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FCC RADIO TEST REPORT

Applicant's company	**Broadcom Corporation**
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	**QDS-BRCM1075**
Manufacturer's company	**Broadcom Corporation**
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card
Brand Name	Broadcom
Model No.	BCM943162ZP
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Dec. 25, 2013
Final Test Date	Feb. 13, 2014
Submission Type	Original Equipment
Operating Mode	Client (without radar detection function)

Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a/ac (5150 ~ 5350MHz / 5470 ~ 5725MHz) 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 C63.4-2003**, **47 CFR FCC Part 15 Subpart E, KDB 789033 D01 v01r03, 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

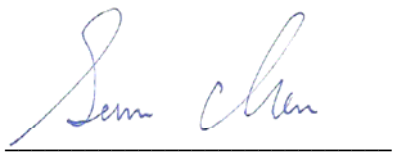
REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D2546AB	Rev. 01	Initial issue of report	Jan. 31, 2014
FR3D2546AB	Rev. 02	1. Revising the KDB644545 version to "D01v01r02" from "D01v01r01". 2. Adding 5610 MHz test result.	Feb. 11, 2014
FR3D2546AB	Rev. 03	Adding Duty Cycle value	Feb. 12, 2014
FR3D2546AB	Rev. 04	1. Removing KDB644545 D02v01. 2. Adding duty factor value. 3. Re-measured radiated emission and band-edge with VB set to 3kHz due to duty cycle < 98% for worst case mode. 4. Testing 5825MHz for band-edge of straddle channel.	Feb. 14, 2014

Certificate No.: CB10301255

1. CERTIFICATE OF COMPLIANCE

Product Name	:	**Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card**
Brand Name	:	**Broadcom**
Model No.	:	**BCM943162ZP**
Applicant	:	**Broadcom 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 Dec. 25, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	14.30 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.06 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.7 dB
4.5	15.407(a)	Peak Excursion	Complies	2.77 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.12 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.02 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 (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From host system
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 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	20 for 20MHz bandwidth ; 10 for 40MHz bandwidth 5 for 80MHz bandwidth
Channel Band Width (99%)	802.11ac MCS0/Nss1 (20MHz): 27.52 MHz ; 802.11ac MCS0/Nss1 (40MHz): 59.52 MHz ; 802.11ac MCS0/Nss1 (80MHz): 115.84 MHz
Maximum Conducted Output Power	Band 1: 802.11ac MCS0/Nss1 (20MHz): 16.86 dBm ; 802.11ac MCS0/Nss1 (40MHz): 16.94 dBm ; 802.11ac MCS0/Nss1 (80MHz): 15.35 dBm Band 2: 802.11ac MCS0/Nss1 (20MHz): 21.25 dBm ; 802.11ac MCS0/Nss1 (40MHz): 19.37 dBm ; 802.11ac MCS0/Nss1 (80MHz): 15.52 dBm Band 3: 802.11ac MCS0/Nss1 (20MHz): 21.32 dBm ; 802.11ac MCS0/Nss1 (40MHz): 21.44 dBm ; 802.11ac MCS0/Nss1 (80MHz): 20.94 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 host system
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 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	20
Channel Band Width (99%)	11a: 27.04 MHz
Maximum Conducted Output Power	Band 1: 16.94 dBm ; Band 2: 21.23 dBm ; Band 3: 21.29 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna and Band width

Antenna	Single (TX)		
Band width Mode	20 MHz	40 MHz	80MHz
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)	1	MCS 0-7
802.11n (HT40)	1	MCS 0-7
802.11ac (VHT20)	1	MCS 0-9/Nss1
802.11ac (VHT40)	1	MCS 0-9/Nss1
802.11ac (VHT80)	1	MCS 0-9/Nss1

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:

11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Set	Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)				
						2.4GHz	5GHz B1	5GHz B2	5GHz B3	5GHz B4
1	1	Hitachi	HMT05/HFT17-DL07	WLAN/BT antenna	Micro Coaxial	3.9	3.9	5.6	5.8	5.8
	2	Hitachi	HMT05/HFT17-DL07	WLAN/BT antenna	Micro Coaxial	3.9	3.9	5.6	5.8	5.8

Note: The EUT has one set of antenna and each set has two antennas.

For 2.4G:

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

The EUT supports the antenna with TX/RX diversity function.

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one antenna can be used as transmitting/receiving antenna at the same time.

Chain 1 generated the worst case than Chain 2, so it tested and recorded in the report.

For 5G:

For IEEE 802.11a/n/ac mode (1TX/1RX)

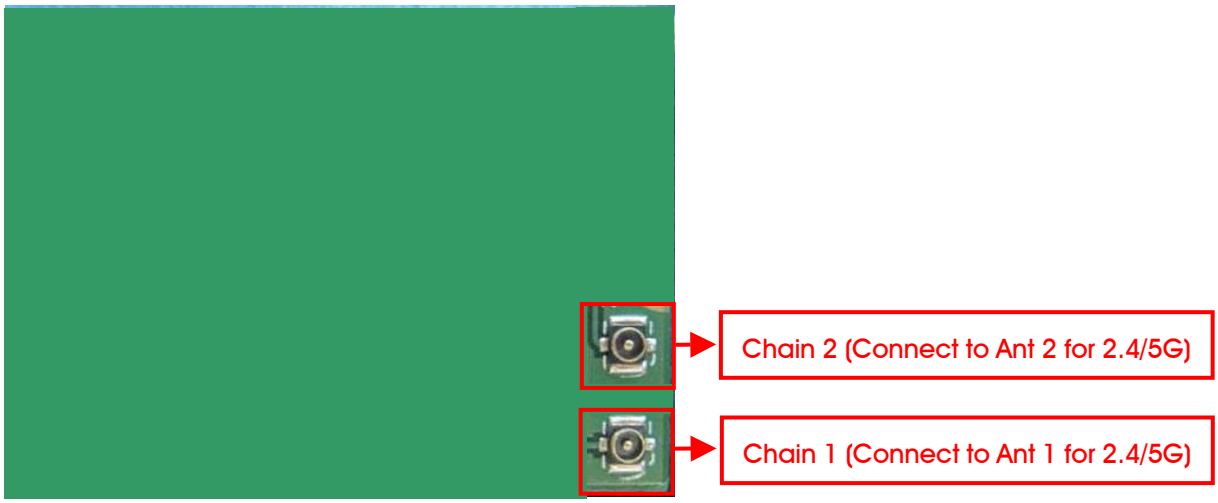
The EUT supports the antenna with TX/RX diversity function.

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one antenna can be used as transmitting/receiving antenna at the same time.

Chain 1 generated the worst case than Chain 2, so it tested and recorded in the report.

For Bluetooth mode (1TX/1RX)

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



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 142.

For 80MHz bandwidth systems, use Channel 42, 58, 106, 122, 138.

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	-	-
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	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-

3.5. Table for Product Information

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

3.6. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/100/116/140/144	1
Power Spectral Density	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/100/116/140/144	1
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/100/116/140/144	1
Peak Excursion	11ac 20MHz	Band 1-3	MCS0/Nss1	48/52/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	46/54/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/138	1
	11a/BPSK	Band 1-3	6Mbps	36/60/144	1
Radiated Emission Below 1GHz	Normal Link		-	-	-

Radiated Emission Above 1GHz	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/ 100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/ 102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/ 100/116/140/144	1
Band Edge Emission	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/ 100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/ 102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/ 100/116/140/144	1
Frequency Stability	Un-modulation		-	40/60/100	1

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. Normal Link -2.4GHz WLAN function + Bluetooth function

Mode 2. Normal Link -5GHz WLAN function + Bluetooth function

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

For Radiated Emission Below 1GHz test:

Mode 1. Normal Link -2.4GHz WLAN function + Bluetooth function

Mode 2. Normal Link -5GHz WLAN function + Bluetooth function

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

For Radiated Emission Above 1GHz test:

Mode 1. CTX-EUT

For Co-location test:

Mode 1. 2.4GHz WLAN function + Bluetooth function

Mode 2. 5GHz WLAN function + Bluetooth function

For MPE and Co-location Test:

The EUT could be applied 2.4GHz / 5GHz with WLAN function and Bluetooth function; therefore Maximum Permissible Exposure (please refer to Appendix C) and Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz / 5GHz WLAN function and Bluetooth function.

Note:

The straddle channel all UNII test items(Max. Conducted Output Power, Radiated Emission and Band Edge Emission) has measurement and show result in the report. And straddle channel UNII limit stringent than DTS limit, the power will be able to meet the UNII comply DTS.

3.7. 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).

3.8. Table for Supporting Units

For Test Site No: CO01-CB and 03CH01-CB (Below 1GHz)

Support Unit	Brand	Model	FCC ID
Wireless AP	Planex	GW-AP54SGX	N/A
NB	DELL	E6430	DoC
NB	DELL	E6220	DoC
Mouse	Logitech	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	N/A
Test fixture*2	Broadcom	BCM9NGFF2EC_1	N/A
Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card (Device)	Broadcom	BCM943162ZP	QDS-BRCM1075

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E6220	DoC
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6510	N/A
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

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 20MHz

Test Software Version	Mtool 2.0.1.5									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
MCS0/Nss1 20MHz	69	69	69	86	82	76	68	79	69	86

Power Parameters of IEEE 802.11ac MCS0/Nss1 40MHz

Test Software Version	Mtool 2.0.1.5							
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz
MCS0/Nss1 40MHz	58	69	77	61	51	86	78	86

Power Parameters of IEEE 802.11ac MCS0/Nss1 80MHz

Test Software Version	Mtool 2.0.1.5				
Frequency	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz
MCS0/Nss1 80MHz	63	62	56	76	86

Power Parameters of IEEE 802.11a

Test Software Version	Mtool 2.0.1.5									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
802.11a	69	69	69	86	86	76	68	79	69	86

3.10. EUT Operation during Test

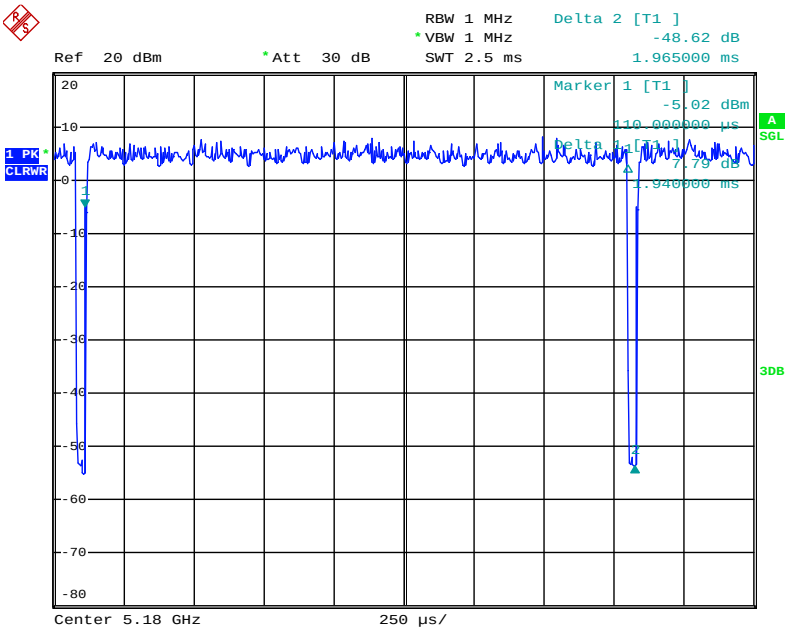
The EUT was programmed to be in continuously transmitting mode.

3.11. Test Signal Duty Cycle

Band	Mode	TX-on (ms)	TX-on+TX-off (ms)	TX-on/(TX-on+TX-off)x100= Duty cycle (%)
5G	802.11ac MCS0/Nss1 20MHz	1.94	1.965	98.73
	802.11ac MCS0/Nss1 40MHz	0.96	0.985	97.46
	802.11ac MCS0/Nss1 80MHz	0.46	0.485	94.85
	802.11a	2.075	2.1	98.81

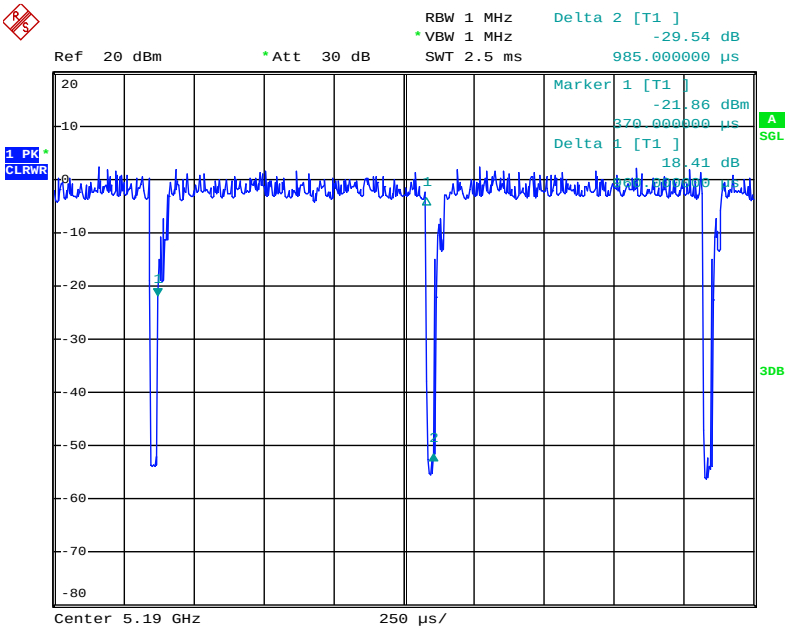
3.12. Plots of Duty Cycle

IEEE 802.11ac MCS0/Nss1 20MHz



Date: 22.JAN.2014 23:39:56

IEEE 802.11ac MCS0/Nss1 40MHz



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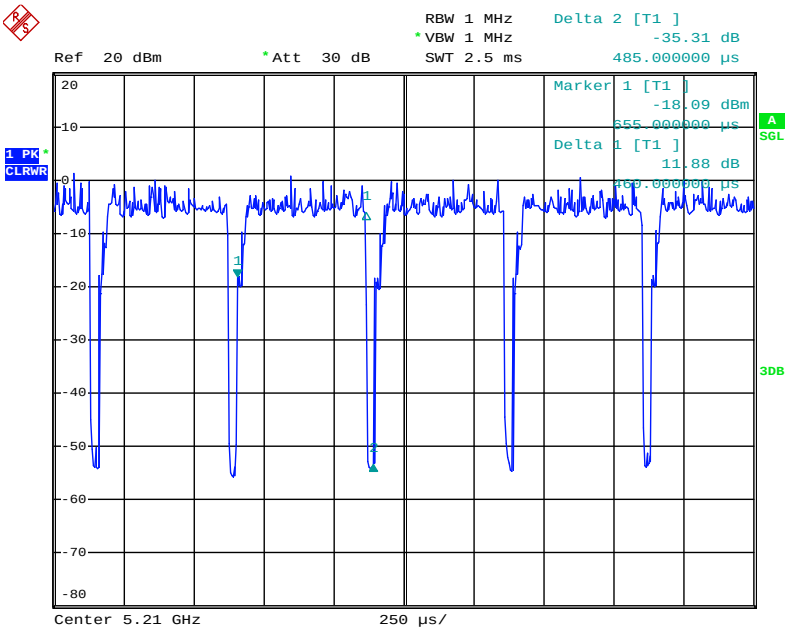
IEEE 802.11ac MCS0/Nss1 80MHz



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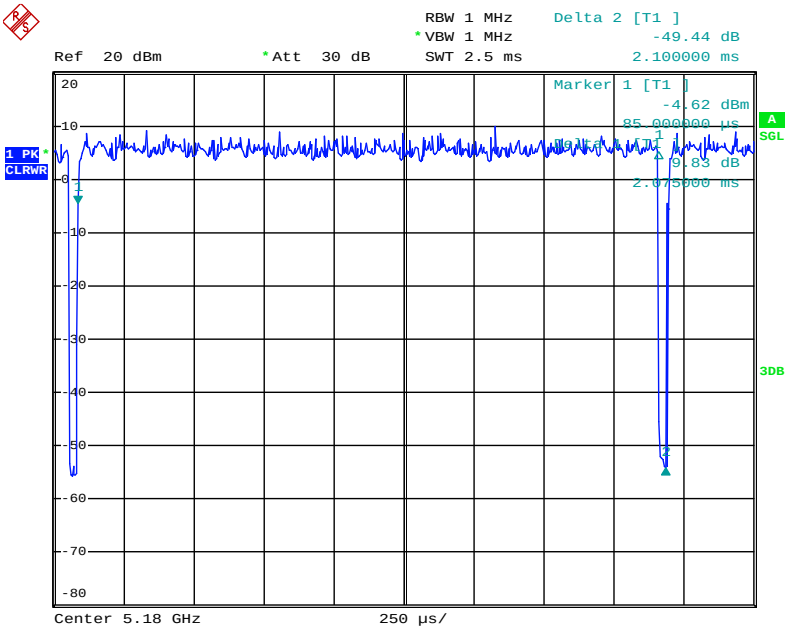
IEEE 802.11a



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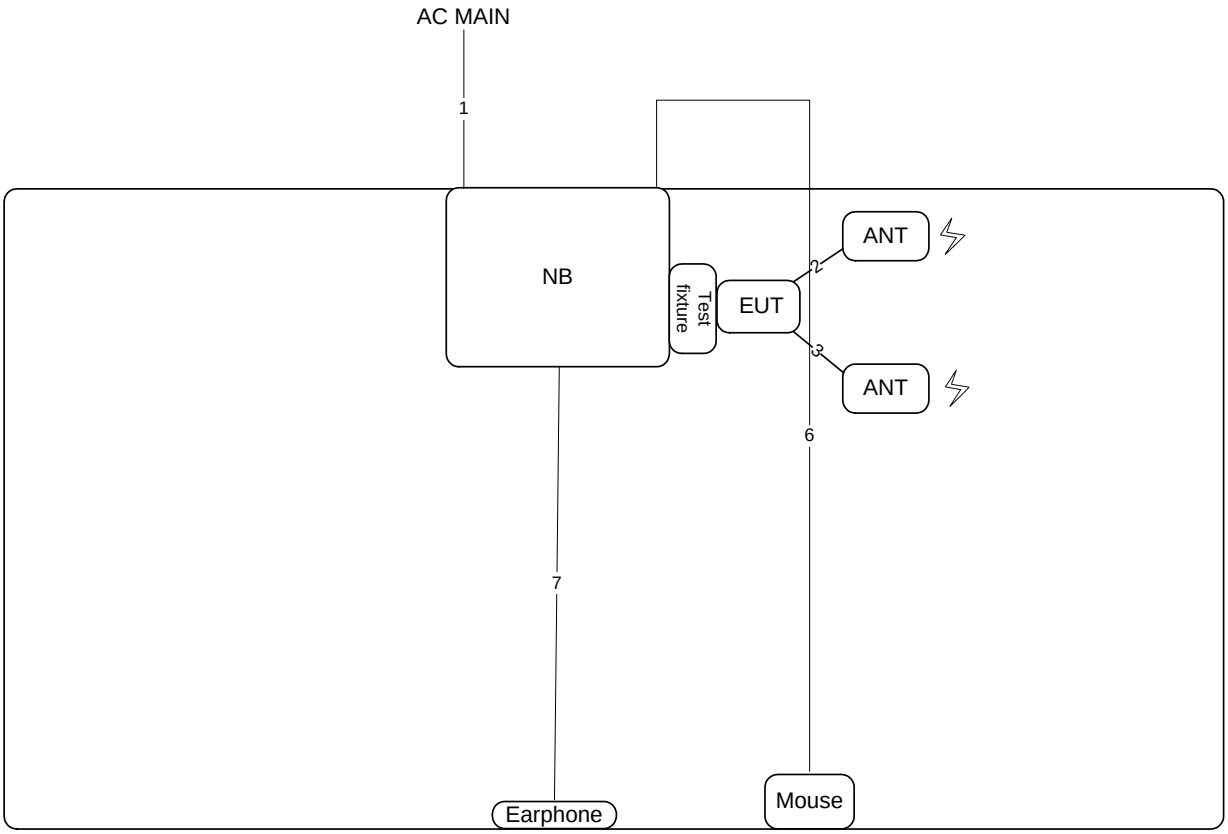
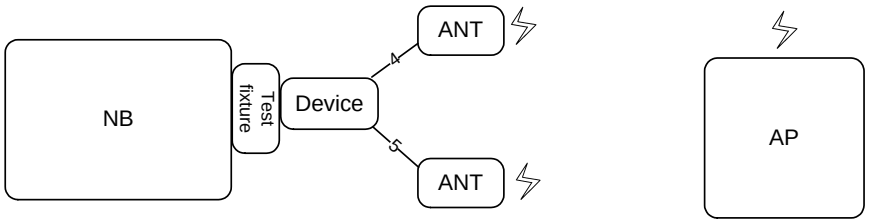
3.13. Test Configurations

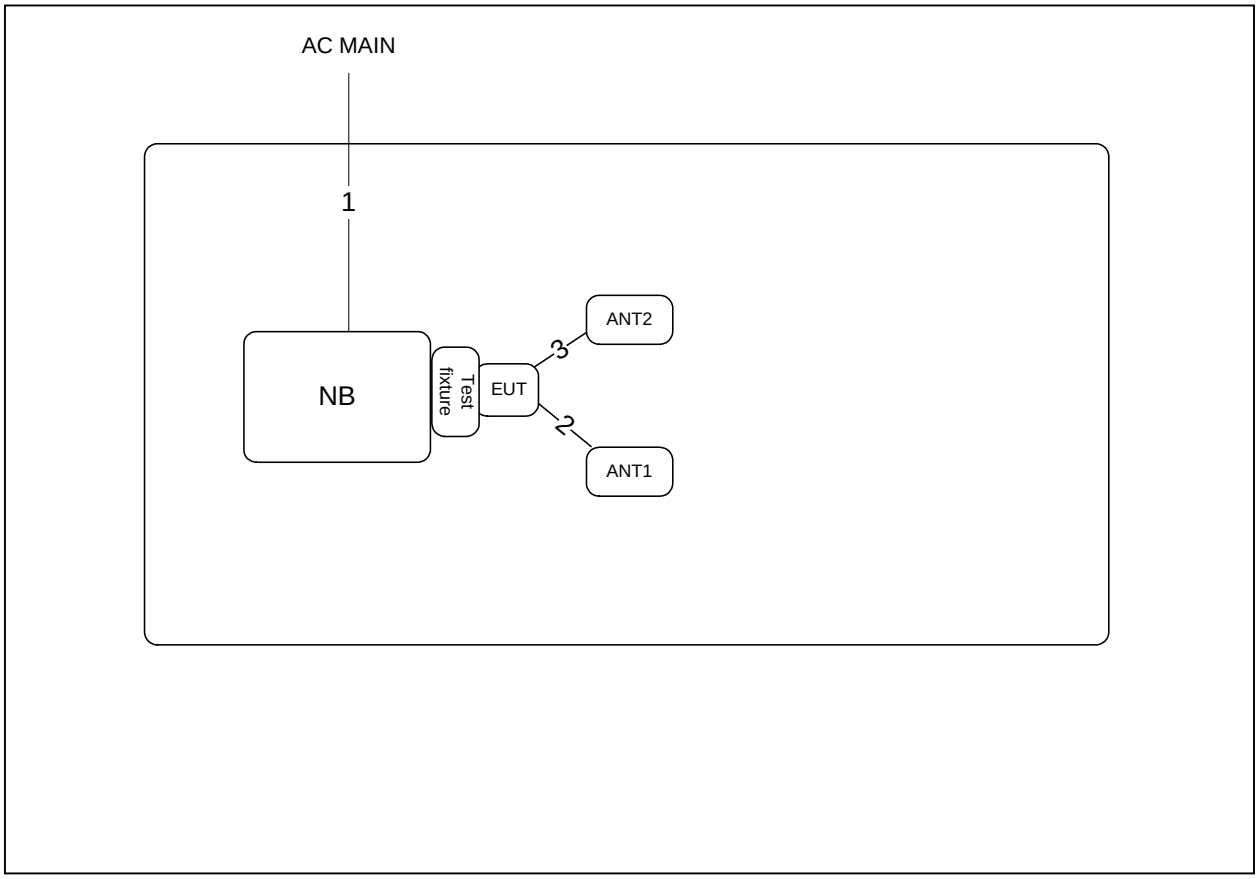
3.13.1. AC Power Line Conduction and Radiation Emissions Below 1GHz Test Configuration





Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	ANT cable	Yes	0.2m
3	ANT cable	Yes	0.2m
4	ANT cable	Yes	0.2m
5	ANT cable	Yes	0.2m
6	USB cable	Yes	1.8m
7	Audio cable	No	1.1m

3.13.2. Radiation Emissions Above 1GHz Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	ANT cable	Yes	0.2m
3	ANT cable	Yes	0.2m

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

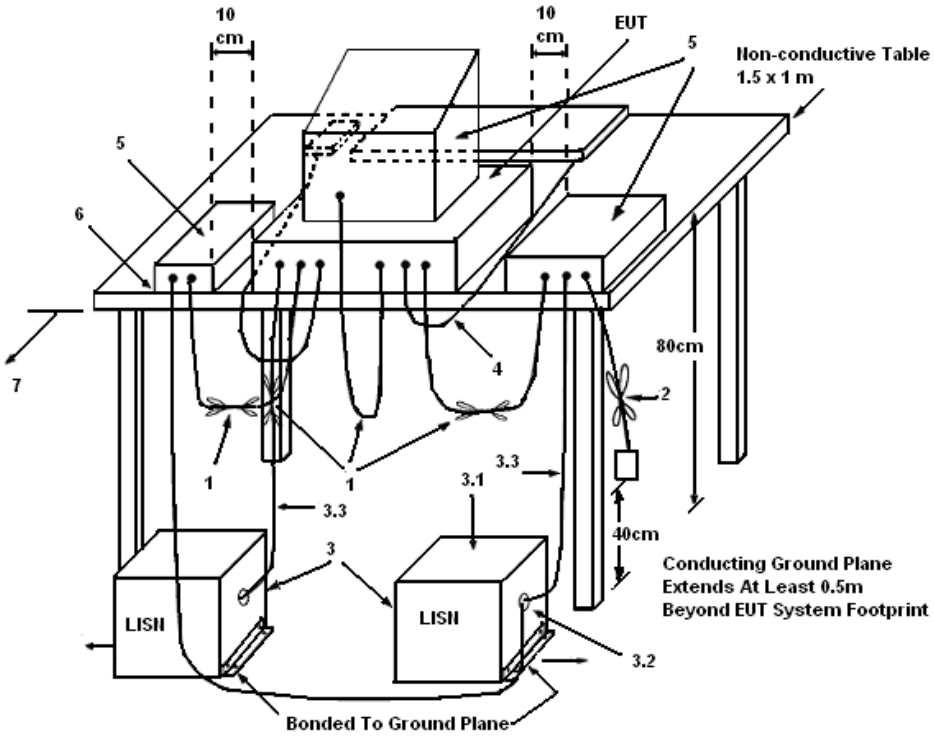
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

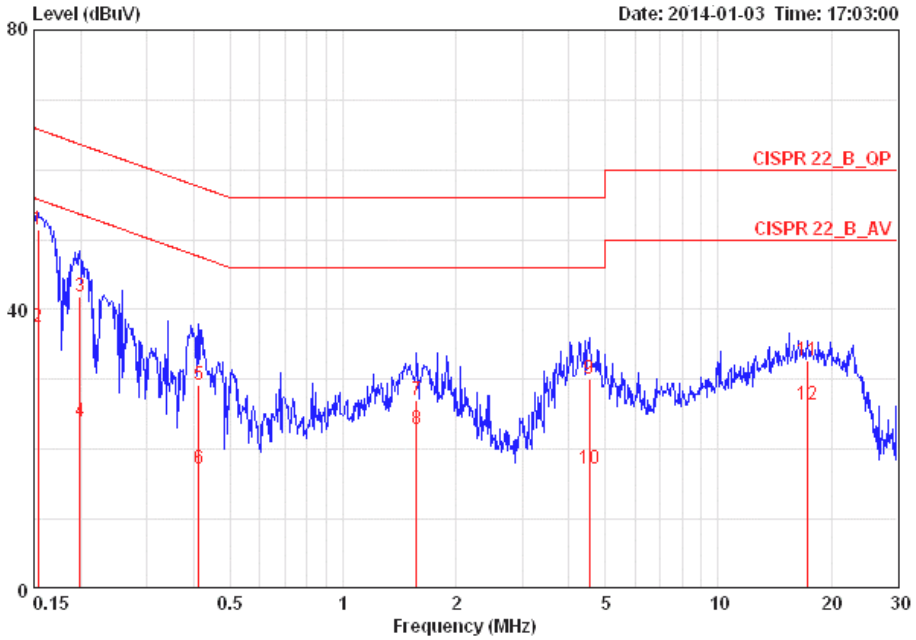
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

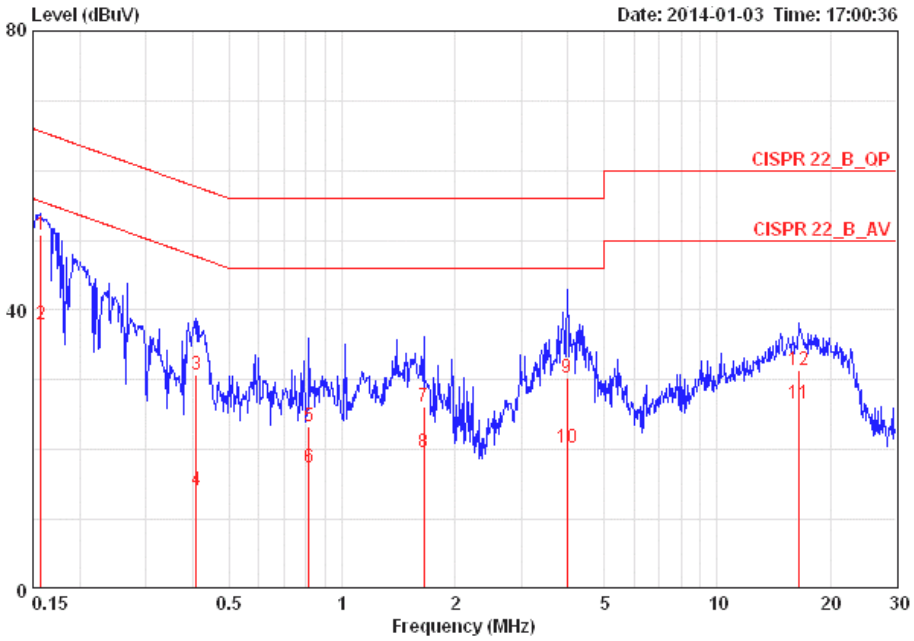
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25℃	Humidity	52%
Test Engineer	Justin Chiu	Phase	Line
Configuration	Normal Link	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1 @	0.15403	51.48	-14.30	65.78	51.17	0.15	0.16	QP	LINE
2 @	0.15403	37.53	-18.25	55.78	37.22	0.15	0.16	AVERAGE	LINE
3	0.19863	41.83	-21.83	63.67	41.52	0.15	0.16	QP	LINE
4	0.19863	24.04	-29.62	53.67	23.73	0.15	0.16	AVERAGE	LINE
5	0.41266	29.25	-28.34	57.59	28.92	0.15	0.18	QP	LINE
6	0.41266	17.23	-30.36	47.59	16.90	0.15	0.18	AVERAGE	LINE
7	1.568	27.12	-28.88	56.00	26.71	0.18	0.23	QP	LINE
8	1.568	22.83	-23.17	46.00	22.42	0.18	0.23	AVERAGE	LINE
9	4.525	30.12	-25.88	56.00	29.52	0.29	0.31	QP	LINE
10	4.525	17.19	-28.81	46.00	16.59	0.29	0.31	AVERAGE	LINE
11	17.291	32.62	-27.38	60.00	31.60	0.54	0.48	QP	LINE
12	17.291	26.45	-23.55	50.00	25.43	0.54	0.48	AVERAGE	LINE

Temperature	25°C	Humidity	52%
Test Engineer	Justin Chiu	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1 @	0.15733	50.75	-14.85	65.60	50.52	0.07	0.16	QP	NEUTRAL
2 @	0.15733	37.89	-17.71	55.60	37.66	0.07	0.16	AVERAGE	NEUTRAL
3	0.40831	30.65	-27.03	57.68	30.40	0.07	0.18	QP	NEUTRAL
4	0.40831	14.26	-33.42	47.68	14.01	0.07	0.18	AVERAGE	NEUTRAL
5	0.81737	23.29	-32.71	56.00	23.02	0.08	0.20	QP	NEUTRAL
6	0.81737	17.42	-28.58	46.00	17.15	0.08	0.20	AVERAGE	NEUTRAL
7	1.654	26.16	-29.84	56.00	25.82	0.10	0.24	QP	NEUTRAL
8	1.654	19.56	-26.44	46.00	19.22	0.10	0.24	AVERAGE	NEUTRAL
9	3.985	30.40	-25.60	56.00	29.97	0.13	0.30	QP	NEUTRAL
10	3.985	20.33	-25.67	46.00	19.90	0.13	0.30	AVERAGE	NEUTRAL
11	16.486	26.51	-23.49	50.00	25.66	0.39	0.47	AVERAGE	NEUTRAL
12	16.486	31.45	-28.55	60.00	30.60	0.39	0.47	QP	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	21.92	18.24
40	5200 MHz	21.92	18.40
48	5240 MHz	21.92	18.24
52	5260 MHz	45.12	26.08
60	5300 MHz	36.96	19.52
64	5320 MHz	24.32	18.56
100	5500 MHz	21.92	18.40
116	5580 MHz	34.72	19.04
140	5700 MHz	22.24	18.40
144	5720 MHz	46.40	27.52

Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	39.68	36.48
46	5230 MHz	39.68	36.48
54	5270 MHz	64.00	36.80
62	5310 MHz	39.68	36.48
102	5510 MHz	39.68	36.48
110	5550 MHz	90.88	53.76
134	5670 MHz	84.16	39.04
142	5710 MHz	90.88	59.52

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1

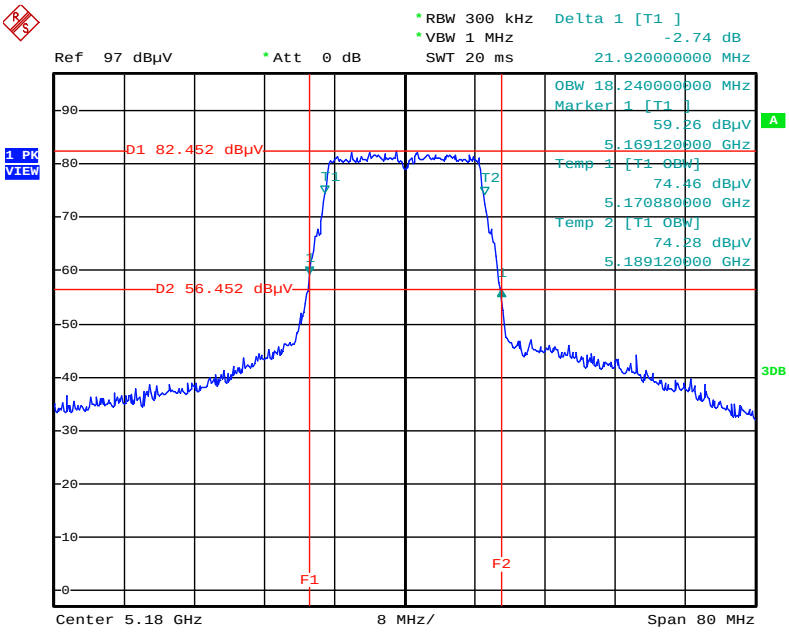
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
42	5210 MHz	81.92	76.16
58	5290 MHz	81.92	76.16
106	5530 MHz	81.92	76.80
122	5610 MHz	182.40	107.52
138	5690 MHz	200.32	115.84

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Chain 1

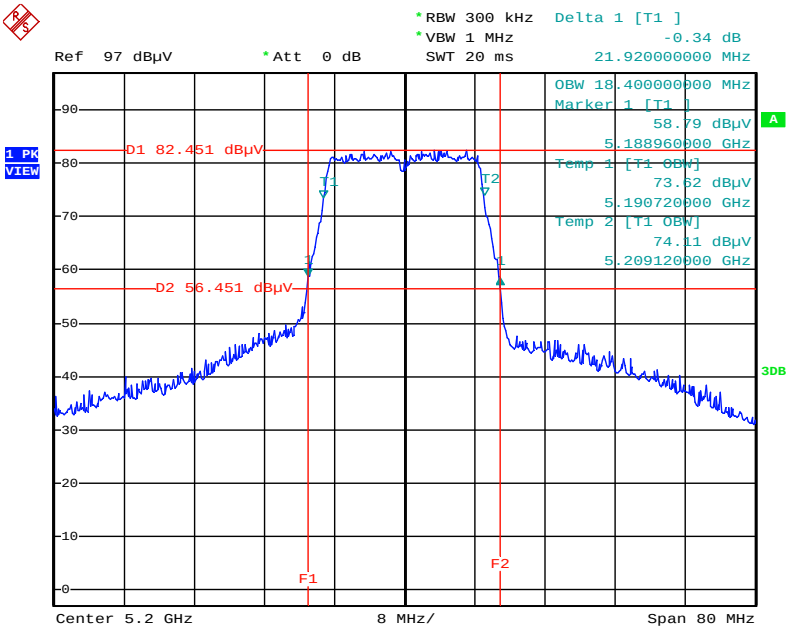
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	21.60	17.28
40	5200 MHz	21.60	17.44
48	5240 MHz	21.92	17.28
52	5260 MHz	41.76	23.68
60	5300 MHz	40.32	23.04
64	5320 MHz	24.96	17.76
100	5500 MHz	21.60	17.28
116	5580 MHz	33.12	18.24
140	5700 MHz	21.76	17.44
144	5720 MHz	43.36	27.04

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5180 MHz



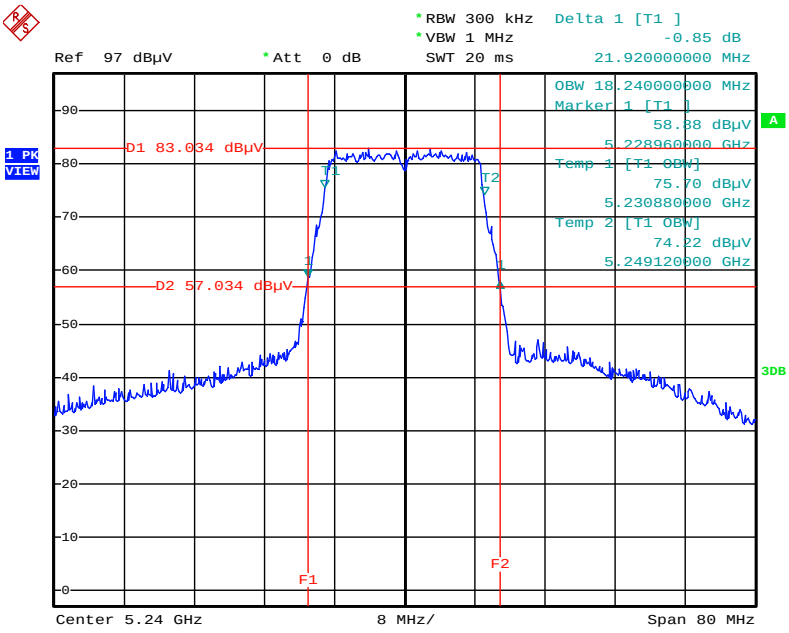
Date: 22.JAN.2014 22:55:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5200 MHz



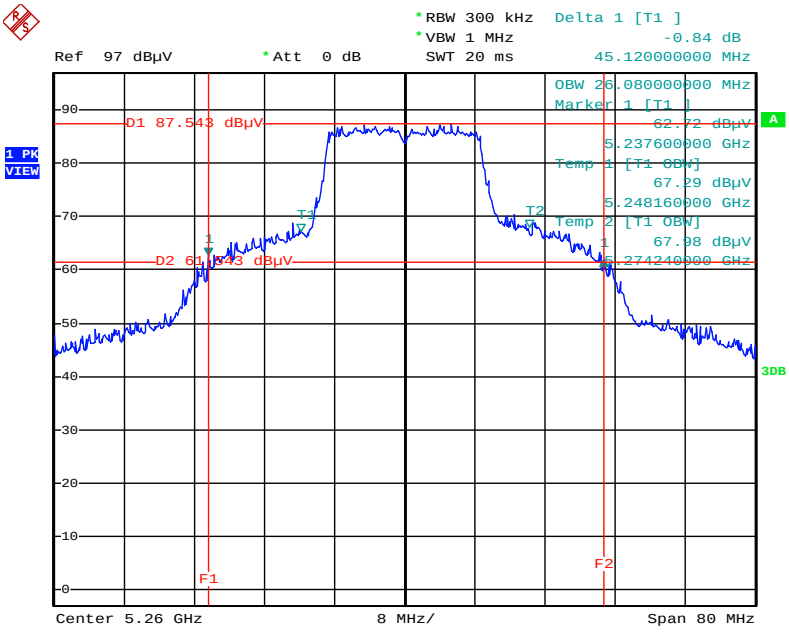
Date: 22.JAN.2014 22:55:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5240 MHz



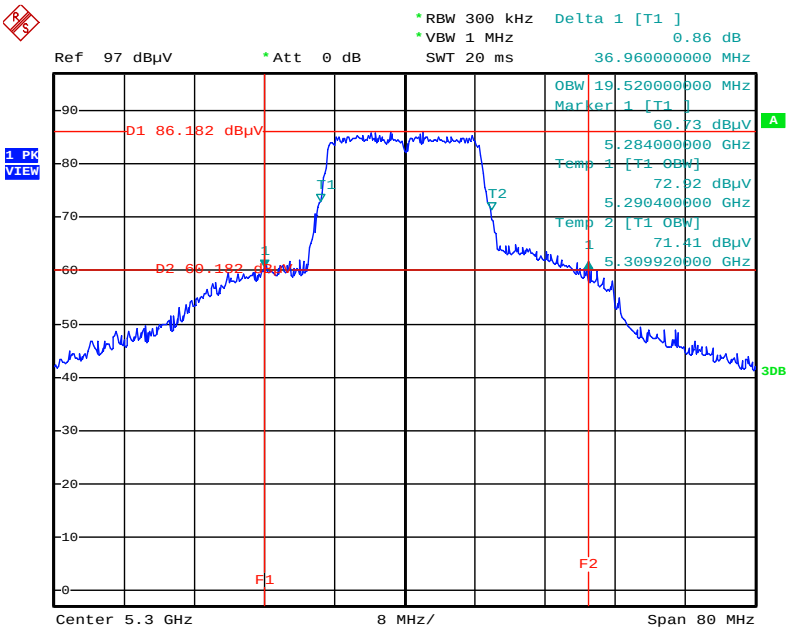
Date: 22.JAN.2014 22:56:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5260 MHz



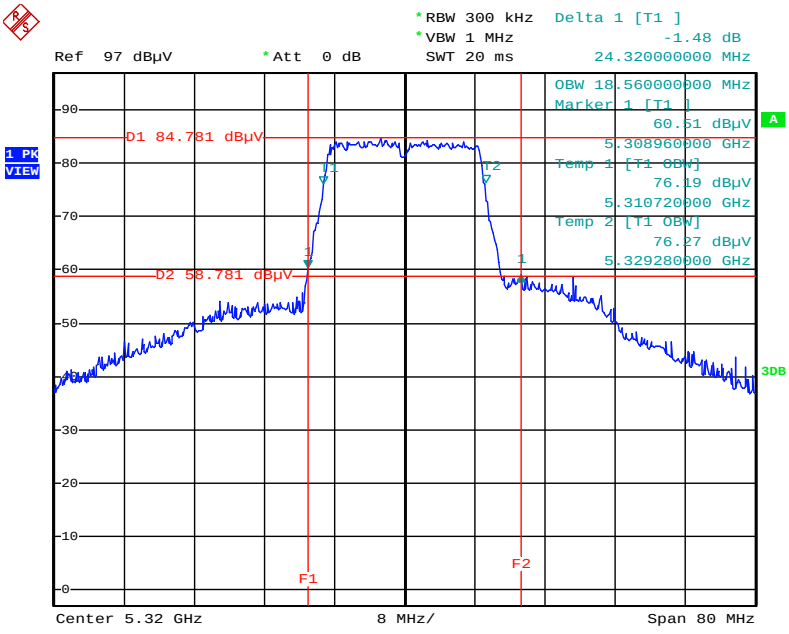
Date: 22.JAN.2014 22:56:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5300 MHz



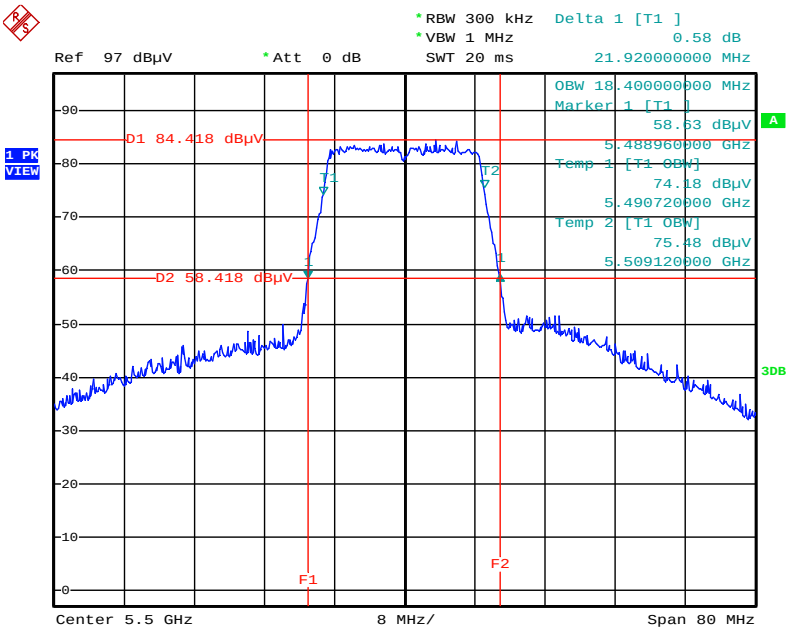
Date: 22.JAN.2014 22:57:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5320 MHz



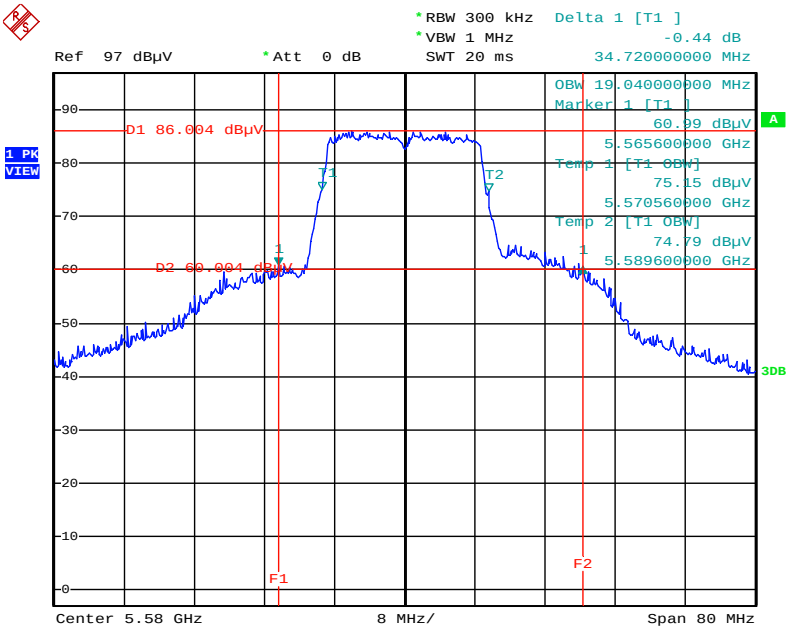
Date: 22.JAN.2014 22:57:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5500 MHz



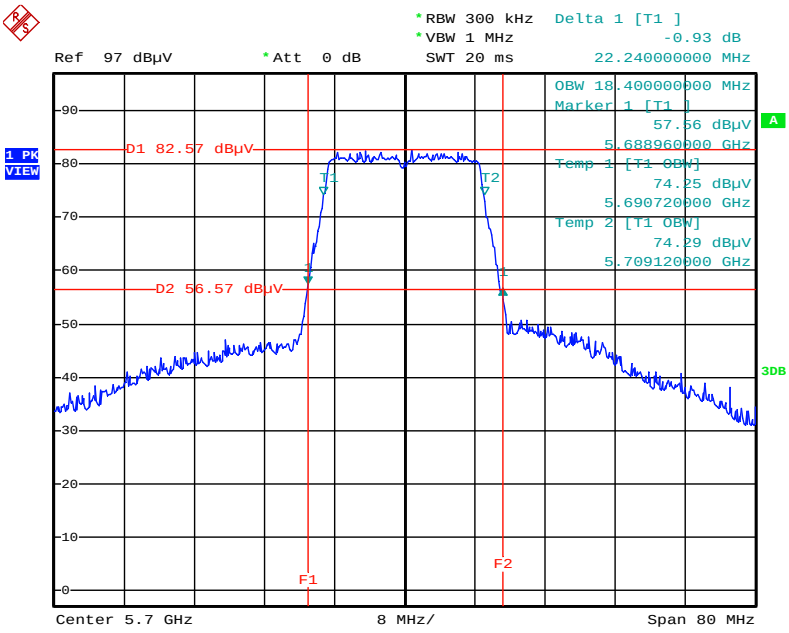
Date: 22.JAN.2014 23:13:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5580 MHz



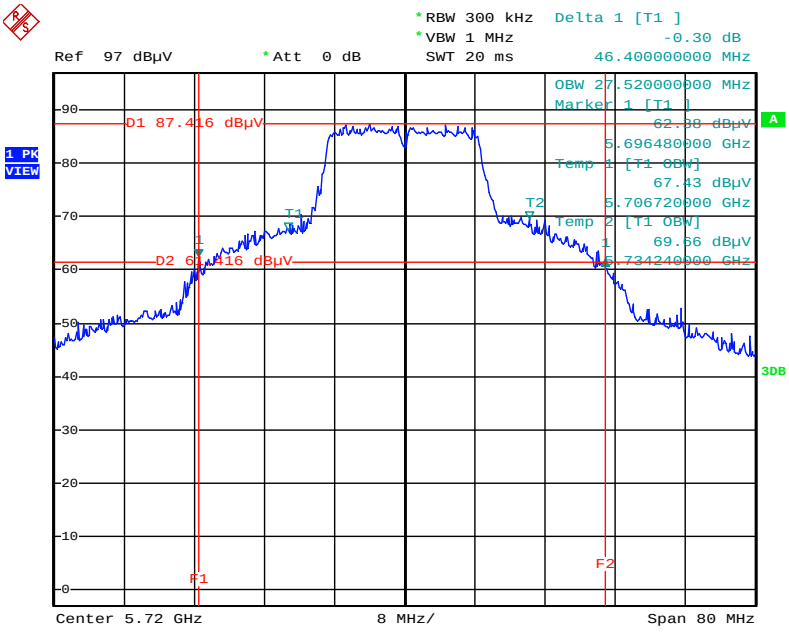
Date: 22.JAN.2014 23:14:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5700 MHz



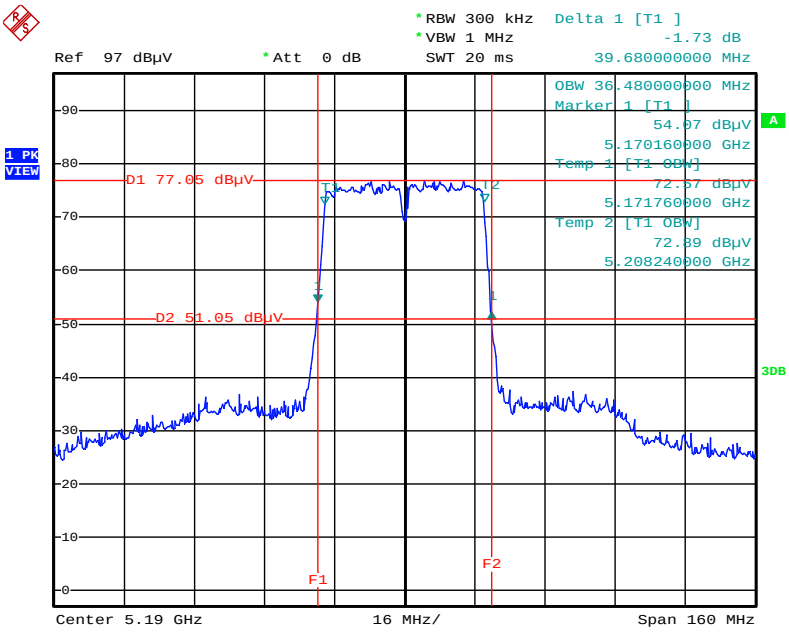
Date: 22.JAN.2014 23:14:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5720 MHz



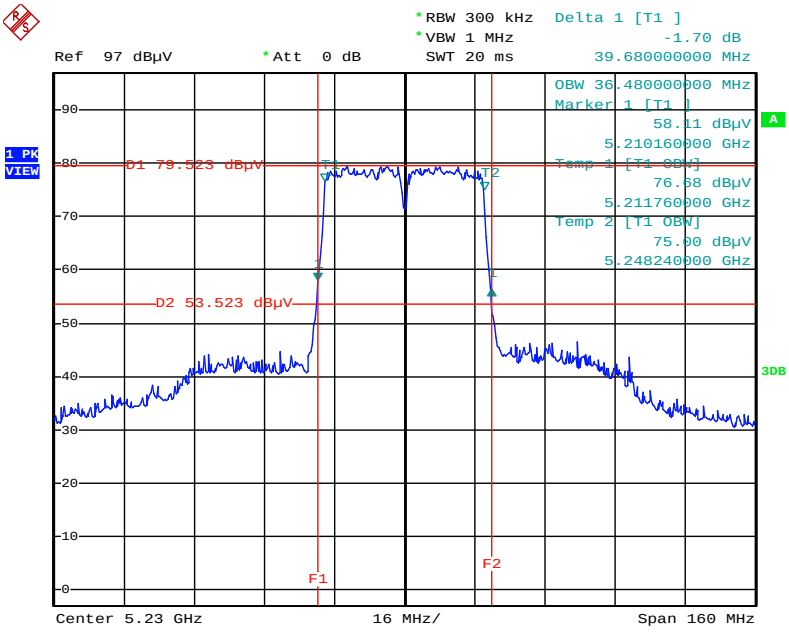
Date: 29.JAN.2014 15:40:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5190 MHz



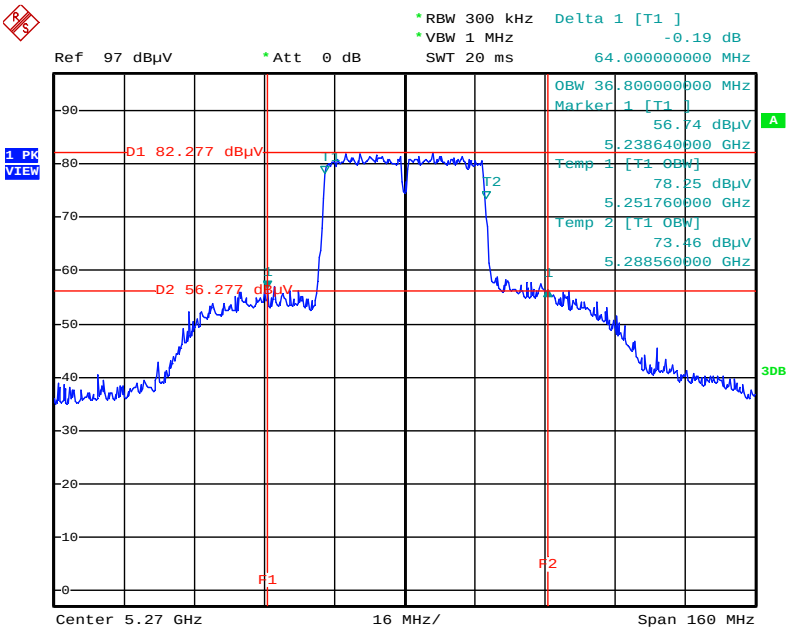
Date: 22.JAN.2014 23:15:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5230 MHz



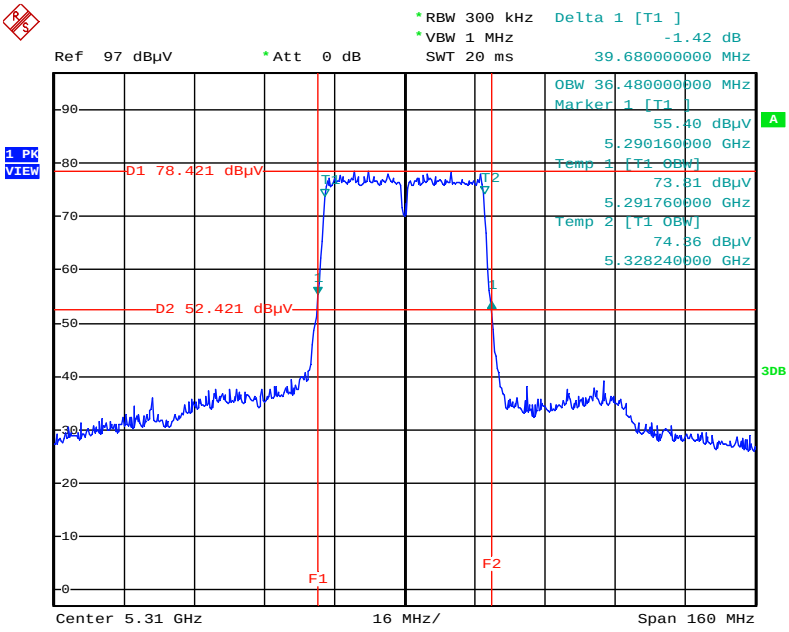
Date: 22.JAN.2014 23:15:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5270 MHz



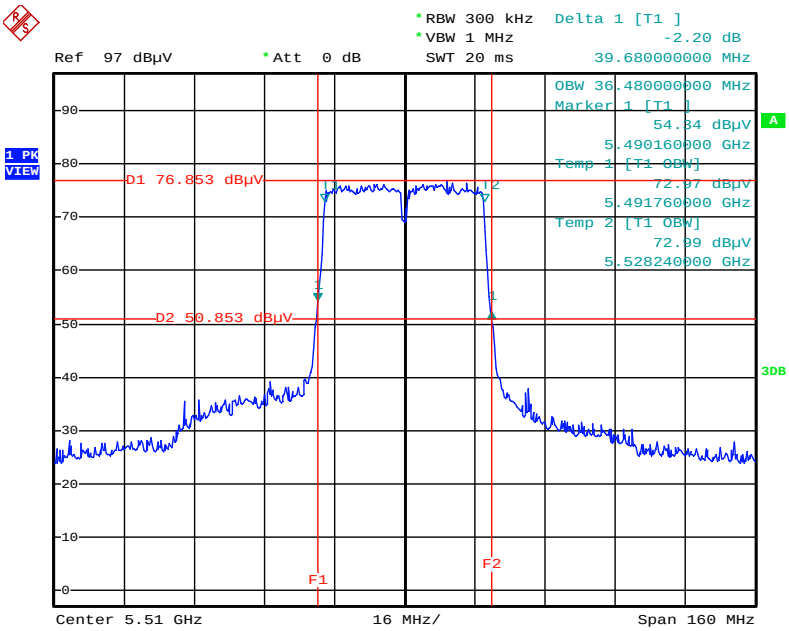
Date: 22.JAN.2014 23:16:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5310 MHz



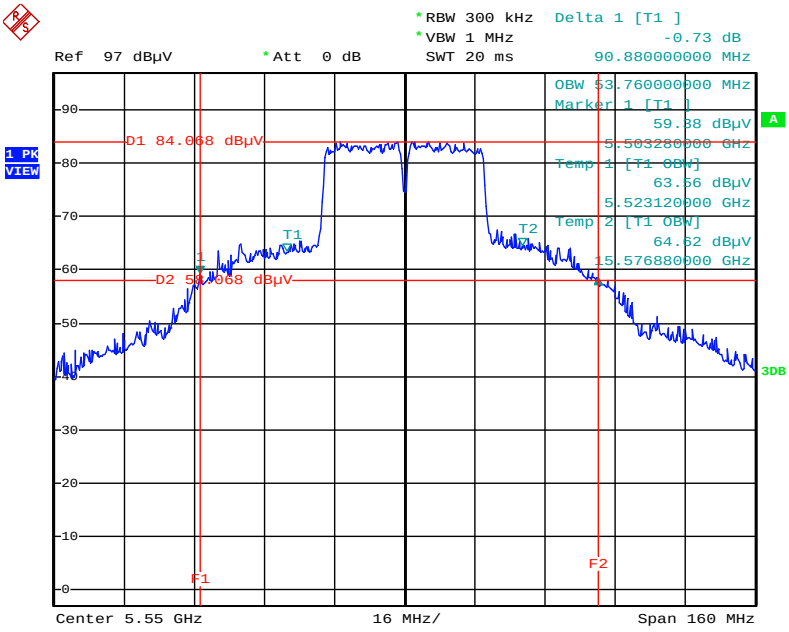
Date: 22.JAN.2014 23:17:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5510 MHz



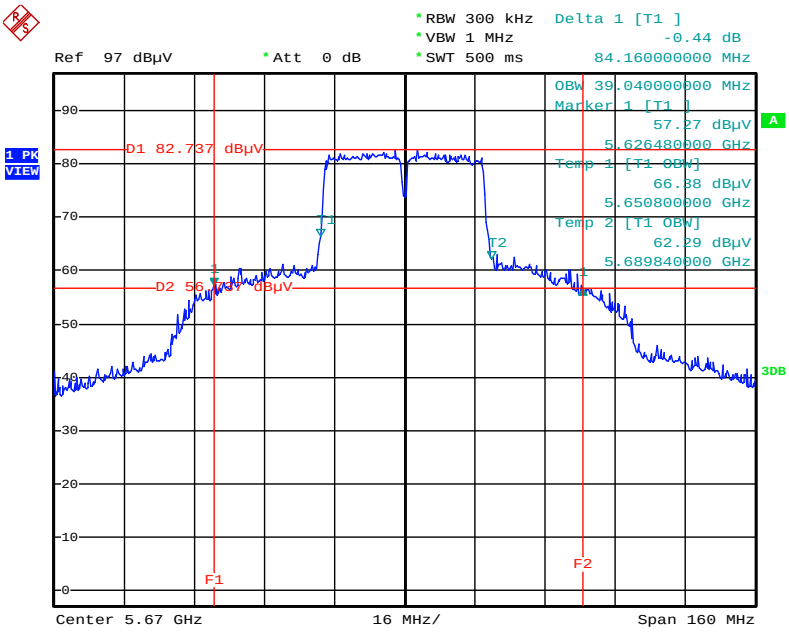
Date: 22.JAN.2014 23:18:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5550 MHz



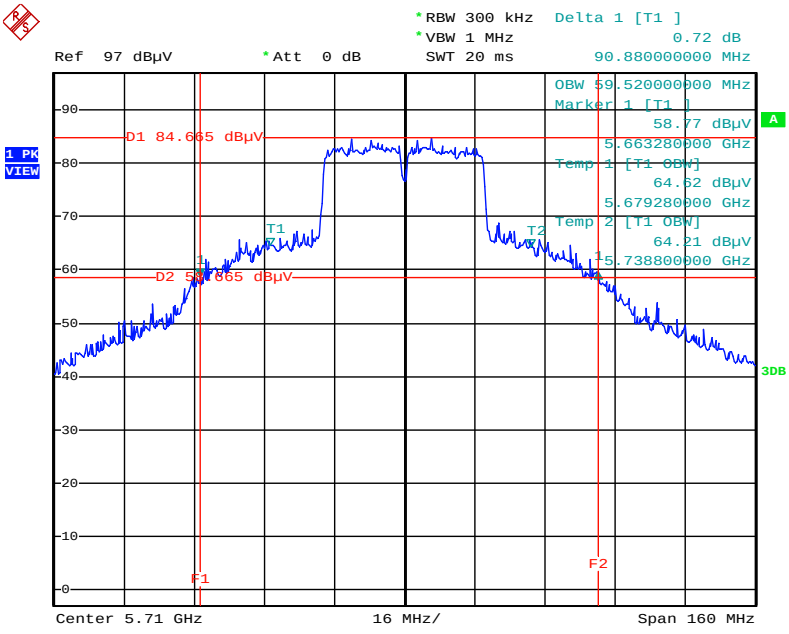
Date: 22.JAN.2014 23:19:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5670 MHz



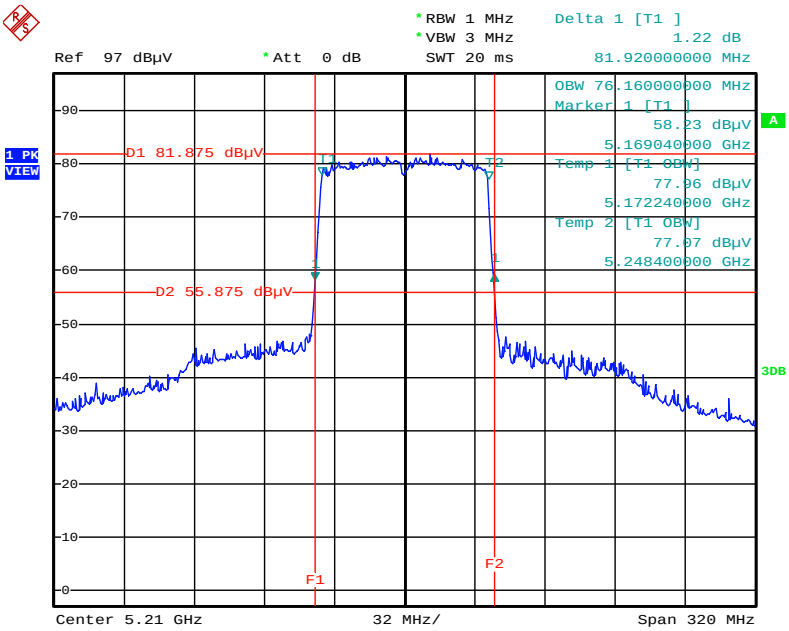
Date: 22.JAN.2014 23:19:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5710 MHz



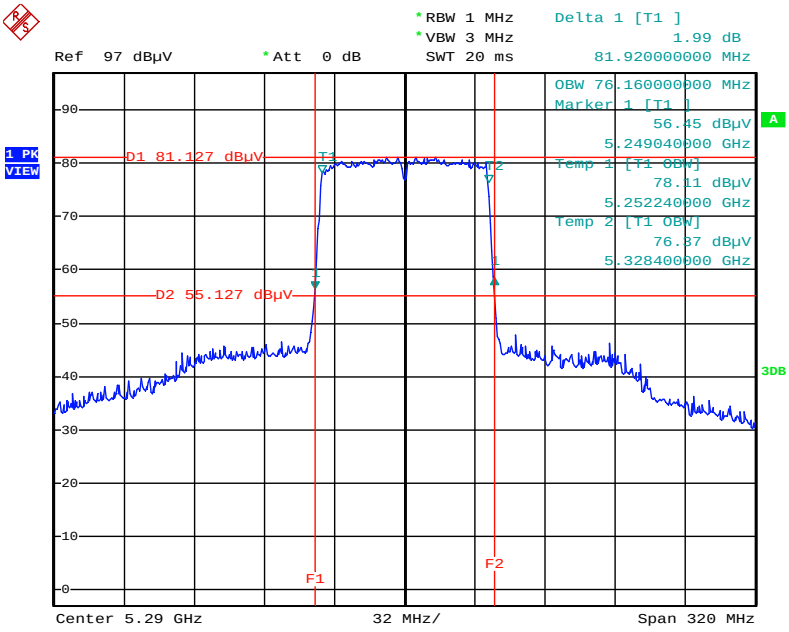
Date: 29.JAN.2014 15:42:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5210 MHz



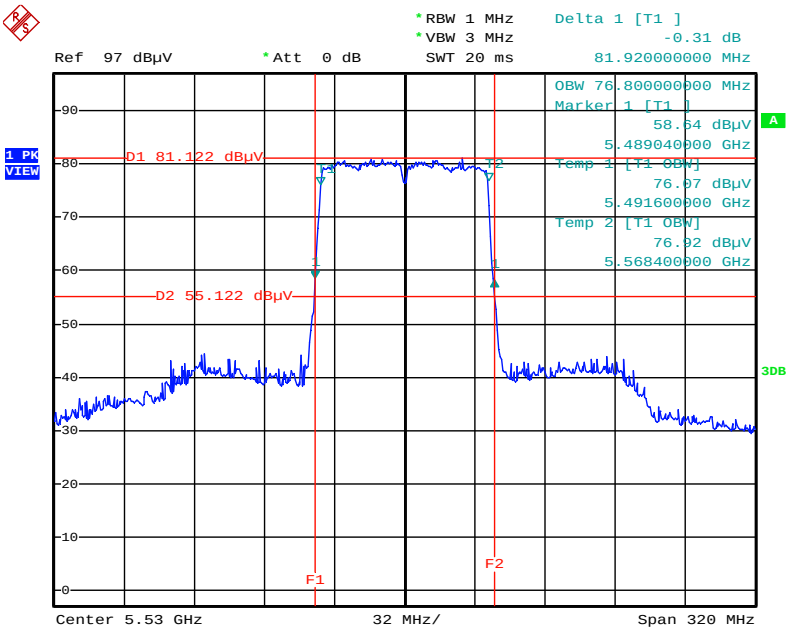
Date: 22.JAN.2014 23:21:10

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5290 MHz



Date: 22.JAN.2014 23:22:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5530 MHz



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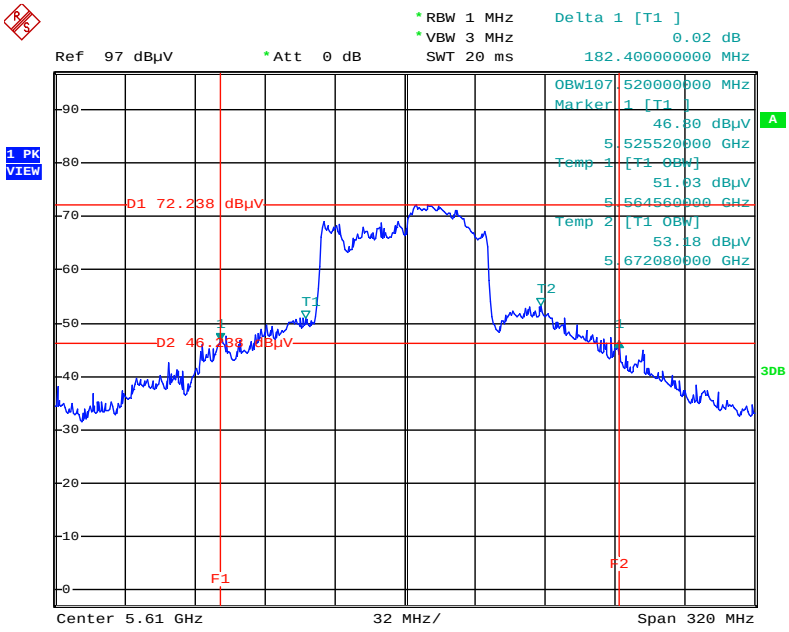
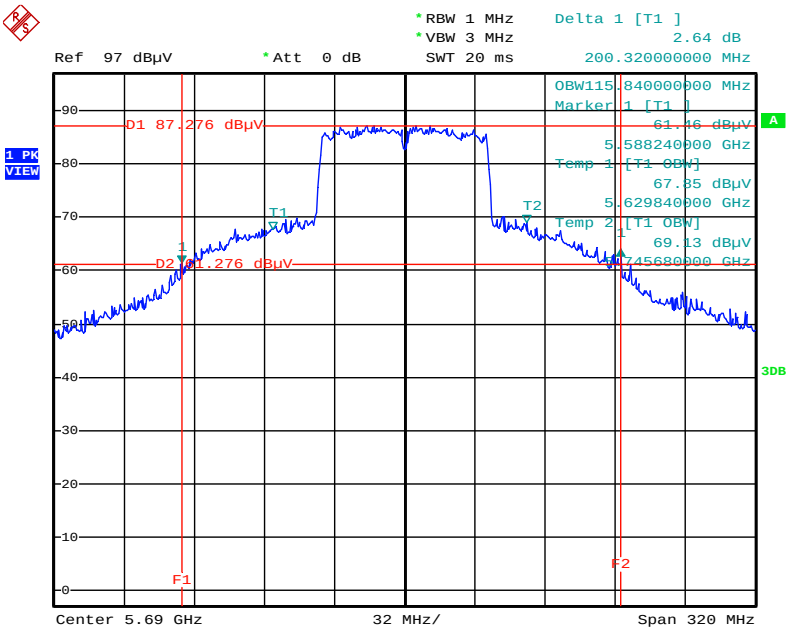
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5610 MHz



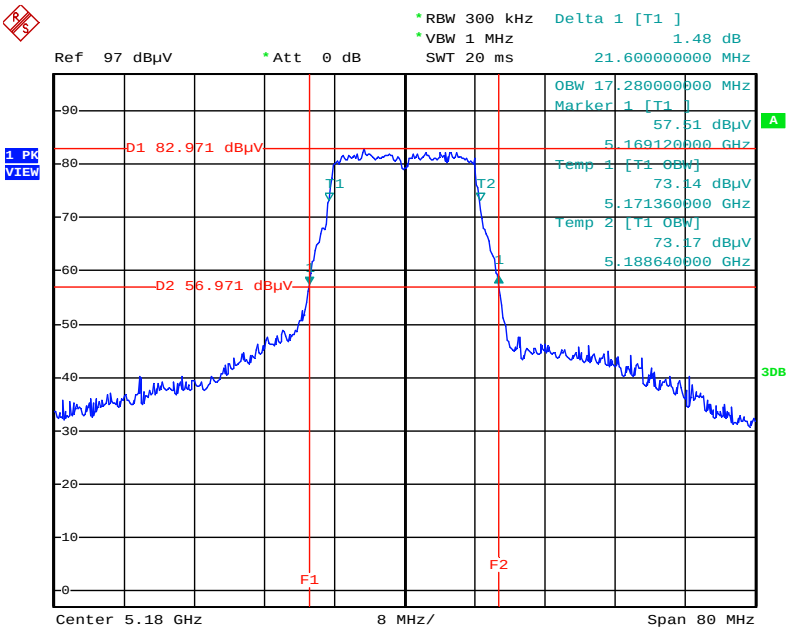
Date: 7.FEB.2014 08:33:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5690 MHz



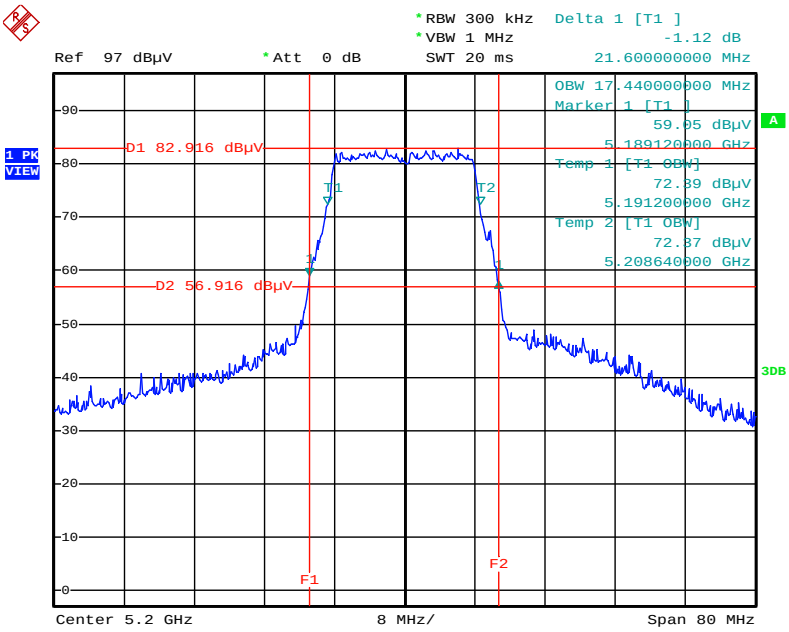
Date: 29.JAN.2014 15:54:12

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



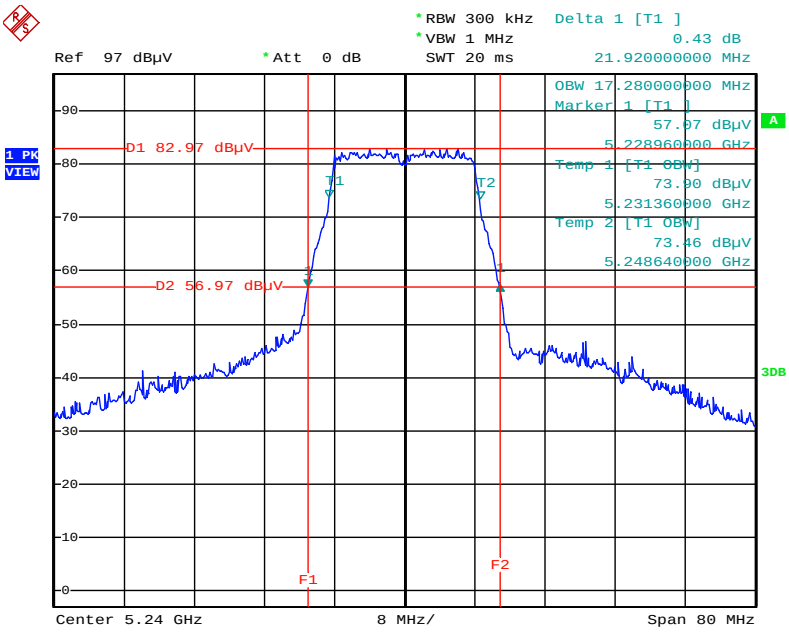
Date: 22.JAN.2014 22:43:23

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



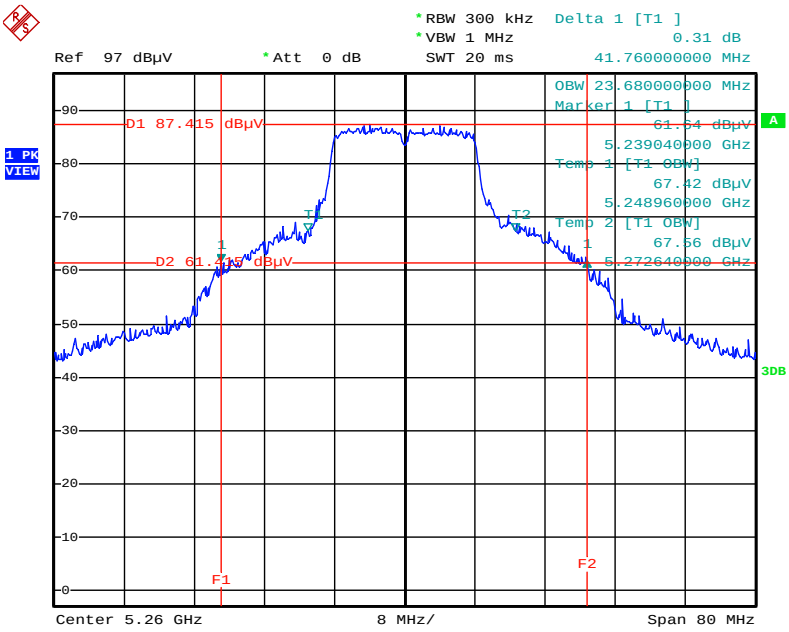
Date: 22.JAN.2014 22:44:46

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



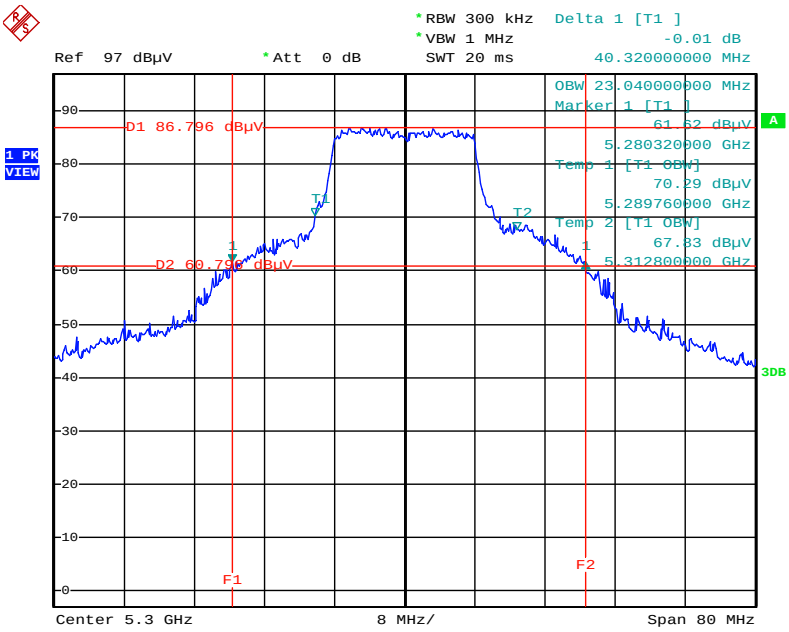
Date: 22.JAN.2014 22:45:12

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



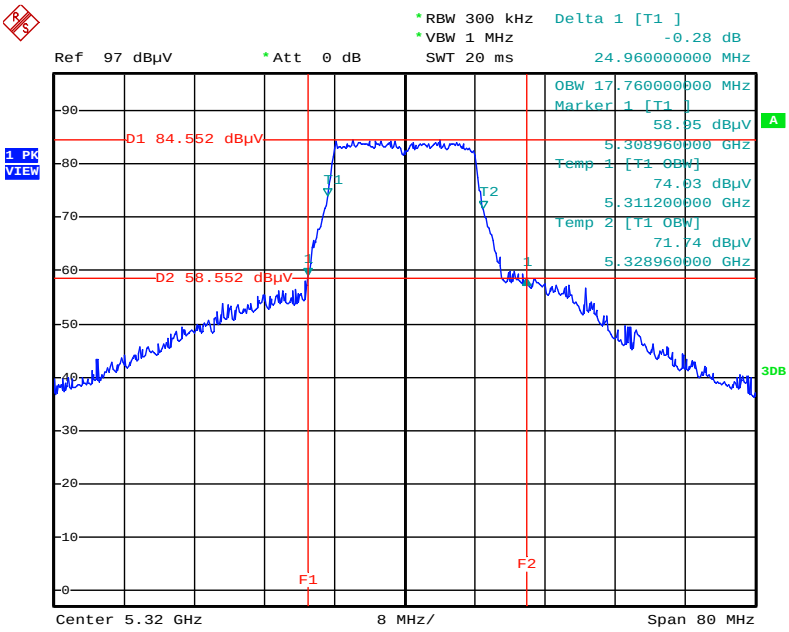
Date: 22.JAN.2014 22:45:42

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



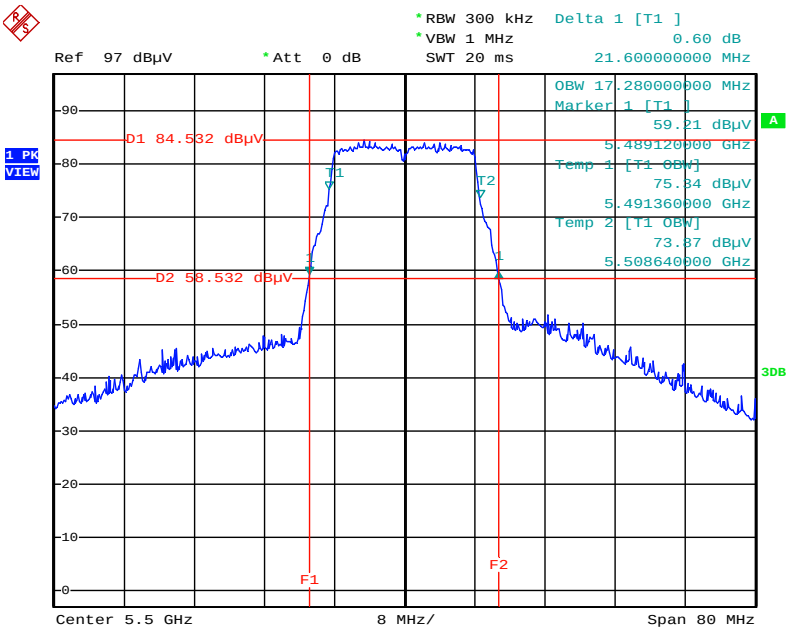
Date: 22.JAN.2014 22:46:21

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



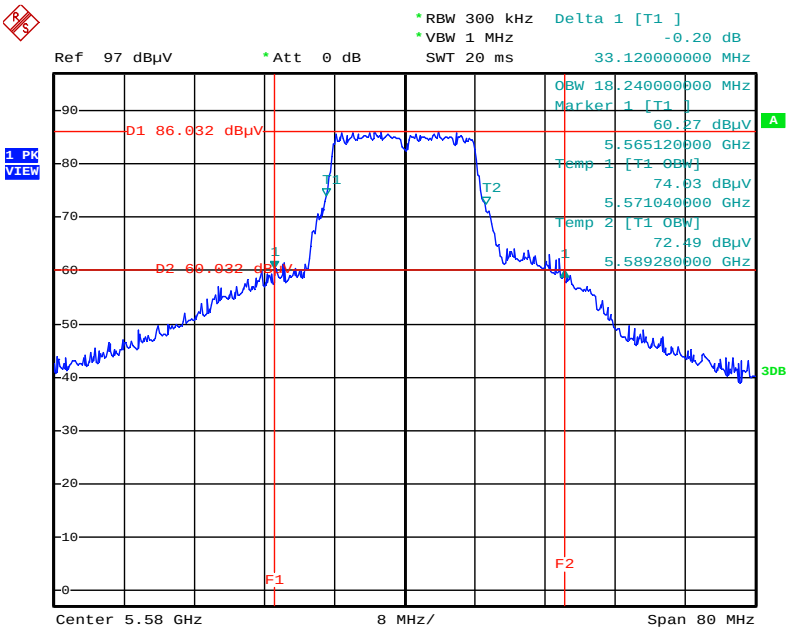
Date: 22.JAN.2014 22:50:31

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



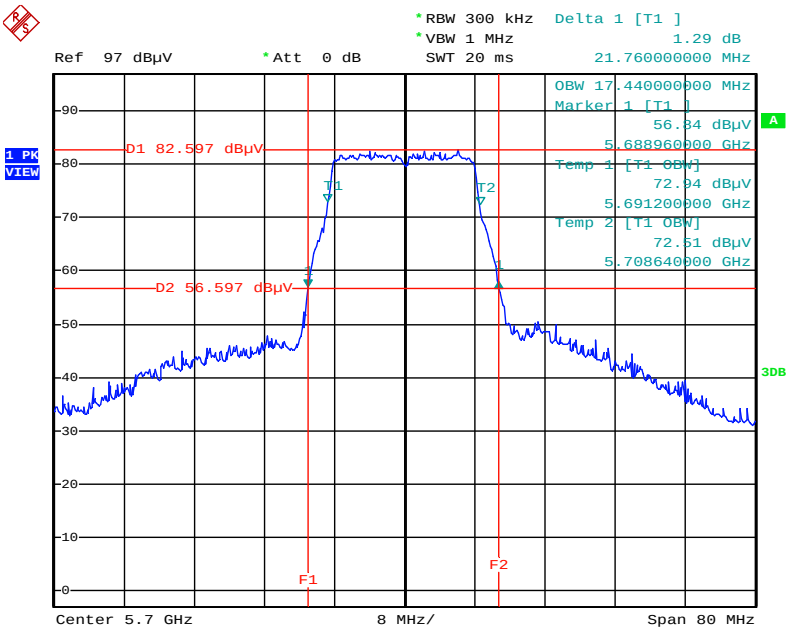
Date: 22.JAN.2014 22:52:07

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



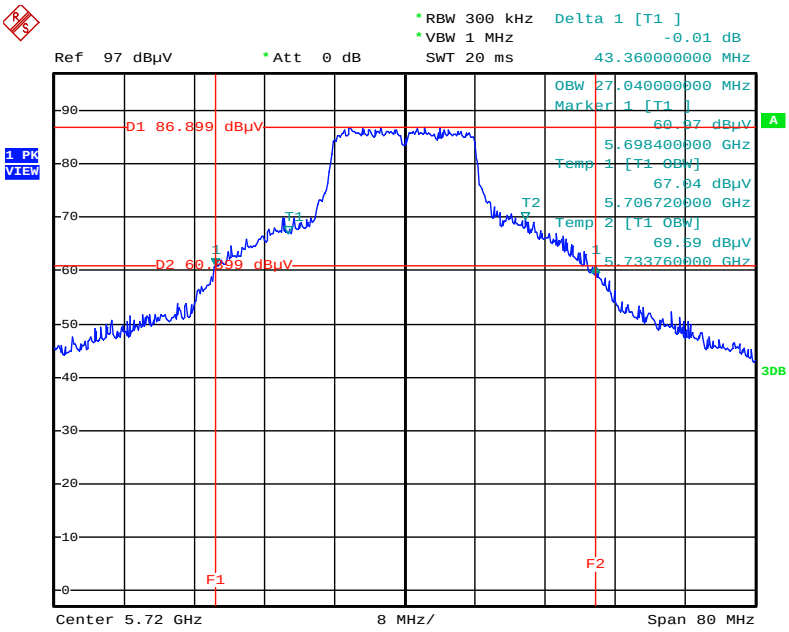
Date: 22.JAN.2014 22:52:40

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



Date: 22.JAN.2014 22:53:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



Date: 29.JAN.2014 15:39:15

4.3. Maximum Conducted Output Power Measurement

4.3.1. Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

4.3.2. Measuring Instruments and Setting

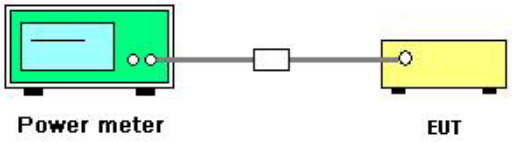
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB 789033 D01 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E,section (E) Maximum conducted output power =>(3) Method PM (Measurement using an RF average power meter) Multiple antenna systems was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. When measuring maximum conducted output power with multiple antenna systems,add every result of the values by mathematic formula.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Maximum Conducted Output Power

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Jan. 22, 2014 and Feb. 07, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 20MHz

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	0.06	16.82	17.00	Complies
40	5200 MHz		16.79	17.00	Complies
48	5240 MHz		16.86	17.00	Complies
52	5260 MHz		21.25	24.00	Complies
60	5300 MHz		20.12	24.00	Complies
64	5320 MHz		18.81	24.00	Complies
100	5500 MHz		17.24	24.00	Complies
116	5580 MHz		19.31	24.00	Complies
140	5700 MHz		16.71	24.00	Complies
144	5720 MHz		21.32	24.00	Complies

straddle channel complies with output power limit of Band 3&Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	46.40	27.52	5696.48	5706.72	28.52	17.88	21.32	24.00	29.52	Complies

Note :
UNII 3 Limit : 24dBm or 11+10log(B)
UNII 4 Limit : 30dBm or 17+10log(B)

Configuration IEEE 802.11ac MCS0/Nss1 40MHz

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	0.11	14.28	17.00	Complies
46	5230 MHz		16.94	17.00	Complies
54	5270 MHz		19.37	24.00	Complies
62	5310 MHz		15.47	24.00	Complies
102	5510 MHz		13.08	24.00	Complies
110	5550 MHz		20.88	24.00	Complies
134	5670 MHz		19.42	24.00	Complies
142	5710 MHz		21.44	24.00	Complies

straddle channel complies with output power limit of Band 3&Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
142	90.88	59.52	5663.28	5679.28	61.72	29.16	21.44	24.00	30.00	Complies

Note :
UNII 3 Limit : 24dBm or 11+10log(B)
UNII 4 Limit : 30dBm or 17+10log(B)

Configuration IEEE 802.11ac MCS0/Nss1 80MHz

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
42	5210 MHz	0.23	15.35	17.00	Complies
58	5290 MHz		15.52	24.00	Complies
106	5530 MHz		14.18	24.00	Complies
122	5610 MHz		18.21	24.00	Complies
138	5690 MHz		20.94	24.00	Complies

straddle channel complies with output power limit of Band 3&Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
138	200.32	115.84	5588.24	5629.84	136.76	63.56	20.94	24.00	30.00	Complies

Note :
UNII 3 Limit : 24dBm or 11+10log(B)
UNII 4 Limit : 30dBm or 17+10log(B)

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a
Test Date	Jan. 22, 2014		

Configuration IEEE 802.11a

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	0.05	16.94	17.00	Complies
40	5200 MHz		16.92	17.00	Complies
48	5240 MHz		16.89	17.00	Complies
52	5260 MHz		21.18	24.00	Complies
60	5300 MHz		21.23	24.00	Complies
64	5320 MHz		18.71	24.00	Complies
100	5500 MHz		17.35	24.00	Complies
116	5580 MHz		19.48	24.00	Complies
140	5700 MHz		16.85	24.00	Complies
144	5720 MHz		21.29	24.00	Complies

straddle channel complies with output power limit of Band 3&Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	43.36	27.04	5698.40	5706.72	26.60	16.76	21.29	24.00	29.24	Complies

Note :
UNII 3 Limit : 24dBm or 11+10log(B)
UNII 4 Limit : 30dBm or 17+10log(B)

4.4. Power Spectral Density Measurement

4.4.1. 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 4.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5.470-5.725 GHz	11

4.4.2. Measuring Instruments and Setting

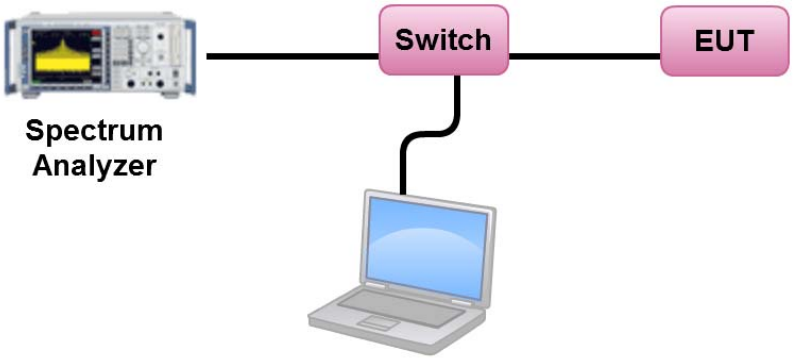
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB 789033 D01 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E,section © Maximum conducted output power => (d) Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).
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.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Power Spectral Density

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n
Test Date	Jan. 22, 2014 and Feb. 07, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	2.83	4.00	Complies
40	5200 MHz	2.69	4.00	Complies
48	5240 MHz	3.05	4.00	Complies
52	5260 MHz	7.39	11.00	Complies
60	5300 MHz	6.16	11.00	Complies
64	5320 MHz	4.94	11.00	Complies
100	5500 MHz	4.57	11.00	Complies
116	5580 MHz	6.78	11.00	Complies
140	5700 MHz	2.57	11.00	Complies
144	5720 MHz	8.03	11.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-2.82	4.00	Complies
46	5230 MHz	0.15	4.00	Complies
54	5270 MHz	2.60	11.00	Complies
62	5310 MHz	-1.29	11.00	Complies
102	5510 MHz	-2.71	11.00	Complies
110	5550 MHz	4.78	11.00	Complies
134	5670 MHz	2.83	11.00	Complies
142	5710 MHz	4.98	11.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-4.04	4.00	Complies
58	5290 MHz	-3.86	11.00	Complies
106	5530 MHz	-4.36	11.00	Complies
122	5610 MHz	-0.88	11.00	Complies
138	5690 MHz	1.92	11.00	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a
Test Date	Jan. 22, 2014		

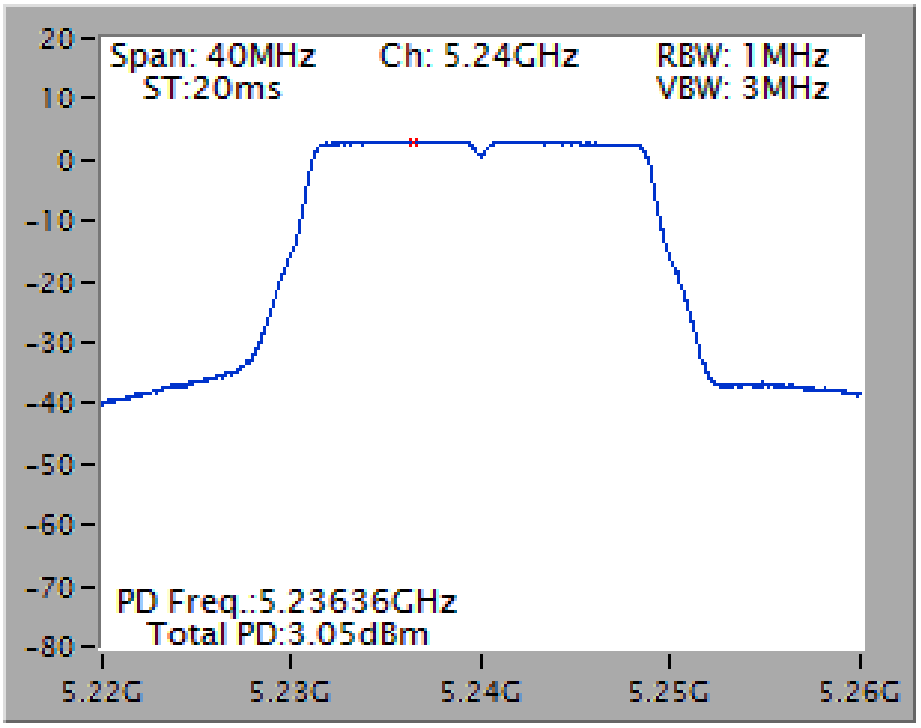
Configuration IEEE 802.11a / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	3.13	4.00	Complies
40	5200 MHz	2.99	4.00	Complies
48	5240 MHz	3.30	4.00	Complies
52	5260 MHz	7.65	11.00	Complies
60	5300 MHz	7.65	11.00	Complies
64	5320 MHz	5.36	11.00	Complies
100	5500 MHz	4.86	11.00	Complies
116	5580 MHz	7.10	11.00	Complies
140	5700 MHz	2.95	11.00	Complies
144	5720 MHz	7.89	11.00	Complies

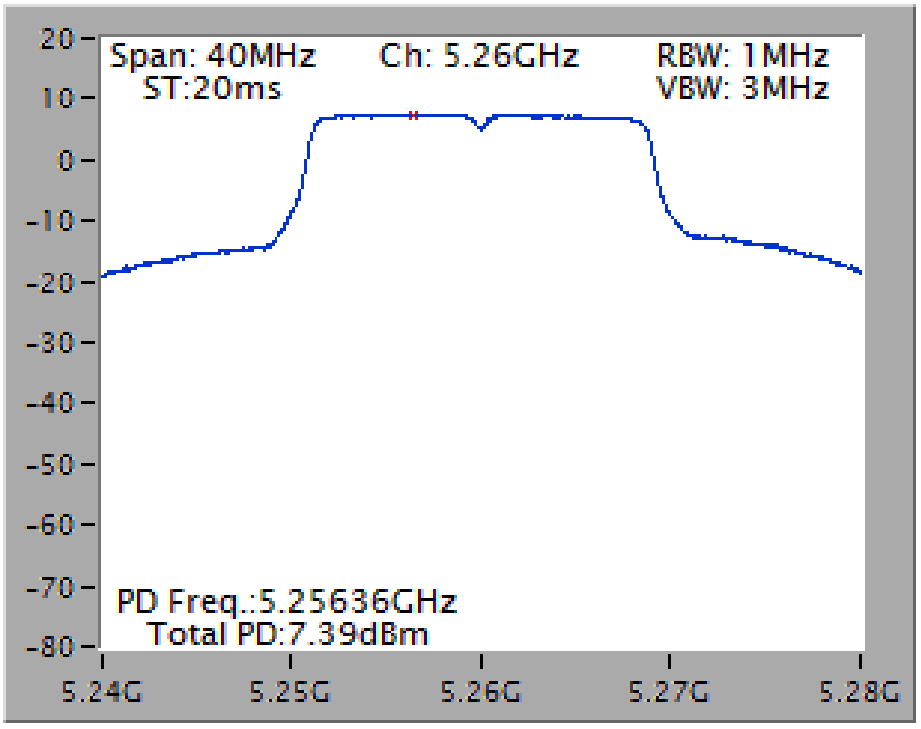
Note: All the test values were listed in the report.

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

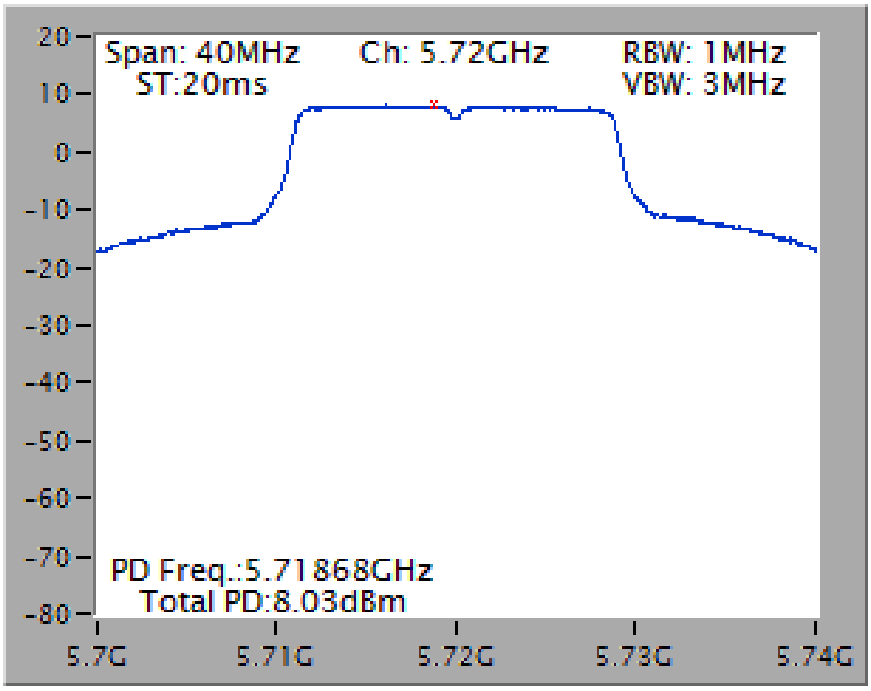
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5240 MHz



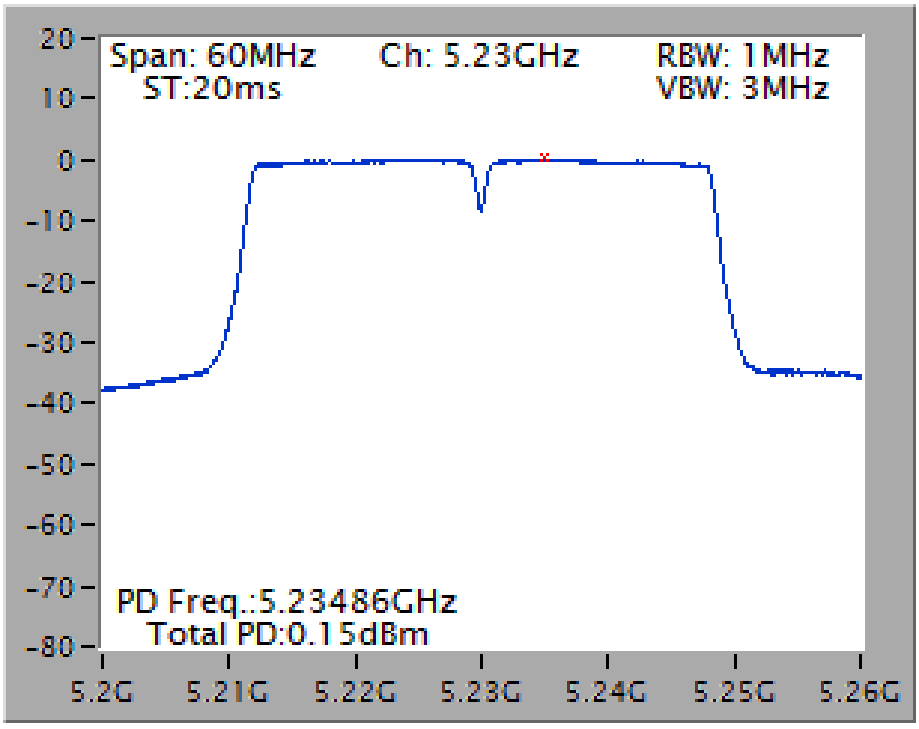
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5260 MHz



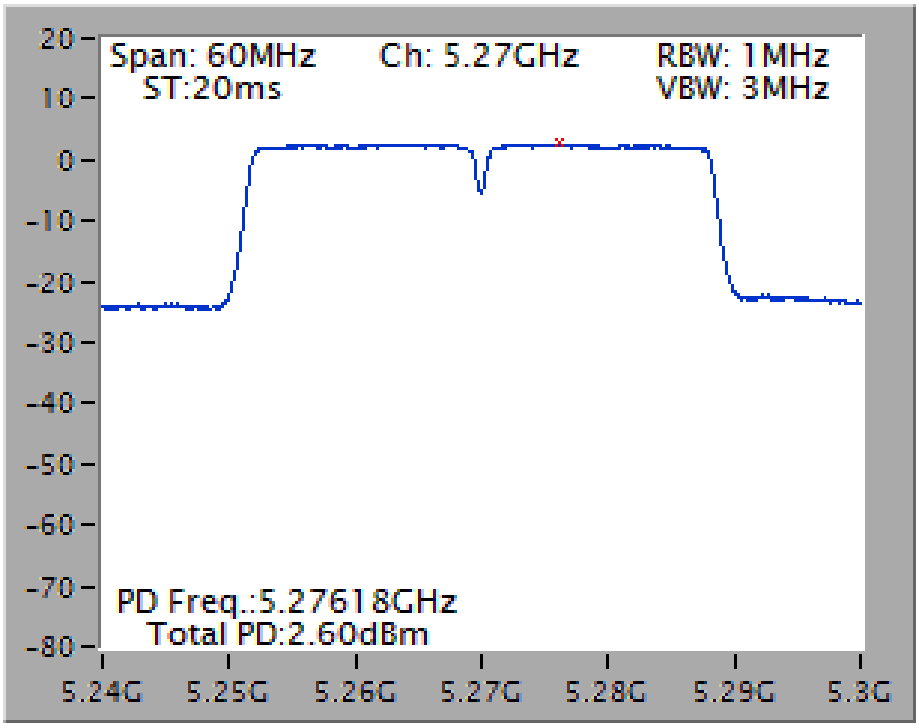
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5720 MHz



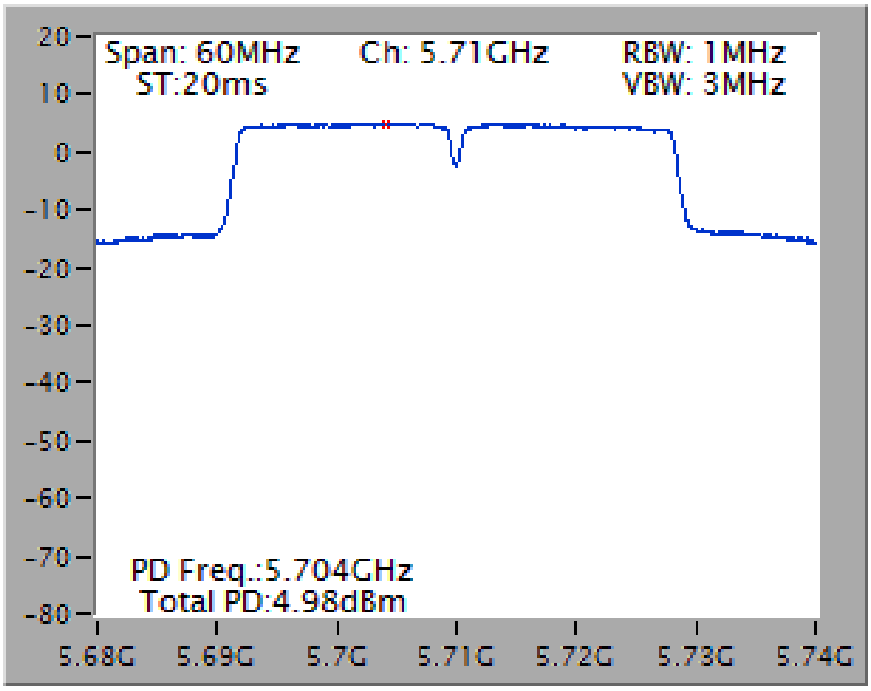
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5230 MHz



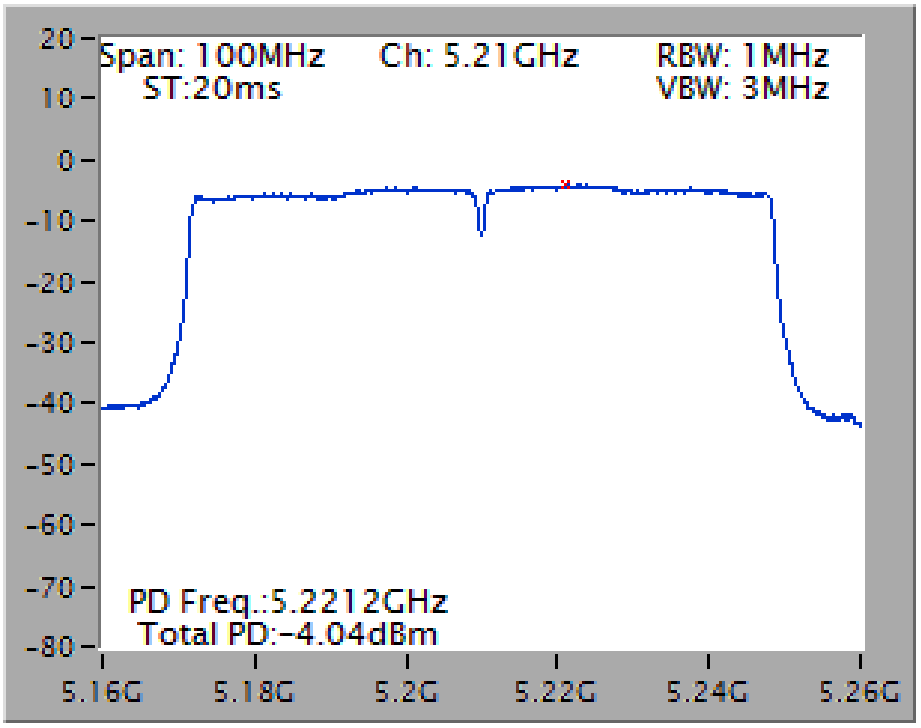
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5270 MHz



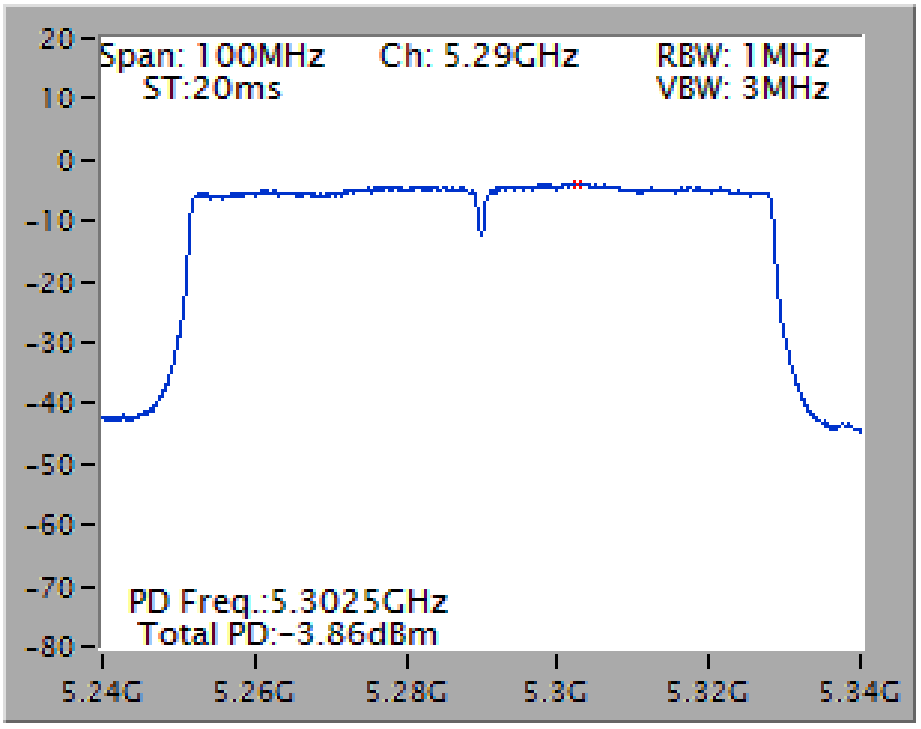
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5710 MHz



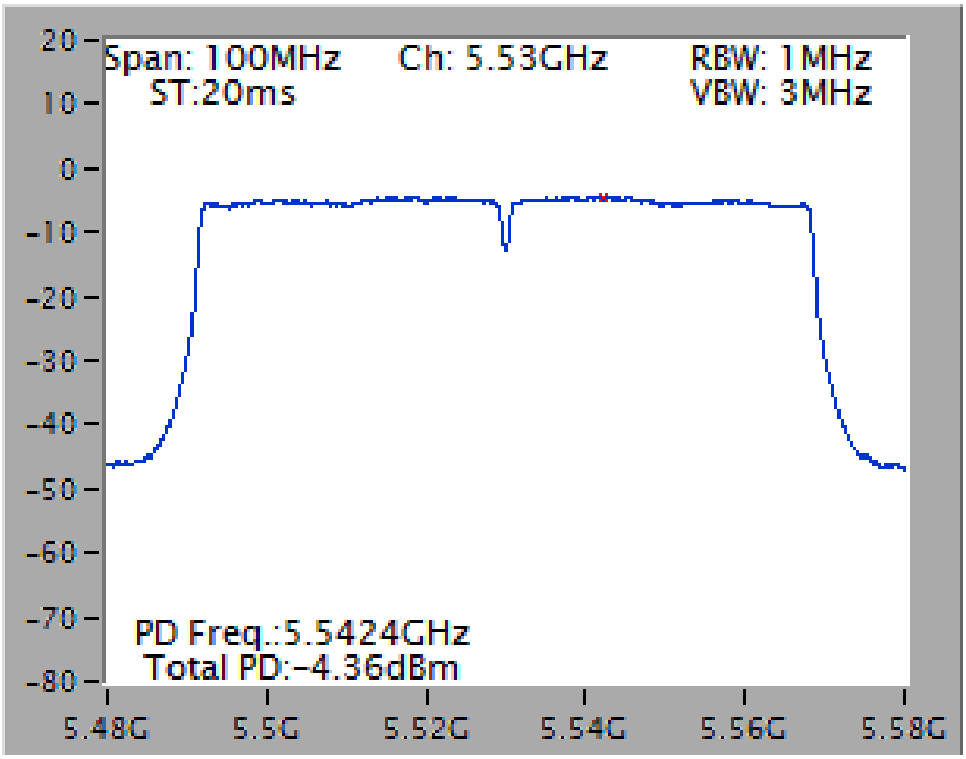
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5210 MHz



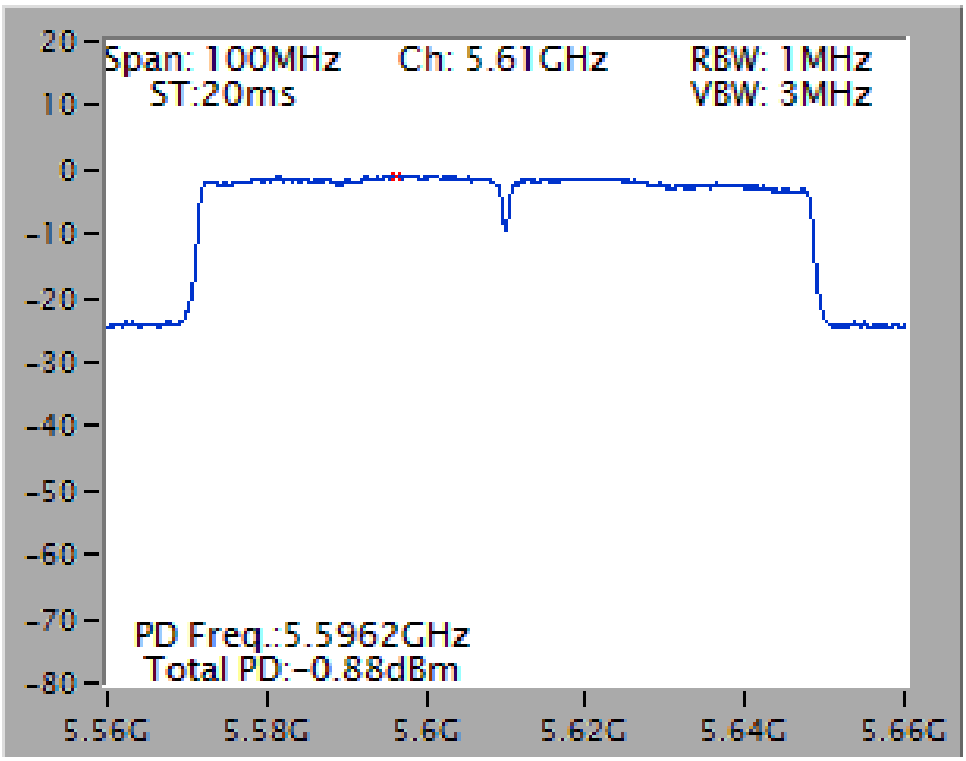
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5290 MHz



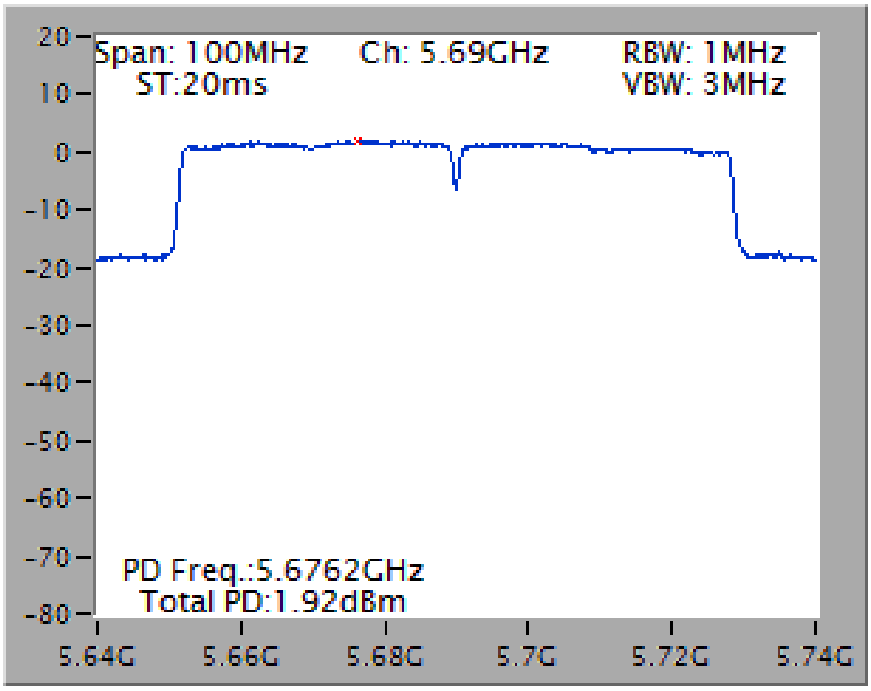
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5530 MHz



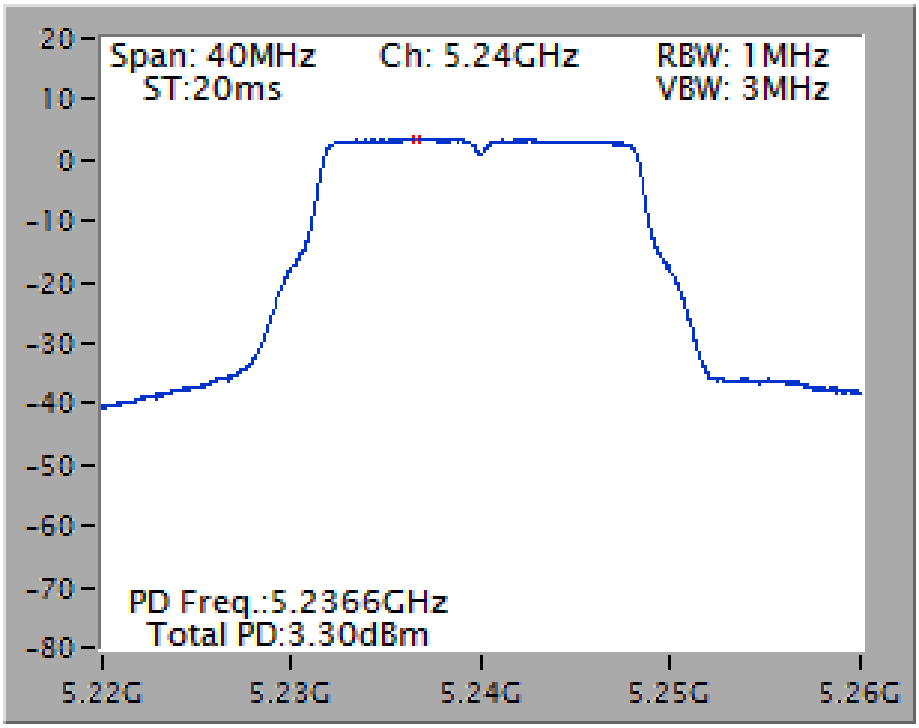
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5610 MHz



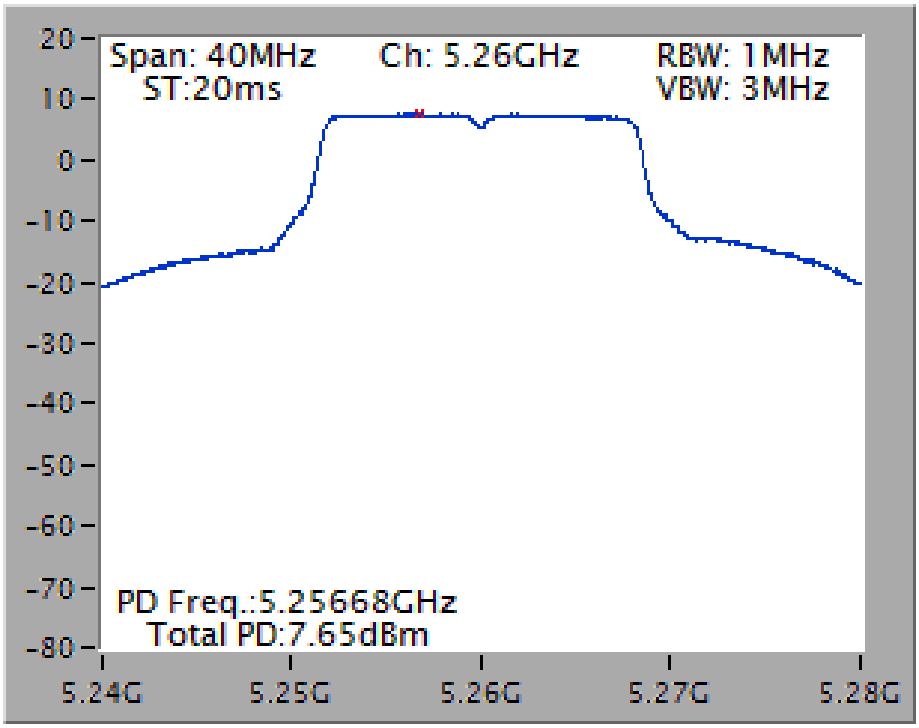
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5690 MHz



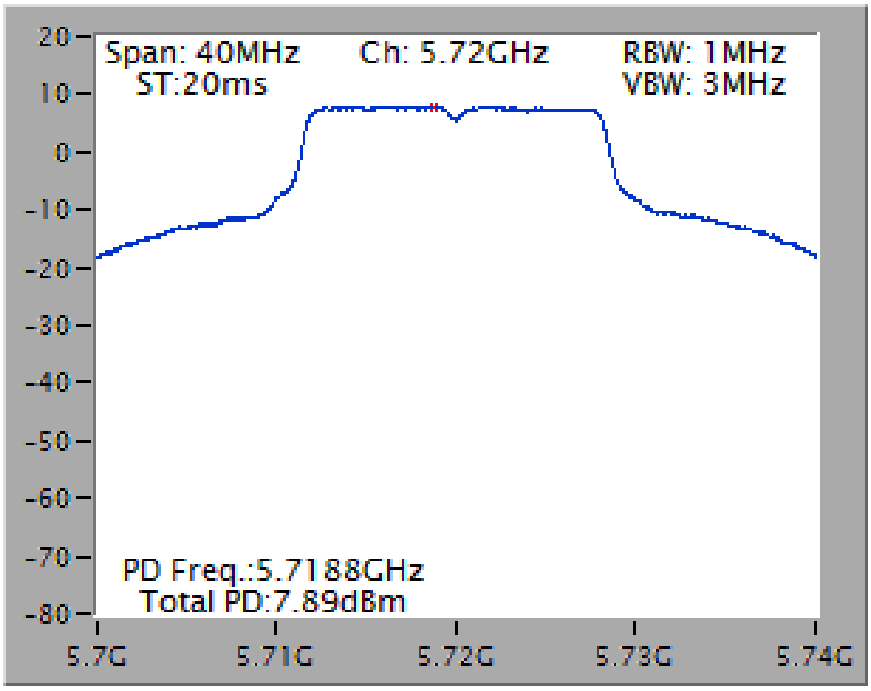
Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5240 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5260 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



4.5. Peak Excursion Measurement

4.5.1. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1MHz (Peak Trace) / 1MHz (Average Trace)
VBW	≥ 3MHz (Peak Trace) / ≥ 3MHz (Average Trace)
Detector	Peak (Peak Trace) / RMS (Average Trace)
Trace	Trace: Max hold (Peak Trace) / Trace Average Sweep Count 100 (Average Trace)
Sweep Time	AUTO

4.5.3. Test Procedures

1. Trace A, Set RBW =1MHz, VBW = 3MHz, Span >26dB bandwidth, Max. hold.
2. Delta Mark trace A Maximum frequency and trace B same frequency.
3. Repeat the above procedure until measurements for all frequencies were complete.
4. Testing each modulation mode on a single channel in single operating band at single output port. All signal types need test (DSSS, OFDM). All modulation types need test (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM). All bandwidth modes need test.

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

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Peak Excursion

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac 20MHz / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5240MHz	8.84	13	Complies
QPSK (MCS1)	5240MHz	9.05	13	Complies
16QAM (MCS3)	5240MHz	8.83	13	Complies
64QAM (MCS5)	5240MHz	9.35	13	Complies
256QAM (MCS8)	5240MHz	9.90	13	Complies
BPSK (MCS0)	5260MHz	9.27	13	Complies
QPSK (MCS1)	5260MHz	8.93	13	Complies
16QAM (MCS3)	5260MHz	8.66	13	Complies
64QAM (MCS5)	5260MHz	9.57	13	Complies
256QAM (MCS8)	5260MHz	9.88	13	Complies
BPSK (MCS0)	5720MHz	8.80	13	Complies
QPSK (MCS1)	5720MHz	9.00	13	Complies
16QAM (MCS3)	5720MHz	8.73	13	Complies
64QAM (MCS5)	5720MHz	9.51	13	Complies
256QAM (MCS8)	5720MHz	9.09	13	Complies

Configuration IEEE 802.11ac 40MHz / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5230MHz	9.27	13	Complies
QPSK (MCS1)	5230MHz	9.12	13	Complies
16QAM (MCS3)	5230MHz	9.47	13	Complies
64QAM (MCS5)	5230MHz	10.00	13	Complies
256QAM (MCS8)	5230MHz	9.79	13	Complies
BPSK (MCS0)	5270MHz	9.11	13	Complies
QPSK (MCS1)	5270MHz	8.57	13	Complies
16QAM (MCS3)	5270MHz	9.41	13	Complies
64QAM (MCS5)	5270MHz	9.85	13	Complies
256QAM (MCS8)	5270MHz	10.02	13	Complies
BPSK (MCS0)	5710MHz	8.86	13	Complies
QPSK (MCS1)	5710MHz	9.08	13	Complies
16QAM (MCS3)	5710MHz	9.29	13	Complies
64QAM (MCS5)	5710MHz	9.98	13	Complies
256QAM (MCS8)	5710MHz	9.82	13	Complies

Configuration IEEE 802.11ac 80MHz / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5210MHz	8.84	13	Complies
QPSK (MCS1)	5210MHz	9.34	13	Complies
16QAM (MCS3)	5210MHz	9.77	13	Complies
64QAM (MCS5)	5210MHz	9.59	13	Complies
256QAM (MCS8)	5210MHz	9.22	13	Complies
BPSK (MCS0)	5290MHz	9.30	13	Complies
QPSK (MCS1)	5290MHz	9.38	13	Complies
16QAM (MCS3)	5290MHz	10.23	13	Complies
64QAM (MCS5)	5290MHz	9.86	13	Complies
256QAM (MCS8)	5290MHz	9.93	13	Complies
BPSK (MCS0)	5690MHz	9.70	13	Complies
QPSK (MCS1)	5690MHz	9.23	13	Complies
16QAM (MCS3)	5690MHz	9.87	13	Complies
64QAM (MCS5)	5690MHz	9.86	13	Complies
256QAM (MCS8)	5690MHz	9.77	13	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

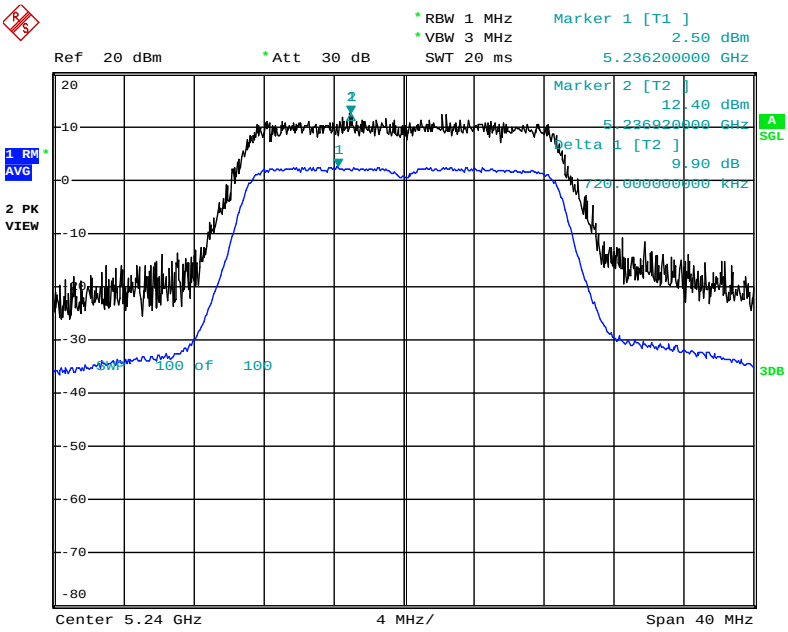
Configuration IEEE 802.11a / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (6Mbps)	5180MHz	8.88	13	Complies
QPSK (12Mbps)	5180MHz	8.90	13	Complies
16QAM (24Mbps)	5180MHz	8.89	13	Complies
64QAM (48Mbps)	5180MHz	8.70	13	Complies
BPSK (6Mbps)	5300MHz	8.78	13	Complies
QPSK (12Mbps)	5300MHz	8.50	13	Complies
16QAM (24Mbps)	5300MHz	8.59	13	Complies
64QAM (48Mbps)	5300MHz	8.64	13	Complies
BSPK(6Mbps)	5720MHz	9.03	13	Complies
QPSK(12Mbps)	5720MHz	8.51	13	Complies
16QAM(24Mbps)	5720MHz	8.44	13	Complies
64QAM(48Mbps)	5720MHz	8.53	13	Complies

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

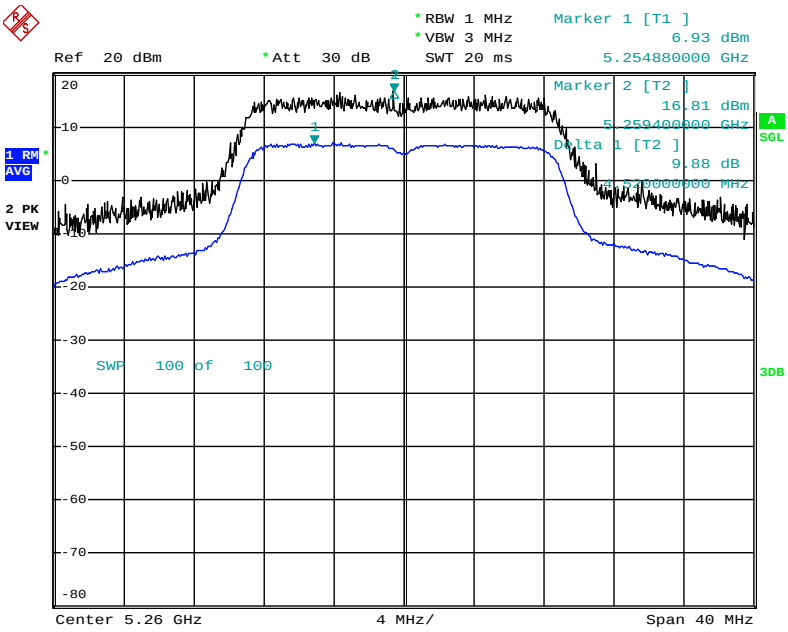
For plots, only the modulation with worse result was shown.

Peak Excursion Plot on Configuration IEEE 802.11ac 20MHz / Chain 1 / 256QAM(MCS8) / 5240 MHz



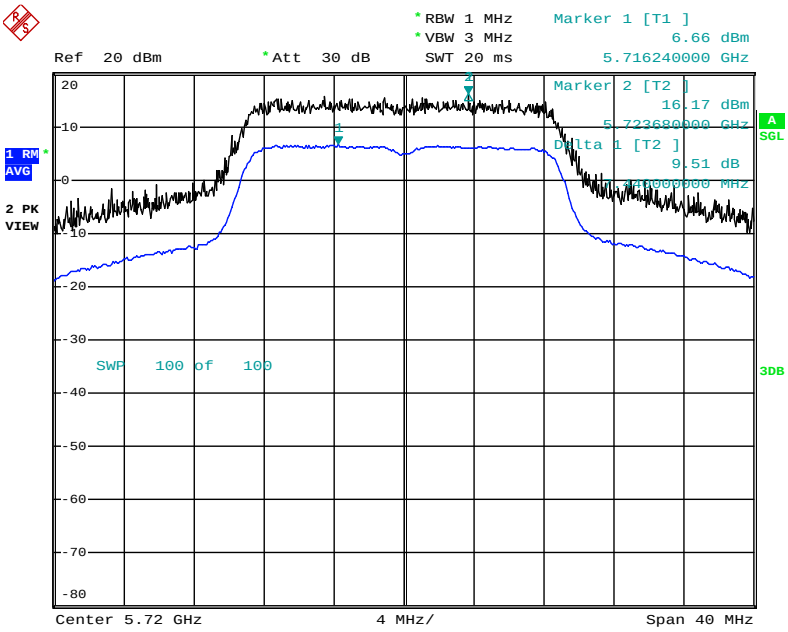
Date: 23.JAN.2014 00:48:58

Peak Excursion Plot on Configuration IEEE 802.11ac 20MHz / Chain 1 / 256QAM(MCS8) / 5260 MHz



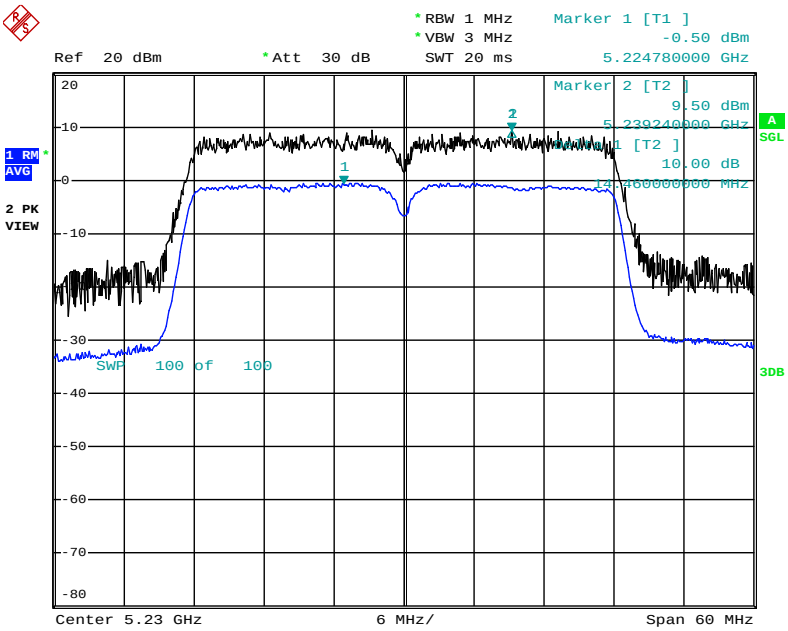
Date: 23.JAN.2014 00:50:11

Peak Excursion Plot on Configuration IEEE 802.11ac 20MHz / Chain 1 / 64QAM(MCS5) / 5720 MHz



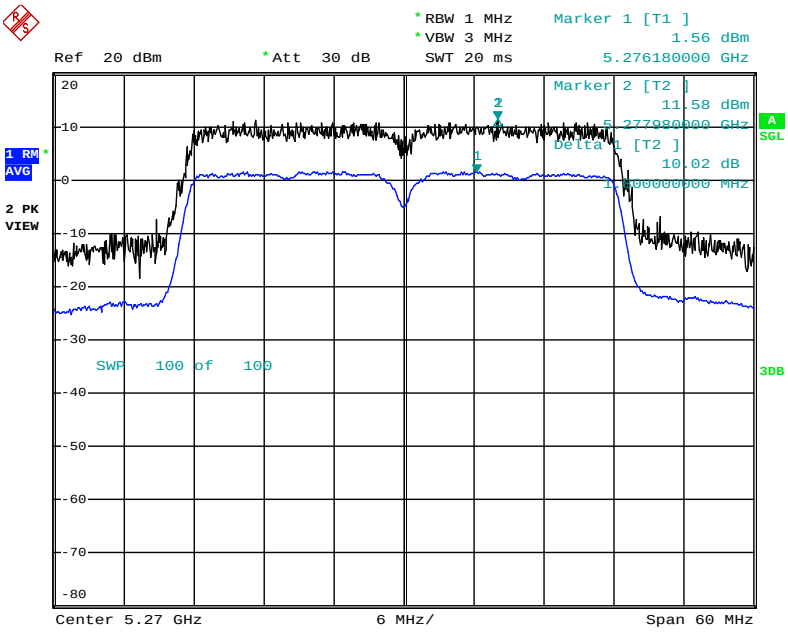
Date: 29.JAN.2014 16:18:09

Peak Excursion Plot on Configuration IEEE 802.11ac 40MHz / Chain 1 / 64QAM(MCS5) / 5230 MHz



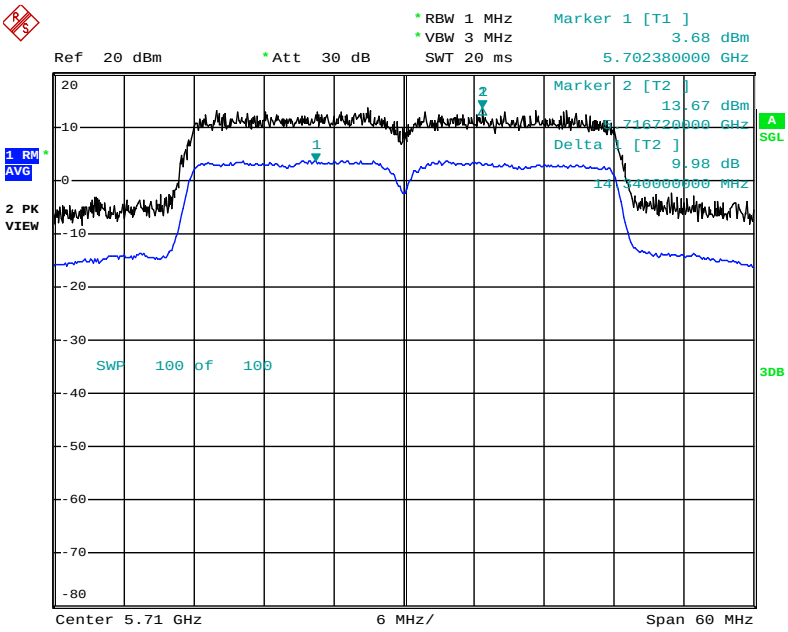
Date: 23.JAN.2014 00:59:21

Peak Excursion Plot on Configuration IEEE 802.11ac 40MHz / Chain 1 / 256QAM(MCS8) / 5270 MHz



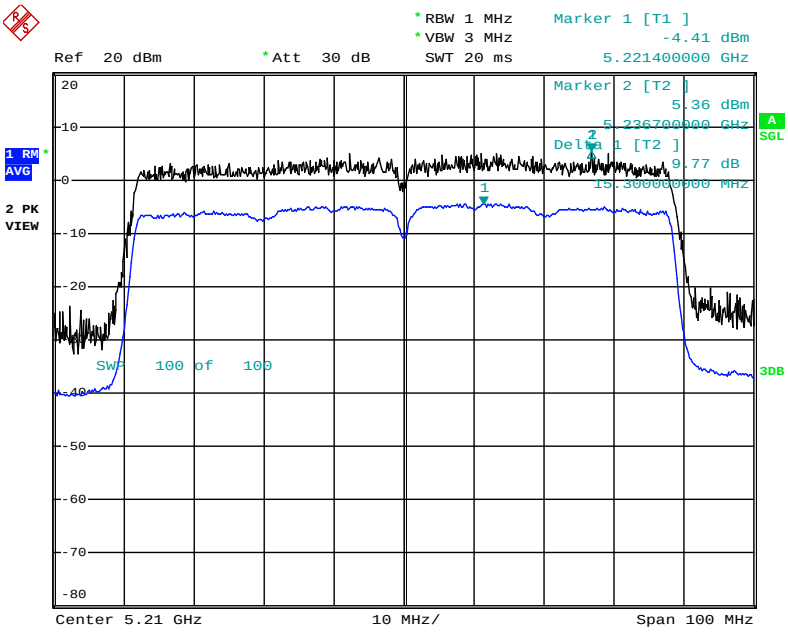
Date: 23.JAN.2014 01:00:41

Peak Excursion Plot on Configuration IEEE 802.11ac 40MHz / Chain 1 / 64QAM(MCS5) / 5710 MHz



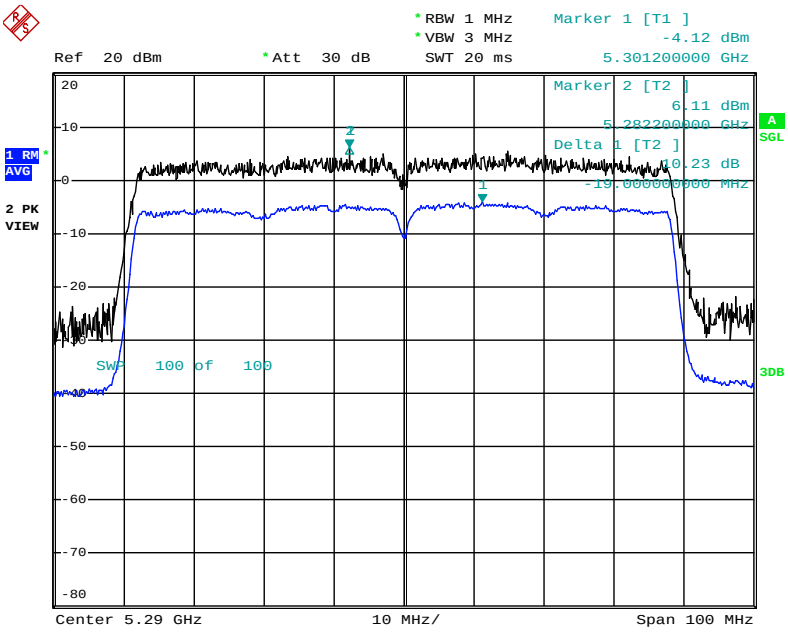
Date: 29.JAN.2014 16:20:44

Peak Excursion Plot on Configuration IEEE 802.11ac 80MHz / Chain 1 / 16QAM(MCS3) / 5210 MHz



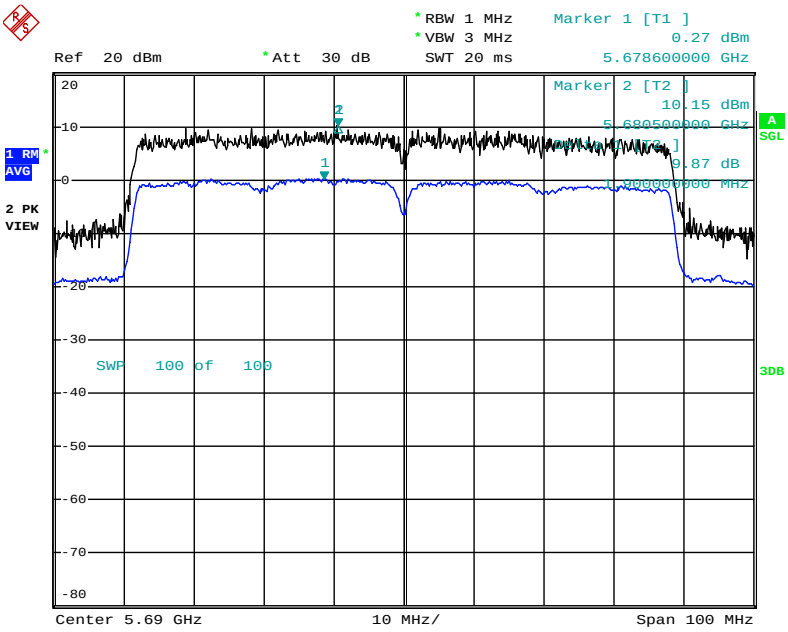
Date: 23.JAN.2014 01:07:13

Peak Excursion Plot on Configuration IEEE 802.11ac 80MHz / Chain 1 / 16QAM(MCS3) / 5290 MHz



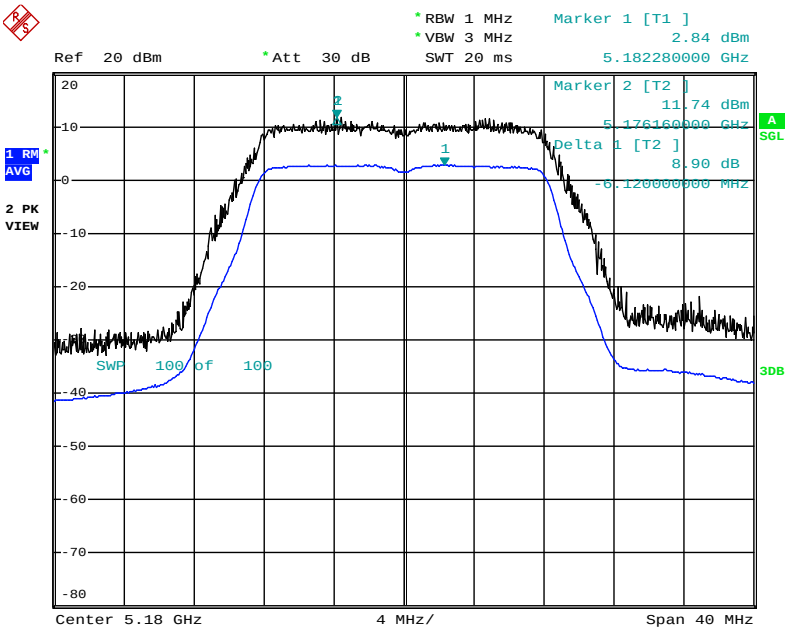
Date: 23.JAN.2014 01:09:48

Peak Excursion Plot on Configuration IEEE 802.11ac 80MHz / Chain 1 / 16QAM(MCS3) / 5690 MHz



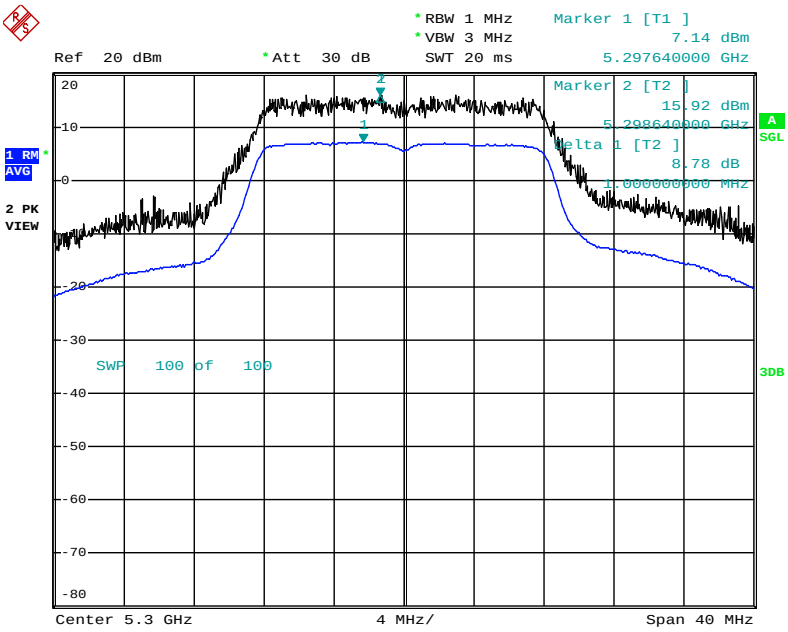
Date: 29.JAN.2014 16:25:11

Peak Excursion Plot on Configuration IEEE 802.11a / Chain 1 / QPSK(12Mbps) / 5180 MHz



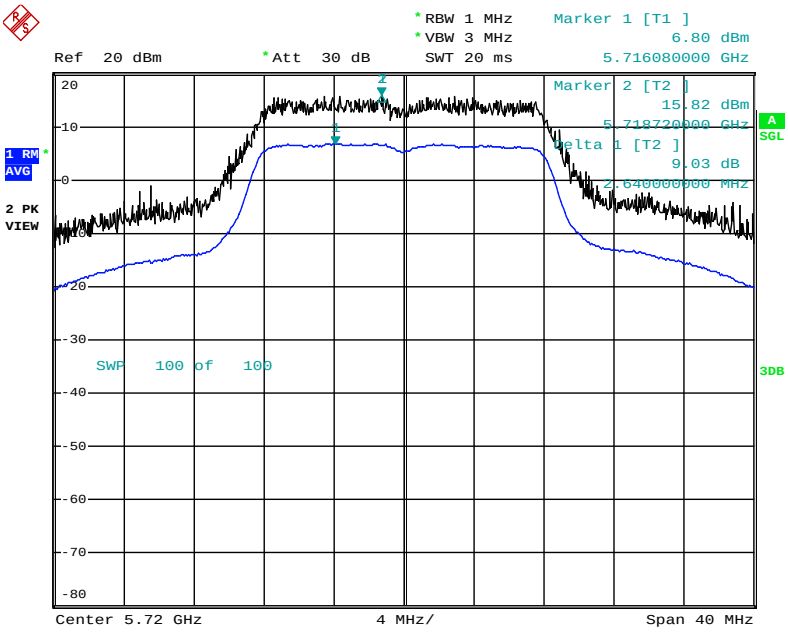
Date: 23.JAN.2014 00:33:29

Peak Excursion Plot on Configuration IEEE 802.11a / Chain 1 / BSPK(6Mbps) / 5300 MHz



Date: 23.JAN.2014 00:39:59

Peak Excursion Plot on Configuration IEEE 802.11a / Chain 1 / BPSK (6Mbps) / 5720 MHz



Date: 29.JAN.2014 16:11:41

4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. 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

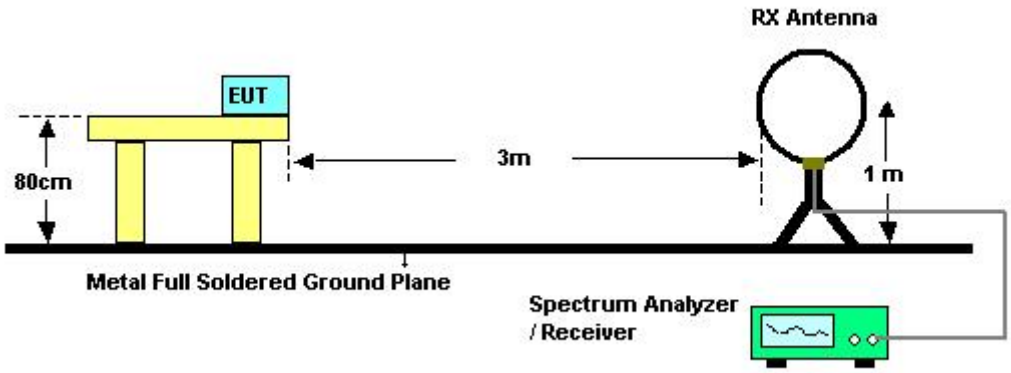
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

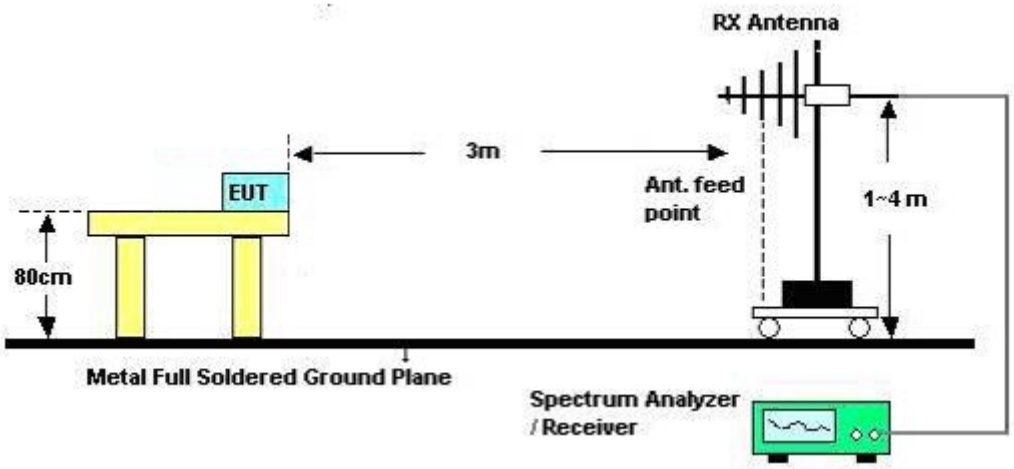
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. 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.
9. 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.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.6.4. Test Setup Layout

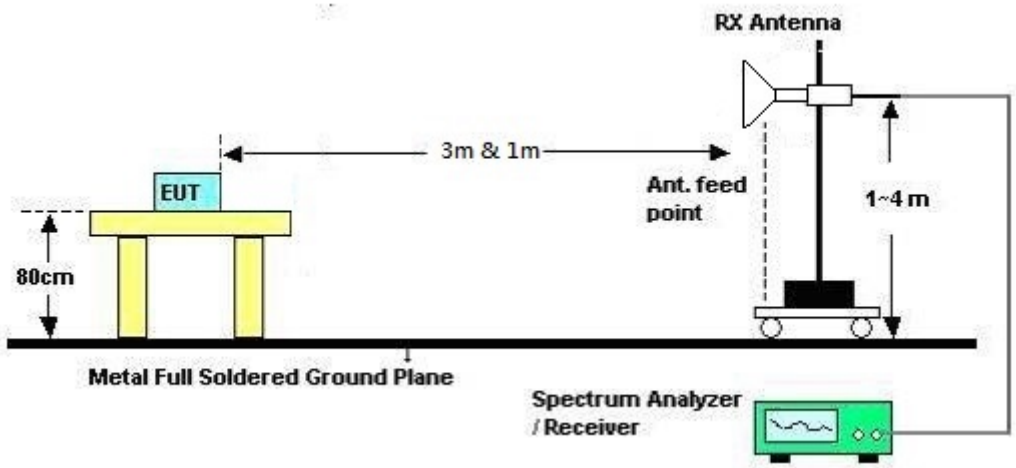
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	Normal Link
Test Date	Jan. 08, 2014	Test Mode	Mode 1

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

Note:

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

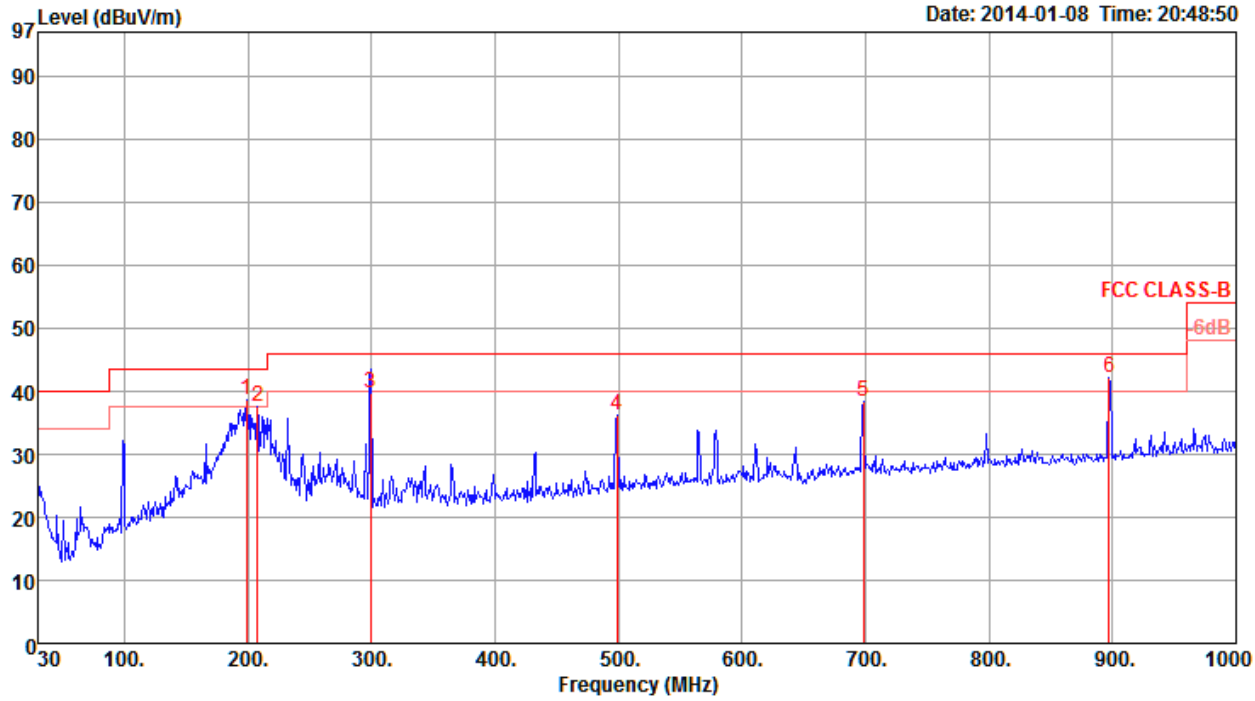
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

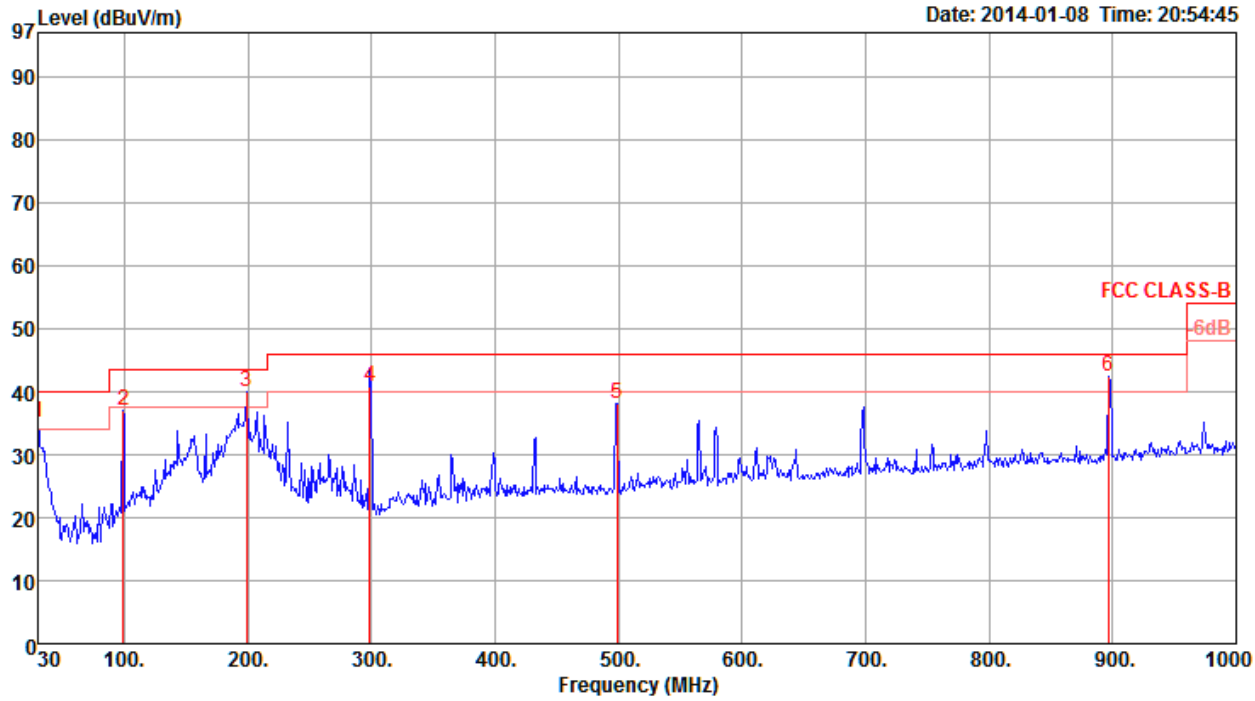
Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	198.78	38.73	43.50	-4.77	53.56	2.09	27.26	-14.83	Peak	0	400	HORIZONTAL
2	207.51	37.62	43.50	-5.88	52.11	2.15	27.19	-14.49	Peak	0	400	HORIZONTAL
3	299.66	39.82	46.00	-6.18	50.34	2.51	26.83	-10.52	QP	349	106	HORIZONTAL
4	498.51	36.29	46.00	-9.71	43.07	3.38	27.93	-6.78	Peak	0	400	HORIZONTAL
5	698.33	38.35	46.00	-7.65	41.32	4.15	27.10	-2.97	Peak	0	400	HORIZONTAL
6	897.18	42.27	46.00	-3.73	43.04	4.58	26.83	-0.77	Peak	0	400	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	30.00	35.16	40.00	-4.84	42.40	0.83	27.97	-7.24	Peak	0	100	VERTICAL
2	98.87	36.98	43.50	-6.52	52.12	1.49	27.82	-15.14	Peak	0	100	VERTICAL
3	198.78	40.03	43.50	-3.47	54.86	2.09	27.26	-14.83	Peak	0	100	VERTICAL
4	298.69	40.78	46.00	-5.22	51.30	2.51	26.83	-10.52	QP	166	100	VERTICAL
5	498.51	38.14	46.00	-7.86	44.92	3.38	27.93	-6.78	Peak	0	100	VERTICAL
6	896.21	42.29	46.00	-3.71	43.07	4.58	26.84	-0.78	Peak	0	100	VERTICAL

Note:

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

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

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

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 36 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15539.16	55.76	74.00	-18.24	44.21	7.85	34.79	11.55	Peak	41	100	HORIZONTAL
2	15549.32	42.17	54.00	-11.83	30.63	7.86	34.81	11.54	Average	41	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15537.68	41.93	54.00	-12.07	30.38	7.85	34.79	11.55	Average	215	100	VERTICAL
2	15544.48	55.13	74.00	-18.87	43.57	7.86	34.79	11.56	Peak	215	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 40 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15591.16	54.99	74.00	-19.01	43.47	7.87	34.83	11.52	Peak	287	100	HORIZONTAL
2	15591.72	41.85	54.00	-12.15	30.33	7.87	34.83	11.52	Average	287	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15595.24	54.38	74.00	-19.62	42.85	7.88	34.83	11.53	Peak	177	100	VERTICAL
2	15606.64	41.83	54.00	-12.17	30.33	7.88	34.86	11.50	Average	177	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 48 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15713.48	53.85	74.00	-20.15	42.42	7.91	34.94	11.43	Peak	137	100	HORIZONTAL
2	15725.20	41.19	54.00	-12.81	29.75	7.92	34.94	11.44	Average	137	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15721.04	41.37	54.00	-12.63	29.93	7.92	34.94	11.44	Average	194	100	VERTICAL
2	15722.08	53.46	74.00	-20.54	42.02	7.92	34.94	11.44	Peak	194	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 52 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15779.52	54.48	74.00	-19.52	43.12	7.93	35.01	11.36	Peak	311	100	HORIZONTAL
2	15783.36	41.47	54.00	-12.53	30.10	7.94	35.01	11.37	Average	311	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15772.64	41.47	54.00	-12.53	30.09	7.93	34.99	11.38	Average	233	100	VERTICAL
2	15773.16	53.95	74.00	-20.05	42.57	7.93	34.99	11.38	Peak	233	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 60 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10598.52	63.06	74.00	-10.94	53.10	6.60	35.12	9.96	Peak	249	130	HORIZONTAL
2	10599.24	48.29	54.00	-5.71	38.33	6.60	35.12	9.96	Average	249	130	HORIZONTAL
3	15900.04	54.51	74.00	-19.49	43.21	7.97	35.09	11.30	Peak	234	100	HORIZONTAL
4	15907.68	42.13	54.00	-11.87	30.85	7.98	35.12	11.28	Average	234	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10600.84	62.04	74.00	-11.96	52.06	6.60	35.10	9.98	Peak	95	100	VERTICAL
2	10600.84	47.62	54.00	-6.38	37.64	6.60	35.10	9.98	Average	95	100	VERTICAL
3	15892.64	54.93	74.00	-19.07	43.63	7.97	35.09	11.30	Peak	169	100	VERTICAL
4	15901.68	42.38	54.00	-11.62	31.07	7.98	35.09	11.31	Average	169	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 64 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10637.16	59.71	74.00	-14.29	49.73	6.59	35.08	9.98	Peak	253	127	HORIZONTAL
2	10640.32	44.27	54.00	-9.73	34.29	6.59	35.08	9.98	Average	253	127	HORIZONTAL
3	15966.76	42.45	54.00	-11.55	31.20	8.00	35.16	11.25	Average	293	100	HORIZONTAL
4	15968.00	55.36	74.00	-18.64	44.11	8.00	35.16	11.25	Peak	293	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10641.12	46.98	54.00	-7.02	37.00	6.59	35.08	9.98	Average	93	190	VERTICAL
2	10645.72	62.02	74.00	-11.98	52.04	6.59	35.08	9.98	Peak	93	190	VERTICAL
3	15961.08	42.30	54.00	-11.70	31.05	8.00	35.16	11.25	Average	176	100	VERTICAL
4	15968.08	54.97	74.00	-19.03	43.72	8.00	35.16	11.25	Peak	176	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 100 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11000.36	60.49	74.00	-13.51	50.44	6.46	34.81	10.05	Peak	258	156	HORIZONTAL
2	11000.56	45.90	54.00	-8.10	35.85	6.46	34.81	10.05	Average	258	156	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11000.60	46.04	54.00	-7.96	35.99	6.46	34.81	10.05	Average	88	178	VERTICAL
2	11005.88	61.20	74.00	-12.80	51.14	6.47	34.81	10.06	Peak	88	178	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 116 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11161.60	53.81	54.00	-0.19	43.63	6.56	34.81	10.18	Average	264	125	HORIZONTAL
2	11162.76	69.35	74.00	-4.65	59.17	6.56	34.81	10.18	Peak	264	125	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11160.96	52.92	54.00	-1.08	42.74	6.56	34.81	10.18	Average	85	175	VERTICAL
2	11165.88	67.57	74.00	-6.43	57.39	6.56	34.81	10.18	Peak	85	175	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 140 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11400.88	46.75	54.00	-7.25	36.40	6.69	34.82	10.35	Average	273	154	HORIZONTAL
2	11401.96	61.00	74.00	-13.00	50.65	6.69	34.82	10.35	Peak	273	154	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11399.08	44.71	54.00	-9.29	34.36	6.69	34.82	10.35	Average	335	114	VERTICAL
2	11403.44	60.43	74.00	-13.57	50.08	6.69	34.82	10.35	Peak	335	114	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 144 / Chain 1
Test Date	Jan. 28, 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	11440.32	51.64	54.00	-2.36	43.08	5.10	38.73	35.27	Average	100	353	HORIZONTAL
2	11440.32	63.83	74.00	-10.17	55.27	5.10	38.73	35.27	Peak	100	353	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	11439.04	53.47	54.00	-0.53	44.91	5.10	38.73	35.27	Average	100	69	VERTICAL
2	11442.16	66.36	74.00	-7.64	57.80	5.10	38.73	35.27	Peak	100	69	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 38 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15566.32	42.00	54.00	-12.00	30.46	7.86	34.81	11.54	Average	292	100	HORIZONTAL
2	15569.44	54.47	74.00	-19.53	42.93	7.86	34.81	11.54	Peak	292	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15565.56	42.15	54.00	-11.85	30.61	7.86	34.81	11.54	Average	138	100	VERTICAL
2	15571.64	55.61	74.00	-18.39	44.07	7.86	34.81	11.54	Peak	138	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 46 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15682.92	41.39	54.00	-12.61	29.95	7.90	34.92	11.44	Average	252	100	HORIZONTAL
2	15697.04	54.34	74.00	-19.66	42.89	7.91	34.92	11.45	Peak	252	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15686.56	41.46	54.00	-12.54	30.02	7.90	34.92	11.44	Average	120	100	VERTICAL
2	15687.76	54.41	74.00	-19.59	42.97	7.90	34.92	11.44	Peak	120	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 54 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15811.80	54.01	74.00	-19.99	42.65	7.95	35.03	11.36	Peak	183	100	HORIZONTAL
2	15813.80	41.44	54.00	-12.56	30.08	7.95	35.03	11.36	Average	183	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15809.88	54.32	74.00	-19.68	42.96	7.95	35.03	11.36	Peak	91	100	VERTICAL
2	15819.04	41.48	54.00	-12.52	30.13	7.95	35.03	11.35	Average	91	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 62 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10615.20	38.57	54.00	-15.43	28.59	6.60	35.10	9.98	Average	78	100	HORIZONTAL
2	10619.16	51.38	74.00	-22.62	41.40	6.60	35.10	9.98	Peak	78	100	HORIZONTAL
3	15922.04	42.34	54.00	-11.66	31.06	7.99	35.12	11.28	Average	201	100	HORIZONTAL
4	15932.44	55.28	74.00	-18.72	44.02	7.99	35.14	11.26	Peak	201	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10617.40	38.61	54.00	-15.39	28.63	6.60	35.10	9.98	Average	355	100	VERTICAL
2	10617.44	50.98	74.00	-23.02	41.00	6.60	35.10	9.98	Peak	355	100	VERTICAL
3	15923.52	42.31	54.00	-11.69	31.03	7.99	35.12	11.28	Average	283	100	VERTICAL
4	15938.60	55.34	74.00	-18.66	44.08	7.99	35.14	11.26	Peak	283	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 102 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11024.84	50.36	74.00	-23.64	40.28	6.48	34.81	10.08	Peak	328	100	HORIZONTAL
2	11026.60	38.31	54.00	-15.69	28.23	6.48	34.81	10.08	Average	328	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11020.68	49.57	74.00	-24.43	39.51	6.47	34.81	10.06	Peak	151	100	VERTICAL
2	11028.16	37.80	54.00	-16.20	27.72	6.48	34.81	10.08	Average	151	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 110 / Chain 1
Test Date	Jan. 03, 2014 & Feb. 13, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11100.56	49.99	54.00	-4.01	39.86	6.52	34.81	10.13	Average	265	127	HORIZONTAL
2	11101.36	64.29	74.00	-9.71	54.16	6.52	34.81	10.13	Peak	265	127	HORIZONTAL

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 52.21 dBuV/m.

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11097.56	49.62	54.00	-4.38	39.49	6.52	34.81	10.13	Average	87	176	VERTICAL
2	11100.04	64.08	74.00	-9.92	53.95	6.52	34.81	10.13	Peak	87	176	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 134 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11338.64	49.90	54.00	-4.10	39.60	6.65	34.82	10.30	Average	263	126	HORIZONTAL
2	11340.56	65.01	74.00	-8.99	54.71	6.65	34.82	10.30	Peak	263	126	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11338.92	46.91	54.00	-7.09	36.61	6.65	34.82	10.30	Average	255	100	VERTICAL
2	11341.20	61.23	74.00	-12.77	50.93	6.65	34.82	10.30	Peak	255	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 142 / Chain 1
Test Date	Jan. 28, 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	11420.10	48.49	54.00	-5.51	39.93	5.10	38.72	35.26	Average	101	354	HORIZONTAL
2	11421.30	60.47	74.00	-13.53	51.91	5.10	38.72	35.26	Peak	101	354	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	11418.80	62.55	74.00	-11.45	53.99	5.10	38.72	35.26	Peak	100	69	VERTICAL
2	11420.30	49.95	54.00	-4.05	41.39	5.10	38.72	35.26	Average	100	69	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 42 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15630.08	41.65	54.00	-12.35	30.17	7.89	34.88	11.48	Average	307	100	HORIZONTAL
2	15631.20	54.71	74.00	-19.29	43.23	7.89	34.88	11.48	Peak	307	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15621.68	54.85	74.00	-19.15	43.35	7.88	34.86	11.50	Peak	171	100	VERTICAL
2	15638.96	41.55	54.00	-12.45	30.07	7.89	34.88	11.48	Average	171	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 58 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15872.96	41.98	54.00	-12.02	30.66	7.97	35.07	11.32	Average	340	100	HORIZONTAL
2	15874.76	54.29	74.00	-19.71	42.97	7.97	35.07	11.32	Peak	340	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15868.30	42.19	54.00	-11.81	30.87	7.97	35.07	11.32	Average	229	100	VERTICAL
2	15869.00	53.89	74.00	-20.11	42.57	7.97	35.07	11.32	Peak	229	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 106 / Chain 1
Test Date	Jan. 03, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11075.90	49.57	74.00	-24.43	39.45	6.51	34.81	10.12	Peak	68	100	HORIZONTAL
2	11080.60	38.06	54.00	-15.94	27.94	6.51	34.81	10.12	Average	68	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11065.70	49.53	74.00	-24.47	39.43	6.50	34.81	10.10	Peak	175	100	VERTICAL
2	11072.80	37.60	54.00	-16.40	27.48	6.51	34.81	10.12	Average	175	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 122 / Chain 1
Test Date	Jan. 03, 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	11224.68	63.42	74.00	-10.58	49.78	9.07	39.50	34.93	Peak	100	266	HORIZONTAL
2	11225.00	47.74	54.00	-6.26	34.10	9.07	39.50	34.93	Average	100	266	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	11221.04	48.29	54.00	-5.71	34.65	9.07	39.50	34.93	Average	117	344	VERTICAL
2	11223.36	64.07	74.00	-9.93	50.43	9.07	39.50	34.93	Peak	117	344	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 138 / Chain 1
Test Date	Jan. 28, 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	11368.90	45.08	54.00	-8.92	36.57	5.09	38.67	35.25	Average	103	-1	HORIZONTAL
2	11376.00	58.71	74.00	-15.29	50.20	5.09	38.67	35.25	Peak	103	-1	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	11389.60	46.53	54.00	-7.47	38.01	5.09	38.68	35.25	Average	100	71	VERTICAL
2	11396.50	60.69	74.00	-13.31	52.16	5.10	38.68	35.25	Peak	100	71	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.

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 36 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15535.32	42.03	54.00	-11.97	30.48	7.85	34.79	11.55	Average	167	100	HORIZONTAL
2	15540.32	54.88	74.00	-19.12	43.33	7.85	34.79	11.55	Peak	167	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15541.40	42.23	54.00	-11.77	30.68	7.85	34.79	11.55	Average	31	100	VERTICAL
2	15549.56	55.13	74.00	-18.87	43.59	7.86	34.81	11.54	Peak	31	100	VERTICAL

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 40 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15594.84	54.25	74.00	-19.75	42.72	7.88	34.83	11.53	Peak	323	100	HORIZONTAL
2	15603.84	41.72	54.00	-12.28	30.22	7.88	34.86	11.50	Average	323	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15592.68	42.02	54.00	-11.98	30.50	7.87	34.83	11.52	Average	272	100	VERTICAL
2	15608.72	55.29	74.00	-18.71	43.79	7.88	34.86	11.50	Peak	272	100	VERTICAL

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 48 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15712.88	54.11	74.00	-19.89	42.68	7.91	34.94	11.43	Peak	109	100	HORIZONTAL
2	15714.32	41.33	54.00	-12.67	29.89	7.92	34.94	11.44	Average	109	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15710.68	41.35	54.00	-12.65	29.92	7.91	34.94	11.43	Average	228	100	VERTICAL
2	15721.76	54.42	74.00	-19.58	42.98	7.92	34.94	11.44	Peak	228	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 52 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15774.08	41.49	54.00	-12.51	30.11	7.93	34.99	11.38	Average	330	100	HORIZONTAL
2	15782.76	53.46	74.00	-20.54	42.09	7.94	35.01	11.37	Peak	330	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	15777.04	41.51	54.00	-12.49	30.13	7.93	34.99	11.38	Average	149	100	VERTICAL
2	15787.48	53.74	74.00	-20.26	42.37	7.94	35.01	11.37	Peak	149	100	VERTICAL

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 60 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10600.28	65.31	74.00	-8.69	55.35	6.60	35.12	9.96	Peak	250	129	HORIZONTAL
2	10601.84	50.61	54.00	-3.39	40.63	6.60	35.10	9.98	Average	250	129	HORIZONTAL
3	15901.08	42.17	54.00	-11.83	30.86	7.98	35.09	11.31	Average	59	100	HORIZONTAL
4	15909.36	54.17	74.00	-19.83	42.89	7.98	35.12	11.28	Peak	59	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10600.36	68.43	74.00	-5.57	58.47	6.60	35.12	9.96	Peak	91	192	VERTICAL
2	10601.68	53.88	54.00	-0.12	43.90	6.60	35.10	9.98	Average	91	192	VERTICAL
3	15891.56	55.60	74.00	-18.40	44.30	7.97	35.09	11.30	Peak	110	100	VERTICAL
4	15905.00	42.22	54.00	-11.78	30.94	7.98	35.12	11.28	Average	110	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 64 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10638.76	59.36	74.00	-14.64	49.38	6.59	35.08	9.98	Peak	257	126	HORIZONTAL
2	10639.88	44.80	54.00	-9.20	34.82	6.59	35.08	9.98	Average	257	126	HORIZONTAL
3	15958.44	54.92	74.00	-19.08	43.67	8.00	35.16	11.25	Peak	355	100	HORIZONTAL
4	15964.64	42.54	54.00	-11.46	31.29	8.00	35.16	11.25	Average	355	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10638.84	63.77	74.00	-10.23	53.79	6.59	35.08	9.98	Peak	86	179	VERTICAL
2	10641.76	48.49	54.00	-5.51	38.51	6.59	35.08	9.98	Average	86	179	VERTICAL
3	15953.28	55.11	74.00	-18.89	43.84	8.00	35.14	11.27	Peak	178	100	VERTICAL
4	15968.40	42.27	54.00	-11.73	31.02	8.00	35.16	11.25	Average	178	100	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 100 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11000.12	46.25	54.00	-7.75	36.20	6.46	34.81	10.05	Average	256	155	HORIZONTAL
2	11002.64	60.65	74.00	-13.35	50.60	6.46	34.81	10.05	Peak	256	155	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	10996.08	45.54	54.00	-8.46	35.49	6.46	34.81	10.05	Average	87	184	VERTICAL
2	11000.32	60.19	74.00	-13.81	50.14	6.46	34.81	10.05	Peak	87	184	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 116 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11160.28	68.46	74.00	-5.54	58.28	6.56	34.81	10.18	Peak	263	154	HORIZONTAL
2	11161.72	53.71	54.00	-0.29	43.53	6.56	34.81	10.18	Average	263	154	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11158.72	67.37	74.00	-6.63	57.19	6.56	34.81	10.18	Peak	86	174	VERTICAL
2	11161.68	52.64	54.00	-1.36	42.46	6.56	34.81	10.18	Average	86	174	VERTICAL

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 140 / Chain 1
Test Date	Jan. 04, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11398.84	62.34	74.00	-11.66	51.99	6.69	34.82	10.35	Peak	272	153	HORIZONTAL
2	11401.60	47.43	54.00	-6.57	37.08	6.69	34.82	10.35	Average	272	153	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	11398.52	62.20	74.00	-11.80	51.85	6.69	34.82	10.35	Peak	344	120	VERTICAL
2	11401.64	47.29	54.00	-6.71	36.94	6.69	34.82	10.35	Average	344	120	VERTICAL

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 144 / Chain 1
Test Date	Jan. 28, 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	11440.36	64.94	74.00	-9.06	56.38	5.10	38.73	35.27	Peak	100	351	HORIZONTAL
2	11441.64	51.61	54.00	-2.39	43.05	5.10	38.73	35.27	Average	100	351	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	11440.28	65.84	74.00	-8.16	57.28	5.10	38.73	35.27	Peak	100	68	VERTICAL
2	11441.84	53.29	54.00	-0.71	44.73	5.10	38.73	35.27	Average	100	68	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 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. 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 bandedges.

4.7.4. Test Setup Layout

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

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 36, 40, 48 / Chain 1
Test Date	Jan. 01, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5148.40	69.88	74.00	-4.12	32.40	4.34	0.00	37.48	Peak	80	107	VERTICAL
2	5150.00	53.55	54.00	-0.45	16.07	4.34	0.00	37.48	Average	80	107	VERTICAL
3	5179.04	112.07			74.52	4.36	0.00	37.55	Peak	80	107	VERTICAL
4	5181.44	101.68			64.13	4.36	0.00	37.55	Average	80	107	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5150.00	67.90	74.00	-6.10	30.42	4.34	0.00	37.48	Peak	82	108	VERTICAL
2	5150.00	53.96	54.00	-0.04	16.48	4.34	0.00	37.48	Average	82	108	VERTICAL
3	5197.60	113.79			76.20	4.37	0.00	37.59	Peak	82	108	VERTICAL
4	5198.40	102.58			64.99	4.37	0.00	37.59	Average	82	108	VERTICAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5146.64	63.86	74.00	-10.14	26.38	4.34	0.00	37.48	Peak	304	117	HORIZONTAL
2	5150.00	47.58	54.00	-6.42	10.10	4.34	0.00	37.48	Average	304	117	HORIZONTAL
3	5241.44	107.21			69.55	4.39	0.00	37.66	Average	304	117	HORIZONTAL
4	5247.21	119.15			81.45	4.40	0.00	37.70	Peak	304	117	HORIZONTAL
5	5350.00	47.07	54.00	-6.93	9.14	4.47	0.00	37.93	Average	304	117	HORIZONTAL
6	5353.37	60.95	74.00	-13.05	23.02	4.47	0.00	37.93	Peak	304	117	HORIZONTAL

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 52, 60, 64 / Chain 1
Test Date	Jan. 01, 2014		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5147.12	60.31	74.00	-13.69	22.83	4.34	0.00	37.48	Peak	309	107	HORIZONTAL
2	5150.00	46.06	54.00	-7.94	8.58	4.34	0.00	37.48	Average	309	107	HORIZONTAL
3	5252.79	106.83			69.13	4.40	0.00	37.70	Average	309	107	HORIZONTAL
4	5254.23	118.04			80.34	4.40	0.00	37.70	Peak	309	107	HORIZONTAL
5	5350.00	48.39	54.00	-5.61	10.46	4.47	0.00	37.93	Average	309	107	HORIZONTAL
6	5363.46	63.56	74.00	-10.44	25.59	4.48	0.00	37.97	Peak	309	107	HORIZONTAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5301.28	104.63			66.81	4.44	0.00	37.82	Average	308	117	HORIZONTAL
2	5301.92	116.07			78.25	4.44	0.00	37.82	Peak	308	117	HORIZONTAL
3	5350.00	53.31	54.00	-0.69	15.38	4.47	0.00	37.93	Average	308	117	HORIZONTAL
4	5351.28	67.28	74.00	-6.72	29.35	4.47	0.00	37.93	Peak	308	117	HORIZONTAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5317.92	112.79			74.93	4.45	0.00	37.86	Peak	237	117	HORIZONTAL
2	5318.24	101.57			63.71	4.45	0.00	37.86	Average	237	117	HORIZONTAL
3	5350.00	53.21	54.00	-0.79	15.28	4.47	0.00	37.93	Average	237	117	HORIZONTAL
4	5354.01	69.41	74.00	-4.59	31.48	4.47	0.00	37.93	Peak	237	117	HORIZONTAL

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 100, 140, 144 / Chain 1
Test Date	Jan. 01, 2014 ~ Feb. 13, 2014		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5454.87	65.16	74.00	-8.84	27.00	4.54	0.00	38.16	Peak	285	100	VERTICAL
2	5460.00	50.80	54.00	-3.20	12.64	4.54	0.00	38.16	Average	285	100	VERTICAL
3	5468.72	53.52	54.00	-0.48	15.32	4.55	0.00	38.20	Average	285	100	VERTICAL
4	5469.84	68.45	74.00	-5.55	30.25	4.55	0.00	38.20	Peak	285	100	VERTICAL
5	5493.11	103.41			65.18	4.56	0.00	38.23	Average	285	100	VERTICAL
6	5497.76	113.77			75.50	4.57	0.00	38.27	Peak	285	100	VERTICAL

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5702.40	102.53			63.50	4.71	0.00	39.03	Average	84	157	VERTICAL
2	5703.37	113.36			74.33	4.71	0.00	39.03	Peak	84	157	VERTICAL
3	5725.00	53.57	54.00	-0.43	14.48	4.72	0.00	39.09	Average	84	157	VERTICAL
4	5725.16	69.07	74.00	-4.93	29.98	4.72	0.00	39.09	Peak	84	157	VERTICAL

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

Channel 144

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5721.00	112.07			72.98	4.72	0.00	39.09	Peak	91	109	HORIZONTAL
2	5727.00	101.78			62.69	4.72	0.00	39.09	Average	91	109	HORIZONTAL
3	5825.00	54.30	74.00	-19.70	14.83	4.79	0.00	39.47	Peak	91	109	HORIZONTAL
4	5825.00	42.66	54.00	-11.34	3.19	4.79	0.00	39.47	Average	91	109	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 38, 46 / Chain 1
Test Date	Jan. 03, 2014 & Feb. 13, 2014		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5147.60	68.53	74.00	-5.47	31.05	4.34	0.00	37.48	Peak	83	109	VERTICAL
2	5150.00	53.84	54.00	-0.16	16.36	4.34	0.00	37.48	Average	83	109	VERTICAL
3	5183.60	94.13			56.58	4.36	0.00	37.55	Average	83	109	VERTICAL
4	5184.80	106.11			68.56	4.36	0.00	37.55	Peak	83	109	VERTICAL

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

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.94 dBuV/m.

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5149.60	67.65	74.00	-6.35	30.17	4.34	0.00	37.48	Peak	90	108	VERTICAL
2	5150.00	53.67	54.00	-0.33	16.19	4.34	0.00	37.48	Average	90	108	VERTICAL
3	5215.20	111.56			73.93	4.38	0.00	37.63	Peak	90	108	VERTICAL
4	5216.00	99.32			61.69	4.38	0.00	37.63	Average	90	108	VERTICAL

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 54, 62 / Chain 1
Test Date	Jan. 03, 2014 & Feb. 13, 2014		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5261.20	108.86			71.11	4.42	0.00	37.75	Peak	296	118	HORIZONTAL
2	5274.80	96.62			58.87	4.42	0.00	37.75	Average	296	118	HORIZONTAL
3	5350.00	53.98	54.00	-0.02	16.05	4.47	0.00	37.93	Average	296	118	HORIZONTAL
4	5354.80	66.08	74.00	-7.92	28.15	4.47	0.00	37.93	Peak	296	118	HORIZONTAL

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

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.99 dBuV/m.

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5315.20	105.74			67.88	4.45	0.00	37.86	Peak	304	176	HORIZONTAL
2	5324.40	92.95			55.09	4.45	0.00	37.86	Average	304	176	HORIZONTAL
3	5350.00	53.08	54.00	-0.92	15.15	4.47	0.00	37.93	Average	304	176	HORIZONTAL
4	5353.20	69.30	74.00	-4.70	31.37	4.47	0.00	37.93	Peak	304	176	HORIZONTAL

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 102, 110 / Chain 1
Test Date	Jan. 03, 2014 & Feb. 13, 2014		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5460.00	62.67	74.00	-11.33	24.51	4.54	0.00	38.16	Peak	278	183	VERTICAL
2	5460.00	47.94	54.00	-6.06	9.78	4.54	0.00	38.16	Average	278	183	VERTICAL
3	5467.20	68.51	74.00	-5.49	30.31	4.55	0.00	38.20	Peak	278	183	VERTICAL
4	5470.00	53.81	54.00	-0.19	15.61	4.55	0.00	38.20	Average	278	183	VERTICAL
5	5502.40	91.85			53.58	4.57	0.00	38.27	Average	278	183	VERTICAL
6	5506.80	103.71			65.44	4.57	0.00	38.27	Peak	278	183	VERTICAL

Item 5, 6 are the fundamental frequency at 5510 MHz.

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.85 dBuV/m.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5458.80	64.75	74.00	-9.25	26.59	4.54	0.00	38.16	Peak	313	182	HORIZONTAL
2	5460.00	50.00	54.00	-4.00	11.84	4.54	0.00	38.16	Average	313	182	HORIZONTAL
3	5469.20	67.54	74.00	-6.46	29.34	4.55	0.00	38.20	Peak	313	182	HORIZONTAL
4	5470.00	51.41	54.00	-2.59	13.21	4.55	0.00	38.20	Average	313	182	HORIZONTAL
5	5541.60	109.47			71.08	4.59	0.00	38.39	Peak	313	182	HORIZONTAL
6	5543.20	97.56			59.17	4.59	0.00	38.39	Average	313	182	HORIZONTAL

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 134, 142 / Chain 1
Test Date	Jan. 03, 2014 & Feb. 13, 2014		

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5667.20	94.92			56.02	4.68	0.00	38.90	Average	281	143	VERTICAL
2	5667.60	106.54			67.64	4.68	0.00	38.90	Peak	281	143	VERTICAL
3	5725.00	53.71	54.00	-0.29	14.62	4.72	0.00	39.09	Average	281	143	VERTICAL
4	5727.80	69.27	74.00	-4.73	30.18	4.72	0.00	39.09	Peak	281	143	VERTICAL

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

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.92 dBuV/m.

Channel 142

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5711.00	97.03			58.00	4.71	0.00	39.03	Average	90	100	HORIZONTAL
2	5713.00	106.43			67.40	4.71	0.00	39.03	Peak	90	100	HORIZONTAL
3	5825.00	62.21	74.00	-11.79	22.74	4.79	0.00	39.47	Peak	90	100	HORIZONTAL
4	5825.00	47.15	54.00	-6.85	7.68	4.79	0.00	39.47	Average	90	100	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5710 MHz.

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 42, 58 / Chain 1
Test Date	Jan. 03, 2014 & Feb. 13, 2014		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5135.00	68.31	74.00	-5.69	30.87	4.33	0.00	37.44	Peak	88	121	VERTICAL
2	5150.00	53.62	54.00	-0.38	16.14	4.34	0.00	37.48	Average	88	121	VERTICAL
3	5201.00	104.47			66.88	4.37	0.00	37.59	Peak	88	121	VERTICAL
4	5218.00	90.51			52.88	4.38	0.00	37.63	Average	88	121	VERTICAL

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

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.99 dBuV/m.

Channel 58

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5306.00	102.73			64.91	4.44	0.00	37.82	Peak	298	120	HORIZONTAL
2	5318.00	88.45			50.59	4.45	0.00	37.86	Average	298	120	HORIZONTAL
3	5360.00	67.63	74.00	-6.37	29.70	4.47	0.00	37.93	Peak	298	120	HORIZONTAL
4	5361.00	53.68	54.00	-0.32	15.71	4.48	0.00	37.97	Average	298	120	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5290 MHz.

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.79 dBuV/m.

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 106, 122, 138 / Chain 1
Test Date	Jan. 03, 2014 ~ Feb. 13, 2014		

Channel 106

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5438.00	68.45	74.00	-5.55	30.33	4.53	0.00	38.12	Peak	307	112	HORIZONTAL
2	5455.00	53.67	54.00	-0.33	15.51	4.54	0.00	38.16	Average	307	112	HORIZONTAL
3	5470.00	65.50	74.00	-8.50	27.30	4.55	0.00	38.20	Peak	307	112	HORIZONTAL
4	5470.00	52.75	54.00	-1.25	14.55	4.55	0.00	38.20	Average	307	112	HORIZONTAL
5	5528.00	102.43			64.10	4.58	0.00	38.33	Peak	307	112	HORIZONTAL
6	5535.00	88.45			50.06	4.59	0.00	38.39	Average	307	112	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

Note: Re-measured with VB set to 3kHz due to duty cycle < 98% and measured value was 53.73 dBuV/m.

Channel 122

	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	5592.00	93.99			52.82	6.39	34.78	0.00	Average	100	0	HORIZONTAL
2	5593.00	107.64			66.47	6.39	34.78	0.00	Peak	100	0	HORIZONTAL
3	5725.00	53.49	54.00	-0.51	12.15	6.45	34.89	0.00	Average	100	0	HORIZONTAL
4	5739.00	66.27	74.00	-7.73	24.93	6.45	34.89	0.00	Peak	100	0	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5610 MHz.

Channel 138

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5662.00	104.63			65.79	4.67	0.00	38.84	Average	38	100	HORIZONTAL
2	5665.00	93.33			54.49	4.67	0.00	38.84	Average	38	100	HORIZONTAL
3	5835.00	67.81	68.20	-0.39	28.34	4.79	0.00	39.47	Average	38	100	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5690 MHz.

Note:

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

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1
Test Date	Jan. 01, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5146.10	66.32	74.00	-7.68	28.84	4.34	0.00	37.48	Peak	300	119	HORIZONTAL
2	5150.00	53.06	54.00	-0.94	15.58	4.34	0.00	37.48	Average	300	119	HORIZONTAL
3	5172.40	99.41			61.89	4.35	0.00	37.52	Average	300	119	HORIZONTAL
4	5175.30	110.25			72.70	4.36	0.00	37.55	Peak	300	119	HORIZONTAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5148.40	65.12	74.00	-8.88	27.64	4.34	0.00	37.48	Peak	241	123	HORIZONTAL
2	5150.00	52.82	54.00	-1.18	15.34	4.34	0.00	37.48	Average	241	123	HORIZONTAL
3	5197.20	100.94			63.35	4.37	0.00	37.59	Average	241	123	HORIZONTAL
4	5198.40	111.57			73.98	4.37	0.00	37.59	Peak	241	123	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5150.00	60.71	74.00	-13.29	23.23	4.34	0.00	37.48	Peak	310	121	HORIZONTAL
2	5150.00	46.84	54.00	-7.16	9.36	4.34	0.00	37.48	Average	310	121	HORIZONTAL
3	5235.19	118.23			80.57	4.39	0.00	37.66	Peak	310	121	HORIZONTAL
4	5236.64	107.55			69.89	4.39	0.00	37.66	Average	310	121	HORIZONTAL
5	5352.40	45.67	54.00	-8.33	7.74	4.47	0.00	37.93	Average	310	121	HORIZONTAL
6	5355.77	60.33	74.00	-13.67	22.40	4.47	0.00	37.93	Peak	310	121	HORIZONTAL

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

Temperature	20°C	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain1
Test Date	Jan. 01, 2014		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5146.15	60.89	74.00	-13.11	23.41	4.34	0.00	37.48	Peak	308	118	HORIZONTAL
2	5149.04	46.34	54.00	-7.66	8.86	4.34	0.00	37.48	Average	308	118	HORIZONTAL
3	5256.64	107.77			70.07	4.40	0.00	37.70	Average	308	118	HORIZONTAL
4	5261.44	118.51			80.76	4.42	0.00	37.75	Peak	308	118	HORIZONTAL
5	5350.00	47.56	54.00	-6.44	9.63	4.47	0.00	37.93	Average	308	118	HORIZONTAL
6	5371.64	62.53	74.00	-11.47	24.56	4.48	0.00	37.97	Peak	308	118	HORIZONTAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5293.60	111.59			73.77	4.44	0.00	37.82	Peak	233	111	HORIZONTAL
2	5296.40	101.11			63.29	4.44	0.00	37.82	Average	233	111	HORIZONTAL
3	5350.00	50.15	54.00	-3.85	12.22	4.47	0.00	37.93	Average	233	111	HORIZONTAL
4	5352.40	65.98	74.00	-8.02	28.05	4.47	0.00	37.93	Peak	233	111	HORIZONTAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5312.40	97.24			59.38	4.45	0.00	37.86	Average	334	102	VERTICAL
2	5318.40	107.84			69.98	4.45	0.00	37.86	Peak	334	102	VERTICAL
3	5350.00	53.66	54.00	-0.34	15.73	4.47	0.00	37.93	Average	334	102	VERTICAL
4	5351.60	68.34	74.00	-5.66	30.41	4.47	0.00	37.93	Peak	334	102	VERTICAL

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

Temperature	20℃	Humidity	55%
Test Engineer	David Tseng	Configurations	IEEE 802.11a CH 100, 140, 144 / Chain 1
Test Date	Jan. 01, 2014 ~ Feb. 13, 2014		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5460.00	61.84	74.00	-12.16	23.68	4.54	0.00	38.16	Peak	298	117	HORIZONTAL
2	5460.00	49.11	54.00	-4.89	10.95	4.54	0.00	38.16	Average	298	117	HORIZONTAL
3	5468.00	70.17	74.00	-3.83	31.97	4.55	0.00	38.20	Peak	298	117	HORIZONTAL
4	5470.00	53.77	54.00	-0.23	15.57	4.55	0.00	38.20	Average	298	117	HORIZONTAL
5	5498.00	110.38			72.11	4.57	0.00	38.27	Peak	298	117	HORIZONTAL
6	5503.20	99.34			61.07	4.57	0.00	38.27	Average	298	117	HORIZONTAL

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5701.20	96.76			57.73	4.71	0.00	39.03	Average	254	108	HORIZONTAL
2	5702.20	107.61			68.58	4.71	0.00	39.03	Peak	254	108	HORIZONTAL
3	5725.00	53.97	54.00	-0.03	14.88	4.72	0.00	39.09	Average	254	108	HORIZONTAL
4	5725.80	69.25	74.00	-4.75	30.16	4.72	0.00	39.09	Peak	254	108	HORIZONTAL

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

Channel 144

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5721.00	110.66			71.57	4.72	0.00	39.09	Peak	346	114	VERTICAL
2	5721.00	100.93			61.84	4.72	0.00	39.09	Average	346	114	VERTICAL
3	5832.00	43.99	54.00	-10.01	4.52	4.79	0.00	39.47	Average	346	114	VERTICAL
4	5834.00	55.60	74.00	-18.40	16.13	4.79	0.00	39.47	Peak	346	114	VERTICAL

Item 1, 2 are the fundamental frequency at 5720 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

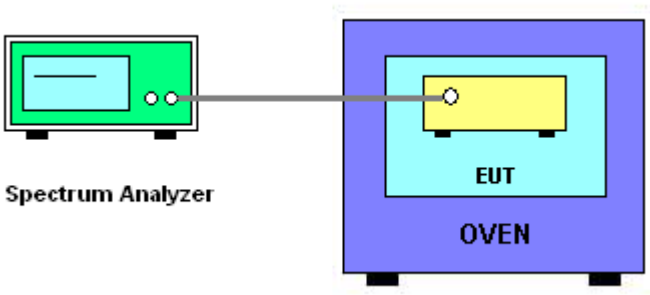
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 0°C~70°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	20°C	Humidity	53%
Test Engineer	Wen Chao	Test Date	Jan. 22, 2014

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)		
(V)	5200 MHz	5300 MHz	5500 MHz
126.50	5199.9566	5299.9542	5499.9514
110.00	5199.9568	5299.9544	5499.9514
93.50	5199.9568	5299.9546	5499.9513
Max. Deviation (MHz)	**0.043400**	**0.045800**	**0.048700**
Max. Deviation (ppm)	**8.35**	**8.64**	**8.85**

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)		
(°C)	5200 MHz	5300 MHz	5500 MHz
0	5199.9562	5299.9540	5499.9512
10	5199.9564	5299.9540	5499.9512
20	5199.9564	5299.9541	5499.9514
30	5199.9566	5299.9542	5499.9514
40	5199.9568	5299.9542	5499.9516
50	5199.9568	5299.9544	5499.9516
60	5199.9569	5299.9544	5499.9521
70	5199.9569	5299.9546	5499.9523
Max. Deviation (MHz)	**0.043800**	**0.046000**	**0.048800**
Max. Deviation (ppm)	**8.42**	**8.68**	**8.87**

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. 12, 2013	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150 kHz ~ 100 MHz	Nov. 23, 2013	Conduction (CO01-CB)
Arifical Mains Network	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Nov. 23, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150 kHz ~ 30 MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	-	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	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	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-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 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)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 04, 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)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
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