

Application for FCC Certification
On behalf of
Holley Group Co., Ltd.

Product Name: Middle TX Power ZigBee Module

Model No.: HT-MDL-Z-EM-2400-101-X

Serial No.: E07100806

Trademark 1#: Holley

Trademark 2#: Hornetone

FCC ID: VQMHZME2A

Prepared For : Holley Group Co., Ltd.
No.18, Xidoumen Rd., Hangzhou, Zhejiang, China

Prepared By :Audix Technology (Shanghai) Co., Ltd.
3F 34Bldg 680 Guiping Rd.,
Caohejing Hi-Tech Park,
Shanghai, China 200233

Tel: +86-21-64955500

Fax: +86-21-64955491

Report No. : ACI-F07041
Date of Test : Oct 08 –Oct 09, 2007
Date of Report : Oct 09, 2007

TABLE OF CONTENTS

	Page
1 SUMMARY OF STANDARDS AND RESULTS	5
1.1 Description of Standards and Results	5
2 GENERAL INFORMATION	6
2.1 Description of Equipment Under Test	6
2.2 Supported Simulators	7
2.3 Description of Test Facility	7
2.4 Measurement Uncertainty	7
3 RADIATED EMISSION TEST	8
3.1 Test Equipment	8
3.2 Block Diagram of Test Setup	8
3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]	9
3.4 Test Configuration	9
3.5 Operating Condition of EUT	10
3.6 Test Procedures	10
3.7 Test Results	11
4 6 dB BANDWIDTH MEASUREMENT	30
4.1 Test Equipment	30
4.2 Block Diagram of Test Setup	30
4.3 Specification Limits (§15.247(a)(2))	30
4.4 Operating Condition of EUT	30
4.5 Test Procedure	30
4.6 Test Results	31
5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT	34
5.1 Test Equipment	34
5.2 Block Diagram of Test Setup	34
5.3 Specification Limits (§15.247(b)(3))	34
5.4 Operating Condition of EUT	34
5.5 Test Procedure	34
5.6 Test Results	35
6 RF EXPOSURE MEASUREMENT	36
6.1 Test Equipment	36
6.2 Block Diagram of Test Setup	36
6.3 Specification Limits (§15.247(i), §1.1310)	36
6.4 Operating Condition of EUT	36
6.5 Test Procedure	36
6.6 Test Results	37
7 EMISSION LIMITATIONS MEASUREMENT	38
7.1 Test Equipment	38
7.2 Block Diagram of Test Setup	38
7.3 Specification Limits (§15.247(d))	38
7.4 Operating Condition of EUT	38
7.5 Test Procedure	38
7.6 Test Results	39
8 BAND EDGES MEASUREMENT	42

8.1	Test Equipment.....	42
8.2	Block Diagram of Test Setup	42
8.3	Specification Limits (§15.247(d))	42
8.4	Operating Condition of EUT	42
8.5	Test Procedure.....	42
8.6	Test Results	42
9	POWER SPECTRAL DENSITY MEASUREMENT	44
9.1	Test Equipment.....	44
9.2	Block Diagram of Test Setup	44
9.3	Specification Limits (§15.247(e))	44
9.4	Operating Condition of EUT	44
9.5	Test Procedure.....	44
9.6	Test Results	44
10	DEVIATION TO TEST SPECIFICATIONS	47
11	DEBUG DESCRIPTION	48

TEST REPORT FOR FCC CERTIFICATION

Applicant : Holley Group Co., Ltd.
Manufacturer 1# : Holley Group Co., Ltd.
Trademark 1# : Holley
Manufacturer 2# : Zhejiang Hornetone Information Technology Co., Ltd.
Trademark 2# : Hornetone
EUT Description : Middle TX Power ZigBee Module
(A) Model No. : HT-MDL-Z-EM-2400-101-X
(B) Serial No. : E07100806
(C) Power Supply : DC 3.3V

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007
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: HT-Z-EM-MDL-2400-101-X, S/N: E07100806), which was tested on Oct 08-09, 2007 is technically compliance with the FCC official 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 : Oct 08-09, 2007

Prepared By:

Alan He 2007.10.11
ALAN HE / Assistant

Reviewer:

Sammy Chen 2007.10.11
SAMMY CHEN / Deputy Assistant Manager

Approved Signatory:

Ian Chien 2007.10.11
IAN CHIEN / Assistant 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			
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.209
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.247(a)(2)
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.247(b)(3)
RF Exposure Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.247(i)
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.247(d)
Band Edge Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.247(d)
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C April 2007 AND ANSI C63.4:2003	Pass	15.247(e)

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description	:	Middle TX Power ZigBee Module
Type of EUT	:	<input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-product <input type="checkbox"/> Pro-type
Model Number	:	HT-MDL-Z-EM-2400-101-X
Serial Number	:	E07100806
Note	:	The X in the model number means different antenna interface . The character A is for MMCX straight jack and B is for MMCX right angle jack.
Applicant	:	Holley Group Co., Ltd. Address 1#: No.18, Xidoumen Rd., Hangzhou, Zhejiang, China Address 2#: No.501 Moganshan Rd., Hangzhou, Zhejiang, China
Manufacturer 1#	:	Holley Group Co., Ltd. Address 1#: No.18, Xidoumen Rd., Hangzhou, Zhejiang, China Address 2#: No.501 Moganshan Rd., Hangzhou, Zhejiang, China
Trademark 1#	:	Holley
Manufacturer 2#	:	Zhejiang Hornetone Information Technology Co., Ltd. No.18, Xidoumen Rd., Hangzhou, Zhejiang, China
Trademark 2#	:	Hornetone
Power Supply	:	DC 3.3V (from batteries on Motherboard)
Radio Tech	:	IEEE 802.15.4 (ZigBee®)
Freq. Band	:	2405 MHz ~ 2475 MHz In 5 MHz Separation
Tested Freq.	:	2405 MHz (Channel 11) 2440 MHz (Channel 18) 2475 MHz (Channel 25)
Freq. Channel	:	15 channels

2.2 Supported Simulators

2.2.1 Motherboard

Manufacturer : Holley
Model Number : 05-X02-27VS1.1

2.2.2 Antenna

Manufacturer : Fuweicom
Model Number : ANT-FW-2400-1.3-B
Gain : 2.1 dBi

2.2.3 Battery Box : Batteries (Size AA * 4)

2.3 Description of Test Facility

Site Description (Semi-Anechoic Chamber) : Sept. 17, 1998 file on
June 26, 2006 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, China 200233

FCC registration Number : 91789

Accredited by NVLAP, Lab Code : 200371-0

TAF Accreditation No : 1417

2.4 Measurement Uncertainty

Radiated Disturbance Expanded Uncertainty : U = 2.96 dB

3 RADIATED EMISSION TEST

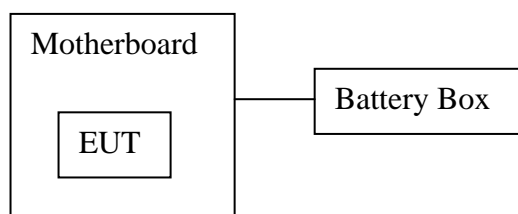
3.1 Test Equipment

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

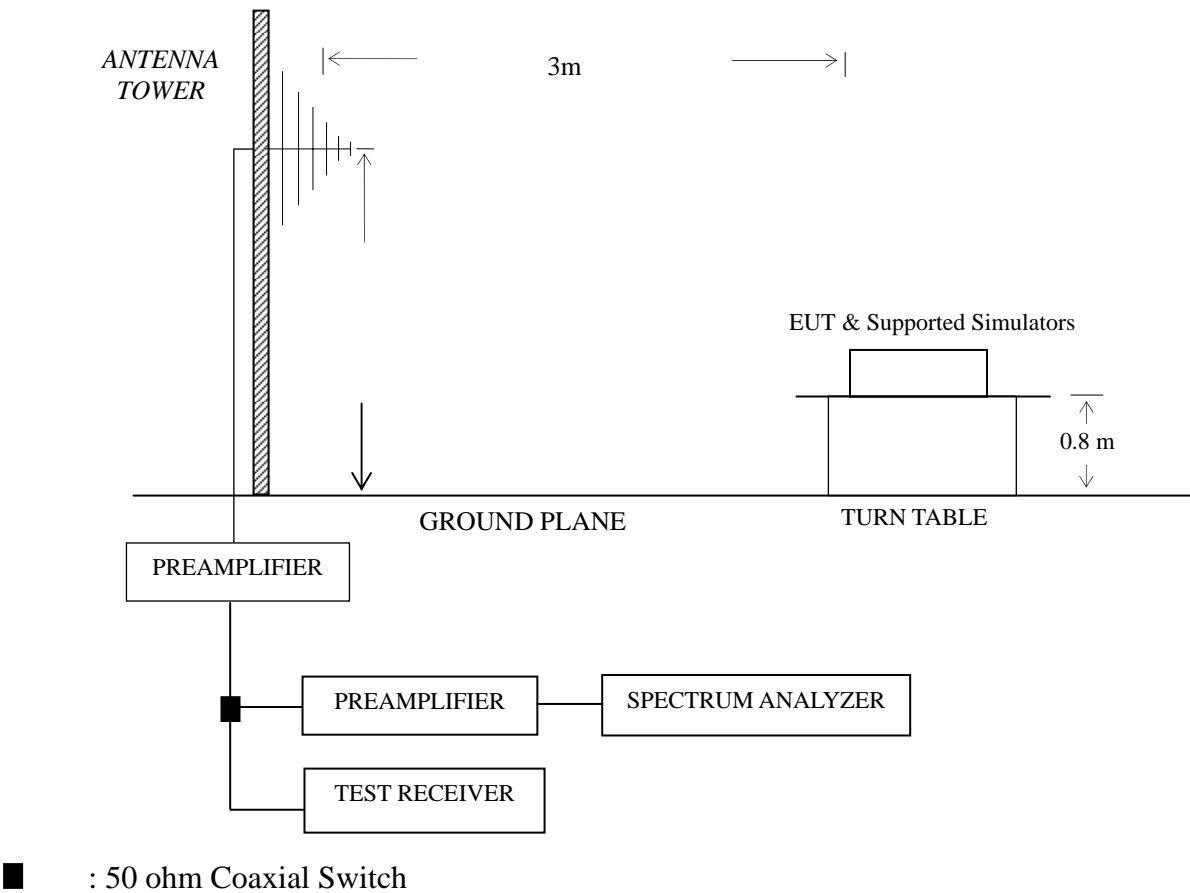
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	HP	8447D	2944A10548	Sep 19, 2007	Mar 19, 2008
2.	Spectrum Analyzer	Agilent	E7405A	MY45106600	Apr 06, 2007	Apr 06, 2008
3.	Test Receiver	R&S	ESVS10	832699/004	Apr 06, 2007	Apr 06, 2008
4.	Bilog Antenna	Chase	CBL6111	1145	Sep 18, 2007	Mar 18, 2008
5.	Horn Antenna	EMCO	3115	9607-4878	Apr 06, 2007	Apr 06, 2008
6.	Horn Antenna	EMCO	3116	00062643	Apr 06, 2007	Apr 06, 2008
7.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2007	Mar 18, 2008
8.	Software	Audix	E3	SET00200 9912M295-2	-	-

3.2 Block Diagram of Test Setup

3.2.1 EUT & Supported Simulators



3.2.2 Test Setup



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 lg 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 - On any frequencies above 1000MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated.			

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.

3.6 Test Procedures

The EUT and simulators were 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 30M to 1000MHz.

The bandwidth of Spectrum Analyzer Agilent E7405A was set at 1MHz above 1 GHz.

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	11	2405 MHz
2.		18	2440 MHz
3.		25	2475 MHz
4.	Receiving	18	2440 MHz

Note: when the EUT was in transmitting mode, it sent 40bytes per data frame. The repetition interval is 5ms. The modulation method is DSSS.

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.

Mode	Operation	Channel	Frequency	Data Page	
				Low Frequency	High Frequency
1.	Transmitting	11	2405 MHz	P12-P13	P14-P15
2.		18	2440 MHz	P16-P17	P18-P19
3.		25	2475 MHz	P20-P21	P22-P23
4.	Receiving	18	2440 MHz	P24-P25	P26-P27

Band –Edges Radiated Spurious emissions 15.205 are on page 28-29.

NOTE 1 - All reading are Quasi-Peak values below or equal to 1GHz and Peak values above 1GHz. For measurements above 1 GHz, the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

NOTE 2 - 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

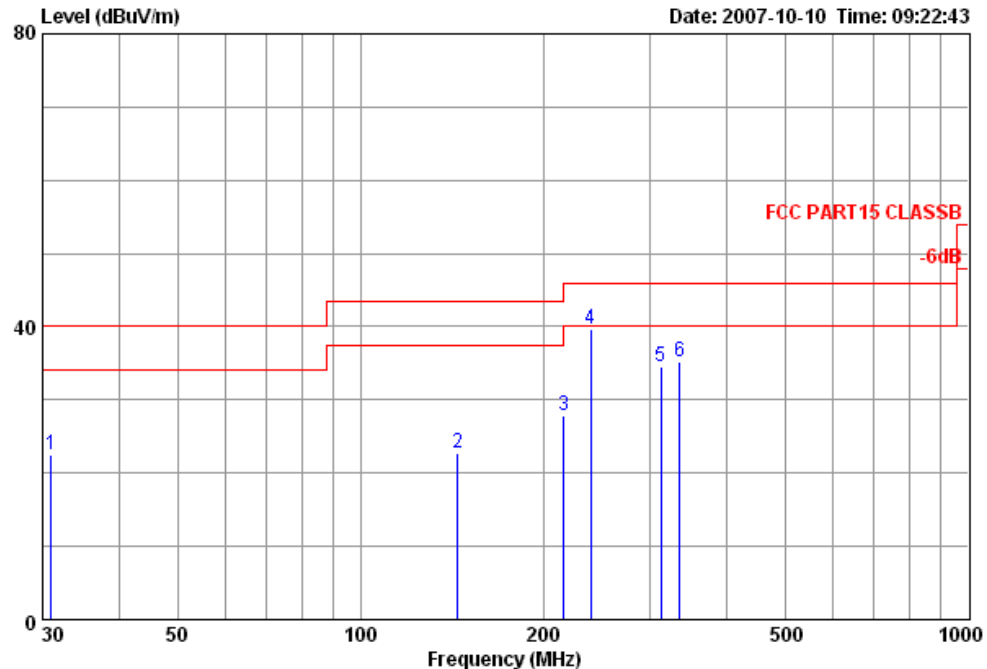
NOTE 3 – The worst case is for Transmitting 2405 MHz CH 11. The worst emission at horizontal polarization was detected at 129.52 MHz with corrected signal level of 39.69 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.20 m height and the turntable was at 200°. The worst emission at vertical polarization was detected at 856.44 MHz with corrected signal level of 38.83 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was 1.00 m height and the turntable was at 160°.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 57 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:22:43



Site no	: Audix ACI (3m Chamber)	Data no.	: 57
Dis. / Ant.	: 3m / 1145-07.03.18	Ant. pol.	: HORIZONTAL
Limit	: FCC PART15 CLASSB	Engineer	: Leo
Env. / Ins.	: 25'C 60% / ESVS10		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Transmitting		
Memo	: CH11(2405MHz)		

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.97	16.76	0.91	4.76	22.43	40.00	17.57
2	144.46	11.21	2.04	9.49	22.74	43.50	20.76
3	216.24	13.35	2.50	12.03	27.88	46.00	18.12
4	239.52	13.70	2.71	23.28	39.69	46.00	6.31
5	312.27	13.86	3.18	17.61	34.65	46.00	11.35
6	335.55	15.08	3.30	16.86	35.24	46.00	10.76

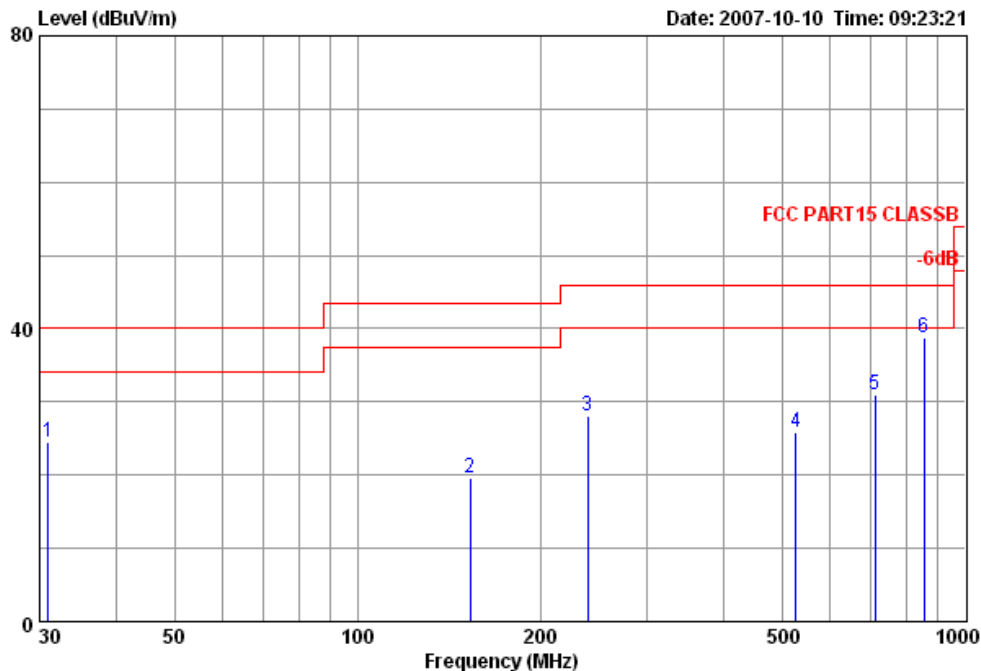
Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 58 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:23:21



Site no	: Audix ACI (3m Chamber)	Data no.	: 58
Dis. / Ant.	: 3m / 1145-07.03.18	Ant. pol.	: VERTICAL
Limit	: FCC PART15 CLASSB	Engineer	: Leo
Env. / Ins.	: 25'C 60% / ESVS10		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-Z-EM-MDL-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Transmitting		
Memo	: CH11(2405MHz)		

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.97	16.76	0.91	6.87	24.54	40.00	15.46
2	153.19	11.01	2.10	6.49	19.60	43.50	23.90
3	239.52	13.70	2.71	11.60	28.01	46.00	17.99
4	526.64	20.29	4.06	1.56	25.91	46.00	20.09
5	710.94	21.55	4.90	4.44	30.89	46.00	15.11
6	856.44	23.28	5.55	10.00	38.83	46.00	7.17

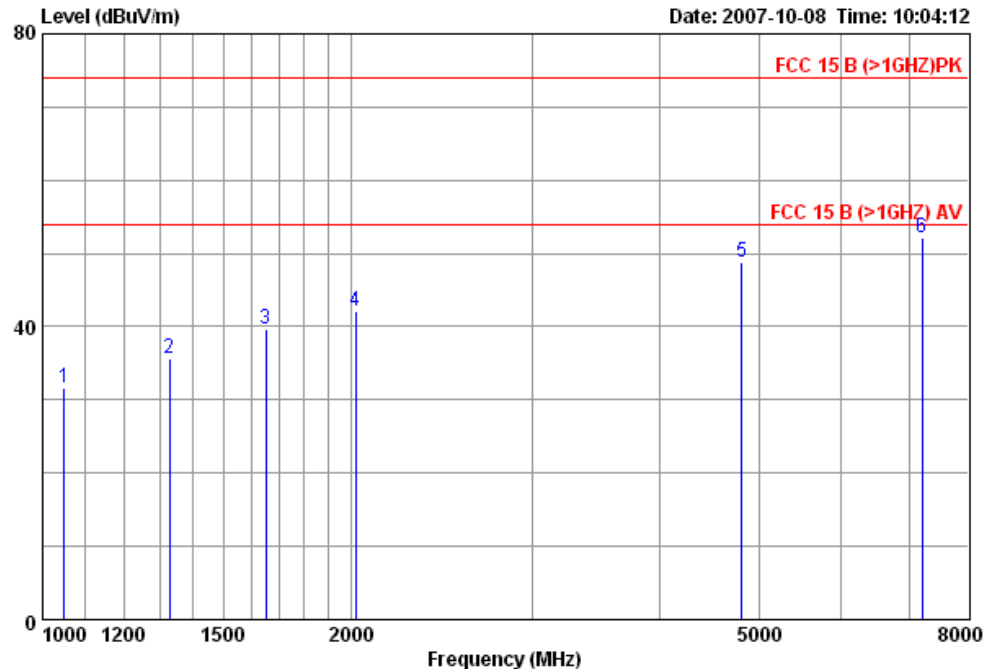
Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 47 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:04:12



Site no	: Audix ACI (3m Chamber)	Data no.	: 47
Dis. / Ant.	: 3m / EMC03115	Ant. pol.	: HORIZONTAL
Limit	: FCC 15 B (>1GHZ)PK	Engineer	: Leo
Env. / Ins.	: 25'C 60% / E7405A		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Transmitting		
Memo	: CH11(2405MHz)		

	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	1049.00	24.35	37.56	6.79	38.07	31.65	74.00	42.35	Peak
2	1329.00	25.53	36.88	7.66	39.45	35.76	74.00	38.24	Peak
3	1651.00	26.62	36.25	8.85	40.37	39.59	74.00	34.41	Peak
4	2022.00	27.68	35.67	9.98	40.15	42.14	74.00	31.86	Peak
5	4810.00	33.25	34.59	12.46	37.71	48.83	74.00	25.17	Peak
6	7215.00	35.49	34.48	12.97	38.20	52.18	74.00	21.82	Peak

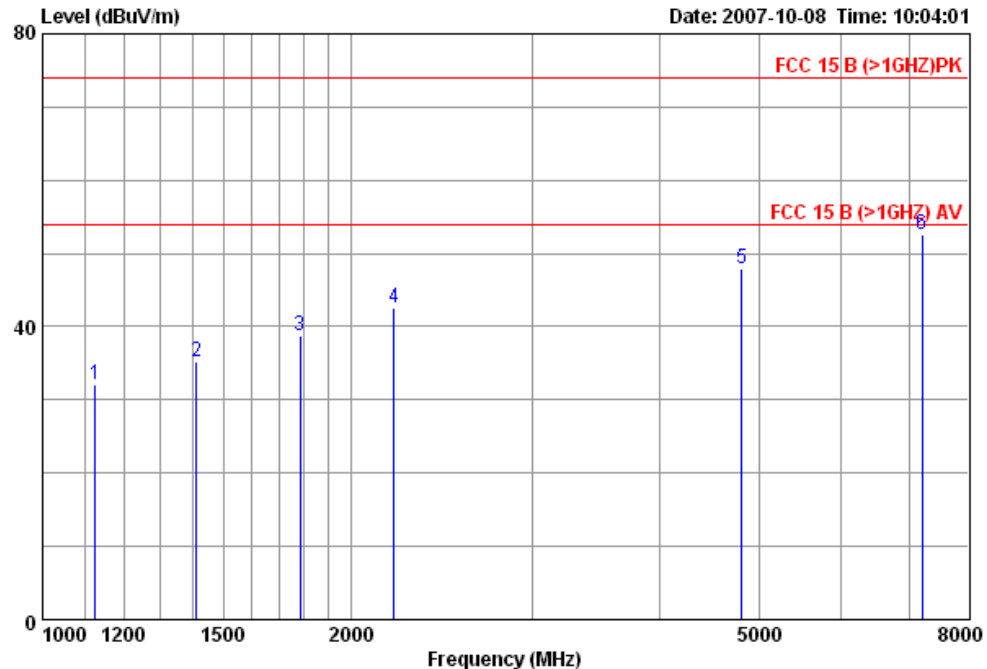
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 48 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:04:01



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / EMC03115
 Limit : FCC 15 B (>1GHZ)PK
 Env. / Ins. : 25'C 60% / E7405A
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH11(2405MHz)

Data no. : 48
 Ant. pol. : VERTICAL
 Engineer : Leo

	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	1126.00	24.70	37.35	6.95	37.73	32.03	74.00	41.97	Peak
2	1413.00	25.85	36.70	8.09	37.95	35.19	74.00	38.81	Peak
3	1784.00	27.02	36.03	9.32	38.35	38.66	74.00	35.34	Peak
4	2204.00	28.28	35.48	10.60	39.14	42.54	74.00	31.46	Peak
5	4810.00	33.25	34.59	12.46	36.69	47.81	74.00	26.19	Peak
6	7215.00	35.49	34.48	12.97	38.50	52.48	74.00	21.52	Peak

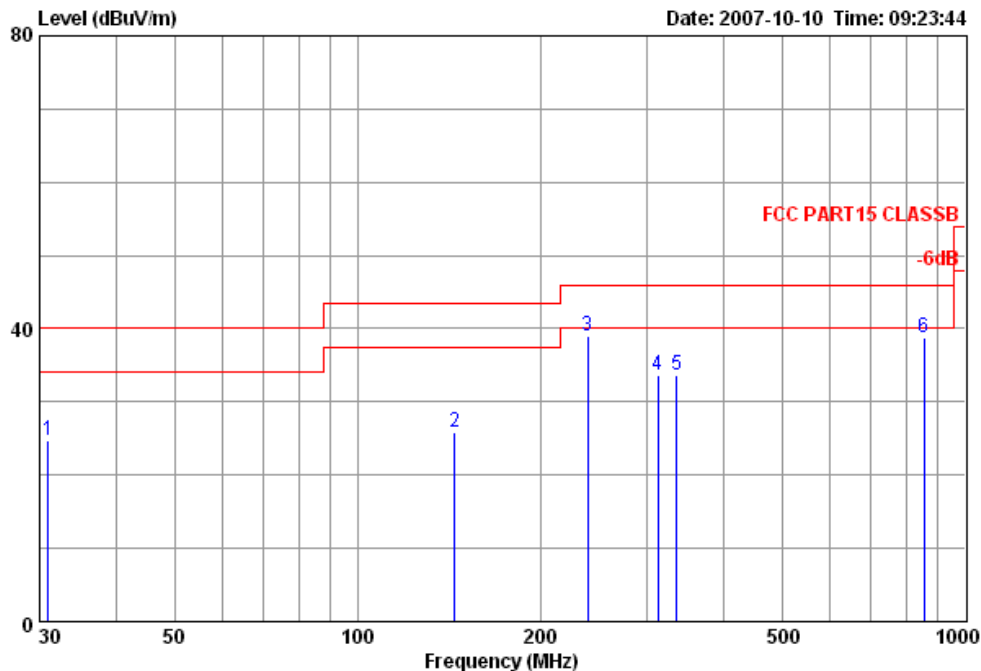
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 59 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:23:44



Site no : Audix ACI (3m Chamber) Data no. : 59
 Dis. / Ant. : 3m / 1145-07.03.18
 Limit : FCC PART15 CLASSB Ant. pol. : HORIZONTAL
 Env. / Ins. : 25'C 60% / ESVS10 Engineer : Leo
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH18(2440MHz)

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.97	16.76	0.91	6.96	24.63	40.00	15.37
2	144.46	11.21	2.04	12.53	25.78	43.50	17.72
3	239.52	13.70	2.71	22.54	38.95	46.00	7.05
4	312.27	13.86	3.18	16.57	33.61	46.00	12.39
5	335.55	15.08	3.30	15.26	33.64	46.00	12.36
6	856.44	23.28	5.55	10.00	38.83	46.00	7.17

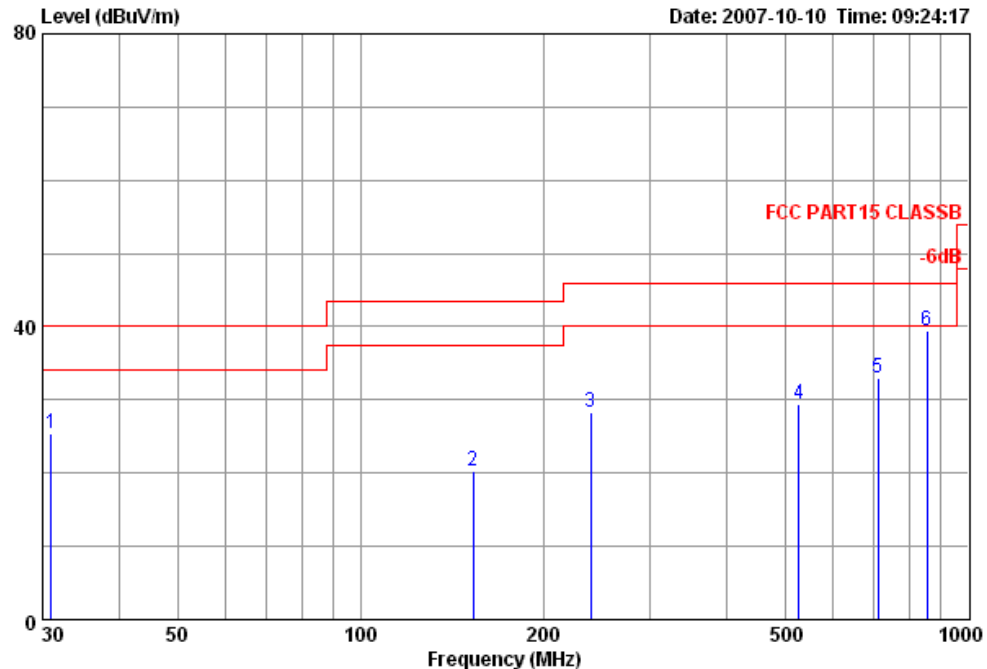
Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 60 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:24:17



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / 1145-07.03.18
 Limit : FCC PART15 CLASSB
 Env. / Ins. : 25'C 60% / ESVS10
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH18(2440MHz)

Data no. : 60
 Ant. pol. : VERTICAL
 Engineer : Leo

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.97	16.76	0.91	7.72	25.39	40.00	14.61
2	153.19	11.01	2.10	7.22	20.33	43.50	23.17
3	239.52	13.70	2.71	11.78	28.19	46.00	17.81
4	526.64	20.29	4.06	5.07	29.42	46.00	16.58
5	710.94	21.55	4.90	6.55	33.00	46.00	13.00
6	856.44	23.28	5.55	10.56	39.39	46.00	6.61

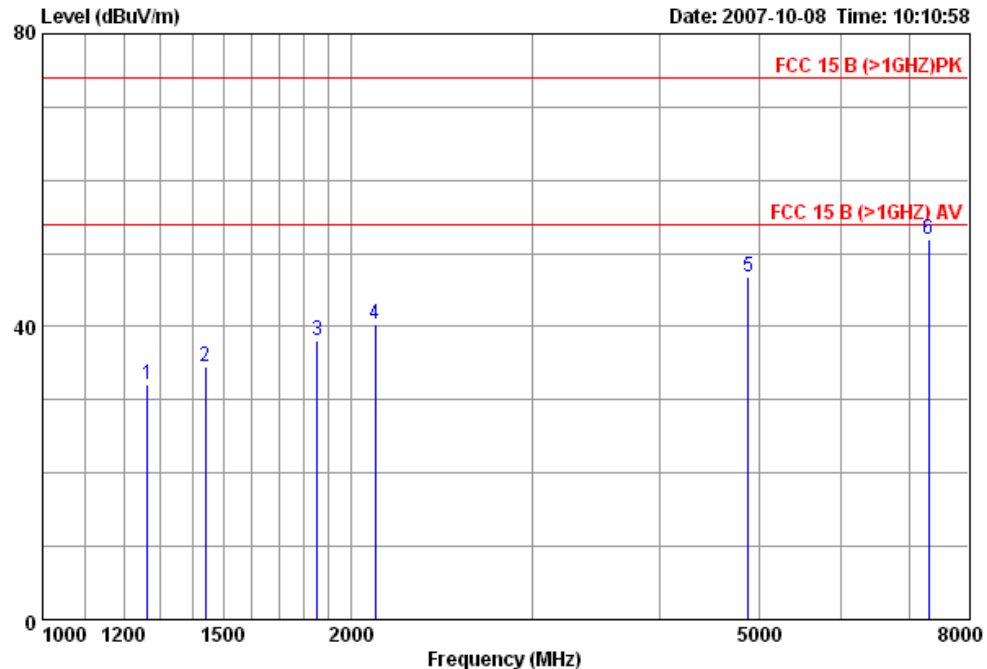
Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 49 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:10:58



Site no	: Audix ACI (3m Chamber)	Data no.	: 49
Dis. / Ant.	: 3m / EMC03115	Ant. pol.	: HORIZONTAL
Limit	: FCC 15 B (>1GHZ)PK	Engineer	: Leo
Env. / Ins.	: 25'C 60% / E7405A		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Transmitting		
Memo	: CH18(2440MHz)		

	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	1266.00	25.30	37.02	7.41	36.32	32.01	74.00	41.99	Peak
2	1441.00	25.94	36.64	8.18	37.14	34.62	74.00	39.38	Peak
3	1854.00	27.22	35.92	9.48	37.27	38.05	74.00	35.95	Peak
4	2113.00	27.99	35.57	10.29	37.54	40.25	74.00	33.75	Peak
5	4880.00	33.31	34.67	12.47	35.78	46.89	74.00	27.11	Peak
6	7320.00	35.58	34.47	13.00	37.92	52.03	74.00	21.97	Peak

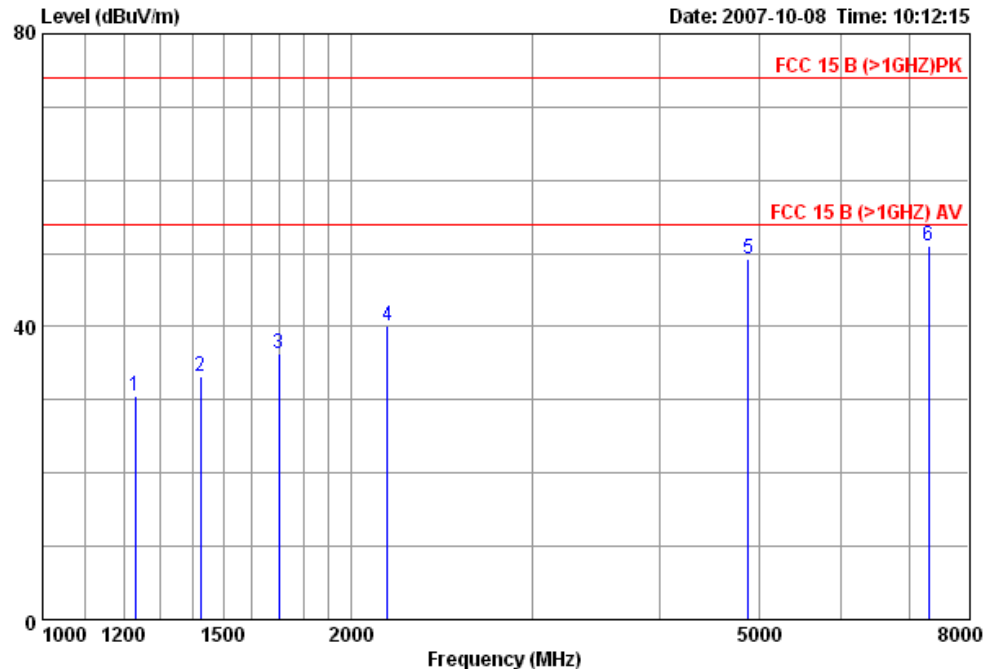
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 50 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:12:15



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / EMC03115
 Limit : FCC 15 B (>1GHZ)PK
 Env. / Ins. : 25'C 60% / E7405A
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH18(2440MHz)

Data no. : 50
 Ant. pol. : VERTICAL
 Engineer : Leo

	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	1231.00	25.15	37.10	7.24	35.23	30.52	74.00	43.48	Peak
2	1427.00	25.89	36.67	8.09	35.87	33.18	74.00	40.82	Peak
3	1700.00	26.78	36.17	8.99	36.63	36.23	74.00	37.77	Peak
4	2169.00	28.18	35.52	10.50	36.85	40.01	74.00	33.99	Peak
5	4880.00	33.31	34.67	12.47	38.09	49.20	74.00	24.80	Peak
6	7320.00	35.58	34.47	13.00	37.02	51.13	74.00	22.87	Peak

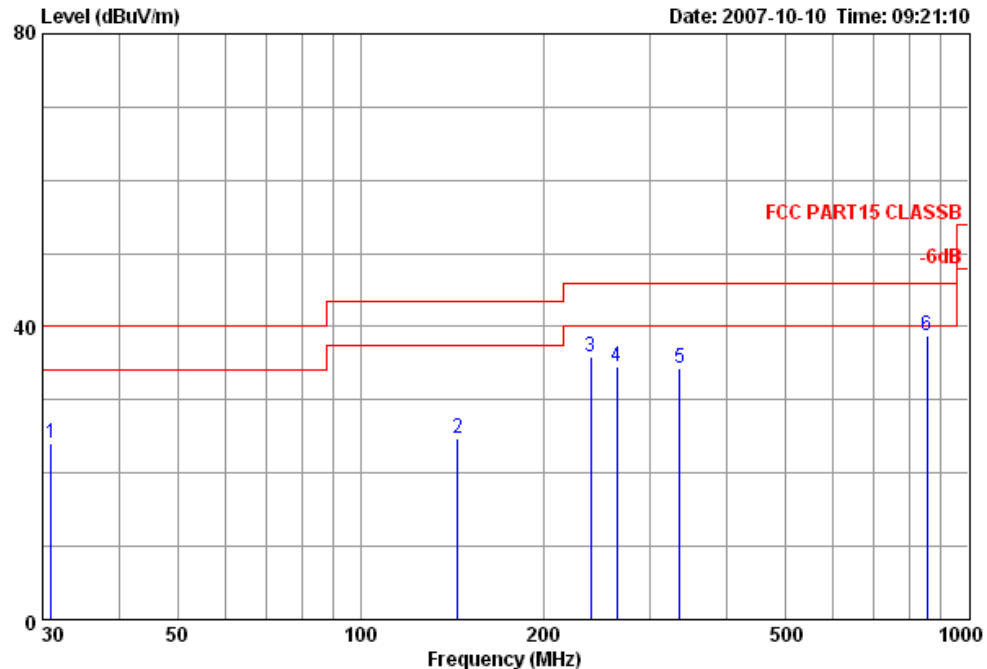
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 55 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:21:10



Site no	: Audix ACI (3m Chamber)	Data no.	: 55
Dis. / Ant.	: 3m / 1145-07.03.18	Ant. pol.	: HORIZONTAL
Limit	: FCC PART15 CLASSB	Engineer	: Leo
Env. / Ins.	: 25'C 60% / ESVS10		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Transmitting		
Memo	: CH25(2475MHz)		

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.97	16.76	0.91	6.31	23.98	40.00	16.02
2	144.46	11.21	2.04	11.59	24.84	43.50	18.66
3	239.52	13.70	2.71	19.40	35.81	46.00	10.19
4	263.77	13.67	2.89	18.04	34.60	46.00	11.40
5	335.55	15.08	3.30	15.84	34.22	46.00	11.78
6	856.44	23.28	5.55	9.95	38.78	46.00	7.22

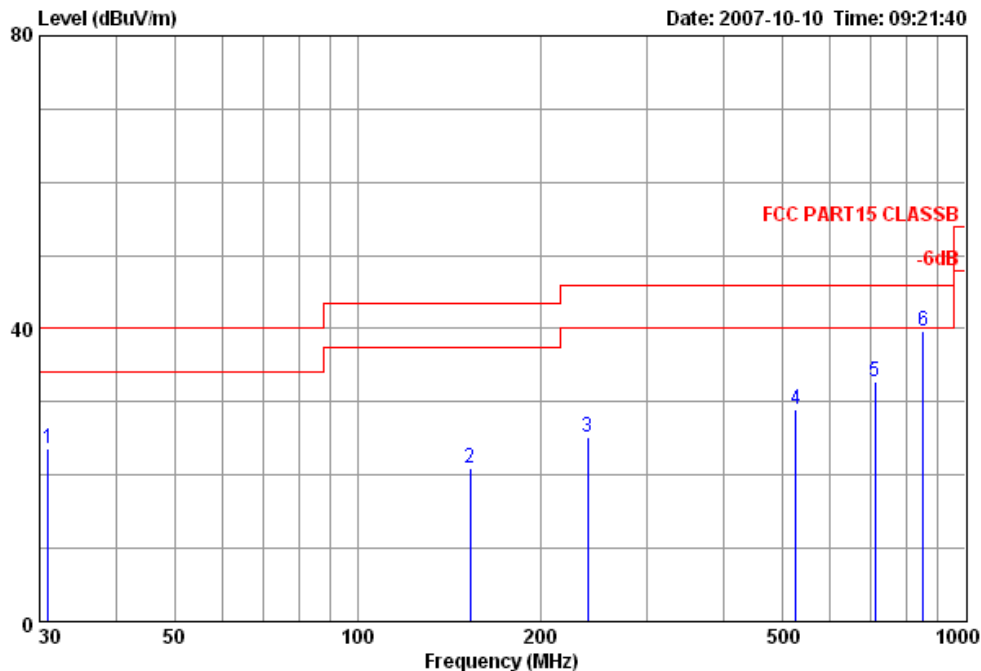
Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 56 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:21:40



