

Application for FCC Certification
On behalf of

Philips Medical Systems North America Co.

Product Name: Patient Interface Module

Model No.: ST80i WPIM

Serial No.: P2D1100037

FCC ID: PQC-ST80IWPIM

Prepared For : Philips Medical Systems North America Co.
3000 Minuteman Road, Andover, Massachusetts,
United States, 01810

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F12024
Date of Test : Jan. 13 – 21, 2012
Date of Report : Feb. 09, 2012

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Philips Medical Systems North America Co.
 Manufacturer : Philips Medical Systems North America Co.
 EUT Description : Patient Interface Module
 (A) Model No. : ST80i WPIM
 (B) Serial No. : P2D1100037
 (C) Test Voltage : DC 1.5V (AA Battery*1)

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2010
 AND ANSI C63.4-2003*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: see Sec. 2.1, S/N: see Sec. 2.1), which was tested on Jan. 13 - 21, 2012 is technically compliance with the FCC limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jan. 09 - 21, 2012 Date of Report : Feb. 09, 2012

Producer : Alan He
ALAN HE / Assistant

Review : Sammy Chen
SAMMY CHEN / Deputy Manager

AUDIX[®] For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : Byron Kwo
Authorized Signature EMC BYRON KWO / Senior Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	N/A	N/A
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	Pass	15.209(a) 15.205(a)(c)
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	Pass	15.247(a)(2)
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	Pass	15.247(b)(3)
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	Pass	15.247(d)
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	Pass	15.247(d)
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2010 AND ANSI C63.4:2003 AND KDB558074:2005	Pass	15.247(e)

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : Patient Interface Module

Type of EUT Production Pre-product Pro-type

Model Number : ST80i WPIM

Serial Number : P2D1100037

Radio Tech : IEEE 802.15.4 (ZigBee®)

Freq. Band : 2405 MHz ~ 2480 MHz
Total 16 Channels in 5 MHz Separation

Tested Freq. : 2405 MHz (Channel 00)
2440 MHz (Channel 07)
2480 MHz (Channel 15)

Antenna Gain : 3.0 dBi

Applicant : Philips Medical Systems North America Co.
3000 Minuteman Road, Andover, Massachusetts,
United States, 01810

Manufacturer : Philips Medical Systems North America Co.
3000 Minuteman Road, Andover, Massachusetts,
United States, 01810

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber) : Sept. 17, 1998 file on
Apr 29, 2009 Renewed
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3 F 34 Bldg 680 Guiping Rd.,
Caohejing Hi-Tech Park,
Shanghai 200233, China

FCC registration Number : 91789

Accredited by NVLAP, Lab Code : 200371-0

2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty (30-200MHz):
U = 4.58dB (Horizontal)
U = 4.70dB (Vertical)

Radiated Emission Expanded Uncertainty (200M-1GHz):
U = 4.84dB (Horizontal)
U = 4.70dB (Vertical)

Radiated Emission Expanded Uncertainty (Above 1GHz):
U= 4.60 dB (Horizontal)
U= 4.18 dB (Vertical)

6 dB Bandwidth Expanded Uncertainty : U = 0.05 kHz

Maximum Peak Output Power Expanded Uncertainty: U = 0.30 dB

Emission Limitations Expanded Uncertainty : U = 0.15 dB

Band Edge Expanded Uncertainty : U = 0.15 dB

Power Spectral Density Expanded Uncertainty : U = 0.15 dB

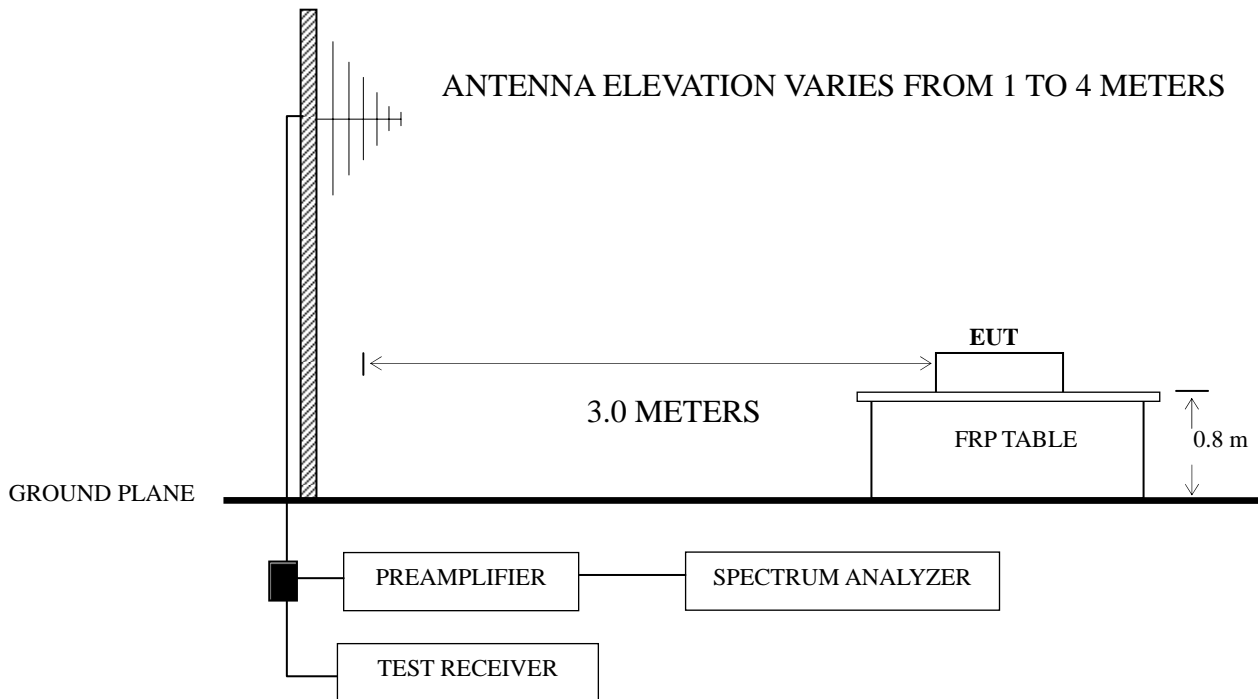
3 RADIATED EMISSION TEST

3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	Agilent	8447D	2944A10548	Mar 22, 2011	Mar 22, 2012
2.	Preamplifier	HP	8449B	3008A00864	Mar 22, 2011	Mar 22, 2012
3.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2011	Mar 22, 2012
4.	Test Receiver	R&S	ESVS10	844594/001	Mar 22, 2011	Mar 22, 2012
5.	Bi-log Antenna	TESEQ	CBL6112D	23192	Dec 01, 2011	Dec 01, 2012
6.	Horn Antenna	EMCO	3115	9607-4878	May 06, 2011	May 06, 2012
7.	Horn Antenna	EMCO	3116	00062643	May 13, 2011	May 13, 2012
8.	50Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2011	Mar 18, 2012
9.	Software	Audix	E3	SET00200 9912M295-2	-	-

3.2 Block Diagram of Test Setup



■ : 50 ohm Coaxial Switch

3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

Frequency (MHz)	Distance (m)	Field strength limits (μV/m)	
		(μV/m)	dB(μV/m)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB (μV/m) = 20 log Emission Level (μV/m)
 NOTE 2 - The tighter limit applies at the band edges.
 NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.
 NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.3.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipment.

3.5.3 Turn the EUT on the test mode, and then test.

3.5.4 Configured the EUT in three axis: Lying / Side / Stand, and test separately.

3.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESVS10 was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz for Spectrum Agilent E7405A.

The frequency range from 30 MHz to 25 GHz (Up to 10th harmonics from fundamental frequency) was checked.

The EUT was tested under the following test modes:

Mode	Operation	Channel	Frequency
1.	Transmitting	00	2405 MHz
2.		07	2440 MHz
3.		15	2480 MHz
4.	Receiving	07	2440 MHz
5.	Transmitting	00	2405 MHz
6.	Band-Edge	15	2480 MHz

All the test results are listed in Sec.3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

No.	Operation	Channel	Frequency	Data Page	
1.	Transmitting	Duty Cycle		P12	
2.		00	2405 MHz	P13	
3.		07	2440 MHz	P14	
4.		15	2480 MHz	P15	
5.	Receiving	07	2440 MHz	P16	
6.	Transmitting	00	2405 MHz	Band	P17-P20
7.		15	2480 MHz	Edge	P21-P24

NOTE 1 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

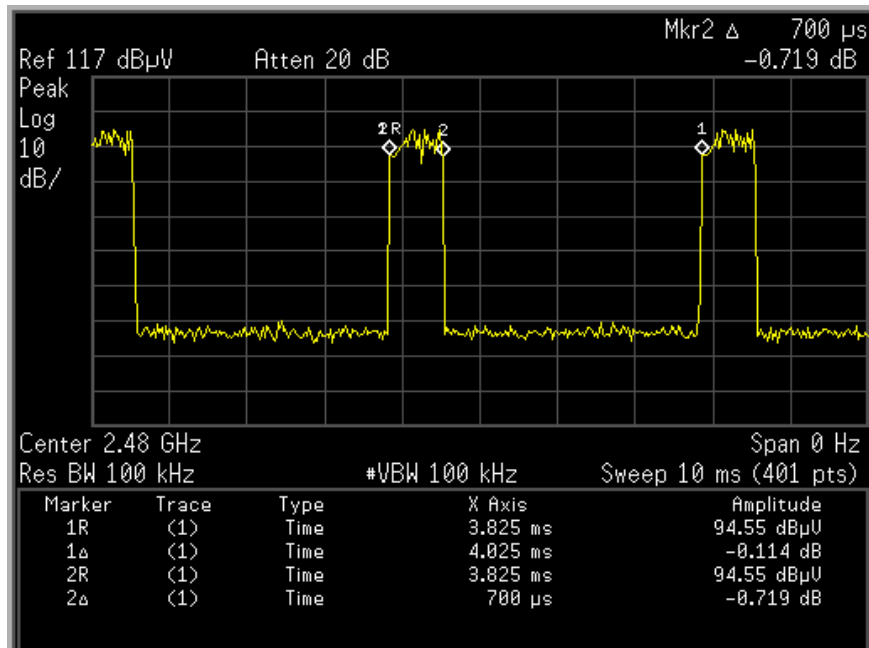
Average value = Peak value - |Duty cycle Factor |

NOTE 2 – For Receiving Mode, we selected Receiving Ch07 mode to perform the test.

NOTE 3 – The emission levels recorded below is data of EUT configured in Lying direction, for Lying direction was the maximum emission direction during the test. The data of Side & Stand direction are too low against the official limit to be reported.

NOTE 4 – **For Band-Edge measurement, marker-delta method was used to obtain the test result according to FCC KDB 913591.**

Band Edge Measurement



$$\text{Duty cycle} = \text{TX on} / (\text{TX on} + \text{TX off}) = 0.7 / 4.025 = 0.17$$

$$\text{Duty cycle Factor} = 20\log(0.17) = -15.4 \text{ dB}$$

EUT : Patient Interface Module Temperature : 25°C

Model No. : ST80i WPIM Humidity : 45%RH

Serial No. : P2D1100037 Date of Test : Jan 21, 2012

Test Mode : Transmitting Ch00

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	36.79	1.49	14.57	0.85	--	16.91	40.00	23.09	QP
	86.26	0.53	10.83	1.68	--	13.04	40.00	26.96	
	270.56	0.29	12.82	2.67	--	15.78	46.00	30.22	
	412.18	1.65	16.45	3.02	--	21.12	46.00	24.88	
	496.57	5.04	17.56	3.27	--	25.87	46.00	20.13	
	768.17	0.25	20.27	3.84	--	24.36	46.00	21.64	
	1480.00	46.48	26.95	5.76	37.02	42.17	74.00	31.83	PK
	3772.00	45.66	32.78	7.62	35.73	50.33	74.00	23.67	
	4816.00	52.99	35.74	9.09	35.30	62.52	74.00	11.48	
	7540.00	44.63	38.59	10.14	34.72	58.64	74.00	15.36	
	1480.00	--	--	--	--	26.77	54.00	27.23	AV
	3772.00	--	--	--	--	34.93	54.00	19.07	
	4816.00	--	--	--	--	47.12	54.00	6.88	
	7540.00	--	--	--	--	43.24	54.00	10.76	
Vertical	32.91	2.56	16.79	0.82	--	20.17	40.00	19.83	QP
	69.77	9.72	9.85	1.41	--	20.98	40.00	19.02	
	140.58	9.53	10.60	2.18	--	22.31	43.50	21.19	
	177.44	5.62	10.02	2.35	--	17.99	43.50	25.51	
	431.58	3.84	16.72	3.08	--	23.64	46.00	22.36	
	526.64	5.68	17.76	3.33	--	26.77	46.00	19.23	
	1756.00	47.88	27.22	6.17	36.50	44.77	74.00	29.23	PK
	2872.00	46.47	31.40	6.60	35.93	48.54	74.00	25.46	
	4816.00	49.78	35.74	9.09	35.30	59.31	74.00	14.69	
	9544.00	45.70	39.46	12.55	34.94	62.77	74.00	11.23	
	1756.00	--	--	--	--	29.37	54.00	24.63	AV
	2872.00	--	--	--	--	33.14	54.00	20.86	
	4816.00	--	--	--	--	43.91	54.00	10.09	
	9544.00	--	--	--	--	47.37	54.00	6.63	

TEST ENGINEER: RAVEN JIN

EUT : Patient Interface Module Temperature : 25°C
 Model No. : ST80i WPIM Humidity : 45%RH
 Serial No. : P2D1100037 Date of Test : Jan 21, 2012
 Test Mode : Transmitting Ch07

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	30.97	-1.27	17.78	0.81	--	17.32	40.00	22.68	QP
	53.28	13.90	8.70	1.01	--	23.61	40.00	16.39	
	80.44	4.33	10.56	1.59	--	16.48	40.00	23.52	
	416.06	2.08	16.50	3.02	--	21.60	46.00	24.40	
	495.60	3.23	17.56	3.25	--	24.04	46.00	21.96	
	962.17	0.86	20.63	5.12	--	26.61	54.00	27.39	
	1516.00	46.91	27.01	5.79	36.93	42.78	74.00	31.22	PK
	2860.00	47.38	31.36	6.60	35.94	49.40	74.00	24.60	
	4888.00	54.01	36.12	9.14	35.26	64.01	74.00	9.99	
	6592.00	45.42	37.15	9.45	34.77	57.25	74.00	16.75	AV
	1516.00	--	--	--	--	27.38	54.00	26.62	
	2860.00	--	--	--	--	34.00	54.00	20.00	
	4888.00	--	--	--	--	48.61	54.00	5.39	
6592.00	--	--	--	--	41.85	54.00	12.15		
Vertical	35.82	1.07	15.19	0.84	--	17.10	40.00	22.90	QP
	85.29	14.42	10.80	1.66	--	26.88	40.00	13.12	
	163.86	0.90	10.20	2.29	--	13.39	43.50	30.11	
	361.74	2.59	15.45	2.91	--	20.95	46.00	25.05	
	497.54	2.79	17.58	3.27	--	23.64	46.00	22.36	
	526.64	4.88	17.76	3.33	--	25.97	46.00	20.03	
	1540.00	46.33	27.03	5.86	36.87	42.35	74.00	31.65	PK
	2968.00	46.17	31.77	6.49	35.90	48.53	74.00	25.47	
	4888.00	54.27	36.12	9.14	35.26	64.27	74.00	9.73	
	7600.00	45.28	38.41	10.22	34.72	59.19	74.00	14.81	AV
	1540.00	--	--	--	--	26.95	54.00	27.05	
	2968.00	--	--	--	--	33.13	54.00	20.87	
	4888.00	--	--	--	--	48.87	54.00	5.13	
7600.00	--	--	--	--	43.79	54.00	10.21		

