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Project Number: 08170-10

Prepared for:

Scosche Industries, Inc.

1550 Pacific Ave  
Oxnard, CA 93033

By

Professional Testing (EMI), Inc.

1601 FM 1460, Suite B  
Round Rock, Texas 78664

December 2007

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**CERTIFICATION**  
**Electromagnetic Interference Test Report**  
**Scosche Industries, Inc.**  
**FMTD1**

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*THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF PROFESSIONAL TESTING (EMI), INC.*



# Certificate Of Compliance

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Applicant: Scosche Industries, Inc.

Applicant's Address: 1550 Pacific Ave  
Oxnard, CA 93033

FCC ID: IKQFMTD1

IC Number 6955A-FMTD1

Project Number: 08170-10

Test Dates: December 06, 2007

I, Jason Anderson, for Professional Testing (EMI), Inc., being familiar with the FCC and IC rules and test procedures have reviewed the test setup, measured data and this report. I believe them to be true and accurate.

The **Scosche Industries, Inc., FMTD1** was tested to and found to be in compliance with FCC Part 15 Subpart C and IC RSS 210 for an Intentional Radiator.

The highest emissions generated by the above equipment are listed below:

	<u>Frequency (MHz)</u>	<u>Level (dB<math>\mu</math>V/m)</u>	<u>Limit (dB<math>\mu</math>V/m)</u>	<u>Margin (dB)</u>
Fundamental	88.1	47.9.0	48	-0.1
Spurious	335	42.7	46	-3.3
Occupied Bandwidth	174.7 kHz			

Jason Anderson  
Director of Testing Services

This report has been reviewed and accepted by Scosche Industries, Inc. The undersigned is responsible for ensuring that **Scosche Industries, Inc., FMTD1** will continue to comply with the FCC and IC rules.

## 1.0 EUT Description

The Scosche Industries, Inc. FMTD1 enables you to play your digital music through your FM radio. The FMTD1 wirelessly broadcasts the audio signal to your FM radio in your car. 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.

The system tested consisted of the following:

<b>Manufacturer &amp; Model</b>	<b>FCC Number</b>	<b>IC Number</b>
Scosche Industries, Inc., FMTD1	IKQFMTD1	6955A-FMTD1

## 1.1 Applicable Documents

<b>Guidelines</b>	<b>FCC Rule Parts Part 15</b>	<b>IC Rule Parts</b>
Transmitter Characteristics	15.239	RSS-210 A2.8
Spurious Radiated Power	15.205, 15.209, 15.239	RSS-210 2.7 Table 2
Antenna Requirement	15.203	RSS-Gen 7.1.4

## 1.2 EUT Operation

The EUT was operated in continuous transmit mode at max power frequency modulated with music generated from an MP3 player to measure fundamental, harmonics, and spurious radiation.

## 1.3 Applicable Documents

ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment.	2003
47 CFR	Part 15 – Radio Frequency Devices Subpart C	
RSS-210 Issue 7	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	June 2007
RSS-Gen Issue 2	General Requirements and Information for the Certification of Radiocommunication Equipment	June 2007

## **2.0 Electromagnetic Emissions Testing**

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates and expressions thereof for EMC testing.

### **2.1 Radiated Emissions Measurements**

Radiated emission measurements were made of the Fundamental and Spurious Emission levels for FMTD1. Measurements of the occupied bandwidth were also made for the EUT.

Measurements of the maximum emission levels for the spurious/harmonic emissions of the FMTD1 were made at the Professional Testing 10 meter chamber “Site 45”, located in Austin, Texas to determine the radio noise radiated from the EUT. A “Description of Measurement Facilities” has been submitted to the FCC and approved pursuant to Section 2.948 of CFR 47 of the FCC rules. The test site number for Industry Canada is 3036A-1.

Tests of the fundamental for the device were performed to determine the worst case polarization of the devices. The fundamental emissions of the device were measured with the antenna of the device in horizontal and vertical polarization.

#### **2.1.1 Test Procedure**

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable which allows 360 degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. The radiated emissions were maximized by rotating the EUT.

A Spectrum Analyzer with peak detection was used to find the maximums of the radiated emissions during the variability testing. A drawing showing the test setup is given as Figure 2.

### 2.1.2 Test Criteria

The table below shows FCC radiated limits for an intentional radiator operating under the provisions of part 15.239. The measurement of the harmonics was performed to the tenth harmonic (1.08 GHz). The reference distance for each limit is also shown in this table.

Frequency MHz	Test Distance (Meters)	Field Strength	
		(uV/m)@3m	(dBuV/m)@Test Distance
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46
Above 960	3	500	54
Fundamental	3	250	48

**Note: Fundamental and Harmonic Limits are expressed in Average field strengths. The spurious limits are expressed in Quasi-Peak.**

### 2.1.3 Test Results

The radiated test data for the fundamental is included in Appendix A. Peak detection was used during the test for the fundamental and harmonics. Quasi-Peak detection was used for spurious emissions below 1 GHz. Peak detection was used for spurious emissions above 1 GHz. The radiated emission test data is included in Appendix A. The radiated emissions generated by the FMTD1 are below the FCC and IC limits.

### **3.0 Occupied Bandwidth Measurements**

Measurements of the occupied bandwidth for the fundamental signals were made at Professional Testing Round Rock, Texas site. All measurements were made in a controlled indoor environment in a configuration which did not present measurement distortion or ambient interference.

#### **3.1 Test Procedure**

The EUT was placed on a non-conductive table 0.8 meters above the floor. The table was rotated to an angle which presented the highest signal level. The occupied bandwidth was based on a 26 dB criteria (26 dB down either side of the emission from the peak emission). A drawing showing the test setup is given as Figure 1.

#### **3.2 Test Criteria**

According to FCC Part 15.239, the bandwidth of the emission shall be less than 200 kHz.

#### **3.3 Test Results**

The occupied bandwidth test data is included in Appendix A. The maximum occupied bandwidth for the fundamental frequency 98.1 MHz is 174.7 kHz. This occupied bandwidth complies with the FCC and IC requirement.

### **4.0 Antenna Requirement**

An analysis of the FMTD1 was performed to determine compliance with FCC Section 15.203. This section requires specific handling and control of antennas used for devices subject to regulations.

#### **4.1 Evaluation Procedure**

The structure and application of the FMTD1 was analyzed with respect to the rules. The antenna is an internal antenna, and is not accessible to the user. An auxiliary antenna port is not present.

## 4.2 Evaluation Criteria

Section 15.203 of the rules states that the subject device must meet at least one of the following criteria:

- (a) Antenna must be permanently attached to the unit.
- (b) Antenna must use a unique type of connector to attach to the EUT.
- (c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

## 4.3 Evaluation Results

The FMTD1 meets the criteria of this rule by virtue of having an internal antenna inaccessible to the user. The EUT is therefore compliant.

## 5.0 Modifications to Equipment

No modifications made.

