

Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1

**TEST REPORT**

**Report Number: 3104630LAX-017**

**Project Number: 3104630**

**May 30, 2007**

**Testing performed on the  
FM Modulator  
FCC ID: D6NLOWFMMOD2V1  
Model: LOWFMMOD2V1**

to

**FCC Part 15.239  
RSS-210 part A2.8**

**For  
Navico Inc.**




A2LA Certificate Number: 2085-01

Test Performed by:  
Intertek  
27611 La Paz Road., Suite C  
Laguna Niguel, CA 92677

Test Authorized by:  
Navico Inc.  
2601 Industry Street  
Oceanside, CA 92054

Prepared by:   
Sergey Marker

Date: May 30, 2007

Reviewed by:   
Suresh Kondapalli

Date: May 31, 2007

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**1.0 Summary of Test Results**

<b>FCC / RSS-210 RULE</b>	<b>DESCRIPTION OF TEST</b>	<b>RESULT</b>	<b>PAGE</b>
15.239(a) / A2.8 (2)	Occupied Frequency Band	Complies	17
15.239(b) A2.8 (1)	Field Strength of fundamental	Complies	10
15.239(c) / A2.8 (2)	Radiated emissions outside the band	Complies	12
15.109	Radiated Emission	Complies	15
15.203	Antenna requirement	Complies	25
15.207/107	Line Conducted Emissions	Complies	27

*We attest to the accuracy of this report:*

EMC Department

Date of issue: March 14, 2007

Test Engineer:



Sergey Marker

Reviewing Engineer:



Suresh Kondapalli

Date of Test: March 12 – May 29, 2007

**FCC ID: D6NLOWFMMOD2V1****2.0 General Description****2.1 Product Description***EQUIPMENT UNDER TEST**Type of equipment* FM Modulator*Type/Model* LOWFMMOD2V1

- Power consumption: 22mA@ 5V
- RF Output: Loop Antenna Radiation Output
- Audio Input: Cable Internal to the Host Board
- Carrier Frequency: Frequency Modulated
- Transmission Frequency: Tunable from 88.1 to 107.9 MHz in 0.2 MHz steps.
- Physical dimension: 34.19x33.19x8.07mm
- Weight: 10 g (.022 lb)
- Main Functions: Provides the full FM band tuning range in 0.2 MHz steps.
- Antenna: Built-in internal antenna.

*Manufacturer* Navico Inc.  
12000 East Skelly Drive  
Tulsa, OK 74128 USA*Tested by request of**Standards:* FCC Part 15.239  
RSS-210 part A2.8*Test Report No.* 3104630LAX-017*FCC ID:* D6NLOWFMMOD2V1**Product Description:**

This product is a modular built-in FM Stereo Modulator that creates a wireless audio link for a GPS navigation device. It links pre-recorded music or turn-by-turn directions to the user's FM car radio. No additional wiring is necessary. The broadcast frequency is fully adjustable throughout the FM band in 200 kHz steps from 88.1 to 107.9 MHz. It is for use in several Navico's GPS products.

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## 2.2 Related Submittal(s) Grants

This report is for use with an application for certification of a low power transmitter. One transmitter is included in the application. This specific report details the emission characteristics of transmitter.

## 2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Radiated emission measurements were performed in 10 m OATS. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

## 2.4 Test Facility

The test facility was a specially designed and constructed Open Area Test Site (OATS).

The test site consists of a metal ground plane constructed of 22-gauge sheet metal. The site contains a 2.5 meter diameter turntable for floor standing equipment, and a fiber glass table measuring 1.5 x 1.5 x 0.8 meters for table top equipment. To facilitate testing, the site also has heat and air conditioning systems to control environmental test conditions.

This test facility and site measurement data have been fully placed on file with the FCC, Industry of Canada and A2LA accredited.

Test Facility: Intertek ETL Semko  
27611 La Paz Road, Suite C  
Laguna Niguel, CA 92677

### Accreditations:

FCC Registration Number: 90711  
A2LA Certificate Number: 2085-01  
IC Reference Number: IC 3753

### **3.0 System Test Configuration**

#### 3.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions.

For the measurements, the EUT is attached to a cardboard box (if necessary) and placed on the fiber glass table. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

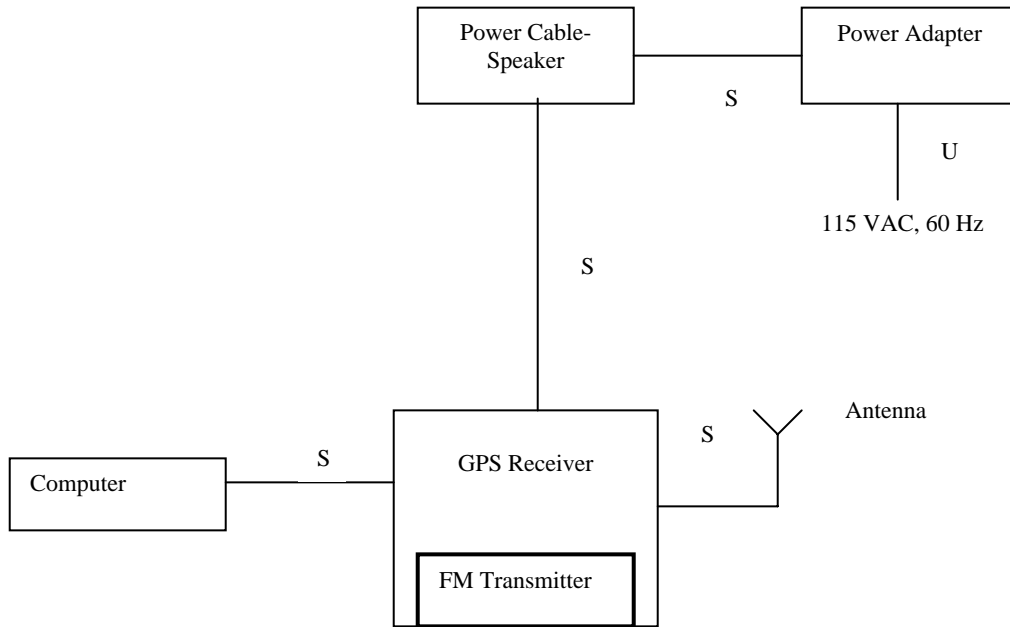
Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

#### 3.2 EUT Exercising Software

No software was required to exercise the EUT.

