

RF Exposure Evaluation Report

Client: **Garmin International**
1200 E 151st Street
Olathe Kansas 66062 USA

FCC ID: **IPH-04396**
IC: **1792A-04396**

Test Report No.: **RFE20221028-22-01**

ISED CAB Identifier: **US0177**

Approved By:



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Total Pages: **6**

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Revision Page

Rev. No.	Date	Description
Original	3 November 2022	Prepared by – NJohnson

Regulatory Requirements:

FCC Part 1.1310, 1.1307
RSS-102, Issue 5

Summary:

The EUT's EIRP and conducted output power were used to evaluate for exemption from routine SAR testing.

EUT:

FCC ID: IPH-04396;
IC: 1792A-04396

Report references:

Report:	2022-015
Laboratory:	Garmin International
FCC designation number:	US1311
ISED CAB Identifier	US0233
EIRP:	18.70 dBm EIRP / 0.074W
Conducted Power:	14.26 dBm / 0.026W
EIRP + 10% tune-up tolerance:	14.56 dBm / 0.0286 W
Antenna gain:	4.44 dBi / 2.28 numeric

Antenna gain was declared by manufacturer with a separate document to describe as stated in the referenced test report.

Limits:

from FCC Part 1.1310

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
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(i) Limits for Occupational/Controlled Exposure

0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6

(ii) Limits for General Population/Uncontrolled Exposure

0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

Calculations:

The Friis transmission equation was used to calculate the field strength at the specified separation distance:

$$S = (P \times G) / (4 \times \pi \times d^2)$$

To calculate for compliance with exemption limits:

$$S = EIRP \text{ (including tolerance)} / (4 \times \pi \times d^2)$$

S = power density (in mW/cm²)

P = transmitter conducted power (in mW) = EIRP(mW) / Antenna gain (numeric)

G = antenna numeric gain = 2.78 numeric / 4.44 dBi. Antenna gain was reported by the manufacturer

D = distance to radiation center (20 cm)

The EUT could transmit using multiple modulations within the 2400 – 2483.5 MHz band. The worse-case power value was used to calculate maximum permissible exposure. There is only 1 radio and it cannot transmit on multiple modulations simultaneously.

General Population/uncontrolled								
Frequency Band*	Antenna Gain	Power Conducted	Power EIRP	Power EIRP +10% for tolerance	Power Density	Limit at specified distance	% of limit	Result
MHz	numeric	mW	mW	mW	mW/cm ²	mW/cm ²		
2400 – 2483.5	2.78	26.73	74.30	81.73	0.016	1.00	1.63	PASS

*Shows allowed frequency band of operation, not actual channels. All channels used fall within this range.

RSS 102, Issue 5, Section 2.5.2

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;

$f(\text{MHz}) = 2.400 \text{ GHz}$ (lowest limit frequency within range)

Exemption limit = 2.67 W =	2670 mW
EIRP with 10% tolerance =	81.73 mW
Conducted power with 10% tolerance =	29.40 mW

Both EIRP and conducted power with tolerance are **EXEMPT**

Result:

The EUT was found to be exempt from routine SAR testing and **COMPLIANT** with RF exposure requirements

REPORT END