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**COMPLIANCE WORLDWIDE INC.  
TEST REPORT 469-14**

**In Accordance with the Requirements of  
Federal Communications Commission  
CFR 47 Part 95, Subpart H  
Wireless Medical Telemetry Devices  
In the bands 1395-1400 and 1427-1432 MHz**

Issued to

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

for the


**ITS4843C**

**IntelliVue Access Point  
Philips Telemetry System  
1.4 GHz Access Point**

**FCC ID: PQC-4843C**

**Report Issued on December 24, 2014**

Tested by

  
\_\_\_\_\_  
Brian F. Breault

Reviewed by

  
\_\_\_\_\_  
Larry K. Stillings

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## Table of Contents

1. Scope.....	3
2. Product Details.....	3
2.1. Manufacturer .....	3
2.2. Model Number .....	3
2.3. Serial Number.....	3
2.4. Description.....	3
2.5. Power Source .....	3
2.6. EMC Modifications.....	3
3. Product Configuration .....	3
3.1. Operational Characteristics & Software.....	3
3.2. EUT Hardware.....	3
3.3. EUT Cables/Transducers .....	3
3.4. Support Equipment.....	4
3.5. Support Equipment Cables/Transducers.....	4
3.6. Miscellaneous.....	4
3.7. Block Diagram .....	5
4. Measurements Parameters.....	6
4.1. Measurement Equipment and Software Used to Perform Test .....	6
4.2. Measurement & Equipment Setup.....	6
4.3. Test Procedure .....	7
4.4. Measurement Uncertainty .....	7
5. Choice of Equipment for Test Suits .....	7
5.1. Choice of Model.....	7
5.2. Presentation .....	7
5.3. Choice of Operating Frequencies .....	7
6. Measurement Summary.....	8
7. Measurement Data .....	9
7.1. Occupied Bandwidth.....	9
7.2. Radiated Field Strength of Fundamental and Effective Radiated Power .....	12
7.3. Combined Radiated Field Strength of Harmonics .....	15
7.4. Band Edge.....	16
7.5. Spurious Radiated Emissions.....	18
7.6. Frequency Stability .....	25
7.7. Conducted Emissions.....	28
7.8. Public Exposure to Radio Frequency Energy Levels .....	31
8. Test Site Description.....	32

### 1. Scope

This test report certifies that the Philips IntelliVue 1.4 GHz “RadioHead” Access Point, revision 1439, utilizing the Triquint TKP770001 power amplifier, meets the Federal Communications Commission CFR 47, PART 95 requirement as tested. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

### 2. Product Details

- 2.1 **Manufacturer:** Philips Medical Systems
- 2.2 **Model Number:** 989803171211/ITS4843C
- 2.3 **Serial Number:** US40600131
- 2.4 **Description of EUT:** The IntelliVue Access Point is incorporated into the Philips ITS4840A 1.4 GHz Telemetry system infrastructure.  
Operating Frequencies: 1395.9, 1397.5, 1399.1, 1427.9, 1429.5, 1431.1 MHz.
- 2.5 **Power Source:** DC 48 volts – From Power Over Ethernet switch.
- 2.6 **EMC Modifications:** None

### 3. Product Configuration

#### 3.1. Operational Characteristics & Software

The ITS4843C is connected to the M3185A Philips Clinical Network which shall be outside the field of test. The patient information will be displayed on a Philips M3150A IntelliVue Information Center which shall also be outside the field of test along with the TRx4841A 1.4 GHz Telemetry Transceiver-Patient Worn Device.

#### 3.2. EUT Hardware

Blk Diag #	Manufactr	Model/Part # / Options	Serial Number	Input Voltage	Frq (Hz)	Description/Function
1	Philips	989803171211/ ITS4843C	US40600131	48 V	DC	Philips Telemetry II Cluster Access Point 1.4 GHz

#### 3.3. EUT Cables/Transducers

Blk Diag Ltr	Manufacturer	Model/Part #	Length (m)	Shield Y/N	Description/Function
A	Philips	NA	10	N	Category 5 UTP LAN cable, quantity 3
D	Philips	NA	10	Y/N	Coaxial/UTP combination cable

### 3. Product Configuration (continued)

#### 3.4. Support Equipment

Blk Diag #	Manufactr	Model/Part # Options	Serial Number	Input Voltage	Input Frq.	Description/Function
1A	Philips	865052/ITS4846A	RO83323241	48	VDC	1.4 GHz AP remote antenna
1B	Philips	865052/ITS4846A	RO83323219	48	VDC	1.4 GHz AP remote antenna
2	Philips	865350	US018Z1935	3.7	VDC	IntelliVue 1.4 GHz Patient Worn Monitor
3	Philips	453563495101	US42200058	100-240	50-60	IntelliVue Synchronization Box
4	PowerDSine	PD-6512	N/A	100-240	50-60	Power-over-Ethernet hub
5	Cisco	WS-C2950T-24	F0C0816X1QJ	100-240	50-60	24 Port Ethernet LAN Switch
6	HP/ Philips	H1S81UC#ABA /453564310461	2UA30409Y4	120	60	IntelliVue Information Center
7	Philips	170S8FB	N/A	100-240	50-60	17 inch display
8	Proxim	APC7560/27	S/N 756005-22913150	100-240	50-60	Access Point Controller
9	Tripplite	SMART500RT1U	N/A	100-240	50-60	Uninterruptible power supply

#### 3.5. Support Equipment Cables/Transducers

Blk Diag Ltr	Manufactr	Model/Part #	Length (m)	Shield Y/N	Description/Function
A	Philips	989803172051	2	N	ECG + SpO2 leadset
B	N/A	NA	Various	N	Category 5 UTP LAN cables
C	N/A	NA	2	N	AC Power cords

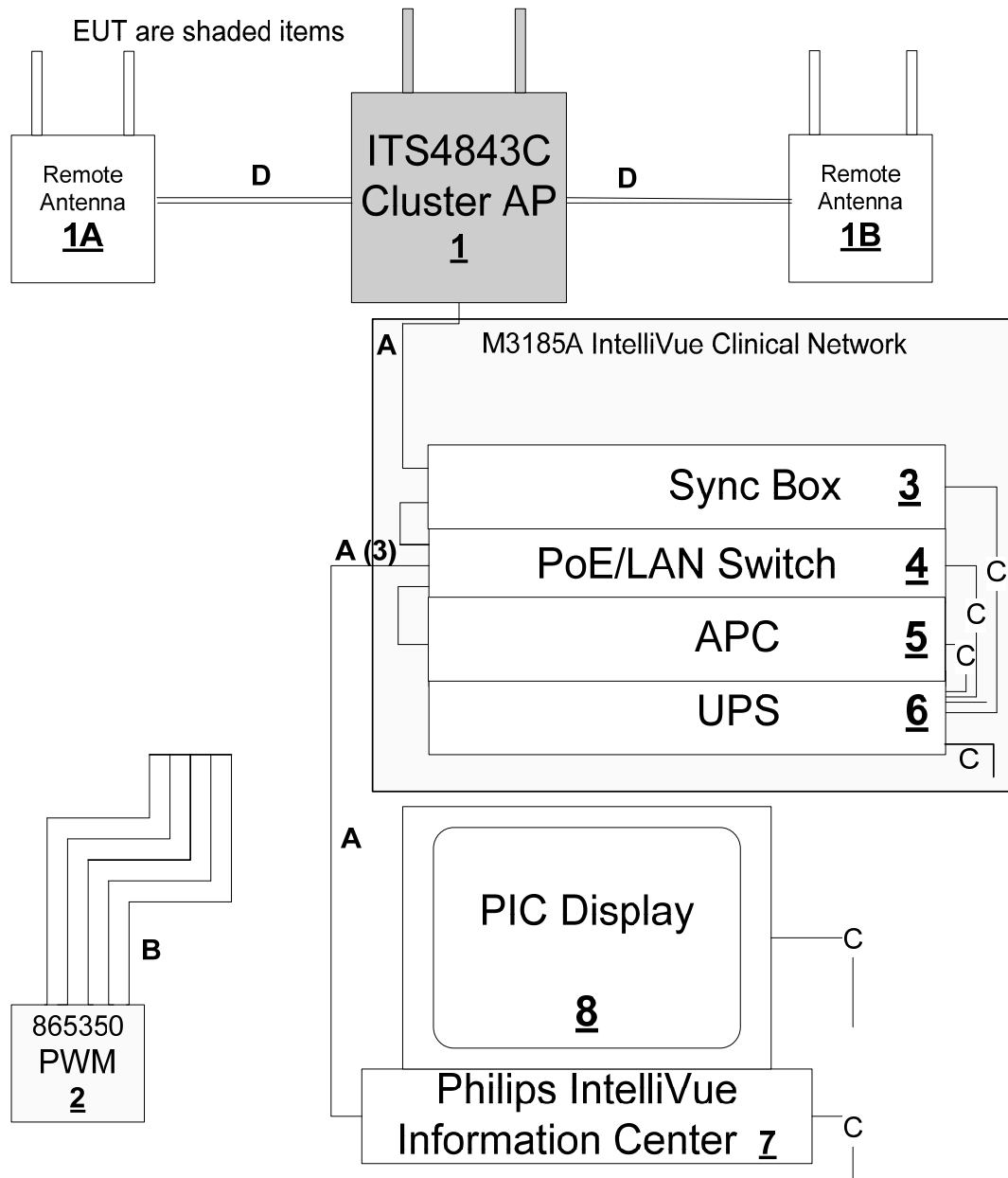
#### 3.6. Miscellaneous (e.g., consumables, test fixtures, etc.):

Blk Diag Ltr	Manufactr	Model/Part #	Qty	Description/Function
NA	Duracell	AA batteries	3	For the IntelliVue 1.4 GHz Patient Worn Monitor

3. Product Configuration (continued)

3.7. Block Diagram

# FCC Test System



#### 4. Measurements Parameters

##### 4.1. Measurement Equipment and Software Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9kHz - 7GHz <sup>1</sup>	Rohde & Schwarz	ESR7	101156	4/4/2015	2 Years
Spectrum Analyzer 20 Hz – 40 GHz <sup>2</sup>	Rohde & Schwarz	FSV40	100899	6/5/2015	2 Years
Spectrum Analyzer, 9 kHz to 40 GHz <sup>3</sup>	Rohde & Schwarz	FSVR40	100909	5/15/2015	2 Years
EMI Receiver	Hewlett Packard	8546A	3650A00360	6/4/2016	2 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B OPT H02	3008A00329	6/5/2015	2 Years
Loop Antenna	EMCO	6512	9309-1139	9/23/2016	2 Years
Biconilog Antenna	Sunol Sciences Corp	JB1	A050913	5/15/2015	2 Years
Horn Antenna, 1 GHz – 18 GHz	ETS-Lindgren	3117	00143292	1/14/2015	2 Years
LISN 50 Ω 50 μH, 9 kHz to 30 MHz	EMCO	3825/2	9109-1860	6/2/2015	1 Year
Power Supply	Hewlett Packard	6296A	7M0599	8/26/2015	1 Year
Digital Barometer	Control Company	4195	ID236	2/25/2015	2 Years
High Pass Filter, 2500 to 19300 MHz	Micro-Tronics	HPM50110	070	2/4/2015	1 Year
Temperature Chamber	Associated Research	E-0029	N/A	N/A	N/A

<sup>1</sup> ESR7 Firmware revision: V2.26, Date installed: 8/15/2014, previous V2.17, installed 6/11/2014.

<sup>2</sup> FSV40 Firmware revision: V2.30 SP1, Date installed: 10/22/2014, previous V2.30, installed 7/23/2014.

<sup>3</sup> FSVR40 Firmware revision: V2.23, Date installed: 10/20/2014, previous V1.63 SP1, installed 8/28/2013.

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	7.7. Conducted Emissions

##### 4.2. Measurement & Equipment Setup

Test Dates: Dec 10 - Dec 19, 2014

Test Engineer: Brian Breault

Normal Site Temperature (15 - 35°C): 24.0

Relative Humidity (20 -75%RH): 33%

Frequency Range: 30 MHz to 15 GHz

Measurement Distance: 3 Meters

EMI Receiver IF Bandwidth: 120 kHz - 30 MHz to 1 GHz  
1 MHz - Above 1 GHz

EMI Receiver Avg Bandwidth: 300 kHz - 30 MHz to 1 GHz  
3 MHz - Above 1 GHz

Detector Function: Peak, QP - 30 MHz to 1 GHz  
Peak, Avg - Above 1 GHz  
Unless otherwise specified.

#### 4. Measurements Parameters (continued)

##### 4.3. Test Procedure

All references to CFR 47 PART 95, Subpart H - Wireless Medical Telemetry Service (WMTS) - refer to the 10-1-13 edition.

The test methods used to generate the data in this test report is in accordance with ANSI C63.4: 2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

##### 4.4. Measurement Uncertainty

The following uncertainties are expressed for an expansion/coverage factor of K=2.

RF Frequency	$\pm 1 \times 10^{-8}$
Radiated Emission of Transmitter	$\pm 4.55$ dB
Radiated Emission of Receiver	$\pm 4.55$ dB
Temperature	$\pm 0.91^{\circ}$ C
Humidity	$\pm 5\%$

#### 5. Choice of Equipment for Test Suits

##### 5.1 Choice of Model

This test report is based on the test samples supplied by the manufacturer and are reported by the manufacturer to be equivalent to the production units.

##### 5.2 Presentation

This test sample was tested complete with all required ancillary equipment. Refer to Section 3 of this report for product equipment configuration.

##### 5.3 Choice of Operating Frequencies

The choice of operating frequencies selected for the testing outlined in this report was based on the lowest and highest operating frequencies in each of the two bands utilized by the device under test. The frequencies selected were 1395.9 MHz, 1399.1 MHz, 1427.9 MHz and 1431.1 MHz.

**6. Measurement Summary**

Transmitter Test Requirement	FCC Requirement	Test Report Section	Result	Comment
Product Labeling	95.1109(b)	N/A	N/A	See exhibits FCC label sample and label location.
Emission Type	95.1115(c)	N/A	N/A	Transmits Data and ECG Waveform
Frequency Stability	95.1115(e)	N/A	N/A	Data Provided By Philips Medical
RF Safety	95.1125	N/A	N/A	Statement and Technical Basis
Occupied Bandwidth	95.1111(a)(2)	7.1	Compliant	
Radiated Field Strength of Fundamental	95.1115(a)(2)	7.2	Compliant	
Radiated Field Strength of Harmonics	95.1115(b)(2)	7.3	Compliant	
Band Edge Measurements	95.1115(b)(2)	7.4	Compliant	
Spurious Radiated Emissions	95.1115(b)	7.5	Compliant	
Frequency Stability	95.1115 (e)	7.6	Compliant	
Conducted Emissions	15.207	7.7	Compliant	
Public Exposure to Radio Frequency Energy Levels	95.1125 1.1037(b)(1)	7.8	Compliant	



## 7. Measurement Data

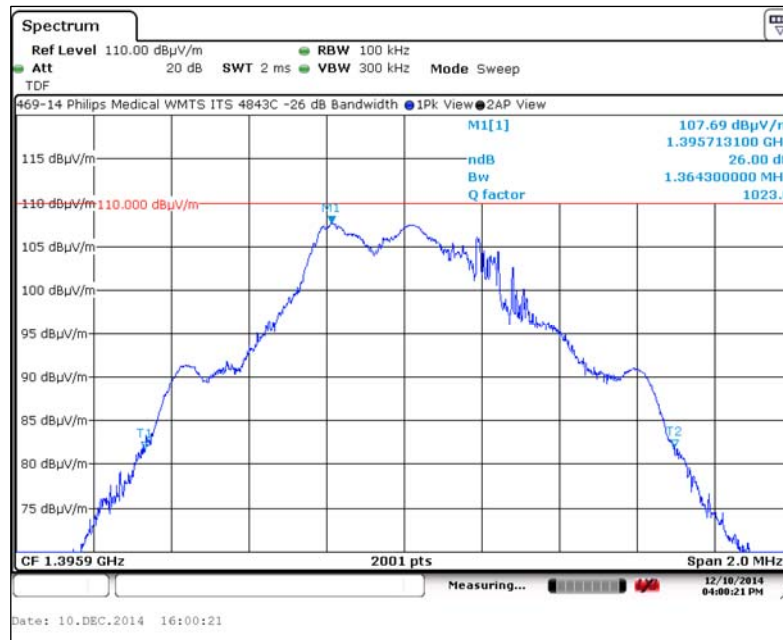
### 7.1. Occupied Bandwidth

Requirement: The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst-case (i.e., the widest) bandwidth. If no bandwidth requirement is specified by the procuring or regulatory agency, measure the bandwidth at  $-26$  dB with respect to the reference level.

Results: Compliant

Channel	Freq (MHz)	Bandwidth (MHz)
1	1395.9	1.3643
3	1399.1	1.4403
4	1427.9	1.3483
6	1431.1	1.3573

