COMPLIANCE WORLDWIDE INC.
TEST REPORT 504-11R1A

In Accordance with the Requirements of

MPE Calculation for
FCC Part 15.247, Subpart C
FCC Part 15.407, Subpart E
INDUSTRY CANADA RSS 210, ISSUE 8

Issued to

Philips Medical Systems
3000 Minuteman Drive
Andover, MA 01810
978-659-2800

for the

Philips Telemetry System
MX40 Patient Worn Monitor
2.4 / 5 GHz 802.11a/g WLAN

FCC ID: PQC-MX40WLAN2
IC: 3549B-MX40WLAN2

Report Issued on April 23, 2012

Tested by

Brian F. Breault

Reviewed by

Larry K. Stillings

RF Exposure Requirements: 1.1307(b)(1) and 1.1.307(b)(2): Systems operating under the provision of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: 1.1310: As specified in this section, the Maximum Permissible Exposure (MPE) limit shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in Section 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec 2.1093 of this chapter.

Test Results: Compliant. A summation of the power densities of each of the individual radios shows that the combination of the two radios are in compliance with the limit.

Radio	MPE Distance (cm)	DUT Output Power (dBm)	Time Averaged Power (dBm)	DUT Antenna Gain (dBi)	Power Density (mW/cm2)	Power Density (W/m2)	Limit (mW/cm2)	Result
	(1)	(2)	(2)	(3)	(4)	(4)	(5)	
SRR	2.5	0.60	N/A	0.3	0.0156591	0.1565914	1.00	Compliant
WLAN 2.4	2.5	19.20	-33.76	-3.0	0.0000027	0.0000269	1.00	Compliant
SUM	**2.5**	**N/A**	**N/A**	**N/A**	**0.0156618**	**0.1566183**	**1.00**	**Compliant**

Radio	MPE Distance (cm)	DUT Output Power (dBm)	Time Averaged Power (dBm)	DUT Antenna Gain (dBi)	Power Density (mW/cm2)	Power Density (W/m2)	Limit (mW/cm2)	Result
	(1)	(2)	(2)	(3)	(4)	(4)	(5)	
SRR	2.5	0.60	N/A	0.3	0.0156591	0.1565914	1.00	Compliant
WLAN 5.8	2.5	18.23	-29.73	1.0	0.0000171	0.0001707	1.00	Compliant
SUM	**2.5**	**N/A**	**N/A**	**N/A**	**0.0156762**	**0.1567621**	**1.00**	**Compliant**

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7. Measurement Data for SRR Radio from Test Report #264-11R1

7.10. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102

Channel Frequency	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
				(mW/cm2)	(W/m2)		
	(1)	(2)	(3)	(4)		(5)	
2405	2.5	-5.83	0.3	0.00356	0.03565	1	Compliant
2440	2.5	-4.50	0.3	0.00484	0.04842	1	Compliant
2480	2.5	-2.23	0.3	0.00817	0.08166	1	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

- **PD = Power Density (mW/cm^2)**
- **OP = DUT Output Power (dBm)**
- **AG = DUT Antenna Gain (dBi)**
- **d = MPE Distance (cm)**

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 2.5 centimeters of the body of the user.
2. Section 7.4 of this test report.
3. Data supplied by the client. Antenna specification data of worst case antenna used by the DUT.
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

RSS-102 Section 2.5, 2.5.1 & 2.5.2 Requirements:

2.5 - All transmitters are exempt from routine SAR and RF exposure evaluations provided that output power complies with the power levels of sections 2.5.1 or 2.5.2. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly signed declaration of compliance (see Annex C).

2.5.1 - SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 20 mW for general public use and 100 mW for controlled use

2.5.2 - RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- at or above 1.5 GHz and the maximum EIRP of the device is equal to or less than 5 W.

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7. Measurement Data (continued) for WLAN from Test Report #141-12R1

7.10. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102

Channel Frequency	MPE Distance (cm)	DUT Output Power (dBm)	Time Averaged Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
					(mW/cm2)	(W/m2)		
	(1)	(2)	(2)	(3)	(4)		(5)	
2412	2.5	19.20	-33.76	-3.0	0.0000027	0.0000269	1	Compliant
2437	2.5	18.22	-34.74	-3.0	0.0000021	0.0000214	1	Compliant
2462	2.5	18.85	-34.11	-3.0	0.0000025	0.0000248	1	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

- **PD = Power Density (mW/cm^2)**
- **OP = DUT Output Power (dBm)**
- **AG = DUT Antenna Gain (dBi)**
- **d = MPE Distance (cm)**

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 2.5 centimeters of the body of the user.
2. Section 7.4 of this test report.
3. Data supplied by the client. Antenna specification data of worst case antenna used by the DUT.
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

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7. Measurement Data (continued)

7.10. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102 (cont.)

