# FCC Test Report

Product Name	Wireless Motherboard
Model No.	TA70CA1
FCC ID.	WL6-TABC7CA1

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

Date of Receipt	Nov. 27, 2013
Issued Date	Dec. 24, 2013
Report No.	13C0051R-RFUSP03V00
Report Version	V1.0



The Test Results relate only to the samples tested.

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## Test Report Certification

Issued Date: Dec. 24, 2013 Report No.: 13C0051R-RFUSP03V00



Product Name	Wireless Motherboard		
Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD.		
Address	No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan		
Manufacturer	ELITEGROUP COMPUTER SYSTEMS CO., LTD.		
Model No.	TA70CA1		
FCC ID.	WL6-TABC7CA1		
EUT Rated Voltage	DC 3.7V (Power by Battery)		
EUT Test Voltage	AC 120V/ 60Hz		
Trade Name	ECS / JP SA COUTO, S.A.		
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2012		
	ANSI C63.4: 2003, ANSI C63.10: 2009		
Test Result	Complied		

The Test Results relate only to the samples tested.

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( Director / Vincent Lin )

## TABLE OF CONTENTS

Desc		age
	GENERAL INFORMATION	
	EUT Description	
	Operational Description	
	Tested System Details	8
	Configuration of Tested System	8
	EUT Exercise Software	8
	Test Facility	9
	CONDUCTED EMISSION	
	Test Equipment	
	Test Setup	
	Limits	
	Test Procedure	11
	Uncertainty	11
	Test Result of Conducted Emission	12
	PEAK POWER OUTPUT	
	Test Equipment	
	Test Setup	14
	Limit	
	Test Procedure	
	Uncertainty	
	Test Result of Peak Power Output	
	RADIATED EMISSION	
	Test Equipment	
	Test Setup	17
	Limits	18
	Test Procedure	
	Uncertainty	19
	Test Result of Radiated Emission	
	RF ANTENNA CONDUCTED TEST	
	Test Equipment	
	Test Setup	28
	Limits	28
	Test Procedure	28
	Uncertainty	28
	Test Result of RF Antenna Conducted Test	
	BAND EDGE	
	Test Equipment	
	Test Setup	32
	Limit	33
	Test Procedure	
	Uncertainty	
	Test Result of Band Edge	
	CHANNEL NUMBER	
	Test Equipment	
	Test Setup	
	Limit	
	Test Procedure	
	Uncertainty	
	Test Result of Channel Number	
	CHANNEL SEPARATION	
	Test Equipment	
	Test Setup	
	Limit	
	Test Procedure	
	Uncertainty	
	Test Result of Channel Separation	
	*	
	DWELL TIME	
	Test Equipment	

## 

9.2.	Test Setup	50
9.3.	Limit	50
9.4.	Test Procedure	50
9.5.	Uncertainty	50
9.6.	Test Result of Dwell Time	51
10.	OCCUPIED BANDWIDTH	55
10.1.	Test Equipment	
10.2.	Test Setup	55
10.3.	Limits	55
10.4.	Test Procedure	55
10.5.	Uncertainty	55
10.6.	Test Result of Occupied Bandwidth	
11.	EMI REDUCTION METHOD DURING COMPLIANCE TESTING	
Attachme	ent 1: EUT Test Photographs	

Attachment 2: EUT Detailed Photographs

## 1. GENERAL INFORMATION

## 1.1. EUT Description

Product Name	Wireless Motherboard	
Trade Name	ECS / JP SA COUTO, S.A.	
Model No.	TA70CA1	
FCC ID.	WL6-TABC7CA1	
Frequency Range	2402 – 2480MHz	
Channel Number	79	
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)	
Antenna Type	PIFA Antenna	
Channel Control	Auto	
Antenna Gain	Refer to the table "Antenna List"	

#### Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	JEM	13H130-JV6070	PIFA Antenna	2.98 dBi for 2.4GHz
2	WGT	13H130-JV6050	PIFA Antenna	2.48 dBi for 2.4GHz

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

Center Frequency of Each Channel:

Channal	Energy energy	Channal	Encourse	Channal	Encorrection	Channal	<b>E</b> ma av. am av.
Channel	Frequency	Channel	Frequency	Channel	Frequency		Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

- 1. The EUT is a Tablet PC with a built-in WLAN and Bluetooth transceiver, this report for Bluetooth.
- 2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
- 3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- 4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
- 5. Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through pre-testing, to produce emissions similar to those for 3Mb/s.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK)	
	Mode 2: Transmit - 3Mbps (8DPSK)	

## **1.2.** Operational Description

The EUT is a Wireless Motherboard with built-in 2.4GHz Bluetooth V2.1+EDR transceiver. The number of the channels is 79 in 2402-2480MHz. This device provides three kinds of transmitting speed and modulation, respectively GFSK(1Mbps) /  $\pi$  /4DQPSK(2Mbps) / 8DPSK(3Mbps). The antenna is PIFA antenna and provides diversity function to improve the receiving function.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted.

The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

This equipment includes WLAN and Bluetooth, which can not transmit signals simultaneously.

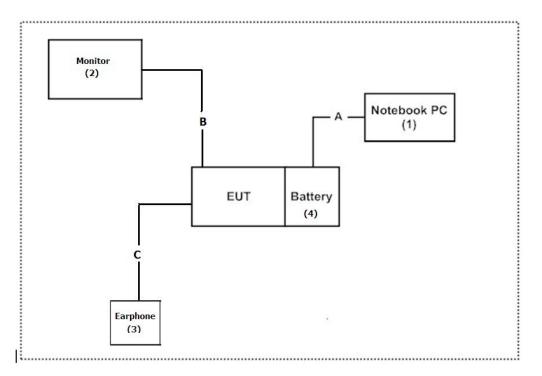
## **1.3.** Tested System Details

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

Proc	luct	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	РРТ	N/A	Non-Shielded, 0.8m
2	Monitor	DELL	ST2320LF	N/A	Non-Shielded, 0.8m
3	Earphone	РСНОМЕ	N/A	N/A	N/A
4	Battery	TCL	13H202-300320	N/A	N/A

	Signal Cable Type	Signal cable Description
А	USB Cable	Non-Shielded, 1.5m
В	HDMI Cable	Shielded, 1.8m
С	Earphone Cable	Non-Shielded, 2m

## 1.4. Configuration of Tested System



## **1.5.** EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute program "WL.exe" on the Notebook PC.
- (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

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

Ambient conditions in the laboratory:

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

from QuieTek Corporation's Web Site: <u>http://www.quietek.com/tw/ctg/cts/accreditations.htm</u> The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site: <u>http://www.quietek.com/</u>

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

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

FCC Accreditation Number: TW1014

## 2. Conducted Emission

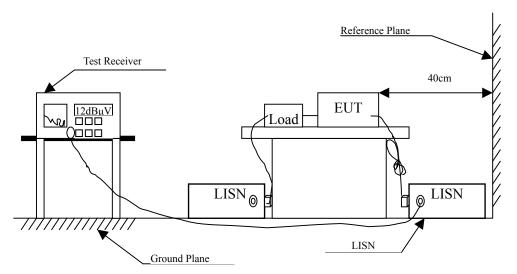
## 2.1. Test Equipment

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

Note:

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

## 2.2. Test Setup



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

#### 2.3. Limits

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

## 2.4. Test Procedure

The EUT and Peripherals 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 refer 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 the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

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

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

## 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product	:	Wireless Motherboard
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBµV	dBµV	dB	dBµV
LINE 1					
Quasi-Peak					
0.154	9.697	39.510	49.207	-16.679	65.886
0.298	9.703	34.170	43.873	-17.898	61.771
0.673	9.720	29.160	38.880	-17.120	56.000
3.623	9.820	30.260	40.080	-15.920	56.000
7.013	9.850	25.870	35.720	-24.280	60.000
10.677	9.880	26.500	36.380	-23.620	60.000
Average					
0.154	9.697	37.100	46.797	-9.089	55.886
0.298	9.703	27.730	37.433	-14.338	51.771
0.673	9.720	20.440	30.160	-15.840	46.000
3.623	9.820	25.160	34.980	-11.020	46.000
7.013	9.850	20.800	30.650	-19.350	50.000
10.677	9.880	21.270	31.150	-18.850	50.000

## Note:

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

2. " means the worst emission level.

3. Measurement Level = Reading Level + Correct Factor

Product	: Wireless Motherboard					
Test Item	: Conducted Emission Test					
Power Line	: Line 2	: Line 2				
Test Mode	: Mode 2	: Transmit - 3Mbp	s (8DPSK) (2441MH	z)		
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV	dB	dBµV	
LINE 2						
Quasi-Peak						
0.173	9.677	33.780	43.457	-21.886	65.343	
1.318	9.739	26.010	35.749	-20.251	56.000	
3.697	9.810	28.990	38.800	-17.200	56.000	
6.392	9.840	24.620	34.460	-25.540	60.000	
12.045	9.920	23.530	33.450	-26.550	60.000	
22.779	10.084	24.330	34.414	-25.586	60.000	
Average						
0.173	9.677	25.200	34.877	-20.466	55.343	
1.318	9.739	18.220	27.959	-18.041	46.000	
3.697	9.810	23.880	33.690	-12.310	46.000	
6.392	9.840	19.550	29.390	-20.610	50.000	
12.045	9.920	18.440	28.360	-21.640	50.000	
22.779	10.084	19.390	29.474	-20.526	50.000	

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor

## 3. Peak Power Output

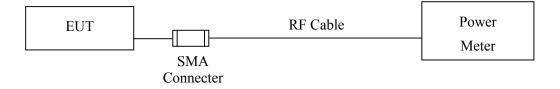
## 3.1. Test Equipment

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

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

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

## 3.2. Test Setup



## **3.3.** Limit

The maximum peak power shall be less 1Watt.

## **3.4.** Test Procedure

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

## 3.5. Uncertainty

 $\pm$  1.27 dB

## 3.6. Test Result of Peak Power Output

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

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	3.05	1 Watt= 30 dBm	Pass
Channel 39	2441.00	4.02	1 Watt= 30 dBm	Pass
Channel 78	2480.00	4.21	1 Watt= 30 dBm	Pass

Product	:	Wireless Motherboard
Test Item	:	Peak Power Output
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	1.69	1 Watt= 30 dBm	Pass
Channel 39	2441.00	2.05	1 Watt= 30 dBm	Pass
Channel 78	2480.00	1.53	1 Watt= 30 dBm	Pass

## 4. Radiated Emission

#### 4.1. Test Equipment

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

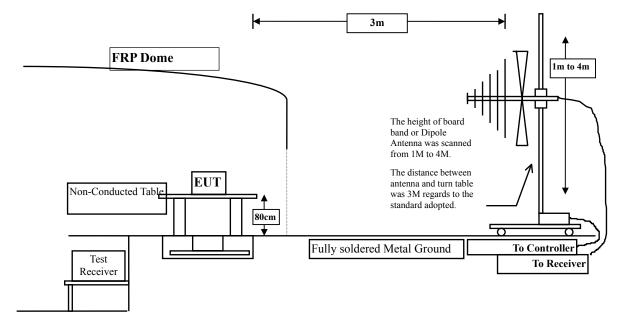
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 3	X Loop Antenna		Teseq	HLA6120 / 26739	Jul., 2013
	Х	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X Horn Antenna S		Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X Horn Antenna S		Schwarzbeck	BBHA9170/208	Jul., 2013
	Х	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2013
	Х	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
	Х	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	Х	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2013
	Х	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	Х	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

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

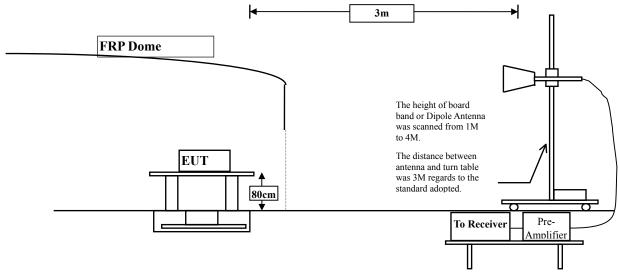
2. The test instruments marked by "X" are used to measure the final test results.

## 4.2. Test Setup

Below 1GHz



Above 1GHz



#### Limits

#### General Radiated Emission 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 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: 1. RF Voltage  $(dB\mu V) = 20 \log RF$  Voltage (uV)

- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

## 4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

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

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10, 2009 on radiated measurement.

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 on the Final Measurement.

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

## 4.4. Uncertainty

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

Product Test Item Test Site Test Mode	<ul> <li>Wireless Motherboard</li> <li>Harmonic Radiated Emission</li> <li>No.3 OATS</li> <li>Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)</li> </ul>					
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV/m	dB	dBµV/m	
Horizontal						
Peak Detector:						
4804.000	3.327	43.960	47.287	-26.713	74.000	
7206.000	10.136	36.760	46.896	-27.104	74.000	
9608.000	13.706	36.710	50.416	-23.584	74.000	
Average						
<b>Detector:</b>						
Vertical						
Peak Detector:						
4804.000	6.638	44.570	51.207	-22.793	74.000	
7206.000	11.005	36.930	47.935	-26.065	74.000	
9608.000	14.103	36.900	51.003	-22.997	74.000	
Average						
<b>Detector:</b>						

## 4.5. Test Result of Radiated Emission

- 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	: Harmoni	: Harmonic Radiated Emission					
Test Site	: No.3 OA	: No.3 OATS					
Test Mode	: Mode 1:	Transmit - 1Mbp	os (GFSK)(2441MHz)	)			
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBµV	$dB\mu V/m$	dB	$dB\mu V/m$		
Horizontal							
Peak Detector:							
4882.000	3.001	44.180	47.181	-26.819	74.000		
7323.000	11.846	36.150	47.997	-26.003	74.000		
9764.000	12.563	36.940	49.503	-24.497	74.000		
Average							
<b>Detector:</b>							
Vertical							
Peak Detector:							
4882.000	5.713	44.500	50.214	-23.786	74.000		
7323.000	12.727	35.390	48.118	-25.882	74.000		
9764.000	13.028	37.650	50.678	-23.322	74.000		
Average							
<b>Detector:</b>							

- 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 Test Item	<ul> <li>Wireless Motherboard</li> <li>Harmonic Radiated Emission</li> </ul>						
Test Site	: No.3 OAT	-					
Test Mode			s (GFSK)(2480MHz)				
Test Widde	. Wode 1. 1		S (OF SK)(240010112)				
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBµV	dBµV/m	dB	$dB\mu V/m$		
Horizontal							
<b>Peak Detector:</b>							
4960.000	2.760	46.020	48.780	-25.220	74.000		
7440.000	12.567	35.980	48.546	-25.454	74.000		
9920.000	13.456	36.400	49.856	-24.144	74.000		
Average							
Detector:							
Vertical							
<b>Peak Detector:</b>							
4960.000	5.557	44.940	50.497	-23.503	74.000		
7440.000	13.426	35.900	49.325	-24.675	74.000		
9920.000	13.958	36.360	50.318	-23.682	74.000		
Average							
Detector:							

---

- 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 Test Item Test Site Test Mode	<ul> <li>Wireless Motherboard</li> <li>Harmonic Radiated Emission</li> <li>No.3 OATS</li> <li>Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)</li> </ul>					
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level	-		
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m	
Horizontal						
<b>Peak Detector:</b>						
4804.000	3.327	43.160	46.487	-27.513	74.000	
7206.000	10.136	37.340	47.476	-26.524	74.000	
9608.000	13.706	36.400	50.106	-23.894	74.000	
Average						
<b>Detector:</b>						
Vertical						
<b>Peak Detector:</b>						
4804.000	6.638	43.200	49.837	-24.163	74.000	
7206.000	11.005	36.770	47.775	-26.225	74.000	
9608.000	14.103	36.650	50.753	-23.247	74.000	
Average						
Detector:						

- 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 Test Item	<ul> <li>Wireless Motherboard</li> <li>Harmonic Radiated Emission</li> </ul>						
Test Site	: No.3 OA	: No.3 OATS					
Test Mode	: Mode 2:	Transmit - 3Mbp	os (8DPSK) (2441MH	[z)			
Frequency	Correct	Reading	Measurement	Margin	Limit		
	Factor	Level	Level				
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m		
Horizontal							
<b>Peak Detector:</b>							
4882.000	3.001	42.380	45.381	-28.619	74.000		
7323.000	11.846	36.580	48.427	-25.573	74.000		
9764.000	12.563	37.030	49.593	-24.407	74.000		
Average							
Detector:							
Vertical							
<b>Peak Detector:</b>							
4882.000	5.713	43.270	48.984	-25.016	74.000		
7323.000	12.727	35.890	48.618	-25.382	74.000		
9764.000	13.028	37.330	50.358	-23.642	74.000		
Average							
Detector:							

- 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 Test Item Test Site Test Mode	<ul> <li>Wireless Motherboard</li> <li>Harmonic Radiated Emission</li> <li>No.3 OATS</li> <li>Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)</li> </ul>					
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV/m	dB	dBµV/m	
Horizontal						
Peak Detector:						
4960.000	2.760	45.620	48.380	-25.620	74.000	
7440.000	12.567	35.800	48.366	-25.634	74.000	
9920.000	13.456	36.520	49.976	-24.024	74.000	
Average						
<b>Detector:</b>						
Vertical						
Peak Detector:						
4960.000	5.557	44.700	50.257	-23.743	74.000	
7440.000	13.426	35.100	48.525	-25.475	74.000	
9920.000	13.958	36.510	50.468	-23.532	74.000	
Average						
<b>Detector:</b>						

- 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					
Test Site	: No.3 OATS					
Test Mode	: Mode 1	: Transmit - 1Mbp	s (GFSK) (2441MHz			
-					<b>.</b>	
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	dBµV/m	dB	dBµV/m	
Horizontal						
231.760	-8.338	34.192	25.854	-20.146	46.000	
379.200	-1.005	30.282	29.276	-16.724	46.000	
707.060	2.919	28.311	31.230	-14.770	46.000	
774.960	4.187	29.329	33.516	-12.484	46.000	
856.440	6.382	24.928	31.310	-14.690	46.000	
932.100	6.922	24.412	31.334	-14.666	46.000	
Vertical						
127.000	-4.087	34.315	30.228	-13.272	43.500	
377.260	-1.765	31.776	30.011	-15.989	46.000	
542.160	-0.269	24.780	24.511	-21.489	46.000	
681.840	1.484	24.916	26.400	-19.600	46.000	
813.760	3.168	25.633	28.801	-17.199	46.000	
961.200	7.260	24.872	32.132	-21.868	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					
Test Site	: No.3 OATS					
Test Mode	: Mode 2	: Transmit - 3Mbp	s (8DPSK) (2441MH	[z)		
Frequency	Correct	Reading	Measurement	Margin	Limit	
	Factor	Level	Level			
MHz	dB	dBµV	$dB\mu V/m$	dB	dBµV/m	
Horizontal						
154.160	-10.091	35.601	25.510	-17.990	43.500	
231.760	-8.338	33.100	24.762	-21.238	46.000	
373.380	-1.163	31.433	30.270	-15.730	46.000	
596.480	4.017	25.861	29.878	-16.122	46.000	
813.760	5.098	25.633	30.731	-15.269	46.000	
941.800	6.435	24.148	30.583	-15.417	46.000	
Vertical						
127.000	-4.087	34.620	30.533	-12.967	43.500	
377.260	-1.765	31.776	30.011	-15.989	46.000	
689.600	2.538	25.053	27.591	-18.409	46.000	
813.760	3.168	25.633	28.801	-17.199	46.000	
926.280	5.821	24.711	30.532	-15.468	46.000	
968.960	8.191	23.697	31.888	-22.112	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.