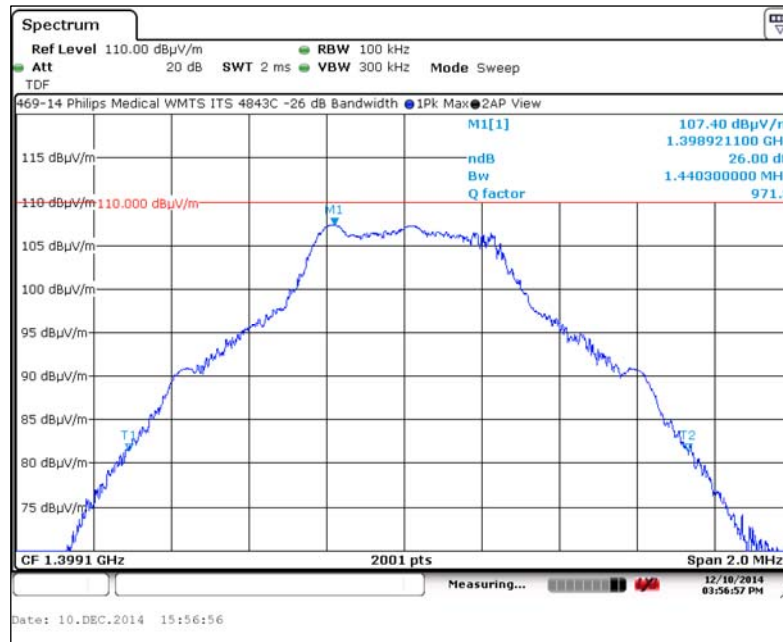
#### 7.1.1. Channel 1, 1395.9 MHz



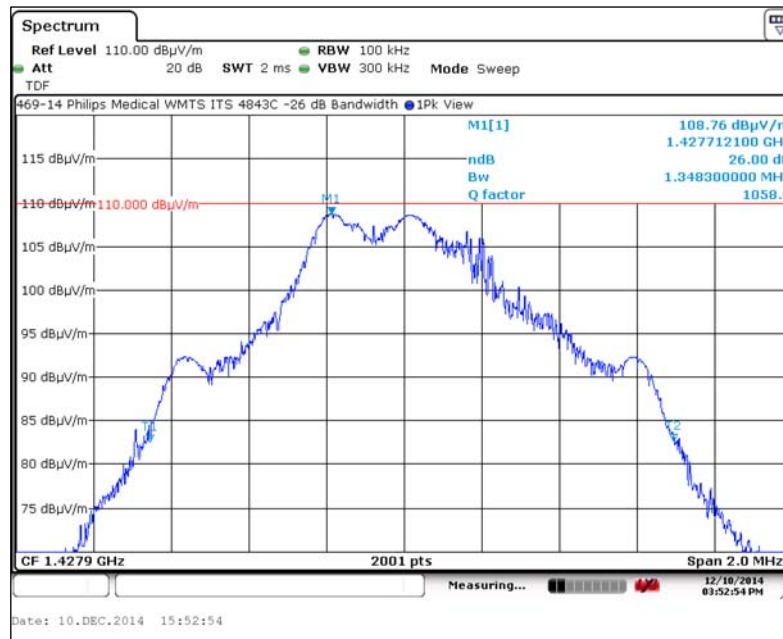
7. Measurement Data (continued)

7.1. Occupied Bandwidth (continued)

7.1.2. Channel 3, 1399.1 MHz



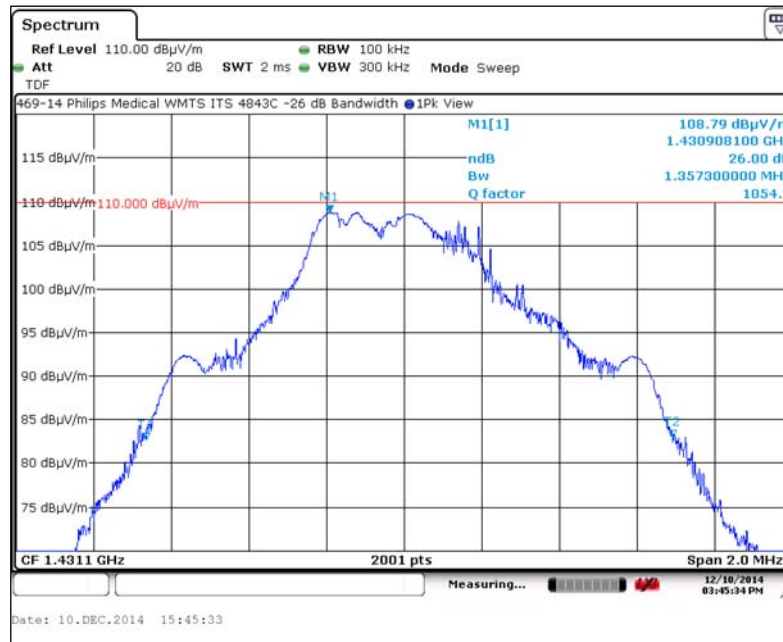
7.1.3. Channel 4, 1427.9 MHz



7. Measurement Data (continued)

7.1. Occupied Bandwidth (continued)

7.1.4. Channel 6, 1431.1 MHz



**7. Measurement Data (continued)**

**7.2. Radiated Field Strength of Fundamental and Effective Radiated Power**

Requirement: In the 1395–1400 MHz and 1427–1429.5 MHz bands, the maximum allowable field strength is 740 mV/m (117.4 dBμV/m), as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth (§ 95.1115, (a)(2)).

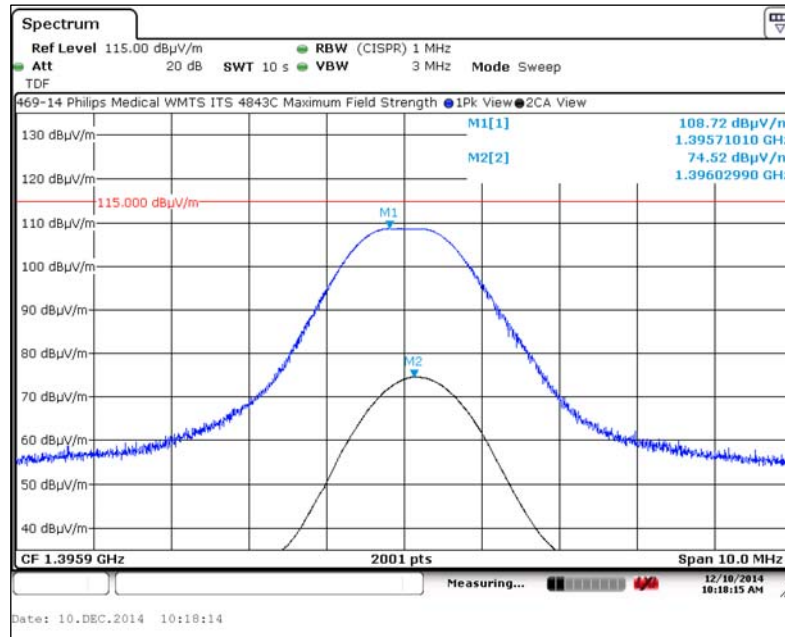
When average radiated emission measurements are specified in this part, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Except as specified in § 95.1105, operation of WMTS equipment prior to registration is not authorized under this part. The registration must include the following information: Effective radiated power (95.1111(a)(3)).

Results: Compliant.

Channel	Freq (MHz)	Field Strength (dBμV/m)		Limit (dBμV/m)		Peak Margin (dB)	Average Margin (dB)	Result
		Peak	Average	Peak	Average			
1	1395.9	108.72	74.52	137.4	117.4	-28.68	-42.88	Compliant
3	1399.1	108.18	72.14	137.4	117.4	-29.22	-45.26	Compliant
4	1427.9	108.74	72.67	137.4	117.4	-28.66	-44.73	Compliant
6	1431.1	108.74	62.22	137.4	117.4	-28.66	-55.18	Compliant

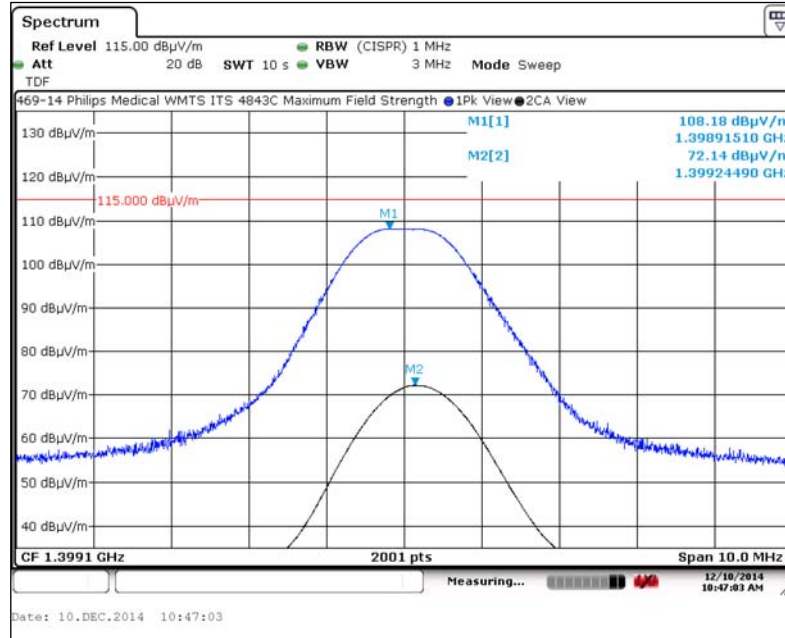
**7.2.1. Channel 1**



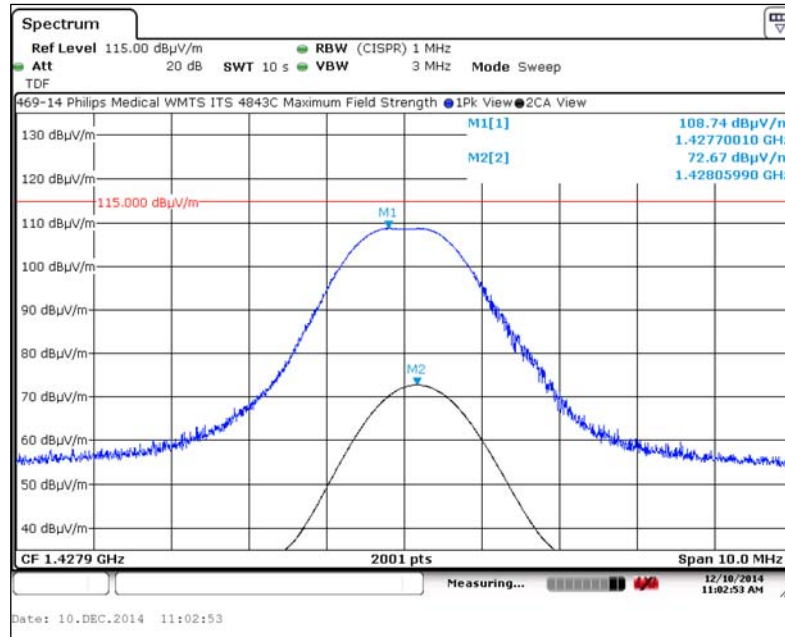
7. Measurement Data (continued)

7.2. Radiated Field Strength of Fundamental (continued)

7.2.2. Channel 3



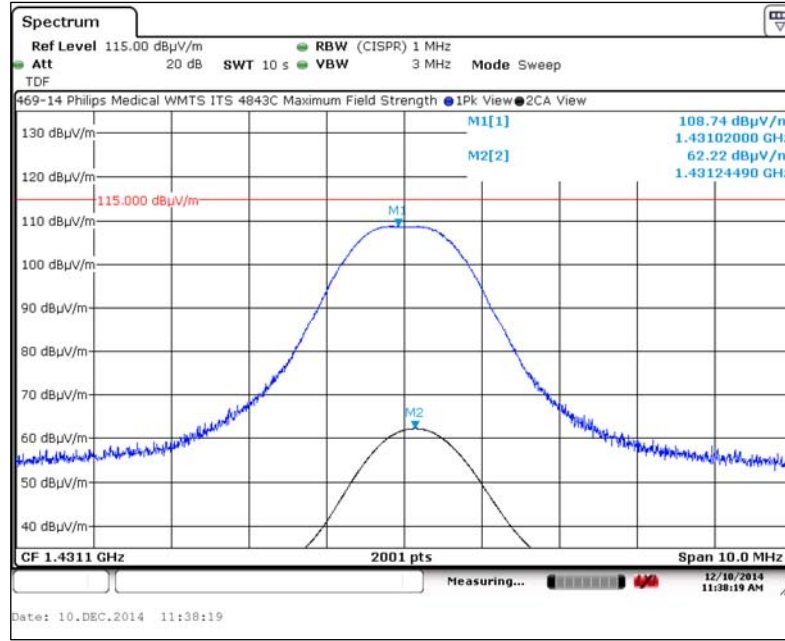
7.2.3. Channel 4



7. Measurement Data (continued)

7.2. Radiated Field Strength of Fundamental (continued)

7.2.4. Channel 6



Calculation of Effective Radiated Power (ERP)

Tech Note: The effective radiated power was calculated from the field strength using the following formulas<sup>1</sup>:

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

P = the power in Watts.

E = the measured maximum field strength 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.

$$ERP = \frac{EIRP}{1.64}$$

<sup>1</sup> Reference ANSI C63.10-2013, Annex G

Channel	Frequency	Peak Field Strength	Distance	Antenna Gain <sup>1</sup>	Measured EIRP	Calculated ERP
	(MHz)	(dBµV/m)	(m)	(dBi)	(mW)	(mW)
1	1395.9	108.72	3.0	2.0	14.10	8.60
3	1399.1	108.18	3.0	2.0	12.45	7.59
4	1427.9	108.74	3.0	2.0	14.16	8.64
6	1431.1	108.74	3.0	2.0	14.16	8.64

<sup>1</sup> Taken from the antenna manufacture's data guide.

**7. Measurement Data (continued)**

**7.3. Combined Radiated Field Strength of Harmonics**

Requirement: Out-of-band emissions above 960 MHz are limited to 500 microvolts/meter as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz (§ 95.1115, (b)(2)).

Results: Compliant.

Frequency (MHz)	Field Strength (dBµV/m)		Limit (dBµV/m)		Margin (dB)		Antenna Polarity (H/V)
	Peak	Avg	Peak	Avg	Peak	Avg	
2791.8	43.98	32.90	74	54	-30.02	-21.10	H
2798.2	48.15	33.02	74	54	-25.85	-20.98	V
2855.8	47.25	33.09	74	54	-26.75	-20.91	V
2862.2	46.81	32.77	74	54	-27.19	-21.23	H
4187.7	48.29	34.52	74	54	-25.71	-19.48	H
4197.3	48.02	34.56	74	54	-25.98	-19.44	V
4283.7	48.67	34.98	74	54	-25.33	-19.02	V
4293.3	48.74	34.81	74	54	-25.26	-19.19	H
5583.6	53.29	36.93	74	54	-20.71	-17.07	H
5596.4	50.72	37.07	74	54	-23.28	-16.93	V
5711.6	52.47	37.21	74	54	-21.53	-16.79	V
5724.4	50.38	36.83	74	54	-23.62	-17.17	H
6979.5	52.87	39.17	74	54	-21.13	-14.83	V
6995.5	52.95	39.58	74	54	-21.05	-14.42	V
7139.5	52.47	39.09	74	54	-21.53	-14.91	V
7155.5	53.17	39.19	74	54	-20.83	-14.81	V
8375.4	53.65	39.83	74	54	-20.35	-14.17	H
8394.6	54.08	40.04	74	54	-19.92	-13.96	V
8567.4	53.98	40.48	74	54	-20.02	-13.52	V
8586.6	54.00	40.38	74	54	-20.00	-13.62	H
9771.3	55.86	42.12	74	54	-18.14	-11.88	H
9793.7	57.78	42.23	74	54	-16.22	-11.77	H
9995.3	56.32	42.15	74	54	-17.68	-11.85	V
10017.7	55.94	42.53	74	54	-18.06	-11.47	H
11167.2	57.62	43.85	74	54	-16.38	-10.15	V
11192.8	57.78	44.21	74	54	-16.22	-9.79	H
11423.2	57.35	43.78	74	54	-16.65	-10.22	V
11448.8	57.81	43.67	74	54	-16.19	-10.33	V
12563.1	59.78	46.21	74	54	-14.22	-7.79	V
12591.9	59.97	46.36	74	54	-14.03	-7.64	H
12851.1	59.77	46.19	74	54	-14.23	-7.81	V
12879.9	60.14	46.31	74	54	-13.86	-7.69	V
13959.0	61.10	47.07	74	54	-12.90	-6.93	V
13991.0	60.96	47.39	74	54	-13.04	-6.61	V
14279.0	61.99	47.90	74	54	-12.01	-6.10	V
14311.0	61.44	47.66	74	54	-12.56	-6.34	V



**7.4. Band Edge**

Requirement: Out-of-band emissions above 960 MHz are limited to 500 microvolts per meter (54 dBµV/m) as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth.

Results: Compliant

**7.4.1. Lower Band Edge (1395–1400)**

Channel 1 (MHz)	Field Strength (dBµV/m)		Band Edge Frequency (MHz)	Field Strength (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1395.9	108.72	74.52	1395	62.81	42.61	54	-11.39	Compliant

Worst Case Out of Band (1395–1400)

Channel 1 (MHz)	Field Strength (dBµV/m)		Out of Band Frequency (MHz)	Field Strength (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1395.9	108.72	74.52	1394.7631	67.37	36.84	54	-17.16	Compliant

**7.4.2. Upper Band Edge (1395–1400)**

Channel 3 (MHz)	Field Strength (dBµV/m)		Band Edge Frequency (MHz)	Field Strength (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1399.1	108.18	72.14	1400	67.08	50.58	54	-3.42	Compliant

Worst Case Out of Band (1395–1400)

Channel 3 (MHz)	Field Strength (dBµV/m)		Out of Band Frequency (MHz)	Field Strength (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1399.1	108.18	72.14	1400.2849	67.32	42.66	54	-11.34	Compliant

**7.4.3. Lower Band Edge (1427–1429.5)**

Channel 4 (MHz)	Field Strength (dBµV/m)		Band Edge Frequency (MHz)	Field Strength (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1427.9	108.74	72.67	1427	66.83	51.7	54	-2.30	Compliant

Worst Case Out of Band (1427–1429.5)

Channel 4 (MHz)	Field Strength (dBµV/m)		Band Edge Frequency (MHz)	Field Strength (dBµV/m)		Average Limit (dBµV/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1427.9	108.74	72.67	1426.7766	69.52	44.59	54	-9.41	Compliant



7. Measurement Data (continued)

7.4. Band Edge (continued)

7.4.4. Upper Band Edge (1427–1429.5)

Channel 6 (MHz)	Field Strength (dB $\mu$ V/m)		Band Edge Frequency (MHz)	Field Strength (dB $\mu$ V/m)		Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1431.1	108.74	62.22	1432	68.01	50.97	54	-3.03	Compliant

Worst Case Out of Band (1427–1429.5)

Channel 6 (MHz)	Field Strength (dB $\mu$ V/m)		Band Edge Frequency (MHz)	Field Strength (dB $\mu$ V/m)		Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
	Peak	Average		Peak	Average			
1431.1	108.74	62.22	1432.2669	70.17	45.26	54	-8.74	Compliant

**7. Measurement Data (continued)**

**7.5. Spurious Radiated Emissions**

Regulatory Limit: FCC Part 209, Class B, Quasi-Peak

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m) <sup>1</sup>
0.009 to 0.490	3	128.5 to 93.8
0.490 to 1.705	3	73.8 to 63.0
1.705 to 30	3	69.5
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
>960	3	54.0

<sup>1</sup> Measurements in the 9 to 90 kHz, 110 to 490 kHz and above 1000 MHz ranges employ an average detector. Otherwise a quasi-peak detector is used.

