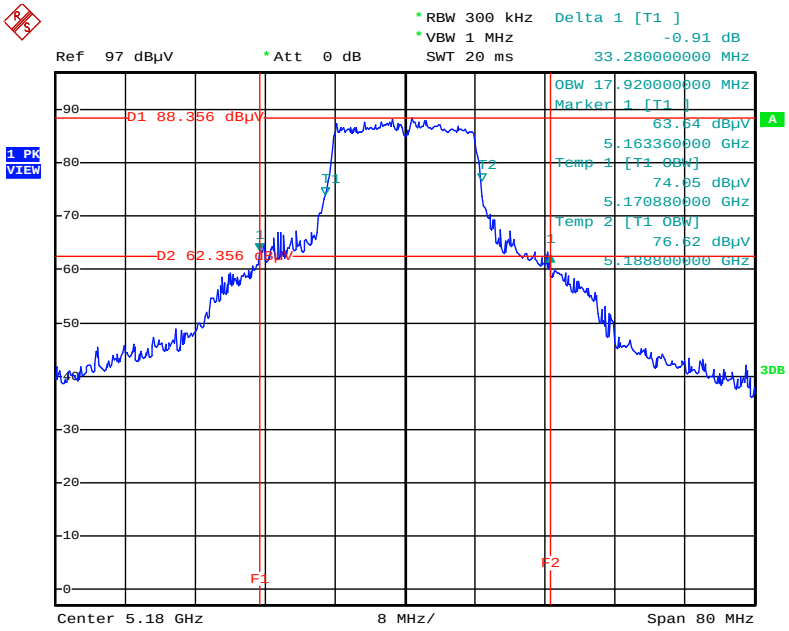
Date: 22.MAY.2014 17:43:49

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



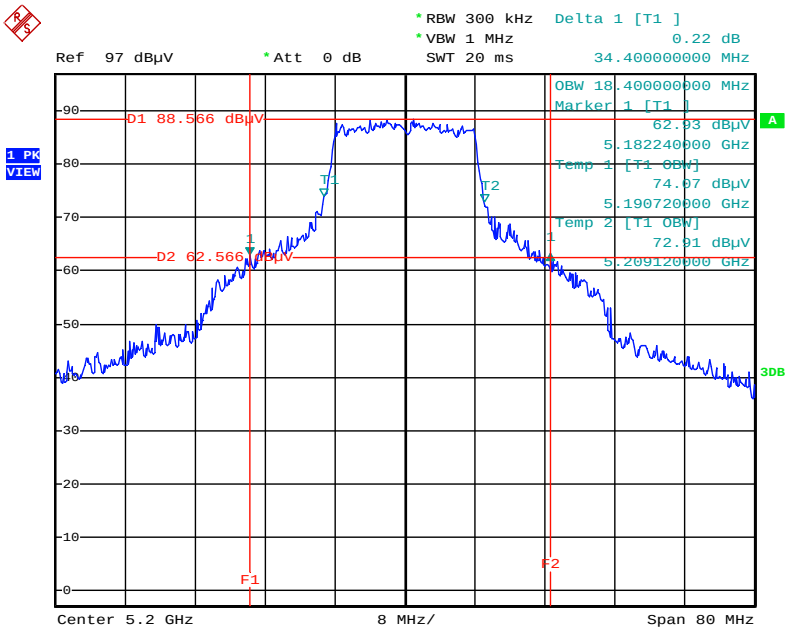
Date: 22.MAY.2014 17:41:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 6 / 5180 MHz



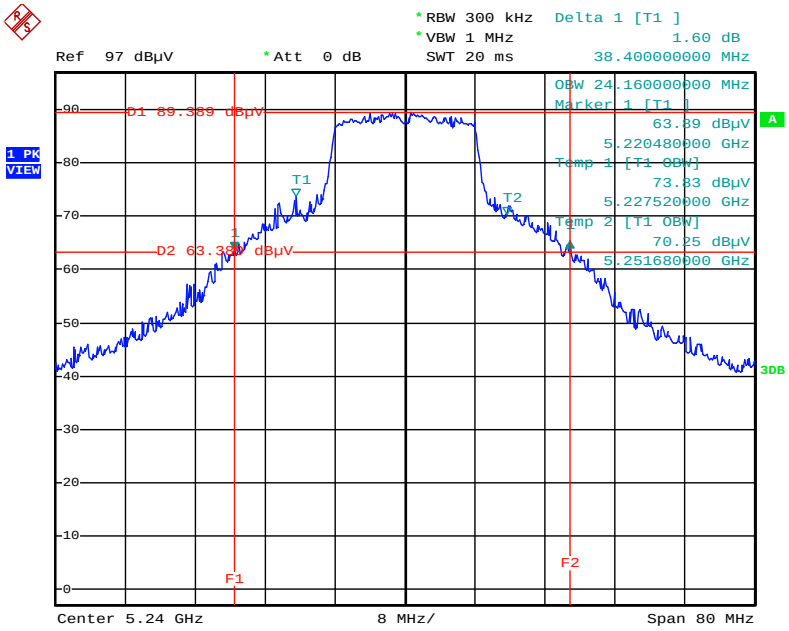
Date: 22.MAY.2014 17:50:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 6 / 5200 MHz



Date: 22.MAY.2014 17:50:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 6 / 5240 MHz



Date: 22.MAY.2014 17:49:19

4.3. 6dB Spectrum Bandwidth and 99% Occupied 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.

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. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Deviation

There is no deviation with the original standard.

4.3.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.6. Test Result of 6dB Spectrum Bandwidth and 99% Occupied Bandwidth

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n/ac

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.16	17.76	500	Complies
157	5785 MHz	16.96	17.84	500	Complies
165	5825 MHz	16.40	17.76	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	35.84	36.48	500	Complies
159	5795 MHz	35.52	36.48	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	71.68	76.16	500	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

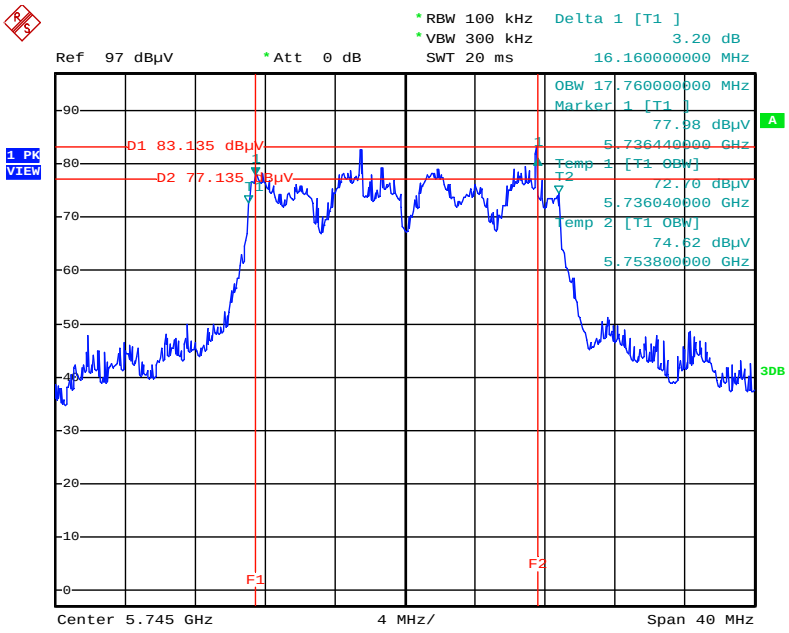
Configuration IEEE 802.11a / Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.32	19.04	500	Complies
157	5785 MHz	16.32	22.00	500	Complies
165	5825 MHz	16.32	21.68	500	Complies

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

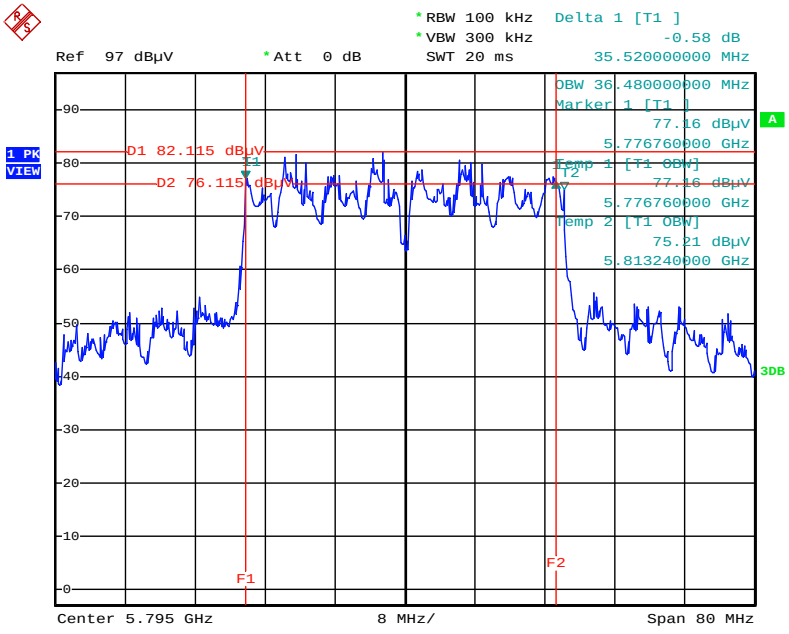
For plots, only the channel with worse result was shown.

