



Product Name	Touch Note
Model No	M1028, R1028
FCC ID.	JCK-M1028
Transmitter Module	Atheros / AR5B91

Applicant	GIGA-BYTE TECHNOLOGY CO., LTD
Address	5FL., No. 6, Bau Chiang Road, Hsin-Tien, Taipei-Hsien,
	Taiwan, R.O.C.

Date of Receipt	Feb. 05, 2009
Issue Date	Feb. 19, 2009
Report No.	092040R-RFUSP05V01
Version	V1.0

The test results relate only to the samples tested.

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Test Report Certification

Issue Date: Feb. 19, 2009

Report No.: 092040R-RFUSP05V01



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

Product Name	Touch Note		
Applicant	GIGA-BYTE TECHNOLOGY CO., LTD		
Address	5FL., No. 6, Bau Chiang Road, Hsin-Tien, Taipei-Hsien, Taiwan,		
	R.O.C.		
Manufacturer	GIGA-BYTE TECHNOLOGY CO., LTD		
Model No.	M1028, R1028		
Rated Voltage	AC 120V/60Hz		
Working Voltage	AC 100-240V / 50-60Hz		
Trade Name	GIGABYTE		
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2007		
	ANSI C63.4: 2003		
Test Result	Complied NVLAP Lab Code: 200533-0		

The test results relate only to the samples tested.

Tested By

Approved By

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lac-MRA

Testing Laboratory

0914



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Attachment 1: EUT Test Photographs
Attachment 2: EUT Detailed Photographs



1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Touch Note			
Trade Name	GIGABYTE			
Model No.	M1028, R1028			
FCC ID.	JCK-M1028			
Frequency Range	2412-2462MHz for 802.11b/g/n-20BW, 2422-2452MHz for 802.11n-40BW			
Number of Channels	802.11b/g/n-20MHz: 11, n-40MHz: 7			
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps, 802.11n: 6.5-135Mbps			
Type of Modulation	802.11b:DSSS			
	DBPSK, DQPSK, CCK			
	802.11g/n:OFDM			
	BPSK, QPSK, 16QAM, 64QAM			
Antenna Type	PIFA			
Antenna Gain	Refer to the table "Antenna List"			
Channel Control	Auto			
Power Adapter	MFR: Delta, M/N: ADP-36EH C			
	Input: AC 100-240V, 50-60Hz, 1.0A			
	Output: DC 12V, 3A			
	Cable Out: Non-shielded, 1.8m			

Antenna List

]	No. Manufacturer F		Part No.	Peak Gain
	1	ARISTOTLE RFA-02-P24-70B-340-R		-5.0 dBi for 2.4 GHz
			RFA-02-P24-70B-305-L	



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

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

802.11n-40MHz Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2422 MHz	Channel 02:	2427 MHz	Channel 03:	2432 MHz	Channel 04:	2437 MHz
Channel 05:	2442 MHz	Channel 06:	2447 MHz	Channel 07:	2452 MHz		

- 1. The EUT is a Touch Note with a built-in 2.4GHz WLAN transceiver.
- 2. The EUT is including two models for different marketing requirement.
- 3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
- 4. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 1Mbps \(\cdot 802.11g \) is 6Mbps \(\cdot 802.11n(20M-BW) \) is 6.5Mbps and \(\cdot 802.11n(40M-BW) \) is 13.5Mbps)
- 5. 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
- 6. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.



1.2. Operational Description

The EUT is a Touch Note with 11 channels. This device provided four kinds of transmitting speed 1, 2, 5.5 and 11Mbps and the device of RF carrier is DBPSK, DQPSK and CCK (IEEE 802.11b). The device provided of eight kinds of transmitting speed 6, 9, 12, 18, 24, 36, 48 and 54Mbps the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11g).

The device provided of eight kinds of transmitting speed 6.5,13,19.5,26,39,52,58.5 and 65Mbps in 802.11n(20M-BW) mode and 13.5,27,40.5,54,81,108,121.5 and 135 Mbps(40M-BW) the device of RF carrier is BPSK, QPSK, 16QAM and 64QAM (IEEE 802.11n), the IEEE 802.11n is Multiple In, Multiple Out" (MIMO) technology and two antennas to support 1(Transmit) * 2(Receive) MIMO technology.

The device adapts direct sequence spread spectrum modulation. The antenna provides diversity function to improve the receiving function.

This Touch Note, compliant with IEEE 802.11b and IEEE 802.11g/n, is a high-efficiency Wireless LAN adapter. It allows your computer to connect to a wireless network and to share resources, such as files or printers without being bound to the network wires. Operation in 2.4GHz Direst Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM) radio transmission, the Touch Note Wired Equivalent Protection (WEP) algorithm is used. In addition, its standard compliance ensures that it can communicate with any IEEE 802.11b and IEEE 802.11g/n network.

Test Mode:	Mode 1: Transmitter (802.11b 1Mbps)
	Mode 2: Transmitter (802.11g 6Mbps)
	Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW)
	Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW)



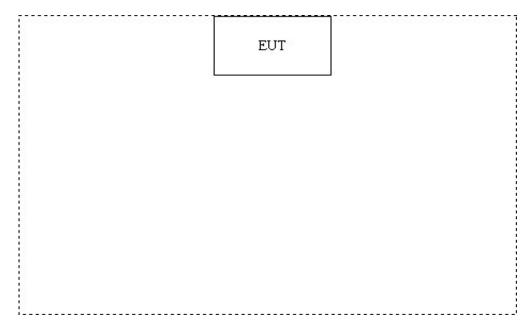
1.3. Tested System Details

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

		Product	Manufacturer	Model No.	Serial No.	Power Cord
(1)	N/A		N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	N/A	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4
- (2) Execute "ART.exe" on the EUT.
- (3) Configure the test mode, the test channel, and the data rate to start the continuous transmit
- (4) 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: http://tw.quietek.com/modules/myalbum/ The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site: http://www.quietek.com/

Site Description: File on

Federal Communications Commission

FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046

Registration Number: 92195

Accreditation on NVLAP NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,

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FCC Accreditation Number: TW1014









2. Conducted Emission

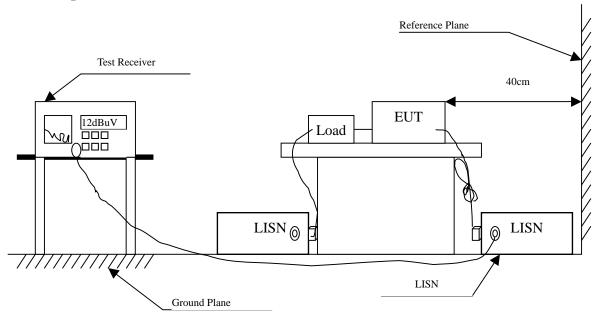
2.1. Test Equipment

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

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2008	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2008	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2008	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2008	
5	No.1 Shielded Room	m		N/A	

Note: All instruments are calibrated every one year.

2.2. Test Setup





2.3. Limits

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

2.4. Test Procedure

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

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

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

2.5. Uncertainty

± 2.26 dB



2.6. Test Result of Conducted Emission

Product : Touch Note

Test Item : Conducted Emission Test

Power Line : Line 1

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.263	9.667	32.070	41.737	-21.034	62.771
0.388	9.650	24.190	33.840	-25.360	59.200
0.787	9.650	15.410	25.060	-30.940	56.000
2.607	9.690	16.510	26.200	-29.800	56.000
4.072	9.700	18.400	28.100	-27.900	56.000
13.627	9.940	20.190	30.130	-29.870	60.000
Average					
0.263	9.667	25.030	34.697	-18.074	52.771
0.388	9.650	16.090	25.740	-23.460	49.200
0.787	9.650	11.410	21.060	-24.940	46.000
2.607	9.690	4.560	14.250	-31.750	46.000
4.072	9.700	10.340	20.040	-25.960	46.000
13.627	9.940	12.610	22.550	-27.450	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



Test Item : Conducted Emission Test

Power Line : Line 2

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.267	9.675	28.740	38.415	-24.242	62.657
0.396	9.650	26.880	36.530	-22.441	58.971
0.916	9.670	19.620	29.290	-26.710	56.000
2.603	9.690	19.420	29.110	-26.890	56.000
5.295	9.700	15.000	24.700	-35.300	60.000
14.388	9.970	15.720	25.690	-34.310	60.000
Average					
0.267	9.675	23.830	33.505	-19.152	52.657
0.396	9.650	20.710	30.360	-18.611	48.971
0.916	9.670	14.870	24.540	-21.460	46.000
2.603	9.690	9.510	19.200	-26.800	46.000
5.295	9.700	5.480	15.180	-34.820	50.000
14.388	9.970	9.290	19.260	-30.740	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



Test Item : Conducted Emission Test

Power Line : Line 1

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					_
Quasi-Peak					
0.263	9.667	29.780	39.447	-23.324	62.771
0.392	9.650	26.160	35.810	-23.276	59.086
0.791	9.650	20.270	29.920	-26.080	56.000
1.459	9.670	19.300	28.970	-27.030	56.000
2.478	9.680	18.460	28.140	-27.860	56.000
13.791	9.940	17.510	27.450	-32.550	60.000
Average					
0.263	9.667	22.970	32.637	-20.134	52.771
0.392	9.650	22.310	31.960	-17.126	49.086
0.791	9.650	15.620	25.270	-20.730	46.000
1.459	9.670	7.530	17.200	-28.800	46.000
2.478	9.680	9.040	18.720	-27.280	46.000
13.791	9.940	10.740	20.680	-29.320	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



Test Item : Conducted Emission Test

Power Line : Line 2

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.259	9.680	29.850	39.530	-23.356	62.886
0.654	9.650	23.260	32.910	-23.090	56.000
1.447	9.670	19.390	29.060	-26.940	56.000
2.767	9.690	18.820	28.510	-27.490	56.000
5.615	9.720	15.500	25.220	-34.780	60.000
13.396	9.930	17.760	27.690	-32.310	60.000
Average					
0.259	9.680	22.080	31.760	-21.126	52.886
0.654	9.650	20.250	29.900	-16.100	46.000
1.447	9.670	12.990	22.660	-23.340	46.000
2.767	9.690	10.690	20.380	-25.620	46.000
5.615	9.720	7.390	17.110	-32.890	50.000
13.396	9.930	11.320	21.250	-28.750	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

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

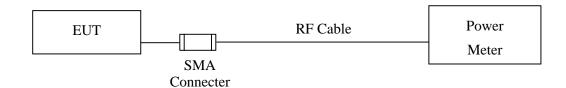
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2008
X	Power Sensor	Anritsu	MA2491A/034457	May, 2008

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

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

3.2. Test Setup

Conducted Measurement



3.3. Limits

The maximum peak power shall be less 1 Watt.

3.4. Test Procedure

The EUT was tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

3.5. Uncertainty

± 1.27 dB



3.6. Test Result of Peak Power Output

Product : Touch Note

Test Item : Peak Power Output Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps)

Cable	e Loss=0.5dB	Peak Power Output						
Channel No.	Erramon (MII-)		Data Rate					
	Frequency (MHz)	1	2	5.5	11	Required Limit		
1	2412.00	21.01				1Watt= 30 dBm		
6	2437.00	21.92	21.92	21.91	21.9	1Watt= 30 dBm		
11	2462.00	22.31				1Watt= 30 dBm		

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



Test Item : Peak Power Output Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps)

Cable l	Cable Loss=0.5dB Peak Power Output									
Channel No.	. Frequency (MHz)		Data Rate							December d I insit
		6	9	12	18	24	36	48	54	Required Limit
1	2412.00	24.08								1Watt= 30 dBm
6	2437.00	24.43	24.43	24.42	24.42	24.42	24.41	24.41	24.41	1Watt= 30 dBm
11	2462.00	24.6								1Watt= 30 dBm

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



Test Item : Peak Power Output Data

Test Site : No.3 OATS

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW)

Cable Loss=0.5dB						Peak Po	wer Ou	tput		
Channel No.	Frequency (MHz)		Data Rate							
		6.5	13	19.5	26	39	52	58.5	65	Required Limit
1	2412.00	24.06	1							1Watt= 30 dBm
6	2437.00	24.4	24.4	24.4	24.39	24.38	24.38	24.37	24.37	1Watt= 30 dBm
11	2462.00	24.63								1Watt= 30 dBm

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



Test Item : Peak Power Output Data

Test Site : No.3 OATS

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW)

Cable l	Cable Loss=0.5dB				Peak Power Output					
Channel No. Frequency (MHz)		Data Rate					D 1111			
	13.5	27	40.5	54	81	108	121.5	135	Required Limit	
1	2422.00	23.97								1Watt= 30 dBm
4	2437.00	24.32	24.31	24.27	24.25	24.2	24.19	24.15	24.13	1Watt= 30 dBm
7	2452.00	24.33								1Watt= 30 dBm

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



4. Radiated Emission

4.1. Test Equipment

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

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Aug., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2008
⊠ Site # 3	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2008
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2008
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2009
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

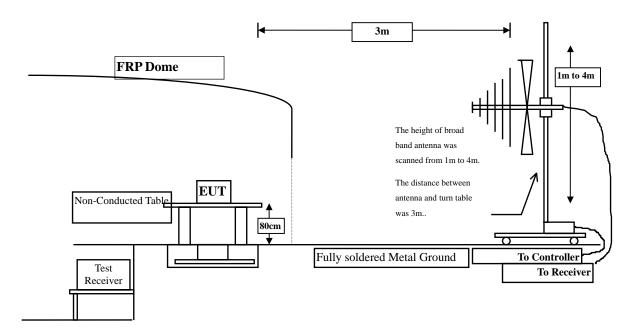
Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

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

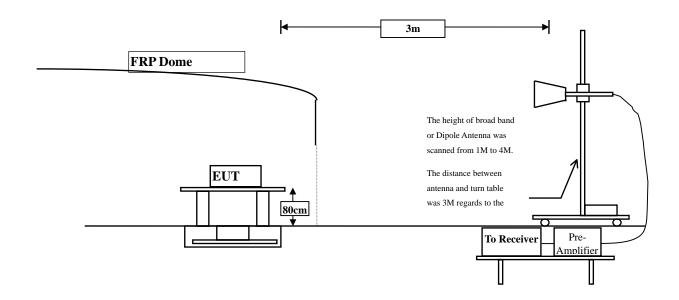


4.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz





4.3. Limits

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

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

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



4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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

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

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

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

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

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

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

The frequency range from 30MHz to 10th harminics is checked.

4.5. Uncertainty

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



4.6. Test Result of Radiated Emission

Product : Touch Note

Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.723	36.230	39.953	-34.047	74.000
7236.000	9.439	32.590	42.029	-31.971	74.000
9648.000	11.829	33.900	45.729	-28.271	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4824.000	3.723	31.100	34.823	-39.177	74.000
7236.000	9.439	32.100	41.539	-32.461	74.000
9648.000	11.829	34.200	46.029	-27.971	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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.723	31.100	34.823	-39.177	74.000
7236.000	9.439	32.100	41.539	-32.461	74.000
9648.000	11.829	34.200	46.029	-27.971	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4874.000	3.893	32.360	36.252	-37.748	74.000
7311.000	9.624	31.200	40.824	-33.176	74.000
9748.000	11.805	32.600	44.406	-29.594	74.000
Average					
Detectors					

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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					_
Peak Detector:					
4924.000	4.075	33.840	37.915	-36.085	74.000
7386.000	9.812	32.680	42.492	-31.508	74.000
9848.000	11.819	33.480	45.299	-28.701	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4924.000	4.075	32.680	36.755	-37.245	74.000
7386.000	9.812	32.580	42.392	-31.608	74.000
9848.000	11.819	34.200	46.019	-27.981	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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.723	33.380	37.103	-36.897	74.000
7236.000	9.439	32.660	42.099	-31.901	74.000
9648.000	11.829	33.480	45.309	-28.691	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4824.000	3.723	36.280	40.003	-33.997	74.000
7236.000	9.439	34.500	43.939	-30.061	74.000
9648.000	11.829	34.300	46.129	-27.871	74.000
A verage					

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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.893	33.270	37.162	-36.838	74.000
7311.000	9.624	32.858	42.482	-31.518	74.000
9748.000	11.805	32.890	44.696	-29.304	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4874.000	3.893	33.900	37.792	-36.208	74.000
7311.000	9.624	32.850	42.474	-31.526	74.000
9748.000	11.805	33.680	45.486	-28.514	74.000
Average					
Dotootore					

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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4924.000	4.075	35.690	39.765	-34.235	74.000
7386.000	9.812	32.900	42.712	-31.288	74.000
9848.000	11.819	34.580	46.399	-27.601	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4924.000	4.075	33.470	37.545	-36.455	74.000
7386.000	9.812	34.200	44.012	-29.988	74.000
9848.000	11.819	35.210	47.029	-26.971	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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.723	33.870	37.593	-36.407	74.000
7236.000	9.439	32.860	42.299	-31.701	74.000
9648.000	11.829	32.480	44.309	-29.691	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4824.000	3.723	33.140	36.863	-37.137	74.000
7236.000	9.439	32.480	41.919	-32.081	74.000
9648.000	11.829	34.587	46.416	-27.584	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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					_
Peak Detector:					
4874.000	3.893	35.640	39.532	-34.468	74.000
7311.000	9.624	33.690	43.314	-30.686	74.000
9748.000	11.805	34.852	46.658	-27.342	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4874.000	3.893	32.870	36.762	-37.238	74.000
7311.000	9.624	34.820	44.444	-29.556	74.000
9748.000	11.805	35.200	47.006	-26.994	74.000
Average					

Note:

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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4924.000	4.075	35.310	39.385	-34.615	74.000
7386.000	9.812	33.900	43.712	-30.288	74.000
9848.000	11.819	34.940	46.759	-27.241	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4924.000	4.075	33.840	37.915	-36.085	54.000
7386.000	9.812	33.620	43.432	-30.568	74.000
9848.000	11.819	32.850	44.669	-29.331	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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2422MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4844.000	3.788	33.780	37.568	-36.432	74.000
7266.000	9.517	30.990	40.507	-33.493	74.000
9688.000	11.818	34.590	46.408	-27.592	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4844.000	3.788	36.240	40.028	-33.972	74.000
7266.000	9.517	33.580	43.097	-30.903	74.000
9688.000	11.818	34.800	46.618	-27.382	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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.893	35.870	39.762	-34.238	74.000
7311.000	9.624	33.490	43.114	-30.886	74.000
9748.000	11.805	32.840	44.646	-29.354	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4874.000	3.893	35.140	39.032	-34.968	74.000
7311.000	9.624	33.780	43.404	-30.596	74.000
9748.000	11.805	34.780	46.586	-27.414	74.000
Average					
5 0					

Note:

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. "*", 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.



Test Item : Harmonic Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2452 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					_
Peak Detector:					
4904.000	4.002	32.830	36.832	-37.168	74.000
7356.000	9.747	34.590	44.337	-29.663	74.000
9808.000	11.795	35.217	47.012	-26.988	74.000
Average					
Detector:					
Vertical					
Peak Detector:					
4904.000	4.002	35.580	39.582	-34.418	74.000
7356.000	9.747	32.170	41.917	-32.083	74.000
9808.000	11.795	35.620	47.415	-26.585	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. "*", 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.



Test Item : General Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
460.680	1.131	29.422	30.553	-15.447	46.000
544.100	2.992	30.512	33.504	-12.496	46.000
596.480	3.489	30.255	33.744	-12.256	46.000
720.640	3.021	32.464	35.485	-10.515	46.000
780.780	3.804	29.752	33.556	-12.444	46.000
833.160	5.289	29.894	35.183	-10.817	46.000
Vertical					
390.840	-3.695	29.903	26.208	-19.792	46.000
449.040	-7.949	30.186	22.237	-23.763	46.000
540.220	-0.403	30.282	29.879	-16.121	46.000
691.540	1.975	30.106	32.081	-13.919	46.000
815.700	2.925	32.951	35.876	-10.124	46.000
922.400	5.055	29.422	34.477	-11.523	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. "*", 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.



Test Item : General Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
385.020	-1.998	30.739	28.741	-17.259	46.000
468.440	0.737	30.378	31.115	-14.885	46.000
544.100	2.992	30.682	33.674	-12.326	46.000
720.640	3.021	31.852	34.873	-11.127	46.000
802.120	4.729	30.674	35.403	-10.597	46.000
930.160	6.700	33.384	40.084	-5.916	46.000
Vertical					
383.080	-2.819	29.811	26.992	-19.008	46.000
538.280	-0.506	31.564	31.058	-14.942	46.000
676.020	-0.399	30.617	30.218	-15.782	46.000
740.040	-0.864	29.853	28.989	-17.011	46.000
815.700	2.925	33.169	36.094	-9.906	46.000
914.640	0.560	30.126	30.686	-15.314	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. "*", 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.



Test Item : General Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
266.680	-5.404	30.283	24.879	-21.121	46.000
346.220	-2.544	29.866	27.322	-18.678	46.000
460.680	1.131	31.663	32.794	-13.206	46.000
629.460	1.079	30.571	31.650	-14.350	46.000
815.700	4.975	33.169	38.144	-7.856	46.000
889.420	5.822	31.282	37.105	-8.895	46.000
Vertical					
247.280	-8.428	30.855	22.427	-23.573	46.000
340.400	-4.181	31.136	26.955	-19.045	46.000
460.680	-3.679	31.663	27.984	-18.016	46.000
538.280	-0.506	31.564	31.058	-14.942	46.000
676.020	-0.399	30.818	30.419	-15.581	46.000
806.000	3.567	31.410	34.977	-11.023	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. "*", 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.



Test Item : General Radiated Emission Data

Test Site : No.3 OATS

Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
460.680	1.131	31.663	32.794	-13.206	46.000
608.120	3.877	30.609	34.486	-11.514	46.000
720.640	3.021	32.380	35.401	-10.599	46.000
798.240	4.775	29.894	34.669	-11.331	46.000
829.280	6.015	31.487	37.502	-8.498	46.000
928.220	6.410	31.396	37.806	-8.194	46.000
Vertical					
375.320	-2.599	31.011	28.412	-17.588	46.000
460.680	-3.679	31.663	27.984	-18.016	46.000
538.280	-0.506	31.564	31.058	-14.942	46.000
689.600	2.094	31.063	33.157	-12.843	46.000
755.560	2.775	31.044	33.819	-12.181	46.000
815.700	2.925	33.183	36.108	-9.892	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. "*", 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.



5. RF antenna conducted test

5.1. Test Equipment

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

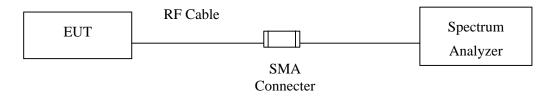
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Nov, 2008
	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2008
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2008

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 Mar. 2005 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 1.27dB



5.6. Test Result of RF antenna conducted test

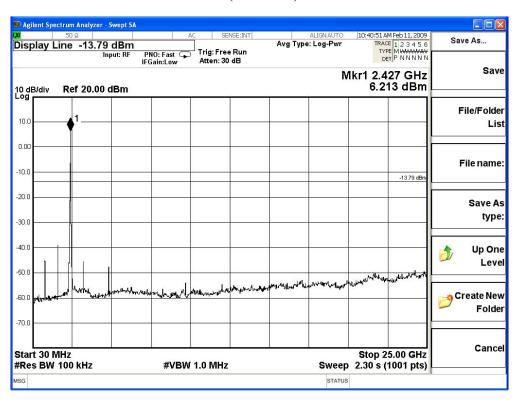
Product : Touch Note

Test Item : RF antenna conducted test

Test Site : No.3 OATS

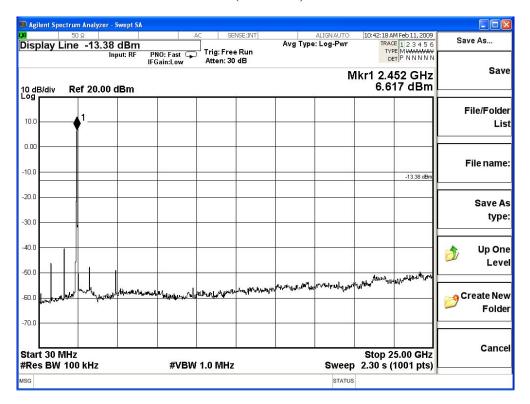
Test Mode : Mode 1: Transmitter (802.11b 1Mbps)

Channel 01 (2412MHz) 30-25GHz

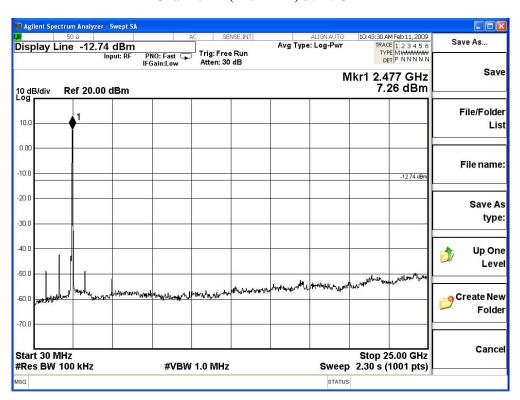




Channel 06 (2437MHz) 30-25GHz



Channel 11 (2462MHz) 30-25GHz



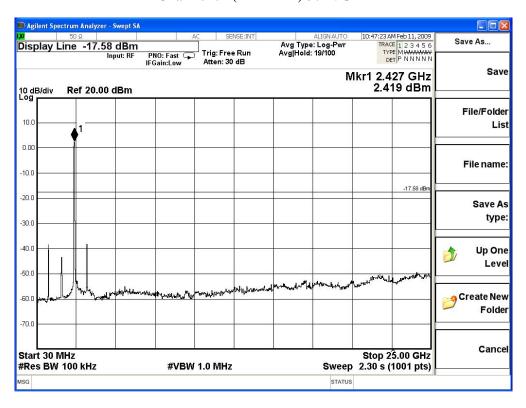


Test Item : RF Antenna Conducted Spurious

Test Site : No.3 OATS

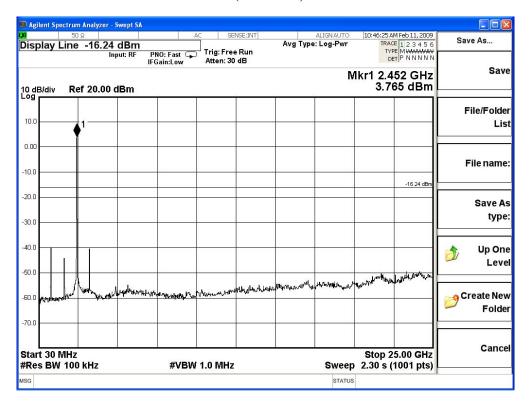
Test Mode : Mode 2: Transmitter (802.11g 6Mbps)

Channel 01 (2412MHz) 30-25GHz

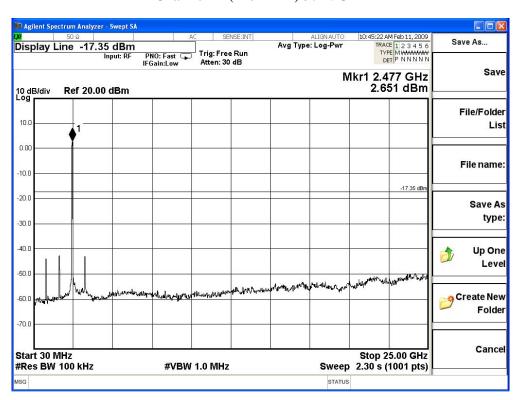




Channel 06 (2437MHz) 30-25GHz



Channel 11 (2462MHz) 30-25GHz



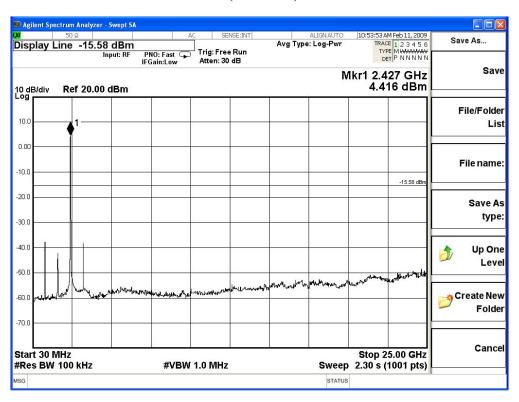


Test Item : RF Antenna Conducted Spurious

Test Site : No.3 OATS

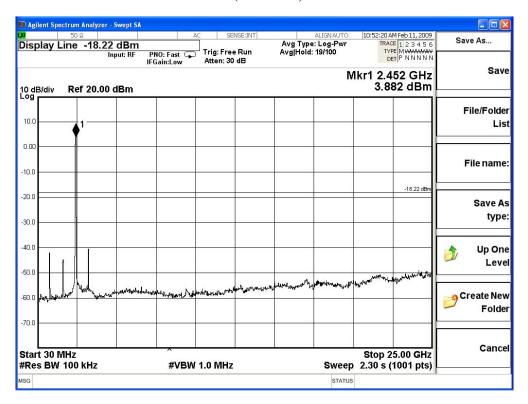
Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW)

Channel 01 (2412MHz) 30-25GHz

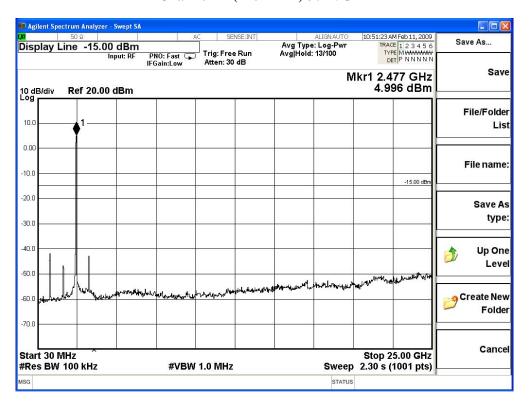




Channel 06 (2437MHz) 30-25GHz



Channel 11 (2462MHz) 30-25GHz



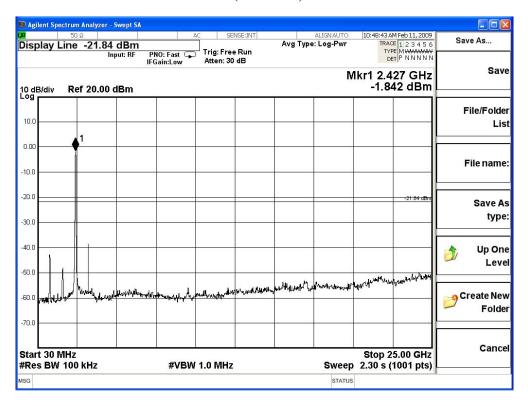


Test Item : RF Antenna Conducted Spurious

Test Site : No.3 OATS

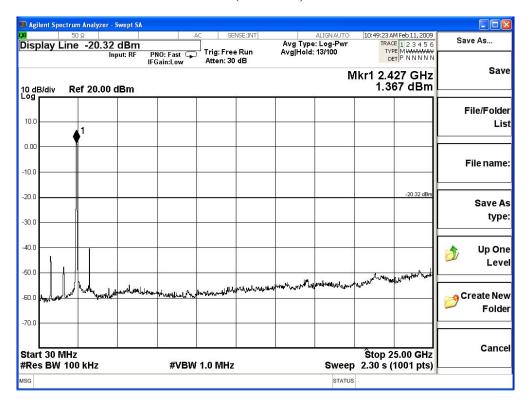
Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW)

Channel 01 (2422MHz) 30-25GHz

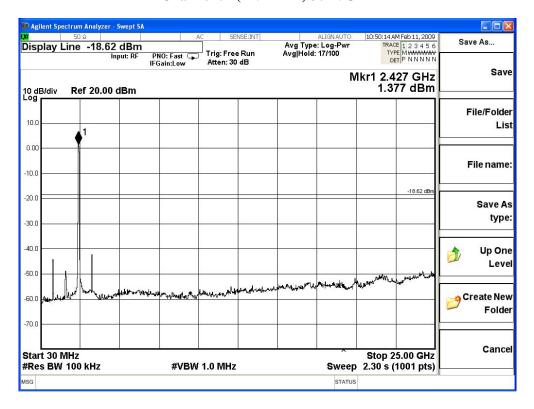




Channel 04 (2437MHz) 30-25GHz



Channel 07 (2452MHz) 30-25GHz





6. Band Edge

6.1. Test Equipment

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

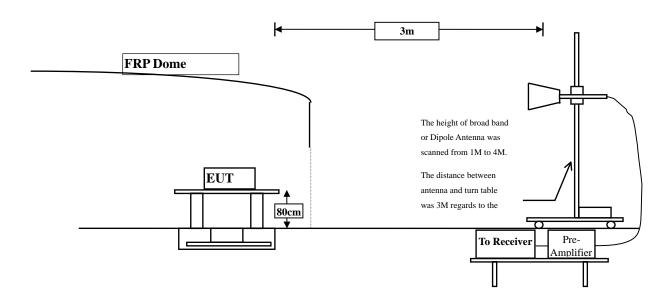
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Aug., 2008
	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2008
⊠Site # 3	Site # 3 X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2008
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2009
X	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note:

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

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 C63.4, 2003 and tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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

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

6.5. Uncertainty

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



6.6. Test Result of Band Edge

Product : Touch Note
Test Item : Band Edge Data
Test Site : No.3 OATS

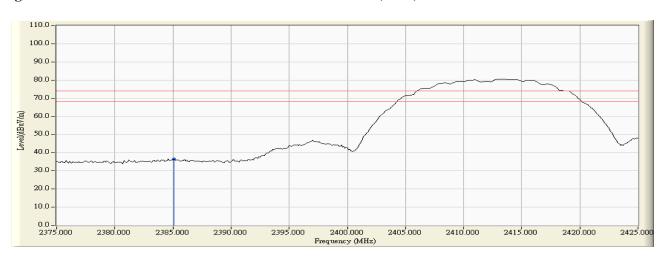
Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (Horizontal):

Channal No	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Result
Channel No.	(MHz)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Result
01 (Peak)	2385.100	-2.402	39.084	36.683	74.00	54.00	Pass
01 (Average)		-			74.00	54.00	Pass

Figure Channel 01:

Horizontal (Peak)



- 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.

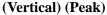


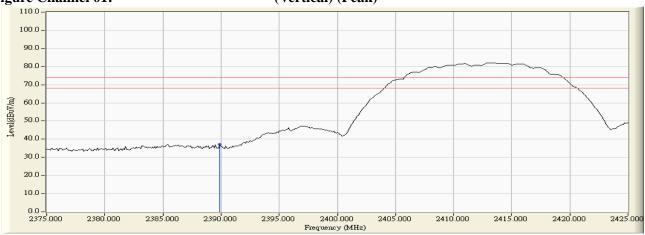
Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Result
	(MHz)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Result
01 (Peak)	2389.900	-2.378	39.467	37.089	74.00	54.00	Pass
01 (Average)					74.00	54.00	Pass







- 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.



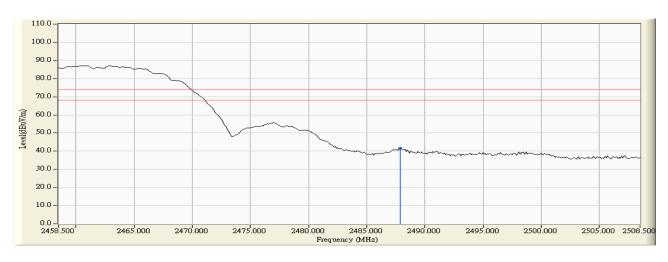
Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2487.900	-1.922	43.627	41.704	74.00	54.00	Pass
11(Average)					74.00	54.00	Pass

Figure Channel 11:

Horizontal (Peak)



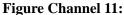
- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "*", means this data is the worst emission level.
- 5. Measurement Level =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



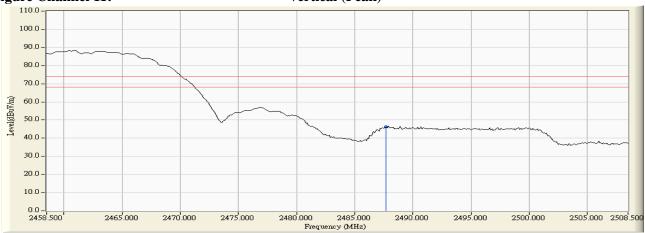
Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2487.700	-1.925	48.134	46.210	74.00	54.00	Pass
11(Average)		-			74.00	54.00	Pass







- 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.



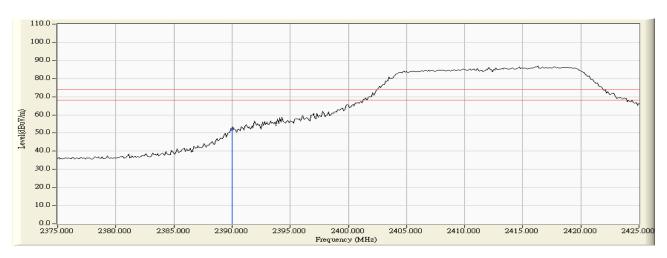
Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (Horizontal):

Chanal Na	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Result
Channel No.	(MHz)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Kesuit
01 (Peak)	2390.000	-2.378	54.530	52.153	74.00	54.00	Pass
01 (Average)					74.00	54.00	Pass

Figure Channel 01:

Horizontal (Peak)



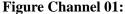
- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "*", means this data is the worst emission level.
- 5. Measurement Level =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



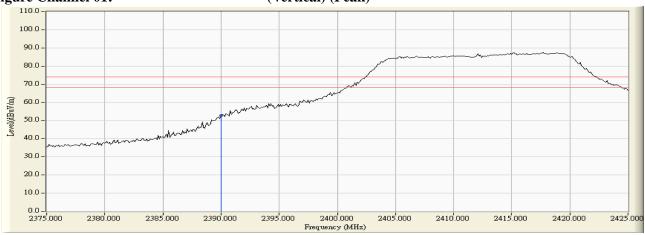
Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	-2.378	55.035	52.658	74.00	54.00	Pass
01 (Average)					74.00	54.00	Pass







- 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.



Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2483.700	-1.936	66.372	64.436	74.00	54.00	Pass
11 (Average)	2483.700	-1.936	41.754	39.818	74.00	54.00	Pass

Figure Channel 11:

Horizontal (Peak)

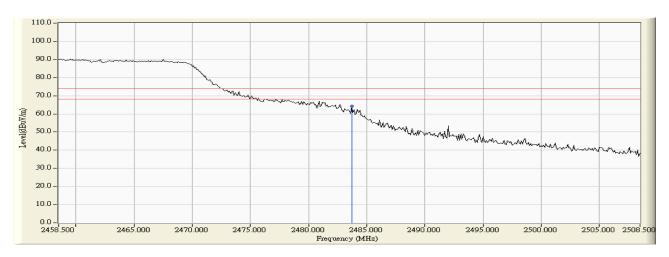
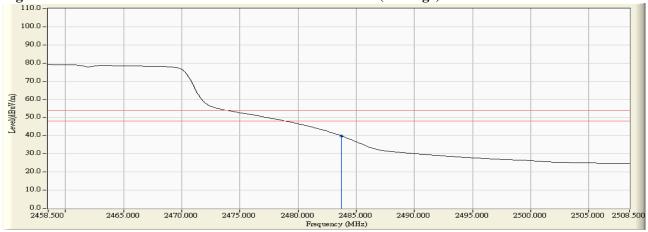


Figure Channel 11:

Horizontal (Average)



- 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.



Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2483.500	-1.937	66.144	64.207	74.00	54.00	Pass
11(Average)	2483.500	-1.937	44.156	42.219	74.00	54.00	Pass



Vertical (Peak)

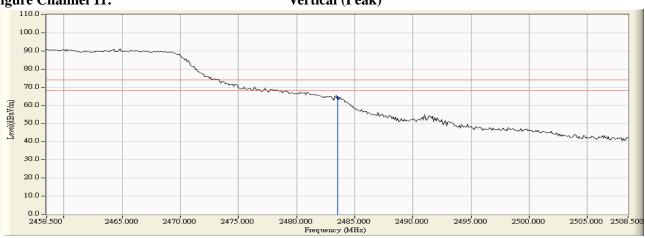
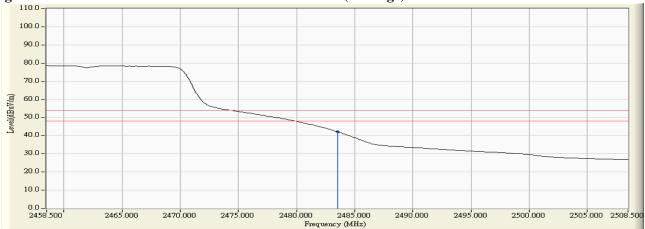


Figure Channel 11:

Vertical (Average)



- 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.



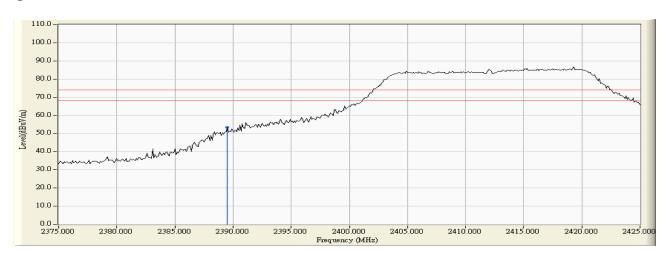
Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2412MHz)

RF Radiated Measurement (Horizontal):

CI IN	Frequency	Correct Factor	Reading Level	Emission Level	Peak Limit	Average Limit	Result
Channel No.	(MHz)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dBuV/m)	Kesuit
01 (Peak)	2389.500	-2.379	55.856	53.476	74.00	54.00	Pass
01 (Average)					74.00	54.00	Pass

Figure Channel 01:

Horizontal (Peak)



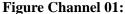
- 1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. "*", means this data is the worst emission level.
- 5. Measurement Level =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



Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2412MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	-2.378	57.069	54.692	74.00	54.00	Pass
01 (Average)	2390.000	-2.378	35.777	33.400	74.00	54.00	Pass



(Vertical) (Peak)

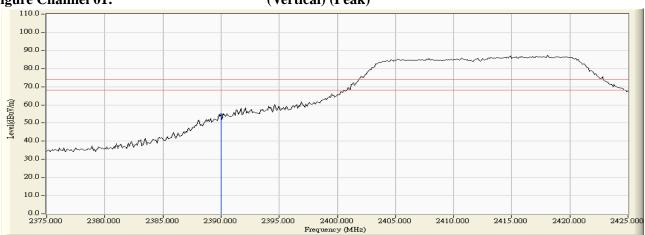
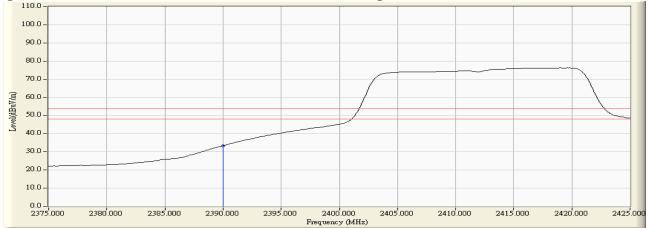


Figure Channel 01:

(Vertical) (Average)



- 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.



Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2462MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2483.900	-1.936	66.787	64.851	74.00	54.00	Pass
11 (Average)	2483.900	-1.936	46.551	44.615	74.00	54.00	Pass



Horizontal (Peak)

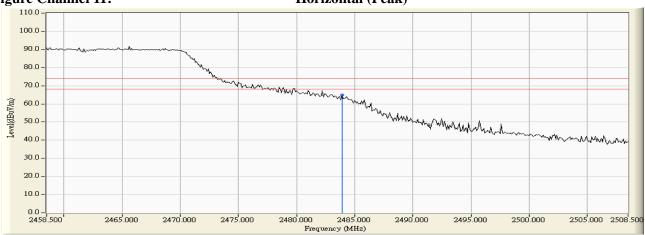


Figure Channel 11:

Horizontal (Average)



- 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.



Test Mode : Mode 3: Transmitter (802.11n MCS7 6.5Mbps 20M-BW) (2462MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2483.500	-1.937	68.894	66.957	74.00	54.00	Pass
11 (Average)	2483.500	-1.937	46.440	44.503	74.00	54.00	Pass



Vertical (Peak)

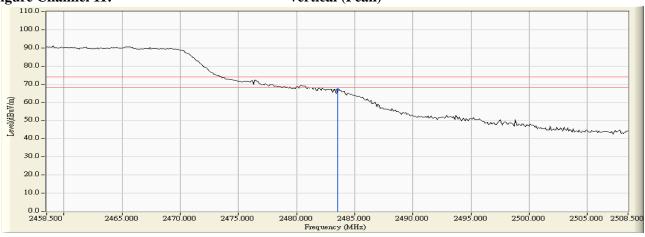
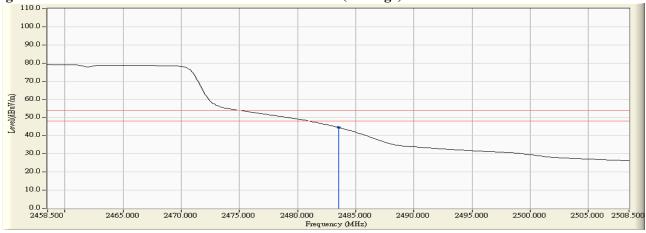


Figure Channel 11:

Vertical (Average)



- 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.



Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2422MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	-2.378	57.205	54.828	74.00	54.00	Pass
01 (Average)	2390.000	-2.378	37.511	35.134	74.00	54.00	Pass



Horizontal (Peak)

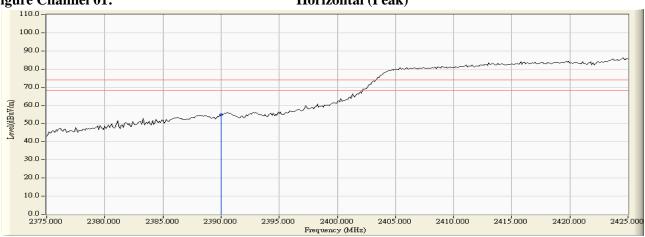
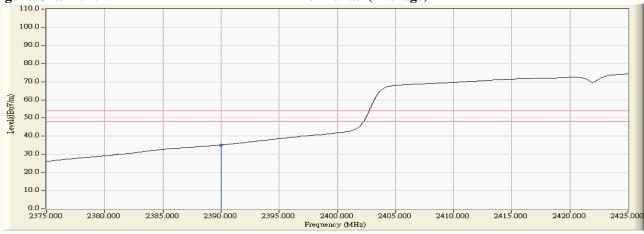


Figure Channel 01:

Horizontal (Average)



- 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.



Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2422MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2390.000	-2.378	58.516	56.139	74.00	54.00	Pass
01 (Average)	2390.000	-2.378	40.048	37.671	74.00	54.00	Pass



(Vertical) (Peak)

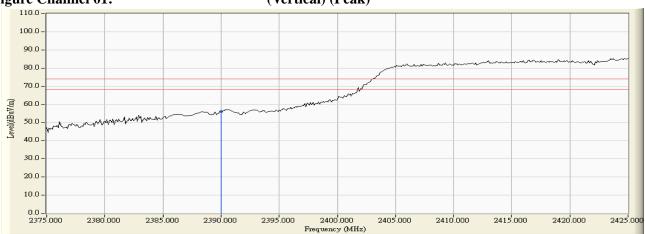
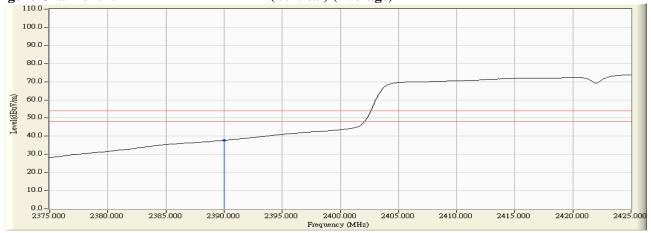


Figure Channel 01:

(Vertical) (Average)



- 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.



Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2452MHz)

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
07 (Peak)	2483.900	-1.936	66.846	64.910	74.00	54.00	Pass
07 (Average)	2483.900	-1.936	48.722	46.786	74.00	54.00	Pass



Horizontal (Peak)

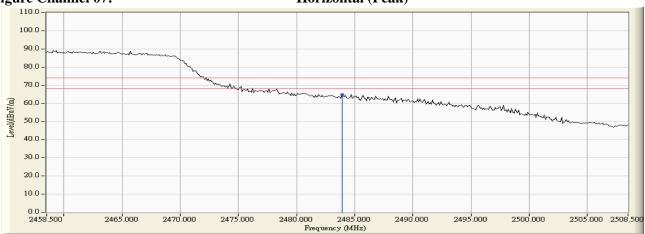
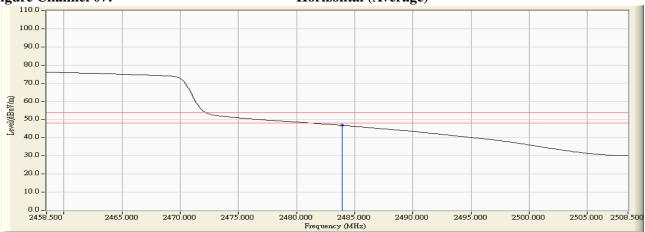


Figure Channel 07:

Horizontal (Average)



- 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.



Test Mode : Mode 4: Transmitter (802.11n MCS7 13.5Mbps 40M-BW) (2452MHz)

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
07 (Peak)	2484.100	-1.935	66.448	64.513	74.00	54.00	Pass
07 (Average)	2484.100	-1.935	48.150	46.215	74.00	54.00	Pass



Vertical (Peak)

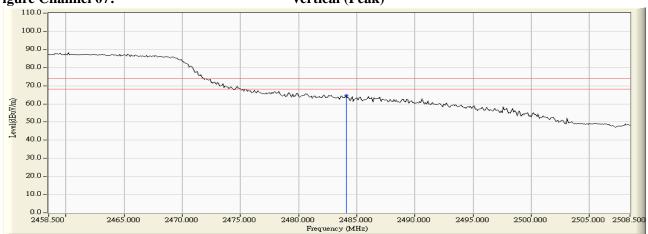


Figure Channel 07:

Vertical (Average)



- 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.



7. Occupied Bandwidth

7.1. Test Equipment

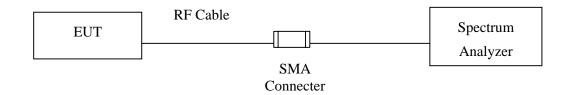
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Nov, 2008
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr, 2008

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

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

7.2. Test Setup



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, 2003; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

7.5. Uncertainty

± 150Hz



7.6. Test Result of Occupied Bandwidth

Product : Touch Note

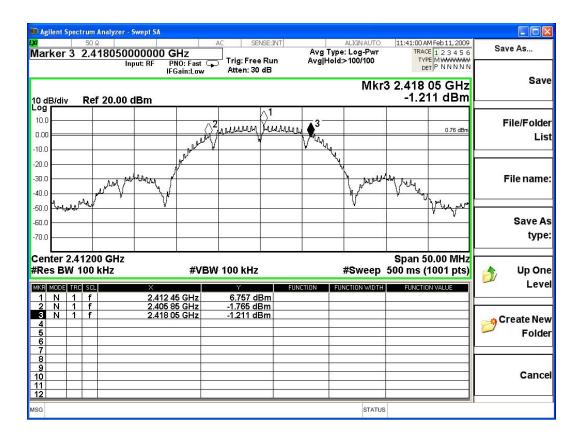
Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	12200	>500	Pass

Figure Channel 1:





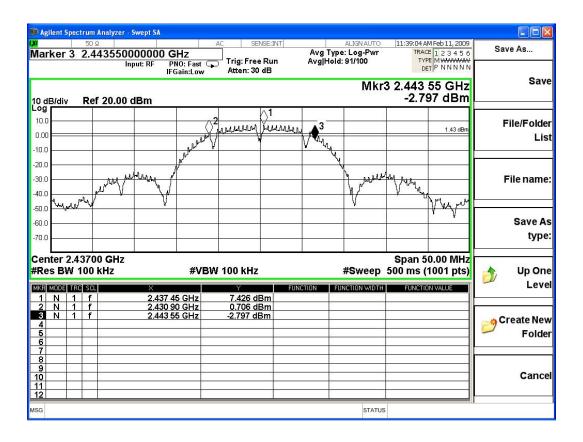
Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	12650	>500	Pass

Figure Channel 6:





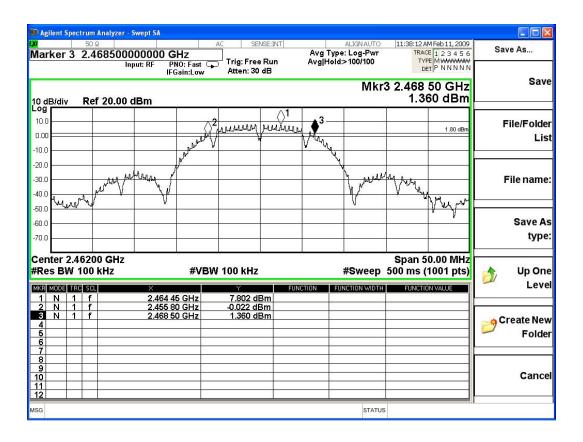
Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 1: Transmitter (802.11b 1Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	12700	>500	Pass

Figure Channel 11:





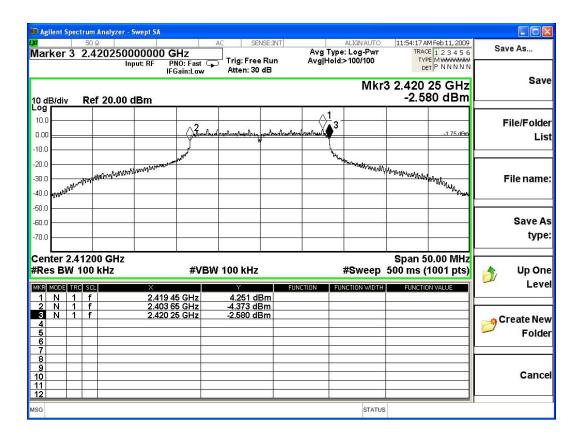
Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412.00	16600	>500	Pass

Figure Channel 1:





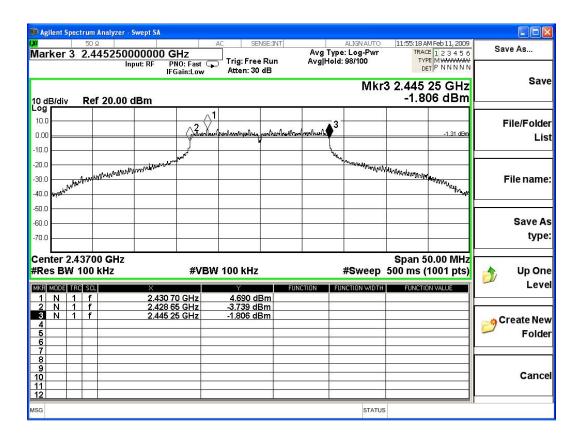
Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437.00	16600	>500	Pass

Figure Channel 6:





Test Item : Occupied Bandwidth Data

Test Site : No.3 OATS

Test Mode : Mode 2: Transmitter (802.11g 6Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462.00	16550	>500	Pass

Figure Channel 11:

