FCC PART 15.247

EMI MEASUREMENT AND TEST REPORT

For

UTStarcom Telecom Co.,Ltd.

No.368,Liuhe Road,Binjiang, Hangzhou ,P.R.C

FCC ID: O6Y-F1000G

August 4, 2005

This Report Concerns:	**Equipment Type:**
☒ Original Report	WIFI Handset

Test Engineer:	Jandy Su
Report No.:	RSH05063001
Test Date:	July 1-August 4, 2005
Reviewed By:	Chris Zeng
Prepared By:	Bay Area Compliance Lab Corp. (ShenZhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China Tel: +86-755-33320018 Fax: +86-755-33320008

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *UTStarcom Telecom Co.,Ltd.*'s product, model number: F1000G or the "EUT" as referred to in this report is a WIFI Handset, 802.11b/g which measures approximately 12.0 cm L x 4.3cmW x 2.2cmH. The EUT operates at the frequency range of 2412– 2472MHz, with maximum output power of 33.88mW (14.47dBm), rated input voltage: DC 3.6 V Battery, the EUT can be charging by AC 120 V/60 Hz adapter.

Adapter: Manufacturer: UTStarcom Telecom Co.,Ltd.
Model: S526005A
Input: 100-240 VAC 50-60 Hz 150mA
Output: 5.2 VDC 600mA

** The test data gathered are from production sample, serial number: 146753026, provided by the manufacturer.*

Objective

This Type approval report is prepared on behalf of UTStarcom Telecom Co.,Ltd. in accordance with Part 2, Subpart J, Part 15, Subparts A , B and C of the Federal Communication Commissions rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Lab Corp. (ShenZhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Lab Corp. (ShenZhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm

External I/O Cable

Cable Description	Length (M)	From/Port	To
Unshielded Detachable Earphone Cable	1.16	EUT	Earphone
Shielded Detachable DC Power Cable	1.80	EUT	Adapter

SYSTEM TEST CONFIGURATION

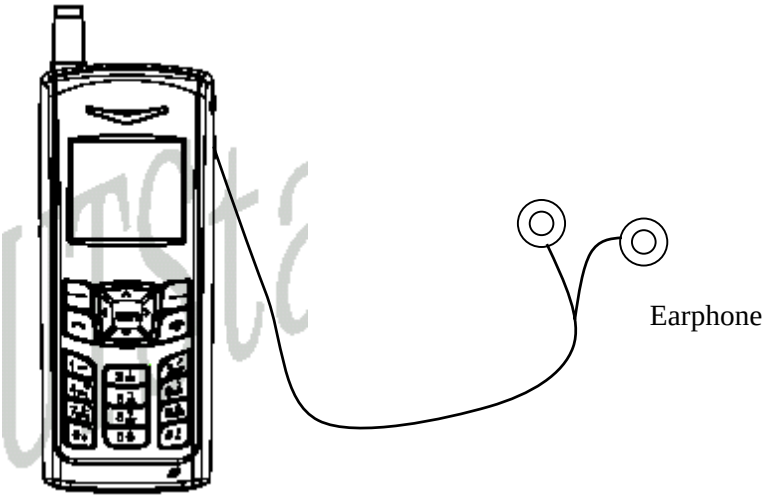
Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

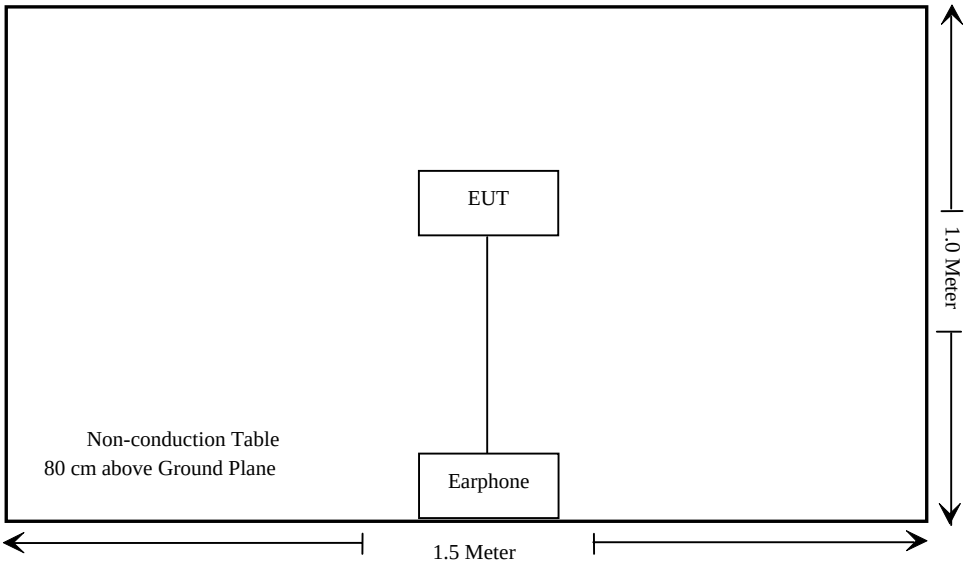
Bay Area Compliance Lab Corp. (ShenZhen) has not done any modification on the EUT.

Configuration of Test Setup



EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band	Compliant
§ 15.207 (a)	Conducted Emissions	Compliant
§2.1051	Spurious Emission at Antenna Port	Compliant
§15.209 (a)	Radiated Emission	Compliant *
§15.247 (a)(2)	6 dB Bandwidth	Compliant
§15.247 (b)(3)	Maximum Peak Output Power	Compliant
§ 15.247 (d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247 (e)	Peak Power Spectral Density	Compliant

*: Test data are within the measurement uncertainty.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (b) (4), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna for this device is an integral antenna with gain of 1.68dBi.

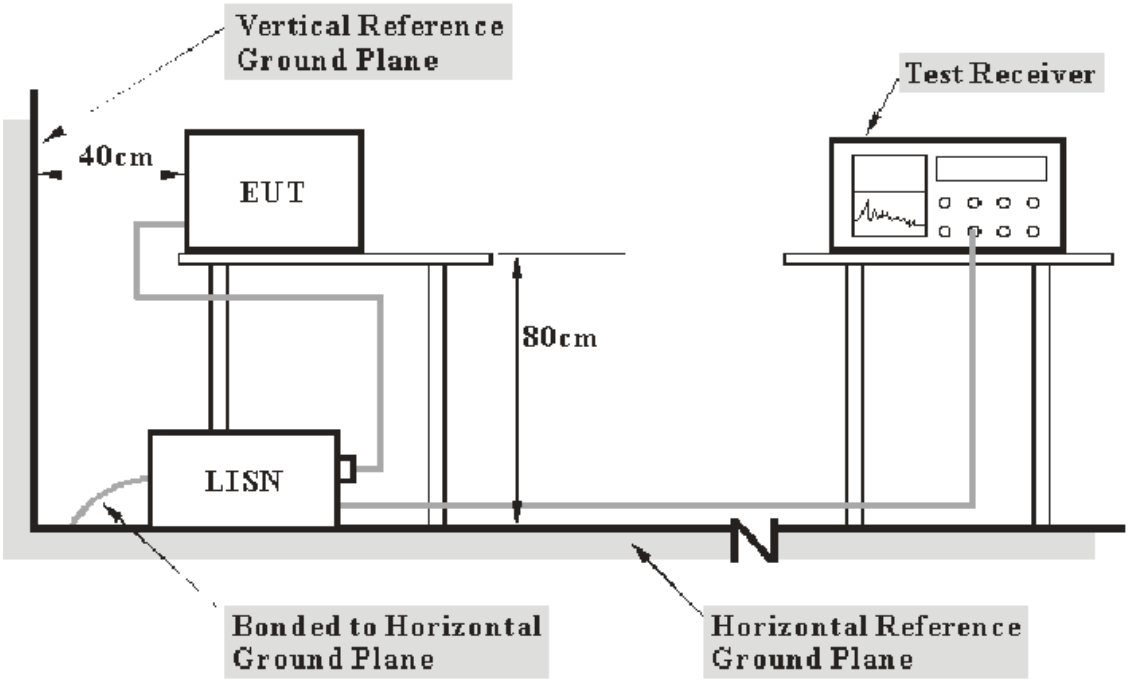
§15.207(a) - CONDUCTED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Lab Corp. (ShenZhen) is ±2.4 dB.

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	***IFBW***
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12008	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	830245/006	2005-1-26	2006-1-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2005-2-28	2006-2-28

***** Com-Power's LISN were used as the supporting equipment.
*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN.

Maximizing procedure were performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and Average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

-10.13 dB at **0.360 MHz** in the **Line** conductor mode.

Test Data

Environmental Conditions

Temperature:	28 ° C
Relative Humidity:	55%
ATM Pressure:	1000mbar

The testing was performed by Jandy Su on 2005-7-1.

Test Mode: Charging

LINE CONDUCTED EMISSIONS				FCC PART 15.207	
Frequency MHz	Amplitude dBµV	Detector QP/AV	Phase Line/Neutral	Limit dBµV	Margin dB
0.360	38.6	AV	Line	48.73	-10.13
0.540	34.6	AV	Line	46.00	-11.40
0.980	33.2	AV	Line	46.00	-12.80
0.980	42.7	QP	Line	56.00	-13.30
3.370	32.2	AV	Line	46.00	-13.80
0.720	32.0	AV	Line	46.00	-14.00
3.370	40.5	QP	Line	56.00	-15.50
0.300	34.0	AV	Line	50.24	-16.24
0.360	41.5	QP	Line	58.73	-17.23
0.390	30.6	AV	Neutral	48.06	-17.46
0.790	28.3	AV	Neutral	46.00	-17.70
0.540	37.7	QP	Line	56.00	-18.30
0.720	36.8	QP	Line	56.00	-19.20
0.790	36.6	QP	Neutral	56.00	-19.40
1.940	26.0	AV	Neutral	46.00	-20.00
1.210	25.6	AV	Neutral	46.00	-20.40
0.390	37.2	QP	Neutral	58.06	-20.86
2.780	23.4	AV	Neutral	46.00	-22.60
0.300	37.4	QP	Line	60.24	-22.84
2.780	32.3	QP	Neutral	56.00	-23.70
1.940	30.9	QP	Neutral	56.00	-25.10
1.030	29.5	QP	Neutral	56.00	-26.50
1.210	29.3	QP	Neutral	56.00	-26.70
1.030	19.1	AV	Neutral	46.00	-26.90

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Conduction Emission Test FCC 15

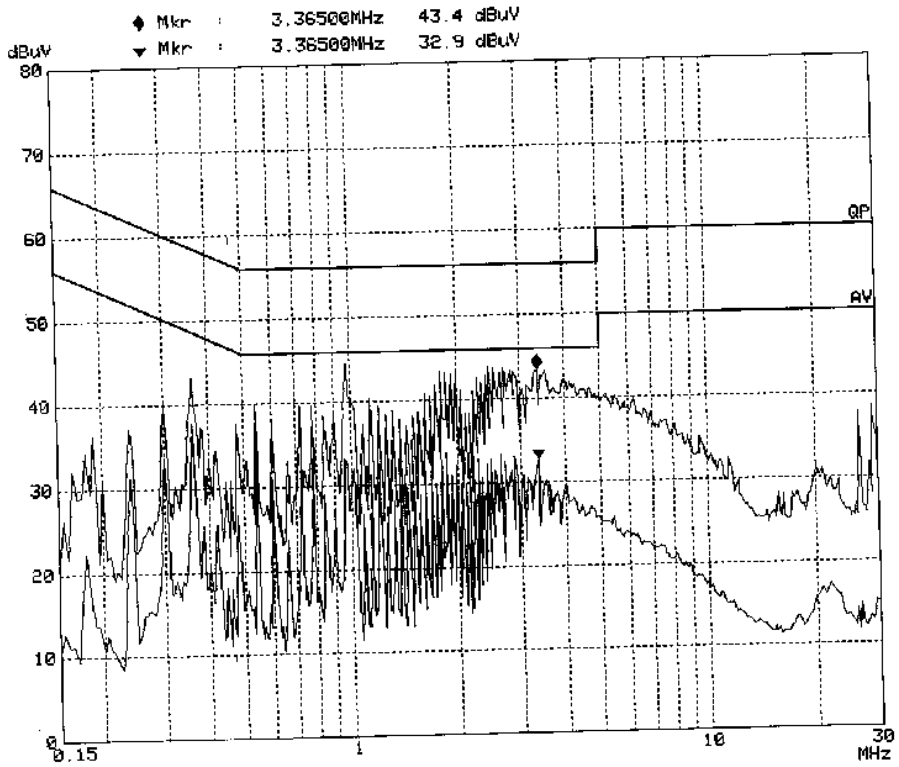
EUT:	WIFI Handset M/N:F1000g
Manuf:	UTStarcom
Op Cond:	Charging
Operator:	Jandy
Test Spec:	AC 120V/60Hz L
Comment:	Temp:28
	Humi:55%
Date:	01. Jul 05 15:17

