eurofins | MET Labs

HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

# Radio Frequency Exposure Test Report

## 47 CFR Part 1, Subpart I, Section 1.1310

## Model: OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors

## MET Report: EMC103549-FCC MPE

| | |
|---|---|
| Company | InVue |
| Address | 9201 Baybrook Lane |
| | Charlotte, NC 28277 |
| Report date | August 1, 2019 |

Donald Salguero
Engineer, EMC Wireless

# Report Status Sheet

| Revision | Report Date | Reason for Revision |
|---|---|---|
| ∅ | August 1, 2019 | Initial Issue. |

## 1.0 Scope

The Federal Communications Commission (FCC) publishes standards regarding the evaluation of RF exposure hazard of wireless communications devices. An evaluation was performed to InVue, OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors, pursuant to the relevant requirements of the 47 CFR Part 1, Subpart I, Section 1.1310.

## 1.1 Objective

The objective of the manufacturer is to comply with the Federal Communications Commission (FCC) publishes standards referenced above.

## 1.2 Statement of Compliance

The evaluation of InVue OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors in the configuration detailed in this test report, complied with the relevant requirements of 47 CFR Part 1, Subpart I, Section 1.1310. Maintenance of compliance is the responsibility of the manufacturer.

# 2.0 Equipment Configuration

## 2.1 Overview

MET Laboratories, Inc. was contracted by InVue to perform testing on the OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors, under InVue purchase order number 64553.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the InVue, OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors.

In accordance with §2.955(a) (3), the following data is presented in support of the verification of the InVue, OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors. InVue should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors has been **permanently** discontinued, as per §2.955(b).

The results obtained relate only to the item(s) tested.

| | |
|---|---|
| **Model Tested:** | OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors |
| **Model Covered:** | OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors |
| **Primary Power as Tested:** | 4.5 to 5.5VDC |
| **Equipment Emissions Class:** | B |
| **Highest Clock Frequency:** | 6 MHz internal clock |
| **Evaluated by:** | Donald Salguero |
| **Report Date:** | August 1, 2019 |

**Table 1. EUT Overview**

## 2.2 Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Avenue, Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

MET Laboratories is a ISO/IEC 17025 accredited site by A2LA, #0591.01.

Radiated Emissions measurements were performed in a semi-anechoic chamber. In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

## 2.3 Equipment Configuration

The EUT was set up as outlined in the customer provided block diagram. All equipment incorporated as part of the EUT is included in the following list.

| Ref. ID | Slot # | Name / Description | Model Number | Part Number | Serial Number | Rev. # |
|---|---|---|---|---|---|---|
| A | | OnePod Wearable Samsung Galaxy Watch Open Hoop Sensors (EUT) | F1748 | F1748101 | N/A | 0 |

**Table 2. Equipment Configuration**

## 2.4 Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

| Ref. ID | Name / Description | Manufacturer | Model Number | *Customer Supplied Calibration Data |
|---|---|---|---|---|
| B | Power Supply (DC 5V) | InVue | PS515 | N/A |
| C | Smart Watch | Samsung | Galaxy Watch | N/A |
| D | One Pod Sensor | InVue | DBD210-W | N/A |
| E | One Pod Stand | InVue | DBD106-W | N/A |

The 'Customer Supplied Calibration Data' column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.

**Table 3. Support Equipment**

## 2.5 Ports and Cabling Information

| Ref. ID | Port name on EUT | Cable Description or reason for no cable | Qty | Length as tested (m) | Max Length (m) | Shielded ? (Y/N) | Termination Box ID & Port Name |
|---|---|---|---|---|---|---|---|
| 1 | Vin | 2 conductors, 24AWG | 1 | 1 | 1.1 | No | B.Vout |
| 2 | Vin2 | 3 conductors, 24AWG | 1 | 0.25 | 0.3 | No | A.Vin2 |
| 3 | RFout | Wireless power transfer (no cable) | 1 | N/A | N/A | No | C.RFin |

**Table 4. Ports and Cabling Information**

## 2.6 Modifications

### 2.6.1 Modifications to the EUT

No modifications were made to the EUT.

### 2.6.2 Modifications to the Test Standard

No modifications were made to the test standard.

## 3.0 Limits

The EUT shall comply with the relevant limits for general public exposure specified as basic restrictions or reference levels in the 47 CFR Part 1, Subpart I, Section 1.1310 as below table.

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($mW/cm^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| **(A) Limits for Occupational/Controlled Exposures** | | | | |
| 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 |
| 300-1500 | / | / | f/300 | 6 |
| 1500-100,000 | / | / | 5 | 6 |
| **(B) 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 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,000 | / | / | 1.0 | 30 |

F=frequency in MHz
*=Plane-wave equivalent power density
RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

## 4.0 Evaluation

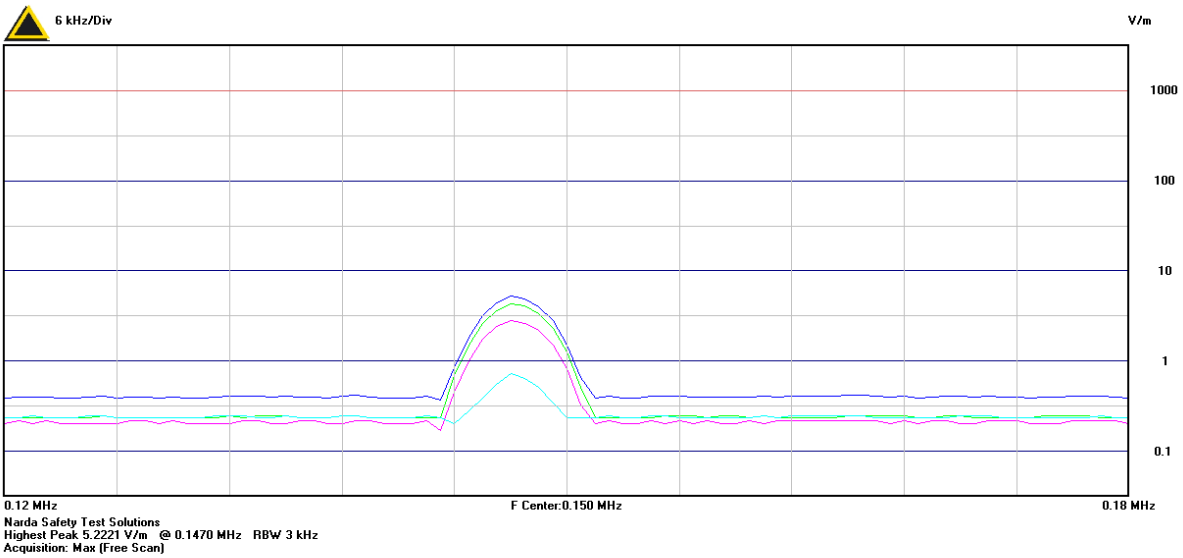
| Environmental Conditions | |
|---|---|
| **Ambient Temperature (°C)** | 21.5 |
| **Relative Humidity (%)** | 35 |

## 4.1 Results

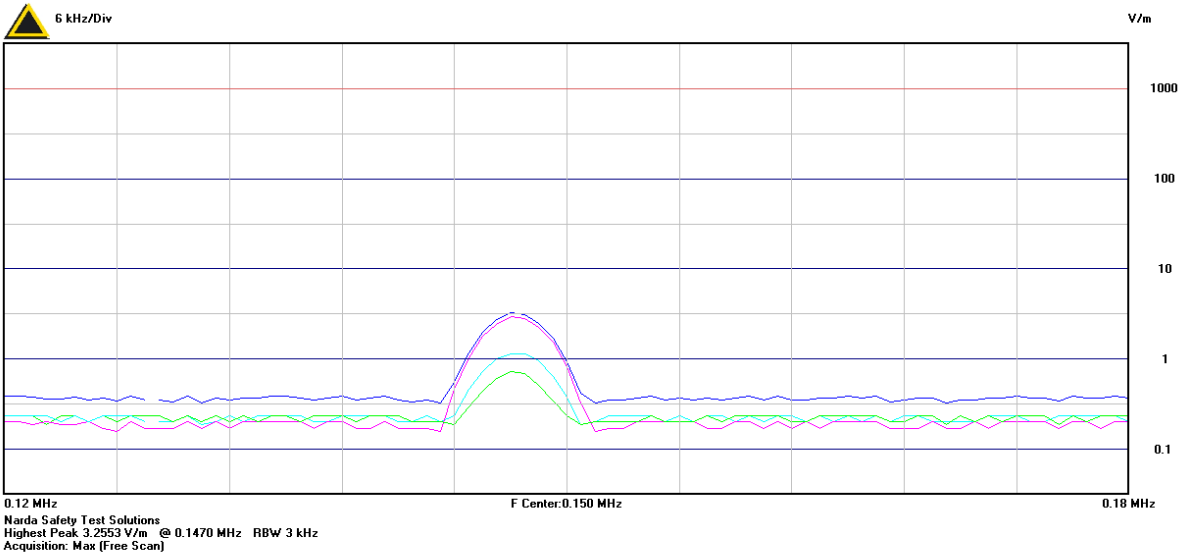
The device was tested at a 10 cm distance both alone, and with the watch charging.

| Frequency of Operation | Mode of Operation | Electric Field | 50% MPE Limit (V/m) | Result |
|---|---|---|---|---|
| 147 kHz | X - field | 5.2221 V/m | 307 | Pass |
| | Y - field | 3.2553 V/m | 307 | Pass |

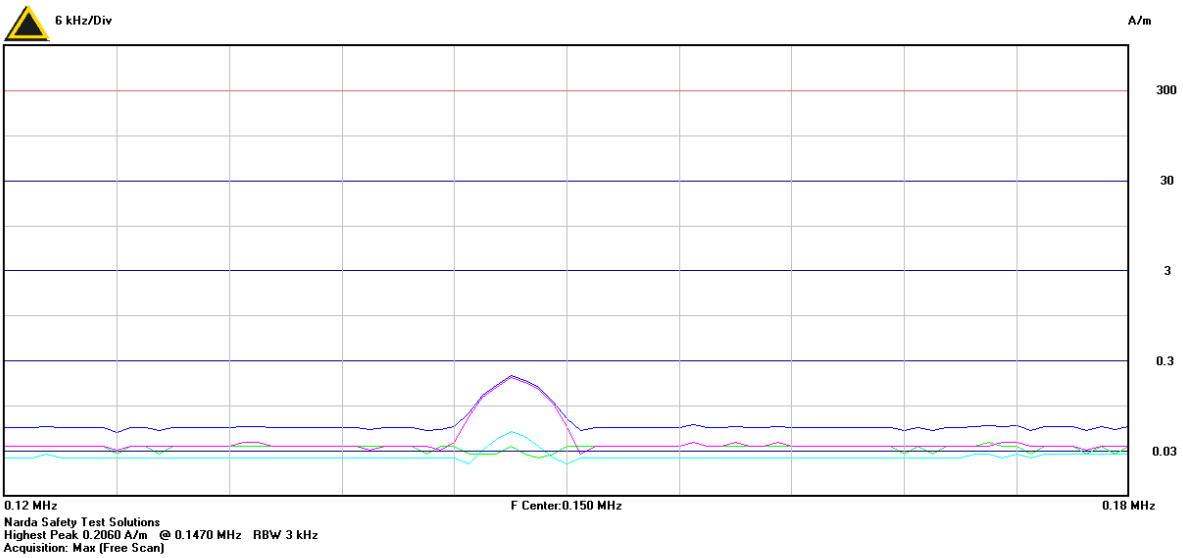
| Frequency of Operation | Mode of Operation | Magnetic Field | 50% MPE Limit (A/m) | Result |
|---|---|---|---|---|
| 147 kHz | X - field | 0.2060 A/m | 0.815 | Pass |
| | Y - field | 0.5626 A/m | 0.815 | Pass |



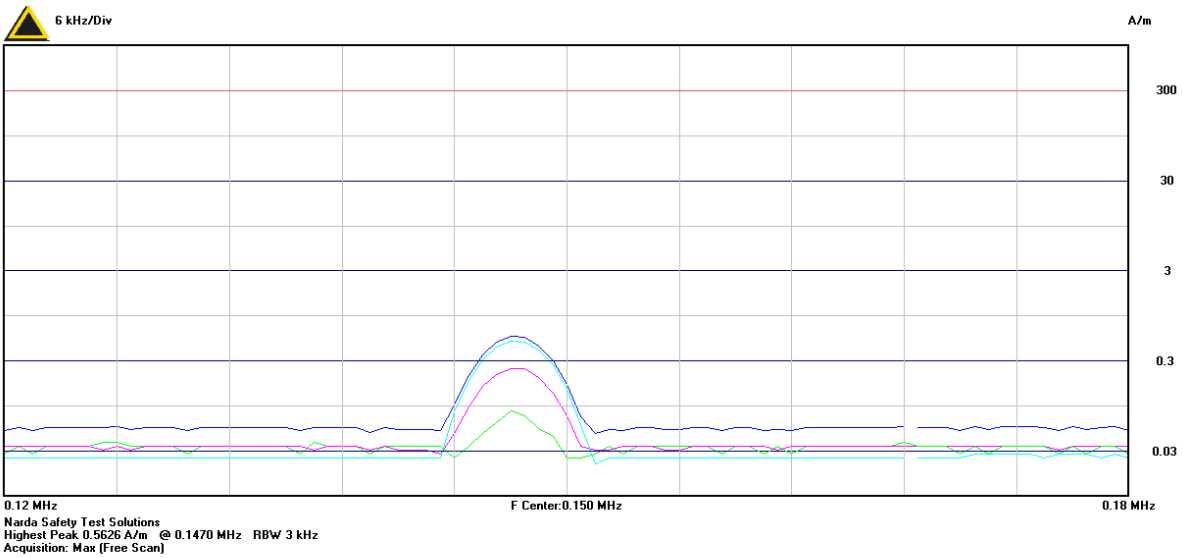

**Plot 1. FCC MPE, E Field, X**



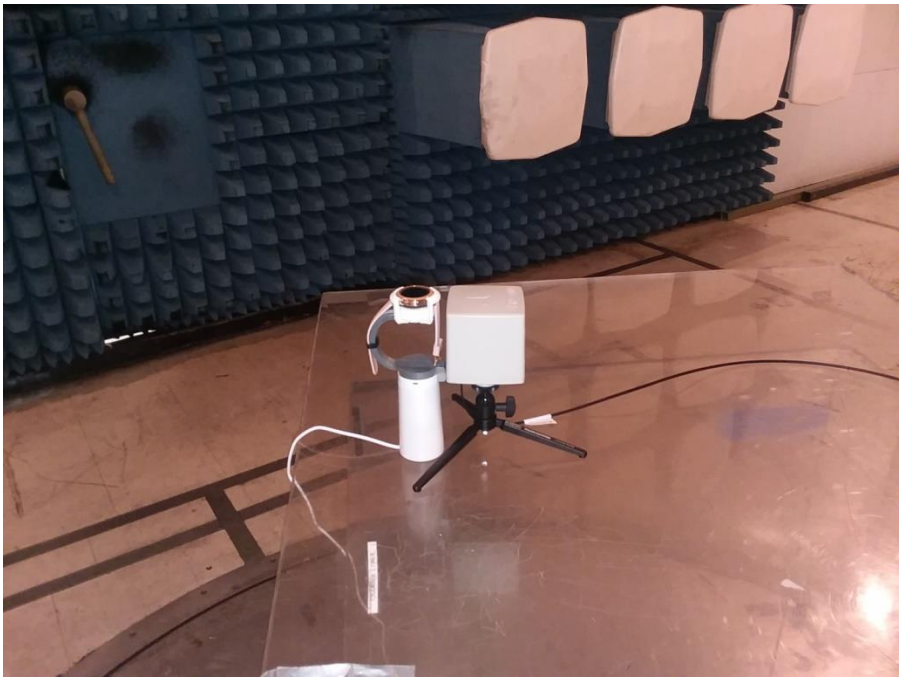

**Plot 2. FCC MPE, E field, Y**




**Plot 3. FCC MPE, H Field, X**




**Plot 4. FCC MPE, H field, Y**



**Photograph 1. Test Setup Photo**

## 5.0 Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

| **Test Name: MPE Evaluation** | | | | **Test Date(s):** June 4, 2019 | |
|---|---|---|---|---|---|
| **MET/EF Asset #** | **Nomenclature** | **Manufacturer** | **Model** | **Last Cal Date** | **Cal Due Date** |
| 1T7845 | Electric and Magnetic Field Analyzer | Narda | EHP-200 | 11/06/2018 | 11/05/2020 |
| 1T4300 | SEMI-ANECHOIC CHAMBER (NSA) | EMC TEST SYSTEMS | NONE | 6/30/2019 | 6/30/2020 |

**--END--**