



Test Report

Prepared for: Garmin International Inc

Model: A02777

Description: Camera

Serial Number: N/A

FCC ID: IPH-02777
IC: 1792A-02777

To

FCC Part 15.249

Date of Issue: July 23, 2016

On the behalf of the applicant:

Garmin International Inc
1200 E. 151st. Street
Olathe, KS 66062

Attention of:

Paul Phrommany, Compliance Engineer
Ph: (913)440-2012
E-mail: Paul.Phrommany@garmin.com

Prepared by
Compliance Testing, LLC
1724 S. Nevada Way
Mesa, AZ 85204
(480) 926-3100 phone / (480) 926-3598 fax
www.compliancetesting.com
Project No: p1660026

Kenneth Lee
Project Test Engineer

This report may not be reproduced, except in full, without written permission from Compliance Testing.
All results contained herein relate only to the sample tested.

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	June 28, 2016	Kenneth Lee	Original Document
2.0	July 23, 2016	Amanda Reed	Updated model & description

Table of Contents

<u>Description</u>	<u>Page</u>
Standard Test Conditions Engineering Practices	6
Test Results Summary	7
Fundamental Field Strength	8
Radiated Spurious Emissions	9
99% Occupied Bandwidth	11
Test Equipment Utilized	13

ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

The applicant has been cautioned as to the following

15.21: Information to User

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a): Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator the responsible part may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Standard Test Conditions Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.10-2009 and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F) unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Measurement results, unless otherwise noted, are worst-case measurements.

Environmental Conditions		
Temperature (°C)	Humidity (%)	Pressure (mbar)
25.6	26.8	946.7

EUT Description

Model: A02777

Description: Camera

Firmware: N/A

Software: N/A

Serial Number: N/A

Additional Information: None

EUT Operation during Tests

The EUT was put into a test mode installed on the device software. This test mode allowed the device to be set to the high, middle and low channels, while in CW or ANT modulations.

Accessories: None

Cables: None

Modifications: None

15.203: Antenna Requirement:

- The antenna is permanently attached to the EUT
- The antenna uses a unique coupling
- The EUT must be professionally installed
- The antenna requirement does not apply



Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.249(a)	Fundamental Field Strength	Pass	
15.249(d) and 15.215(b)	Out of Band Spurious Emissions	Pass	
RSS-210	99% Occupied Bandwidth	Pass	

Fundamental Field Strength

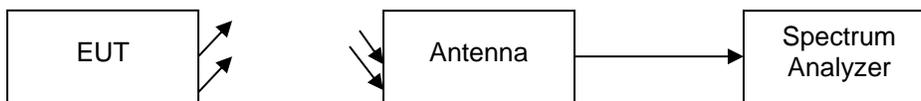
Engineer: Kenneth Lee

Test Date: 06/28/2016

Test Procedure

The EUT was tested in a semi- anechoic chamber at a distance of 1 meter from the receiving antenna A spectrum analyzer was used to verify that the EUT met the requirements for Fundamental Field Strength. The antenna correction and distance correction factors were summed with the quasi-peak measurement to ensure correct readings.

Test Setup



Spectrum Analyzer Settings

Detector Settings	RBW	VBW	Span
Peak	1 MHz	1 MHz	As Necessary
Average	1 MHz	3 MHz	As Necessary
Quasi – Peak	120 kHz	300 kHz	As Necessary

Sample Calculations:

Correction Factors include Antenna and cable insertion loss.

Measured Level includes correction factors that were entered into the spectrum analyzer before recording test data.

Fundamental Field Strength

Tuned Frequency (MHz)	Peak Measured Level (dBuV/m)	Avg Limit (dBuV/m)	Result
2402	93.65	94.0	Pass
2441	92.39	94.0	Pass
2480	91.93	94.0	Pass

Radiated Spurious Emissions

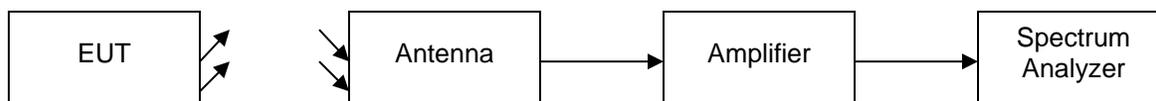
Engineer: Kenneth Lee

Test Date: 06/28/2016

Test Procedure

The EUT was tested in a semi-anechoic chamber set 1 m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the limits for Radiated Spurious Emissions. The antenna, band reject filter, amplifier and cable correction factors were input into the spectrum analyzer before recording data. The spectrum for each tuned frequency was examined to the 10th harmonic.

Test Setup



Analyzer Settings

Detector Settings	RBW	VBW	Span
Peak	1 MHz	3 MHz	As Necessary
Average	1 MHz	30 Hz	As Necessary

Sample Calculations:

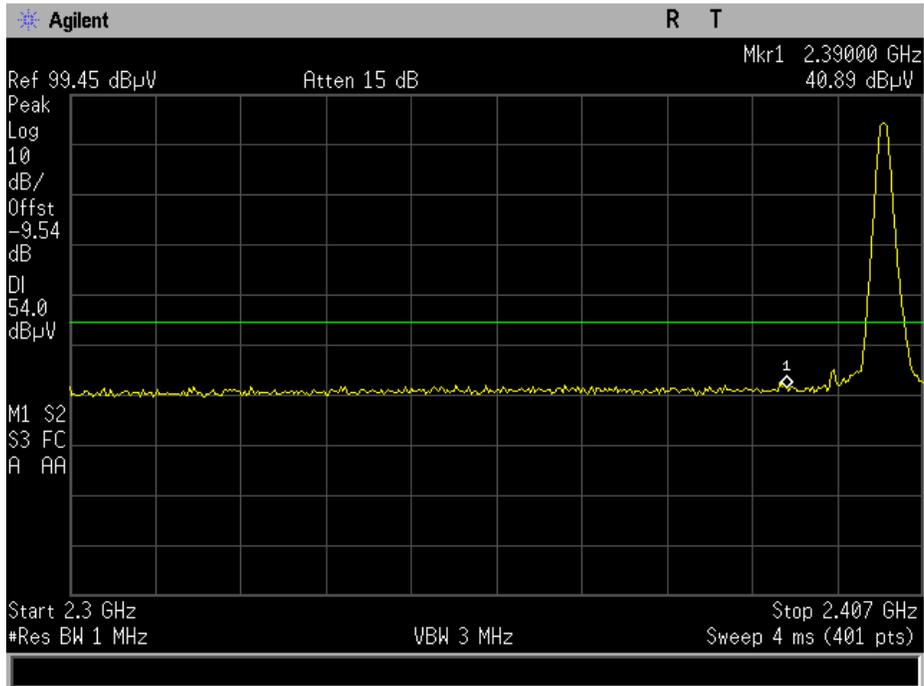
Correction Factors include Antenna and cable insertion loss correction factors.

Measured Level includes correction factors that were input to the spectrum analyzer before recording test data

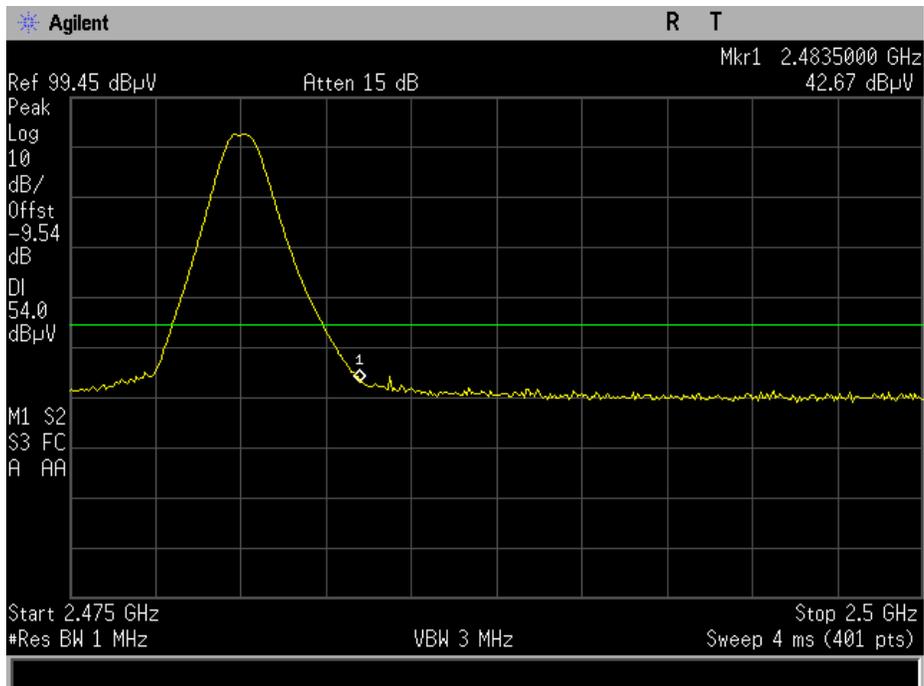
See Annex A for test data



Lower Band Edge Plot



Upper Band Edge Plot



99% Occupied Bandwidth

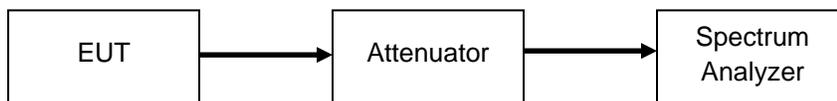
Engineer: Kenneth Lee

Test Date: 06/28/2016

Test Procedure

The EUT was connected to a spectrum analyzer input. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold while the 99% bandwidth was measured.

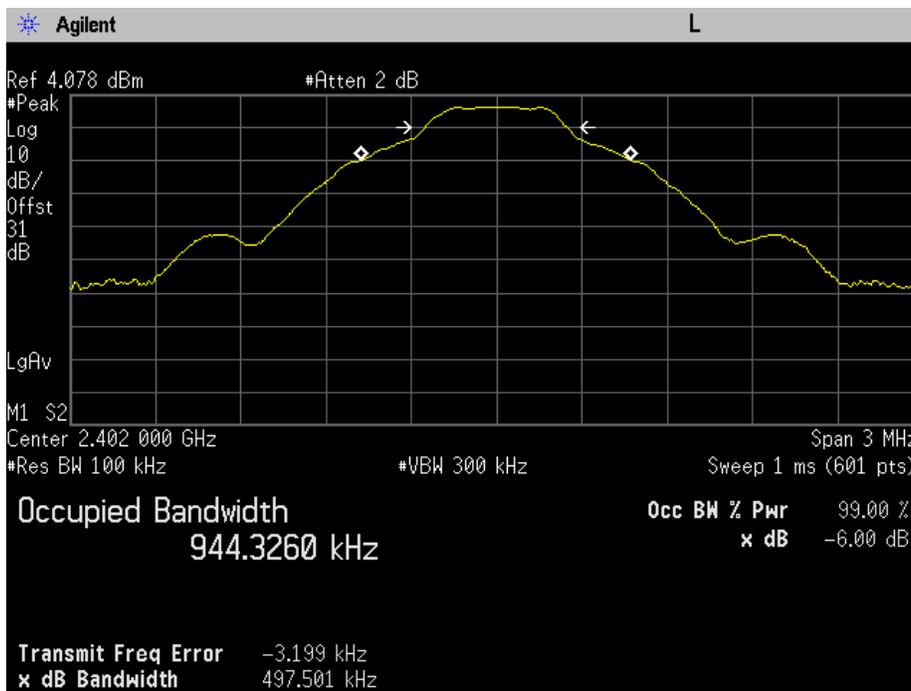
Test Setup



Occupied Bandwidth Summary

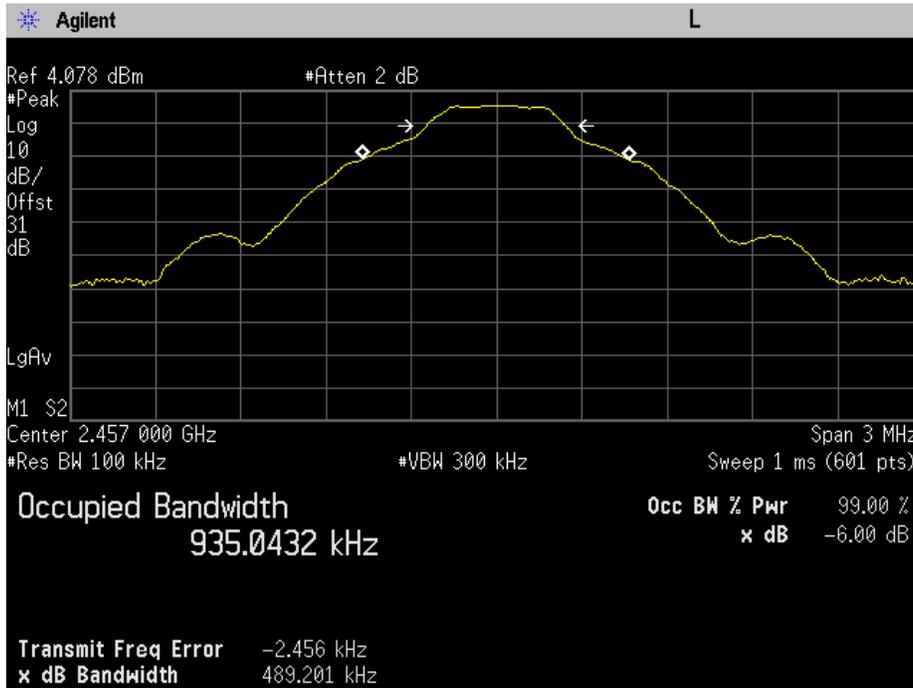
Frequency MHz	Recorded Measurement	Result
2402	944.326 kHz	Pass
2441	935.043 kHz	Pass
2480	933.754 kHz	Pass

99% Bandwidth 2402 MHz

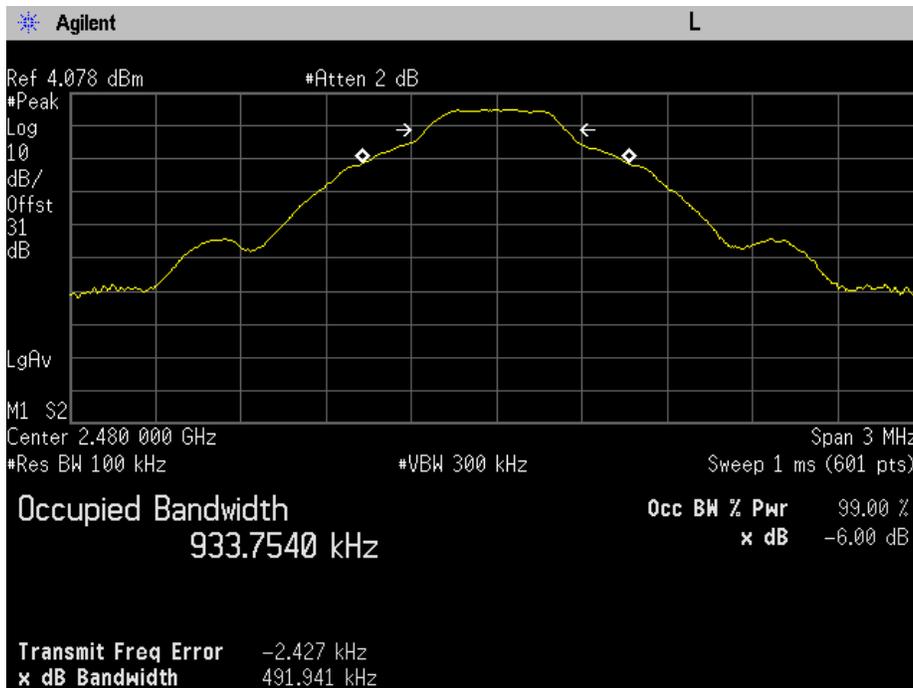




99% Bandwidth 2441 MHz



99% Bandwidth 2480 MHz



Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Horn Antenna, Amplified	ARA	MWH-1826/B	i00273	4/22/15	4/22/18
Spectrum Analyzer	Agilent	E4407B	i00331	9/18/15	9/18/16
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	10/19/15	10/19/17
Horn Antenna	ARA	DRG-118/A	i00271	6/16/16	6/16/18
Preamplifier for 1-18GHz horn antenna	Miteq	AFS44 00101 400 23-10P-44	i00509	Verified on: 06/28/16	
EMI Analyzer	Agilent	E7405A	i00379	2/11/16	2/11/17
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	7/27/14	7/27/16
PSA Spectrum Analyzer	Agilent	E4445A	i00471	8/26/15	8/26/16

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT