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FCC RADIO TEST REPORT

Applicant's company	**Linksys LLC**
Applicant Address	131 Theory Drive, Irvine, CA 92617, USA
FCC ID	**Q87-RE6500**
Manufacturer's company	**U-MEDIA Communications, Inc.**
Manufacturer Address	9F, No. 1, Jin-Shan 7th St., Hsinchu 300, Taiwan

Product Name	Linksys AC1200 MAX Wi-Fi Range Extender
Brand Name	Linksys
Model No.	RE6500
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Feb. 18, 2014
Final Test Date	Jul. 03, 2014
Submission Type	Class II Change

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g and IEEE 802.11a/ac of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2009**, **47 CFR FCC Part 15 Subpart C**, **KDB 558074 D01 v03r02**, **KDB 662911 D01 v02r01**, **KDB644545 D01 v01r02.**

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
FR421849-01AA	Rev. 01	Initial issue of report	Jul. 15, 2014

Certificate No.: CB10307074

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Linksys AC1200 MAX Wi-Fi Range Extender
Brand Name	:	Linksys
Model No.	:	RE6500
Applicant	:	Linksys LLC
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Feb. 18, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.247(b)(3)	Maximum Conducted Output Power	Complies	6.85 dB
4.2	15.247(e)	Power Spectral Density	Complies	12.55 dB
4.3	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.4	15.247(d)	Radiated Emissions	Complies	0.37 dB
4.5	15.247(d)	Band Edge Emissions	Complies	1.02 dB
4.6	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
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	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth ; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (HT20): 25.38 MHz ; MCS0 (HT40): 36.02 MHz For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 30.24 MHz ; 802.11ac MCS0/Nss1 (VHT40): 61.28 MHz ; 802.11ac MCS0/Nss1 (VHT80): 75.20 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (HT20): 22.79 dBm ; MCS0 (HT40): 15.76 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 23.08 dBm ; 802.11ac MCS0/Nss1 (VHT40): 22.88 dBm ; 802.11ac MCS0/Nss1 (VHT80): 16.58 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a/b/g

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 12.50 MHz ; 11g: 24.23 MHz ; 11a: 29.28 MHz
Maximum Conducted Output Power	11b: 19.59 dBm ; 11g: 22.92 dBm ; 11a: 23.15 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☐ With beamforming	☒ Without beamforming

Antenna and Band width

Antenna	Two (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X
IEEE 802.11b	V	X	X
IEEE 802.11g	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)	2	MCS0-15
802.11n (HT40)	2	MCS0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1 (Fixed plug)	Ktec	KSAS0121200100VU	INPUT: 100-240Vac, 50/60Hz, 0.4A OUTPUT: 12Vdc, 1.0A
Adapter 2 (Removable plug)	Ktec	KSAS0121200100D5	INPUT: 100-240Vac, 50/60Hz, 0.4A OUTPUT: 12Vdc, 1.0A
Others			
Plug*1 (Only for Adapter 2's use)			
RJ-45 cable*1: Non-shielded, 1.5m			

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)		Cable Loss (dB)		True Gain (dBi)	
					2.4GHz	5GHz	2.4GHz	5GHz	2.4GHz	5GHz
1	Joymax	TWX-1561RSXX-711	Dipole	Reversed-SMA	5.5	5.62	1.0	2.8	4.50	2.82
2	Joymax	TWX-1561RSXX-711	Dipole	Reversed-SMA	5.5	5.62	2.8	1.0	2.70	4.62
3	Cortec	AN2450-9220BRS	Dipole	SMA Male Reverse	5.03	5.01	1.0	2.8	4.03	2.21
4	Cortec	AN2450-9220BRS	Dipole	SMA Male Reverse	5.03	5.01	2.8	1.0	2.23	4.01

Note:

Ant. 1～ 4 are the same type antennas. Only the higher gain antennas "Ant. 1～2" were tested and recorded in the report.

For 2.4GHz function:

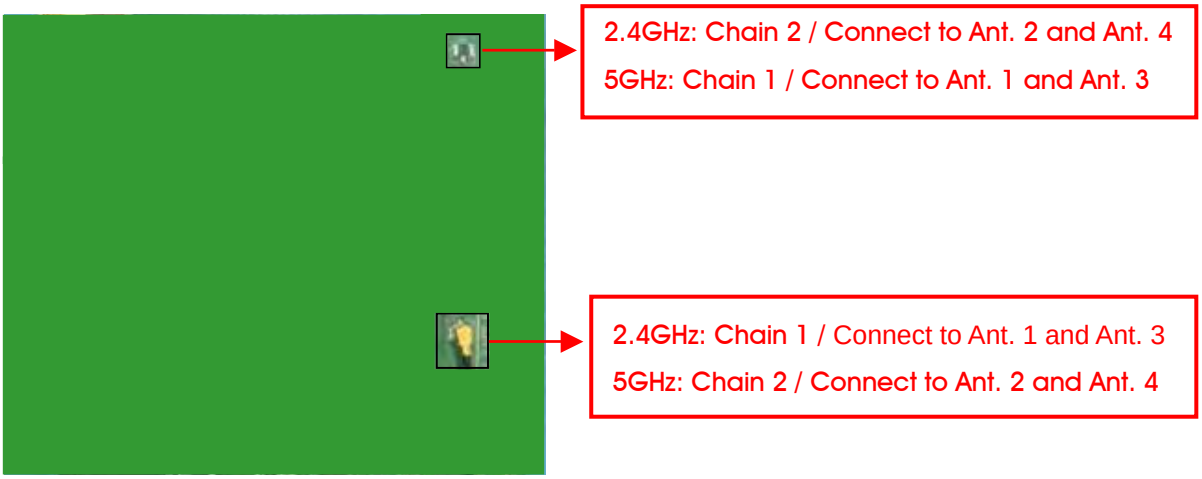
For IEEE 802.11b/g/n mode (2TX/2RX)

Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz function:

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

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

For 5GHz Band:

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 149, 153, 157, 161, 165.

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

For 80MHz bandwidth systems, use Channel 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Test Modes

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

For 2.4GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
Power Spectral Density	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
6dB Spectrum Bandwidth	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
Band Edge Emissions	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2

For 5GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Power Spectral Density	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
6dB Spectrum Bandwidth	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Band Edge Emissions	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2

The following test modes were performed for all tests:

For Radiated Emissions below 1GHz test:

Mode 1. EUT laying + Adapter 1

Mode 2. EUT standing + Adapter 1

Mode 1 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.

Mode 3. EUT laying + Adapter 2

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

For Radiated Emissions above 1GHz test:

The EUT for Radiated emission test was performed at laying and standing position and the worst case was found from laying. So the measurement will follow this same test configuration.

Mode 1. EUT laying

For Co-location MPE and Radiated Emission Co-location Test:

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

3.6. Table for Testing Locations

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

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 421849

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

Modifications	Performance Checking
Adding 4 higher gain antennas.	1. Maximum Conducted Output Power Measurement 2. Power Spectral Density Measurement 3. 6dB Spectrum Bandwidth Measurement 4. Radiated Emissions Measurement 5. Emissions Measurement 6. Maximum Permissible Exposure 7. Radiated Emission Co-location

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

For Radiated Emissions below 1GHz test:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1340	E2K4965AGNM
Notebook	DELL	E6430	DoC
Notebook	DELL	D420	E2KWM3945ABG
AP Router	Planex	GW-AP54SGX	KA220030603014-1
Earphone	E-BOOKI	E-EPC040	N/A

For Radiated Emissions above 1GHz test:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2K4965AGNM

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC

3.9. Table for Parameters of Test Software Setting

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

For 2.4GHz Band

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	MT7662 QA V0.0.2.3		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 HT20	1F/27	30/38	1B/23

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	MT7662 QA V0.0.2.3		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 HT40	1B/23	1C/24	1A/22

Power Parameters of IEEE 802.11b/g

Test Software Version	MT7662 QA V0.0.2.3		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	25/2D	23/2B	25/2D
IEEE 802.11g	1E/26	30/38	1B/23

For 5GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	MT7662 QA V0.0.2.3		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	2F/26	3F/38	3F/38

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	MT7662 QA V0.0.2.3	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	2B/20	3F/36

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	MT7662 QA V0.0.2.3
Frequency	5775 MHz
MCS0/Nss1 VHT80	1A/0F

Power Parameters of IEEE 802.11a

Test Software Version	MT7662 QA V0.0.2.3		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	32/29	3F/36	3F/38

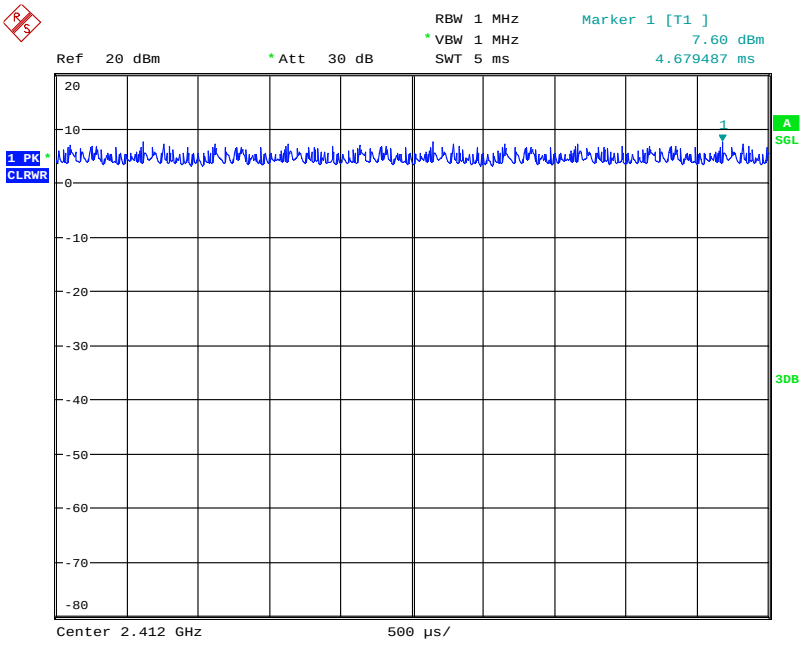
3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

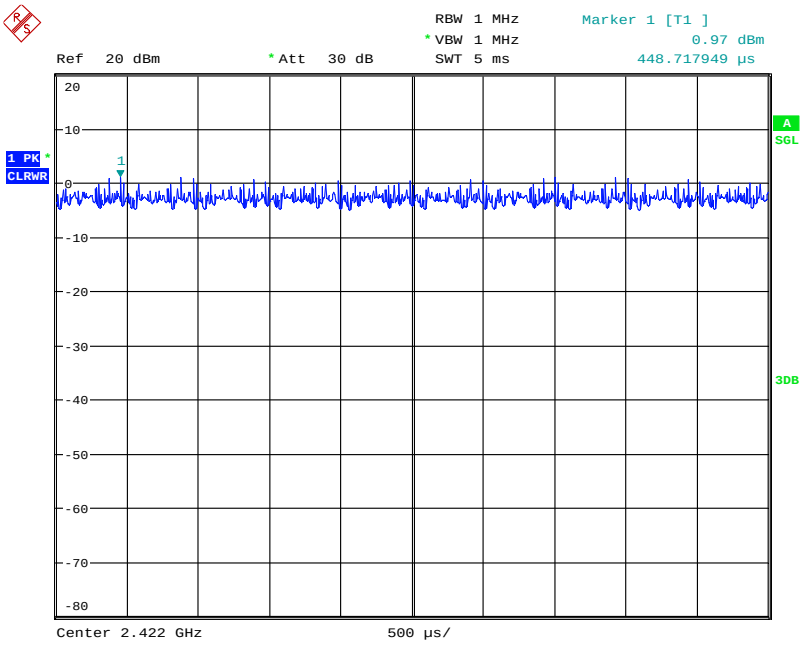
3.11. Duty Cycle

For 2.4GHz Band:

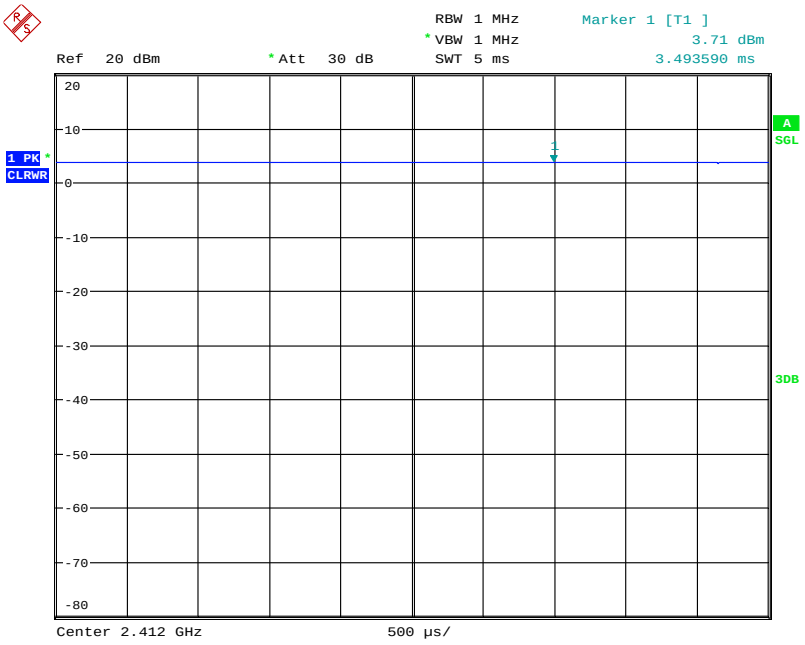
IEEE 802.11n MCS0 HT20



IEEE 802.11n MCS0 HT40



IEEE 802.11b



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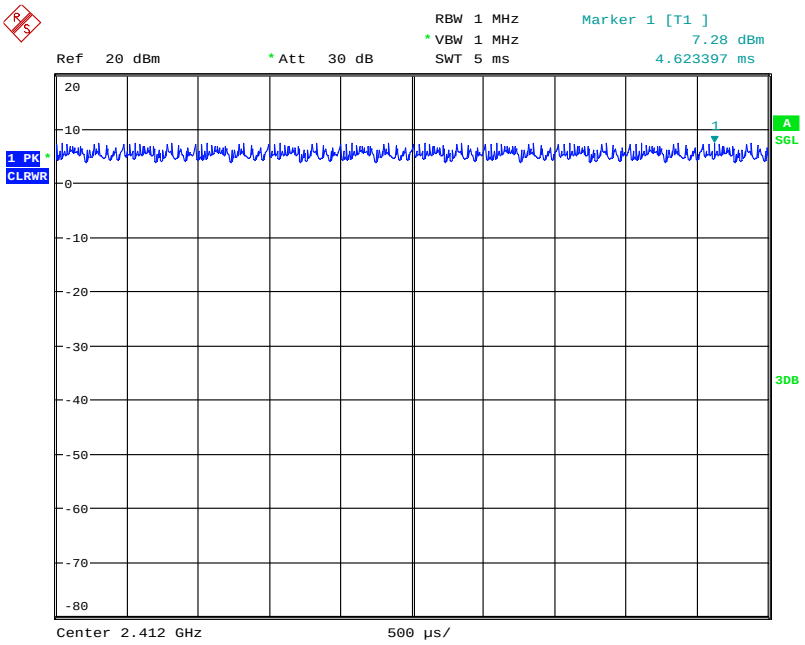

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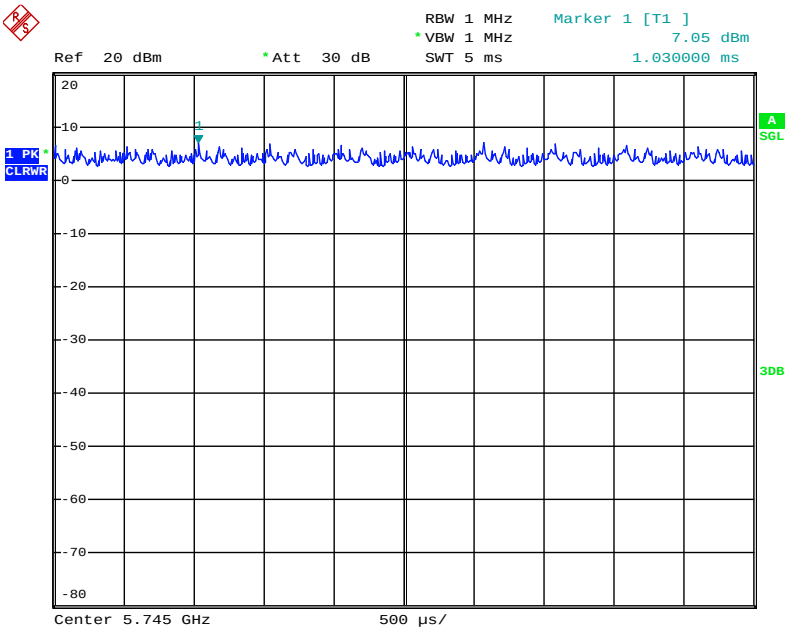
For 5GHz Band:

IEEE 802.11ac MCS0/Nss1 VHT20



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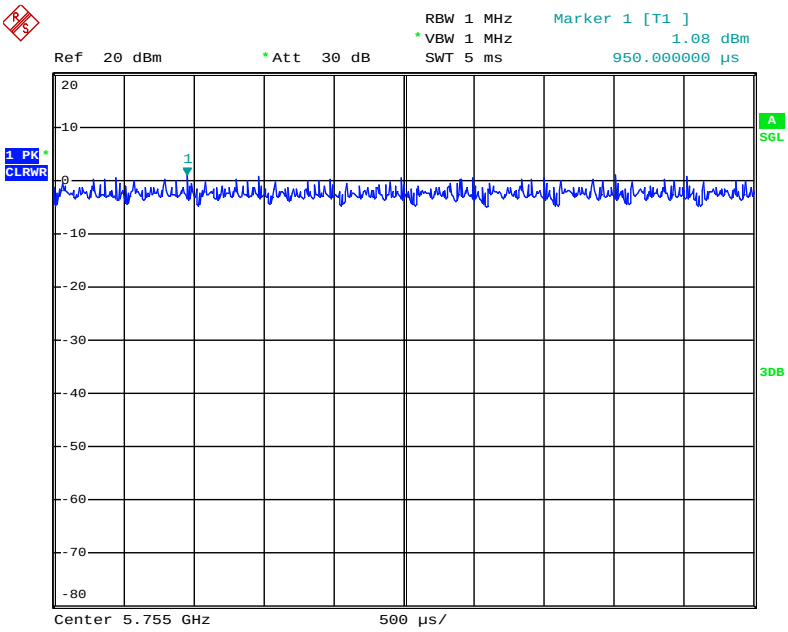
IEEE 802.11ac MCS0/Nss1 VHT40



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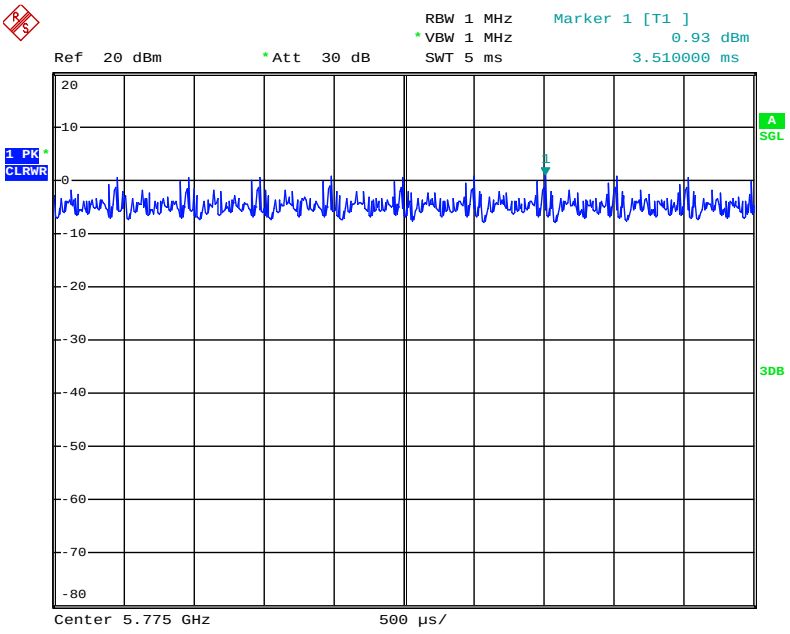
IEEE 802.11ac MCS0/Nss1 VHT80



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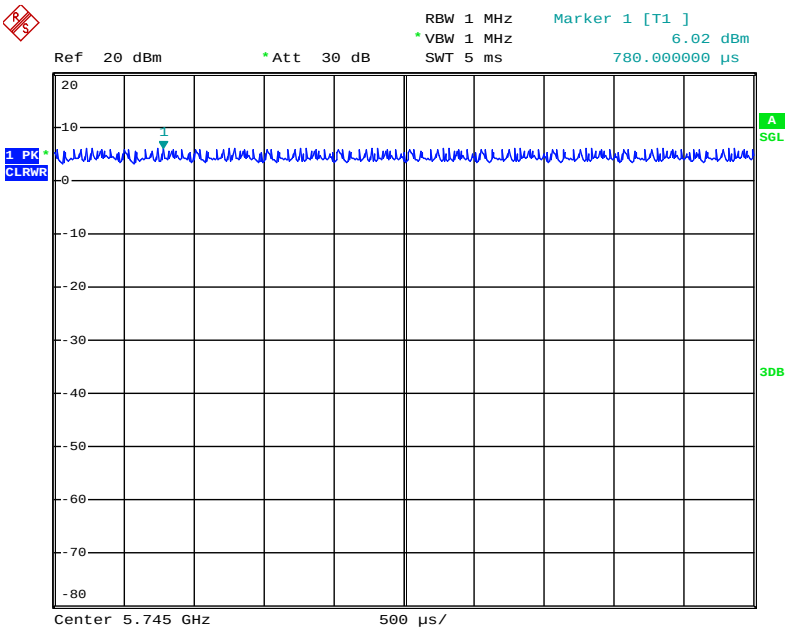
IEEE 802.11a



