Proteus Digital Health, Inc.

TEST REPORT FOR

PPM (RP4) Electronics Module
Model: SPC-0175

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.247
and
RSS 210 Issue 8

Report No.: 94175-17

Date of issue: April 2, 2013

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Proteus Digital Health, Inc.
2600 Bridge Parkway Suite 101
Redwood City, CA 94065

Representative: Robert Leichner
Customer Reference Number: C29833

REPORT PREPARED BY:

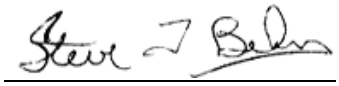
Dianne Dudley
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 94175

DATE OF EQUIPMENT RECEIPT: March 12, 2013
DATE(S) OF TESTING: March 12-April 18, 2013

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
1120 Fulton Place
Fremont, CA 94539

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Fremont	US0082	SL2-IN-E-1148R	3082B-1	958979	A-0149

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C 15.247 and RSS 210 Issue 8

Description	Test Procedure/Method	Results
Voltage Variation	FCC Part 15 Subpart C Section 15.31(e)	Pass
RF Power Output	FCC Part 15 Subpart C Section 15.247(a)(1) / DA 00-705	Pass
Average Time of Occupancy	FCC Part 15 Subpart C 15.247 (a)(1)(iii) / DA 00-705	Pass
-20dBc & 99% Occupied Bandwidth	FCC Part 15 Subpart C Section 15.247 / DA 00-705 / RSS 210 Issue 8	Pass
Bandedge	FCC Part 15 Subpart C / ITU-R 55/1/ DA 00-705	Pass
Radiated Spurious Emissions	FCC Part 15 Subpart C Section 15.247(d)	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
Modifications during testing: Two ferrites (742 700 32) on a cable which connects from the EUT to a DC power supply with one pass through.

At the time of testing the serial numbers and software versions used were not supplied to the test engineers. The manufacturer declares that the following serial numbers and configurations were used:
 	
SPC-0175 Hardware:
• Part number: SPC-0175, Rev 3: Electronics Module, RP4
• Serial numbers: 000013241, 000013242, 000013243
 	
Software Used supporting external control of Bluetooth radio:
• Firmware: (test firmware for external control of Bluetooth radio)
  ○ Microcontroller: "External UART Control" (SVN repository # 3989)
  ○ Bluetooth radio: Intel "HCI_UART_115200bps.eep" dated 2/27/2008
• PC Application: Intel "HCI_Lite_V3.02.exe"

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

PPM (RP4) Electronic Module
Manuf: Proteus Digital Health, Inc.
Model: SPC-0175
Serial: None

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Laptop AC/DC Power Adapter
Manuf: Dell
Model: D130PE1-00
Serial: CN-0JU012-48661-09U-K8GG-A04

Laptop
Manuf: Dell
Model: Latitude E6500
Serial: B76FVL1

USB to TTL Serial Cable-1.8m Wire End Version
Manuf: FTDI
Model: TTL-232RG-VREG1V8-WE
Serial: None

DC Power Supply
Manuf: EZ
Model: GP-4303A
Serial: 01070038

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15C requirements for Unlicensed Radio Frequency Devices, Subpart C - Intentional Radiators.

15.31(e) Voltage Variations

Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 1120 Fulton Places • Fremont, CA 94539 • (510) 249-1170

Customer: **Proteus Digital Health, Inc.**
Specification: **15.31(e)**
Work Order #: **94175** Date: 3/12/2013
Time: 14:47:55
Equipment: **PPM (RP4) Electronics Module** Sequence#: 3
Manufacturer: Proteus Digital Health, Inc. Tested By: Hieu Song Nguyenpham
Model: SPC-0175
S/N: None

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	ANP05843	Cable	32022-2-29094K-48TC	8/7/2012	8/7/2014
	AN02668	Spectrum Analyzer	E4446A	2/22/2013	2/22/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
PPM (RP4) Electronic Module*	Proteus Digital Health, Inc.	SPC-0175	None

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop AC/DC Power Adapter	Dell	D130PE1-00	CN-0JU012-48661-09U-K8GG-A04
Laptop	Dell	Latitude E6500	B76FVL1
DC power Supply	EZ	GP-4303A	01070038
USB to TTL Serial Cable-1.8m Wire End Version	FTDI	TTL-232RG-VREG1V8-WE	None

Test Conditions / Notes:

The EUT is a battery device, and it is adaptive equipment. The EUT is placed on the test bench. The measurement is performed at the antenna port. The service port is connected to a laptop for testing configuration purposes. Instead of using a fresh battery, the EUT is connected to a DC power supply at 2.4V

Temperature: 19.9°C
Humidity: 40 %
Atmospheric Pressure:101.9kPa

High Clock: 26Mhz
Software Used: HCI Lite
Rate power = +4dBm (nominal)

Transmitter Operation Frequency Range: 2400 - 2483.5 MHz

Low Channel: 2402MHz
Middle Channel: 2441Mhz
High Channel: 2480MHz

15.31(e) A fresh battery is used.

10dB External attenuation, 1.72 dB gain of the antenna and 0.9dB cable loss compensated as amplitude offset entered into the spectrum analyzer.

15.247(a)(1) RF Power Output

Test Location: CKC Laboratories, Inc • 1120 Fulton Places • Fremont, CA 94539 • (510) 249-1170

Customer: **Proteus Digital Health, Inc.**
Specification: **15.247(a)(1) Power Output (2400-2483.5 MHz FHSS)**
Work Order #: **94175** Date: 4/18/2013
Test Type: **Radiated Scan** Time: 10:45:01
Equipment: **PPM (RP4) Electronic Module** Sequence#: 1
Manufacturer: Proteus Digital Health, Inc Tested By: Hieu Song Nguyenpham
Model: SPC-0175
S/N: 000013241

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	ANP01211	Attenuator	PE7002-10	4/2/2013	4/2/2015
T2	ANP05843	Cable	32022-2-29094K-48TC	8/7/2012	8/7/2014
	AN02668	Spectrum Analyzer	E4446A	2/22/2013	2/22/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
PPM (RP4) Electronic Module*	Proteus Digital Health, Inc	SPC-0175	000013241

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop AC/DC Power Adapter	Dell	D130PE1-00	CN-0JU012-48661-09U-K8GG-A04
Laptop	Dell	Latitude E6500	B76FVL1
USB to TTL Serial Cable-1.8m Wire End Version	FTDI	TTL-232RG-VREG1V8-WE	None

Test Conditions / Notes:

The EUT is a battery device. The EUT is placed on the test bench. The measurement is performed at the antenna port.
The service port is connected to a laptop for testing configuration purposes. Instead of using a fresh battery, the EUT is connected to a DC power supply at 2.4V
Temperature: 22.9°C
Humidity: 32 %
Atmospheric Pressure:102.4 kPa
High Clock: 26Mhz
Software Used: HCI_Lite_V3.02.exe
Rate power of chip=+4dBm
Transmitter Operation Frequency Range: 2400 - 2483.5 MHz
Low Channel: 2402MHz
Middle Channel: 2441Mhz
High Channel: 2480MHz
RBW=VBW=3MHz
Bit Pattern: 10101010

Table of RF power in WATTS for 3 modes

Ref	Freq in MHz	Meter dBµV	Factors	Dist	Corr	Power Output in Watt	Notes
1	2401.995	79.8	10.9	0	90.7	2.34423E-05	Low Channel GFSK
2	2401.995	78.4	10.9	0	89.3	1.69824E-05	Low Channel QPSK
3	2401.995	78	10.9	0	88.9	1.54882E-05	Low channel 8PSK
4	2441.026	77.8	10.9	0	88.7	1.47911E-05	Middle Channel GFSK
5	2441.026	76.1	10.9	0	87	0.00001	Middle Channel QPSK
6	2441.026	75.8	10.9	0	86.7	9.33254E-06	Middle Channel 8PSK
7	2479.95	77	10.9	0	87.9	1.23027E-05	High Channel GFSK
8	2479.95	74.8	10.9	0	85.7	7.4131E-06	High Channel QPSK
9	2479.95	74.5	10.9	0	85.4	6.91831E-06	High Channel 8PSK

Limit:

15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than **125 mW.**

Test Setup Photos