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	10ms	AUTO	LN OFF

Transducer No.	Start	Stop	Name
1	9k	30M	ESH3

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



Conduction Emission Test
FCC 15

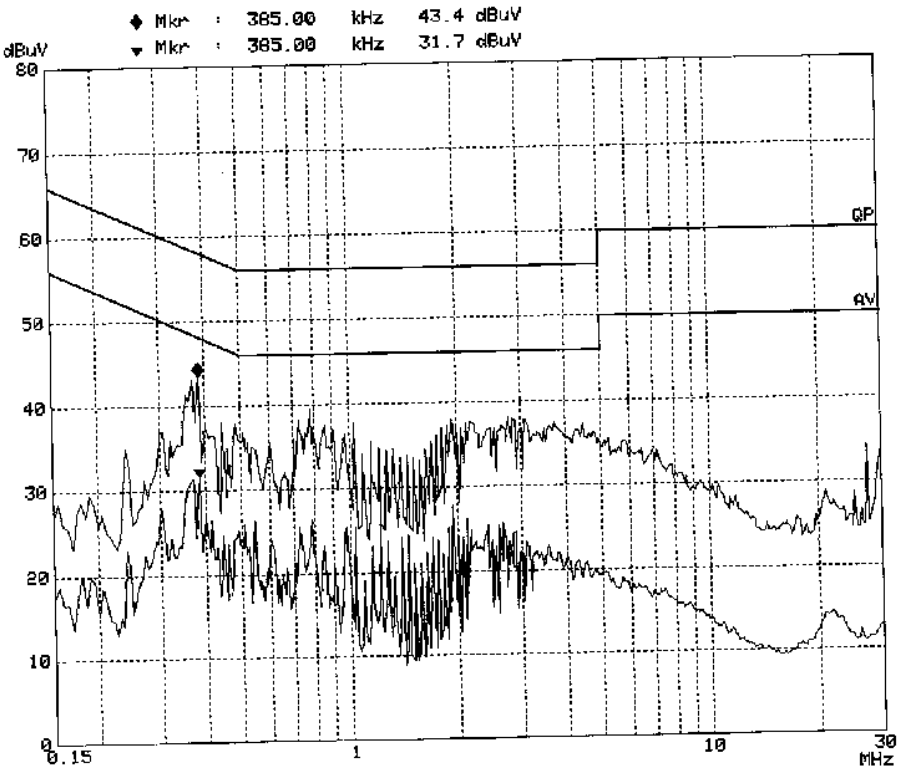
EUT: WIFI Handset M/N:F1000g
Manuf: UTStarcom
Op Cond: Charging
Operator: Jandy
Test Spec: AC 120V/60Hz N
Comment: Temp:28
Humi:55%
Date: 01. Jul 05 14:55

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
150k	30M	5k	9k	PK+AV	10ms	AUTO	LN OFF

Transducer No.	Start	Stop	Name
1	9k	30M	ESH3

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



§2.1051 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Requirements: CFR 47, § 2.1051.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 30 MHz-1 GHz: RBW 100 kHz, above 1 GHz: RBW 1 MHz, RF antenna conducted test: Set RBW = 100 kHz, Video bandwidth (VBW) >RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. * If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1032mbar

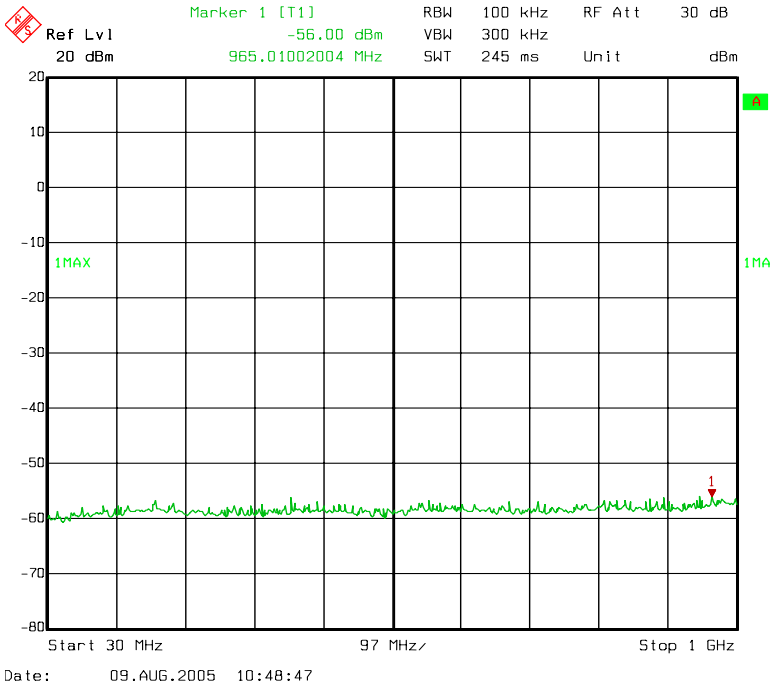
The testing was performed by Jandy Su on 2005-7-5 and 2005-7-21

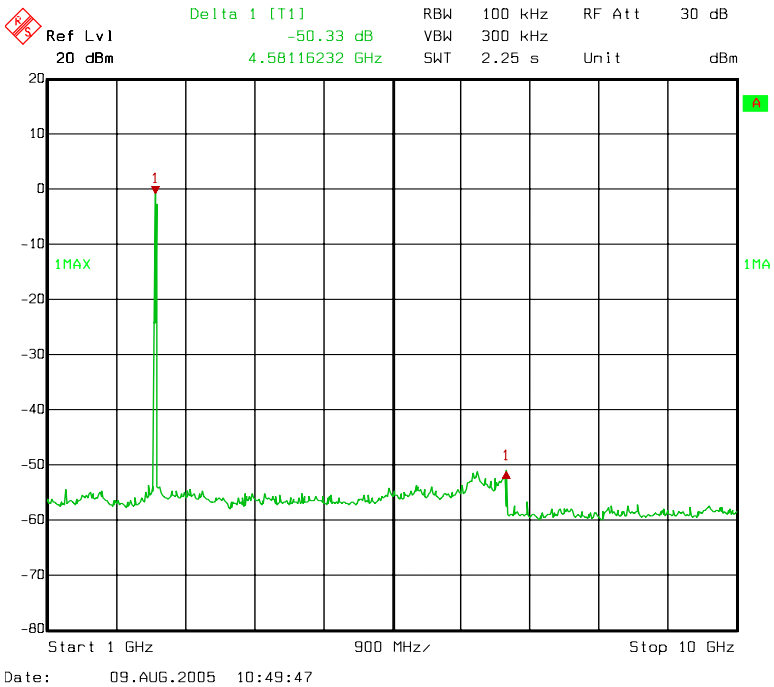
Test Result: Pass

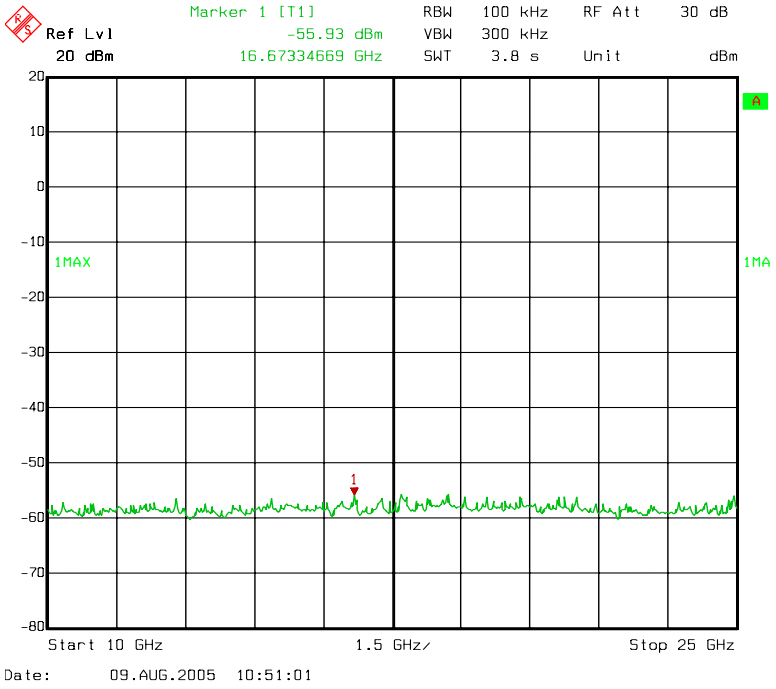
Test Mode: Transmitting

802.11b

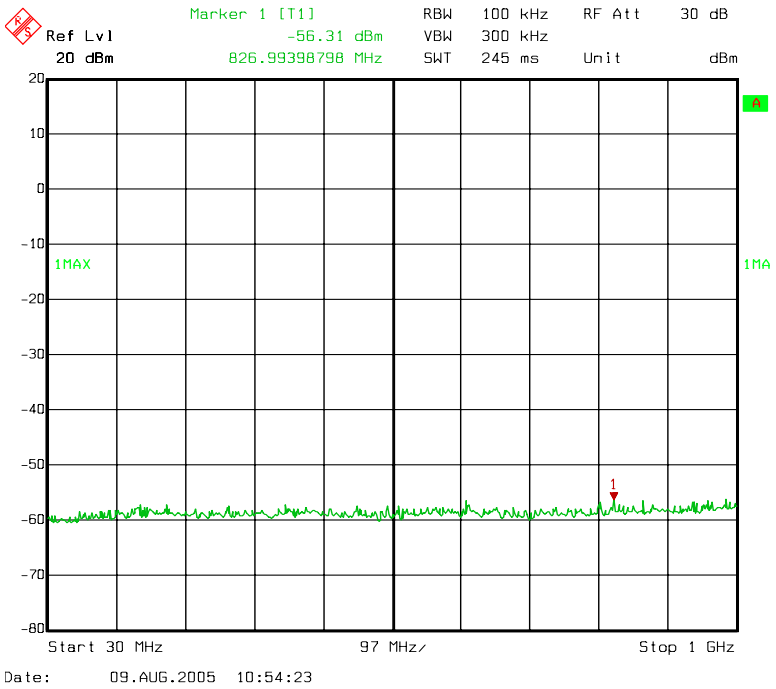
Channel 1

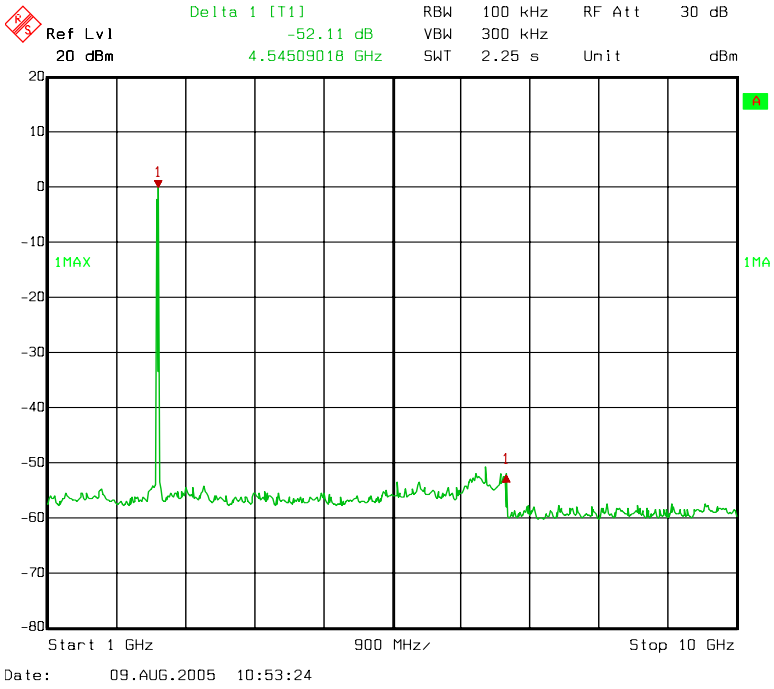


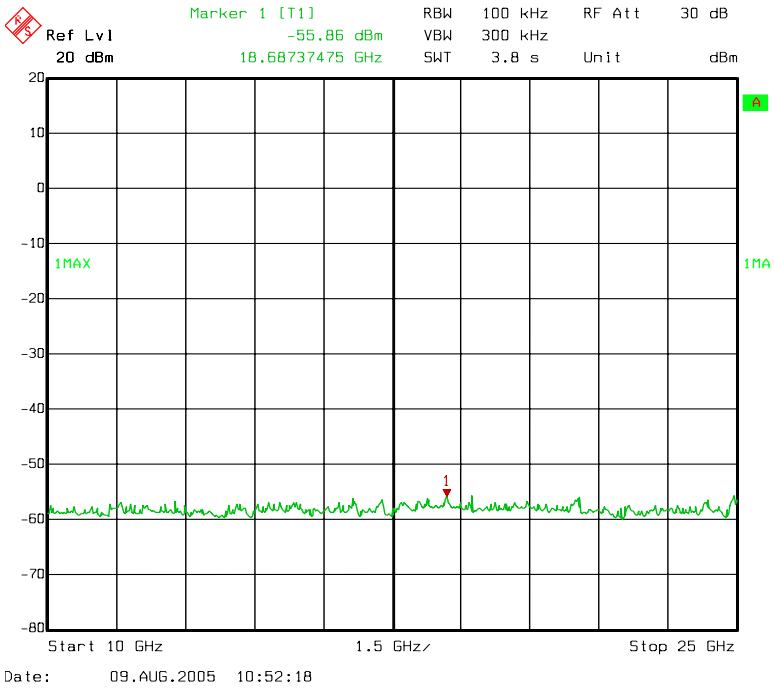



Marker 1 [T1]
Ref Lvl
20 dBm
-55.93 dBm
16.67334669 GHz
RBW 100 kHz
VBW 300 kHz
SWT 3.8 s
RF Att 30 dB
Unit dBm
A
1MAX
1MA
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 09.AUG.2005 10:51:01

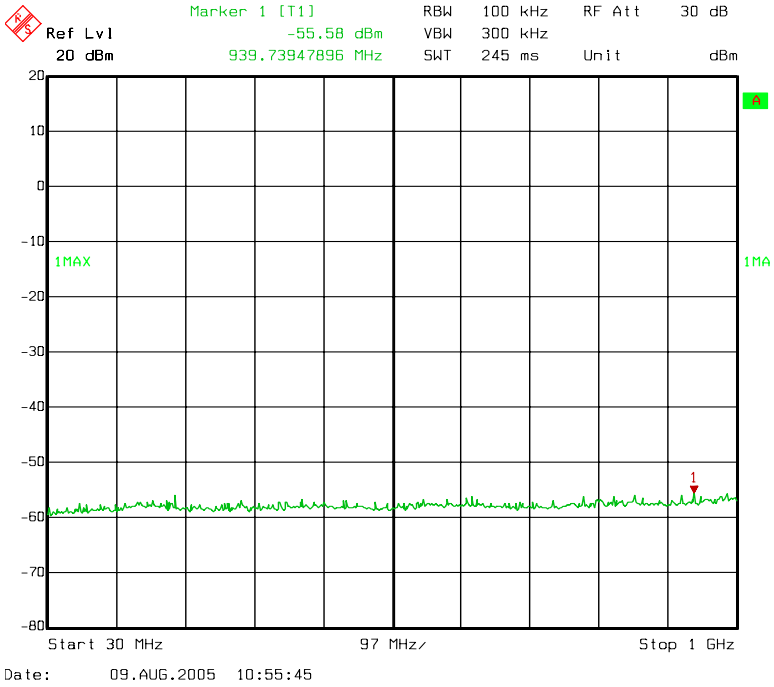
Channel 7

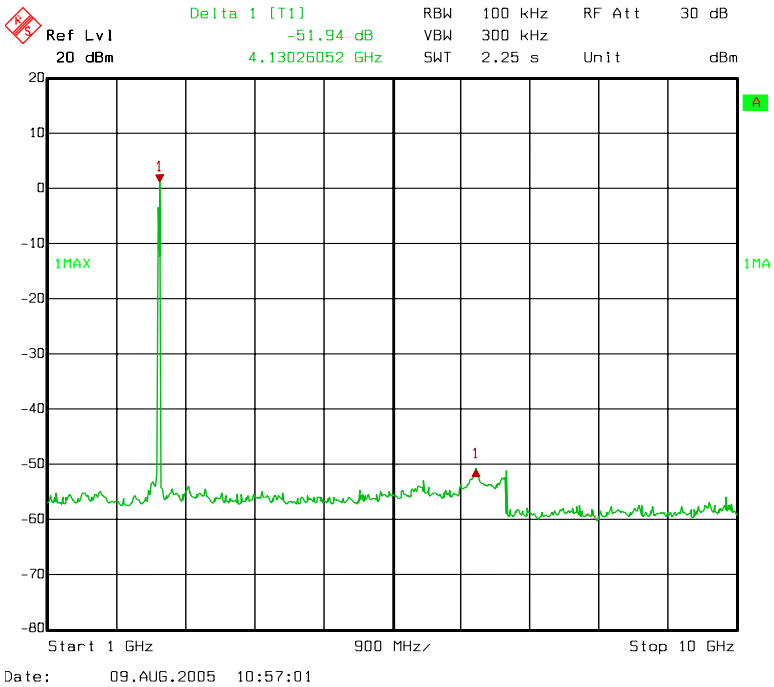

Marker 1 [T1]
Ref Lvl
20 dBm
-56.31 dBm
826.99398798 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 30 dB
Unit dBm
A
1MAX
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 09.AUG.2005 10:54:23

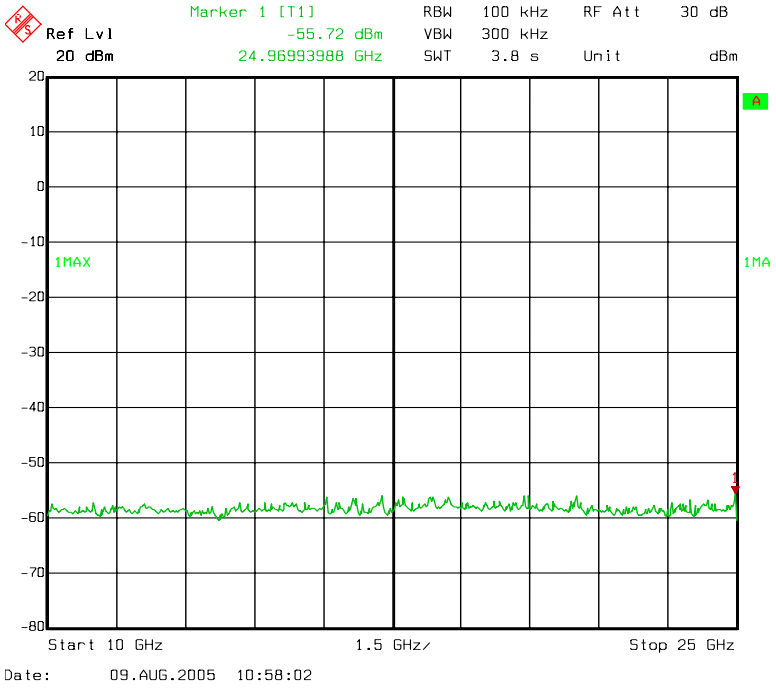

Delta 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-52.11 dB
VBW 300 kHz
20 dBm
4.54509018 GHz
SWT 2.25 s
Unit dBm
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1MAX
1MA
A
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 09.AUG.2005 10:53:24


Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-55.86 dBm
VBW 300 kHz
20 dBm
18.68737475 GHz
SWT 3.8 s
Unit dBm
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1MAX
1MA
A
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 09.AUG.2005 10:52:18

Channel 11

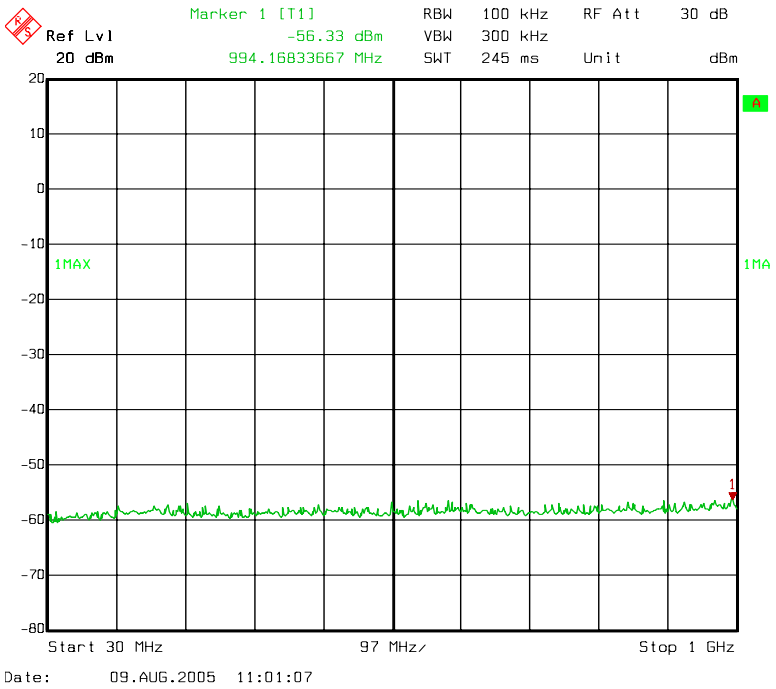

Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-55.58 dBm
VBW 300 kHz
20 dBm
939.73947896 MHz
SWT 245 ms
Unit dBm
A
1MAX
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 09.AUG.2005 10:55:45

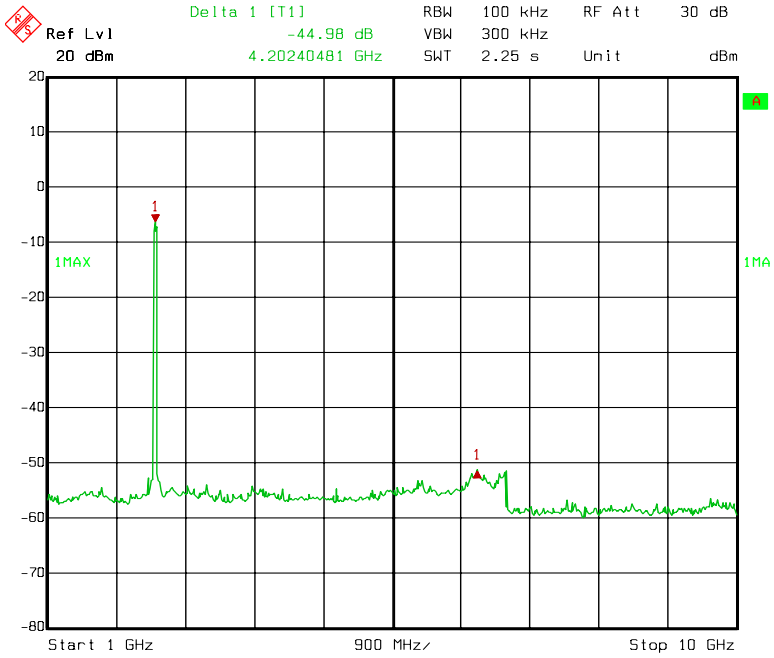

Delta 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-51.94 dB
VBW 300 kHz
20 dBm
4.13026052 GHz
SWT 2.25 s
Unit dBm
A
1MAX
1MA
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 09.AUG.2005 10:57:01

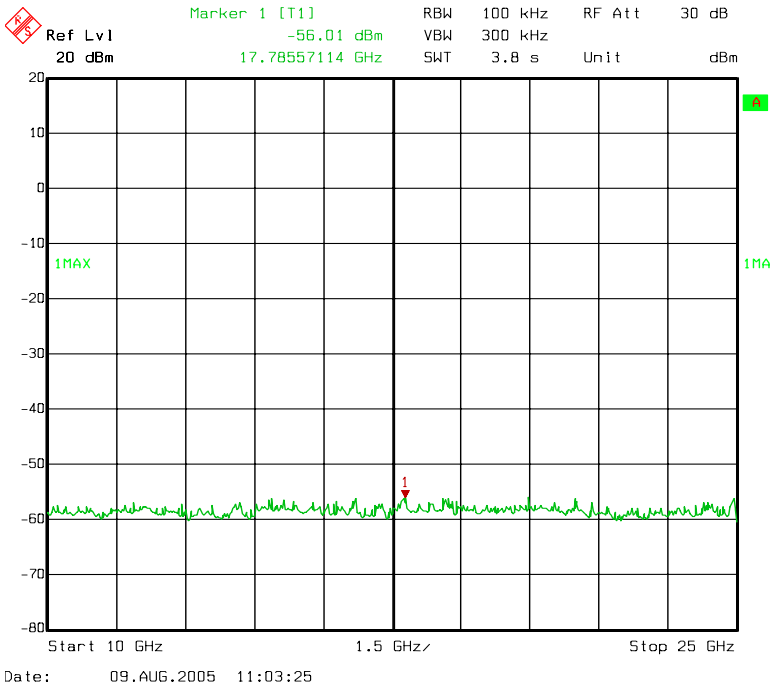


802.11g

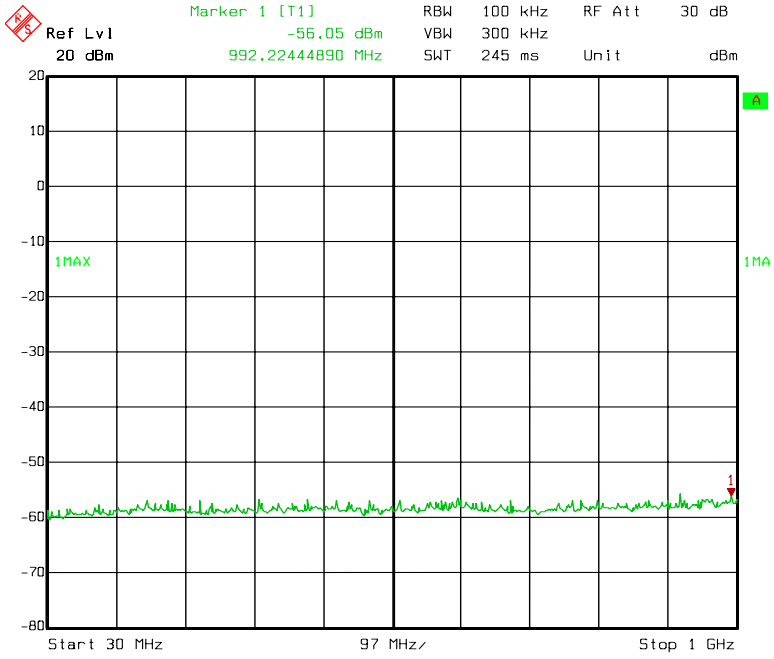
Channel 1

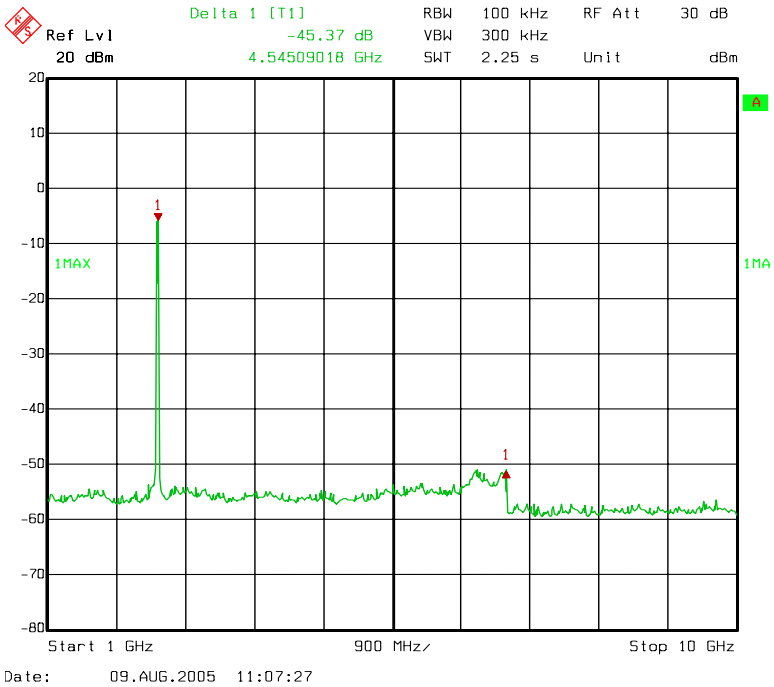


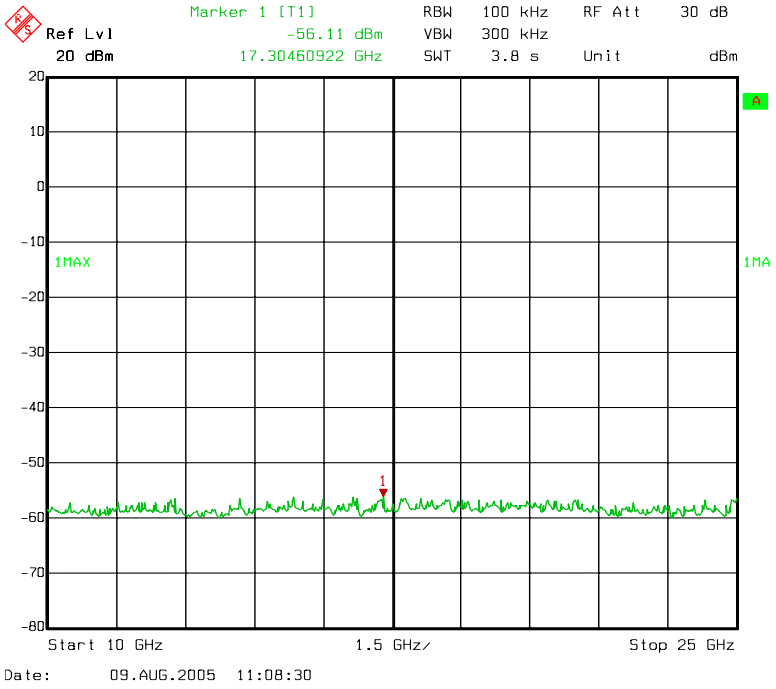

Delta 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-44.98 dB
VBW 300 kHz
20 dBm
4.20240481 GHz
SWT 2.25 s
Unit dBm
1MAX
1MA
A
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 09.AUG.2005 11:02:33


Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-56.01 dBm
VBW 300 kHz
20 dBm
17.78557114 GHz
SWT 3.8 s
Unit dBm
1MAX
1MA
A
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 09.AUG.2005 11:03:25

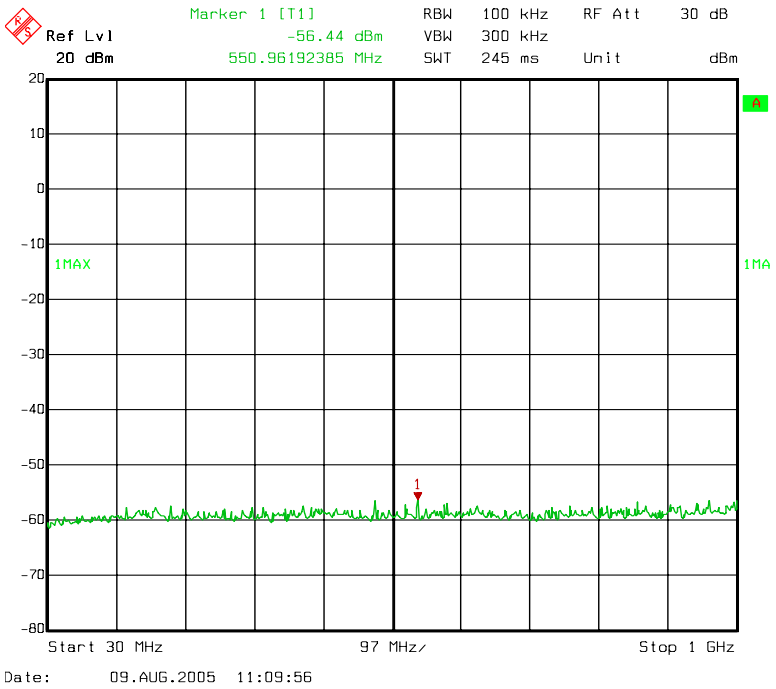
Channel 7

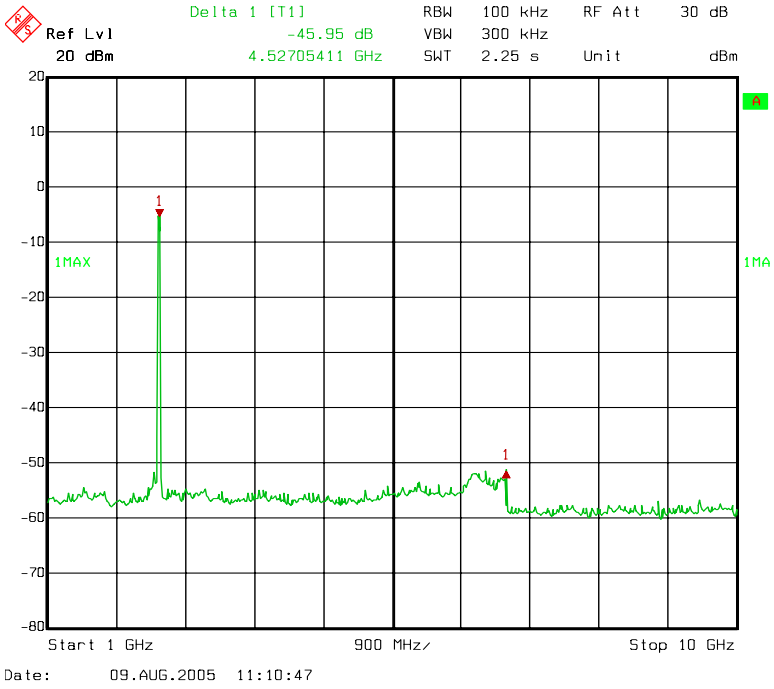

Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-56.05 dBm
VBW 300 kHz
20 dBm
992.22444890 MHz
SWT 245 ms
Unit dBm
1MAX
1MA
A
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 09.AUG.2005 11:05:21

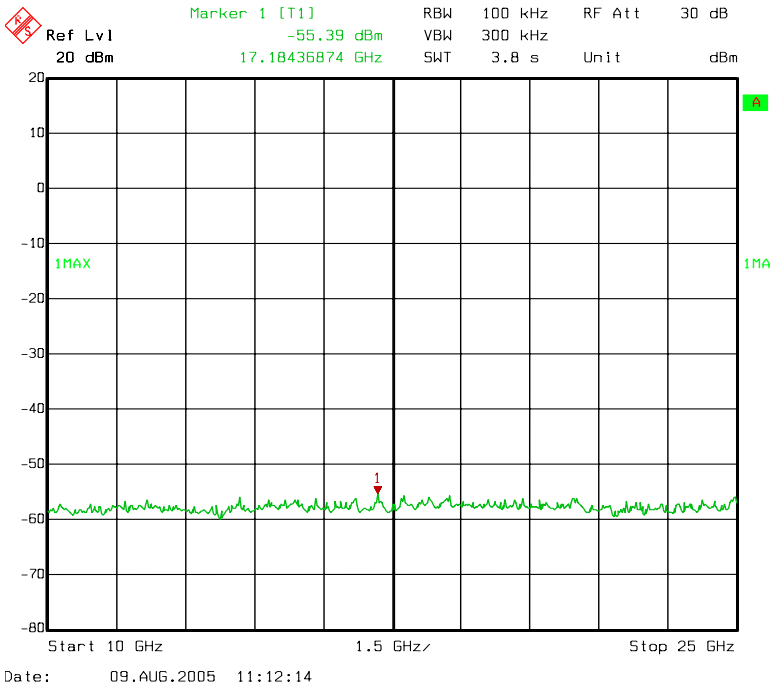

Delta 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-45.37 dB
VBW 300 kHz
20 dBm
4.54509018 GHz
SWT 2.25 s
Unit dBm
1MAX
1MA
A
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 09.AUG.2005 11:07:27


Marker 1 [T1]
Ref Lvl
20 dBm
-56.11 dBm
17.30460922 GHz
RBW 100 kHz
VBW 300 kHz
SWT 3.8 s
RF Att 30 dB
Unit dBm
1MAX
1MA
A
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 09.AUG.2005 11:08:30

Channel 11


Marker 1 [T1]
Ref Lvl
20 dBm
-56.44 dBm
550.96192385 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 30 dB
Unit dBm
1MAX
1MA
A
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 09.AUG.2005 11:09:56


Delta 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-45.95 dB
VBW 300 kHz
20 dBm
4.52705411 GHz
SWT 2.25 s
Unit dBm
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
A
1MAX
1MA
1
1
Start 1 GHz
900 MHz/
Stop 10 GHz
Date: 09.AUG.2005 11:10:47


Marker 1 [T1]
RBW 100 kHz
RF Att 30 dB
Ref Lvl
-55.39 dBm
VBW 300 kHz
20 dBm
17.18436874 GHz
SWT 3.8 s
Unit dBm
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
A
1MAX
1MA
1
Start 10 GHz
1.5 GHz/
Stop 25 GHz
Date: 09.AUG.2005 11:12:14

§15.205 & §15.209 - SPURIOUS RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (AVrage), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Lab Corp. (ShenZhen) is ±4.0 dB.

According to §15.205, except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
[1]0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.57725	240 – 285	3345.8 – 3358	36.43 – 36.5
13.36 – 13.41	322 – 335.4	3600 – 4400	([2])

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz
[2] Above 38.6

Except as provided in paragraph (d) and (e), the filed strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the AVrage value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

According to §15.209, the device shall meet radiated emission general requirements.

Except for Class A device, the filed strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (Microvolts/meter)	(dBμV/meter)
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	HP8657A	2849U00982	2005-2-28	2006-2-28
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10
SUNOL SCIENCES	Horn Antenna	DRH-118	A052604	2005-6-2	2006-6-2
A.H. System	Horn Antenna	SAS-200/571	135	2005-4-28	2006-4-28
Giga-tronics	Signal Generator	1026	270801	2005-2-28	2006-2-28

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "**Qp**" in the data table.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Loss + Cable Loss- Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - FCC 15.209 Limit

Test Results Summary

According to the data hereinafter, the EUT test data are within the measurement uncertainty ±4.0 dB, and had the worst margin of:

802.11b:

-16.30 dB at **4824.20 MHz** in the **Vertical** polarization, Channel 1

-21.40 dB at **4883.90 MHz** in the **Horizontal** polarization, Channel 7

-22.00 dB at **4924.30 MHz** in the **Vertical** polarization, Channel 11

-5.38 dB at **42.00 MHz** in the **Horizontal** polarization, Unintentional Emission

802.11g:

-20.10 dB at **4824.20 MHz** in the **Vertical** polarization, Channel 1

-27.80 dB at **7327.80 MHz** in the **Horizontal** polarization, Channel 7

-25.54 dB at **4924.30 MHz** in the **Vertical** polarization, Channel 11

-3.71 dB at **30.00 MHz** in the **Horizontal** polarization, Unintentional Emission

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1032mbar

The testing was performed by Jandy Su on 2005-7-7 and 2005-7-14

Test Mode: Transmitting

Radiated Emission Test Result for 802.11b

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency MHz	Meter Reading dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna Loss dB	Cable Loss dB	Amp. Gain dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Channel 1, 1-25GHz											
4824.20	31.70	AV	60	1.6	V	33.8	5.2	33.00	37.70	54	-16.30
4824.20	31.40	AV	180	1.6	H	33.8	5.2	33.00	37.40	54	-16.60
4824.20	40.30	PK	60	1.6	V	33.8	5.2	33.00	46.3	74	-27.70
4824.20	39.40	PK	180	1.6	H	33.8	5.2	33.00	45.4	74	-28.60
9648.40	14.58	AV	60	1.6	H	38.0	7.0	34.72	24.86	54	-29.14
9648.40	14.20	AV	120	1.5	V	38.0	7.0	34.72	24.48	54	-29.52
7237.10	14.50	AV	180	1.6	V	36.8	6.0	33.50	23.80	54	-30.20
7237.10	13.30	AV	120	1.5	H	36.8	6.0	33.50	22.60	54	-31.40
9648.40	24.10	PK	120	1.5	V	38.0	7.0	34.72	34.4	74	-39.62
9648.40	23.64	PK	60	1.6	H	38.0	7.0	34.72	33.9	74	-40.08
7237.10	23.42	PK	180	1.6	V	36.8	6.0	33.50	32.7	74	-41.28
7237.10	22.50	PK	120	1.5	H	36.8	6.0	33.50	31.8	74	-42.20
Channel 7, 1-25GHz											
4883.90	26.60	AV	180	1.6	H	33.8	5.2	33.00	32.60	54	-21.40
4883.90	26.40	AV	60	1.6	V	33.8	5.2	33.00	32.40	54	-21.60
7327.80	18.70	AV	180	1.6	V	36.8	6.0	33.50	28.00	54	-26.00
7327.80	18.60	AV	120	1.5	H	36.8	6.0	33.50	27.90	54	-26.10
9768.60	16.20	AV	60	1.6	H	38.0	7.0	34.72	26.48	54	-27.52
9768.60	15.60	AV	120	1.5	V	38.0	7.0	34.72	25.88	54	-28.12
4883.90	35.40	PK	60	1.6	V	33.8	5.2	33.00	41.4	74	-32.60
4883.90	35.30	PK	180	1.6	H	33.8	5.2	33.00	41.3	74	-32.70
7327.80	29.60	PK	180	1.6	V	36.8	6.0	33.50	38.9	74	-35.10
7327.80	27.50	PK	120	1.5	H	36.8	6.0	33.50	36.8	74	-37.20
9768.60	24.70	PK	120	1.5	V	38.0	7.0	34.72	35.0	74	-39.02
9768.60	24.30	PK	60	1.6	H	38.0	7.0	34.72	34.6	74	-39.42
Channel 11, 1-25GHz											
4924.30	26.00	AV	60	1.6	V	33.8	5.2	33.00	32.00	54	-22.00
4924.30	23.24	AV	180	1.6	H	33.8	5.2	33.00	29.24	54	-24.76
7386.50	16.35	AV	120	1.5	H	36.8	6.0	33.50	25.65	54	-28.35
7386.50	16.20	AV	180	1.6	V	36.8	6.0	33.50	25.50	54	-28.50
9848.60	15.22	AV	60	1.6	H	38.0	7.0	34.72	25.50	54	-28.50
9848.60	14.35	AV	120	1.5	V	38.0	7.0	34.72	24.63	54	-29.37
4924.30	35.70	PK	60	1.6	V	33.8	5.2	33.00	41.7	74	-32.30
4924.30	29.60	PK	180	1.6	H	33.8	5.2	33.00	35.6	74	-38.40
7386.50	25.40	PK	180	1.6	V	36.8	6.0	33.50	34.7	74	-39.30
9848.60	24.00	PK	60	1.6	H	38.0	7.0	34.72	34.3	74	-39.72
7386.50	24.70	PK	120	1.5	H	36.8	6.0	33.50	34.0	74	-40.00
9848.60	23.40	PK	120	1.5	V	38.0	7.0	34.72	33.7	74	-40.32

30MHz – 1GHz

Indicated				Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Meter Reading dBμV/m	Comments	Direction Degree	Height Meter	Polar H/V	Antenna Loss dB	Cable Loss dB	Amp. Gain dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
42.00	45.25	PK	45	1.0	H	14.3	1.51	26.44	34.62	40.0	-5.38
31.73	34.49	PK	289	1.0	V	24.1	1.37	26.44	33.52	40.0	-6.48
35.50	39.54	PK	289	1.0	V	17.7	1.65	26.46	32.43	40.0	-7.57
34.82	32.32	PK	60	1.2	H	24.1	1.37	26.44	31.35	40.0	-8.65
35.50	37.61	PK	35	3.8	H	17.7	1.65	26.46	30.50	40.0	-9.50
42.30	39.81	PK	45	1.2	V	14.3	1.51	26.44	29.18	40.0	-10.82
77.87	43.77	PK	45	1.2	H	8.6	1.37	26.34	27.40	40.0	-12.60
100.93	45.67	PK	35	3.8	H	9.6	1.48	26.23	30.52	43.5	-12.98
100.93	44.53	PK	60	1.0	V	9.6	1.48	26.23	29.38	43.5	-14.12
126.33	39.21	PK	180	1.2	V	14.4	1.45	25.98	29.08	43.5	-14.42
126.33	36.62	PK	90	1.2	H	14.4	1.45	25.98	26.49	43.5	-17.01
717.32	31.76	PK	45	1.0	V	20.3	2.90	26.07	28.89	46.0	-17.11

Radiated Emission Test Result for 802.11g

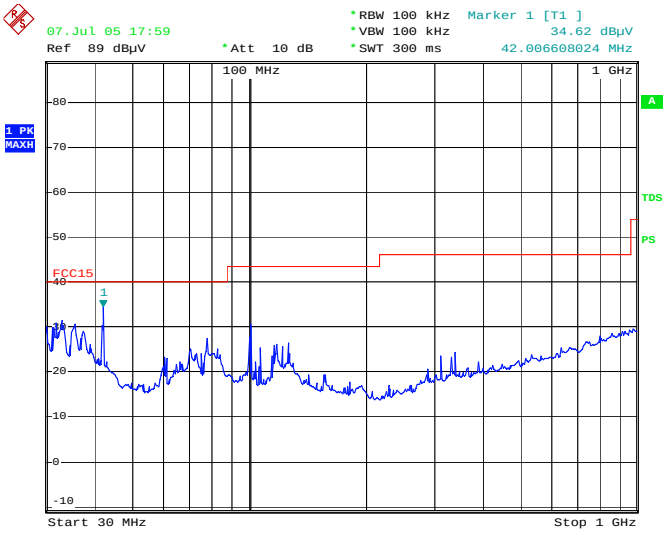
Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart C	
Frequency	Meter Reading	Comments	Angle	Height	Polar	Antenna Loss	Cable Loss	Amp. Gain	Corr. Ampl.	Limit	Margin
MHz	dBμV/m		Degree	Meter	H/ V	dB	dB	dB	dBμV/m	dBμV/m	dB
Channel 1, 1-25GHz											
4824.20	27.90	AV	60	1.6	V	33.8	5.2	33.00	33.90	54	-20.10
4824.20	27.50	AV	180	1.6	H	33.8	5.2	33.00	33.50	54	-20.50
7237.10	18.10	AV	120	1.5	H	36.8	6.0	33.50	27.40	54	-26.60
7237.10	17.30	AV	180	1.6	V	36.8	6.0	33.50	26.60	54	-27.40
9648.40	15.60	AV	60	1.6	H	38.0	7.0	34.72	25.88	54	-28.12
9648.40	15.52	AV	120	1.5	V	38.0	7.0	34.72	25.80	54	-28.20
4824.20	36.40	PK	60	1.6	V	33.8	5.2	33.00	42.4	74	-31.60
4824.20	35.80	PK	180	1.6	H	33.8	5.2	33.00	41.8	74	-32.20
7237.10	26.70	PK	120	1.5	H	36.8	6.0	33.50	36.0	74	-38.00
7237.10	26.30	PK	180	1.6	V	36.8	6.0	33.50	35.6	74	-38.40
9648.40	24.50	PK	120	1.5	V	38.0	7.0	34.72	34.8	74	-39.22
9648.40	24.20	PK	60	1.6	H	38.0	7.0	34.72	34.5	74	-39.52
Channel 7, 1-25GHz											
7327.80	16.90	AV	120	1.5	H	36.8	6.0	33.50	26.20	54	-27.80
9768.60	15.80	AV	120	1.5	V	38.0	7.0	34.72	26.08	54	-27.92
7327.80	16.70	AV	180	1.6	V	36.8	6.0	33.50	26.00	54	-28.00
4883.90	19.80	AV	180	1.6	H	33.8	5.2	33.00	25.80	54	-28.20
4883.90	19.60	AV	60	1.6	V	33.8	5.2	33.00	25.60	54	-28.40
9768.60	14.20	AV	60	1.6	H	38.0	7.0	34.72	24.48	54	-29.52
4883.90	29.20	PK	60	1.6	V	33.8	5.2	33.00	35.2	74	-38.80
9768.60	24.50	PK	120	1.5	V	38.0	7.0	34.72	34.8	74	-39.22
7327.80	25.40	PK	180	1.6	V	36.8	6.0	33.50	34.7	74	-39.30
7327.80	25.40	PK	120	1.5	H	36.8	6.0	33.50	34.7	74	-39.30
4883.90	26.70	PK	180	1.6	H	33.8	5.2	33.00	32.7	74	-41.30
9768.60	22.40	PK	60	1.6	H	38.0	7.0	34.72	32.7	74	-41.32
Channel 11, 1-25GHz											
4924.30	22.46	AV	60	1.6	V	33.8	5.2	33.00	28.46	54	-25.54
4924.30	20.45	AV	180	1.6	H	33.8	5.2	33.00	26.45	54	-27.55
9848.60	14.25	AV	120	1.5	V	38.0	7.0	34.72	24.53	54	-29.47
9848.60	14.22	AV	60	1.6	H	38.0	7.0	34.72	22.93	54	-31.07
7386.50	13.36	AV	180	1.6	V	36.8	6.0	33.50	22.66	54	-31.34
7386.50	12.65	AV	120	1.5	H	36.8	6.0	33.50	21.95	54	-32.05
4924.30	29.70	PK	180	1.6	H	33.8	5.2	33.00	35.7	74	-38.30
9848.60	24.90	PK	60	1.6	H	38.0	7.0	34.72	35.2	74	-38.82
4924.30	28.90	PK	60	1.6	V	33.8	5.2	33.00	34.9	74	-39.10
9848.60	24.50	PK	120	1.5	V	38.0	7.0	34.72	34.8	74	-39.22
7386.50	23.40	PK	180	1.6	V	36.8	6.0	33.50	32.7	74	-41.30
7386.50	19.50	PK	120	1.5	H	36.8	6.0	33.50	28.8	74	-45.20

30MHz – 1GHz

Indicated				Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Meter Reading dBμV/m	Comments	Direction Degree	Height Meter	Polar H/V	Antenna Loss dB	Cable Loss dB	Amp. Gain dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
30.00	27.26	PK	60	1.2	H	24.1	1.37	26.44	26.29	30.0	-3.71
30.21	31.21	PK	180	1.2	V	24.1	1.37	26.44	30.24	40.0	-9.76
47.66	42.15	PK	45	1.0	V	10.8	1.37	26.36	27.96	40.0	-12.04
958.79	31.88	PK	45	1.0	V	23.4	3.46	25.51	33.23	46.0	-12.77
46.34	39.64	PK	270	1.0	H	10.8	1.37	26.36	25.45	40.0	-14.55
81.78	39.04	PK	90	1.2	H	8.4	1.42	26.22	22.64	40.0	-17.36
339.59	35.50	PK	45	1.0	H	14.6	2.48	25.30	27.28	46.0	-18.72
159.23	35.13	PK	60	1.0	V	12.8	1.59	25.91	23.61	43.5	-19.89
160.35	34.42	PK	45	1.2	H	12.7	1.63	25.79	22.96	43.5	-20.54
139.36	32.56	PK	180	1.2	H	14.2	1.51	26.03	22.24	43.5	-21.26
92.79	38.50	PK	45	1.2	V	7.7	1.46	26.14	21.52	43.5	-21.98
339.59	31.48	PK	180	1.2	V	14.6	2.48	25.30	23.26	46.0	-22.74

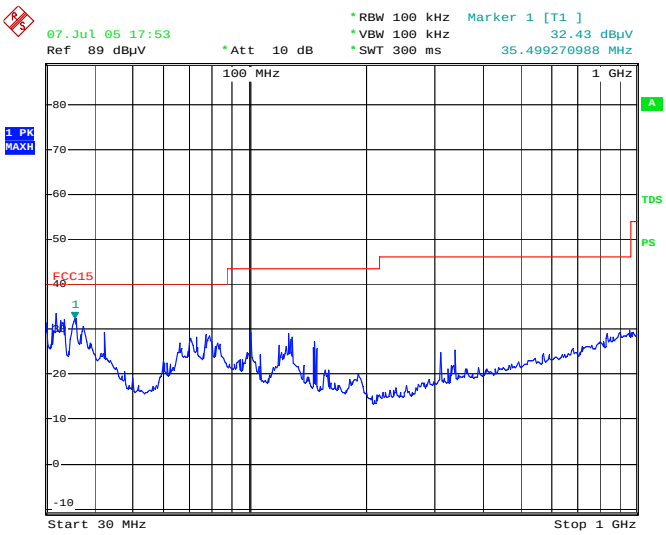
FUND = Fundamental
AV = Average

802.11b



UTStarcom HORIZONTAL

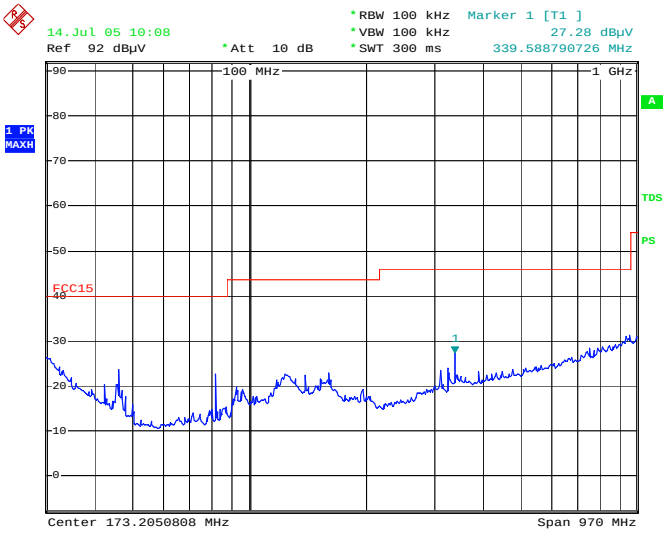
Date: 7.JUL.2005 17:59:36



UTStarcom VERTICAL

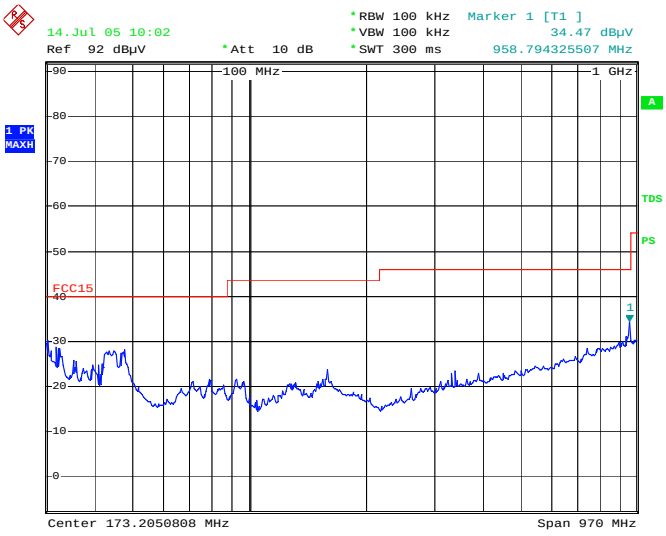
Date: 7.JUL.2005 17:53:45

802.11g



UTStarcom WIFI Handset Hor.

Date: 14.JUL.2005 10:08:02



UTStarcom WIFI Handset Ver.

Date: 14.JUL.2005 10:02:40

§15.247(a)(2) – 6 dB BANDWIDTH

Applicable Standard

(a) According to §15.247(a)(2), for digital modulation techniques, the minimum 6dB bandwidth shall be at least 500 kHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth. (6 dB bandwidth for DTS)
4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	1032mbar

The testing was performed by Jandy Su on 2005-7-5 and 2005-7-21

Test Result: Pass

Test Mode: Transmitting

802.11b

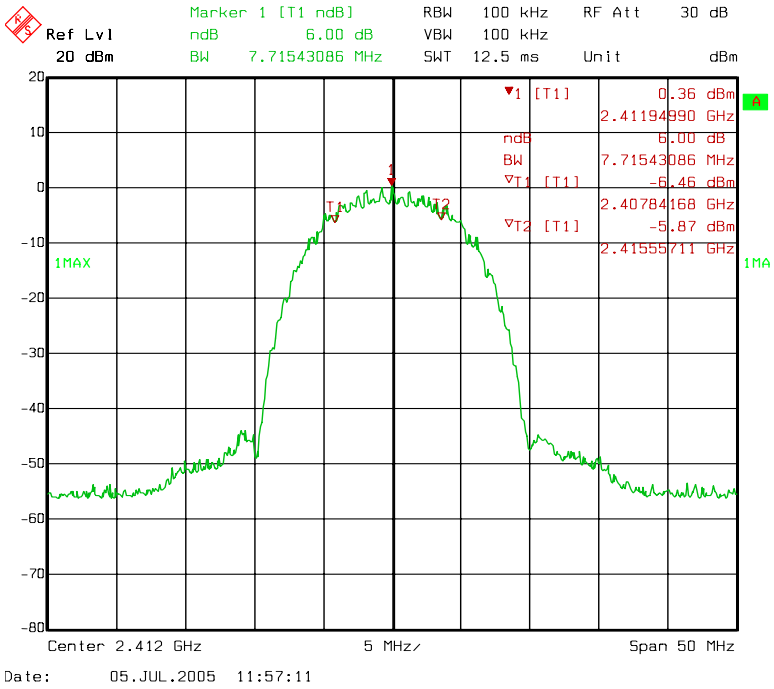
Channel	Channel frequency (MHz)	6dB Bandwidth (MHz)	Limit (KHz)
01	2412	7.72	>500
07	2442	7.45	>500
11	2462	7.67	>500

802.11g

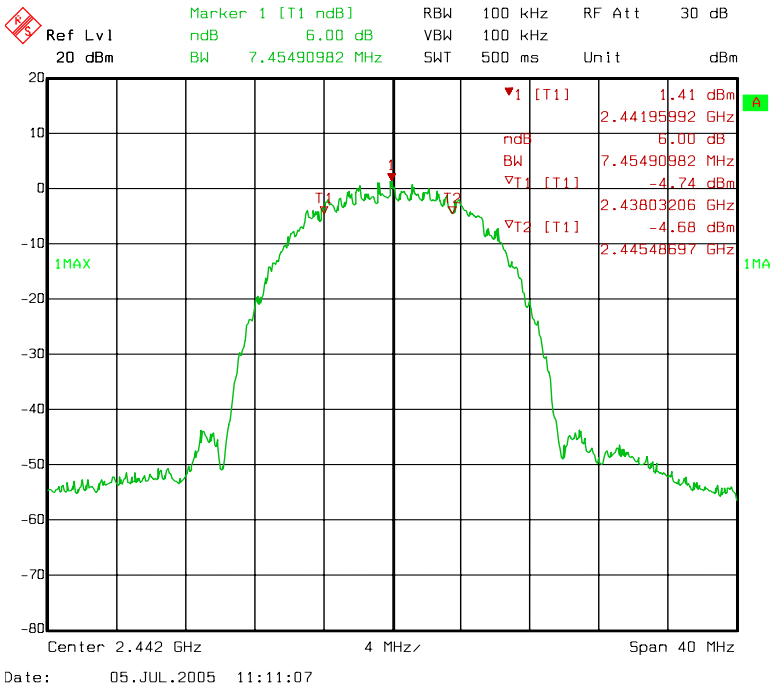
Channel	Channel frequency (MHz)	6dB Bandwidth (MHz)	Limit (KHz)
01	2412	16.71	>500
07	2442	16.77	>500
11	2462	16.63	>500

802.11b

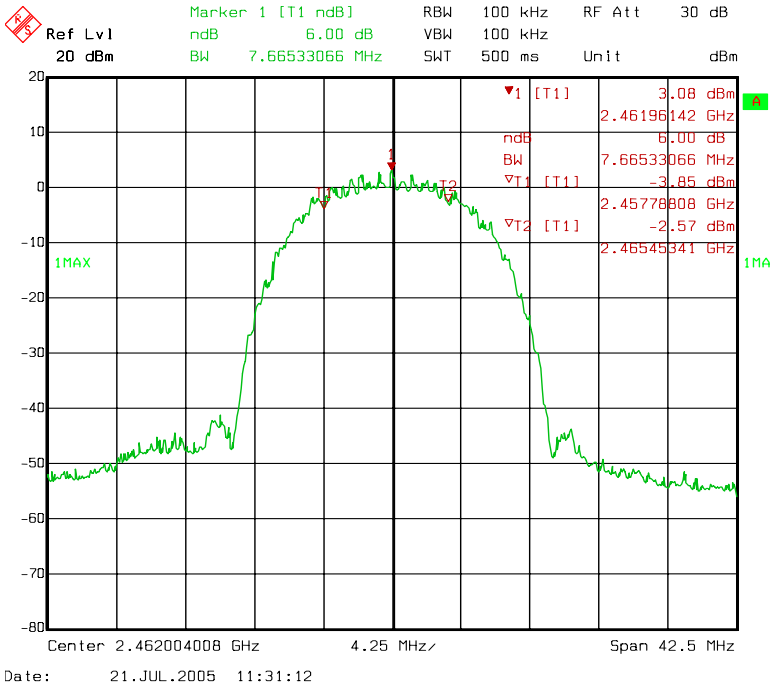
Channel 1



Channel 7

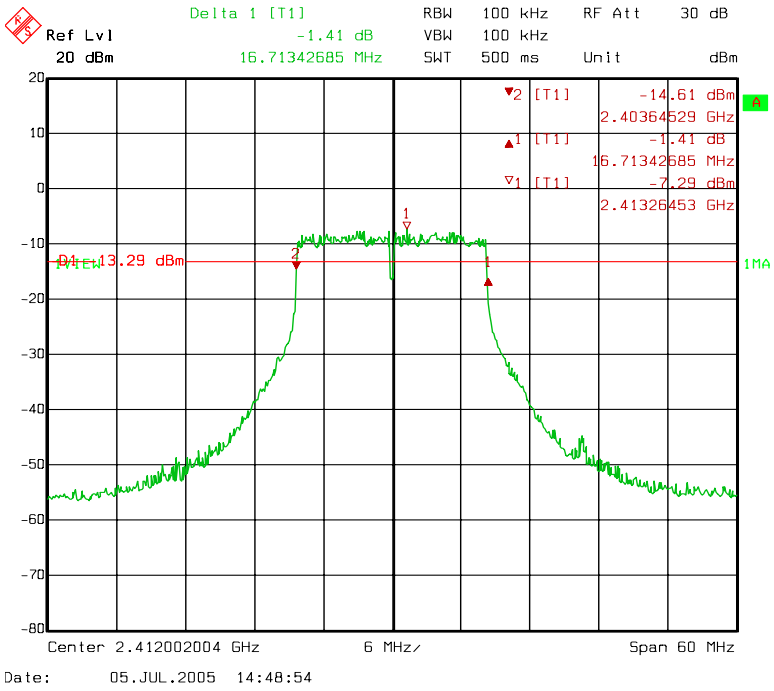


Channel 11

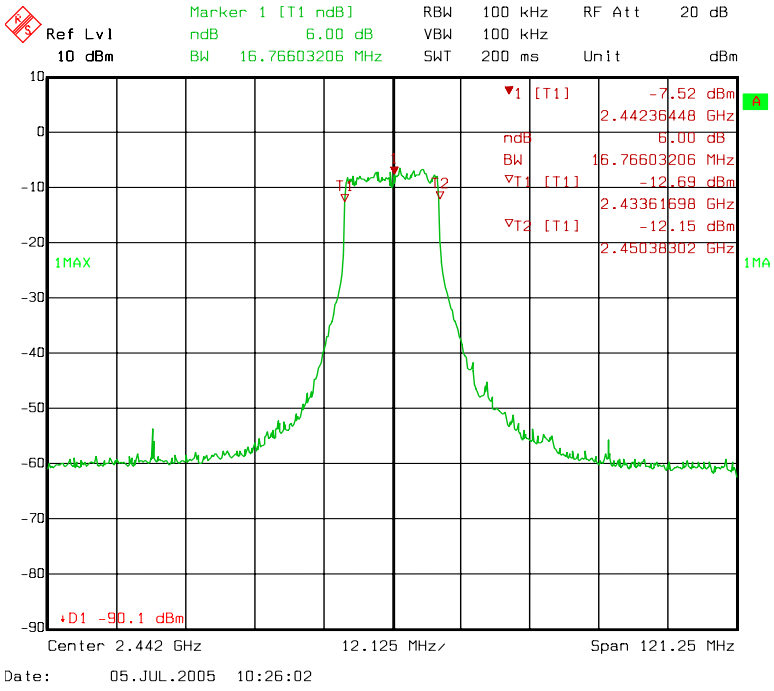


802.11g

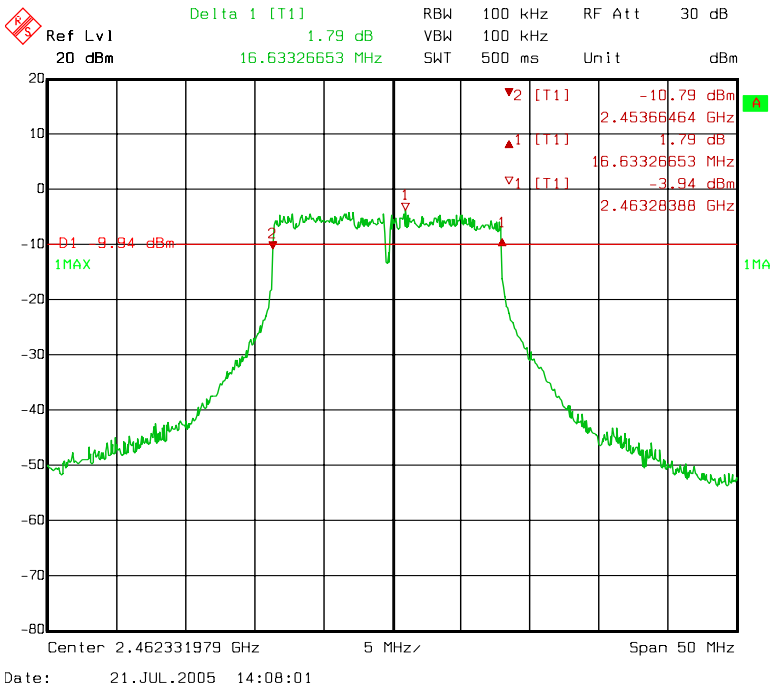
Channel 1



Channel 7



Channel 11



§15.247(b)(3) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (3), for systems using digital modulation in 2400-2483.5 MHz: 1 Watt

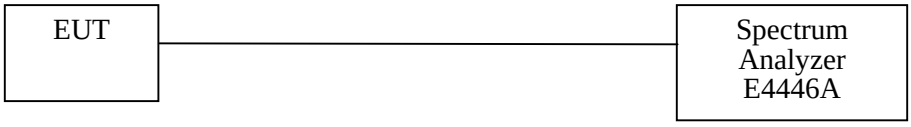
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer Spectrum	E4446A	US44300386	2004-11-10

*** Statement of Traceability:** Bay Area Compliance Lab Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	45%
ATM Pressure:	1018mbar

The testing was performed by Daniel Deng on 2005-08-19.

Please refer to the following plots.

802.11b

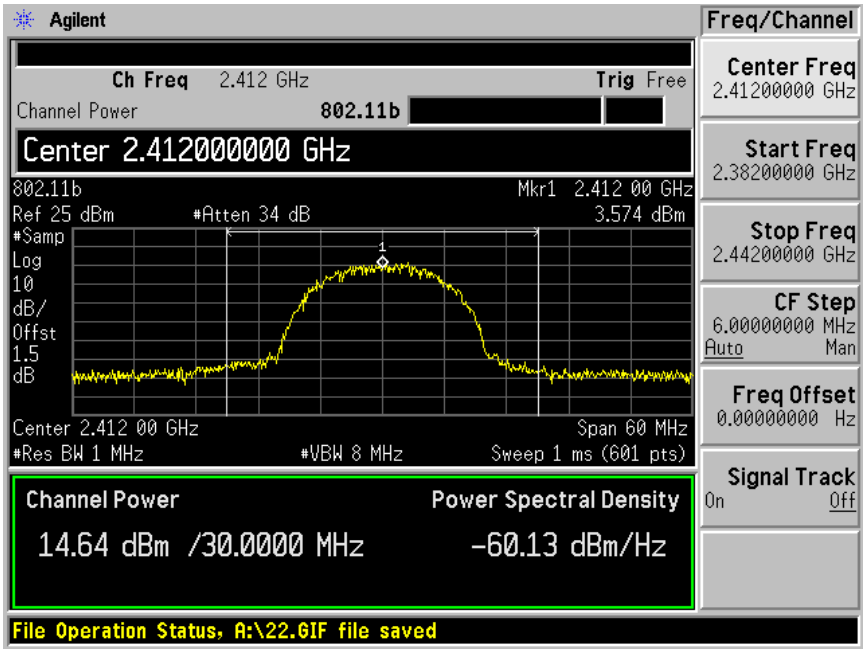
Channel	Frequency (MHz)	Peak output power (dBm)	Peak Output Power (W)	Limit (W)
Low	2412	14.64	0.029	1
Mid.	2442	14.69	0.029	1
High	2462	14.34	0.027	1

802.11g

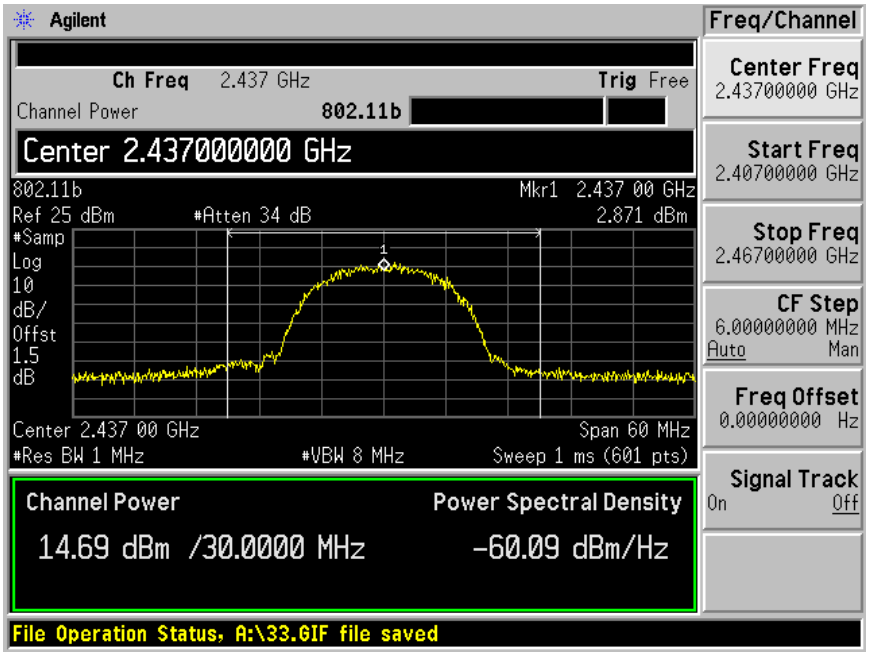
Channel	Frequency (MHz)	Peak output power (dBm)	Peak Output Power (W)	Limit (W)
Low	2412	11.33	0.014	1
Mid.	2442	11.08	0.013	1
High	2462	11.34	0.014	1

802.11b

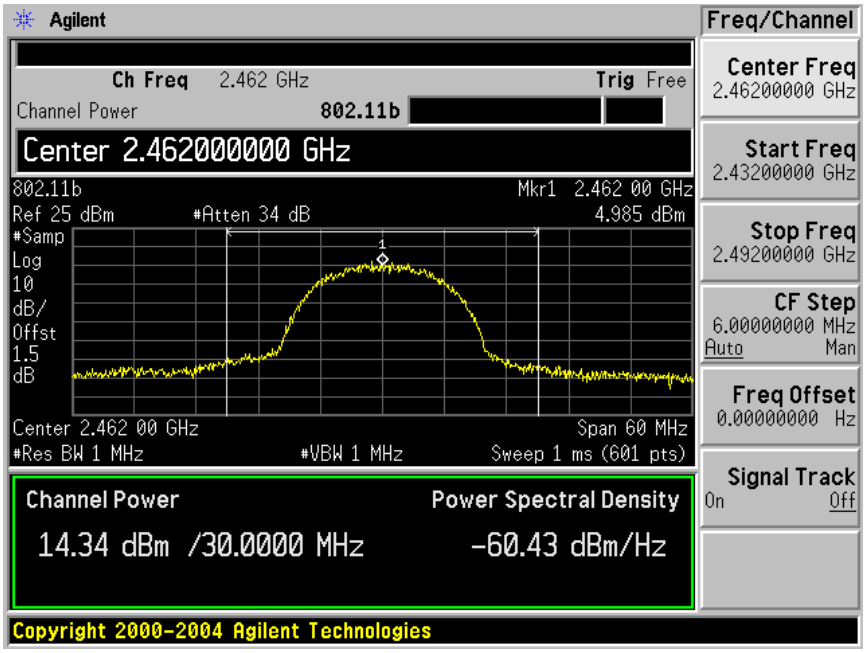
Low Channel



Mid. Channel

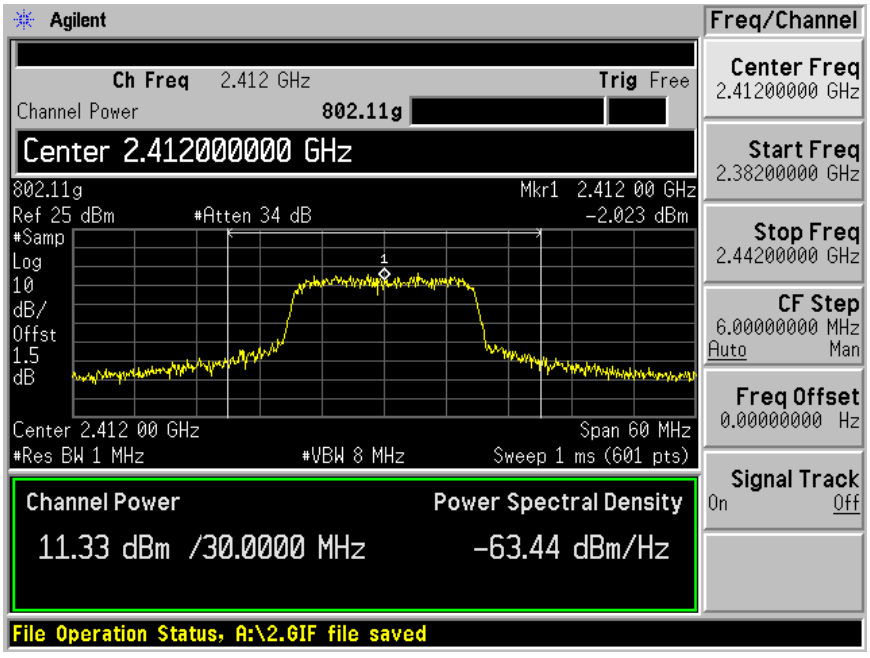


High Channel

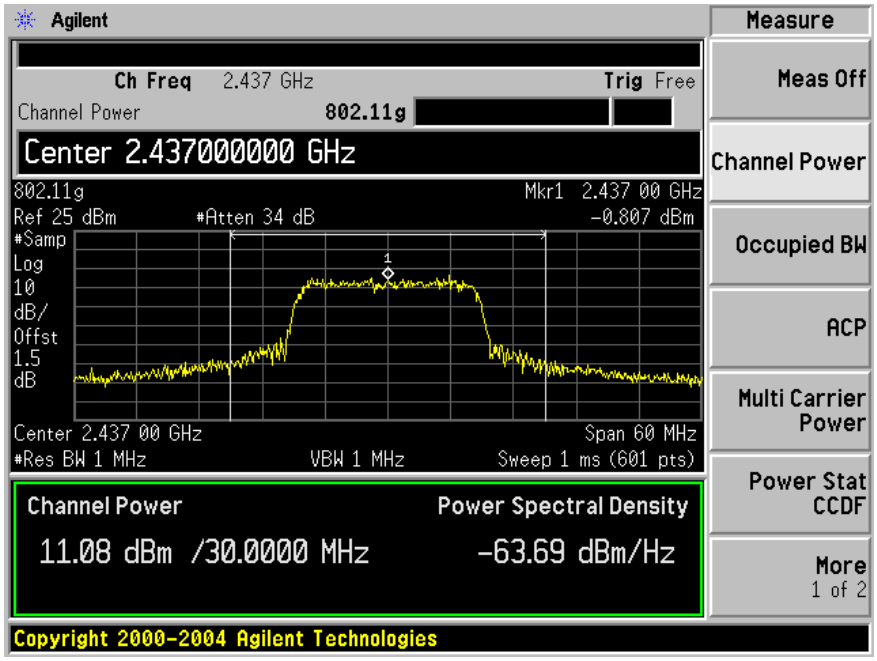


802.11g

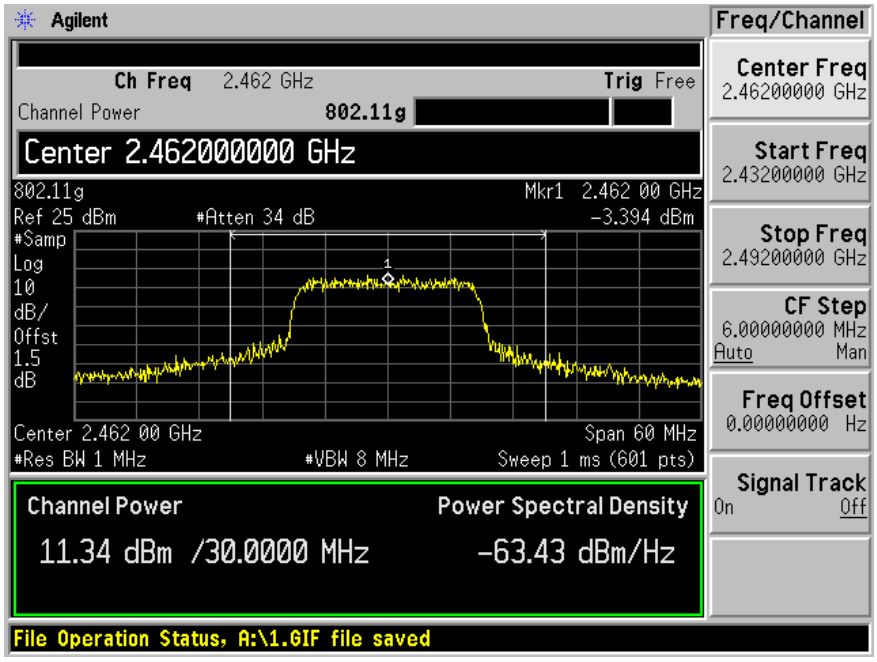
Low Channel



Mid. Channel



High Channel



§15.247(d) - 100 KHZ BANDWIDTH OF BAND EDGES

Applicable Standard

According to §15.247(d), in *any* 100 kHz bandwidth outside the frequency bands 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) see §15.205(c)).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
A.H. System	Horn Antenna	SAS-200/571	135	2005-4-28	2006-4-28
HP	Amplifier	HP8447D	2944A09795	2004-9-1	2005-8-31
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10
SUNOL SCIENCES	Horn Antenna	DRH-118	A052604	2005-6-2	2006-6-2

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	53 %

ATM Pressure:	1015 mbar

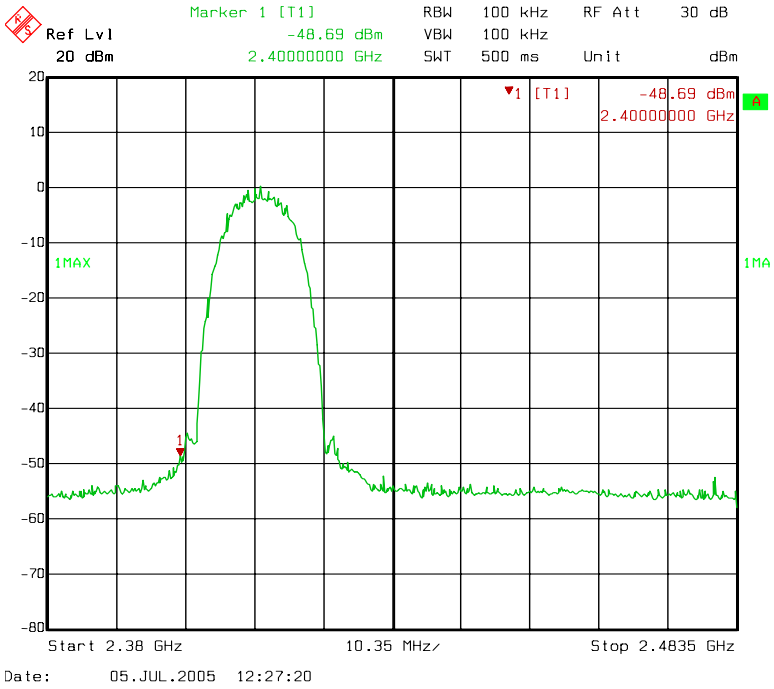
The testing was performed by Jandy Su on 2005-7-5 and 2005-7-21

Test Result: Pass

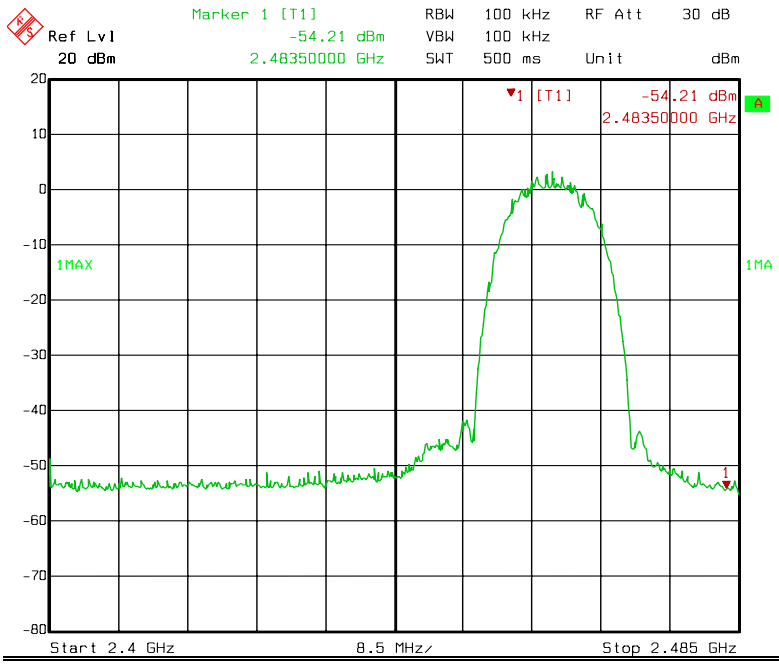
Test Mode: Transmitting

802.11b

Channel 1

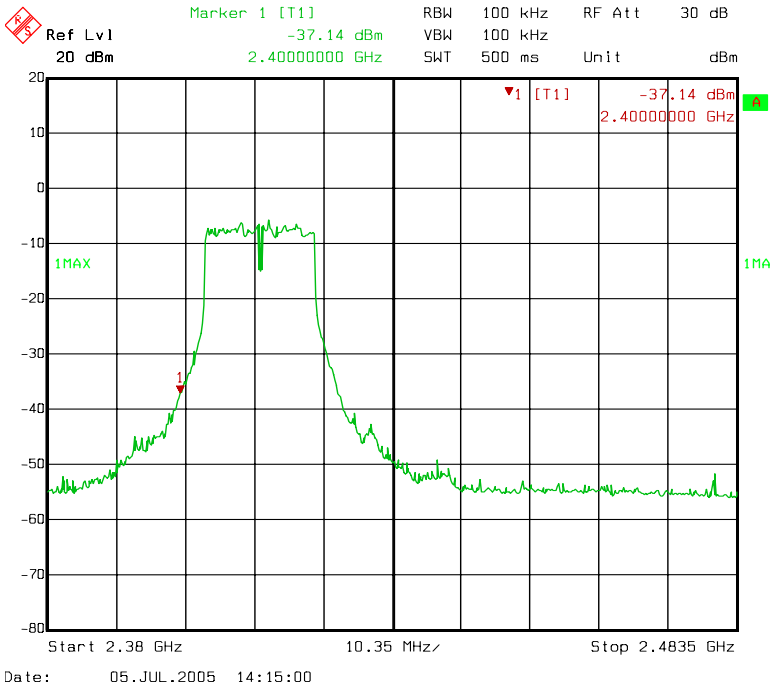


Channel 11

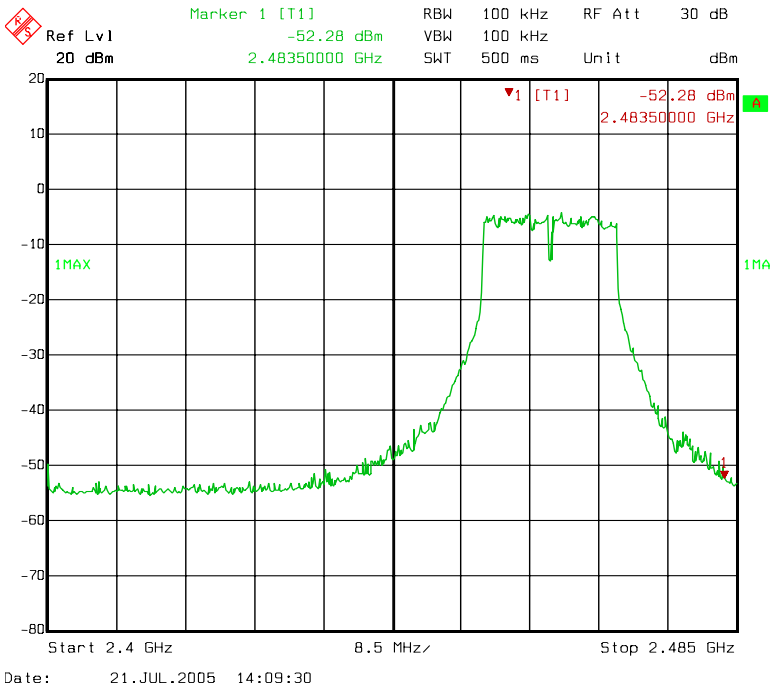


802.11g

Channel 1



Channel 11



§15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

According to §15.247 (e), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde&Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-10

*** Statement of Traceability:** Bay Area Compliance Lab Corp. (ShenZhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
4. Locate and zoom in on emission pesk(s) within the pass band. Set RBW-3kHz, VBW RBW, sweep=(SPAN/3 kHz). The peak level measured must be no greater than+8 dBm.

Test Data

Environmental Conditions

Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1015 mbar

The testing was performed by Jandy Su on 2005-7-5 and 2005-7-30

Test Result: Pass

Test Mode: Transmitting

802.11b

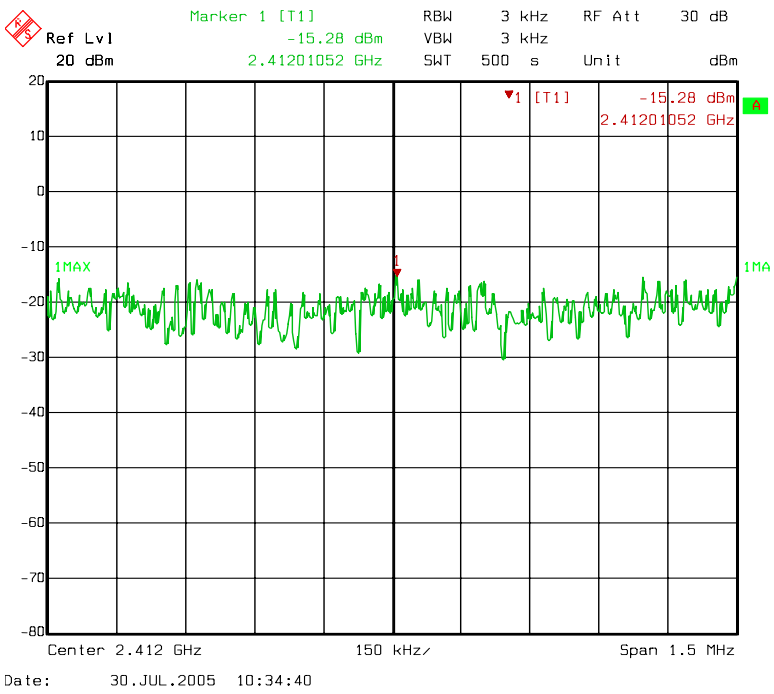
Channel	Channel frequency (MHz)	Peak Amplitude (dBm)	Limit (dBm)
01	2412	-15.28	<8
07	2442	-15.79	<8
11	2462	-15.18	<8

802.11g

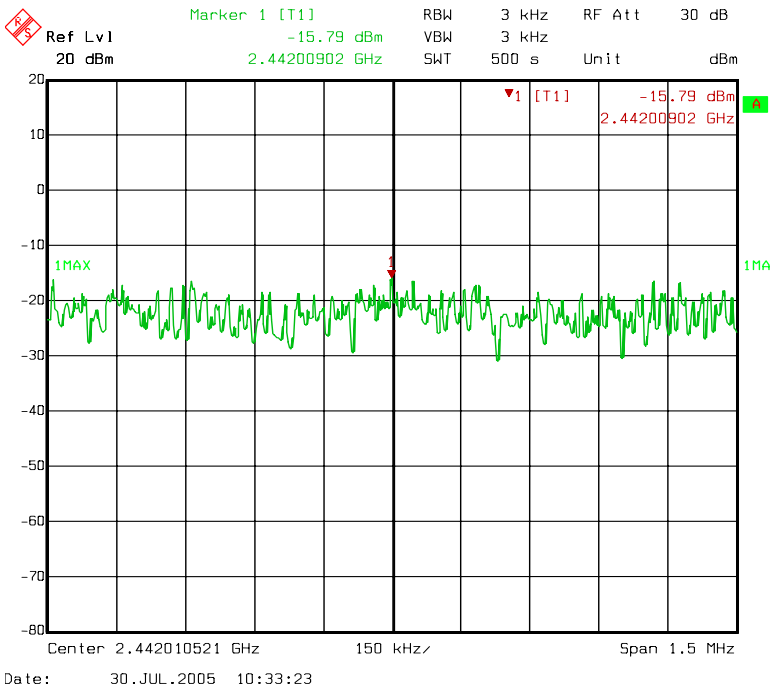
Channel	Channel frequency (MHz)	Peak Amplitude (dBm)	Limit (dBm)
01	2412	-20.00	<8
07	2442	-19.66	<8
11	2462	-19.30	<8

802.11b

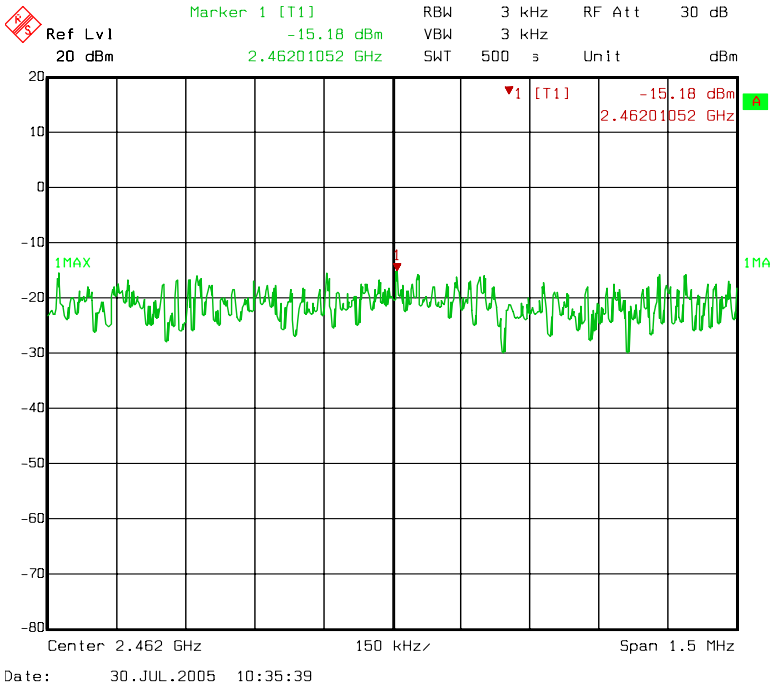
Channel 1



Channel 7

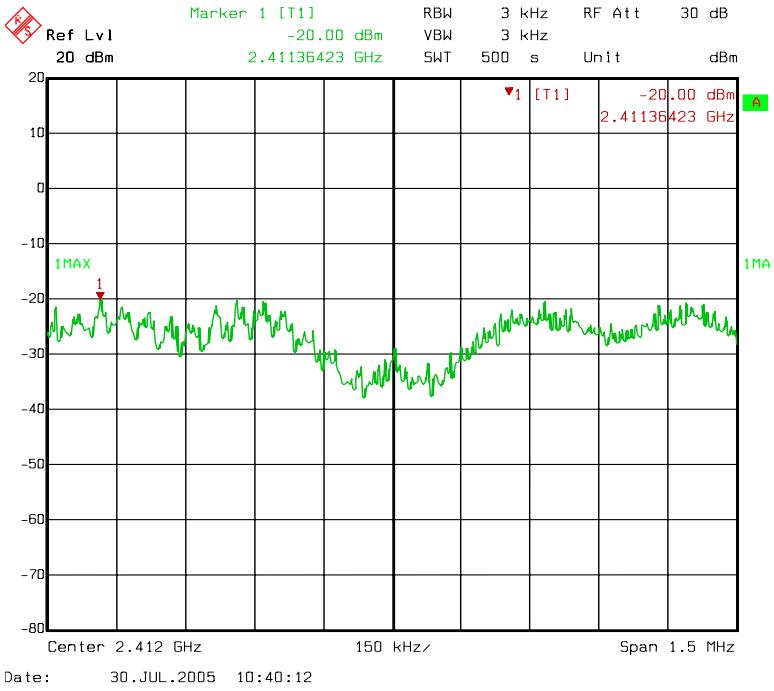


Channel 11

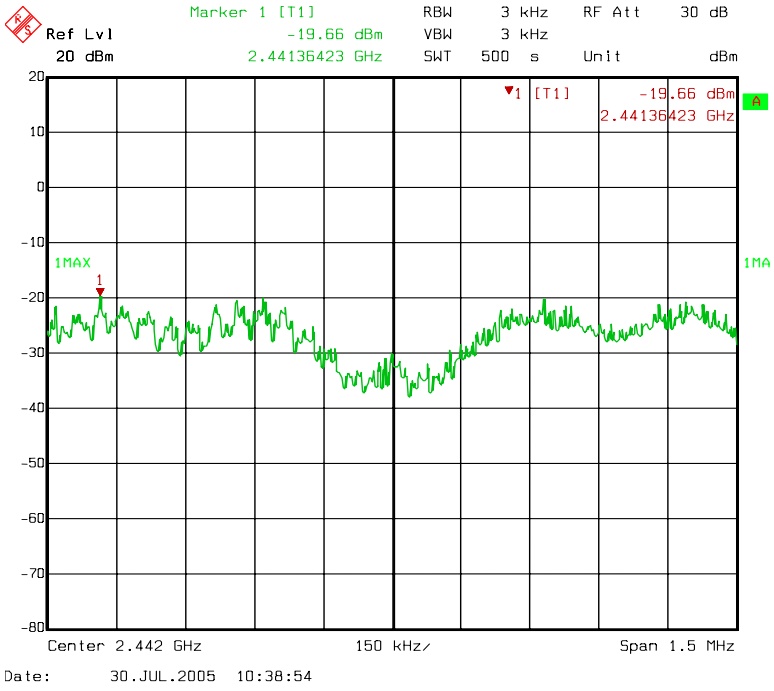


802.11g

Channel 1



Channel 7



Channel 11