



Radio Frequency Exposure Evaluation Report

FOR:

Philips RS North America LLC

Model:

U.S (FCC): DSX510H11C, DSX510T11C, DSX520H11C, DSX520T11C, DSX420H11C, DSX420T11C, DSX410H11C, DSX410T11C, VAX520H21C, VAX520T21C, VAX520T21C15, DSX520T11C15
Canada (ISED): CAX410T12C, CAX521H12C, CAX410H12C, CAX521T12C, CAX510T12C, CAX521T12C15, CAX510H12C

Product Description:

CPAP machine with integral Cell modem and BT

FCC ID: THO1141623

IC ID: 3234B-1141623

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_PHIL4-111-22001_FCC_ISED_MPE

DATE: 2022-04-12



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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 RS North America LLC	CPAP machine with integral Cell modem and BT	U.S (FCC): DSX510H11C, DSX510T11C, DSX520H11C, DSX520T11C, DSX420H11C, DSX420T11C, DSX410H11C, DSX410T11C, VAX520H21C, VAX520T21C, VAX520T21C15, DSX520T11C15 Canada (ISED): CAX410T12C, CAX521H12C, CAX410H12C, CAX521T12C, CAX510T12C, CAX521T12C15, CAX510H12C

Report reviewed by: TCB Evaluator

Kevin Wang

(EMC Lab Manager)

2022-04-12

Compliance

Date	Section	Name	Signature
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Responsible for the Report:

Cheng Song

(EMC Engineer)

2022-04-12

Compliance

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:	Kevin Wang
Responsible Project Leader:	Cathy Palacios

2.2 Identification of the Client / Manufacturer

Client's Name:	Philips RS North America LLC
Street Address:	6501 Living Place
City/Zip Code	Pittsburgh PA 15206
Country	USA

Identification of the Manufacturer

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

3 Equipment under Assessment

Model No:	U.S (FCC): DSX510H11C, DSX510T11C, DSX520H11C, DSX520T11C, DSX420H11C, DSX420T11C, DSX410H11C, DSX410T11C, VAX520H21C, VAX520T21C, VAX520T21C15, DSX520T11C15 Canada (ISED): CAX410T12C, CAX521H12C, CAX410H12C, CAX521T12C, CAX510T12C, CAX521T12C15, CAX510H12C
HW Version :	00
SW Version :	V1.0.5
Product Marketing Name (PMN):	DreamStation 2 Advanced Auto CPAP
Radios included in device	Cellular: <ul style="list-style-type: none"> • u-blox SARA-R500Sv1 (CAT-M1) • FCC ID: XPYUBX19KM01; IC ID: 8595A-UBX19KM01 • LTE Bands: 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71 Bluetooth: <ul style="list-style-type: none"> • Dialog DA14585 SoC (BLE)
Antenna info:	Cellular: <ul style="list-style-type: none"> • Flexible Polymer Antenna • Max gain: 4 dBi Bluetooth: <ul style="list-style-type: none"> • PCB Trace Antenna • Max gain: 2.81 dBi
Maximum Conducted Output Power:	Cellular: <ul style="list-style-type: none"> • LTE Bands: 2, 4, 5, 12, 13, 25, 26, 66, 71, 8 • Max Output Power: 25 dBm Bluetooth: <ul style="list-style-type: none"> • BTLE 2402 – 2480 MHz • Max Output Power: 9.3 dBm
Power Supply/ Rated Operating Voltage Range:	10.8 V (Low) / 12 V (Nominal) / 13.2 V (Max)
Operating Temperature Range:	5°C ~ +35°C
Sample Revision:	<input type="checkbox"/> Prototype Unit; <input type="checkbox"/> Production Unit; <input checked="" type="checkbox"/> Pre-Production

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	$0.02619 \times f \text{ (MHz)}^{0.6834}$	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 < $0.0131 \times f \text{ (MHz)}^{0.6834}$ 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 BTLE.

Radio	freq MHz	MaxPower W conducted	MaxPower convert to dBm	Ant Gain dbi	Ant Gain lin	EIRP W calculate d	Max Duty Cycle	IC W/m2	FCC W/m2	Actual W/m2	How much of IC limit is used up	How much of FCC limit is used up
LTE 2	1850	0.316	25.000	4	2.51	0.794	100.00%	4.476	10.000	1.580	35.30%	15.80%
LTE 4	1710	0.316	25.000	4	2.51	0.794	100.00%	4.242	10.000	1.580	37.26%	15.80%
LTE 5	824	0.316	25.000	4	2.51	0.794	100.00%	2.576	5.493	1.580	61.36%	28.76%
LTE 12	699	0.316	25.000	4	2.51	0.794	100.00%	2.302	4.660	1.580	68.67%	33.91%
LTE 13	777	0.316	25.000	4	2.51	0.794	100.00%	2.474	5.180	1.580	63.86%	30.50%
LTE 25	1850	0.316	25.000	4	2.51	0.794	100.00%	4.476	10.000	1.580	35.30%	15.80%
LTE 26	814	0.316	25.000	4	2.51	0.794	100.00%	2.554	5.427	1.580	61.86%	29.12%
LTE 66	1710	0.316	25.000	4	2.51	0.794	100.00%	4.242	10.000	1.580	37.26%	15.80%
LTE 71	663	0.316	25.000	4	2.51	0.794	100.00%	2.220	4.420	1.580	71.17%	35.75%
LTE 8	880	0.316	25.000	4	2.51	0.794	100.00%	2.694	5.867	1.580	58.67%	26.93%
Distance(m)=										0.200		
BTLE	2400	0.009	9.300	2.81	1.91	0.016	100.00%	5.348	10.000	0.032	0.60%	0.32%

Note2: The calculation is based on the distance of 20cm

5.2 Conclusion:

The worst-case is LTE 71 simultaneous with BTLE, which is using 36.07 of FCC limit of 100% and 71.77 of IC limit of 100%. The equipment is passing RF exposure requirements for 20cm distance.

6 Revision History

Date	Report Name	Changes to report	Prepared by
2022-04-12	EMC_PHIL4-111-22001_FCC_ISSED_MPE	Initial Release	Cheng Song

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