Proteus Patch (RW1, DW5) Operational Description

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1 Purpose and Scope

This document presents an operational description of the Proteus Patch products SPC-0655 (RW1) and SPC-0800 (DW5). This operational description is required for Bluetooth radio qualification.

2 Definitions, Acronyms and Abbreviations

Term	Meaning
DW5	Disposable Wearable 5, a 5th generation Proteus Patch
RW1	Reusable Wearable 1; a 5th generation Proteus Patch

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3 Reference Documents

Document Number	Rev	Document Title
SPC-0700	1	DW5 Assembly
SPC-0693	1	DW5 PCBA Assembly
BOM-0024	1	DW5 Bill of materials
SPC-0660	1	RW1 Pod Assembly
SPC-0607	1	RW1 PCBA Assembly
BOM-0022	1	RW1 Bill of Materials

4 Proteus Personal Monitor – Product Overview

The Proteus Patch is a miniaturized, multi- channel, ambulatory, battery-operated data-logging device that is worn on the torso to record activity, heart rate, body angle relative to gravity, and patient-logged events. Patient-logged events can be extrinsic (e.g., dosing of a medication) or intrinsic (e.g., a symptom) and are time-stamped by swallowing the Proteus ingestible sensor in order to contextualize the physiologic measures. The user assigns subjective meanings of these events. Proper contact of the device with the skin is verified with an electrode-to- electrode impedance measurement. Data recorded by the Proteus Patch is transferred via Bluetooth telemetry to a general computing device for display and conversion for export to other programs.

The RW1 Patch Pod model SPC-0660 and DW5 Proteus Patch model SPC-0700 are comprised of a printed circuit assembly, a means of connecting to hydrogel skin electrodes, a coin cell battery and a battery cover. These two models employ the same PCB and PCBA assembly with only minor differences in the Bill of Materials which do not affect EMC or Radio emissions or susceptibility.

5 Proteus Patch – Operational Details#

Proteus Patch models RW1 and DW5 include a Bluetooth Low-Energy^{Tm} radio subsystem which is compliant with the Bluetooth Part 4.0 standard.

The Bluetooth radio transmits and receives on 40 frequency bands which are equally-spaced at 2MHz intervals between 2402MHz and 2480MHz.

The effective receive bandwidth is 1.25MHz.

The transmit modulation is frequency-hopping using GFSK (Gaussian Frequency Shift Keying) with a bandwidth-bit period product BT=0.5. The Modulation index is between 0.28 and 0.35.

The Bluetooth transceiver circuit, Nordic part number nRF51822, is rated for 4 dBm typical at the nominal device power setting.

The Bluetooth antenna is a PCB mounted component, Ethertronics part number 1001312. The antenna is rated 1.72 dBi Typical.

The effective radiated power (ERP) is -15DBM**.**