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TIMCO ENGINEERING, Inc.

An IIA Company

RF Exposure Evaluation Report

APPLICANT	YAESU MUSEN CO., LTD.
ADDRESS	Tennozu Parkside Building 2-5-8 Higashi-Shinagawa, Shinagawa-ku Tokyo 140-0002 JAPAN
FCC ID	K6630643X3D
IC	511B-30643X3D
MODEL NUMBER	GX1850GPS, GX1850, GX1800GPS, GX1800
PRODUCT DESCRIPTION	VHF MARINE TRANSCEIVER
DATE	11/09/2018
PREPARED BY	Franklin Rose
TEST RESULTS	☒ PASS ☐ FAIL

Report Number	Report Version	Description	Issue Date
18881UT18 MPE_TestReport_	Rev1	Initial Issue	11/09/2018

TABLE OF CONTENTS

GENERAL REMARKS

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report and was selected by the customer.

☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669
Designation #: US1070

Prepared by:

Name and Title	Franklin Rose, Project Manager / EMC Testing Technician
Date	11/09/2018

GENERAL INFORMATION

EUT Description	VHF MARINE TRANSCEIVER		
Model Number	GX1850GPS, GX1850, GX1800GPS, GX1800		
EUT Power Source	☐ 110–120Vac, 50–60Hz	☒ DC Power	☐ Battery Operated
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☐ Fixed	☒ Mobile	☐ Portable
Antenna Connector	External UFL		
Test Conditions	The temperature was 26ºC Relative humidity of 50%.		
Modification to the EUT	None		
Applicable Standards	FCC CFR 47 Part 2.1091, RSS-102 Table 4 (i5)		
Test Facility	**Shenzhen Huatongwei International Inspection Co., Ltd.** 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China		

ANTENNA INFORMATION

Manufacturer Provides Antenna	Type	Max Gain (dBi)
No	n/a	**0.0**

MPE CALCULATION

RF Exposure Exemption Calculation: RSS-102, s. 2.5.2:

> **2.5.2 Exemption Limits for Routine Evaluation — RF Exposure Evaluation**
>
> RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:
>
> - at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

1.31 * 0.01(161.6^0.6834) = 0.423 mW

25 W ≥ 0.423 mW

Result: Device is **NOT** exempt from Routine RF Exposure Evaluation.

Power Density Calculation: Calculated when separation distance < 20 cm

R = SQRT (P * (G-L)) / (S * 4π)

Where:

S = Maximum Power Density (mW/cm^2)
P = Power input to the antenna (mW)
G = Numeric power gain of the antenna (dBi)
L = Numeric power loss between transmitter and antenna (dB)
R = Distance to the center of antenna radiation (cm)

R = SQRT (25000 * (1)) / (S * 4π)

R = 99.74 cm

R = 1.00 m

MPE CALCULATION

FCC: General Uncontrolled Exposure Environment: FCC 1.1310, Table 1

Variable	Value
Highest Frequency	161.6 MHz
Max Power	25 W
Duty Cycle (at full power)	100%
Max Antenna Gain	0 dBi
Coax Loss	0 dBm
Power Density	0.20 mW/cm^2
Minimum Separation Distance	99.74 cm

ISED: General Uncontrolled Exposure Environment: RSS-102, s. 4, Table 4

Variable	Value
Highest Frequency	161.6 MHz
Max Power	25 W
Duty Cycle (at full power)	100%
Max Antenna Gain	0 dBi
Coax Loss	0 dBm
Power Density	1.291 W/m^2
Minimum Separation Distance	124.14 cm