

**EMI TEST REPORT**

**Report Number: 3072605.EMI.FCCC**

**Project Number: 3072605**

**Testing performed on the:**

**Insulin Management System**

**Model: OmniPod**

**To:**


**FCC CFR47 Part 15 Subpart C Section 15.225**

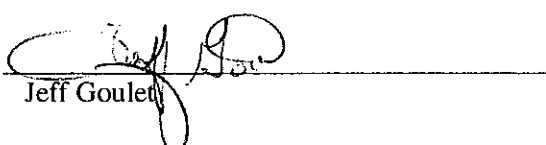
**For:**

**Insulet Corporation**

Test Performed by:  
Intertek – ETL SEMKO  
70 Codman Hill Road  
Boxborough, MA 01719

Test Authorized by:  
Insulet Corporation  
9 Oak Park Drive  
Bedford, MA, 01730

Prepared by:  Date: 2/28/05  
Nicholas Abbondante

Reviewed by:  Date: 2-28-05  
Jeff Goulet

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## 1.0 Job Description

### 1.1 Client Information

This EUT has been tested at the request of:

**Company:** Insulet Corporation

**Contact:** Mohsen Moghaddami

**Telephone:** 781-457-5000

**Fax:** 781-457-5011

**Email:** [mmoghaddami@insulet.com](mailto:mmoghaddami@insulet.com)

### 1.2 Equipment Under Test

**Equipment Type:** Insulin Management System

**Model Number(s):** OmniPod

**Serial number(s):** PDM: See Individual Tests POD: See Individual Tests

**Manufacturer:** Insulet Corporation

**EUT receive date:** 2/16/2005

**EUT received condition:** Good

**Test start date:** 2/16/2005

**Test end date:** 2/25/2005

**1.3 Test Plan Reference:** Tested according to the standards listed

### 1.4 Test Configuration

#### 1.4.1. Cables:

There are no cables associated with this device

#### 1.4.2. Support Equipment:

**Name:** There is no support equipment. The POD and PDM  
**Model No.:** are subcomponents of the OmniPod system and  
**Serial No.:** interact with each other.

**2.0 Test Summary**

TEST STANDARD	RESULTS	
FCC CFR47 Part 15 Subpart C Section 15.225		
SUB-TEST	TEST PARAMETER	COMMENT
Radiated Emissions and RF Output Power	Emissions below specified limits	Pass
Frequency Stability	Transmit frequency must not deviate by more than 0.01% across the temperature range from – 20 to +50 celsius while powered from a fresh battery	Pass

**3.0 Test Results:** Pass

**3.1 Test Standard:** FCC CFR47 Part 15 Subpart C Section 15.225

**3.2 Test:** Radiated Emissions and RF Power Output

**3.3 Test Environment:**

See Data Table

**3.4 Maximum Test Disturbance Parameters:** Readings below specified limits.

**Test Date:** 2/16-17/2005

**Test Engineer Initials:** NJA

**Date:** 2/21/05

**Test Engineer:** Nicholas Abbondante, Michael Murphy

**Reviewer Initials:** SB

**Date:** 2-22-05

**3.5 Test Equipment Used:**

Intertek ID	Manufacturer	Model	Serial Number	Cal. Due
LOOP2	Empire	LP-105	905	06/17/2005
CBL022	Belden	RG-58/U	CBL022	11/17/2005
BAR2	Mannix	0ABA116	BAR2	07/02/2005
AGL001	Agilent	E7405A	US40240205	07/23/2005
S2 10M FLR	ITS	RG214B/U	S2 10M FLR	09/15/2005
LOG4	EMCO	3142	9711-1225	02/25/2005

**3.6 Software Utilized:**

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	2/07/05 Revision

**3.7 Test Results:**

**Radiated Emissions**

Company: Insulet Corporation      Site 2      Model #: OPI  
 Engineer: Michael F. Murphy      Location: Parking Lot      Serial #: Lot #4644  
 Project #: 3072605      Pressure: 997mbar      Receiver: Agilent E7405A  
 Date: 02/17/05      Temp: 22C      Antenna: LOOP2-H 6-17-05.ant LOOP2-H 6-17-05.ant  
 Standard: Part 15.225      Humidity: 31%      PreAmp: NONE.  
 Class: None      Group: None      Cable(s): CBL022 11-17-2005.cbl NONE.  
 Limit Distance: 30 meters      Test Distance: 1 meters  
 Voltage/Frequency: Battery Operated      Frequency Range: 9kHz to 30MHz  
 Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; 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
PK	V	13.560	23.6	9.2	0.4	0.0	29.5	3.6	84.0	-80.4	9/30 kHz
PK	V	27.120	6.3	11.7	0.6	0.0	29.5	-10.9	29.5	-40.4	9/30 kHz

**Radiated emissions setup photos**



**4.0 Test Results:** Pass

**4.1 Test Standard:** FCC CFR47 Part 15 Subpart C Section 15.225

**4.2 Test:** Frequency Stability

**4.3 Test Environment:**

**Temp:** -20 - +50 °C

**Voltage:** Fresh Battery

**4.4 Maximum Test Disturbance Parameters:** The transmit frequency must not deviate from its nominal frequency at room temperature by more than 0.01%.

**Test Date:** 2/25/2005

**Test Engineer:** Nicholas Abbondante

*nmn*  
**Test Engineer Initials:** 2/25/05 **Date:** \_\_\_\_\_  
**Reviewer Initials:** JS **Date:** 2-28-05

**4.5 Test Equipment Used:**

Intertek ID	Manufacturer	Model	Serial Number	Cal. Due
SA0001	Hewlett Packard	8591E	3308A01445	07/23/2005
SAF187	Bryant Manufacturing	TH-5S	1207	04/06/2005

**4.6 Software Utilized:**

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3

**4.7 Test Results:**

Frequency Stability 2/25/2005 PDM S/N: 2052 POD S/N: 2491

Temp celsius	PDM Freq MHz	PDM Deviation MHz	PDM % Deviation	Max MHz Drift	POD Freq MHz	POD Deviation MHz	POD % Deviation	Max MHz Drift
-20	13.55800	-0.00085	-0.00627	0.00136	13.55880	-0.00025	-0.00184	0.00136
-10	13.55820	-0.00065	-0.00479	0.00136	13.55885	-0.00020	-0.00148	0.00136
0	13.55850	-0.00035	-0.00258	0.00136	13.55890	-0.00015	-0.00111	0.00136
10	13.55870	-0.00015	-0.00111	0.00136	13.55895	-0.00010	-0.00074	0.00136
20	13.55885	0.00000	0.00000	0.00136	13.55905	0.00000	0.00000	0.00136
30	13.55890	0.00005	0.00037	0.00136	13.55900	-0.00005	-0.00037	0.00136
40	13.55885	0.00000	0.00000	0.00136	13.55895	-0.00010	-0.00074	0.00136
50	13.55875	-0.00010	-0.00074	0.00136	13.55885	-0.00020	-0.00148	0.00136

### **Emissions Site Description:**

Site 2C (Middle Site) is a 3m and 10m sheltered emissions measurement range located in a light commercial environment in Boxborough, Massachusetts. It meets the technical requirements of ANSI C63.4-1992 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal ground plane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity is provided for floor-standing equipment. A wooden table 80 cm high is used for tabletop equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the ground plane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical ground plane (2 meter X 2 meter area) is used for line-conducted measurements for tabletop equipment. The vertical ground plane is electrically connected to the reference ground plane.

Parking Lot – Magnetic field emissions testing below 30 MHz is performed in the asphalt parking lot located next to site 2. There is no ground plane.

### **Measurement Uncertainty:**

Note that the measurement uncertainty contained herein is  $\pm 4.0$  dB for radiated emissions and  $\pm 2.0$  dB for line-conducted emissions.