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RF Exposure Evaluation Report

Client:	**Garmin International** **1200 E 151st Street** **Olathe Kansas 66062 USA**
Model:	**A04600**
FCC ID: **IC:**	**IPH-04600** **1792A-04600**
Test Report No.:	**RFE20221116-20-01**
ISED CAB Identifier:	**US0177**
Approved By:	 **Nic S. Johnson, NCE** **Techncial Manager** **iNARTE certified EMC Engineer EMC-003337-NE**
Date:	**February 14, 2023**
Total Pages:	**6**

Revision Page

Rev. No.	Date	Description
Original	11 February 2023	Approved by – NJohnson Prepared by – KVepuri

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-04600
IC:	1792A-04600
MPE Lab	Nebraska Center for Excellence in Electronics
MPE Labs FCC Cab Designation:	US1060
MPE Labs ISED Cab Designation:	US0177

EMC Report references:

2402 – 2480 MHz

EMC Report:	2022-035 Version A
EMC Laboratory:	Garmin International
FCC designation number (EMC lab):	US1311
ISED CAB Identifier (EMC Lab)	US0233
EIRP:	2.63 dBm / 0.001832 W
Conducted Power:	2.63 dBm / 0.001832 W
MaxPower + 10% tune-up tolerance:	2.893 dBm / 0.001947W
Antenna gain:	-3.7 dBi (rounded up to zero for cacluation)

EIRP (mW) = Conducted power (mW) + antenna gain (numeric)

13.56 MHz

EMC Report:	2022-034 Version A
EMC Laboratory:	Garmin International
FCC designation number (EMC lab):	US1311
ISED CAB Identifier (EMC Lab)	US0233
Field Strength:	62.5 dBuV/m
EIRP:	-32.73 dBm / 0.000000533 W
EIRP + 10% tune-up tolerance:	-36.003 dBm / 0.000000251W
Antenna gain:	NA

EIRP (dBm) = Field Strength-95.23

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

Calculations:

FCC

Parameters:

Test separation < 5 mm

2402 – 2480 MHz, maximum channel power, including tune-up tolerance, mW = 1.947 mW

13.56 MHz maximum channel power, including tune-up tolerance, mW = 0.000251 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:

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

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

Limit / numeric threshold = 7.5 for extremity SAR

2402 – 2480MHz: [2 / 5] x SQRT(2.480) = 0.63(8.4% of the limit) ≤ 7.5
13.56 MHz**:** [1 / 5] x SQRT(.01356) = 0.07(1% of the limit) ≤ 7.5

Total % 8.4%+1% = 9.4% < 100% therefore it is **Exempt**

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

ISED

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(MHz) = 2.400 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 ≤5 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 = 2 mW (worse-case in 2402 – 2480 MHz range)
2.4 Ghz Max power with 10% tolerance = 1.947 mW = 97.35% of worst case Limit (3500 MHz limit was used)
NFC Max power with 10% tolerance = 0.000251 mW = 0.00035 % of worst-case Limit (≤300 MHz limit was used)

Total % = BLE % +NFC % = 97.35%+0.00035% = 97.35% <100%, therefore it is **Exempt**

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