

Application for FCC Certification
On behalf of

Philips Medical Systems North America Co.

Product Name: Advanced Interface Module

Model No.: ST80i AIM

Serial No.: AWD1100021

FCC ID: PQC-ST80IAIM

Prepared For : Philips Medical Systems North America Co.
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Report No. : ACI-F12023
Date of Test : Jan. 09 - 21, 2012
Date of Report : Feb. 09, 2012

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DEVIATION TO TEST SPECIFICATIONS

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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 : Advanced Interface Module
(A) Model No. : ST80i AIM
(B) Serial No. : AWD1100021
(C) Test Voltage : DC 5V (USB Power)

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. 09 - 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.

The test result as a class B personal computer peripheral digital device of the EUT is contained in No.F12022, Certificate reports.

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

Producer : Alan He
ALAN HE / Assistant

Review : Sammey Chen
SAMMEY CHEN / Deputy Manager

 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	Pass	15.207
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 : Advanced Interface Module

Type of EUT ☒ Production ☐ Pre-product ☐ Pro-type

Model Number : ST80i AIM

Serial Number : AWD1100021

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 : 2.0 dBi (for both Antenna0 and Antenna1)

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

Remark:

The EUT is a Advanced Interface Module which input/output ports as follows:

For Host unit:

- (1) One USB Port : Connected with PC
- (2) Four Signal Ports : Connected with Signal line and Load

For Patient unit:

- (1) One Signal Port : Connected with Load

2.2 Peripheral

2.2.1 Notebook PC

Manufacturer : DELL
Model Number : PP38L
Serial Number : N/A
Certificate : CE/EMC, FCC DoC, CCC, VCCI, BSMI

2.3 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

2.4 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 3.38 dB

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

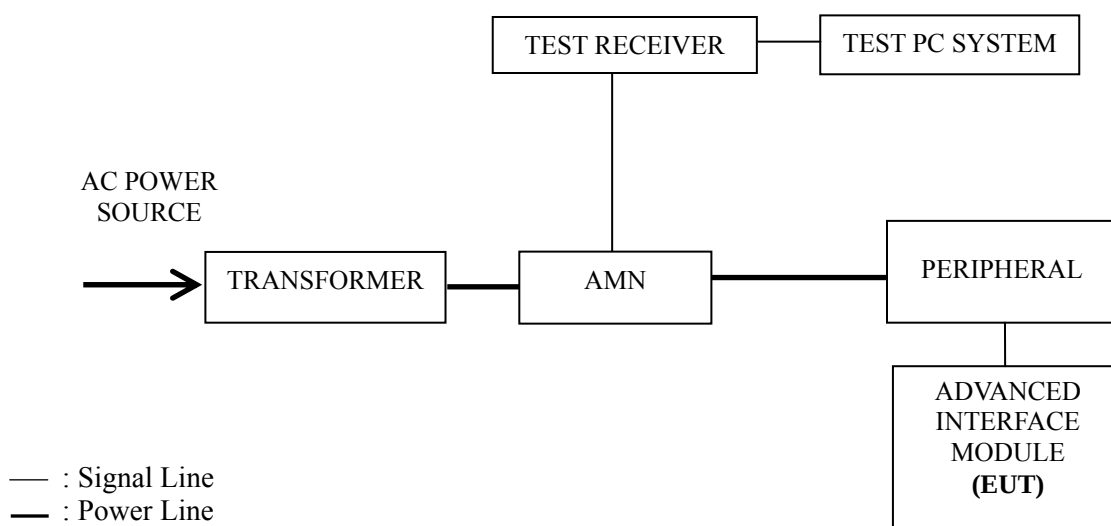
3 CONDUCTED EMISSION TEST

3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	100841	Mar 22, 2011	Mar 22, 2012
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Mar 22, 2011	Mar 22, 2012
3.	50Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep 18, 2011	Mar 18, 2012
4.	Software	Audix	E3	SET00200 9804M592	--	--

3.2 Block Diagram of Test Setup



3.3 Conducted Emission Limits [FCC Part 15 Subpart C 15.207]

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56*	56~46*
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE – *Decreases with the logarithm of the frequency.

3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement 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 equipments and the EUT.

3.5.3 Set the EUT on the test mode (Transmitting), and then test.

3.6 Test Procedures

The EUT was connected to Notebook PC, and the Notebook PC was connected to the power mains through an Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4:2003 during conducted emission test.

The bandwidth of R&S Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7.

3.7 Test Results

< **PASS** >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

NOTE 1 – Factor = Cable Loss + AMN Factor.

NOTE 2 – Emission Level = Meter Reading + Factor.

NOTE 3 – “QP” means “Quasi-Peak” values, “AV” means “Average” values.

NOTE 4 – The worst emission is detected at 0.150 MHz (Average Value) with corrected signal level of 54.81 dB (μV) (limit is 66.00 dB (μV)), when the Line of the Notebook PC is connected to AMN.

EUT : Advanced Interface Module Temperature : 25°C

Model No. : ST80i AIM Humidity : 44%RH

Serial No. : AWD1100021 Date of Test : Jan. 20, 2012

Test Mode : Transmitting

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.150	54.59	0.22	54.81	66.00	11.19	QP
	0.277	44.00	0.23	44.23	60.90	16.67	
	0.297	40.20	0.24	40.44	60.34	19.90	
	0.343	44.94	0.27	45.21	59.13	13.92	
	0.510	42.13	0.31	42.44	56.00	13.56	
	0.830	40.77	0.39	41.16	56.00	14.84	
	0.150	34.45	0.22	34.67	56.00	21.33	AV
	0.277	30.60	0.23	30.83	50.90	20.07	
	0.297	37.40	0.24	37.64	50.34	12.70	
	0.343	27.71	0.27	27.98	49.13	21.15	
	0.510	28.10	0.31	28.41	46.00	17.59	
	0.830	26.60	0.39	26.99	46.00	19.01	
Neutral	0.151	51.78	0.18	51.96	65.96	14.00	QP
	0.296	40.83	0.19	41.02	60.37	19.35	
	0.346	43.95	0.21	44.16	59.05	14.89	
	0.516	41.95	0.24	42.19	56.00	13.81	
	0.686	41.77	0.28	42.05	56.00	13.95	
	0.822	40.77	0.34	41.11	56.00	14.89	
	0.151	35.50	0.18	35.68	55.96	20.28	AV
	0.296	38.10	0.19	38.29	50.37	12.08	
	0.346	26.20	0.21	26.41	49.05	22.64	
	0.516	25.70	0.24	25.94	46.00	20.06	
	0.686	28.20	0.28	28.48	46.00	17.52	
	0.822	24.70	0.34	25.04	46.00	20.96	

TEST ENGINEER: LVY LV

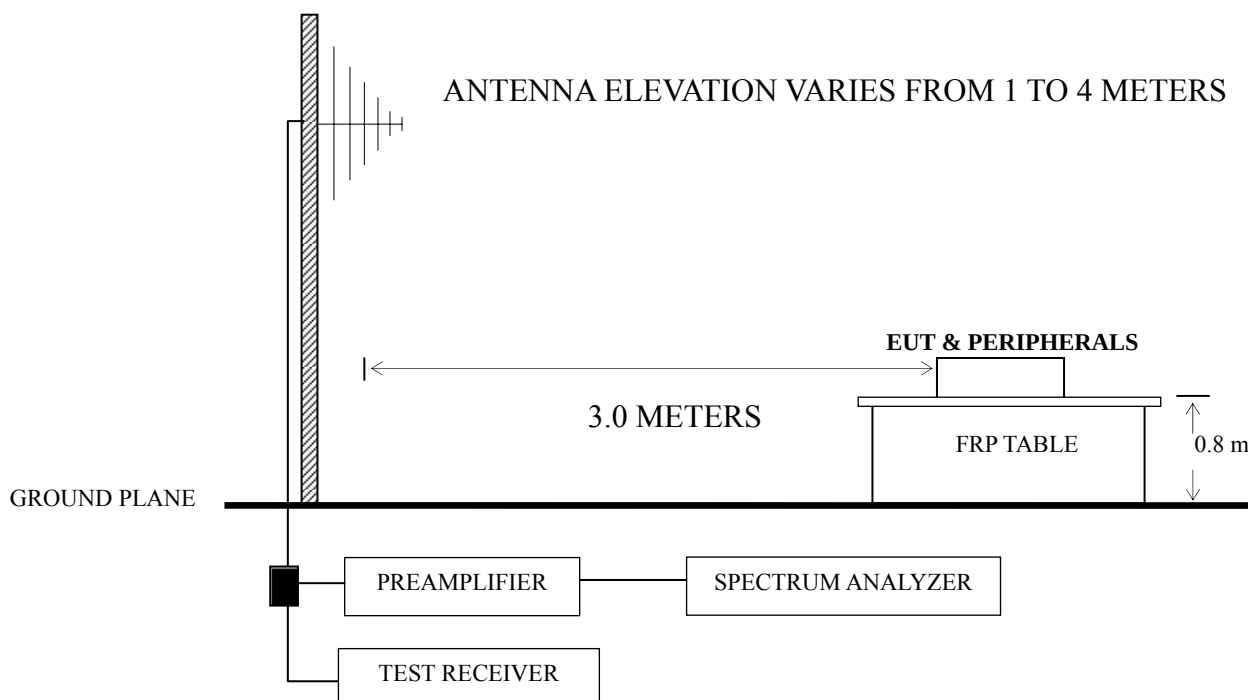
4 RADIATED EMISSION TEST

4.1 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.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2011	Mar 18, 2012
9.	Software	Audix	E3	SET00200 9912M295-2	-	-

4.2 Block Diagram of Test Setup



■ : 50 ohm Coaxial Switch

4.3 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			

4.4 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.

4.5 Operating Condition of EUT

4.5.1 Setup the EUT as shown in Sec. 3.2.

4.5.2 Turn on the power of all equipment.

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

4.6 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.4.7.

4.7 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	Antenna	Channel	Frequency	Data Page	
1.	Transmitting	--	Duty Cycle		P15	
2.		0	00	2405 MHz	P16	
3.			07	2440 MHz	P17	
4.			15	2480 MHz	P18	
5.		1	00	2405 MHz	P19	
6.			07	2440 MHz	P20	
7.			15	2480 MHz	P21	
8.	Receiving	0 and 1	07	2440 MHz	P22	
9.	Transmitting	0	00	2405 MHz	Band Edge	P23-P26
10.			15	2480 MHz		P27-P30
11.		1	00	2405 MHz		P31-P34
12.			15	2480 MHz		P35-P38

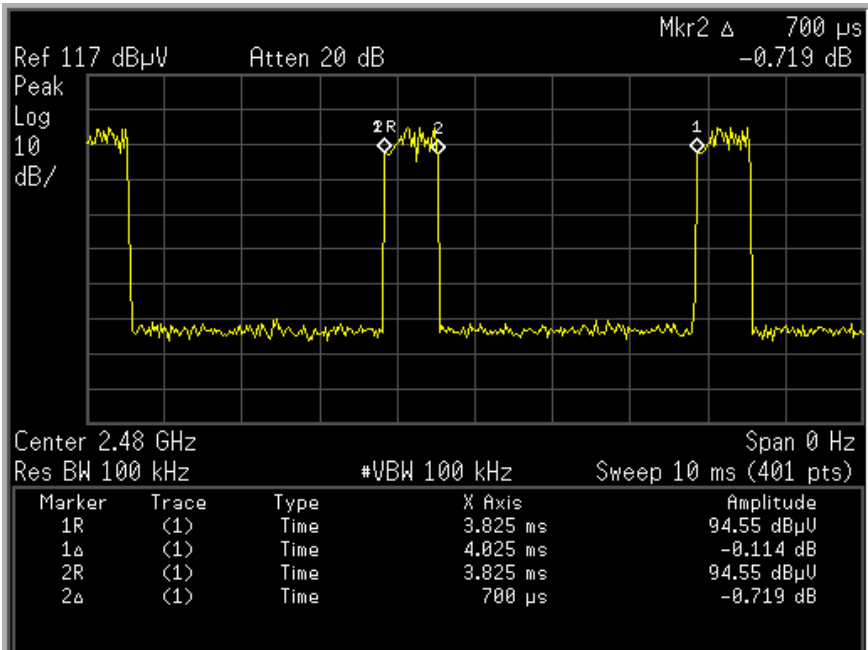
NOTE 1 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

Average value = Peak value - |Duty cycle Factor |

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

NOTE 3 – **For Band-Edge measurement, marker-delta method was used to obtain the test result according to FCC KDB 913591.**

Band Edge Measurement



Duty cycle = TX on / (TX on + TX off) = 0.7 / 4.025 = 0.17
Duty cycle Factor = 20log (0.17) = -15.4 dB

EUT	:	<u>Advanced Interface Module</u>	Temperature :	<u>25°C</u>
Model No.	:	<u>ST80i AIM</u>	Humidity :	<u>45%RH</u>
Serial No.	:	<u>AWD1100021</u>	Date of Test :	<u>Jan 21, 2012</u>
Test Mode	:	<u>Transmitting Ch00</u>	Antenna :	<u>0</u>

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	53.28	10.68	8.70	1.01	--	20.39	40.00	19.61	QP
	101.78	10.51	11.32	1.86	--	23.69	43.50	19.81	
	162.89	12.25	10.21	2.29	--	24.75	43.50	18.75	
	243.40	15.86	11.65	2.58	--	30.09	46.00	15.91	
	384.05	8.70	15.97	2.96	--	27.63	46.00	18.37	
	640.13	7.35	18.74	3.55	--	29.64	46.00	16.36	
	1660.00	48.21	27.13	6.03	36.64	44.73	74.00	29.27	PK
	1996.00	50.03	27.40	6.41	36.21	47.63	74.00	26.37	
	5104.00	42.67	36.66	9.30	35.14	53.49	74.00	20.51	
	7576.00	43.82	38.47	10.14	34.72	57.71	74.00	16.29	
	1660.00	--	--	--	--	29.33	54.00	24.67	AV
	1996.00	--	--	--	--	32.23	54.00	21.77	
	5104.00	--	--	--	--	38.09	54.00	15.91	
	7576.00	--	--	--	--	42.31	54.00	11.69	
Vertical	50.37	22.00	8.51	0.93	--	31.44	40.00	8.56	QP
	82.38	18.53	10.67	1.63	--	30.83	40.00	9.17	
	94.99	20.78	11.18	1.80	--	33.76	43.50	9.74	
	157.07	15.53	10.30	2.26	--	28.09	43.50	15.41	
	241.46	16.84	11.60	2.58	--	31.02	46.00	14.98	
	544.10	9.43	17.87	3.36	--	30.66	46.00	15.34	
	1336.00	53.57	26.47	5.53	37.42	48.15	74.00	25.85	PK
	1672.00	55.08	27.14	6.03	36.62	51.63	74.00	22.37	
	4816.00	45.69	35.74	9.09	35.30	55.22	74.00	18.78	
	7396.00	43.76	38.34	10.02	34.72	57.40	74.00	16.60	
	1336.00	--	--	--	--	32.75	54.00	21.25	AV
	1672.00	--	--	--	--	36.23	54.00	17.77	
	4816.00	--	--	--	--	39.82	54.00	14.18	
	7396.00	--	--	--	--	42.00	54.00	12.00	

TEST ENGINEER: RAVEN JIN

EUT	:	Advanced Interface Module	Temperature :	25°C
Model No.	:	ST80i AIM	Humidity :	45%RH
Serial No.	:	AWD1100021	Date of Test :	Jan 21, 2012
Test Mode	:	Transmitting Ch07	Antenna :	0

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	94.99	10.85	11.18	1.80	--	23.83	43.50	19.67	QP
	101.78	10.61	11.32	1.86	--	23.79	43.50	19.71	
	162.89	12.33	10.21	2.29	--	24.83	43.50	18.67	
	241.46	15.45	11.60	2.58	--	29.63	46.00	16.37	
	384.05	9.41	15.97	2.96	--	28.34	46.00	17.66	
	640.13	7.32	18.74	3.55	--	29.61	46.00	16.39	
	1720.00	52.47	27.19	6.10	36.55	49.21	74.00	24.79	PK
	2980.00	44.84	31.84	6.49	35.90	47.27	74.00	26.73	
	5464.00	42.32	36.51	9.55	34.98	53.40	74.00	20.60	
	7720.00	44.11	38.11	10.31	34.71	57.82	74.00	16.18	
	1720.00	--	--	--	--	33.81	54.00	20.19	AV
	2980.00	--	--	--	--	31.87	54.00	22.13	
	5464.00	--	--	--	--	38.00	54.00	16.00	
	7720.00	--	--	--	--	42.42	54.00	11.58	
Vertical	50.37	22.09	8.51	0.93	--	31.53	40.00	8.47	QP
	94.99	21.21	11.18	1.80	--	34.19	43.50	9.31	
	101.78	17.87	11.32	1.86	--	31.05	43.50	12.45	
	162.89	15.34	10.21	2.29	--	27.84	43.50	15.66	
	243.40	16.68	11.65	2.58	--	30.91	46.00	15.09	
	666.32	6.85	19.08	3.62	--	29.55	46.00	16.45	
	1636.00	51.94	27.11	6.00	36.69	48.36	74.00	25.64	PK
	1996.00	51.95	27.40	6.41	36.21	49.55	74.00	24.45	
	4876.00	47.07	36.04	9.14	35.27	56.98	74.00	17.02	
	7564.00	42.67	38.53	10.14	34.72	56.62	74.00	17.38	
	1636.00	--	--	--	--	32.96	54.00	21.04	AV
	1996.00	--	--	--	--	34.15	54.00	19.85	
	4876.00	--	--	--	--	41.58	54.00	12.42	
	7564.00	--	--	--	--	41.22	54.00	12.78	

TEST ENGINEER: RAVEN JIN

EUT	:	Advanced Interface Module	Temperature :	25°C
Model No.	:	ST80i AIM	Humidity :	45%RH
Serial No.	:	AWD1100021	Date of Test :	Jan 21, 2012
Test Mode	:	Transmitting Ch15	Antenna :	0

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	48.43	7.40	9.02	0.90	--	17.32	40.00	22.68	QP
	101.78	10.86	11.32	1.86	--	24.04	43.50	19.46	
	162.89	12.18	10.21	2.29	--	24.68	43.50	18.82	
	243.40	15.94	11.65	2.58	--	30.17	46.00	15.83	
	381.14	9.00	15.90	2.95	--	27.85	46.00	18.15	
	640.13	7.47	18.74	3.55	--	29.76	46.00	16.24	
	1600.00	49.26	27.08	5.93	36.76	45.51	74.00	28.49	PK
	2944.00	45.19	31.71	6.53	35.91	47.52	74.00	26.48	
	5344.00	41.75	36.56	9.45	35.03	52.73	74.00	21.27	
	7516.00	43.01	38.64	10.14	34.72	57.07	74.00	16.93	
	1600.00	--	--	--	--	30.11	54.00	23.89	AV
	2944.00	--	--	--	--	32.12	54.00	21.88	
	5344.00	--	--	--	--	37.33	54.00	16.67	
	7516.00	--	--	--	--	41.67	54.00	12.33	
Vertical	50.37	22.99	8.51	0.93	--	32.43	40.00	7.57	QP
	89.17	16.69	10.96	1.72	--	29.37	43.50	14.13	
	94.99	20.14	11.18	1.80	--	33.12	43.50	10.38	
	101.78	17.89	11.32	1.86	--	31.07	43.50	12.43	
	162.89	15.11	10.21	2.29	--	27.61	43.50	15.89	
	239.52	17.36	11.51	2.57	--	31.44	46.00	14.56	
	1708.00	52.57	27.18	6.10	36.57	49.28	74.00	24.72	PK
	1996.00	51.70	27.40	6.41	36.21	49.30	74.00	24.70	
	4960.00	45.68	36.49	9.20	35.21	56.16	74.00	17.84	
	7540.00	42.63	38.59	10.14	34.72	56.64	74.00	17.36	
	1708.00	--	--	--	--	33.88	54.00	20.12	AV
	1996.00	--	--	--	--	33.90	54.00	20.10	
	4960.00	--	--	--	--	40.76	54.00	13.24	
	7540.00	--	--	--	--	41.24	54.00	12.76	

TEST ENGINEER: RAVEN JIN

EUT	:	Advanced Interface Module	Temperature :	25°C
Model No.	:	ST80i AIM	Humidity :	45%RH
Serial No.	:	AWD1100021	Date of Test :	Jan 21, 2012
Test Mode	:	Transmitting Ch00	Antenna :	1