## 5. **RF Antenna Conducted Test**

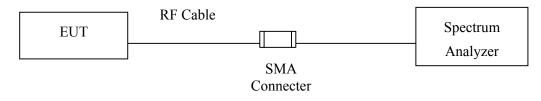
## 5.1. Test Equipment

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

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

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

## 5.2. Test Setup



## 5.3. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

## 5.4. Test Procedure

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

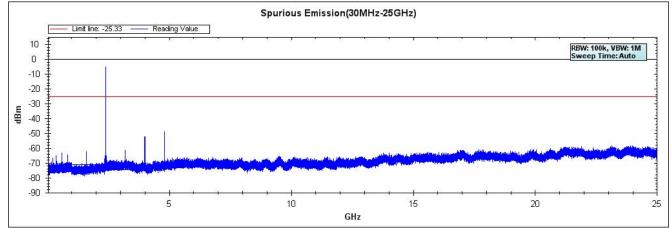
## 5.5. Uncertainty

± 150Hz

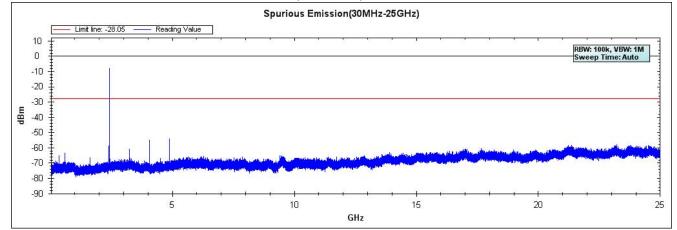
## 5.6. Test Result of RF Antenna Conducted Test

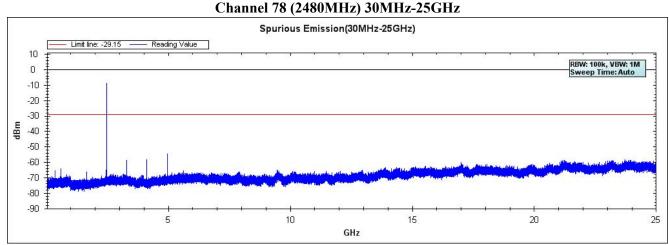
Product	:	Wireless Motherboard
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

#### Channel 00 (2402MHz) 30MHz-25GHz



#### Channel 39 (2441MHz) 30MHz-25GHz

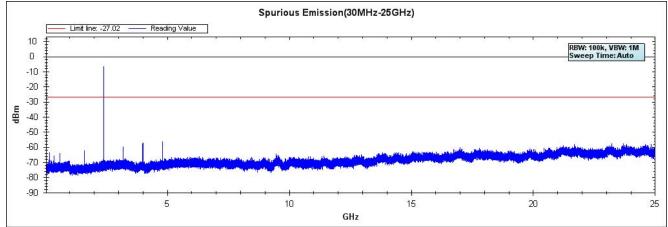




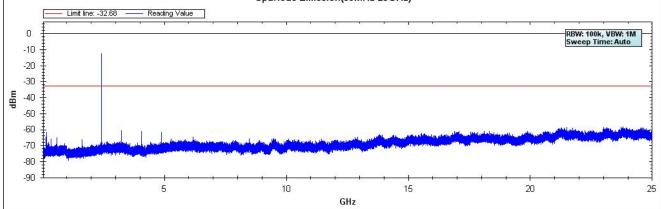
Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Wireless Motherboard
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

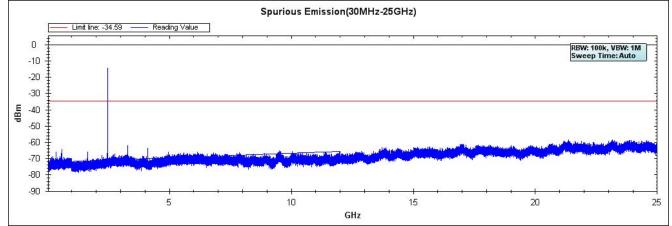
#### Channel 00 (2402MHz) 30MHz-25GHz











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

## 6. Band Edge

## 6.1. Test Equipment

#### **RF** Conducted Measurement

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

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

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

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

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	Х	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
	Х	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2013
	Х	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	Х	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2013
	Х	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	Х	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

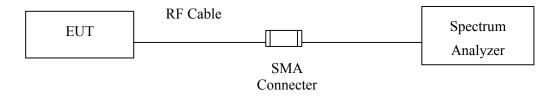
Note:

1. All equipments are calibrated every one year.

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

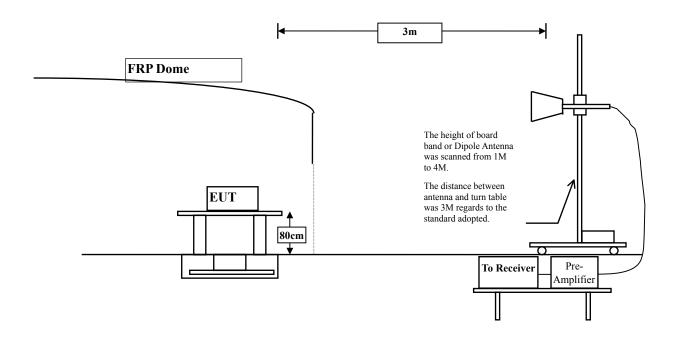
## 6.2. Test Setup

#### **RF** Conducted Measurement



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

Above 1GHz



## 6.3. Limit

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)).

## 6.4. Test Procedure

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

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10:2009 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

## 6.5. Uncertainty

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

## 6.6. Test Result of Band Edge

Product	:	Wireless Motherboard
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

## Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB µV]	Emission Level [dBμV/m]	Detector
Horizontal	2402	31.573	72.39	103.964	Peak
Horizontal	2402	31.573	58.51	90.084	Average
Vertical	2402	30.917	73.36	104.277	Peak
Vertical	2402	30.917	60.36	91.277	Average

Note: 1:Spectrum Analyzer setting:

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

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

## Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBµV/m)	Δ (dB)	Band Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Detector
Horizontal	2350.2	103.964	45.261	58.703	74.000	Peak
Horizontal	2390	90.084	48.239	41.845	54.000	Average
Vertical	2350.2	104.277	45.261	59.016	74.000	Peak
Vertical	2390	91.277	48.239	43.038	54.000	Average

Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements

per the Marker-Delta Method with the following formula:

Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

 $\Delta$  = Conducted Band Edge Delta (Peak or Average)

nter Freg 2.39		SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	05:16:25 PM Dec 20, 2013 TRACE 1 2 3 4 5 6	Frequency
anter Freq 2.55	IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Hold:>100/100	TYPE MWWWWW DET P N N N N N	
dB/div Ref 20.0	)0 dBm		Mk	r1 2.402 2 GHz 3.957 dBm	Auto Tu
g .0			1		Center Fr
					2.390000000
0			2		Start Fi
0 <b>4</b>		3			2.340000000 0
		or on sorren where to read the	" " " " " " " " " " " " " " " " " " "	๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛	
0					Stop Fi 2.440000000 0
nter 2.39000 GH es BW 1.0 MHz		SW 1.0 MHz	#O	Span 100.0 MHz	CF St
MODE TRC SCL	#VE		#Sweep	500 ms (1001 pts)	10.000000 N Auto
N 1 f	2.402 2 GHz 2.400 0 GHz	3.957 dBm -29.955 dBm			
N 1 f N 1 f	2.390 0 GHz 2.350 2 GHz	-43.177 dBm -41.304 dBm			Freq Off

## Peak Detector of conducted Band Edge Delta

#### Average Detector of conducted Band Edge Delta

Agilent Spectrum Analyzer - S					
Center Freq 2.390		SENSE:INT	ALIGNAUT Avg Type: Log-Pw Avg Hold: 4/100	r TRACE 123456 TYPE MWWWWW	Frequency
10 dB/div Ref 20.00	IFGain:Low	Atten: 30 dB	85.87	<sub>Der</sub> P NNNN 1kr1 2.402 1 GHz -8.270 dBm	Auto Tune
10.0 0.00 -10.0			1		Center Fred 2.390000000 GHz
-20.0			2		Start Fred 2.340000000 GHz
-50.0		^ <b>3</b>			Stop Fred 2.440000000 GH2
Center 2.39000 GHz #Res BW 1.0 MHz	#VE	3W 10 Hz		Span 100.0 MHz ep 7.80 s (1001 pts)	CF Step 10.000000 MH;
MKR         MODE         TRC         SCL           1         N         1         f           2         N         1         f           3         N         1         f           4         -         -         -           5         -         -         -           6         -         -         -           7         -         -         -	* 2.402 1 GHz 2.400 0 GHz 2.390 0 GHz	45.421 dBm -45.421 dBm -56.509 dBm	FUNCTION VID	TH FUNCTION VALUE	Auto Mar Freq Offset 0 Hz

Product	:	Wireless Motherboard
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

## Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB $\mu$ V]	Emission Level [dB(uV/m)]	Detector
Horizontal	2480	32.155	64.57	96.726	Peak
Horizontal	2480	32.155	52.44	84.596	Average
Vertical	2480	31.412	67.29	98.702	Peak
Vertical	2480	31.412	55.38	86.792	Average

Note: 1:Spectrum Analyzer setting:

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

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

## Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBµV/m)	Δ (dB)	Band Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Detector
Horizontal	2483.5	96.726	49.25	47.476	74.000	Peak
Horizontal	2483.5	84.596	48.49	36.106	54.000	Average
Vertical	2483.5	98.702	49.25	49.452	74.000	Peak
Vertical	2483.5	86.792	48.49	38.302	54.000	Average

Note:

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

Band Edge field Strength = F -  $\Delta$ 

F = Fundamental field Strength (Peak or Average)

 $\Delta$  = Conducted Band Edge Delta (Peak or Average)

Agilent Spectrum Analyzer - So	wept SA	and as			
	Ω AC	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	12:47:07 PM Nov 18, 2013	Frequency
Center Freq 2.4835	PN0: Fast C	Trig: Free Run	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWW	
	IFGain:Low	#Atten: 20 dB		DET P N N N N N	
10 dB/div Ref 10.00	dBm		Mk	r2 2.483 5 GHz -57.48 dBm	Auto Tune
		.1			
5.1655		0'			Center Fre
-10.0		Λ			2.483500000 GH
-20.0					
-30.0					
-40.0			-		Start Fre
-50.0		2			2.433500000 GH
-60.0	A		and the second sec		
-70.0			a contraction franchistic and a second state		Stop Fre
					2.533500000 GH
-80.0					2.555500000 GH
Center 2.48350 GHz	10 10			Span 100.0 MHz	
#Res BW 1.0 MHz	#VBW	1.0 MHz	#Sweep	500 ms (1001 pts)	CF Ste
MKR MODE TRC SCL	X	Y FU	NCTION FUNCTION WIDTH	<u> </u>	10.000000 MH Auto Ma
1 N 1 f	2.479 8 GHz	-8.23 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
2 N 1 f (Δ)	2.483 5 GHz (Δ)	-57.48 dBm			
3 4					Freq Offse
5					0 H
6 7					
8					
9					
10					
12					
MSG			STATUS		

## Peak Detector of conducted Band Edge Delta

#### Average Detector of conducted Band Edge Delta

Agilent Spectrum Analyzer - Sv				
Center Freq 2.4835	00000 GHz	ALIGN AUTO Avg Type: Log-Pwr	12:46:35 PMNov 18, 2013 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 10.00	IFGain:Low #Atten: 20 dB	Mk	r2 2.483 5 GHz -69.60 dBm	Auto Tune
-10.0				Center Fred 2.483500000 GHz
-30.0 -40.0 -50.0				Start Fred 2.433500000 GHz
-60.0	2-	~ ~		Stop Fred 2.533500000 GH2
Center 2.48350 GHz #Res BW 1.0 MHz	#VBW 10 Hz	Sweep	Span 100.0 MHz 7.80 s (1001 pts)	CF Step 10.000000 MHz
MKR MODE         TRC         SCL           1         N         1         f           2         N         1         f         (Δ)           3         -         -         -           4         -         -         -	X         Y         FL           2.480 0 GHz         -21.11 dBm           2.483 5 GHz         (Δ)         -69.60 dBm	JNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar Freq Offse
5 6 7 8 9				0 Hz
10 11 12 12 MSG		STATUS		

Product	:	Wireless Motherboard
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

#### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB $\mu$ V]	Emission Level [dB $\mu$ V/m]	Detector
Horizontal	2402	31.573	71.35	102.924	Peak
Horizontal	2402	31.573	55.24	86.814	Average
Vertical	2402	30.917	72.4	103.317	Peak
Vertical	2402	30.917	56.91	87.827	Average

Note: 1:Spectrum Analyzer setting:

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

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

## Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBµV/m)	Δ (dB)	Band Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Detector
Horizontal	2390	102.924	47.505	55.419	74.000	Peak
Horizontal	2390	86.814	46.375	40.439	54.000	Average
Vertical	2390	103.317	47.505	55.812	74.000	Peak
Vertical	2390	87.827	46.375	41.452	54.000	Average

Note:

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

Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

 $\Delta$  = Conducted Band Edge Delta (Peak or Average)

RF	50 Ω AC	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	05:42:58 PM Dec 20, 2013 TRACE 1 2 3 4 5 6	Frequency
enter Freq 2.3	90000000 GHz IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Hold:>100/100	TYPE MWWWWWW DET P N N N N N	
dB/div Ref 20	.00 dBm		Mk	r1 2.402 0 GHz 4.044 dBm	Auto Tu
9 <b>9</b> 0.0			<b>_</b> 1		Center Fr
00			- A		2.390000000 G
.0			2		
.0		3			Start Fr 2.340000000 G
.0 <b>International Contractions</b>	and the second state of th	Le requisire a ser a ser	homenian		
.0					Stop Fr 2.440000000 G
.0					2.440000000
enter 2.39000 G tes BW 1.0 MHz		BW 1.0 MHz	#Sweep	Span 100.0 MHz 500 ms (1001 pts)	CF St 10.000000 M
R MODE TRC SCL	× 2.402 0 GHz	4.044 dBm	JNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> N
2 N 1 f 3 N 1 f	2.400 0 GHz 2.390 0 GHz	-22.176 dBm -43.461 dBm			Freq Off
					0
3			1		
7 3 9 0 1					

## Peak Detector of conducted Band Edge Delta

#### Average Detector of conducted Band Edge Delta

Agilent Spectrum Analyzer				X4 10	
Center Freg 2.39	50 Ω AC 000000 GHz	SENSE:INT	ALIGNAUTO Avg Type: Log-Pwr	05:41:51 PMDec 20, 2013 TRACE 1 2 3 4 5 6	Frequency
	(IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Hold: 2/100	TYPE NUMBER P NNNNN T1 2.402 1 GHz	Auto Tun
10 dB/div <b>Ref 20.0</b>	00 dBm			-10.024 dBm	
10.0					Center Fre
10.00			• <sup>1</sup>		2.390000000 GH
20.0					01
30.0			2		Start Fre 2.340000000 GH
40.0		3			
50.0 60.0		¥			Stop Fre
70.0					2.440000000 GI
Center 2.39000 GH Res BW 1.0 MHz		W 10 Hz	Sweep	Span 100.0 MHz 7.80 s (1001 pts)	CF Ste
MKR MODE TRC SCL	×		UNCTION FUNCTION WIDTH	FUNCTION VALUE	10.000000 Mi <u>Auto</u> Mi
1 N 1 f 2 N 1 f	2.402 1 GHz 2.400 0 GHz	-10.024 dBm -39.730 dBm			
3 N 1 f	2.390 0 GHz	-56.399 dBm			Freq Offs
5 6					01
7 8					
9 10					
11 12					
SG			STATUS		1

Product	:	Wireless Motherboard
Test Item	:	Band Edge
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

# Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dB $\mu$ V]	Emission Level [dB(uV/m)]	Detector
Horizontal	2480	32.155	64.65	96.806	Peak
Horizontal	2480	32.155	49.68	81.836	Average
Vertical	2480	31.412	67.27	98.682	Peak
Vertical	2480	31.412	53.27	84.682	Average

Note: 1:Spectrum Analyzer setting:

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

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

# Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBµV/m)	Δ (dB)	Band Edge Field Strength (dBµV/m)	Limit (dBµV/m)	Detector
Horizontal	2483.5	96.806	47.65	49.156	74.000	Peak
Horizontal	2483.5	81.836	44.89	36.946	54.000	Average
Vertical	2483.5	98.682	47.65	51.032	74.000	Peak
Vertical	2483.5	84.682	44.89	39.792	54.000	Average

Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements

per the Marker-Delta Method with the following formula:

Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

 $\Delta$  = Conducted Band Edge Delta (Peak or Average)

RL RF 50 \$	2 AC SENSE:INT	ALIGN AUTO 02:31:07 PM Nov 18, 2013	_
enter Freq 2.4835	00000 GHz	Avg Type: Log-Pwr TRACE 1 2 3 4 5 6	Frequency
•	PNO: Fast  Trig: Free Run IFGain:Low #Atten: 20 dB	TYPE MWWWWW DET P N N N N N	
0 dB/div Ref 10.00	dBm	Mkr2 2.483 5 GHz -58.12 dBm	Auto Tun
.og 0.00	<b>1</b>		Center Fre
10.0			2.483500000 GH
30.0			
40.0			Start Fre 2.433500000 GI
50.0 60.0	2		
70.0	n - daaloonin - caaloonin		Stop Fr
80.0			2.533500000 GI
enter 2.48350 GHz Res BW 1.0 MHz	#VBW 1.0 MHz	Span 100.0 MHz #Sweep 500 ms (1001 pts)	CF Ste 10.000000 M
IKR MODE TRC SCL		FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto M
1 N 1 f 2 N 1 f (Δ)	2.479 9 GHz -10.47 dBm 2.483 5 GHz (∆) -58.12 dBm		
3 4 5			Freq Offs 0
6 7			0
8			
9			

## Peak Detector of conducted Band Edge Delta

#### Average Detector of conducted Band Edge Delta

Agilent Spectrum Analyzer - Sw			
Center Freq 2.4835		ALIGN AUTO 02:30:35 PMNov 18, 2013 Avg Type: Log-Pwr TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
10 dB/div Ref 10.00	IFGain:Low #Atten: 20 dB	DET P NNNN Mkr2 2.483 5 GHz -70.31 dBm	Auto Tun
-09 0.00 -10.0 -20.0			Center Fre 2.483500000 GH
30.0 40.0 50.0			<b>Start Fr</b> 2.433500000 G
60.0 70.0 80.0	2 <sup>2</sup>		<b>Stop Fr</b> 2.533500000 G
Center 2.48350 GHz Res BW 1.0 MHz	#VBW 10 Hz	Span 100.0 MHz Sweep  7.80 s (1001 pts)	CF Ste 10.000000 M
MKR         MODE         TRC         SCL           1         N         1         f           2         N         1         f           3         -         -           4         -         -           5         -         -           6         -         -	× 2.480 0 GHz 2.483 5 GHz (Δ) -70.31 dBm	FUNCTION FUNCTION WIDTH FUNCTION VALUE	Auto M Freq Offs 0
8 9 10 10 11 12 13 15 15 15 15 15 15 15 15 15 15 15 15 15		STATUS	

## 7. Channel Number

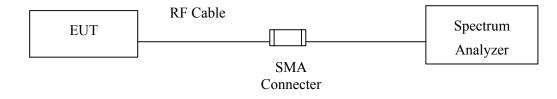
### 7.1. Test Equipment

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

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

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

### 7.2. Test Setup



#### 7.3. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

#### 7.4. Test Procedure

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

## 7.5. Uncertainty

N/A

#### 7.6. Test Result of Channel Number

Product	:	Wireless Motherboard
Test Item	:	Channel Number
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

Frequency Range	Measurement	Required Limit	Result		
(MHz)	(Hopping Channel)	(Hopping Channel)	Kesult		
$2402 \sim 2480$	79	>75	Pass		

#### 2402-2421MHz

#### 2422-2441MHz

Agliant S	pectru																						ectrum	Inaly	zer Swa	ept SA														
Cente	er Fr	eq				GH	z	·	.   <sub>T</sub>	ig:Fre			A	у Тур	CLog-P		1256ch Tř	VPNNix 11, 215 NGT 1 2 3 4 5 1 TVPT Mysteres DFT P NNNN		Frequency	Ce			2.4	43150		) GH	z		Trig: Fre	• Pup	Avg		Log-Pwr	)in:	11:CIP TRAI TV	MNary 111, 17 1 2 3 4 PT MWWW	20101 156	Fre	quency
10 dB/c	410	Re	r 10.0	in de	um	IF6	il): Fa ialin:L	od ( <sub>1</sub> owr	, <del>1</del> 4	itten: 2	20 dB				N	lkr2	2.42	1 00 GHz	a	Auto Tune	10.	dB/d	lu R	ef 1	0.00 (	dBm	PN IFG	D: Faed alm:Low		Atten: 2	0 dB			Mk	r <b>2 2</b> .	ہ 441	00 G 33 dE	Hz		Auto Tune
Log			Ŵ	V	7	Ą	/1	Л	h	۲V	h	M	h	<i>(</i> n	n	ų	rv.	VV	⊫	Center Freq 2.411600000 GHz	Log 0.0 -10 -20			5		h	n	ŕ٧	γ	V١	Ň	vr	n	лл	h	Δ	N	Â		enter Freq 500000 GHz
30.0																			2	Start Freq 401500000 GHz	00. 40. 50.	u U																		Start Freq 500000 GHz
-60 N -70 N -80 N																			⊩	Stop Freq 2.421500000 GHz	-81	n n																		Stop Freq
Start 2 #Res I	BW	100	kHz		×		#	VBV	V 10	0 kH:	z	81	VETION	51	Swee	р 2	2.47 ms	42150 GH; (1001 pts)	Aut	CF Step 2.000000 MHz to Man	#R	es E	.4215 SW 10	0 kł	Hz Iz	×		#VE	BW 1	00 kHz		NCTION	_	Sweep	2.47	ms (	4150 C 1001 p	pts)		CF Step
1 N 2 N 3 4 6 5	1	f				02 00 21 00		z (A)		5.15 c 5.65 c										Freq Offset 0 Hz	1	NN	1	F	U		422 00 441 00	GHz GHZ	Δ	-5.61 c -5.33 c	IBm								_	req Offset 0 Hz
7 8 9 10 11 12																					7 8 9 10 11 12	-																		
MSG	Mac Introduction International														s	AIUS					мес													STATU	rs -					

#### 2442-2461MHz

#### 2462-2480MHz

CO RI	Freq 2.4	50 Q A	C 00 GHz	z		NSE:DVT		ALIGNAUTO	01:15:26 PM Nov 18, 2013 IKAOS 1 2:14 5 6	Frequency	UN R	- I	RF	dyzer - Swept 50 R 2.471500	AC   000 GHz	4		NSE:2NT	Avg Typ	ALIGNAUTO De: Log-Pwr	1169	PMNov 18, 2013	Frequency
10 dB/div	Ref 10	.00 dBr	IFGe	): Fast 🕞	#Atten: 20			Mkr	2 2.461 00 GHz -7.45 dBm		10 di	B/div	Ref	10.00 dB	IFGa	): Fast 🕞	#Atten: 2			Mki	2 2.480	00 GHz	Auto Tune
	$\mathcal{M}$	Ń	VV		$\sim$	$\sim$		$\sim$	ww	Center Freq 2.451500000 GHz		Ŵ	V	vv	W	M	$\sim$	m	w	w			Center Freq 2.471500000 GHz
-300 -400 -500										Start Freq 2.441500000 GHz	-30.0 -40.0 -50.0											h	Start Freq 2.461500000 GHz
00.0 70.0 00.0			-							Stop Freq 2.461500000 GHz													Stop Freq 2.481500000 GHz
#Res BV			×		/ 100 kHz		COUN TO	Sweep	Stop 2.46150 GHz 2.47 ms (1001 pts)	CF Step 2.000000 MHz Auto Man	#Re	MIDI III		kHz	×		/ 100 kHz	110	#2000N	Sweep	2.47 ms	8150 GHz (1001 pts)	
3 4 5 6	1 f 1 f (Δ)		2.442.00 2.461.00	GHz GHz (Δ)	-5.42 d -7.45 d	Bm Bm	+			Freq Offset 0 Hz	3	N 1	f	(Δ)	2.462.00 2.490.00	GHz GHz (Δ)	-7.44 d -8.92 d	Bm Bm					Freq Offset 0 Hz
7 8 9 10 11											7 8 9 10 11												
12 MSG								STATUS	:	1	12 MSG									STATU	s		

:	Wireless Motherboard
:	Channel Number
:	No.3 OATS
:	Mode 2: Transmit - 3Mbps (8DPSK)
	•

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
$2402 \sim 2480$	79	>75	Pass

#### 2402-2421MHz

#### 2422-2441MHz

Apilant Spectrum Analyzer - Swept SA			Apilant Spectrum Analyzer - Swept SA							
OP         HI         RF         DO R         SENSEDUT         ALIGNAUTO         D2:41:37 PM           Center Freq 2.411500000 GHz         Avg Type: Log-Pwr         IXAU         IXAU         IXAU	the second second	Frequency	Center Freq 2.431500000 GHz	ncy						
			Price Fried 2.43 100000 CH2 Trig: Free Run Trig: Free Run Fried 2.43 100000 CH2 Fried Run Fried							
Mkr2 2.421	00 GHz 14 dBm	Auto Tune	Mkr2 2.441 00 GHz 10 dBidiy Ref 10.00 dBm10.30 dBm	o Tune						
Log and the second seco	n Å	Center Freq 2.411500000 GHz	uw 01 Cente	er Freq 000 GHz						
-810 -810		Start Freq 2.401500000 GHz		<b>irt Freq</b> 000 GHz						
		Stop Freq 2.421500000 GHz		o <b>p Freq</b> 000 GHz						
Start 2.40150 GHz Stop 2.42 #Res BW 100 kHz Sweep 2.47 ms (*		2.000000 MHz	#Res Bit 100 kn2 #VBit 100 kn2 Gweep 2.47 IIIs (1001 pts) 2.0000	F Step						
M20         M20         M20         Y         HENRING         HENRING           1         N         1         Γ         2.402.00 GHz         -7.33 dBm         -           2         N         1         Γ         2.422.00 GHz         -7.33 dBm         -           2         N         1         Γ         2.422.00 GHz         -3.14 dBm         -	IN VALUE	<u>Auto</u> Man	Ματ (MEX)         ΠΕ         Χ         Υ         ΠΕΛΗΠΑ         ΠΕΛΗΠΑ         ΠΕΛΗΠΑ         ΠΕΛΗΠΑ         Αυτο           1         N         1         Γ         2.422.00 GHz         -7.99 dBm         -	Man						
		Freq Offset 0 Hz		Offset 0 Hz						
6 7 9										
10 11 12										

#### 2442-2461MHz

#### 2462-2480MHz

Agilent Spectrum Analyzer - Swept SA		Aglient Spectrum Analyzer - Swept SA	
00         R.L         III         NIII         NIIIXAURO         Descentational           Center Freq 2.451500000 GHz         Tigs Free Run         Avg Typs: Log-Pwr         Tigs Free Run           PN0: Float         Tigs Free Run         More Togs Free Run         Tigs Free Run	456 Frequency	M         RL         III         NID         A         NID         Description           Center Freq 2.4715000000 GHz         Ing: Free Run         Avg Type: Log-Pwr         Trig: Free Run         Trig: Free Run	Frequency
Position and the second	Auto Toma	IFGain:Low #Atten: 20 dB	Auto Tune
Mkr2 2.461 00 C 10 dB/div Ref 10.00 dBm12.81 d -28 d	HZ	Mkr2 2.480 00 GHz 10 dB/div Ref 10.00 dBm - 12.15 dBm	Auto Tune
	2 Center Freq 2.451500000 GHz		Center Freq 2.471500000 GHz
	2.441500000 GHz		Start Freq 2.461500000 GHz
400 -700 -800	Stop Freq 2.461500000 GHz		Stop Freq 2.481500000 GHz
Start 2.44150 GHz         Stop 2.46150           #Res BW 100 kHz         #VBW 100 kHz         Sweep 2.47 ms (1001	pts) CF Step 2.000000 MHz	Start 2.46150 GHz Stop 2.48150 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 2.47 ms (1001 pts)	CF Step 2.000000 MHz
MNR M0002         FIGURE         Y         RUNCTION WOTH         Execution woth           1         N         1         f         2.442 00 GHz         -9.88 dBm         -9.88 dBm           2         N         1         f         (2.451 00 GHz)         -2.81 dBm	Auto Man	D028         MO208         FIG.         X         FUNCTION         FUNCTION WORTH         FUNCTION WORTH	Auto Man
3 4 6	Freq Offset	3  6	Freq Offset 0 Hz
5 7 8 9		6 7 8 9	
9 10 11 12	-	9 10 11 12	
MEC EIAIUS		MSC STATUS	

## 8. Channel Separation

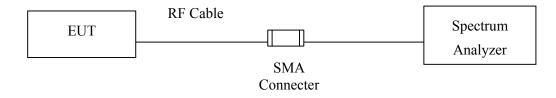
#### 8.1. Test Equipment

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

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

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

#### 8.2. Test Setup



#### 8.3. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

## 8.4. Test Procedure

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

#### 8.5. Uncertainty

± 150Hz

#### 8.6. Test Result of Channel Separation

Product	:	Wireless Motherboard
Test Item	:	Channel Separation
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)

	Fraguanau	Measurement	Limit	Limit of (2/3)*20dB	
Channel No.	Frequency (MHz)	Level	(kHz)	Bandwidth (kHz)	Result
	(WITIZ)	(kHz)	(KIIZ)	Dandwiddii (KHZ)	
00	2402	1000	>25 kHz	746.7	Pass
39	2441	1000	>25 kHz	746.7	Pass
78	2480	1000	>25 kHz	746.7	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

ilent Spectrum Analyzer - Swept SA				
RL RF 50 Ω AC enter Freq 2.402000000		ALIGNAUTO	12:15:13 PM Nov 18, 2013 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
0 dB/div Ref 10.00 dBm	PNO: Wide Trig: Free Run IFGain:Low #Atten: 20 dB	Mkr2	2.403 00 GHz -5.77 dBm	Auto Tun
0.00		2		Center Fre 2.402000000 GH
	n	hun		<b>Start Fr</b> 2.397000000 G
0.0				<b>Stop Fr</b> 2.407000000 G
enter 2.402000 GHz Res BW 100 kHz	#VBW 100 kHz	#Sweep	Span 10.00 MHz 500 ms (1001 pts) EUNO(ION WALUE	CF Sto 1.000000 M Auto M
1 N 1 f 2.4	402 00 GHz <u>-5.67 dBm</u> 403 00 GHz (Δ) <u>-5.77 dBm</u>			Freq Offs
7 7 9 0 1 2				
G		STATUS		

#### Channel 00 2402MHz

ectrum Analyzer - Swept SA	
RF 50 Ω AC SENSE:INT ALIGN AUTO 12:42:34 PMN	
Freq 2.441000000 GHz Avg Type: Log-Pwr TRACE PNO: Wide IFGain:Low #Atten: 20 dB Det	Frequency Frequency PNNNNN
Mkr2 2.442 0 • Ref 10.00 dBm -7.1	0 GHz Auto Tu 1 dBm
	Center Fr
	2.441000000 G
	Start Fi
	2.436000000 G
	Stop Fi
	2.446000000
2.441000 GHz Span 10. W 100 kHz #VBW 100 kHz #Sweep 500 ms (10	
TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION	
TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION	VALUE Auto N
TRC SQL         X         Y         FUNCTION         FUNCTION WIDTH         FUNCTION           1         f         2.441 00 GHz         -7.02 dBm         -7.02 d	VALUE Auto M
TRC SQL         X         Y         FUNCTION         FUNCTION WIDTH         FUNCTION           1         f         2.441 00 GHz         -7.02 dBm         -7.02 d	VALUE Auto M
TRC SQL         X         Y         FUNCTION         FUNCTION WIDTH         FUNCTION           1         f         2.441 00 GHz         -7.02 dBm         -7.02 d	

#### Channel 39 2441MHz

#### Channel 78 2480 MHz

Agilent Spectrum Analyzer - Swe					
XIRL RF 50Ω Center Freq 2.48000	0000 GHz PNO: Wide C Trig: Fre	Avg Type: ee Run	Log-Pwr TRACE	Nov 18, 2013 1 2 3 4 5 6 MWWWWW P N N N N N	У
10 dB/div Ref 10.00 d		20 98	Mkr1 2.479 (	A	ſune
-0.0 -10.0 -20.0		2		Center F 2.480000000	
30.0 40.0 50.0		hun		Start F 2.475000000	
60.0			and the second and the	Stop F 2.485000000	
Center 2.480000 GHz Res BW 100 kHz	#VBW 100 kH	FUNCTION FUN	Span 10 Sweep 500 ms (1 CTION WIDTH	1.000000	
1         Λ         1         f           2         N         1         f         (Δ)           3         -         -         -           4         -         -         -           5         -         -         -           6         -         -         -	2.479 00 GHz -9.06 2.480 00 GHz (△) -9.14 (			Freq Of	offs 0⊦
7 8 9 10 11 12					
ISG			STATUS		

Product	:	Wireless Motherboard
Test Item	:	Channel Separation
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)

	Frequency	Measurement	Limit	Limit of (2/3)*20dB	
Channel No.	(MHz)	Level	(kHz)	Bandwidth (kHz)	Result
		(kHz)			
00	2402	1000	>25 kHz	940.0	Pass
39	2441	1000	>25 kHz	946.7	Pass
78	2480	1000	>25 kHz	940.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

## Channel 00 2402MHz

RL RF 50 Ω	AC	SENSE:INT	ALIGNAUTO	02:22:59 PMNov 18, 2013	
enter Freq 2.40200	10000 GHz PNO: Wide G IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Frequency
dB/div Ref 10.00 d	dBm		Mkr	2 2.403 00 GHz -8.11 dBm	Auto Tun
9 00 0.0		- 1 madamar	2		Center Fre 2.402000000 GH
).0 ).0 ).0		~			Start Fre 2.397000000 GF
0.0					<b>Stop Fre</b> 2.407000000 GH
enter 2.402000 GHz Res BW 100 kHz	#VBW	/ 100 kHz	#Sweep	Span 10.00 MHz 500 ms (1001 pts) FUNCTION VALUE	CF Ste 1.000000 Mł Auto Mł
N 1 f N 1 f (Δ)	2.402 00 GHz 2.403 00 GHz (Δ)	-7.92 dBm -8.11 dBm			Freq Offs

			112	21111	01 37	manni	~						
								SA	/zer - Swej	n Anal	ectrun	nt Spe	giler
Frequency	PMNov 18, 2013		ALIGN AUTO		NSE:INT	SE		AC		RF			a R
Frequency	ACE 1 2 3 4 5 6	TRAI TY	e: Log-Pwr	Avg Ty	Dun	Trig: Free		000 GHz	44100	eq 2	Fre	nter	:en
	DET P N N N N N	D				#Atten: 20		PNO: Wi IFGain:L					
Auto Tu	2 00 GHz	2 2 442	Mkr2										
	.92 dBm							m	10.00 d	Ref	v	B/di	0 di
				200									og
Center Fr				2-	1	1				-			0.00
2.441000000 G				200	2					_			0.0
				7									0.0
						1							nn
Start Fr				1		1							0.0
2.436000000 G						/	~	con a la con					
			m			-	sole -	Maria	-				0.0
		An Company	March 1					7	- and	1 and	~		D.O
Stop Fr	mark Margane			_							40.	V	0.0
2.446000000 G													0.0
	10.00 MHz				<i></i>				0 GHz	1100	2.44	nter	en
CF St 1.000000 M	(1001 pts)	500 ms (	#Sweep			100 kHz	#VBW	#	Hz	00 k	W 1	es B	Re
Auto M	TION VALUE	FUNCTI	NCTION WIDTH	INCTION		Y		×		SCL	TRC	MODE	KB
						-9.81 d	lz	2.441 00 GH		f	1	Ν	1
and strength					Bm	-9.92 d	Hz (Δ)	2.442 00 GH	∆)	f	1	Ν	2 3
Freq Offs													4
0													5
						-				s			<u>6</u> 7
										2			B
													9
													0
													2
			STATUS										G
			514103										9

#### Channel 39 2441MHz

## Channel 78 2480 MHz

enter Frea 2.4	0000000000				
	F80000000 GHZ PNO: Wide ( IEGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Frequency
	0.00 dBm		Mkr	1 2.479 00 GHz -12.48 dBm	Auto Tur
<b>°g</b> 0.00 10.0 20.0		1 2 Martin			Center Fre 2.480000000 Gi
0.0	Martin Martin				<b>Start Fr</b> 2.475000000 G
0.0			- www.www.	and the second	<b>Stop Fr</b> 2.485000000 G
enter 2.480000 Res BW 100 kH		W 100 kHz	#Sweep	Span 10.00 MHz 500 ms (1001 pts)	CF Sto 1.000000 M Auto M
1         N         1         f           2         N         1         f         (2)           3         -         -         -         -           3         -         -         -         -           4         -         -         -         -         -           5         -	2.479 00 GHz	-12.48 dBm			Freq Offs

#### 9. Dwell Time

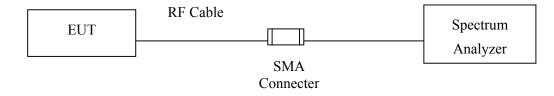
#### 9.1. Test Equipment

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

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

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

#### 9.2. Test Setup



#### **9.3.** Limit

The dwell time shall be the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

#### 9.4. Test Procedure

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

#### 9.5. Uncertainty

± 25msec

#### 9.6. Test Result of Dwell Time

Product	:	Wireless Motherboard
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK) (Channel 00,39,78 –DH5)

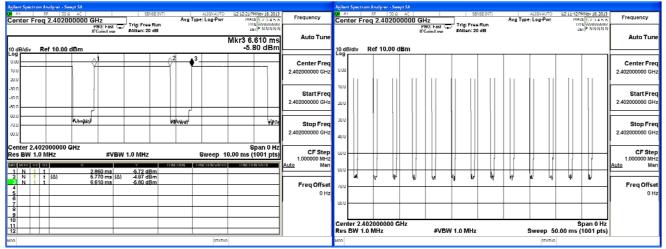
Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.910	13	50	0.76	0.303	0.4	Pass
2441	2.910	13	50	0.76	0.303	0.4	Pass
2480	2.900	13	50	0.75	0.302	0.4	Pass

Duty cycle =((Time slot length(ms)\*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) \* (79\*0.4)

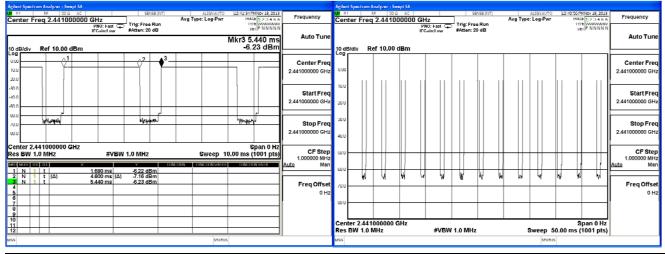
#### CH 00 Time Interval between hops

#### CH 00 Transmission Time



#### CH39 Time Interval between hops

#### CH 39Transmission Time



#### CH 78 Time Interval between hops

CH 78 Transmission Time

	um Analyzer - Swej				*					nt Spectrum	Analyzer	-Swept S	5A									
	req 2.48000		· · · ·		Avg Type: Log	-Pwr	12501557 PMNiw 10, 2010 TRACE 1 2 3 4 5 6 TVPF WWWWWWW DET I'' N N N N N	Frequency	Cer	nter Free		00000	IND CH	lz	- I - İ -	a Na ani			Log-Pwr	12516	TYPE WWWWWWWWW	Frequency
		PNO: Fie IFGaln:Lo	a ( <sub>▶</sub> ) <sup> </sup> Trig:Fi w #Atten:	20 dB				Auto Tumo					P6 IFG	ia: Field ( <sub>1</sub> Salin:Low	#Atten:	20 dB					DET P NNNN N	Auto Tun
10 dB/div	Ref 10.00 d	Bm				M	kr3 5.800 ms -8.34 dBm		10 d Log	B/div F	tef 10.	00 dBr	n									Auto Tuli
-10.0	-	1		0 <sup>2</sup>	3	_		Center Freq 2.49000000 GHz														Center Fre 2.480000000 GH
20.0 20.0				-				Start Freg	-10.0		+		-11		+++-	+		-11-				Start Fre
90.0								2.480000000 GHz			+++											2.480000000 GH
nn nn nn	vanad			ya salayin T			สบารสกาส	Stop Freq 2.49000000 GHz									╫	+				Stop Fro 2.480000000 G
es BW 1			/BW 1.0 MF				Span 0 Hz 10 ms (1001 pts)	1.000000 MHz														CF St 1.000000 M
1 N 1 2 N 1	t t (Δ)	2.060 ms 4.950 ms	iΔ) -8,35	dBm dBm	UNCTION FUNCTION	WDTH	FUNCTION VALUE	<u>Auto</u> Man	-60.0			Ų	ų	4	V.	Ų	J.	V	N.	U	l l	<u>Auto</u> M
3 N 1 4 6	t	6.800 ms	-8.34	dBm		_		Freq Offset 0 Hz						I.								Freq Offs 01
7 8 9									-80.0													
10 11 12										L ter 2.48 BW 1.0		00 GHz	2	#VBV	/ 1.0 MH	IZ		1	Sweep	50.00 m	Span 0 Hz s (1001 pts)	
ISC						STATUS			MEG										STAT	15		

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

Product	:	Wireless Motherboard
Test Item	:	Dwell Time
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (Channel 00,39,78 –DH5)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.900	13	50	0.75	0.302	0.4	Pass
2441	2.910	14	50	0.81	0.326	0.4	Pass
2480	2.910	13	50	0.76	0.303	0.4	Pass

Duty cycle =((Time slot length(ms)\*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) \* (79\*0.4)

#### CH 00 Time Interval between hops

#### Center Freq 2.402000000 GHz All:Bargetter III NIO I Avg Type: Log-Pwr Frequency Frequency Avg Type: Log-Pw RAT 123 Trig: Free Run #Atten: 20 dB TYPE WWW Auto Tur Auto Tur Mkr3 5.490 m -6.73 dBr Ref 10.00 dBn Ref 10.00 dBm ∆<sup>2</sup> Center Fre 402000000 GH ∆**1 ♦**<sup>3</sup> Center Fre Start Free 2000000 GH Start Fre 240 ليطابل Stop Fred 2.40200000 GH: Stop Free 2.40200000 GH Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 10.00 ms (1001 pts) CF Step 1.000000 MH: Mar CF Ste #VBW 1.0 MHz 1.00 1 N 2 N 1 t IA -6.74 dBn -7.20 dBn -6.73 dBn 4.640 ms (A) 6.490 ms Freq Offse Freq Offse Center 2.4020000 Res BW 1.0 MHz Span 0 Hz Sweep 50.00 ms (1001 pts) #VBW 1.0 MHz

#### CH39 Time Interval between hops

#### CH 39Transmission Time

Agricut Spectrum Analyzer, Swept SA UR RL III NIO //   ISAN INIO	Frequency	RL   enter Fred	8 510		z	1	NR SNI		ADGNAUTO e: Log-Pwr	DOMESTIC:	MN:w 10,2010 7 1 2 3 4 5 6 7 WWWWWWW 7 P NNNN	Frequency
Center Freq 2.4+ 1000000 GPIG. For (*) Program (*) Prog	0 ms Auto Tune	dB/div R	ef 10.00 d	IFG	0: Fied ( ) aln:Low	∫ Trig:Fre #Atten:2	e Run 0 dB			n	PNNNNN	Auto Tune
	Center Freq 2.441000000 GHz			_								Center Freq 2.441000000 GHz
μυμ	Start Freq 2.441000000 GHz											Start Freq 2.441000000 GHz
รถก เสมชนมูน" เมือง เมรี เมริงอนูน" เมริง 	Stop Freq 2.441000000 GHz	nn										Stop Freq 2.441000000 GHz
Res BW 1.0 MHz         #VBW 1.0 MHz         Sweep 10.00 ms (100           UD2 BUGS FR2 [SG]         X         Y         FUNCTION (FRUCTION (FR	n 0 Hz 01 pts) Auto Man	nn (				ſ			. [			CF Step 1.000000 MHz <u>Auto</u> Man
2         N         1         t         Δ3.890 ms (Δ)         -9.85 dBm           3         N         1         t         4.720 ms         -9.71 dBm           4         6	Freq Offset 0 Hz		W	ч	A H	4	₩.	ψ w	- ¥	40	la hi	Freq Offset 0 Hz
7 8 9 10 11 12		enter 2.441 es BW 1.01		Hz	#VBW	1.0 MHz			Sweep 5		pan 0 Hz 1001 pts)	
MBC									SIAIU			1

#### CH 00 Transmission Time

## CH 78 Time Interval between hops

CH 78 Transmission Time

UN RL	rum Analyzer Swe III SITO Freq 2.48000		- I - '	922 ::N1]	Avg Type: Log-Pwr	DOBAT2 PMN w 10,2010 TRACE 12.3.4.5.6 TYPE MTTP: NNNNN	Frequency	QU R	L I	req 2.48	STO .	×	Ηz	- I - '	:2 N22		Avg T)	ALIEN (pe: Log-		(125114-10) Th	PMN: v 10, 201 VZF 1 2 3 4 5 ( VFF WWWWWWW VFT I' N N N N	Frequency
10 dB/dlv	Ref 10.00 d		( <sub>▶</sub> ) <sup> </sup> Trig:Free v #Atten:20	dB		Mkr3 5.600 ms -11.36 dBm	Auto Tune		B/div	Ref 10.	00 dB		nz. NO: Faed († Galin:Low	, ing: #Atte	n: 20 di	3					NNNNI	Auto Tune
-100			^2	¢3			Center Freq 2.480000000 GHz		1													Center Freq 2.480000000 GHz
30.0 40.0 50.0							Start Freq 2.48000000 GHz		٣r		ľ				ľ				-			Start Freq 2.480000000 GHz
-60 N -70 N -80 N	queents al <sup>ed</sup>		44	hate		quenyst	Stop Freq 2.48000000 GHz															Stop Freq 2.480000000 GHz
Center 2. Res BW 1	RE SCU	#V	BW 1.0 MHz Y -11.34 di	RUNG	Sweep 1	Span 0 Hz 0.00 ms (1001 pts) FUNHENIVEUE				Į.				J								CF Step 1.000000 MHz <u>Auto</u> Man
2 N 3 N 4 6 5		4.760 ms 6.600 ms	(Δ) -12.23 dB	3m 3m			Freq Offset 0 Hz		М	۲	v	M	W	r	LA	v	u	N	и	ļ9	Ŵ	Freq Offset 0 Hz
7 9 10 11 12								Cen		8000000	00 GH	z	#VB1	N 1.0 M	IHZ			Swee	ep 50		Span 0 Hz (1001 pts	
MSG					STATU	5	1	MBG											STATUS			1

Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

## 10. Occupied Bandwidth

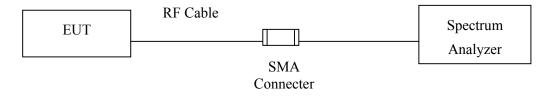
#### 10.1. Test Equipment

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

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

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

#### 10.2. Test Setup



#### 10.3. Limits

N/A

#### **10.4.** Test Procedure

The EUT was setup to ANSI C63.10, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

#### 10.5. Uncertainty

± 150Hz

## 10.6. Test Result of Occupied Bandwidth

:	Wireless Motherboard
:	Occupied Bandwidth Data
:	No.3 OATS
:	Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)
	:

Channel 1	No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00		2402	1130		NA

## Figure Channel 00:

R L RF	50 Ω AC	SENSE:INT	ALIGN AUTO	12:06:19 PM Nov 18, 2013	English
enter Freq 2.40	2000000 GHz PNO: Wide C IFGain:Low	➡ Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWWW DET P N N N N N	Frequency
dB/div Ref 10.	00 dBm		Mkr	2 2.401 39 GHz -25.24 dBm	Auto Tur
og 0.00		1			Center Fre
0.0		A2 \_3			2.402000000 GI
D.0				-24.64 dBm	
3.0			1		Start Fr
0.0			how have		2.397000000 G
0.0 min wom	month		the me the second	man	
0.0 0.0					Stop Fr 2.407000000 G
enter 2.402000 G Res BW 100 kHz		W 100 kHz		Span 10.00 MHz	CF Ste
Res BW 100 KHZ	**************************************		Sweep	1.27 ms (1001 pts) FUNCTION VALUE	1.000000 M Auto M
1 N 1 f 2 N 1 f (Δ)	2.401 94 GHz 2.401 39 GHz (A	-4.64 dBm	NCTION FONCTION WIDTH	FONCTION VALUE	<u>Auto</u> M
2 N 1 Γ (Δ) 3 N 1 Γ 4	2.401 39 GH2 (2 2.402 52 GHz	-24.68 dBm			Freq Offs
5					0
7 B					
9					
1					

Product	:	Wireless Motherboard
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1130		NA

## Figure Channel 39:

RL RF 50 Ω	AC	SENSE:		ALIGN AUTO	12:36:55 PM Nov	
enter Freq 2.44100	0000 GHz PNO: Wide IFGain:Low	Trig: Free Ru #Atten: 20 dE	in – –	pe: Log-Pwr	TRACE 1 2 TYPE M A DET P N	NNNN
dB/div Ref 10.00 c	IBm			Mkr	2 2.440 38 -27.05 c	
99						Center Fr
1.0		- M				2.441000000 G
0.0		<sup>2</sup>	3	-	.2	6.01 dBm
1.0		1	×	-		
.0						2.436000000 G
0.0	, m		tog	J M		
1.0				my	mmmm	ma
.0					An and A hai	2.446000000 G
1.0						2.446000000
enter 2.441000 GHz					Span 10.00	
les BW 100 kHz	#VE	SW 100 kHz		Sweep '	1.27 ms (100	1 pts) 1.000000 M
R MODE TRC SC.	× 2.440 95 GHz	-6.01 dBm		UNCTION WIDTH	FUNCTION VAL	UE <u>Auto</u> N
2 N 1 f (Δ)	2.440 38 GHz (	Δ) -27.05 dBm				
	2.441 51 GHz	-26.06 dBm				Freq Offs
5						0
3						
2			-			

Product	:	Wireless Motherboard
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1140		NA

#### Figure Channel 78:

enter Freg 2.48000	2 AC 00000 GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	12:46:03 PM Nov 18, 2013 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide C IFGain:Low	➡ <sup>'</sup> Trig: Free Run #Atten: 20 dB		TYPE MWWWWWW DET P N N N N N	
0 dB/div Ref 10.00	dBm		Mkr	2 2.479 38 GHz -28.90 dBm	Auto Tur
					Center Fro
0.0		- A			2.48000000 G
0.0		$4^2$	3	-28.12 dBm	
0.0					Start Fr
0.0	ma	N	M		2.475000000 G
0.0 Automation	man was		man		
D.0 2000				<u>^^~~</u>	Stop Fr 2.485000000 G
0.0					2.400000000
		W 100 kHz	Sweep 7	Span 10.00 MHz 1.27 ms (1001 pts)	
Res BW 100 kHz	#VB	Y	Sweep 7	1.27 ms (1001 pts)	1.000000 M
Res BW 100 kHz G MODE TRE SCL 1 N 1 f 2 N 1 f (Δ)	#VB 2.479 95 GHz 2.479 38 GHz (A	-8.12 dBm		1.27 ms (1001 pts)	1.000000 M
Res BW 100 kHz           G MODE TRO SOL           1         N           2         N         1           3         N         1           4	#VB × 2.479 95 GHz	Y -8.12 dBm		1.27 ms (1001 pts)	Freq Offs
Res BW 100 kHz           G MODE TRE SCU           1         Λ           1         Λ           3         Λ           4         Γ           5         Γ           6         Γ	#VB 2.479 95 GHz 2.479 38 GHz (A	-8.12 dBm		1.27 ms (1001 pts)	1.000000 M <u>Auto</u> M Freq Offs
Res BW 100 kHz           R MODE TRC SCL           1         N         1         f           2         N         1         f           3         N         1         f           4         -         -           5         -         -           6         -         -           7         -         -	#VB 2.479 95 GHz 2.479 38 GHz (A	-8.12 dBm		1.27 ms (1001 pts)	1.000000 M <u>Auto</u> M
2 N 1 f (Δ)	#VB 2.479 95 GHz 2.479 38 GHz (A	-8.12 dBm		1.27 ms (1001 pts)	1.000000 M <u>Auto</u> M Freq Offs

Product	:	Wireless Motherboard
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK) (2402MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1400		NA

## Figure Channel 00:

· - 0 100000	AC AC	SENSE:I		ALIGNAUTO Type: Log-Pwr		MNov 18, 2013 E 1 2 3 4 5 6	Frequency
enter Freq 2.402000	PNO: Wide C IFGain:Low	➡ Trig: Free Rui #Atten: 20 dB	n –	Type: Log-Pwr	TYF	E MWWWWW P N N N N N	
dB/div Ref 10.00 dB	۶m			Mkr		26 GHz 74 dBm	Auto Tui
00							Center Fr
0.0		- m					2.402000000 G
0.0		<b>4</b> 2	3			-26.60 dBm	
.0		1					Start Fr
.0	M	- A	has				2.397000000 G
.0	a cont			Down him	~		
0	Jool UV				m mo	brood Con	
.0		-					Stop Fr 2.407000000 G
.0							2.407000000 G
						0.00 MHz	CE Of
	#VB	W 100 kHz		Sweep ′		0.00 MHz 1001 pts)	
es BW 100 kHz R MODE TRC SCL	X	Y	FUNCTION	Sweep		1001 pts)	1.000000 M
Res BW 100 kHz R MODE TRE SCL N 1 f N 1 f (Δ)	× 2.401 95 GHz 2.401 26 GHz (A	-6.60 dBm -27.74 dBm	FUNCTION		1.27 ms (	1001 pts)	1.000000 M
R         MODE         TRC         SCL           N         1         f         1         f           N         1         f         1         f           N         1         f         1         f	× 2.401 95 GHz	⊻ -6.60 dBm	FUNCTION		1.27 ms (	1001 pts)	1.000000 M <u>Auto</u> M Freq Offs
N         1         f           N         1         f           N         1         f           N         1         f	× 2.401 95 GHz 2.401 26 GHz (A	-6.60 dBm -27.74 dBm	FUNCTION		1.27 ms (	1001 pts)	1.000000 M <u>Auto</u> M Freq Offs
R MODE TRG SCI           N         1         f           N         1         f           N         1         f           N         1         f           N         1         f           N         1         f           N         1         f           N         1         f           N         1         f	× 2.401 95 GHz 2.401 26 GHz (A	-6.60 dBm -27.74 dBm	FUNCTION		1.27 ms (	1001 pts)	1.000000 M <u>Auto</u> M Freq Offs
Res         BW         100 kHz           N         1         f           2         N         1         f           3         N         1         f           4         -         -         -           5         -         -         -           8         -         -         -           9         -         -         -	× 2.401 95 GHz 2.401 26 GHz (A	-6.60 dBm -27.74 dBm	FUNCTION		1.27 ms (	1001 pts)	1.000000 M <u>Auto</u> M Freq Offs
2 N 1 f (Δ)	× 2.401 95 GHz 2.401 26 GHz (A	-6.60 dBm -27.74 dBm	FUNCTION		1.27 ms (	1001 pts)	CF St. 1.000000 M <u>Auto</u> M Freq Offs 0

:	Wireless Motherboard
:	Occupied Bandwidth Data
:	No.3 OATS
:	Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2441	1390		NA

## Figure Channel 39:

RL RF 50 Ω	AC	SENSE:INT	ALIGN AUTO	02:23:48 PM Nov 18, 2013	Frequency
enter Freq 2.44100	0000 GHz PNO: Wide G IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	
dB/div Ref 10.00 c	IBm		Mkr	2 2.440 26 GHz -28.62 dBm	Auto Tu
00		<u>1</u>			Center Fr
0.0		.2 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			2.441000000 G
.0		$\checkmark^2$		-28.54 dBm	
.0			~		Start Fr 2.436000000 G
.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		man and a		
			-	And Andrew and the representation of	Stop Fr 2.446000000 G
enter 2.441000 GHz				Span 10.00 MHz	CF St
es BW 100 kHz		100 kHz		1.27 ms (1001 pts)	1.000000 N
R MODE TRC SCL N 1 f N 1 f (Δ)	× 2.440 95 GHz 2.440 26 GHz (Δ)	-8.54 dBm -28.62 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> N
N 1 f	2.441 65 GHz	-29.51 dBm			Freq Off
					0
			1		

Product	:	Wireless Motherboard
Test Item	:	Occupied Bandwidth Data
Test Site	:	No.3 OATS
Test Mode	:	Mode 2: Transmit - 3Mbps (8DPSK)(2480MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
78	2480	1400		NA

#### Figure Channel 78:

	AC	SENSE:INT	ALIGN AUTO	02:30:03 PM Nov 18, 2013	Frequency
enter Freq 2.48000	DOOOO GHz PNO: Wide G IFGain:Low	Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	
0 dB/div Ref 10.00 d	dBm		Mkr	2 2.479 25 GHz -32.56 dBm	Auto Tur
<b>Pg</b>		1			Center Fr
0.0		m			2.48000000 G
0.0		▲ <sup>2</sup>		-31.20 dBm	
).0		1			Start Fr
0.0	man		N		2.475000000 G
0.0			man when	1.5211	
0.0				and a state of the second s	Stop Fr 2.485000000 G
		- 0. 10			
enter 2.480000 GHz		/ 100 kHz	Sweep	Span 10.00 MHz 1.27 ms (1001 pts)	CF St
enter 2.480000 GHz Res BW 100 kHz G MODE TRC SCL	#VBW	Y FL	Sweep	1.27 ms (1001 pts)	CF St 1.000000 M
enter 2.480000 GHz Res BW 100 kHz G MODE TRC SCL 1 N 1 f 2 N 1 f (Δ)	#VBW 2.479 96 GHz 2.479 25 GHz (Δ)	Y FL -11.20 dBm -32.56 dBm		1.27 ms (1001 pts)	CF Str 1.000000 M <u>Auto</u> M
enter 2.480000 GHz Res BW 100 kHz G M009 Hz Sci C N 1 f 2 N 1 f 3 N 1 f 4 4	#VBW	Y FL -11.20 dBm		1.27 ms (1001 pts)	CF Str 1.000000 M <u>Auto</u> M Freq Offs
enter 2.480000 GHz Res BW 100 kHz G Mode Tre sc. 1 N 1 f 2 N 1 f 3 N 1 f 4 f 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	#VBW 2.479 96 GHz 2.479 25 GHz (Δ)	Y FL -11.20 dBm -32.56 dBm		1.27 ms (1001 pts)	CF St 1.000000 M <u>Auto</u> M Freq Offs
enter 2.480000 GHz Res BW 100 kHz G MODE TRC SCL 1 N 1 f 2 N 1 f 3 N 1 f 4	#VBW 2.479 96 GHz 2.479 25 GHz (Δ)	Y FL -11.20 dBm -32.56 dBm		1.27 ms (1001 pts)	CF Str 1.000000 M <u>Auto</u> M
2 N 1 f (Δ)	#VBW 2.479 96 GHz 2.479 25 GHz (Δ)	Y FL -11.20 dBm -32.56 dBm		1.27 ms (1001 pts)	CF Str 1.000000 M <u>Auto</u> M Freq Offs

# 11. EMI Reduction Method During Compliance Testing

No modification was made during testing.