FCC Test Report

Product Name	ASUS Miracast Dongle
Model No	90XB01F0-BEX000 / 90XB01F0-BEX010 / 90XB01F0-BEX020 / 90XB01F0-BEX030 / 90XB01F0-BEX040 / 90XB01F0-BEX050 / 90XB01F0-BEX060 / 90XB01F0-BEX070
FCC ID.	PPQ-SWS003

Applicant	Lite-On Technology Corp.
Address	4F, 90, Chien 1 Road, Chung Ho, New Taipei City 235, Taiwan, R.O.C.

Date of Receipt	Aug. 23, 2013
Issue Date	Oct. 16, 2013
Report No.	138468R-RFUSP28V01
Report Version	V1.0

Testing Laboratory 0914

Test Report Certification

Issue Date: Oct. 16, 2013

Report No.: 138468R-RFUSP28V01

Product Name	ASUS Miracast Dongle
Applicant	Lite-On Technology Corp.
Address	4F, 90, Chien 1 Road, Chung Ho, New Taipei City 235, Taiwan, R.O.C.
Manufacturer	DONG GUAN G-COM COMPUTER CO., LTD.
Model No.	90XB01F0-BEX000 / 90XB01F0-BEX010 / 90XB01F0-BEX020 / 90XB01F0-BEX030 / 90XB01F0-BEX040 / 90XB01F0-BEX050 / 90XB01F0-BEX060 / 90XB01F0-BEX070
EUT Rated Voltage	DC 5V
EUT Test Voltage	AC 120V/60Hz
Trade Name	/SUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2012 ANSI C63.4: 2003, ANSI C63.10: 2009, KDB 558074
Test Result	Complied

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

This report must not be used to claim product endorsement by TAF or any agency of the U.S. Government

Documented By : *Jinn Chen*

(Senior Adm. Specialist / Jinn Chen)

Tested By : *Andy Lin*

(Engineer / Andy Lin)

Approved By : *[signature]*

(Manager / Vincent Lin)

TABLE OF CONTENTS

Attachment 1:   EUT Test Photographs

Attachment 2:   EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	ASUS Miracast Dongle
Trade Name	/SUS
Model No.	90XB01F0-BEX000 / 90XB01F0-BEX010 / 90XB01F0-BEX020 / 90XB01F0-BEX030 / 90XB01F0-BEX040 / 90XB01F0-BEX050 / 90XB01F0-BEX060 / 90XB01F0-BEX070
FCC ID.	PPQ-SWS003
Frequency Range	802.11b/g/n-20MHz:2412-2462MHz 802.11a/n-20MHz:5745-5825MHz ,802.11n-40MHz:5755-5795MHz
Number of Channels	802.11b/g/n-20MHz: 11 802.11a/n-20MHz: 5, n-40MHz: 2
Data Speed	802.11b: 1-11Mbps, 802.11a/g: 6-54Mbps, 802.11n: up to 150Mbps
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	Printed on PCB
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto
HDMI Converter	1 set
USB Cable	Non-shielded, 0.3m
Power Adapter	MFR：DVE, M/N：DSA-5PFK-05-FUS 050100a Input：100-240V~50/60Hz 0.2A Output：+5V⎓1A

Antenna List

No.	Manufacturer	Model Name.	Peak Gain
1	LITE-ON	SWS003C (Main) (Aux)	3.77 dBi in 2.4GHz 3.30 dBi in 5725-5850GHz

Note: The antenna of EUT is conform to FCC 15.203

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 (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 an ASUS Miracast Dongle with a built-in 2.4GHz and 5GHz WLAN transceiver.
2. The EUT is including eight models for different marketing requirement.
3. The different of each model is shown as below:

Model Number	Description
90XB01F0-BEX000	MIRACAST DONGLE/US/HDMI/6IN1
90XB01F0-BEX010	MIRACAST DONGLE/AU/HDMI/6IN1
90XB01F0-BEX020	MIRACAST DONGLE/TW/HDMI/6IN1
90XB01F0-BEX030	MIRACAST DONGLE/EU/HDMI/6IN1
90XB01F0-BEX040	MIRACAST DONGLE/UK/HDMI/6IN1
90XB01F0-BEX050	MIRACAST DONGLE/CN/HDMI/6IN1
90XB01F0-BEX060	MIRACAST DONGLE/JP/HDMI/6IN1
90XB01F0-BEX070	MIRACAST DONGLE/CA/HDMI/6IN1

4. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
5. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps、802.11a/g is 6Mbps、802.11n(20M-BW) is 7.2Mbps and 802.11n(40M-BW) is 150Mbps).
6. 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.
7. 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_7.2Mbps(2.4G Band)
	Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band)
	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band)
	Mode 7: Adapter mode

1.3. Tested System Details

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

For Adapter Mode

Product		Manufacturer	Model No.	Serial No.	Power Cord
(1)	Monitor	Dell	ST2320Lf	CN-OM2NN6 72872-22I-C9WS	Non-shielded, 1.8m

	Signal Cable Type	Signal cable Description
A	HDMI Cable	Non-shielded, 1.2m

For Transmit mode

Product		Manufacturer	Model No.	Serial No.	Power Cord
(1)	Monitor	Dell	ST2320Lf	CN-OM2NN6 72872-22I-C9WS	Non-shielded, 1.8m
(2)	Notebook PC	DELL	PPT	N/A	Non-shielded, 0.8m

	Signal Cable Type	Signal cable Description
A	HDMI Cable	Non-shielded, 1.2m
B	USB Cable	Non-shielded, 0.3m

1.4. Configuration of Tested System

For Adapter Mode
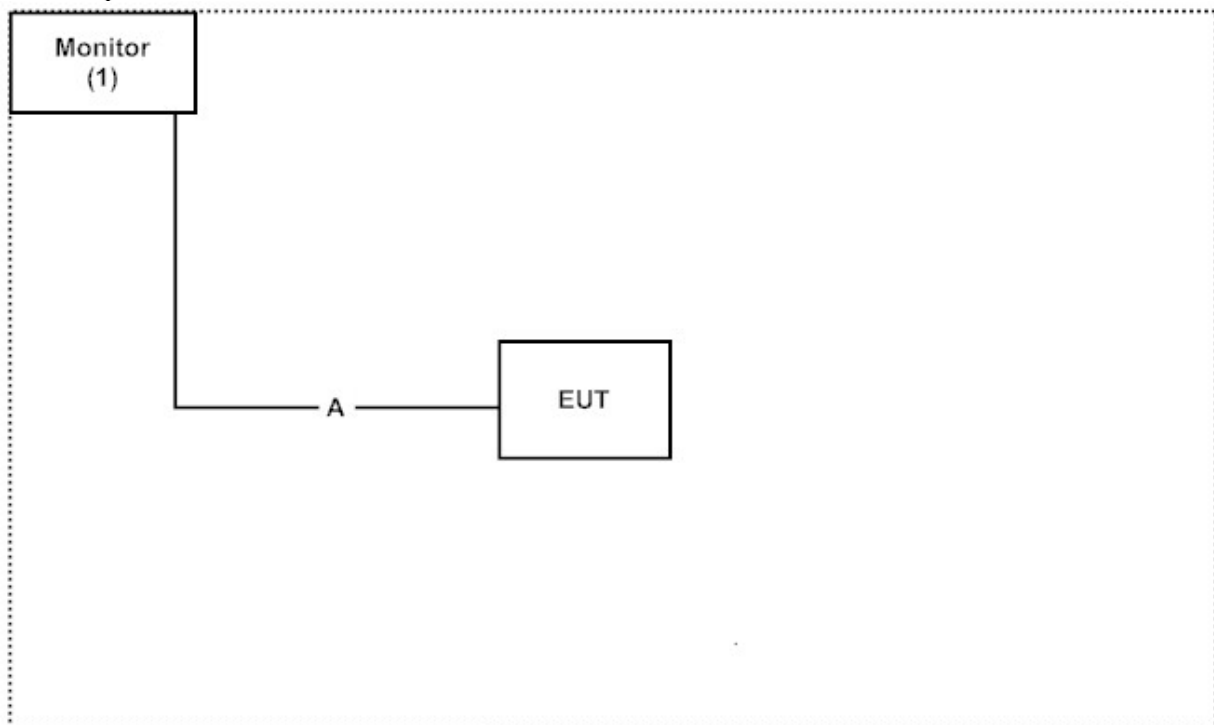
For Transmit mode
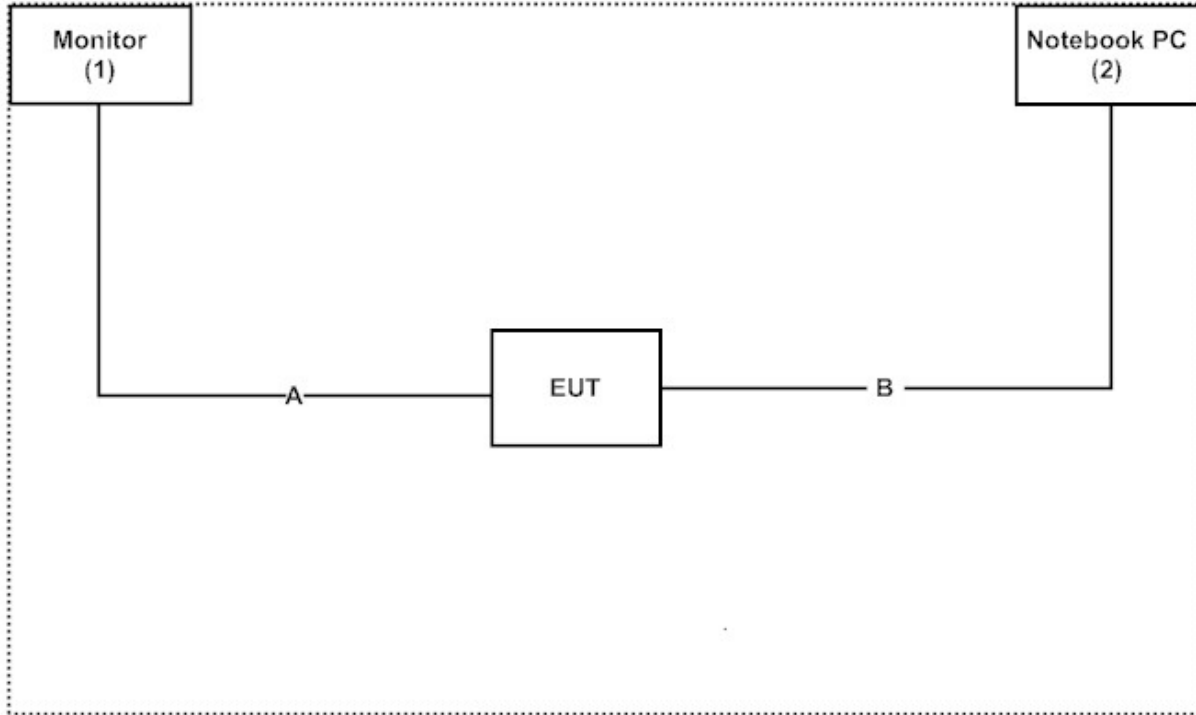
1.5.   EUT Exercise Software

(1) Setup the EUT as shown in Section 1.4

(2) Execute program "ART2-GUI v2.3"on the Notebook PC.

(3) Configure the test mode, the test channel, and the data rate.

(4) Start transmits continually.

(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

Site Name: Quietek Corporation
Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
                      Lin-Kou Shiang, Taipei,
                      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

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2013	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2013	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2013	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2013	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2013	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

2.2. Test Setup
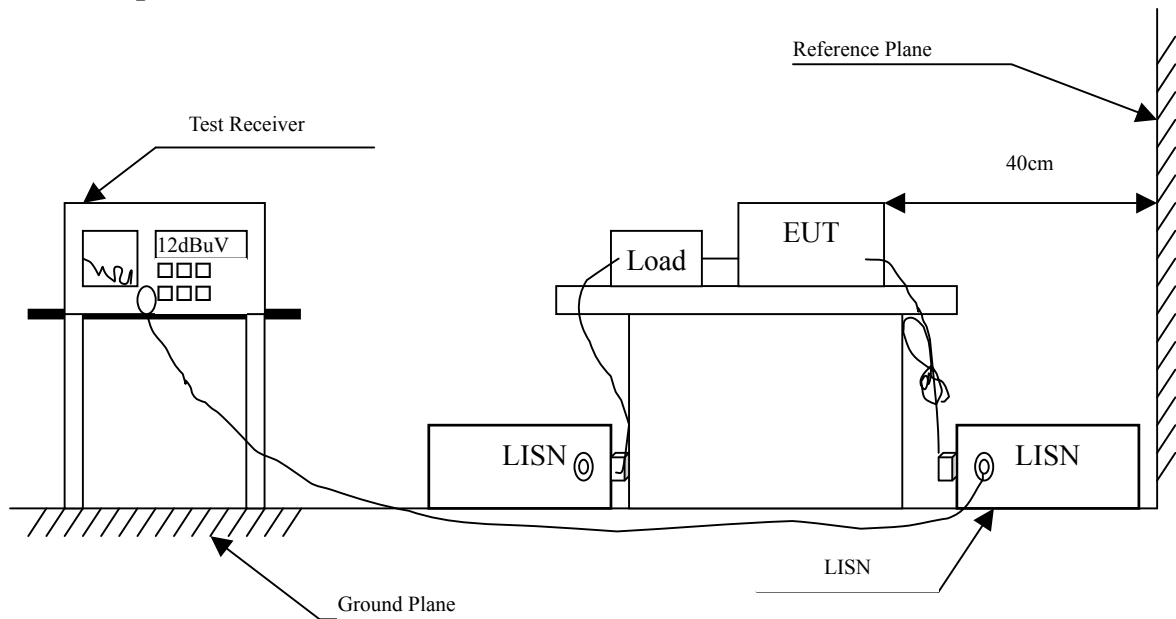
2.3. Limits

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 C63.10: 2009 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   :   ASUS Miracast Dongle
Test Item   :   Conducted Emission Test
Power Line   :   Line 1
Test Mode   :   Mode 7: Adapter mode

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.396	9.708	32.590	42.298	-16.673	58.971
0.654	9.719	34.030	43.749	-12.251	56.000
1.212	9.745	24.820	34.565	-21.435	56.000
2.134	9.807	25.110	34.917	-21.083	56.000
5.240	9.830	27.520	37.350	-22.650	60.000
11.396	9.880	28.940	38.820	-21.180	60.000
Average					
0.396	9.708	28.880	38.588	-10.383	48.971
0.654	9.719	19.950	29.669	-16.331	46.000
1.212	9.745	17.070	26.815	-19.185	46.000
2.134	9.807	16.890	26.697	-19.303	46.000
5.240	9.830	19.650	29.480	-20.520	50.000
11.396	9.880	19.720	29.600	-20.400	50.000

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	:	ASUS Miracast Dongle
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test Mode	:	Mode 7: Adapter mode

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.392	9.687	33.660	43.347	-15.739	59.086
0.588	9.696	24.140	33.836	-22.164	56.000
1.759	9.770	21.970	31.740	-24.260	56.000
4.158	9.810	24.450	34.260	-21.740	56.000
6.009	9.840	23.650	33.490	-26.510	60.000
11.959	9.920	24.520	34.440	-25.560	60.000
Average					
0.392	9.687	29.600	39.287	-9.799	49.086
0.588	9.696	15.420	25.116	-20.884	46.000
1.759	9.770	14.480	24.250	-21.750	46.000
4.158	9.810	18.010	27.820	-18.180	46.000
6.009	9.840	16.480	26.320	-23.680	50.000
11.959	9.920	16.220	26.140	-23.860	50.000

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	:	ASUS Miracast Dongle
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2437MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.158	9.697	35.630	45.327	-20.444	65.771
0.181	9.698	21.310	31.008	-34.106	65.114
0.271	9.702	30.270	39.972	-22.571	62.543
0.330	9.705	22.760	32.465	-28.392	60.857
0.576	9.716	22.990	32.706	-23.294	56.000
8.068	9.860	10.310	20.170	-39.830	60.000
Average					
0.158	9.697	11.580	21.277	-34.494	55.771
0.181	9.698	10.340	20.038	-35.076	55.114
0.271	9.702	18.100	27.802	-24.741	52.543
0.330	9.705	17.800	27.505	-23.352	50.857
0.576	9.716	16.240	25.956	-20.044	46.000
8.068	9.860	4.390	14.250	-35.750	50.000

Note:

4. All Reading Levels are Quasi-Peak and average value.

5. "   " means the worst emission level.

6. Measurement Level = Reading Level + Correct Factor

Product	:	ASUS Miracast Dongle
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2437MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.193	9.678	24.220	33.898	-30.873	64.771
0.236	9.680	25.860	35.540	-28.003	63.543
0.283	9.682	33.140	42.822	-19.378	62.200
0.420	9.689	15.810	25.499	-32.787	58.286
0.869	9.719	17.630	27.349	-28.651	56.000
7.849	9.860	9.660	19.520	-40.480	60.000
Average					
0.193	9.678	13.110	22.788	-31.983	54.771
0.236	9.680	22.330	32.010	-21.533	53.543
0.283	9.682	30.840	40.522	-11.678	52.200
0.420	9.689	4.880	14.569	-33.717	48.286
0.869	9.719	9.820	19.539	-26.461	46.000
7.849	9.860	2.700	12.560	-37.440	50.000

Note:

4. All Reading Levels are Quasi-Peak and average value.

5. "   " means the worst emission level.

6. Measurement Level = Reading Level + Correct Factor

Product	:	ASUS Miracast Dongle			
Test Item	:	Conducted Emission Test			
Power Line	:	Line 1			
Test Mode	:	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band) (5755MHz)			

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.193	9.698	32.900	42.598	-22.173	64.771
0.220	9.700	31.280	40.980	-23.020	64.000
0.283	9.702	32.690	42.392	-19.808	62.200
0.517	9.713	17.010	26.723	-29.277	56.000
0.591	9.716	19.130	28.846	-27.154	56.000
1.154	9.742	15.640	25.382	-30.618	56.000
Average					
0.193	9.698	16.720	26.418	-28.353	54.771
0.220	9.700	12.360	22.060	-31.940	54.000
0.283	9.702	27.620	37.322	-14.878	52.200
0.517	9.713	11.530	21.243	-24.757	46.000
0.591	9.716	15.260	24.976	-21.024	46.000
1.154	9.742	9.950	19.692	-26.308	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	:	ASUS Miracast Dongle			
Test Item	:	Conducted Emission Test			
Power Line	:	Line 2			
Test Mode	:	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band) (5755MHz)			

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.193	9.678	24.520	34.198	-30.573	64.771
0.240	9.680	25.380	35.060	-28.369	63.429
0.287	9.683	33.100	42.783	-19.303	62.086
0.560	9.695	16.750	26.445	-29.555	56.000
0.873	9.719	16.320	26.039	-29.961	56.000
2.017	9.781	5.970	15.751	-40.249	56.000
Average					
0.193	9.678	12.610	22.288	-32.483	54.771
0.240	9.680	21.540	31.220	-22.209	53.429
0.287	9.683	30.750	40.433	-11.653	52.086
0.560	9.695	7.650	17.345	-28.655	46.000
0.873	9.719	11.070	20.789	-25.211	46.000
2.017	9.781	-0.800	8.981	-37.019	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

3. Peak Power Output

3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2013
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2013

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 KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product	:	ASUS Miracast Dongle	
Test Item	:	Peak Power Output Data	
Test Site	:	No.3 OATS	
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)	

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	15.23	--	--	--	17.39	<30dBm	Pass
06	2437	15.63	15.58	15.47	15.32	17.96	<30dBm	Pass
11	2462	14.37	--	--	--	16.89	<30dBm	Pass

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

Product   :   ASUS Miracast Dongle
Test Item   :   Peak Power Output Data
Test Site   :   No.3 OATS
Test Mode   :   Mode 2: Transmit (802.11g 6Mbps)

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	15.16	--	--	--	--	--	--	--	23.45	<30dBm	Pass
06	2437	18.90	18.81	18.77	18.69	18.61	18.59	18.44	18.37	25.07	<30dBm	Pass
11	2462	14.63	--	--	--	--	--	--	--	23.23	<30dBm	Pass

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

Product : ASUS Miracast Dongle
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit - 802.11a 6Mbps

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	16.19	--	--	--	--	--	--	--	19.66	<30dBm	Pass
157	5785	16.12	15.99	15.94	15.91	15.87	15.79	15.71	15.55	21.17	<30dBm	Pass
165	5825	16.20	--	--	--	--	--	--	--	20.74	<30dBm	Pass

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

Product : ASUS Miracast Dongle
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	7.2		
		Measurement Level (dBm)										
01	2412	14.2	--	--	--	--	--	--	--	22.55	<30dBm	Pass
06	2437	18.85	18.77	18.74	18.69	18.64	18.58	18.51	18.44	25.08	<30dBm	Pass
11	2462	13.25	--	--	--	--	--	--	--	22.65	<30dBm	Pass

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

Product　　　:　ASUS Miracast Dongle
Test Item　　:　Peak Power Output Data
Test Site　　:　No.3 OATS
Test Mode　　:　Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	7.2		
		Measurement Level (dBm)										
149	5745	17.02	--	--	--	--	--	--	--	21.15	<30dBm	Pass
157	5785	17.05	16.87	16.84	16.77	16.71	16.68	16.51	16.44	22.24	<30dBm	Pass
165	5825	17.12	--	--	--	--	--	--	--	22.08	<30dBm	Pass

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

Product : ASUS Miracast Dongle
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band)

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		15	30	45	60	90	120	135	150	15		
		Measurement Level (dBm)										
151	5755	16.23	16.14	16.01	15.88	15.79	15.7	15.61	15.57	21.13	<30dBm	Pass
159	5795	16.37	--	--	--	--	--	--	--	21.75	<30dBm	Pass