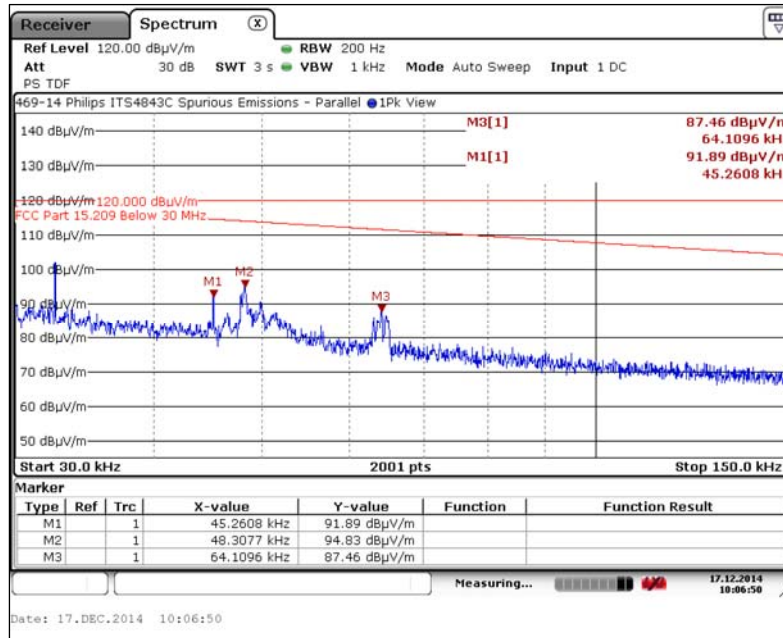
**Test Procedure:** Test measurements were made in accordance with ANSI C63.4-2009, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

**Results:** The DUT is meets the FCC Part 15.209 requirements for radiated emissions.

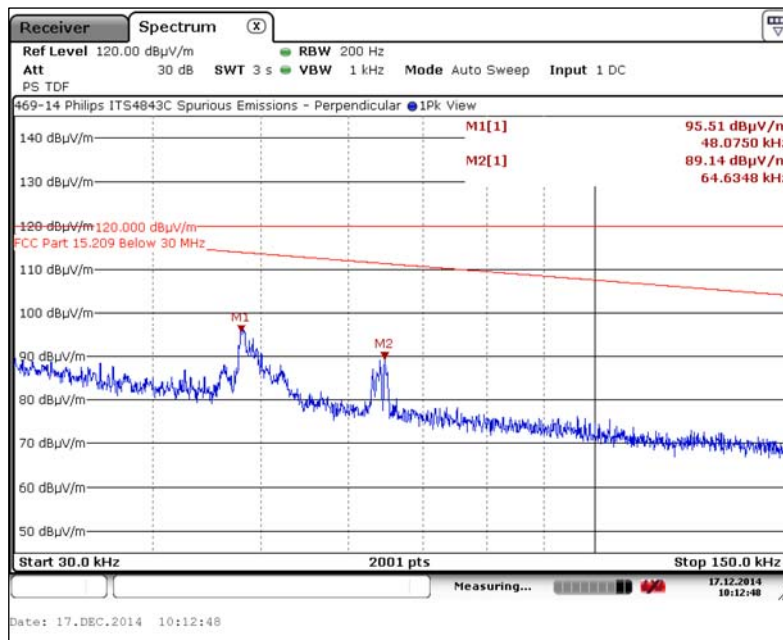
7. Measurement Data (continued)

7.5. Spurious Radiated Emissions (continued)

7.5.1. 30 kHz to 150 kHz, Parallel Antenna



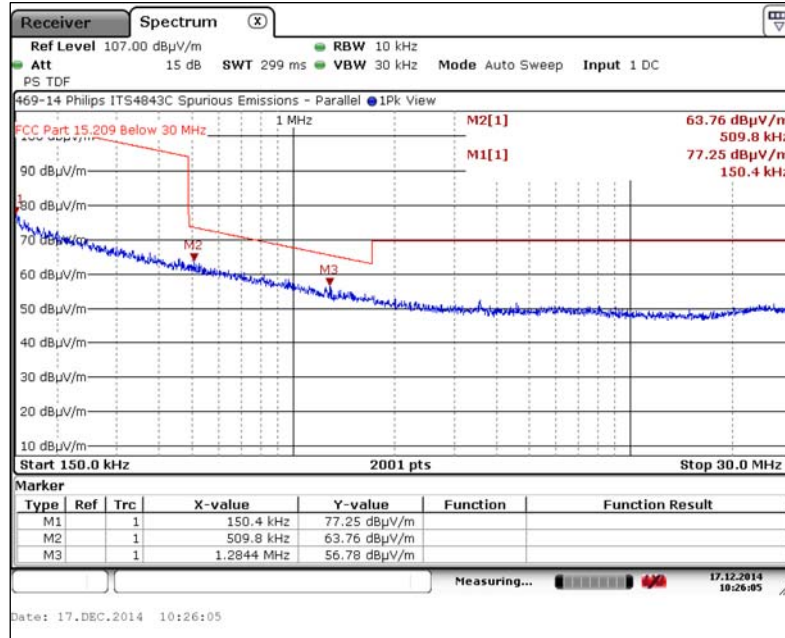
7.5.2. 32 kHz to 150 kHz, Perpendicular Antenna



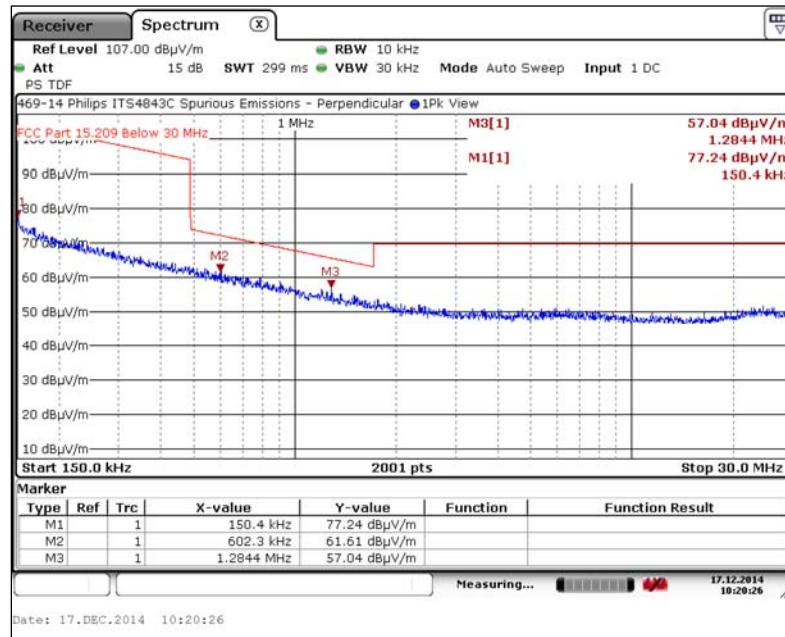
7. Measurement Data (continued)

7.5. Spurious Radiated Emissions (continued)

7.5.3. 150 kHz to 30 MHz, Parallel Antenna



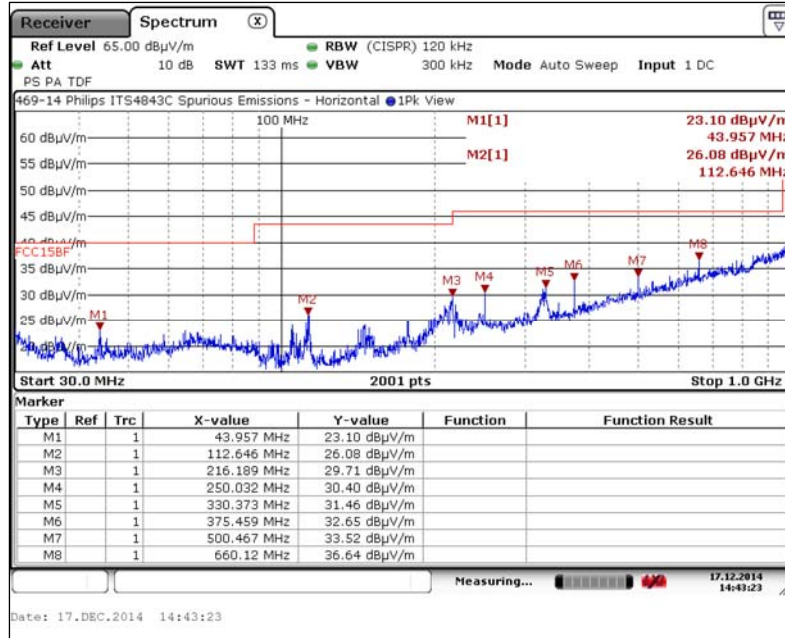
7.5.4. 150 kHz to 30 MHz, Perpendicular Antenna



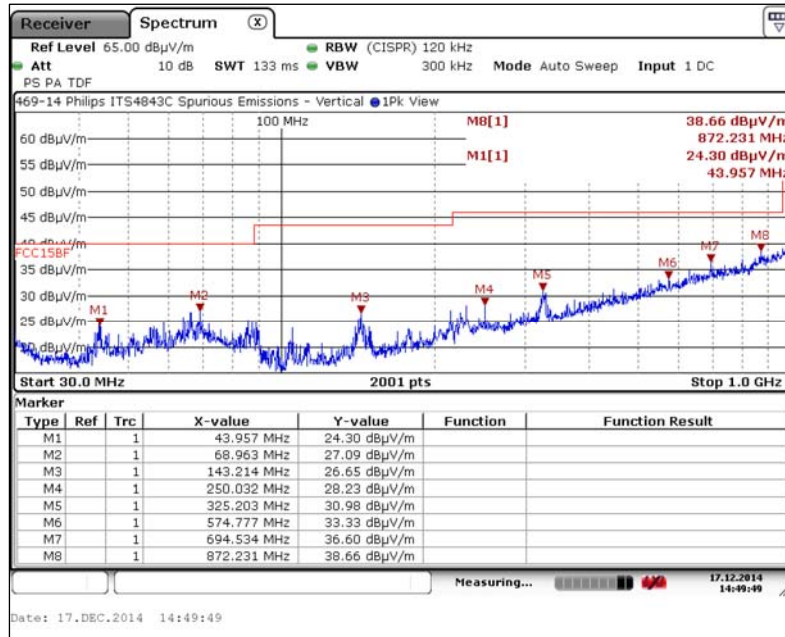
7. Measurement Data (continued)

