

**EMC EVALUATION OF THE
BELKIN CORPORATION
FLIP FOR PC, WIRELESS**

Date: MAY 26, 2006
Test Report Number: TRR0312.06

**IN ACCORDANCE WITH
FCC PART 15 SUBPART C 15.231**

Prepared For: BELKIN CORPORATION
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WOBURN FACILITY
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Test Technician or Engineer: _____

CTS Approved Signatory: _____

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LIST OF DEFINITIONS/ABBREVIATIONS

AC	Alternating Current
BB	Broadband
BW	Bandwidth
cm	Centimeter
CPU	Calibrate Prior to Use
dB	Decibel
DC	Direct Current
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
ER	Electric Radiation
EUT	Equipment Under Test
GHz	GigaHertz
Hz	Hertz
I-face	Interface
kHz	KiloHertz
m	Meter
MHz	MegaHertz
mm	Millimeter
mS	Millisecond
mV	MilliVolt
MR	Magnetic Radiation
NB	Narrowband
NCR	No Calibration Required
PLC	Power Line Conduction
PPS	Pulses Per Second
uF	MicroFarad
uH	MicroHenry
uS	Microsecond
uV	MicroVolt
UWC	Use With Calibrated Equipment

1.0 GENERAL

1.1 Introduction

1.1.1 Purpose

The purpose of this report is to document the performance of the Belkin Corporation Flip for PC, Wireless during an electromagnetic interference (EMI) test and record the test requirements and procedures used. At the request of Belkin Corporation, the tests were performed by Chomerics Test Services (CTS) of Woburn, Massachusetts at Chomerics' test facility located in Rochester, New York. The assessment will determine the compliance or non-compliance with the requirements set up by the FCC Part 15 Subpart C 15.231 Radio Frequency Devices – Intentional Transmitters – Periodic Operation in the band of 40.66 – 40.77 MHz and above 70 MHz.

Jack Priebe from Belkin Corporation was present during testing. Testing was performed during the period of May 8, 12 and May 17, 19, 2006 under Belkin's purchase order #122591.

1.1.2 Requirements

The requirements for the sequence of tests performed on the Flip for PC, Wireless are as follows:

FCC Part 15 Subpart A 15.33

FCC Part 15 Subpart A 15.33, Frequency Range of Radiated Measurements:

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in paragraph (1).

If the intentional radiator operates below 10 GHz, emissions must be measured to the tenth harmonic of the highest fundamental or to 40 GHz, whichever is lower.

FCC Part 15 Subpart A 15.35

FCC Part 15 Subpart C 15.35, Measurement Detector Functions and Bandwidths:

On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument used were in accordance with CISPR 16. Peak detector measured data may be substituted for the appropriate detector data to show compliance if the peak level obtained does not exceed the limit. The bandwidth used shall be greater than or equal to 100 Hz from 9 kHz to 150 kHz, 9 kHz from 150 kHz to 30 MHz and 100 kHz from 30 MHz to 1000 MHz.

Actual Bandwidths used:

1 – 30 MHz; 9 kHz

30 – 1000 MHz; 120 kHz

> 1000 MHz; 1 MHz

FCC Part 15 Subpart C 15.205

FCC Part 15 Subpart C 15.205, Restricted Bands of Operation:

Sec. 15.205: Only spurious emissions are permitted in the frequency bands listed in paragraph (a) of this document. The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Sec 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Sec. 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emissions limits in Sec. 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions of Sec. 15.35 apply to these measurements.

FCC Part 15 Subpart C 15.209

FCC Part 15 Subpart C 15.209, Radiated Emission; General Requirements:

Sec. 15.209: Emissions from the intentional radiator shall not exceed the field strength levels given in paragraph (a) of this document.

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

The emission limits shown in table (a) are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

FCC Part 15 Subpart C 15.231

FCC Part 15 Subpart C 15.231, Periodic Operation in the Band 40.66 – 40.70 MHz and above 70 MHz:

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in Sec. 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of Sec. 15.205 shall be demonstrated using the measurement instrumentation specified in that section.

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Sec. 15.209, whichever limit permits a higher field strength.

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

1.2 TEST SUMMARY

The terms "Passed" or "Failed" in this section are intended to guide the reader as to whether or not the EUT met the minimum requirements that can be interpreted from the FCC Part 15 Subpart C 15.231 Emissions Standard as defined in Section 1.5. The "Results" paragraph in each test section to follow and the test data sheets will outline specifically how the EUT performed during each test.

FCC Part 15 Subpart A 15.33, Frequency Range of Radiated Measurements	Passed
FCC Part 15.209 Radiated Emissions; General Requirements	Passed
FCC Part 15.231 Periodic Operation Above 70 MHz	Passed

1.2.1 Summary of Recommendations

The Belkin Corporation Flip for PC, Wireless will require no modifications in order to ensure compliance with the Electromagnetic Interference Standard FCC Part 15 Subpart A 15.33, Subpart C 15.209, Subpart C 15.231.

The worst case radiated emission was observed at 433.907 MHz.

Please note that if any modifications and or fixes were implemented to the EUT to achieve compliance, other approaches to solving the problem may exist. In addition, any EMI/EMC shielding products listed in this report may be substituted with an equivalent.

1.3 Administrative Data

1.3.1 Test Facility

Chomerics Test Services in Rochester, New York is an American Association for Laboratory Accreditation (A2LA) accredited facility as defined on Certification Number 1980-02. For Emissions and Immunity testing, the Scope of Accreditation is limited to the following tests: CFR 47, FCC Part 15 Subpart B, CISPR 11, EN 55011, CISPR 13, EN55013, CISPR 14, EN55014-1, CISPR 22, EN55022, AS/NZS 3548, VCCI, EN 61000-3-2, EN 61000-3-3, EN 50081-1, EN55081-2, EN61000-6-3, EN 61000-6-4, EN 61000-4-2, EN 61000-4-3, EN61000-4-4, EN 61000-4-5, EN 61000-4-6, EN61000-4-8, EN 61000-4-11, EN 50082-1, EN 50082-2, EN 61000-6-1, EN 61000-6-2, IEC/EN 60601-1-2, EN 300 386, EN 61326-1, CISPR 24, EN55024, CISPR 14, and EN 55014-2. Any tests in this report that are not listed above are not covered by the A2LA Accreditation.

Chomerics' Semi-anechoic Test Chamber is listed by the Federal Communications Commission (FCC) for Radiated and Conducted Emissions testing.

Chomerics' Semi-anechoic Test Chamber is accredited for Radiated and Conducted Emissions tests through Industry Canada (IC) under file numbers IC4154.

Chomerics test facility operates under the current revision of Chomerics Quality Assurance (QA) Manual

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Document Number QA002.

The QA Manual has been constructed to reflect a quality program in accordance with the requirements of the National Institute of Standards and Technology (NIST), ISO 9002, ISO 17025, ISO Guide 25, NIST Handbook 150, EN 45001, MIL-I-45208A, MIL-STD-461D, 462D and Chomerics Quality Assurance Program (QAP).

The QA Manual outlines and describes the procedures for establishing and maintaining the quality of analysis, research, inspection, and testing within Chomerics Test Service (CTS).

This test report does not represent an endorsement by the U.S. Government.

The results and/or conclusions within this test report refer and/or apply only to the unit(s) tested as defined by this report.

Measurements performed for this test are traceable to the National Institute of Standards and Technology (NIST) based on the fact that all test equipment used for the measurements were previously calibrated using standards traceable to NIST.

No deviations, additions to, or exclusions from the test specification(s) were made.

Chomerics Test Services measurement uncertainty calculations are available for review upon request.

Sample Calculation:

Radiated Emissions

The tabular data listed in the report is the highest signal detected during the scan. At a minimum six of the highest signals will be selected and maximized. The tabular data sheet shall contain the measured value "QP-Value", field level, limit, margin to the limit, antenna height, antenna polarity and turn table azimuth.

The field level is the final value that will be compared to the limit in order to determine if the EUT is in compliance. The field level will be calculated by the following for each of the signals maximized:

Field Level dBuV = Measured Value dBuV + Antenna Factor dB + Cable Loss dB

$$37\text{dBuV} = 30\text{dBuV} + 5\text{dB} + 2\text{dB}$$

The margin to the limit shall be calculated by subtracting the field level to the limit. The margin to the limit shall be calculated by the following for each of the signal maximized.

$$\begin{aligned} \text{Margin to Limit dB} &= \text{Field Level dBuV} - \text{Limit dBuV} \\ -3\text{dB} &= 37\text{dBuV} - 40\text{dBuV} \end{aligned}$$

Duty Cycle Correction Factor

The average detector measurements are dependent upon the pulse width or pulse train characteristics and the measuring instruments specifications. To improve the reliability and repeatability of the signal measurement, the measured peak reading must be converted to an average value using the duty cycle correction factor.

Duty Cycle = on time / 100 milliseconds or period, whichever is less

$$\text{On time} = N_1L_1 + N_2L_2 + \dots + N_{N-1}L_{N-1} + N_NL_N$$

Where N_1 is the number of type 1 pulses and L_1 is the length of type 1 pulses, etc.

Example: For a pulse length of 4 milliseconds and a transmissions rate of 120 milliseconds

$$\text{Duty Cycle} = 4/100 \text{ or } 0.04 \text{ or } 4\%$$

To correct the peak reading to the average value of an emissions, you multiply the percent duty cycle factor expressed in decimal form (0.04) times the peak field strength value expressed in terms of microvolt/meter @ 3 meters.

Suppose the peak reading is 1000 uV/m @ 3 meters. Multiply 1000 uV/m times 0.04 to get 40 uV/m @ 3 meters as the average field strength.

1.3.2 Equipment Calibration

The calibration of Chomerics test facility equipment is controlled under the current edition of Chomerics Laboratory Test Equipment Calibration Manual Document Number QA001.

The test equipment used throughout this test sequence conforms to laboratory calibration standards, MIL-STD-45662, traceable to the National Institute of Standards and Technology (NIST). The date of the next due scheduled calibration is listed in each test section for the applicable equipment.

All test equipment is calibrated in one year intervals.

1.3.3 Test Personnel

The test personnel performing or supervising the tests are accredited by the National Association of Radio and Telecommunications Engineers, Inc. (NARTE) as Certified Electromagnetic Compatibility Engineers (N.C.E.) and Technicians (N.C.T.).

1.4 Test Set-up

1.4.1 Test Site Matrix

The specific test locations used for the emissions testing of the Belkin Corporation Flip for PC, Wireless are as follows: (Refer to Section 1.4.2 for test site descriptions).

Emissions Test

FCC Part 15.33 Frequency Range of Radiated Emissions
FCC Part 15.209 Radiated Emissions; General Requirements
FCC Part 15.231 Periodic Operation Above 70 MHz

Test Site

Semi-Anechoic Chamber
Semi-Anechoic Chamber
Semi-Anechoic Chamber

1.4.2 Test Site Descriptions

The following is a list of test sites and descriptions of each. Refer to Section 1.4.1 for specific test sites used for testing.

Semi-anechoic Chamber: Chomerics’ Semi-anechoic Test Chamber is located at 100 Indigo Creek Drive, Rochester, NY 14626 (see Figure 1). The shielded enclosures were manufactured and installed by EMC Test Systems of Texas. The continuous transmission exterior dimensions of the shielded indoor semi-anechoic chamber are approximately 28 feet long by 20 feet wide by 18 feet high and consist of rigid, steel-clad, wood core modular panels with steel framing.

The shielding performance is as follows:

Field	Attenuation
Magnetic	20dB a 1kHz, increasing to 56dB at 10kHz and increasing to 100dB at 200kHz
Electric	100dB from 200kHz to 18GHz

The anechoic absorber treatment is broadband hybrid EMC absorbers, FerroSorb model number FS-400. All interior surfaces of the chamber with the exception of the ground plane are covered with FS-400 absorber. The FS-400 absorber material is a combination of dielectric foam absorber and magnetic ferrite tile, which is 16 inches thick.

Two swing type shielded doors are provided for personal access into the control room and chamber. The doors are 4 feet wide by 7 feet high. The doors are a single unit containing a brass door leaf and frame and a single leaf of spring finger gaskets. The doors provide 100dB of attenuation from 30MHz to 18 GHz.

The quiet zone for the Chomerics semi-anechoic test chamber is a cylinder two meters in diameter.

Air conditioning is provided by honeycomb wave-guide to supply and return air in the main chamber. Four (4) incandescent light fixtures provide lighting of the chamber.

The turntable is an electrically driven EMCO metal top turntable with a 2-meter diameter. The turntable is grounded around its circumference with continuous metallic brush to the semi-anechoic chamber floor by a ground ring. The electrically driven turntable doesn’t introduce conducted or radiated noise above the ambient levels existing within the chamber. An EMCO 2090 Controller controls the turntable with an IEEE-488 data/controller for automation. Interconnecting cables are routed along an access area through the center bearing.

The ground plane consists of raised standard steel floor panels. RF and fiber optic cables are routes under the raised steel floor of the chamber.

Power is supplied on separate circuits to the chamber and the control room. Separate filters are provided for signal distribution as well in the semi-anechoic chamber. All filters provided a minimum of 100dB attenuation from 10kHz to 10GHz per MIL-STD 220A.

See Figure 1 for the overall dimensional drawing of the semi-anechoic chamber.

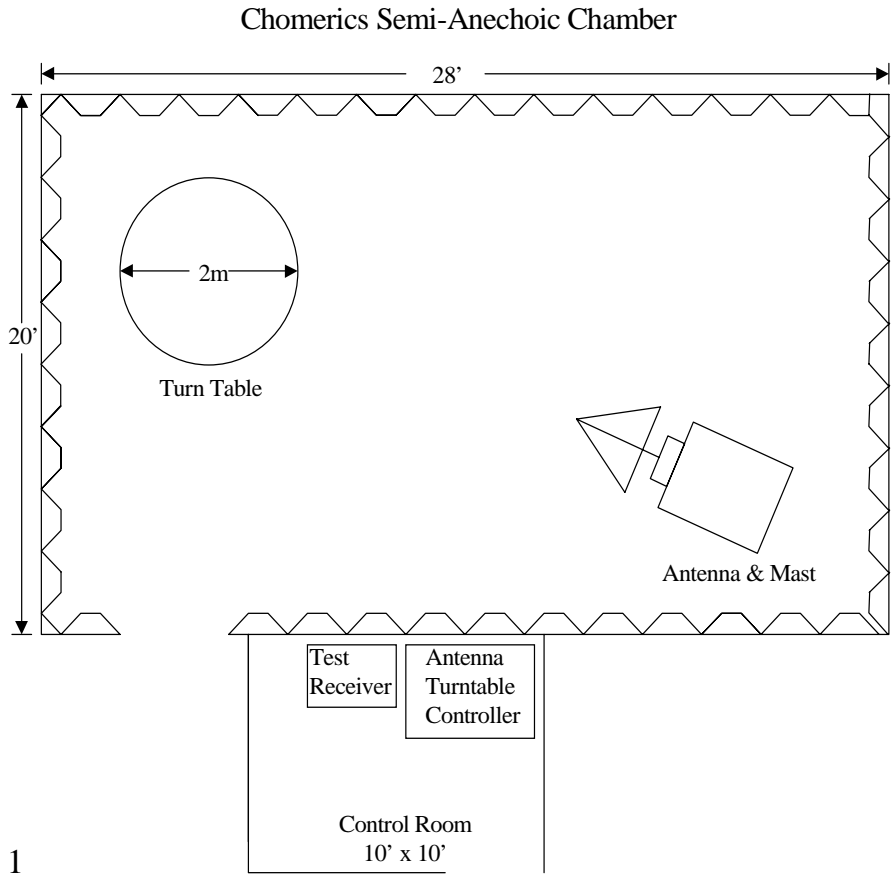


Figure 1

1.4.3 Equipment Under Test

The Belkin Corporation Flip for PC, Wireless (Serial Number 72858) is a device that wirelessly transmits data to a receiver. It allows the user to wirelessly switch control of a keyboard, mouse and video signal between two computers.

There was no support equipment needed to run the Belkin Corporation Flip for PC, Wireless. For simplicity of testing, the unit was wired to transmit continuously.

The Flip for PC, Wireless is a DC powered device which operates on +3VDC battery power. There are no I/O connections.

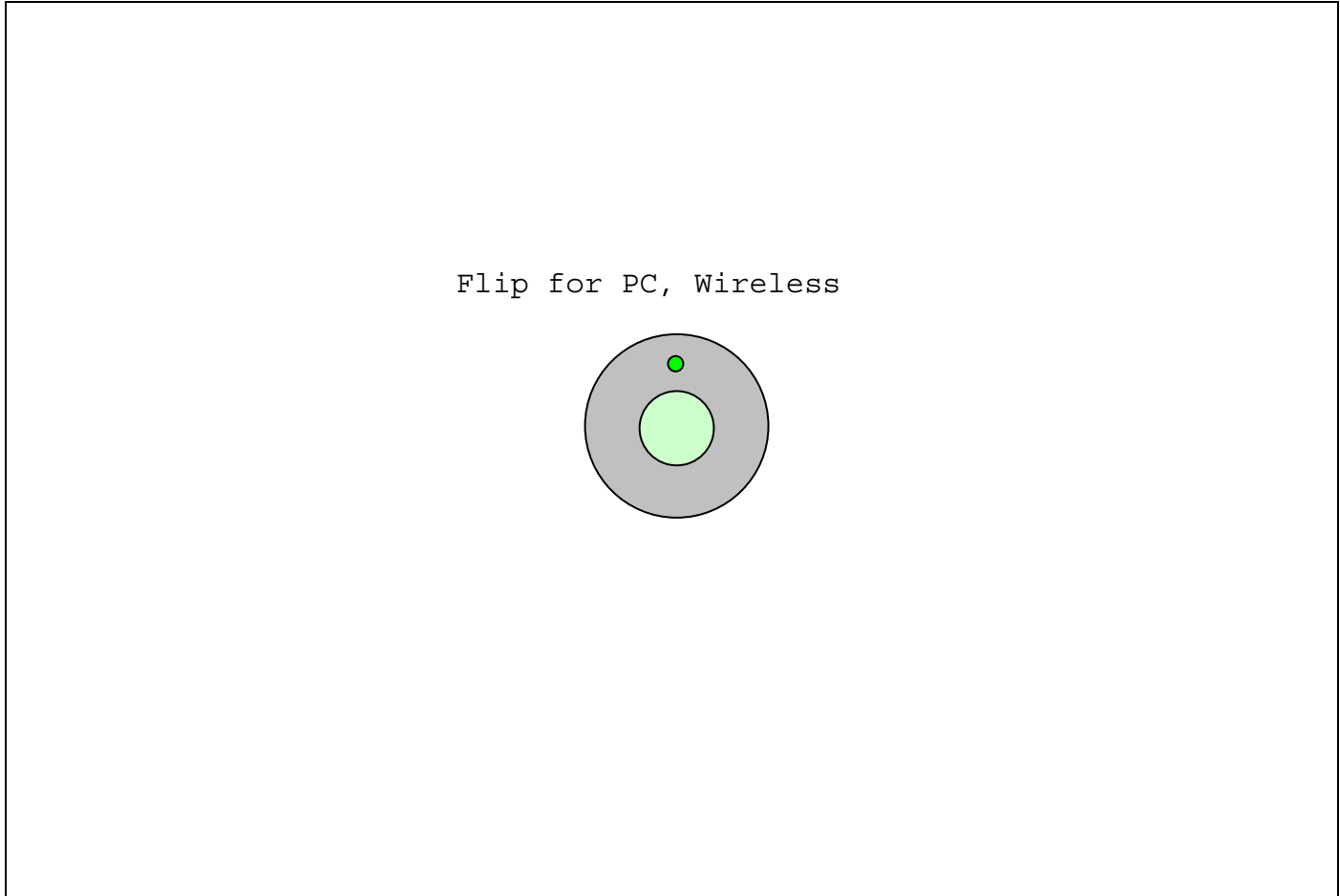
The continuous transmission mode of operation was used for emissions tests. The Flip for PC, Wireless was monitored during the tests by Jack Priebe of the Belkin Corporation.

The equipment under test was setup as illustrated on CTS-Form-014.

1.4.4 Block Diagram

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS

DATE: MAY 12, 2006
TESTED BY: MATTHEW HANEL



System Configuration Block Diagram – Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside the testing field.

FORM CTS-014

2.0 EMISSIONS TESTS PERFORMED

2.1 FCC Part 15.33 Frequency Range of Radiated Measurements

2.1.1 Equipment Used

	Test Equipment	Asset #	Serial #	Cal Date
X	EMC Test Systems Semi-anechoic Chamber	667	N/A	10/06
X	Rhode and Schwartz ESCS30 Test Receiver	638	826547/024	12/06
X	EMC Test Systems 6512 Loop Antenna	787	00051667	11/06
X	Hewlett Packard Vectra VL	N/A	US71656121	NCR
	Hewlett Packard 8447 Pre Amp	TBD	TBD	TBD
	Electro Metrics ALR-25M Loop Antenna	17	4706	1/07
	EMCO 3115 Microwave Horn Antenna	376	2796	1/07
X	EMCO 3105 Microwave Horn Antenna	78	2118	1/07
	Luthi EM101 Absorbing Clamp	654	35543	11/06
X	EMCO Multi Device Controller Model 2090	639	9808-1343	NCR
X	EMCO Antenna Mast Model 3801/2NM	666	N/A	NCR
X	EMCO Video Camera Controller Model VCC-01	653	N/A	NCR
X	EMCO Video Camera Model 2075	680	00183858	NCR
X	Quantum Change Tile Software	N/A	Version 3.2	NCR

2.1.2 Test Conditions

Radiated emissions testing was performed with the EUT set up on a wooden table above the turntable at a distance of 1 meter from the Loop and Horn antennas within the Semi-anechoic Chamber.

The Belkin Corporation Flip for PC, Wireless was configured to operate in the continuous transmission mode of operation to maximize the emissions. The Flip for PC, Wireless was set up and powered by +3VDC for radiated emission tests. The worst case signals detected were recorded.

2.1.3 Test Method

The test method of FCC Part 15.33 was followed. The lowest frequency generated or used on this device was identified to be 100 kHz. An automated scan was performed from 10 kHz – 30 MHz, in 3 antenna polarizations to maximize the emissions from the EUT using the Quantum Change Tile Software.

The intentional radiator operates at 433.901 MHz. A manual scan was also performed from 1 GHz – 4.34 GHz. During these scans, the receiving antenna and turntable were manipulated to maximize the emission levels in a given frequency band displayed on the receiver.

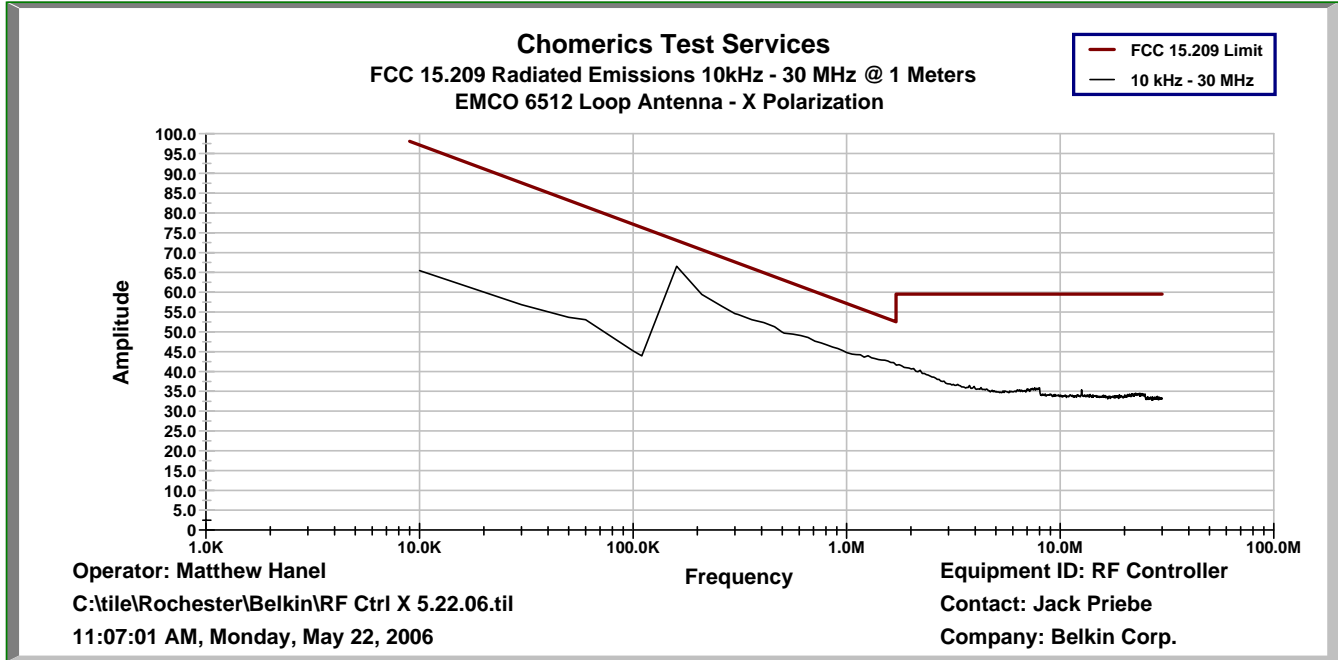
2.1.4 Results

The Belkin Corporation Flip for PC, Wireless meets the requirements for radiated emissions as required by FCC Part 15.33.

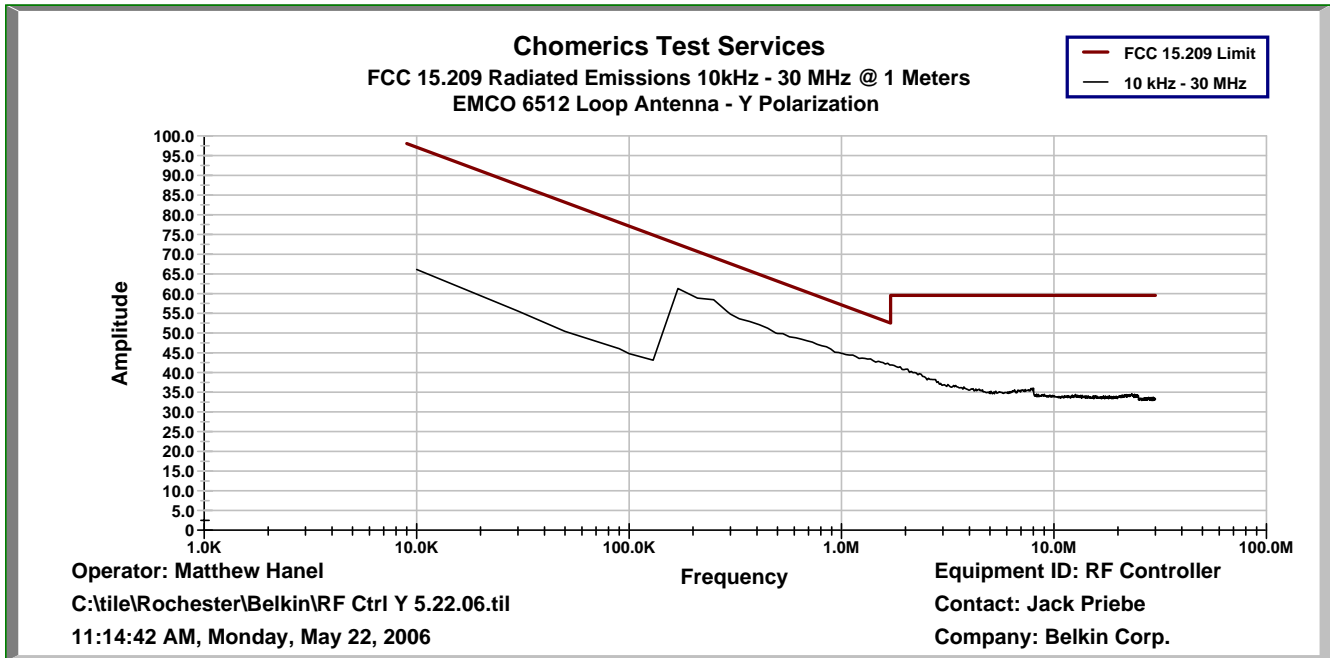
2.1.5 Test Data

Emissions below 30 MHz

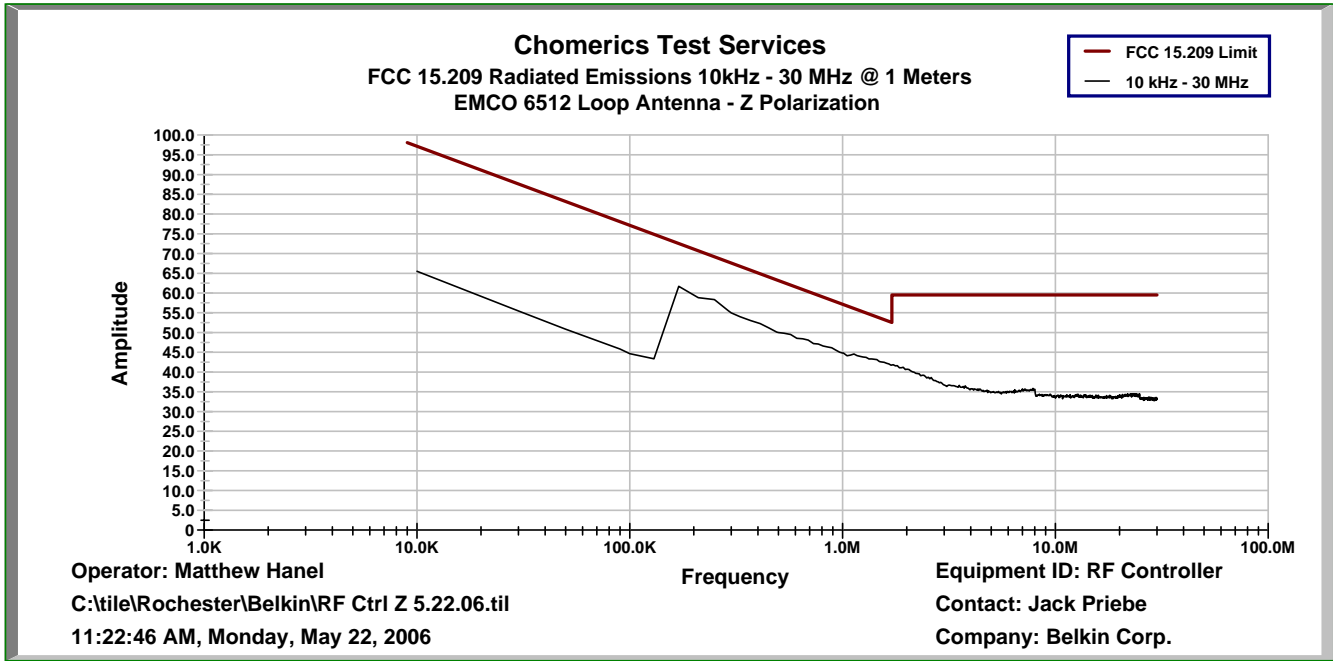
Loop Antenna -X Polarization



Loop Antenna - Y Polarization



Loop Antenna - Z Polarization



Emissions Above 1000 MHz

Chomerics Test Services
 Radiated Emissions 30 MHz - 1 GHz
 FCC 15.231

Operator: Matthew Hanel
 C:\tile\Rochester\Belkin\RF xmtr Rad Emissions 5.19.06.TIL
 13:47:09 AM, Friday, May 19, 2006
 Equipment ID: RF Remote Control
 Contact: Jack Priebe
 Company: Belkin Corp.

Peak to Average Signal Conversion

Frequency	Measured	Antenna	Cable	Corrected Peak	*Adjusted Avg.	FCC 15.231	Pass / Fail	Angle	Height	Polarity
MHz	dBuV	Factor	Factor	dBuV	dBuV	Limit	Margin	Deg.	cm	H / V
1301.69	41.30	26.10	4.00	71.40	46.01	60.11	-14.10	204	113	H
1735.51	32.88	28.02	4.10	65.00	39.65	60.11	-20.46	333	101	H

*Duty Cycle Correction Factor = 27 ms / 500 ms = 0.054

2.1.6 Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS
TESTED BY: MATTHEW HANEL
OPERATING MODE: CONTINUOUS TRANSMISSION

DATE: MAY 19 & 22, 2006
TEST NUMBER: 3
COUPLING DEVICE: MODEL 6512 LOOP ANTENNA



Photograph Description: Test set-up

FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS
TESTED BY: MATTHEW HANEL
OPERATING MODE: CONTINUOUS TRANSMISSION

DATE: MAY 19 & 22, 2006
TEST NUMBER: 3
COUPLING DEVICE: MODEL 3105 HORN ANTENNA



Photograph Description: Test set-up

FORM CTS-PHOTO

2.2 FCC Part 15.209 Radiated Emissions; General Requirements

2.2.1 Equipment Used

	Test Equipment	Asset #	Serial #	Cal Date
X	EMC Test Systems Semi-anechoic Chamber	667	N/A	10/06
X	Rhode and Schwartz ESCS30 Test Receiver	638	826547/024	12/06
X	EMCO 3142B Biconilog Antenna	668	9903-1357	12/06
X	IBM Personal Computer Model 300XL	N/A	23TMP08	NCR
	Hewlett Packard 8447 Pre Amp	TBD	TBD	TBD
	Electro Metrics ALR-25M Loop Antenna	17	4706	1/07
	EMCO 3115 Microwave Horn Antenna	376	2796	1/07
	EMCO 3105 Microwave Horn Antenna	78	2118	1/07
	Luthi EM101 Absorbing Clamp	654	35543	11/06
X	EMCO Multi Device Controller Model 2090	639	9808-1343	NCR
X	EMCO Antenna Mast Model 3801/2NM	666	N/A	NCR
X	EMCO Video Camera Controller Model VCC-01	653	N/A	NCR
X	EMCO Video Camera Model 2075	680	00183858	NCR
X	Quantum Change Tile Software	N/A	Version 3.2	NCR

2.3.2 Test Conditions

Radiated emissions testing was performed with the EUT set up on a wooden table above the turntable at a distance of 3 meters from the Biconilog antenna within the Semi-anechoic Chamber.

The Belkin Corporation Flip for PC, Wireless was configured to operate in the continuous transmission mode of operation to maximize the emissions. The Flip for PC, Wireless was set up and powered by +3 VDC for radiated emission tests. The worst case signals detected were recorded.

2.3.3 Test Method

The test method of FCC Part 15.209 Radiated Emissions was followed for intentional radiators. For the radiated emission measurements, a manual scan was performed from 30 MHz – 1000 MHz. During this scan, the antenna and turntable positions were manipulated to maximize the emission levels in a given frequency band displayed on the receiver.

Subsequently, an automated scan was performed in both peak and quasi-peak detection modes using the Quantum Change Tile Software.

Belkin Corporation Flip for PC, Wireless
 Document #: TRR0312.06
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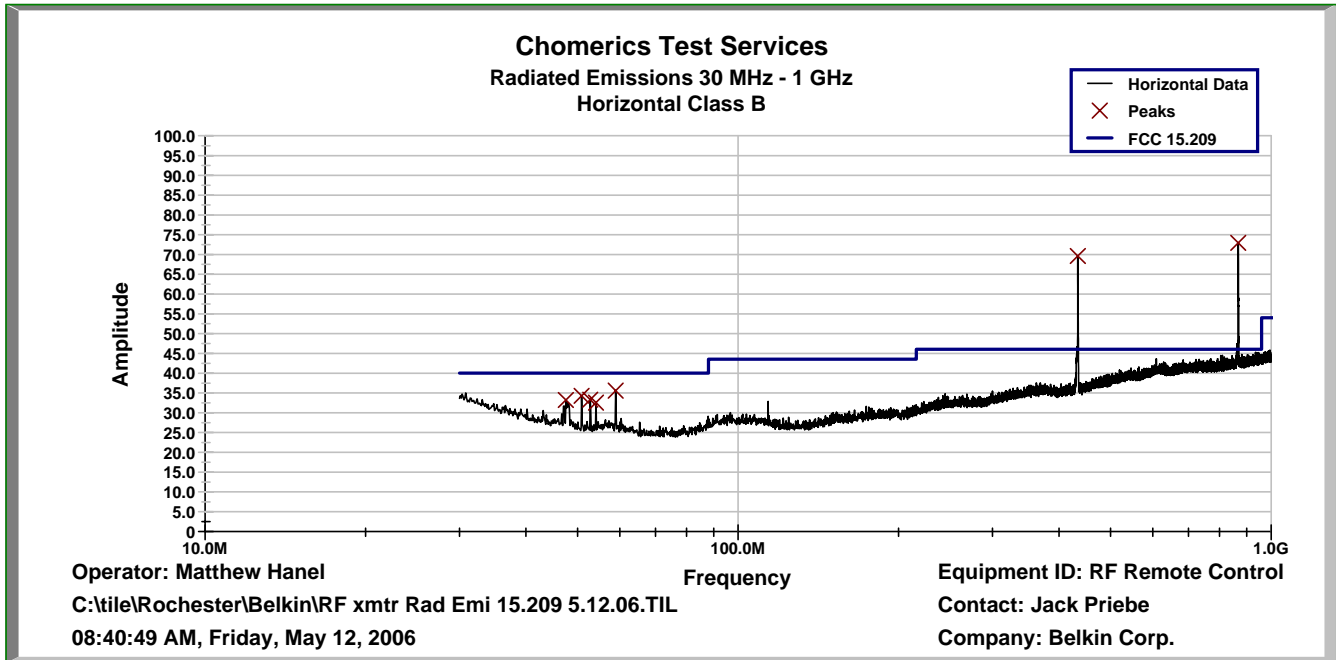
2.3.4 Results

The Belkin Corporation Flip for PC, Wireless meets the requirements for radiated emissions as required by FCC Part 15.209 for intentional radiators.

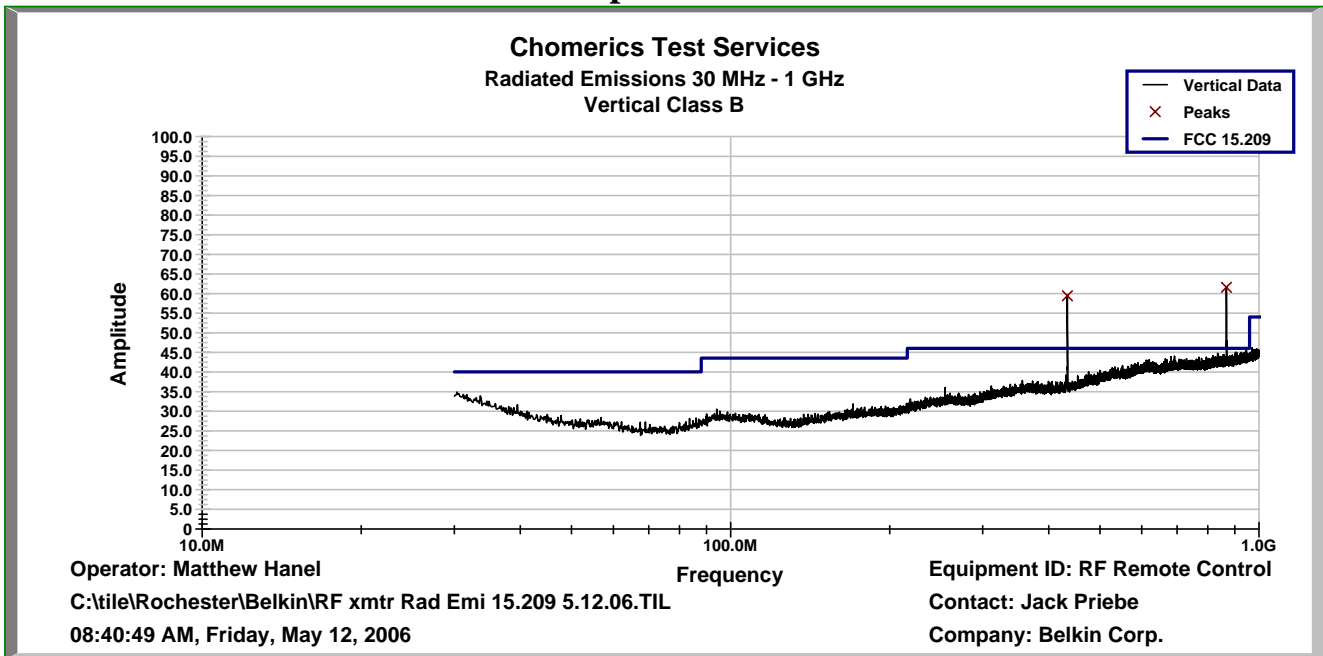
None of the spurious emissions detected were in the restricted bands of operation referred to in FCC Part 15.205 Restricted Bands of Operation.

2.2.5 Test Data

Graph Horizontal



Graph Vertical



Ambient Temperature: 72°F

Humidity: 33%

Atmospheric Pressure: 30.1"

Belkin Corporation Flip for PC, Wireless
Document #: TRR0312.06
Date: May 26, 2006

Tabular Data

Chomerics Test Services
 Radiated Emissions 30 MHz - 1 GHz
 FCC 15.209

Operator: Matthew Hanel
 C:\tile\Rochester\Belkin\RF xmtr Rad Emissions 5.12.06.TIL
 08:47:09 AM, Friday, May 12, 2006
 Equipment ID: RF Remote Control
 Contact: Jack Priebe
 Company: Belkin Corp.

Quasi-Peak Values

Frequency MHz	Measured QP dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Class B Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
47.509	2.76	8.60	0.62	11.98	40.00	-28.03	320	198	H
50.908	2.98	8.07	0.65	11.70	40.00	-28.30	15	166	H
52.788	2.95	7.90	0.66	11.51	40.00	-28.49	259	321	H
54.118	2.95	7.90	0.67	11.52	40.00	-28.48	62	374	H
59.008	3.08	7.81	0.70	11.59	40.00	-28.41	258	123	H

Ambient Temperature: 72°F

Humidity: 33%

Atmospheric Pressure: 30.1"

Belkin Corporation Flip for PC, Wireless
 Document #: TRR0312.06
 Date: May 26, 2006

2.2.6 Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS
TESTED BY: MATTHEW HANEL
OPERATING MODE: CONTINUOUS TRANSMISSION

DATE: MAY 12, 2006
TEST NUMBER: 1
COUPLING DEVICE: EMCO BICONILOG



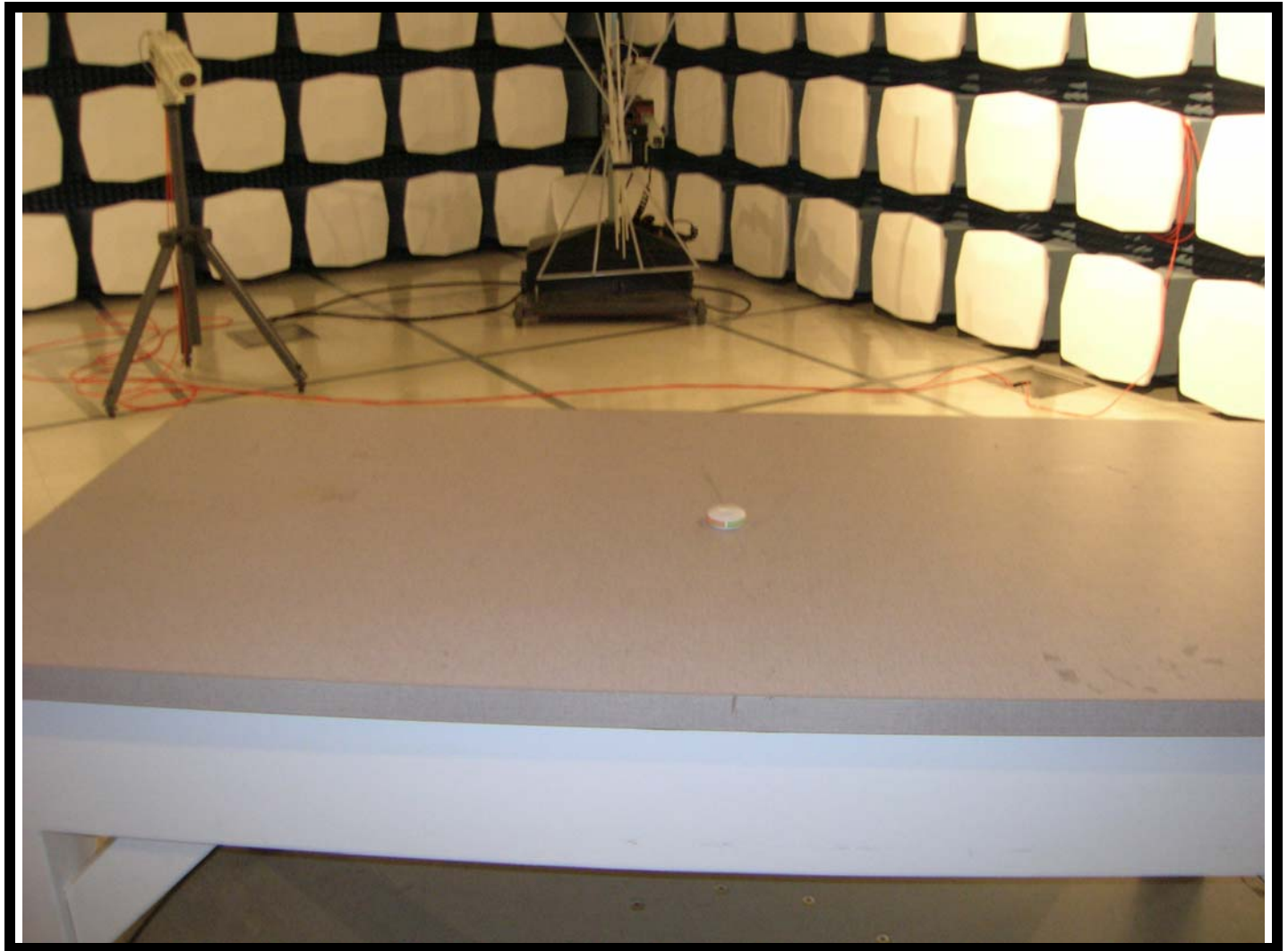
Photograph Description: Test set-up

FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS
TESTED BY: MATTHEW HANEL
OPERATING MODE: CONTINUOUS TRANSMISSION

DATE: MAY 12, 2006
TEST NUMBER: 1
COUPLING DEVICE: EMCO BICONILOG



Photograph Description: Test set-up

FORM CTS-PHOTO

2.3 FCC Part 15.231 Periodic Operation Above 70 MHz

2.3.1 Equipment Used

	Test Equipment	Asset #	Serial #	Cal Date
X	EMC Test Systems Semi-anechoic Chamber	667	N/A	10/06
X	Rhode and Schwartz ESCS30 Test Receiver	638	826547/024	12/06
X	EMCO 3142B Biconilog Antenna	668	9903-1357	12/06
X	IBM Personal Computer Model 300XL	N/A	23TMP08	NCR
X	EMCO 3105 Microwave Horn Antenna	78	2118	1/07
X	EMCO Multi Device Controller Model 2090	639	9808-1343	NCR
X	EMCO Antenna Mast Model 3801/2NM	666	N/A	NCR
X	EMCO Video Camera Controller Model VCC-01	653	N/A	NCR
X	EMCO Video Camera Model 2075	680	00183858	NCR
X	Quantum Change Tile Software	N/A	Version 3.2	NCR

2.3.2 Test Conditions

Radiated emissions testing was performed with the EUT set up on a wooden table above the turntable at a distance of 3 meters from the Biconilog antenna within the Semi-anechoic Chamber.

The Belkin Corporation Flip for PC, Wireless was configured to operate in the continuous transmission mode of operation to maximize the emissions. The Flip for PC, Wireless was set up and powered by +3VDC for radiated emission tests. The worst case signals detected were recorded.

2.3.3 Test Method

The test method of FCC Part 15 Radiated Emissions was followed for intentional radiators. For the radiated emission measurements, a scan was performed using the Biconilog and Horn antennas from 30 MHz – 4.34 GHz. During this scan, the antenna and turntable positions were manipulated to maximize the emission levels in a given frequency band displayed on the receiver.

An automated scan was then performed in the average detection mode using the Quantum Change Tile Software. Above 1GHz the frequency span was manually scanned to 4.34 GHz. Manual data points recorded were included in the tabular data.

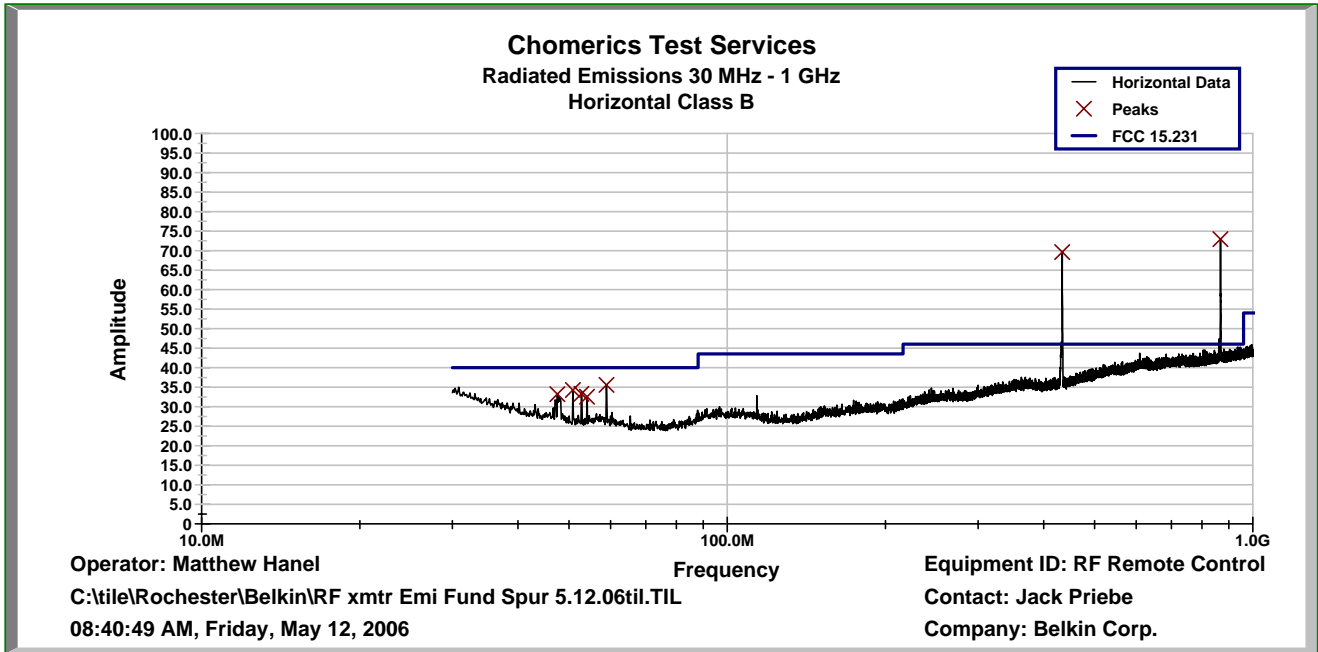
Finally, the bandwidth of the emission was measured at the point 20 dB down from the center of the fundamental emission.

2.3.4 Results

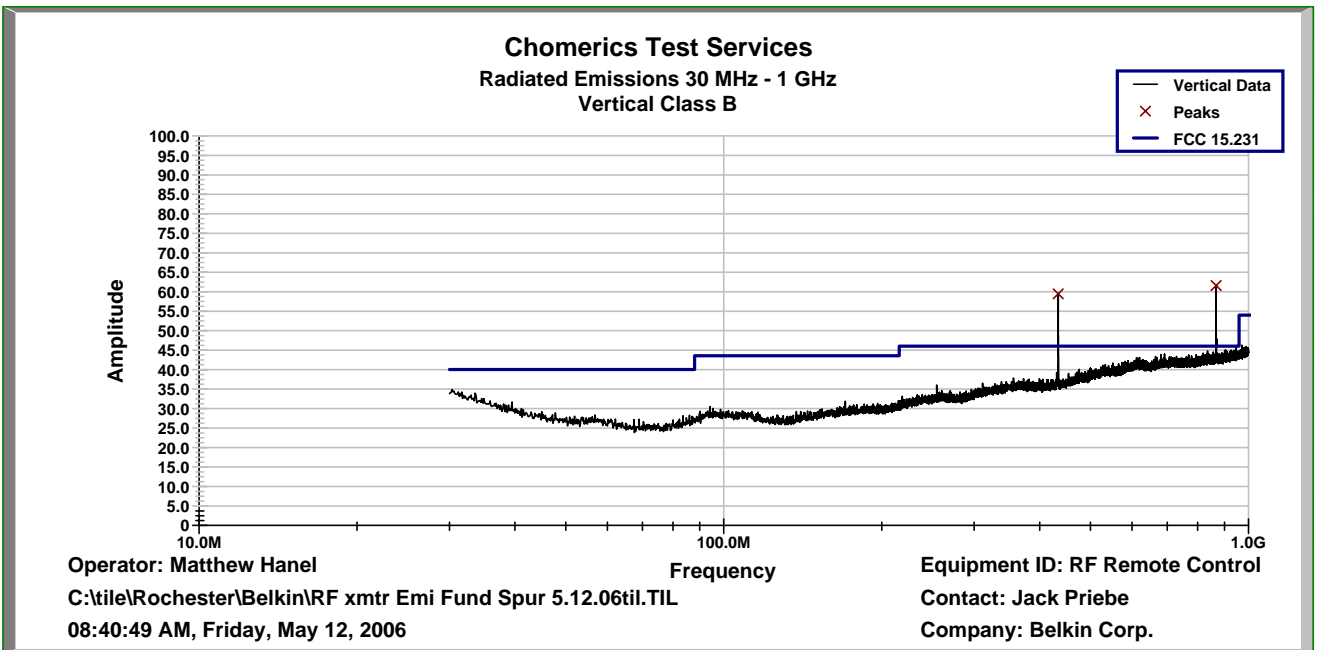
The Belkin Corporation Flip for PC, Wireless meets the requirements for the fundamental and spurious radiated emissions as required by FCC Part 15.231 Periodic Operation above 70 MHz.

2.3.5 Test Data

Graph Horizontal



Graph Vertical



Ambient Temperature: 72°F

Humidity: 33%

Atmospheric Pressure: 30.1"

Belkin Corporation Flip for PC, Wireless
Document #: TRR0312.06
Date: May 26, 2006

Tabular Data

Chomerics Test Services
 Radiated Emissions 30 MHz - 1 GHz
 FCC 15.209

Operator: Matthew Hanel
 C:\tile\Rochester\Belkin\RF xmtr Rad Emissions 5.12.06.TIL
 08:47:09 AM, Friday, May 12, 2006
 Equipment ID: RF Remote Control
 Contact: Jack Priebe
 Company: Belkin Corp.

Peak to Average Signal Conversion

Frequency MHz	Measured dBuV	Antenna Factor	Cable Factor	Corrected Peak dBuV	*Adjusted Peak dBuV	FCC 15.231 Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
433.91	51.85	15.86	2.00	69.70	44.39	80.11	-35.72	217	102	H
867.79	47.35	21.90	3.60	72.84	47.51	60.11	-12.60	352	102	H
1301.69	41.30	26.10	4.00	71.40	46.01	60.11	-14.10	204	113	H
1735.51	32.88	28.02	4.10	65.00	39.65	60.11	-20.46	333	101	H

*Duty Cycle Correction Factor = 27 ms / 500 ms = 0.054

Ambient Temperature: 72°F

Humidity: 33%

Atmospheric Pressure: 30.1"

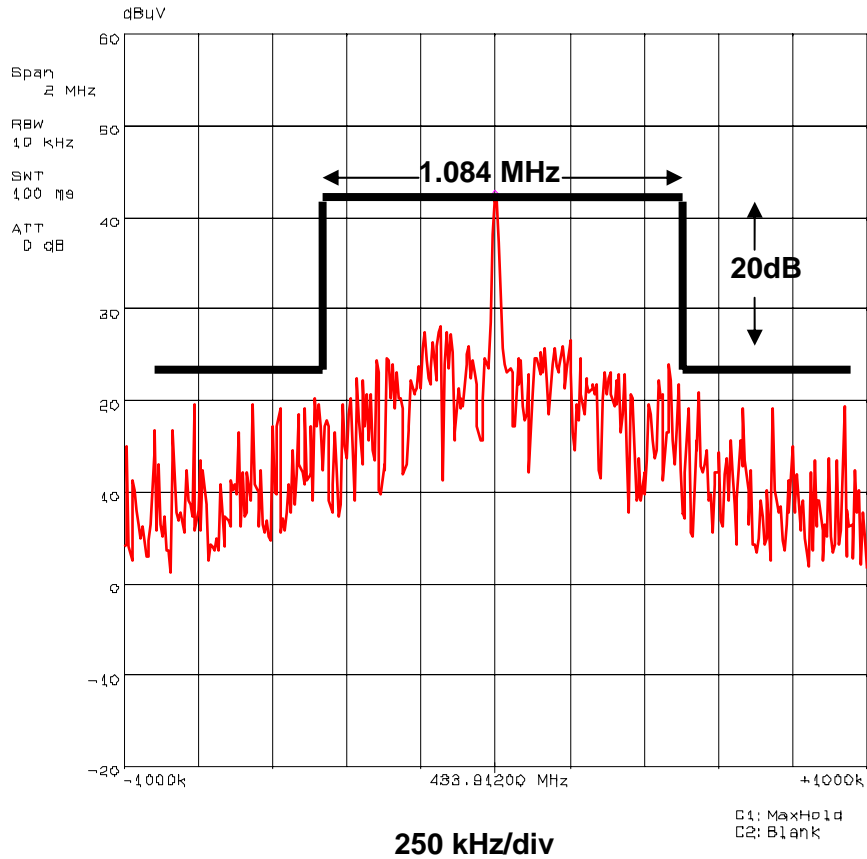
Belkin Corporation Flip for PC, Wireless
 Document #: TRR0312.06
 Date: May 26, 2006

RF Remote Control

08. May 06 14: 22

20 dB Bandwidth 433.907 Fundamental Emission

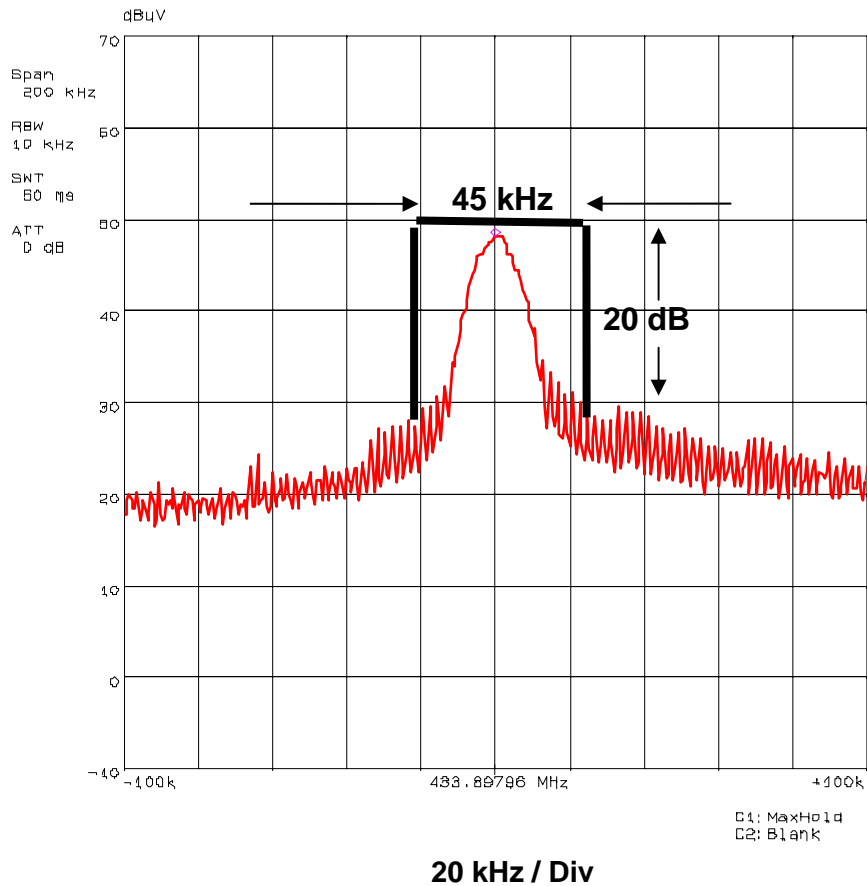
◊ Mkr : 433.912 MHz 42.0 dB



12. May 06 14:24

20 dB Bandwidth 433.907 Fundamental Emission

◊ Mkr : 433.8980 MHz 48.2 dB



2.3.6 Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS
TESTED BY: MATTHEW HANEL
OPERATING MODE: CONTINUOUS TRANSMISSION

DATE: MAY 12, 2006
TEST NUMBER: 2
COUPLING DEVICE: EMCO BICONILOG



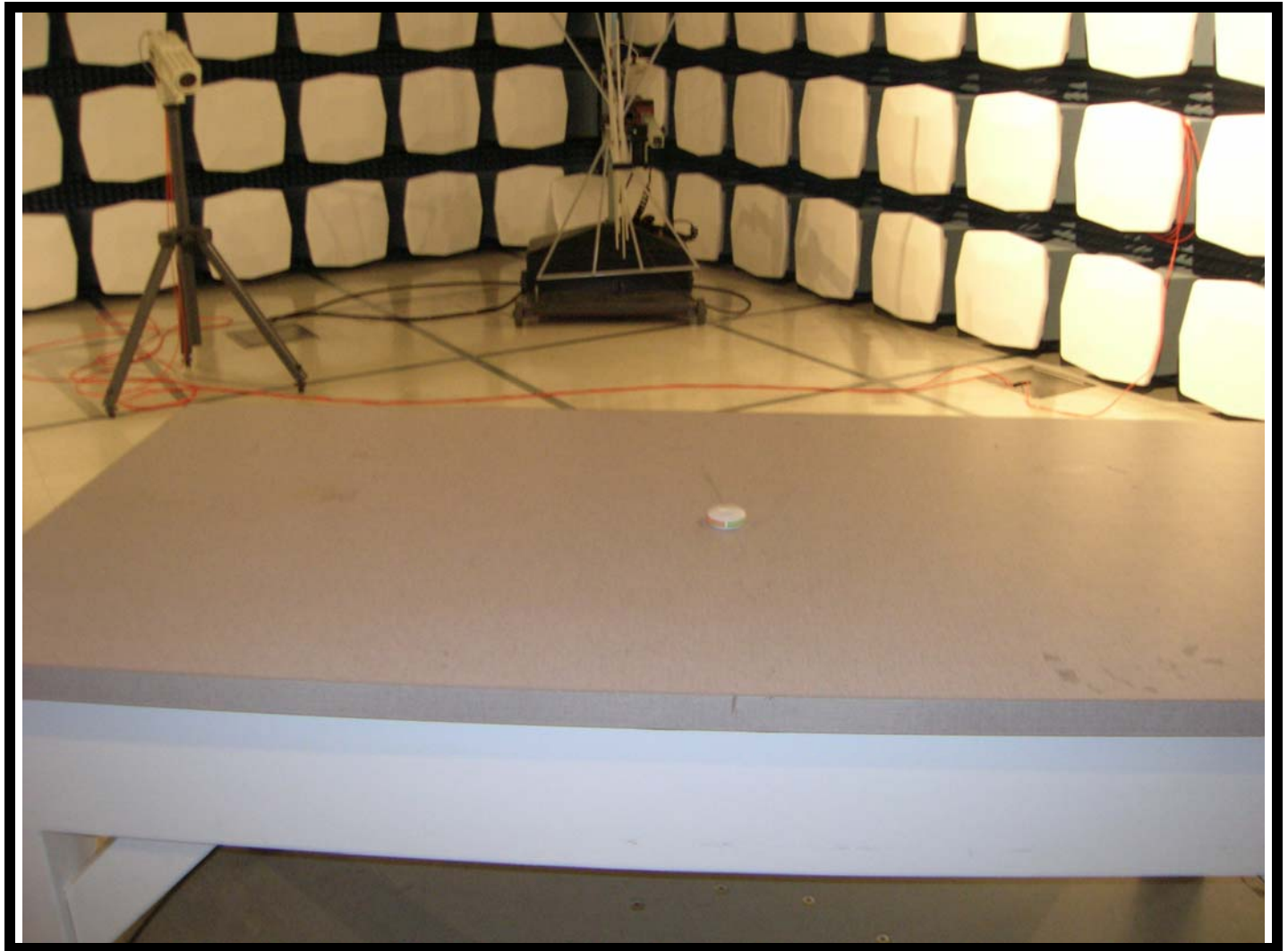
Photograph Description: Radiated set-up

FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS
TESTED BY: MATTHEW HANEL
OPERATING MODE: CONTINUOUS TRANSMISSION

DATE: MAY 12, 2006
TEST NUMBER: 2
COUPLING DEVICE: EMCO BICONILOG



Photograph Description: Radiated set-up

FORM CTS-PHOTO

APPENDIX A

TEST LOG

TEST LOG

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: FLIP FOR PC, WIRELESS

PROGRAM: EMISSIONS
TESTED BY: MATTHEW HANEL

Pre-Test Checklist	Date	Comments					
	May 12, 2006	Test Plan/Procedure: ANSI C63.4 Test Specification: FCC Part 15 Subpart 15.33, 209, 231 Chomerics Procedure: CHO TPECROC T2, T3 EUT Power Requirement Verified: Voltage 3VDC Frequency N/A Phase N/A EUT Functional Operational Check: [X] Pass [] Fail Environmental: Bonding/Grounding: N/A Safety Issues: N/A					
In-Process Test Checklist	Date	Test #	Test Type	Test Equipment Calibrated	Test Performed Properly – Data Accepted	EUT Set-up Check/Operational Check	EUT Pass/Fail
	5.12.06	1	FCC 15.209	Yes	Yes	Yes	Pass
	5.12.06	2	FCC 15.231	Yes	Yes	Yes	Pass
	5.19.06	3	FCC 15.33	Yes	Yes	Yes	Pass
	5.22.06	-	FCC 15.33 (continued)	Yes	Yes	Yes	Pass
Post Test Checklist	Date:	EUT Functional Operation Check:					
	May 22, 2006	[X] Pass [] Fail		_____ Test Engineer/Tech Approved Signatory			

FORM CTS-010