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Report On

FCC and IC Testing of the
Garmin International Inc
VHF300AIS Fixed Mount Radio

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FCC ID: IPH-GARVHF3
IC ID: 1792A-GARVHF3 D

Document 75906328 Report 05 Issue 3

August 2009



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Garmin International Inc
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DATED

11 August 2009

This report has been up-issued to Issue 3 to correct typographical errors.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Parts 15 B and RSS-Gen The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

A Guy





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SECTION 1

REPORT SUMMARY

FCC and IC Testing of the
Garmin International Inc
VHF300AIS Fixed Mount Radio



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Garmin International Inc VHF300AIS Fixed Mount Radio to the requirements of FCC CFR 47 Part 15B and RSS-Gen.

Objective	To perform FCC and IC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Garmin International
Model Number(s)	VHF300AIS
Declared Variant(s)	VHF 300i, VHF 300 AIS, VHF 300
Serial Number(s)	02
Software Version	2.00
Hardware Version	1.00
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2006 RSS Gen Issue 2: 2007
Incoming Release Date	Declaration of Build Status 21 April 2009
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	148862 Rev 0 25 March 2009
Start of Test	06 June 2009
Finish of Test	06 June 2009
Name of Engineer(s)	A Guy
Related Document(s)	ANSI 63.4 : 2001



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 15B and RSS Gen, is shown below.

Configuration 1 - Normal							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	IC					
2.1	15.109(a)	6(a), 7.2.3	Radiated Emissions (Enclosure Port)	Transmit		N/A	ANSI 63.4
				Receive	Pass	0	
	15.107	6(b), 7.2.2	Conducted Emissions (AC Power Port)	Transmit		N/A	ANSI 63.4
				Receive		N/A	

N/A – Not Applicable



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1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	VHF Radio with or without AIS receiver (AIS version has receiver)
MANUFACTURER	Garmin International
TYPE	VHF300AIS (VHF300iAIS, VHF300 VHF300i as a listed variants)
PART NUMBER	VHF300AIS
SERIAL NUMBER	TBD
HARDWARE VERSION	1.00 or later
SOFTWARE VERSION	2.00
TRANSMITTER OPERATING RANGE	156.025MHz to 157.425 MHz
RECEIVER OPERATING RANGE	156.025MHz to 163.275MHz
COUNTRY OF ORIGIN	China
INTERMEDIATE FREQUENCIES	1st – 21.6MHz, 2nd – 450kHz
ITU DESIGNATION OF EMISSION	16K0G3EJN, 16K0G2BJN
HIGHEST INTERNALLY GENERATED FREQUENCY	163Mhz
OUTPUT POWER (W or dBm)	1W or 25W
FCC ID	IPH-GARVHF3
INDUSTRY CANADA ID	1792A-GARVHF3
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The VHF300 is a fixed mount Class D DSC VHF marine radio. For use on non SOLAS vessels

Signature

Date

21 April 2009

Declaration of Build Status Serial Number 75906328/01

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Declaration of Build Status, to declare the build state of the equipment submitted for test.

No responsibility will be accepted by TÜV Product Service as to the accuracy of the information declared in this document by the manufacturer.



1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Garmin International Inc VHF300AIS Fixed Mount Radio as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test



1.4.2 Test Configuration

Configuration 1: Normal

The EUT was configured in accordance with FCC CFR 47 Part 15B and RSS-Gen.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened
DC Power Cable	2m	Power Cable	Multicore	No
NMEA Cable & Termination Bar	2m	NMEA	Multicore	No
Handset & Cable	0.6m (un-stretched)	to H/S 1 Port	Multicore	No
Speaker & Cable	2 x 1.3m lengths	to H/S 1 Port	Multicore	No
Extension Cable	10m	to H/S 1 Port	Multicore	No
Handset & Cable	0.6m (un-stretched)	to H/S 2 Port	Multicore	No
Speaker & Cable	2 x 1.3m lengths	to H/S 2 Port	Multicore	No
Extension Cable	10m	to H/S 2 Port	Multicore	No
Handset & Cable	0.6m (un-stretched)	to H/S 3 Port	Multicore	No
Speaker & Cable	2 x 1.3m lengths	to H/S 3 Port	Multicore	No
Extension Cable	10m	to H/S 3 Port	Multicore	No

1.4.4 Modes of Operation

Modes of operation of each EUT during testing were as follows:

Mode 1 - Receive

Information on the specific test mode utilised is detailed in the test procedure for each individual test.



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1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 12V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.7 MODIFICATION RECORD

No modifications were made to the EUT during testing.



