



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Ever Sparkle Technologies Ltd.

X-Box Wireless Head Set

Model: 81440

Trade Name: NYKO

Prepared for

Ever Sparkle Technologies Ltd.

**Unit B, 6/F., Kingswell Comm. Tower, 171-173 Lockhart Road, Wanchai,
HongKong.**

Prepared by

COMPLIANCE CERTIFICATION SERVICES (KUNSHAN) INC.

10#Weiye Rd, Innovation Park

Eco. & Tec. Development Zone

Kunshan City JiangSu, (215300) CHINA

TEL: 86-512-57355888

FAX: 86-512-57370818



Lab. Code: 200581-0

Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document.



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION..... 3

2. EUT DESCRIPTION 4

3. TEST METHODOLOGY 5

 3.1 EUT CONFIGURATION5

 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 MODES6

4. INSTRUMENT CALIBRATION..... 7

5. FACILITIES AND ACCREDITATIONS 8

 5.1 FACILITIES8

 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 EQUIPMENT10

7. FCC PART 15.247 REQUIREMENTS..... 11

 7.1 6DB BANDWIDTH.....11

 7.2 PEAK POWER13

 7.3 BAND EDGES MEASUREMENT15

 7.4 PEAK POWER SPECTRAL DENSITY20

 7.5 RADIO FREQUENCY EXPOSURE.....22

 7.6 SPURIOUS EMISSIONS.....25

 7.7 POWERLINE CONDUCTED EMISSIONS.....32

APPENDIX 1 PHOTOGRPHS OF TEST SETUP 34



1. TEST RESULT CERTIFICATION

Applicant: Ever Sparkle Technologies Ltd.
 Unit B 6/F., Kingswell Comm. Tower, 171-173 Lockhart Road,
 Wanchai, HongKong.

Equipment Under Test: X-Box Wireless Head Set

Trade Name: NYKO

Model: 81440

Date of Test: March23~ 28, 2005

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 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

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

Approved by:

Reviewed by:

 Denny Yang
 Vice General Manager of Kunshan Laboratory
 Compliance Certification Services Inc.

 Eric Lin
 Section Manager of Kunshan Laboratory
 Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	X-Box Wireless Head Set
Trade Name	NYTO
Model Number	81440
Model Discrepancy	N/A
Power Supply	Powered from power adapter (Rating: 120V / 200mA / 2.5W)
Frequency Range	2440MHz
Number of Channels	1 Channel
Antenna Specification	Chip Antenna Gain: 2 dBi (Max)

Note: This submittal(s) (test report) is intended for FCC ID: SQO814401 filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

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 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.



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.

Sample itself is tuned by the manufacturer for the continue transmitting mode. Channel 1(2440MHz) is chosen for the final testing.



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 CCS China Kunshan Lab at 10#, Weiye Rd, Innovation Park Eco. & Tec. Development Zone Kunshan city JiangSu, (215300)CHINA.

The measurement facilities are constructed in conformance with the requirements of CISPR 16-1, ANSI C63.4 and other equivalent standards.

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: 200581-0 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.

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP	EN 55022, EN 61000-3-2, EN 61000-3-3, EN550024, EN 61000-4-2, EN 61000-4-3, EN61000-4-4, EN 61000-4-5, EN 61000-4-6, IEC 61000-4-8, EN 61000-4-11 ANSI C63.4, CISPR16-1, IEC61000-3-2, IEC61000-3-3, 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	 Lab. Code: 200581-0 ----
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	 93105, 90471
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	 R-1600 C-1707
Norway	NEMKO	EN61000-6-1/2/3/4, EN 50082-1/2, IEC 61000-6-1/2/3/4, EN 50091-2, EN 55011, EN 55022, EN 55024, EN 61000-3-2/3, EN 61000-11, IEC 61000-4-2/3/4/5/6/8/11, CISPR16-1/2/3/4	 ELA 105

** 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

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
XBOX	Microsoft	N/A	Nil	5001906 20602	N/A	Shielded, 1.8m
XBOX	Microsoft	N/A	Nil	5122585 25202	N/A	Shielded, 1.8m
TV	SANYO	CK15F5(S)-00	DOC	62101390	N/A	Un-Shielded, 1.7m

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

7.1 6DB BANDWIDTH

LIMIT

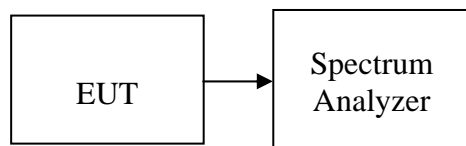
For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	03/05/2006

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

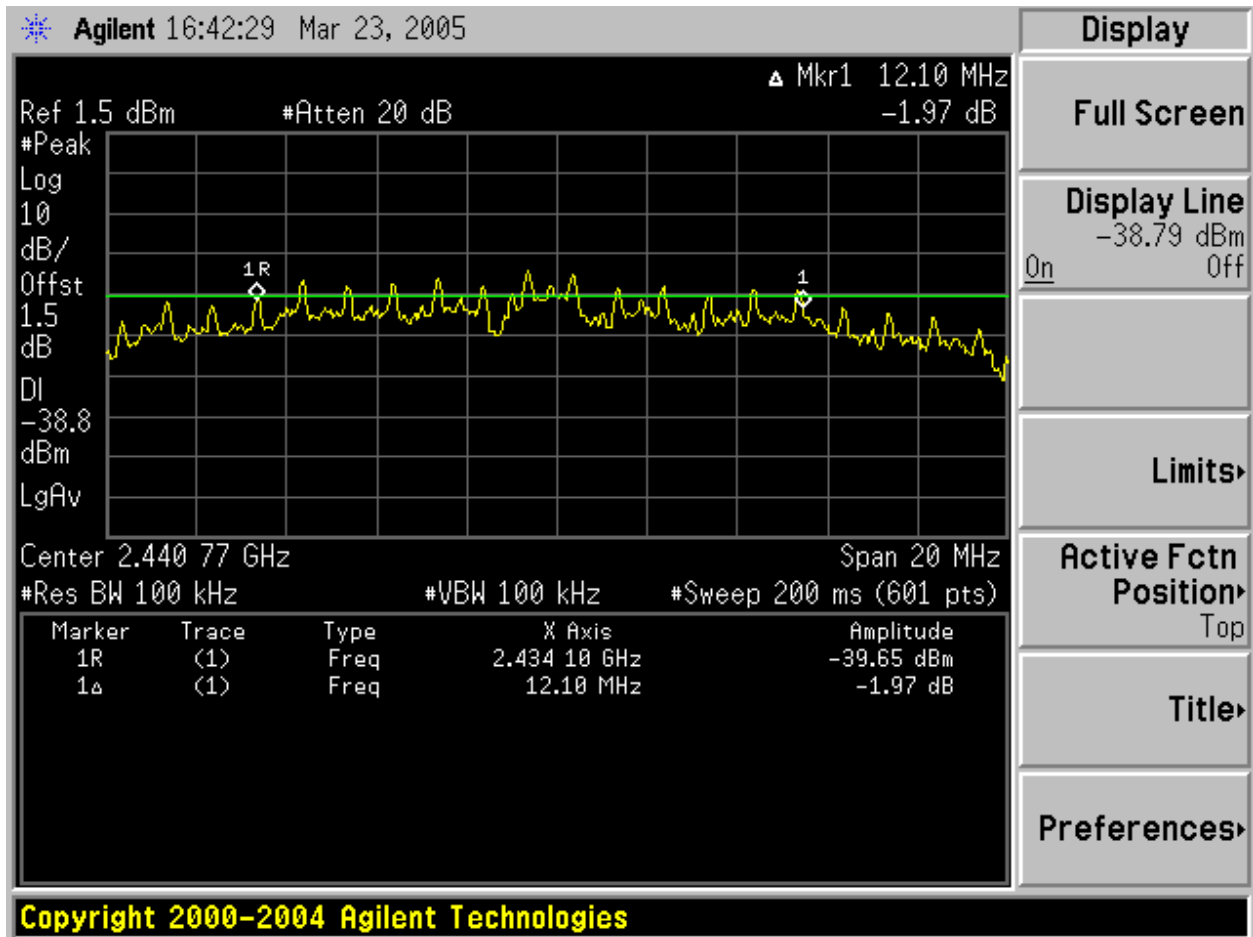
Test Data

Test mode: TX

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
1	2440	12100	>500	PASS

Test Plot

6dB Bandwidth



7.2 PEAK POWER

LIMIT

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

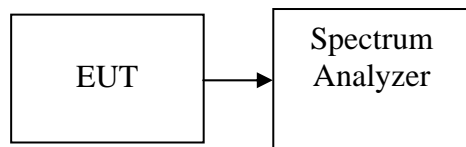
1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt.
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional 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	MY44020154	03/05/2006

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

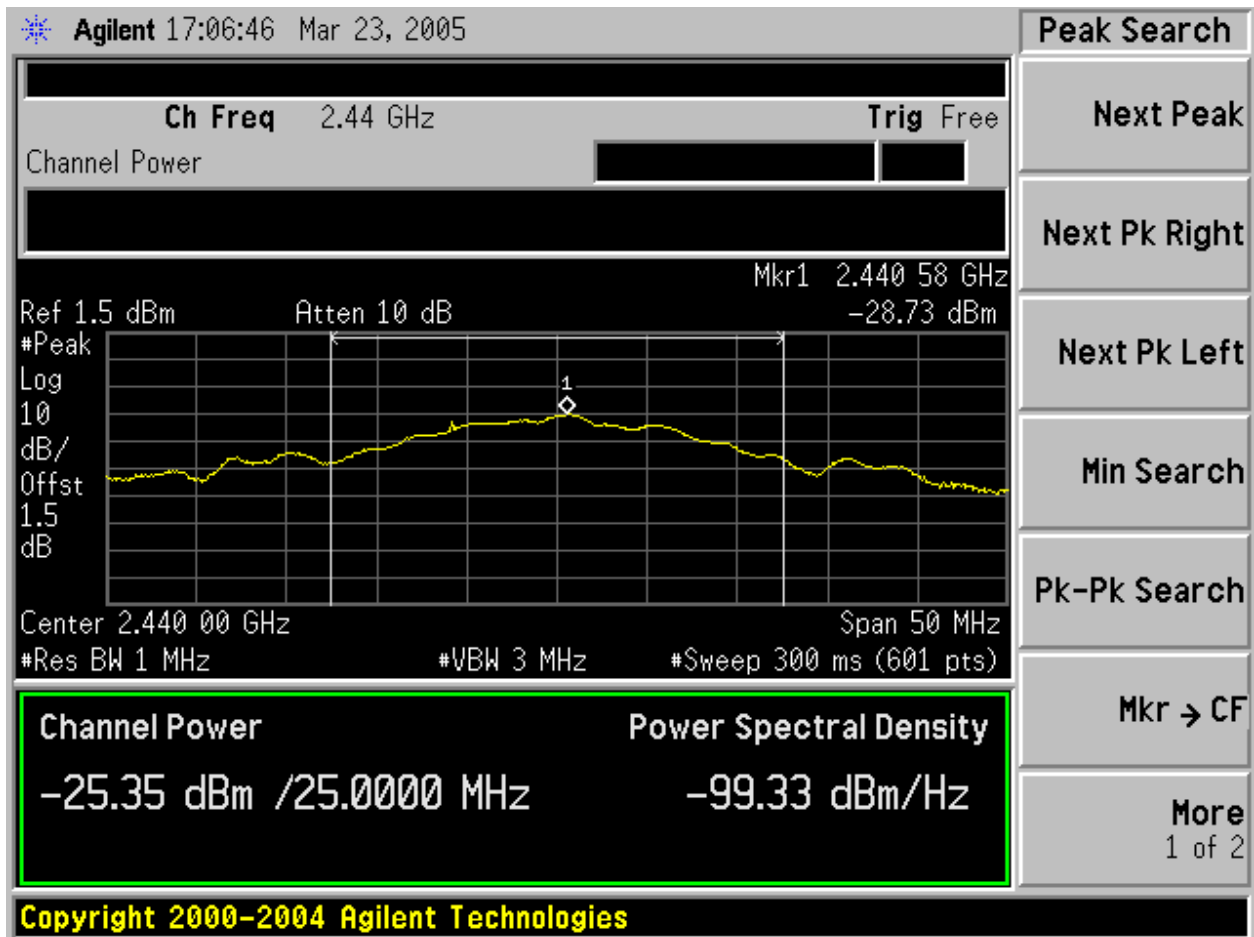
No non-compliance noted

Test Data

Channel	Frequency (MHz)	Output Power (dBm)	Factor (dB)	Output Power (dBm)	Output Power (mW)	Limit (W)	Result
1	2440	-27.35	2.00	-25.35	0.002917427	1	PASS

Test Plot

Peak power (CH 1)



7.3 BAND EDGES MEASUREMENT

LIMIT

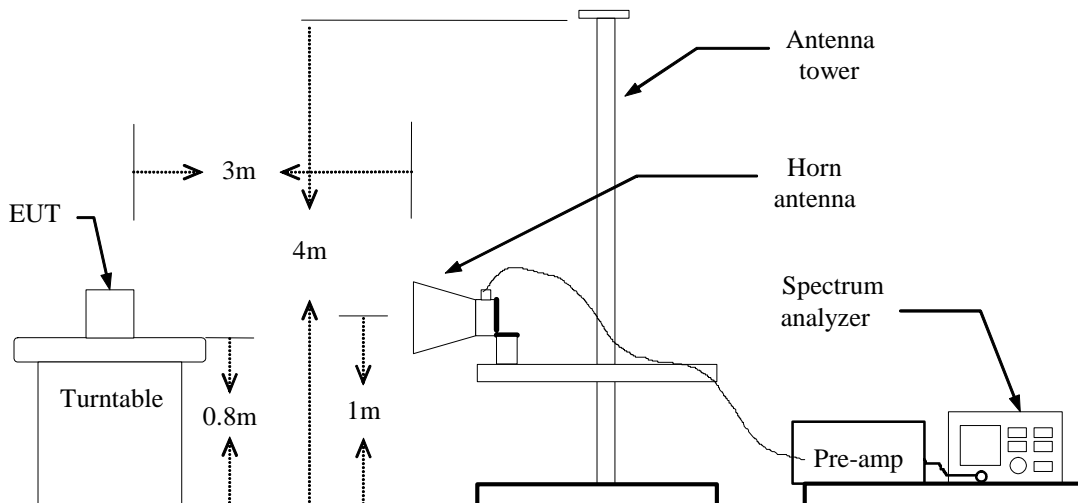
According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains 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	Agilent	E4446A	MY44020154	03/05/2006

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

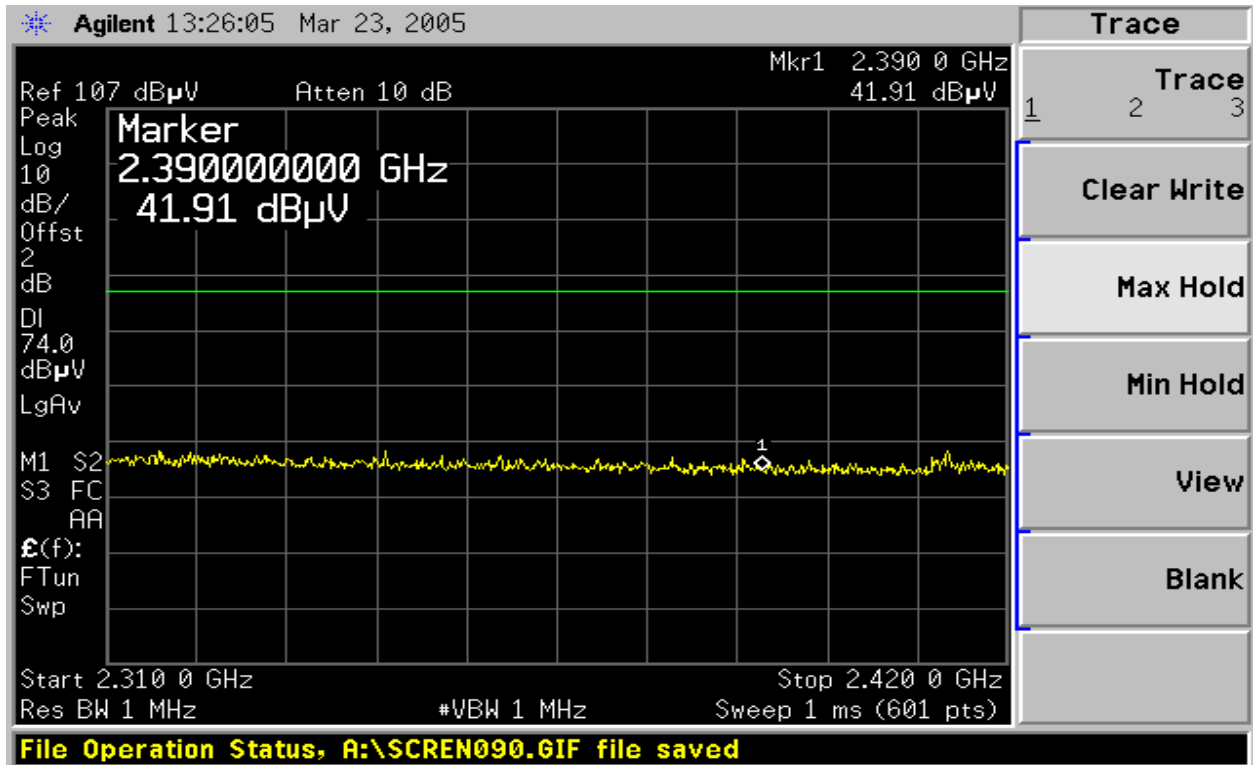
Refer to attach spectrum analyzer data chart.



Band Edges

Detector mode: Peak

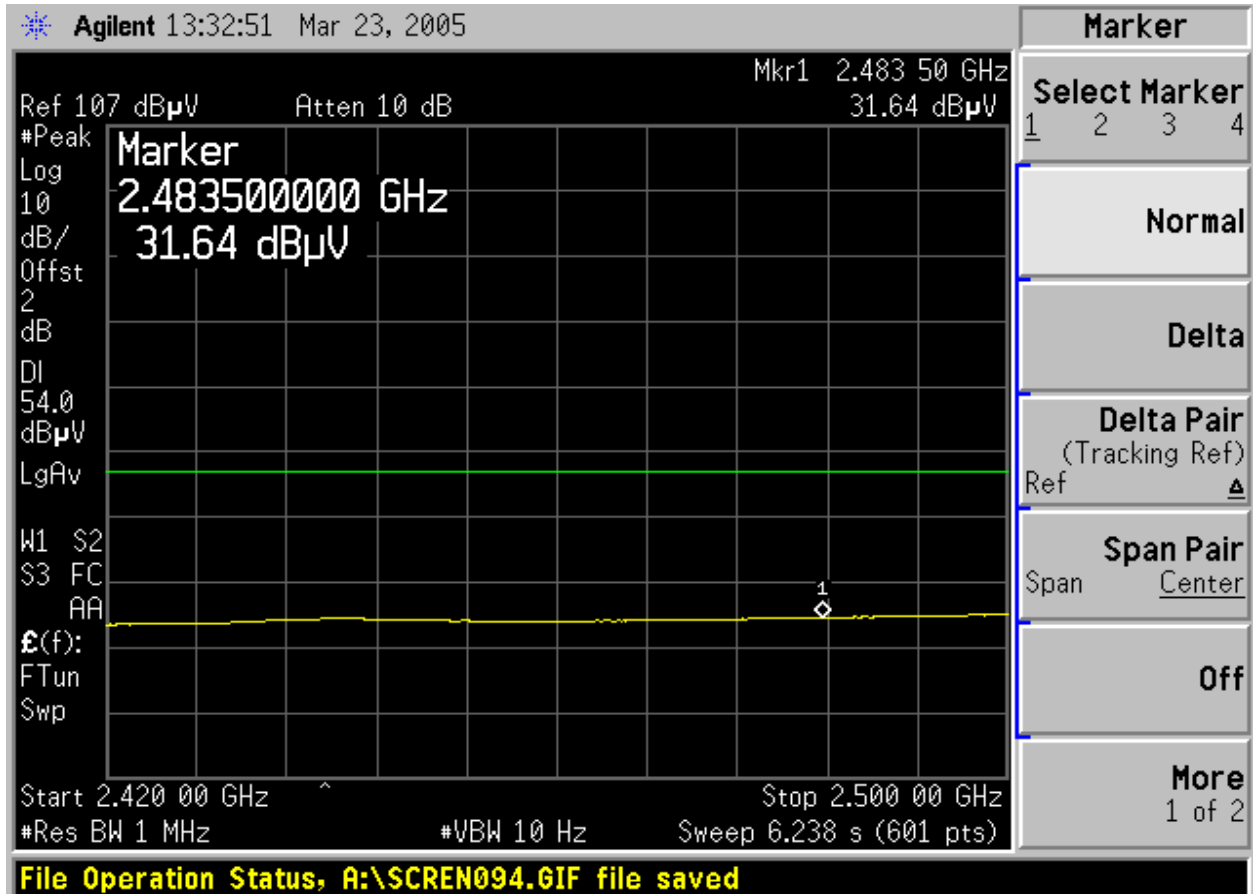
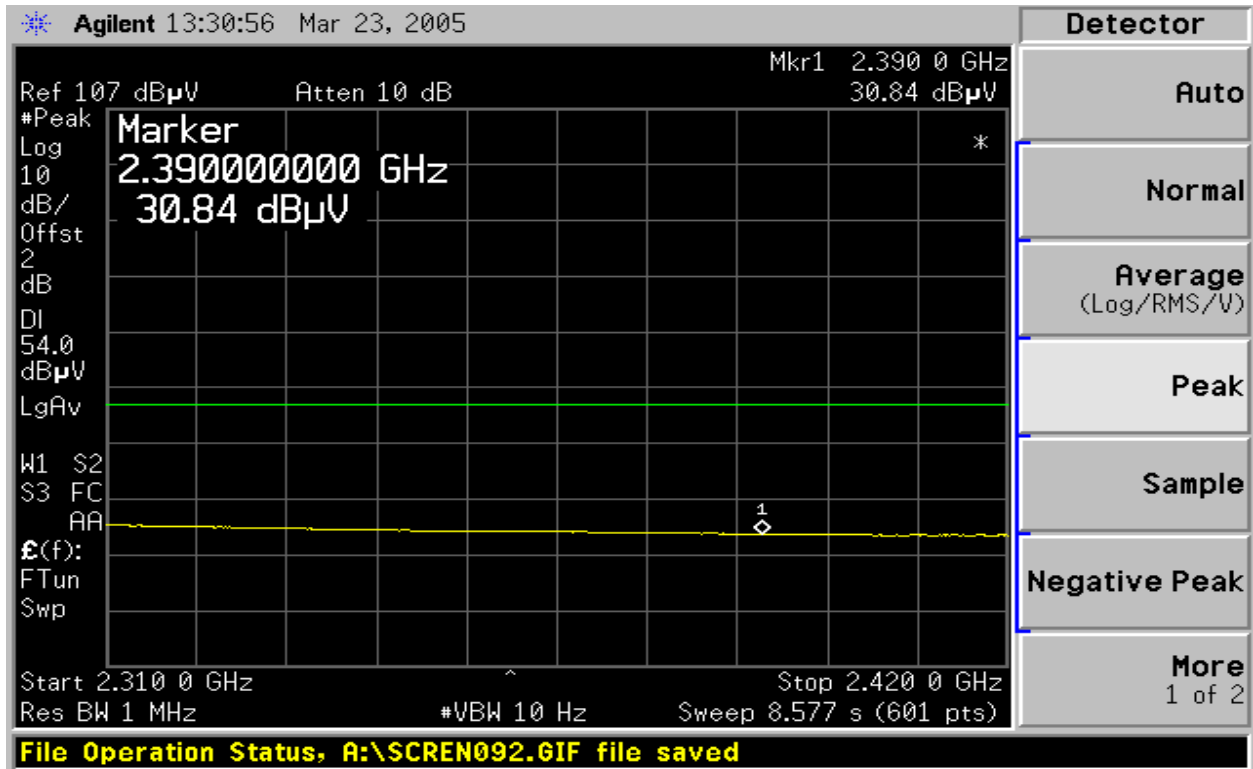
Polarity: Vertical





Detector mode: Average

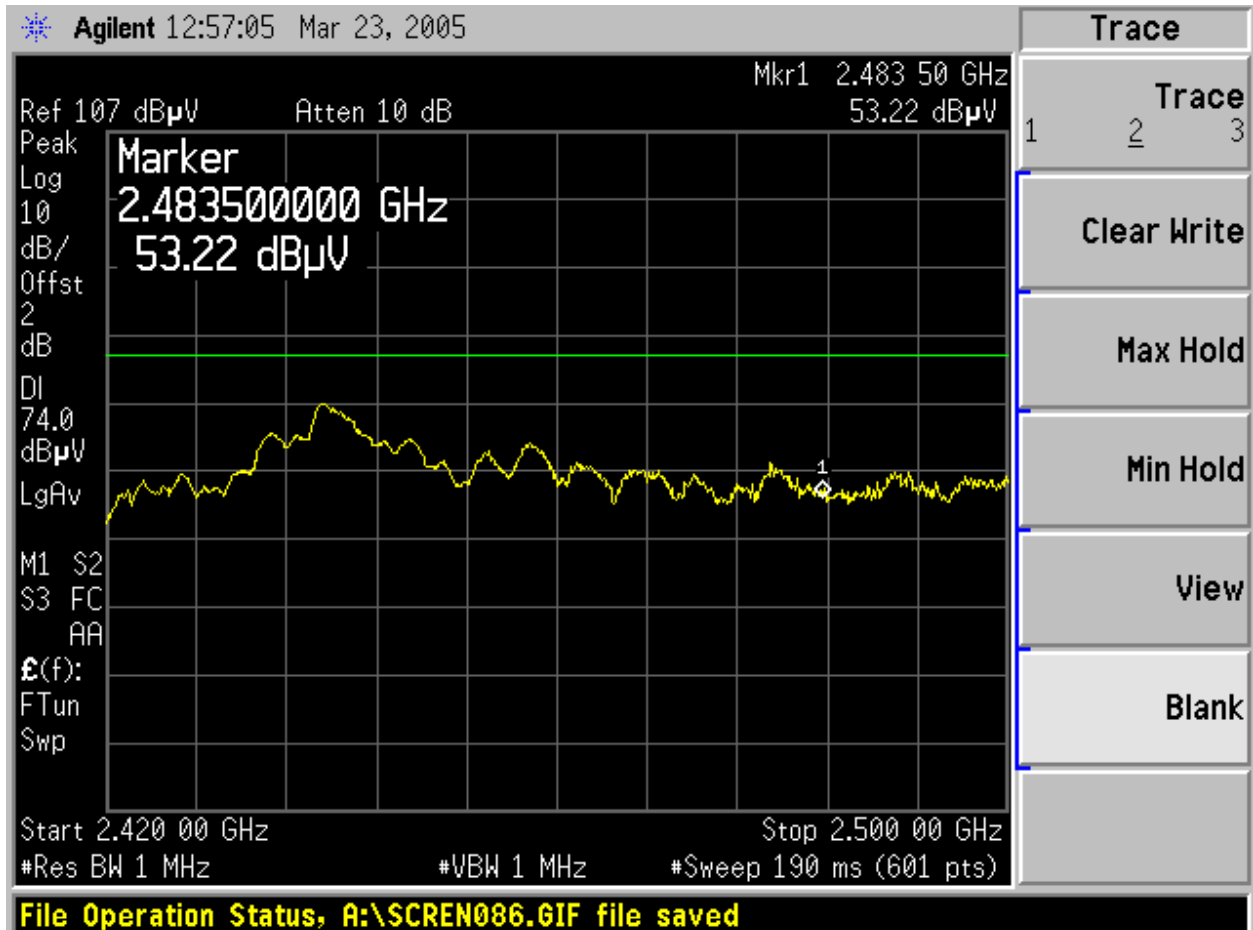
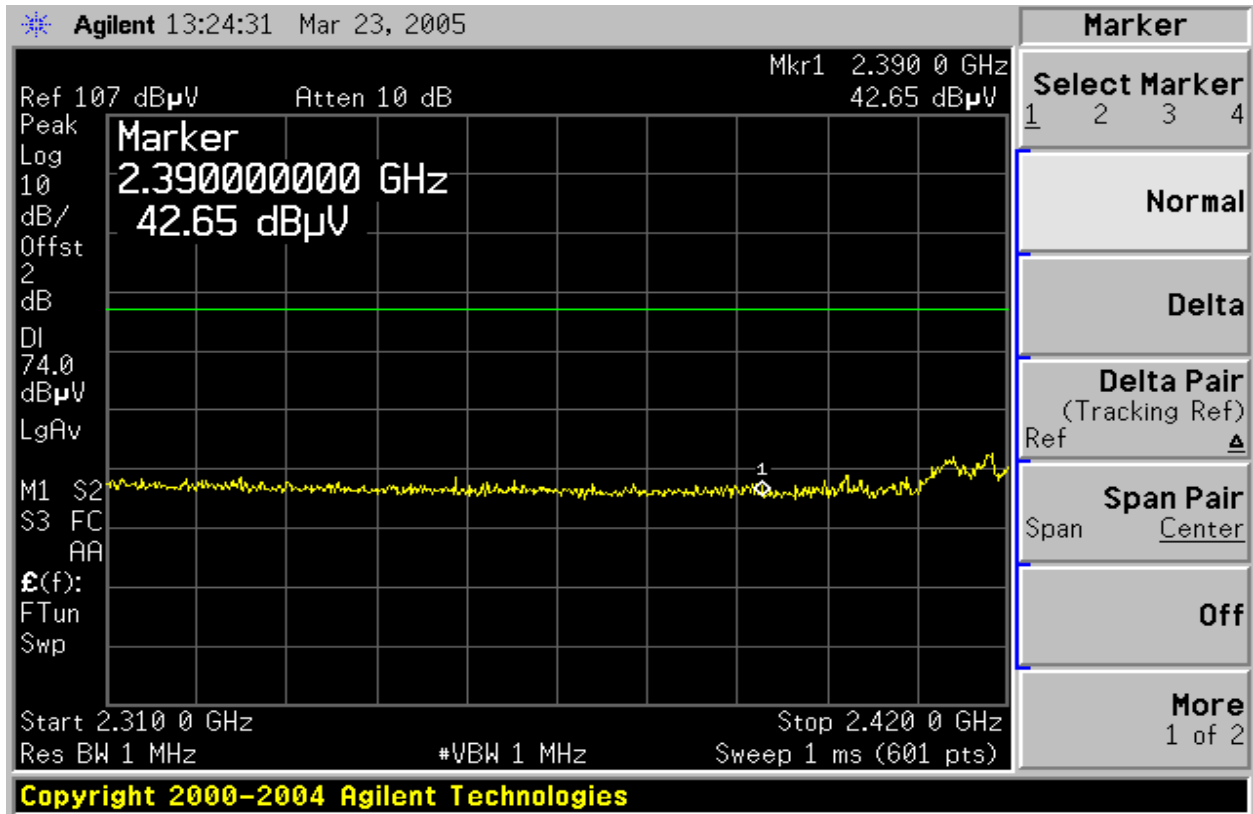
Polarity: Vertical





Detector mode: Peak

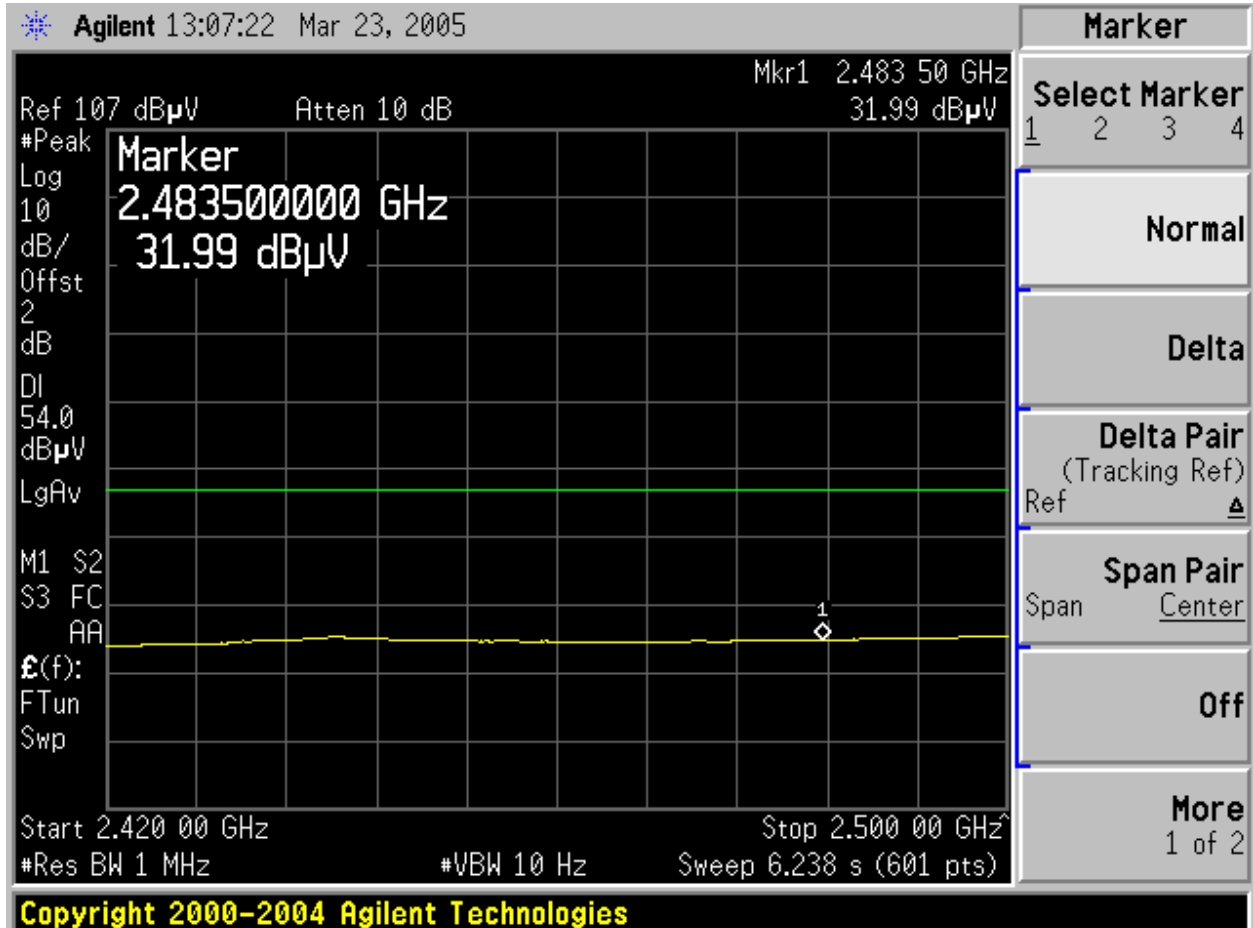
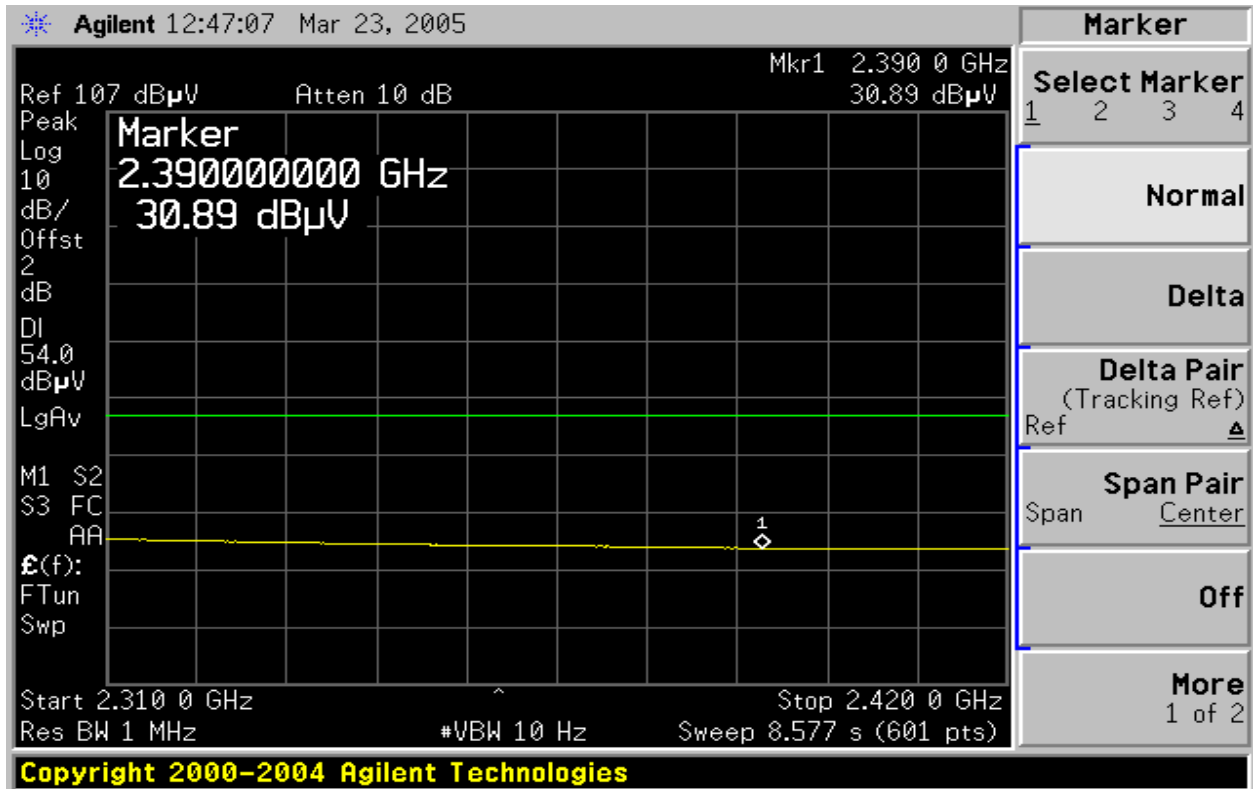
Polarity: Horizontal





Detector mode: Average

Polarity: Horizontal



7.4 PEAK POWER SPECTRAL DENSITY

LIMIT

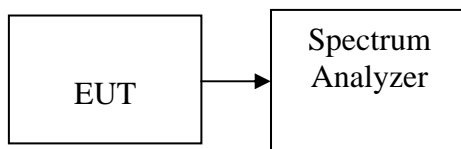
1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping 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	MY44020154	03/05/2006

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

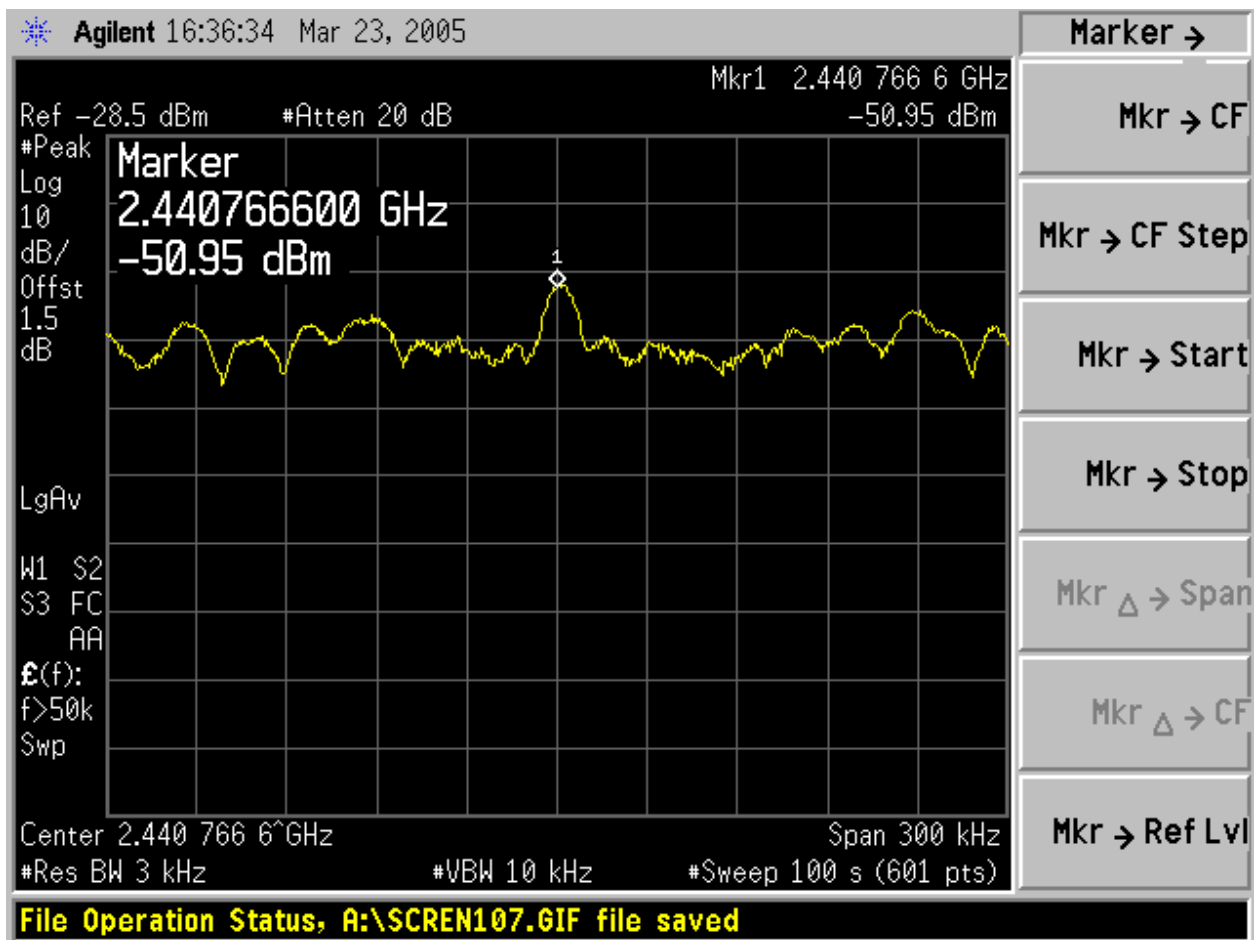
No non-compliance noted

Test Data

Channel	Frequency	Reading (dBm)	Factor (dB)	PPSD (dBm)	Limit (dBm)	Result
1	2440	-48.95	2.00	-50.95	8.00	PASS

Test Plot

PPSD (CH 1)





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

EUT	X-Box Wireless Head Set
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 ~ 5825GHz <input checked="" type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" 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 checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <ul style="list-style-type: none"> <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Max. output power	-25.35 dBm (0.002917mW)
Antenna gain (Max)	2 dBi (Numeric gain: 1.58)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation*

Note:

1. The maximum output power -25.35 dBm (0.0000029 W) at 2440MHz (with 1.58 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.
4. For portable transmitters, SAR evaluation is required if the peak output power is over the low threshold of the general population defined in the <TCB Exclusion List>

TEST RESULTS

No non-compliance noted

Calculation

Given $E = \sqrt{\frac{30 \times P \times G}{d}}$ & $S = \frac{E^2}{3770}$

Where $E =$ Field Strength in Volts / meter

$P =$ Power in Watts

$G =$ Numeric antenna gain

$d =$ Distance in meters

$S =$ Power Density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$d = \sqrt{\frac{30 \times P \times G}{3770 \times S}}$$

Changing to units of mW and cm, using:

$$P (mW) = P (W) / 1000 \text{ and}$$

$$d (cm) = 100 * d (m)$$

Yields

$$d = 100 \times \sqrt{\frac{30 \times (P/1000) \times G}{3770 \times S}} = 0.282 \times \sqrt{\frac{P \times G}{S}}$$

Where $d =$ distance in cm

$P =$ Power in mW

$G =$ Numeric antenna gain

$S =$ Power Density in mW / cm²

Substituting the logarithmic form of power and gain using:

$$P (mW) = 10^{(P (dBm) / 10)} \text{ and}$$

$$G (\text{numeric}) = 10^{(G (dBi) / 10)}$$

Yields

$$d = 0.282 \times \frac{10^{(P+G)/20}}{\sqrt{20}}$$

Equation 1

Where $d =$ MPE safe distance in cm

$P =$ Power in dBm

$G =$ Antenna Gain in dBi

$S =$ Power Density Limit in mW / cm²



Maximum Permissible Exposure

EUT output power = 0.000002917W

S = 1.0 mW / cm² from 1.1310 Table 1

Substituting these parameters into the above Equation 1:

$$\rightarrow \underline{MPE \text{ Safe Distance} = 1.59^{E-4} \text{ cm}}$$

(For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.)

7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Measurement

LIMIT

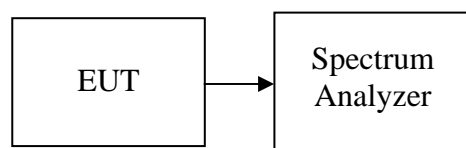
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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	MY44020154	03/05/2006

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 26GHz range with the transmitter set to the lowest, middle, and highest channels.

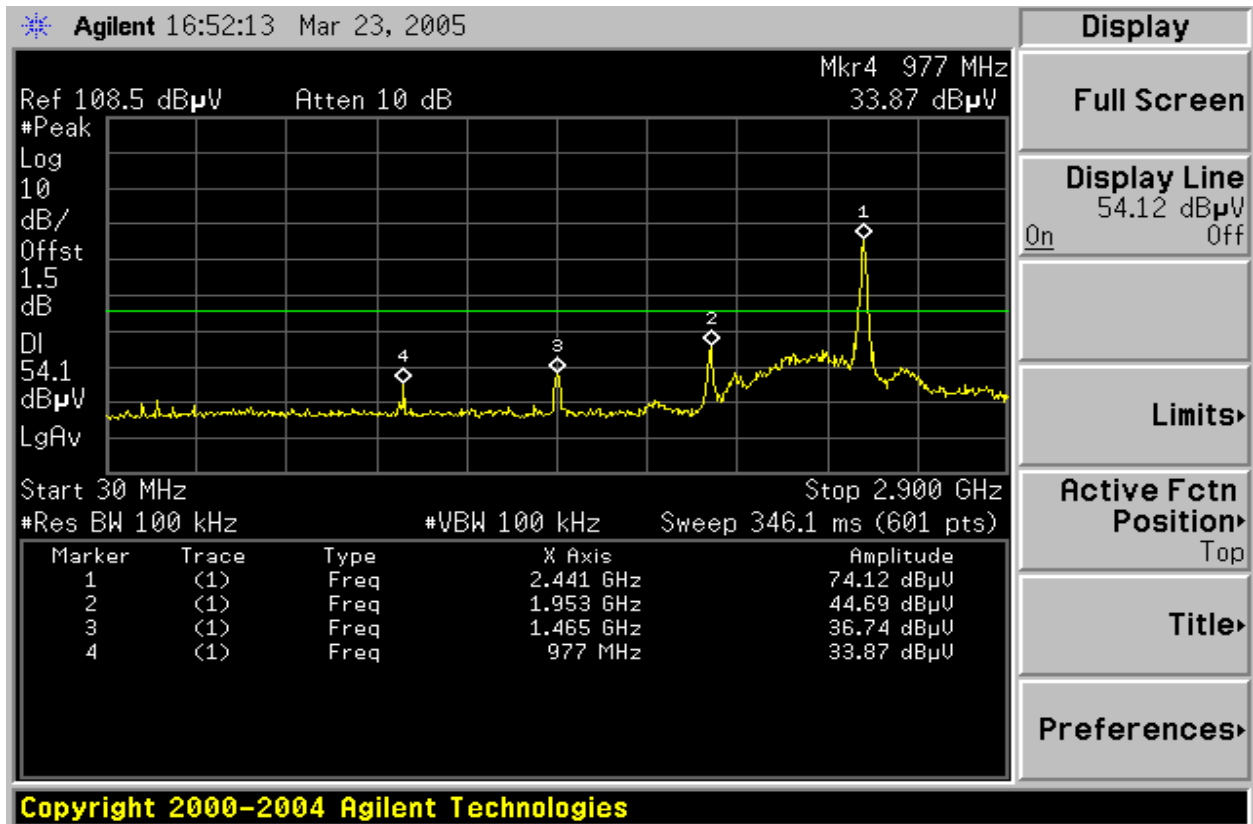
TEST RESULTS

No non-compliance noted

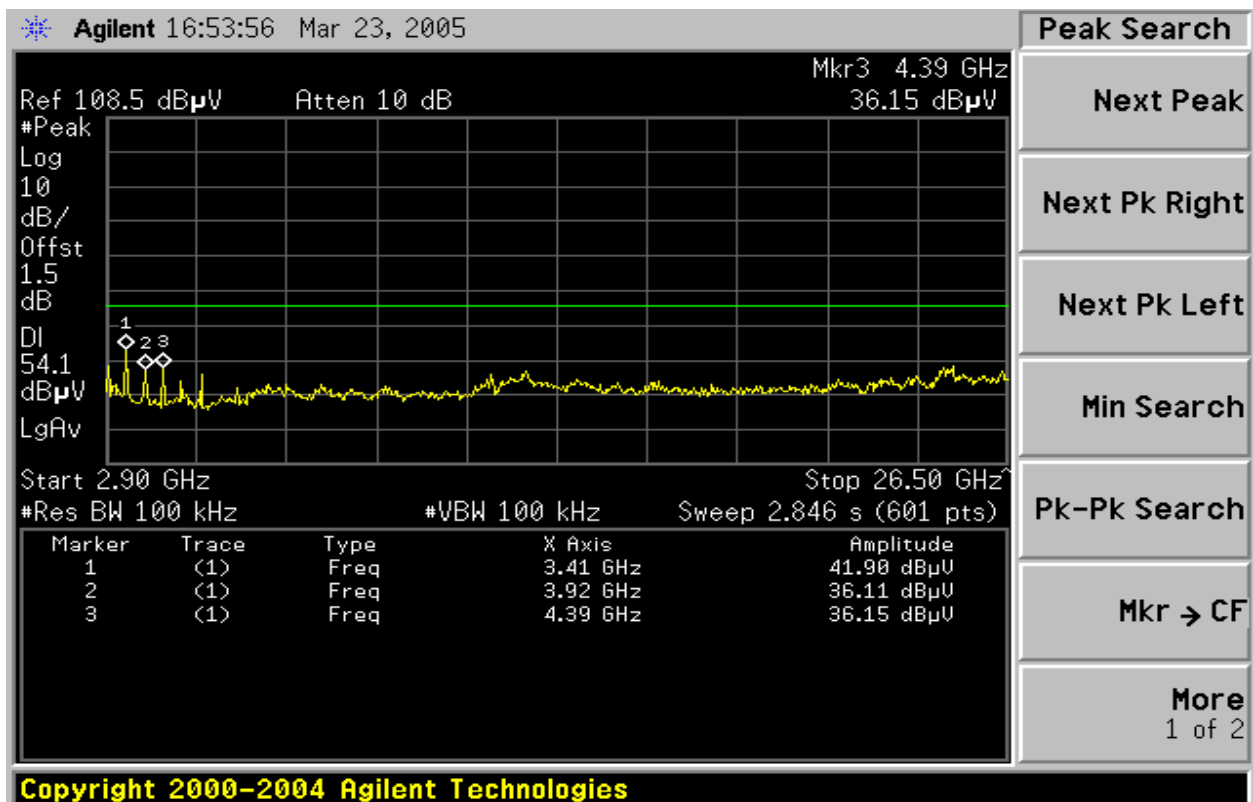


Test Plot

30MHz ~ 2.9GHz



2.9GHz ~ 26.5GHz





7.6.2 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

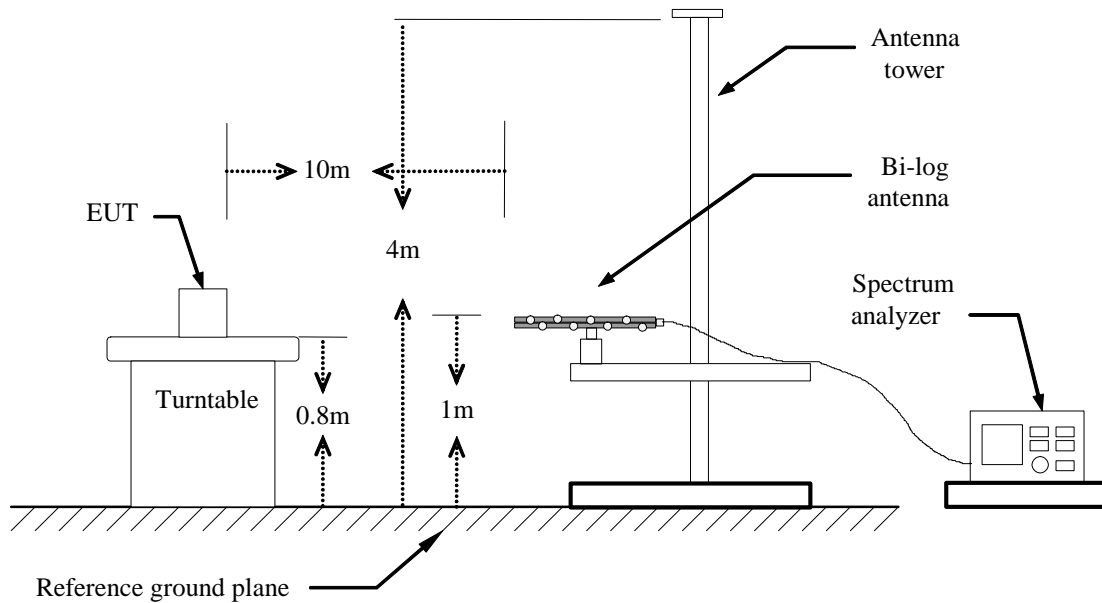
MEASUREMENT EQUIPMENT USED

Test Site A (10m chamber)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	03/05/2006
Bi-log Antenna	Schaffner	CBL 6143	5061	12/19/2006
Horn Antenna	Austriah	BBHA9120D	D:267	02/04/2006
System Controller	Sunol	SC99V	121501-1	N/A
Turn Table	Sunol	FM3022HS	N/A	N/A
Antenna Mast	Sunol	TWR 99-4	121501-3	N/A
Coax Switch	Anitsu	MP 598	M 80094	N/A
Site NSA	CCS Lab.	N/A	N/A	02/16/2006

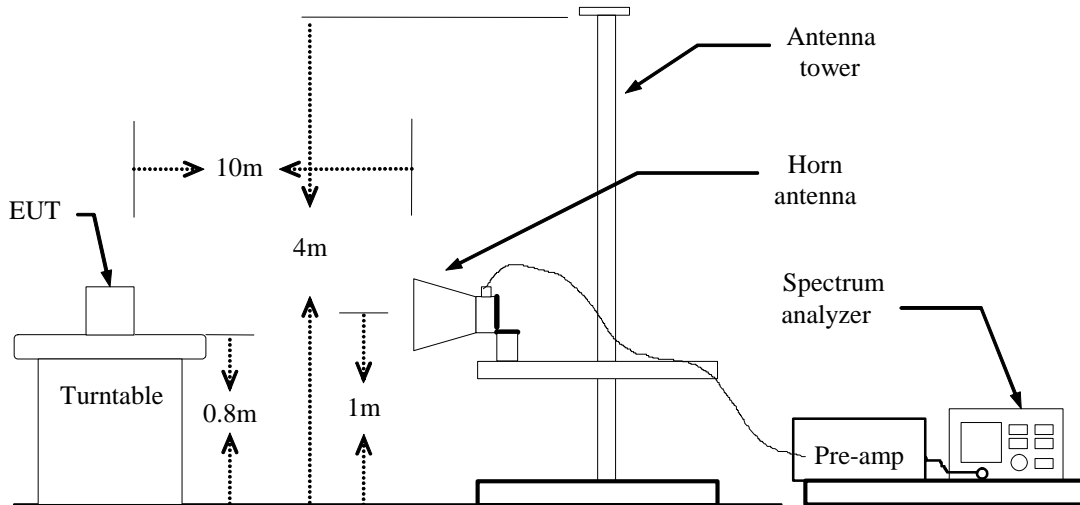
Remark: Each piece of equipment is scheduled for calibration once a year.

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 10m 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. Repeat above procedures until the measurements for all frequencies are complete.



TEST RESULTS

Below 1 GHz

Operation Mode: TX

Test Date: March 28, 2005

Temperature: 20°C

Tested by: Spring

Humidity: 70 % 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)
47.5500	V	Peak	50.64	-15.32	35.32	40.00	-4.68
84.0000	V	Peak	47.35	-21.51	25.84	40.00	-14.16
167.7000	V	Peak	55.63	-18.36	37.27	43.50	-6.23
368.2500	V	Peak	54.64	-12.53	42.11	46.00	-3.89
434.7500	V	Peak	48.83	-10.80	38.03	46.00	-7.97
800.5000	V	Peak	40.65	-6.34	34.31	46.00	-11.69
84.0000	H	Peak	58.68	-21.51	37.17	40.00	-2.83
108.3000	H	Peak	53.53	-17.58	35.95	43.50	-7.55
119.7750	H	Peak	56.25	-16.56	39.69	43.50	-3.81
167.7000	H	Peak	55.26	-18.36	36.90	43.50	-6.60
179.8500	H	Peak	57.33	-18.18	39.15	43.50	-4.35
368.2500	H	Peak	51.44	-12.53	38.91	46.00	-7.09

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

Test Date: March 28, 2005

Temperature: 20°C

Tested by: Spring

Humidity: 70 % 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)				
1954.00	V	38.12	---	1.18	39.30	---	74.00	54.00	-34.70	Peak
4881.00	V	41.23	---	9.19	50.42	---	74.00	54.00	-23.58	peak
N/A										
N/A										
N/A										
1954.00	H	40.32	---	1.18	41.50	---	74.00	54.00	-32.50	Peak
4881.00	H	42.61	---	9.19	51.80	---	74.00	54.00	-22.20	Peak
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 = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.



7.7 POWERLINE 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

Conducted Emission Test Site # 2				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ES126	100068	02/11/2006
LISN	R&S	ENV 4200	830326/016	02/28/2006
LISN	R&S	ESH3-Z5	01068	02/11/2006

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.

Test Data

Model: 81440 (Dongle)

Test Mode: opeating

Temperature: 16°C

Humidity: % RH

Tested by: Robin

Test Results: Pass

(The chart below shows the highest readings taken from the final data)

Freq. (MHz)	Q.P. Raw (dBuV)	AVG Raw (dBuV)	Q.P. Limit (dBuV)	AVG Limit (dBuV)	Q.P. Margin (dB)	AVG Margin (dB)	NOTE
0.195	29.56	---	64.71	54.71	-35.15	---	L1
0.555	37.68	---	56.00	46.00	-18.32	---	L1
1.580	33.92	---	56.00	46.00	-22.08	---	L1
1.855	35.91	---	56.00	46.00	-20.09	---	L1
17.825	31.82	---	60.00	50.00	-28.18	---	L1
24.005	47.09	---	60.00	50.00	-12.91	---	L1
0.185	45.72	---	65.00	55.00	-19.28	---	L2
0.475	12.54	---	56.71	46.71	-44.17	---	L2
0.660	20.49	---	56.00	46.00	-35.51	---	L2
2.100	20.58	---	56.00	46.00	-35.42	---	L2
18.005	30.56	---	60.00	50.00	-29.44	---	L2
24.005	45.28	---	60.00	50.00	-14.72	---	L2

L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

Note: “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

Common Mode Conducted Emission

Not applicable

APPENDIX 1 PHOTOGRPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST



RADIATED EMISSION TEST