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



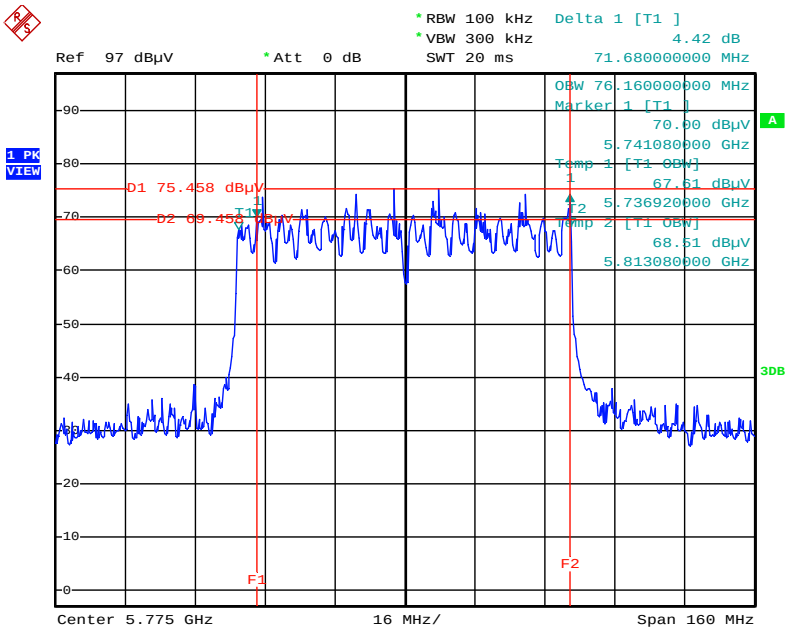
Date: 22.MAY.2014 17:34:06

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 4 + Chain 5 + Chain 6



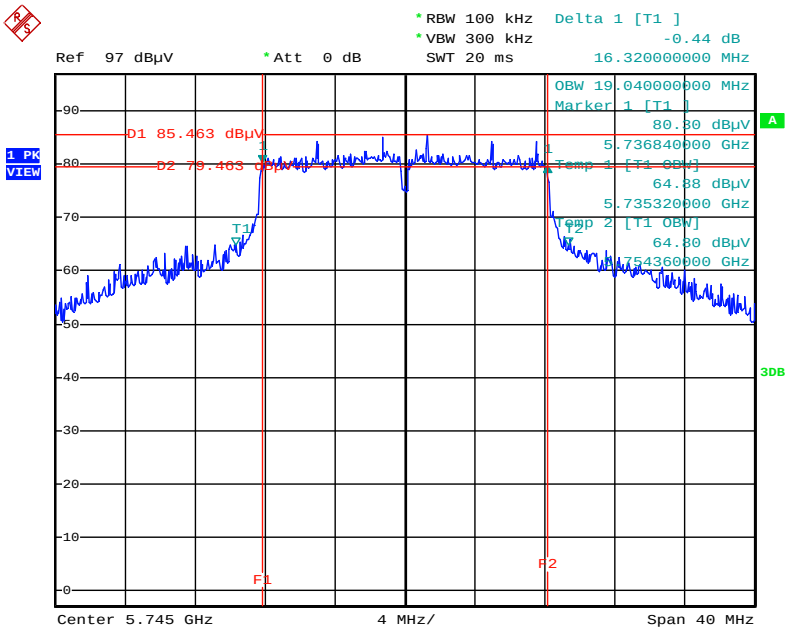
Date: 22.MAY.2014 17:37:08

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



Date: 22.MAY.2014 17:37:53

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 6



Date: 22.MAY.2014 17:30:46

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

For the band 5.15~5.25 GHz, 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).

For the band 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. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.4.2. Measuring Instruments and Setting

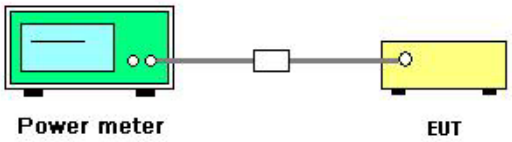
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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 General UNII Test Procedures Effective 2014 DR02-41759 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).
3. Multiple antenna systems was performed in accordance with KDB 662911 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	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	May 22, 2014		

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

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
36	5180 MHz	19.19	18.62	19.15	23.77	30.00	Complies
40	5200 MHz	17.27	16.75	17.07	21.81	30.00	Complies
48	5240 MHz	18.31	17.65	17.91	22.74	30.00	Complies
149	5745 MHz	19.06	16.67	16.47	22.34	30.00	Complies
157	5785 MHz	20.11	18.16	18.06	23.65	30.00	Complies
165	5825 MHz	18.78	16.48	16.38	22.13	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
38	5190 MHz	18.68	18.12	18.38	23.17	30.00	Complies
46	5230 MHz	21.23	20.71	20.62	25.63	30.00	Complies
151	5755 MHz	16.13	14.16	14.44	19.77	30.00	Complies
159	5795 MHz	20.53	18.14	18.12	23.86	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
42	5210 MHz	17.96	17.86	18.12	22.75	30.00	Complies
155	5775 MHz	16.35	14.45	14.58	19.99	30.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a
Test Date	May 22, 2014		

Configuration IEEE 802.11a / Chain 6

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	22.32	30.00	Complies
40	5200 MHz	22.68	30.00	Complies
48	5240 MHz	23.74	30.00	Complies
149	5745 MHz	20.76	30.00	Complies
157	5785 MHz	21.15	30.00	Complies
165	5825 MHz	21.37	30.00	Complies

4.5. Power Spectral Density Measurement

4.5.1. Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 4.4.1.

Frequency Range	Power Spectral Density limit
5.15~5.25 GHz	17 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.

For 5.15~5.25 GHz

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

For 5.725~5.85 GHz

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	RBW ≥ 1/T
VBW	VBW ≥ 3 RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple
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

For 5.15~5.25 GHz

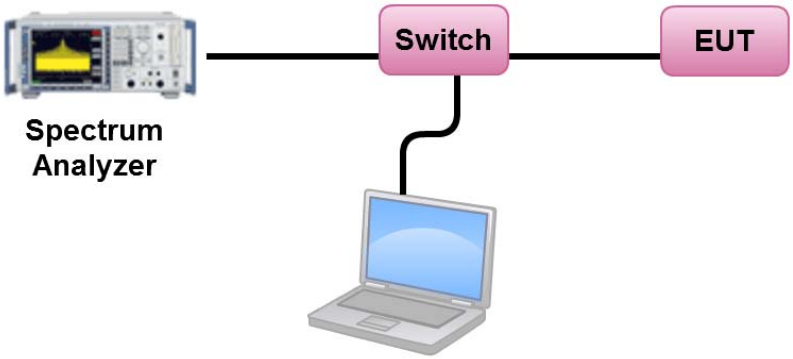
1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 General UNII Test Procedures Effective 2014 DR02-41759 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB 662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

For 5.725~5.85 GHz

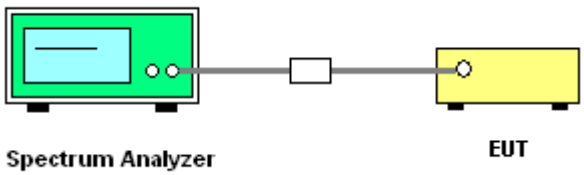
1. Test procedures refer KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout

For 5.15~5.25 GHz



For 5.725~5.85 GHz



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	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Data	May 22, 2014		

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

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.09	17.00	Complies
40	5200 MHz	7.93	17.00	Complies
48	5240 MHz	9.16	17.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Band1 Limit =17dBm/MHz

Channel	Frequency	Power Density (dBm/3kHz)				BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 4	Chain 5	Chain 6	Total	3kHz to 500kHz	dBm/500kHz		
149	5745 MHz	-7.07	-9.04	-7.14	-2.89	22.22	19.33	30.00	Complies
157	5785 MHz	-5.39	-6.60	-4.78	-0.75	22.22	21.47	30.00	Complies
165	5825 MHz	-5.20	-9.12	-7.03	-2.06	22.22	20.16	30.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Power Density Limit =30dBm/500kHz

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

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	6.58	17.00	Complies
46	5230 MHz	9.00	17.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Band1 Limit =17dBm/MHz

Channel	Frequency	Power Density (dBm/3kHz)				BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 4	Chain 5	Chain 6	Total	3kHz to 500kHz	dBm/500kHz		
151	5755 MHz	-12.24	-14.06	-12.30	-8.02	22.22	14.20	30.00	Complies
159	5795 MHz	-7.45	-9.19	-7.92	-3.36	22.22	18.86	30.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Power Density Limit =30dBm/500kHz

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

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	2.80	17.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Band1 Limit =17dBm/MHz

