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FCC RADIO TEST REPORT

Applicant's company	ASUSTeK COMPUTER INC.
Applicant Address	4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan
FCC ID	MSQ-PCIE0U00
Manufacturer's company (1)	ASKEY TECHNOLOGY (JIANG SU) LTD
Manufacturer Address	NO1388, Jiao Tong Road, Wujiang Economic Technological Development Area Jiangsu Province 215200 China
Manufacturer's company (2)	Compal Networking (KunShan) Co., LTD.
Manufacturer Address	No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China

Product Name	Dual Band 4x4 802.11ac PCI-E adapter
Brand Name	ASUS
Model No.	PCE-AC88
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Nov. 05, 2015
Final Test Date	Jan. 09, 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 v01r01, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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



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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5N0421-01	Rev. 01	Initial issue of report	Mar. 02, 2016

1. VERIFICATION OF COMPLIANCE

Product Name : Dual Band 4x4 802.11ac PCI-E adapter
Brand Name : ASUS
Model No. : PCE-AC88
Applicant : ASUSTeK COMPUTER 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 Nov. 05, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.2	15.407(a)	Maximum Conducted Output Power	Complies	0.02 dB
4.3	15.407(a)	Power Spectral Density	Complies	0.12 dB
4.4	15.407(b)	Radiated Emissions	Complies	9.65 dB
4.5	15.407(b)	Band Edge Emissions	Complies	1.02 dB
4.6	15.407(g)	Frequency Stability	Complies	-
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From host system
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, 1024QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	12 for 20MHz bandwidth ; 5 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 2: IEEE 802.11a: 17.45 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.23 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.61 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz Band 3: IEEE 802.11a: 17.54 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz
Maximum Conducted Output Power	Band 2: IEEE 802.11a: 23.84 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.96 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.87 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 21.77 dBm Band 3: IEEE 802.11a: 23.92 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.96 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.84 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.67 dBm

Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☐ With 5600~5650MHz	☒ Without 5600~5650MHz
Beamforming Function	☒ With beamforming	☐ Without beamforming
	The product has beamforming function for 802.11n/ac.	
Operate Condition	☒ Indoor	☐ Outdoor

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS0-11/Nss1-4
802.11ac (VHT40)	4	MCS0-11/Nss1-4
802.11ac (VHT80)	4	MCS0-11/Nss1-4

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

Description
Antenna connection pedestal*1

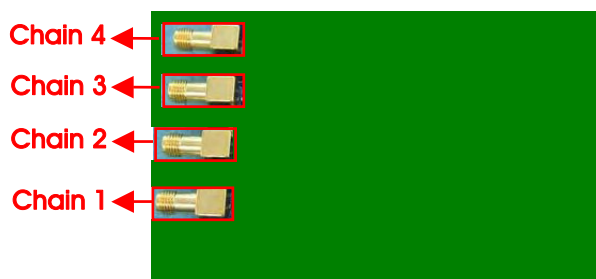
3.3. Table for Filed Antenna

Set	Brand	P/N	Type	Connector	Gain (dBi)				
					2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
1	WHA YU	C660-510336-A (SRF20141892)	Dipole	Reversed-SMA	1.86	1.97	1.96	1.95	1.95

Set	Loss of Cable (dB)					True Gain (dBi)				
	2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4	2.4GHz	5GHz Band 1	5GHz Band 2	5GHz Band 3	5GHz Band 4
1	1.70	2.80	2.80	2.80	2.80	0.16	-0.83	-0.84	-0.85	-0.85

Note: The EUT has one set antenna, and each set contains four antennas.

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/11 0/134	1+2+3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	1+2+3+4
Power Spectral Density	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/11 0/134	1+2+3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	1+2+3+4
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/11 0/134	1+2+3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	1+2+3+4
Radiated Emission Above 1GHz	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/11 0/134	1+2+3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	1+2+3+4
Band Edge Emission	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/ 116/140	1+2+3+4

	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	1+2+3+4
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	1+2+3+4
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	1+2+3+4
Frequency Stability	20 MHz	Band 2-3	-	60/116	1
	40 MHz	Band 2-3	-	62/110	1
	80 MHz	Band 2-3	-	58/106	1

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

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

3. There are two functions of EUT, one is beamforming function, and the other is non-beamforming function for 802.11n/ac, after evaluating, beamforming function has been evaluated to be the worst case, so it was selected to test and record in this test report.

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No.
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR5N0421

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

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

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

For non-beamforming function:

Support Unit	Brand	Model	FCC ID
PC	ASUS	Vintage2-PH1	DoC
LCD Monitor	ASUS	VB171	DoC
Keyboard	ASUS	AS-KBA000	DoC
Mouse	ASUS	MOBTUO	DoC

For beamforming function:

Support Unit	Brand	Model	FCC ID
PC	ASUS	Vintage2-PH1	DoC
LCD Monitor	ASUS	VB171	DoC
Keyboard	ASUS	AS-KBA000	DoC
Mouse	ASUS	MOBTUO	DoC
Wireless ac AP	ASUS	RT-AC88U	MSQ-RTGW00
Notebook	DELL	E4300	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
PC	ASUS	Vintage2-PH1	DoC
LCD Monitor	ASUS	VB171	DoC
Keyboard	ASUS	AS-KBA000	DoC
Mouse	ASUS	MOBTUO	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	Mtool 2.0.0.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	70	70	70	70	70	70
802.11ac MCS0/Nss1 VHT20	70	70	70	70	70	70
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	70	71	67	70	70	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5290 MHz			5530 MHz		
	62			70		

3.10. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN XP were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under DOS.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by Wireless ac AP and transmit duty cycle no less 98%

3.11.1. Duty Cycle

For non-beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.035	2.067	98.45%	0.07	0.01

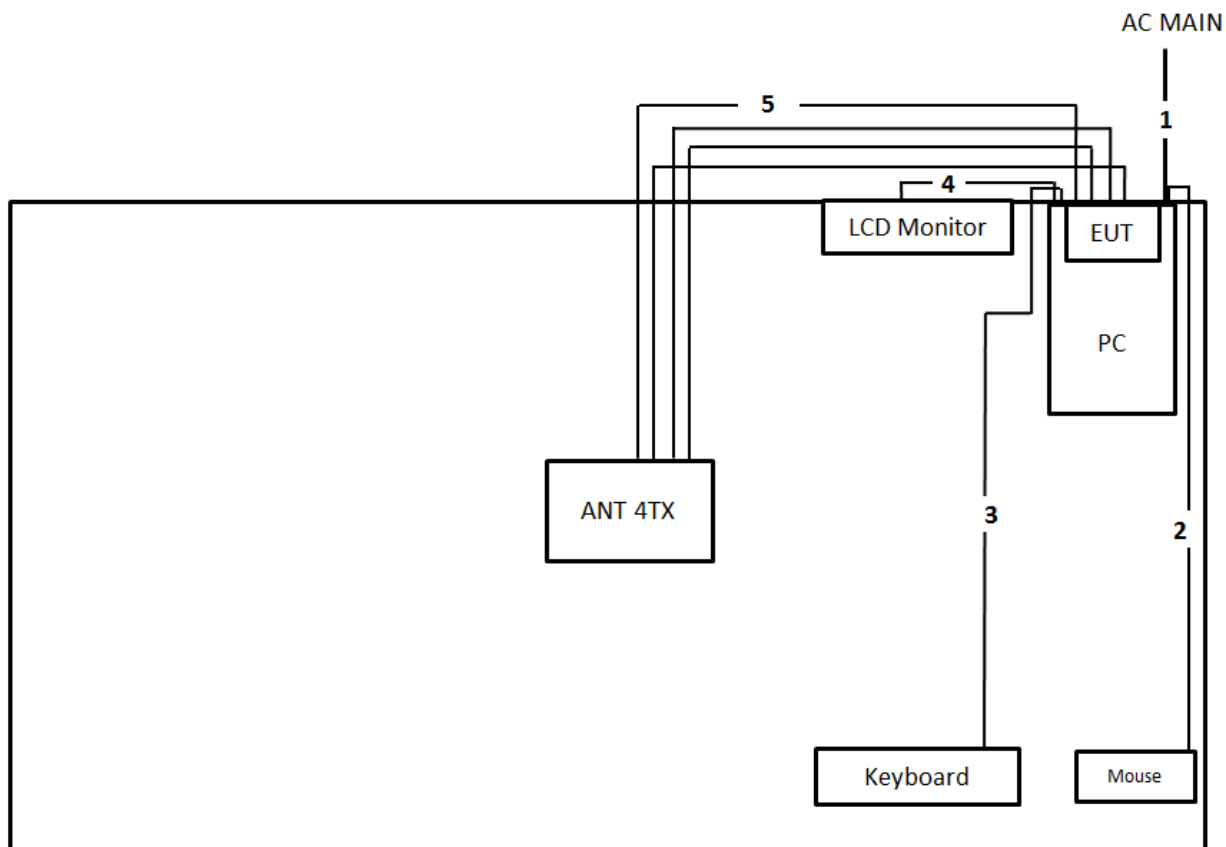
For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.856	4.320	89.26%	0.49	0.26
802.11ac MCS0/Nss1 VHT40	1.870	2.170	86.18%	0.65	0.53
802.11ac MCS0/Nss1 VHT80	1.314	1.602	82.02%	0.86	0.76

3.12. Test Configurations

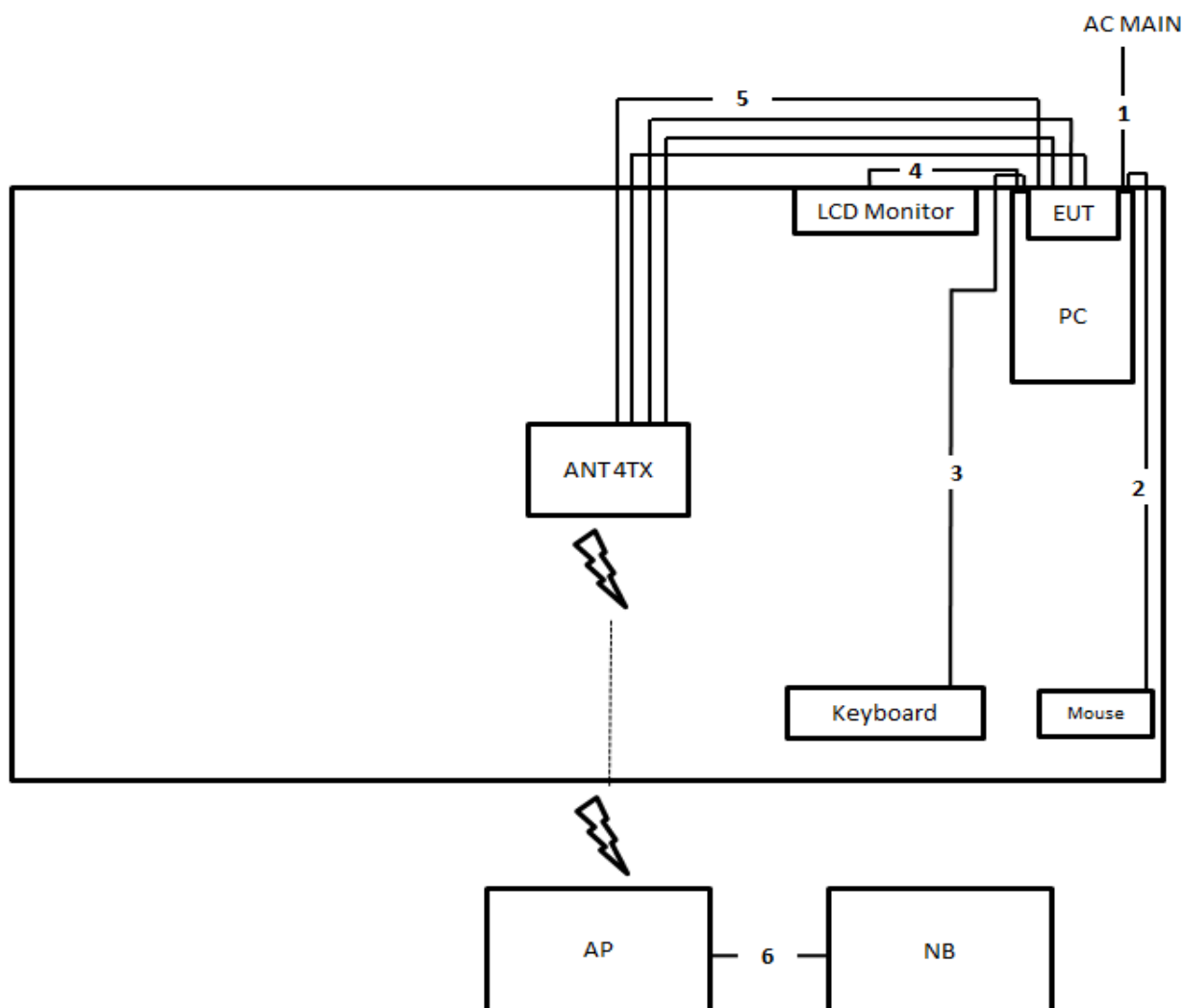
3.12.1. Radiation Emissions Test Configuration

