

RF Exposure Evaluation Report

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

FCC ID: IPH-04408
IC: 1792A-04408

Test Report No.: RFE20220809-20-01B

ISED CAB Identifier: US0177

Approved By:



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Revision Page

Rev. No.	Date	Description
Original	2 November 2022	Prepared by – NJohnson
A	16 November 22	Corrected separation distance and calculations
B	17 November 2022	Listed FCC CAB designation no.

Regulatory Requirements:

FCC Part 1.1310, 2.1091, 2.1093
KDB 447498 D01
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-04408
IC: 1792A-04408

MPE Lab Nebraska Center for Excellence in Electronics
MPE Labs FCC Cab Designation: US1060
MPE Labs ISED Cab Designation: US0177

EMC Report references:

EMC Report: 2022-019
EMC Laboratory: Garmin International
FCC designation number (EMC lab): US1311
ISED CAB Identifier (EMC Lab) US0233

EIRP: 6.16 dBm EIRP / 0.00413 W
Conducted Power: 3.99 dBm / 0.00251 W
EIRP + 10% tune-up tolerance: 6.57 dBm / 0.004543 W
Antenna gain: 2.17 dBi / 1.65 numeric

$$\text{EIRP (mW)} = \text{Conducted power (mW)} \times \text{antenna gain (numeric)}$$

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

Calculations:

Parameters:

Test separation < 5 mm

max. EIRP of channel, including tune-up tolerance, mW = 6.57 mW

f(GHz) = 2.480 GHz (highest frequency of range chosen for worse-case)

EIRP + 10% tolerance was used as it is higher than the conducted value.

KDB 447498 D01, Section 4.3.1(a):

For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,³⁰ where

- $f_{\text{(GHz)}}$ is the RF channel transmit frequency in GHz

Limit / numeric threshold = 7.5 for extremity SAR

$[7 / 5] \times \text{SQRT}(2.480) = 2.20 \leq 7.5$ **EXEMPT**

EIRP + power tolerance was rounded up to to the nearest mW as instructed in the KDB

RSS 102, Issue 5, Section 2.5.1

2.5.1 Exemption Limits for Routine Evaluation — SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1. $f(\text{MHz}) = 2.400 \text{ GHz}$ (lowest limit frequency within range)

Table 1: SAR evaluation — Exemption limits for routine evaluation based on frequency and separation distance ^{4,5}					
Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of $\leq 5 \text{ mm}$	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤ 300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Exemption limit = 9.85 mW (extrapolated to 2480 MHz and x2.5)
 EIRP with 10% tolerance = 6.57 mW
 Conducted power with 10% tolerance = 2.76 mW

For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5

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