

Test Report (Class II Permissive Change)

Product Name	HD Streaming Player
Model No	2500X
FCC ID.	TC2R1001

Applicant	Roku, Inc.
Address	12980 Saratoga Avenue Suite #D Saratoga California United
	States 95070

Date of Receipt	June 01, 2012
Issue Date	June 05, 2012
Report No.	126094R-RFUSP29V01
Report Version	V1.0



The test results relate only to the samples tested.

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Test Report Certification

Issue Date: June 05, 2012 Report No.: 126094R-RFUSP29V01



Accredited by NIST (NVLAP) NVLAP Lab Code: 200533-0

Product Name	HD Streaming Player		
Applicant	Roku, Inc.		
Address	12980 Saratoga Avenue Suite #D Saratoga California United States 95070		
Manufacturer	DONG GUAN G-COM COMPUTER CO., LTD		
Model No.	2500X		
FCC ID.	TC2R1001		
EUT Rated Voltage	AC 100-240V, 50-60Hz		
EUT Test Voltage	AC 120V/60Hz		
Trade Name	Roku		
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010		
	ANSI C63.4: 2003		
Test Result	Complied		

The test results relate only to the samples tested.

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	HD Streaming Player		
Trade Name	Roku		
Model No.	2500X		
FCC ID.	TC2R1001		
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW		
Number of Channels	802.11b/g/n-20MHz: 11		
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 150Mbps		
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK)		
	802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)		
Antenna Type	PIFA Antenna		
Antenna Gain	Refer to the table "Antenna List"		
Channel Control	Auto		
Power Adapter	MFR: Roku, M/N: FA-0521000SUA		
	Input: AC 100-240V, 0.15A, 50-60Hz		
	Output: DC 5.0V=1.0A		
	Cable Out: Non-Shielded, 1.75m		

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	MAG. LAYERS	MSA-1911-2G4C1-A2	PIFA Antenna	3.74 dBi for 2.4 GHz

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		

Note:

- 1. The EUT is a Roku Player with a built-in 2.4GHz WLAN transceiver.
- 2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- 4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g/n transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.
- 5. This is requesting a Class II permissive change for FCC ID: TC2R1001. Originally grantedon 02/22/2012.

The differences are listed as below:

Change #1: Add memory size of SDRAM.

Change #2: Change the manufacturer of the oscillator, the oscillation frequency is identical.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

1.3. Tested System Details

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

Prod	uct	Manufacturer	Model No.	Serial No.	Power Cord
1	Monitor	JVC	LT-20BW7BJ	N/A	Non-Shielded, 1.8m

Signal Cable Type		Signal cable Description
А	RCA (3 to 3) cable	Non-Shielded, 2.0m
В	HDMI Cable	Non-Shielded, 1.5m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Connect EUT and Notebook via test fixture.
- (2) Execute program on the Notebook
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press "OK" to start the continuous transmission.
- (5) Remove notebook and test fixture, Setup the EUT as shown in Section 1.4
- (6) 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: <u>http://www.quietek.com/tw/ctg/cts/accreditations.htm</u> The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site: <u>http://www.quietek.com/</u>

Site Description:	File on						
	Federal Communications Commission						
	FCC Engineering Laboratory						
	7435 Oakland Mills Road						
	Columbia, MD 21046						
	Registration Number: 92195						
	Accreditation on NVLAP						
	NVLAP Lab Code: 200533-0						
Site Name:	Quietek Corporation						
Site Address:	No.5-22, Ruishukeng,						
	Linkou Dist. New Taipei City 24451,						
	Taiwan, R.O.C.						
	TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789						
	E-Mail : <u>service@quietek.com</u>						

FCC Accreditation Number: TW1014

2. Conducted Emission

2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
Х	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2011	
Х	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2012	Peripherals
Х	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2012	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2012	EUT
Х	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2012	
	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	Limits							
MHz	QP	AVG						
0.15 - 0.50	66-56	56-46						
0.50-5.0	56	46						
5.0 - 30	60	50						

2.4. Test Procedure

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

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

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

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product	:	HD Streaming Player
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)

Frequency	Correct	Reading	ng Measurement M		Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.154	9.717	50.170	59.887	-5.999	65.886
0.193	9.691	45.650	55.341	-9.430	64.771
0.279	9.647	36.860	46.507	-15.807	62.314
0.412	9.640	30.460	40.100	-18.414	58.514
0.763	9.655	18.310	27.965	-28.035	56.000
14.822	9.850	15.750	25.600	-34.400	60.000
Average					
0.154	9.717	37.260	46.977	-8.909	55.886
0.193	9.691	33.660	43.351	-11.420	54.771
0.279	9.647	28.310	37.957	-14.357	52.314
0.412	9.640	21.700	31.340	-17.174	48.514
0.763	9.655	9.510	19.165	-26.835	46.000
14.822	9.850	8.670	18.520	-31.480	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	: HD Streaming Player											
Test Item	: Conducted Emission Test											
Power Line	: Line 2											
Test Mode	: Mode 3: Tr	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437MHz)										
Frequency	Correct	Reading	Measurement	Margin	Limit							
	Factor	Level	Level									
MHz	dB	dBuV	dBuV	dB	dBuV							
Line 2												
Quasi-Peak												
0.158	9.725	48.240	57.965	-7.806	65.771							
0.197	9.689	44.720	54.409	-10.248	64.657							
0.252	9.656	38.210	47.866	-15.220	63.086							
0.302	9.647	34.770	44.417	-17.240	61.657							
0.384	9.650	29.250	38.900	-20.414	59.314							
12.162	9.900	16.720	26.620	-33.380	60.000							
Average												
0.158	9.725	34.430	44.155	-11.616	55.771							
0.197	9.689	32.000	41.689	-12.968	54.657							
0.252	9.656	26.610	36.266	-16.820	53.086							
0.302	9.647	26.530	36.177	-15.480	51.657							
0.384	9.650	19.350	29.000	-20.314	49.314							
12.162	9.900	10.220	20.120	-29.880	50.000							

- 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.
Х	Power Meter	Anritsu	ML2495A/6K00003357	May, 2012
Х	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2012
Note:				
1.	All equipments are	calibrated with trace	eable calibrations. Each calibr	ation is traceable to the
	national or internati	onal standards.		

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

3.2. Test Setup

Conducted Measurement



3.3. Limits

The maximum peak power shall be less 1 Watt.

3.4. Test Procedure

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

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product	:	HD Streaming Player
Test Item	:	Peak Power Output Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

Channel No	Frequency	For d	Average ifferent Da	e Power ata Rate (N	Peak Power	Required	Recult	
	(MHz)	1	2	5.5	11	1	Limit	Result
			Measur					
01	2412	16.28				19.16	<30dBm	Pass
06	2437	16.38	16.27	16.19	16.05	19.44	<30dBm	Pass
11	2462	16.63				19.61	<30dBm	Pass

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

Product	:	HD Streaming Player
Test Item	:	Peak Power Output Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

Fromo			Average PowerPeakFor different Data Rate (Mbps)Power							Paguirad		
Channel No	(MHz)	6	9	12	18	24	36	48	54	6	Limit	Result
			Measurement Level (dBm)									
01	2412	13.37								23.56	<30dBm	Pass
06	2437	13.49	13.38	13.28	13.19	13.1	13.02	12.95	12.86	23.81	<30dBm	Pass
11	2462	13.75								23.79	<30dBm	Pass

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

Product	:	HD Streaming Player
Test Item	:	Peak Power Output Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

		Average Power Peak					Peak					
	Frequency		F	or diffe	erent Da	ata Rate	e (Mbps	5)		Power	Required	
Channel No	(MHz)	7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	7.2	Limit	Result
Measurement Level (c						level (d	Bm)					
01	2412	12.89								23.58	<30dBm	Pass
06	2437	12.95	12.84	12.74	12.63	12.54	12.46	12.31	12.22	23.96	<30dBm	Pass
11	2462	13.26								23.87	<30dBm	Pass

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

4. Radiated Emission

4.1. Test Equipment

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

Test Site	Equi	pment	Manufacturer	Model No./Serial No.	Last Cal.
\Box Site # 3	Х	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	Х	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
	Х	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	Х	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2011
	Х	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	Х	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	Х	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2012
	Х	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	Χ	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

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

4.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.3. Limits

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

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

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

4.4. Test Procedure

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

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

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

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

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

The measurement is divided into the Preliminary Measurement and the Final Measurement. The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The worst radiated emission is measured in the Open Area Test Site on the Final Measurement. The frequency range from 30MHz to 10th harminics is checked.

4.5. Uncertainty

- ± 3.9 dB above 1GHz
- ± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product	:	HD Streaming Player
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.261	37.970	41.231	-32.769	74.000
7236.000	10.650	36.020	46.670	-27.330	74.000
9648.000	13.337	36.030	49.366	-24.634	74.000
Average Detector:					
Vertical					
Peak Detector:					
4824.000	6.421	36.850	43.271	-30.729	74.000
7236.000	11.495	35.450	46.945	-27.055	74.000
9648.000	13.807	35.250	49.056	-24.944	74.000

Average Detector:

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- 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	: HD Streaming Player						
Test Item	: Harmonic Radiated Emission Data						
Test Site	: No.3 OATS						
Test Mode	: Mode 1:	Transmit (802.11	b 1Mbps) (2437 MH	z)			
Frequency	Correct	Reading	Measurement	Margin	Limit		
requency	Factor	Level	Level	in an Bin			
MHz	dB	dBuV	dBuV/m	dB	dBuV/m		
Horizontal							
Peak Detector:							
4874.000	3.038	37.340	40.377	-33.623	74.000		
7311.000	11.795	34.470	46.264	-27.736	74.000		
9748.000	12.635	36.360	48.995	-25.005	74.000		
Average Detector:							
Vertical							
Peak Detector:							
4874.000	5.812	37.520	43.331	-30.669	74.000		
7311.000	12.630	35.540	48.169	-25.831	74.000		
9748.000	13.126	36.060	49.186	-24.814	74.000		

- 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	: HD Streaming Player						
Test Item	: Harmonic Radiated Emission Data						
Test Site	: No.3 OATS						
Test Mode	: Mode 1:	Transmit (802.11	b 1Mbps) (2462 MH	z)			
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBuV	dBuV/m	dB	dBuV/m		
Horizontal							
Peak Detector:							
4924.000	2.858	37.180	40.037	-33.963	74.000		
7386.000	12.127	35.090	47.218	-26.782	74.000		
9848.000	12.852	37.170	50.023	-23.977	74.000		
Average Detector:							
Vertical							
Peak Detector:							
4924.000	5.521	37.380	42.900	-31.100	74.000		
7386.000	13.254	34.720	47.974	-26.026	74.000		
9848.000	13.367	36.520	49.887	-24.113	74.000		

- 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	: HD Stre	aming Player						
Test Item	: Harmonic Radiated Emission Data							
Test Site	Test Site : No.3 OATS							
Test Mode	: Mode 2: Transmit (802.11g 6Mbps) (2412MHz)							
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Horizontal								
Peak Detector:								
4824.000	3.261	38.050	41.311	-32.689	74.000			
7236.000	10.650	36.890	47.540	-26.460	74.000			
9648.000	13.337	36.040	49.376	-24.624	74.000			
Average Detector:								
Vertical								
Peak Detector:								
4824.000	6.421	37.120	43.541	-30.459	74.000			
7236.000	11.495	36.150	47.645	-26.355	74.000			
9648.000	13.807	36.210	50.016	-23.984	74.000			

