Test Report to EN 62479:2010

Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

Report Number: AT72141218-3R1

Manufacturer: Johnson Outdoors, Inc

Model(s): Helix 7x CHIRP MSI GPS G3N

Test Begin Date: August 28, 2018
Test End Date: September 5, 2018

Report Issue Date: December 4, 2018

FOR THE SCOPE OF ACCREDITATION UNDER Certificate Number: 2955.09

This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

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This report contains 10 pages

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GENERAL

1.1 Purpose

To verify compliance of the Equipment Under Test (EUT) with regards to EMF exposure requirements as defined under the test specification BS EN 62479:2010.

1.2 Manufacturer Information

Johnson Outdoors Marine Electronics, Inc.
678 Humminbird Lane
Eufaula, AL 36027

1.3 Product Description

Product Name: HELIX 7X CHIRP MSI GPS G3N

The Humminbird Helix 7X CHIRP MSI GPS G3N is a fish finder/GPS product with side imaging sonar capability. It is comprised of a keypad, 7" LCD display, two SD card slots, internal GPS, Bluetooth capability, Ethernet capability, transducer and power cable. All G3N CHIRP model variations are built exactly the same. The non G3N variations do not have Bluetooth. They all differ by installed options, SELV circuits, and languages. The only difference in the -1 (12) and -1M (12X) models are languages included in the model.

HELIX 7 CHIRP GPS G3
HELIX 7X CHIRP GPS G3
HELIX 7 CHIRP MDI GPS G3
HELIX 7X CHIRP MDI GPS G3
HELIX 7 CHIRP MSI GPS G3
HELIX 7X CHIRP MSI GPS G3
ICE HELIX 7 CHIRP GPS G2N

HELIX 7 CHIRP GPS G3N
HELIX 7X CHIRP GPS G3N
HELIX 7 CHIRP MDI GPS G3N
HELIX 7X CHIRP MDI GPS G3N
HELIX 7 CHIRP MSI GPS G3N
HELIX 7X CHIRP MSI GPS G3N (Tested Variant)

Serial numbers: 180731223006

Technical Information:

Detail	Description
Transmit Frequency / Alignment Range	2402 MHz – 2480 MHz
Receiver Frequency / Alignment Range	2402 MHz – 2480 MHz
Modulation Format	GFSK, π/4-DQPSK, 8-DPSK
Rated RF Output Power	10dBm (Radiated)
Channel Spacing	2 MHz
Operating Voltage	1.8 VDC
Adaptive	Yes
Antenna Type / Gain:	Surface Mount Ceramic Chip / 0.9 dBi
Type of equipment:	Fixed
Software release:	1.730

1.4 Test Methodology and Considerations

All measurements and/or calculations contained in this report were conducted with EN 62479:2010. Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz).

1.5 Modifications of EUT

No modification of the EUT were required for compliance.

1.6 References

- EN 62479:2010. Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz).
- IEC 62311:2008. Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz).
- ICNIRP Guidelines. For Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (Up to 300 GHz). Published in: Health Physics 74 (4):494-522; 1998.
- Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz)(1999/519/EC).

2.0 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

TÜV SÜD America, Inc.
5945 Cabot Pkwy, Suite 100
Alpharetta, GA 30005
Phone: (678) 341-5900
Fax: N/A

2.2 Laboratory Accreditations/Recognitions/Certifications

TÜV SÜD America, Inc. (Alpharetta Facility) is accredited to ISO/IEC 17025 by the American Association for Laboratory Accreditation/A2LA accreditation program and has been issued certificate number 2955.09 in recognition of this accreditation.

Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scopes of accreditation.

The Semi-Anechoic Chamber Test Sites, Open Area Test Sites (OATS) and Conducted Emissions Sites have been fully described, submitted to, and accepted by the FCC, ISED Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

FCC Registration Number:	967699
ISED Canada Lab Code:	23597
VCCI Member Number:	1831
• VCCI Registration Number	A-0295

3.0 CONCLUSIONS, OBSERVATIONS AND COMMENTS

The test report will be filed at TÜV SÜD America, Inc. for a period of 10 years following the issue of this report. It may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval from TÜV SÜD America, Inc.

The results of the tests as stated in this report are exclusively applicable to the EUT as identified in this report. TÜV SÜD America, Inc. cannot be held liable for properties of the EUT that have not been observed during these tests.

TÜV SÜD America, Inc. assumes the sample to comply with the requirements of EN 62479 for the respective test sector, if the test results turn out positive.

Comments: The provider was responsible for ensuring the test samples provided were representative of final production units.

4.0 CONFORMITY ASSESSMENT METHODS

Figure 4-1 summarizes the applicable assessment route for the EUT corresponding with the essential requirements defined in Section 4.0 of EN 62479:2010.

