CHOMERICS Parker

TEST SERVICES

EMC EVALUATION OF THE
BELKIN CORPORATION
TUNEFM - MODEL F8Z075

Date: **APRIL 18, 2006**
Test Report Number: **TRR0296.06 REVISION 1**

IN ACCORDANCE WITH
FCC PART 15 SUBPART A 15.33
FCC PART 15 SUBPART C 15.209
FCC PART 15 SUBPART C 15.239
AS/NZS 4268:2003

Prepared For: **BELKIN CORPORATION**
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TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

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 TuneFM - Model F8Z075 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 15.239 and AS/NZS 4268:2003 Radio Equipment and Systems – Short Range Devices- Limits and Methods measurement.

Jeff Meyers from Belkin Corporation was present during testing. Testing was performed during the period of March 21 – 22, and April 14, 2006 under Chomerics' order number 941372.

1.1.2 Requirements

The requirements for the sequence of tests performed on the TuneFM - Model F8Z075 are as follows:

FCC Part 15 Subpart C 15.239 – Section 2.0

FCC Part 15 Subpart C 15.239, Emission requirements:

Sec. 15.239: Operation in the band 88-108 MHz. - Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz. The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microVolts/meter (47.95 dBuV) at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions for limiting Peak emissions in 15.35 apply The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in Sec. 15.209.

AS/NZS 4268:2003 – Section 2.4

Table 1
Maximum EIRP = 10uW
Maximum Transmitter Spurious Emissions EIRP = 0.1uW
Maximum 20dB Bandwidth 180kHz

FCC Part 15 Subpart C 15.33 – Section 2.5

FCC Part 15 Subpart C 15.33, Radio Frequency Devices:

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).

(1) If the intentional radiator operates below 10 GHz: 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:

(a) 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

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 15.239 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 15.239 20dB Bandwidth	Passed
FCC Part 15.239 Field Strength	Passed
FCC Class B Radiated Emissions (FCC 47 CFR 15.209 Class B)	Passed
AS/NZS 4268: 2003 EIRP of Fundamental	Passed
AS/NZS 4268:2003 EIRP Spurious	Passed
AS/NZS 4268:2003 20dB Bandwidth	Passed
FCC Class B Radiated Emissions (FCC 47 CFR 15.33)	Passed

1.2.1 Summary of Recommendations

The Belkin Corporation TuneFM - Model F8Z075 will require no modifications in order to ensure compliance with the Electromagnetic Interference Standard FCC Part 15 Subpart C 15.239, Subpart A 15.33, Subpart C 15.209 or AS/NZS 4268:2003.

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 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.

Additions to, or exclusions from the test specification(s) were made. AS/NZS 4268:2003 tests were performed as well as the FCC Part 15 Subpart C 15.239 measurements.

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

37dBuV = 30dBuV + 5dB + 2dB

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.

Margin to Limit dB = Field Level dBuV – Limit dBuV
-3dB = 37dBuV - 40dBuV

Conducted 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, final level, limit, margin to the limit, LISN factor

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

Final Value dBuV = measured value dBuV + LISN Factor dB
50dBuV = 49dBuV + 1dB

The margin to the limit shall be calculated by subtracting the final value to the limit. The margin to the limit shall be calculated by the following for each signal maximized.

Margin to Limit dB = Field Level dBuV – Limit dBuV
-3dB = 37dBuV - 40dBuV

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 TuneFM - Model F8Z075 are as follows: (Refer to Section 1.4.2 for test site descriptions).

Emissions Test	Test Site
FCC Part 15.239 20dB Bandwidth	Semi-Anechoic Chamber
FCC Part 15.239 Field Strength	Semi-Anechoic Chamber
FCC Class B Radiated Emissions (FCC 47 CFR 15.209 Class B)	Semi-Anechoic Chamber
AS/NZS 4268:2003 EIRP of Fundamental	Semi-Anechoic Chamber
AS/NZS 4268:2003 EIRP Spurious	Semi-Anechoic Chamber
AS/NZS 4268:2003 20dB Bandwidth	Semi-Anechoic Chamber
FCC Class B Radiated Emissions (FCC 47 CFR 15.33)	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 normal 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 title, 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.

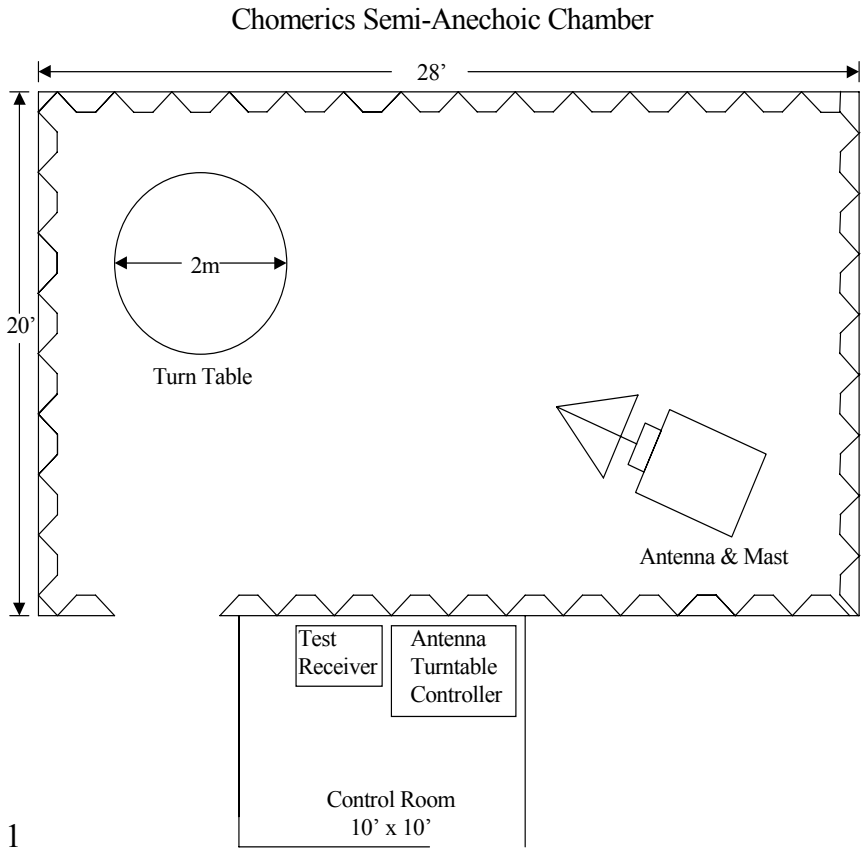


Figure 1

1.4.3 Equipment Under Test

The Belkin Corporation TuneFM - Model F8Z075 (Serial Number PVT2) is a device that wirelessly transmits audio signals from an iPod to an FM receiver. It also allows the user to set the transmission frequency in the band 88.1 MHz – 107.9 MHz in 0.1 MHz intervals.

The support equipment needed to run the Belkin Corporation TuneFM - Model F8Z075 in the normal mode of operation consisted of the following:

a. iPod 5G Manufacturer: Apple
Model: A1136
S/N: JQ5438QYTXL

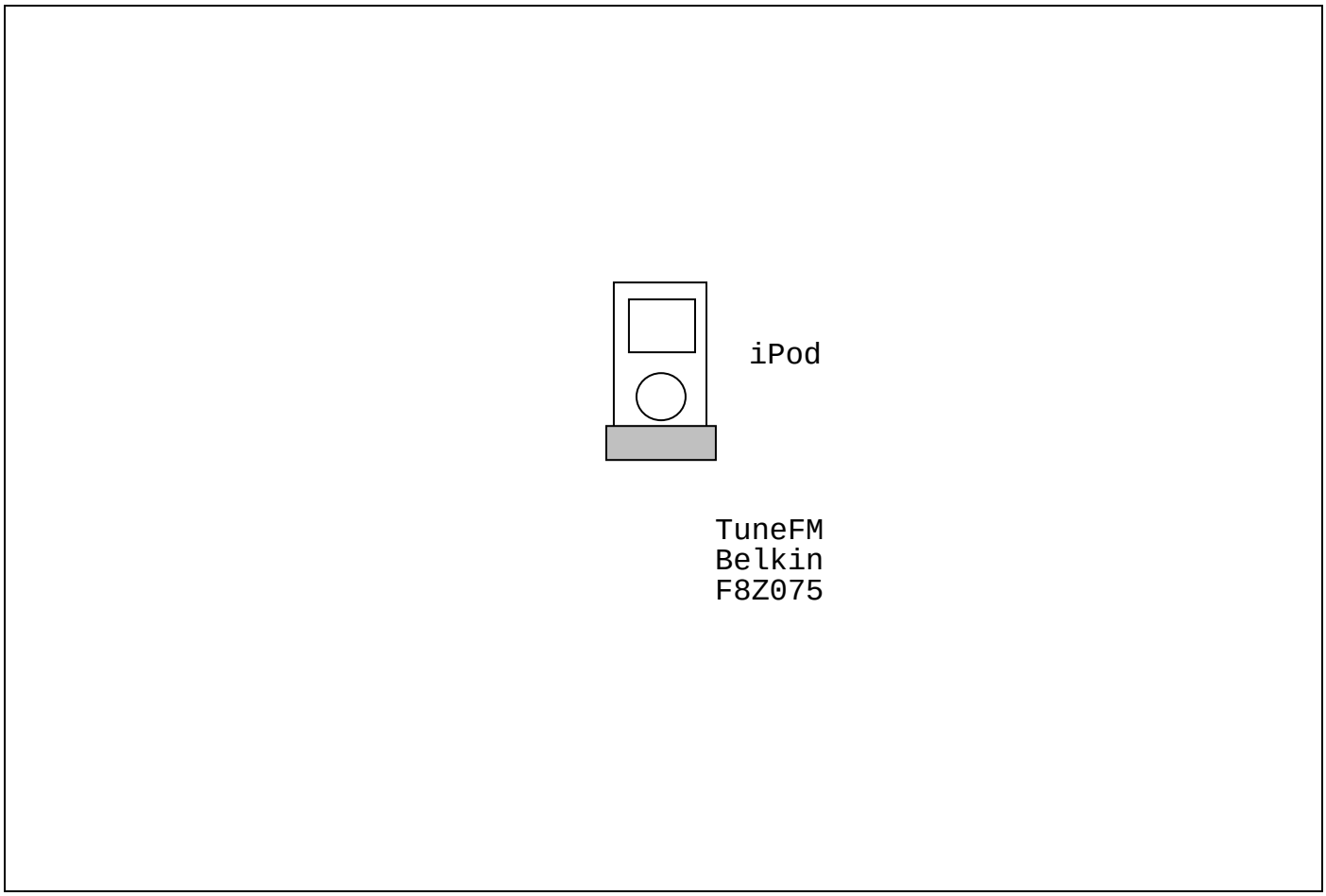
The TuneFM - Model F8Z075 is a DC powered devices which operates on 3.3 VDC power supplied by the iPod. There are no I/O connections.

The normal mode of operation was used for emissions tests. The TuneFM - Model F8Z075 was monitored during the tests by Jeff Meyers of the Belkin Corporation.

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

1.4.4 Block Diagram

CUSTOMER: BELKIN CORPORATION **DATE: MARCH 21, 2006**
EQUIPMENT: TUNEFM - MODEL F8Z075 **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 20dB BANDWIDTH OF FUNDAMENTAL EMISSION

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	EMCO 3142B Biconilog Antenna	668	9903-1357	12/06
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
	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

The 20dB Bandwidth measurement testing was performed with the TuneFM – Model F8Z075 set up on a wooden table above the turntable at a distance of 3 meters from Biconilog antenna within the semi-anechoic chamber. The TuneFM – Model F8Z075 was configured to operate in the normal mode of operation at the low, mid and then high transmit frequencies.

2.1.3 Test Method

The bandwidth of the TuneFM – Model F8Z075 was measured through an air interface. The TuneFM – Model F8Z075 was placed on top of a wooden turntable 3 meters from a receiving antenna. The bandwidths of the TuneFM – Model F8Z075 were measured at the low, mid, and high transmit frequencies. During this test, the antenna, turntable and the EUT were manipulated to maximize the emission level. The device was positioned to maximize radiation in all three orthogonal planes during preliminary testing.

2.1.4 Results

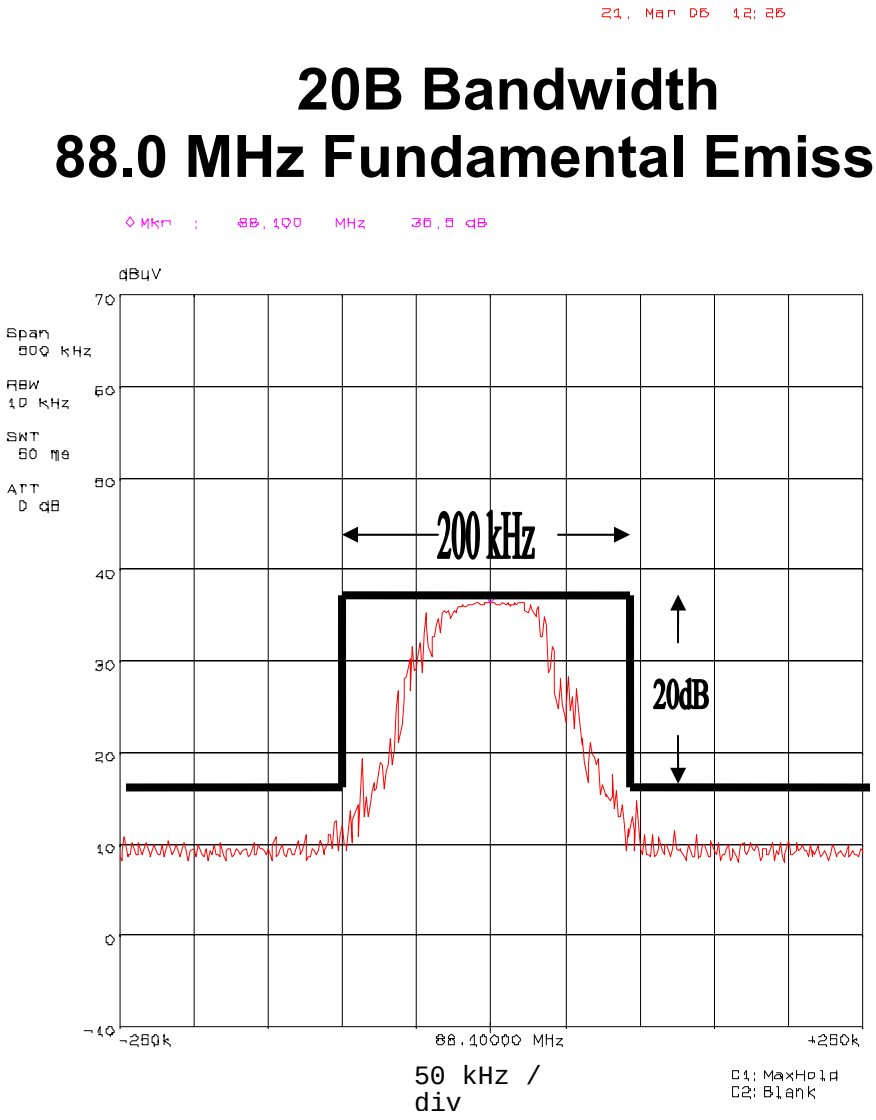
The Belkin TuneFM – Model F8Z075 meets the maximum 200 kHz bandwidth requirements of FCC Part15.239 and 180 kHz requirement of AS/NZS 4268:2033 at the frequencies tested. As shown on the plots, the radiated fundamental signal lies wholly within the authorized frequency band at the 20dB bandwidth measurement as required by 15.239 (a) at both 88MHz and 108MHz.

2.1.5 Test Data

20dB BANDWIDTH MEASUREMENTS

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TuneFM – Model F8Z075
TESTED BY: MATTHEW HANEL

DATE: MARCH 21, 2006
TEST NUMBER: 1
OPERATING MODE: CONTINUOUS TRANSMISSION
LOW FREQ.

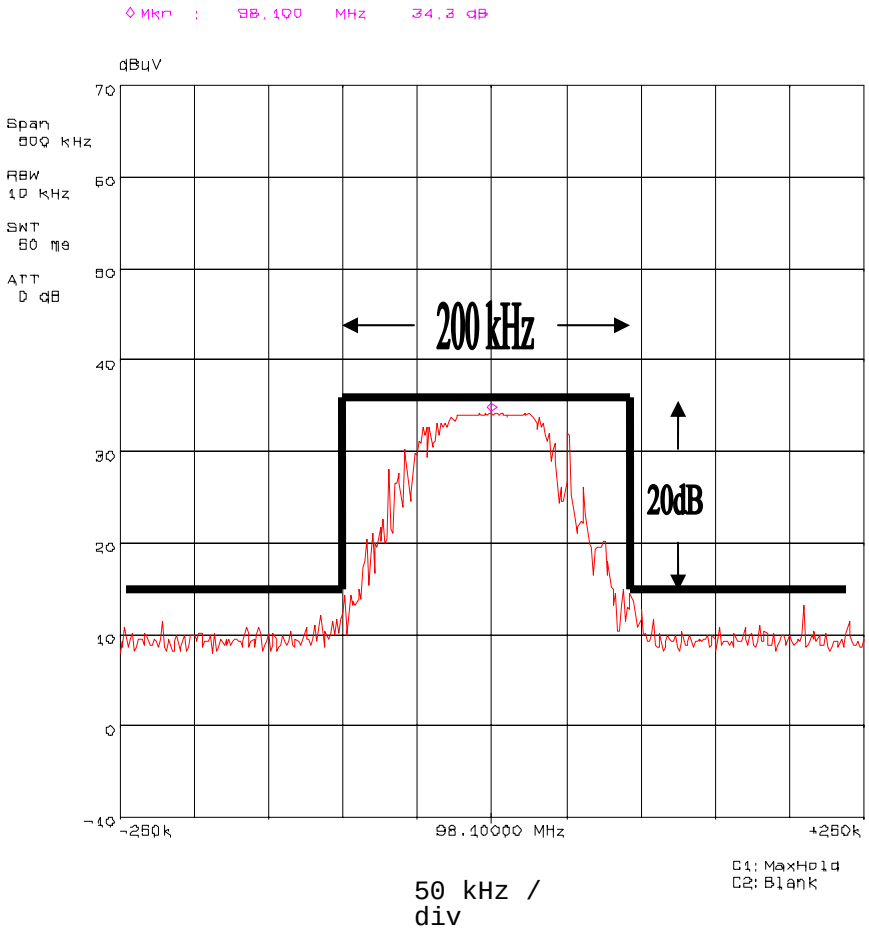


Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TuneFM – Model F8Z075
TESTED BY: MATTHEW HANEL

DATE: MARCH 21, 2006
TEST NUMBER: 1
OPERATING MODE: CONTINUOUS TRANSMISSION MID FREQ.

20B Bandwidth
98.0 MHz Fundamental Emission

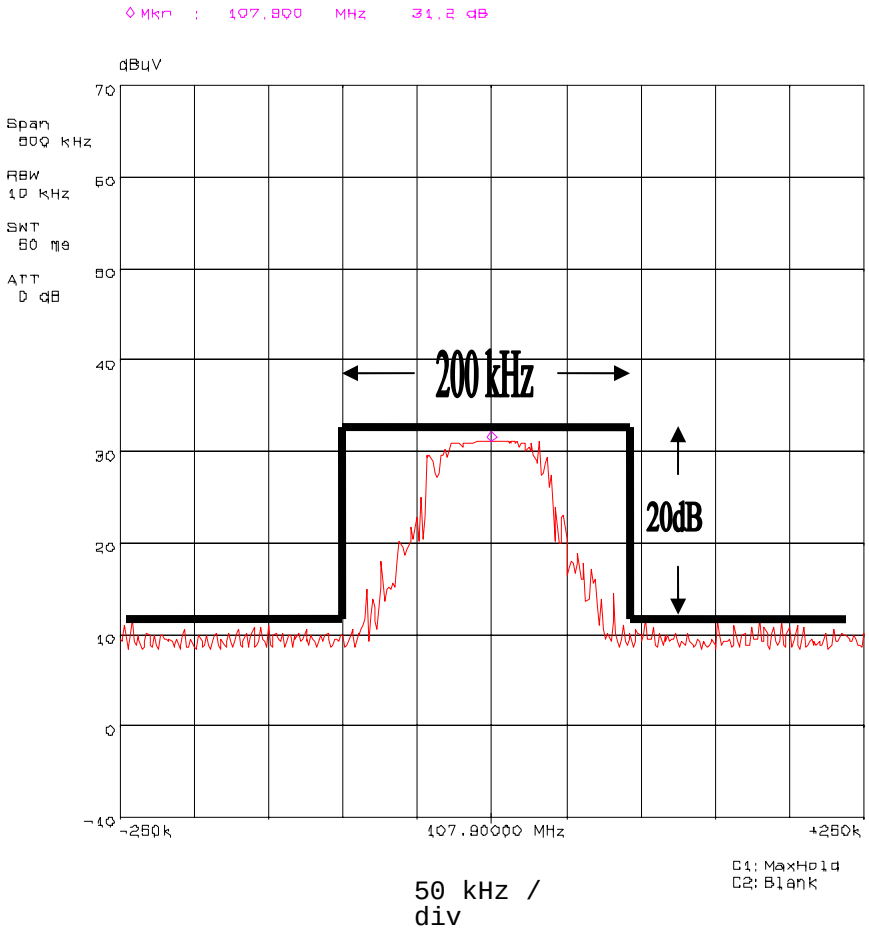


Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TuneFM – Model F8Z075
TESTED BY: MATTHEW HANEL

DATE: MARCH 21, 2006
TEST NUMBER: 1
OPERATING MODE: CONTINUOUS TRANSMISSION
HIGH FREQ.

20B Bandwidth
107.9 MHz Fundamental Emission



Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

2.1.6 Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TUNEFM – MODEL F8Z075
TESTED BY: MATTHEW HANEL

DATE: MARCH 21, 2006
TEST NUMBER: 1
OPERATING MODE: CONTINUOUS TRANSMISSION HIGH FREQ.

Photograph Description: Test set-up

FORM CTS-PHOTO

2.2 FCC Part 15 Subpart C Field Strength (FCC 47 CFR 15.239)

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

2.2.2 Test Conditions

Output Power tests were performed on the Belkin TuneFM – Model F8Z075 while it was set up on a wooden table above the turntable at a distance of 3 meters from Biconilog antenna within the semi-anechoic chamber. The TuneFM – Model F8Z075 was configured to operate in the normal mode of operation at the low, mid and then high transmit frequencies.

2.2.3 Test Method

The field strength of the Belkin TuneFM – Model F8Z075 was measured with the Rhode and Schwarz ESCS30 Test Receiver.

2.2.4 Results

The Belkin TuneFM – Model F8Z075 meets the field strength requirement of FCC Part 15 Subpart C 15.239, for the frequencies tested.

2.2.5 Test Data

OUTPUT POWER MEASUREMENTS

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TuneFM – Model F8Z075
TESTED BY: MATTHEW HANEL

DATE: MARCH 21, 2006
TEST NUMBER: 2
OPERATING MODE: CONTINUOUS TRANSMISSION

TuneFM for iPod - Model: F8Z075
Field Strength of Fundamental Emission - Low Frequency 88.1 MHz

Peak

Frequency MHz	Measured Pk dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
88.1	36.87	8.06	0.89	45.82	67.95	-22.13	114	108	V

Average

Frequency MHz	Measured Av dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
88.1	36.78	8.06	0.89	45.73	47.95	-2.22	114	108	V

Field Strength of Fundamental Emission - Mid. Frequency 98.1 MHz

Peak

Frequency MHz	Measured Pk dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
98.1	34.27	9.37	0.96	44.60	67.95	-23.35	167	100	V

Average

Frequency MHz	Measured Av dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
98.1	34.20	9.37	0.96	44.53	47.95	-3.42	167	100	V

Field Strength of Fundamental Emission - High Frequency 107.9 MHz

Peak

Frequency MHz	Measured Pk dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
107.9	30.28	9.10	1.01	40.39	67.95	-27.56	230	100	V

Average

Frequency MHz	Measured Av dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
107.9	30.21	9.10	1.01	40.32	47.95	-7.63	230	100	V

Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

2.2.6 Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TUNEFM - MODEL F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 21, 2006
TEST NUMBER: 2
COUPLING DEVICE: EMCO BICONILOG

Photograph Description: Conducted set-up

FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TUNEFM - MODEL F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 21, 2006
TEST NUMBER: 2
COUPLING DEVICE: EMCO BICONILOG

Photograph Description: Conducted set-up

FORM CTS-PHOTO

2.3 FCC Class B Radiated Emissions (FCC 47 CFR 15.209 Class B)

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 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 TuneFM - Model F8Z075 was configured to operate in the normal mode of operation to maximize the emissions. The TuneFM - Model F8Z075 was set up and powered by +3.3 VDC for radiated emission tests. The worst case signals detected were recorded.

2.3.3 Test Method

The test method of FCC Part 15 Radiated Emissions was followed for Class B equipment. For the radiated emission measurements, a manual scan was performed from 30 MHz – 1080 MHz. During this scan, the antenna, turntable and the EUT's cable positions were manipulated to maximize the emission levels in a given frequency band displayed on the spectrum analyzer.

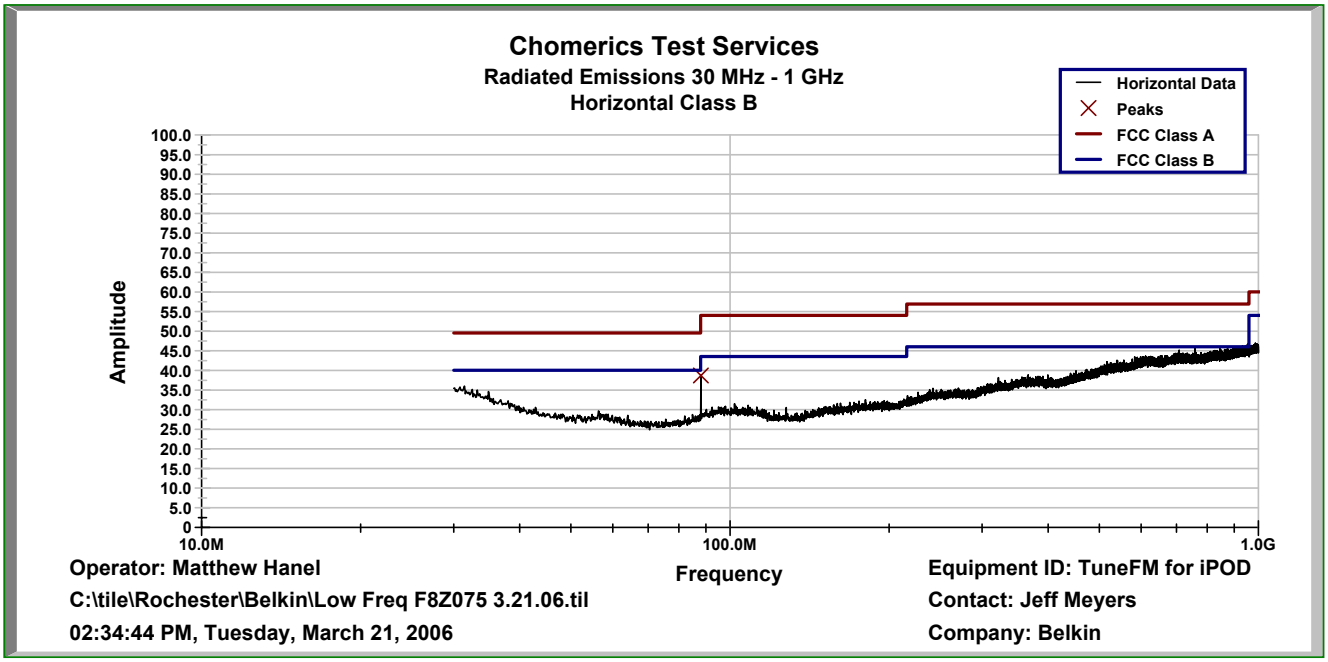
Subsequently, an automated scan was performed in both peak and quasi-peak detection modes using the Quantum Change Tile Software.

2.3.4 Results

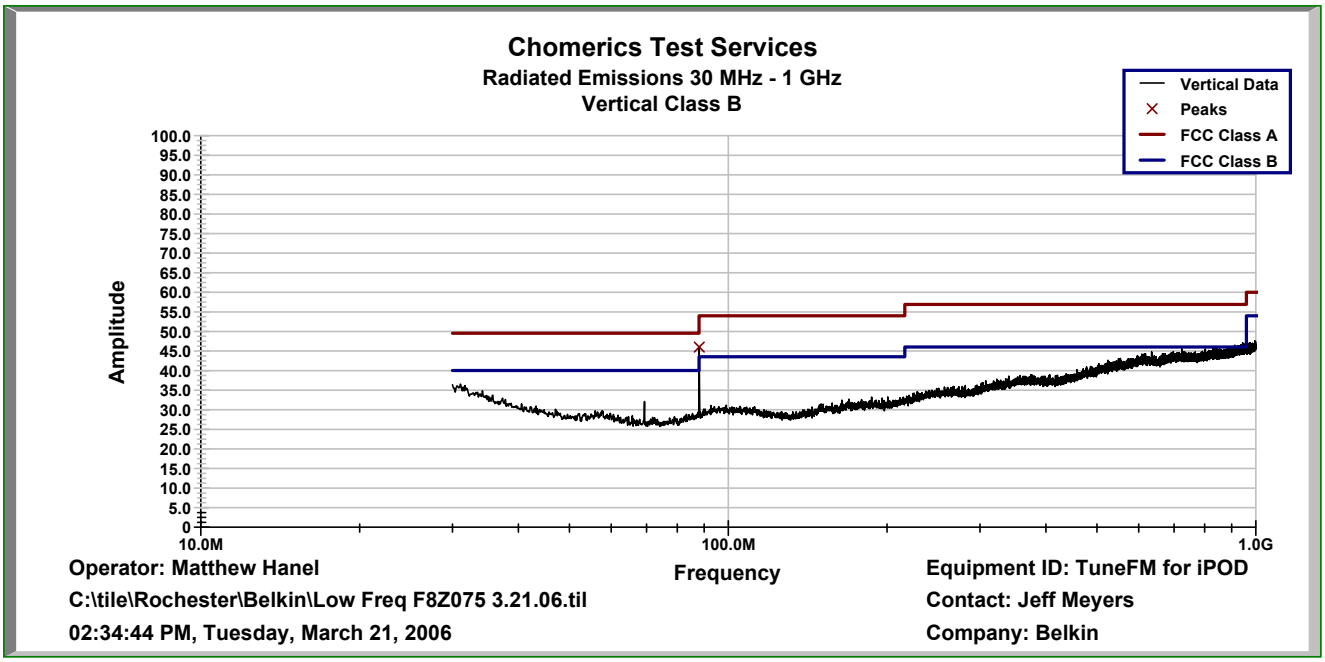
The Belkin Corporation TuneFM - Model F8Z075 meets the requirements for radiated emissions as required by FCC Part 15, Class B equipment.

2.3.5 Test Data

Low Frequency 88.1 MHz
Graph Horizontal



Graph Vertical



Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

Tabular Data – 88.1 MHz

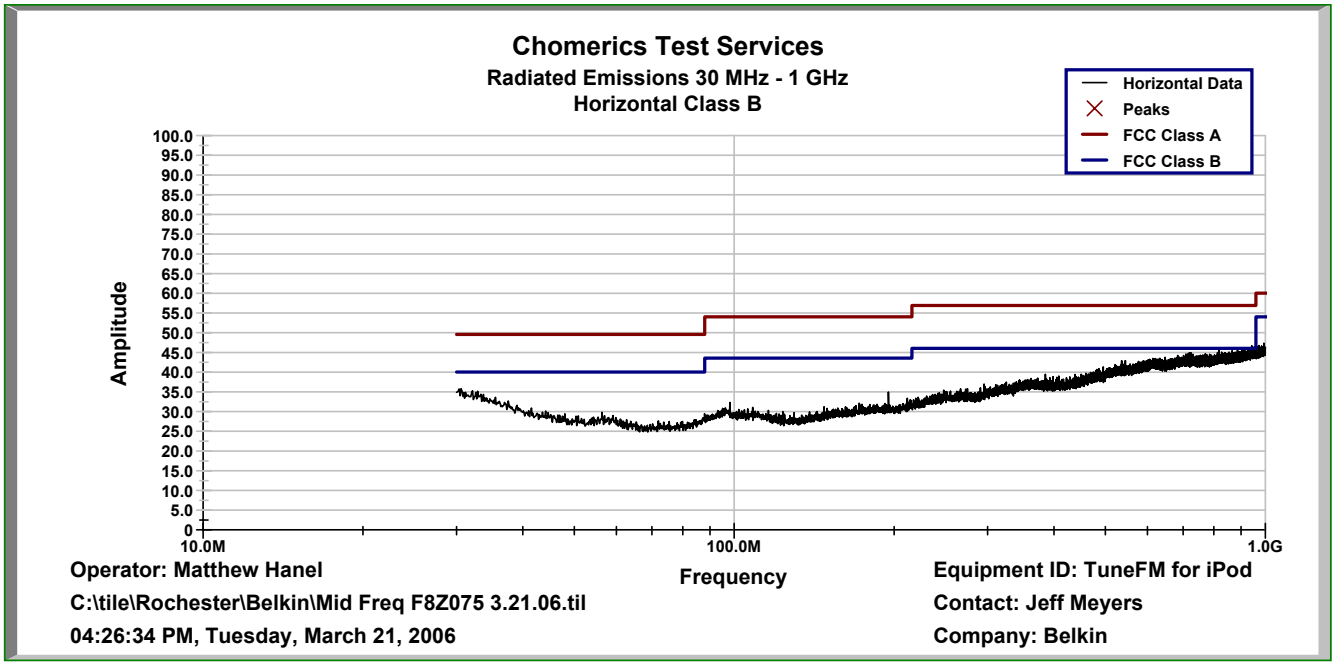
Chomerics Test Services
Radiated Emissions 30 MHz - 1 GHz
Final Class B Quasi-Peak Values

Operator: Matthew Hanel
C:\tile\Rochester\Belkin\Low Freq F8Z075 3.21.06.til
02:47:17 PM, Tuesday, March 21, 2006
Equipment ID: TuneFM for iPOD
Contact: Jeff Meyers
Company: Belkin

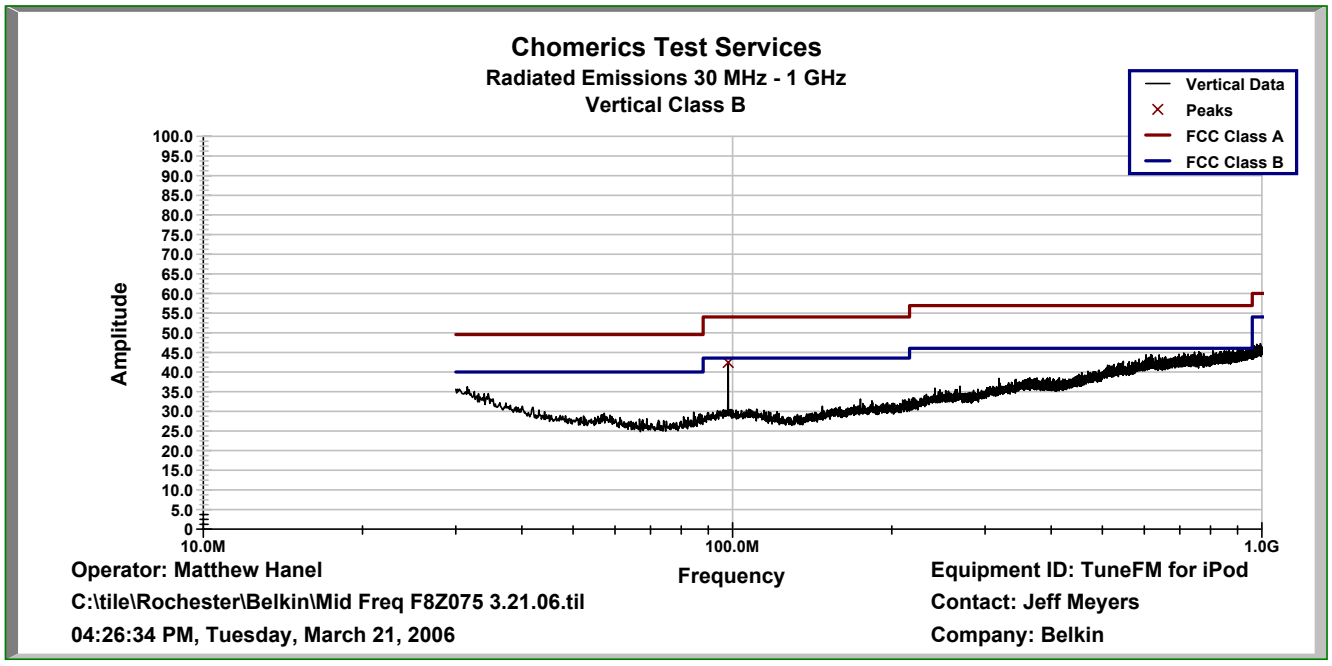
Frequency MHz	Measured QP dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Class B Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
31.10	3.91	15.83	0.45	20.19	40.00	-19.81	4	241	V
31.46	4.10	15.63	0.46	20.19	40.00	-19.81	46	230	H
69.26	4.70	5.90	0.77	11.37	40.00	-28.64	162	187	V
708.02	3.44	20.86	3.07	27.37	46.02	-18.65	81	289	H
954.48	3.26	22.70	3.91	29.87	46.02	-16.15	219	145	H
956.54	3.06	22.70	3.92	29.68	46.02	-16.34	176	123	V

Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

Mid Frequency 98.1 MHz
Graph Horizontal



Graph Vertical



Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

Tabular Data – 98.1 MHz

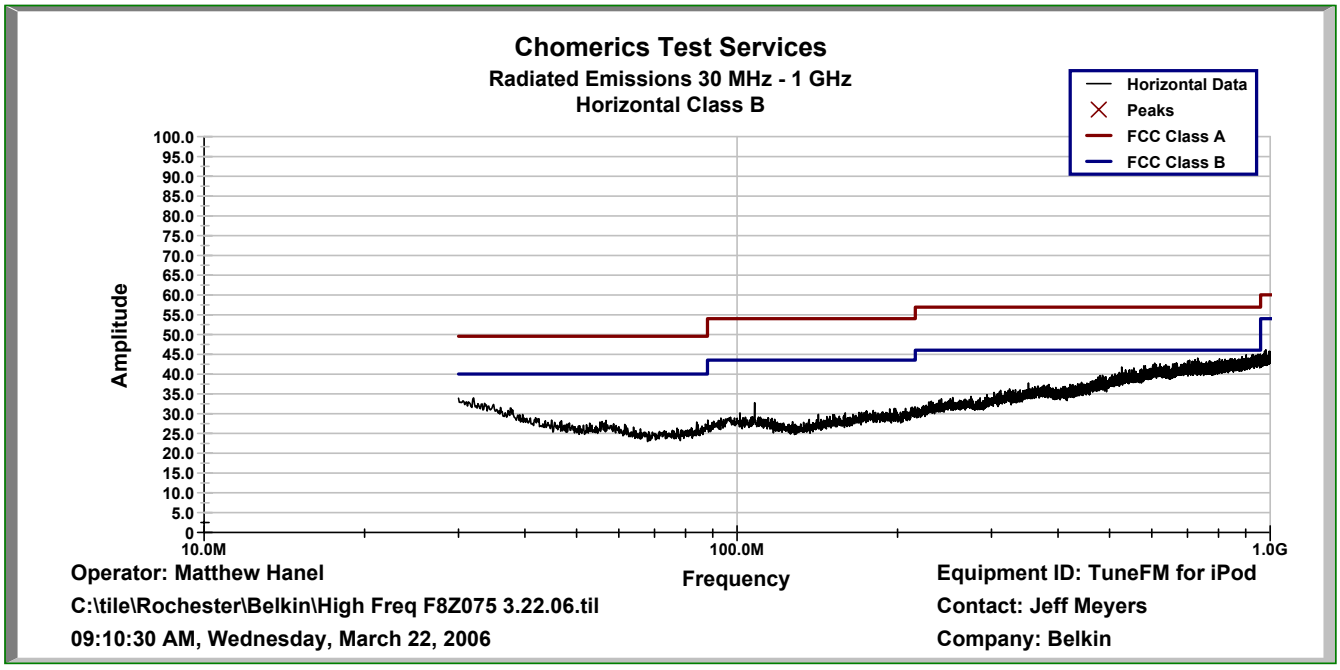
Chomerics Test Services
Radiated Emissions 30 MHz - 1 GHz
Final Class B Quasi-Peak Values

Operator: Matthew Hanel
C:\tile\Rochester\Belkin\Mid Freq F8Z075 3.21.06.til
04:38:07 PM, Tuesday, March 21, 2006
Equipment ID: TuneFM for iPod
Contact: Jeff Meyers
Company: Belkin

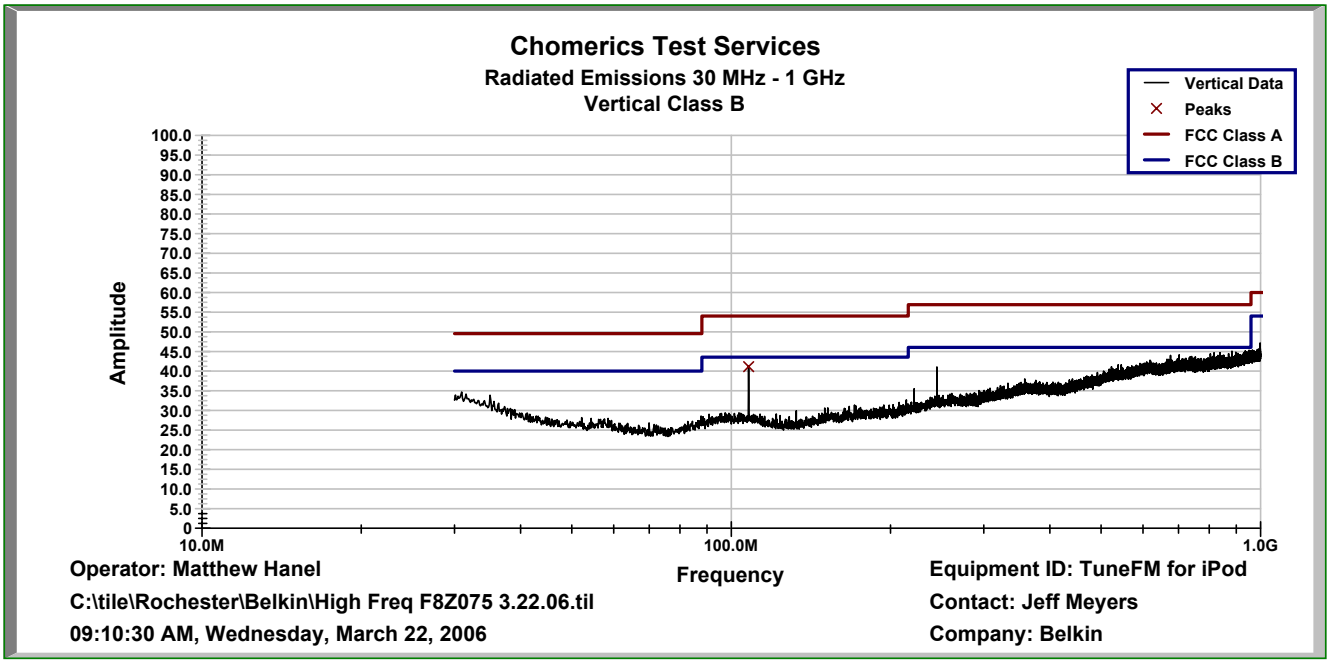
Frequency MHz	Measured QP dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Class B Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
31.55	3.95	15.56	0.46	19.97	40.00	-20.03	346	219	V
195.29	4.44	10.20	1.41	16.05	43.52	-27.47	49	321	H
719.46	3.71	20.90	3.11	27.72	46.02	-18.30	56	321	H
901.42	2.63	22.26	3.71	28.59	46.02	-17.43	219	112	V
955.37	3.03	22.70	3.92	29.65	46.02	-16.38	176	276	V
961.25	3.05	22.70	3.93	29.68	53.98	-24.30	198	187	H

Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

High Frequency 107.9 MHz
Graph Horizontal



Graph Vertical



Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

Tabular Data – 107.9 MHz

Chomerics Test Services
Radiated Emissions 30 MHz - 1 GHz
Final Class B Quasi-Peak Values

Operator: Matthew Hanel
C:\tile\Rochester\Belkin\High Freq F8Z075 3.22.06.til
09:25:17 AM, Wednesday, March 22, 2006
Equipment ID: TuneFM for iPod
Contact: Jeff Meyers
Company: Belkin

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
30.46	3.32	16.19	0.45	19.96	40.00	-20.04	201	289	V
32.56	3.31	14.93	0.47	18.71	40.00	-21.29	330	209	H
35.06	3.18	13.45	0.49	17.12	40.00	-22.88	176	165	V
244.08	3.79	12.40	1.68	17.87	46.02	-28.15	2	188	V
929.09	2.19	22.50	3.82	28.51	46.02	-17.51	313	118	H
960.06	1.83	22.70	3.93	28.46	53.98	-25.52	120	156	V

Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

2.3.6 Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TUNEFM - MODEL F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 21-22, 2006
TEST NUMBER: 3
COUPLING DEVICE: EMCO BICONILOG

Photograph Description: Radiated set-up

FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TUNEFM - MODEL F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 21-22, 2006
TEST NUMBER: 3
COUPLING DEVICE: EMCO BICONILOG

Photograph Description: Radiated set-up

FORM CTS-PHOTO

2.4 Effective Isotropic Radiated Power Fundamental and Spurious Emissions

2.4.1 Equipment Used

	Equipment Used	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	EMCO Biconical Antenna	679	9106-2444	11/06
X	Rhode and Schwartz SML01 Signal Generator	689	33216	10/06
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
	EMCO Video Camera Model 2075	680	00183858	NCR

2.4.2 Test Conditions

EIRP measurements were performed with the TuneFM – Model F8Z075 set up on a wooden table above the turntable at a distance of 3 meters from Biconilog antenna within the semi-anechoic chamber.

The TuneFM - Model F8Z075 was configured to operate in the continuous mode of operation to maximize the emissions. The TuneFM - Model F8Z075 was tested at the low mid and high frequencies. The TuneFM - Model F8Z075 was set up and powered by +3.3 VDC for this test.

2.4.3 Test Method

The test method of ESTI EN 300 220-1 Clause 8.3 was followed for the EIRP measurement. A manual signal substation test was performed. During this test, the antenna, turntable and the EUT were manipulated to maximize the emission level. The device was positioned to maximize radiation in all three orthogonal planes during preliminary testing.

2.4.4 Results

The Belkin Corporation TuneFM – Model F8Z075 is fully compliant with the EIRP requirement for the Fundamental and Spurious Emissions of AS/NZS 4268:2003.

No Spurious emissions were detected.

The maximum EIRP measured was 7.2uW at 88.1 MHz.

2.4.5 Test Data

EIRP OF THE FUNDAMENTAL

CUSTOMER: Belkin Corporation
EQUIPMENT: TuneFM - Model F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 22, 3006
TEST NUMBER: 4
PROCEDURE: ESTI EN 300 220-1 Clause 8.3

FREQUENCY MHz	Signal Generator -dBm	ANTENNA HEIGHT (METERS)	TURNTABLE AZIMUTH (DEGREES)	ANTENNA V	CABLE LOSS dB	NUMERIC GAIN dBI	EIRP -dBm	EIRP UW
88.1	**-52.8**	**1.0**	**0**	**V**	**0.80**	**0.60**	**-51.4**	**7.2**
98.2	**-54.9**	**1.0**	**0**	**V**	**0.80**	**0.99**	**-53.1**	**4.9**
107.9	**-57.9**	**1.0**	**0**	**V**	**1.00**	**0.45**	**-56.5**	**2.2**

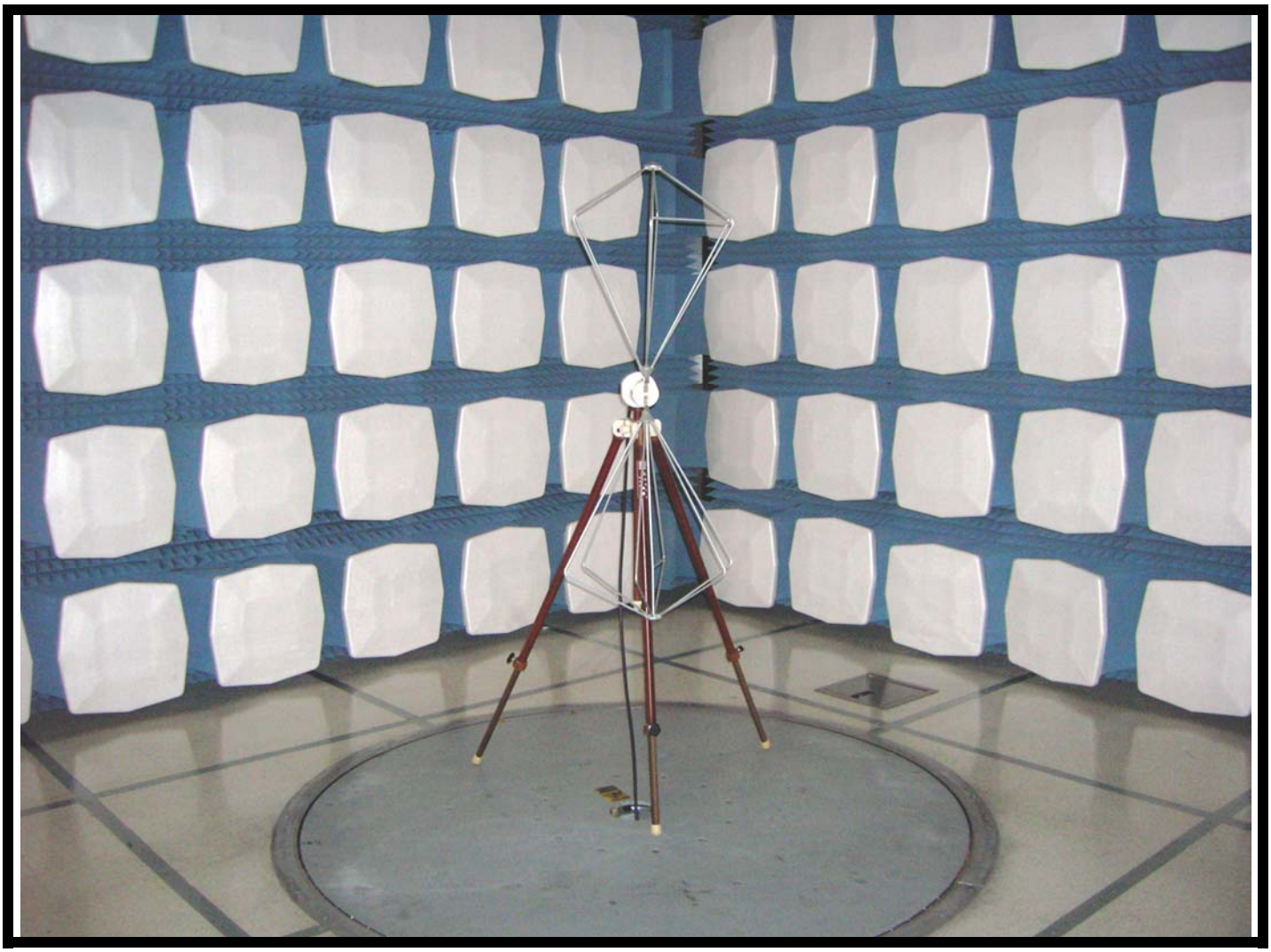
Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**
NOTES: 1MHz BW

FORM CTS-DS-001R

2.4.6 Photographic Documentation

CUSTOMER: Belkin Corporation
EQUIPMENT: TuneFM - Model F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 22, 3006
TEST NUMBER: 4
PROCEDURE: ESTI EN 300 220-1 Clause 8.3

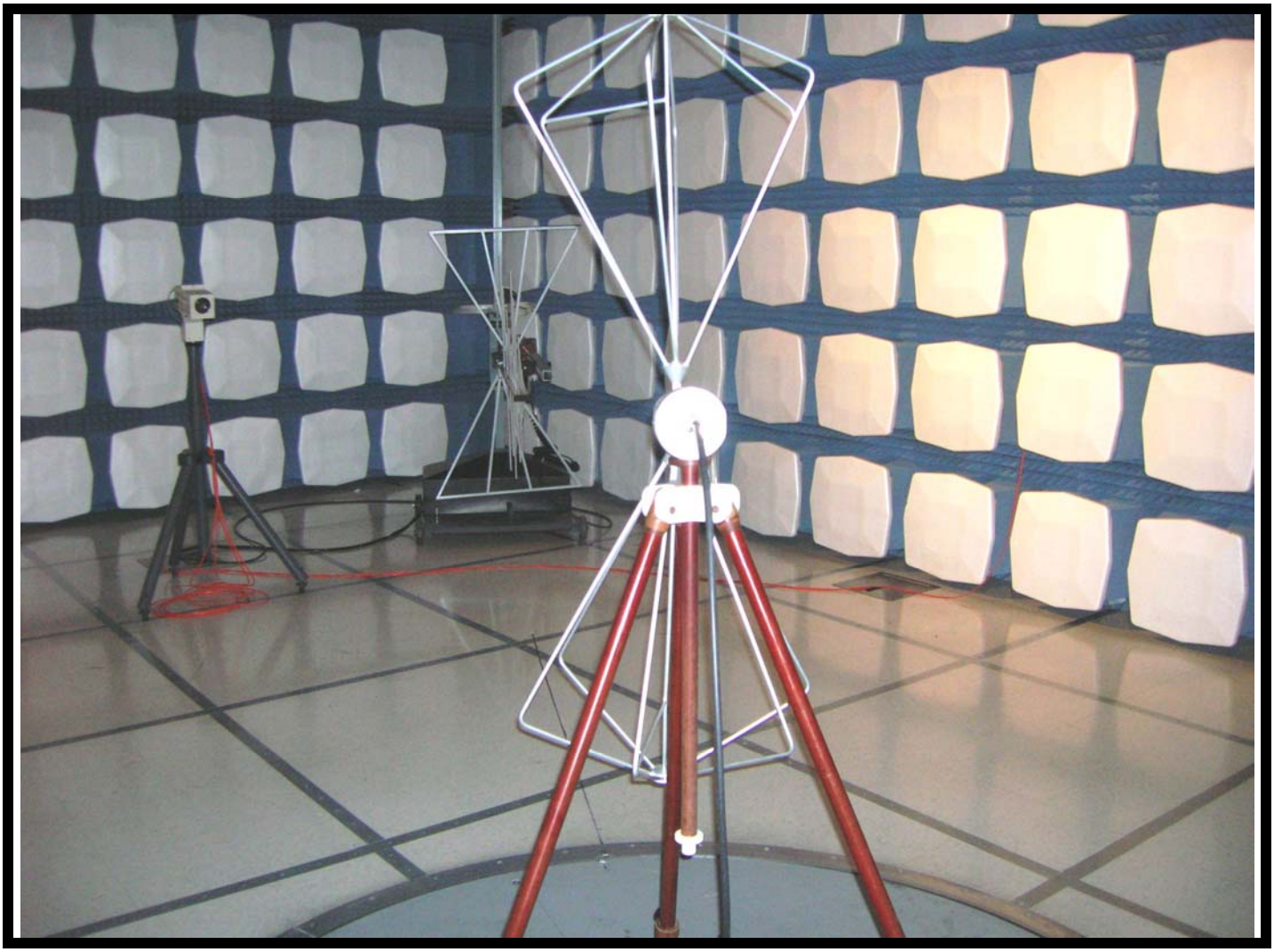


FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: Belkin Corporation
EQUIPMENT: TuneFM - Model F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: MARCH 22, 3006
TEST NUMBER: 4
PROCEDURE: ESTI EN 300 220-1 Clause 8.3



FORM CTS-PHOTO

2.5 FCC Class B Radiated Emissions (FCC 47 CFR 15.33)

2.5.1 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	IBM Personal Computer Model 300XL	N/A	23TMP08	NCR
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

2.5.2 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 antenna within the Semi-anechoic Chamber.

The Belkin Corporation TuneFM - Model F8Z075 was configured to operate in the normal mode of operation to maximize the emissions. The TuneFM - Model F8Z075 was set up and powered by +3.3 VDC for radiated emission tests. The worst case signals detected were recorded.

2.5.3 Test Method

The test method of FCC Part 15.33 Radio Frequency Devices was followed. The lowest frequency generated or used on this device was identified to be 1.2 MHz; therefore, a manual scan was performed from 1 MHz – 30 MHz. During this scan, the antenna, turntable and the EUT's position was manipulated to maximize the emission levels in a given frequency band displayed on the receiver. The device was positioned to maximize radiation in all three orthogonal planes during preliminary testing.

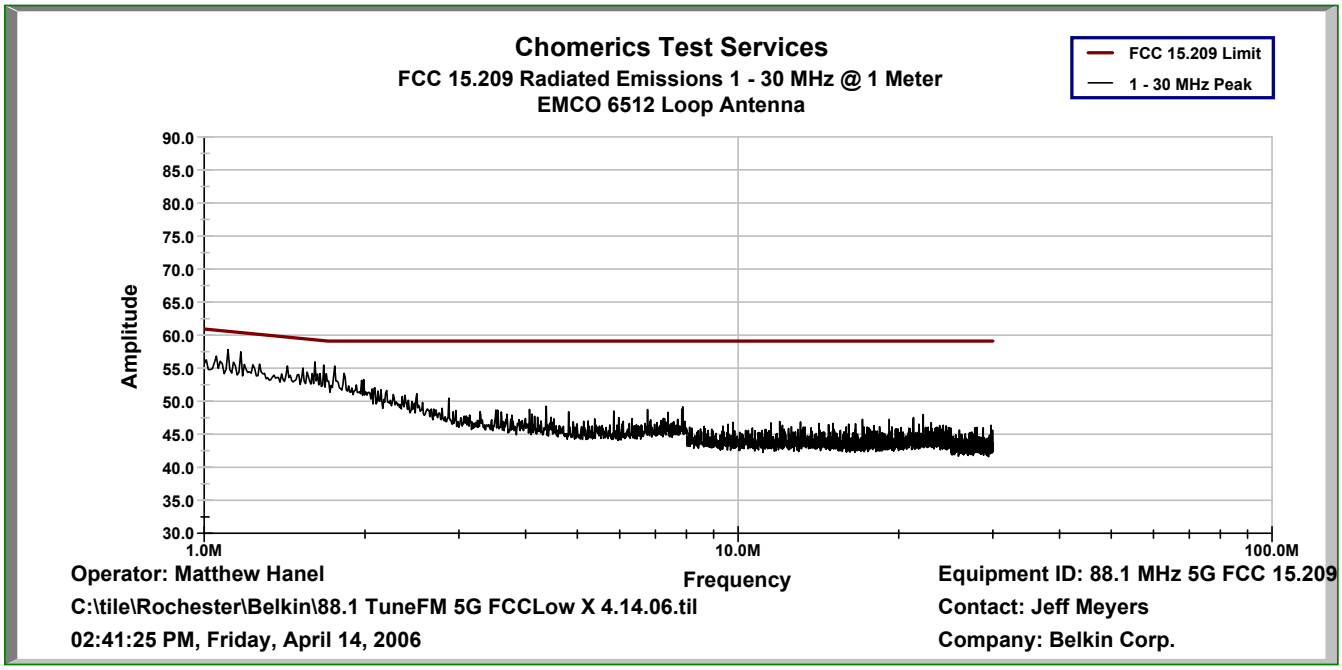
Subsequently, an automated scan was performed in 3 antenna polarizations to maximize the emissions from the EUT using the Quantum Change Tile Software.

2.5.4 Results

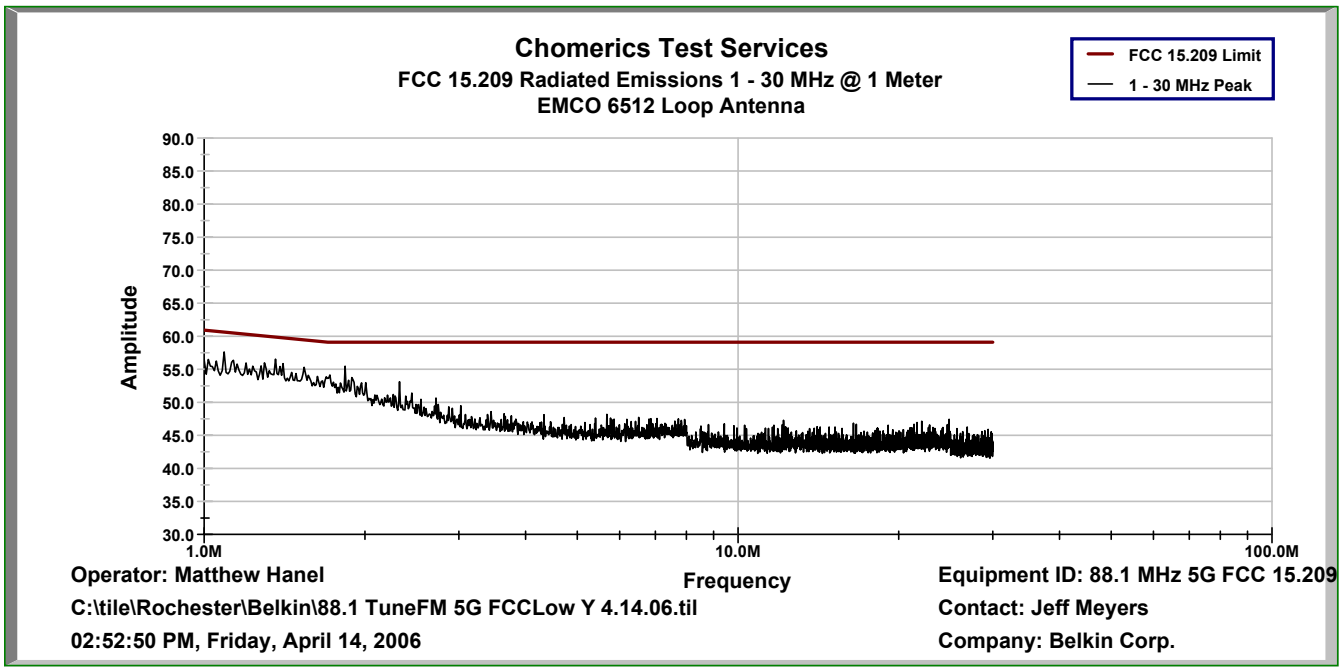
Peak measurements recorded across the frequency range of 1 – 30 MHz revealed no signals that were within 6dB of the limit. The Belkin Corporation TuneFM - Model F8Z075 meets the requirements for radiated emissions as required by FCC Part 15.33.

2.5.5 Test Data

Low Frequency 88.1 MHz – X Polarization

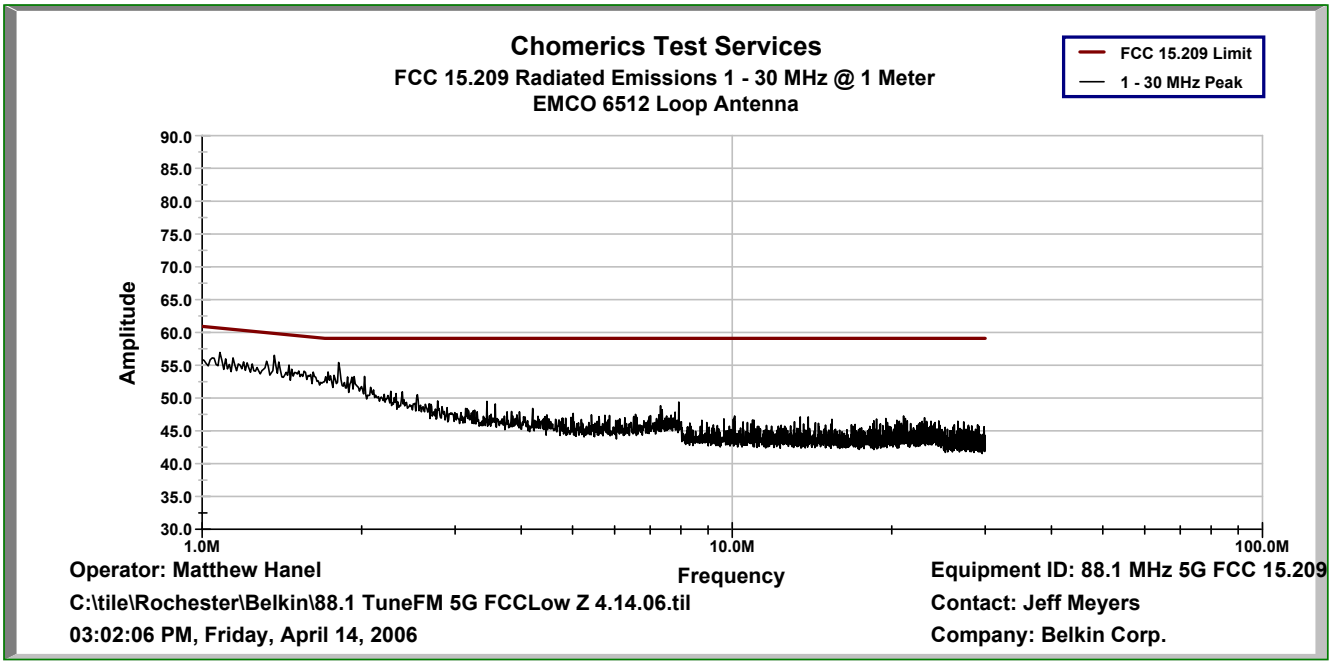


Low Frequency 88.1 MHz – Y Polarization

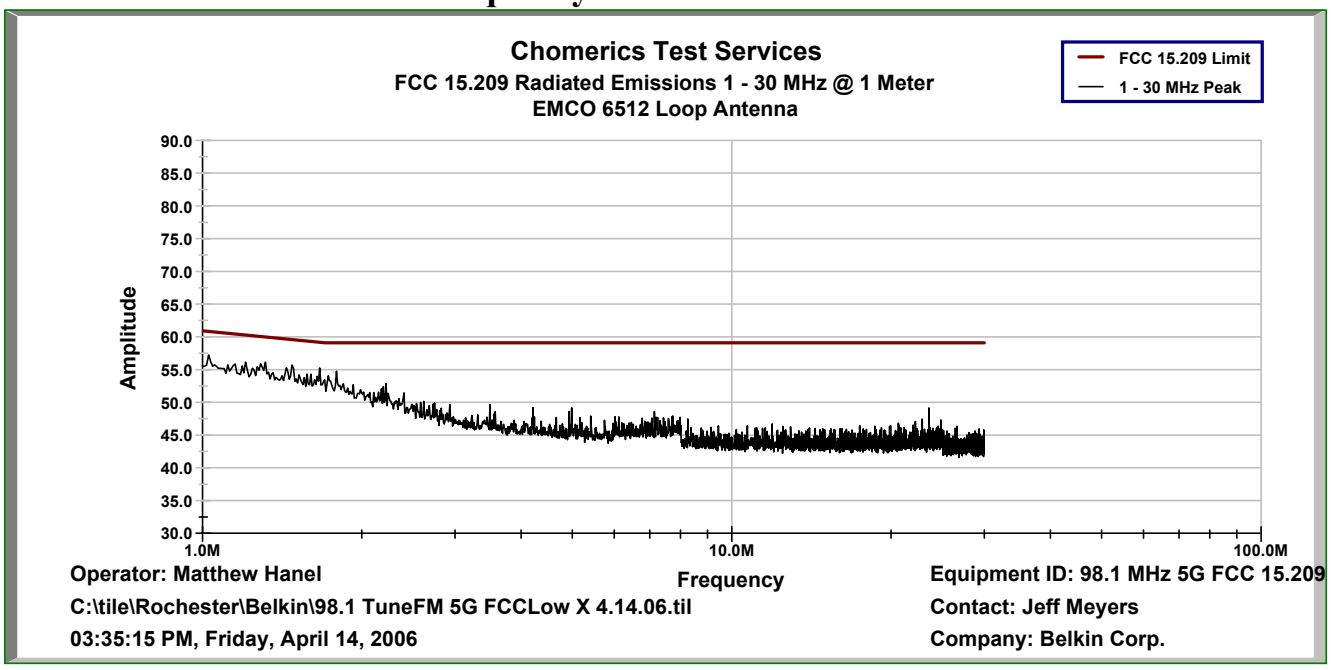


Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

Low Frequency 88.1 MHz – Z Polarization

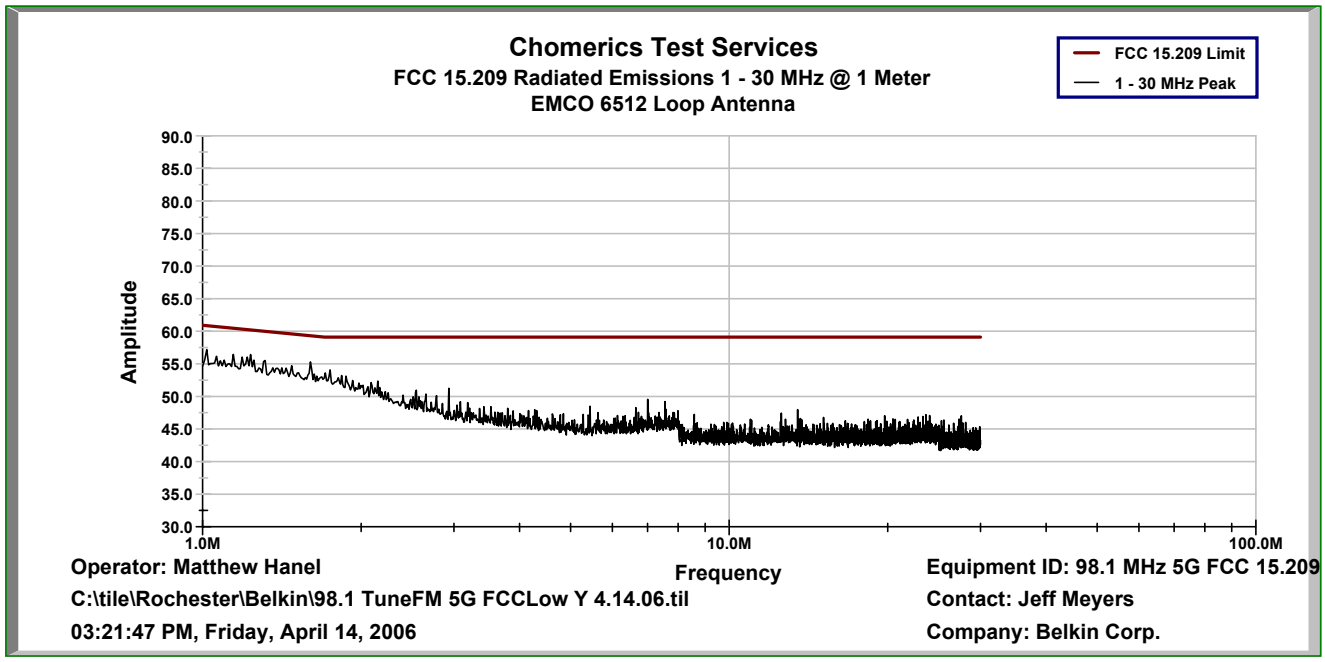


Middle Frequency 98.1 MHz – X Polarization

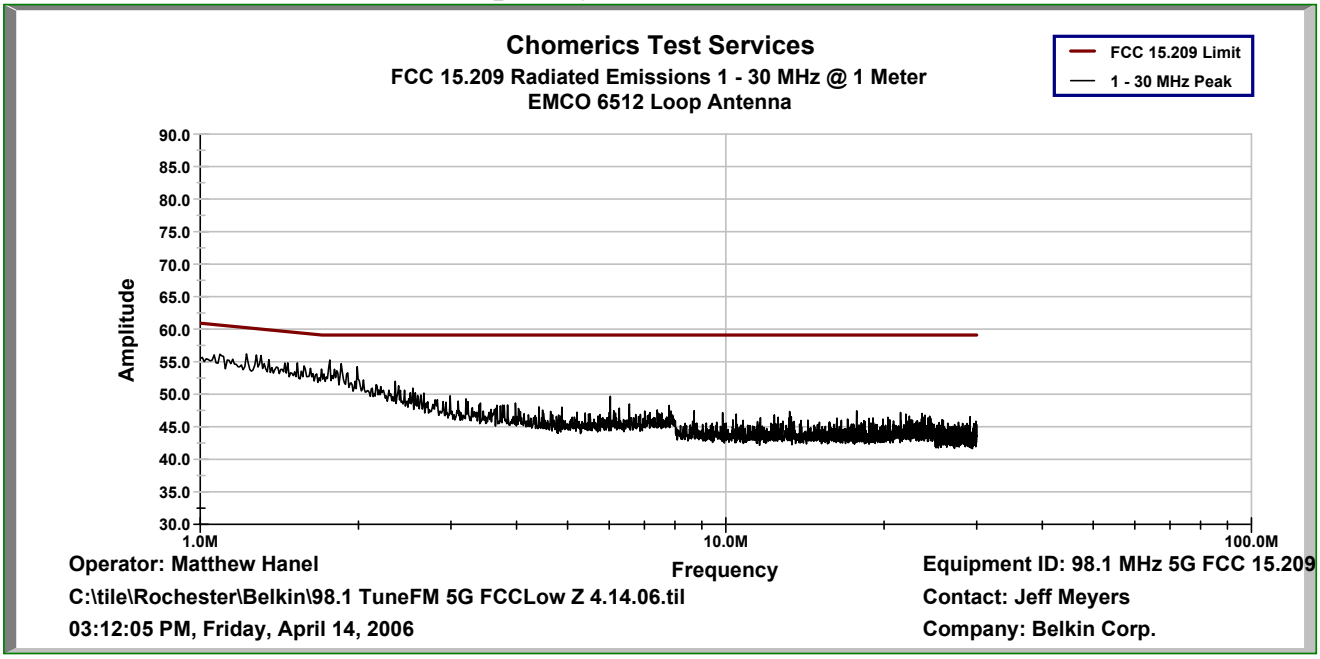


Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

Middle Frequency 98.1 MHz – Y Polarization

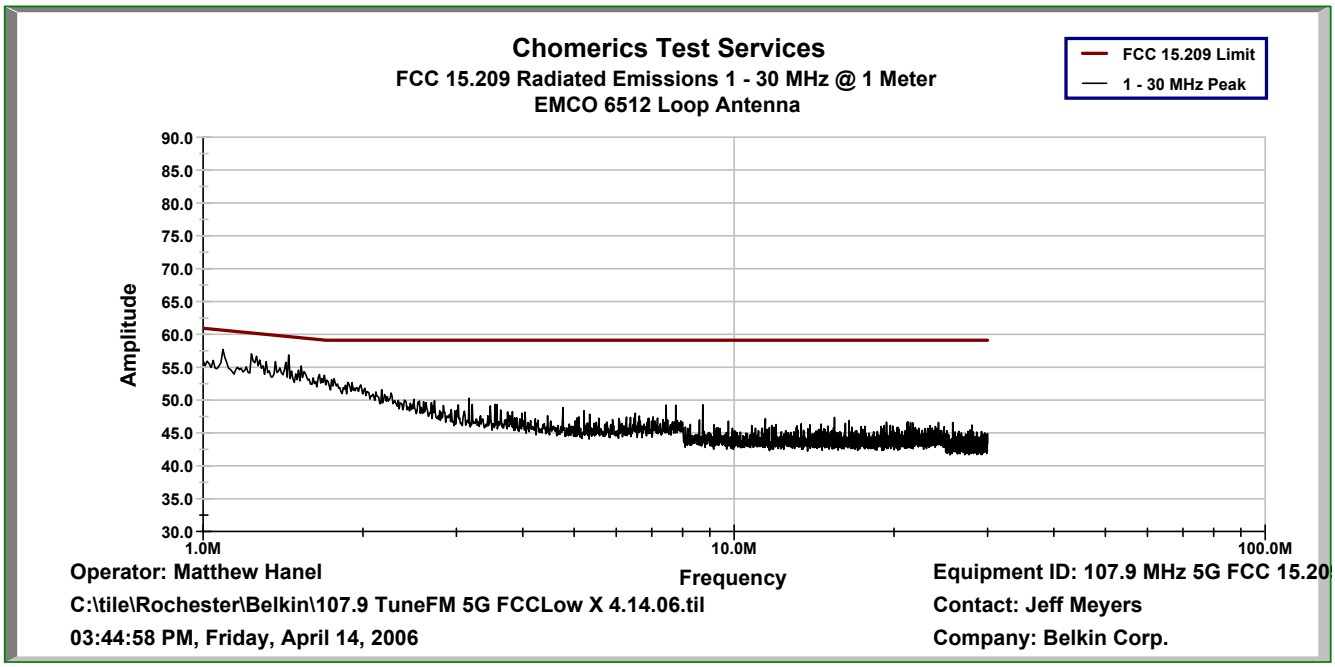


Middle Frequency 98.1 MHz – Z Polarization

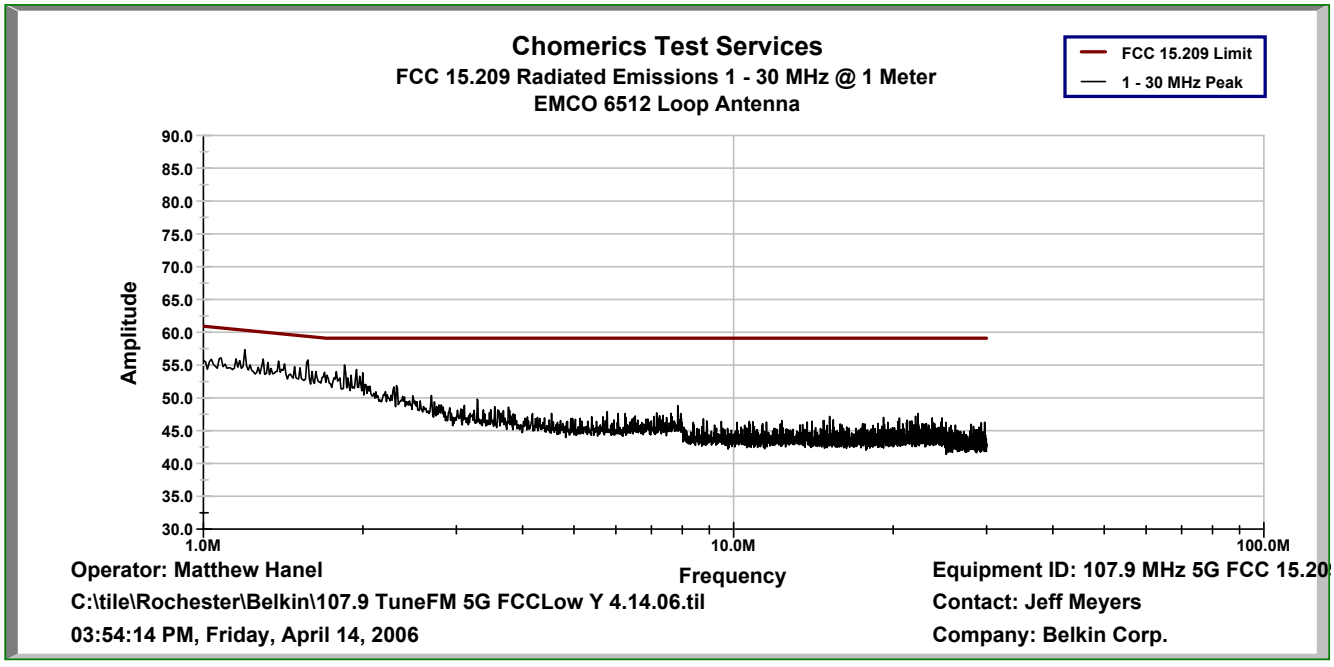


Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

High Frequency 98.1 MHz – X Polarization

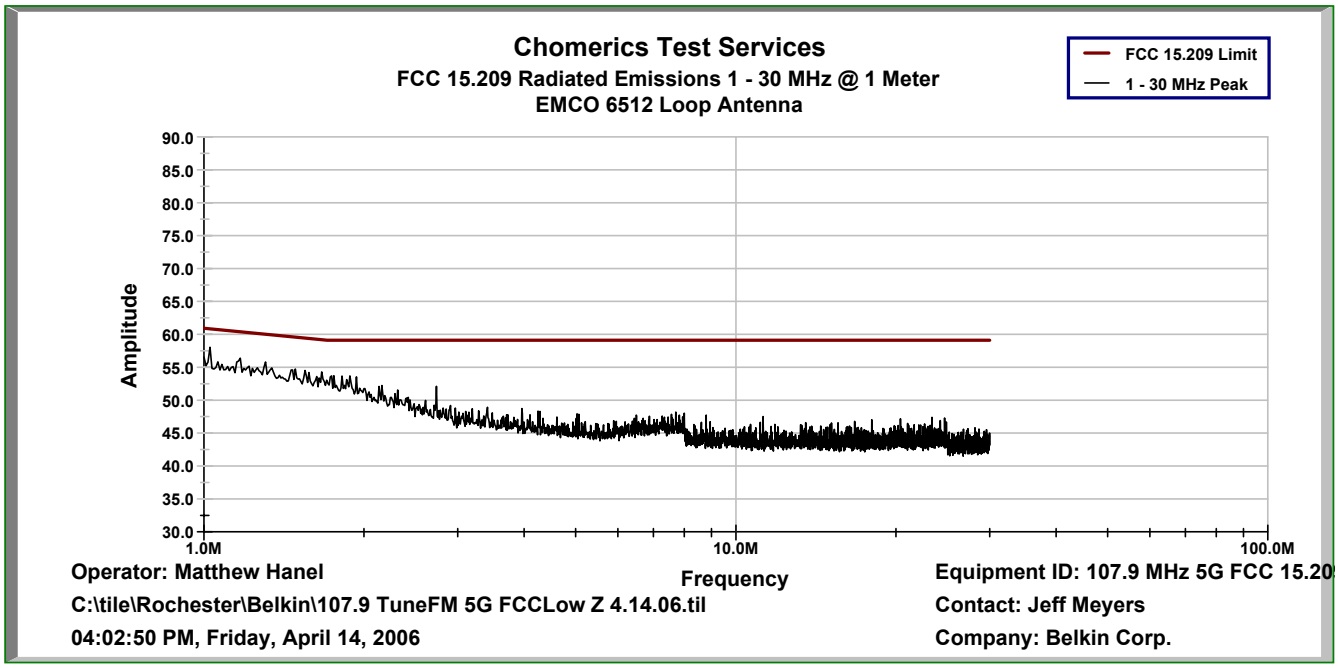


High Frequency 98.1 MHz – Y Polarization



Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

High Frequency 98.1 MHz – Z Polarization



Ambient Temperature: 72°F **Humidity: 33%** **Atmospheric Pressure: 30.1″**

2.5.6 Photographic Documentation

CUSTOMER: Belkin Corporation
EQUIPMENT: TuneFM - Model F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

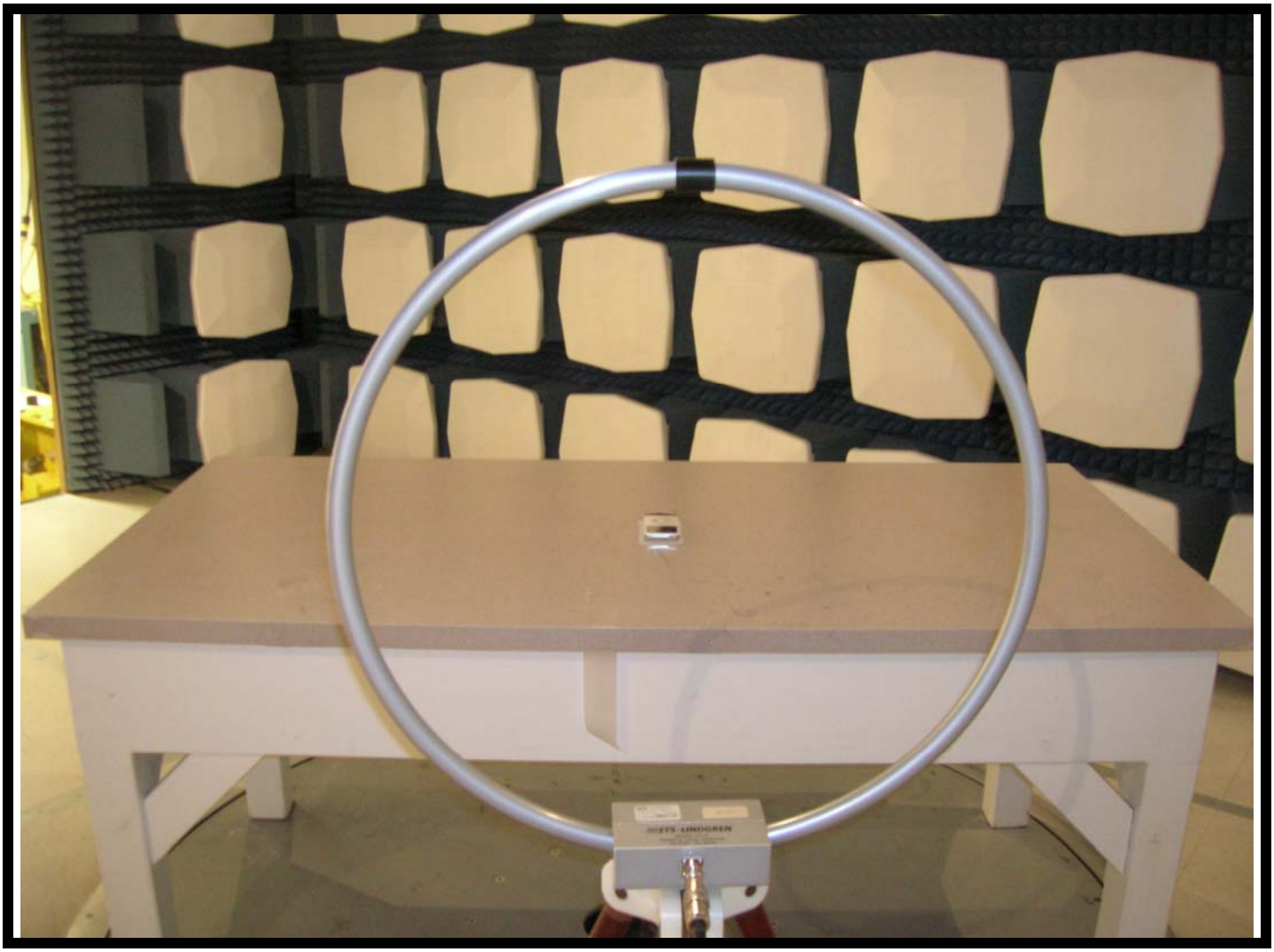
DATE: APRIL 14, 2006
TEST NUMBER: 5
FCC Subpart C 15.33

FORM CTS-PHOTO

Photographic Documentation

CUSTOMER: Belkin Corporation
EQUIPMENT: TuneFM - Model F8Z075
TESTED BY: MATTHEW HANEL
OPERATING MODE: NORMAL

DATE: APRIL 14, 2006
TEST NUMBER: 5
FCC Subpart C 15.33



FORM CTS-PHOTO

APPENDIX A

TEST LOG

TEST LOG

CUSTOMER: BELKIN CORPORATION
EQUIPMENT: TUNEFM - MODEL F8Z075

PROGRAM: EMISSIONS
TESTED BY: MATTHEW HANEL

	Date	Comments					
Pre-Test Checklist	March 21, 2006	Test Plan/Procedure: ANSI C63.4 & ESTI EN 300 220-1 Clause 8.3 Test Specification: FCC Part 15 Subpart C 15.239, 15.33 & AS/NZS 4268:2003 Chomerics Procedure: CHO TPECROC T2 EUT Power Requirement Verified: Voltage 3.3VDC 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
	3.21.06	1	20dB Width Measurements	Yes	Yes	Yes	Pass
	3.32.06	2	Output Power Measurements	Yes	Yes	Yes	Pass
	3.21.06 – 3.22.06	3	FCC 15.239 Radiated Emissions	Yes	Yes	Yes	Pass
	3.22.06	4	EIRP	Yes	Yes	Yes	Pass
	4.14.06	5	FCC 15.33 Radiated Emissions	Yes	Yes	Yes	Pass
Post Test Checklist	Date: April 14, 2006	EUT Functional Operation Check: [X] Pass [ ] Fail			Test Engineer/Tech	Approved Signatory	

FORM CTS-010