

Test Report

Prepared for: Icom Incorporated

Model: MR-1010RII

Description: Marine Radar

Serial Number: 00000205

FCC ID: AFJ271420

To

FCC Part 1.1310

Date of Issue: December 8, 2020

On the behalf of the applicant:

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	December 8,2020	Greg Corbin	Original Document

ANAB

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

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FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

EUT Description

Model: MR1010-RII

Description: Marine Radar

Serial Number: 00000120

Additional Information:

The EUT is a 4kW Radome Scanner Marine Radar operating at 9.4 GHz.

The radar operates from 10.2 – 42 volts DC.

There is a 10 inch color TFT display that is used to control the radar and display the radar images.

The RF output going to the antenna port is WR90 waveguide.

Antenna gain = 25 dBi

Due to the wide bandwidth (10 – 27 MHz, dependent on PW and PRR) of the radar signal, the channel power was measured using the channel power tool on the spectrum analyzer.

The channel power was measured for 3 combinations of PW and PRR and the combination with the highest output was used to calculate the RF exposure.

MPE Evaluation

This is a mobile device used in Uncontrolled Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm ²] = 100
1.34-30 MHz:	Limit [mW/cm ²] = (180/f ²)
30-300 MHz:	Limit [mW/cm ²] = 0.2
300-1500 MHz:	Limit [mW/cm ²] = f/1500
1500-100,000 MHz	Limit [mW/cm ²] = 1.0

Test Data

Test Frequency, MHz	9415
Power, Conducted, mW (P)	3605.8
Antenna Gain Isotropic	25 dBi
Antenna Gain Numeric (G)	316.23
Antenna Type	Slotted Waveguide Array
Distance (R)	20 cm

$S = \frac{P * G}{4\pi r^2}$
Power Density (S) mw/cm ²
226.85 mw/cm ²

Power Density (S) = 226.85 mw/cm ²
Limit = (from above table) = 1.0 mw/cm ²

The power density at 226.85 mw/cm² is over the 1.0 mw/cm² limit so the minimum safe distance was calculated.

Minimum Safe Distance Evaluation

This is a mobile device used in Uncontrolled Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)

0.3-1.234 MHz:	Limit [mW/cm ²] = 100
1.34-30 MHz:	Limit [mW/cm ²] = (180/f ²)
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300-1500 MHz:	Limit [mW/cm ²] = f/1500
1500-100,000 MHz	Limit [mW/cm ²] = 1.0

Test Data

Test Frequency, MHz	9415
Power, Conducted, mW (P)	3605.8
Antenna Gain Isotropic	25 dBi
Antenna Gain Numeric (G)	316.23
Antenna Type	Slotted Waveguide Array
Limit (L)	20 cm

$R = \sqrt{(PG/4\pi L)}$			
Distance (R) cm	Power mW (P)	Numeric Gain (G)	Limit (L)
301.3	3605.8	316.23	1.0

The minimum safe distance is 301.3 cm with a 25 dBi gain antenna.

END OF TEST REPORT