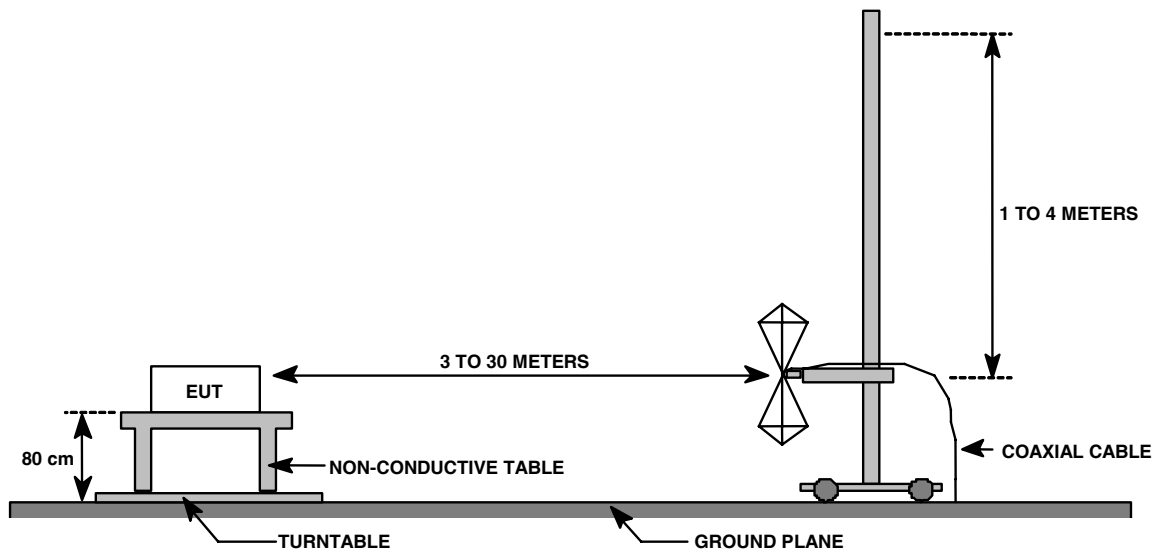
## 6.0 List of Test Equipment

A list of the test equipment utilized to perform the testing is given below. The date of calibration is given for each.

Asset #	Manufacturer	Model #	Description	Calibration Due
275	HP	85650A	Quasi-peak Adapter (high band)	June 18, 2008
83	HP	85662A	Spectrum Analyzer Display (high band)	NCR
84	HP	8566B	Spectrum Analyzer (high band)	March 27, 2008
1035	HP	85685A	RF Preselector (high band)	December 8, 2007
1277	HP	85650A	Quasi-peak Adapter (low band)	June 18, 2008
45	HP	85662A	Spectrum Analyzer Display (low band)	NCR
1148	HP	8568B	Spectrum Analyzer (low band)	June 18, 2008
990	HP	85685A	RF Preselector (low band)	January 11, 2008
1455	HP	8447D	RF Preamplifier	May 1, 2008
1497	Emco	3108	Biconical Antenna	April 18, 2008
1486	Emco	3147	Log Periodic Dipole Array Antenna	April 19, 2008
C026	none	none	Coaxial Cable (low band)	June 28, 2008
C027	none	none	Coaxial Cable (high band)	June 28, 2008



**FIGURE 1: Radiated Emissions Test Setup**



**APPENDIX A      EMISSIONS DATA SHEET**

**Radiated Data Sheet**  
**Scosche Industries, Inc.**  
**FMTD1**  
**Peak Detection RBW =120 kHz**

Test Date: December 06, 2007  
Measurement Distance (Meters): 3

**Low Channel Horizontal**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Function
88.1	260	2.2	65.4	26.4	7.9	1.0	47.9	48	-0.1	Avg
176.2	250	1.8	37.5	26.0	12.1	1.6	25.3	43.5	-18.2	QP
264	190	1.3	48.1	36.3	13.0	2.4	27.2	46	-18.8	QP
288	0	1.2	50.2	36.6	13.6	2.5	29.7	46	-16.3	QP
335	100	1	62.4	36.9	14.4	2.8	42.7	46	-3.3	QP
360	160	1	58.5	37.0	15.0	2.9	39.3	46	-6.7	QP

**Low Channel Vertical**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Function
88.1	40	1	61.2	26.4	7.9	1.0	43.7	48	-4.3	Avg
176.2	300	1	32.7	26.0	12.1	1.6	20.5	43.5	-23.0	QP
264.2	330	1.1	45.7	36.3	13.0	2.4	24.8	46	-21.2	QP
288	60	1	46.4	36.6	13.6	2.5	25.9	46	-20.1	QP
336	0	1	52.1	36.9	14.5	2.8	32.4	46	-13.6	QP
360	300	1	58.9	37.0	15.0	2.9	39.7	46	-6.3	QP

**Result: PASS**

**TEST ENGINEER: Jesse Banda**

**Radiated Data Sheet**  
**Scosche Industries, Inc.**  
**FMTD1**  
**Peak Detection RBW =120 kHz**

Test Date: December 06, 2007  
Measurement Distance (Meters): 3

**Middle Channel Horizontal**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Function
98.1	140	3	60.7	26.3	9.0	1.0	44.4	48	-3.6	Avg
196.2	180	1.6	36.7	25.9	13.6	1.7	26.1	43.5	-17.4	QP
294	220	1.8	41.2	36.7	13.7	2.5	20.8	46	-25.2	QP
336	0	1	60.3	36.9	14.5	2.8	40.6	46	-5.4	QP
540	320	2.3	51.4	37.0	19.2	3.6	37.2	46	-8.8	QP
564	0	350	50.7	37.0	19.4	3.8	36.8	46	-9.2	QP

**Middle Channel Vertical**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Function
98.1	340	1	55.7	26.3	9.0	1.0	39.4	48	-8.6	Avg
196.2	300	1	35.8	25.9	13.6	1.7	25.2	43.5	-18.3	QP
240	10	1	51.4	36.0	12.0	2.1	29.5	46	-16.5	QP
294.3	0	1	39.5	36.7	13.7	2.5	19.1	46	-26.9	QP
336	0	1	50.4	36.9	14.5	2.8	30.7	46	-15.3	QP
360	270	1	47.5	37.0	15.0	2.9	28.3	47	-18.7	QP

**Result: PASS**

**TEST ENGINEER: Jesse Banda**

**Radiated Data Sheet**  
**Scosche Industries, Inc.**  
**FMTD1**  
**Peak Detection RBW =120 kHz**

Test Date: December 06, 2007  
Measurement Distance (Meters): 3

**High Channel Horizontal**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Function
107.9	260	2.5	52	26.3	9.9	1.2	36.8	48	-11.2	Avg
214	100	1	41.7	35.6	11.0	2.0	19.1	43.5	-24.4	QP
240	80	1	41	36.0	12.0	2.1	19.1	46	-26.9	QP
360	140	1	39.1	37.0	15.0	2.9	19.9	46	-26.1	QP
432	0	1.9	35	37.2	17.6	3.1	18.5	46	-27.5	QP
564	340	2	42.2	37.0	19.4	3.8	28.3	46	-17.7	QP

**High Channel Vertical**

Frequency (MHz)	EUT Direction (degrees)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Function
107.9	0	1	48.5	26.3	9.9	1.2	33.3	48	-14.7	Avg
215.8	0	1	40.2	35.6	11.0	2.0	17.6	43.5	-25.9	QP
312	330	1.1	43.2	36.8	14.1	2.6	23.0	46	-23.0	QP
336	230	1.1	52.9	36.9	14.5	2.8	33.2	46	-12.8	QP
360	140	1	47.6	37.0	15.0	2.9	28.4	46	-17.6	QP
384	160	1	45.1	37.1	15.9	2.9	26.7	47	-20.3	QP

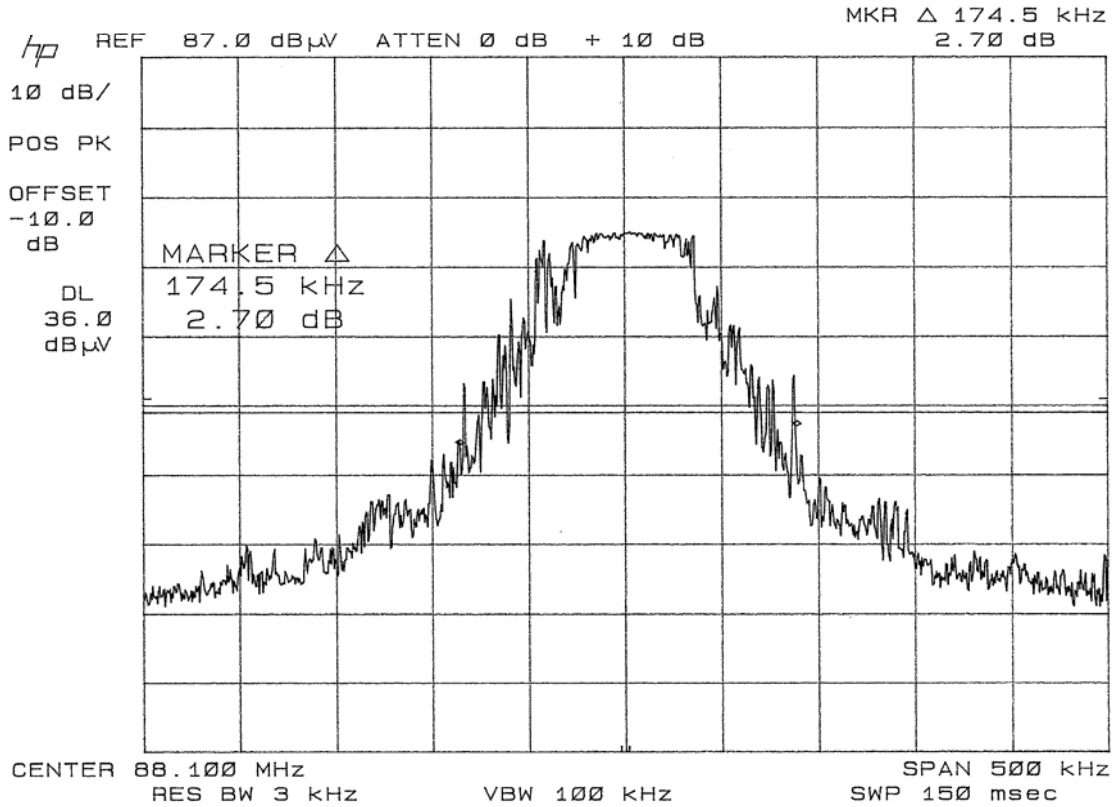
**Result: PASS**

**TEST ENGINEER: Jesse Banda**

Occupied Bandwidth Datasheet  
Scosche Industries, Inc.  
FMTD1

Test Date: December 06, 2007  
Measurement Distance (Meters): 3

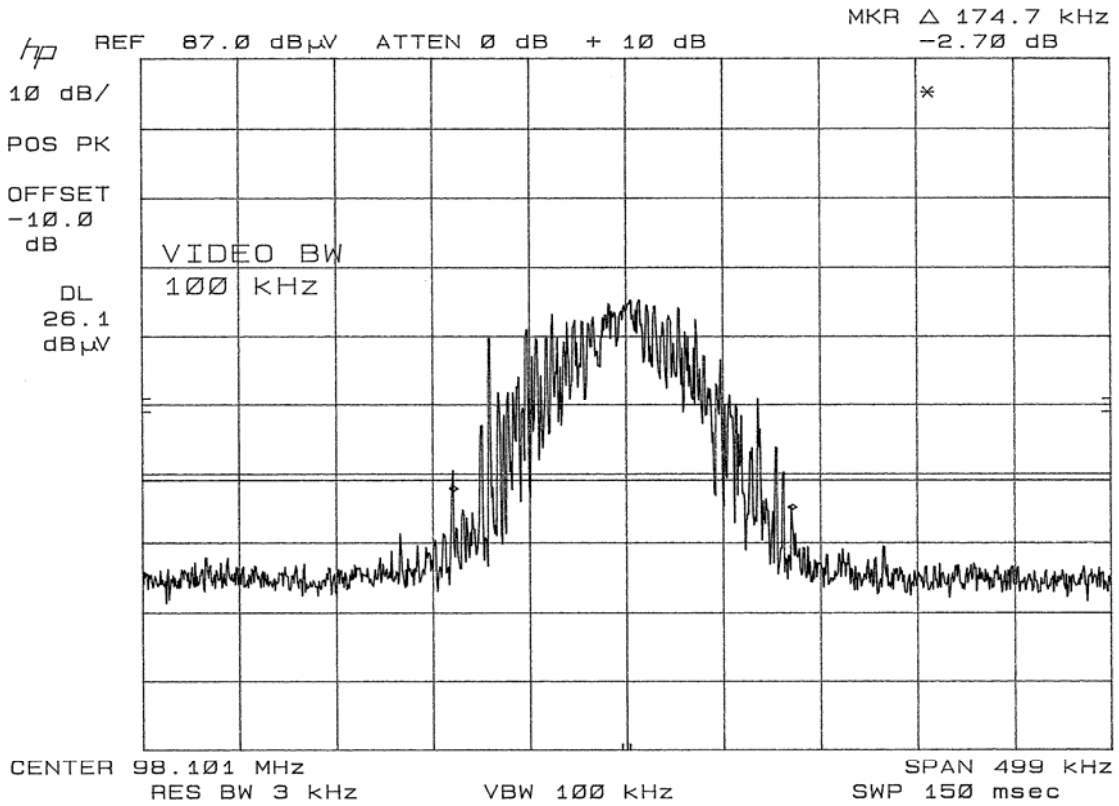
Low Channel 26dB



Occupied Bandwidth Datasheet  
Scosche Industries, Inc.  
FMTD1

Test Date: December 06, 2007  
Measurement Distance (Meters): 3

Mid Channel 26dB



Occupied Bandwidth Datasheet  
Scosche Industries, Inc.  
FMTD1

Test Date: December 06, 2007  
Measurement Distance (Meters): 3

High Channel 26dB