TEST ENGINEER: RAVEN JIN

EUT : Patient Interface Module Temperature : 25°C

Model No. : ST80i WPIM Humidity : 45%RH

Serial No. : P2D1100037 Date of Test : Jan 21, 2012

Test Mode : Transmitting Ch15

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	31.94	-0.43	17.29	0.82	--	17.68	40.00	22.32	QP
	68.80	-0.62	9.79	1.39	--	10.56	40.00	29.44	
	137.67	-0.76	10.66	2.15	--	12.05	43.50	31.45	
	415.09	2.07	16.50	3.02	--	21.59	46.00	24.41	
	497.54	4.18	17.58	3.27	--	25.03	46.00	20.97	
	871.96	7.12	20.38	4.60	--	32.10	46.00	13.90	
	2212.00	47.14	28.40	6.72	36.14	46.12	74.00	27.88	PK
	3748.00	45.27	32.73	7.62	35.73	49.89	74.00	24.11	
	4960.00	57.00	36.49	9.20	35.21	67.48	74.00	6.52	
	9244.00	45.63	39.50	12.28	34.90	62.51	74.00	11.49	AV
	2212.00	--	--	--	--	30.72	54.00	23.28	
	3748.00	--	--	--	--	34.49	54.00	19.51	
	4960.00	--	--	--	--	52.08	54.00	1.92	
9244.00	--	--	--	--	47.11	54.00	6.89		
Vertical	44.55	16.39	10.47	0.89	--	27.75	40.00	12.25	QP
	85.29	11.61	10.80	1.66	--	24.07	40.00	15.93	
	117.30	5.19	11.05	2.00	--	18.24	43.50	25.26	
	218.18	9.14	10.52	2.50	--	22.16	46.00	23.84	
	355.92	13.72	15.29	2.90	--	31.91	46.00	14.09	
	478.14	10.18	17.34	3.21	--	30.73	46.00	15.27	
	1612.00	47.53	27.09	5.96	36.73	43.85	74.00	30.15	PK
	2872.00	46.14	31.40	6.60	35.93	48.21	74.00	25.79	
	4960.00	56.22	36.49	9.20	35.21	66.70	74.00	7.30	
	7444.00	45.11	38.56	10.02	34.72	58.97	74.00	15.03	AV
	1612.00	--	--	--	--	28.45	54.00	25.55	
	2872.00	--	--	--	--	32.81	54.00	21.19	
	4960.00	--	--	--	--	51.30	54.00	2.70	
7444.00	--	--	--	--	43.57	54.00	10.43		

TEST ENGINEER: RAVEN JIN

EUT : Patient Interface Module Temperature : 25°C

Model No. : ST80i WPIM Humidity : 45%RH

Serial No. : P2D1100037 Date of Test : Jan 21, 2012

Test Mode : Receiving Ch07

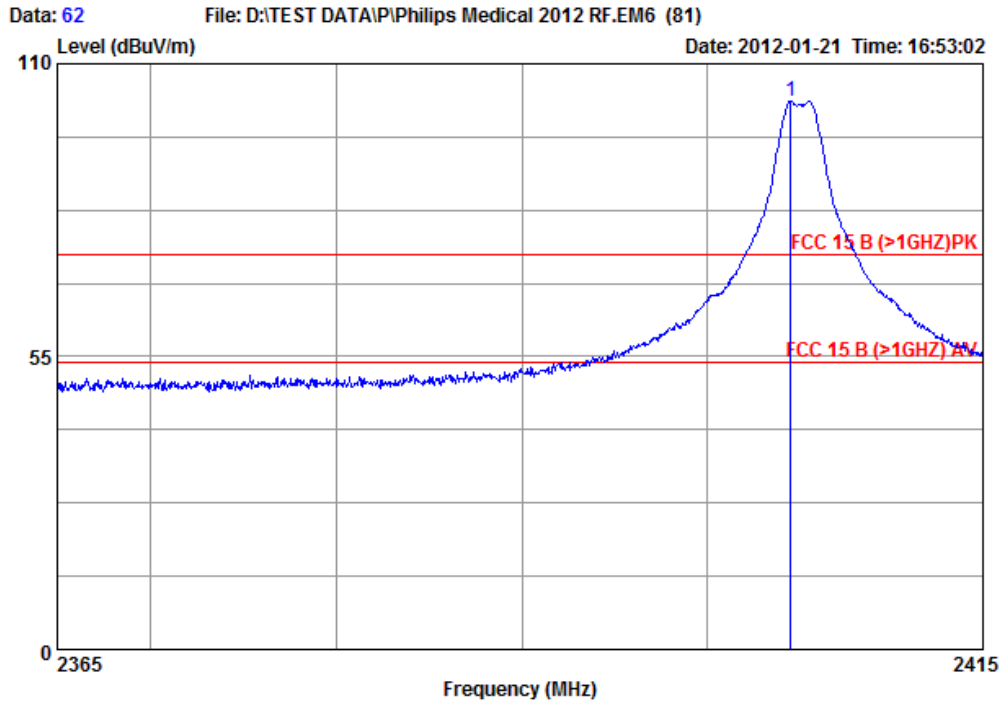
Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	50.37	9.37	8.51	0.93	--	18.81	40.00	21.19	QP
	163.86	2.46	10.20	2.29	--	14.95	43.50	28.55	
	331.67	1.54	14.58	2.84	--	18.96	46.00	27.04	
	414.12	2.07	16.48	3.02	--	21.57	46.00	24.43	
	497.54	4.04	17.58	3.27	--	24.89	46.00	21.11	
	760.41	0.81	20.20	3.82	--	24.83	46.00	21.17	
	1588.00	46.86	27.07	5.93	36.78	43.08	74.00	30.92	PK
	2956.00	46.60	31.74	6.53	35.90	48.97	74.00	25.03	
	4972.00	44.24	36.56	9.20	35.21	54.79	74.00	19.21	
	7492.00	44.18	38.70	10.14	34.72	58.30	74.00	15.70	AV
	1588.00	--	--	--	--	27.68	54.00	26.32	
	2956.00	--	--	--	--	33.57	54.00	20.43	
4972.00	--	--	--	--	39.39	54.00	14.61		
7492.00	--	--	--	--	42.90	54.00	11.10		
Vertical	35.82	3.29	15.19	0.84	--	19.32	40.00	20.68	QP
	44.55	5.60	10.47	0.89	--	16.96	40.00	23.04	
	97.90	1.19	11.28	1.83	--	14.30	43.50	29.20	
	218.18	3.55	10.52	2.50	--	16.57	46.00	29.43	
	362.71	3.40	15.45	2.91	--	21.76	46.00	24.24	
	526.64	6.51	17.76	3.33	--	27.60	46.00	18.40	
	1624.00	46.67	27.10	5.96	36.71	43.02	74.00	30.98	PK
	2980.00	46.45	31.84	6.49	35.90	48.88	74.00	25.12	
	4984.00	43.83	36.63	9.20	35.20	54.46	74.00	19.54	
	7528.00	45.00	38.64	10.14	34.72	59.06	74.00	14.94	AV
	1624.00	--	--	--	--	27.62	54.00	26.38	
	2980.00	--	--	--	--	33.48	54.00	20.52	
4984.00	--	--	--	--	39.06	54.00	14.94		
7528.00	--	--	--	--	43.66	54.00	10.34		

TEST ENGINEER: RAVEN JIN

Ch00 2405MHz



Audix Technology (Shanghai) Co., Ltd.
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audixaci@audix.com



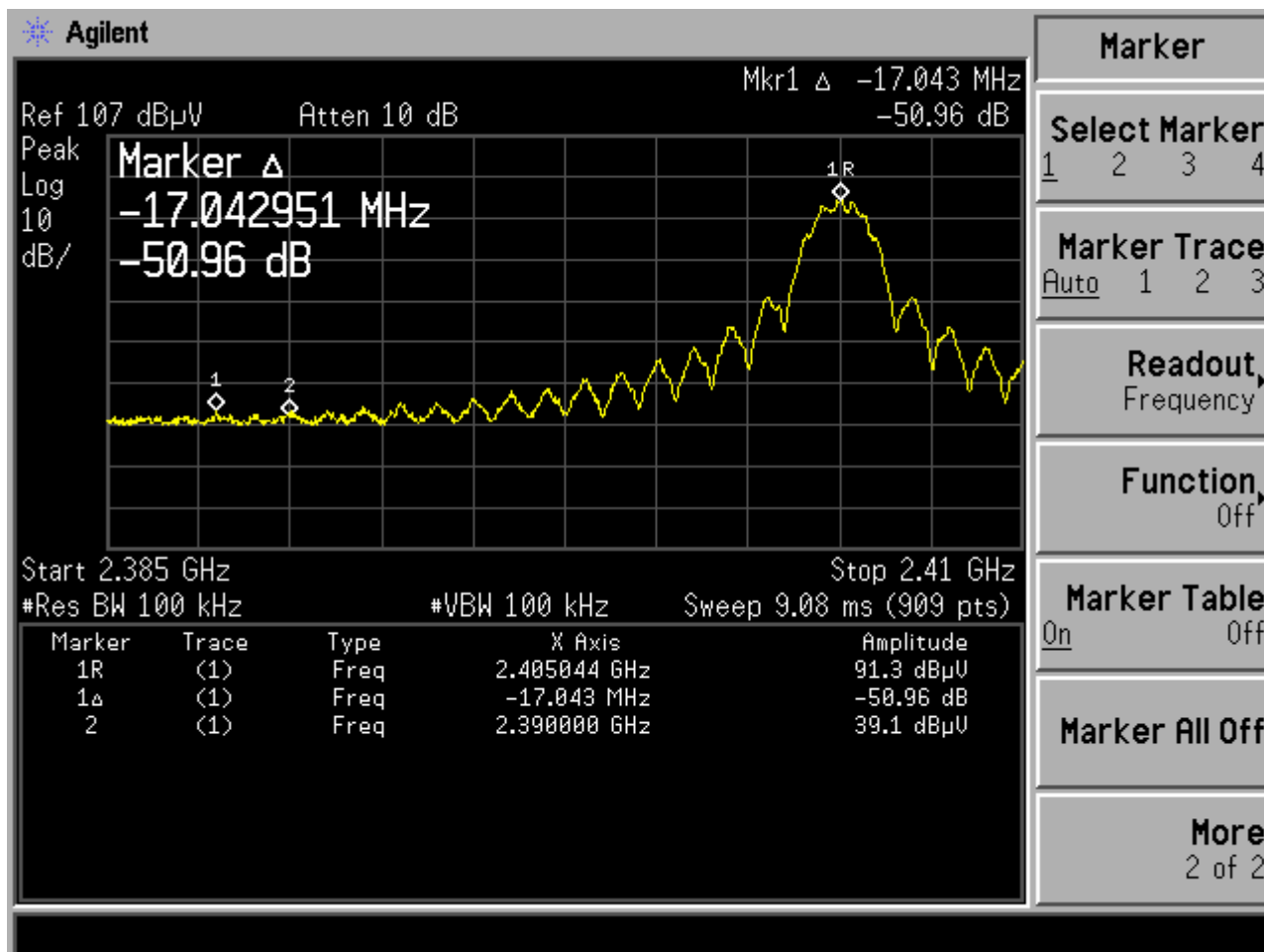
Site no : Audix ACI (3m Chamber) Data no. : 62
 Dis. / Ant. : 3m / EMCO
 Limit : FCC 15 B (>1GHZ) PK Ant. pol. : HORIZONTAL
 Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
 M/N : ST80i WPIM
 Power Rating: 120V/60Hz
 Test Mode : TX CHO

Freq. (MHz)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2404.550	29.27	36.09	6.89	102.91	102.98	74.00	-28.98	Peak

Remarks: Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.

PK Result = 102.98 dBuV/m

AV Result = 102.98 - 15.4 = 87.58 dBuV/m



Delta = 50.96 dB

PK Final Result = PK Result - Delta = 102.98 – 50.96 = 52.02 dBuV/m

Limit = 74 dBuV/m

Result is **PASS**

AV Final Result = AV Result - Delta = 87.58 – 50.96 = 36.62 dBuV/m

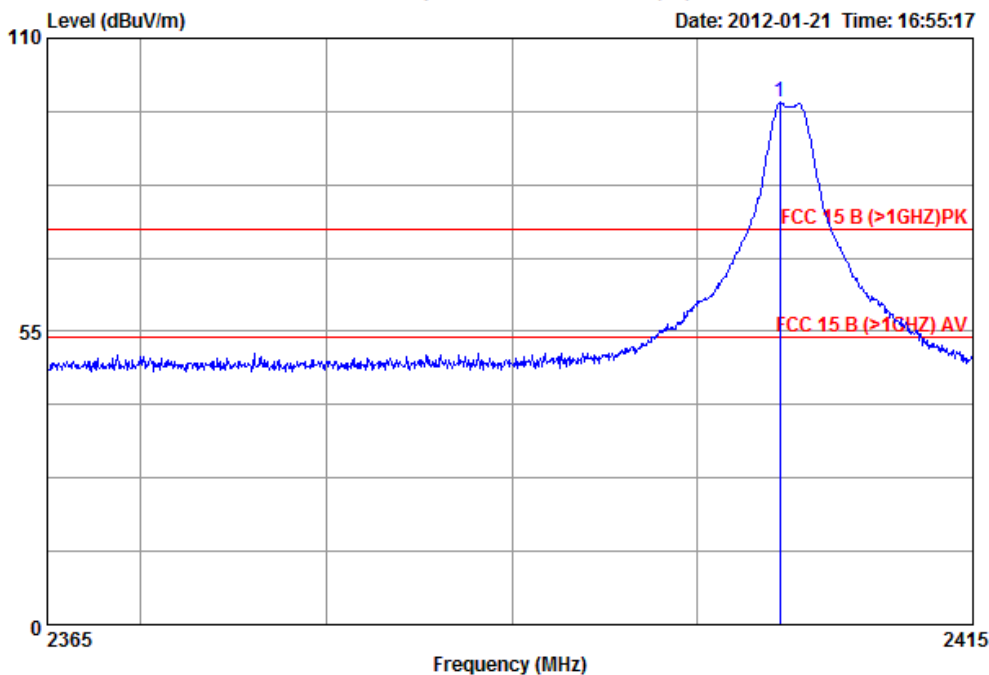
Limit = 54 dBuV/m

Result is **PASS**



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audixaci@audix.com

Data: 64 File: D:\TEST DATA\PI\Philips Medical 2012 RF.EM6 (81) Date: 2012-01-21 Time: 16:55:17



