



Radio Frequency Exposure Evaluation Report

For:
Philips Respironics

Model Name:
DreamStation

Product Description:
Continuous Airway Pressure Device with Bluetooth Radio (BDR/EDR) and accessory 2G/3G cellular modem, which sends and receives data

FCC ID: THO1116426
IC ID: 3234B-1116426

Per:
CFR Part Part1 (1.1307 & 1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISED RSS-102 Issue 5

Report number: EMC_PHIL4-071-20001_FCC_22_24_ISED_C2PC

DATE: 2020-06-26



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1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091) and IC standard RSS-102 issue 5 under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant).

In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits as stipulated by the above given FCC and IC rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model #
Philips Respironics	Continuous Airway Pressure Device with Bluetooth Radio (BDR/EDR) and accessory 2G/3G cellular modem, which sends and receives data	1116426

Specifically, this report shows that the product fulfills the RF Exposure requirements, operating in simultaneous transmission mode when plugged into a common host together with the following cellular modem model:

Company Name	Product Description	Model #
Philips Respironics	2G/3G cellular modem which sends and receives data on Bands GSM 850, GSM 1900, UMTS II, UMTS V	100610C & 100650C

Based on client similarity declaration, both cellular modem models use the same integrated cellular module (Gemalto Cinterion EHS6), and have only differences in the labels and the SIM internal data.

Report reviewed by:

2020-06-26 Compliance Cindy Li
(Lab Manager)

Date	Section	Name	Signature
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Responsible for the Report:

2020-06-26 Compliance Chin Ming Lui
(Associate EMC Engineer)

Date	Section	Name	Signature
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2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
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Lab Manager:	Cindy Li
Responsible Project Leader:	Cathy Palacios

2.2 Identification of the Client

Client's Name:	Philips Respironics
Street Address:	1740 Golden Mile Highway
City/Zip Code	Monroeville, PA 15146
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Assessment

Model No:	Host Device: 1116426, Cellular Modem: 100610C & 100650C
HW Version :	Rev. 4
SW Version :	4.003
Firmware Version Identification Number (FVIN):	N/A
Hardware Version Identification Number (HVIN):	100610C & 100650C
Product Marketing Name (PMN):	DreamStation
Regulatory Band:	<ul style="list-style-type: none"> ❖ <u>Cellular Module:</u> <ul style="list-style-type: none"> ▪ WCDMA/UMTS FDD BAND II: 1852.4 ~ 1907.6 MHz ▪ WCDMA/UMTS FDD BAND V: 826.4 ~ 846.6 MHz ▪ GSM 850: 824.2 ~ 848.8 MHz ▪ GSM 1900: 1850.2 ~ 1909.8 MHz ❖ <u>Bluetooth Classic (BDR/EDR):</u> <ul style="list-style-type: none"> ▪ Nominal band: 2400 MHz – 2483.5 MHz; ▪ Center to center: 2402 MHz (ch 0) – 2480 MHz (ch 78), 79 channels
Integrated Module Info:	<ul style="list-style-type: none"> ❖ <u>Cellular Module:</u> <ul style="list-style-type: none"> ▪ Module name: Gemalto Cinterion ▪ Model number: EHS6 ▪ FCC/IC ID: QIPEHS6 / 7830A-EHS6 ❖ <u>Bluetooth Classic (BDR/EDR):</u> <ul style="list-style-type: none"> ▪ Module name: Broadcom ▪ Model number: 1116426 ▪ FCC/IC ID: THO1116426 / 3234B-1116426
Antenna Information as declared:	<ul style="list-style-type: none"> ❖ <u>Cellular:</u> <ul style="list-style-type: none"> ▪ Type: Printed on Case ▪ Location: Internal ▪ Maximum gain: <ul style="list-style-type: none"> ○ UMTS Band II / GSM 1900 (1900 Band): 2 dBi ○ UMTS Band V / GSM 850 (800 Band): 0 dBi ❖ <u>Bluetooth Classic (BDR/EDR):</u> <ul style="list-style-type: none"> ▪ Type: PCB Trace ▪ Location: Internal ▪ Antenna gain: 1.5 dBi

Conducted Output Power:	<ul style="list-style-type: none"> ❖ Cellular: <small>Note 1</small> <ul style="list-style-type: none"> ▪ GSM 850: 2.466 W ▪ GSM 1900: 1.122 W ▪ WCDMA Band II: 0.253 W ▪ WCDMA Band V: 0.263 W ❖ Bluetooth Classic (BDR/EDR): <small>Note 2</small> <ul style="list-style-type: none"> ▪ 0.004 W
Power Supply/ Rated Operating Voltage Range:	Low: 100 VAC, Nominal: 115 VAC, High: 240 VAC
Operating Temperature Range:	Low 5° C, Nominal 25° C, High 35° C
Sample Revision:	<input type="checkbox"/> Prototype Unit; <input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production

Note 1: Conducted Output Power leveraged from certification grant of cellular module Gemalto EHS6 (FCC ID: QIPEHS6, IC ID: 7830A-EHS6)

Note 2: Peak Conducted Output Power leveraged from certification grant of Bluetooth modular grant (FCC ID: THO1116426, IC ID: 3234B-1116426)

4. RF Exposure Limits and FCC and IC Basic Rules

For the specific described radio apparatus the following basic limits and rules apply for both, FCC and IC where not indicated differently.

4.1 Power Density Limits acc. to FCC 1.1310(e) / RSS-102 i5, cl. 4:

FCC

Frequency Range (MHz)	Power density (mW/cm ²)	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100000	1.0	30

IC

300 – 6000	0.02619 x f (MHz) ^{0.6834}	6
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4.2 Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c) / RSS-102, cl. 2.5 (rounded to 1 decimal point):

FCC

operating frequency < 1.5GHz: excluded if ERP < 1.5W / 31.8dBm (EIRP: 33.9 dBm);
operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8dBm (EIRP: 36.9 dBm);

IC

300MHz ≤ operating frequency < 6 GHz: excluded if EIRP < 0.0131 x f (MHz)^{0.6834} W

4.3 RF Exposure Estimation (MPE Estimation)

Having available the source based average output power and peak antenna gain or the ERP/EIRP of the specified device and for a known minimum distance of its radiating structures from the body of persons according to its use cases (at least 20cm) the power density at that distance can be estimated by the following formula for plane-wave equivalent conditions (far-field conditions), when ground reflection is neglected.

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (mW/cm² or W/m²)

P = power input to the antenna (mW or W)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm or m)

5 Evaluations

5.1 Analysis of RF Exposure for simultaneous transmission

- Evaluations are based on worst case power density limits for Canada.
- Calculations are made for 20cm.
- Evaluations are based on ERP/EIRP measured or calculated from known gain and conducted output power.
- Cellular can transmit simultaneously with Bluetooth.

Radio	freq [MHz]	Max Conducted power [W] Note 1	Gain [dBi]	Gain [lin]	EIRP ^{Note 2} [W]	IC Limit [W/m ²]	FCC Llimit [W/m ²]	Actual [W/m ²] ²	How much of limit is used up
GSM 850	824.2	3.162	0	1	0.395	2.576	5.495	0.786	30.52%
GSM 1900	1850.2	1.585	2	1.585	0.314	4.477	10.000	0.625	13.95%
WCDMA II	1852.4	0.316	2	1.585	0.501	4.480	10.000	0.996	22.24%
WCDMA V	826.4	0.316	0	1	0.316	2.581	5.509	0.629	24.36%
BT	2400	0.004	1.5	1.413	0.00565	5.348	10.000	0.0112	0.210%

Note 1: For cellular bands, maximum tune-up tolerance was applied to account for highest maximum power output

Note 2: GSM 850 and GSM 1900 bands operate on single active time slot.

Hence, EIRP results for GSM 850 and 1900 were corrected for 1 out of 8 available time slots per frame.

For GSM 850 and 1900: $EIRP [W] = \text{Max Conducted power [W]} \times \text{Gain [lin]} \times 1/8 \text{ division factor}$

Note 3: Calculation is based on distance of 20cm and highest power

5.2 Conclusion:

The worst-case simultaneous transmission is GSM 850 simultaneous with BT, which is using 30.73% of a limit of 100%. The equipment is passing RF exposure requirements for 20cm distance.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
2020-06-26	EMC_PHIL4-071-20001_FCC_ISED_MPE_C2PC	Initial Release	Chin Ming Lui

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