



M. Flom Associates, Inc.
International Compliance Testing Laboratory
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Date: January 10, 2005

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Landmark Audio Technologies LLC
Equipment: FM-350
FCC ID: STK-FM350
FCC Rules: 15.239

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

David E. Lee, Compliance Test Manager

enclosure(s)
cc: Applicant
DEL/ca

M. Flom Associates, Inc.
3356 N. San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(480) 926-3100 phone, fax (480) 926-3598

FCC ID: STK-FM350
MFA p04c0004, d0510016



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Transmitter Certification

of

FCC ID: STK-FM350

Model: FM-350

to

Federal Communications Commission

Rule Part 15.239

Date of report: January 10, 2005

On the Behalf of the Applicant:

Landmark Audio Technologies LLC

At the Request of:

P.O. Deposit Check #12763

Landmark Audio Technologies LLC
159 Jay Street
Albany, NY 12210

Attention of:

Donald Person, Vice President
888-677-4387; fax: (518) 426-0172
E-mail: dperson@landmarkfm.com

Supervised by:

David E. Lee, Compliance Test Manager

List of Exhibits

(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: Landmark Audio Technologies LLC

FCC ID: STK-FM350

By Applicant:

1. Letter of Authorization
2. Confidentiality Request: 0.457 And 0.459
3. Identification Drawings, 2.1033(c)(11)
 - Label
 - Location of Label
 - Compliance Statement
 - Location of Compliance Statement
4. Photographs, 2.1033(c)(12)
5. Documentation: 2.1033(c)
 - (3) User Manual
 - (9) Tune Up Info
 - (10) Schematic Diagram
 - (10) Circuit Description
 - Block Diagram
 - Parts List
 - Active Devices

By M.F.A. Inc.:

- A. Testimonial & Statement of Certification

The Applicant has been cautioned as to the following:

15.21 Information to the User .

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories .

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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15.107	A/C Powerline Conducted Emissions	18

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0510016

d) Client: Landmark Audio Technologies LLC
159 Jay Street
Albany, NY 12210

e) Identification: FM-350
FCC ID: STK-FM350

EUT Description: FM transmitter

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: January 10, 2005
EUT Received: December 2, 2004

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:



David E. Lee, Compliance Test Manager

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2001, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.



A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 – 1999 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Certificate Number: **2152-01**



NIST

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at <http://ts.nist.gov/mra> under the 'Asia' category."

BSMI Number: **SL2-IN-E-041R**

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to

Sub-part 2.1033

(c)(1): **Name and Address of Applicant:**

Landmark Audio Technologies LLC
159 Jay Street
Albany, NY 12210

Manufacturer:

Applicant

(c)(2): **FCC ID:**

STK-FM350

Model Number:

FM-350

(c)(3): **Instruction Manual(s):**

Please see attached exhibits

(c)(4): **Type of Emission:**

200KF3E

(c)(5): **Frequency Range, MHz:**

88.1 to 107.9

(c)(6): **Power Rating,**

_____ Switchable

_____ Variable

234 mV/m @ 3m
_____ X _____ N/A

(c)(7): **Maximum Power Rating, Watts:**

250mV/m @ 3m

DUT Results:

Passes _____ X _____ Fails _____

Subpart 2.1033 (continued)

(c)(8): Voltages & currents in all elements in final RF stage, including final transistor or solid-state device:

Collector Current, A	=	0.1
Collector Voltage, Vdc	=	5
Supply Voltage, Vac	=	115

(c)(9): **Tune-Up Procedure:**

Please see attached exhibits

(c)(10): **Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please see attached exhibits

(c)(11): **Label Information:**

Please see attached exhibits

(c)(12): **Photographs:**

Please see attached exhibits

(c)(13): **Digital Modulation Description:**

☐	Attached Exhibits
☒	N/A

(c)(14): **Test and Measurement Data:**

Follows

Name of Test: RF Power Output (Radiated)

Specification: 47 CFR 2.1046(a)

Test Equipment: As per attached page

Measurement Procedure (Radiated)

1. The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Equivalent loading was calculated from the equation $P_t = ((E \times R)^2 / 49.2)$ watts, where $R = 3m$.
2. Measurement accuracy is ± 1.5 dB.

Test Equipment

Asset	Description	s/n	Cycle	Last Cal
Transducer				
i00088	EMCO 3109-B 25MHz-300MHz	2336	24 mo.	Sep-03
X i00089	Apriel 2001 200MHz-1GHz	001500	24 mo.	Sep-03
X i00103	EMCO 3115 1GHz-18GHz	9208-3925	24 mo.	Jan-04
Amplifier				
X i00028	HP 8449A	2749A00121	12 mo.	May-04
Spectrum Analyzer				
X i00029	HP 8563E	3213A00104	12 mo.	May-04
X i00033	HP 85462A	3625A00357	12 mo.	Aug-04
Substitution Generator				
X i00067	HP 8920A Communication TS	3345U01242	12 mo.	Jun-04
i00207	HP 8753D Network Analyzer	3410A08514	12 mo.	Jul-04

Name of Test: RF Power Output (Radiated) - Continued

Measurement Results

g04c0038: 2004-Dec-06 Mon 09:33:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C

Amps Mode:

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	Calculated, dBuV/m	mV/m @ 3m
89.900000	89.912000	23.5	10.81	34.31	51.0
97.500000	97.512500	30.13	12.03	42.16	125.0
106.500000	106.520500	34.56	13.01	47.57	234.0

Performed by:



Samir Mahmoud

Name of Test: Field Strength of Spurious Radiation

Specification: 47 CFR 2.1053(a)

Guide: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

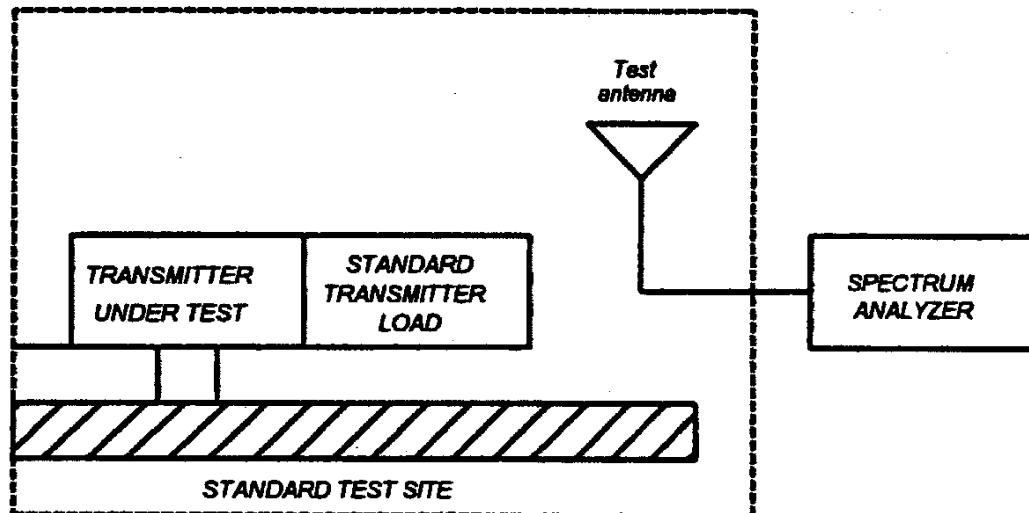
Measurement Procedure

Definition:

Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies, which are outside an occupied band, sufficient to ensure transmission of information of required quality for the class of communications desired.

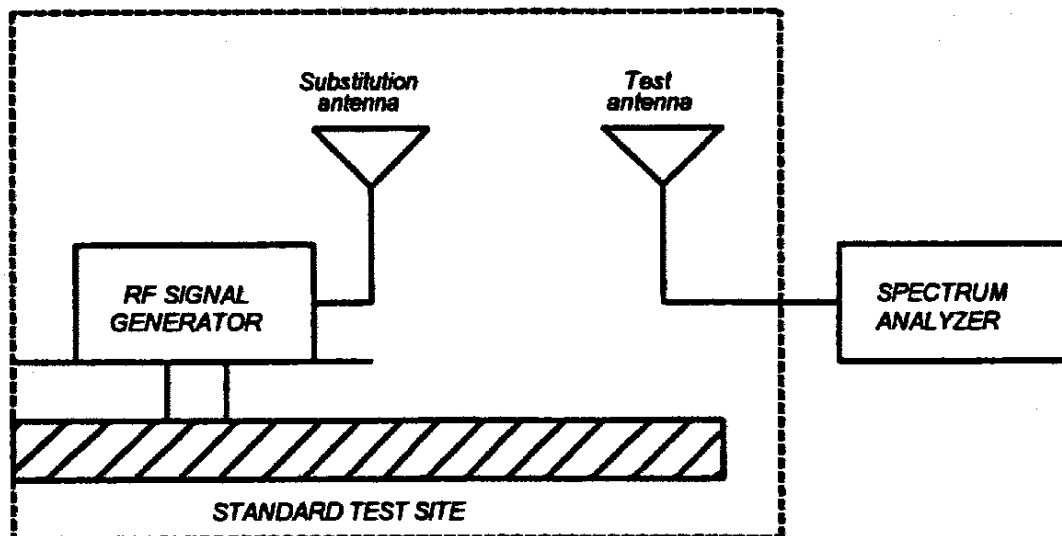
Method of Measurement:

- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
 - 2) Video Bandwidth = 3 times Resolution Bandwidth, or 30 kHz (22.917)
 - 3) Sweep Speed ≤ 2000 Hz/second
 - 4) Detector Mode = Mean or Average Power
- C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load that is placed on the turntable. The RF cable to this load should be of minimum length.



Name of Test: Field Strength of Spurious Radiation (Cont.)

- D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to $\pm$ the test bandwidth (see section 1.3.4.4).
- E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

Name of Test: Field Strength of Spurious Radiation (Cont.)

- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.
- M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =

$$10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step I)}$$

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Test Equipment

Asset	Description	s/n	Cycle	Last Cal
Transducer				
i00088	EMCO 3109-B 25MHz-300MHz	2336	24 mo.	Sep-03
X i00089	Apriel 2001 200MHz-1GHz	001500	24 mo.	Sep-03
X i00103	EMCO 3115 1GHz-18GHz	9208-3925	24 mo.	Jan-04
Amplifier				
X i00028	HP 8449A	2749A00121	12 mo.	May-04
Spectrum Analyzer				
X i00029	HP 8563E	3213A00104	12 mo.	May-04
X i00033	HP 85462A	3625A00357	12 mo.	Sep-04
Substitution Generator				
X i00067	HP 8920A Communication TS	3345U01242	12 mo.	Jun-04
i00207	HP 8753D Network Analyzer	3410A08514	12 mo.	Jul-04

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g04c0040: 2004-Dec-06 Mon 15:48:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV/m	CF, dB	Calculated, dBuV/m	Calculated, uV/m
89.900000	179.800000	-1.1	16.0	14.9	6
97.500000	195.000000	4.7	17.2	21.9	12
106.500000	213.003560	-11.1	18.4	7.3	2
89.900000	269.700000	-3.0	24.7	21.7	12
97.500000	292.500000	-3.7	29.0	25.3	18
106.500000	319.472300	25.0	20.3	45.3	183
89.900000	359.760000	20.8	21.5	42.3	130
97.500000	390.000000	1.4	22.4	23.8	15
106.500000	426.003500	12.6	23.3	35.9	62
89.900000	449.480000	4.7	23.8	28.5	27
97.500000	487.500000	5.5	24.6	30.1	32
89.900000	539.375000	1.1	27.4	28.5	26
97.500000	584.995000	-5.7	30.1	24.4	17
89.900000	629.270000	3.3	31.6	34.9	56
106.500000	638.989800	1.4	31.9	33.3	46
89.900000	719.165000	1.5	33.0	34.5	53
106.500000	745.489800	1.1	32.8	33.9	49
97.500000	780.000000	0.4	32.5	32.9	44
89.900000	809.060000	1.9	32.5	34.5	54
106.500000	851.989800	6.2	33.2	39.3	93
89.900000	898.955000	1.2	33.9	35.2	57
106.500000	958.489800	5.8	36.4	42.2	129
97.500000	975.000000	3.6	37.1	40.7	108
106.500000	1064.989800	0.7	34.5	35.2	57



Performed by:

Samir Mahmoud

Name of Test: Emission Masks (Occupied Bandwidth)

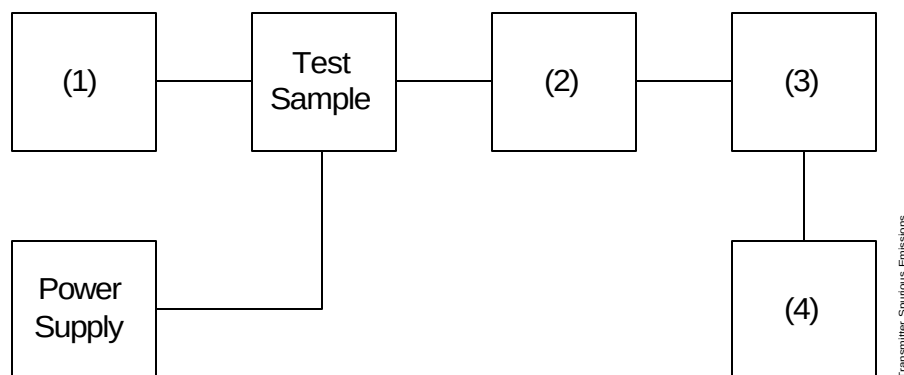
Specification: 47 CFR 2.1049(c)(1)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

Measurement Procedure

- A) The EUT and test equipment were set up as shown below
- B) For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for $\pm 2.5/\pm 1.25$ kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.
- C) For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- D) The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

Transmitter Test Set-Up: Occupied Bandwidth



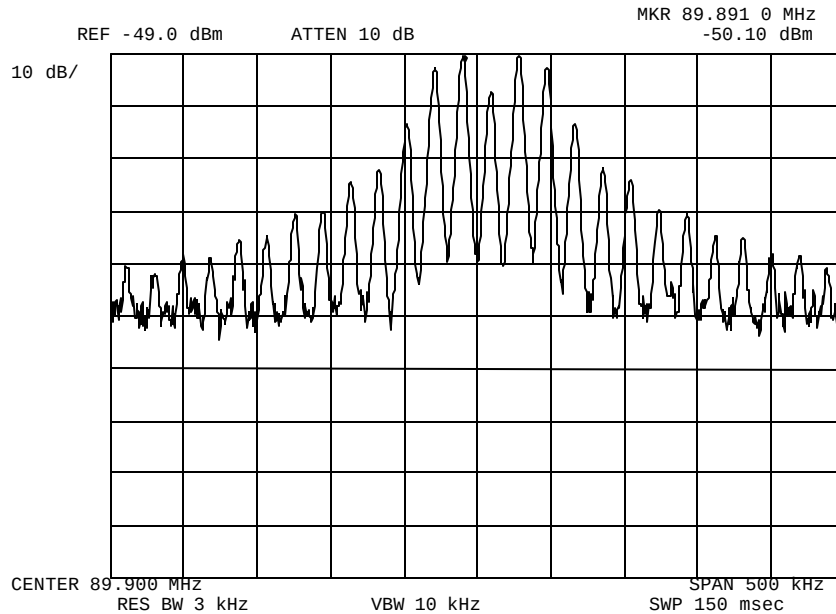
Asset	Description	s/n	Cycle	Last Cal
(1) Audio Oscillator/Generator				
X i00017	HP 8903A Modulation Meter	2216A01753	12 mo.	Apr-04
(2) Coaxial Attenuator				
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
i00123	NARDA 766 (10 dB)	7802A	NCR	
(3) Interface				
X i00021	HP 8954A Transceiver Interface	2146A00159	NCR	
(4) Spectrum Analyzer				
X i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Oct-04
i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-04

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g04c0043: 2004-Dec-08 Wed 14:22:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
Low Channel

Performed by:



Samir Mahmoud

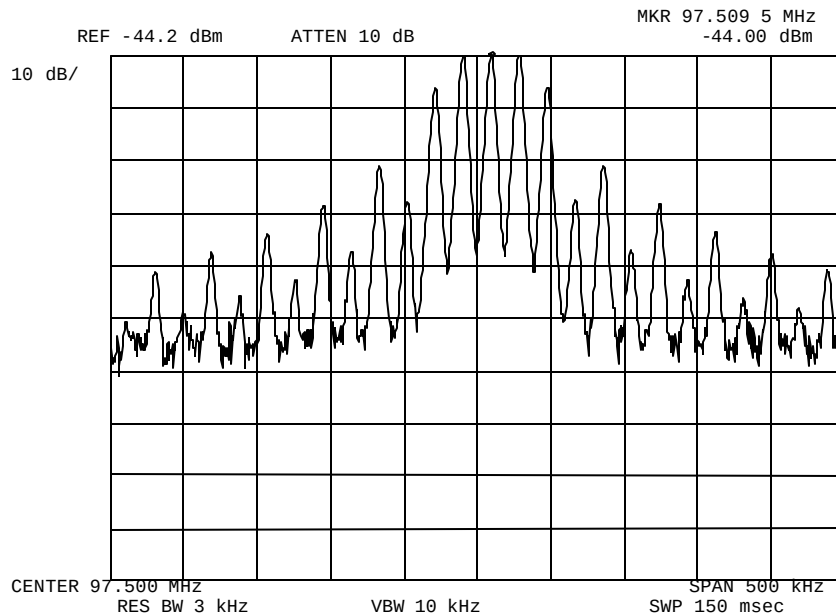
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g04c0044: 2004-Dec-08 Wed 14:30:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
Mid Channel

Performed by:



Samir Mahmoud

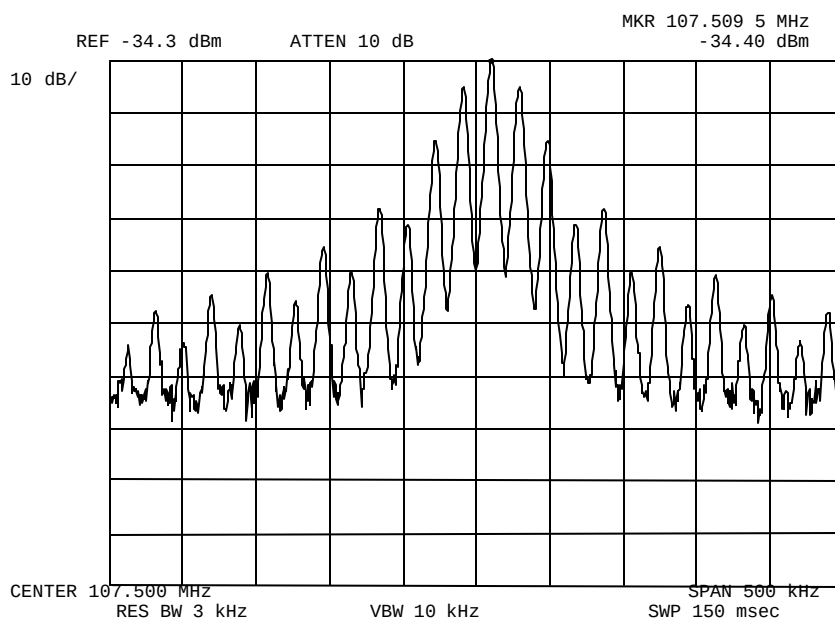
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g04c0045: 2004-Dec-08 Wed 14:32:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
High Channel

Performed by:



Samir Mahmoud

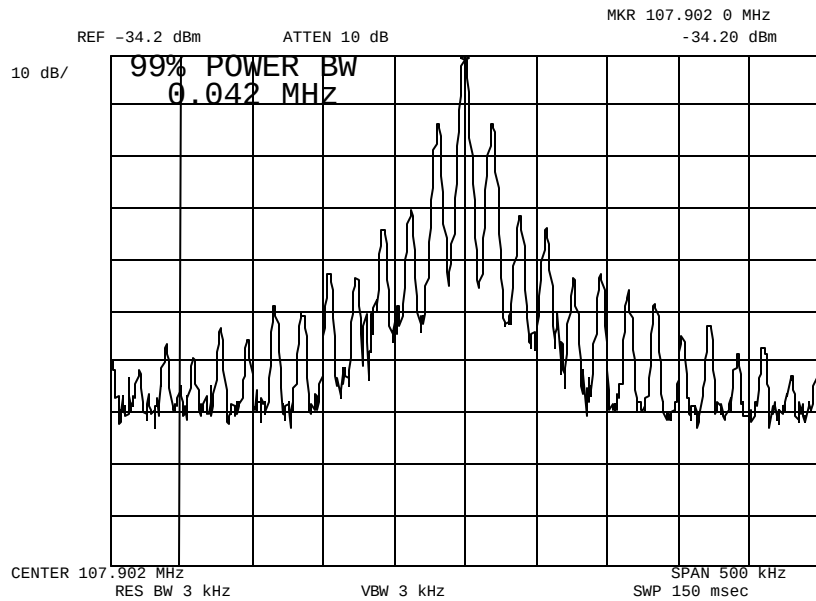
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g04c0048: 2004-Dec-08 Wed 15:32:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
99% Power Bandwidth = 42kHz



Performed by:

David E. Lee,
Compliance Test Manager

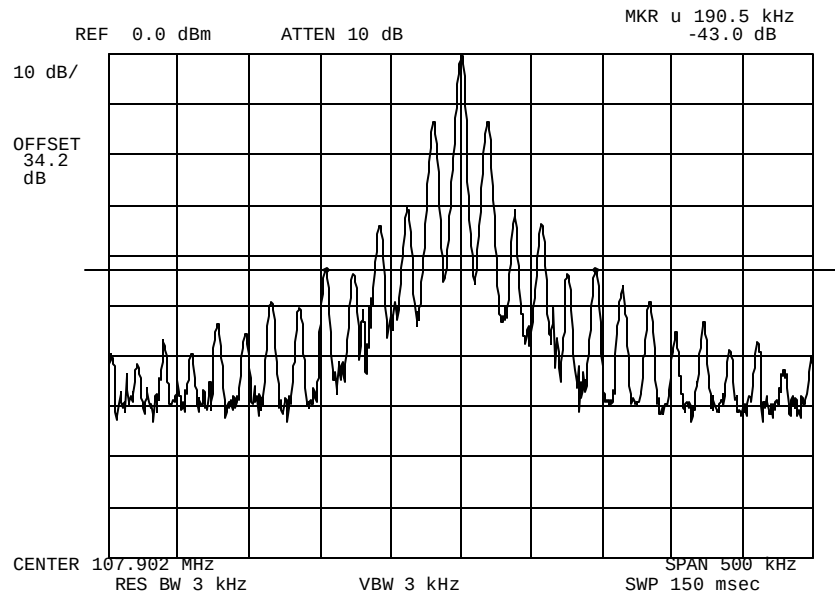
Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g04c0049: 2004-Dec-08 Wed 15:44:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:

Modulation:

Loose Coupled (Normalized to 0dBm)

Stereo

190.5 kHz at 43dB down



Performed by:

David E. Lee,
Compliance Test Manager

Name of Test: Test Set Up Photographs



Name of Test: A/C Powerline Conducted Emissions

Specification: FCC: 47 CFR 15.107

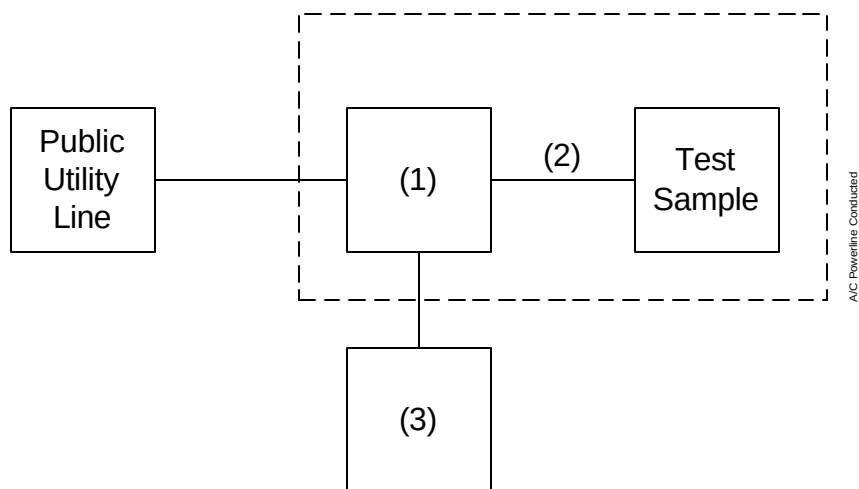
Guide: IEEE Standard 213

Test Conditions: S. T. & H.

Measurement Procedure

1. A test sample was connected to the Public Utility lines through a LISN.
2. A reference level of 250 μ V was set on the Spectrum Analyzer. The spectrum was searched over the range of 150 kHz to 30 MHz.
3. All other emissions were 20 dB or more below limit.
4. ☐ The test sample used a charger.
☒ The test sample does not use a charger.
5. Measurement Results: Attached.

Test Set Up: A/C Powerline Conducted Measurements



Asset	Description	s/n	Cycle	Last Cal
(1) Line Impedance Stabilization Network				
X i00244	Fischer 50-20-2-01	2047	NCR	
(2) Screen Room				
X i00170	Lindgren LG170	4999	NCR	
(3) Spectrum Analyzer				
X i00033	HP 85462A	3625A00357	12 mo.	Jul-04
i00048	HP 8566B	2511AD1467	12 mo.	Sep-04

Test Setup:

A/C Powerline Conducted Emissions



Results:

A/C Powerline Conducted Emissions

g04c0041: 2004-Dec-07 Tue 10:41:00

State: 0: Line Side

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	C.F., dB	$\mu\text{V}/\text{m}$
90.100000	0.210000	38.18	0.91	90.05
90.100000	0.320000	39.10	0.60	96.61
90.100000	0.860000	36.16	0.59	68.79
90.100000	2.030000	42.12	0.58	136.46
90.100000	13.350000	35.71	1.11	69.34
90.100000	28.310000	36.50	1.66	80.91

g04c0042: 2004-Dec-07 Tue 10:43:00

State: 0: Neutral Side

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	C.F., dB	$\mu\text{V}/\text{m}$
90.100000	0.210000	41.41	0.94	131.07
90.100000	0.320000	36.63	0.60	72.69
90.100000	0.640000	36.46	0.56	70.96
90.100000	2.030000	42.08	0.51	134.74
90.100000	11.930000	35.97	1.08	71.20
90.100000	28.310000	34.82	1.92	68.71

Performed By:



Samir Mahmoud

END OF TEST REPORT

**Testimonial
and
Statement of Certification**

This is to Certify:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.



Certifying Engineer:

David E. Lee, Compliance Test Manager