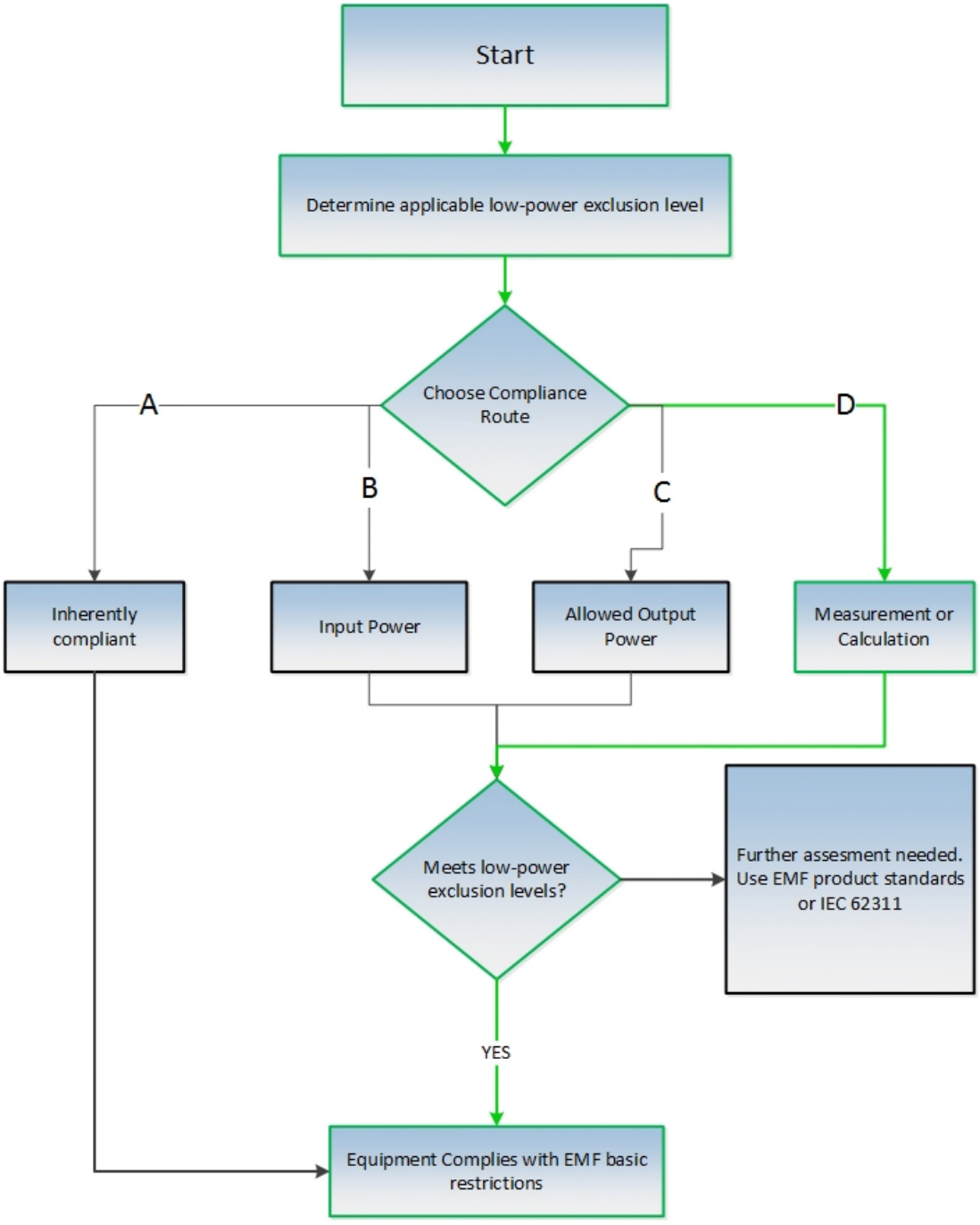

Figure 4-1: Assessment Flowchart

5.0 VERIFICATION PROCEDURE, LIMITS, AND RESULTS

5.1 Verification Procedure

Verification is based on antenna port conducted measurements taken from the following RF test report(s):

Test Report	Radio Standard	Issued by:
G0M-1303-2693-TFC093P-V01	FCC 47 CFR Part 2.10923 RSS-102	Eurofins Product Service GmbH
G0M-1303-2693-TFC247B-V01	FCC 47 CFR Part 15.247 RSS-210	Eurofins Product Service GmbH
G0M-1303-2693-TFC247W-V01	FCC 47 CFR Part 15.247 RSS-210	Eurofins Product Service GmbH

EUT test information such as test equipment used, date of actual test, environmental conditions, measurement uncertainty and the person who performed the original tests are referenced in the above test reports.

5.2 Verification Limits

The applicable limits from Table A.1 of EN 62479:2010 are found in Table 5.2-1 below.

Table 5.2-1: EN 62479:2010 limits in Table A.1

Guideline/Standard	SAR limit, SAR_{max} W/kg	Averaging mass, *m* g	P*max* mW	Exposure tier	Region of body
ICNIRP	2	10	20	General Public	Head and Trunk

Where P*max* is the low-power exclusion level. Specified condition on device output power, which may also depend on other variables such as frequency and distance of radiating source from persons, such that the exposure level produced by the source will not exceed a specific basic restriction. If the device output power is less than P*max*, then the device is deemed to comply with the basic restrictions

5.3 Verification Results

The verification results are summarized in Table 5.3-1 below.

Table 5.3-1: Verification Results

Technology	Modulation	Frequency Range (MHz)	Duty Cycle (%)	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	Limit (dBm)	Result
Bluetooth LE	GFSK	2402 - 2480	100	10.52	0.9	11.42	13	Pass
Bluetooth 2.1+EDR	GFSK π/4-DQPSK 8-DPSK	2402 – 2480	100	10.2	0.9	11.1	13	Pass

6.0 PHOTOGRAPHS OF THE EQUIPMENT (UUT)

Figure 6-1: Isotropic View – Equipment Under Test

Figure 6-2: Isotropic View – Equipment Under Test

END REPORT