Channel	Frequency	Power Density (dBm/3kHz)				BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 4	Chain 5	Chain 6	Total	3kHz to 500kHz	dBm/500kHz		
155	5775 MHz	-14.27	-15.23	-11.74	-8.72	22.22	13.50	30.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Power Density Limit =30dBm/500kHz

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a
Test Data	May 22, 2014		

Configuration IEEE 802.11a / Chain 6

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	8.29	17.00	Complies
40	5200 MHz	8.43	17.00	Complies
48	5240 MHz	9.98	17.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Band1 Limit =17dBm/MHz

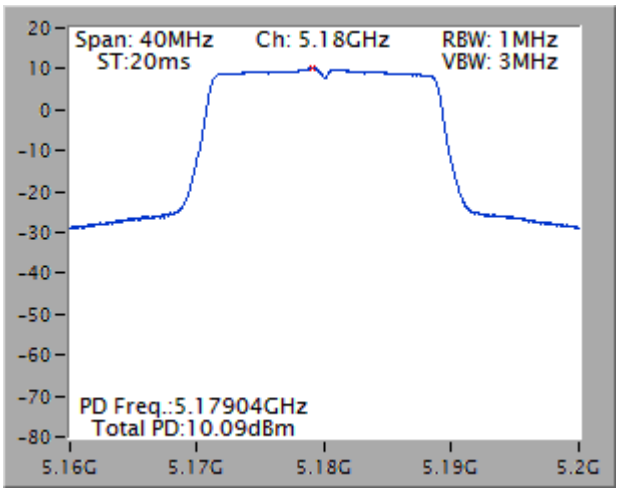
Channel	Frequency	Power Density (dBm/3kHz)	BWCF factor	Total Power Density	Power Density Limit	Result
			3kHz to 500kHz	dBm/500kHz		
149	5745 MHz	-4.17	22.22	18.05	30.00	Complies
157	5785 MHz	-2.11	22.22	20.11	30.00	Complies
165	5825 MHz	-4.11	22.22	18.11	30.00	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.49dBi <6dBi,So Power Density Limit =30dBm/500kHz

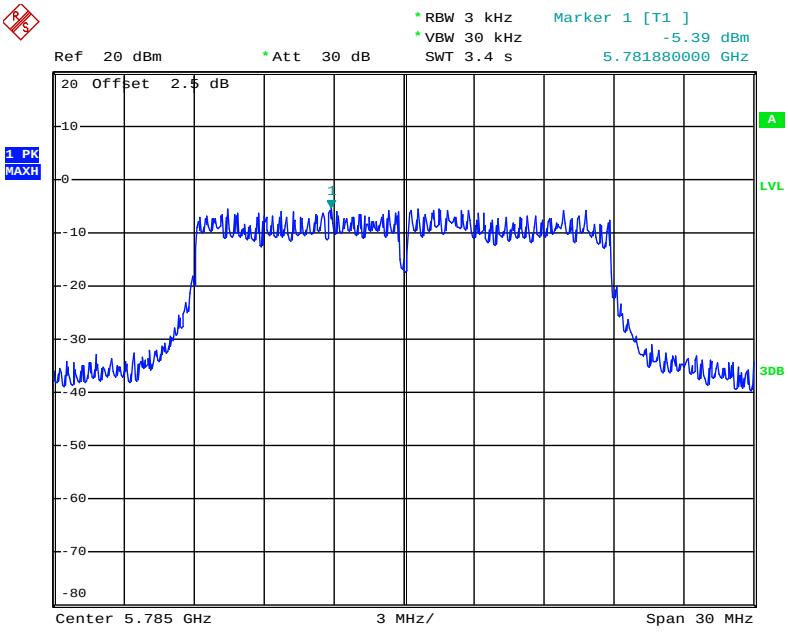
Note: All the test values were listed in the report.

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

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5180 MHz

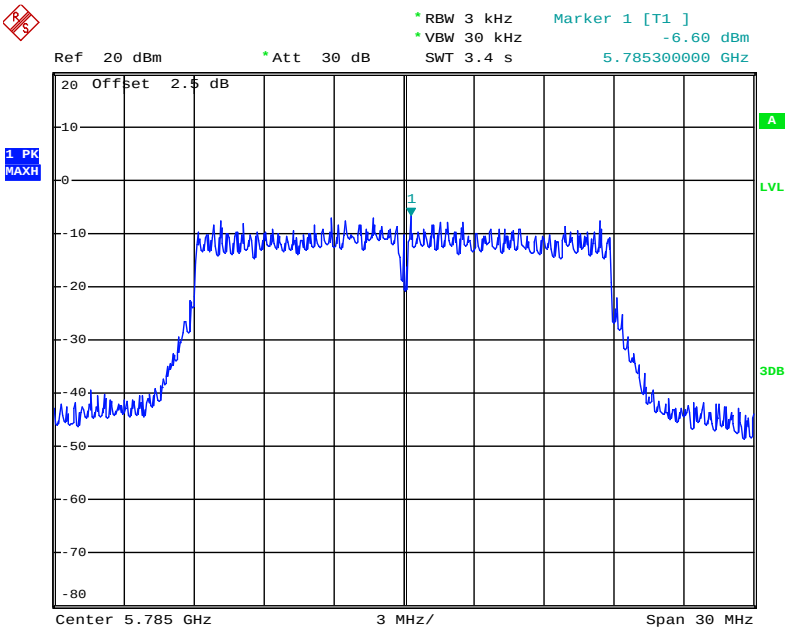


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 / 5785 MHz



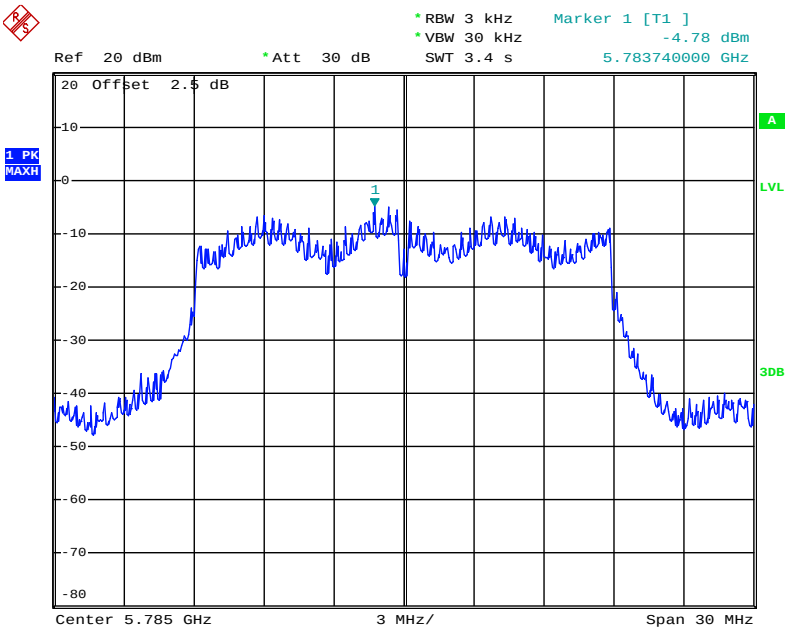
Date: 22.MAY.2014 16:57:34

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 5 / 5785 MHz



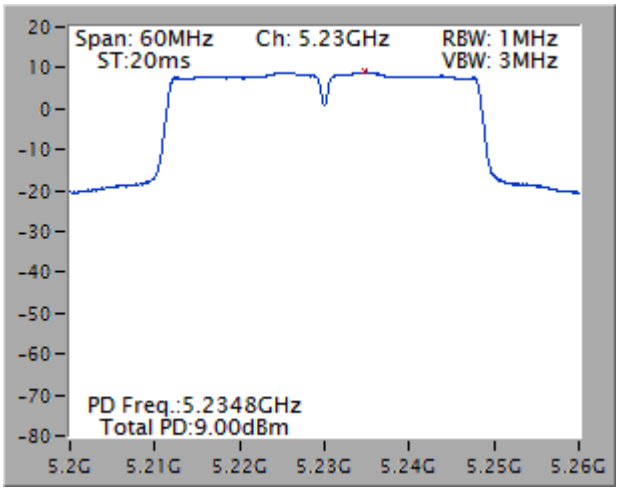
Date: 22.MAY.2014 16:59:09

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 6 / 5785 MHz

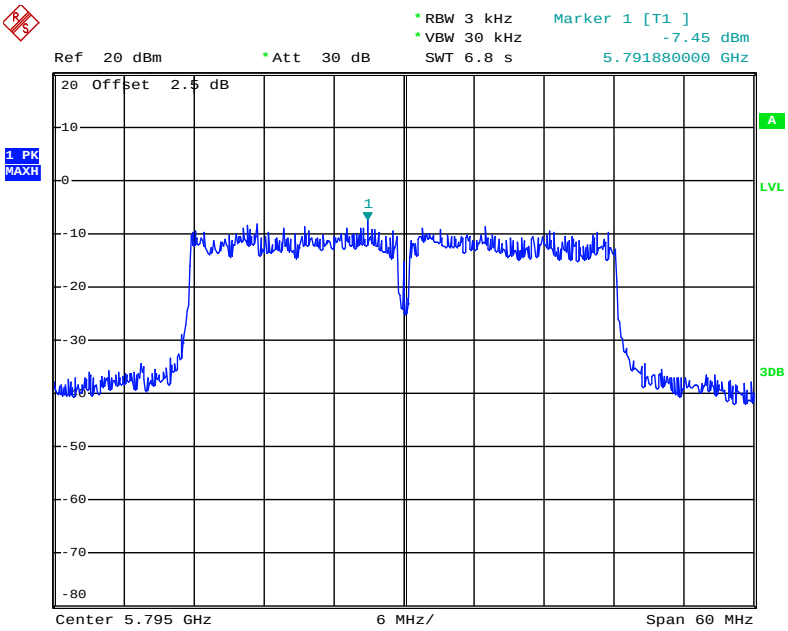


Date: 22.MAY.2014 17:00:19

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

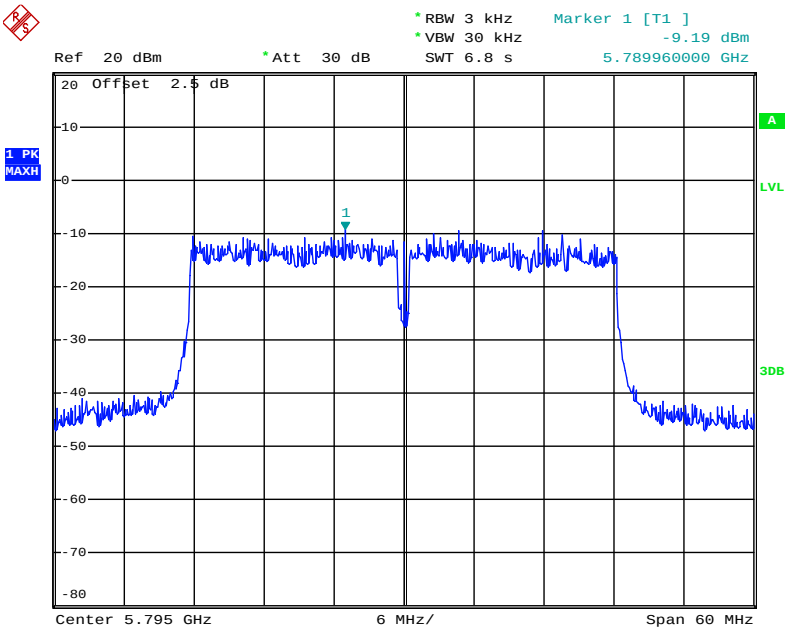


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 / 5795 MHz



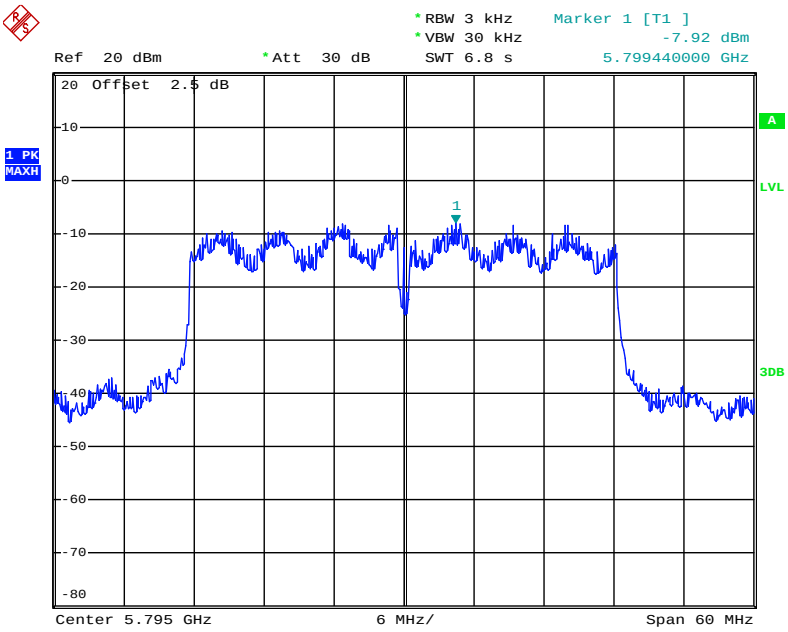
Date: 22.MAY.2014 17:11:39

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 5 / 5795 MHz



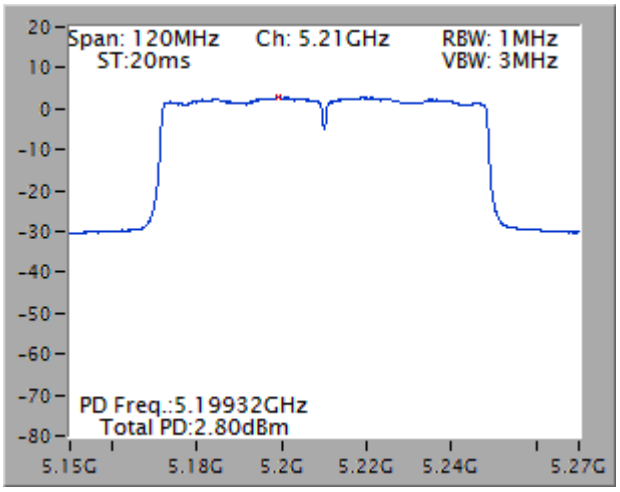
Date: 22.MAY.2014 17:10:27

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 6 / 5795 MHz

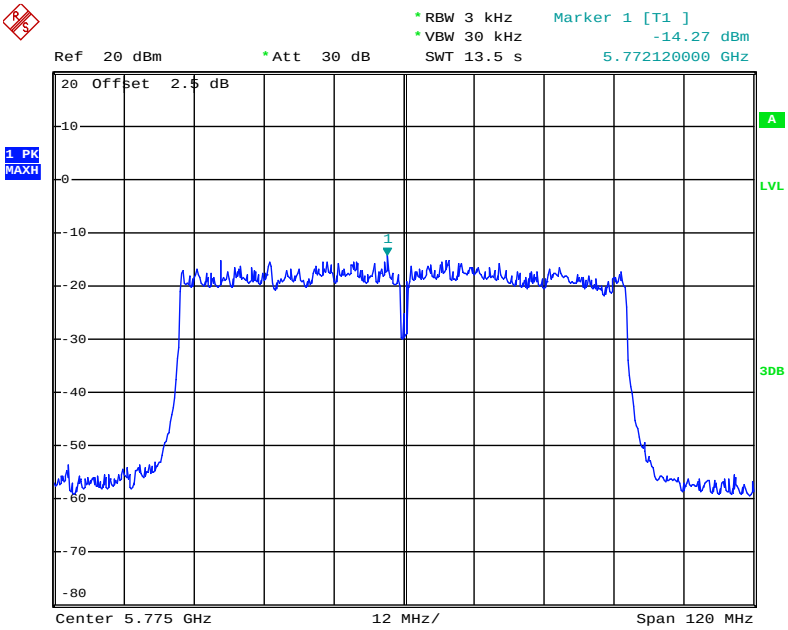


Date: 22.MAY.2014 17:08:30

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

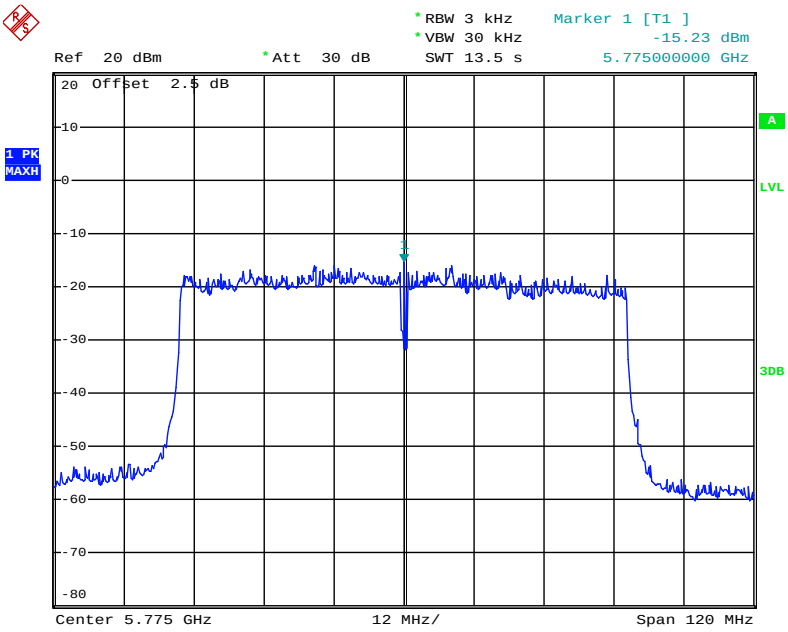


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 / 5775 MHz



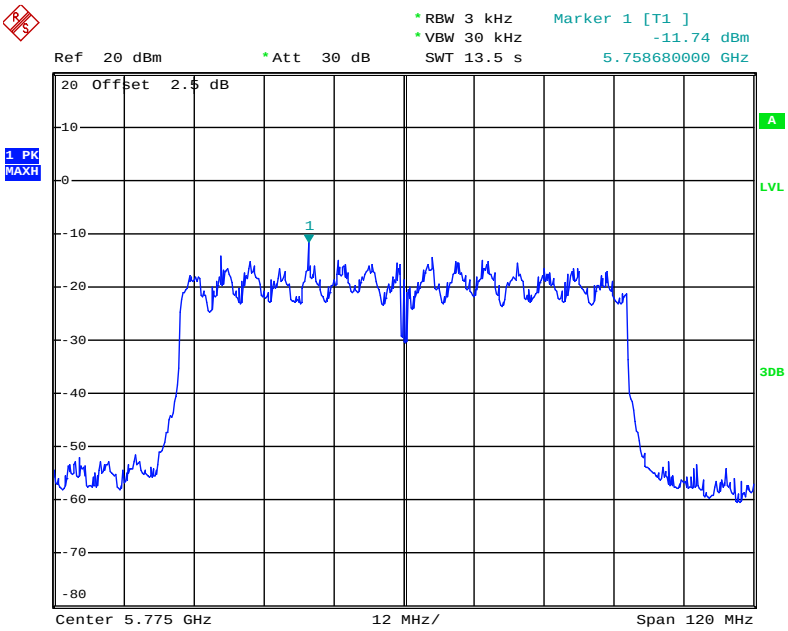
Date: 22.MAY.2014 17:13:13

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 5 / 5775 MHz



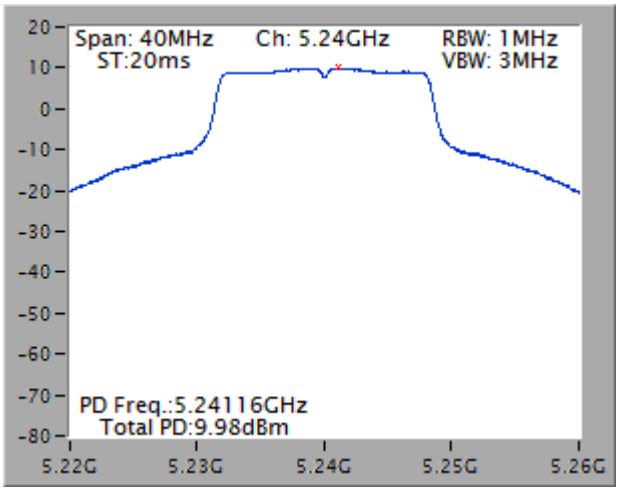
Date: 22.MAY.2014 17:14:51

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 6 / 5775 MHz

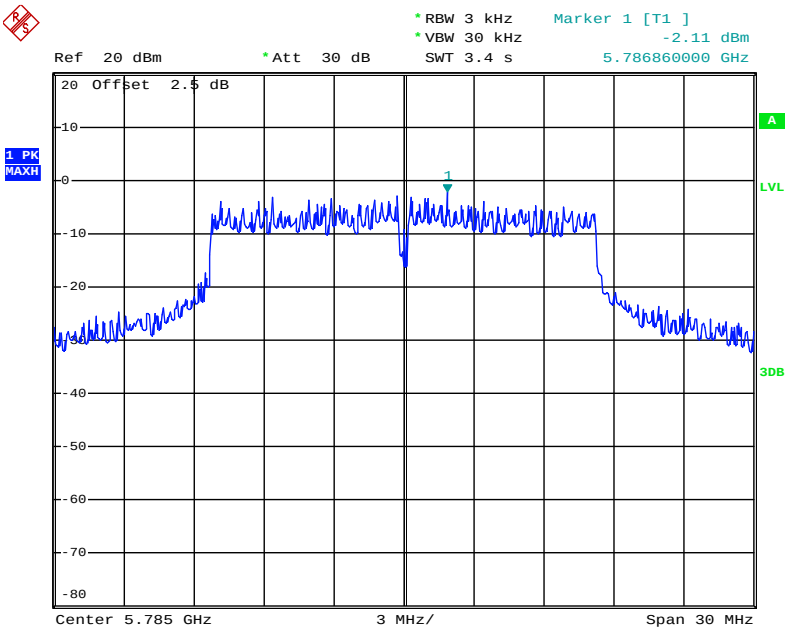


Date: 22.MAY.2014 17:15:53

Power Density Plot on Configuration IEEE 802.11a / Chain 6 / 5240 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 6 / 5785 MHz



Date: 22.MAY.2014 16:52:09

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 / 10Hz 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 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters 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 RBW for peak reading. Then 1MHz RBW and 10Hz 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 Deviation

There is no deviation with the original standard.

4.6.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	CTX
Test Date	Jun. 03, 2014	Test Mode	Mode 1

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

Note:

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

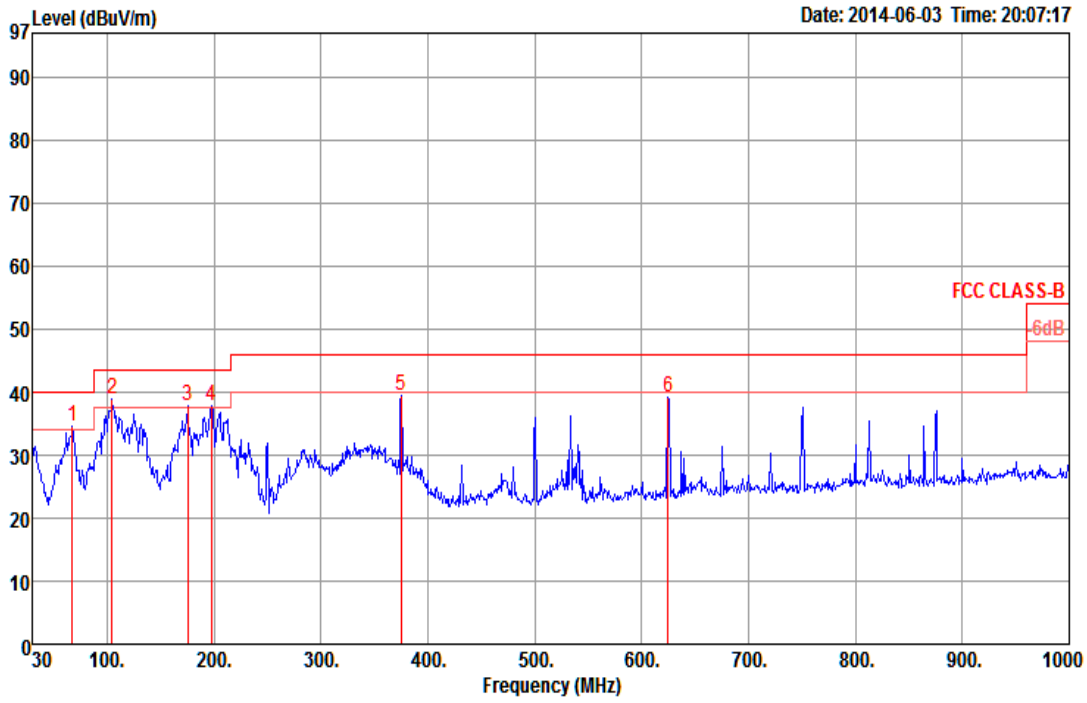
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

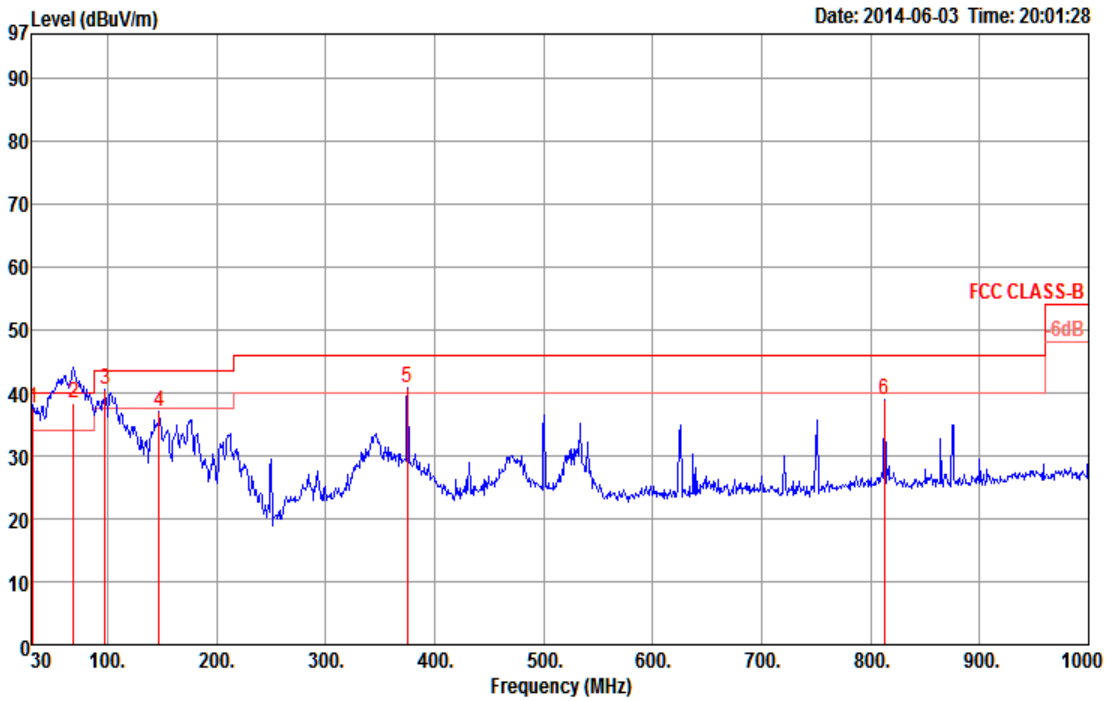
Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	CTX
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	67.83	34.58	40.00	-5.42	54.46	1.25	6.82	27.95	Peak	0	100	HORIZONTAL
2	104.69	38.94	43.50	-4.56	53.18	1.53	12.00	27.77	Peak	0	100	HORIZONTAL
3	175.50	37.93	43.50	-5.57	53.27	1.98	10.08	27.40	Peak	0	100	HORIZONTAL
4	197.81	37.75	43.50	-5.75	52.65	2.08	10.28	27.26	Peak	0	100	HORIZONTAL
5	375.32	39.32	46.00	-6.68	47.78	2.89	15.91	27.26	Peak	0	100	HORIZONTAL
6	624.61	39.09	46.00	-6.91	43.41	3.81	19.45	27.58	Peak	0	100	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	31.94	37.59	40.00	-2.41	46.00	0.87	18.70	27.98	Peak	2	100	VERTICAL
2	68.80	38.30	40.00	-1.70	58.17	1.26	6.81	27.94	QP	17	141	VERTICAL
3	97.90	40.40	43.50	-3.10	55.77	1.48	10.98	27.83	Peak	0	400	VERTICAL
4	147.37	37.14	43.50	-6.36	51.43	1.78	11.45	27.52	Peak	0	400	VERTICAL
5	375.32	40.71	46.00	-5.29	49.17	2.89	15.91	27.26	Peak	0	400	VERTICAL
6	812.79	38.82	46.00	-7.18	40.43	4.38	20.90	26.89	Peak	0	400	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.

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

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15538.72	57.46	74.00	-16.54	44.16	10.77	38.12	35.59	Peak	172	27	HORIZONTAL
2	15539.28	43.93	54.00	-10.07	30.63	10.77	38.12	35.59	Average	172	27	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15538.60	43.43	54.00	-10.57	30.13	10.77	38.12	35.59	Average	172	220	VERTICAL
2	15539.16	57.90	74.00	-16.10	44.60	10.77	38.12	35.59	Peak	172	220	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15590.84	43.45	54.00	-10.55	30.21	10.78	38.04	35.58	Average	165	352	HORIZONTAL
2	15602.52	56.25	74.00	-17.75	43.01	10.78	38.04	35.58	Peak	165	352	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15600.00	56.11	74.00	-17.89	42.87	10.78	38.04	35.58	Peak	183	64	VERTICAL
2	15600.24	43.39	54.00	-10.61	30.15	10.78	38.04	35.58	Average	183	64	VERTICAL

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15715.16	43.23	54.00	-10.77	30.15	10.79	37.85	35.56	Average	182	116	HORIZONTAL
2	15729.32	55.97	74.00	-18.03	42.91	10.79	37.83	35.56	Peak	182	116	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15718.92	43.29	54.00	-10.71	30.21	10.79	37.85	35.56	Average	133	347	VERTICAL
2	15725.80	55.82	74.00	-18.18	42.76	10.79	37.83	35.56	Peak	133	347	VERTICAL

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.48	55.40	74.00	-18.60	41.74	9.24	39.50	35.08	Peak	154	307	HORIZONTAL
2	11489.92	44.23	54.00	-9.77	30.57	9.24	39.50	35.08	Average	154	307	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.56	50.29	54.00	-3.71	36.63	9.24	39.50	35.08	Average	205	266	VERTICAL
2	11489.68	65.32	74.00	-8.68	51.66	9.24	39.50	35.08	Peak	205	266	VERTICAL

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11571.88	45.84	54.00	-8.16	32.19	9.26	39.47	35.08	Average	108	320	HORIZONTAL
2	11576.00	61.12	74.00	-12.88	47.47	9.26	39.47	35.08	Peak	108	320	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11571.76	53.63	54.00	-0.37	39.99	9.26	39.47	35.09	Average	186	266	VERTICAL
2	11576.00	68.04	74.00	-5.96	54.39	9.26	39.47	35.08	Peak	186	266	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11647.08	46.85	54.00	-7.15	33.20	9.28	39.44	35.07	Average	111	326	HORIZONTAL
2	11647.08	60.91	74.00	-13.09	47.26	9.28	39.44	35.07	Peak	111	326	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11651.68	53.98	54.00	-0.02	40.33	9.28	39.44	35.07	Average	209	280	VERTICAL
2	11655.84	69.22	74.00	-4.78	55.57	9.28	39.44	35.07	Peak	209	280	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15561.40	43.84	54.00	-10.16	30.55	10.78	38.09	35.58	Average	100	357	HORIZONTAL
2	15563.52	56.34	74.00	-17.66	43.05	10.78	38.09	35.58	Peak	100	357	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15564.44	43.66	54.00	-10.34	30.37	10.78	38.09	35.58	Average	143	102	VERTICAL
2	15574.80	57.32	74.00	-16.68	44.05	10.78	38.07	35.58	Peak	143	102	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15685.44	42.73	54.00	-11.27	29.59	10.79	37.91	35.56	Average	100	101	HORIZONTAL
2	15686.60	55.61	74.00	-18.39	42.47	10.79	37.91	35.56	Peak	100	101	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15683.16	42.73	54.00	-11.27	29.59	10.79	37.91	35.56	Average	8955	228	VERTICAL
2	15696.96	55.61	74.00	-18.39	42.50	10.79	37.88	35.56	Peak	100	228	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11514.60	42.06	54.00	-11.94	28.41	9.25	39.50	35.10	Average	188	277	HORIZONTAL
2	11519.36	54.08	74.00	-19.92	40.44	9.25	39.49	35.10	Peak	188	277	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11506.28	59.86	74.00	-14.14	46.21	9.25	39.50	35.10	Peak	202	258	VERTICAL
2	11511.80	45.65	54.00	-8.35	32.00	9.25	39.50	35.10	Average	202	258	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11586.68	56.91	74.00	-17.09	43.25	9.27	39.47	35.08	Peak	119	328	HORIZONTAL
2	11587.16	45.99	54.00	-8.01	32.33	9.27	39.47	35.08	Average	119	328	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11591.64	66.64	74.00	-7.36	52.98	9.27	39.47	35.08	Peak	204	287	VERTICAL
2	11591.88	51.88	54.00	-2.12	38.22	9.27	39.47	35.08	Average	204	287	VERTICAL

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15637.28	55.99	74.00	-18.01	42.79	10.78	37.99	35.57	Peak	100	284	HORIZONTAL
2	15639.52	43.10	54.00	-10.90	29.90	10.78	37.99	35.57	Average	164	284	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15624.44	43.01	54.00	-10.99	29.81	10.78	37.99	35.57	Average	100	40	VERTICAL
2	15624.92	56.01	74.00	-17.99	42.81	10.78	37.99	35.57	Peak	100	40	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11549.28	54.97	74.00	-19.03	41.31	9.26	39.49	35.09	Peak	153	283	HORIZONTAL
2	11559.36	42.38	54.00	-11.62	28.73	9.26	39.48	35.09	Average	153	283	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11556.88	47.11	54.00	-6.89	33.46	9.26	39.48	35.09	Average	198	270	VERTICAL
2	11566.32	60.62	74.00	-13.38	46.97	9.26	39.48	35.09	Peak	198	270	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 36 / Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15538.48	44.56	54.00	-9.44	31.26	10.77	38.12	35.59	Average	187	326	HORIZONTAL
2	15542.04	59.52	74.00	-14.48	46.22	10.77	38.12	35.59	Peak	187	326	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15538.44	44.41	54.00	-9.59	31.11	10.77	38.12	35.59	Average	167	299	VERTICAL
2	15541.92	59.38	74.00	-14.62	46.08	10.77	38.12	35.59	Peak	167	299	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 40 / Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15600.96	57.86	74.00	-16.14	44.62	10.78	38.04	35.58	Peak	178	284	HORIZONTAL
2	15601.52	43.58	54.00	-10.42	30.34	10.78	38.04	35.58	Average	178	284	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15598.84	46.57	54.00	-7.43	33.33	10.78	38.04	35.58	Average	212	309	VERTICAL
2	15601.60	62.31	74.00	-11.69	49.07	10.78	38.04	35.58	Peak	212	309	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 48 / Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15722.56	46.73	54.00	-7.27	33.65	10.79	37.85	35.56	Average	45	299	HORIZONTAL
2	15723.40	62.18	74.00	-11.82	49.10	10.79	37.85	35.56	Peak	171	299	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15719.76	47.02	54.00	-6.98	33.94	10.79	37.85	35.56	Average	225	114	VERTICAL
2	15723.16	61.99	74.00	-12.01	48.91	10.79	37.85	35.56	Peak	225	114	VERTICAL

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 149 / Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11483.60	54.01	74.00	-19.99	40.35	9.24	39.50	35.08	Peak	216	27	HORIZONTAL
2	11493.08	41.63	54.00	-12.37	27.97	9.24	39.50	35.08	Average	216	27	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11488.84	61.01	74.00	-12.99	47.35	9.24	39.50	35.08	Peak	193	269	VERTICAL
2	11491.92	46.91	54.00	-7.09	33.25	9.24	39.50	35.08	Average	193	269	VERTICAL

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 157 / Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11567.52	55.79	74.00	-18.21	42.15	9.26	39.47	35.09	Peak	208	26	HORIZONTAL
2	11567.56	42.93	54.00	-11.07	29.29	9.26	39.47	35.09	Average	208	26	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.52	61.26	74.00	-12.74	47.62	9.26	39.47	35.09	Peak	167	275	VERTICAL
2	11572.00	48.39	54.00	-5.61	34.74	9.26	39.47	35.08	Average	167	275	VERTICAL

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 165 / Chain 6
Test Date	May 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11654.32	43.76	54.00	-10.24	30.11	9.28	39.44	35.07	Average	202	251	HORIZONTAL
2	11658.92	56.71	74.00	-17.29	43.06	9.28	39.44	35.07	Peak	202	251	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11645.96	49.35	54.00	-4.65	35.70	9.28	39.44	35.07	Average	173	268	VERTICAL
2	11650.40	61.90	74.00	-12.10	48.25	9.28	39.44	35.07	Peak	173	268	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 / 10Hz 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, only the frequency range investigated is limited to 100MHz around band edges.

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	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5019.00	53.54	54.00	-0.46	48.97	6.04	33.73	35.20	Average	151	164	HORIZONTAL
2	5024.00	64.00	74.00	-10.00	59.42	6.05	33.73	35.20	Peak	151	164	HORIZONTAL
3	5179.00	101.25			96.22	6.15	34.08	35.20	Average	151	164	HORIZONTAL
4	5184.00	112.46			107.43	6.15	34.08	35.20	Peak	151	164	HORIZONTAL
5	5350.00	50.54	54.00	-3.46	45.06	6.26	34.42	35.20	Average	151	164	HORIZONTAL
6	5350.00	60.08	74.00	-13.92	54.60	6.26	34.42	35.20	Peak	151	164	HORIZONTAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5119.00	50.84	54.00	-3.16	45.99	6.11	33.94	35.20	Average	166	168	HORIZONTAL
2	5119.00	61.05	74.00	-12.95	56.20	6.11	33.94	35.20	Peak	166	168	HORIZONTAL
3	5194.00	110.84			105.80	6.16	34.08	35.20	Peak	166	168	HORIZONTAL
4	5199.00	100.02			94.95	6.16	34.11	35.20	Average	166	168	HORIZONTAL
5	5354.00	64.65	74.00	-9.35	59.17	6.26	34.42	35.20	Peak	166	168	HORIZONTAL
6	5359.00	53.52	54.00	-0.48	48.04	6.26	34.42	35.20	Average	166	168	HORIZONTAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5020.00	52.20	54.00	-1.80	47.63	6.04	33.73	35.20	Average	170	164	HORIZONTAL
2	5021.00	62.92	74.00	-11.08	58.34	6.05	33.73	35.20	Peak	170	164	HORIZONTAL
3	5239.00	100.00			94.84	6.18	34.18	35.20	Average	170	164	HORIZONTAL
4	5239.00	111.04			105.88	6.18	34.18	35.20	Peak	170	164	HORIZONTAL
5	5399.00	53.89	54.00	-0.11	48.27	6.29	34.53	35.20	Average	170	164	HORIZONTAL
6	5399.00	65.15	74.00	-8.85	59.53	6.29	34.53	35.20	Peak	170	164	HORIZONTAL

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

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5707.00	61.39	68.20	-6.81	55.28	6.44	34.87	35.20	Peak	233	91	HORIZONTAL
2	5725.00	77.62	78.20	-0.58	71.48	6.45	34.89	35.20	Peak	233	91	HORIZONTAL
3	5742.00	98.11			91.96	6.45	34.90	35.20	Average	233	91	HORIZONTAL
4	5742.00	108.22			102.07	6.45	34.90	35.20	Peak	233	91	HORIZONTAL
5	5860.00	57.75	68.20	-10.45	51.46	6.50	34.99	35.20	Peak	233	91	HORIZONTAL
6	5908.00	65.04	68.20	-3.16	58.70	6.52	35.02	35.20	Peak	233	91	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5708.00	61.97	68.20	-6.23	55.86	6.44	34.87	35.20	Peak	258	310	HORIZONTAL
2	5722.00	58.67	78.20	-19.53	52.55	6.45	34.87	35.20	Peak	258	310	HORIZONTAL
3	5784.00	99.59			93.40	6.46	34.93	35.20	Average	258	310	HORIZONTAL
4	5789.00	111.21			105.01	6.47	34.93	35.20	Peak	258	310	HORIZONTAL
5	5859.00	64.77	78.20	-13.43	58.48	6.50	34.99	35.20	Peak	258	310	HORIZONTAL
6	5944.00	65.96	68.20	-2.24	59.58	6.53	35.05	35.20	Peak	258	310	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5664.00	62.53	68.20	-5.67	56.48	6.42	34.83	35.20	Peak	233	88	HORIZONTAL
2	5722.00	55.37	78.20	-22.83	49.25	6.45	34.87	35.20	Peak	233	88	HORIZONTAL
3	5817.00	110.32			104.09	6.48	34.95	35.20	Peak	233	88	HORIZONTAL
4	5822.00	99.00			92.77	6.48	34.95	35.20	Average	233	88	HORIZONTAL
5	5860.00	66.95	68.20	-1.25	60.66	6.50	34.99	35.20	Peak	233	88	HORIZONTAL
6	5907.00	65.72	68.20	-2.48	59.38	6.52	35.02	35.20	Peak	233	88	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5825 MHz.

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5149.00	53.69	54.00	-0.31	48.75	6.13	34.01	35.20	Average	157	160	HORIZONTAL
2	5149.00	71.80	74.00	-2.20	66.86	6.13	34.01	35.20	Peak	157	160	HORIZONTAL
3	5184.00	109.88			104.85	6.15	34.08	35.20	Peak	157	160	HORIZONTAL
4	5194.00	98.27			93.23	6.16	34.08	35.20	Average	157	160	HORIZONTAL
5	5354.00	53.19	54.00	-0.81	47.71	6.26	34.42	35.20	Average	157	160	HORIZONTAL
6	5364.00	62.94	74.00	-11.06	57.45	6.27	34.42	35.20	Peak	157	160	HORIZONTAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5064.00	53.65	54.00	-0.35	48.94	6.07	33.84	35.20	Average	189	162	HORIZONTAL
2	5144.00	66.83	74.00	-7.17	61.89	6.13	34.01	35.20	Peak	189	162	HORIZONTAL
3	5224.00	100.58			95.46	6.17	34.15	35.20	Average	189	162	HORIZONTAL
4	5234.00	112.36			107.20	6.18	34.18	35.20	Peak	189	162	HORIZONTAL
5	5384.00	53.80	54.00	-0.20	48.23	6.28	34.49	35.20	Average	189	162	HORIZONTAL
6	5385.00	64.45	74.00	-9.55	58.88	6.28	34.49	35.20	Peak	189	162	HORIZONTAL

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

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5710.00	67.01	68.20	-1.19	60.90	6.44	34.87	35.20	Peak	195	86	HORIZONTAL
2	5722.00	72.39	78.20	-5.81	66.27	6.45	34.87	35.20	Peak	195	86	HORIZONTAL
3	5760.00	91.59			85.42	6.46	34.91	35.20	Average	195	86	HORIZONTAL
4	5760.00	102.66			96.49	6.46	34.91	35.20	Peak	195	86	HORIZONTAL
5	5852.00	58.24	78.20	-19.96	51.97	6.49	34.98	35.20	Peak	195	86	HORIZONTAL
6	5912.00	61.24	68.20	-6.96	54.89	6.52	35.03	35.20	Peak	195	86	HORIZONTAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5705.00	60.88	68.20	-7.32	54.78	6.44	34.86	35.20	Peak	203	91	HORIZONTAL
2	5722.00	62.99	78.20	-15.21	56.87	6.45	34.87	35.20	Peak	203	91	HORIZONTAL
3	5792.00	95.93			89.72	6.47	34.94	35.20	Average	203	91	HORIZONTAL
4	5792.00	107.21			101.00	6.47	34.94	35.20	Peak	203	91	HORIZONTAL
5	5851.00	67.89	78.20	-10.31	61.62	6.49	34.98	35.20	Peak	203	91	HORIZONTAL
6	5861.00	66.86	68.20	-1.34	60.57	6.50	34.99	35.20	Peak	203	91	HORIZONTAL

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

Temperature	23°C	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 4 + Chain 5 + Chain 6
Test Date	May 13, 2014		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5145.00	53.83	54.00	-0.17	48.89	6.13	34.01	35.20	Average	164	158	HORIZONTAL
2	5149.00	73.55	74.00	-0.45	68.61	6.13	34.01	35.20	Peak	164	158	HORIZONTAL
3	5199.00	93.10			88.03	6.16	34.11	35.20	Average	164	158	HORIZONTAL
4	5199.00	106.34			101.27	6.16	34.11	35.20	Peak	164	158	HORIZONTAL
5	5354.00	49.34	54.00	-4.66	43.86	6.26	34.42	35.20	Average	164	158	HORIZONTAL
6	5355.00	60.40	74.00	-13.60	54.92	6.26	34.42	35.20	Peak	164	158	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5210 MHz.

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5711.00	66.63	68.20	-1.57	60.52	6.44	34.87	35.20	Peak	215	88	HORIZONTAL
2	5721.00	69.96	78.20	-8.24	63.84	6.45	34.87	35.20	Peak	215	88	HORIZONTAL
3	5779.00	99.97			93.78	6.46	34.93	35.20	Average	215	88	HORIZONTAL
4	5781.40	87.30			81.11	6.46	34.93	35.20	Peak	215	88	HORIZONTAL
5	5857.20	65.17	78.20	-13.03	58.89	6.50	34.98	35.20	Peak	215	88	HORIZONTAL
6	5867.20	64.01	68.20	-4.19	57.72	6.50	34.99	35.20	Peak	215	88	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5775 MHz.

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 6
Test Date	May 13, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	53.75	54.00	-0.25	48.81	6.13	34.01	35.20	Average	206	175	VERTICAL
2	5150.00	68.59	74.00	-5.41	63.65	6.13	34.01	35.20	Peak	206	175	VERTICAL
3	5181.00	99.98			94.95	6.15	34.08	35.20	Average	206	175	VERTICAL
4	5182.00	110.49			105.46	6.15	34.08	35.20	Peak	206	175	VERTICAL
5	5350.00	44.49	54.00	-9.51	39.01	6.26	34.42	35.20	Average	206	175	VERTICAL
6	5394.00	60.45	74.00	-13.55	54.88	6.28	34.49	35.20	Peak	206	175	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5115.00	61.90	74.00	-12.10	57.05	6.11	33.94	35.20	Peak	176	172	VERTICAL
2	5118.00	51.24	54.00	-2.76	46.39	6.11	33.94	35.20	Average	176	172	VERTICAL
3	5201.00	99.97			94.90	6.16	34.11	35.20	Average	176	172	VERTICAL
4	5203.00	110.28			105.21	6.16	34.11	35.20	Peak	176	172	VERTICAL
5	5359.00	64.19	74.00	-9.81	58.71	6.26	34.42	35.20	Peak	176	172	VERTICAL
6	5362.00	53.53	54.00	-0.47	48.04	6.27	34.42	35.20	Average	176	172	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5081.00	48.88	54.00	-5.12	44.12	6.09	33.87	35.20	Average	201	29	VERTICAL
2	5084.00	58.88	74.00	-15.12	54.12	6.09	33.87	35.20	Peak	201	29	VERTICAL
3	5239.00	99.91			94.75	6.18	34.18	35.20	Average	201	29	VERTICAL
4	5243.00	110.00			104.82	6.20	34.18	35.20	Peak	201	29	VERTICAL
5	5400.00	63.38	74.00	-10.62	57.76	6.29	34.53	35.20	Peak	201	29	VERTICAL
6	5402.00	52.89	54.00	-1.11	47.27	6.29	34.53	35.20	Average	201	29	VERTICAL

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

Temperature	23℃	Humidity	58%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 6
Test Date	May 12, 2014		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5712.00	65.33	68.20	-2.87	59.22	6.44	34.87	35.20	Peak	228	45	VERTICAL
2	5725.00	77.95	78.20	-0.25	71.81	6.45	34.89	35.20	Peak	228	45	VERTICAL
3	5746.00	98.21			92.06	6.45	34.90	35.20	Average	228	45	VERTICAL
4	5747.00	109.16			103.01	6.45	34.90	35.20	Peak	228	45	VERTICAL
5	5858.00	57.39	78.20	-20.81	51.11	6.50	34.98	35.20	Peak	228	45	VERTICAL
6	5904.00	62.18	68.20	-6.02	55.85	6.51	35.02	35.20	Peak	228	45	VERTICAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5710.00	64.10	68.20	-4.10	57.99	6.44	34.87	35.20	Peak	222	166	VERTICAL
2	5724.00	58.93	78.20	-19.27	52.79	6.45	34.89	35.20	Peak	222	166	VERTICAL
3	5783.00	110.45			104.26	6.46	34.93	35.20	Peak	222	166	VERTICAL
4	5786.00	99.58			93.38	6.47	34.93	35.20	Average	222	166	VERTICAL
5	5858.00	63.75	78.20	-14.45	57.47	6.50	34.98	35.20	Peak	222	166	VERTICAL
6	5866.00	65.04	68.20	-3.16	58.75	6.50	34.99	35.20	Peak	222	166	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5666.00	62.10	68.20	-6.10	56.05	6.42	34.83	35.20	Peak	207	47	VERTICAL
2	5723.00	55.24	78.20	-22.96	49.10	6.45	34.89	35.20	Peak	207	47	VERTICAL
3	5817.00	99.69			93.46	6.48	34.95	35.20	Average	207	47	VERTICAL
4	5826.00	110.31			104.06	6.48	34.97	35.20	Peak	207	47	VERTICAL
5	5850.00	77.00	78.20	-1.20	70.73	6.49	34.98	35.20	Peak	207	47	VERTICAL
6	5902.00	64.83	68.20	-3.37	58.50	6.51	35.02	35.20	Peak	207	47	VERTICAL

Item 3, 4 are the fundamental frequency at 5825 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

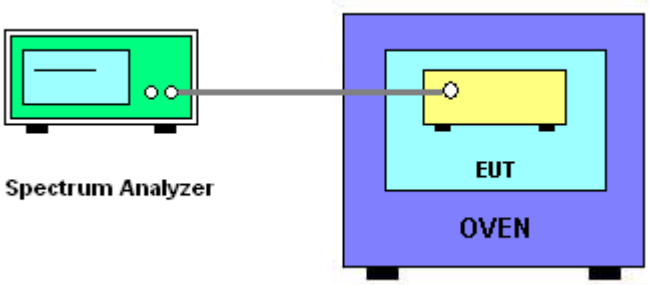
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. 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	26°C	Humidity	63%
Test Engineer	Wen Chao	Test Date	May 22, 2014

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5200 MHz
126.50	5199.9906
110.00	5199.9904
93.50	5199.9904
Max. Deviation (MHz)	0.009600
Max. Deviation (ppm)	1.85

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5200 MHz
-30	5199.9910
-20	5199.9908
-10	5199.9908
0	5199.9906
10	5199.9904
20	5199.9904
30	5199.9904
40	5199.9902
50	5199.9902
Max. Deviation (MHz)	0.009800
Max. Deviation (ppm)	1.88

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 Test Receiver	R&S	ESCS 30	100355	9 kHz ~ 2.75 GHz	Apr. 23, 2014	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150 kHz ~ 100 MHz	Nov. 23, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 11, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150 kHz ~ 30 MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Apr. 16, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 2013	Conducted (TH01-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Dec. 02, 2013	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 17, 2013	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Divider	Woken	4 Way	0120A04056002D	2GHz ~ 18GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	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

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.026	dB	normal(k=2)	0.013
Cable loss	0.002	dB	normal(k=2)	0.001
AMN/LISN specification	1.200	dB	normal(k=2)	0.600
Mismatch Receiver VSWR 1= AMN/LISN VSWR 2=	-0.080	dB	U-shaped	0.060
Combined standard uncertainty Uc(y)				1.2
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				2.4

Uncertainty of Radiated Emission Measurement (30MHz ~ 1,000MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.173	dB	k=1	0.086
Cable loss	±0.174	dB	k=2	0.087
Antenna gain	±0.169	dB	k=2	0.084
Site imperfection	±0.433	dB	Triangular	0.214
Pre-amplifier gain	±0.366	dB	k=2	0.183
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.778
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.555

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.191	dB	k=1	0.095
Cable loss	±0.169	dB	k=2	0.084
Antenna gain	±0.191	dB	k=2	0.096
Site imperfection	±0.582	dB	Triangular	0.291
Pre-amplifier gain	±0.304	dB	k=2	0.152
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.839
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.678

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.186	dB	k=1	0.093
Cable loss	±0.167	dB	k=2	0.083
Antenna gain	±0.190	dB	k=2	0.095
Site imperfection	±0.488	dB	Triangular	0.244
Pre-amplifier gain	±0.269	dB	k=2	0.134
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.771
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.541

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Cable loss	±0.038	dB	k=2	0.019
Attenuator	±0.047	dB	k=2	0.024
Power Meter specification	±0.300	dB	Triangular	0.150
Power Sensor specification	±0.300	dB	Rectangular	0.150
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				0.863
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				1.726