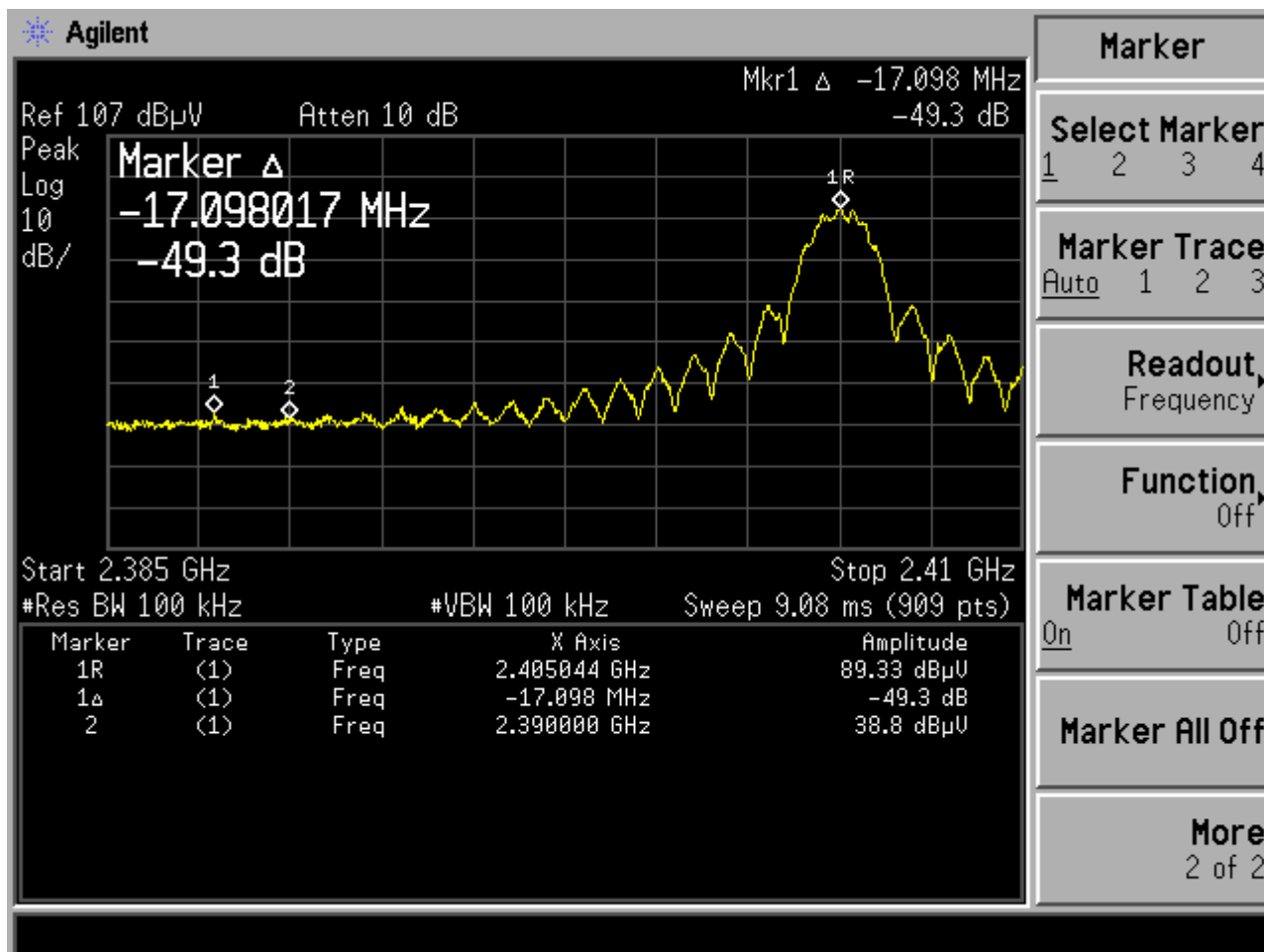
Site no : Audix ACI (3m Chamber) Data no. : 64
 Dis. / Ant. : 3m / EMCO
 Limit : FCC 15 B (>1GHZ)PK Ant. pol. : VERTICAL
 Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
 M/N : ST80i WPIM
 Power Rating: 120V/60Hz
 Test Mode : TX CHO

Freq. (MHz)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2404.500	29.27	36.09	6.89	97.91	97.98	74.00	-23.98	Peak

Remarks: Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.

PK Result = 97.98 dBuV/m

AV Result = 97.98 - 15.4 = 82.58 dBuV/m



Delta = 49.3 dB

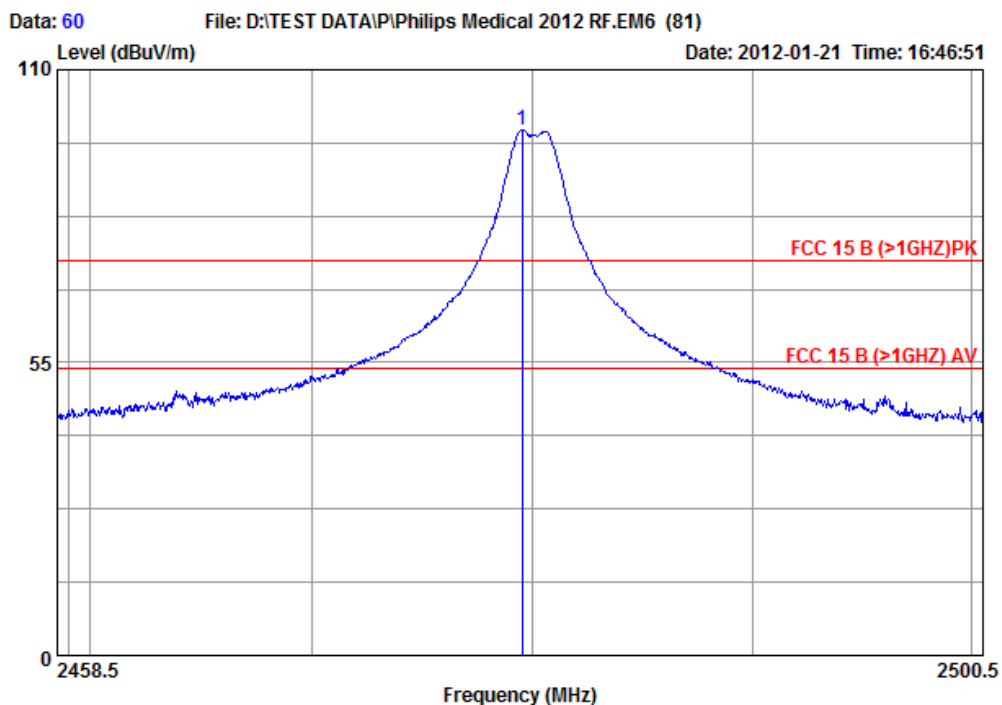
PK Final Result = PK Result - Delta = 97.98 - 49.3 = 48.68 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 82.58 - 49.3 = 33.28 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**

Ch15 2480MHz



Audix Technology (Shanghai) Co., Ltd.
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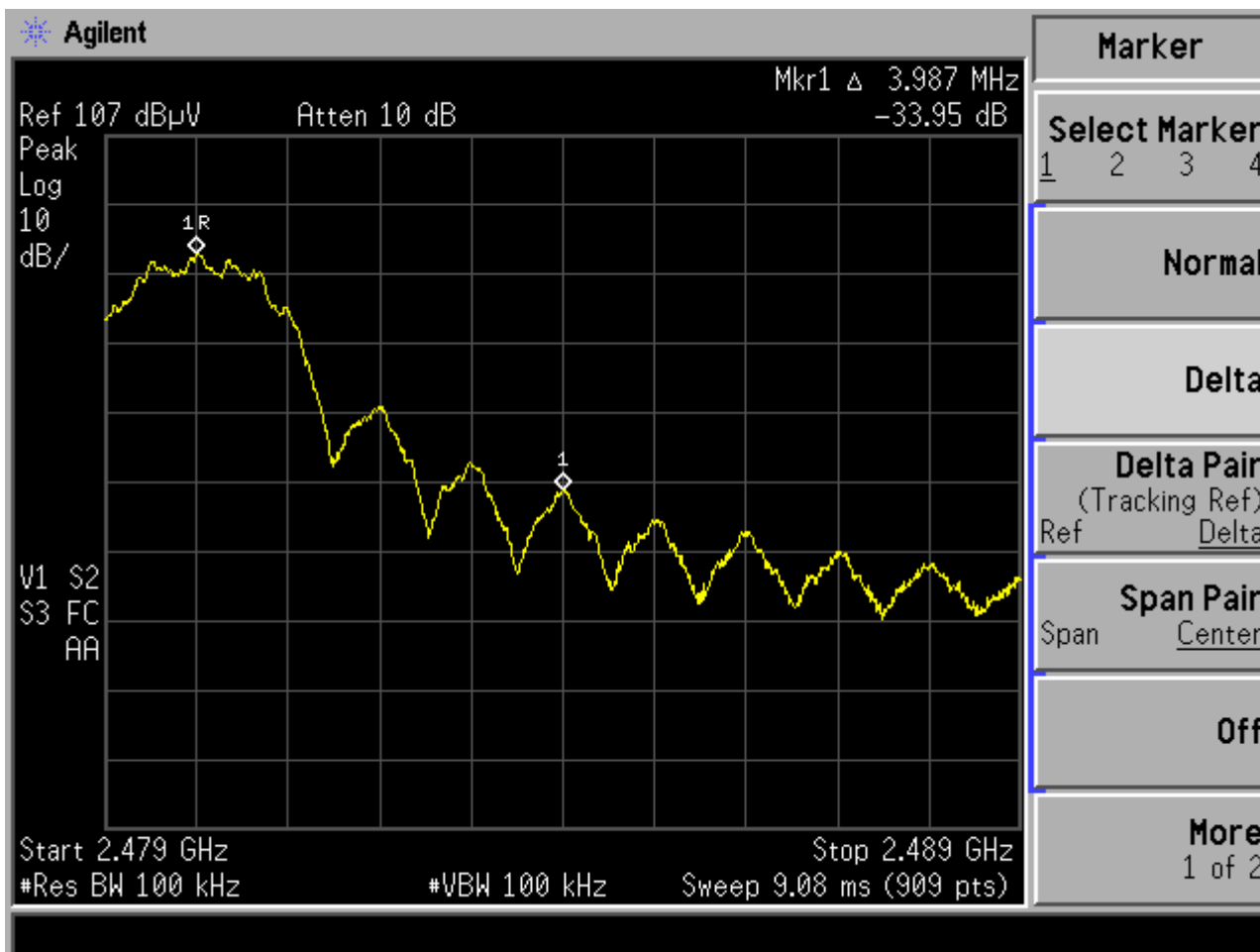
Site no : Audix ACI (3m Chamber) Data no. : 60
Dis. / Ant. : 3m / EMCO
Limit : FCC 15 B (>1GHZ) PK Ant. pol. : HORIZONTAL
Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
M/N : ST80i WPIM
Power Rating: 120V/60Hz
Test Mode : TX CH15

Freq. (MHz)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2479.500	29.53	36.07	6.96	98.23	98.65	74.00	-24.65	Peak

Remarks: Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.

PK Result = 98.65 dBuV/m

AV Result = 98.65 - 15.4 = 83.25 dBuV/m



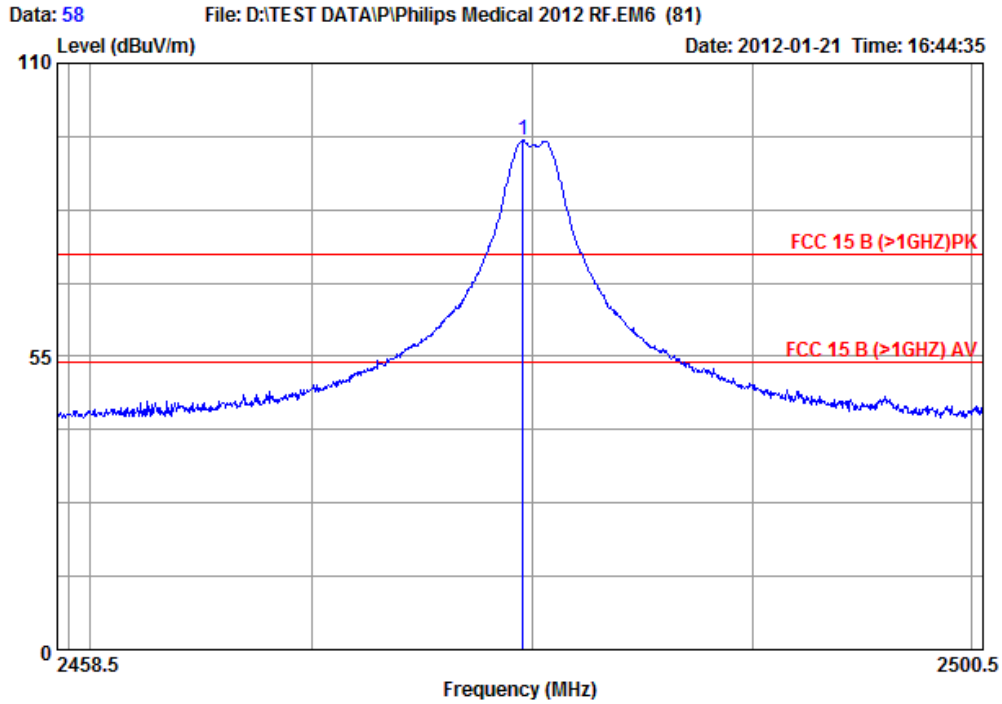
Delta = 33.95 dB

PK Final Result = PK Result - Delta = 98.65 - 33.95 = 64.70 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 83.25 - 33.95 = 49.30 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**



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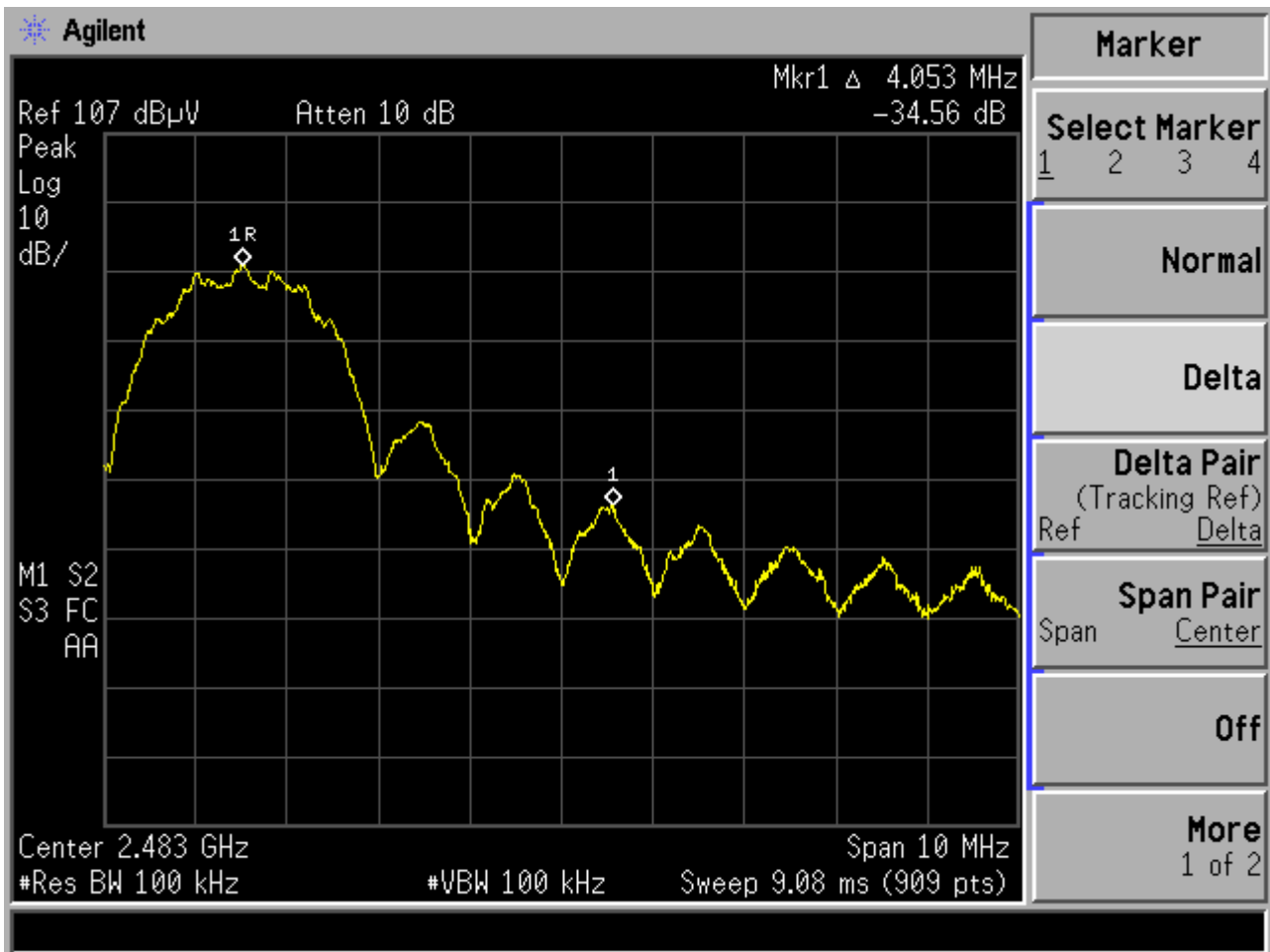
Site no      : Audix ACI (3m Chamber)           Data no.   : 58
Dis. / Ant.  : 3m / EMCO
Limit        : FCC 15 B (>1GHZ)PK             Ant. pol.  : VERTICAL
Env. / Ins.  : 22'C 60%RH/ E7405A             Engineer   : Raven
M/N         : ST80i WPIM
Power Rating: 120V/60Hz
Test Mode    : TX CH15
    
