

Global EMC Inc. Labs

MPE Evaluation

As per

Industry Canada Safety Code 6

EMC
&

FCC Part 15 Subpart C: 2010 15.247i

FCC Part 1, Section 1.1310 Table 1 (B)

On the

Wireless Audio Transmitter Module – WTX1015



Ashwani Malhotra
Global EMC Inc.
180 Brodie Dr, Unit 2
Richmond Hill, ON L4B 3K8
Canada
Ph: (905) 883-3919

Testing produced for

SONAUOX
Audio Solution

See Appendix A for full customer & EUT details.


Industry
Canada

LAB REGISTRATION #6844A-1



FEDERAL COMMUNICATIONS
FC
COMMISSION
USA

FCC REGISTRATION
#612361


ACCREDITED
TESTING LABORATORY
CERTIFICATE #2666.01

Client	Sonavox Audio Solution
Product	Wireless Audio Transceiver Module – WTX1015
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010



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Client	Sonavox Audio Solution
Product	Wireless Audio Transceiver Module – WTX1015
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2010



Report Scope

This report addresses the EMC verification testing and test results of the Wireless Audio Transceiver Module – WTX1015, herein referred to as EUT (Equipment Under Test) performed at Global EMC Labs.

The EUT was evaluated for compliance against the following standards:

IC Safety Code 6 & FCC Part 1, Section 1.1310 Table 1 (B)

Test procedures, results, justifications, and engineering considerations, if any, follow later in this report.

The results contained in this report relate only to the item(s) tested.

This report does not imply product endorsement by A2LA or any other accreditation agency, any government, or Global EMC Inc.

Opinions/interpretations expressed in this report, if any, are outside the scope of Global EMC Inc accreditation. Any opinions expressed do not necessarily reflect the opinions of Global EMC Inc, unless otherwise stated.

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Summary

The results contained in this report relate only to the item(s) tested.

EUT FCC Certification #, FCC ID:	WUO-WTX1015
EUT Industry Canada Certification #, IC:	7985A-WTX1015
EUT Passed all tests performed.	Yes (see test results summary)
Tests conducted by	Ashwani Malhotra

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Test Results Summary

Standard/Method	Description	Class/Limit	Result
FCC 15.247(i) IC Safety code 6	Maximum Permissible Exposure	> 2.5 cm separation.	Pass See justification and calculations
Overall Result			PASS

All tests were performed by Ashwani Malhotra

If the product as tested or otherwise complies with the specification, the EUT is deemed to comply with the requirement and is deemed a 'PASS' grade. If not 'FAIL' grade will be issued. Note that 'PASS' / 'FAIL' grade is independent of any measurement uncertainties. A 'PASS' / 'FAIL' grade within measurement uncertainty is marked with a '*'.

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Justifications, Descriptions, or Deviations

The following justifications for tests not performed or deviations from the above listed specifications apply:

For maximum permissible exposure, this device operates at less than 1 Watt at 2400 – 2480.0 MHz and can be operated at less than 2.5cm from the body. No testing is required, however worst case calculated exposure compliance follows later in this report.

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Applicable Standards, Specifications and Methods

ANSI C63.4:2003 - Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ANSI C63.10:2009 - American national standard for testing unlicensed wireless devices

CFR 47 FCC 15 - Code of Federal Regulations – Radio Frequency Devices

CISPR 22:1997 - Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

ICES-003:2004 - Digital Apparatus - Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard

ISO 17025:2005 - General Requirements for the competence of testing and calibration laboratories

RSS 210:2010 - Issue 7: Spectrum Management and Telecommunications Policy. Radio Standards Specification Low Power Licence-Exempt Radiocommunication Devices

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Sample calculation(s)

Margin = limit – (received signal + antenna factor + cable loss – pre-amp gain)

Margin = 50.5dBuV/m – (50dBuV + 10dB + 2.5dB – 20dB)

Margin = 8.5 dB

Document Revision Status

Revision 1 - March 21st, 2011 – Initial report release.

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Definitions and Acronyms

The following definitions and acronyms are applicable in this report.
See also ANSI C63.14.

AE – Auxillary Equipment.

BW – Bandwidth. Unless otherwise stated, this is refers to the 6 dB bandwidth.

EMC – Electro-Magnetic Compatibility

EMI – Electro-Magnetic Immunity

EUT – Equipment Under Test

ITE – Information Technology Equipment with a primary function(s) of entry, storage, display, retrieval, transmission, processing, switching, or control, of data.

LISN – Line impedance stabilization network

NCR – No Calibration Required

RF – Radio Frequency

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Testing Facility

Testing for EMC on the EUT was carried out at Global EMC labs in Toronto, Ontario, Canada. The testing lab consists of a 3m semi-anechoic chamber calibrated to be able to allow measurements on an EUT with a maximum width or length of up to 2m and height up to 3m. The chamber is equipped with a turn table that is capable of testing devices up to 3300lb in weight. This facility is capable of testing products that are rated for 120 Vac and 240Vac single phase, or 208 Vac 3 phase input. DC capability is also available. The chamber is equipped with an antenna mast that controls polarization and height from the control room adjoining the shielded chamber. Radiated emissions measurements are performed using a Bilog, and Horn antenna where applicable. Conducted emissions, unless otherwise stated, are performed using a LISN.

Calibrations and Accreditations

The measurement site used is registered with Federal Communications Commission (FCC) and Industry Canada (IC). This site is calibrated for Normalized Site Attenuation (NSA) using test procedures outlined in ANSI C63.4 “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”. The semi-anechoic chamber is lined with ferrite tiles and absorption cones to minimize any undesired reflections. All measuring equipment is calibrated on an annual or bi-annual basis as listed for each respective test.

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Testing Environmental Conditions and Dates

Following were the environmental conditions in the facility during time of testing –

Date	Test	Init.	Temperature (°C)	Humidity (%)	Pressure (kPa)
Mar 15 – 18, 2011	All	AM	23 - 26 °C	32%-42%	100.8 -101.6 kPa

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Detailed Test Results Section

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Maximum Permissible Exposure

Purpose

The purpose of this test is to ensure that the RF energy intentionally transmitted, in terms of power density emitted from the EUT at a stated operating distance does not exceed the limits listed below as defined in the applicable test standard, as calculated based upon readings obtained during testing. This helps protect human exposure to excessive RF fields.

Limit(s) and Method

The limits, as defined in FCC 15.247(i) and FCC 1.1310 Table 1 (B) limits for general public exposure was applied. The limit for the frequency range of 1.5 GHz to 100 GHz was applied. This is a limit of 1.0 mW/cm². The distance used for calculations was 1cm, as this unit could be body worn in the end use.

Results

The EUT passed the requirements. The worst case calculated power density was 0.087 mW/cm², this is significantly under the 1.0 mW/cm² requirement.

Calculations

Method 1 (conducted power)

$$P_d = (P_t * G) / (4 * \pi * R^2)$$

Where Pt = -1.6 dbm or 0.69mW as per Peak power conducted output

Where G = 2.0 dBi, or numerically 1.58

Where R = 1 cm

$$P_d = (0.69 \times 1.58) / (4 \times \pi \times 1\text{cm}^2)$$

$$P_d = 1.09 \text{ mW} / 12.56 \text{ cm}^2$$

$$P_d = 0.087 \text{ mW/cm}^2$$

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Appendix A – EUT Summary

General EUT Description

EUT Details	
Manufacturer	Sonavox Audio Solutions
EUT Model number	WTX1015
Equipment Category	Wireless module for audio applications.
Basic EUT Functionality	WTX1015 is a wireless audio transmitter for iPod devices.
Input Voltage and Frequency	5 Vdc
Connectors available on EUT	None. A SMA connector was soldered on the EUT for conducted testing.
Peripherals Required for Test	None.
Release type	Final
Intentional Radiator Frequency	2400 – 2477.0 MHz

Note the EUT is considered to have been received the date of the commencement of the first test, unless otherwise stated. For a close-up picture of the EUT, see ‘Appendix B – EUT & Test Setup Photographs’.

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Appendix B – EUT and Test Setup Photographs

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Figure 1 – Radiated emission setup

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Figure 2 – Conducted power output setup

Note: These photos are for information purposes only. Also refer to PDF files that are separate from this test report.