The calculated output power can be referenced in column 6 of the table below. The calculated peak output power is higher than the 24.37 / 20 mW requirement for performing SAR testing using the formula: 60 / F (GHz). However, the time averaged power is considerably lower then the 24.37 /20 mW requirement.

Channel	Frequency	Peak Field Strength	Distance	Antenna Gain[1]	Measured Output Power	Time Averaged Power
	(MHz)	(dBµV/m)	(m)	(dBi)	(mW)	(mW)
Low	2412	111.43	3.0	-3.0	83.20	0.0004212
Mid	2437	110.45	3.0	-3.0	66.39	0.0003361
High	2462	111.08	3.0	-3.0	76.76	0.0003886

RSS-102 Section 2.5, 2.5.1 & 2.5.2 Requirements:

2.5 - All transmitters are exempt from routine SAR and RF exposure evaluations provided that output power complies with the power levels of sections 2.5.1 or 2.5.2. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly signed declaration of compliance (see Annex C).

2.5.1 - SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 20 mW for general public use and 100 mW for controlled use.

- above 3 GHz and up to 6 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 10 mW for general public use and 50 mW for controlled use.

2.5.2 - RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- at or above 1.5 GHz and the maximum EIRP of the device is equal to or less than 5 W.

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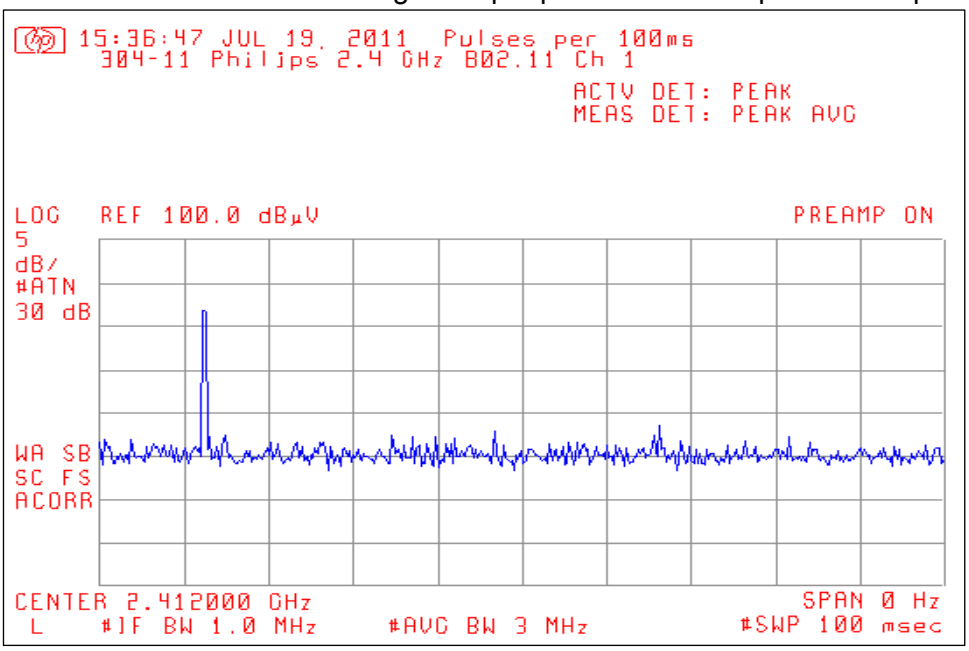
7. Measurement Data (continued)

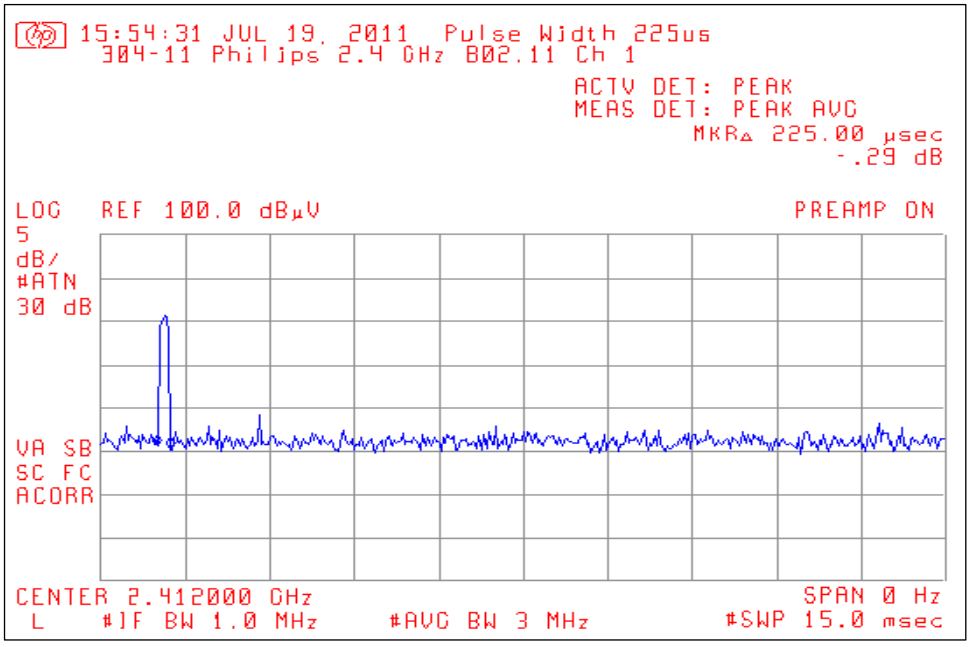
7.10. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102 (continued)