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

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	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2013
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2013
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2013
	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
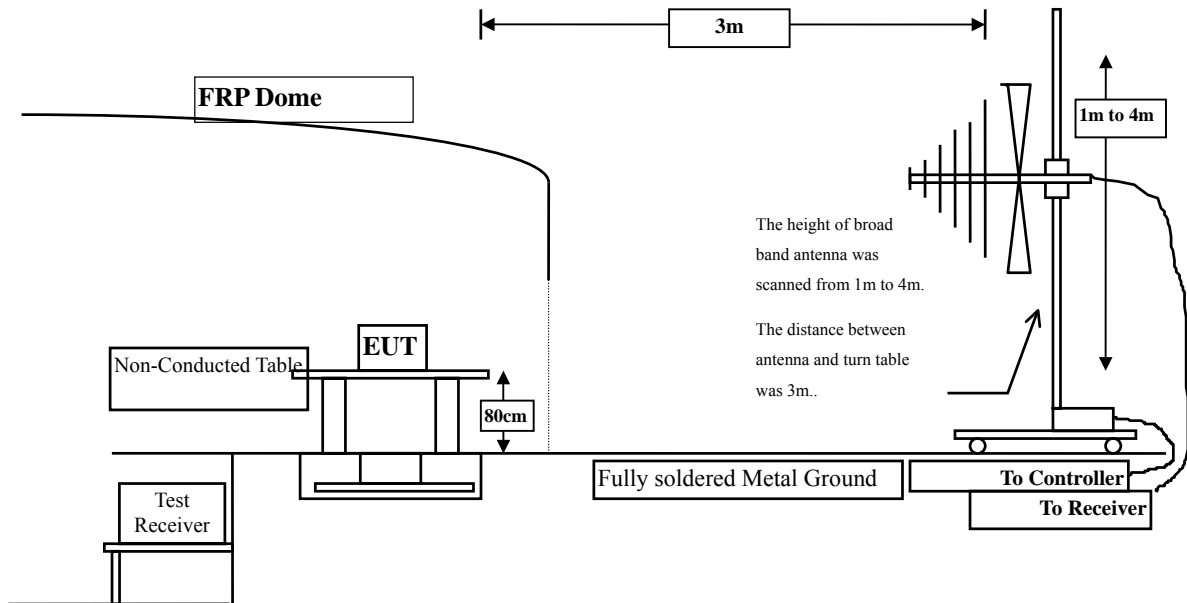
Radiated Emission Above 1GHz
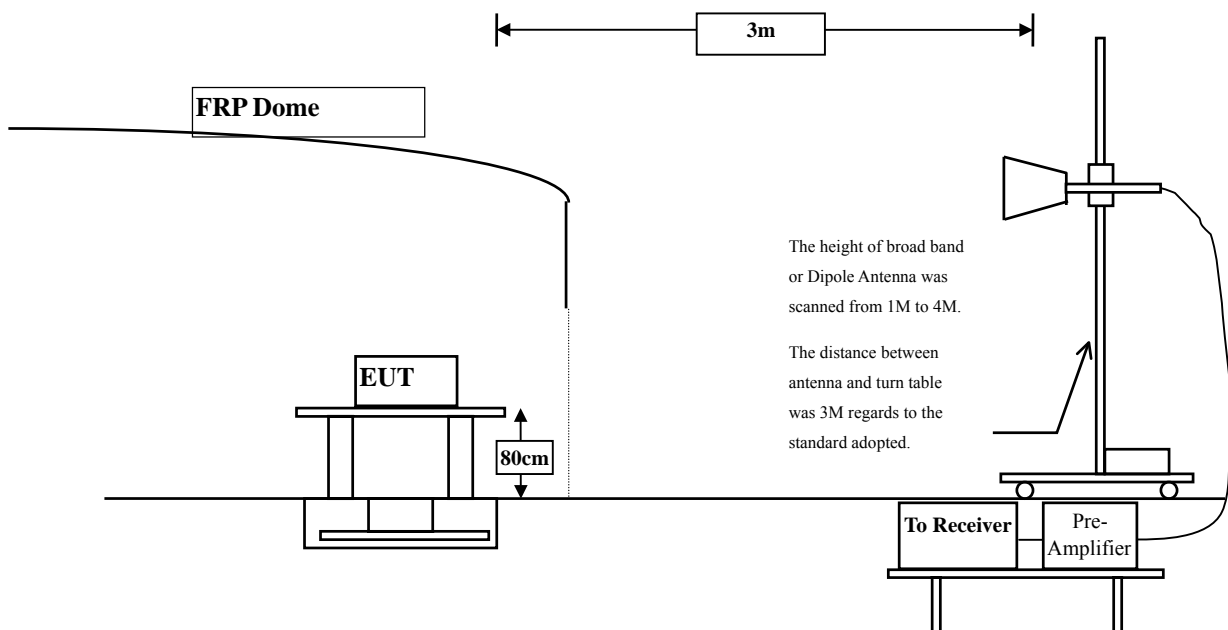
4.3.   Limits

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	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

4.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to DTS test procedure of 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 C63.10:2009 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~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 form 9kHz - 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   :   ASUS Miracast Dongle
Test Item   :   Harmonic Radiated Emission Data
Test Site   :   No.3 OATS
Test Mode   :   Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	6.421	41.820	48.241	-25.759	74.000
7236.000	10.650	45.790	56.440	-17.560	74.000
9648.000	13.807	38.260	52.066	-21.934	74.000
Average					
Detector:					
7236.000	10.650	39.660	50.310	-3.690	54.000
Vertical					
Peak Detector:					
4824.000	6.421	41.260	47.681	-26.319	74.000
7236.000	11.495	44.920	56.415	-17.585	74.000
9648.000	13.807	39.870	53.676	-20.324	74.000
Average					
Detector:					
7236.000	11.495	39.250	50.745	-3.255	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	:	ASUS Miracast Dongle			
Test Item	:	Harmonic Radiated Emission Data			
Test Site	:	No.3 OATS			
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)			

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	40.150	43.187	-30.813	74.000
7311.000	11.795	45.720	57.514	-16.486	74.000
9748.000	12.635	38.260	50.895	-23.105	74.000
Average Detector:					
7311.000	11.795	39.180	50.974	-3.026	54.000
Vertical					
Peak Detector:					
4874.000	5.812	41.230	47.041	-26.959	74.000
7311.000	12.630	45.290	57.919	-16.081	74.000
9748.000	13.126	40.260	53.386	-20.614	74.000
Average Detector:					
7311.000	12.630	38.300	50.929	-3.071	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.858	40.050	42.907	-31.093	74.000
7386.000	13.254	43.260	56.514	-17.486	74.000
9848.000	13.367	40.230	53.597	-20.403	74.000
Average Detector:					
7386.000	12.127	37.140	49.268	-4.732	54.000
Vertical					
Peak Detector:					
4924.000	5.521	42.230	47.750	-26.250	74.000
7386.000	12.127	45.290	57.418	-16.582	74.000
9848.000	12.852	40.870	53.723	-20.277	74.000
Average Detector:					
7386.000	13.254	37.390	50.644	-3.356	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.261	42.680	45.941	-28.059	74.000
7236.000	10.650	46.470	57.120	-16.880	74.000
9648.000	13.337	38.150	51.486	-22.514	74.000
Average					
Detector:					
7236.000	10.650	32.140	42.790	-11.210	54.000
Vertical					
Peak Detector:					
4824.000	6.421	40.230	46.651	-27.349	74.000
7236.000	11.495	48.680	60.175	-13.825	74.000
9648.000	13.807	38.560	52.366	-21.634	74.000
Average					
Detector:					
7236.000	11.495	34.010	45.505	-8.495	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	:	ASUS Miracast Dongle			
Test Item	:	Harmonic Radiated Emission Data			
Test Site	:	No.3 OATS			
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)			

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	40.230	43.267	-30.733	74.000
7311.000	11.795	50.290	62.084	-11.916	74.000
9748.000	12.635	38.290	50.925	-23.075	74.000
Average					
Detector:					
7311.000	11.795	35.450	47.244	-6.756	54.000
Vertical					
Peak Detector:					
4874.000	5.812	38.150	43.961	-30.039	74.000
7311.000	12.630	48.410	61.039	-12.961	74.000
9748.000	13.126	39.260	52.386	-21.614	74.000
Average					
Detector:					
7311.000	12.630	35.120	47.749	-6.251	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.858	39.150	42.007	-31.993	74.000
7386.000	12.127	46.210	58.338	-15.662	74.000
9848.000	12.852	38.230	51.083	-22.917	74.000
Average Detector:					
7386.000	12.127	31.150	43.278	-10.722	54.000
Vertical					
Peak Detector:					
4924.000	5.521	39.150	44.670	-29.330	74.000
7386.000	13.254	46.730	59.984	-14.016	74.000
9848.000	13.367	38.560	51.927	-22.073	74.000
Average Detector:					
7386.000	13.254	32.150	45.404	-8.596	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit - 802.11a 6Mbps (5745 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11490.000	17.106	35.940	53.047	-20.953	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11490.000	18.034	35.820	53.855	-20.145	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit - 802.11a 6Mbps (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	35.890	52.699	-21.301	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11570.000	17.698	35.550	53.248	-20.752	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit - 802.11a 6Mbps (5825 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11650.000	16.158	34.780	50.938	-23.062	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11650.000	17.274	36.490	53.765	-20.235	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	:	ASUS Miracast Dongle			
Test Item	:	Harmonic Radiated Emission Data			
Test Site	:	No.3 OATS			
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2412MHz)			

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.261	41.260	44.521	-29.479	74.000
7236.000	10.650	46.170	56.820	-17.180	74.000
9648.000	13.337	38.590	51.926	-22.074	74.000
Average					
Detector:					
7236.000	10.650	32.290	42.940	-11.060	54.000
Vertical					
Peak Detector:					
4824.000	6.421	39.260	45.681	-28.319	74.000
7236.000	11.495	45.890	57.385	-16.615	74.000
9648.000	13.807	39.260	53.066	-20.934	74.000
Average					
Detector:					
7236.000	11.495	32.560	44.055	-9.945	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	40.290	43.327	-30.673	74.000
7311.000	11.795	50.560	62.354	-11.646	74.000
9748.000	12.635	38.520	51.155	-22.845	74.000
Average Detector:					
7311.000	11.795	34.930	46.724	-7.276	54.000
Vertical					
Peak Detector:					
4874.000	5.812	39.500	45.311	-28.689	74.000
7311.000	12.630	48.260	60.889	-13.111	74.000
9748.000	13.126	38.510	51.636	-22.364	74.000
Average Detector:					
7311.000	12.630	33.590	46.219	-7.781	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2462 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.858	38.260	41.117	-32.883	74.000
7386.000	12.127	44.510	56.638	-17.362	74.000
9848.000	12.852	38.230	51.083	-22.917	74.000
Average					
Detector:					
7386.000	12.127	30.890	43.018	-10.982	54.000
Vertical					
Peak Detector:					
4924.000	5.521	38.260	43.780	-30.220	74.000
7386.000	13.254	45.980	59.234	-14.766	74.000
9848.000	13.367	38.230	51.597	-22.403	74.000
Average					
Detector:					
7386.000	13.254	30.530	43.784	-10.216	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band) (5745MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11490.000	17.106	36.750	53.857	-20.143	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11490.000	18.034	35.850	53.885	-20.115	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	:	ASUS Miracast Dongle			
Test Item	:	Harmonic Radiated Emission Data			
Test Site	:	No.3 OATS			
Test Mode	:	Mode 5: Transmit - 802.11n-20BW_7.2Mbps(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	35.750	52.559	-21.441	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11570.000	17.698	38.800	56.498	-17.502	74.000
Average Detector:					
11570.000	17.698	26.240	43.938	-10.062	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band) (5825 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11650.000	16.158	37.830	53.988	-20.012	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
11650.000	17.274	39.710	56.985	-17.015	74.000
Average					
Detector:					
11650.000	17.274	27.880	45.155	-8.845	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band) (5755MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11510.000	17.124	35.170	52.294	-21.706	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11510.000	18.081	35.810	53.891	-20.109	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	:	ASUS Miracast Dongle
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band) (5795 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
11590.000	16.701	35.650	52.350	-21.650	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
11590.000	17.567	35.260	52.826	-21.174	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	:	ASUS Miracast Dongle
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 7: Adapter mode

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
148.500	-10.250	34.367	24.117	-19.383	43.500
297.000	-3.641	33.715	30.073	-15.927	46.000
445.500	-3.058	29.349	26.291	-19.709	46.000
594.000	3.882	23.182	27.064	-18.936	46.000
742.500	3.340	28.096	31.436	-14.564	46.000
891.000	5.977	24.713	30.690	-15.310	46.000
Vertical					
136.700	-5.143	29.513	24.370	-19.130	43.500
297.000	-7.263	27.836	20.573	-25.427	46.000
445.000	-8.012	37.503	29.491	-16.509	46.000
594.000	-4.068	32.232	28.164	-17.836	46.000
742.500	0.470	30.566	31.036	-14.964	46.000
891.000	2.285	25.305	27.590	-18.410	46.000

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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	ASUS Miracast Dongle			
Test Item	:	General Radiated Emission Data			
Test Site	:	No.3 OATS			
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)			

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
95.960	-7.820	44.067	36.247	-7.253	43.500
243.400	-6.441	39.380	32.939	-13.061	46.000
499.480	0.048	31.772	31.820	-14.180	46.000
625.580	1.770	30.479	32.249	-13.751	46.000
709.000	3.458	31.759	35.217	-10.783	46.000
798.240	5.148	29.333	34.481	-11.519	46.000
Vertical					
202.660	-7.739	40.774	33.035	-10.465	43.500
371.440	-2.737	27.003	24.266	-21.734	46.000
499.480	-0.852	37.291	36.439	-9.561	46.000
800.180	2.801	30.782	33.583	-12.417	46.000
924.340	5.550	25.853	31.403	-14.597	46.000
968.960	8.191	25.696	33.887	-20.113	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

| Product	:	ASUS Miracast Dongle
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
239.520	-6.851	39.867	33.017	-12.983	46.000
361.740	-1.549	34.469	32.920	-13.080	46.000
499.480	0.048	32.485	32.533	-13.467	46.000
567.380	1.664	32.973	34.637	-11.363	46.000
813.760	5.098	27.178	32.276	-13.724	46.000
937.920	6.406	23.870	30.276	-15.724	46.000
Vertical					
181.320	-9.512	40.636	31.124	-12.376	43.500
355.920	-3.488	34.087	30.599	-15.401	46.000
499.480	-0.852	34.702	33.850	-12.150	46.000
567.380	-5.426	32.366	26.940	-19.060	46.000
798.240	2.808	31.314	34.122	-11.878	46.000
968.960	8.191	25.916	34.107	-19.893	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	ASUS Miracast Dongle
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit - 802.11a 6Mbps (5785MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
95.960	-7.820	45.124	37.304	-6.196	43.500
239.520	-6.851	39.639	32.789	-13.211	46.000
377.260	-1.115	29.649	28.534	-17.466	46.000
499.480	0.048	33.488	33.536	-12.464	46.000
693.480	3.568	31.766	35.334	-10.666	46.000
800.180	5.141	27.407	32.548	-13.452	46.000
Vertical					
123.120	-3.921	35.120	31.199	-12.301	43.500
499.480	-0.852	34.671	33.819	-12.181	46.000
567.380	-5.426	31.273	25.847	-20.153	46.000
693.480	2.168	35.220	37.388	-8.612	46.000
798.240	2.808	28.967	31.775	-14.225	46.000
968.960	8.191	24.118	32.309	-21.691	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	ASUS Miracast Dongle
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2437 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
99.840	-7.471	43.421	35.950	-7.550	43.500
361.740	-1.549	33.996	32.447	-13.553	46.000
499.480	0.048	33.438	33.486	-12.514	46.000
625.580	1.770	29.820	31.590	-14.410	46.000
813.760	5.098	26.571	31.669	-14.331	46.000
916.580	6.144	22.406	28.550	-17.450	46.000
Vertical					
123.120	-3.921	37.903	33.982	-9.518	43.500
192.960	-9.878	40.718	30.840	-12.660	43.500
357.860	-3.734	34.377	30.643	-15.357	46.000
499.480	-0.852	37.626	36.774	-9.226	46.000
567.380	-5.426	31.003	25.577	-20.423	46.000
798.240	2.808	29.151	31.959	-14.041	46.000

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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	ASUS Miracast Dongle
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band) (5785 MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
148.340	-10.254	39.543	29.289	-14.211	43.500
297.720	-3.633	34.681	31.049	-14.951	46.000
499.480	0.048	33.602	33.650	-12.350	46.000
693.480	3.568	34.437	38.005	-7.995	46.000
798.240	5.148	27.749	32.897	-13.103	46.000
968.960	6.981	23.849	30.830	-23.170	54.000
Vertical					
179.380	-8.591	39.448	30.857	-12.643	43.500
371.440	-2.737	28.010	25.273	-20.727	46.000
499.480	-0.852	30.226	29.374	-16.626	46.000
693.480	2.168	35.237	37.405	-8.595	46.000
800.180	2.801	30.405	33.206	-12.794	46.000
968.960	8.191	24.808	32.999	-21.001	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	ASUS Miracast Dongle
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band) (5755MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
97.900	-7.650	43.873	36.222	-7.278	43.500
239.520	-6.851	39.154	32.304	-13.696	46.000
499.480	0.048	34.160	34.208	-11.792	46.000
693.480	3.568	30.148	33.716	-12.284	46.000
798.240	5.148	26.100	31.248	-14.752	46.000
937.920	6.406	23.565	29.971	-16.029	46.000
Vertical					
99.840	-0.021	34.110	34.089	-9.411	43.500
206.540	-7.705	39.299	31.594	-11.906	43.500
499.480	-0.852	34.442	33.590	-12.410	46.000
567.380	-5.426	32.557	27.131	-18.869	46.000
798.240	2.808	27.079	29.887	-16.113	46.000
968.960	8.191	23.703	31.894	-22.106	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

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, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

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:
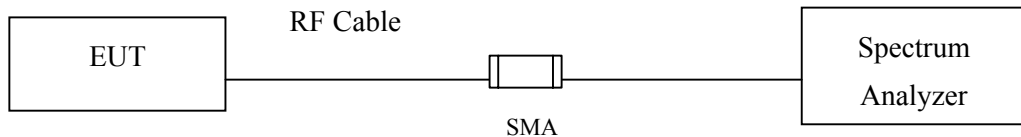
5.3. Limits

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 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 $\pm$ 1.27dB

5.6. Test Result of RF antenna conducted test

Product : ASUS Miracast Dongle
Test Item : RF antenna conducted test
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

Channel 01 (2412MHz) 30MHz-25GHz
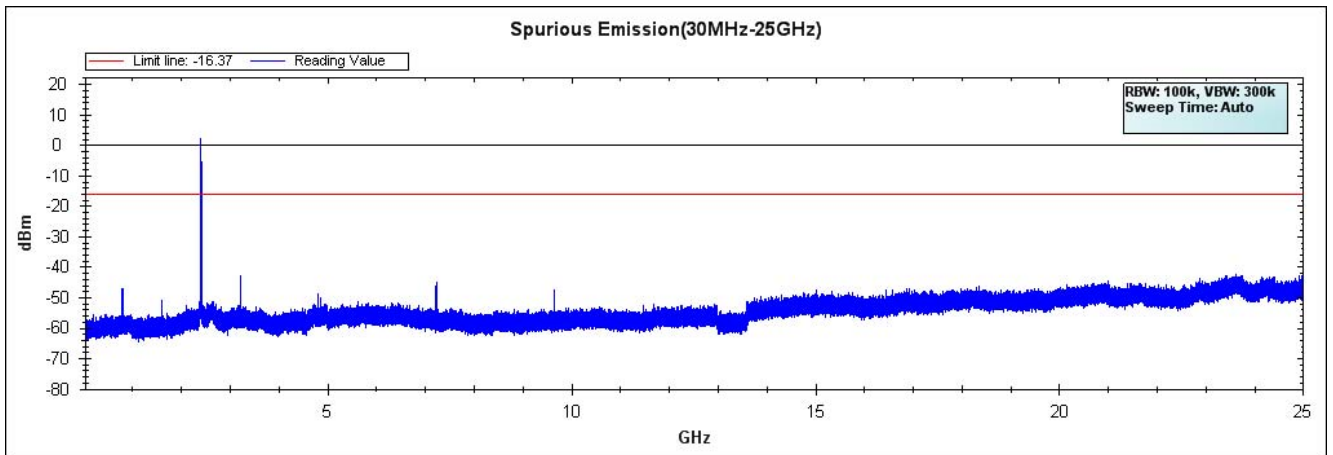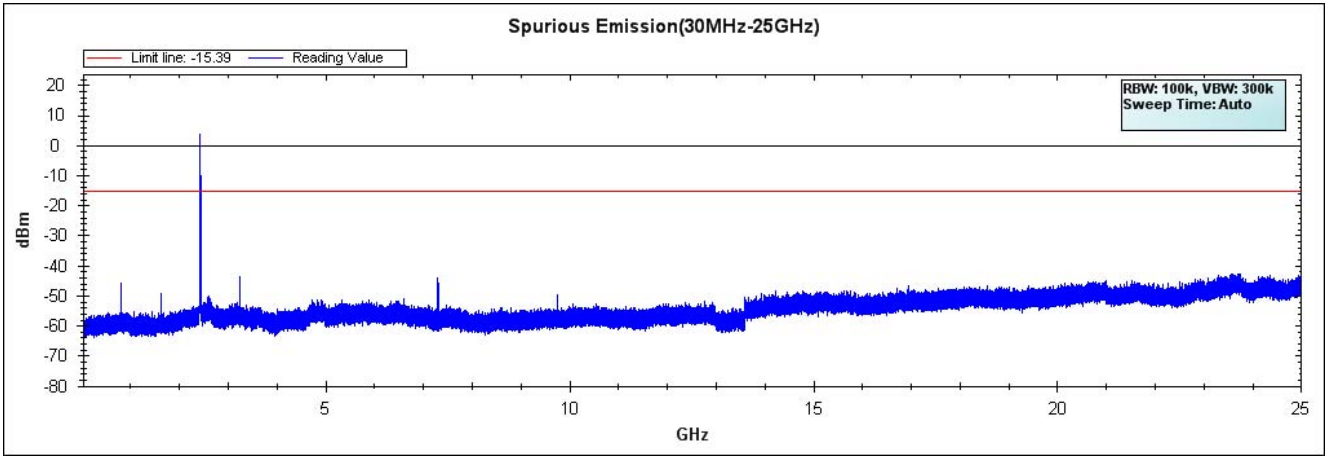
Channel 06 (2437MHz) 30MHz -25GHz

Channel 11 (2462MHz) 30MHz -25GHz
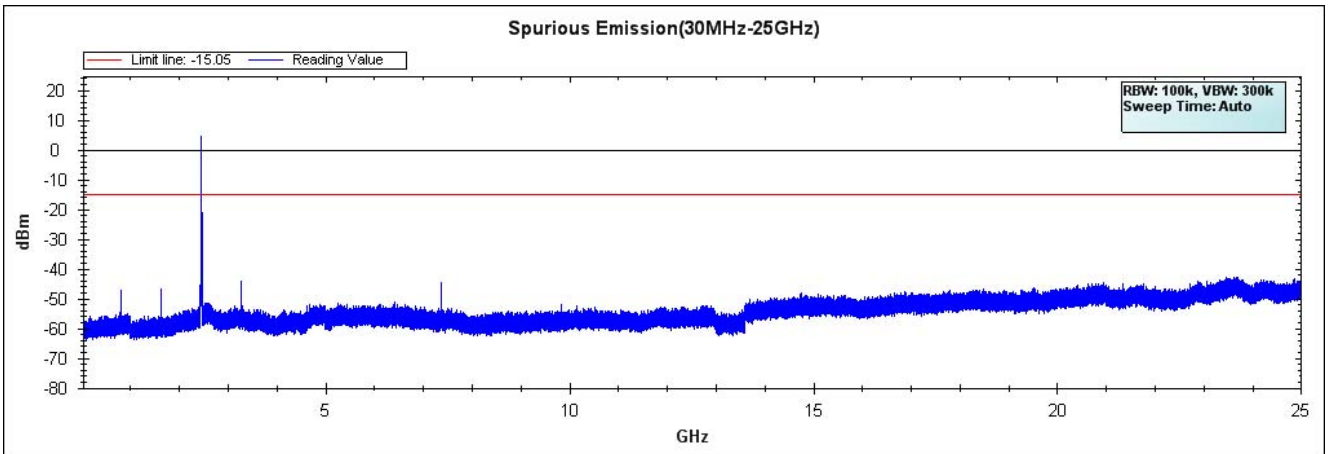
Product   :   ASUS Miracast Dongle
Test Item   :   RF Antenna Conducted Spurious
Test Site   :   No.3 OATS
Test Mode   :   Mode 2: Transmit (802.11g 6Mbps)

Channel 01 (2412MHz) 30MHz -25GHz
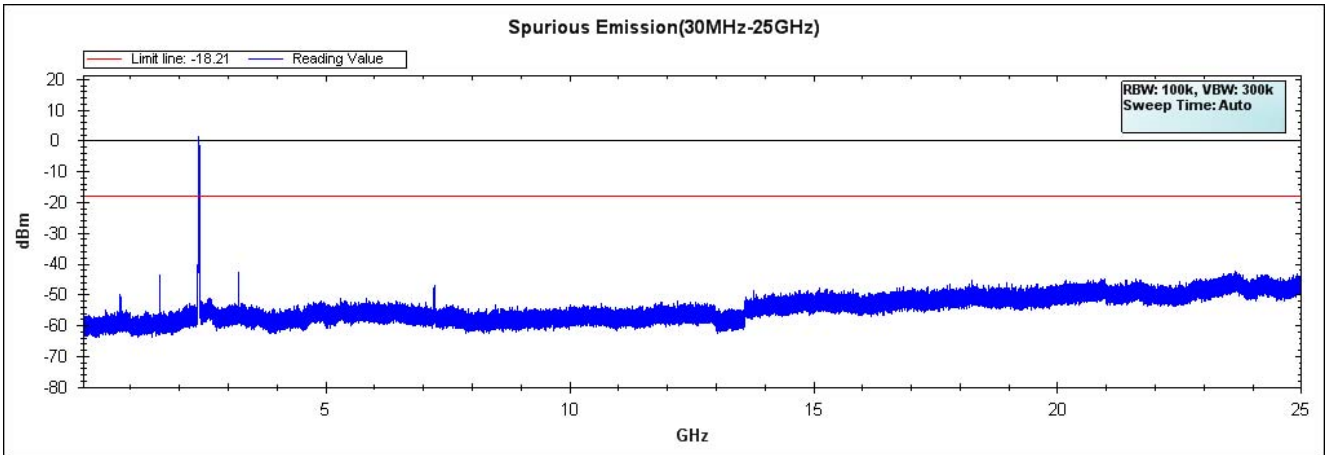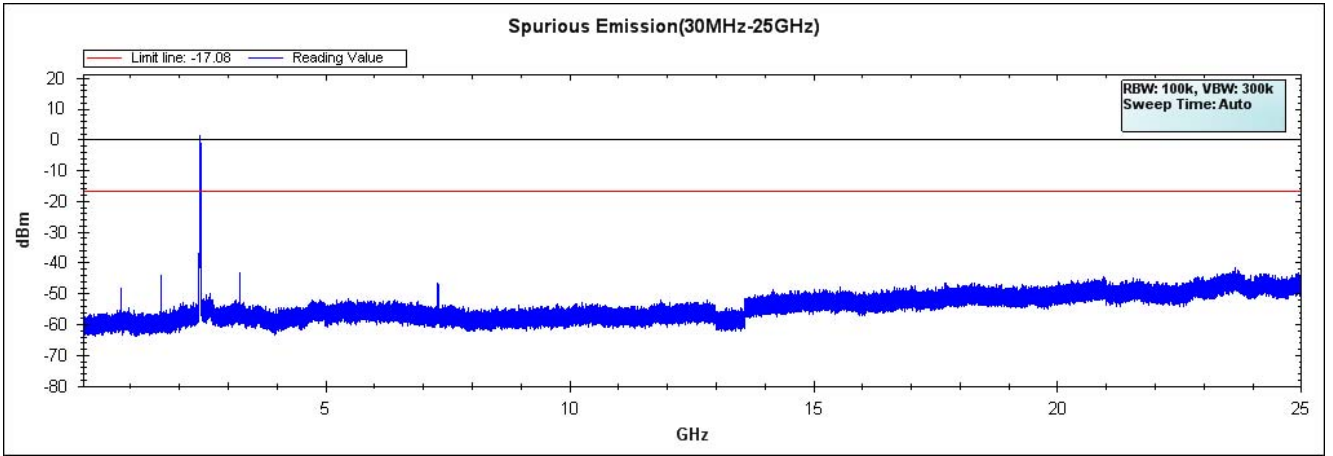
Channel 06 (2437MHz) 30MHz -25GHz

Channel 11 (2462MHz) 30MHz -25GHz
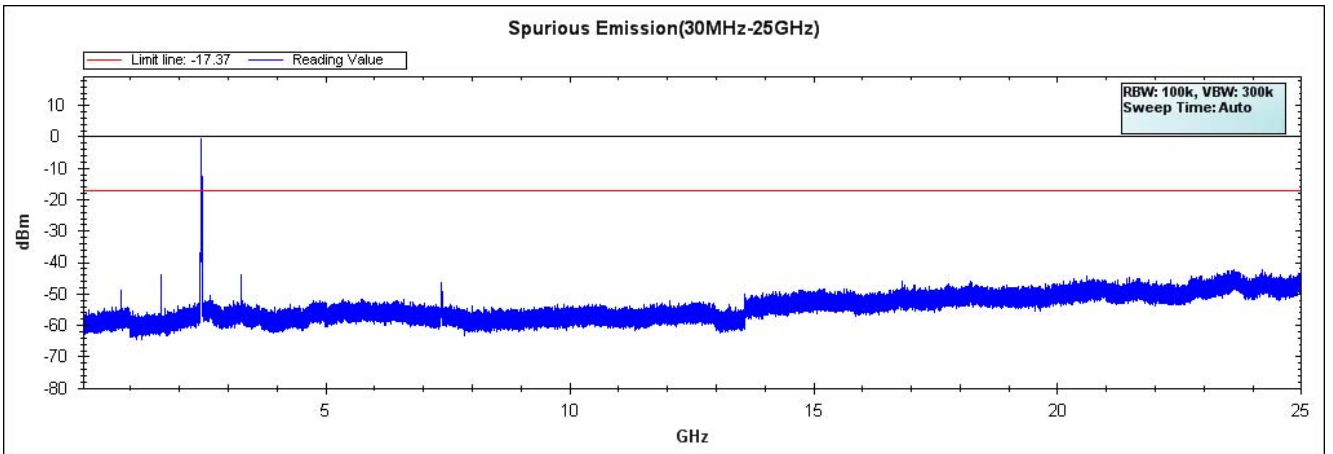
Product : ASUS Miracast Dongle

Test Item : RF Antenna Conducted Spurious

Test Site : No.3 OATS

Test Mode : Mode 3: Transmit - 802.11a 6Mbps

Channel 149 (5745MHz) 30MHz -25GHz
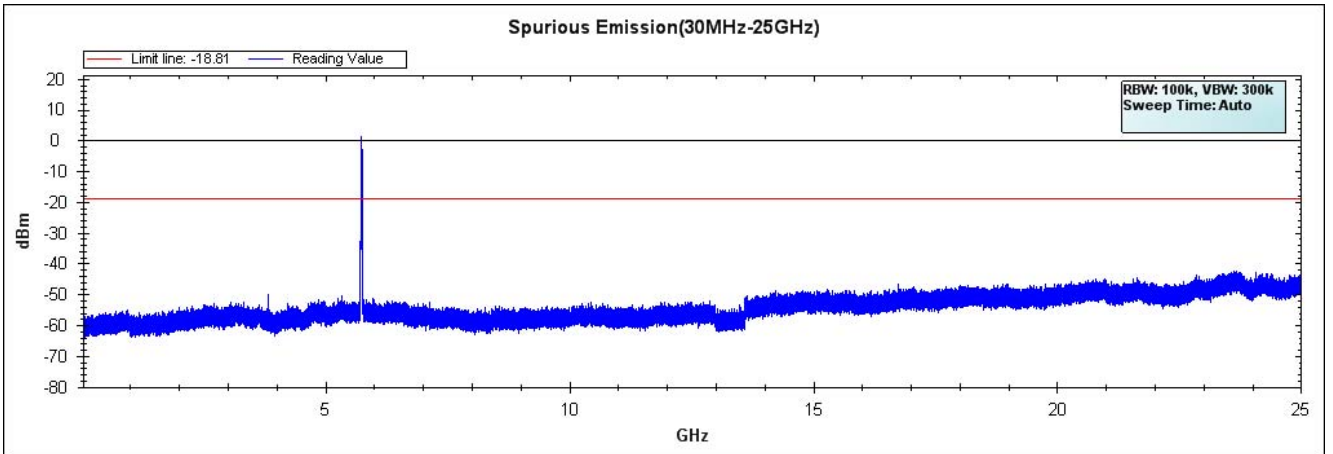
Channel 149 (5745MHz) 25GHz -40GHz
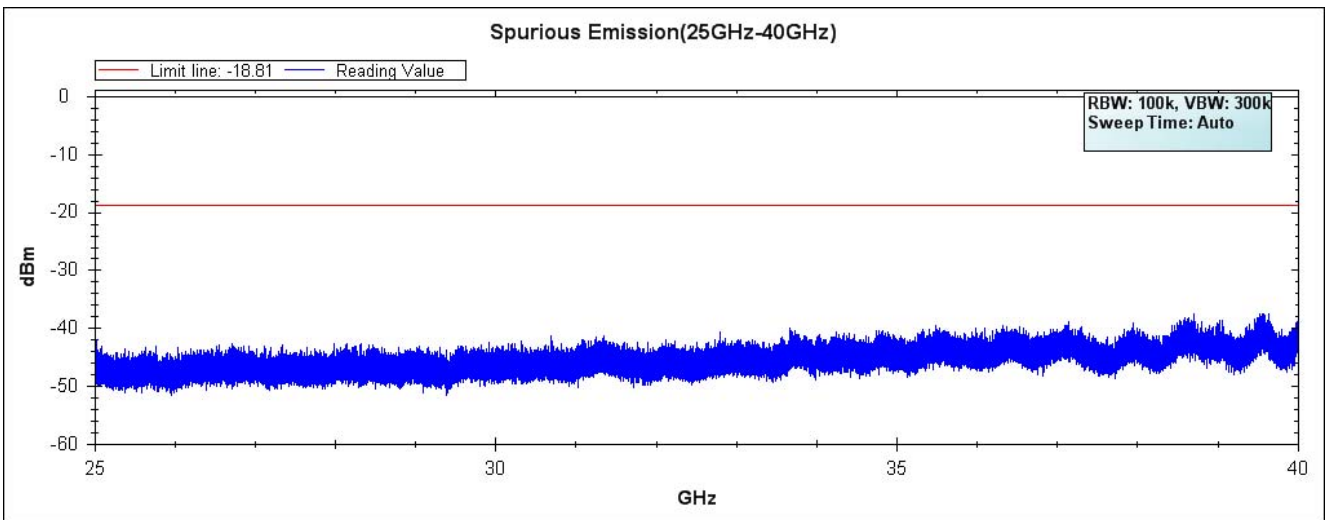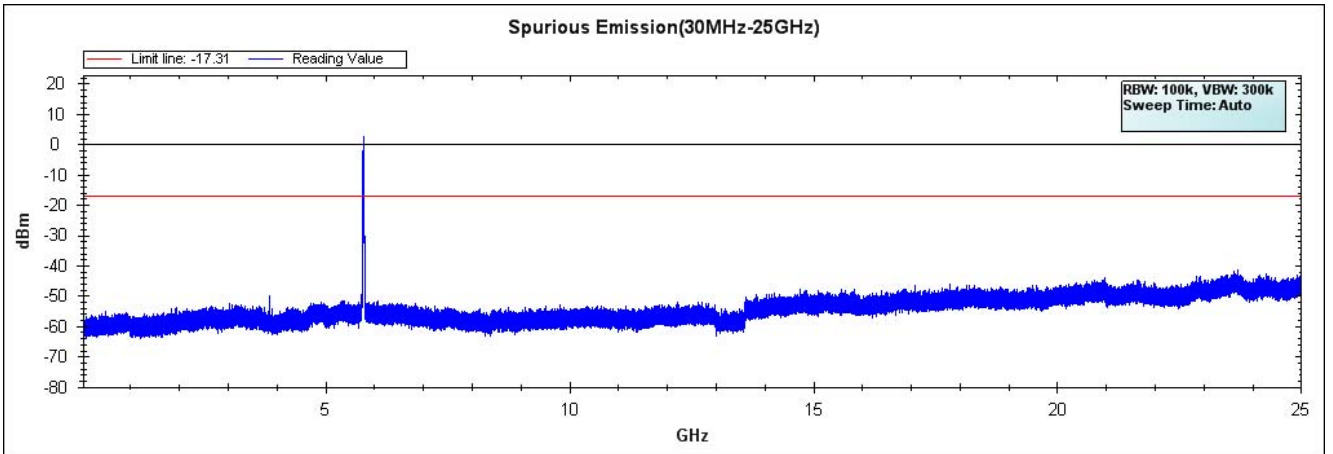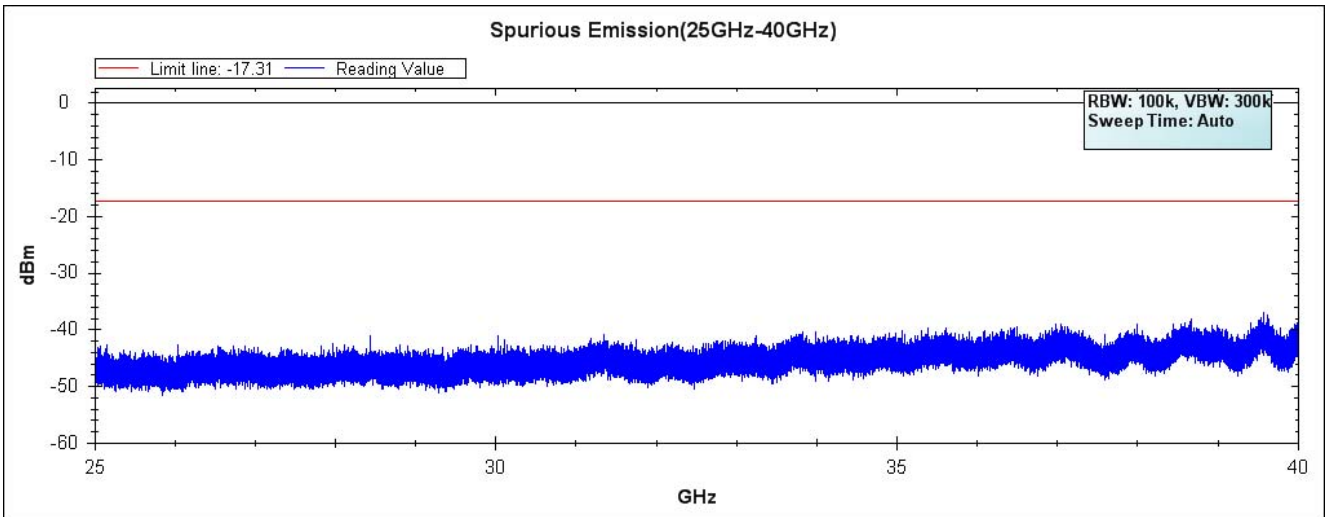
Channel 157 (5785MHz) 30MHz -25GHz

Channel 157 (5785MHz) 25GHz -40GHz

Channel 165 (5825MHz) 30MHz -25GHz
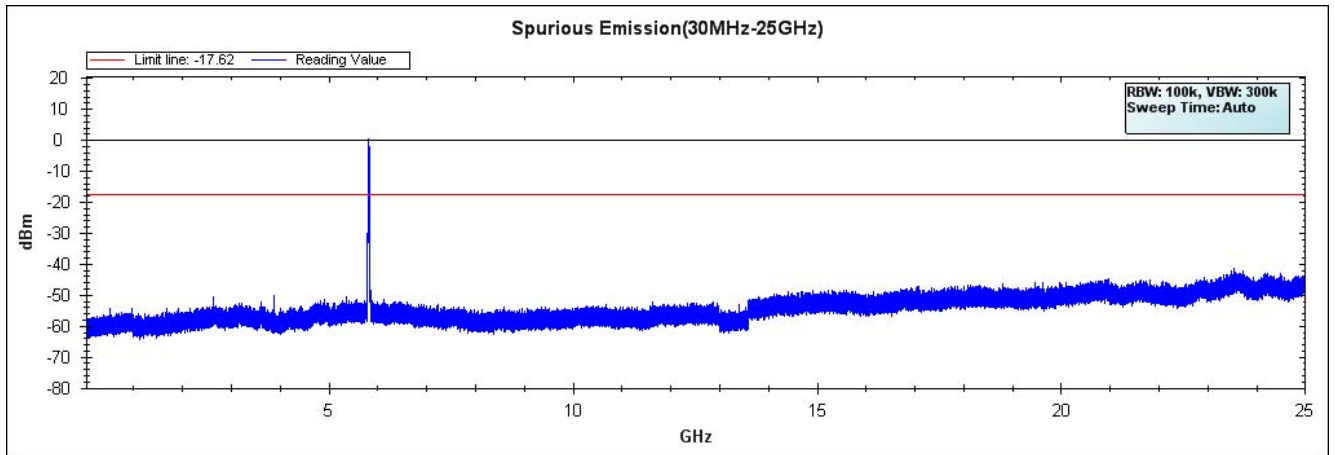
Channel 165 (5825MHz) 25GHz -40GHz
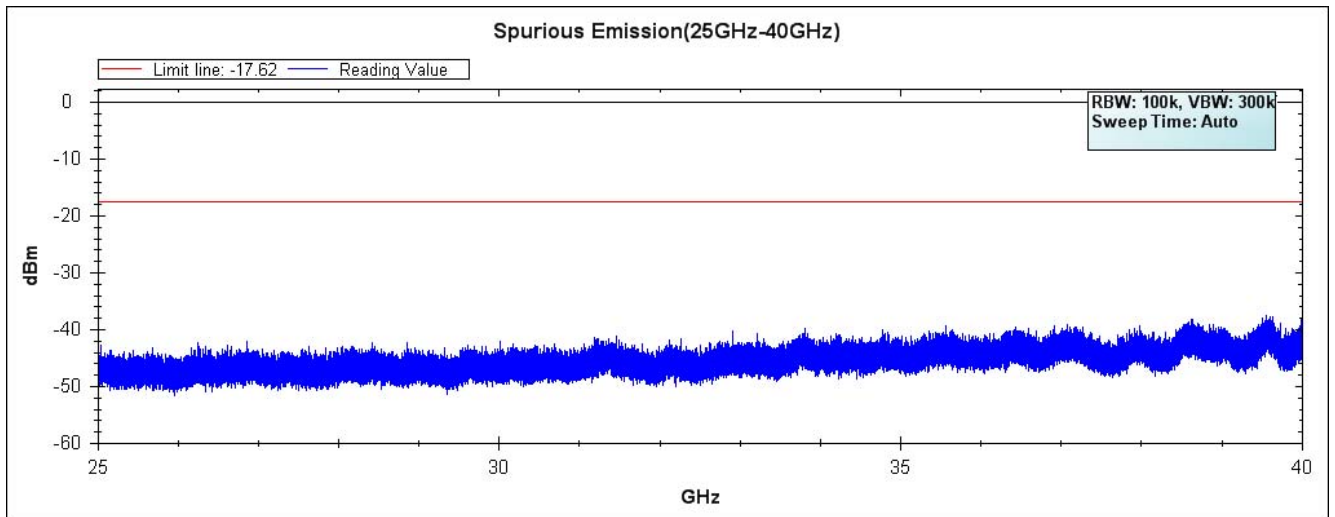
Product   :   ASUS Miracast Dongle
Test Item   :   RF Antenna Conducted Spurious
Test Site   :   No.3 OATS
Test Mode   :   Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band)

Channel 01 (2412MHz) 30MHz -25GHz
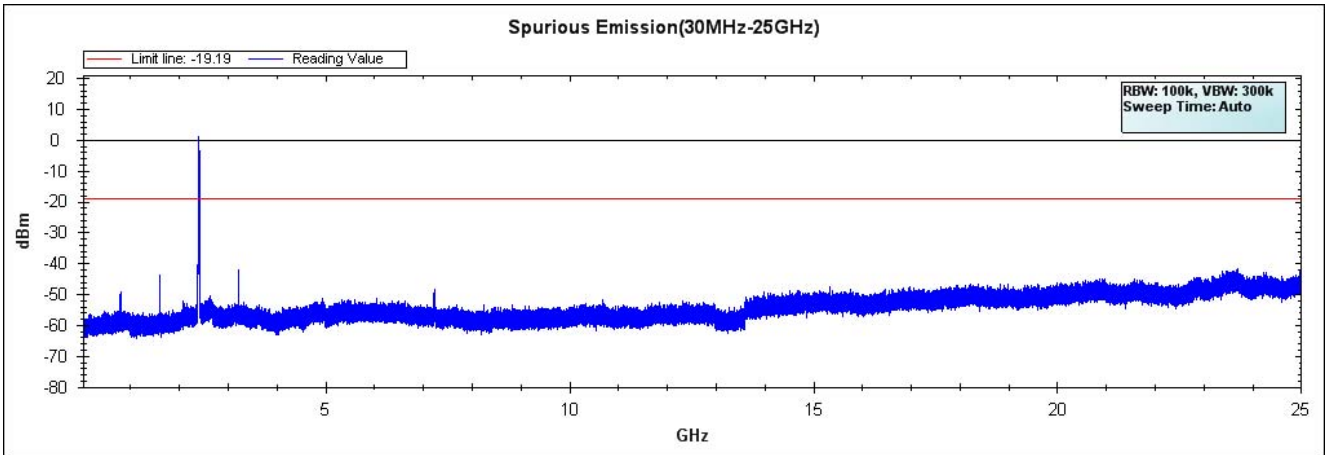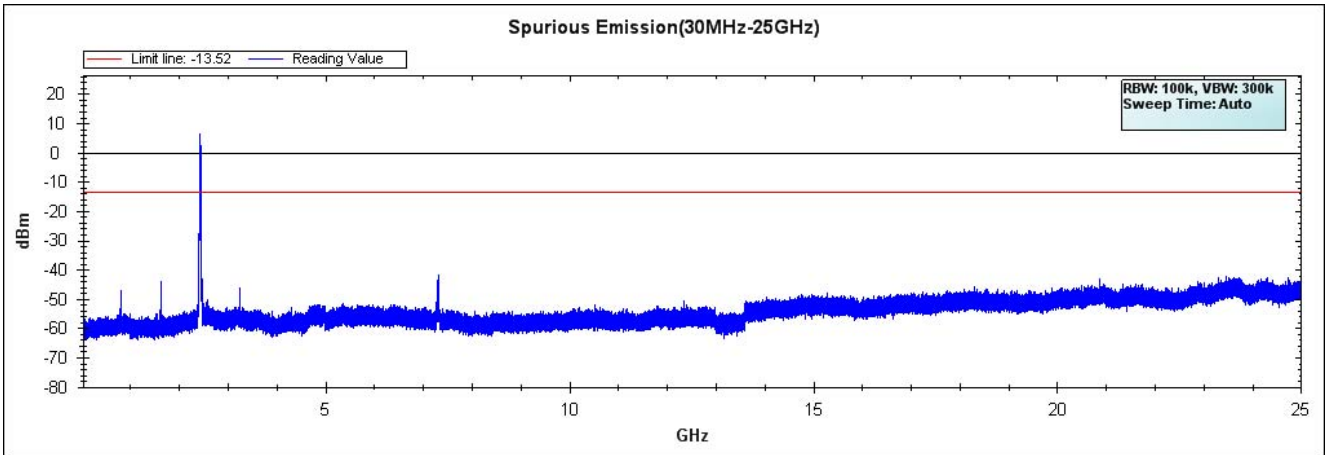
Channel 06 (2437MHz) 30MHz -25GHz

Channel 11 (2462MHz) 30MHz -25GHz
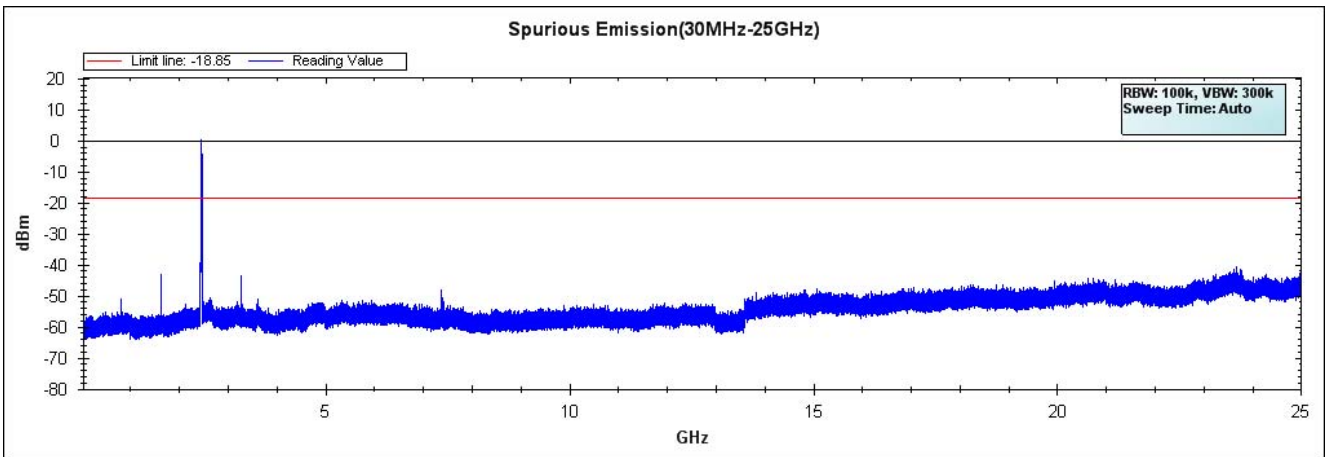
Product	:	ASUS Miracast Dongle
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band)

Channel 49 (5745MHz) 30MHz -25GHz
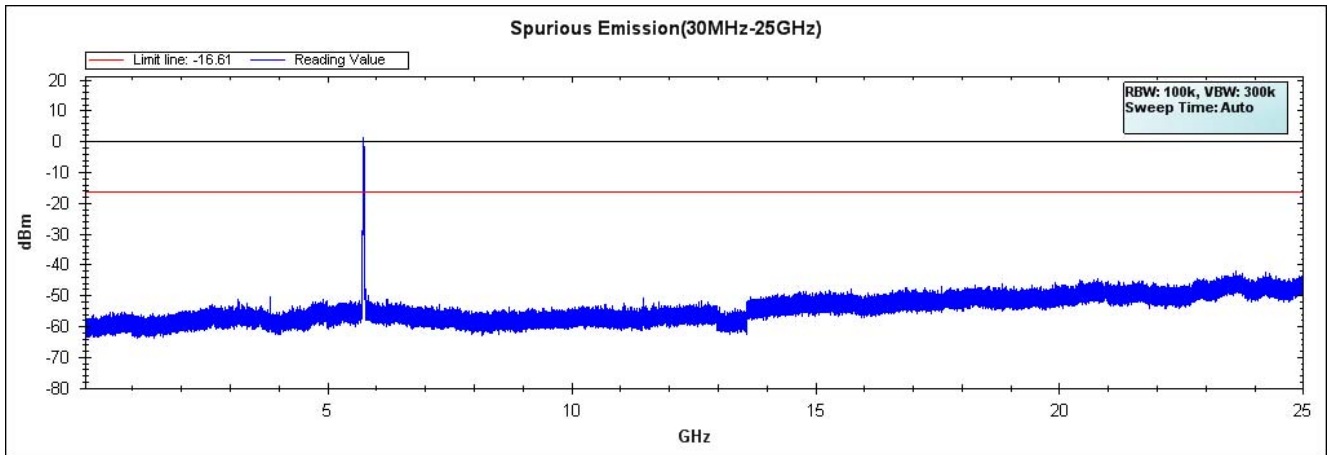
Channel 49 (5745MHz) 25GHz -40GHz
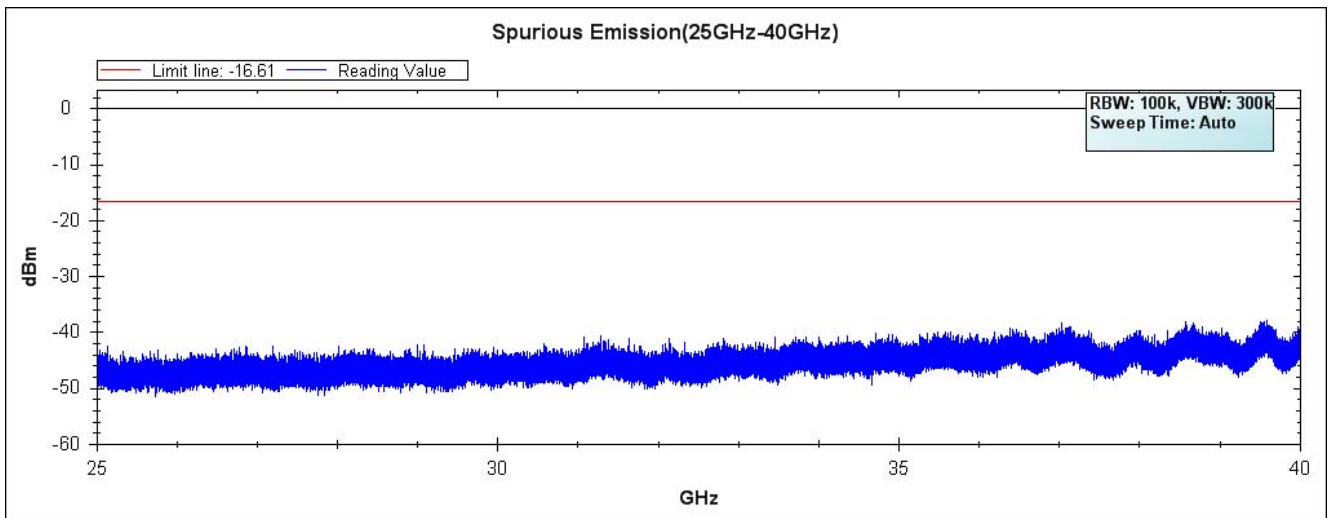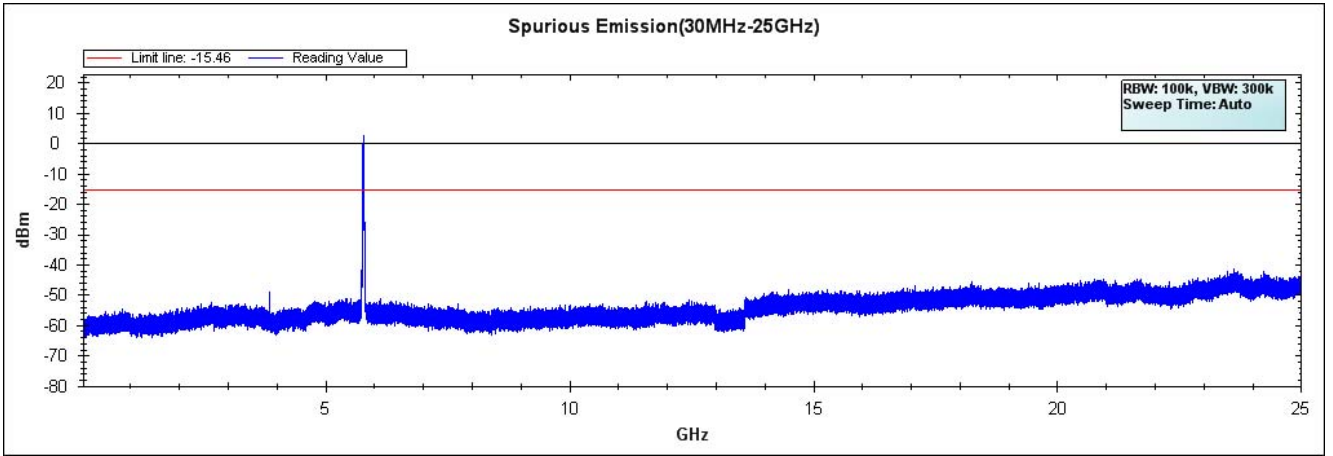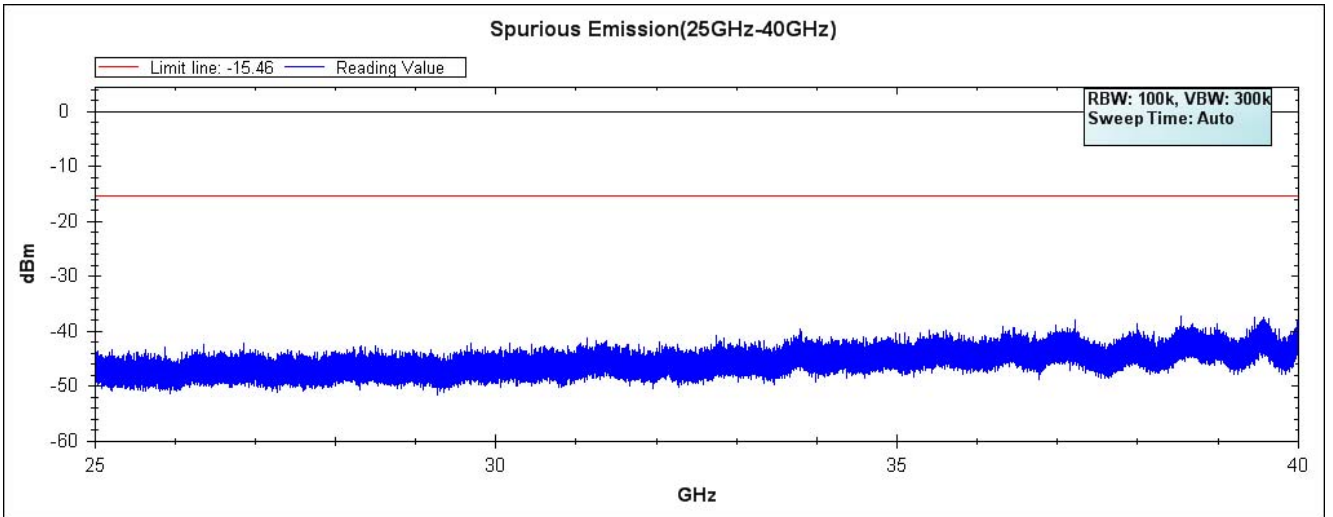
Channel 157 (5785MHz) 30MHz -25GHz

Channel 157 (5785MHz) 25GHz -40GHz

Channel 165 (5825MHz) 30MHz -25GHz
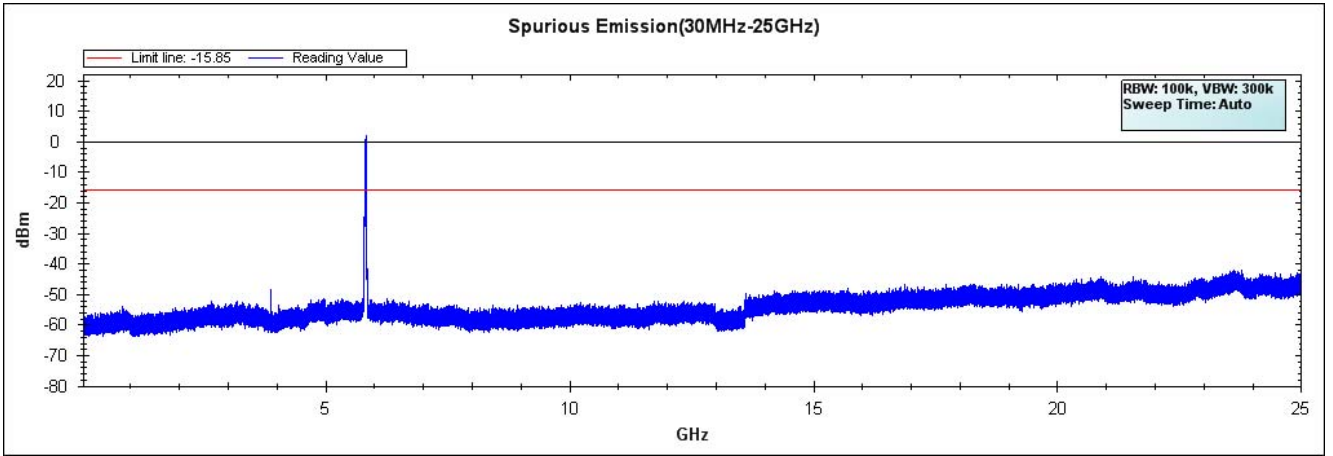
Channel 165 (5825MHz) 25GHz -40GHz
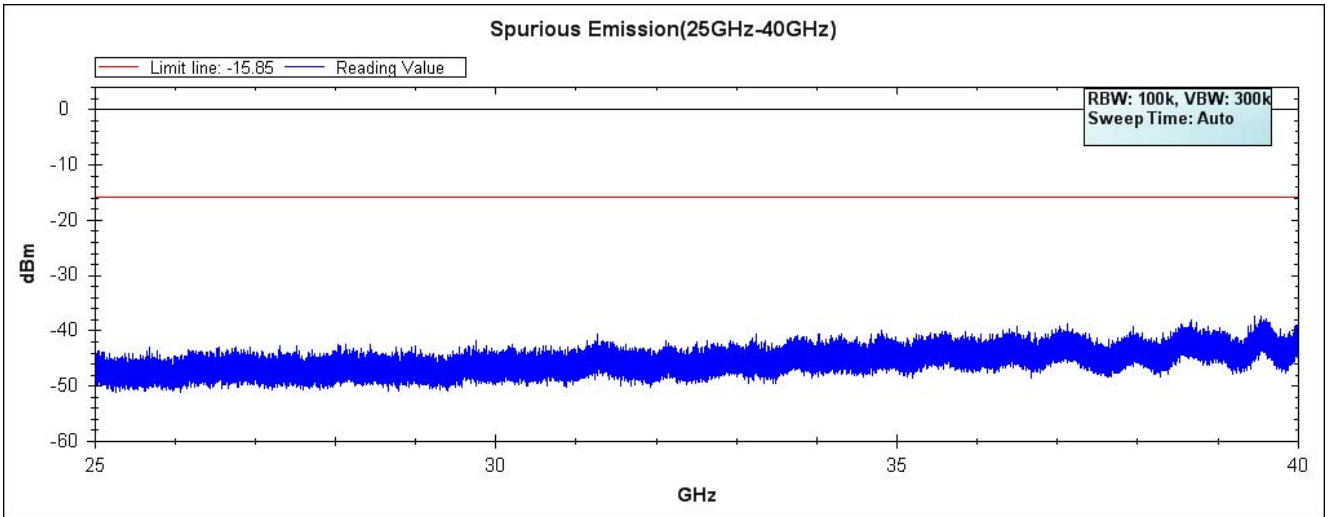
Product	:	ASUS Miracast Dongle
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band)

Channel 151 (5755MHz) 30MHz -25GHz
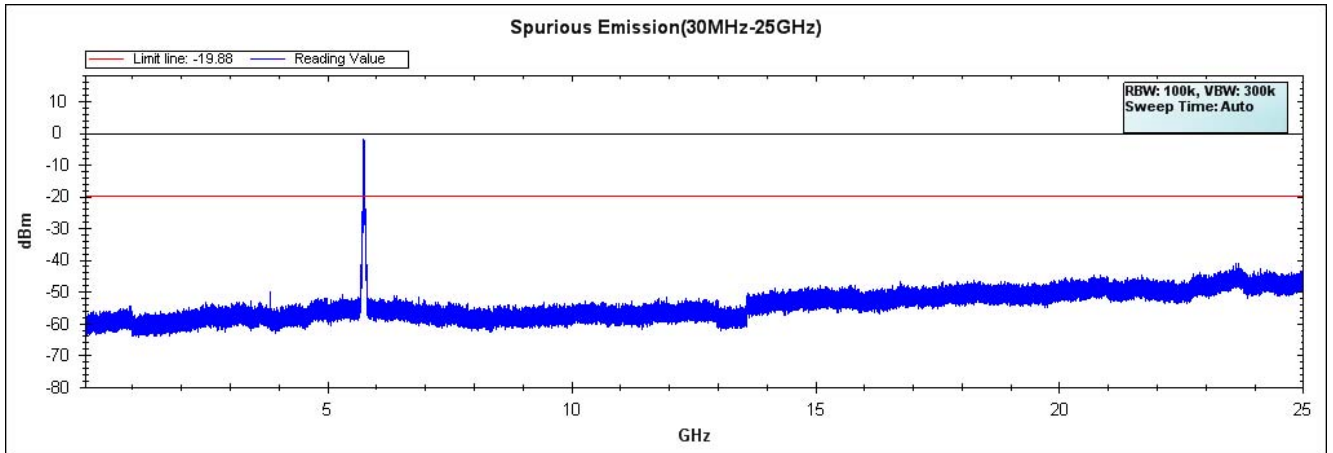
Channel 151 (5755MHz) 25GHz -40GHz
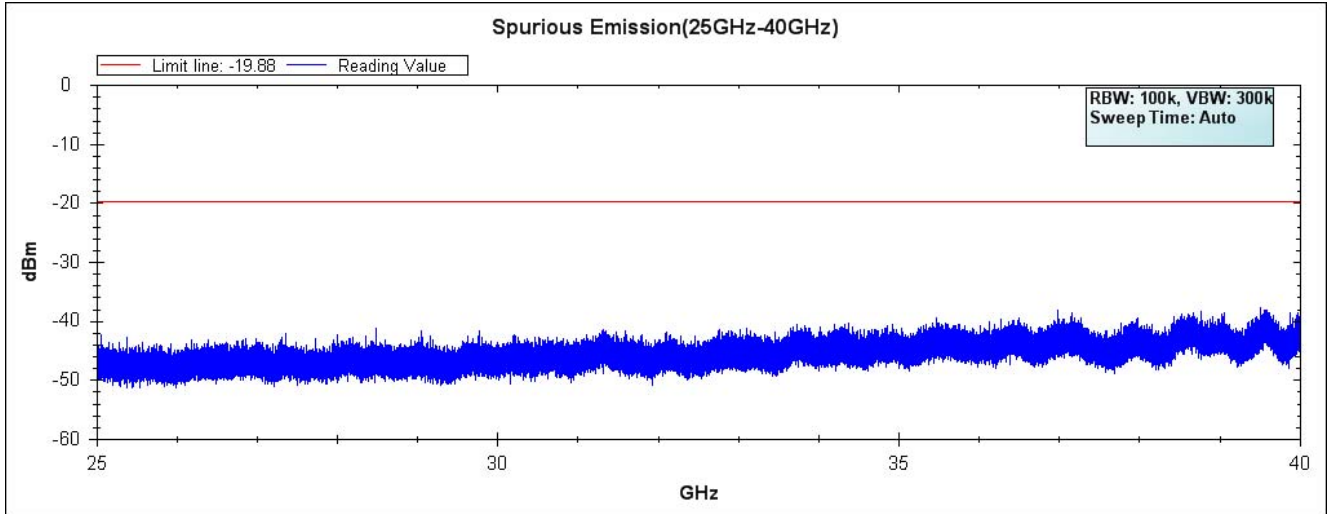
Channel 159 (5795MHz) 30MHz -25GHz
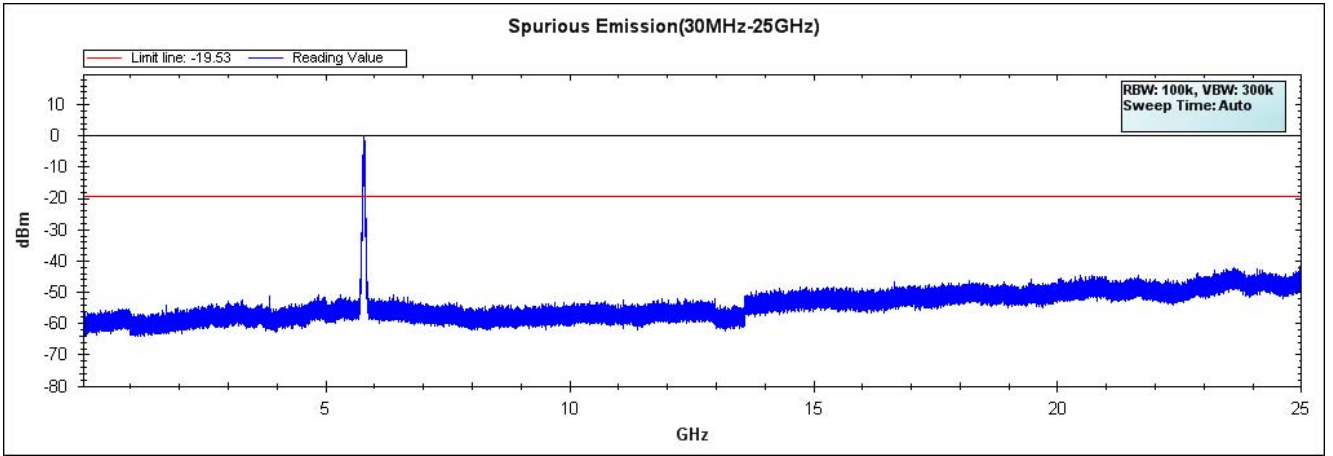
Channel 159 (5795MHz) 25GHz -40GHz
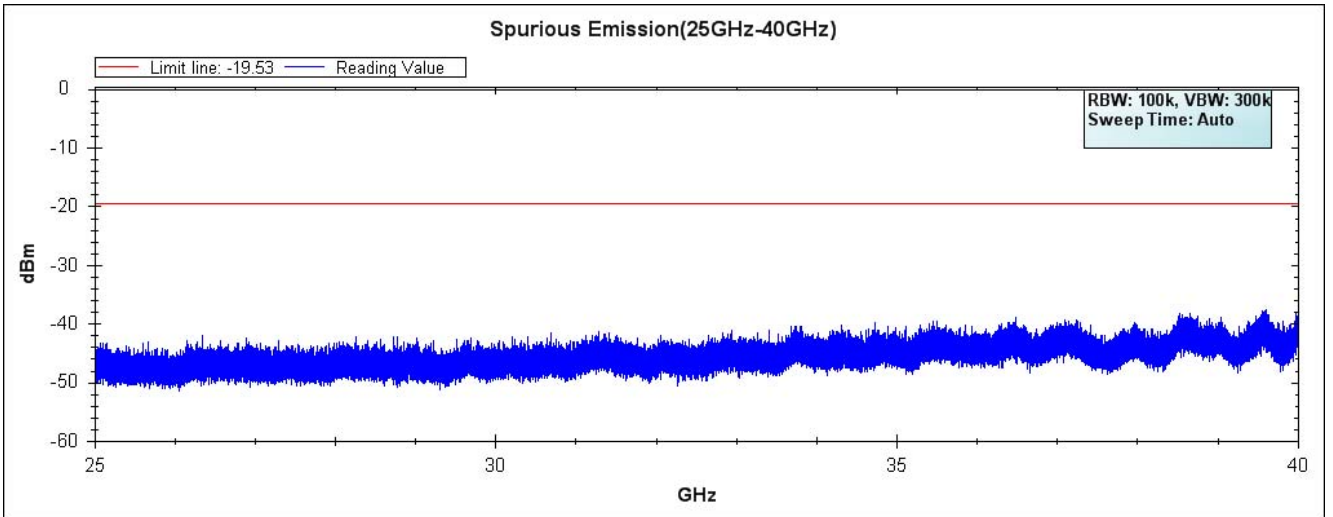
6. Band Edge

6.1. Test Equipment

RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013
	8-WAY Power Divider	JFW	50PD-647 / 526770 0916	Apr., 2013

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.

RF Radiated Measurement:

The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
		Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2013
		Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2013
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All instruments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

6.2. Test Setup

RF Conducted Measurement
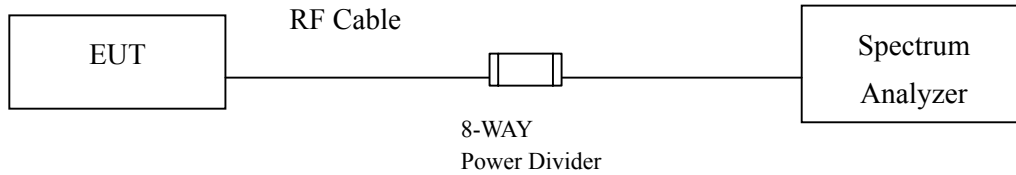
RF Radiated Measurement:
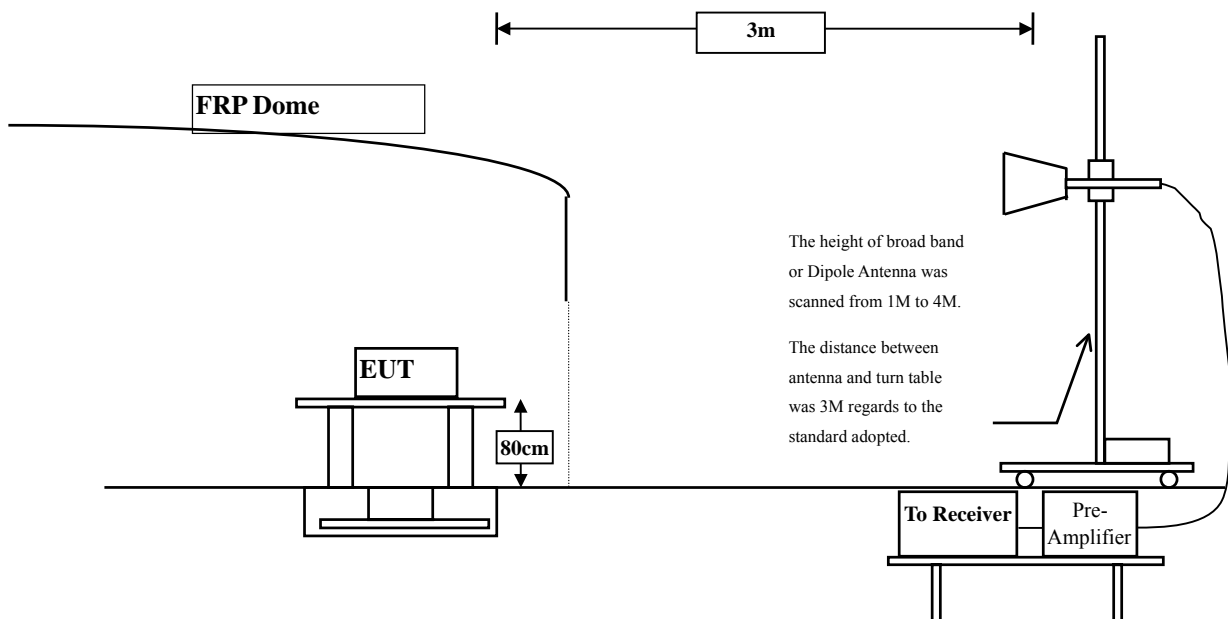
6.3. Limits

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.

6.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to DTS test procedure of 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 from 1 meter to 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 C63.10:2009. on radiated measurement.

6.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

6.6. Test Result of Band Edge

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2388.200	31.502	24.781	56.283	74.00	54.00	Pass
01 (Peak)	2390.000	31.509	24.549	56.058	74.00	54.00	Pass
01 (Peak)	2413.000	31.646	70.416	102.062	--	--	--
01 (Average)	2387.200	31.498	13.286	44.784	74.00	54.00	Pass
01 (Average)	2390.000	31.509	12.599	44.108	74.00	54.00	Pass
01 (Average)	2411.200	31.632	66.483	98.115	--	--	--

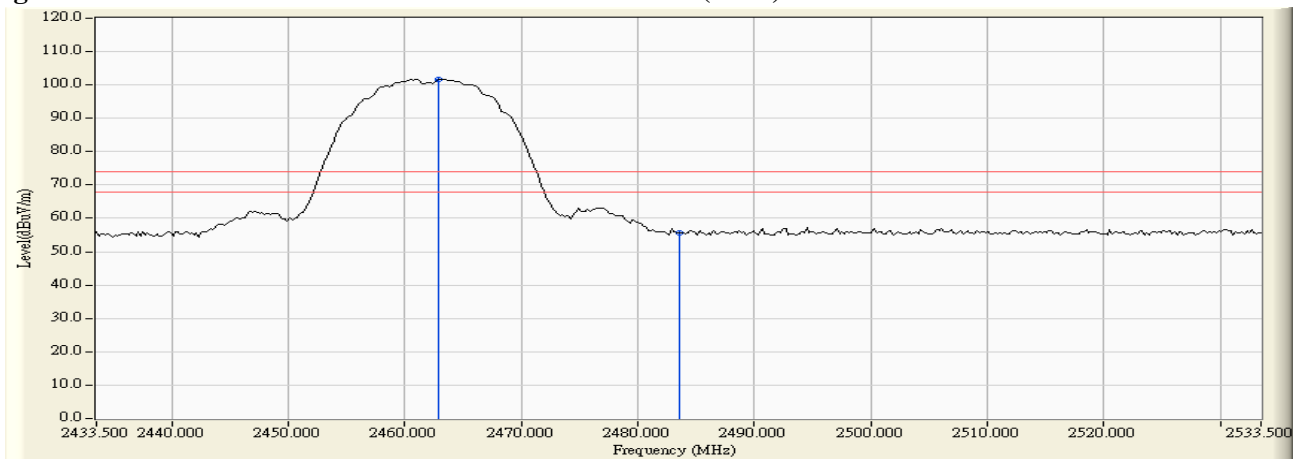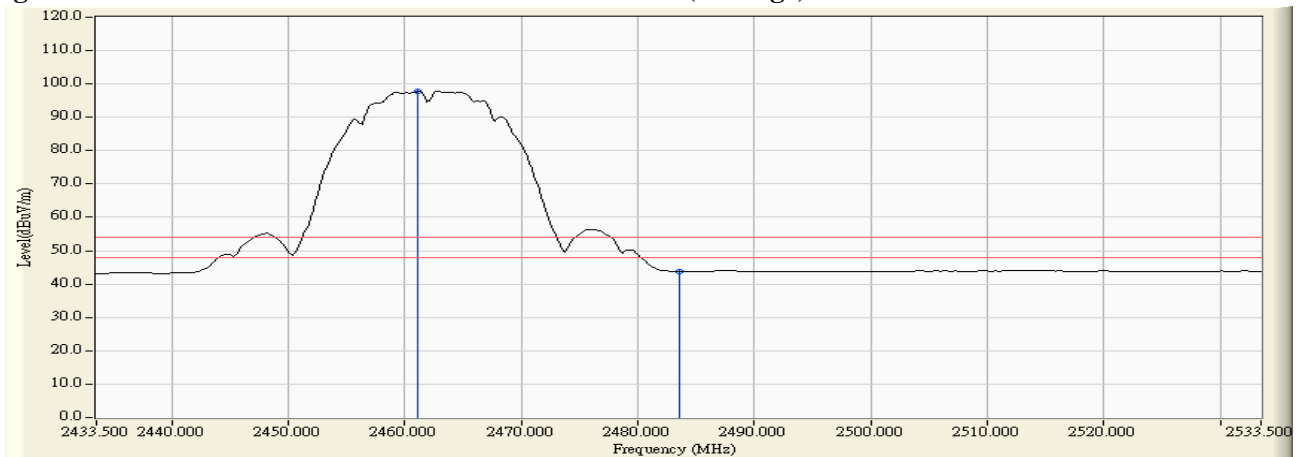**Figure Channel 01:**   **Horizontal (Peak)**

Figure Channel 01:   **Horizontal (Average)**

Note:
1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	ASUS Miracast Dongle
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2387.400	30.927	25.430	56.357	74.00	54.00	Pass
01 (Peak)	2390.000	30.915	23.845	54.760	74.00	54.00	Pass
01 (Peak)	2413.000	30.956	71.610	102.566	--	--	--
01 (Average)	2387.400	30.927	13.923	44.850	74.00	54.00	Pass
01 (Average)	2390.000	30.915	13.067	43.982	74.00	54.00	Pass
01 (Average)	2411.200	30.944	67.801	98.745	--	--	--

Figure Channel 01:   **Vertical (Peak)**
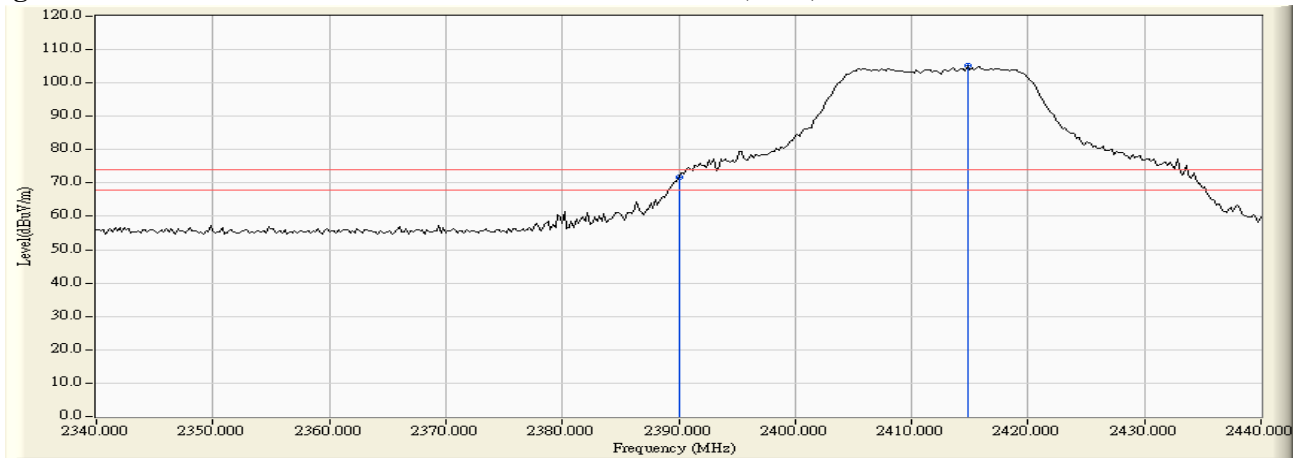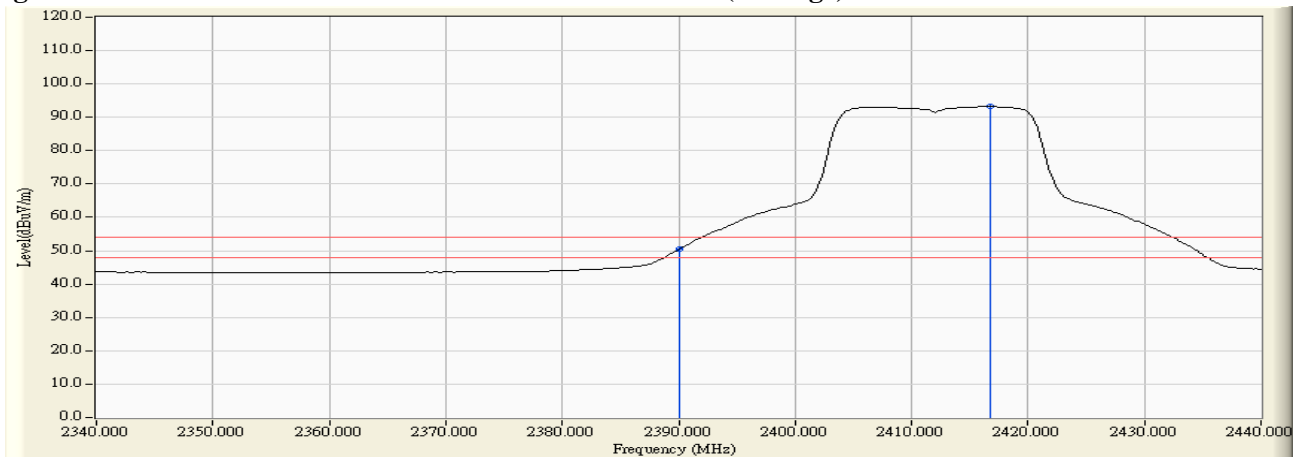

Figure Channel 01:   **Vertical (Average)**

Note:1.   All readings 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.   " * ", means this data is the worst emission level.
5.   Measurement Level = Reading Level + Correct Factor.
6.   The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2460.900	32.011	66.806	98.817	--	--	--
11 (Peak)	2483.500	32.182	24.290	56.472	74.00	54.00	Pass
11 (Average)	2461.300	32.014	63.035	95.049	--	--	--
11 (Average)	2483.500	32.182	12.380	44.562	74.00	54.00	Pass

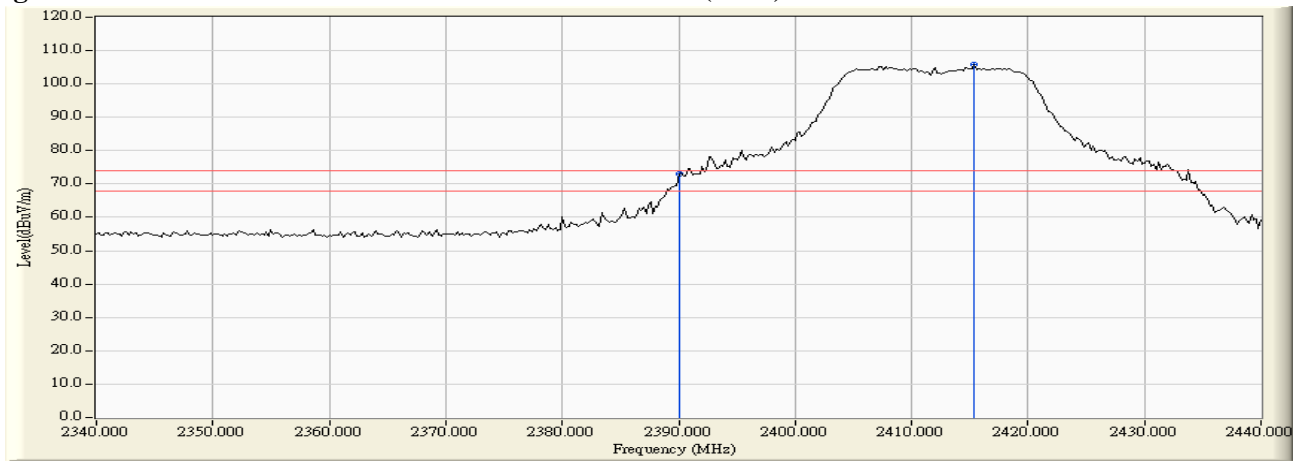**Figure Channel 11:** **Horizontal (Peak)**

Figure Channel 11: **Horizontal (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2462.900	31.296	70.441	101.737	--	--	--
11 (Peak)	2483.500	31.435	24.322	55.757	74.00	54.00	Pass
11 (Average)	2461.100	31.285	66.612	97.896	--	--	--
11 (Average)	2483.500	31.435	12.374	43.809	74.00	54.00	Pass

Figure Channel 11:   **Vertical (Peak)**
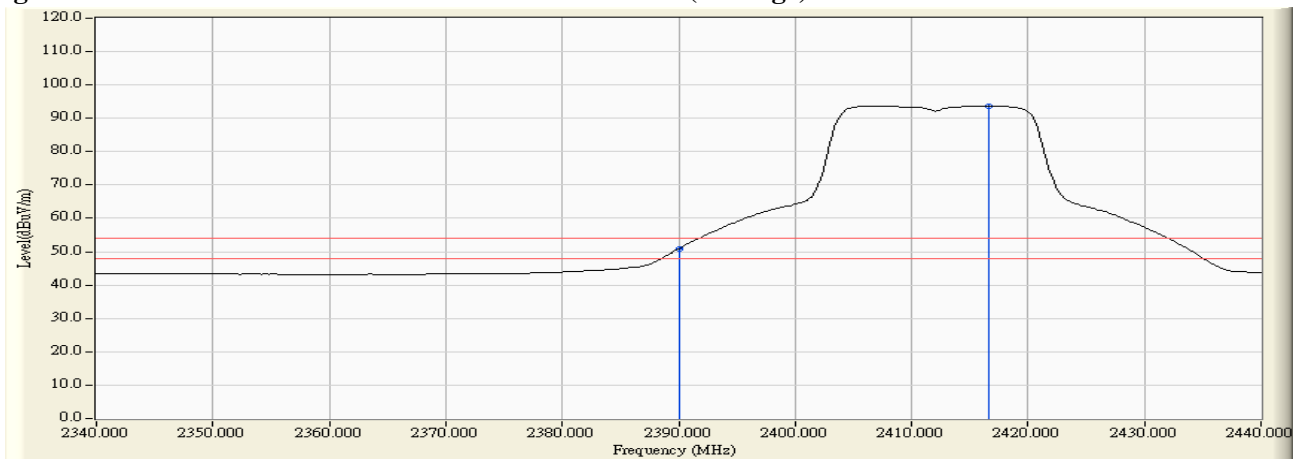

Figure Channel 11:   **Vertical (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2390.000	31.509	40.170	71.679	74.00	54.00	Pass
01 (Peak)	2414.800	31.660	73.563	105.223	--	--	--
01 (Average)	2390.000	31.509	18.878	50.387	74.00	54.00	Pass
01 (Average)	2416.800	31.675	61.536	93.211	--	--	--

Figure Channel 01:   **Horizontal (Peak)**
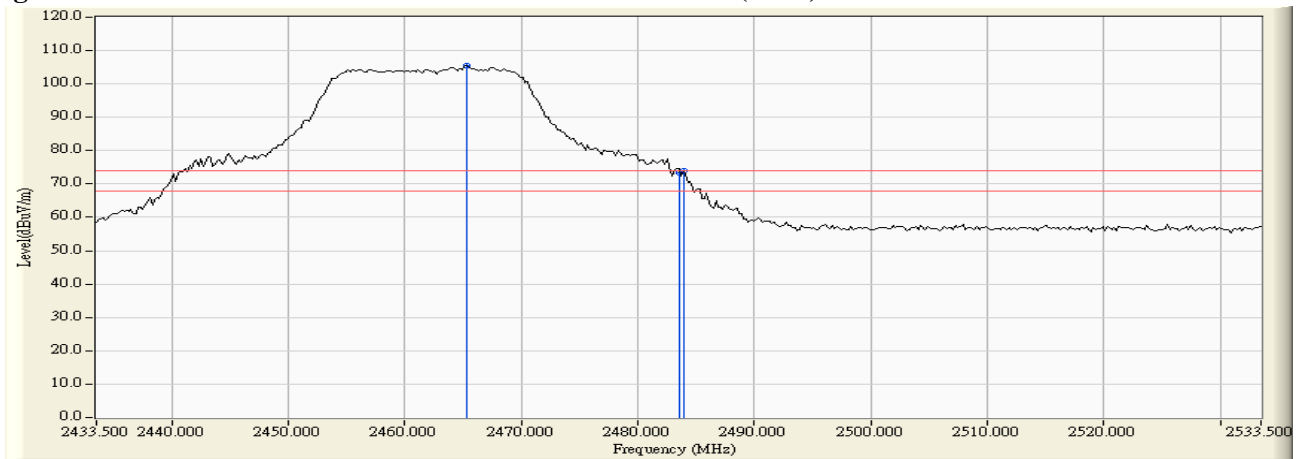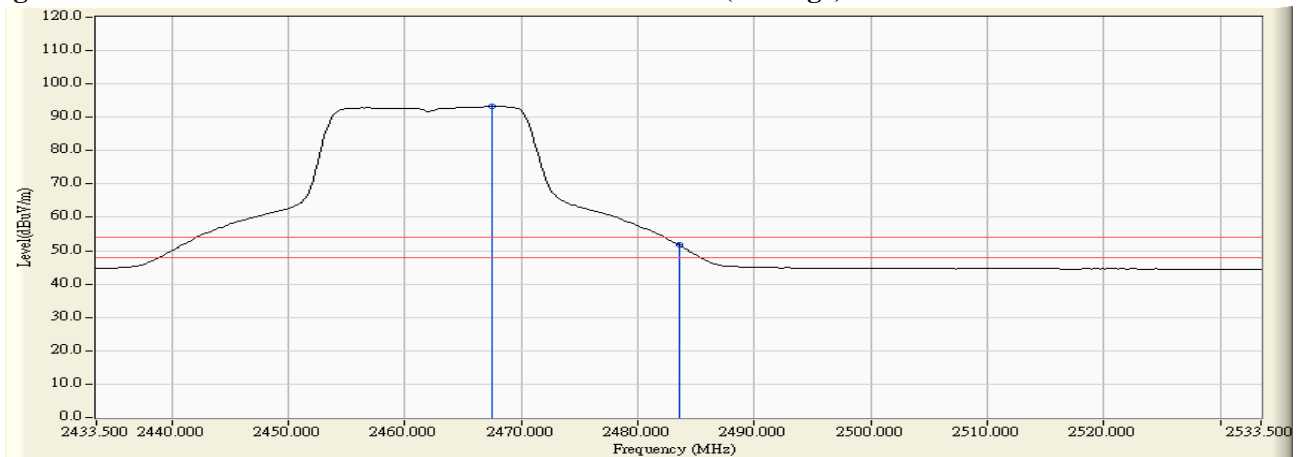

Figure Channel 01:   **Horizontal (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2390.000	30.915	42.050	72.965	74.00	54.00	Pass
01 (Peak)	2415.400	30.972	74.929	105.901	--	--	--
01 (Average)	2390.000	30.915	19.961	50.876	74.00	54.00	Pass
01 (Average)	2416.600	30.981	62.742	93.723	--	--	--

Figure Channel 01:   **Vertical (Peak)**
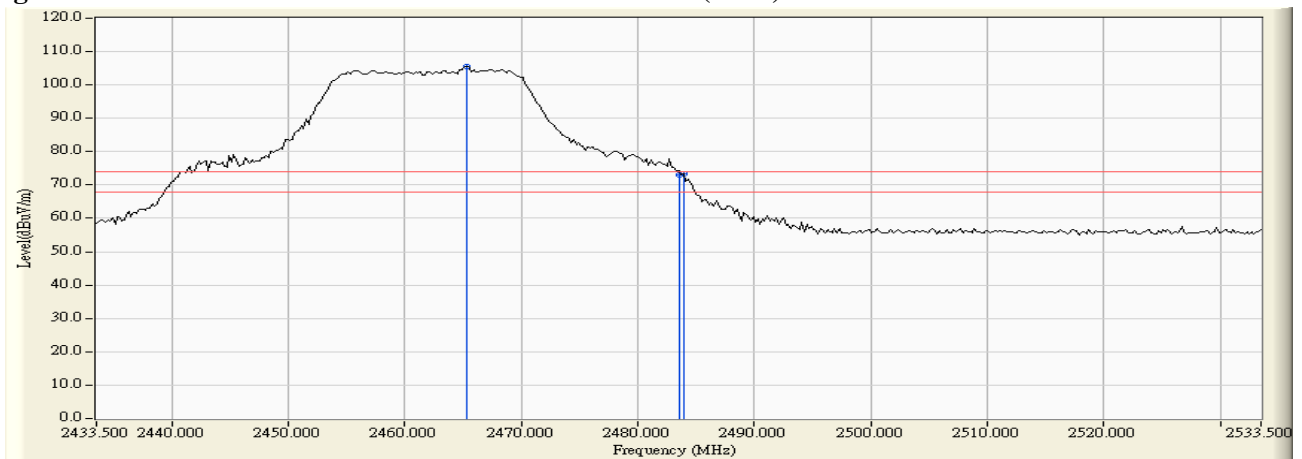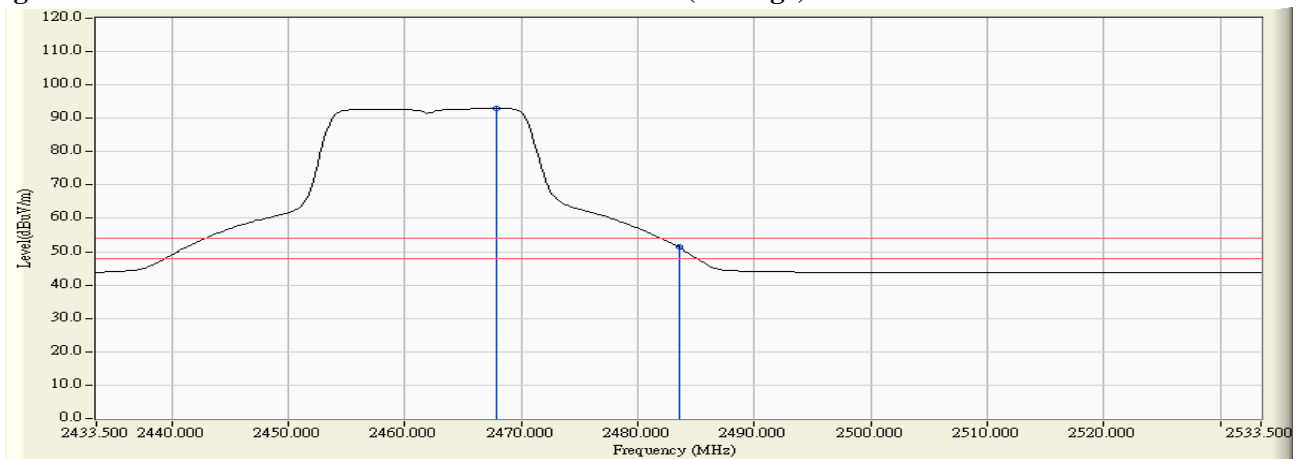

Figure Channel 01:   **Vertical (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
     5. Measurement Level = Reading Level + Correct Factor.
     6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2465.300	32.044	73.512	105.556	--	--	--
11 (Peak)	2483.500	32.182	41.148	73.330	74.00	54.00	Pass
11 (Peak)	2483.900	32.185	41.704	73.889	74.00	54.00	Pass
11 (Average)	2467.500	32.061	61.159	93.220	--	--	--
11 (Average)	2483.500	32.182	19.466	51.648	74.00	54.00	Pass

Figure Channel 11:   **Horizontal (Peak)**

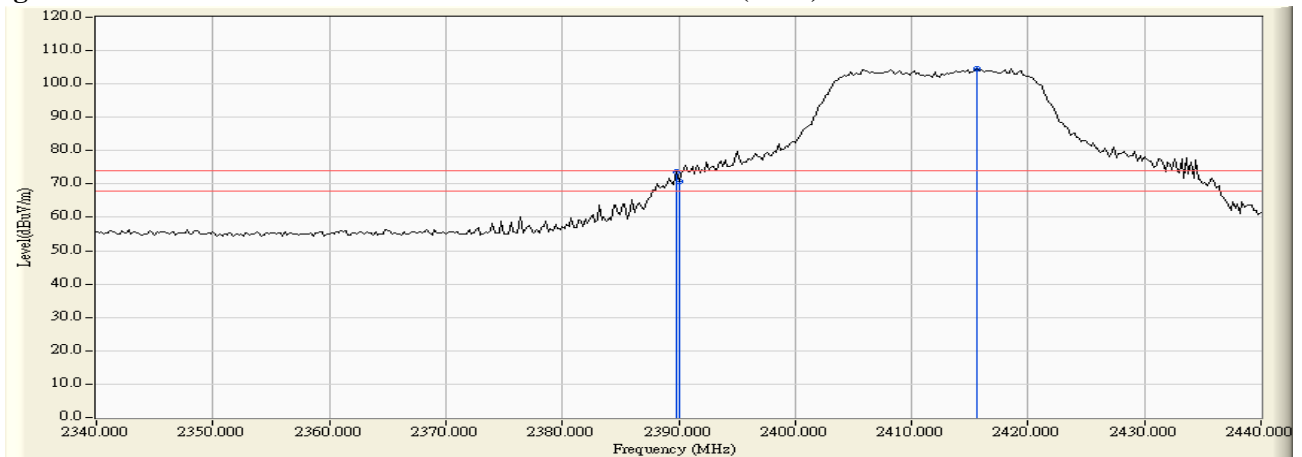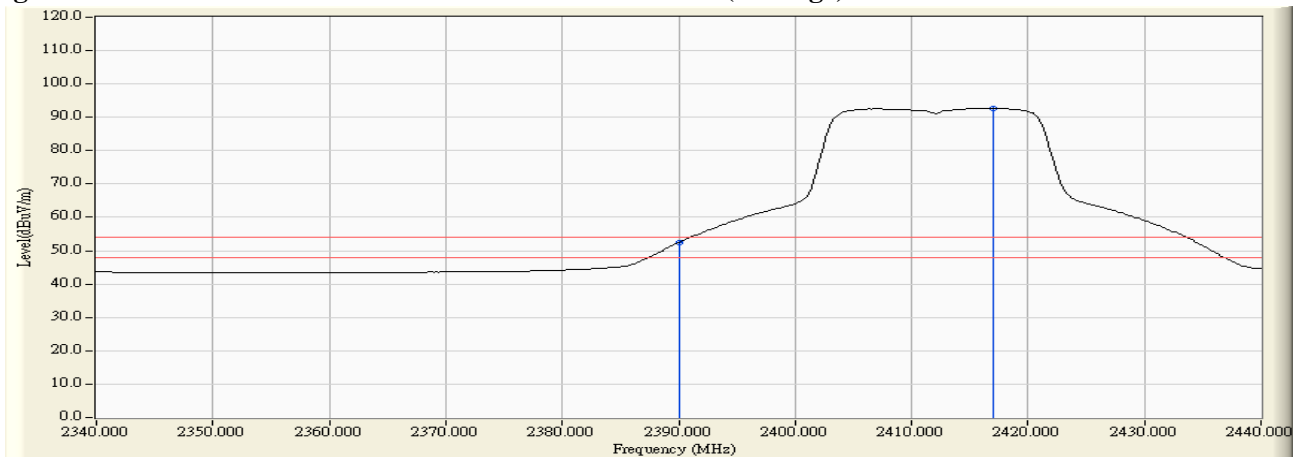

Figure Channel 11:   **Horizontal (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
   5. Measurement Level = Reading Level + Correct Factor.
   6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	ASUS Miracast Dongle
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2465.300	31.313	74.101	105.414	--	--	--
11 (Peak)	2483.500	31.435	41.647	73.082	74.00	54.00	Pass
11 (Peak)	2483.900	31.438	41.799	73.237	74.00	54.00	Pass
11 (Average)	2467.900	31.330	61.780	93.110	--	--	--
11 (Average)	2483.500	31.435	19.887	51.322	74.00	54.00	Pass

Figure Channel 11:   **Vertical (Peak)**
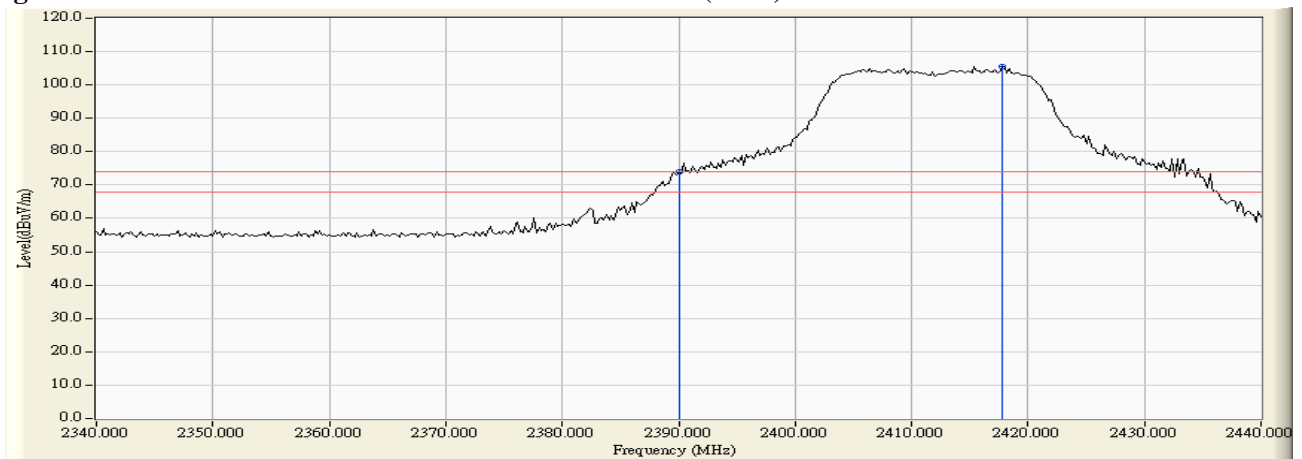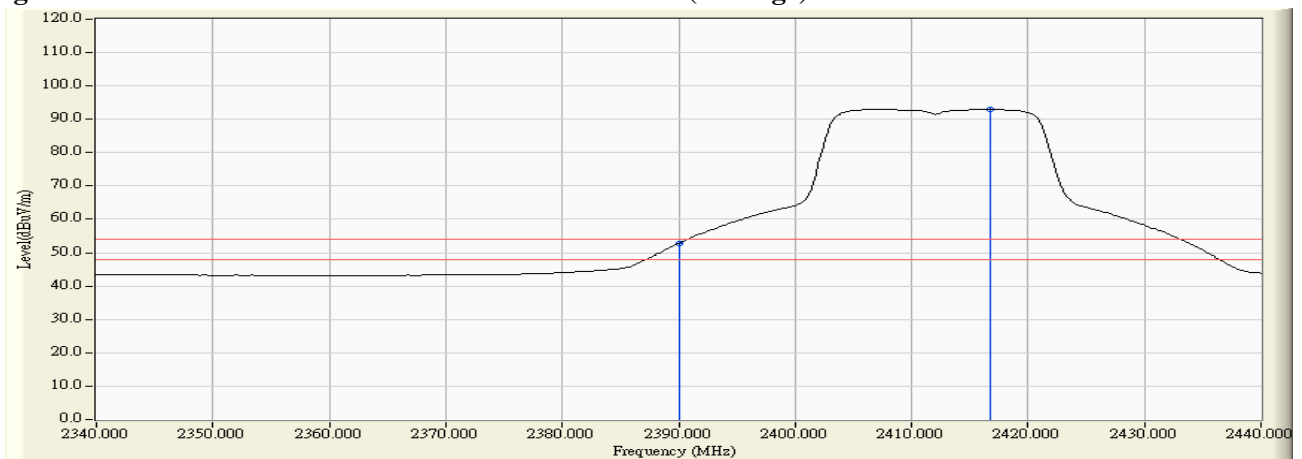

Figure Channel 11:   **Vertical (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
    5. Measurement Level = Reading Level + Correct Factor.
    6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	ASUS Miracast Dongle
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2389.800	31.508	42.090	73.598	74.00	54.00	Pass
01 (Peak)	2390.000	31.509	39.391	70.900	74.00	54.00	Pass
01 (Peak)	2415.600	31.665	72.901	104.567	--	--	--
01 (Average)	2390.000	31.509	20.985	52.494	74.00	54.00	Pass
01 (Average)	2417.000	31.676	61.050	92.727	--	--	--

Figure Channel 01:   **Horizontal (Peak)**
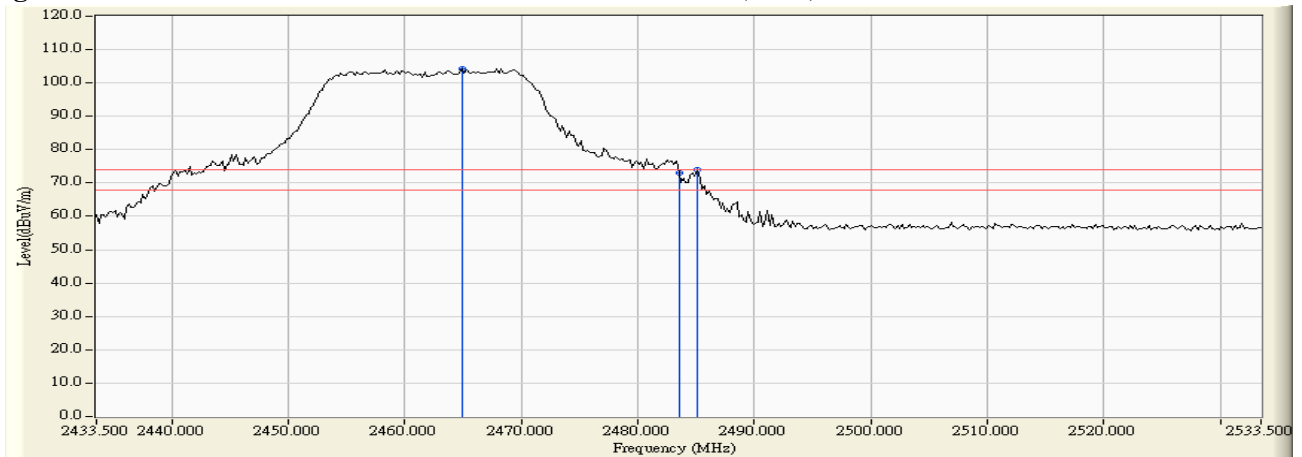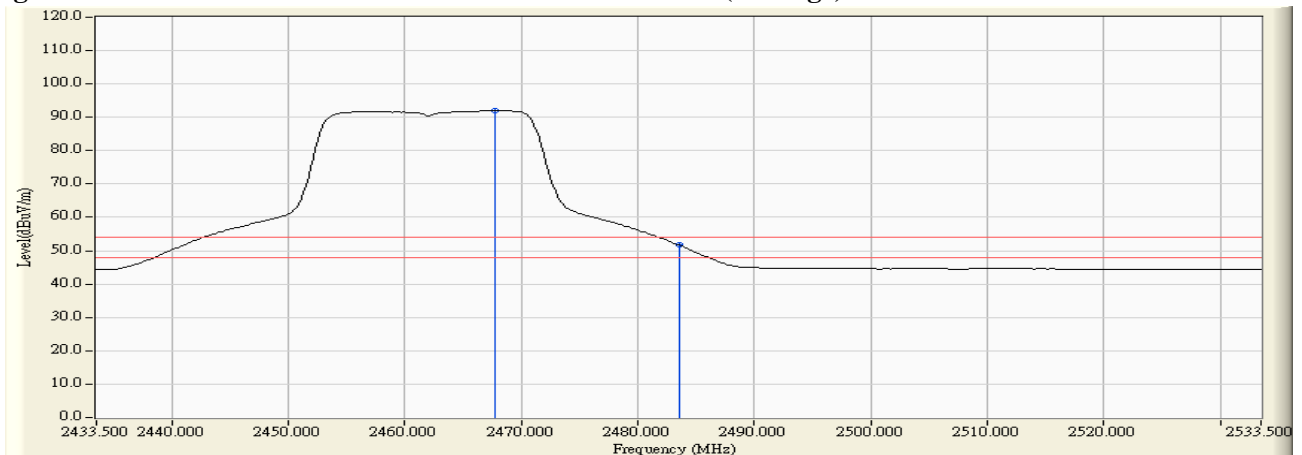

Figure Channel 01:   **Horizontal (Average)**

Note: 1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
01 (Peak)	2390.000	30.915	43.012	73.927	74.00	54.00	Pass
01 (Peak)	2417.800	30.989	74.408	105.397	--	--	--
01 (Average)	2390.000	30.915	21.903	52.818	74.00	54.00	Pass
01 (Average)	2416.800	30.982	62.054	93.036	--	--	--

Figure Channel 01:   **Vertical (Peak)**
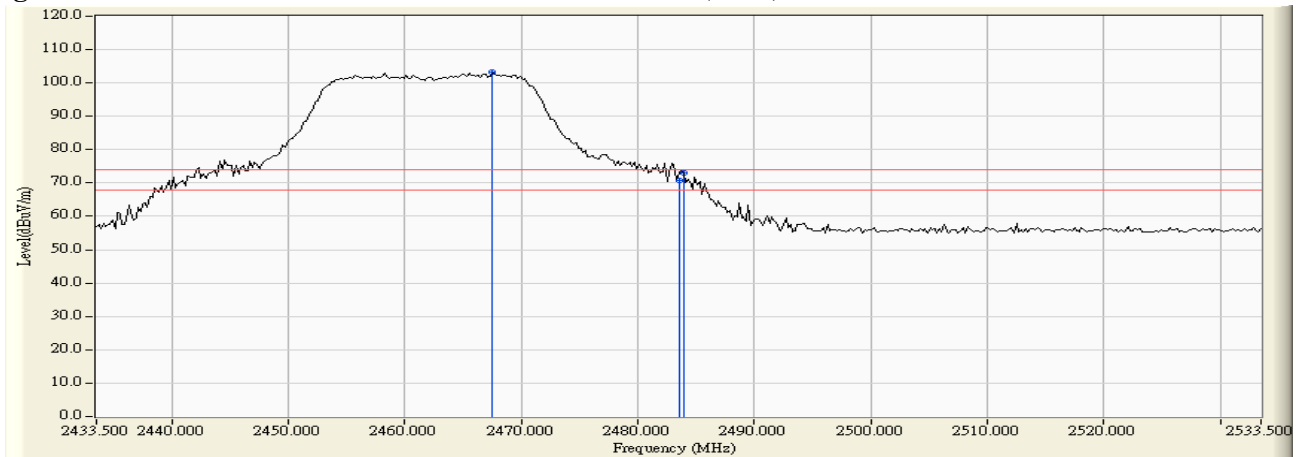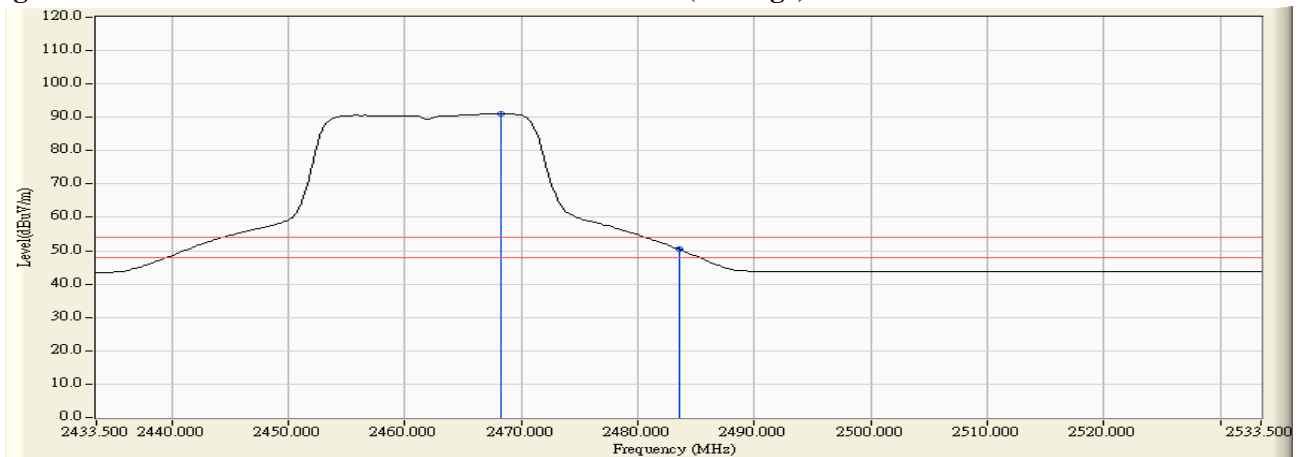

Figure Channel 01:   **Vertical (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
   5. Measurement Level = Reading Level + Correct Factor.
   6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2464.900	32.042	72.302	104.343	--	--	--
11 (Peak)	2483.500	32.182	40.973	73.155	74.00	54.00	Pass
11 (Peak)	2485.100	32.194	41.777	73.971	74.00	54.00	Pass
11 (Average)	2467.700	32.063	59.905	91.967	--	--	--
11 (Average)	2483.500	32.182	19.486	51.668	74.00	54.00	Pass

Figure Channel 11:   **Horizontal (Peak)**

Figure Channel 11:   **Horizontal (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection. Note:
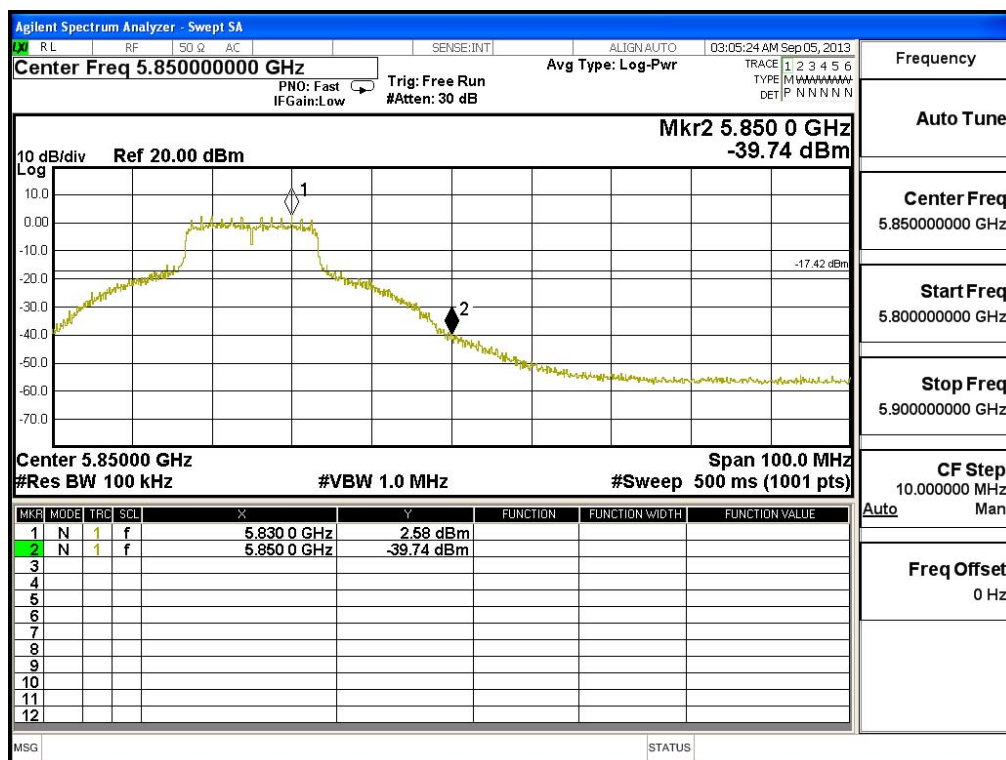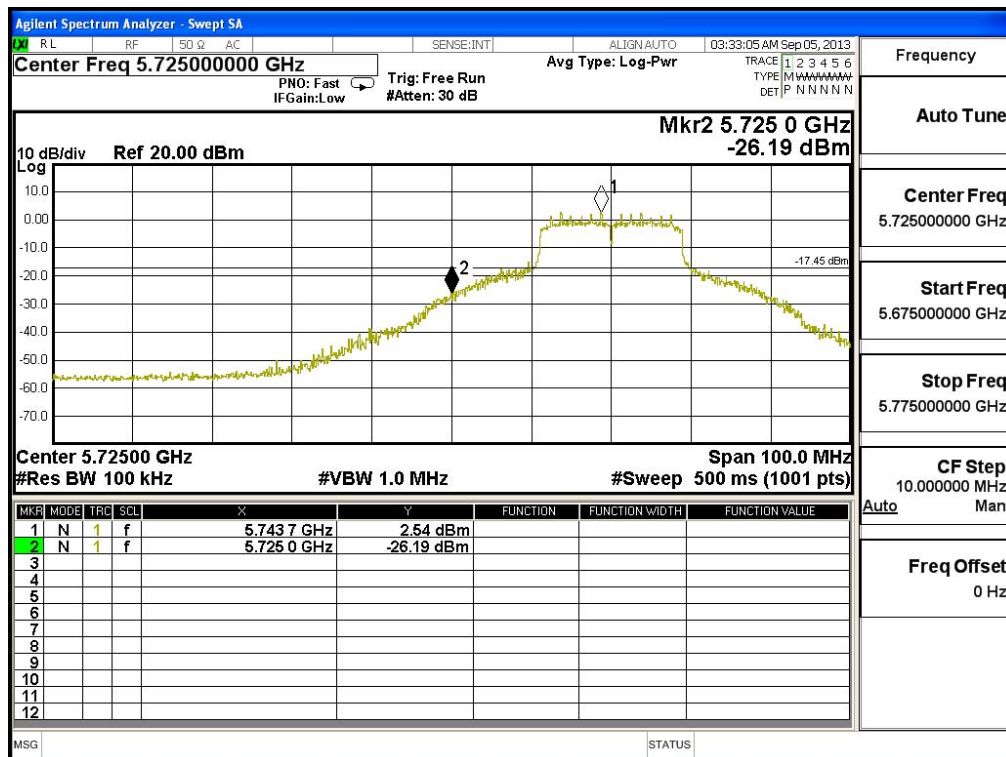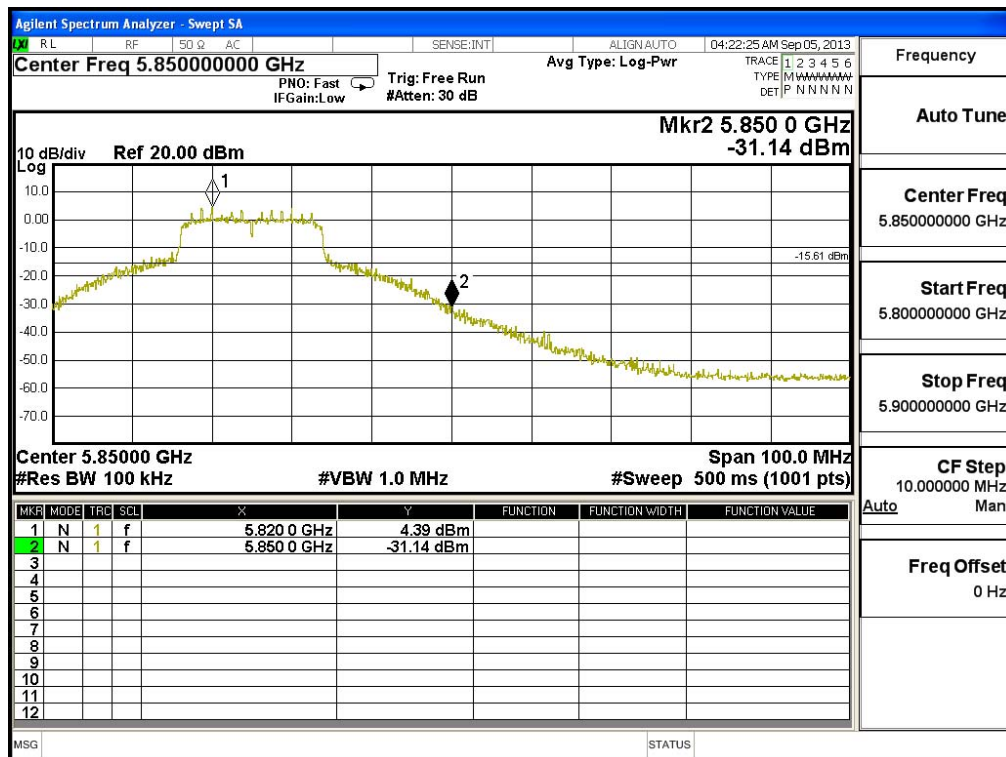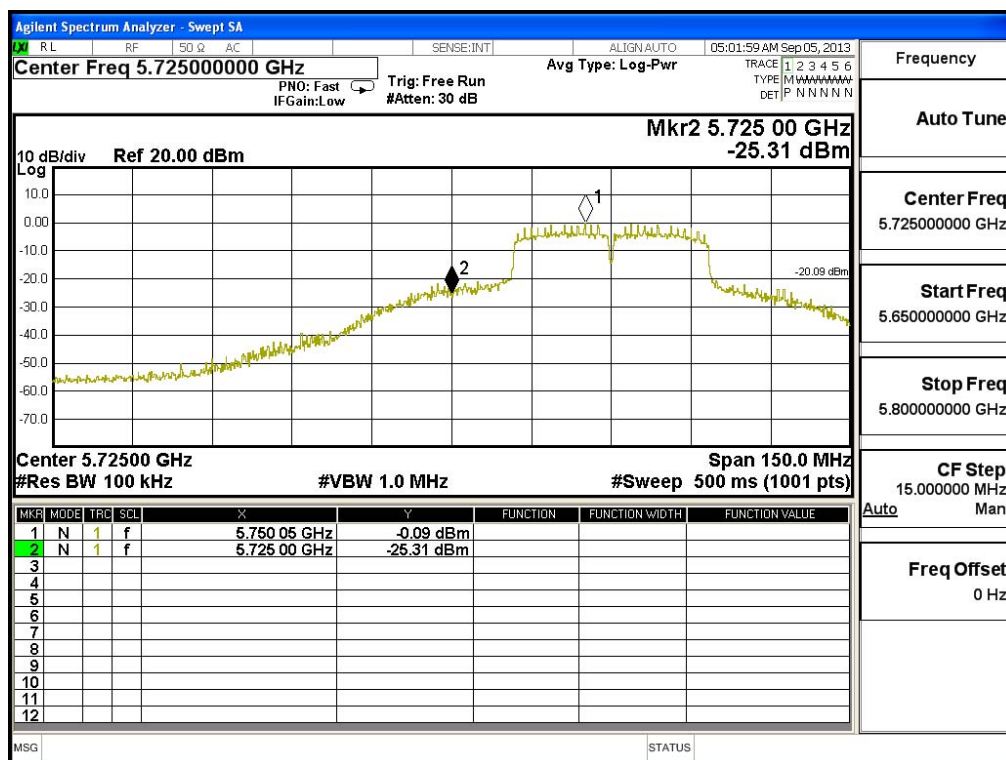
Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
11 (Peak)	2467.500	31.327	71.820	103.147	--	--	--
11 (Peak)	2483.500	31.435	39.317	70.752	74.00	54.00	Pass
11 (Peak)	2483.900	31.438	41.672	73.110	74.00	54.00	Pass
11 (Average)	2468.300	31.333	59.722	91.055	--	--	--
11 (Average)	2483.500	31.435	18.988	50.423	74.00	54.00	Pass

Figure Channel 11:   **Vertical (Peak)**

Figure Channel 11:   **Vertical (Average)**

Note:1. All readings 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. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit - 802.11a 6Mbps

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
5745	32.52	>20	PASS
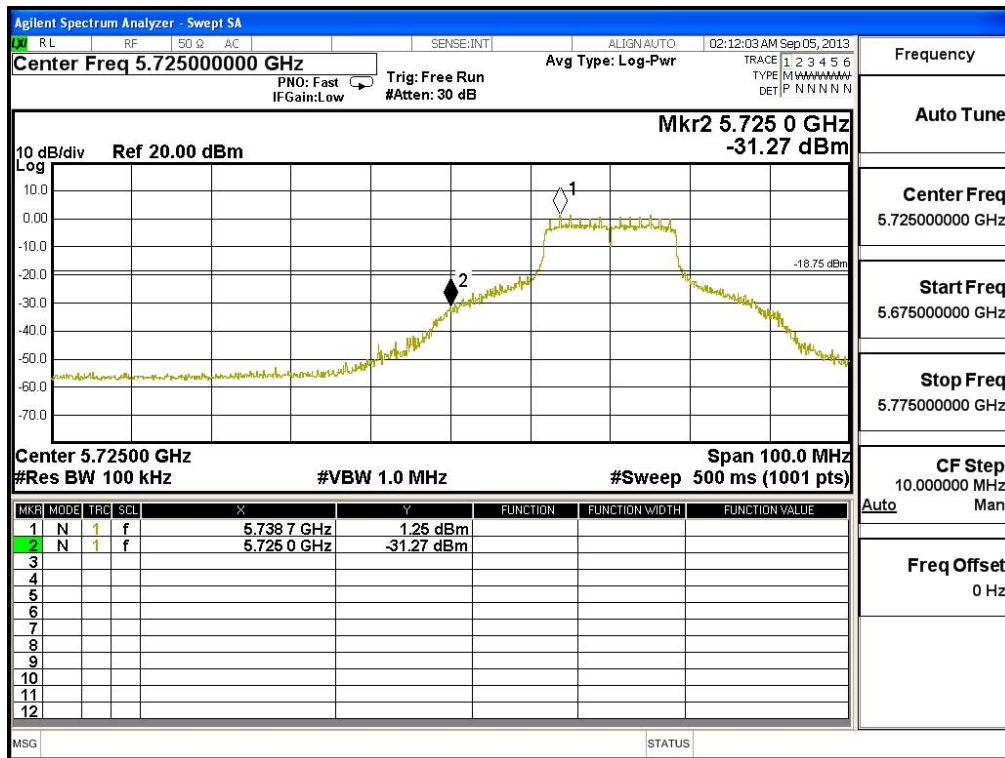
Product   :   ASUS Miracast Dongle
Test Item   :   Band Edge
Test Site   :   No.3 OATS
Test Mode   :   Mode 3: Transmit - 802.11a 6Mbps

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
5825	42.32	>20	PASS

Product   :   ASUS Miracast Dongle
Test Item   :   Band Edge
Test Site   :   No.3 OATS
Test Mode   :   Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band)

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
5745	28.73	>20	PASS

Product   :   ASUS Miracast Dongle
Test Item   :   Band Edge
Test Site   :   No.3 OATS
Test Mode   :   Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band)

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
5825	35.53	>20	PASS

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band)

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
5755	25.22	>20	PASS

Product : ASUS Miracast Dongle
Test Item : Band Edge
Test Site : No.3 OATS
Test Mode : Mode 6: Transmit - 802.11n-40BW_15Mbps(5G Band)

Test Frequency (MHz)	Measurement Level Δ (dB)	Limit Δ (dB)	Result
5795	42.71	>20	PASS
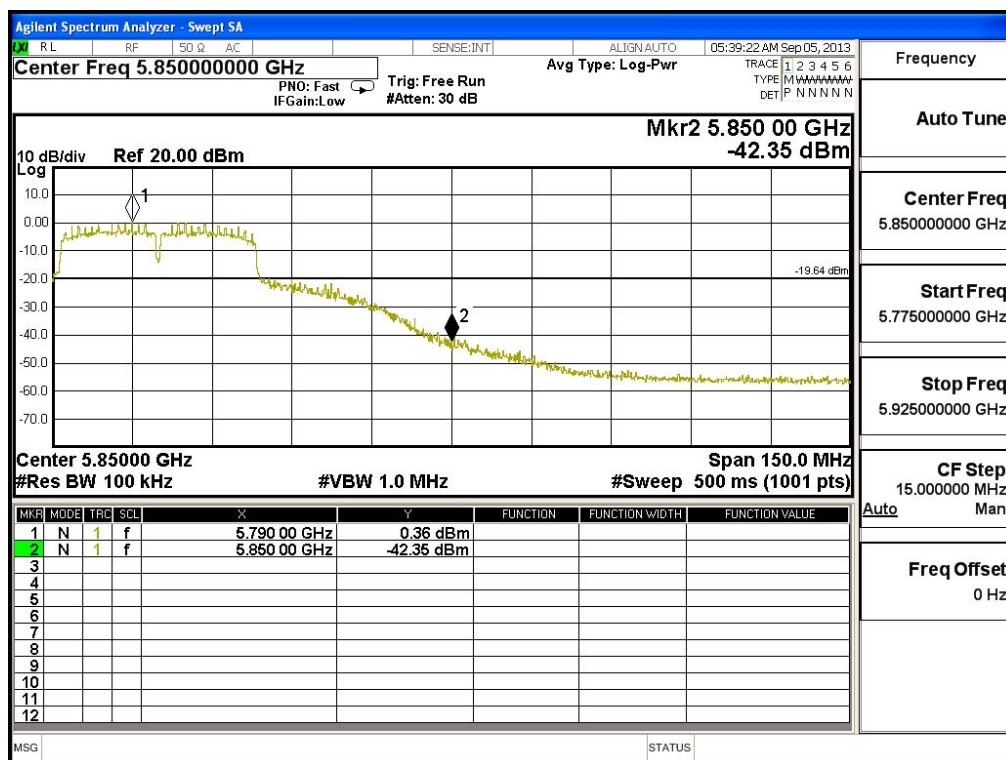
7. Occupied Bandwidth

7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

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.

7.2. Test Setup
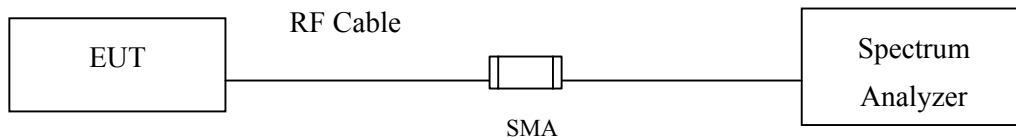
7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

7.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

7.5. Uncertainty

± 150Hz

7.6. Test Result of Occupied Bandwidth
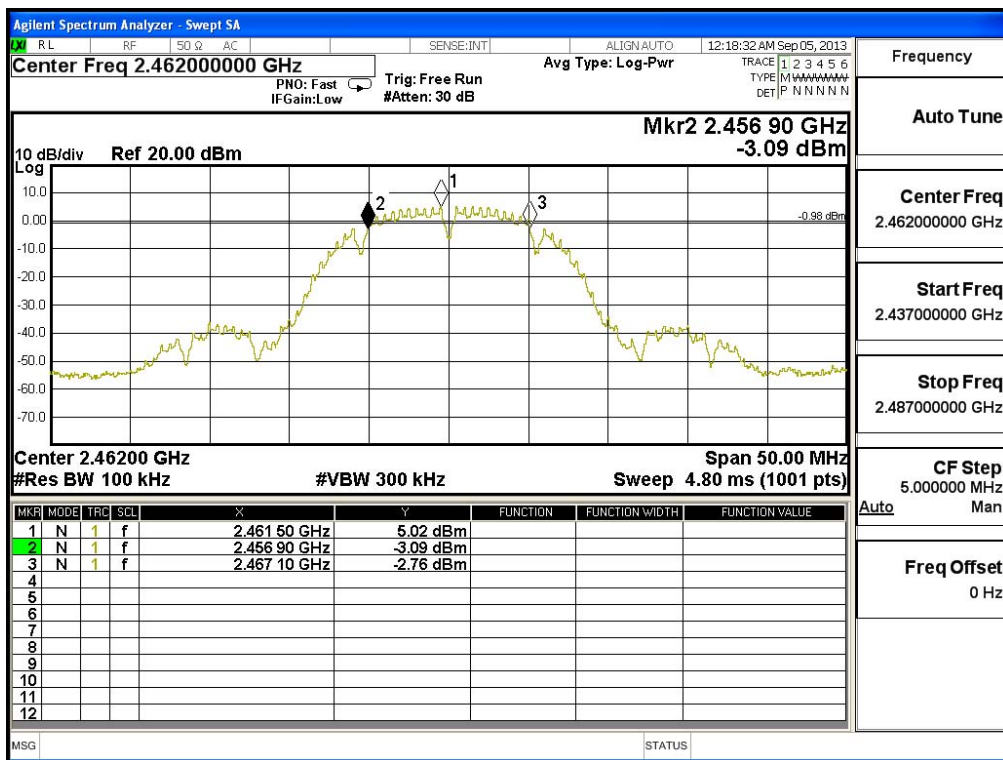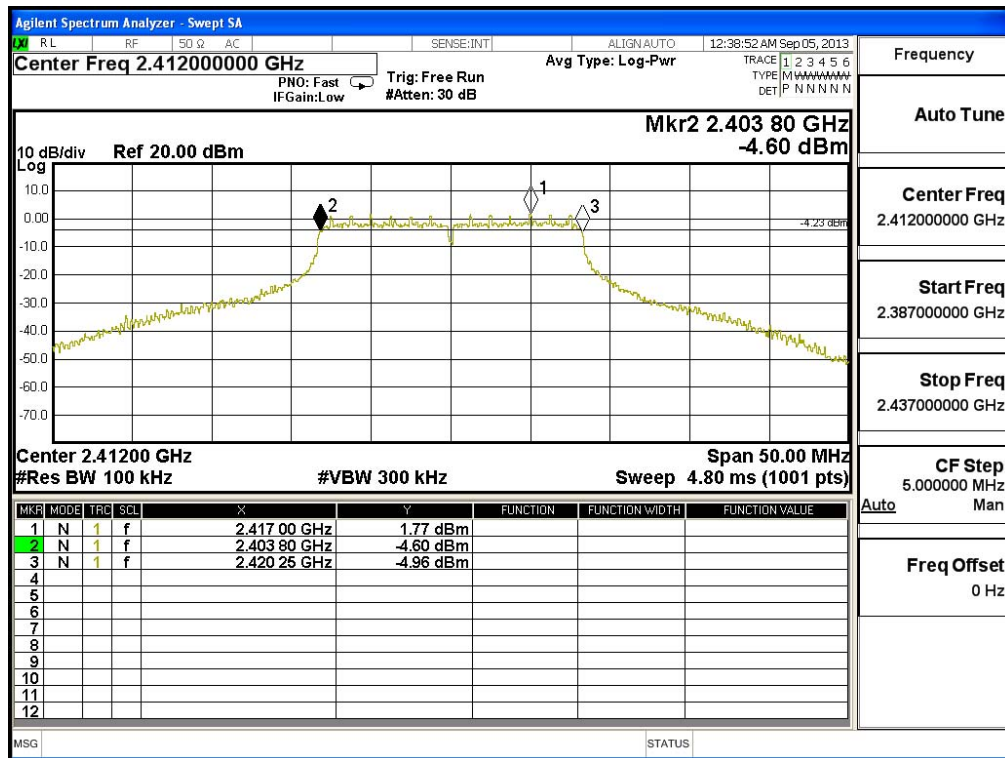
Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

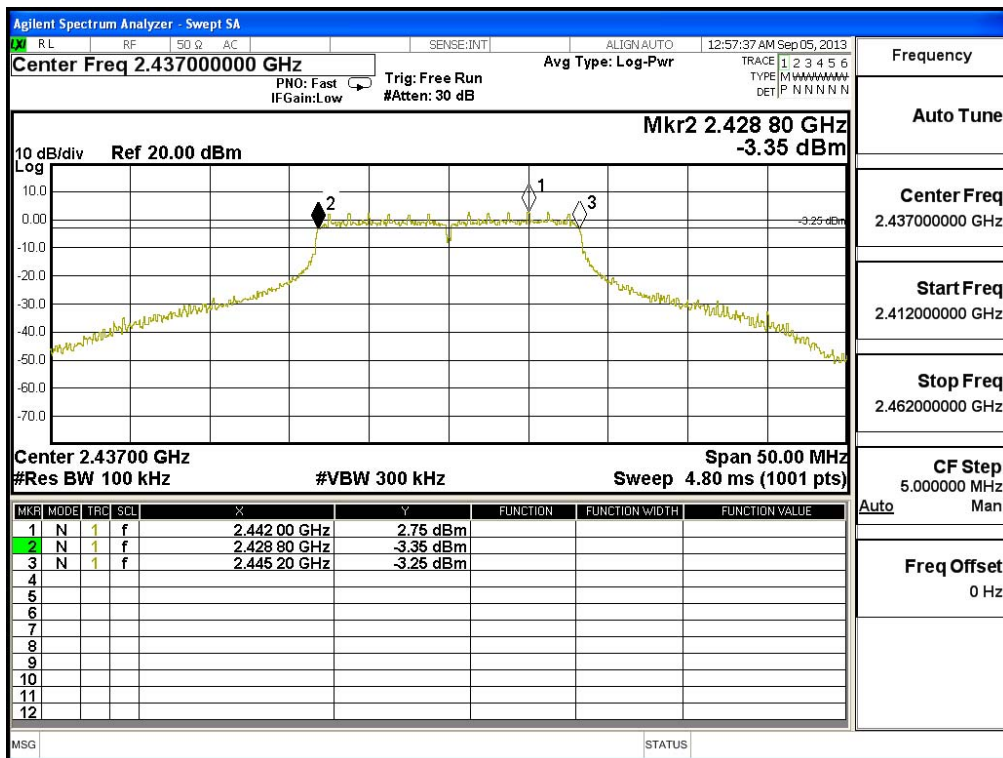| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	10200	>500	Pass
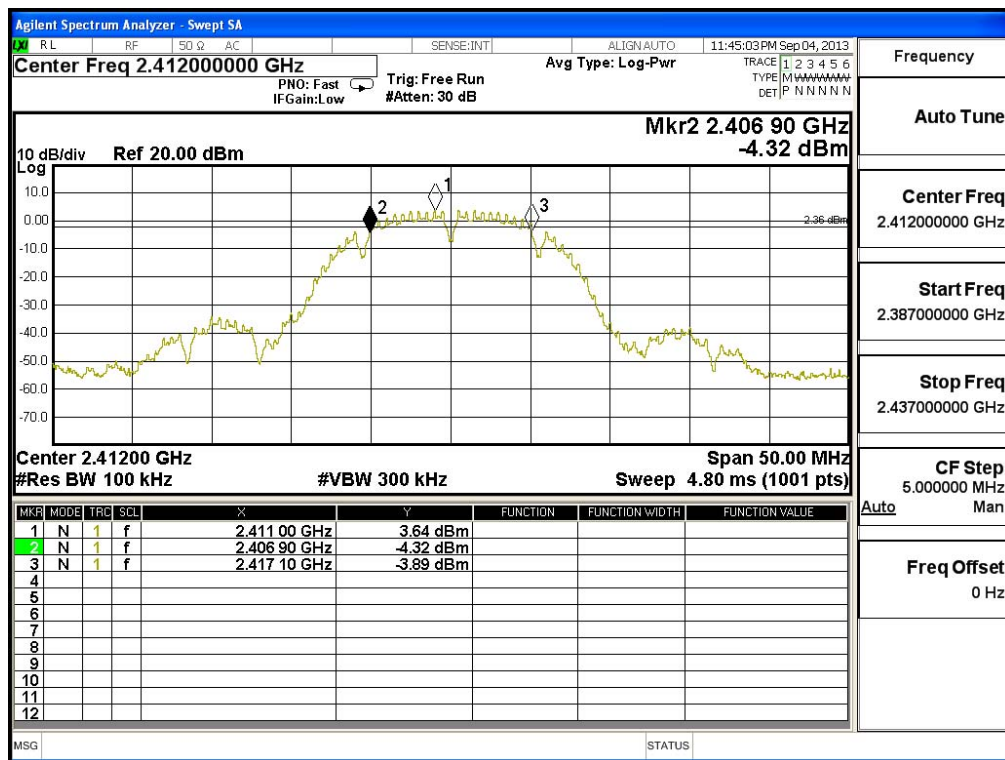
Figure Channel 1:

Product : ASUS Miracast Dongle

Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	10200	>500	Pass

Figure Channel 6:
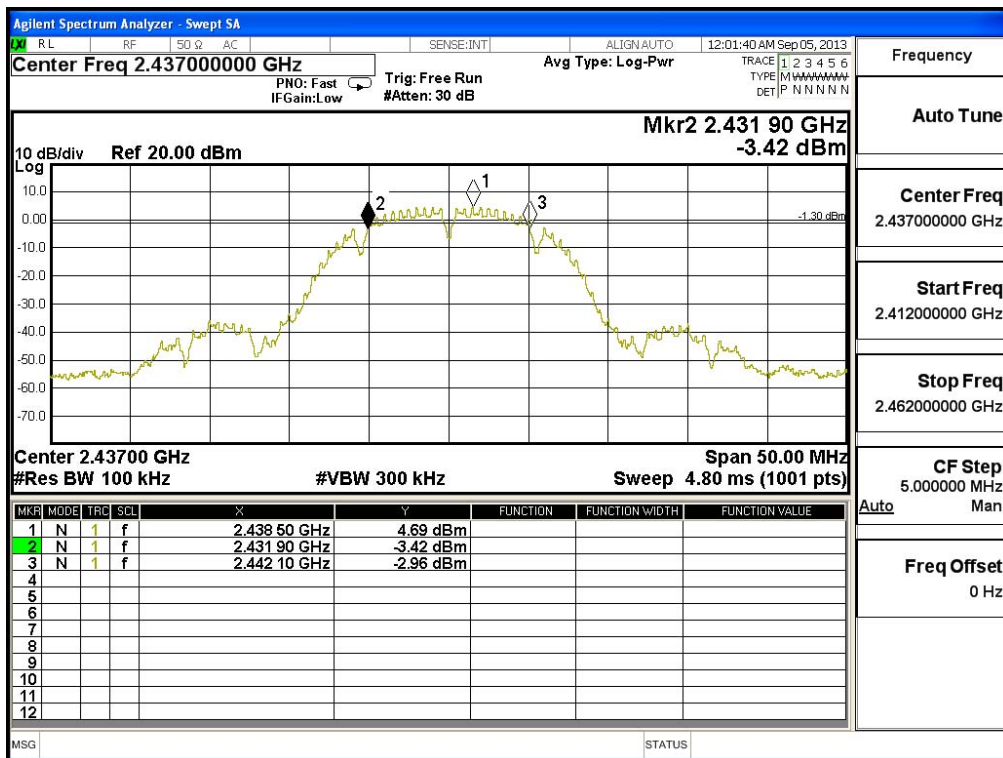
Product : ASUS Miracast Dongle

Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

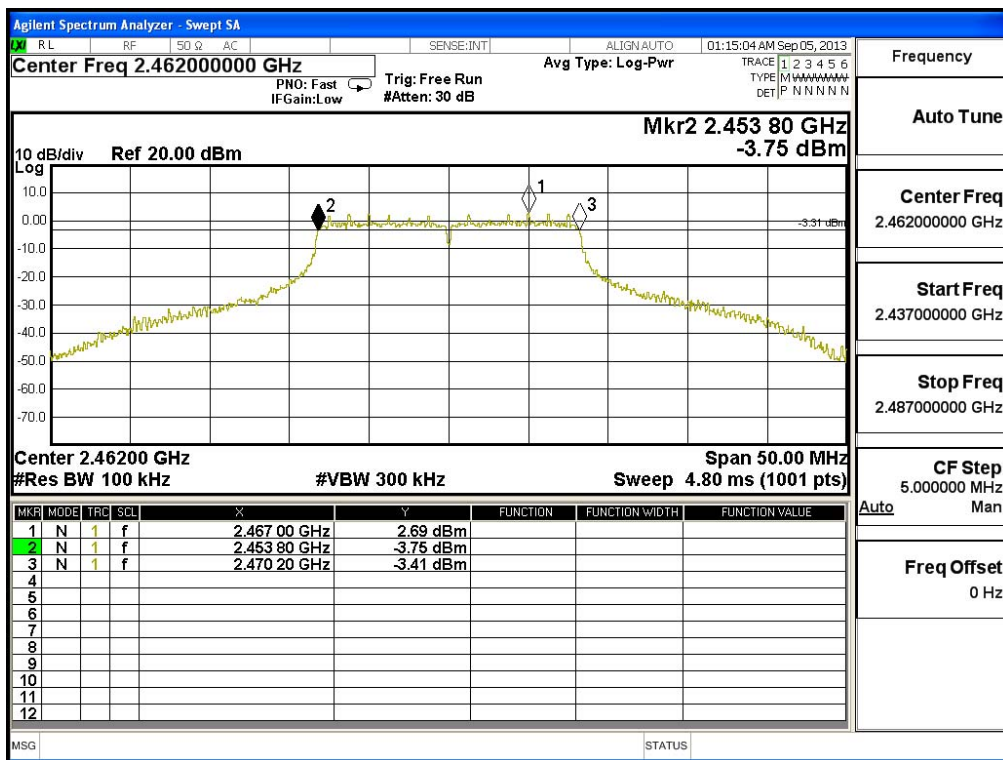| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	10200	>500	Pass

Figure Channel 11:

Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

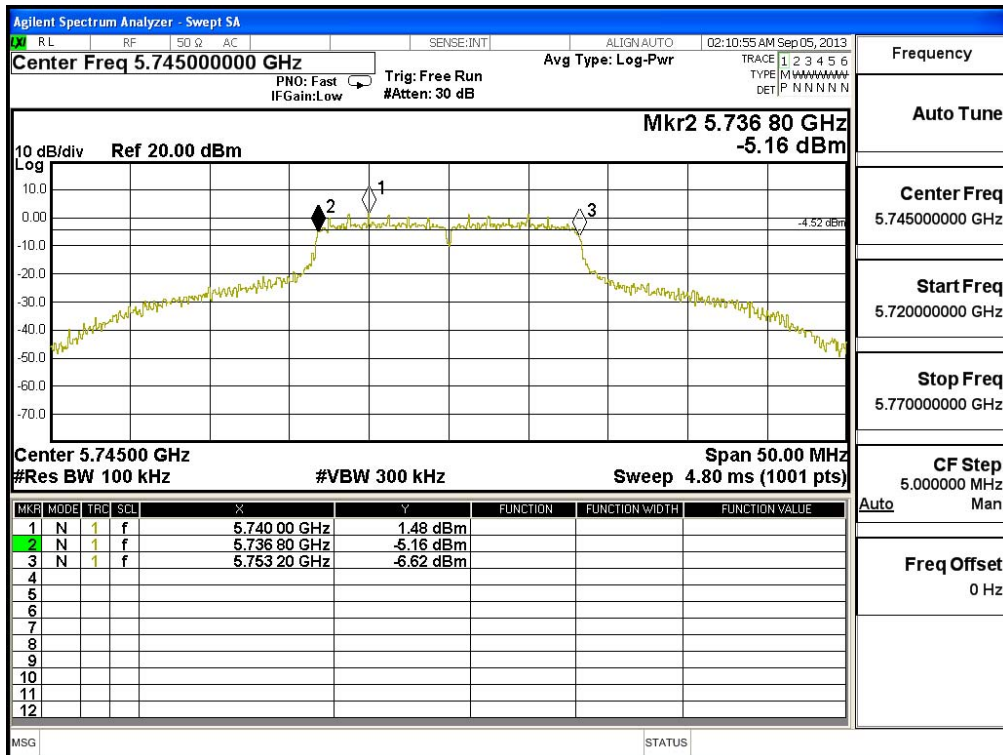| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	16450	>500	Pass

Figure Channel 1:

Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

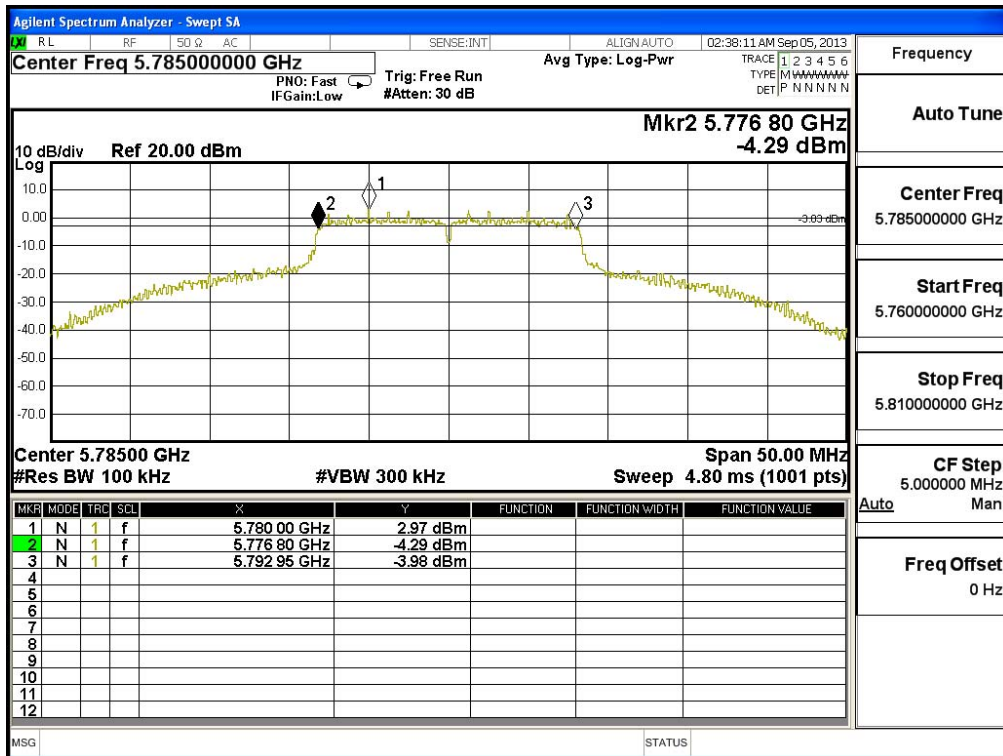| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	16400	>500	Pass

Figure Channel 6:

Product   :   ASUS Miracast Dongle
Test Item   :   Occupied Bandwidth Data
Test Site   :   No.3 OATS
Test Mode   :   Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	16400	>500	Pass

Figure Channel 11:

Product	:	ASUS Miracast Dongle
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit - 802.11a 6Mbps (5745MHz)

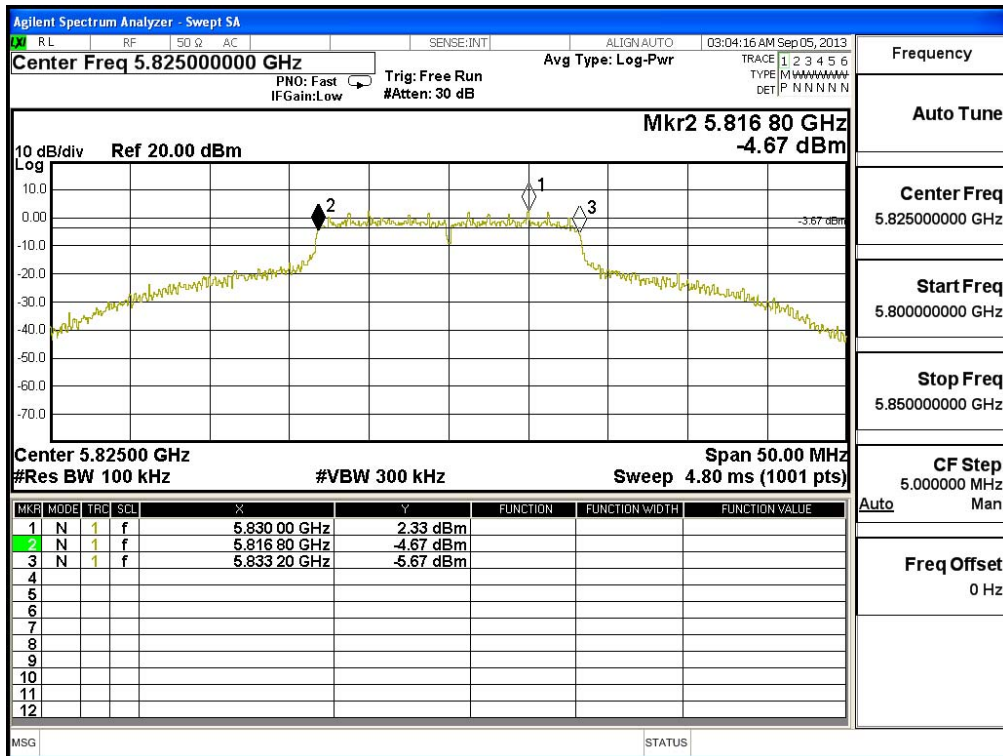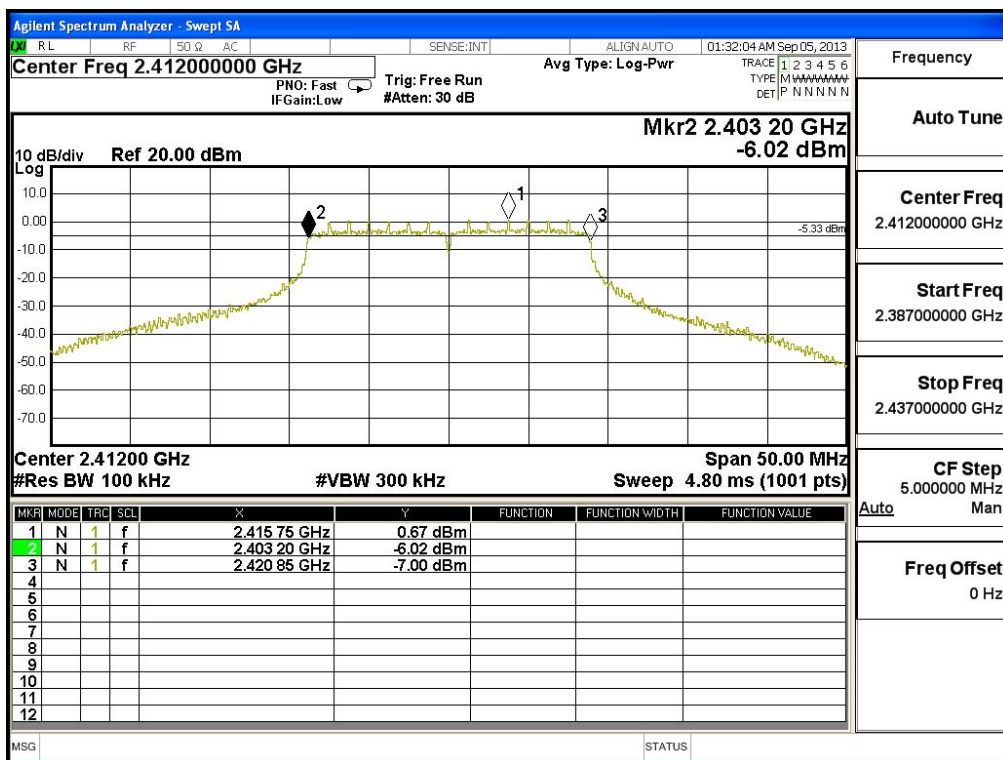| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	16400	>500	Pass

Figure Channel 149:

Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit - 802.11a 6Mbps (5785MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	16150	>500	Pass

Figure Channel 157:

Product	:	ASUS Miracast Dongle
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit - 802.11a 6Mbps (5825MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
165	5825.00	16400	>500	Pass

Figure Channel 165:

Product	:	ASUS Miracast Dongle	
Test Item	:	Occupied Bandwidth Data	
Test Site	:	No.3 OATS	
Test Mode	:	Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2412MHz)	

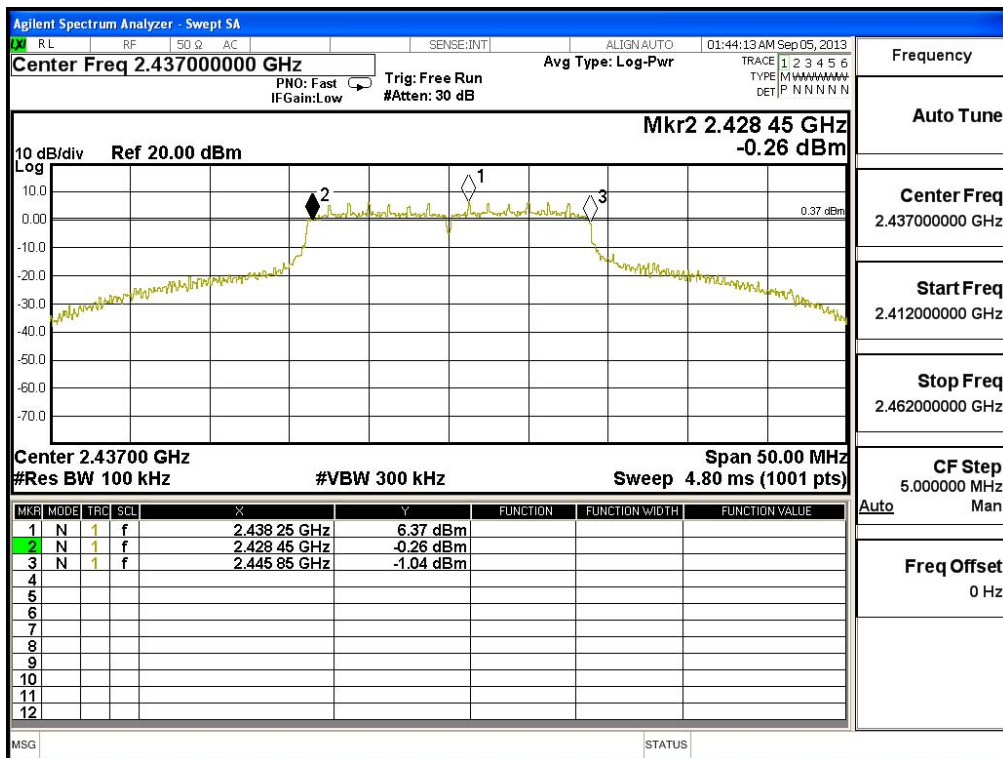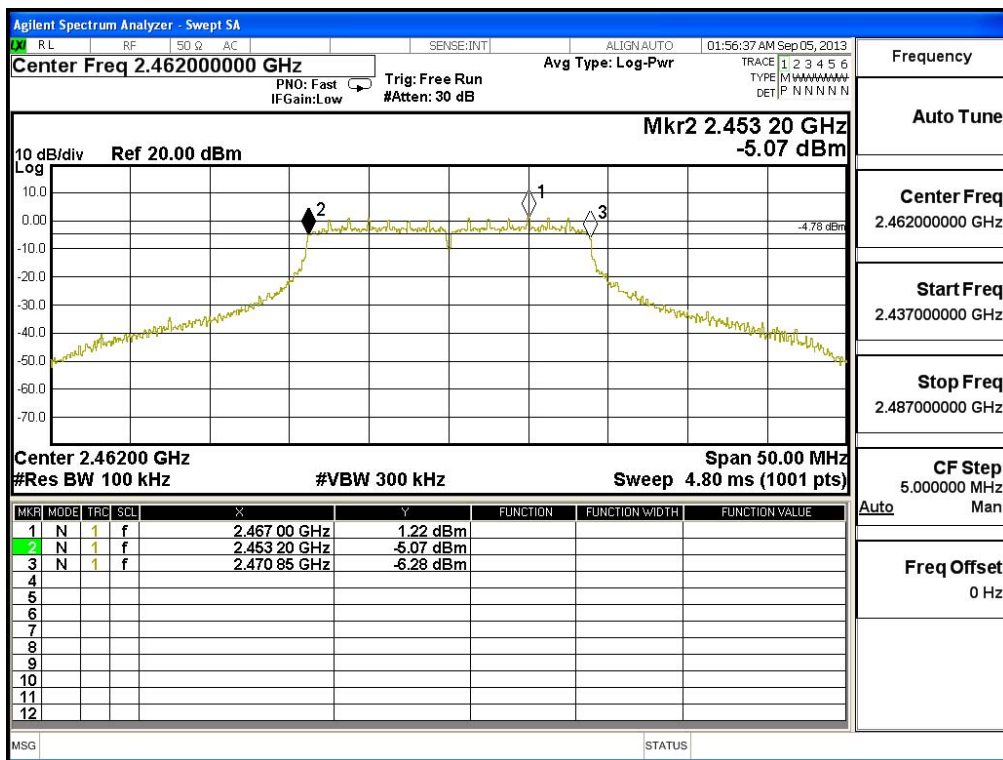| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	17650	>500	Pass

Figure Channel 1:

Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	17400	>500	Pass

Figure Channel 6:

Product : ASUS Miracast Dongle

Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 4: Transmit - 802.11n-20BW_7.2Mbps(2.4G Band) (2462MHz)

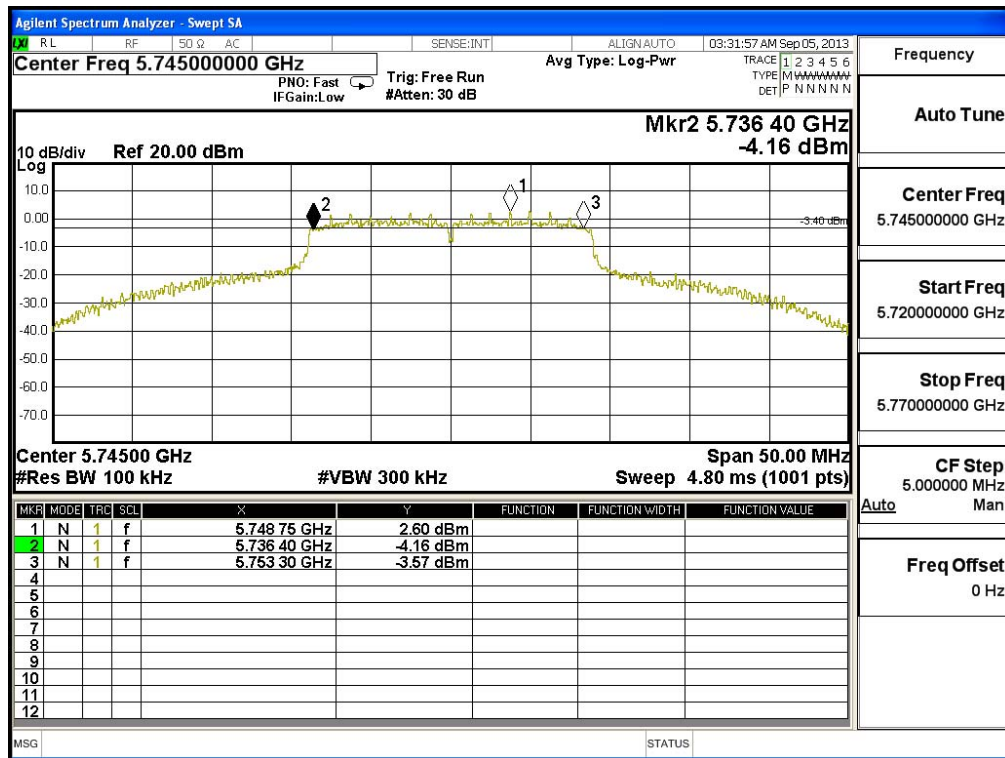| Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	17650	>500	Pass

Figure Channel 11:

Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band) (5745MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
149	5745.00	16900	>500	Pass

Figure Channel 149:

Product : ASUS Miracast Dongle
Test Item : Occupied Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 5: Transmit - 802.11n-20BW_7.2Mbps(5G Band) (5785MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
157	5785.00	16750	>500	Pass

Figure Channel 157: