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FCC RADIO TEST REPORT

Applicant's company	**Realtek Semiconductor Corp.**
Applicant Address	No. 2,Innovation Road II, Hsinchu Science Park, Hsinchu 300,Taiwan
FCC ID	**TX2-RTL8812AE**
Manufacturer's company	**Realtek Semiconductor Corp.**
Manufacturer Address	No. 2,Innovation Road II, Hsinchu Science Park, Hsinchu 300,Taiwan

Product Name	802.11a/b/g/n/ac RTL8812AE miniCard
Brand Name	Realtek
Model Name	RTL8812AE
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Nov. 26, 2012
Final Test Date	Dec. 10, 2012
Submission Type	Original Equipment

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g part and IEEE 802.11a/ac (5725 ~ 5850MHz) 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 v02** and **KDB 662911 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
FR2N2613AA	Rev. 01	Initial issue of report	Jan. 02, 2013

Certificate No.: CB10112137

1. CERTIFICATE OF COMPLIANCE

Product Name	:	**802.11a/b/g/n/ac RTL8812AE miniCard**
Brand Name	:	**Realtek**
Model Name	:	**RTL8812AE**
Applicant	:	**Realtek Semiconductor Corp.**
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 Nov. 26, 2012 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.

Jordan Hsiao

Jordan Hsiao

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	15.207	AC Power Line Conducted Emissions	Complies	6.86 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	4.27 dB
4.3	15.247(e)	Power Spectral Density	Complies	9.79 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	3.43 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.53 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 8.5\times10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1GHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (1TX, 2RX / 2TX, 2RX)
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
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 (20MHz): 20.24 MHz ; MCS0 (40MHz): 36.32 MHz ; MCS8 (20MHz): 17.76 MHz ; MCS8 (40MHz): 36.32 MHz For 5GHz Band: MCS0 (20MHz): 26.96 MHz ; MCS0 (40MHz): 52.48 MHz ; MCS8 (20MHz): 19.92 MHz ; MCS8 (40MHz): 37.12 MHz ; MCS0-Nss1 (80MHz): 104.96 MHz ; MCS0-Nss2 (80MHz): 85.44 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 23.38 dBm ; MCS0 (40MHz): 18.51 dBm ; MCS8 (20MHz): 23.98 dBm ; MCS8 (40MHz): 20.74 dBm For 5GHz Band: MCS0 (20MHz): 24.05 dBm ; MCS0 (40MHz): 23.99 dBm ; MCS8 (20MHz): 25.73 dBm ; MCS8 (40MHz): 25.27 dBm ; MCS0-Nss1 (20MHz): 24.05 dBm ; MCS0-Nss1 (40MHz): 23.99 dBm ; MCS0-Nss2 (20MHz): 25.73 dBm ; MCS0-Nss2 (40MHz): 25.27 dBm; MCS0-Nss1 (80MHz): 23.66 dBm ; MCS0-Nss2 (80MHz): 25.03 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11a/b/g

Items	Description
Product Type	For IEEE 802.11b: WLAN (1TX, 1RX), For IEEE 802.11g: WLAN (1TX, 2RX), For IEEE 802.11a: WLAN (1TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
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: 15.04 MHz ; 11g: 20.64 MHz ; 11a: 26.64 MHz
Maximum Conducted Output Power	11b: 23.72 dBm ; 11g: 23.65 dBm ; 11a: 24.38 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

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

IEEE 802.11n spec

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Datarate(Mbps)			
									800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.444	30
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.889	60
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.333	90
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.778	120
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.667	180
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.556	240
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.000	270
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.444	300

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

IEEE 802. 11a, 11n and 11ac Spec.

Worst Modulation Used for Conformance Testing				
Protocol	**Number of Transmit Chains (NTX)**	**Data Rate / MCS**	**Worst Data Rate / MCS**	**Worst Modulation Mode**
802.11a	1	6-54 Mbps	6Mbps	11A5.8G-20M
802.11n 20MHz	1/2	MCS 0-15	MCS0/MCS8	11N5.8G-20M
802.11n 40MHz	1/2	MCS 0-15	MCS0/MCS8	11N5.8G-40M
802.11ac 20MHz	1/2	MCS 0-9	MCS0-Nss1/ MCS0-Nss2	11AC5.8G-20M
802.11ac 40MHz	1/2	MCS 0-9	MCS0-Nss1/ MCS0-Nss2	11AC5.8G-40M
802.11ac 80MHz	1/2	MCS 0-9	MCS0-Nss1/ MCS0-Nss2	11AC5.8G-80M
Note 1: IEEE 802.11 modulation consists of IEEE 802.11a.				
Note 2: IEEE 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Worst modulation mode of Guard Interval (GI) is 400ns.				
Note 3: IEEE 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160. Then EUT support VHT20, VHT40, VHT80. (VHT: Very High Throughput).				
Note 4: Modulation modes consist of 11A5.8G-20M, 11N5.8G-20M, 11N5.8G-40M, 11AC5.8G-20M, 11AC5.8G-40M, 11AC5.8G-80M.				
11A: IEEE 802.11a, 11N: IEEE 802.11n, 11AC: IEEE 802.11ac. 5.8G: 5.725-5.850GHz band				
20M/40M/80M: Channel Bandwidth 20MHz/40MHz/80MHz				

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)		Remark
					2.4GHz	5GHz	
1	LYNwave	ALA110-222050-300010	PIFA Antenna	I-PEX	3.5	5	TX/RX
2	LYNwave	ALA110-222050-300010	PIFA Antenna	I-PEX	3.5	5	TX/RX

Note: The EUT has two Chains.

<For 2.4GHz Band:>

For IEEE 802.11b mode (1TX, 1RX):

The EUT supports 1TX/1RX function, and it supports TX/RX diversity function.

Both Chain 1 and Chain 2 could be used as transmitting/receiving antenna.

Chain 1 and Chain 2, both can transmit simultaneously, but there is only one will be used at the same time.

Only the higher gain antenna "Chain 1" was tested and recorded in the report.

For IEEE 802.11g mode (1TX, 2RX):

The EUT supports 1TX/2RX function, and it supports TX diversity function.

Both Chain 1 and Chain 2 could be used as transmitting antenna, but Chain 1 and Chain 2 could receive simultaneously.

Only the higher gain antenna "Chain 1" was tested and recorded in the report.

For IEEE 802.11n mode (1TX, 2RX / 2TX, 2RX):

1. For 1TX, 2RX function (MCS0-7):

   The EUT supports TX diversity function.

   Both Chain 1 and Chain 2 could be used as transmitting antenna, but Chain 1 and Chain 2 could receive simultaneously.

   Only the higher gain antenna "Chain 1" was tested and recorded in the report.

2. For 2TX, 2RX function (MCS8-15):

   Both Chain 1 and Chain 2 could be used as transmitting/receiving antenna.

   Chain 1 and Chain 2 could transmitting/receiving simultaneously.

<For 5GHz Band:>

For IEEE 802.11a mode (1TX, 2RX):

The EUT supports 1TX/2RX function, and it supports TX diversity function.

Both Chain 1 and Chain 2 could be used as transmitting antenna, but Chain 1 and Chain 2 could receive simultaneously.

Only the higher gain antenna "Chain 1" was tested and recorded in the report.

For IEEE 802.11n mode (1TX, 2RX / 2TX, 2RX):

1. For 1TX, 2RX function (MCS0~7):

   The EUT supports TX diversity function.

   Both Chain 1 and Chain 2 could be used as transmitting antenna, but Chain 1 and Chain 2 could receive simultaneously.

   Only the higher gain antenna "Chain 1" was tested and recorded in the report.

2. For 2TX, 2RX function (MCS8~15):

   Both Chain 1 and Chain 2 could be used as transmitting/receiving antenna.

   Chain 1 and Chain 2 could transmitting/receiving simultaneously.

For IEEE 802.11ac mode (1TX, 2RX / 2TX, 2RX):

1. For 1TX, 2RX function (NSS1 MCS0~9):

   The EUT supports TX diversity function.

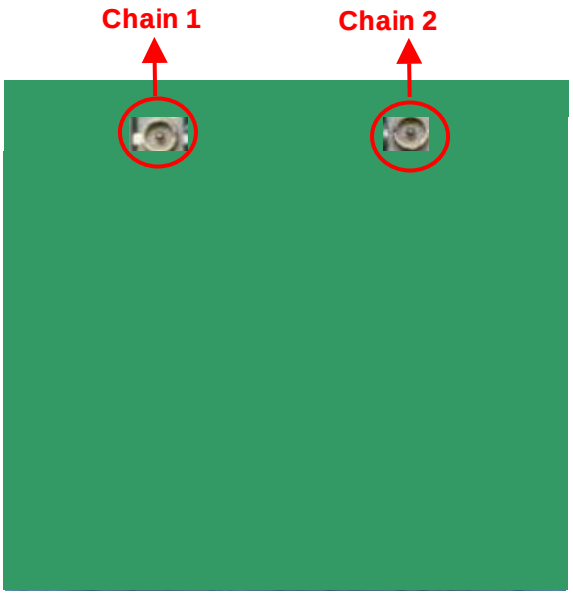
   Both Chain 1 and Chain 2 could be used as transmitting antenna, but Chain 1 and Chain 2 could receive simultaneously.

   Only the higher gain antenna "Chain 1" was tested and recorded in the report.

2. For 2TX, 2RX function (NSS2 MCS0~9):

   Both Chain 1 and Chain 2 could be used as transmitting/receiving antenna.

   Chain 1 and Chain 2 could transmitting/receiving simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

For both 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	Auto	-	-
Maximum Conducted Output Power	MCS0/20MHz	7.2 Mbps	1/6/11	1
	MCS0/40MHz	15 Mbps	3/6/9	1
	MCS8/20MHz	15 Mbps	1/6/11	1/2/1+2
	MCS8/40MHz	30 Mbps	3/6/9	1/2/1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Power Spectral Density	MCS0/20MHz	7.2 Mbps	1/6/11	1
	MCS0/40MHz	15 Mbps	3/6/9	1
	MCS8/20MHz	15 Mbps	1/6/11	1/2
	MCS8/40MHz	30 Mbps	3/6/9	1/2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
6dB Spectrum Bandwidth	MCS0/20MHz	7.2 Mbps	1/6/11	1
	MCS0/40MHz	15 Mbps	3/6/9	1
	MCS8/20MHz	15 Mbps	1/6/11	1+2
	MCS8/40MHz	30 Mbps	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS0/20MHz	7.2 Mbps	1/6/11	1
	MCS0/40MHz	15 Mbps	3/6/9	1
	MCS8/20MHz	15 Mbps	1/6/11	1+2
	MCS8/40MHz	30 Mbps	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Band Edge Emissions	MCS0/20MHz	7.2 Mbps	1/6/11	1
	MCS0/40MHz	15 Mbps	3/6/9	1
	MCS8/20MHz	15 Mbps	1/6/11	1+2
	MCS8/40MHz	30 Mbps	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Maximum Conducted Output Power	MCS0/20MHz	7.2 Mbps	149/157/165	1
	MCS0/40MHz	15 Mbps	151/159	1
	MCS8/20MHz	15 Mbps	149/157/165	1/2/1+2
	MCS8/40MHz	30 Mbps	151/159	1/2/1+2
	MCS0-Nss1/20MHz	7.2 Mbps	149/157/165	1
	MCS0-Nss1/40MHz	15 Mbps	151/159	1
	MCS0-Nss2/20MHz	15 Mbps	149/157/165	1/2/1+2
	MCS0-Nss2/40MHz	30 Mbps	151/159	1/2/1+2
	MCS0-Nss1/80MHz	29.3 Mbps	155	1
	MCS0-Nss2/80MHz	58.5 Mbps	155	1/2/1+2
	11a/BPSK	6 Mbps	149/157/165	1
Power Spectral Density	MCS0/20MHz	7.2 Mbps	149/157/165	1
	MCS0/40MHz	15 Mbps	151/159	1
	MCS8/20MHz	15 Mbps	149/157/165	1/2
	MCS8/40MHz	30 Mbps	151/159	1/2
	MCS0-Nss1/80MHz	29.3 Mbps	155	1
	MCS0-Nss2/80MHz	58.5 Mbps	155	1/2
	11a/BPSK	6 Mbps	149/157/165	1
6dB Spectrum Bandwidth	MCS0/20MHz	7.2 Mbps	149/157/165	1
	MCS0/40MHz	15 Mbps	151/159	1
	MCS8/20MHz	15 Mbps	149/157/165	1+2
	MCS8/40MHz	30 Mbps	151/159	1+2
	MCS0-Nss1/80MHz	29.3 Mbps	155	1
	MCS0-Nss2/80MHz	58.5 Mbps	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS0/20MHz	7.2 Mbps	149/157/165	1
	MCS0/40MHz	15 Mbps	151/159	1
	MCS8/20MHz	15 Mbps	149/157/165	1+2
	MCS8/40MHz	30 Mbps	151/159	1+2
	MCS0-Nss1/80MHz	29.3 Mbps	155	1
	MCS0-Nss2/80MHz	58.5 Mbps	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File 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).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6220	E2KWM3945ABG
Mouse	iCooky	AMS0706W	DoC
Earphone	SHYARO CHI	MIC-04	N/A
Wireless AP	BELKIN	WG7016G22-LF-AK	DoC

3.8. Table for Parameters of Test Software Setting

During testing, Channel & 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 20MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	49	62	49

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	48	51	47

Power Parameters of IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS8 20MHz	47/46	59/59	48/48

Power Parameters of IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS8 40MHz	46/46	51/51	47/47

Power Parameters of IEEE 802.11b/g / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	48	49	44
IEEE 802.11g	50	63	49

For 5GHz Band

Power Parameters of IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	63	63	63

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	63	63

Power Parameters of IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	63/61	63/61	63/61

Power Parameters of IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122	
Frequency	5755 MHz	5795 MHz
MCS8 40MHz	63/61	63/61

Power Parameters of IEEE 802.11ac MCS0-Nss1 20MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	63	63	63

Power Parameters of IEEE 802.11ac MCS0-Nss1 40MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	63	63

Power Parameters of IEEE 802.11ac MCS0-Nss2 20MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	63/61	63/61	63/61

Power Parameters of IEEE 802.11ac MCS0-Nss2 40MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122	
Frequency	5755 MHz	5795 MHz
MCS8 40MHz	63/61	63/61

Power Parameters of IEEE 802.11ac MCS0-Nss1 80MHz / Chain 1 (1TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122
Frequency	5775 MHz
MCS0 80MHz	63

Power Parameters of IEEE 802.11ac MCS0-Nss2 80MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122
Frequency	5775 MHz
MCS8 80MHz	63/60

Power Parameters of IEEE 802.11a / Chain 1 (1TX)

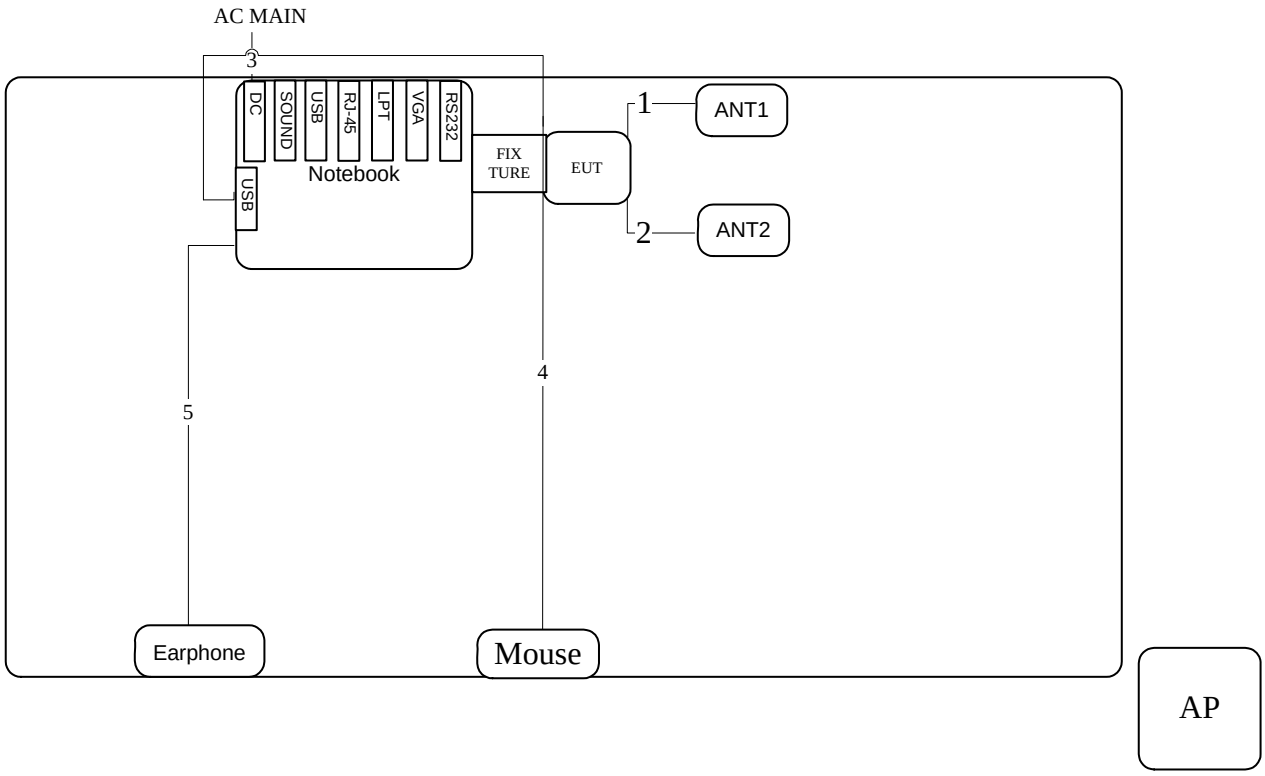
Test Software Version	Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	63	63	63

During the test, "Realtek 11ac 8812A PCIE WLAN MP Diagnostic Program 0.0028.20121122" under WIN 7 was executed the test program to control the EUT continuously transmit RF signal.

3.9. Test Configurations

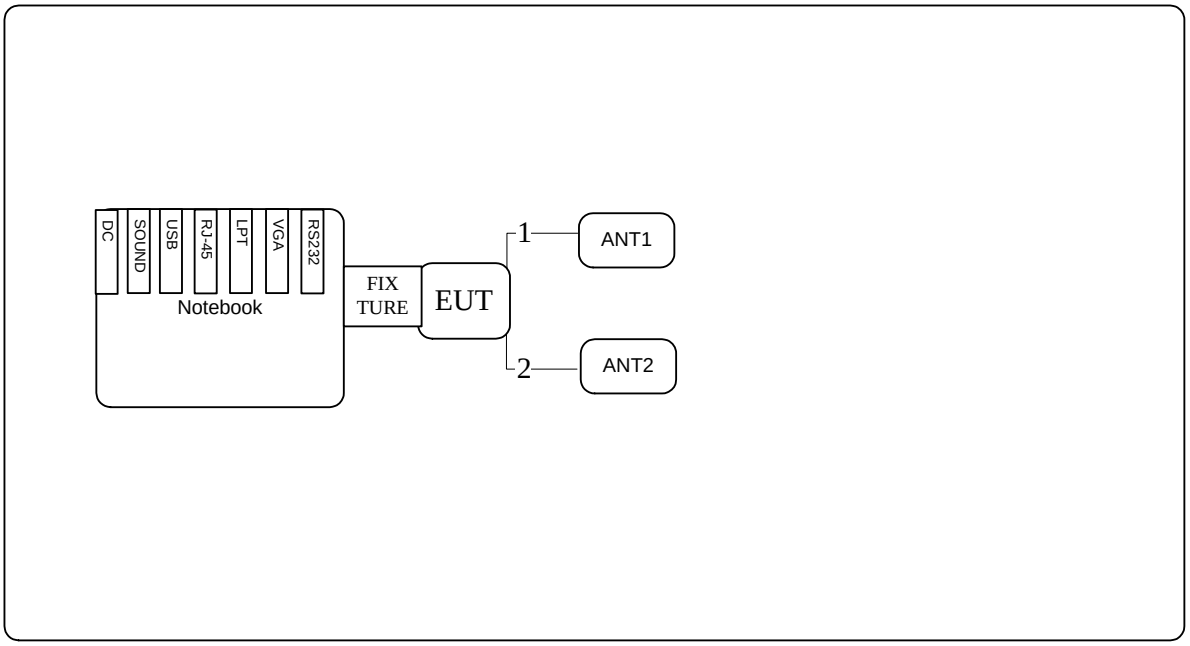
3.9.1. Radiation Emissions Test Configuration

Test Configuration: 30 MHz~1GHz



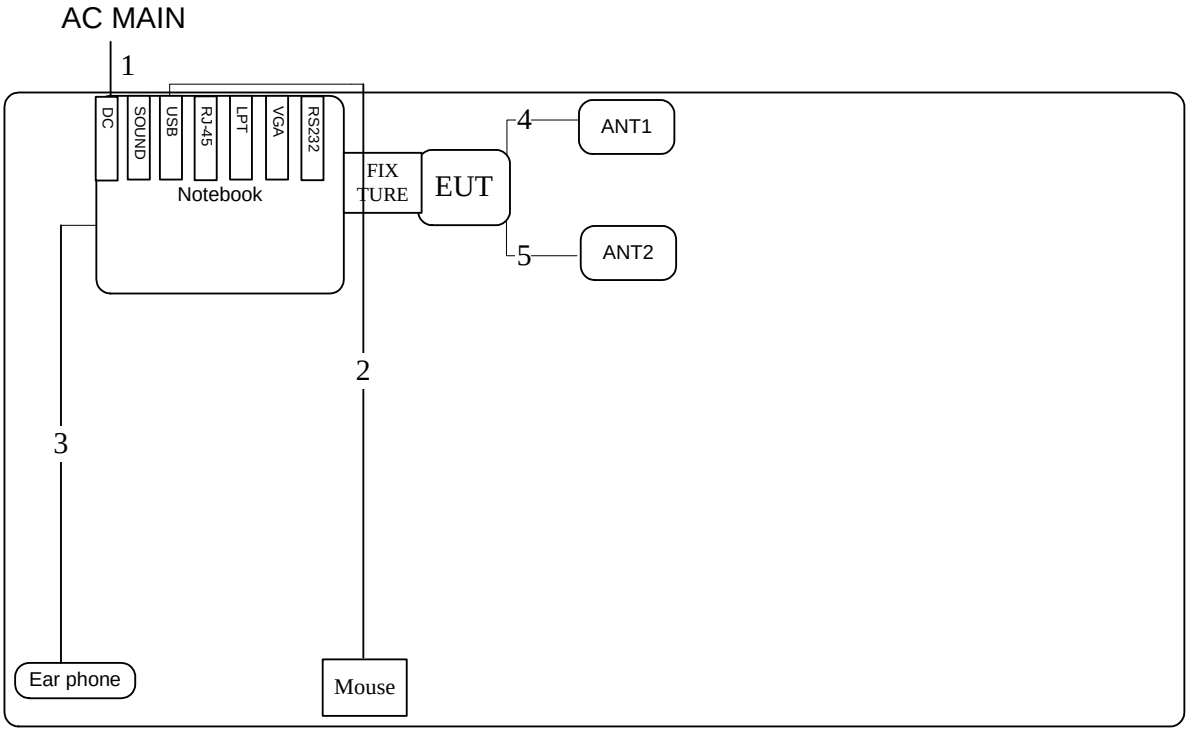
Item	Connection	Shield	Length
1	Ant. Cable	No	0.3m
2	Ant. Cable	No	0.3m
3	Power Cable	No	2.6m
4	USB Cable	No	1.8m
5	Audio Cable	No	1m

Test Configuration: Above 1 GHz



Item	Connection	Shield	Length
1	Ant. Cable	No	0.3m
2	Ant. Cable	No	0.3m

3.9.2. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	Power Cable	No	2.6m
2	USB Cable	No	1.8m
3	Audio Cable	No	1.1m
4	Ant. Cable	No	0.3m
5	Ant. Cable	No	0.3m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

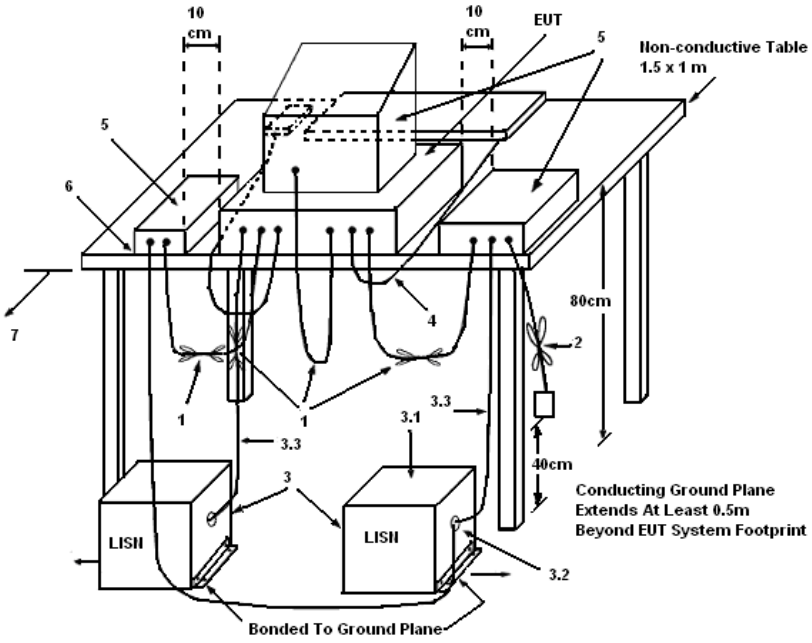
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

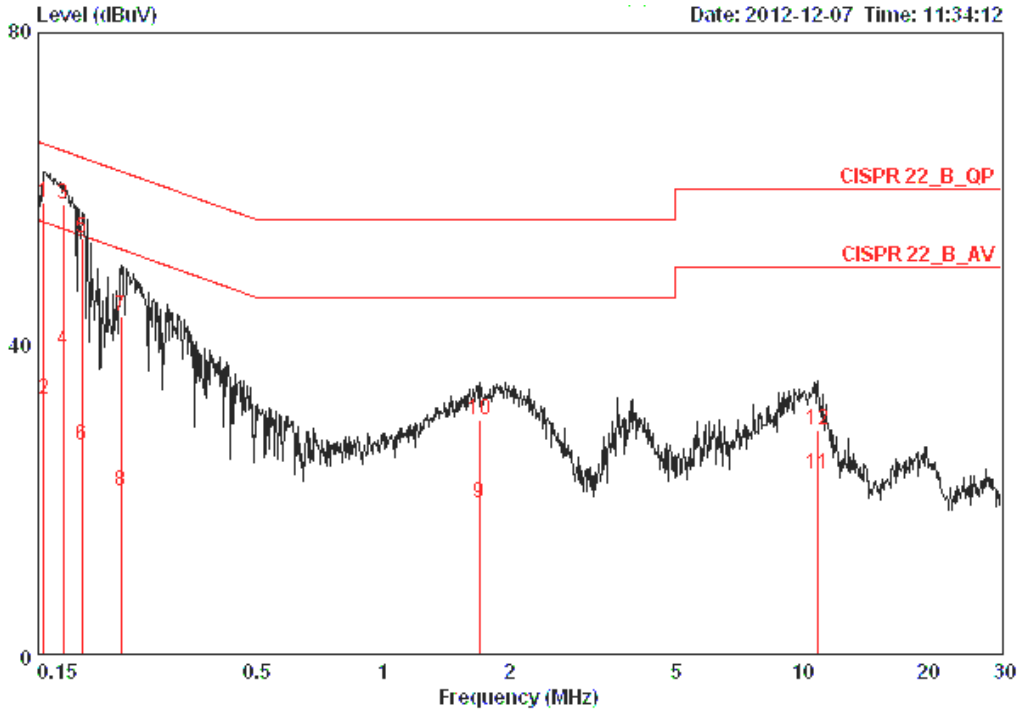
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

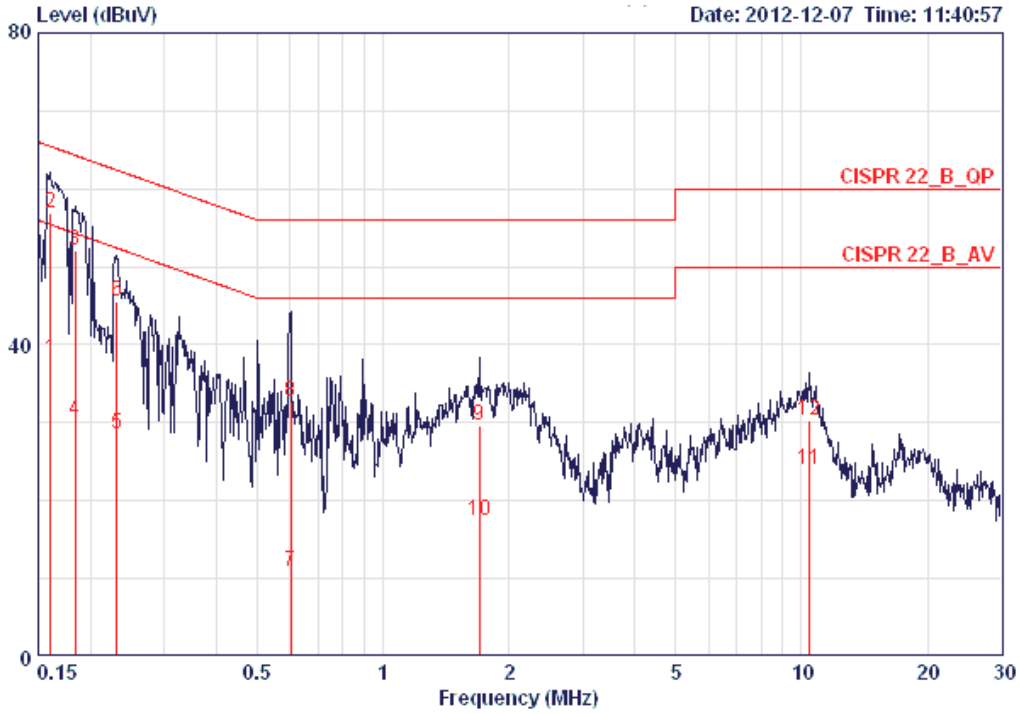
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24℃	Humidity	55%
Test Engineer	Justin Chiu	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1 @	0.15440	58.26	-7.50	65.76	58.00	0.08	0.18	LINE	QP
2	0.15440	32.87	-22.89	55.76	32.61	0.08	0.18	LINE	AVERAGE
3 @	0.17215	58.00	-6.86	64.86	57.73	0.08	0.19	LINE	QP
4	0.17215	39.22	-15.64	54.86	38.95	0.08	0.19	LINE	AVERAGE
5	0.19039	53.61	-10.41	64.02	53.33	0.08	0.20	LINE	QP
6	0.19039	27.01	-27.01	54.02	26.73	0.08	0.20	LINE	AVERAGE
7	0.23658	43.67	-18.55	62.22	43.39	0.08	0.20	LINE	QP
8	0.23658	21.18	-31.04	52.22	20.90	0.08	0.20	LINE	AVERAGE
9	1.698	19.53	-26.47	46.00	19.20	0.10	0.22	LINE	AVERAGE
10	1.698	30.28	-25.72	56.00	29.95	0.10	0.22	LINE	QP
11	10.905	23.37	-26.63	50.00	22.74	0.25	0.38	LINE	AVERAGE
12	10.905	28.93	-31.07	60.00	28.30	0.25	0.38	LINE	QP

Temperature	24℃	Humidity	55%
Test Engineer	Justin Chiu	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.16070	38.07	-17.35	55.43	37.81	0.08	0.18	NEUTRAL	AVERAGE
2 @	0.16070	56.82	-8.60	65.43	56.56	0.08	0.18	NEUTRAL	QP
3	0.18346	52.11	-12.21	64.33	51.84	0.08	0.19	NEUTRAL	QP
4	0.18346	30.24	-24.08	54.33	29.97	0.08	0.19	NEUTRAL	AVERAGE
5	0.23162	28.64	-23.75	52.39	28.36	0.08	0.20	NEUTRAL	AVERAGE
6	0.23162	45.52	-16.87	62.39	45.24	0.08	0.20	NEUTRAL	QP
7	0.60112	10.97	-35.03	46.00	10.69	0.08	0.20	NEUTRAL	AVERAGE
8	0.60112	32.76	-23.24	56.00	32.48	0.08	0.20	NEUTRAL	QP
9	1.698	29.54	-26.46	56.00	29.21	0.10	0.22	NEUTRAL	QP
10	1.698	17.54	-28.46	46.00	17.21	0.10	0.22	NEUTRAL	AVERAGE
11	10.397	24.07	-25.93	50.00	23.46	0.25	0.36	NEUTRAL	AVERAGE
12	10.397	30.29	-29.71	60.00	29.68	0.25	0.36	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted Output Power Measurement

4.2.1. 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.

4.2.2. Measuring Instruments and Setting

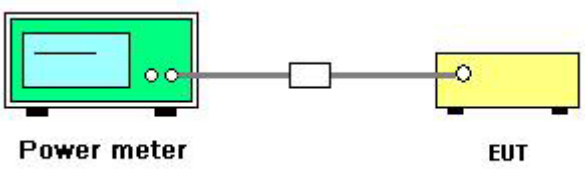
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB558074 v01 r02 section 8.2.3 option 3.
2. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	25℃	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac
Test Date	Dec. 12, 2012		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	18.16	30.00	**Complies**
6	2437 MHz	23.38	30.00	**Complies**
11	2462 MHz	18.29	30.00	**Complies**

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	17.01	30.00	**Complies**
6	2437 MHz	18.51	30.00	**Complies**
9	2452 MHz	16.40	30.00	**Complies**

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
1	2412 MHz	16.33	16.25	19.30	30.00	**Complies**
6	2437 MHz	20.90	21.04	23.98	30.00	**Complies**
11	2462 MHz	17.88	17.03	20.49	30.00	**Complies**

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
3	2422 MHz	15.28	15.59	18.45	30.00	**Complies**
6	2437 MHz	17.58	17.88	20.74	30.00	**Complies**
9	2452 MHz	15.76	16.01	18.90	30.00	**Complies**

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.98	30.00	**Complies**
157	5785 MHz	24.01	30.00	**Complies**
165	5825 MHz	24.04	30.00	**Complies**

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	23.76	30.00	**Complies**
159	5795 MHz	23.87	30.00	**Complies**

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
149	5745 MHz	22.53	22.67	25.61	30.00	**Complies**
157	5785 MHz	22.61	22.69	25.66	30.00	**Complies**
165	5825 MHz	22.65	22.73	25.70	30.00	**Complies**

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
151	5755 MHz	22.09	22.12	25.12	30.00	**Complies**
159	5795 MHz	22.15	22.24	25.21	30.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss1 20MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.86	30.00	**Complies**
157	5785 MHz	23.99	30.00	**Complies**
165	5825 MHz	24.05	30.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss1 40MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	23.83	30.00	**Complies**
159	5795 MHz	23.99	30.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss1 80MHz / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
155	5775 MHz	23.66	30.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss2 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
149	5745 MHz	22.63	22.64	25.65	30.00	**Complies**
157	5785 MHz	22.65	22.72	25.70	30.00	**Complies**
165	5825 MHz	22.71	22.73	25.73	30.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss2 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
151	5755 MHz	22.12	22.21	25.18	30.00	**Complies**
159	5795 MHz	22.24	22.28	25.27	30.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss2 80MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
155	5775 MHz	21.92	22.11	25.03	30.00	**Complies**

Temperature	25℃	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g
Test Date	Dec. 12, 2012		

Configuration IEEE 802.11b / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.20	30.00	**Complies**
6	2437 MHz	23.72	30.00	**Complies**
11	2462 MHz	21.68	30.00	**Complies**

Configuration IEEE 802.11g / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	18.83	30.00	**Complies**
6	2437 MHz	23.65	30.00	**Complies**
11	2462 MHz	18.18	30.00	**Complies**

Configuration IEEE 802.11a / Chain 1 (1TX)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.94	30.00	**Complies**
157	5785 MHz	24.15	30.00	**Complies**
165	5825 MHz	24.38	30.00	**Complies**

4.3. Power Spectral Density Measurement

4.3.1. 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.

4.3.2. Measuring Instruments and Setting

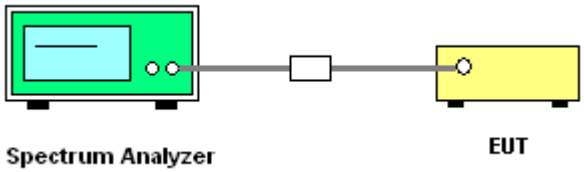
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RB	100 kHz
VB	300 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.3.3. Test Procedures

1. Test procedures refer KDB558074 v01 r02 section 9.1 option 1
2. Spectrum analyzer must be capable of utilizing a number of measurement points in each sweep that is greater than or equal to twice the span/RBW in order to ensure bin-to-bin spacing of ≤ RBW/2 so that narrowband signals are not lost between frequency bins.
3. 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.
4. 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).
5. Use the peak marker function to determine the maximum level in any 100 kHz band segment within the fundamental EBW.
6. Scale the observed power level to an equivalent level in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where: BWCF = 10log (3 kHz/100 kHz = -15.2 dB).
7. The resulting PSD level must be ≤ 8 dBm.
8. When measuring power spectral density 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 Power Spectral Density

Temperature	25℃	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac
Test Date	Dec. 12, 2012		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	3.84	-15.23	-11.39	8.00	**Complies**
6	2437 MHz	9.07	-15.23	-6.16	8.00	**Complies**
11	2462 MHz	3.94	-15.23	-11.29	8.00	**Complies**

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
3	2422 MHz	-0.88	-15.23	-16.11	8.00	**Complies**
6	2437 MHz	0.49	-15.23	-14.74	8.00	**Complies**
9	2452 MHz	-1.11	-15.23	-16.34	8.00	**Complies**

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/100kHz)		BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		Chain 1	Chain 2		
1	2412 MHz	3.24	3.41	-15.23	-11.99	-11.82	4.99	**Complies**
6	2437 MHz	8.07	8.70	-15.23	-7.16	-6.53	4.99	**Complies**
11	2462 MHz	3.09	3.51	-15.23	-12.14	-11.72	4.99	**Complies**

Note: PSD Limit =(8dBm/MHz –(10log(2))=4.99dBm/MHz

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/100kHz)		BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		Chain 1	Chain 2		
3	2422 MHz	-1.98	-1.81	-15.23	-17.21	-17.04	4.99	**Complies**
6	2437 MHz	0.80	1.02	-15.23	-14.43	-14.21	4.99	**Complies**
9	2452 MHz	-1.42	-1.04	-15.23	-16.65	-16.27	4.99	**Complies**

Note: PSD Limit =(8dBm/MHz –(10log(2))=4.99dBm/MHz

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	10.69	-15.23	-4.54	8.00	**Complies**
157	5785 MHz	11.06	-15.23	-4.17	8.00	**Complies**
165	5825 MHz	11.45	-15.23	-3.78	8.00	**Complies**

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
151	5755 MHz	7.17	-15.23	-8.06	8.00	**Complies**
159	5795 MHz	7.38	-15.23	-7.85	8.00	**Complies**

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/100kHz)		BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		Chain 1	Chain 2		
149	5745 MHz	9.88	9.93	-15.23	-5.35	-5.30	4.99	**Complies**
157	5785 MHz	10.05	10.16	-15.23	-5.18	-5.07	4.99	**Complies**
165	5825 MHz	10.30	10.43	-15.23	-4.93	-4.80	4.99	**Complies**

Note: PSD Limit =(8dBm/MHz –(10log(2))=4.99dBm/MHz

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/100kHz)		BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		Chain 1	Chain 2		
151	5755 MHz	6.38	6.49	-15.23	-8.85	-8.74	4.99	**Complies**
159	5795 MHz	6.88	7.27	-15.23	-8.35	-7.96	4.99	**Complies**

Note: PSD Limit =(8dBm/MHz –(10log(2))=4.99dBm/MHz

Configuration IEEE 802.11ac MCS0-Nss1 80MHz / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
155	5775 MHz	4.83	-15.23	-10.40	8.00	**Complies**

Configuration IEEE 802.11ac MCS0-Nss2 80MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/100kHz)		BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		Chain 1	Chain 2		
155	5775 MHz	4.57	4.89	-15.23	-10.66	-10.34	4.99	**Complies**

Note: PSD Limit =(8dBm/MHz –(10log(2))=4.99dBm/MHz

Temperature	25℃	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g
Test Date	Dec. 12, 2012		

Configuration IEEE 802.11b / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	12.43	-15.23	-2.80	8.00	**Complies**
6	2437 MHz	12.96	-15.23	-2.27	8.00	**Complies**
11	2462 MHz	10.83	-15.23	-4.40	8.00	**Complies**

Configuration IEEE 802.11g / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	4.41	-15.23	-10.82	8.00	**Complies**
6	2437 MHz	9.83	-15.23	-5.40	8.00	**Complies**
11	2462 MHz	3.88	-15.23	-11.35	8.00	**Complies**

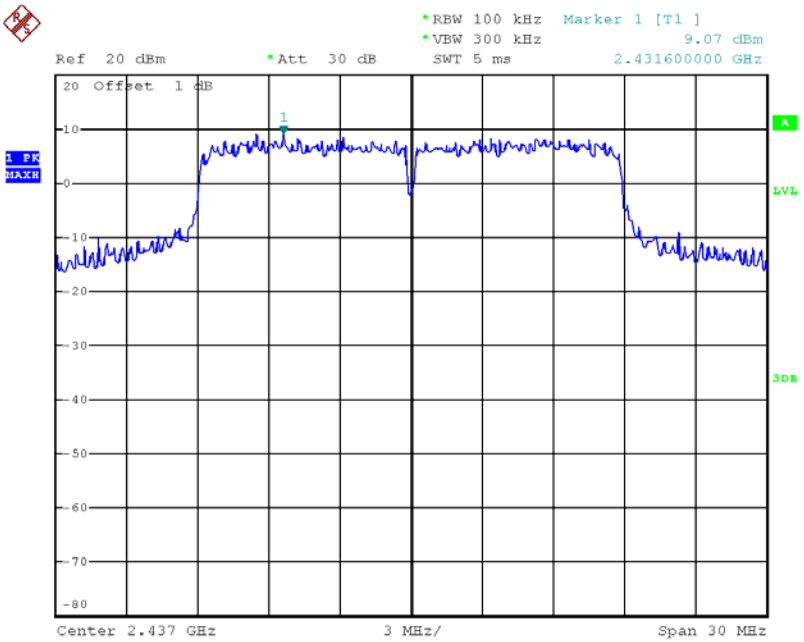
Configuration IEEE 802.11a / Chain 1 (1TX)

Channel	Frequency	Power Density (dBm/100kHz)	BWCF factor (100KHz to 3KHz)	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	11.06	-15.23	-4.17	8.00	**Complies**
157	5785 MHz	11.69	-15.23	-3.54	8.00	**Complies**
165	5825 MHz	11.90	-15.23	-3.33	8.00	**Complies**

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

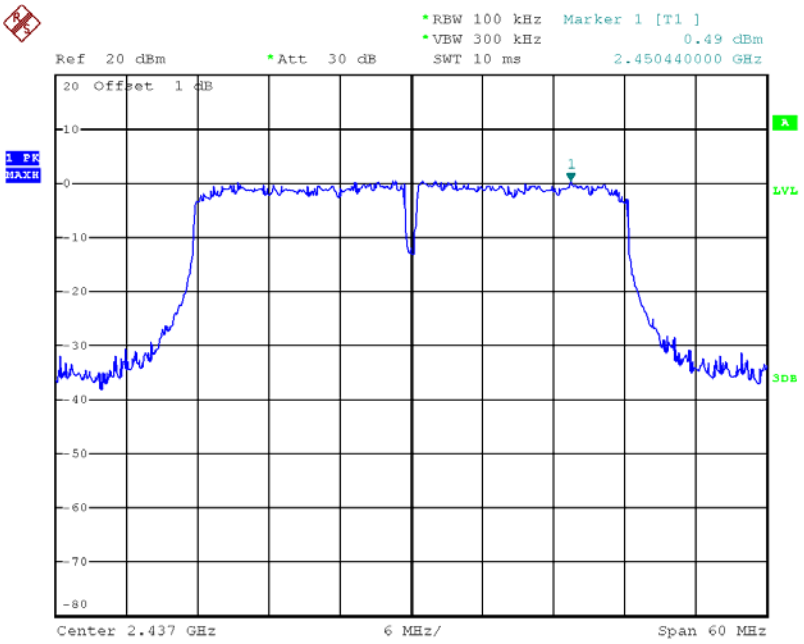
For plots, only the channel with maximum results was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 2437MHz / Chain 1 (1TX)



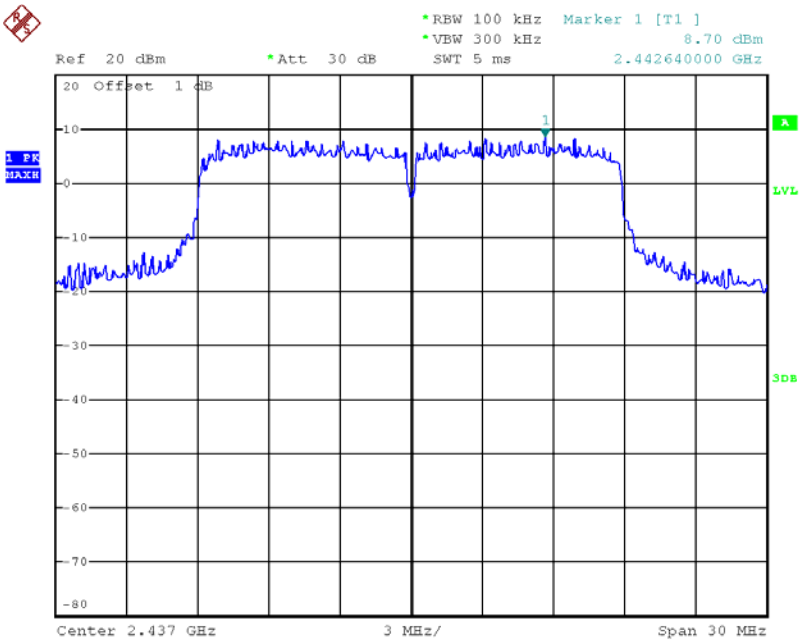
Date: 12.DEC.2012 17:46:45

Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 2437MHz / Chain 1 (1TX)



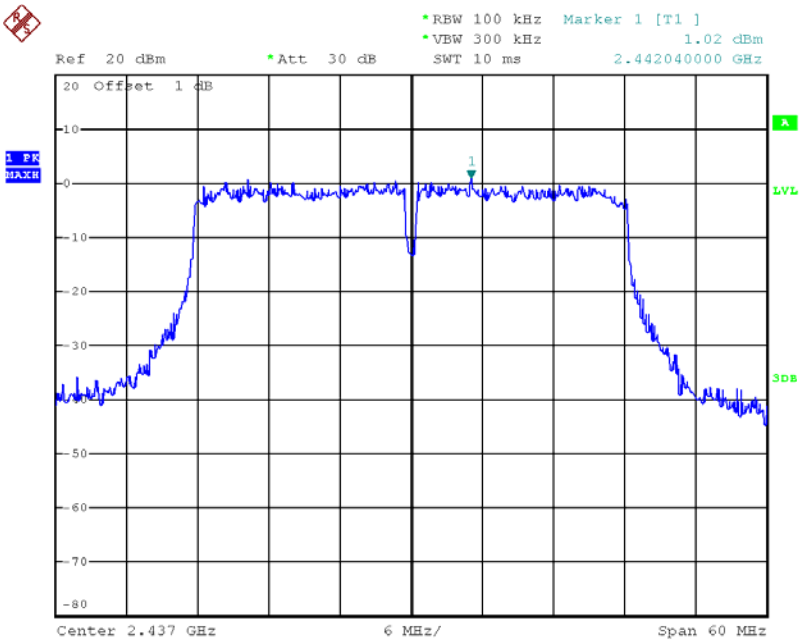
Date: 12.DEC.2012 17:48:54

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 2437MHz / Chain 2 (2TX)



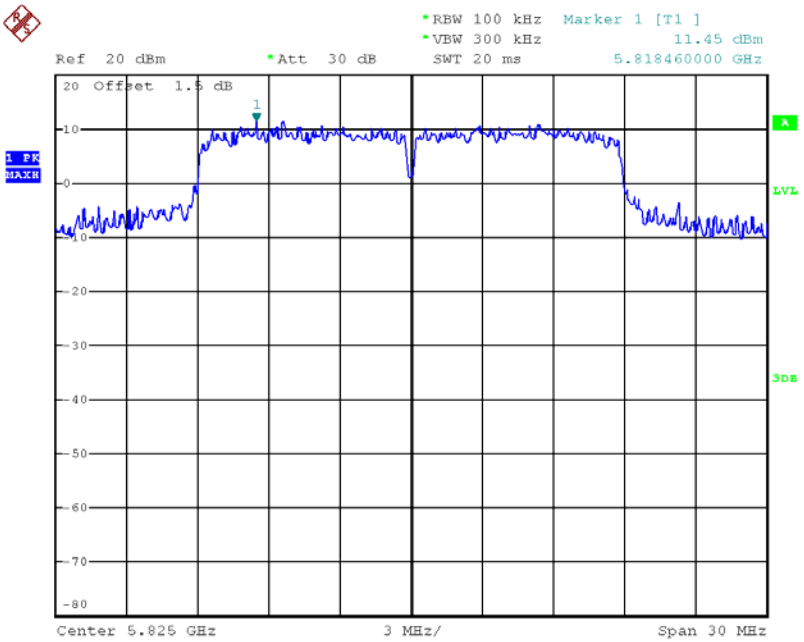
Date: 12.DEC.2012 18:16:53

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 2437MHz / Chain 2 (2TX)



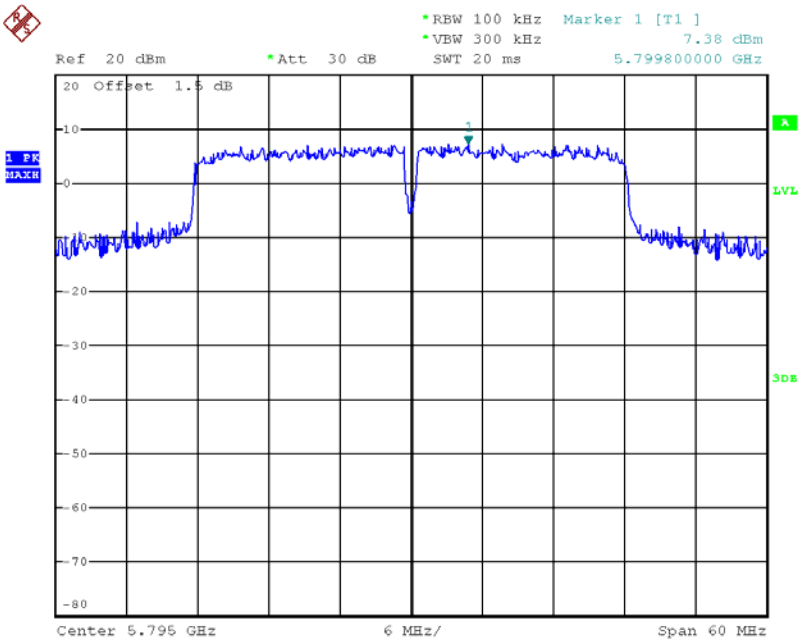
Date: 12.DEC.2012 18:27:08

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 5825MHz / Chain 1 (1TX)



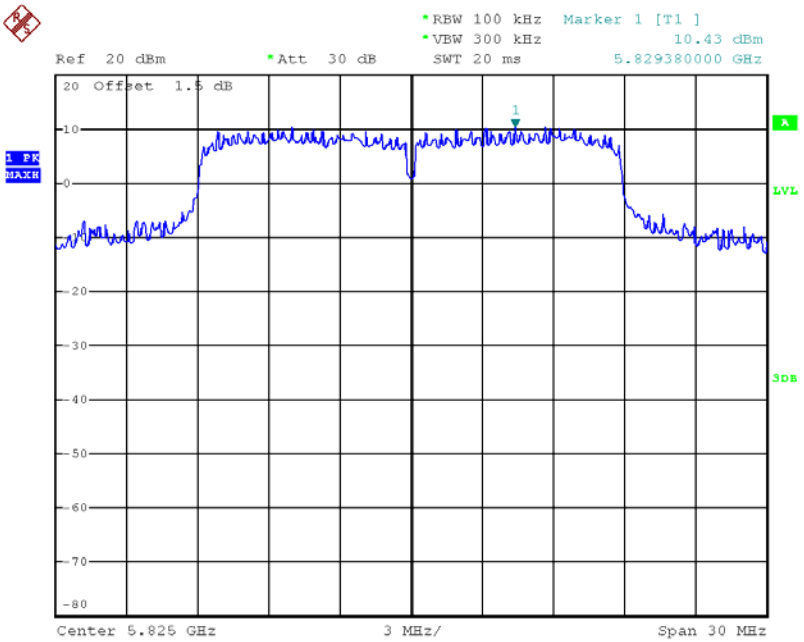
Date: 12.DEC.2012 17:56:46

Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 5795MHz / Chain 1 (1TX)

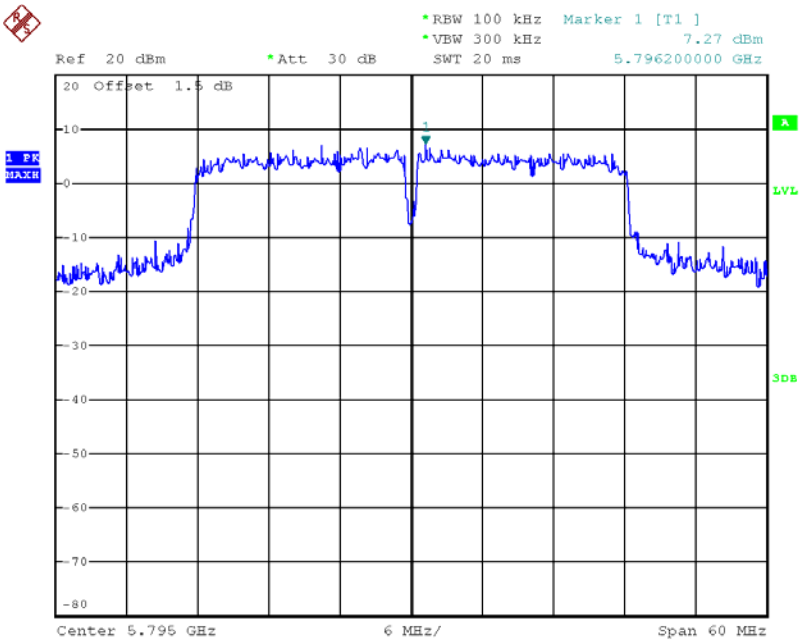


Date: 12.DEC.2012 17:58:25

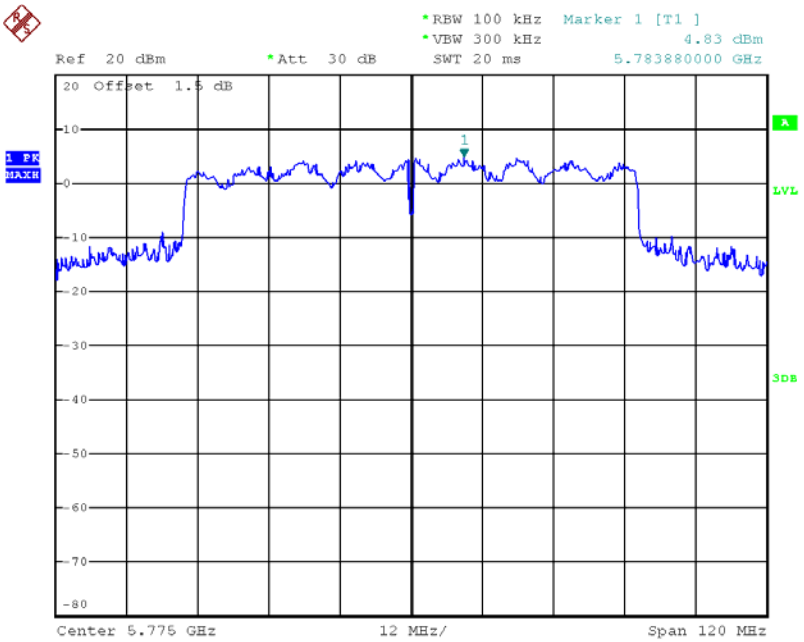
Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 5825MHz / Chain 2 (2TX)



Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 5795MHz / Chain 2 (2TX)

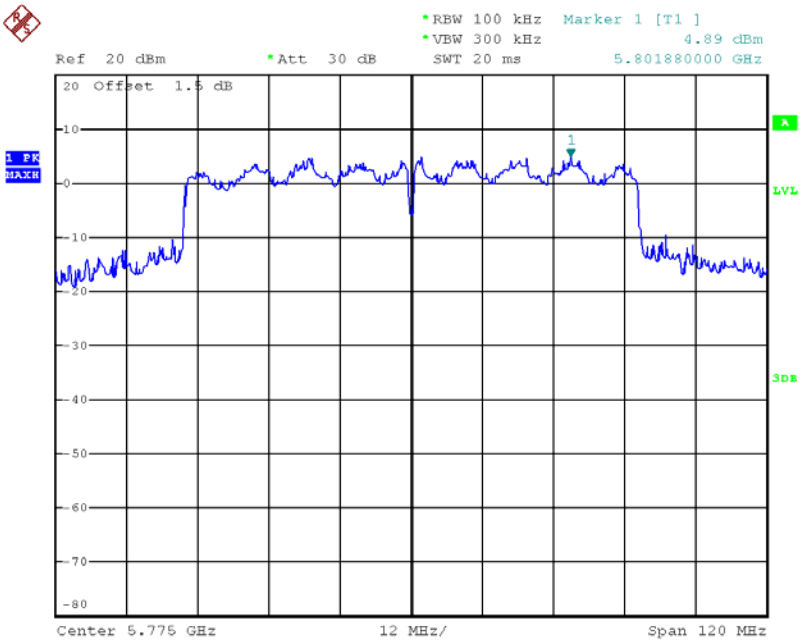


Power Density Plot on Configuration IEEE 802.11ac MCS0-Nss1 80MHz / 5755MHz / Chain 1 (1TX)



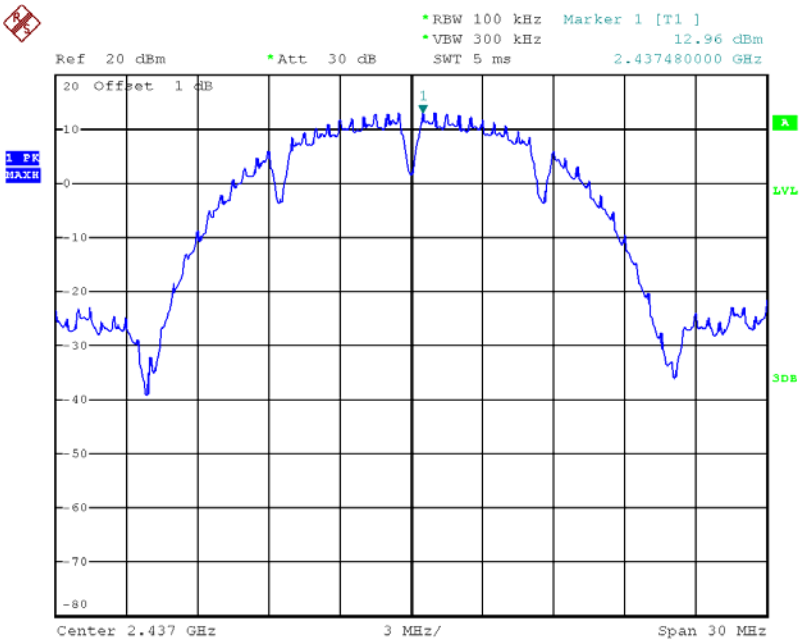
Date: 12.DEC.2012 17:59:44

Power Density Plot on Configuration IEEE 802.11ac MCS0-Nss2 80MHz / 5755MHz / Chain 2 (2TX)



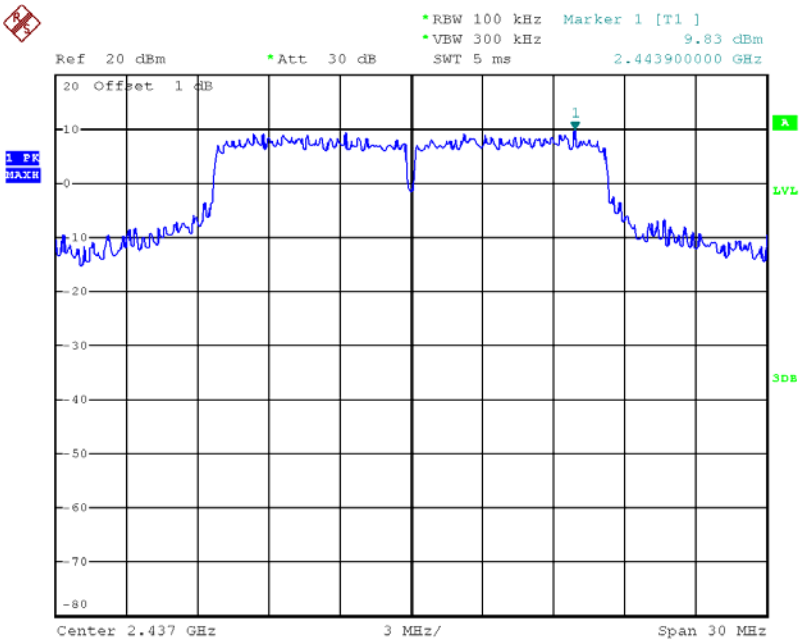
Date: 12.DEC.2012 18:10:37

Power Density Plot on Configuration IEEE 802.11b / 2437MHz / Chain 1 (1TX)



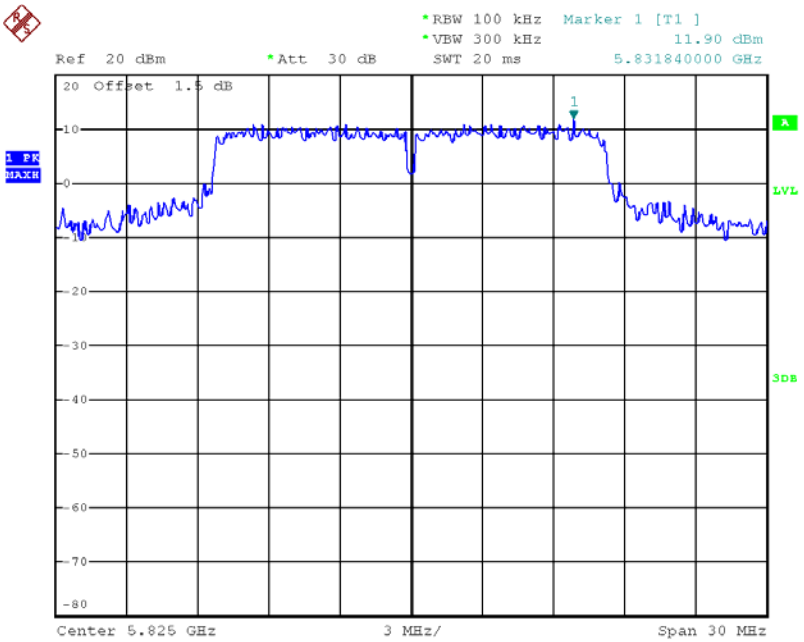
Date: 12.DEC.2012 17:32:14

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



Date: 12.DEC.2012 17:45:15

Power Density Plot on Configuration IEEE 802.11a / 5825MHz / Chain 1 (1TX)



Date: 12.DEC.2012 17:52:08

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

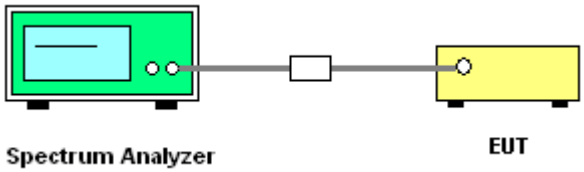
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	1-5 % or DTS BW, not exceed 100KHz
VB	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 5.1.1 EBW Measurement Procedure
3. Multiple antenna system was performed in accordance with KDB 662911 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

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 6dB Spectrum Bandwidth

Temperature	25℃	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac
Test Date	Dec. 12, 2012		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.60	17.60	500	**Complies**
6	2437 MHz	17.60	20.24	500	**Complies**
11	2462 MHz	17.60	17.60	500	**Complies**

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.48	36.32	500	**Complies**
6	2437 MHz	36.48	36.32	500	**Complies**
9	2452 MHz	36.48	36.16	500	**Complies**

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.60	17.60	500	**Complies**
6	2437 MHz	17.60	17.76	500	**Complies**
11	2462 MHz	17.60	17.60	500	**Complies**

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.48	36.32	500	**Complies**
6	2437 MHz	36.48	36.32	500	**Complies**
9	2452 MHz	36.48	36.16	500	**Complies**

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.76	26.88	500	**Complies**
157	5785 MHz	17.68	26.72	500	**Complies**
165	5825 MHz	17.68	26.96	500	**Complies**

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.48	52.16	500	**Complies**
159	5795 MHz	36.48	52.48	500	**Complies**

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.60	19.04	500	**Complies**
157	5785 MHz	17.60	19.92	500	**Complies**
165	5825 MHz	17.60	19.68	500	**Complies**

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.48	37.12	500	**Complies**
159	5795 MHz	36.48	36.64	500	**Complies**

Configuration IEEE 802.11ac MCS0-Nss1 80MHz / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	76.48	104.96	500	**Complies**

Configuration IEEE 802.11ac MCS0-Nss2 80MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	76.48	85.44	500	**Complies**

Temperature	25℃	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g
Test Date	Dec. 12, 2012		

Configuration IEEE 802.11b / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.08	15.04	500	**Complies**
6	2437 MHz	10.08	15.04	500	**Complies**
11	2462 MHz	10.08	14.88	500	**Complies**

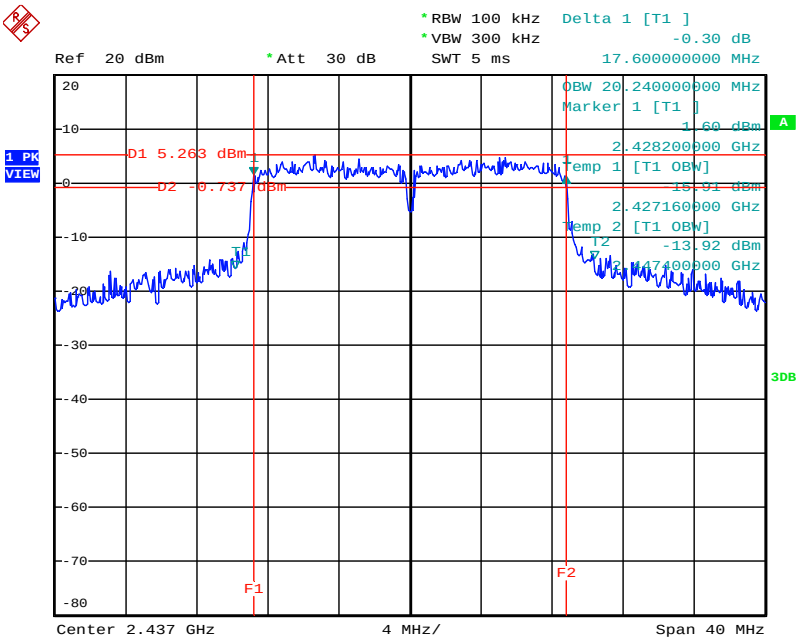
Configuration IEEE 802.11g / Chain 1 (1TX)

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.48	16.48	500	**Complies**
6	2437 MHz	16.48	20.64	500	**Complies**
11	2462 MHz	16.48	16.48	500	**Complies**

Configuration IEEE 802.11a / Chain 1 (1TX)

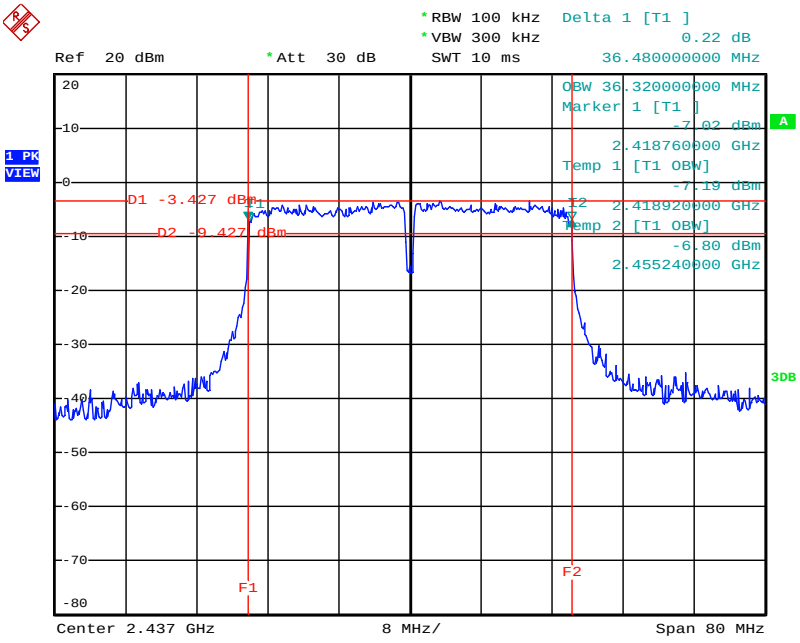
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.48	26.64	500	**Complies**
157	5785 MHz	16.40	25.76	500	**Complies**
165	5825 MHz	16.56	25.84	500	**Complies**

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 2437MHz / Chain 1 (1TX)



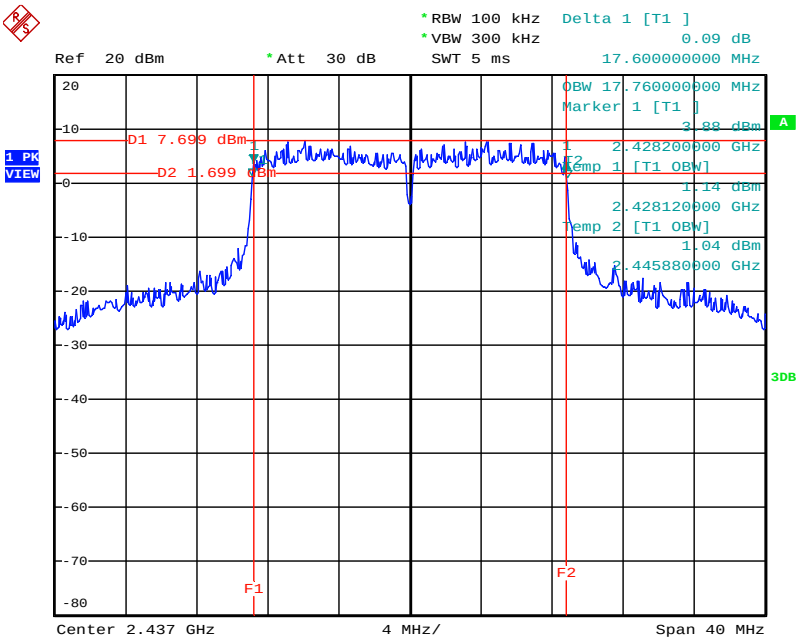
Date: 12.DEC.2012 19:32:05

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 2437MHz / Chain 1 (1TX)



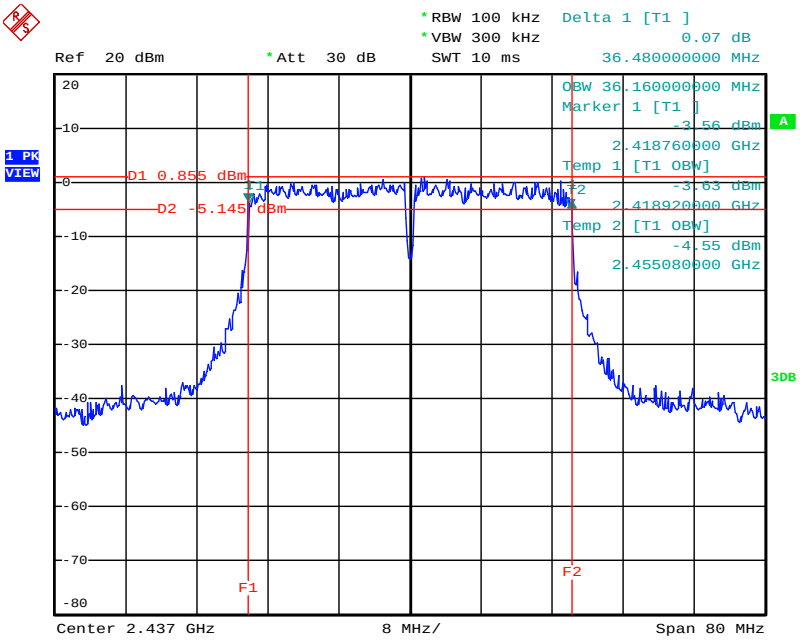
Date: 12.DEC.2012 19:33:56

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 2437MHz / Chain 1 + Chain 2 (2TX)



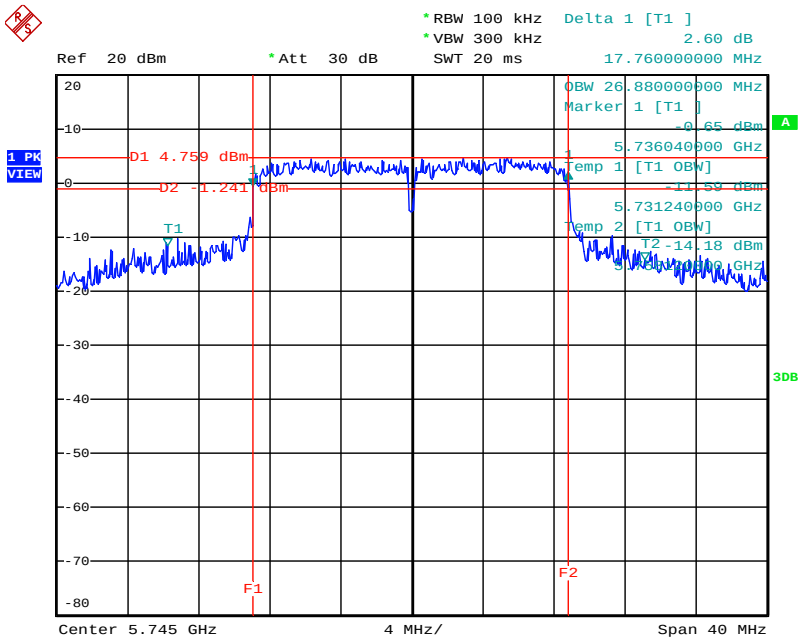
Date: 12.DEC.2012 19:37:31

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 2437MHz / Chain 1 + Chain 2 (2TX)



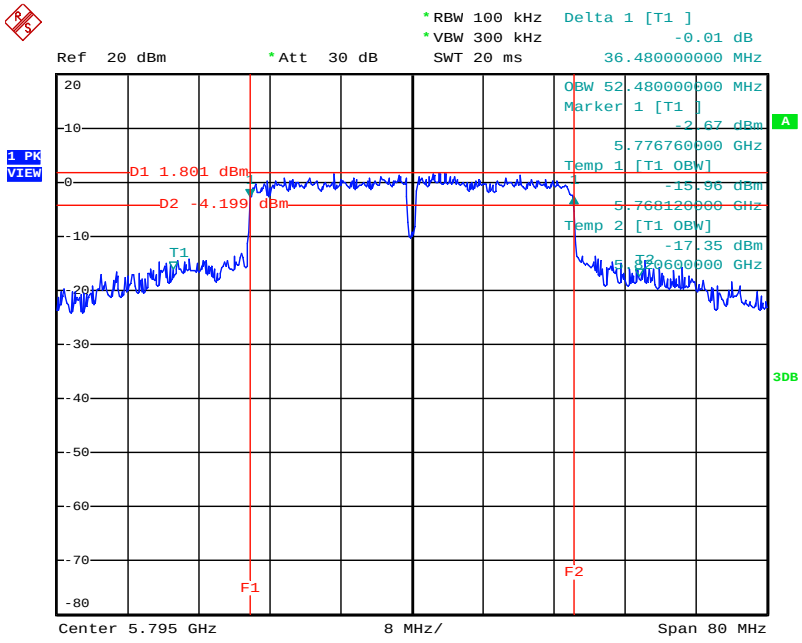
Date: 12.DEC.2012 19:35:58

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5745MHz / Chain 1 (1TX)



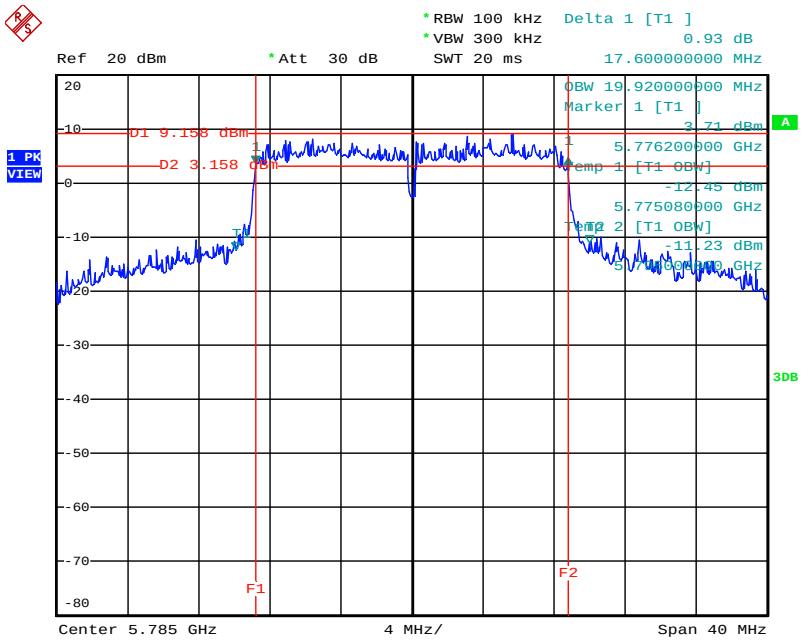
Date: 12.DEC.2012 19:41:50

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5795MHz / Chain 1 (1TX)



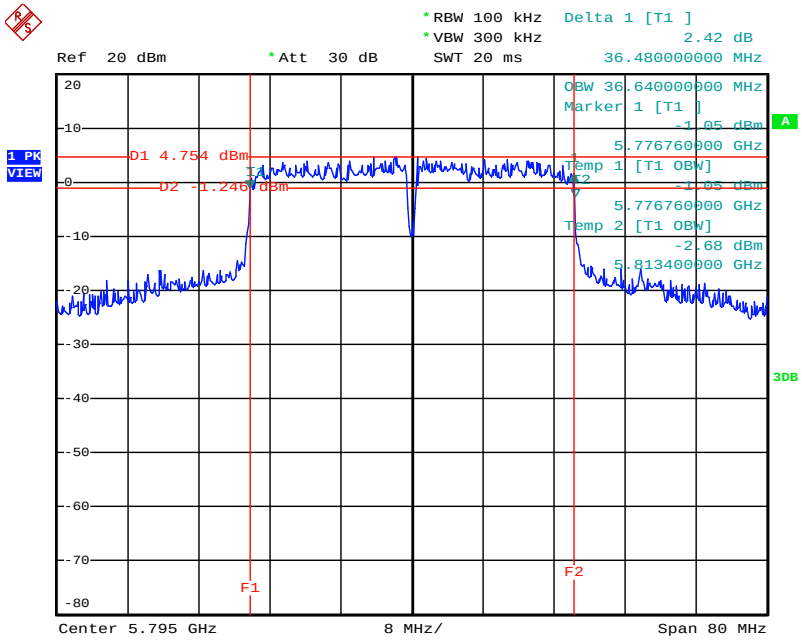
Date: 12.DEC.2012 19:42:54

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5785MHz / Chain 1 + Chain 2 (2TX)



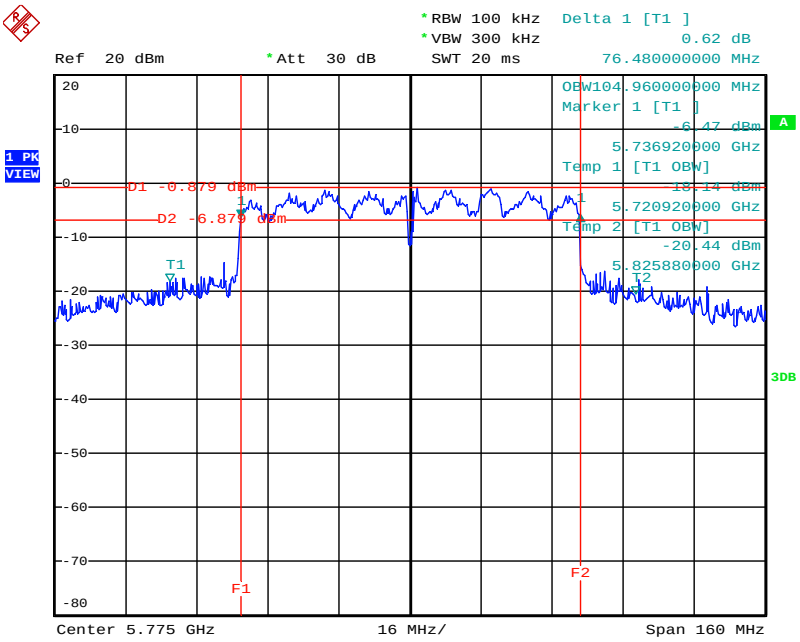
Date: 12.DEC.2012 19:51:00

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5795MHz / Chain 1 + Chain 2 (2TX)



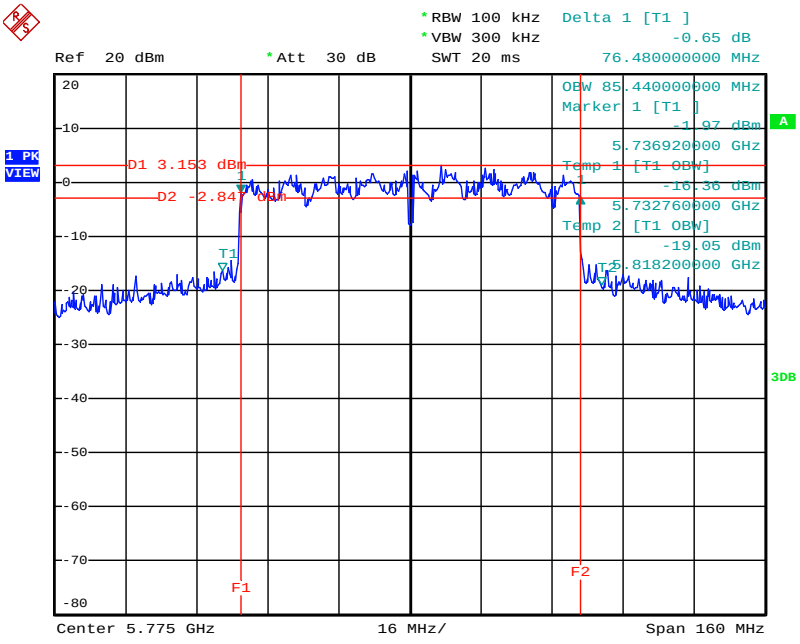
Date: 12.DEC.2012 19:52:57

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0-Nss1 80MHz / 5755MHz / Chain 1 (1TX)



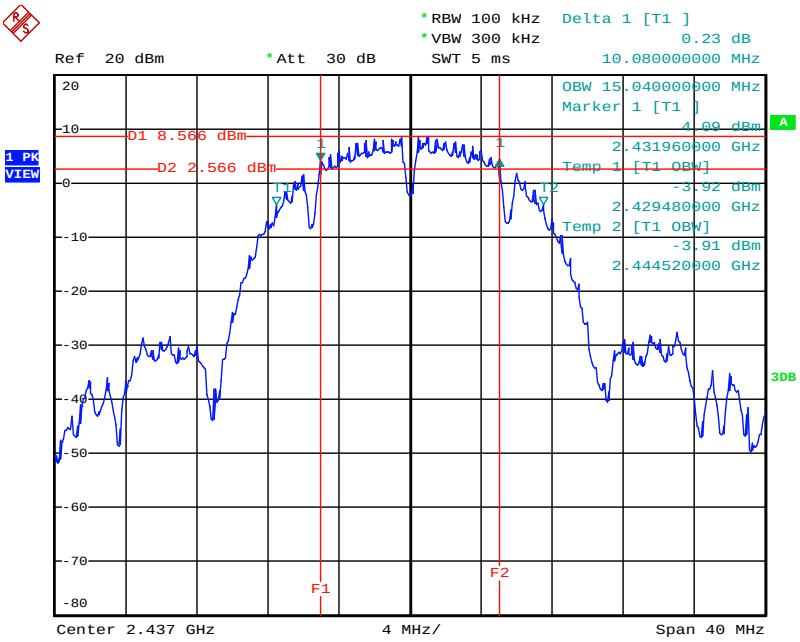
Date: 12.DEC.2012 19:45:17

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0-Nss2 80MHz / 5755MHz / Chain 1 + Chain 2 (2TX)



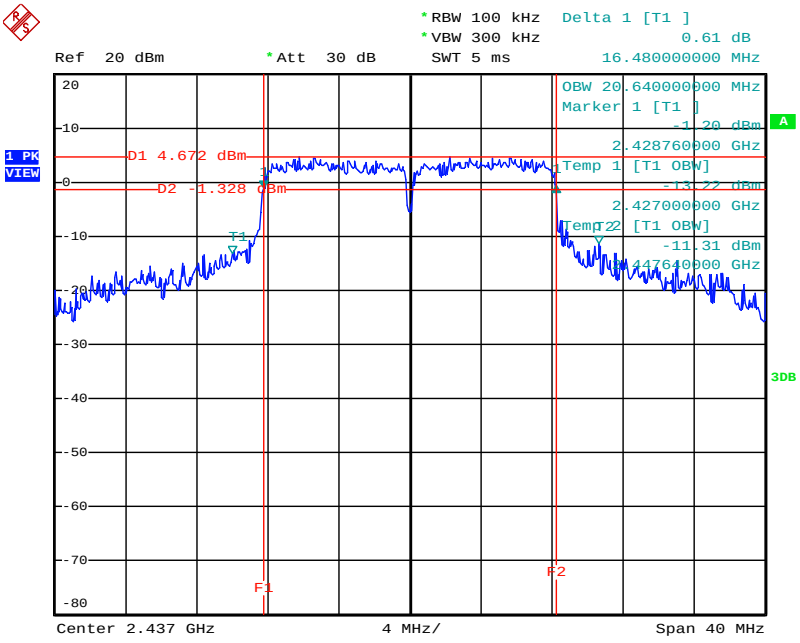
Date: 12.DEC.2012 19:44:45

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437MHz / Chain 1 (1TX)



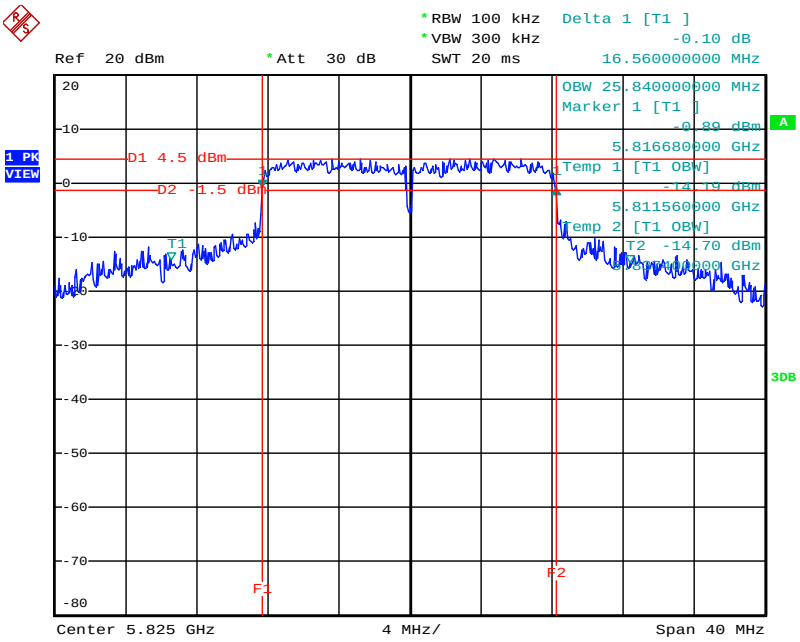
Date: 12.DEC.2012 19:27:49

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437MHz / Chain 1 (1TX)



Date: 12.DEC.2012 19:30:29

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5825MHz / Chain 1 (1TX)



Date: 12.DEC.2012 19:40:09

4.5. Radiated 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 spectrum analyzer and receiver.

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

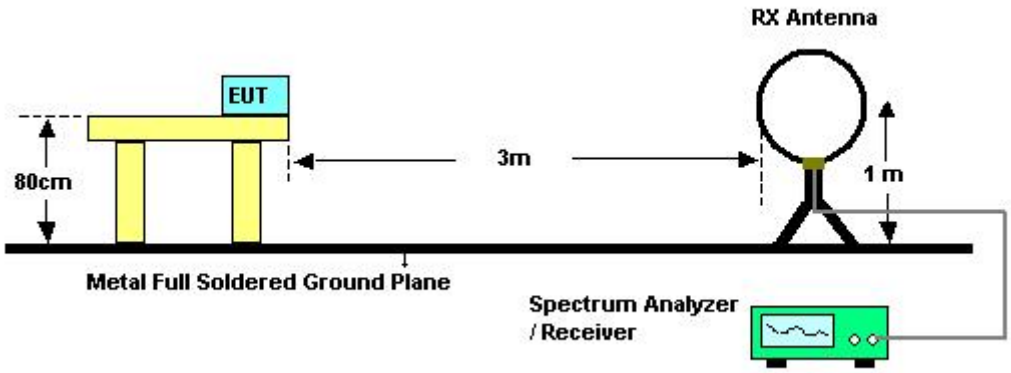
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RB 120kHz for QP

4.5.3. Test Procedures

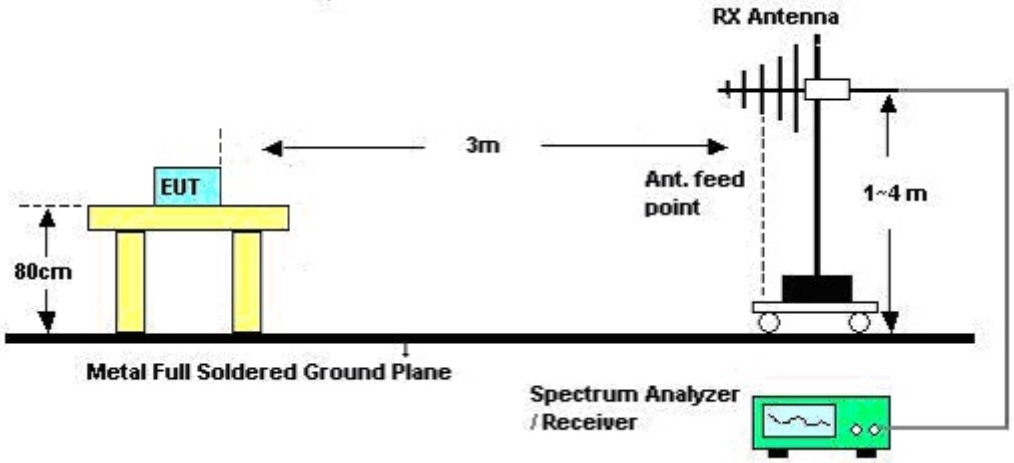
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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. 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.

4.5.4. Test Setup Layout

For radiated emissions below 1 GHz



For radiated emissions above 1 GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	Normal Link
Test Date	Dec. 05, 2012		

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.

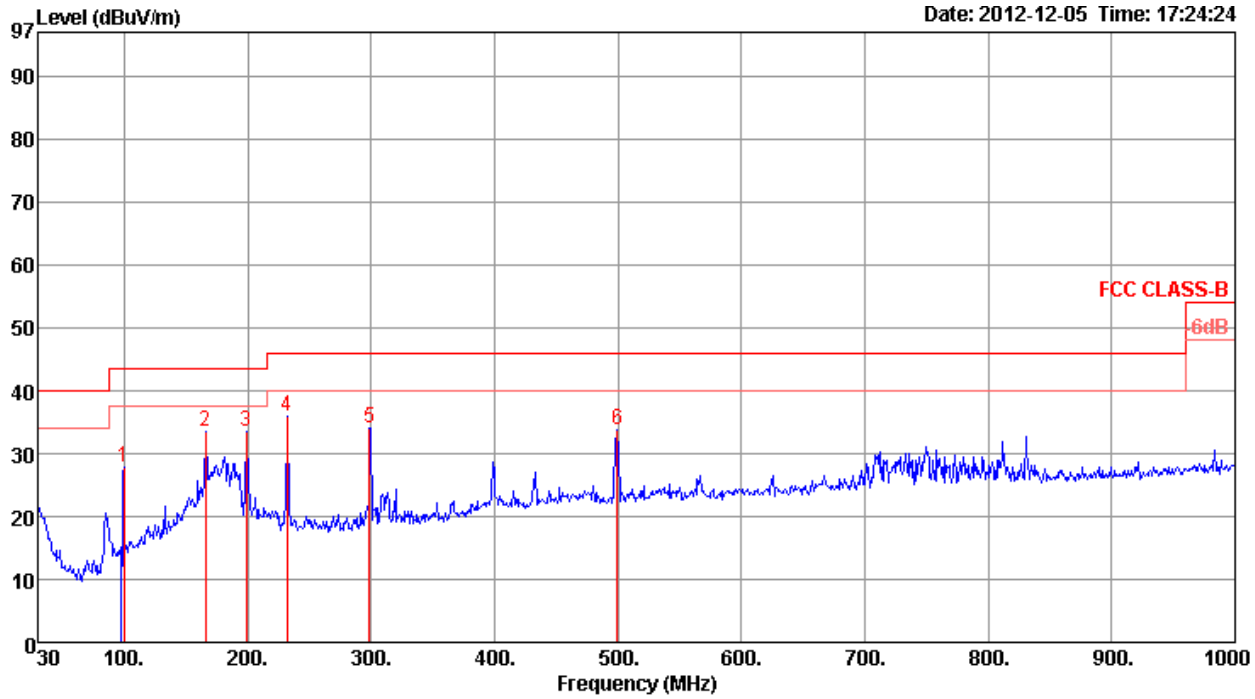
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

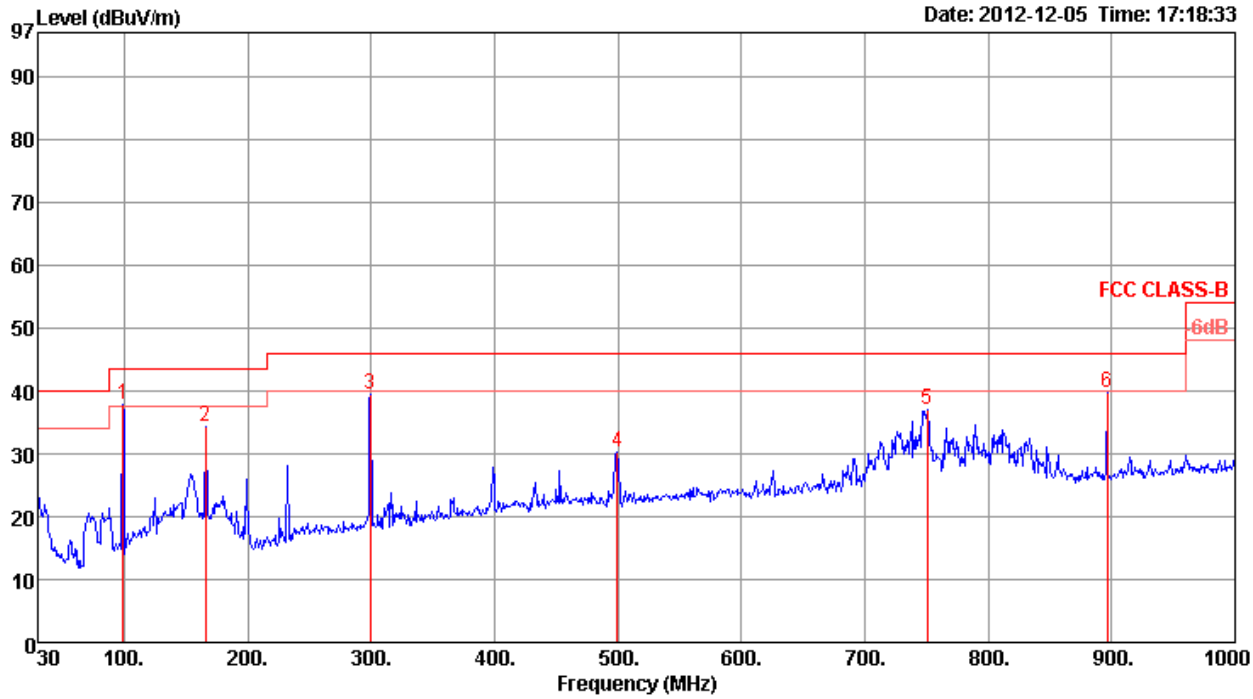
Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	Normal Link

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	99.84	27.73	43.50	-15.77	43.14	1.20	10.99	27.60	Peak	400	0	HORIZONTAL
2	165.80	33.61	43.50	-9.89	46.88	1.53	12.47	27.27	Peak	400	0	HORIZONTAL
3	198.78	33.56	43.50	-9.94	49.73	1.69	9.25	27.11	Peak	400	0	HORIZONTAL
4	231.76	35.95	46.00	-10.05	49.75	1.83	11.41	27.04	Peak	400	0	HORIZONTAL
5	298.69	34.08	46.00	-11.92	45.53	2.10	13.35	26.90	Peak	400	0	HORIZONTAL
6	499.48	33.78	46.00	-12.22	41.56	2.70	17.61	28.09	Peak	400	0	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	98.87	37.75	43.50	-5.75	53.39	1.18	10.79	27.61	Peak	400	0	VERTICAL
2	165.80	34.44	43.50	-9.06	47.71	1.53	12.47	27.27	Peak	400	0	VERTICAL
3	299.66	39.46	46.00	-6.54	50.90	2.10	13.36	26.90	Peak	400	0	VERTICAL
4	499.48	30.34	46.00	-15.66	38.12	2.70	17.61	28.09	Peak	400	0	VERTICAL
5	750.71	36.88	46.00	-9.12	41.75	3.50	19.43	27.80	Peak	400	0	VERTICAL
6	896.21	39.59	46.00	-6.41	42.92	3.58	20.50	27.41	Peak	400	0	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.

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

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz Ch 1 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4818.24	43.59	74.00	-30.41	39.16	6.27	33.36	35.20	Peak	100	177	HORIZONTAL
2	4818.56	32.04	54.00	-21.96	27.61	6.27	33.36	35.20	Average	100	177	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	4823.24	44.11	74.00	-29.89	39.65	6.27	33.39	35.20	Peak	100	330	VERTICAL
2	4823.96	32.51	54.00	-21.49	28.05	6.27	33.39	35.20	Average	100	330	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz Ch 6 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4876.72	31.93	54.00	-22.07	27.34	6.31	33.48	35.20	Average	100	176	HORIZONTAL
2	4877.44	44.20	74.00	-29.80	39.61	6.31	33.48	35.20	Peak	100	176	HORIZONTAL
3	7303.48	48.55	74.00	-25.45	39.98	7.51	36.48	35.42	Peak	100	71	HORIZONTAL
4	7304.28	36.21	54.00	-17.79	27.64	7.51	36.48	35.42	Average	100	71	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	4875.84	43.07	74.00	-30.93	38.48	6.31	33.48	35.20	Peak	100	237	VERTICAL
2	4876.76	33.46	54.00	-20.54	28.87	6.31	33.48	35.20	Average	100	237	VERTICAL
3	7305.40	48.16	74.00	-25.84	39.59	7.51	36.48	35.42	Peak	100	136	VERTICAL
4	7306.00	36.07	54.00	-17.93	27.50	7.51	36.48	35.42	Average	100	136	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz Ch11 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4920.80	32.83	54.00	-21.17	28.14	6.35	33.54	35.20	Average	100	234	HORIZONTAL
2	4921.76	44.22	74.00	-29.78	39.53	6.35	33.54	35.20	Peak	100	234	HORIZONTAL
3	7377.04	35.97	54.00	-18.03	27.20	7.61	36.61	35.45	Average	100	108	HORIZONTAL
4	7377.28	47.25	74.00	-26.75	38.48	7.61	36.61	35.45	Peak	100	108	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	4917.96	32.91	54.00	-21.09	28.22	6.35	33.54	35.20	Average	100	307	VERTICAL
2	4919.80	45.79	74.00	-28.21	41.10	6.35	33.54	35.20	Peak	100	307	VERTICAL
3	7385.48	35.95	54.00	-18.05	27.19	7.61	36.61	35.46	Average	100	85	VERTICAL
4	7386.16	48.43	74.00	-25.57	39.67	7.61	36.61	35.46	Peak	100	85	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 40MHz Ch 3 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4827.90	32.03	54.00	-21.97	27.57	6.27	33.39	35.20	Average	100	191	HORIZONTAL
2	4828.50	43.58	74.00	-30.42	39.12	6.27	33.39	35.20	Peak	100	191	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	4831.50	31.40	54.00	-22.60	26.94	6.27	33.39	35.20	Average	100	101	VERTICAL
2	4832.80	43.63	74.00	-30.37	39.17	6.27	33.39	35.20	Peak	100	101	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 40MHz Ch 6 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4892.70	43.93	74.00	-30.07	39.29	6.33	33.51	35.20	Peak	100	167	HORIZONTAL
2	4893.70	32.04	54.00	-21.96	27.40	6.33	33.51	35.20	Average	100	167	HORIZONTAL
3	7293.20	47.30	74.00	-26.70	38.73	7.51	36.48	35.42	Peak	100	242	HORIZONTAL
4	7293.90	36.38	54.00	-17.62	27.81	7.51	36.48	35.42	Average	100	242	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	4884.60	32.15	54.00	-21.85	27.56	6.31	33.48	35.20	Average	100	254	VERTICAL
2	4885.20	43.84	74.00	-30.16	39.25	6.31	33.48	35.20	Peak	100	254	VERTICAL
3	7294.10	47.58	74.00	-26.42	39.01	7.51	36.48	35.42	Peak	100	299	VERTICAL
4	7295.40	36.22	54.00	-17.78	27.65	7.51	36.48	35.42	Average	100	299	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 40MHz Ch 9 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4913.20	45.26	74.00	-28.74	40.57	6.35	33.54	35.20	Peak	100	281	HORIZONTAL
2	4916.00	32.61	54.00	-21.39	27.92	6.35	33.54	35.20	Average	100	281	HORIZONTAL
3	7354.00	48.02	74.00	-25.98	39.33	7.57	36.56	35.44	Peak	100	205	HORIZONTAL
4	7356.10	36.42	54.00	-17.58	27.73	7.57	36.56	35.44	Average	100	205	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	4915.30	42.84	74.00	-31.16	38.15	6.35	33.54	35.20	Peak	100	52	VERTICAL
2	4917.10	32.67	54.00	-21.33	27.98	6.35	33.54	35.20	Average	100	52	VERTICAL
3	7358.60	47.62	74.00	-26.38	38.91	7.57	36.59	35.45	Peak	100	111	VERTICAL
4	7361.50	36.25	54.00	-17.75	27.54	7.57	36.59	35.45	Average	100	111	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz Ch 1 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	4820.40	32.04	54.00	-21.96	27.58	6.27	33.39	35.20	Average	100	217	HORIZONTAL
2	4820.60	43.77	74.00	-30.23	39.31	6.27	33.39	35.20	Peak	100	217	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	4824.76	43.98	74.00	-30.02	39.52	6.27	33.39	35.20	Peak	100	311	VERTICAL
2	4825.28	32.58	54.00	-21.42	28.12	6.27	33.39	35.20	Average	100	311	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz Ch 6 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	4876.96	43.86	74.00	-30.14	39.27	6.31	33.48	35.20	Peak	100	102	HORIZONTAL
2	4877.40	31.89	54.00	-22.11	27.30	6.31	33.48	35.20	Average	100	102	HORIZONTAL
3	7307.36	47.67	74.00	-26.33	39.11	7.51	36.48	35.43	Peak	100	188	HORIZONTAL
4	7307.92	35.93	54.00	-18.07	27.34	7.51	36.51	35.43	Average	100	188	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	4874.64	43.69	74.00	-30.31	39.10	6.31	33.48	35.20	Peak	100	50	VERTICAL
2	4874.84	33.07	54.00	-20.93	28.48	6.31	33.48	35.20	Average	100	50	VERTICAL
3	7302.32	36.10	54.00	-17.90	27.53	7.51	36.48	35.42	Average	100	341	VERTICAL
4	7304.04	47.83	74.00	-26.17	39.26	7.51	36.48	35.42	Peak	100	341	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz Ch11 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	4922.00	44.09	74.00	-29.91	39.36	6.35	33.58	35.20	Peak	100	308	HORIZONTAL
2	4922.12	32.60	54.00	-21.40	27.87	6.35	33.58	35.20	Average	100	308	HORIZONTAL
3	7379.00	35.98	54.00	-18.02	27.21	7.61	36.61	35.45	Average	100	204	HORIZONTAL
4	7379.76	48.13	74.00	-25.87	39.36	7.61	36.61	35.45	Peak	100	204	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	4924.84	32.55	54.00	-21.45	27.82	6.35	33.58	35.20	Average	100	196	VERTICAL
2	4925.56	43.86	74.00	-30.14	39.13	6.35	33.58	35.20	Peak	100	196	VERTICAL
3	7377.04	35.85	54.00	-18.15	27.08	7.61	36.61	35.45	Average	100	338	VERTICAL
4	7378.24	48.25	74.00	-25.75	39.48	7.61	36.61	35.45	Peak	100	338	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 40MHz Ch 3 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	4826.00	44.25	74.00	-29.75	39.79	6.27	33.39	35.20	Peak	100	164	HORIZONTAL
2	4826.30	32.06	54.00	-21.94	27.60	6.27	33.39	35.20	Average	100	164	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	4841.30	43.18	74.00	-30.82	38.67	6.29	33.42	35.20	Peak	100	282	VERTICAL
2	4842.50	31.57	54.00	-22.43	27.06	6.29	33.42	35.20	Average	100	282	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 40MHz Ch 6 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	4851.30	32.11	54.00	-21.89	27.60	6.29	33.42	35.20	Average	100	225	HORIZONTAL
2	4852.30	43.41	74.00	-30.59	38.90	6.29	33.42	35.20	Peak	100	225	HORIZONTAL
3	7301.90	36.04	54.00	-17.96	27.47	7.51	36.48	35.42	Average	100	290	HORIZONTAL
4	7303.20	48.21	74.00	-25.79	39.64	7.51	36.48	35.42	Peak	100	290	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	4870.30	43.97	74.00	-30.03	39.41	6.31	33.45	35.20	Peak	100	163	VERTICAL
2	4871.80	31.27	54.00	-22.73	26.68	6.31	33.48	35.20	Average	100	163	VERTICAL
3	7297.30	48.10	74.00	-25.90	39.53	7.51	36.48	35.42	Peak	100	249	VERTICAL
4	7298.10	35.87	54.00	-18.13	27.30	7.51	36.48	35.42	Average	100	249	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 40MHz Ch 9 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	4906.20	45.63	74.00	-28.37	40.96	6.33	33.54	35.20	Peak	100	187	HORIZONTAL
2	4918.20	32.89	54.00	-21.11	28.20	6.35	33.54	35.20	Average	100	187	HORIZONTAL
3	7360.90	49.10	74.00	-24.90	40.39	7.57	36.59	35.45	Peak	100	124	HORIZONTAL
4	7361.00	36.55	54.00	-17.45	27.84	7.57	36.59	35.45	Average	100	124	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	4909.30	45.46	74.00	-28.54	40.79	6.33	33.54	35.20	Peak	100	194	VERTICAL
2	4910.30	32.61	54.00	-21.39	27.94	6.33	33.54	35.20	Average	100	194	VERTICAL
3	7358.60	48.19	74.00	-25.81	39.48	7.57	36.59	35.45	Peak	100	115	VERTICAL
4	7359.30	36.79	54.00	-17.21	28.08	7.57	36.59	35.45	Average	100	115	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz CH 149 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11490.00	44.71	54.00	-9.29	30.58	9.71	39.50	35.08	Average	150	37	HORIZONTAL
2	11494.52	57.74	74.00	-16.26	43.61	9.71	39.50	35.08	Peak	150	37	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	11487.92	63.11	74.00	-10.89	48.98	9.71	39.50	35.08	Peak	151	179	VERTICAL
2	11489.92	50.51	54.00	-3.49	36.38	9.71	39.50	35.08	Average	151	179	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz CH 157 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11569.00	57.54	74.00	-16.46	43.51	9.65	39.47	35.09	Peak	144	29	HORIZONTAL
2	11570.00	44.86	54.00	-9.14	30.83	9.65	39.47	35.09	Average	144	29	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	11569.64	61.34	74.00	-12.66	47.31	9.65	39.47	35.09	Peak	144	179	VERTICAL
2	11569.88	49.28	54.00	-4.72	35.25	9.65	39.47	35.09	Average	144	179	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz CH 165 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11644.08	58.26	74.00	-15.74	44.30	9.59	39.44	35.07	Peak	143	175	VERTICAL
2	11649.92	46.11	54.00	-7.89	32.15	9.59	39.44	35.07	Average	143	175	VERTICAL

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	11643.56	56.57	74.00	-17.43	42.61	9.59	39.44	35.07	Peak	146	32	HORIZONTAL
2	11650.00	44.20	54.00	-9.80	30.24	9.59	39.44	35.07	Average	146	32	HORIZONTAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 40MHz CH 151 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11507.28	56.26	74.00	-17.74	42.15	9.71	39.50	35.10	Peak	140	29	HORIZONTAL
2	11509.96	44.24	54.00	-9.76	30.13	9.71	39.50	35.10	Average	140	29	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	11509.32	58.88	74.00	-15.12	44.77	9.71	39.50	35.10	Peak	152	179	VERTICAL
2	11509.88	48.04	54.00	-5.96	33.93	9.71	39.50	35.10	Average	152	179	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 40MHz CH 159 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11587.84	54.07	74.00	-19.93	40.05	9.63	39.47	35.08	Peak	142	46	HORIZONTAL
2	11589.92	42.33	54.00	-11.67	28.31	9.63	39.47	35.08	Average	142	46	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	11580.28	56.88	74.00	-17.12	42.84	9.65	39.47	35.08	Peak	151	180	VERTICAL
2	11590.12	44.58	54.00	-9.42	30.56	9.63	39.47	35.08	Average	151	180	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz CH 149 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	11488.44	55.79	74.00	-18.21	41.66	9.71	39.50	35.08	Peak	100	204	HORIZONTAL
2	11489.40	43.62	54.00	-10.38	29.49	9.71	39.50	35.08	Average	100	204	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.08	62.22	74.00	-11.78	48.09	9.71	39.50	35.08	Peak	144	13	VERTICAL
2	11490.12	50.00	54.00	-4.00	35.87	9.71	39.50	35.08	Average	144	13	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz CH 157 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	11570.64	43.36	54.00	-10.64	29.33	9.65	39.47	35.09	Average	100	161	HORIZONTAL
2	11575.44	56.36	74.00	-17.64	42.32	9.65	39.47	35.08	Peak	100	161	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.08	48.08	54.00	-5.92	34.05	9.65	39.47	35.09	Average	142	35	VERTICAL
2	11570.52	60.05	74.00	-13.95	46.02	9.65	39.47	35.09	Peak	142	35	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz CH 165 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	11650.04	47.04	54.00	-6.96	33.08	9.59	39.44	35.07	Average	139	32	VERTICAL
2	11650.28	60.13	74.00	-13.87	46.17	9.59	39.44	35.07	Peak	139	32	VERTICAL

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	11648.24	42.28	54.00	-11.72	28.32	9.59	39.44	35.07	Average	100	164	HORIZONTAL
2	11652.76	55.17	74.00	-18.83	41.21	9.59	39.44	35.07	Peak	100	164	HORIZONTAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 40MHz CH 151 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	11510.00	41.79	54.00	-12.21	27.68	9.71	39.50	35.10	Average	2535	99	HORIZONTAL
2	11510.24	54.67	74.00	-19.33	40.56	9.71	39.50	35.10	Peak	100	99	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11506.80	58.13	74.00	-15.87	44.02	9.71	39.50	35.10	Peak	152	183	VERTICAL
2	11510.00	45.81	54.00	-8.19	31.70	9.71	39.50	35.10	Average	152	183	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 40MHz CH 159 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	11587.60	54.25	74.00	-19.75	40.23	9.63	39.47	35.08	Peak	100	126	HORIZONTAL
2	11587.96	41.49	54.00	-12.51	27.47	9.63	39.47	35.08	Average	100	126	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	11582.28	43.53	54.00	-10.47	29.49	9.65	39.47	35.08	Average	150	180	VERTICAL
2	11587.12	56.17	74.00	-17.83	42.13	9.65	39.47	35.08	Peak	150	180	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0-Nss1 80MHz CH 155 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11544.40	40.96	54.00	-13.04	26.89	9.67	39.49	35.09	Average	2675	40	HORIZONTAL
2	11545.76	53.16	74.00	-20.84	39.09	9.67	39.49	35.09	Peak	100	40	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	11549.76	57.60	74.00	-16.40	43.53	9.67	39.49	35.09	Peak	151	178	VERTICAL
2	11550.00	45.76	54.00	-8.24	31.69	9.67	39.49	35.09	Average	151	178	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0-Nss2 80MHz CH 155 / Chain 1 + Chain 2 (2TX)
Test Date	Dec. 04, 2012		

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	11544.92	41.66	54.00	-12.34	27.59	9.67	39.49	35.09	Average	100	140	HORIZONTAL
2	11559.92	54.00	74.00	-20.00	39.94	9.67	39.48	35.09	Peak	100	140	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	11542.60	58.58	74.00	-15.42	44.51	9.67	39.49	35.09	Peak	163	188	VERTICAL
2	11550.00	45.80	54.00	-8.20	31.73	9.67	39.49	35.09	Average	163	188	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 1 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4823.92	49.94	74.00	-24.06	45.48	6.27	33.39	35.20	Peak	100	48	HORIZONTAL
2	4823.96	45.05	54.00	-8.95	40.59	6.27	33.39	35.20	Average	100	48	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	4823.97	48.05	54.00	-5.95	43.59	6.27	33.39	35.20	Average	100	274	VERTICAL
2	4823.97	51.96	74.00	-22.04	47.50	6.27	33.39	35.20	Peak	100	274	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 6 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4873.97	51.08	74.00	-22.92	46.49	6.31	33.48	35.20	Peak	100	46	HORIZONTAL
2	4873.98	46.56	54.00	-7.44	41.97	6.31	33.48	35.20	Average	100	46	HORIZONTAL
3	7309.90	36.29	54.00	-17.71	27.70	7.51	36.51	35.43	Average	100	138	HORIZONTAL
4	7311.73	48.59	74.00	-25.41	40.00	7.51	36.51	35.43	Peak	100	138	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	4873.89	53.07	74.00	-20.93	48.48	6.31	33.48	35.20	Peak	109	273	VERTICAL
2	4873.96	49.65	54.00	-4.35	45.06	6.31	33.48	35.20	Average	109	273	VERTICAL
3	7310.35	51.71	74.00	-22.29	43.12	7.51	36.51	35.43	Peak	100	69	VERTICAL
4	7311.74	39.94	54.00	-14.06	31.35	7.51	36.51	35.43	Average	100	69	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 11 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	45.06	54.00	-8.94	40.33	6.35	33.58	35.20	Average	100	47	HORIZONTAL
2	4923.98	50.10	74.00	-23.90	45.37	6.35	33.58	35.20	Peak	100	47	HORIZONTAL
3	7384.88	48.44	74.00	-25.56	39.68	7.61	36.61	35.46	Peak	100	144	HORIZONTAL
4	7387.77	35.87	54.00	-18.13	27.08	7.64	36.61	35.46	Average	100	144	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	4923.87	52.32	74.00	-21.68	47.59	6.35	33.58	35.20	Peak	108	96	VERTICAL
2	4923.97	48.62	54.00	-5.38	43.89	6.35	33.58	35.20	Average	108	96	VERTICAL
3	7384.27	50.09	74.00	-23.91	41.33	7.61	36.61	35.46	Peak	100	68	VERTICAL
4	7384.78	37.26	54.00	-16.74	28.50	7.61	36.61	35.46	Average	100	68	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 1 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4817.56	44.71	74.00	-29.29	40.28	6.27	33.36	35.20	Peak	100	164	HORIZONTAL
2	4825.64	32.21	54.00	-21.79	27.75	6.27	33.39	35.20	Average	100	164	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	4821.32	45.44	74.00	-28.56	40.98	6.27	33.39	35.20	Peak	100	278	VERTICAL
2	4824.24	32.93	54.00	-21.07	28.47	6.27	33.39	35.20	Average	100	278	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 6 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4877.24	31.91	54.00	-22.09	27.32	6.31	33.48	35.20	Average	100	159	HORIZONTAL
2	4877.44	43.90	74.00	-30.10	39.31	6.31	33.48	35.20	Peak	100	159	HORIZONTAL
3	7308.36	35.88	54.00	-18.12	27.29	7.51	36.51	35.43	Average	100	230	HORIZONTAL
4	7309.64	48.96	74.00	-25.04	40.37	7.51	36.51	35.43	Peak	100	230	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	4874.12	33.50	54.00	-20.50	28.91	6.31	33.48	35.20	Average	100	101	VERTICAL
2	4876.80	46.17	74.00	-27.83	41.58	6.31	33.48	35.20	Peak	100	101	VERTICAL
3	7306.88	49.61	74.00	-24.39	41.05	7.51	36.48	35.43	Peak	100	300	VERTICAL
4	7312.52	35.99	54.00	-18.01	27.37	7.54	36.51	35.43	Average	100	300	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 11 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	4926.68	32.50	54.00	-21.50	27.77	6.35	33.58	35.20	Average	100	99	HORIZONTAL
2	4927.00	44.63	74.00	-29.37	39.90	6.35	33.58	35.20	Peak	100	99	HORIZONTAL
3	7377.44	47.32	74.00	-26.68	38.55	7.61	36.61	35.45	Peak	100	164	HORIZONTAL
4	7378.12	35.85	54.00	-18.15	27.08	7.61	36.61	35.45	Average	100	164	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	4926.24	33.20	54.00	-20.80	28.47	6.35	33.58	35.20	Average	100	319	VERTICAL
2	4926.56	45.05	74.00	-28.95	40.32	6.35	33.58	35.20	Peak	100	319	VERTICAL
3	7376.88	48.05	74.00	-25.95	39.28	7.61	36.61	35.45	Peak	100	130	VERTICAL
4	7377.76	35.85	54.00	-18.15	27.08	7.61	36.61	35.45	Average	8960	130	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a CH 149 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11490.04	55.22	74.00	-18.78	41.09	9.71	39.50	35.08	Peak	100	200	HORIZONTAL
2	11490.12	42.05	54.00	-11.95	27.92	9.71	39.50	35.08	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	11490.12	50.57	54.00	-3.43	36.44	9.71	39.50	35.08	Average	151	181	VERTICAL
2	11492.80	63.02	74.00	-10.98	48.89	9.71	39.50	35.08	Peak	151	181	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a CH 157 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11570.08	44.19	54.00	-9.81	30.16	9.65	39.47	35.09	Average	141	28	HORIZONTAL
2	11572.80	56.82	74.00	-17.18	42.78	9.65	39.47	35.08	Peak	141	28	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	11566.88	61.67	74.00	-12.33	47.63	9.65	39.48	35.09	Peak	150	179	VERTICAL
2	11570.04	48.83	54.00	-5.17	34.80	9.65	39.47	35.09	Average	150	179	VERTICAL

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a CH 165 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	11650.08	44.29	54.00	-9.71	30.33	9.59	39.44	35.07	Average	151	29	HORIZONTAL
2	11651.68	55.67	74.00	-18.33	41.71	9.59	39.44	35.07	Peak	151	29	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	11649.88	47.10	54.00	-6.90	33.14	9.59	39.44	35.07	Average	149	177	VERTICAL
2	11650.28	59.96	74.00	-14.04	46.00	9.59	39.44	35.07	Peak	149	177	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. Band Edge Emissions Measurement

4.6.1. 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

4.6.2. Measuring Instruments and Setting

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

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

4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

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. Test Result of Band Edge and Fundamental Emissions

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 20MHz Ch 1, 6, 11 / Chain 1 (1TX)
Test date	Dec. 04, 2012		

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	2390.00	53.16	54.00	-0.84	20.77	4.34	28.05	0.00	Average	144	74	HORIZONTAL
2	2390.00	73.17	74.00	-0.83	40.78	4.34	28.05	0.00	Peak	144	74	HORIZONTAL
3	2417.40	102.72			70.23	4.36	28.13	0.00	Average	144	74	HORIZONTAL
4	2418.40	112.37			79.88	4.36	28.13	0.00	Peak	144	74	HORIZONTAL

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	2387.60	61.23	74.00	-12.77	28.84	4.34	28.05	0.00	Peak	140	76	HORIZONTAL
2	2388.80	47.01	54.00	-6.99	14.62	4.34	28.05	0.00	Average	140	76	HORIZONTAL
3	2442.20	104.12			71.56	4.38	28.18	0.00	Average	140	76	HORIZONTAL
4	2443.40	113.70			81.14	4.38	28.18	0.00	Peak	140	76	HORIZONTAL
5	2483.50	47.81	54.00	-6.19	15.15	4.40	28.26	0.00	Average	140	76	HORIZONTAL
6	2483.50	62.23	74.00	-11.77	29.57	4.40	28.26	0.00	Peak	140	76	HORIZONTAL

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

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	2456.20	111.52			78.92	4.38	28.22	0.00	Peak	143	86	HORIZONTAL
2	2456.40	101.87			69.27	4.38	28.22	0.00	Average	143	86	HORIZONTAL
3	2483.50	53.35	54.00	-0.65	20.69	4.40	28.26	0.00	Average	143	86	HORIZONTAL
4	2483.70	73.20	74.00	-0.80	40.54	4.40	28.26	0.00	Peak	143	86	HORIZONTAL

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

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 40MHz Ch 3, 6, 9 / Chain 1 (1TX)
Test date	Dec. 04, 2012		

Channel 3

	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	2388.40	69.65	74.00	-4.35	37.26	4.34	28.05	0.00	Peak	145	86	HORIZONTAL
2	2390.00	53.47	54.00	-0.53	21.08	4.34	28.05	0.00	Average	145	86	HORIZONTAL
3	2420.00	108.14			75.65	4.36	28.13	0.00	Peak	145	86	HORIZONTAL
4	2423.60	98.39			65.90	4.36	28.13	0.00	Average	145	86	HORIZONTAL

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	66.04	74.00	-7.96	33.65	4.34	28.05	0.00	Peak	146	89	HORIZONTAL
2	2390.00	51.48	54.00	-2.52	19.09	4.34	28.05	0.00	Average	146	89	HORIZONTAL
3	2435.00	99.75			67.21	4.36	28.18	0.00	Average	146	89	HORIZONTAL
4	2435.00	109.23			76.69	4.36	28.18	0.00	Peak	146	89	HORIZONTAL
5	2483.50	52.92	54.00	-1.08	20.26	4.40	28.26	0.00	Average	146	89	HORIZONTAL
6	2483.50	68.10	74.00	-5.90	35.44	4.40	28.26	0.00	Peak	146	89	HORIZONTAL

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

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	2448.00	107.61			75.05	4.38	28.18	0.00	Peak	142	88	HORIZONTAL
2	2450.00	98.14			65.58	4.38	28.18	0.00	Average	142	88	HORIZONTAL
3	2483.50	52.99	54.00	-1.01	20.33	4.40	28.26	0.00	Average	142	88	HORIZONTAL
4	2484.70	69.34	74.00	-4.66	36.68	4.40	28.26	0.00	Peak	142	88	HORIZONTAL

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	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 20MHz Ch 1, 6, 11 / Chain 1 + Chain 2 (2TX)
Test date	Dec. 04, 2012		

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	2389.00	65.39	74.00	-8.61	33.00	4.34	28.05	0.00	Peak	144	74	HORIZONTAL
2	2390.00	53.06	54.00	-0.94	20.67	4.34	28.05	0.00	Average	144	74	HORIZONTAL
3	2418.20	103.45			70.96	4.36	28.13	0.00	Average	144	74	HORIZONTAL
4	2418.60	114.42			81.93	4.36	28.13	0.00	Peak	144	74	HORIZONTAL

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	2388.40	58.47	74.00	-15.53	26.08	4.34	28.05	0.00	Peak	146	86	HORIZONTAL
2	2390.00	46.38	54.00	-7.62	13.99	4.34	28.05	0.00	Average	146	86	HORIZONTAL
3	2431.40	117.52			85.03	4.36	28.13	0.00	Peak	146	86	HORIZONTAL
4	2431.80	105.72			73.23	4.36	28.13	0.00	Average	146	86	HORIZONTAL
5	2483.50	47.04	54.00	-6.96	14.38	4.40	28.26	0.00	Average	146	86	HORIZONTAL
6	2488.30	60.10	74.00	-13.90	27.38	4.42	28.30	0.00	Peak	146	86	HORIZONTAL

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

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	2456.60	114.61			82.01	4.38	28.22	0.00	Peak	141	85	HORIZONTAL
2	2468.00	103.32			70.70	4.40	28.22	0.00	Average	141	85	HORIZONTAL
3	2483.50	52.99	54.00	-1.01	20.33	4.40	28.26	0.00	Average	141	85	HORIZONTAL
4	2483.70	67.27	74.00	-6.73	34.61	4.40	28.26	0.00	Peak	141	85	HORIZONTAL

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

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS8 40MHz Ch 3, 6, 9 / Chain 1 + Chain 2 (2TX)
Test date	Dec. 04, 2012		

Channel 3

	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	2385.20	65.61	74.00	-8.39	33.24	4.32	28.05	0.00	Peak	145	88	HORIZONTAL
2	2390.00	53.02	54.00	-0.98	20.63	4.34	28.05	0.00	Average	145	88	HORIZONTAL
3	2423.20	99.01			66.52	4.36	28.13	0.00	Average	145	88	HORIZONTAL
4	2423.60	109.73			77.24	4.36	28.13	0.00	Peak	145	88	HORIZONTAL

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	2390.00	53.34	54.00	-0.66	20.95	4.34	28.05	0.00	Average	148	88	HORIZONTAL
2	2390.00	67.67	74.00	-6.33	35.28	4.34	28.05	0.00	Peak	148	88	HORIZONTAL
3	2435.40	101.83			69.29	4.36	28.18	0.00	Average	148	88	HORIZONTAL
4	2438.60	112.36			79.80	4.38	28.18	0.00	Peak	148	88	HORIZONTAL
5	2483.50	52.74	54.00	-1.26	20.08	4.40	28.26	0.00	Average	148	88	HORIZONTAL
6	2483.50	66.49	74.00	-7.51	33.83	4.40	28.26	0.00	Peak	148	88	HORIZONTAL

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

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	2448.80	109.99			77.43	4.38	28.18	0.00	Peak	141	89	HORIZONTAL
2	2449.20	99.39			66.83	4.38	28.18	0.00	Average	141	89	HORIZONTAL
3	2483.50	52.94	54.00	-1.06	20.28	4.40	28.26	0.00	Average	141	89	HORIZONTAL
4	2484.70	67.77	74.00	-6.23	35.11	4.40	28.26	0.00	Peak	141	89	HORIZONTAL

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	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	2388.80	60.98	74.00	-13.02	28.59	4.34	28.05	0.00	Peak	117	91	HORIZONTAL
2	2389.20	52.31	54.00	-1.69	19.92	4.34	28.05	0.00	Average	117	91	HORIZONTAL
3	2410.20	111.88			79.45	4.34	28.09	0.00	Average	117	91	HORIZONTAL
4	2411.00	115.71			83.28	4.34	28.09	0.00	Peak	117	91	HORIZONTAL

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	2388.80	51.53	54.00	-2.47	19.14	4.34	28.05	0.00	Average	144	88	HORIZONTAL
2	2389.20	59.59	74.00	-14.41	27.20	4.34	28.05	0.00	Peak	144	88	HORIZONTAL
3	2436.20	112.22			79.68	4.36	28.18	0.00	Average	144	88	HORIZONTAL
4	2436.20	116.11			83.57	4.36	28.18	0.00	Peak	144	88	HORIZONTAL
5	2485.10	53.07	54.00	-0.93	20.37	4.40	28.30	0.00	Average	144	88	HORIZONTAL
6	2485.10	60.65	74.00	-13.35	27.95	4.40	28.30	0.00	Peak	144	88	HORIZONTAL

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	2462.80	110.34			77.72	4.40	28.22	0.00	Average	145	88	HORIZONTAL
2	2463.00	114.41			81.79	4.40	28.22	0.00	Peak	145	88	HORIZONTAL
3	2487.90	61.93	74.00	-12.07	29.21	4.42	28.30	0.00	Peak	145	88	HORIZONTAL
4	2491.30	52.65	54.00	-1.35	19.93	4.42	28.30	0.00	Average	145	88	HORIZONTAL

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

Temperature	24.5℃	Humidity	56%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 (1TX)
Test Date	Dec. 04, 2012		

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	2390.00	53.01	54.00	-0.99	20.62	4.34	28.05	0.00	Average	143	74	HORIZONTAL
2	2390.00	71.06	74.00	-2.94	38.67	4.34	28.05	0.00	Peak	143	74	HORIZONTAL
3	2417.60	113.17			80.68	4.36	28.13	0.00	Peak	143	74	HORIZONTAL
4	2418.20	104.04			71.55	4.36	28.13	0.00	Average	143	74	HORIZONTAL

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	2385.60	59.63	74.00	-14.37	27.26	4.32	28.05	0.00	Peak	142	87	HORIZONTAL
2	2390.00	46.62	54.00	-7.38	14.23	4.34	28.05	0.00	Average	142	87	HORIZONTAL
3	2443.40	104.40			71.84	4.38	28.18	0.00	Average	142	87	HORIZONTAL
4	2443.80	114.01			81.45	4.38	28.18	0.00	Peak	142	87	HORIZONTAL
5	2483.50	47.94	54.00	-6.06	15.28	4.40	28.26	0.00	Average	142	87	HORIZONTAL
6	2484.30	62.38	74.00	-11.62	29.72	4.40	28.26	0.00	Peak	142	87	HORIZONTAL

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	2455.80	111.54			78.94	4.38	28.22	0.00	Peak	142	87	HORIZONTAL
2	2456.80	101.90			69.30	4.38	28.22	0.00	Average	142	87	HORIZONTAL
3	2483.50	53.24	54.00	-0.76	20.58	4.40	28.26	0.00	Average	142	87	HORIZONTAL
4	2483.50	71.48	74.00	-2.52	38.82	4.40	28.26	0.00	Peak	142	87	HORIZONTAL

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

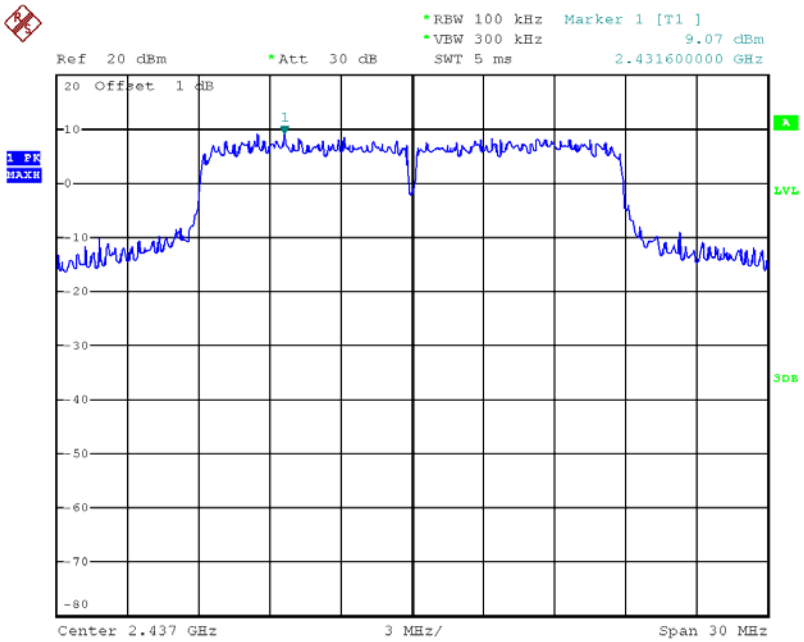
Note:

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

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

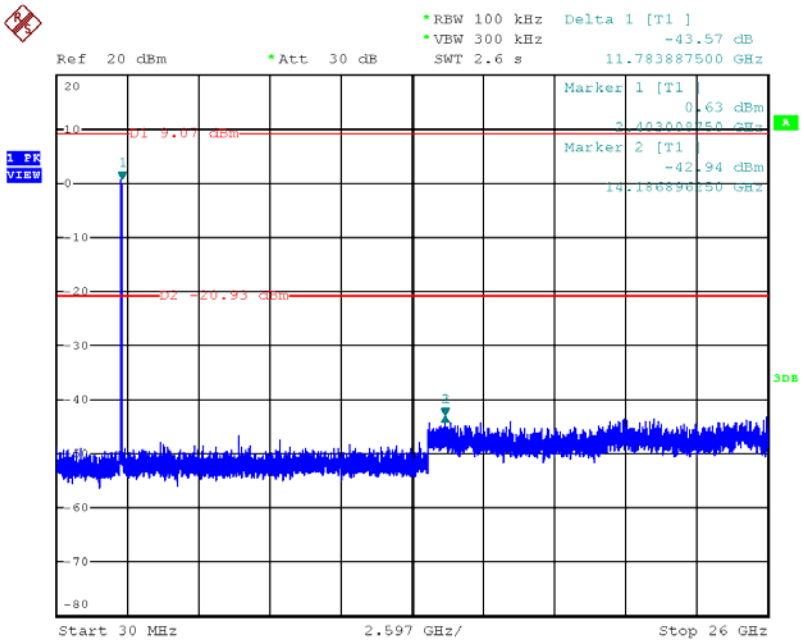
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 20MHz / Reference Level / Chain 1 (1TX)



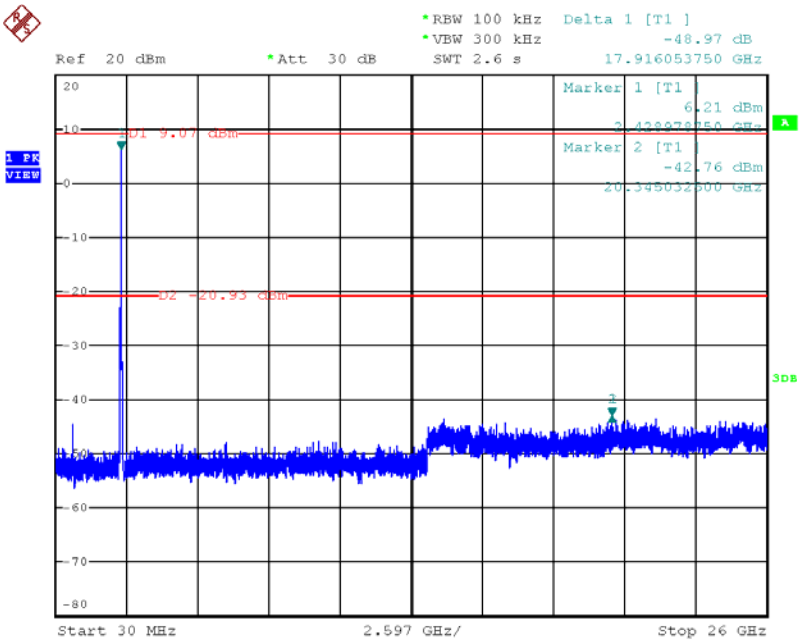
Date: 12.DEC.2012 17:46:45

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 1 (down 30dBc) / Chain 1 (1TX)



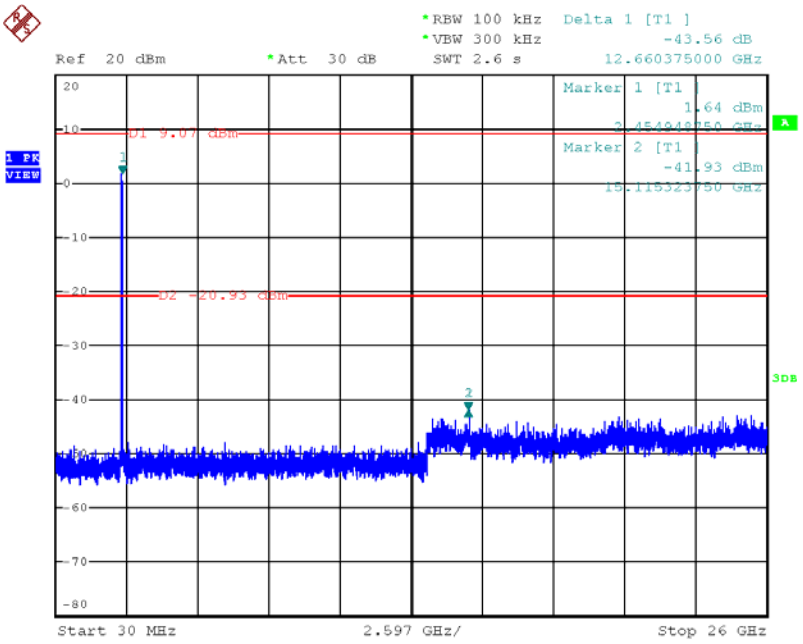
Date: 12.DEC.2012 18:37:46

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 6 (down 30dBc) / Chain 1 (1TX)



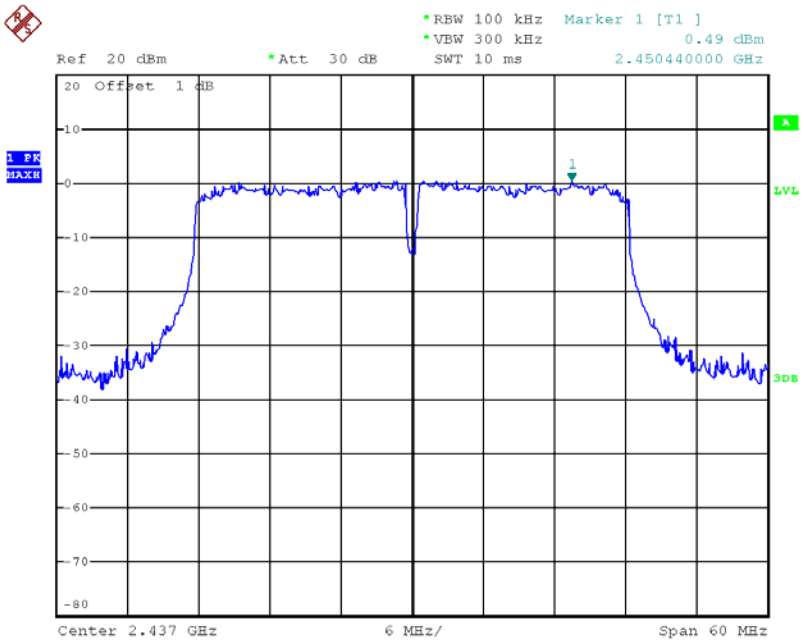
Date: 12.DEC.2012 18:38:08

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 11 (down 30dBc) / Chain 1 (1TX)



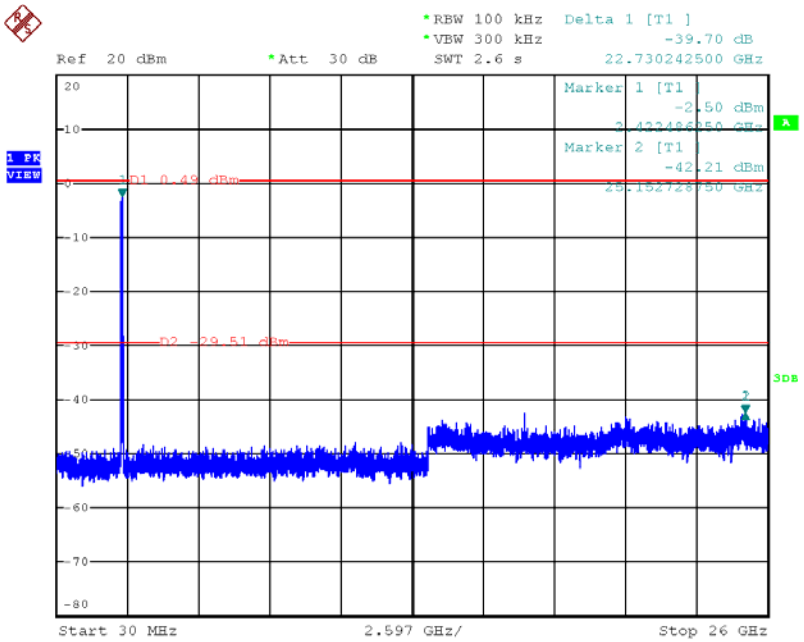
Date: 12.DEC.2012 18:38:37

Plot on Configuration IEEE 802.11n MCS0 40MHz / Reference Level / Chain 1 (1TX)



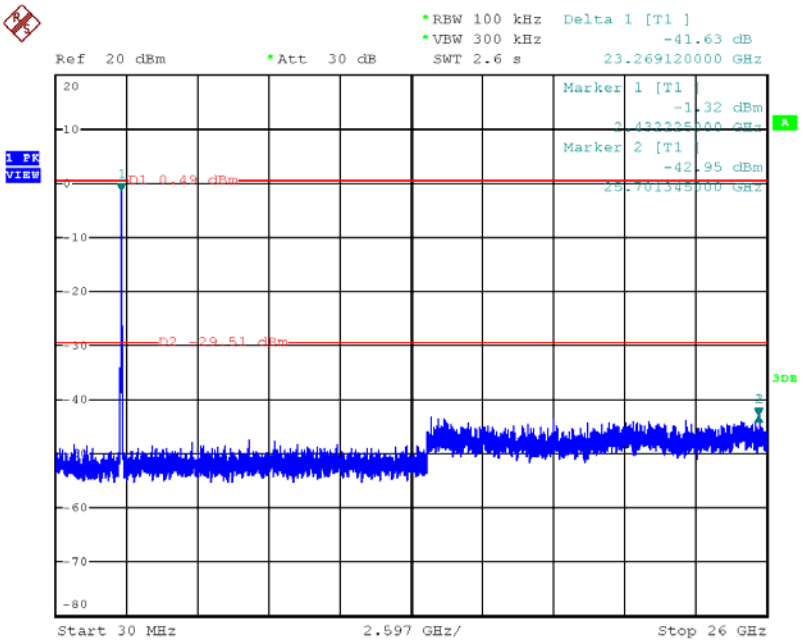
Date: 12.DEC.2012 17:48:54

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 3 (down 30dBc) / Chain 1 (1TX)



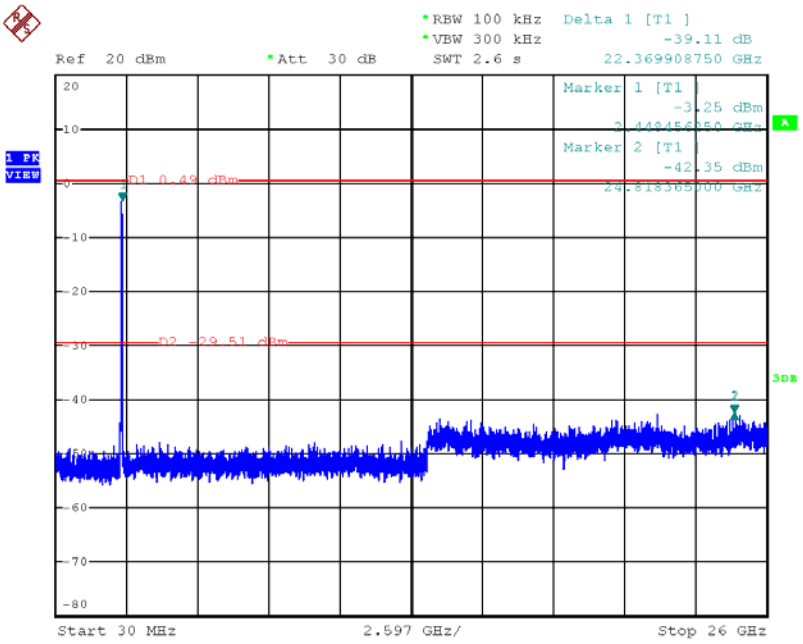
Date: 12.DEC.2012 18:39:49

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 6 (down 30dBc) / Chain 1 (1TX)



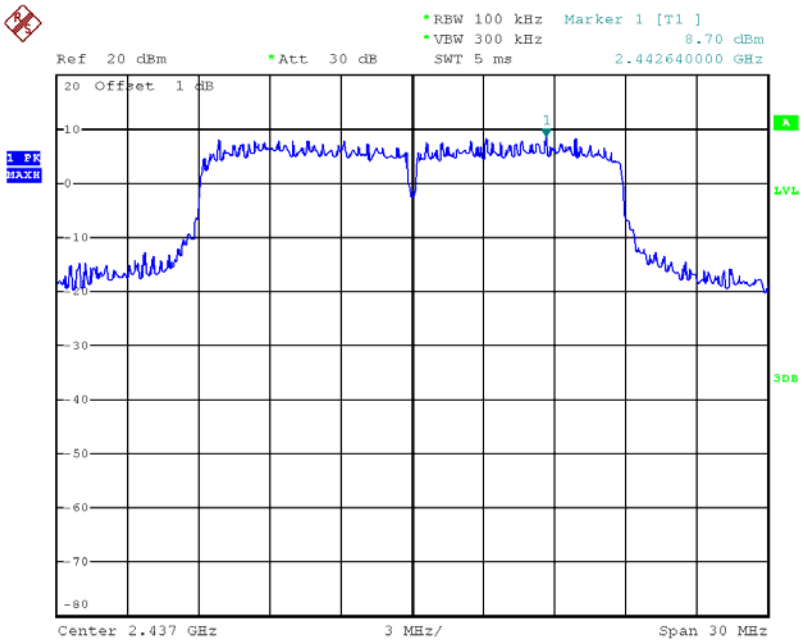
Date: 12.DEC.2012 18:40:12

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 9 (down 30dBc) / Chain 1 (1TX)



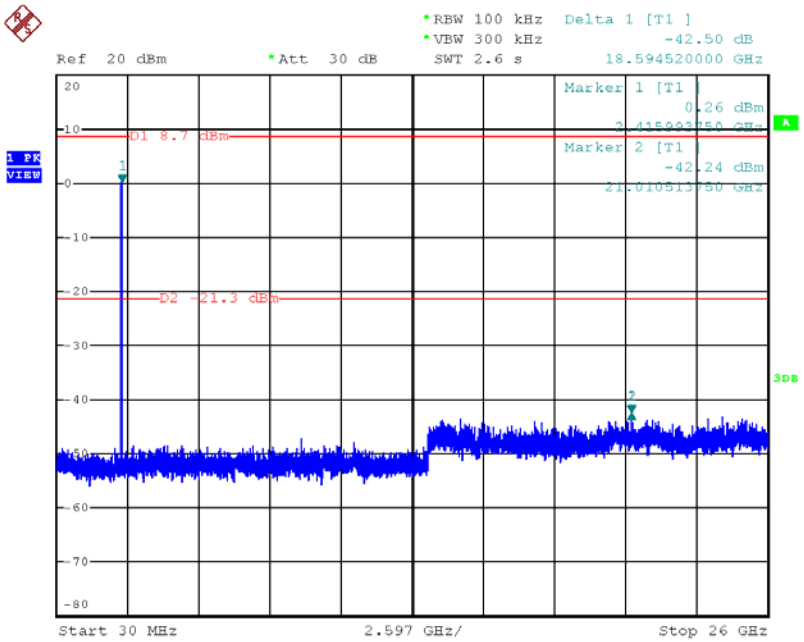
Date: 12.DEC.2012 18:40:36

Plot on Configuration IEEE 802.11n MCS8 20MHz / Reference Level / Chain 1 + Chain 2 (2TX)



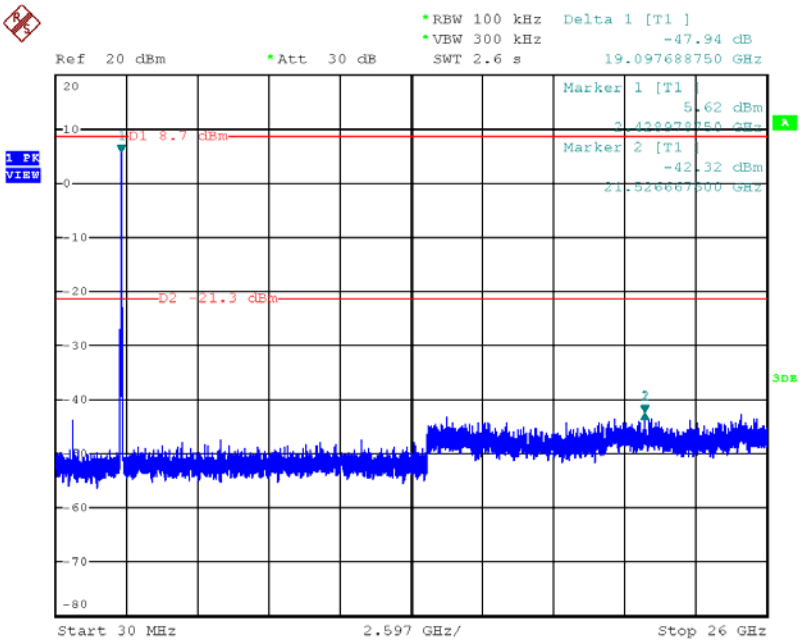
Date: 12.DEC.2012 18:16:53

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 1 (down 30dBc) / Chain 1 + Chain 2 (2TX)



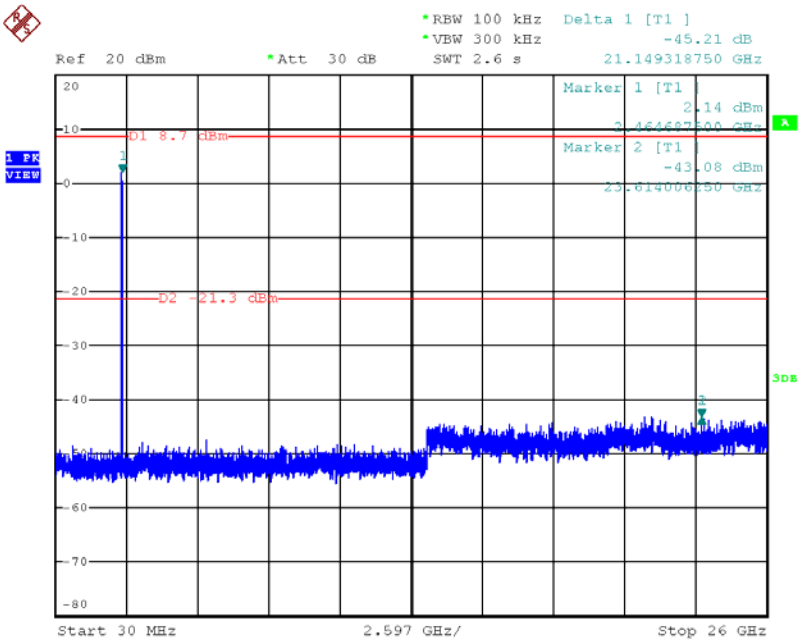
Date: 12.DEC.2012 19:01:05

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 6 (down 30dBc) / Chain 1 + Chain 2 (2TX)



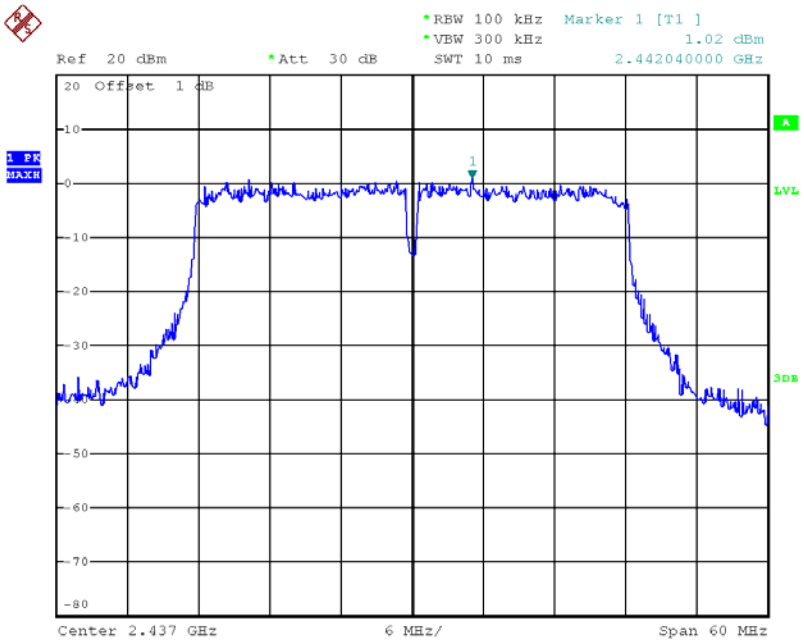
Date: 12.DEC.2012 19:01:32

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 11 (down 30dBc) / Chain 1 + Chain 2 (2TX)



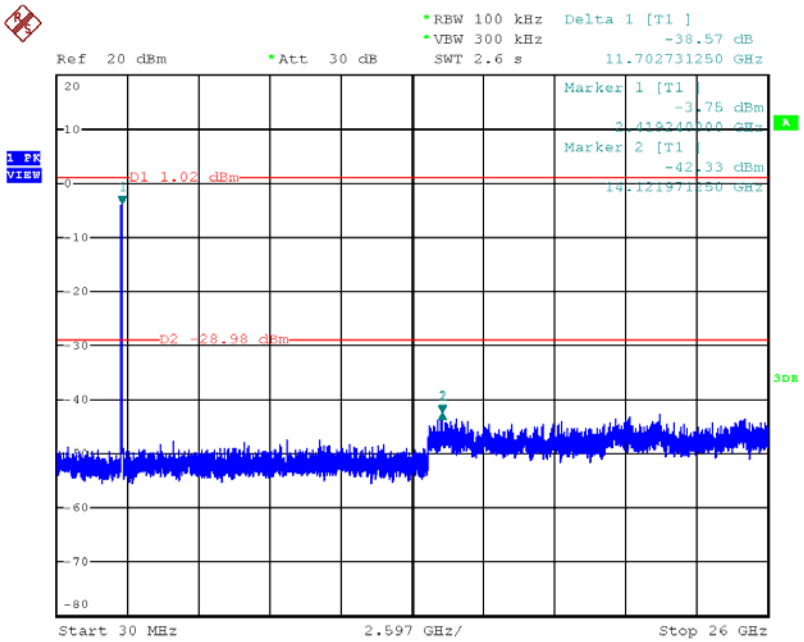
Date: 12.DEC.2012 19:02:01

Plot on Configuration IEEE 802.11n MCS8 40MHz / Reference Level / Chain 1 + Chain 2 (2TX)



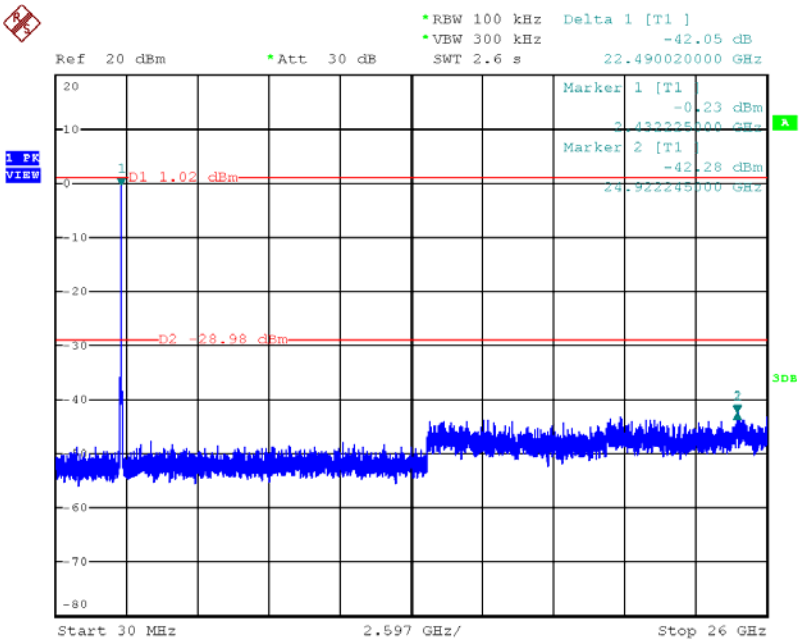
Date: 12.DEC.2012 18:27:08

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 3 (down 30dBc) / Chain 1 + Chain 2 (2TX)



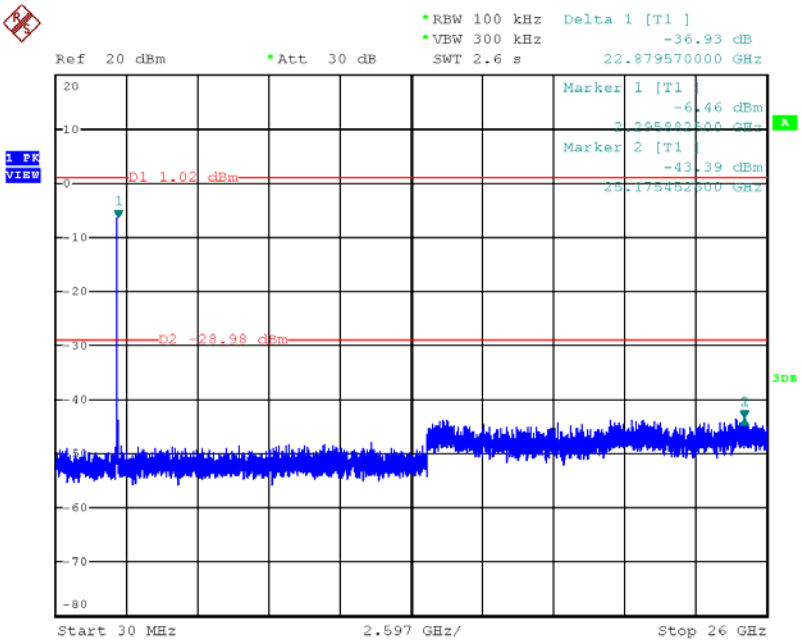
Date: 12.DEC.2012 19:03:08

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 6 (down 30dBc) / Chain 1 + Chain 2 (2TX)



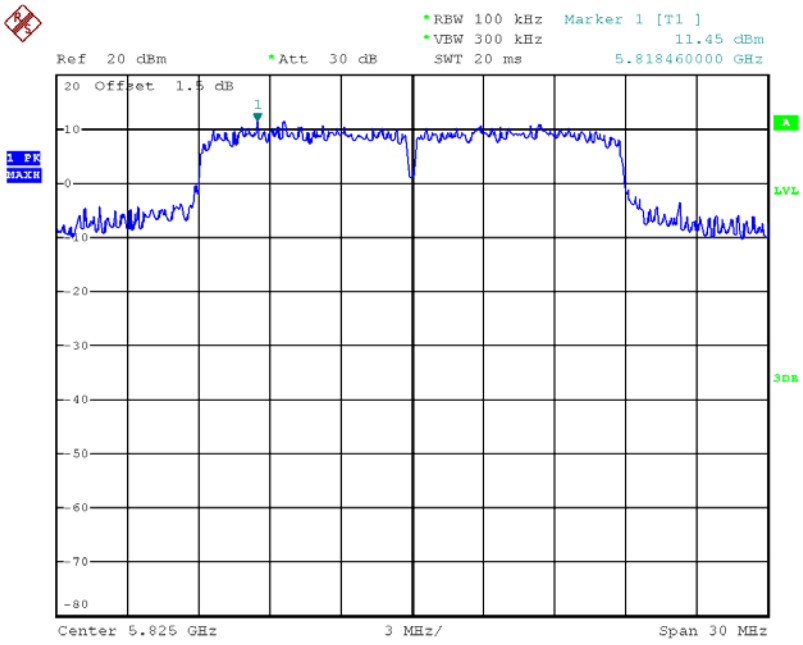
Date: 12.DEC.2012 19:03:34

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 9 (down 30dBc) / Chain 1 + Chain 2 (2TX)



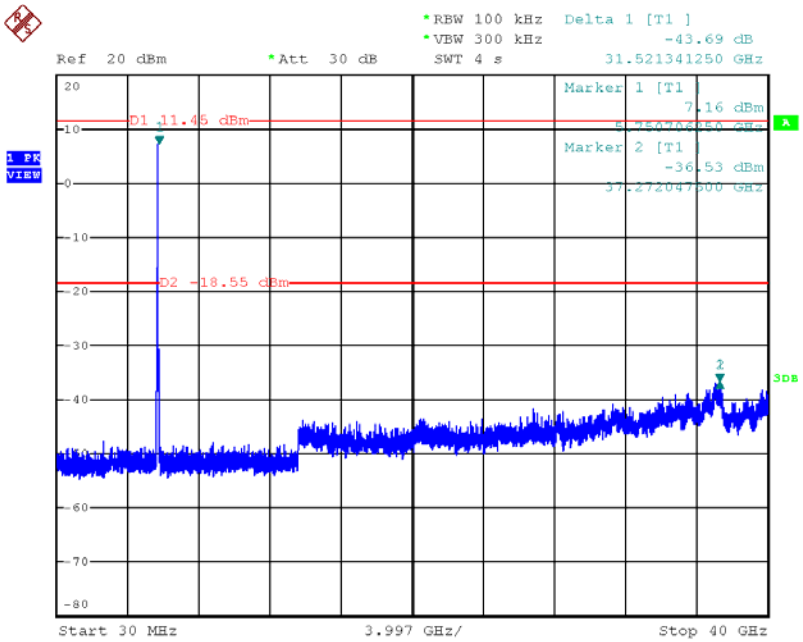
Date: 12.DEC.2012 19:04:01

Plot on Configuration IEEE 802.11n MCS0 20MHz / Reference Level / Chain 1 (1TX)



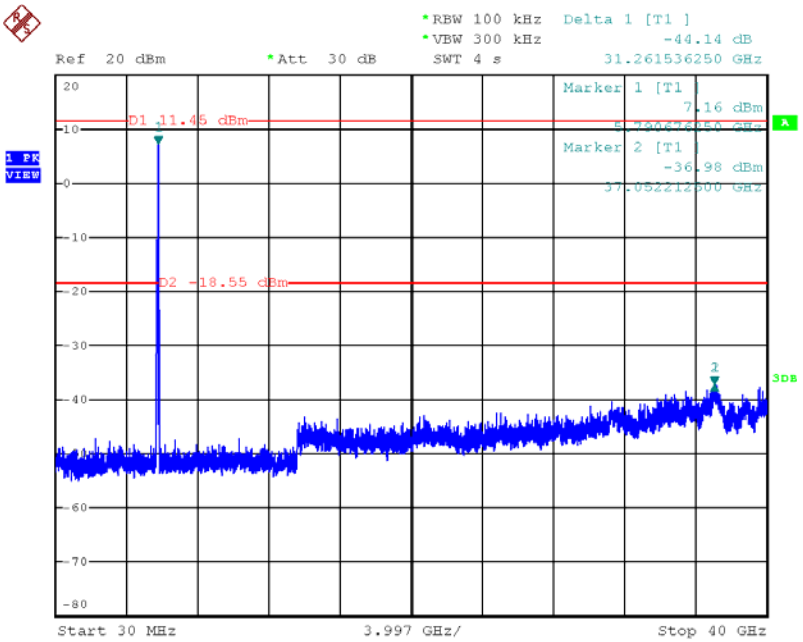
Date: 12.DEC.2012 17:56:46

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 149 (down 30dBc) / Chain 1 (1TX)



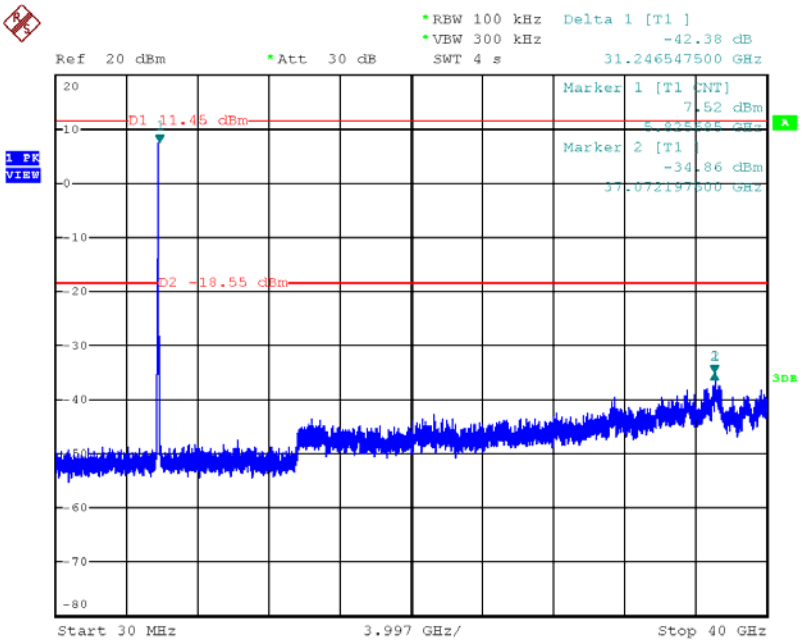
Date: 12.DEC.2012 18:45:07

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 157 (down 30dBc) / Chain 1 (1TX)



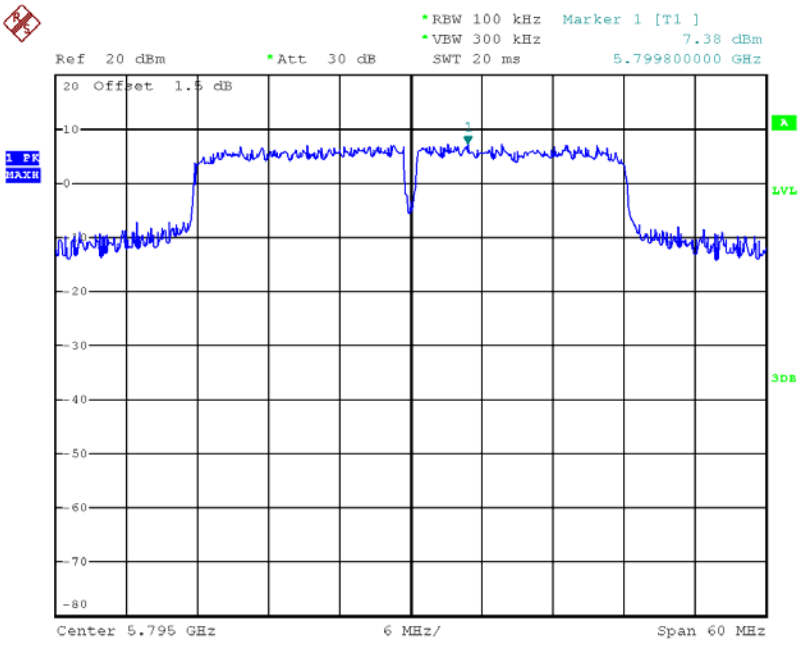
Date: 12.DEC.2012 18:45:29

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 165 (down 30dBc) / Chain 1 (1TX)



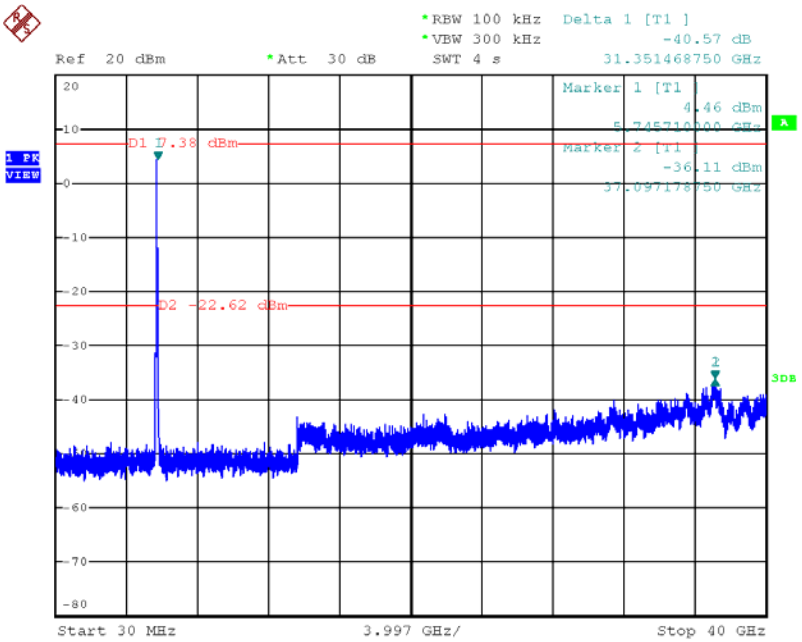
Date: 12.DEC.2012 18:45:54

Plot on Configuration IEEE 802.11n MCS0 40MHz / Reference Level / Chain 1 (1TX)



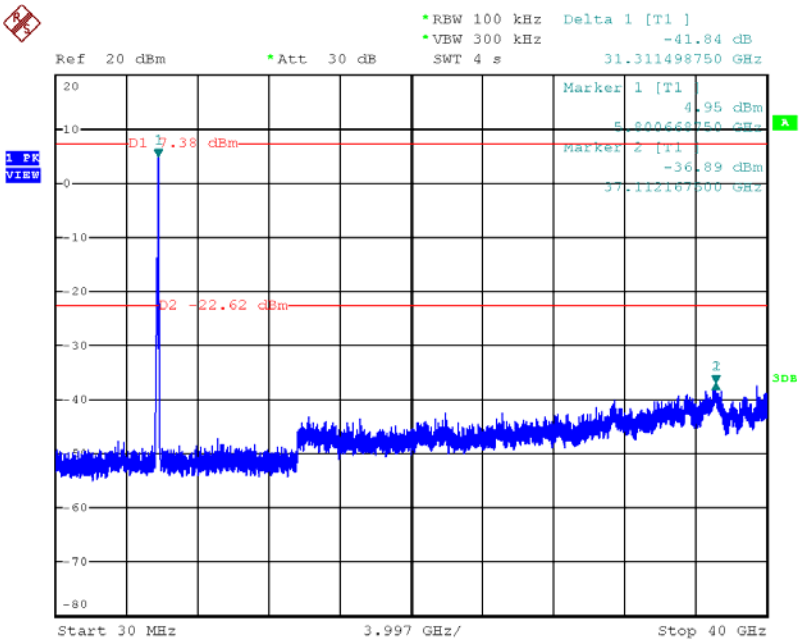
Date: 12.DEC.2012 17:58:25

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 151 (down 30dBc) / Chain 1 (1TX)



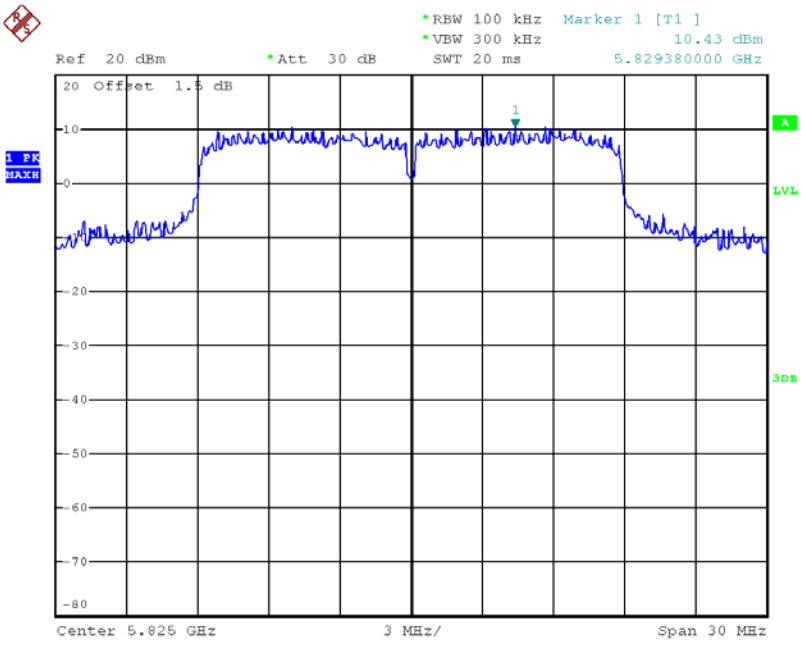
Date: 12.DEC.2012 18:47:36

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 159 (down 30dBc) / Chain 1 (1TX)



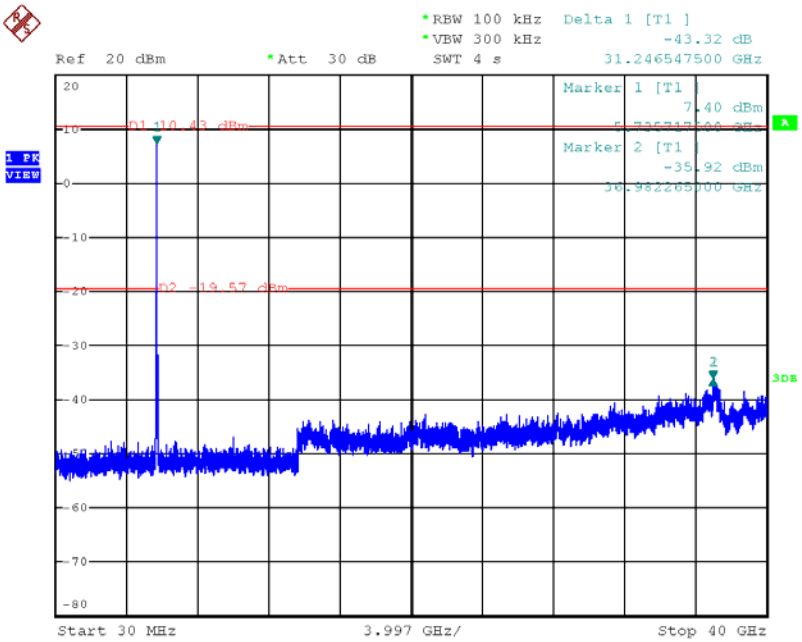
Date: 12.DEC.2012 18:48:04

Plot on Configuration IEEE 802.11n MCS8 20MHz / Reference Level / Chain 1 + Chain 2 (2TX)



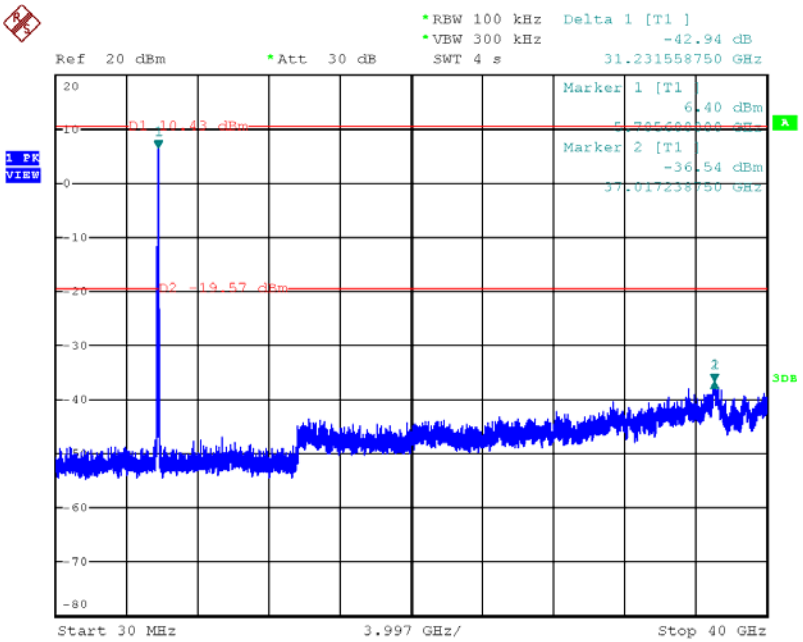
Date: 12.DEC.2012 18:14:53

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 149 (down 30dBc) / Chain 1 + Chain 2 (2TX)



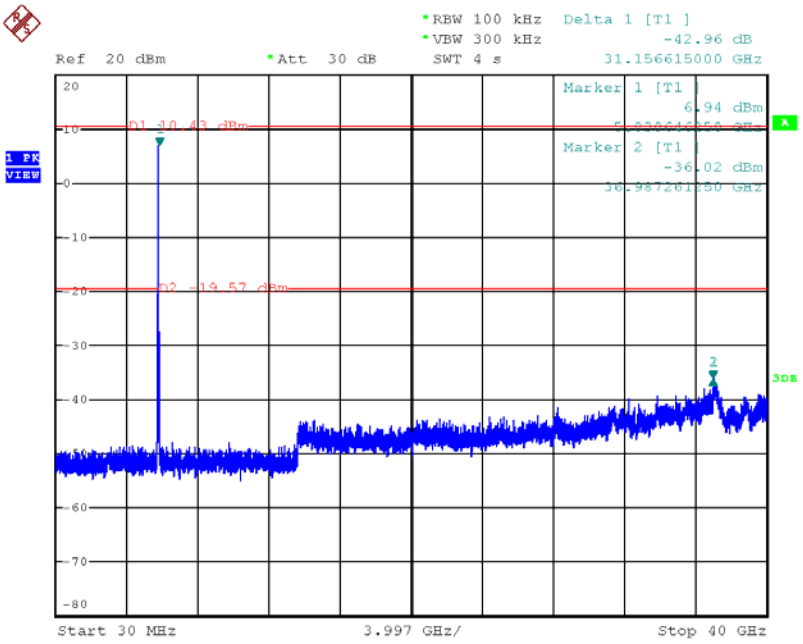
Date: 12.DEC.2012 18:51:35

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 157 (down 30dBc) / Chain 1 + Chain 2 (2TX)



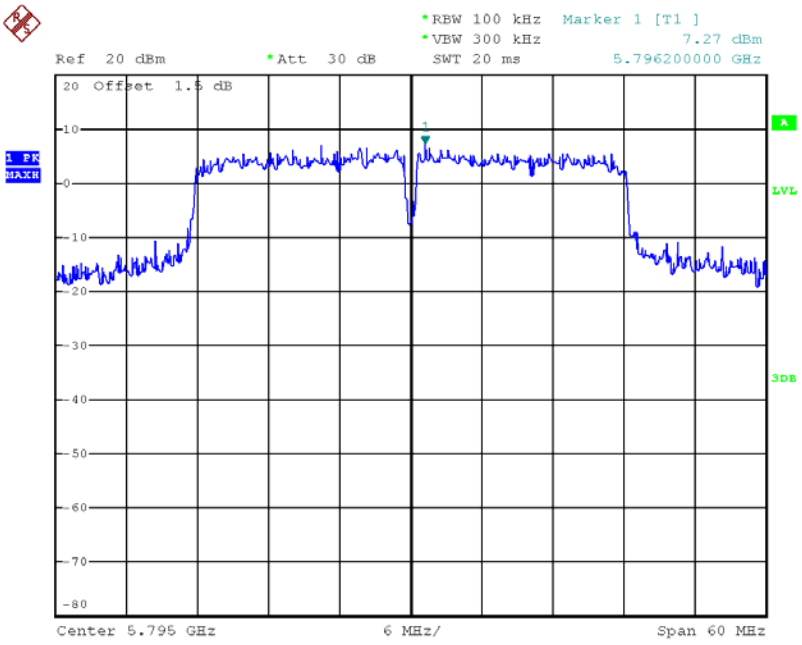
Date: 12.DEC.2012 18:52:18

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 165 (down 30dBc) / Chain 1 + Chain 2 (2TX)



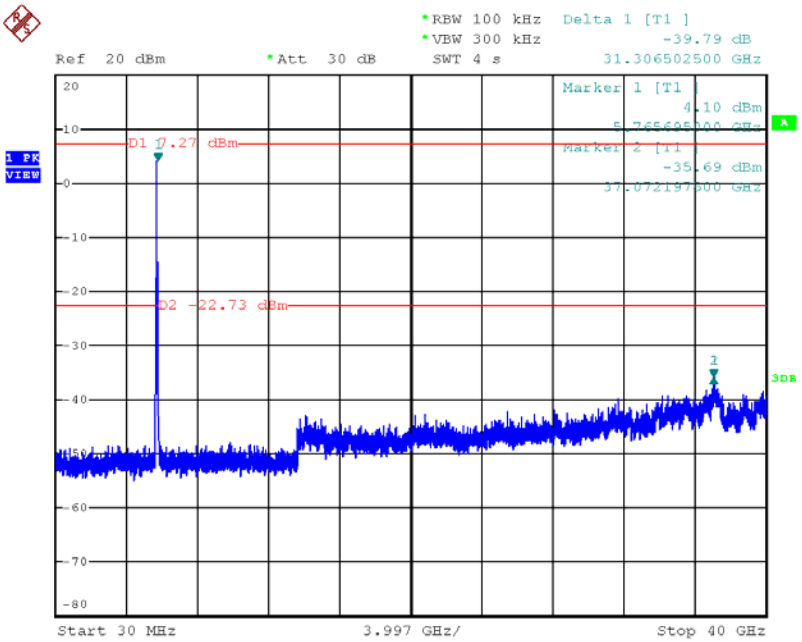
Date: 12.DEC.2012 18:52:44

Plot on Configuration IEEE 802.11n MCS8 40MHz / Reference Level / Chain 1 + Chain 2 (2TX)



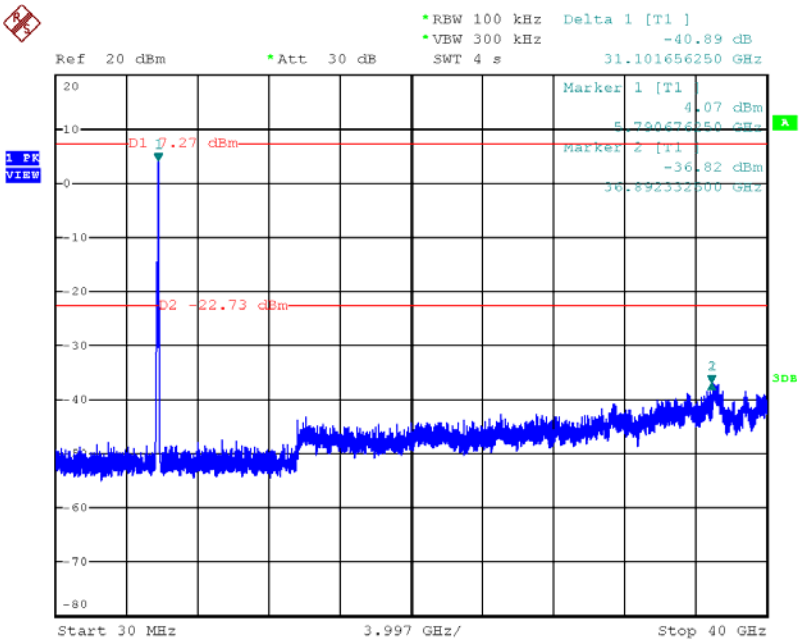
Date: 12.DEC.2012 18:12:56

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 151 (down 30dBc) / Chain 1 + Chain 2 (2TX)



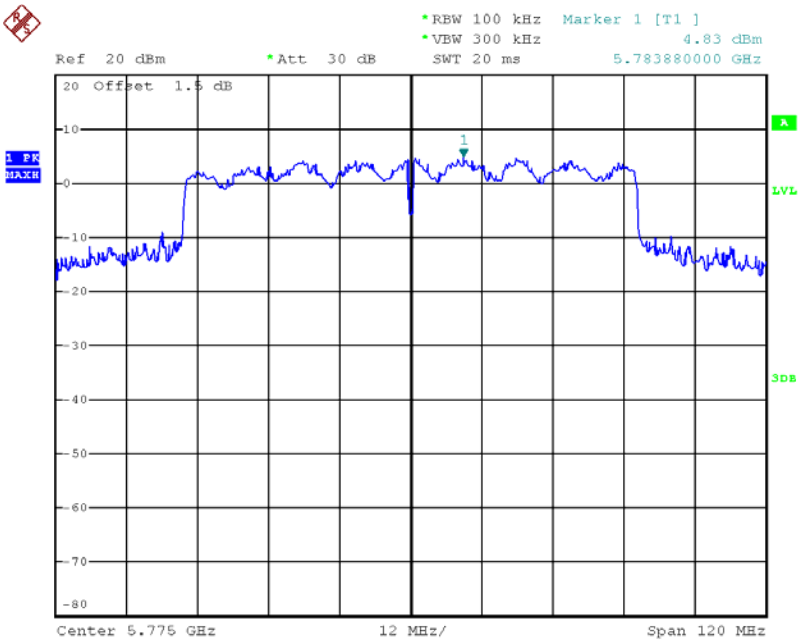
Date: 12.DEC.2012 18:54:08

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 159 (down 30dBc) / Chain 1 + Chain 2 (2TX)



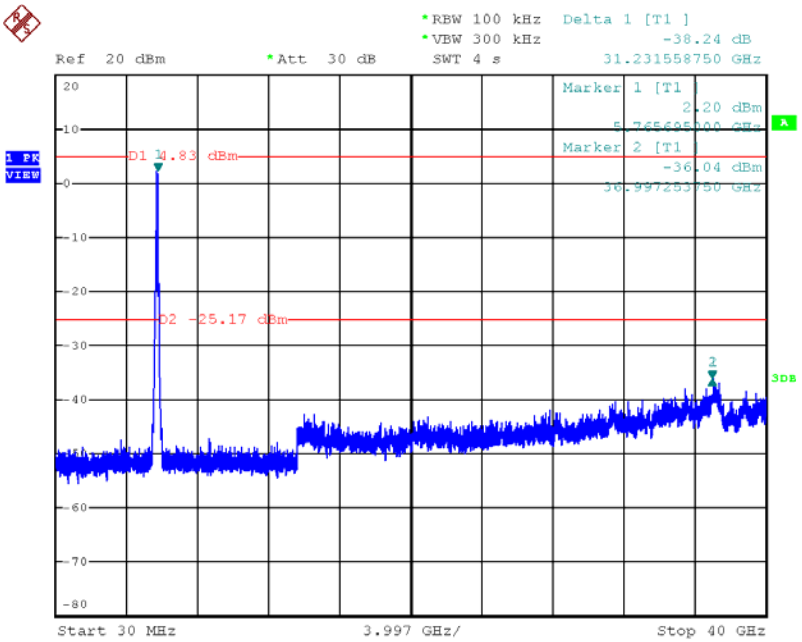
Date: 12.DEC.2012 18:54:32

Plot on Configuration IEEE 802.11ac MCS0-Nss1 80MHz / Reference Level / Chain 1 (1TX)



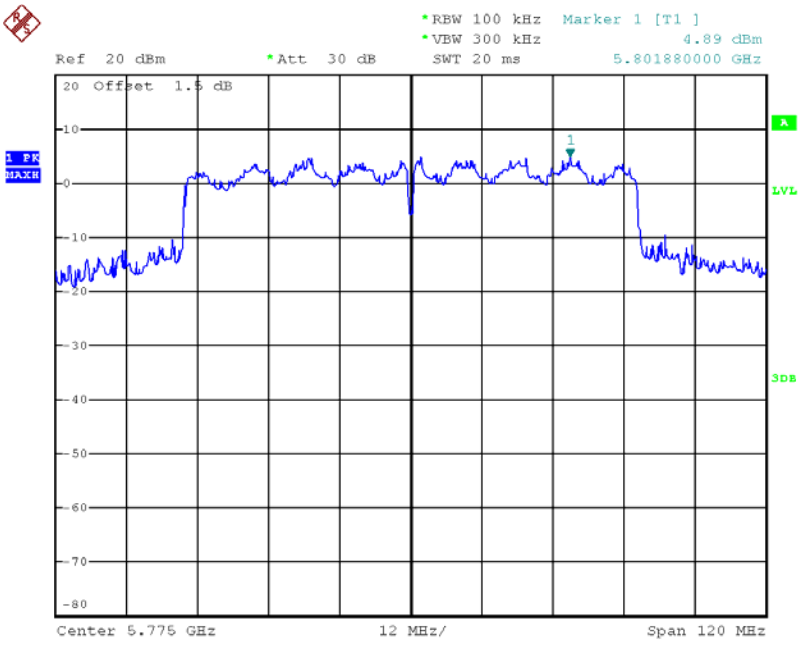
Date: 12.DEC.2012 17:59:44

Plot on Configuration IEEE 802.11ac MCS0-Nss1 80MHz / CH 155 (down 30dBc) / Chain 1 (1TX)



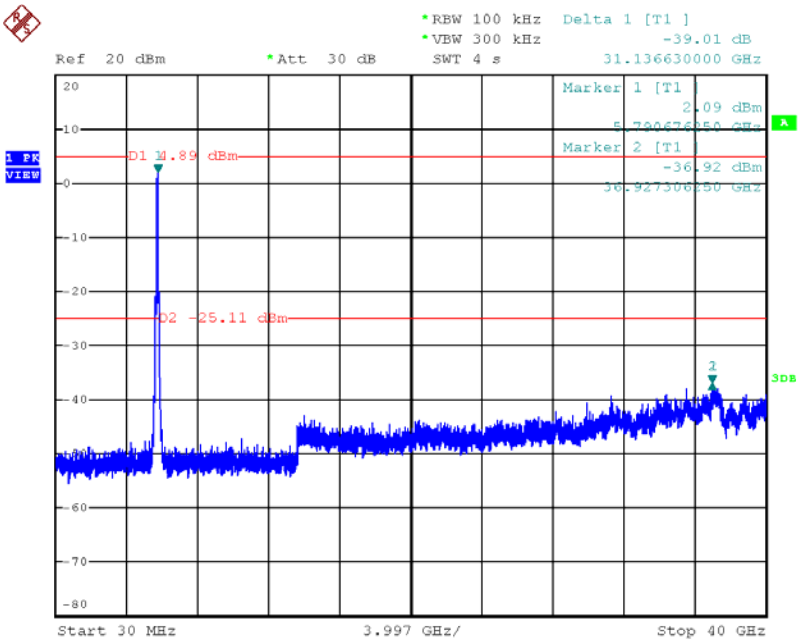
Date: 12.DEC.2012 18:49:14

Plot on Configuration IEEE 802.11ac MCS0-Nss2 80MHz / Reference Level / Chain 1 + Chain 2 (2TX)



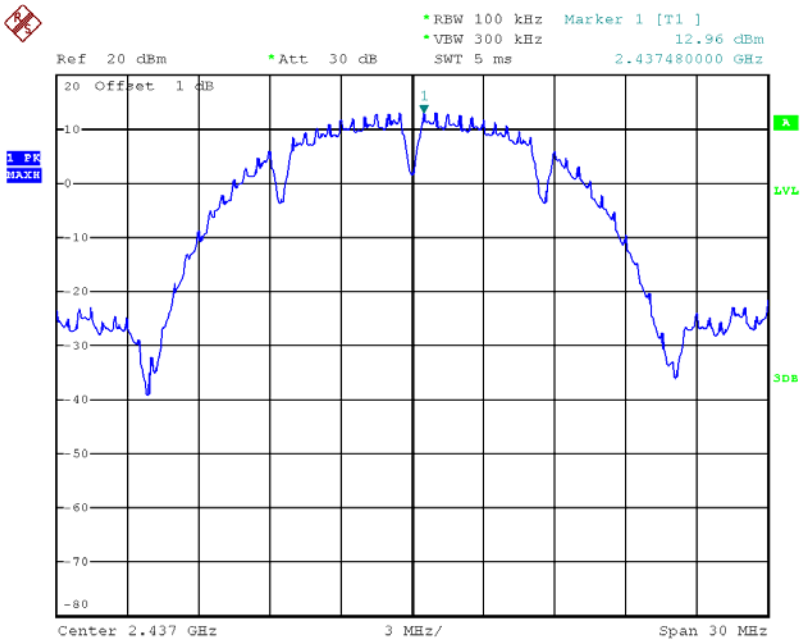
Date: 12.DEC.2012 18:10:37

Plot on Configuration IEEE 802.11ac MCS0-Nss2 80MHz / CH 155 (down 30dBc) / Chain 1 + Chain 2 (2TX)



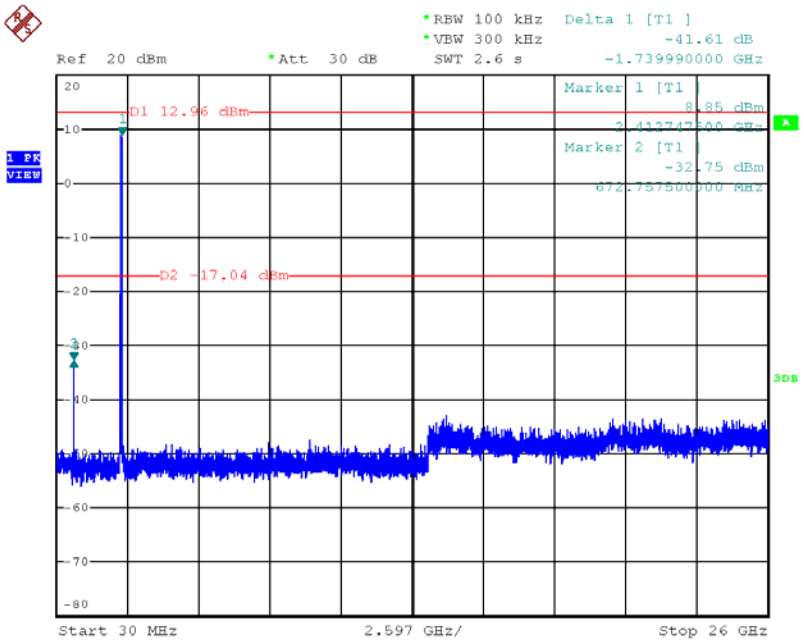
Date: 12.DEC.2012 18:59:41

Plot on Configuration IEEE 802.11b / Reference Level / Chain 1 (1TX)



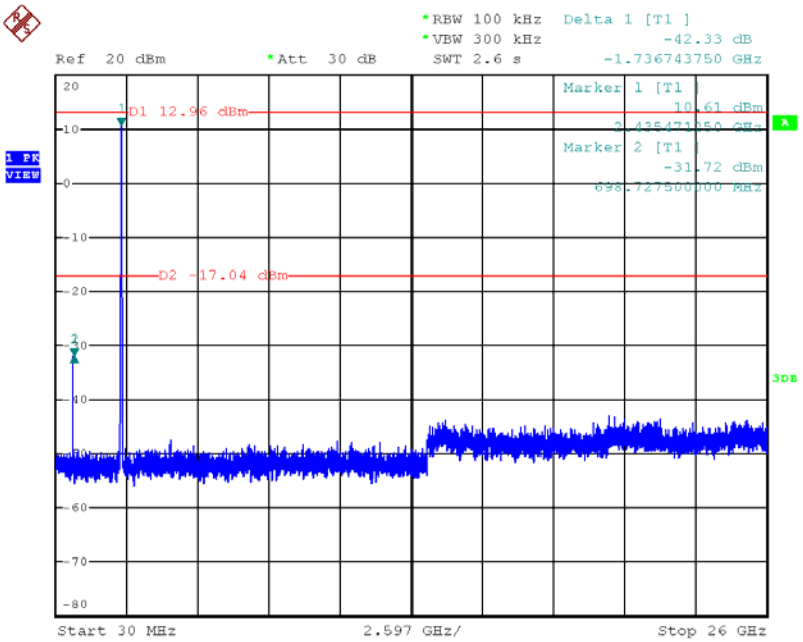
Date: 12.DEC.2012 17:32:14

Plot on Configuration IEEE 802.11b / CH 1 (down 30dBc) / Chain 1 (1TX)



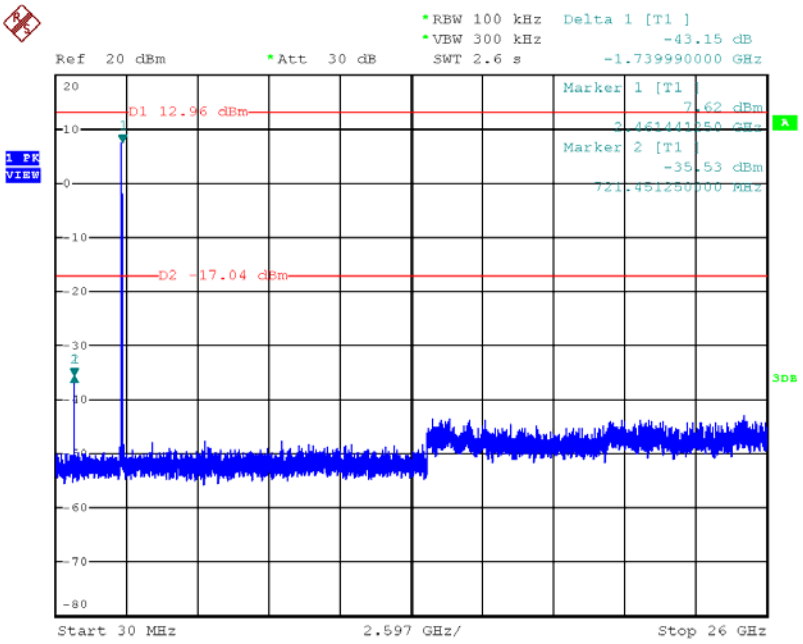
Date: 12.DEC.2012 18:33:00

Plot on Configuration IEEE 802.11b / CH 6 (down 30dBc) / Chain 1 (1TX)



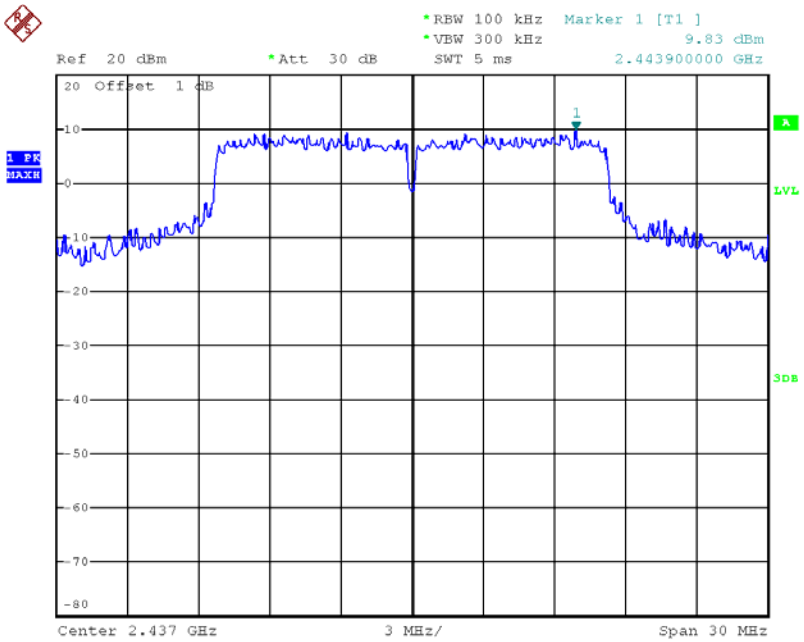
Date: 12.DEC.2012 18:33:35

Plot on Configuration IEEE 802.11b / CH 11 (down 30dBc) / Chain 1 (1TX)



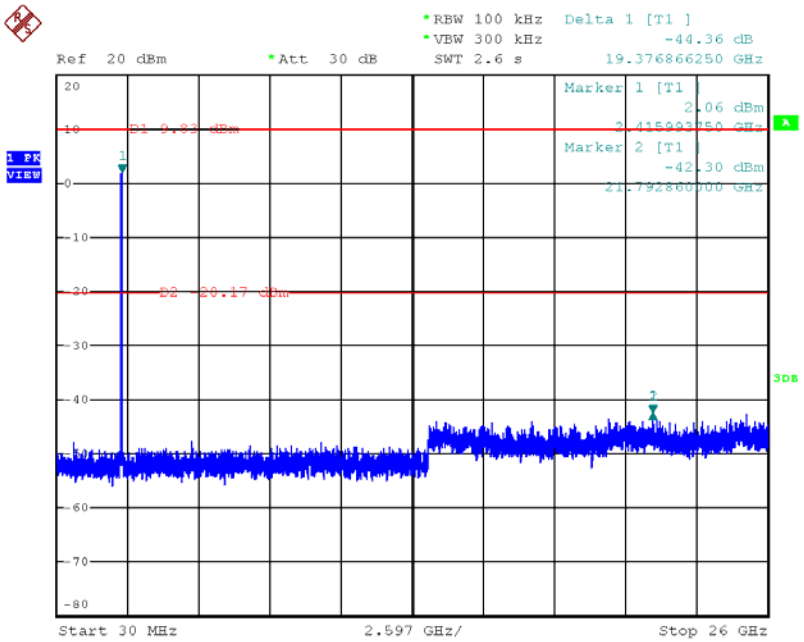
Date: 12.DEC.2012 18:34:10

Plot on Configuration IEEE 802.11g / Reference Level / Chain 1 (1TX)



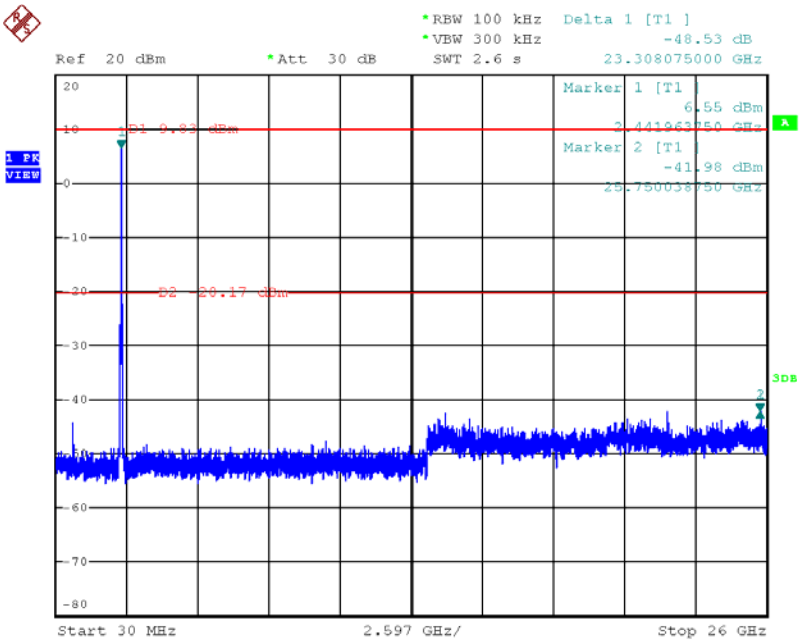
Date: 12.DEC.2012 17:45:15

Plot on Configuration IEEE 802.11g / CH 1 (down 30dBc) / Chain 1 (1TX)



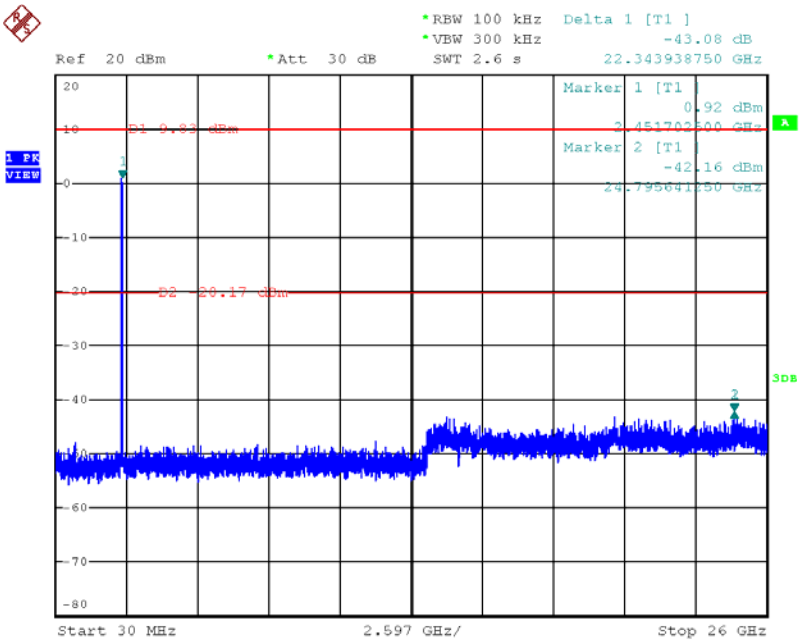
Date: 12.DEC.2012 18:35:25

Plot on Configuration IEEE 802.11g / CH 6 (down 30dBc) / Chain 1 (1TX)



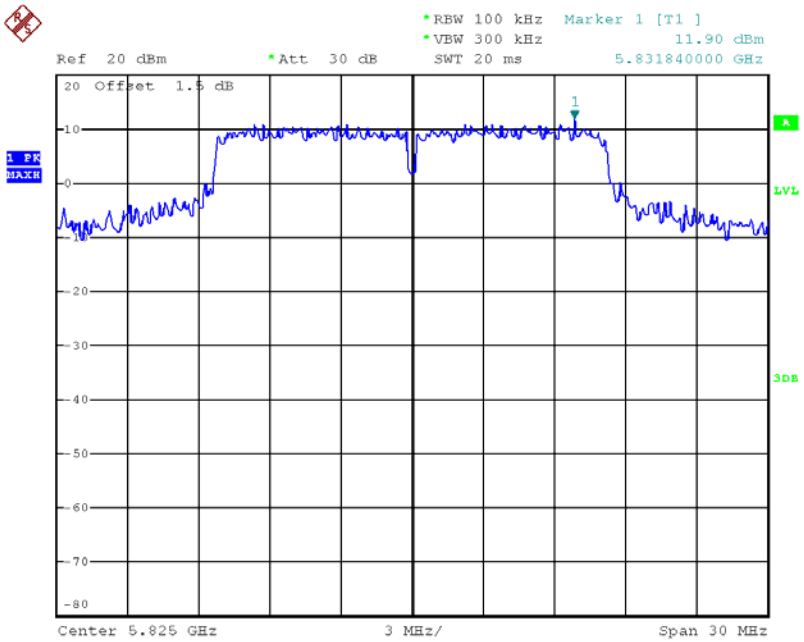
Date: 12.DEC.2012 18:35:55

Plot on Configuration IEEE 802.11g / CH 11 (down 30dBc) / Chain 1 (1TX)



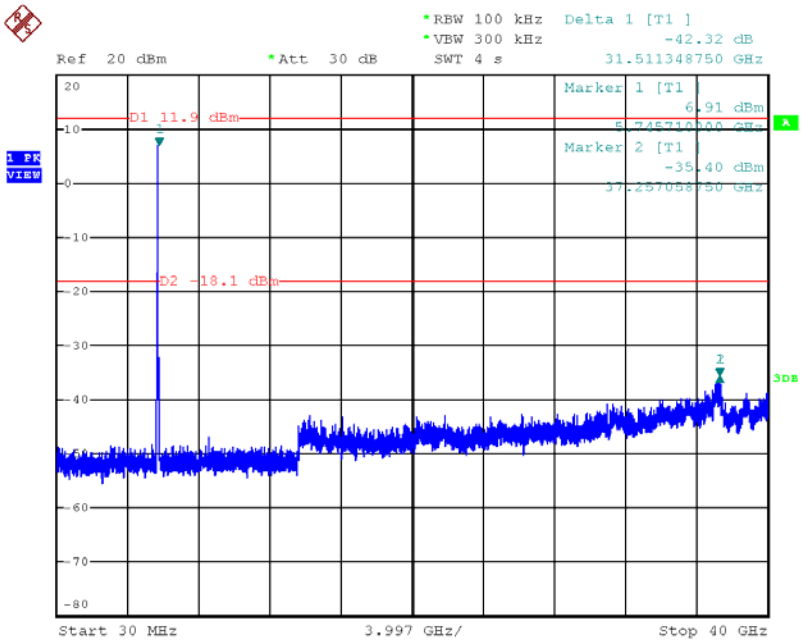
Date: 12.DEC.2012 18:36:16

Plot on Configuration IEEE 802.11a / Reference Level / Chain 1 (1TX)



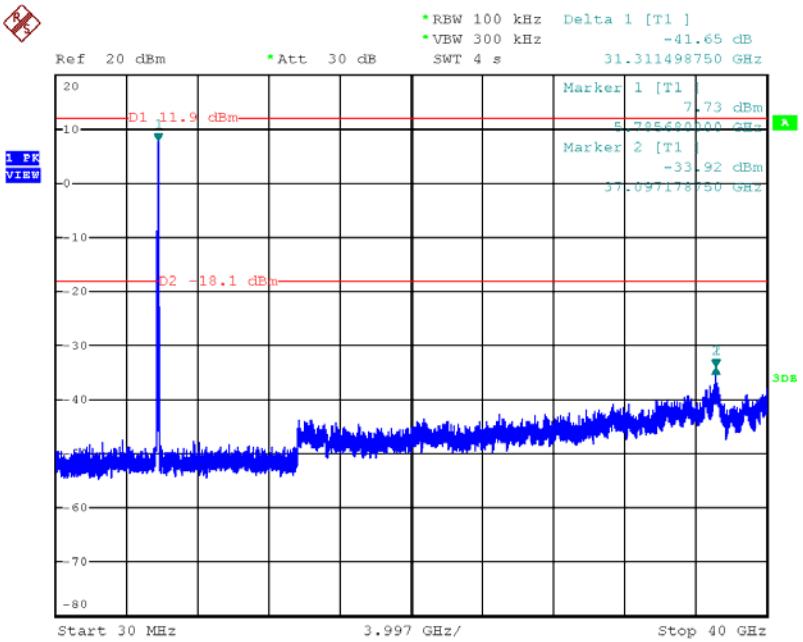
Date: 12.DEC.2012 17:52:08

Plot on Configuration IEEE 802.11a / CH 149 (down 30dBc) / Chain 1 (1TX)



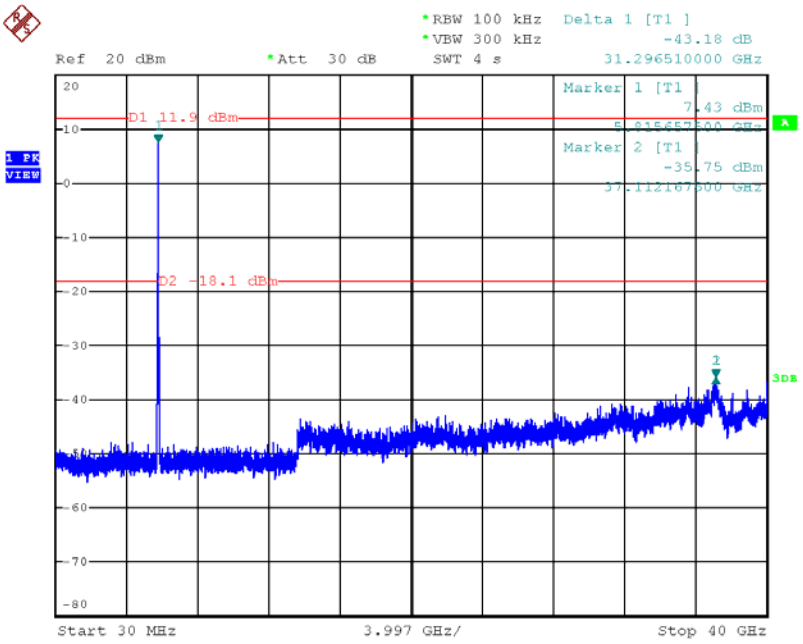
Date: 12.DEC.2012 18:42:30

Plot on Configuration IEEE 802.11a / CH 157 (down 30dBc) / Chain 1 (1TX)



Date: 12.DEC.2012 18:42:54

Plot on Configuration IEEE 802.11a / CH 165 (down 30dBc) / Chain 1 (1TX)



Date: 12.DEC.2012 18:43:24

4.7. Antenna Requirements

4.7.1. Limit

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

4.7.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Oct. 23, 2012	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9kHz ~ 30MHz	Jun. 22, 2012	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 4, 2012	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-----	-----	Conduction (CO01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Nov. 27, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	4 Way	0120A04056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2012	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	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. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)

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

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

NCR means Non-Calibration required.

6. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	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

7. TAF CERTIFICATE OF ACCREDITATION

Certificate No.：L1190-110702

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Road, Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date：July 02, 2011

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The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix