# EMISSION TEST REPORT

**Report Number:** 100193203BOX-004b
**Project Number:** G100193203

**Report Issue Date:** 08/10/2011

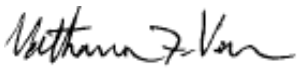
**Product Designation:** Eros (UST400) system

**Standards:** FCC Part 15 Subpart C Section 15.231
CFR47 FCC Part15, Subpart B:2009

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719

Client:
Insulet Corporation
9 Oak Park Drive
Bedford, MA 01730

Report prepared by



Vathana F. Ven, Senior Project Engineer

Report reviewed by

Michael F. Murphy/EMC Staff Engineer

## 1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

## 2 Test Summary

| Section | Test full name | Result |
|---|---|---|
| 3 | Client Information | |
| 4 | Description of Equipment Under Test | |
| 5 | System Setup and Method | |
| 6 | 15.231(b) – Fundamental Field Strength | Pass |
| 7 | 15.231(b) – Harmonics and Spurious Field Strength | Pass |
| 8 | 15.231(c) – 20 dB Bandwidth | Pass |
| 9 | 15.231(a)(2) – 5 Seconds Off | Pass |
| 10 | Revision History | |

## 3 Client Information

This EUT was tested at the request of:

**Company:** Insulet Corporation
9 Oak Park Drive
Bedford, MA 01730

**Contact:** Mr. John D'Arco
**Telephone:** (781) 457-4937
**Fax:** (781) 457-5011
**Email:** jdarco@insulet.com

## 4 Description of Equipment Under Test

| Equipment Under Test | | | |
|---|---|---|---|
| Description | Manufacturer | Model Number | Serial Number |
| EROS PDM (Personal Diabetes Manager) | Insulet Corporation | EROS PDM | 030000006 |
| Insulin Pump | Insulet Corporation | POD | 020017 |
| | | | |
| | | | |

| | |
|---|---|
| Receive Date: | 10/20/10 |
| Received Condition: | Good |
| Type: | Production |

Description of Equipment Under Test (provided by client)
Personal diabetes management system.

| Equipment Under Test Power Configuration | | | |
|---|---|---|---|
| Rated Voltage | Rated Current | Rated Frequency | Number of Phases |
| 3.1VDC | N/A | N/A | N/A |

**Operating modes of the EUT:**

| No. | Descriptions of EUT Exercising |
|---|---|
| 1 | Continuous transmitting with modulation |
| 2 | Continuous transmitting without modulation |

## 5 System Setup and Method

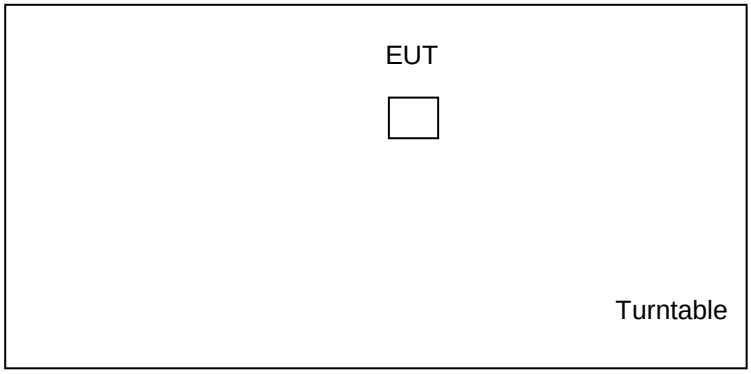
| Cables | | | | | |
|---|---|---|---|---|---|
| ID | Description | Length (m) | Shielding | Ferrites | Termination |
| | None | | | | |
| | | | | | |

| Support Equipment | | | |
|---|---|---|---|
| Description | Manufacturer | Model Number | Serial Number |
| None | | | |
| | | | |

### 5.1 Method:

Configuration as required by Section 15.231(a) to 15.231(c) of Standard taking Precedence.

### 5.2 EUT Block Diagram:



# 6 Fundamental Field Strength

## 6.1 Method

Tests are performed in accordance with 15.231(b).

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

**Measurement Uncertainty**

For radiated emissions, $U_{lab}$ (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < $U_{CISPR}$ (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

**Sample Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

**Example:**

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

## 6.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| 145 106 | Bilog Antenna | Sunol Sciences | JB5 | A111003 | 07/20/2010 | 07/20/2011 |
| 145 003 | Preamplifier (150 KHz to 1.3 GHz) | Hewlett Packard | 8447D | 2443A04077 | 09/16/2010 | 09/16/2011 |
| 145 128 | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESI | 837771/027 | 08/10/2010 | 08/10/2011 |
| 145-410 | Cables 145-400 145-406 145-407 145-405 145-403 | Huber + Suhner | 10m Track A Cables | multiple | 08/31/2010 | 08/31/2011 |
| DAV 003 | Weather Station | Davis Instruments | 7400 | PE80529A39 A | 06/11/2010 | 06/11/2011 |
| 145-416 | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN3 | HORN ANTENNA | EMCO | 3115 | 9610-4980 | 03/28/2011 | 03/28/2012 |

**Software Utilized:**

| Name | Manufacturer | Version |
|---|---|---|
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 4/17/09 |

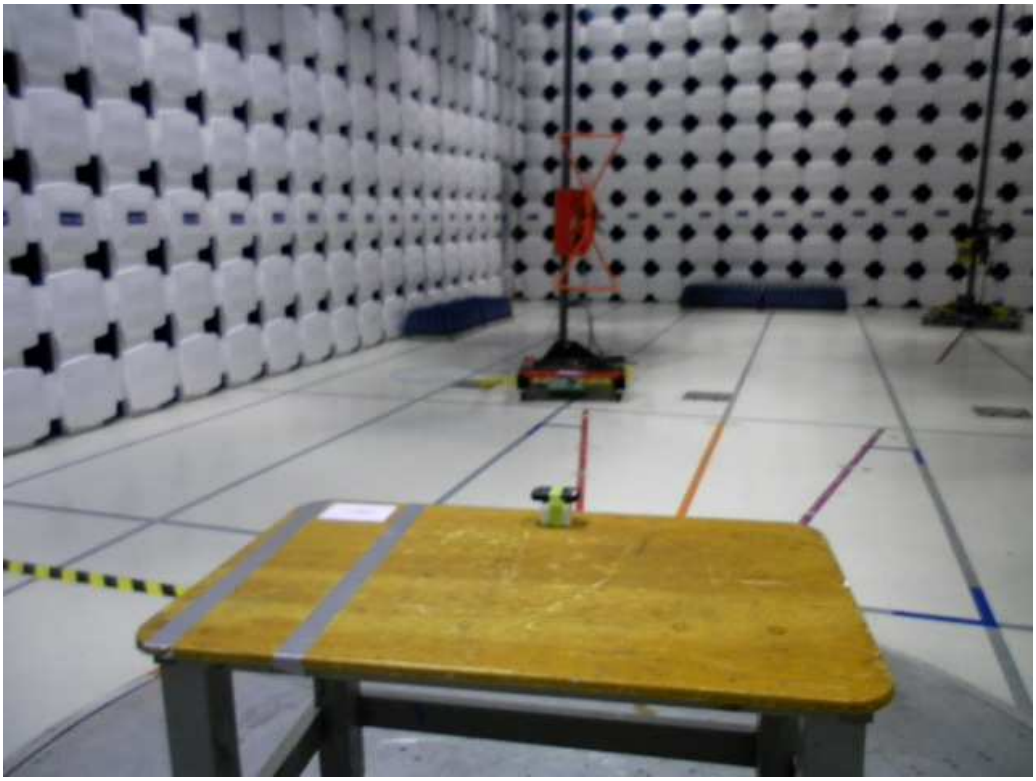
Note: Your Laptop may use a different version of Excel. Record the version you actually used!

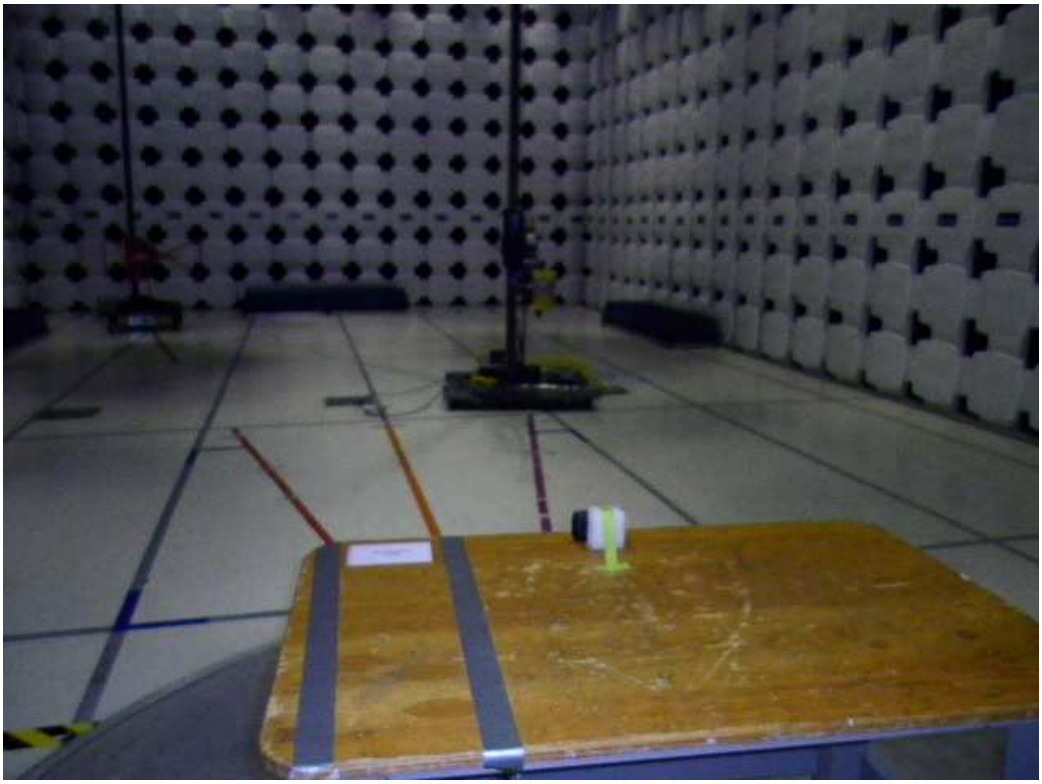
## 6.3 Results:

The sample tested was found to Comply.

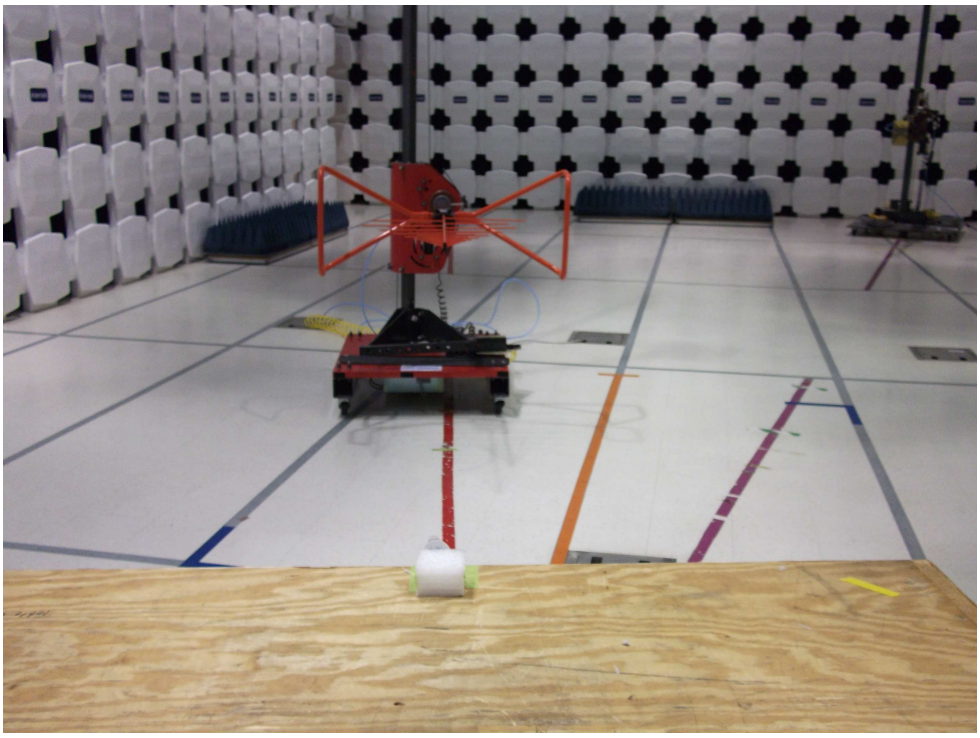
## 6.4 Setup Photographs:

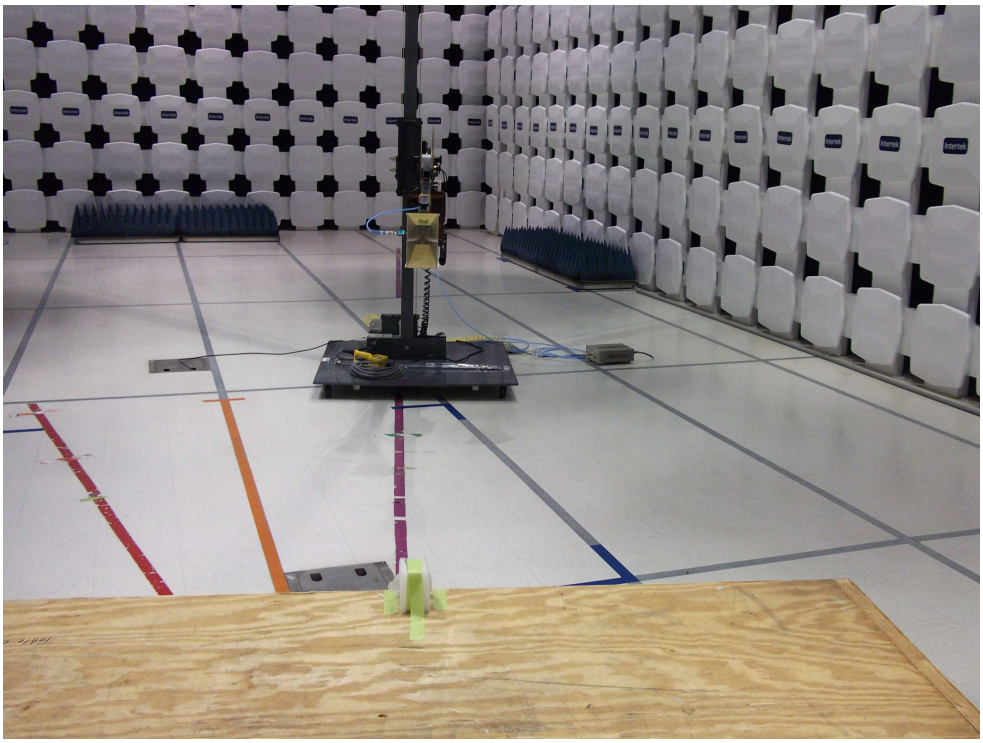
**EROS PDM**





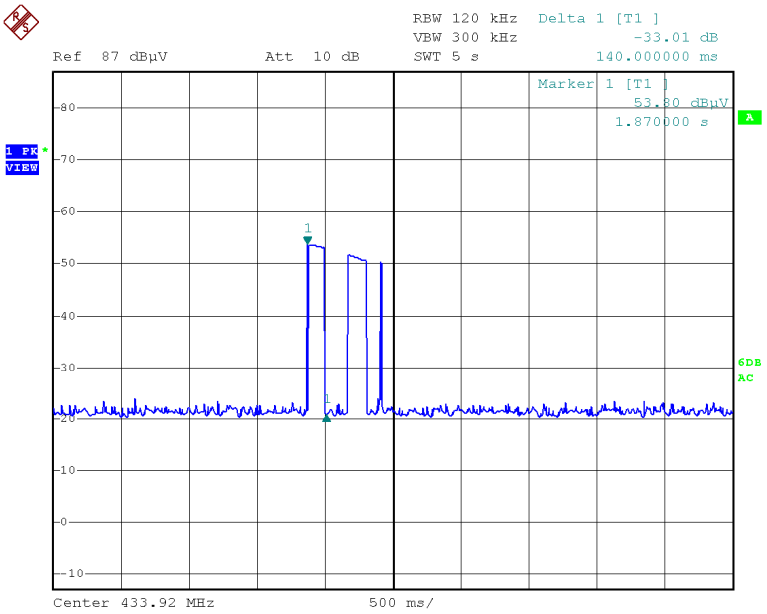
**EROS POD**





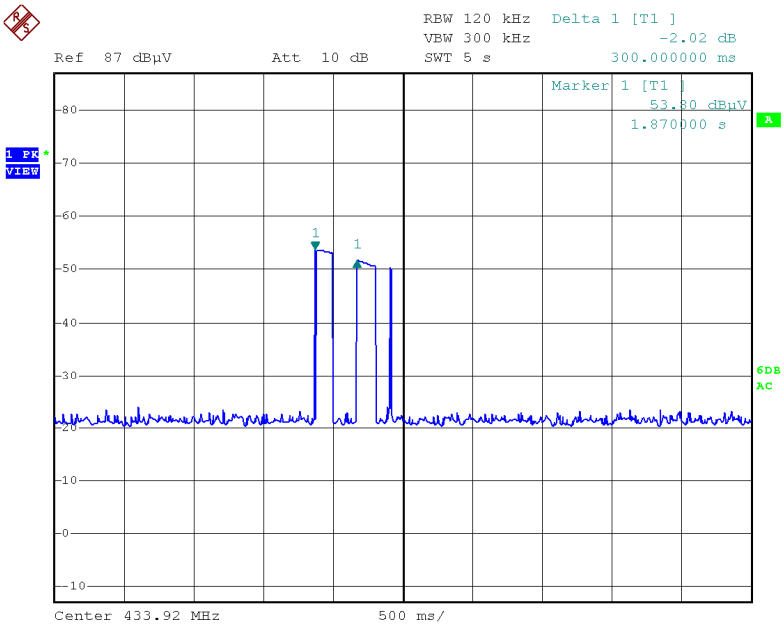
## 6.5 Plots and data:

**EROS PDM**



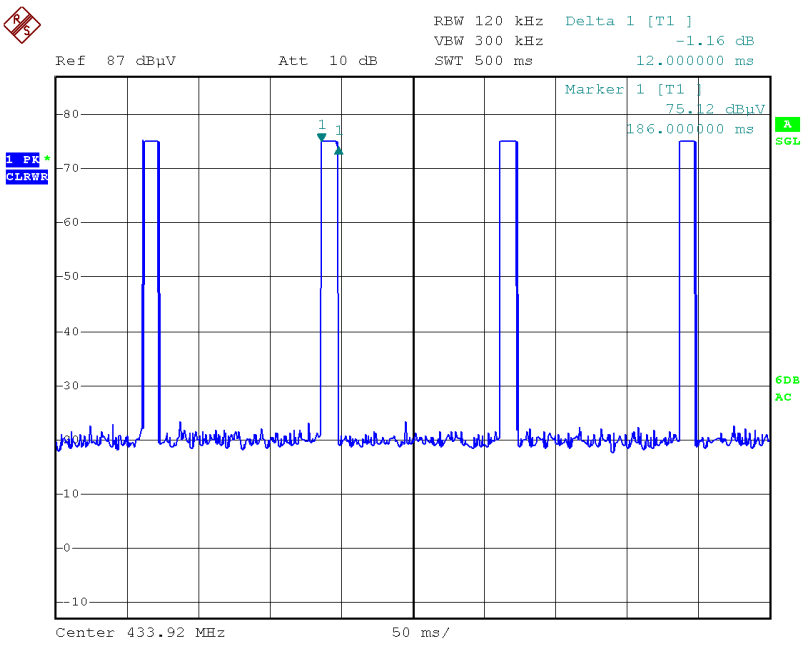

Date: 29.OCT.2010 23:53:48

On time



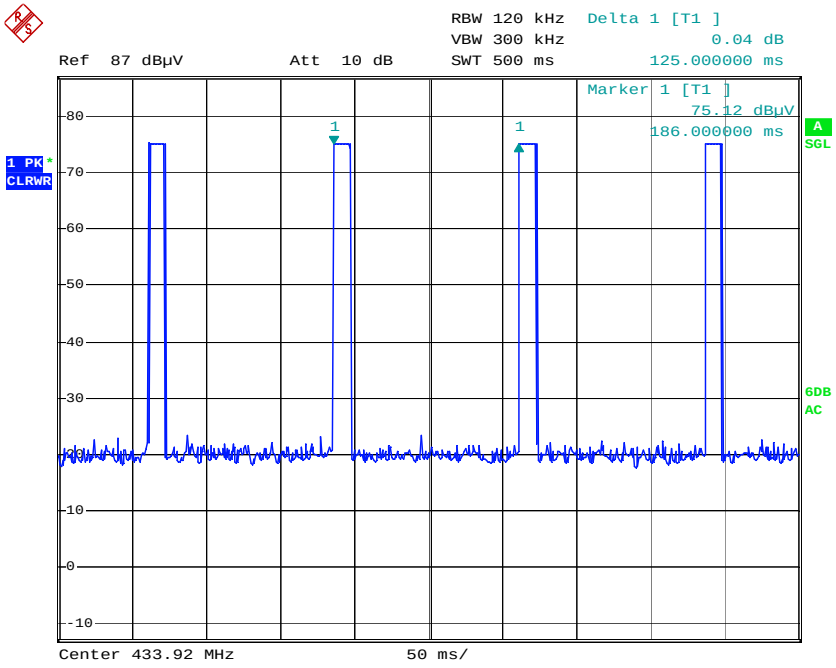

Date: 30.OCT.2010 00:00:58

## EROS POD




Date: 30.OCT.2010 00:06:08

On time




Date: 30.OCT.2010 00:18:08

Period

Average factor = 20*LOG (12/100) = 18.4dB

**Radiated Emissions**

Company: Insulet Corporation — Antenna & Cables: N — Bands: N, LF, HF, SHF
Model #: EROS PDM — Antenna: 145-106 3M VER 07-20-11.txt 145-106 3M HOR 07-20-11.txt
Serial #: 030000006 — Cable(s): 3mTrackA 145-414 08-31-2011.txt NONE.
Engineers: Vathana Ven — Location: 10m Chamber — Barometer: DAV004 — Filter: NONE
Project #: G100193203 — Date(s): 10/28/10
Standard: FCC Part 15 Subpart C 15.209 — Temp/Humidity/Pressure: 21c 46% 1002mB
Receiver: R&S ESI (145128) 08-10-2011 — Limit Distance (m): 3
PreAmp: PRE-145014_1-5-2011.txt — Test Distance (m): 3
PreAmp Used? (Y or N): N — Voltage/Frequency: Battery — Frequency Range: 30 MHz - 1000 MHz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Note: Modulated Carrier; TXCC 433P42 REV1; No emissions were detected other than the fundamental and 2nd harmonic | | | | | | | | | | | | | |
| Note: X | | | | | | | | | | | | | |
| PK | V | 433.944 | 46.25 | 16.52 | 2.67 | 0.00 | 0.00 | 65.44 | 100.82 | -35.38 | 120/300 kHz | | |
| AVG | V | 433.944 | 42.44 | 16.52 | 2.67 | 0.00 | 0.00 | 61.63 | 80.82 | -19.19 | 120/300 kHz | | |
| PK | H | 433.944 | 48.24 | 16.80 | 2.67 | 0.00 | 0.00 | 67.71 | 100.82 | -33.11 | 120/300 kHz | | |
| AVG | H | 433.944 | 44.74 | 16.80 | 2.67 | 0.00 | 0.00 | 64.21 | 80.82 | -16.61 | 120/300 kHz | | |
| Note: Y | | | | | | | | | | | | | |
| PK | V | 433.944 | 51.50 | 16.52 | 2.67 | 0.00 | 0.00 | 70.69 | 100.82 | -30.13 | 120/300 kHz | | |
| AVG | V | 433.944 | 47.30 | 16.52 | 2.67 | 0.00 | 0.00 | 66.49 | 80.82 | -14.33 | 120/300 kHz | | |
| PK | H | 433.944 | 45.70 | 16.80 | 2.67 | 0.00 | 0.00 | 65.17 | 100.82 | -35.65 | 120/300 kHz | | |
| AVG | H | 433.944 | 41.70 | 16.80 | 2.67 | 0.00 | 0.00 | 61.17 | 80.82 | -19.65 | 120/300 kHz | | |
| Note: Z | | | | | | | | | | | | | |
| PK | V | 433.944 | 46.50 | 16.52 | 2.67 | 0.00 | 0.00 | 65.69 | 100.82 | -35.13 | 120/300 kHz | | |
| AVG | V | 433.944 | 42.30 | 16.52 | 2.67 | 0.00 | 0.00 | 61.49 | 80.82 | -19.33 | 120/300 kHz | | |
| PK | H | 433.944 | 51.15 | 16.80 | 2.67 | 0.00 | 0.00 | 70.62 | 100.82 | -30.20 | 120/300 kHz | | |
| AVG | H | 433.944 | 46.89 | 16.80 | 2.67 | 0.00 | 0.00 | 66.36 | 80.82 | -14.46 | 120/300 kHz | | |

**Radiated Emissions**

Company: Insulet Corporation
Model #: Eros POD
Serial #: 020017
Engineers: Nicholas Abbondante
Project #: G100193203 Date(s): 10/25/10
Standard: FCC Part 15 Subpart C 15.231
Receiver: R&S ESI (145128) 08-10-2011
PreAmp: PRE-145014_1-5-2011.txt
PreAmp Used? (Y or N): N
Antenna & Cables: N Bands: N, LF, HF, SHF
Antenna: 145-106 3M VER 07-20-11.txt 145-106 3M HOR 07-20-11.txt
Cable(s): 3mTrackA 145-414 08-31-2011.txt NONE.
Location: 10m Chamber Barometer: DAV004 Filter: NONE
Temp/Humidity/Pressure: 21c 46% 1002mB
Limit Distance (m): 3
Test Distance (m): 3
Voltage/Frequency: Battery Frequency Range: 30 MHz - 1000 MHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Note: Modulated Carrier; TXCC_433P42_REV1; No emissions were detected other than the fundamental and 2nd harmonic | | | | | | | | | | | | | |
| Note: X | | | | | | | | | | | | | |
| PK | V | 433.919 | 58.68 | 16.52 | 2.67 | 0.00 | 0.00 | 77.87 | 100.82 | -22.95 | 120/300 kHz | | |
| AVG | V | 433.919 | 55.86 | 16.52 | 2.67 | 0.00 | 0.00 | 75.05 | 80.82 | -5.77 | 120/300 kHz | | |
| PK | H | 433.919 | 59.91 | 16.80 | 2.67 | 0.00 | 0.00 | 79.38 | 100.82 | -21.44 | 120/300 kHz | | |
| AVG | H | 433.919 | 57.11 | 16.80 | 2.67 | 0.00 | 0.00 | 76.58 | 80.82 | -4.24 | 120/300 kHz | | |
| Note: Y | | | | | | | | | | | | | |
| PK | V | 433.919 | 62.66 | 16.52 | 2.67 | 0.00 | 0.00 | 81.85 | 100.82 | -18.97 | 120/300 kHz | | |
| AVG | V | 433.919 | 59.82 | 16.52 | 2.67 | 0.00 | 0.00 | 79.01 | 80.82 | -1.81 | 120/300 kHz | | |
| PK | H | 433.919 | 62.03 | 16.80 | 2.67 | 0.00 | 0.00 | 81.50 | 100.82 | -19.32 | 120/300 kHz | | |
| AVG | H | 433.919 | 59.21 | 16.80 | 2.67 | 0.00 | 0.00 | 78.68 | 80.82 | -2.14 | 120/300 kHz | | |
| Note: Z | | | | | | | | | | | | | |
| PK | V | 433.919 | 59.07 | 16.52 | 2.67 | 0.00 | 0.00 | 78.26 | 100.82 | -22.56 | 120/300 kHz | | |
| AVG | V | 433.919 | 56.22 | 16.52 | 2.67 | 0.00 | 0.00 | 75.41 | 80.82 | -5.41 | 120/300 kHz | | |
| PK | H | 433.919 | 60.60 | 16.80 | 2.67 | 0.00 | 0.00 | 80.07 | 100.82 | -20.75 | 120/300 kHz | | |
| AVG | H | 433.919 | 57.76 | 16.80 | 2.67 | 0.00 | 0.00 | 77.23 | 80.82 | -3.59 | 120/300 kHz | | |

Test Personnel: Vathana Ven VJV / Nicholas Abbondante
Product Standard: 15.231
Input Voltage: 3.1VDC
Pretest Verification w/ BB Source: **No**

Test Date: 10/25, 10/26, 10/28/2010
Test Levels: Below specified limits
Ambient Temperature: 22 ºC
Relative Humidity: 56 %
Atmospheric Pressure: 1003 mbars

Deviations, Additions, or Exclusions: None

# 7 Harmonics and Spurious Field Strength

## 7.1 Method

Tests are performed in accordance with 15.231(b).

**TEST SITE:** 10m ALSE

**The 10m ALSE** is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

**Measurement Uncertainty**

For radiated emissions, $U_{lab}$ (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < $U_{CISPR}$ (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

**Sample Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

**Example:**

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

## 7.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| 145 106 | Bilog Antenna | Sunol Sciences | JB5 | A111003 | 07/20/2010 | 07/20/2011 |
| 145 003 | Preamplifier (150 KHz to 1.3 GHz) | Hewlett Packard | 8447D | 2443A04077 | 09/16/2010 | 09/16/2011 |
| 145 128 | EMI Test Receiver (20Hz - 40GHz) | Rohde & Schwarz | ESI | 837771/027 | 08/10/2010 | 08/10/2011 |
| 145-410 | Cables 145-400 145-406 145-407 145-405 145-403 | Huber + Suhner | 10m Track A Cables | multiple | 08/31/2010 | 08/31/2011 |
| DAV 003 | Weather Station | Davis Instruments | 7400 | PE80529A39 A | 06/11/2010 | 06/11/2011 |
| 145-416 | Cables 145-400 145-408 145-402 145-404 | Huber + Suhner | 3m Track B cables | multiple | 08/31/2010 | 08/31/2011 |
| HORN3 | HORN ANTENNA | EMCO | 3115 | 9610-4980 | 03/28/2011 | 03/28/2012 |

**Software Utilized:**

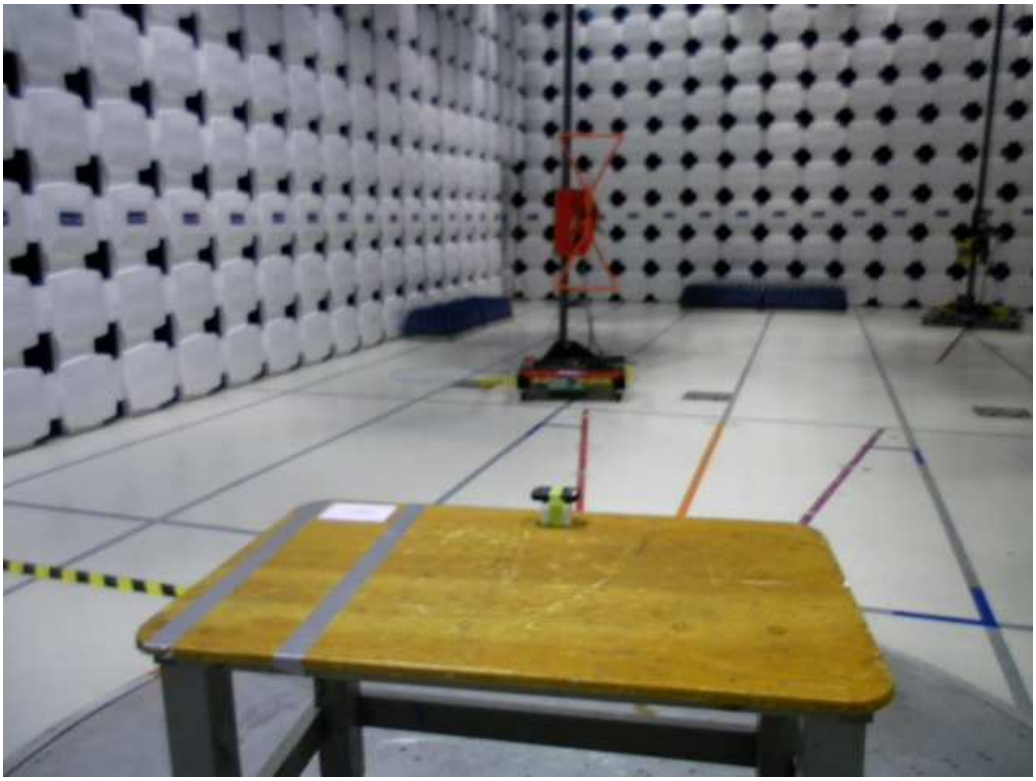
| Name | Manufacturer | Version |
|---|---|---|
| Excel 2003 | Microsoft | (11.8231.8221) SP3 |
| EMI Boxborough.xls | Intertek | 4/17/09 |

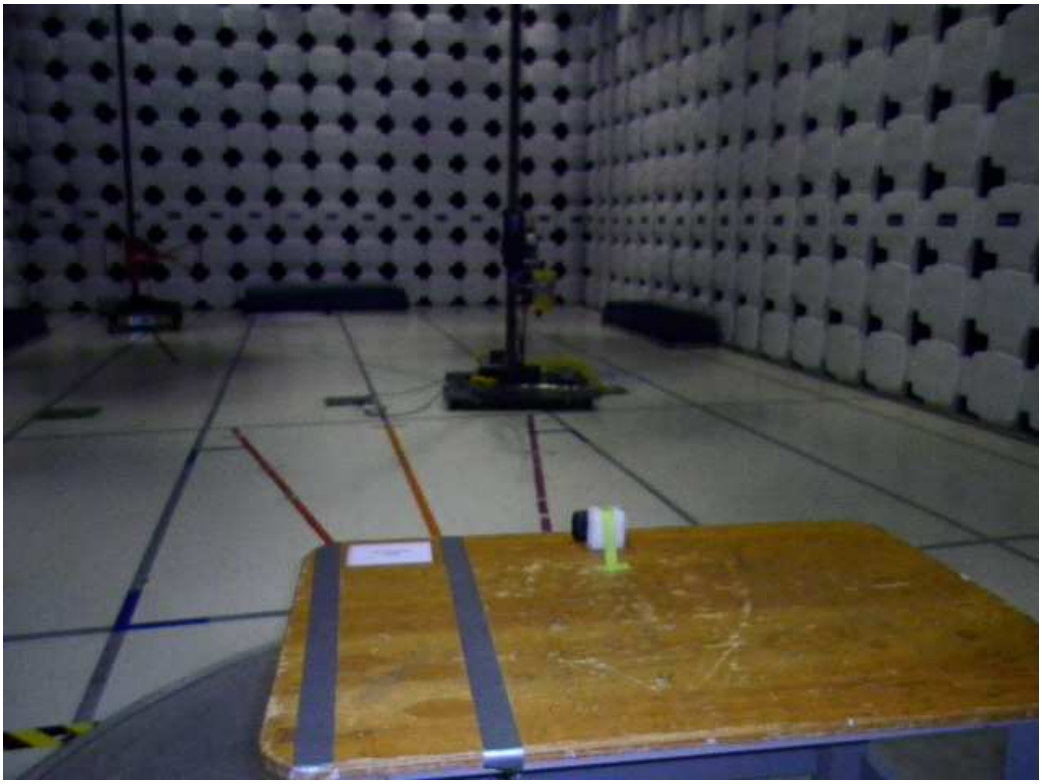
## 7.3 Results:

The sample tested was found to Comply.

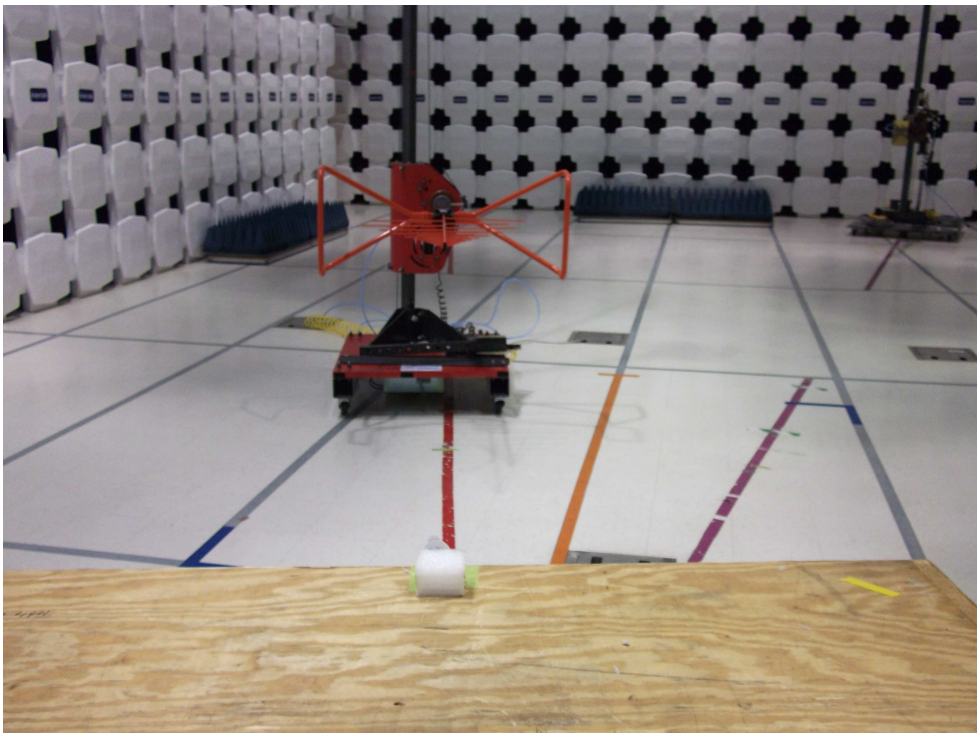
## 7.4 Setup Photographs:

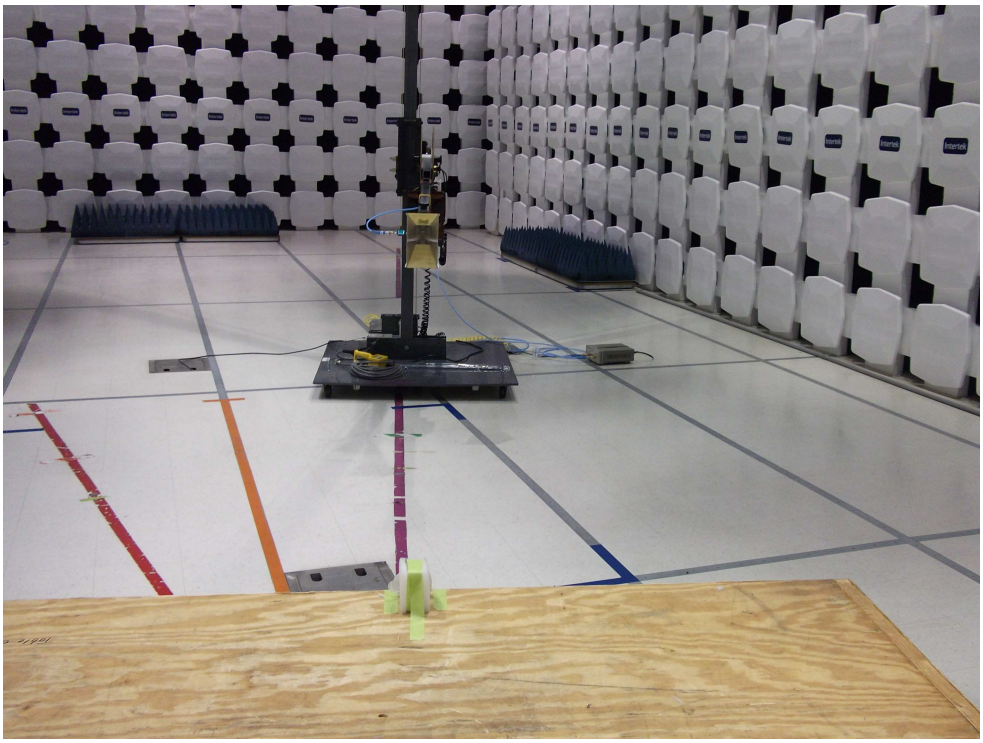
**EROS PDM**





**EROS POD**





## 7.5 Plots and data:

**Radiated Emissions**

Company: Insulet Corporation — Antenna & Cables: N — Bands: N, LF, HF, SHF
Model #: EROS PDM — Antenna: 145-106 3M VER 07-20-11.txt — 145-106 3M HOR 07-20-11.txt
Serial #: 030000006 — Cable(s): 3mTrackA 145-414 08-31-2011.txt — NONE.
Engineers: Vathana Ven — Location: 10m Chamber — Barometer: DAV004 — Filter: NONE
Project #: G100193203 — Date(s): 10/28/10
Standard: FCC Part 15 Subpart C 15.209 — Temp/Humidity/Pressure: 21c — 46% — 1002mB
Receiver: R&S ESI (145128) 08-10-2011 — Limit Distance (m): 3
PreAmp: PRE-145014_1-5-2011.txt — Test Distance (m): 3
PreAmp Used? (Y or N): N — Voltage/Frequency: Battery — Frequency Range: 30 MHz - 1000 MHz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 867.838 | 14.70 | 21.80 | 3.68 | 0.00 | 0.00 | 40.18 | 80.82 | -40.64 | 120/300 kHz | | |
| AVG | V | 867.838 | 2.50 | 21.80 | 3.68 | 0.00 | 0.00 | 27.98 | 60.82 | -32.84 | 120/300 kHz | | |
| PK | H | 867.838 | 14.48 | 22.44 | 3.68 | 0.00 | 0.00 | 40.60 | 80.82 | -40.22 | 120/300 kHz | | |
| AVG | H | 867.838 | 2.50 | 22.44 | 3.68 | 0.00 | 0.00 | 28.62 | 60.82 | -32.20 | 120/300 kHz | | |
| Note: Y | | | | | | | | | | | | | |
| PK | V | 867.838 | 15.10 | 21.80 | 3.68 | 0.00 | 0.00 | 40.58 | 80.82 | -40.24 | 120/300 kHz | | |
| AVG | V | 867.838 | 2.50 | 21.80 | 3.68 | 0.00 | 0.00 | 27.98 | 60.82 | -32.84 | 120/300 kHz | | |
| PK | H | 867.838 | 14.80 | 22.44 | 3.68 | 0.00 | 0.00 | 40.92 | 80.82 | -39.90 | 120/300 kHz | | |
| AVG | H | 867.838 | 2.50 | 22.44 | 3.68 | 0.00 | 0.00 | 28.62 | 60.82 | -32.20 | 120/300 kHz | | |
| Note: Z | | | | | | | | | | | | | |
| PK | V | 867.838 | 14.86 | 21.80 | 3.68 | 0.00 | 0.00 | 40.34 | 80.82 | -40.48 | 120/300 kHz | | |
| AVG | V | 867.838 | 2.50 | 21.80 | 3.68 | 0.00 | 0.00 | 27.98 | 60.82 | -32.84 | 120/300 kHz | | |
| PK | H | 867.838 | 14.40 | 22.44 | 3.68 | 0.00 | 0.00 | 40.52 | 80.82 | -40.30 | 120/300 kHz | | |
| AVG | H | 867.838 | 2.50 | 22.44 | 3.68 | 0.00 | 0.00 | 28.62 | 60.82 | -32.20 | 120/300 kHz | | |

**Special Radiated Emissions**

Company: Insulet Corporation
Model #: EROS PDM
Serial #: 030000006
Engineers: Vathana Ven
Project #: G100193203
Standard: FCC Part 15 Subpart C 15.209
Receiver: R&S ESI (145128) 08-10-2011
PreAmp: PRE-145014_1-5-2011.txt
Date(s): 10/26/10
Location: 10m Chamber
Limit Distance (m): 3
Test Distance (m): 3
Antenna & Cables: HF
Antenna: HORN3 V3m 03-22-2011.txt
Cable(s): 3mTrackB 145-416 08-31-2011.txt
Barometer: DAV004
Temp/Humidity/Pressure: 22c
Bands: N, LF, HF, SHF
HORN3 H3m 03-22-2011.txt
NONE.
Filter: REA003
56%
1003mB
PreAmp Used? (Y or N): Y
Voltage/Frequency: Battery
Frequency Range: 1-5 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC | Harmonic? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 1301.760 | 45.35 | 25.73 | 4.10 | 34.09 | 0.00 | 41.09 | 74.00 | -32.91 | 1/3 MHz | RB | RB | |
| AVG | V | 1301.760 | 36.30 | 25.73 | 4.10 | 34.09 | 0.00 | 32.04 | 54.00 | -21.96 | 1/3 MHz | RB | RB | |
| PK | V | 1735.680 | 38.74 | 26.46 | 4.90 | 33.98 | 0.00 | 36.12 | 74.00 | -37.88 | 1/3 MHz | | | |
| AVG | V | 1735.680 | 26.67 | 26.46 | 4.90 | 33.98 | 0.00 | 24.05 | 54.00 | -29.95 | 1/3 MHz | | | |
| PK | V | 2169.600 | 41.50 | 27.79 | 5.37 | 34.14 | 0.00 | 40.52 | 74.00 | -33.48 | 1/3 MHz | | | |
| AVG | V | 2169.600 | 28.32 | 27.79 | 5.37 | 34.14 | 0.00 | 27.34 | 54.00 | -26.66 | 1/3 MHz | | | |
| PK | V | 2603.520 | 33.82 | 28.97 | 6.01 | 34.40 | 0.00 | 34.39 | 74.00 | -39.61 | 1/3 MHz | | | |
| AVG | V | 2603.520 | 20.37 | 28.97 | 6.01 | 34.40 | 0.00 | 20.94 | 54.00 | -33.06 | 1/3 MHz | | | Noise Floor |
| PK | H | 3037.440 | 30.00 | 30.34 | 6.44 | 34.73 | 0.00 | 32.05 | 74.00 | -41.95 | 1/3 MHz | | | Noise Floor |
| AVG | H | 3037.440 | 17.65 | 30.34 | 6.44 | 34.73 | 0.00 | 19.70 | 54.00 | -34.30 | 1/3 MHz | | | Noise Floor |
| PK | H | 3471.360 | 30.10 | 31.32 | 7.04 | 35.23 | 0.00 | 33.24 | 74.00 | -40.76 | 1/3 MHz | | | Noise Floor |
| AVG | H | 3471.360 | 17.97 | 31.32 | 7.04 | 35.23 | 0.00 | 21.11 | 54.00 | -32.89 | 1/3 MHz | | | Noise Floor |
| PK | H | 3905.280 | 28.50 | 32.50 | 7.60 | 35.15 | 0.00 | 33.45 | 74.00 | -40.55 | 1/3 MHz | RB | RB | Noise Floor |
| AVG | H | 3905.280 | 16.39 | 32.50 | 7.60 | 35.15 | 0.00 | 21.34 | 54.00 | -32.66 | 1/3 MHz | RB | RB | Noise Floor |
| PK | H | 4339.200 | 29.00 | 32.29 | 7.82 | 35.26 | 0.00 | 33.85 | 74.00 | -40.15 | 1/3 MHz | RB | RB | Noise Floor |
| AVG | H | 4339.200 | 16.65 | 32.29 | 7.82 | 35.26 | 0.00 | 21.50 | 54.00 | -32.50 | 1/3 MHz | RB | RB | Noise Floor |

**Radiated Emissions**

Company: Insulet Corporation — Antenna & Cables: N — Bands: N, LF, HF, SHF
Model #: Eros POD — Antenna: 145-106 3M VER 07-20-11.txt 145-106 3M HOR 07-20-11.txt
Serial #: 020017 — Cable(s): 3mTrackA 145-414 08-31-2011.txt NONE.
Engineers: Nicholas Abbondante — Location: 10m Chamber — Barometer: DAV004 — Filter: NONE
Project #: G100193203 — Date(s): 10/25/10
Standard: FCC Part 15 Subpart C 15.231 — Temp/Humidity/Pressure: 21c 46% 1002mB
Receiver: R&S ESI (145128) 08-10-2011 — Limit Distance (m): 3
PreAmp: PRE-145014_1-5-2011.txt — Test Distance (m): 3
PreAmp Used? (Y or N): N — Voltage/Frequency: Battery — Frequency Range: 30 MHz - 1000 MHz
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 867.838 | 30.71 | 21.80 | 3.68 | 0.00 | 0.00 | 56.19 | 80.82 | -24.63 | 120/300 kHz | | |
| AVG | V | 867.838 | 18.41 | 21.80 | 3.68 | 0.00 | 0.00 | 43.89 | 60.82 | -16.93 | 120/300 kHz | | |
| PK | H | 867.838 | 29.54 | 22.44 | 3.68 | 0.00 | 0.00 | 55.66 | 80.82 | -25.16 | 120/300 kHz | | |
| AVG | H | 867.838 | 17.69 | 22.44 | 3.68 | 0.00 | 0.00 | 43.81 | 60.82 | -17.01 | 120/300 kHz | | |
| Note: Y | | | | | | | | | | | | | |
| PK | V | 867.838 | 30.46 | 21.80 | 3.68 | 0.00 | 0.00 | 55.94 | 80.82 | -24.88 | 120/300 kHz | | |
| AVG | V | 867.838 | 18.06 | 21.80 | 3.68 | 0.00 | 0.00 | 43.54 | 60.82 | -17.28 | 120/300 kHz | | |
| PK | H | 867.838 | 27.96 | 22.44 | 3.68 | 0.00 | 0.00 | 54.08 | 80.82 | -26.74 | 120/300 kHz | | |
| AVG | H | 867.838 | 15.80 | 22.44 | 3.68 | 0.00 | 0.00 | 41.92 | 60.82 | -18.90 | 120/300 kHz | | |
| Note: Z | | | | | | | | | | | | | |
| PK | V | 867.838 | 27.84 | 21.80 | 3.68 | 0.00 | 0.00 | 53.32 | 80.82 | -27.50 | 120/300 kHz | | |
| AVG | V | 867.838 | 15.56 | 21.80 | 3.68 | 0.00 | 0.00 | 41.04 | 60.82 | -19.78 | 120/300 kHz | | |
| PK | H | 867.838 | 28.99 | 22.44 | 3.68 | 0.00 | 0.00 | 55.11 | 80.82 | -25.71 | 120/300 kHz | | |
| AVG | H | 867.838 | 17.88 | 22.44 | 3.68 | 0.00 | 0.00 | 44.00 | 60.82 | -16.82 | 120/300 kHz | | |

**Special Radiated Emissions**

Company: Insulet Corporation
Model #: Eros POD
Serial #: 20017
Engineers: Nicholas Abbondante
Project #: G100193203 Date(s): 10/26/10
Standard: FCC Part 15 Subpart C 15.209
Receiver: R&S ESI (145128) 08-10-2011
PreAmp: PRE-145014_1-5-2011.txt
PreAmp Used? (Y or N): Y
Location: 10m Chamber
Limit Distance (m): 3
Test Distance (m): 3
Voltage/Frequency: Battery
Antenna & Cables: HF Bands: N, LF, HF, SHF
Antenna: HORN3 V3m 03-22-2011.txt HORN3 H3m 03-22-2011.txt
Cable(s): 3mTrackB 145-416 08-31-2011.txt NONE.
Barometer: DAV004 Filter: REA003
Temp/Humidity/Pressure: 22c 56% 1003mB
Frequency Range: 1-5 GHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

| Detector Type | Ant. Pol. (V/H) | Frequency MHz | Reading dB(uV) | Antenna Factor dB(1/m) | Cable Loss dB | Pre-amp Factor dB | Distance Factor dB | Net dB(uV/m) | Limit dB(uV/m) | Margin dB | Bandwidth | FCC | IC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PK | V | 1301.760 | 51.06 | 25.73 | 4.10 | 34.09 | 0.00 | 46.80 | 74.00 | -27.20 | 1/3 MHz | RB | RB |
| AVG | V | 1301.760 | 47.69 | 25.73 | 4.10 | 34.09 | 0.00 | 43.43 | 54.00 | -10.57 | 1/3 MHz | RB | RB |
| PK | V | 1735.680 | 47.30 | 26.46 | 4.90 | 33.98 | 0.00 | 44.68 | 74.00 | -29.32 | 1/3 MHz | | |
| AVG | V | 1735.680 | 40.30 | 26.46 | 4.90 | 33.98 | 0.00 | 37.68 | 54.00 | -16.32 | 1/3 MHz | | |
| PK | V | 2169.600 | 45.10 | 27.79 | 5.37 | 34.14 | 0.00 | 44.12 | 74.00 | -29.88 | 1/3 MHz | | |
| AVG | V | 2169.600 | 34.86 | 27.79 | 5.37 | 34.14 | 0.00 | 33.88 | 54.00 | -20.12 | 1/3 MHz | | |
| PK | H | 2603.520 | 45.60 | 29.06 | 6.01 | 34.40 | 0.00 | 46.26 | 74.00 | -27.74 | 1/3 MHz | | |
| AVG | H | 2603.520 | 38.89 | 29.06 | 6.01 | 34.40 | 0.00 | 39.55 | 54.00 | -14.45 | 1/3 MHz | | |
| PK | H | 3037.440 | 52.14 | 30.34 | 6.44 | 34.73 | 0.00 | 54.19 | 74.00 | -19.81 | 1/3 MHz | | |
| AVG | H | 3037.440 | 49.44 | 30.34 | 6.44 | 34.73 | 0.00 | 51.49 | 54.00 | -2.51 | 1/3 MHz | | |
| PK | H | 3905.280 | 43.10 | 32.50 | 7.60 | 35.15 | 0.00 | 48.05 | 74.00 | -25.95 | 1/3 MHz | RB | RB |
| AVG | H | 3905.280 | 32.80 | 32.50 | 7.60 | 35.15 | 0.00 | 37.75 | 54.00 | -16.25 | 1/3 MHz | RB | RB |

Test Personnel: Vathana Ven VJV / Nicholas Abbondante
Product Standard: 15.231
Input Voltage: 3.1VDC
Pretest Verification w/ BB Source: **No**

Test Date: 10/25, 10/26, 10/28/2010
Test Levels: Below specified limits
Ambient Temperature: 22 ºC
Relative Humidity: 56 %
Atmospheric Pressure: 1003 mbars

Deviations, Additions, or Exclusions: None

# 8 20 dB Bandwidth

## 8.1 Method

Tests are performed in accordance with 15.231c.

**TEST SITE:** EMC

**The EMC Lab** has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

## 8.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| ROS001 | Spectrum Analyzer 20Hz - 40 GHz | Rohde & Schwartz | FSEK-30 | 100225 | 01/13/2011 | 01/13/2012 |
| ANT3C | BROADBAND ANTENNA | Compliance Design | B300 | 1651 | 04/19/2010 | 04/19/2011 |
| DAV001 | Weather Station | Davis Instruments | 7400 | PE80519A61 | 08/02/2011 | 08/02/2012 |
| | | | | | | |

**Software Utilized:**

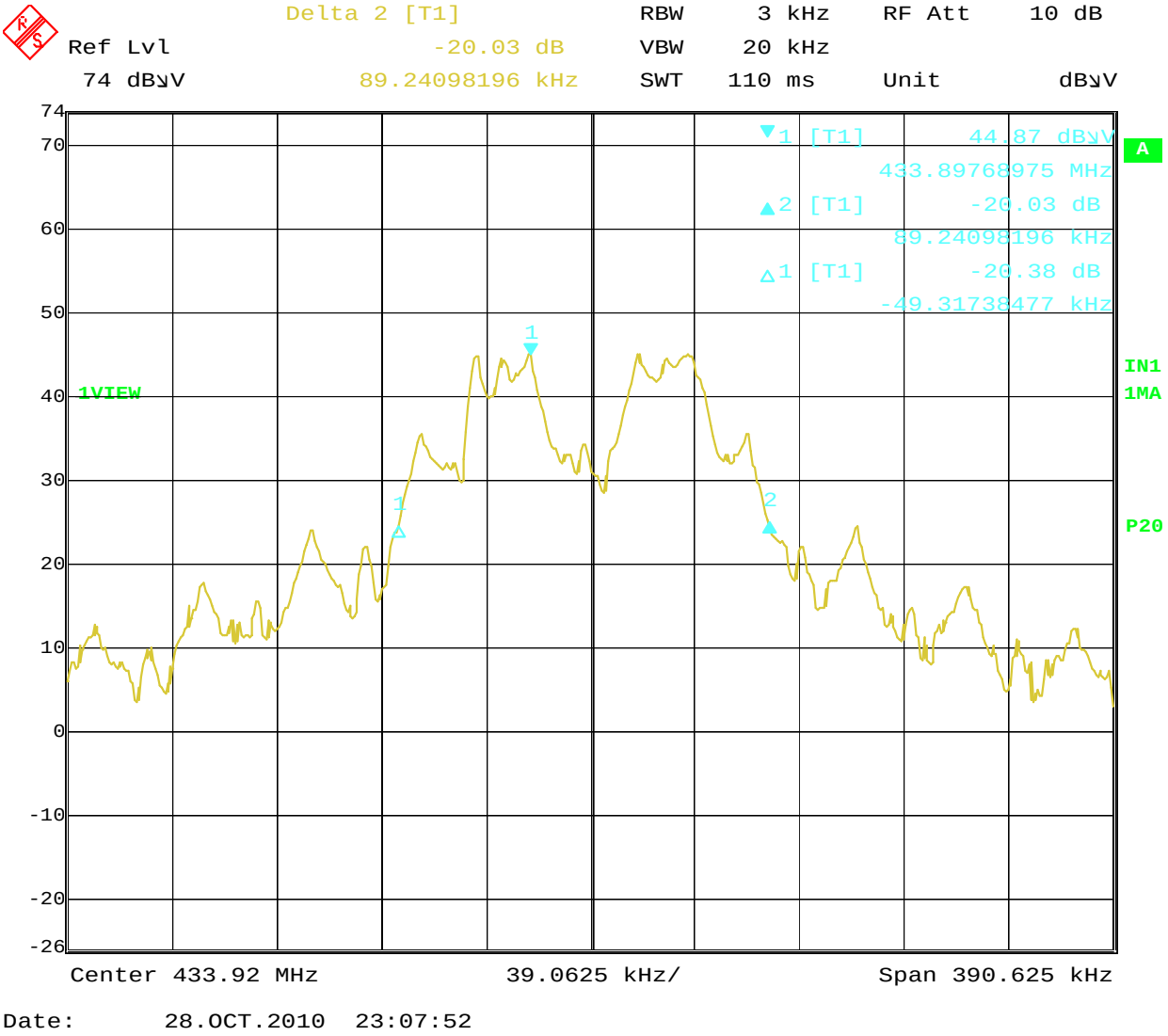
| Name | Manufacturer | Version |
|---|---|---|
| None | | |

## 8.3 Results:

The sample tested was found to Comply.

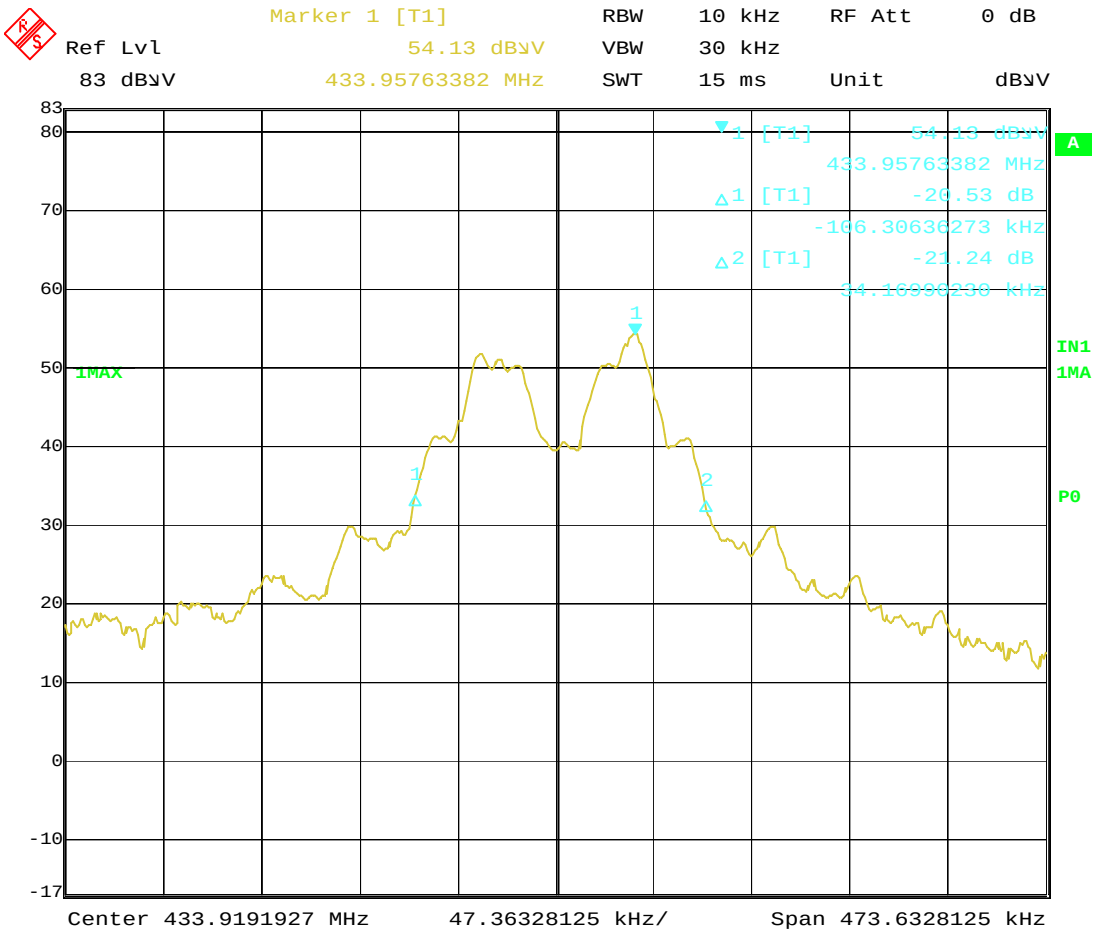
## 8.4 Data:

**EROS PDM**




**20 dB Bandwidth is 138.6 kHz, passed limit of (0.25% * 433.9MHz) = 1084.75kHz**

**EROS POD**




**20 dB Bandwidth is 140.5 kHz, passed limit of (0.25% * 433.9MHz) = 1084.75kHz**

| | | | |
|---|---|---|---|
| Test Personnel: | Vathana Ven | Test Date: | 10/28/2010 |
| Product Standard: | 15.231 | Test Levels: | Below specified limits |
| Input Voltage: | 3.1VDC | | |
| Pretest Verification w/ BB Source: | **No** | Ambient Temperature: | 21 ºC |
| | | Relative Humidity: | 58 % |
| | | Atmospheric Pressure: | 995 mbars |

# 9 5 Seconds Off

## 9.1 Method

Tests are performed in accordance with 15.231(a)(2).

**TEST SITE:** EMC

**The EMC Lab** has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

## 9.2 Test Equipment Used:

| Asset | Description | Manufacturer | Model | Serial | Cal Date | Cal Due |
|---|---|---|---|---|---|---|
| ROS001 | Spectrum Analyzer 20Hz - 40 GHz | Rohde & Schwartz | FSEK-30 | 100225 | 01/13/2011 | 01/13/2012 |
| ANT3C | BROADBAND ANTENNA | Compliance Design | B300 | 1651 | 04/19/2010 | 04/19/2011 |
| DAV001 | Weather Station | Davis Instruments | 7400 | PE80519A61 | 08/02/2011 | 08/02/2012 |
| | | | | | | |

**Software Utilized:**

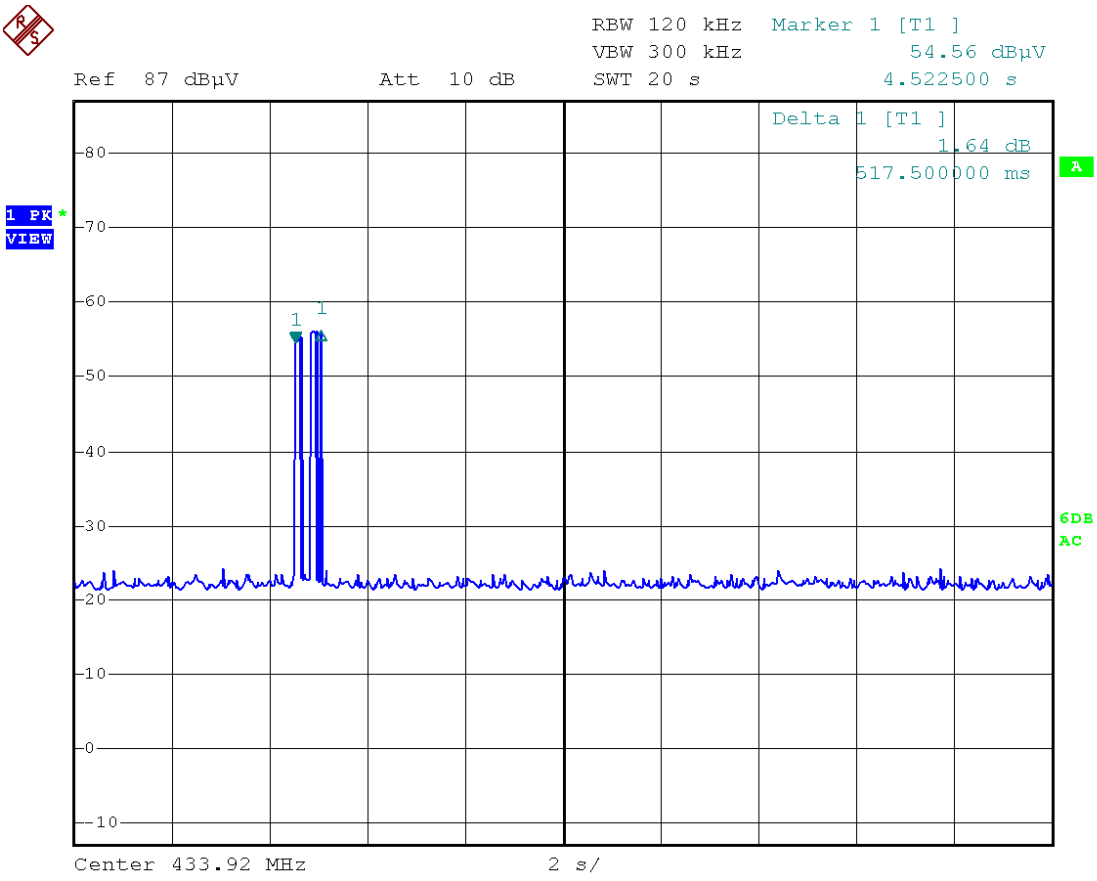
| Name | Manufacturer | Version |
|---|---|---|
| None | | |

## 9.3 Results:

The sample tested was found to Comply.

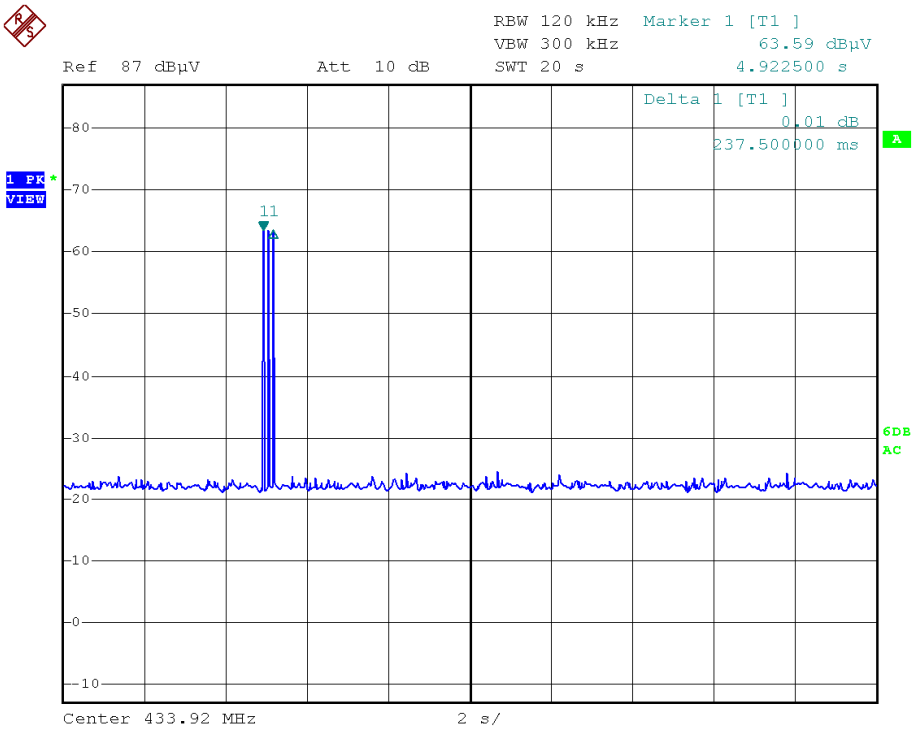
## 9.4 Data:

**EROS PDM**




Date: 29.OCT.2010 23:48:32

## EROS POD




Date: 29.OCT.2010 23:34:28

| | | | |
|---|---|---|---|
| Test Personnel: | Vathana Ven | Test Date: | 10/28/2010 |
| Product Standard: | 15.231 | Test Levels: | Below specified limits |
| Input Voltage: | 3.1VDC | | |
| Pretest Verification w/ BB Source: | **No** | Ambient Temperature: | 21 ºC |
| | | Relative Humidity: | 58 % |
| | | Atmospheric Pressure: | 995 mbars |

## 10 Revision History

| Revision Level | Date | Report Number | Notes |
|---|---|---|---|
| 0 | 12/01/2010 | 100193203BOX-004 | Original Issue |
| 1 | 08/05/2011 | 100193203BOX-004a | Added limits of Emissions bandwidth |
| 2 | 08/10/2011 | 100193203BOX-004b | Error correction on bandwidth |
| | | | |
| | | | |
| | | | |