3.3 System Test Configuration

3.3.1 Block Diagram of Test Setup



<b>S:</b>	Shielded	<b>U:</b>	Unshielded	<b>F:</b>	With Ferrite Core
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3.3.2 EUT is a FM transmitter

EUT				
Equipment	Manufacturer	Model #	S/N #	FCC ID
FM Transmitter (inside GPS receiver)	Navico Inc.	LOWFMMOD2V1	N/A	D6NLOWFMMOD2V1
GPS receiver	Navico Inc. Lowrance)	iWay 550C	N/A	N/A
Power Adapter (GPS accessories)	Globtek Inc.	GT-41052-1512	N/A	N/A
Power Cable-Speaker (GPS accessories)	Navico Inc.	iWay 550C	N/A	N/A
Remote Amplifying Antenna (GPS accessories)	Navico Inc.	RAAA-4	N/A	N/A

3.3.3 Support Equipment

Support Equipment				
Equipment	Manufacturer	Model #	S/N #	FCC ID
Computer	Compaq	Armada	3J13FMZ1T L4G S88	N/A

3.4 Equipment Modification

None

3.5 Mode(s) of operation

- The EUT was powered from power adapter. During the tests EUT was operating in continuous transmitting mode.
- It was determined that the highest OBW was produced by playing the following MP3 file: Do Me Like 3-15.mp3. This file was continuously playing through all testing.
- The volume control was set to maximum level.
- The Tuning range was manually verified. Tuning controls were manually adjusted to verify maximum tuning range (88.1 to 107.9 MHz with 0.2 MHz step)

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**4.0 Field Strength of Emission**

4.1 Test Description:

Parameter:	FCC 15.239(b)
Requirement:	FCC 15.239(b)
Emission within the permitted 200 kHz band	Limit: 46 dBµV

4.1.1 Test Procedure

For the measurements, the EUT is attached to a cardboard box (if necessary) and placed on the fiberglass turntable which is 0.8 m above the ground plane on the open test site. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power. The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Radiated emission measurements were performed from 30 MHz to the 10<sup>th</sup> harmonic of transmitter frequency. Analyzer resolution is 120 KHz for 30 to 1000 MHz, 1 MHz for >1000 MHz. This test was performed per test procedure specified in ANSI C63.4 (2003).

4.1.2 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with antennas, cables, preamplifiers (if any) and average factors (when specified limits is in average and measurements are made with peak detectors) The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG + AV$$

where FS = Field Strength in dB(µV/m)  
 RA = Receiver Amplitude in dB(µV)  
 CF = Cable Attenuation Factor in dB  
 AF = Antenna Factor in dB/m  
 AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(µV) is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB(µV/m).

$$\begin{aligned}
 RA &= 52 \text{ dB}(\mu\text{V}) & CF &= 1.6 \text{ dB} \\
 AF &= 7.4 \text{ dB/m} & AG &= 29 \text{ dB} & FS &= 52 + 7.4 + 1.6 - 29 = 32 \text{ dB}(\mu\text{V/m})
 \end{aligned}$$

This value in dB(µV/m) was converted to its corresponding level in µV/m.

Level in µV/m = Common Antilogarithm {[32 dB(µV/m)]/20} = 39.8 µV/m

**Note:** In the following table(s), the level shown on the data table includes the antenna factor, cable factor and preamplifier gain.

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4.1.3 Radiated Emission Data

**Standard:** FCC Part 15.239(b)  
**Company:** Navico Inc..  
**Job No.** 3104630LAX-017  
**Model Name:** LOWFMMOD2V1  
**Distance:** 3 m

Measurement Uncertainty: 4.2dB  
 Temperature: 24°C  
 Relative Humidity: 49 %

Frequency	Detector	Vertical level	Horizontal level	D.C.F.	Limit	Margin
MHz		(dBuV/m)	(dBuV/m)	dB	(dBuV/m)	(dB)
FM 88.1 MHz						
88.1	Ave.	37.1	42.8	0	46	-3.2
88.1	Peak	42.0	46.2	0	66	-19.8
FM 98.1 MHz						
98.1	Ave.	35.8	42.7	0	46	-3.3
98.1	Peak	39.2	44.9	0	66	-21.1
FM 107.9 MHz						
107.9	Ave.	38.9	43.4	0	46	-2.6
107.9	Peak	42.8	46.0	0	66	-20.0

**Notes:**

- a) The field strength shown in the table (Vertical and Horizontal levels) included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- b) Negative signs (-) in Margin column signify levels below the limits.
- c) Analyzer setting: RBW =120 KHz, VBW =300 KHz
- d) Peak measurement shown for the compliance with 15.35b (peak measurements of emission shall not exceed the average limits specified above by more than 20 dB).
- e) D.C.F: Distance Correction Factor.

<b>Test Result</b>	<p><b>Passed with margin 2.6 dB at 107.9 MHz.</b></p> <p>The measurement result is below the specification limit by a margin less than the measurement uncertainty; it is not therefore possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a high probability that the product tested complies with the specification limit</p>
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4.2 Test Description:

Parameter:	FCC 15.239(c)
Requirement:	FCC 15.209
0.009 – 0.490	2400/F (kHz) ( $\mu\text{V/m}$ ) @ 300 m
0.490 – 1.705	2400/F (kHz) ( $\mu\text{V/m}$ ) @ 30 m
1.705 – 30.0	29.5 dB $\mu\text{V}$ @ 30 m
30-88 MHz	40 dB $\mu$ @ 3 m
88-216 MHz	43.5 dB $\mu\text{V}$ @ 3 m
216-960 MHz	46 dB $\mu\text{V}$ @ 3 m
Above 960 MHz	54 dB $\mu\text{V}$ @ 3 m

4.2.1 Test Procedure

See section 4.1.1.

4.2.2 Field Strength Calculation

See section 4.1.2.

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4.2.3 Radiated Emission Data

**Standard:** FCC Part 15.209  
**Company:** Navico Inc.  
**Job No.** 3104630LAX-017  
**Model Name:** LOWFMMOD2V1  
**Distance:** 3 m

Measurement Uncertainty: 4.2 dB  
 Temperature: 24°C  
 Relative Humidity: 49 %

Frequency	Detector	Polarization	Field level	Distance	D.C.F.	Limit	Margin
MHz			(dBuV/m)	m	dB	(dBuV/m)	(dB)
FM 88.1 MHz							
*88.0	Q-P	H	35.1	3	0	40.0	-4.9
*88.2	Q-P	H	34.7	3	0	43.5	-8.8
126.4	Q-P	H	14.3	3	0	43.5	-29.2
176.2	Q-P	H	16.1	3	0	43.5	-27.4
240.0	Q-P	H	21.3	3	0	46	-24.7
264.0	Q-P	H	38.7	3	0	46	-7.3
297.0	Q-P	H	34.0	3	0	46	-12.0
299.6	Q-P	H	32.6	3	0	46	-13.4
380.0	Q-P	H	35.5	3	0	46	-10.5
FM 98.1 MHz							
82.3	Q-P	V	20.4	3	0	40.0	-19.6
*98.0	Q-P	H	37.4	3	0	43.5	-6.1
*98.2	Q-P	H	37.2	3	0	43.5	-6.3
110.1	Q-P	V	21.5	3	0	43.5	-22.0
199.9	Q-P	H	16.2	3	0	43.5	-27.3
264.0	Q-P	H	31.0	3	0	46	-15.0
294.3	Q-P	V	21.6	3	0	46	-24.4
299.6	Q-P	V	32.1	3	0	46	-13.9
461.0	Q-P	H	27.1	3	0	46	-18.9
578.0	Q-P	V	31.1	3	0	46	-14.9
588.6	Q-P	V	24.0	3	0	46	-22.0
FM 107.9 MHz							
80.9	Q-P	V	23.8	3	0	40.0	-16.2
*107.8	Q-P	H	36.7	3	0	43.5	-6.8
*108.0	Q-P	H	37.3	3	0	43.5	-6.2
170.4	Q-P	V	25.6	3	0	43.5	-17.9
199.9	Q-P	H	28.9	3	0	43.5	-14.6
215.8	Q-P	H	28.5	3	0	43.5	-15.0
264.0	Q-P	H	35.2	3	0	46	-10.8
299.6	Q-P	H	35.4	3	0	46	-10.6
324.0	Q-P	H	30.1	3	0	46	-15.9
540.0	Q-P	H	25.3	3	0	46	-20.7

