

ROGERS LABS, INC.

4405 West 259th Terrace
Louisburg, KS 66053
Phone / Fax (913) 837-3214

Class 2 Permissive Change Test Report for Certification

For

Model: A03302

1616.0-1626.5 MHz

Mobile Earth Station

FCC ID: IPH-03302

IC: 1792A-03302

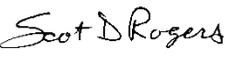
Garmin International, Inc.

1200 East 151st Street
Olathe, KS 66062

FCC Designation: US5305
ISED Registration: 3041A-1

Test Report Number: 210506

Test Date: May 6 to November 5, 2021

Authorized Signatory: 
Scot D. Rogers

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Rogers Labs, Inc.
4405 West 259th Terrace
Louisburg, KS 66053
Phone/Fax: (913) 837-3214
Revision 1

Garmin International, Inc.
Model: A03302 Host: A04166
Test: 210506
Test to: 47CFR 2.1043, (Part 25)
File: A03302 C2PC TstRpt 210506

SN's: 3368623639/ 3368623596
FCC ID: IPH-03302
IC: 1792A-03302
Date: December 6, 2021
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Revisions

Revision 1 Issued December 6, 2021

Executive Summary

The following information is submitted for consideration in processing Class 2 Permissive Change (C2PC) of authorized equipment. The module model: A03302, (FCC ID: IPH-03302) has been granted module authorization operating under 47CFR part 25 and Industry Canada RSS-170 operations in the 1616.0-1626.5 MHz frequency band. The original Grant restricted use for mobile use and prohibited collocation use with other transceivers. This report presents documentation supporting the use of this module in a portable host (FCC ID: IPH-04166) model: A04166 which also houses other transceiver circuitry operating in the 2402-2480 MHz and 5 GHz bands.

Name of Applicant: Garmin International, Inc.
 1200 East 151st Street
 Olathe, KS 66062

Module: A03302 FCC I.D.: IPH-03302
 Host FCC ID: IPH-04166
 Frequency Range: 1616.0-1626.5 MHz
 Operating Power: 1.43 Watts, Occupied Bandwidth 99% 33.1 kHz
 emissions designator 33K1Q7D

Opinion / Interpretation of Results

Test Performed per 47CFR	Minimum Margin (dB)	Results
Radiated Emissions (General Out-of-Band)	-8.0	Complies
Radiated Emissions (harmonics)	-7.7	Complies

Equipment Tested

<u>Equipment</u>	<u>Model / PN</u>	<u>FCC Identifier</u>
EUT	A03302	IPH-03302
EUT (#2)	A03302	IPH-03302

Test results in this report relate only to the items tested

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Equipment Function

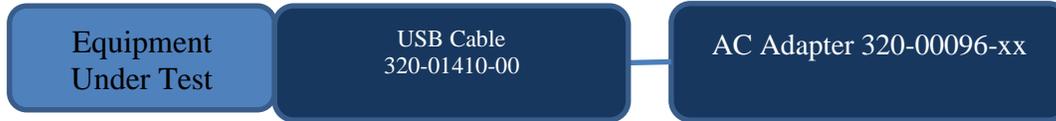
The EUT is a Satellite short burst data transceiver module with operation capability in the 1616.0-1626.5 MHz frequency band. The assembled product FCC ID: IPH-04166, (model: A04166) adds 2.4 and 5 GHz wireless communications capabilities as well as incorporating FCC ID: IPH-03302 wireless module. The design provides the ability to send data using the 1616-1626 MHz data link. The portable host design offers a handheld or mobile mounted satellite communications capability with the 2 and 5 GHz transceivers. The product operates from internal rechargeable battery or external direct current power and provides USB-C interface connection port as documented in this report. Test samples were provided with test software providing the ability to enable transmitter functions on defined channels and operational modes. The EUT was arranged as described by the manufacturer for testing purposes. The EUT offers no other interface connections than those in the configuration options shown below as described by the manufacturer. For testing purposes, the EUT received power from external direct current power and configured to operate in available modes. As requested by the manufacturer and required by regulations, the equipment was tested for emissions compliance using the available configurations with the worst-case data presented. Test results in this report relate only to the products described in this report.

Equipment Configuration

- 1) EUT operating on internal battery



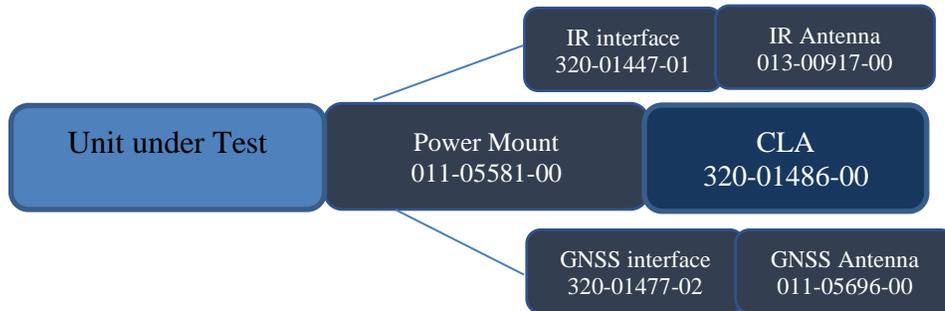
- 2) EUT connected to (and powered by) AC adapter through USB cable (GPN: 320-01410-00)



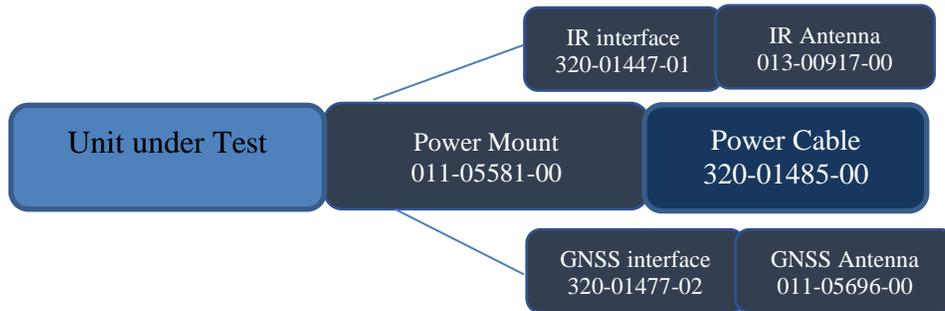
- 3) EUT connected to Computer USB port through cable assembly (GPN: 320-01410-00)



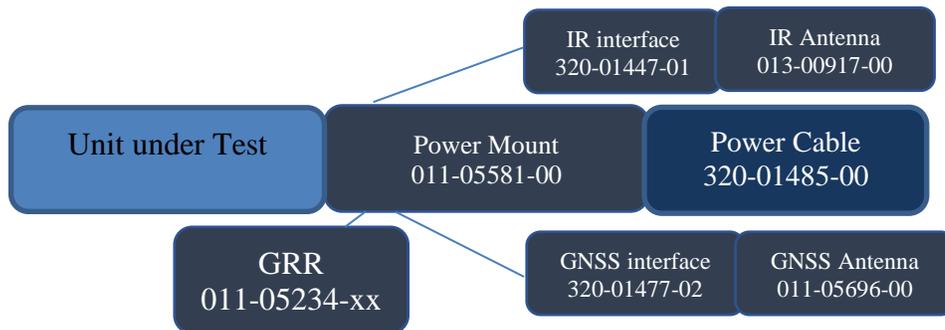
- 4) EUT connected to PWR Mount powered through CLA (320-01486-00)



- 5) EUT connected to PWR Mount powered through Power Cable (320-01485-00)



- 6) EUT connected to PWR Mount with GRR powered through Power Cable (320-01485-00)



Application for Certification

- (1) Manufacturer: Garmin International, Inc.
1200 East 151st Street
Olathe, KS 66062
- (2) Identification: Model: A03302
FCC ID: IPH-03302 IC: 1792A-03302
- (3) Instruction Book:
Refer to Original Filing Exhibit for Instruction Manual.
- (4) Description of Circuit Functions:
Refer to Original Filing Exhibit of Operational Description.
- (5) Block Diagram with Frequencies:
Refer to Original Filing Exhibit of Operational Description.
- (6) Report of Measurements:
Report of measurements follows in this Report.
- (7) Photographs: Construction, Component Placement, etc.:
Refer to Original Filing Exhibit for photographs of equipment.
- (8) List of Peripheral Equipment Necessary for operation. The equipment operates from direct current power. The host design provides USB-C interface port for power and communications as presented in this filing. The EUT offers no other connection ports than those presented in this filing.
- (9) Transition Provisions of CFR47 15.37 are not requested.
- (10) Not Applicable. The unit is not a scanning receiver.
- (11) Not Applicable. The EUT does not operate in the 59 – 64 GHz frequency band.
- (12) The equipment is not software defined and this section is not applicable.
- (13) Applications for certification of U-NII devices in the 5.15-5.35 GHz and the 5.47-5.85 GHz bands must include a high-level operational description of the security procedures that control the radio frequency operating parameters and ensure that unauthorized modifications cannot be made. This requirement is not applicable to his DTS device.
- (14) Contain at least one drawing or photograph showing the test set-up for each of the required types of tests applicable to the device for which certification is requested. These drawings or photographs must show enough detail to confirm other information contained in the test report. Any photographs used must be focused originals without glare or dark spots and must clearly show the test configuration used. This information is provided in this report and Test Setup Exhibits provided with the application filing.

Applicable Standards & Test Procedures

In accordance with the 47CFR, dated November 30, 2021, Part 2, Subpart J, Paragraphs 2.932, and 2.1043, and applicable parts of paragraph 25.202 the following information is submitted.

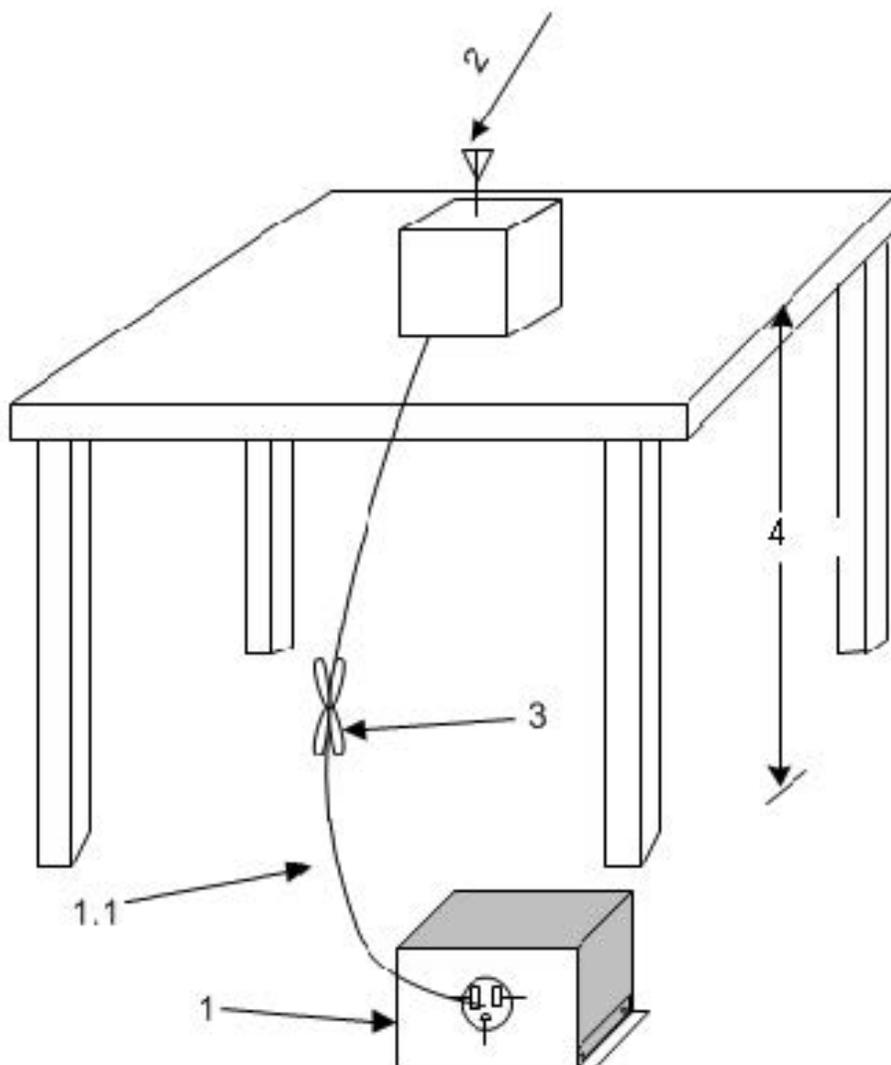
documents compliance for the EUT operations as Low Power Transmitter (DXX).

Equipment Testing Procedures

Radiated Emission Test Procedure

Radiated emissions testing was performed as required in 47 CFR 15C, RSS-210 Issue 10, and specified in ANSI C63.10-2013. The EUT was placed on a rotating 0.9 x 1.2-meter platform, elevated as required above the ground plane at a distance of three meters from the FSM antenna. EMI energy was maximized by equipment placement permitting orientation in three orthogonal axes, raising, and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Each emission was maximized before data was taken and recorded. The frequency spectrum from 9 kHz to 25,000 MHz was searched for emissions during preliminary investigation. Refer to diagrams one and two showing typical test setup. Refer to photographs in the test setup exhibits for specific EUT placement during testing.

Diagram 1 Test arrangement for radiated emissions of tabletop equipment



1—A LISN is optional for radiated measurements between 30 MHz and 1000 MHz but not allowed for measurements below 30 MHz and above 1000 MHz (see 6.3.1). If used, then connect EUT to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. The LISN may be placed on top of, or immediately beneath, the reference ground plane (see 6.2.2 and 6.2.3.2).

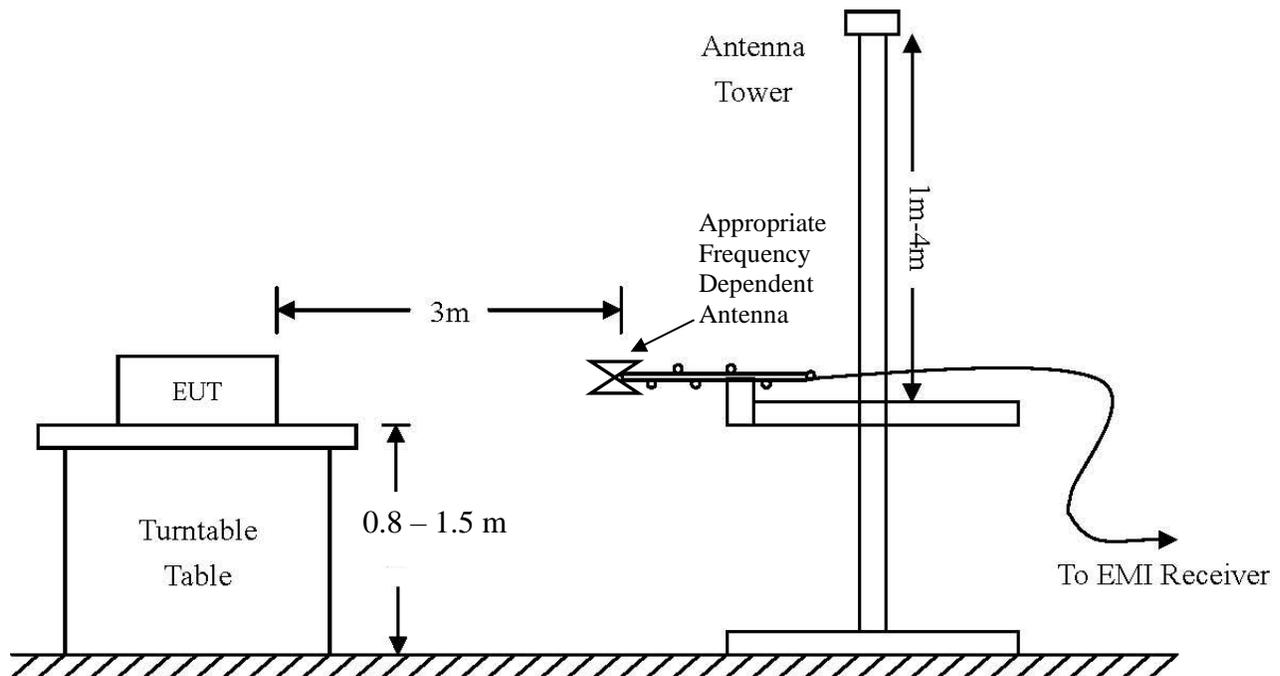
1.1—LISN spaced at least 80 cm from the nearest part of the EUT chassis.

2—Antenna can be integral or detachable, depending on the EUT (see 6.3.1).

3—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long (see 6.3.1).

4—For emission measurements at or below 1 GHz, the table height shall be 80 cm. For emission measurements above 1 GHz, the table height shall be 1.5 m for measurements, except as otherwise specified (see 6.3.1 and 6.6.3.1).

Diagram 2 Test arrangement for radiated emissions tested on Open Area Test Site (OATS)



Test Site Locations

Conducted EMI AC line conducted emissions testing performed in a shielded screen room located at Rogers Labs, Inc., 4405 West 259th Terrace, Louisburg, KS

Antenna port Antenna port conducted emissions testing was performed in a shielded screen room located at Rogers Labs, Inc., 4405 West 259th Terrace, Louisburg, KS

Radiated EMI The radiated emissions tests were performed at the three meters, Open Area Test Site (OATS) located at Rogers Labs, Inc., 4405 West 259th Terrace, Louisburg, KS

Registered Site information: FCC Site: US5305, ISED: 3041A, CAB Identifier: US0096

NVLAP Accreditation Lab code 200087-0

Units of Measurements

Conducted EMI Data presented in dB μ V; dB referenced to one microvolt

Antenna port Conducted Data is in dBm; dB referenced to one milliwatt

Radiated EMI Data presented in dB μ V/m; dB referenced to one microvolt per meter

Note: Radiated limit may be expressed for measurement in dB μ V/m when the measurement is taken at a distance of 3 or 10 meters. Data taken for this report was taken at distance of three meters. Sample calculation demonstrates corrected field strength reading for Open Area Test Site using the measurement reading and correcting for receive antenna factor, cable losses, and amplifier gains.

Sample Calculation:

RFS = Radiated Field Strength, FSM = Field Strength Measured

A.F. = Receive antenna factor, Losses = attenuators/cable losses, Gain = amplification gains

$RFS (dB\mu V/m @ 3m) = FSM (dB\mu V) + A.F. (dB/m) + Losses (dB) - Gain (dB)$

Environmental Conditions

Ambient Temperature 22.7-27.2° C

Relative Humidity 33-41 %

Atmospheric Pressure 1014.3-1019.6 mb

Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to demonstrate compliance with the CFR47 Parts 2, 15B and 25, RSS-GEN, and RSS-170 emission requirements. There were no deviations to the specifications.

General Radiated EMI Testing Procedure

The EUT was arranged in the test configuration emulating worst-case equipment configuration and operated through available modes. Preliminary testing was performed in a screen room with the EUT positioned one meter from the FSM. Investigations were performed to identify the frequencies, which produced the highest radiated emissions. Radiated emission investigations were performed from 9 kHz to 17,000 MHz with the EUT oriented in the manufacturer defined orientation. Frequencies of interest were recorded for use during testing on the OATS. Each investigated emission was then maximized at the OATS site before final radiated emissions measurements were performed. Final data was taken with the EUT located at the open area test site at a distance of 3 meters between the EUT and the receiving antenna. Peak and average amplitudes of frequencies above 1000 MHz were compared to the required limits with worst-case data presented below. Measured emission levels were maximized by EUT placement on the table, changing cable location, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna polarization between horizontal and vertical. Antennas used were Loop from 0.009 to 30 MHz, Broadband Biconical from 30 MHz to 200 MHz, Log Periodic from 200 MHz to 1 GHz, and/or Biconilog from 30 MHz to 1000 MHz, and above 1 GHz, Double Ridge or Pyramidal Horns, notch filters and appropriate amplifiers and mixers were utilized.

Table 1 General Radiated Emissions Data (worst-case)

Frequency (MHz)	Horizontal Peak (dB μ V/m)	Horizontal Quasi-Peak (dB μ V/m)	Vertical Peak (dB μ V/m)	Vertical Quasi-Peak (dB μ V/m)	Limit @ 3m (dB μ V/m)	Horizontal Margin (dB)	Vertical Margin (dB)
45.9	30.4	24.1	36.9	45.9	40.0	-15.9	-9.5
56.1	31.7	25.0	37.0	56.1	40.0	-15.0	-8.0
73.5	27.5	21.9	29.3	73.5	40.0	-18.1	-17.5
75.2	34.4	30.4	35.5	75.2	40.0	-9.6	-10.1
166.3	20.1	13.1	21.0	166.3	40.0	-26.9	-24.9
368.6	25.1	18.7	25.1	368.6	47.0	-28.3	-27.5

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded for frequency range above 1000 MHz.

Summary of Results for General Radiated Emissions

The EUT demonstrated compliance with the radiated emissions. The EUT demonstrated a minimum margin of -8.0 dB below general unintentional radiator equipment radiated emissions requirements. There are no other significantly measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements.

Operation in the Band 1616.0-1626.5 MHz

The test was applied in accordance with the test method requirements of FCC 47CFR Part 2.1043.

A preliminary profile of the Spurious Radiated Emissions was obtained up to a minimum of the 10th harmonic of the highest internally generated frequency by operating the EUT in a screen room. Measurements of emissions from the EUT were taken with the Measurement Antenna in both Horizontal and Vertical Polarizations at a 3-meter distance on the Open Area Test Site (OATS). The profiling produced a list of the worst-case emissions. Using the information from the preliminary testing of the EUT, the list of emissions was then confirmed on the Open Area Test Site (OATS). Emission levels were maximized by adjusting the receive antenna height, antenna polarization and turntable azimuth. The EUT was set to transmit on maximum power in turn on lowest, middle, and highest channels.

For any emissions found the EUT was then removed from the OATS and replaced with a substitution antenna. Using a signal generator, the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gains and losses, and cable loss. Radiated emissions measurements were performed at a 3m distance unless otherwise stated. Emission measurements were performed with all transmitters active.

Table 2 Transmitter Antenna Conducted Emissions Data

Frequency (MHz)	Horizontal Peak (dB μ V/m)	Horizontal Quasi-Peak (dB μ V/m)	Vertical Peak (dB μ V/m)	Vertical Quasi-Peak (dB μ V/m)	Limit @ 3m (dB μ V/m)	Horizontal Margin (dB)	Vertical Margin (dB)
3252.8	46.6	33.3	46.6	33.2	54.0	-20.7	-20.8
4879.2	49.8	36.3	50.1	36.2	54.0	-17.7	-17.8
6505.6	52.2	39.4	52.3	39.4	54.0	-14.6	-14.6
8132.0	54.7	41.3	54.7	41.2	54.0	-12.7	-12.8
9758.4	56.9	43.4	55.9	43.2	54.0	-10.6	-10.8
11384.8	58.4	45.9	58.7	45.7	54.0	-8.1	-8.3
13011.2	59.4	46.0	58.9	45.9	54.0	-8.0	-8.1
14637.6	59.2	46.3	59.4	46.2	54.0	-7.7	-7.8

The antenna conducted output power and 20-dB bandwidth were measured while operating in available modes for the lowest, middle, and highest available channels. The data reported below represents the worst-case operational conditions.

Summary of Results for Emissions of Intentional Radiator

The EUT demonstrated a minimum out of band radiated emission margin of at least 20 dB below requirements. The EUT demonstrated a minimum margin of -7.7 dB below general unintentional radiator equipment radiated emissions requirements. The EUT tested was observed in compliance with the radiated emissions requirements of 47CFR Part 25 and Industry Canada RSS-170. Other emissions were present with amplitudes at least 20 dB below the requirements. There were no other significantly measurable emissions observed other than those recorded in this report. There were no deviations or exceptions to the requirements.

Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Rogers Labs Test Equipment List
- Annex C Rogers Qualifications
- Annex D Laboratory Certificate of Accreditation

Annex A Measurement Uncertainty Calculations

The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16-4. Result of measurement uncertainty calculations are recorded below. Component and process variability of production devices similar to those tested may result in additional deviations. The manufacturer has the sole responsibility of continued compliance.

Measurement	Expanded Measurement Uncertainty $U_{(lab)}$
3 Meter Horizontal 0.009-1000 MHz Measurements	4.16
3 Meter Vertical 0.009-1000 MHz Measurements	4.33
3 Meter Measurements 1-18 GHz	5.14
3 Meter Measurements 18-40 GHz	5.16
10 Meter Horizontal Measurements 0.009-1000 MHz	4.15
10 Meter Vertical Measurements 0.009-1000 MHz	4.32
AC Line Conducted	1.75
Antenna Port Conducted power	1.17
Frequency Stability	1.00E-11
Temperature	1.6°C
Humidity	3%

Annex B Test Equipment

<u>Equipment</u>	<u>Manufacturer</u>	<u>Model (SN)</u>	<u>Band</u>	<u>Cal Date(m/d/y)</u>	<u>Due</u>
<input checked="" type="checkbox"/> LISN	FCC	FCC-LISN-50-25-10(1PA) (160611)	.15-30MHz	4/6/2021	4/6/2022
<input checked="" type="checkbox"/> LISN	Compliance Design	FCC-LISN-2.Mod.cd,(126)	.15-30MHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(L10M)(303073)	9kHz-40 GHz	10/14/2021	10/14/2022
<input type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303069)	9kHz-40 GHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303070)	9kHz-40 GHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Cable	Belden	RG-58 (L1-CAT3-11509)	9kHz-30 MHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Cable	Belden	RG-58 (L2-CAT3-11509)	9kHz-30 MHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Antenna	Com Power	AL-130 (121055)	.001-30 MHz	10/14/2021	10/14/2022
<input type="checkbox"/> Antenna:	EMCO	6509	.001-30 MHz	10/14/2020	10/14/2022
<input type="checkbox"/> Antenna	ARA	BCD-235-B (169)	20-350MHz	10/14/2021	10/14/2022
<input type="checkbox"/> Antenna:	Schwarzbeck Model	VHBB 9124 (1468)		10/14/2020	10/14/2022
<input checked="" type="checkbox"/> Antenna	Sunol	JB-6 (A100709)	30-1000 MHz	10/14/2021	10/14/2022
<input type="checkbox"/> Antenna	ETS-Lindgren	3147 (40582)	200-1000MHz	10/14/2020	10/14/2022
<input type="checkbox"/> Antenna:	Schwarzbeck Model:	VULP 9118 A (VULP 9118 A-534)		10/14/2020	10/14/2022
<input checked="" type="checkbox"/> Antenna	ETS-Lindgren	3117 (200389)	1-18 GHz	4/21/2020	4/21/2022
<input type="checkbox"/> Antenna	Com Power	AH-118 (10110)	1-18 GHz	10/14/2020	10/14/2022
<input checked="" type="checkbox"/> Antenna	Com Power	AH-840 (101046)	18-40 GHz	4/6/2021	4/6/2023
<input checked="" type="checkbox"/> Analyzer	Rohde & Schwarz	ESU40 (100108)	20Hz-40GHz	5/20/2021	5/20/2022
<input checked="" type="checkbox"/> Analyzer	Rohde & Schwarz	ESW44 (101534)	20Hz-44GHz	1/12/2021	1/12/2022
<input type="checkbox"/> Analyzer	Rohde & Schwarz	FS-Z60, 90, 140, and 220	40GHz-220GHz	12/22/2017	12/22/2027
<input checked="" type="checkbox"/> Amplifier	Com-Power	PA-010 (171003)	100Hz-30MHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Amplifier	Com-Power	CPPA-102 (01254)	1-1000 MHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Amplifier	Com-Power	PAM-118A (551014)	0.5-18 GHz	10/14/2021	10/14/2022
<input checked="" type="checkbox"/> Amplifier	Com-Power	PAM-840A (461328)	18-40 GHz	10/14/2021	10/14/2022
<input type="checkbox"/> Power Meter	Agilent	N1911A with N1921A	0.05-40 GHz	4/6/2021	4/6/2022
<input type="checkbox"/> Generator	Rohde & Schwarz	SMB100A6 (100150)	20Hz-6 GHz	4/6/2021	4/6/2022
<input type="checkbox"/> Generator	Rohde & Schwarz	SMBV100A6 (260771)	20Hz-6 GHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC50722 (009).9G notch	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	HPM50114 (017)1.5G HPF	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	HPM50117 (063) 3G HPF	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	HPM50105 (059) 6G HPF	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	BRM50702 (172) 2G notch	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC50703 (G102) 5G notch	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC50705 (024) 5G notch	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> Attenuator	Fairview	SA6NFNF100W-40 (1625)	30-18000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> Attenuator	Mini-Circuits	VAT-3W2+ (1436)	30-6000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> Attenuator	Mini-Circuits	VAT-3W2+ (1445)	30-6000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> Attenuator	Mini-Circuits	VAT-3W2+ (1735)	30-6000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> Attenuator	Mini-Circuits	VAT-6W2+ (1438)	30-6000 MHz	4/6/2021	4/6/2022
<input type="checkbox"/> Attenuator	Mini-Circuits	VAT-6W2+ (1736)	30-6000 MHz	4/6/2021	4/6/2022
<input checked="" type="checkbox"/> Weather station	Davis	6312 (A81120N075)		11/4/2020	11/4/2021

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List of Test Equipment	Calibration	Date (m/d/y)	Due
<input type="checkbox"/> Antenna: Schwarzbeck Model VHBB 9124 (9124-627)		4/21/2020	4/21/2022
<input type="checkbox"/> Antenna: Schwarzbeck Model: VULP 9118 A (VULP 9118 A-534)		4/21/2020	4/21/2022
<input type="checkbox"/> Frequency Counter: Leader LDC-825 (8060153)		4/6/2021	4/6/2022
<input type="checkbox"/> LISN: Com-Power Model LI-220A		10/14/2020	10/14/2022
<input type="checkbox"/> LISN: Com-Power Model LI-550C		10/14/2020	10/14/2022
<input type="checkbox"/> ISN: Com-Power Model ISN T-8		4/6/2021	4/6/2022
<input type="checkbox"/> LISN: Fischer Custom Communications Model: FCC-LISN-50-16-2-08		4/6/2021	4/6/2022
<input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(1.5M)(303072) 9kHz-40 GHz		10/14/2021	10/14/2022
<input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(L1M)(281183) 9kHz-40 GHz		10/14/2021	10/14/2022
<input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(L4M)(281184) 9kHz-40 GHz		10/14/2021	10/14/2022
<input type="checkbox"/> Cable Huber & Suhner Inc. Sucoflex102ea(L10M)(317546)9kHz-40 GHz		10/14/2021	10/14/2022
<input type="checkbox"/> Cable Time Microwave 4M-750HF290-750 (4M) 9kHz-24 GHz		10/14/2021	10/14/2022
<input type="checkbox"/> RF Filter Micro-Tronics BRC17663 (001) 9.3-9.5 notch 30-1800 MHz		4/6/2021	4/6/2022
<input type="checkbox"/> RF Filter Micro-Tronics BRC19565 (001) 9.2-9.6 notch 30-1800 MHz		10/16/2018	4/6/2022
<input type="checkbox"/> Analyzer HP 8562A (3051A05950) 9kHz-125GHz		4/6/2021	4/6/2022
<input type="checkbox"/> Wave Form Generator Keysight 33512B (MY57400128)		4/21/2020	4/6/2022
<input type="checkbox"/> Antenna: Solar 9229-1 & 9230-1		2/22/2021	2/22/2022
<input type="checkbox"/> CDN: Com-Power Model CDN325E		10/14/2021	10/14/2022
<input type="checkbox"/> Injection Clamp Luthi Model EM101		10/14/2021	10/14/2022
<input type="checkbox"/> Oscilloscope Scope: Tektronix MDO 4104		2/22/2021	2/22/2022
<input type="checkbox"/> EMC Transient Generator HVT TR 3000		2/22/2021	2/22/2022
<input type="checkbox"/> AC Power Source (Ametech, California Instruments)		2/22/2021	2/22/2022
<input type="checkbox"/> Field Intensity Meter: EFM-018		2/22/2021	2/22/2022
<input type="checkbox"/> ESD Simulator: MZ-15		2/22/2021	2/22/2022
<input type="checkbox"/> R.F. Power Amp ACS 230-50W			not required
<input type="checkbox"/> R.F. Power Amp EIN Model: A301			not required
<input type="checkbox"/> R.F. Power Amp A.R. Model: 10W 1010M7			not required
<input type="checkbox"/> R.F. Power Amp A.R. Model: 50U1000			not required
<input type="checkbox"/> Tenney Temperature Chamber			not required
<input checked="" type="checkbox"/> Shielded Room			not required

Rogers Labs, Inc.
 4405 West 259th Terrace
 Louisburg, KS 66053
 Phone/Fax: (913) 837-3214
 Revision 1

Garmin International, Inc.
 Model: A03302 Host: A04166
 Test: 210506
 Test to: 47CFR 2.1043, (Part 25)
 File: A03302 C2PC TstRpt 210506

SN's: 3368623639/ 3368623596
 FCC ID: IPH-03302
 IC: 1792A-03302
 Date: December 6, 2021
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Annex C Rogers Qualifications

Scot D. Rogers, Engineer

Rogers Labs, Inc.

Mr. Rogers has approximately 35 years' experience in the field of electronics. Working experience includes six years working in the automated controls industry and remaining years working with the design, development and testing of radio communications and electronic equipment.

Positions Held:

Systems Engineer: A/C Controls Mfg. Co., Inc. 6 Years

Electrical Engineer: Rogers Consulting Labs, Inc. 5 Years

Electrical Engineer: Rogers Labs, Inc. Current

Educational Background:

Bachelor of Science Degree in Electrical Engineering from Kansas State University

Bachelor of Science Degree in Business Administration Kansas State University

Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming

Annex D Laboratory Certificate of Accreditation

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200087-0

Rogers Labs, Inc.
Louisburg, KS

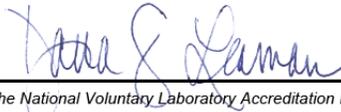
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is 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 joint ISO-ILAC-IAF Communiqué dated January 2009).*

2021-02-19 through 2022-03-31
Effective Dates




For the National Voluntary Laboratory Accreditation Program

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