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SECTION 2

TEST DETAILS

FCC and IC Testing of the
Garmin International Inc
VHF300AIS Fixed Mount Radio



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2.1 RADIATED EMISSIONS (ENCLOSURE PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109(a)
RSS Gen, Clause, 6(a), 7.2.3

2.1.2 Equipment Under Test

VHF300AIS Fixed Mount Radio, S/N: 02

2.1.3 Date of Test and Modification State

06 June 2009 - Modification State 0

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI 63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.1.6 Environmental Conditions

06 June 2009

Ambient Temperature 19°C

Relative Humidity 38%

Atmospheric Pressure 996mbar



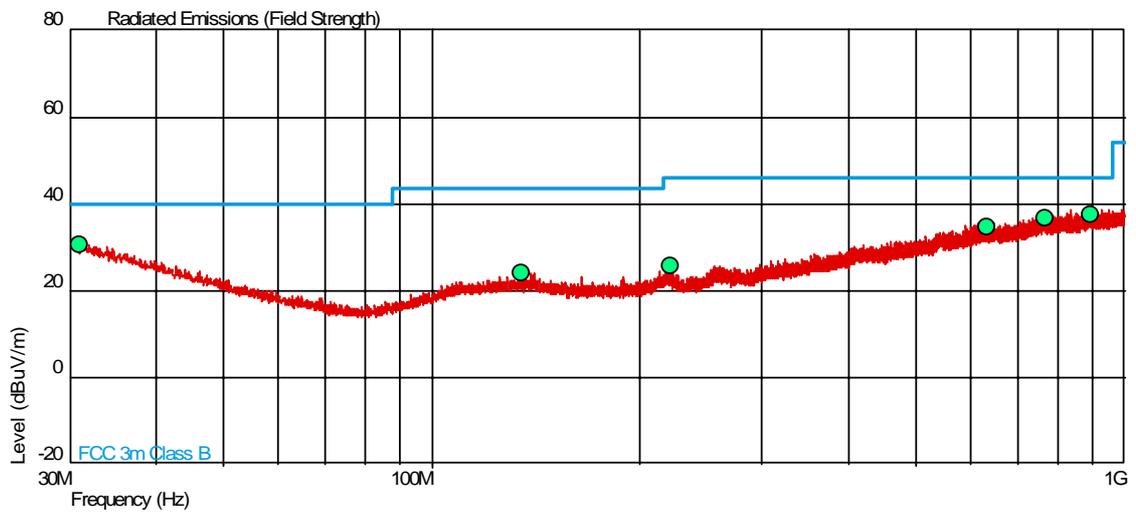
2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15B and RSS Gen for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1

30MHz to 1GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.973	30.7	34.7	40.0	100	-9.3	-65.7	290	1.00	Vertical
134.979	24.0	15.8	43.5	150	-19.5	-133.8	223	1.00	Vertical
221.013	25.6	19.1	46.0	200	-20.4	-180.5	129	1.00	Vertical
634.445	34.5	53.1	46.0	200	-11.5	-146.4	357	1.00	Horizontal
766.946	36.8	69.2	46.0	200	-9.2	-130.3	194	1.00	Vertical
896.271	37.6	75.9	46.0	200	-8.4	-123.7	255	2.01	Vertical



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SECTION 3

TEST EQUIPMENT USED



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3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 EMC - Radiated Emissions					
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	28-Nov-2009
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	20-Aug-2009

TU – Traceability Unscheduled



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	26MHz to 2.5GHz Test Amplitude	1.4dB†
Conducted Susceptibility	100kHz to 250MHz Amplitude	1.8dB†
DC Input Ripple Immunity	Current Voltage	0.45% 0.91%
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°

Worst case error for both Time and Frequency measurement 12 parts in 10⁶.

* In accordance with CISPR 16-4

† In accordance with UKAS Lab 34



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SECTION 4

PHOTOGRAPHS



4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)



Front View



Rear View



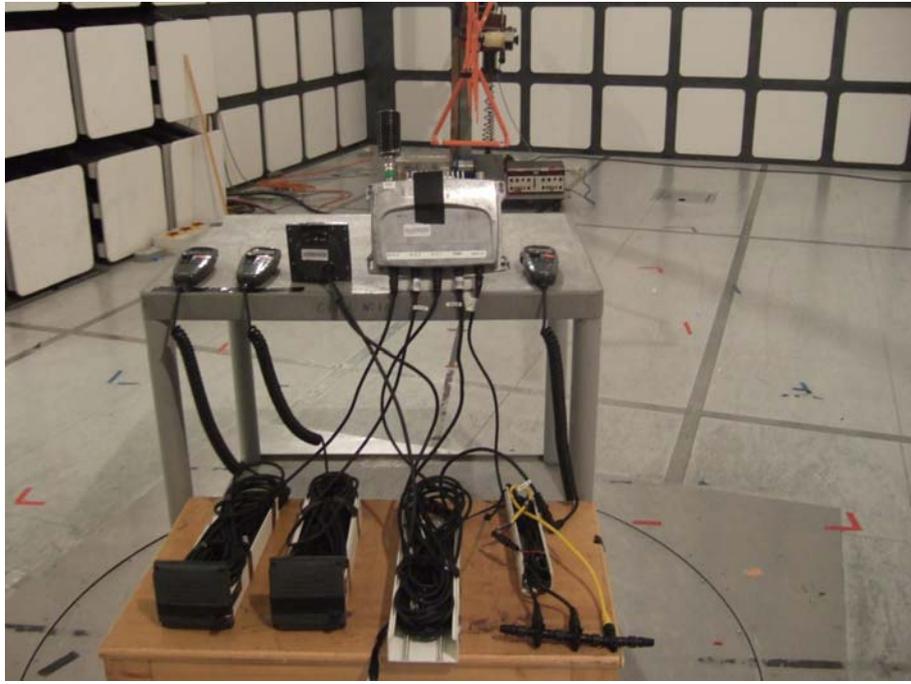
View of Radio Microphone



Front View



4.2 TEST SET UP PHOTOGRAPHS



Radiated Emissions (Enclosure Port)



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SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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