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- 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	: HD Streaming Player						
Test Item	: Harmonic Radiated Emission Data						
Test Site	: No.3 OA	ATS					
Test Mode	: Mode 2:	Transmit (802.11	g 6Mbps) (2437 MH	z)			
Frequency	Correct	Reading	Measurement	Margin	Limit		
riequency	Factor	Level	Level	in an			
MHz	dB	dBuV	dBuV/m	dB	dBuV/m		
Horizontal							
Peak Detector:							
4874.000	3.038	37.320	40.357	-33.643	74.000		
7311.000	11.795	35.440	47.234	-26.766	74.000		
9748.000	12.635	36.750	49.385	-24.615	74.000		
Average Detector:							
Peak Detector:							
4874.000	5.812	37.160	42.971	-31.029	74.000		
7311.000	12.630	35.110	47.739	-26.261	74.000		
9748.000	13.126	37.040	50.166	-23.834	74.000		

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- 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	: HD Streaming Player							
Test Item	: Harmonic Radiated Emission Data							
Test Site	Test Site : No.3 OATS							
Test Mode	: Mode 2:	: Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)						
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Horizontal								
Peak Detector:								
4924.000	2.858	37.630	40.487	-33.513	74.000			
7386.000	12.127	35.740	47.868	-26.132	74.000			
9848.000	12.852	36.500	49.353	-24.647	74.000			
Average Detector:								
Vertical								
Peak Detector:								
4924.000	5.521	37.900	43.420	-30.580	74.000			
7386.000	13.254	35.610	48.864	-25.136	74.000			
9848.000	13.367	36.710	50.077	-23.923	74.000			

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- 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	: HD Streaming Player						
Test Item	: Harmonic Radiated Emission Data						
Test Site	: No.3 OATS						
Test Mode	: Mode 3:	Transmit (802.11	n MCS0 7.2Mbps 20	M-BW)(2412MF	Iz)		
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBuV	dBuV/m	dB	dBuV/m		
Horizontal							
Peak Detector:							
4824.000	3.261	37.360	40.621	-33.379	74.000		
7236.000	10.650	36.680	47.330	-26.670	74.000		
9648.000	13.337	36.120	49.456	-24.544	74.000		
Average Detector:							
Vertical							
Peak Detector:							
4824.000	6.421	37.300	43.721	-30.279	74.000		
7236.000	11.495	36.330	47.825	-26.175	74.000		
9648.000	13.807	36.140	49.946	-24.054	74.000		

- 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	:	HD Streaming Player
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.038	37.350	40.387	-33.613	74.000
7311.000	11.795	35.890	47.684	-26.316	74.000
9748.000	12.635	36.200	48.835	-25.165	74.000
Average Detector:					
Vertical					
Peak Detector:					
4874.000	5.812	37.610	43.421	-30.579	74.000
7311.000	12.630	35.880	48.509	-25.491	74.000
9748.000	13.126	36.510	49.636	-24.364	74.000

- 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	:	HD Streaming Player
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBuV	dBuV/m	dB	dBuV/m	
Horizontal						
Peak Detector:						
4924.000	2.858	37.460	40.317	-33.683	74.000	
7386.000	12.127	35.140	47.268	-26.732	74.000	
9848.000	12.852	36.740	49.593	-24.407	74.000	
Average Detector:						
Vertical						
Peak Detector:						
4924.000	5.521	36.830	42.350	-31.650	74.000	
7386.000	13.254	35.490	48.744	-25.256	74.000	
9848.000	13.367	36.490	49.857	-24.143	74.000	

- 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	: HD Streaming Player								
Test Item	: General Radiated Emission Data								
Test Site	: No.3 OATS								
Test Mode	: Mode 1:	Transmit (802.11	b 1Mbps)(2437 MHz	2)					
Frequency	Correct	Reading	Measurement	Margin	Limit				
	Factor	Level	Level						
MHz	dB	dBuV	dBuV/m	dB	dBuV/m				
Horizontal									
94.020	-8.189	38.309	30.119	-13.381	43.500				
288.020	-4.579	41.138	36.559	-9.441	46.000				
431.580	-2.099	43.507	41.408	-4.592	46.000				
499.480	0.048	37.437	37.485	-8.515	46.000				
928.220	6.893	31.709	38.602	-7.398	46.000				
972.840	6.802	34.237	41.039	-12.961	54.000				
Vertical									
109.540	-0.418	37.841	37.423	-6.077	43.500				
357.860	-3.734	36.844	33.110	-12.890	46.000				
497.540	-1.393	33.787	32.394	-13.606	46.000				
842.860	3.074	31.345	34.419	-11.581	46.000				
904.940	2.607	36.874	39.481	-6.519	46.000				
972.840	4.582	35.544	40.126	-13.874	54.000				

- 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	: HD Streaming Player								
Test Item	: General Radiated Emission Data								
Test Site	: No.3 OATS								
Test Mode	: Mode 2:	Transmit (802.11	g 6Mbps)(2437 MHz	2)					
Frequency	Correct	Reading	Measurement	Margin	Limit				
	Factor	Level	Level						
MHz	dB	dBuV	dBuV/m	dB	dBuV/m				
Horizontal									
84.320	-10.564	35.550	24.986	-15.014	40.000				
144.460	-10.377	35.027	24.650	-18.850	43.500				
480.080	-0.329	30.705	30.376	-15.624	46.000				
831.220	6.121	22.521	28.642	-17.358	46.000				
891.360	5.888	23.251	29.139	-16.861	46.000				
965.080	6.852	22.827	29.679	-24.321	54.000				
Vertical									
84.320	-4.484	36.448	31.964	-8.036	40.000				
119.240	-3.541	35.688	32.147	-11.353	43.500				
357.860	-3.734	36.240	32.506	-13.494	46.000				
480.080	-4.359	31.194	26.835	-19.165	46.000				
809.880	3.279	23.100	26.379	-19.621	46.000				
965.080	7.932	22.827	30.759	-23.241	54.000				

