Test Report # 317060 D

Equipment Under Test:	PPD
Test Date(s):	8/28/17
Prepared for:	GE Healthcare Attn: Matt Pekarske 8200 West Tower Ave. Milwaukee, WI 53223

Report Issued by: Shane Dock, EMC Engineer

Signature:

Date:10/31/17

Report Reviewed by: Adam Alger, Quality Systems Engineer

Signature:

Date: 10/27/2017

Report Constructed by: Shane Dock, EMC Engineer

Signature:

Date: 10/31/17

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Laird Technologies Test Services in Review

The Laird Technologies, Inc. laboratory located at W66 N220 Commerce Court Cedarburg, Wisconsin, 53012 USA is recognized through the following organizations:

TESTING CERT #1255.01

A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025: 2005 with Electrical (EMC) Scope
A2LA Certificate Number: 1255.01
Scope of accreditation includes all test methods listed herein, unless otherwise noted.

Federal Communications Commission (FCC) – USA

Accredited recognition of two 3 meter Semi-Anechoic Chambers

Accredited Test Firm Registration Number: 953492

Government of Canada

Innovation, Science and Economic Development Canada

ISED Site listing of two 3 meter Semi-Anechoic Chambers based on RSS-GEN – Issue 4
File Number: IC 3088A-2
File Number: IC 3088A-3

1 TEST REPORT SUMMARY

During **8/28/17** the Equipment Under Test (EUT), **PPD**, as provided by **GE Healthcare** was tested to the following requirements:

Requirement	Description	Specification	Method	Result
FCC Part 1.1307, 2.1091, 2.1093	RF Exposure and equipment authorization requirements	Reported	FCC KDB 447498	Reported
ISED Canada RSS-102	Radiofrequency Radiation Exposure Evaluation: Portable	Reported	RSS-102 Section 2.5.2	Reported

Notice:

The results relate only to the item tested and described in this report. Any modifications made to the equipment under test after the specified test date(s) may invalidate the data herein.

If the resulting measurement margin is seen to be within the uncertainty value, as listed in this report, the possibility exists that this unit may not meet the required limit specification if subsequently tested.

2 CLIENT INFORMATION

Company Name	GE Healthcare
Contact Person	Matthew Pekarske
Address	8200 West Tower Ave

2.1 Equipment Under Test (EUT) Information

The following information has been supplied by the client

Product Name	PPD
Model Number	CARESCAPE ONE v1
Serial Number	Conducted measurements: SNA 16260004SP Radiated measurements: SNA 16270022SP DFS testing: SNA 16260004SP
FCC/IC Number	FCC: OU5-CSONE01 IC: 4048B-CSONE01

2.2 Product Description

The PPD CARESCAPE ONE v1 is a transport bedside patient monitor used for measuring and displaying the physiologic data acquired from the connected patient. The wireless functionality will not be enabled in v1.

2.3 Modifications Incorporated for Compliance

None noted at time of test

2.4 Deviations and Exclusions from Test Specifications

None noted at time of test

2.5 Additional Information

Unit's WLAN functionality programmed via serial connection. Unit connected to 120V power with an adaptor as well as an internal battery. Channels 1, 6, 11 used for the WLAN's low, mid and high channels. The unit was tested on the 1 MBPS, 6 MBPS, and MCS0 data rates in the HT20 Tx modes.

FCC .ini file: GE_modified_FCC_930-0049-R1.2.ini

IC .ini file: GE_modified_IC_930-0049-R1.2.ini

3 REFERENCES

Publication	Edition	Date
CFR 47 Part 15	-	2017
ANSI C63.10	-	2013
RSS-247	2	2017
RSS GEN	4	2014
RSS-102	5	2015
CFR 47 Part 1 and 2	-	2017
FCC KDB 447498	6	2015

4 UNCERTAINTY SUMMARY

Using the guidance of the following publications the calculated measurement uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k = 2.

References	Version / Date
CISPR 16-4-1	Ed. 2 (2009-02)
CISPR 16-4-2	Ed. 2 (2011-06)
CISPR 32	Ed. 1 (2012-01)
ANSI C63.23	2012
A2LA P103	February 4, 2016
A2LA P103c	August 10, 2015
ETSI TR 100-028	V1.3.1 (2001-03)

Measurement Type	Configuration	Uncertainty ±
Radiated Emissions	Biconical Antenna	5.0 dB
Radiated Emissions	Log Periodic Antenna	5.3 dB
Radiated Emissions	Horn Antenna	4.7 dB
AC Line Conducted Emissions	Artificial Mains Network	3.4 dB
Telecom Conducted Emissions	Asymmetric Artificial Network	4.9 dB
Disturbance Power Emissions	Absorbing Clamp	4.1 dB
Radiated Immunity	3 Volts/meter	2.2 dB
Conducted Immunity	CDN/EM/BCI	2.4/3.5/3.4 dB
EFT Burst/Surge	Peak pulse voltage	164 volts
ESD Immunity	15 kV level	1377 Volts

Parameter	ETSI U.C. ±	U.C. ±
Radio Frequency, from F0	$1x10^{-7}$	$0.55x10^{-7}$
Occupied Channel Bandwidth	5 %	2 %
RF conducted Power (Power Meter)	1.5 dB	1.2 dB
RF conducted emissions (Spectrum Analyzer)	3.0 dB	1.7 dB
All emissions, radiated	6.0 dB	5.3 dB
Temperature	1° C	0.65° C
Humidity	5 %	2.9 %
Supply voltages	3 %	1 %

5 TEST DATA

2.4 GHz WLAN

Operator	Aidi Zainal
QA	Shane Dock
Test Date	8/28/2017
Location	Conducted measurement area
Temp. / R.H.	72/66%
Requirement	FCC: 15.247 (b)(3) IC: RSS-247 5.4 (4)
Method	FCC KDB 558074 D01 DTS Meas Guidance V04, section 9.1.3

Limits:

Maximum Conducted Output Power (watts)	Maximum Conducted Output Power (dBm)
1	30

Test Parameters

Frequency	2412, 2437 and 2462 MHz
Settings	Channel mode = Modulated
Settings	Measurement = Peak
Settings	Trigger source = internal A

Table

1MBPS				
Channel	Frequency (MHz)	Peak Output power (dBm)	Limit (dBm)	Margin (dB)
1	2412.0	19.6	30.0	10.4
6	2437.0	19.9	30.0	10.2
11	2462.0	20.0	30.0	10.0

6MBPS				
Channel	Frequency (MHz)	Peak Output power (dBm)	Limit (dBm)	Margin (dB)
1	2412.0	22.1	30.0	7.9
6	2437.0	22.0	30.0	8.0
11	2462.0	22.3	30.0	7.7

MCS0				
Channel	Frequency (MHz)	Peak Output power (dBm)	Limit (dBm)	Margin (dB)
1	2412.0	21.7	30.0	8.3
6	2437.0	22.5	30.0	7.5
11	2462.0	22.5	30.0	7.6

5 GHz WLAN

Operator	Aidi Zainal
QA	Coty Hammerer
Test Date	9/8/17, 9/15/17, 9/26/17,
Location	Conducted RF Measurement Area
Temp. / R.H.	71 degrees F/ 50% RH
Requirement	FCC 15.407 (a)(1)(iv), (a)(2), (a)(3) RSS 247 Issue 2 Sections 6.2.1.1, 6.2.2.1, 6.2.3.1, 6.2.4.1
Method	KDB 789033 D02 v01r04 Section II.E.2.d Method SA-2 U-NII-2C HT-20 signals: KDB 789033 D02 v01r04 Section II.E.2.b Method SA-1

Limits:

U-NII Band	FCC Limit	ISED Limit
U-NII-1	24 dBm	Lesser of: 23 dBm or [10dBm + 10log(99%BW)] e.i.r.p.
U-NII-2A	Lesser of: 24 dBm or [11 dBm + 10 log(26 dB BW)]	1) Lesser of: 24 dBm or [11 dBm + 10 log (99% BW)] 2) Lesser of: 30 dBm or [17 dBm + 10 log (99% BW)] e.i.r.p
U-NII-2C	Lesser of: 24 dBm or [11 dBm + 10 log(26 dB BW)]	1) Lesser of: 24 dBm or [11 dBm + 10 log (99% BW)] 2) Lesser of: 30 dBm or [17 dBm + 10 log (99% BW)] e.i.r.p
U-NII-3	30 dBm	30 dBm

Test Parameters

Settings	RMS Detector
Settings	Integration over EBW
Settings	Measured over on and off times and add duty cycle correction
Example Calculation	Measured + Duty cycle correction = Output power
Example Calculation	Measured + Duty cycle correction+antenna gain = EIRP

Instrumentation

Laird
Smart Technology. Delivered.

Date : 22-Aug-2017 Test : Conducted RF Radio Job : C-2826

PE : Shane Dock Customer : GE Healthcare Quote : 317060

No.	Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due Date	Equipment Status
1	AA 960160	UTiFLEX Cable	Micro-Coax	UFC142A-0-0720-20(	218652-001	6/29/2016	11/11/2017	Active Verification
2	EE960073	Spectrum Analyzer	Agilent	E4446A	US45300564	11/21/2016	11/21/2017	Active Calibration

Tested By: Quality Assurance: Shane Dock

Table (Worst Case Shown)

6MBPS												
UNII 2a 5250 to 5350 MHz												
Channel	Frequency (MHz)	Measured (dBm)	D.C. Correction (dB)	Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	FCC Limit (dBm)	FCC Margin (dB)	ISED Cond Power limit (dBm)	ISED Cond Power margin (dB)	ISED EIRP Limit (dBm)	ISED EIRP Margin (dB)
56	5280.0	15.8	0.2	16.0	4.5	20.5	24.0	8.0	23.3	7.3	29.3	8.8
60	5300.0	15.9	0.2	16.1	4.5	20.6	24.0	7.9	23.2	7.2	29.2	8.7
64	5320.0	15.8	0.2	16.0	4.5	20.5	24.0	8.0	23.2	7.2	29.2	8.7

6 EXCLUSION CALCULATION

6.1 FCC - 2.4 GHz WLAN

Frequency = 2462 MHz
Output Power = 22.5 dBm + 2.0 dB (Tune-up Tolerance) = 24.5 dBm
=281.8 mW

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

where: S = power density
P = power input to the antenna
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

Maximum peak output power at antenna input terminal:	24.50	(dBm)
Maximum peak output power at antenna input terminal:	281.838	(mW)
Antenna gain(typical):	3.5	(dBi)
Maximum antenna gain:	2.239	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2462	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm^2)

Power density at prediction frequency:	0.125525	(mW/cm^2)
Maximum allowable antenna gain:	12.5	(dBi)
Margin of Compliance at 20 cm =	9.0	dB

6.2 Industry Canada -2.4 GHz WLAN

Threshold – (0.0131) * (f(MHz) ^ .6834) = 2.7 W, which is more than .63 W.

The EUT is therefore exempt from routine evaluation at 20 cm or more.

6.3 FCC - 5 GHz WLAN

Frequency = 5300 MHz
Output Power = 16.1 dBm + 2.0 dB (Tune-up Tolerance) = 18.1 dBm
=64.6 mW

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

where: S = power density
P = power input to the antenna
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

Maximum peak output power at antenna input terminal:	18.10	(dBm)
Maximum peak output power at antenna input terminal:	64.565	(mW)
Antenna gain(typical):	4.5	(dBi)
Maximum antenna gain:	2.818	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	5300	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm^2)

Power density at prediction frequency:	0.036202	(mW/cm^2)
Maximum allowable antenna gain:	18.9	(dBi)
Margin of Compliance at 20 cm =	14.4	dB

6.4 Industry Canada - 5 GHz WLAN

Threshold – (0.0131) * (f(MHz) ^ .6834) = 4.6 W, which is more than .18 W.

The EUT is therefore exempt from routine evaluation at 20 cm or more.

7 REVISION HISTORY

Version	Date	Notes	Person
V0	10/24/17	First Draft	Shane Dock
V1	10/25/17	Revised Draft	Shane Dock
V2	10/26/17	Final Draft	Shane Dock
V3	2/8/18	Updated Draft	Shane Dock

END OF REPORT