**Notes:**

- a) The field strength shown in the table for Q-Peak Detector (Vertical and Horizontal levels) included Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- b) All emissions not reported were at least 20 dB below the limits or noise level of EMI receiver
- c) Negative signs (-) in Margin column signify levels below the limits.
- d) Analyzer setting:           RBW  $\geq$  1 MHz, VBW  $\geq$  1 MHz, for freq. > 1 GHz  
                                      RBW  $\geq$  100kHz, VBW  $\geq$  100 kHz, for freq. < 1 GHz  
                                      RBW  $\geq$  1 kHz, VBW  $\geq$  1 kHz for freq, < 150 kHz  
      Detector mode: Average (>1 GHz and < 150 kHz) and Quasi-peak (<1 GHz).
- e) D.C.F: Distance Correction Factor
- f) \* - Bandage frequencies shown for compliance with 15.209

Test Result	Passed with 7.3 dB margin at 264 MHz.
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## 4.3 Test Description

Parameter:	FCC 15.109
Requirement:	FCC 15.109, class B
30-88 MHz	40 dB $\mu$ @ 3 m
88-216 MHz	43.5 dB $\mu$ V @ 3 m
216-960 MHz	46 dB $\mu$ V @ 3 m
Above 960 MHz	54 dB $\mu$ V @ 3 m

## 4.3.1 Test Procedure

See section 4.1.1

## 4.3.2 Field Strength Calculation

See section 4.1.2

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## 4.3.3 Radiated Emission Data

**Standard:** FCC Part 15.109 class B

Measurement Uncertainty: 4.2 dB

**Company:** Navico Inc.

Temperature: 24°C

**Job No.:** 3104630LAX-017

Relative Humidity: 49 %

**Model Name:** LOWFMMOD2V1**Distance:** 3 m**Mode:** Transmitter is Off

Frequency	Detector	Polarization	Field level	Distance	D.C.F.	Limit	Margin
MHz			(dBuV/m)	m	dB	(dBuV/m)	(dB)
264.0	Q-P	H	35.2	3	0	46	-10.8
299.6	Q-P	H	35.4	3	0	46	-10.6
330.0	Q-P	H	38.3	3	0	46	-7.7
346.9	Q-P	H	35.0	3	0	46	-11.0
359.6	Q-P	H	37.7	3	0	46	-8.3
372.0	Q-P	H	37.6	3	0	46	-8.4
*396.0	Q-P	H	42.0	3	0	46	-4.0
*399.5	Q-P	H	45.0	3	0	46	-1.0
*499.4	Q-P	H	42.8	3	0	46	-3.2
*528.0	Q-P	H	44.2	3	0	46	-1.8

**Notes:**

- The field strength shown in the table for Q-Peak Detector (Vertical and Horizontal levels) includes Antenna factor, Cable loss and Pre-amplifier Gain (if applicable).
- All emissions not reported were at least 20 dB below the limits or noise level of EMI receiver.
- Negative signs (-) in Margin column signify levels below the limits.
- Analyzer setting: RBW ≥ 1 MHz, VBW ≥ 1 MHz, for freq. > 1 GHz  
RBW ≥ 100kHz, VBW ≥ 100 kHz, for freq. < 1 GHz  
RBW ≥ 1 kHz, VBW ≥ 1 kHz for freq. < 150 kHz  
Detector mode: Average (>1 GHz and < 150 kHz) and Quasi-peak (<1 GHz).
- D.C.F: Distance Correction Factor

Test Result	Passed with 1.0 dB margin at 399.5 MHz. * The measurement result is below the specification limit by a margin less than the measurement uncertainty; it is not therefore possible to determine compliance at a level of confidence of 95%. However, the measured result indicates a high probability that the product tested complies with the specification limit
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**5.0 Occupied Bandwidth.**

5.1 Test Description:

Parameter:	FCC 15.239(a)
Requirement:	FCC 15.239(a), ANSI C63.4 (13.1.7)
Emission from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency	Limit: 200 kHz

5.1.1 Test Procedure

The bandwidth is measured at the amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation product in all typical modes of operation. If no bandwidth requirement is specified by the procuring or regulatory agency, measure the bandwidth at -26 dB with respect to the reference level. This test was performed per test procedure specified in ANSI C63.4 (2003).

**It was determined that the highest OBW was produced by playing the following MP3 file: Do Me Like 3-15.mp3. This file was continuously playing through all testing.**

**The volume control was set to maximum level.**

**The Tuning range was manually verified. Tuning controls were manually adjusted to verify maximum tuning range (88.1 to 107.9 MHz with 0.2 MHz step)**

5.1.2 Test Results

Please see next pages for the occupied bandwidth plot:

Test Result:	The Occupied Bandwidth is 133 kHz
--------------	-----------------------------------