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / 1145-07.03.18
 Limit : FCC PART15 CLASSB
 Env. / Ins. : 25'C 60% / ESVS10
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH25(2475MHz)

Data no. : 56
 Ant. pol. : VERTICAL
 Engineer : Leo

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.97	16.76	0.91	5.93	23.60	40.00	16.40
2	153.19	11.01	2.10	7.78	20.89	43.50	22.61
3	239.52	13.70	2.71	8.74	25.15	46.00	20.85
4	526.64	20.29	4.06	4.71	29.06	46.00	16.94
5	710.94	21.55	4.90	6.23	32.68	46.00	13.32
6	851.59	23.34	5.55	10.78	39.67	46.00	6.33

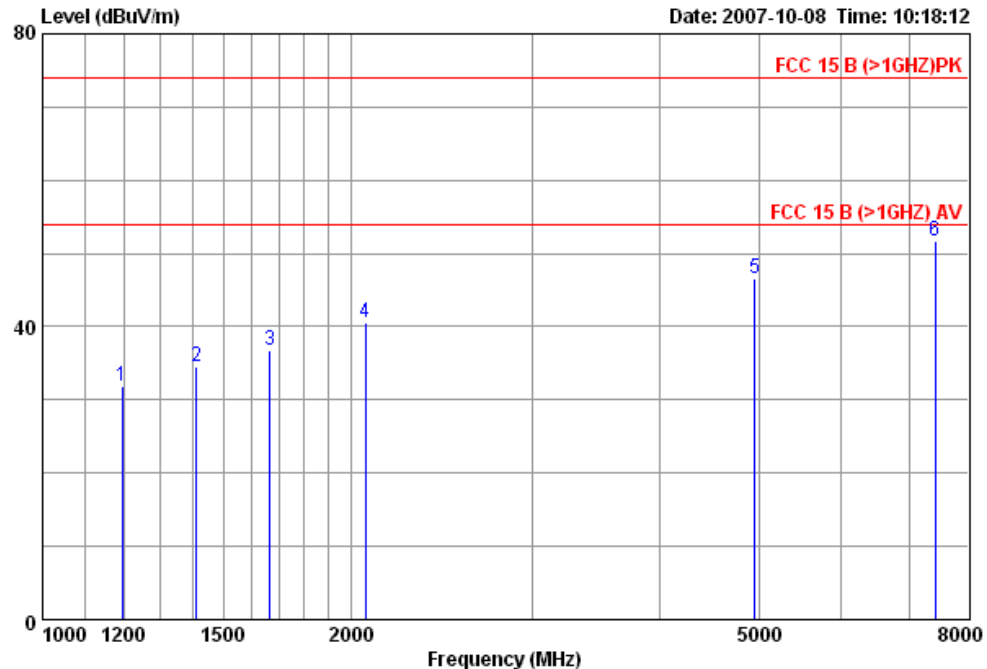
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 51 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:18:12



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / EMC03115
 Limit : FCC 15 B (>1GHZ)PK
 Env. / Ins. : 25'C 60% / E7405A
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH25(2475MHz)

Data no. : 51
 Ant. pol. : HORIZONTAL
 Engineer : Leo

	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	1196.00	25.00	37.18	7.07	36.94	31.83	74.00	42.17	Peak
2	1413.00	25.85	36.70	8.09	37.26	34.50	74.00	39.50	Peak
3	1665.00	26.67	36.23	8.92	37.50	36.86	74.00	37.14	Peak
4	2064.00	27.83	35.63	10.19	38.25	40.64	74.00	33.36	Peak
5	4950.00	33.36	34.75	12.49	35.54	46.64	74.00	27.36	Peak
6	7425.00	35.67	34.46	13.03	37.55	51.79	74.00	22.21	Peak

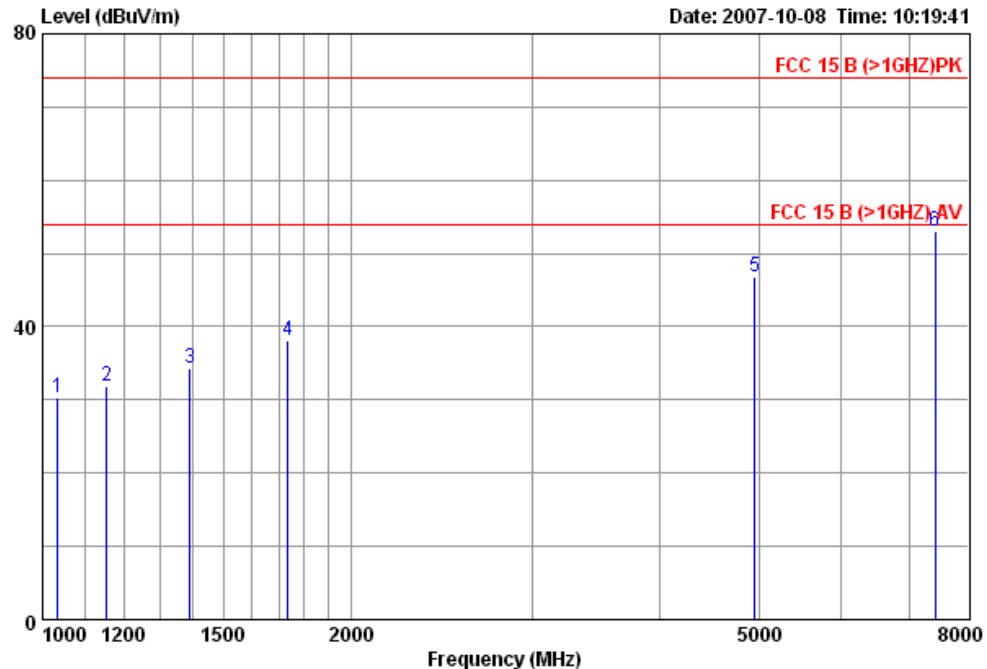
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 52 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:19:41



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / EMC03115
 Limit : FCC 15 B (>1GHZ)PK
 Env. / Ins. : 25'C 60% / E7405A
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH25(2475MHz)

Data no. : 52
 Ant. pol. : VERTICAL
 Engineer : Leo

	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	1035.00	24.27	37.60	6.76	36.97	30.40	74.00	43.60	Peak
2	1154.00	24.83	37.28	7.01	37.29	31.85	74.00	42.15	Peak
3	1392.00	25.76	36.75	8.01	37.23	34.25	74.00	39.75	Peak
4	1735.00	26.89	36.11	9.15	38.09	38.02	74.00	35.98	Peak
5	4950.00	33.36	34.75	12.49	35.65	46.75	74.00	27.25	Peak
6	7425.00	35.67	34.46	13.03	38.77	53.01	74.00	20.99	Peak

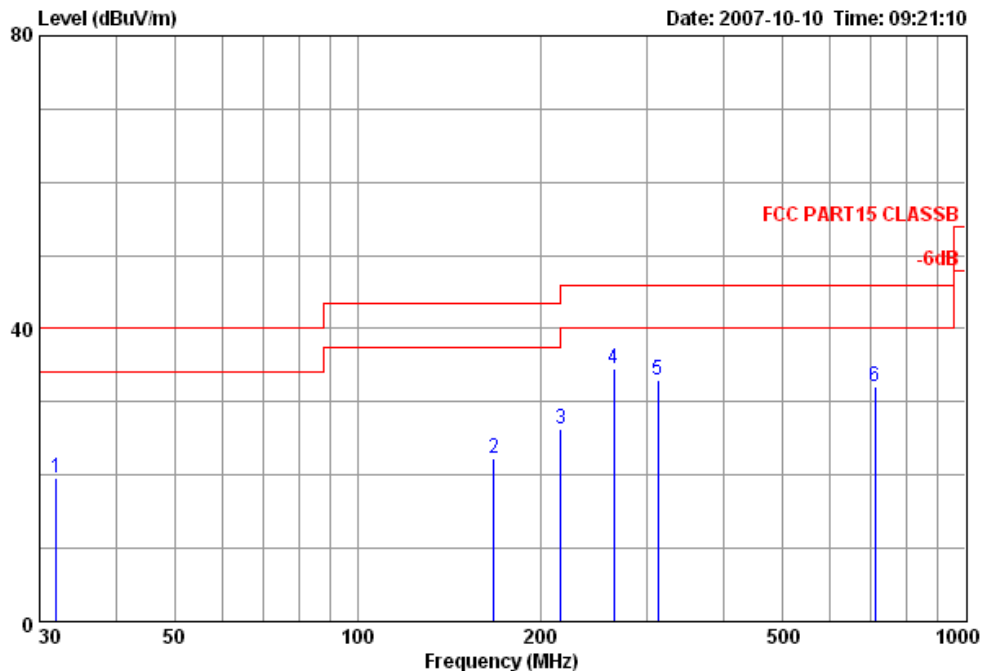
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 61 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:21:10



Site no	: Audix ACI (3m Chamber)	Data no.	: 61
Dis. / Ant.	: 3m / 1145-07.03.18	Ant. pol.	: HORIZONTAL
Limit	: FCC PART15 CLASSB	Engineer	: Leo
Env. / Ins.	: 25'C 60% / ESVS10		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Receiving		
Memo	: CH18(2440MHz)		

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	31.94	15.50	0.92	3.16	19.58	40.00	20.42
2	167.74	11.15	2.17	9.02	22.34	43.50	21.16
3	216.24	13.35	2.50	10.46	26.31	46.00	19.69
4	263.77	13.67	2.89	18.04	34.60	46.00	11.40
5	312.27	13.86	3.18	15.85	32.89	46.00	13.11
6	710.94	21.55	4.90	5.64	32.09	46.00	13.91

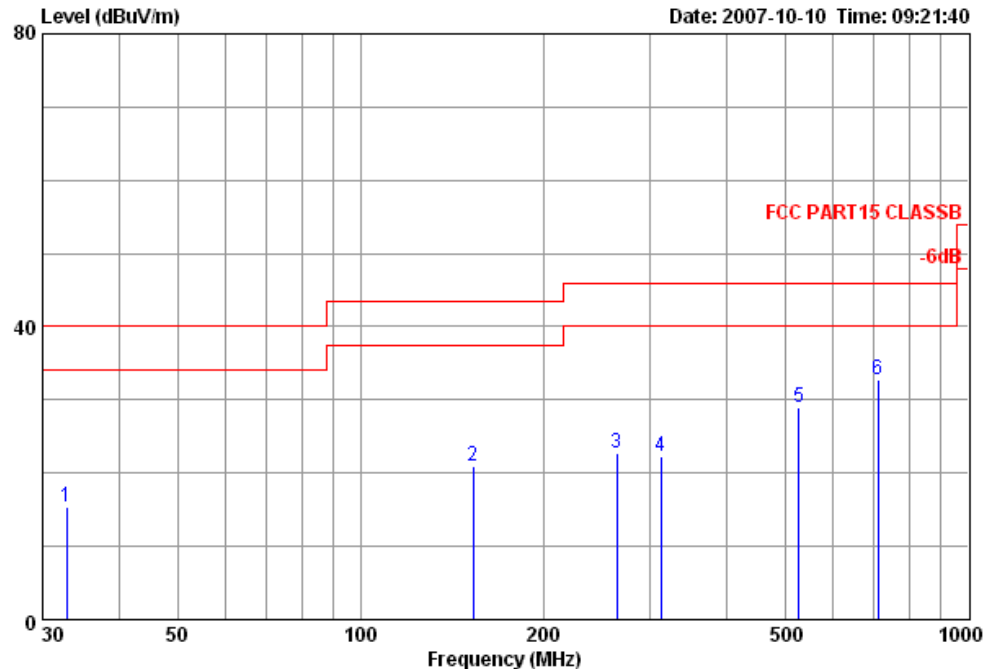
Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 62 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:21:40



Site no : Audix ACI (3m Chamber) Data no. : 62
 Dis. / Ant. : 3m / 1145-07.03.18
 Limit : FCC PART15 CLASSB Ant. pol. : VERTICAL
 Env. / Ins. : 25'C 60% / ESVS10 Engineer : Leo
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Receiving
 Memo : CH18(2440MHz)

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	32.91	14.38	0.92	0.13	15.43	40.00	24.57
2	153.19	11.01	2.10	7.78	20.89	43.50	22.61
3	263.77	13.67	2.89	6.08	22.64	46.00	23.36
4	312.27	13.86	3.18	5.26	22.30	46.00	23.70
5	526.64	20.29	4.06	4.71	29.06	46.00	16.94
6	710.94	21.55	4.90	6.23	32.68	46.00	13.32

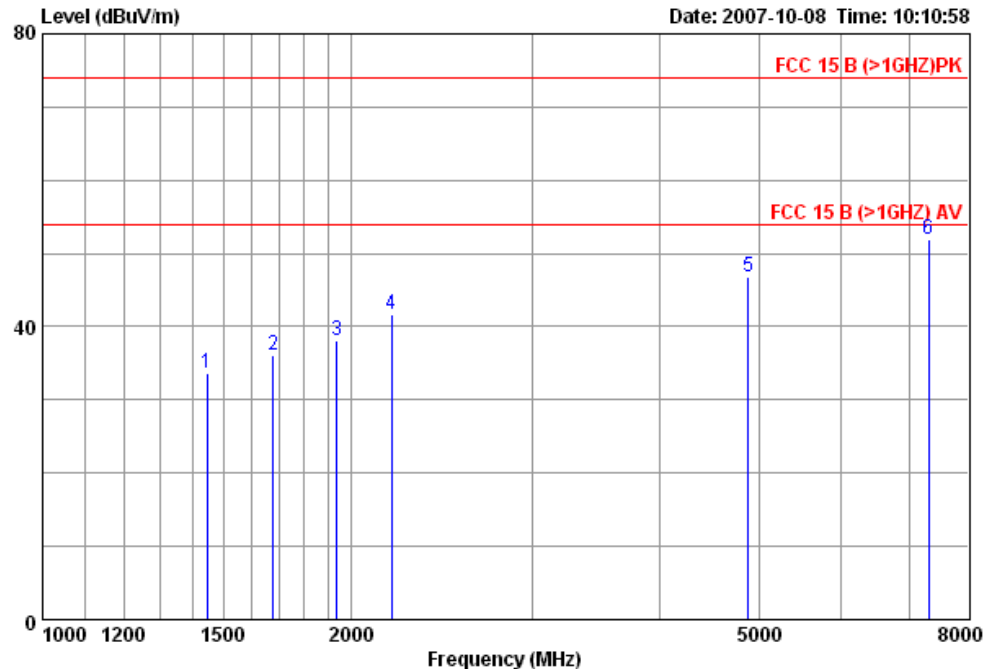
Remarks: 1.Emission Level= Antenna Factor + Cable Loss + Reading.
 2.The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 63 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:10:58