Time Average Reduction = 20 $\log_{10}$ (.225 ms / 100 ms) = -52.96 dB.

7.10.1 Determination of time averaged output power – 1 Pulse per 100 ms period.



7.10.2 Determination of time averaged output power – Pulse width = 225 µs.



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7. Measurement Data (continued) for WLAN from Test Report #504-11R1

7.11. Public Exposure to Radio Frequency Energy Levels

Requirement: (15.407(f))

U-NII devices are subject to the radio frequency radiation exposure requirements specified in 47CFR 1.1307(b), FCC 47 CFR 2.1091 and 47 CFR 2.1093, as appropriate. All equipment shall be considered to operate in a ‘‘general population/uncontrolled’’ environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request

Procedure: The power density is calculated from the peak field strength and device antenna gain.

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

PD	Power Density	mW/cm^2
OP	DUT Output Power	dBm
AG	DUT Antenna Gain	dBi
d	MPE Distance	cm

Conditions: Temperature: 21°C Relative Humidity: 31% (Nominal)

Conclusion: The device under test is meets radio frequency radiation exposure requirements specified in 47CFR 1.1307(b), § 2.1091 and § 2.1093.

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7. Measurement Data (continued)

7.11. Public Exposure to Radio Frequency Energy Levels (15.407(f) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102 (cont.)

The calculated output power can be referenced in column 6 of the table below. The calculated peak output power is higher than the 10.34 / 10 mW requirement for performing SAR testing using the formula: 60 / F (GHz). However, the time averaged power is considerably lower then the 10.34 / 10 mW requirements.

Power Calculated from Peak Field Strength

Channel	Frequency	Field Strength	Distance	Antenna Gain[1]	Measured Output Power		Time Averaged Power
	(MHz)	(dBµV/m)	(m)	(dBi)	(mW)	(dBm)	(mW)
36	5180	108.53	3.0	1.0	16.99	12.30	0.0002718
40	5200	108.82	3.0	1.0	18.16	12.59	0.0002906
48	5240	109.29	3.0	1.0	20.24	13.06	0.0003238
52	5260	109.42	3.0	1.0	20.85	13.19	0.0003336
64	5320	107.00	3.0	1.0	11.94	10.77	0.0001911
100	5500	112.57	3.0	1.0	43.06	16.34	0.0006890
116	5580	112.86	3.0	1.0	46.04	16.63	0.0007366
140	5700	113.01	3.0	1.0	47.66	16.78	0.0007625
149	5745	114.22	3.0	1.0	62.97	17.99	0.0010075
153	5765	113.96	3.0	1.0	59.31	17.73	0.0009489
161	5805	114.46	3.0	1.0	66.55	18.23	0.0010647

[1] Taken from the antenna manufacture's data guide.

RSS-102 Section 2.5, 2.5.1 & 2.5.2 Requirements:

2.5 - All transmitters are exempt from routine SAR and RF exposure evaluations provided that output power complies with the power levels of sections 2.5.1 or 2.5.2. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly signed declaration of compliance (see Annex C).

2.5.1 - SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- above 3 GHz and up to 6 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 10 mW for general public use and 50 mW for controlled use.

2.5.2 - RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- at or above 1.5 GHz and the maximum EIRP of the device is equal to or less than 5 W.

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7. Measurement Data (continued)

7.11. Public Exposure to Radio Frequency Energy Levels (continued)

Channel Frequency	MPE Distance (cm)	DUT Output Power (dBm)	Time Averaged Power	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
					(mW/cm2)	(W/m2)		
	(1)	(2)	dBm	(3)	(4)		(5)	
5180	2.5	12.30	-35.66	1.0	0.000004	0.00004	1	Compliant
5200	2.5	12.59	-35.37	1.0	0.000005	0.00005	1	Compliant
5240	2.5	13.06	-34.90	1.0	0.000005	0.00005	1	Compliant
5260	2.5	13.19	-34.77	1.0	0.000005	0.00005	1	Compliant
5320	2.5	10.77	-37.19	1.0	0.000003	0.00003	1	Compliant
5500	2.5	16.34	-31.62	1.0	0.000011	0.00011	1	Compliant
5580	2.5	16.63	-31.33	1.0	0.000012	0.00012	1	Compliant
5700	2.5	16.78	-31.18	1.0	0.000012	0.00012	1	Compliant
5745	2.5	17.99	-29.97	1.0	0.000016	0.00016	1	Compliant
5765	2.5	17.73	-30.23	1.0	0.000015	0.00015	1	Compliant
5805	2.5	18.23	-29.73	1.0	0.000017	0.00017	1	Compliant

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 2.5 centimeters of the body of the user.
2. Peak field strength values derived from measurements taken for Section 6.1 of this test report.
3. Data supplied by the client.
4. Power density is calculated from field strength measurement and antenna gain. Reference the procedure outlined above.
5. Reference FCC 47CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

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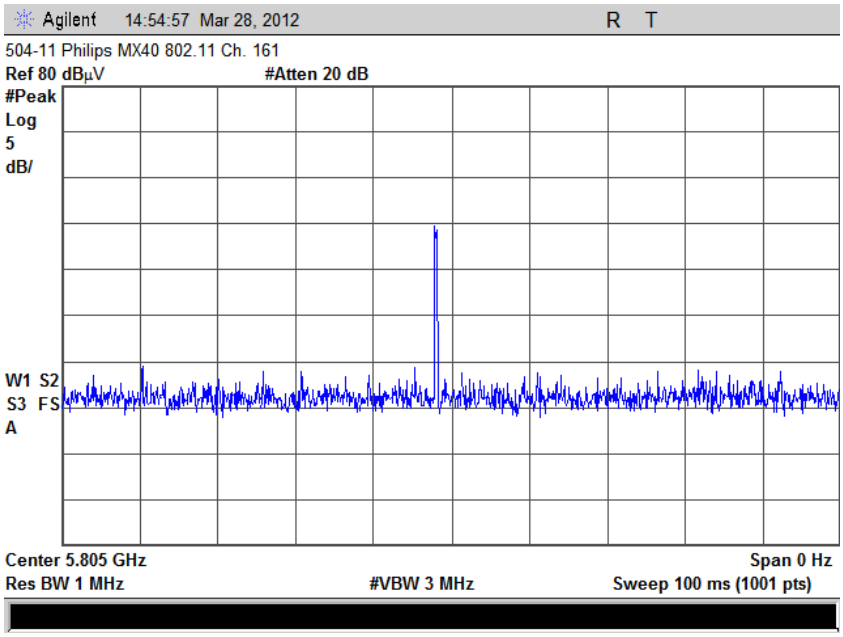
7. Measurement Data (continued)

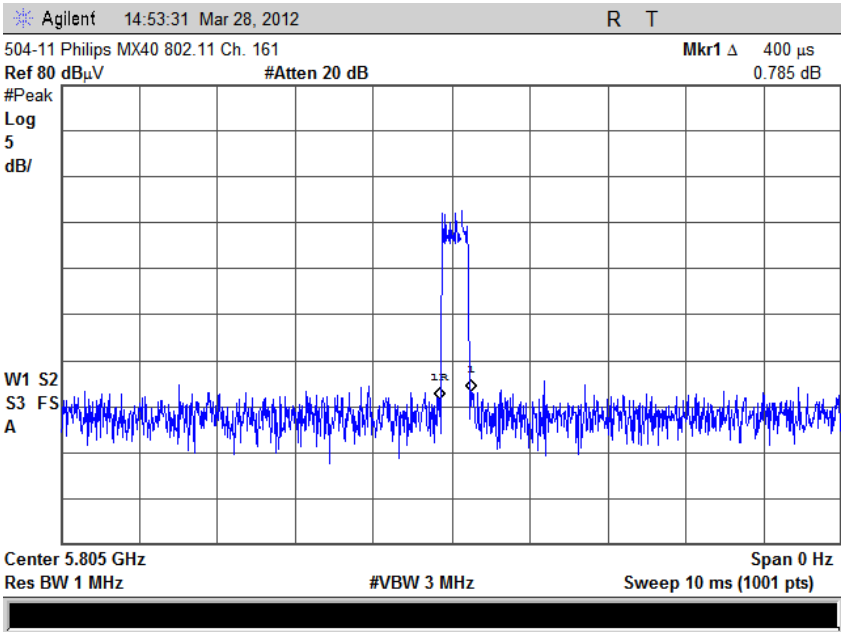
7.11. Public Exposure to Radio Frequency Energy Levels (15.407(f) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102 (continued)

Time Average Reduction = 20 $\log_{10}$ (.400 ms / 100 ms) = -47.96 dB.

7.11.1 Determination of time averaged output power – 1 Pulse per 100 ms period.



7.11.2 Determination of time averaged output power – Pulse width = 400 µs.



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