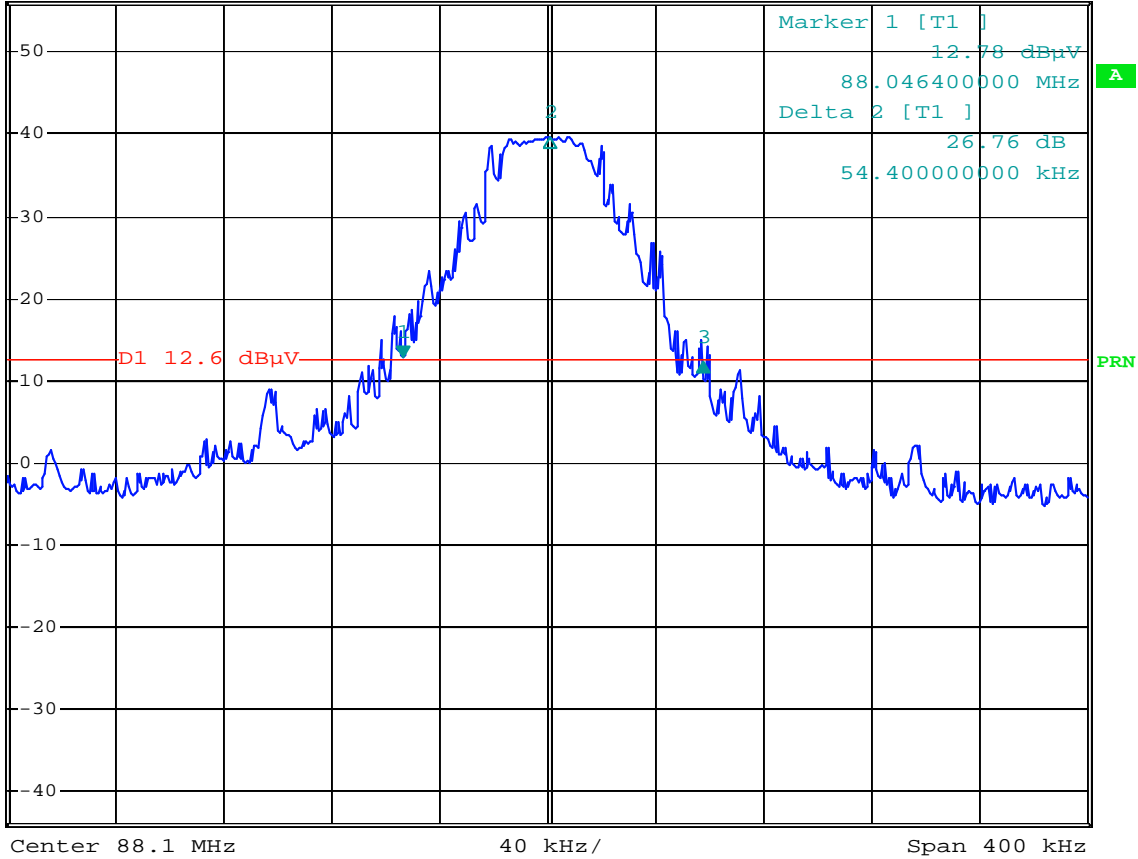
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\*RBW 3 kHz      Delta 3 [T1 ]  
 \*VBW 3 kHz      -0.50 dB  
 Ref 56 dBμV      \*Att 0 dB      SWT 90 ms      111.20000000 kHz

1 PK  
VIEW



Comment: 88.1 MHz 26 dB Occupied Bandwidth  
 Date: 29.MAY.2007 14:06:06

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FCC ID: D6NLOWFMMOD2V1

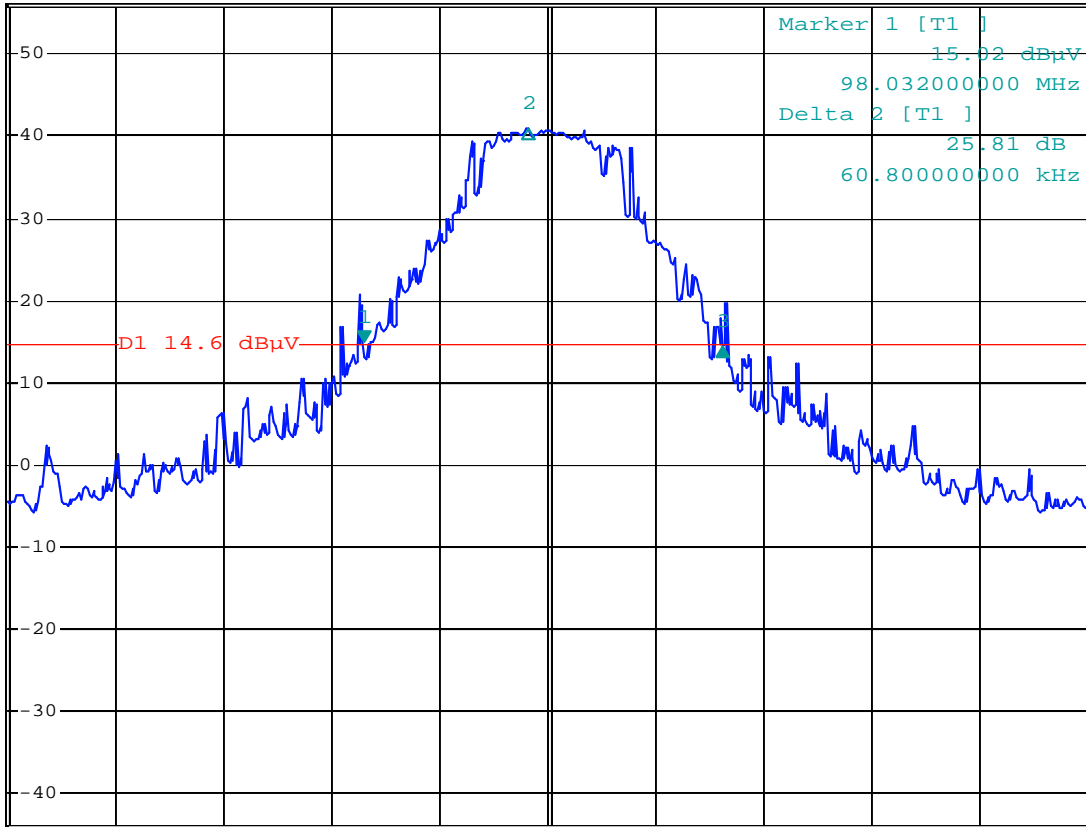


\*RBW 3 kHz Delta 3 [T1 ]  
 \*VBW 3 kHz -0.65 dB  
 SWT 90 ms 132.80000000 kHz

Ref 56 dBμV

\*Att 0 dB

1 PK  
VIEW



Center 98.1 MHz

40 kHz/

Span 400 kHz

Comment: 98.1 MHz 26 dB Occupied Bandwidth

Date: 29.MAY.2007 13:38:55

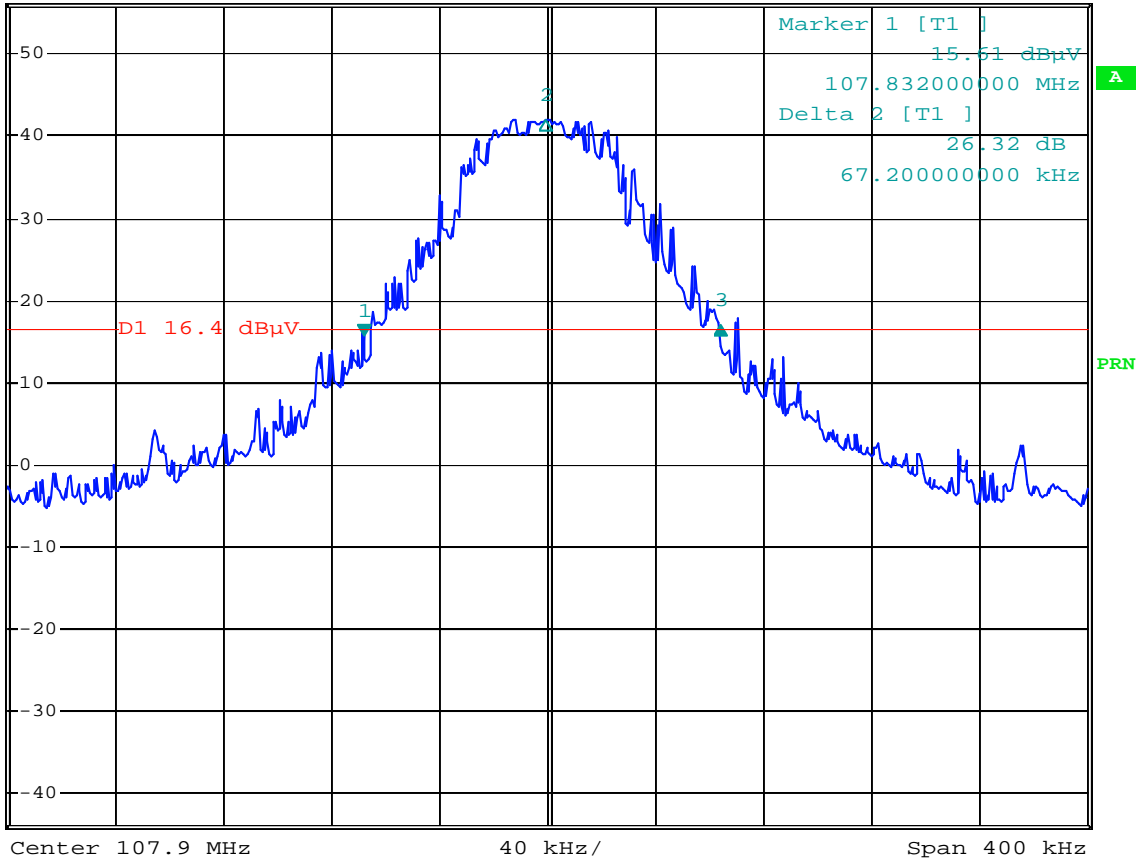
Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1



\*RBW 3 kHz      Delta 3 [T1 ]  
 \*VBW 3 kHz      1.34 dB  
 Ref 56 dBμV      \*Att 0 dB      SWT 90 ms      132.00000000 kHz

1 PK  
VIEW



Comment: 107.9 MHz 26 db Occupied Bandwidth  
 Date: 29.MAY.2007 13:57:27

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5.2 Test Description:

Parameter:	RSS-210 A2.8(2)
Requirement:	RSS-Gen 4.4.1
The occupied bandwidth shall not exceed 200 kHz	Limit: 200 kHz

5.2.1 Test Procedure

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured. If the equipment has an integral antenna or a unique connector for a dedicated antenna, and cannot be connected to the spectrum analyzer, a signal from the equipment may be coupled to the spectrum analyzer using an antenna connected to the spectrum analyzer. The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

**It was determined that the highest OBW was produced by playing the following MP3 file: Do Me Like 3-15.mp3. This file was continuously playing through all testing.**

**The volume control was set to maximum level.**

**The Tuning range was manually verified. Tuning controls were manually adjusted to verify maximum tuning range (88.1 to 107.9 MHz with 0.2 MHz step)**

5.2.2 Test Results

Please see next pages for the occupied bandwidth plots:

Test Result:	The Occupied Bandwidth is 95 kHz
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Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1

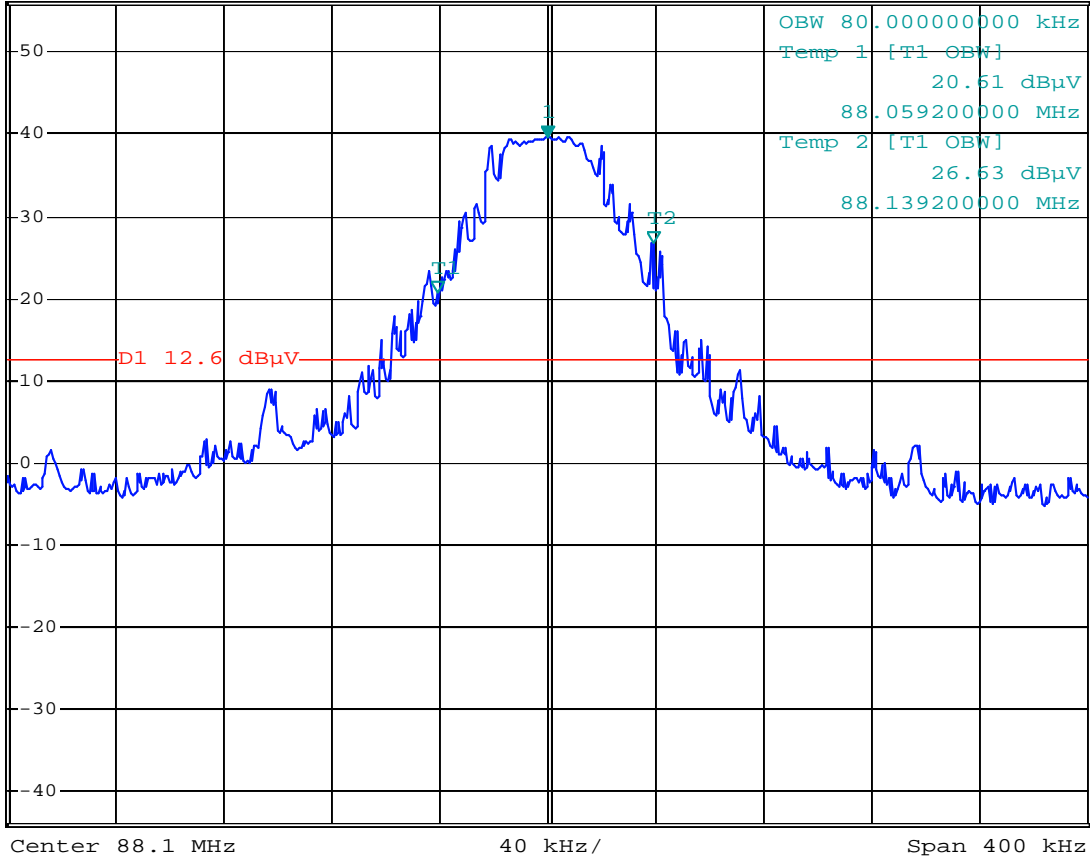


\*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 3 kHz      39.56 dBμV  
 SWT 90 ms      88.10000000 MHz

Ref 56 dBμV

\*Att 0 dB

1 PK  
VIEW



Comment: 88.1 MHz 99% Occupied Bandwidth  
 Date: 29.MAY.2007 14:21:30

Date of Test: March 12 – May 29, 2007

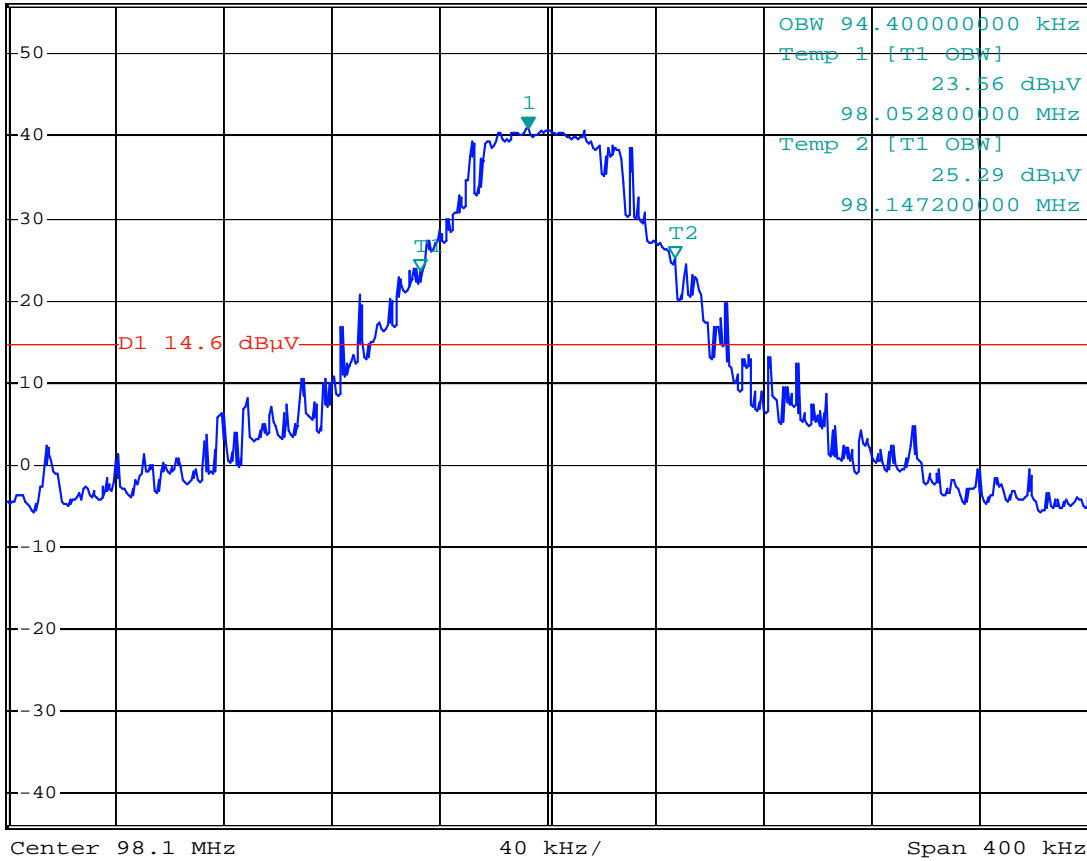
FCC ID: D6NLOWFMMOD2V1



\*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 3 kHz      40.82 dBμV  
 \*Att 0 dB      98.092800000 MHz  
 SWT 90 ms

Ref 56 dBμV

1 PK  
VIEW



Comment: 98.1 MHz 99% Occupied Bandwidth  
 Date: 29.MAY.2007 13:40:07

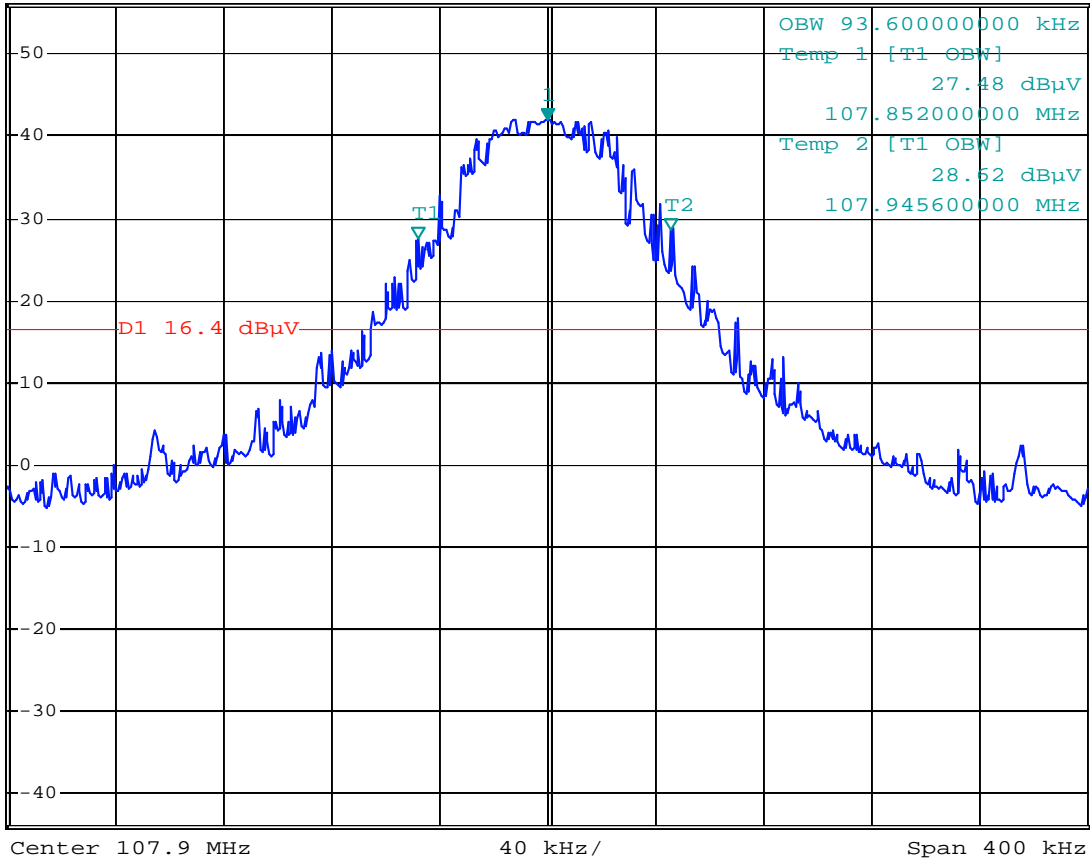
Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1



\*RBW 3 kHz      Marker 1 [T1 ]  
 \*VBW 3 kHz      42.06 dBμV  
 Ref 56 dBμV      \*Att 0 dB      SWT 90 ms      107.90000000 MHz

1 PK  
VIEW



Comment: 107.9 MHz 99% Occupied Bandwidth  
 Date: 29.MAY.2007 13:58:24



Date of Test: March 12 – May 29, 2007

**FCC ID: D6NLOWFMMOD2V1****6.0 Antenna Requirement**

## 6.1 Test description

Parameter:	FCC 15.203
Requirement:	FCC 15.203
Descriptions:	No antenna other than furnished by the responsible party shall be used with the device.

## 6.2 Test Procedure

None

## 6.3 Test Result

The device is considered to comply with the requirements by:

	Description
	The transmitter uses a permanently connected antenna.
X	Antenna integrated inside the transmitter.

**7.0 Line Conducted Emission**

**7.1 Test Description**

Parameter:	FCC 15.107, 15.207	
Requirement:	FCC 15.107, class B; 15.207	
<b>Frequency (MHz)</b>	<b>QP Limits (dB<math>\mu</math>V)</b>	<b>AVG Limits (dB<math>\mu</math>V)</b>
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

**7.2 Test Procedure**

All conducted voltage measurements were made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension by the use of mating plugs and receptacles on the EUT and LISN/AMN if used. Equipment was tested with power cords that were normally used or that have electrical and shielding characteristics that were the same as those cords normally used. For those measurements using a LISN/AMN, the 50  $\Omega$  measuring port was terminated by a 50  $\Omega$  receiver or a 50  $\Omega$  resistive load. Hence all 50  $\Omega$  measuring ports of the LISN/AMN were terminated by 50  $\Omega$ .

If a screened room or chamber was used, the EUT was placed 40 cm from a conductive wall, with the wall at the lead of the EUT. IF the test was being performed on an OATS or sheltered site, the vertical ground plane was placed 40 cm away from the rear of the EUT.

The excess length of the lead between the EUT and the LISN/AMN receptacle (or mains outlet where a LISN/AMN cannot be used) was folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. If the EUT does not have a flexible power lead, then it was placed at a distance of 80 cm from the LISN/AMN (or mains outlet where a LISN/AMN cannot be used) and connected to it by a lead or appropriate connection no longer than 1 m. Measurements were made at the LISN/AMN end of this lead or connection

Conducted emission measurements were performed according to the procedures in ANSI C63.4 (2003)

Date of Test: March 12 – May 29, 2007

**FCC ID: D6NLOWFMMOD2V1****7.3 Line Conducted Emission Data (15.107/207)**

**Standard:** FCC part 15.107 (Class B), 15/207  
**Company:** Navico Inc.  
**Job No.:** 3104630LAX-017  
**Model Name:** LOWFMMOD2V1  
**Mode:** Transmitting

Measurement Uncertainty: 2.6 dB  
 Temperature: 24°C  
 Relative Humidity: 49 %

Measurements made on selected frequencies from neutral conductor are given below:

Frequency	AV	AV Limit	Q. Peak	QP Limit	Margin
MHz	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)
0.192	32.4	53.9	42.7	63.9	
0.45	32.1	46.9	30.9	56.9	
0.706	30.0	46	31.6	56	
1.03	30.2	46	31.9	56	
2.57	31.8	46	33.6	56	
17.3	25.2	50	30.6	60	

Measurements made on selected frequencies from line conductor are given below:

Frequency	AV	AV Limit	Q. Peak	QP Limit	Margin
MHz	(dBµV)	(dBµV)	(dBµV)	(dBµV)	(dBµV)
0.192	30.3	53.9	42.3	63.9	
0.515	27.8	46	30.6	56	
0.835	26.0	46	27.2	56	
1.67	29.1	46	31.0	56	
2.57	27.8	46	31.8	56	
17.4	24.9	50	30.5	60	

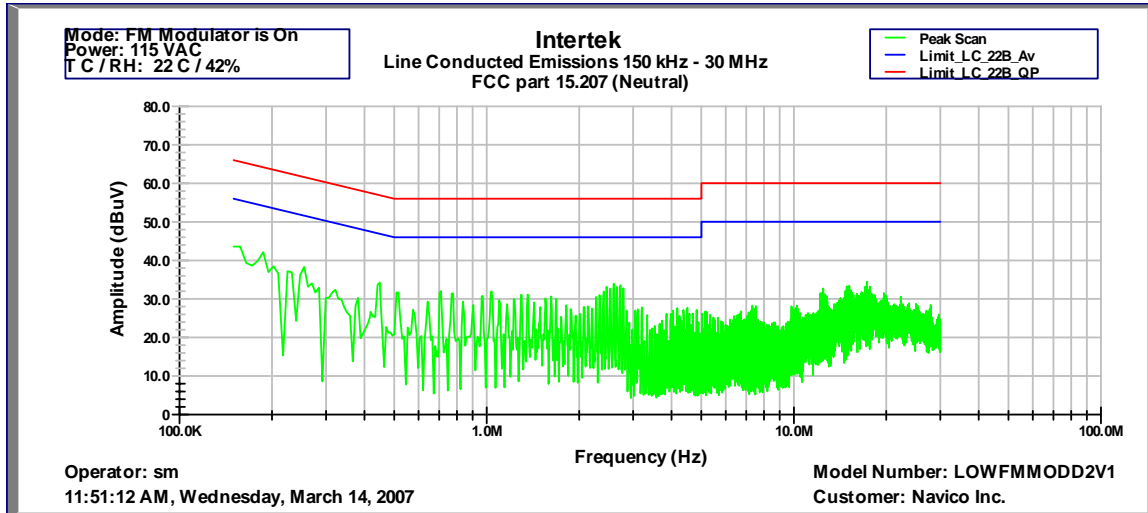
- Note 1: a) A complete scan from 0.15 - 30 MHz was made.  
 b) Analyzer setting: RBW = 9 kHz, VBW = 30 kHz  
 c) Detector mode: Quasi-peak and Average.  
 d) All other measurements were more than 20 dB below the limit lines.  
 e) Numbers with a minus sign in margin column are below the limit.

The next two pages are the peak scan made on line and neutral conductors

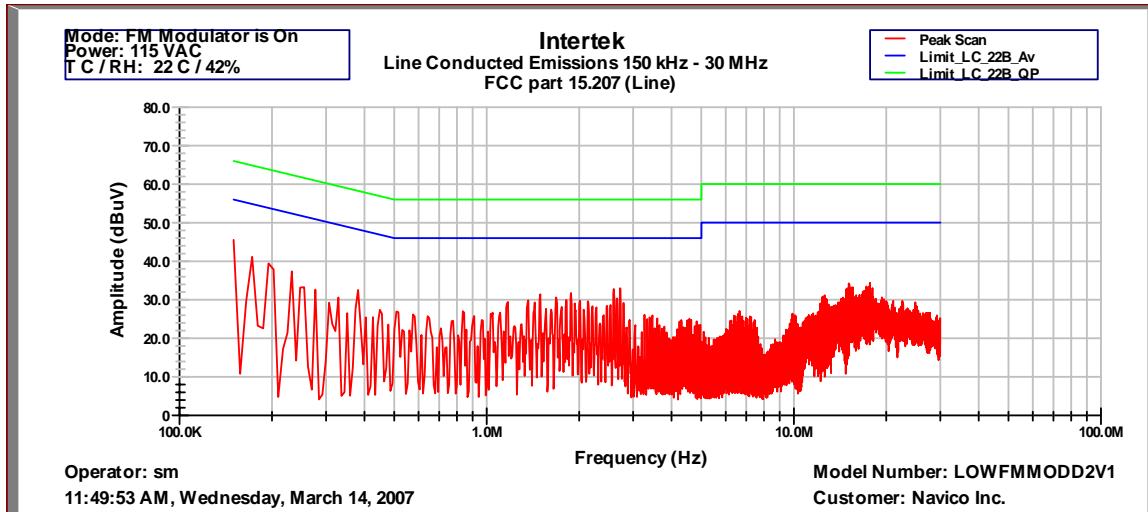
<b>Test Result</b>	Passed with 0.8 dB margin at 28.0 MHz.
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Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1



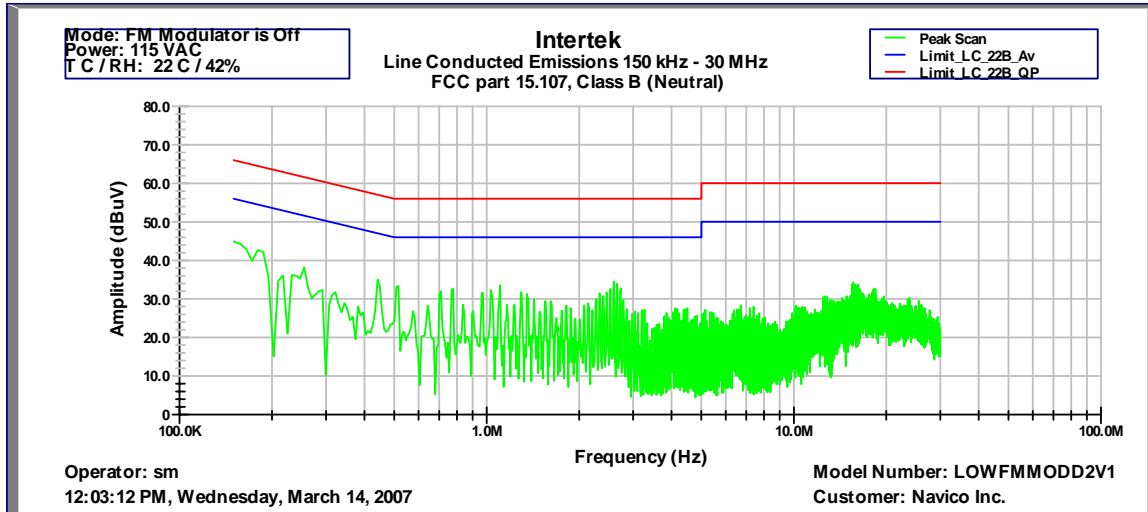
Line Conducted Emission on Neutral Conductor (Transmitting mode)



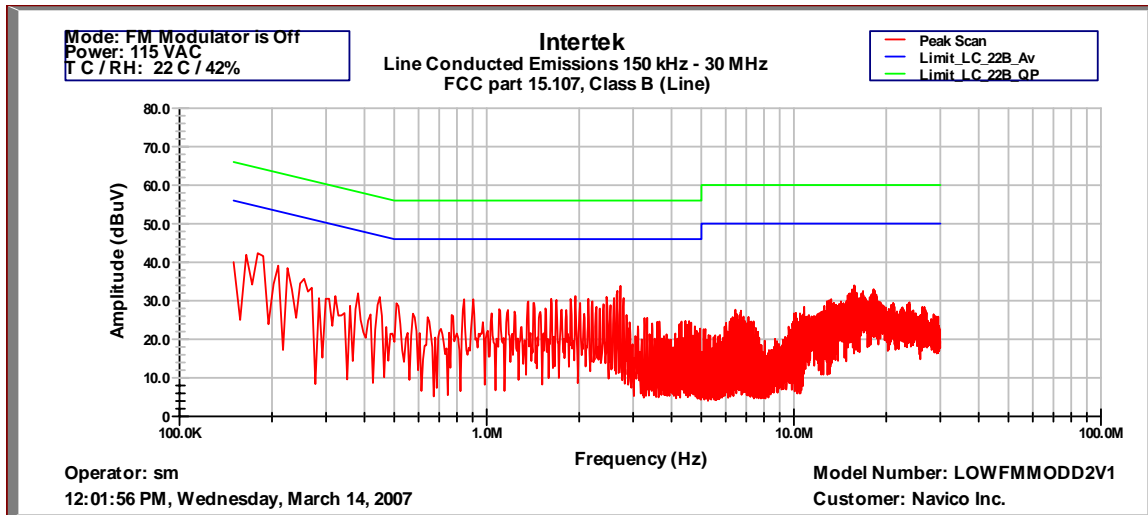
Line Conducted Emission on Line Conductor (Transmitting mode)

Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1



Line Conducted Emission on Neutral Conductor (Standby mode)



Line Conducted Emission on Line Conductor (Standby mode)

Date of Test: March 12 – May 29, 2007

FCC ID: D6NLOWFMMOD2V1

## 8.0 TEST EQUIPMENT

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

### Receivers / Spectrum Analyzers

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
HP 8546A Receiver RF Section	3549A00261	1/02/07	1/02/08	X
HP 85460A RF Filter Section	3448A00265	1/02/07	1/02/08	X
Tile Software	Rev. 3.0 G	N/A	N/A	X
R & S FSP40 Spectrum Analyzer	100027	3/10/07	3/01/08	X

### Antennas / Preamplifiers

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
ETS Lindgren Biconical Antenna 3110B	56996	4/17/07	4/17/08	X
A.H.System SAS-510-4 Logperiodic Antenna	156	1/19/07	1/19/08	X
ETS Lindgren 3115 Horn Antenna	00031626	4/16/07	4/16/08	X
Agilent RF Preamplifier 8447D	2944A101	12/22/06	12/22/07	X
HP RF Preamplifier 8449B	30080116	1/03/07	1/03/08	X

### Artificial Mains Networks/Absorbing Clamps

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
EMCO 3816/2NM 16A LISN	1039	10/04/06	10/04/07	
EMCO 3825/2 25 A LISN	2527	8/17/06	8/17/07	X

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Date of Test: March 12 – May 29, 2007

**FCC ID: D6NLOWFMMOD2V1**

**9.0 Document History**

<b>Revision/Job Number</b>	<b>Writer Initials</b>	<b>Date</b>	<b>Change</b>
	SM	May 29, 2007	Original document