

FC

Test Report

Product Name	802.11 a/b/g/n RTL8192DU Module
Model No	RTL8192DU
FCC ID.	RK9-RTL8192DU

Applicant	CastleNet Technology Inc.
Address	No.64, Chung-Shan Rd. Tu-Cheng District, New Taipei City, Taiwan

Date of Receipt	May 02, 2012
Issue Date	June 27, 2012
Report No.	125068R-RFUSP28V01
Report Version	V1.0



The test results relate only to the samples tested.

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Test Report Certification

Issue Date: June 27, 2012

Report No.: 125068R-RFUSP28V01

**Accredited by NIST (NVLAP)**

NVLAP Lab Code: 200533-0

Product Name	802.11 a/b/g/n RTL8192DU Module
Applicant	CastleNet Technology Inc.
Address	No.64,Chung-Shan Rd. Tu-Cheng District, New Taipei City, Taiwan
Manufacturer	CastleNet Technology Inc.
Model No.	RTL8192DU
FCC ID.	RK9-RTL8192DU
EUT Rated Voltage	DC 5V(Power by USB)
EUT Test Voltage	AC 120V/60Hz
Trade Name	CastleNet
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 ANSI C63.4: 2003
Test Result	Complied

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Documented By :



(Senior Adm. Specialist / Genie Chang)

Tested By :



(Assistant Engineer / Jack Hsu)

Approved By :



(Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	802.11 a/b/g/n RTL8192DU Module
Trade Name	CastleNet
Model No.	RTL8192DU
FCC ID.	RK9-RTL8192DU
Frequency Range	802.11b/g/n-20MHz:2412-2462MHz,802.11n-40MHz:2422-2452MHz 802.11a/n-20MHz:5745-5825MHz ,802.11n-40MHz:5755-5795MHz
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7 802.11a/n-20MHz: 5, n-40MHz: 2
Data Speed	802.11b: 1-11Mbps, 802.11a/g: 6-54Mbps, 802.11n: up to 300Mbps
Channel separation	802.11b/g/n-20MHz: 5 MHz, 802.11a/n-20MHz: 20MHz 802.11n-40MHz: 40MHz
Type of Modulation	802.11b:DSSS DBPSK, DQPSK, CCK 802.11a/g/n: OFDM BPSK, QPSK, 16QAM, 64QAM
Antenna Type	PIFA Antenna
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto

Antenna List

No.	Manufacturer	Model No.	Peak Gain
1	SpeedTech	DPLP13B-00001-H	4.77dBi For 2.4GHz 3.77dBi For 5.725~5.85GHz
2	BRITO TECHNOLOGY	WFOEM33-I0185	3.64dBi For 2.4GHz 1.23dBi For 5.725~5.85GHz

Note: 1.The antenna of EUT is conform to FCC 15.203

2.This report uses the maximum antenna gain.

802.11b/g/n-20MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

802.11a/n-20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 149:	5745 MHz	Channel 153:	5765 MHz	Channel 157:	5785 MHz	Channel 161:	5805 MHz
Channel 165:	5825 MHz						

802.11n-40MHz (2.4G Band) Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 3:	2422 MHz	Channel 4:	2427 MHz	Channel 5:	2432 MHz	Channel 6:	2437 MHz
Channel 7:	2442 MHz	Channel 8:	2447 MHz	Channel 9:	2452 MHz		

802.11n-40MHz (5G Band) Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency
Channel 151:	5755 MHz	Channel 159:	5795 MHz

Note:

1. This device is a 802.11 a/b/g/n RTL8192DU Module with a built-in 2.4GHz and 5GHz WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps 、 802.11g is 6Mbps 、 802.11n(20M-BW) is 14.4Mbps and 、 802.11n(40M-BW) is 30Mbps).
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11a/b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:	Mode 1: Transmit - 802.11b 1Mbps
	Mode 2: Transmit - 802.11g 6Mbps
	Mode 3: Transmit - 802.11a 6Mbps
	Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band)
	Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band)
	Mode 6: Transmit - 802.11n-20BW_14.4Mbps(5G Band)
	Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band)

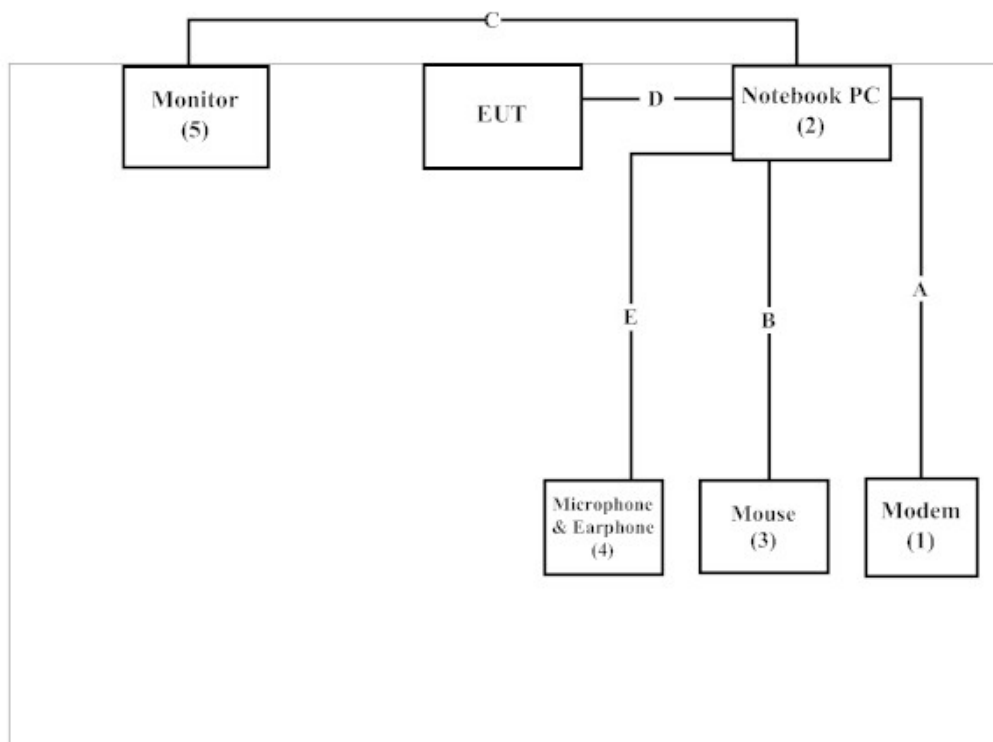
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
(1) Modem	ACEEX	DM-1414	0102027558	Non-Shielded, 1.8m
(2) Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
(3) Mouse	Microsoft	X09-13962	69657-492-9730045-60447	N/A
(4) Microphone & Earphone	Ergotech	ET-E201	N/A	N/A
(5) Monitor	LG	W2261VT	907YHZK07373	Non-Shielded, 1.8m

Signal Cable Type	Signal cable Description
A Modem Cable	Non-Shielded, 1.5m
B Mouse Cable	Non-Shielded, 1.8m
C VGA Cable	Non-Shielded, 1.8m, with one ferrite core bonded.
D USB Cable	Non-Shielded, 0.26m
E Earphone & Microphone Cable	Non-Shielded, 1.7m, with one ferrite core bonded.

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute program on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (5) Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from

Quietek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web

site : <http://www.quietek.com/>

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Accreditation on NVLAP
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation
Site Address: No.5-22, Ruishukeng Linkou Dist., New Taipei City
24451, Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

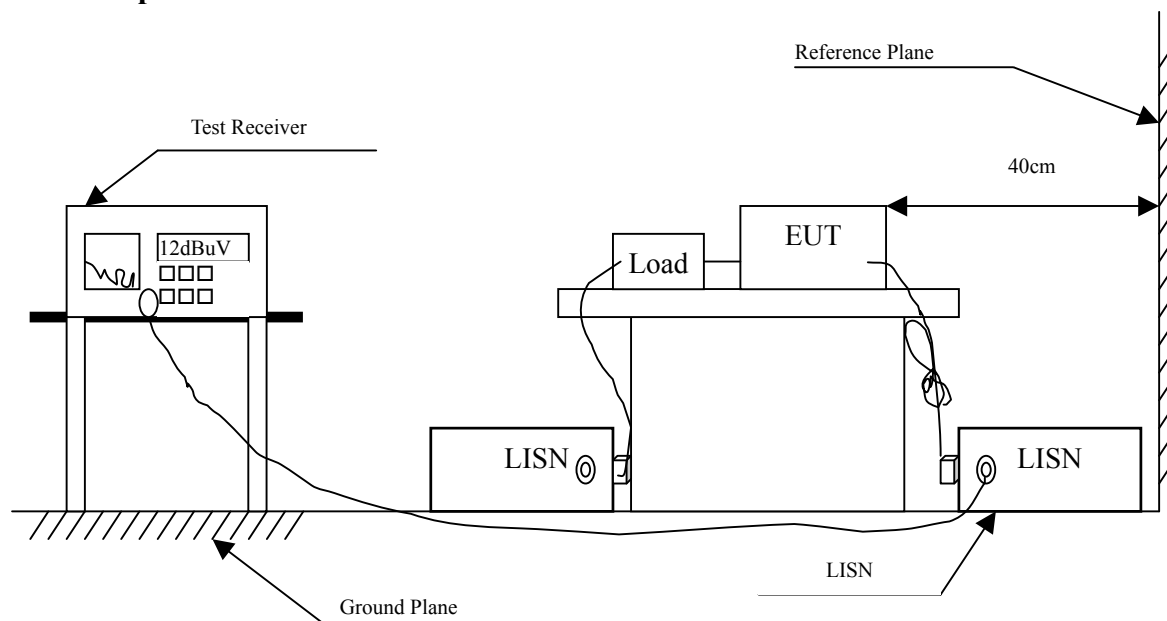
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2011	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2012	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2012	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2012	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2012	
	No.1 Shielded Room				

Note: All instruments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band) (2437MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
Line 1					
Quasi-Peak					
0.158	9.715	40.550	50.265	-15.506	65.771
0.181	9.699	42.170	51.869	-13.245	65.114
0.212	9.678	39.260	48.938	-15.291	64.229
0.224	9.670	36.100	45.770	-18.116	63.886
0.310	9.640	35.040	44.680	-16.749	61.429
0.947	9.670	24.630	34.300	-21.700	56.000
Average					
0.158	9.715	24.870	34.585	-21.186	55.771
0.181	9.699	25.610	35.309	-19.805	55.114
0.212	9.678	21.120	30.798	-23.431	54.229
0.224	9.670	27.850	37.520	-16.366	53.886
0.310	9.640	33.930	43.570	-7.859	51.429
0.947	9.670	8.870	18.540	-27.460	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.154	9.727	35.910	45.637	-20.249	65.886
0.189	9.694	35.610	45.304	-19.582	64.886
0.209	9.681	38.040	47.721	-16.593	64.314
0.283	9.647	34.980	44.626	-17.574	62.200
0.373	9.650	28.700	38.350	-21.279	59.629
0.431	9.650	30.200	39.850	-18.121	57.971
Average					
0.154	9.727	29.190	38.917	-16.969	55.886
0.189	9.694	19.640	29.334	-25.552	54.886
0.209	9.681	27.390	37.071	-17.243	54.314
0.283	9.647	34.380	44.026	-8.174	52.200
0.373	9.650	13.240	22.890	-26.739	49.629
0.431	9.650	19.440	29.090	-18.881	47.971

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band) (5755MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.150	9.720	40.980	50.700	-15.300	66.000
0.177	9.702	42.370	52.072	-13.157	65.229
0.201	9.686	39.180	48.866	-15.677	64.543
0.314	9.640	35.740	45.380	-15.934	61.314
0.427	9.640	26.010	35.650	-22.436	58.086
0.720	9.641	25.100	34.741	-21.259	56.000
Average					
0.150	9.720	29.310	39.030	-16.970	56.000
0.177	9.702	29.000	38.702	-16.527	55.229
0.201	9.686	20.310	29.996	-24.547	54.543
0.314	9.640	34.550	44.190	-7.124	51.314
0.427	9.640	15.980	25.620	-22.466	48.086
0.720	9.641	15.240	24.881	-21.119	46.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band) (5755MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.150	9.730	36.540	46.270	-19.730	66.000
0.173	9.710	37.000	46.710	-18.633	65.343
0.216	9.676	35.560	45.236	-18.878	64.114
0.314	9.650	35.780	45.430	-15.884	61.314
0.420	9.650	32.170	41.820	-16.466	58.286
0.494	9.650	26.930	36.580	-19.591	56.171
Average					
0.150	9.730	28.180	37.910	-18.090	56.000
0.173	9.710	23.290	33.000	-22.343	55.343
0.216	9.676	27.080	36.756	-17.358	54.114
0.314	9.650	33.930	43.580	-7.734	51.314
0.420	9.650	19.990	29.640	-18.646	48.286
0.494	9.650	15.900	25.550	-20.621	46.171

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

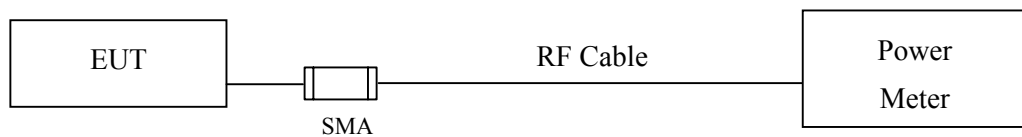
3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2012
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2012

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

3.2. Test Setup



3.3. Limits

The maximum peak power shall be less 1 Watt.

3.4. Test Procedure

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 802.11b 1Mbps

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	16.6	--	--	--	18.77	<30dBm	Pass
06	2437	17.43	17.4	17.35	17.3	19.63	<30dBm	Pass
11	2462	18.02	--	--	--	20.21	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 802.11g 6Mbps

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	12.1	--	--	--	--	--	--	--	21.75	<30dBm	Pass
06	2437	12.85	12.83	12.81	12.78	12.76	12.76	12.74	12.71	22.68	<30dBm	Pass
11	2462	13.45	--	--	--	--	--	--	--	23.21	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 802.11a 6Mbps

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
149	5745	13.56	--	--	--	--	--	--	--	19.11	<30dBm	Pass
157	5785	12.48	12.45	12.44	12.42	12.41	12.38	12.38	12.37	18.69	<30dBm	Pass
165	5825	11.94	--	--	--	--	--	--	--	18.31	<30dBm	Pass

Note: Peak Power Output Value = Reading value on power meter + cable loss

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	
		Measurement Level (dBm)								
01	2412	11.97	--	--	--	--	--	--	--	21.94
06	2437	12.39	12.38	12.35	12.32	12.33	12.3	12.28	12.24	22.22
11	2462	12.99	--	--	--	--	--	--	--	22.87

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	14.4
		Measurement Level (dBm)								
01	2412	10.53	--	--	--	--	--	--	--	19.01
06	2437	10.92	10.9	10.87	10.86	10.84	10.83	10.83	10.81	19.66
11	2462	11.08	--	--	--	--	--	--	--	19.78

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	HT8	21.94	19.01	23.73	<30dBm	Pass
6	2437	HT8	22.22	19.66	24.14	<30dBm	Pass
11	2462	HT8	22.87	19.78	24.60	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		30	60	90	120	180	240	270	300	30
		Measurement Level (dBm)								
3	2422	11.26	--	--	--	--	--	--	--	20.23
6	2437	11.86	11.86	11.84	11.83	11.83	11.81	11.79	11.77	21.01
9	2452	12.03	--	--	--	--	--	--	--	21.13

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		30	60	90	120	180	240	270	300	30
		Measurement Level (dBm)								
3	2422	10.61	--	--	--	--	--	--	--	19.24
6	2437	10.95	10.94	10.91	10.88	10.84	10.84	10.83	10.82	19.85
9	2452	11.03	--	--	--	--	--	--	--	19.66

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rata (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
3	2422	HT8	20.23	19.24	22.77	<30dBm	Pass
6	2437	HT8	21.01	19.85	23.48	<30dBm	Pass
9	2452	HT8	21.13	19.66	23.47	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 6: Transmit - 802.11n-20BW_14.4Mbps(5G Band)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	14.4
		Measurement Level (dBm)								
149	5745	9.86	--	--	--	--	--	--	--	17.18
157	5785	8.73	8.72	8.72	8.71	8.69	8.67	8.66	8.63	16.51
165	5825	8.02	--	--	--	--	--	--	--	16.12

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		14.4	28.9	43.3	57.8	86.7	115.6	130	144.4	14.4
		Measurement Level (dBm)								
149	5745	9.95	--	--	--	--	--	--	--	17.23
157	5785	9.15	9.13	9.11	9.09	9.08	9.08	9.07	9.05	16.2
165	5825	7.94	--	--	--	--	--	--	--	15.92

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rata (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
149	5745	HT8	17.18	17.23	20.22	<30dBm	Pass
157	5785	HT8	16.51	16.20	19.37	<30dBm	Pass
165	5825	HT8	16.12	15.92	19.03	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Peak Power Output Data
 Test Site : No.3 OATS
 Test Mode : Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
151	5755	9.12	--	--	--	--	--	--	--	17.62
159	5795	8.31	8.28	8.26	8.24	8.23	8.22	8.22	8.2	16.55

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		30	60	90	120	180	240	270	300	
		Measurement Level (dBm)								
151	5755	9.53	--	--	--	--	--	--	--	18.18
159	5795	8.86	8.84	8.84	8.82	8.8	8.78	8.75	8.74	17.68

Note: Peak Power Output Value =Reading value on power meter + cable loss

CHAIN A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
151	5755	HT8	17.62	18.18	20.92	<30dBm	Pass
159	5795	HT8	16.55	17.68	20.16	<30dBm	Pass

Note: Peak Power Output Value (dBm) = 10*LOG (Chain A (mW)+ Chain B (mW))

4. Radiated Emission

4.1. Test Equipment

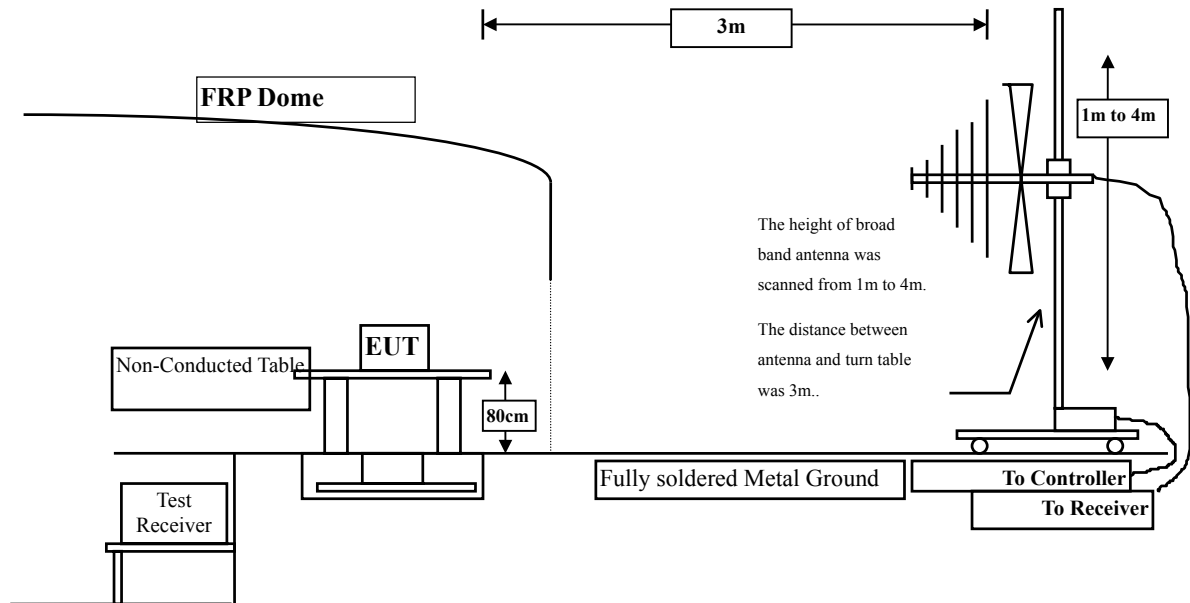
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2012
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2012
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2012
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

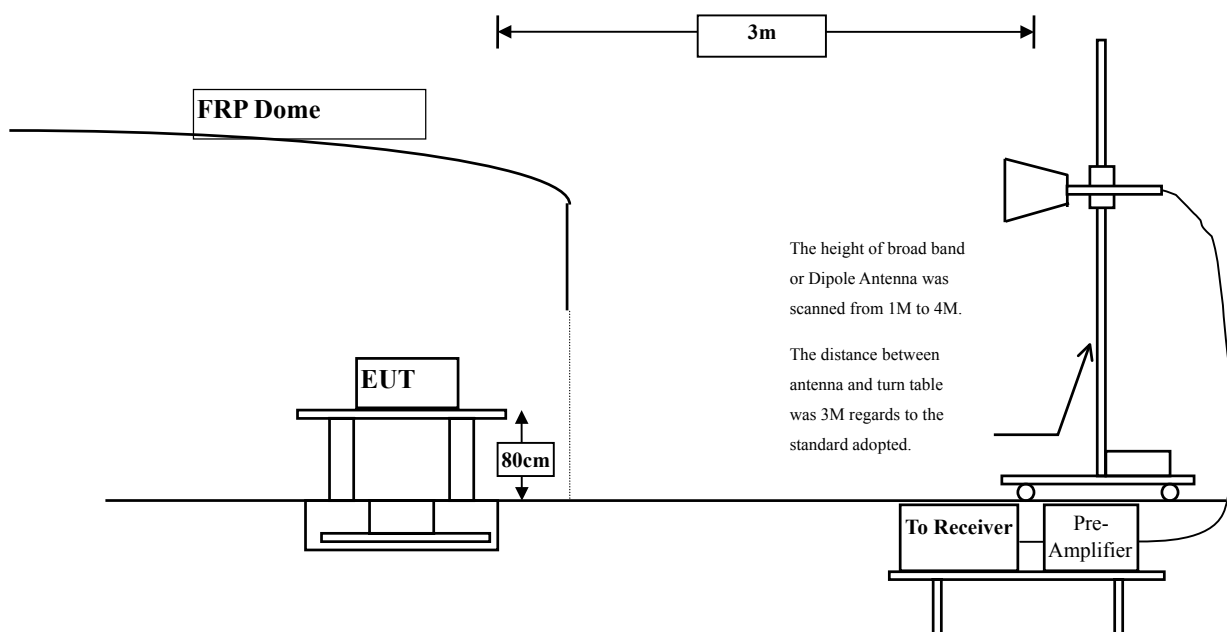
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

4.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range from 30MHz - 10th Harmonic of fundamental was investigated.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : 802.11 a/b/g/n RTL8192DU Module
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 802.11b 1Mbps (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.261	35.250	38.511	-35.489	74.000
7326.000	11.860	34.100	45.960	-28.040	74.000
9648.000	13.337	33.500	46.836	-27.164	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4824.000	6.421	35.310	41.731	-32.269	74.000
7236.000	11.495	33.850	45.345	-28.655	74.000
9648.000	13.807	33.920	47.726	-26.274	74.000
Average Detector:					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 802.11b 1Mbps (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	35.480	38.517	-35.483	74.000
7311.000	11.795	32.910	44.704	-29.296	74.000
9748.000	12.635	33.660	46.295	-27.705	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4874.000	5.812	34.900	40.711	-33.289	74.000
7311.000	12.630	33.580	46.209	-27.791	74.000
9748.000	13.126	35.910	49.036	-24.964	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 802.11b 1Mbps (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.858	35.520	38.377	-35.623	74.000
7386.000	12.127	32.790	44.918	-29.082	74.000
9848.000	12.852	34.020	46.873	-27.127	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4924.000	5.521	34.670	40.190	-33.810	74.000
7386.000	13.254	32.680	45.934	-28.066	74.000
9848.000	13.367	34.430	47.797	-26.203	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 802.11g 6Mbps (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4824.000	3.261	35.530	38.791	-35.209	74.000
7236.000	10.650	33.690	44.340	-29.660	74.000
9648.000	13.337	33.330	46.666	-27.334	74.000

Average

Detector:

--

Vertical

Peak Detector:

4824.000	6.421	35.380	41.801	-32.199	74.000
7236.000	11.495	33.770	45.265	-28.735	74.000
9648.000	13.807	33.840	47.646	-26.354	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 802.11g 6Mbps (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	34.750	37.787	-36.213	74.000
7311.000	11.795	33.550	45.344	-28.656	74.000
9748.000	12.635	34.180	46.815	-27.185	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4874.000	5.812	34.670	40.481	-33.519	74.000
7311.000	12.630	32.820	45.449	-28.551	74.000
9748.000	13.126	33.800	46.926	-27.074	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 802.11g 6Mbps (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.858	34.540	37.397	-36.603	74.000
7386.000	12.127	32.660	44.788	-29.212	74.000
9848.000	12.852	33.900	46.753	-27.247	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4924.000	5.521	34.290	39.810	-34.190	74.000
7386.000	13.254	32.820	46.074	-27.926	74.000
9848.000	13.367	35.050	48.417	-25.583	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 802.11a 6Mbps (5745 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11490.000	17.106	33.000	50.107	-23.893	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11490.000	18.034	33.580	51.615	-22.385	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 802.11a 6Mbps (5785 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11570.000	16.809	32.690	49.499	-24.501	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11570.000	17.698	32.900	50.598	-23.402	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 802.11a 6Mbps (5825 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

11650.000	16.158	32.310	48.468	-25.532	74.000
-----------	--------	--------	--------	---------	--------

Average

Detector:

--

Vertical

Peak Detector:

11650.000	17.274	32.460	49.735	-24.265	74.000
-----------	--------	--------	--------	---------	--------

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4824.000	3.261	34.670	37.931	-36.069	74.000
7236.000	10.650	33.860	44.510	-29.490	74.000
9648.000	13.337	33.160	46.496	-27.504	74.000

Average

Detector:

--

Vertical

Peak Detector:

4824.000	6.421	34.630	41.051	-32.949	74.000
7236.000	11.495	33.880	45.375	-28.625	74.000
9648.000	13.807	34.050	47.856	-26.144	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	35.180	38.217	-35.783	74.000
7311.000	11.795	33.140	44.934	-29.066	74.000
9748.000	12.635	33.940	46.575	-27.425	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4874.000	5.812	35.520	41.331	-32.669	74.000
7311.000	12.630	33.030	45.659	-28.341	74.000
9748.000	13.126	34.430	47.556	-26.444	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.858	35.260	38.117	-35.883	74.000
7386.000	12.127	33.410	45.538	-28.462	74.000
9848.000	12.852	34.840	47.693	-26.307	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4924.000	5.521	34.710	40.230	-33.770	74.000
7386.000	13.254	32.730	45.984	-28.016	74.000
9848.000	13.367	34.330	47.697	-26.303	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band) (2422MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4844.000	3.171	34.570	37.741	-36.259	74.000
7266.000	11.162	34.110	45.272	-28.728	74.000
9688.000	12.964	34.360	47.325	-26.675	74.000

Average

Detector:

--

Vertical

Peak Detector:

4844.000	6.178	35.070	41.248	-32.752	74.000
7266.000	11.982	34.330	46.312	-27.688	74.000
9688.000	13.507	34.480	47.988	-26.012	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	35.060	38.097	-35.903	74.000
7311.000	11.795	32.830	44.624	-29.376	74.000
9748.000	12.635	34.200	46.835	-27.165	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4874.000	5.812	34.980	40.791	-33.209	74.000
7311.000	12.630	32.760	45.389	-28.611	74.000
9748.000	13.126	34.090	47.216	-26.784	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band) (2452 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4904.000	2.914	35.240	38.155	-35.845	74.000
7356.000	11.995	33.320	45.314	-28.686	74.000
9808.000	12.475	34.080	46.555	-27.445	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4904.000	5.530	34.990	40.521	-33.479	74.000
7356.000	13.005	33.540	46.544	-27.456	74.000
9808.000	12.901	34.690	47.591	-26.409	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 6: Transmit - 802.11n-20BW_14.4Mbps(5G Band) (5745MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11490.000	17.106	33.000	50.107	-23.893	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11490.000	18.034	33.580	51.615	-22.385	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 6: Transmit - 802.11n-20BW_14.4Mbps(5G Band) (5785 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11570.000	16.809	32.690	49.499	-24.501	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11570.000	17.698	32.900	50.598	-23.402	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 6: Transmit - 802.11n-20BW_14.4Mbps(5G Band) (5825 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11650.000	16.158	32.310	48.468	-25.532	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11650.000	17.274	32.460	49.735	-24.265	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band) (5755MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11510.000	17.124	32.670	49.794	-24.206	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11510.000	18.081	32.920	51.001	-22.999	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band) (5795 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11590.000	16.701	32.740	49.440	-24.560	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11590.000	17.567	32.510	50.076	-23.924	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 802.11b 1Mbps (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
41.640	-3.949	36.237	32.288	-7.712	40.000
140.580	-10.471	48.835	38.364	-5.136	43.500
280.260	-5.507	47.134	41.627	-4.373	46.000
348.160	-2.268	41.545	39.277	-6.723	46.000
747.800	3.296	35.569	38.865	-7.135	46.000
1000.000	9.119	39.008	48.127	-5.873	54.000
Vertical					
97.900	-1.400	37.208	35.807	-7.693	43.500
264.740	-7.681	44.211	36.530	-9.470	46.000
365.620	-2.179	37.134	34.955	-11.045	46.000
542.160	-0.269	33.741	33.472	-12.528	46.000
747.800	2.166	30.372	32.538	-13.462	46.000
1000.000	4.329	39.805	44.134	-9.866	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 802.11g 6Mbps (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
43.580	-4.496	37.807	33.311	-6.689	40.000
132.820	-10.230	50.316	40.086	-3.414	43.500
249.220	-6.014	46.192	40.178	-5.822	46.000
433.520	-1.972	38.762	36.790	-9.210	46.000
668.260	2.016	35.669	37.685	-8.315	46.000
996.120	7.669	40.211	47.880	-6.120	54.000
Vertical					
97.900	-1.400	36.549	35.148	-8.352	43.500
262.800	-7.543	45.101	37.558	-8.442	46.000
365.620	-2.179	36.581	34.402	-11.598	46.000
528.580	-0.462	30.997	30.535	-15.465	46.000
753.620	3.187	29.969	33.156	-12.844	46.000
1000.000	4.329	40.510	44.839	-9.161	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 802.11a 6Mbps (5785MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
119.240	-9.621	48.385	38.764	-4.736	43.500
249.220	-6.014	44.397	38.383	-7.617	46.000
365.620	-1.329	43.214	41.885	-4.115	46.000
431.580	-2.099	38.098	35.999	-10.001	46.000
747.800	3.296	31.440	34.736	-11.264	46.000
1000.000	9.119	37.886	47.005	-6.995	54.000
Vertical					
97.900	-1.400	36.123	34.722	-8.778	43.500
249.220	-7.634	44.477	36.843	-9.157	46.000
365.620	-2.179	36.503	34.324	-11.676	46.000
542.160	-0.269	36.458	36.189	-9.811	46.000
747.800	2.166	31.453	33.619	-12.381	46.000
1000.000	4.329	39.850	44.179	-9.821	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
132.820	-10.230	50.006	39.776	-3.724	43.500
249.220	-6.014	44.104	38.090	-7.910	46.000
365.620	-1.329	42.910	41.581	-4.419	46.000
542.160	3.011	35.949	38.960	-7.040	46.000
747.800	3.296	32.816	36.112	-9.888	46.000
1000.000	9.119	38.886	48.005	-5.995	54.000
Vertical					
121.180	-3.814	39.171	35.357	-8.143	43.500
264.740	-7.681	44.945	37.264	-8.736	46.000
365.620	-2.179	36.496	34.317	-11.683	46.000
573.200	-5.563	38.353	32.790	-13.210	46.000
749.740	2.510	31.375	33.885	-12.115	46.000
996.120	4.019	40.204	44.223	-9.777	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 5: Transmit - 802.11n-40BW_30Mbps(2.4G Band) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
142.520	-10.427	48.330	37.903	-5.597	43.500
249.220	-6.014	44.522	38.508	-7.492	46.000
365.620	-1.329	42.361	41.032	-4.968	46.000
542.160	3.011	33.171	36.182	-9.818	46.000
749.740	3.320	32.123	35.443	-10.557	46.000
1000.000	9.119	38.443	47.562	-6.438	54.000
Vertical					
105.660	-0.253	35.871	35.618	-7.882	43.500
256.980	-7.573	44.202	36.629	-9.371	46.000
365.620	-2.179	36.662	34.483	-11.517	46.000
528.580	-0.462	32.188	31.726	-14.274	46.000
747.800	2.166	34.559	36.725	-9.275	46.000
1000.000	4.329	41.496	45.825	-8.175	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 6: Transmit - 802.11n-20BW_14.4Mbps(5G Band) (5785 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
105.660	-0.253	35.871	35.618	-7.882	43.500
256.980	-7.573	44.202	36.629	-9.371	46.000
365.620	-2.179	36.662	34.483	-11.517	46.000
528.580	-0.462	32.188	31.726	-14.274	46.000
747.800	2.166	34.559	36.725	-9.275	46.000
1000.000	4.329	41.496	45.825	-8.175	54.000
Vertical					
97.900	-1.400	36.123	34.722	-8.778	43.500
249.220	-7.634	44.477	36.843	-9.157	46.000
365.620	-2.179	36.503	34.324	-11.676	46.000
542.160	-0.269	36.458	36.189	-9.811	46.000
747.800	2.166	31.453	33.619	-12.381	46.000
1000.000	4.329	39.850	44.179	-9.821	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : 802.11 a/b/g/n RTL8192DU Module
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 7: Transmit - 802.11n-40BW_30Mbps(5G Band) (5755MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
125.060	-9.946	48.819	38.873	-4.627	43.500
301.600	-3.375	40.615	37.241	-8.759	46.000
474.260	0.024	35.210	35.233	-10.767	46.000
747.800	3.296	30.888	34.184	-11.816	46.000
844.800	5.601	29.581	35.182	-10.818	46.000
1000.000	9.119	38.096	47.215	-6.785	54.000
Vertical					
97.900	-1.400	36.059	34.658	-8.842	43.500
262.800	-7.543	44.405	36.862	-9.138	46.000
365.620	-2.179	36.691	34.512	-11.488	46.000
528.580	-0.462	31.684	31.222	-14.778	46.000
747.800	2.166	30.391	32.557	-13.443	46.000
996.120	4.019	40.735	44.754	-9.246	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

5. RF antenna conducted test

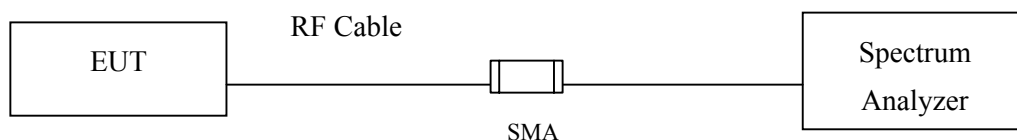
5.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2012
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with “X” are used to measure the final test results.

5.2. Test Setup

RF antenna Conducted Measurement:



5.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.4. Test Procedure

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

5.5. Uncertainty

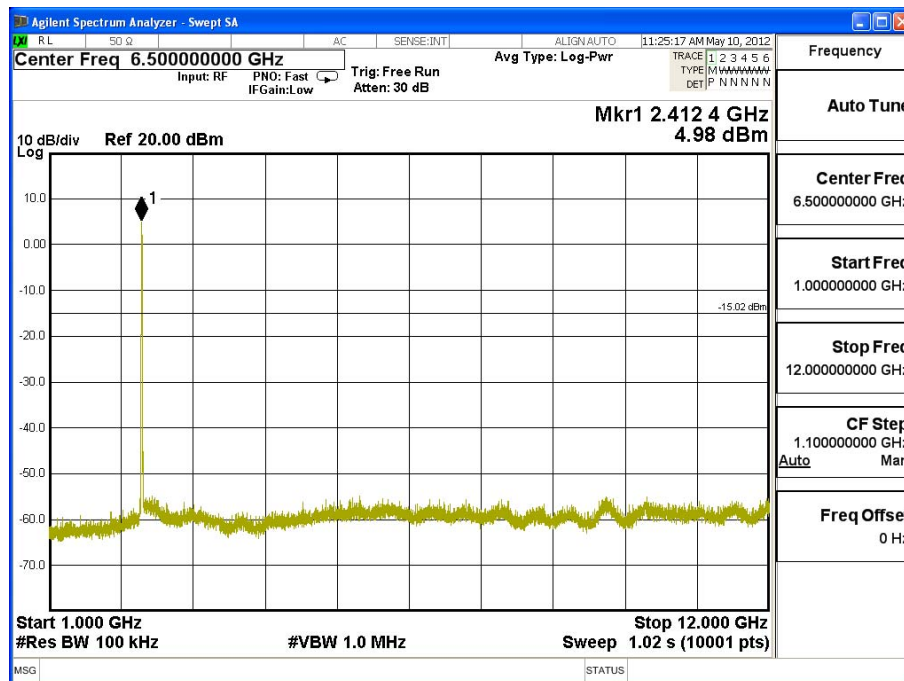
The measurement uncertainty

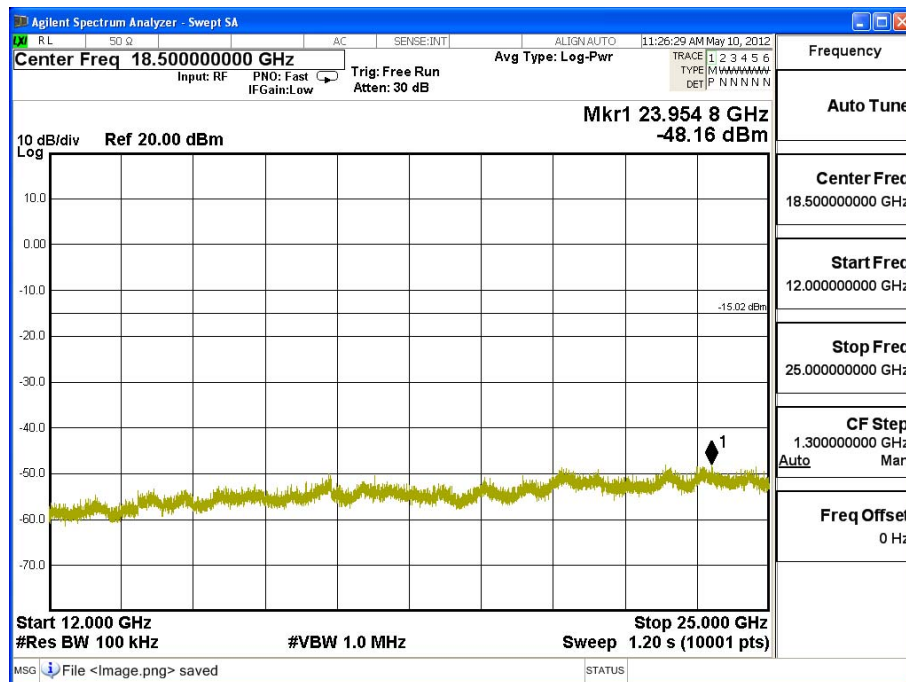
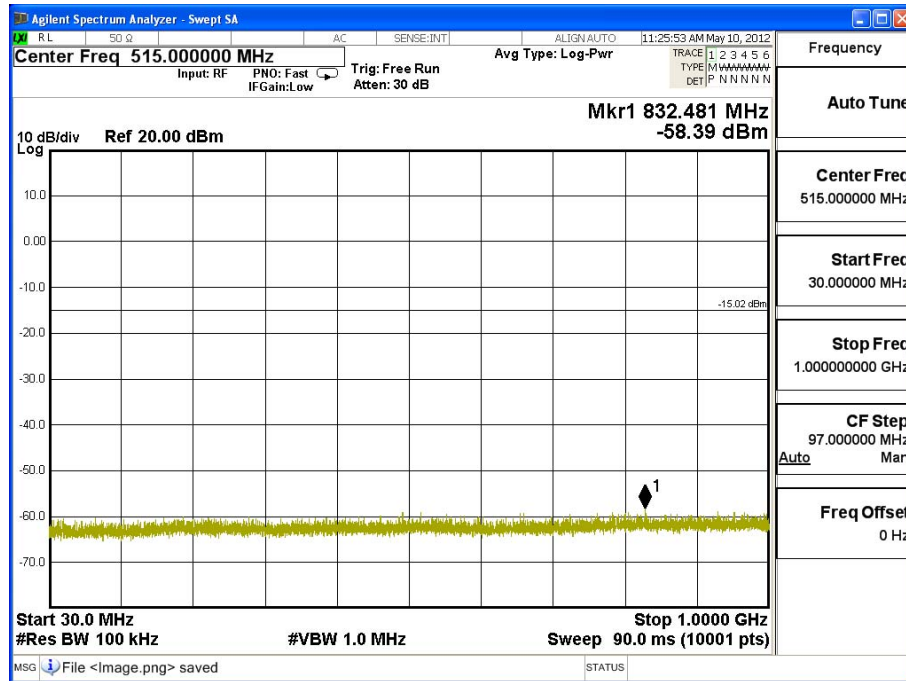
Conducted is defined as $\pm 1.27\text{dB}$

5.6. Test Result of RF antenna conducted test

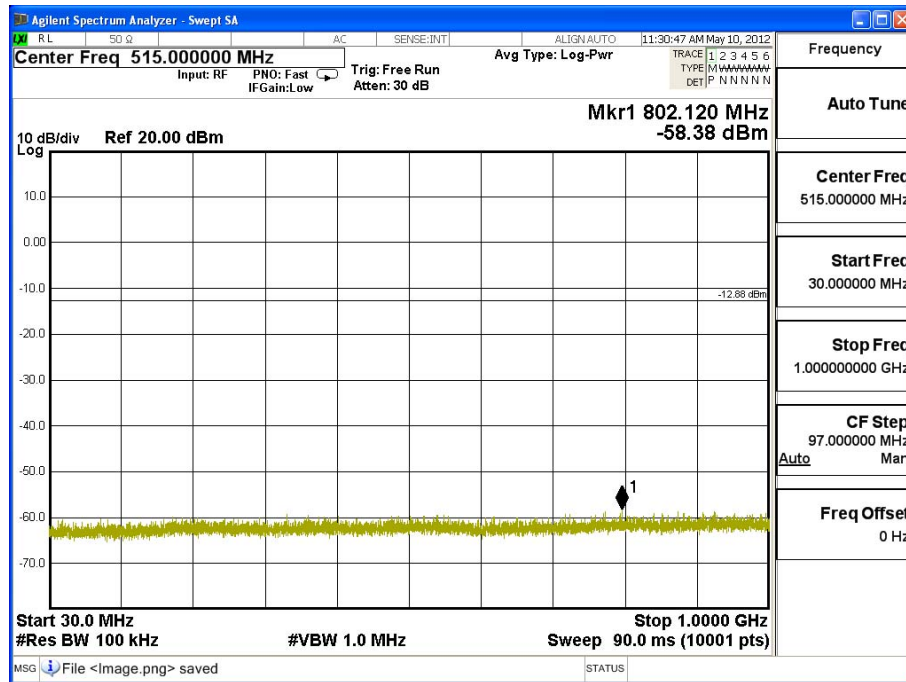
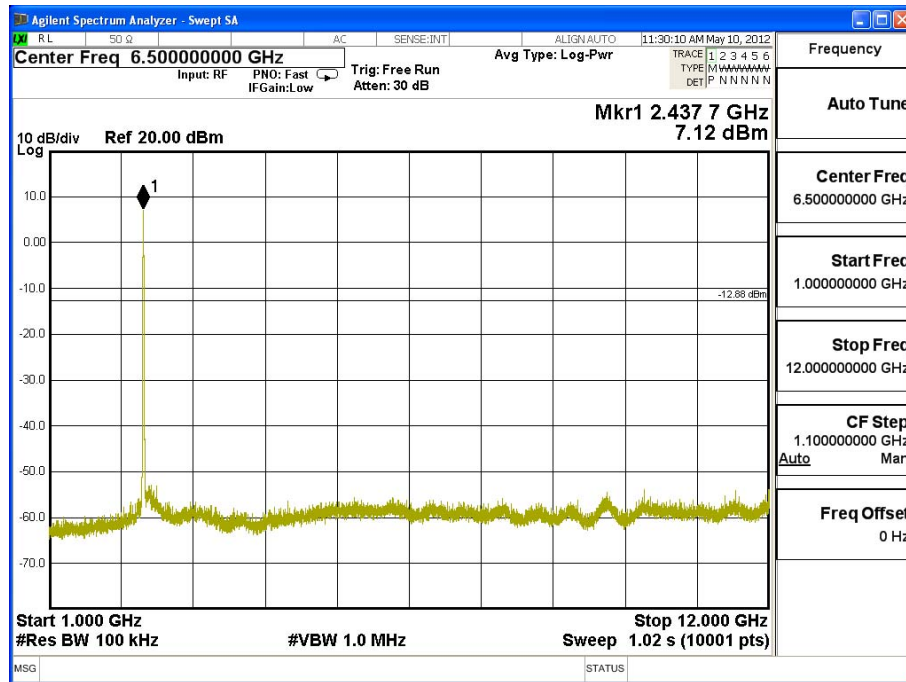
Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : RF antenna conducted test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 802.11b 1Mbps

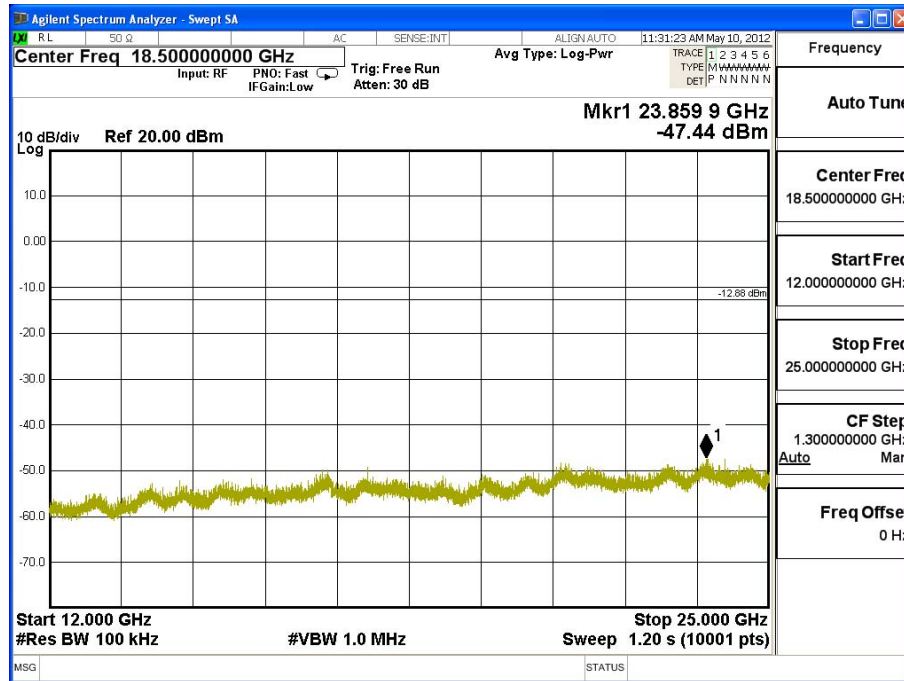
Channel 01 (2412MHz) 30MHz-25GHz-Chain A



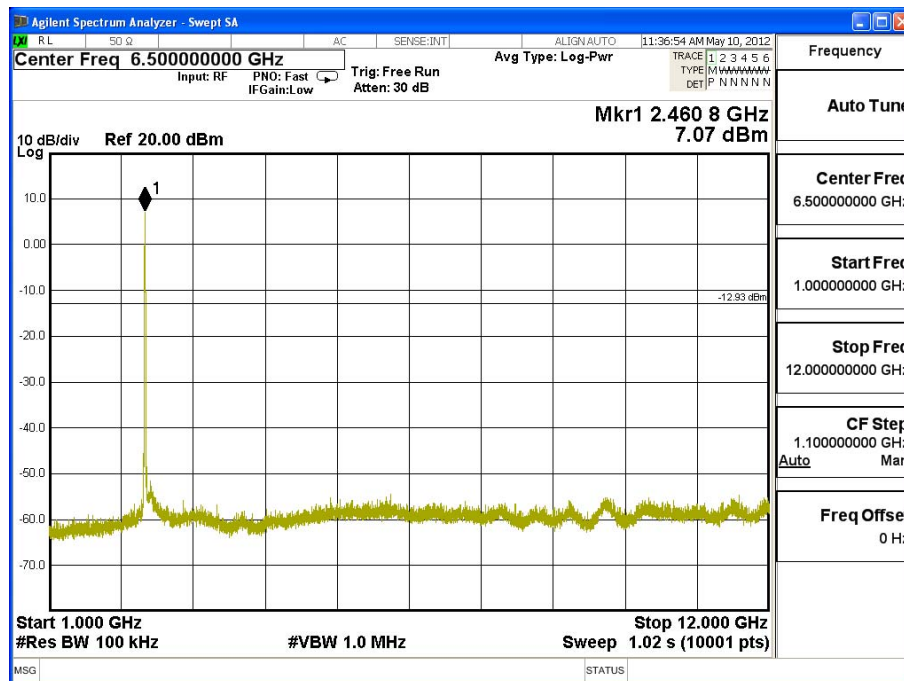


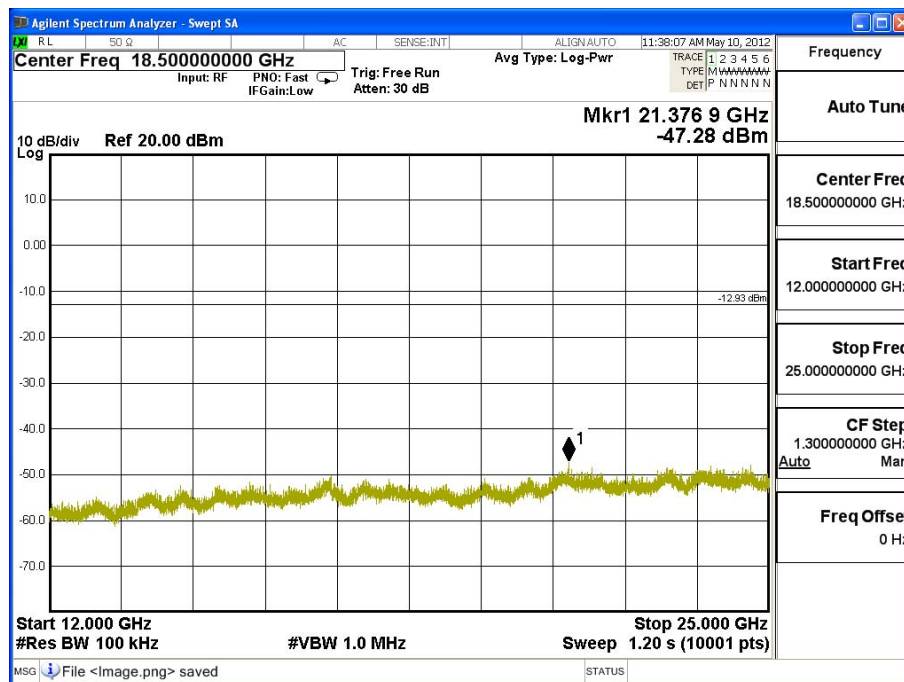
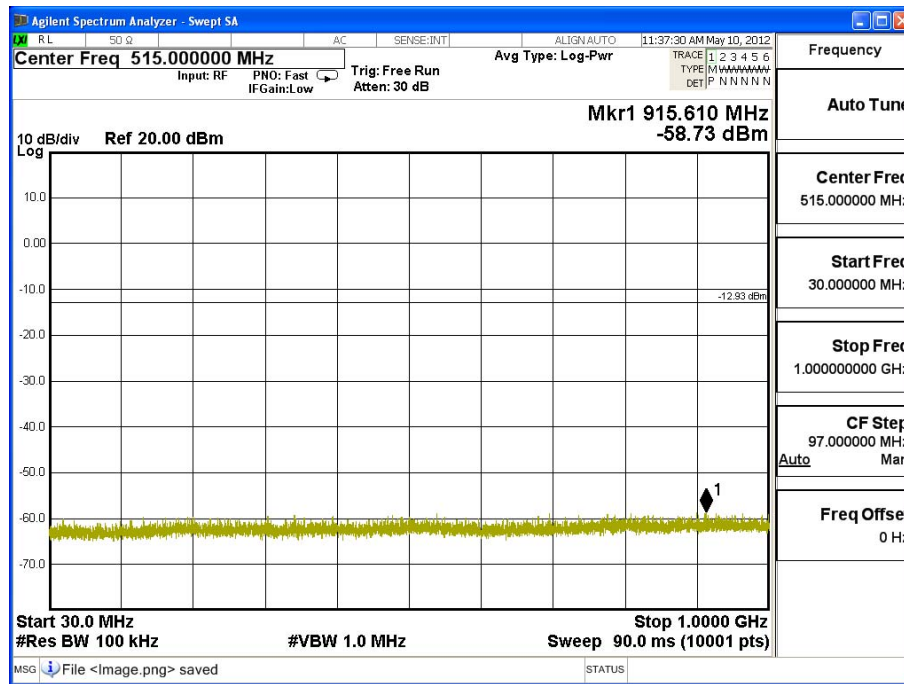
Channel 06 (2437MHz) 30MHz -25GHz-Chain A





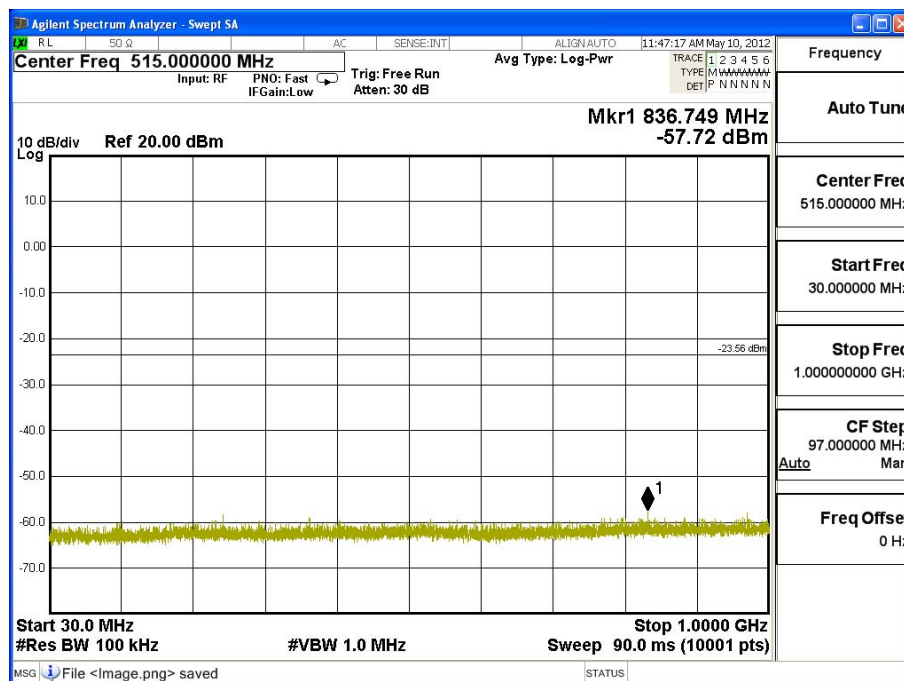
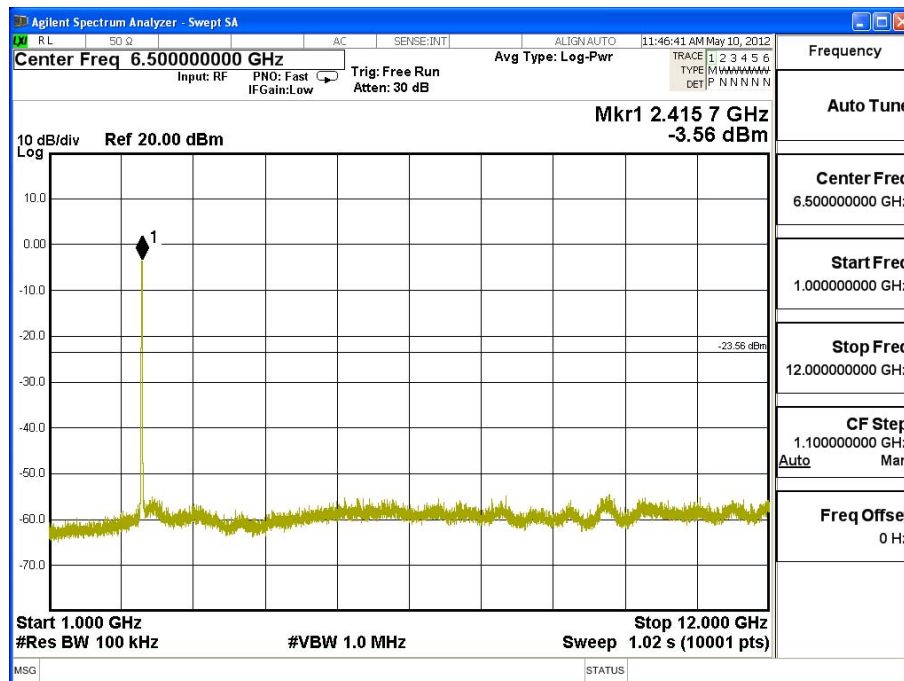
Channel 11 (2462MHz) 30MHz -25GHz-Chain A

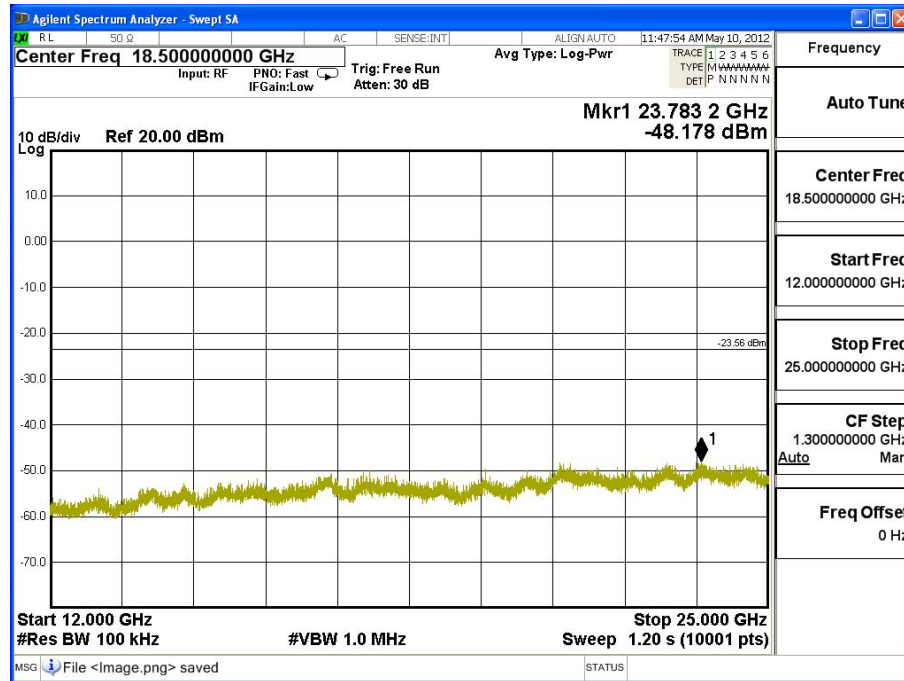




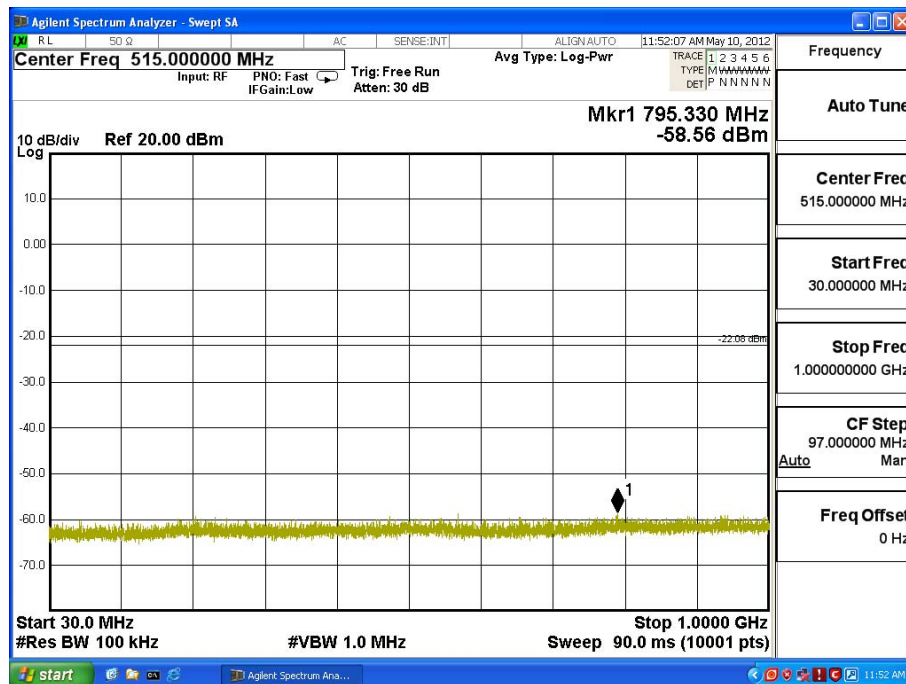
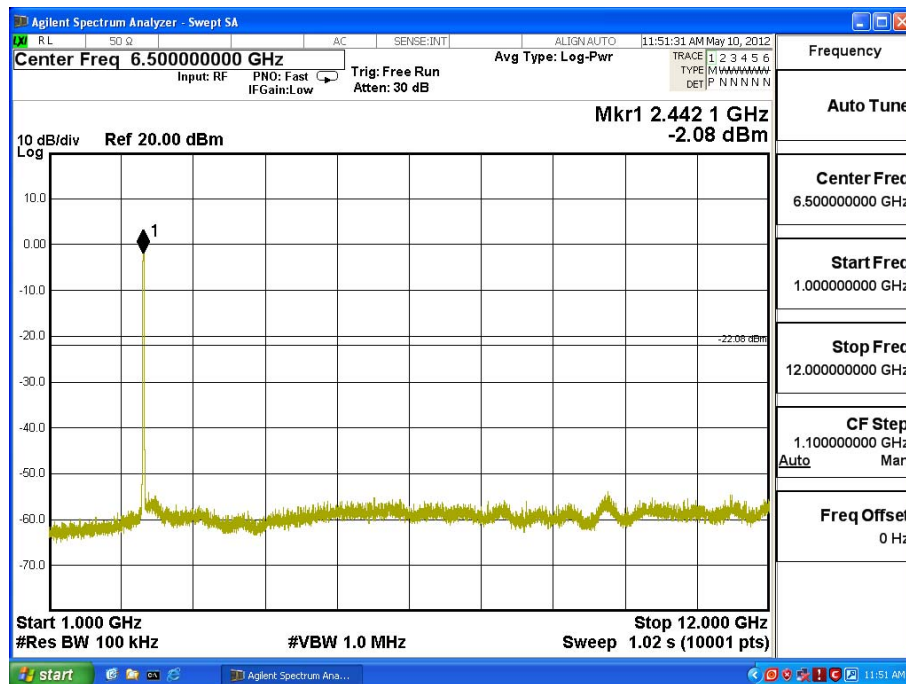
Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : RF Antenna Conducted Spurious
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 802.11g 6Mbps

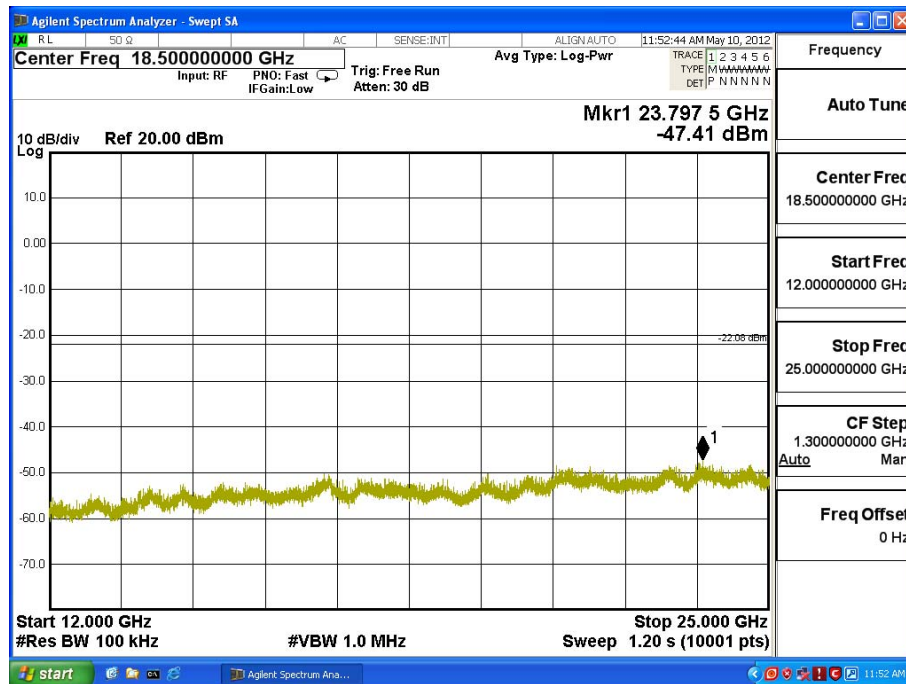
Channel 01 (2412MHz) 30MHz -25GHz-Chain A



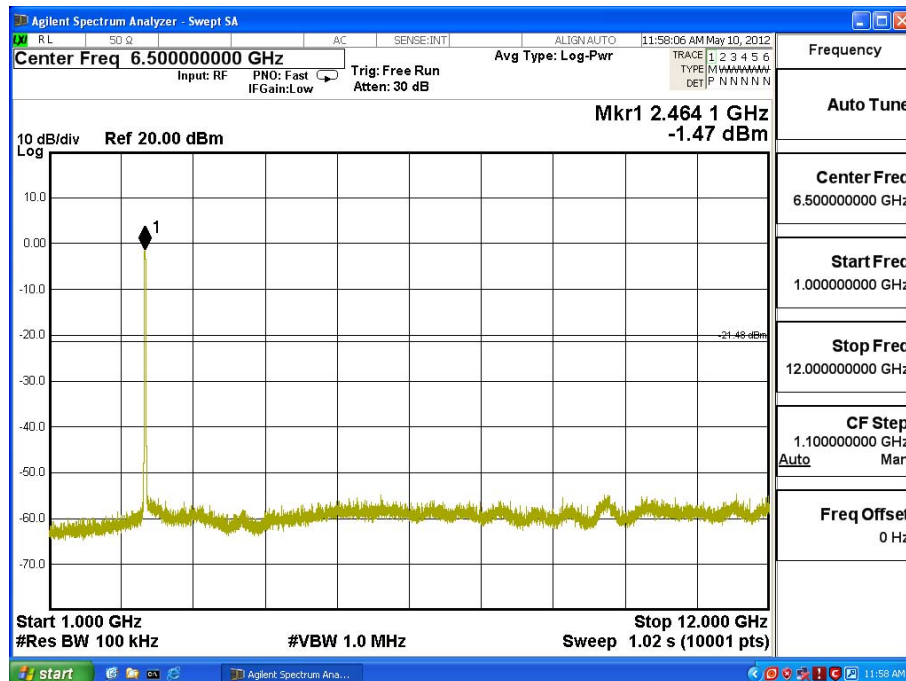


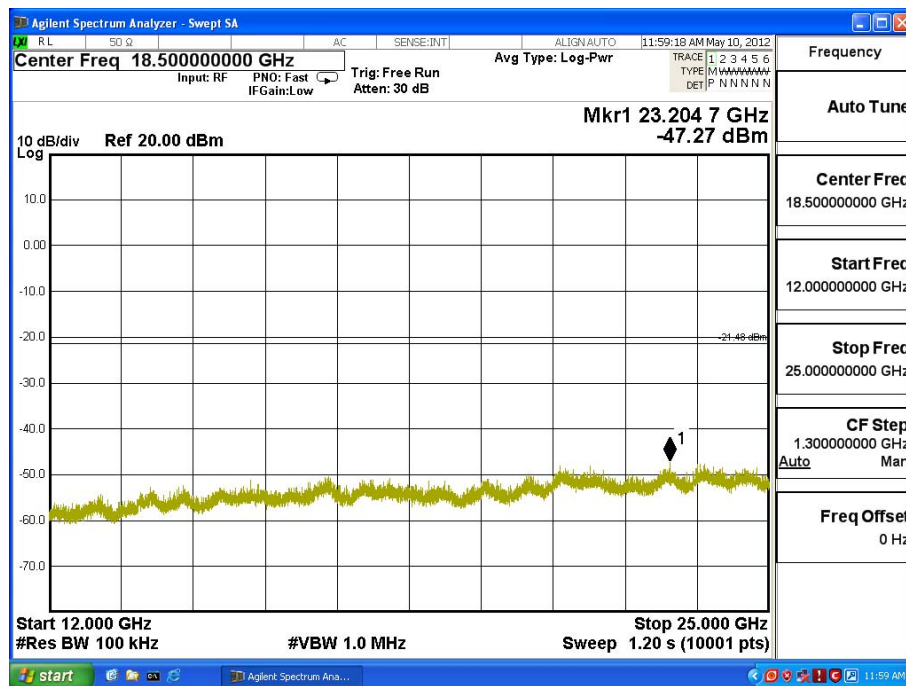
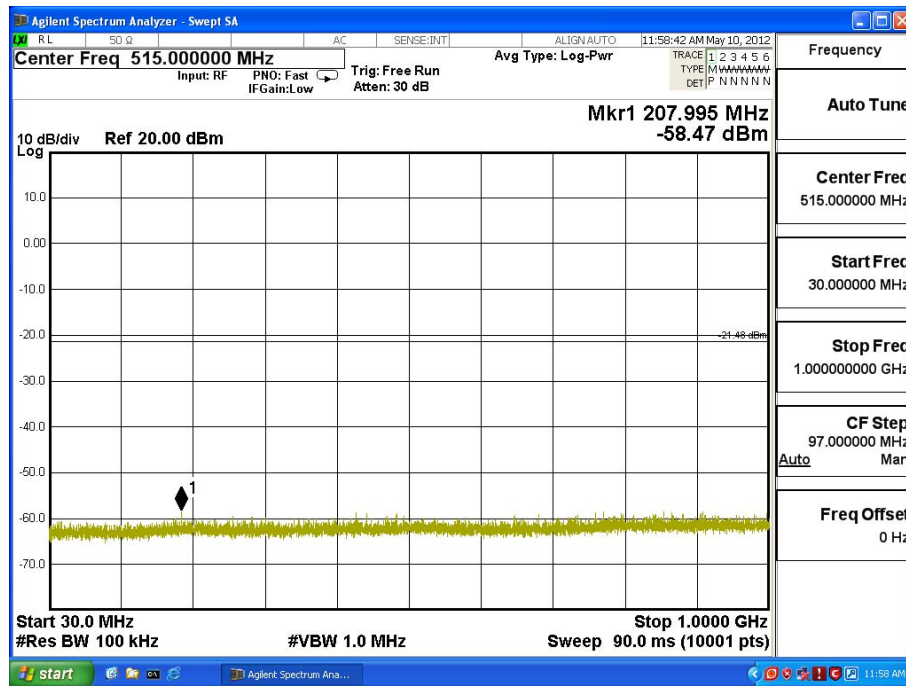
Channel 06 (2437MHz) 30MHz -25GHz-Chain A





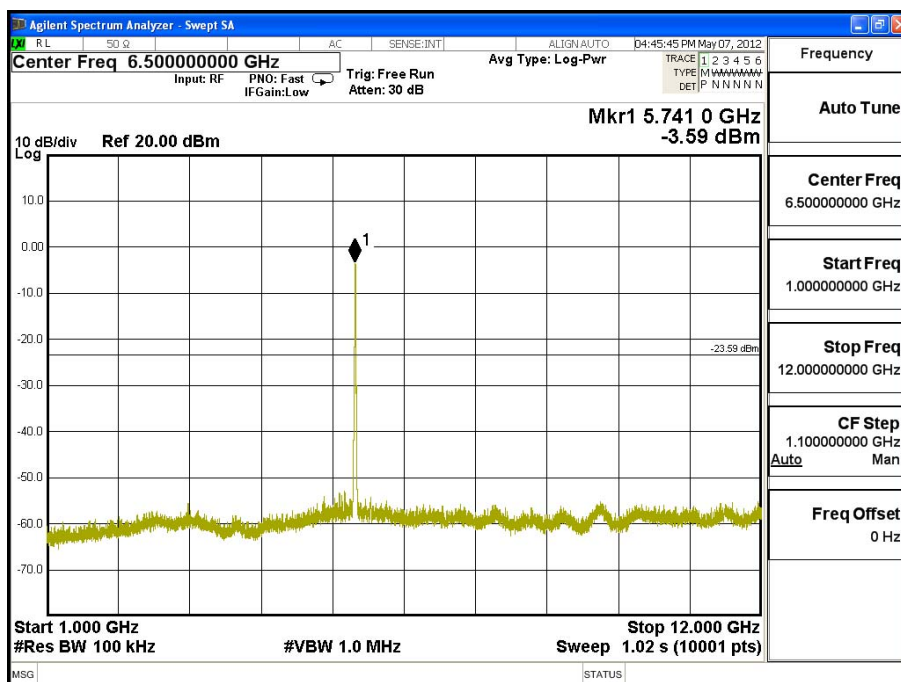
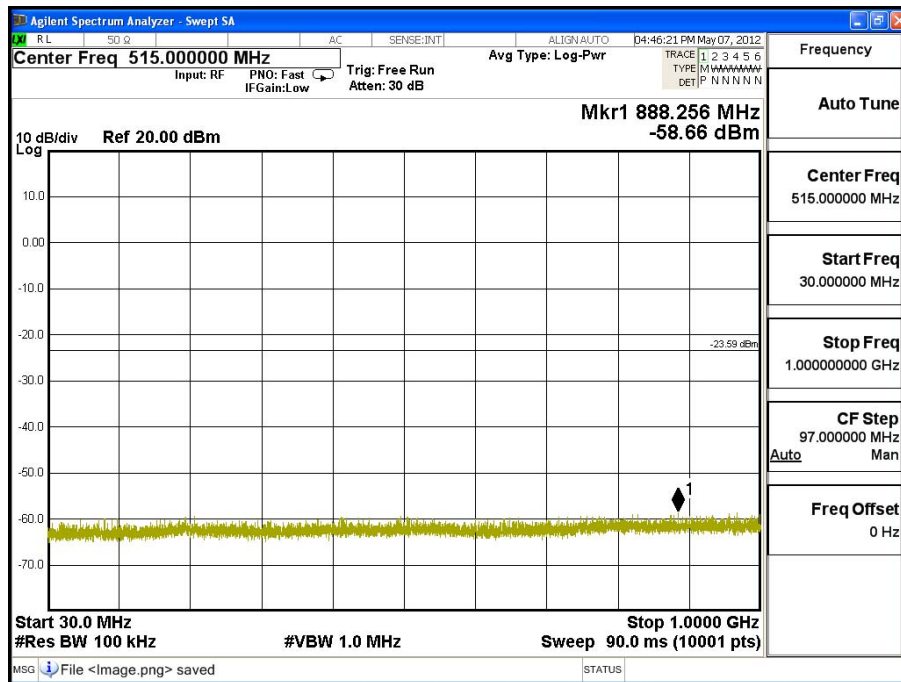
Channel 11 (2462MHz) 30MHz -25GHz-Chain A

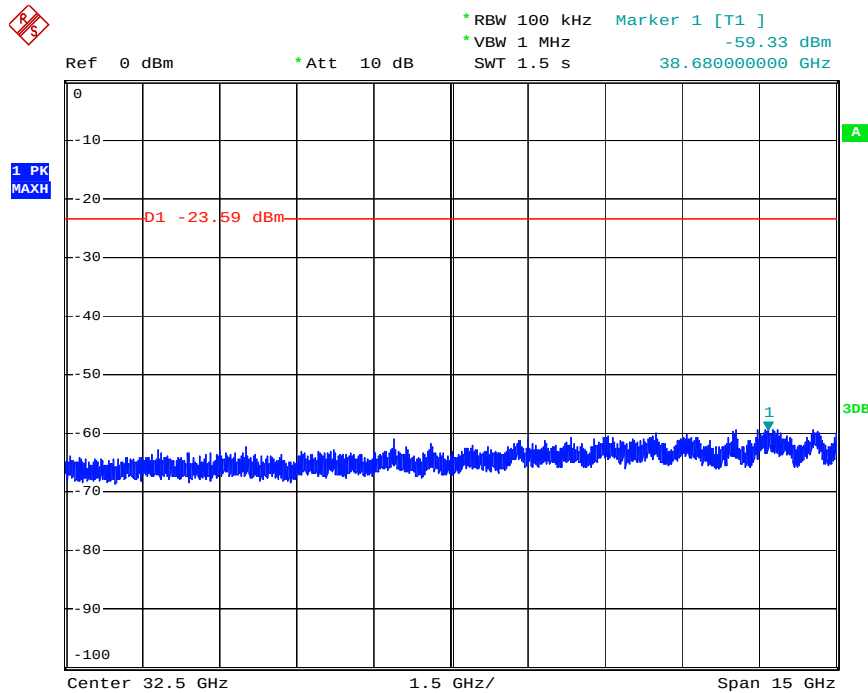
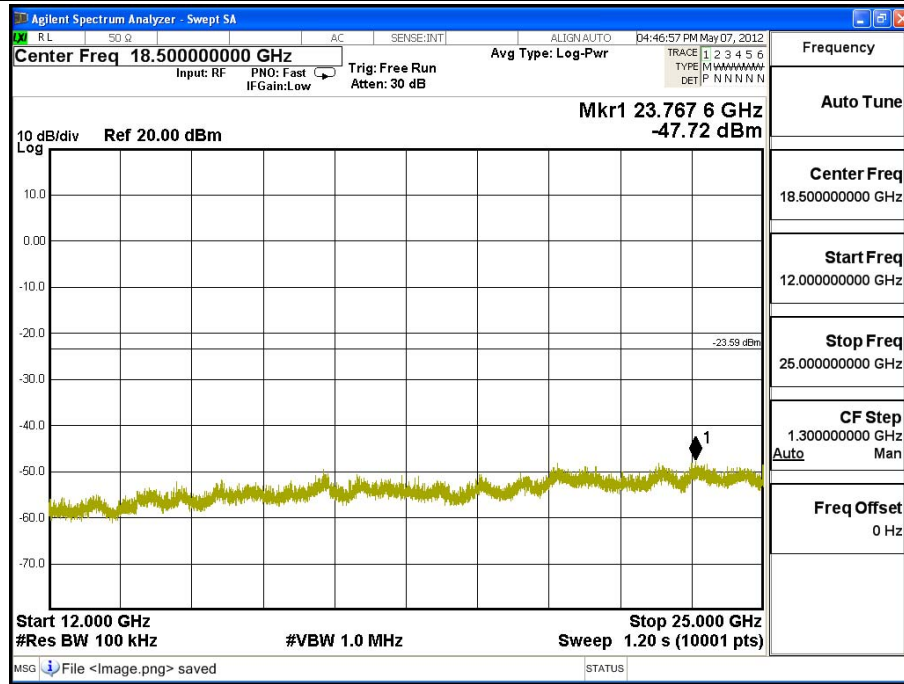




Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : RF Antenna Conducted Spurious
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - 802.11a 6Mbps

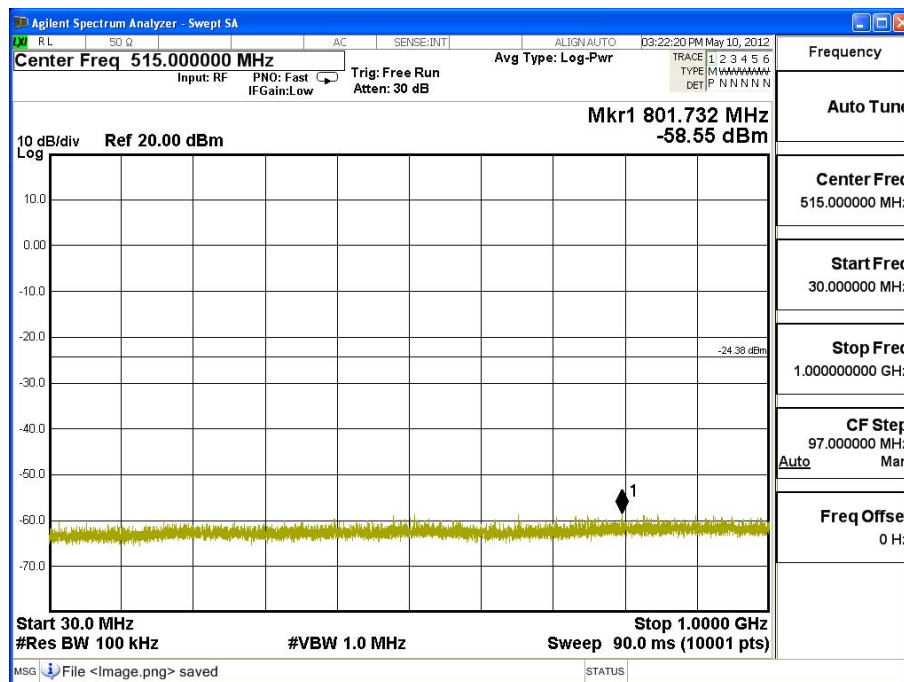
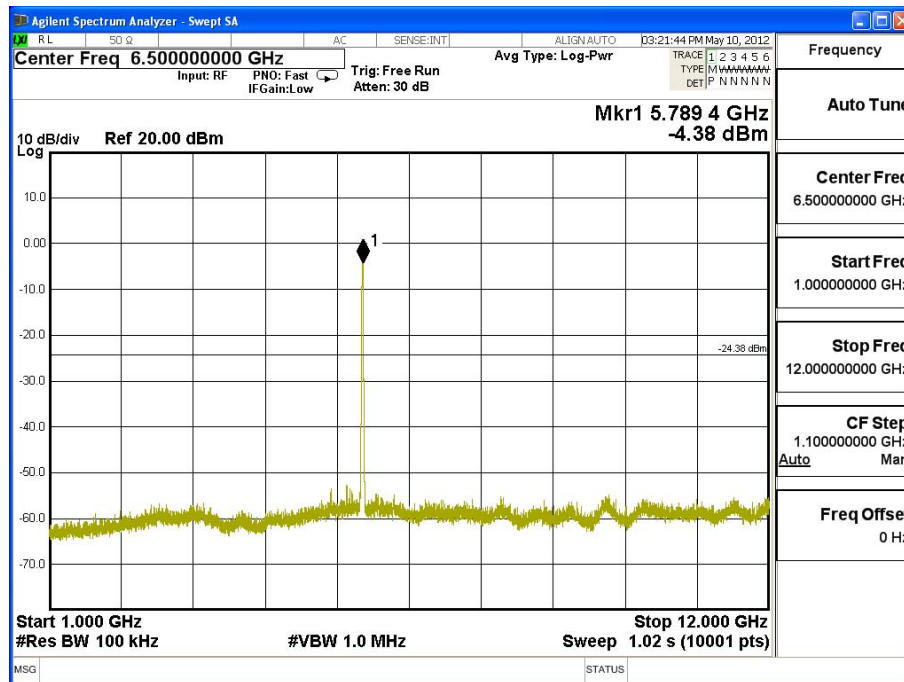
Channel 149 (5745MHz) 30MHz -40GHz-Chain A

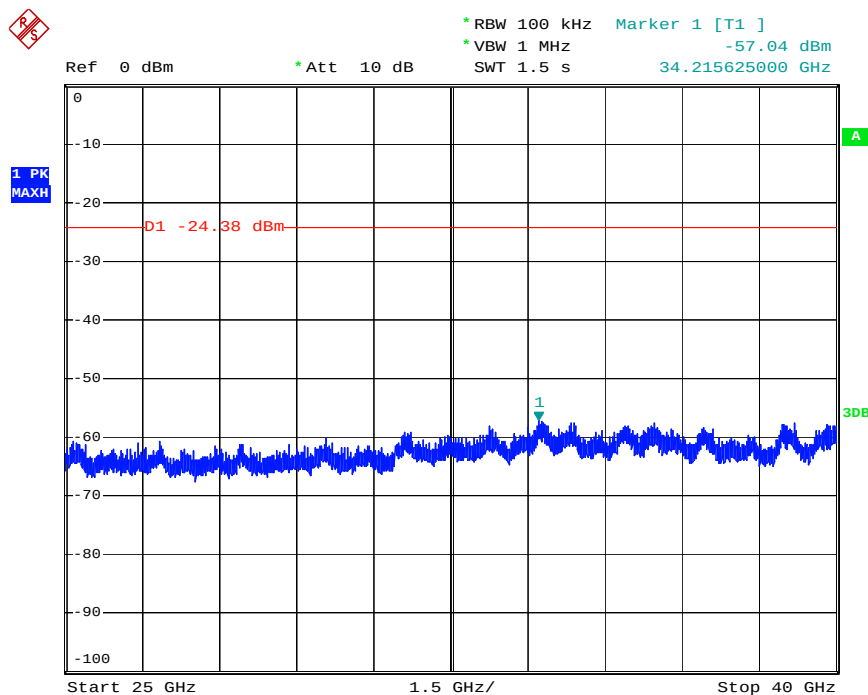
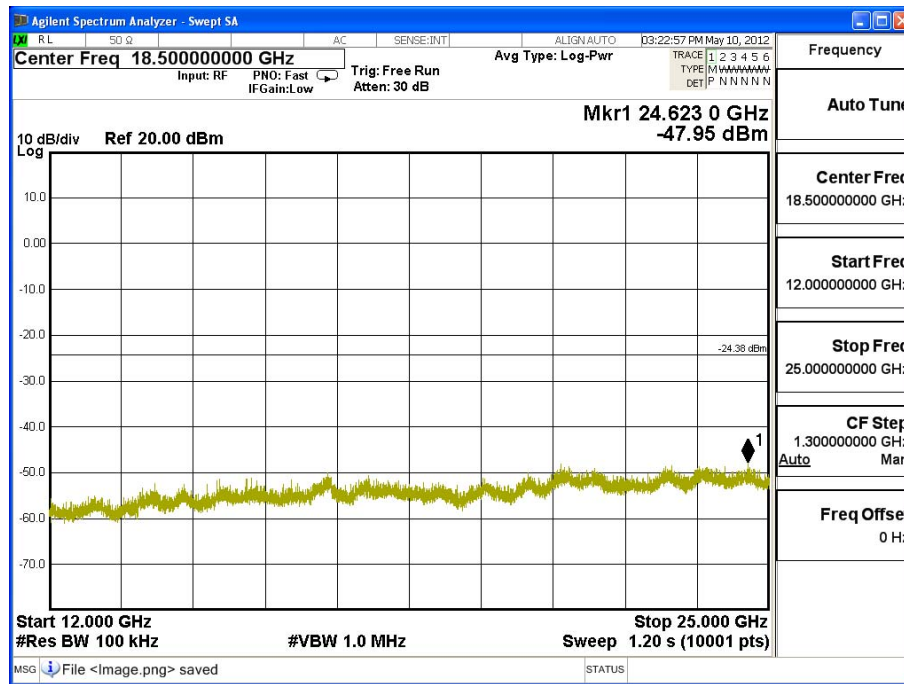




Date: 17.MAY.2012 11:46:30

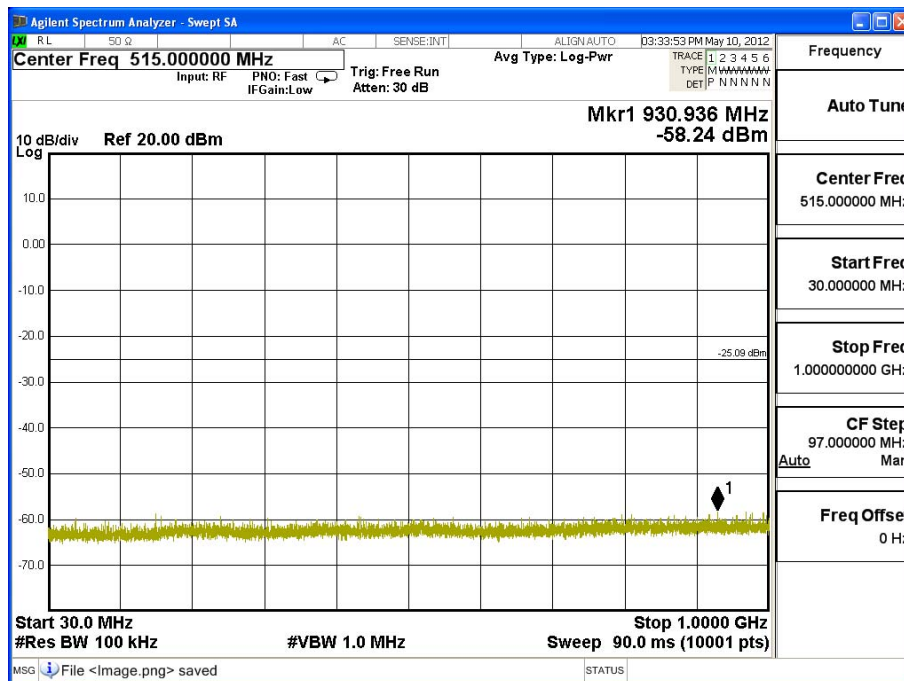
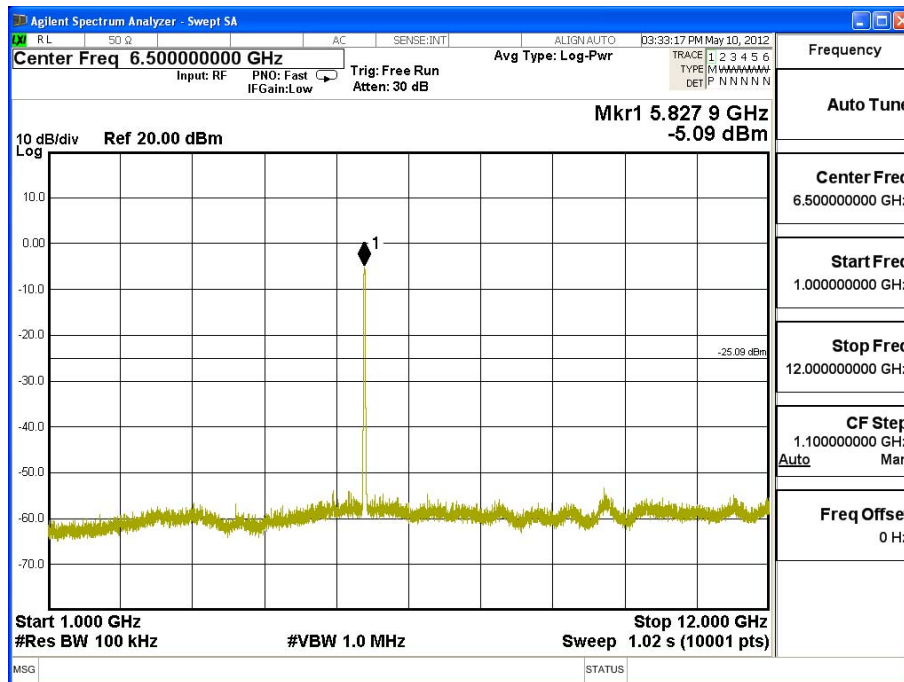
Channel 157 (5785MHz) 30MHz -40GHz-Chain A

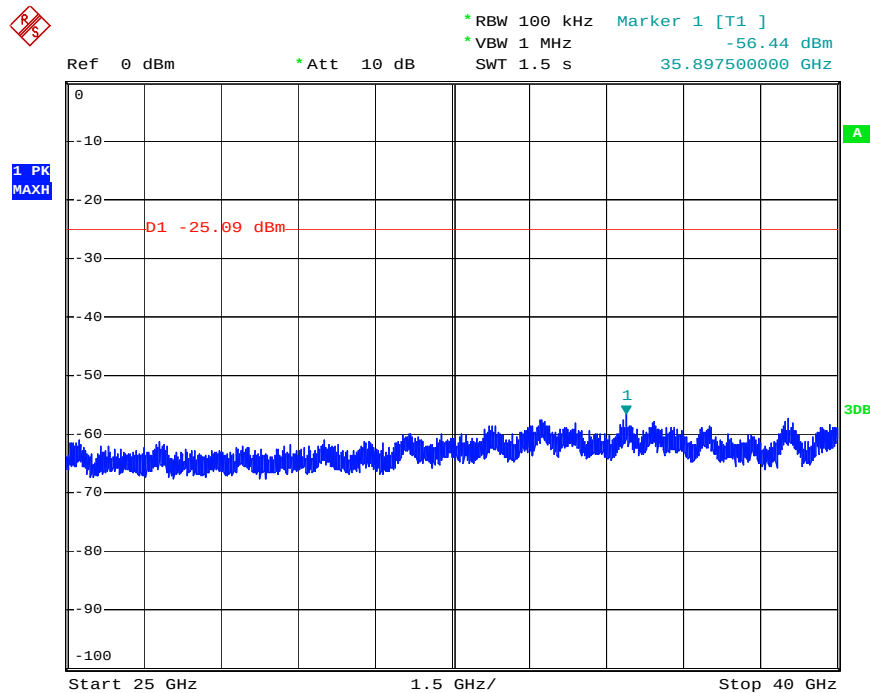
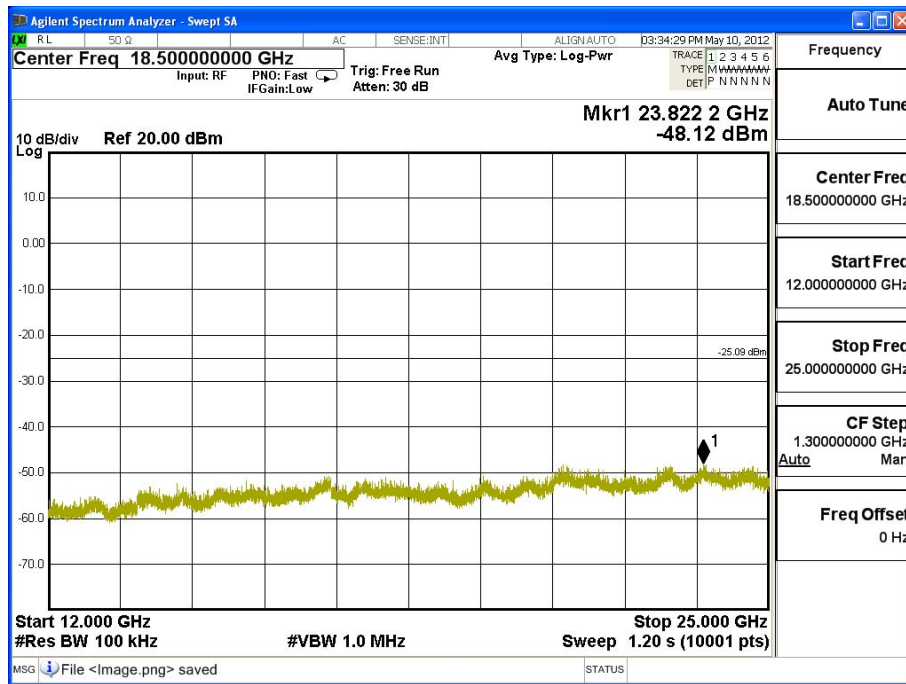




Date: 14.MAY.2012 19:44:25

Channel 165 (5825MHz) 30MHz -40GHz-Chain A

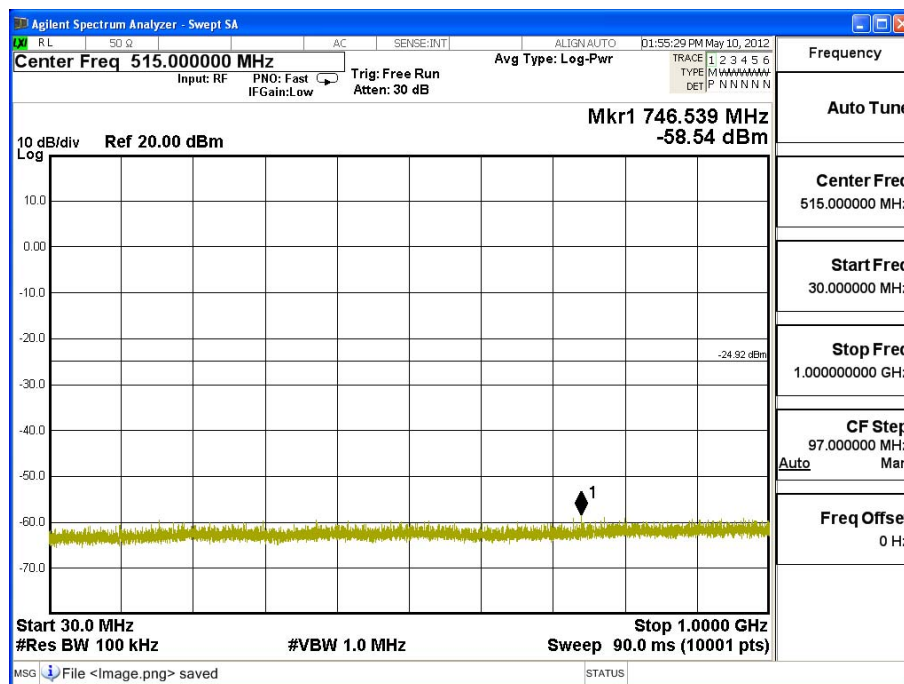
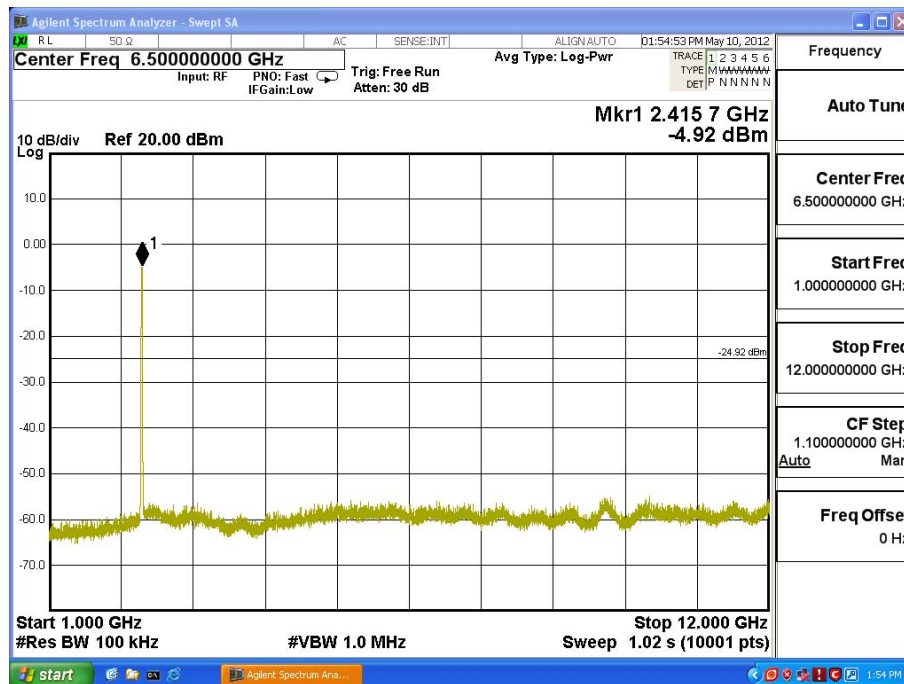


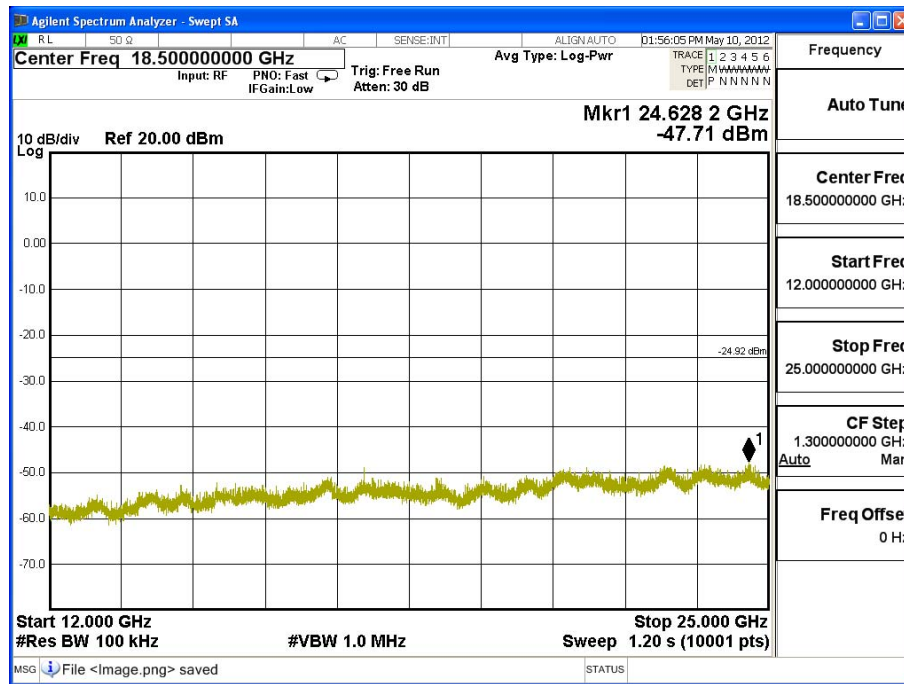


Date: 14.MAY.2012 19:46:20

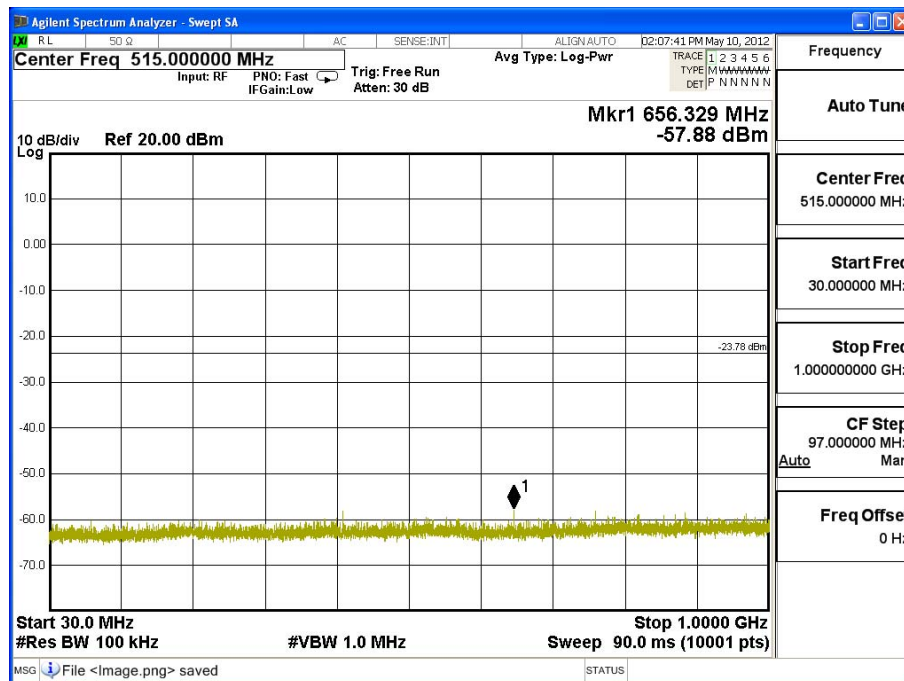
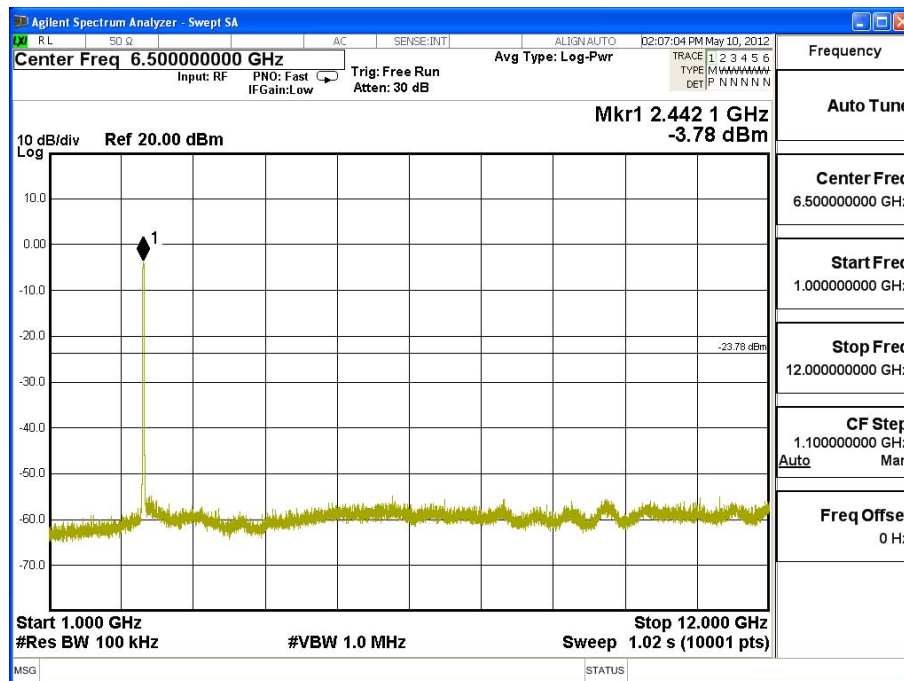
Product : 802.11 a/b/g/n RTL8192DU Module
 Test Item : RF Antenna Conducted Spurious
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmit - 802.11n-20BW_14.4Mbps(2.4G Band)

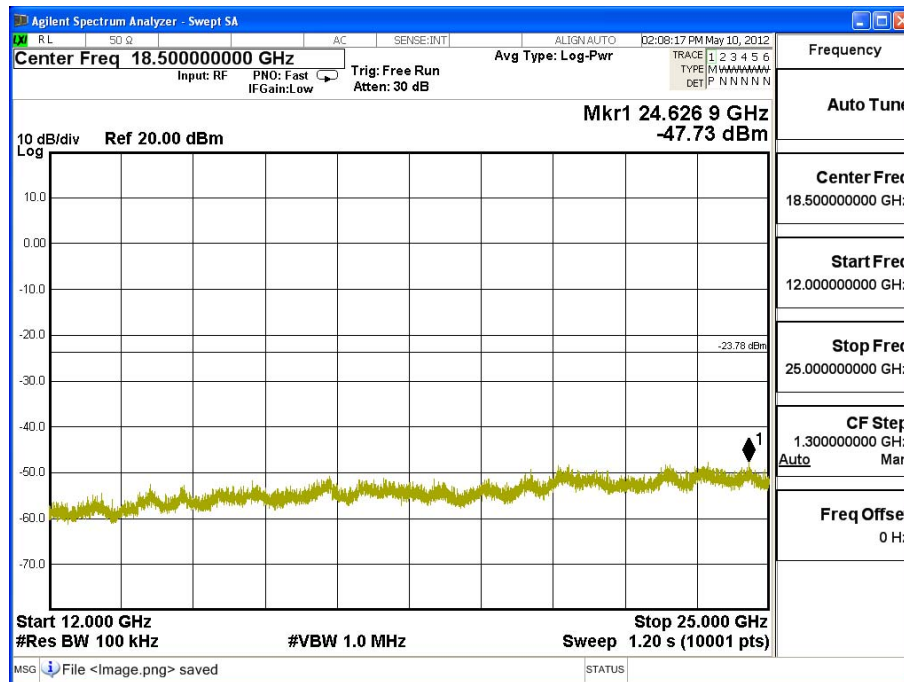
Channel 01 (2412MHz) 30MHz -25GHz-Chain A



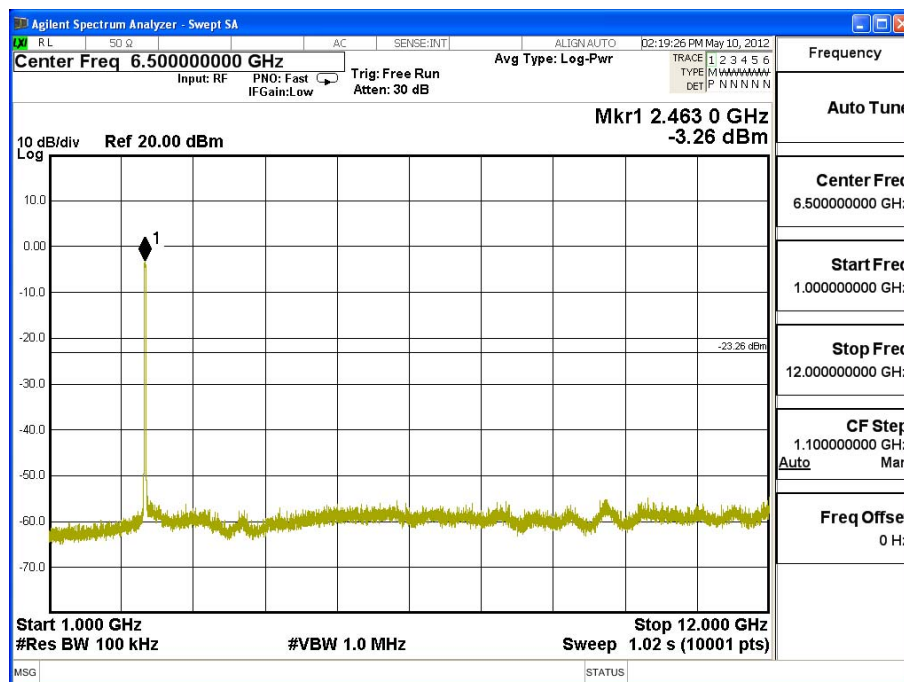


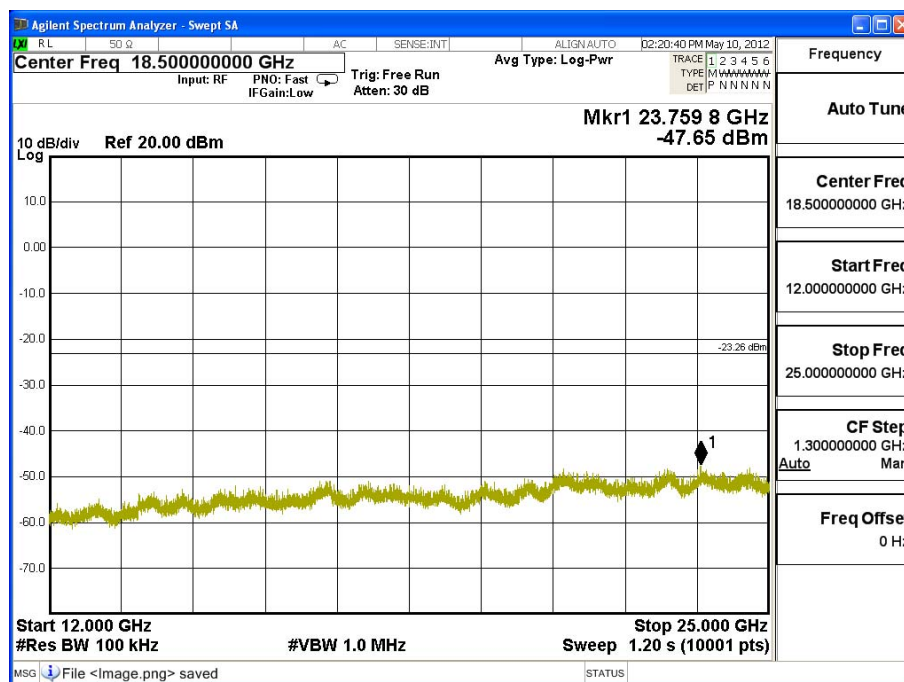
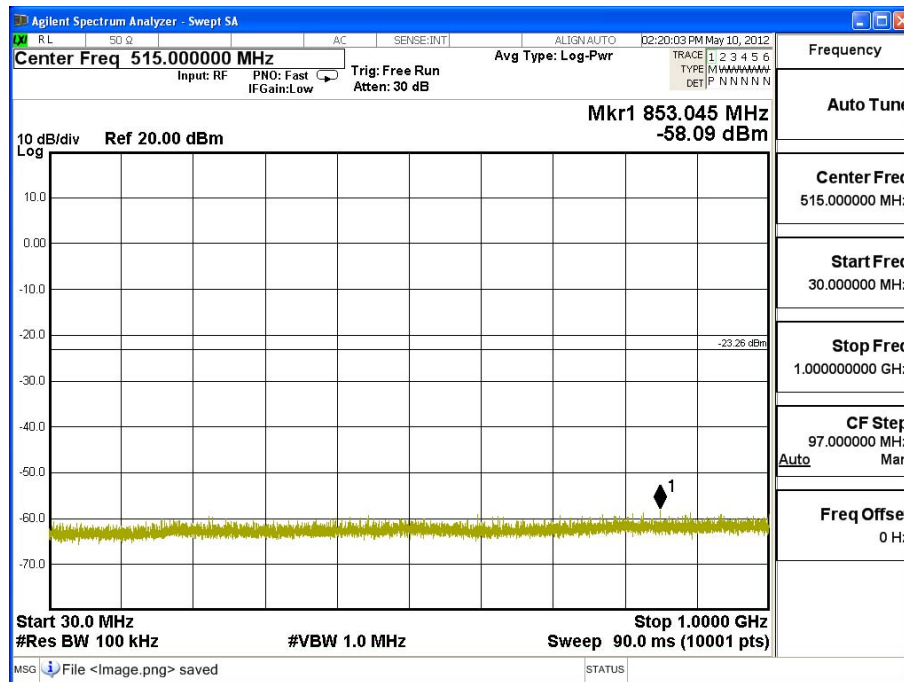
Channel 06 (2437MHz) 30MHz -25GHz-Chain A





Channel 11 (2462MHz) 30MHz -25GHz-Chain A





Channel 01 (2412MHz) 30MHz -25GHz-Chain B