For non-beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	USB cable	Yes	1.8m
3	USB cable	Yes	1.8m
4	VGA cable	Yes	1.8m
5	Ant. cable*4	Yes	1m

For beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	USB cable	Yes	1.8m
3	USB cable	Yes	1.8m
4	VGA cable	Yes	1.8m
5	Ant. cable*4	Yes	1m
6	RJ-45 cable	No	1.5m

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

4.1.2. Measuring Instruments and Setting

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

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

4.1.3. Test Procedures

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

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

4.1.4. Test Setup Layout

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

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

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

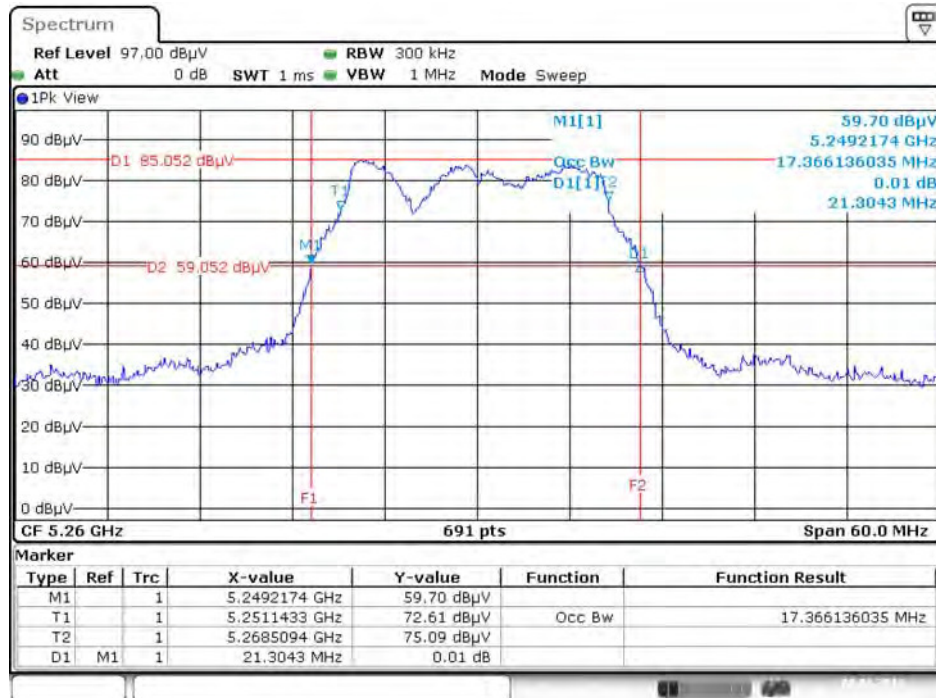
The EUT was programmed to be in continuously transmitting mode.

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

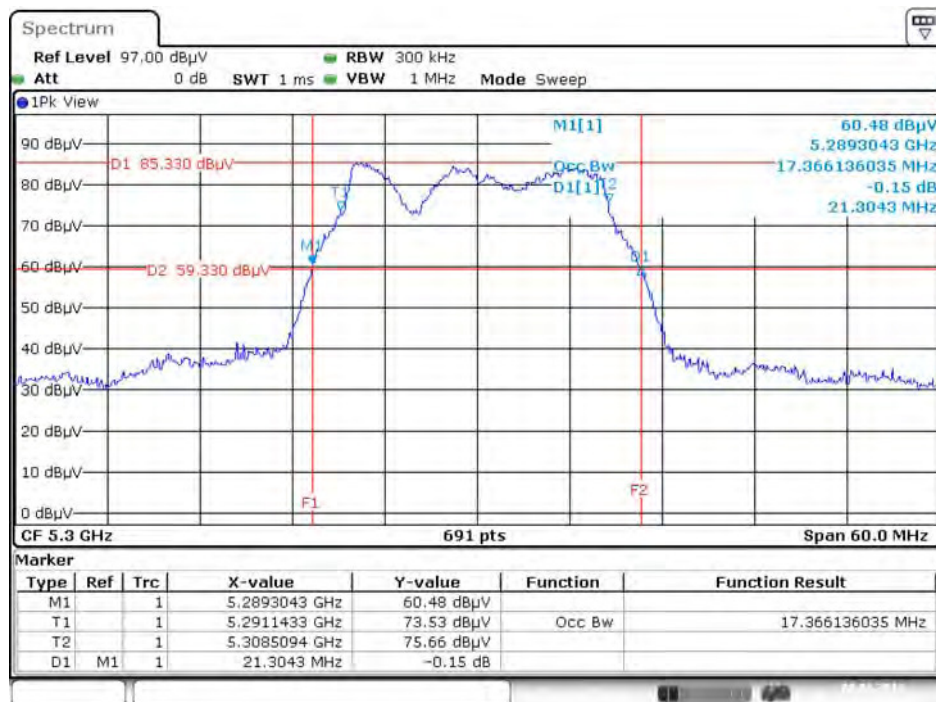
Temperature	24°C	Humidity	50%
Test Engineer	Clemens Fang		

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	21.30	17.37
	5300 MHz	21.30	17.37
	5320 MHz	21.30	17.45
	5500 MHz	21.30	17.54
	5580 MHz	21.30	17.37
	5700 MHz	21.13	17.54
802.11ac MCS0/Nss1 VHT20	5260 MHz	21.57	18.06
	5300 MHz	21.74	18.23
	5320 MHz	21.57	18.06
	5500 MHz	21.39	17.97
	5580 MHz	21.65	17.97
	5700 MHz	21.91	17.97
802.11ac MCS0/Nss1 VHT40	5270 MHz	40.58	36.61
	5310 MHz	40.58	36.61
	5510 MHz	40.73	36.76
	5550 MHz	40.73	36.76
	5670 MHz	41.16	36.76
802.11ac MCS0/Nss1 VHT80	5290 MHz	81.45	76.12
	5530 MHz	81.74	75.83

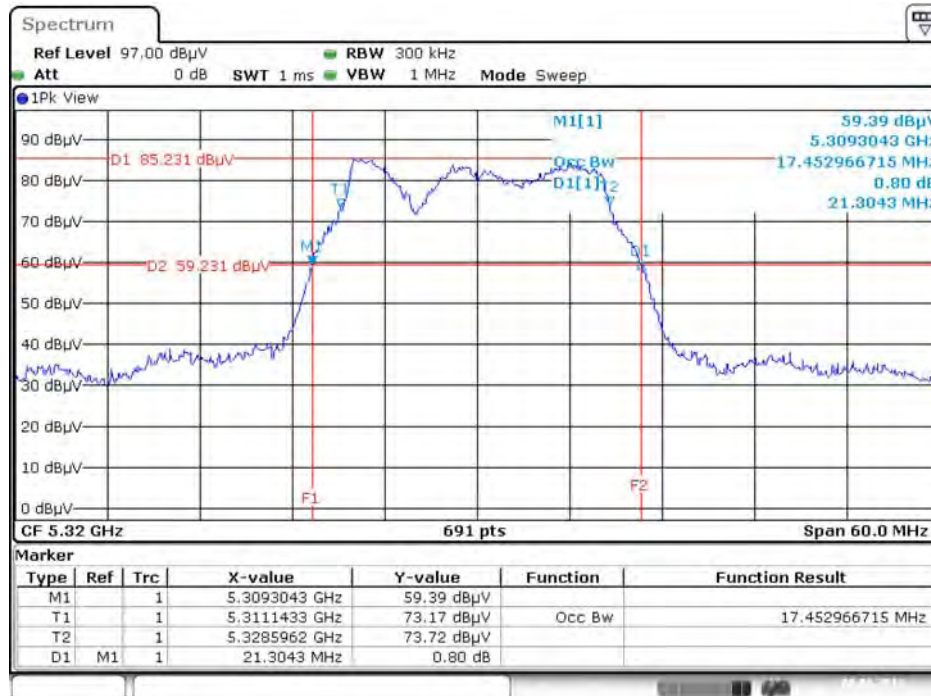
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2
+ Chain 3 + Chain 4 / 5260 MHz



26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2
+ Chain 3 + Chain 4 / 5300 MHz

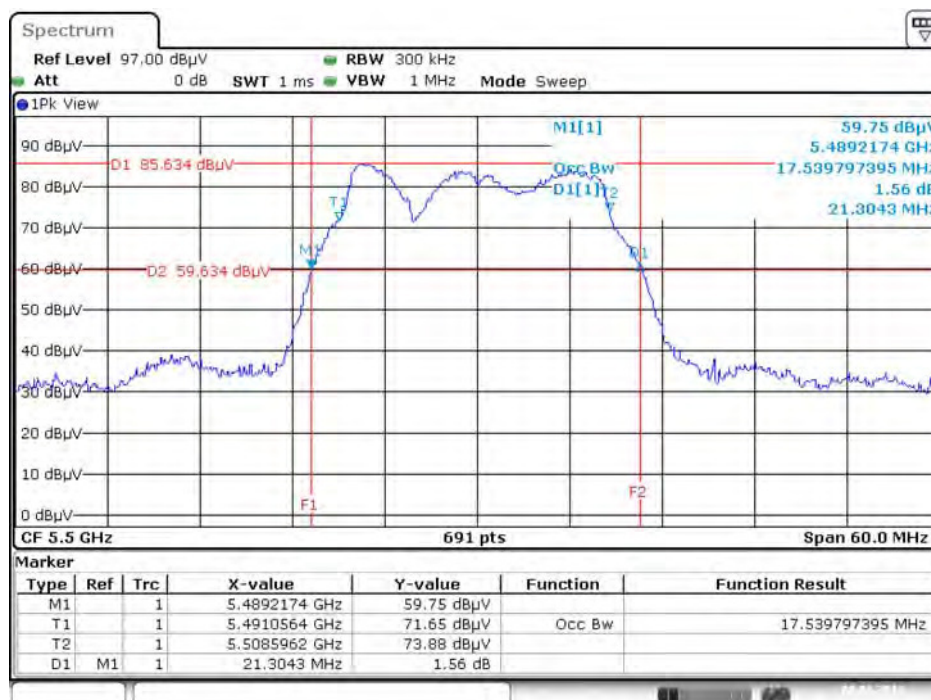


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



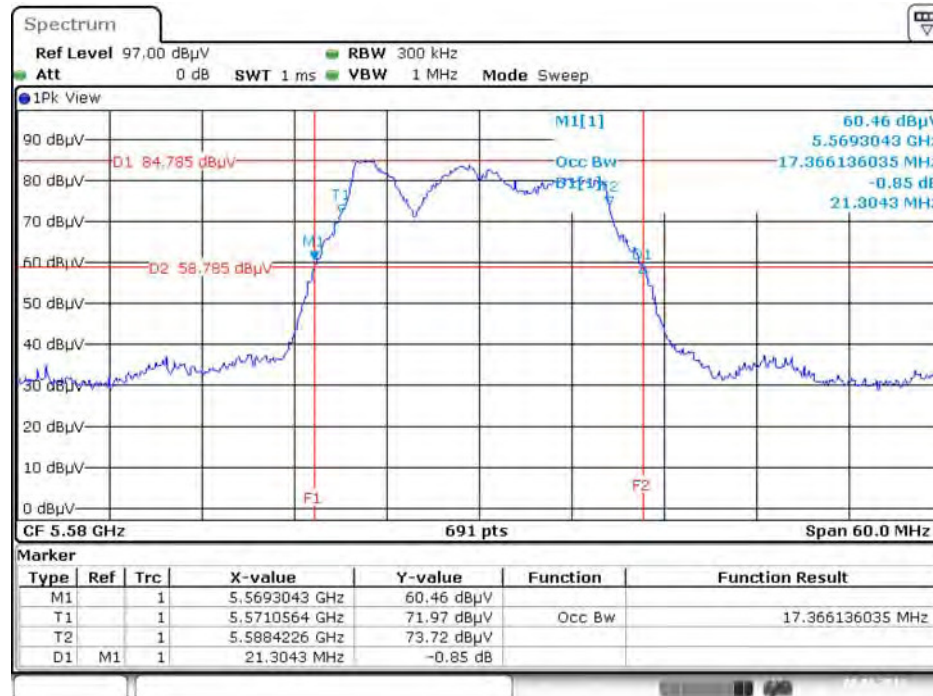
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