- 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	: HD Streaming Player								
Test Item	: General Radiated Emission Data								
Test Site	: No.3 OATS								
Test Mode	: Mode 3:	Transmit (802.11	n MCS0 7.2Mbps 20	M-BW)(2437 MI	Hz)				
Frequency	Correct	Reading	Measurement	Margin	Limit				
	Factor	Level	Level						
MHz	dB	dBuV	dBuV/m	dB	dBuV/m				
Horizontal									
70.740	-12.921	35.088	22.167	-17.833	40.000				
266.680	-4.963	24.628	19.665	-26.335	46.000				
385.020	-1.350	27.396	26.046	-19.954	46.000				
480.080	-0.329	32.589	32.260	-13.740	46.000				
864.200	5.671	23.844	29.515	-16.485	46.000				
920.460	6.467	23.341	29.808	-16.192	46.000				
Vertical									
84.320	-4.484	36.388	31.904	-8.096	40.000				
119.240	-3.541	36.034	32.493	-11.007	43.500				
357.860	-3.734	34.131	30.397	-15.603	46.000				
480.080	-4.359	31.807	27.448	-18.552	46.000				
794.360	2.861	23.683	26.544	-19.456	46.000				
965.080	7.932	23.172	31.104	-22.896	54.000				

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

5. **RF** antenna conducted test

5.1. Test Equipment

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

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

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

5.2. Test Setup

RF antenna Conducted Measurement:



5.3. Limits

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

5.4. Test Procedure

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

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

5.5. Uncertainty

The measurement uncertainty Conducted is defined as ± 1.27 dB

5.6. Test Result of RF antenna conducted test

Product	:	HD Streaming Player
Test Item	:	RF antenna conducted test
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

Channel 01 (2412MHz)

Agilent	t Spectru	m Analyzer - S	wept SA								
Cent	ter Fr	RF 50 eq 515.0	Ω AC 00000 M	Hz	SEI	NSE:INT	Avg Type	ALIGNAUT : Log-Pw	0 05:40:431 r TRA	PM Jun 01, 2012 CE 1 2 3 4 5 6	Frequency
10 dE	3/div	Ref 20.00	ı dBm	PNO: Fast 🍙 FGain:Low	Atten: 30	dB		М	kr1 978.6 -54.	66 dBm	Auto Tune
10.0											Center Freq 515.000000 MHz
0.00 ·										-14.37 dBm	Start Freq 30.000000 MHz
-20.0 + -30.0 +											Stop Freq 1.000000000 GHz
-40.0 ·											CF Step 97.000000 MHz <u>Auto</u> Man
-60.0		gan ba bili setas		an an littleten stand			and Constituted by	Alexandrianae	n () Sharan () Sharan () Sharan () Sharan () Dayahasa salar na dasa sa ()	n le fin her ei ster bei ernen ne mit die besteren en	Freq Offset 0 Hz
Start #Res	t 30.0 s BW 1	MHz 00 kHz	saved	#VBW	1.0 MHz			Sweep	Stop 1. 90.0 ms (1	0000 GHz 10001 pts)	



Agilent Spectru	m Analyzer - Swep	ot SA						
Center Fr	RF 50 Ω eq 6.50000	AC 0000 GHz		Avg Type	ALIGNAUTO e: Log-Pwr	05:40:12 P	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 20.00 dl	PNO: Fast G	Atten: 30 dB		Mk	r1 2.411 5.(I 3 GHz 63 dBm	Auto Tune
10.0	1						<u>.</u>	Center Freq 6.50000000 GHz
-10.0							-14.37 dBm	Start Freq 1.000000000 GHz
-20.0								Stop Freq 12.000000000 GHz
-40.0			u se anna an a					CF Step 1.100000000 GHz <u>Auto</u> Man
-60.0					an a	(produkter og skriver) generalet besteret		Freq Offset 0 Hz
Start 1.000 #Res BW 1	I GHz 100 kHz	#VBW	1.0 MHz		Sweep	Stop 12. 1.02 s (1	.000 GHz 0001 pts)	
MSG Points	s changed; all tr m Analyzer - Swer	aces cleared			STATUS			

Agilen	nt Spectrum #	Analyzer - Sw	vept SA								
Cen	L Iter Fred	RF 50 ແ 18.500	2 AC	GHz	SE	NSE:INT	Avg Type	ALIGNAUTO : Log-Pwr	05:41:14 P TRAC	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 di	B/div R	ef 20.00	PI IFC dBm	NO: Fast 🦕 Gain:Low	┘ Trig: Free Atten: 30	dB		Mkr	۲۷۴ 1 23.71 -41.3	5 6 GHz 31 dBm	Auto Tune
10.0											Center Freq 18.50000000 GHz
0.00 -10.0										-14.37 dBm	Start Freq 12.000000000 GHz
-20.0 -30.0											Stop Freq 25.000000000 GHz
-40.0 -50.0			an en al al al an	Linear and Linear and			ر المراجع المراجع				CF Step 1.30000000 GHz <u>Auto</u> Man
-60.0	a an an the second second		and in the second second								Freq Offset 0 Hz
-70.0 Star #Re	t 12.000 s BW 100	GHz 0 kHz		#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
MSG	₽File <lm< td=""><td>age.png> s</td><td>aved</td><td></td><td></td><td></td><td></td><td>STATUS</td><td></td><td></td><td></td></lm<>	age.png> s	aved					STATUS			



Agilen	t Spectru	m Analyzer - Sw	rept SA								
Cen	ter Fre	eq 515.00	2 AC 100000 MH	Z	SEI	NSE:INT	Avg Type	ALIGNAUTO : Log-Pwr	05:47:09 F TRAC TYF	M Jun 01, 2012 E 1 2 3 4 5 6 E M WWWWW	Frequency
10 dE	3/div	Ref 20.00	ı⊧ dBm	Gain:Low	Atten: 30	dB		Mkr	⊓ 1 977.9 -54.	81 MHz 11 dBm	Auto Tune
10.0								0			Center Freq 515.000000 MHz
0.00 -10.0										-13.99 dBm	Start Freq 30.000000 MHz
-20.0										415.55 dbin	Stop Freq 1.00000000 GHz
-30.0											CF Step 97.000000 MHz
-50.0	Michael	maglicensed	- Completing and	a alta	and the state of the	stheshipping	ing house of the first test to a track		l Charlen an Anna an An	a ana las diana lai.	Freg Offset
-80.0	an thigh before the factor										0 Hz
Star #Re:	t 30.0 s BW 1	MHz 00 kHz	aved	#VBW	1.0 MHz			Sweep 9	Stop 1.0 0.0 ms (1	0000 GHz 0001 pts)	

Channel 06 (2437MHz)





Agilent Spectru	m Analyzer - Swe	pt SA							
Center Fre	RF 50 Ω eq 18.5000	AC 000000 GHz	SEI		Avg Type	ALIGNAUTO : Log-Pwr	05:47:40 P TRAC	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 20.00 d	IFGain:Low	Atten: 30	dB		Mkr	_{DE} 1 23.631 -41.3	3 9 GHz 38 dBm	Auto Tune
10.0									Center Freq 18.500000000 GHz
-10.0								-13.99 dBm	Start Freq 12.000000000 GHz
-20.0 -30.0									Stop Freq 25.000000000 GHz
-40.0				ang sa Para Julia da sa	The state of the state of the	tan tan ¹⁸ bilia serias			CF Step 1.30000000 GHz <u>Auto</u> Man
-60.0									Freq Offset 0 Hz
-70.0 Start 12.00 #Res BW 1	0 GHz 00 kHz	#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
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Agilent Spectrum Analyzer - Swept SA XI RL UTO 05:58:38 PM Jun 01, 2012 SENSE:INT ALIGN A Frequency Center Freq 515.000000 MHz Avg Type: Log-Pwr TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N Trig: Free Run PNO: Fast 🖵 IFGain:Low Atten: 30 dB Auto Tune Mkr1 974.586 MHz -53.42 dBm 10 dB/div Log Ref 20.00 dBm **Center Freq** 10.0 515.000000 MHz 0.00 Start Freq 30.000000 MHz -10.0 -13.34 dBr -20.0 Stop Freq 1.000000000 GHz -30.0 CF Step 97.000000 MHz -40.0 Auto Man • -50.0 **Freq Offset** -60.0 0 Hz -70.0 Start 30.0 MHz Stop 1.0000 GHz #Res BW 100 kHz #VBW 1.0 MHz Sweep 90.0 ms (10001 pts) мsg 🔱 File <lmage.png> saved STATUS

Channel 11 (2462MHz)





Agilent Spectrum	n Analyzer - Swe	ept SA								
Center Fre	RF 50 Ω cq 18.500	AC 000000 G	Hz	SE		Avg Type	ALIGNAUTO : Log-Pwr	05:59:09 P TRAC	M Jun 01, 2012	Frequency
10 dB/div	Ref 20.00 c	IFGa IFGa): Fast () iin:Low	Atten: 30	dB		Mkr	^{DE} 1 23.511 -41.2	I 5 GHz 22 dBm	Auto Tune
10.0									¢	Center Freq 18.50000000 GHz
-10.0									-13.34 dBm	Start Freq 12.000000000 GHz
-20.0										Stop Freq 25.000000000 GHz
-40.0					A Jacob Hall	and the second				CF Step 1.300000000 GHz <u>Auto</u> Man
-60.0	n Maria ang Pangan Ang Pang Pangan Ang Pang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pang Pangan Ang Pang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan Ang Pangan									Freq Offset 0 Hz
-70.0 Start 12.000 #Res BW 10	0 GHz 00 kHz		#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
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Product	:	HD Streaming Player
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

Channel 01 (2412MHz)

Agilent Spectr	um Analyzer - Sw	rept SA								
Center Fi	req 515.00	AC	z		NSE:INT	Avg Type	ALIGNAUTO : Log-Pwr) 06:06:45 F TRA(M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 20.00	P IF⊓ dBm	NO: Fast 😱 Gain:Low	Atten: 30	dB		Mk	kr1 785.7 -55.	27 MHz 26 dBm	Auto Tune
10.0										Center Freq 515.000000 MHz
-10.0										Start Freq 30.000000 MHz
-20.0									-21 03 dBm	Stop Freq 1.000000000 GHz
-40.0								1		CF Step 97.000000 MHz <u>Auto</u> Man
-60.0	han blant och ditterne bisk skore	l no hitta dista	a Harad Jahar Harag Analas an Analas an A	Principalitati Andri Alt Manadora di Antra Santa	line line to be	ny pakasahi di kaupas Manana manananya	discontrated	Read I was by Athena		Freq Offset 0 Hz
-70.0 Start 30.0 #Res BW	MHz 100 kHz		#VBW	1.0 MHz			Sweep	Stop 1.0 90.0 ms (1	0000 GHz 0001 pts)	
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Agilen	t Spectru	ım Analyz	er - Swep	ot SA								
Cen	ter Fr	eq 6.	50 Ω 50000	AC 0000 G	iHz	SEI	NSE:INT	Avg Typ	alignauto e: Log-Pwr	06:06:15 F	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dE	3/div	Ref 20	0.00 di	P IF Bm	NO: Fast 🖵 Gain:Low	Atten: 30	dB		Mk	r1 2.410 -1.1	0 2 GHz 03 dBm	Auto Tune
10.0			1									Center Freq 6.50000000 GHz
0.00 -10.0		•	-									Start Freq 1.000000000 GHz
-20.0 -30.0											-21.03 dBm	Stop Freq 12.000000000 GHz
-40.0												CF Step 1.100000000 GHz <u>Auto</u> Man
-50.0 -60.0		المليب				Property of the second s	l d'ann a taobh a suid a t Tabha an taonn taong a			ar line service sources	Applet by a probably preserving program	Freq Offset 0 Hz
-70.0 Star	t 1.000) GHz								Stop 12	.000 GHz	
#Res	S BW '	100 kH s change	z ed; all tr	aces clea	#VBW	1.0 MHz			Sweep STATUS	1.02 s (1	0001 pts)	

Agiler	nt Spectru	ım Analyzer - S	wept SA								
Cen	L Iter Fr	RF 50 eq 18.50	Ω AC 0000000	GHz	SB Tria: Free		Avg Type	ALIGNAUTO : Log-Pwr	06:07:16 F TRAC TYF	M Jun 01, 2012 E 1 2 3 4 5 6 E M WWWWW	Frequency
10 di	B/div	Ref 20.00	dBm	Gain:Low	Atten: 30	dB		Mkr	1 23.65 -39.	7 1 GHz 88 dBm	Auto Tune
10.0											Center Freq 18.500000000 GHz
0.00 -10.0											Start Freq 12.000000000 GHz
-20.0 -30.0										-21.03.dBm	Stop Freq 25.000000000 GHz
-40.0					1. 1. 1.		June of a Charles	la national de la competition			CF Step 1.30000000 GHz <u>Auto</u> Man
-50.0 -60.0			rap and a state bary pairs			riado di Mendi, grafilita a					Freq Offset 0 Hz
-70.0 Star #Re	t 12.00	00 GHz 100 kHz		#VBW	1.0 MHz			Sweep	Stop 25	.000 GHz	
MSG 🤇	↓ File <	lmage.png>	saved					STATUS			



Agilen	it Spectr	um An	alyzer - Sv	vept SA									
Cen	∟ iter Fi	RF req	50 s	2 AC	MHz	East 🕟	SE Trig: Free	NSE:INT	Avg Type	ALIGNAUTO : Log-Pwr	06:15:03 F TRAC TYI	M Jun 01, 2012 E 1 2 3 4 5 6 E MWWWWW	Frequency
10 dE	3/div	Rei	f 20.00	dBm	IFGai	n:Low	Atten: 30	dB		Mk	¤ 1 917.6 -55.0	47 MHz 66 dBm	Auto Tune
10.0													Center Freq 515.000000 MHz
0.00 -10.0													Start Freq 30.000000 MHz
-20.0 -30.0												-20.16 dBm	Stop Freq 1.000000000 GHz
-40.0 -50.0												 1	CF Step 97.000000 MHz <u>Auto</u> Man
-60.0	ի _{պարու} հունո	y apist (al a de la caracita d			na ing kabula kabula Kabula ng kabula kabu		and a set of				Freq Offset 0 Hz
-70.0 Star #Re:	t 30.0 s BW	MH: 100	z kHz			#VBW	1.0 MHz			Sweep !	Stop 1.0 90.0 ms (1	0000 GHz 0001 pts)	
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Channel 06 (2437MHz)





Agilent Spectrun	n Analyzer - Swe	pt SA							
Center Fre	RF 50 Ω 50 Ω	AC 000000 GHz	SEI		Avg Type	ALIGNAUTO : Log-Pwr	06:15:34 F TRAC	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 20.00 d	IFGain:Low	Atten: 30	dB		Mkr	^{Dr} 1 23.621 -40.1	B 5 GHz 5 dBm	Auto Tune
10.0			2						Center Freq 18.50000000 GHz
-10.0									Start Freq 12.000000000 GHz
-20.0								-20.16 dBm	Stop Freq 25.00000000 GHz
-40.0				Institute and the	allela del constituto				CF Step 1.300000000 GHz <u>Auto</u> Man
-60.0									Freq Offset 0 Hz
-70.0 Start 12.00 #Res BW 1	0 GHz 00 kHz	#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
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Agilen	t Spectru	m Analyzer - S	wept SA								
Cen	ter Fre	RF 50 eq 515.0	Ω AC 00000 MH P	Z NO: Fast 😱	SEI	NSE:INT	Avg Type	ALIGNAUTO : Log-Pwr	06:22:33 P TRAC TYP	M Jun 01, 2012 E 1 2 3 4 5 6 E MWWWWWW	Frequency
10 de	3/div	Ref 20.00	⊫ dBm	Gain:Low	Atten: 30	dB		Mki	1 886.8 -54.:	01 MHz 22 dBm	Auto Tune
10.0											Center Freq 515.000000 MHz
0.00 -10.0											Start Freq 30.000000 MHz
-20.0 -30.0										-20.33 dBm	Stop Freq 1.000000000 GHz
-40.0										1	CF Step 97.00000 MHz <u>Auto</u> Man
-60.0	r Hanny Nevlan Generation and	an chi hati sa	and the lay of the last of the	ll man e failellair	and the special fi	ni, dale di	100 de la personation persona a constitución de la constitu a constitución de la constitución de			n far fill an populit fir. Met fill an populit fir.	Freq Offset 0 Hz
-70.0 Star	t 30.0 l	VIHz							Stop 1.0	0000 GHz	
#Re: мsg 🤇	s BW 1	00 kHz mage.png>	saved	#VBW	1.0 MHz		5	Sweep 9	0.0 ms (1	0001 pts)	

Channel 11 (2462MHz)





Agilent Spectrum A	nalyzer - Swept SA						22		
Center Freq	F 50 Ω AC 18.50000000	0 GHz			Avg Type	LIGNAUTO	06:23:03 P TRAC TYF	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/div Re	ef 20.00 dBm	IFGain:Low	Atten: 30	dB		Mkr	_{De} 1 24.910 -40.5	6 8 GHz 90 dBm	Auto Tune
10.0									Center Freq 18.500000000 GHz
-10.0									Start Freq 12.000000000 GHz
-20.0								-20.33 dBm	Stop Freq 25.000000000 GHz
-40.0			na tijetilo par bilet		e dan sebat sebat seb	and HAN Star Pelloop			CF Step 1.30000000 GHz <u>Auto</u> Man
-60.0									Freq Offset 0 Hz
-70.0 Start 12.000 0 #Res BW 100	GHz kHz	#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
мsg 🗼 File <ima< td=""><td>ge.png> saved</td><td></td><td></td><td></td><td></td><td>STATUS</td><td></td><td></td><td></td></ima<>	ge.png> saved					STATUS			

Product	:	HD Streaming Player
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel 01 (2412MHz)

Agilent Sp	ectrum An	alyzer - Swe	ept SA								
Center	r Freq	50 Ω 515.00	AC 0000 MH	z	SEI		Avg Type	ALIGNAUTO : Log-Pwr	06:30:26 F TRA	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/di	v Rei	f 20.00 c	PI IFC IBm	NO: Fast 🖵 Gain:Low	Atten: 30	dB		Mk	r1 954.6 -54.	04 MHz 84 dBm	Auto Tune
10.0											Center Freq 515.000000 MHz
0.00											Start Freq 30.000000 MHz
-20.0										-19.00 dBm	Stop Freq 1.000000000 GHz
-40.0										1_	CF Step 97.000000 MHz <u>Auto</u> Man
-60.0 🗰	aldestation (a lege til er fan an besen til Den sen seg er sen seg er til se		whet the process	polo a duba sedar		() I produced by		Freq Offset 0 Hz
-70.0	0.0 MU	7							Stop 1		
#Res B	W 100	د kHz		#VBW	1.0 MHz		į	Sweep	90.0 ms (1	0001 pts)	
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Page : 48 of 89



Agilent Spectru	ım Analyzer - Sw	vept SA							
Center Fr	RF 50 Ω eq 6.5000	2 AC 000000 GHz	SE Tria: Eros		Avg Type	ALIGNAUTO : Log-Pwr	06:29:55 F	M Jun 01, 2012	Frequency
10 dB/div	Ref 20.00	PNO: Fast C	Atten: 30	dB		Mk	r1 2.400 1.1	6 9 GHz 00 dBm	Auto Tune
10.0	1								Center Freq 6.50000000 GHz
-10.0									Start Freq 1.000000000 GHz
-20.0								-19.00 dBm	Stop Freq 12.000000000 GHz
-40.0			a)						CF Step 1.10000000 GHz <u>Auto</u> Man
-60.0	Marine Marine			And Description of the State of		ahla _{tere} nediya talayi bad _M ha da anatan bahtum	y de constant de la constante de constantes de	n an faile a least diff Genetitie plantificatie	Freq Offset 0 Hz
-70.0 Start 1.000 #Res BW 1) GHz 100 kHz	#VBW	/ 1.0 MHz			Sweep	Stop 12 1.02 s (1	.000 GHz 0001 pts)	
мsg 🗼 Points	s changed; all	traces cleared				STATUS			

Agiler	nt Spectri	um Analyzer - S	Swept SA								
Cen	∟ nter Fr	RF 50 req 18.50	Ω AC	GHz	SE Trig: Free	NSE:INT	Avg Type	ALIGNAUTO :: Log-Pwr	06:30:57 F TRAC TYI	M Jun 01, 2012 E 1 2 3 4 5 6 E M WWWWWW	Frequency
10 di	B/div	Ref 20.00) dBm	NU: Fast 🕞 Gain:Low	Atten: 30	dB		Mkr	⊓ 1 23.71 -40.	5 6 GHz 59 dBm	Auto Tune
10.0											Center Freq 18.500000000 GHz
0.00 -10.0											Start Freq 12.000000000 GHz
-20.0										-19.00 dBm	Stop Freq 25.00000000 GHz
-40.0					June Jacob	and a state	tereformen et ^{bla} l pe (114 det	and the second	. In the second second		CF Step 1.300000000 GHz Auto Man
-50.0 -60.0	a parala bar ana di kasi					n hits an		n a stat fill de stat a a			Freq Offset
-70.0											0 112
Star #Re	t 12.0 s BW	00 GHz 100 kHz		#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
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Agilent Spectrum Analyzer - Swept SA											
Cen	ter Fre	eq 515.00	Ω AC D0000 MH P	Z NO: Fast	Trig: Free	NSE:INT	Avg Type	LIGNAUTO	06:37:29 F TRAC TYF	M Jun 01, 2012 E 1 2 3 4 5 6 E M WWWWW	Frequency
10 dE	IFGain:Low Atten: 30 dB DET/P NNNNN 0 dB/div Ref 20.00 dBm -55.28 dBm										Auto Tune
10.0											Center Freq 515.000000 MHz
0.00 -10.0											Start Freq 30.000000 MHz
-20.0 -30.0										-19.50 dBm	Stop Freq 1.000000000 GHz
-40.0											CF Step 97.000000 MHz <u>Auto</u> Man
-60.0	erest actions purposed and	i na disean in an a fi	as senten en ment	a da any filipena ang ang ang ang ang ang ang ang ang a	nd all an third at the	needille sygnitice Second Construction		l ny finansy kantangan Manganangan	Communi Mati	er mit and all all all and an	Freq Offset 0 Hz
-70.0 Star	t 30.0 l	MHz		<i>#</i>					Stop 1.0	0000 GHz	
#KC	5 677 1 File <	mage.png> s	saved	#vBW	1.0 WIHZ		,	Sweep 9 STATUS	u.u ms (1	0001 pts)	

Channel 06 (2437MHz)





Agilen	t Spectru	m Analyzer - Sv	vept SA	-							
Cen	ter Fr	eq 18.500	2 AC	GHz			Avg Type	LIGNAUTO	06:38:00 P TRAC TYF	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dE	3/div	Ref 20.00	ہ IFO dBm	NO: Fast 🖵 Gain:Low	Atten: 30	dB		Mkr	^{DE} 1 23.57 -41.	5 2 GHz 15 dBm	Auto Tune
10.0											Center Freq 18.50000000 GHz
0.00 -10.0											Start Freq 12.000000000 GHz
-20.0 -30.0										-19.50 dBm	Stop Freq 25.00000000 GHz
-40.0 -50.0		And also				Vakillange, Filitie		a tan ini ini ang			CF Step 1.300000000 GHz <u>Auto</u> Man
-60.0	a glastyn stals an or fer the second										Freq Offset 0 Hz
-70.0 Star #Re:	t 12.00 s BW 1	0 GHz 00 kHz		#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
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Agilen	nt Spectrum A	nalyzer - Swe	ept SA								
LXI R	L R	F 50 Ω	AC		SEI	NSE:INT	A	ALIGNAUTO	06:44:51 F	M Jun 01, 2012	Frequency
Cen	Center Freq 515.000000 MHZ PNO: Fast IFGain:Low				Trig: Free Atten: 30	e Run dB	AVg Type	: Log-Pwr	TYP	TYPE MWWWWW DET P N N N N N	
10 di Log	B/div Re	ef 20.00 c	IBm					Mk	r1 964.4 -55.	98 MHz 27 dBm	Auto Tune
											Center Freq
10.0											515.000000 MHz
0.00											Start Freq
-10.0											30.000000 MHz
-20.0						-				-18.88 dBm	01 E
											1.000000000 GHz
-30.0											
-40.0									-		CF Step
											97.000000 MHz <u>Auto</u> Man
-50.0						G.	× 51	1000	25 30	\bullet^1	
-60.0	and the langest	and a full second and for a presented of the second		Margan & Leonateshik Margan & Leonateshik	lailea fallaighteiltig Aisigt San Smithilitig		onted a diagonal plants Aparticipation and a state	lang period a la barrier Protección especial	aland pendatifadi		Freq Offset
											0 Hz
-70.0											
Star	t 30.0 MH	Iz	1		1450 - 1842-1710 (1712)			I	Stop 1.0	0000 GHz	
#Re	s BW 100	kHz		#VBW	1.0 MHz		9	Sweep 9	90.0 ms (1	0001 pts)	
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Channel 11 (2462MHz)

Agilent Spectrum A	nalyzer - Swept SA								
Center Freq	F 50 Ω AC	GHz	SEI	NSE:INT	Avg Type	ALIGNAUTO : Log-Pwr	06:44:20 F	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dB/div Re	ef 20.00 dBm	PNO: Fast 🆵 IFGain:Low	Atten: 30	dB		Mk	r1 2.46 1.	4 1 GHz 12 dBm	Auto Tune
10.0	▲ ¹		,						Center Freq 6.500000000 GHz
-10.0									Start Freq 1.000000000 GHz
-20.0								-18.88 dBm	Stop Freq 12.000000000 GHz
-40.0									CF Step 1.100000000 GHz <u>Auto</u> Man
-60.0			a men literi maya lan			disperies and and	nggan ^{ta} tag ^{an} awanah Jawanahan minaka	and Proved Jacobia Hall And De angle Antonia Salayan Antonia Angle Antonia Salayan Antonia Sa	Freq Offset 0 Hz
-70.0 Start 1.000 G	Hz					Not	Stop 12	.000 GHz	
#Res BW 100	kHz anged; all traces c	#VBW leared	1.0 MHz			Sweep STATUS	1.02 s (1	0001 pts)	



Agilen	t Spectrur	n Analyzer - Sw	rept SA								
Cen	ter Fre	RF 50 Ω eq 18.500	AC 000000	GHz	SE		Avg Type	LIGNAUTO	06:45:23 P TRAC	M Jun 01, 2012 E 1 2 3 4 5 6	Frequency
10 dE	3/div	Ref 20.00 (dBm	NO: Fast 🖵 Gain:Low	Atten: 30	dB		Mkr	^{DE} 1 23.607 -40.1	7 7 GHz 84 dBm	Auto Tune
10.0			0		à						Center Freq 18.50000000 GHz
0.00 -10.0											Start Freq 12.000000000 GHz
-20.0 -30.0										-18.88 dBm	Stop Freq 25.000000000 GHz
-40.0 -50.0					and a second of the second				الله المراجل		CF Step 1.30000000 GHz <u>Auto</u> Man
-60.0	andersde <mark>stand ^{den} sond</mark> andersde ferfense										Freq Offset 0 Hz
-70.0 Star #Re:	t 12.00 s BW 1	0 GHz 00 kHz		#VBW	1.0 MHz			Sweep	Stop 25 1.20 s (1	.000 GHz 0001 pts)	
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