



Test Report

Product Name	Digital Set Top Box
Model No.	STB-2200
FCC ID	BJM-STB2200

Applicant	TATUNG CO.
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

Date of Receipt	May 10, 2007
Issued Date	July 05, 2007
Report No.	075L080-RFUSP05V01

The test results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date: July 05, 2007

Report No.: 075L080-RFUSP05V01



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name	Digital Set Top Box
Applicant	TATUNG CO.
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.
Manufacturer	TATUNG CO.
Model No.	STB-2200
Rated Voltage	AC 120V/60Hz
Working Voltage	AC 120V/60Hz
Trade Name	TATUNG
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2006 ANSI C63.4: 2003
Test Result	Complied



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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Digital Set Top Box
Trade Name	TATUNG
Model No.	STB-2200
FCC ID.	BJM-STB2200
Frequency Range	2412 – 2462MHz
Number of Channels	IEEE 802.11b/g : CH1-11
Data Speed	IEEE 802.11b – 1, 2, 5.5, 11Mbps IEEE 802.11g – 6, 9, 12, 18, 24, 36 48, 54Mbps
Type of Modulation	DSSS/ OFDM
Antenna Type	PIFA / Dipole
Antenna Connector Type	I-PEX / Reverse SMA
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Power Adapter (1)	MFR: ACBEL, M/N: API2AD13-860G Cable Out: Non-Shielded, 1.8m with one ferrite core bonded.
Power Adapter (2)	MFR: HIPRO, M/N: HP-O2040D43LF Cable Out: Non-Shielded, 1.8m with one ferrite core bonded.

Antenna List

No.	Manufacturer	Part No.	Antenna type	Peak Gain
1	FVC	SMD1812P150TF	PIFA	1.5dBi for 2.4 GHz
2	JOYMAX	IWX-2411RSXX-351	Dipole	2dBi for 2.4 GHz

Frequency of Each Channel (802.11b/g):

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2412 MHz	Channel 5:	2432 MHz	Channel 9:	2452 MHz
Channel 2:	2417 MHz	Channel 6:	2437 MHz	Channel 10:	2457 MHz
Channel 3:	2422 MHz	Channel 7:	2442 MHz	Channel 11:	2462 MHz
Channel 4:	2427 MHz	Channel 8:	2447 MHz		

Note:

1. The EUT is a Digital Set Top Box with a built-in 2.4GHz WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11b is 11Mbps and 802.11g is 54Mbps)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices
5. 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 Digital Set Top Box with a built-in 2.4GHz transceiver. There are 11 channels in 2412 – 2462MHz. The channels are separated by 5MHz. This device supports the data rates of 1, 2, 5.5, 11Mbps in 802.11b mode and 6, 9, 12, 18, 24, 36, 48, 54Mbps in 802.11g mode. The signals are modulated by DSSS in 802.11b mode and OFDM in 802.11g mode. The antenna type is PIFA and Dipole.

Test Mode	Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1)
	Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1)
	Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2)
	Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2)

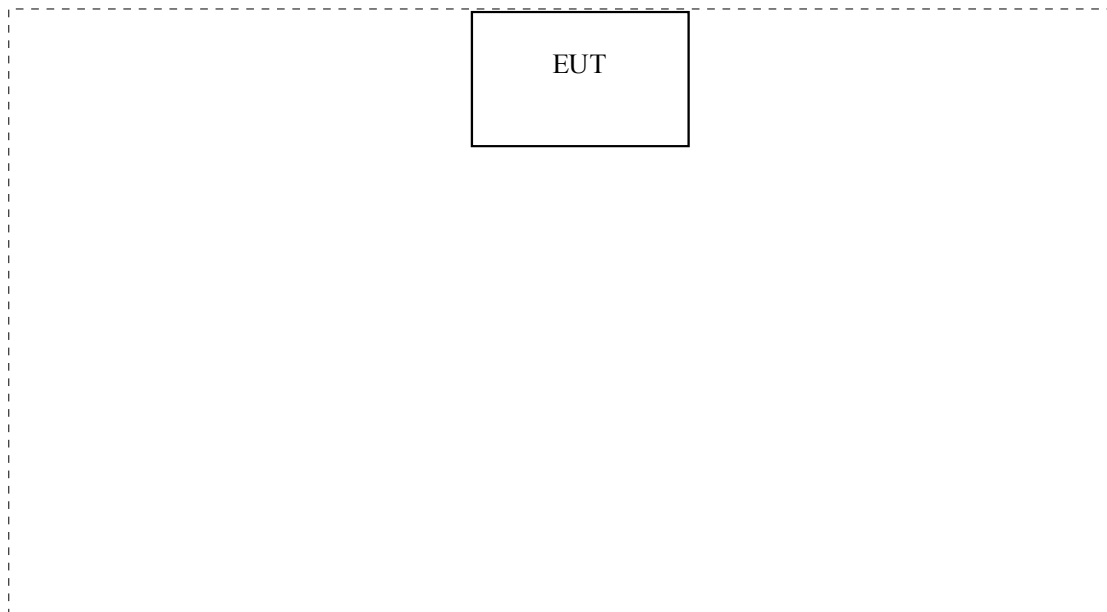
1.3. Tested System Details

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.	FCC ID	Power Cord
1.	N/A	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 Test System



1.5. EUT Exercise Software

- 1 Setup the EUT and simulators as shown on 1.4.
- 2 Use Ethernet cable connect EUT and laptop each other.
- 3 Laptop use RS-232 interface to control EUT
- 4 Execute tftpd32.EXE
- 5 Execute EUT terminal program then turn on the EUT power.
- 6 Run a short while, key in the login name "root"
- 7 Messages will be transmitted and received through EUT.
- 8 Test is based on the mandatory continuous transmitter.
- 9 After finishing the setup, remove RS-232 cable and Ethernet cable.
- 10 Repeat the above procedure (3) to (4).

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

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



Accreditation on NVLAP
NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation
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FCC Accreditation Number: TW1014

2. Conducted Emission

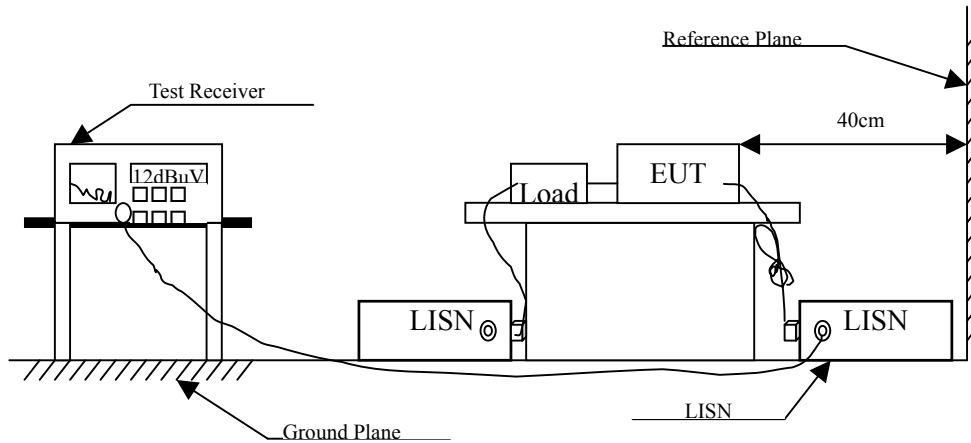
2.1. Test Equipment

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, 2007	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2007	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2007	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2007	
5	No.1 Shielded Room			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 MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56 _(註)	56-46 _(註)
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 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 C63.4: 2003 on conducted measurement.

Conducted emissions were investigated 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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.188	0.202	45.180	45.382	-19.532	64.914
0.248	0.203	36.450	36.653	-26.547	63.200
0.308	0.214	38.960	39.174	-22.312	61.486
0.438	0.216	28.810	29.026	-28.745	57.771
2.912	0.308	26.740	27.048	-28.952	56.000
10.341	0.648	28.800	29.448	-30.552	60.000
Average					
0.188	0.202	36.580	36.782	-18.132	54.914
0.248	0.203	32.210	32.413	-20.787	53.200
0.308	0.214	34.420	34.634	-16.852	51.486
0.438	0.216	25.200	25.416	-22.355	47.771
2.912	0.308	18.480	18.788	-27.212	46.000
10.341	0.648	25.350	25.998	-24.002	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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.189	0.202	40.870	41.072	-23.814	64.886
0.249	0.203	33.180	33.383	-29.788	63.171
0.309	0.214	32.530	32.744	-28.713	61.457
0.429	0.215	19.600	19.815	-38.214	58.029
2.537	0.294	26.260	26.554	-29.446	56.000
9.537	0.517	26.670	27.187	-32.813	60.000
Average					
0.189	0.202	32.620	32.822	-22.064	54.886
0.249	0.203	24.990	25.193	-27.978	53.171
0.309	0.214	26.620	26.834	-24.623	51.457
0.429	0.215	16.520	16.735	-31.294	48.029
2.537	0.294	17.850	18.144	-27.856	46.000
9.537	0.517	24.270	24.787	-25.213	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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.185	0.202	46.300	46.502	-18.498	65.000
0.245	0.203	34.840	35.043	-28.243	63.286
0.315	0.214	32.390	32.604	-28.682	61.286
0.375	0.215	27.410	27.625	-31.946	59.571
0.435	0.216	31.870	32.086	-25.771	57.857
10.158	0.639	29.050	29.689	-30.311	60.000
Average					
0.185	0.202	37.810	38.012	-16.988	55.000
0.245	0.203	30.830	31.033	-22.253	53.286
0.315	0.214	27.590	27.804	-23.482	51.286
0.375	0.215	21.640	21.855	-27.716	49.571
0.435	0.216	28.500	28.716	-19.141	47.857
10.158	0.639	25.600	26.239	-23.761	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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.188	0.202	41.940	42.142	-22.772	64.914
0.248	0.203	33.600	33.803	-29.397	63.200
0.308	0.214	31.410	31.624	-29.862	61.486
0.368	0.214	22.900	23.114	-36.657	59.771
0.438	0.216	19.890	20.106	-37.665	57.771
8.423	0.482	26.910	27.392	-32.608	60.000
Average					
0.188	0.202	33.810	34.012	-20.902	54.914
0.248	0.203	25.630	25.833	-27.367	53.200
0.308	0.214	25.880	26.094	-25.392	51.486
0.368	0.214	15.730	15.944	-33.827	49.771
0.438	0.216	17.380	17.596	-30.175	47.771
8.423	0.482	25.860	26.342	-23.658	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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.205	0.202	47.510	47.712	-16.717	64.429
0.315	0.214	37.590	37.804	-23.482	61.286
0.415	0.215	31.210	31.425	-27.004	58.429
4.259	0.366	32.750	33.116	-22.884	56.000
6.338	0.464	30.800	31.264	-28.736	60.000
23.166	1.069	32.050	33.119	-26.881	60.000
Average					
0.205	0.202	38.260	38.462	-15.967	54.429
0.315	0.214	28.500	28.714	-22.572	51.286
0.415	0.215	25.400	25.615	-22.814	48.429
4.259	0.366	31.780	32.146	-13.854	46.000
6.338	0.464	29.260	29.724	-20.276	50.000
23.166	1.069	27.570	28.639	-21.361	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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.205	0.202	47.330	47.532	-16.897	64.429
0.315	0.214	38.460	38.674	-22.612	61.286
0.415	0.215	30.500	30.715	-27.714	58.429
0.515	0.216	27.360	27.576	-28.424	56.000
0.725	0.229	29.230	29.459	-26.541	56.000
4.466	0.369	33.980	34.349	-21.651	56.000
Average					
0.205	0.202	39.650	39.852	-14.577	54.429
0.315	0.214	33.900	34.114	-17.172	51.286
0.415	0.215	26.670	26.885	-21.544	48.429
0.515	0.216	24.890	25.106	-20.894	46.000
0.725	0.229	27.460	27.689	-18.311	46.000
4.466	0.369	33.490	33.859	-12.141	46.000

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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.207	0.202	50.210	50.412	-13.959	64.371
0.307	0.214	35.400	35.614	-25.900	61.514
0.417	0.215	31.390	31.605	-26.766	58.371
0.517	0.216	29.220	29.436	-26.564	56.000
0.627	0.218	25.290	25.508	-30.492	56.000
4.361	0.368	35.810	36.178	-19.822	56.000
Average					
0.207	0.202	41.650	41.852	-12.519	54.371
0.307	0.214	30.030	30.244	-21.270	51.514
0.417	0.215	29.720	29.935	-18.436	48.371
0.517	0.216	25.280	25.496	-20.504	46.000
0.627	0.218	23.980	24.198	-21.802	46.000
4.361	0.368	35.360	35.728	-10.272	46.000

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 : Digital Set Top Box
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.205	0.202	46.860	47.062	-17.367	64.429
0.315	0.214	38.160	38.374	-22.912	61.286
0.415	0.215	29.750	29.965	-28.464	58.429
0.515	0.216	27.870	28.086	-27.914	56.000
4.463	0.369	34.160	34.529	-21.471	56.000
20.865	0.778	32.360	33.138	-26.862	60.000
Average					
0.205	0.202	39.480	39.682	-14.747	54.429
0.315	0.214	33.810	34.024	-17.262	51.286
0.415	0.215	27.190	27.405	-21.024	48.429
0.515	0.216	25.720	25.936	-20.064	46.000
4.463	0.369	33.390	33.759	-12.241	46.000
20.865	0.778	28.920	29.698	-20.302	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

3. Peak Power Output

3.1. Test Equipment

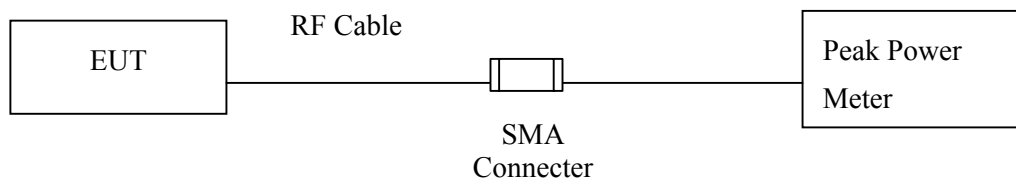
The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Peak Power Meter	Anritsu	ML2495A /6K00003357	June, 2007
X	Power Sensor	Anritsu	MA2491A /034457	June, 2007

- 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. Uncertainty

± 1.27 dB

3.5. Test Result of Peak Power Output

Product : Digital Set Top Box
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1)

Data Speed: 11Mbps

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
1	2412.00	16.02dBm	1 Watt= 30 dBm	Pass
6	2437.00	17.51dBm	1 Watt= 30 dBm	Pass
11	2462.00	18.61dBm	1 Watt= 30 dBm	Pass

Product : Digital Set Top Box
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1)

Data Speed: 54Mbps

Channel No.	Frequency (MHz)	Measurement	Required Limit	Result
1	2412.00	18.67dBm	1 Watt= 30 dBm	Pass
6	2437.00	19.81dBm	1 Watt= 30 dBm	Pass
11	2462.00	21.13dBm	1 Watt= 30 dBm	Pass

4. Radiated Emission

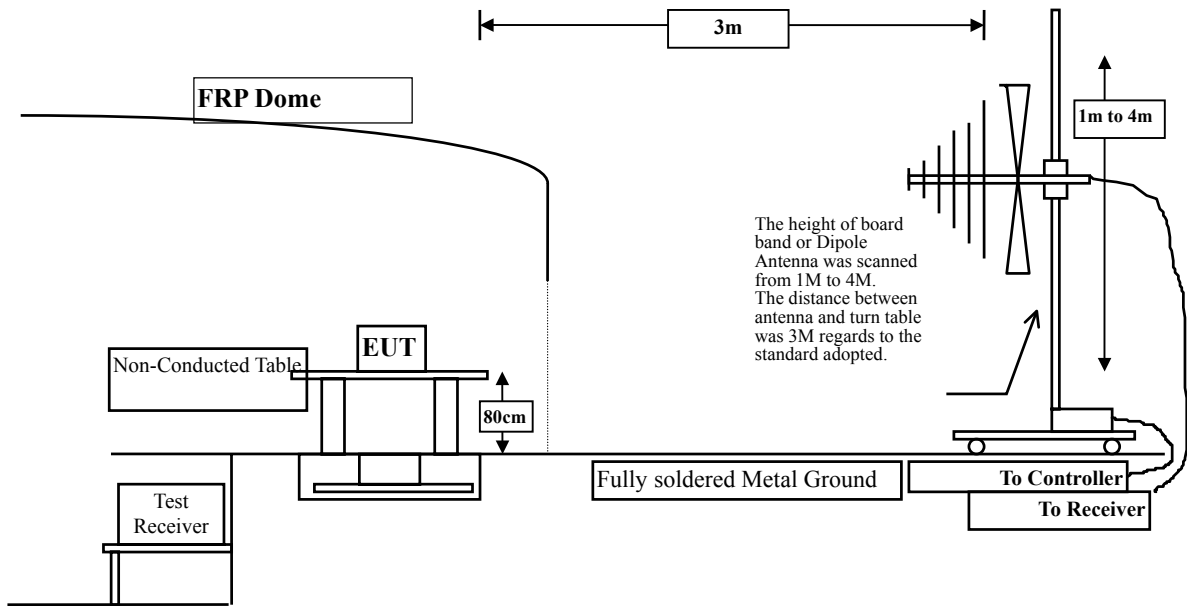
4.1. Test Equipment

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

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	Test Receiver	R & S	ESCS 30 / 825442/14	May, 2007
	Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2007
	Pre-Amplifier	HP	8447D/3307A01812	May, 2007
	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2006
	Horn Antenna	EM	EM6917 / 103325	May, 2007
Site # 2	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2007
	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2007
	Pre-Amplifier	HP	8447D/3307A01814	May, 2007
	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2006
	Horn Antenna	EM	EM6917 / 103325	May, 2007
Site # 3	X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
	X Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
	X Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
	X Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
	X Pre-Amplifier	HP	8449B / 3008A01123	July, 2007

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

4.2. Test Setup



4.3. 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(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.4. Test Procedure

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

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

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

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

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

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Digital Set Top Box
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2412MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.723	50.313	54.036	-19.964	74.000
7236.000	9.439	37.623	47.061	-26.939	74.000
9648.000	11.829	35.828	47.657	-26.343	74.000
Average Detector:					
4824.000	3.723	36.524	40.247	-13.753	54.000
Vertical					
Peak Detector:					
4824.000	3.723	48.023	51.746	-22.254	74.000
7236.000	9.439	35.795	45.233	-28.767	74.000
9648.000	11.829	36.551	48.380	-25.620	74.000
Average Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4874.000	3.893	50.194	54.086	-19.914	74.000
7311.000	9.624	35.288	44.912	-29.088	74.000
9748.000	11.805	35.738	47.544	-26.456	74.000
Average					
Detector:					
4874.000	3.893	36.055	39.947	-14.053	54.000
Vertical					
Peak Detector:					
4874.000	3.893	47.592	51.484	-22.516	74.000
7311.000	9.624	35.565	45.189	-28.811	74.000
9748.000	11.805	36.838	48.644	-25.356	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (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	51.818	55.892	-18.108	74.000
7386.000	9.812	36.913	46.725	-27.275	74.000
9848.000	11.819	38.762	50.581	-23.419	74.000
Average					
Detector:					
4924.000	4.075	37.500	41.574	-12.426	54.000
Vertical					
Peak Detector:					
4924.000	4.075	50.111	54.185	-19.815	74.000
7386.000	9.812	36.156	45.968	-28.032	74.000
9848.000	11.819	36.825	48.644	-25.356	74.000
Average					
Detector:					
4924.000	4.075	35.949	40.023	-13.977	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4824.000	3.723	43.516	47.239	-26.761	74.000
7236.000	9.439	36.595	46.033	-27.967	74.000
9648.000	11.829	36.015	47.844	-26.156	74.000

Average

Detector:

--

Vertical

Peak Detector:

4824.000	3.723	43.525	47.248	-26.752	74.000
7236.000	9.439	36.673	46.111	-27.889	74.000
9648.000	11.829	36.529	48.358	-25.642	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4874.000	3.893	42.517	46.409	-27.591	74.000
7311.000	9.624	35.580	45.204	-28.796	74.000
9748.000	11.805	34.508	46.314	-27.686	74.000

Average

Detector:

--

Vertical

Peak Detector:

4874.000	3.893	41.733	45.625	-28.375	74.000
7311.000	9.624	35.476	45.100	-28.900	74.000
9748.000	11.805	35.259	47.065	-26.935	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4924.000	4.075	44.129	48.203	-25.797	74.000
7386.000	9.812	35.481	45.293	-28.707	74.000
9848.000	11.819	35.314	47.133	-26.867	74.000

Average

Detector:

--

Vertical

Peak Detector:

4924.000	4.075	42.241	46.315	-27.685	74.000
7386.000	9.812	36.611	46.423	-27.577	74.000
9848.000	11.819	35.123	46.942	-27.058	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4824.000	3.723	39.538	43.261	-30.739	74.000
7236.000	9.439	37.781	47.219	-26.781	74.000
9648.000	11.829	36.181	48.010	-25.990	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4824.000	3.723	44.882	48.605	-25.395	74.000
7236.000	9.439	37.790	47.228	-26.772	74.000
9648.000	11.829	37.097	48.926	-25.074	74.000
Average					
Detector:					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4874.000	3.893	42.777	46.669	-27.331	74.000
7311.000	9.624	36.647	46.271	-27.729	74.000
9748.000	11.805	37.275	49.081	-24.919	74.000

Average

Detector:

--

Vertical

Peak Detector:

4874.000	3.893	48.947	52.839	-21.161	74.000
7311.000	9.624	35.718	45.342	-28.658	74.000
9748.000	11.805	36.525	48.331	-25.669	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4924.000	4.075	40.791	44.865	-29.135	74.000
7386.000	9.812	36.573	46.385	-27.615	74.000
9848.000	11.819	36.095	47.914	-26.086	74.000

Average

Detector:

--

Vertical

Peak Detector:

4924.000	4.075	48.712	52.786	-21.214	74.000
7386.000	9.812	37.746	47.558	-26.442	74.000
9848.000	11.819	38.075	49.894	-24.106	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4824.000	3.723	39.824	43.547	-30.453	74.000
7236.000	9.439	37.285	46.723	-27.277	74.000
9648.000	11.829	35.418	47.247	-26.753	74.000

Average

Detector:

--

Vertical

Peak Detector:

4824.000	3.723	40.970	44.693	-29.307	74.000
7236.000	9.439	38.170	47.608	-26.392	74.000
9648.000	11.829	34.977	46.806	-27.194	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4874.000	3.893	37.974	41.866	-32.134	74.000
7311.000	9.624	35.596	45.220	-28.780	74.000
9748.000	11.805	35.469	47.275	-26.725	74.000

Average

Detector:

--

Vertical

Peak Detector:

4874.000	3.893	44.492	48.384	-25.616	74.000
7311.000	9.624	36.785	46.409	-27.591	74.000
9748.000	11.805	36.139	47.945	-26.055	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4924.000	4.075	38.265	42.339	-31.661	74.000
7386.000	9.812	37.252	47.064	-26.936	74.000
9848.000	11.819	37.712	49.531	-24.469	74.000

Average

Detector:

--

Vertical

Peak Detector:

4924.000	4.075	42.191	46.265	-27.735	74.000
7386.000	9.812	35.699	45.511	-28.489	74.000
9848.000	11.819	36.227	48.046	-25.954	74.000

Average

Detector:

--

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Digital Set Top Box
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
401.025	16.644	19.668	36.312	-9.688	46.000
432.550	17.666	25.360	43.026	-2.974	46.000
650.800	20.763	15.747	36.510	-9.490	46.000
667.775	20.663	18.809	39.472	-6.528	46.000
701.725	20.632	18.925	39.557	-6.443	46.000
750.225	21.085	18.877	39.962	-6.038	46.000
Vertical					
401.025	18.298	12.223	30.521	-15.479	46.000
432.550	19.299	15.313	34.612	-11.388	46.000
667.775	19.949	12.430	32.379	-13.621	46.000
701.725	20.783	10.974	31.756	-14.244	46.000
750.225	23.184	10.377	33.561	-12.439	46.000
900.575	23.649	9.739	33.388	-12.612	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Digital Set Top Box
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
401.025	16.644	19.683	36.327	-9.673	46.000
432.550	17.666	24.993	42.659	-3.341	46.000
534.400	18.780	16.269	35.049	-10.951	46.000
667.775	20.663	18.842	39.505	-6.495	46.000
701.725	20.632	19.327	39.959	-6.041	46.000
750.225	21.085	18.615	39.700	-6.300	46.000
Vertical					
432.550	19.299	12.311	31.610	-14.390	46.000
667.775	19.949	13.628	33.577	-12.423	46.000
701.725	20.783	10.285	31.067	-14.933	46.000
750.225	23.184	10.599	33.783	-12.217	46.000
900.575	23.649	9.395	33.044	-12.956	46.000
961.200	23.009	10.166	33.175	-20.825	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Digital Set Top Box
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
432.550	17.666	25.082	42.748	-3.252	46.000
534.400	18.780	14.366	33.146	-12.854	46.000
650.800	20.763	15.999	36.762	-9.238	46.000
667.775	20.663	19.134	39.797	-6.203	46.000
701.725	20.632	19.004	39.636	-6.364	46.000
750.225	21.085	19.075	40.160	-5.840	46.000
Vertical					
432.550	19.299	12.599	31.898	-14.102	46.000
667.775	19.949	13.165	33.114	-12.886	46.000
701.725	20.783	12.576	33.358	-12.642	46.000
750.225	23.184	10.760	33.944	-12.056	46.000
900.575	23.649	9.523	33.172	-12.828	46.000
961.200	23.009	11.336	34.345	-19.655	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

Product : Digital Set Top Box
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
323.425	13.920	19.546	33.465	-12.535	46.000
401.025	16.644	19.517	36.161	-9.839	46.000
432.550	17.666	25.135	42.801	-3.199	46.000
650.800	20.763	16.333	37.096	-8.904	46.000
667.775	20.663	19.327	39.990	-6.010	46.000
750.225	21.085	19.223	40.308	-5.692	46.000
Vertical					
432.550	19.299	12.366	31.665	-14.335	46.000
667.775	19.949	13.556	33.505	-12.495	46.000
701.725	20.783	11.454	32.236	-13.764	46.000
750.225	23.184	11.191	34.375	-11.625	46.000
839.950	21.403	11.978	33.381	-12.619	46.000
900.575	23.649	10.053	33.702	-12.298	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

5. Band Edge

5.1. Test Equipment

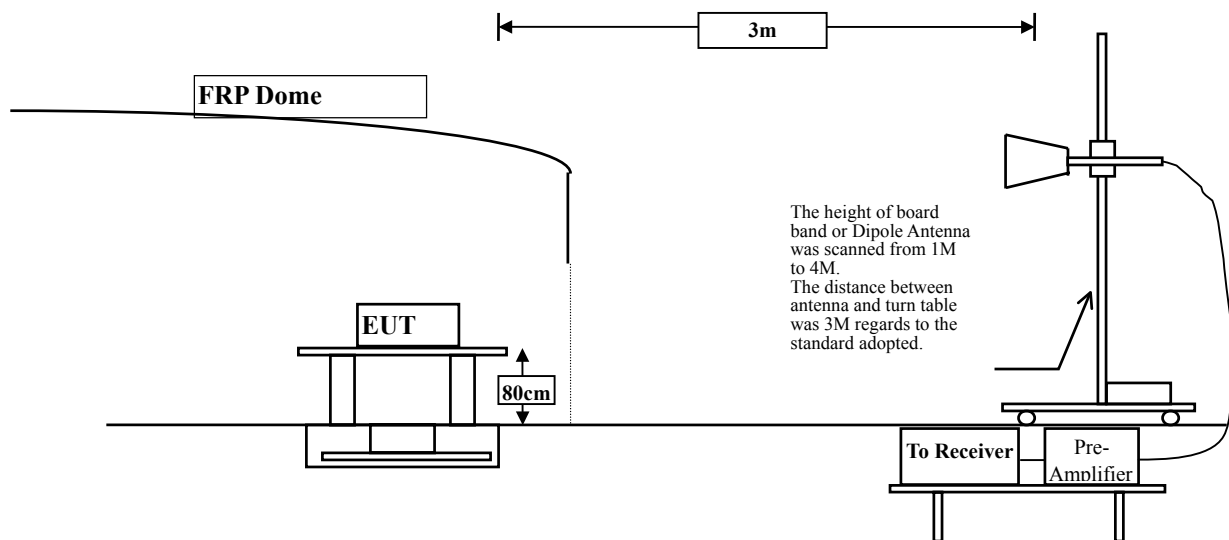
The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007
X	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2007
X	Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2007
X	Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2007
X	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2007
X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2007
X	Pre-Amplifier	HP	8449B / 3008A01123	July, 2007

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

5.2. Test Setup

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

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

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated measurement.

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

5.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

5.6. Test Result of Band Edge

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1)

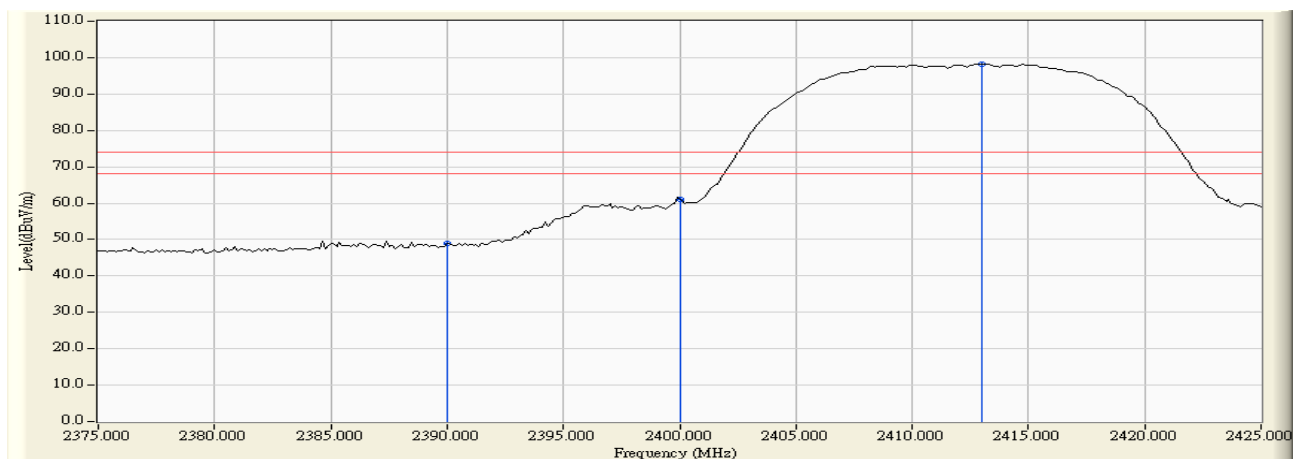
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Horizontal)	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	51.225	48.848	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1)

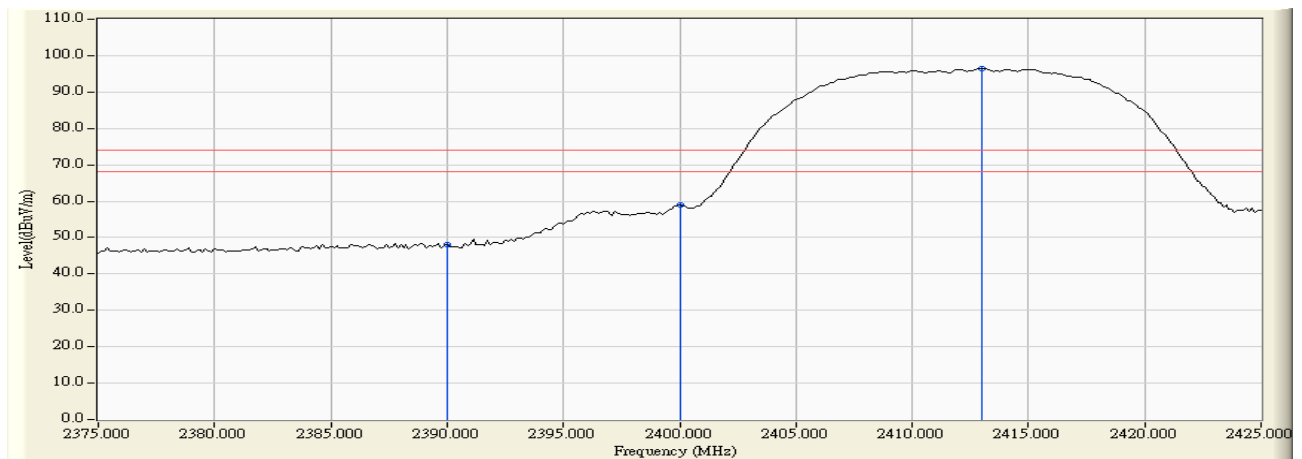
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Vertical)	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Fcator (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	50.329	47.952	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Vertical (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1)

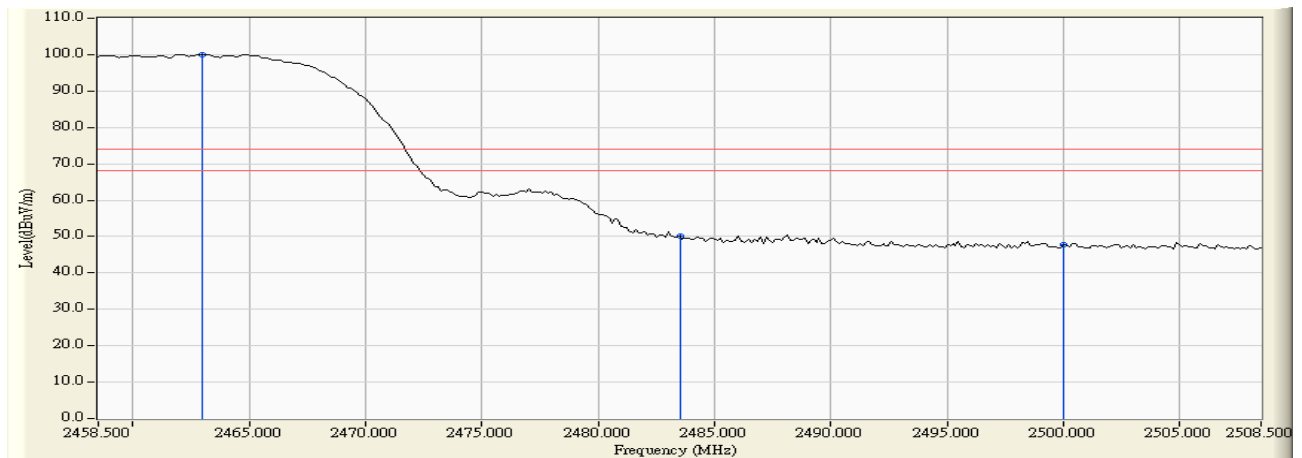
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Horizontal)	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	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	51.926	49.989	74.00	54.00	Pass
11(Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1)

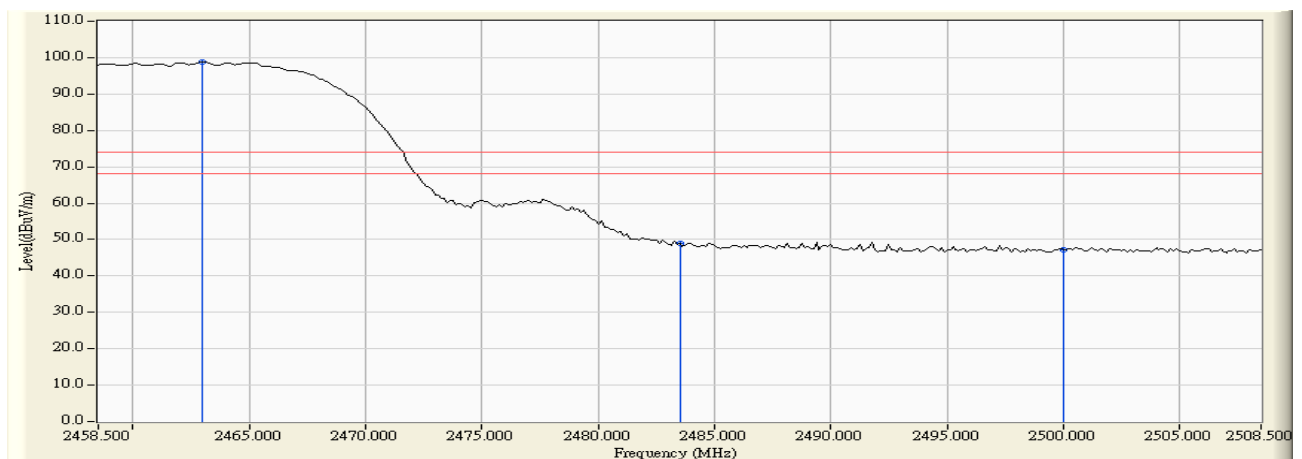
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Vertical)	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel	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	50.780	48.843	74.00	54.00	Pass
11(Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 11: (Vertical) (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1)

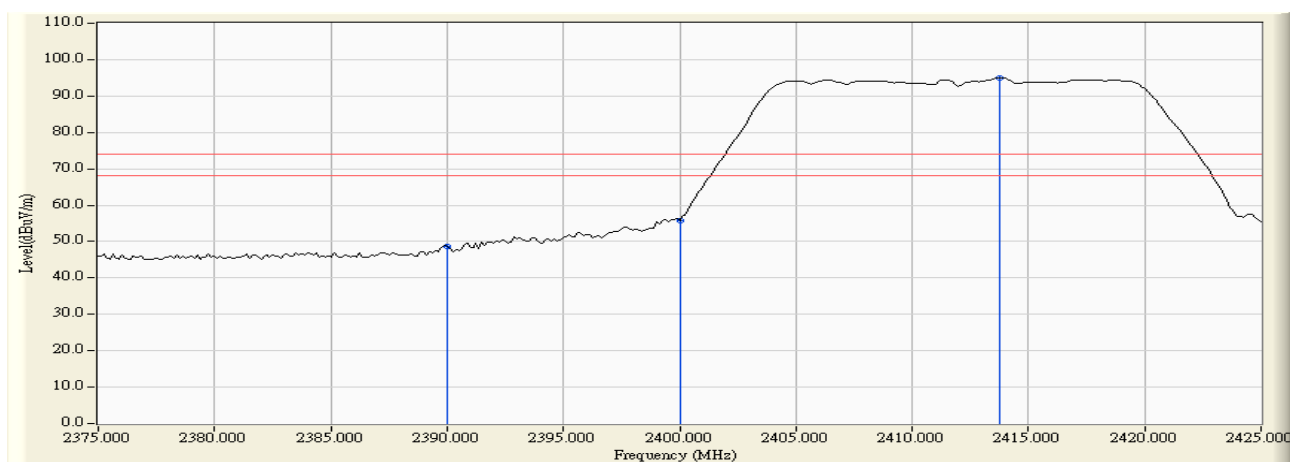
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Horizontal)	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	51.077	48.700	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1)

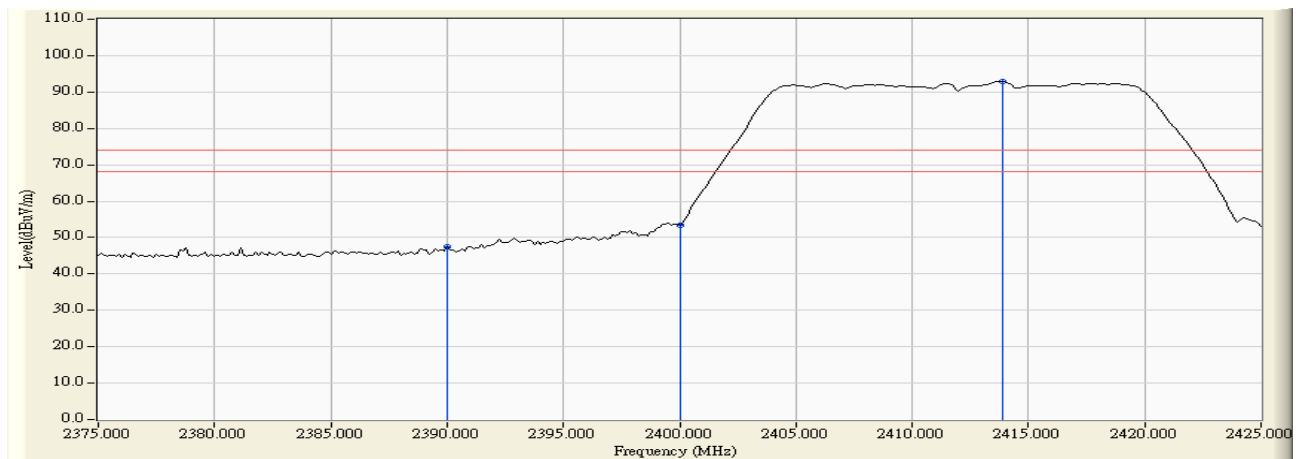
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Vertical)	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Fcator (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Arerage Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	49.883	47.506	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Vertical (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1)

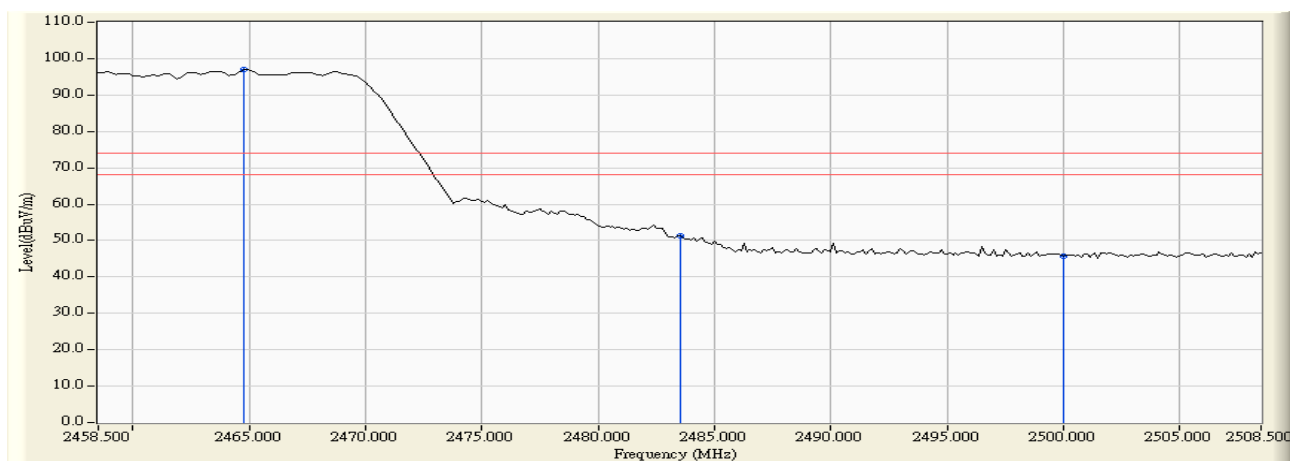
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Horizontal)	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	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	53.244	51.307	74.00	54.00	Pass
11(Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 11: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1)

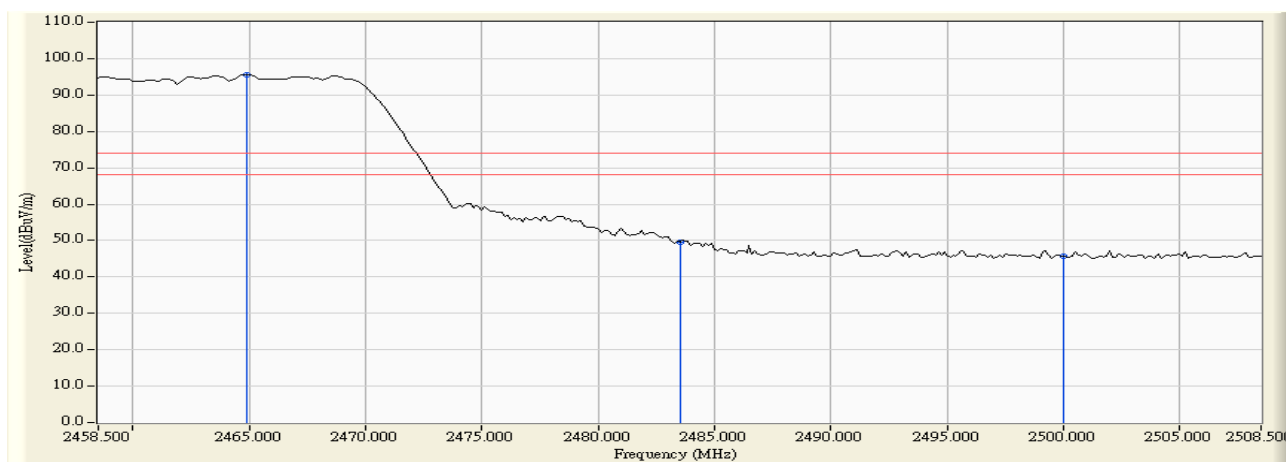
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Vertical)	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel	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	51.516	49.579	74.00	54.00	Pass
11(Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 11: (Vertical) (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2)

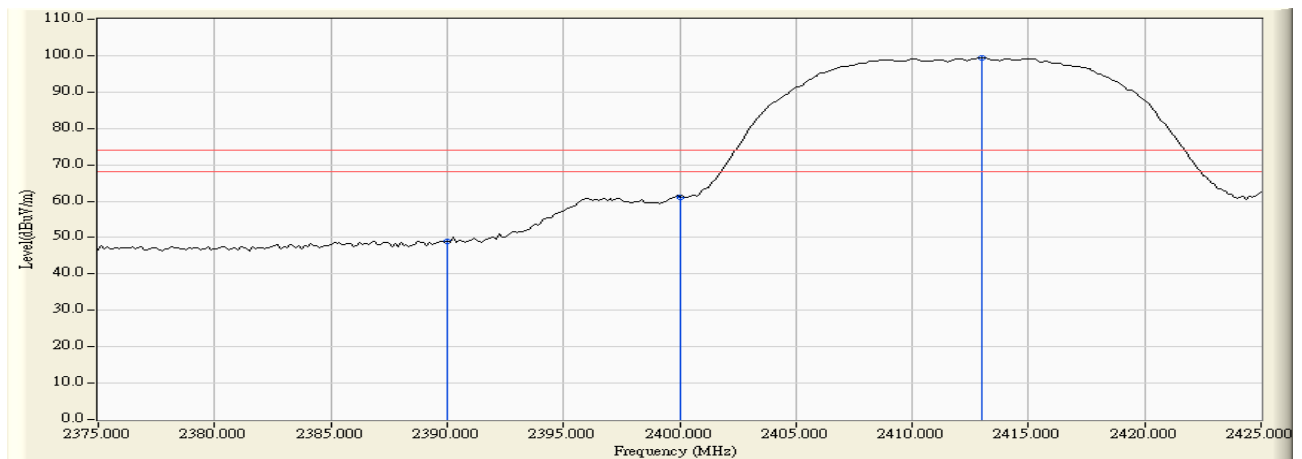
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Horizontal)	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	51.397	49.020	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2)

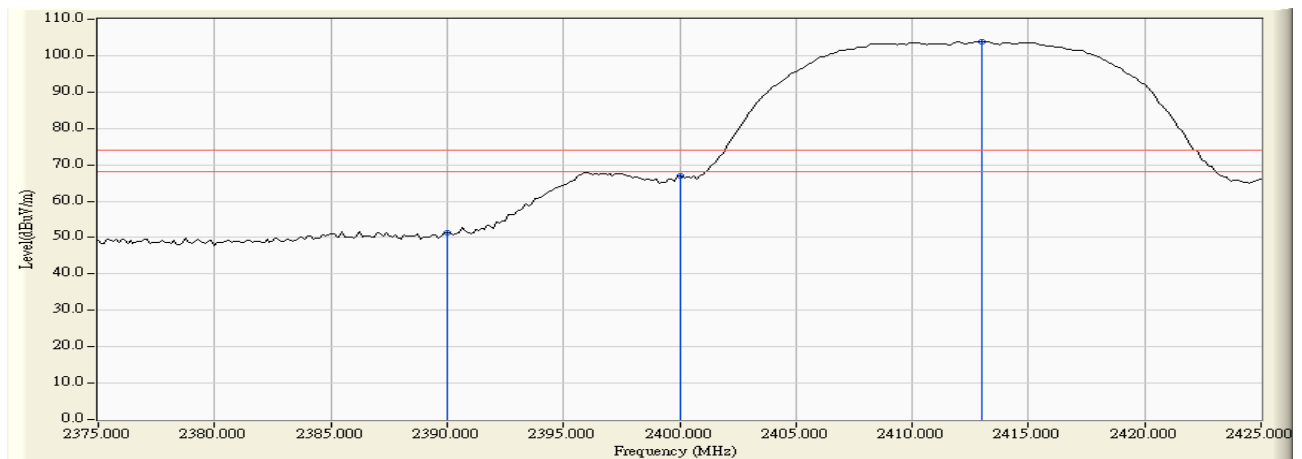
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Vertical)	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Fcator (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	53.624	51.247	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Vertical (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2)