```

Freq. (MHz)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2479.542	29.53	36.07	6.96	95.05	95.47	74.00	-21.47	Peak

Remarks: Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.

PK Result = 95.47 dBuV/m

AV Result = 95.47 - 15.4 = 80.07 dBuV/m



Delta = 34.56 dB

PK Final Result = PK Result - Delta = 95.47 - 34.56 = 60.91 dBuV/m
 Limit = 74 dBuV/m
 Result is **PASS**

AV Final Result = AV Result - Delta = 80.07 - 34.56 = 45.51 dBuV/m
 Limit = 54 dBuV/m
 Result is **PASS**

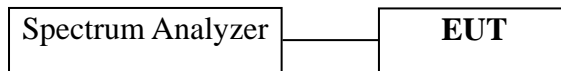
4 6 dB BANDWIDTH MEASUREMENT

4.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2011	Mar 22, 2012

4.2 Block Diagram of Test Setup



4.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

4.4 Operating Condition of EUT

The test program “Hyper-Terminal” was used to enable the EUT to transmit data at different channel frequency individually.

4.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100 kHz RBW / 100 kHz VBW.

The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB. The test procedure is defined in KDB558074:2005.

4.6 Test Results

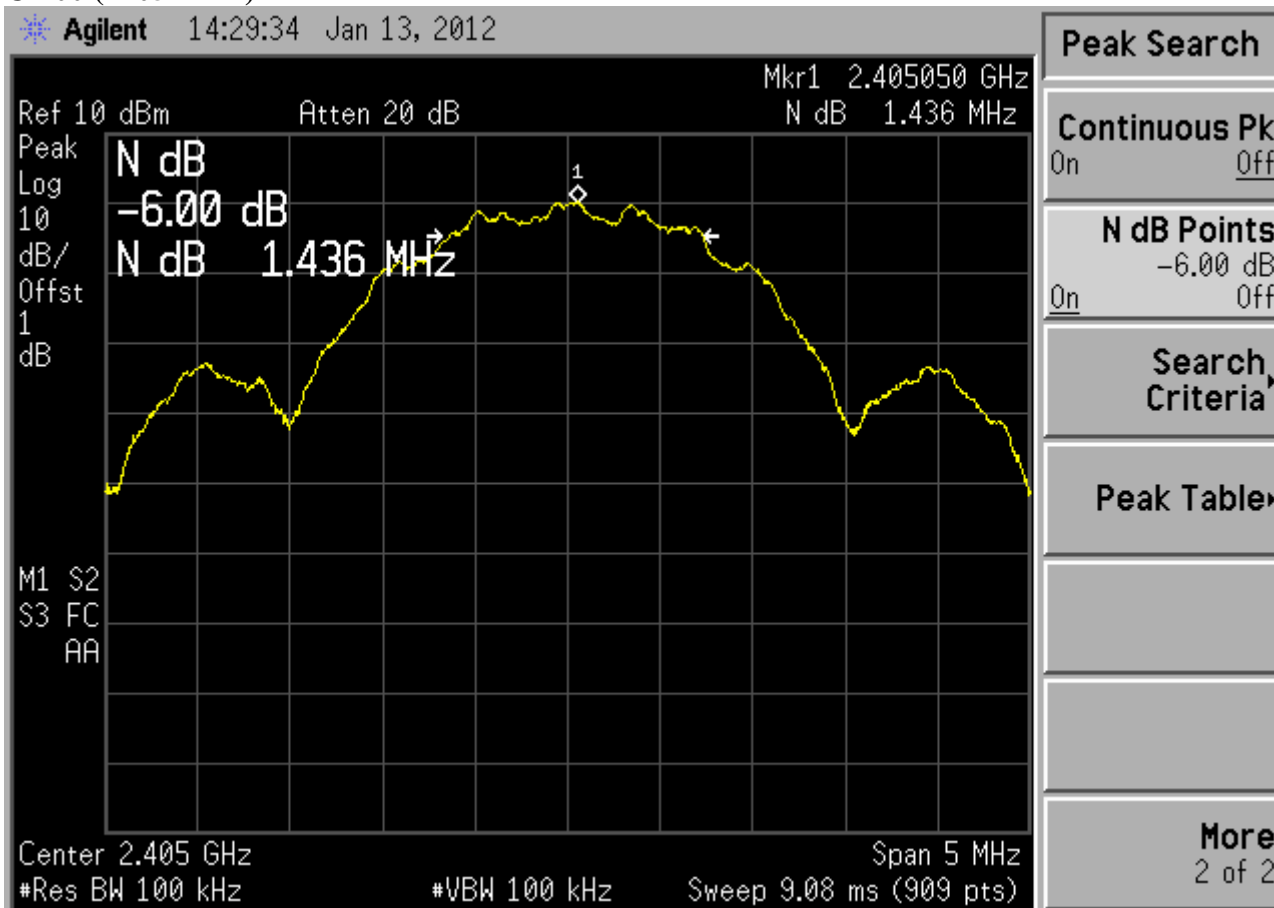
PASSED.

All the test results are attached in next pages.

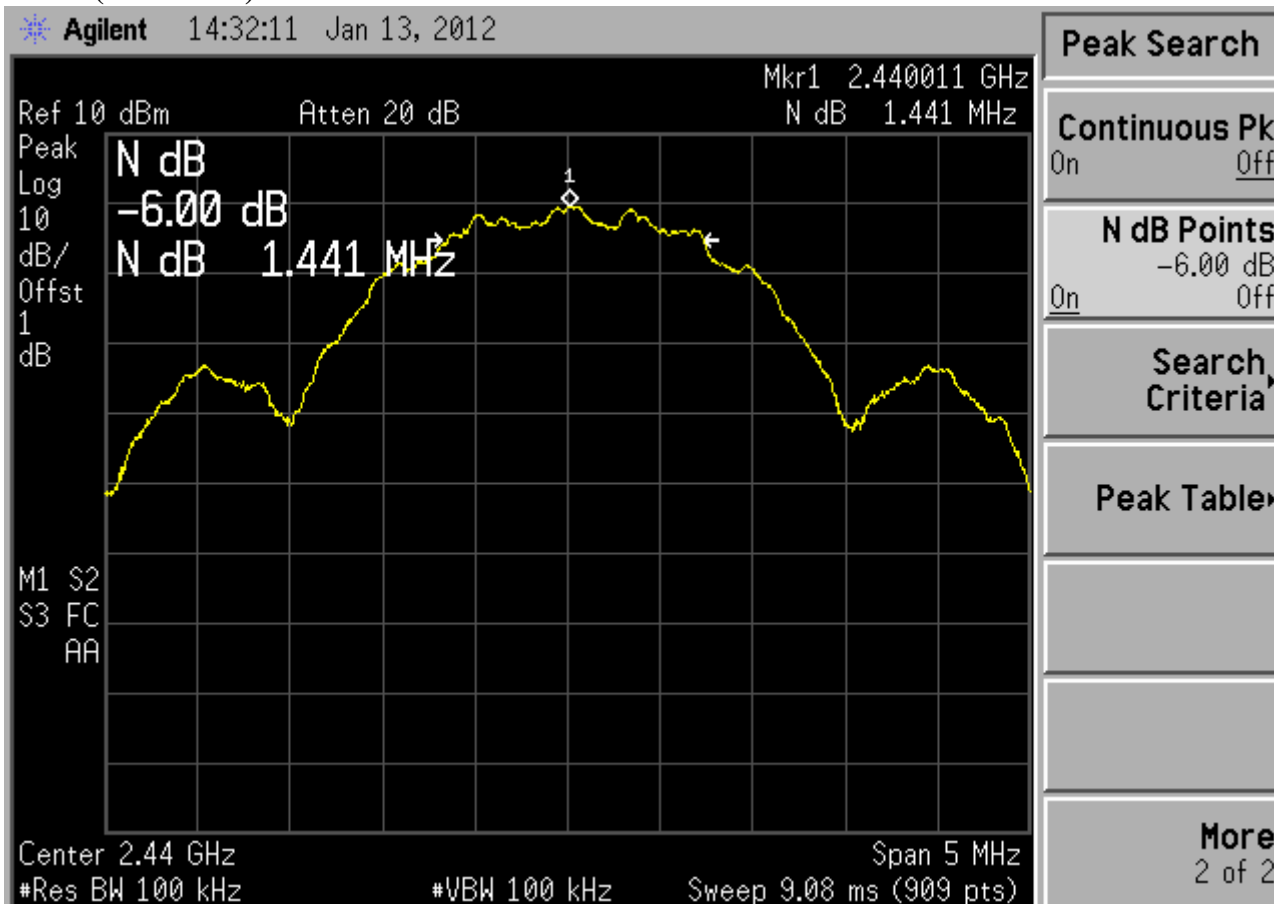
(Test Date: Jan. 13, 2012 Temperature: 23°C Humidity: 48 %)

Channel	Frequency	6dB Bandwidth
00	2405 MHz	1.436 MHz
07	2440 MHz	1.441 MHz
15	2480 MHz	1.469 MHz

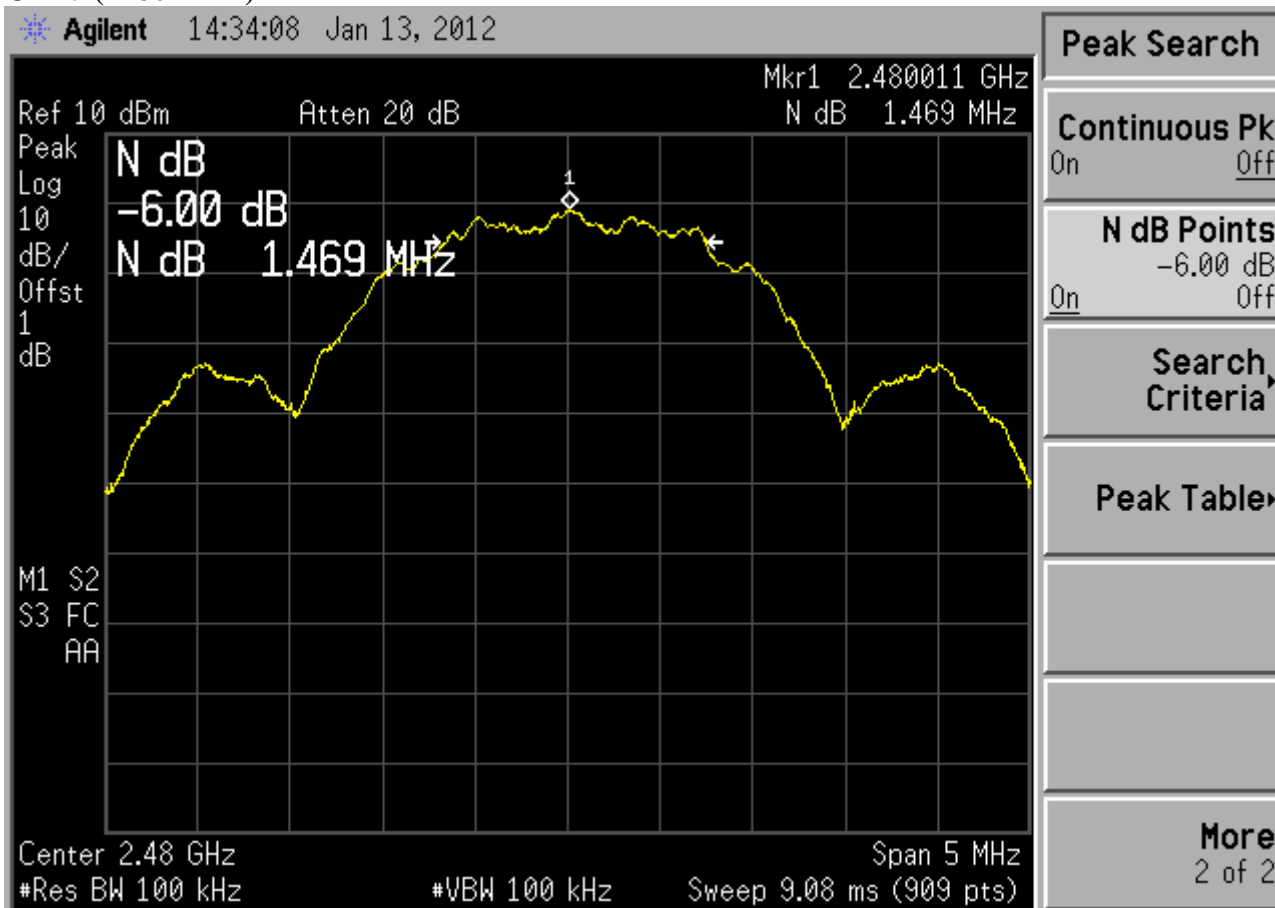
Ch 00 (2405 MHz)



Ch 07 (2440 MHz)



Ch 15 (2480 MHz)



5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Meter	Anritsu	ML2487A	6K00003245	Mar 22, 2011	Mar 22, 2012
2.	Power Sensor	Anritsu	MA2491A	32489	Mar 22, 2011	Mar 22, 2012

5.2 Block Diagram of Test Setup



5.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

5.4 Operating Condition of EUT

The test program “Hyper-Terminal” was used to enable the EUT to transmit data at different channel frequency individually.

5.5 Test Procedure

This is an RF conducted test. Use a direct connection between the antenna port of the transmitter and the power meter, through suitable attenuation. We use Power Output Option 1 (which defined in KDB558074) to measure the power output. Power Output Option 1 is a peak measurement. The transmitter output was connected to the power meter that was designed to detect peak value automatically.

Note: The bandwidth of the power meter is 20MHz.

5.6 Test Results

PASSED. All the test results are listed below.

(Test Date: Jan. 13, 2012 Temperature: 23°C Humidity: 48 %)

Channel	Frequency	Peak Output Power	Limit
00	2405 MHz	3.14 dBm	30 dBm
07	2440 MHz	2.77 dBm	30 dBm
15	2480 MHz	2.36 dBm	30 dBm

6 EMISSION LIMITATIONS MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the emission limitations test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2011	Mar 22, 2012

6.2 Block Diagram of Test Setup

The same as Section. 4.2.

6.3 Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).(※This test result attaching to Section. 4.7)

6.4 Operating Condition of EUT

The test program “Hyper-Terminal” was used to enable the EUT to transmit data at different channel frequency individually.

6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

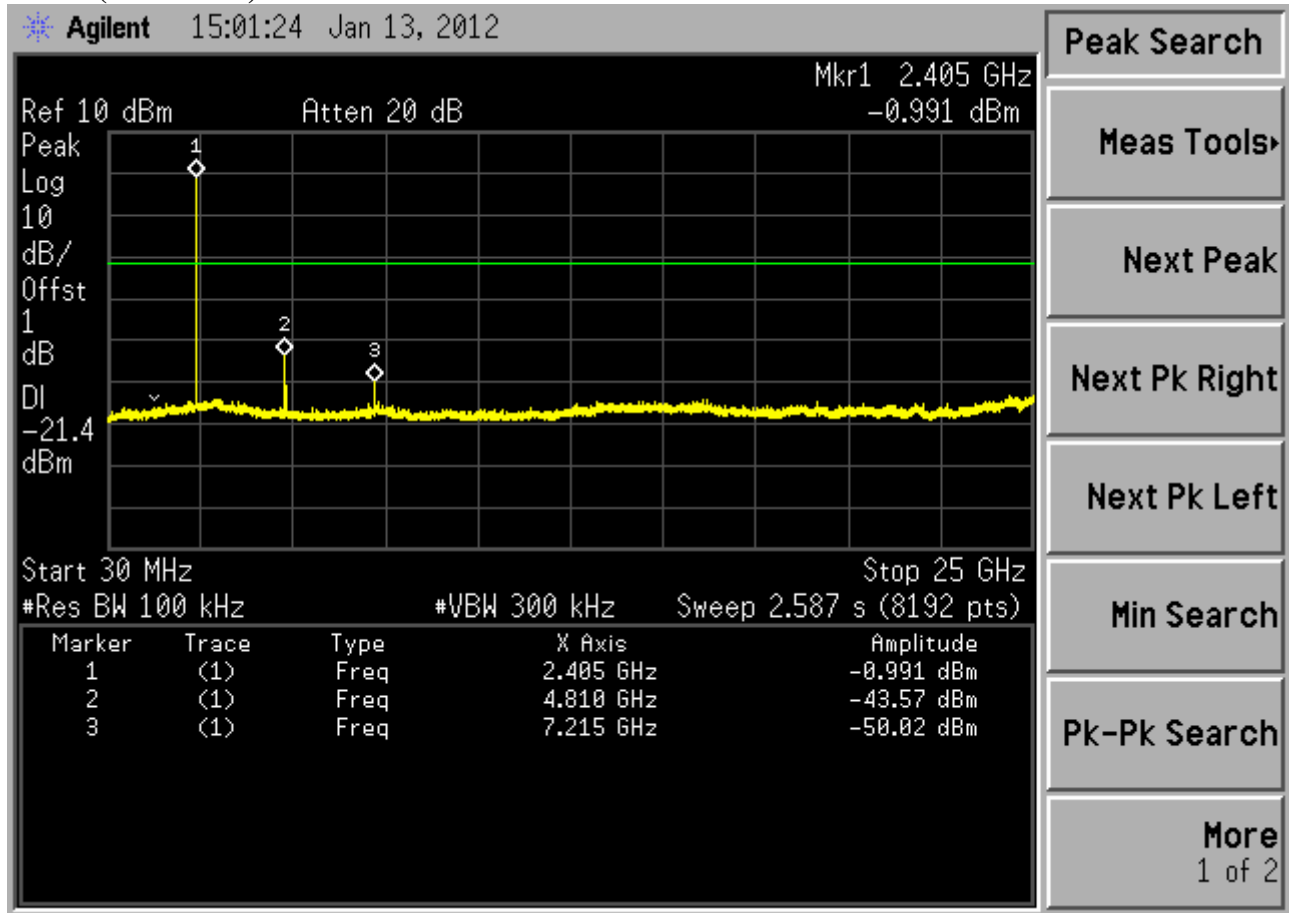
6.6 Test Results

PASSED.

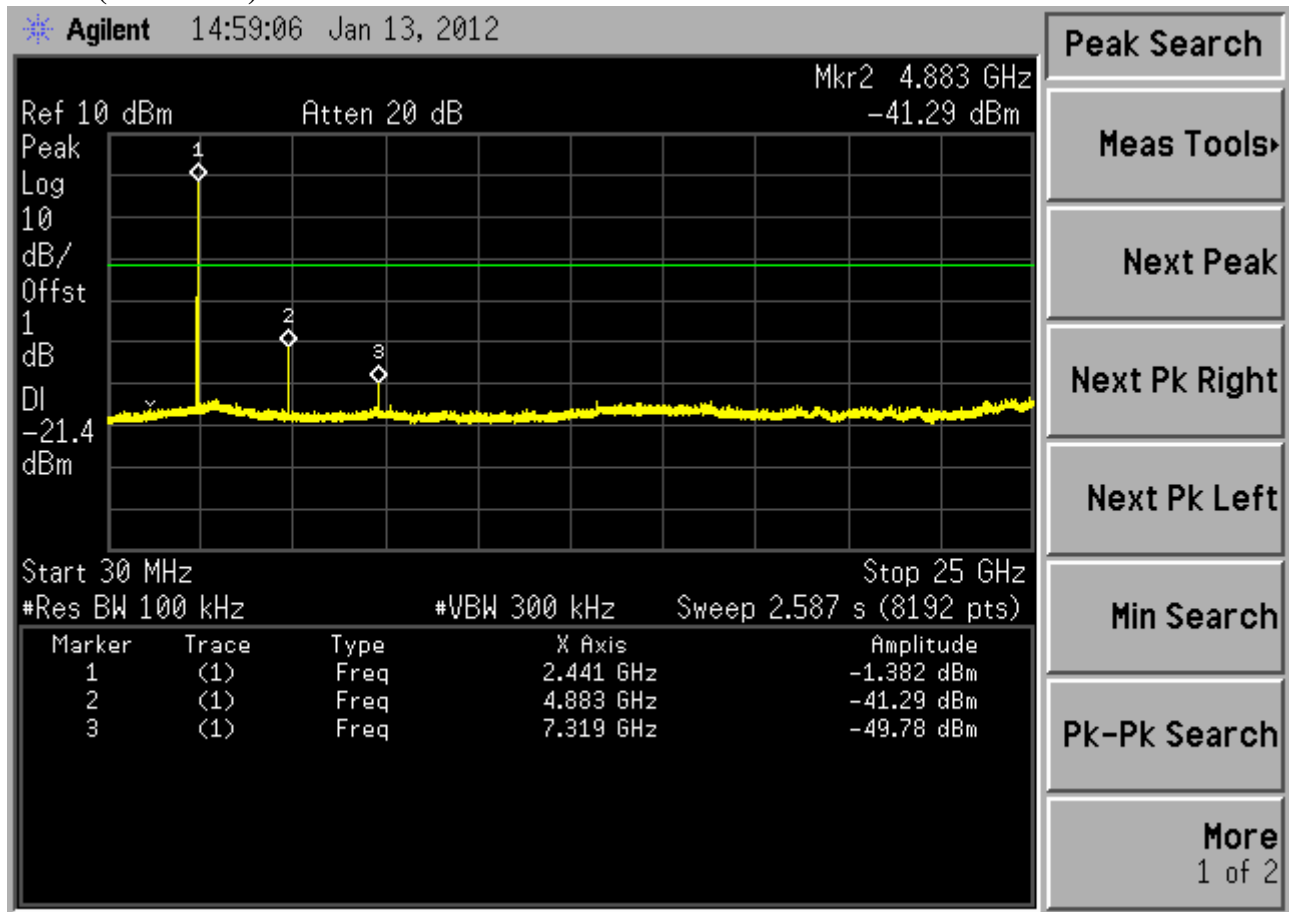
The test data was attached in the next pages.

(Test Date: Jan. 13, 2012 Temperature: 23°C Humidity: 48 %)

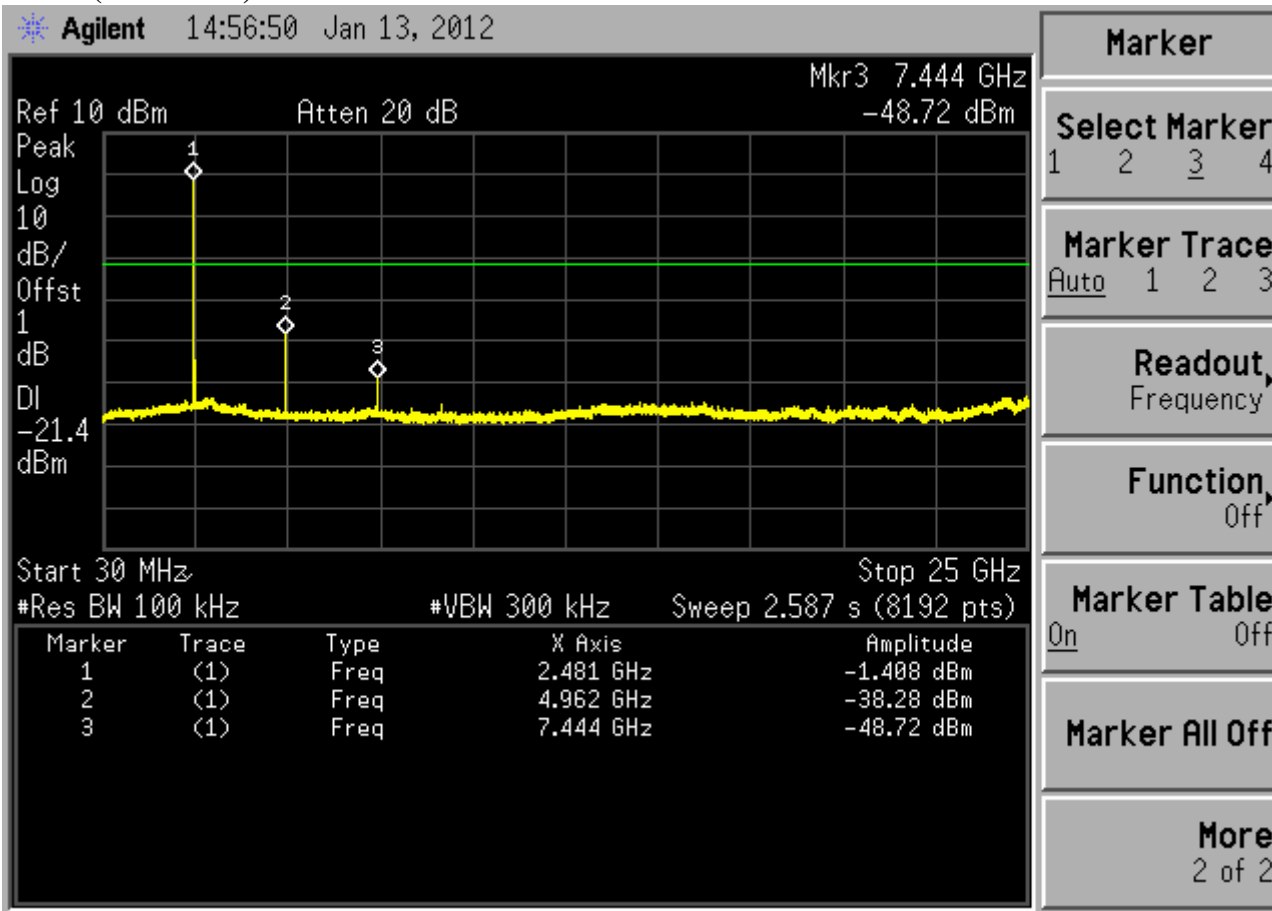
Ch 00 (2405 MHz)



Ch 07 (2440 MHz)



Ch 15 (2480 MHz)



7 BAND EDGES MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the band edges measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2011	Mar 22, 2012

7.2 Block Diagram of Test Setup

The same as section.4.2.

7.3 Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

7.4 Operating Condition of EUT

The test program “Hyper-Terminal” was used to enable the EUT to transmit and receive data at different channel frequency individually.

7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.

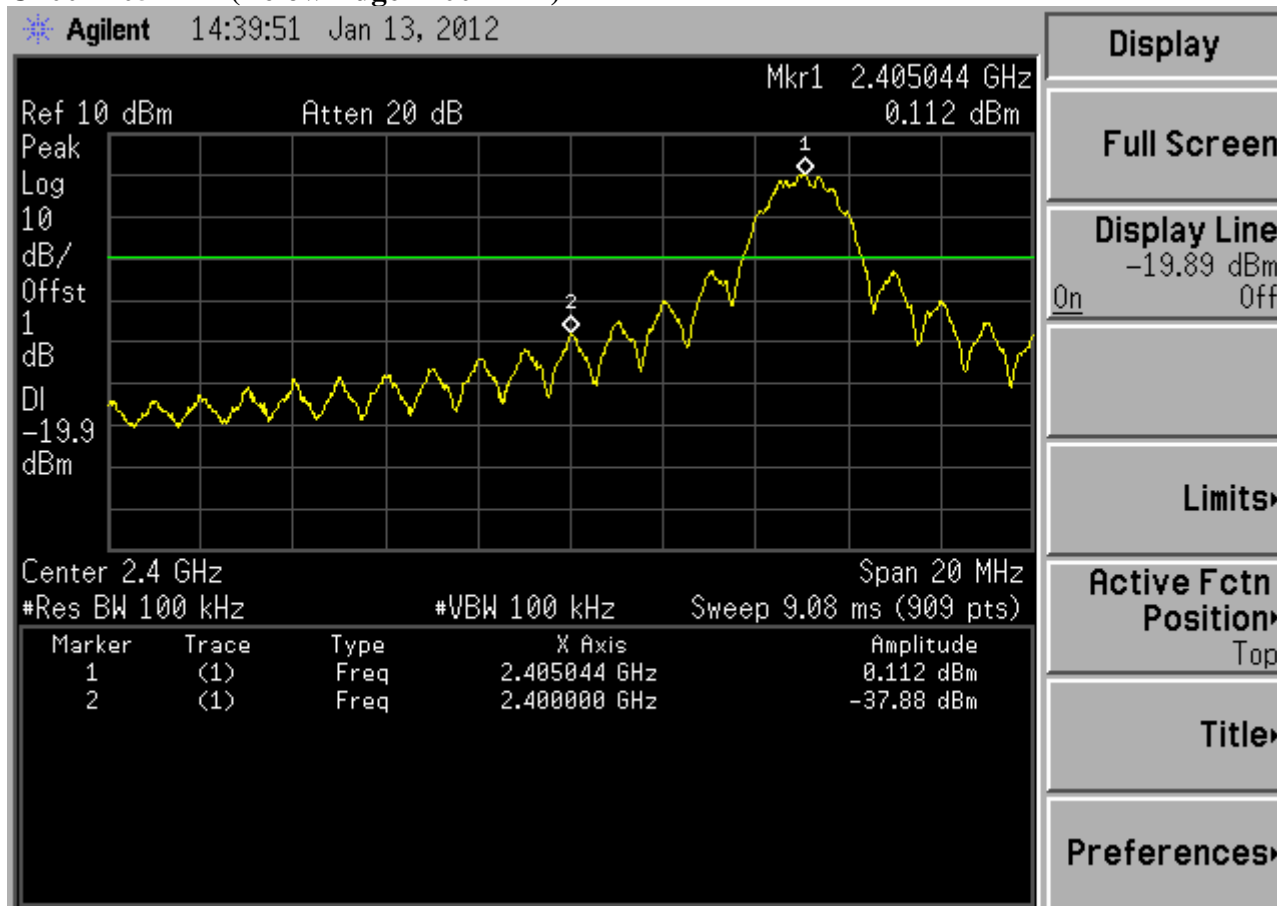
7.6 Test Results

PASSED. All the test results are attached in next pages.

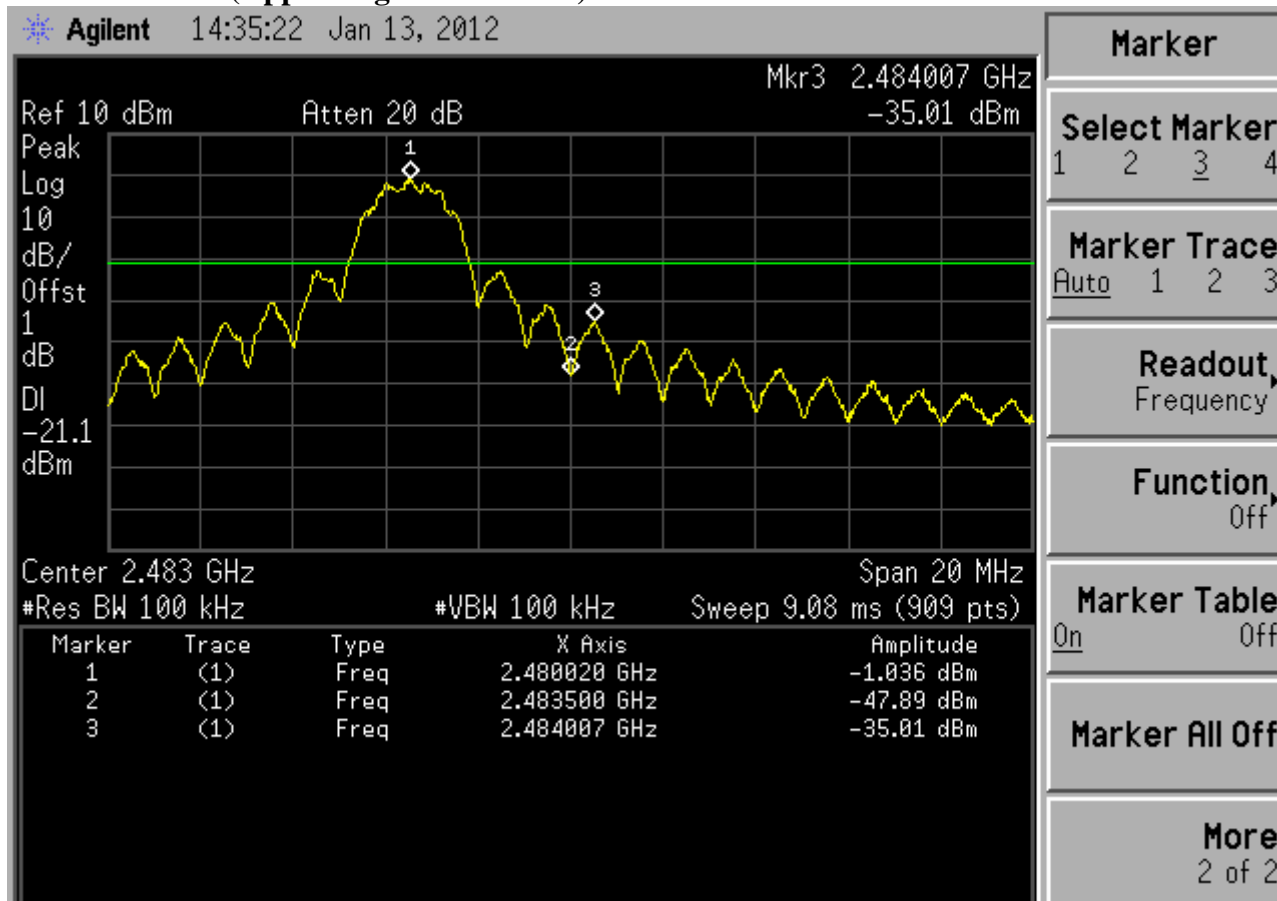
(Test Date: Jan. 13, 2012 Temperature: 23°C Humidity: 48 %%)

Location	Channel	Frequency	Delta Marker	Result
Below Band Edge	00	2405 MHz	37.992 dB	More than 20 dB below the highest level of the desired power
Upper Band Edge	15	2480 MHz	33.974 dB	

Ch00 2405MHz (Below Edge 2400 MHz)



Ch15 2480MHz (Upper Edge 2483.5 MHz)



8 POWER SPECTRAL DENSITY MEASUREMENT

8.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Mar 22, 2011	Mar 22, 2012

8.2 Block Diagram of Test Setup

The same as section.4.2.

8.3 Specification Limits (§15.247(e))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band.

8.4 Operating Condition of EUT

The test program “Hyper-Terminal” was used to enable the EUT to transmit data at different channel frequency individually.

8.5 Test Procedure

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output is measured, then a peak power spectral density measurement is required. Use PSD Option 1 (which defined in KDB558074:2005) if Power output Option 1 was used.

PSD Option 1:

Locate and zoom in on emission peak(s) within the passband. Set RBW = 3kHz, VBW > RBW, sweep = (SPAN/3kHz). The peak level measured must be no greater than +8 dBm.

The transmitter output was connected to the spectrum analyzer. The fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz.

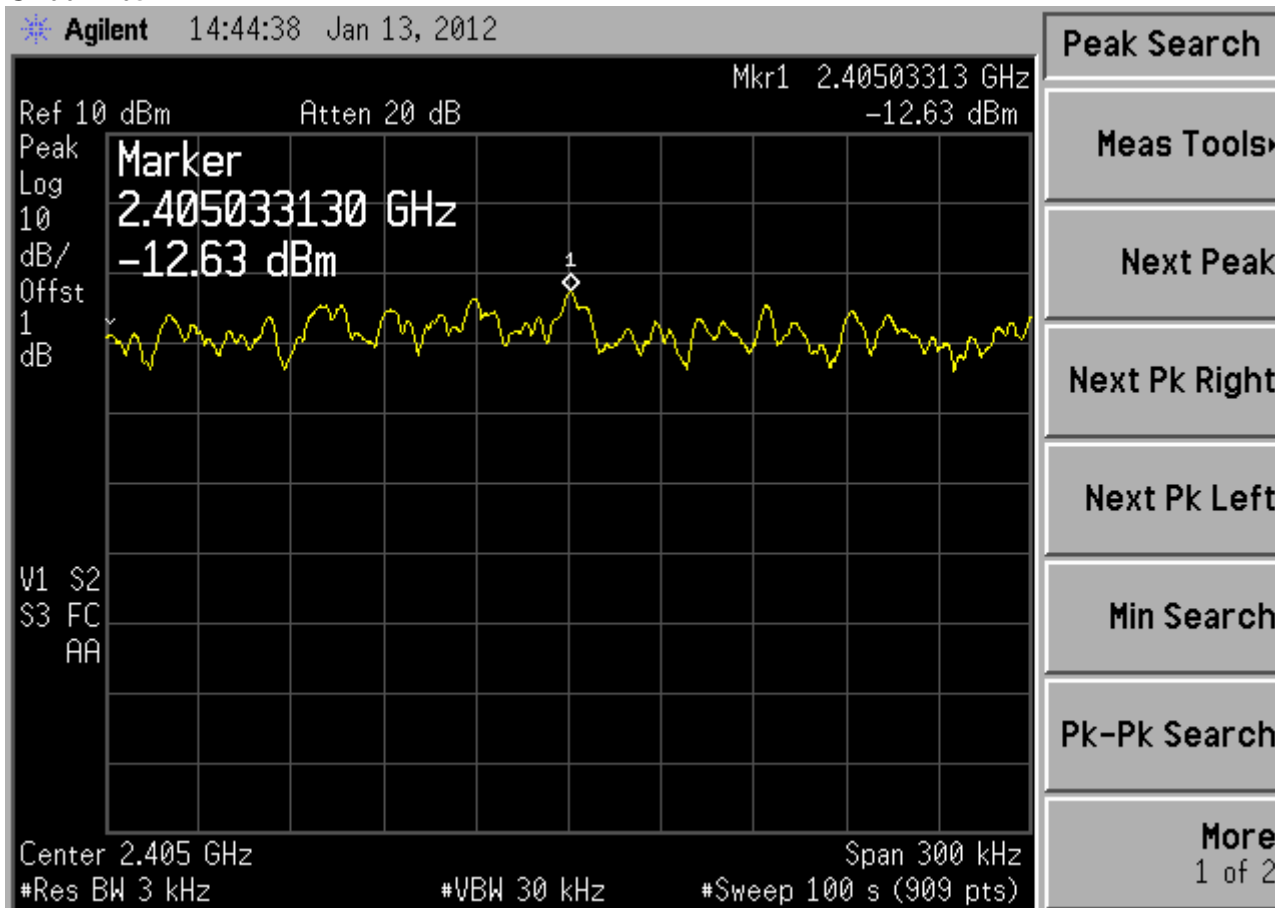
8.6 Test Results

PASSED. All the test results are attached in next pages.

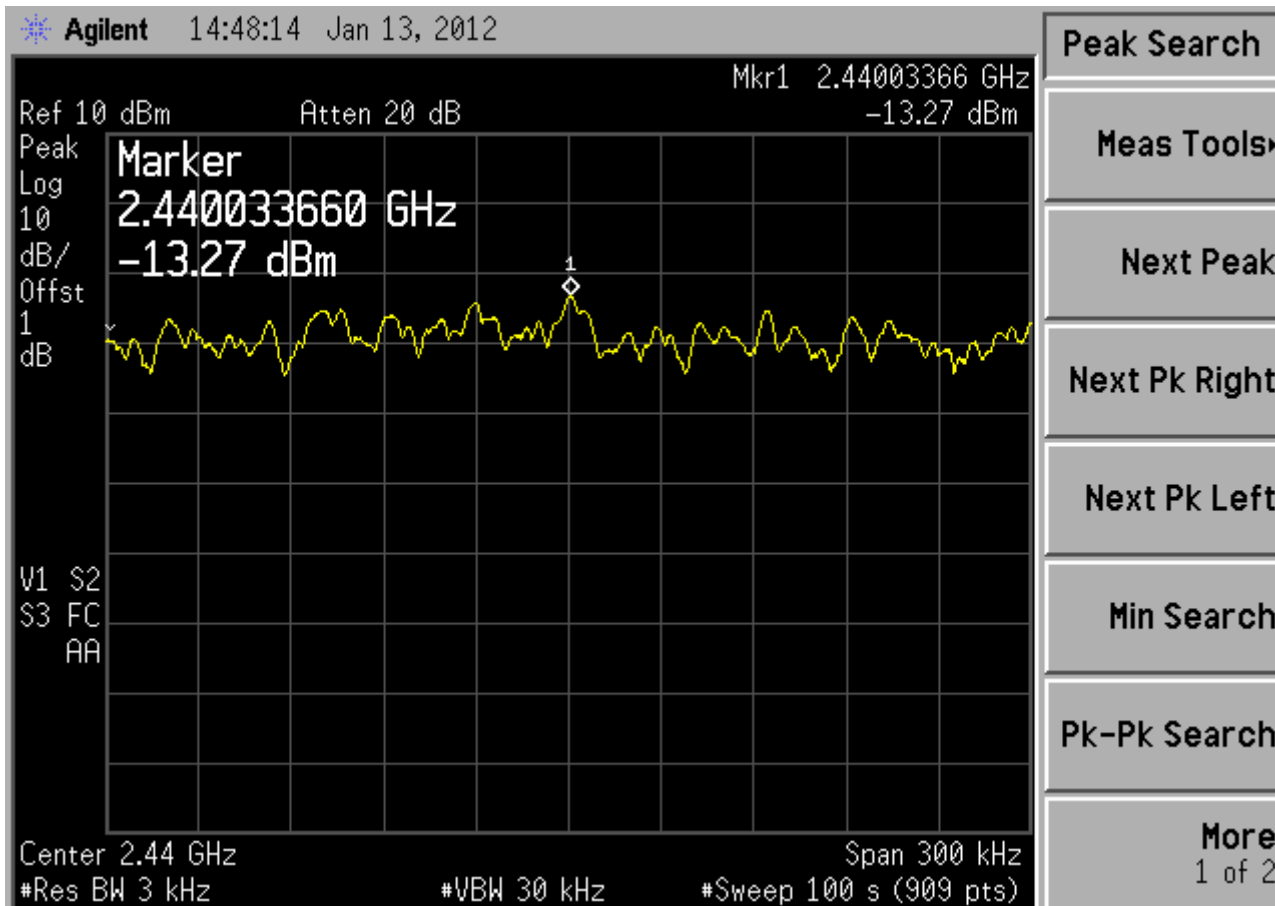
(Test Date: Jan. 13, 2012 Temperature: 23°C Humidity: 48 %)

Channel	Frequency	Power Spectral Density	Limit
00	2405 MHz	-12.63 dBm	8dBm
07	2440 MHz	-13.27 dBm	8dBm
15	2480 MHz	-14.24 dBm	8dBm

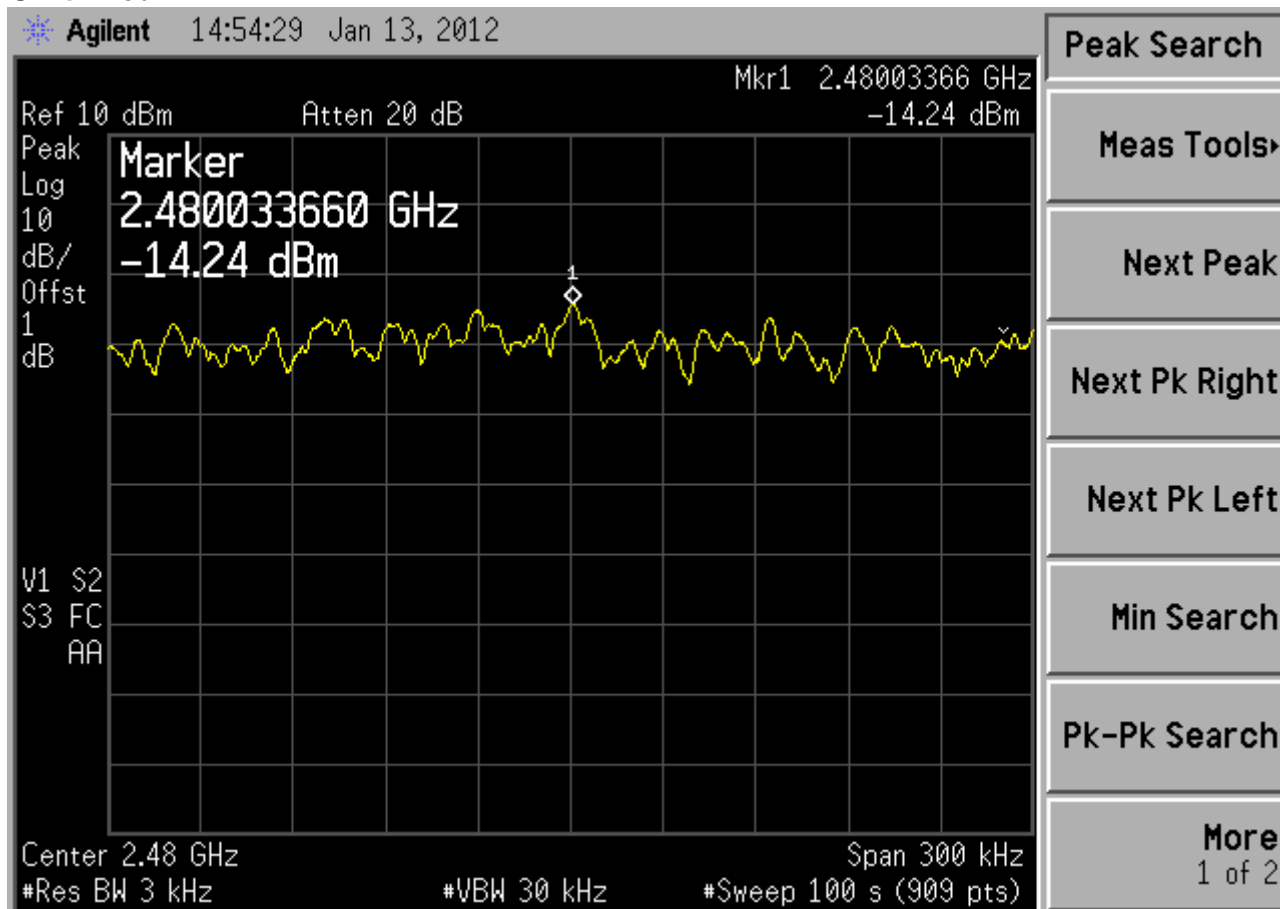
Ch00 2405 MHz



Ch07 2440 MHz



Ch15 2480 MHz



9 DEVIATION TO TEST SPECIFICATIONS

None.

APPENDIX I

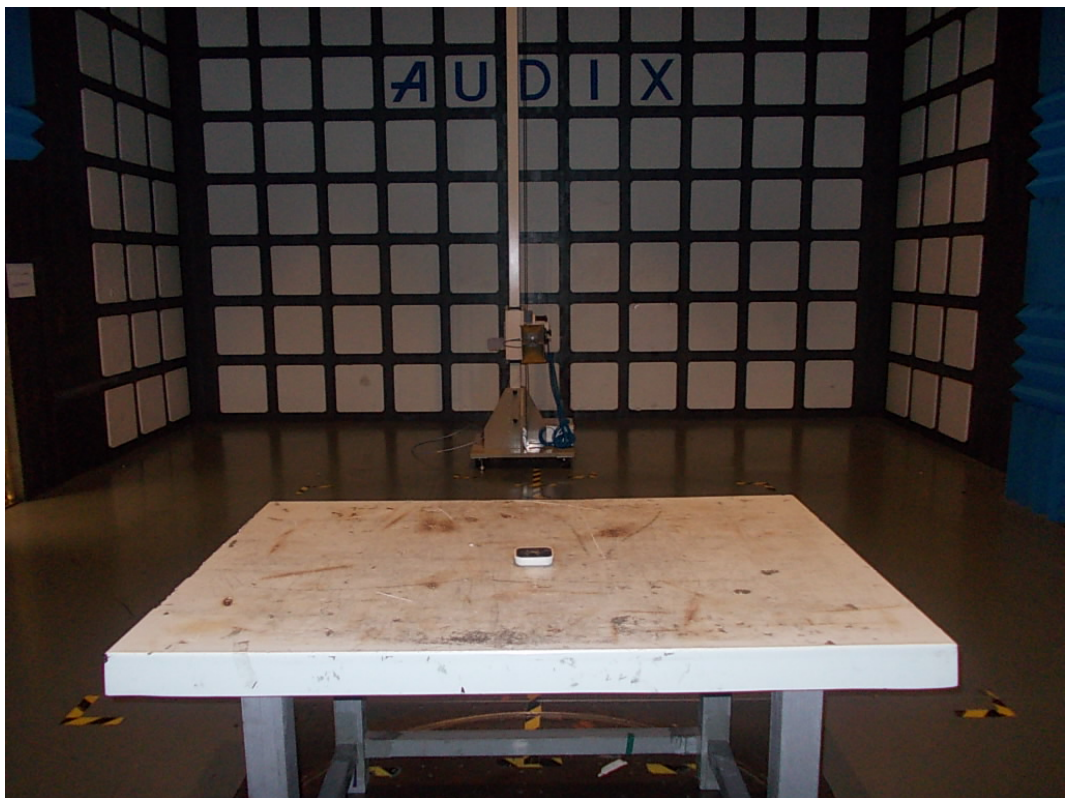
PHOTOGRAPHS OF TEST

Test Set-Up Photos

1. Radiated Electromagnetic Emission Test

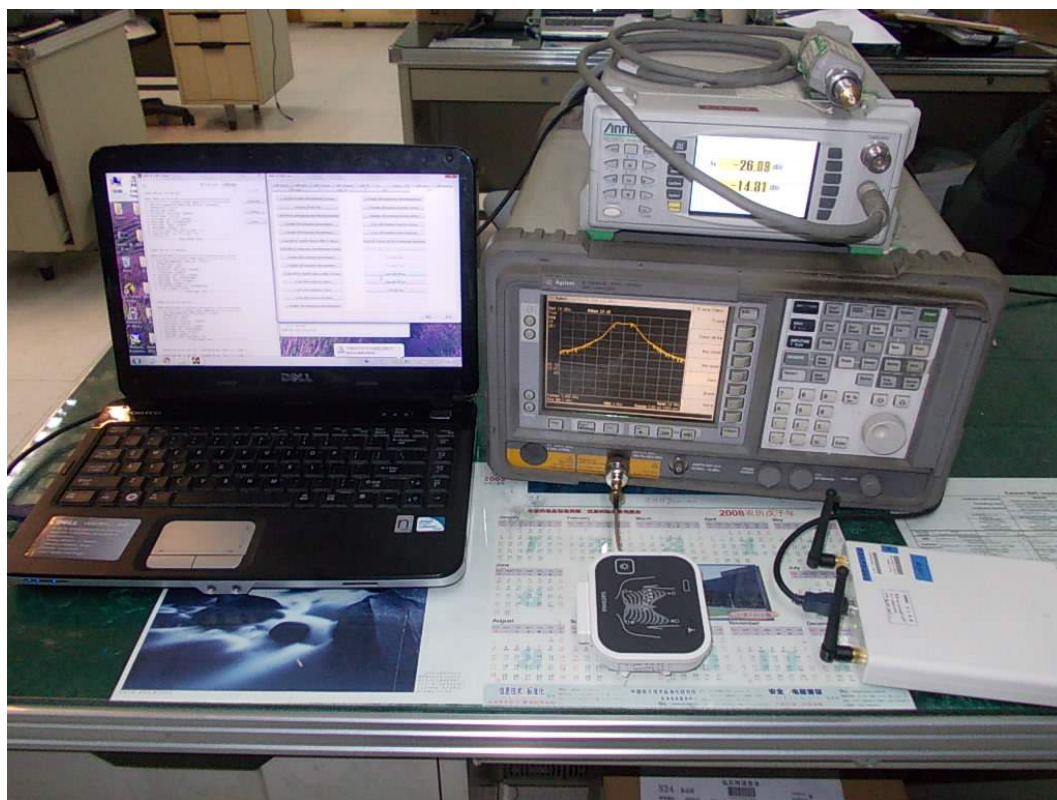


*FRONT VIEW OF RADIATED EMISSION TEST
(BELOW 1GHZ)*



*BACK VIEW OF RADIATED EMISSION TEST
(ABOVE 1GHZ)*

2. RF Test



APPENDIX II

PHOTOGRAPHS OF EUT

FIGURE 1
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
GENERAL APPEARANCE (FRONT VIEW)

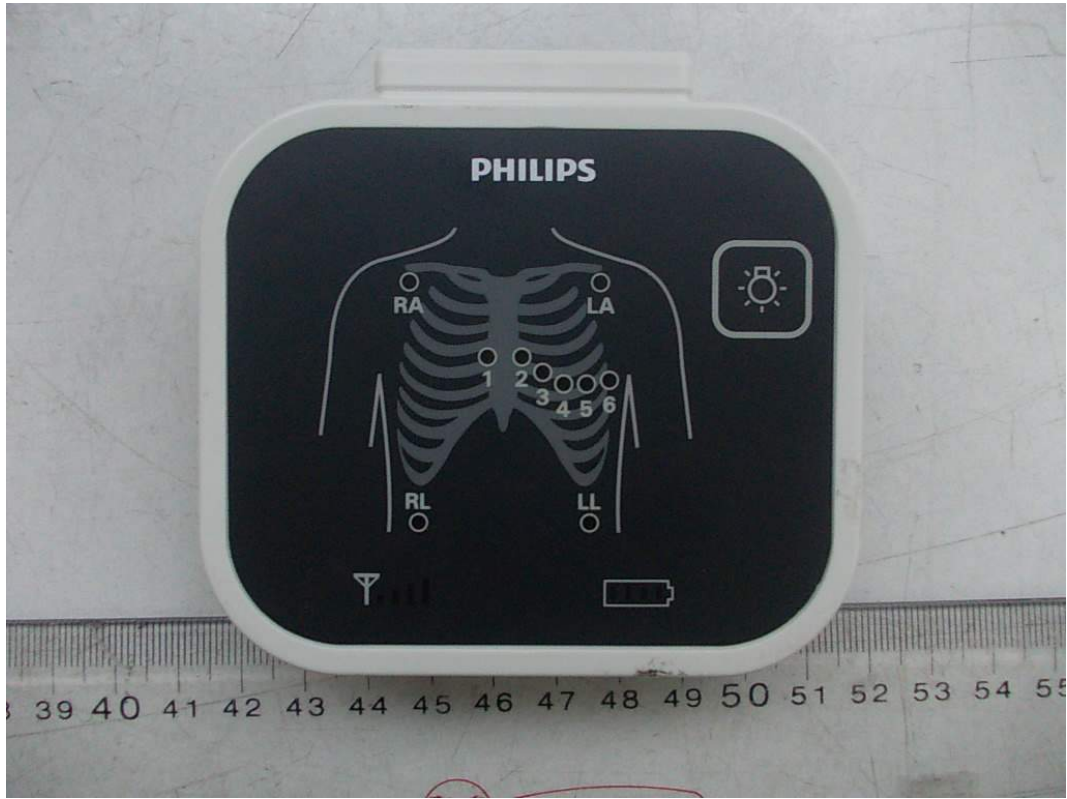


FIGURE 2
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
GENERAL APPEARANCE (BACK VIEW)



FIGURE 3
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
GENERAL APPEARANCE (PORT VIEW)



FIGURE 4
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
LABEL

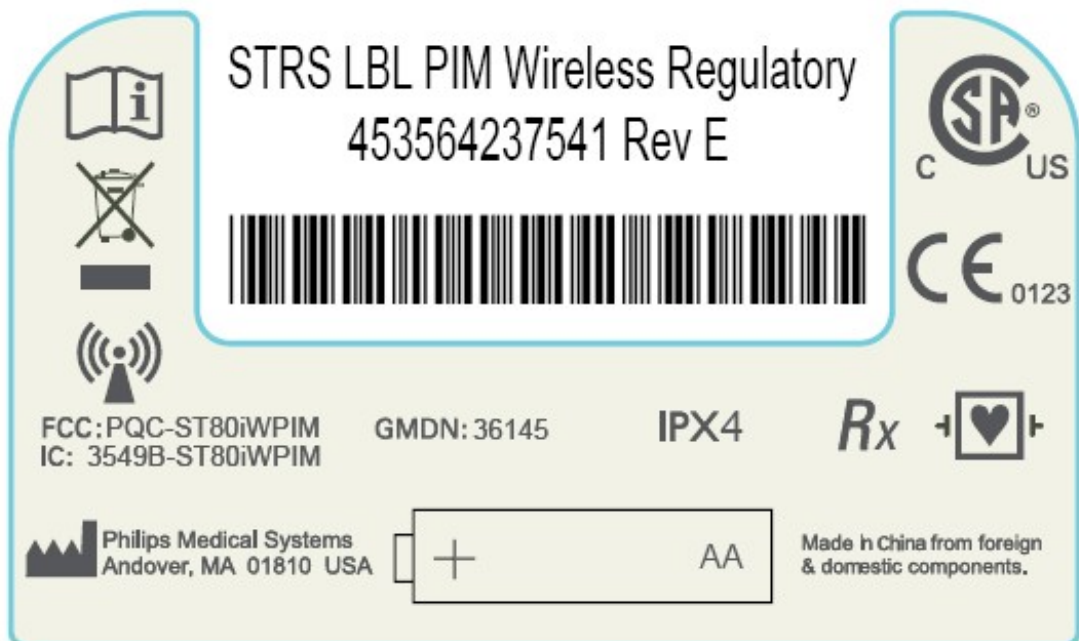


FIGURE 5
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
COVER REMOVED

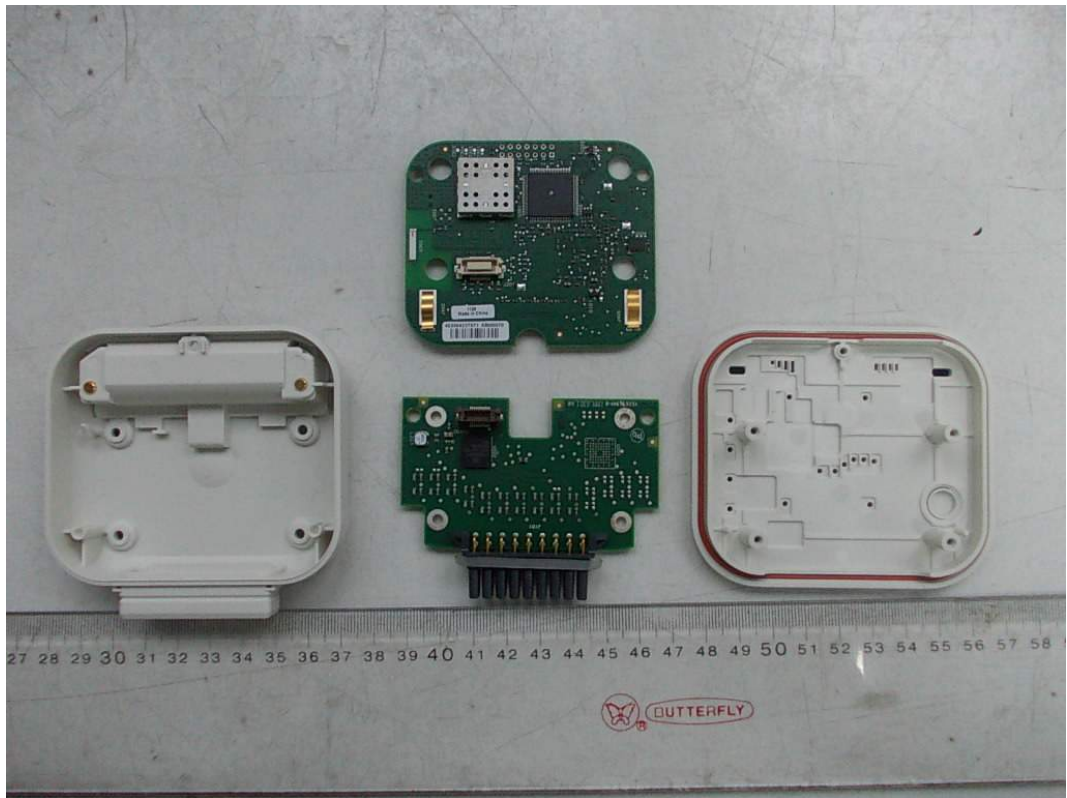


FIGURE 6
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
MAIN BOARD (FRONT VIEW)



FIGURE 7
PATIENT INTERFACE MODULE (M/N: ST80I WPIM)
MAIN BOARD (BACK VIEW)

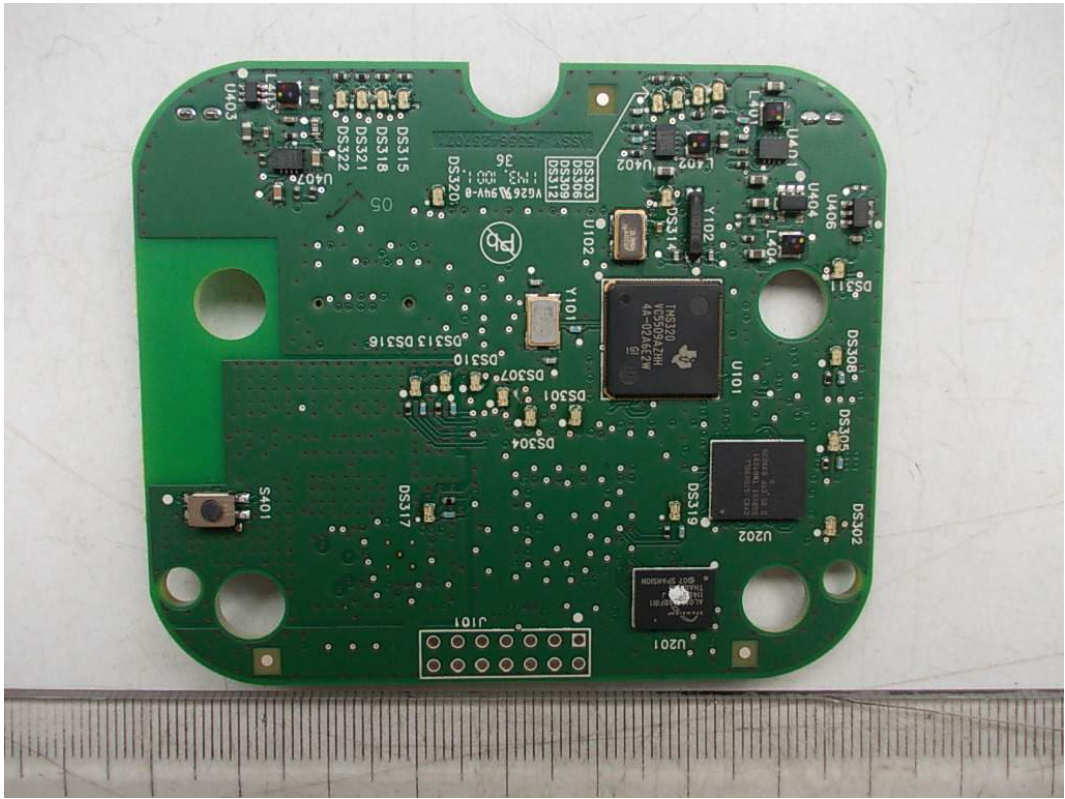


FIGURE 8
PATIENT INTERFACE MODULE (M/N: ST80I WPIM)
CHIP & CRYSTAL ON MAIN BOARD

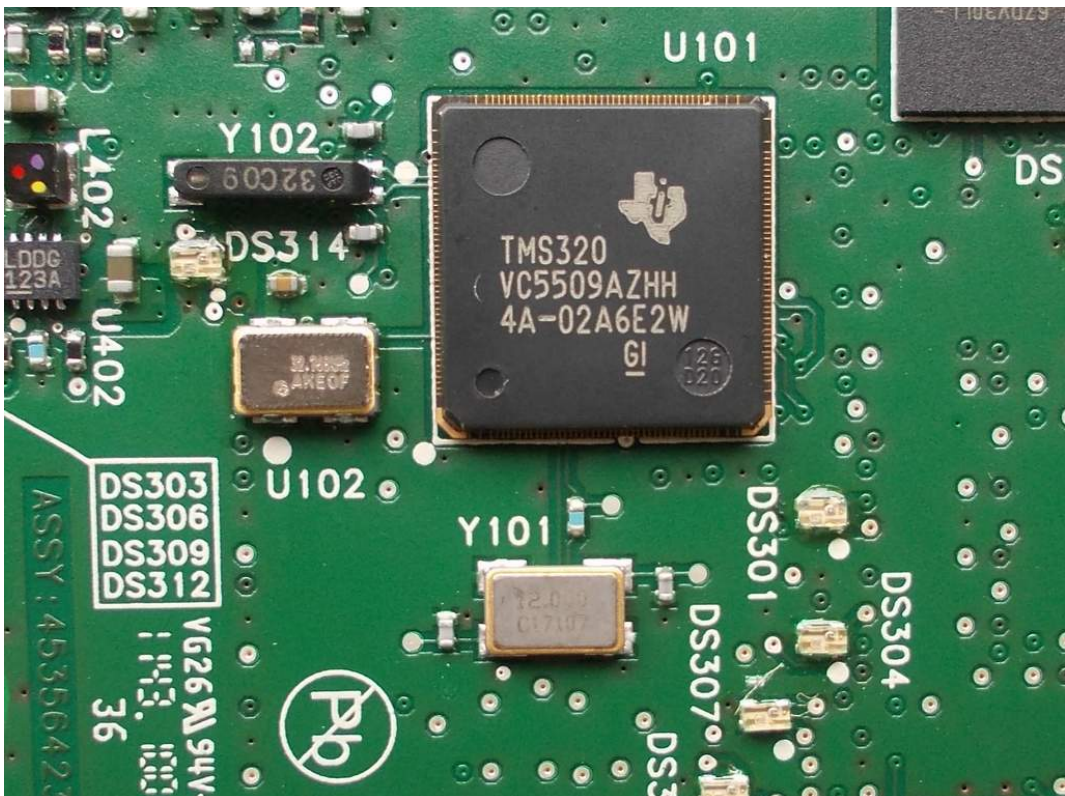


FIGURE 9
PATIENT INTERFACE MODULE (M/N: ST80I WPIM)
RF MODULE ON MAIN BOARD

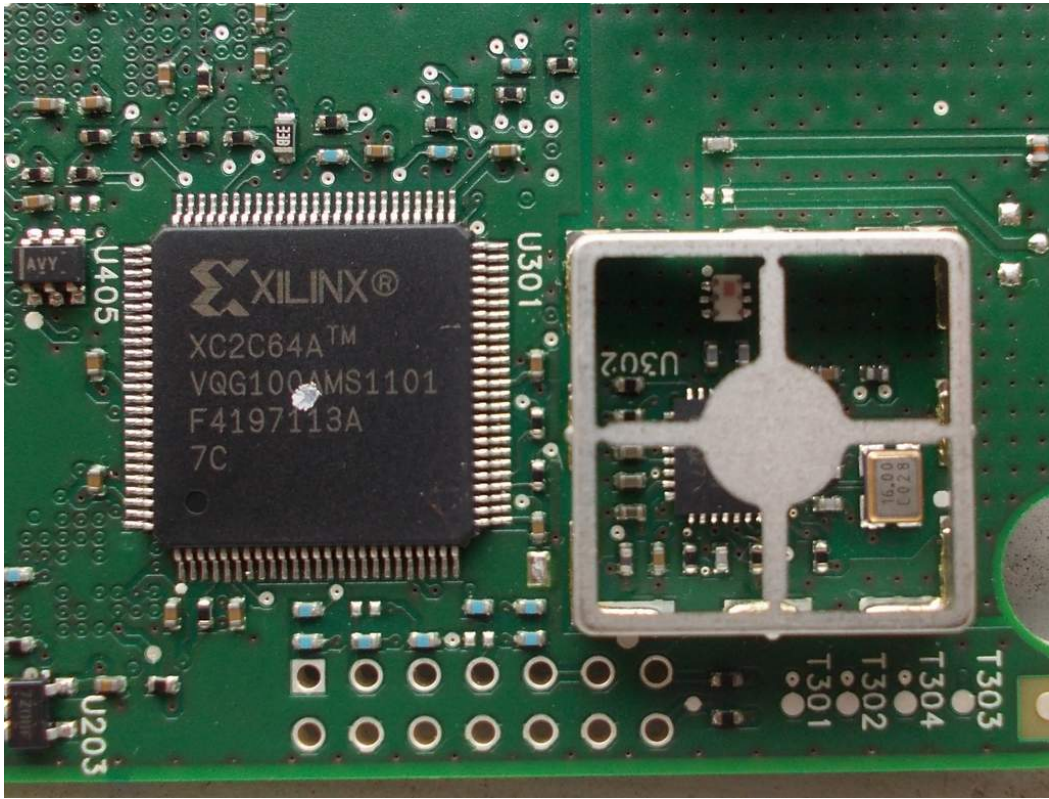
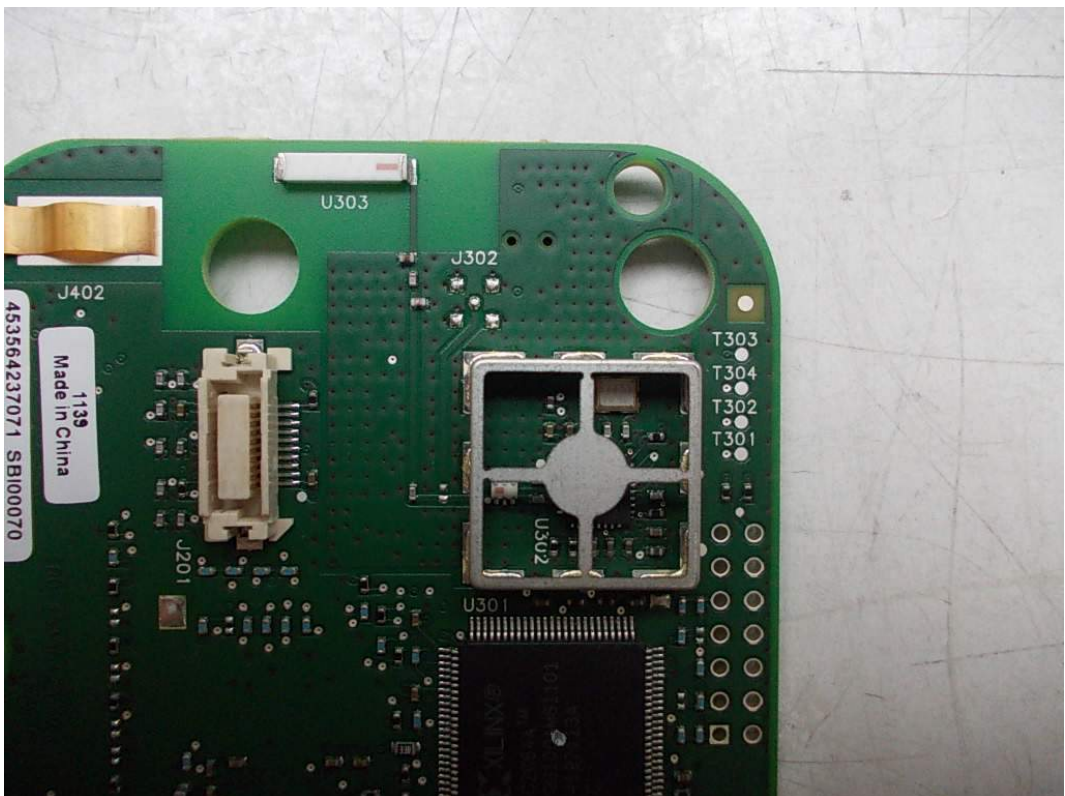
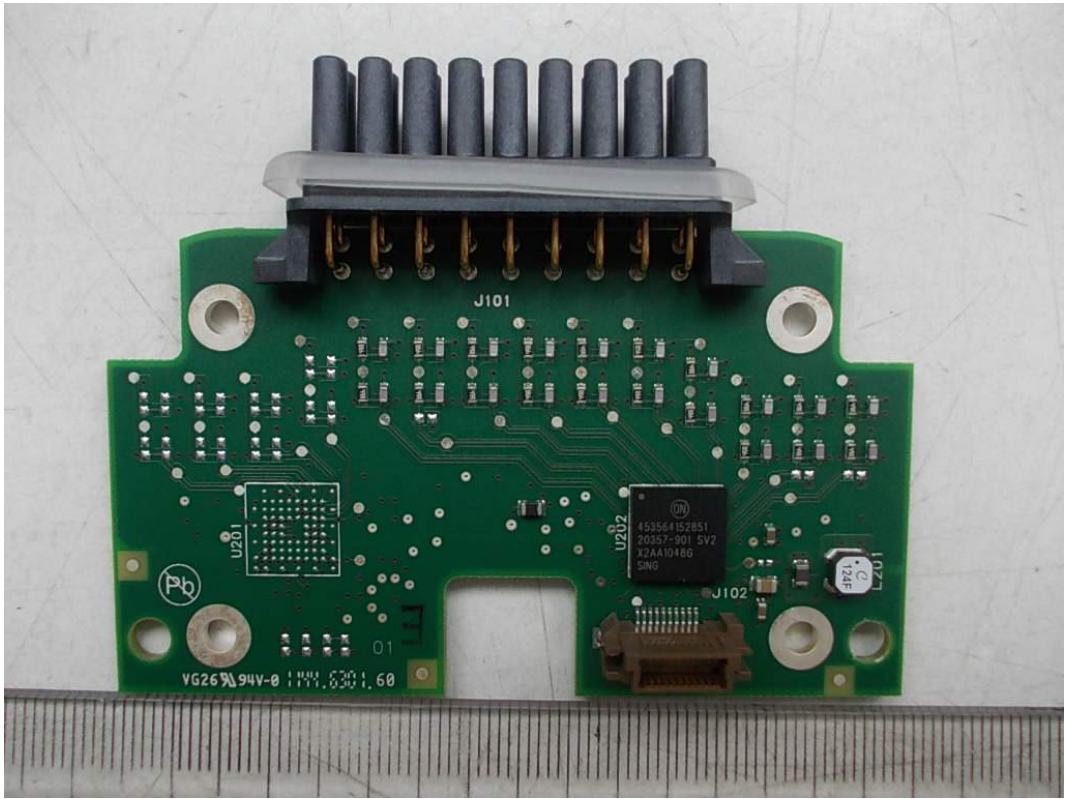


FIGURE 10
PATIENT INTERFACE MODULE (M/N: ST80I WPIM)
ANTENNA ON MAIN BOARD



*FIGURE 11
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
PORT BOARD (FRONT VIEW)*



*FIGURE 12
PATIENT INTERFACE MODULE (M/N: ST80i WPIM)
PORT BOARD (BACK VIEW)*

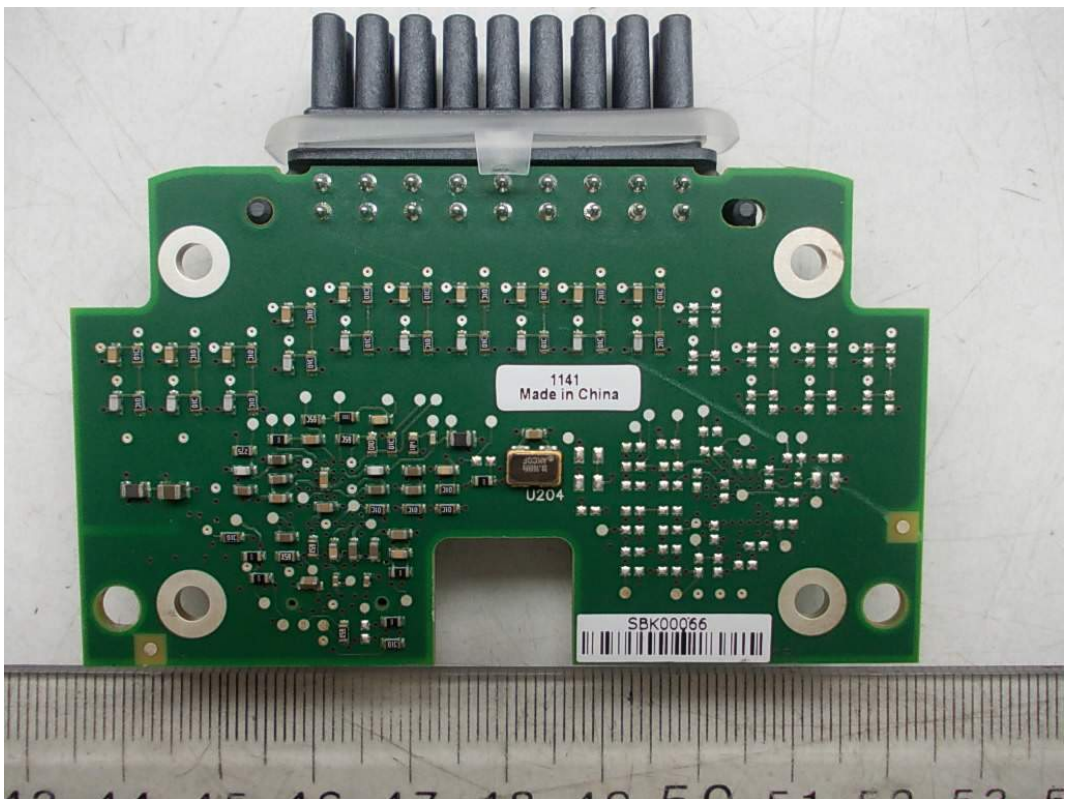


FIGURE 13
PATIENT INTERFACE MODULE (M/N: ST80I WPIM)
CRYSTAL ON PORT BOARD