Site no	: Audix ACI (3m Chamber)	Data no.	: 63
Dis. / Ant.	: 3m / EMC03115	Ant. pol.	: HORIZONTAL
Limit	: FCC 15 B (>1GHZ)PK	Engineer	: Leo
Env. / Ins.	: 25'C 60% / E7405A		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Receiving		
Memo	: CH18(2440MHz)		

	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	1448.00	25.97	36.63	8.18	36.13	33.65	74.00	40.35	Peak
2	1679.00	26.71	36.20	8.92	36.67	36.10	74.00	37.90	Peak
3	1938.00	27.44	35.79	9.73	36.71	38.09	74.00	35.91	Peak
4	2190.00	28.24	35.49	10.60	38.40	41.75	74.00	32.25	Peak
5	4880.00	33.31	34.67	12.47	35.78	46.89	74.00	27.11	Peak
6	7320.00	35.58	34.47	13.00	37.92	52.03	74.00	21.97	Peak

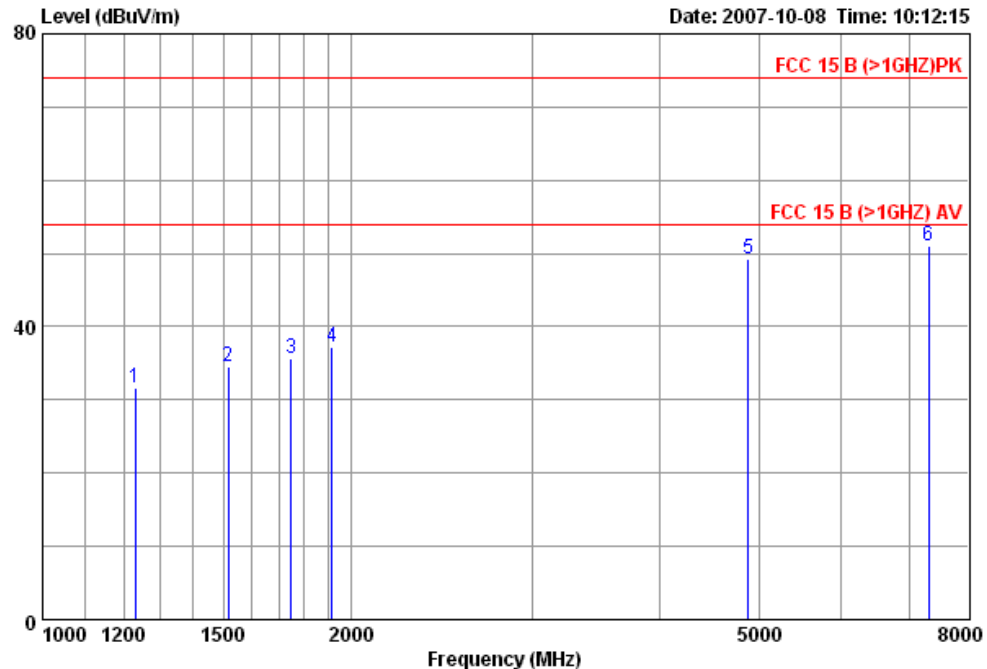
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 64 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-08 Time: 10:12:15



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / EMC03115
 Limit : FCC 15 B (>1GHZ)PK
 Env. / Ins. : 25'C 60% / E7405A
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Receiving
 Memo : CH18(2440MHz)

Data no. : 64
 Ant. pol. : VERTICAL
 Engineer : Leo

	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	1231.00	25.15	37.10	7.24	36.41	31.70	74.00	42.30	Peak
2	1518.00	26.20	36.50	8.50	36.43	34.63	74.00	39.37	Peak
3	1749.00	26.91	36.08	9.15	35.64	35.62	74.00	38.38	Peak
4	1917.00	27.38	35.82	9.73	35.82	37.11	74.00	36.89	Peak
5	4880.00	33.31	34.67	12.47	38.09	49.20	74.00	24.80	Peak
6	7320.00	35.58	34.47	13.00	37.02	51.13	74.00	22.87	Peak

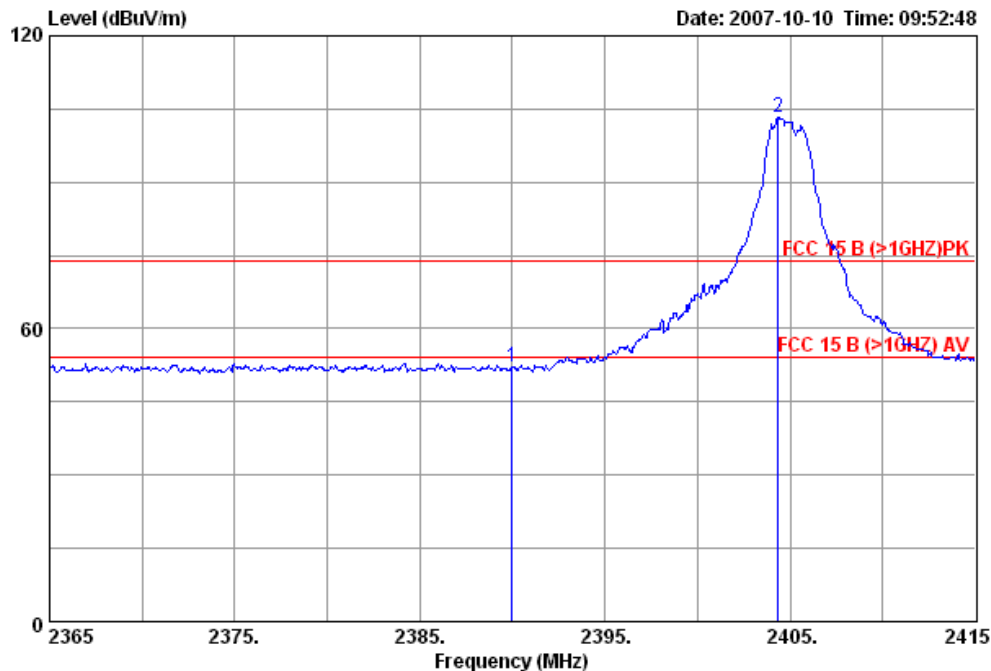
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Preamp Factor + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 25 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:52:48



Site no : Audix ACI (3m Chamber)
 Dis. / Ant. : 3m / 1145-07.03.18
 Limit : FCC 15 B (>1GHz)PK
 Env. / Ins. : 25'C 60% / ESVS10
 EUT : Middle TX Power ZigBee Module
 M/N : HT-MDL-Z-EM-2400-101-X
 S/N : E07100806
 Power Rating: 3.3V DC
 Test Mode : Transmitting
 Memo : CH11(2405MHz)

Data no. : 25
 Ant. pol. : VERTICAL
 Engineer : Leo

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	2390.00	28.86	11.23	11.92	52.01	74.00	21.99
2	2404.35	28.93	11.23	62.99	103.15	74.00	-29.15

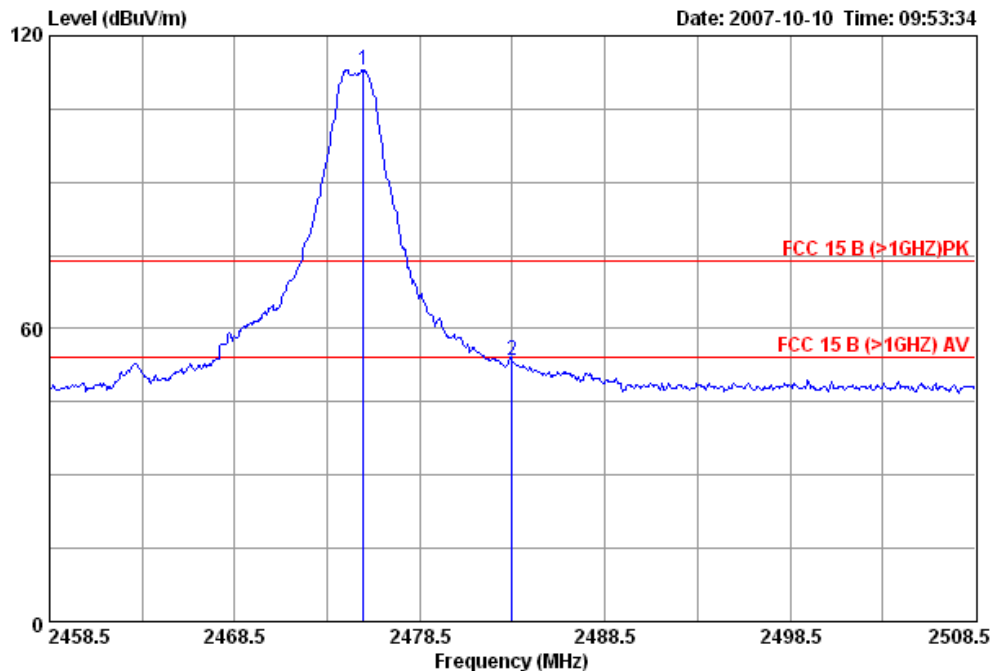
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.



Audix Technology (Shanghai) Co., Ltd.
 3F #34Bldg. No.680 GuiPing Rd.,
 CaoHeJing Hi-Tech Park,
 Shanghai, China 200233
 Tel: +86-21-64955500 Fax: +86-21-64955491
 audixaci@audix.com

Data: 28 File: D:\Test-Data\H\Holley.EM6 (64)

Date: 2007-10-10 Time: 09:53:34



Site no	: Audix ACI (3m Chamber)	Data no.	: 28
Dis. / Ant.	: 3m / 1145-07.03.18	Ant. pol.	: VERTICAL
Limit	: FCC 15 B (>1GHZ)PK	Engineer	: Leo
Env. / Ins.	: 25'C 60% / ESVS10		
EUT	: Middle TX Power ZigBee Module		
M/N	: HT-MDL-Z-EM-2400-101-X		
S/N	: E07100806		
Power Rating	: 3.3V DC		
Test Mode	: Transmitting		
Memo	: CH25(2475MHz)		

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	2475.45	29.13	11.44	72.51	113.08	74.00	-39.08
2	2483.50	29.15	11.44	12.99	53.58	74.00	20.42

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official are not report.

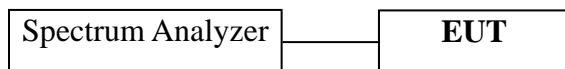
4 6 dB BANDWIDTH MEASUREMENT

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	Apr 06, 2007	Apr 06, 2008

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 “Super Terminal” was used to enable the EUT to transmit and receive 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 and 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.

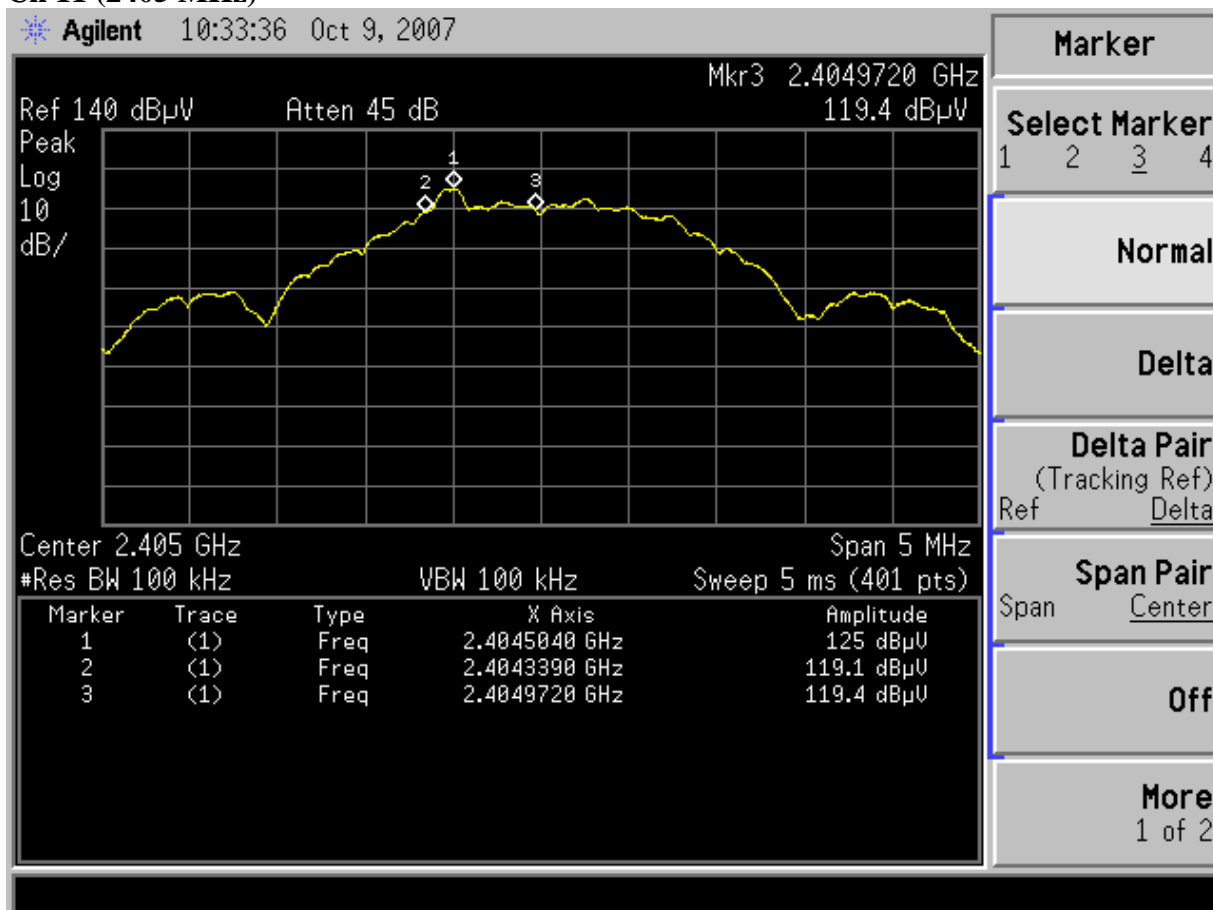
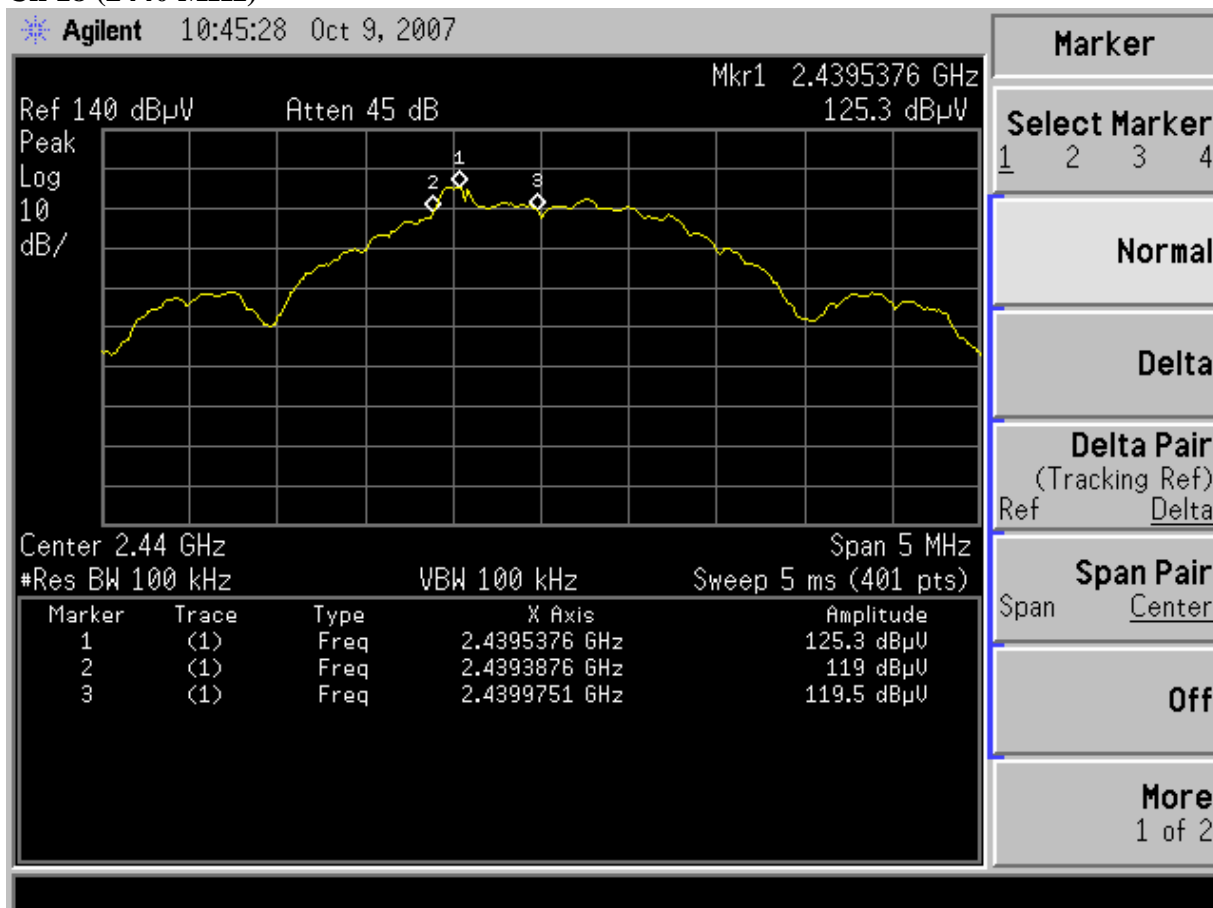
4.6 Test Results

PASSED.

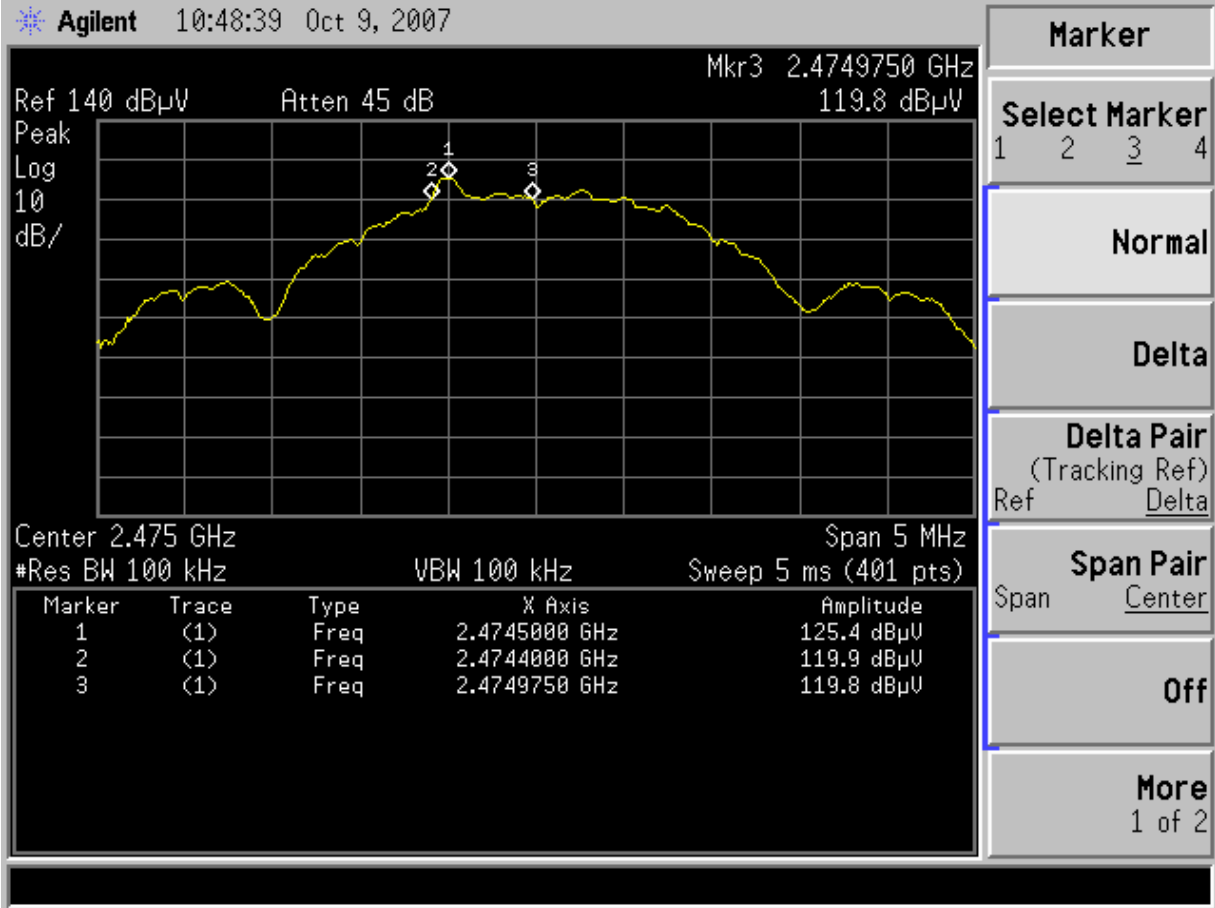
All the test results are attached in next pages.

(Test Date : Oct 09, 2007 Temperature : 23°C Humidity : 54 %)

Channel	Frequency	6dB Bandwidth
11	2405 MHz	633 kHz
18	2440 MHz	587.5 kHz
25	2475 MHz	575 kHz

Ch 11 (2405 MHz)**Ch 18 (2440 MHz)**

Ch 25 (2475 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	Aug 05, 2007	Aug 05, 2008
2.	Power Sensor	Anritsu	MA2491A	32489	Aug 05, 2007	Aug 05, 2008

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 “Super Terminal” was used to enable the EUT to transmit and receive data at different channel frequency individually.

5.5 Test Procedure

The transmitter output was connected to the power meter that was designed to detect peak value automatically.

5.6 Test Results

PASSED. All the test results are listed below.

(Test date: Oct 08, 2007 Temperature : 23 °C Humidity : 54 %)

Channel	Frequency	Peak Output Power	Limit
11	2405 MHz	18.45 dBm	30 dBm
18	2440 MHz	18.70 dBm	30 dBm
25	2475 MHz	18.87 dBm	30 dBm

6 RF EXPOSURE 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	Aug 05, 2007	Aug 05, 2008
2.	Power Sensor	Anritsu	MA2491A	32489	Aug 05, 2007	Aug 05, 2008

6.2 Block Diagram of Test Setup



6.3 Specification Limits (§15.247(i), §1.1310)

The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
(A)LIMITS FOR OCCUPATIONAL / CONTROL EXPOSURES				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B)LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1.0	30

F = Frequency in MHz

6.4 Operating Condition of EUT

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

6.5 Test Procedure

The transmitter output was connected to the power meter that was designed to detect peak value automatically.

6.6 Test Results

PASSED. All the test results are listed below.

(Test date: Oct 08, 2007 Temperature : 23 °C Humidity : 54 %)

Channel	Frequency (MHz)	Output Power to Antenna (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)
11	2405	69.98	0.0226	1.0
18	2440	74.13	0.0239	1.0
25	2475	77.09	0.0248	1.0

Note: $S = \frac{P \cdot G}{4 \cdot \pi \cdot r^2}$

Where S = Power Density in mW/cm²

P = Output Power to Antenna in mW (See Section 5.6)

G = Antenna Gain in numerical (G = 2.1 dBi = 1.62)

r = 20cm

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	Apr 06, 2007	Apr 06, 2008

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. 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 “Super 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. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100 kHz RBW and 100 kHz VBW.

7.6 Test Results

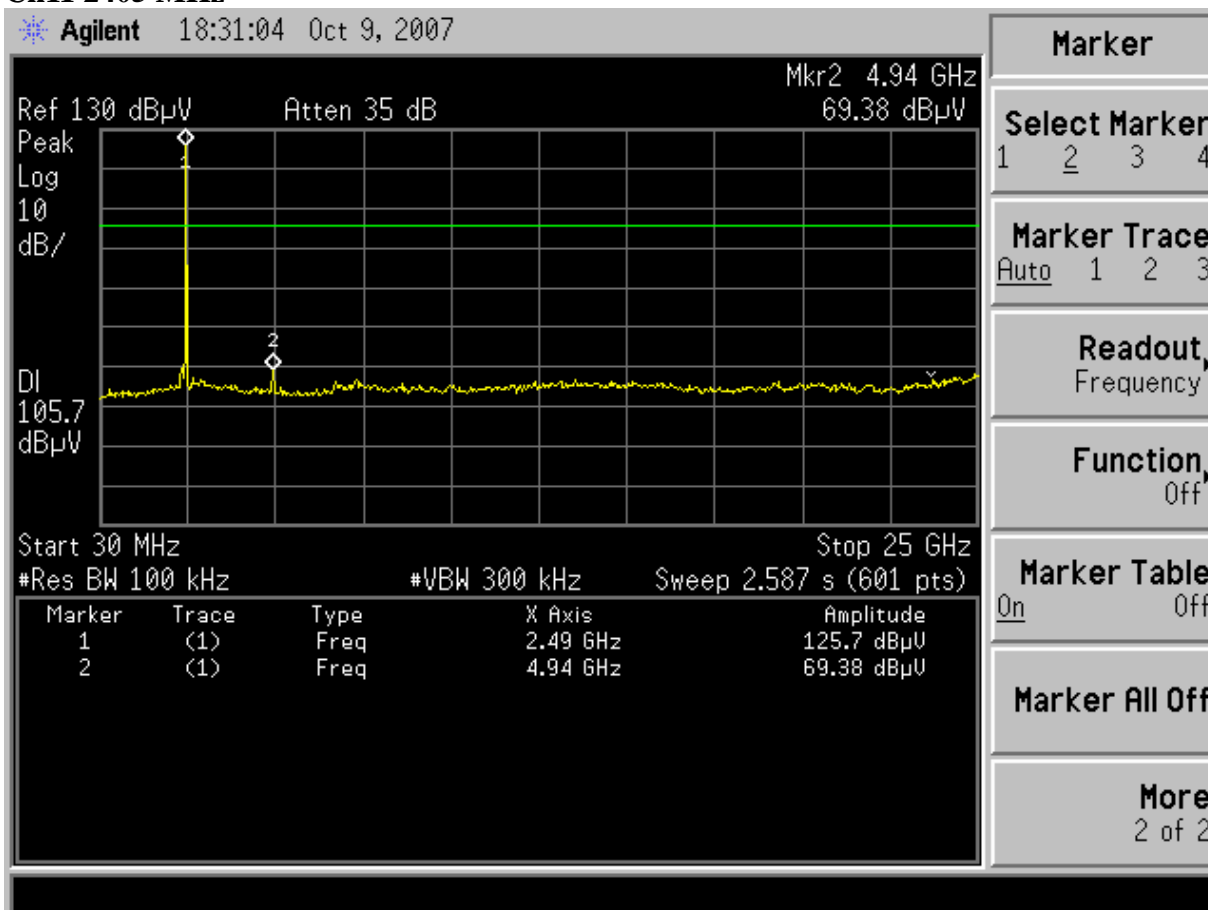
PASSED. The testing data was attached in the next pages.

(Test date: Oct 09, 2007 Temperature : 23 °C Humidity : 54 %)

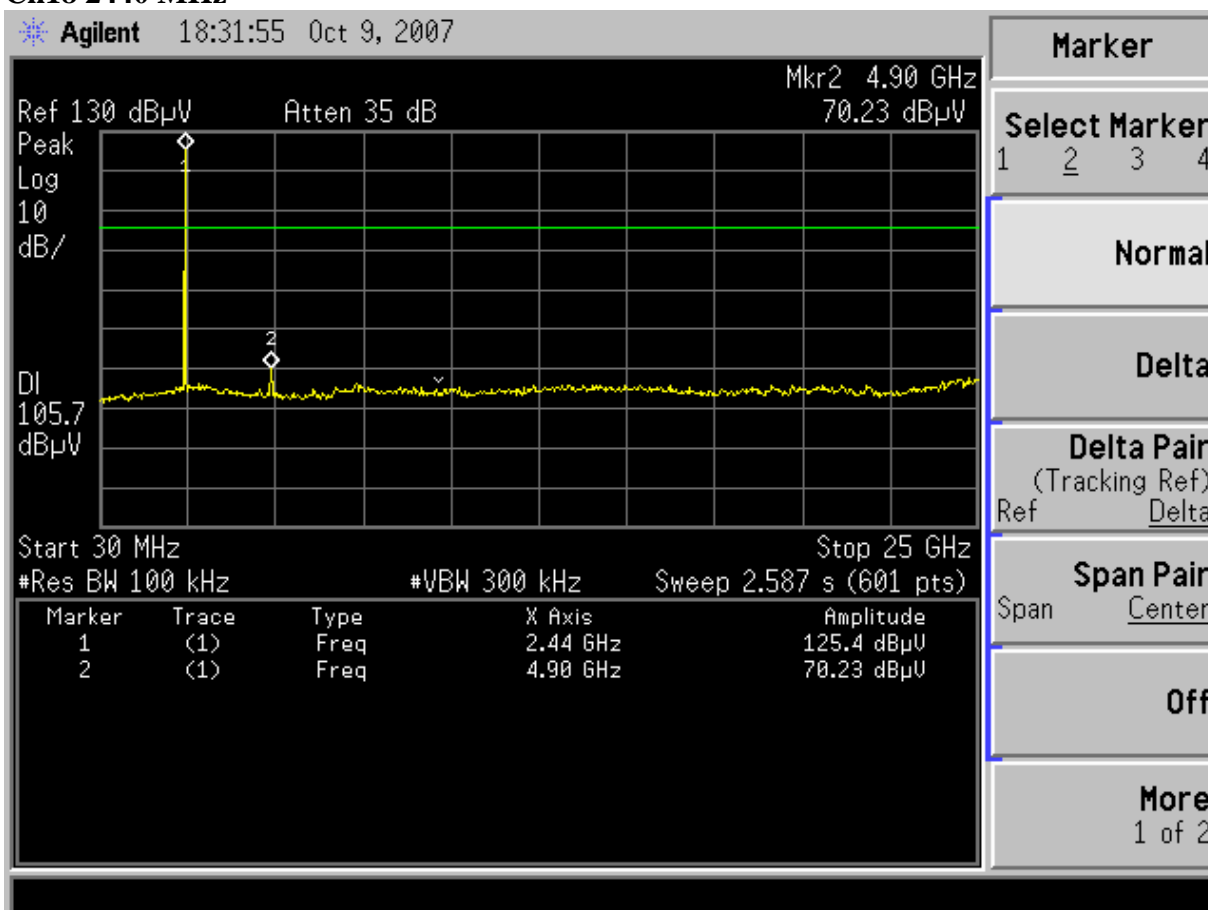
Channel	Highest level of desired power (dBm)	Max Value			Limit (dB)
		Freq. (GHz)	Level (dBuV)	Result (dB)	
11	18.7	4.96	-37.62	56.32	20
18	18.4	4.90	-36.77	55.17	20
25	17.9	4.82	-38.45	56.35	20

Note: The peak above the limit line is the carrier frequency.

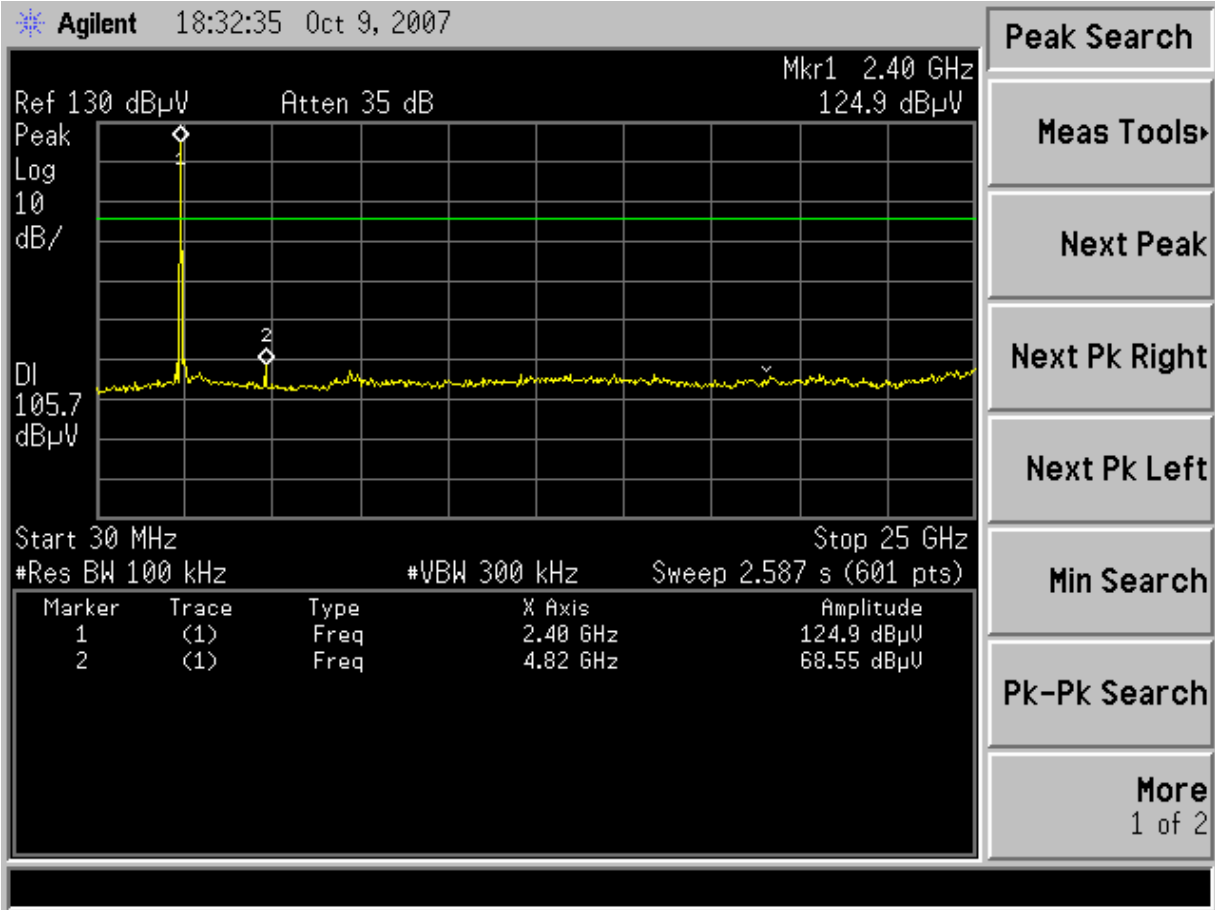
Ch11 2405 MHz



Ch18 2440 MHz



Ch25 2475 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	Apr 06, 2007	Apr 06, 2008

8.2 Block Diagram of Test Setup

The same as section.4.2.

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 “Super Terminal” was used to enable the EUT to transmit and receive data at different channel frequency individually.

8.5 Test Procedure

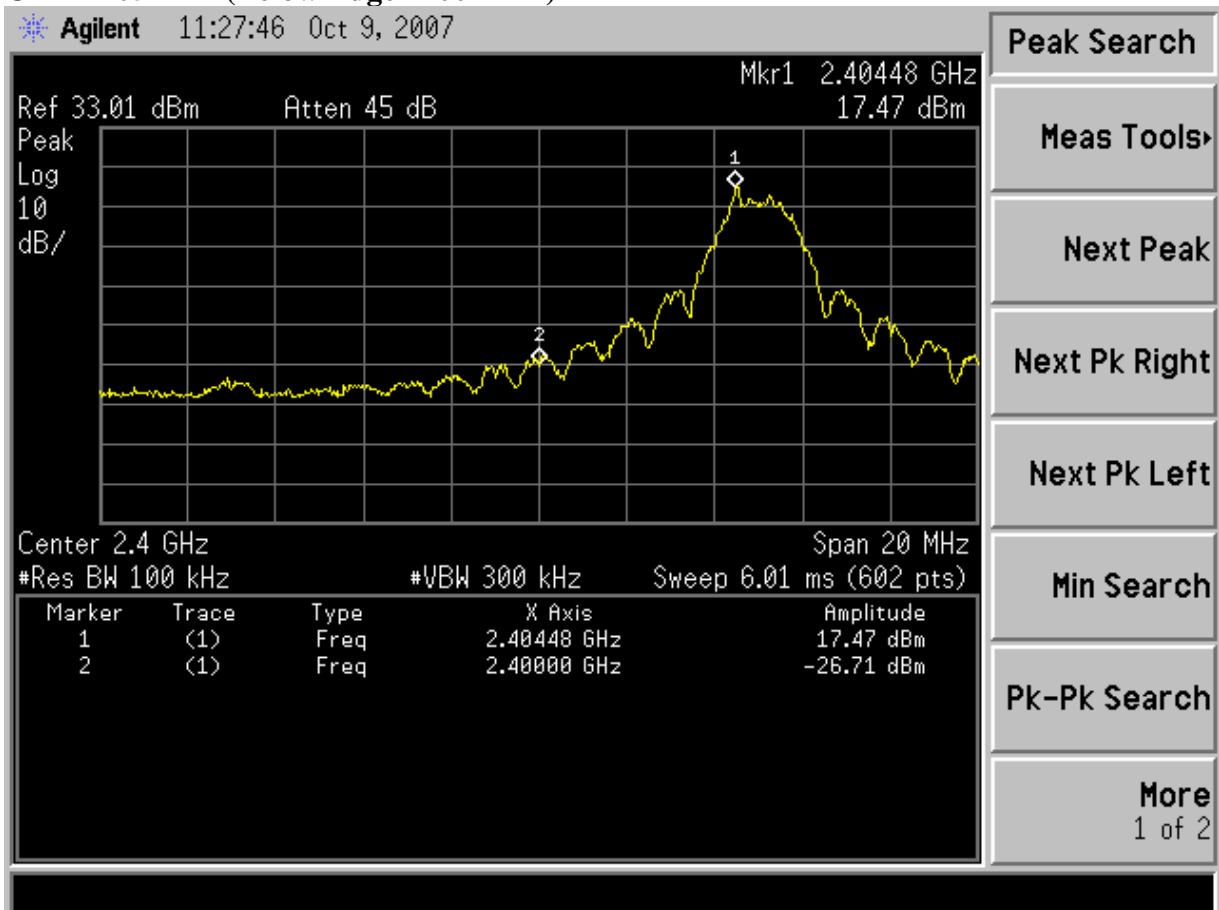
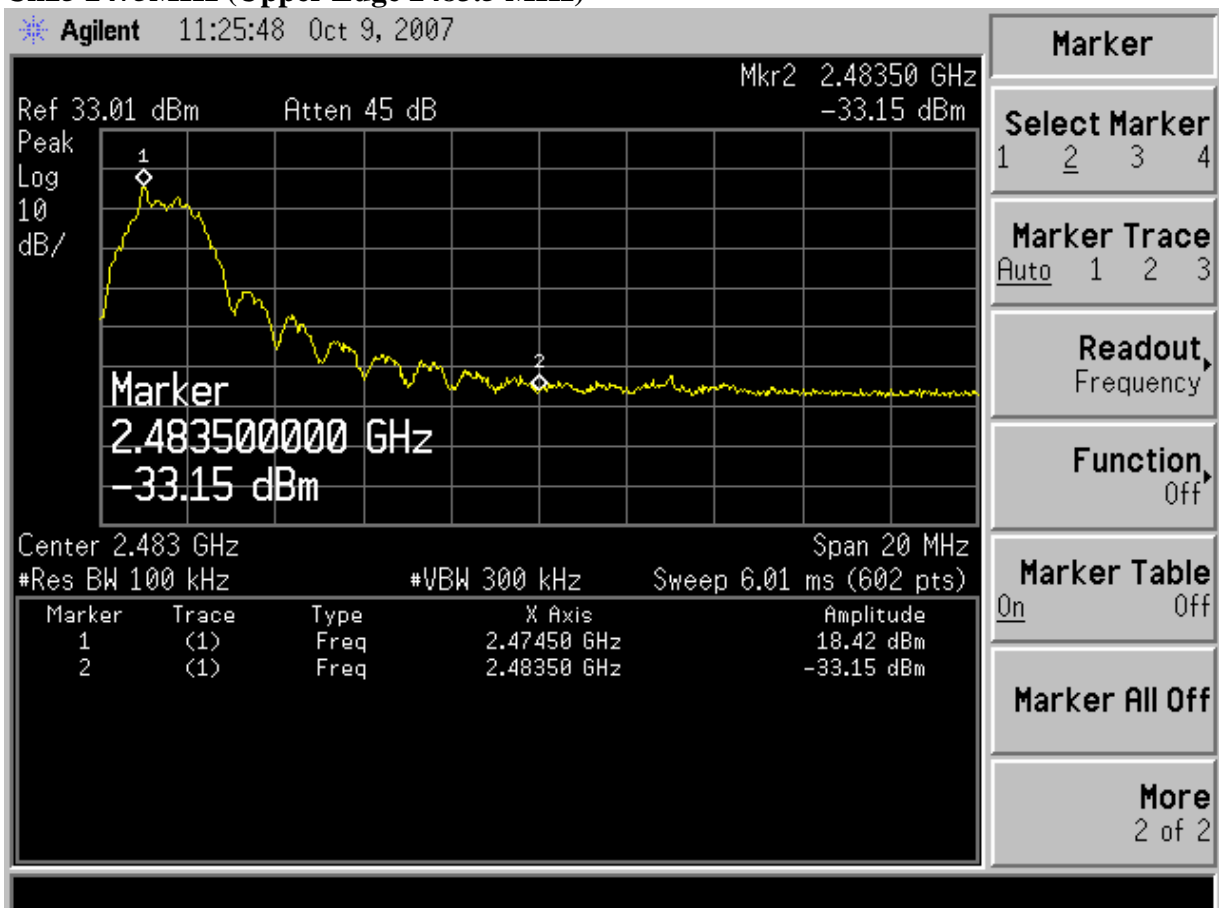
The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.

8.6 Test Results

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

(Test date: Oct 09, 2007 Temperature : 23°C Humidity : 54 %)

	Channel	Frequency	Delta Marker	result
Below Band Edge	11	2400 MHz	44.18 dB	More than 20 dB below the highest level of the desired power
Upper Band Edge	25	2483.5 MHz	51.57 dB	

Ch11 2405MHz (Below Edge 2400 MHz)**Ch25 2475MHz (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	Apr 06, 2007	Apr 06, 2008

9.2 Block Diagram of Test Setup

The same as section.4.2.

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 “Super Terminal” was used to enable the EUT to transmit and receive data at different channel frequency individually.

9.5 Test Procedure

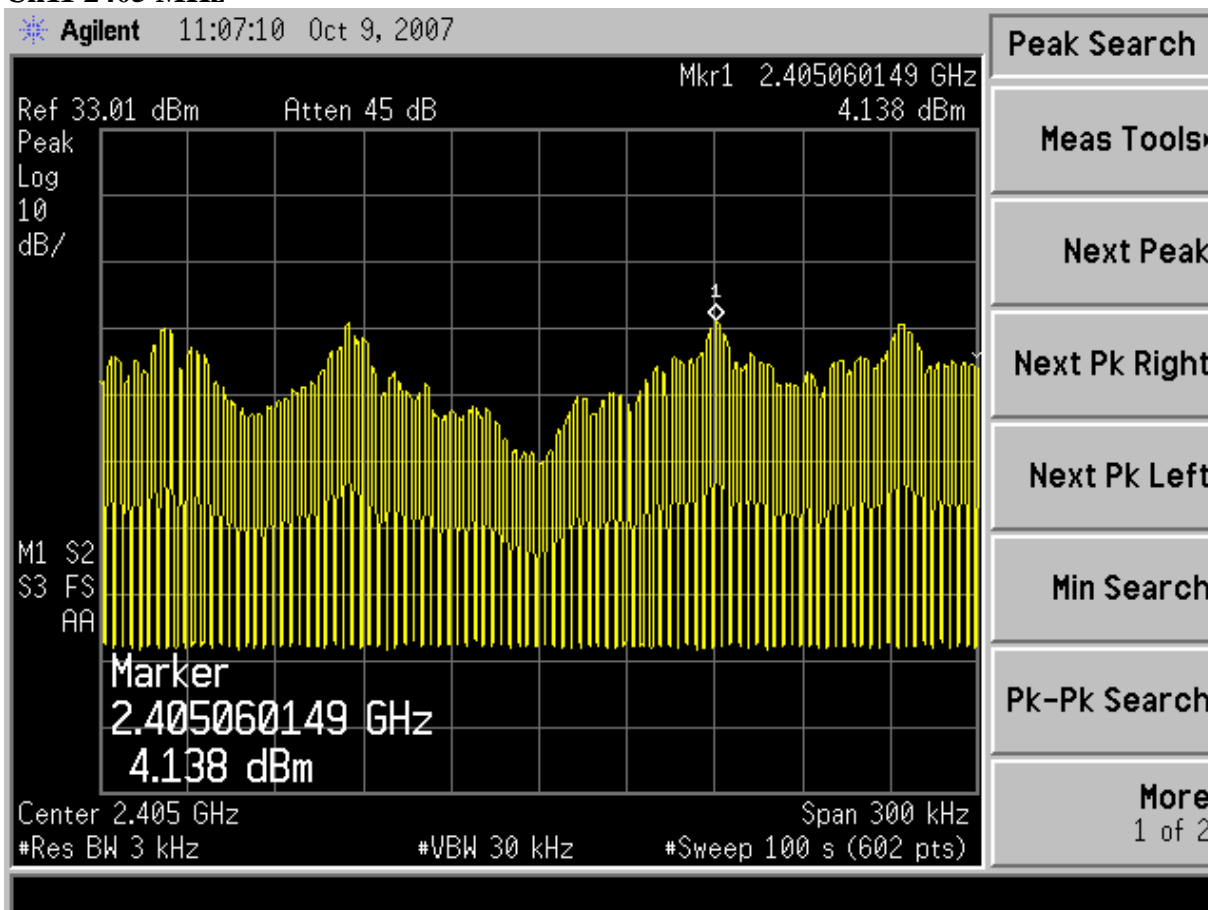
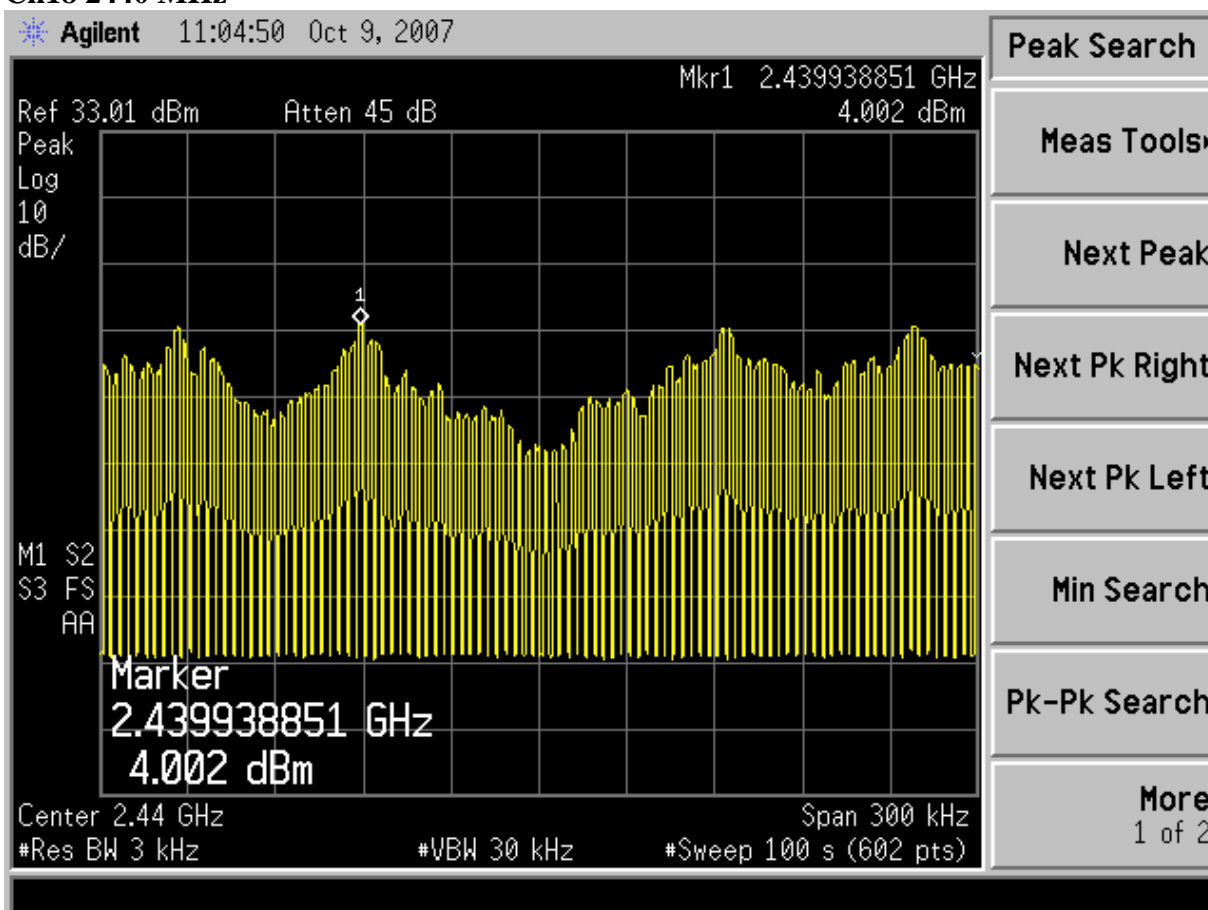
The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz.

9.6 Test Results

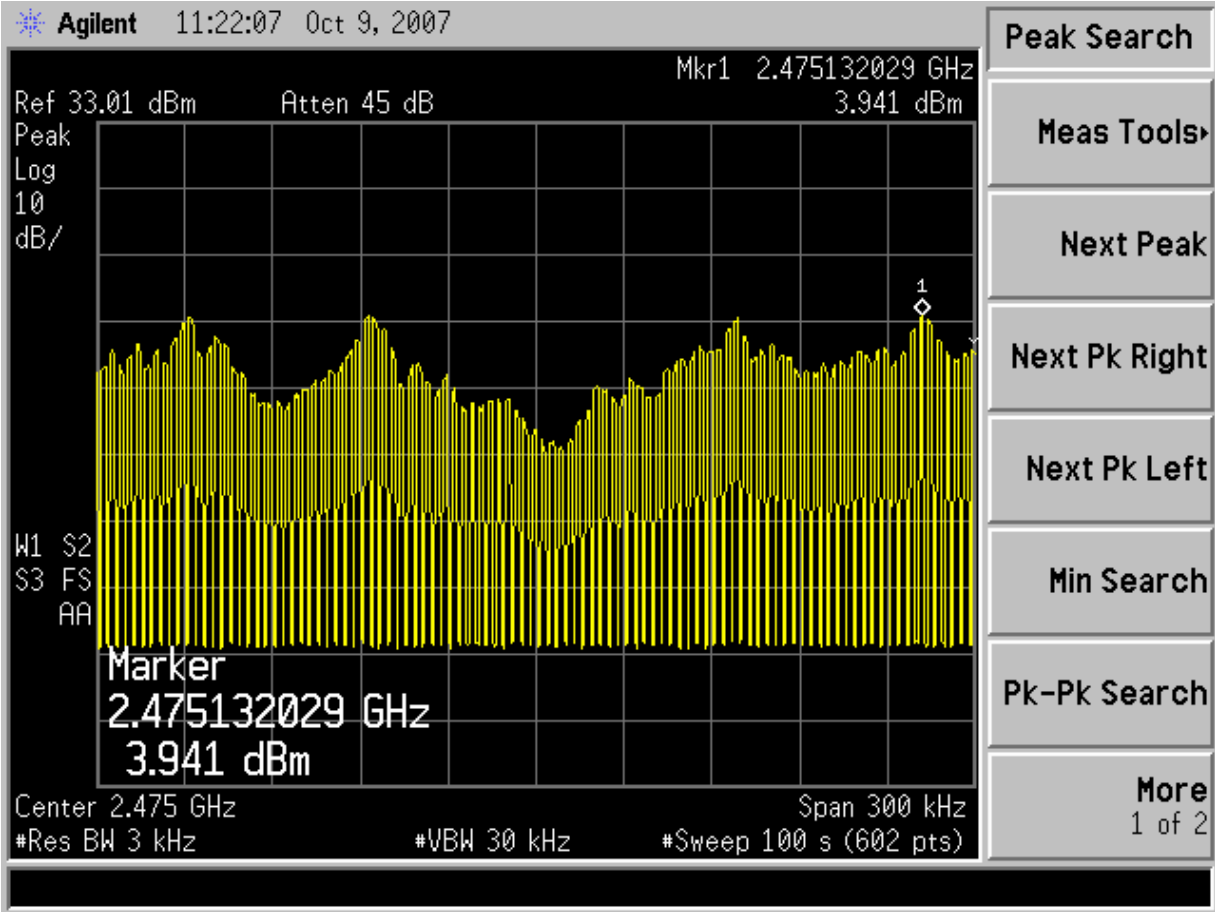
PASSED. All the test results are attached in next pages.

(Test date: Oct 09, 2007 Temperature : 23°C Humidity : 54 %)

Channel	Frequency	Power Spectral Density	Limit
11	2405 MHz	4.138 dBm	8dBm
18	2440 MHz	4.002 dBm	8dBm
25	2475 MHz	3.941 dBm	8dBm

Ch11 2405 MHz**Ch18 2440 MHz**

Ch25 2475 MHz



10 DEVIATION TO TEST SPECIFICATIONS

None.

11 DEBUG DESCRIPTION

None