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	48.43	9.94	9.02	0.90	--	19.86	40.00	20.14	QP
	94.99	13.39	11.18	1.80	--	26.37	43.50	17.13	
	162.89	14.24	10.21	2.29	--	26.74	43.50	16.76	
	243.40	15.63	11.65	2.58	--	29.86	46.00	16.14	
	331.67	11.21	14.58	2.84	--	28.63	46.00	17.37	
	366.59	11.74	15.57	2.92	--	30.23	46.00	15.77	
	1684.00	47.62	27.15	6.06	36.61	44.22	74.00	29.78	PK
	1996.00	47.79	27.40	6.41	36.21	45.39	74.00	28.61	
	4972.00	42.20	36.56	9.20	35.21	52.75	74.00	21.25	
	7744.00	43.51	38.05	10.31	34.71	57.16	74.00	16.84	
	1684.00	--	--	--	--	28.82	54.00	25.18	AV
	1996.00	--	--	--	--	29.99	54.00	24.01	
	4972.00	--	--	--	--	37.35	54.00	16.65	
	7744.00	--	--	--	--	41.76	54.00	12.24	
Vertical	35.82	10.57	15.19	0.84	--	26.60	40.00	13.40	QP
	50.37	22.49	8.51	0.93	--	31.93	40.00	8.07	
	94.99	20.12	11.18	1.80	--	33.10	43.50	10.40	
	101.78	17.57	11.32	1.86	--	30.75	43.50	12.75	
	162.89	15.50	10.21	2.29	--	28.00	43.50	15.50	
	242.43	16.98	11.65	2.58	--	31.21	46.00	14.79	
	1684.00	53.30	27.15	6.06	36.61	49.90	74.00	24.10	PK
	2332.00	52.43	28.97	6.82	36.11	52.11	74.00	21.89	
	4816.00	45.63	35.74	9.09	35.30	55.16	74.00	18.84	
	7372.00	44.32	38.26	9.91	34.73	57.76	74.00	16.24	
	1684.00	--	--	--	--	34.50	54.00	19.50	AV
	2332.00	--	--	--	--	36.71	54.00	17.29	
	4816.00	--	--	--	--	39.76	54.00	14.24	
	7372.00	--	--	--	--	42.36	54.00	11.64	

TEST ENGINEER: RAVEN JIN

EUT : Advanced Interface Module Temperature : 25°C

Model No. : ST80i AIM Humidity : 45%RH

Serial No. : AWD1100021 Date of Test : Jan 21, 2012

Test Mode : Transmitting Ch07 Antenna : 1

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	45.52	8.51	10.09	0.89	--	19.49	40.00	20.51	QP
	94.99	13.47	11.18	1.80	--	26.45	43.50	17.05	
	101.78	12.61	11.32	1.86	--	25.79	43.50	17.71	
	162.89	13.63	10.21	2.29	--	26.13	43.50	17.37	
	243.40	15.52	11.65	2.58	--	29.75	46.00	16.25	
	384.05	8.41	15.97	2.96	--	27.34	46.00	18.66	
	1768.00	49.24	27.23	6.17	36.48	46.16	74.00	27.84	PK
	2968.00	44.83	31.77	6.49	35.90	47.19	74.00	26.81	
	4780.00	42.89	35.50	9.09	35.32	52.16	74.00	21.84	
	7528.00	42.65	38.64	10.14	34.72	56.71	74.00	17.29	
	1768.00	--	--	--	--	30.76	54.00	23.24	AV
	2968.00	--	--	--	--	31.79	54.00	22.21	
	4780.00	--	--	--	--	36.76	54.00	17.24	
	7528.00	--	--	--	--	41.31	54.00	12.69	
Vertical	49.40	22.03	8.69	0.91	--	31.63	40.00	8.37	QP
	94.99	20.40	11.18	1.80	--	33.38	43.50	10.12	
	162.89	15.84	10.21	2.29	--	28.34	43.50	15.16	
	239.52	17.04	11.51	2.57	--	31.12	46.00	14.88	
	437.40	9.30	16.79	3.09	--	29.18	46.00	16.82	
	666.32	5.90	19.08	3.62	--	28.60	46.00	17.40	
	1336.00	55.10	26.47	5.53	37.42	49.68	74.00	24.32	PK
	1732.00	54.44	27.20	6.13	36.53	51.24	74.00	22.76	
	4876.00	50.02	36.04	9.14	35.27	59.93	74.00	14.07	
	7552.00	42.73	38.59	10.14	34.72	56.74	74.00	17.26	
	1336.00	--	--	--	--	34.28	54.00	19.72	AV
	1732.00	--	--	--	--	35.84	54.00	18.16	
	4876.00	--	--	--	--	44.53	54.00	9.47	
	7552.00	--	--	--	--	41.34	54.00	12.66	

TEST ENGINEER: RAVEN JIN

EUT	:	Advanced Interface Module	Temperature :	25°C
Model No.	:	ST80i AIM	Humidity :	45%RH
Serial No.	:	AWD1100021	Date of Test :	Jan 21, 2012
Test Mode	:	Transmitting Ch15	Antenna :	1

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	94.99	10.40	11.18	1.80	--	23.38	43.50	20.12	QP
	101.78	11.01	11.32	1.86	--	24.19	43.50	19.31	
	162.89	11.99	10.21	2.29	--	24.49	43.50	19.01	
	243.40	15.50	11.65	2.58	--	29.73	46.00	16.27	
	384.05	9.08	15.97	2.96	--	28.01	46.00	17.99	
	640.13	7.81	18.74	3.55	--	30.10	46.00	15.90	
	1660.00	53.80	27.13	6.03	36.64	50.32	74.00	23.68	PK
	1996.00	51.89	27.40	6.41	36.21	49.49	74.00	24.51	
	4960.00	47.68	36.49	9.20	35.21	58.16	74.00	15.84	
	7552.00	43.18	38.59	10.14	34.72	57.19	74.00	16.81	
	1660.00	--	--	--	--	34.92	54.00	19.08	AV
	1996.00	--	--	--	--	34.09	54.00	19.91	
	4960.00	--	--	--	--	42.76	54.00	11.24	
	7552.00	--	--	--	--	41.79	54.00	12.21	
Vertical	35.82	9.80	15.19	0.84	--	25.83	40.00	14.17	QP
	49.40	23.51	8.69	0.91	--	33.11	40.00	6.89	
	94.99	20.26	11.18	1.80	--	33.24	43.50	10.26	
	162.89	15.33	10.21	2.29	--	27.83	43.50	15.67	
	242.43	16.84	11.65	2.58	--	31.07	46.00	14.93	
	666.32	7.12	19.08	3.62	--	29.82	46.00	16.18	
	1684.00	48.23	27.15	6.06	36.61	44.83	74.00	29.17	PK
	2968.00	44.61	31.77	6.49	35.90	46.97	74.00	27.03	
	5104.00	42.23	36.66	9.30	35.14	53.05	74.00	20.95	
	7552.00	42.34	38.59	10.14	34.72	56.35	74.00	17.65	
	1684.00	--	--	--	--	29.43	54.00	24.57	AV
	2968.00	--	--	--	--	31.57	54.00	22.43	
	5104.00	--	--	--	--	37.65	54.00	16.35	
	7552.00	--	--	--	--	40.95	54.00	13.05	

TEST ENGINEER: RAVEN JIN

EUT	:	Advanced Interface Module	Temperature :	25°C
Model No.	:	ST80i AIM	Humidity :	45%RH
Serial No.	:	AWD1100021	Date of Test :	Jan 21, 2012
Test Mode	:	Receiving Ch07	Antenna :	0 and 1

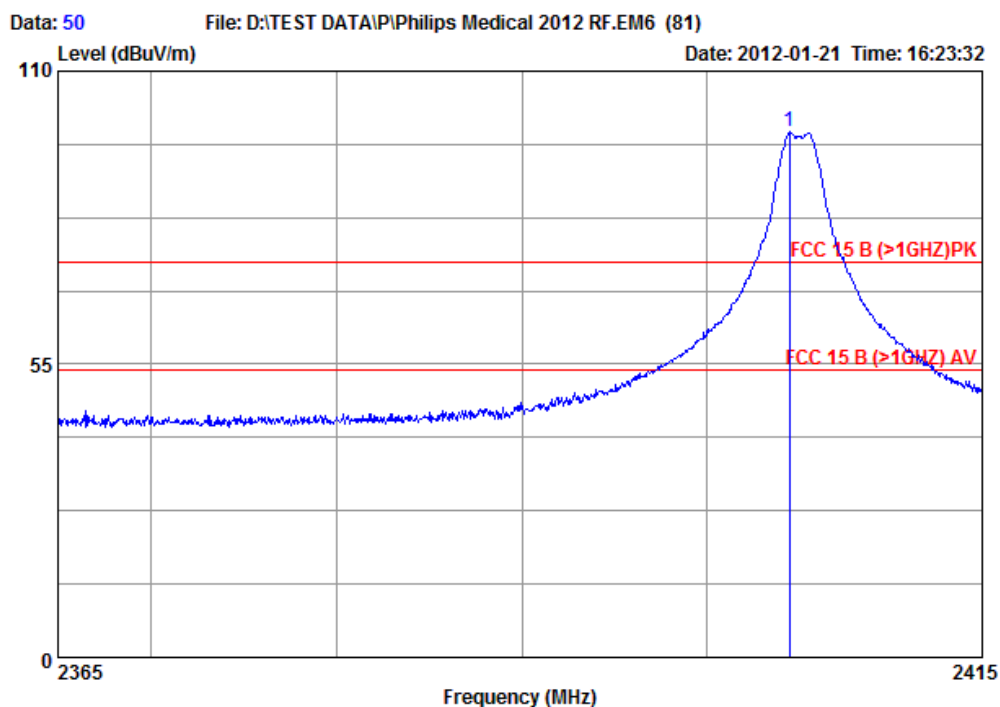
Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	48.43	6.66	9.02	0.90	--	16.58	40.00	23.42	QP
	94.99	11.03	11.18	1.80	--	24.01	43.50	19.49	
	162.89	12.02	10.21	2.29	--	24.52	43.50	18.98	
	243.40	15.49	11.65	2.58	--	29.72	46.00	16.28	
	384.05	8.58	15.97	2.96	--	27.51	46.00	18.49	
	640.13	7.48	18.74	3.55	--	29.77	46.00	16.23	
	1684.00	48.77	27.15	6.06	36.61	45.37	74.00	28.63	PK
	1996.00	50.12	27.40	6.41	36.21	47.72	74.00	26.28	
	2476.00	49.48	29.53	6.96	36.07	49.90	74.00	24.10	
	5224.00	42.50	36.61	9.40	35.09	53.42	74.00	20.58	
	1684.00	--	--	--	--	29.97	54.00	24.03	AV
	1996.00	--	--	--	--	32.32	54.00	21.68	
	2476.00	--	--	--	--	34.50	54.00	19.50	
	5224.00	--	--	--	--	38.02	54.00	15.98	
Vertical	51.34	21.84	8.58	0.95	--	31.37	40.00	8.63	QP
	94.99	19.96	11.18	1.80	--	32.94	43.50	10.56	
	101.78	18.29	11.32	1.86	--	31.47	43.50	12.03	
	165.80	17.33	10.17	2.30	--	29.80	43.50	13.70	
	242.43	16.64	11.65	2.58	--	30.87	46.00	15.13	
	666.32	6.63	19.08	3.62	--	29.33	46.00	16.67	
	1336.00	57.42	26.47	5.53	37.42	52.00	74.00	22.00	PK
	2332.00	52.11	28.97	6.82	36.11	51.79	74.00	22.21	
	5044.00	42.42	36.68	9.25	35.17	53.18	74.00	20.82	
	6088.00	43.13	36.54	9.07	34.80	53.94	74.00	20.06	
	1336.00	--	--	--	--	36.60	54.00	17.40	AV
	2332.00	--	--	--	--	36.39	54.00	17.61	
	5044.00	--	--	--	--	37.78	54.00	16.22	
	6088.00	--	--	--	--	38.54	54.00	15.46	

TEST ENGINEER: RAVEN JIN

Antenna0 Ch00 2405MHz



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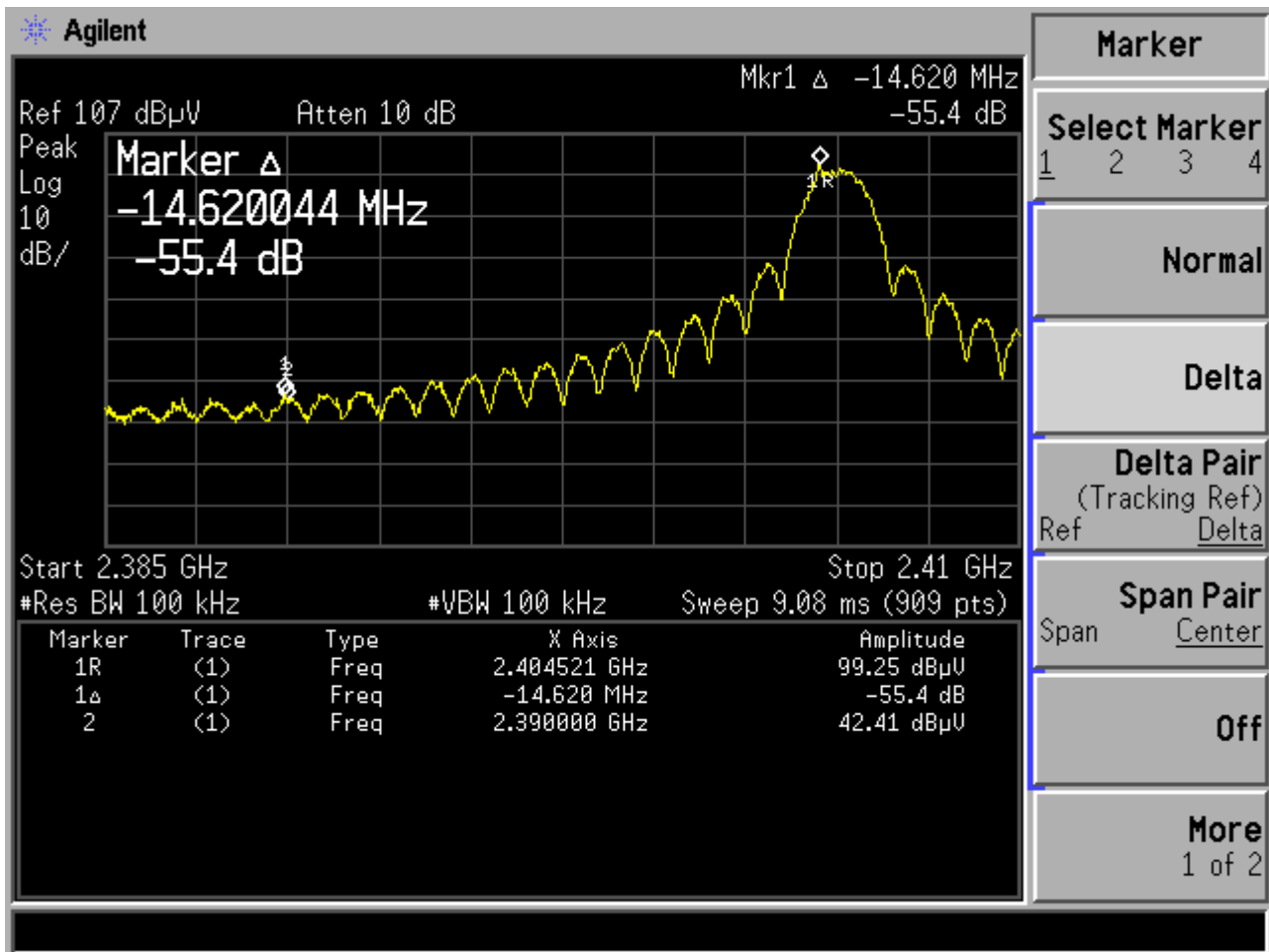
Site no	: Audix ACI (3m Chamber)	Data no.	: 50
Dis. / Ant.	: 3m / EMCO	Ant. pol.	: HORIZONTAL
Limit	: FCC 15 B (>1GHZ) PK	Engineer	: Raven
Env. / Ins.	: 22'C 60%RH/ E7405A		
M/N	: ST80i AIM		
Power Rating:	120V/60Hz		
Test Mode	: TX CH0 ANT0		

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	98.44	98.51	74.00	-24.51	Peak

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

PK Result = 98.51 dBuV/m

AV Result = 102.98 – 15.4 = 83.11 dBuV/m



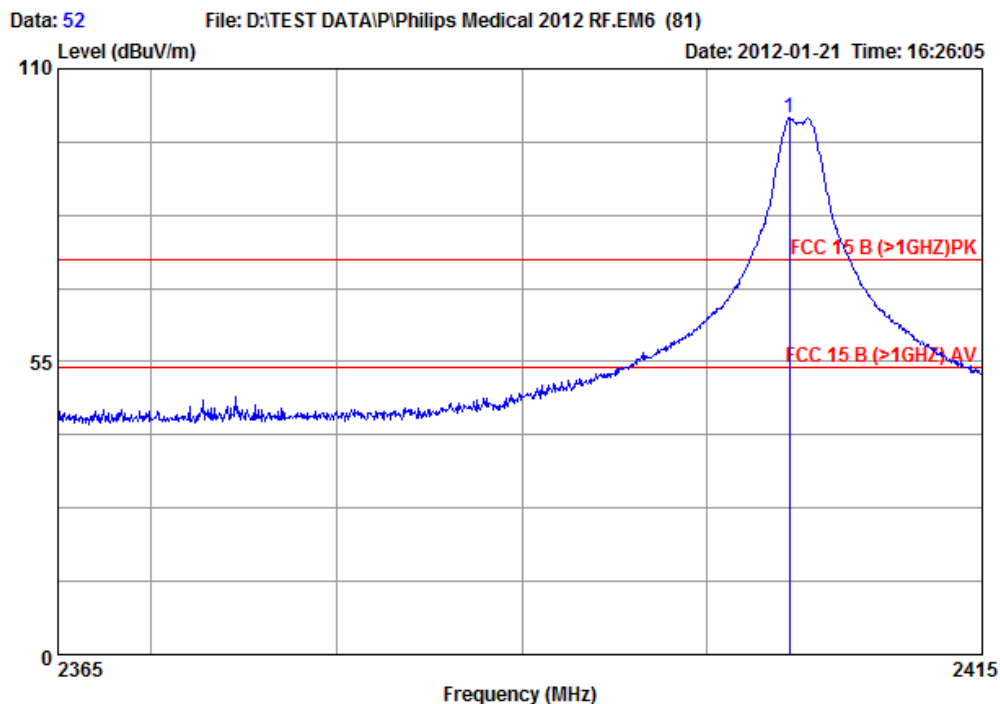
Delta = 55.4 dB

PK Final Result = PK Result - Delta = 98.51 – 55.4 = 43.11 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 83.11 – 55.4 = 27.71 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**



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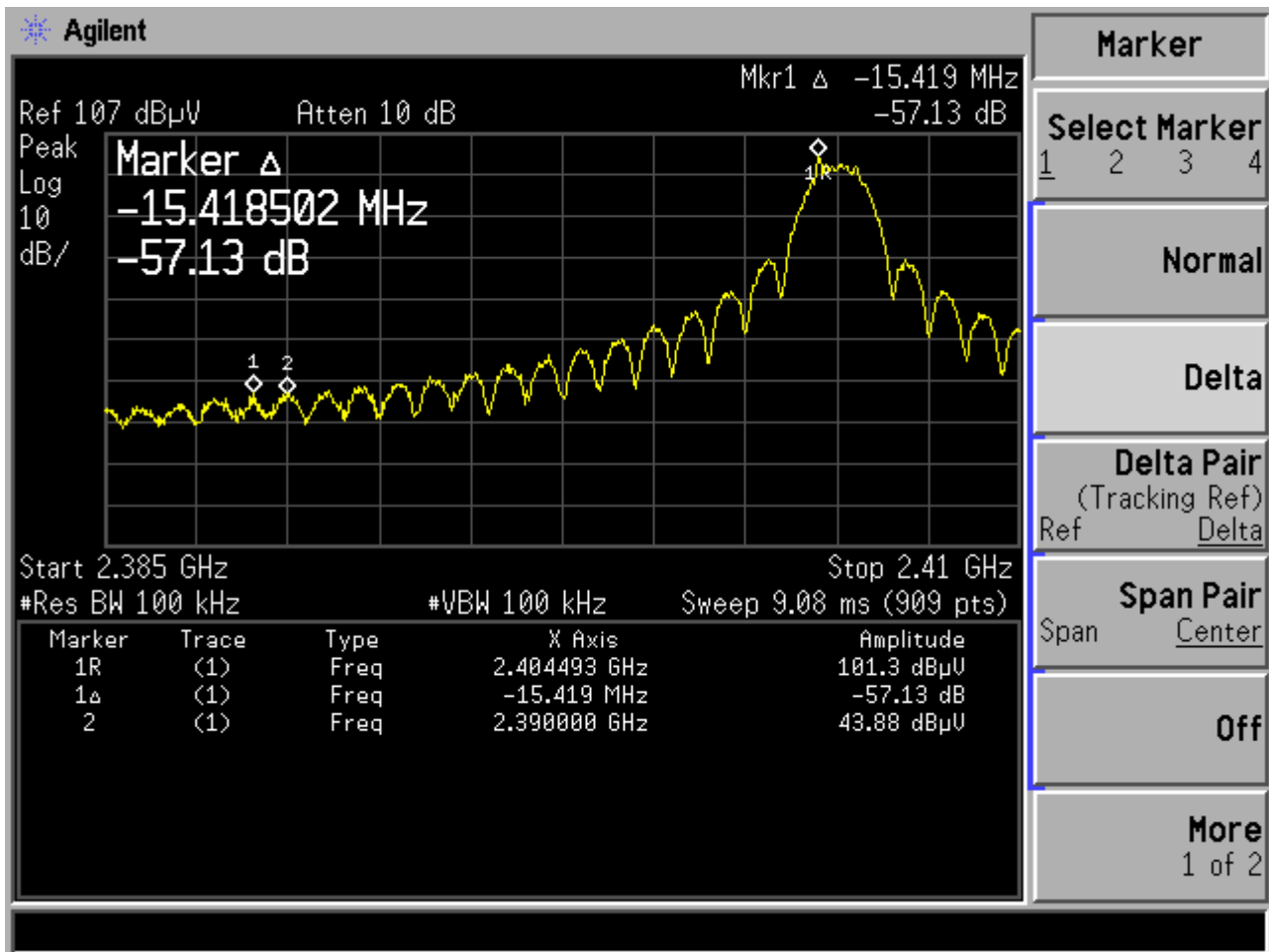
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Dis. / Ant. : 3m / EMCO
Limit : FCC 15 B (>1GHZ) PK Ant. pol. : VERTICAL
Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
M/N : ST80i AIM
Power Rating: 120V/60Hz
Test Mode : TX CH0 ANT0