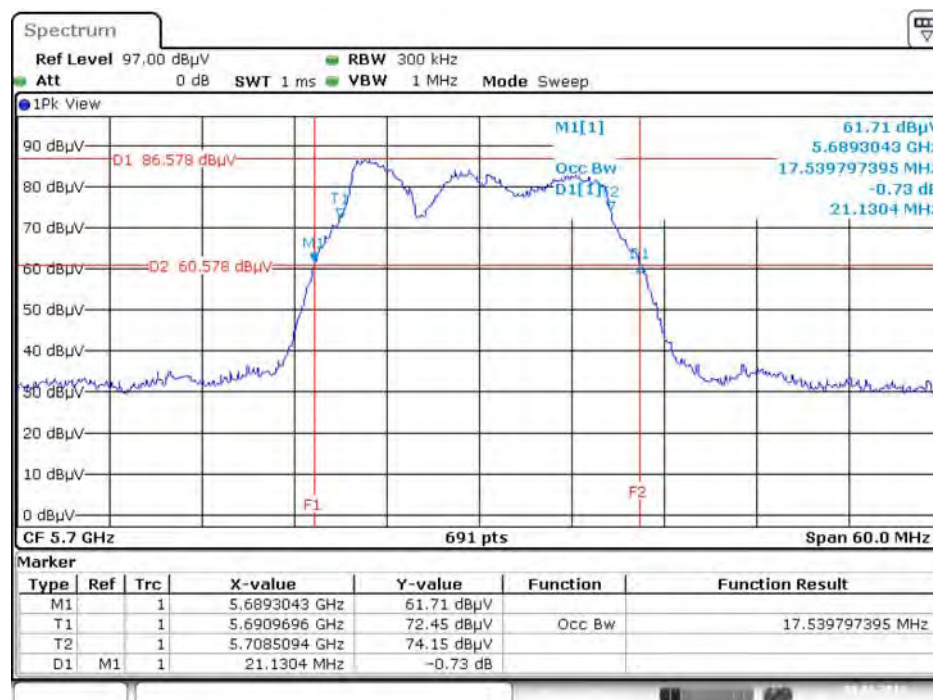
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



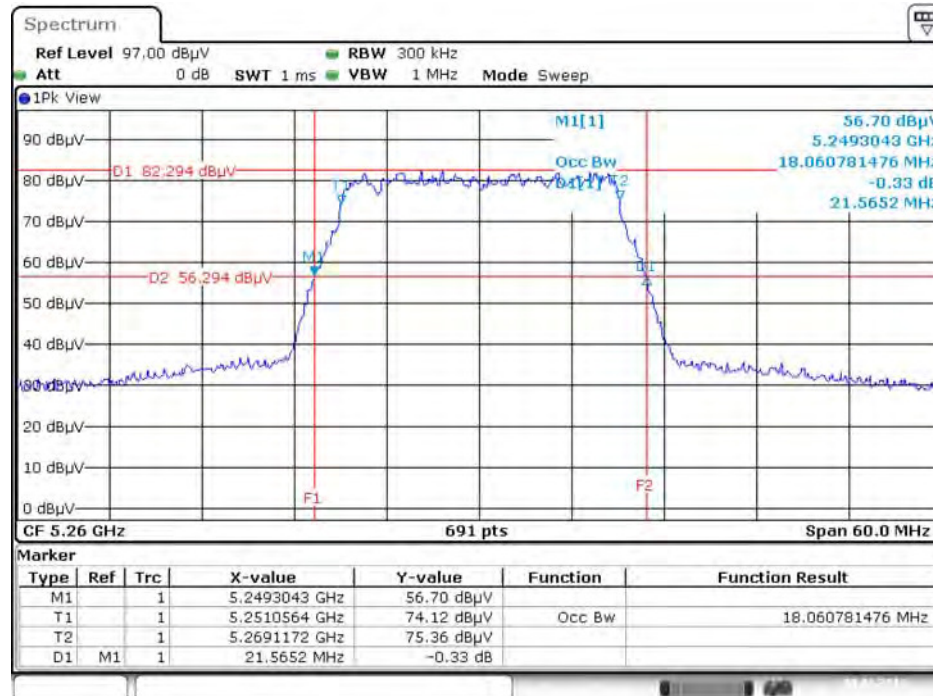
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



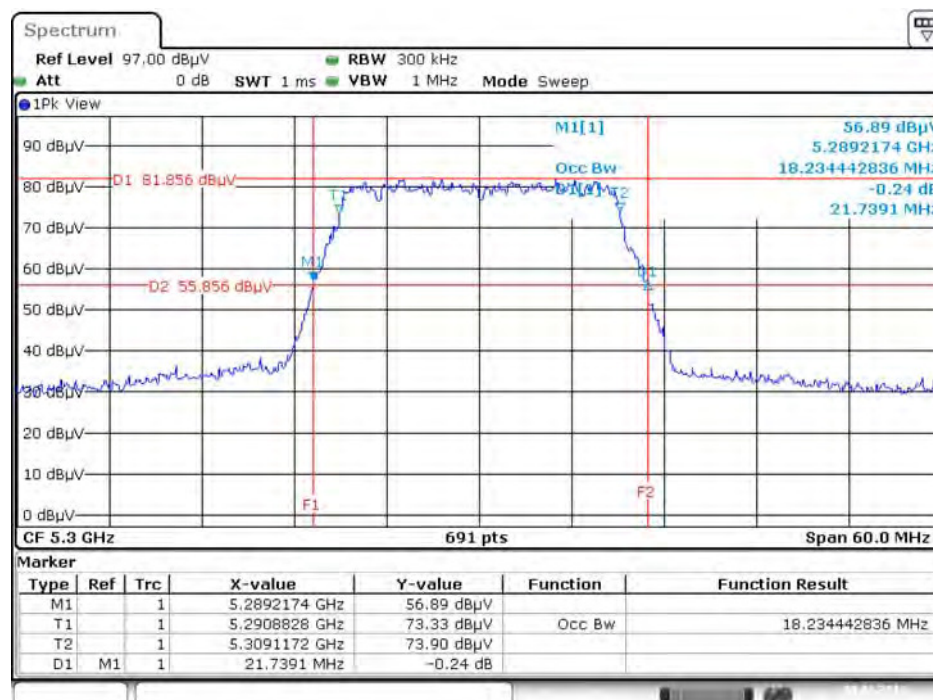
Date: 9 JAN 2016 00:00:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5260 MHz



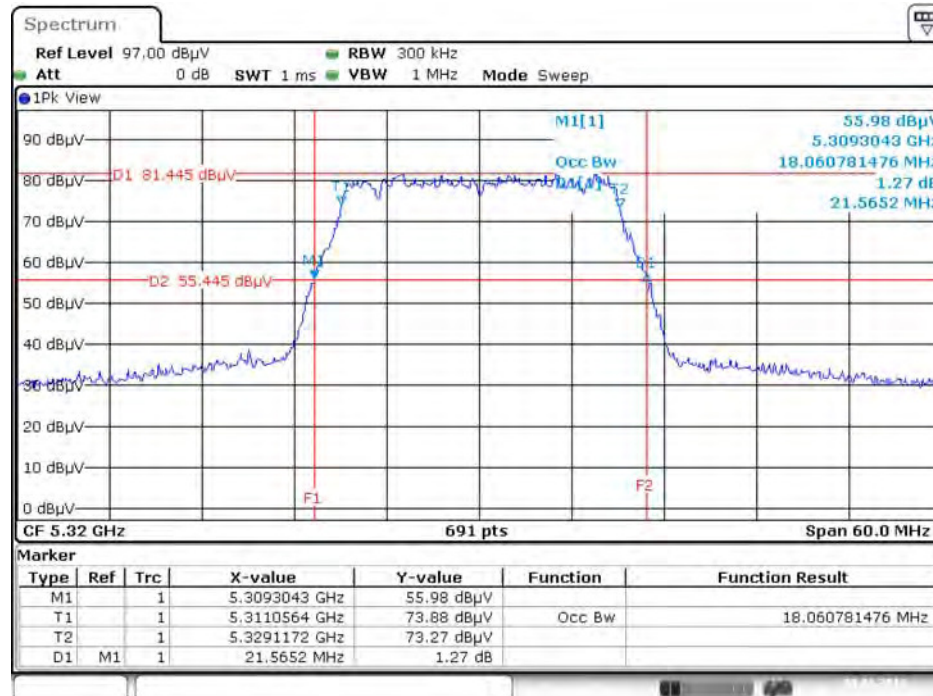
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5300 MHz



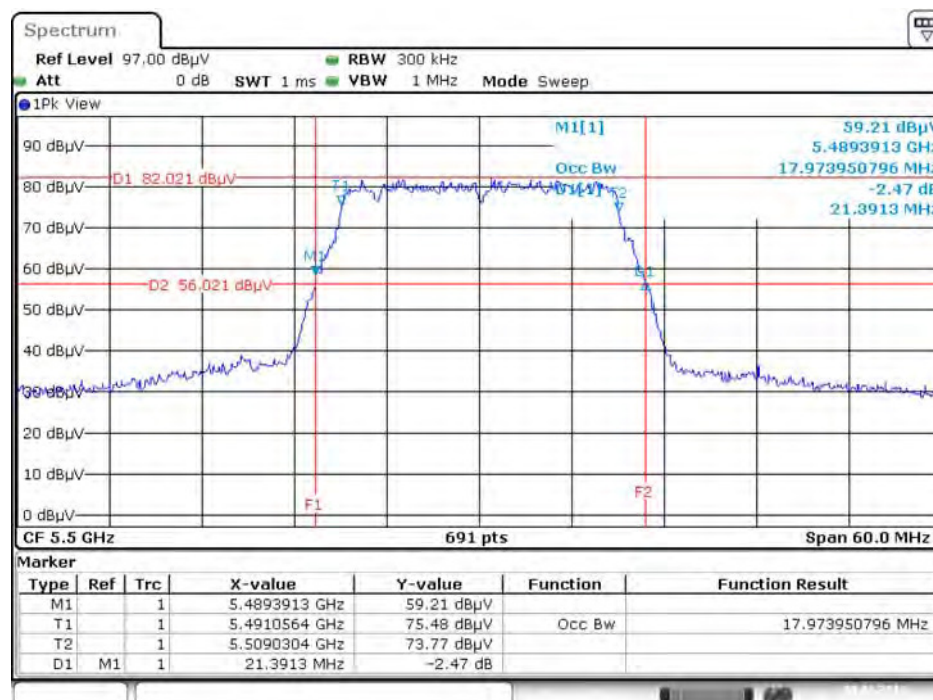
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



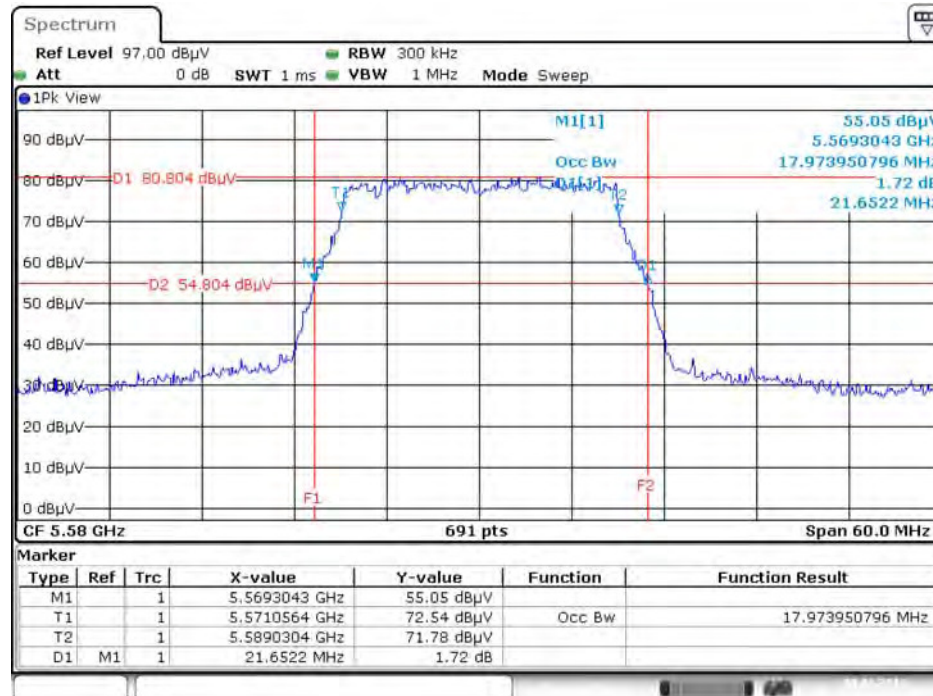
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



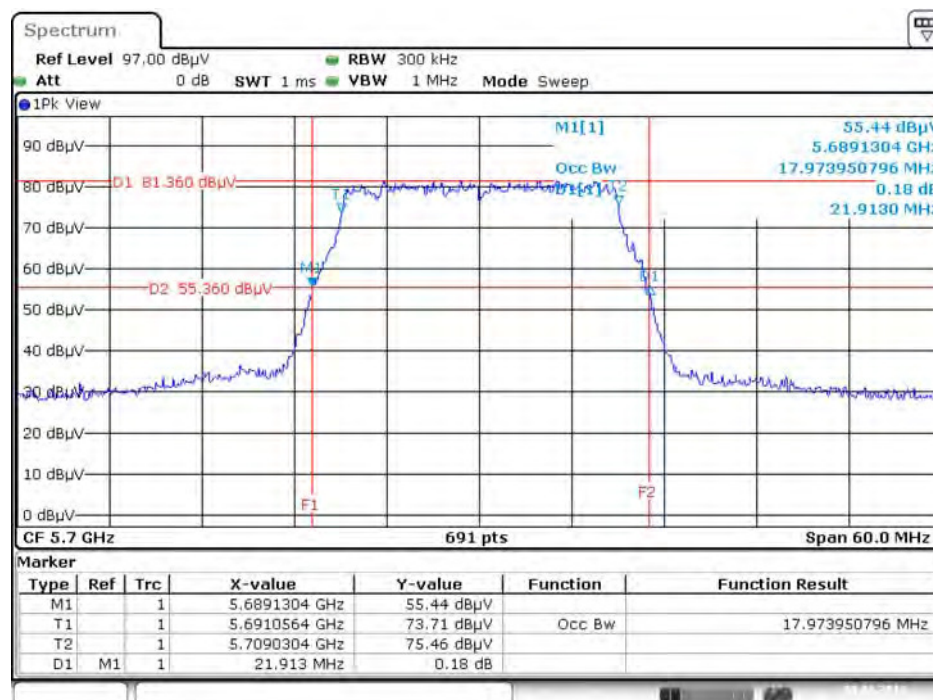
Date: 9 JAN 2016 00:03:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



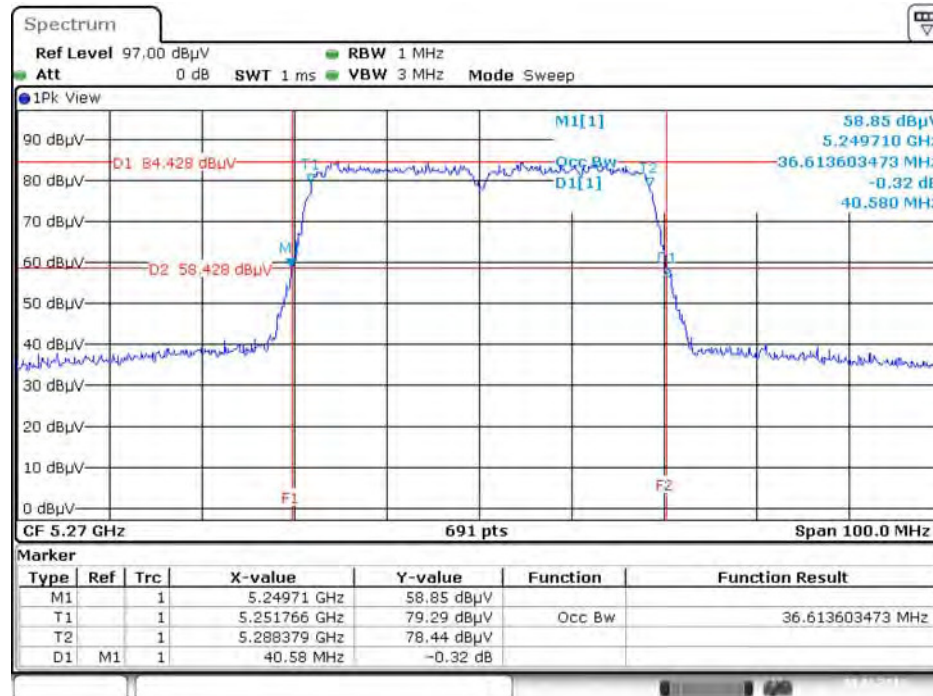
Date: 9 JAN 2016 00:03:15

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



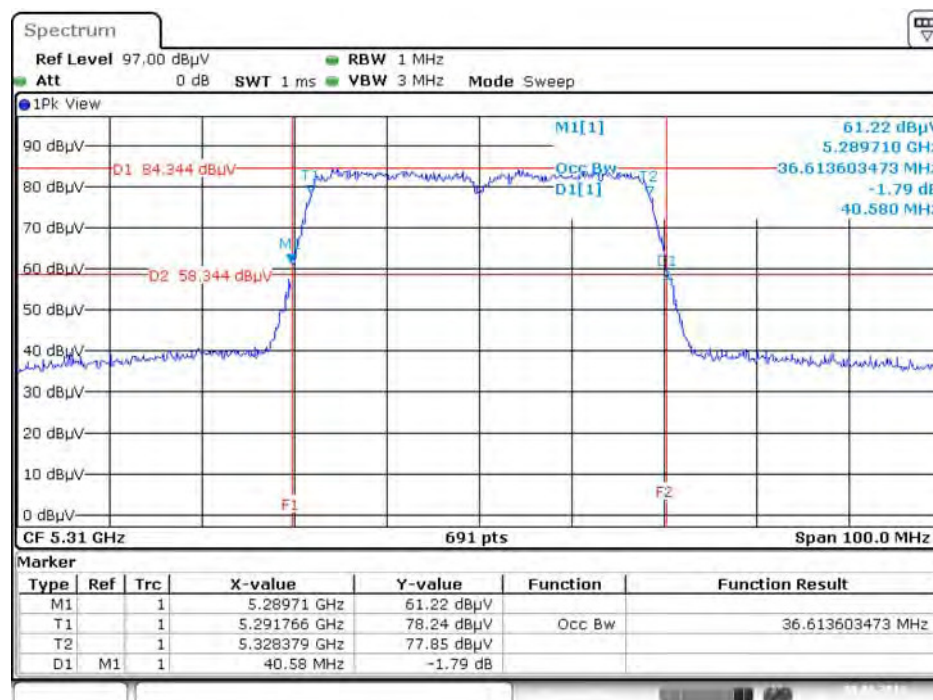
Date: 9 JAN 2016 00:02:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



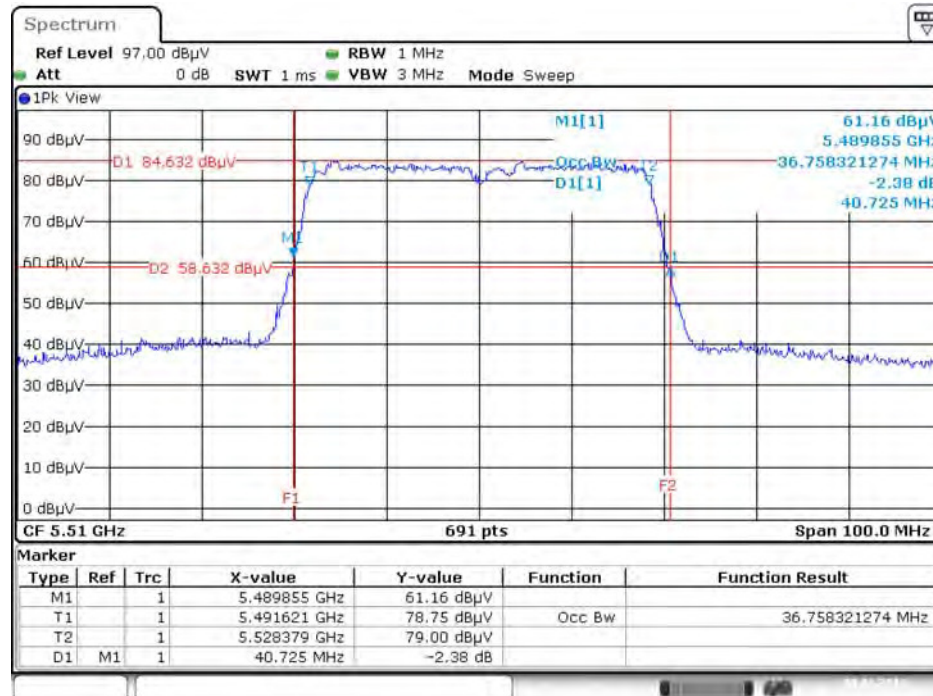
Date: 9 JAN 2016 00:09:36

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5310 MHz



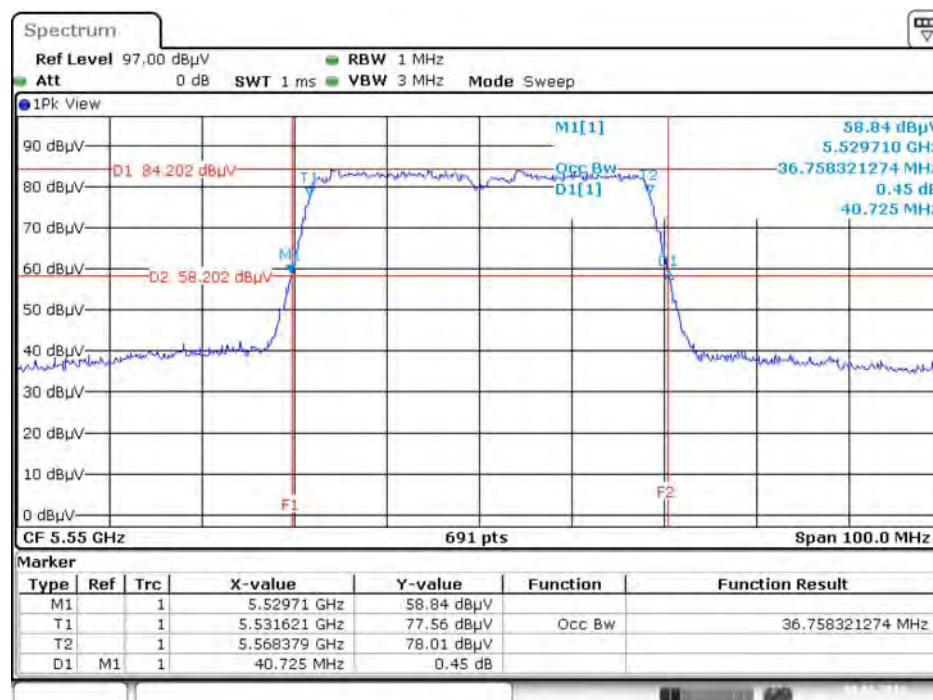
Date: 9 JAN 2016 00:10:31

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



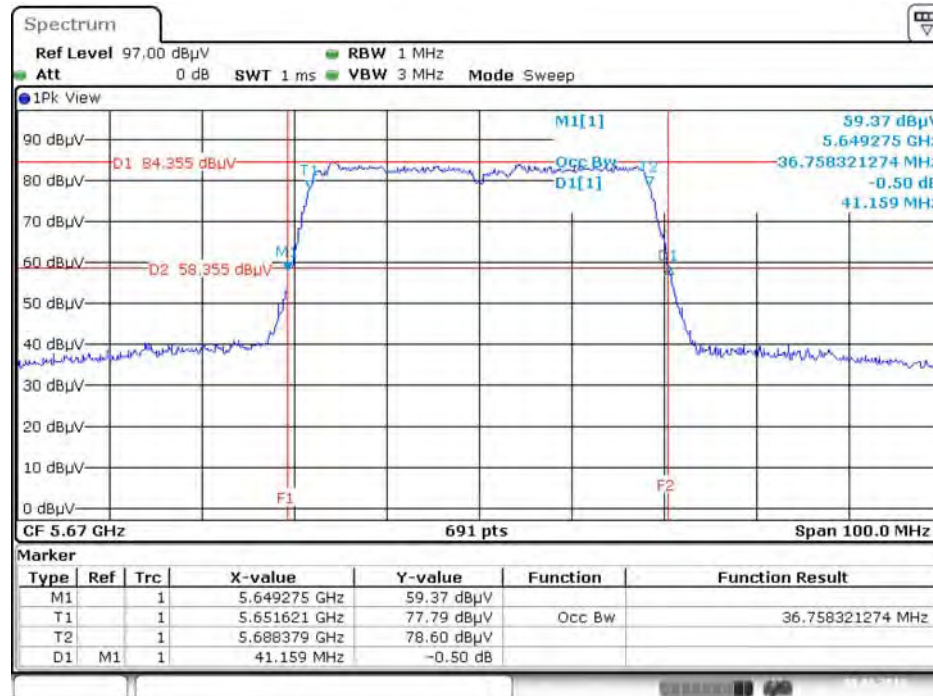
Date: 9 JAN 2016 00:11:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



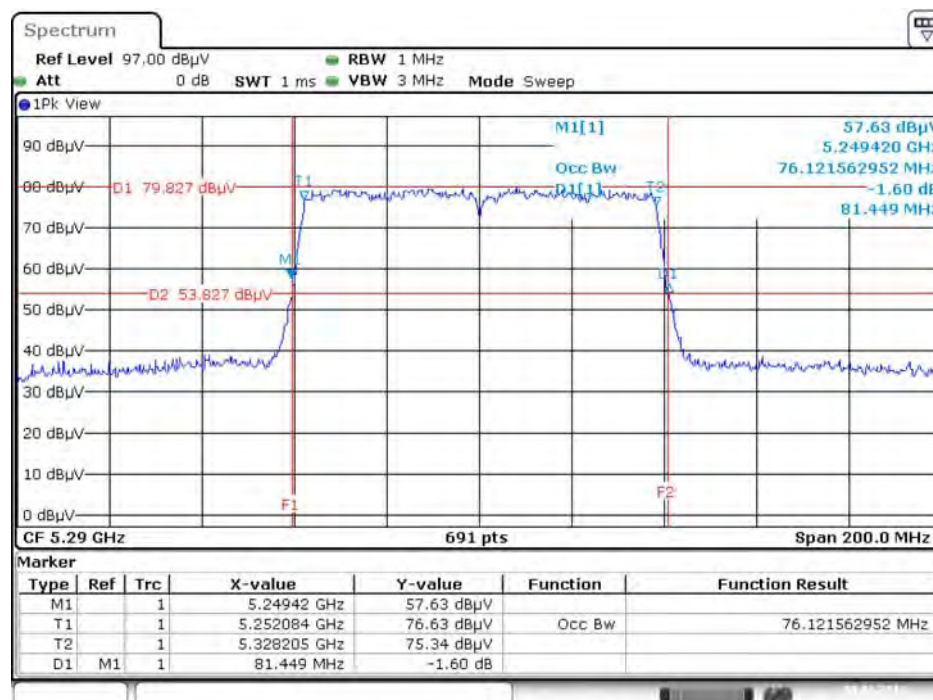
Date: 9 JAN 2016 00:12:26

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 /
Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



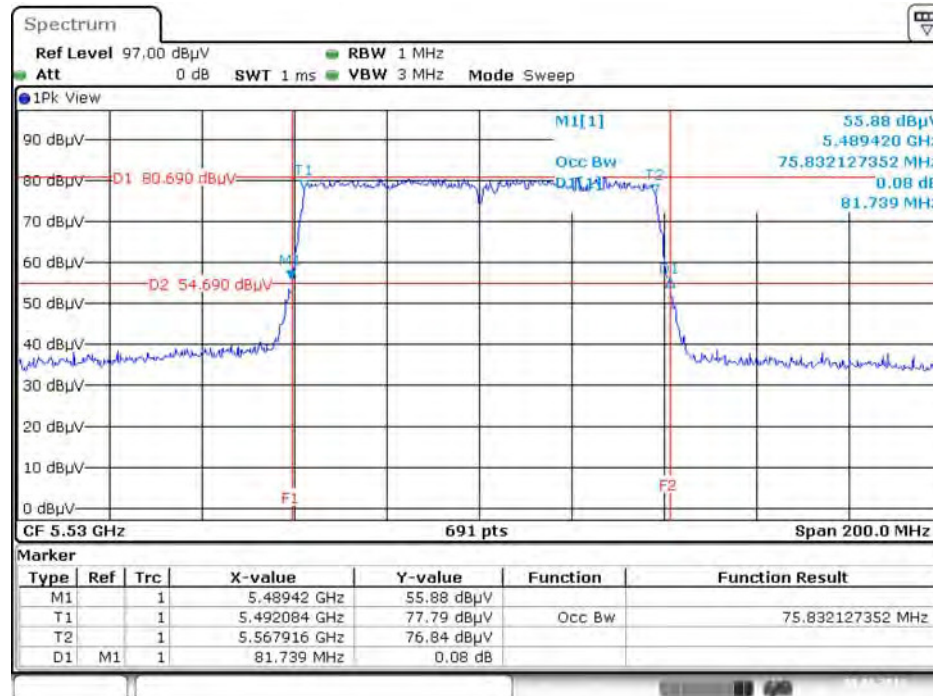
Date: 9 JAN 2016 00:12:58

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 /
Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5290 MHz



Date: 9 JAN 2016 00:14:13

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5530 MHz



Date: 9 JAN 2016 00:14:51

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

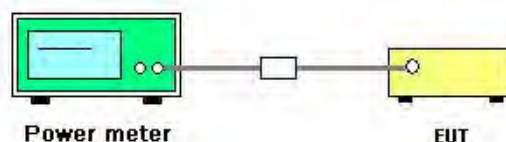
Please refer to section 5 of equipments list in this report The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	24°C	Humidity	50%
Test Engineer	Clemens Fang	Test Date	Jan. 08, 2016

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5260 MHz	17.59	17.93	17.29	18.32	23.82	23.98	Complies
	5300 MHz	17.48	17.88	17.29	18.41	23.81	23.98	Complies
	5320 MHz	17.65	17.98	17.12	18.43	23.84	23.98	Complies
	5500 MHz	17.53	18.21	17.33	18.42	23.92	23.98	Complies
	5580 MHz	17.46	17.73	17.22	18.63	23.81	23.98	Complies
	5700 MHz	18.01	17.52	17.41	18.52	23.91	23.98	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	17.57	18.13	17.57	18.43	23.96	23.98	Complies
	5300 MHz	17.58	18.11	17.03	18.42	23.84	23.98	Complies
	5320 MHz	17.52	17.95	16.98	18.53	23.80	23.98	Complies
	5500 MHz	17.41	18.06	17.14	18.44	23.81	23.98	Complies
	5580 MHz	17.38	17.93	17.11	18.54	23.80	23.98	Complies
	5700 MHz	17.73	18.06	17.43	18.48	23.96	23.98	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	17.75	17.83	17.27	18.46	23.87	23.98	Complies
	5310 MHz	17.46	17.42	17.24	18.35	23.66	23.98	Complies
	5510 MHz	16.99	17.04	16.69	17.48	23.08	23.98	Complies
	5550 MHz	17.47	17.93	17.35	18.45	23.84	23.98	Complies
	5670 MHz	17.44	18.02	17.42	18.23	23.81	23.98	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	15.32	16.15	15.23	16.22	21.77	23.98	Complies
	5530 MHz	17.39	17.62	17.26	18.25	23.67	23.98	Complies

For 802.11ac Mode:

$$\text{Band 2: } \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.18 \text{ dBi} < 6 \text{ dBi, so the limit doesn't reduce.}$$

$$\text{Band 3: } \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.17 \text{ dBi} < 6 \text{ dBi, so the limit doesn't reduce.}$$

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

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

4.3.2. Measuring Instruments and Setting

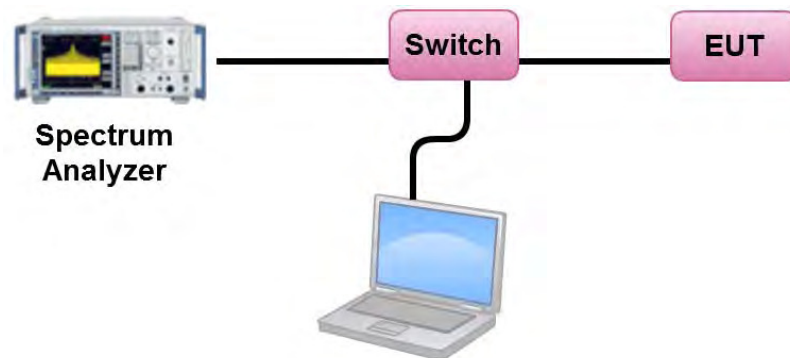
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	24°C	Humidity	50%
Test Engineer	Clemens Fang		

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11a	5260 MHz	10.72	11.00	Complies
	5300 MHz	10.65	11.00	Complies
	5320 MHz	10.69	11.00	Complies
	5500 MHz	10.75	11.00	Complies
	5580 MHz	10.74	11.00	Complies
	5700 MHz	10.86	11.00	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	10.88	11.00	Complies
	5300 MHz	10.76	11.00	Complies
	5320 MHz	10.78	11.00	Complies
	5500 MHz	10.66	11.00	Complies
	5580 MHz	10.71	11.00	Complies
	5700 MHz	10.88	11.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	7.74	11.00	Complies
	5310 MHz	7.45	11.00	Complies
	5510 MHz	7.02	11.00	Complies
	5550 MHz	7.67	11.00	Complies
	5670 MHz	7.75	11.00	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	2.62	11.00	Complies
	5530 MHz	4.43	11.00	Complies

Note:

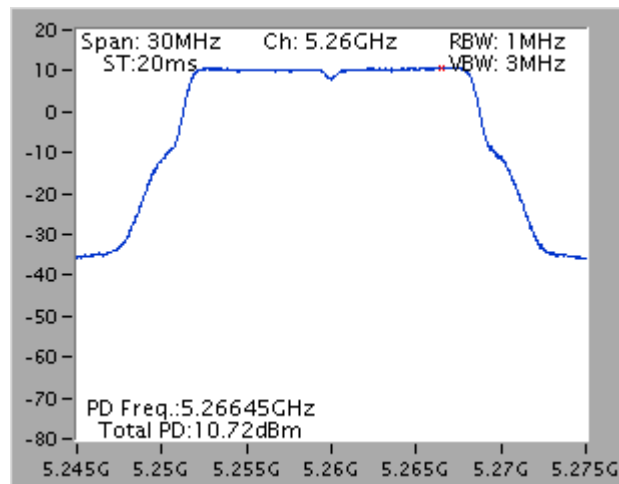
$$\text{Band 2: } \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.18 \text{ dBi} < 6\text{dBi, so the limit doesn't reduce.}$$

$$\text{Band 3: } \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.17 \text{ dBi} < 6\text{dBi, so the limit doesn't reduce.}$$

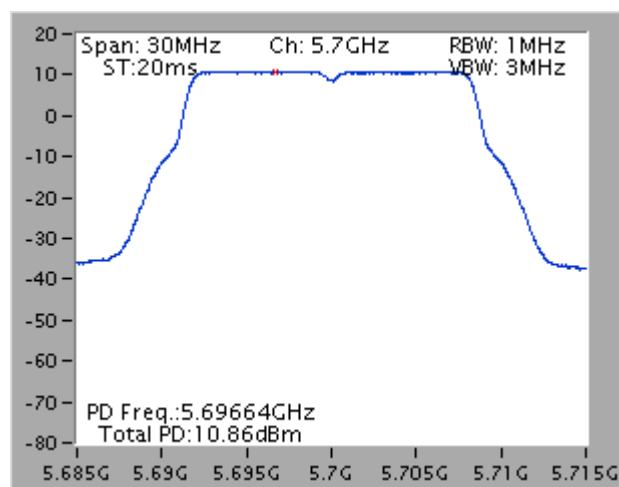
Note: All the test values were listed in the report.

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

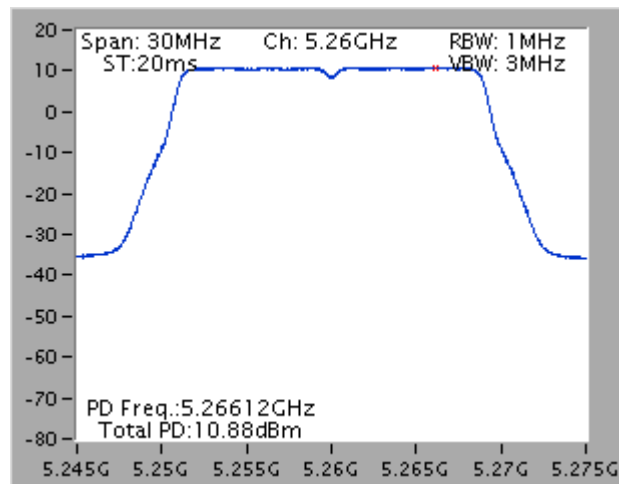
**Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + + Chain 4 /
5260 MHz**



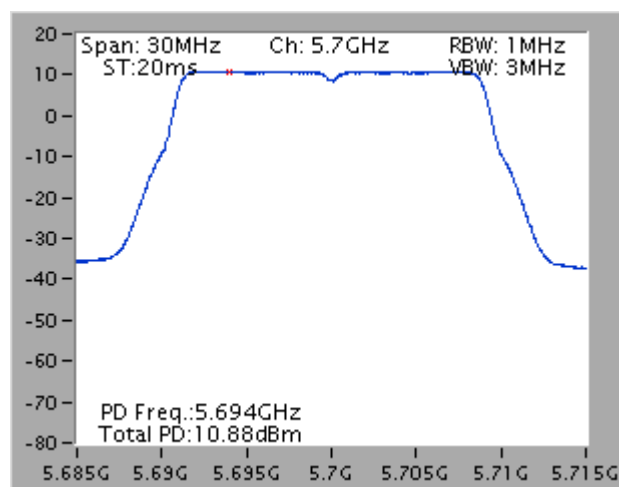
**Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + + Chain 4 /
5700 MHz**



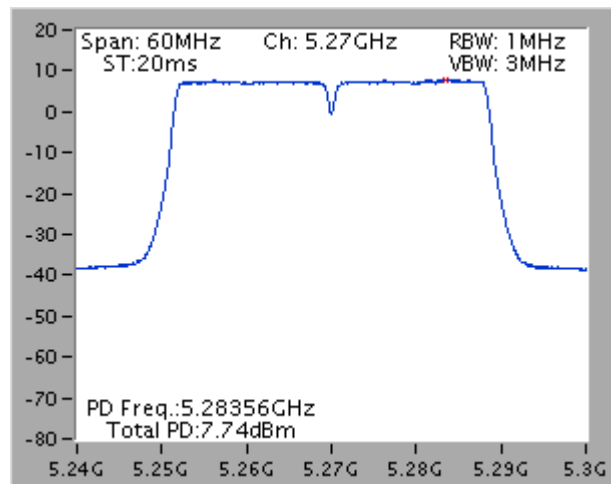
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5260 MHz



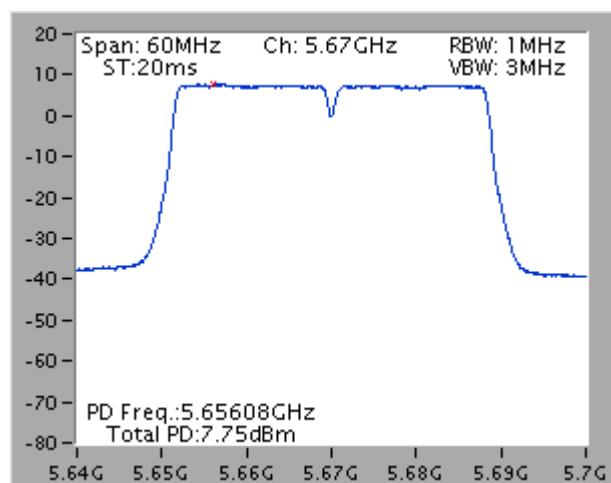
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



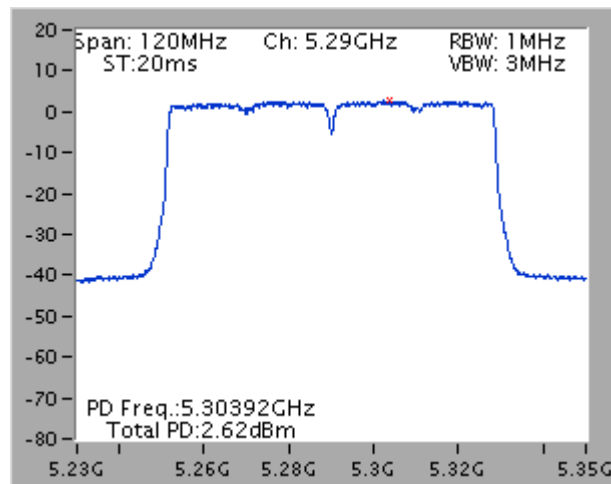
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



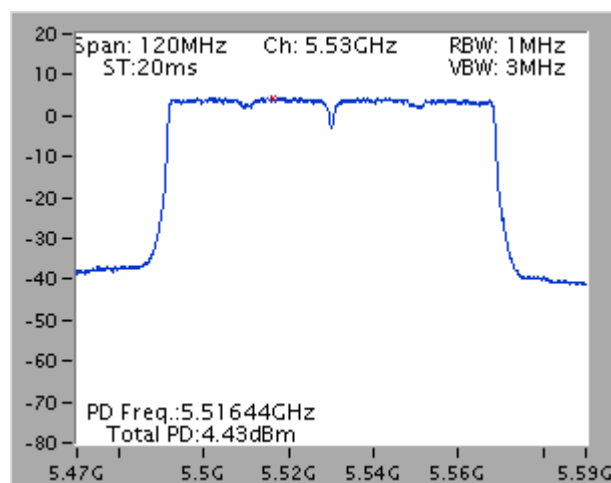
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5290 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5530 MHz



4.4. Radiated Emissions Measurement

4.4.1. Limit

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

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

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

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

4.4.2. Measuring Instruments and Setting

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

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

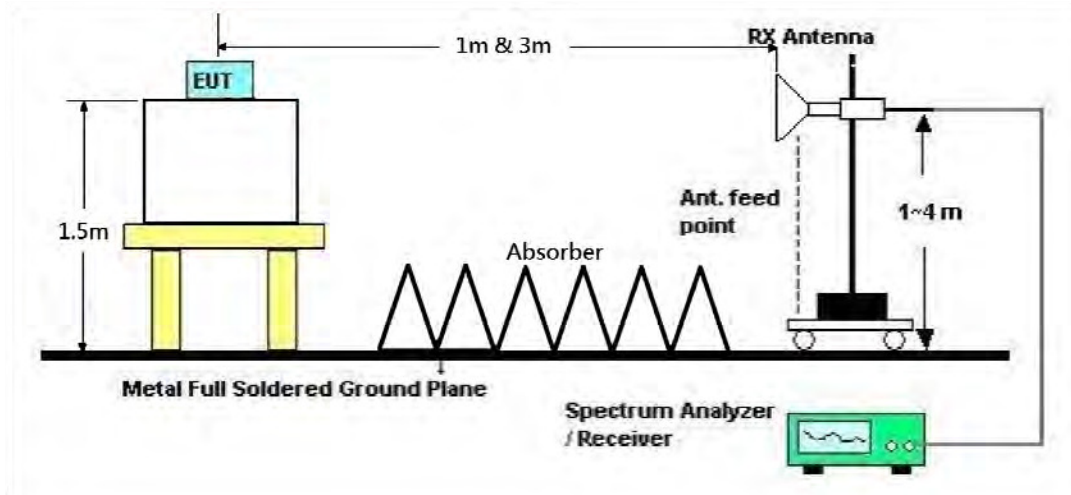
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout

For Radiated Emissions: Above 1GHz



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15774.92	57.22	74.00	-16.78	42.10	12.63	38.35	35.86	168	93	HORIZONTAL	Peak
2	15775.48	43.73	54.00	-10.27	28.61	12.63	38.35	35.86	168	93	HORIZONTAL	Average

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15772.88	44.00	54.00	-10.00	28.88	12.63	38.35	35.86	170	258	VERTICAL	Average
2	15787.72	56.49	74.00	-17.51	41.35	12.66	38.34	35.86	170	258	VERTICAL	Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10595.22	53.67	74.00	-20.33	40.17	10.46	38.98	35.94	175	145	HORIZONTAL Peak
2	10602.94	40.68	54.00	-13.32	27.18	10.46	38.98	35.94	175	145	HORIZONTAL Average
3	15896.40	43.25	54.00	-10.75	28.08	12.71	38.32	35.86	193	232	HORIZONTAL Average
4	15899.46	56.19	74.00	-17.81	41.02	12.71	38.32	35.86	193	232	HORIZONTAL Peak

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10599.68	54.24	74.00	-19.76	40.74	10.46	38.98	35.94	184	80	VERTICAL Peak
2	10601.06	42.33	54.00	-11.67	28.83	10.46	38.98	35.94	184	80	VERTICAL Average
3	15897.74	56.19	74.00	-17.81	41.02	12.71	38.32	35.86	162	246	VERTICAL Peak
4	15901.14	43.42	54.00	-10.58	28.25	12.71	38.32	35.86	162	246	VERTICAL Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10640.00	55.00	74.00	-19.00	41.47	10.48	39.00	35.95	139	189	HORIZONTAL Peak
2	10640.01	41.85	54.00	-12.15	28.32	10.48	39.00	35.95	139	189	HORIZONTAL Average
3	15960.00	56.53	74.00	-17.47	41.34	12.74	38.31	35.86	164	101	HORIZONTAL Peak
4	15960.00	43.53	54.00	-10.47	28.34	12.74	38.31	35.86	164	101	HORIZONTAL Average

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10640.00	54.45	74.00	-19.55	40.92	10.48	39.00	35.95	179	257	VERTICAL Peak
2	10640.01	42.17	54.00	-11.83	28.64	10.48	39.00	35.95	179	257	VERTICAL Average
3	15959.99	56.72	74.00	-17.28	41.53	12.74	38.31	35.86	176	213	VERTICAL Peak
4	15960.00	43.87	54.00	-10.13	28.68	12.74	38.31	35.86	176	213	VERTICAL Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	10997.52	54.35	74.00	-19.65	40.33	10.69	39.30	35.97	210	190	HORIZONTAL Peak
2	11005.92	41.05	54.00	-12.95	27.03	10.69	39.30	35.97	210	190	HORIZONTAL Average

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	10990.00	41.37	54.00	-12.63	27.40	10.67	39.27	35.97	185	78	VERTICAL Average
2	10994.84	54.73	74.00	-19.27	40.76	10.67	39.27	35.97	185	78	VERTICAL Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11155.36	41.16	54.00	-12.84	27.10	10.75	39.27	35.96	116	87	HORIZONTAL	Average
2	11165.08	53.85	74.00	-20.15	39.77	10.77	39.27	35.96	116	87	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11154.04	54.17	74.00	-19.83	40.11	10.75	39.27	35.96	180	309	VERTICAL	Peak
2	11160.04	41.45	54.00	-12.55	27.37	10.77	39.27	35.96	180	309	VERTICAL	Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11397.28	41.63	54.00	-12.37	27.45	10.89	39.22	35.93	180	259	HORIZONTAL	Average
2	11404.52	54.69	74.00	-19.31	40.51	10.89	39.22	35.93	180	259	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11396.40	55.39	74.00	-18.61	41.21	10.89	39.22	35.93	215	125	VERTICAL	Peak
2	11407.60	41.86	54.00	-12.14	27.68	10.89	39.22	35.93	215	125	VERTICAL	Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10527.48	42.34	54.00	-11.66	28.97	10.41	38.90	35.94	137	126	HORIZONTAL	Average
2	10530.00	55.17	74.00	-18.83	41.75	10.43	38.93	35.94	137	126	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10522.52	55.30	74.00	-18.70	41.93	10.41	38.90	35.94	171	193	VERTICAL	Peak
2	10528.68	42.08	54.00	-11.92	28.71	10.41	38.90	35.94	171	193	VERTICAL	Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10606.44	42.19	54.00	-11.81	28.69	10.46	38.98	35.94	132	184	HORIZONTAL Average
2	10609.12	54.96	74.00	-19.04	41.46	10.46	38.98	35.94	132	184	HORIZONTAL Peak
3	15894.60	44.10	54.00	-9.90	28.93	12.71	38.32	35.86	156	146	HORIZONTAL Average
4	15899.00	57.35	74.00	-16.65	42.18	12.71	38.32	35.86	156	146	HORIZONTAL Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10600.00	54.47	74.00	-19.53	40.97	10.46	38.98	35.94	165	80	VERTICAL Peak
2	10606.28	41.73	54.00	-12.27	28.23	10.46	38.98	35.94	165	80	VERTICAL Average
3	15893.64	44.14	54.00	-9.86	28.97	12.71	38.32	35.86	138	112	VERTICAL Average
4	15901.92	57.84	74.00	-16.16	42.67	12.71	38.32	35.86	138	112	VERTICAL Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10633.32	42.43	54.00	-11.57	28.89	10.48	39.00	35.94	189	360	HORIZONTAL Average
2	10643.44	54.91	74.00	-19.09	41.38	10.48	39.00	35.95	189	360	HORIZONTAL Peak
3	15955.80	44.35	54.00	-9.65	29.16	12.74	38.31	35.86	184	294	HORIZONTAL Average
4	15956.56	56.87	74.00	-17.13	41.68	12.74	38.31	35.86	184	294	HORIZONTAL Peak

