

Product Name	WHDI Rx board	
Model No	WV301A	
FCC ID	PPQ-WV301A	

Applicant	LITE-ON TECHNOLOGY CORP.
Address	4F, 90, Chien 1 Road, Chung Ho, Taipei Hsien 235, Taiwan, R.O.C.

Date of Receipt	Sep. 16, 2011
Issued Date	Oct. 14, 2011
Report No.	119322R-RFUSP32V01
Report Version	V1.0

The test results relate only to the samples tested.

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Test Report Certification

Issued Date: Oct. 14, 2011 Report No.: 119322R-RFUSP32V01



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name	WHDI Rx board		
Applicant	LITE-ON TECHNOLOGY CORP.		
Address	4F, 90, Chien 1 Road, Chung Ho, Taipei Hsien 235, Taiwan, R.O.C.		
Manufacturer	DONG GUAN G-COM COMPUTER CO., LTD		
Model No.	WV301A		
FCC ID.	PPQ-WV301A		
EUT Rated Voltage	DC 5V		
EUT Test Voltage	AC 120V/60Hz		
Trade Name	LITE-ON		
Applicable Standard	FCC CFR Title 47 Part 15 Subpart E: 2010		
	ANSI C63.4: 2009, KDB-789033		
Test Result	Complied		

The Test Results relate only to the samples tested.

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Approved By

(Manager / Vincent Lin)



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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	WHDI Rx board	
Trade Name	LITE-ON	
FCC ID.	PPQ-WV301A	
Model No.	WV301A	
Frequency Range	20MHz-BW: 5180-5240MHz; 40MHz-BW: 5190-5230MHz	
Number of Channels	20MHz-BW: 4; 40MHz-BW: 2	
Data Rate	20MHz mode: 30kbps, 40MHz mode: 60kbps	
Channel Control	Auto	
Type of Modulation	OFDM	
Antenna type	Printed on PCB (PIFA)	
Antenna Gain	Refer to the table "Antenna List"	
Power Adapter	MFR: Asian, M/N: WA-15C05R	
	Input: AC 100-240V, 50-60Hz, 0.5A Max.	
	Output: DC 5V, 3A	
	Cable Out: Shielded, 1.5m, with one ferrite core bonded.	

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	LITE-ON	N/A	2dBi for 5GHz

Note: The antenna of EUT is conform to FCC 15.203

20MHz Center Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 36:	5180 MHz	Channel 40:	5200 MHz	Channel 44:	5220 MHz	Channel 48:	5240 MHz

40MHz Center Working Frequency of Each Channel:ChannelFrequencyChannel 38:5190 MHzChannel 46:5230 MHz

- 1. This device is a WHDI Rx board with a built-in and 5GHz WLAN transceiver.
- 2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- 3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.
- 4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

1.2. Operational Description

The EUT is a Full HD Video Wireless Receiver Module with a built-in 5GHz transceiver, together with Full HD Video Wireless Transmitter Module. It has a MISO design of five channel and one slow rate output wireless channel, which generates an upstream channel for data content transmissions.

The data modulation is OFDM, using five antennas to support 1(Transmit) * 5(Receive) technology. The device only provided one transmitting speed 30kbps in 20MHz bandwidth mode and 60kbps in 40MHz bandwidth mode.

Presents the ultimate solution for converting any High Definition (HD) system, including Full HD, into a wireless one. These add-on modules enable wireless A/V applications that fit easily into the living room and eliminate traditional A/V wiring. The perfect HD video and audio quality and the high robustness are unmatched by any other wireless technology and present a true alternative to cable. The WHDI system transmits uncompressed video and audio streams wirelessly and thus simplifies and eliminates system issues, such as: lip-sync, large buffers and other burdens like retransmissions or error propagation.

The device can receive audio and video signal from associate equipment, device will transmit signal to request associate equipment change transmission frequency. The IC AMN2220 WHDI baseband receiver chip is the heart of the WV301A WHDI Receiver module. The AMN2220 interfaces the A/V sink through the WHDI connector and is controlled by the internal MAC uC. The AMN2220 is based on MIMO technology receiving up to five input channels. Five analog-to-digital converters and one digital-to-analog converter are embedded within the chip.

The AMN2220 internal PLL accepts an input clock frequency of 40MHz. The input frequency is multiplied and then used as an internal system clock. The IC AMN3210 is a fully-integrated Zero-IF MIMO receiver specifically designed for WHDI applications using OFDM modulation for single-band 5.15 -5.25GHz and 5.725 - 5.85 GHz. The device consists of:

- Five Complete Downlink Zero-IF Receivers.
- One Uplink Direct Conversion Transmitter.
- Integrated Synthesizer/VCO.
- Internal DC Servo Loops.
- RSSI, RF and Baseband Control Interface.
- Power Management Unit.
- 3-Wire SPI Interface.

To complete the RF front-end solution, the AMN3210 uses external PA, RF Band Pass Filters (BPF), RF BALUNs and a few passive components.

Test Mode	Mode 1: Transmit - 20BW
	Mode 2: Transmit - 40BW

QuieTer

1.3. Tested System Datails

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
(1)	Notebook PC	DELL	РРТ	N/A	Non-Shielded, 0.8m
(2)	Monitor	LG	W2261VT	907YHZK07373	Non-Shielded, 1.8m
(3)	DVD ROM	DELL	PD01S	03029	N/A
(4)	Modem	ACEEX	DM-1414	0102027550	Non-Shielded, 1.8m
(5)	Microphone &	Ergotech	ET-E201	N/A	N/A
	Earphone				

Signal Cable Type		Signal cable Description	
Α	VGA Cable	Shielded, 1.8m, with two ferrite cores bonded.	
в	HDMI Cable	Shielded, 1.2m	
С	USB Cable	Shielded, 1.2m	
D	DVD ROM Cable	Shielded, 0.6m	
Е	Modem Cable	Non-Shielded, 1.8m	
F	Microphone & Earphone Cable	Non-Shielded, 1.0m	



1.4. Configuration of tested System

1.5. EUT Exercise Software

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

1.6. **Test Facility**

Ambient conditions in the laboratory:

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

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : <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 : http://www.quietek.com/

Site Description: File on

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

Accreditation on NVLAP NVLAP Lab Code: 200533-0





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

FCC Accreditation Number: TW1014



2. Conducted Emission

2.1. Test Equipment

	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., 2011	Peripherals
Х	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2011	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2011	EUT
Х	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2011	
	No.8 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	AV			
0.15 - 0.50	66-56	56-46			
0.50-5.0	56	46			
5.0 - 30	60	50			

Remarks : In the above table, the tighter limit applies at the band edges.

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: 2009 on conducted measurement.

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

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

Product	:	WHDI Rx board
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Mode	:	Mode 2: Transmit - 40BW (5190MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.189	9.714	51.040	60.754	-4.132	64.886
0.263	9.667	41.220	50.887	-11.884	62.771
0.341	9.650	38.480	48.130	-12.413	60.543
0.447	9.640	37.500	47.140	-10.374	57.514
0.736	9.636	40.200	49.836	-6.164	56.000
15.216	9.990	32.980	42.970	-17.030	60.000
Average					
0.189	9.714	34.700	44.414	-10.472	54.886
0.263	9.667	27.050	36.717	-16.054	52.771
0.341	9.650	26.380	36.030	-14.513	50.543
0.447	9.640	26.270	35.910	-11.604	47.514
0.736	9.636	28.930	38.566	-7.434	46.000
15.216	9.990	24.970	34.960	-15.040	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

-

Product	: WHDI	: WHDI Rx board					
Test Item	: Conduc	: Conducted Emission Test					
Power Line	: Line 2						
Test Mode	: Mode 2	2: Transmit - 40BW	/ (5190MHz)				
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBuV	dBuV	dB	dBuV		
LINE 2							
Quasi-Peak							
0.185	9.727	47.360	57.088	-7.912	65.000		
0.255	9.683	41.420	51.102	-11.898	63.000		
0.349	9.657	41.800	51.457	-8.857	60.314		
0.455	9.641	40.540	50.181	-7.105	57.286		
0.732	9.655	41.400	51.055	-4.945	56.000		
15.033	10.000	33.180	43.180	-16.820	60.000		
Average							
0.185	9.727	28.350	38.078	-16.922	55.000		
0.255	9.683	26.590	36.272	-16.728	53.000		
0.349	9.657	27.250	36.907	-13.407	50.314		
0.455	9.641	29.620	39.261	-8.025	47.286		
0.732	9.655	33.510	43.165	-2.835	46.000		
15.033	10.000	24.590	34.590	-15.410	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 Transmit Power

3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Х	Power Meter	Anritsu	ML2495A/6K00003357	May, 2011
Х	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011
Note	2:			

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

26dBc Occupied Bandwidth



Conduction Power Measurement



3.3. Limits

- (1) For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (2) For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (3) For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1W or 17 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

3.4. Test Procedur

As an alternative to KDB-789033, the EUT peak power was measured with a peak power meter employing a video bandwidth greater than 6dB BW of the emission under test. Peak output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the limitations of KDB-789033, and provides more accurate measurements.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Transmit Power

Product	:	WHDI Rx board
Test Item	:	Peak Transmit Power
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW

Peak Transmit Power Measurement:

Channel Number	Frequency	26dB Bandwidth	Output Power	Output Power Limit	
	(MHz)	(MHz)	(dBm)	(dBm)	dBm+10log(BW)
36	5180	20.40	13.75	17	17.10
44	5220	20.40	14.01	17	17.10
48	5240	20.35	14.43	17	17.09

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

26dBc Occupied Bandwidth:

Channel 36

Agilent Spectrum Analyzer - Swept SA				
222 RL RF 50Ω AC Center Freq 5.180000000 GHz	SENSE:INT	ALIGNAUTO #Avg Type: Log-Pwr	07:08:14 PM Oct 05, 2011 TRACE 1 2 3 4 5 6	Frequency
PNO: IFGair 10 dB/div Ref 20.00 dBm	Fast C High Free Run :Low Atten: 30 dB	Mkr2	5.179 125 GHz -1.72 dBm	Auto Tune
Log 10.0 0.00 -10.0	Newwww.	hoffer for the formation of the formatio	- AND	Center Freq 5.180000000 GHz
-20.0 -30.0 MMAU -40.0			MAN HUMAN	Start Freq 5.167500000 GHz
-50.0				Stop Freq 5.192500000 GHz
Center 5.18000 GHz #Res BW 1.0 MHz MXR MODE TRE SCL X 1 N 1 f 5.174 200 G	#VBW 3.0 MHz	#Sweep	Span 25.00 MHz 500 ms (1001 pts) FUNCTION VALUE	CF Step 2.500000 MHz <u>Auto</u> Man
2 N 2 f 5.179 125 G 3 - </td <td>Hz -1.72 dBm</td> <td></td> <td></td> <td>Freq Offset 0 Hz</td>	Hz -1.72 dBm			Freq Offset 0 Hz
7				
MSG		STATUS	<u> </u>	1

26dBc Occupied Bandwidth:

Channel 44

Agilent Spectrum Analyzer - S	wept SA				
Center Freq 5.220	Ω AC 000000 GHz	SENSE:INT	ALIGNAUTO #Avg Type: Log-Pwr	07:17:43PM Oct 05, 2011 TRACE 1 2 3 4 5 6 TYPE MMMMMMMM	Frequency
10 dB/div Ref 20.00	IFGain:Low	Atten: 30 dB	Mkr2	5.220 725 GHz -1.50 dBm	Auto Tune
10.0 -10.0	1 hogingtook/north/homonorodoco	production and and and and and and and and and an	ard of a state of the state of	- WM and WALL	Center Freq 5.220000000 GHz
-20.0 -30.0 -40.0				Window when	Start Freq 5.207500000 GHz
-50.0					Stop Freq 5.232500000 GHz
Center 5.22000 GHz #Res BW 1.0 MHz	#VBV	V 3.0 MHz	#Sweep	Span 25.00 MHz 500 ms (1001 pts) FUNCTION VALUE	CF Step 2.500000 MHz Auto Man
1 N 1 f 2 N 2 f 3	5.214 075 GHz 5.220 725 GHz	10.16 dBm -1.50 dBm			Freq Offset 0 Hz
MSG 🧼 Alignment Comple	eted		STATUS	5	I

26dBc Occupied Bandwidth:

Channel 48

Agilent Spectrum An	alyzer - Swept SA				
Center Freq	50 Ω AC 5.240000000 GHz	SENSE:INT	ALIGN AUTO #Avg Type: Log-Pwr	07:22:08 PM Oct 05, 2011 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Re	PNO: Fas IFGain:Lo f 20.00 dBm	t 🖵 Trig:Free Run w Atten: 30 dB	Mkr2	5.240 650 GHz -1.29 dBm	Auto Tune
Log 10.0 0.00 -10.0	1 per per and a second	any my Min fun and an and a	าสมุของการต่างสามารถสามารถสามารถสา	MANNING WIN	Center Freq 5.240000000 GHz
-20.0				Martan .	Start Freq 5.227500000 GHz
-60.0					Stop Freq 5.252500000 GHz
Center 5.2400 #Res BW 1.0	0 GHz MHz #\	/BW 3.0 MHz	#Sweep :	Span 25.00 MHz 500 ms (1001 pts)	CF Step 2.500000 MHz Auto Man
1 N 1 f 2 N 2 f 3 - - - 4 - - - 5 - - - 6 - - - - 7 - - - - - 9 -	5.234 100 GHz 5.240 650 GHz	10.76 dBm -1.29 dBm			Freq Offset 0 Hz