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	100.69	100.76	74.00	-26.76	Peak

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

PK Result = 100.76 dBuV/m

AV Result = 100.76 – 15.4 = 85.36 dBuV/m



Delta = 57.13 dB

PK Final Result = PK Result - Delta = 100.76 – 57.13 = 43.63 dBuV/m

Limit = 74 dBuV/m

Result is **PASS**

AV Final Result = AV Result - Delta = 85.36 – 57.13 = 28.23 dBuV/m

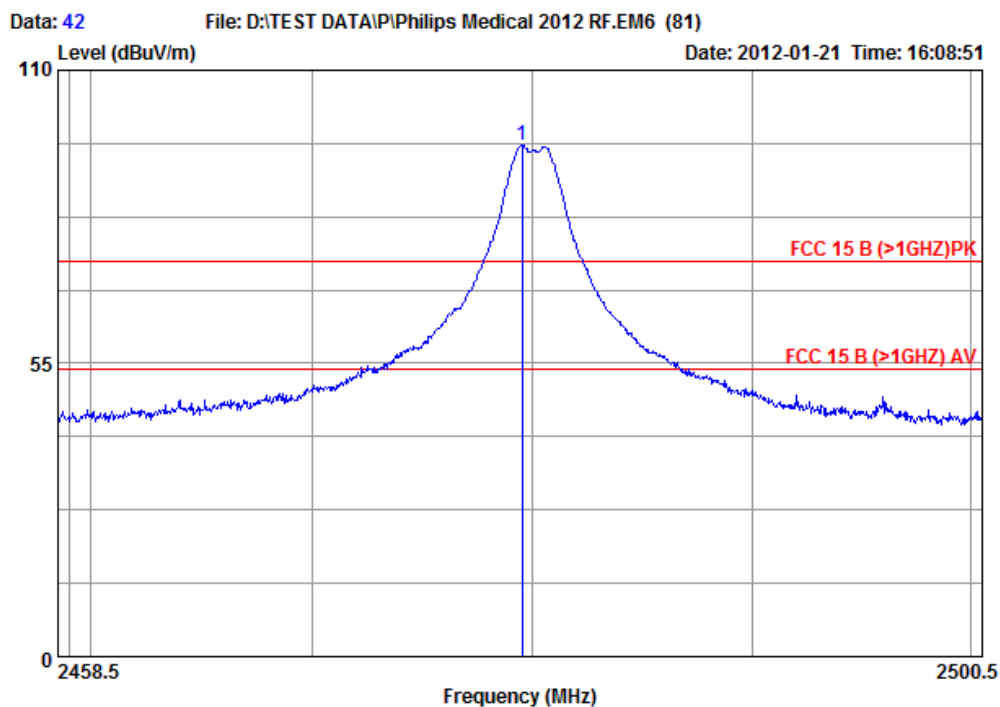
Limit = 54 dBuV/m

Result is **PASS**

Antenna0 Ch15 2480MHz



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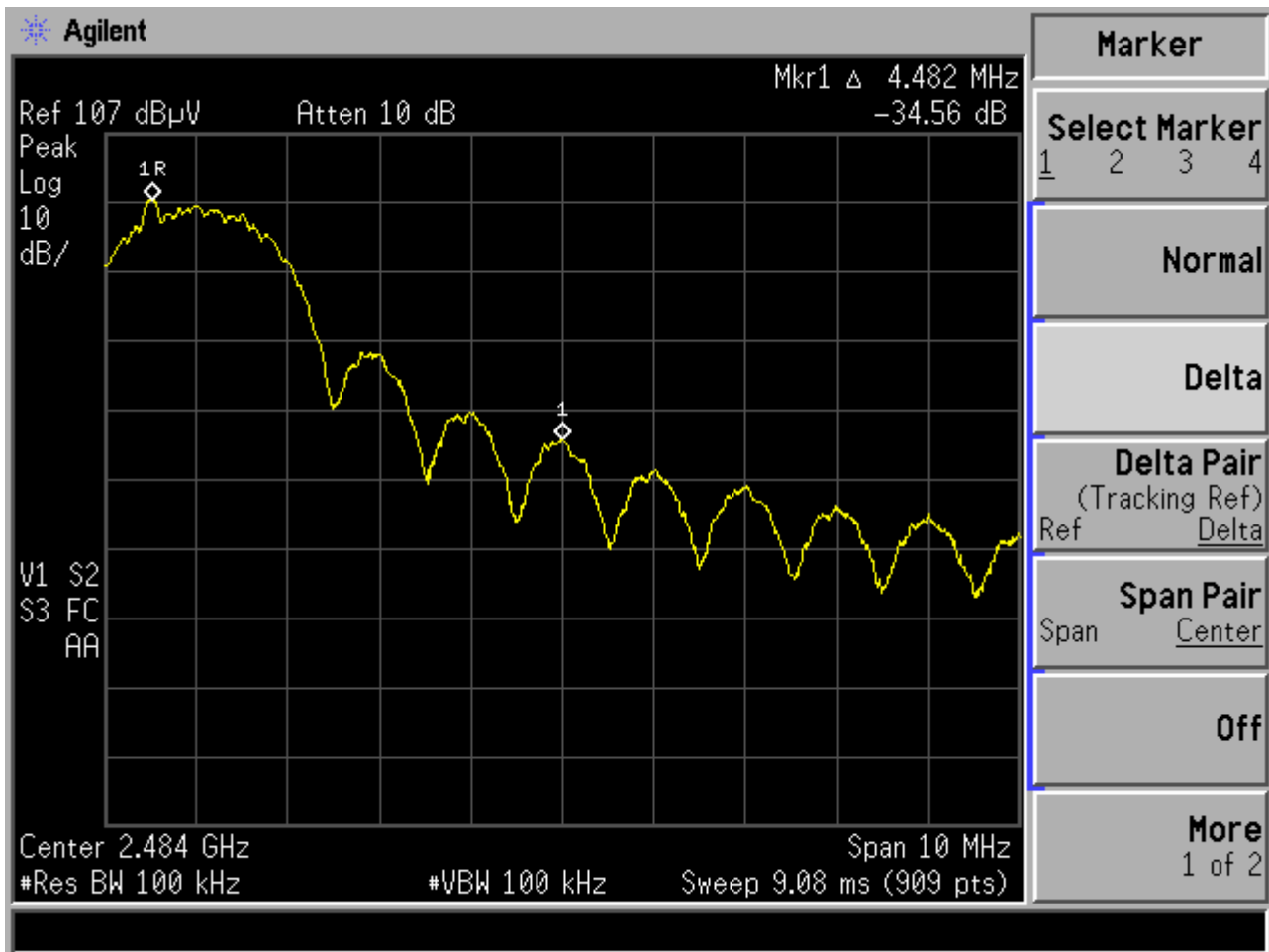
Site no : Audix ACI (3m Chamber) Data no. : 42
Dis. / Ant. : 3m / EMCO
Limit : FCC 15 B (>1GHZ) PK Ant. pol. : HORIZONTAL
Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
M/N : ST80i AIM
Power Rating: 120V/60Hz
Test Mode : TX CH15 ANT0

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	95.55	95.97	74.00	-21.97	Peak

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

PK Result = 95.97 dBUV/m

AV Result = 95.97 - 15.4 = 80.57 dBUV/m



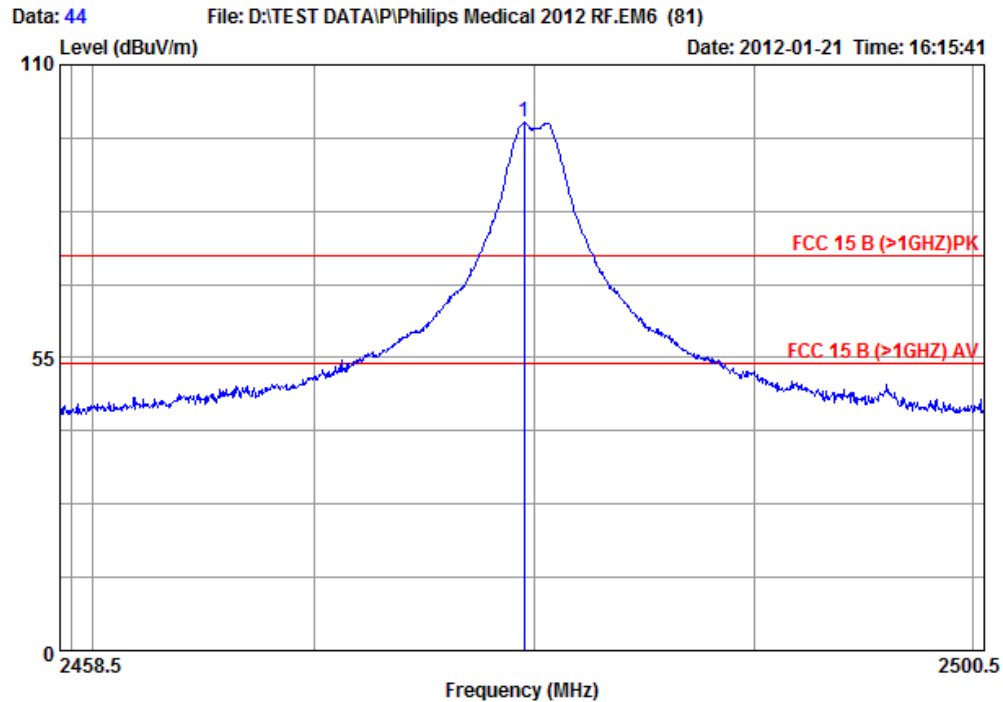
Delta = 34.56 dB

PK Final Result = PK Result - Delta = 95.97 – 34.56 = 61.41 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 80.57 – 34.56 = 46.01 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**



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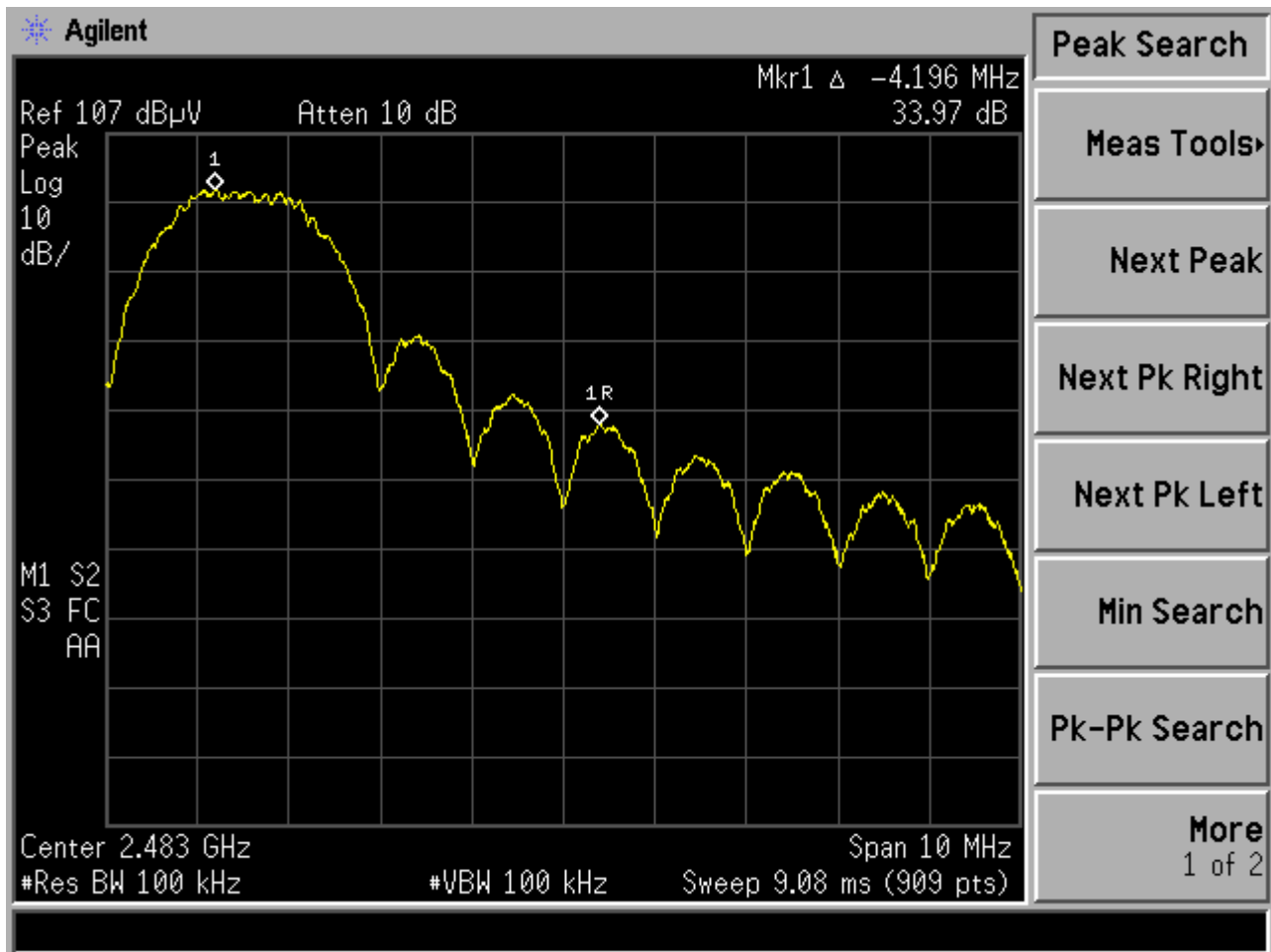
Site no : Audix ACI (3m Chamber) Data no. : 44
Dis. / Ant. : 3m / EMCO
Limit : FCC 15 B (>1GHZ) PK Ant. pol. : VERTICAL
Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
M/N : ST80i AIM
Power Rating: 120V/60Hz
Test Mode : TX CH15 ANT0

Freq.	Antenna	Preamp	Cable	Reading	Emission	Limits	Margin	Remark
(MHz)	Factor	Factor	Loss	(dBuV)	Level	(dBuV/m)	(dB)	
	(dB/m)	(dB)	(dB)		(dBuV/m)			
1 2479.500	29.53	36.07	6.96	98.76	99.18	74.00	-25.18	Peak

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

PK Result = 99.18 dBuV/m

AV Result = 99.18 – 15.4 = 83.78 dBuV/m



Delta = 33.97 dB

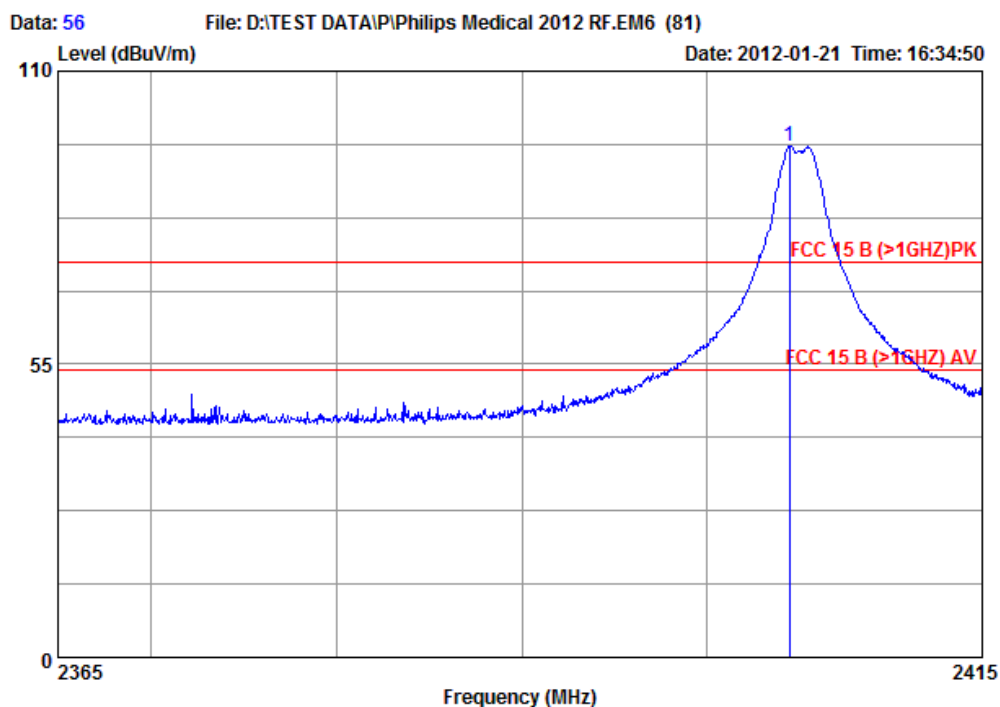
PK Final Result = PK Result - Delta = 99.18 – 33.97 = 65.21 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 83.78 – 33.97 = 49.81 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**

Antenna1 Ch00 2405MHz



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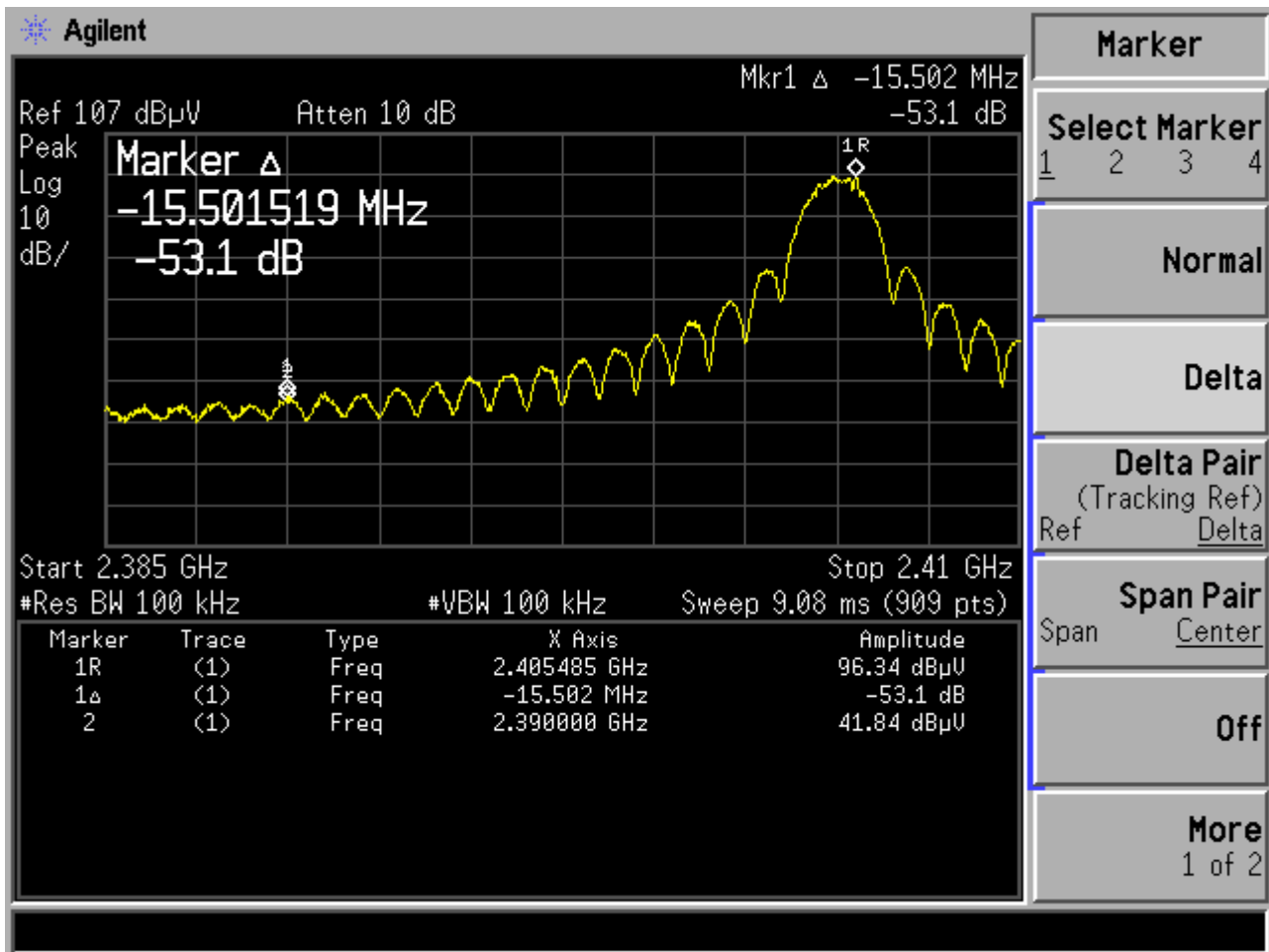
Site no	: Audix ACI (3m Chamber)	Data no.	: 56
Dis. / Ant.	: 3m / EMCO	Ant. pol.	: HORIZONTAL
Limit	: FCC 15 B (>1GHZ) PK	Engineer	: Raven
Env. / Ins.	: 22'C 60%RH/ E7405A		
M/N	: ST80i AIM		
Power Rating:	120V/60Hz		
Test Mode	: TX CH0 ANT1		

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	95.78	95.85	74.00	-21.85	Peak

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

PK Result = 95.85 dBuV/m

AV Result = 95.85 - 15.4 = 80.45 dBuV/m



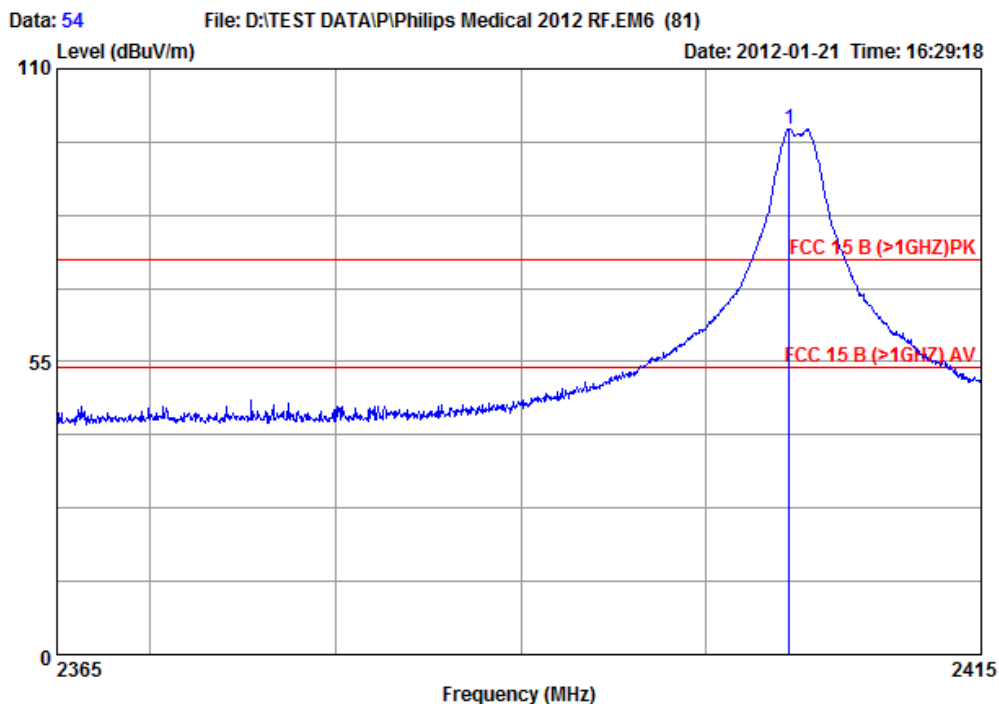
Delta = 53.1 dB

PK Final Result = PK Result - Delta = 95.85 – 53.1 = 42.75 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 80.45 – 53.1 = 27.35 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**



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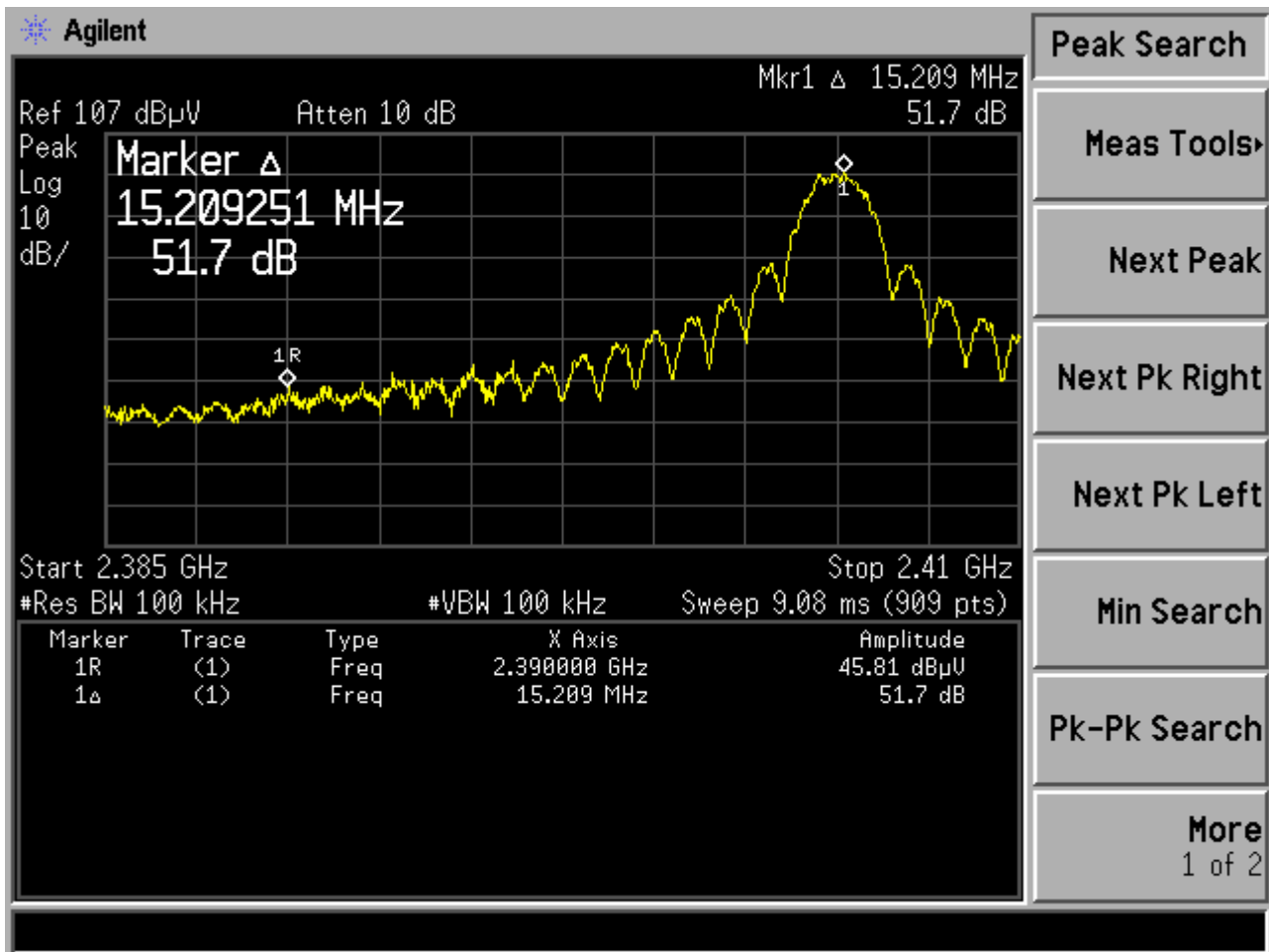
Site no : Audix ACI (3m Chamber) Data no. : 54
Dis. / Ant. : 3m / EMCO
Limit : FCC 15 B (>1GHZ) PK Ant. pol. : VERTICAL
Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
M/N : ST80i AIM
Power Rating: 120V/60Hz
Test Mode : TX CH0 ANT1

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	98.63	98.70	74.00	-24.70	Peak

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

PK Result = 98.70 dBuV/m

AV Result = 98.70 – 15.4 = 83.30 dBuV/m



Delta = 51.7 dB

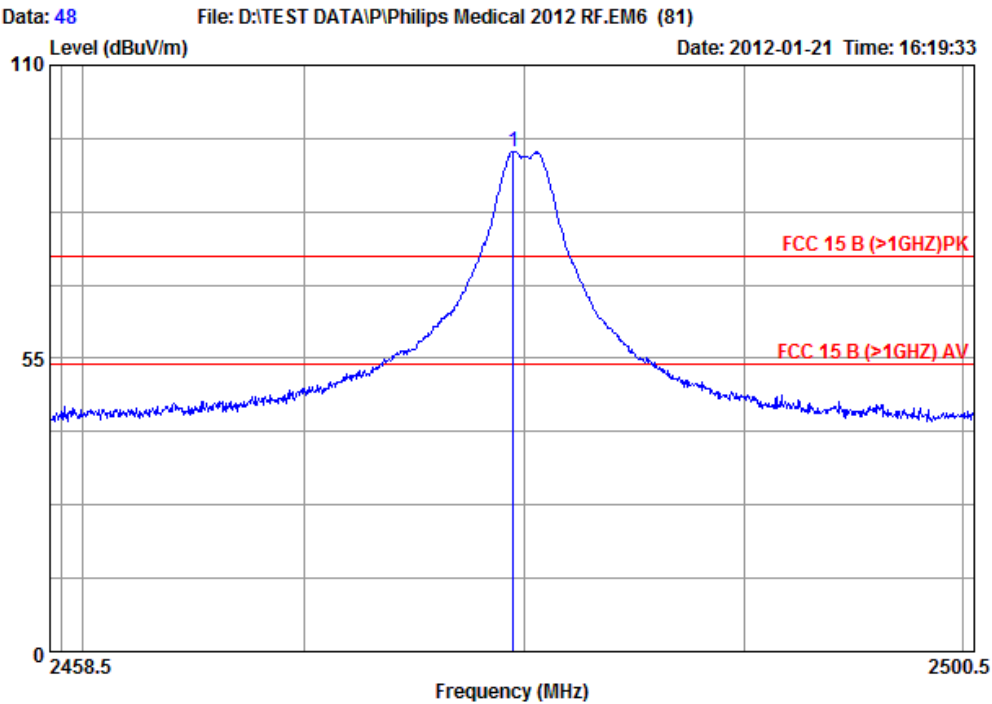
PK Final Result = PK Result - Delta = 98.70 – 51.7 = 47.00 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 83.30 – 51.7 = 31.60 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**

Antenna1 Ch15 2480MHz



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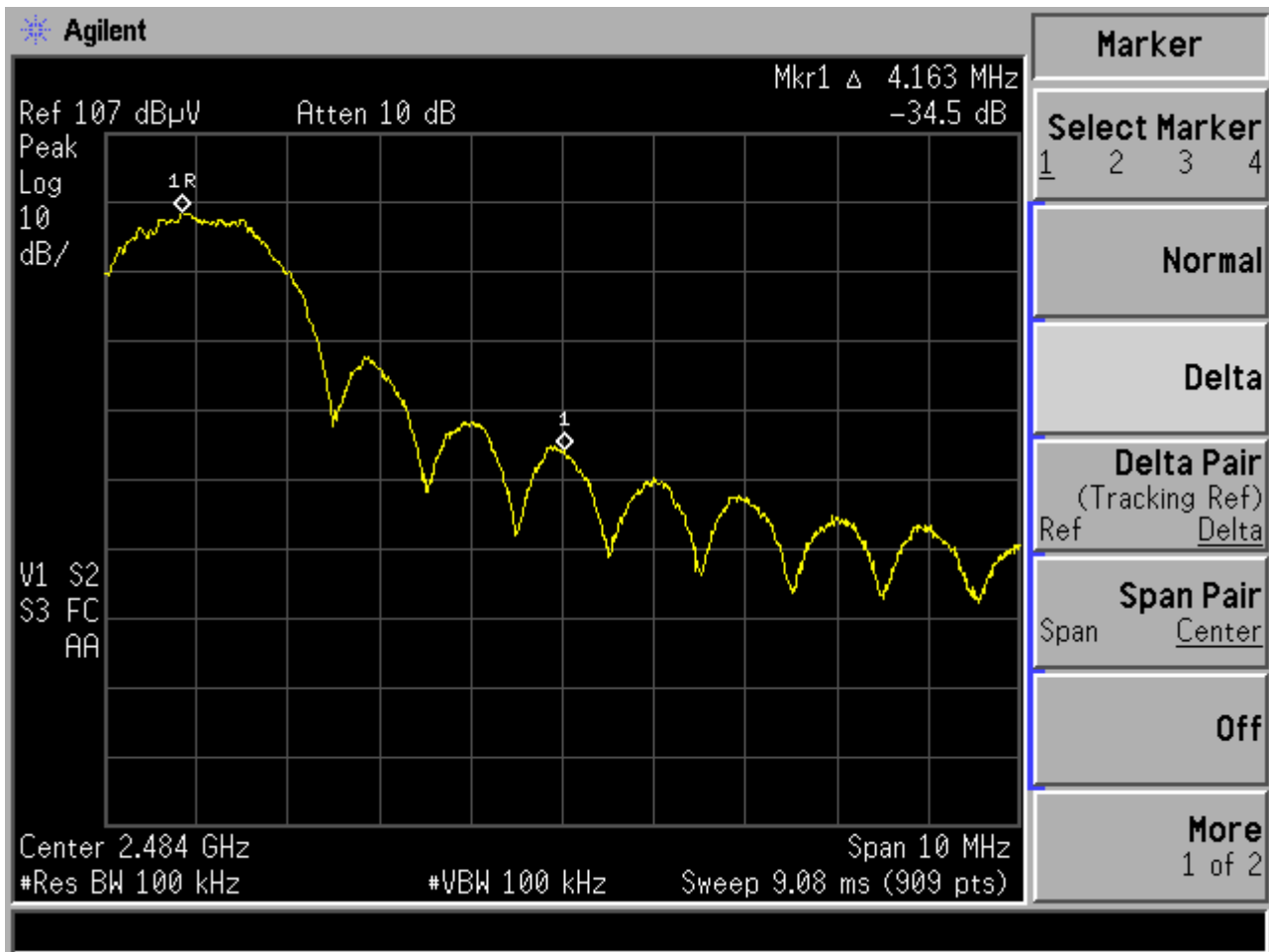
Site no	: Audix ACI (3m Chamber)	Data no.	: 48
Dis. / Ant.	: 3m / EMCO	Ant. pol.	: HORIZONTAL
Limit	: FCC 15 B (>1GHZ) PK	Engineer	: Raven
Env. / Ins.	: 22'C 60%RH/ E7405A		
M/N	: ST80i AIM		
Power Rating:	120V/60Hz		
Test Mode	: TX CH15 ANT1		

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 2479.458	29.53	36.07	6.96	93.47	93.89	74.00	-19.89	Peak

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

PK Result = 93.89 dBUV/m

AV Result = 93.89 – 15.4 = 78.49 dBUV/m



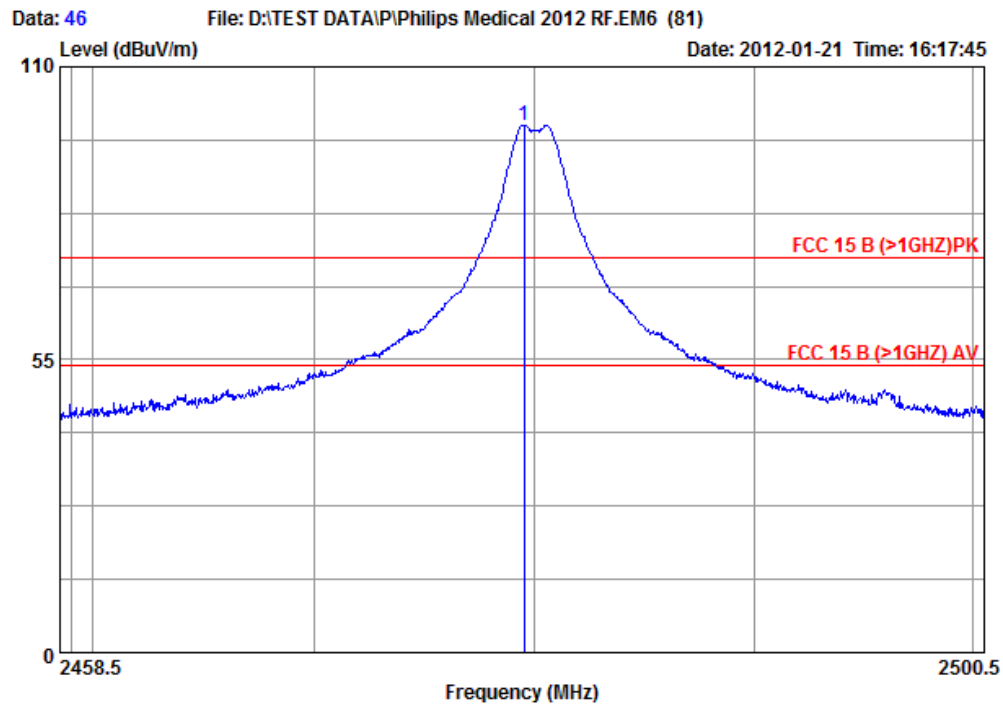
Delta = 34.5 dB

PK Final Result = PK Result - Delta = 93.89 - 34.5 = 59.39 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 78.49 - 34.5 = 43.99 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**



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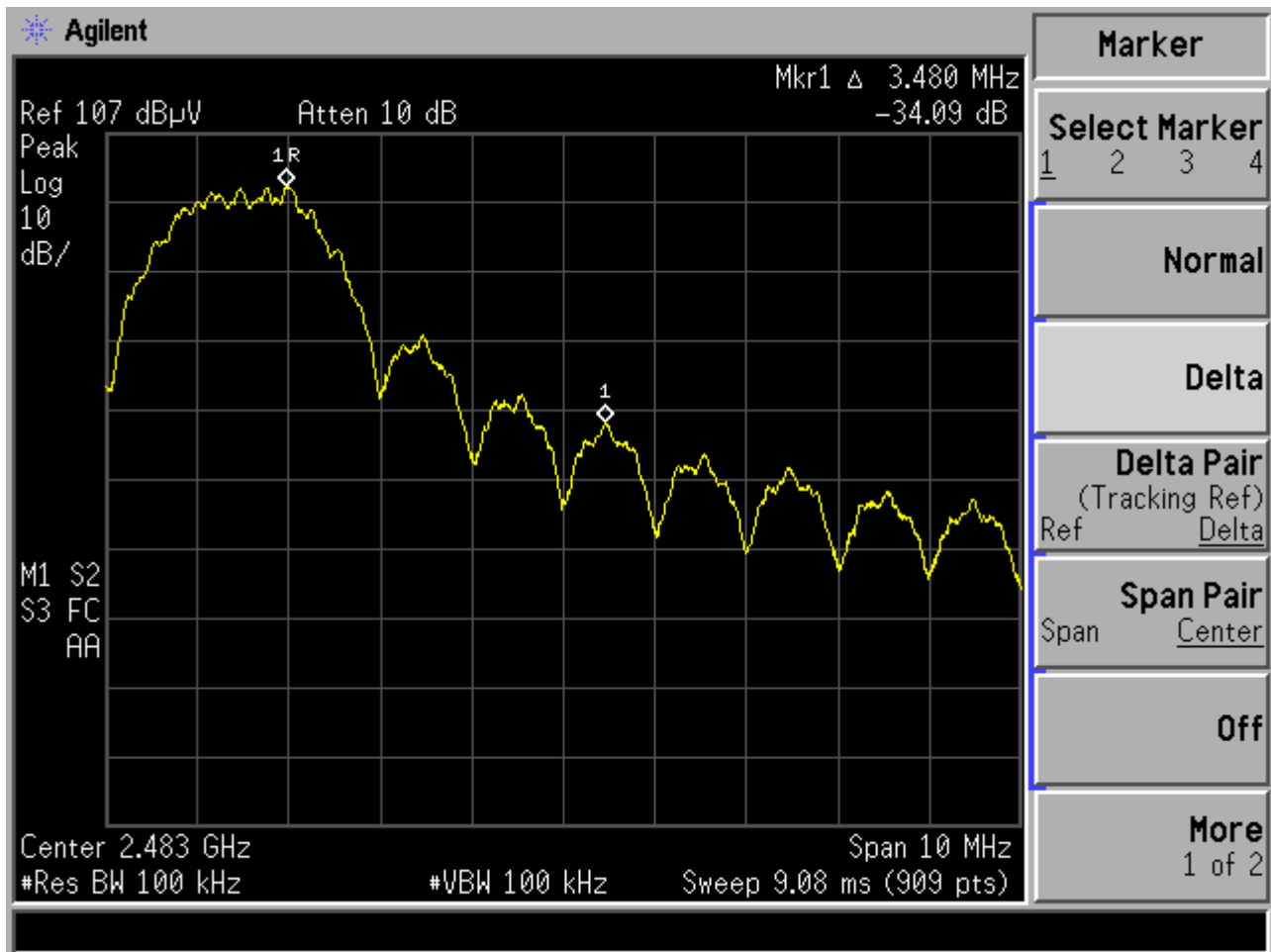
Site no : Audix ACI (3m Chamber) Data no. : 46
Dis. / Ant. : 3m / EMCO
Limit : FCC 15 B (>1GHZ)PK Ant. pol. : VERTICAL
Env. / Ins. : 22'C 60%RH/ E7405A Engineer : Raven
M/N : ST80i AIM
Power Rating: 120V/60Hz
Test Mode : TX CH15 ANT1

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	98.70	99.12	74.00	-25.12	Peak

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

PK Result = 99.12 dBuV/m

AV Result = 99.12 - 15.4 = 83.72 dBuV/m



Delta = 34.09 dB

PK Final Result = PK Result - Delta = 99.12 – 34.09 = 65.03 dBuV/m
Limit = 74 dBuV/m
Result is **PASS**

AV Final Result = AV Result - Delta = 83.72 – 34.09 = 49.63 dBuV/m
Limit = 54 dBuV/m
Result is **PASS**

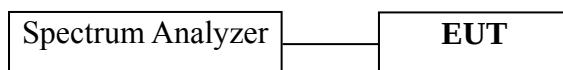
5 6 dB BANDWIDTH MEASUREMENT

5.1 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

5.2 Block Diagram of Test Setup



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

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

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

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.

5.6 Test Results

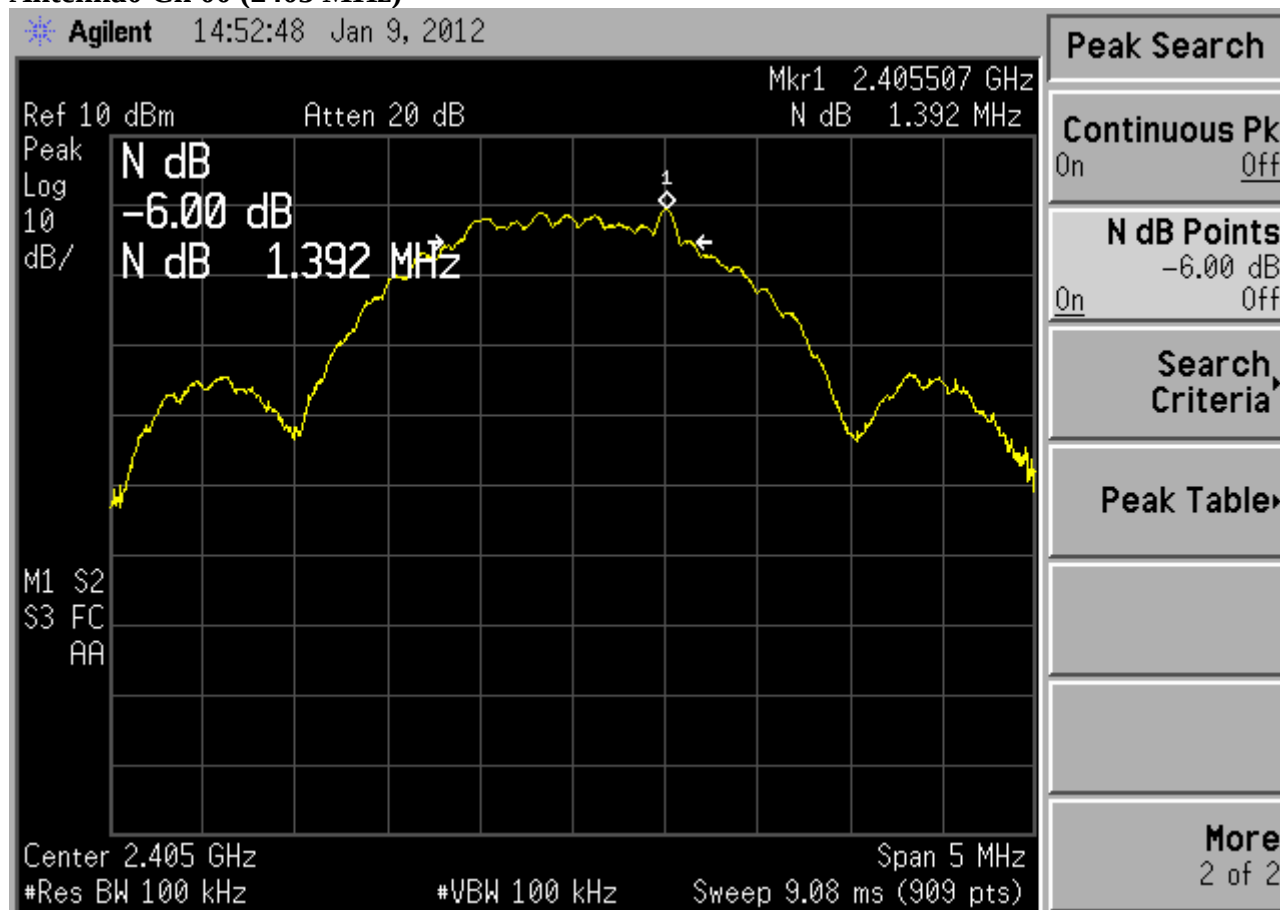
PASSED.

All the test results are attached in next pages.

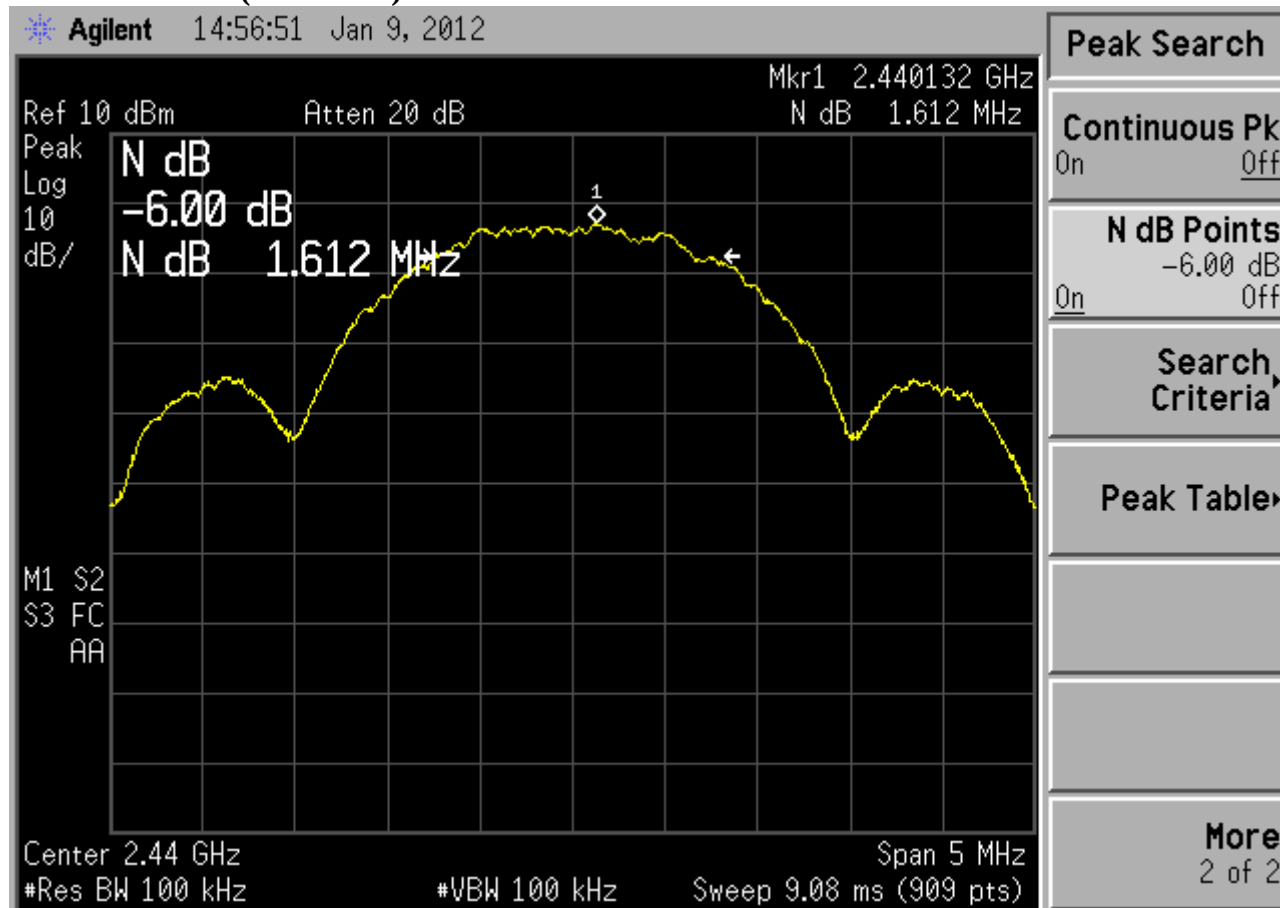
(Test Date: Jan. 09, 2012 Temperature: 23°C Humidity: 48 %)

Antenna	Channel	Frequency	6dB Bandwidth
0	00	2405 MHz	1.392 MHz
	07	2440 MHz	1.612 MHz
	15	2480 MHz	1.623 MHz
1	00	2405 MHz	1.606 MHz
	07	2440 MHz	1.221 MHz
	15	2480 MHz	1.502 MHz

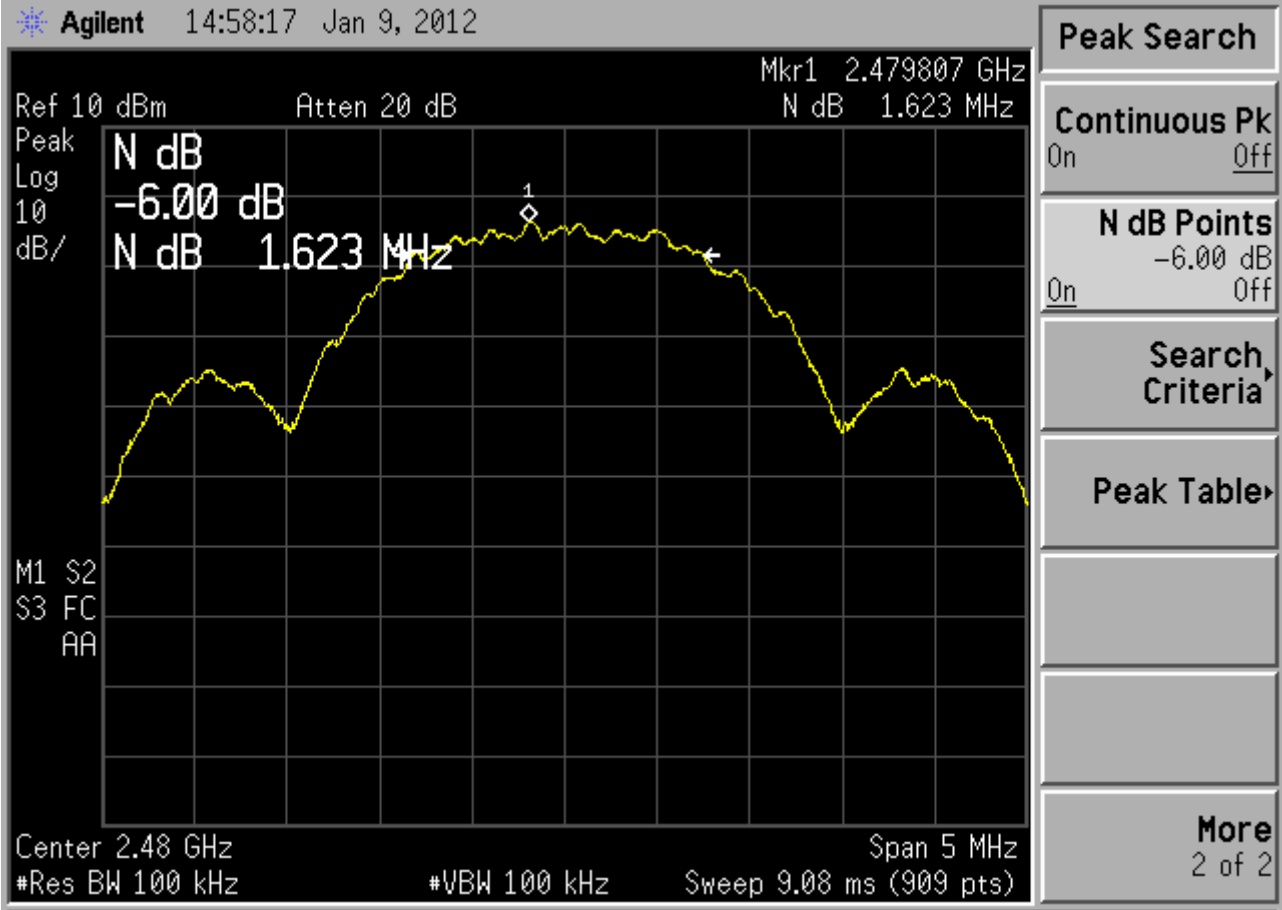
Antenna0 Ch 00 (2405 MHz)



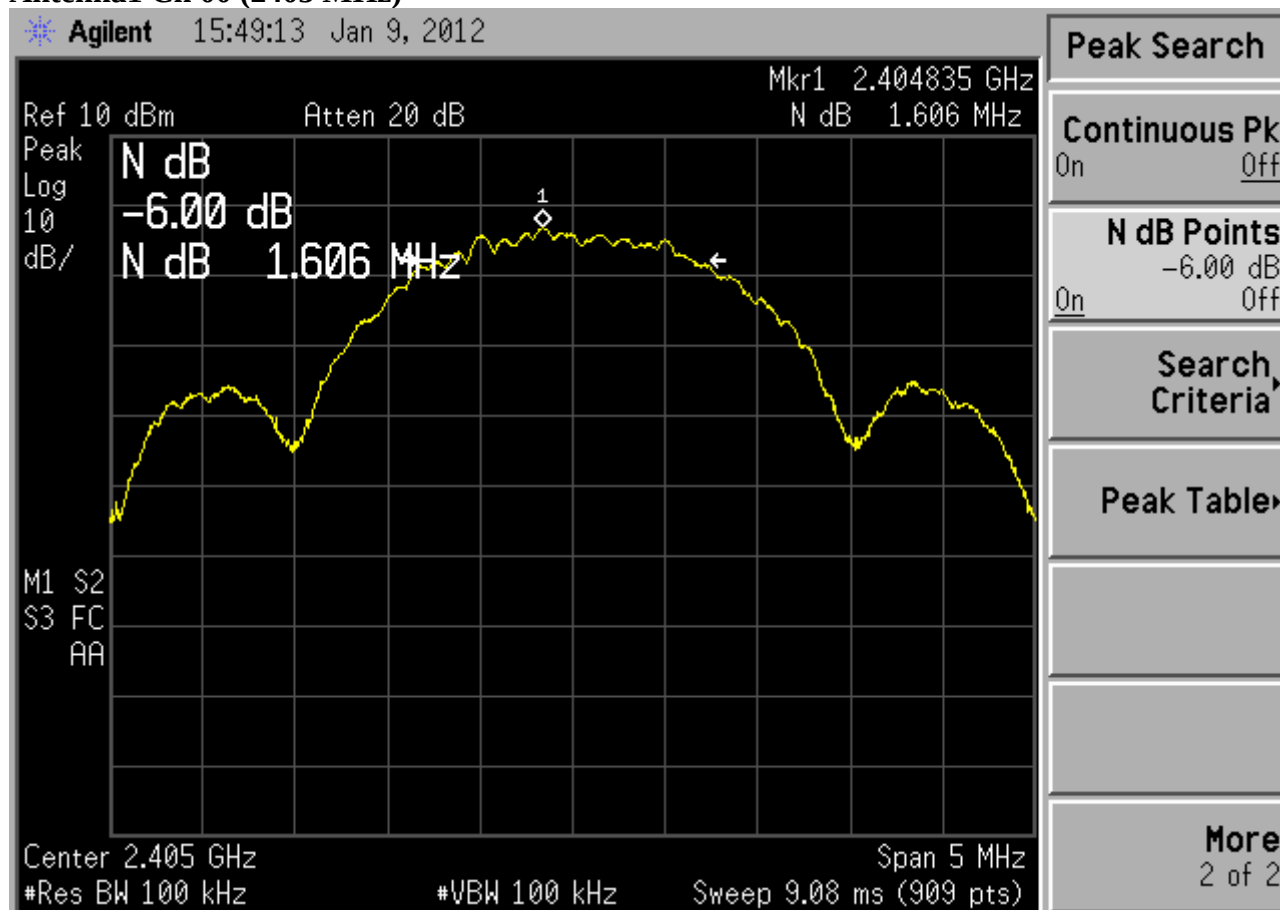
Antenna0 Ch 07 (2440 MHz)



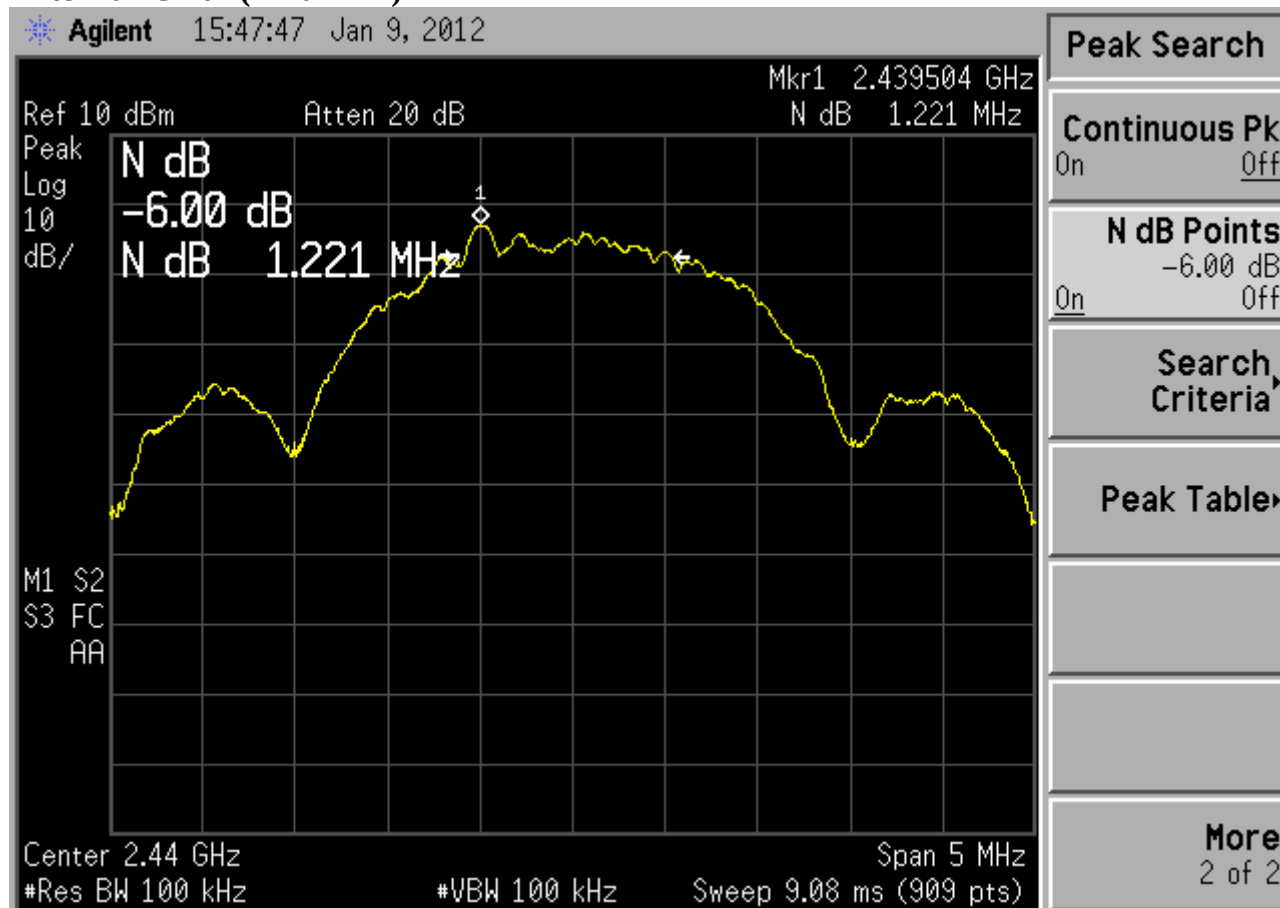
Antenna0 Ch 15 (2480 MHz)



Antenna1 Ch 00 (2405 MHz)



Antenna1 Ch 07 (2440 MHz)



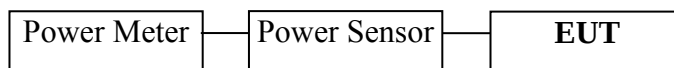
6 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

6.1 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

6.2 Block Diagram of Test Setup



6.3 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)

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

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.

6.6 Test Results

PASSED. All the test results are listed below.

(Test Date: Jan. 09, 2012 Temperature: 23°C Humidity: 48 %)

Antenna	Channel	Frequency	Peak Output Power	Limit
0	00	2405 MHz	2.16 dBm	30 dBm
	07	2440 MHz	1.47 dBm	30 dBm
	15	2480 MHz	0.58 dBm	30 dBm
1	00	2405 MHz	0.31 dBm	30 dBm
	07	2440 MHz	-0.18 dBm	30 dBm
	15	2480 MHz	-0.59 dBm	30 dBm

7 EMISSION LIMITATIONS MEASUREMENT

7.1 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

7.2 Block Diagram of Test Setup

The same as Section. 5.2.

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. 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)

7.4 Operating Condition of EUT

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

7.5 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.

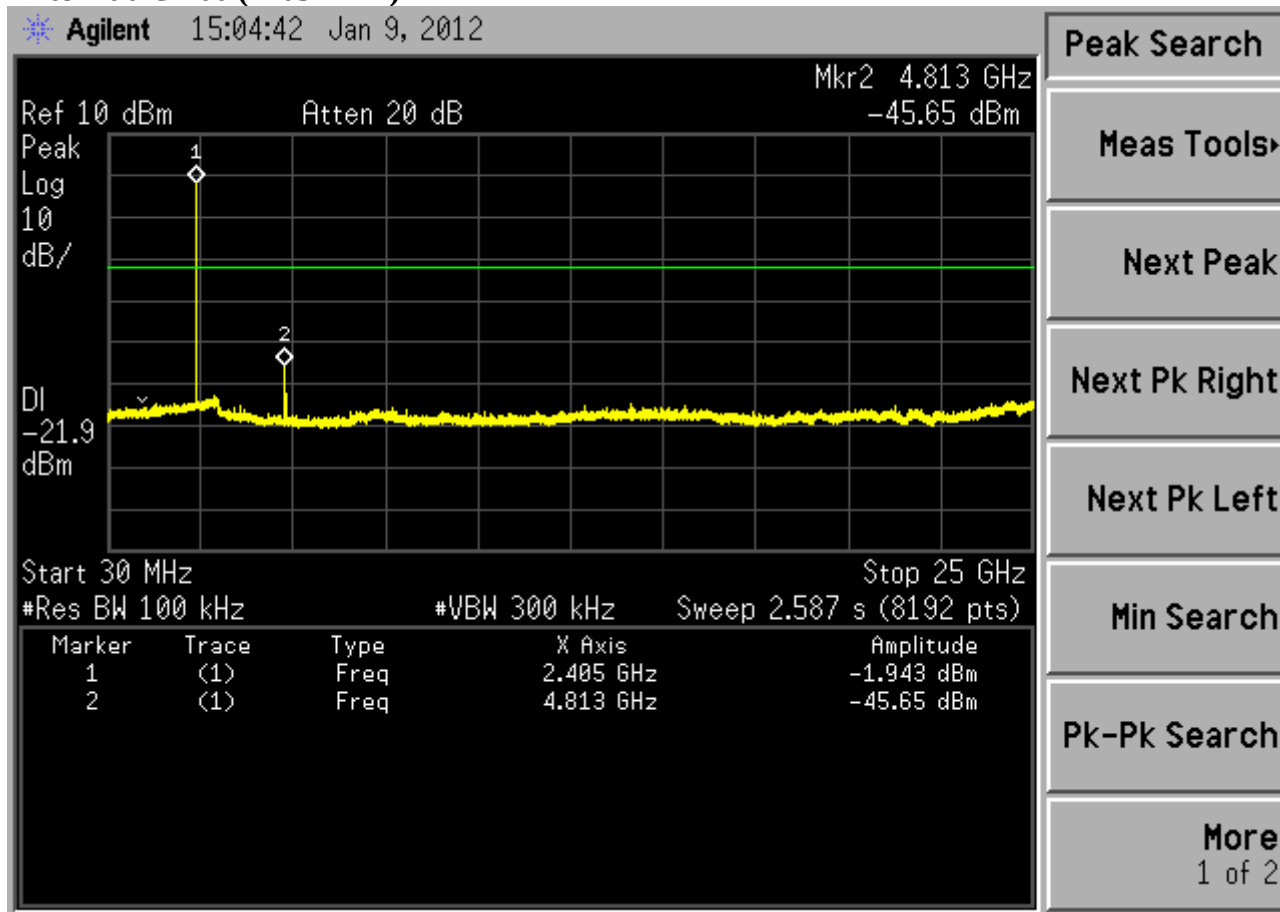
7.6 Test Results

PASSED.

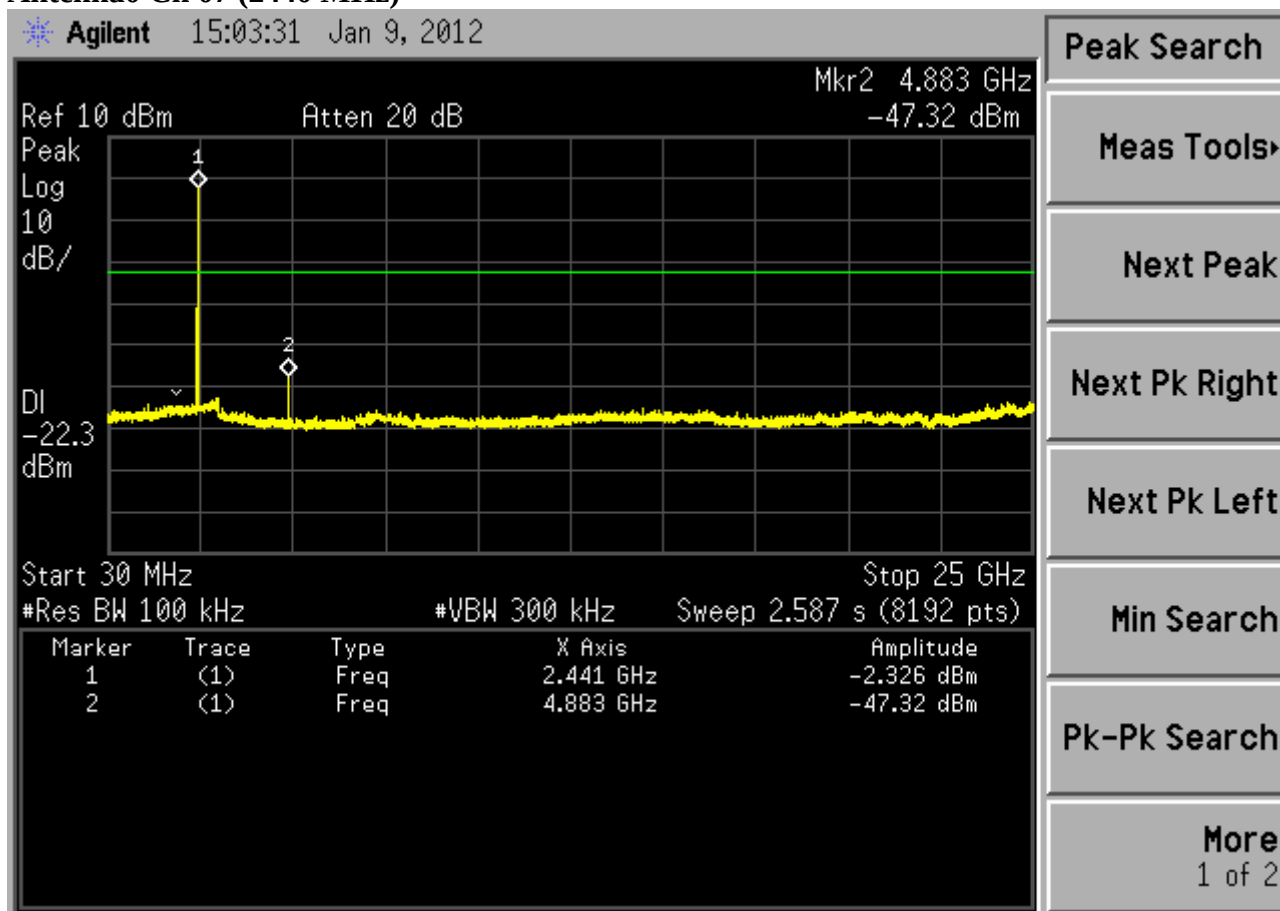
The test data was attached in the next pages.

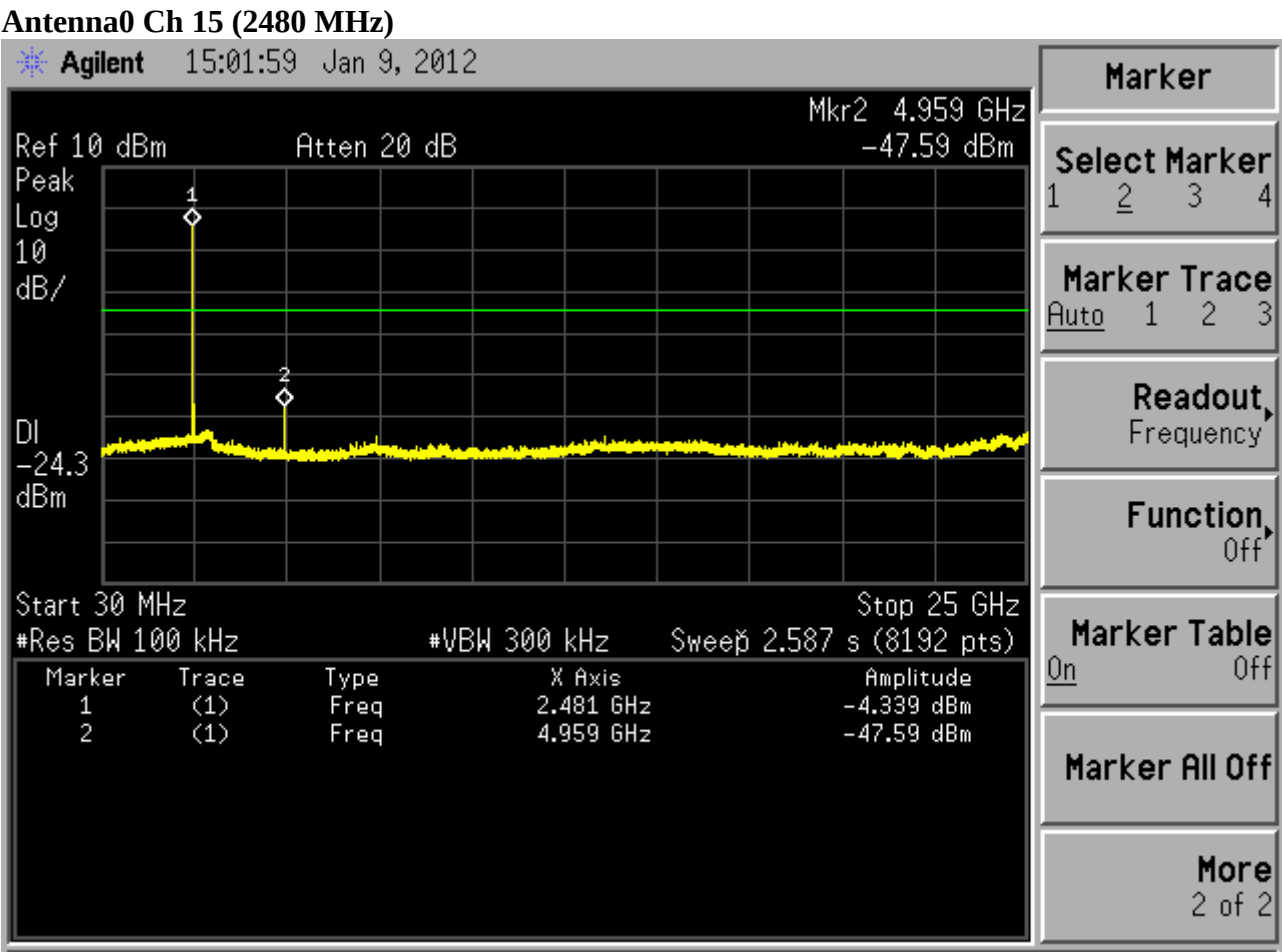
(Test Date: Jan. 13, 2012 Temperature: 23°C Humidity: 48 %)

Antenna0 Ch 00 (2405 MHz)

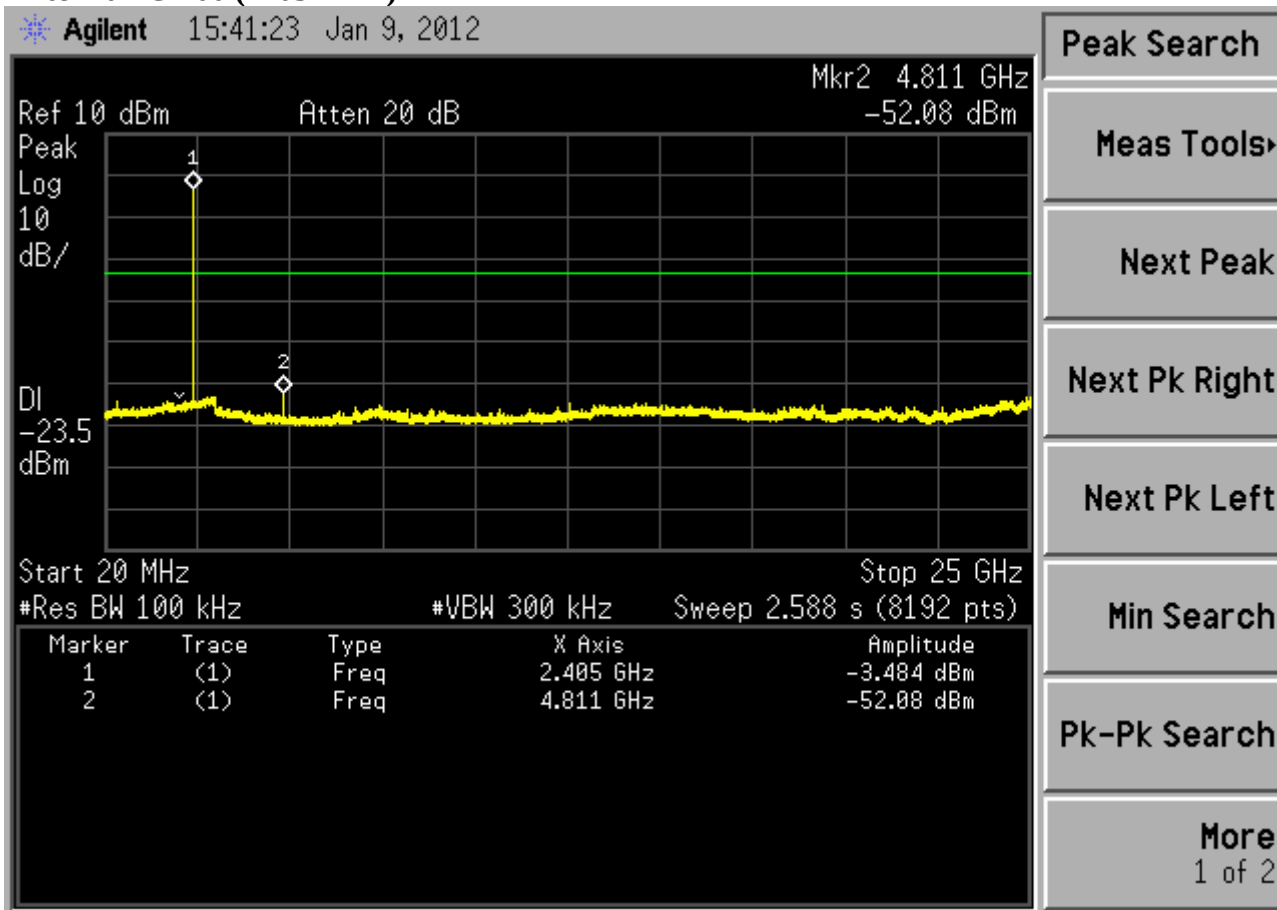


Antenna0 Ch 07 (2440 MHz)

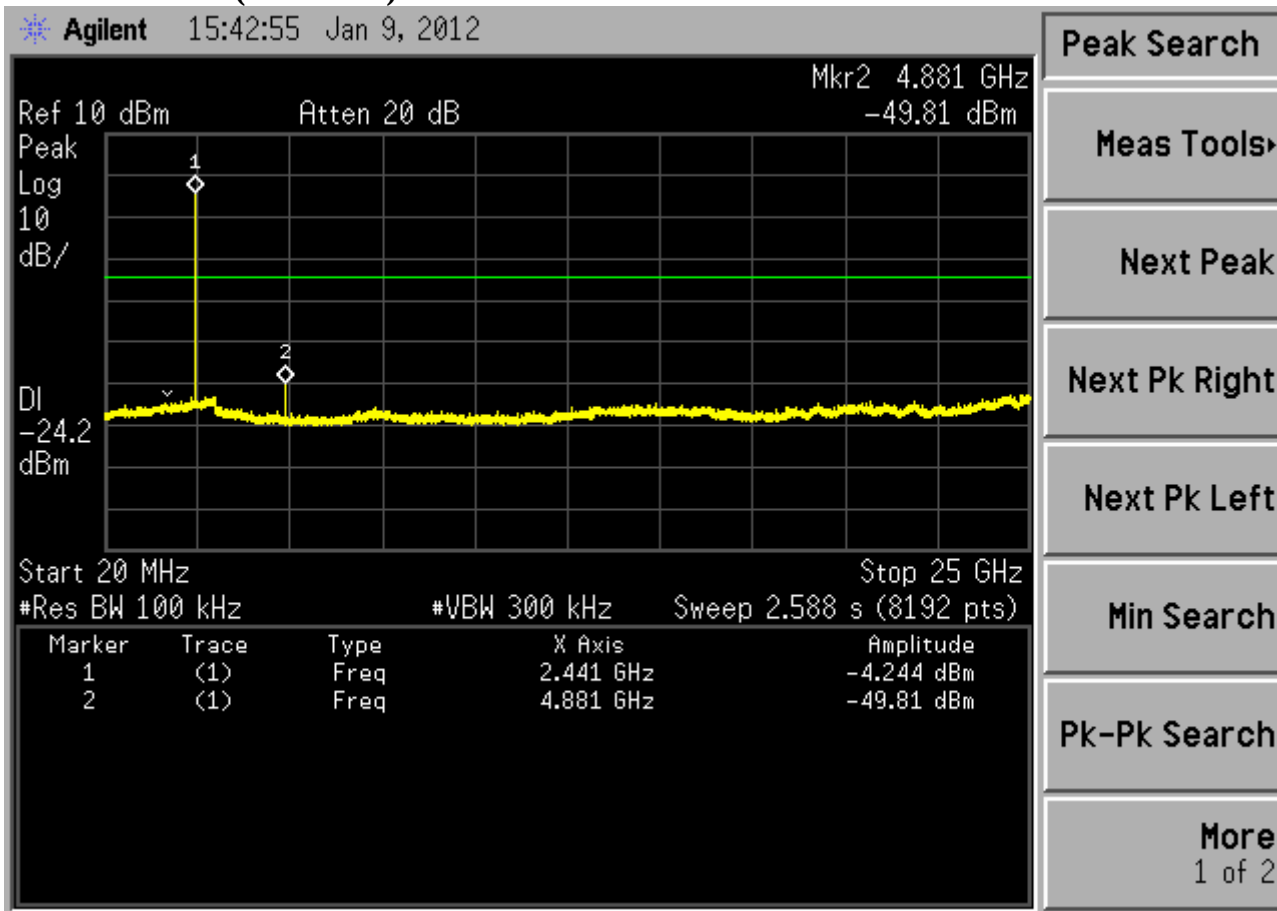




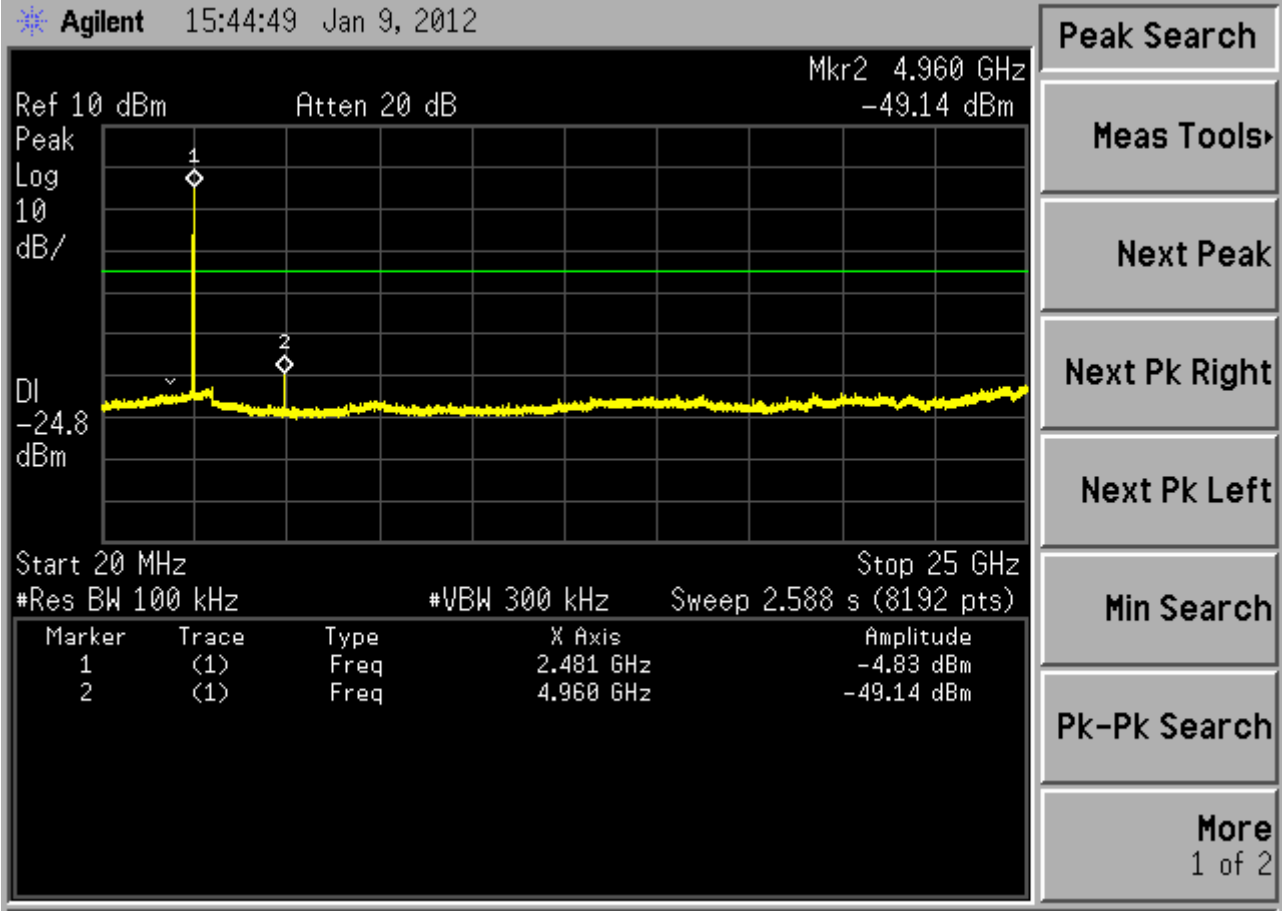
Antenna1 Ch 00 (2405 MHz)



Antenna1 Ch 07 (2440 MHz)



Antenna1 Ch 15 (2480 MHz)



8 BAND EDGES MEASUREMENT

8.1 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

8.2 Block Diagram of Test Setup

The same as section.5.2.

8.3 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.

8.4 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.

8.5 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.

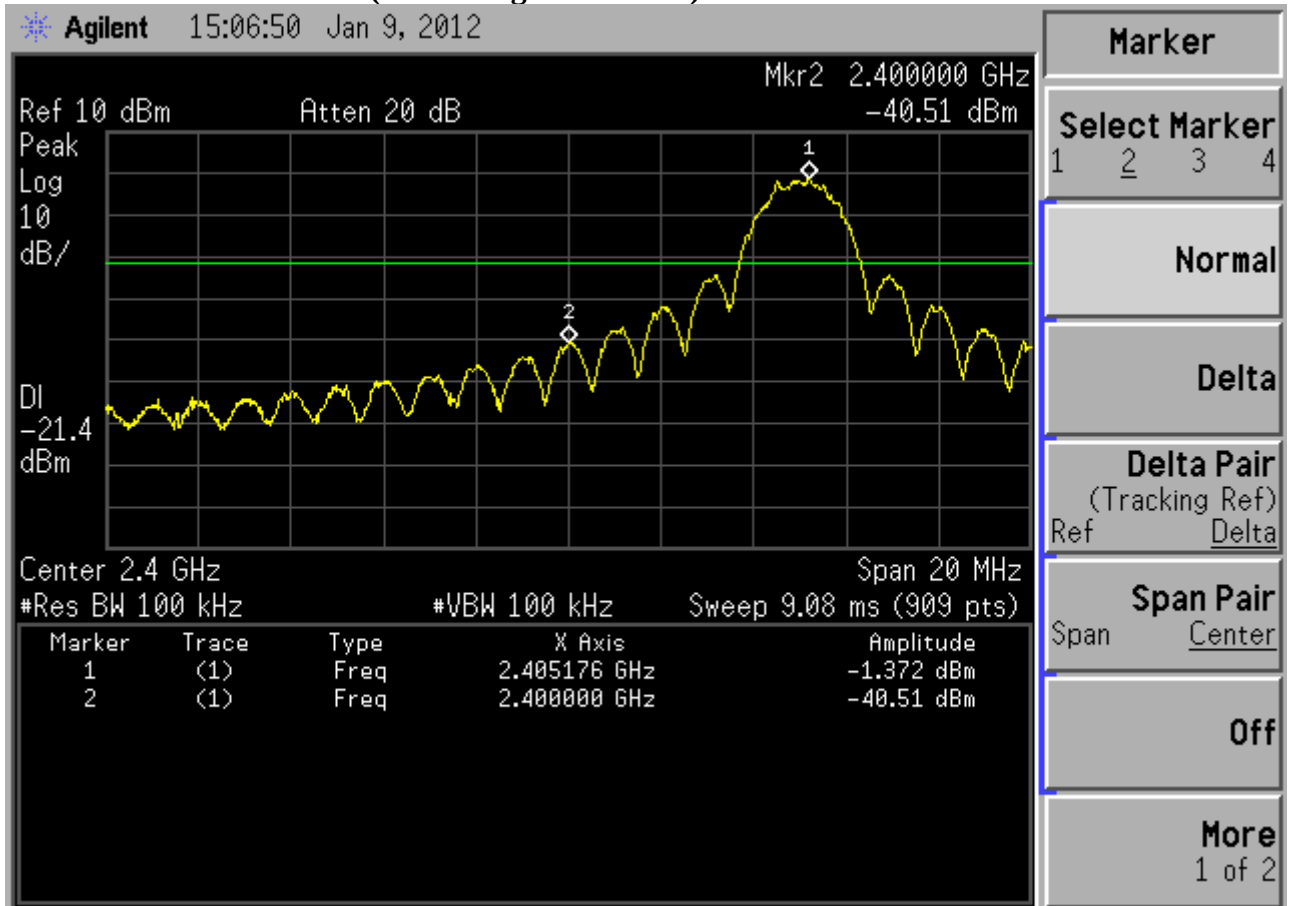
8.6 Test Results

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

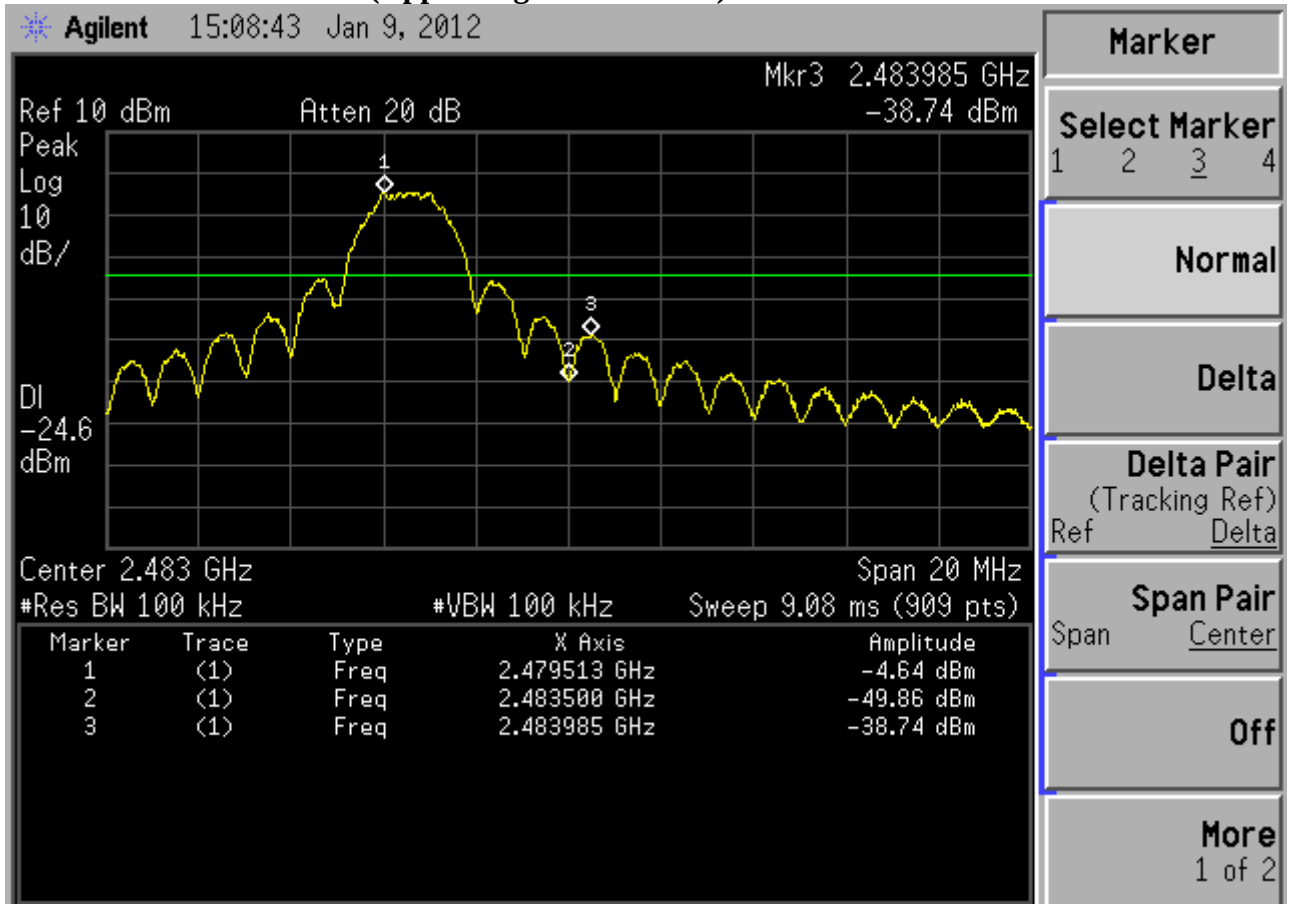
(Test Date: Jan. 09, 2012 Temperature: 23°C Humidity: 48 %%)

Antenna	Location	Channel	Frequency	Delta Marker	Result
0	Below Band Edge	00	2405 MHz	39.138 dB	More than 20 dB below the highest level of the desired power
	Upper Band Edge	15	2480 MHz	34.100 dB	
1	Below Band Edge	00	2405 MHz	38.932 dB	
	Upper Band Edge	15	2480 MHz	34.563 dB	

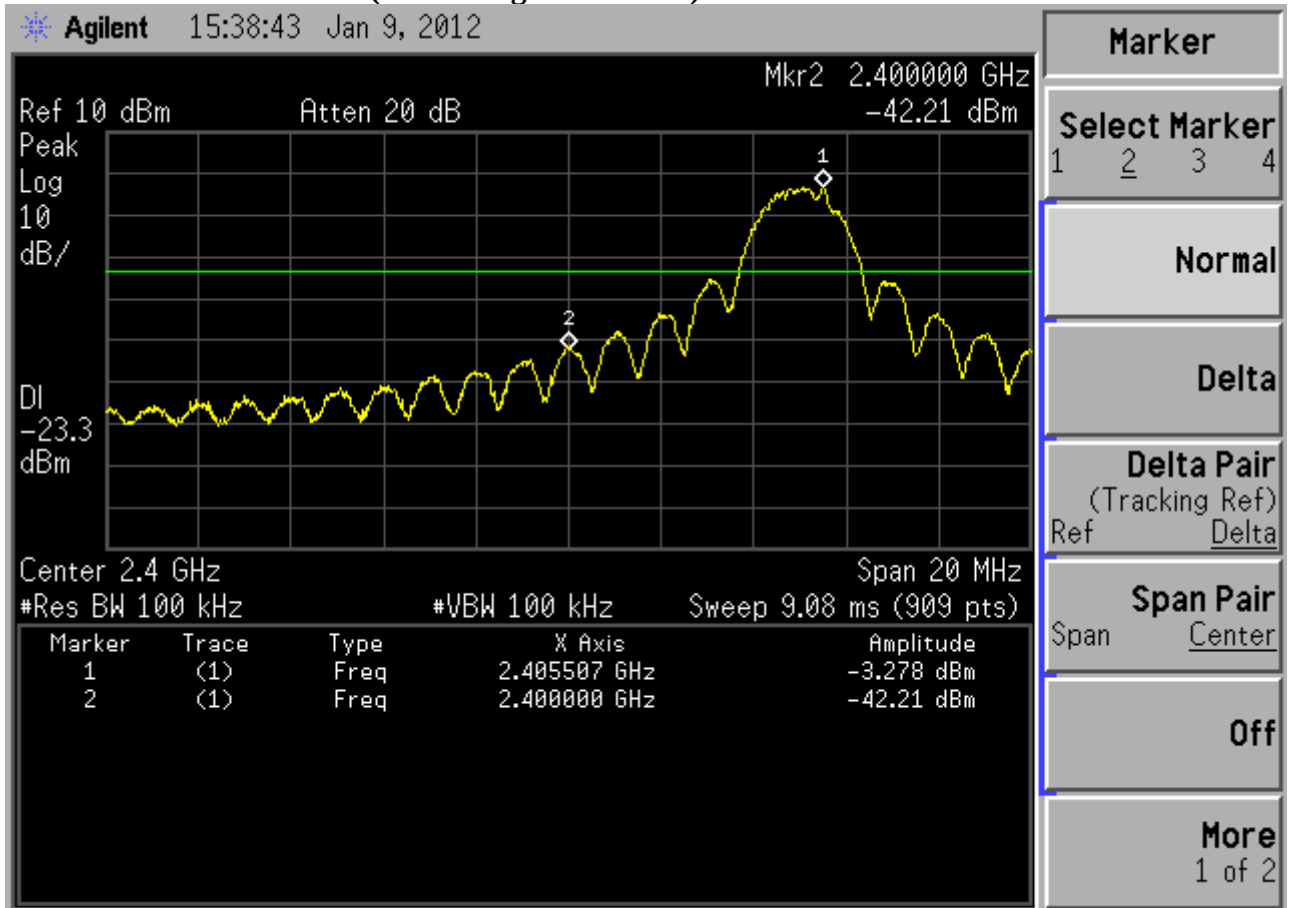
Antenna0 Ch00 2405MHz (Below Edge 2400 MHz)



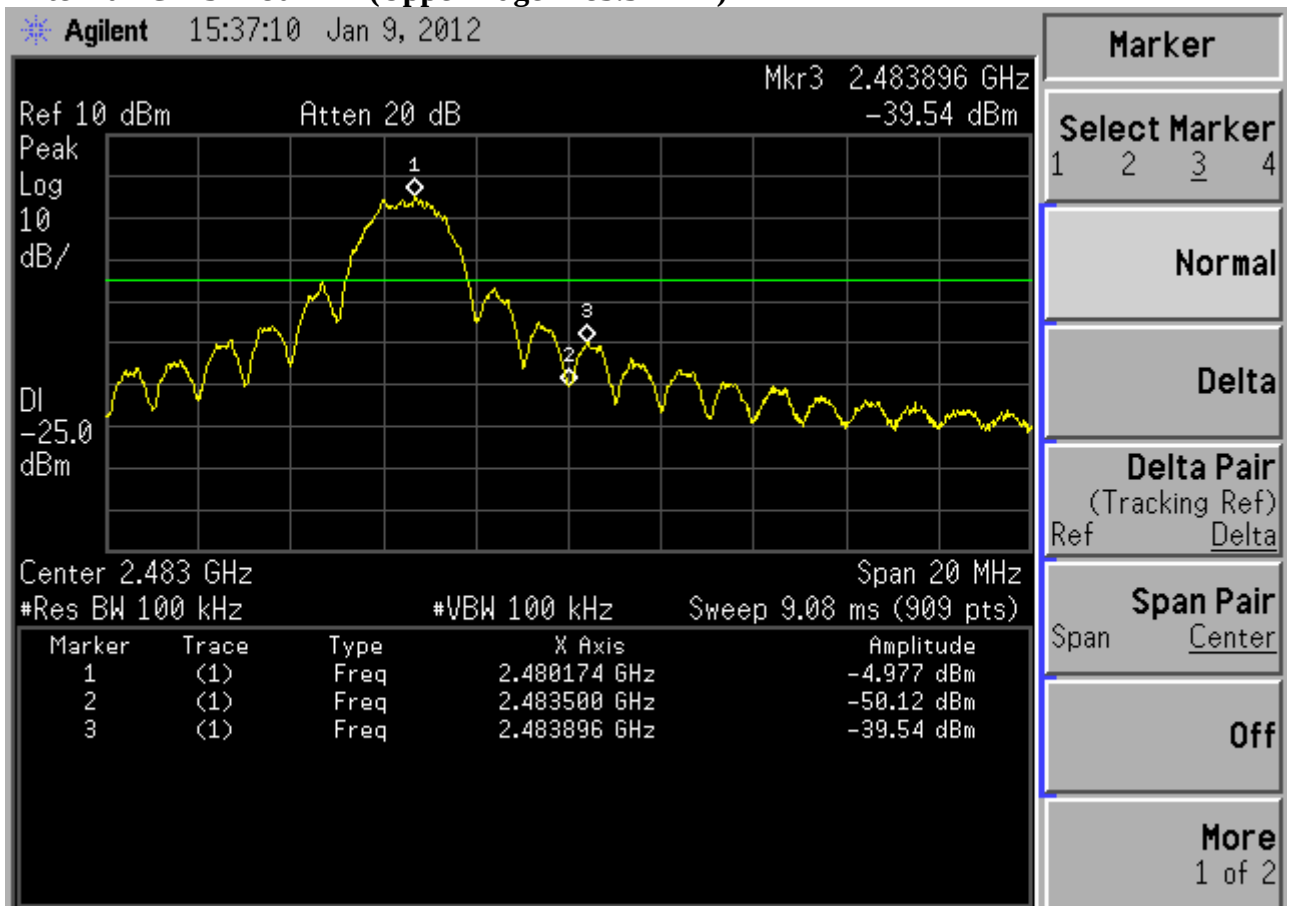
Antenna0 Ch15 2480MHz (Upper Edge 2483.5 MHz)



Antenna1 Ch00 2405MHz (Below Edge 2400 MHz)



Antenna1 Ch15 2480MHz (Upper Edge 2483.5 MHz)



9 POWER SPECTRAL DENSITY MEASUREMENT

9.1 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

9.2 Block Diagram of Test Setup

The same as section.5.2.

9.3 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.

9.4 Operating Condition of EUT

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

9.5 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) 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.