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10630.04	54.85	74.00	-19.15	41.31	10.48	39.00	35.94	177	156	VERTICAL Peak
2	10633.00	42.38	54.00	-11.62	28.84	10.48	39.00	35.94	177	156	VERTICAL Average
3	15955.32	44.04	54.00	-9.96	28.85	12.74	38.31	35.86	148	196	VERTICAL Average
4	15959.28	57.28	74.00	-16.72	42.09	12.74	38.31	35.86	148	196	VERTICAL Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	10995.80	42.20	54.00	-11.80	28.23	10.67	39.27	35.97	125	177	HORIZONTAL	Average
2	11000.80	55.29	74.00	-18.71	41.27	10.69	39.30	35.97	125	177	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	10998.80	42.34	54.00	-11.66	28.32	10.69	39.30	35.97	129	155	VERTICAL	Average
2	11003.80	55.59	74.00	-18.41	41.57	10.69	39.30	35.97	129	155	VERTICAL	Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11159.76	54.81	74.00	-19.19	40.73	10.77	39.27	35.96	120	311	HORIZONTAL	Peak
2	11165.96	41.82	54.00	-12.18	27.74	10.77	39.27	35.96	120	311	HORIZONTAL	Average

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11169.76	54.91	74.00	-19.09	40.83	10.77	39.27	35.96	114	217	VERTICAL	Peak
2	11169.96	41.90	54.00	-12.10	27.82	10.77	39.27	35.96	114	217	VERTICAL	Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11405.36	43.39	54.00	-10.61	29.21	10.89	39.22	35.93	111	220	HORIZONTAL	Average
2	11409.64	56.53	74.00	-17.47	42.35	10.89	39.22	35.93	111	220	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11407.36	43.42	54.00	-10.58	29.24	10.89	39.22	35.93	171	312	VERTICAL	Average
2	11407.64	56.53	74.00	-17.47	42.35	10.89	39.22	35.93	171	312	VERTICAL	Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	15790.16	43.77	54.00	-10.23	28.63	12.66	38.34	35.86	163	95	HORIZONTAL	Average
2	15803.60	57.11	74.00	-16.89	41.97	12.66	38.34	35.86	163	95	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	15820.80	56.65	74.00	-17.35	41.51	12.66	38.34	35.86	121	14	VERTICAL	Peak
2	15820.88	44.06	54.00	-9.94	28.92	12.66	38.34	35.86	121	14	VERTICAL	Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10609.36	54.53	74.00	-19.47	41.03	10.46	38.98	35.94	155	206	HORIZONTAL Peak
2	10618.24	41.85	54.00	-12.15	28.35	10.46	38.98	35.94	155	206	HORIZONTAL Average
3	15926.40	56.43	74.00	-17.57	41.24	12.74	38.31	35.86	148	259	HORIZONTAL Peak
4	15932.64	43.97	54.00	-10.03	28.78	12.74	38.31	35.86	148	259	HORIZONTAL Average

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10613.68	54.98	74.00	-19.02	41.48	10.46	38.98	35.94	175	212	VERTICAL Peak
2	10629.12	42.36	54.00	-11.64	28.82	10.48	39.00	35.94	175	212	VERTICAL Average
3	15931.52	43.69	54.00	-10.31	28.50	12.74	38.31	35.86	187	159	VERTICAL Average
4	15942.00	56.31	74.00	-17.69	41.12	12.74	38.31	35.86	187	159	VERTICAL Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11015.67	42.55	54.00	-11.45	28.53	10.69	39.30	35.97	150	213	HORIZONTAL	Average
2	11017.03	55.33	74.00	-18.67	41.31	10.69	39.30	35.97	150	213	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	11017.67	42.51	54.00	-11.49	28.49	10.69	39.30	35.97	178	111	VERTICAL	Average
2	11019.03	55.43	74.00	-18.57	41.41	10.69	39.30	35.97	178	111	VERTICAL	Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	11101.68	42.41	54.00	-11.59	28.35	10.74	39.28	35.96	116	300	HORIZONTAL Average
2	11102.17	55.27	74.00	-18.73	41.21	10.74	39.28	35.96	116	300	HORIZONTAL Peak

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	11100.68	42.47	54.00	-11.53	28.41	10.74	39.28	35.96	112	253	VERTICAL Average
2	11101.17	55.39	74.00	-18.61	41.33	10.74	39.28	35.96	112	253	VERTICAL Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11337.64	42.01	54.00	-11.99	27.86	10.86	39.23	35.94	150	99 HORIZONTAL	Average
2	11341.46	54.43	74.00	-19.57	40.28	10.86	39.23	35.94	150	99 HORIZONTAL	Peak

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11338.64	42.11	54.00	-11.89	27.96	10.86	39.23	35.94	163	131 VERTICAL	Average
2	11341.42	54.45	74.00	-19.55	40.30	10.86	39.23	35.94	163	131 VERTICAL	Peak

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15833.04	56.56	74.00	-17.44	41.40	12.69	38.33	35.86	151	18	HORIZONTAL	Peak
2	15898.64	43.72	54.00	-10.28	28.55	12.71	38.32	35.86	151	18	HORIZONTAL	Average

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15875.28	55.91	74.00	-18.09	40.74	12.71	38.32	35.86	129	82	VERTICAL	Peak
2	15884.40	43.78	54.00	-10.22	28.61	12.71	38.32	35.86	129	82	VERTICAL	Average

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11060.52	55.44	74.00	-18.56	41.40	10.72	39.29	35.97	131	333	HORIZONTAL	Peak
2	11063.14	41.90	54.00	-12.10	27.86	10.72	39.29	35.97	131	333	HORIZONTAL	Average

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11061.14	42.90	54.00	-11.10	28.86	10.72	39.29	35.97	146	276	VERTICAL	Average
2	11061.52	56.44	74.00	-17.56	42.40	10.72	39.29	35.97	146	276	VERTICAL	Peak

Note:

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

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

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

4.5. Band Edge Emissions Measurement

4.5.1. Limit

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

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

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

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

4.5.2. Measuring Instruments and Setting

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

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

4.5.3. Test Procedures

The test procedure is the same as section 4.4.3.

4.5.4. Test Setup Layout

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

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 21, 2015		

Channel 52

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5150.00	45.88	54.00	-8.12	40.66	6.39	33.17	34.34	209	0 VERTICAL	Average
2	5150.00	58.79	74.00	-15.21	53.57	6.39	33.17	34.34	209	0 VERTICAL	Peak
3	5263.00	107.91			102.31	6.54	33.39	34.33	209	0 VERTICAL	Average
4	5263.60	118.16			112.56	6.54	33.39	34.33	209	0 VERTICAL	Peak
5	5350.00	45.98	54.00	-8.02	40.14	6.63	33.53	34.32	209	0 VERTICAL	Average
6	5350.00	59.49	74.00	-14.51	53.65	6.63	33.53	34.32	209	0 VERTICAL	Peak

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

Channel 60

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5302.80	117.38			111.68	6.58	33.45	34.33	211	0 VERTICAL	Peak
2	5303.60	108.56			102.86	6.58	33.45	34.33	211	0 VERTICAL	Average
3	5383.20	48.96	54.00	-5.04	43.03	6.67	33.58	34.32	211	0 VERTICAL	Average
4	5383.20	61.57	74.00	-12.43	55.64	6.67	33.58	34.32	211	0 VERTICAL	Peak

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

Channel 64

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5312.60	108.03			102.29	6.60	33.47	34.33	210	91 VERTICAL	Average
2	5312.60	118.69			112.95	6.60	33.47	34.33	210	91 VERTICAL	Peak
3	5352.80	50.20	54.00	-3.80	44.36	6.63	33.53	34.32	210	91 VERTICAL	Average
4	5353.00	64.22	74.00	-9.78	58.38	6.63	33.53	34.32	210	91 VERTICAL	Peak

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

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11a CH 100, 116, 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Channel 100

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5458.40	48.94	54.00	-5.06	42.80	6.73	33.72	34.31	220	354 VERTICAL	Average
2	5458.40	59.53	74.00	-14.47	53.39	6.73	33.72	34.31	220	354 VERTICAL	Peak
3	5470.00	51.31	54.00	-2.69	45.13	6.74	33.75	34.31	220	354 VERTICAL	Average
4	5470.00	62.60	74.00	-11.40	56.42	6.74	33.75	34.31	220	354 VERTICAL	Peak
5	5502.60	118.93			112.67	6.77	33.80	34.31	220	354 VERTICAL	Peak
6	5503.00	109.44			103.18	6.77	33.80	34.31	220	354 VERTICAL	Average

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

Channel 116

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5456.00	58.84	74.00	-15.16	52.70	6.73	33.72	34.31	201	38 VERTICAL	Peak
2	5456.40	47.14	54.00	-6.86	41.00	6.73	33.72	34.31	201	38 VERTICAL	Average
3	5468.41	61.22	74.00	-12.78	55.04	6.74	33.75	34.31	201	38 VERTICAL	Peak
4	5469.60	47.26	54.00	-6.74	41.08	6.74	33.75	34.31	201	38 VERTICAL	Average
5	5584.80	118.72			112.20	6.82	34.03	34.33	201	38 VERTICAL	Peak
6	5586.00	109.27			102.75	6.82	34.03	34.33	201	38 VERTICAL	Average
7	5728.20	47.42	54.00	-6.58	40.47	6.86	34.45	34.36	201	38 VERTICAL	Average
8	5728.20	58.19	74.00	-15.81	51.24	6.86	34.45	34.36	201	38 VERTICAL	Peak

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

Channel 140

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5706.40	116.72			109.81	6.85	34.41	34.35	200	43 VERTICAL	Peak
2	5706.80	107.60			100.69	6.85	34.41	34.35	200	43 VERTICAL	Average
3	5725.00	51.14	54.00	-2.86	44.19	6.86	34.45	34.36	200	43 VERTICAL	Average
4	5725.00	61.37	74.00	-12.63	54.42	6.86	34.45	34.36	200	43 VERTICAL	Peak

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

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Channel 52

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5106.00	45.52	54.00	-8.48	41.78	7.16	33.09	36.51	226	278	VERTICAL Average
2	5149.00	58.49	74.00	-15.51	54.58	7.24	33.17	36.50	226	278	VERTICAL Peak
3	5254.00	107.39			103.13	7.38	33.36	36.48	226	278	VERTICAL Average
4	5254.00	117.51			113.25	7.38	33.36	36.48	226	278	VERTICAL Peak
5	5383.00	57.74	74.00	-16.26	53.12	7.49	33.58	36.45	226	278	VERTICAL Peak
6	5428.00	46.20	54.00	-7.80	41.43	7.56	33.66	36.45	226	278	VERTICAL Average

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

Channel 60

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5305.60	106.78			102.38	7.42	33.45	36.47	216	186	VERTICAL Average
2	5305.60	117.81			113.41	7.42	33.45	36.47	216	186	VERTICAL Peak
3	5384.80	59.37	74.00	-14.63	54.75	7.49	33.58	36.45	216	186	VERTICAL Peak
4	5388.80	47.81	54.00	-6.19	43.15	7.50	33.61	36.45	216	186	VERTICAL Average

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

Channel 64

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5311.60	105.20			100.77	7.43	33.47	36.47	226	215	VERTICAL Average
2	5312.00	115.36			110.93	7.43	33.47	36.47	226	215	VERTICAL Peak
3	5351.60	48.84	54.00	-5.16	44.31	7.46	33.53	36.46	226	215	VERTICAL Average
4	5351.60	60.96	74.00	-13.04	56.43	7.46	33.53	36.46	226	215	VERTICAL Peak

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

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5426.80	50.22	54.00	-3.78	45.45	7.56	33.66	36.45	195	185	VERTICAL	Average
2	5427.40	63.54	74.00	-10.46	58.77	7.56	33.66	36.45	195	185	VERTICAL	Peak
3	5468.20	61.88	74.00	-12.12	56.91	7.66	33.75	36.44	195	185	VERTICAL	Peak
4	5470.00	49.34	54.00	-4.66	44.36	7.66	33.75	36.43	195	185	VERTICAL	Average
5	5502.40	107.31			102.22	7.72	33.80	36.43	195	185	VERTICAL	Average
6	5504.20	118.30			113.21	7.72	33.80	36.43	195	185	VERTICAL	Peak

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

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5420.00	60.96	74.00	-13.04	56.19	7.56	33.66	36.45	213	274	VERTICAL	Peak
2	5425.60	49.47	54.00	-4.53	44.70	7.56	33.66	36.45	213	274	VERTICAL	Average
3	5466.80	59.19	74.00	-14.81	54.22	7.66	33.75	36.44	213	274	VERTICAL	Peak
4	5470.00	46.59	54.00	-7.41	41.61	7.66	33.75	36.43	213	274	VERTICAL	Average
5	5574.40	108.28			102.85	7.85	33.99	36.41	213	274	VERTICAL	Average
6	5583.20	119.52			114.02	7.88	34.03	36.41	213	274	VERTICAL	Peak
7	5735.20	49.42	54.00	-4.58	43.47	7.87	34.45	36.37	213	274	VERTICAL	Average
8	5736.00	62.57	74.00	-11.43	56.62	7.87	34.45	36.37	213	274	VERTICAL	Peak

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

Channel 140

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	5694.00	106.30			100.44	7.88	34.36	36.38	203	233	VERTICAL	Average
2	5701.20	116.97			111.11	7.88	34.36	36.38	203	233	VERTICAL	Peak
3	5725.00	52.50	54.00	-1.50	46.55	7.87	34.45	36.37	203	233	VERTICAL	Average
4	5725.00	67.12	74.00	-6.88	61.17	7.87	34.45	36.37	203	233	VERTICAL	Peak

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

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015 / Dec. 23, 2015		

Channel 54

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5254.80	99.82			95.56	7.38	33.36	36.48	216	44 VERTICAL	Average
2	5254.80	114.56			110.30	7.38	33.36	36.48	216	44 VERTICAL	Peak
3	5355.60	46.28	54.00	-7.72	41.72	7.47	33.55	36.46	216	44 VERTICAL	Average
4	5363.60	59.50	74.00	-14.50	54.94	7.47	33.55	36.46	216	44 VERTICAL	Peak

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

Channel 62

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5302.80	112.01			107.61	7.42	33.45	36.47	220	185 VERTICAL	Peak
2	5304.40	96.80			92.40	7.42	33.45	36.47	220	185 VERTICAL	Average
3	5350.00	52.88	54.00	-1.12	48.35	7.46	33.53	36.46	220	185 VERTICAL	Average
4	5354.00	65.64	74.00	-8.36	61.11	7.46	33.53	36.46	220	185 VERTICAL	Peak

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

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015 / Dec. 23, 2015		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5458.00	49.33	54.00	-4.67	44.42	7.63	33.72	36.44	198	186	VERTICAL	Average
2	5459.60	62.84	74.00	-11.16	57.93	7.63	33.72	36.44	198	186	VERTICAL	Peak
3	5467.60	66.93	68.20	-1.27	61.96	7.66	33.75	36.44	198	186	VERTICAL	Peak
4	5498.00	97.52			92.43	7.72	33.80	36.43	198	186	VERTICAL	Average
5	5504.00	111.80			106.71	7.72	33.80	36.43	198	186	VERTICAL	Peak

Item 4, 5 are the fundamental frequency at 5510 MHz.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5405.20	48.43	54.00	-5.57	43.71	7.53	33.64	36.45	196	359	VERTICAL	Average
2	5455.60	60.64	74.00	-13.36	55.73	7.63	33.72	36.44	196	359	VERTICAL	Peak
3	5467.60	48.63	54.00	-5.37	43.66	7.66	33.75	36.44	196	359	VERTICAL	Average
4	5469.20	61.28	74.00	-12.72	56.31	7.66	33.75	36.44	196	359	VERTICAL	Peak
5	5566.80	114.98			109.55	7.85	33.99	36.41	196	359	VERTICAL	Peak
6	5567.60	101.14			95.71	7.85	33.99	36.41	196	359	VERTICAL	Average

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5665.20	99.46			93.69	7.89	34.27	36.39	198	185	VERTICAL	Average
2	5666.00	113.66			107.89	7.89	34.27	36.39	198	185	VERTICAL	Peak
3	5732.00	49.45	54.00	-4.55	43.50	7.87	34.45	36.37	198	185	VERTICAL	Average
4	5733.20	63.63	74.00	-10.37	57.68	7.87	34.45	36.37	198	185	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5670 MHz.

Temperature	25°C	Humidity	60%
Test Engineer	Eason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 22, 2015		

Channel 58

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5127.00	56.38	74.00	-17.62	52.51	7.22	33.15	36.50	195	267 VERTICAL	Peak
2	5143.00	44.38	54.00	-9.62	40.47	7.24	33.17	36.50	195	267 VERTICAL	Average
3	5283.00	95.44			91.09	7.40	33.42	36.47	195	267 VERTICAL	Average
4	5284.00	106.72			102.37	7.40	33.42	36.47	195	267 VERTICAL	Peak
5	5351.00	52.76	54.00	-1.24	48.23	7.46	33.53	36.46	195	267 VERTICAL	Average
6	5356.00	65.73	74.00	-8.27	61.17	7.47	33.55	36.46	195	267 VERTICAL	Peak

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

Channel 106

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5459.00	66.99	74.00	-7.01	62.08	7.63	33.72	36.44	196	0 VERTICAL	Peak
2	5460.00	52.97	54.00	-1.03	48.06	7.63	33.72	36.44	196	0 VERTICAL	Average
3	5467.00	67.18	68.20	-1.02	62.21	7.66	33.75	36.44	196	0 VERTICAL	Peak
4	5566.00	110.21			104.78	7.85	33.99	36.41	196	0 VERTICAL	Peak
5	5568.00	98.66			93.23	7.85	33.99	36.41	196	0 VERTICAL	Average
6	5762.00	58.68	68.20	-9.52	52.63	7.86	34.55	36.36	196	0 VERTICAL	Peak

Item 4, 5 are the fundamental frequency at 5530 MHz.

Note:

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

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

4.6. Frequency Stability Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

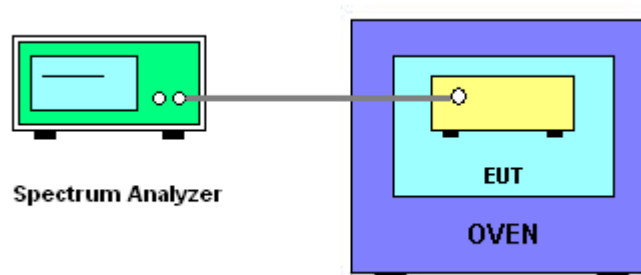
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.6.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is $0^\circ\text{C} \sim 40^\circ\text{C}$.

4.6.4. Test Setup Layout



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

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

4.6.7. Test Result of Frequency Stability

Temperature	24°C	Humidity	50%
Test Engineer	Clemens Fang	Test Date	Jan. 08, 2016

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5299.9883	5299.9873	5299.9863	5299.9855
110.00	5299.9874	5299.9867	5299.9863	5299.9853
93.50	5299.9867	5299.9861	5299.9851	5299.9848
Max. Deviation (MHz)	0.0133	0.0139	0.0149	0.0152
Max. Deviation (ppm)	2.51	2.62	2.81	2.87
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5299.9893	5299.9883	5299.9879	5299.9873
10	5299.9885	5299.9877	5299.9869	5299.9868
20	5299.9874	5299.9873	5299.9867	5299.9859
30	5299.9860	5299.9856	5299.9851	5299.9842
40	5299.9852	5299.9848	5299.9840	5299.9837
Max. Deviation (MHz)	0.0148	0.0152	0.0160	0.0163
Max. Deviation (ppm)	2.79	2.87	3.02	3.08
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5579.9881	5579.9873	5579.9868	5579.9863
110.00	5579.9874	5579.9869	5579.9866	5579.9865
93.50	5579.9864	5579.9856	5579.9847	5579.9843
Max. Deviation (MHz)	0.0136	0.0144	0.0153	0.0157
Max. Deviation (ppm)	2.44	2.58	2.74	2.81
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5579.9904	5579.9903	5579.9901	5579.9898
10	5579.9886	5579.9880	5579.9870	5579.9864
20	5579.9874	5579.9866	5579.9865	5579.9859
30	5579.9860	5579.9859	5579.9854	5579.9850
40	5579.9856	5579.9853	5579.9845	5579.9842
Max. Deviation (MHz)	0.0144	0.0147	0.0155	0.0158
Max. Deviation (ppm)	2.58	2.63	2.78	2.83
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5309.9875	5309.9870	5309.9863	5309.9861
110.00	5309.9874	5309.9871	5309.9868	5309.9864
93.50	5309.9864	5309.9862	5309.9856	5309.9848
Max. Deviation (MHz)	0.0136	0.0138	0.0144	0.0152
Max. Deviation (ppm)	2.56	2.60	2.71	2.86
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5309.9898	5309.9888	5309.9887	5309.9879
10	5309.9886	5309.9884	5309.9874	5309.9865
20	5309.9874	5309.9866	5309.9863	5309.9854
30	5309.9860	5309.9855	5309.9851	5309.9850
40	5309.9844	5309.9838	5309.9837	5309.9829
Max. Deviation (MHz)	0.0156	0.0162	0.0163	0.0171
Max. Deviation (ppm)	2.94	3.05	3.07	3.22
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5549.9875	5549.9872	5549.9862	5549.9861
110.00	5549.9874	5549.9868	5549.9860	5549.9859
93.50	5549.9864	5549.9857	5549.9853	5549.9848
Max. Deviation (MHz)	0.0136	0.0143	0.0147	0.0152
Max. Deviation (ppm)	2.45	2.58	2.65	2.74
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5549.9897	5549.9887	5549.9877	5549.9872
10	5549.9884	5549.9881	5549.9879	5549.9869
20	5549.9874	5549.9865	5549.9861	5549.9851
30	5549.9860	5549.9853	5549.9845	5549.9838
40	5549.9845	5549.9844	5549.9835	5549.9826
Max. Deviation (MHz)	0.0155	0.0156	0.0165	0.0174
Max. Deviation (ppm)	2.79	2.81	2.97	3.14
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5289.9883	5289.9878	5289.9877	5289.9868
110.00	5289.9874	5289.9865	5289.9861	5289.9851
93.50	5289.9870	5289.9867	5289.9860	5289.9853
Max. Deviation (MHz)	0.0130	0.0135	0.0140	0.0149
Max. Deviation (ppm)	2.46	2.55	2.65	2.82
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5289.9887	5289.9879	5289.9871	5289.9870
10	5289.9886	5289.9877	5289.9870	5289.9869
20	5289.9874	5289.9869	5289.9867	5289.9862
30	5289.9860	5289.9854	5289.9852	5289.9851
40	5289.9850	5289.9845	5289.9836	5289.9830
Max. Deviation (MHz)	0.0150	0.0155	0.0164	0.0170
Max. Deviation (ppm)	2.84	2.93	3.10	3.21
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5529.9883	5529.9881	5529.9879	5529.9878
110.00	5529.9874	5529.9873	5529.9865	5529.9863
93.50	5529.9871	5529.9862	5529.9857	5529.9851
Max. Deviation (MHz)	0.0129	0.0138	0.0143	0.0149
Max. Deviation (ppm)	2.33	2.50	2.59	2.69
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5529.9910	5529.9909	5529.9901	5529.9899
10	5529.9890	5529.9884	5529.9879	5529.9871
20	5529.9874	5529.9871	5529.9864	5529.9856
30	5529.9860	5529.9858	5529.9851	5529.9845
40	5529.9847	5529.9844	5529.9840	5529.9830
Max. Deviation (MHz)	0.0153	0.0156	0.0160	0.0170
Max. Deviation (ppm)	2.77	2.82	2.89	3.07
Result	Complies			

4.7. Antenna Requirements

4.7.1. Limit

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

4.7.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Sep. 21, 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-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

6. MEASUREMENT UNCERTAINTY

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