

**EMC EVALUATION OF THE  
BELKIN CORPORATION  
TUNEBASE FM FOR IPOD - MODEL F8Z049**

**Date:** DECEMBER 6, 2005  
**Test Report Number:** TRR0265.05

**IN ACCORDANCE WITH  
FCC PART 15 SUBPART C 15.239**

**Prepared For:** BELKIN CORPORATION  
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ATTENTION: JEFF MEYERS

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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 TuneBase FM for iPod - Model F8Z049 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 Electromagnetic Interference (EMI) Standard FCC Part 15 Subpart C 15.239.

The Radiated and Conducted Emission Standard FCC Part 15 Subpart C 15.239 is designated for Information Technology Equipment (ITE) with intentional transmitters.

Jeff Meyers from Belkin Corporation was present during testing. Testing was performed on December 2, 2005.

**1.1.2 Requirements**

The requirements for the sequence of tests performed on the TuneBase FM for iPod - Model F8Z049 are as follows:

**FCC Part 15 Subpart C 15.239 Radiated Electromagnetic Emissions**

FCC Part 15 Subpart C 15.239, Emission requirements for Information Technology Equipment (ITE).

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 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.

Conducted Emissions is not required due to the fact that the device under test is DC powered.

## 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.

20dB Bandwidth of Fundamental Emission	Passed
FCC Part 15 Subpart C Field Strength (FCC 47 CFR 15.239)	Passed
FCC Class B Radiated Emissions (FCC 47 CFR 15.209 Class B)	Passed

### 1.2.1 Summary of Recommendations

The Belkin Corporation TuneBase FM for iPod - Model F8Z049 will require no modifications in order to ensure compliance with the Electromagnetic Interference Standard FCC Part 15 Subpart C 15.239.

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.

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:

$$\text{Field Level dBuV} = \text{Measured Value dBuV} + \text{Antenna Factor dB} + \text{Cable Loss dB}$$

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

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.

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

**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 TuneBase FM for iPod - Model F8Z049 are as follows: (Refer to Section 1.4.2 for test site descriptions).

**Emissions Test**

**Test Site**

20dB Bandwidth of Fundamental Emission	Semi-Anechoic Chamber
FCC Part 15 Subpart C Field Strength (FCC 47 CFR 15.239)	Semi-Anechoic Chamber
FCC Class B Radiated Emissions (FCC 47 CFR 15.209 Class B)	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:

<b>Field</b>	<b>Attenuation</b>
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.



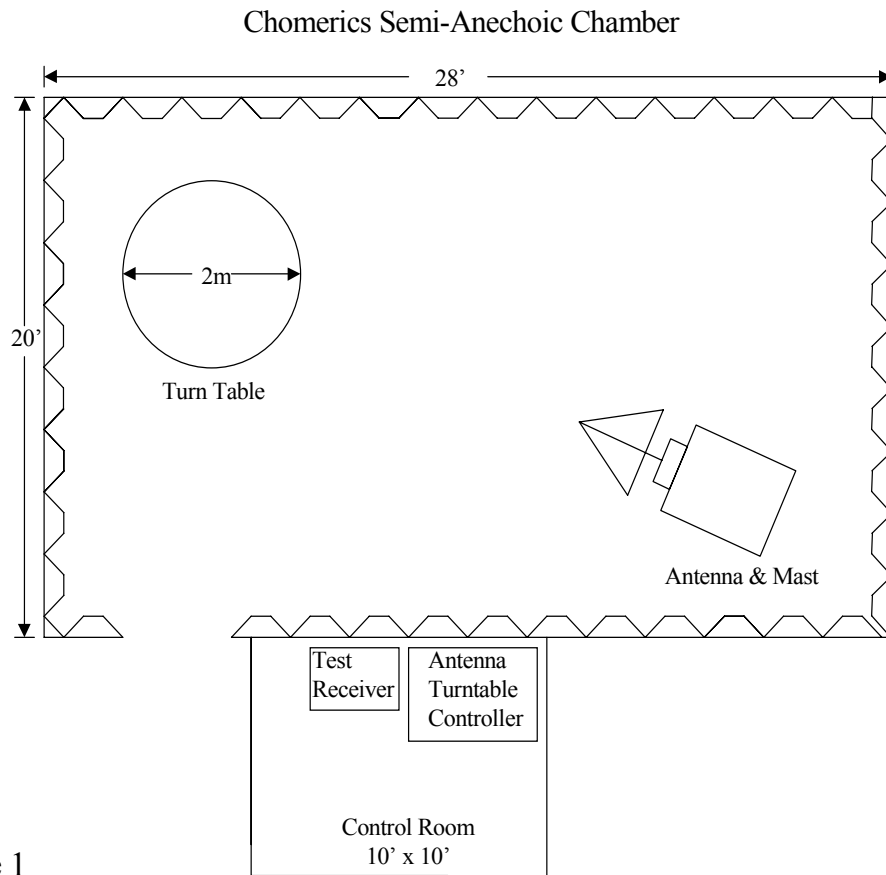


Figure 1

### 1.4.3 Equipment Under Test

The Belkin Corporation TuneBase FM for iPod - Model F8Z049 (Serial Number: Unit 1) is a device that wirelessly transmits audio signals from a 4G iPod to an FM receiver. It also allows the user to set the transmission frequency in the band 88.1MHz to 107.9MHz in 0.1MHz intervals.

The support equipment needed to run the Belkin Corporation TuneBase FM for iPod - Model F8Z049 in the normal mode of operation consisted of the following:

- a. DC Power Source                      Manufacturer: Eveready Battery Co.  
P/N; 24F-525EV
  
- b. 4G iPod -                                Manufacturer: Apple  
Model: A1059  
S/N: 2Z52043JPS9

The TuneBase FM for iPod - Model F8Z049 is a DC powered device and normally operates on +5 VDC power from a vehicle. For the purpose of radiated emission tests, power was supplied by the 12 VDC automotive battery.

There were no I/O connections other than the 3” gooseneck from the automotive power accessory to the iPod.

The normal mode of operation was used for emissions tests. The TuneBase FM for iPod - Model F8Z049 was monitored during the tests by Jeff Meyers of Belkin.

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

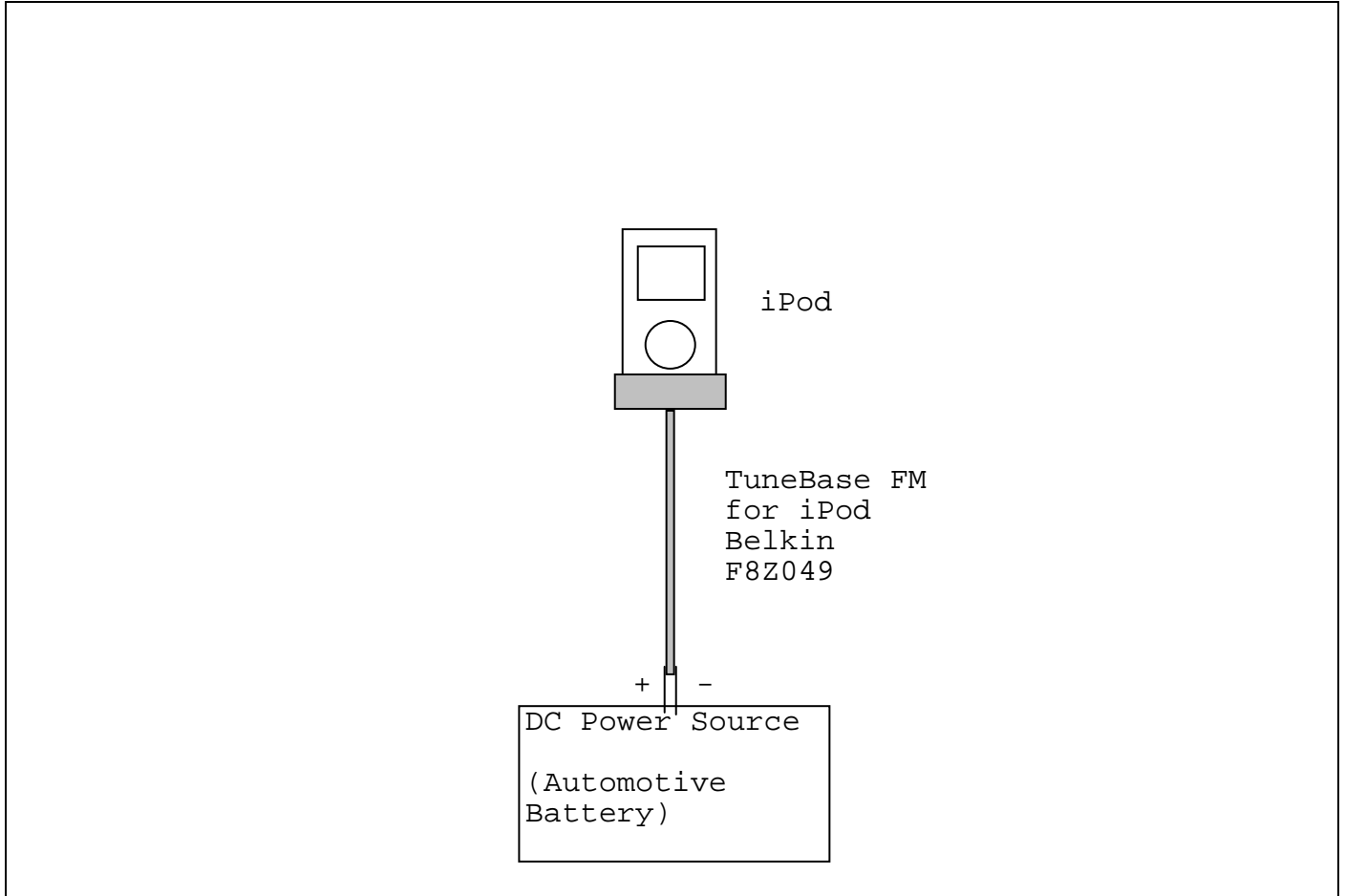
1.4.4 Block Diagram

CUSTOMER: BELKIN CORPORATION

DATE: DECEMBER 2, 2005

EQUIPMENT: TUNEBase FM FOR IPOD - MODEL F8Z049

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**

	<b>Test Equipment</b>	<b>Asset #</b>	<b>Serial #</b>	<b>Cal Date</b>
X	EMC Test Systems Semi-anechoic Chamber	667	N/A	10/06
X	Rhode and Schwartz ESCS30 Test Receiver	638	826547/024	12/05
X	EMCO 3142B Biconilog Antenna	668	9903-1357	12/05
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	1/06
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 TuneBase FM for iPod – Model F8Z049 set up on a wooden table above the turntable at a distance of 3 meters from biconilog antenna within the semi-anechoic chamber. The TuneBase FM for iPod – Model F8Z049 was configured to operate in the normal mode of operation at the low, middle and then high transmit frequencies.

**2.1.3 Test Method**

The bandwidth of the TuneBase FM for iPod – Model F8Z049 was measured through an air interface. The TuneBase FM for iPod – Model F8Z049 was placed on top of a wooden turntable 3 meters from a receiving antenna. The bandwidths of the TuneBase FM for iPod – Model F8Z049 were measured at the low, middle and high transmit frequencies.

**2.1.4 Results**

The Belkin TuneBase FM for iPod – Model F8Z049 meets the maximum 200 kHz bandwidth requirement at each of the frequencies tested.

2.1.5 Test Data

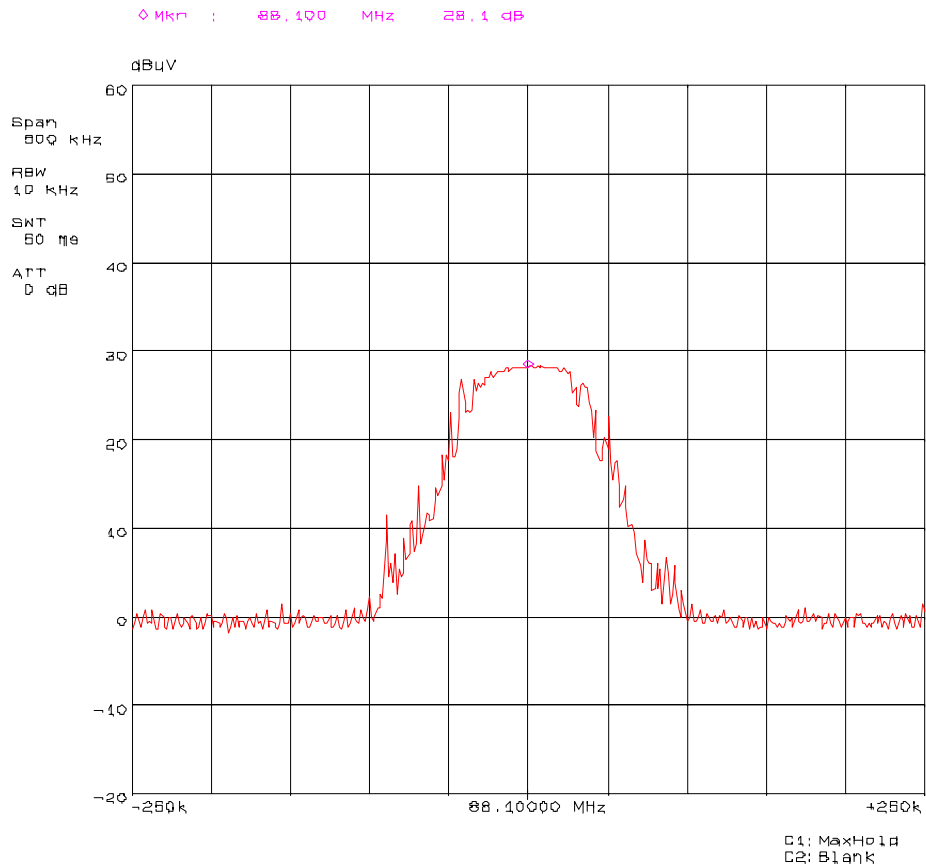
20dB BANDWIDTH MEASUREMENTS

CUSTOMER: BELKIN CORPORATION  
 EQUIPMENT: TUNEBASE FM FOR IPOD – MODEL F8Z049  
 TESTED BY: MATTHEW HANEL

DATE: DECEMBER 2, 2005  
 TEST NUMBER: 1  
 OPERATING MODE: CONTINUOUS TRANSMISSION  
 LOW FREQ.

02, Dec 05 12:18

20B Bandwidth  
 88.1 MHz Fundamental Frequency



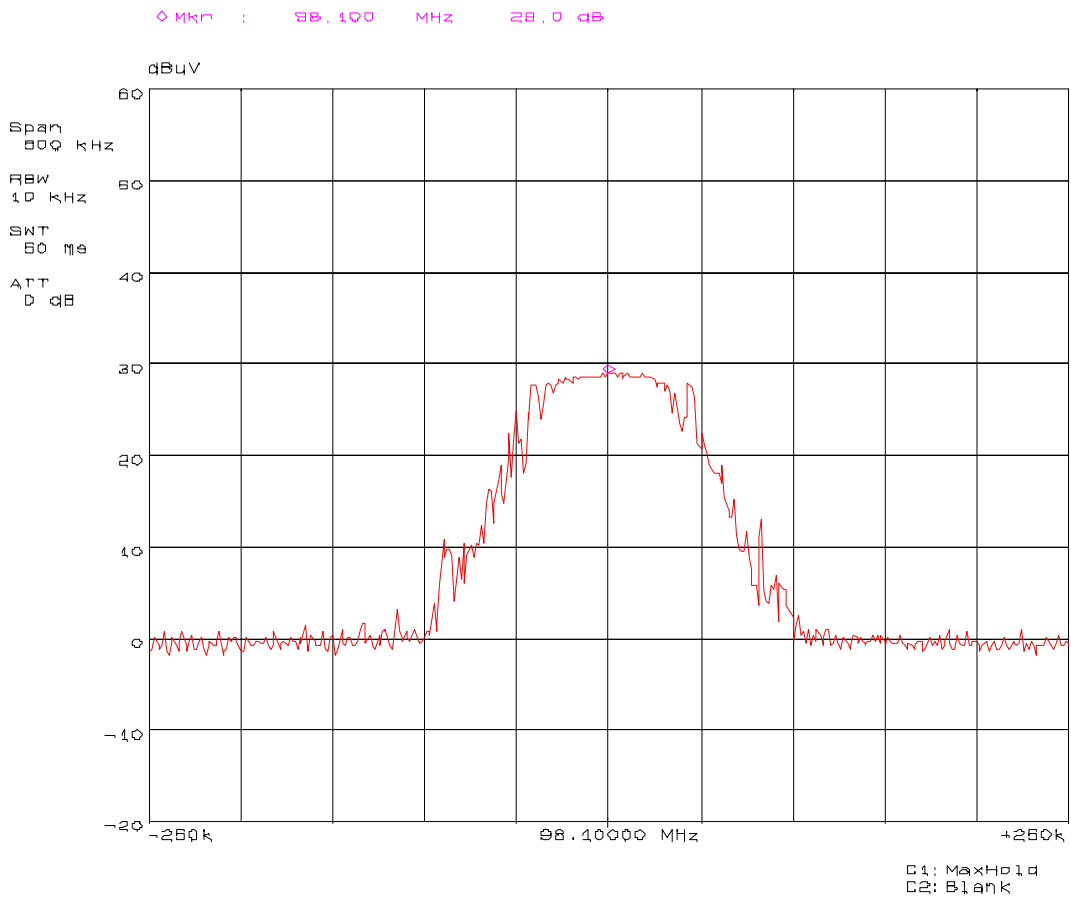
CUSTOMER: BELKIN CORPORATION  
 EQUIPMENT: TUNEBase FM FOR IPOD – MODEL F8Z049  
 TESTED BY: MATTHEW HANEL

DATE: DECEMBER 2, 2005  
 TEST NUMBER: 1

OPERATING MODE: CONTINUOUS TRANSMISSION  
 MID. FREQ.

02. Dec 05 12:55

**20B Bandwidth  
 98.1 MHz Fundamental Frequency**



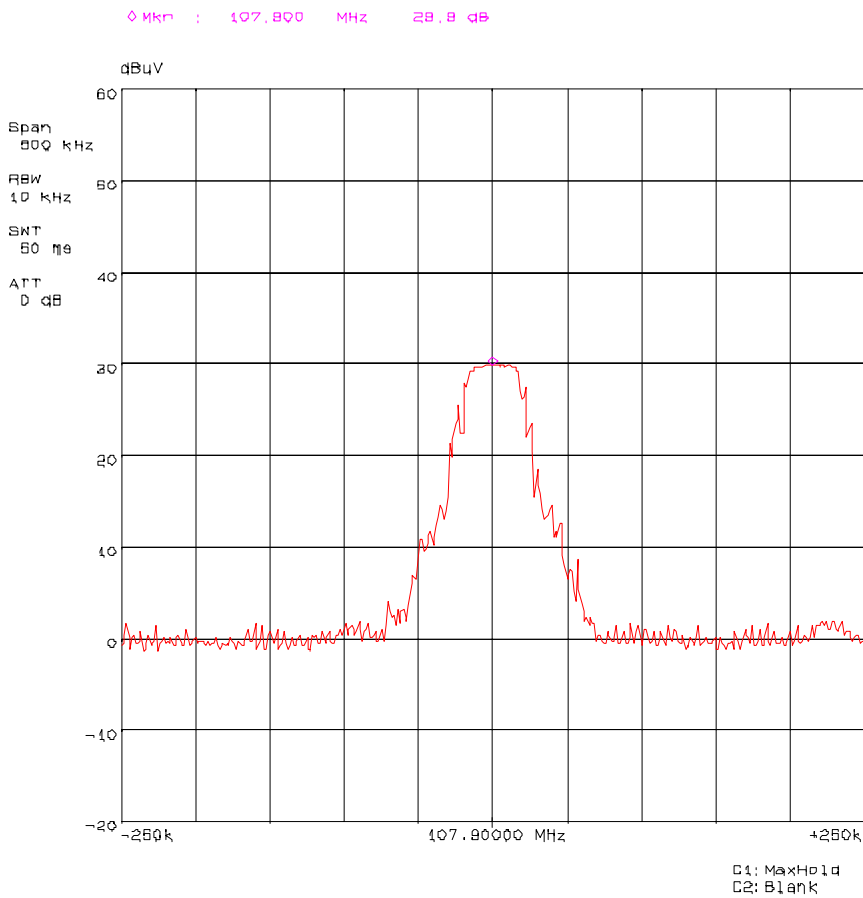
Belkin Corporation TuneBase FM for iPod - Model F8Z049  
 Document #: TRR0265.05  
 Date: December 6, 2005

CUSTOMER: BELKIN CORPORATION  
 EQUIPMENT: TUNEBASE FM FOR IPOD – MODEL F8Z049  
 TESTED BY: MATTHEW HANEL

DATE: DECEMBER 2, 2005  
 TEST NUMBER: 1  
 OPERATING MODE: CONTINUOUS TRANSMISSION  
 HIGH FREQ.

02, Dec 05 13:28

**20B Bandwidth**  
**107.9 MHz Fundamental Frequency**



## 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	12/05
X	EMCO 3142B Biconilog Antenna	668	9903-1357	12/05
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	1/06
	EMCO 3115 Microwave Horn Antenna	376	2796	1/06
	EMCO 3105 Microwave Horn Antenna	78	2118	1/06
	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 TuneBase FM for iPod – Model F8Z049 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 TuneBase FM for iPod – Model F8Z049 was configured to operate in the normal mode of operation at the low, middle and then high transmit frequencies.

### 2.2.3 Test Method

The field strength of the Belkin TuneBase FM for iPod – Model F8Z049 was measured with the Rhode and Schwarz ESCS30 Test Receiver.

### 2.2.4 Results

The Belkin TuneBase FM for iPod – Model F8Z049 meets the field strength requirement of FCC Part 15 Subpart C 15.239, for the frequencies tested.



2.2.4 Test Data

OUTPUT POWER MEASUREMENTS

CUSTOMER: BELKIN CORPORATION

DATE: DECEMBER 2, 2005

EQUIPMENT: TUNEBASE FM FOR IPOD – MODEL F8Z049

TEST NUMBER: 2

TESTED BY: MATTHEW HANEL

OPERATING MODE: CONTINUOUS TRANSMISSION

Field Strength of Fundamental Emissions - Low Frequency 88.1 MHz

Peak

Frequency MHz	Measured dBuV	QP	Antenna Factor	Cable Factor	Corrected dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
88.1	33.81		6.98	0.78	41.57	67.95	-26.38	264	379	H

Average

Frequency MHz	Measured dBuV	QP	Antenna Factor	Cable Factor	Corrected dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
88.1	33.71		6.98	0.78	41.47	47.95	-6.48	264	379	H

Field Strength of Fundamental Emissions - Mid. Frequency 98.1 MHz

Peak

Frequency MHz	Measured dBuV	QP	Antenna Factor	Cable Factor	Corrected dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
98.1	35.30		8.91	0.68	44.89	67.95	-23.06	262	300	H

Average

Frequency MHz	Measured dBuV	QP	Antenna Factor	Cable Factor	Corrected dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
98.1	35.09		8.91	0.68	44.69	47.95	-3.27	262	300	H

Field Strength of Fundamental Emissions - High Frequency 107.9 MHz

Peak

Frequency MHz	Measured dBuV	QP	Antenna Factor	Cable Factor	Corrected dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
107.9	36.30		8.38	0.70	45.39	67.95	-22.56	264	299	H

Average

Frequency MHz	Measured dBuV	QP	Antenna Factor	Cable Factor	Corrected dBuV	FCC Subpart C Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
107.9	36.24		8.38	0.70	45.33	47.95	-2.62	264	299	H

**2.2.6 Photographic Documentation**

CUSTOMER: BELKIN CORPORATION  
EQUIPMENT: TUNEBASE FM FOR IPOD - MODEL F8Z049  
TESTED BY: MATTHEW HANEL  
OPERATING MODE: NORMAL

DATE: DECEMBER 2, 2005  
TEST NUMBER: 2  
COUPLING DEVICE: EMCO BICONILOG ANTENNA



**Photograph Description: Radiated set-up**

**FORM CTS-PHOTO**

**Photographic Documentation**

CUSTOMER: BELKIN CORPORATION  
EQUIPMENT: TUNEBase FM FOR IPOD - MODEL F8Z049  
TESTED BY: MATTHEW HANEL  
OPERATING MODE: NORMAL

DATE: DECEMBER 2, 2005  
TEST NUMBER: 2  
COUPLING DEVICE: EMCO BICONILOG ANTENNA



**Photograph Description: Radiated 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	12/05
X	EMCO 3142B Biconilog Antenna	668	9903-1357	12/05
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 TuneBase FM for iPod - Model F8Z049 was configured to operate in the normal mode of operation to maximize the emissions. The TuneBase FM for iPod - Model F8Z049 was set up and powered by +5 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.

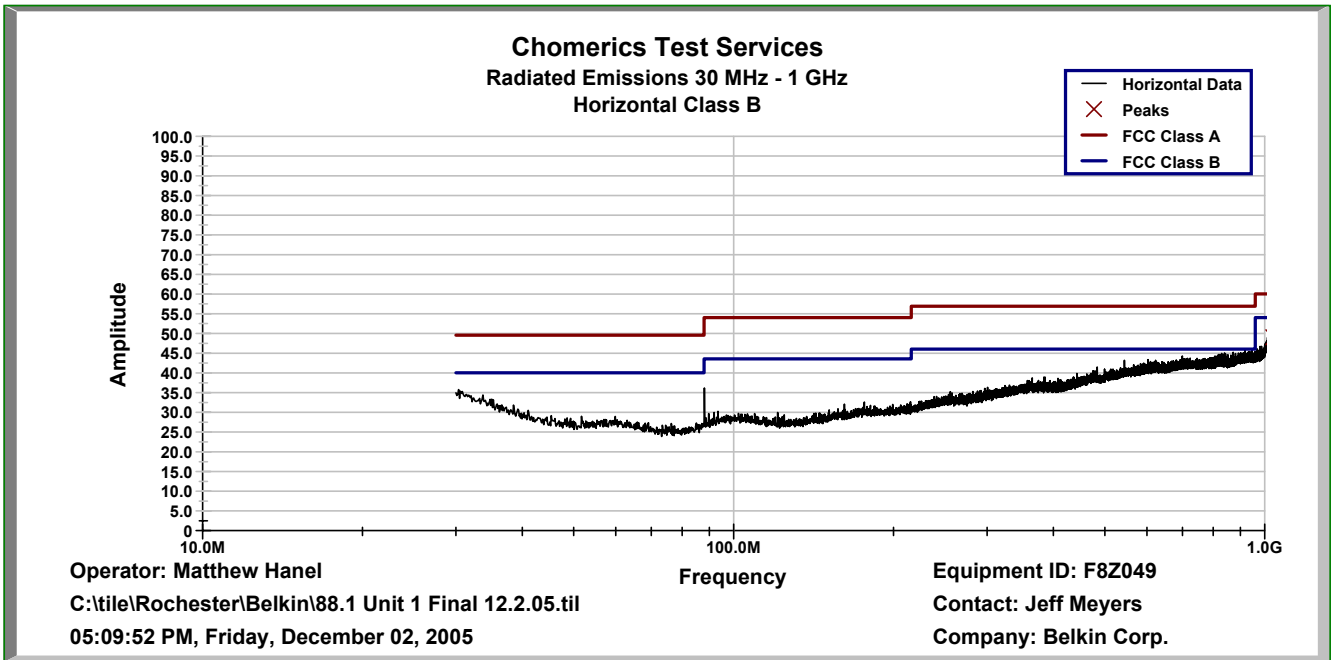
Subsequently, an automated scan was performed in both peak and quasi-peak detection modes using the Quantum Change Tile Software.

**2.3.4 Results**

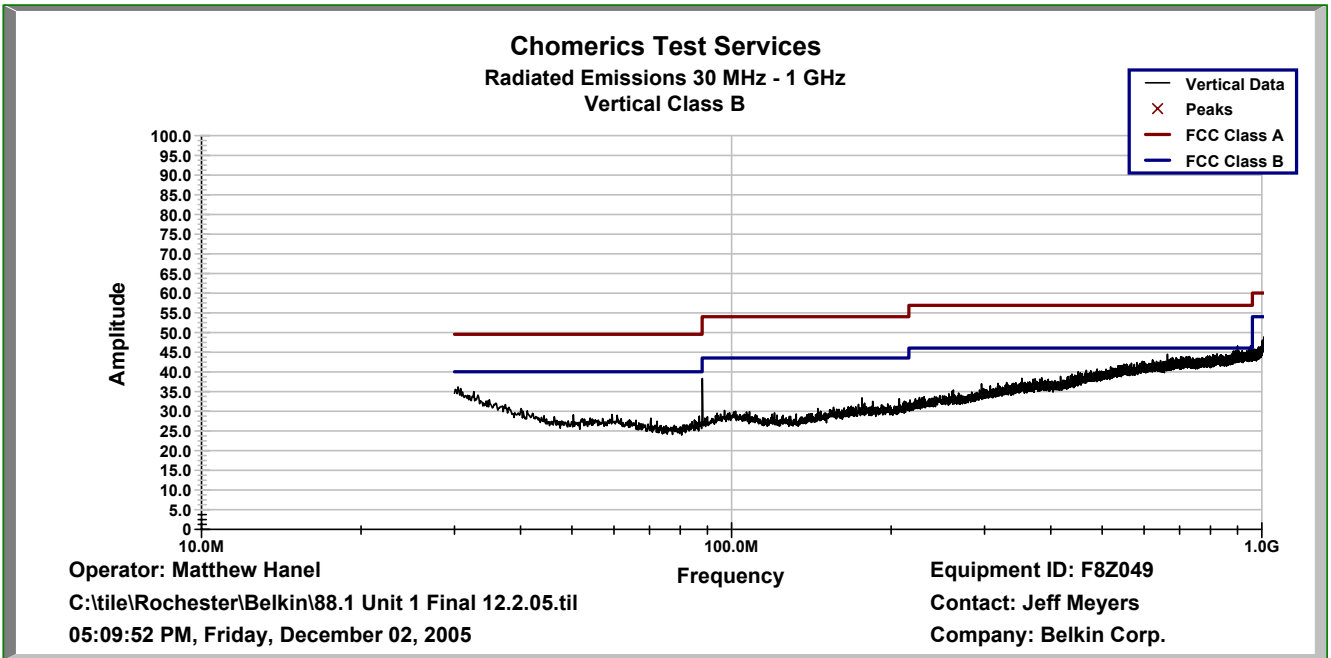
The Belkin Corporation TuneBase FM for iPod - Model F8Z049 meets the requirements for radiated emissions as required by FCC Part 15, Class B equipment.

2.3.5 Test Data

Low Frequency 88.1 MHz  
Graph Horizontal



Graph Vertical



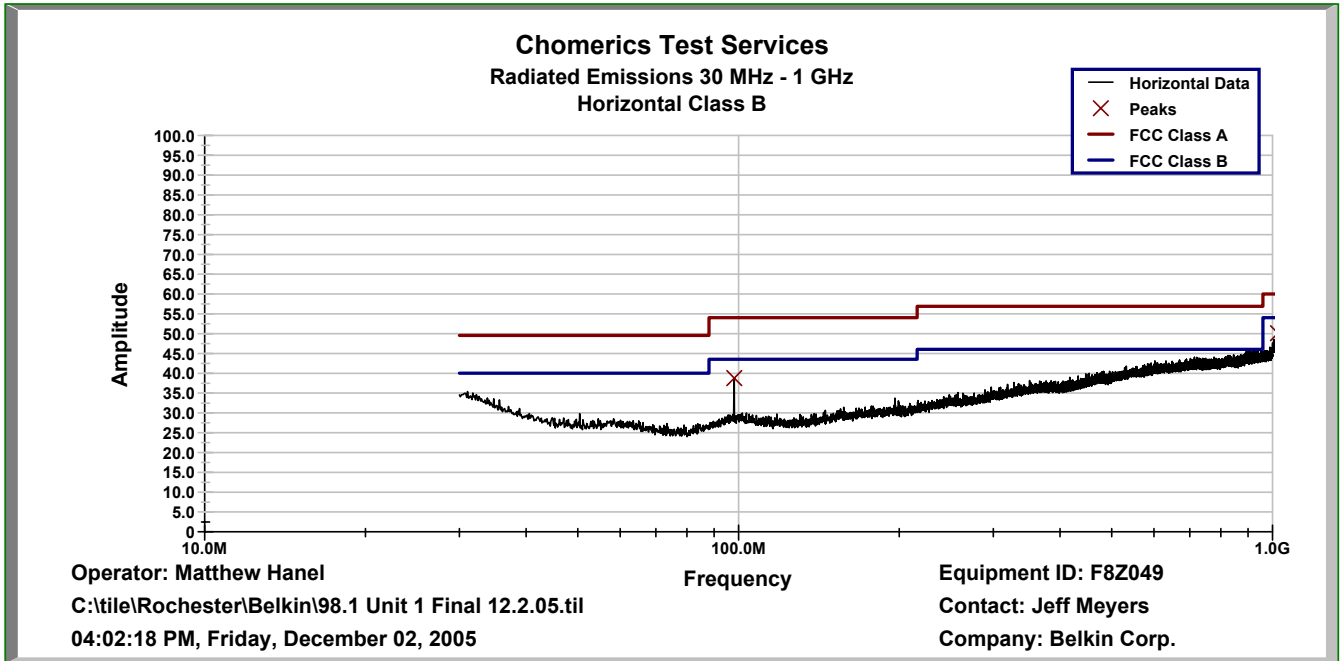
**Tabular Data – 88.1 MHz**

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

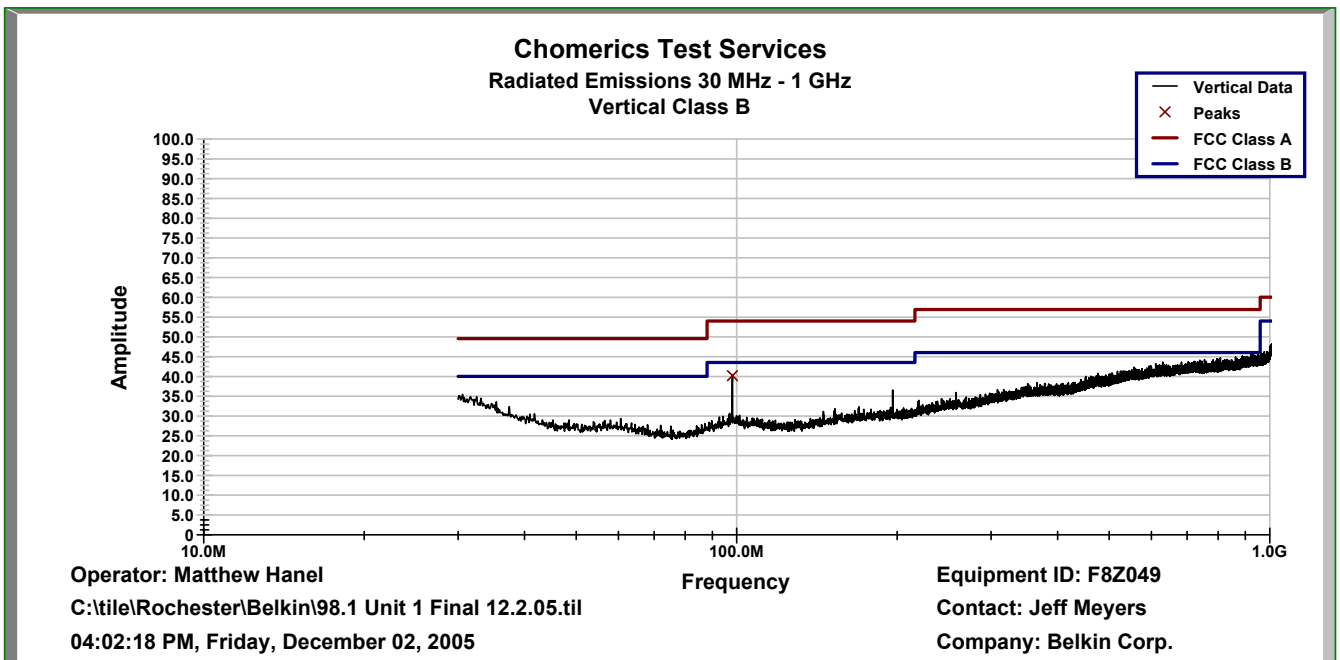
Operator: Matthew Hanel  
 C:\tile\Rochester\Belkin\88.1 Unit 1 Final 12.2.05.til  
 05:17:45 PM, Friday, December 02, 2005  
 Equipment ID: F8Z049  
 Contact: Jeff Meyers  
 Company: Belkin Corp.

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
917.87	1.73	22.73	3.27	27.73	46.02	-18.29	161	267	H
945.92	1.88	22.87	3.35	28.10	46.02	-17.92	229	113	H
900.09	1.77	22.80	3.22	27.79	46.02	-18.23	143	220	V
959.96	1.95	22.90	3.36	28.21	46.02	-17.81	296	102	V

Mid Frequency 98.1 MHz  
Graph Horizontal



Graph Vertical



**Tabular Data – 98.1 MHz**

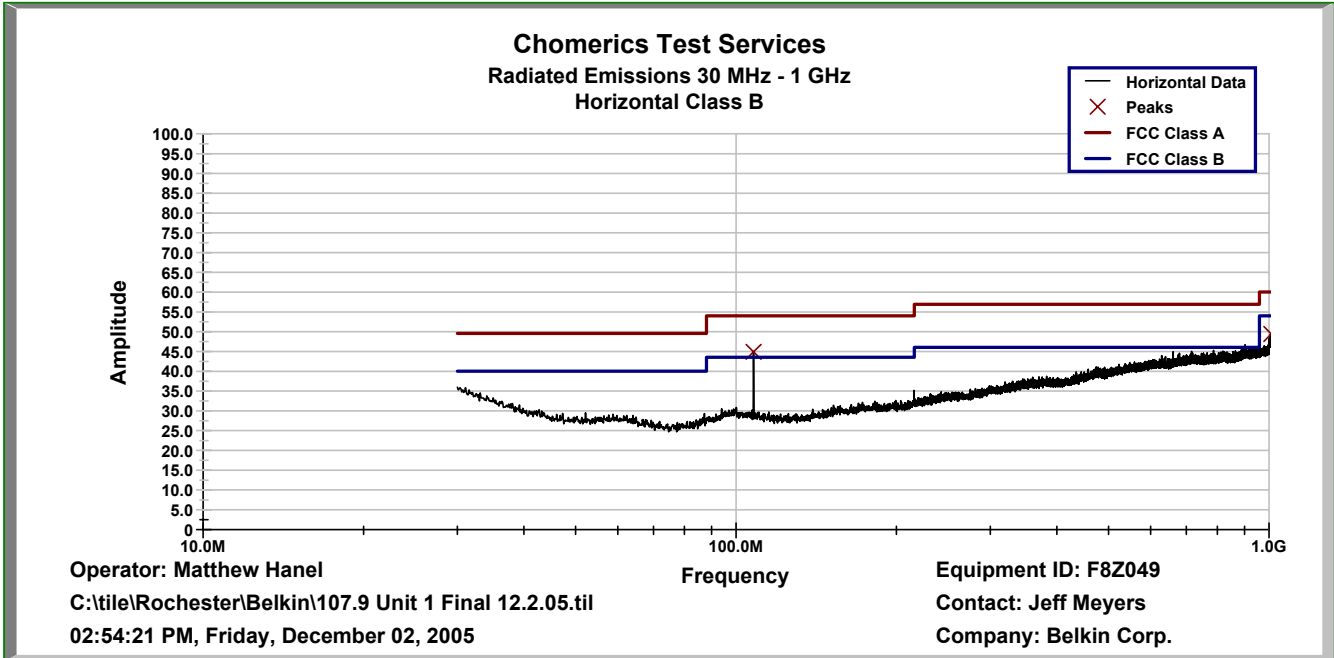
Chomerics Test Services  
 Radiated Emissions 30 MHz - 1 GHz  
 Final Class B Quasi-Peak Values

Operator: Matthew Hanel  
 C:\tile\Rochester\Belkin\98.1 Unit 1 Final 12.2.05.til  
 04:11:12 PM, Friday, December 02, 2005  
 Equipment ID: F8Z049  
 Contact: Jeff Meyers  
 Company: Belkin Corp.

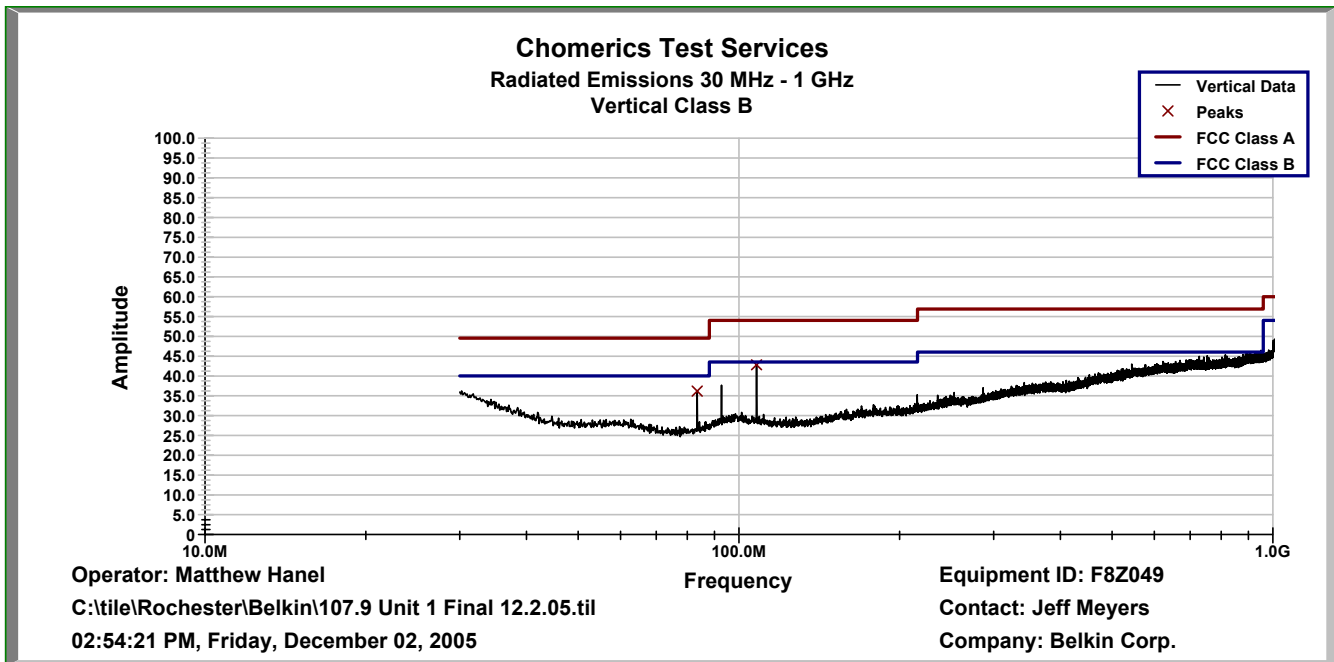
Frequency MHz	Measured QP dBuV	Antenna Factor	Cable Factor	Corrected QP dBuV	FCC Class B Limit	Pass / Fail Margin	Angle Deg.	Height cm	Polarity H / V
196.19	22.67	10.36	1.08	34.11	43.52	-9.41	161	100	V
959.99	1.93	22.90	3.36	28.19	46.02	-17.83	41	267	V
929.72	1.31	22.74	3.30	27.35	46.02	-18.67	344	230	H
952.62	1.81	22.90	3.36	28.07	46.02	-17.95	257	310	H



### High Frequency 107.9 MHz Graph Horizontal



### Graph Vertical



**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\107.9 Unit 1 Final 12.2.05.til  
 03:00:35 PM, Friday, December 02, 2005  
 Equipment ID: F8Z049  
 Contact: Jeff Meyers  
 Company: Belkin Corp.

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
83.62	4.06	6.00	0.81	10.87	40.00	-29.14	287	342	V
1000.00	1.57	23.40	3.38	28.35	53.98	-25.63	272	379	H
1064.00	1.89	23.40	3.38	28.67	53.98	-25.31	61	252	V

**2.3.6 Photographic Documentation**

CUSTOMER: BELKIN CORPORATION  
EQUIPMENT: TUNEBASE FM FOR IPOD - MODEL F8Z049  
TESTED BY: MATTHEW HANEL  
OPERATING MODE: NORMAL

DATE: DECEMBER 2, 2005  
TEST NUMBER: 3  
COUPLING DEVICE: EMCO BICONILOG ANTENNA



**Photograph Description: Radiated set-up**

**FORM CTS-PHOTO**

**Photographic Documentation**

CUSTOMER: BELKIN CORPORATION  
EQUIPMENT: TUNEBASE FM FOR IPOD - MODEL F8Z049  
TESTED BY: MATTHEW HANEL  
OPERATING MODE: NORMAL

DATE: DECEMBER 2, 2005  
TEST NUMBER: 3  
COUPLING DEVICE: EMCO BICONILOG ANTENNA



**Photograph Description: Radiated set-up**

**FORM CTS-PHOTO**

**APPENDIX A**  
**TEST LOG**

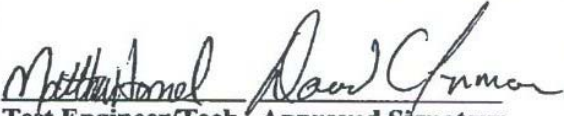
**TEST LOG**

CUSTOMER: BELKIN CORPORATION

PROGRAM: FCC

EQUIPMENT: TUNEBASE FM FOR IPOD - MODEL F8Z049

TESTED BY: MATTHEW HANEL

<b>Pre-Test Checklist</b>	Date	Comments					
	December 2, 2005	Test Plan/Procedure: ANSI C63.4 Test Specification: FCC Part 15 Subpart C 15.239 Chomerics Procedure: CHO TPECROC T2 EUT Power Requirement Verified: Voltage +5 VDC Frequency NA Phase NA Voltage +12 VDC Frequency NA Phase NA EUT Functional Operational Check: [ X ] Pass [ ] Fail Environmental: Bonding/Grounding: N/A Safety Issues: N/A					
<b>In-Process Test Checklist</b>	Date	Test #	Test Type	Test Equipment Calibrated	Test Performed Properly – Data Accepted	EUT Set-up Check/Operational Check	EUT Pass/Fail
	12.02.05	1	20dB Width Measurements	Yes	Yes	Yes	Pass
	12.02.05	2	Output Power Measurements	Yes	Yes	Yes	Pass
	12.02.05	3	FCC Radiated Emissions	Yes	Yes	Yes	Pass
<b>Post Test Checklist</b>	Date:	EUT Functional Operation Check:		 Test Engineer/Tech    Approved Signatory			
	December 2, 2005	[ X ] Pass [ ] Fail					

**FORM CTS-010**

Belkin Corporation TuneBase FM for iPod - Model F8Z049

Document #: TRR0265.05

Date: December 6, 2005