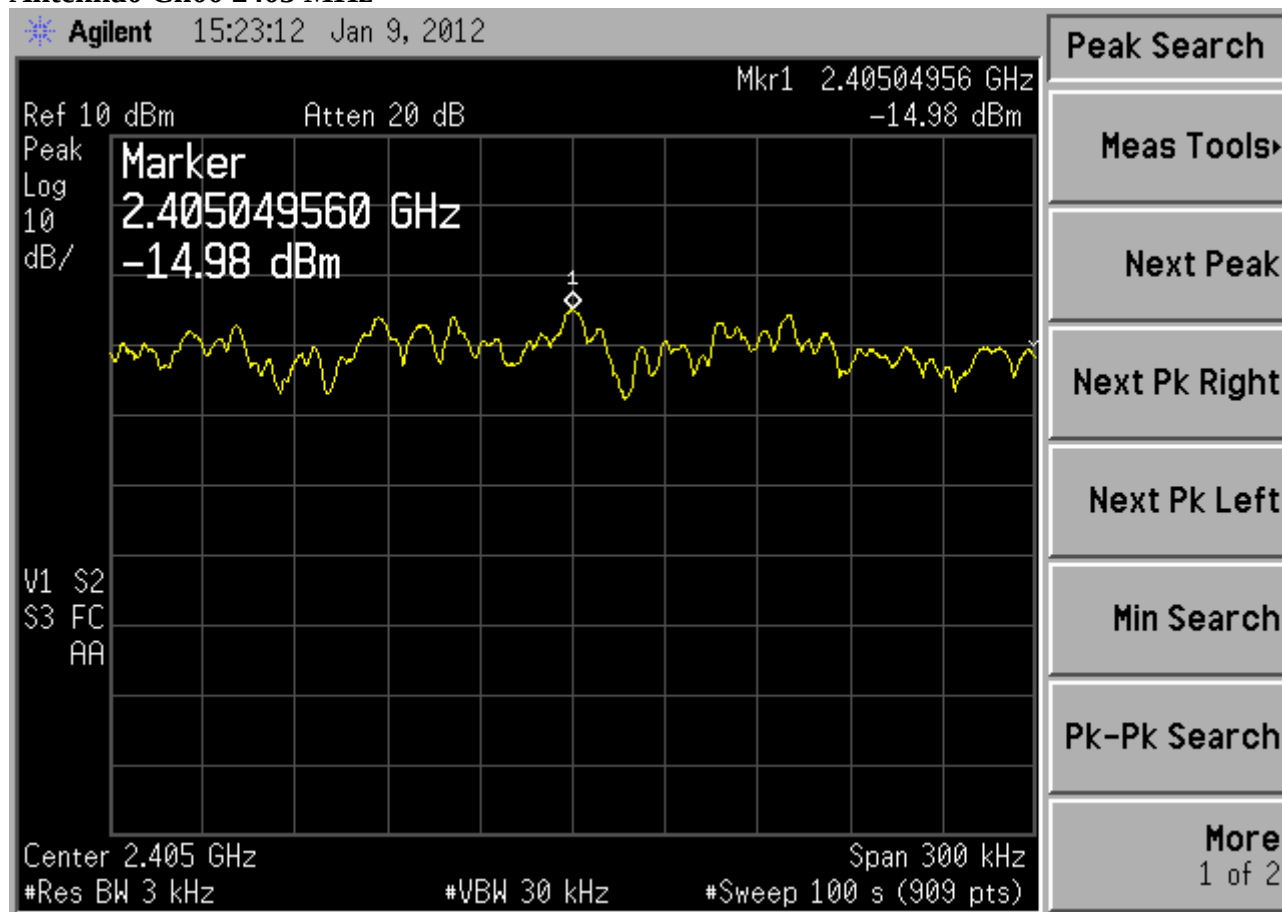
9.6 Test Results

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

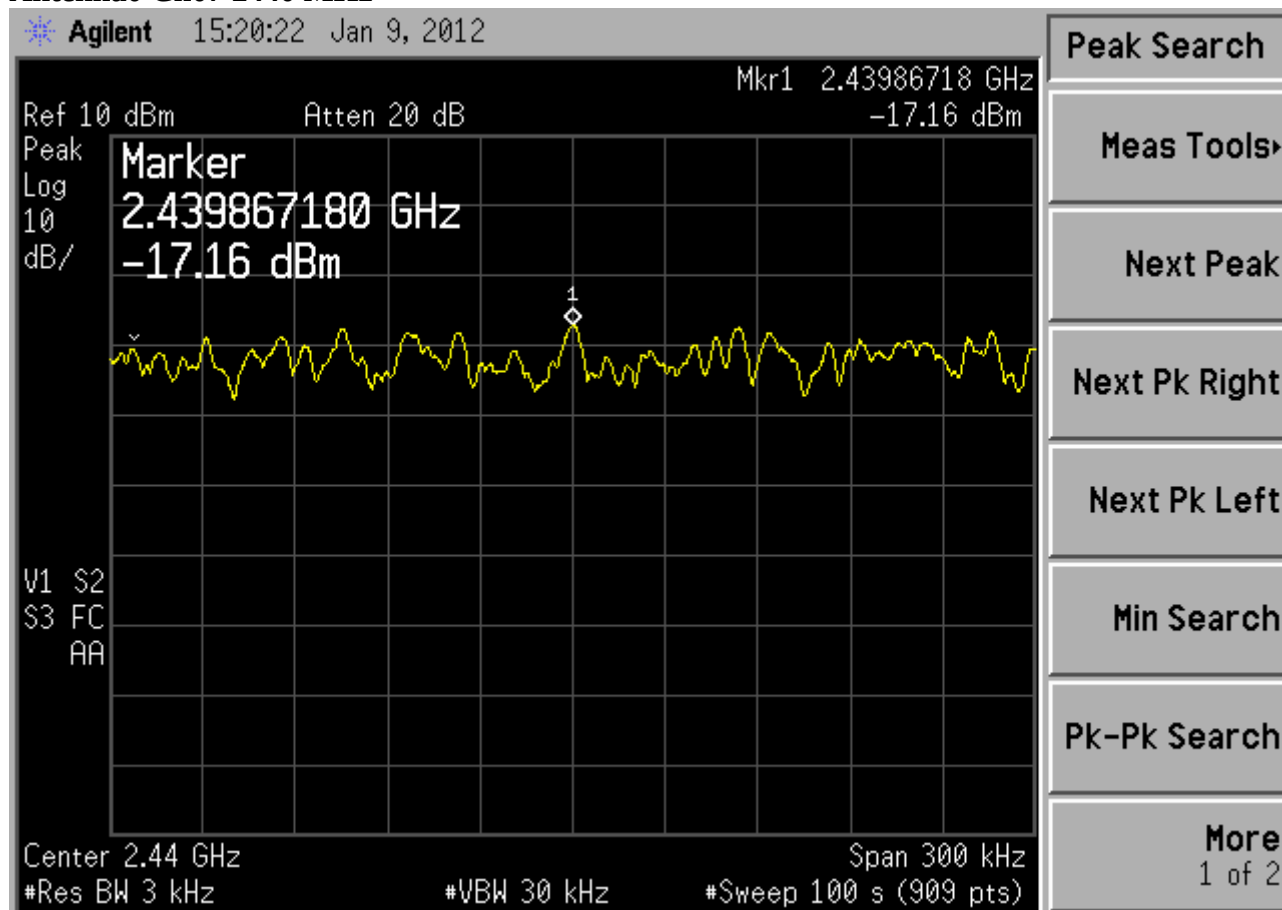
(Test Date: Jan. 09, 2012 Temperature: 23°C Humidity: 48 %)

Antenna	Channel	Frequency	Power Spectral Density	Limit
0	00	2405 MHz	-14.98 dBm	8dBm
	07	2440 MHz	-17.16 dBm	8dBm
	15	2480 MHz	-18.39 dBm	8dBm
1	00	2405 MHz	-16.07 dBm	8dBm
	07	2440 MHz	-17.24 dBm	8dBm
	15	2480 MHz	-19.15 dBm	8dBm

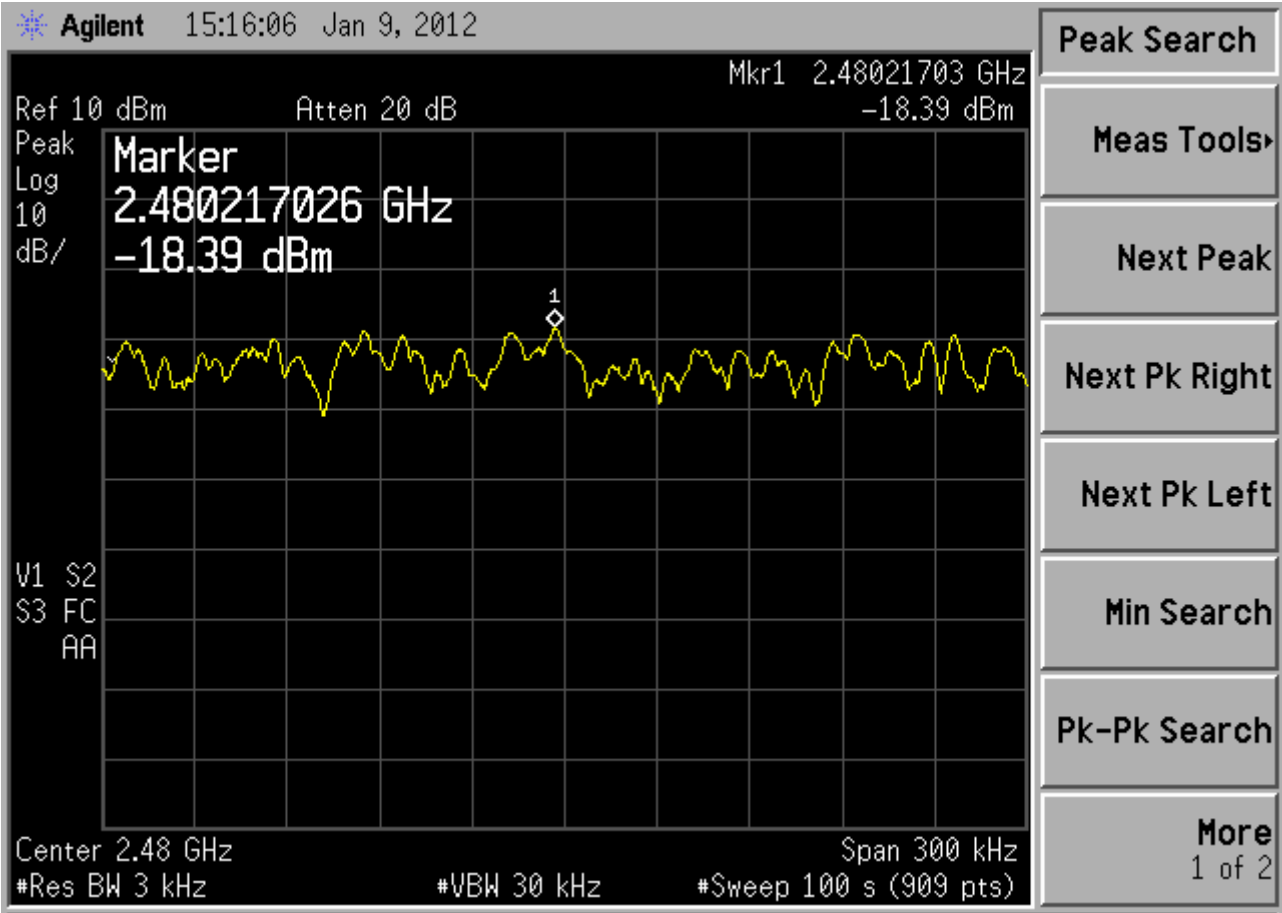
Antenna0 Ch00 2405 MHz



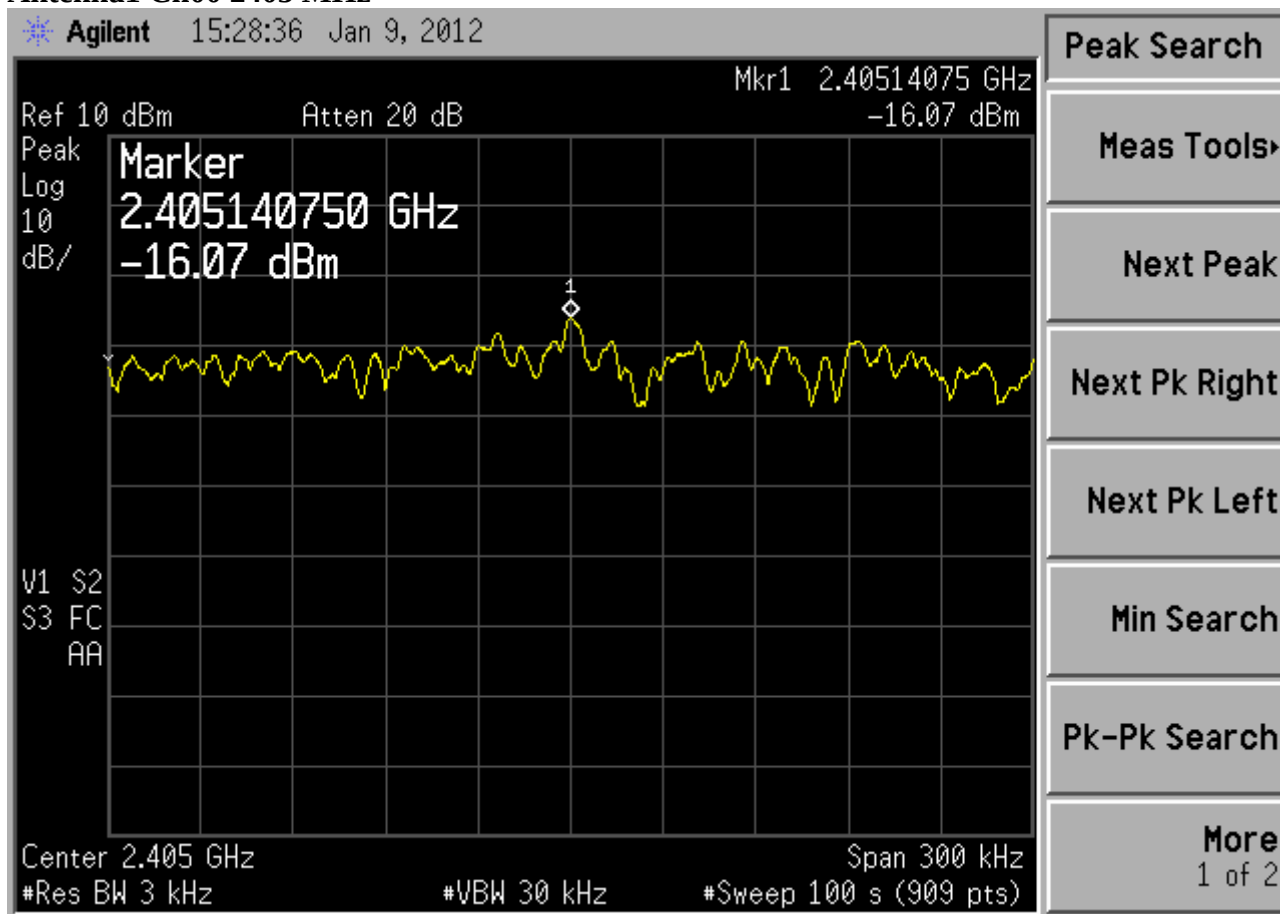
Antenna0 Ch07 2440 MHz



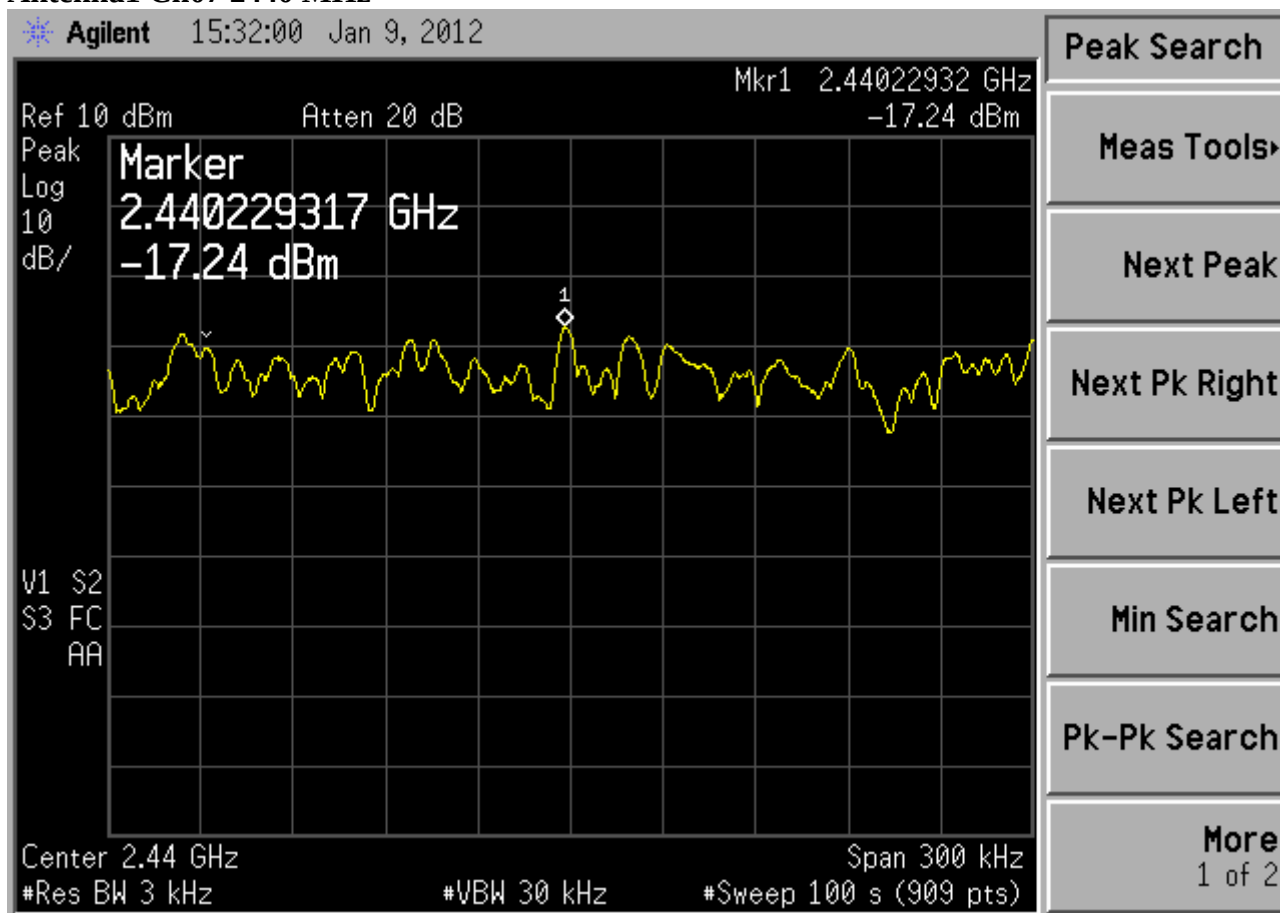
Antenna0 Ch15 2480 MHz



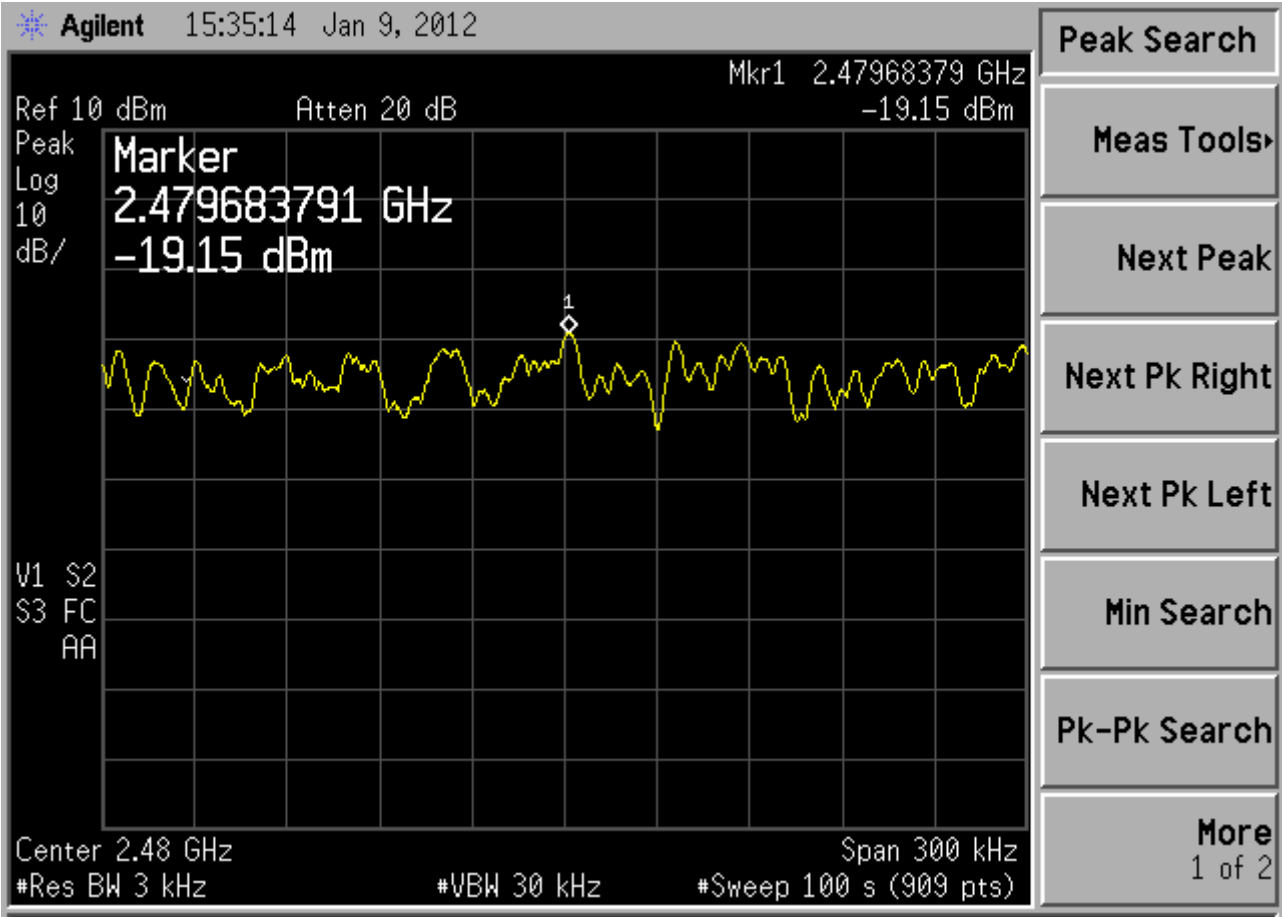
Antenna1 Ch00 2405 MHz



Antenna1 Ch07 2440 MHz



Antenna1 Ch15 2480 MHz



10 DEVIATION TO TEST SPECIFICATIONS

None.