FCC Test Report
(Class II Permissive Change)

Product Name	WAH0001
Model No	QI-150P
FCC ID.	2AOV3QI-150P

Applicant	Hitachi Information & Telecommunication Engineering, Ltd.
Address	Queen's Tower B 22F, 2-3-3, Minatomirai, Nishi-ku, Yokohama 220-6122, Japan

Date of Receipt	May. 10, 2018
Issue Date	Jul. 16, 2018
Report No.	1850118R-RFUSP27V00
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
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Test Report

Issue Date: Jul. 16, 2018
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Product Name	WAH0001
Applicant	Hitachi Information & Telecommunication Engineering, Ltd.
Address	Queen's Tower B 22F, 2-3-3, Minatomirai, Nishi-ku, Yokohama 220-6122, Japan
Manufacturer	Hitachi Information & Telecommunication Engineering, Ltd.
Model No.	QI-150P
FCC ID.	2AOV3QI-150P
EUT Rated Voltage	DC 3.3V
EUT Test Voltage	DC 3.3V
Trade Name	Hitachi Information & Telecommuniation Engineering, Ltd
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v04
Test Result	Complied

Documented By : Anny Chou

(Senior Adm. Specialist / Anny Chou)

Tested By : Paul Jiang

(Engineer / Paul Jiang)

Approved By :

(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	WAH0001
Trade Name	Hitachi Information & Telecommuniation Engineering, Ltd
Model No.	QI-150P
FCC ID.	2AOV3QI-150P
Frequency Range	802.11b/g/n-20/VHT20 MHz:2412-2472MHz, 802.11n-40/VHT40 MHz:2422-2462MHz
Number of Channels	802.11b/g/n-20/VHT20MHz: 13, n-40/VHT40MHz: 11
Data Speed	802.11b: 1-11Mbps, 802.11a/g: 6-54Mbps, 802.11n: up to 300Mbps
Type of Modulation	802.11b:DSSS, DBPSK, DQPSK, CCK 802.11g/n: OFDM, BPSK, QPSK, 16QAM, 64QAM
Antenna Type	Dipole Antenna
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	STAF	T17-002-1054	Dipole Antenna	0.65dBi for 2.4 GHz

Note: The antenna of EUT is conforming to FCC 15.203.

802.11b/g/n-20/VHT20 MHz 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	Channel 12:	2467 MHz
Channel 13:	2472 MHz						

802.11n-40/VHT40 MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
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. This EUT is an WAH0001 with a built-in WiGig、WLAN and Bluetooth transceiver, this report for WLAN 2.4GHz.
2. 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.
3. This is to request a Class II permissive change for FCC ID: 2AOV3QI-150P, originally granted on 07/25/2018.

The major change filed under this application is:

Change #1: Reduce the Output Power through firmware(only reduce Bluetooth Output Power, WLAN Output Power haven't changes), All other hardware is identical with original granted.

#2: Addition one new antenna(WLAN and Bluetooth), the antenna type is different, the antenna gain is lower than the original application.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)
	Mode 3: Transmit - (VHT 20BW)
	Mode 4: Transmit - (VHT 40BW)

1.2. Operational Description

The EUT is a WAH0001 with a built-in 2.4GHz and 5GHz WLAN transceiver. This device provided four kinds of transmitting speed 1, 2, 5.5 and 11Mbps and the device of RF carrier is DBPSK, DQPSK and CCK (IEEE 802.11b). The device provided of eight kinds of transmitting speed 6, 9, 12, 18, 24, 36, 48 and 54Mbps the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11g).

The device provided of eight kinds of transmitting speed 14.4,28.9,43.3,57.8,86.7,115.6,130 and 144.4Mbps in 802.11n(20M-BW)/VHT20 mode and 30,60,90,120,180,240,270 and 300 Mbps(40M-BW)/VHT40 the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11n), the IEEE 802.11n is Multiple In, Multiple Out" (MIMO) technology.

The device adapts direct sequence spread spectrum modulation. The antenna provides diversity function to improve the receiving function and the antennas to support 2(Transmit) × 2(Receive) MIMO technology.

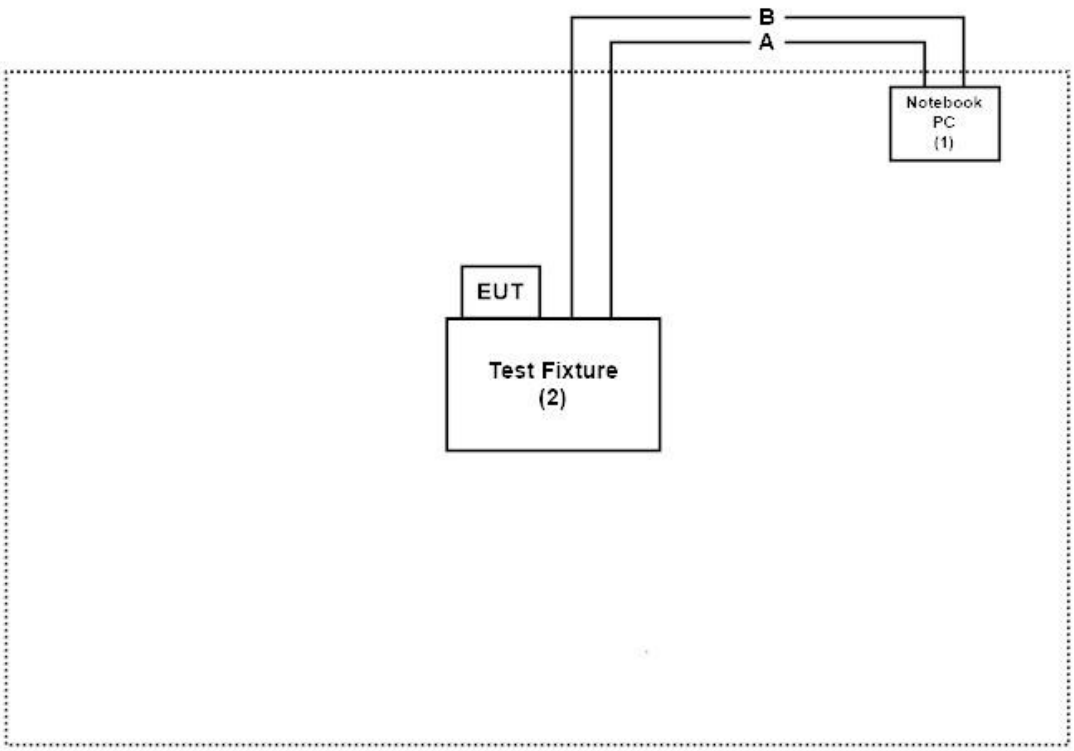
1.3. Tested System Details

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude E5440	B6TYTZ1	Non-shielded, 1.8m
2	Test Fixture	Hitachi Information & Telecommuniation Engineering, Ltd	N/A	N/A	Non-shielded, 1.8m

Signal Cable Type		Signal cable Description
A	LAN Cable	Non-shielded, 3m
B	USB Cable	Shielded, 1.2m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

(1) Setup the EUT as shown on 1.4

(2) Execute “Qualcomm v3.0.244.0” program on the Notebook PC.

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

(4) Start the continuous transmission.

(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 DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
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E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2018/2/12	2019/2/11
X	Spectrum Analyzer	Agilent	N9010A	MY48030495	2017/10/13	2018/10/12
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2017/7/19	2018/7/18
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/7/6	2019/7/5
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/7/6	2019/7/5
	EMI Test Receiver	R&S	ESCS 30	100369	2017/11/7	2018/11/6
	LISN	R&S	ESH3-Z5	836679/017	2018/2/9	2019/2/8
	LISN	R&S	ENV216	100097	2018/2/9	2019/2/8
	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/6/22	2019/6/21

For Radiated measurements /Site3/CB8

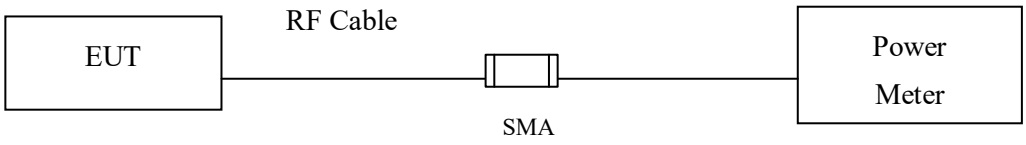
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2018/3/12	2019/3/11
	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2018/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/6/25	2019/6/24
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/6/15	2019/6/14
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2017/7/19	2018/7/18
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/5/3	2019/5/2
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/4/10	2019/4/9
X	Coaxial Cable	QuieTek	SF-106	LC035/37/41-SF LC038-SF,LC037-SF	2018/6/21	2019/6/20
	Amplifier + Cable	EMCI	EMC184045SE	980370	2018/3/21	2019/3/20
	Horn Antenna	Com-Power	AH-840	101043	2018/1/9	2019/1/8
X	Filter	MicroTRON	BRM50701	019	2017/11/21	2018/11/20
	Filter	Microwave Circuits	N0257881	36681	2018/1/22	2019/1/21

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.

Test Software version :QuieTek EMI 2.0 V2.1.113.

2. Maximum Conducted Power

2.1. Test Setup



2.2. Limits

The maximum average power shall be less 1 Watt. (Section 15.247 (b)(3))

2.3. Test Procedure

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

2.4. Uncertainty

± 1.19 dB

2.5. Test Result of Maximum Conducted Power

Product : WAH0001
Test Item : Maximum Conducted Power
Test Site : No.3 OATS
Test Date : 2018/07/10
Test Mode : Mode 1: Transmit (802.11b 1Mbps)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	19.25	--	--	--	21.3	<30dBm	Pass
06	2437	20.03	19.94	19.86	19.81	22.01	<30dBm	Pass
11	2462	19.81	--	--	--	21.75	<30dBm	Pass
12	2467	15.74	--	--	--	18.03	<30dBm	Pass
13	2472	10.96	--	--	--	13.51	<30dBm	Pass

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

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	18.01	--	--	--	20.22	<30dBm	Pass
06	2437	18.26	18.22	18.15	18.09	20.53	<30dBm	Pass
11	2462	18.21	--	--	--	20.37	<30dBm	Pass
12	2467	13.38	--	--	--	16.05	<30dBm	Pass
13	2472	9.78	--	--	--	12.34	<30dBm	Pass

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

Chain A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	1	21.30	20.22	23.80	<30dBm	Pass
6	2437	1	22.01	20.53	24.34	<30dBm	Pass
11	2462	1	21.75	20.37	24.12	<30dBm	Pass
12	2467	1	18.03	16.05	20.16	<30dBm	Pass
13	2472	1	13.51	12.34	15.97	<30dBm	Pass

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

Product : WAH0001
Test Item : Maximum Conducted Power
Test Site : No.3 OATS
Test Date : 2018/07/10
Test Mode : Mode 2: Transmit (802.11g 6Mbps)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	15.06	--	--	--	--	--	--	--	21.24	<30dBm	Pass
06	2437	19.25	19.21	19.17	19.12	19.08	19.05	19.01	18.95	23.58	<30dBm	Pass
11	2462	14.51	--	--	--	--	--	--	--	20.25	<30dBm	Pass
12	2467	11.22	--	--	--	--	--	--	--	17.05	<30dBm	Pass
13	2472	2.23	--	--	--	--	--	--	--	8.19	<30dBm	Pass

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

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	14.02	--	--	--	--	--	--	--	19.89	<30dBm	Pass
06	2437	17.48	17.43	17.39	17.34	17.31	17.27	17.23	17.19	22.34	<30dBm	Pass
11	2462	13.31	--	--	--	--	--	--	--	19.21	<30dBm	Pass
12	2467	9.94	--	--	--	--	--	--	--	16.13	<30dBm	Pass
13	2472	0.94	--	--	--	--	--	--	--	7.01	<30dBm	Pass

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

Chain A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	6	21.24	19.89	23.63	<30dBm	Pass
6	2437	6	23.58	22.34	26.01	<30dBm	Pass
11	2462	6	20.25	19.21	22.77	<30dBm	Pass
12	2467	6	17.05	16.13	19.62	<30dBm	Pass
13	2472	6	8.19	7.01	10.65	<30dBm	Pass

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

Product : WAH0001
Test Item : Maximum Conducted Power
Test Site : No.3 OATS
Test Date : 2018/07/10
Test Mode : Mode 3: Transmit - (VHT 20BW)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH0
		Measurement Level (dBm)								
01	2412	13.72	--	--	--	--	--	--	--	20.18
06	2437	19.14	19.08	19.03	19.01	18.97	18.93	18.91	18.87	23.72
11	2462	13.25	--	--	--	--	--	--	--	19.4
12	2467	10.92	--	--	--	--	--	--	--	17.19
13	2472	0.97	--	--	--	--	--	--	--	6.64

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

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH0
		Measurement Level (dBm)								
01	2412	13.45	--	--	--	--	--	--	--	19.48
06	2437	17.25	17.21	17.15	17.11	17.07	17.02	16.97	16.93	22.46
11	2462	12.14	--	--	--	--	--	--	--	18.34
06	2437	9.74	--	--	--	--	--	--	--	16.11
11	2462	-0.53	--	--	--	--	--	--	--	5.86

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

Chain A+B

Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
1	2412	VTH0	20.18	19.48	22.85	<30dBm	Pass
6	2437	VTH0	23.72	22.46	26.15	<30dBm	Pass
11	2462	VTH0	19.40	18.34	21.91	<30dBm	Pass
12	2467	VTH0	17.19	16.11	19.69	<30dBm	Pass
13	2472	VTH0	6.64	5.86	9.28	<30dBm	Pass

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

Product : WAH0001
Test Item : Maximum Conducted Power
Test Site : No.3 OATS
Test Date : 2018/07/10
Test Mode : Mode 4: Transmit - (VHT 40BW)

CHAIN A

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH0
		Measurement Level (dBm)								
03	2422	11.95	--	--	--	--	--	--	--	18.58
06	2437	17.95	17.91	17.88	17.82	17.78	17.74	17.71	17.69	23.52
09	2452	10.62	--	--	--	--	--	--	--	17.62
10	2457	8.61	--	--	--	--	--	--	--	15.54
11	2462	1.62	--	--	--	--	--	--	--	7.78

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

CHAIN B

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power
		VTH0	VTH1	VTH2	VTH3	VTH4	VTH5	VTH6	VTH7	VTH0
		Measurement Level (dBm)								
03	2422	11.62	--	--	--	--	--	--	--	17.82
06	2437	16.98	16.94	16.91	16.87	16.83	16.81	16.77	16.72	22.28
9	2452	9.17	--	--	--	--	--	--	--	16.24
10	2457	7.44	--	--	--	--	--	--	--	14.32
11	2462	0.23	--	--	--	--	--	--	--	7.07

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

Chain A+B

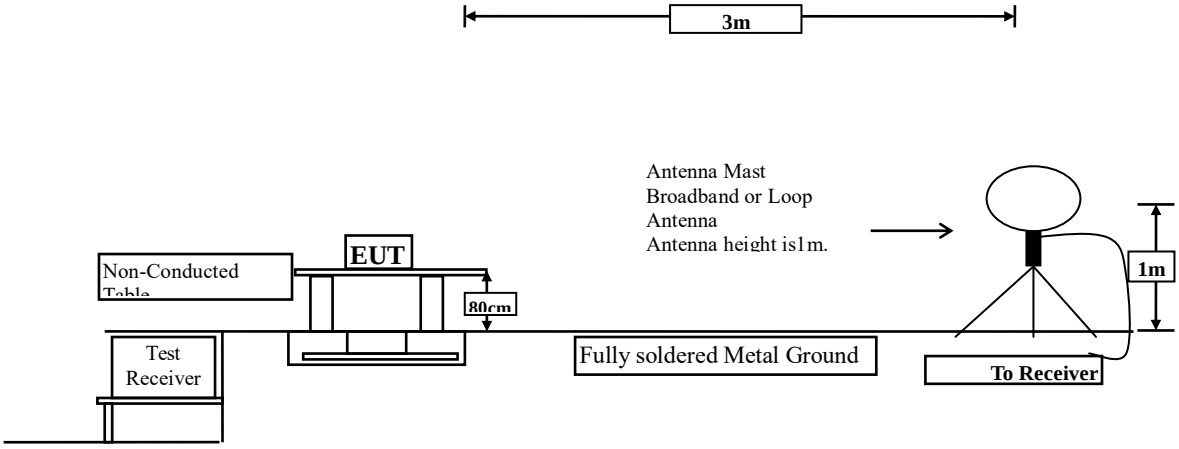
Channel	Frequency (MHz)	Data Rate (Mbps)	Chain A Power (dBm)	Chain B Power (dBm)	Chain A+B Power (dBm)	Limit (dBm)	Result
3	2422	VTH0	18.58	17.82	21.23	<30dBm	Pass
6	2437	VTH0	23.52	22.28	25.95	<30dBm	Pass
9	2452	VTH0	17.62	16.24	19.99	<30dBm	Pass
10	2457	VTH0	15.54	14.32	17.98	<30dBm	Pass
11	2462	VTH0	7.78	7.07	10.45	<30dBm	Pass

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

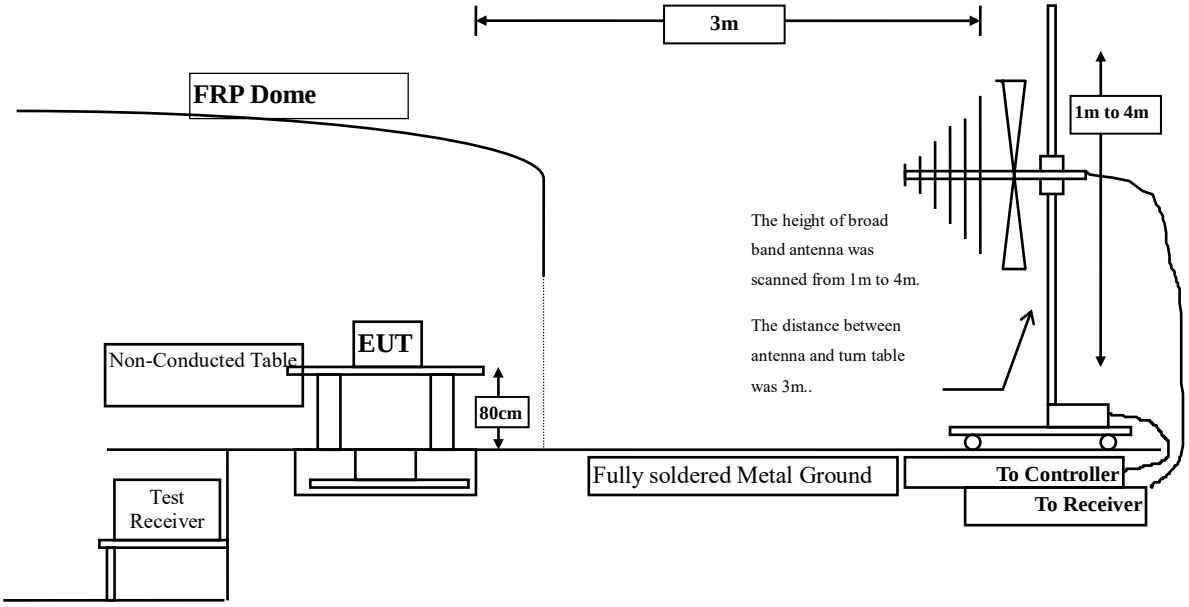
3. Radiated Emission

3.1. Test Setup

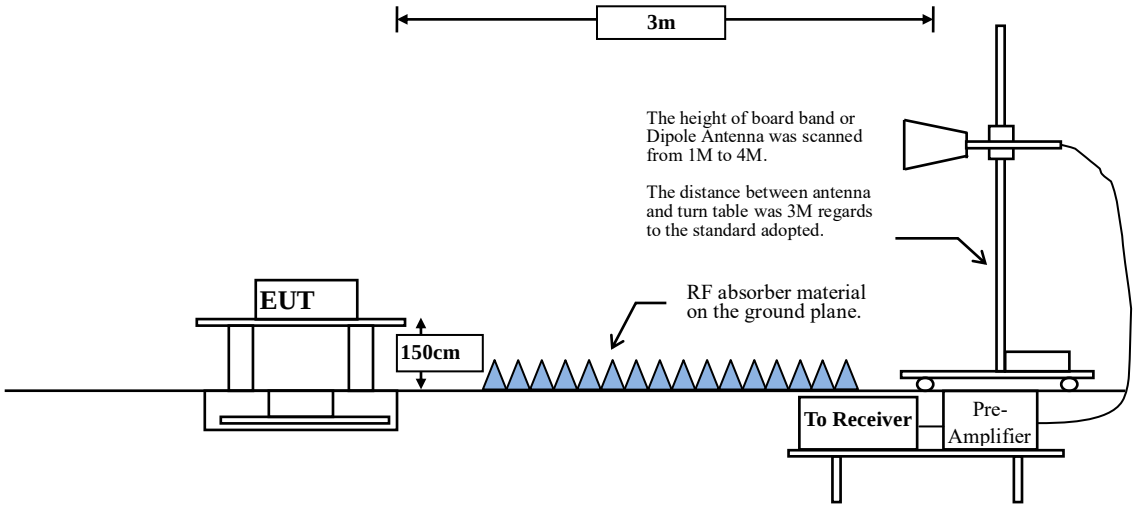
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.2. Limits

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

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

3.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

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

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

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

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

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

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11 b	98.84	12.3913	81	100
802.11 g	92.21	2.0580	486	500
VHT20	92.36	1.9275	519	1000
VHT40	83.89	0.9058	1104	2000

Note: Duty Cycle Refer to Section 5.

3.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

3.5. Test Result of Radiated Emission

Product : WAH0001
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Date : 2018/07/06
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4824.000	2.428	41.340	43.769	-30.231	74.000
7236.000	9.177	39.510	48.687	-25.313	74.000
9648.000	10.019	38.890	48.910	-25.090	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4824.000	2.837	45.160	47.997	-26.003	74.000
7236.000	9.676	38.970	48.646	-25.354	74.000
9648.000	10.557	39.240	49.797	-24.203	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2437MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4874.000	2.076	41.450	43.527	-30.473	74.000
7311.000	9.512	39.630	49.142	-24.858	74.000
9748.000	9.630	39.810	49.440	-24.560	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4874.000	2.532	47.440	49.972	-24.028	74.000
7311.000	10.089	39.580	49.669	-24.331	74.000
9748.000	10.266	40.790	51.057	-22.943	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal Peak Detector:					
4924.000	2.191	42.990	45.181	-28.819	74.000
7386.000	10.373	39.380	49.754	-24.246	74.000
9848.000	9.964	38.790	48.754	-25.246	74.000
Average Detector:					
--					
Vertical Peak Detector:					
4924.000	2.805	48.370	51.175	-22.825	74.000
7386.000	11.180	38.910	50.090	-23.910	74.000
9848.000	10.801	39.010	49.811	-24.189	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2467 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4934.000	2.307	41.030	43.337	-30.663	74.000
7401.000	10.407	38.270	48.677	-25.323	74.000
9868.000	10.040	39.480	49.520	-24.480	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4934.000	2.977	41.430	44.408	-29.592	74.000
7401.000	11.222	38.970	50.192	-23.808	74.000
9868.000	10.964	39.050	50.014	-23.986	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2472 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4944.000	2.423	41.050	43.473	-30.527	74.000
7416.000	10.458	38.690	49.148	-24.852	74.000
9888.000	10.123	39.030	49.153	-24.847	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4944.000	3.150	43.420	46.570	-27.430	74.000
7416.000	11.231	38.920	50.151	-23.849	74.000
9888.000	11.133	39.820	50.953	-23.047	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4824.000	2.428	42.090	44.519	-29.481	74.000
7236.000	9.177	39.250	48.427	-25.573	74.000
9648.000	10.019	39.260	49.280	-24.720	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4824.000	2.836	48.950	51.787	-22.213	74.000
7236.000	9.676	39.360	49.036	-24.964	74.000
9648.000	10.556	39.220	49.777	-24.223	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4874.000	2.076	46.840	48.917	-25.083	74.000
7311.000	9.512	39.460	48.972	-25.028	74.000
9748.000	9.630	39.190	48.820	-25.180	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4874.000	2.532	52.730	55.262	-18.738	74.000
7311.000	10.089	39.510	49.599	-24.401	74.000
9748.000	10.266	39.840	50.107	-23.893	74.000
Average Detector:					
4874.000	2.532	38.450	40.982	-13.018	54.000

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal Peak Detector:					
4924.000	2.191	41.670	43.861	-30.139	74.000
7386.000	10.373	38.920	49.294	-24.706	74.000
9848.000	9.964	39.430	49.394	-24.606	74.000
Average Detector:					
--					
Vertical Peak Detector:					
4924.000	2.805	48.430	51.235	-22.765	74.000
7386.000	11.180	38.600	49.780	-24.220	74.000
9848.000	10.801	38.640	49.441	-24.559	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2467 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4934.000	2.307	41.260	43.567	-30.433	74.000
7401.000	10.407	38.830	49.237	-24.763	74.000
9868.000	10.040	39.710	49.750	-24.250	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4934.000	2.977	44.940	47.918	-26.082	74.000
7401.000	11.222	38.960	50.182	-23.818	74.000
9868.000	10.964	39.170	50.134	-23.866	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2472 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4944.000	2.423	40.810	43.233	-30.767	74.000
7416.000	10.458	38.540	48.998	-25.002	74.000
9888.000	10.123	39.590	49.713	-24.287	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4944.000	3.150	42.620	45.770	-28.230	74.000
7416.000	11.231	38.950	50.181	-23.819	74.000
9888.000	11.133	39.320	50.453	-23.547	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4824.000	2.428	42.630	45.059	-28.941	74.000
7236.000	9.177	39.580	48.757	-25.243	74.000
9648.000	10.019	38.860	48.880	-25.120	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4824.000	2.837	48.440	51.277	-22.723	74.000
7236.000	9.676	39.310	48.986	-25.014	74.000
9648.000	10.557	38.980	49.537	-24.463	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4874.000	2.076	45.350	47.427	-26.573	74.000
7311.000	9.512	39.630	49.142	-24.858	74.000
9748.000	9.630	39.710	49.340	-24.660	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4874.000	2.532	52.850	55.382	-18.618	74.000
7311.000	10.089	39.620	49.709	-24.291	74.000
9748.000	10.266	39.820	50.087	-23.913	74.000
Average Detector:					
4874.000	2.532	38.020	40.552	-13.448	54.000

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal Peak Detector:					
4924.000	2.191	42.130	44.321	-29.679	74.000
7386.000	10.373	39.140	49.514	-24.486	74.000
9848.000	9.964	39.750	49.714	-24.286	74.000
Average Detector:					
--					
Vertical Peak Detector:					
4924.000	2.805	46.840	49.645	-24.355	74.000
7386.000	11.180	38.810	49.990	-24.010	74.000
9848.000	10.801	38.590	49.391	-24.609	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2467 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4934.000	2.307	40.950	43.257	-30.743	74.000
7401.000	10.407	39.130	49.537	-24.463	74.000
9868.000	10.040	39.620	49.660	-24.340	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4934.000	2.977	43.970	46.948	-27.052	74.000
7401.000	11.222	39.240	50.462	-23.538	74.000
9868.000	10.964	39.270	50.234	-23.766	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2472 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4944.000	2.423	41.320	43.743	-30.257	74.000
7416.000	10.458	38.940	49.398	-24.602	74.000
9888.000	10.123	39.510	49.633	-24.367	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4944.000	3.150	42.570	45.720	-28.280	74.000
7416.000	11.231	39.050	50.281	-23.719	74.000
9888.000	11.133	39.410	50.543	-23.457	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2422MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4844.000	2.280	41.560	43.841	-30.159	74.000
7266.000	9.106	39.440	48.546	-25.454	74.000
9688.000	9.663	38.970	48.633	-25.367	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4844.000	2.707	43.630	46.338	-27.662	74.000
7266.000	9.626	39.560	49.186	-24.814	74.000
9688.000	10.284	39.740	50.024	-23.976	74.000
Average Detector:					
--					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4874.000	2.076	42.800	44.877	-29.123	74.000
7311.000	9.512	39.160	48.672	-25.328	74.000
9748.000	9.630	38.920	48.550	-25.450	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4874.000	2.532	48.220	50.752	-23.248	74.000
7311.000	10.089	39.210	49.299	-24.701	74.000
9748.000	10.266	39.750	50.017	-23.983	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2452 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal Peak Detector:					
4904.000	2.000	40.120	42.121	-31.879	74.000
7356.000	10.308	38.710	49.018	-24.982	74.000
9808.000	9.850	38.150	48.000	-26.000	74.000
Average Detector:					
--					
Vertical Peak Detector:					
4904.000	2.513	45.380	47.894	-26.106	74.000
7356.000	11.022	38.310	49.332	-24.668	74.000
9808.000	10.512	38.170	48.682	-25.318	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2457 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4914.000	2.073	40.190	42.263	-31.737	74.000
7371.000	10.352	38.620	48.971	-25.029	74.000
9828.000	9.905	38.910	48.815	-25.185	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4914.000	2.630	41.860	44.490	-29.510	74.000
7371.000	11.112	38.920	50.031	-23.969	74.000
9828.000	10.655	38.630	49.284	-24.716	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2462 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4924.000	2.191	40.250	42.441	-31.559	74.000
7386.000	10.373	38.560	48.934	-25.066	74.000
9848.000	9.964	39.240	49.204	-24.796	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4924.000	2.805	41.570	44.375	-29.625	74.000
7386.000	11.180	38.610	49.790	-24.210	74.000
9848.000	10.801	38.980	49.781	-24.219	74.000
Average Detector:					
--					

Note:

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

Product	:	WAH0001
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
72.680	-8.373	41.002	32.629	-7.371	40.000
220.120	-19.395	46.984	27.589	-18.411	46.000
499.480	-7.470	46.850	39.380	-6.620	46.000
749.740	-5.955	39.463	33.508	-12.492	46.000
875.840	-4.310	42.708	38.398	-7.602	46.000
961.200	-3.242	34.827	31.585	-22.415	54.000
Vertical					
88.200	-5.862	39.841	33.979	-9.521	43.500
288.020	-14.743	39.507	24.764	-21.236	46.000
499.480	-9.660	41.870	32.210	-13.790	46.000
600.360	-8.328	35.884	27.556	-18.444	46.000
749.740	-7.895	38.121	30.226	-15.774	46.000
875.840	-9.610	40.836	31.226	-14.774	46.000

Note:

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

Product	:	WAH0001
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
72.680	-8.373	42.541	34.168	-5.832	40.000
299.660	-14.011	40.369	26.358	-19.642	46.000
499.480	-7.470	47.281	39.811	-6.189	46.000
749.740	-5.955	40.903	34.948	-11.052	46.000
875.840	-4.310	43.150	38.840	-7.160	46.000
961.200	-3.242	35.300	32.058	-21.942	54.000
Vertical					
88.200	-5.862	38.689	32.827	-10.673	43.500
499.480	-9.660	41.819	32.159	-13.841	46.000
600.360	-8.328	36.936	28.608	-17.392	46.000
749.740	-7.895	39.121	31.226	-14.774	46.000
875.840	-9.610	41.213	31.603	-14.397	46.000
1000.000	-11.160	38.091	26.931	-27.069	54.000

Note:

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

Product	:	WAH0001
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
74.620	-10.424	43.856	33.432	-6.568	40.000
220.120	-19.395	47.232	27.837	-18.163	46.000
499.480	-7.470	46.713	39.243	-6.757	46.000
749.740	-5.955	39.569	33.614	-12.386	46.000
875.840	-4.310	42.580	38.270	-7.730	46.000
961.200	-3.242	35.037	31.795	-22.205	54.000
Vertical					
88.200	-5.862	39.551	33.689	-9.811	43.500
288.020	-14.743	40.055	25.312	-20.688	46.000
499.480	-9.660	41.895	32.235	-13.765	46.000
749.740	-7.895	39.279	31.384	-14.616	46.000
875.840	-9.610	40.885	31.275	-14.725	46.000
1000.000	-11.160	38.259	27.099	-26.901	54.000

Note:

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

Product	:	WAH0001
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Date	:	2018/07/06
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2437 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
72.680	-8.373	42.730	34.357	-5.643	40.000
220.120	-19.395	47.574	28.179	-17.821	46.000
499.480	-7.470	47.463	39.993	-6.007	46.000
749.740	-5.955	39.296	33.341	-12.659	46.000
875.840	-4.310	43.228	38.918	-7.082	46.000
1000.000	-0.430	41.763	41.333	-12.667	54.000
Vertical					
90.140	-7.193	42.896	35.703	-7.797	43.500
299.660	-13.321	39.670	26.349	-19.651	46.000
499.480	-9.660	41.685	32.025	-13.975	46.000
749.740	-7.895	38.357	30.462	-15.538	46.000
875.840	-9.610	40.378	30.768	-15.232	46.000
1000.000	-11.160	38.702	27.542	-26.458	54.000

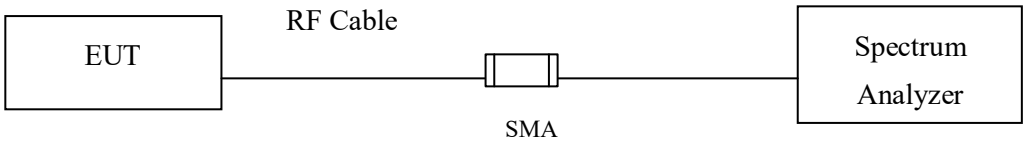
Note:

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

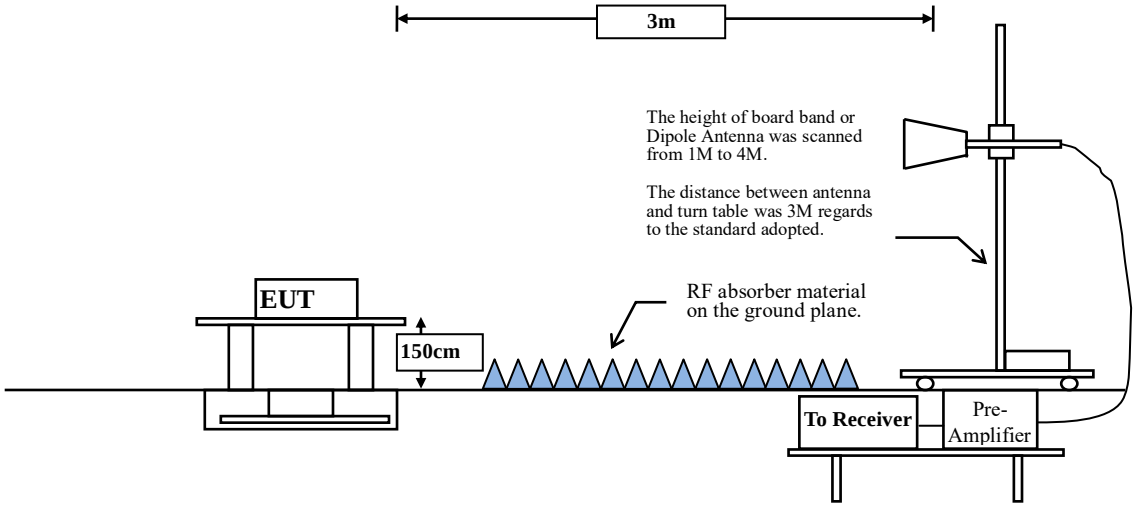
4. Band Edge

4.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



4.2. 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.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
802.11 b	98.84	12.3913	81	100
802.11 g	92.21	2.0580	486	500
VHT20	92.36	1.9275	519	1000
VHT40	83.89	0.9058	1104	2000

Note: Duty Cycle Refer to Section 5.

4.4. Uncertainty

± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Band Edge

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2386.812	6.461	53.933	60.394	74.00	54.00	Pass
01 (Peak)	2390.000	6.474	52.688	59.163	74.00	54.00	Pass
01 (Peak)	2397.681	6.514	71.669	78.183	--	--	--
01 (Peak)	2400.000	6.528	67.816	74.344	--	--	--
01 (Peak)	2411.159	6.597	104.984	111.581	--	--	--
01 (Average)	2387.391	6.463	42.898	49.361	74.00	54.00	Pass
01 (Average)	2390.000	6.474	38.016	44.491	74.00	54.00	Pass
01 (Average)	2397.826	6.515	68.844	75.359	--	--	--
01 (Average)	2400.000	6.528	64.578	71.106	--	--	--
01 (Average)	2411.449	6.599	101.440	108.039	--	--	--

Figure Channel 01: Horizontal (Peak)

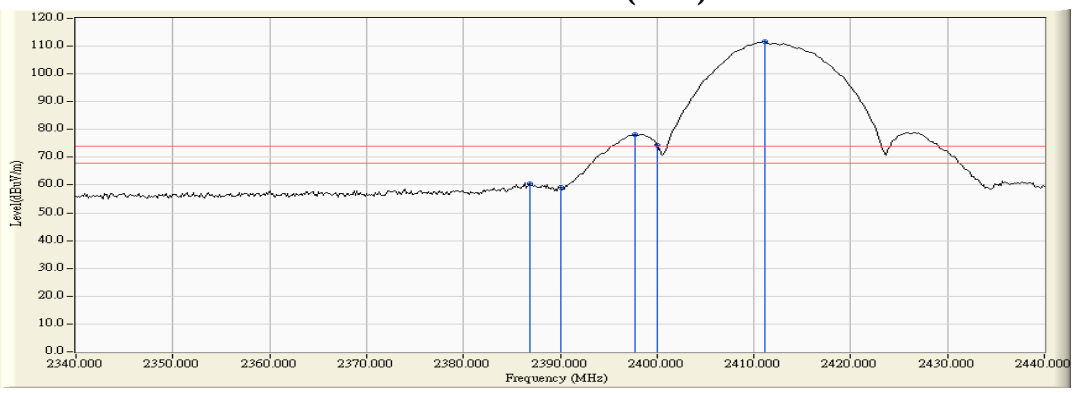
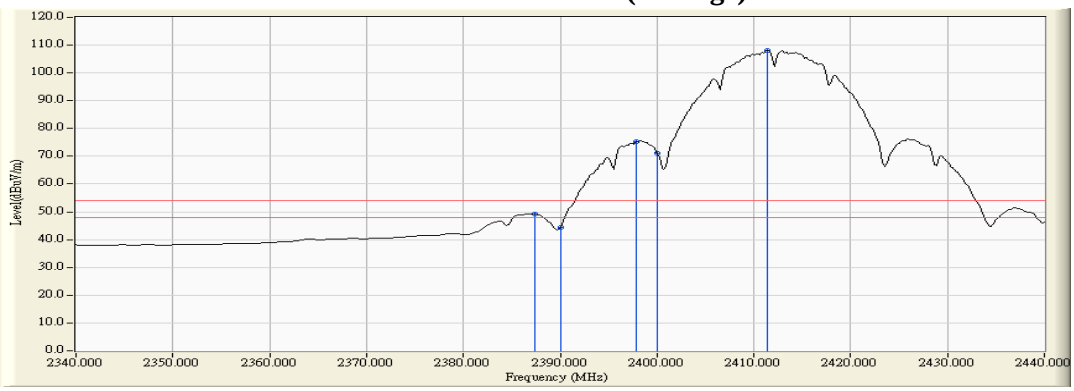


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2366.957	5.974	52.348	58.323	74.00	54.00	Pass
01 (Peak)	2390.000	5.880	50.615	56.496	74.00	54.00	Pass
01 (Peak)	2398.406	5.876	63.718	69.593	--	--	--
01 (Peak)	2400.000	5.879	60.683	66.562	--	--	--
01 (Peak)	2413.188	5.921	102.147	108.068	--	--	--
01 (Average)	2383.188	5.910	35.952	41.861	74.00	54.00	Pass
01 (Average)	2390.000	5.880	34.390	40.271	74.00	54.00	Pass
01 (Average)	2398.261	5.876	59.411	65.286	--	--	--
01 (Average)	2400.000	5.879	54.898	60.777	--	--	--
01 (Average)	2412.899	5.920	98.265	104.184	--	--	--

Figure Channel 01: Vertical (Peak)

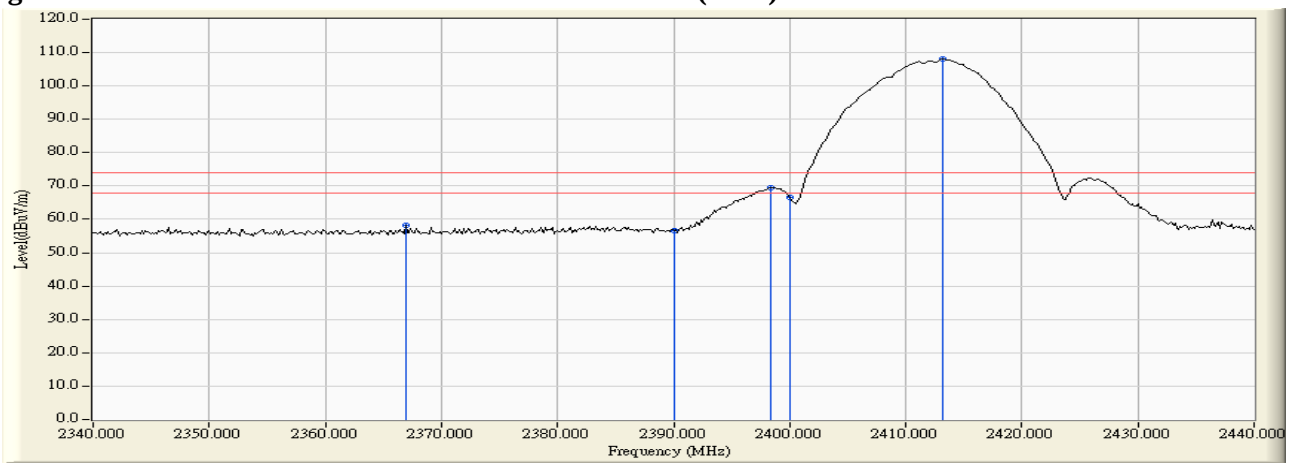
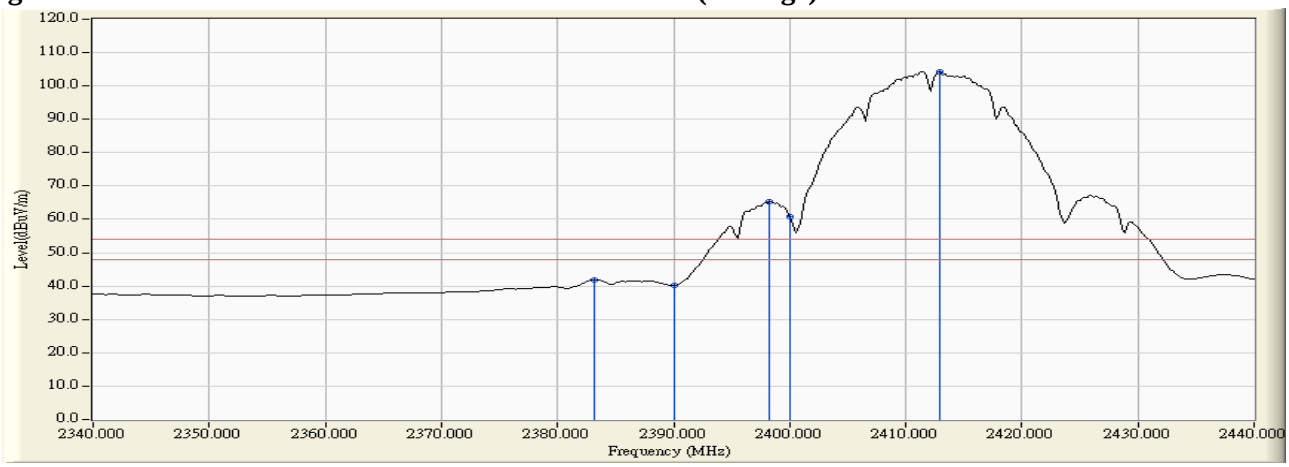


Figure Channel 01: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2461.036	6.952	105.522	112.474	--	--	--
11 (Peak)	2483.500	7.110	54.558	61.668	74.00	54.00	Pass
11 (Peak)	2485.964	7.127	55.138	62.265	74.00	54.00	Pass
11 (Average)	2461.326	6.954	102.544	109.498	--	--	--
11 (Average)	2483.500	7.110	44.213	51.323	74.00	54.00	Pass
11 (Average)	2486.833	7.134	45.531	52.665	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

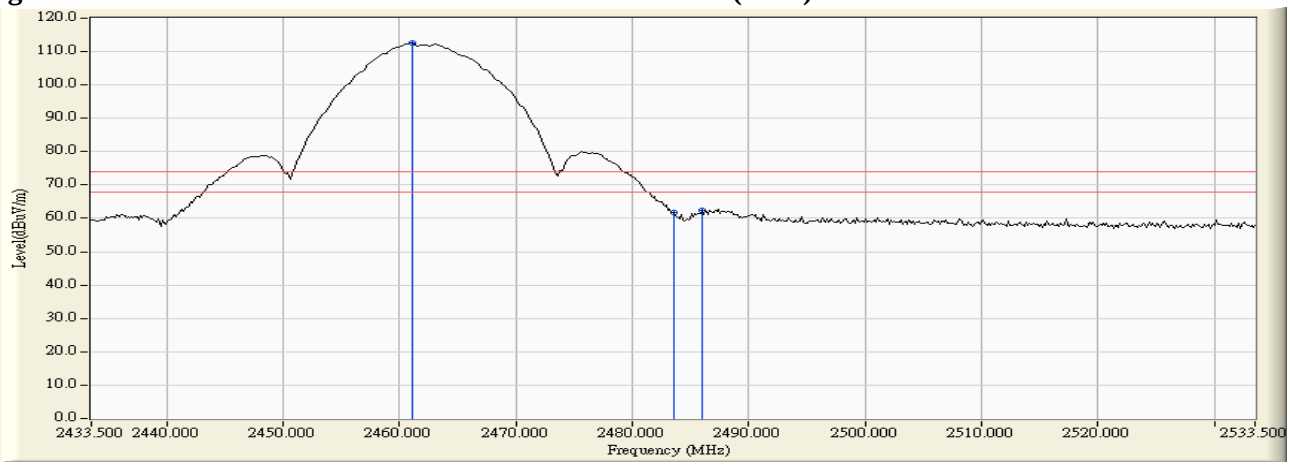
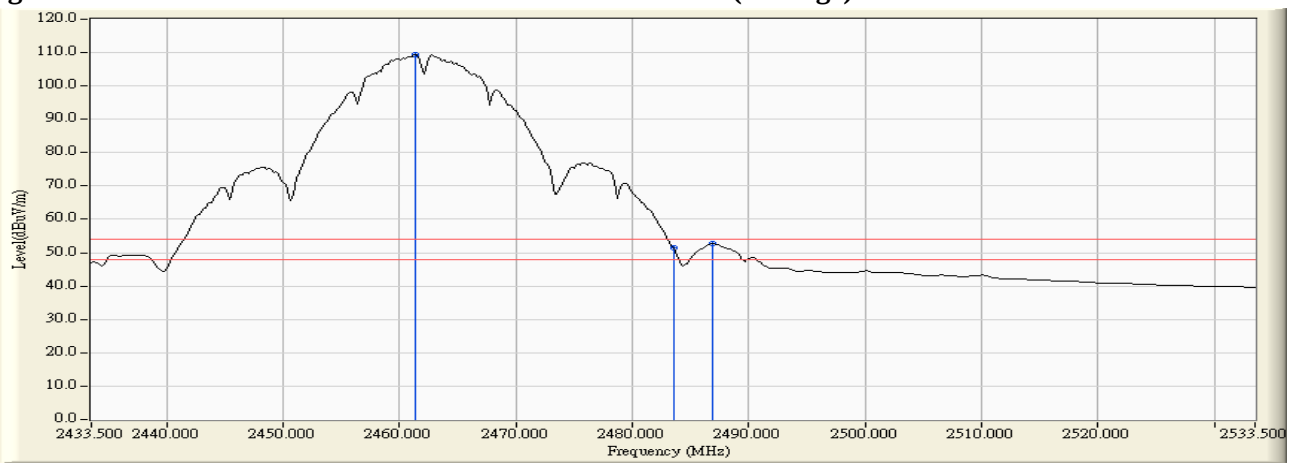


Figure Channel 11: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2461.036	6.223	104.136	110.359	--	--	--
11 (Peak)	2483.500	6.363	52.522	58.885	74.00	54.00	Pass
11 (Peak)	2484.659	6.371	53.991	60.362	74.00	54.00	Pass
11 (Average)	2462.775	6.234	99.553	105.787	--	--	--
11 (Average)	2483.500	6.363	37.227	43.590	74.00	54.00	Pass
11 (Average)	2485.819	6.378	37.478	43.856	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

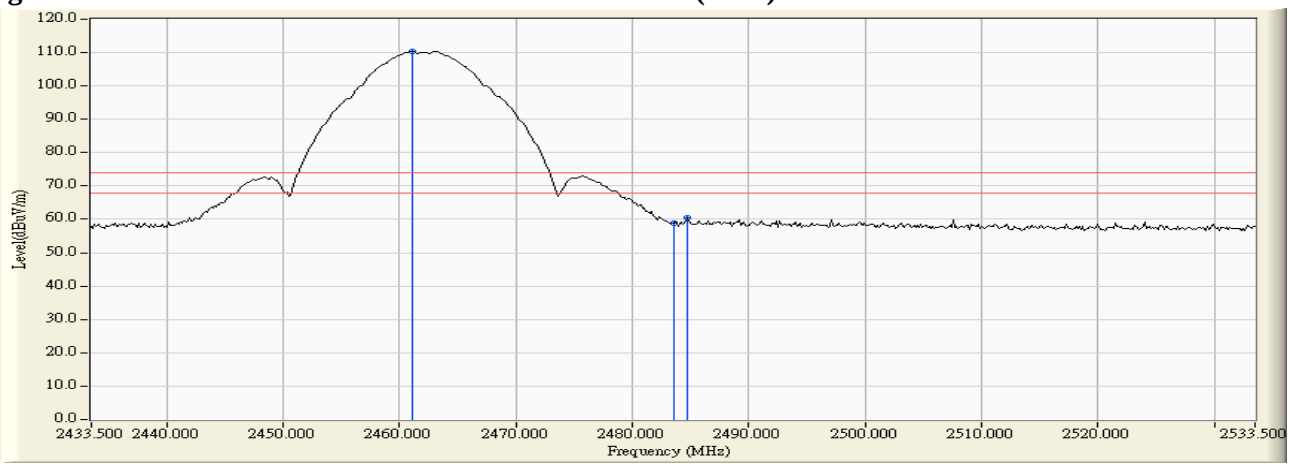
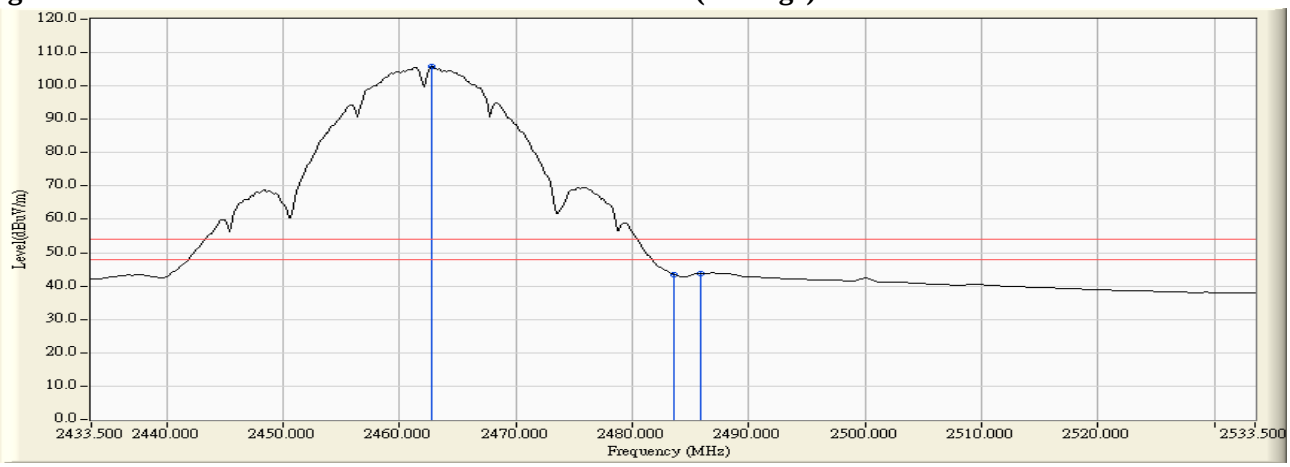


Figure Channel 11: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2467MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
12 (Peak)	2465.964	6.987	101.769	108.755	--	--	--
12 (Peak)	2483.500	7.110	56.041	63.151	74.00	54.00	Pass
12 (Average)	2467.848	7.000	97.531	104.530	--	--	--
12 (Average)	2483.500	7.110	46.829	53.939	74.00	54.00	Pass

Figure Channel 12: Horizontal (Peak)

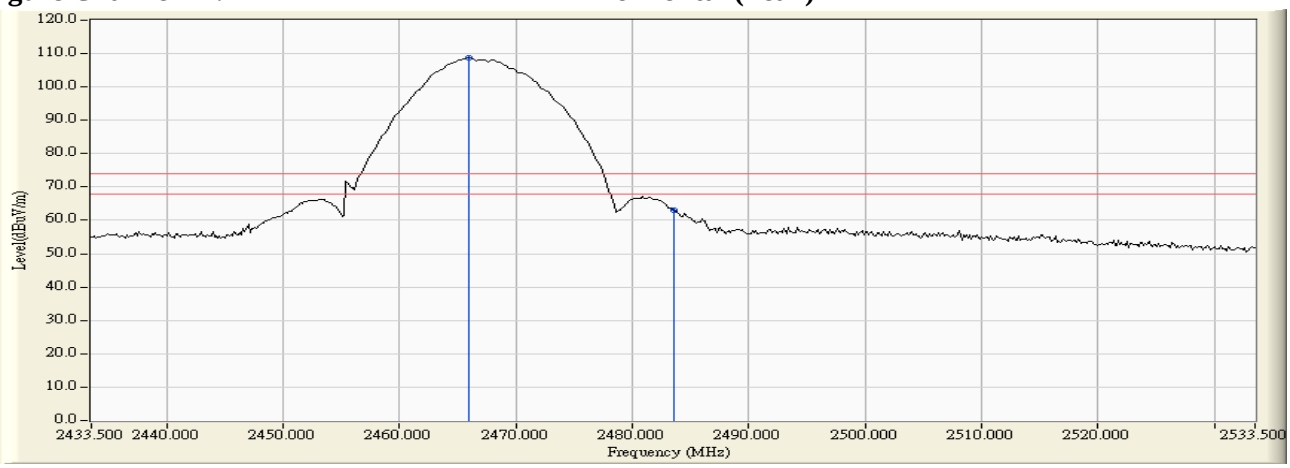
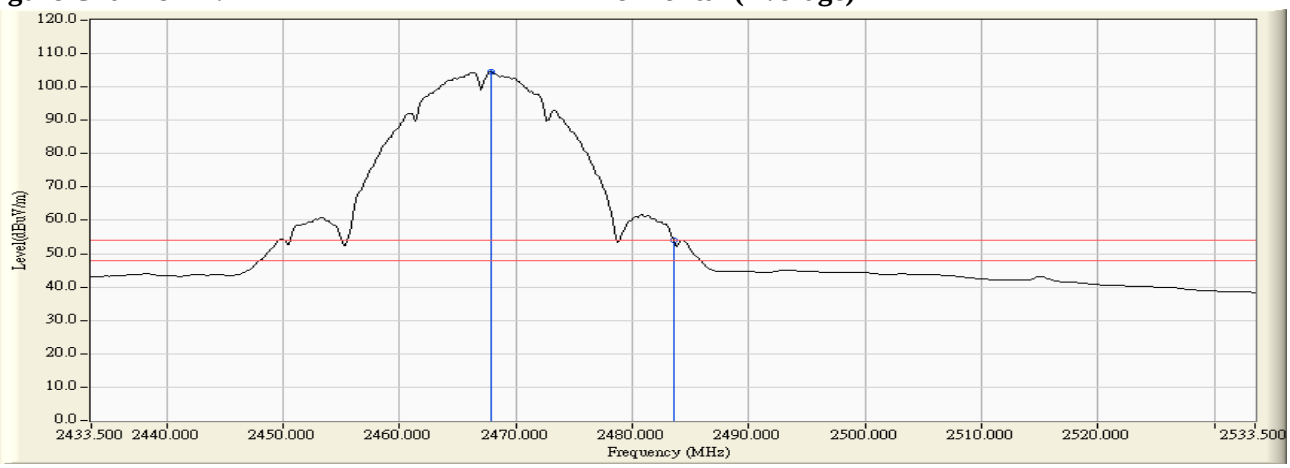


Figure Channel 12: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2467MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
12 (Peak)	2465.964	6.254	99.193	105.447	--	--	--
12 (Peak)	2483.500	6.363	50.019	56.382	74.00	54.00	Pass
12 (Peak)	2484.080	6.367	51.193	57.560	74.00	54.00	Pass
12 (Average)	2466.254	6.256	95.138	101.394	--	--	--
12 (Average)	2483.500	6.363	38.967	45.330	74.00	54.00	Pass

Figure Channel 12: Vertical (Peak)

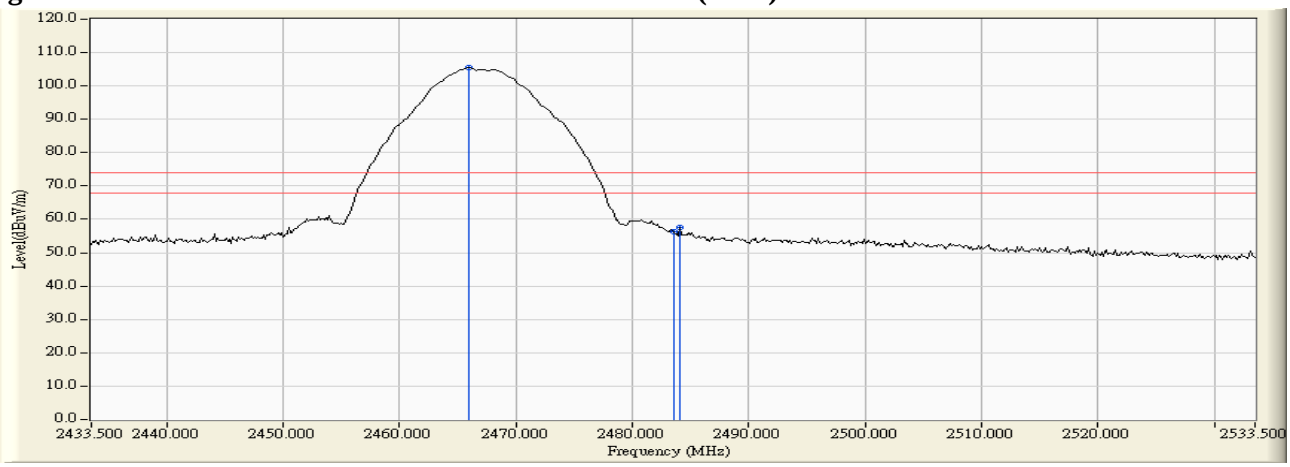
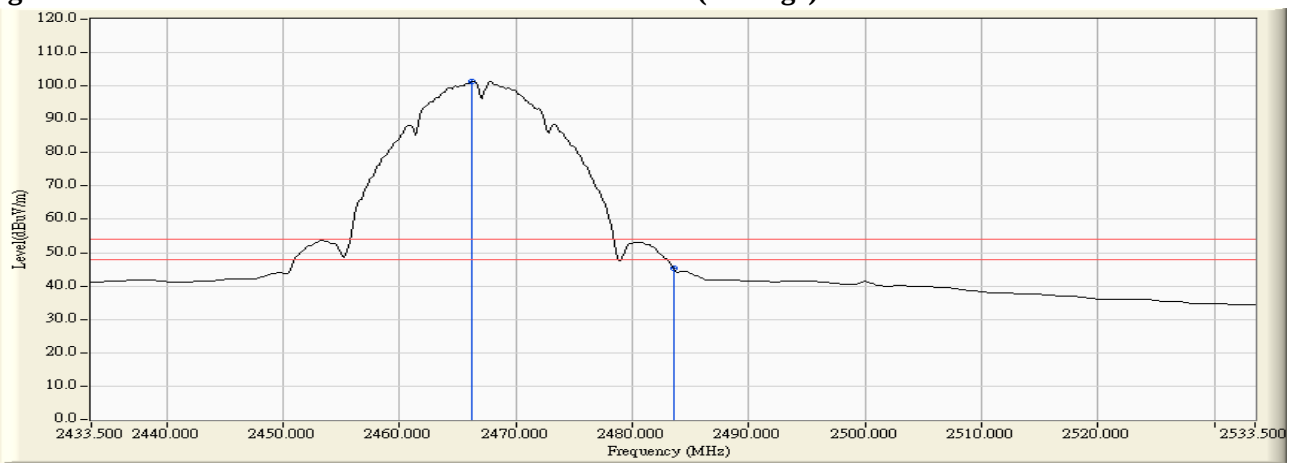


Figure Channel 12: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2472MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
13 (Peak)	2470.891	7.021	97.115	104.136	--	--	--
13 (Peak)	2483.500	7.110	52.474	59.584	74.00	54.00	Pass
13 (Average)	2472.775	7.034	93.678	100.712	--	--	--
13 (Average)	2483.500	7.110	41.458	48.568	74.00	54.00	Pass

Figure Channel 13: Horizontal (Peak)

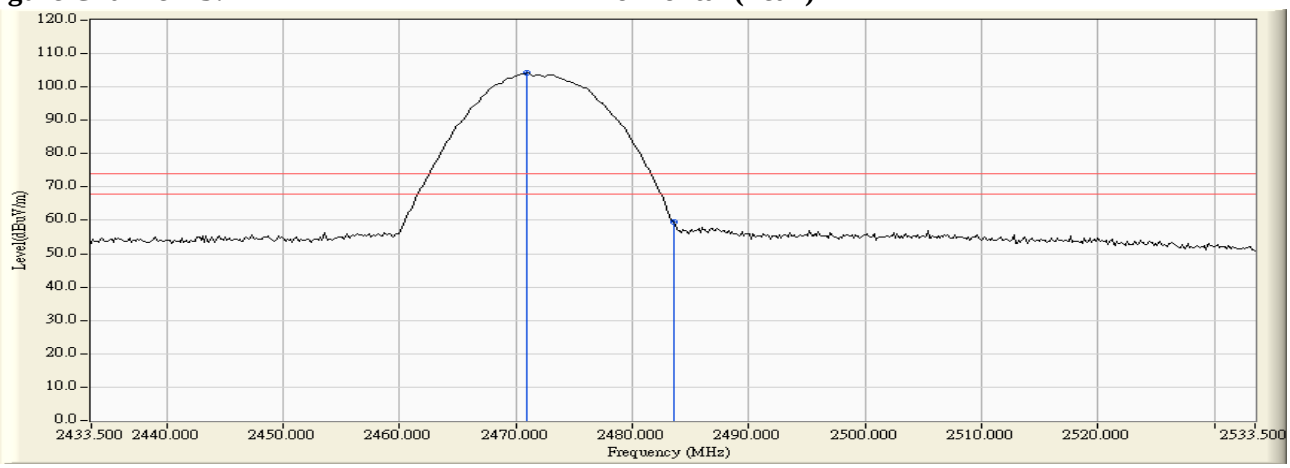
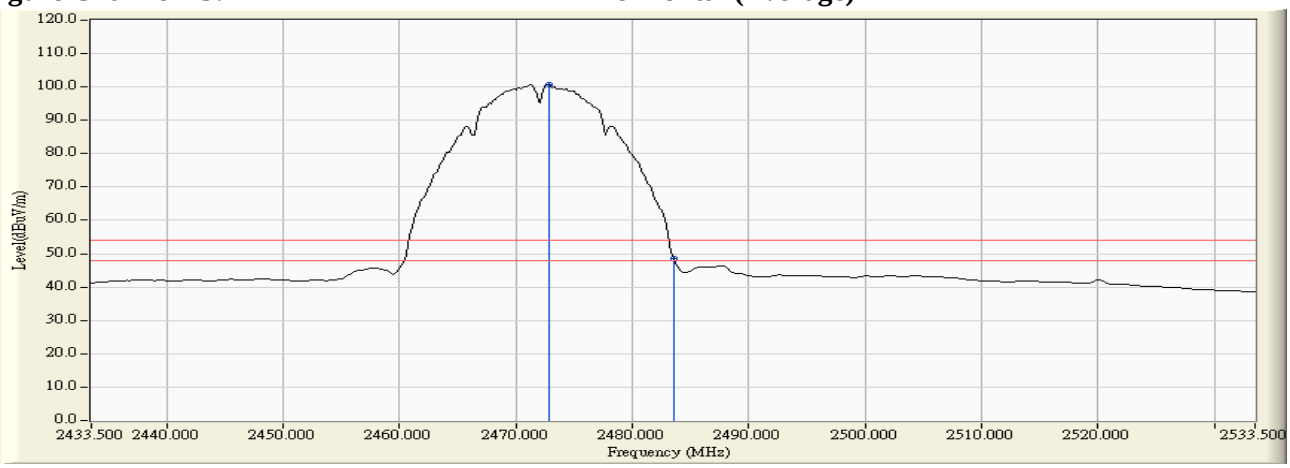


Figure Channel 13: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2472MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
13 (Peak)	2471.036	6.285	94.904	101.189	--	--	--
13 (Peak)	2483.500	6.363	48.989	55.352	74.00	54.00	Pass
13 (Average)	2472.775	6.296	91.474	97.770	--	--	--
13 (Average)	2483.500	6.363	37.825	44.188	74.00	54.00	Pass

Figure Channel 13: Vertical (Peak)

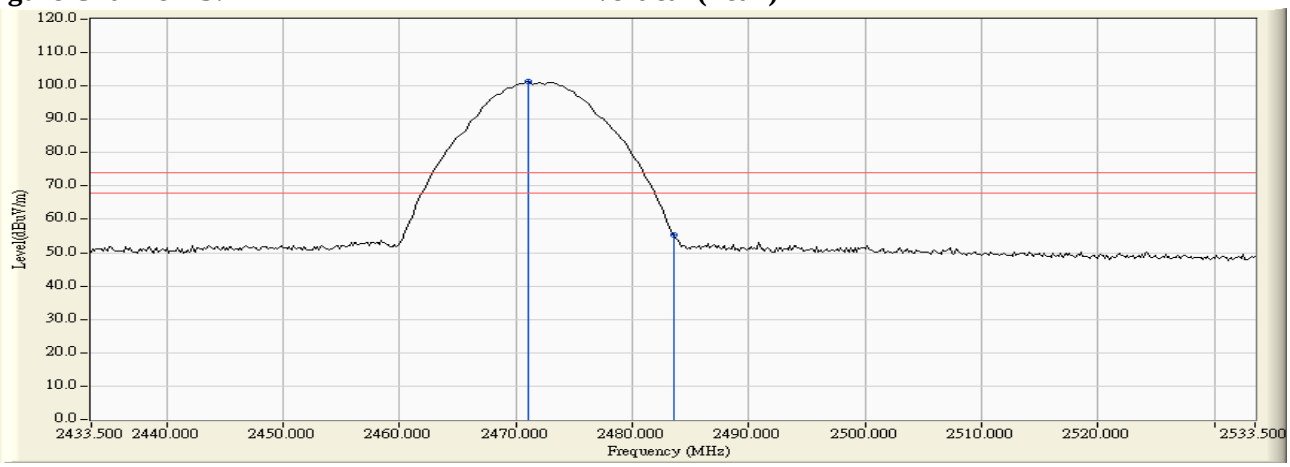
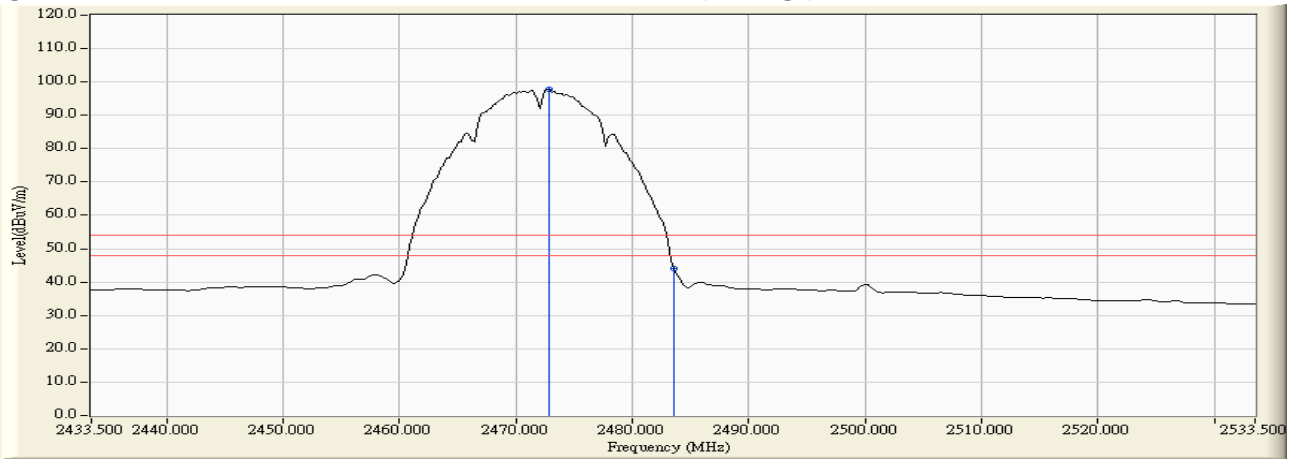


Figure Channel 13: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	6.474	56.351	62.826	74.00	54.00	Pass
01 (Peak)	2400.000	6.528	72.787	79.315	--	--	--
01 (Peak)	2409.710	6.588	104.301	110.889	--	--	--
01(Average)	2390.000	6.474	42.159	48.634	74.00	54.00	Pass
01(Average)	2400.000	6.528	60.109	66.637	--	--	--
01(Average)	2413.043	6.610	95.271	101.881	--	--	--

Figure Channel 01: Horizontal (Peak)

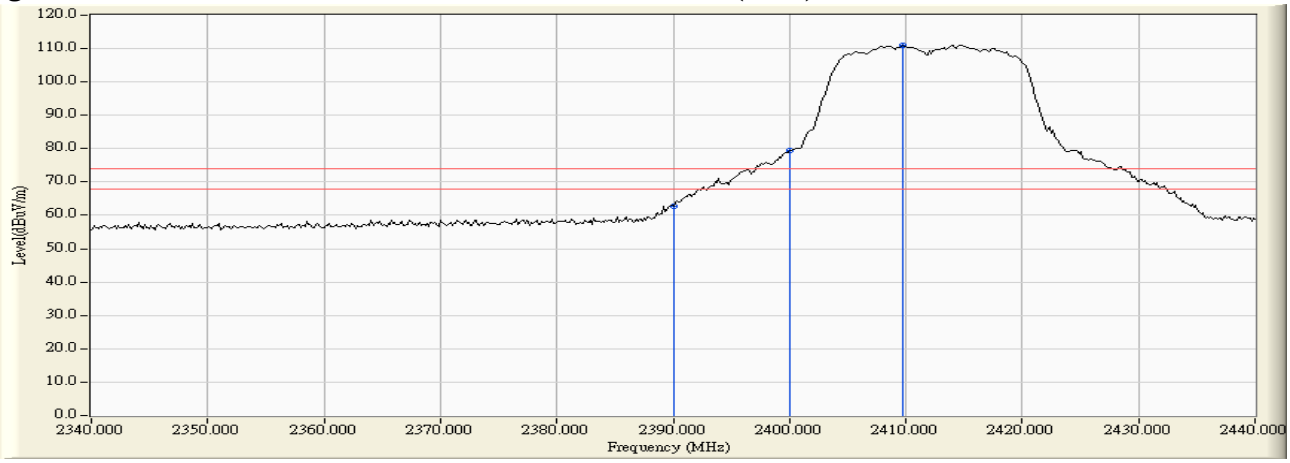
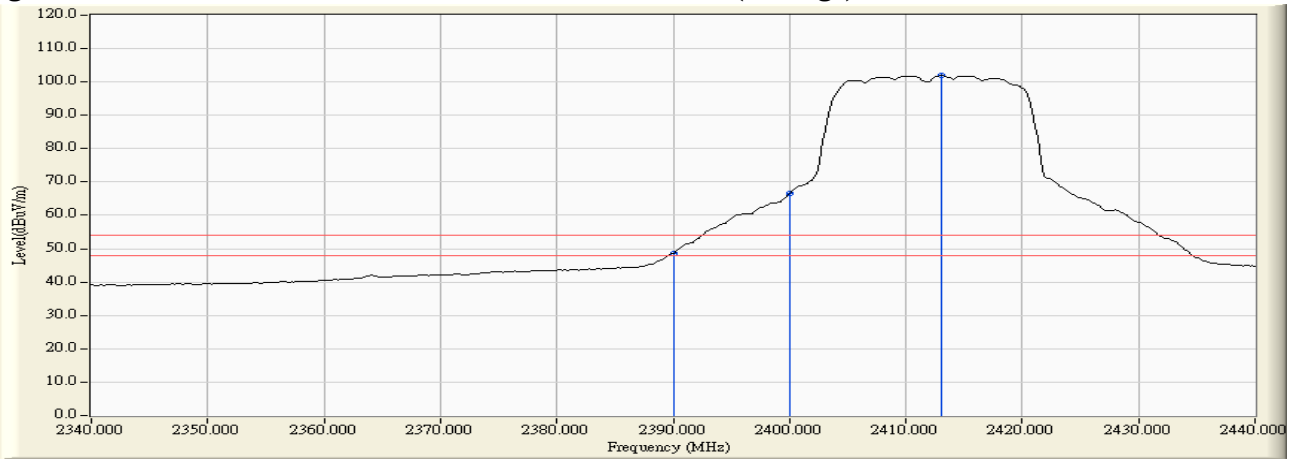


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	5.880	52.600	58.481	74.00	54.00	Pass
01 (Peak)	2399.710	5.878	67.307	73.185	--	--	--
01 (Peak)	2400.000	5.879	66.787	72.666	--	--	--
01 (Peak)	2414.203	5.927	101.000	106.928	--	--	--
01 (Average)	2390.000	5.880	37.259	43.140	74.00	54.00	Pass
01 (Average)	2400.000	5.879	53.585	59.464	--	--	--
01 (Average)	2414.203	5.927	92.307	98.235	--	--	--

Figure Channel 01: Vertical (Peak)

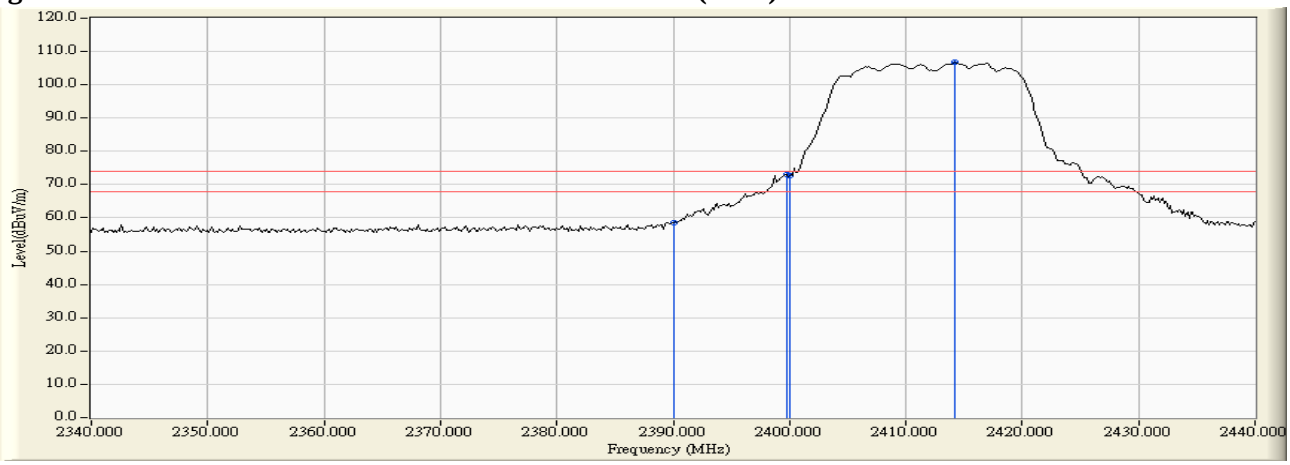
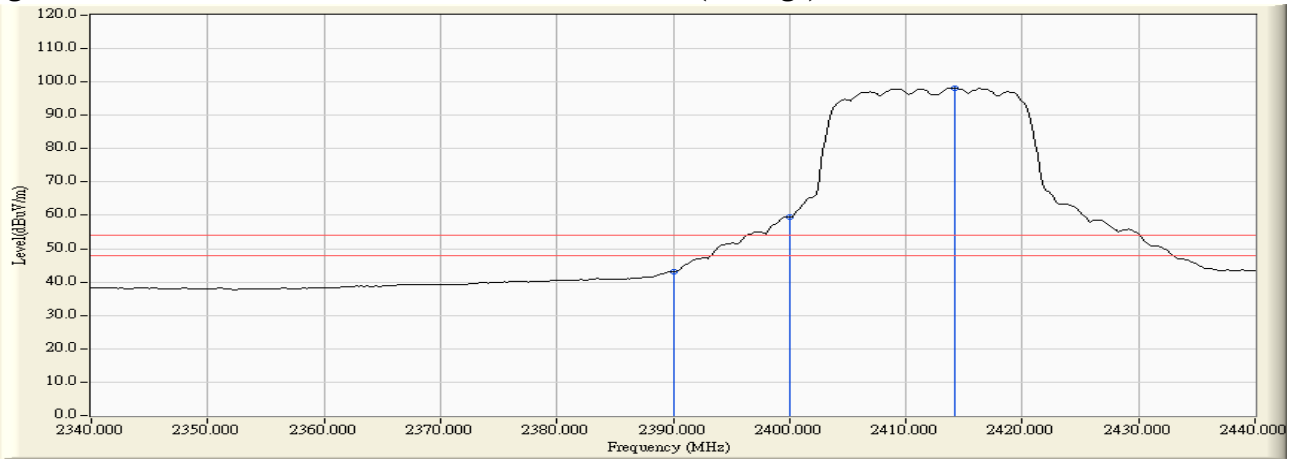


Figure Channel 01: Vertical (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2463.790	6.971	103.937	110.908	--	--	--
11 (Peak)	2483.500	7.110	57.273	64.383	74.00	54.00	Pass
11 (Average)	2464.949	6.979	94.703	101.682	--	--	--
11 (Average)	2483.500	7.110	42.615	49.725	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

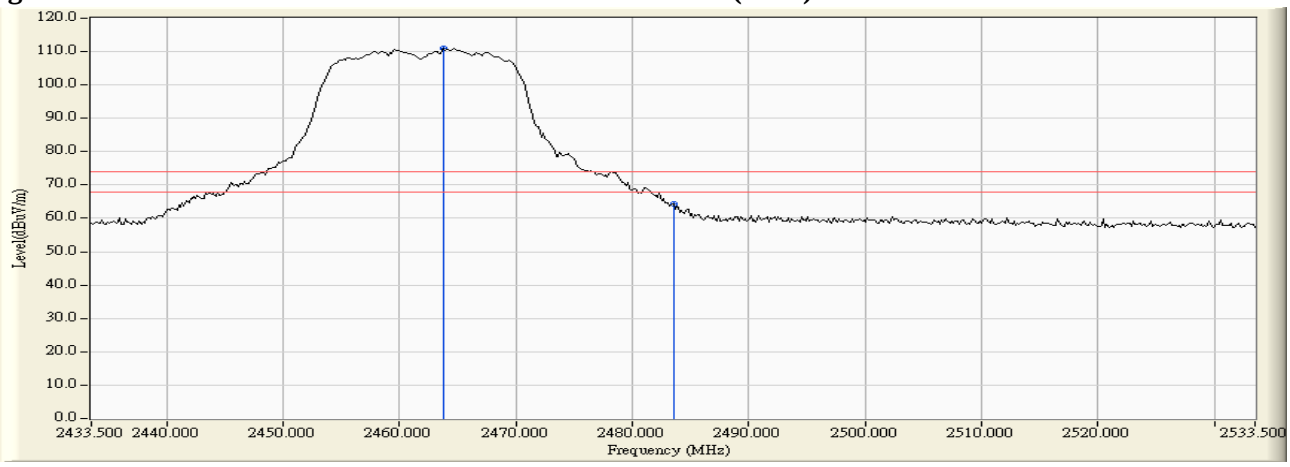
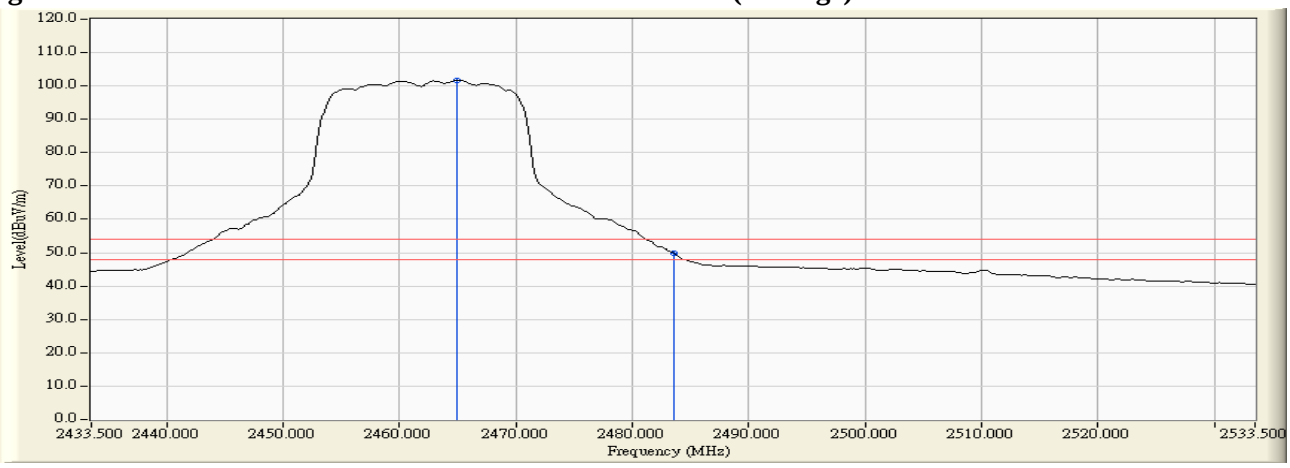


Figure Channel 11: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2464.225	6.244	101.721	107.964	--	--	--
11 (Peak)	2483.500	6.363	53.712	60.075	74.00	54.00	Pass
11 (Peak)	2483.645	6.364	54.229	60.593	74.00	54.00	Pass
11 (Average)	2464.659	6.246	92.836	99.082	--	--	--
11 (Average)	2483.500	6.363	38.749	45.112	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

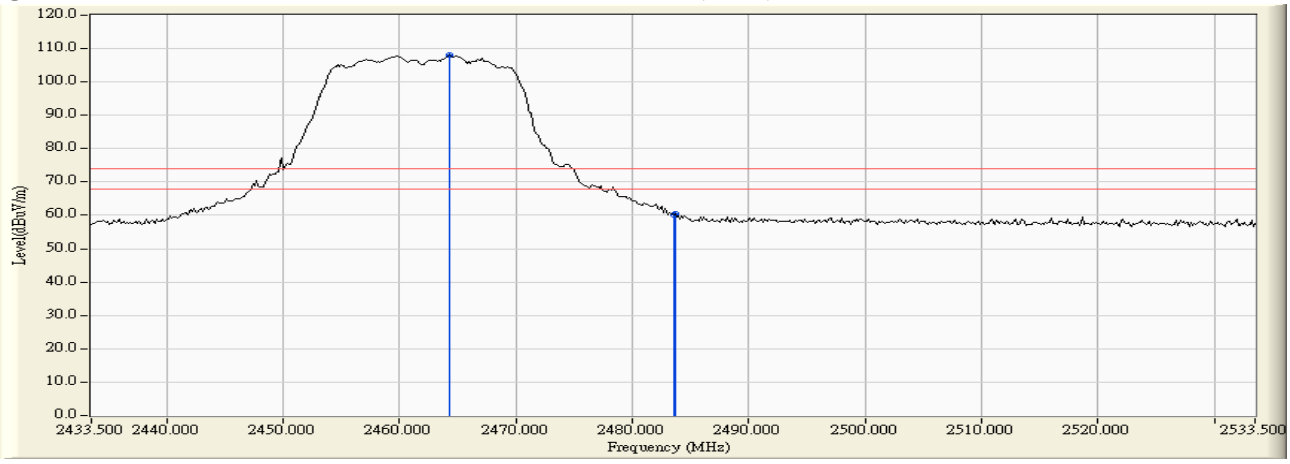
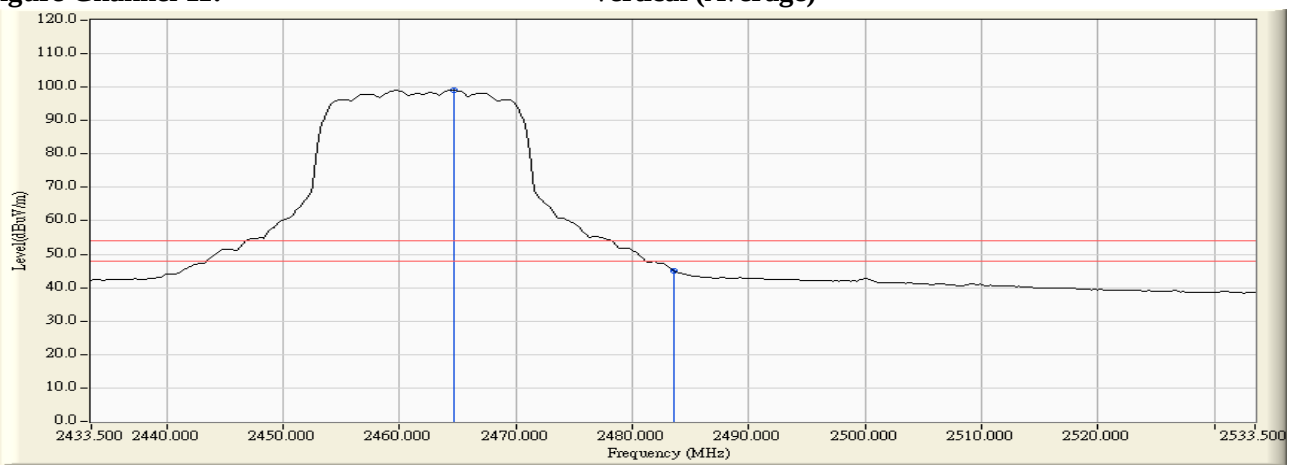


Figure Channel 11: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2467MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
12 (Peak)	2464.514	6.976	99.935	106.911	--	--	--
12 (Peak)	2483.500	7.110	57.466	64.576	74.00	54.00	Pass
12 (Average)	2465.239	6.981	90.745	97.726	--	--	--
12 (Average)	2483.500	7.110	42.851	49.961	74.00	54.00	Pass

Figure Channel 12: Horizontal (Peak)

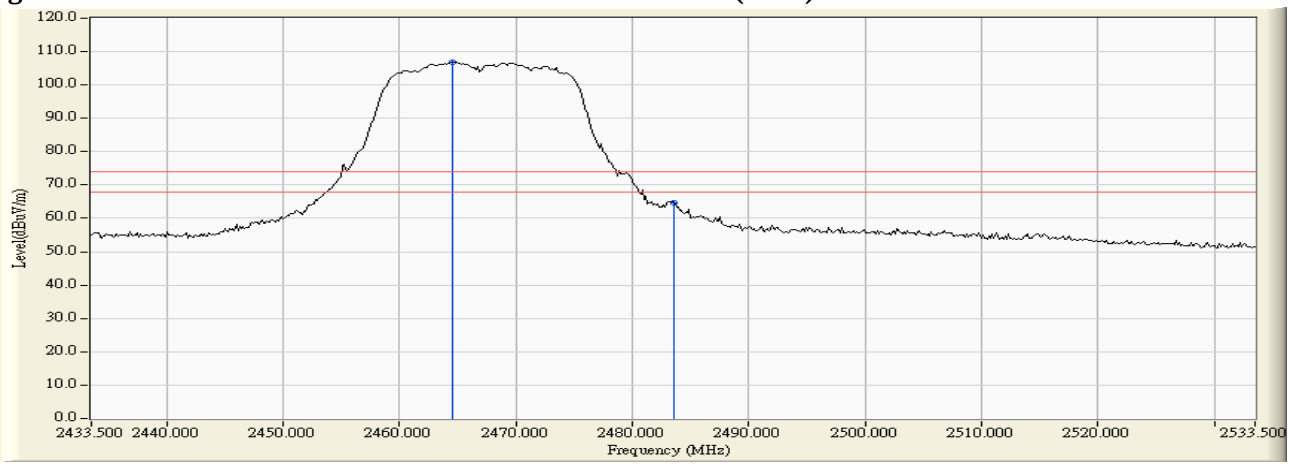
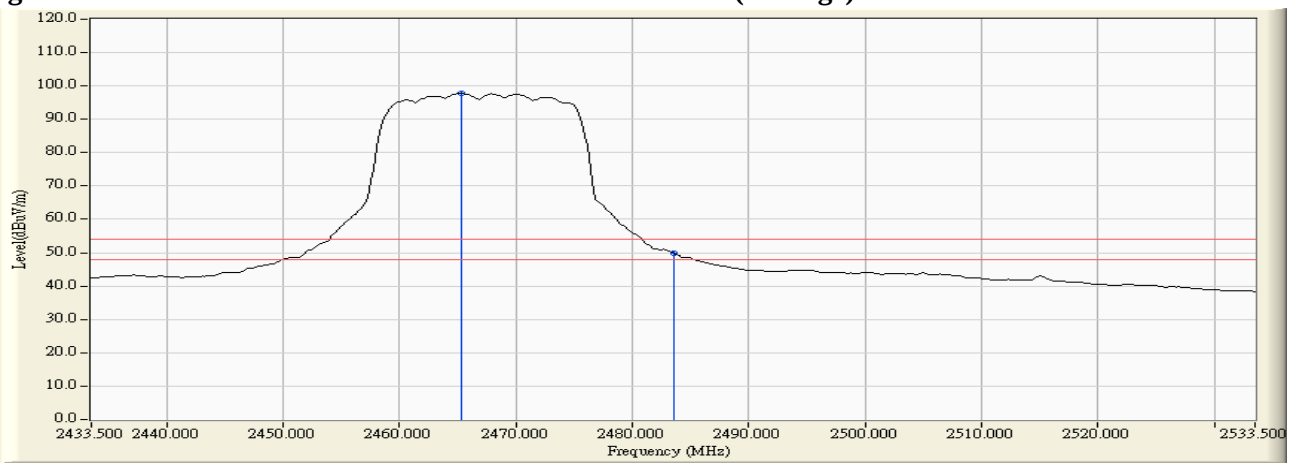


Figure Channel 12: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2467MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
12 (Peak)	2464.514	6.245	97.521	103.766	--	--	--
12 (Peak)	2483.500	6.363	50.694	57.057	74.00	54.00	Pass
12 (Peak)	2483.645	6.364	52.417	58.781	74.00	54.00	Pass
12 (Average)	2464.804	6.247	88.940	95.187	--	--	--
12 (Average)	2483.500	6.363	37.904	44.267	74.00	54.00	Pass

Figure Channel 12: Vertical (Peak)

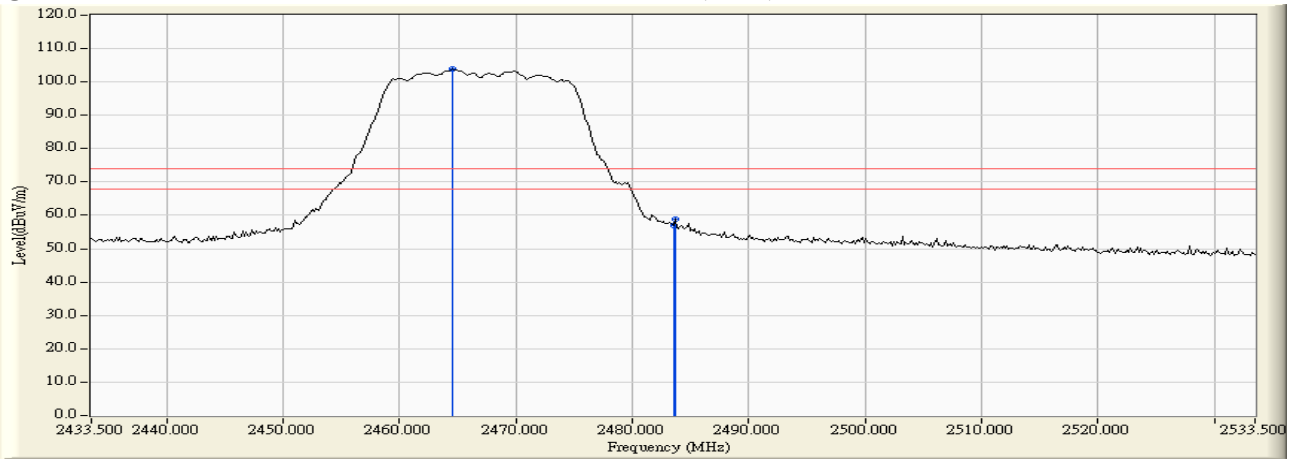
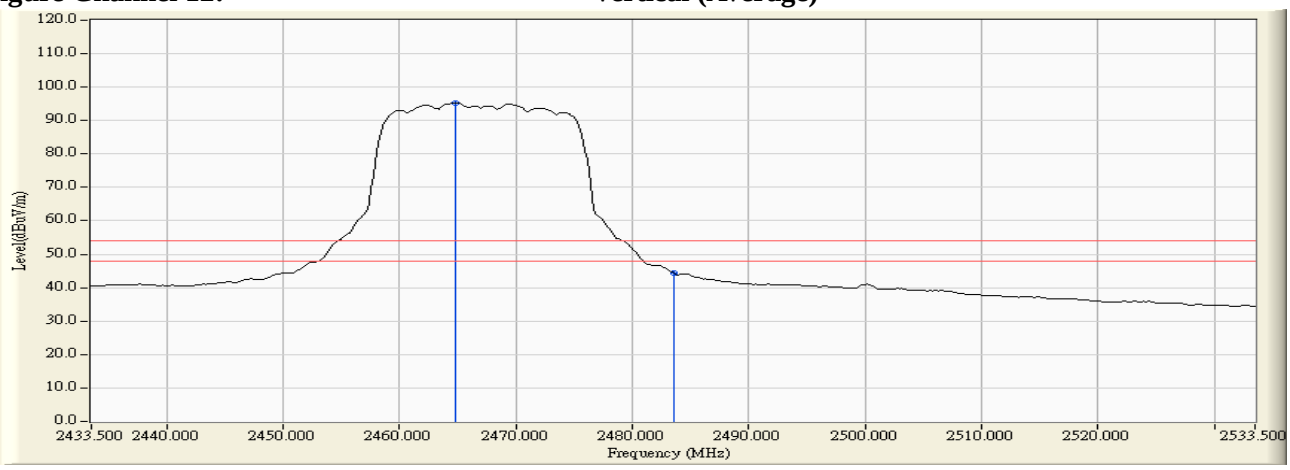


Figure Channel 12: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2472MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
13 (Peak)	2474.659	7.047	91.042	98.089	--	--	--
13 (Peak)	2483.500	7.110	56.168	63.278	74.00	54.00	Pass
13 (Average)	2475.239	7.052	81.909	88.960	--	--	--
13 (Average)	2483.500	7.110	41.624	48.734	74.00	54.00	Pass

Figure Channel 13: Horizontal (Peak)

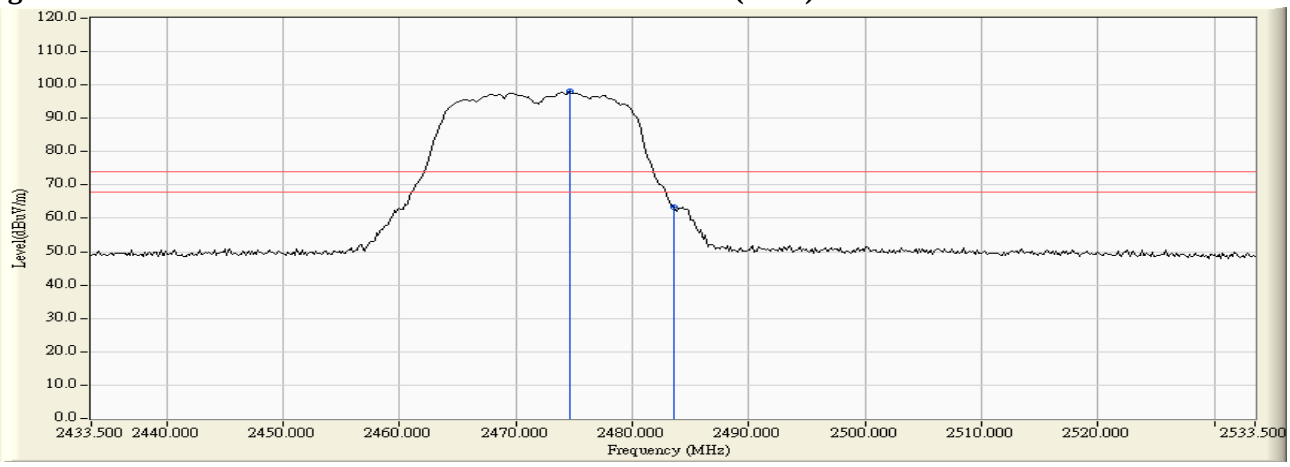
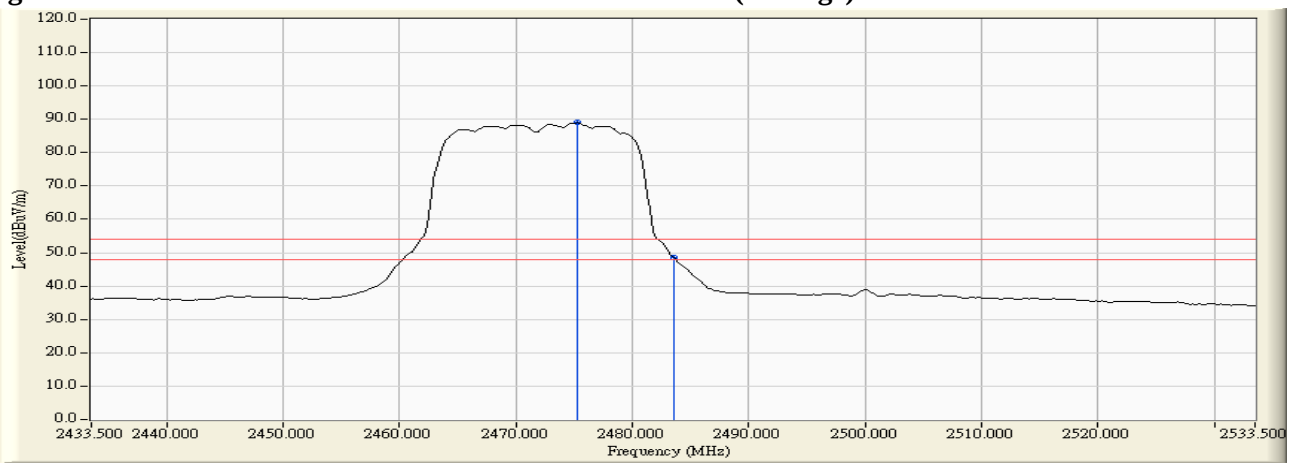


Figure Channel 13: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2472MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
13 (Peak)	2474.949	6.310	87.627	93.937	--	--	--
13 (Peak)	2483.500	6.363	53.873	60.236	74.00	54.00	Pass
13 (Average)	2474.514	6.307	79.296	85.603	--	--	--
13 (Average)	2483.500	6.363	37.845	44.208	74.00	54.00	Pass

Figure Channel 13: Vertical (Peak)

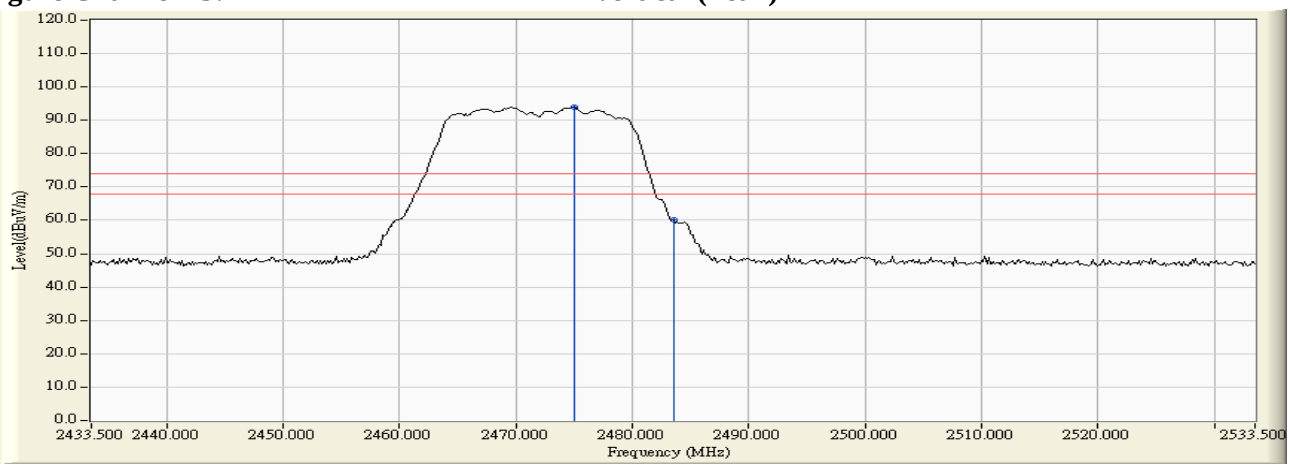
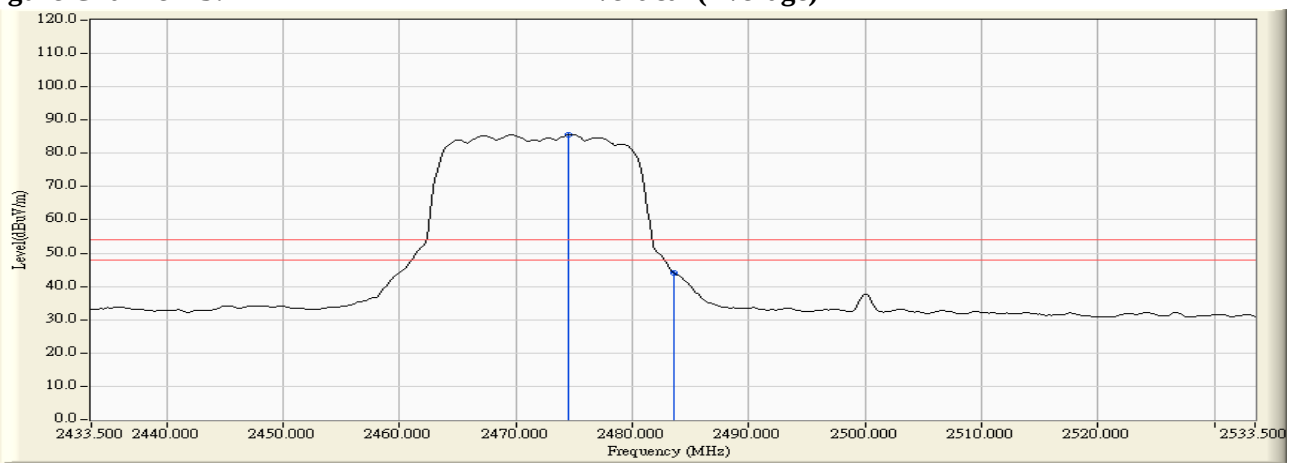


Figure Channel 13: Vertical (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2412MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2389.565	6.473	57.005	63.478	74.00	54.00	Pass
01 (Peak)	2390.000	6.474	56.740	63.215	74.00	54.00	Pass
01 (Peak)	2400.000	6.528	70.313	76.841	--	--	--
01 (Peak)	2413.623	6.614	104.216	110.830	--	--	--
01 (Average)	2390.000	6.474	43.135	49.610	74.00	54.00	Pass
01 (Average)	2400.000	6.528	57.334	63.862	--	--	--
01 (Average)	2414.783	6.623	95.037	101.660	--	--	--

Figure Channel 01: Horizontal (Peak)

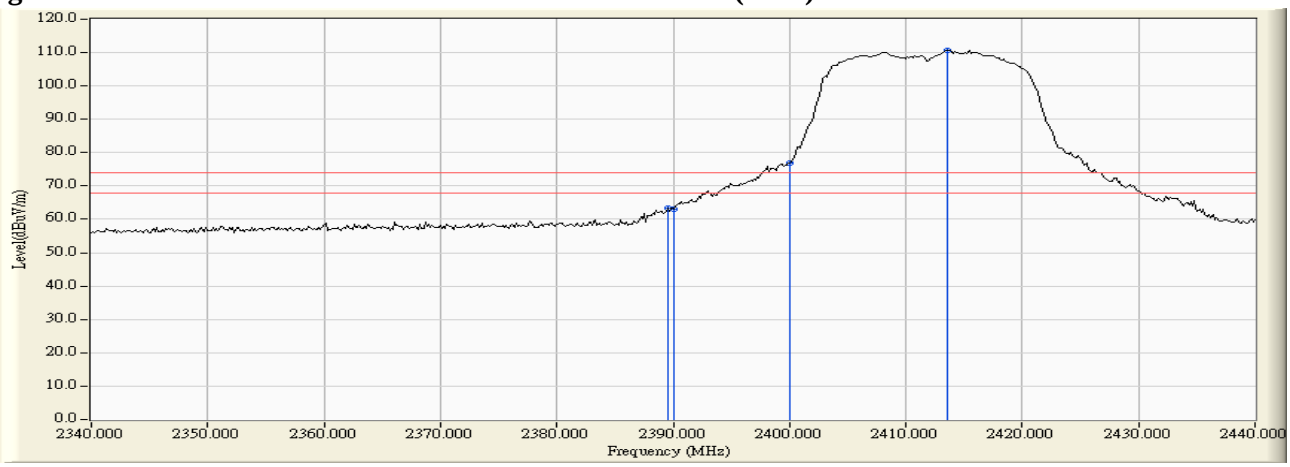
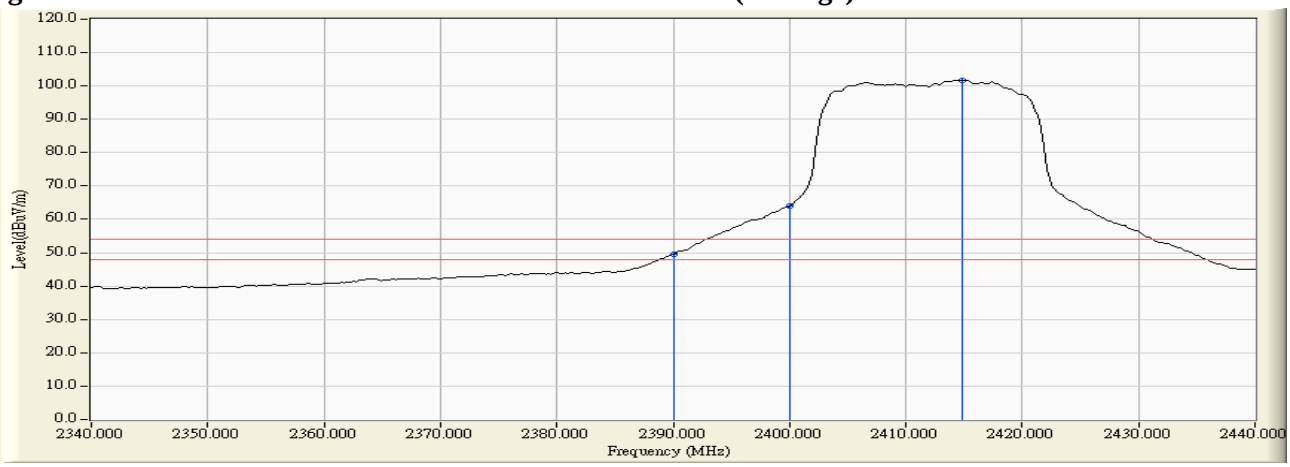


Figure Channel 01: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	29.821	53.831	59.712	74.00	54.00	Pass
01 (Peak)	2400.000	29.819	66.760	72.639	--	--	--
01 (Peak)	2410.870	29.847	99.759	105.666	--	--	--
01 (Average)	2390.000	5.880	38.867	44.748	74.00	54.00	Pass
01 (Average)	2400.000	5.879	52.788	58.667	--	--	--
01 (Average)	2410.580	5.906	91.588	97.494	--	--	--

Figure Channel 01: Vertical (Peak)

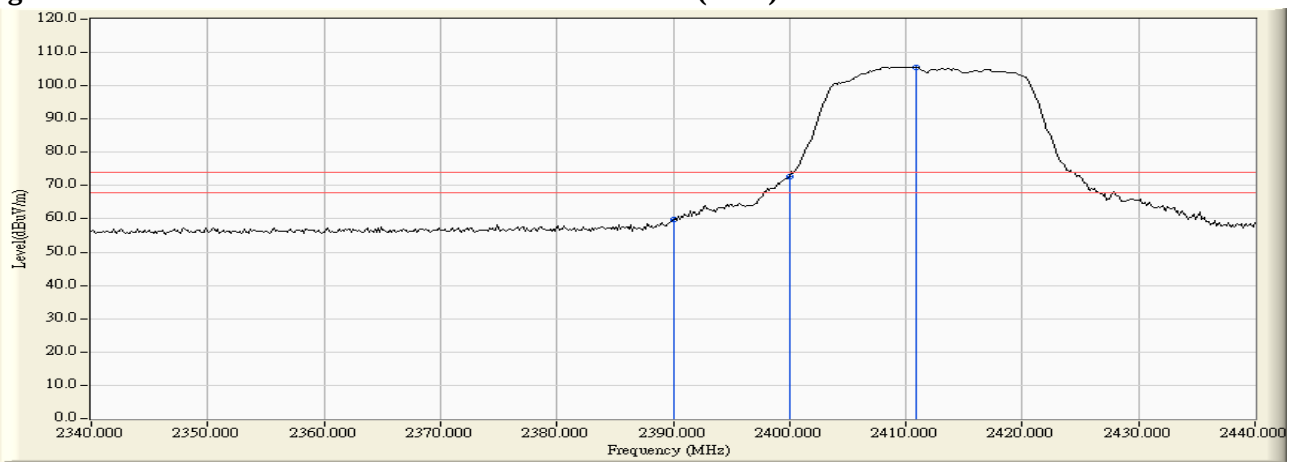
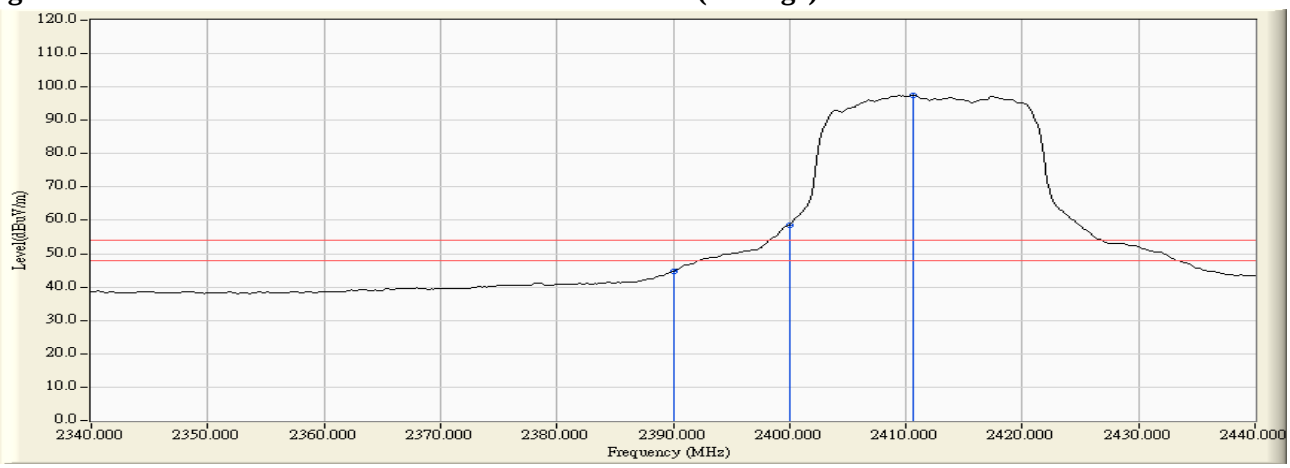


Figure Channel 01: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2463.500	6.969	103.106	110.075	--	--	--
11 (Peak)	2483.500	7.110	54.663	61.773	74.00	54.00	Pass
11 (Peak)	2483.790	7.112	56.158	63.270	74.00	54.00	Pass
11 (Average)	2464.949	6.979	94.055	101.034	--	--	--
11 (Average)	2483.500	7.110	42.137	49.247	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

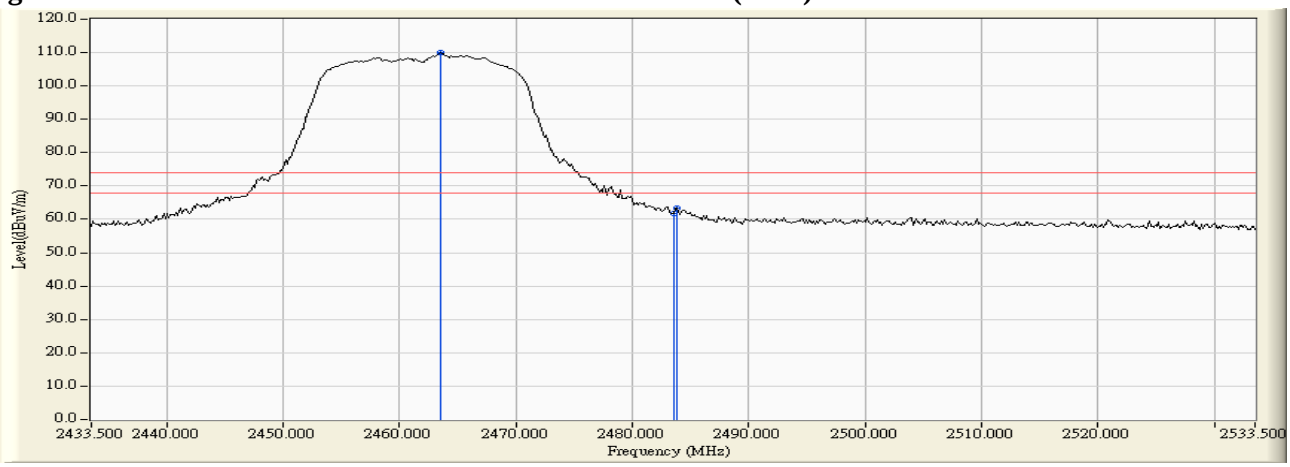
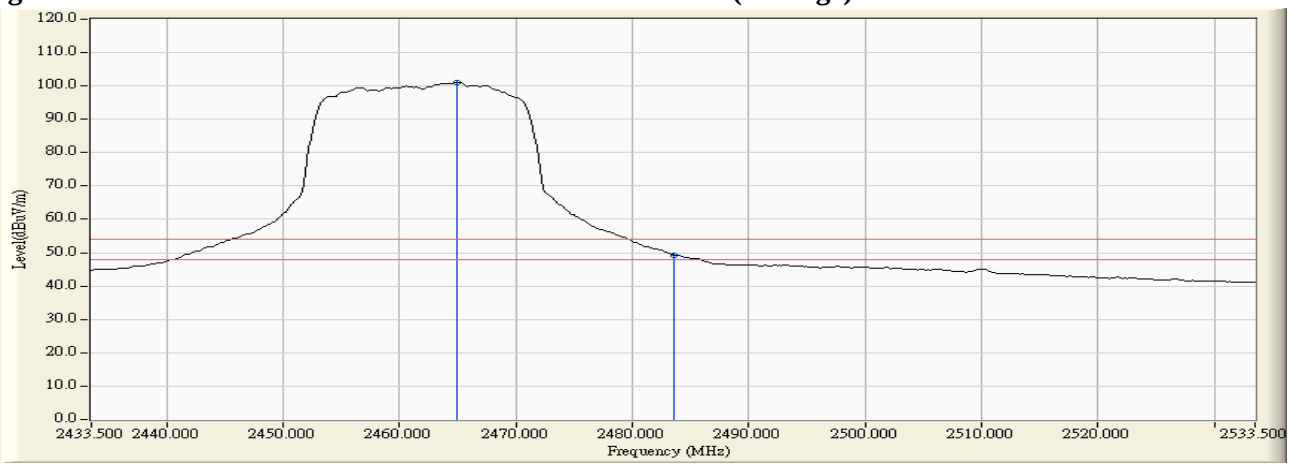


Figure Channel 11: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 3: Transmit - (VHT 20BW) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2462.920	6.235	99.818	106.053	--	--	--
11 (Peak)	2483.500	6.363	53.280	59.643	74.00	54.00	Pass
11 (Average)	2463.500	6.238	91.484	97.723	--	--	--
11 (Average)	2483.500	6.363	38.987	45.350	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

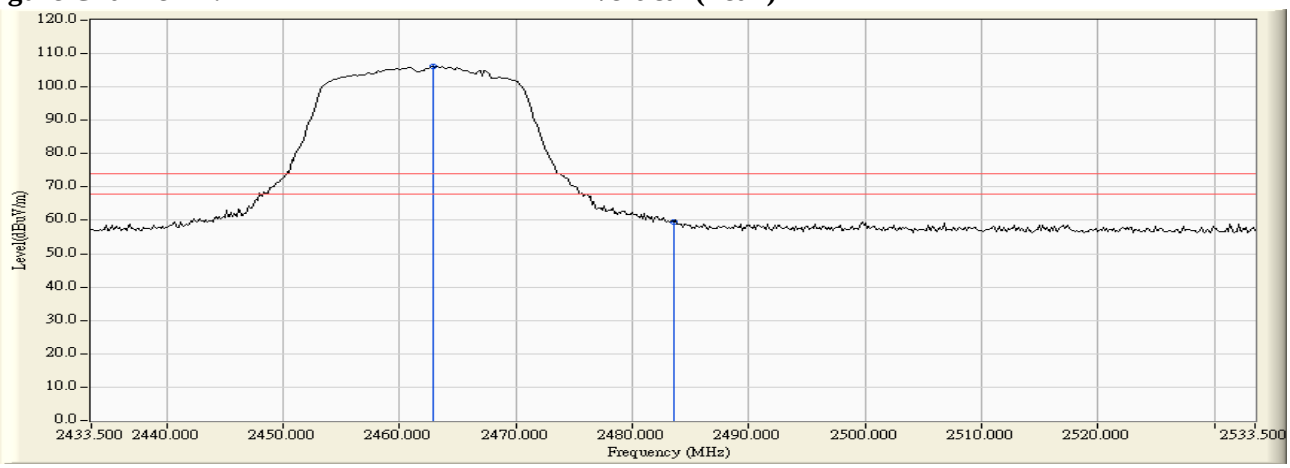
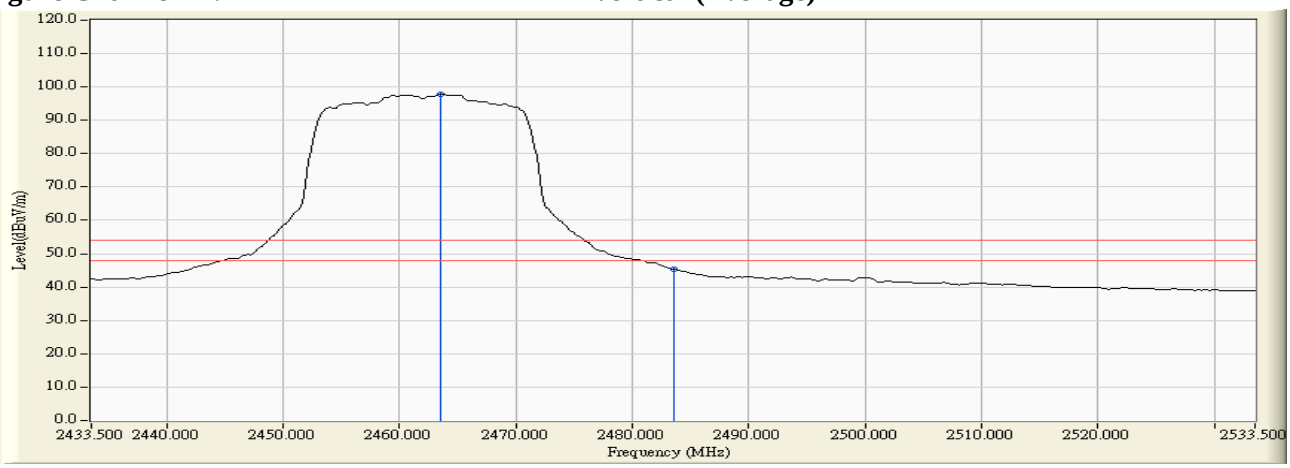


Figure Channel 11: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 3: Transmit - (VHT 20BW) (2467MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
12 (Peak)	2468.572	7.005	99.978	106.983	--	--	--
12 (Peak)	2483.500	7.110	55.799	62.909	74.00	54.00	Pass
12 (Peak)	2484.370	7.116	55.987	63.103	74.00	54.00	Pass
12 (Average)	2470.022	7.015	90.938	97.953	--	--	--
12 (Average)	2483.500	7.110	42.104	49.214	74.00	54.00	Pass

Figure Channel 12: Horizontal (Peak)

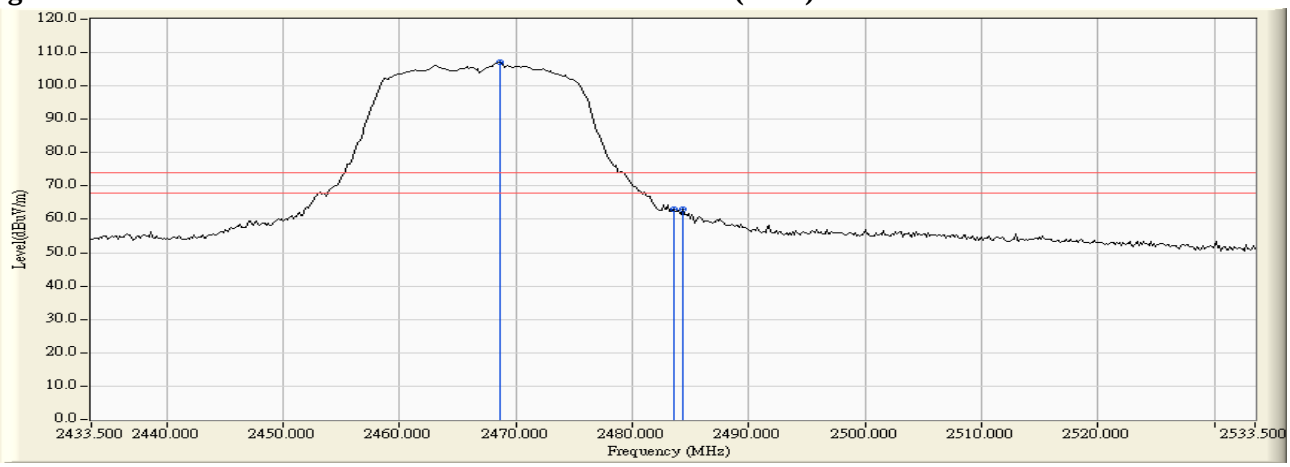
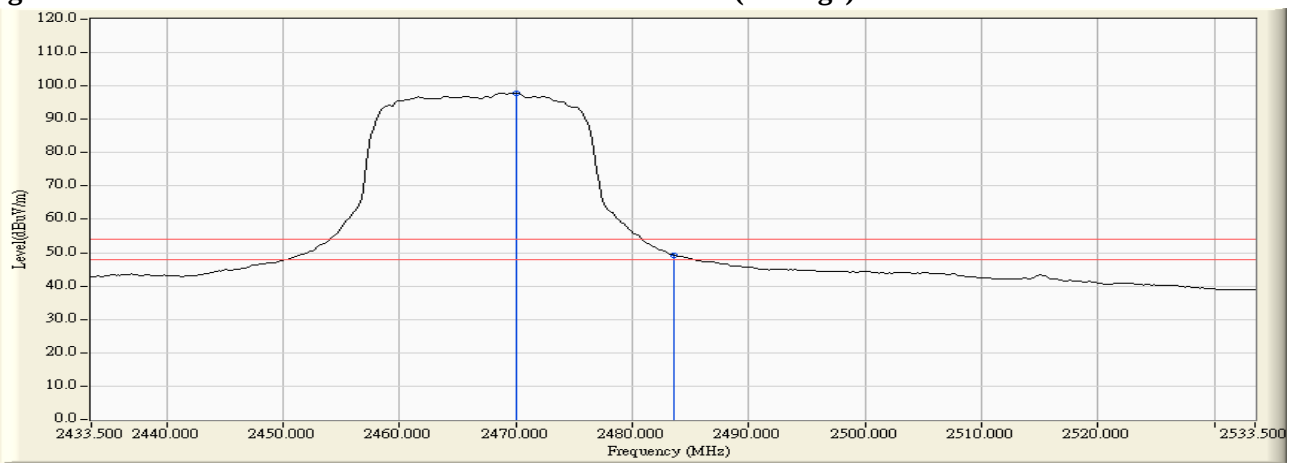


Figure Channel 12: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 3: Transmit - (VHT 20BW) (2467MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
12 (Peak)	2465.674	6.252	97.350	103.602	--	--	--
12 (Peak)	2483.500	6.363	49.431	55.794	74.00	54.00	Pass
12 (Peak)	2484.514	6.369	50.480	56.850	74.00	54.00	Pass
12 (Average)	2465.529	6.251	89.126	95.377	--	--	--
12 (Average)	2483.500	6.363	37.540	43.903	74.00	54.00	Pass

Figure Channel 12: Vertical (Peak)

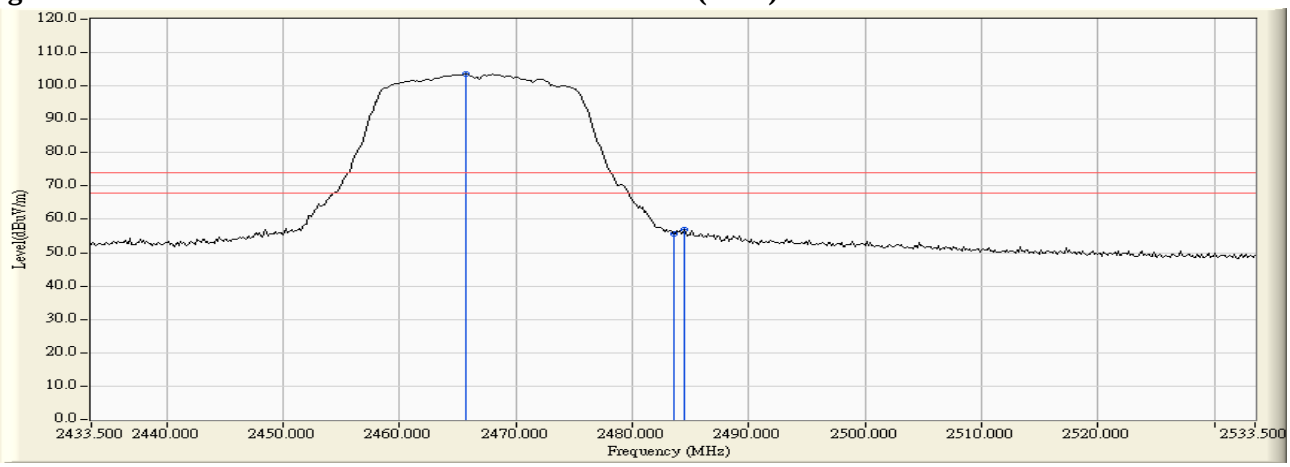
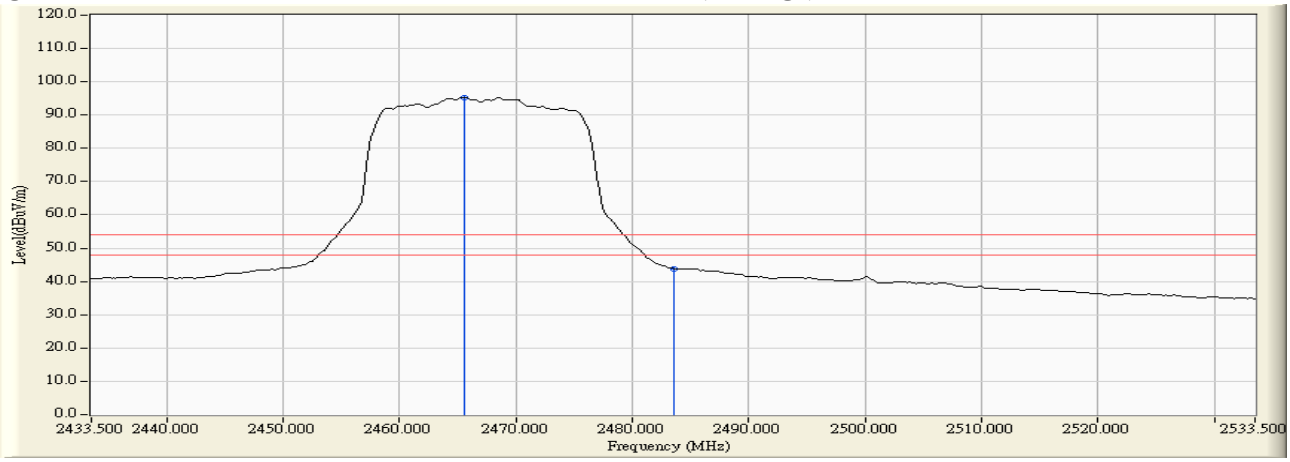


Figure Channel 12: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 3: Transmit - (VHT 20BW) (2472MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
13 (Peak)	2473.645	7.040	89.362	96.402	--	--	--
13 (Peak)	2483.500	7.110	56.778	63.888	74.00	54.00	Pass
13 (Average)	2474.949	7.050	80.604	87.653	--	--	--
13 (Average)	2483.500	7.110	41.449	48.559	74.00	54.00	Pass

Figure Channel 13: Horizontal (Peak)

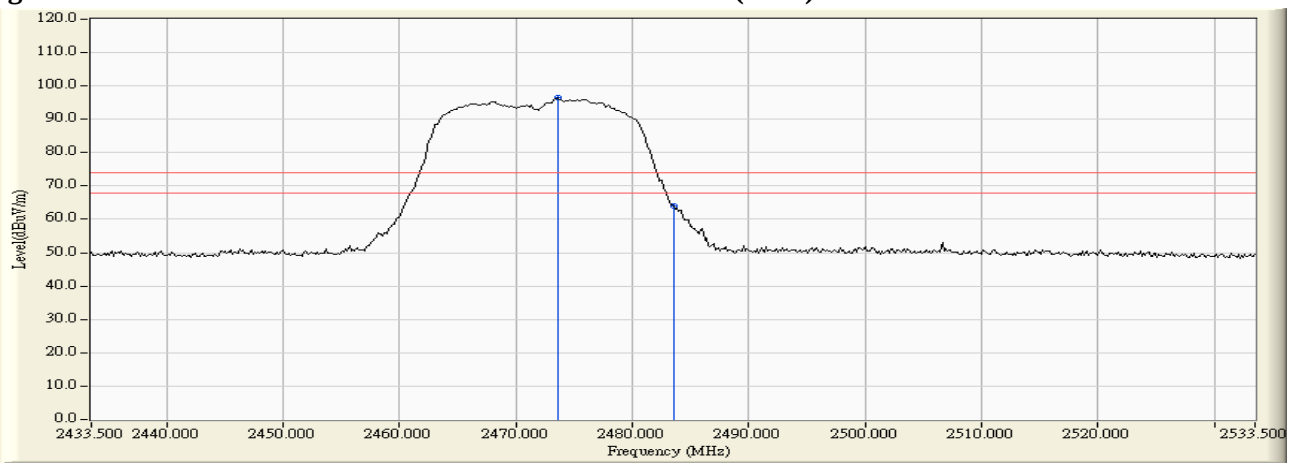
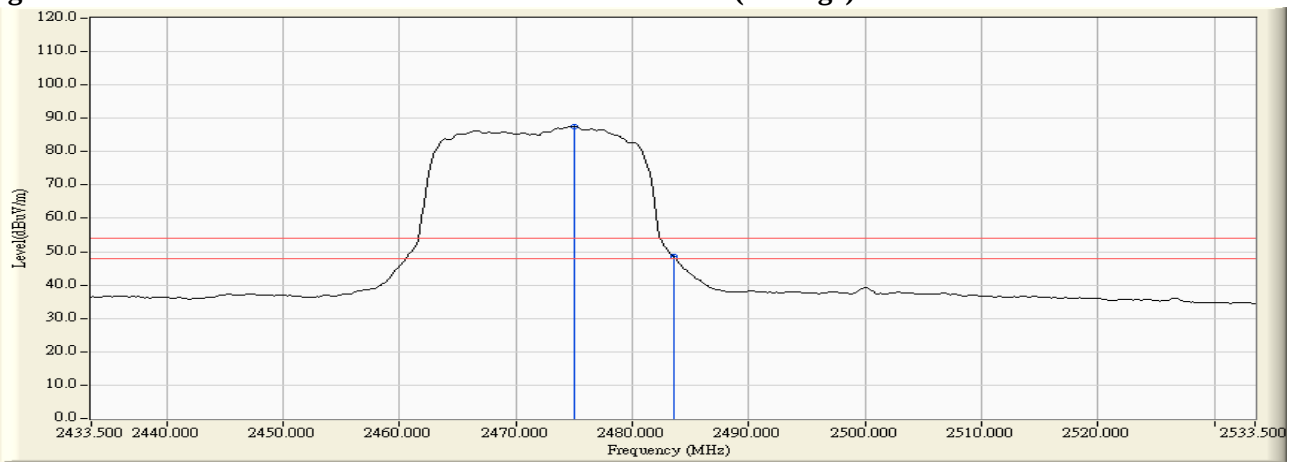


Figure Channel 13: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 3: Transmit - (VHT 20BW) (2472MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
13 (Peak)	2472.920	6.297	86.387	92.684	--	--	--
13 (Peak)	2483.500	6.363	54.613	60.976	74.00	54.00	Pass
13 (Average)	2475.094	6.311	77.822	84.133	--	--	--
13 (Average)	2483.500	6.363	38.492	44.855	74.00	54.00	Pass

Figure Channel 13: Vertical (Peak)

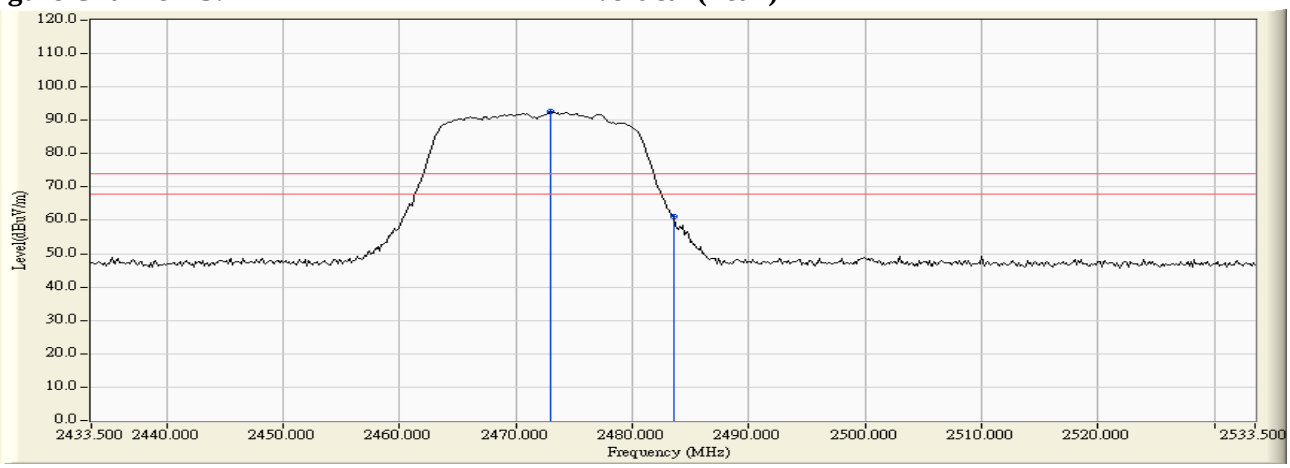
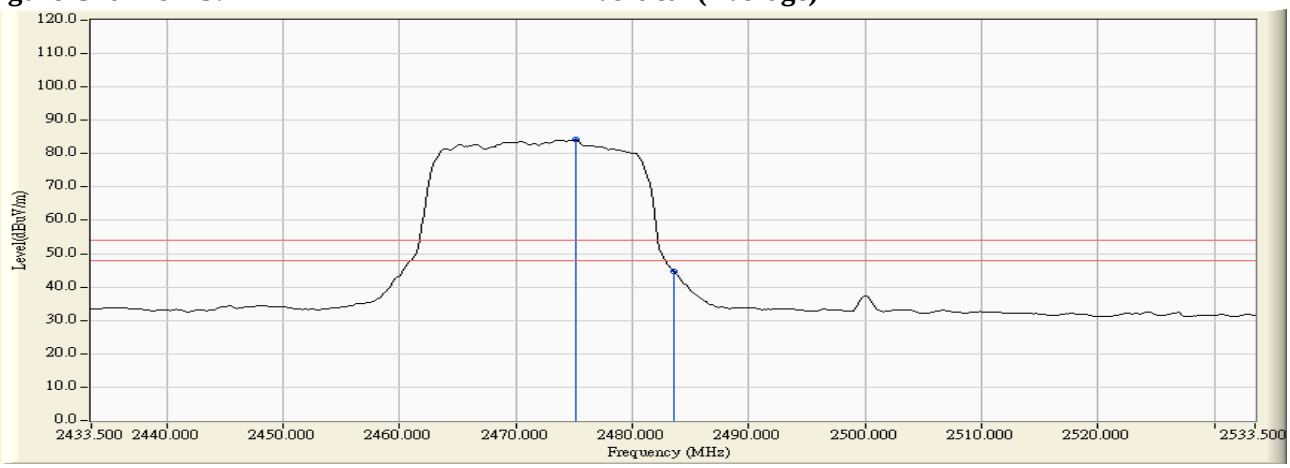


Figure Channel 13: Vertical (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 4: Transmit - (VHT 40BW) (2422MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
03 (Peak)	2388.841	6.470	63.950	70.420	74.00	54.00	Pass
03 (Peak)	2390.000	6.474	59.046	65.521	74.00	54.00	Pass
03 (Peak)	2399.420	6.525	71.775	78.300	--	--	--
03 (Peak)	2400.000	6.528	67.566	74.094	--	--	--
03 (Peak)	2426.522	6.706	97.781	104.487	--	--	--
03 (Average)	2389.420	6.472	44.703	51.175	74.00	54.00	Pass
03 (Average)	2390.000	6.474	44.285	50.760	74.00	54.00	Pass
03 (Average)	2400.000	6.528	53.380	59.908	--	--	--
03 (Average)	2426.667	6.707	90.209	96.916	--	--	--

Figure Channel 03: Horizontal (Peak)

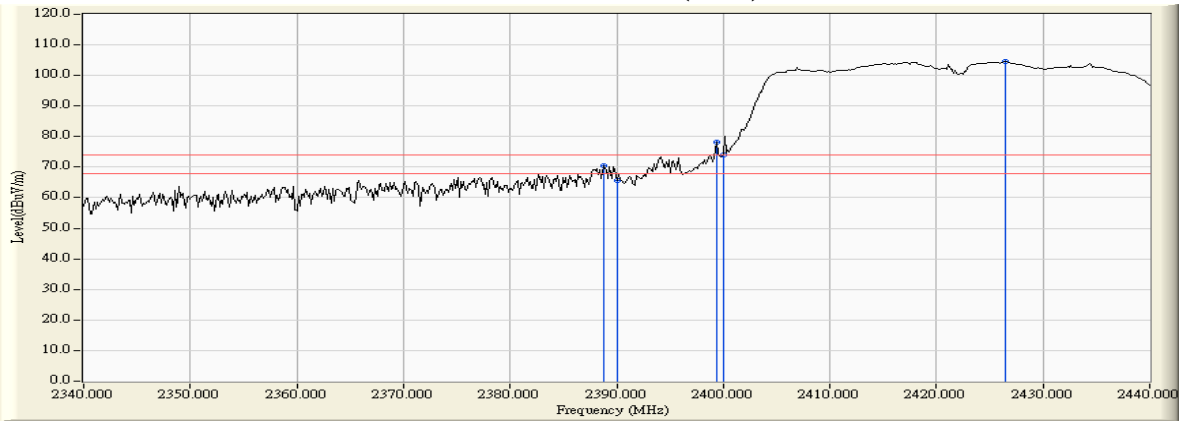
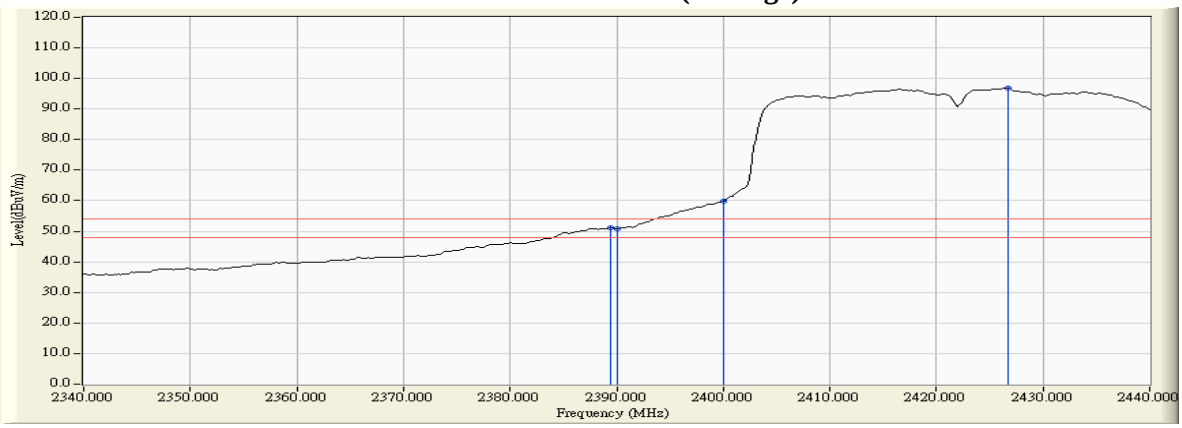


Figure Channel 03: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 4: Transmit - (VHT 40BW) (2422MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
03 (Peak)	2388.116	5.889	60.124	66.013	74.00	54.00	Pass
03 (Peak)	2390.000	5.880	54.616	60.497	74.00	54.00	Pass
03 (Peak)	2399.275	5.878	66.647	72.524	--	--	--
03 (Peak)	2400.000	5.879	63.901	69.780	--	--	--
03 (Peak)	2420.000	5.964	94.814	100.778	--	--	--
03 (Average)	2390.000	5.880	39.177	45.058	74.00	54.00	Pass
03 (Average)	2400.000	5.879	50.162	56.041	--	--	--
03 (Average)	2418.696	5.955	87.097	93.053	--	--	--

Figure Channel 03: Vertical (Peak)

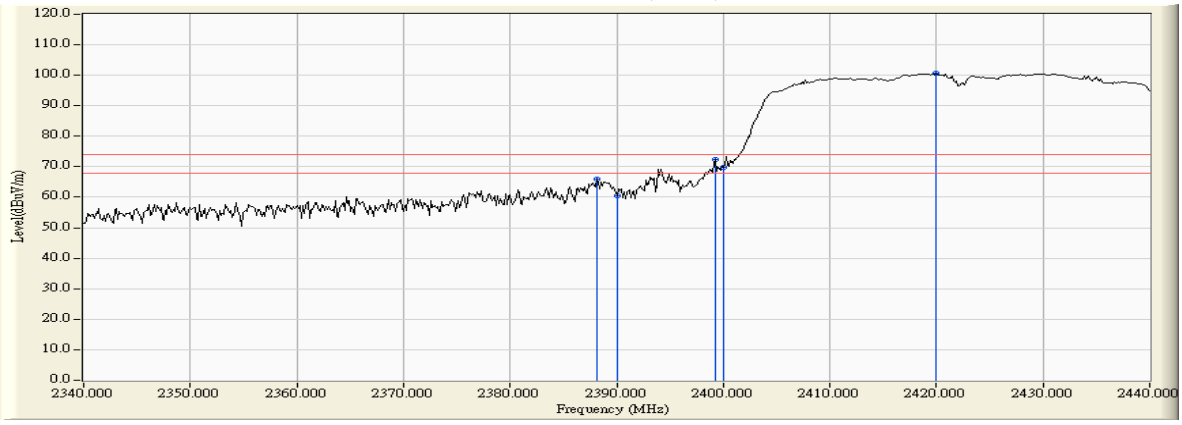
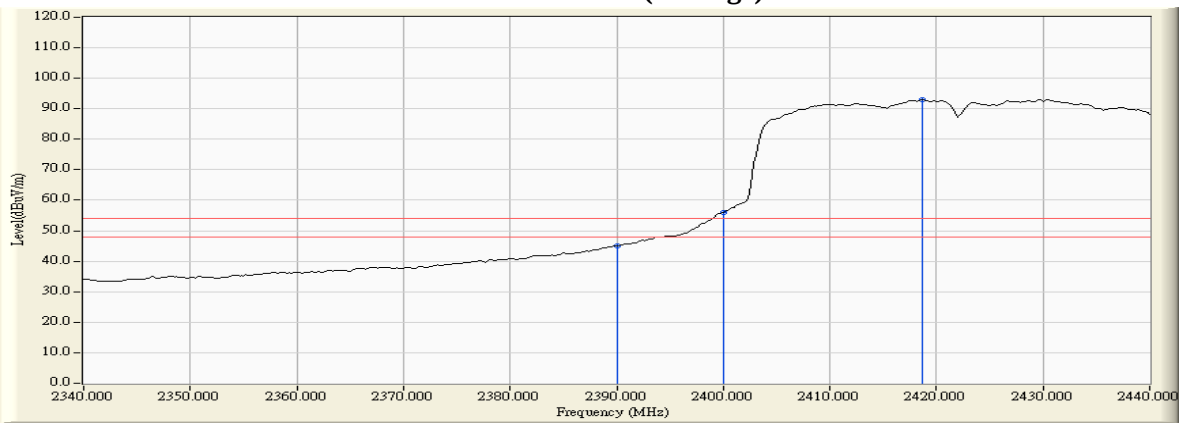


Figure Channel 03: Vertical (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2452MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
09 (Peak)	2462.775	6.964	96.418	103.382	--	--	--
09 (Peak)	2483.500	7.110	58.892	66.002	74.00	54.00	Pass
09 (Peak)	2485.384	7.123	63.003	70.126	74.00	54.00	Pass
09 (Average)	2456.688	6.920	87.788	94.709	--	--	--
09 (Average)	2483.500	7.110	43.466	50.576	74.00	54.00	Pass
09 (Average)	2484.080	7.114	43.468	50.582	74.00	54.00	Pass

Figure Channel 09: Horizontal (Peak)

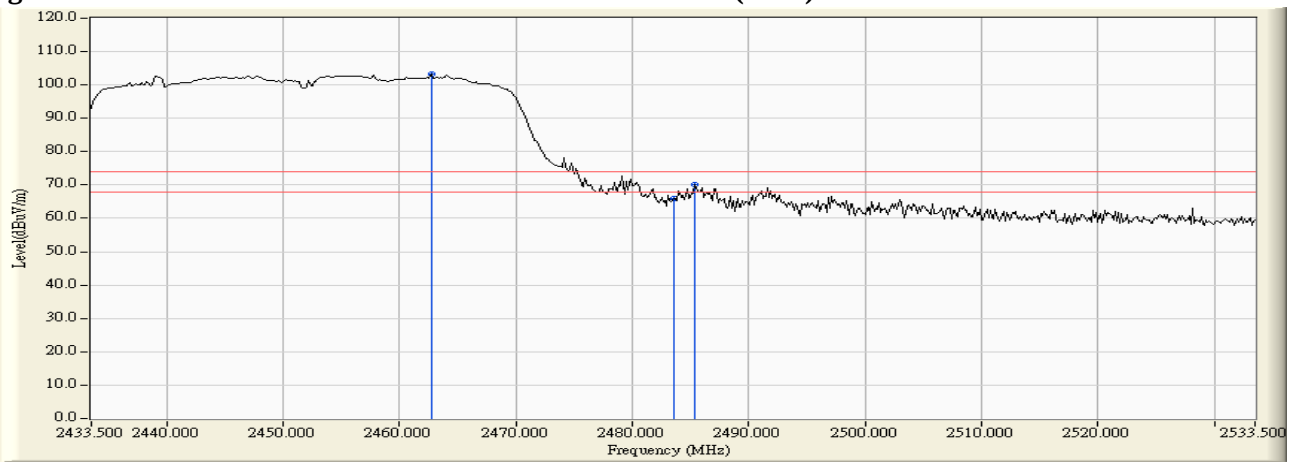
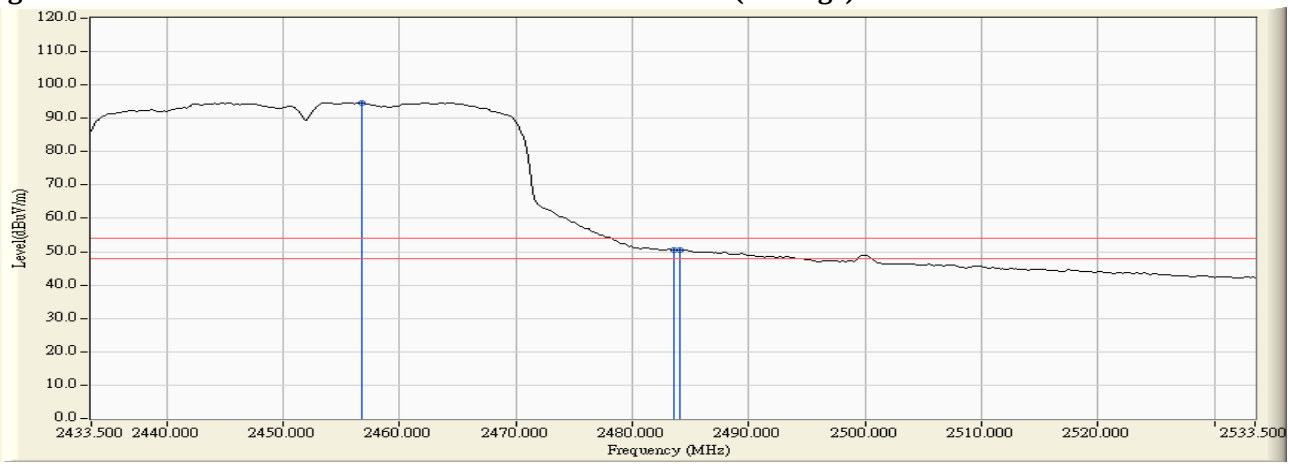


Figure Channel 09: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2452MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
09 (Peak)	2446.833	6.132	93.983	100.115	--	--	--
09 (Peak)	2483.500	6.363	53.394	59.757	74.00	54.00	Pass
09 (Peak)	2486.399	6.382	58.769	65.150	74.00	54.00	Pass
09 (Average)	2460.746	6.222	86.183	92.404	--	--	--
09 (Average)	2483.500	6.363	39.262	45.625	74.00	54.00	Pass
09 (Average)	2484.225	6.368	39.694	46.062	74.00	54.00	Pass

Figure Channel 09: Vertical (Peak)

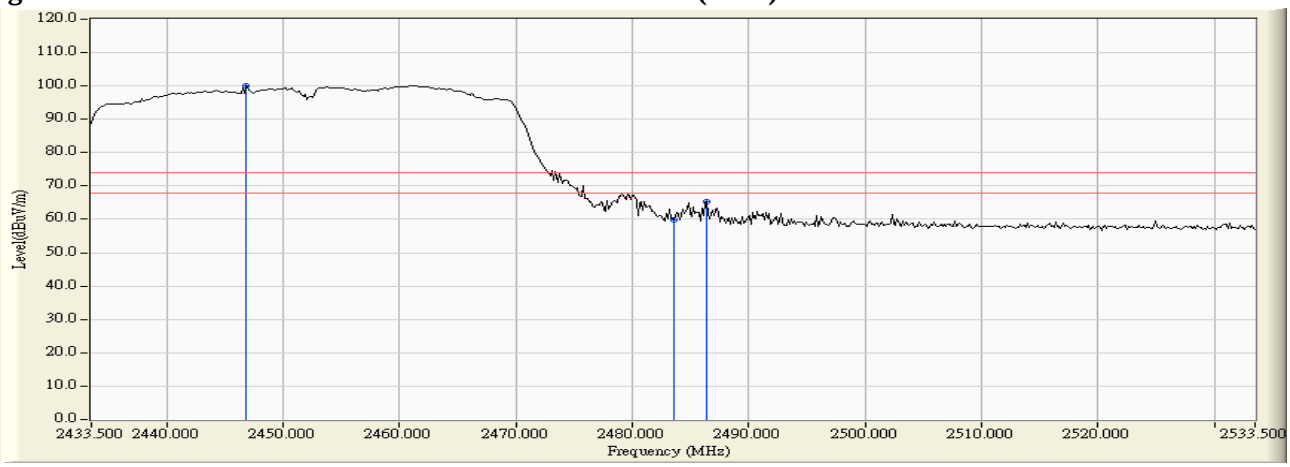
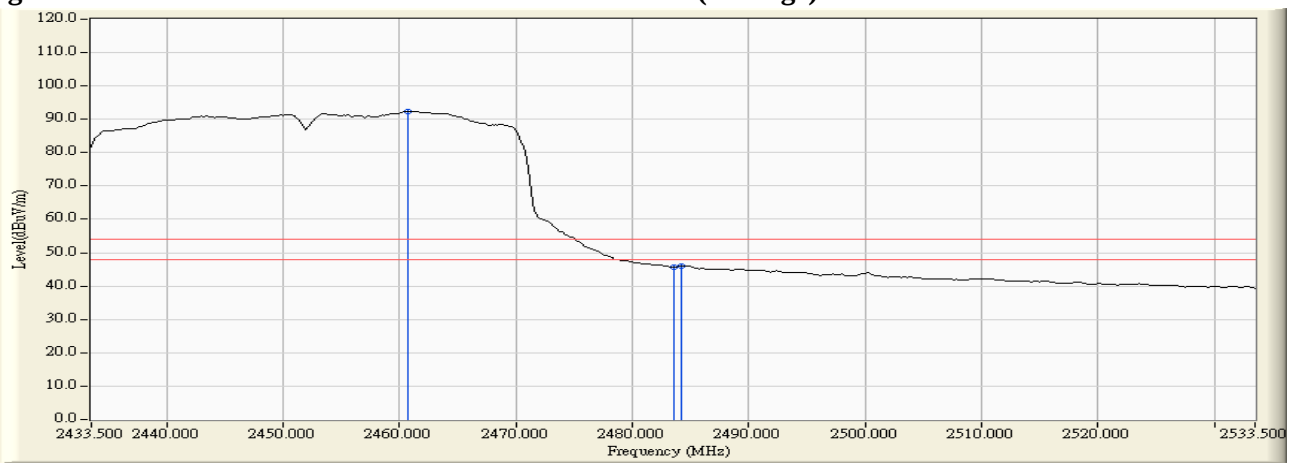


Figure Channel 09: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2457MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
10 (Peak)	2447.268	6.854	94.819	101.672	--	--	--
10 (Peak)	2483.500	7.110	57.415	64.525	74.00	54.00	Pass
10 (Peak)	2484.804	7.120	62.294	69.413	74.00	54.00	Pass
10 (Average)	2461.471	6.955	85.522	92.477	--	--	--
10 (Average)	2483.500	7.110	42.145	49.255	74.00	54.00	Pass

Figure Channel 10: Horizontal (Peak)

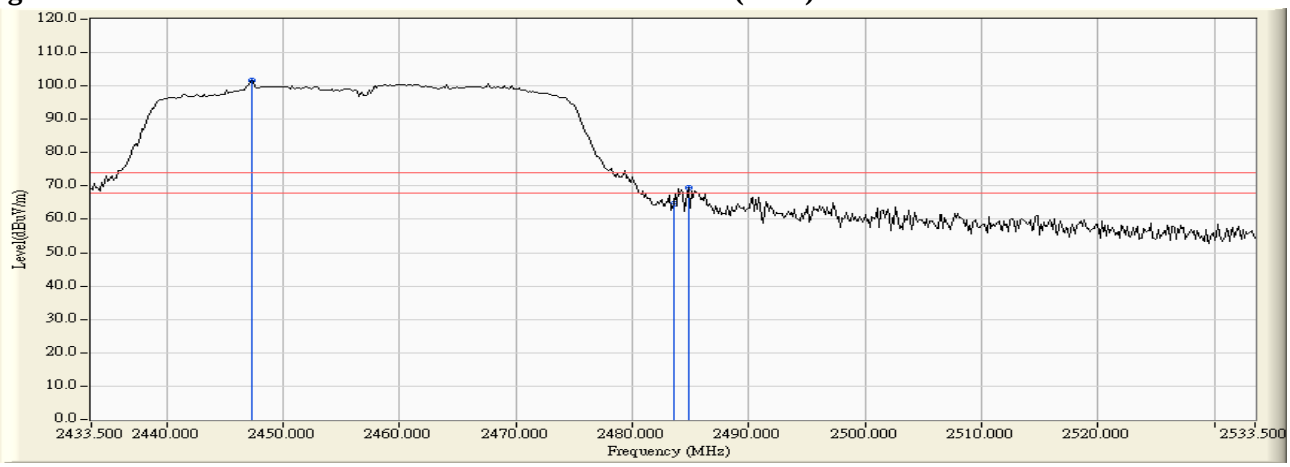
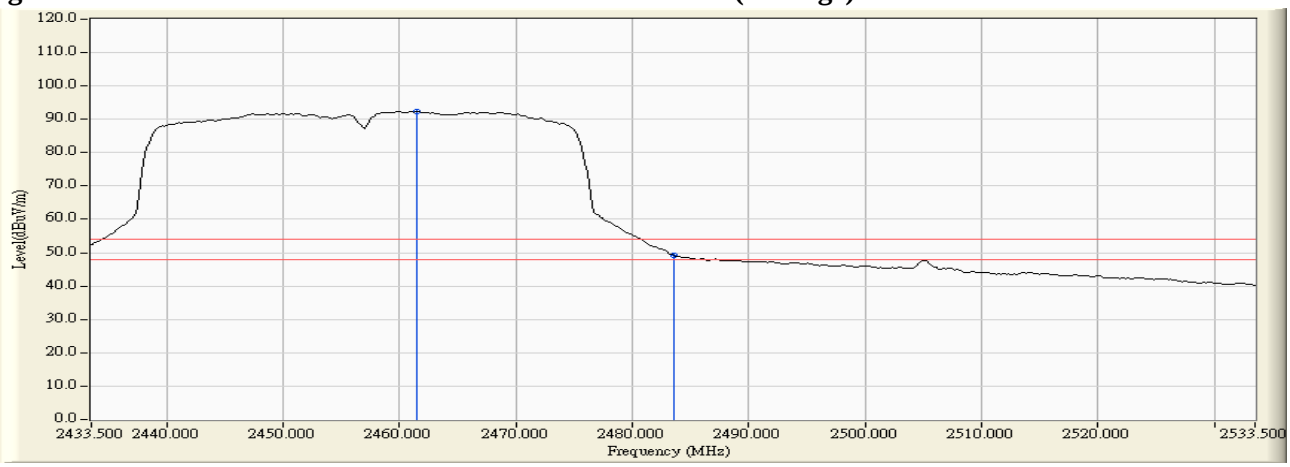


Figure Channel 10: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : WAH0001
Test Item : Band Edge
Test Site : No.3 OATS
Test Date : 2018/07/03
Test Mode : Mode 4: Transmit - (VHT 40BW) (2457MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
10 (Peak)	2465.964	6.254	91.722	97.976	--	--	--
10 (Peak)	2483.500	6.363	55.571	61.934	74.00	54.00	Pass
10 (Peak)	2484.659	6.371	58.607	64.978	74.00	54.00	Pass
10 (Average)	2465.529	6.251	84.148	90.399	--	--	--
10 (Average)	2483.500	6.363	37.373	43.736	74.00	54.00	Pass

Figure Channel 10: Vertical (Peak)

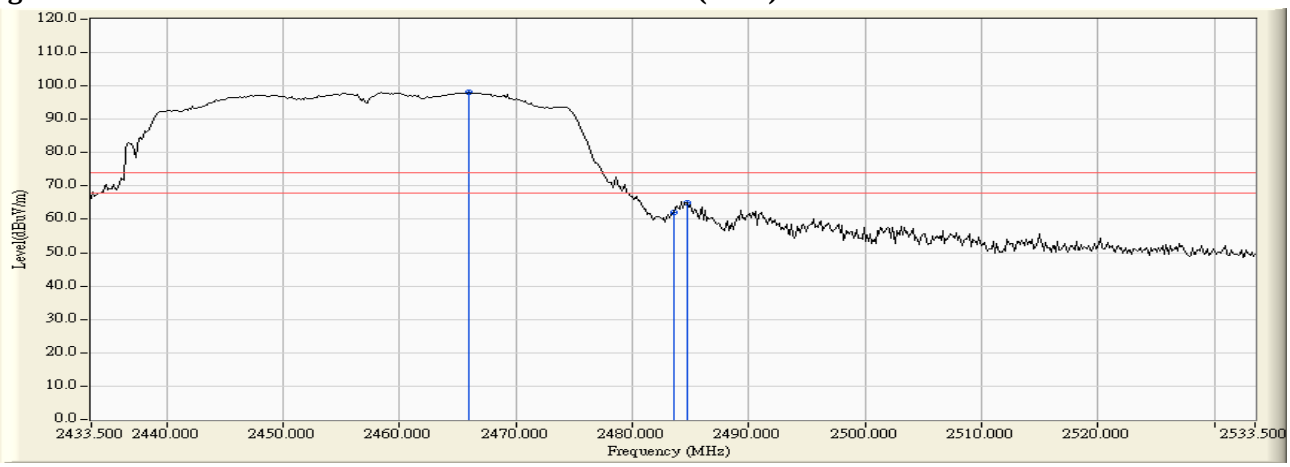
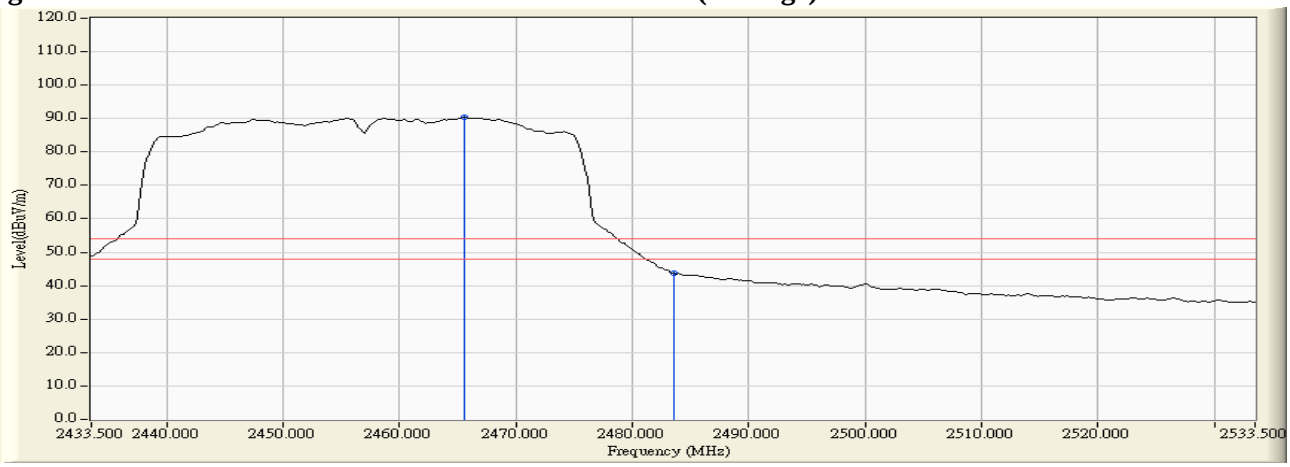


Figure Channel 10: Vertical (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2465.239	6.981	85.764	92.745	--	--	--
11 (Peak)	2483.500	7.110	57.602	64.712	74.00	54.00	Pass
11 (Peak)	2484.225	7.115	58.921	66.036	74.00	54.00	Pass
11 (Average)	2466.543	6.990	78.299	85.289	--	--	--
11 (Average)	2483.500	7.110	42.117	49.227	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)

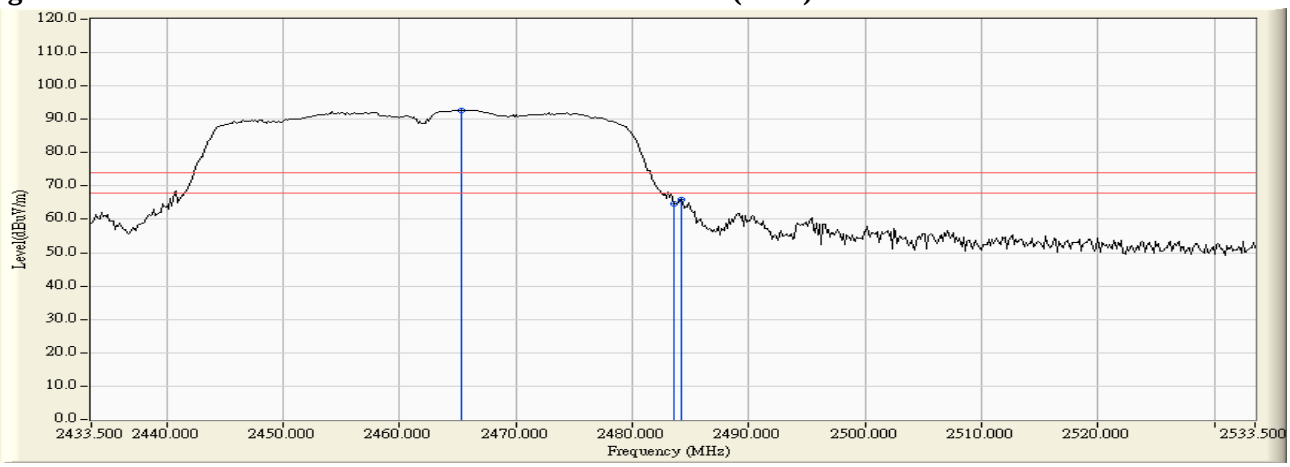
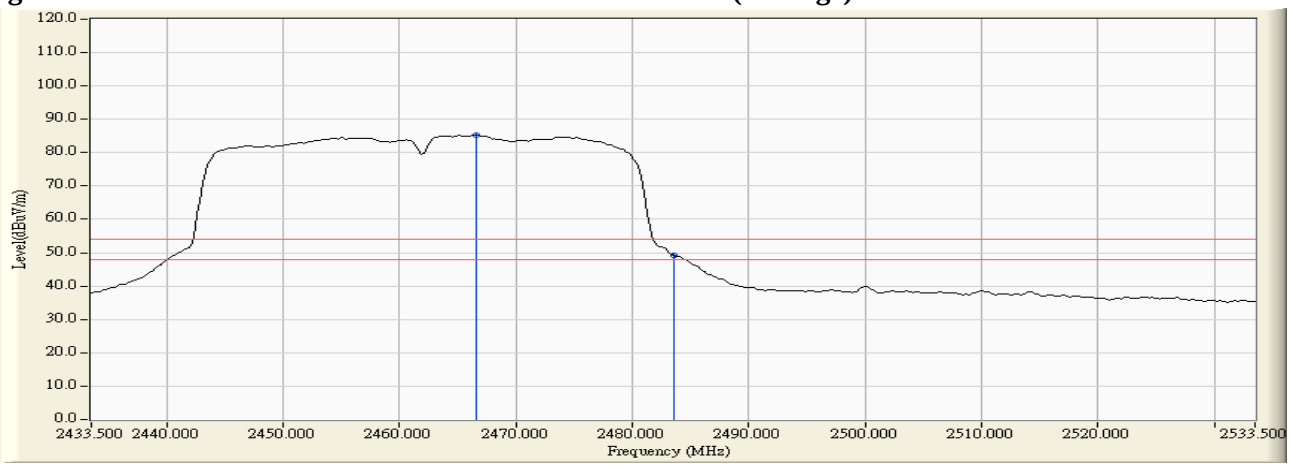


Figure Channel 11: Horizontal (Average)



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product	:	WAH0001
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Date	:	2018/07/03
Test Mode	:	Mode 4: Transmit - (VHT 40BW) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2463.355	6.238	84.153	90.391	--	--	--
11 (Peak)	2483.500	6.363	54.578	60.941	74.00	54.00	Pass
11 (Average)	2463.355	6.238	76.422	82.660	--	--	--
11 (Average)	2483.500	6.363	39.296	45.659	74.00	54.00	Pass

Figure Channel 11: Vertical (Peak)

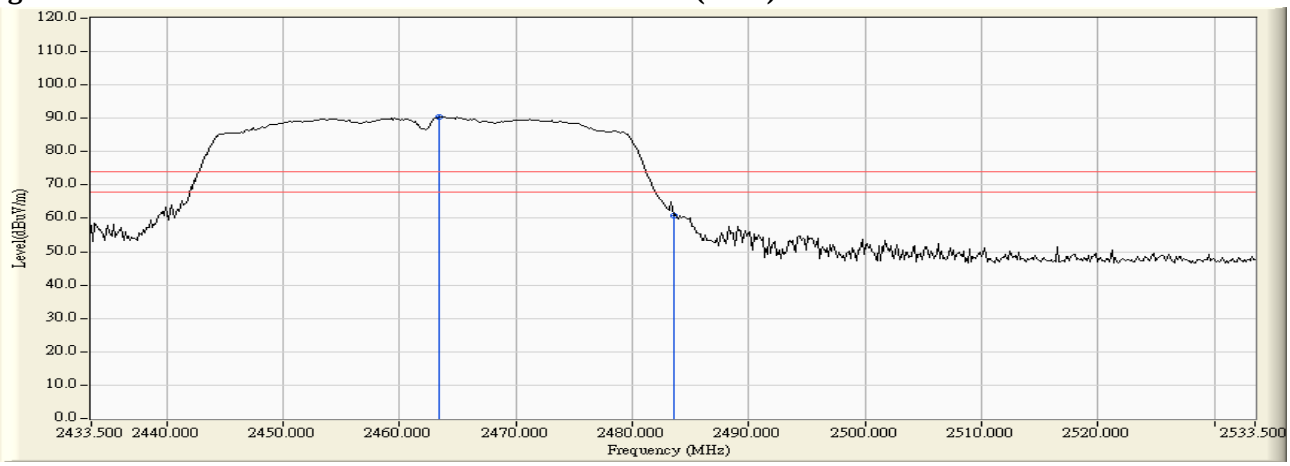
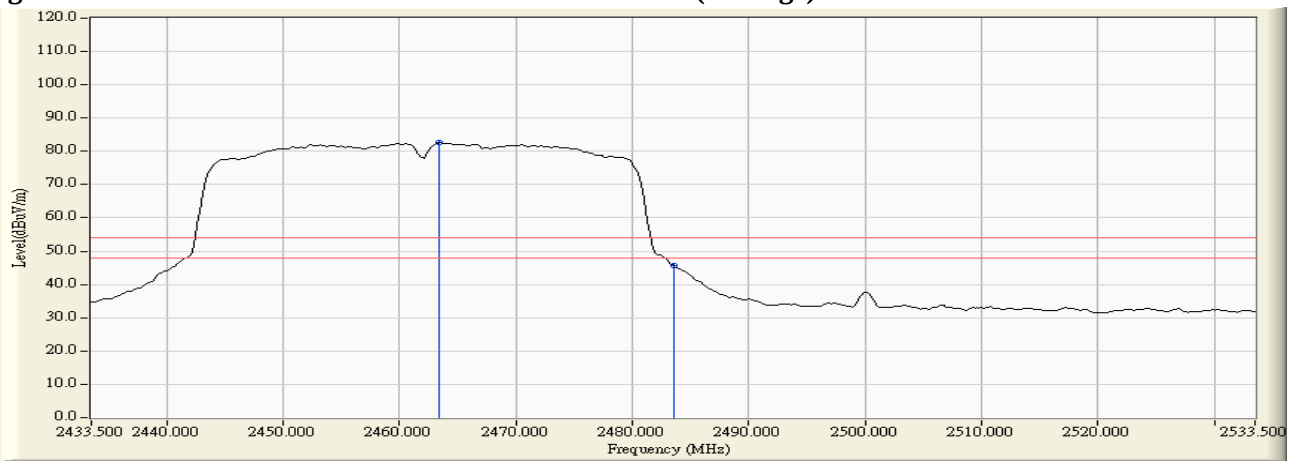


Figure Channel 11: Vertical (Average)

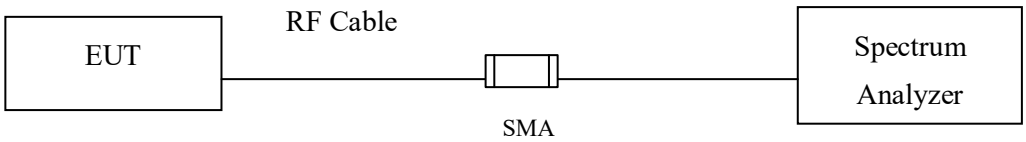


Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

5. Duty Cycle

5.1. Test Setup



5.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

5.3. Uncertainty

± 25msec

5.4. Test Result of Duty Cycle

Product : WAH0001
Test Item : Duty Cycle
Test Mode : Transmit

Duty Cycle Formula:

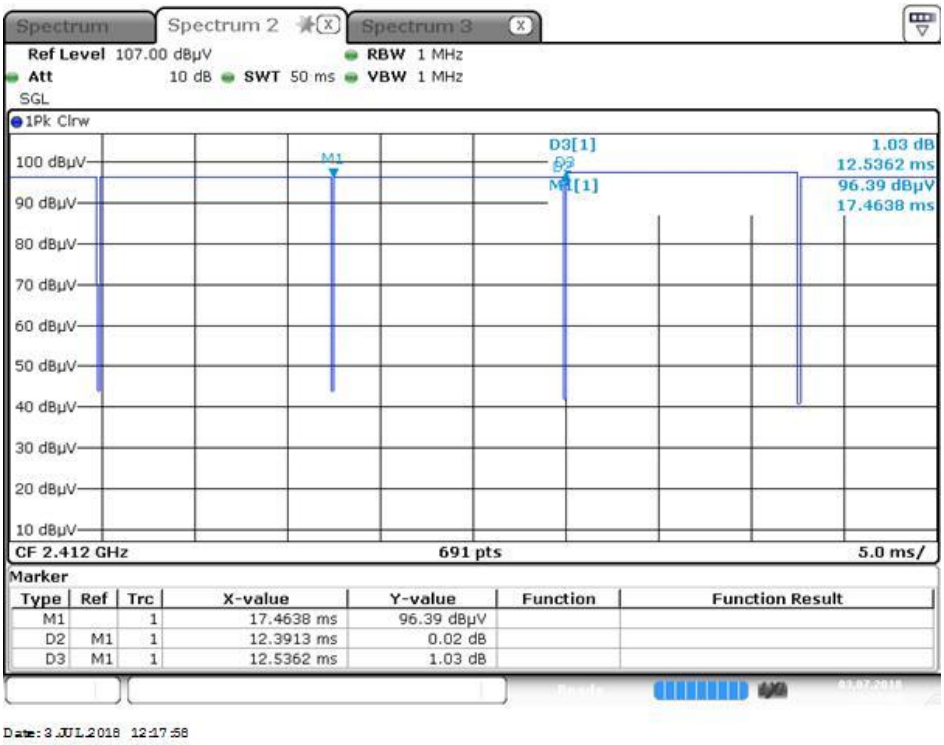
Duty Cycle = Ton / (Ton + Toff)

Duty Factor = 10 Log (1/Duty Cycle)

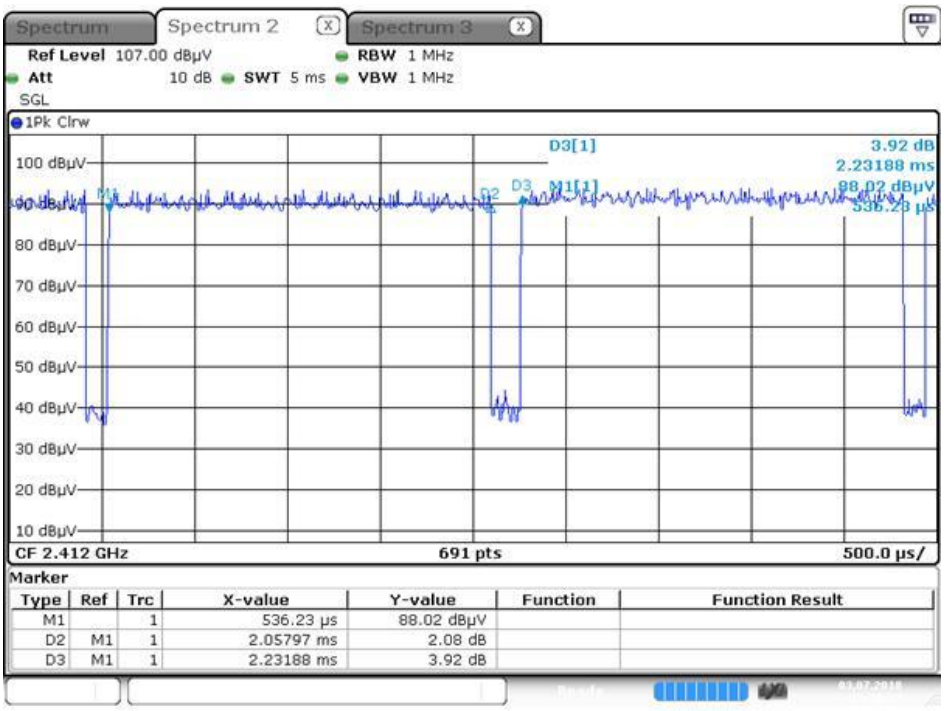
Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11 b	12.3913	12.5362	98.84	0.05
802.11 g	2.0580	2.2319	92.21	0.35
VHT20	1.9275	2.0870	92.36	0.35
VHT40	0.9058	1.0797	83.89	0.76

802.11b



802.11g



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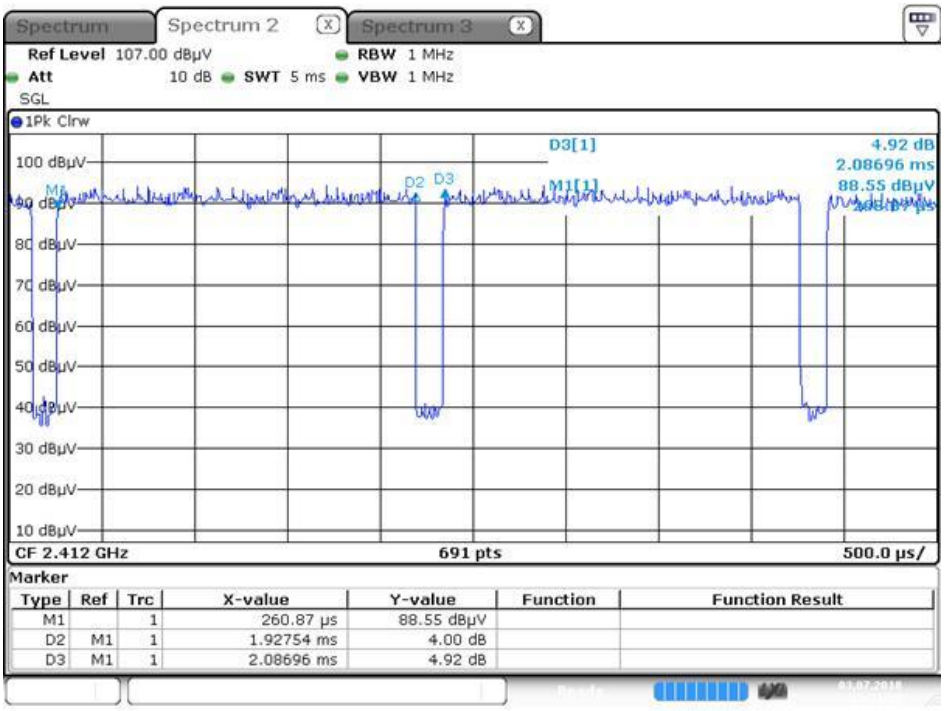
VHT20



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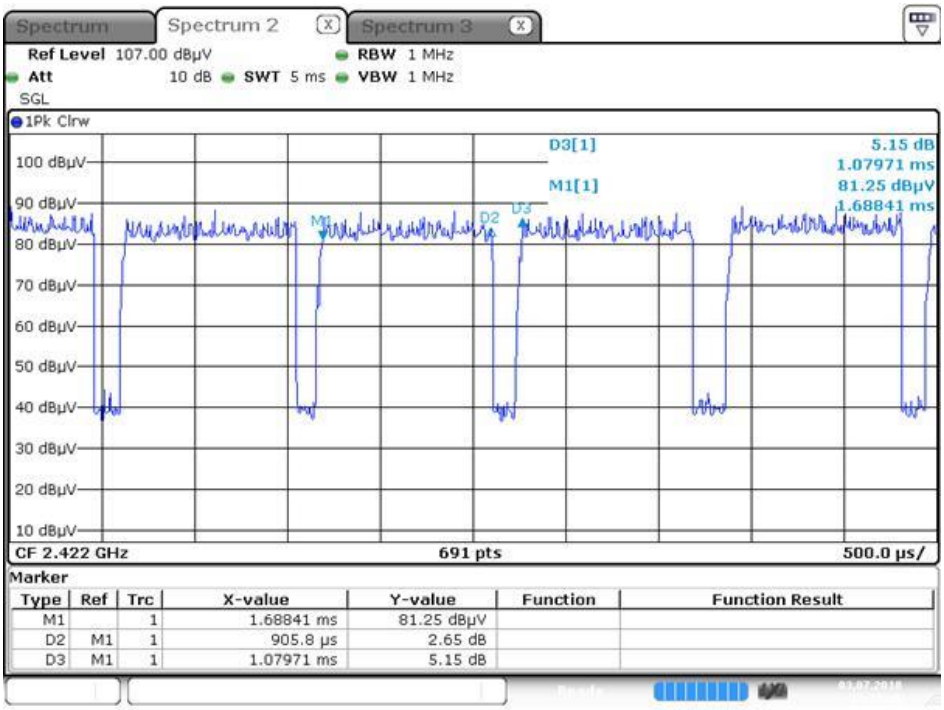
VHT40



Date: 3.JUL.2018 13:33:36

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.