Product	:	WHDI Rx board
Test Item	:	Peak Transmit Power
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW

Peak Transmit Power Measurement:

Channel Number	Frequency	26dB Bandwidth	Output Power	Output Power Limit	
	(MHz)	(MHz)	(dBm)	(dBm)	dBm+10log(BW)
38	5190	39.25	14.06	17	19.94
46	5230	39.40	14.50	17	19.95

- 1. Power Output Value = Reading value on peak power meter + cable loss
- 2. Output Power (dBm) = 10LOG (Chain A Power (mW)+ Chain B Power (mW)

26dBc Occupied Bandwidth:

Channel 38

Agilent Spectrum Analyzer - Swept SA									
222 RL RF 50 Ω AC Center Freq 5.190000000 GH	Z SENSE:IN	ALIGN AUTO #Avg Type: Log-Pwr	07:54:10 PM Oct 05, 2011 TRACE 1 2 3 4 5 6	Frequency					
PNG IFGa 10 dB/div Ref 20.00 dBm	PNO: Fast Trig: Free Run IFGain:Low Atten: 30 dB Mkr2 5.190 90 GHz -3.34 dBm								
Log 10.0 0.00 -10.0		urrilellattenserieserieserieserieseriese		Center Freq 5.190000000 GHz					
-20.0 -30.0 -40.0			Y William Concernen	Start Freq 5.165000000 GHz					
-50.0 -60.0 -70.0				Stop Freq 5.215000000 GHz					
Center 5.19000 GHz #Res BW 1.0 MHz MKR MODE TRO SCL X 1 N 1 f 5.18150	#VBW 3.0 MHz	#Sweep	Span 50.00 MHz 500 ms (1001 pts) FUNCTION VALUE	CF Step 5.000000 MHz <u>Auto</u> Man					
2 N 2 f 5.190 90 3 4 5 6 6 8	GHz -3.34 dBm			Freq Offset 0 Hz					
7 8 9 10 11 12									
MSG	L. I	STATUS							

26dBc Occupied Bandwidth:

Channel 46

Agilent Spectrum Analyzer - Swept SA				
M RL RF 50 Ω AC Center Freq 5.230000000 GHz	SENSE:INT	ALIGNAUTO (TRACE 1 2 3 4 5 6	Frequency
PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB	Mkr2 5	5.230 85 GHz -3.46 dBm	Auto Tune
10.0 0.00 -10.0	plantand any and any and any and	full-anti-pre-monatively about	Witten	Center Freq 5.230000000 GHz
-20.0 -30.0 -40.0			VIIIAN Construction	Start Freq 5.205000000 GHz
-60.0				Stop Freq 5.255000000 GHz
Center 5.23000 GHz #Res BW 1.0 MHz #VBW 3	3.0 MHz	s #Sweep 50	Span 50.00 MHz 0 ms (1001 pts)	CF Step 5.000000 MHz
MRR MODE Ho Still × 1 N 1 f 5.221 45 GHz 2 N 2 f 5.230 85 GHz	8.24 dBm -3.46 dBm	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
3				Freq Offset 0 Hz
12		STATUS]	

4. Peak Power Spectral Density

4.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

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



4.3. Limits

- (4) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (5) For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- (6) For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

4.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

4.5. Uncertainty

± 1.27 dB

4.6. Test Result of Peak Power Spectral Density

Product	:	WHDI Rx board
Test Item	:	Peak Power Spectral Density
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
36	5180	0.790	<4	Pass
44	5220	0.410	<4	Pass
48	5240	1.320	<4	Pass

Agilent Spectrum Analyzer - Swept S	SA				
RL RF 50 Ω A Center Freq 5.180000	000 GHz	NSE:INT #Avg Type	ALIGNAUTO 07:09:05 F Pwr(RMS) TRAC	M Oct 05, 2011	Frequency
10 dB/div Ref 20.00 dBr	PN0: Fast C Ing. Free IFGain:Low Atten: 30 M	dB	Mkr1 5.177 4 0.	50 GHz 79 dBm	Auto Tune
10.0	1				Center Freq 5.180000000 GHz
-10.0	new providence and the second strange	Marin Marin Marin Marine Marine	Break area and and a set		Start Freq 5.167500000 GHz
-20.0					Stop Freq 5.192500000 GHz
-40.0 2010 2010 2010 2010 2010 2010 2010 2				14 yophic	CF Step 2.500000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
Center 5.18000 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz		Span 2 #Sweep 500 ms (5.00 MHz 1001 pts)	
MSG			STATUS		

Channel 36:



Agilen	t Spectr	um Analyzer - Sw	ept SA								
Cen	ter Fr	RF 50 Ω req 5.2200	AC 00000 GI	Hz	SE		#Avg Type	ALIGNAUTO : Pwr(RMS	07:18:28F	M Oct 05, 2011	Frequency
10 de	3/div	Ref 20.00	er IFC	iu: Fast C	Atten: 30	dB		Mkr1	5.227 3 0.4	25 GHz 41 dBm	Auto Tune
10.0									1		Center Freq 5.220000000 GHz
0.00 -10.0		Aman	the mountainstation	Ann un langar	Mind way	ANNUTERA	mantapada	aline per vice and a second	WW. WW.		Start Freq 5.207500000 GHz
-20.0 -30.0		N.							h		Stop Freq 5.232500000 GHz
-40.0 -50.0	- And the state of	r ·								THU WAR	CF Step 2.500000 MHz <u>Auto</u> Man
-60.0											Freq Offset 0 Hz
-70.0											
Cen #Res	ter 5.2 s BW	2000 GHz 1.0 MHz		#VBW	3.0 MHz			#Sweep	Span 2 500 ms (5.00 MHz 1001 pts)	
MSG								STATUS			

Channel 44:

Channel 48:



Product	:	WHDI Rx board
Test Item	:	Peak Power Spectral Density
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
38	5190	0.570	<4	Pass
46	5230	0.550	<4	Pass

Channel 38:





Agilent	Spectrum Analyzer	- Swept SA								
Cent	er Freq 5.23	50 Ω AC 00000000 G F	iHz NO: Fast 🖵	SEI	NSE:INT	#Avg Typ	ALIGNAUTO e: Pwr(RMS)	07:59:20F TRAC TYF	M Oct 05, 2011 E 1 2 3 4 5 6 E A WWWWW	Frequency
10 dB/	div Ref 20.0	⊮)0 dBm	Gain:Low	Atten: 30	dB		Mkr	1 5.229 0.:	95 GHz 55 dBm	Auto Tune
10.0 -					1					Center Freq 5.230000000 GHz
0.00 - -10.0 -		manananananan	henthenplorend	L'Harman H	Lamont market	entreth mattern	where the way	mun		Start Freq 5.20500000 GHz
-20.0 -	- AN									Stop Freq 5.25500000 GHz
-40.0								1	Management	CF Step 5.000000 MHz <u>Auto</u> Man
-60.0 -										Freq Offset 0 Hz
-70.0 -	or 5 22000 CH	_						Snan 6	0.00 MHz	
#Res	BW 1.0 MHz	2	#VBW	3.0 MHz		į	#Sweep	span 5 500 ms (0.00 MHZ 1001 pts)	

Channel 46:

5. Peak Excursion

5.1. Test Equipment

_	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

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

Conduction Power Measurement



5.3. Limits

The ratio of the peak excursion of the modulation envelope (measured suing a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

5.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

5.5. Uncertainty

± 1.27 dB

5.6. Test Result of Peak Excursion

Product	:	WHDI Rx board
Test Item	:	Peak Excursion
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW

Channel No.	Frequency (MHz)	Measurement Level	Required Limit	Result
36	5180	11.980	<13	Pass
44	5220	11.660	<13	Pass
48	5240	12.050	<13	Pass

Channel 36:

XX RL RF 50 Ω AC SENSE:INT ALIGNAUTO 07:08:14PM Oct 05, 2011	Fraguancy
Center Fred 5. 180000000 GHZ	Frequency
PN0: Fast Hig. Hee Adh IFGain:Low Atten: 30 dB Mkr2 5.179 125 GHz 	Auto Tune
Log 10.0 0.00 -10.0	Center Freq 5.18000000 GHz
-20.0 -30.0 -40.0	Start Freq 5.167500000 GHz
-50.0 -60.0 -70.0	Stop Freq 5.192500000 GHz
Center 5.18000 GHz Span 25.00 MHz #Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 500 ms (1001 pts)	CF Step 2.500000 MHz <u>ito</u> Man
I N I S. 174 200 GHZ 10.26 dBm I N 2 f S. 179 125 GHZ -1.72 dBm 3	Freq Offset 0 Hz



Agilent Spectrum Analyzer - Swept SA	and and and			
	SENSE:INT		07:17:43PM Oct 05, 2011	Frequency
Center Freq 5.220000000 GHz PNO: Fast IEGaind aw	Trig: Free Run Atten: 30 dB	#Avg Type. Log-r wi	TYPE MMWWWWW DET P S N N N N	
I Gain.Low		Mkr2	5.220 725 GHz	Auto Tune
10 dB/div Ref 20.00 dBm			-1.50 dBm	
		and the second sec		Center Freq
0.00	hat my diaman and and any of the loss	noteen all all rate of the flate land have	NEW RICH	5.220000000 GHz
-10.0				
-20.0			Withhan	Start Fred
-30.0 HWUM			hydroly	5.207500000 GHz
-40.0				
-60.0				Stop Frea
-70.0				5.232500000 GHz
Contor & 22000 CHz	2		Span 25 00 MHz	
#Res BW 1.0 MHz #VBW 3	3.0 MHz	#Sweep	500 ms (1001 pts)	CF Step
MKR MODE TRC SCL X	Y FUNI	TION FUNCTION WIDTH	FUNCTION VALUE	Auto Man
1 N 1 f 5.214 075 GHz 2 N 2 f 5.220 725 GHz	10.16 dBm -1.50 dBm			
3 4				Freq Offset
5				0 Hz
7				
9				
MSG Alignment Completed		STATUS]	

Channel 44:

Channel 48:

Agilent Spectr	um Analyze	r - Swept SA								
Center Fi	req 5.2	50 Ω AC 400000000 GI	Hz	SENS		#Avg Typ	ALIGNAUTO e: Log-Pwr	07:22:08F TRAC	M Oct 05, 2011	Frequency
		Pr IFG	iU: Fast 🕒 Sain:Low	Atten: 30 d	В		Mkr2	5.240 6	50 GHz	Auto Tune
10 dB/div Log	Ref 20	00 dBm			- 1			-1.	29 aBM	Contor From
0.00	A REAL PROPERTY AND	and the property of the for	n Hlennen mannen	Will lake and	Pro Jely ha	-alternational and	pallingungungung	Mulphan Will		5.240000000 GHz
-20.0									Mar Constant	Start Freq 5.227500000 GHz
-50.0 -60.0 -70.0										Stop Freq 5.252500000 GHz
Center 5.2 #Res BW	24000 G 1.0 MHz	Hz :	#VBV	V 3.0 MHz			#Sweep	Span 2 500 ms (5.00 MHz 1001 pts)	CF Step 2.500000 MHz
	f	5.234 100) GHz	10.76 dBr	m	CIIUN	NCTION WIDTH	FUNCTI	JN VALUE	<u>Auto</u> Man
2 N 2 3 4 5 6		5.240 650		-1.29 dBi	m					Freq Offset 0 Hz
7 8 9 10										
11 12										
MSG							STATUS			

Product	:	WHDI Rx board
Test Item	:	Peak Excursion
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW

Channel	Frequency	Measurement Level	Required Limit	Pogult
No.	(MHz)	(dB)	(dB)	Kesult
38	5190	11.090	<13	Pass
46	5230	11.700	<13	Pass

Channel 38:

Agilent Spectrum Analyzer - Swept SA		
Mail RF 50 Ω AC SENSE:INT ALIGNAUTO 07:5 Center Freq 5.190000000 GHz #Avg Type: Log-Pwr #Avg Type: Log-Pwr	4:10 PM Oct 05, 2011 TRACE 1 2 3 4 5 6 TYPE MMWMMMM	Frequency
IFGain:Low Atten: 30 dB Mkr2 5.1 10 dB/div Ref 20.00 dBm	90 90 GHz -3.34 dBm	Auto Tune
	AL V	Center Freq 5.190000000 GHz
	HANNA CONTRACTOR	Start Freq 5.165000000 GHz
-50.0 -60.0 -70.0		Stop Freq 5.215000000 GHz
Center 5.19000 GHz Spa #Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 500 m MKR Model TRC Sci. X Y Function Function windth FU	an 50.00 MHz ns (1001 pts) Notion value	CF Step 5.000000 MHz Auto Man
1 N 1 f 5.181 50 GHz 7.75 dBm 2 N 2 f 5.190 90 GHz -3.34 dBm 3		Freq Offset 0 Hz
MSG		



Agilent Spectrum Analyzer - Swept SA						
Center Freq 5.230000000 G	Hz	SENSE:INT #Av	ALIGN AUTO g Type: Log-Pwr	07:58:35 PM O TRACE 1	ct 05, 2011 2 3 4 5 6	Frequency
P IF	Gain:Low Atten:	30 dB		DET P	SNNNN	Auto Tune
10 dB/div Ref 20.00 dBm			MKr	-3.46	dBm	
10.0 0.00 0.00	1	2 martine Manual	Uhralming and Monoralitally	AN CONTRACT		Center Freq 5.230000000 GHz
-10.0 -20.0 -30.0 -40.0				PUNIN N	mulerendese Moleron Mar	Start Freq 5.20500000 GHz
-50.0 -60.0 -70.0						Stop Freq 5.255000000 GHz
Center 5.23000 GHz #Res BW 1.0 MHz	#VBW 3.0 MH	Z	#Sweep	Span 50.0 500 ms (10	00 MHz 01 pts)	CF Step 5.000000 MHz
In N 1 f 5.221 / 2 N 2 f 5.230 / 3	45 GHz 8.24 35 GHz -3.46	dBm dBm		FUNCTION		Erea Offset
4 5 6 7						0 Hz
8 9 10 11 12						
MSG			STATUS			

Channel 46:

6. Radiated Emission

6.1. Test Equipment

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

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
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	QTK	QTK-AMP-03 / 0003	May, 2011
	Х	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	Х	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2011
	Х	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
	Х	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	Х	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	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.

6.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



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.

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)

6.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to KDB-789033 test procedure for compliance to FCC 47CFR 15.407 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 C63.4:2009 on radiated measurement.

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

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

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

6.5. Uncertainty

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

6.6. Test Result of Radiated Emission

Product	:	WHDI Rx board
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW (5180MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
10360.000	12.930	38.670	51.600	-22.400	74.000
15540.000	*	*	*	*	74.000
20720.000	*	*	*	*	74.000
25900.000	*	*	*	*	74.000
Average Detector:					
10360.000	*	*	*	*	54.000
15540.000	*	*	*	*	54.000
20720.000	*	*	*	*	54.000
25900.000	*	*	*	*	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	: WHDI R	Ax board						
Test Item	: Harmonic Radiated Emission Data							
Test Site : No.3 OATS								
Test Mode	: Mode 1:	: Mode 1: Transmit - 20BW (5180MHz)						
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Vertical								
Peak Detector:								
10360.000	13.724	41.820	55.544	-18.456	74.000			
15540.000	*	*	*	*	74.000			
20720.000	*	*	*	*	74.000			
25900.000	*	*	*	*	74.000			
Average Detector:								
10360.000	13.724	36.940	50.664	-3.336	54.000			
15540.000	*	*	*	*	54.000			
20720.000	*	*	*	*	54.000			
25900.000	*	*	*	*	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	: WHDI Rx board							
Test Item	: Harmonic Radiated Emission Data							
Test Site	: No.3 OA	ATS						
Test Mode	: Mode 1:	: Mode 1: Transmit - 20BW (5220MHz)						
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Horizontal								
Peak Detector:								
10440.000	13.322	38.080	51.402	-22.598	74.000			
15660.000	*	*	*	*	74.000			
20880.000	*	*	*	*	74.000			
26100.000	*	*	*	*	74.000			
Average Detector:								
10440.000	*	*	*	*	54.000			
15660.000	*	*	*	*	54.000			
20880.000	*	*	*	*	54.000			
26100.000	*	*	*	*	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	: WHDIE	Rx board					
Test Item	Harmonic Radiated Emission DataNo.3 OATS						
Test Site							
Test Mode	: Mode 1:	Transmit - 20BW	V (5220MHz)				
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBuV	dBuV/m	dB	dBuV/m		
Vertical							
Peak Detector:							
10440.000	14.245	41.250	55.495	-18.505	74.000		
15660.000	*	*	*	*	74.000		
20880.000	*	*	*	*	74.000		
26100.000	*	*	*	*	74.000		
Average Detector:							
10440.000	14.245	25.920	50.075	2.025	54,000		
10440.000	14.245	35.830	50.075	-3.925	54.000		
15660.000	*	*	*	*	54.000		
20880.000	*	*	*	*	54.000		
26100.000	*	*	*	*	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	: WHDIR	Rx board					
Test Item	 Harmonic Radiated Emission Data No.3 OATS 						
Test Site							
Test Mode	: Mode 1: Transmit - 20BW (5240MHz)						
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBuV	dBuV/m	dB	dBuV/m		
Horizontal							
Peak Detector:							
10480.000	13.693	38.420	52.114	-21.886	74.000		
15720.000	*	*	*	*	74.000		
20960.000	*	*	*	*	74.000		
26200.000	*	*	*	*	74.000		
Average Detector:							
10480.000	*	*	*	*	54.000		
15720.000	*	*	*	*	54.000		
20960.000	*	*	*	*	54.000		
26200.000	*	*	*	*	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	: WHDI F	Rx board						
Test Item	: Harmonic Radiated Emission Data							
Test Site	: No.3 OATS							
Test Mode	: Mode 1:	Transmit - 20BW	V (5240MHz)					
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Vertical								
Peak Detector:								
10480.000	14.620	41.490	56.111	-17.889	74.000			
15720.000	*	*	*	*	74.000			
20960.000	*	*	*	*	74.000			
26200.000	*	*	*	*	74.000			
Average Detector:								
10480.000	14.620	36.540	51.161	-2.839	54.000			
15720.000	*	*	*	*	54.000			
20960.000	*	*	*	*	54.000			
26200.000	*	*	*	*	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	: WHDI Rx board							
Test Item	: Harmonic Radiated Emission Data							
Test Site	: No.3 OATS							
Test Mode	: Mode 2: Transmit - 40BW (5190MHz)							
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Horizontal								
Peak Detector:								
10380.000	12.939	38.400	51.339	-22.661	74.000			
15570.000	*	*	*	*	74.000			
20760.000	*	*	*	*	74.000			
25950.000	*	*	*	*	74.000			
Average Detector:								
10380.000	*	*	*	*	54.000			
15570.000	*	*	*	*	54.000			
20760.000	*	*	*	*	54.000			
25950.000	*	*	*	*	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	: WHDI Rx board							
Test Item	: Harmonic Radiated Emission Data							
Test Site	: No.3 OATS							
Test Mode	: Mode 2: Transmit - 40BW (5190MHz)							
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Vertical								
Peak Detector:								
10380.000	13.796	42.290	56.086	-17.914	74.000			
15570.000	*	*	*	*	74.000			
20760.000	*	*	*	*	74.000			
25950.000	*	*	*	*	74.000			
Average Detector:								
10380.000	13.796	37.520	51.316	-2.684	54.000			
15570.000	*	*	*	*	54.000			
20760.000	*	*	*	*	54.000			
25950.000	*	*	*	*	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	: WHDI F	Ax board						
Test Item	em : Harmonic Radiated Emission Data							
Test Site	: No.3 OATS							
Test Mode	: Mode 2: Transmit - 40BW (5230MHz)							
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Horizontal								
Peak Detector:								
10460.000	13.508	37.610	51.118	-22.882	74.000			
15690.000	*	*	*	*	74.000			
20920.000	*	*	*	*	74.000			
26150.000	*	*	*	*	74.000			
Average Detector:								
10460.000	*	*	*	*	54.000			
15690.000	*	*	*	*	54.000			
20920.000	*	*	*	*	54.000			
26150.000	*	*	*	*	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	: WHDI Rx board							
Test Item	: Harmonic Radiated Emission Data							
Test Site	: No.3 OATS							
Test Mode	: Mode 2: Transmit - 40BW (5230MHz)							
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Vertical								
Peak Detector:								
10460.000	14.433	39.210	53.643	-20.357	74.000			
15690.000	*	*	*	*	74.000			
20920.000	*	*	*	*	74.000			
26150.000	*	*	*	*	74.000			
Average Detector:								
10460.000	*	*	*	*	54.000			
15690.000	*	*	*	*	54.000			
20920.000	*	*	*	*	54.000			
26150.000	*	*	*	*	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	: WHDI Rx board							
Test Item	: General Radiated Emission							
Test Site	: No.3 OA	: No.3 OATS						
Test Mode	: Mode 1:	Transmit - 20BW	(5220MHz)					
Frequency	Correct	Reading	Measurement	Margin	Limit			
	Factor	Level	Level					
MHz	dB	dBuV	dBuV/m	dB	dBuV/m			
Horizontal								
Peak Detector								
39.700	-3.625	32.810	29.185	-10.815	40.000			
295.780	-4.747	32.378	27.631	-18.369	46.000			
445.160	-0.432	35.342	34.910	-11.090	46.000			
594.540	3.555	33.992	37.547	-8.453	46.000			
741.980	3.892	34.222	38.114	-7.886	46.000			
891.360	6.265	35.202	41.467	-4.533	46.000			
Vertical								
Peak Detector								
43.580	-10.919	36.688	25.769	-14.231	40.000			
295.780	-4.687	32.878	28.191	-17.809	46.000			
445.160	-6.402	41.023	34.621	-11.379	46.000			
594.540	0.175	37.538	37.714	-8.286	46.000			
743.920	0.718	33.543	34.261	-11.739	46.000			
891.360	0.905	36.282	37.188	-8.812	46.000			

- 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	: WHDI Rx board									
Test Item	: General Radiated Emission									
Test Site	: No.3 OATS									
Test Mode	: Mode 2: Transmit - 40BW (5190MHz)									
Frequency	Correct	Reading	Measurement	Margin	Limit					
	Factor	Level	Level							
MHz	dB	dBuV	dBuV/m	dB	dBuV/m					
Horizontal										
Peak Detector										
41.640	-6.175	36.640	30.466	-9.534	40.000					
295.780	-4.747	31.971	27.224	-18.776	46.000					
445.160	-0.432	35.744	35.312	-10.688	46.000					
594.540	3.555	34.738	38.294	-7.706	46.000					
743.920	3.898	33.369	37.267	-8.733	46.000					
891.360	6.265	35.141	41.407	-4.593	46.000					
Vertical										
Peak Detector										
148.340	-5.406	32.657	27.252	-16.248	43.500					
295.780	-4.687	31.971	27.284	-18.716	46.000					
445.160	-6.402	38.244	31.842	-14.158	46.000					
594.540	0.175	37.038	37.214	-8.786	46.000					
743.920	0.718	33.369	34.087	-11.913	46.000					
891.360	0.905	36.241	37.147	-8.853	46.000					

- 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.

7. Band Edge

7.1. 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, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

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., 2011
	Х	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
		Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2011
	Х	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
		Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2011
	Х	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	Х	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	Х	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.

7.2. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



7.3. Limits

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 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 : 1. RF Voltage $(dBuV) = 20 \log RF$ Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

7.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2009 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.4, 2009; tested to UNII test procedure of KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

7.5. Uncertainty

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

7.6. Test Result of Band Edge

Product	:	WHDI Rx board
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW -Channel 36

Fundamental Filed Strength

Antenna	Frequency	Reading Level	Correction Factor	Emission Level	Detector
Pole	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	
Horizontal	5180	34.966	65.28	100.246	Peak
Horizontal	5180	34.966	53.583	88.549	Average
Vertical	5180	37.073	61.64	98.714	Peak
Vertical	5180	37.073	49.11	86.184	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

Band Edge Test Data

Antenna Pole	Test Frequency	Fundamental (dBuV/m)	Δ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	5148.9	100.246	38.668	61.578	74.000	Peak
Horizontal	5148.2	88.549	50.259	38.29	54.000	Average
Vertical	5148.9	98.714	38.668	60.046	74.000	Peak
Vertical	5148.2	86.184	50.259	35.925	54.000	Average

Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

F = Fundamental field Strength (Peak or Average)

 Δ = Conducted Band Edge Delta (Peak or Average)

D Ag	ilent S	Spect	trum	Analyzer	- Swe	pt SA		205												
	ntor	Fre	50 S	2 5 150	nnn	000	GH-	7	AC	: SE]	ENSE:INT		Avg T	¢ vpe:	LIGNAUTO	05:08:	11 PM	Aug 02, 201:	1	Frequency
	itei	110	-4	5.150	Input:	RF	PNO: IFGai	:Fast n:Low	₽	Trig: Fre Atten: 30	e Run 0 dB		Avg Ho	old: 3	1/100		TYPE DET		Ĭ	
10 d	B/div	,	Ref	f 20.00) dB	m									Mk	r3 5.1 -26	148 5.53	9 GHz 0 dBm		Auto Tulle
10.0 0.00														/	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					Center Freq 5.15000000 GHz
-10.0 -20.0			+								32	. net	al to have been a	m				West Martinetory	╞	
-30.0 -40.0		- 4-1		A 14 as basilation		an base ford	والموالي	, Luji (deta	мулич	the for the second of	Jase									Start Freq 5.100000000 GHz
-50.0 -60.0			_																ľ	Stop Freq
-70.0	tor	5 1	500	0 6 4 7												Sna	n 10	0 0 MU-		5.200000000 GHz
#Re	s B	W 1	.0 P	VHz				#VI	зw	1.0 MHz	<u>.</u>			#	Sweep	500 m	is (1	001 pts)		CF Step 10.000000 MHz
1	N	1	f			× 5.18 5.15	3740 5000	GHz GHz	_	12.138 d -29.751 d	IBm Bm	FUNU		FUNU	TIUN WIDTH	FUI	NCTIUN	I VALUE	ľ	<u>Auto</u> Man
3 4 5	N	1	f			5.14	48 9 (GHz		-26.530 d	Bm									Freq Offset 0 Hz
6 7 8																				
9 10 11																				
MSG				<u> </u>											STATUS	5				

Peak Detector of conducted Band Edge Delta

Average Detector of conducted Band Edge Delta

🗊 Agilent Sp	ectrum A	nalyzer - Sw	ept SA								
🕅 Center F	50 Ω Freq 5	.150000	0000 GI	Hz	AC SE		Avg Type Avg Hold	ALIGNAUTO e: Log-Pwr · 1/100	05:08:48 P	Aug 02, 2011 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref	20.00 dE	6: RF PF IFG 3m	NO: Fast C Gain:Low	Atten: 30	dB	A BUILDIN	Mk	r3 5.148 -50.1	3 2 GHz 82 dBm	Auto Tune
10.0 0.00 -10.0											Center Freq 5.15000000 GHz
-20.0						2					Start Freq 5.100000000 GHz
-50.0 -60.0 -70.0			-								Stop Freq 5.20000000 GHz
Center 5 #Res BW	.15000 / 1.0 M	GHz Hz	~	#VB	W 10 Hz	511		Sweep	Span 1 7.80 s (00.0 MHz 1001 pts)	CF Step 10.000000 MHz
1 N 2 N 3 N 4 5 6 7 8 9 9 10 11 11 12	1 f 1 f 1 f		5.187 5.150 5.148	1 GHz 0 GHz 2 GHz	0.077 dl -51.719 dl -50.182 dl	3m 3m 3m 3m					Freq Offset 0 Hz
MSG								STATUS			

Product	:	WHDI Rx board
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW-Channel 48

Test Frequency	Measurement Level (20dB BW)	Limit	Result
(MHz)	(MHz)	(MHz)	
5240	5249.65	<5250	PASS

NOTE: Accordance with 15.215 requirement.

Agilent Spectrum Analyzer - Swept SA	
M RF 50 Ω AC SENSE:INT ALIGN AUTO 07:21:10 PM Center Freq 5.240000000 GHz Trig: Error But Avg Type: Log-Pwr TRACE	Oct 05, 2011 1 2 3 4 5 6 Mutual Mutual Frequency
PNO: Fast Hig. Free Kun IFGain:Low Atten: 30 dB Mkr2 5.249 6	5 GHz Auto Tune
10.0 Bb/div Ref 20.00 dBm - 14.24	Center Freq 5.240000000 GHz
-20.0 -30.0 -40.0 with marked all and	Start Freq 5.215000000 GHz
-50.0 -60.0 -70.0	Stop Freq 5.265000000 GHz
Center 5.24000 GHz Span 50 #Res BW 300 kHz #VBW 1.0 MHz #Sweep 500 ms (10 MXR M0001 TRO SCI. X Y FUNCTION FUNCTION WIDTH FUNCTION 1 N 1 f 5.247 40 GHz 5.95 dBm FUNCTION FUNCTION	.00 MHz 001 pts) CF Step 5.000000 MHz <u>Auto</u> Man
I I <thi< th=""> <thi< th=""> <thi< th=""> <thi< th=""></thi<></thi<></thi<></thi<>	Freq Offset 0 Hz

Product	:	WHDI Rx board
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 40BW -Channel 38

Fundamental Filed Strength

Antenna	Frequency	Reading Level	Correction Factor	Emission Level	Detector
Pole	[MHz]	[dBuV]	[dB/m]	[dBuV/m]	
Horizontal	5190	34.907	63.98	98.888	Peak
Horizontal	5190	34.907	53.37	88.278	Average
Vertical	5190	37.077	59.53	96.608	Peak
Vertical	5190	37.077	50.55	87.628	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=30Hz

Band Edge Test Data

Antenna Pole	Test Frequency	Fundamental	Δ (dB)	Band Edge Field Strength	Requiqment Limit	Detector
	(IVIIIZ)	(uBu v/III)		(uBu v/III)	(uDu v/III)	
Horizontal	5150	98.888	36.115	62.773	74.000	Peak
Horizontal	5150	88.278	46.528	41.75	54.000	Average
Vertical	5150	96.608	36.115	60.493	74.000	Peak
Vertical	5150	87.628	46.528	41.1	54.000	Average

Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Δ

F = Fundamental field Strength (Peak or Average)

 Δ = Conducted Band Edge Delta (Peak or Average)

D Ag	ilent S	Spect	trum	Analyzer -	Swept SA	1								0				
w Cer	nter	Fre	50 eq	Ω 5.1500	00000	GH	z	AC	SE	NSE:INT		Avg T)	ALIGNAUTO	05:09:4 1	RACE 1 2 3	2,2011	Fre	equency
				In	iput: RF	PNC IFGa): Fast(in:Low	\mathbf{F}_{μ}	Atten: 30	e Run ∣dB		Avgino	10:26/100		DET P N N	INNN		Auto Tune
10 d	B/div	,	Re	f 20.00	dBm								M	kr2 5.1 -26	50 0 0 .236 d	SHz Bm		Auto Tune
Log 10.0													- m	λ^{1}	\sim	u Mar	C 5 150	enter Freq
-10.0	-		+							2						_	0.100	00000 0112
-20.0 -30.0 -40.0					alutarenter	And all and a second	Manageria	here and the second second	مىرىلىرانى الاركى مىرىكى م مەرىكى مەرىكى	2 un+1++++	و.ا رومادرارو ا	الجعرية محاودتهم	- ⁸ 24				5.100	Start Freq 000000 GHz
-50.0 -60.0 -70.0	-1644.51	10															5.200	Stop Freq
Cer #Re	ter s B	5.1: W 1	500 .0	0 GHz MHz			#VB	SW 1.4	0 MHz			,	#Sweep	Spar 500 m	n 100.0 s (1001	MHz pts)	10.	CF Step
MKB 1	MODE N	TRC 1	SCI f		× 5.	181 4	GHz		Y 9.879 d	Bm	FUNC	TION	FUNCTION WIDTI	H FUN	CTION VALUE		<u>Auto</u>	Man
2 3 4 5 6	<u>N</u>	1	f		5.	150 0	GHz	-20	6.236 dl	Bm							F	F req Offset 0 Hz
7 8 9 10																_		
12 MSG													STATL	IS				

Peak Detector of conducted Band Edge Delta

Average Detector of conducted Band Edge Delta

🗊 Agilent Spec	trum Analyze	er - Swept SA								
Center Fr	50 Ω eq 5.15	0000000 G	Hz	AC SENSE		Avg Type	ALIGNAUTO : Log-Pwr 2/100	05:10:05 PI TRAC	M Aug 02, 2011	Frequency
10 dB/div	Ref 20.0	10 dBm	NO: Fast G Gain:Low	Atten: 30 dE	3		Mk	r2 5.150 -45.5	0 0 GHz 56 dBm	Auto Tune
10.0 0.00 -10.0								~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1	Center Freq 5.150000000 GHz
-20.0 -30.0 -40.0				¢2						Start Freq 5.100000000 GHz
-50.0 -60.0										Stop Freq 5.20000000 GHz
Center 5.1 #Res BW	5000 GH 1.0 MHz	2	#VB۱	W 10 Hz			Sweep	Span 1 7.80 s (00.0 MHz 1001 pts)	CF Step 10.000000 MHz
MKR MODE TRI 1 N 1 2 N 1	f f	× 5.190 5.150	0 GHz 0 GHz	0.972 dBn -45.556 dBn	FUNCT	ION FUN	NCTION WIDTH	FUNCTIO	IN VALUE	<u>Auto</u> Man
3 4 5 6										Freq Offset 0 Hz
7 8 9 10 11										
MSG							STATUS			

Product	:	WHDI Rx board
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 20BW-Channel 48

Test Frequency	Measurement Level (20dB BW)	Limit	Result
(MHz)	(MHz)	(MHz)	
5230	5248.20	<5250	PASS

NOTE: Accordance with 15.215 requirement.

Agilent Spect	rum Anal	yzer - Swe	ept SA										
Center F	RF req 5	50 Ω 5.2300	AC 00000 GI	Hz	Tria: Fra	ENSE:IN	NT	Avg Ty	ALIGN AU pe: Log-Pı)	JTO Wr	07:57:38F TRAC	M Oct 05, 2011	Frequency
10 dB/div	IFGain:Low Atten: 30 dB Mkr2 5.248 2 GHz 0 dB/div Ref 20.00 dBm -17.95 dBm											Auto Tune	
10.0 0.00 -10.0					and and a second	l (m	Jersonth	2 ¹	▲ ²			.17.25 dBm	Center Freq 5.230000000 GHz
-20.0 -30.0 -40.0	y, diseriel ^e	يندانيون ^{ي ال} اوريكي	hemenand	gend .					Likishara	wheeling	velvelynynyn		Start Freq 5.18000000 GHz
-60.0 -70.0													Stop Freq 5.280000000 GHz
Center 5 #Res BW	.23000 / 300 k RC SCU	GHz Hz	× 5.241 2	#VE	3W 1.0 MH	z	FUNC	TION	#Swee	ep 5 IDTH	Span 1 500 ms (00.0 MHz 1001 pts) IN VALUE	CF Step 10.000000 MHz <u>Auto</u> Man
2 N 3 4 5 6 7 7 8 9 10			5.248	2 GHz	-17.95 (JBm							Freq Offset 0 Hz
11 12 MSG									ST	ATUS			

8. Frequency Stability

8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

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.

8.2. Test Setup



8.3. Limits

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified

8.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

8.5. Uncertainty

± 150 Hz

8.6. Test Result of Frequency Stability

Product	:	WHDI Rx board
Test Item	:	Frequency Stability
Test Site	:	Temperature Chamber
Test Mode	:	Carrier Wave

Test C	onditions	Channel	l Frequency (MHz) Frequency (MHz)		∆F (MHz)
		36	5180.0000	5180.0011	-0.0011
		38	5190.0000	5190.0009	-0.0009
Tnom (20) °C	Vnom (110)V	44	5220.0000	5220.0013	-0.0013
		46	5230.0000	5230.0009	-0.0009
		48	5240.0000	5240.0008	-0.0008
Test C	onditions	Channel	Frequency (MHz)	Frequency (MHz)	∆F (MHz)
		36	5180.0000	5180.0012	-0.0012
	Vmax (126.5)V	38	5190.0000	5190.0009	-0.0009
Tmax (50) °C		44	5220.0000	5220.0013	-0.0013
		46	5230.0000	5230.0010	-0.0010
		48	5240.0000	5240.0008	-0.0008
Test C	onditions	Channel	Frequency (MHz)	Frequency (MHz)	∆F (MHz)
		36	5180.0000	5180.0012	-0.0012
		38	5190.0000	5190.0009	-0.0009
Tmax (50) °C	Vmin (93.5)V	44	5220.0000	5220.0013	-0.0013
		46	5230.0000	5230.0010	-0.0010
		48	5240.0000	5240.0008	-0.0008

Test Conditions		Channel	el Frequency (MHz) Frequency (MHz)		△F (MHz)
		36	5180.0000	5180.0012	-0.0012
		38	5190.0000	5190.0010	-0.0010
Tmin (0) °C	Vmax (126.5)V	44	5220.0000	5220.0013	-0.0013
		46 5230.0000 5230.0009		-0.0009	
		48	5240.0000	5240.0008	-0.0008
Test Conditions		Channel	Frequency (MHz)	Frequency (MHz)	△F (MHz)
		36	5180.0000	5180.0012	-0.0012
		38	5190.0000	5190.0010	-0.0010
Tmin (0) °C	Vmin (93.5)V	44	5220.0000	5220.0013	-0.0013
		46	5230.0000	5230.0009	-0.0009
		48	5240.0000	5240.0008	-0.0008

9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs