



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

High Tech Computer Corp.

Pocket PC

Trade Name: Dell

Model: HC03U

Prepared for

**High Tech Computer Corp.
No. 23, Hsin Hua Rd.,
Taoyuan Hsien 330, Taiwan, R.O.C.**

Prepared by

**Compliance Certification Services Inc.
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TABLE OF CONTENTS

- 1. TEST RESULT CERTIFICATION..... 3**
- 2. EUT DESCRIPTION 4**
- 3. TEST METHODOLOGY 5**
 - 3.1 EUT CONFIGURATION 5
 - 3.2 EUT EXERCISE 5
 - 3.3 GENERAL TEST PROCEDURES 5
 - 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS 6
 - 3.5 DESCRIPTION OF TEST MODES 6
- 4. INSTRUMENT CALIBRATION..... 7**
- 5. FACILITIES AND ACCREDITATIONS 8**
 - 5.1 FACILITIES 8
 - 5.2 EQUIPMENT 8
 - 5.3 LABORATORY ACCREDITATIONS AND LISTING 8
 - 5.4 TABLE OF ACCREDITATIONS AND LISTINGS 9
- 6. SETUP OF EQUIPMENT UNDER TEST 10**
 - 6.1 SETUP CONFIGURATION OF EUT 10
 - 6.2 SUPPORT EQUIPMENT 10
- 7. FCC PART 15.247 REQUIREMENTS..... 11**
 - CONDITION A: WLAN OPERATION..... 11**
 - 7.1 6DB BANDWIDTH 11
 - 7.2 PEAK POWER 16
 - 7.3 BAND EDGES MEASUREMENT 21
 - 7.4 PEAK POWER SPECTRAL DENSITY 30
 - 7.5 RADIO FREQUENCY EXPOSURE 35
 - CONDITION B: BLUETOOTH OPERATION..... 37**
 - 7.6 PEAK POWER 37
 - 7.7 BAND EDGES MEASUREMENT 39
 - 7.8 PEAK POWER SPECTRAL DENSITY 48
 - 7.9 FREQUENCY SEPARATION 54
 - 7.10 NUMBER OF HOPPING FREQUENCY..... 58
 - 7.11 TIME OF OCCUPANCY (DWELL TIME)..... 61
 - 7.12 RADIO FREQUENCY EXPOSURE 73
 - 7.13 SPURIOUS EMISSIONS 75
 - 7.14 CONDUCTED MEASUREMENT 75
 - 7.15 LIMIT 75
 - 7.16 RADIATED EMISSIONS 88
 - CONDITION C: CO-LOCATED OPERATION (WLAN & BLUETOOTH OPERATED SIMULTANEOUSLY)..... 115**
 - 7.17 POWER LINE CONDUCTED EMISSIONS 127
- APPENDIX 1 PHOTOGRPHS OF TEST SETUP..... 132**



1. TEST RESULT CERTIFICATION

Applicant: High Tech Computer Corp.
No. 23, Hsin Hua Rd.,
Taoyuan Hsien 330, Taiwan, R.O.C.

Equipment Under Test: Pocket PC

Trade Name: Dell

Model Number: HC03U

Date of Test: July 30 - August 12, 2004

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2001) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.207, 15.209 and 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Reviewed by:

Harris W. Lai
Executive Vice President
Compliance Certification Services Inc.

James Lee
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Pocket PC
Trade Name	Dell
Model Number	HC03U
Model Name Discrepancy	Please refer model difference list as below.
Power Supply	Delta / PA-14 I/P: AC 100-240V, 50-60Hz, 400mA O/P: DC 5.4V, 2410mA LITEON / PA-14 I/P: AC 100-240V, 50-60Hz, 400mA O/P: DC 5.4V, 2410mA Battery: 1. Dell / U6191 / 3.7V, 2200mAh 2. Dell / T6476 / 3.7V, 1100mAh
Frequency Range	WLAN: 2412 – 2462 MHz Bluetooth: 2402 MHz – 2480 MHz
Transmit Power	WLAN: 12.85dBm Bluetooth: 1.78 dBm
Modulation Technique	DSSS (CCK; DQPSK; DBPSK) GFSK
Number of Channels	WLAN: 11 Channels Bluetooth: 79 Channels
Antenna Specification	WLAN: 1.33 dBi Bluetooth: -2.62 dBi
Antenna Designation	WLAN: IFA Antenna Bluetooth: Chip Antenna

Note: This submittal(s) (test report) is intended for FCC ID: NM8HC3U filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

Model difference list

Model	HC03U	
Difference	Type 1	Type 2
Processor / CPU	Intel Bulverde / 520 MHz /LQ035Q7DH05	Intel Bulverde / 624 MHz / LVPXA270C0624
Graphics & Dual Display	No	Yes
Memory (RAM/ROM)	Intel / RD48F4400L0YDQ0 / 64MB	Intel / RD48F4400L0YDQ0 /64 (128) / 64MB
Display	Sharp / LQ035Q7DH05 / 3.5" QVGA	Sharp / LS037V7DD05 / 3.7" VGA



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4. (2001) Radiated testing was performed at an antenna to EUT distance 3 meters.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (2001) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (2001)

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) 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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field 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 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

There are two sources of power adapters and two batteries (please refer EUT description). After verified, the worst data in the test report is Delta / PA-14.

Condition A (WLAN operation): Channel low (2412MHz) 、 mid (2437MHz) and high (2462MHz) with 11Mbps highest data rate (worst case) are chosen for the final testing.

Condition B (Bluetooth operation): Channel low (2402MHz) 、 mid (2441MHz) and high (2480MHz) with highest data rate (worst case) are chosen for final testing.

Condition C (Co-located operation): Radiated among the combination of the Bluetooth Mid channel with every WLAN channel.

The field strength of spurious radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis). The worst case (Y axis) was reported.



4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2001) and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

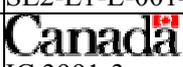
Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200600-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: 93105 and 90471).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP*	EN 55011, EN 55014-1, AS/NZS 1044, CNS 13783-1, EN 55022, CNS 13438, EN 61000-3-2, EN 61000-3-3, ANSI C63.4, FCC OST/MP-5, AS/NZS CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11	 200600-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 93105, 90471
Japan	VCCI	4 3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328-2, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	CNLA	EN 300 328-1/2, EN 300 220-1/2/3, EN 300 440-1/2, EN 61000-3-2, EN 61000-3-3, 47 CFR FCC Part 15 Subpart C/D/E, EN 55013, CNS 13439, EN 55014-1, CNS 13783-1, EN 55022, CNS 13438, CISPR 22, AS/NZS 3548, EN 61000-4-2/3/4/5/6/8/11, ENV 50204, IEEE Std 1528, FCC OET Bulletin, 65+Supplement C, EN50360, EN50361, EN50371, RSS102	 0363 ILAC MRA
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	RSS212, Issue 1	 IC 3991-3 IC 3991-4

* No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	IBM	2656	AK-VF0HT	FCC DoC	N/A	Unshielded, 1.8m
2.	Multimedia Headset	Labtec	Axis-301	N/A	FCC DoC	Unshielded, 1.8m	N/A

Notes:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.247 REQUIREMENTS

CONDITION A: WLAN OPERATION

7.16dB BANDWIDTH

LIMIT

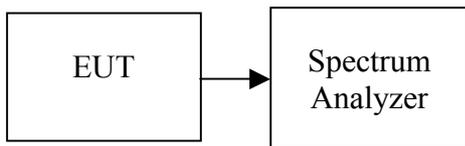
For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = RBW, Span = 20MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.



TEST RESULTS

No non-compliance noted

Test Data

Type 1

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	13000	>500	PASS
Mid	2437	13030		PASS
High	2462	13100		PASS

Type 2

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	13030	>500	PASS
Mid	2437	13100		PASS
High	2462	13600		PASS

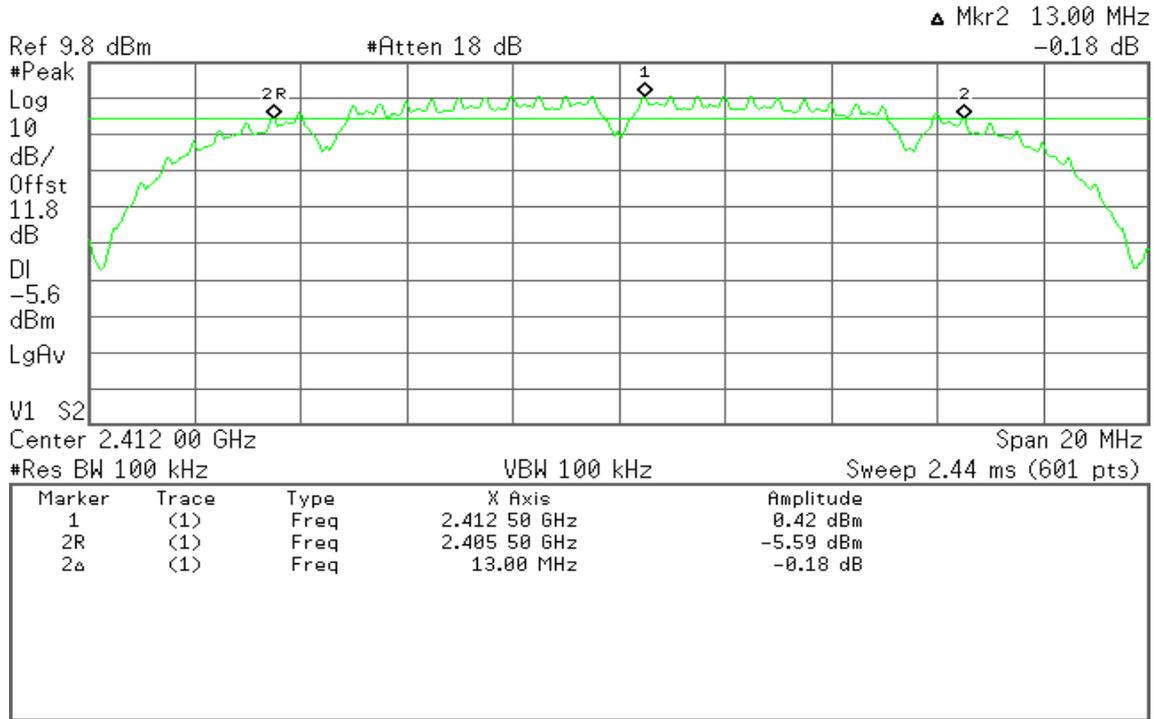


Test Plot

Type 1

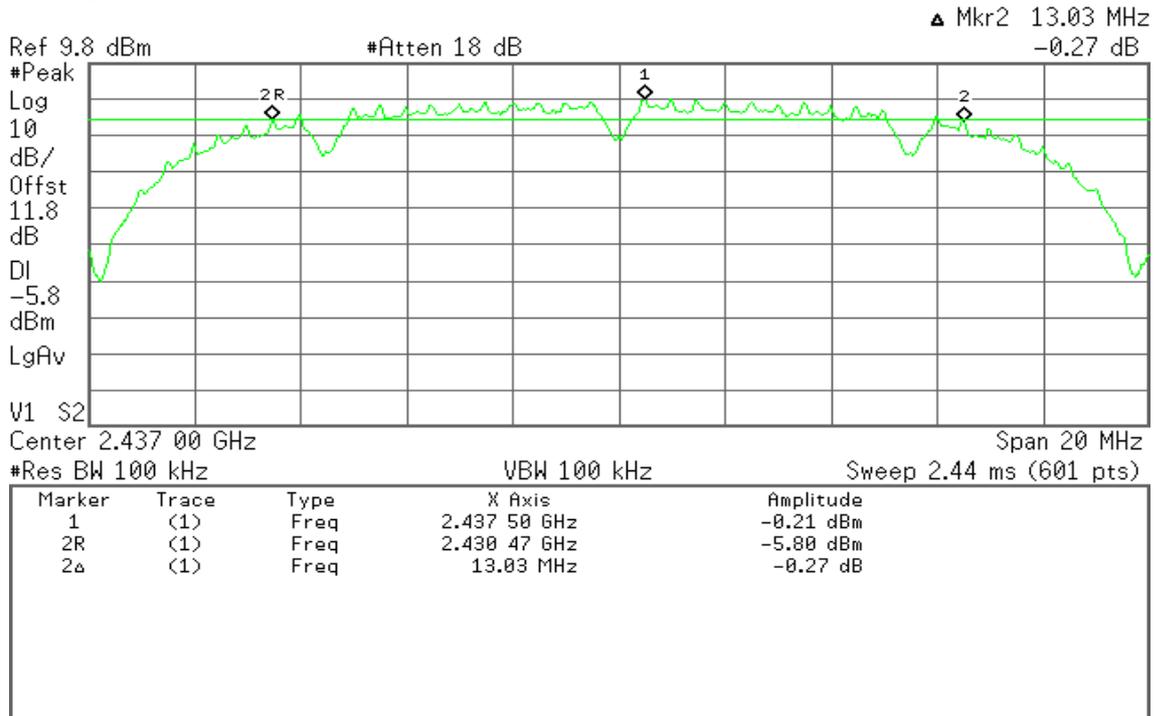
6dB Bandwidth (IEEE 802.11b / CH Low)

Agilent 20:08:42 Jul 30, 2004



6dB Bandwidth (IEEE 802.11b / CH Mid)

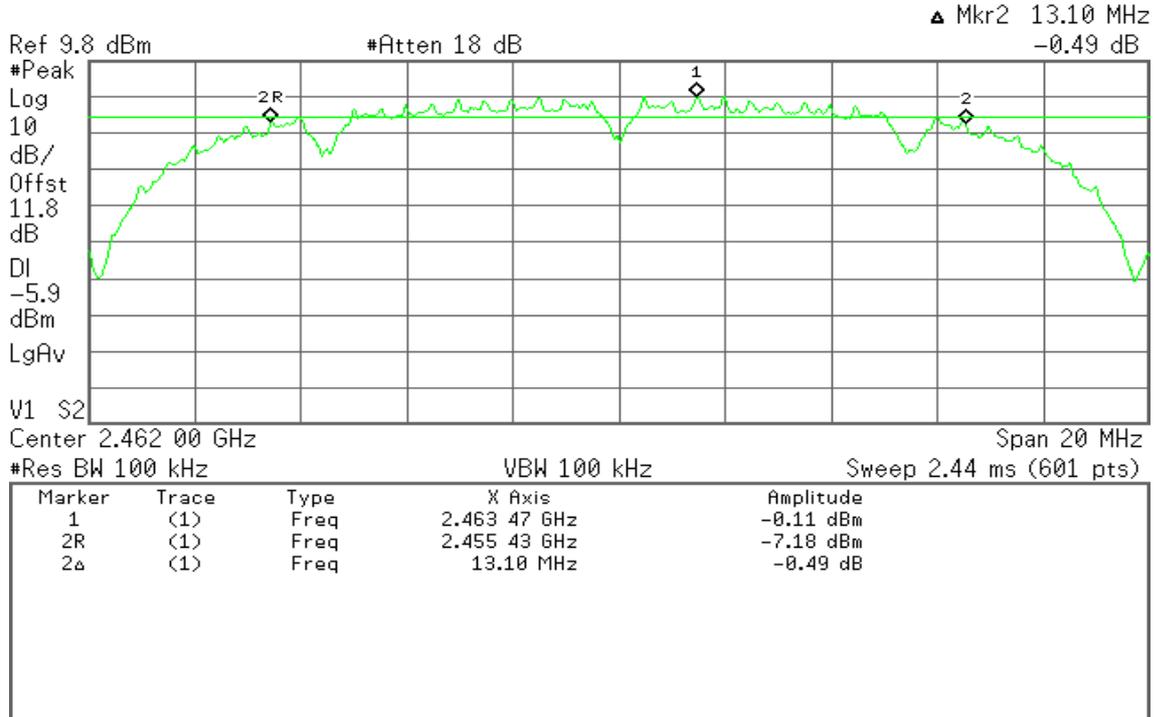
Agilent 20:10:47 Jul 30, 2004





6dB Bandwidth (IEEE 802.11b / CH High)

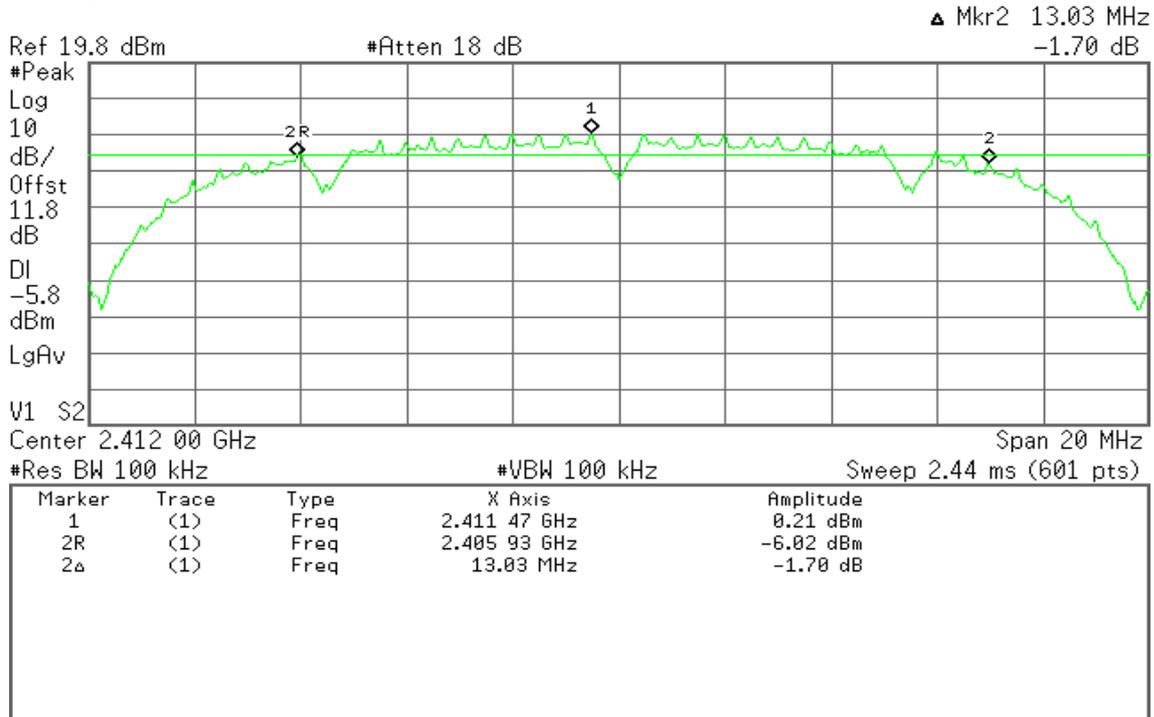
Agilent 20:12:25 Jul 30, 2004



Type 2

6dB Bandwidth (IEEE 802.11b / CH Low)

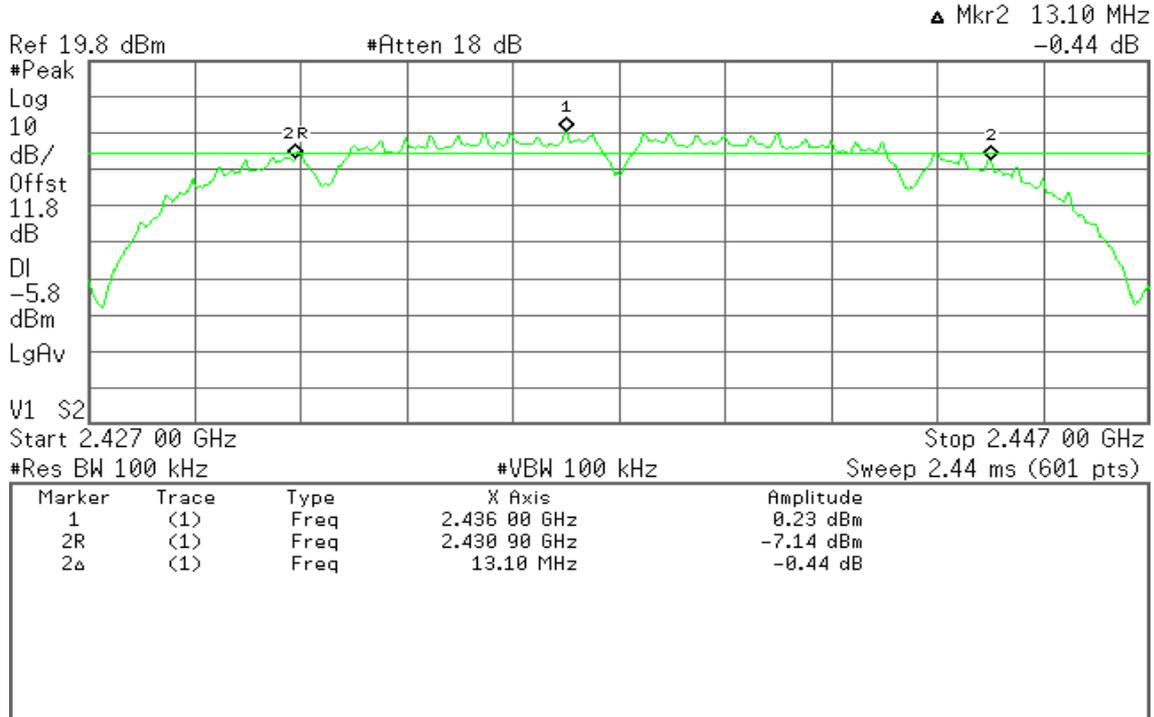
Agilent 21:21:47 Jul 30, 2004





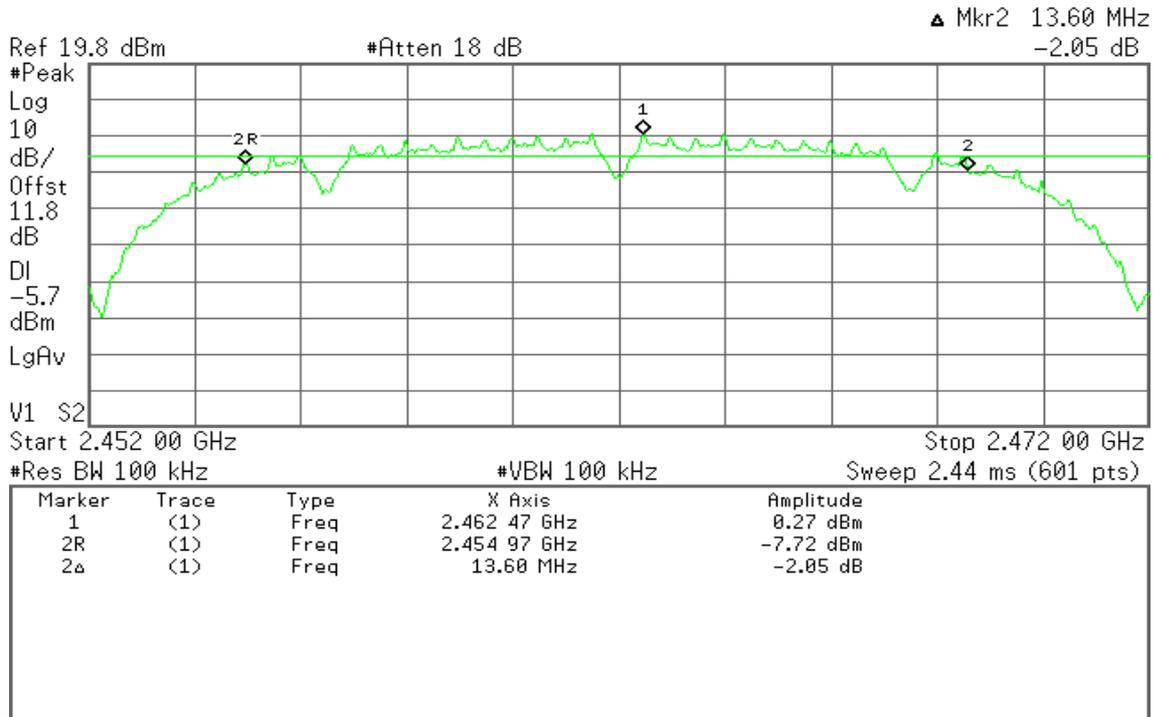
6dB Bandwidth (IEEE 802.11b / CH Mid)

Agilent 21:23:46 Jul 30, 2004



6dB Bandwidth (IEEE 802.11b / CH High)

Agilent 21:25:37 Jul 30, 2004



7.2 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

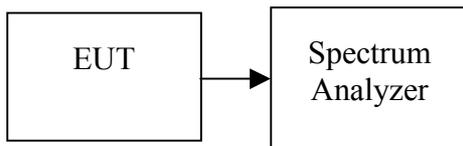
1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.



TEST RESULTS

No non-compliance noted

Test Data

Type 1

Channel	Frequency (MHz)	Output Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	0.84	11.80	12.64	0.01837	1	PASS
Mid	2437	0.70	11.80	12.50	0.01778		PASS
High	2462	0.57	11.80	12.37	0.01726		PASS

Type 2

Channel	Frequency (MHz)	Output Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	1.00	11.80	12.80	0.01905	1	PASS
Mid	2437	1.05	11.80	12.85	0.01928		PASS
High	2462	0.97	11.80	12.77	0.01892		PASS

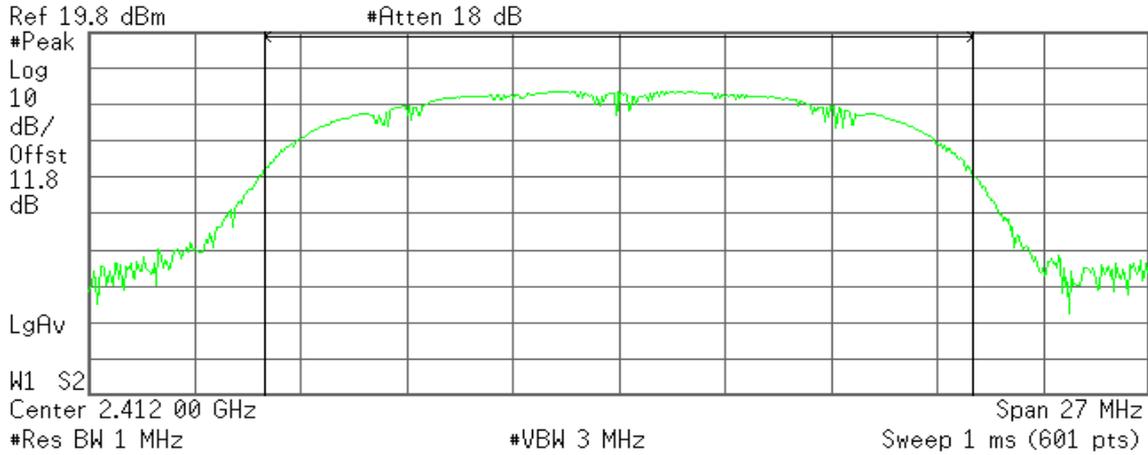


Test Plot

Type 1

Peak power (IEEE 802.11b / Ch Low)

* Agilent 16:29:57 Jul 30, 2004



Channel Power

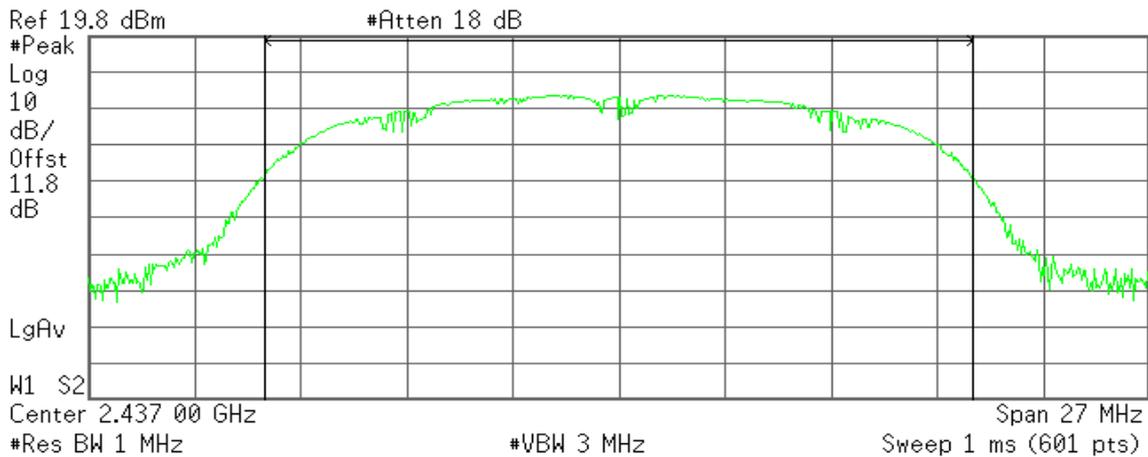
12.64 dBm /18.0000 MHz

Power Spectral Density

-59.91 dBm/Hz

Peak power (IEEE 802.11b / CH Mid)

* Agilent 16:34:52 Jul 30, 2004



Channel Power

12.50 dBm /18.0000 MHz

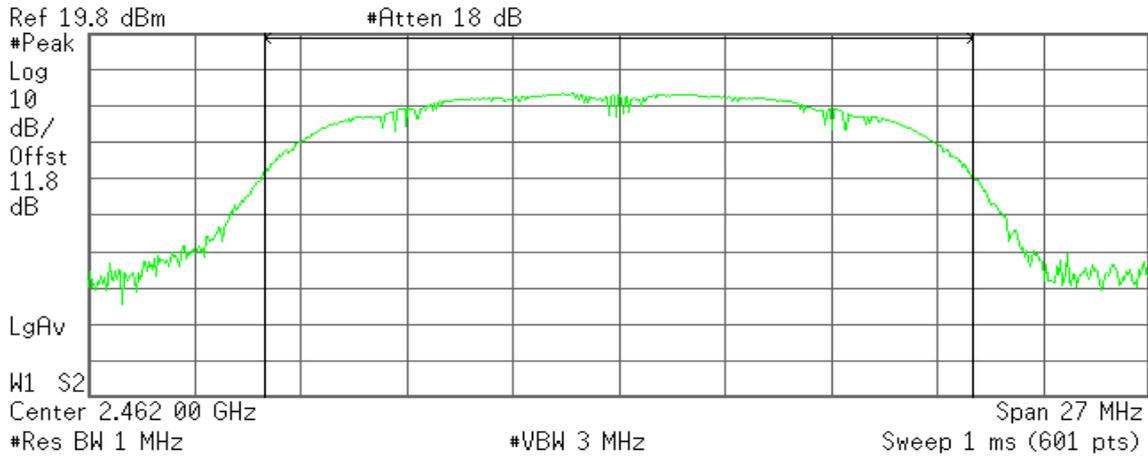
Power Spectral Density

-60.06 dBm/Hz



Peak power (IEEE 802.11b / CH High)

Agilent 16:38:09 Jul 30, 2004



Channel Power

12.37 dBm /18.0000 MHz

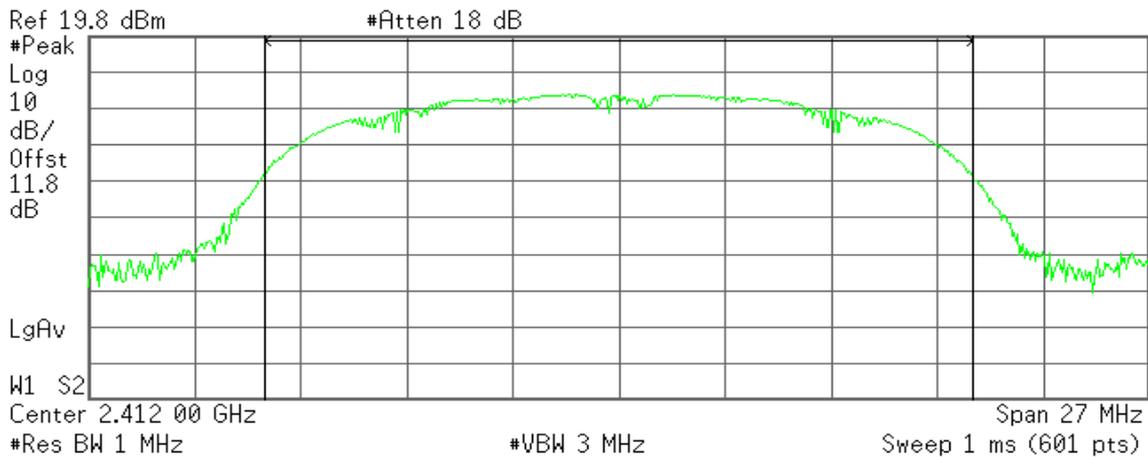
Power Spectral Density

-60.18 dBm/Hz

Type 2

Peak power (IEEE 802.11b / Ch Low)

Agilent 16:53:01 Jul 30, 2004



Channel Power

12.80 dBm /18.0000 MHz

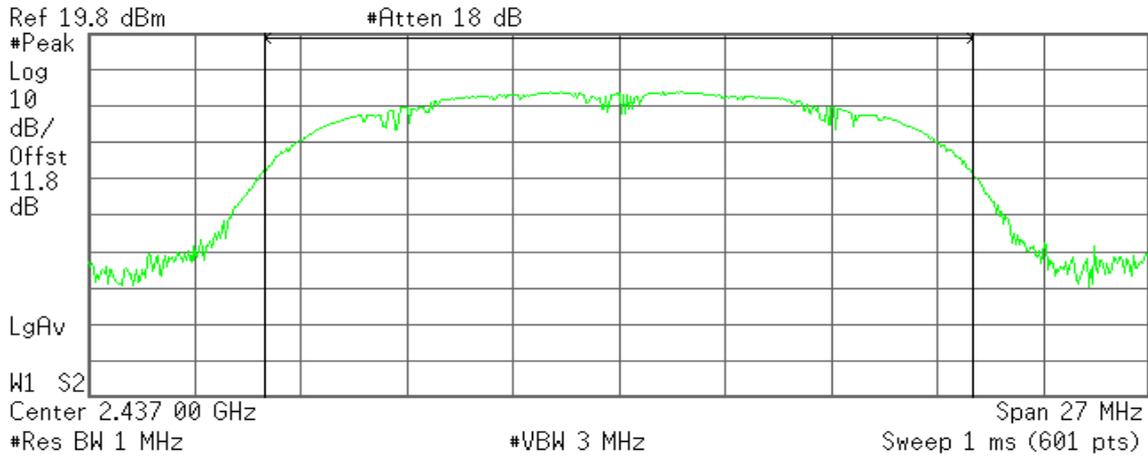
Power Spectral Density

-59.75 dBm/Hz



Peak power (IEEE 802.11b / CH Mid)

* Agilent 16:56:19 Jul 30, 2004



Channel Power

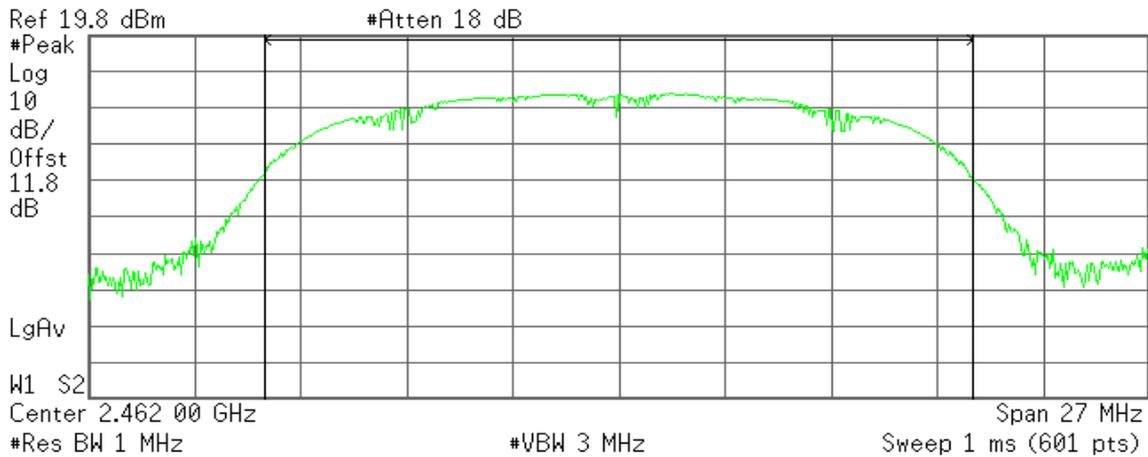
12.85 dBm /18.0000 MHz

Power Spectral Density

-59.70 dBm/Hz

Peak power (IEEE 802.11b / CH High)

* Agilent 17:45:16 Jul 30, 2004



Channel Power

12.77 dBm /18.0000 MHz

Power Spectral Density

-59.78 dBm/Hz

7.3BAND EDGES MEASUREMENT

LIMIT

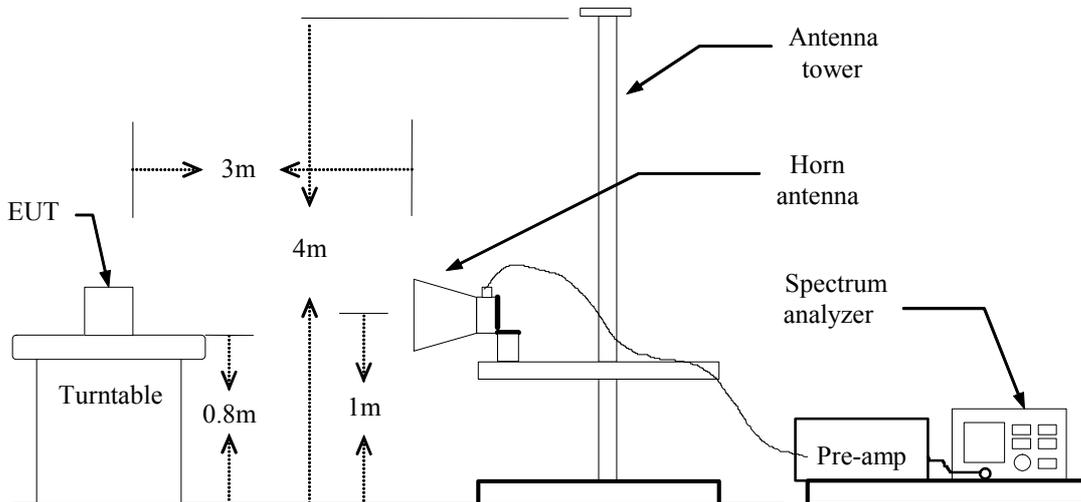
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. 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).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/22/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

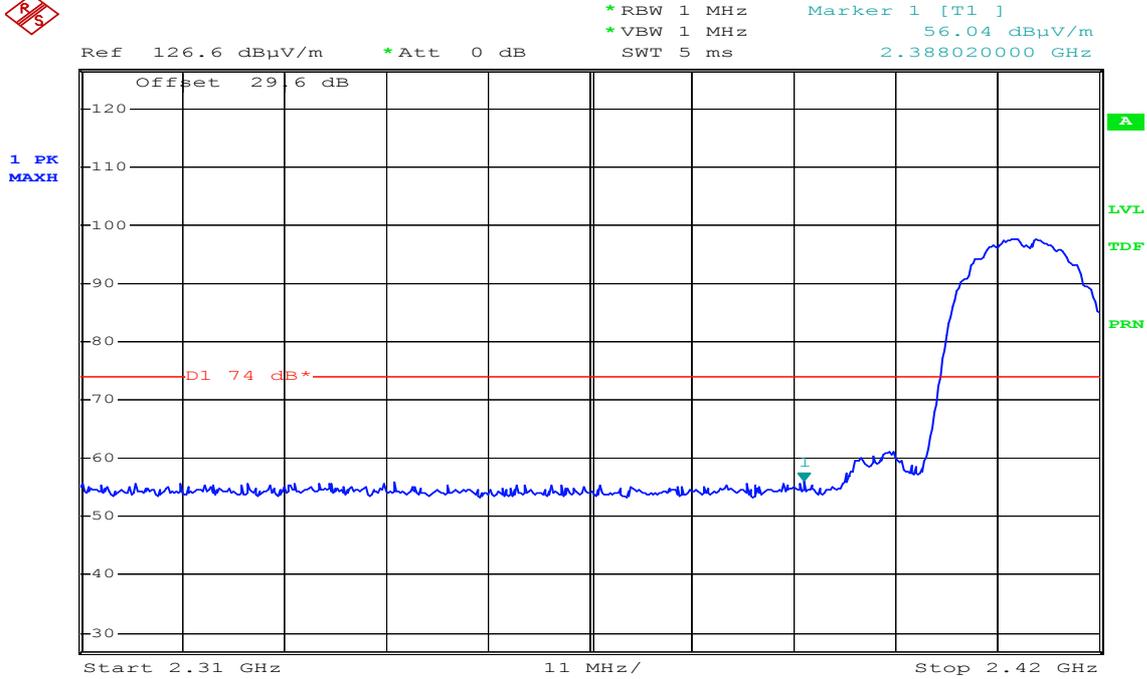


Type 1

Band Edges (IEEE 802.11b / CH Low)

Detector mode: Peak

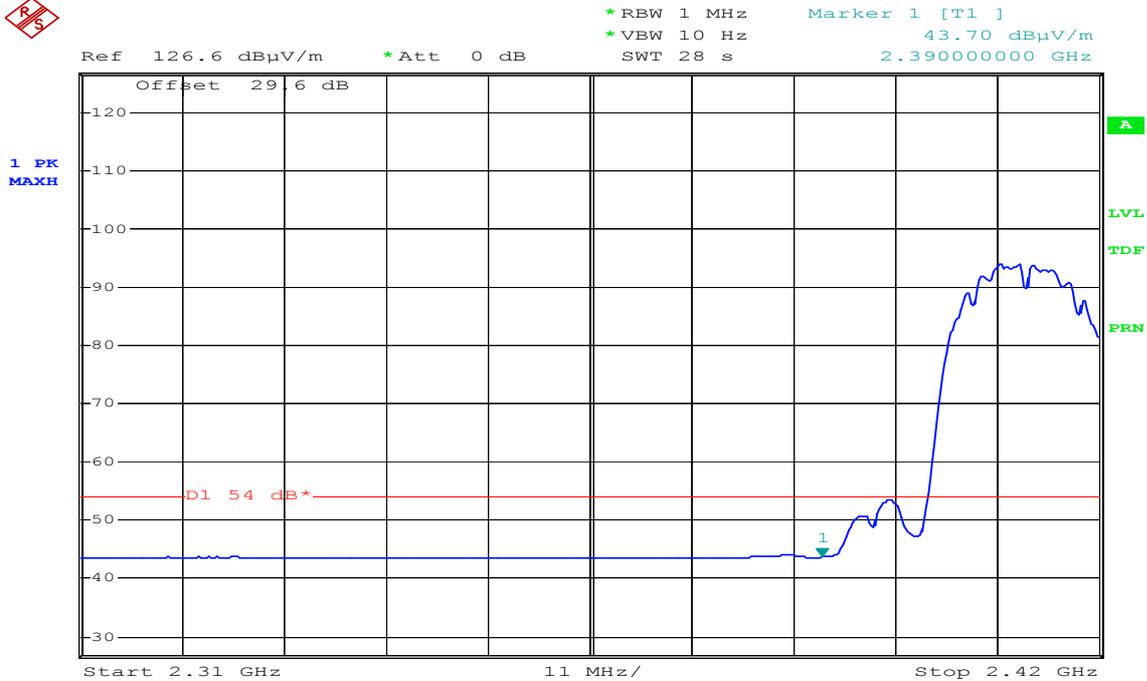
Polarity: Vertical



Date: 5.AUG.2004 05:54:48

Detector mode: Average

Polarity: Vertical



Date: 5.AUG.2004 05:53:11

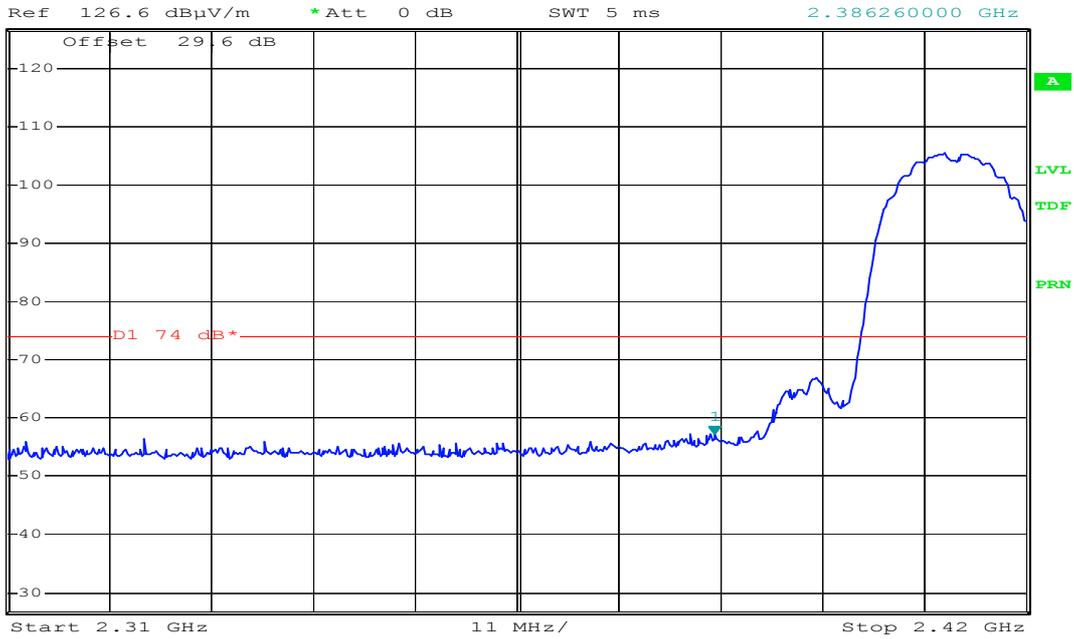


Detector mode: Peak

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1] 57.16 dBµV/m
*VBW 1 MHz
SWT 5 ms 2.386260000 GHz



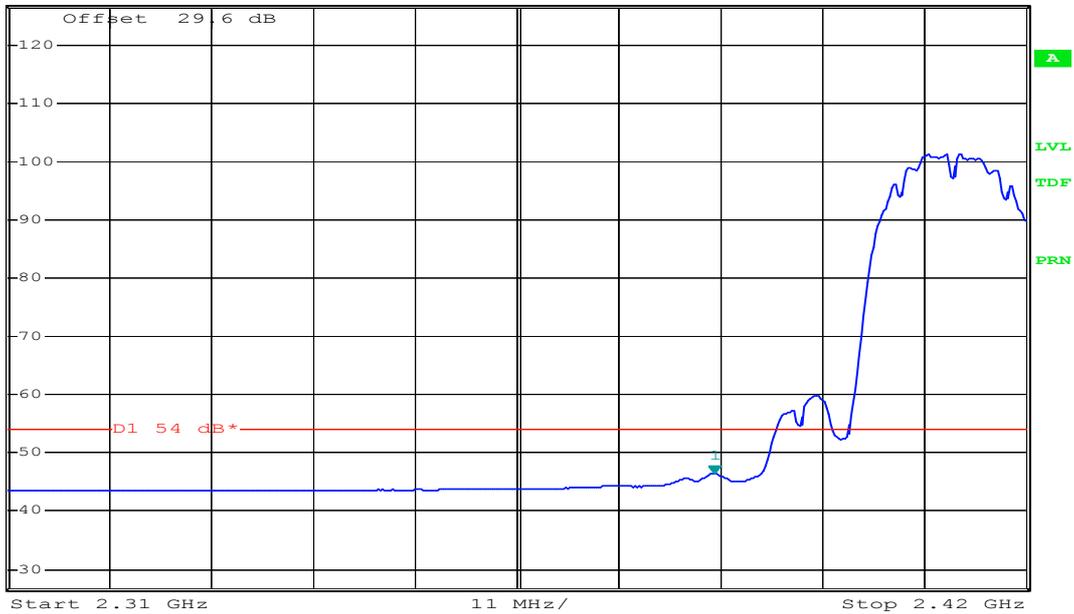
Date: 5.AUG.2004 09:12:05

Detector mode: Average

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1] 46.49 dBµV/m
*VBW 10 Hz
SWT 28 s 2.386260000 GHz



Date: 5.AUG.2004 09:10:48



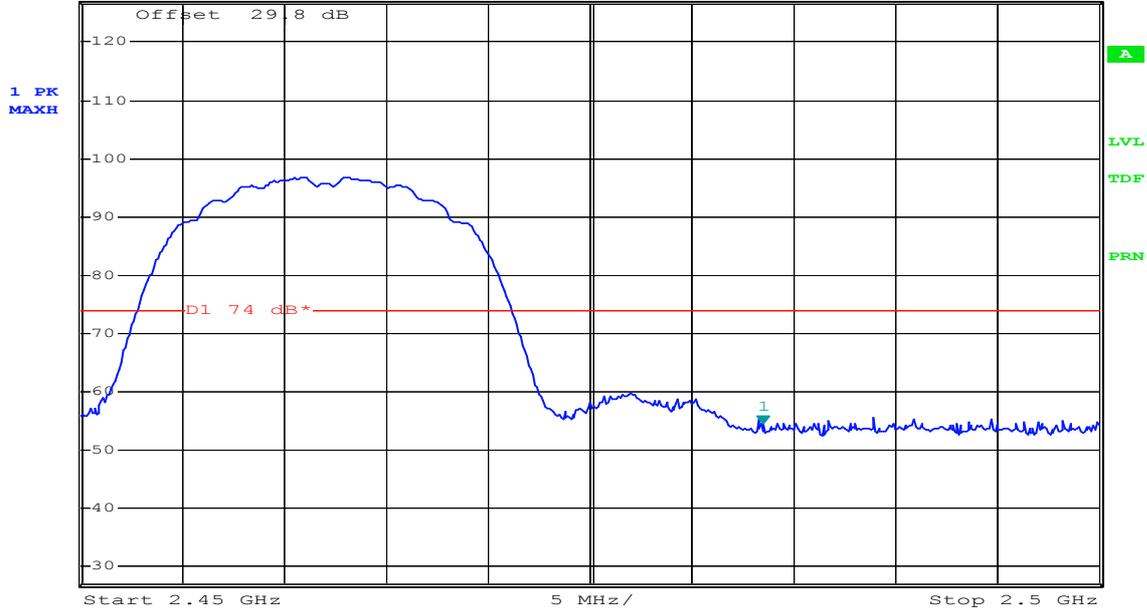
Band Edges (IEEE 802.11b / CH High)

Detector mode: Peak

Polarity: Vertical



Ref 126.8 dB μ V/m *Att 0 dB
*RBW 1 MHz Marker 1 [T1] 54.46 dB μ V/m
*VBW 1 MHz SWT 2.5 ms 2.48350000 GHz



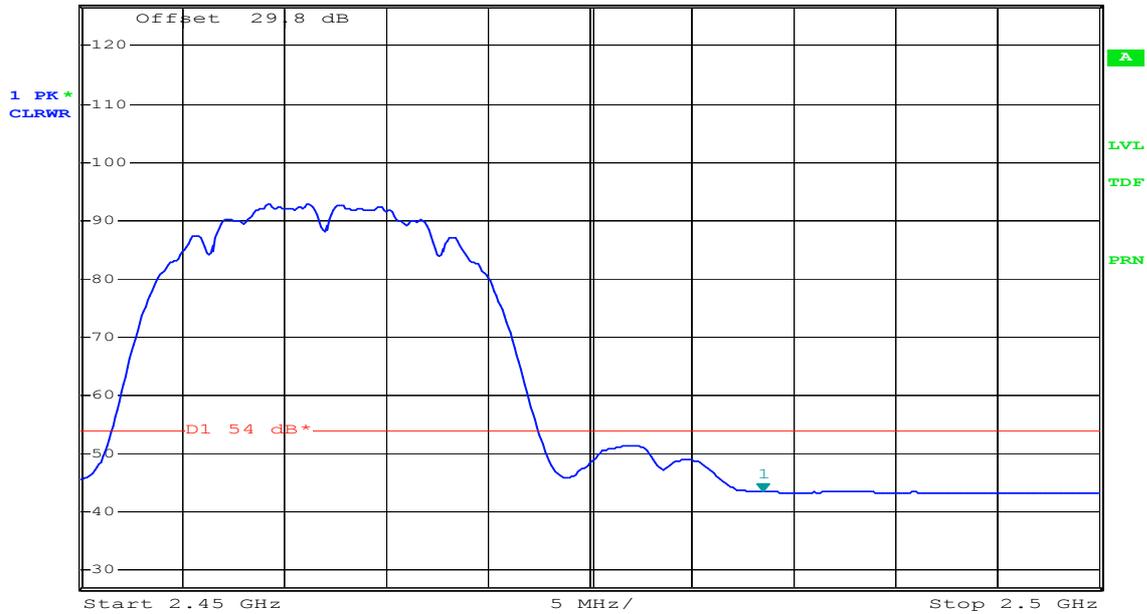
Date: 5.AUG.2004 09:05:15

Detector mode: Average

Polarity: Vertical



Ref 126.8 dB μ V/m *Att 0 dB
*RBW 1 MHz Marker 1 [T1] 43.41 dB μ V/m
*VBW 10 Hz SWT 12.5 s 2.48350000 GHz

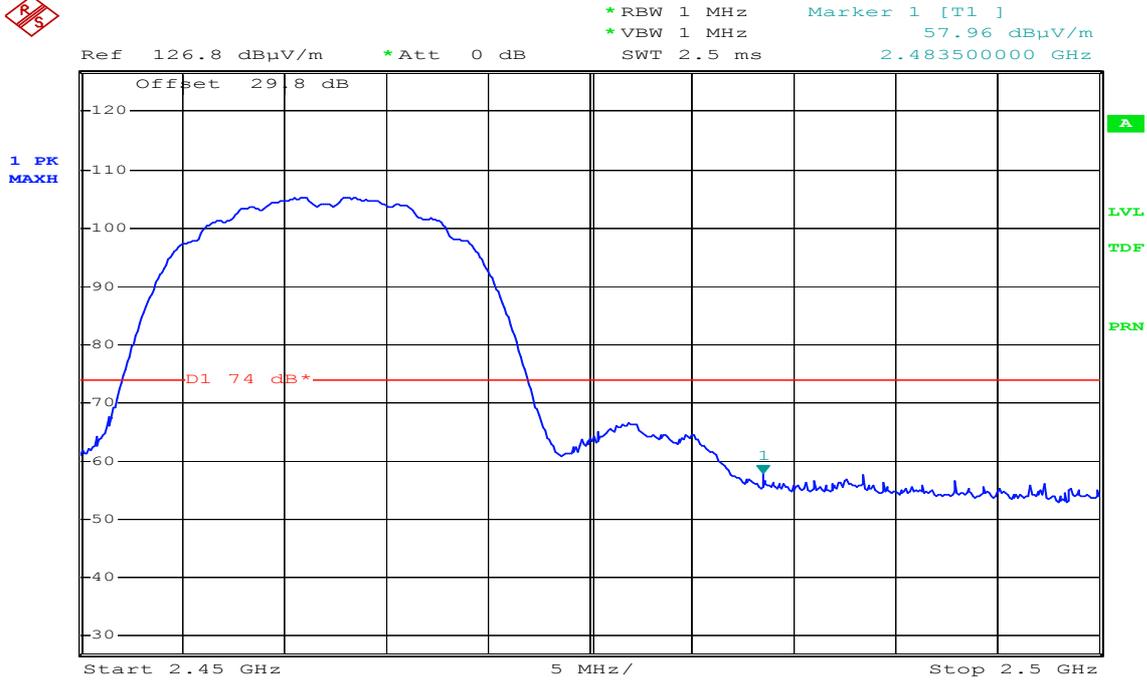


Date: 5.AUG.2004 09:03:54



Detector mode: Peak

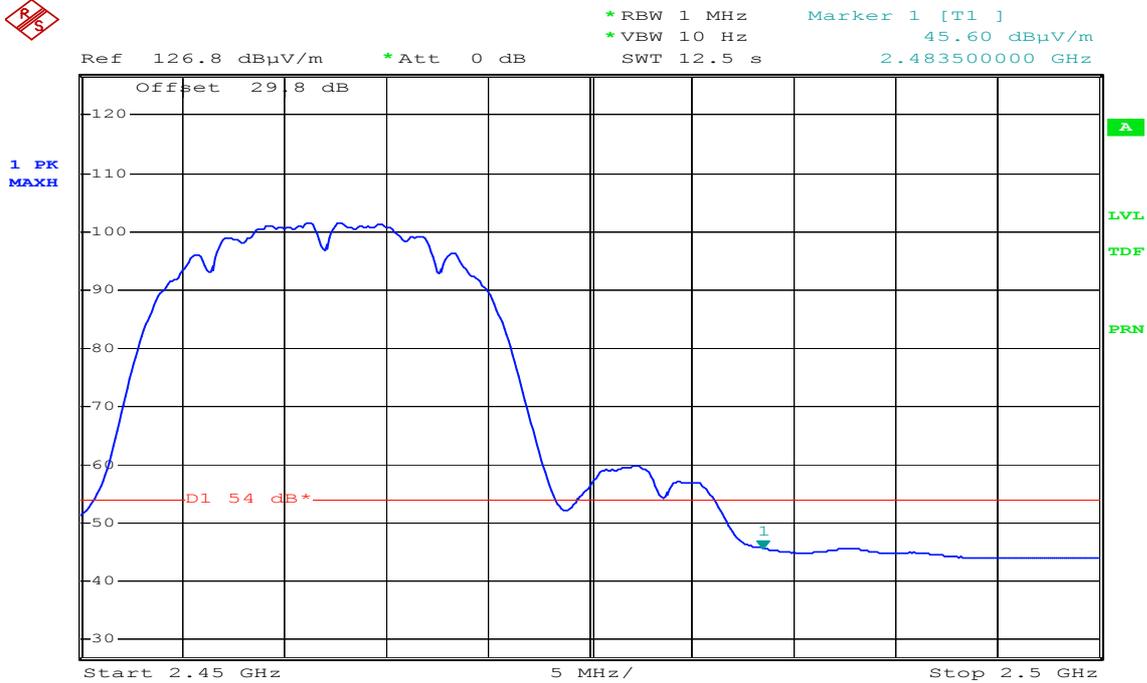
Polarity: Horizontal



Date: 5.AUG.2004 08:53:55

Detector mode: Average

Polarity: Horizontal



Date: 5.AUG.2004 08:52:32

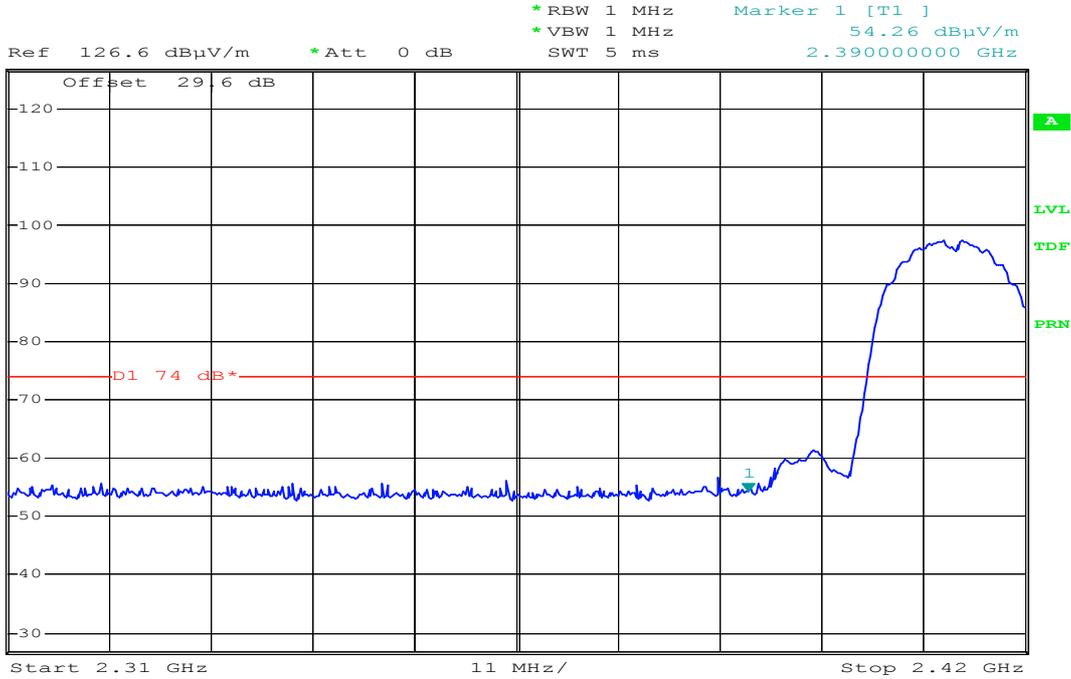


Type 2

Band Edges (IEEE 802.11b / CH Low)

Detector mode: Peak

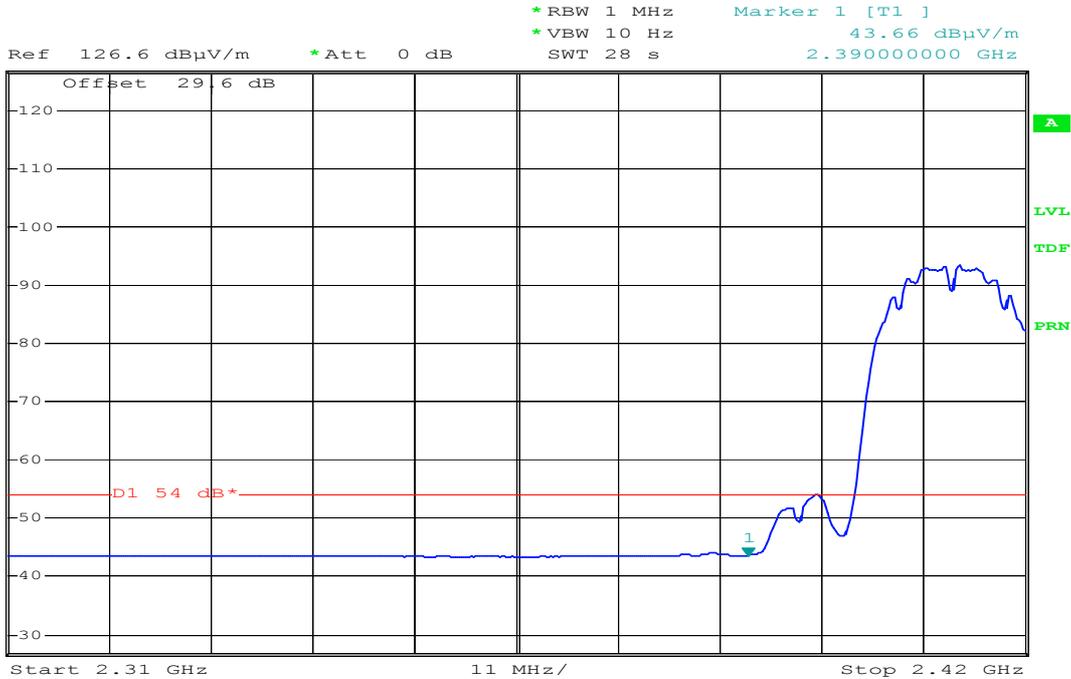
Polarity: Vertical



Date: 5.AUG.2004 09:26:56

Detector mode: Average

Polarity: Vertical



Date: 5.AUG.2004 09:25:30

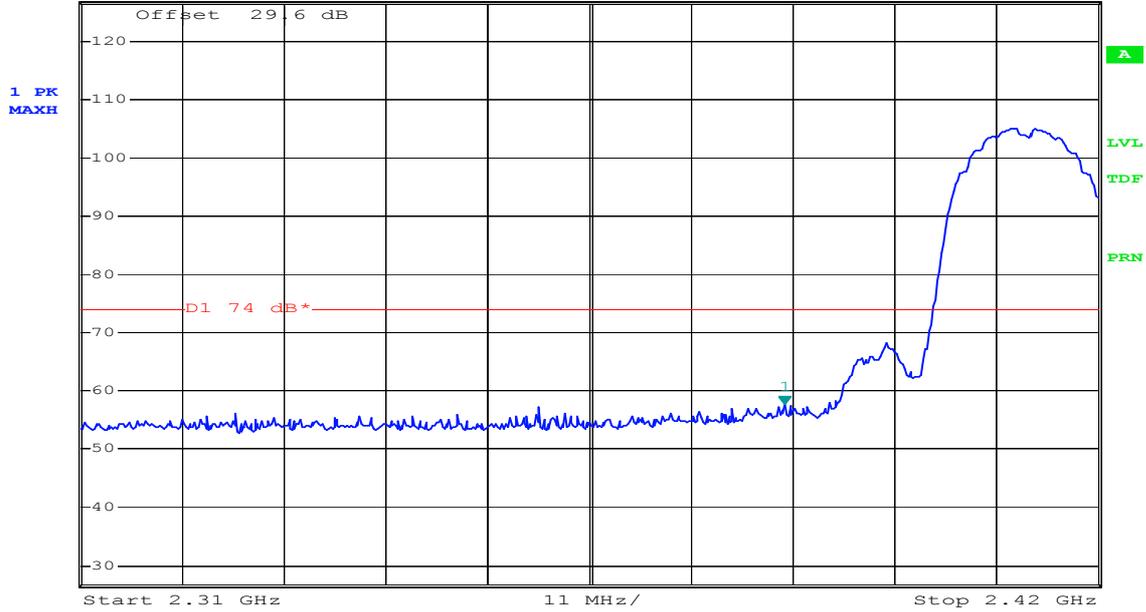


Detector mode: Peak

Polarity: Horizontal



* RBW 1 MHz Marker 1 [T1]
 * VBW 1 MHz 57.60 dBμV/m
 SWT 5 ms 2.386040000 GHz



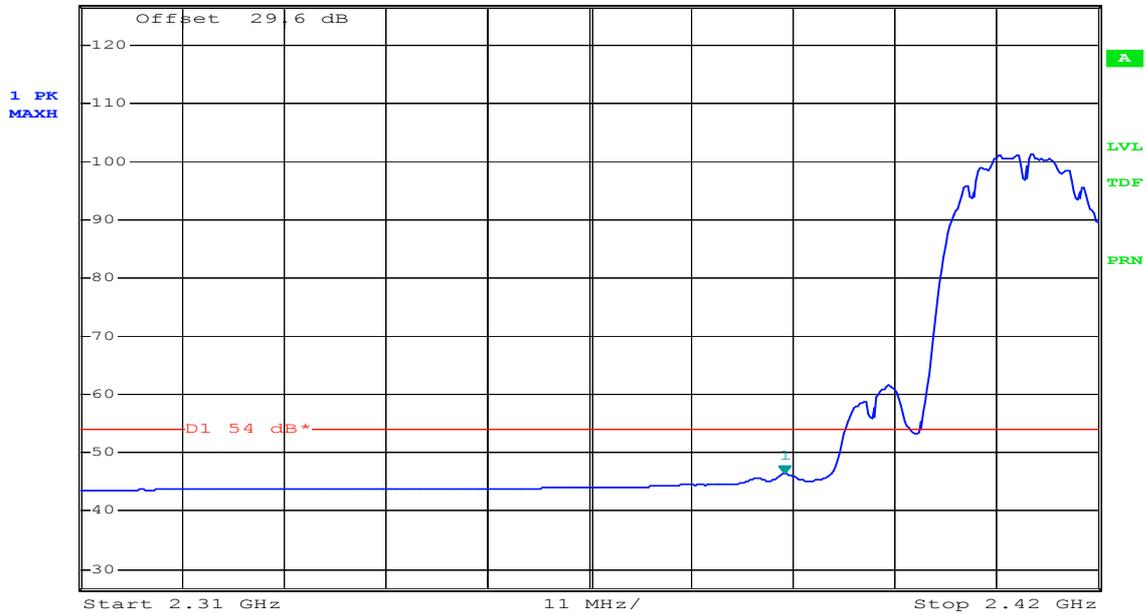
Date: 5.AUG.2004 09:32:38

Detector mode: Average

Polarity: Horizontal



* RBW 1 MHz Marker 1 [T1]
 * VBW 10 Hz 46.32 dBμV/m
 SWT 28 s 2.386040000 GHz



Date: 5.AUG.2004 09:31:36



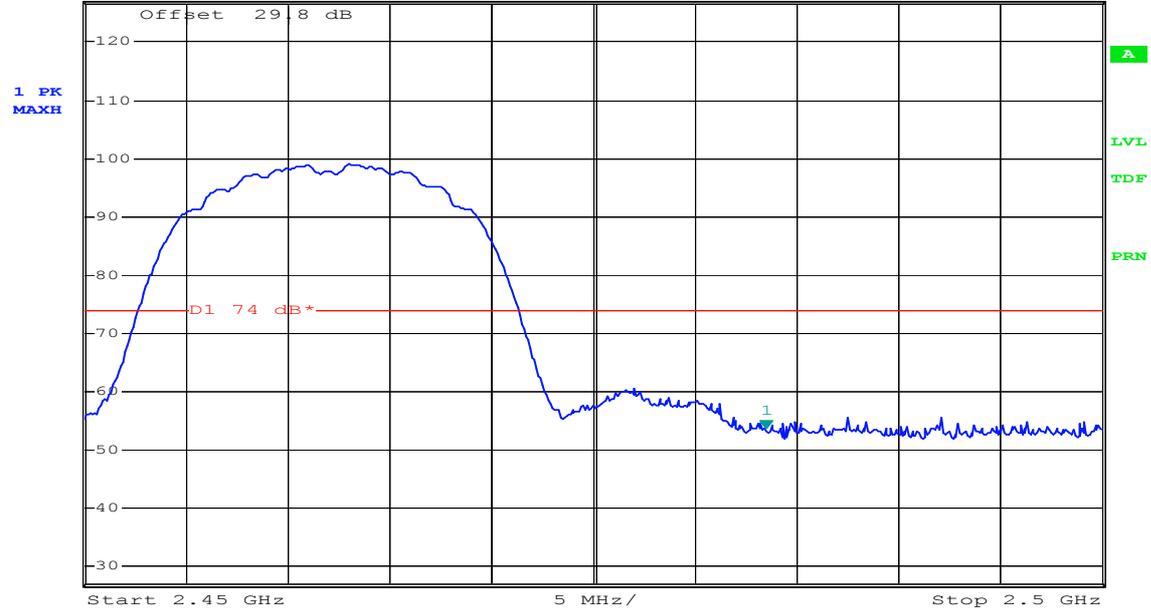
Band Edges (IEEE 802.11b / CH High)

Detector mode: Peak

Polarity: Vertical



Ref 126.8 dB μ V/m *Att 0 dB *RBW 1 MHz Marker 1 [T1] 53.73 dB μ V/m
*VBW 1 MHz SWT 2.5 ms 2.48350000 GHz



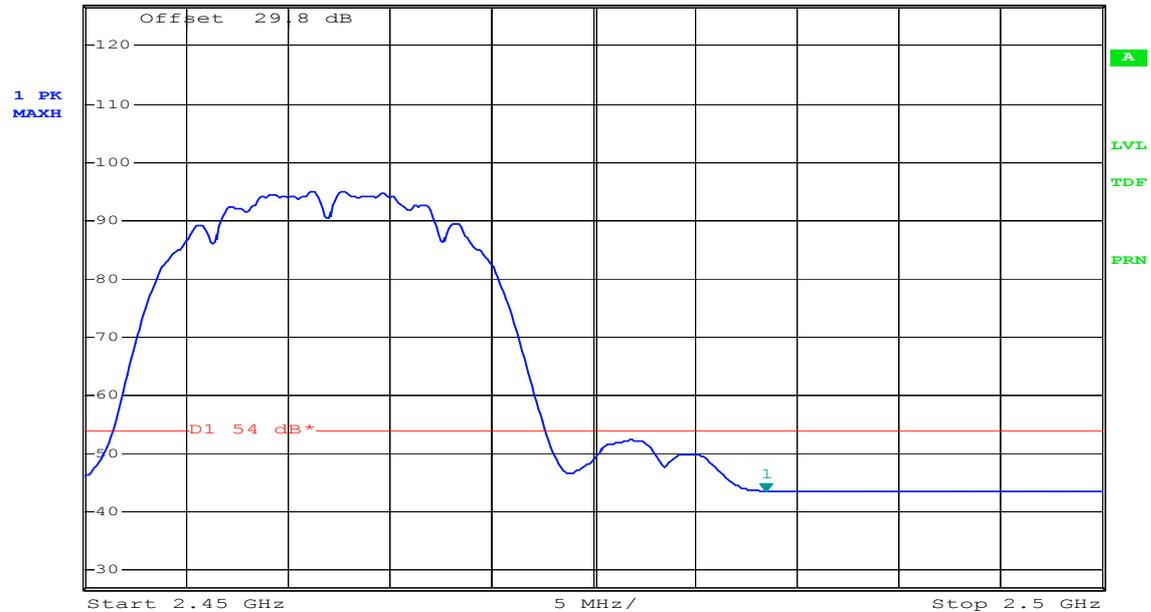
Date: 5.AUG.2004 09:44:08

Detector mode: Average

Polarity: Vertical



Ref 126.8 dB μ V/m *Att 0 dB *RBW 1 MHz Marker 1 [T1] 43.55 dB μ V/m
*VBW 10 Hz SWT 12.5 s 2.48350000 GHz

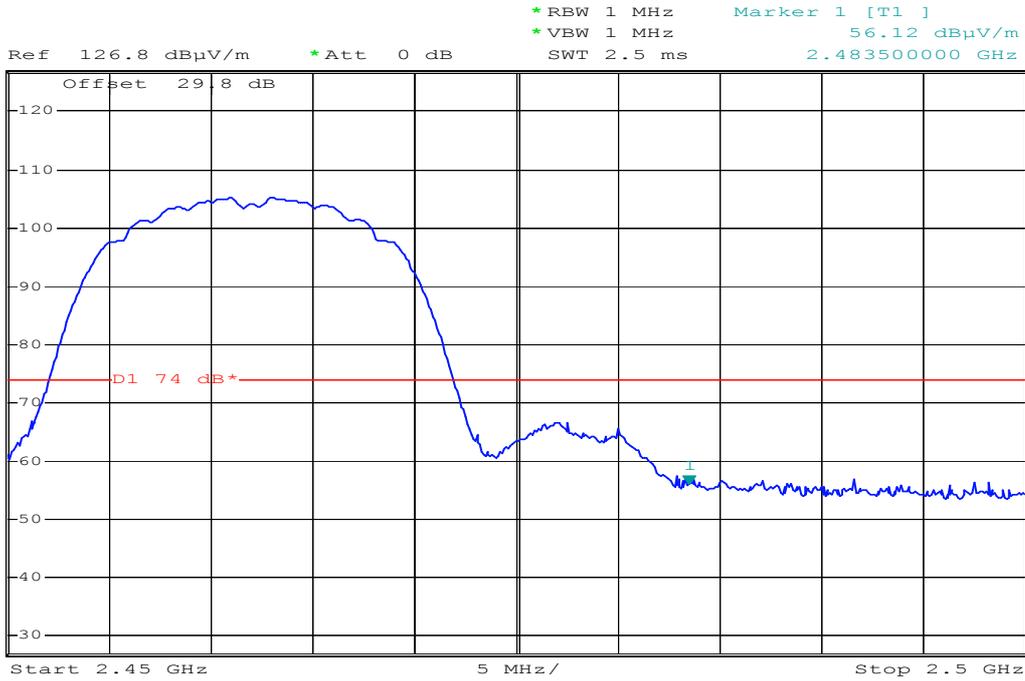


Date: 5.AUG.2004 09:43:04



Detector mode: Peak

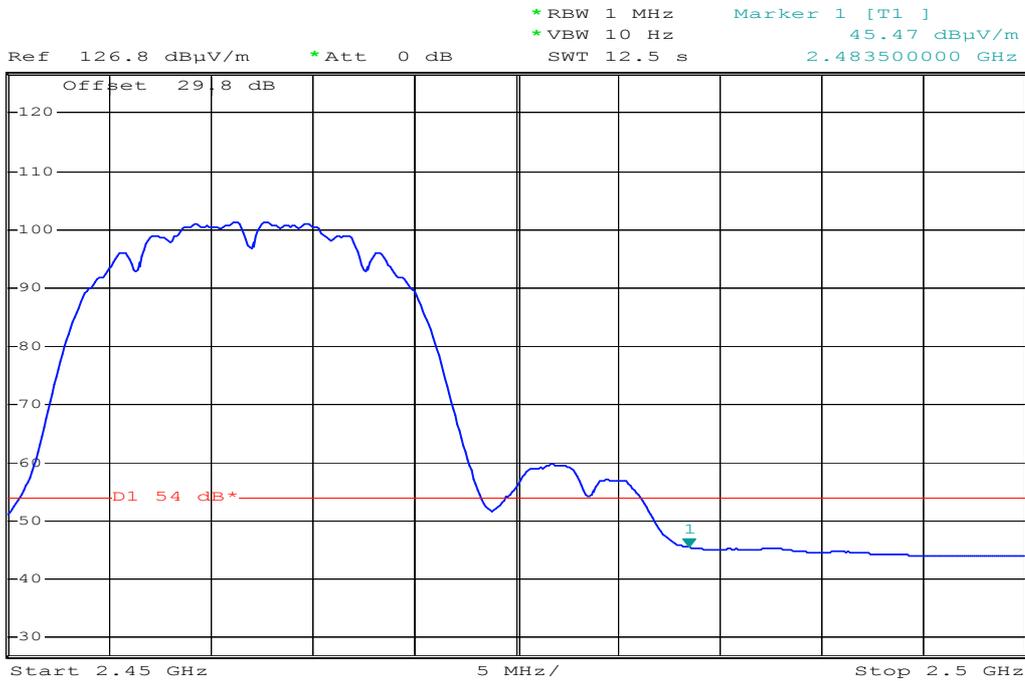
Polarity: Horizontal



Date: 5.AUG.2004 09:39:03

Detector mode: Average

Polarity: Horizontal



Date: 5.AUG.2004 09:37:49

7.4 PEAK POWER SPECTRAL DENSITY

LIMIT

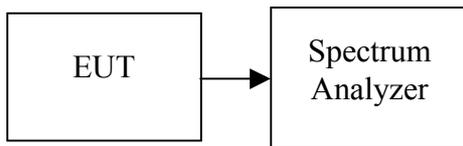
1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.



TEST RESULTS

No non-compliance noted

Test Data

Type 1

Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-25.24	11.80	-13.44	8.00	PASS
Mid	2437	-25.78	11.80	-13.98		PASS
High	2462	-26.11	11.80	-14.31		PASS

Type 2

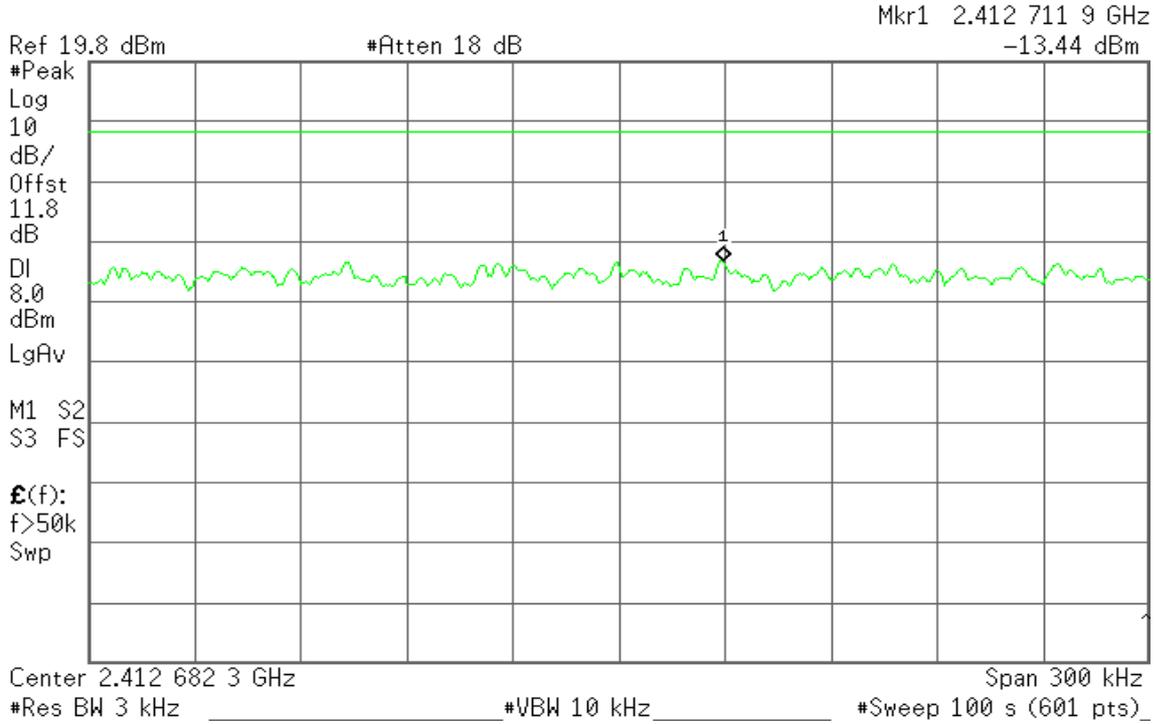
Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-25.48	11.80	-13.68	8.00	PASS
Mid	2437	-24.91	11.80	-13.11		PASS
High	2462	-25.12	11.80	-13.32		PASS



Test Plot
Type 1

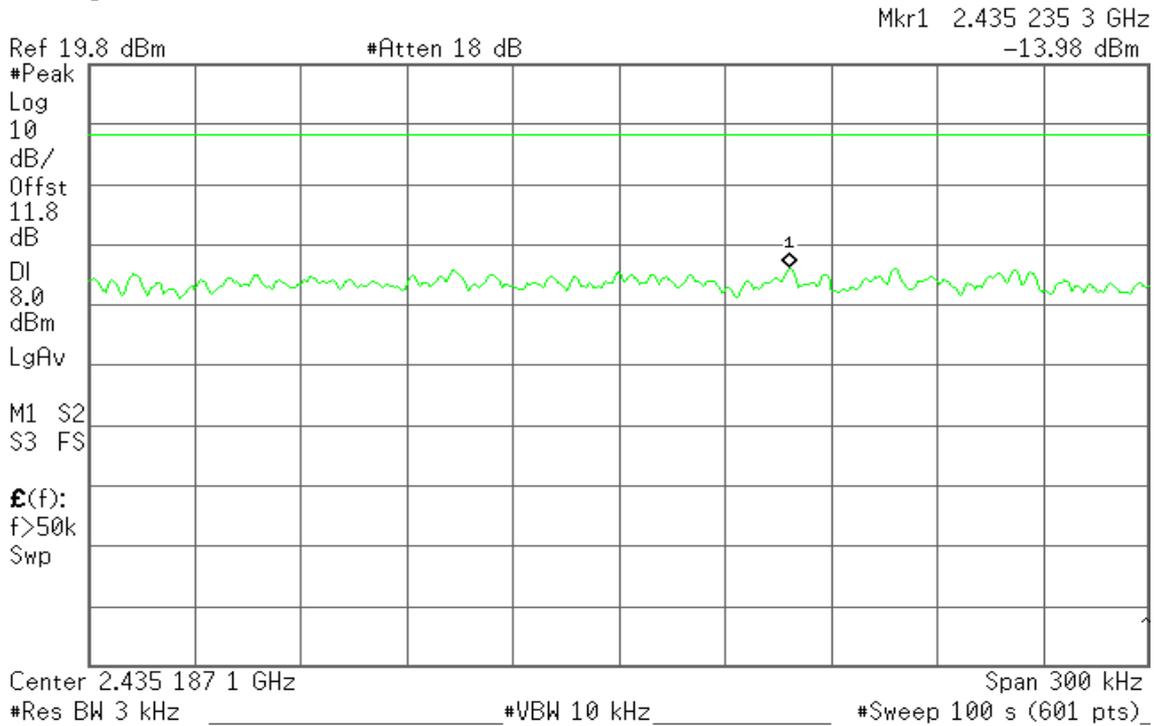
PPSD (IEEE 802.11b / CH Low)

* Agilent 20:35:37 Jul 30, 2004



PPSD (IEEE 802.11b / CH Mid)

* Agilent 20:43:03 Jul 30, 2004

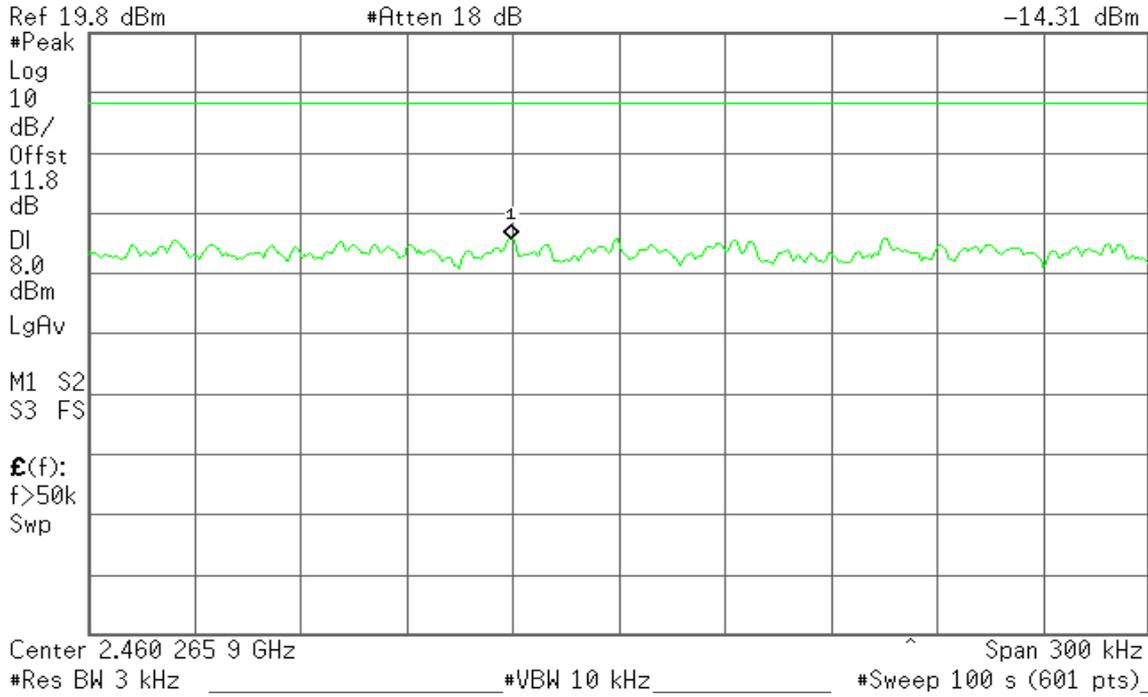




PPSD (IEEE 802.11b / CH High)

Agilent 20:48:11 Jul 30, 2004

Mkr1 2.460 235 3 GHz
-14.31 dBm

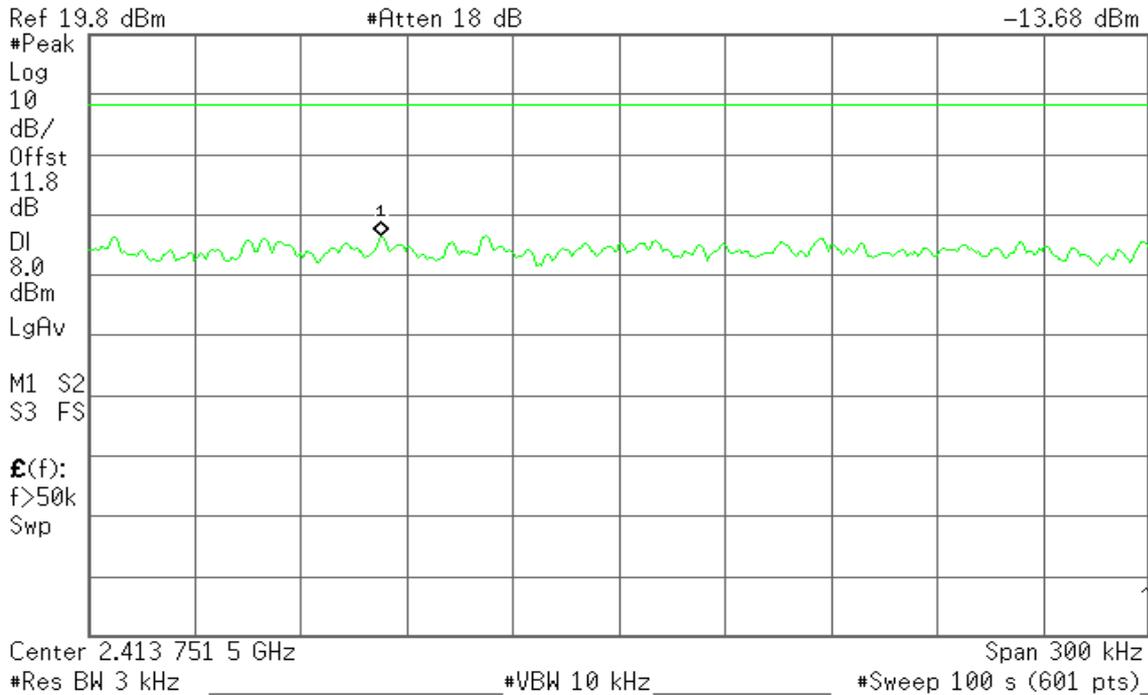


Type 2

PPSD (IEEE 802.11b / CH Low)

Agilent 20:57:17 Jul 30, 2004

Mkr1 2.413 683 6 GHz
-13.68 dBm

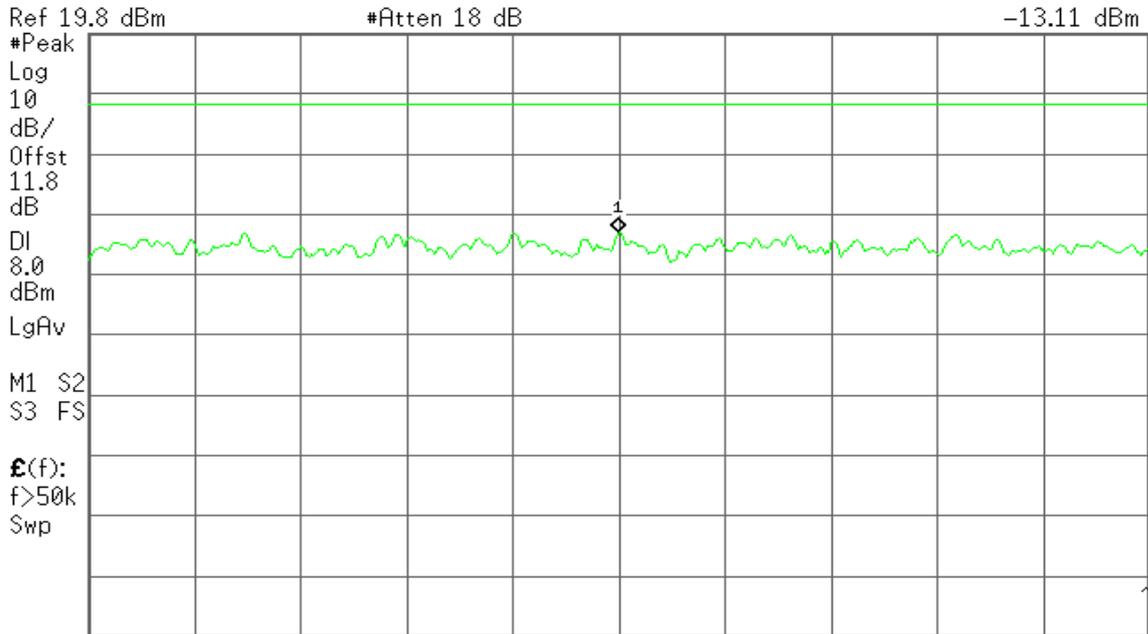




PPSD (IEEE 802.11b / CH Mid)

Agilent 21:05:32 Jul 30, 2004

Mkr1 2.437 712 4 GHz
-13.11 dBm



Center 2.437 712 4 GHz Span 300 kHz
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)

PPSD (IEEE 802.11b / CH High)

Agilent 21:09:22 Jul 30, 2004

Mkr1 2.461 266 2 GHz
-13.32 dBm



Center 2.461 266 2 GHz Span 300 kHz
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)



7.5 RADIO FREQUENCY EXPOSURE

LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §15.247(b)(4) and §1.1307(b)(1) of this chapter.

EUT Specification

Type1

EUT	Pocket PC
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others _____
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5mW/cm^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1mW/cm^2$)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> TX diversity <input type="checkbox"/> RX diversity <input checked="" type="checkbox"/> TX/RX diversity
Max. output power	12.64 dBm (18.365mW)
Antenna gain (Max)	1.33 dBi (Numeric gain: 1.358)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation <input checked="" type="checkbox"/> N/A

Note:

- The maximum output power is 12.64dBm (18.365mW) at 2412MHz (with 1.358numeric antenna gain.)
- DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
- For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.

TEST RESULTS

No non-compliance noted.

(SAR evaluation is not required for the PORTABLE device while its maximum output power is lower than the general population low threshold: $60/f_{(GHz)}=60/2.437=24.62mW$)

MPE evaluation

Not applicable.



Type2

EUT	Pocket PC
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others _____
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5mW/cm^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1mW/cm^2$)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> TX diversity <input type="checkbox"/> RX diversity <input checked="" type="checkbox"/> TX/RX diversity
Max. output power	12.85 dBm (19.275mW)
Antenna gain (Max)	1.33 dBi (Numeric gain: 1.358)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation <input checked="" type="checkbox"/> N/A

Note:

- The maximum output power is 12.85dBm (19.275mW) at 2437MHz (with 1.358numeric antenna gain.)*
- DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.*
- For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*

TEST RESULTS

No non-compliance noted.

(SAR evaluation is not required for the PORTABLE device while its maximum output power is lower than the general population low threshold: $60/f_{(GHz)}=60/2.437=24.62mW$)

MPE evaluation

Not applicable.

CONDITION B: BLUETOOTH OPERATION

7.6 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

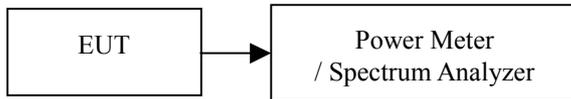
1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Agilent	E4416A	GB41291611	06/02/2005
Power Sensor	Agilent	E9327A	US40441097	06/02/2005
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/22/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

TEST RESULTS

No non-compliance noted



Test Data

Type 1

Channel	Frequency	Output Power	Factor (dB)	Output Power	Output Power	Limit (W)	Result
Low	2402.00	0.68	1.10	1.78	0.00151	1	PASS
Mid	2441.00	0.07	1.10	1.17	0.00131		PASS
High	2480.00	0.52	1.10	1.62	0.00145		PASS

Type 2

Channel	Frequency	Output Power	Factor (dB)	Output Power	Output Power	Limit (W)	Result
Low	2402.00	0.12	1.10	1.22	0.00132	1	PASS
Mid	2441.00	0.12	1.10	1.22	0.00132		PASS
High	2480.00	-0.57	1.10	0.53	0.00113		PASS

7.7 BAND EDGES MEASUREMENT

LIMIT

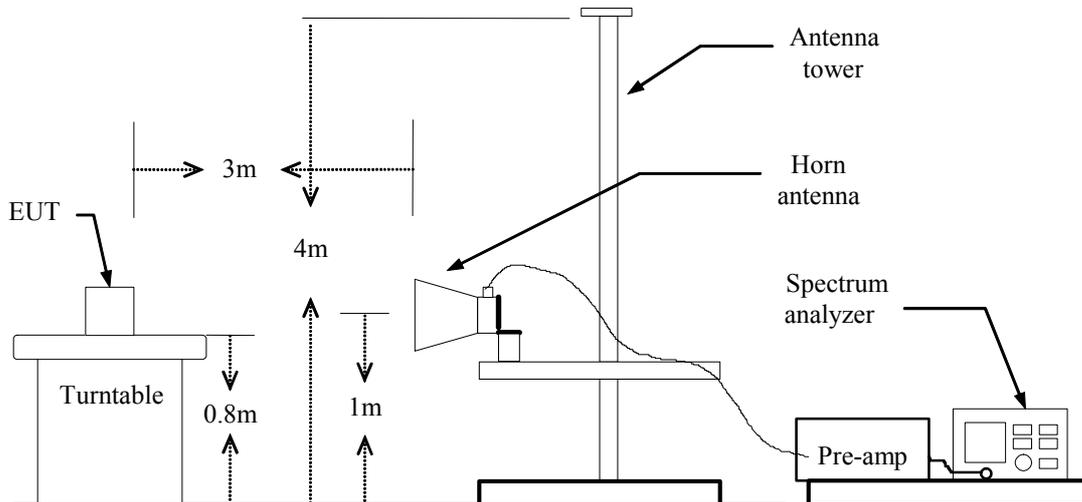
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. 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).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	1093.4495.30	07/22/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (b) PEAK: RBW=VBW=1MHz / Sweep=AUTO
 - (c) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

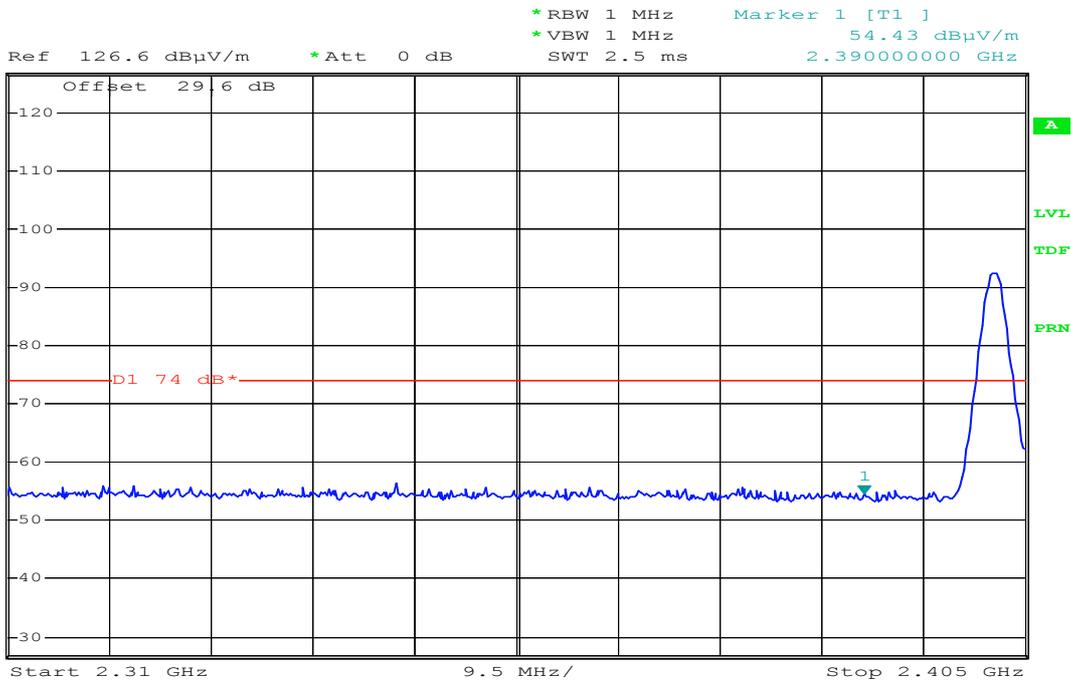


Type 1

Band Edges (Bluetooth mode / CH-Low)

Detector mode: Peak

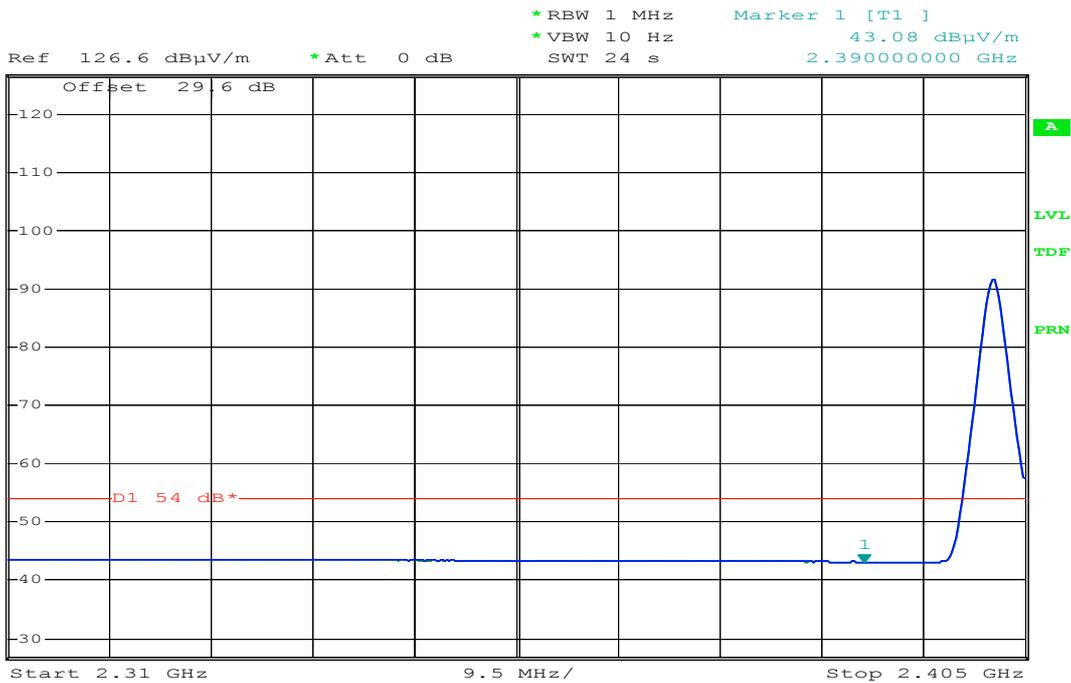
Polarity: Vertical



Date: 5.AUG.2004 10:47:21

Detector mode: Average

Polarity: Vertical

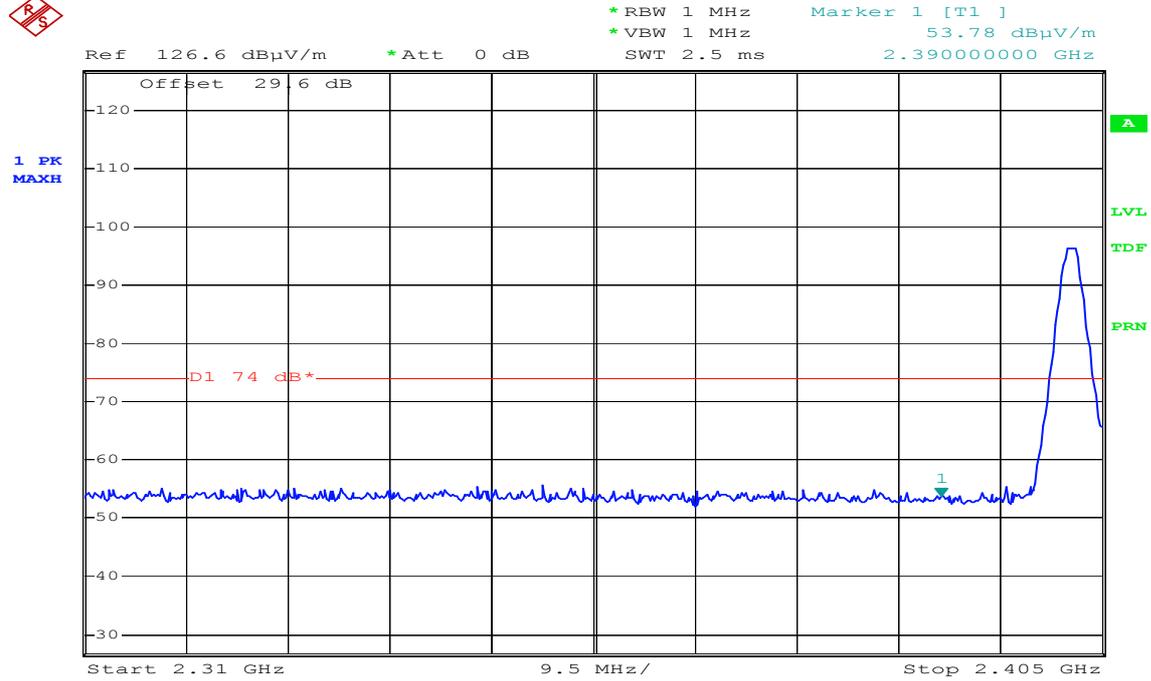


Date: 5.AUG.2004 10:45:31



Detector mode: Peak

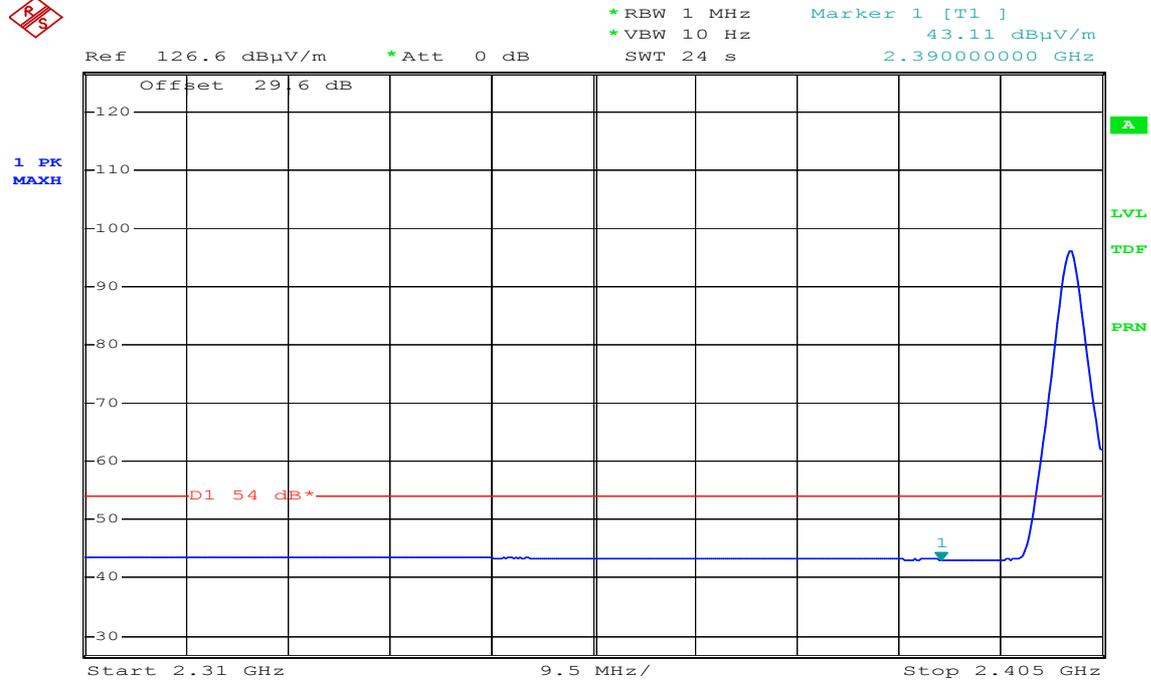
Polarity: Horizontal



Date: 5.AUG.2004 10:54:32

Detector mode: Average

Polarity: Horizontal



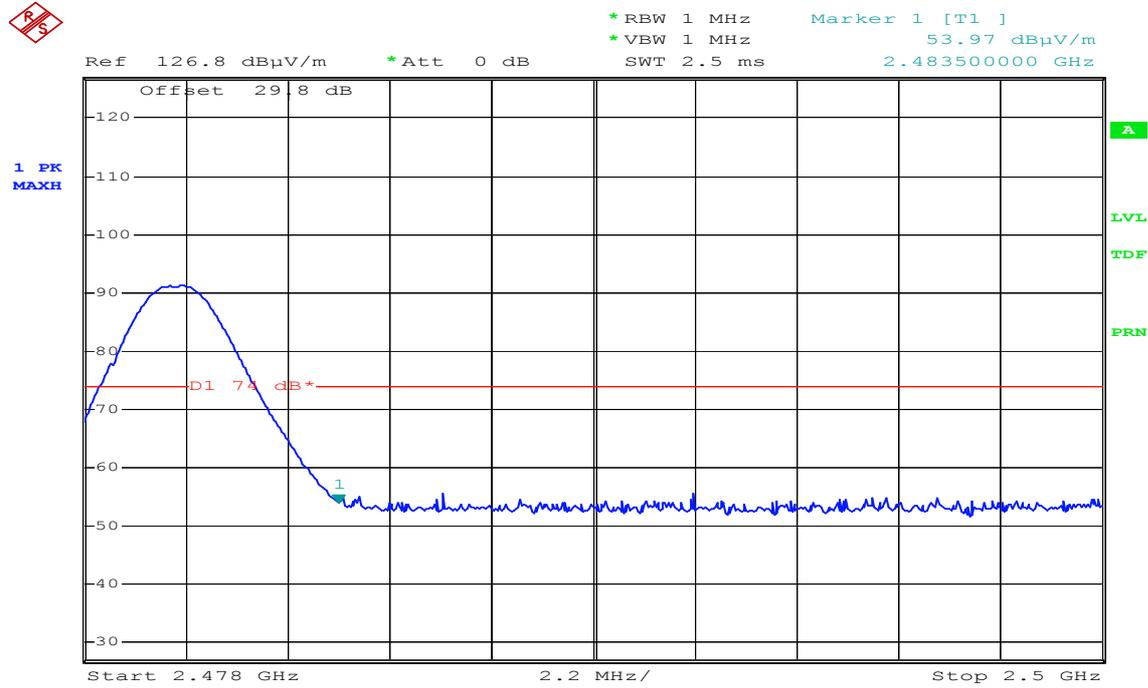
Date: 5.AUG.2004 10:53:17



Band Edges (Bluetooth mode / CH-High)

Detector mode: Peak

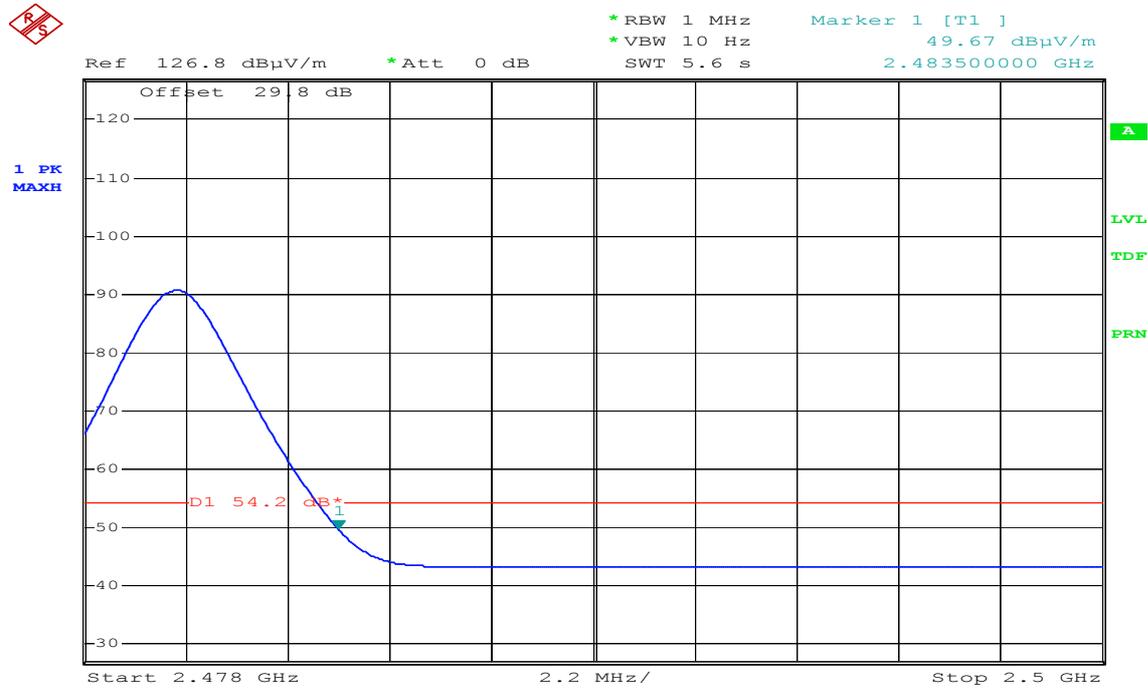
Polarity: Vertical



Date: 5.AUG.2004 11:07:14

Detector mode: Average

Polarity: Vertical

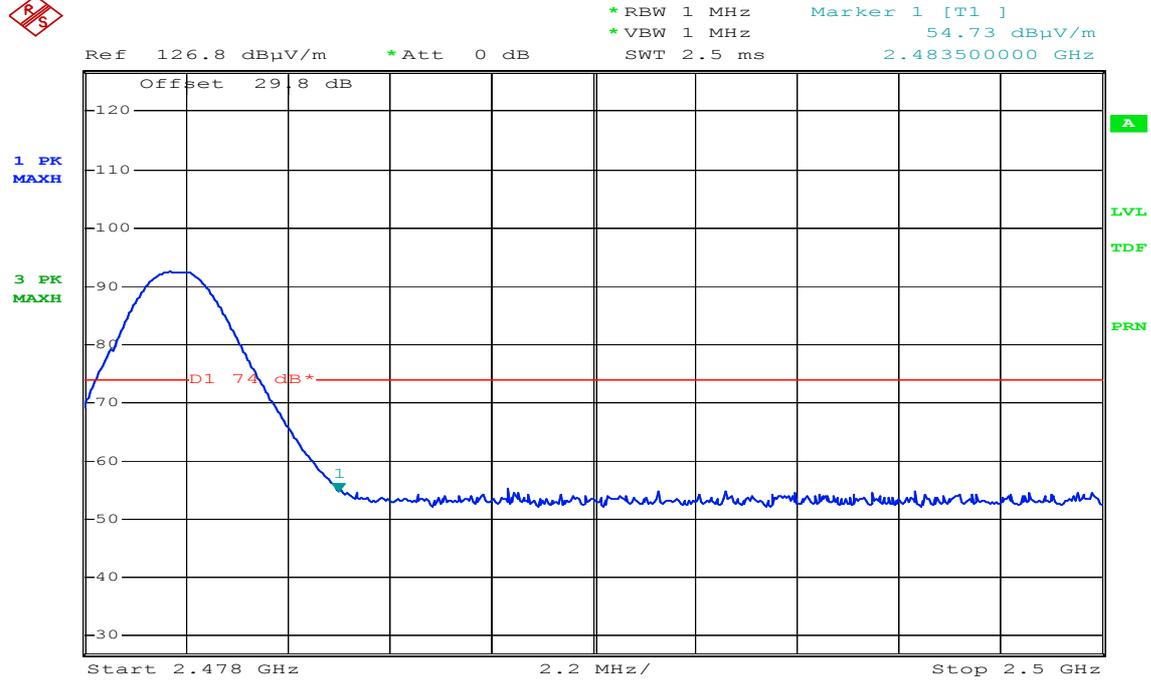


Date: 5.AUG.2004 11:06:09



Detector mode: Peak

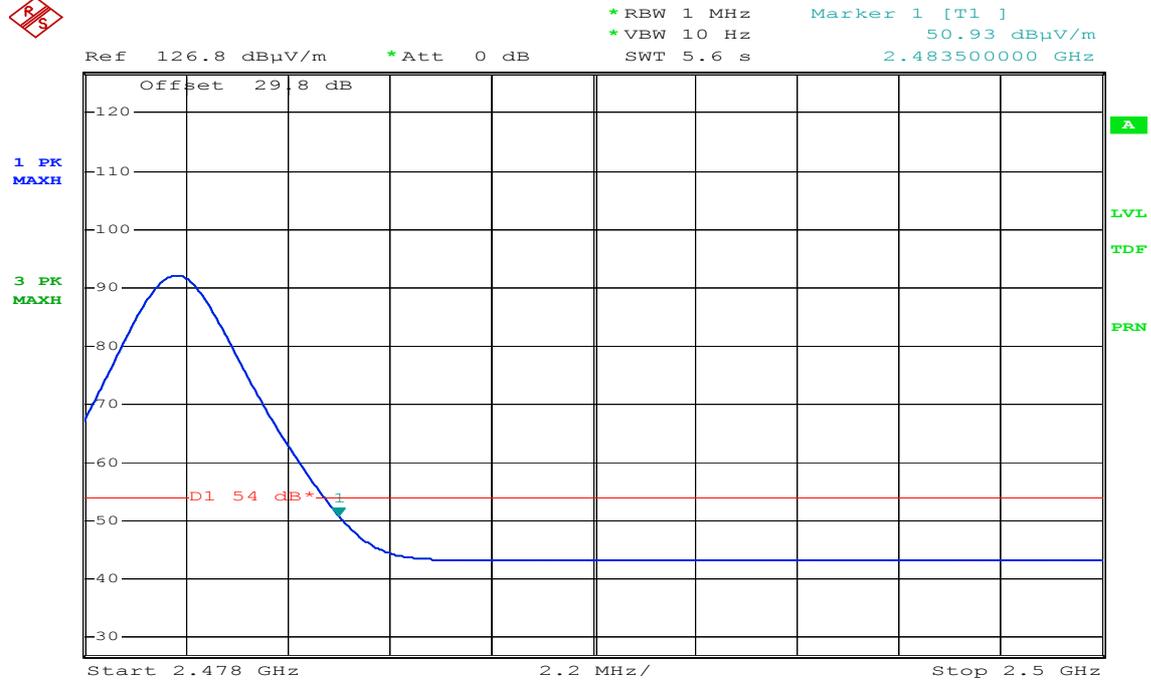
Polarity: Horizontal



Date: 5.AUG.2004 11:16:17

Detector mode: Average

Polarity: Horizontal



Date: 5.AUG.2004 11:15:18

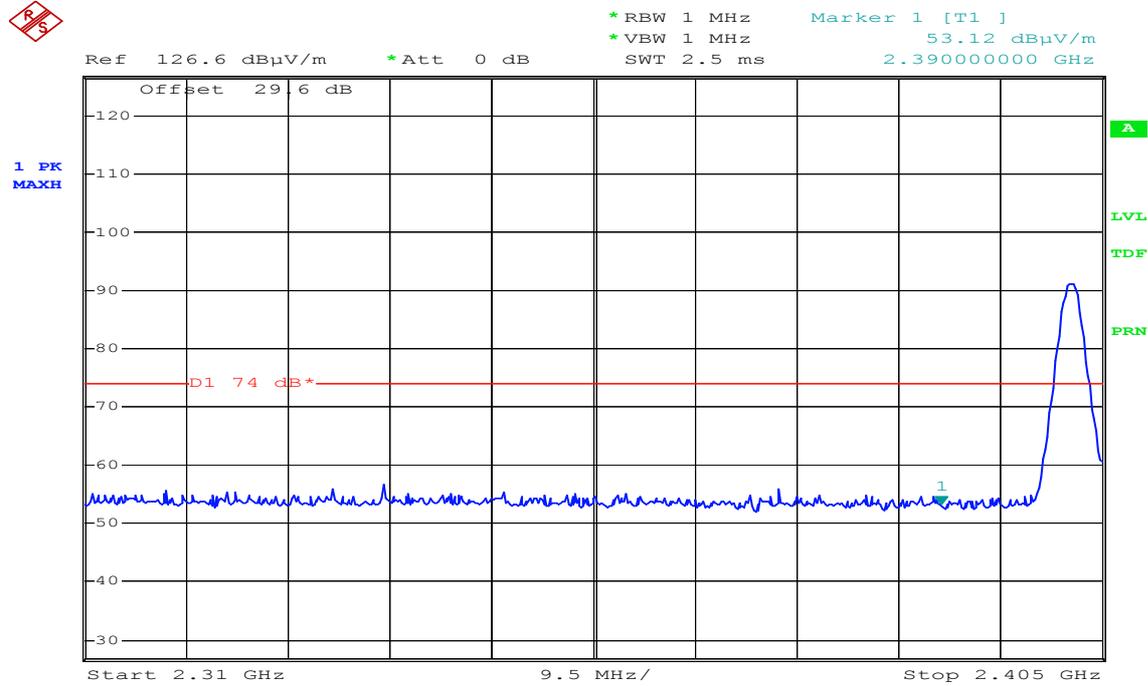


Type 2

Band Edges (Bluetooth mode / CH-Low)

Detector mode: Peak

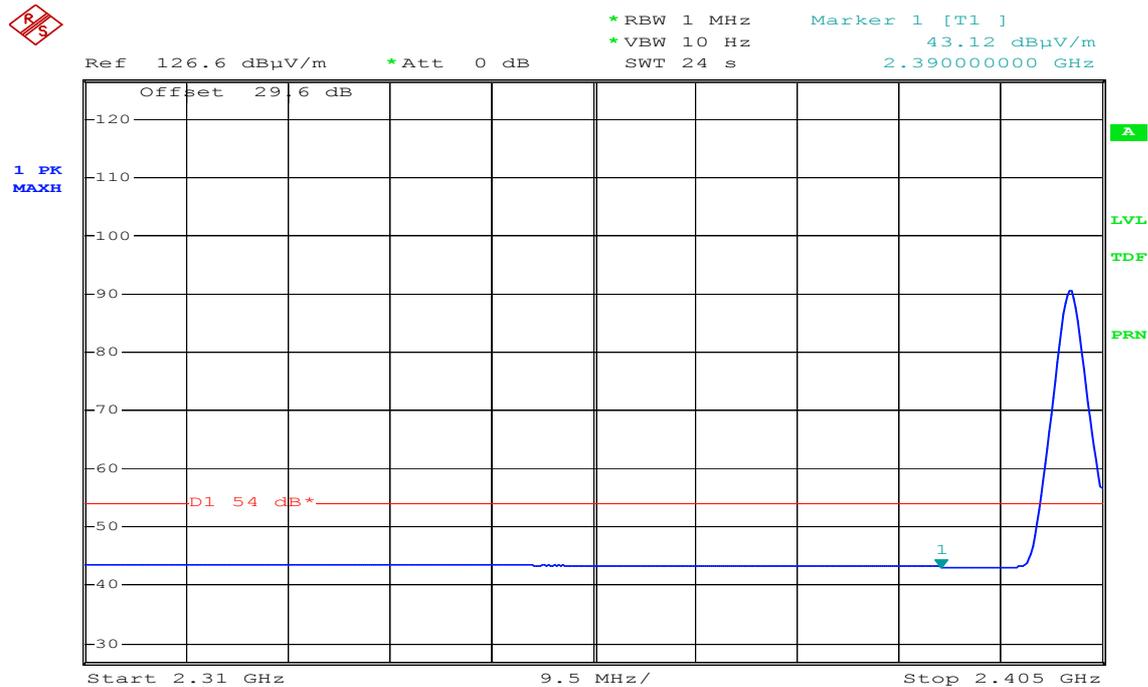
Polarity: Vertical



Date: 5.AUG.2004 11:42:15

Detector mode: Average

Polarity: Vertical

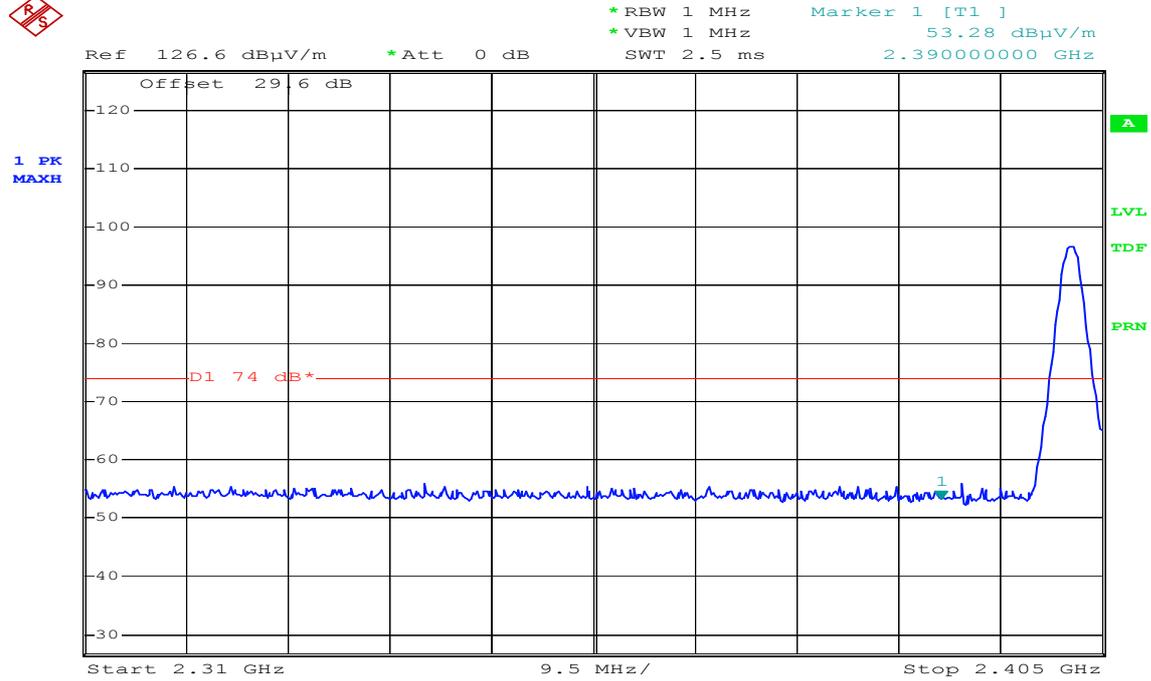


Date: 5.AUG.2004 11:41:07



Detector mode: Peak

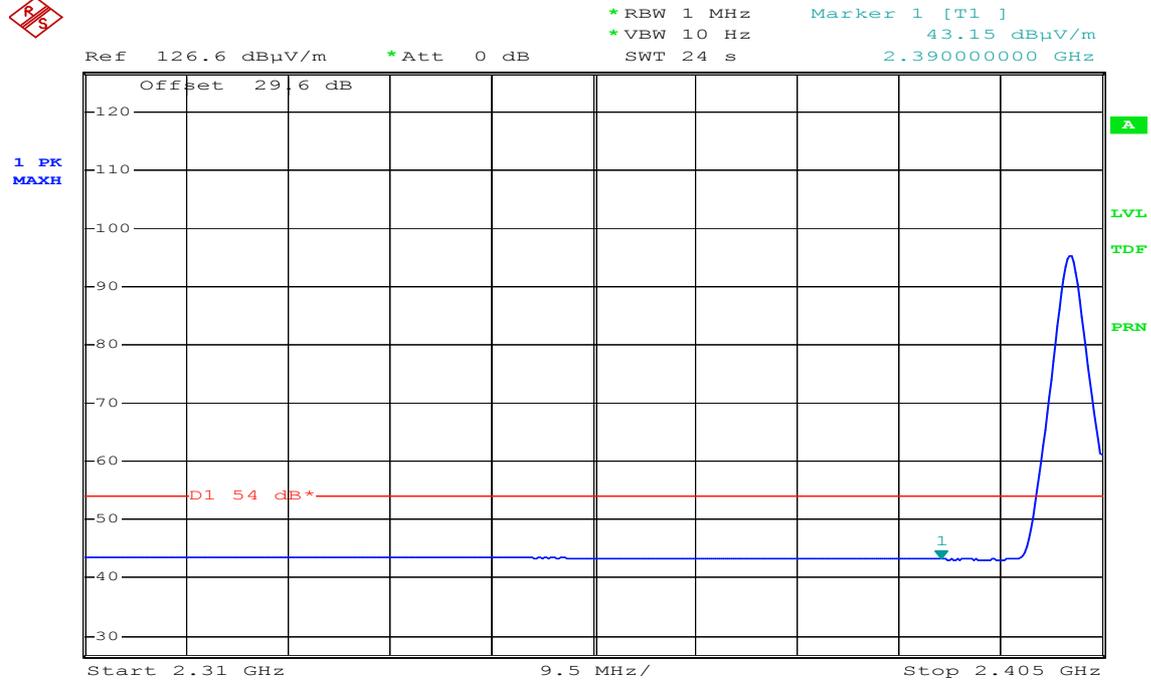
Polarity: Horizontal



Date: 5.AUG.2004 11:49:20

Detector mode: Average

Polarity: Horizontal



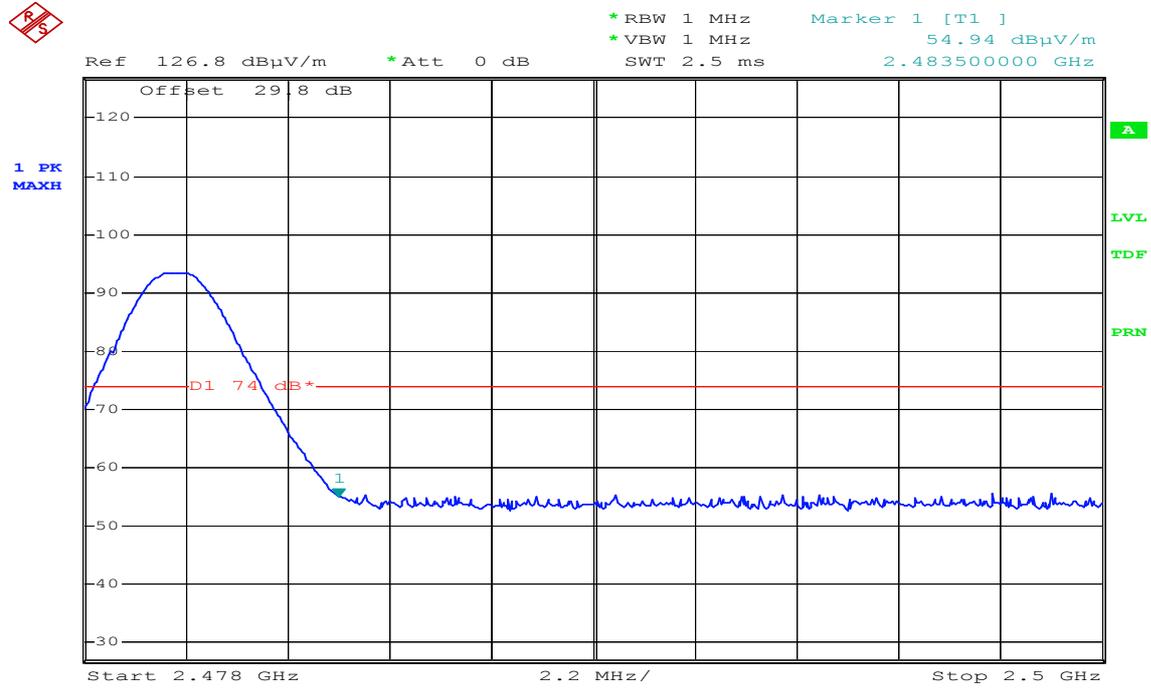
Date: 5.AUG.2004 11:47:53



Band Edges (Bluetooth mode / CH-High)

Detector mode: Peak

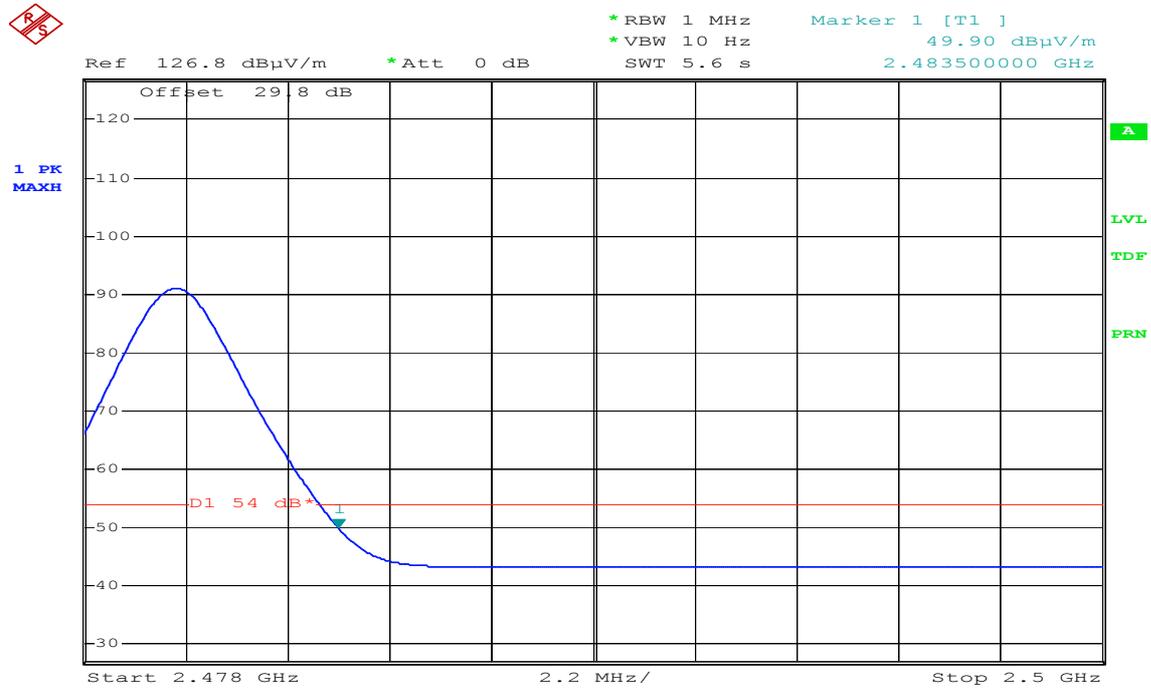
Polarity: Vertical



Date: 5.AUG.2004 11:35:00

Detector mode: Average

Polarity: Vertical

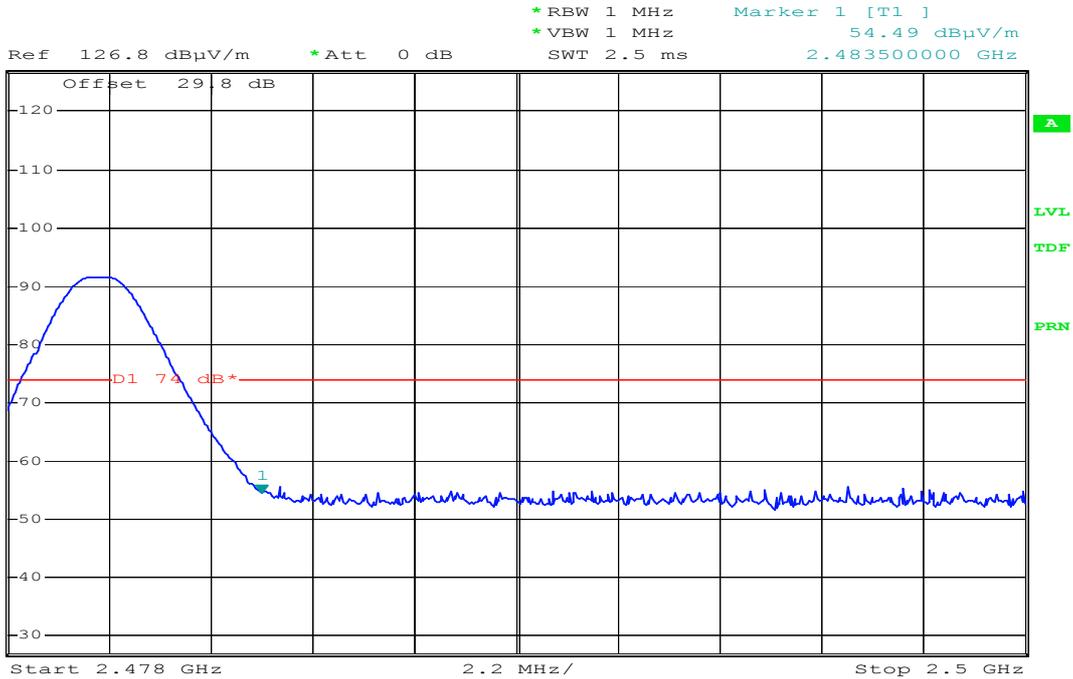


Date: 5.AUG.2004 11:33:27



Detector mode: Peak

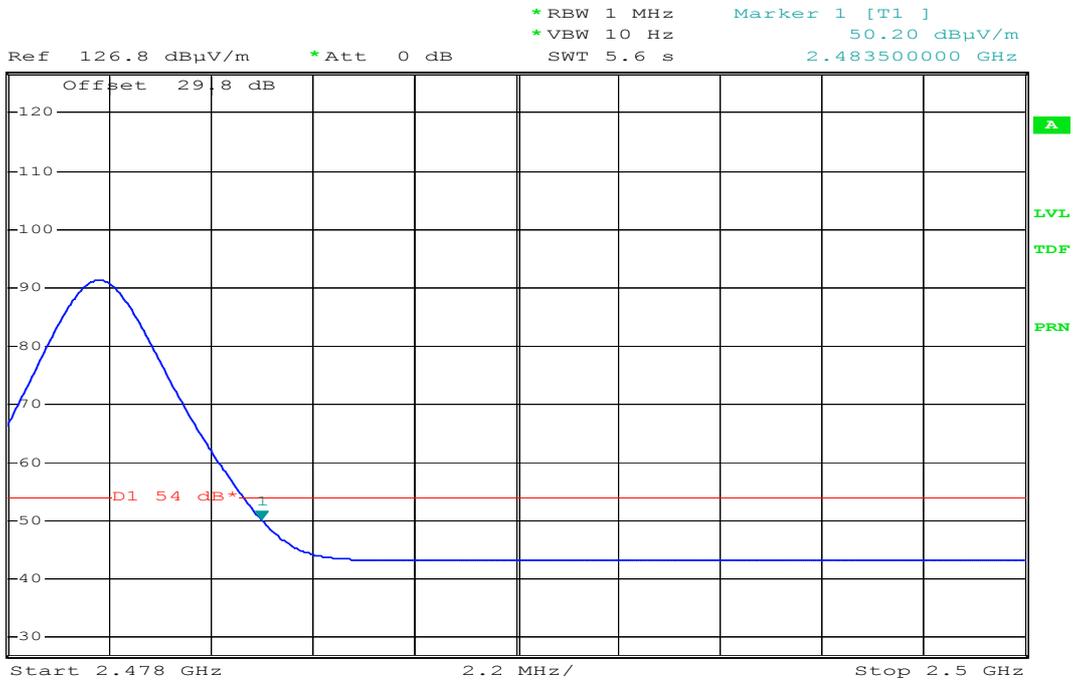
Polarity: Horizontal



Date: 5.AUG.2004 11:28:15

Detector mode: Average

Polarity: Horizontal



Date: 5.AUG.2004 11:26:54

7.8 PEAK POWER SPECTRAL DENSITY

LIMIT

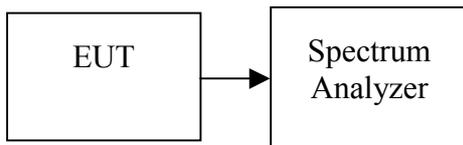
1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table 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 the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
4. Record the max. reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.



TEST RESULTS

No non-compliance noted

Test Data

Type 1

Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
Low	2402	-20.89	11.80	-9.09	8.00	PASS
Mid	2441	-20.80	11.80	-9.00		PASS
High	2480	-21.54	11.80	-9.74		PASS

Type 2

Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
Low	2402	-21.40	11.80	-9.60	8.00	PASS
Mid	2441	-21.16	11.80	-9.36		PASS
High	2480	-21.94	11.80	-10.14		PASS

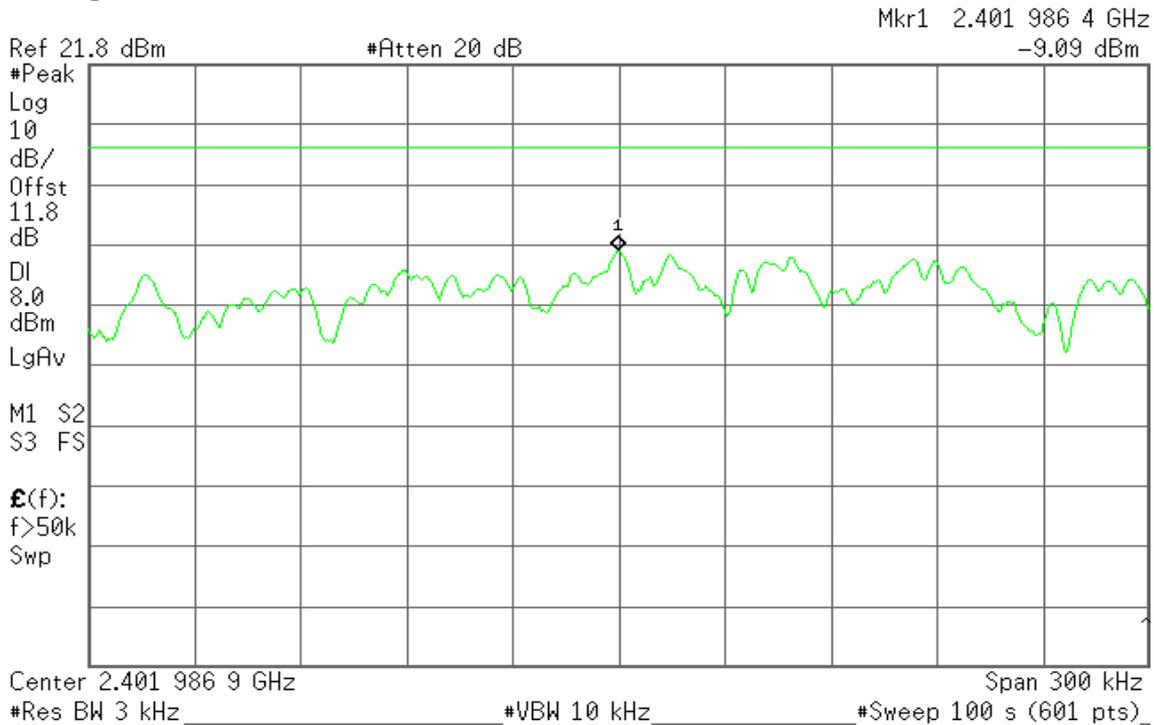


Test Plot

Type 1

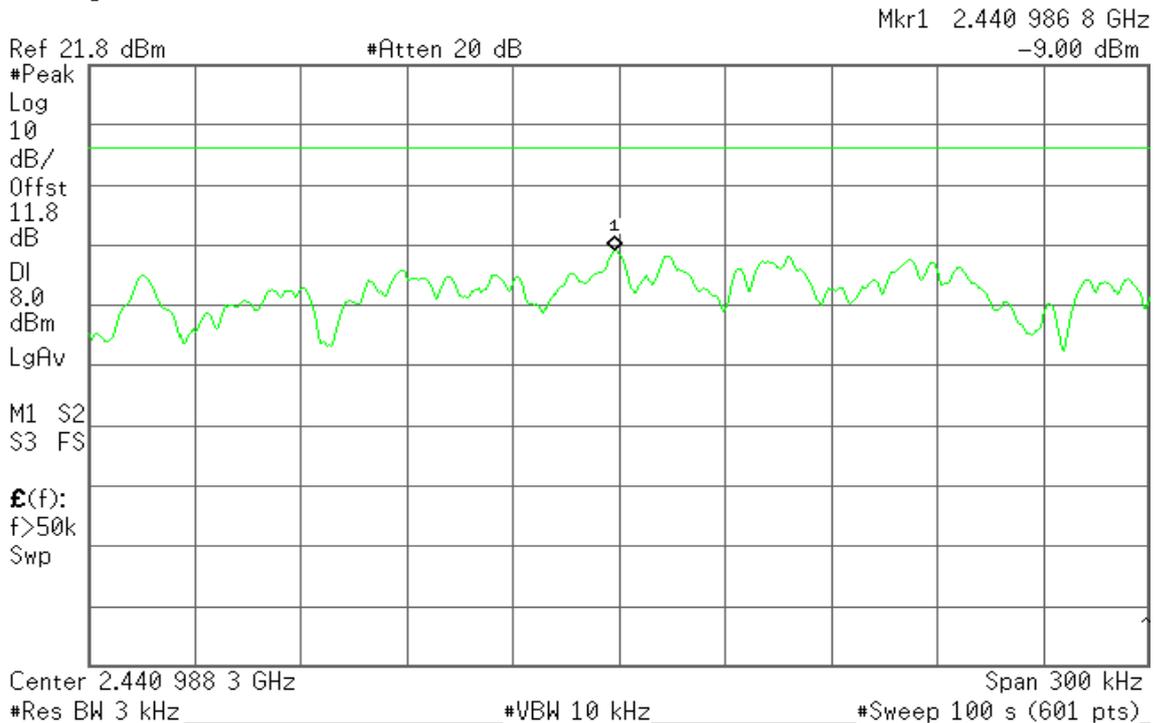
PPSD (CH Low)

Agilent 16:50:42 Aug 3, 2004



PPSD (CH Mid)

Agilent 16:54:47 Aug 3, 2004





PPSD (CH High)

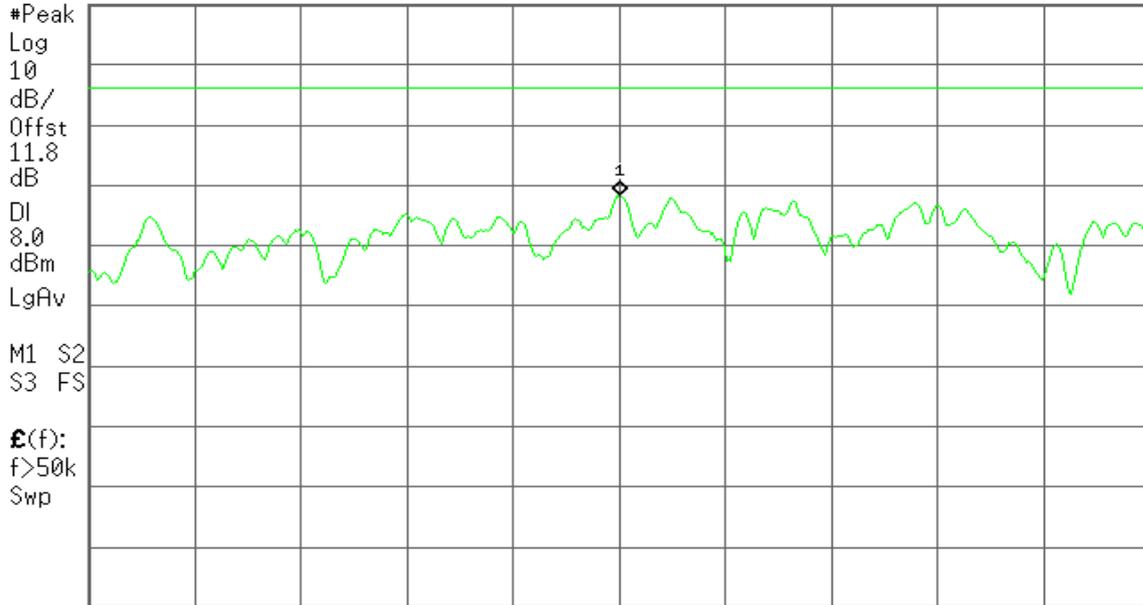
Agilent 16:59:55 Aug 3, 2004

Mkr1 2.479 988 2 GHz

-9.74 dBm

Ref 21.8 dBm

#Atten 20 dB



Center 2.479 987 7 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

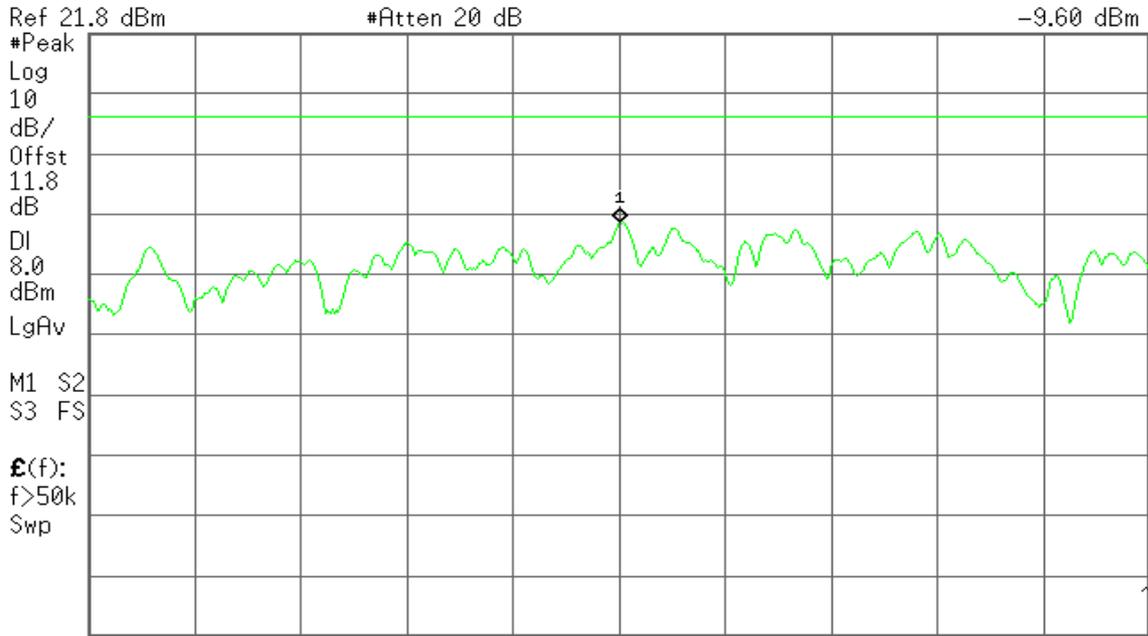


Type 2

PPSD (CH Low)

Agilent 18:28:29 Aug 3, 2004

Mkr1 2.401 973 5 GHz
-9.60 dBm

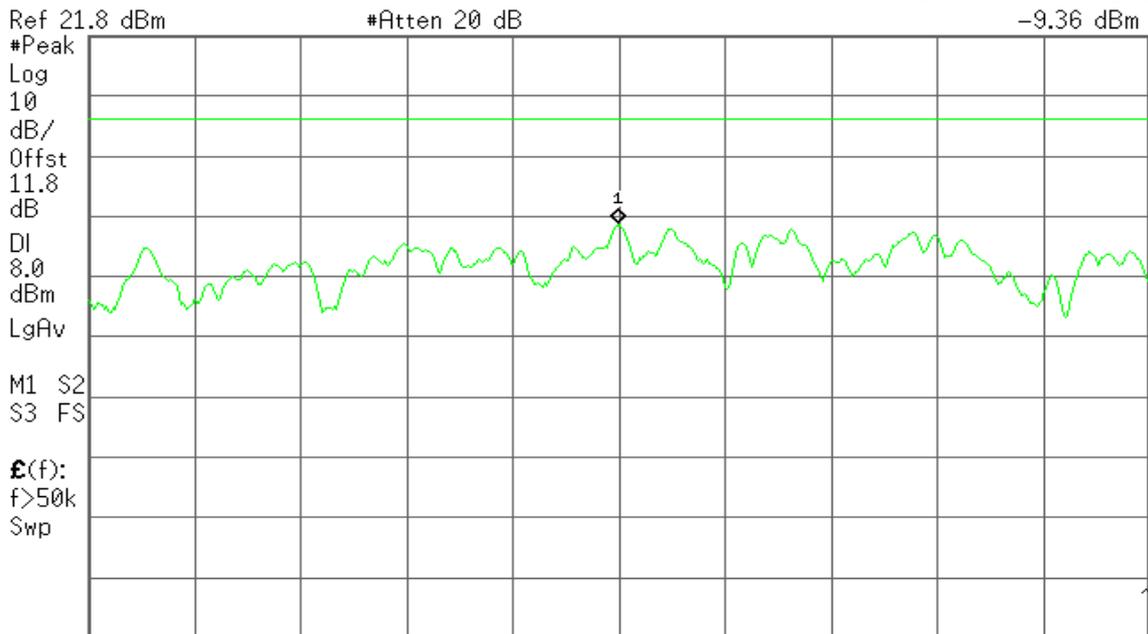


Center 2.401 973 0 GHz Span 300 kHz
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)

PPSD (CH Mid)

Agilent 18:23:09 Aug 3, 2004

Mkr1 2.440 974 1 GHz
-9.36 dBm



Center 2.440 974 1 GHz Span 300 kHz
#Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)



PPSD (CH High)

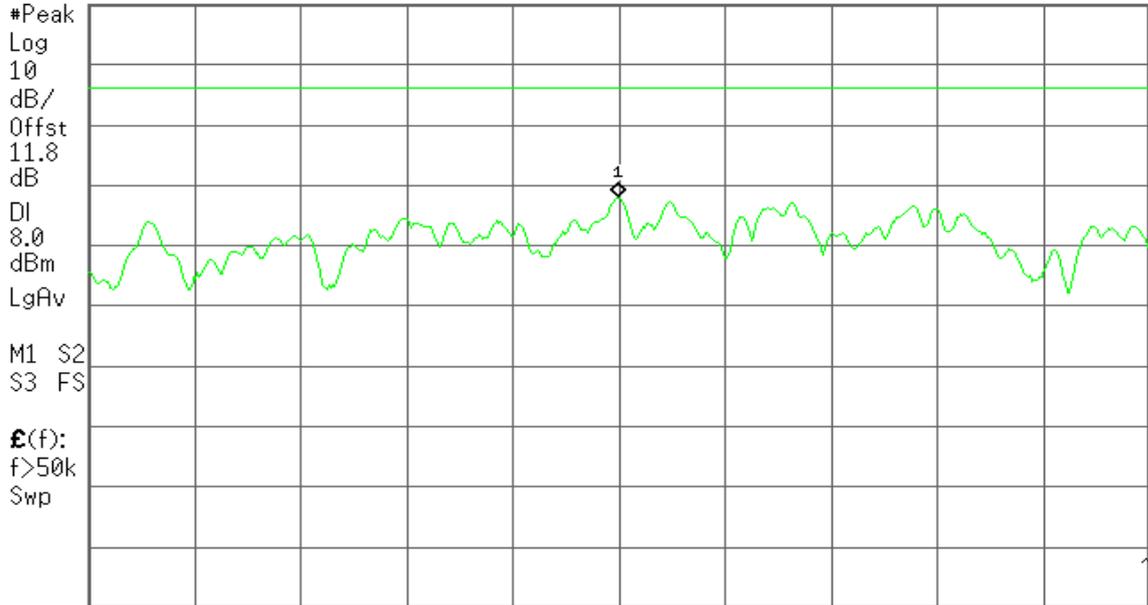
Agilent 18:19:55 Aug 3, 2004

Mkr1 2.479 973 9 GHz

-10.14 dBm

Ref 21.8 dBm

#Atten 20 dB



Center 2.479 974 4 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



7.9 FREQUENCY SEPARATION

LIMIT

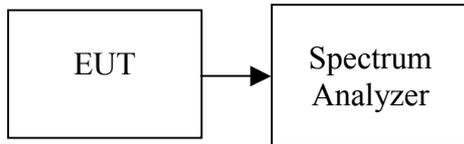
According to §15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table 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 the spectrum analyzer.
3. Set center frequency of spectrum analyzer = middle of hopping channel.
4. Set the spectrum analyzer as RBW, VBW=30kHz, Adjust Span to 3MHz, Sweep = auto.
5. Max hold. Mark 3 Peaks of hopping channel and record the 3 peaks frequency.

TEST RESULTS

No non-compliance noted



Test Data

Type 1

Channel Separation (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
1.00	940.00	>25	Pass

Type 2

Channel Separation (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
1.00	935.00	>25	Pass

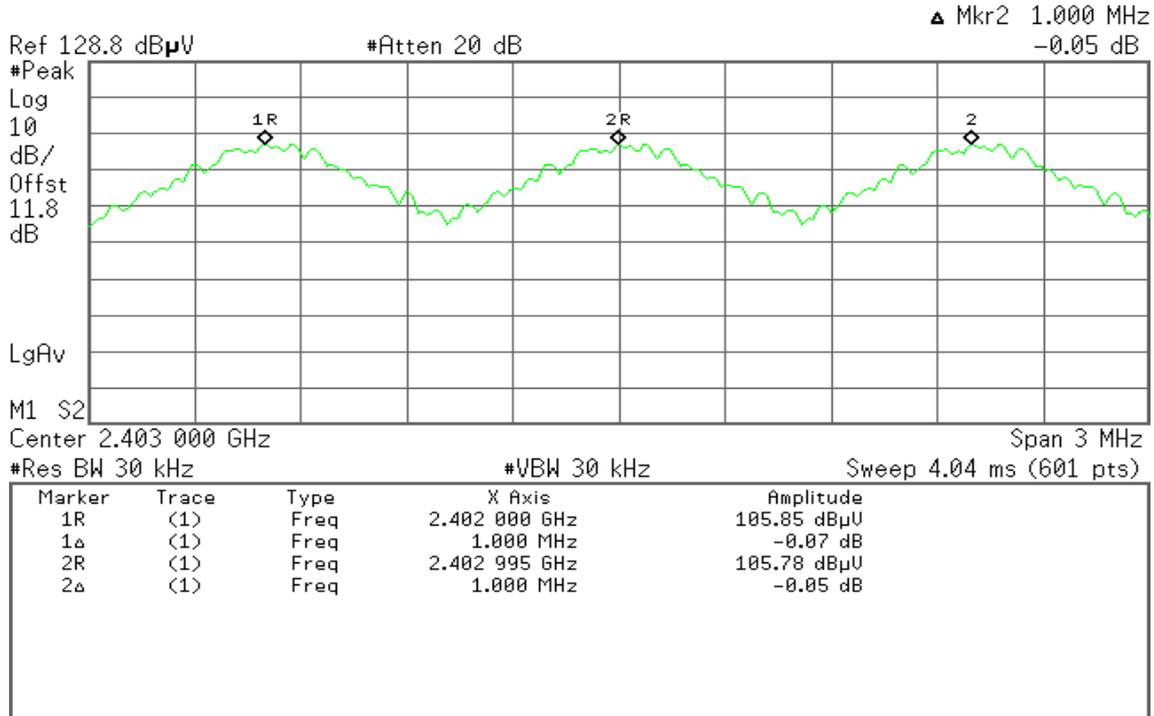


Test Plot

Type 1

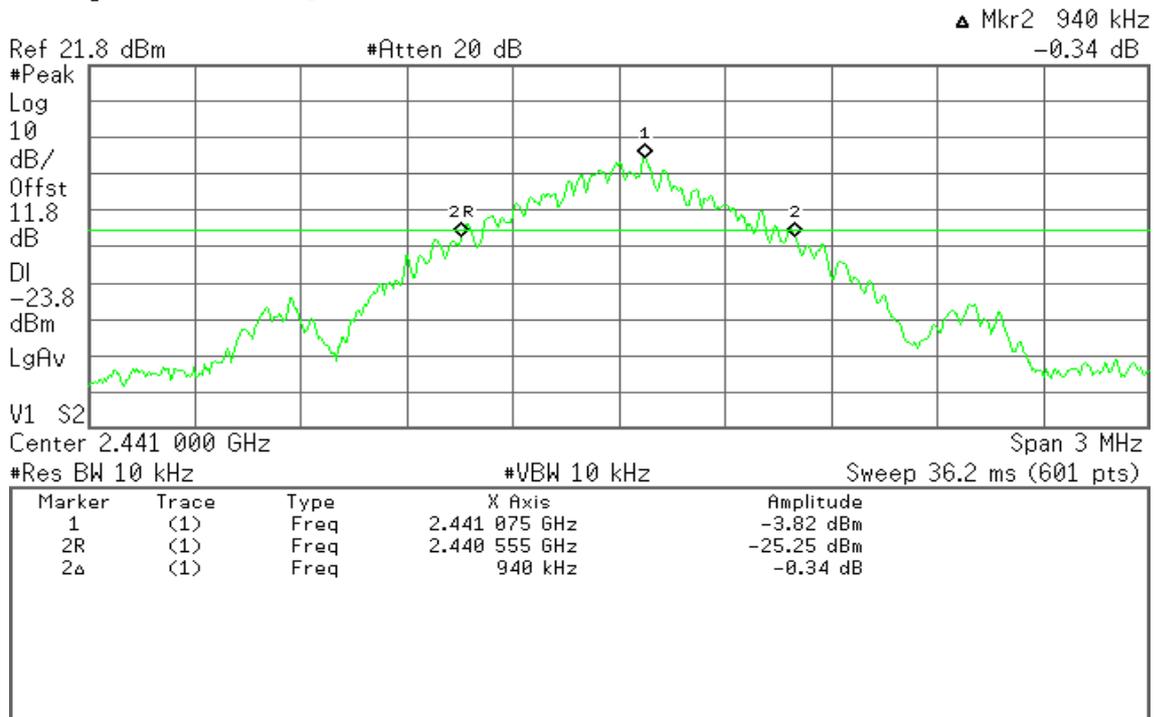
Measurement of Channel Separation

Agilent 15:01:11 Aug 3, 2004



Measurement of 20dB Bandwidth

Agilent 17:07:22 Aug 3, 2004

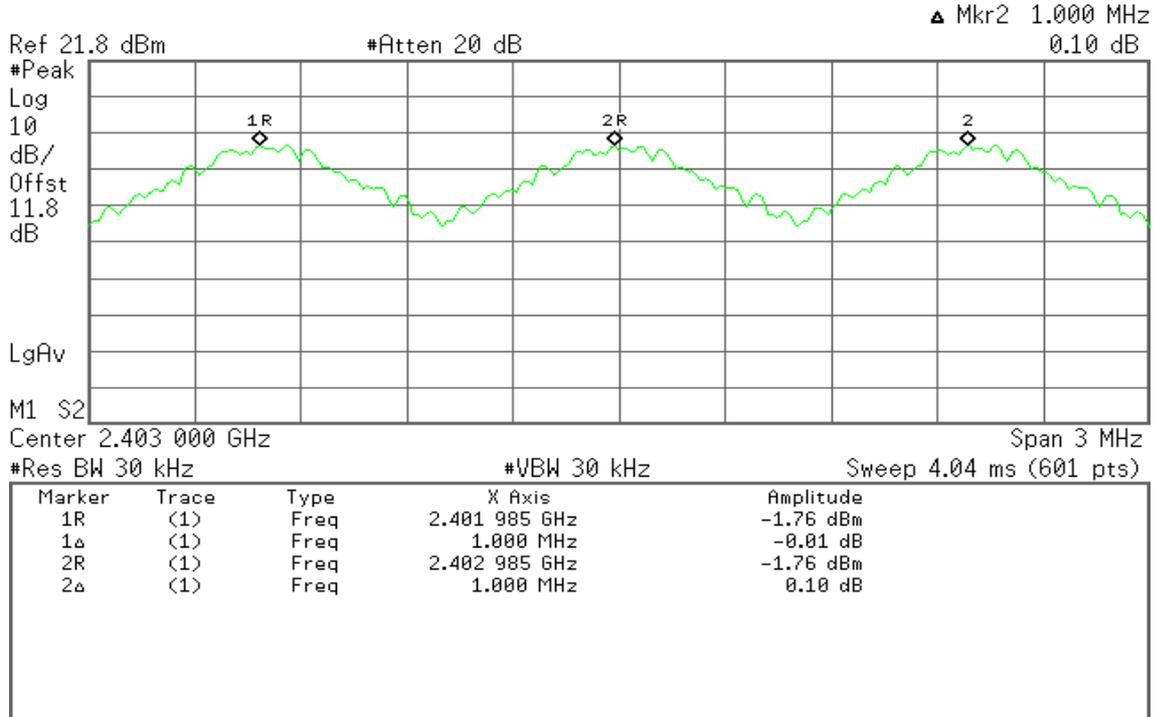




Type 2

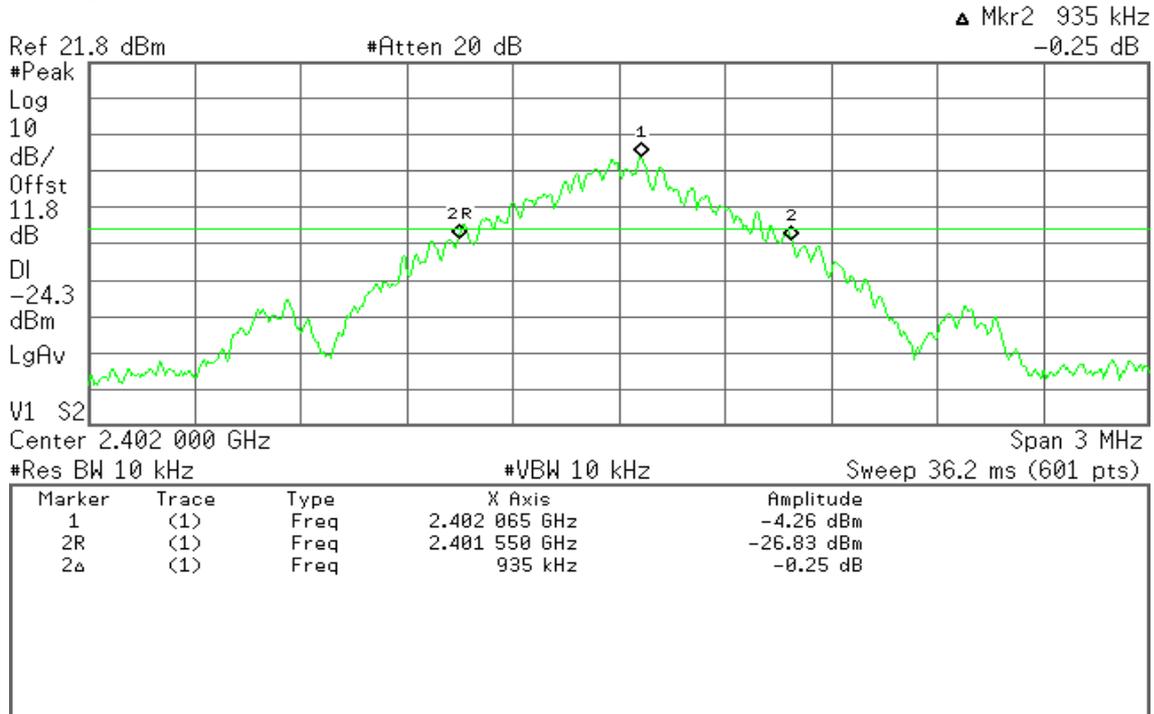
Measurement of Channel Separation

Agilent 17:47:04 Aug 3, 2004



Measurement of 20dB Bandwidth

Agilent 17:27:53 Aug 3, 2004





7.10 NUMBER OF HOPPING FREQUENCY

LIMIT

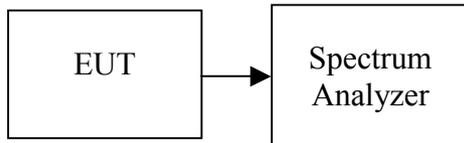
According to §15.247(a)(1)(ii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 75 hopping frequencies.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table 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 the spectrum analyzer.
3. Set spectrum analyzer Start=2400MHz, Stop = 2441.5MHz, Sweep = auto and Start=2441.5MHz, Stop = 2483.5MHz, Sweep = auto.
4. Set the spectrum analyzer as RBW, VBW=1MHz,
5. Max hold, view and count how many channel in the band.

TEST RESULTS

No non-compliance noted

Test Data

Type 1/ 2

Result (No. of CH)	Limit (No. of CH)	Result
79	>75	PASS



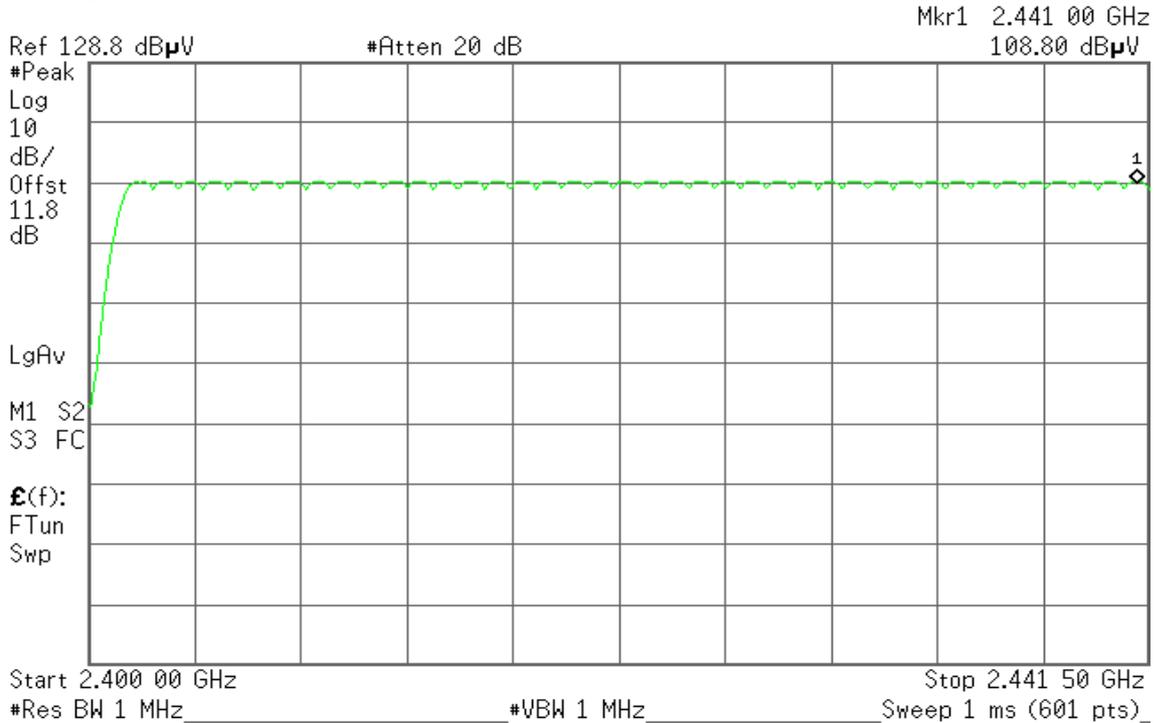
Test Plot

Type 1

Channel Number

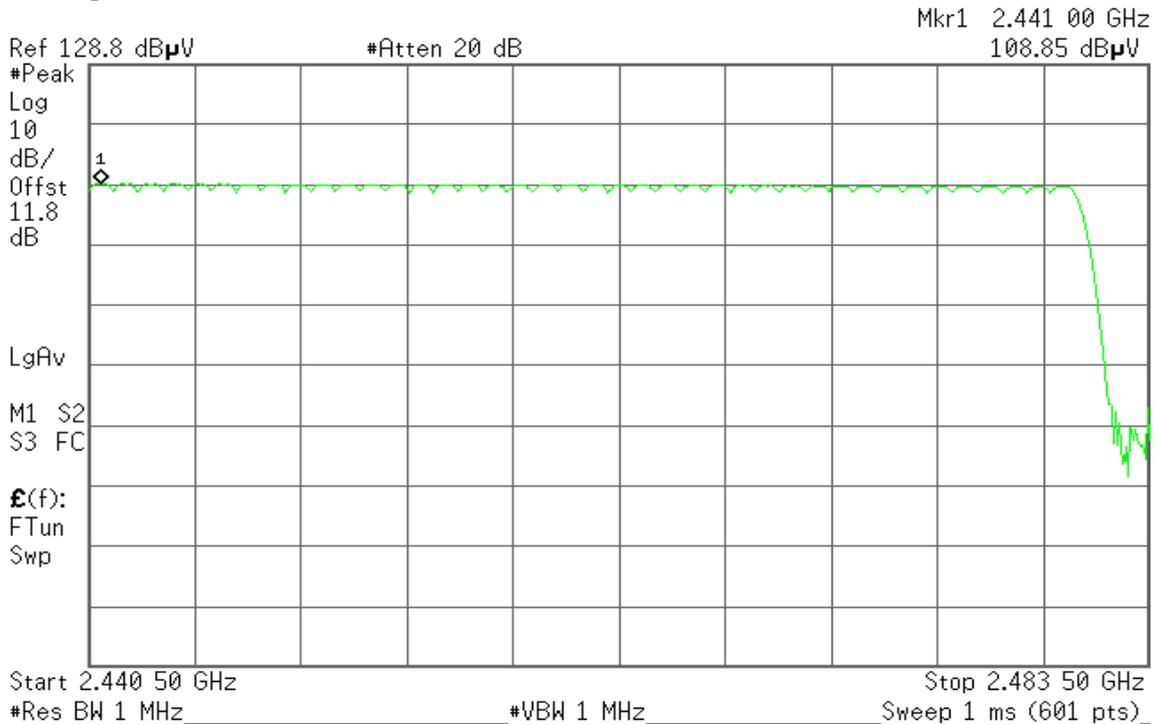
2.4 GHz – 2.441 GHz

Agilent 15:24:09 Aug 3, 2004



2.441 GHz – 2.4835 GHz

Agilent 15:34:32 Aug 3, 2004



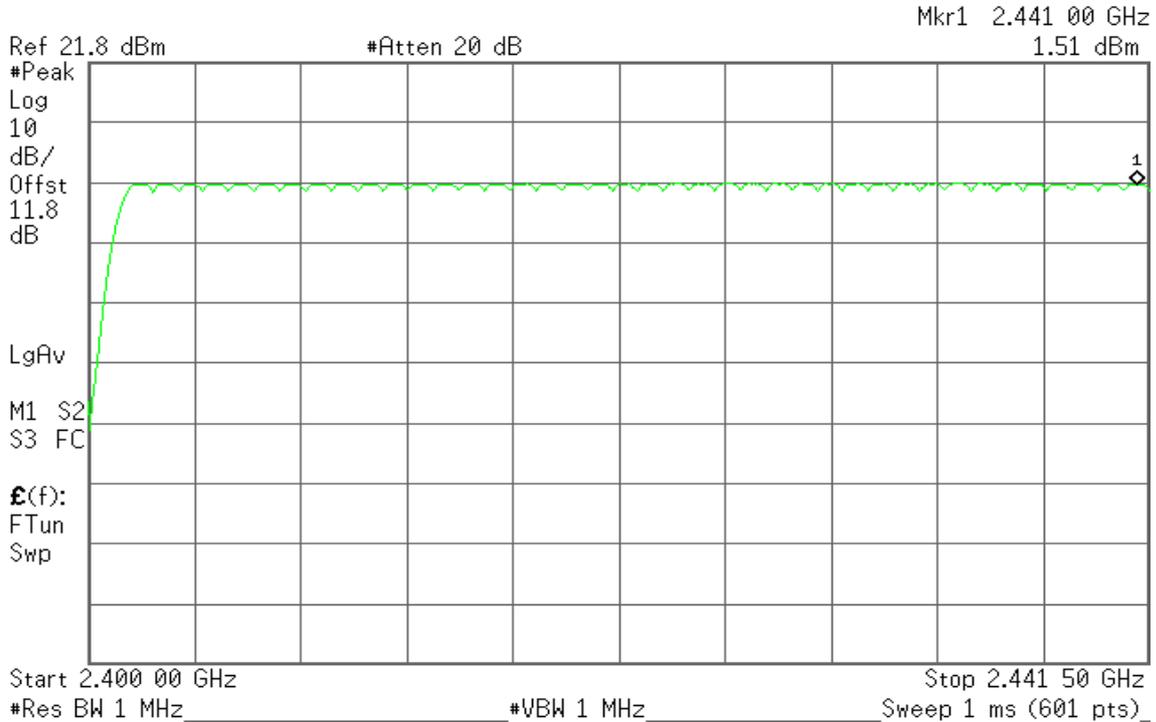


Type 2

Channel Number

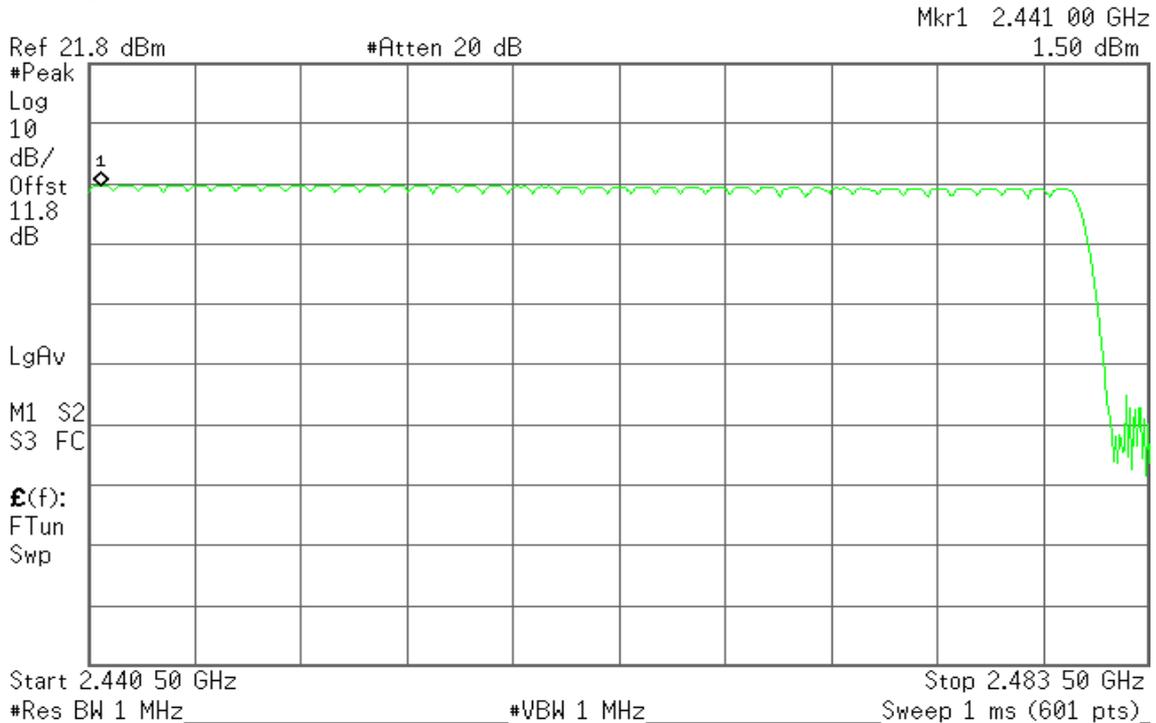
2.4 GHz – 2.441 GHz

Agilent 17:38:43 Aug 3, 2004



2.441 GHz – 2.4835 GHz

Agilent 17:40:26 Aug 3, 2004



7.11 TIME OF OCCUPANCY (DWELL TIME)

LIMIT

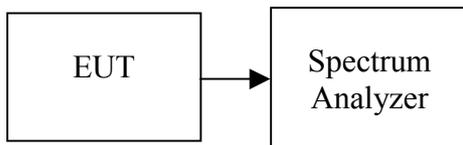
According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table 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 the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Adjust Sweep =10ms.
5. Repeat above procedures until all frequency measured were complete.



TEST RESULTS

No non-compliance noted

Test Data

Type 1 / 2

DH 1

CH Low: $0.400 * (1600/2)/79 * 31.6 = 128.00$ (ms)

CH Mid: $0.400 * (1600/2)/79 * 31.6 = 128.00$ (ms)

CH High: $0.400 * (1600/2)/79 * 31.6 = 128.00$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	0.400	128.00	31.60	400.00	PASS
Mid	0.400	128.00	31.60		PASS
High	0.400	128.00	31.60		PASS

DH 3

CH Low: $1.650 * (1600/4)/79 * 31.6 = 264.00$ (ms)

CH Mid: $1.650 * (1600/4)/79 * 31.6 = 264.00$ (ms)

CH High: $1.650 * (1600/4)/79 * 31.6 = 264.00$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	1.650	264.00	31.60	400.00	PASS
Mid	1.650	264.00	31.60		PASS
High	1.650	264.00	31.60		PASS

DH 5

CH Low: $2.900 * (1600/6)/79 * 31.6 = 309.33$ (ms)

CH Mid: $2.900 * (1600/6)/79 * 31.6 = 309.33$ (ms)

CH High: $2.900 * (1600/6)/79 * 31.6 = 309.33$ (ms)

CH	Pulse Time (ms)	Total of Dwell (ms)	Period Time (s)	Limit (ms)	Result
Low	2.900	309.33	31.60	400.00	PASS
Mid	2.900	309.33	31.60		PASS
High	2.900	309.33	31.60		PASS



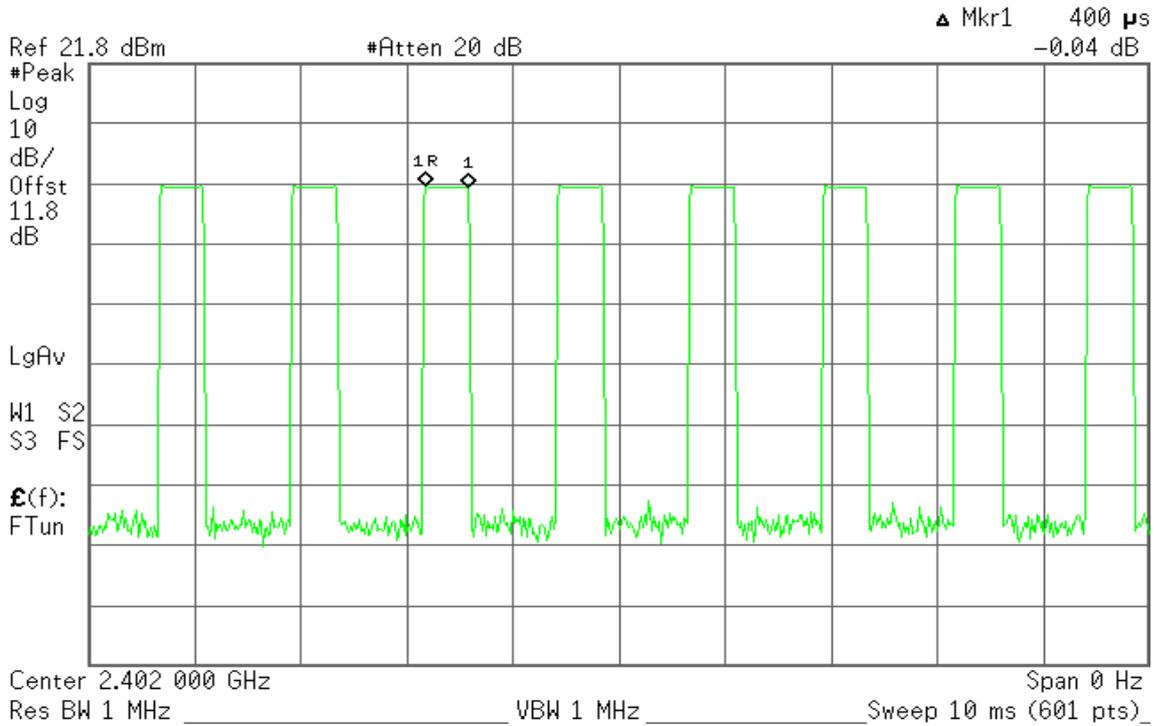
Test Plot

Type 1

DH 1

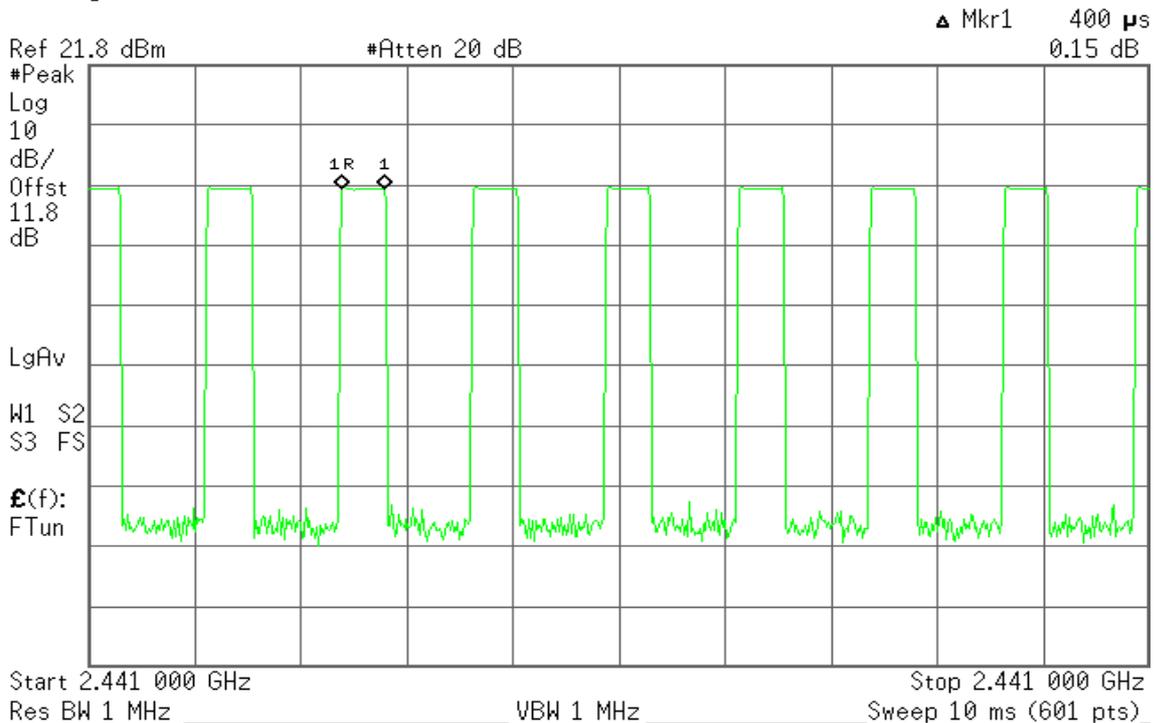
(CH Low)

Agilent 16:04:40 Aug 3, 2004



(CH Mid)

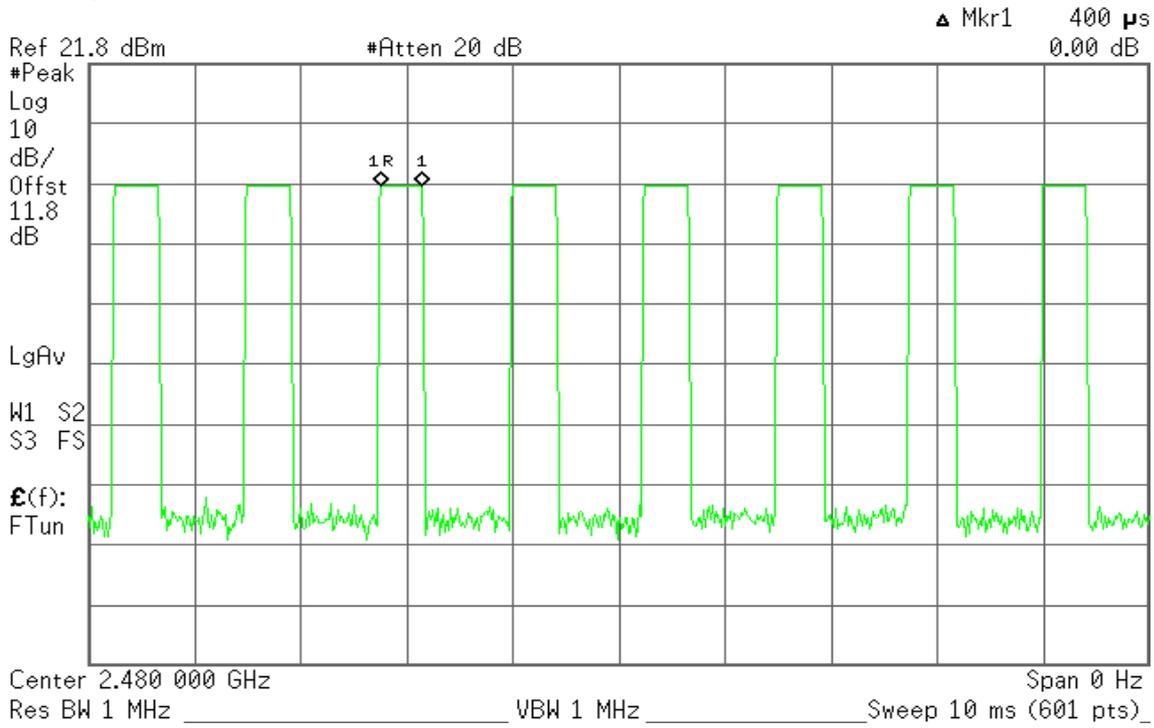
Agilent 16:09:25 Aug 3, 2004





(CH High)

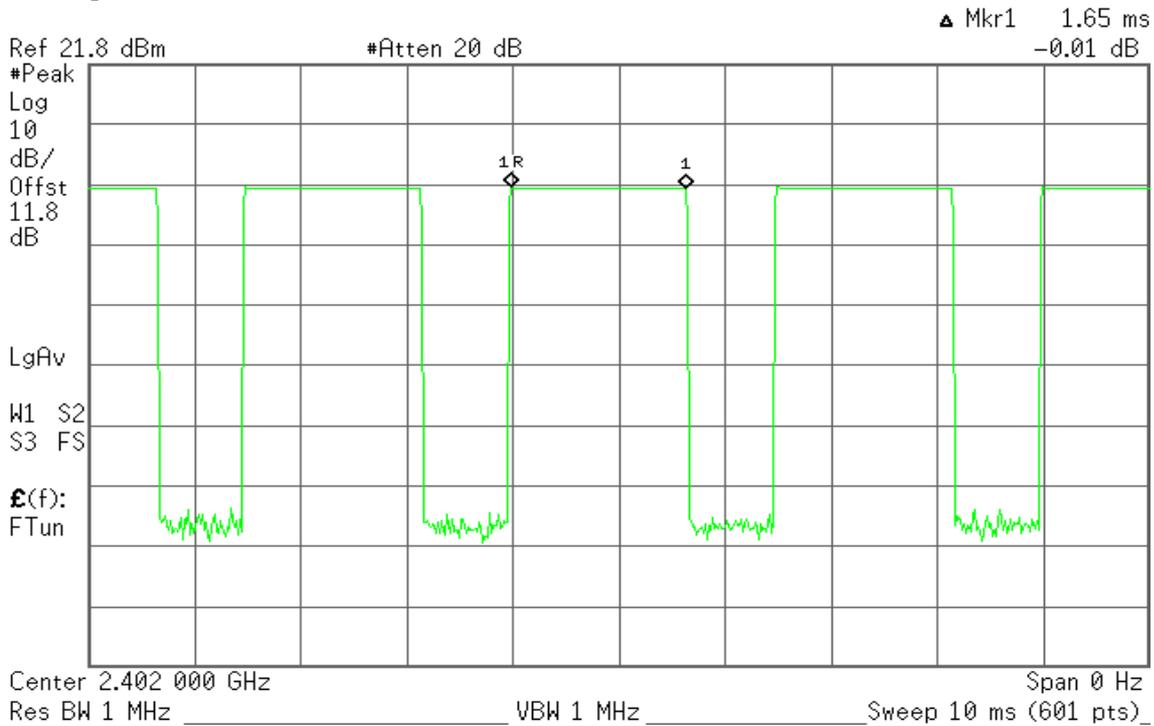
Agilent 16:22:22 Aug 3, 2004



DH 3

(CH Low)

Agilent 16:03:43 Aug 3, 2004

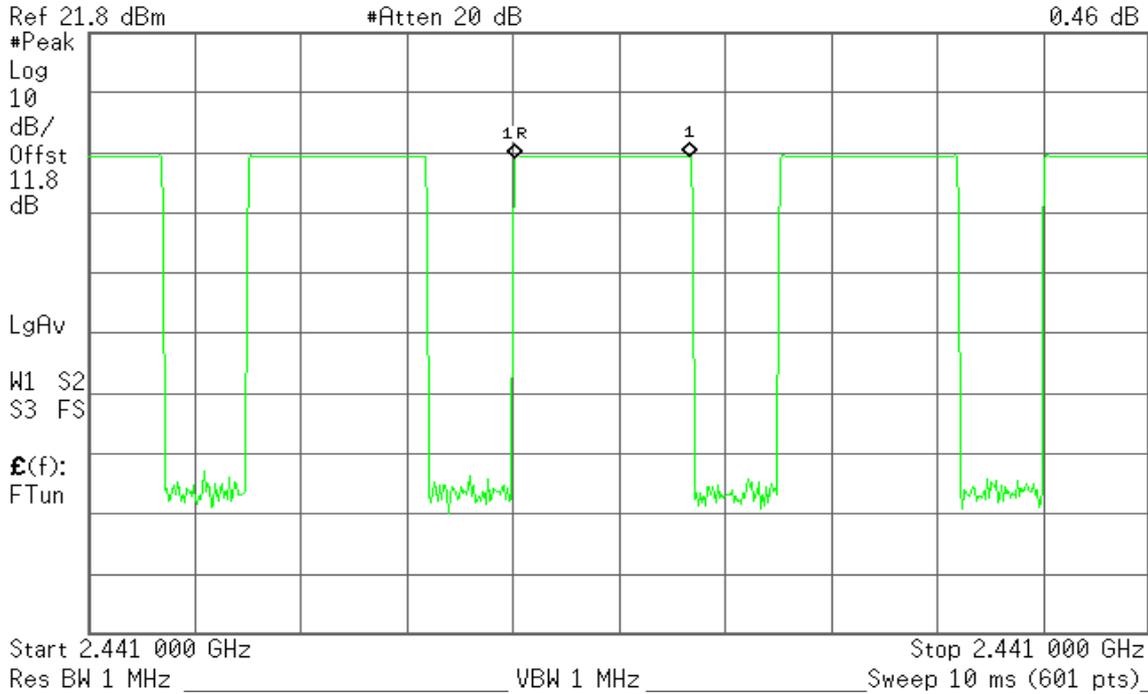




(CH Mid)

Agilent 16:11:48 Aug 3, 2004

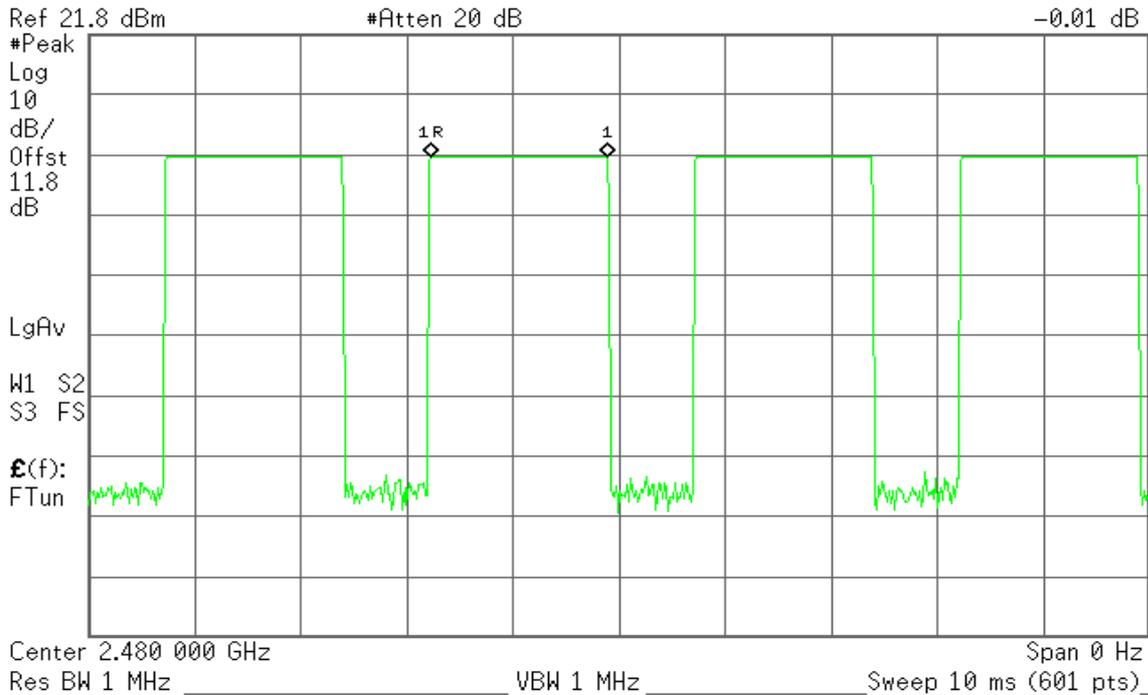
Mkr1 1.65 ms
0.46 dB



(CH High)

Agilent 16:23:40 Aug 3, 2004

Mkr1 1.65 ms
-0.01 dB

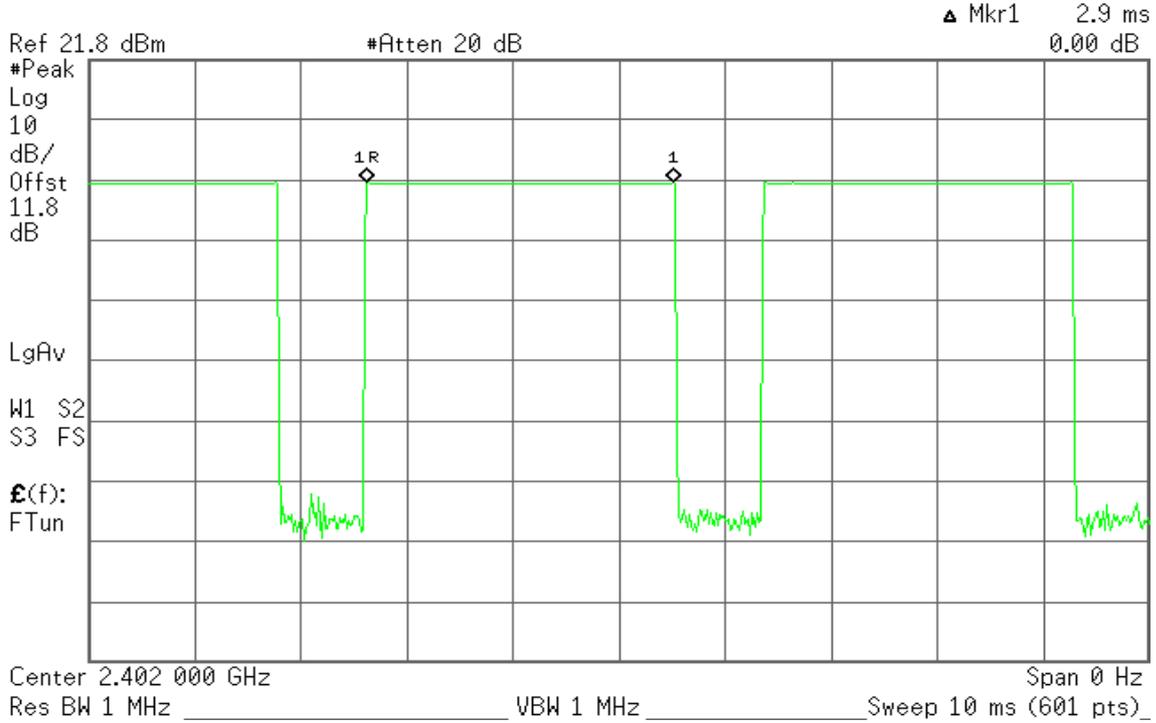




DH 5

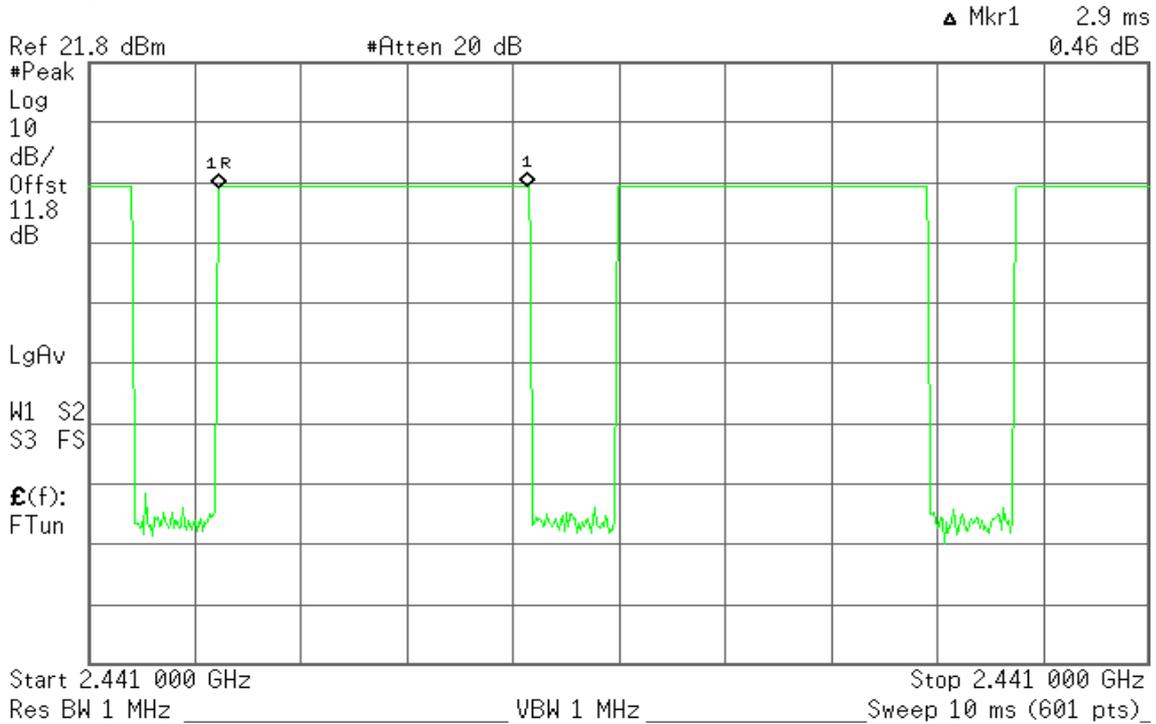
(CH Low)

Agilent 16:02:38 Aug 3, 2004



(CH Mid)

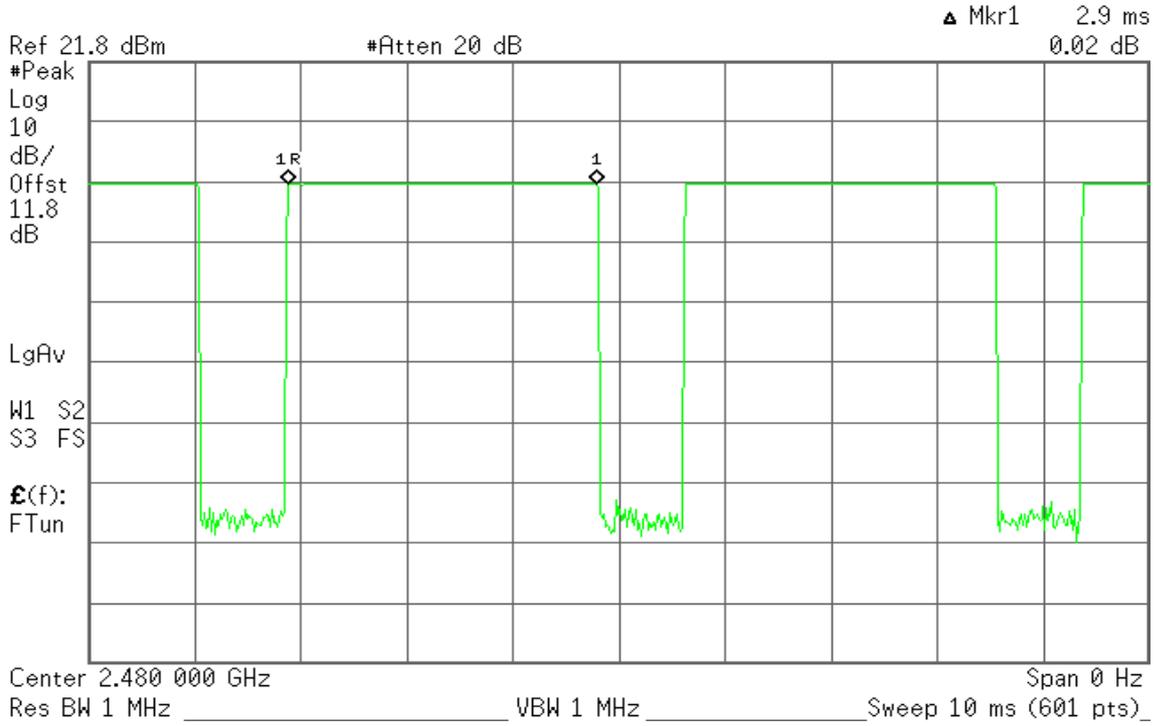
Agilent 16:13:07 Aug 3, 2004





(CH High)

Agilent 16:24:43 Aug 3, 2004



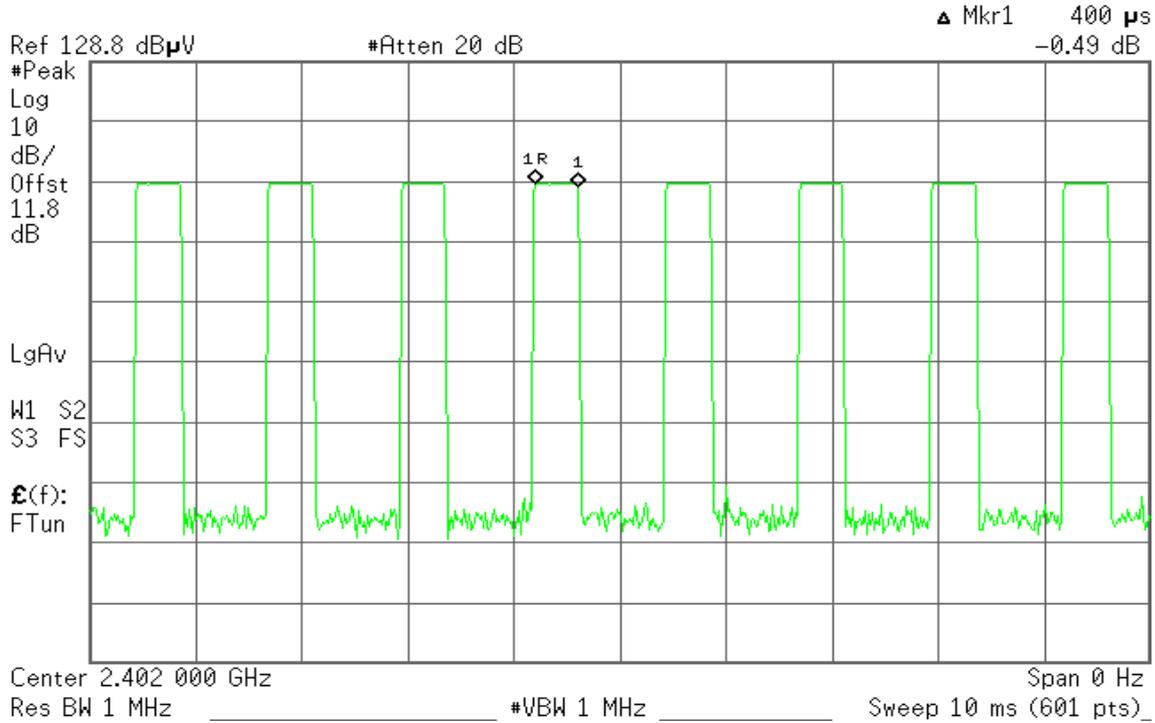


Type 2

DH 1

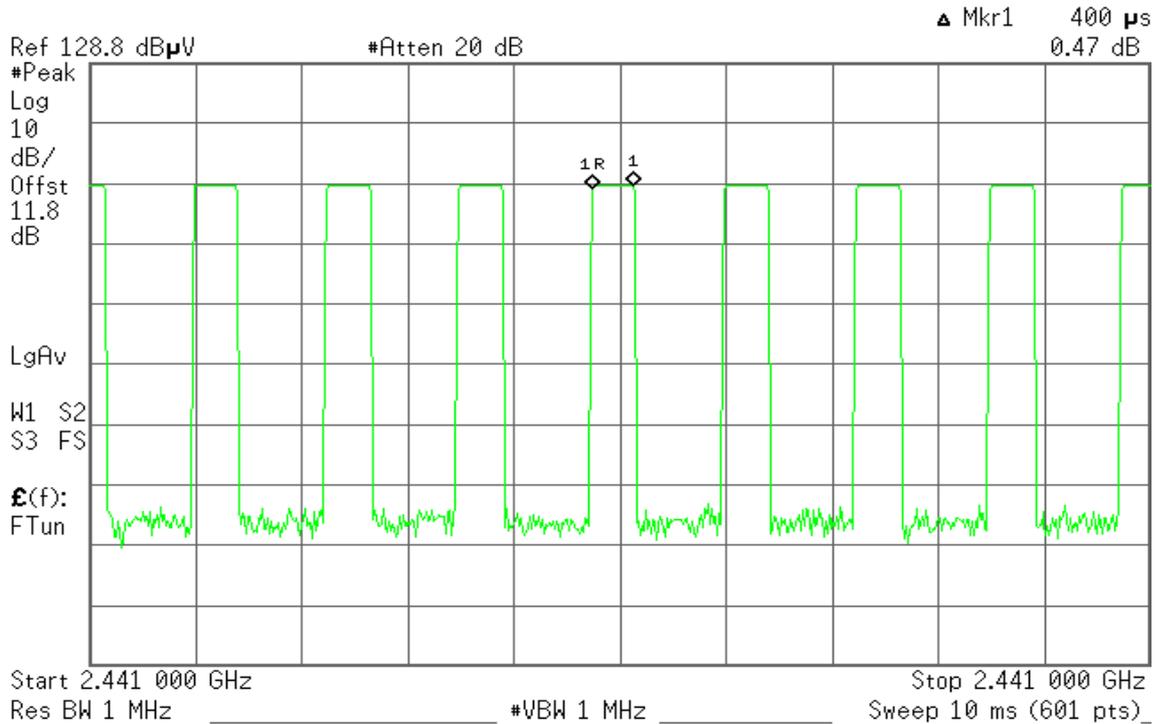
(CH Low)

Agilent 17:59:41 Aug 3, 2004



(CH Mid)

Agilent 18:07:08 Aug 3, 2004

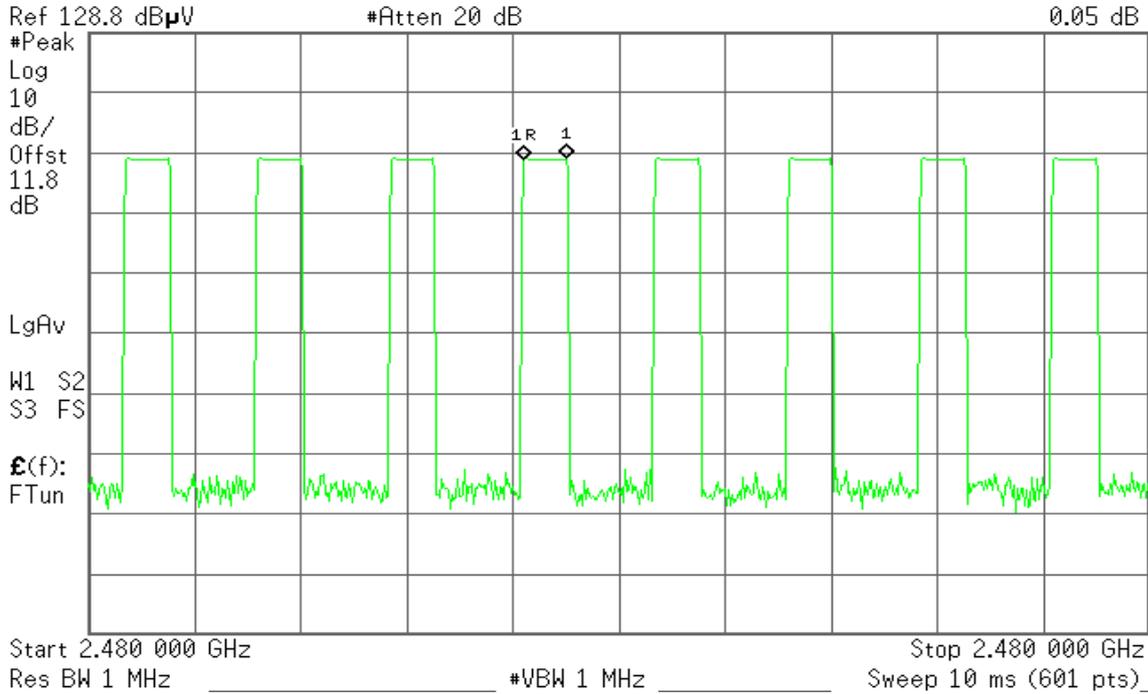




(CH High)

Agilent 18:09:39 Aug 3, 2004

Mkr1 400 μs
0.05 dB

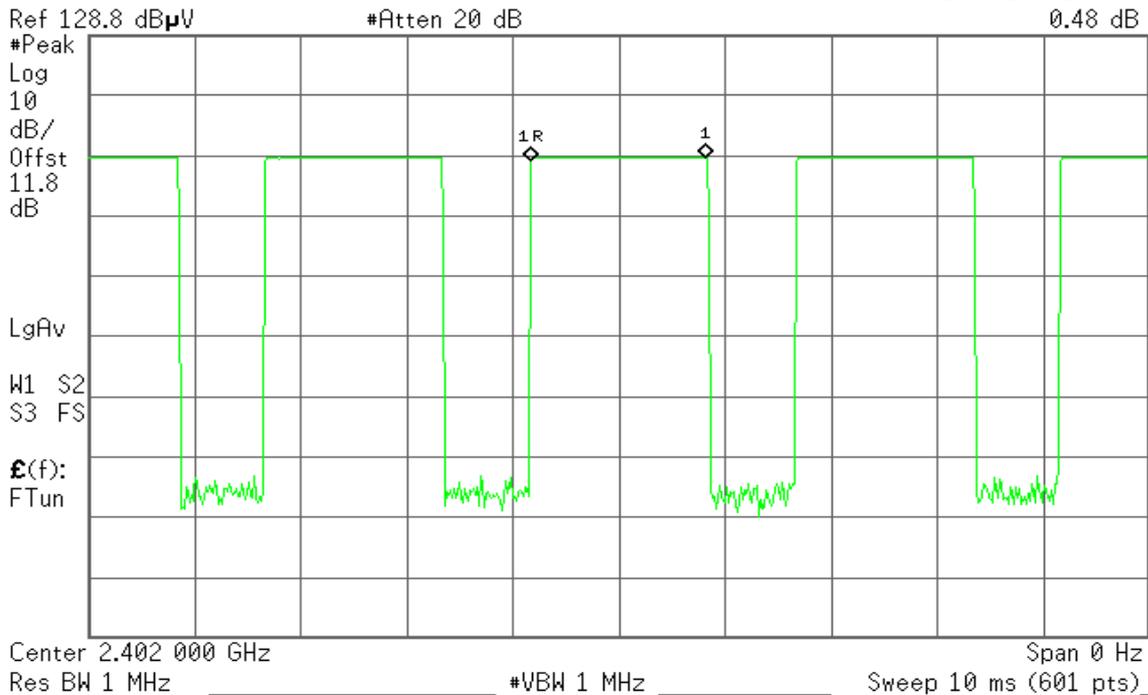


DH 3

(CH Low)

Agilent 18:00:46 Aug 3, 2004

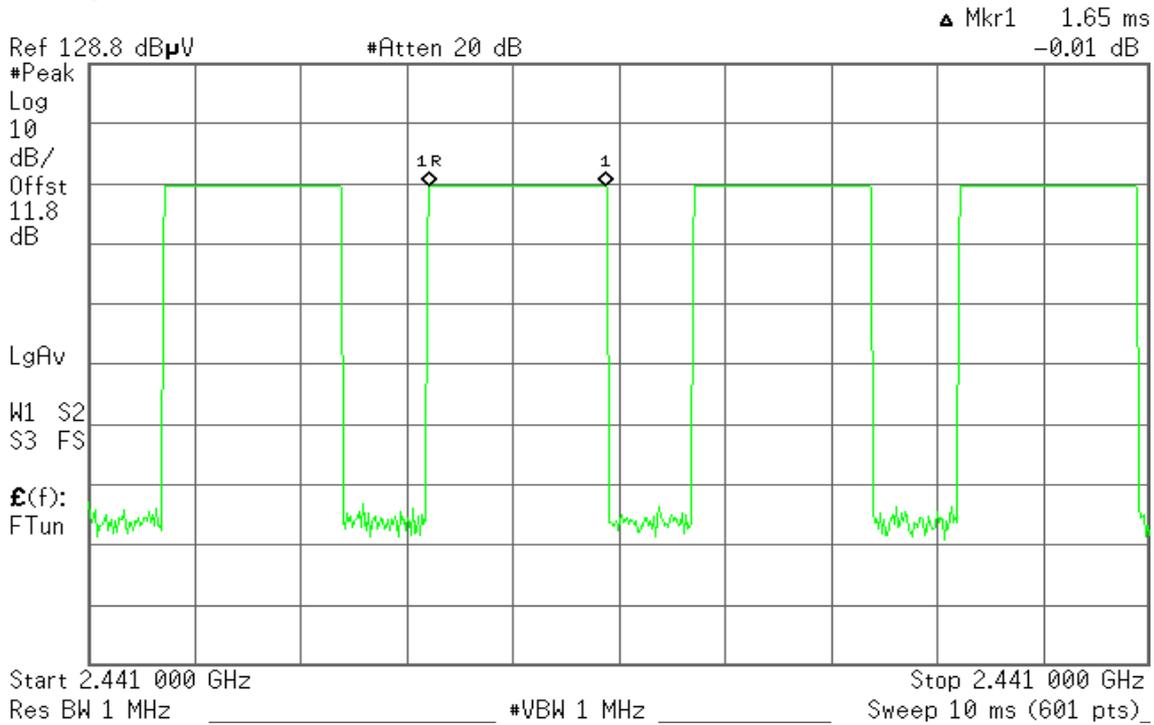
Mkr1 1.65 ms
0.48 dB





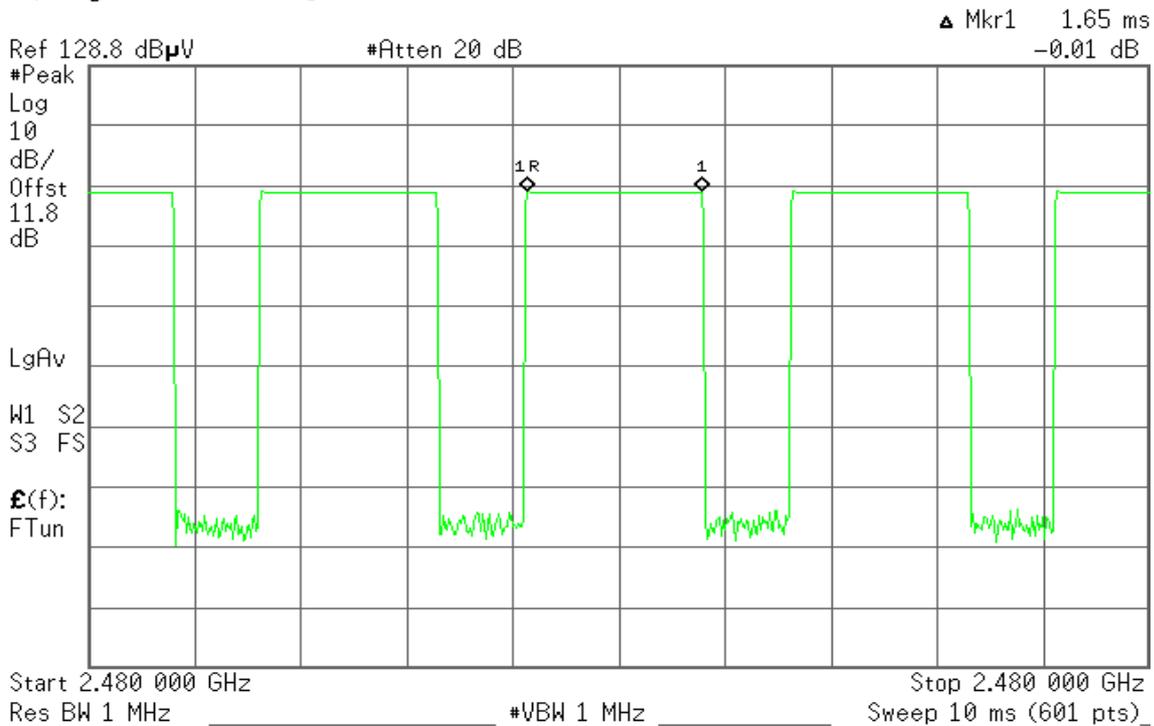
(CH Mid)

Agilent 18:05:36 Aug 3, 2004



(CH High)

Agilent 18:10:44 Aug 3, 2004

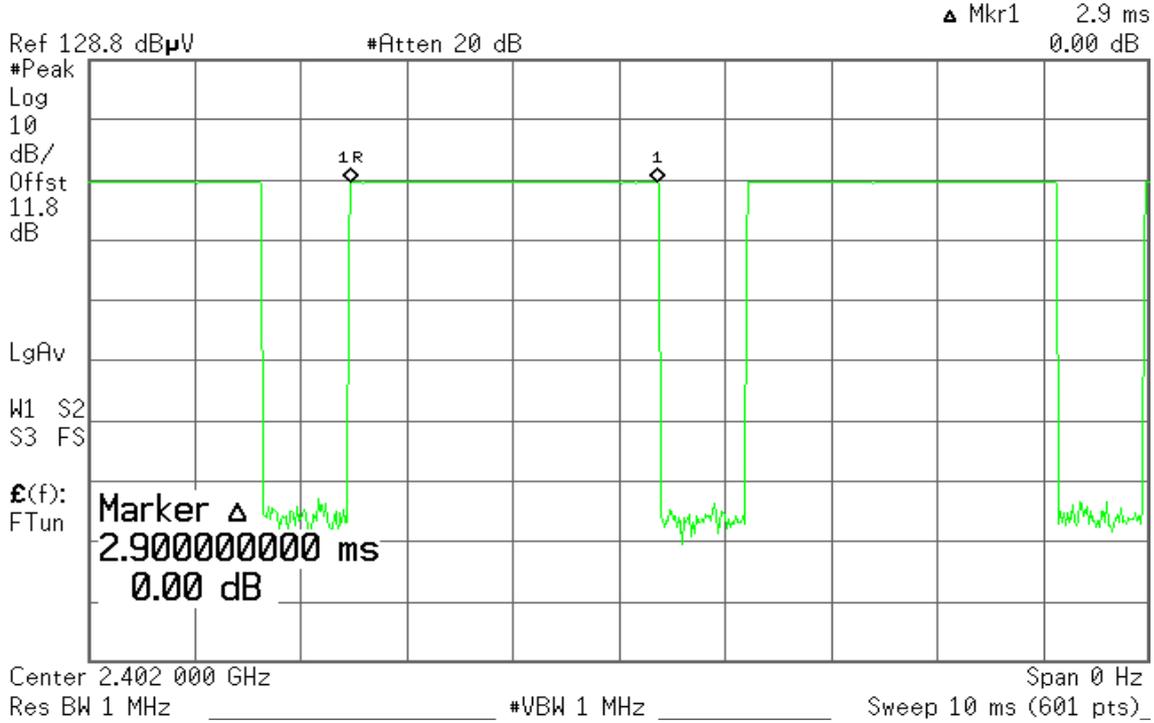




DH 5

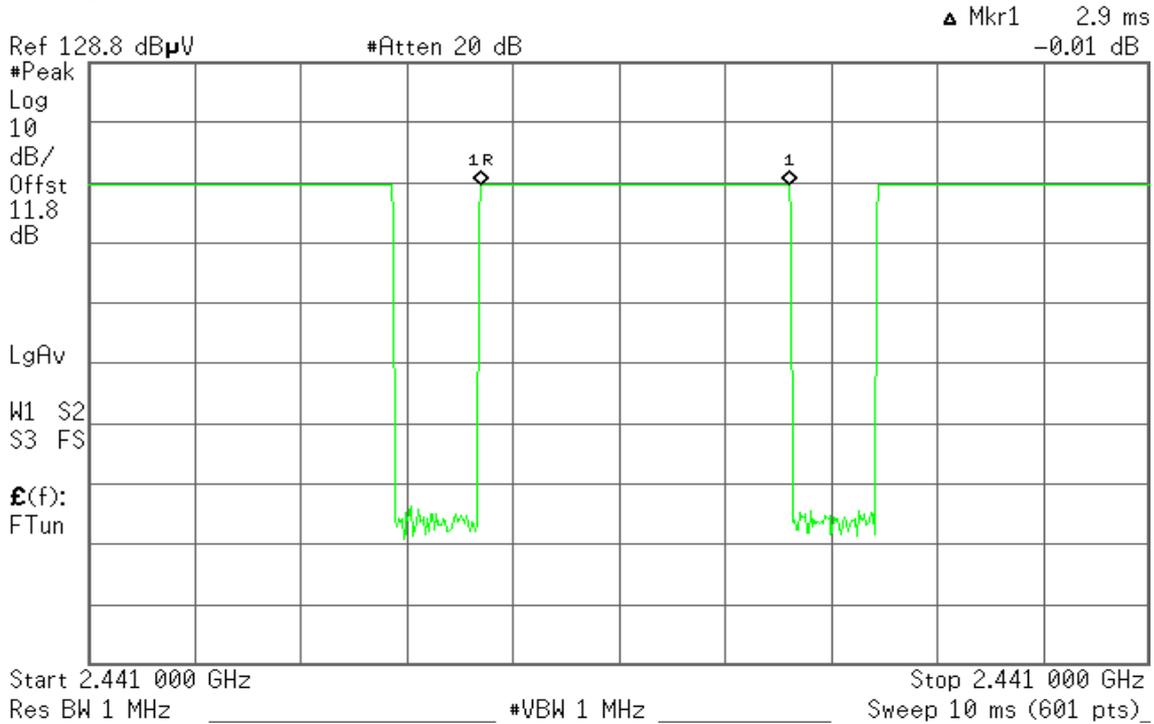
(CH Low)

Agilent 18:01:45 Aug 3, 2004



(CH Mid)

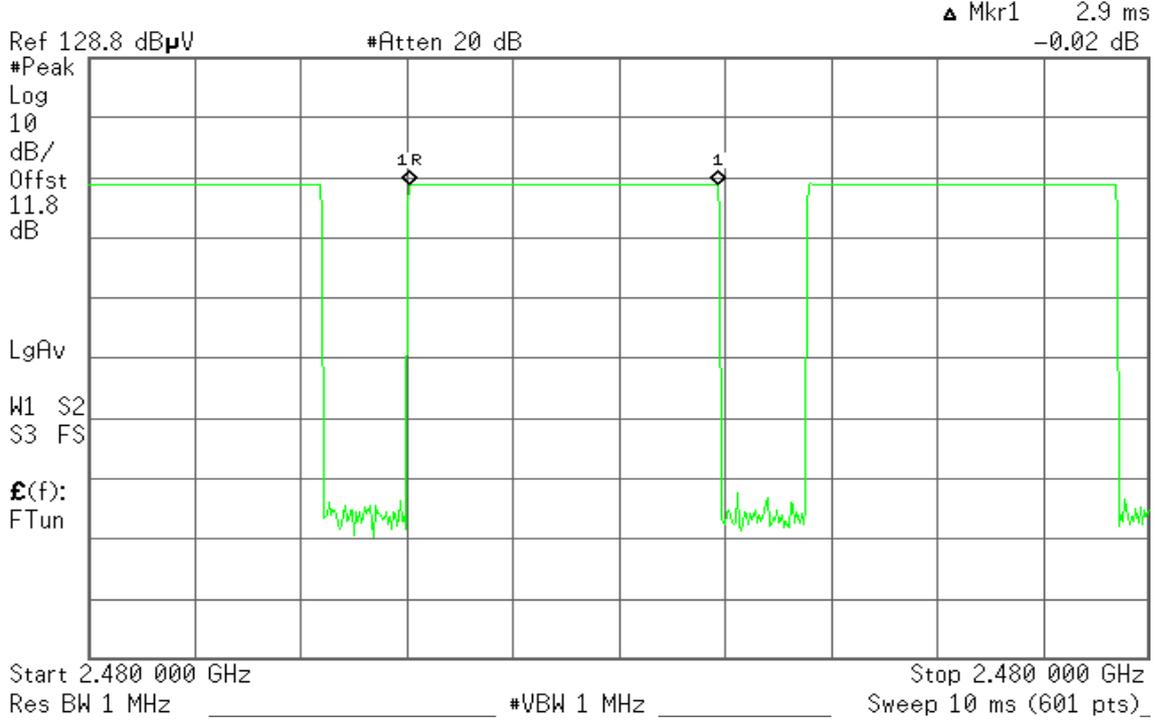
Agilent 18:04:25 Aug 3, 2004





(CH High)

Agilent 18:11:28 Aug 3, 2004





7.12 RADIO FREQUENCY EXPOSURE

LIMIT

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §15.247(b)(4) and §1.1307(b)(1) of this chapter.

EUT Specification

Type 1

EUT	Pocket PC
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others Bluetooth: 2.402GHz ~ 2.480GHz
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5mW/cm^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1mW/cm^2$)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Max. output power	1.78dBm (1.507mW)
Antenna gain (Max)	-2.62 dBi (Numeric gain: 0.547)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation <input checked="" type="checkbox"/> N/A*

Note:

- The maximum output power is 1.78dBm (1.507mW) at 2402MHz (with 0.547 numeric antenna gain.)
- DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
- For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.

TEST RESULTS

No non-compliance noted.

(SAR evaluation is not required for the PORTABLE device while its maximum output power is lower than the general population low threshold: $60/f_{(GHz)}=60/2.441=24.58mW$)

MPE evaluation

Not applicable.



Type 2

EUT	Pocket PC
Frequency band (Operating)	<input type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others <u>Bluetooth: 2.402GHz ~ 2.480GHz</u>
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others _____
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5mW/cm^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1mW/cm^2$)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Max. output power	1.22dBm (1.324mW)
Antenna gain (Max)	-2.62 dBi (Numeric gain: 0.547)
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation <input checked="" type="checkbox"/> N/A*

Note:

1. *The maximum output power is 1.22dBm (1.324mW) at 2402MHz (with 0.547 numeric antenna gain.)*
2. *DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.*
3. *For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*

TEST RESULTS

No non-compliance noted.

(SAR evaluation is not required for the PORTABLE device while its maximum output power is lower than the general population low threshold: $60/f_{(GHz)}=60/2.441=24.58mW$)

MPE evaluation

Not applicable.



7.13 SPURIOUS EMISSIONS

7.14 CONDUCTED MEASUREMENT

7.15 LIMIT

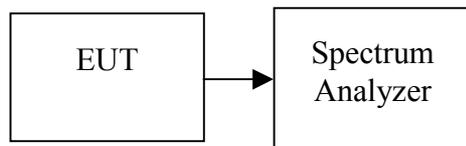
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or 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)).

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/10/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26.5GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

No non-compliance noted



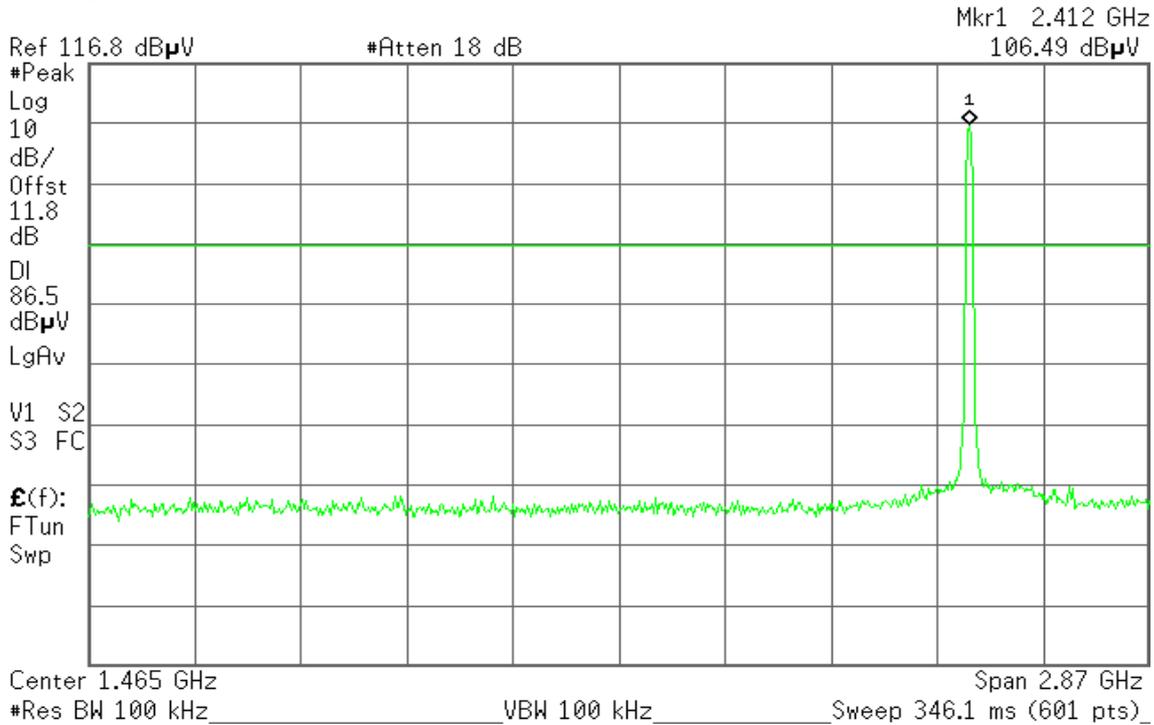
Test Plot

Type 1

WLAN mdoe / CH Low

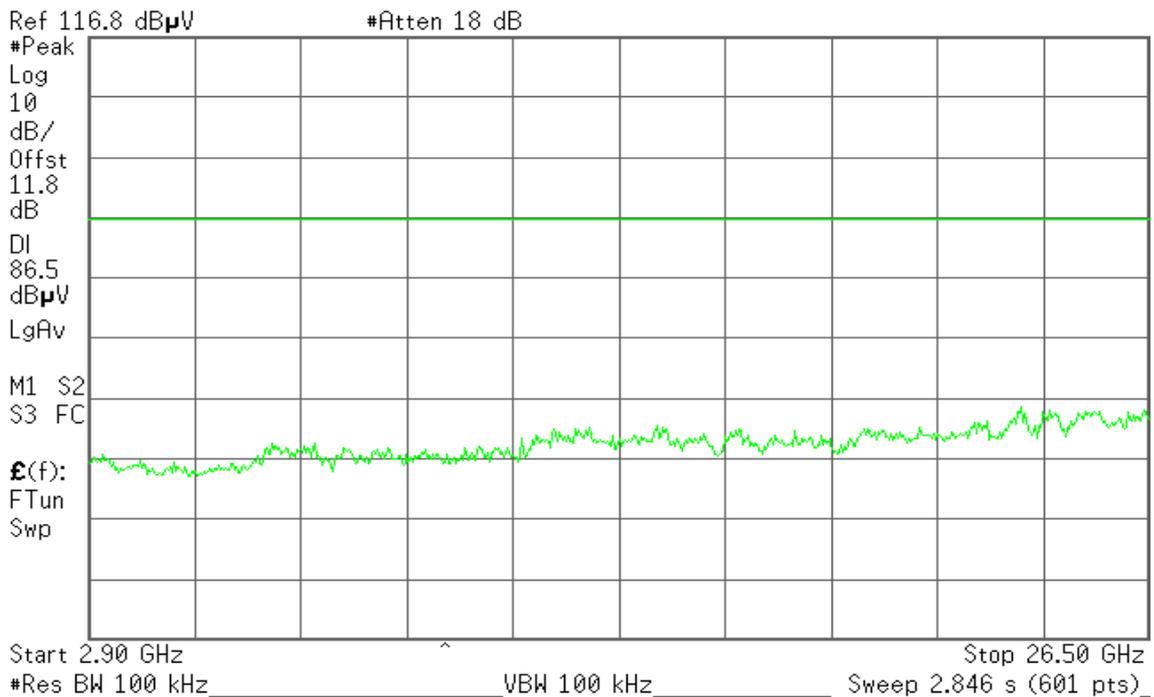
30MHz – 2.9GHz

Agilent 20:17:09 Jul 30, 2004



2.9GHz – 26.5GHz

Agilent 20:17:47 Jul 30, 2004

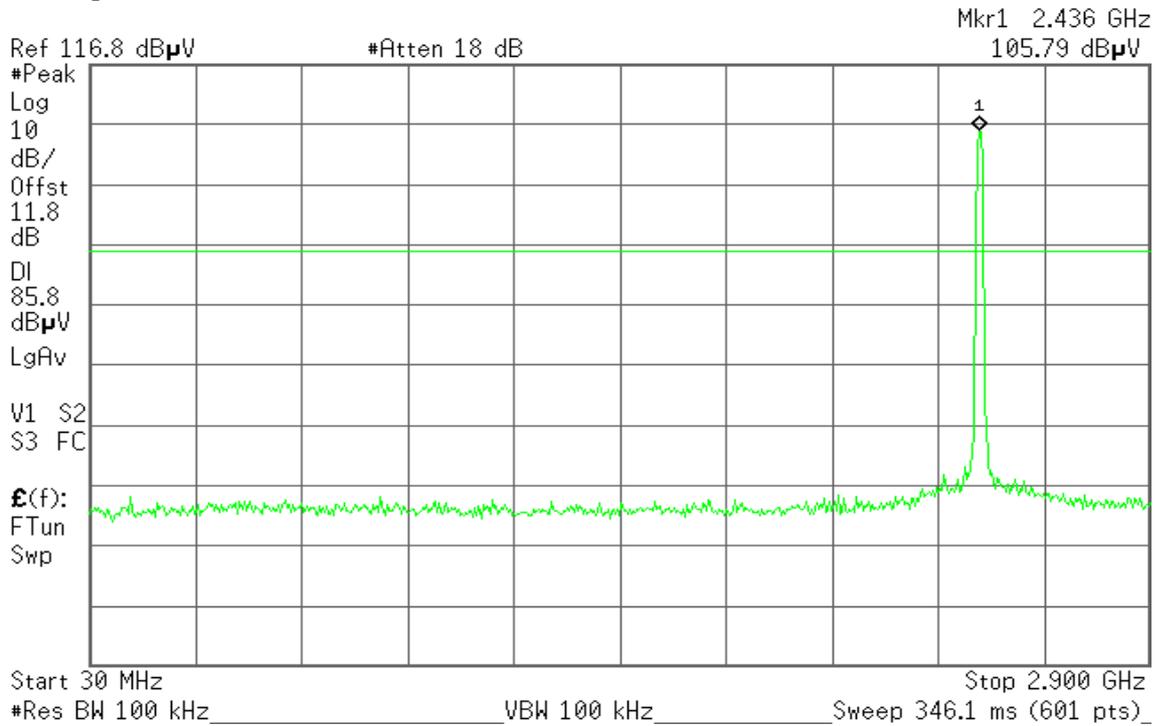




WLAN mdoe / CH Mid

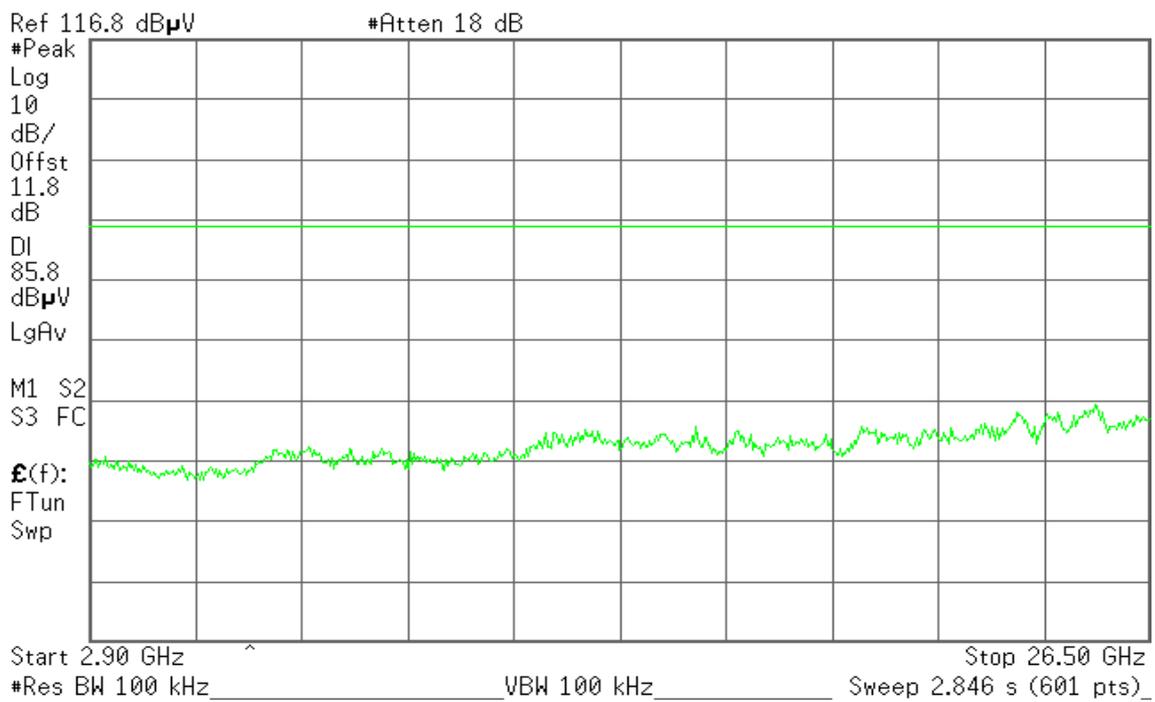
30MHz – 2.9GHz

Agilent 20:19:28 Jul 30, 2004



2.9GHz – 26.5GHz

Agilent 20:20:20 Jul 30, 2004

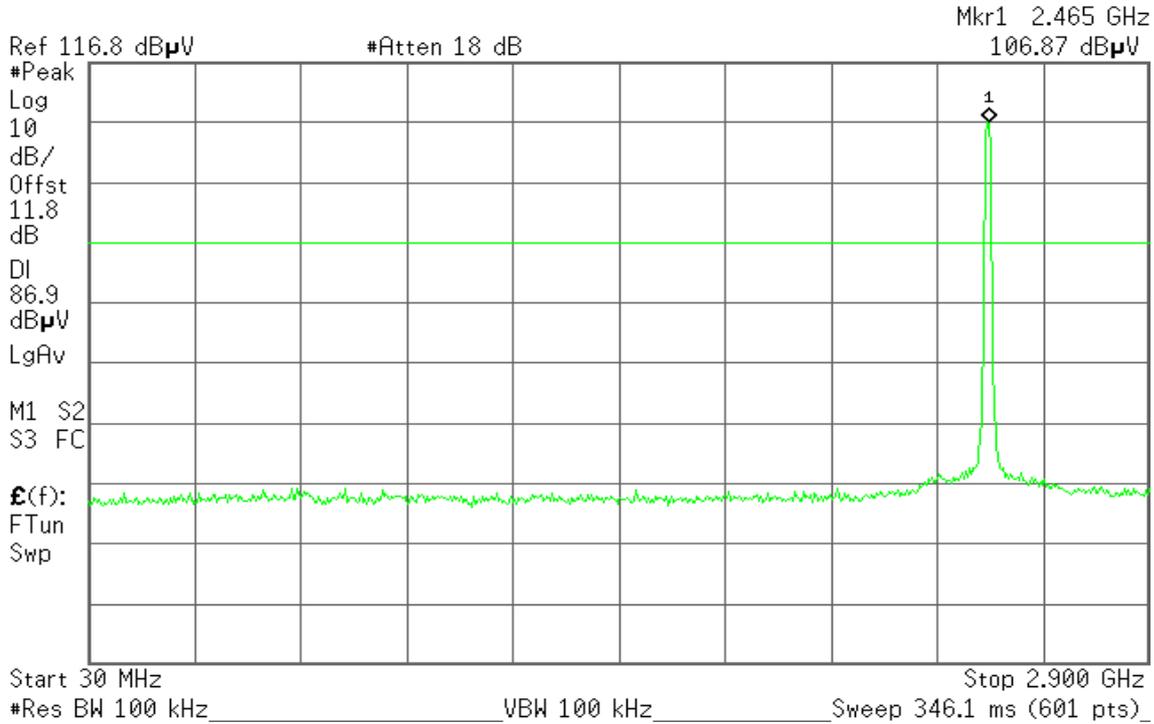




WLAN mdoe / CH High

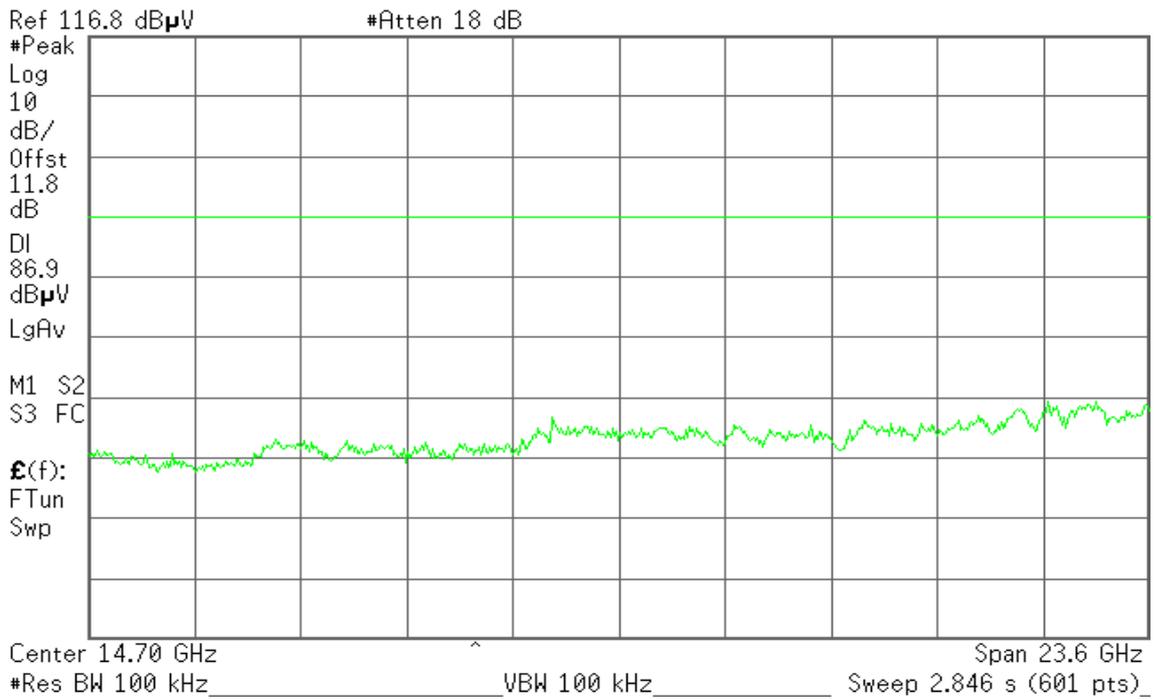
30MHz – 2.9GHz

Agilent 20:25:41 Jul 30, 2004



2.9GHz – 26.5GHz

Agilent 20:27:32 Jul 30, 2004



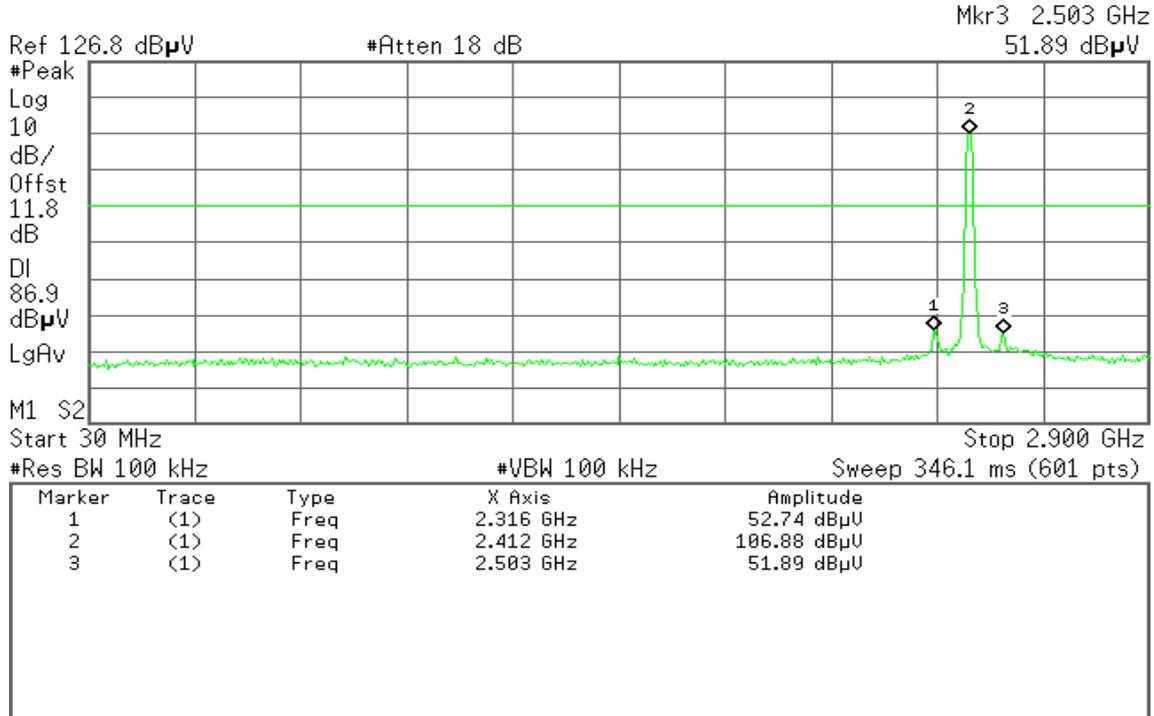


Type 2

WLAN mdoe / CH Low

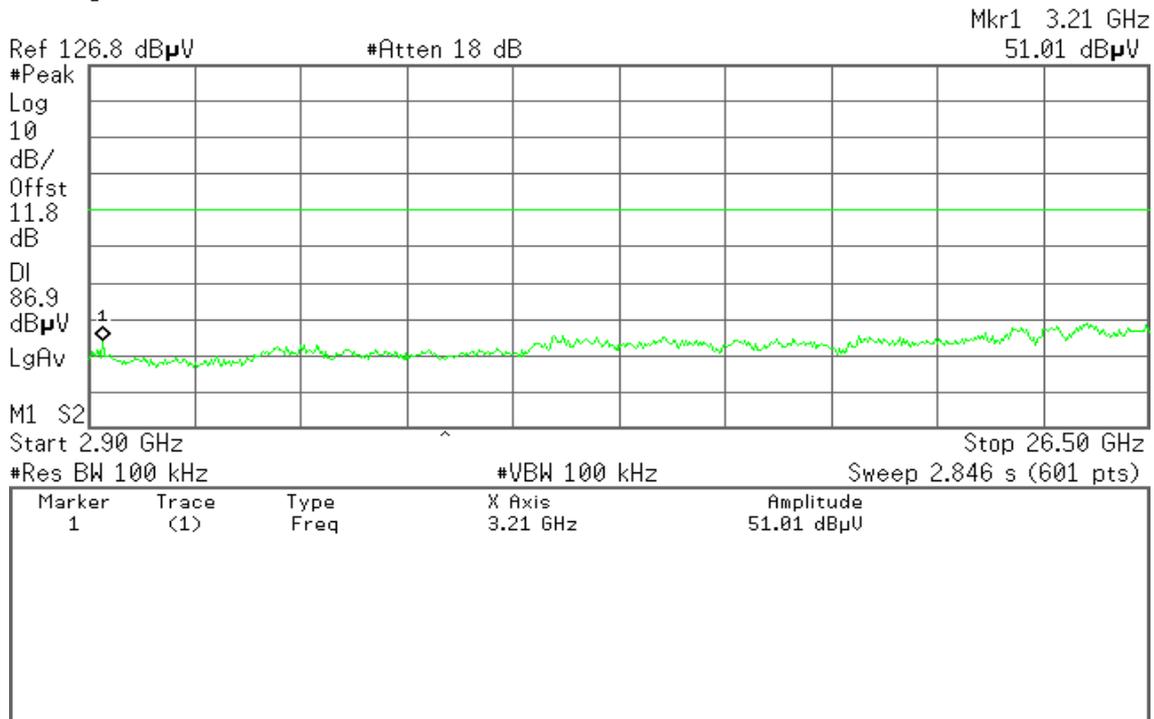
30MHz – 2.9GHz

Agilent 21:33:23 Jul 30, 2004



2.9GHz – 26.5GHz

Agilent 21:33:56 Jul 30, 2004

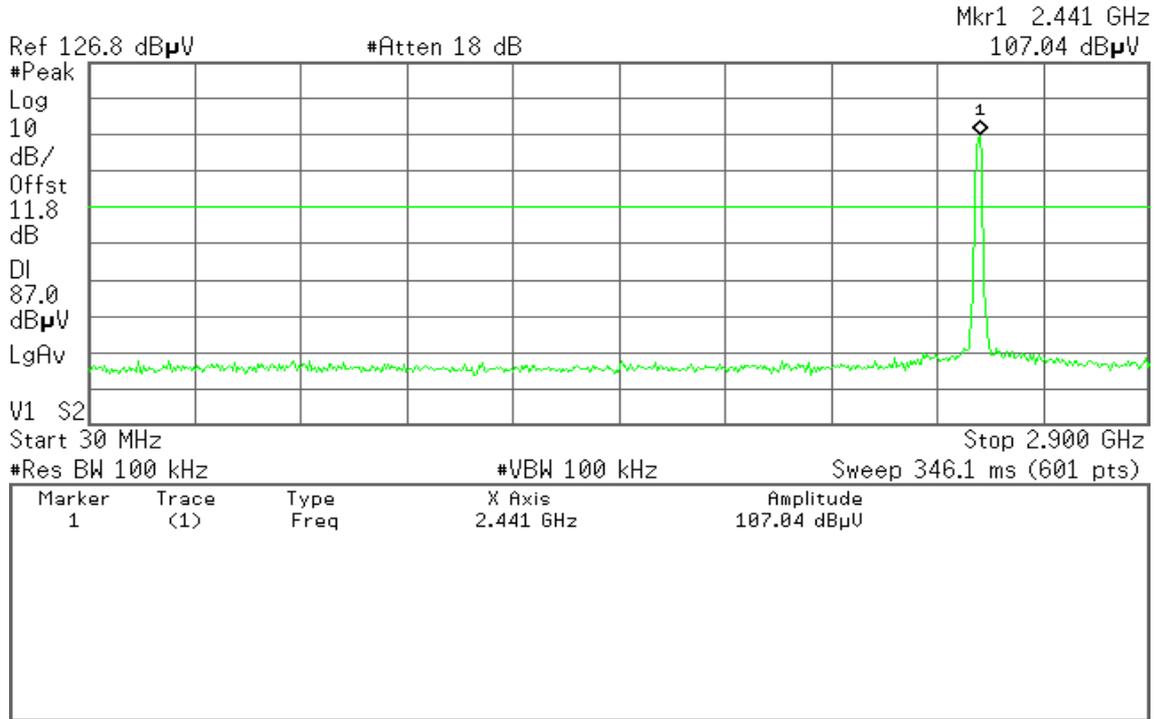




WLAN mdoe / CH Mid

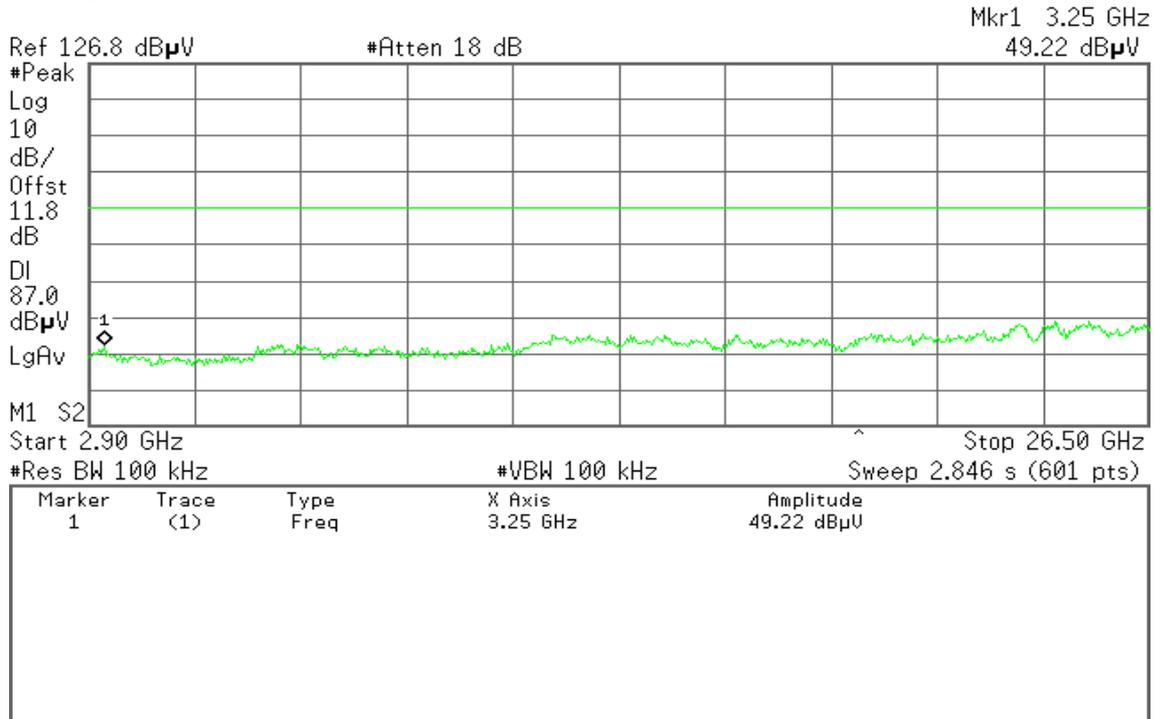
30MHz – 2.9GHz

Agilent 21:35:36 Jul 30, 2004



2.9GHz – 26.5GHz

Agilent 21:36:18 Jul 30, 2004

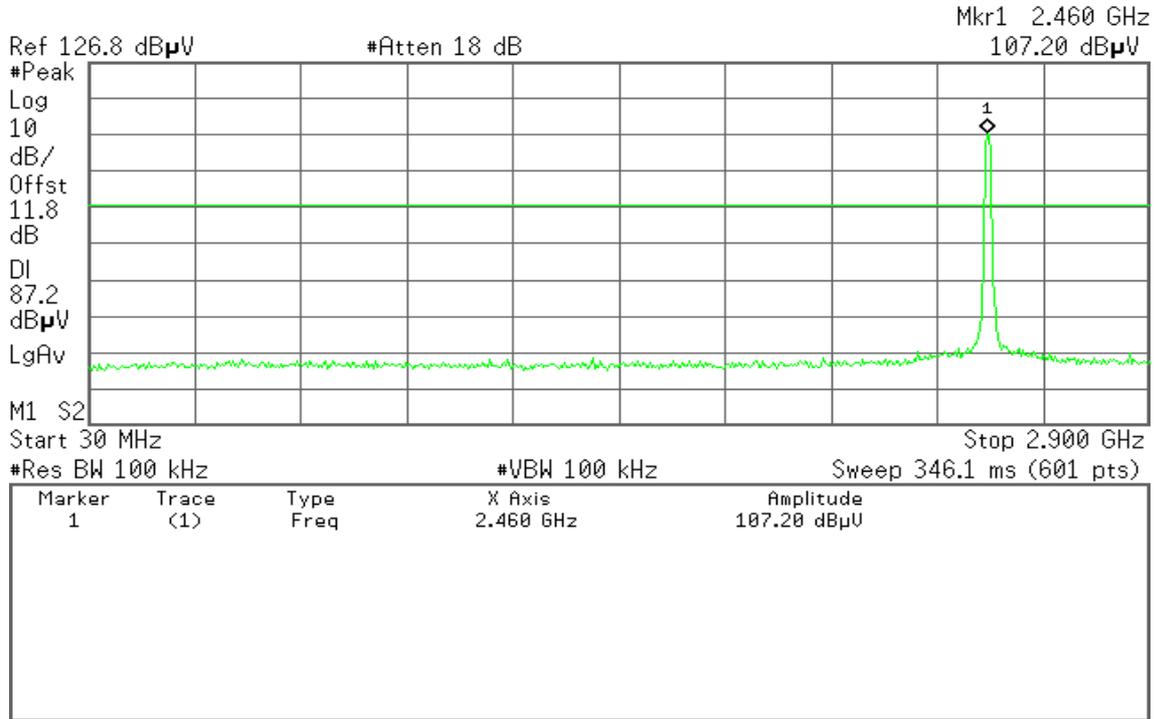




WLAN mdoe / CH High

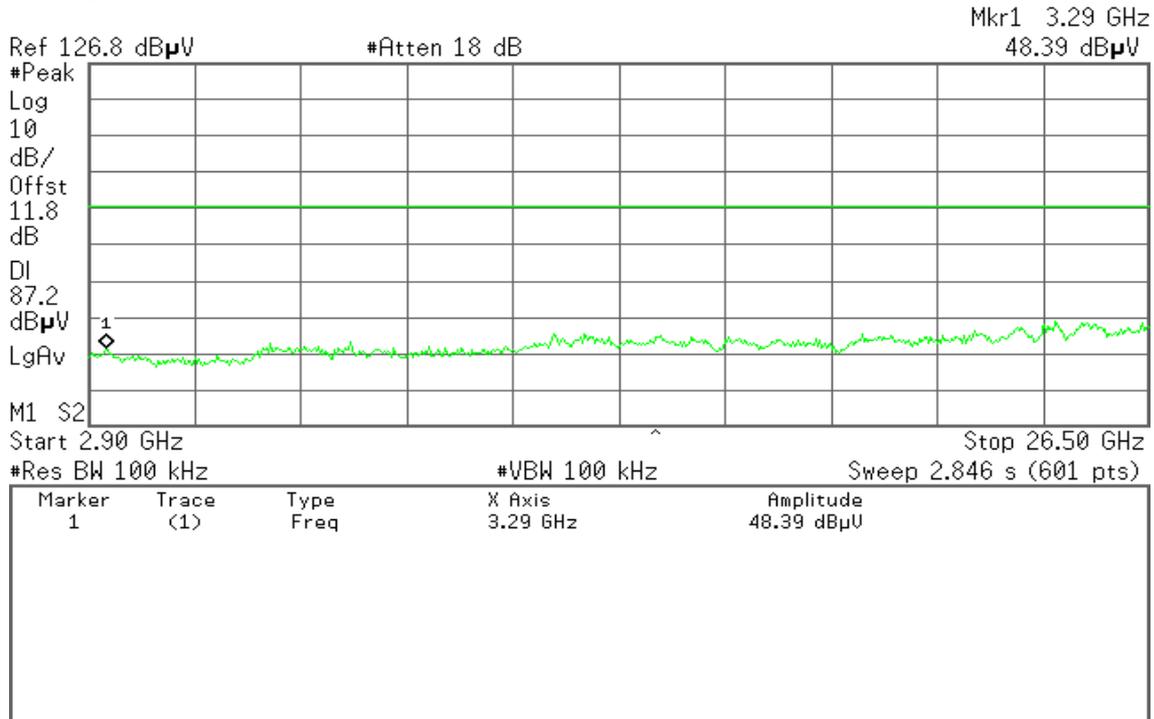
30MHz – 2.9GHz

Agilent 21:38:01 Jul 30, 2004



2.9GHz – 26.5GHz

Agilent 21:38:31 Jul 30, 2004



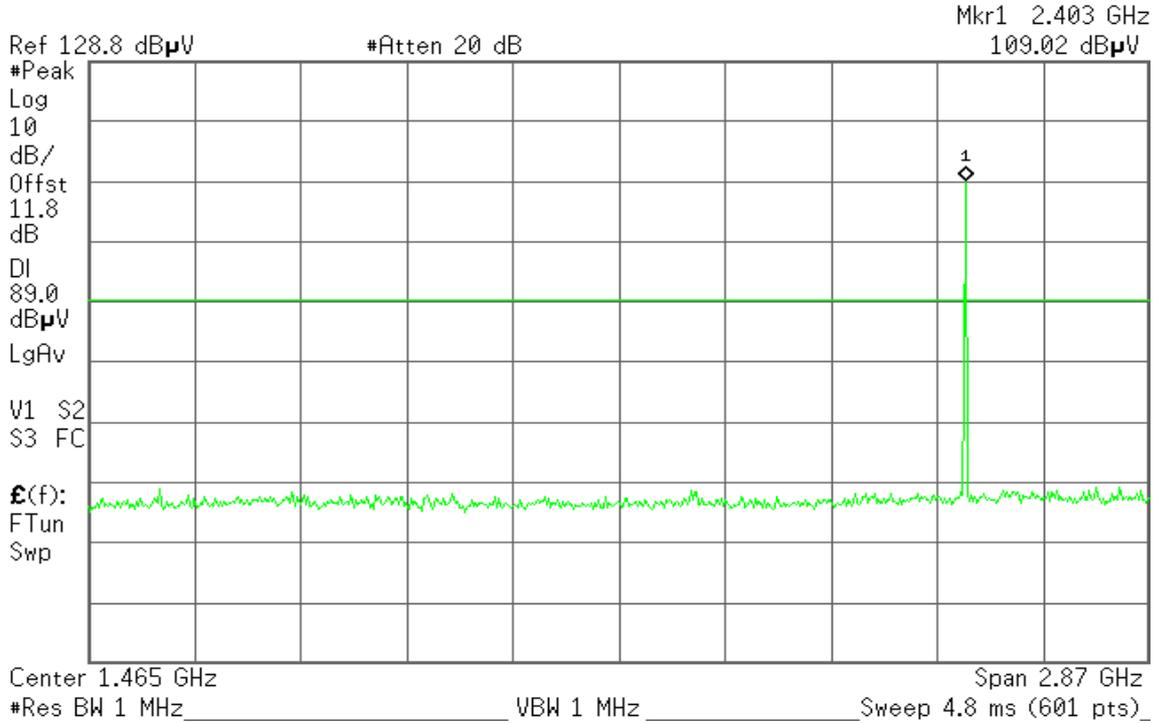


Type 1

Bluetooth mode / CH Low

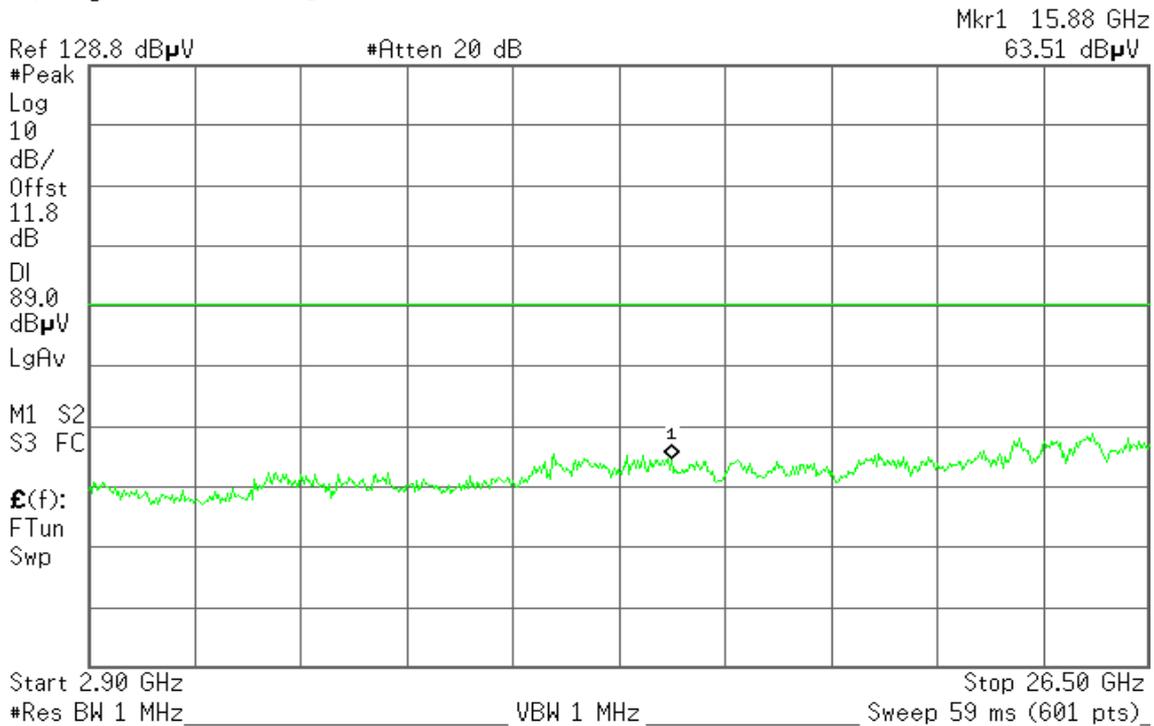
30MHz ~ 2.9GHz

Agilent 16:42:58 Aug 3, 2004



2.9GHz ~ 26.5GHz

Agilent 16:43:28 Aug 3, 2004

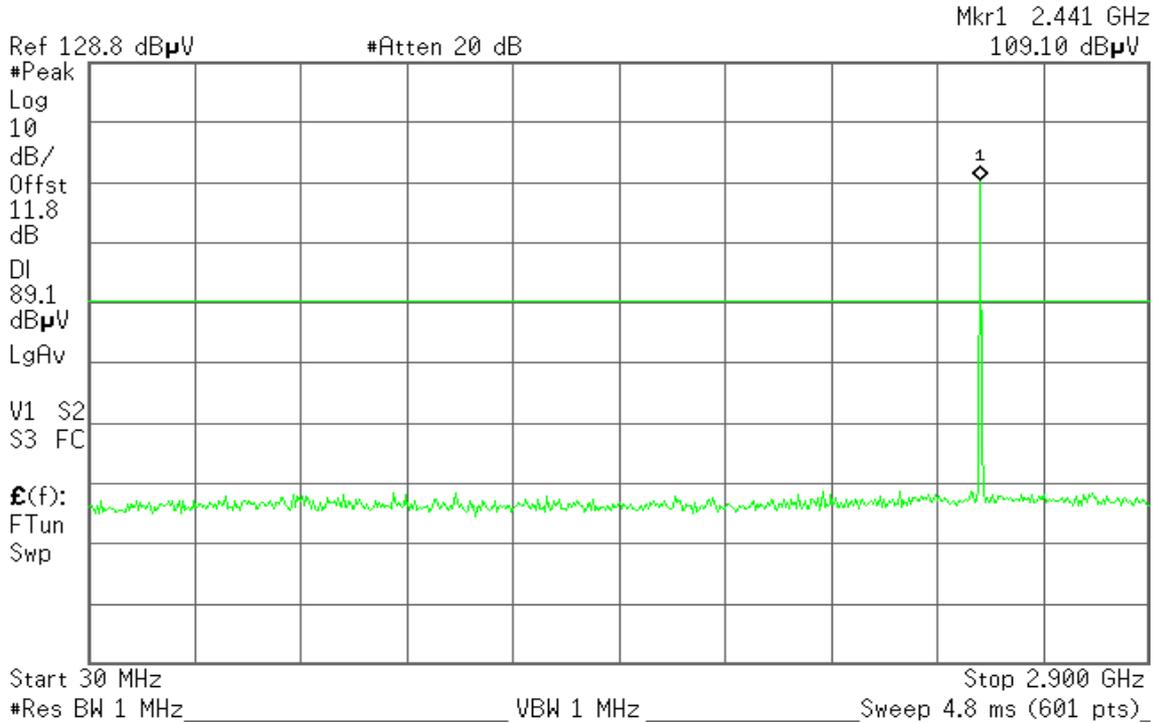




Bluetooth mode / CH Mid

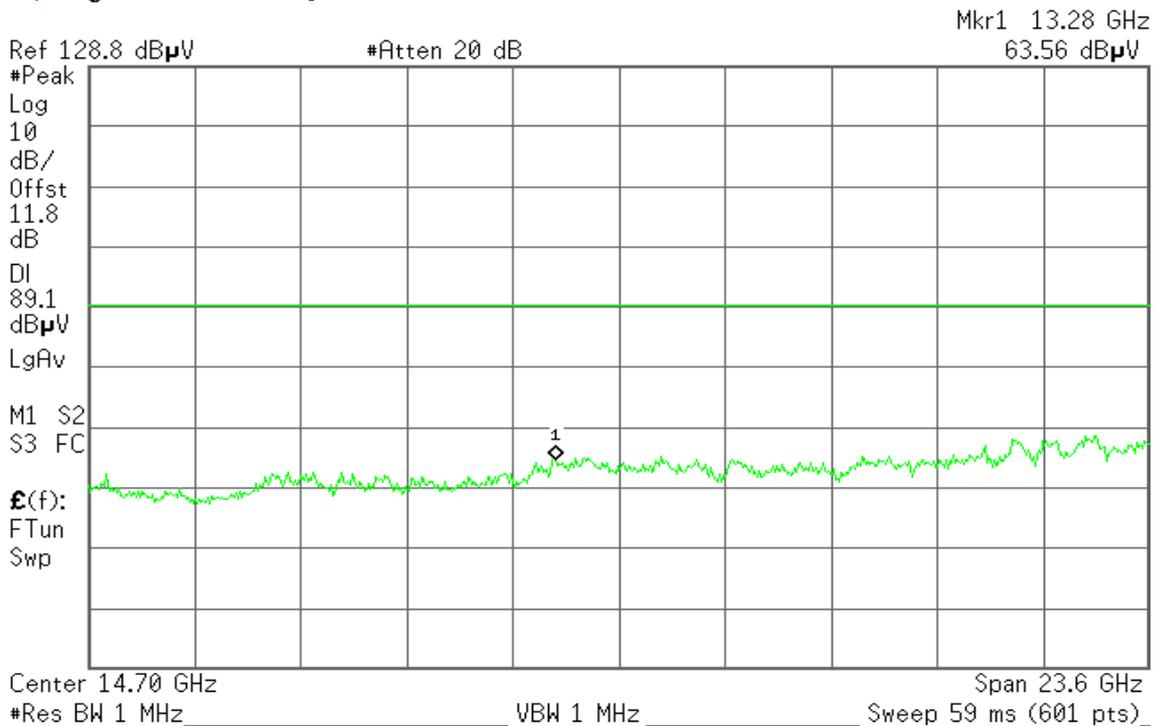
30MHz ~ 2.9GHz

Agilent 16:41:26 Aug 3, 2004



2.9GHz ~ 26.5GHz

Agilent 16:42:05 Aug 3, 2004

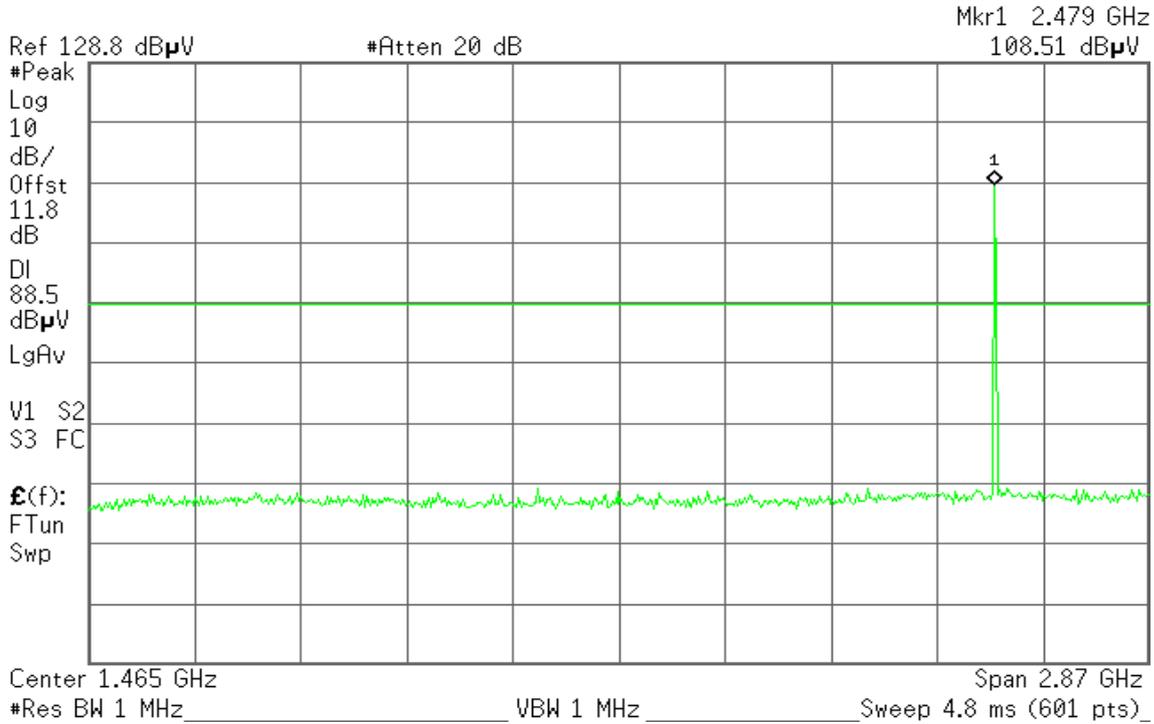




Bluetooth mode / CH High

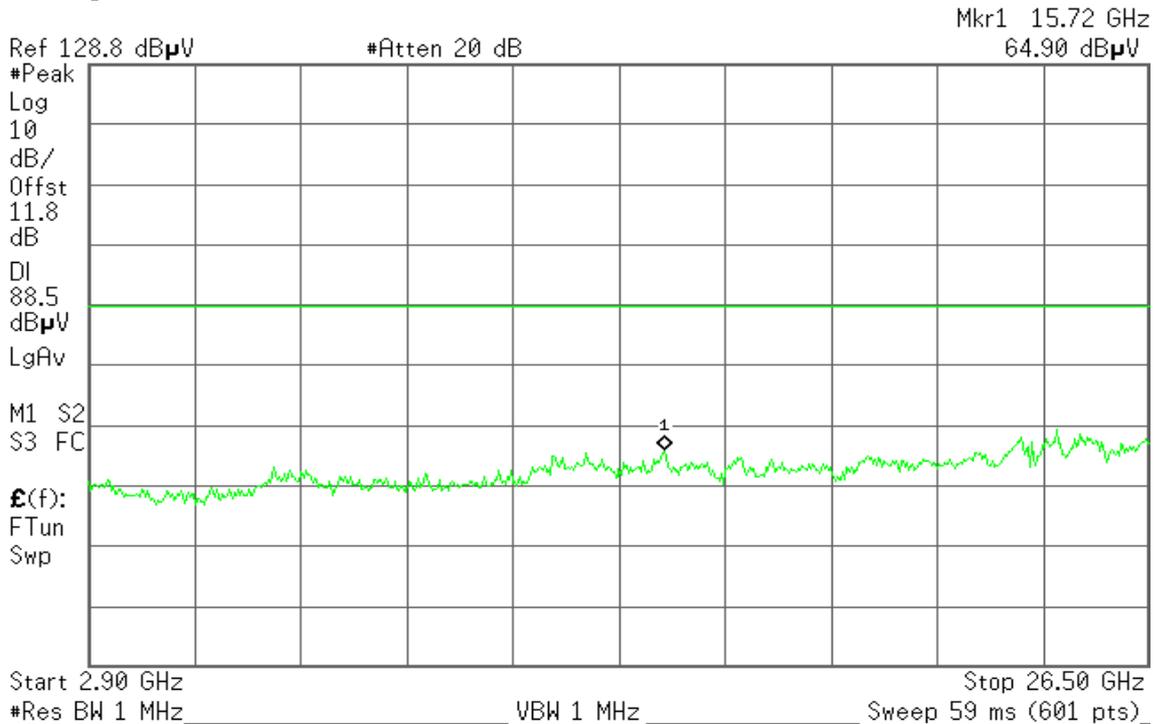
30MHz ~ 2.9GHz

Agilent 16:40:06 Aug 3, 2004



2.9GHz ~ 26.5GHz

Agilent 16:40:35 Aug 3, 2004



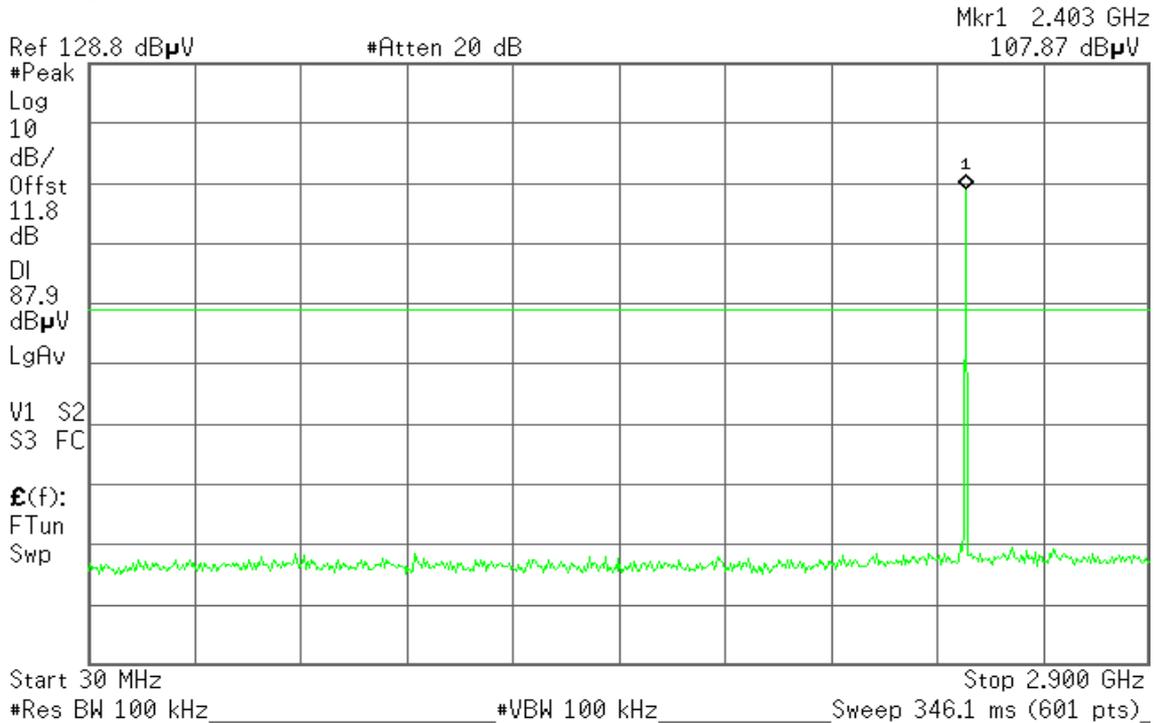


Type 2

Bluetooth mode / CH Low

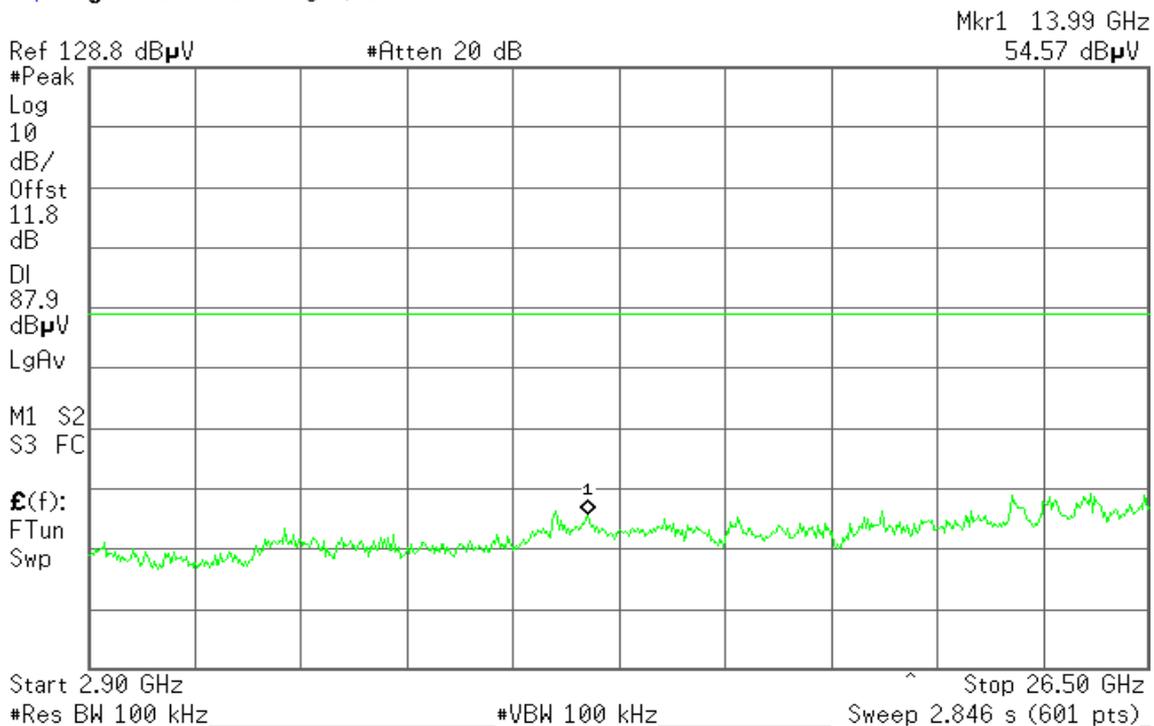
30MHz ~ 2.9GHz

Agilent 17:49:14 Aug 3, 2004



2.9GHz ~ 26.5GHz

Agilent 17:53:20 Aug 3, 2004

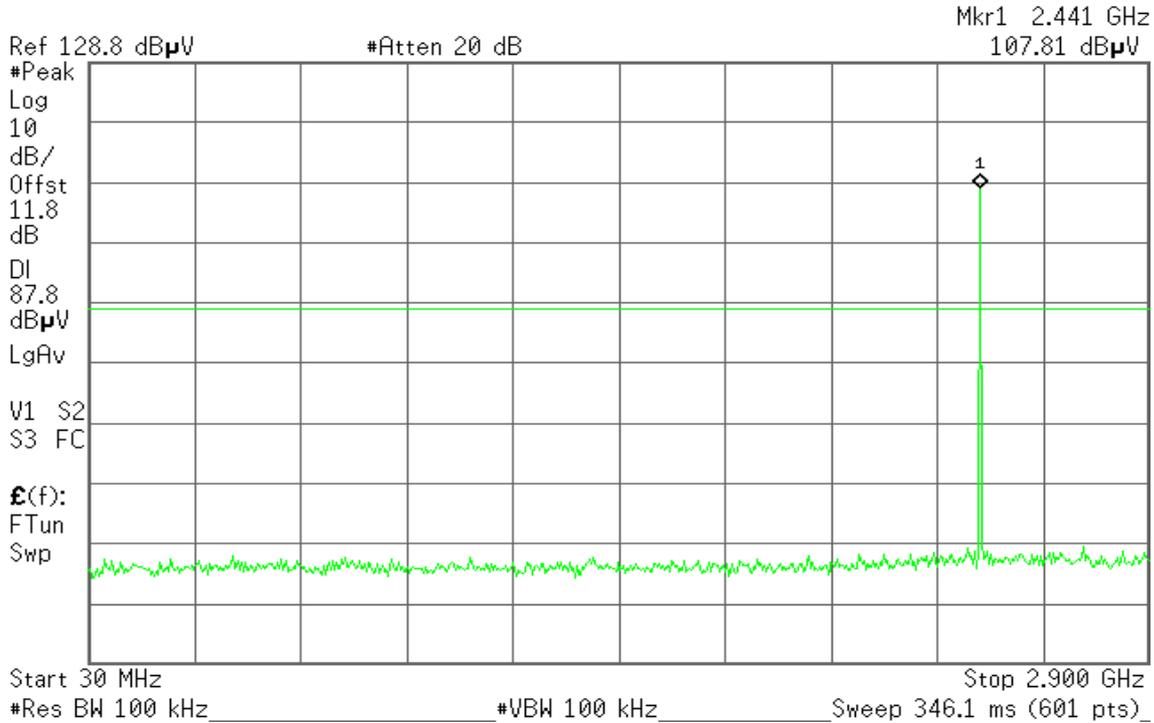




Bluetooth mode / CH Mid

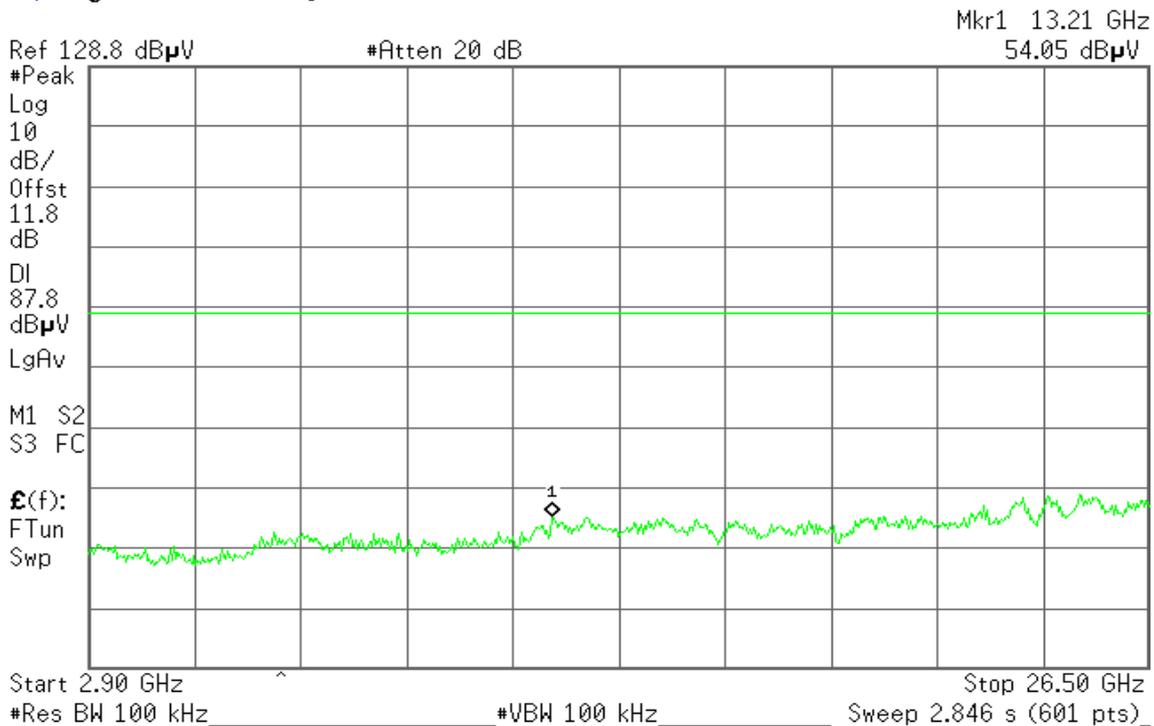
30MHz ~ 2.9GHz

Agilent 17:54:12 Aug 3, 2004



2.9GHz ~ 26.5GHz

Agilent 17:54:49 Aug 3, 2004

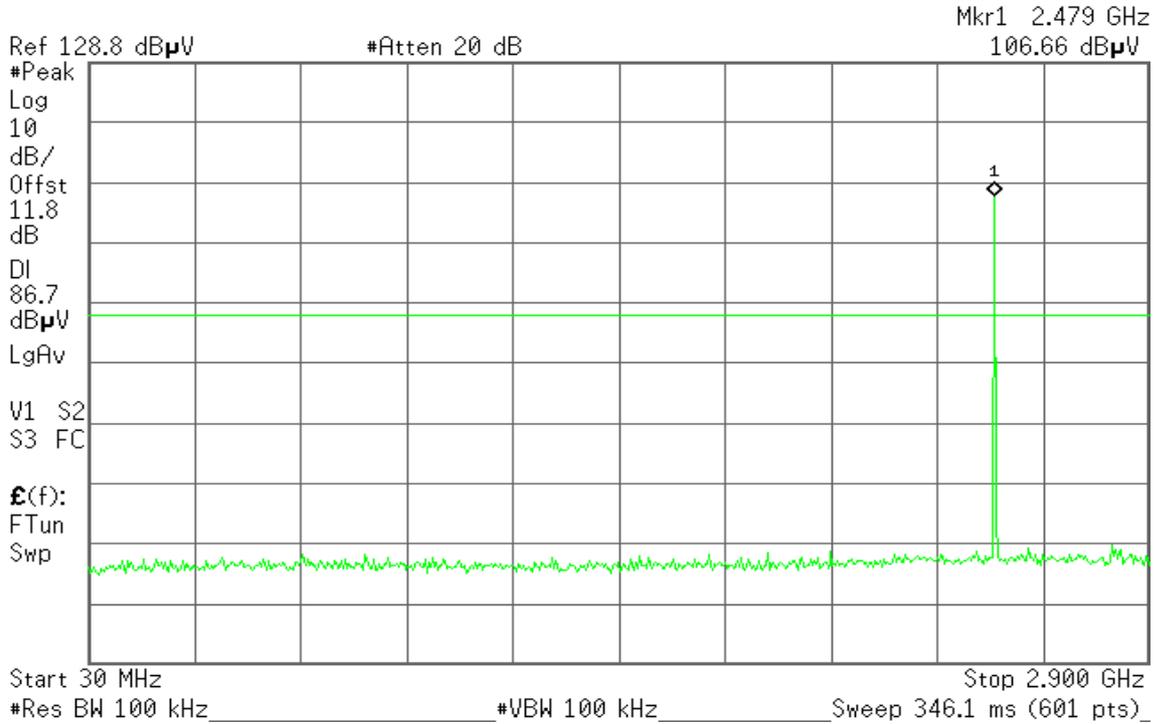




Bluetooth mode / CH High

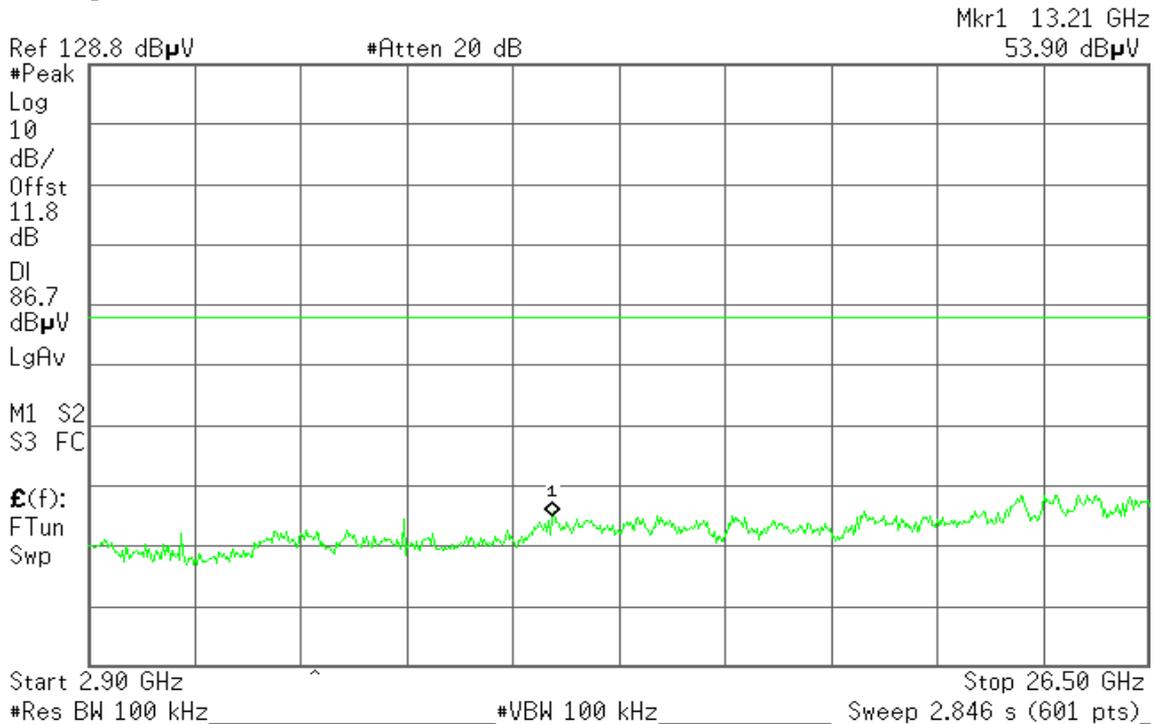
30MHz ~ 2.9GHz

Agilent 17:55:47 Aug 3, 2004



2.9GHz ~ 26.5GHz

Agilent 17:56:39 Aug 3, 2004





7.16 RADIATED EMISSIONS

LIMIT

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Note: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μ V/m at 3-meter)	Field Strength (dB μ V/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

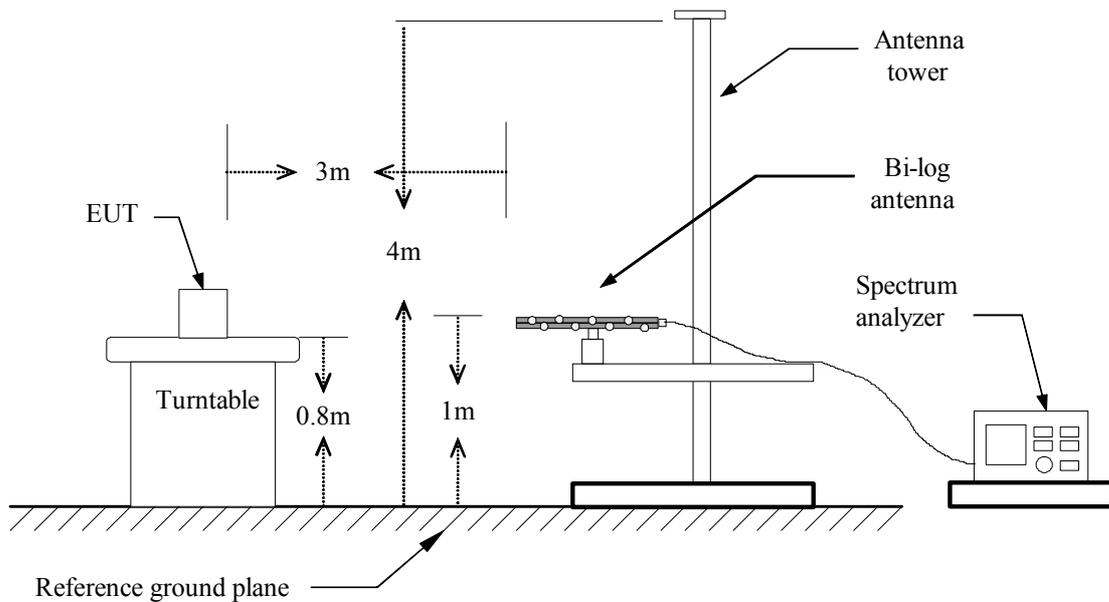
MEASUREMENT EQUIPMENT USED

Open Area Test Site # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	ADVANTEST	R3261A	N/A	03/18/2005
EMI Test Receiver	R&S	ESVS20	838804/004	01/04/2005
Pre-Amplifier	HP	8447D	2944A09173	03/03/2005
Bi-log Antenna	SCHWAZBECK	VULB9163	145	07/05/2005
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Site NSA	C&C	N/A	N/A	09/06/2004
Horn antenna	Schwarzbeck	BBHA 9120	D210	02/23/2005
Loop Antenna	EMCO	6502	2356	07/10/2005
Pre-Amplifier	HP	8449B	3008B00965	10/02/2004

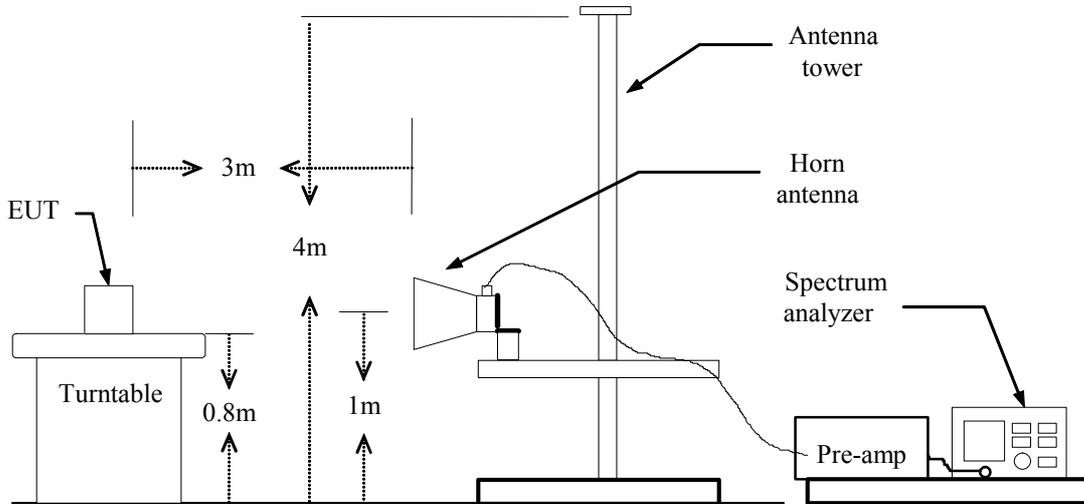
Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration

Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

- a. PEAK: RBW=VBW=1MHz / Sweep=AUTO
- b. AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.



TEST RESULTS

CONDITION A: WLAN OPERATION

Below 1 GHz

Operation Mode: TX / CH Low / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
57.45	V	Peak	10.05	13.97	24.02	40.00	-15.98
134.85	V	Peak	4.46	11.05	15.51	43.50	-27.99
238.35	V	Peak	0.70	15.85	16.55	46.00	-29.45
566.00	V	Peak	3.32	24.63	27.95	46.00	-18.05
867.00	V	Peak	2.12	27.58	29.70	46.00	-16.30
N/A							
123.60	H	Peak	10.01	11.44	21.45	43.50	-22.05
251.85	H	Peak	4.00	16.27	20.27	46.00	-25.73
268.05	H	Peak	6.52	15.88	22.40	46.00	-23.60
763.17	H	Peak	2.17	25.95	28.12	46.00	-17.88
919.50	H	Peak	3.26	28.43	31.69	46.00	-14.31
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH Mid / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
71.40	V	Peak	12.71	10.04	22.75	40.00	-17.25
85.80	V	Peak	14.60	11.01	25.61	40.00	-14.39
199.20	V	Peak	2.24	14.84	17.08	43.50	-26.42
458.67	V	Peak	0.39	20.58	20.97	46.00	-25.03
941.67	V	Peak	3.45	28.74	32.19	46.00	-13.81
N/A							
125.40	H	Peak	10.54	11.38	21.92	43.50	-21.58
200.10	H	Peak	2.19	14.92	17.11	43.50	-26.39
265.80	H	Peak	0.47	15.93	16.40	46.00	-29.60
605.67	H	Peak	3.60	25.31	28.91	46.00	-17.09
820.33	H	Peak	1.91	26.60	28.51	46.00	-17.49
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH High / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
57.00	V	Peak	9.37	14.06	23.43	40.00	-16.57
71.40	V	Peak	13.04	10.04	23.08	40.00	-16.92
201.00	V	Peak	2.21	14.94	17.15	43.50	-26.35
268.50	V	Peak	0.64	15.87	16.51	46.00	-29.49
605.67	V	Peak	3.27	25.31	28.58	46.00	-17.42
N/A							
71.40	H	Peak	12.44	10.04	22.48	40.00	-17.52
199.65	H	Peak	2.88	14.89	17.77	43.50	-25.73
239.70	H	Peak	0.62	15.90	16.52	46.00	-29.48
554.33	H	Peak	4.18	24.37	28.55	46.00	-17.45
982.50	H	Peak	3.67	29.47	33.14	54.00	-20.86
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH Low / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
66.00	V	Peak	15.56	11.46	27.02	40.00	-12.98
150.60	V	Peak	7.36	11.14	18.50	43.50	-25.00
225.75	V	Peak	3.65	15.35	19.00	46.00	-27.00
247.35	V	Peak	2.81	16.21	19.02	46.00	-26.98
399.17	V	Peak	0.86	20.68	21.54	46.00	-24.46
758.50	V	Peak	3.05	25.92	28.97	46.00	-17.03
150.60	H	Peak	8.86	11.14	20.00	43.50	-23.50
175.80	H	Peak	4.53	12.60	17.13	43.50	-26.37
238.35	H	Peak	2.87	15.85	18.72	46.00	-27.28
269.85	H	Peak	2.24	15.83	18.07	46.00	-27.93
399.17	H	Peak	0.53	20.68	21.21	46.00	-24.79
669.83	H	Peak	2.04	25.23	27.27	46.00	-18.73

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH Mid / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
66.00	V	Peak	15.56	11.46	27.02	40.00	-12.98
150.60	V	Peak	7.36	11.14	18.50	43.50	-25.00
199.65	V	Peak	5.04	14.89	19.93	43.50	-23.57
225.75	V	Peak	3.48	15.35	18.83	46.00	-27.17
399.17	V	Peak	0.14	20.68	20.82	46.00	-25.18
826.17	V	Peak	2.51	26.74	29.25	46.00	-16.75
118.20	H	Peak	5.05	11.80	16.85	43.50	-26.65
150.60	H	Peak	8.36	11.14	19.50	43.50	-24.00
236.10	H	Peak	1.70	15.76	17.46	46.00	-28.54
271.65	H	Peak	2.10	15.79	17.89	46.00	-28.11
399.17	H	Peak	0.36	20.68	21.04	46.00	-24.96
519.33	H	Peak	1.59	23.19	24.78	46.00	-21.22

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH High / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
66.90	V	Peak	16.69	11.16	27.85	40.00	-12.15
150.60	V	Peak	8.19	11.14	19.33	43.50	-24.17
225.75	V	Peak	3.31	15.35	18.66	46.00	-27.34
244.65	V	Peak	2.94	16.10	19.04	46.00	-26.96
547.33	V	Peak	3.19	24.19	27.38	46.00	-18.62
834.33	V	Peak	2.63	26.92	29.55	46.00	-16.45
150.60	H	Peak	8.86	11.14	20.00	43.50	-23.50
199.65	H	Peak	3.21	14.89	18.10	43.50	-25.40
242.85	H	Peak	1.75	16.03	17.78	46.00	-28.22
273.00	H	Peak	2.62	15.76	18.38	46.00	-27.62
399.17	H	Peak	1.03	20.68	21.71	46.00	-24.29
667.50	H	Peak	2.35	25.19	27.54	46.00	-18.46

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Above 1 GHz

Operation Mode: TX / CH Low / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



CONDITION B: BLUETOOTH OPERATION

Below 1 GHz

Operation Mode: TX / CH Low / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
57.45	V	Peak	11.55	13.97	25.52	40.00	-14.48
71.85	V	Peak	15.82	10.02	25.84	40.00	-14.16
192.00	V	Peak	3.38	14.12	17.50	43.50	-26.00
281.10	V	Peak	0.24	15.95	16.19	46.00	-29.81
762.00	V	Peak	2.68	25.94	28.62	46.00	-17.38
828.50	V	Peak	2.71	26.79	29.50	46.00	-16.50
120.90	H	Peak	6.41	11.54	17.95	43.50	-25.55
132.15	H	Peak	4.70	11.14	15.84	43.50	-27.66
199.20	H	Peak	2.24	14.84	17.08	43.50	-26.42
308.17	H	Peak	0.24	16.90	17.14	46.00	-28.86
715.33	H	Peak	2.12	25.80	27.92	46.00	-18.08
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH Mid / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
57.00	V	Peak	11.54	14.06	25.60	40.00	-14.40
71.85	V	Peak	15.32	10.02	25.34	40.00	-14.66
204.60	V	Peak	2.47	14.99	17.46	43.50	-26.04
297.30	V	Peak	0.13	16.58	16.71	46.00	-29.29
664.00	V	Peak	1.31	25.13	26.44	46.00	-19.56
875.17	V	Peak	3.58	27.72	31.30	46.00	-14.70
121.35	H	Peak	5.28	11.52	16.80	43.50	-26.70
201.90	H	Peak	2.06	14.95	17.01	43.50	-26.49
301.17	H	Peak	5.88	16.71	22.59	46.00	-23.41
492.50	H	Peak	0.62	22.16	22.78	46.00	-23.22
N/A							
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH High / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
57.45	V	Peak	11.21	13.97	25.18	40.00	-14.82
72.30	V	Peak	15.26	9.99	25.25	40.00	-14.75
175.80	V	Peak	3.03	12.60	15.63	43.50	-27.87
195.15	V	Peak	3.01	14.44	17.45	43.50	-26.05
399.17	V	Peak	0.14	20.68	20.82	46.00	-25.18
606.83	V	Peak	2.25	25.30	27.55	46.00	-18.45
120.90	H	Peak	4.91	11.54	16.45	43.50	-27.05
188.85	H	Peak	2.49	13.81	16.30	43.50	-27.20
200.55	H	Peak	2.37	14.93	17.30	43.50	-26.20
410.83	H	Peak	1.22	20.60	21.82	46.00	-24.18
657.00	H	Peak	1.38	25.00	26.38	46.00	-19.62
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH Low / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
66.00	V	Peak	17.56	11.46	29.02	40.00	-10.98
150.60	V	Peak	10.86	11.14	22.00	43.50	-21.50
221.70	V	Peak	4.68	15.27	19.95	46.00	-26.05
259.95	V	Peak	3.16	16.07	19.23	46.00	-26.77
399.17	V	Peak	0.70	20.68	21.38	46.00	-24.62
706.00	V	Peak	2.75	25.78	28.53	46.00	-17.47
134.85	H	Peak	7.29	11.05	18.34	43.50	-25.16
150.60	H	Peak	13.03	11.14	24.17	43.50	-19.33
200.10	H	Peak	5.86	14.92	20.78	43.50	-22.72
273.45	H	Peak	3.30	15.75	19.05	46.00	-26.95
399.17	H	Peak	1.03	20.68	21.71	46.00	-24.29
811.00	H	Peak	2.57	26.39	28.96	46.00	-17.04

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH Mid / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
150.60	V	Peak	11.03	11.14	22.17	43.50	-21.33
194.70	V	Peak	4.87	14.39	19.26	43.50	-24.24
225.75	V	Peak	3.65	15.35	19.00	46.00	-27.00
259.95	V	Peak	2.83	16.07	18.90	46.00	-27.10
399.17	V	Peak	1.03	20.68	21.71	46.00	-24.29
721.17	V	Peak	2.20	25.82	28.02	46.00	-17.98
150.60	H	Peak	12.86	11.14	24.00	43.50	-19.50
156.45	H	Peak	10.97	11.29	22.26	43.50	-21.24
198.30	H	Peak	6.97	14.75	21.72	43.50	-21.78
275.70	H	Peak	4.45	15.74	20.19	46.00	-25.81
399.17	H	Peak	0.03	20.68	20.71	46.00	-25.29
769.00	H	Peak	2.12	25.98	28.10	46.00	-17.90

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: TX / CH High / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
66.45	V	Peak	17.71	11.31	29.02	40.00	-10.98
150.60	V	Peak	10.86	11.14	22.00	43.50	-21.50
225.75	V	Peak	4.48	15.35	19.83	46.00	-26.17
275.70	V	Peak	3.12	15.74	18.86	46.00	-27.14
399.17	V	Peak	2.20	20.68	22.88	46.00	-23.12
710.67	V	Peak	1.85	25.79	27.64	46.00	-18.36
150.60	H	Peak	11.69	11.14	22.83	43.50	-20.67
156.45	H	Peak	11.31	11.29	22.60	43.50	-20.90
199.65	H	Peak	6.21	14.89	21.10	43.50	-22.40
273.00	H	Peak	3.62	15.76	19.38	46.00	-26.62
399.17	H	Peak	0.86	20.68	21.54	46.00	-24.46
735.17	H	Peak	2.63	25.85	28.48	46.00	-17.52

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Above 1 GHz

Operation Mode: TX / CH Low / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
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Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: TX / CH Mid / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
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Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: TX / CH High / Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
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Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: TX / CH Mid / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
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Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: TX / CH High / Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
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Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



CONDITION C: CO-LOCATED OPERATION (WLAN & BLUETOOTH OPERATED SIMULTANEOUSLY)

WLAN Module Max power + Bluetooth Module mode

Below 1 GHz

Operation Mode: WLAN TX Mode / Ch Low+ BT TX Mode / Ch Low Type 1 **Test Date:** August 9, 2004
Temperature: 30°C **Tested by:** Max Yen
Humidity: 50 % RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
57.00	V	Peak	11.54	14.06	25.60	40.00	-14.40
71.85	V	Peak	15.32	10.02	25.34	40.00	-14.66
201.00	V	Peak	2.21	14.94	17.15	43.50	-26.35
286.95	V	Peak	0.05	16.17	16.22	46.00	-29.78
493.67	V	Peak	1.66	22.21	23.87	46.00	-22.13
779.50	V	Peak	2.04	26.03	28.07	46.00	-17.93
124.95	H	Peak	10.14	11.40	21.54	43.50	-21.96
205.05	H	Peak	2.31	15.00	17.31	43.50	-26.19
263.55	H	Peak	0.92	15.98	16.90	46.00	-29.10
701.33	H	Peak	1.99	25.77	27.76	46.00	-18.24
931.17	H	Peak	3.53	28.59	32.12	46.00	-13.88
N/A							

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: WLAN TX Mode / Ch Low + BT TX Mode / Ch Mid Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
57.45	V	Peak	9.88	13.97	23.85	40.00	-16.15
70.95	V	Peak	15.77	10.07	25.84	40.00	-14.16
144.30	V	Peak	2.61	10.98	13.59	43.50	-29.91
202.80	V	Peak	2.08	14.96	17.04	43.50	-26.46
511.17	V	Peak	1.35	22.91	24.26	46.00	-21.74
762.00	V	Peak	2.18	25.94	28.12	46.00	-17.88
123.60	H	Peak	9.68	16.27	25.95	43.50	-17.55
155.10	H	Peak	2.86	11.26	14.12	43.50	-29.38
205.50	H	Peak	2.49	15.01	17.50	43.50	-26.00
251.85	H	Peak	0.08	16.27	16.35	46.00	-29.65
476.17	H	Peak	2.10	21.39	23.49	46.00	-22.51
711.83	H	Peak	2.34	25.80	28.14	46.00	-17.86

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: WLAN TX Mode / Ch Low+ BT TX Mode / Ch High Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
57.45	V	Peak	10.21	13.97	24.18	40.00	-15.82
70.95	V	Peak	15.77	10.07	25.84	40.00	-14.16
193.80	V	Peak	3.27	14.30	17.57	43.50	-25.93
284.70	V	Peak	0.39	16.09	16.48	46.00	-29.52
557.83	V	Peak	3.61	24.45	28.06	46.00	-17.94
787.67	V	Peak	2.14	26.08	28.22	46.00	-17.78
123.60	H	Peak	10.35	11.44	21.79	43.50	-21.71
203.70	H	Peak	2.78	14.98	17.76	43.50	-25.74
246.00	H	Peak	0.29	16.15	16.44	46.00	-29.56
277.05	H	Peak	1.73	15.79	17.52	46.00	-28.48
499.50	H	Peak	2.01	22.49	24.50	46.00	-21.50
815.67	H	Peak	2.16	26.50	28.66	46.00	-17.34

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: WLAN TX Mode / Ch Mid+ BT TX Mode / Ch Low Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
66.45	V	Peak	16.54	11.31	27.85	40.00	-12.15
154.20	V	Peak	8.30	11.23	19.53	43.50	-23.97
225.75	V	Peak	3.65	15.35	19.00	46.00	-27.00
246.90	V	Peak	2.81	16.19	19.00	46.00	-27.00
325.67	V	Peak	1.61	17.37	18.98	46.00	-27.02
868.17	V	Peak	2.31	27.60	29.91	46.00	-16.09
150.60	H	Peak	9.19	11.14	20.33	43.50	-23.17
154.20	H	Peak	9.80	11.23	21.03	43.50	-22.47
210.45	H	Peak	2.75	15.09	17.84	43.50	-25.66
245.10	H	Peak	1.95	16.12	18.07	46.00	-27.93
398.00	H	Peak	1.22	20.61	21.83	46.00	-24.17
863.50	H	Peak	3.24	27.51	30.75	46.00	-15.25

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: WLAN TX Mode / Ch Mid+ BT TX Mode / Ch Mid Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
66.00	V	Peak	15.72	11.46	27.18	40.00	-12.82
150.60	V	Peak	7.03	11.14	18.17	43.50	-25.33
199.65	V	Peak	4.54	14.89	19.43	43.50	-24.07
225.75	V	Peak	3.31	15.35	18.66	46.00	-27.34
399.17	V	Peak	0.70	20.68	21.38	46.00	-24.62
507.67	V	Peak	0.58	22.78	23.36	46.00	-22.64
150.60	H	Peak	9.03	11.14	20.17	43.50	-23.33
156.45	H	Peak	8.31	11.29	19.60	43.50	-23.90
196.95	H	Peak	4.56	14.62	19.18	43.50	-24.32
238.35	H	Peak	2.54	15.85	18.39	46.00	-27.61
399.17	H	Peak	1.70	20.68	22.38	46.00	-23.62
924.17	H	Peak	3.76	28.49	32.25	46.00	-13.75

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Operation Mode: WLAN TX Mode / Ch Mid+ BT TX Mode / Ch High Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
66.45	V	Peak	16.04	11.31	27.35	40.00	-12.65
120.00	V	Peak	5.39	11.57	16.96	43.50	-26.54
150.60	V	Peak	7.86	11.14	19.00	43.50	-24.50
196.95	V	Peak	4.72	14.62	19.34	43.50	-24.16
399.17	V	Peak	0.36	20.68	21.04	46.00	-24.96
668.67	V	Peak	2.87	25.21	28.08	46.00	-17.92
150.60	H	Peak	9.36	11.14	20.50	43.50	-23.00
154.20	H	Peak	10.97	11.23	22.20	43.50	-21.30
196.95	H	Peak	2.89	14.62	17.51	43.50	-25.99
239.70	H	Peak	3.05	15.90	18.95	46.00	-27.05
399.17	H	Peak	1.03	20.68	21.71	46.00	-24.29
507.67	H	Peak	1.08	22.78	23.86	46.00	-22.14

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Above 1 GHz

Operation Mode: WLAN TX Mode / Ch Low+ BT TX Mode / Ch Low Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1816.67	V	47.67	---	-5.62	42.05	---	74.00	54.00	-11.95	Peak
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: WLAN TX Mode / Ch Low+ BT TX Mode / Ch Mid Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
2363.33	H	51.17	---	-3.18	47.99	---	74.00	54.00	-6.01	Peak
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: WLAN TX Mode / Ch Low+ BT TX Mode / Ch High Type 1

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
2336.67	H	51.50	---	-3.26	48.24	---	74.00	54.00	-5.76	Peak
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: WLAN TX Mode / Ch Mid + BT TX Mode / Ch Low Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: WLAN TX Mode / Ch Mid + BT TX Mode / Ch Mid Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
2363.33	H	53.84	---	-3.18	50.66	---	74.00	54.00	-3.34	Peak
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



Operation Mode: WLAN TX Mode / Ch Mid + BT TX Mode / Ch High Type 2

Test Date: August 9, 2004

Temperature: 30°C

Tested by: Max Yen

Humidity: 50 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
2340.00	H	52.00	---	-3.25	48.75	---	74.00	54.00	-5.25	Peak
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Spectrum setting:
 - a. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = auto.
 - b. AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = auto.



7.17 POWER LINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCS30	847793/012	12/20/2004
LISN	R&S	ESH2-Z5	843285/010	12/15/2004
LISN	EMCO	3825/2	9003-1628	07/25/2005

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Operation Mode: TX + RX mode / Type 1 / Delta **Test Date:** August 12, 2004
Temperature: 25°C **Humidity:** 55% RH
Power Source: AC 110V/50Hz **Tested by:** Max Yen

Freq. (MHz)	Q.P. Raw (dBuV)	AVG Raw (dBuV)	Q.P. Limit (dBuV)	AVG Limit (dBuV)	Q.P. Margin (dB)	AVG Margin (dB)	Note
0.180	48.80	---	64.49	54.49	-15.69	---	L1
0.365	31.60	---	58.61	48.61	-27.01	---	L1
0.545	27.60	---	56.00	46.00	-28.40	---	L1
2.850	30.60	---	56.00	46.00	-25.40	---	L1
5.150	34.30	---	60.00	50.00	-25.70	---	L1
19.450	32.90	---	60.00	50.00	-27.10	---	L1
0.180	49.40	---	64.49	54.49	-15.09	---	L2
0.365	32.80	---	58.61	48.61	-25.81	---	L2
0.970	25.30	---	56.00	46.00	-30.70	---	L2
6.000	32.50	---	60.00	50.00	-27.50	---	L2
18.550	29.30	---	60.00	50.00	-30.70	---	L2
19.700	31.60	---	60.00	50.00	-28.40	---	L2

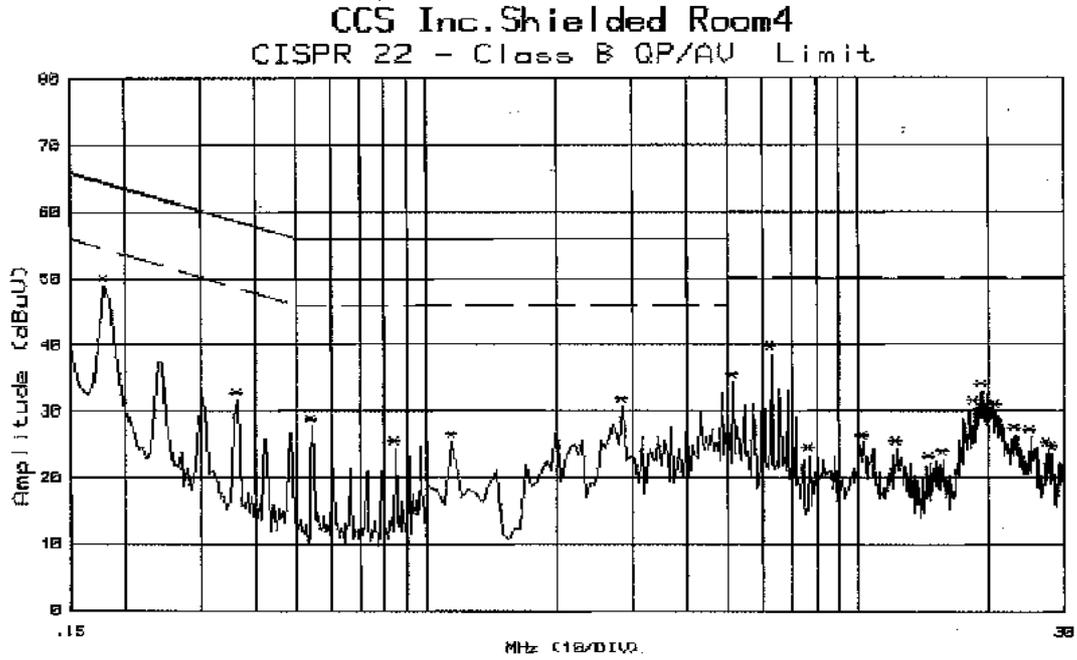
Note:

1. The measuring frequencies range between 0.15 MHz and 30 MHz.
2. The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.
3. “---” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
4. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10kHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.
5. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

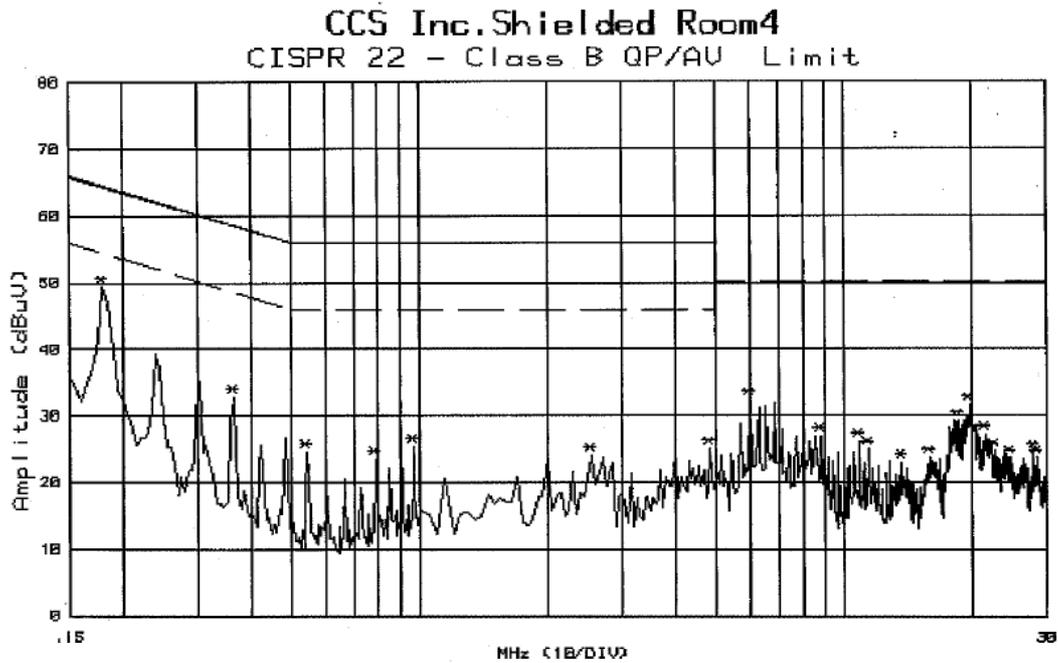


Test Data Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)





Operation Mode: TX + RX mode / Type 2 / Delta **Test Date:** August 12, 2004
Temperature: 25°C **Humidity:** 55% RH
Power Source: AC 110V/50Hz **Tested by:** Max Yen

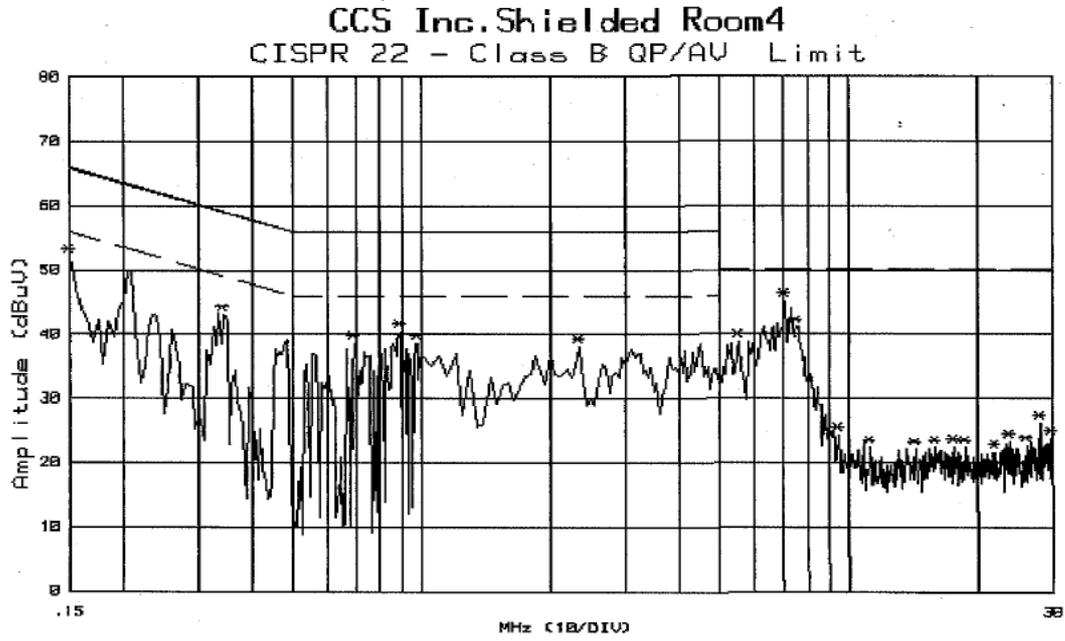
Freq. (MHz)	Q.P. Raw (dBuV)	AVG Raw (dBuV)	Q.P. Limit (dBuV)	AVG Limit (dBuV)	Q.P. Margin (dB)	AVG Margin (dB)	Note
0.150	52.20	---	66.00	56.00	-13.80	---	L1
0.345	43.00	---	59.08	49.08	-16.08	---	L1
0.695	38.60	---	56.00	46.00	-17.40	---	L1
0.890	40.50	---	56.00	46.00	-15.50	---	L1
0.980	38.50	---	56.00	46.00	-17.50	---	L1
7.100	45.20	---	60.00	50.00	-14.80	---	L1
0.195	50.40	---	63.82	53.82	-13.42	---	L2
0.345	41.80	---	59.08	49.08	-17.28	---	L2
0.685	38.10	---	56.00	46.00	-17.90	---	L2
0.760	39.20	---	56.00	46.00	-16.80	---	L2
1.100	39.50	---	56.00	46.00	-16.50	---	L2
3.300	38.60	---	56.00	46.00	-17.40	---	L2

Note:

1. The measuring frequencies range between 0.15 MHz and 30 MHz.
2. The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.
3. “---” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
4. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10kHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.
5. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)



Conducted emissions (Line 1)



Conducted emissions (Line 2)