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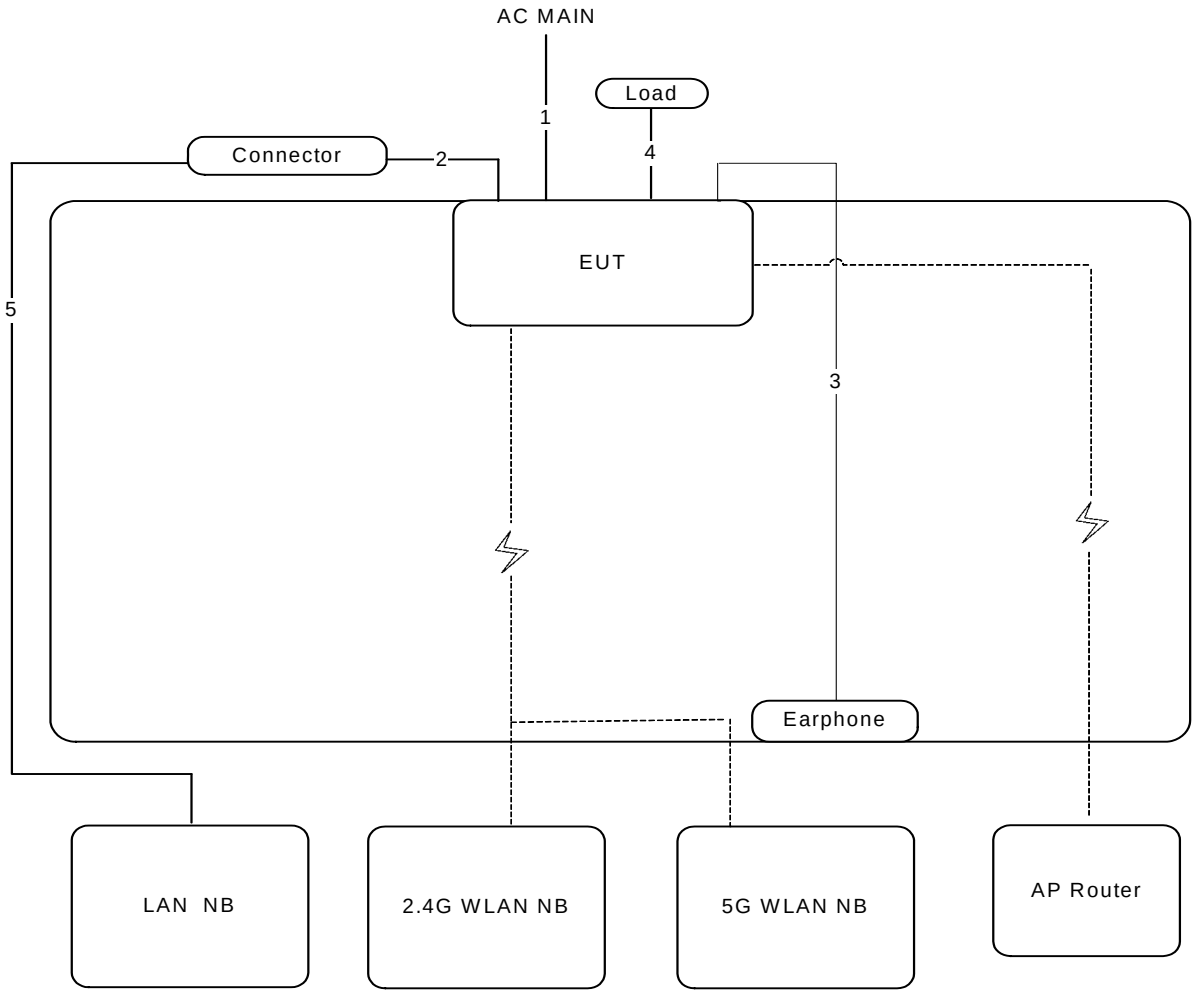
3.12. Test Configurations

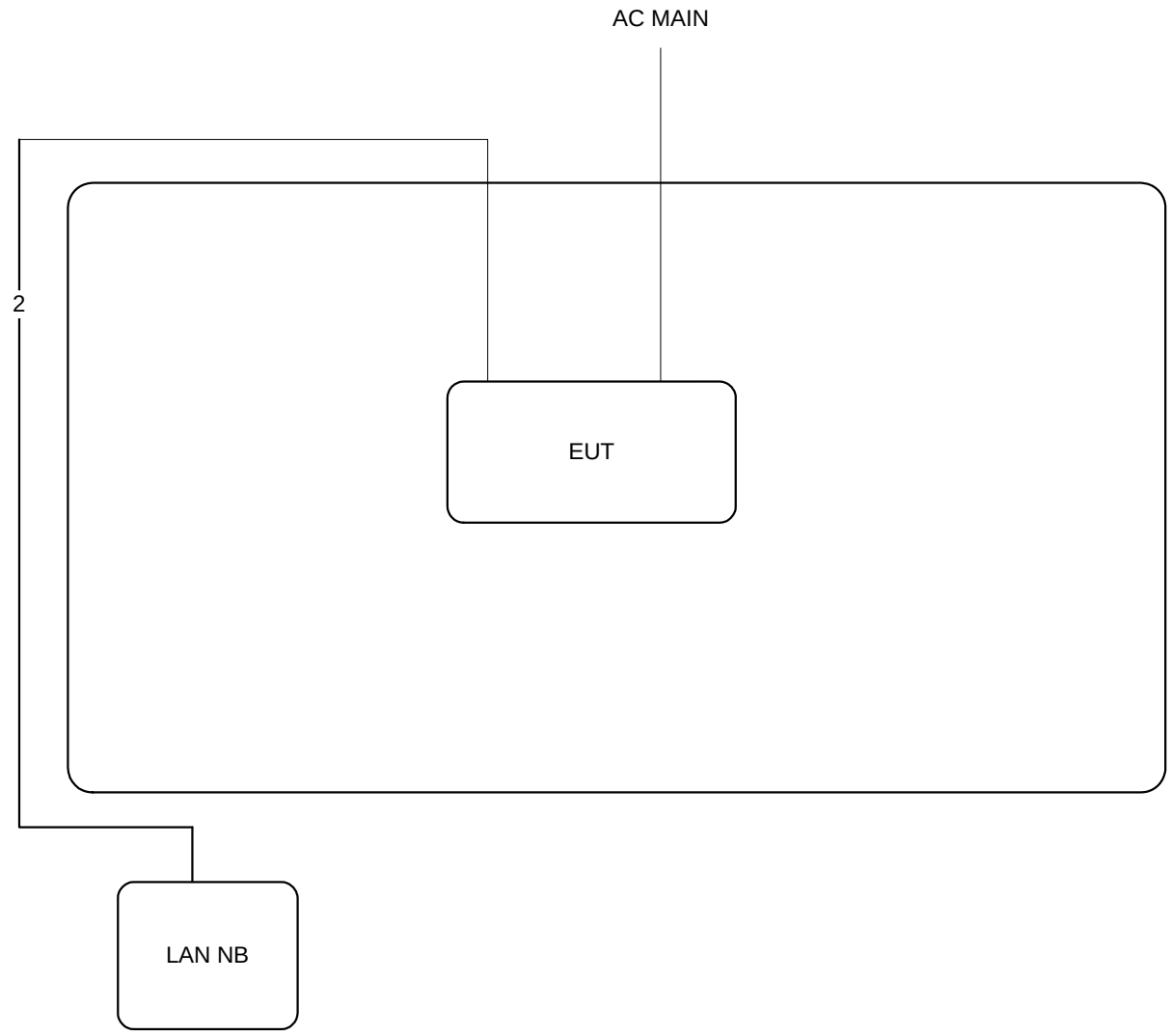
3.12.1. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	1.5m
3	Audio cable	No	1.1m
4	RJ-45 cable*3	No	0.4m
5	RJ-45 cable	No	10m

Test Configuration: above 1GHz



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

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter output power.

4.1.2. Measuring Instruments and Setting

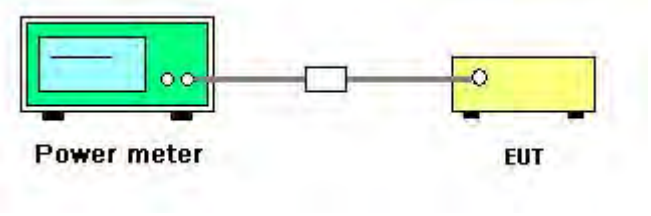
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.1.3. Test Procedures

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 9.2.3.2 Method AVGPM-G (Measurement using a gated RF average power meter).
2. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of Maximum Conducted Output Power

Temperature	24°C	Humidity	61%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac
Test Date	Jul. 03, 2014		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	12.89	12.98	15.95	30.00	Complies
6	2437 MHz	20.18	19.33	22.79	30.00	Complies
11	2462 MHz	11.63	11.71	14.68	30.00	Complies

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
3	2422 MHz	11.87	12.46	15.19	30.00	Complies
6	2437 MHz	12.35	13.12	15.76	30.00	Complies
9	2452 MHz	10.96	11.25	14.12	30.00	Complies

For 5GHz Band

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

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	17.12	16.56	19.86	30.00	Complies
157	5785 MHz	20.19	19.75	22.99	30.00	Complies
165	5825 MHz	20.11	20.03	23.08	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	15.38	14.79	18.11	30.00	Complies
159	5795 MHz	20.05	19.68	22.88	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	13.91	13.20	16.58	30.00	Complies

Temperature	24°C	Humidity	61%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g
Test Date	Jul. 03, 2014		

Configuration IEEE 802.11b / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	16.17	16.42	19.31	30.00	Complies
6	2437 MHz	15.86	16.23	19.06	30.00	Complies
11	2462 MHz	16.41	16.75	19.59	30.00	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	12.96	12.94	15.96	30.00	Complies
6	2437 MHz	20.32	19.45	22.92	30.00	Complies
11	2462 MHz	11.91	12.23	15.08	30.00	Complies

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	18.93	18.07	21.53	30.00	Complies
157	5785 MHz	20.18	19.85	23.03	30.00	Complies
165	5825 MHz	20.06	20.21	23.15	30.00	Complies

4.2. Power Spectral Density Measurement

4.2.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.2.2. Measuring Instruments and Setting

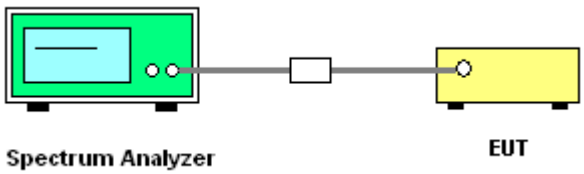
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.2.3. Test Procedures

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Power Spectral Density

Temperature	24°C	Humidity	61%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac
Test Date	Jul. 03, 2014		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	-14.30	-14.23	-11.25	7.30	Complies
6	2437 MHz	-7.69	-8.92	-5.25	7.30	Complies
11	2462 MHz	-15.58	-15.40	-12.48	7.30	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.70dBi>6dBi, so limit=8-(6.70-6)=7.30dBm/3kHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
3	2422 MHz	-19.49	-19.55	-16.51	7.30	Complies
6	2437 MHz	-18.84	-18.50	-15.66	7.30	Complies
9	2452 MHz	-19.64	-19.07	-16.34	7.30	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.70dBi>6dBi, so limit=8-(6.70-6)=7.30dBm/3kHz

For 5GHz Band

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

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	-9.80	-10.49	-7.12	7.18	Complies
157	5785 MHz	-9.25	-9.69	-6.45	7.18	Complies
165	5825 MHz	-9.24	-9.76	-6.48	7.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.82dBi>6dBi, so limit=8-(6.82-6)=7.18dBm/3kHz

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

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	-13.31	-13.45	-10.37	7.18	Complies
159	5795 MHz	-11.96	-12.15	-9.04	7.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.82dBi>6dBi, so limit=8-(6.82-6)=7.18dBm/3kHz

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

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	-19.13	-18.91	-16.01	7.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.82dBi>6dBi, so limit=8-(6.82-6)=7.18dBm/3kHz

Temperature	24°C	Humidity	61%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g
Test Date	Jul. 03, 2014		

Configuration IEEE 802.11b / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	-13.19	-13.59	-10.38	7.30	Complies
6	2437 MHz	-14.06	-14.08	-11.06	7.30	Complies
11	2462 MHz	-13.33	-12.75	-10.02	7.30	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.70dBi>6dBi, so limit=8-(6.70-6)=7.30dBm/3kHz

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	-14.92	-15.29	-12.09	7.30	Complies
6	2437 MHz	-8.07	-8.77	-5.40	7.30	Complies
11	2462 MHz	-15.95	-15.08	-12.48	7.30	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.70dBi>6dBi, so limit=8-(6.70-6)=7.30dBm/3kHz

Configuration IEEE 802.11a / Chain 1 + Chain 2

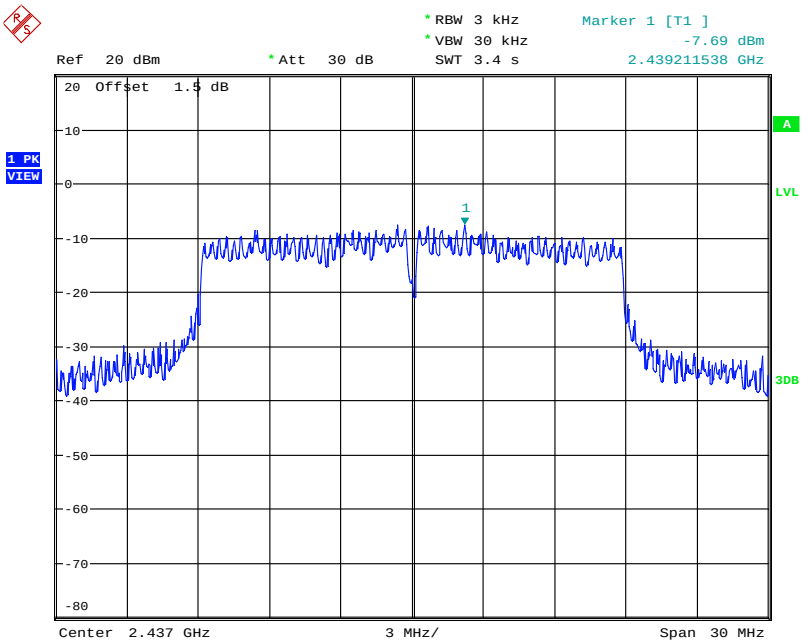
Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	-10.12	-10.48	-7.29	7.18	Complies
157	5785 MHz	-9.05	-9.33	-6.18	7.18	Complies
165	5825 MHz	-9.07	-9.42	-6.23	7.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.82dBi>6dBi, so limit=8-(6.82-6)=7.18dBm/3kHz

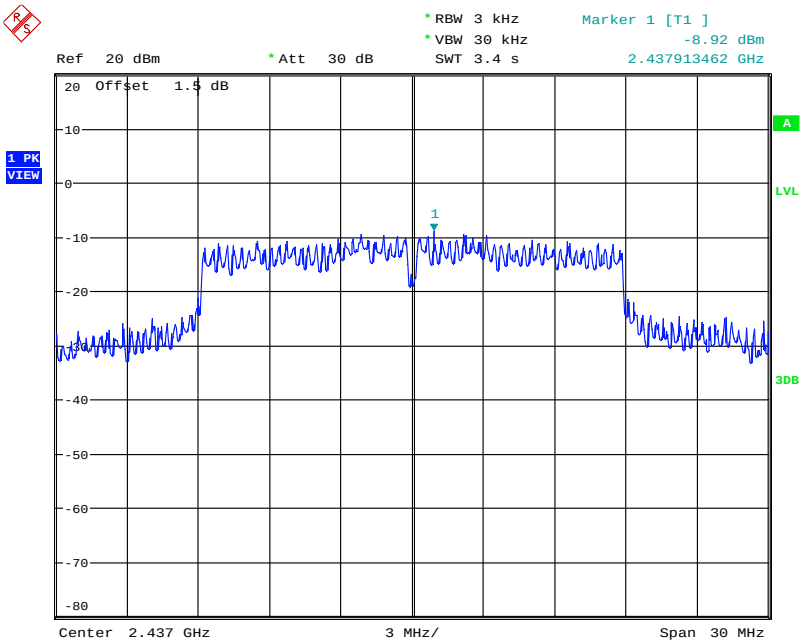
Note: All the test values were listed in the report.

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

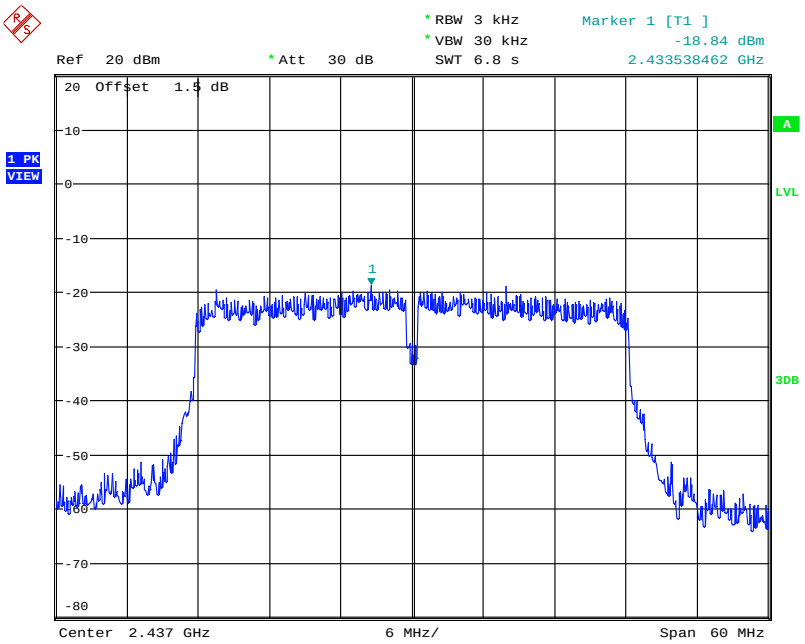
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Chain 1



Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Chain 2

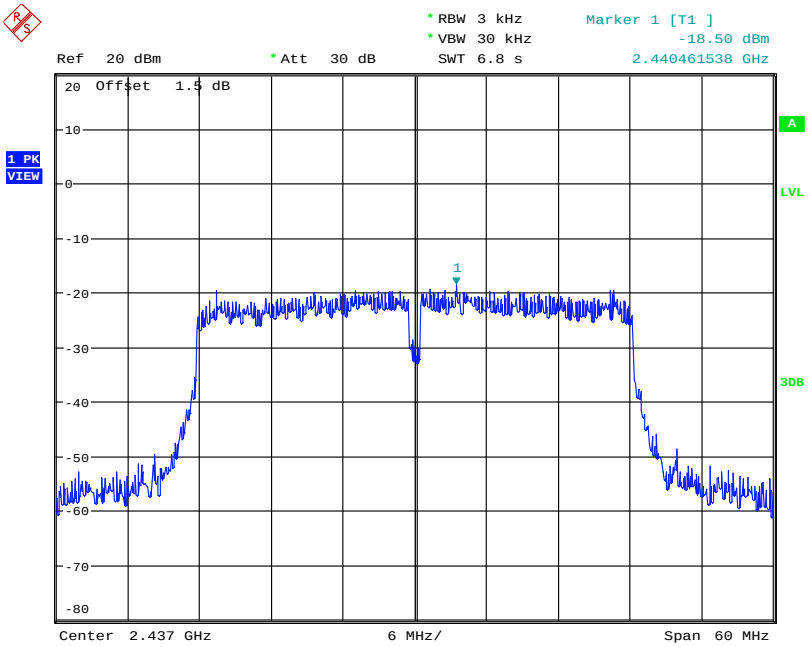


Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Chain 1



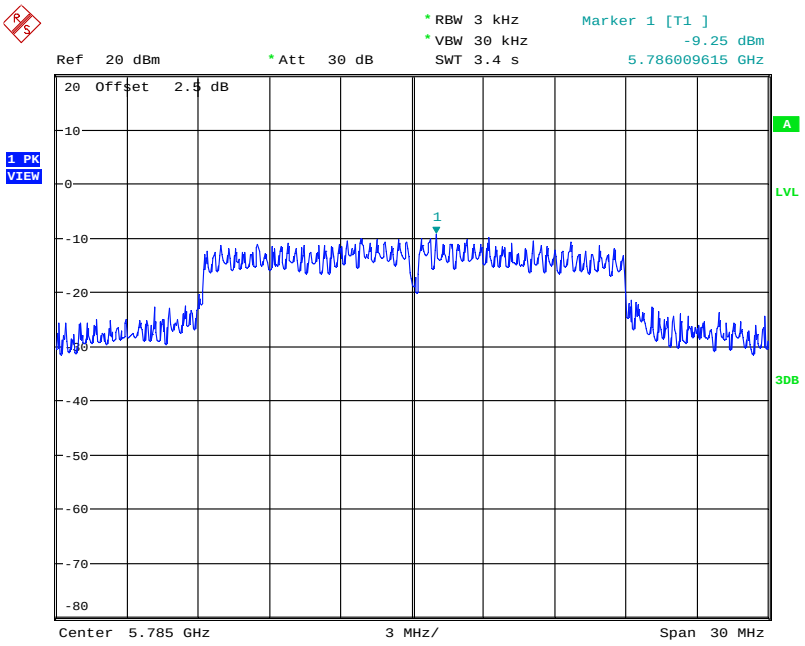
Date: 3.JUL.2014 14:03:13

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Chain 2



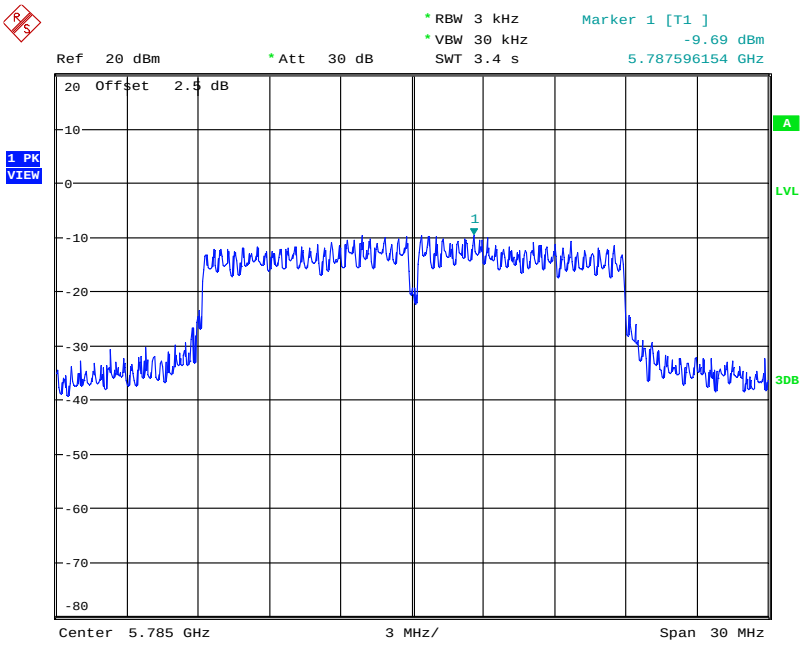
Date: 3.JUL.2014 14:02:16

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 1



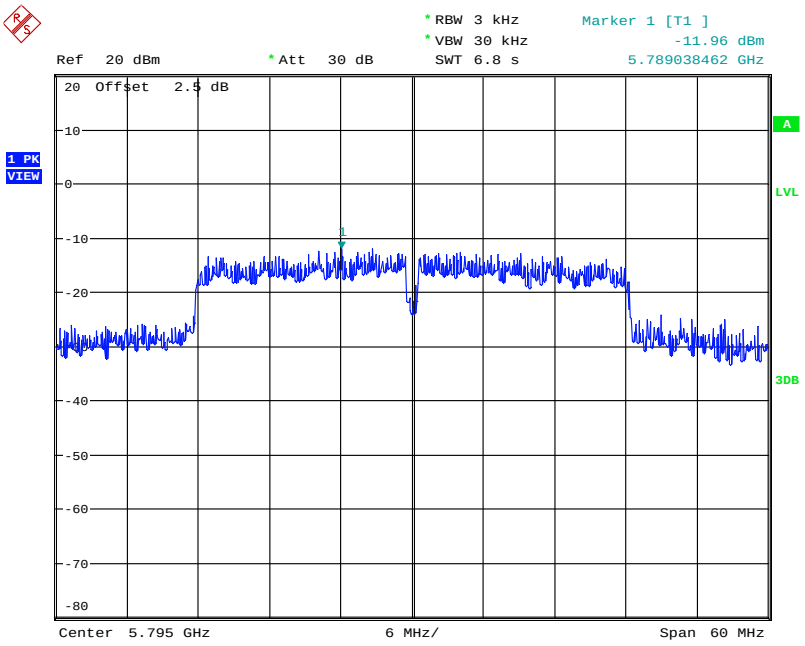
Date: 3.JUL.2014 14:26:11

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 2



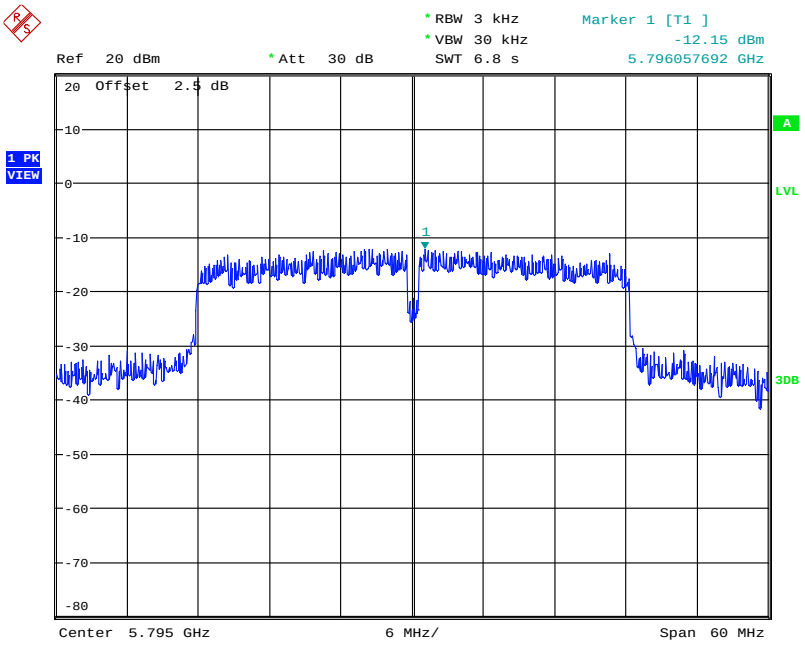
Date: 3.JUL.2014 14:55:49

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



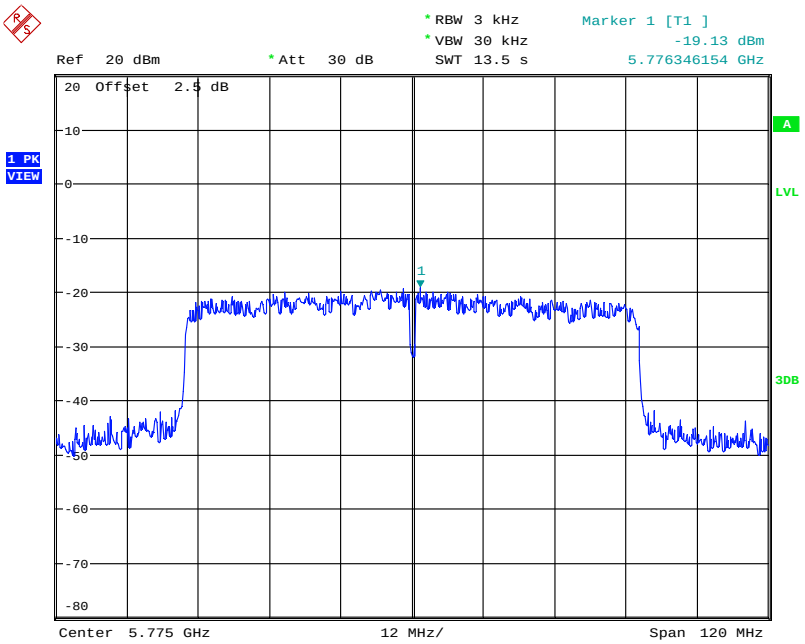
Date: 3.JUL.2014 14:46:47

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



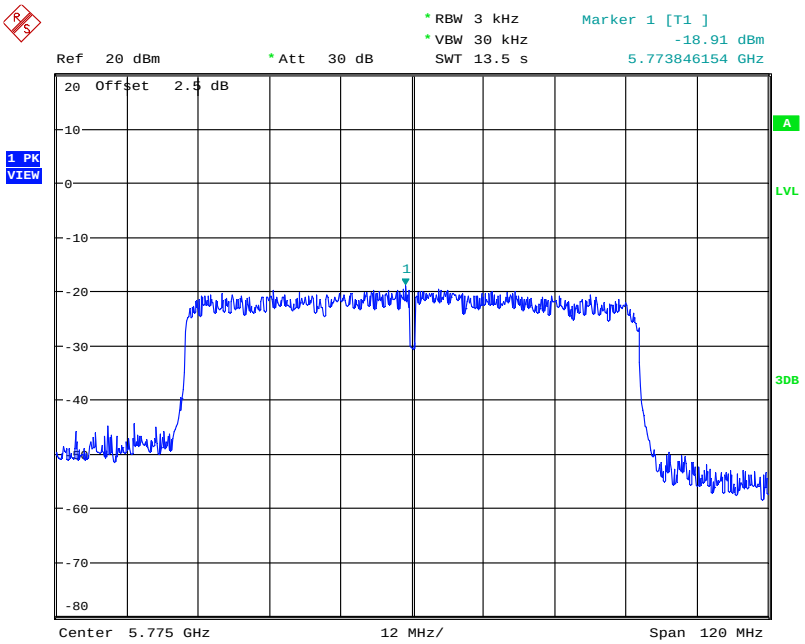
Date: 3.JUL.2014 14:49:56

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



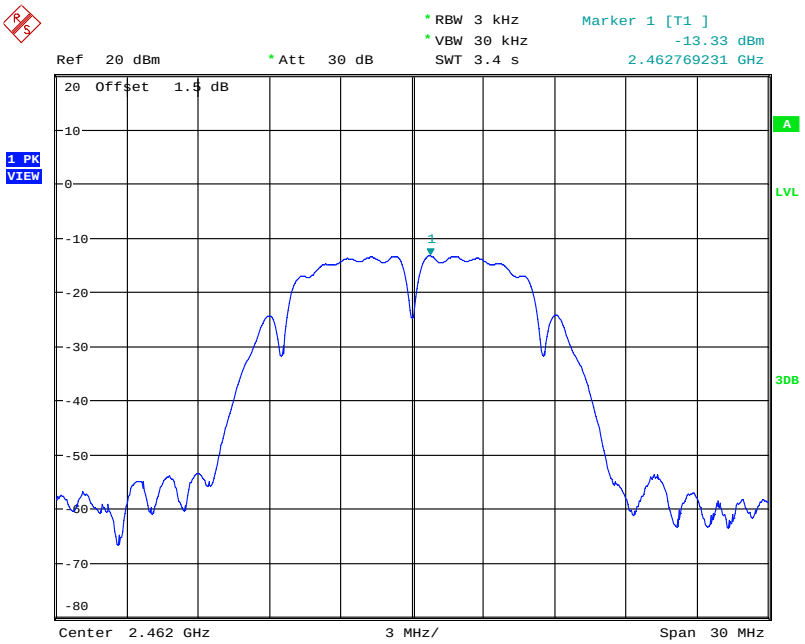
Date: 3.JUL.2014 14:53:28

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



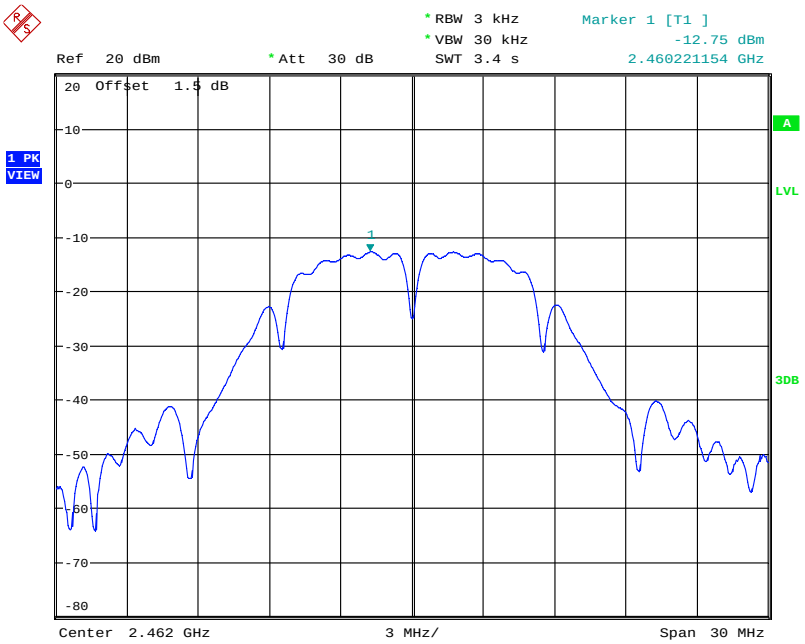
Date: 3.JUL.2014 14:51:52

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1



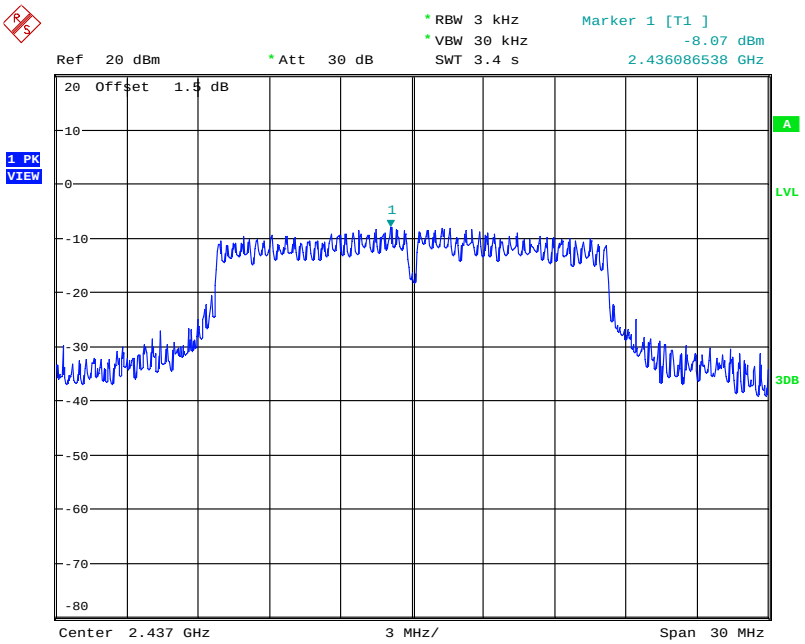
Date: 3.JUL.2014 12:05:27

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 2



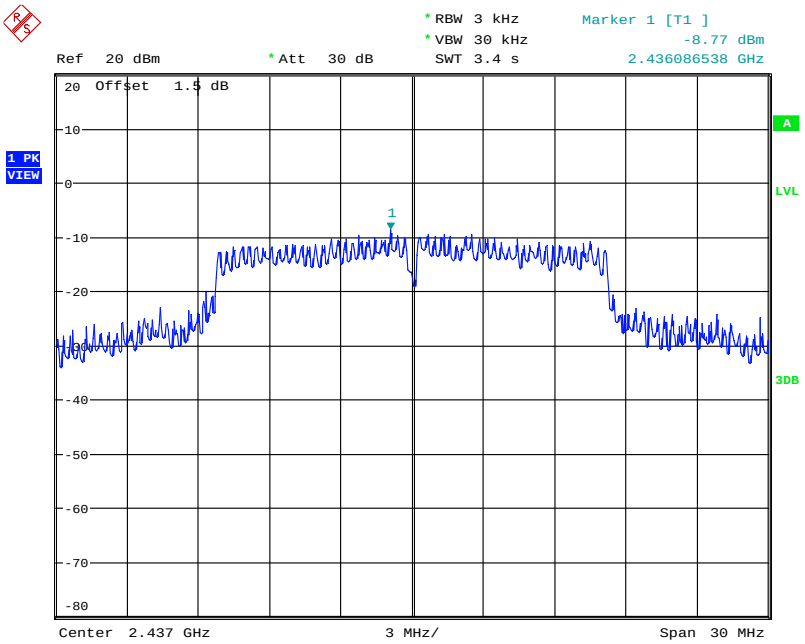
Date: 3.JUL.2014 12:04:47

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1



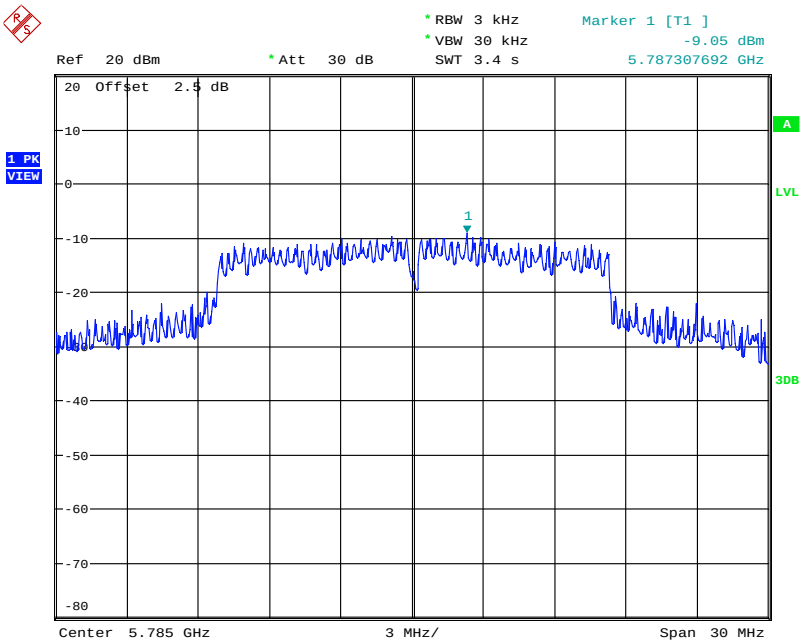
Date: 3.JUL.2014 12:10:49

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



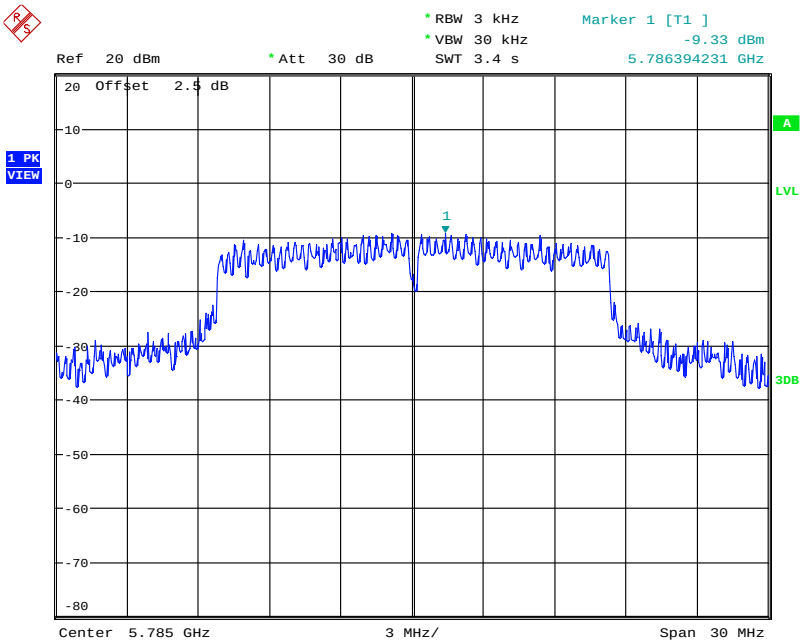
Date: 3.JUL.2014 12:10:09

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



Date: 3.JUL.2014 14:17:36

Power Density Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 2



Date: 3.JUL.2014 14:19:49

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 8.0 DTS bandwidth=> 8.1 Option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	24°C	Humidity	61%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.62	17.62	500	Complies
6	2437 MHz	17.56	25.38	500	Complies
11	2462 MHz	17.62	17.62	500	Complies

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.41	36.02	500	Complies
6	2437 MHz	36.41	36.02	500	Complies
9	2452 MHz	36.41	36.02	500	Complies

For 5GHz Band

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.68	23.92	500	Complies
157	5785 MHz	17.68	30.24	500	Complies
165	5825 MHz	17.68	30.08	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.32	39.68	500	Complies
159	5795 MHz	36.32	61.28	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	75.20	75.20	500	Complies

Temperature	24°C	Humidity	61%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.06	12.43	500	Complies
6	2437 MHz	10.06	12.24	500	Complies
11	2462 MHz	10.06	12.50	500	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.47	16.53	500	Complies
6	2437 MHz	16.41	24.23	500	Complies
11	2462 MHz	16.53	16.53	500	Complies

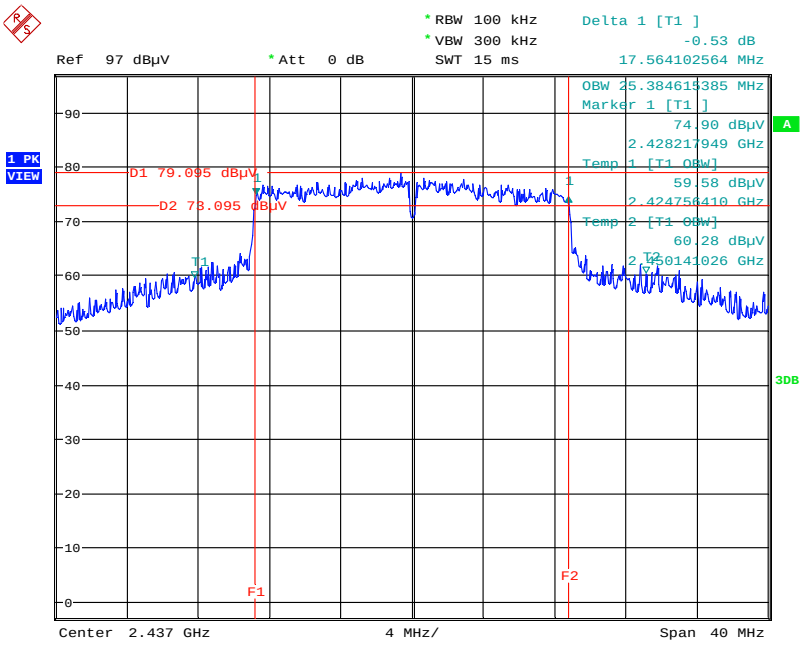
Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.40	24.80	500	Complies
157	5785 MHz	16.40	29.04	500	Complies
165	5825 MHz	16.48	29.28	500	Complies

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

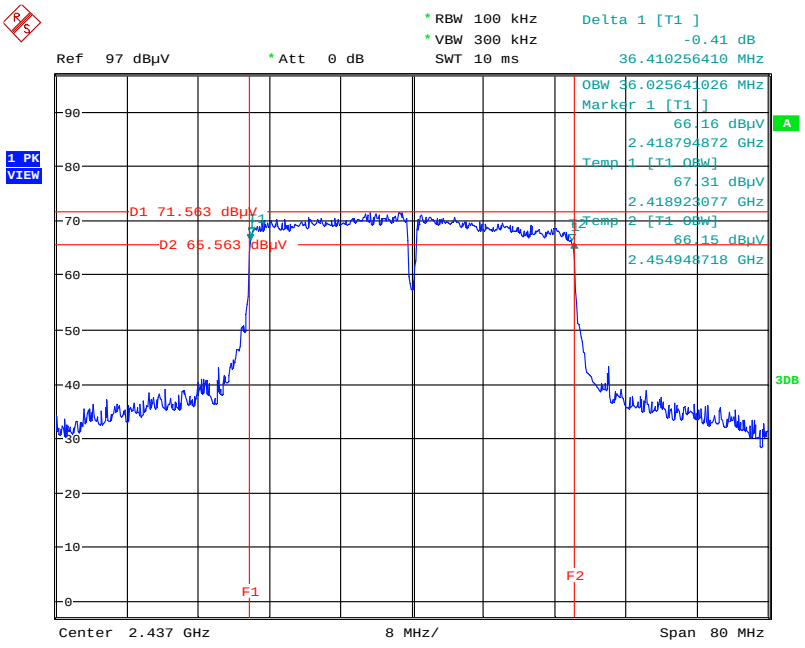
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Chain 1 + Chain 2



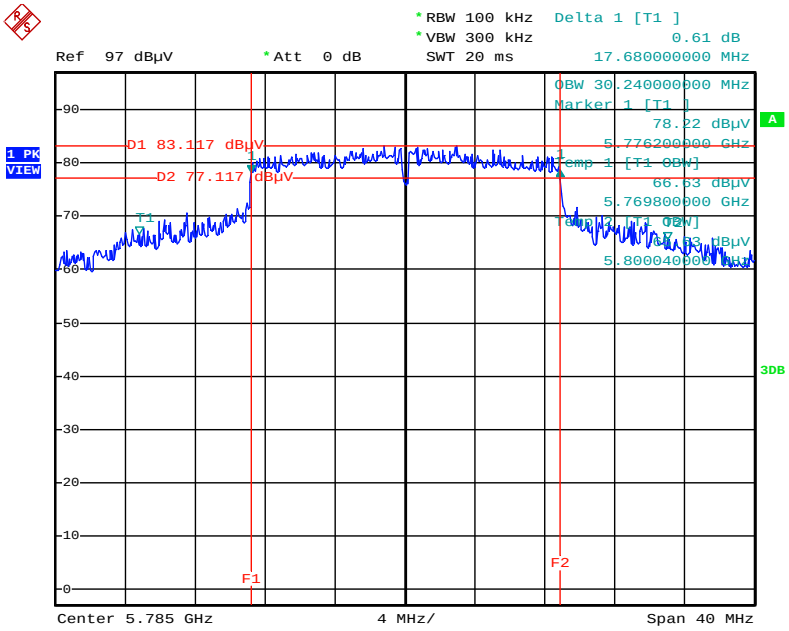
Date: 3.JUL.2014 11:32:59

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Chain 1 + Chain 2



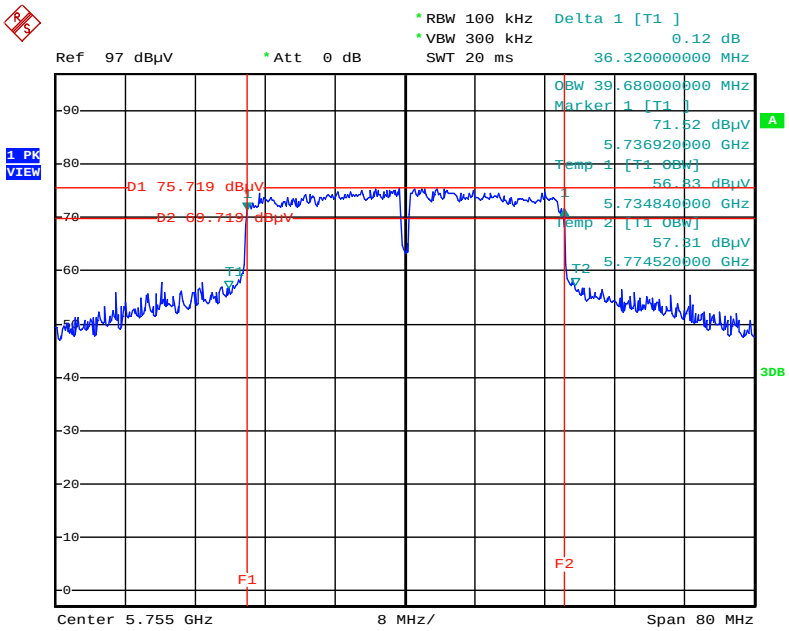
Date: 3.JUL.2014 11:36:54

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



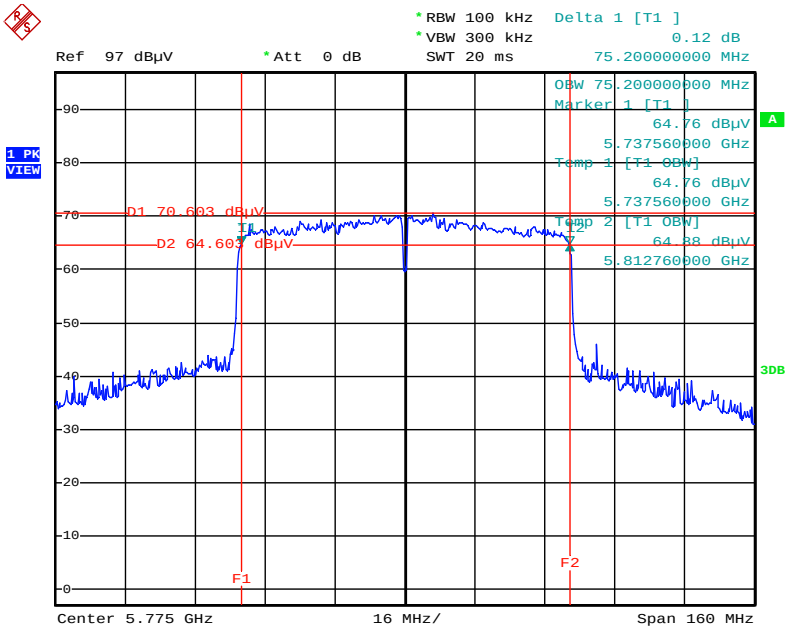
Date: 3.JUL.2014 12:06:20

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



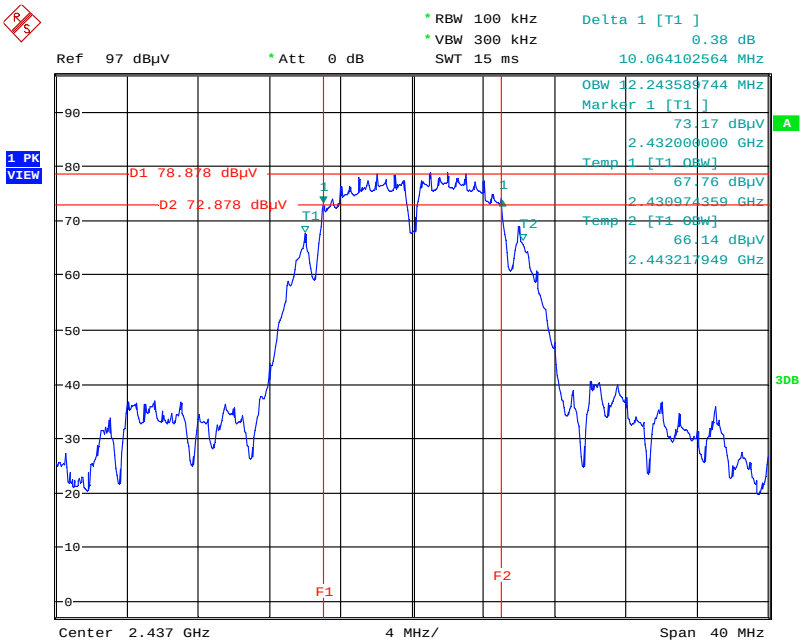
Date: 3.JUL.2014 12:08:35

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



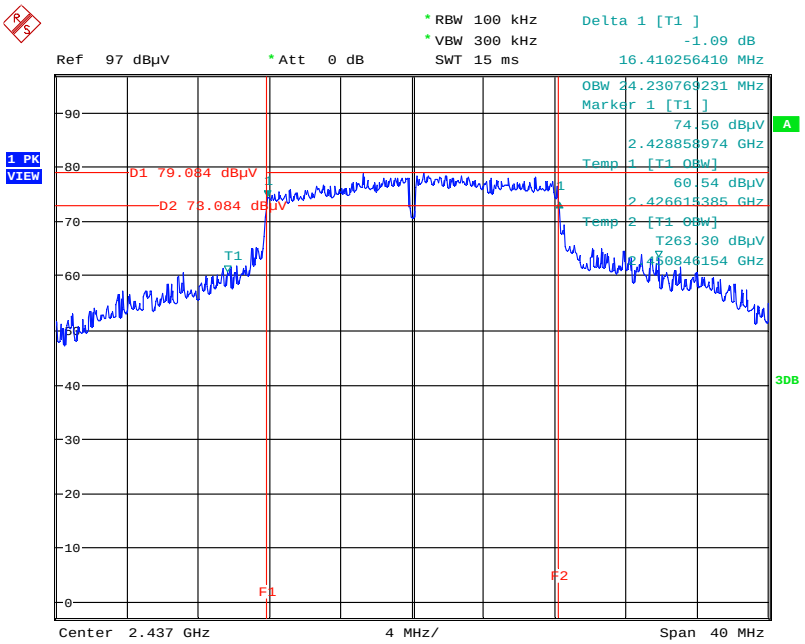
Date: 3.JUL.2014 12:10:47

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2



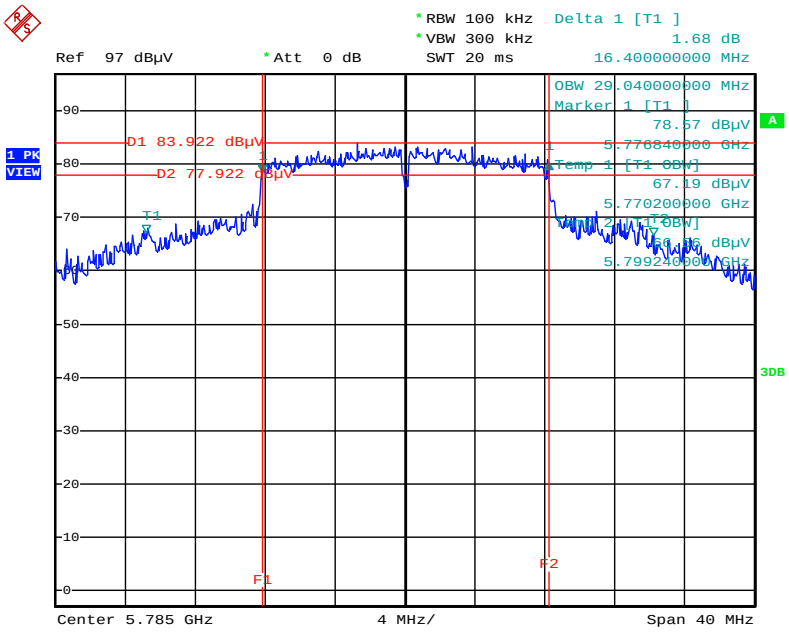
Date: 3.JUL.2014 11:25:28

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1 + Chain 2



Date: 3.JUL.2014 11:29:33

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 1 + Chain 2



Date: 3.JUL.2014 12:04:13

4.4. Radiated Emissions Measurement

4.4.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.4.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1GHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

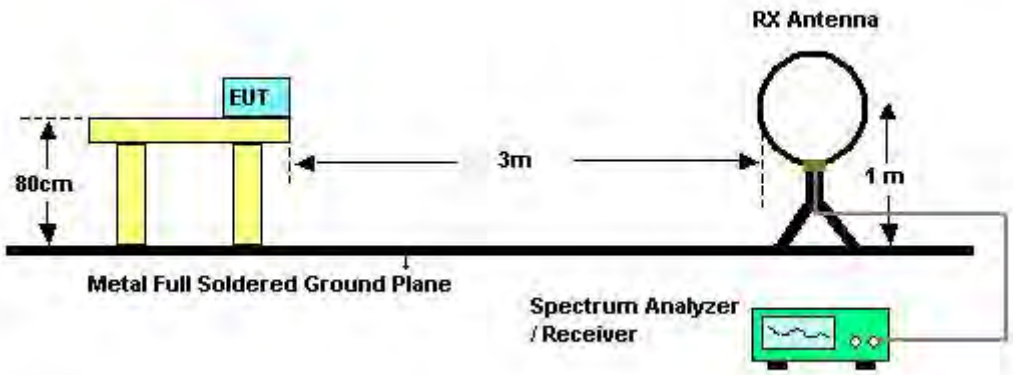
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.4.3. Test Procedures

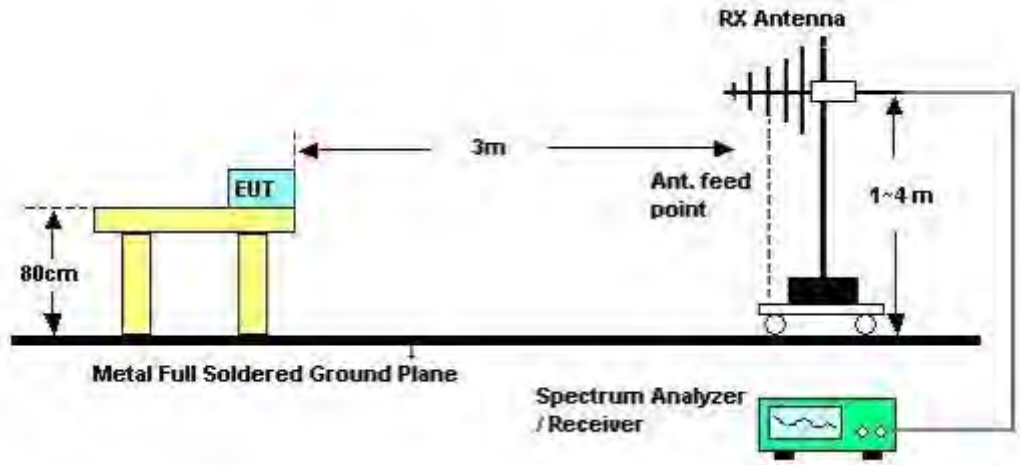
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.4.4. Test Setup Layout

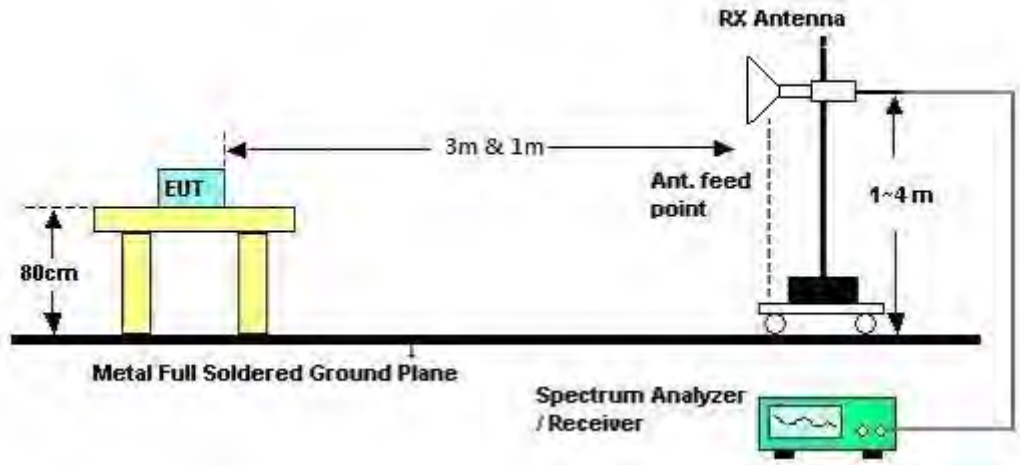
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	Normal Link
Test Date	Jun. 10, 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 20 dB below the permissible value has no need to be reported.

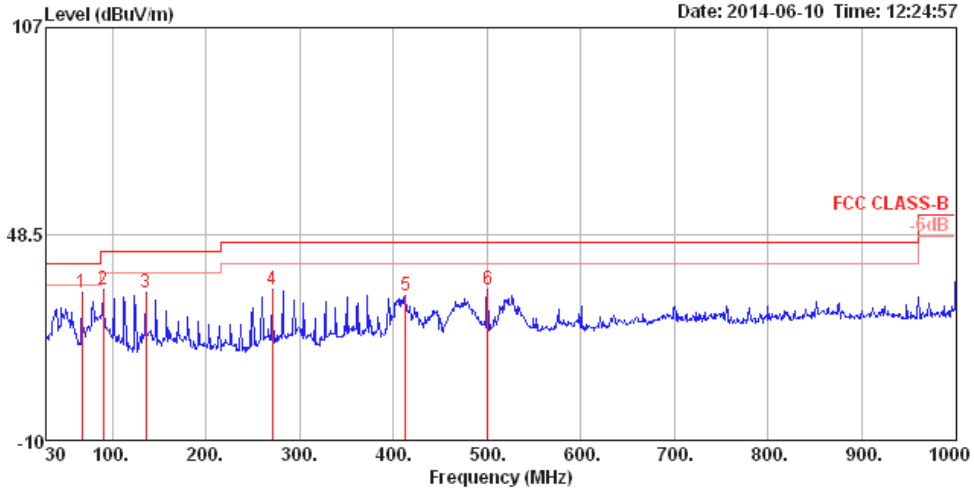
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

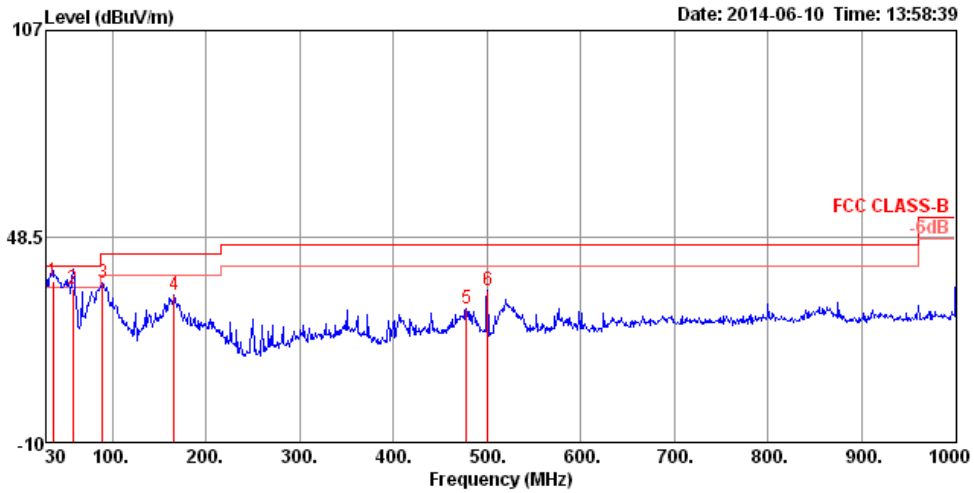
Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	67.83	31.77	40.00	-8.23	57.52	0.98	5.08	31.81	300	104	HORIZONTAL	Peak
2	90.14	32.71	43.50	-10.79	54.43	1.13	8.74	31.59	400	95	HORIZONTAL	Peak
3	135.73	32.01	43.50	-11.49	50.97	1.38	11.20	31.54	300	259	HORIZONTAL	Peak
4	270.56	32.77	46.00	-13.23	49.96	1.99	12.37	31.55	100	38	HORIZONTAL	Peak
5	413.15	30.82	46.00	-15.18	43.27	2.53	16.37	31.35	100	200	HORIZONTAL	Peak
6	500.45	32.60	46.00	-13.40	44.27	2.82	16.92	31.41	100	88	HORIZONTAL	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	36.79	35.84	40.00	-4.16	52.81	0.71	14.20	31.88	100	82	VERTICAL	QP
2	58.13	33.57	40.00	-6.43	59.16	0.88	5.31	31.78	200	260	VERTICAL	QP
3	89.17	35.45	43.50	-8.05	57.39	1.12	8.54	31.60	125	186	VERTICAL	Peak
4	165.80	32.03	43.50	-11.47	52.63	1.56	9.38	31.54	100	143	VERTICAL	Peak
5	478.14	28.20	46.00	-17.80	39.90	2.72	16.79	31.21	200	339	VERTICAL	Peak
6	500.45	33.27	46.00	-12.73	44.94	2.82	16.92	31.41	125	0	VERTICAL	Peak

Note:

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

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

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

4.4.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT20 CH 1 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4823.44	30.76	54.00	-23.24	26.70	5.87	33.39	35.20	Average	100	11	HORIZONTAL
2	4825.08	43.75	74.00	-30.25	39.69	5.87	33.39	35.20	Peak	100	11	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	4821.96	52.65	74.00	-21.35	48.59	5.87	33.39	35.20	Peak	100	250	VERTICAL
2	4824.00	37.29	54.00	-16.71	33.23	5.87	33.39	35.20	Average	100	250	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT20 CH 6 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4870.64	45.68	74.00	-28.32	41.51	5.92	33.45	35.20	Peak	100	78	HORIZONTAL
2	4872.00	31.97	54.00	-22.03	27.77	5.92	33.48	35.20	Average	100	78	HORIZONTAL
3	7310.04	35.70	54.00	-18.30	27.49	7.13	36.51	35.43	Average	100	298	HORIZONTAL
4	7318.32	49.78	74.00	-24.22	41.56	7.14	36.51	35.43	Peak	100	298	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	4872.08	53.77	74.00	-20.23	49.57	5.92	33.48	35.20	Peak	100	260	VERTICAL
2	4872.88	40.18	54.00	-13.82	35.98	5.92	33.48	35.20	Average	100	260	VERTICAL
3	7307.44	50.06	74.00	-23.94	41.85	7.13	36.51	35.43	Peak	100	66	VERTICAL
4	7312.32	36.92	54.00	-17.08	28.71	7.13	36.51	35.43	Average	100	66	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT20 CH 11 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4920.44	31.77	54.00	-22.23	27.46	5.97	33.54	35.20	Average	100	162	HORIZONTAL
2	4928.52	45.69	74.00	-28.31	41.34	5.97	33.58	35.20	Peak	100	162	HORIZONTAL
3	7385.16	36.00	54.00	-18.00	27.68	7.17	36.61	35.46	Average	100	322	HORIZONTAL
4	7386.28	49.24	74.00	-24.76	40.92	7.17	36.61	35.46	Peak	100	322	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	4920.08	32.52	54.00	-21.48	28.21	5.97	33.54	35.20	Average	100	270	VERTICAL
2	4923.80	45.22	74.00	-28.78	40.87	5.97	33.58	35.20	Peak	100	270	VERTICAL
3	7380.16	49.81	74.00	-24.19	41.49	7.16	36.61	35.45	Peak	100	59	VERTICAL
4	7383.84	37.22	54.00	-16.78	28.90	7.17	36.61	35.46	Average	100	59	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT40 CH 3 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4840.56	31.64	54.00	-22.36	27.54	5.88	33.42	35.20	Average	100	113	HORIZONTAL
2	4842.08	45.94	74.00	-28.06	41.84	5.88	33.42	35.20	Peak	100	113	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	4840.20	32.98	54.00	-21.02	28.88	5.88	33.42	35.20	Average	100	308	VERTICAL
2	4850.36	45.11	74.00	-28.89	41.01	5.88	33.42	35.20	Peak	100	308	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4869.88	45.14	74.00	-28.86	40.97	5.92	33.45	35.20	Peak	100	267	HORIZONTAL
2	4871.52	31.79	54.00	-22.21	27.59	5.92	33.48	35.20	Average	100	267	HORIZONTAL
3	7302.08	49.24	74.00	-24.76	41.05	7.13	36.48	35.42	Peak	100	200	HORIZONTAL
4	7312.96	35.69	54.00	-18.31	27.48	7.13	36.51	35.43	Average	100	200	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	4874.28	31.80	54.00	-22.20	27.60	5.92	33.48	35.20	Average	100	274	VERTICAL
2	4877.48	45.84	74.00	-28.16	41.64	5.92	33.48	35.20	Peak	100	274	VERTICAL
3	7309.84	50.02	74.00	-23.98	41.81	7.13	36.51	35.43	Peak	100	162	VERTICAL
4	7312.28	35.65	54.00	-18.35	27.44	7.13	36.51	35.43	Average	100	162	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT40 CH 9 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4902.56	32.97	54.00	-21.03	28.71	5.95	33.51	35.20	Average	100	355	HORIZONTAL
2	4908.20	45.76	74.00	-28.24	41.47	5.95	33.54	35.20	Peak	100	355	HORIZONTAL
3	7360.24	50.13	74.00	-23.87	41.83	7.16	36.59	35.45	Peak	100	273	HORIZONTAL
4	7362.72	37.18	54.00	-16.82	28.88	7.16	36.59	35.45	Average	100	273	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	4901.08	33.82	54.00	-20.18	29.58	5.93	33.51	35.20	Average	100	225	VERTICAL
2	4902.72	45.64	74.00	-28.36	41.38	5.95	33.51	35.20	Peak	100	225	VERTICAL
3	7350.32	51.14	74.00	-22.86	42.86	7.16	36.56	35.44	Peak	100	73	VERTICAL
4	7355.20	37.26	54.00	-16.74	28.98	7.16	36.56	35.44	Average	100	73	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11480.02	41.46	54.00	-12.54	28.13	9.08	39.10	34.85	100	187	HORIZONTAL	Average
2	11490.70	53.05	74.00	-20.95	39.71	9.09	39.10	34.85	100	187	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.12	54.79	74.00	-19.21	41.45	9.09	39.10	34.85	100	32	VERTICAL	Peak
2	11493.72	42.83	54.00	-11.17	29.48	9.10	39.10	34.85	100	32	VERTICAL	Average

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11560.90	41.57	54.00	-12.43	28.31	9.10	39.01	34.85	100	172	HORIZONTAL	Average
2	11563.04	52.79	74.00	-21.21	39.52	9.11	39.01	34.85	100	172	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11576.54	42.38	54.00	-11.62	29.11	9.11	39.01	34.85	100	4	VERTICAL	Average
2	11578.88	53.18	74.00	-20.82	39.91	9.11	39.01	34.85	100	4	VERTICAL	Peak

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11646.20	42.49	54.00	-11.51	29.30	9.11	38.93	34.85	100	201	HORIZONTAL	Average
2	11655.62	52.83	74.00	-21.17	39.68	9.11	38.89	34.85	100	201	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11645.36	43.03	54.00	-10.97	29.84	9.11	38.93	34.85	100	312	VERTICAL	Average
2	11649.80	54.40	74.00	-19.60	41.21	9.11	38.93	34.85	100	312	VERTICAL	Peak

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11510.24	41.77	54.00	-12.23	28.42	9.10	39.10	34.85	100	228	HORIZONTAL	Average
2	11519.24	52.70	74.00	-21.30	39.39	9.10	39.06	34.85	100	228	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11515.34	42.30	54.00	-11.70	28.95	9.10	39.10	34.85	100	360	VERTICAL	Average
2	11517.14	54.59	74.00	-19.41	41.28	9.10	39.06	34.85	100	360	VERTICAL	Peak

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11593.32	53.67	74.00	-20.33	40.44	9.11	38.97	34.85	100	118	HORIZONTAL	Peak
2	11598.80	41.92	54.00	-12.08	28.69	9.11	38.97	34.85	100	118	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11590.30	53.60	74.00	-20.40	40.37	9.11	38.97	34.85	100	360	VERTICAL	Peak
2	11598.04	42.08	54.00	-11.92	28.85	9.11	38.97	34.85	100	360	VERTICAL	Average

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11542.06	41.77	54.00	-12.23	28.46	9.10	39.06	34.85	100	152	HORIZONTAL	Average
2	11543.62	53.78	74.00	-20.22	40.47	9.10	39.06	34.85	100	152	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11544.18	41.72	54.00	-12.28	28.41	9.10	39.06	34.85	100	118	VERTICAL	Average
2	11558.48	52.77	74.00	-21.23	39.51	9.10	39.01	34.85	100	118	VERTICAL	Peak

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4823.96	50.69	74.00	-23.31	46.63	5.87	33.39	35.20	Peak	200	139	HORIZONTAL
2	4824.04	45.95	54.00	-8.05	41.89	5.87	33.39	35.20	Average	200	139	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	4823.98	54.61	74.00	-19.39	50.55	5.87	33.39	35.20	Peak	100	251	VERTICAL
2	4824.04	51.66	54.00	-2.34	47.60	5.87	33.39	35.20	Average	100	251	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2
Test Date	Jun. 23, 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	4874.00	46.08	74.00	-27.92	41.88	5.92	33.48	35.20	Peak	100	212	HORIZONTAL
2	4874.04	36.00	54.00	-18.00	31.80	5.92	33.48	35.20	Average	100	212	HORIZONTAL
3	7304.72	48.66	74.00	-25.34	40.47	7.13	36.48	35.42	Peak	100	184	HORIZONTAL
4	7309.36	36.27	54.00	-17.73	28.06	7.13	36.51	35.43	Average	100	184	HORIZONTAL
5	12177.52	55.13	74.00	-18.87	41.45	9.38	39.13	34.83	Peak	100	170	HORIZONTAL
6	12183.20	40.61	54.00	-13.39	26.95	9.38	39.11	34.83	Average	100	170	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	4874.00	53.63	54.00	-0.37	49.43	5.92	33.48	35.20	Average	100	260	VERTICAL
2	4874.00	55.86	74.00	-18.14	51.66	5.92	33.48	35.20	Peak	100	260	VERTICAL
3	7310.72	35.46	54.00	-18.54	27.25	7.13	36.51	35.43	Average	100	36	VERTICAL
4	7315.80	48.27	74.00	-25.73	40.05	7.14	36.51	35.43	Peak	100	36	VERTICAL
5	12183.72	41.85	54.00	-12.15	28.19	9.38	39.11	34.83	Average	100	130	VERTICAL
6	12194.52	55.98	74.00	-18.02	42.29	9.38	39.11	34.80	Peak	100	130	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2
Test Date	Jun. 23, 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	4923.96	47.85	74.00	-26.15	43.50	5.97	33.58	35.20	Peak	100	154	HORIZONTAL
2	4924.04	41.30	54.00	-12.70	36.95	5.97	33.58	35.20	Average	100	154	HORIZONTAL
3	7378.04	48.76	74.00	-25.24	40.44	7.16	36.61	35.45	Peak	100	188	HORIZONTAL
4	7387.56	35.39	54.00	-18.61	27.07	7.17	36.61	35.46	Average	100	188	HORIZONTAL
5	12304.32	41.13	54.00	-12.87	27.44	9.40	38.99	34.70	Average	100	210	HORIZONTAL
6	12314.32	54.54	74.00	-19.46	40.82	9.40	38.99	34.67	Peak	100	210	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	4924.04	50.83	54.00	-3.17	46.48	5.97	33.58	35.20	Average	100	251	VERTICAL
2	4924.04	53.98	74.00	-20.02	49.63	5.97	33.58	35.20	Peak	100	251	VERTICAL
3	7379.28	34.78	54.00	-19.22	26.46	7.16	36.61	35.45	Average	100	261	VERTICAL
4	7383.40	48.31	74.00	-25.69	40.00	7.16	36.61	35.46	Peak	100	261	VERTICAL
5	12312.36	54.00	74.00	-20.00	40.31	9.40	38.99	34.70	Peak	100	261	VERTICAL
6	12313.84	40.48	54.00	-13.52	26.76	9.40	38.99	34.67	Average	100	261	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	2800.03	48.81	54.00	-5.19	50.18	4.49	29.26	35.12	Average	107	106	HORIZONTAL
2	2800.08	51.33	74.00	-22.67	52.70	4.49	29.26	35.12	Peak	107	106	HORIZONTAL
3	4824.00	35.80	54.00	-18.20	31.74	5.87	33.39	35.20	Average	189	133	HORIZONTAL
4	4824.70	48.79	74.00	-25.21	44.73	5.87	33.39	35.20	Peak	189	133	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	2799.98	53.75	74.00	-20.25	55.12	4.49	29.26	35.12	Peak	100	151	VERTICAL
2	2800.03	51.87	54.00	-2.13	53.24	4.49	29.26	35.12	Average	100	151	VERTICAL
3	4824.00	40.09	54.00	-13.91	36.03	5.87	33.39	35.20	Average	100	251	VERTICAL
4	4824.60	53.60	74.00	-20.40	49.54	5.87	33.39	35.20	Peak	100	251	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	2800.03	49.33	54.00	-4.67	50.70	4.49	29.26	35.12	Average	103	105	HORIZONTAL
2	2800.09	51.66	74.00	-22.34	53.03	4.49	29.26	35.12	Peak	103	105	HORIZONTAL
3	4872.20	34.50	54.00	-19.50	30.30	5.92	33.48	35.20	Average	179	135	HORIZONTAL
4	4874.00	48.32	74.00	-25.68	44.12	5.92	33.48	35.20	Peak	179	135	HORIZONTAL
5	7293.20	49.46	74.00	-24.54	41.28	7.12	36.48	35.42	Peak	100	310	HORIZONTAL
6	7309.70	36.26	54.00	-17.74	28.05	7.13	36.51	35.43	Average	100	310	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	2800.00	54.38	74.00	-19.62	55.75	4.49	29.26	35.12	Peak	100	154	VERTICAL
2	2800.03	52.55	54.00	-1.45	53.92	4.49	29.26	35.12	Average	100	154	VERTICAL
3	4872.00	43.28	54.00	-10.72	39.08	5.92	33.48	35.20	Average	100	260	VERTICAL
4	4874.90	56.16	74.00	-17.84	51.96	5.92	33.48	35.20	Peak	100	260	VERTICAL
5	7305.90	54.63	74.00	-19.37	46.44	7.13	36.48	35.42	Peak	181	86	VERTICAL
6	7310.10	40.09	54.00	-13.91	31.88	7.13	36.51	35.43	Average	181	86	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2
Test Date	Jun. 24, 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	4924.90	31.79	54.00	-22.21	27.44	5.97	33.58	35.20	Average	100	156	HORIZONTAL
2	4936.30	45.52	74.00	-28.48	41.16	5.98	33.58	35.20	Peak	100	156	HORIZONTAL
3	7383.30	36.27	54.00	-17.73	27.95	7.16	36.61	35.45	Average	100	298	HORIZONTAL
4	7385.10	49.73	74.00	-24.27	41.41	7.17	36.61	35.46	Peak	100	298	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	4924.50	49.44	74.00	-24.56	45.09	5.97	33.58	35.20	Peak	100	250	VERTICAL
2	4925.80	35.43	54.00	-18.57	31.08	5.97	33.58	35.20	Average	100	250	VERTICAL
3	7383.00	50.08	74.00	-23.92	41.76	7.16	36.61	35.45	Peak	100	26	VERTICAL
4	7386.10	36.71	54.00	-17.29	28.39	7.17	36.61	35.46	Average	100	26	VERTICAL

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11470.64	41.73	54.00	-12.27	28.40	9.08	39.10	34.85	100	221	HORIZONTAL	Average
2	11484.64	53.00	74.00	-21.00	39.66	9.09	39.10	34.85	100	221	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11488.16	42.54	54.00	-11.46	29.20	9.09	39.10	34.85	100	0	VERTICAL	Average
2	11489.00	54.50	74.00	-19.50	41.16	9.09	39.10	34.85	100	0	VERTICAL	Peak

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11568.12	53.25	74.00	-20.75	39.98	9.11	39.01	34.85	100	352	HORIZONTAL	Peak
2	11589.44	42.04	54.00	-11.96	28.81	9.11	38.97	34.85	100	352	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.08	41.74	54.00	-12.26	28.47	9.11	39.01	34.85	100	14	VERTICAL	Average
2	11582.64	54.48	74.00	-19.52	41.21	9.11	39.01	34.85	100	14	VERTICAL	Peak

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2
Test Date	Jun. 25, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11631.96	42.40	54.00	-11.60	29.21	9.11	38.93	34.85	100	161	HORIZONTAL	Average
2	11643.60	54.28	74.00	-19.72	41.09	9.11	38.93	34.85	100	161	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11634.08	53.45	74.00	-20.55	40.26	9.11	38.93	34.85	100	0	VERTICAL	Peak
2	11647.72	43.28	54.00	-10.72	30.09	9.11	38.93	34.85	100	0	VERTICAL	Average

Note:

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

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

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

4.5. Emissions Measurement

4.5.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	100 kHz / 300 kHz for Peak

4.5.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.4.3, only the frequency range investigated is limited to 100MHz around band edges.

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure
2. The radiated emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
   Only worst data of each operating mode is presented.

4.5.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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 Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT20 CH 1, 6, 11 / Chain 1 + Chain 2
Test date	Jun. 24, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2389.84	68.76	74.00	-5.24	37.93	2.91	27.92	0.00	Peak	61	141	VERTICAL
2	2390.00	52.64	54.00	-1.36	21.81	2.91	27.92	0.00	Average	61	141	VERTICAL
3	2411.20	111.88			81.06	2.92	27.90	0.00	Peak	61	141	VERTICAL
4	2411.52	102.30			71.48	2.92	27.90	0.00	Average	61	141	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2388.08	66.08	74.00	-7.92	35.25	2.91	27.92	0.00	Peak	95	145	VERTICAL
2	2390.00	51.48	54.00	-2.52	20.65	2.91	27.92	0.00	Average	95	145	VERTICAL
3	2437.32	118.03			87.23	2.94	27.86	0.00	Peak	95	145	VERTICAL
4	2437.64	107.91			77.11	2.94	27.86	0.00	Average	95	145	VERTICAL
5	2483.50	52.45	54.00	-1.55	21.67	2.96	27.82	0.00	Average	95	145	VERTICAL
6	2483.82	67.85	74.00	-6.15	37.07	2.96	27.82	0.00	Peak	95	145	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2461.20	110.03			79.24	2.95	27.84	0.00	Peak	93	143	VERTICAL
2	2462.48	100.39			69.60	2.95	27.84	0.00	Average	93	143	VERTICAL
3	2483.50	68.70	74.00	-5.30	37.92	2.96	27.82	0.00	Peak	93	143	VERTICAL
4	2483.50	52.86	54.00	-1.14	22.08	2.96	27.82	0.00	Average	93	143	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11n MCS0 HT40 CH 3, 6, 9 / Chain 1 + Chain 2
Test date	Jun. 24, 2014		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2388.72	67.42	74.00	-6.58	36.59	2.91	27.92	0.00	Peak	62	140	VERTICAL
2	2390.00	52.75	54.00	-1.25	21.92	2.91	27.92	0.00	Average	62	140	VERTICAL
3	2423.28	106.87			76.06	2.93	27.88	0.00	Peak	62	140	VERTICAL
4	2423.60	97.59			66.78	2.93	27.88	0.00	Average	62	140	VERTICAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	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	2388.80	67.36	74.00	-6.64	35.22	4.09	28.05	0.00	Peak	141	54	VERTICAL
2	2390.00	52.61	54.00	-1.39	20.47	4.09	28.05	0.00	Average	141	54	VERTICAL
3	2435.00	108.16			75.86	4.12	28.18	0.00	Peak	141	54	VERTICAL
4	2435.40	98.15			65.85	4.12	28.18	0.00	Average	141	54	VERTICAL
5	2483.50	49.59	54.00	-4.41	17.17	4.16	28.26	0.00	Average	141	54	VERTICAL
6	2483.50	62.98	74.00	-11.02	30.56	4.16	28.26	0.00	Peak	141	54	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9

	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	2454.00	96.07			63.71	4.14	28.22	0.00	Average	100	78	VERTICAL
2	2455.20	106.24			73.88	4.14	28.22	0.00	Peak	100	78	VERTICAL
3	2483.50	52.98	54.00	-1.02	20.56	4.16	28.26	0.00	Average	100	78	VERTICAL
4	2484.70	68.32	74.00	-5.68	35.90	4.16	28.26	0.00	Peak	100	78	VERTICAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Note:

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

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

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2
Test date	Jun. 23, 2014		

Channel 1

	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	2387.00	52.31	54.00	-1.69	20.17	4.09	28.05	0.00	Average	100	143	VERTICAL
2	2387.20	59.20	74.00	-14.80	27.06	4.09	28.05	0.00	Peak	100	143	VERTICAL
3	2410.20	106.55			74.35	4.11	28.09	0.00	Average	100	143	VERTICAL
4	2410.60	110.32			78.12	4.11	28.09	0.00	Peak	100	143	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	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	2390.00	44.48	54.00	-9.52	12.34	4.09	28.05	0.00	Average	100	79	VERTICAL
2	2390.00	55.97	74.00	-18.03	23.83	4.09	28.05	0.00	Peak	100	79	VERTICAL
3	2438.60	98.50			66.19	4.13	28.18	0.00	Average	100	79	VERTICAL
4	2439.80	102.27			69.96	4.13	28.18	0.00	Peak	100	79	VERTICAL
5	2483.50	44.36	54.00	-9.64	11.94	4.16	28.26	0.00	Average	100	79	VERTICAL
6	2483.50	55.01	74.00	-18.99	22.59	4.16	28.26	0.00	Peak	100	79	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	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	2460.20	106.31			73.95	4.14	28.22	0.00	Average	100	264	VERTICAL
2	2460.60	109.79			77.43	4.14	28.22	0.00	Peak	100	264	VERTICAL
3	2486.50	61.27	74.00	-12.73	28.81	4.16	28.30	0.00	Peak	100	264	VERTICAL
4	2486.70	52.87	54.00	-1.13	20.41	4.16	28.30	0.00	Average	100	264	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	24°C	Humidity	55%
Test Engineer	James Chou	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2
Test date	Jun. 24, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2389.52	66.49	74.00	-7.51	35.66	2.91	27.92	0.00	Peak	101	100	VERTICAL
2	2390.00	52.95	54.00	-1.05	22.12	2.91	27.92	0.00	Average	101	100	VERTICAL
3	2411.36	100.58			69.76	2.92	27.90	0.00	Average	101	100	VERTICAL
4	2414.72	109.69			78.87	2.92	27.90	0.00	Peak	101	100	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2389.68	64.74	74.00	-9.26	33.91	2.91	27.92	0.00	Peak	94	146	VERTICAL
2	2390.00	51.43	54.00	-2.57	20.60	2.91	27.92	0.00	Average	94	146	VERTICAL
3	2436.36	108.18			77.37	2.93	27.88	0.00	Average	94	146	VERTICAL
4	2437.96	117.44			86.64	2.94	27.86	0.00	Peak	94	146	VERTICAL
5	2483.50	52.79	54.00	-1.21	22.01	2.96	27.82	0.00	Average	94	146	VERTICAL
6	2484.46	67.46	74.00	-6.54	36.68	2.96	27.82	0.00	Peak	94	146	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2461.36	101.13			70.34	2.95	27.84	0.00	Average	94	142	VERTICAL
2	2463.92	110.36			79.57	2.95	27.84	0.00	Peak	94	142	VERTICAL
3	2483.50	68.17	74.00	-5.83	37.39	2.96	27.82	0.00	Peak	94	142	VERTICAL
4	2483.50	52.61	54.00	-1.39	21.83	2.96	27.82	0.00	Average	94	142	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

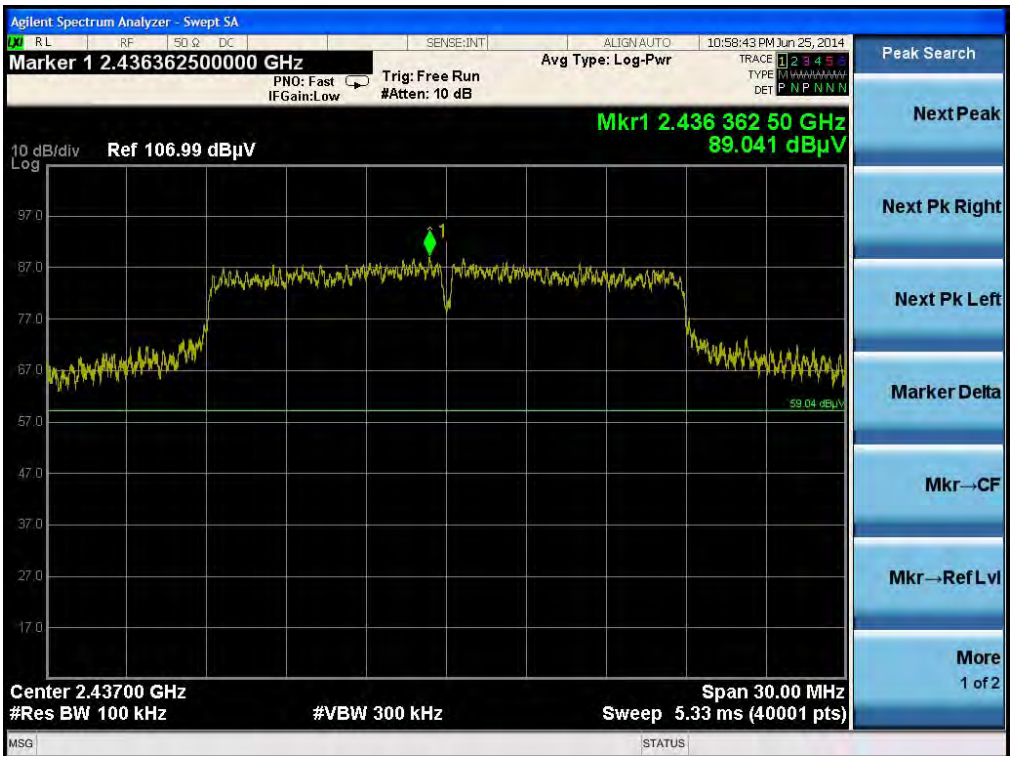
Note:

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

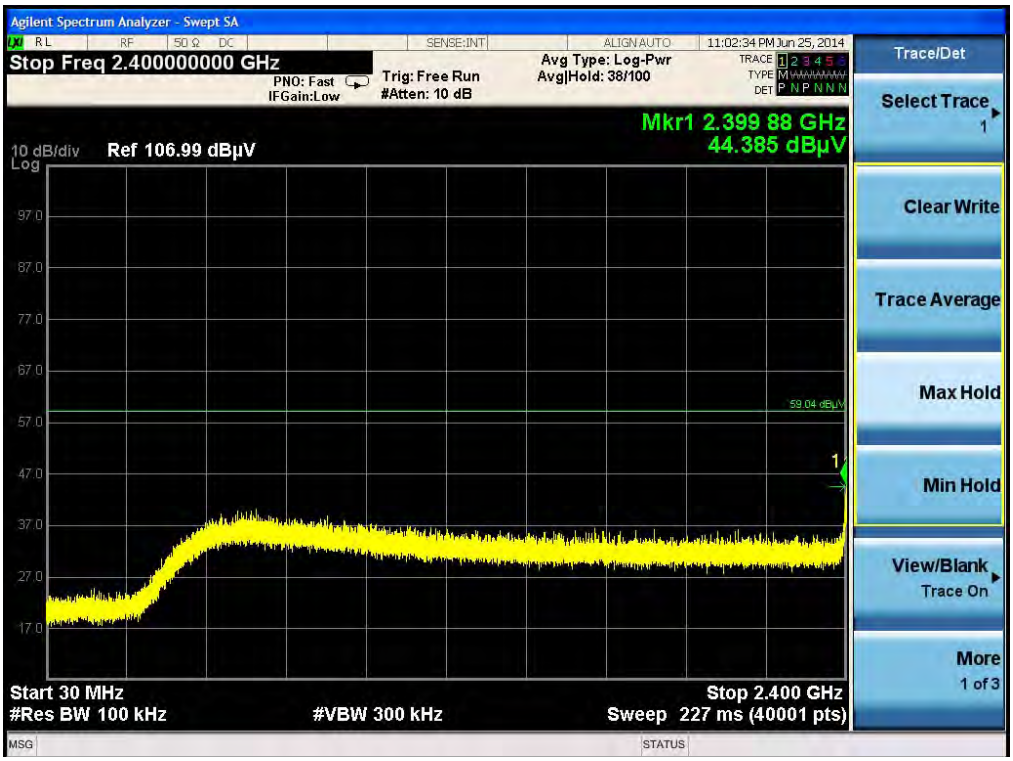
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

For Emission not in Restricted Band

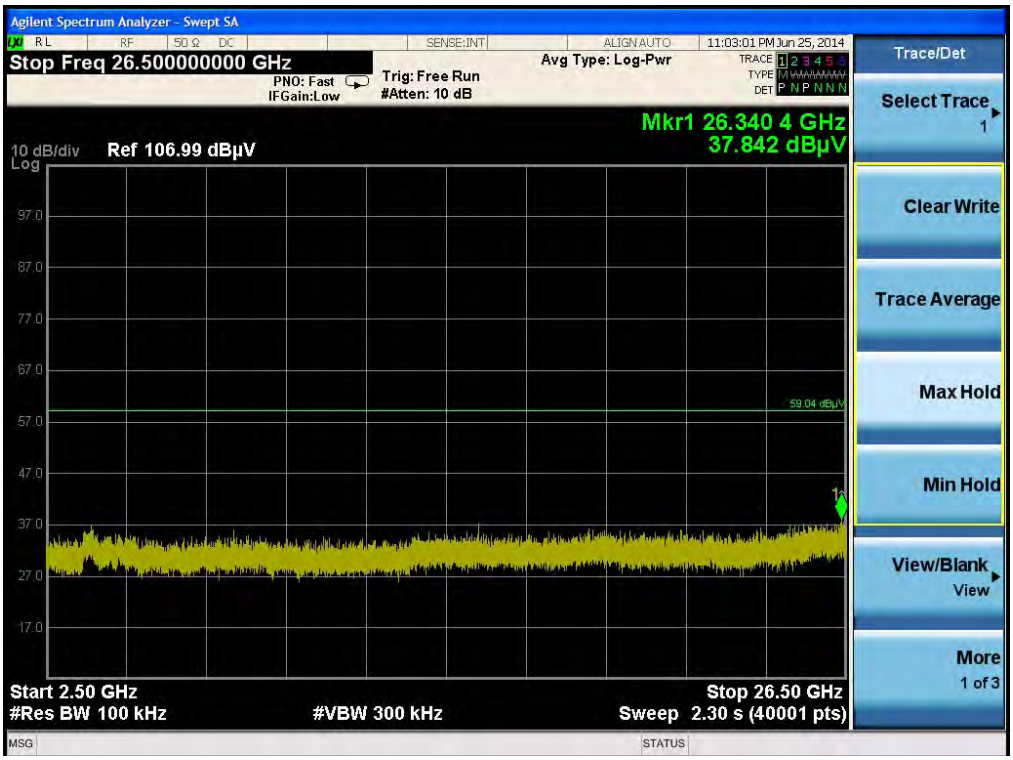
Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level



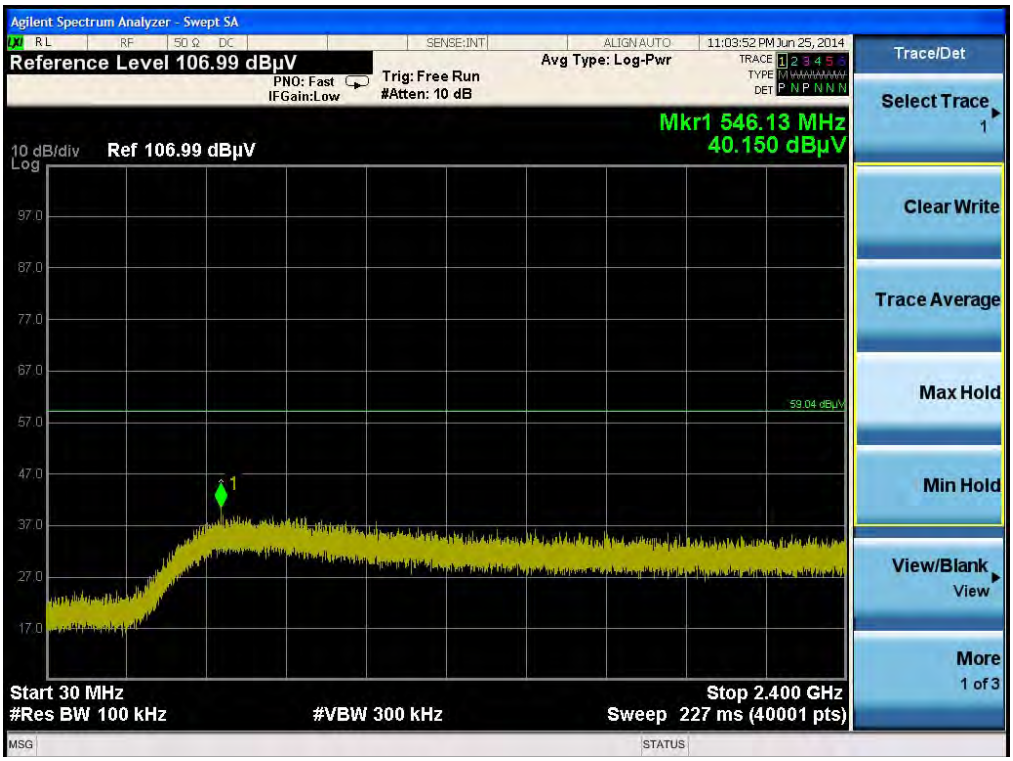
Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



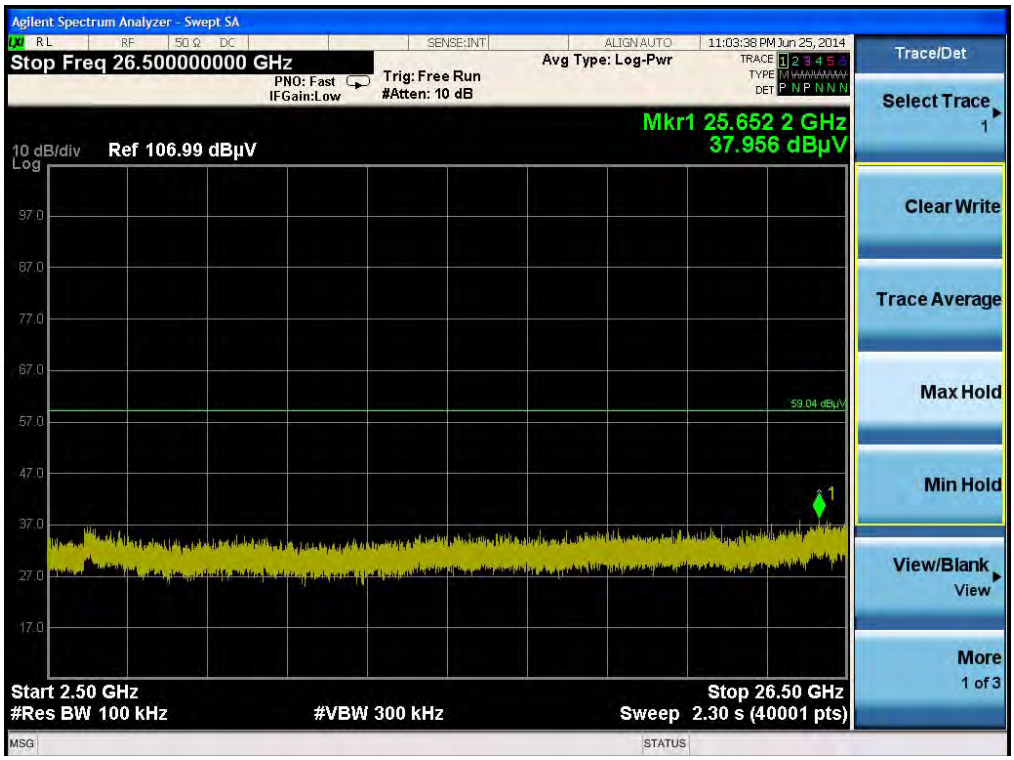
Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



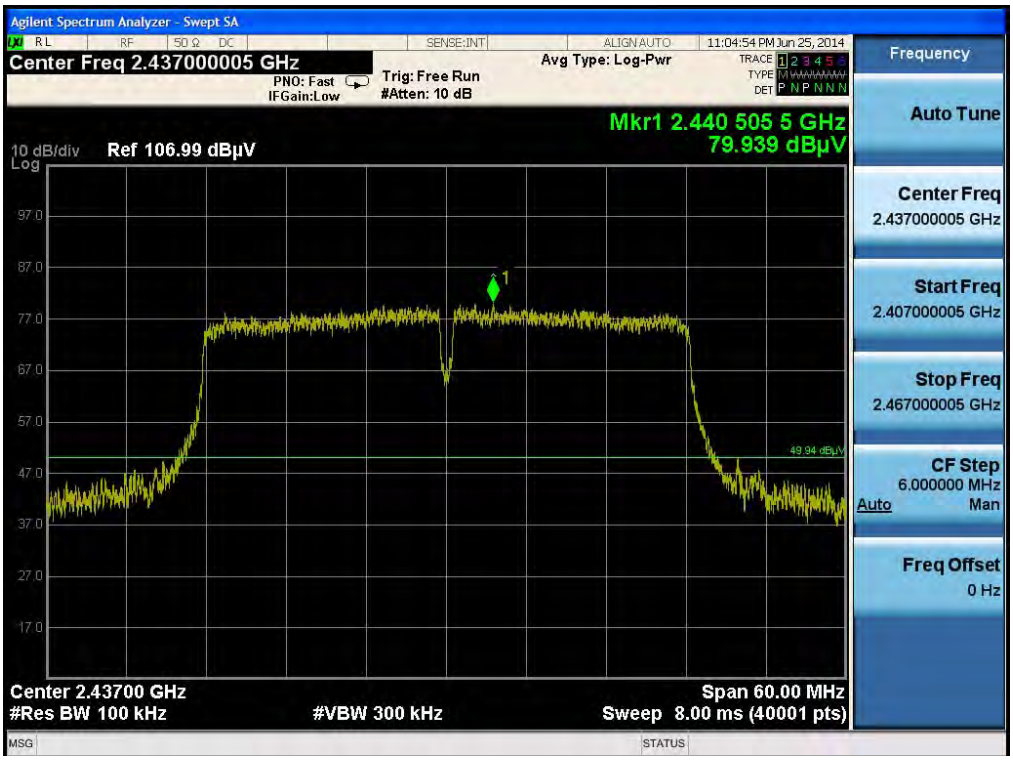
Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)

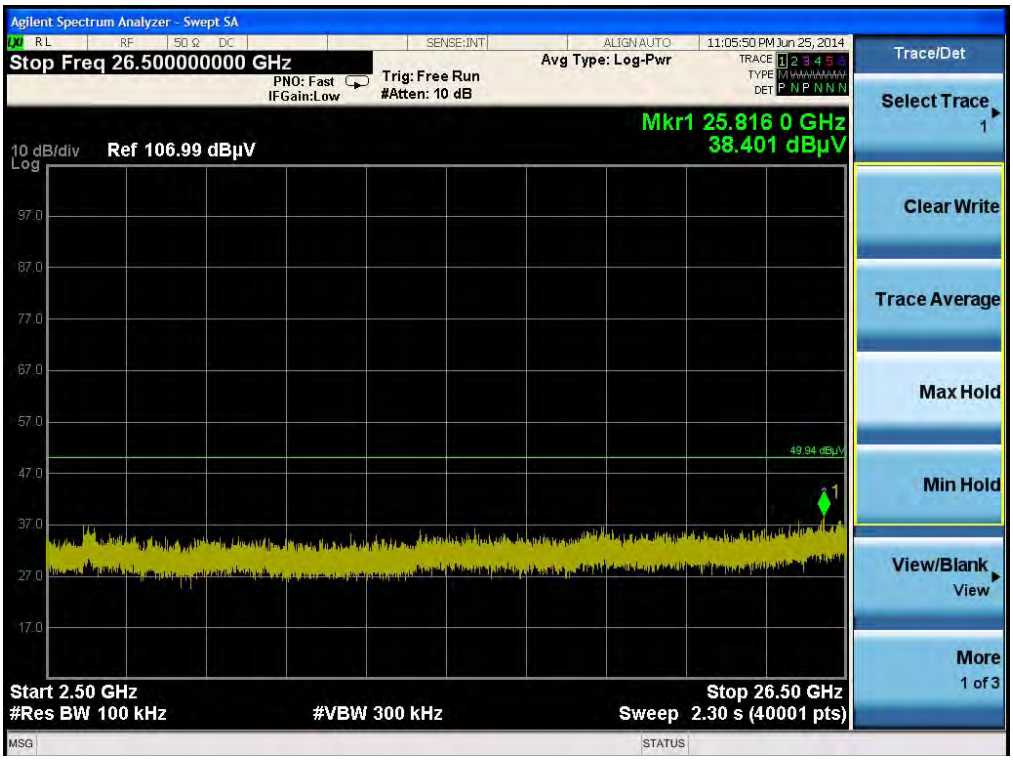


Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level



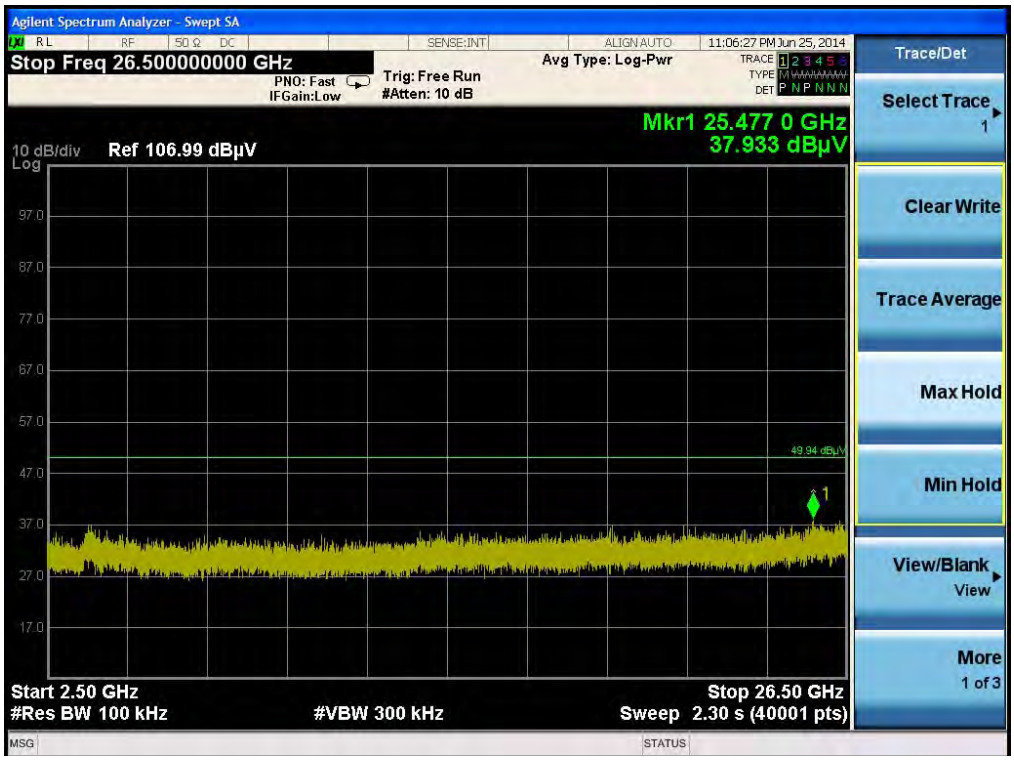
Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 3 / 30MHz~2400MHz (down 30dBc)

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)

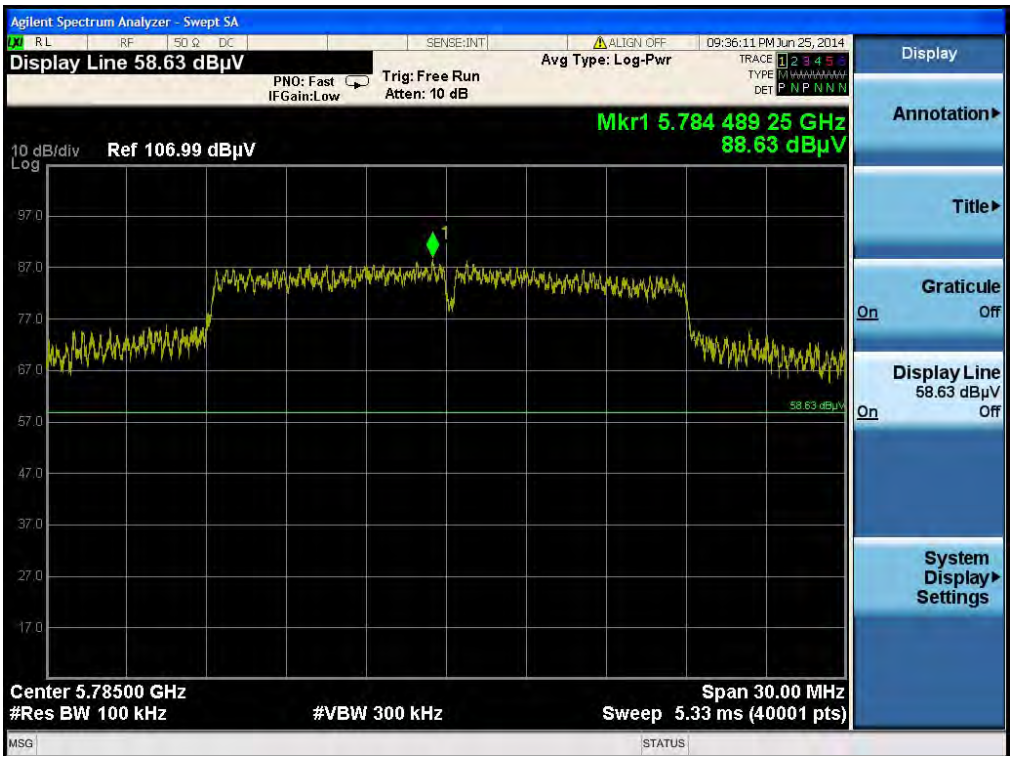


Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 9 / 30MHz~2400MHz (down 30dBc)

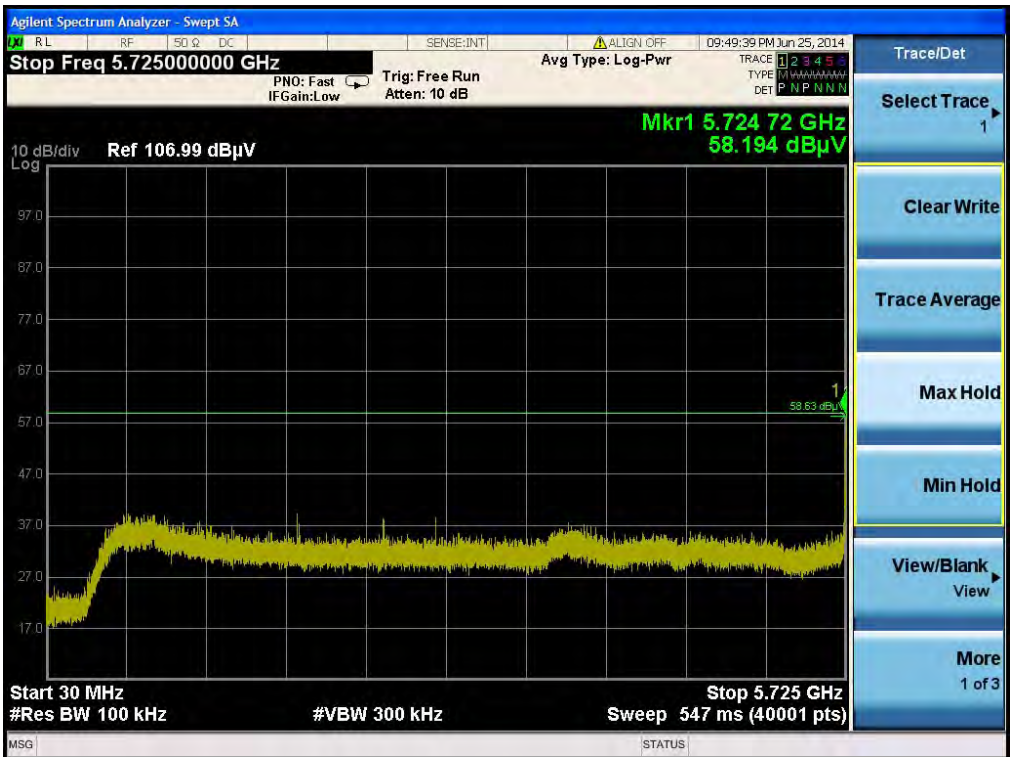
Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level

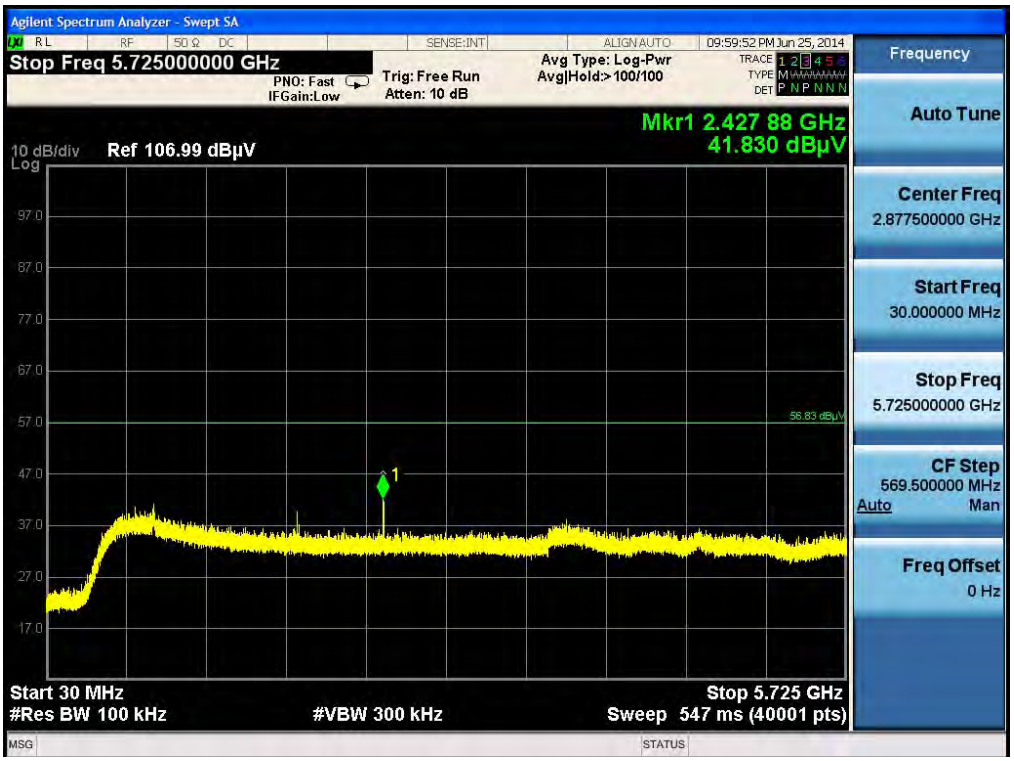


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 30MHz~5725MHz (down 30dBc)



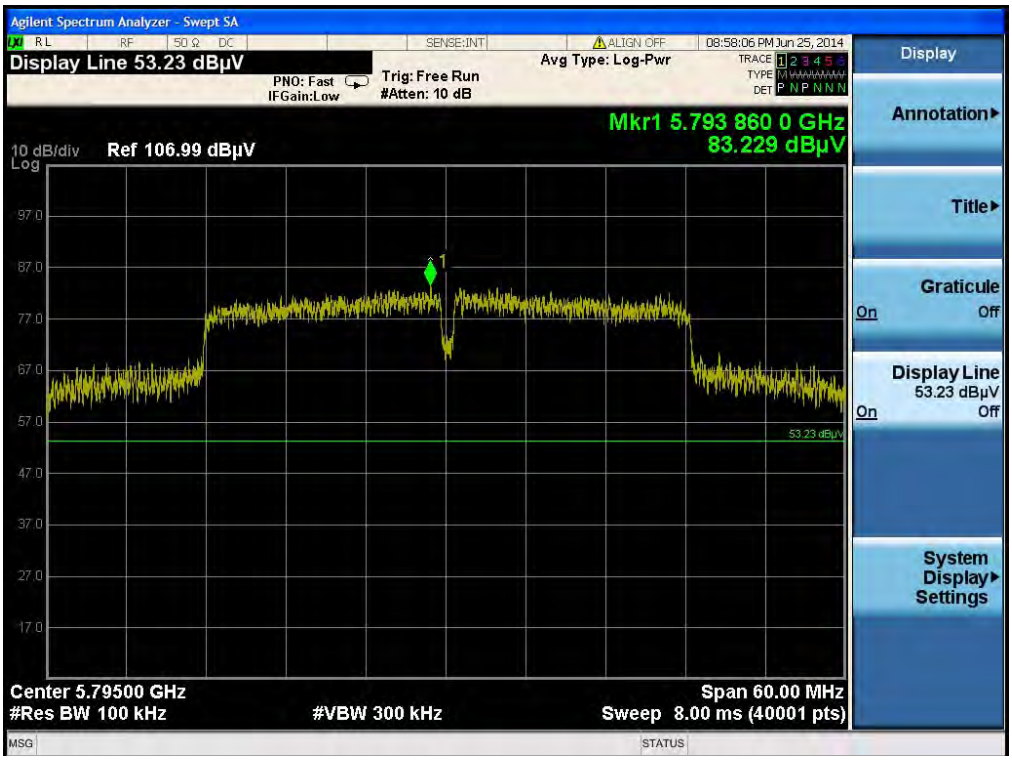
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 5850MHz~40000MHz (down 30dBc)

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 30MHz~5725MHz (down 30dBc)

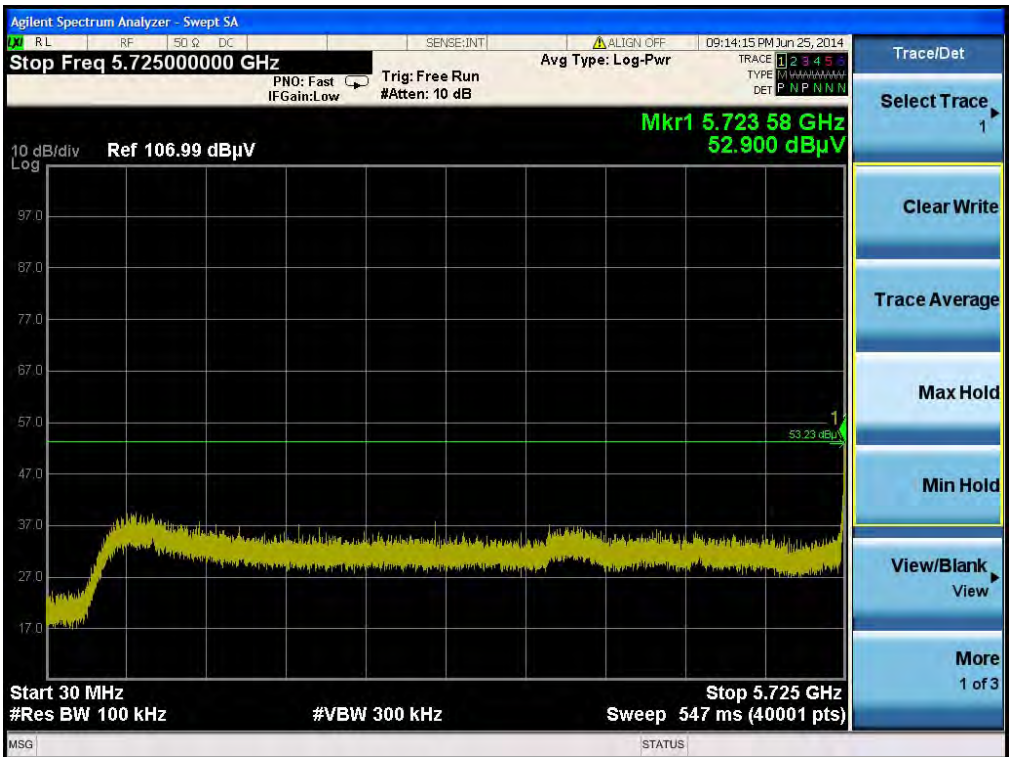


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)

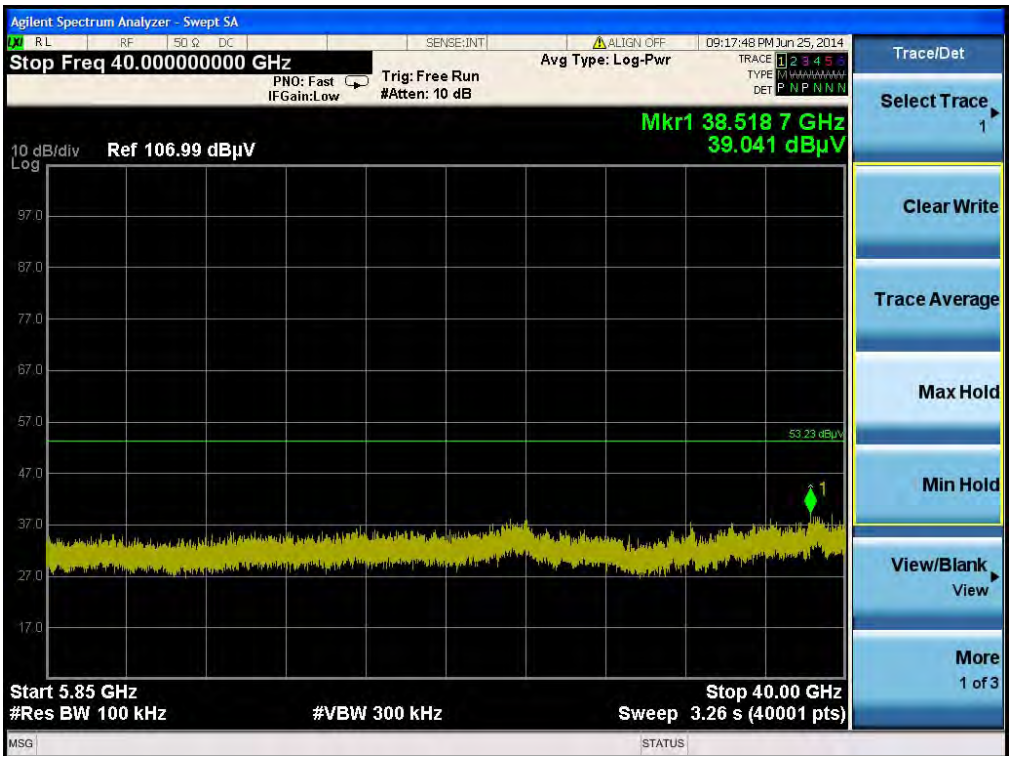
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 30MHz~5725MHz (down 30dBc)

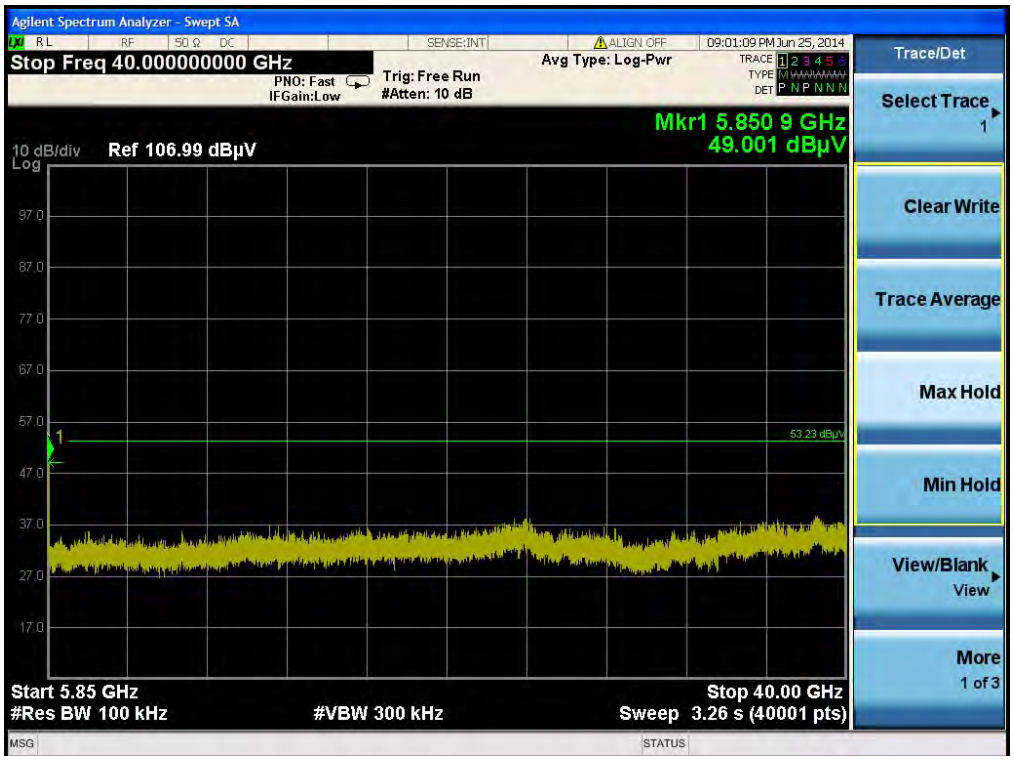


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 5850MHz~40000MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 30MHz~5725MHz (down 30dBc)

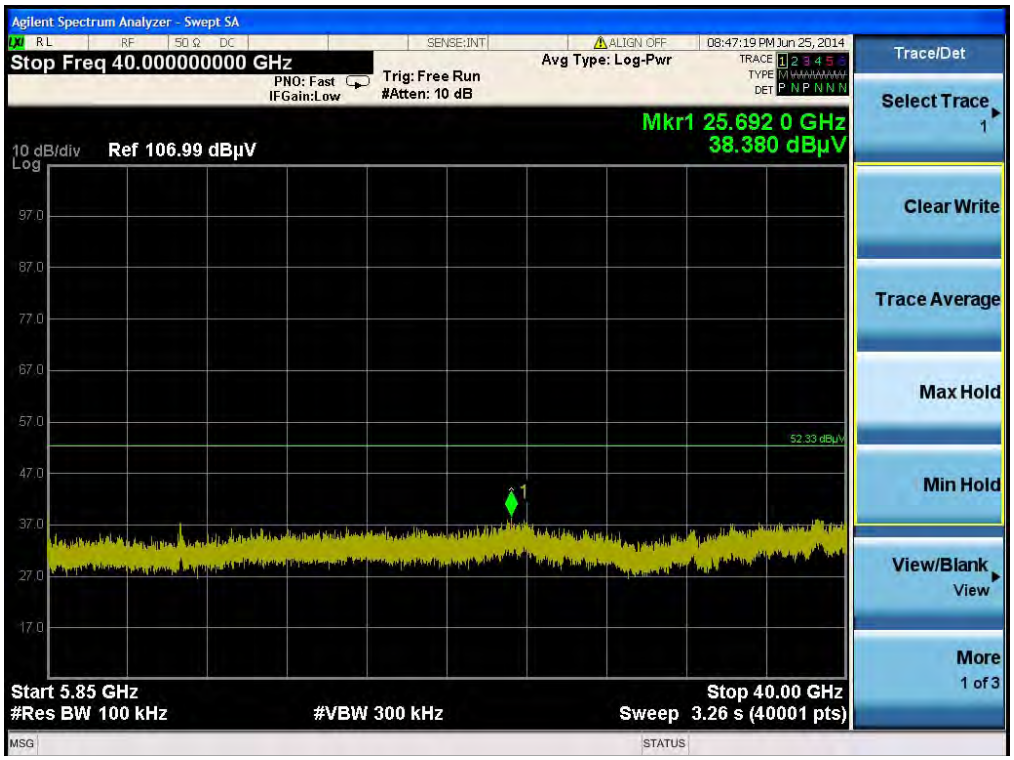
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 5850MHz~40000MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 30MHz~5725MHz (down 30dBc)

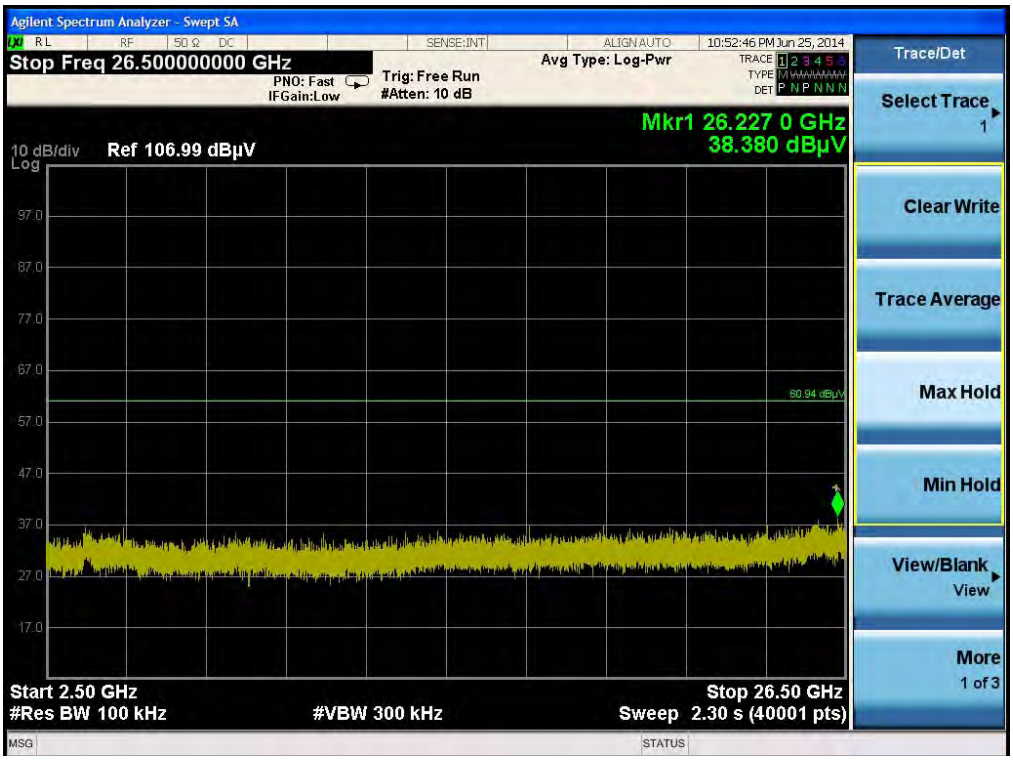
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)



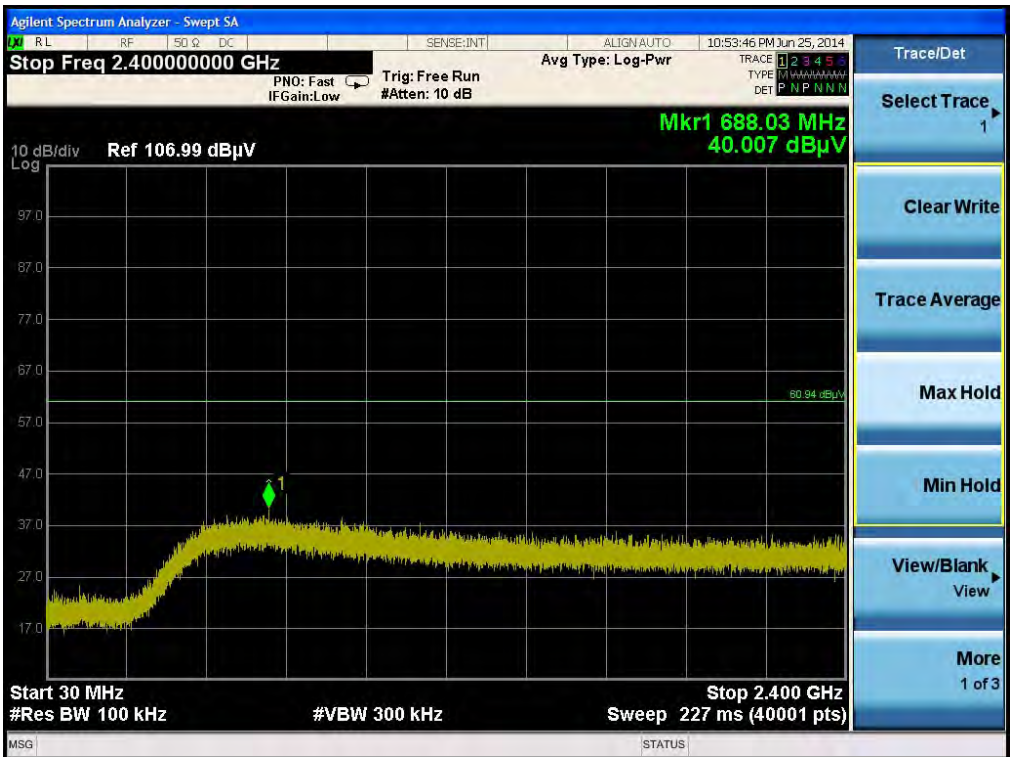
Plot on Configuration IEEE 802.11b / Reference Level

Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc)

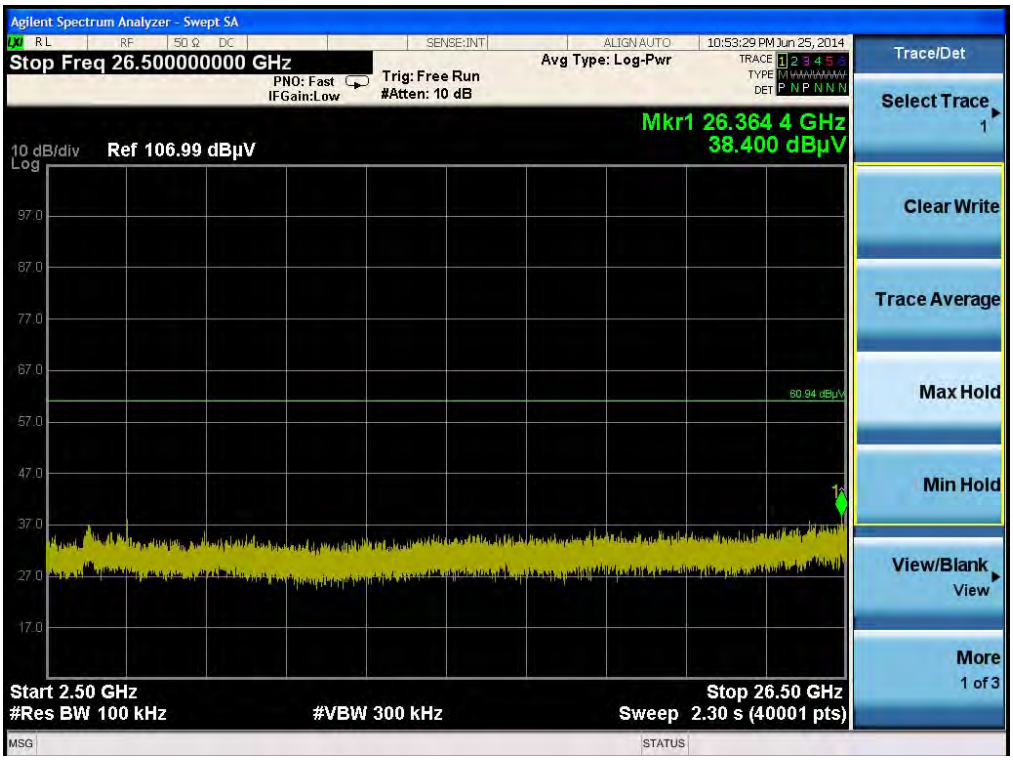
Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



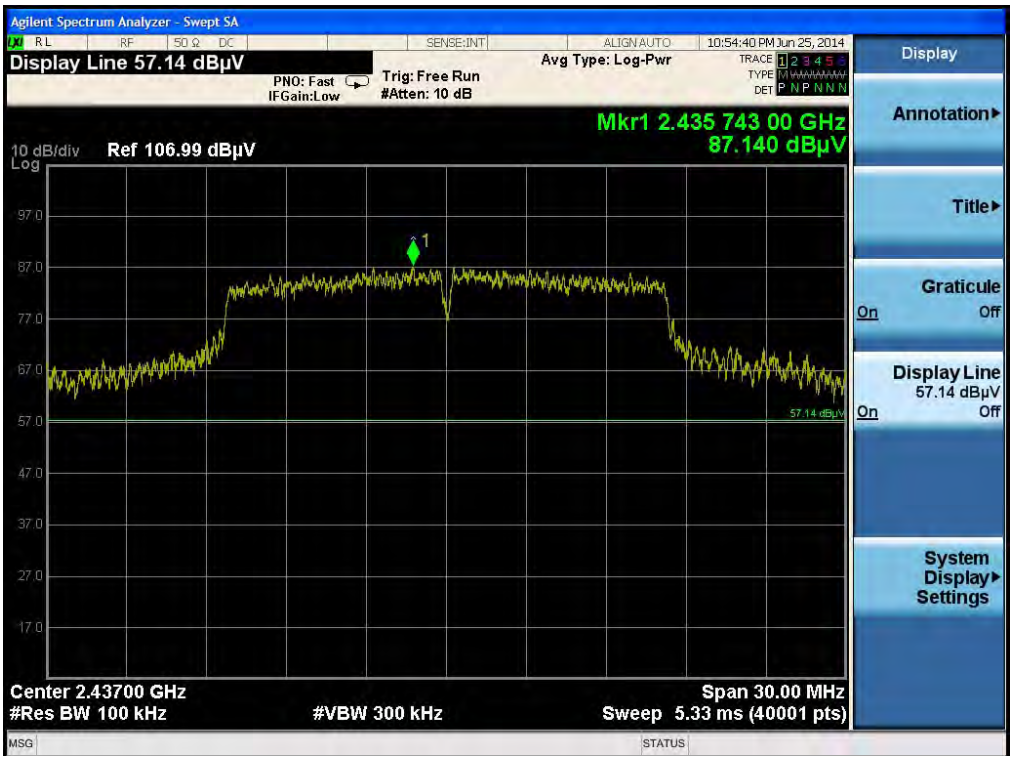
Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



Plot on Configuration IEEE 802.11b / CH 11 / 2500MHz~26500MHz (down 30dBc)

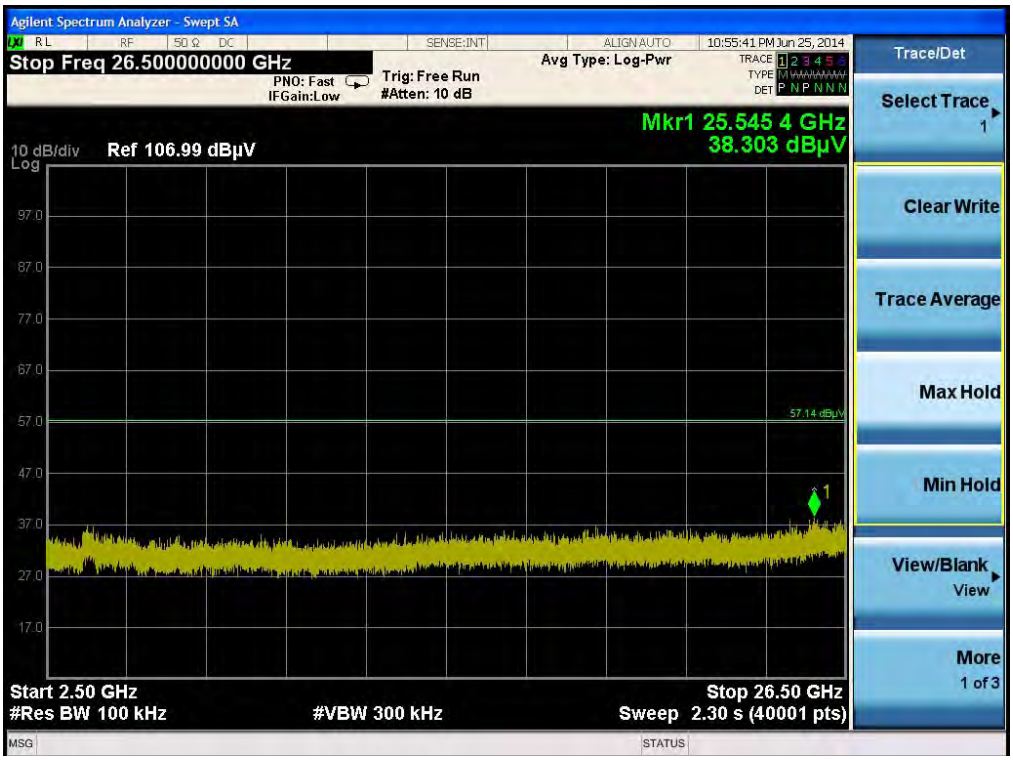


Plot on Configuration IEEE 802.11g / Reference Level

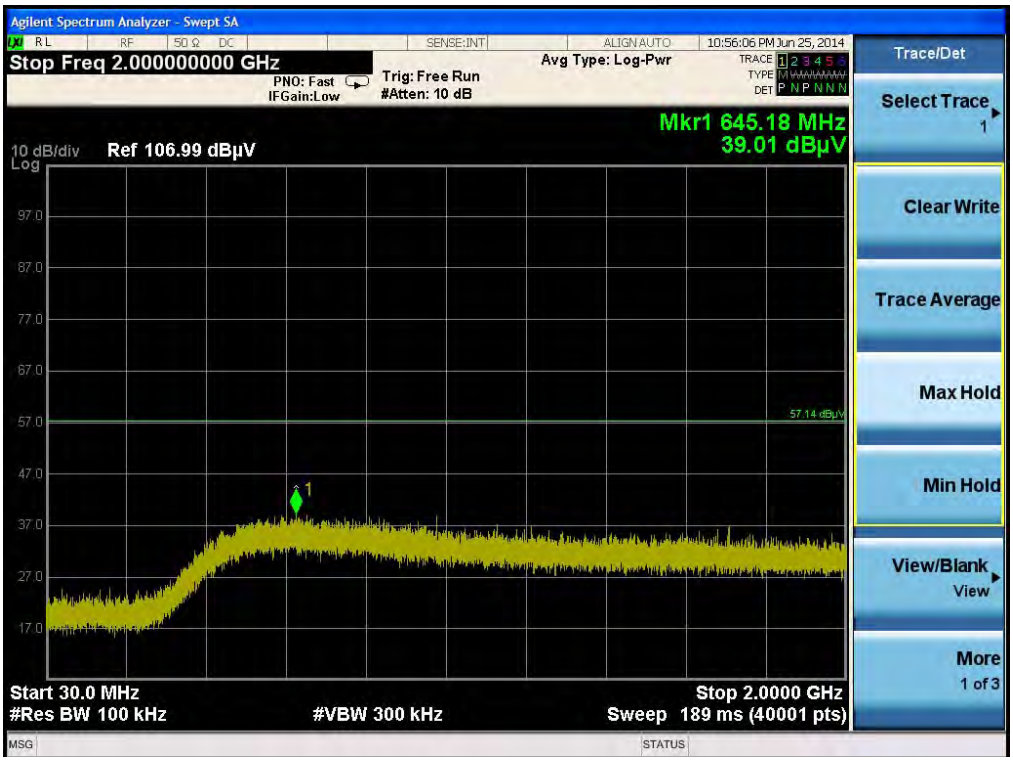


Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)

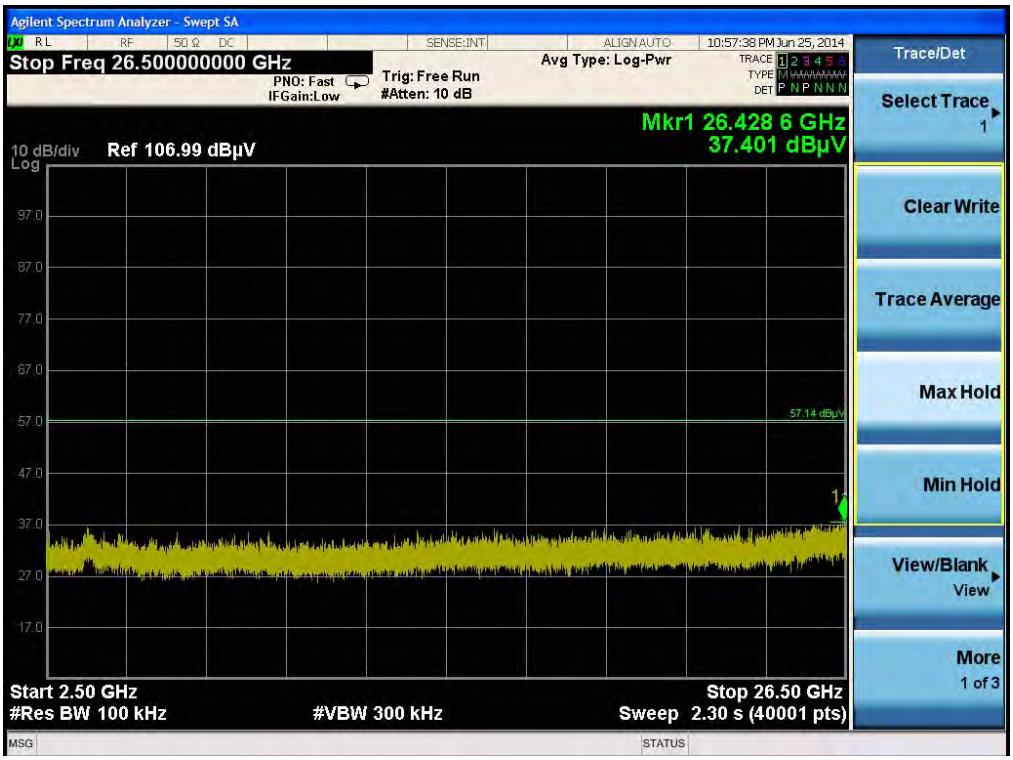
Plot on Configuration IEEE 802.11g / CH 1 / 2500MHz~26500MHz (down 30dBc)



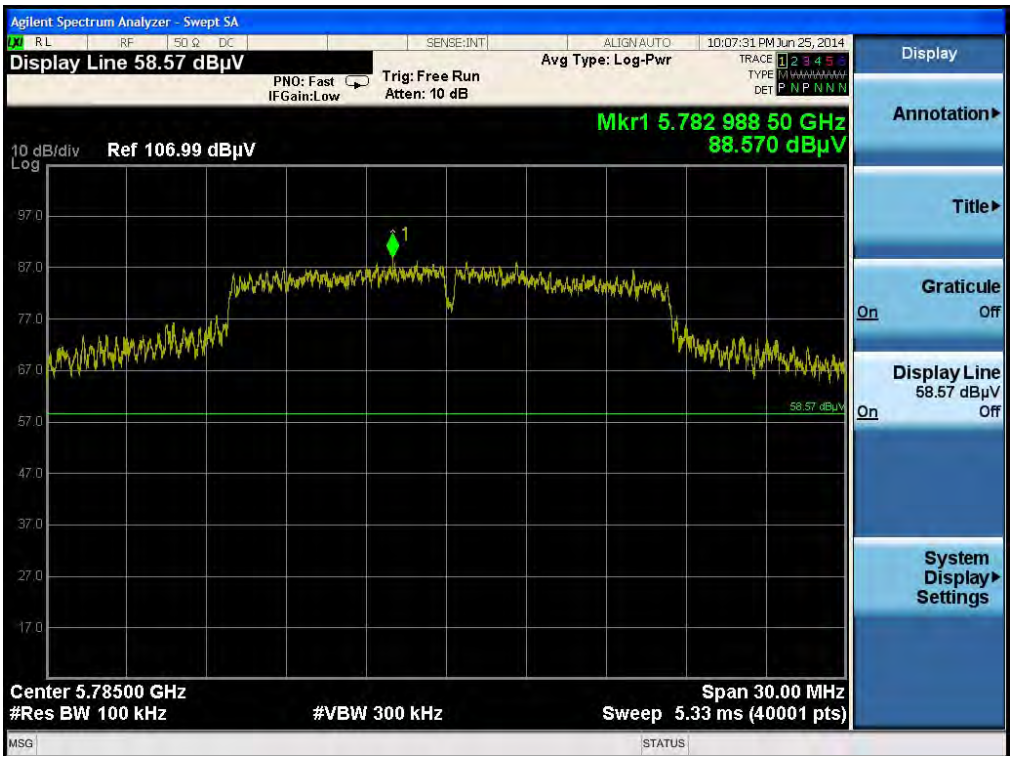
Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)



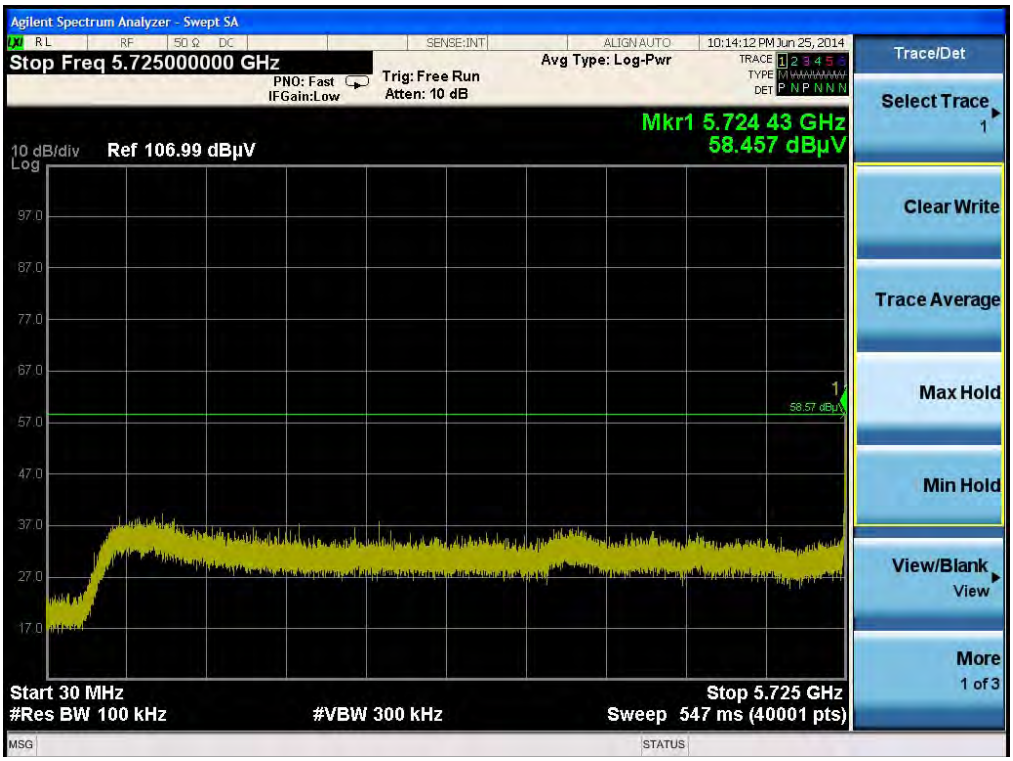
Plot on Configuration IEEE 802.11g / CH 11 / 2500MHz~26500MHz (down 30dBc)



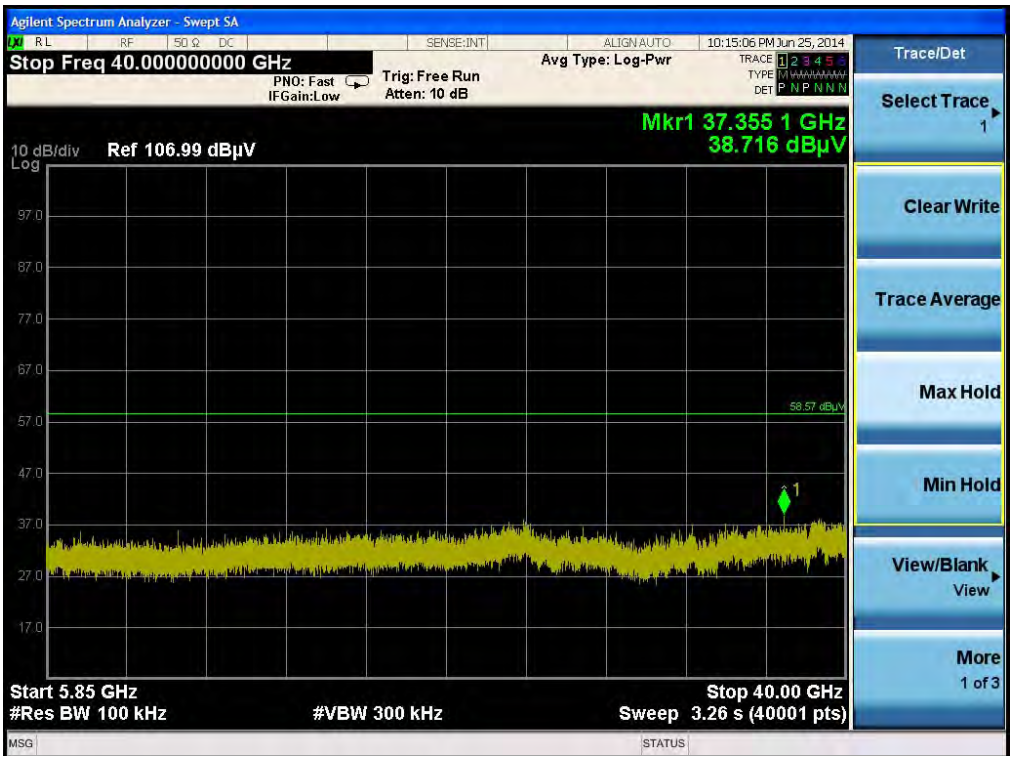
Plot on Configuration IEEE 802.11a / Reference Level



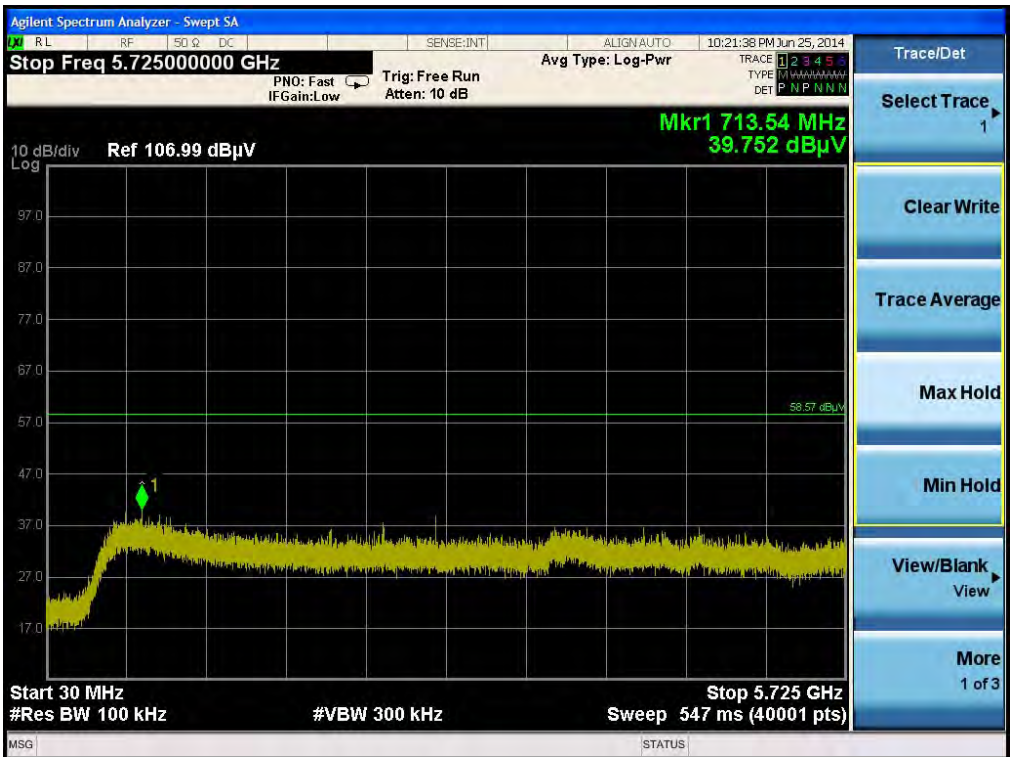
Plot on Configuration IEEE 802.11a / CH 149 / 30MHz~5725MHz (down 30dBc)



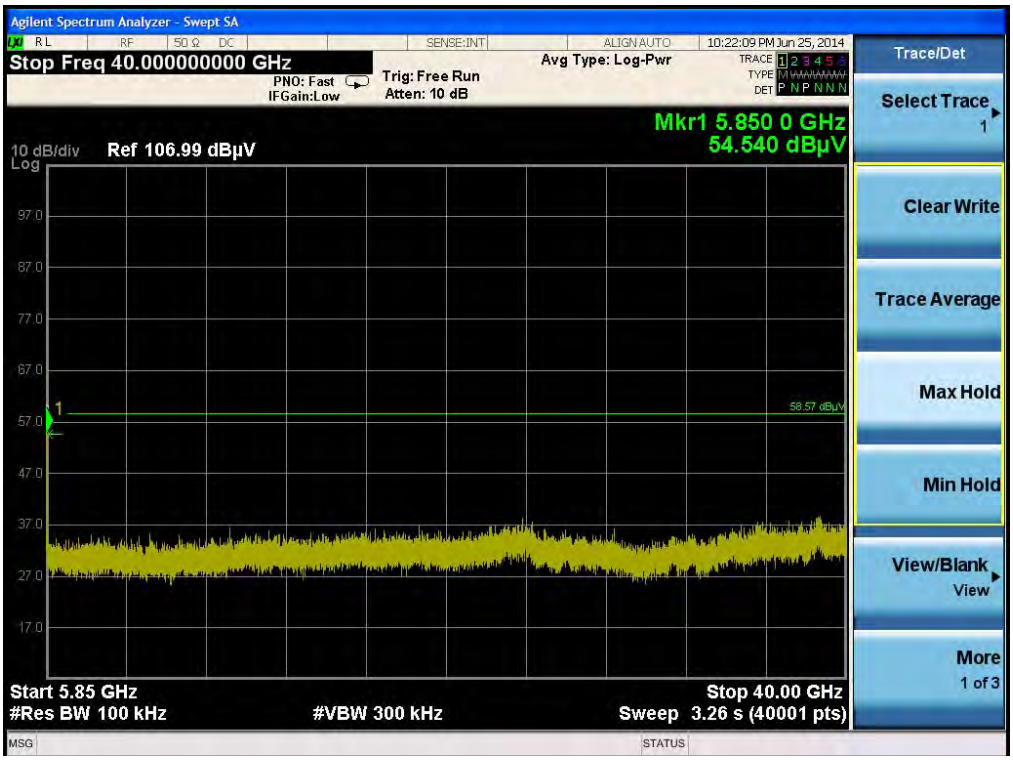
Plot on Configuration IEEE 802.11a / CH 149 / 5850MHz~40000MHz (down 30dBc)



Plot on Configuration IEEE 802.11a / CH 165 / 30MHz~5725MHz (down 30dBc)



Plot on Configuration IEEE 802.11a / CH 165 / 5850MHz~40000MHz (down 30dBc)



4.6. Antenna Requirements

4.6.1. 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.

4.6.2. 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
BILOG ANTENNA	Schaffner	CBL6112B	2928	30MHz ~ 2GHz	Dec. 27, 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-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)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Power Divider	Woken	4 Way	0120A04056002D	2GHz ~ 18GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)

Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)

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

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

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%