



Radio Frequency Exposure Evaluation Report

FOR:
Philips Respironics.

Model Number:
1116426
With Cellular Modem Model Numbers
200603C, 200604C

Product Description:
Continuous Positive Airway Pressure Device with Bluetooth Radio (BDR/EDR) with
LTE Cat M Modem which sends and receives data on Band 4 and Band 13

FCC ID: THO-1116426

Per:
CFR Part Part1 (1.1307 & 1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06

Report number: EMC_PHIL4-066-20001_FCC _MPE

DATE: 2020-04-03



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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) and Part 2 (2.1091) 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 rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model #
Philips Respironics	Continuous Positive Airway Pressure Device with Bluetooth Radio (BDR/EDR)	1116426

Specifically this report shows that the product fulfills the RF Exposure requirements of the device, operating in simultaneous transmission mode, when plugged into a common host together with the Cellular Modem Models below.

Company	Description	Model #
Philips Respironics	LTE Cat M Modem sends and receives data on Band 4, 13	200603C Parent & 200604C Variant

Based on client declaration, the only differences in same accessory models is one is a diminutive version where parts are not stuffed to remove a USB port

Report reviewed by:

2020-04-03	Compliance	Cindy Li (Lab Manager)	 Digitally signed by: Cindy Li DN: CN=Cindy Li@cetecom.com Reason: I am approving this document Location: Date: 2020-04-22 14:53:17
Date	Section	Name	Signature

Responsible for the Report:

2020-04-03	Compliance	Yuchan Lu (Test Engineer)	Yuchan Lu Digitally signed by: Yuchan Lu DN: CN = Yuchan Lu email = Yuchan.Lu@cetecom.com C = US O = CETECOM Inc. OU = EMC Date: 2020.04.03 12:05:43 -0700
Date	Section	Name	Signature

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
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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 Applicant

Applicant's Name:	Philips Respironics
Street Address:	1001 Murry Ridge Lane
City/Zip Code	Murrysville, PA 15668
Country	USA

2.4 Identification of the Manufacturer

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

3 Equipment under Assessment

Model No:	1116426
Cellular Modem Model #:	200603C, 200604C
Marketing name:	DreamStation Cellular Modem
HW Version :	01
SW Version :	B4.00.03.3075
Firmware Version Identification Number (FVIN):	N/A
Hardware Version Identification Number (HVIN):	200603C, 200604C
Product Marketing Name (PMN):	DreamStation Cellular Modem
Regulatory Band:	❖ <u>Cellular Module:</u> ▪ LTE BAND 4: 1710 ~ 1755 MHz ▪ LTE BAND 13: 777 ~ 787 MHz ❖ <u>BT:</u> ▪ Nominal band: 2400 MHz – 2483.5 MHz ▪ Center to center: 2402 MHz (ch 0) – 2480 MHz (ch 78), 79 Channels
Integrated Module Info:	❖ <u>Cellular Module:</u> ▪ Module name: u-blox ▪ Model number: SARA-R410M-02B ▪ FCC ID: XPY2AGQN4NNN ❖ <u>BT:</u> ▪ Module name: Broadcom ▪ Module number: 1116426 ▪ FCC ID: THO1116426
Antenna Type:	❖ <u>Cellular:</u> ▪ Antenna maximum gain: ○ LTE Band 4: -0.51 dBi ○ LTE Band 13: 1.32 dBi ❖ <u>BT:</u> ▪ Antenna gain: PCB Trace 1.5 dBi
Maximum Conducted Output Power:	❖ <u>Cellular:</u> From modular grant [Watts]:

	▪ LTE Band 4: 0.245 ▪ LTE Band 13: 0.275 ❖ BT: From modular grant [Watts]: 0.00326
Power Supply/ Rated Operating Voltage Range:	Low 100 VAC, Nominal 115VAC, High 240 VAC
Operating Temperature Range:	Low 5° C, Nominal 25° C, High 35° C
Sample Revision:	☐ Prototype Unit; ☐ Production Unit; ☒ Pre-Production

4 RF Exposure Limits and FCC Basic Rules

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

4.1 Power Density Limits acc. to FCC 1.1310(e):

FCC

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

4.2 Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c) (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);

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 USA.
- 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 BT.

Radio	Freq [MHz]	Max power + tune up tolerance [W]	Gain [dBi]	Gain [lin]	EIRP [W]	FCC Llimit [W/m2]	Actual [W/m2] ¹	How much of limit is used up
LTE 4	1710	0.316	1.32	1.36	0.429	10	0.853	8.52%
LTE 13	777	0.316	-0.51	0.89	0.281	5.180	0.559	10.79%
BT	2402	0.004	1.5	1.41	0.005	10.000	0.009	0.09%

Note1: The calculation is based on the distance of 20cm. BT power is conducted rounded up to nearest mW.

5.2 Conclusion:

The worst-case simultaneous transmission is LTE 13 simultaneous with BT, which is using 10.9% of the FCC limit of 100%. The Max power density is LTE B4 at 0.853 [W/m²] The equipment is passing FCC RF exposure requirements for 20cm distance.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
2020-04-03	EMC_PHIL4-066-20001_FCC_MPE	Initial Release	Yuchan Lu

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