
**COMPLIANCE WORLDWIDE INC.
TEST REPORT 253-11A**

In Accordance with the Requirements of
**MPE Calculation for
FCC CFR 47 Part 95, Subpart H
FCC Part 15.247, Subpart C**

Issued to

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

for the

**Philips Telemetry System
MX40 Patient Worn Monitor
1.4 GHz CTS Radio**

FCC ID: PQC-MX40SH14

Report Issued on June 20, 2011

Tested by



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RF Exposure Requirements: 1.1307(b)(1) and 1.1307(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 all three radios are in compliance with the limit.

Channel	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
	(1)	(2)	(3)	(4)	(5)	
1.4 GHz	2.5	11.97	-3.0	0.1004688	0.93	Compliant
SRR	2.5	0.60	0.3	0.0156591	1.00	Compliant
WLAN	2.5	13.64	1.0	0.3707075	1.00	Compliant
SUM	2.5	N/A	N/A	0.4868355	1.00	Compliant

7. Measurement Data for 1.4 GHz CTS Radio from Test Report #253-11

7.7. RF Safety (Public Exposure to Radio Frequency Energy Levels (95.1125, 1.1307 (b)(1)))

Requirement: Portable devices as defined in § 2.1093(b) of this chapter operating in the WMTS are subject to radio frequency radiation exposure requirements as specified in §§ 1.1307(b) and 2.1093 of this chapter.

Test Notes: Due to the product configuration, it was not possible to directly connect the device under test to the measurement equipment. The output power of the device was derived from the peak field strength measurements using the following formula:

$$P = \frac{(E \times d)^2}{(30 \times G)}$$

P = the power in Watts.

E = the measured maximum field in V/m

G = the numeric gain of the transmitting antenna over an isotropic radiator.

d = the distance in meters of the field strength measurement.

The calculated output power can be referenced in column 6 of the table below. The calculated peak output power is lower than the 41.93 mW requirement for performing SAR testing using the formula: 60 / F (GHz).

Channel	Frequency	Peak Field Strength	Meas. Distance	Antenna Gain ¹	Output Power
	(MHz)	(dBµV/m)	(m)	(dBi)	(mW)
1	1395.9	104.20	3.0	-3.0	15.7
3	1399.1	104.00	3.0	-3.0	15.0
4	1427.9	102.10	3.0	-3.0	9.7
6	1431.1	101.90	3.0	-3.0	9.3

¹ Data provided by the customer

7. Measurement Data (continued)

7.7. RF Safety (Public Exposure to Radio Frequency Energy Levels (95.1125, 1.1307 (b)(1)) (continued)

The following results are based on the power values derived in the table on the previous page:

Channel	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
	(1)	(2)	(3)	(4)	(5)	
1	2.5	11.97	-3.0	0.1004688	0.93	Compliant
3	2.5	11.77	-3.0	0.0959470	0.93	Compliant
4	2.5	9.87	-3.0	0.0619486	0.95	Compliant
6	2.5	9.67	-3.0	0.0591604	0.95	Compliant

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

PD = Power Density (mW/cm²)

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. Calculated from the peak field strength measurements in section 7.1 of this test report.
3. Data provided by the customer. Antenna manufacturer's data sheets.
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.

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

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/cm ²)	Result
				(mW/cm ²)	(W/m ²)		
	(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/cm²)
- 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.

7. Measurement Data (continued) for WLAN from Test Report #304-11

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/cm ²)	Result
				(mW/cm ²)	(W/m ²)		
				(1)	(2)		
2412	2.5	0.64	1.0	0.01858	0.18579	1	Compliant
2437	2.5	0.94	1.0	0.01991	0.19908	1	Compliant
2462	2.5	0.48	1.0	0.01791	0.17907	1	Compliant
2412	2.5	12.37	1.0	0.27671	2.76714	1	Compliant
2437	2.5	12.37	1.0	0.27671	2.76714	1	Compliant
2462	2.5	12.05	1.0	0.25706	2.57058	1	Compliant
2412	2.5	-0.87	1.0	0.01312	0.13123	1	Compliant
2437	2.5	-1.20	1.0	0.01216	0.12163	1	Compliant
2462	2.5	-1.20	1.0	0.01216	0.12163	1	Compliant
2412	2.5	13.07	1.0	0.32511	3.25111	1	Compliant
2437	2.5	13.15	1.0	0.33116	3.31155	1	Compliant
2462	2.5	13.64	1.0	0.37071	3.70708	1	Compliant

Note: 802.11b and 802.11g analyzed with both energy in a 1 MHz RBW and integrated 26 dB BW power.

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

- PD = Power Density (mW/cm²)
- 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.

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 lower than the 24.37 mW requirement for performing SAR testing using the formula: $60 / F$ (GHz).

Channel	Frequency	Peak Field Strength	Distance	Antenna Gain ¹	Measured Output Power
	(MHz)	(dB μ V/m)	(m)	(dBi)	(mW)
Low	2412.0	96.87	3.0	1.0	1.16
Mid	2437.0	97.17	3.0	1.0	1.24
High	2462.0	96.71	3.0	1.0	1.12
Low	2412.0	108.60	3.0	1.0	17.26
Mid	2437.0	108.60	3.0	1.0	17.26
High	2462.0	108.28	3.0	1.0	16.04
Low	2412.0	95.36	3.0	1.0	0.82
Mid	2437.0	95.03	3.0	1.0	0.76
High	2462.0	95.03	3.0	1.0	0.76
Low	2412.0	109.30	3.0	1.0	20.28
Mid	2437.0	109.38	3.0	1.0	20.66
High	2462.0	109.87	3.0	1.0	23.13

RSS-102 Section 2.5, 2.5.1 & 2.5.2 Requirements:

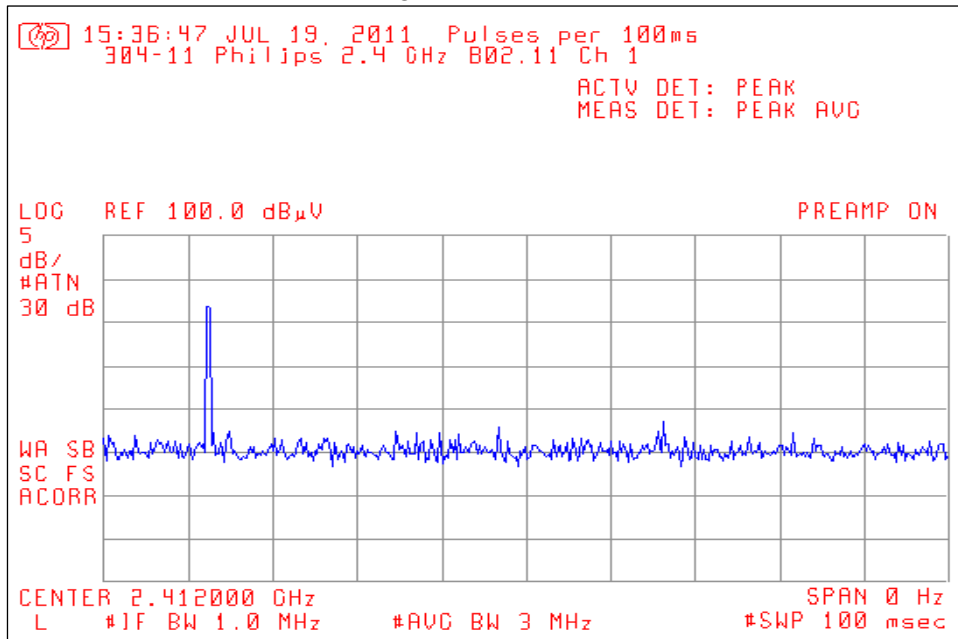
- 2.5 - All transmitters are exempt from routine SAR and RF exposure evaluations provided that output power complies with the power levels of sections 2.5.1 or 2.5.2. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly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

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

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 μ s.