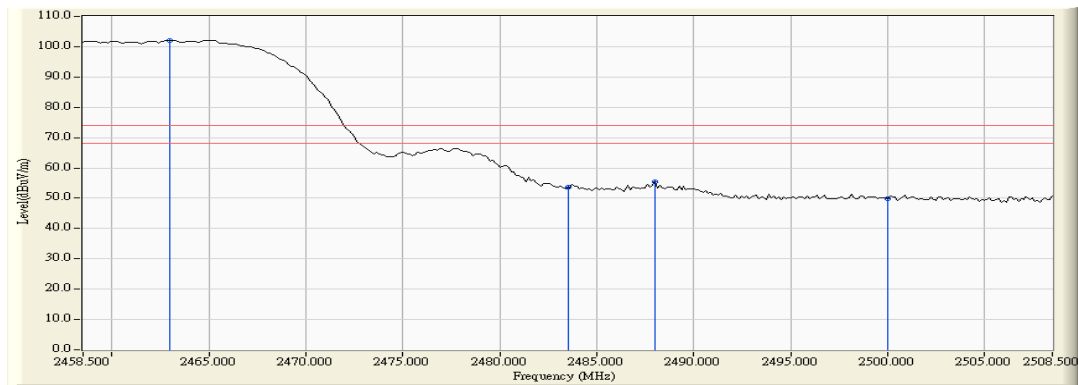
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Horizontal)	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11(Peak)	2488.000	-1.922	57.481	55.558	74.00	54.00	Pass
11(Average)	2488.000	-1.922	45.142	43.219	74.00	54.00	Pass

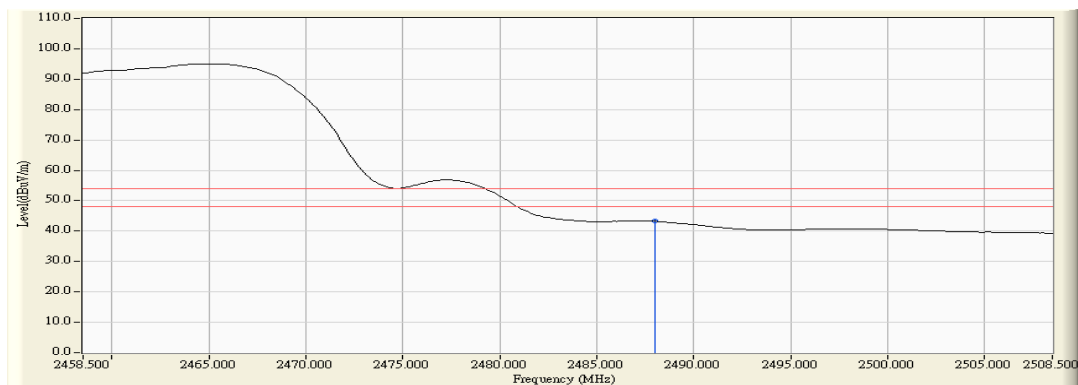
Figure Channel 11: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Figure Channel 11: Horizontal (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmitter 802.11b - Antenna 2+Power Adapter(2)

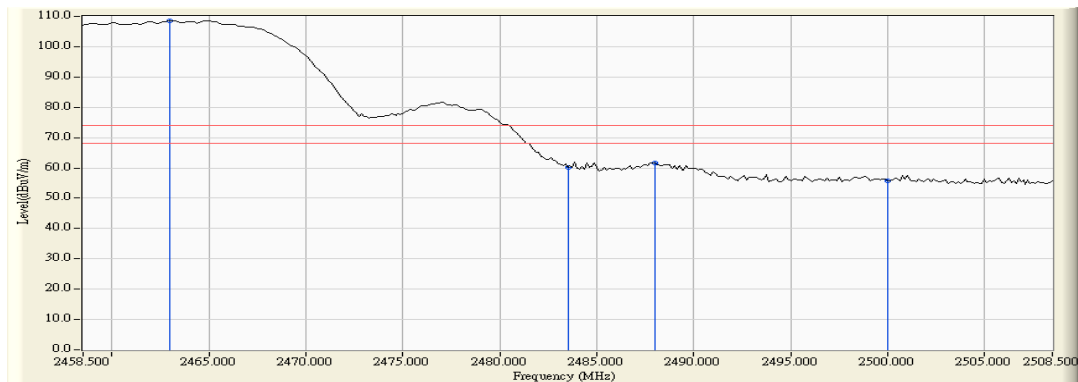
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Vertical)	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11(Peak)	2488.000	-1.922	63.622	61.699	74.00	54.00	Pass
11(Average)	2488.000	-1.922	50.992	49.069	74.00	54.00	Pass

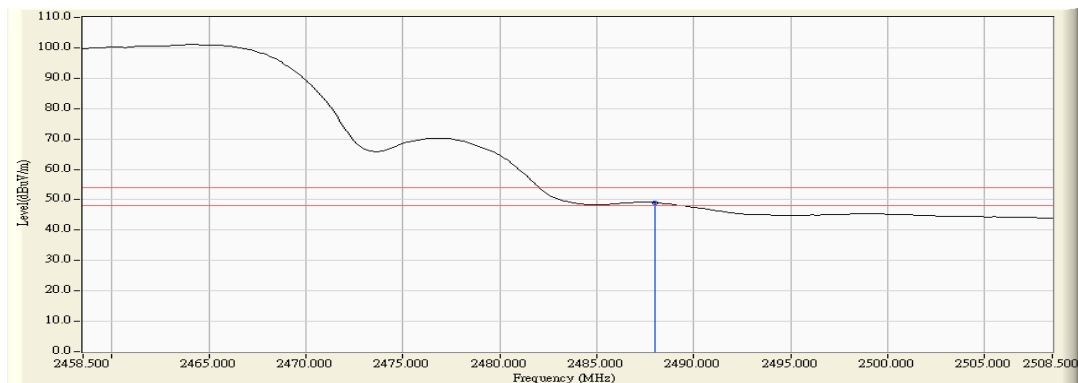
Figure Channel 11: (Vertical) (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Figure Channel 11: (Vertical) (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2)

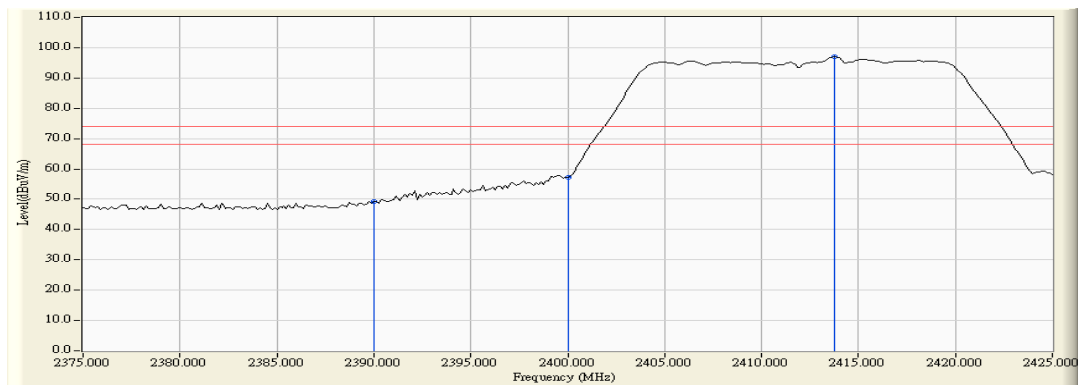
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Horizontal)	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	51.493	49.116	74.00	54.00	Pass
1 (Average)	--	--	--	--	74.00	54.00	Pass

Figure Channel 1: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2)

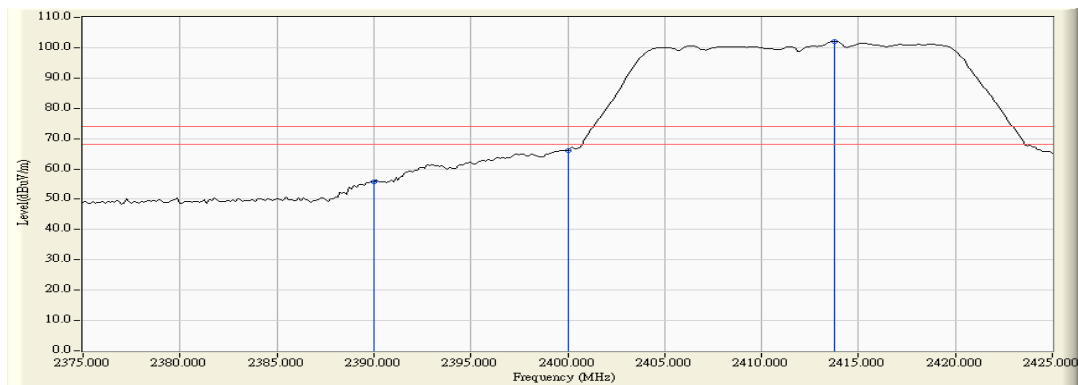
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
1 (Vertical)	<2400	>20	Pass

RF Radiated Measurement (Vertical):

Channel	Frequency (MHz)	Correct Fcator (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
1 (Peak)	2390.000	-2.378	58.014	55.637	74.00	54.00	Pass
1 (Average)	2390.000	-2.378	42.947	40.570	74.00	54.00	Pass

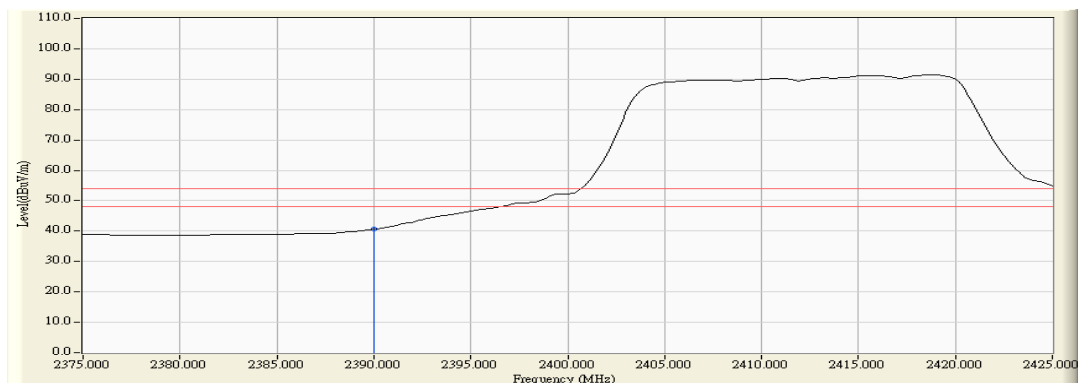
Figure Channel 1: Vertical (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Figure Channel 1: Vertical (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms.

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2)

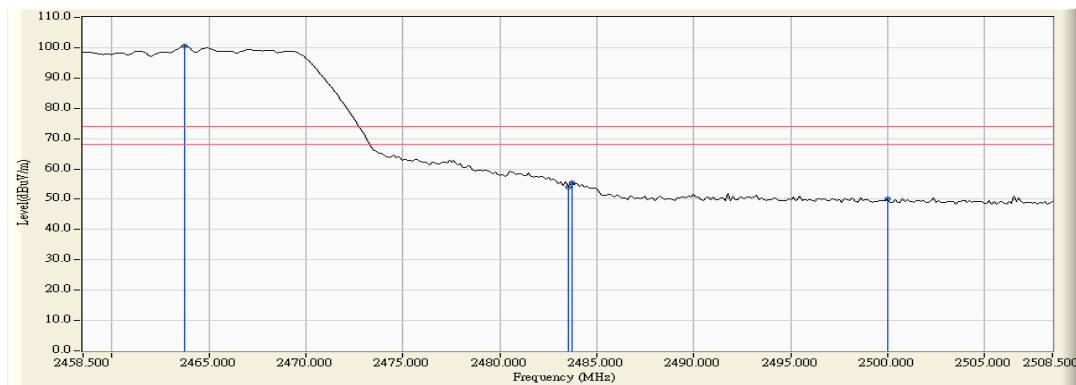
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Horizontal)	>2483.5	>20	Pass

RF Radiated Measurement (Horizontal):

Channel	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11(Peak)	2483.750	-1.936	57.397	55.461	74.00	54.00	Pass
11(Average)	2483.750	-1.936	44.536	42.600	74.00	54.00	Pass

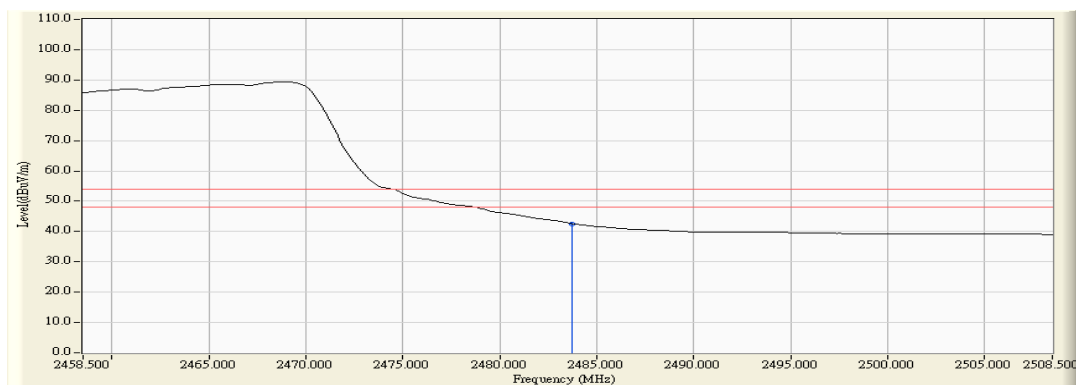
Figure Channel 11: Horizontal (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Figure Channel 11: Horizontal (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms

Product : Digital Set Top Box
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 4: Transmitter 802.11g - Antenna 2+Power Adapter(2)

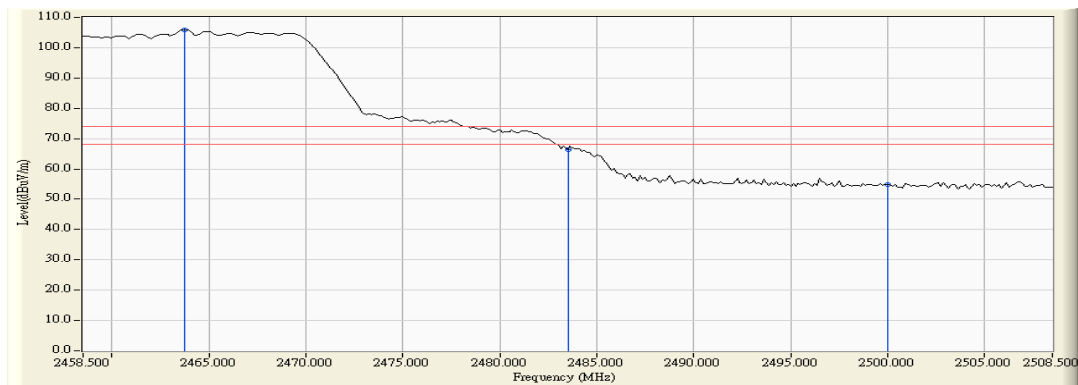
RF Radiated Measurement:

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
11 (Vertical)	>2483.5	>20	Pass

RF Radiated Measurement (Vertical):

Channel	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	68.378	66.441	74.00	54.00	Pass
11(Average)	2483.500	-1.937	52.765	50.828	74.00	54.00	Pass

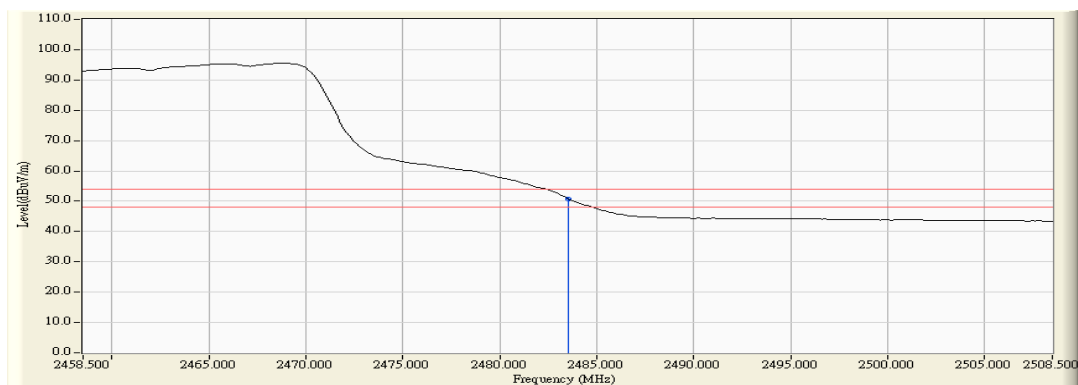
Figure Channel 11: (Vertical) (Peak)



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms.

Figure Channel 11: (Vertical) (Average)



Note:

RBW=1MHz, VBW=300Hz, Sweep Time=500ms.

6. Occupied Bandwidth

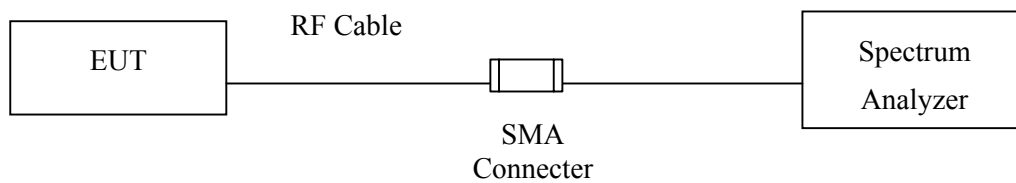
6.1. Test Equipment

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

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

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



6.3. Limits

The minimum bandwidth shall be at least 500kHz.

6.4. Uncertainty

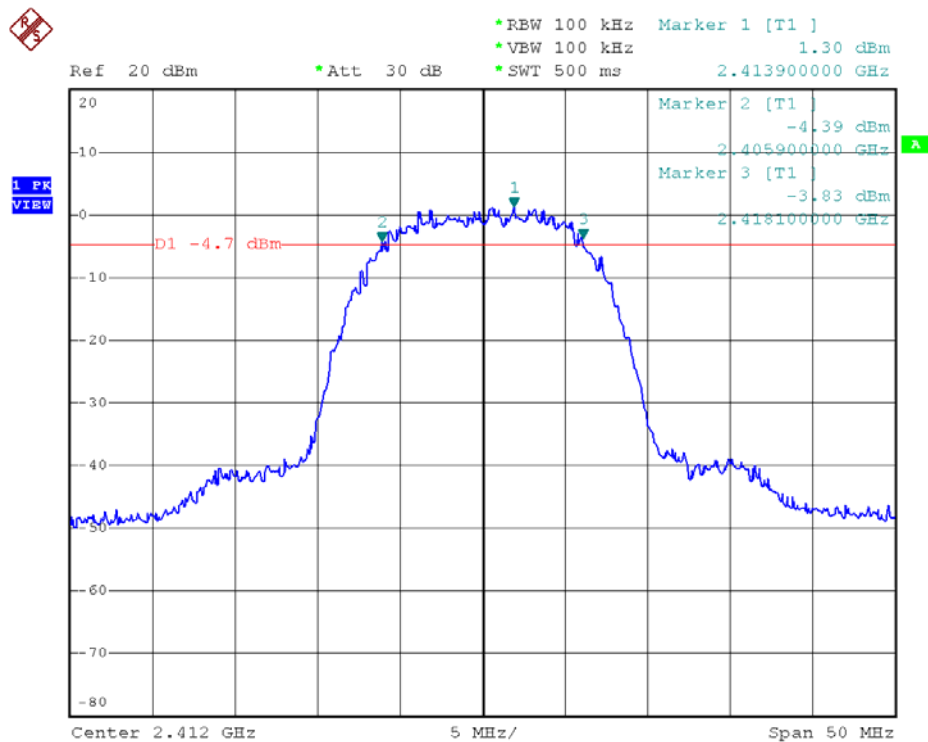
$\pm 150\text{Hz}$

6.5. Test Result of Occupied Bandwidth

Product : Digital Set Top Box
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1 (11Mbps)	2412.00	12200	>500	Pass

Figure Channel 1: 11Mbps



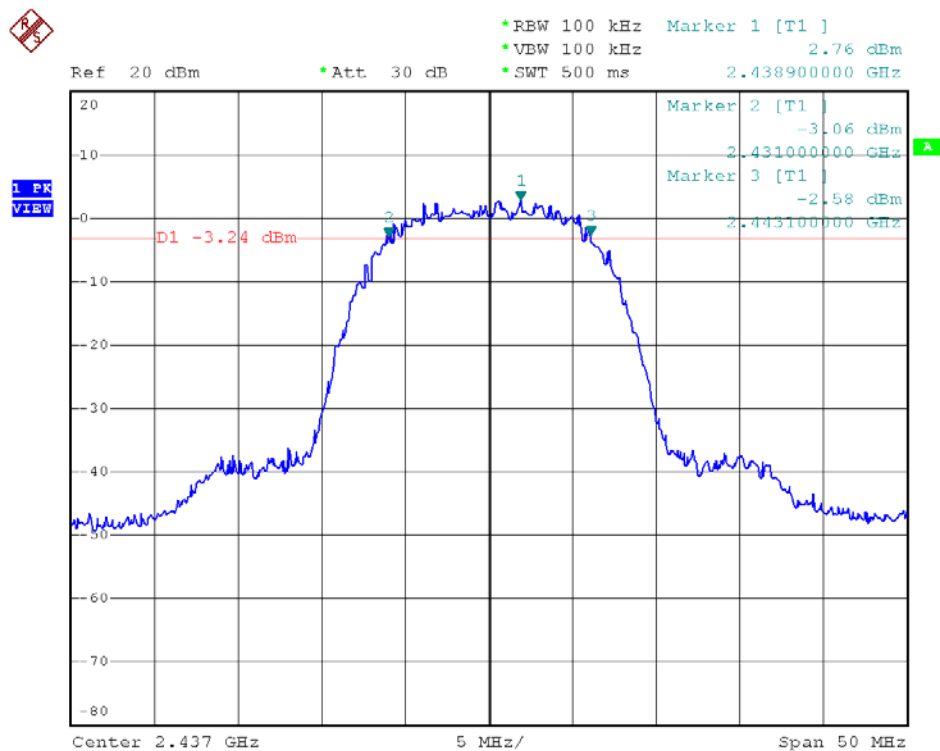
PN1

Date: 27.JUN.2007 09:21:44

Product : Digital Set Top Box
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6 (11Mbps)	2437.00	12100	>500	Pass

Figure Channel 6: 11Mbps



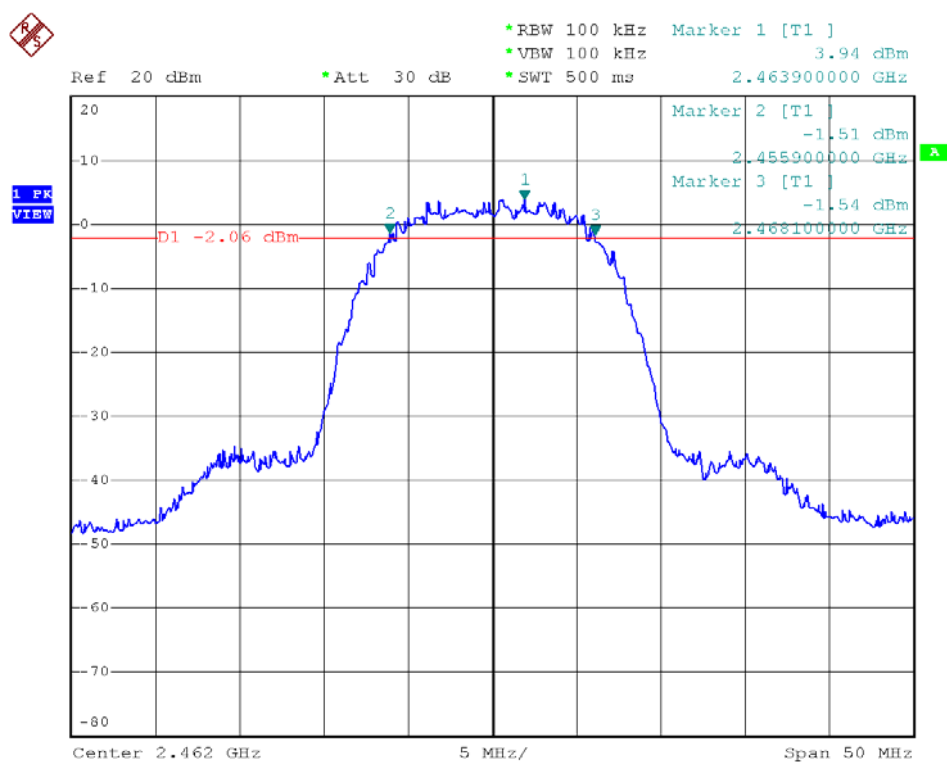
PN1

Date: 27.JUN.2007 09:23:28

Product : Digital Set Top Box
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11 (11Mbps)	2462.00	12200	>500	Pass

Figure Channel 11: 11Mbps



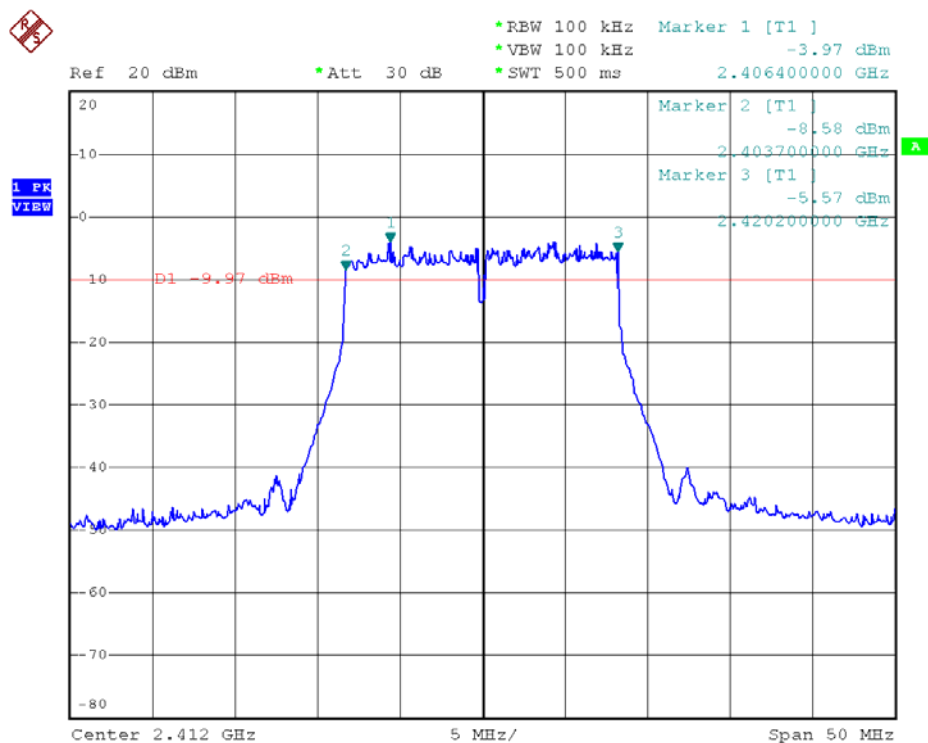
PN1

Date: 27.JUN.2007 09:25:12

Product : Digital Set Top Box
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1 (54Mbps)	2412.00	16500	>500	Pass

Figure Channel 1:



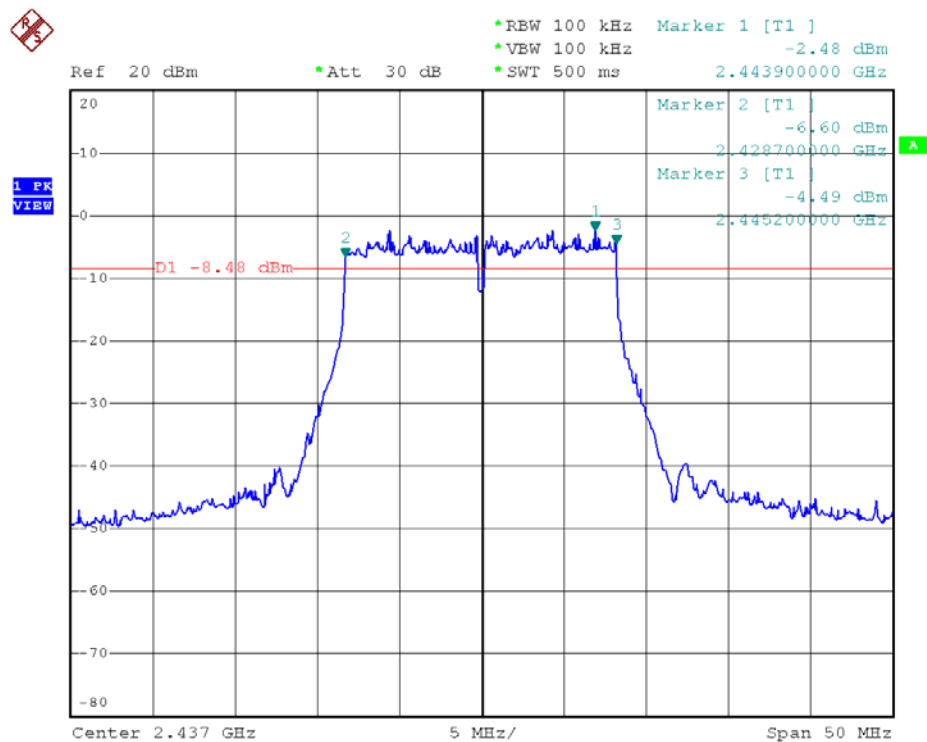
PN1

Date: 27.JUN.2007 09:27:06

Product : Digital Set Top Box
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6 (54Mbps)	2437.00	16500	>500	Pass

Figure Channel 6:



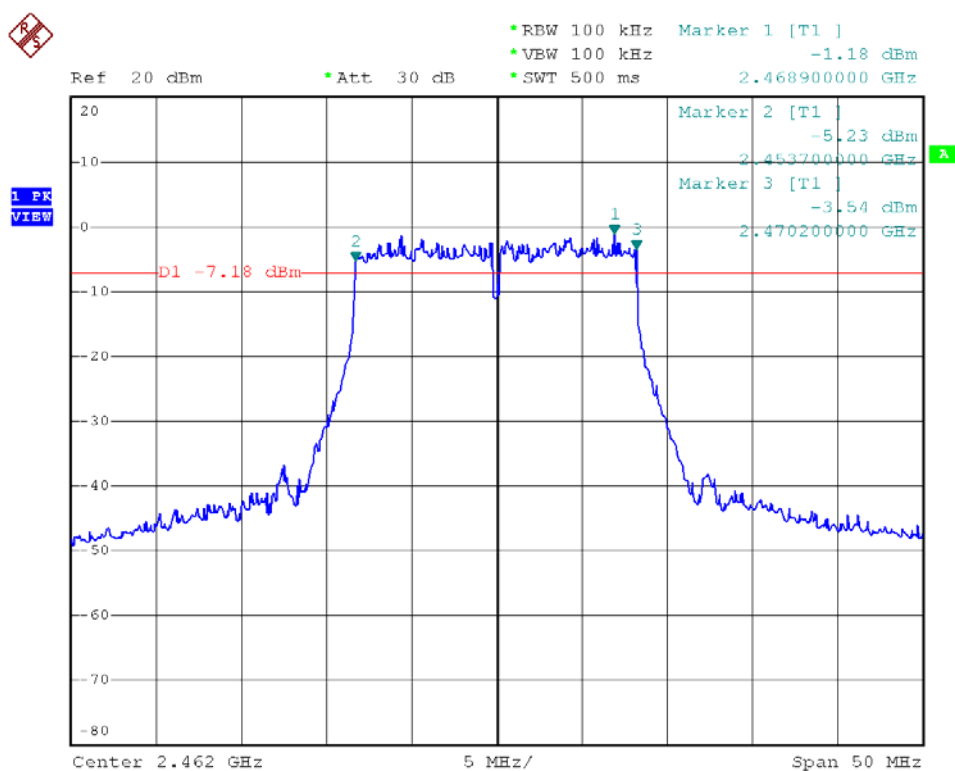
PN1

Date: 27.JUN.2007 09:28:17

Product : Digital Set Top Box
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11 (54Mbps)	2462.00	16500	>500	Pass

Figure Channel 11:



PN1

Date: 27.JUN.2007 09:29:23

7. Power Density

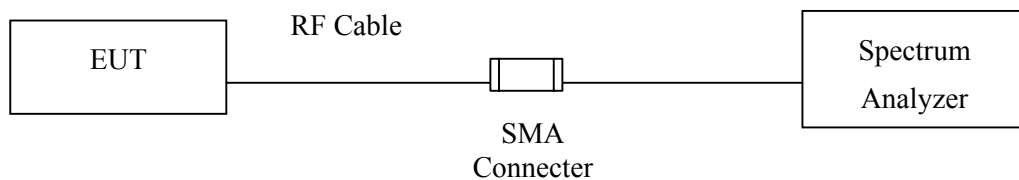
7.1. Test Equipment

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

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2007
X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2007

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. Limits

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

7.4. Uncertainty

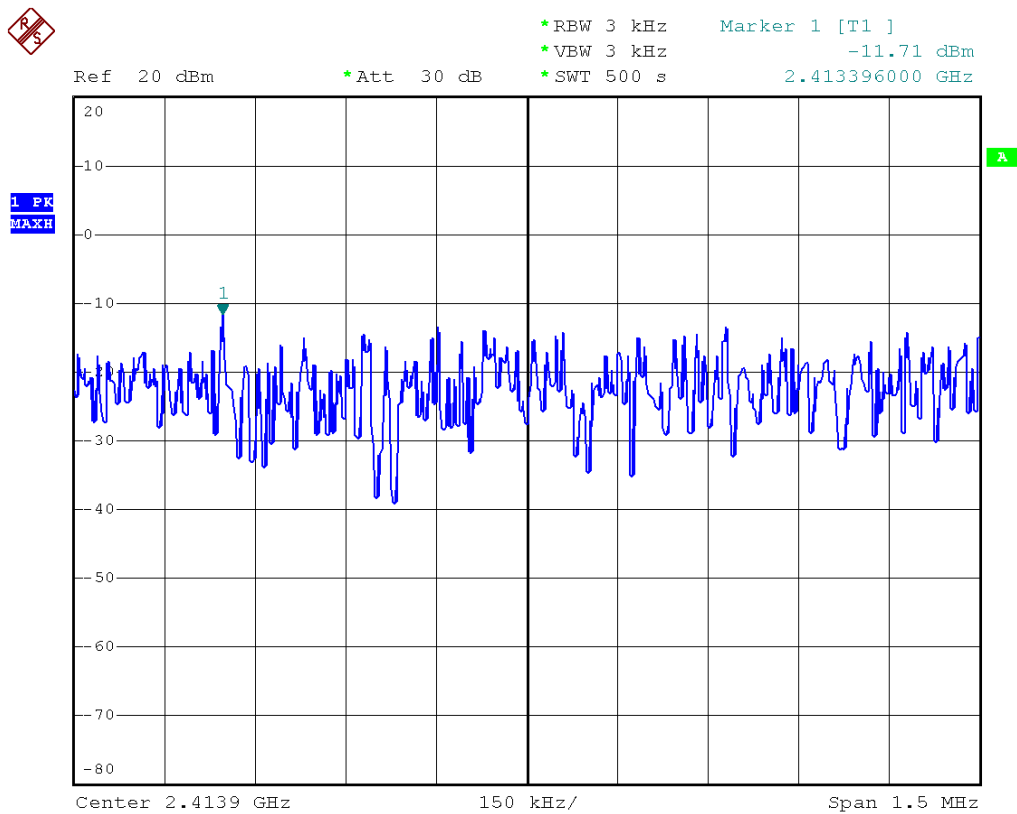
± 1.27 dB

7.5. Test Result of Power Density

Product : Digital Set Top Box
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2412MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1 (11Mbps)	2412.00	-11.71	< 8dBm	Pass

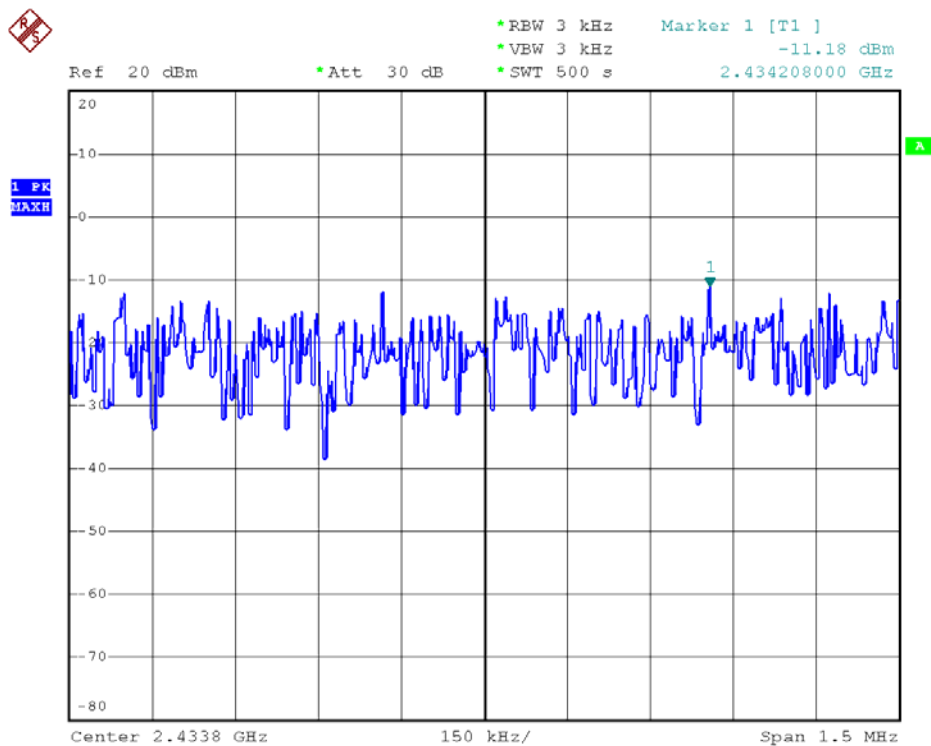
Figure Channel 1: 11Mbps



Product : Digital Set Top Box
 Test Item : Power Density Data
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
6 (11Mbps)	2437.000	-11.18	< 8dBm	Pass

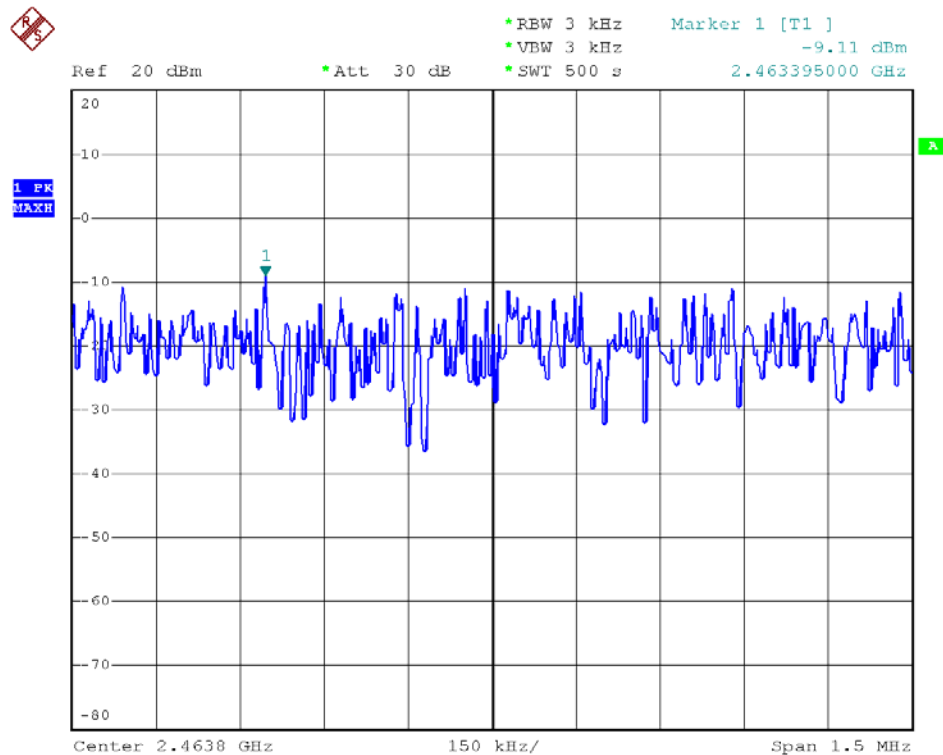
Figure Channel 6: 11Mbps



Product : Digital Set Top Box
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter 802.11b - Antenna 1+Power Adapter(1) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
11 (11Mbps)	2462.00	-9.11	< 8dBm	Pass

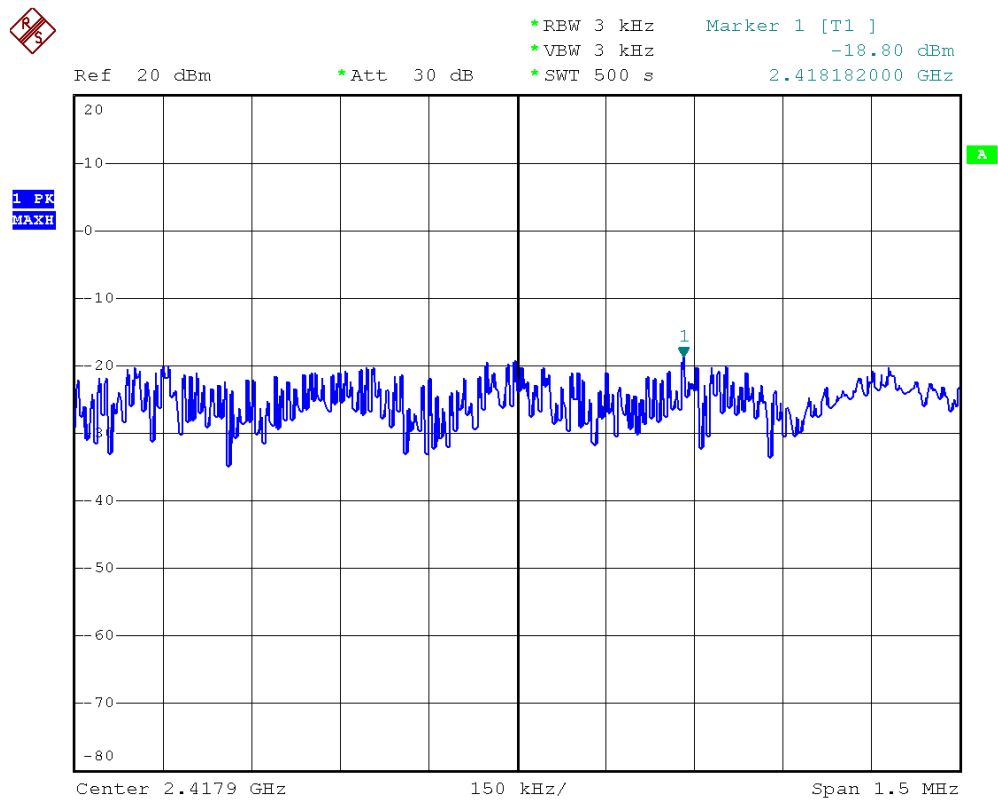
Figure Channel 11: 11Mbps



Product : Digital Set Top Box
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2412MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1 (54Mbps)	2412.00	-18.80	< 8dBm	Pass

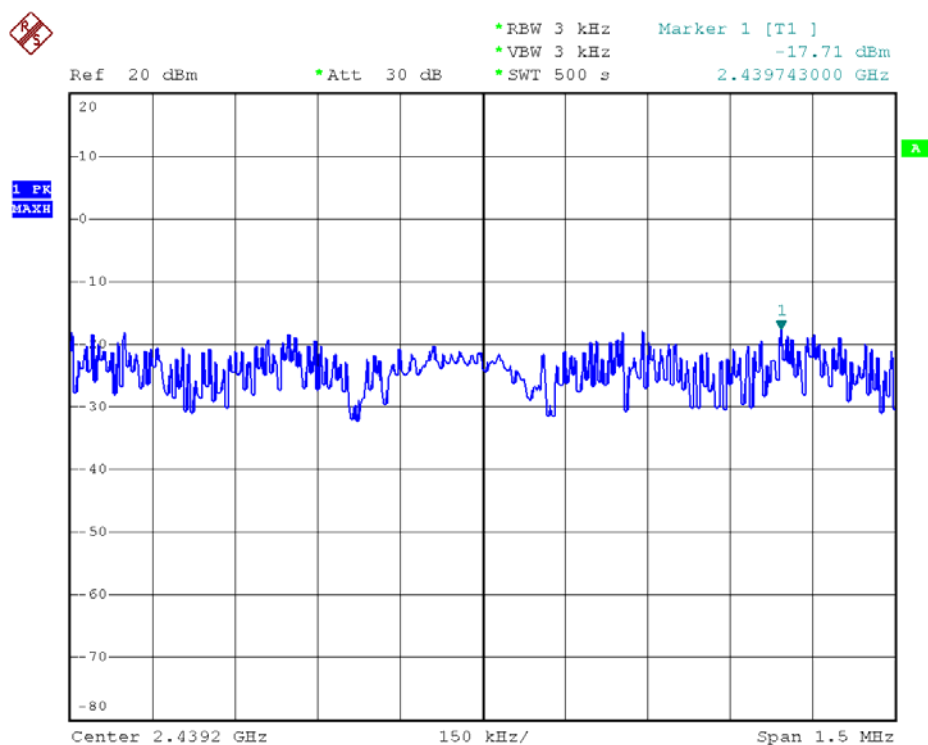
Figure Channel 1:



Product : Digital Set Top Box
 Test Item : Power Density Data
 Test Site : No.3OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
6 (54Mbps)	2437.000	-17.71	< 8dBm	Pass

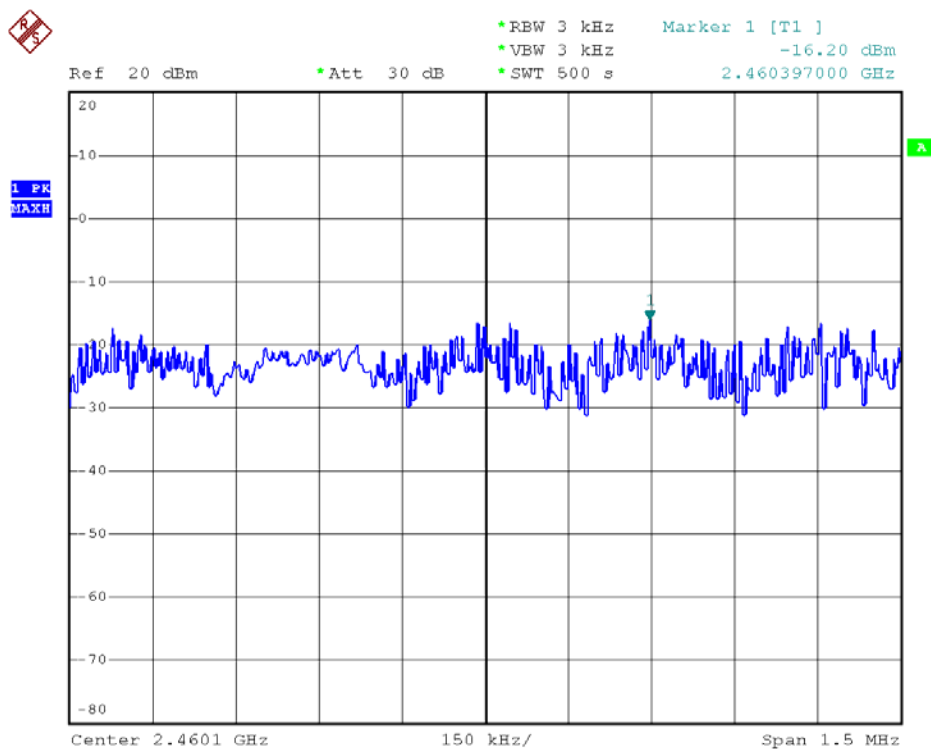
Figure Channel 6:



Product : Digital Set Top Box
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmitter 802.11g - Antenna 1+Power Adapter(1) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
11 (54Mbps)	2462.00	-16.20	< 8dBm	Pass

Figure Channel 11:



8. EMI Reduction Method During Compliance Testing

No modification was made during testing.