7.5. Spurious Radiated Emissions (continued)

7.5.5. 30 MHz to 1 GHz, Horizontal Polarity



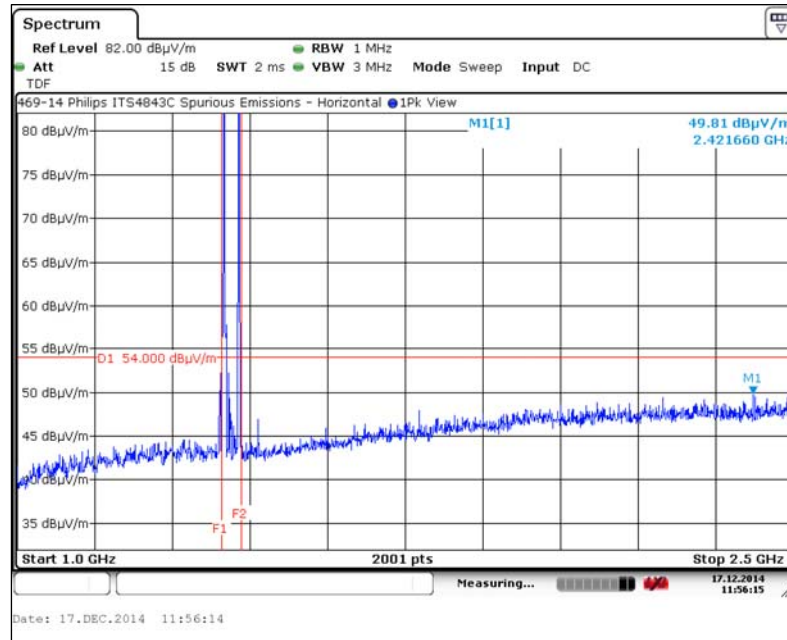
7.5.6. 30 MHz to 1 GHz, Vertical Polarity



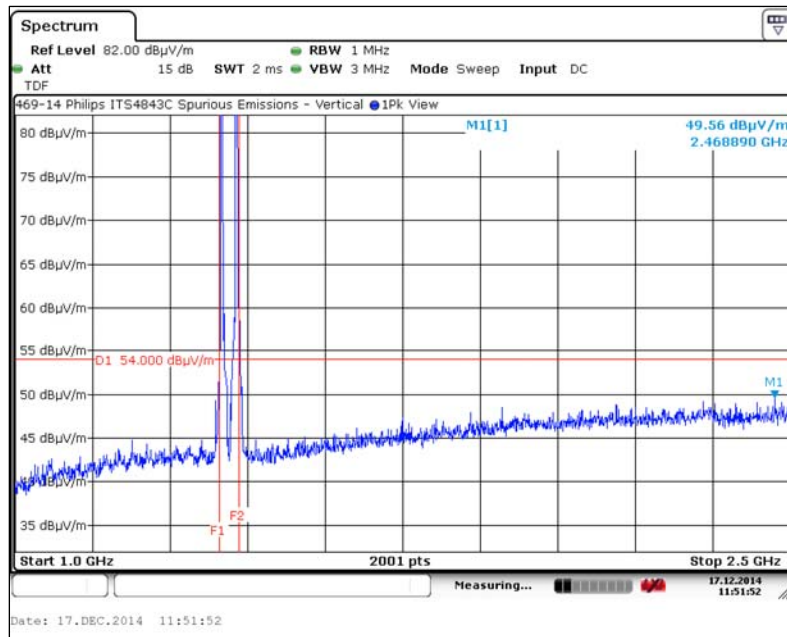
7. Measurement Data (continued)

7.5. Spurious Radiated Emissions (continued)

7.5.7. 1 GHz to 2.5 GHz, Horizontal Polarity



7.5.8. 1 GHz to 2.5 GHz, Vertical Polarity

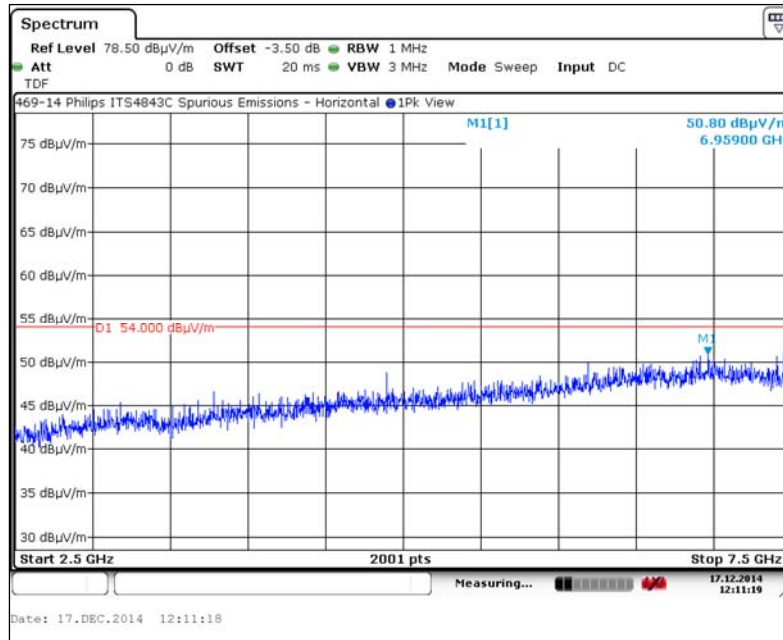




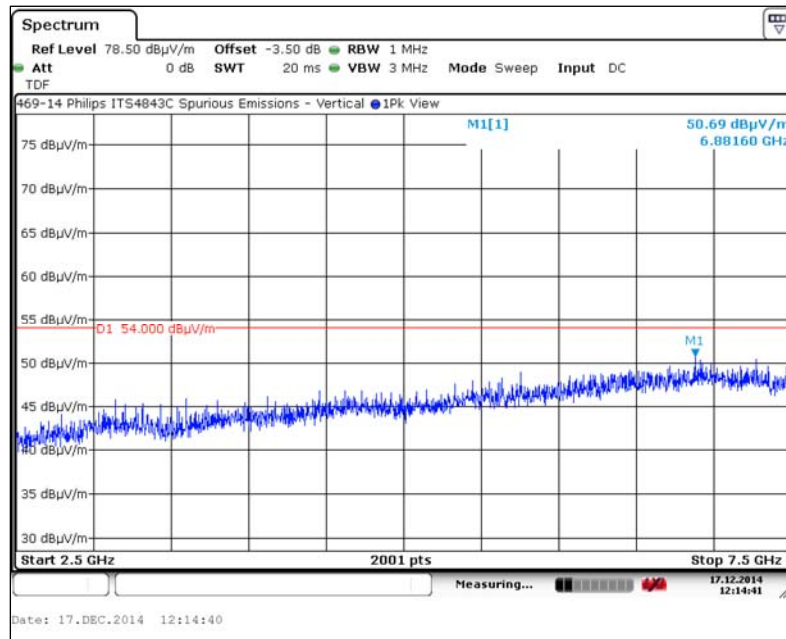
7. Measurement Data (continued)

7.5. Spurious Radiated Emissions (continued)

7.5.9. 2.5 GHz to 7.5 GHz, Horizontal Polarity



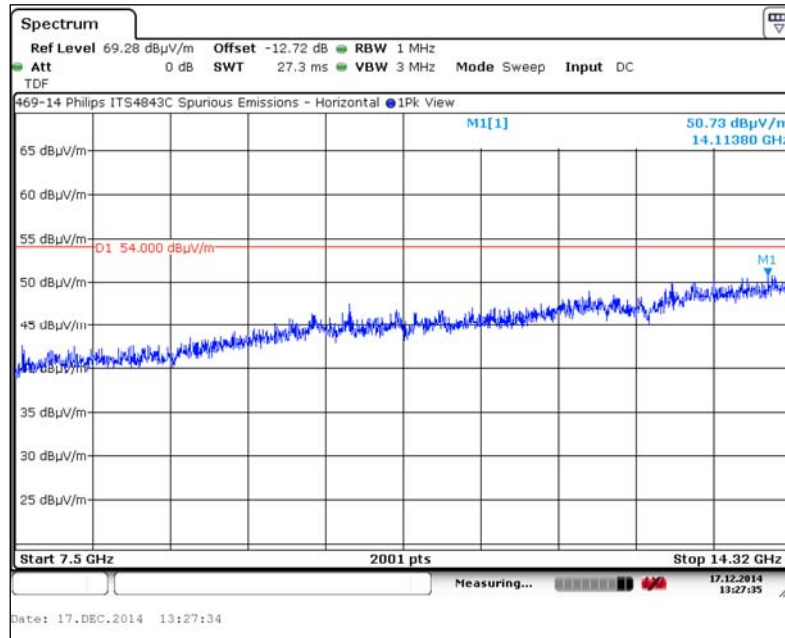
7.5.10. 2.5 GHz to 7.5 GHz, Vertical Polarity



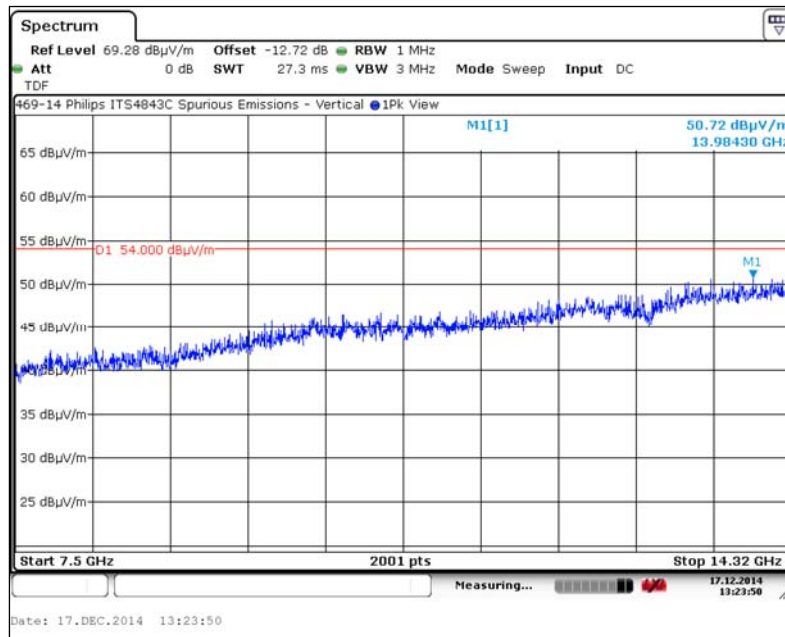
7. Measurement Data (continued)

7.5. Spurious Radiated Emissions (continued)

7.5.11. 7.5 GHz to 14.32 GHz, Horizontal Polarity



7.5.12. 7.5 GHz to 14.32 GHz, Vertical Polarity





**7. Measurement Data (continued)**

**7.6. Frequency Stability (FCC 95.1115 (e))**

Requirement: Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions.

Nominal Temperature : 26.4 °C  
 Temperature Tolerance : Lower : 0 °C  
 Upper : 55 °C  
 Philips Medical requirement

Nominal Voltage : 48.0 Volts DC  
 Voltage Tolerance : Lower : 37 Volts DC  
 Upper : 57 Volts DC  
 IEEE 802.3at Type 1 and Type 2 for Power over Ethernet voltage range at PD (Powered Device).

Results: The DUT remains well within the WMTS bands.

Channel 1

Assigned Freq.	Temperature	Voltage	Meas. Frequency	Meas. Freq. - 1/2 Bandwidth	Band Edge	Result
GHz	Deg. C	VDC	MHz	MHz	MHz	
1395.9	Nominal	Nominal	1395.8864	1395.2042	1395	Compliant
		37	1395.8943	1395.2122	1395	Compliant
		57	1395.8860	1395.2038	1395	Compliant
	55	37	1395.9072	1395.2250	1395	Compliant
		57	1395.8891	1395.2069	1395	Compliant
	45	37	1395.8958	1395.2137	1395	Compliant
		57	1395.8872	1395.2050	1395	Compliant
	35	37	1395.9000	1395.2179	1395	Compliant
		57	1395.9041	1395.2219	1395	Compliant
	25	37	1395.9100	1395.2279	1395	Compliant
		57	1395.8855	1395.2034	1395	Compliant
	15	37	1395.9319	1395.2497	1395	Compliant
		57	1395.9050	1395.2228	1395	Compliant
	5	37	1395.9186	1395.2365	1395	Compliant
		57	1395.8951	1395.2130	1395	Compliant
	0	37	1395.9295	1395.2473	1395	Compliant
		57	1395.9263	1395.2442	1395	Compliant

7. Measurement Data (continued)

7.6. Frequency Stability (FCC 95.1115 (e)) (continued)

Channel 3

Assigned Freq.	Temperature	Voltage	Meas. Frequency	Meas. Freq. + ½Bandwidth	Band Edge	Result
GHz	Deg. C	VDC	MHz	MHz	MHz	
1399.1	Nominal	Nominal	1399.0962	1399.8163	1400	Compliant
		37	1399.1004	1399.8206	1400	Compliant
		57	1399.1004	1399.8206	1400	Compliant
	55	37	1399.0927	1399.8129	1400	Compliant
		57	1399.1065	1399.8267	1400	Compliant
	45	37	1399.0958	1399.8160	1400	Compliant
		57	1399.1015	1399.8216	1400	Compliant
	35	37	1399.0853	1399.8054	1400	Compliant
		57	1399.0962	1399.8164	1400	Compliant
	25	37	1399.1108	1399.8310	1400	Compliant
		57	1399.0951	1399.8153	1400	Compliant
	15	37	1399.1158	1399.8360	1400	Compliant
		57	1399.0880	1399.8081	1400	Compliant
	5	37	1399.1112	1399.8314	1400	Compliant
		57	1399.1046	1399.8247	1400	Compliant
	0	37	1399.0966	1399.8168	1400	Compliant
		57	1399.1066	1399.8268	1400	Compliant

Channel 4

Assigned Freq.	Temperature	Voltage	Meas. Frequency	Meas. Freq. - ½Bandwidth	Band Edge	Result
GHz	Deg. C	VDC	MHz	MHz	MHz	
1427.9	Nominal	Nominal	1427.9059	1427.2318	1427	Compliant
		37	1427.9168	1427.2426	1427	Compliant
		57	1427.9108	1427.2367	1427	Compliant
	55	37	1427.8877	1427.2136	1427	Compliant
		57	1427.8923	1427.2182	1427	Compliant
	45	37	1427.8966	1427.2225	1427	Compliant
		57	1427.8980	1427.2238	1427	Compliant
	35	37	1427.8938	1427.2196	1427	Compliant
		57	1427.9089	1427.2348	1427	Compliant
	25	37	1427.9111	1427.2369	1427	Compliant
		57	1427.9114	1427.2372	1427	Compliant
	15	37	1427.9120	1427.2379	1427	Compliant
		57	1427.8954	1427.2213	1427	Compliant
	5	37	1427.9246	1427.2504	1427	Compliant
		57	1427.9105	1427.2364	1427	Compliant
	0	37	1427.9061	1427.2319	1427	Compliant
		57	1427.9123	1427.2381	1427	Compliant

7. Measurement Data (continued)

7.6. Frequency Stability (FCC 95.1115 (e)) (continued)

Channel 6

Assigned Freq.	Temperature	Voltage	Meas. Frequency	Meas. Freq. + 1/2 Bandwidth	Band Edge	Result
GHz	Deg. C	VDC	MHz	MHz	MHz	
1431.1	Nominal	Nominal	1431.0885	1431.7672	1432	Compliant
		37	1431.1101	1431.7888	1432	Compliant
		57	1431.1092	1431.7878	1432	Compliant
	55	37	1431.0762	1431.7549	1432	Compliant
		57	1431.0811	1431.7597	1432	Compliant
	45	37	1431.0792	1431.7578	1432	Compliant
		57	1431.0935	1431.7722	1432	Compliant
	35	37	1431.0915	1431.7701	1432	Compliant
		57	1431.0718	1431.7504	1432	Compliant
	25	37	1431.0808	1431.7595	1432	Compliant
		57	1431.0896	1431.7682	1432	Compliant
	15	37	1431.0999	1431.7785	1432	Compliant
		57	1431.0831	1431.7618	1432	Compliant
	5	37	1431.0959	1431.7746	1432	Compliant
		57	1431.0730	1431.7516	1432	Compliant
	0	37	1431.1061	1431.7847	1432	Compliant
		57	1431.0810	1431.7596	1432	Compliant

## 7. Measurement Data (continued)

### 7.7. Conducted Emissions

**Requirement:** For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

**Test Note:** The DUT is powered by 48 volts DC supplied by the Ethernet cable (PoE). The power line conducted emissions test was performed on the Power-D-Sine 3001G PoE Box, serial number R07156080008543100 that supplies the 48 VDC to the DUT via the Ethernet cable. The AC emissions from this device are reported in the following tables and graphs.

**Test Results:** The DUT is meets the FCC Part 15.207 requirements for conducted emissions.

Regulatory Limit: FCC Part 15.207

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56 <sup>1</sup>	56 to 46 <sup>1</sup>
0.50 to 5.0	56	46
0.50 to 30	60	50

<sup>1</sup> The limit decreases linearly with the logarithm of the frequency.

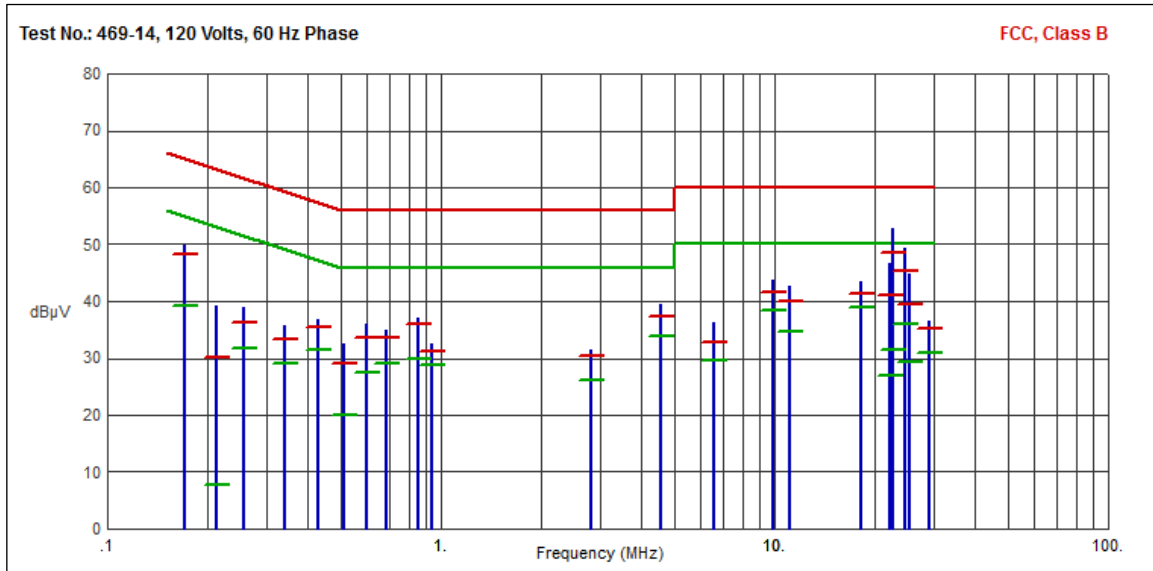
### Test Procedure

Test measurements were made in accordance with CISPR 22, Section 9: Method of measurement of conducted disturbance at mains terminals and telecommunication ports and ANSI C63.4-2009, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

7. Measurement Data (continued)

7.7. Conducted Emissions (continued)

7.7.1. 120 Volts, 60 Hz Phase

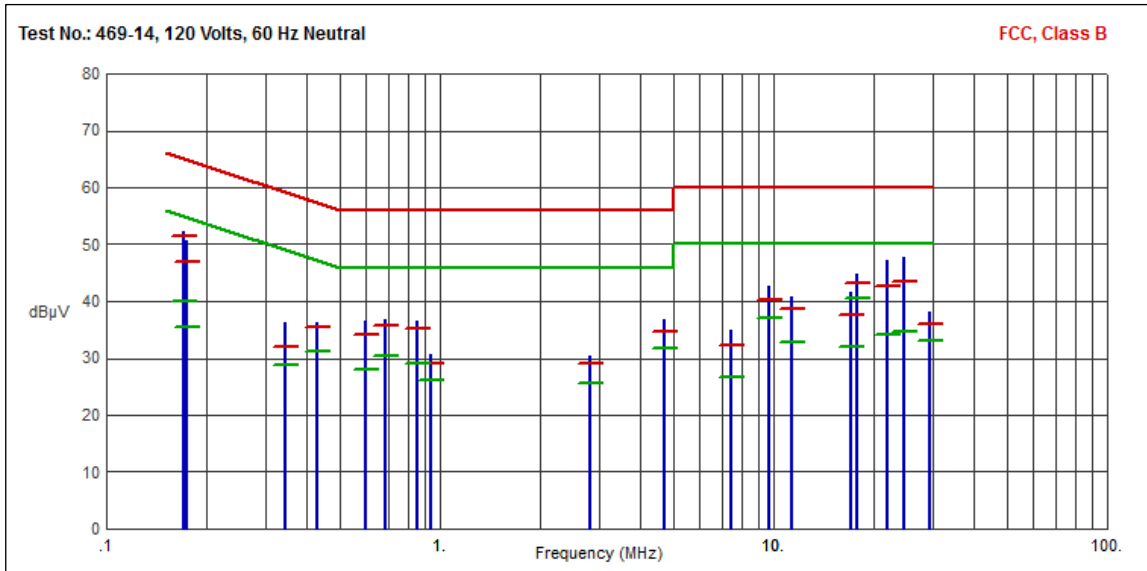


Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1703	49.89	48.19	64.95	-16.76	39.22	54.95	-15.73	
.2114	39.15	30.11	63.15	-33.04	7.83	53.15	-45.32	
.2556	38.80	36.19	61.57	-25.38	31.74	51.57	-19.83	
.3418	35.65	33.41	59.16	-25.75	29.05	49.16	-20.11	
.4278	36.79	35.45	57.30	-21.85	31.35	47.30	-15.95	
.5139	32.41	29.17	56.00	-26.83	19.93	46.00	-26.07	
.5993	36.05	33.54	56.00	-22.46	27.35	46.00	-18.65	
.6854	34.81	33.67	56.00	-22.33	29.12	46.00	-16.88	
.8569	37.11	35.90	56.00	-20.10	29.97	46.00	-16.03	
.9423	32.50	31.29	56.00	-24.71	28.91	46.00	-17.09	
2.8305	31.38	30.34	56.00	-25.66	26.14	46.00	-19.86	
4.5456	39.35	37.29	56.00	-18.71	33.91	46.00	-12.09	
6.6047	36.24	32.92	60.00	-27.08	29.50	50.00	-20.50	
9.8666	43.60	41.54	60.00	-18.46	38.42	50.00	-11.58	
11.1548	42.55	39.94	60.00	-20.06	34.73	50.00	-15.27	
18.2435	43.39	41.36	60.00	-18.64	38.90	50.00	-11.10	
22.1372	46.64	41.09	60.00	-18.91	26.93	50.00	-23.07	
22.6486	52.93	48.55	60.00	-11.45	31.36	50.00	-18.64	
24.5684	49.32	45.36	60.00	-14.64	35.99	50.00	-14.01	
25.4631	44.74	39.47	60.00	-20.53	29.35	50.00	-20.65	
29.1138	36.63	35.08	60.00	-24.92	31.06	50.00	-18.94	

7. Measurement Data (continued)

7.7. Conducted Emissions (continued)

7.7.2. 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1712	52.36	51.37	64.90	-13.53	39.99	54.90	-14.91	
.1745	50.79	46.95	64.74	-17.79	35.59	54.74	-19.15	
.3421	36.24	31.99	59.15	-27.16	28.87	49.15	-20.28	
.4268	36.27	35.36	57.31	-21.95	31.27	47.31	-16.04	
.5971	36.58	34.19	56.00	-21.81	28.13	46.00	-17.87	
.6826	36.70	35.74	56.00	-20.26	30.30	46.00	-15.70	
.8526	36.53	35.24	56.00	-20.76	29.11	46.00	-16.89	
.9397	30.60	29.04	56.00	-26.96	26.11	46.00	-19.89	
2.8179	30.48	29.06	56.00	-26.94	25.51	46.00	-20.49	
4.6982	36.78	34.65	56.00	-21.35	31.76	46.00	-14.24	
7.4315	34.94	32.27	60.00	-27.73	26.56	50.00	-23.44	
9.7397	42.63	40.31	60.00	-19.69	37.08	50.00	-12.92	
11.3636	40.81	38.65	60.00	-21.35	32.81	50.00	-17.19	
17.0843	41.73	37.54	60.00	-22.46	32.13	50.00	-17.87	
17.6941	44.90	43.27	60.00	-16.73	40.51	50.00	-9.49	
21.8795	47.17	42.70	60.00	-17.30	34.14	50.00	-15.86	
24.6972	47.67	43.56	60.00	-16.44	34.55	50.00	-15.45	
29.2378	38.09	35.94	60.00	-24.06	33.06	50.00	-16.94	

**7.8. Public Exposure to Radio Frequency Energy Levels (95.1125) (1.1307 (b)(1))**

- The measured output power was calculated from the peak field strength measurements using the following equation:

Channel	Frequency	Peak Field Strength	Distance	Antenna Gain <sup>1</sup>	Measured Output Power
	(MHz)	(dBµV/m)	(m)	(dBi)	(mW)
1	1395.9	108.72	3.0	2.0	14.10
3	1399.1	108.18	3.0	2.0	12.45
4	1427.9	108.74	3.0	2.0	14.16
6	1431.1	108.74	3.0	2.0	14.16

<sup>1</sup> Antenna gain value was supplied by the manufacturer

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

P = the power in Watts.

E = the measured maximum field strength 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 DUT output power was derived from the measured output power in the above table to determine the power density.

Channel Frequency	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm <sup>2</sup> )	Result
				(mW/cm <sup>2</sup> )	(W/m <sup>2</sup> )		
				(1)	(2)		
1395.9	20.0	11.49	2.0	0.0044448	0.93	Compliant	11.49
1399.1	20.0	10.95	2.0	0.0039251	0.93	Compliant	10.95
1427.9	20.0	11.51	2.0	0.0044653	0.95	Compliant	11.51
1431.1	20.0	11.51	2.0	0.0044653	0.95	Compliant	11.51

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

PD = Power Density (mW/cm<sup>2</sup>)

OP = DUT Output Power (dBm)

AG = DUT Antenna Gain (dBi)

d = MPE Distance (cm)

- 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 20 centimeters of the body of the user.
- Section 7.1 of this test report. Output power was calculated from the measured field strength.
- Antenna gain value for this product was taken from the client's specification data sheet.
- Power density is calculated from power measurement and antenna gain.
- Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

## **8. Test Site Description**

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC), Industry Canada, and Voluntary Control Council Interference (VCCI) standards. A description of the test sites is on file with the FCC (registration number 96392), Industry Canada (file number IC 3023A-1), and VCCI (Member number 3168), Registration numbers C-3673, G-167, R-3305 & T-1809.

Compliance Worldwide is also designated as a Phase 1 CAB under APEC-MRA (US0132) for Australia/New Zealand AS/NZS CISPR 22, Chinese-Taipei (Taiwan) BSMI CNS 13438 and Korea (RRA) KN 22.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.