

# FCC Test Report

Product Name	Wireless Motherboard
Model No	TH80GA
FCC ID.	WL6-TH8AG20GA4

Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address	No.239,Sec.2,Ti Ding Blvd.,Taipei Taiwan

Date of Receipt	Feb. 05, 2016
Issue Date	Mar. 22, 2016
Report No.	1620222R-RFUSP26V00
Report Version	V1.0
	sting 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: Mar. 22, 2016 Report No.: 1620222R-RFUSP26V00



Product Name	Wireless Motherboard	
Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD	
Address	No.239,Sec.2,Ti Ding Blvd.,Taipei Taiwan	
Manufacturer	Elitegroup Computer Systems(SIP) CO., LTD.	
Model No.	TH80GA	
FCC ID.	WL6-TH8AG20GA4	
EUT Rated Voltage	DC 3.7V	
EUT Test Voltage	DC 3.7V	
Trade Name	ECS ELITEGROUP	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2014	
	ANSI C63.4: 2014, ANSI C63.10: 2013	
	KDB 558074 D01 DTS Meas Guidance v03r04	
Test Result	Complied	

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Jinn Chen

(Senior Adm. Specialist / Jinn Chen)

Tested By

-TN

(Assistant Engineer / Bill Lin)

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	Wireless Motherboard	
Trade Name	ECS ELITEGROUP	
Model No.	TH80GA	
FCC ID.	WL6-TH8AG20GA4	
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW	
Number of Channels	802.11b/g/n-20MHz: 11	
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: up to 72.2Mbps	
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK)	
	802.11g/n:OFDM (BPSK, QPSK, 16QAM, 64QAM)	
Antenna Type	PIFA Antenna	
Antenna Gain	Refer to the table "Antenna List"	
Channel Control	Auto	
USB Cable	Shielded, 1.7m	

#### Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	SOUTH STAR	13H130-JJ5370	PIFA Antenna	2.71 dBi for 2.4 GHz

Note:

1. The antenna of EUT conforms to FCC 15.203.

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

Ų		1 v					
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		

- 1. The EUT is a Wireless Motherboard with a built-in WLAN and Bluetooth transceiver, this report for WLAN.
- 2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- 3. At result of pretests, module supports dual-channel transmission, only the worst case is shown in the report.
- 4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
- 5. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps \$ 802.11g is 6Mbps \$ 802.11n(20M-BW) is 7.2Mbps)
- 6. 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.

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



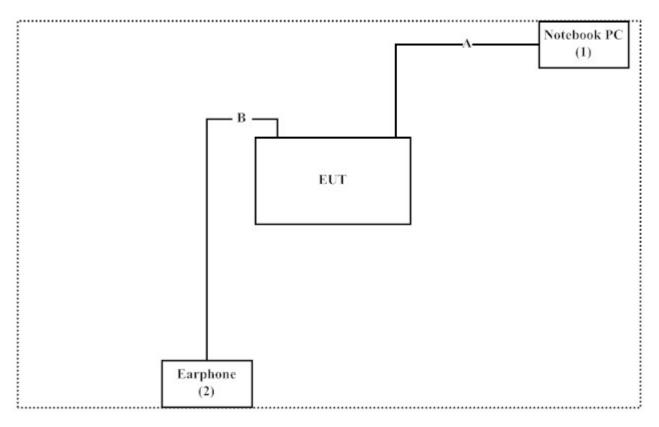
## **1.3.** Tested System Details

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

Prod	uct	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	M65	CG098	Non-Shielded, 0.8m
2	Earphone	PCHOME	N/A	N/A	N/A

Sig	gnal Cable Type	Signal cable Description				
Α	USB Cable	Shielded, 1.7m				
В	Earphone Cable	Non-Shielded, 1.2m				

#### **1.4.** Configuration of Tested System



## **1.5.** EUT Exercise Software

- 1. Setup the EUT as shown in Section 1.4.
- 2. Execute software "phone Tool 10.81.0.0" on the EUT.
- 3. Configure the test mode, the test channel, and the data rate.
- 4. Press "OK" to start the continuous Transmit.
- 5. Verify that the EUT works properly.

## **1.6.** Test Facility

Ambient conditions in the laboratory:

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

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

QuieTek Corporation's Web Site: <u>http://www.quietek.com/chinese/about/certificates.aspx?bval=5</u> The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site: <u>http://www.quietek.com/</u>

Site Description: File on

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

Site Name:	Quietek Corporation
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FCC Accreditation Number: TW1014

## 2. Conducted Emission

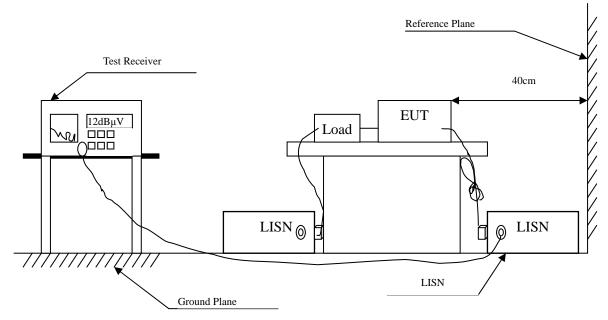
## 2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
Х	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2015	
Х	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2016	Peripherals
Х	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2016	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar., 2016	EUT
Х	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2016	
	No.1 Shielded Room				

Note:

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

## 2.2. Test Setup



#### 2.3. Limits

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

## 2.4. Test Procedure

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

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

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

## 2.5. Uncertainty

± 2.26 dB



## 2.6. Test Result of Conducted Emission

Owing to the DC operation of EUT, this test item is not performed.

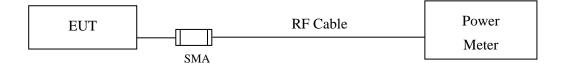
## 3. Peak Power Output

## **3.1.** Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.							
Х	Power Meter	Anritsu	ML2495A/6K00003357	May, 2015							
Х	Power Sensor	Anritsu	MA2411B/0738448	Jun., 2015							
Note:											
1.	All equipments are	All equipments are calibrated with traceable calibrations. Each calibration is traceable to the									
	national or internat	national or international standards.									

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

## 3.2. Test Setup



## 3.3. Limits

The maximum peak power shall be less 1 Watt.

## **3.4.** Test Procedure

The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 D01 DTS Meas Guidance v03r04 section 9.1.2 PKPM1 Peak power meter method.

## 3.5. Uncertainty

 $\pm$  1.27 dB

## **3.6.** Test Result of Peak Power Output

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

Channel Ne	Frequency (MHz)	For d	Average ifferent Da		(lbps)	Peak Power	Required	Result
Channel No		1	2	5.5	11	1	Limit	
			Measur					
01	2412	14.66				17.02	<30dBm	Pass
06	2437	15.32	15.28	15.23	15.20	17.68	<30dBm	Pass
11	2462	16.00				18.24	<30dBm	Pass

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



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

	E		F	Dequired								
Channel No	Frequency (MHz)	6	9	12	18	24	36	48	54	6	Required Limit	Result
01	2412	12.30								17.74	<30dBm	Pass
06	2437	12.02	12	11.96	11.91	11.87	11.85	11.82	11.78	17.83	<30dBm	Pass
11	2462	11.50								16.92	<30dBm	Pass

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



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

	E		Average PowerPeakFor different Data Rate (Mbps)Power									
Channel No	Frequency (MHz)	7.2	14.4	21.7	28.9	43.3	57.8	65	72.2	7.2	Required Limit	Result
			Measurement Level (dBm)									
01	2412	13.36	-	-			-	-		17.78	<30dBm	Pass
06	2437	12.95	12.92	12.90	12.87	12.86	12.84	12.81	12.78	18.39	<30dBm	Pass
11	2462	10.96								16.37	<30dBm	Pass

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

## 4. Radiated Emission

## 4.1. Test Equipment

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

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	Х	Magnetic Loop Antenna	Teseq	HLA6121/ 37133	Sep., 2015
	Х	Bilog Antenna	Schaffner Chase	CBL6112B/ 2707	Jun., 2015
	Х	EMI Test Receiver	R&S	ESCS 30/838251/ 001	Jun., 2015
	Х	Coaxial Cable	QTK(Arnist)	RG 214/ LC003-RG	Jun., 2015
	Х	Coaxial signal switch	Arnist	MP59B/ 6200798682	Jun., 2015

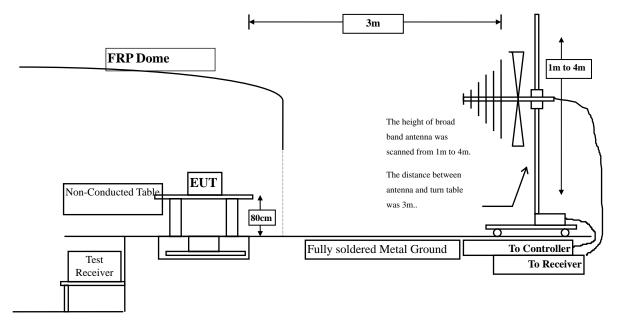
Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
CB # 8	Х	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2015
	Х	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	Х	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan., 2016
	Х	Horn Antenna	TRC	AH-0801/95051	Aug., 2015
	Х	Pre-Amplifier	EMCI	EMC012630SE/980210	Jan., 2016
	Х	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	Х	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

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

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

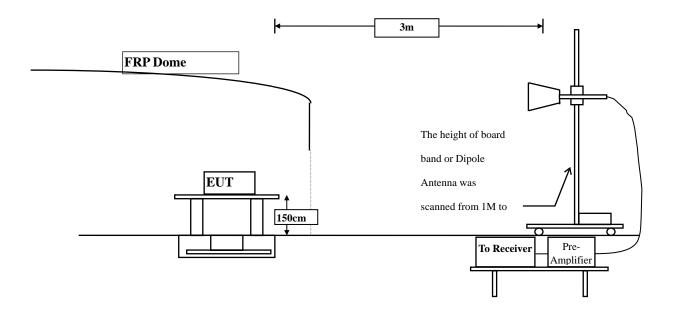
## 4.2. Test Setup

Radiated Emission Below 1GHz





#### Radiated Emission Above 1GHz



#### 4.3. Limits

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

FCC Part 15 Subpart C Paragraph 15.209(a) Limits			
Frequency MHz	Field strength	Measurement distance	
	(microvolts/meter)	(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  $(dB\mu V/m) = 20 \log E$  field strength (uV/m)

#### 4.4. 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.

## 4.5. Uncertainty

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

## 4.6. Test Result of Radiated Emission

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

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
<b>Peak Detector:</b>					
4824.000	3.261	35.740	39.001	-34.999	74.000
7236.000	10.650	34.830	45.480	-28.520	74.000
9648.000	13.337	35.700	49.036	-24.964	74.000
Average Detector:					
Vertical					
<b>Peak Detector:</b>					
4824.000	6.421	35.690	42.111	-31.889	74.000
7236.000	11.495	34.950	46.445	-27.555	74.000
9648.000	13.807	35.350	49.156	-24.844	74.000

#### **Average Detector:**

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

Product	: Wireless Motherboard					
Test Item	: Harmonic Radiated Emission Data					
Test Site	: No.3 OATS					
Test Mode	: Mode 1:	Transmit (802.11	b 1Mbps) (2437 MH	z)		
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV/m	dB	dBµV/m	
Horizontal						
Peak Detector:						
4874.000	3.038	35.330	38.367	-35.633	74.000	
7311.000	11.795	35.720	47.514	-26.486	74.000	
9748.000	12.635	36.470	49.105	-24.895	74.000	
Average Detector:						
Vertical						
Peak Detector:						
4874.000	5.812	35.190	41.001	-32.999	74.000	
7311.000	12.630	35.230	47.859	-26.141	74.000	
9748.000	13.126	36.500	49.626	-24.374	74.000	

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

Product	: Wireless Motherboard					
Test Item	: Harmonic Radiated Emission Data					
Test Site	: No.3 OATS					
Test Mode	: Mode 1:	Transmit (802.11	b 1Mbps) (2462 MH	z)		
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV/m	dB	dBµV/m	
Horizontal						
Peak Detector:						
4924.000	2.858	35.480	38.337	-35.663	74.000	
7386.000	12.127	35.060	47.188	-26.812	74.000	
9848.000	12.852	36.020	48.873	-25.127	74.000	
Average Detector:						
Vertical						
Peak Detector:						
4924.000	5.521	35.770	41.290	-32.710	74.000	
7386.000	13.254	34.800	48.054	-25.946	74.000	
9848.000	13.367	35.880	49.247	-24.753	74.000	

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

Product	:	Wireless Motherboard
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
Peak Detector:					
4824.000	3.261	35.360	38.621	-35.379	74.000
7236.000	10.650	35.100	45.750	-28.250	74.000
9648.000	13.337	35.120	48.456	-25.544	74.000
Average Detector:					
Vertical					
Peak Detector:					
4824.000	6.421	35.590	42.011	-31.989	74.000
7236.000	11.495	34.990	46.485	-27.515	74.000
9648.000	13.807	35.680	49.486	-24.514	74.000

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

Product	: Wireless Motherboard					
Test Item	: Harmonic Radiated Emission Data					
Test Site	: No.3 OA	TS				
Test Mode	: Mode 2:	Transmit (802.11	g 6Mbps) (2437 MH	z)		
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	$dB\mu V/m$	dB	$dB\mu V/m$	
Horizontal						
Peak Detector:						
4874.000	3.038	35.460	38.497	-35.503	74.000	
7311.000	11.795	35.110	46.904	-27.096	74.000	
9748.000	12.635	36.170	48.805	-25.195	74.000	
Average Detector:						
Vertical						
Peak Detector:						
4874.000	5.812	35.400	41.211	-32.789	74.000	
7311.000	12.630	35.330	47.959	-26.041	74.000	
9748.000	13.126	36.530	49.656	-24.344	74.000	

Note:

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.

- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	: Wireless Motherboard					
Test Item	: Harmonic Radiated Emission Data					
Test Site	: No.3 OATS					
Test Mode	Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)					
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV/m	dB	dBµV/m	
Horizontal						
Peak Detector:						
4924.000	2.858	35.710	38.567	-35.433	74.000	
7386.000	12.127	35.120	47.248	-26.752	74.000	
9848.000	12.852	35.500	48.353	-25.647	74.000	
Average Detector:						
Vertical						
Peak Detector:						
4924.000	5.521	35.550	41.070	-32.930	74.000	
7386.000	13.254	34.970	48.224	-25.776	74.000	
9848.000	13.367	36.060	49.427	-24.573	74.000	

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

Product	:	Wireless Motherboard
Test Item	:	Harmonic Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
Peak Detector:					
4824.000	3.261	36.210	39.471	-34.529	74.000
7236.000	10.650	35.140	45.790	-28.210	74.000
9648.000	13.337	35.600	48.936	-25.064	74.000
Average Detector:					
Vertical					
Peak Detector:					
4824.000	6.421	35.460	41.881	-32.119	74.000
7236.000	11.495	35.090	46.585	-27.415	74.000
9648.000	13.807	35.420	49.226	-24.774	74.000

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

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

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
<b>Peak Detector:</b>					
4874.000	3.038	35.850	38.887	-35.113	74.000
7311.000	11.795	35.310	47.104	-26.896	74.000
9748.000	12.635	36.350	48.985	-25.015	74.000
Average Detector:					
Vertical					
<b>Peak Detector:</b>					
4874.000	5.812	35.310	41.121	-32.879	74.000
7311.000	12.630	35.090	47.719	-26.281	74.000
9748.000	13.126	36.170	49.296	-24.704	74.000

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

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

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
<b>Peak Detector:</b>					
4924.000	2.858	35.680	38.537	-35.463	74.000
7386.000	12.127	35.040	47.168	-26.832	74.000
9848.000	12.852	35.990	48.843	-25.157	74.000
Average Detector:					
Vertical					
<b>Peak Detector:</b>					
4924.000	5.521	35.640	41.160	-32.840	74.000
7386.000	13.254	35.340	48.594	-25.406	74.000
9848.000	13.367	35.650	49.017	-24.983	74.000

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

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

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV/m	dB	dBµV/m
Horizontal					
127.000	2.150	26.040	28.190	-15.310	43.500
282.200	2.756	18.723	21.479	-24.521	46.000
452.920	3.191	20.176	23.367	-22.633	46.000
594.540	3.524	15.955	19.479	-26.521	46.000
763.320	3.898	20.551	24.450	-21.550	46.000
939.860	3.897	24.485	28.382	-17.618	46.000
Vertical					
123.120	5.549	25.928	31.477	-12.023	43.500
309.360	6.220	16.966	23.186	-22.814	46.000
474.260	6.674	21.618	28.291	-17.709	46.000
627.520	6.990	14.236	21.226	-24.774	46.000
794.360	7.371	21.302	28.673	-17.327	46.000
974.780	7.362	22.608	29.970	-24.030	54.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.

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

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV/m	dB	$dB\mu V/m$
Horizontal					
105.660	2.014	28.035	30.049	-13.451	43.500
227.880	2.508	20.776	23.285	-22.715	46.000
367.560	2.982	17.075	20.057	-25.943	46.000
557.680	3.418	14.303	17.721	-28.279	46.000
749.740	3.877	19.278	23.155	-22.845	46.000
947.620	3.906	24.751	28.657	-17.343	46.000
Vertical					
111.480	5.476	22.336	27.812	-15.688	43.500
262.800	6.067	17.636	23.703	-22.297	46.000
402.480	6.507	11.875	18.382	-27.618	46.000
577.080	6.899	18.151	25.050	-20.950	46.000
782.720	7.355	12.861	20.216	-25.784	46.000
943.740	7.322	21.656	28.979	-17.021	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	Wireless Motherboard
Test Item	:	General Radiated Emission Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m
Horizontal					
119.240	2.106	30.135	32.241	-11.259	43.500
286.080	2.770	21.315	24.085	-21.915	46.000
437.400	3.137	17.047	20.184	-25.816	46.000
637.220	3.628	22.064	25.692	-20.308	46.000
792.420	3.946	16.853	20.799	-25.201	46.000
968.960	3.938	26.038	29.976	-24.024	54.000
Vertical					
115.360	5.500	21.948	27.448	-16.052	43.500
286.080	6.193	12.681	18.874	-27.126	46.000
419.940	6.536	16.393	22.929	-23.071	46.000
594.540	6.947	14.432	21.379	-24.621	46.000
778.840	7.349	14.349	21.698	-24.302	46.000
943.740	7.322	19.772	27.095	-18.905	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 8. No emission found between lowest internal used/generated frequency to 30MHz.

## 5. **RF** antenna conducted test

#### 5.1. Test Equipment

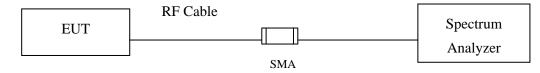
_	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2015
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2015
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

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

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

#### 5.2. Test Setup

#### **RF antenna Conducted Measurement:**



#### 5.3. Limits

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

#### 5.4. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100 kHz, Set VBW> RBW, scan up through 10th harmonic.

#### 5.5. Uncertainty

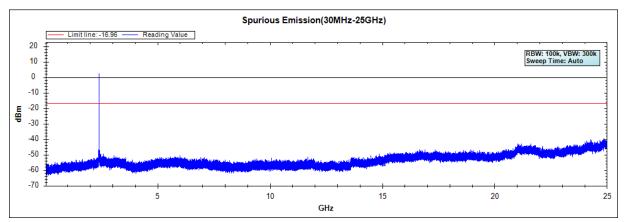
The measurement uncertainty

Conducted is defined as  $\pm 1.27$ dB

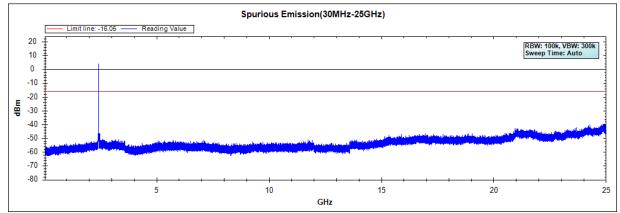
## 5.6. Test Result of RF antenna conducted test

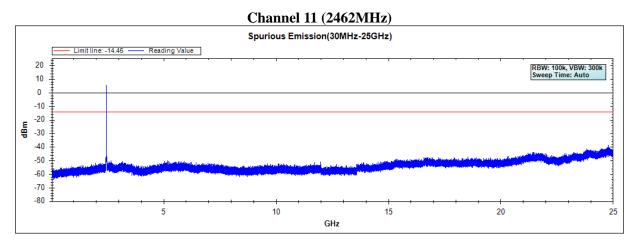
Product	:	Wireless Motherboard
Test Item	:	RF antenna conducted test
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

#### Channel 01 (2412MHz)



#### Channel 06 (2437MHz)



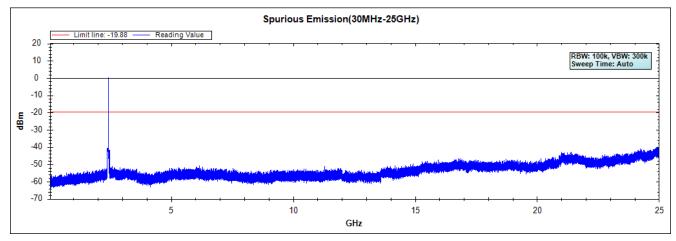


Note: The above test pattern is synthesized by multiple of the frequency range.

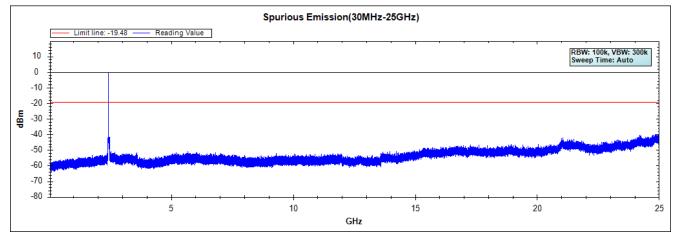


Product	:	Wireless Motherboard
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

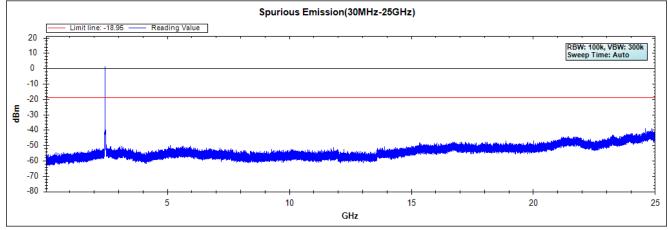
#### Channel 01 (2412MHz)



#### Channel 06 (2437MHz)



#### Channel 11 (2462MHz)

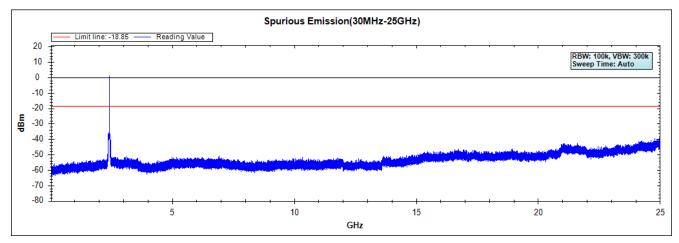


Note: The above test pattern is synthesized by multiple of the frequency range.

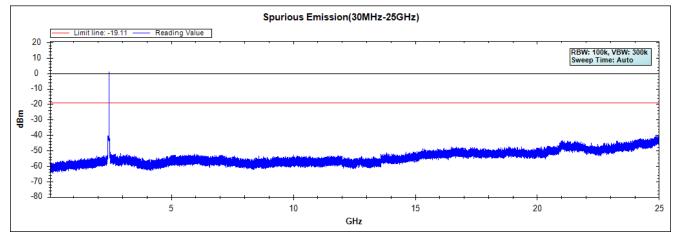


Product	:	Wireless Motherboard
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

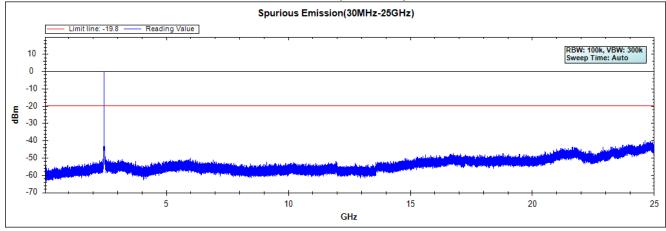
#### Channel 01 (2412MHz)



#### Channel 06 (2437MHz)



#### Channel 11 (2462MHz)



Note: The above test pattern is synthesized by multiple of the frequency range.

## 6. Band Edge

#### 6.1. Test Equipment

#### **RF Radiated Measurement:**

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

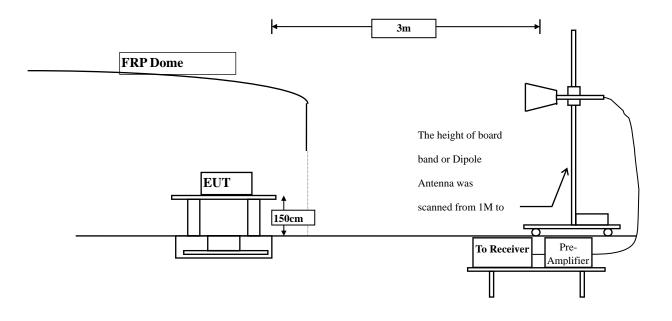
Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
CB # 8	Х	Spectrum Analyzer	R&S	FSP40/ 100339	Oct., 2015
	Х	Horn Antenna	ETS-Lindgren	3117/ 35205	Mar., 2016
	Х	Horn Antenna	Schwarzbeck	BBHA9170/209	Jan., 2016
	Х	Horn Antenna	TRC	AH-0801/95051	Aug., 2015
	X Pre-Amplifier		EMCI	EMC012630SE/980210	Jan., 2016
	Х	Pre-Amplifier	MITEQ	JS41-001040000-58-5P/153945	Jul., 2015
	Х	Pre-Amplifier	NARDA	DBL-1840N506/013	Jul., 2015

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

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

## 6.2. Test Setup

#### **RF Radiated Measurement:**



## 6.3. Limits

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

## 6.4. Test Procedure

The EUT was setup according to ANSI C63.10, 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.

## 6.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz



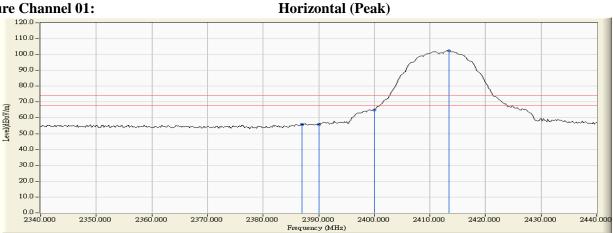
#### **Test Result of Band Edge** 6.6.

Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

#### **RF Radiated Measurement (Horizontal):**

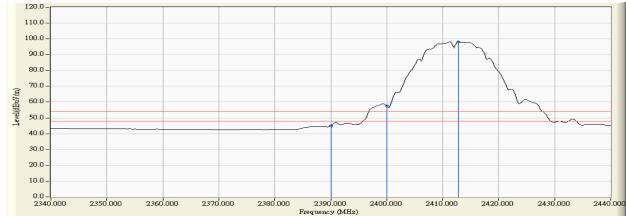
Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
Channel NO.	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
01 (Peak)	2387.000	31.497	24.428	55.925	74.00	54.00	Pass
01 (Peak)	2390.000	31.509	24.247	55.756	74.00	54.00	Pass
01 (Peak)	2400.000	31.561	33.501	65.062			
01 (Peak)	2413.400	31.649	70.645	102.294			
01 (Average)	2390.000	31.509	13.601	45.110	74.00	54.00	Pass
01 (Average)	2400.000	31.561	26.095	57.656			
01 (Average)	2412.800	31.645	66.456	98.100			

#### **Figure Channel 01:**



#### **Figure Channel 01:**

**Horizontal (Average)** 



- Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto. 2.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- "\*", means this data is the worst emission level. 4.
- 5. Measurement Level = Reading Level + Correct Factor.
- The average measurement was not performed when the peak measured data under the limit of average 6. detection.

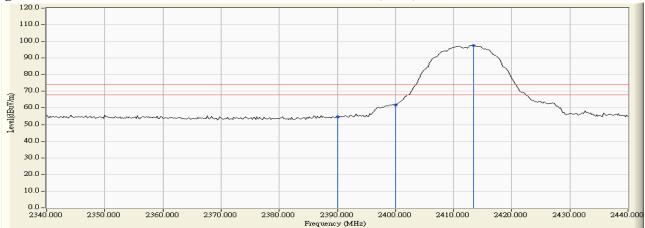


Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
Channel NO.	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	(dBµV/m)	Result
01 (Peak)	2390.000	30.915	23.762	54.677	74.00	54.00	Pass
01 (Peak)	2400.000	30.912	30.972	61.884			
01 (Peak)	2413.400	30.959	66.634	97.593			
01 (Average)	2387.200	30.928	12.322	43.250	74.00	54.00	Pass
01 (Average)	2390.000	30.915	12.222	43.137	74.00	54.00	Pass
01 (Average)	2400.000	30.912	23.157	54.069			
01 (Average)	2412.800	30.955	62.528	93.483			

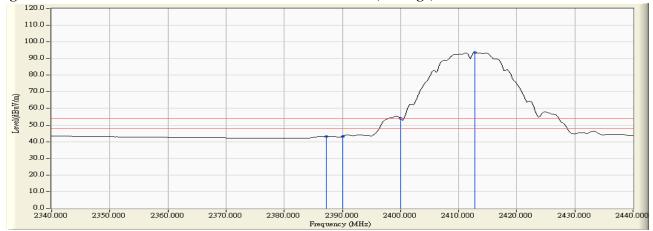
#### Figure Channel 01:

#### VERTICAL (Peak)



#### Figure Channel 01:

#### VERTICAL (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

#### **RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
11 (Peak)	2461.100	32.013	69.400	101.413			
11 (Peak)	2483.500	32.182	15.892	48.074	74.00	54.00	Pass
11 (Average)	2461.100	32.013	69.391	101.404			
11 (Average)	2483.500	32.182	15.862	48.044	74.00	54.00	Pass

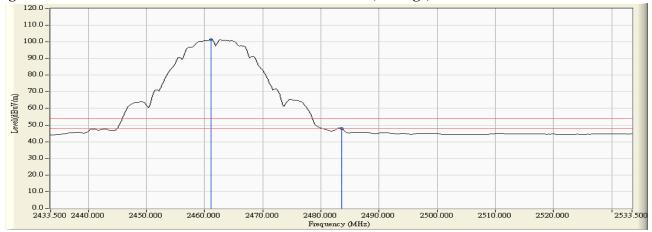
#### **Figure Channel 11:**

#### Horizontal (Peak)



# Figure Channel 11:

#### Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.

2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.

- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.

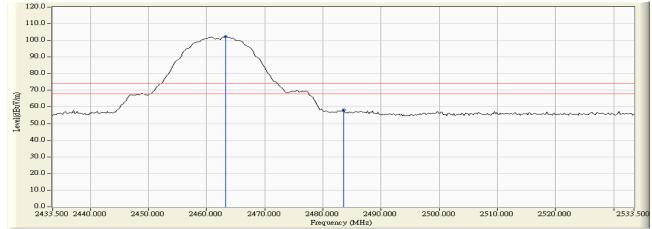


Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
11 (Peak)	2463.300	31.299	70.877	102.176			
11 (Peak)	2483.500	31.435	26.701	58.136	74.00	54.00	Pass
11 (Average)	2461.100	31.285	66.853	98.137			
11 (Average)	2483.500	31.435	15.926	47.361	74.00	54.00	Pass

#### Figure Channel 11:

#### VERTICAL (Peak)



#### Figure Channel 11:

#### VERTICAL (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



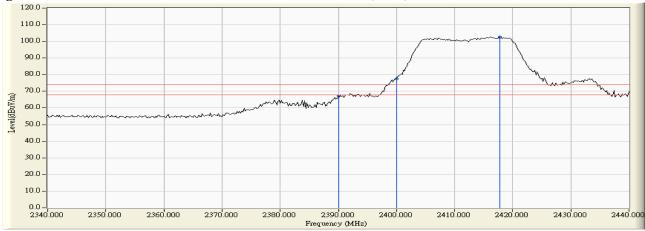
Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

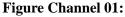
#### **RF Radiated Measurement (Horizontal):**

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
Channel No.	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
01 (Peak)	2390.000	31.509	35.698	67.207	74.00	54.00	Pass
01 (Peak)	2400.000	31.561	45.857	77.418			
01 (Peak)	2417.800	31.683	71.033	102.716			
01 (Average)	2390.000	31.509	18.285	49.794	74.00	54.00	Pass
01 (Average)	2400.000	31.561	25.677	57.238			
01 (Average)	2419.000	31.691	60.146	91.838			

#### Figure Channel 01:

#### Horizontal (Peak)





#### Horizontal (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.

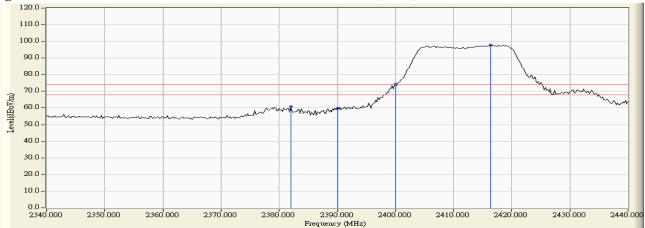


Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
Channel NO.	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	(dBµV/m)	Result
01 (Peak)	2382.000	30.952	29.767	60.719	74.00	54.00	Pass
01 (Peak)	2390.000	30.915	28.985	59.900	74.00	54.00	Pass
01 (Peak)	2400.000	30.912	43.438	74.350			
01 (Peak)	2416.400	30.979	66.959	97.938			
01 (Average)	2390.000	30.915	14.522	45.437	74.00	54.00	Pass
01 (Average)	2400.000	30.912	22.648	53.560			
01 (Average)	2419.200	30.998	56.300	87.298			

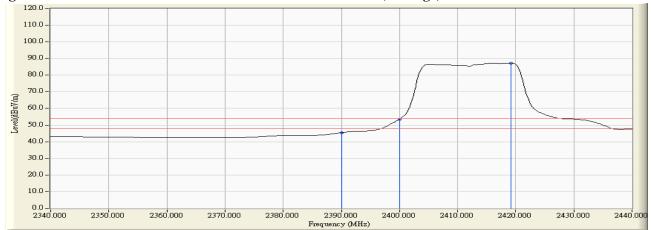
#### Figure Channel 01:

#### VERTICAL (Peak)





#### VERTICAL (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



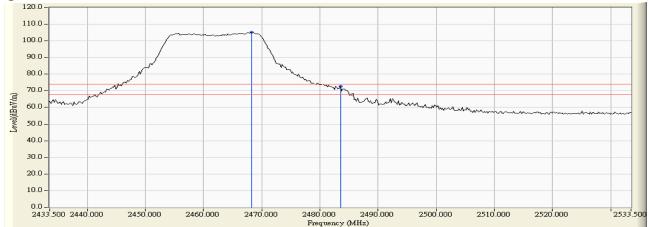
Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

#### **RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)	Result
11 (Peak)	2468.300	32.067	73.068	105.135			
11 (Peak)	2483.500	32.182	40.471	72.653	74.00	54.00	Pass
11 (Average)	2469.100	32.073	62.044	94.117			
11 (Average)	2483.500	32.182	20.605	52.787	74.00	54.00	Pass

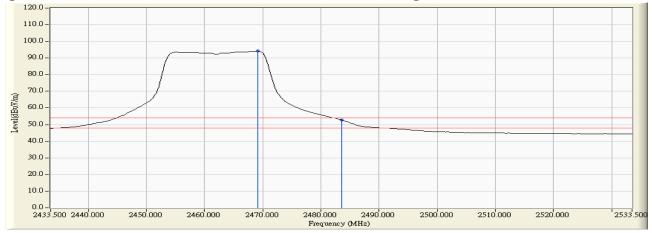
#### **Figure Channel 11:**

#### Horizontal (Peak)



#### Figure Channel 11:

#### Horizontal (Average)



Note:1. All readings above 1GHz are performed with peak and/or average measurements as necessary.

2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.

- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.

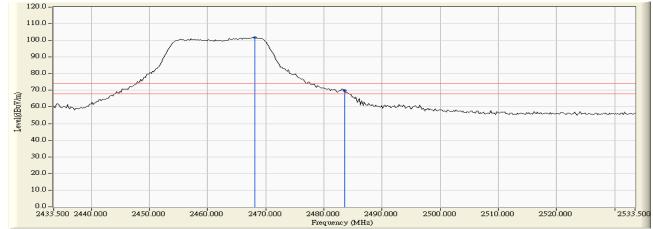


Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
11 (Peak)	2468.100	31.331	70.480	101.811			
11 (Peak)	2483.500	31.435	38.458	69.893	74.00	54.00	Pass
11 (Average)	2468.900	31.337	59.588	90.925			
11 (Average)	2483.500	31.435	18.932	50.367	74.00	54.00	Pass

#### **Figure Channel 11:**

#### VERTICAL (Peak)



#### Figure Channel 11:

#### VERTICAL (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



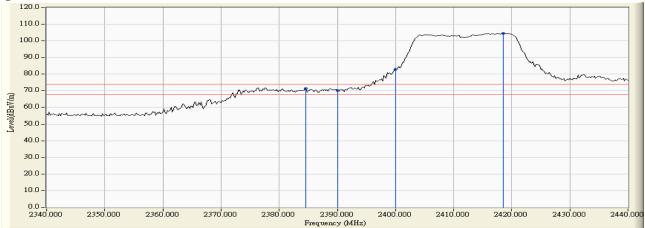
Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

#### **RF Radiated Measurement (Horizontal):**

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBµV)	$(dB\mu V/m)$	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
01 (Peak)	2384.600	31.488	39.934	71.422	74.00	54.00	Pass
01 (Peak)	2390.000	31.509	38.477	69.986	74.00	54.00	Pass
01 (Peak)	2400.000	31.561	51.433	82.994			
01 (Peak)	2418.600	31.689	72.917	104.606			
01 (Average)	2390.000	31.509	22.473	53.982	74.00	54.00	Pass
01 (Average)	2400.000	31.561	29.841	61.402			
01 (Average)	2419.000	31.691	60.616	92.308			

#### Figure Channel 01:

#### Horizontal (Peak)



#### Figure Channel 01:

#### Horizontal (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.

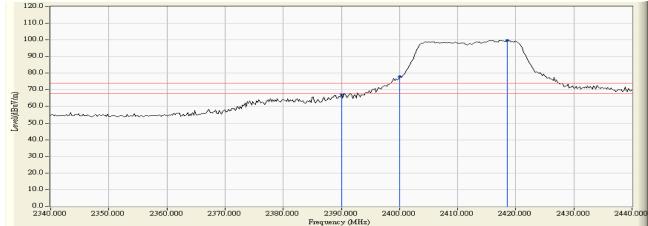


Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2412MHz)

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
Channel No.	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
01 (Peak)	2390.000	30.915	36.373	67.288	74.00	54.00	Pass
01 (Peak)	2400.000	30.912	47.044	77.956			
01 (Peak)	2418.600	30.994	68.857	99.851			
01 (Average)	2390.000	30.915	17.494	48.409	74.00	54.00	Pass
01 (Average)	2400.000	30.912	26.262	57.174			
01 (Average)	2419.000	30.996	56.779	87.776			

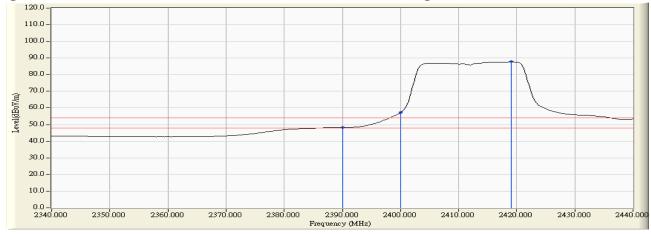
#### Figure Channel 01:

#### VERTICAL (Peak)





#### VERTICAL (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.



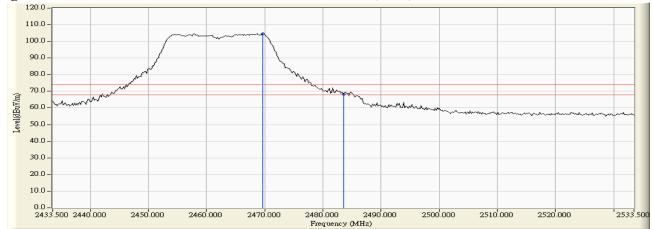
Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

#### **RF Radiated Measurement (Horizontal):**

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Result
11 (Peak)	2469.700	32.078	72.565	104.643			
11 (Peak)	2483.500	32.182	35.942	68.124	74.00	54.00	Pass
11 (Average)	2469.100	32.073	60.774	92.847			
11 (Average)	2483.500	32.182	19.202	51.384	74.00	54.00	Pass

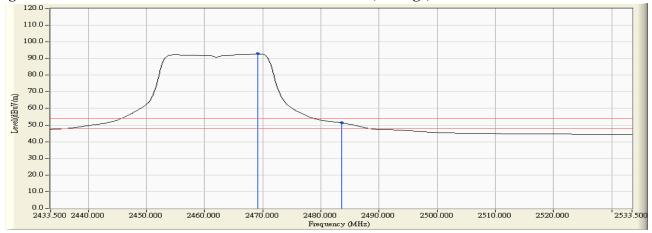
#### **Figure Channel 11:**

#### Horizontal (Peak)



#### Figure Channel 11:

#### Horizontal (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.

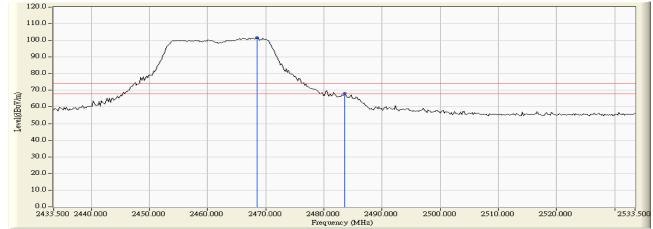


Product	:	Wireless Motherboard
Test Item	:	Band Edge Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW) (2462MHz)

Channel No.	Frequency	Correct Factor	Reading Level	<b>Emission Level</b>	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBµV)	(dBµV/m)	$(dB\mu V/m)$	$(dB\mu V/m)$	Kesuit
11 (Peak)	2468.500	31.334	70.251	101.585			
11 (Peak)	2483.500	31.435	36.825	68.260	74.00	54.00	Pass
11 (Average)	2469.100	31.338	58.299	89.637			
11 (Average)	2483.500	31.435	17.549	48.984	74.00	54.00	Pass

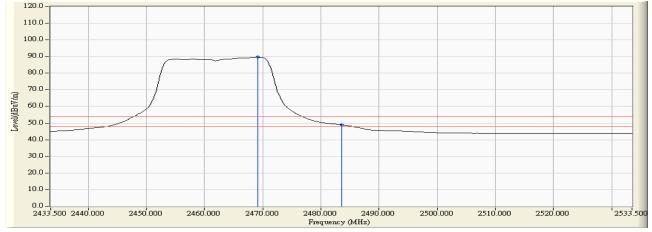
#### **Figure Channel 11:**

#### VERTICAL (Peak)



#### Figure Channel 11:

#### VERTICAL (Average)



- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "\*", means this data is the worst emission level.
- 5. Measurement Level = Reading Level + Correct Factor.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.

# 7. Occupied Bandwidth

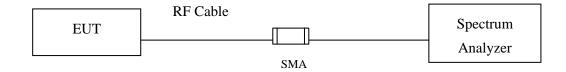
# 7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2015
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2015
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

#### Note:

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

# 7.2. Test Setup



## 7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

# 7.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2014; tested according to DTS test procedure of Jan KDB558074 for compliance to FCC 47CFR 15.247 requirements.

# 7.5. Uncertainty

 $\pm$  150Hz

# 7.6. Test Result of Occupied Bandwidth

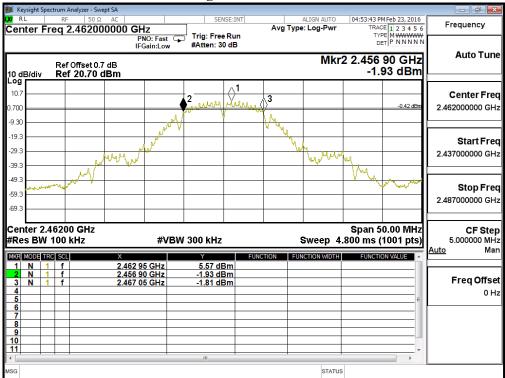
Product	:	Wireless Motherboard
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	10150	>500	Pass
06	2437	10150	>500	Pass
11	2462	10150	>500	Pass

	Analyzer - Swept SA							
Center Freq	50 Ω AC 2.41200000	0 GHz	SENSE:	Avg Typ	ALIGN AUTO	12:36:21 PM Feb 17 TRACE 1 2	3456	Frequency
Re	ef Offset 0.7 dB	PNO: Fast ⊂ IFGain:Low	➡ Trig: Free Ru #Atten: 30 dE		Mkr	TYPE MW DET P N 2 2.406 90 ( -4.21 d	GHZ	Auto Tune
10.7 0.700		A	2 norman res	3		-2	.89 dBm	Center Fred 2.412000000 GHz
-19.3 -29.3 -39.3	- John Market	w	V	V Vy	where			Start Fred 2.387000000 GHz
-49.3 -59.3 -69.3						Mum	a for a second	<b>Stop Fred</b> 2.437000000 GH;
Center 2.412 #Res BW 100	) kHz		W 300 kHz	FUNCTION FU	<u> </u>	Span 50.00 .800 ms (1001	pts)	CF Step 5.000000 MH Auto Mar
1 N 1 f 2 N 1 f 3 N 1 f 4 5	2	2.411 45 GHz 2.406 90 GHz 2.417 05 GHz	3.11 dBm -4.21 dBm -4.38 dBm					Freq Offse 0 H:
6 7 8 9 10 11								
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						0						
									Analyzer - Swe			
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Auto Tune		DE				Trig: Free #Atten: 3	NO: Fast 🔾 Gain:Low	PI IFC				
Auto Tune	90 GHz 13 dBm		Mkr						Offset 0.7 f 20.70 d		B/div	10 d
Center Freq				_	1							Log 10.7
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				May.			۷ <sup>س</sup> مبر					-9.30
Start Freq			×	- North Andrews			a for the second se	لم				-19.3 -29.3
2.412000000 GHz		4	proprie					man				-39.3
Stop Freq	when more	- Laura							~~~/~	~~~~	a sola	-49.3
2.462000000 GHz												-59.3 -69.3
CF Step 5.000000 MHz	0.00 MHz 1001 pts)		Sweep 4.	:		/ 300 kHz	#VBW		0 GHz kHz	2.4370 V 100		
<u>Auto</u> Man	DN VALUE	FUNCTION	CTION WIDTH	CTION FUI		Y 4.01 di	CH2	× 2.436 4		TRC SCL	MODE N	MKR 1
Freq Offset					3m	-3.13 di -3.30 di	0 GHz	2.431 9		1 f 1 f	N	2
0 Hz	E									-		4 5
					_							6 7
					_							8 9 10
												11
<u>  </u>			STATUS									MSG





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

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	16450	>500	Pass
06	2437	16450	>500	Pass
11	2462	16450	>500	Pass

		t Spect		Analyzer -		t SA															
	RL nter	Fre	RF eq 2	50 2.412	ο Ω	AC	GH	Z	_	1	NSE:I		Avg T		LIGN AUTO	12	TRA	M Feb 17 CE 1 2 3 PE M <del>W</del>	845	6	Frequency
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Lōg 10. 0.70 -9.3	7 0							2- /	Jynd	walnuturhey	m	-h-h-h	hallanda	3				-5	87 dBrr		<b>Center Freq</b> 2.412000000 GHz
-19. -29. -39.	3 —	www	nn <sup>ada</sup> a	uple al aleo	MAL	querol	JADA VAL	w						A A	the way the work	hoanbu	MANIM	an and a second	the ported		<b>Start Freq</b> 2.387000000 GHz
-49. -59. -69.	3																				<b>Stop Freq</b> 2.437000000 GHz
#R	nter es B	W 1	00		2	×		#V	вw	300 kHz		FUNC	TION		Sweep 4	.800	ms (	0.00 1001	pts)		CF Step 5.000000 MHz <u>auto</u> Man
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I € MSG								_		m					STATU	s			P.		



		mer uu:		Figu						
							Analyzer - Swe			
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	DET P NNNN	Avg Type: Log-Pwr		Trig: Free #Atten: 3	<b>1Z</b> NO: Fast ( Gain:Low	0000 GH	2.43700	-req 2	ter	zen
Auto Tun	2 2.428 75 GHz -6.23 dBm	Mkr2					Offset 0.7 f 20.70 d		3/div	l0 di _og
Center Fre										.0g 10.7
		$\langle \rangle_{3}^{I}  $			<u>2</u>					
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Start Fre					www.	. /				9.3
2.412000000 GH	Min Marlin Man Market Market	A NOW AND A				North March				29.3
	And you and a stand and a st	- MWH				pl n <sup>tr</sup>	makanahi			39.3
	muy							Paratur	William	19.3
Stop Fre										59.3
2.462000000 GH										
										59.3
<b>CF Ste</b> 5.000000 MH Auto Ma	Span 50.00 MHz 800 ms (1001 pts)	•		W 300 kHz	#VB			/ 100	s BV	Re
	FUNCTION VALUE	ION FUNCTION WIDTH	FUNC	0.52 dE	E CUI-	× 2.444 4		RC SCL	MODE	IKR 1
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Freq Offs			3m	-6.03 dE	0 GHz	2.445 2		1 f	Ν	3
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	rum Analyzer - Swe	pt SA								
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			~							Center Fr
.700			2	A.A.A.	Antonton	-			-4.90 dBm	2.462000000 G
9.30										
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59.3										2.487000000
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enter 2.46									0.00 MHz	CF St
Res BW 1	00 kHz		#VBW 3	300 kHz			Sweep 4.	.800 ms (	1001 pts)	5.000000 N
KR MODE TRC	SCL	X		Y	FUN	CTION FUI	NCTION WIDTH	FUNCTION	ON VALUE	<u>Auto</u> N
1 N 1	f	2.469 45 GI		1.10 dE	m		ĺ			
2 N 1 3 N 1	f	2.453 75 GI 2.470 20 GI		-6.29 dB -5.28 dB						Freq Off
<u>3</u> N 1	-	2.470 20 Gr	12	-9.26 UE	m					0
5									E	, v
6 7					-					
8			-							
9										
10 11										
							STATUS			
SG							STATUS			



Product	:	Wireless Motherboard
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
01	2412	17650	>500	Pass
06	2437	17650	>500	Pass
11	2462	17700	>500	Pass

		m Analyzer - Sv									
Center		RF 50 9	00000 GH			ISE:INT		ALIGN AUTO : Log-Pwr	TRAC	M Feb 17, 2016 E 1 2 3 4 5 6 E M WWWW	Frequency
10 dB/di		ef Offset 0 ef 20.70	IFC	NO: Fast 🕞 Gain:Low	#Atten: 30			Mkr	2 2.403	15 GHz 41 dBm	Auto Tune
10.7 0.700 -9.30				2 milinilin	hydron	mhalachu	1 million 3			-4.85 dBm	Center Freq 2.412000000 GHz
-19.3 -29.3 -39.3 <mark>-1944</mark>	ᡩᡟ᠆ᢑᢞᢛᡘᡟᡃ	mon have	AND				<u> </u>	Manalharakara	maliquestican	ewn horn the fun	Start Freq 2.387000000 GHz
-49.3											Stop Freq 2.437000000 GHz
Center #Res B	W 10		X	#VBV	/ 300 kHz	EUN		Sweep 4	.800 ms (	0.00 MHz 1001 pts)	CF Step 5.000000 MHz <u>Auto</u> Man
1 N 2 N 3 N 4 5 6	1	f f f	2.419 4 2.403 1 2.420 8	5 GHz	<u>1.15 de</u> -5.41 de -4.96 de	3m 3m				=======================================	Freq Offset 0 Hz
7 8 9 10 11											
MSG								STATUS	;		



		rigure Ch			
📕 Keysight Spectrum Analyzer - Sv					
RL RF 50 Center Freq 2.4370		SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	02:11:10 PM Feb 17, 2016 TRACE 1 2 3 4 5 6	Frequency
zenter Freq 2.4370	PNO: Fast IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type. Log-t wi	TYPE MWWWW DET P NNNNN	Auto Tupe
10 dB/div Ref 20.00	dBm		Mkr	2 2.428 15 GHz -5.61 dBm	Auto Tune
-og 10.0					O a más a Fina
	<b>A</b> 2		<b>⊘'</b> _3		Center Fre
0.00	milante	water ala hard	who have a second and a second	-5.10 dBm	2.437000000 GH
10.0					
20.0					Start Fre
30.0	- WHERE -		and the second s	and marked and a second and a	2.412000000 GH
40.0 Month and the state of the	hard		- 14147	and a start a la way of the low	2.412000000 Gi
50.0					
					Stop Fre
50.0					2.462000000 GH
70.0					
Center 2.43700 GHz Res BW 100 kHz	X		Sweep 4.	Span 50.00 MHz 800 ms (1001 pts) FUNCTION VALUE	<b>CF Ste</b> 5.000000 MH <u>Auto</u> Ma
1 N 1 f 2 N 1 f	2.444 45 GHz 2.428 15 GHz	0.90 dBm -5.61 dBm			
3 N 1 f	2.445 80 GHz	-5.15 dBm			Freq Offs
<u>4</u> 5					0 H
6				=	
7 8					
9					
10					
G			STATUS		L
~			514105		

Figure Channel 11:

🚺 Keysight Spectrum Analyzer - Swept SA		8				- # <del>x</del>	
RL         RF         50 Ω         AC           Center Freq 2.462000000 G	iHz	SENSE	Avg Type	ALIGN AUTO E: Log-Pwr	05:12:38 PM Feb 23, 20 TRACE 1 2 3 4	Frequency	
Ref Offset 0.7 dB 10 dB/div Ref 20.70 dBm	PNO: Fast 😱 FGain:Low	Trig: Free R #Atten: 30 d		Mkr2 2.453 15 GHz -6.97 dBm			
10.7 0.700 -9.30	2-	honder from the grade	Antonia (		-5.92 d	Center Freq 2.462000000 GHz	
-19.3 -29.3 -39.3 -49.3				Were Willie	Montemportun	Start Freq 2.437000000 GHz	
-49.3						Stop Freq 2.487000000 GHz	
Center 2.46200 GHz #Res BW 100 kHz	#VBW	300 kHz		Sweep 4.	Span 50.00 MH 800 ms (1001 pt FUNCTION VALUE		
2 N 1 f 2.453	45 GHz 15 GHz 85 GHz	0.07 dBm -6.97 dBm -6.94 dBm	n			Freq Offset 0 Hz	
7 8 9 10 11							
MSG		m		STATUS	• • • • • • • • • • • • • • • • • • •		

# 8. Power Density

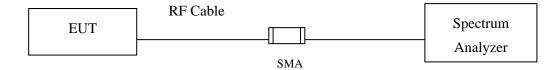
## 8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun., 2015
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun., 2015
Х	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2015

Note:

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

### 8.2. Test Setup



## 8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

#### 8.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2013; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

#### 8.5. Uncertainty

 $\pm$  1.27 dB

# 8.6. Test Result of Power Density

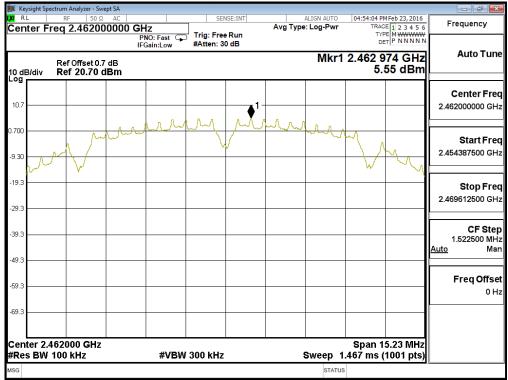
Product	:	Wireless Motherboard
Test Item	:	Power Density Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit (802.11b 1Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	3.040	$\leq$ 8dBm	Pass
06	2437	3.950	$\leq$ 8dBm	Pass
11	2462	5.550	$\leq$ 8dBm	Pass

	pectrum Analyzer - Swe	·			1			1		
Center I	RF 50 Ω Freq 2.41200	AC	IZ NO: Fast 😱	1			LIGN AUTO	TRAC	Feb 17, 2016 E 1 2 3 4 5 6 E M WWWW	Frequency
10 dB/div	Ref Offset 0.7 Ref 20.70 d	'dB	Gain:Low	#Atten: 3			Mkr1	2.411 4	67 GHz 04 dBm	Auto Tune
10.7				<b>▲</b> <sup>1</sup>						Center Freq 2.412000000 GHz
0.700		m			/ mark	ᡃᢌᢛ᠕ᡨᡁᢉᡨᠧᡗ	www.	~	N.	<b>Start Freq</b> 2.404387500 GHz
-19.3									~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<b>Stop Freq</b> 2.419612500 GHz
-39.3										CF Step 1.522500 MHz <u>Auto</u> Mar
-59.3										Freq Offse 0 Hz
-69.3	.412000 GHz							Span 1	5.23 MHz	
#Res BW	/ 100 kHz		#VBW	300 kHz			Sweep 1	, ,	1001 pts)	



		b:	annel (	are Ci	Fig					
								n Analyzer - Swe		
Frequency	12:40:46 PM Feb 17, 2016 TRACE 1 2 3 4 5 6 TYPE M WWWW		Avg Type:		Trig: Free	HZ NO: Fast	00000 GH	35 Ω 2.43700		Cen
Auto Tune	2.436 467 GHz 3.95 dBm	Mkr1 2.		0 dB	#Atten: 3	Gain:Low	IF 7 dB	ef Offset 0.7 ef 20.70 d		10 dE
Center Fred 2.437000000 GHz					1					10.7
<b>Start Fred</b> 2.429387500 GHz	$\overline{\mathbf{v}}$	man	where the second	m		<u>kan</u> n	h			.700 9.30
<b>Stop Fred</b> 2.444612500 GH								·		19.3 29.3
CF Step 1.522500 MH: Auto Mar										39.3 49.3
Freq Offse 0 H:										59.3
										69.3
	Span 15.23 MHz 467 ms (1001 pts)	s veep 1.46	s	1	300 kHz	#VBW			ter 2.437 s BW 10	
		STATUS								//SG





Product	:	Wireless Motherboard
Test Item	:	Power Density Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit (802.11g 6Mbps)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	0.120	$\leq$ 8dBm	Pass
06	2437	0.520	$\leq$ 8dBm	Pass
11	2462	1.050	$\leq$ 8dBm	Pass

	pectrum Analyzer - Swe									- • •	
Center F	RF 50 Ω Freq 2.41200	00000 GH			Run		LIGN AUTO	TRAC	Feb 17, 2016 E 1 2 3 4 5 6 E M WWWW	Frequency	
10 dB/div	Ref Offset 0.7 Ref 20.70 c	IFC dB	NO: Fast 🕞 Gain:Low	#Atten: 3			Mkr1	2.419 4	77 GHz 12 dBm	Auto Tune	
10.7								1		Center Freq 2.412000000 GHz	
-9.30	pm	hundrund	mmm	manduan	montan	Innhan	harten	hay		Start Fred 2.399662500 GH;	
-19.3	Arther and a							W. Mong	manhauph	Stop Frec 2.424337500 GH:	
-39.3										CF Step 2.467500 MH <u>Auto</u> Mar	
-59.3										Freq Offse 0 H	
-69.3	.41200 GHz							Snap 2	4.68 MHz		
#Res BW			#VBW	300 kHz			Sweep 2	.400 ms (	1001 pts)		



			00.	annei	ire Ch	Fig					
										ysight Spectrum	
Frequency	TRACE 1 2 3 4 5 6		ALIGN AUTO : Log-Pwr		ISE:INT	SEN	17		F 50 Ω	ter Freq	XI RI Cen
	DET P N N N N	T	Ū	• ,,		Trig: Free #Atten: 3	NO: Fast 🖵 Gain:Low	Р	2.40700		
Auto Tune	Ref Offset 0.7 dB Mkr1 2.444 477 GHz 10 dB/div Ref 20.70 dBm 0.52 dBm										
Center Fred											og
2.437000000 GHz											10.7
		•1									. 700
Start Freq		alay	Invertain	handman	wondwar	man	montand	mhm	m		).700
2.424662500 GHz					· ·						-9.30
		1 \			ĺ				1		
Stop Free	-w	- W							مى مەربىر		19.3
2.449337500 GH	W W W W W W								ſ	Paral Nº	
										WALL	29.3
CF Step											39.3
2.467500 MH: Auto Mar											
											49.3
Freq Offse											
0 H:											-59.3
											69.3
											35.3
	an 24.68 MHz	Snan 1								ter 2.437	Cert
	ns (1001 pts)		Sweep 2			300 kHz	#VBW			s BW 100	
	<u> </u>	s	STATUS								ISG

	ht Spectrum Analyzer - Sw	vept SA		8.							
Cente	r Freq 2.46200	00000 GHz		SEN	ISE:INT		ALIGN AUTO : Log-Pwr	TRAC	Feb 23, 2016	Frequency	
10 dB/d	Ref Offset 0. liv Ref 20.70	IFGa 7 dB	): Fast ⊊ in:Low	#Atten: 30			Mkr1	2.469 4	77 GHz 05 dBm	Auto Tune	
10.7								1		Center Fred 2.462000000 GHz	
0.700 — -9.30 —	pm	manhaul	w how w	when		hantaan	hanna	hy		Start Free 2.449662500 GH:	
-19.3 —	WWW Pages and							- Wer	www	Stop Free 2.474337500 GH	
-39.3 —										<b>CF Stej</b> 2.467500 MH <u>Auto</u> Ma	
-49.3 — -59.3 —										Freq Offse 0 H	
-69.3											
	r 2.46200 GHz 3W 100 kHz		#VBW :	300 kHz		:	Sweep 2		4.68 MHz 1001 pts)		
MSG							STATUS				



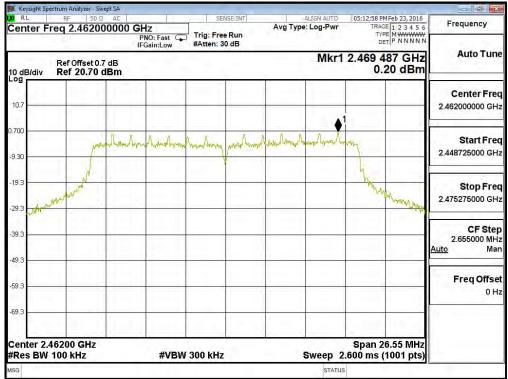
Product	:	Wireless Motherboard
Test Item	:	Power Density Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 3: Transmit (802.11n MCS0 7.2Mbps 20M-BW)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
01	2412	1.150	$\leq$ 8dBm	Pass
06	2437	0.890	$\leq$ 8dBm	Pass
11	2462	0.200	$\leq$ 8dBm	Pass

	t Spectrum Analyzer -	Swept SA		0						
KRL Center	r Freq 2.412	0 Ω AC	Hz		NSE:INT		ALIGN AUTO : Log-Pwr	TRAC	E 1 2 3 4 5 6	Frequency
10 dB/di	Ref Offset v Ref 20.7	IF 0.7 dB	'NO: Fast ⊂ Gain:Low	#Atten: 3			Mkr1	2.419 4	66 GHz 15 dBm	Auto Tune
10.7								1		Center Freq 2.412000000 GHz
0.700 -9.30		prince tomped time.	Awalim	AmerAyming	www.hmad	won John A	manny	the second se		Start Freq 2.398762500 GHz
-19.3	w. Color and for the second se							"hu hung	Month willy	Stop Freq 2.425237500 GHz
-39.3										CF Step 2.647500 MHz <u>Auto</u> Mar
-59.3										Freq Offset 0 Hz
-69.3										
	2.41200 GHz W 100 kHz	2	#VBW	300 kHz		:	Sweep 2	Span 2 .533 ms (	6.48 MHz 1001 pts)	
MSG							STATUS	;		



			Figure C			
			1		ectrum Analyzer - Swept	
Frequency	02:11:31 PM Feb 17, 2016 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	ALIGN AUTO Avg Type: Log-Pwr	SENSERINT	AC 0000 GHz PNO: Fast C	RF 50 Ω req 2.437000	Center F
Auto Tun			#Atten: 30 dB	IFGain:Low		
	2.444 466 GHz 0.89 dBm	Mkr1		Bm	Ref 20.00 dB	10 dB/div
Center Fred 2.437000000 GH						10.0
Start Free 2.423762500 GH	Mmy	m brow board and by	mention produce	ol ward wood how how a	( annol	10.00
Stop Free 2.450237500 GH	hour man hours				monor	20.0
CF Step 2.647500 MH Auto Mar						40.0
Freq Offse 0 H						60.0
				Lati Level	- 1 1 1 1 1	70.0
	Span 26.48 MHz 533 ms (1001 pts)	Sweep 2.	300 kHz	#VBW	43700 GHz 100 kHz	Center 2. #Res BW
		STATUS				ASG





# 9. EMI Reduction Method During Compliance Testing

No modification was made during testing.