FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Pixel Enterprise Limited

Bluetooth Timer Remote Control

Model No.: BG-100

FCC ID: X5SBG-100

Prepared for : Pixel Enterprise Limited
Rm 1228, 12/F, one Grand Tower, 639 Nathan Road, Mong K, Hongkong.

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
Nantou, Shenzhen, Guangdong, China

Tel: (0755) 26639496

Report Number : ACS-F14136
Date of Test : Apr.13~18, 2014
Date of Report : Apr.22, 2014

TABLE OF CONTENTS

Description Page

1. SUMMARY OF STANDARDS AND RESULTS 1-1
1.1. Description of Standards and Results 1-1
2. GENERAL INFORMATION 2-1
2.1. Description of Device (EUT) 2-1
2.2. Tested Supporting System Details 2-2
2.3. Block Diagram of connection between EUT and simulators 2-2
2.4. Test information 2-2
2.5. Test Facility 2-3
2.6. Measurement Uncertainty (95% confidence levels, k=2) 2-3
3. RADIATED EMISSION MEASUREMENT 3-1
3.1. Test Equipment 3-1
3.2. Block Diagram of Test Setup 3-2
3.3. Radiated Emission Limit Standard: FCC 15.209 3-3
3.4. EUT Configuration on Test 3-3
3.5. Operating Condition of EUT 3-3
3.6. Test Procedure 3-3
3.7. Radiated Emission Test Results 3-4
4. CONDUCTED SPURIOUS EMISSIONS 4-1
4.1. Test Equipment 4-1
4.2. Limit 4-1
4.3. Test Procedure 4-1
4.4. Test result 4-1
5. 6dB BANDWIDTH TEST 5-1
5.1. Test Equipment 5-1
5.2. Limit 5-1
5.3. Test Procedure 5-1
5.4. Test Results 5-1
6. MAXIMUM PEAK OUTPUT POWER TEST 6-1
6.1. Test Equipment 6-1
6.2. Limit 6-1
6.3. Test Procedure 6-1
6.4. Test Results 6-1
7. BAND EDGE COMPLIANCE TEST 7-1
7.1. Test Equipment 7-1
7.2. Limit 7-1
7.3. Test Produce 7-1
7.4. Test Results 7-1
8. POWER SPECTRAL DENSITY TEST 8-1
8.1. Test Equipment 8-1
8.2. Limit 8-1
8.3. Test Procedure 8-1
8.4. Test Results 8-2
9. DEVIATION TO TEST SPECIFICATIONS 9-1

10. HOTOGRAPH OF TEST 10-1

10.1. Photos of Radiated Emission Test..... 10-1

TEST REPORT CERTIFICATION

Applicant	:	Pixel Enterprise Limited
Manufacturer	:	Pixel Enterprise Limited
EUT Description	:	Bluetooth Timer Remote Control
FCC ID	:	X5SBG-100

(A) MODEL NO. : BG-100
(B) SERIAL NO. : N/A
(C) POWER SUPPLY : N/A
(D) TEST VOLTAGE : DC 3V

Tested for comply with:
FCC Rules and Regulations Part 15 Subpart C: 2013
Test procedure used:
ANSI C63.10:2009

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements. The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC and IC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

The 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 : Apr.13~ 18, 2014 Report of date: Jun.03, 2014

Prepared by : Sonia Lee / Assistant

Reviewed by : Sunny Lu/ Assistant Manager

信華科技（深圳）有限公司
Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report
Signature: David Jin 6.3

Approved & Authorized Signer : David Jin / 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.

EMISSION		
Description of Test Item	**Standard**	**Results**
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.10 :2009	N/A
Radiated Emission Test	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS
Conducted Spurious Emissions	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2009	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2009	PASS
6dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10 :2009	PASS
Maximum Peak Output Power Test	FCC Part 15: 15.247(b)(1) ANSI C63.10 :2009	PASS
Band Edge Compliance Test	FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS
Power Spectral Density Test	FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS

2. GENERAL INFORMATION

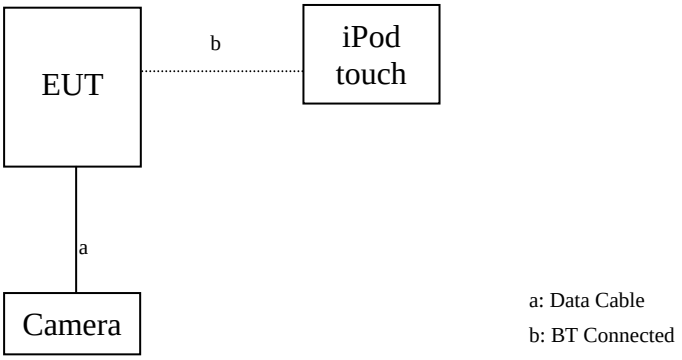
2.1. Description of Device (EUT)

Product Name	: Bluetooth Timer Remote Control
Model Number	: BG-100
FCC ID	: X5SBG-100
Radio	: Bluetooth V4.0
Operation Frequency	: 2402-2480MHz
Modulation Technology	: GFSK
Antenna Assembly Gain	: PCB Antenna, 0dBi
Applicant	: Pixel Enterprise Limited Rm 1228, 12/F, one Grand Tower, 639 Nathan Road, Mong K, Hongkong.
Manufacturer	: Pixel Enterprise Limited Rm 1228, 12/F, one Grand Tower, 639 Nathan Road, Mong K, Hongkong.
Date of Test	: Apr.13~18, 2014
Date of Receipt	: Apr.22, 2014
Sample Type	: Prototype production

2.2. Tested Supporting System Details

No.	Description	ACS No.	Manufacturer	Model	Serial Number	Approved type
1.	Camera	N/A	Canon	DS126181	N/A	☐FCC ID ☐BSMI ID
		Cable: Unshielded, Detachabled, 0.4m				
2	iPod Touch	N/A	Apple	A1421	N/A	☐FCC ID ☐BSMI ID

2.3. Block Diagram of connection between EUT and simulators



(EUT: Bluetooth Timer Remote Control)

2.4. Test information

The test software "bluesuite.exe" was used to control EUT work in Continuous TX mode, and select test channel.

Tested mode, channel, and data rate information			
Mode	data rate (Mbps)	Channel	Frequency (MHz)
Tx Mode GFSK modulation	1	Low :CH 0	2402
	1	Middle: CH19	2440
	1	High: CH39	2480

2.5. Test Facility

Site Description

Name of Firm	:	Audix Technology (Shenzhen) Co., Ltd. No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park,Nantou, Shenzhen, Guangdong, China
3m Anechoic Chamber	:	Certificated by FCC, USA Registration Number: 90454 Valid Date: Feb.22, 2015
3m & 10m Anechoic Chamber	:	Certificated by FCC, USA Registration Number: 794232 Valid Date: Oct.31, 2015
EMC Lab.	:	Certificated by Industry Canada Registration Number: IC 5183A-1 Valid Date: Jun.13, 2014 Certificated by DAkkS, Germany Registration No: D-PL-12151-01-00 Valid Date: Dec.15, 2016 Accredited by NVLAP, USA NVLAP Code: 200372-0 Valid Date: Mar.31, 2015

2.6. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	3.1dB (150KHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	3.22 dB(30~200MHz, Polarize: H)
	3.23 dB(30~200MHz, Polarize: V)
	3.49 dB(200M~1GHz, Polarize: H)
	3.39 dB(200M~1GHz, Polarize: V)
Uncertainty for Radiation Emission test in 3m chamber (1GHz-18GHz)	4.97 dB (1~6GHz, Distance: 3m)
	4.99 dB (6~18GHz, Distance: 3m)
Uncertainty for Radiated Spurious Emission test in RF chamber	3.57 dB
Uncertainty for Conduction Spurious emission test	2.00 dB
Uncertainty for Output power test	0.73 dB
Uncertainty for Bandwidth test	83 kHz
Uncertainty for DC power test	0.038 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

3. RADIATED EMISSION MEASUREMENT

3.1.Test Equipment

Frequency rang: 30~1000MHz

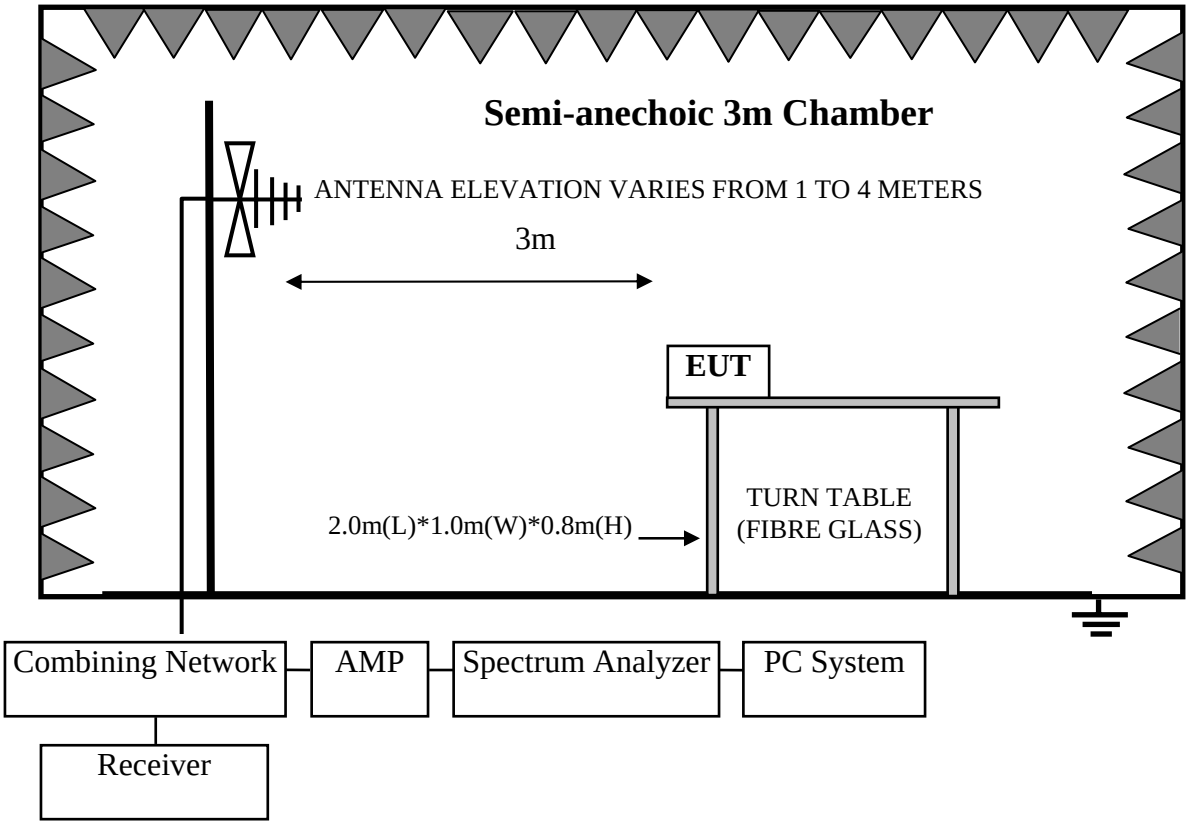
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	3#Chamber	AUDIX	N/A	N/A	Nov.24, 13	1 Year
2	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 13	1 Year
3	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 13	1 Year
4	Amplifier	HP	8447D	2648A04738	May.08, 13	1 Year
5	Bilog Antenna	TESEQ	CBL6112D	35375	May.30, 13	1 Year
6	RF Cable	MIYAZAKI	CFD400-NL	3# Chamber No.1	May.08, 13	1 Year
7	Coaxial Switch	Anritsu	MP59B	M74389	May.08, 13	1 Year

Frequency rang: above 1000MHz

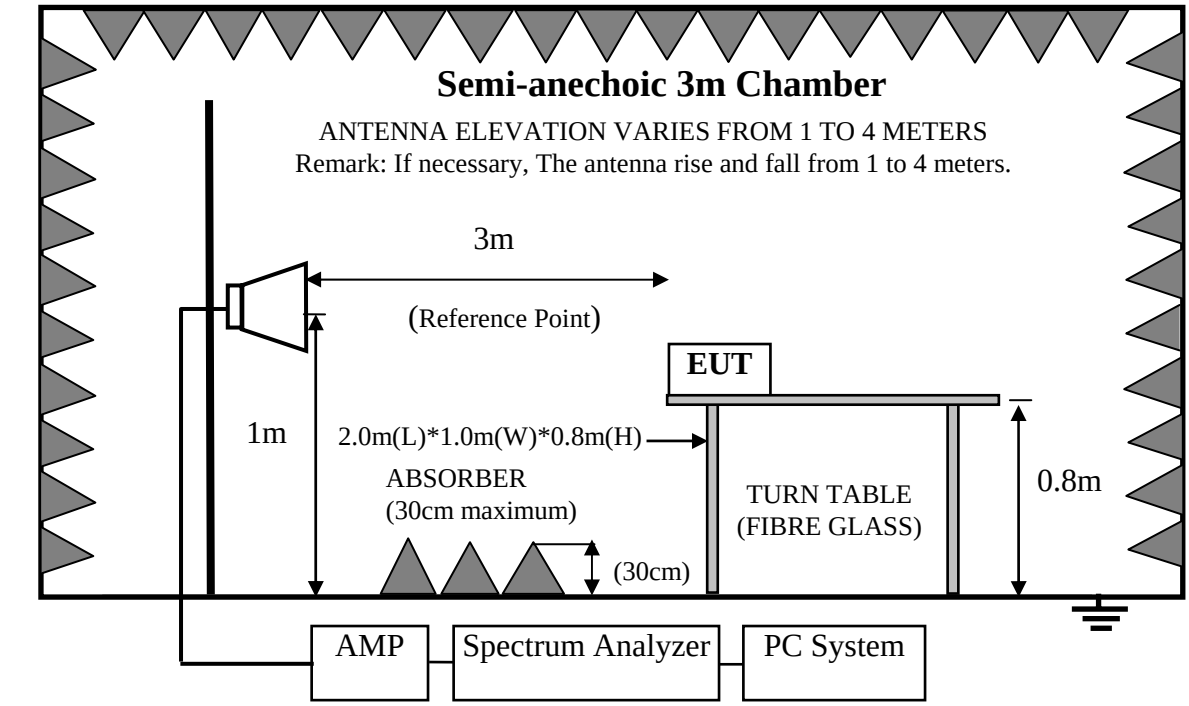
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	May.08, 13	1 Year
2	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
3	Amplifier	Agilent	8449B	3008A00863	May.08, 13	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX106	77980/6	May.08, 13	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	May.08, 13	1 Year
6	Horn Antenna	EMCO	3116	00060089	Aug.28, 13	1 Year

3.2.Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range 1GHz-25GHz



3.3. Radiated Emission Limit Standard: FCC 15.209

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000MHz	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark： (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

3.4. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.4.1. Bluetooth Timer Remote Control (EUT)

Model Number : BG-100
Serial Number : N/A

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 2.2.

3.5.2. Turned on the power of all equipment.

3.5.3. Let EUT work in Tx mode.

3.6. Test Procedure

The EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2009 on radiated emission Test.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as the test photo indicated.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement and RBW is set at 1MHz, VBW is set at 10Hz for average emission measurement above 1GHz.

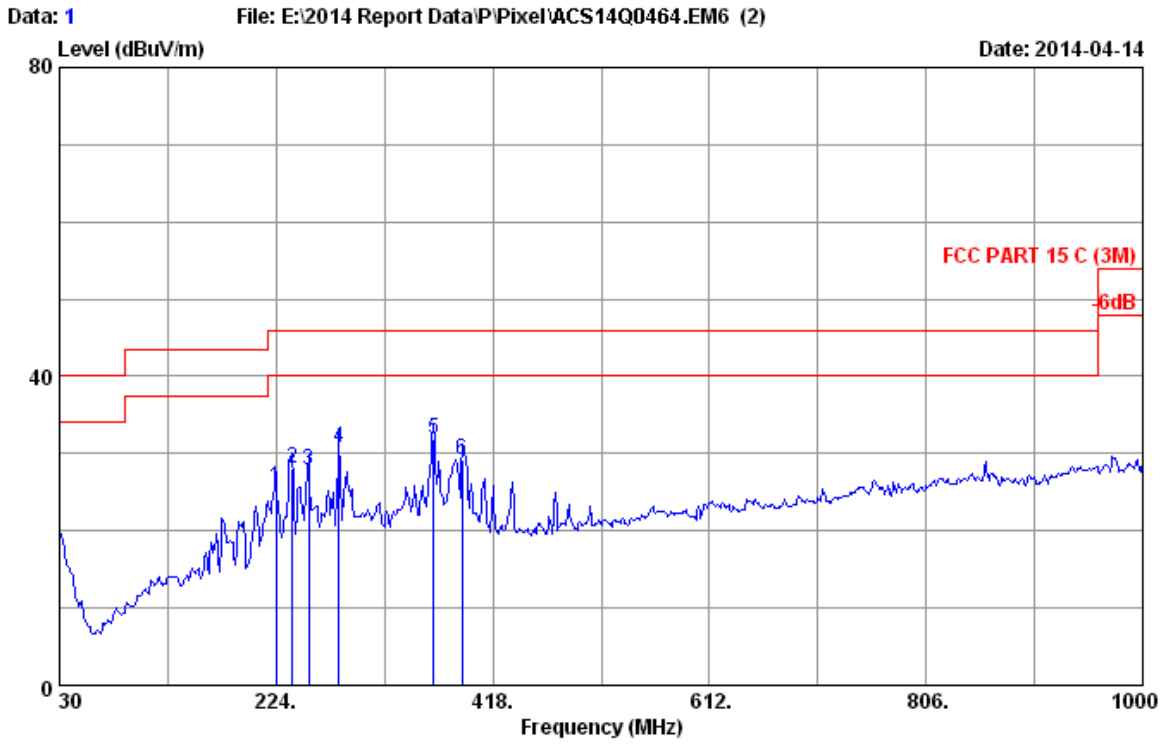
The duty cycle of the test signal is 100%.

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

3.7. Radiated Emission Test Results

PASS.

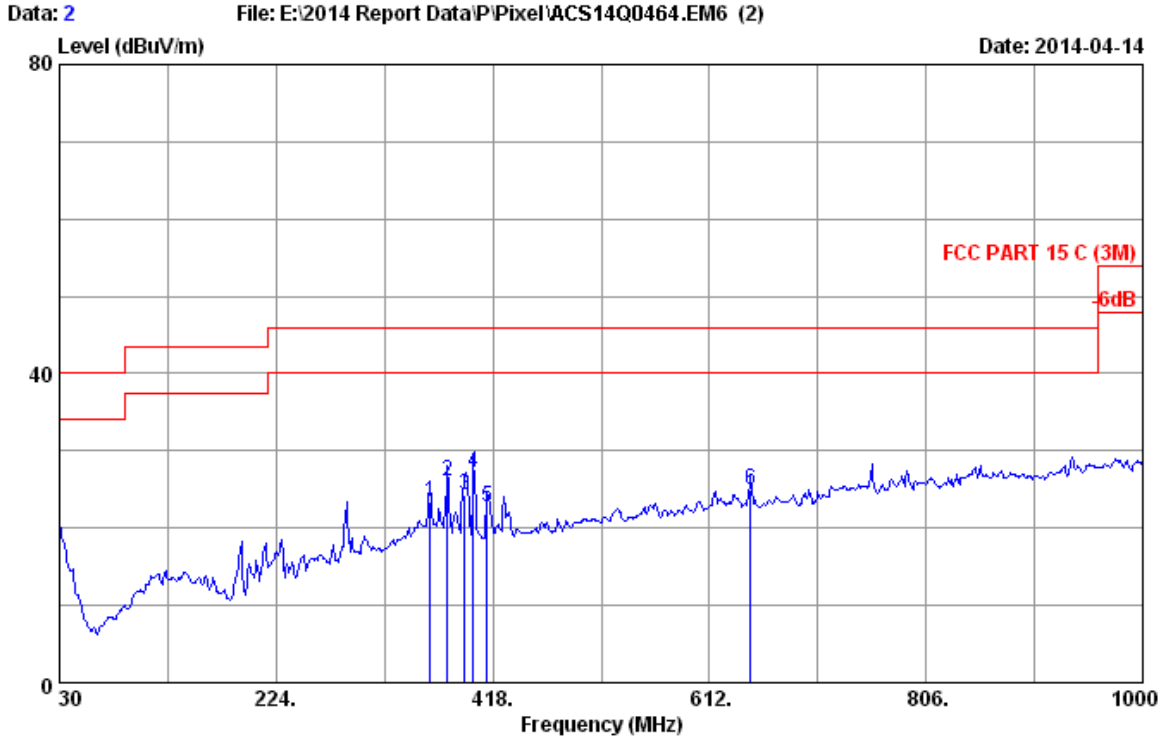
Frequency: 30MHz~1GHz



Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2013 CBL6111C 2598 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24*C/65% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power rating : DC 3V
Test Mode : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	224.000	10.52	1.88	13.24	25.64	46.00	20.36	QP
2	238.550	11.66	1.94	14.49	28.09	46.00	17.91	QP
3	253.100	13.01	1.99	12.76	27.76	46.00	18.24	QP
4	280.260	13.21	2.09	15.37	30.67	46.00	15.33	QP
5	364.650	15.40	2.36	14.22	31.98	46.00	14.02	QP
6	390.840	15.92	2.43	10.95	29.30	46.00	16.70	QP

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

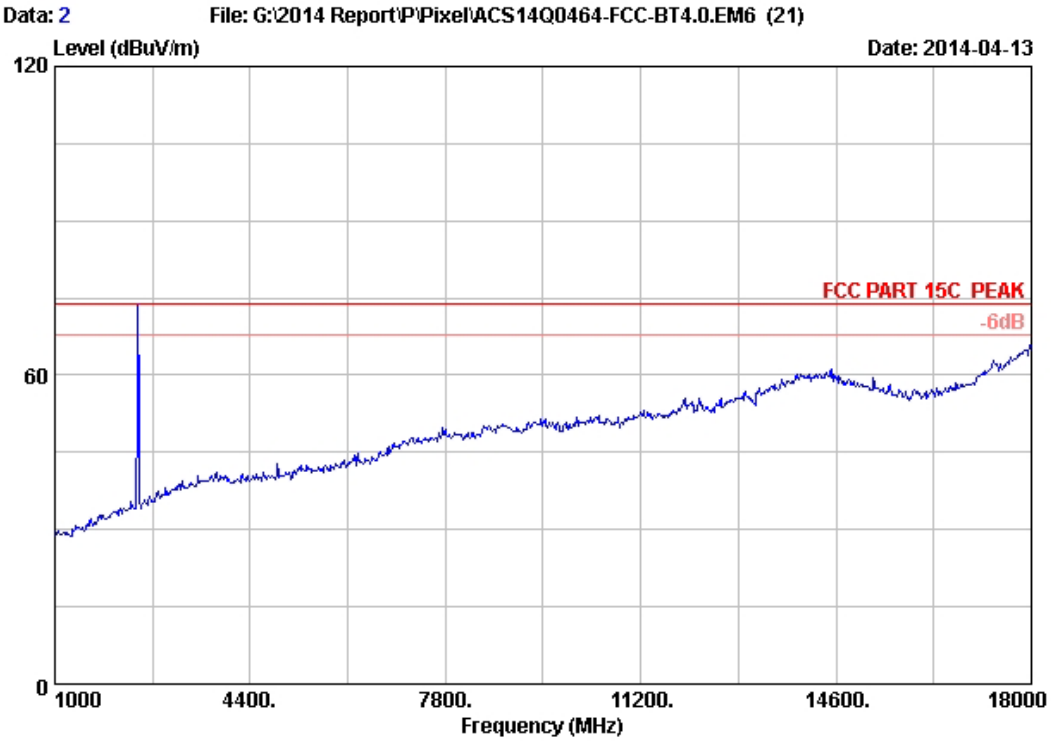


Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2013 CBL6111C 2598 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24*C/65% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power rating : DC 3V
Test Mode : BG-100

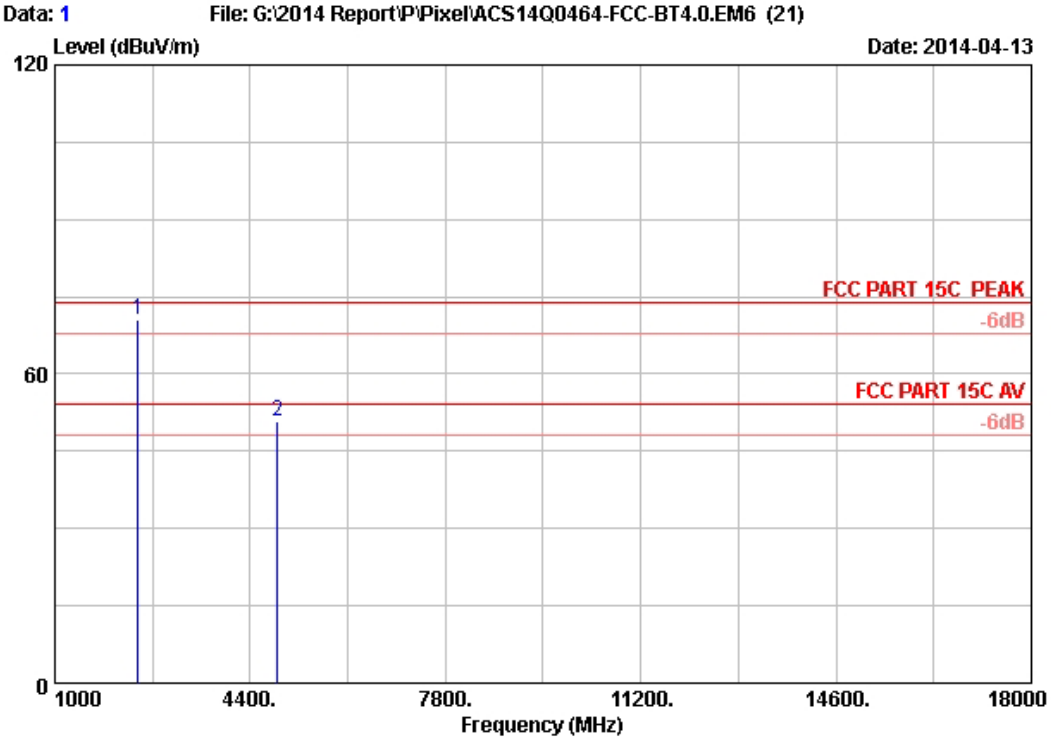
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	361.740	15.40	2.35	33.37	23.51	46.00	22.49	QP
2	377.260	15.65	2.39	35.81	26.12	46.00	19.88	QP
3	392.780	15.96	2.44	33.82	24.37	46.00	21.63	QP
4	400.540	16.22	2.46	36.32	27.10	46.00	18.90	QP
5	413.150	16.73	2.50	31.52	22.79	46.00	23.21	QP
6	648.860	20.30	3.18	29.87	24.90	46.00	21.10	QP

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

Frequency: 1GHz~18GHz



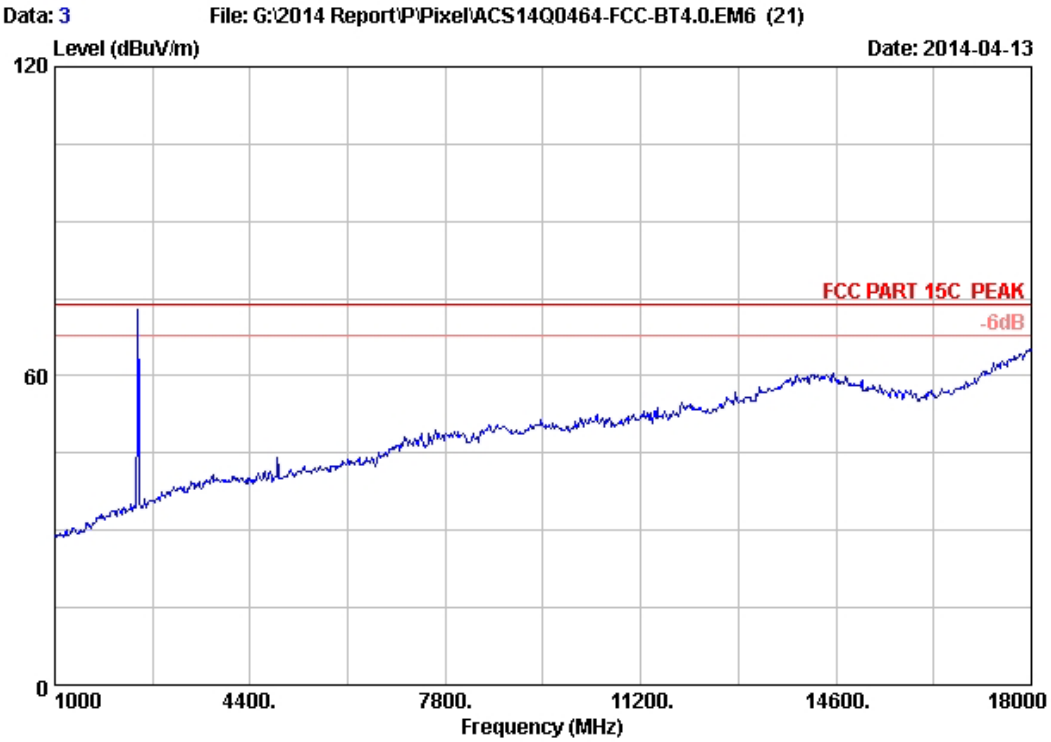

```
Site no.      : 3m Chamber                        Data no.  : 2
Dis. / Ant.   : 3m   2013 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer  : Leo-Li
EUT           : Bluetooth Timer Remote Control
Power Rating  : DC 3V
Test Mode     : 2440MHz Tx Mode
M/N           : BG-100
```



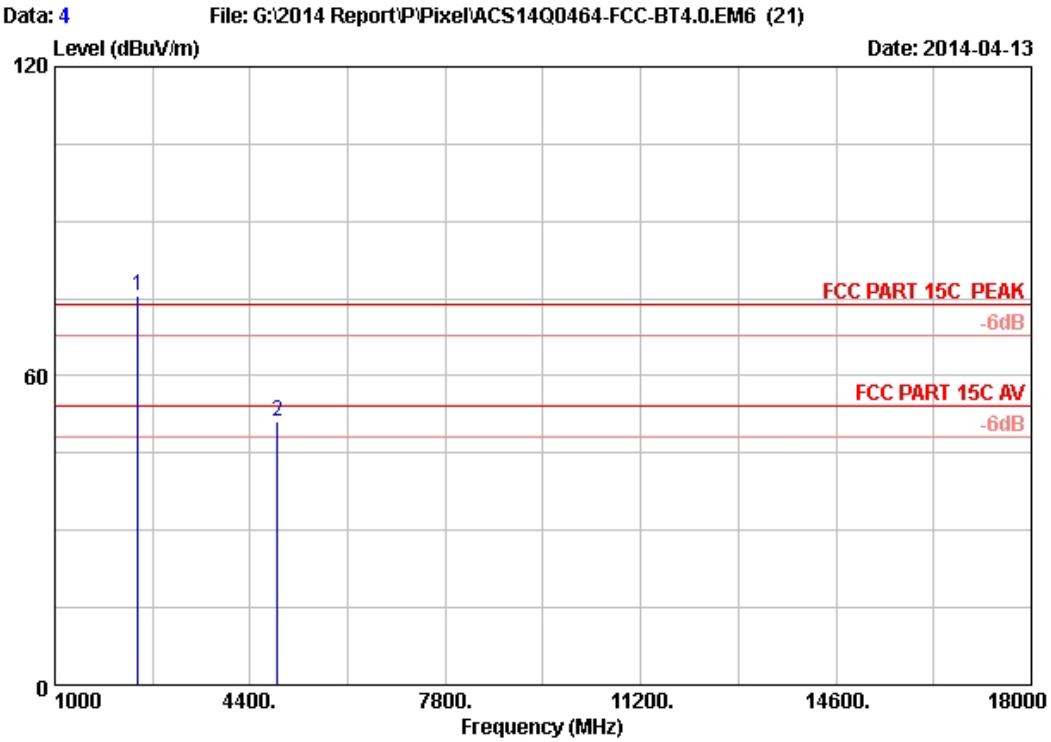
Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2440MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.000	28.27	5.86	35.70	72.14	70.57	74.00	3.43	Peak
2	4880.000	32.98	8.64	35.70	44.81	50.73	74.00	23.27	Peak

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



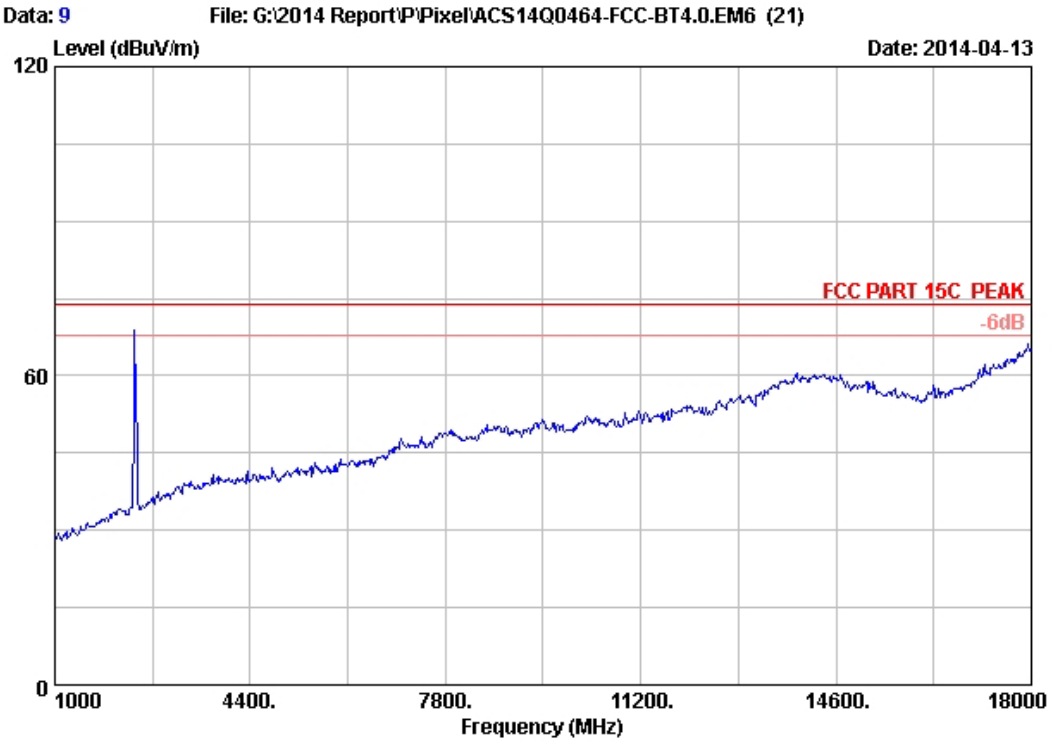

```
Site no.      : 3m Chamber                        Data no.   : 3
Dis. / Ant.   : 3m   2013 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Leo-Li
EUT           : Bluetooth Timer Remote Control
Power Rating  : DC 3V
Test Mode     : 2440MHz Tx Mode
M/N           : BG-100
```



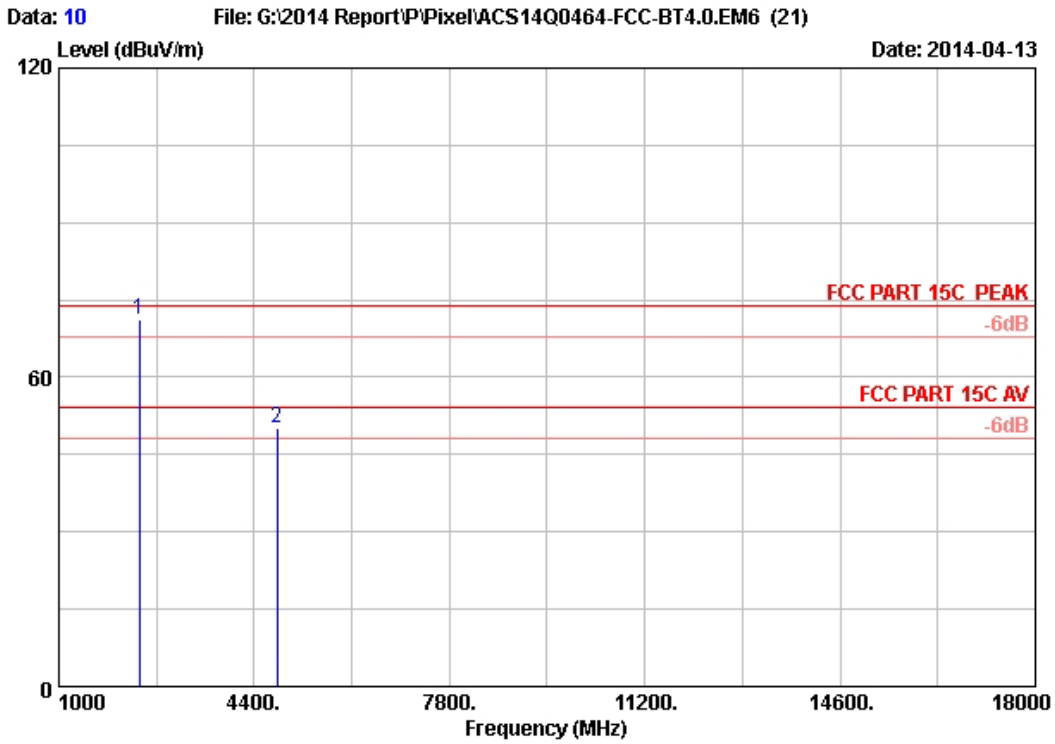
Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2440MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.000	28.27	5.86	35.70	77.10	75.53	74.00	-1.53	Peak
2	4880.000	32.98	8.64	35.70	45.09	51.01	74.00	22.99	Peak

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



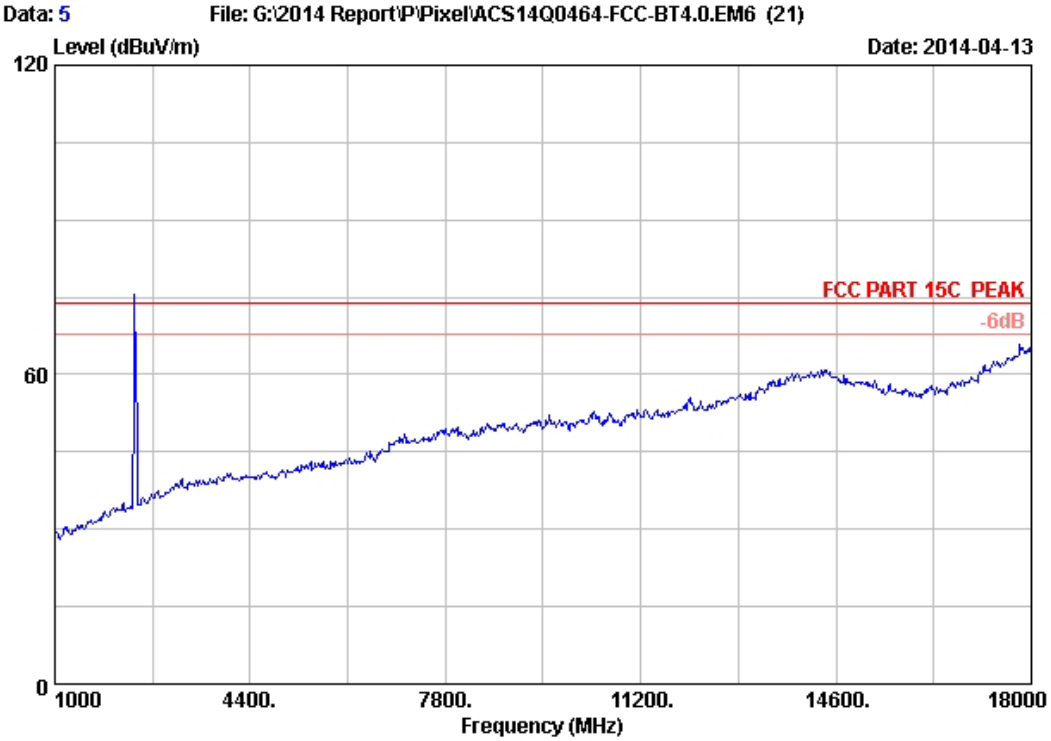

```
Site no.      : 3m Chamber                        Data no.  : 9
Dis. / Ant.   : 3m   2013 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer  : Leo-Li
EUT           : Bluetooth Timer Remote Control
Power Rating  : DC 3V
Test Mode     : 2402MHz Tx Mode
M/N           : BG-100
```



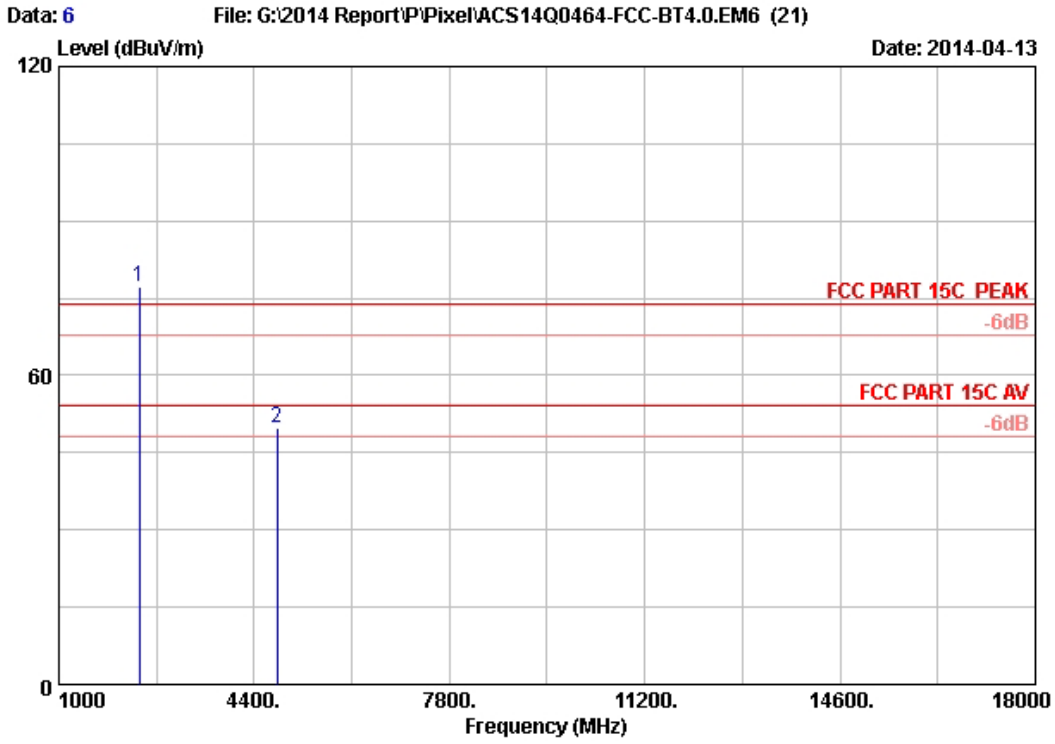
Site no. : 3m Chamber Data no. : 10
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2402MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	28.18	5.80	35.70	72.75	71.03	74.00	2.97	Peak
2	4804.000	32.85	8.56	35.70	44.32	50.03	74.00	23.97	Peak

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



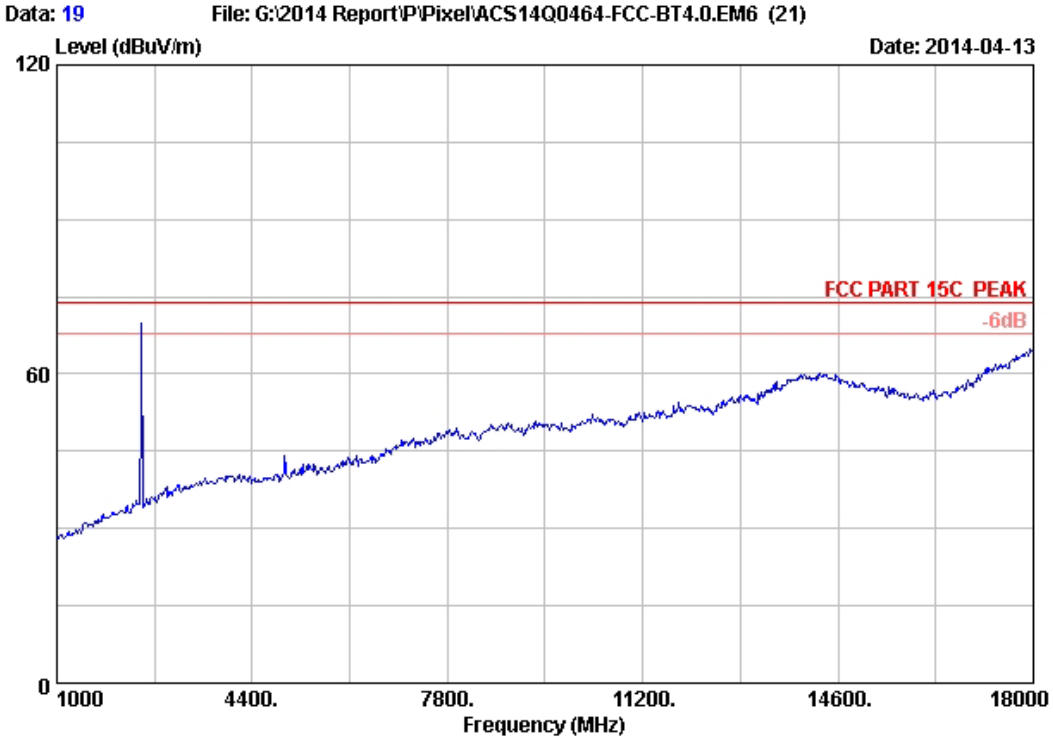

```
Site no.      : 3m Chamber                        Data no.   : 5
Dis. / Ant.   : 3m   2013 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer   : Leo-Li
EUT           : Bluetooth Timer Remote Control
Power Rating  : DC 3V
Test Mode     : 2402MHz Tx Mode
M/N           : BG-100
```



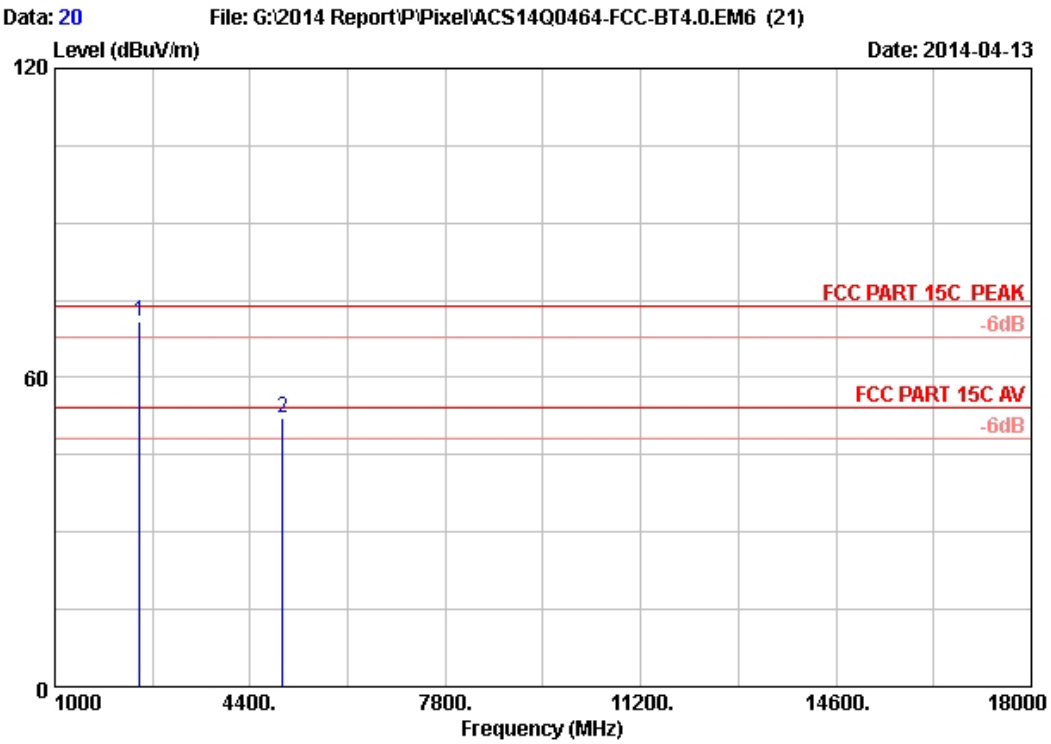
Site no. : 3m Chamber Data no. : 6
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2402MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.000	28.18	5.80	35.70	78.92	77.20	74.00	-3.20	Peak
2	4804.000	32.85	8.56	35.70	44.14	49.85	74.00	24.15	Peak

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



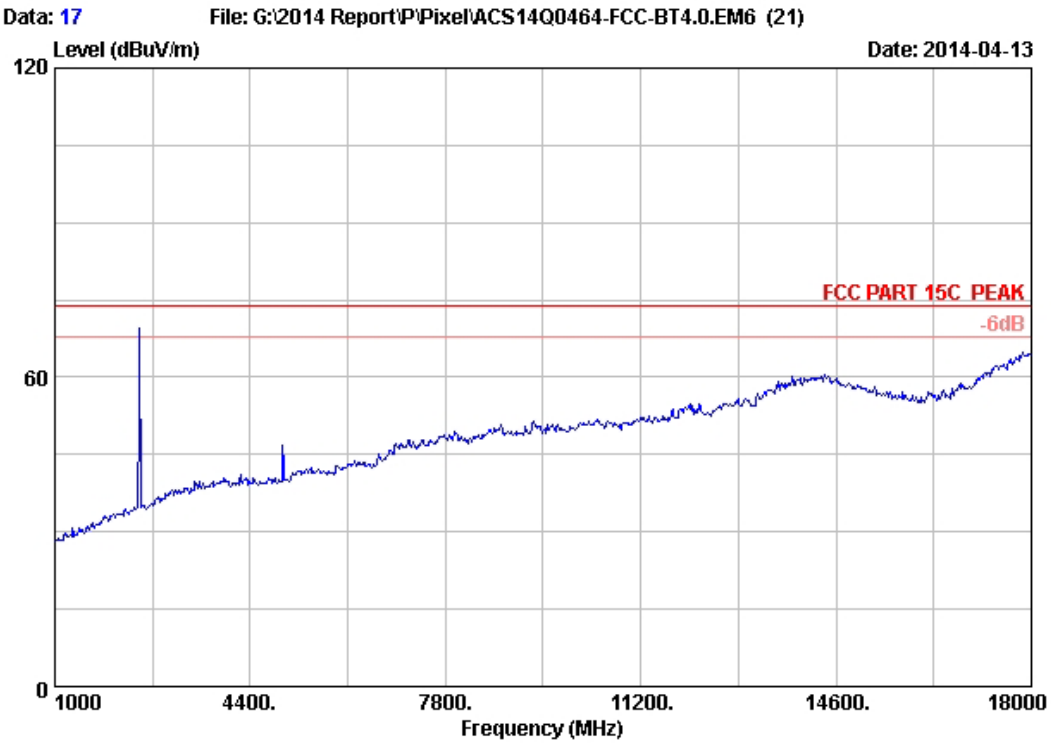

```
Site no.      : 3m Chamber                        Data no.  : 19
Dis. / Ant.   : 3m   2013 3115 (4580)        Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer  : Leo-Li
EUT           : Bluetooth Timer Remote Control
Power Rating  : DC 3V
Test Mode     : 2480MHz Tx Mode
M/N           : BG-100
```



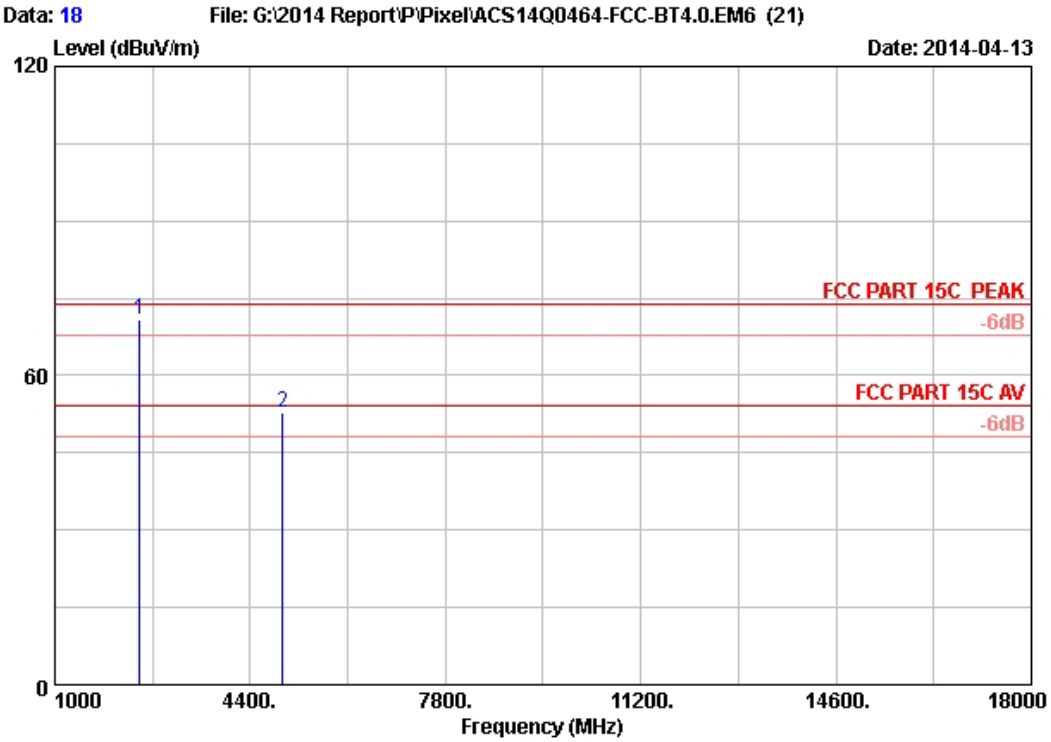
Site no. : 3m Chamber Data no. : 20
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2480MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	28.36	5.91	35.70	72.38	70.95	74.00	3.05	Peak
2	4960.000	33.13	8.72	35.70	45.83	51.98	74.00	22.02	Peak

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




```
Site no.      : 3m Chamber                        Data no.  : 17
Dis. / Ant.   : 3m   2013 3115 (4580)        Ant. pol. : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 24*C/56%                     Engineer  : Leo-Li
EUT           : Bluetooth Timer Remote Control
Power Rating  : DC 3V
Test Mode     : 2480MHz Tx Mode
M/N           : BG-100
```



Site no. : 3m Chamber Data no. : 18
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2480MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.000	28.36	5.91	35.70	72.40	70.97	74.00	3.03	Peak
2	4960.000	33.13	8.72	35.70	46.71	52.86	74.00	21.14	Peak

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

4. CONDUCTED SPURIOUS EMISSIONS

4.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Attenuator	Agilent	8491B	MY39262165	May.08,13	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX102	28618/2	May.08,13	1Year

4.2.Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

4.3.Test Procedure

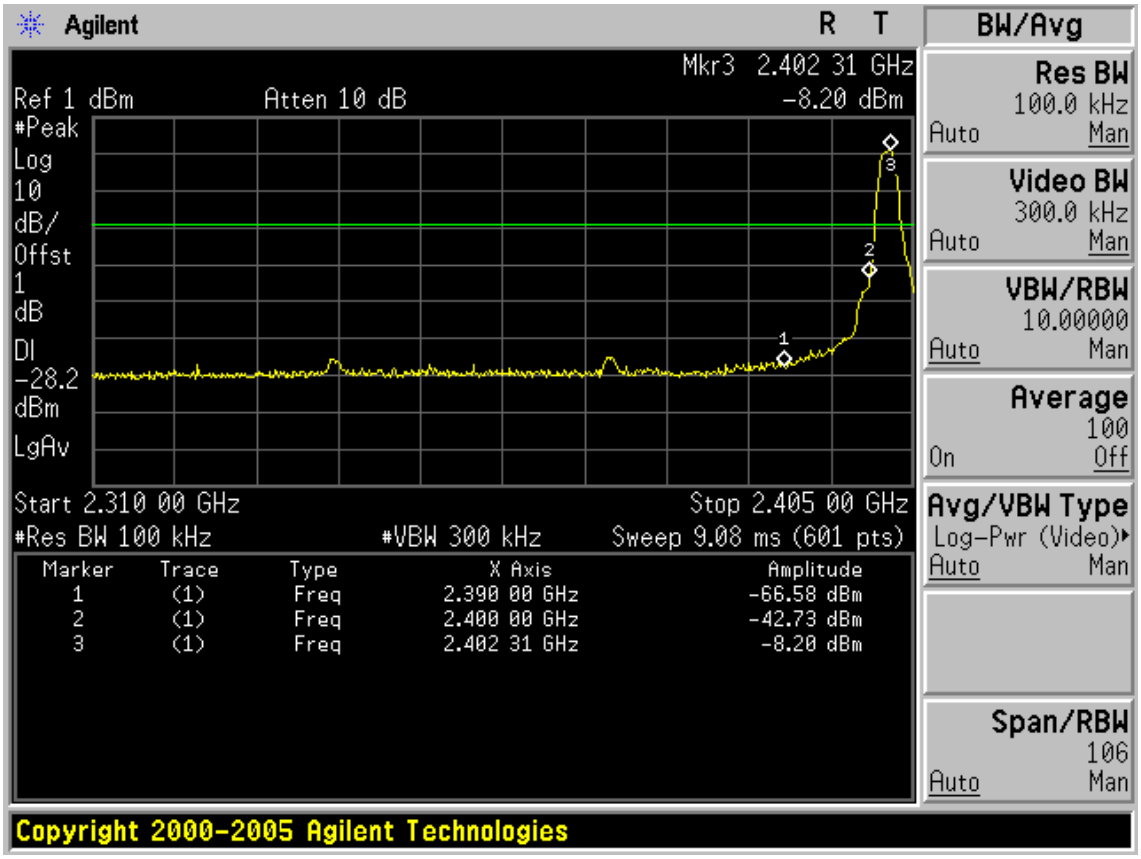
The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions detected.

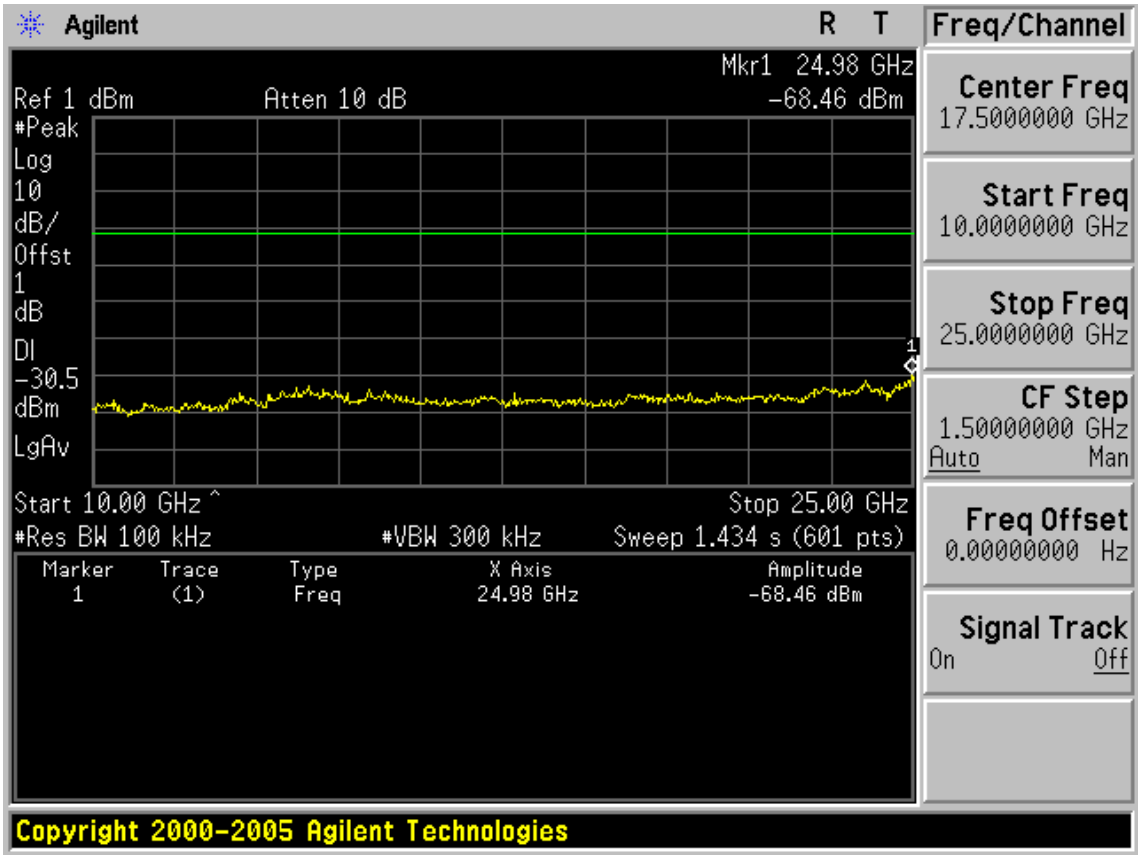
4.4.Test result

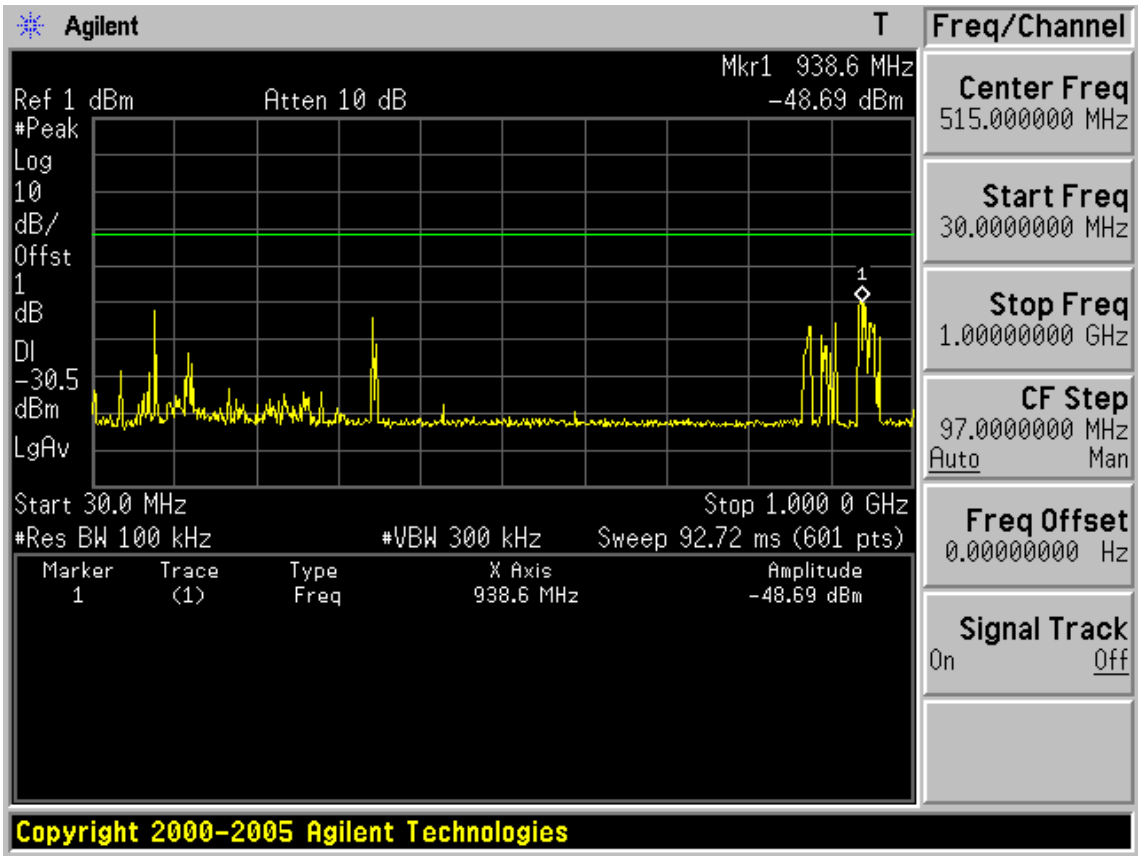
PASS (The testing data was attached in the next pages.)

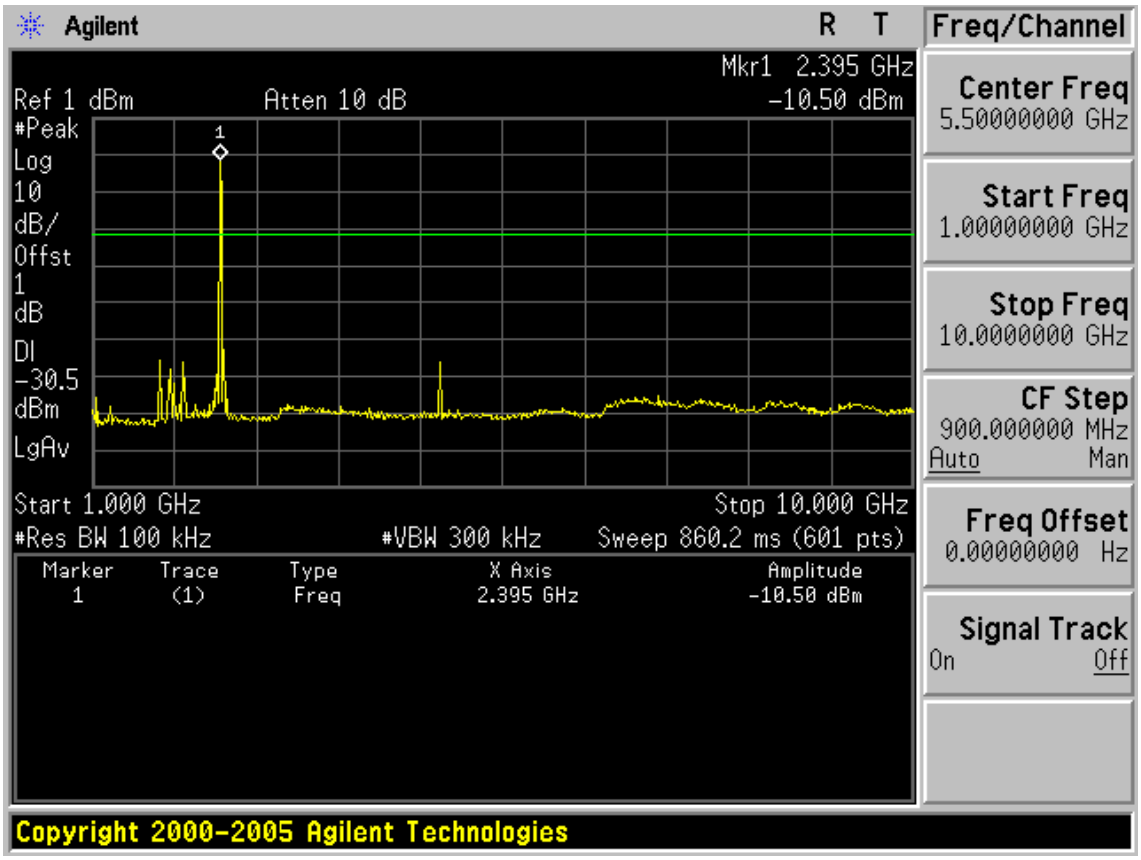
GFSK

2402MHz

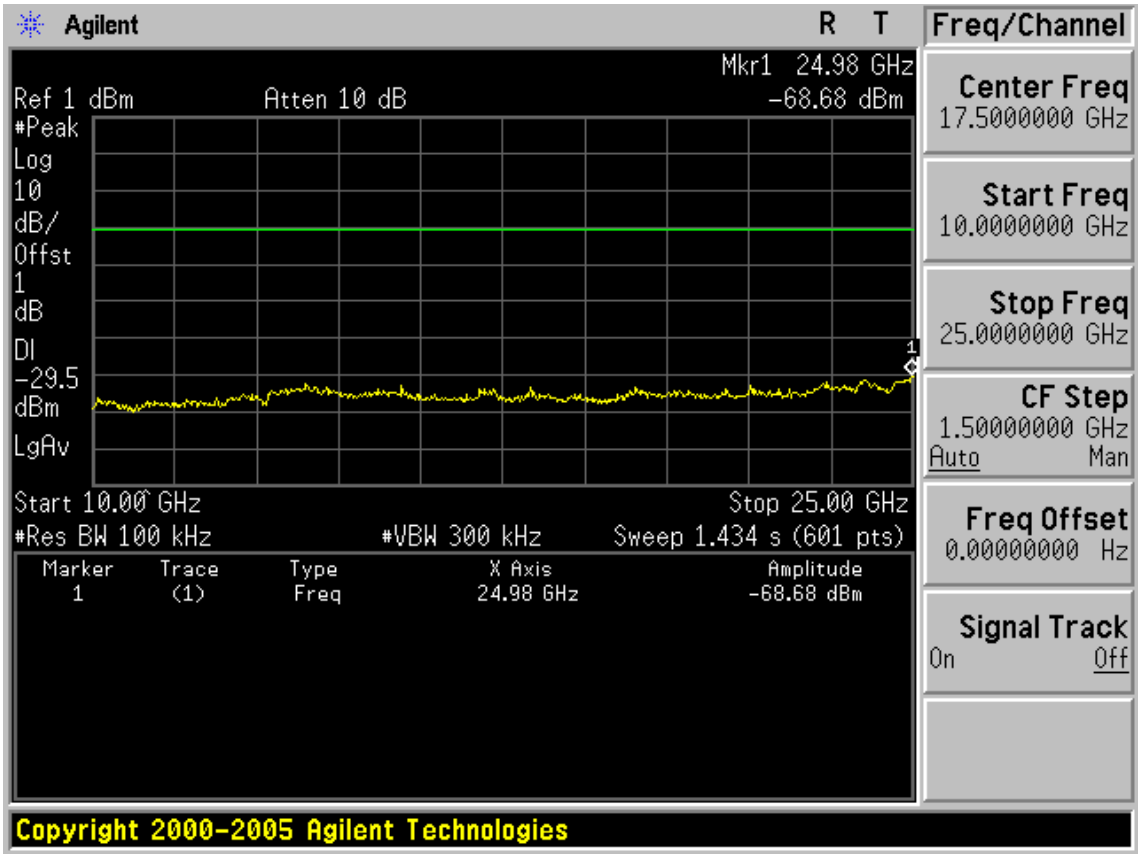


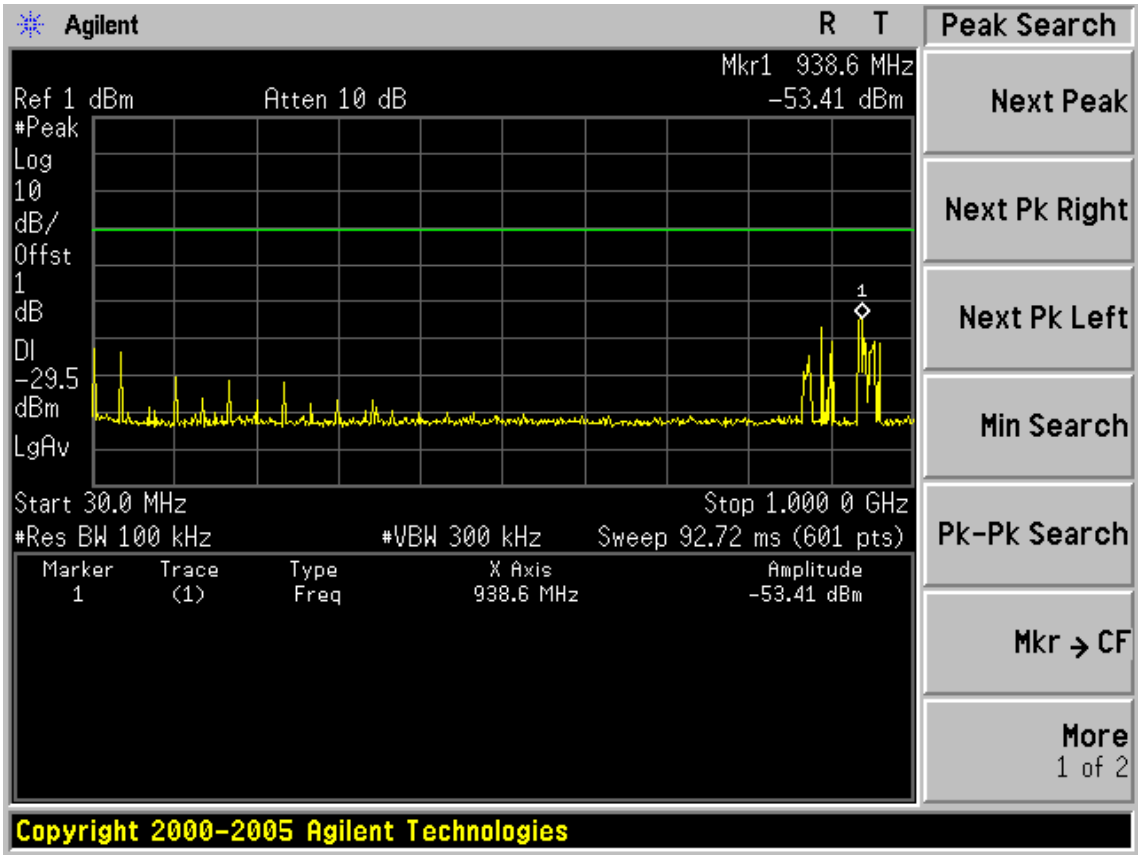


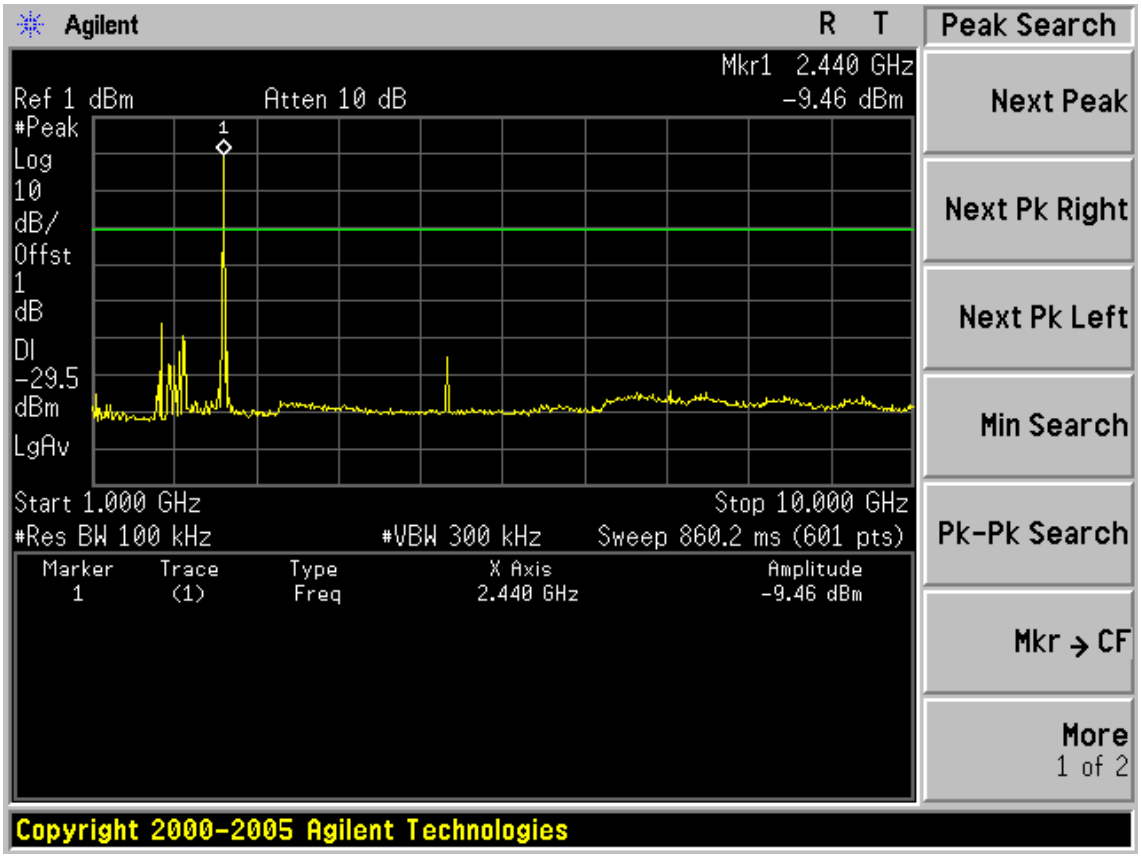

Agilent
T
Freq/Channel
Mkr1 938.6 MHz
Ref 1 dBm
Atten 10 dB
-48.69 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-30.5
dBm
LgAv
1
Center Freq
515.000000 MHz
Start Freq
30.0000000 MHz
Stop Freq
1.00000000 GHz
CF Step
97.0000000 MHz
Auto Man
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 92.72 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 938.6 MHz -48.69 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies


Agilent
R T
Freq/Channel
Mkr1 2.395 GHz
Ref 1 dBm
Atten 10 dB
-10.50 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-30.5
dBm
LgAv
1
Center Freq
5.50000000 GHz
Start Freq
1.00000000 GHz
Stop Freq
10.0000000 GHz
CF Step
900.000000 MHz
Auto Man
Start 1.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 860.2 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.395 GHz -10.50 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies

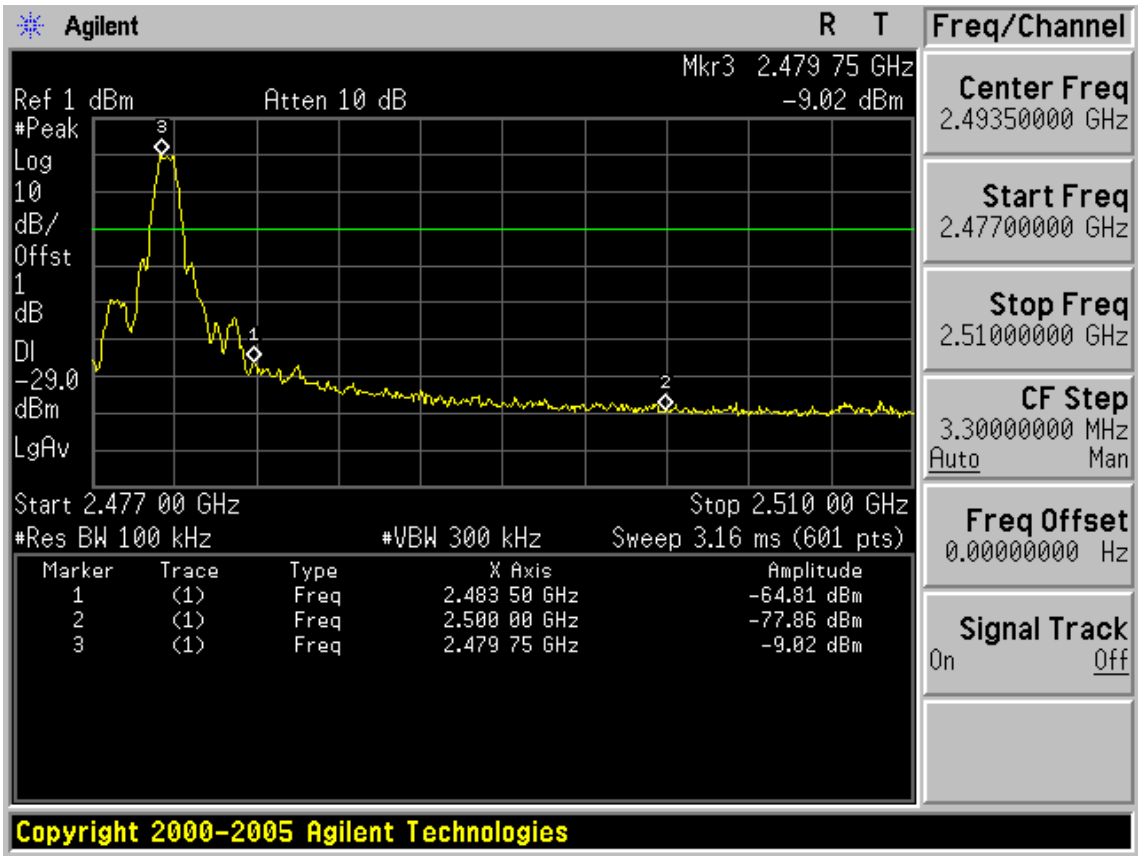
2440MHz

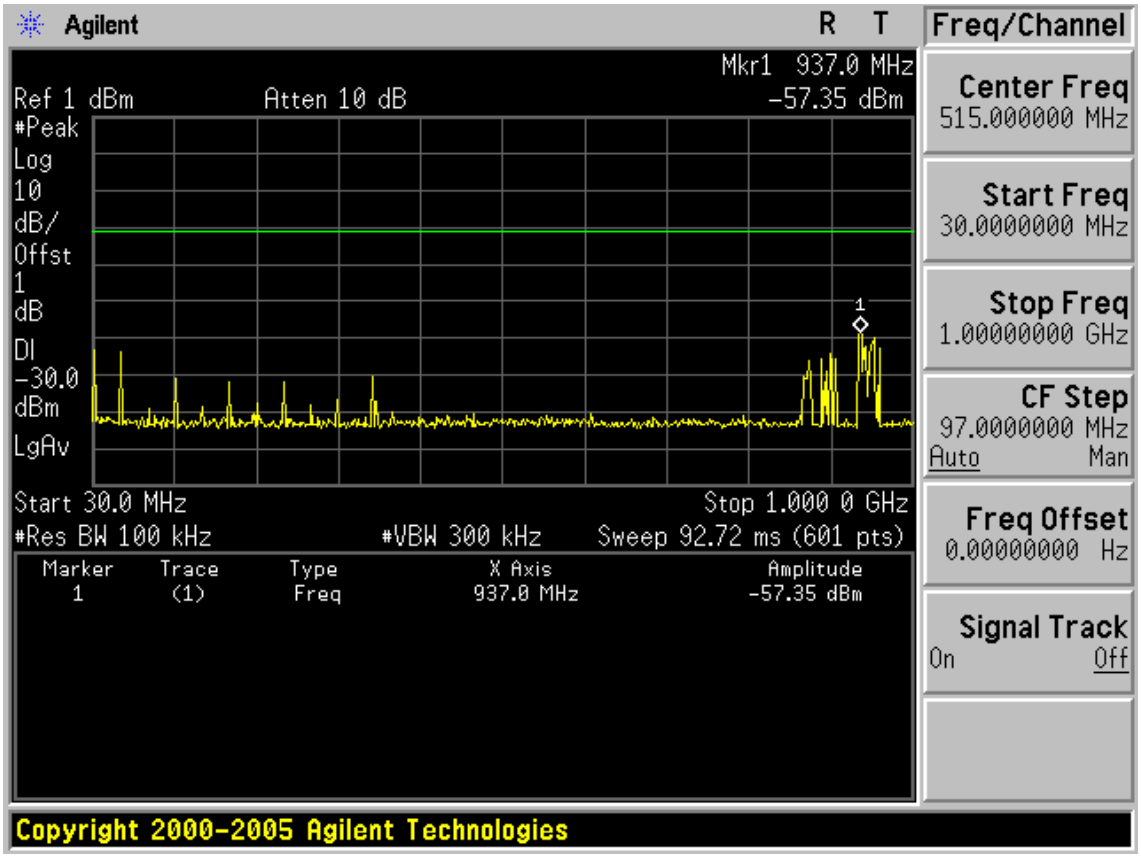

Agilent
R T
Freq/Channel
Mkr1 24.98 GHz
Ref 1 dBm
Atten 10 dB
-68.68 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-29.5
dBm
LgAv
Center Freq
17.5000000 GHz
Start Freq
10.0000000 GHz
Stop Freq
25.0000000 GHz
CF Step
1.50000000 GHz
Auto Man
Start 10.00 GHz
Stop 25.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.434 s (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 24.98 GHz -68.68 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies

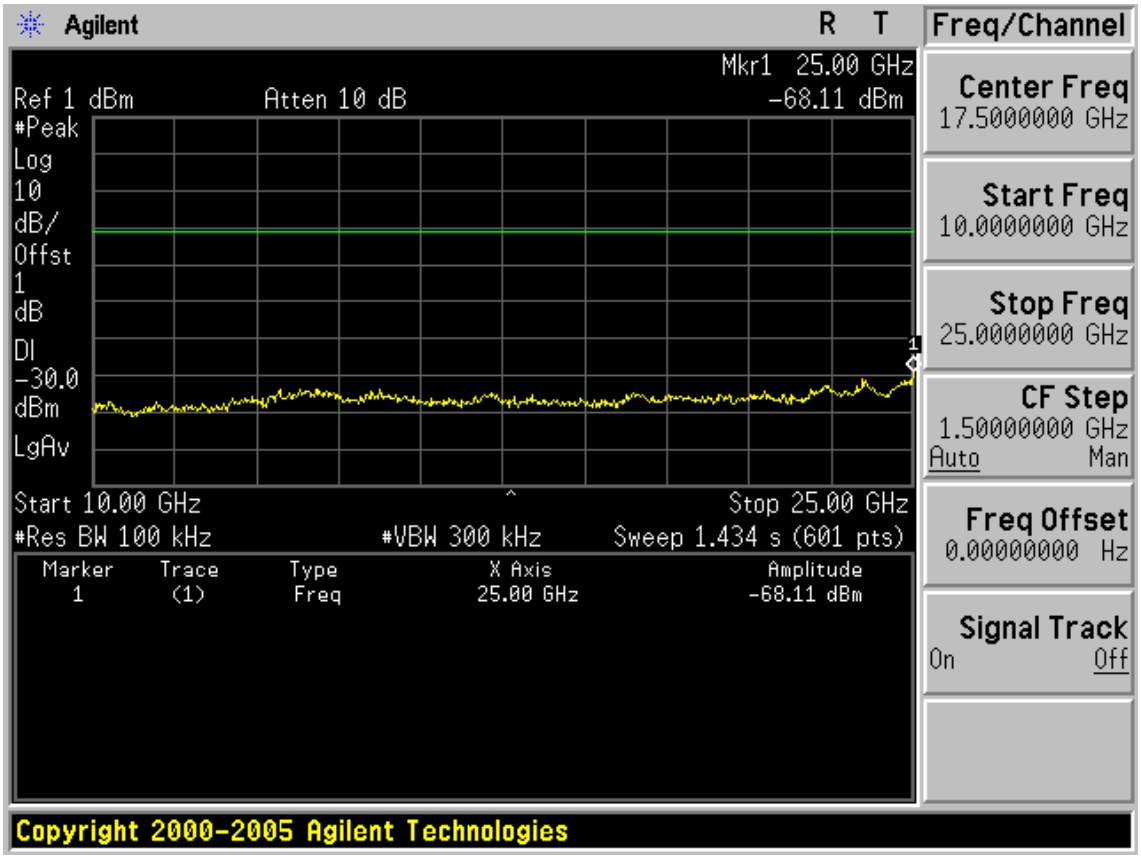

Agilent
R T
Peak Search
Mkr1 938.6 MHz
Ref 1 dBm
Atten 10 dB
-53.41 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-29.5
dBm
LgAv
Next Peak
Next Pk Right
Next Pk Left
Min Search
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 92.72 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 938.6 MHz -53.41 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2005 Agilent Technologies

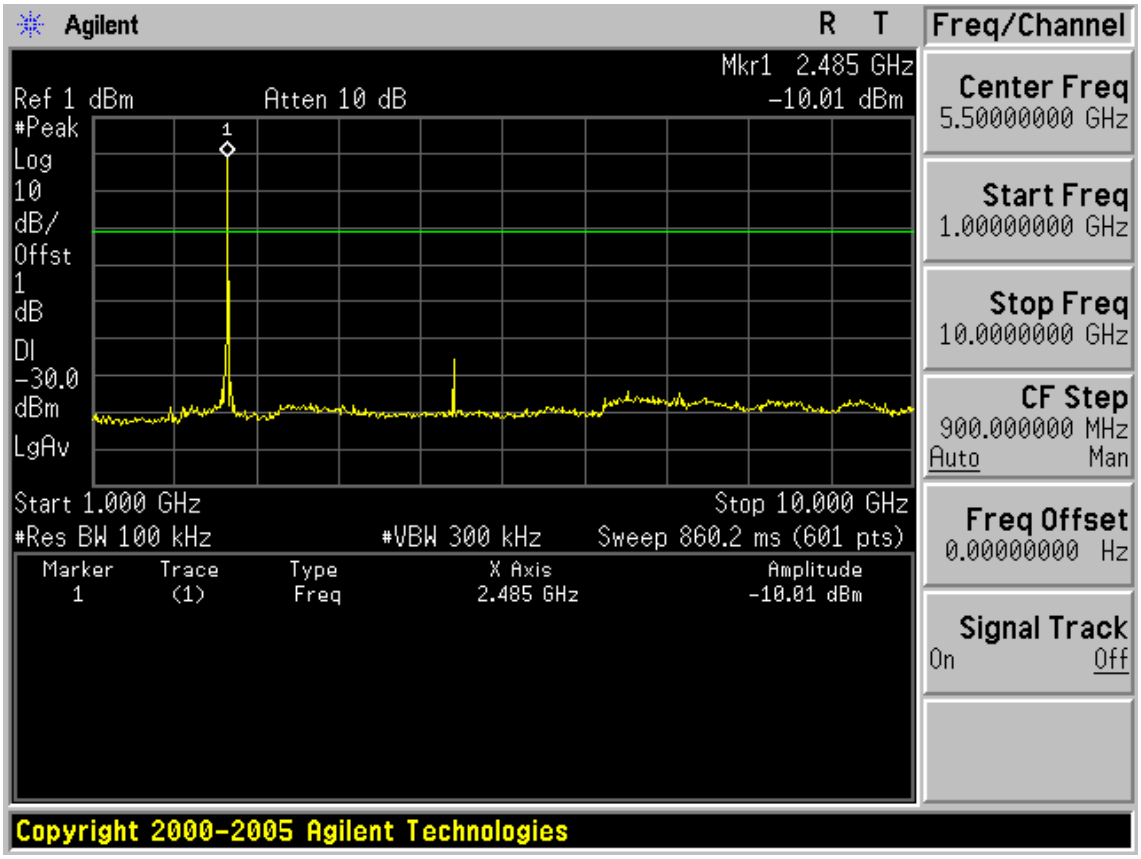

Agilent
R T
Peak Search
Mkr1 2.440 GHz
Ref 1 dBm
Atten 10 dB
-9.46 dBm
Next Peak
#Peak
Log
10
dB/
Offst
1
dB
Next Pk Right
Next Pk Left
Dl
-29.5
dBm
Min Search
LgAv
Start 1.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 860.2 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.440 GHz -9.46 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2005 Agilent Technologies

2480MHz


Agilent
R T
Freq/Channel
Mkr3 2.479 75 GHz
Ref 1 dBm
Atten 10 dB
-9.02 dBm
Center Freq
2.49350000 GHz
#Peak
Log
10
dB/
Offst
1
dB
Start Freq
2.47700000 GHz
Stop Freq
2.51000000 GHz
Dl
-29.0
dBm
CF Step
3.30000000 MHz
Auto Man
LgAv
Start 2.477 00 GHz
Stop 2.510 00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 3.16 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.483 50 GHz -64.81 dBm
2 (1) Freq 2.500 00 GHz -77.86 dBm
3 (1) Freq 2.479 75 GHz -9.02 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies


Agilent
R T
Freq/Channel
Mkr1 937.0 MHz
Ref 1 dBm
Atten 10 dB
-57.35 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-30.0
dBm
LgAv
Center Freq
515.000000 MHz
Start Freq
30.0000000 MHz
Stop Freq
1.00000000 GHz
CF Step
97.0000000 MHz
Auto Man
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 92.72 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 937.0 MHz -57.35 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies


Agilent
R T
Freq/Channel
Mkr1 25.00 GHz
Ref 1 dBm
Atten 10 dB
-68.11 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-30.0
dBm
LgAv
Center Freq
17.5000000 GHz
Start Freq
10.0000000 GHz
Stop Freq
25.0000000 GHz
CF Step
1.50000000 GHz
Auto Man
Start 10.00 GHz
Stop 25.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.434 s (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 25.00 GHz -68.11 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies


Agilent
R T
Freq/Channel
Mkr1 2.485 GHz
Ref 1 dBm
Atten 10 dB
-10.01 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-30.0
dBm
LgAv
Center Freq
5.50000000 GHz
Start Freq
1.00000000 GHz
Stop Freq
10.0000000 GHz
CF Step
900.000000 MHz
Auto Man
Start 1.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 860.2 ms (601 pts)
Freq Offset
0.00000000 Hz
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.485 GHz -10.01 dBm
Signal Track
On Off
Copyright 2000-2005 Agilent Technologies

5. 6dB BANDWIDTH TEST

5.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
3.	HF Cable	Hubersuhner	Sucoflex104	-	May.08, 13	1 Year

5.2.Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

5.3.Test Procedure

The transmitter output was connected to a spectrum analyzer, The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

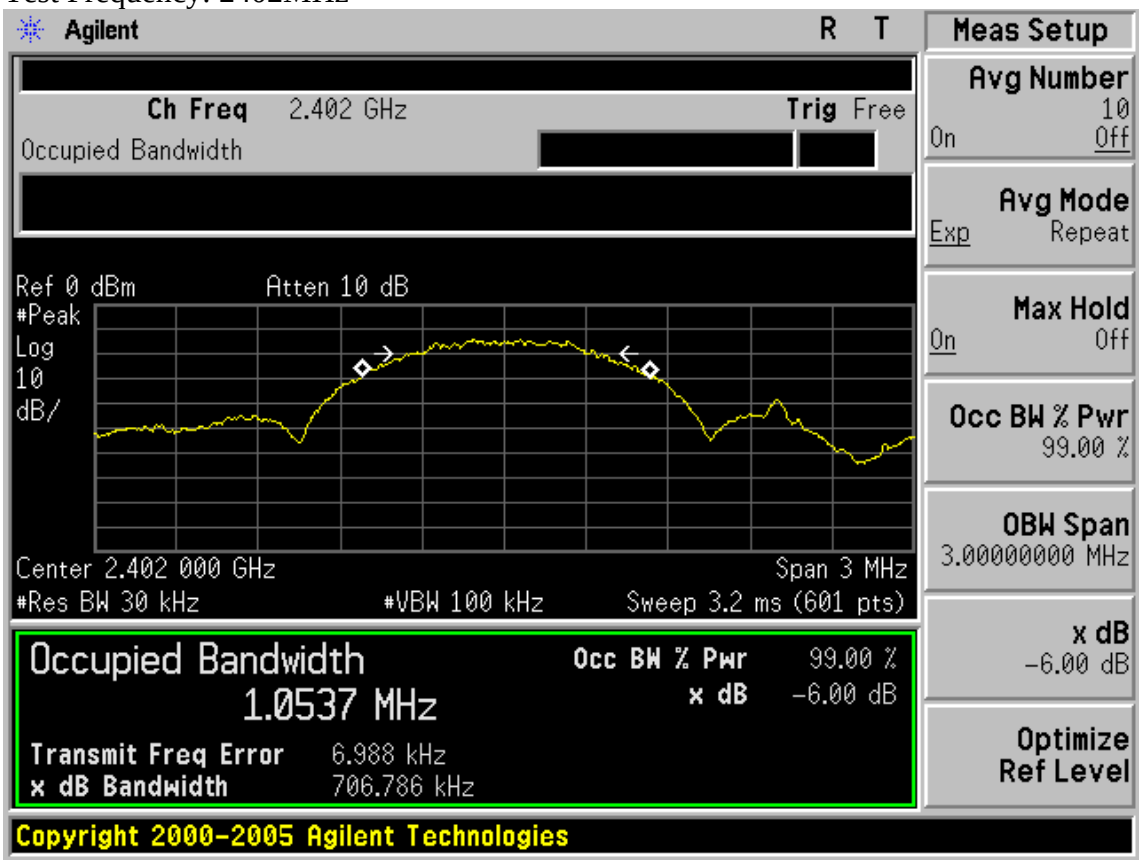
5.4.Test Results

EUT: Bluetooth Timer Remote Control		
M/N: BG-100		
Test date: 2014-04-18	Pressure: 101.9±1.0kpa	Humidity: 52.5±3.0%
Tested by: Leo-Li	Test site: RF site	Temperature: 23.5±0.6℃

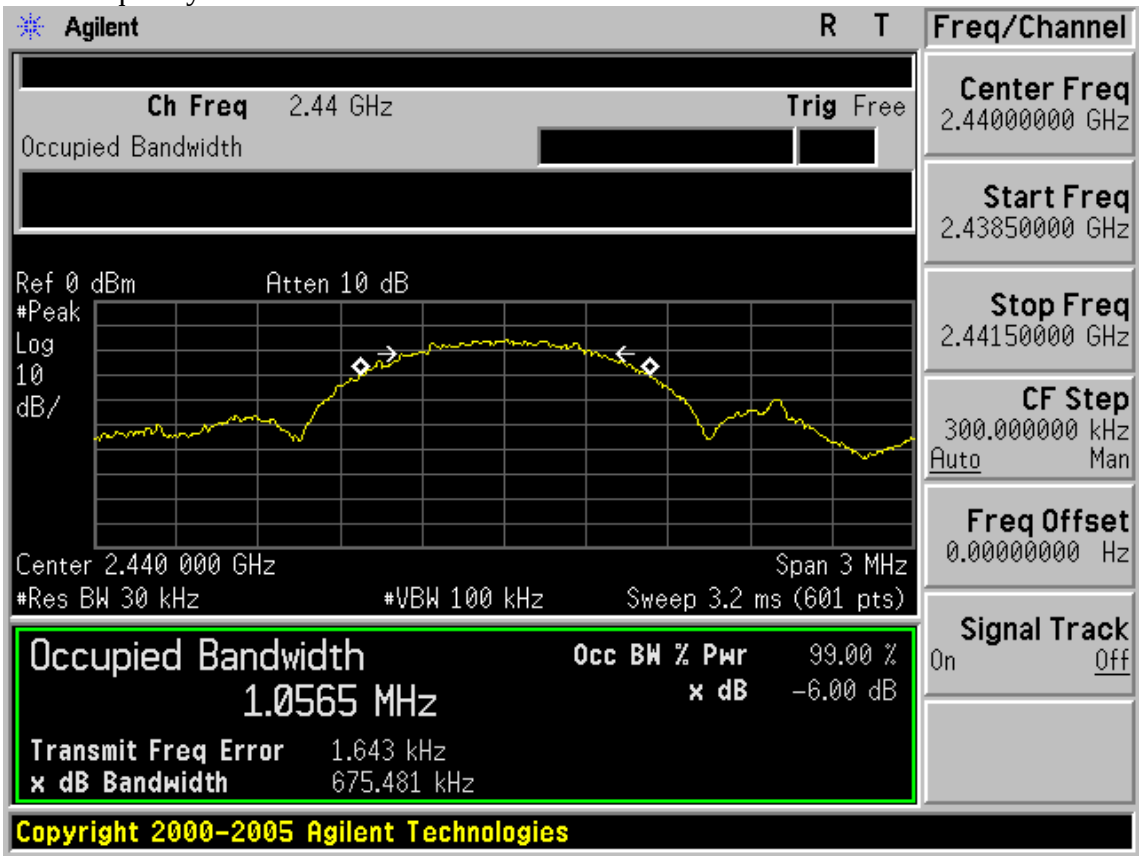
Cable loss: 1.0 dB		Attenuator loss: 20 dB	
Test Mode	CH (MHz)	6 dB bandwidth (kHz)	Limit (KHz)
GFSK	2402	706.786	>500
	2440	675.481	>500
	2480	667.616	>500
Conclusion：PASS			

GFSK

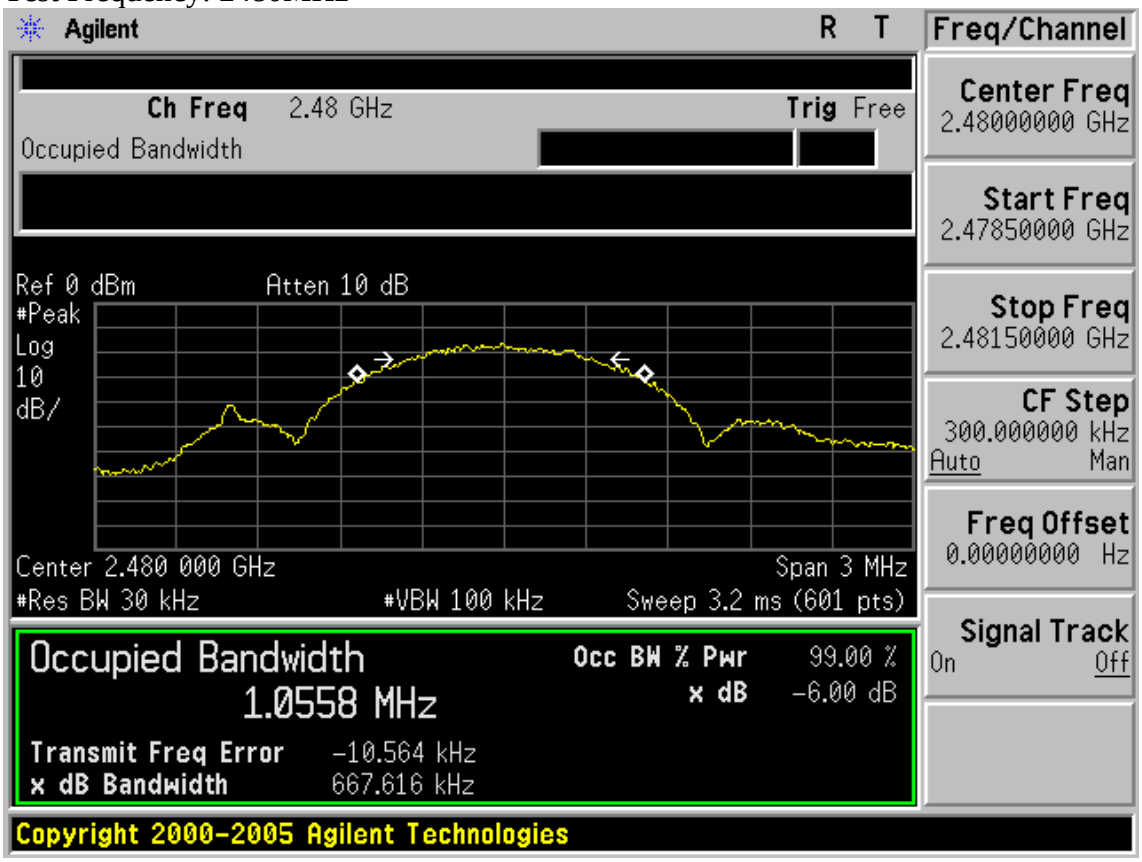
Test Frequency: 2402MHz



Test Frequency: 2440MHz



Test Frequency: 2480MHz



6. MAXIMUM PEAK OUTPUT POWER TEST

6.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year
5.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 13	1Year
6.	Power Sensor	Anritsu	MA2491A	033005	May.08, 13	1Year

6.2.Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

6.3.Test Procedure

Connected the EUT's antenna port to Power Sensor, and use power meter to test peak output power.

6.4.Test Results

EUT: Bluetooth Timer Remote Control			
M/N: BG-100			
Test date: 2014-04-18		Pressure: 102.5±1.0kpa	Humidity: 52.5±3.0%
Tested by: Leo-Li		Test site: RF site	Temperature: 23.8±0.6℃
Cable loss: 1.0 dB		Attenuator loss: 20 dB	
Test Mode	Frequency (MHz)	Peak output Power （dBm）	Limit (dBm)
GFSK	2402	-7.25	30
	2440	-8.14	30
	2480	-9.01	30
Conclusion: PASS			

7. BAND EDGE COMPLIANCE TEST

7.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year

7.2. Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

7.3. Test Produce

For upper band emissions that are up to two bandwidths(2MHz) away (2483.5MHz to 2485.5MHz）from the band-edge use below produce:

1. Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 100KHz and with a video bandwidth 300KHz. Record the peak levels of the fundamental emission and the relevant band-edge emission, Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not a field strength measurement, it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.
2. Subtract the delta measured in step (1) from the maximum field strengths measured in clause 4 .The resultant field strengths are then used to determine band-edge compliance as required by Section 15.205

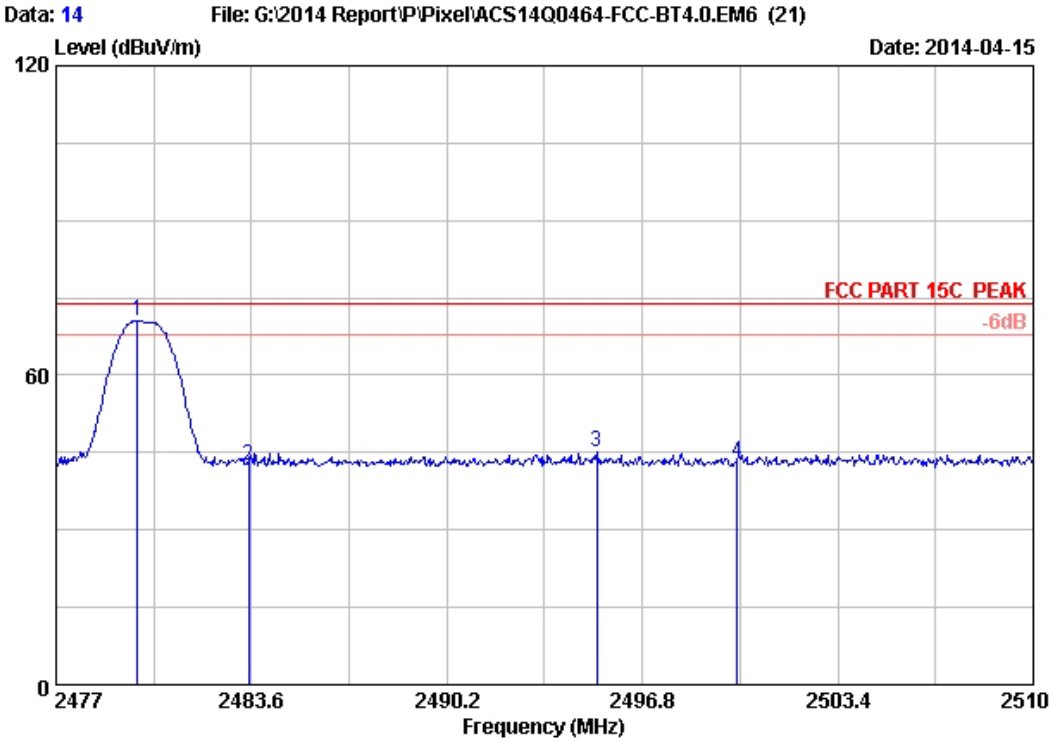
For emissions above two bandwidths away from the band-edge use below produce:

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upperband-edges of the emission:
   (a) PEAK: RBW=1MHz ;VBW=3MHz, PK detector, Sweep Time=AUTO
   (b) AV: RBW=1MHz, VBW= 10Hz, Sweep Time=AUTO

7.4. Test Results

Pass (The testing data was attached in the next pages.)

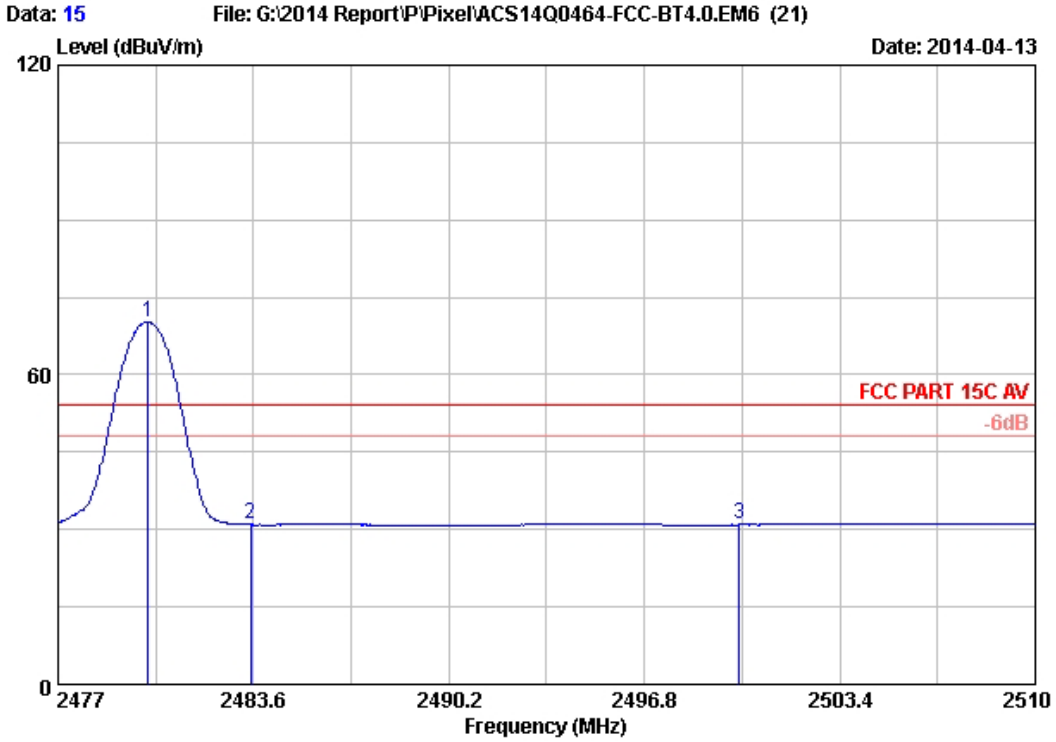
Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.



Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2480MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.739	28.36	5.91	35.70	72.12	70.69	74.00	3.31	Peak
2	2483.500	28.36	5.92	35.70	44.00	42.58	74.00	31.42	Peak
3	2495.249	28.39	5.94	35.70	46.51	45.14	74.00	28.86	Peak
4	2500.000	28.40	5.94	35.70	44.44	43.08	74.00	30.92	Peak

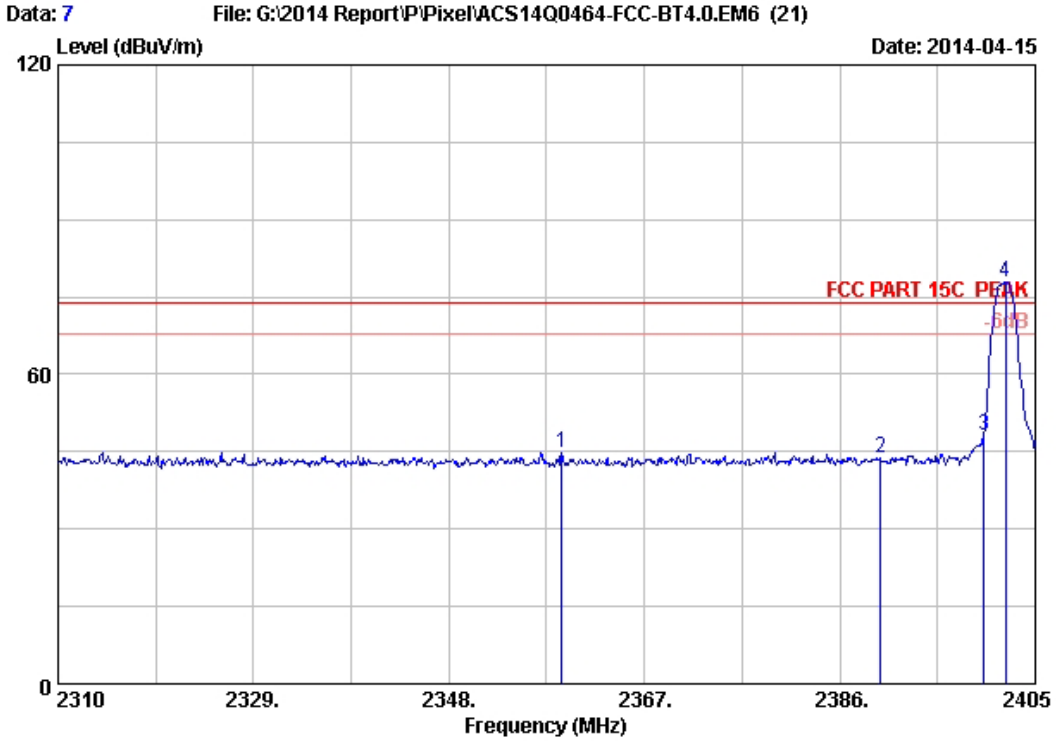
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 15
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C AV
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2480MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.036	28.36	5.91	35.70	71.58	70.15	54.00	-16.15	Average
2	2483.500	28.36	5.92	35.70	32.36	30.94	54.00	23.06	Average
3	2500.000	28.40	5.94	35.70	32.29	30.93	54.00	23.07	Average

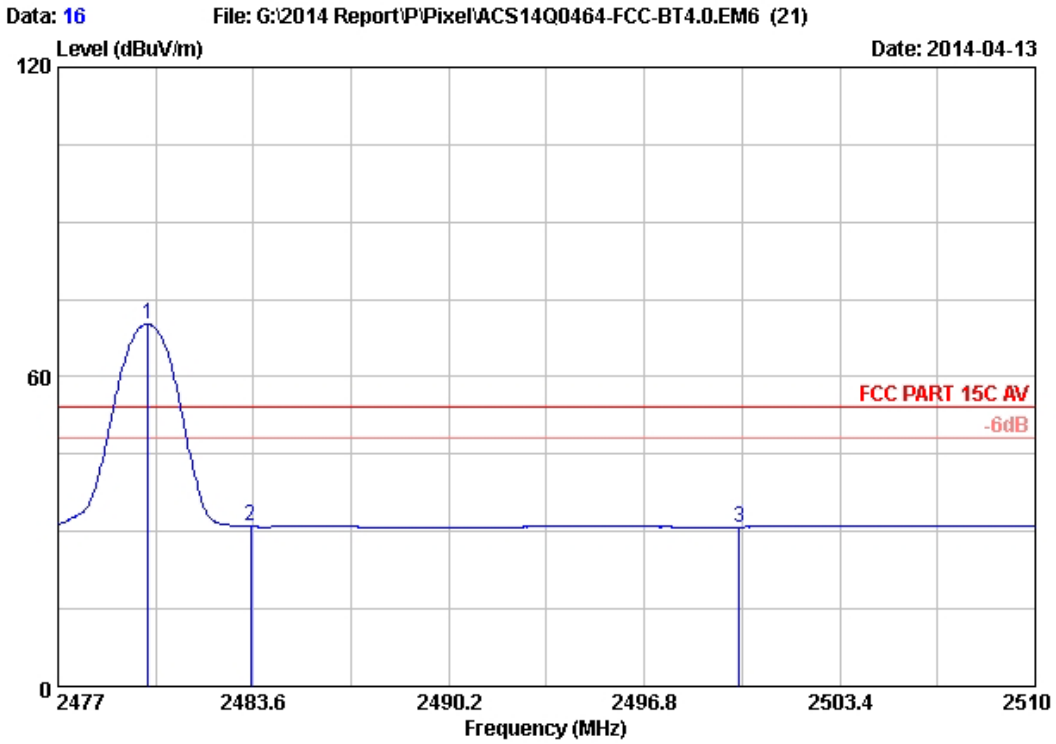
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 7
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2402MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2358.925	28.09	5.74	35.70	46.65	44.78	74.00	29.22	Peak
2	2390.000	28.16	5.78	35.70	45.69	43.93	74.00	30.07	Peak
3	2400.000	28.18	5.80	35.70	49.69	47.97	74.00	26.03	Peak
4	2402.150	28.18	5.80	35.70	79.61	77.89	74.00	-3.89	Peak

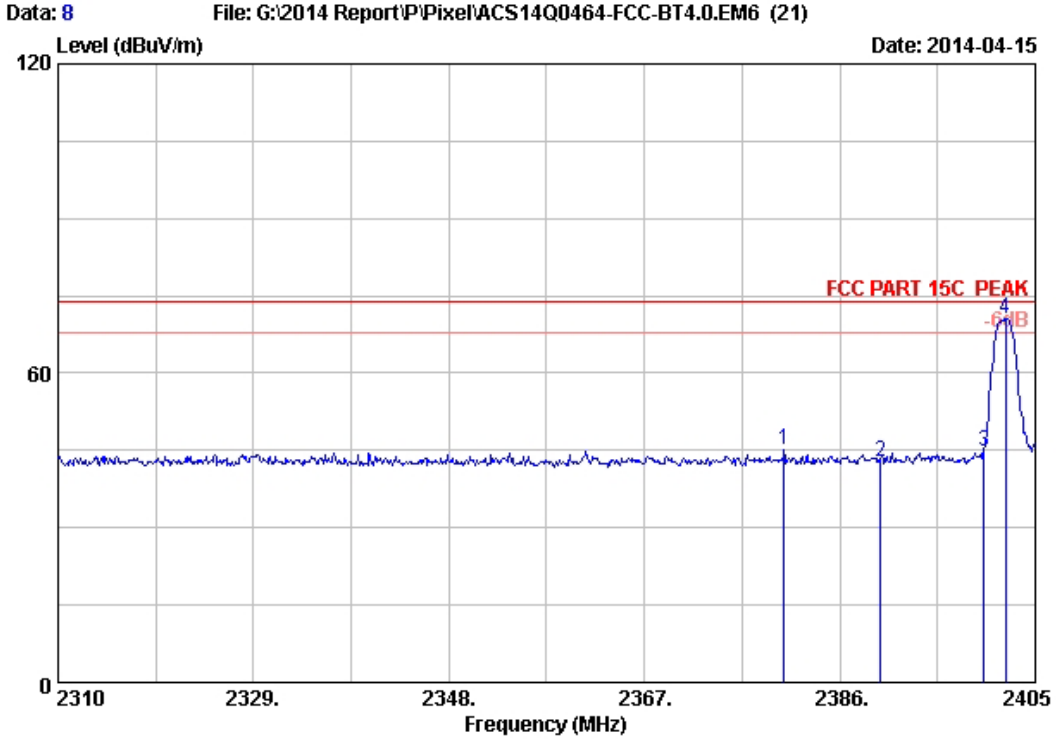
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 16
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C AV
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2480MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.036	28.36	5.91	35.70	71.62	70.19	54.00	-16.19	Average
2	2483.500	28.36	5.92	35.70	32.41	30.99	54.00	23.01	Average
3	2500.000	28.40	5.94	35.70	32.26	30.90	54.00	23.10	Average

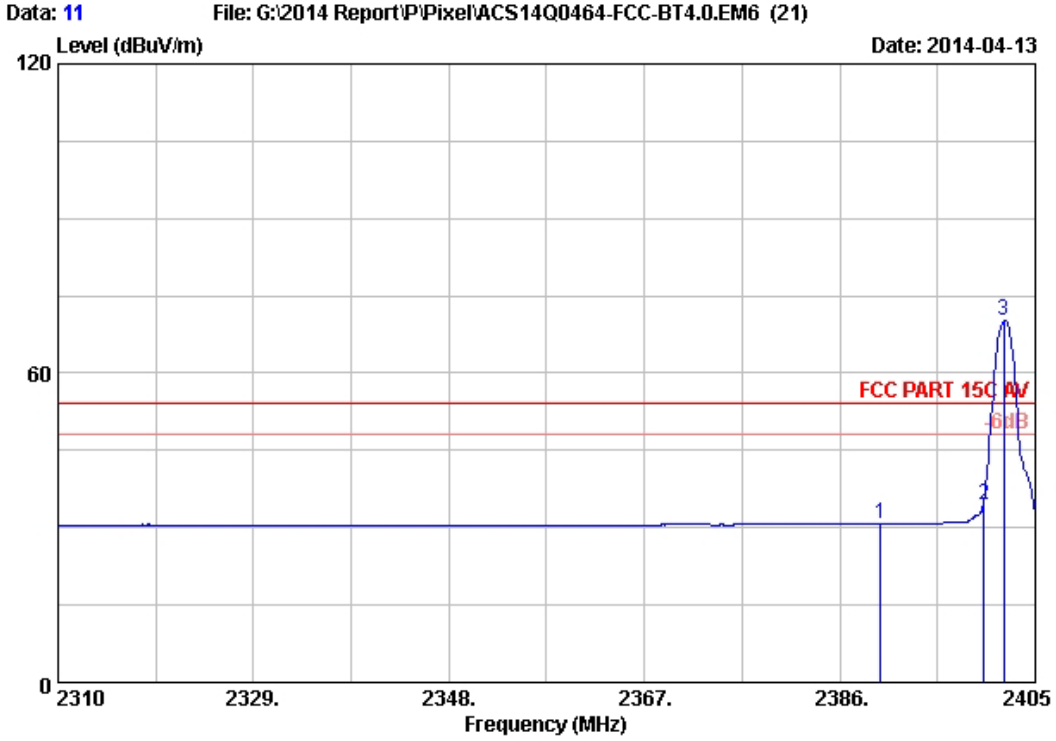
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2402MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2380.585	28.14	5.77	35.70	47.00	45.21	74.00	28.79	Peak
2	2390.000	28.16	5.78	35.70	44.60	42.84	74.00	31.16	Peak
3	2400.000	28.18	5.80	35.70	46.44	44.72	74.00	29.28	Peak
4	2402.150	28.18	5.80	35.70	72.28	70.56	74.00	3.44	Peak

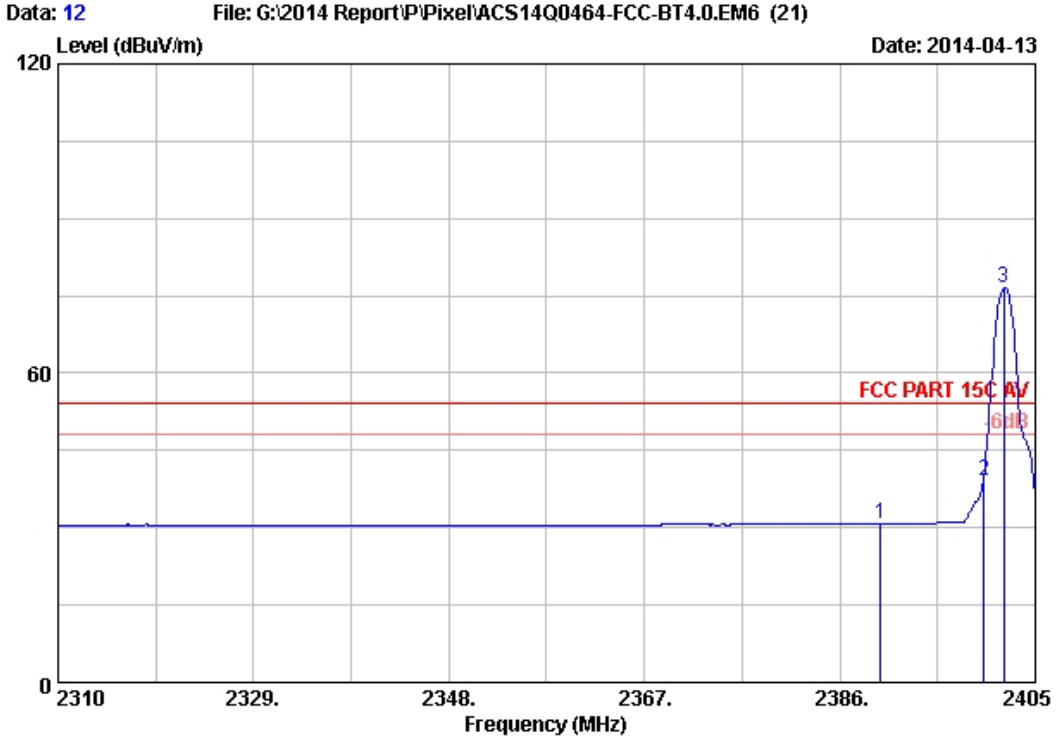
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 11
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C AV
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2402MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	32.65	30.89	54.00	23.11	Average
2	2400.000	28.18	5.80	35.70	36.09	34.37	54.00	19.63	Average
3	2401.960	28.18	5.80	35.70	71.88	70.16	54.00	-16.16	Average

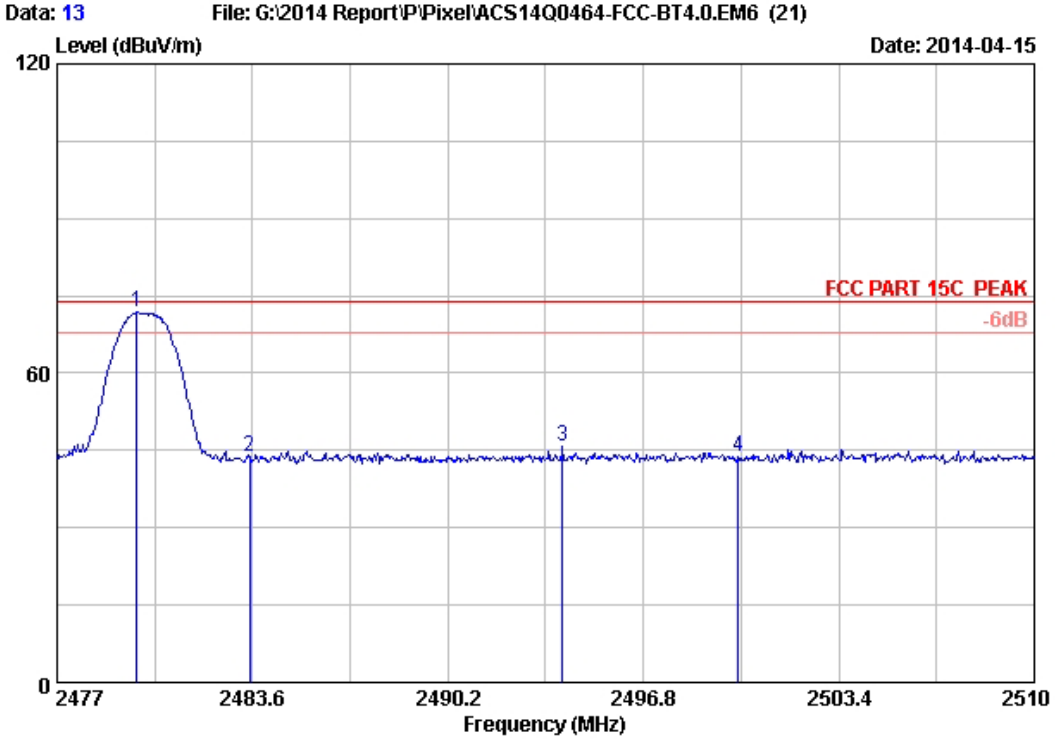
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading -Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 12
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C AV
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2402MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	32.64	30.88	54.00	23.12	Average
2	2400.000	28.18	5.80	35.70	40.80	39.08	54.00	14.92	Average
3	2401.960	28.18	5.80	35.70	78.18	76.46	54.00	-22.46	Average

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



Site no. : 3m Chamber Data no. : 13
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24*C/56% Engineer : Leo-Li
EUT : Bluetooth Timer Remote Control
Power Rating : DC 3V
Test Mode : 2480MHz Tx Mode
M/N : BG-100

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.706	28.36	5.91	35.70	73.21	71.78	74.00	2.22	Peak
2	2483.500	28.36	5.92	35.70	45.06	43.64	74.00	30.36	Peak
3	2494.061	28.39	5.93	35.70	47.28	45.90	74.00	28.10	Peak
4	2500.000	28.40	5.94	35.70	45.00	43.64	74.00	30.36	Peak

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

8. POWER SPECTRAL DENSITY TEST

8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	May.08, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28, 13	1 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year

8.2.Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

8.3.Test Procedure

1. Connected the EUT's antenna port to spectrum analyzer device by 20dB attenuator.

2. Set the test frequency as center frequency, Set RBW=3KHz,VBW=10KHz,Span large enough capture the entire frequency, Read out maximum peak level frequency

3. Set the frequency read from produce 2 as center frequency, then set the span= 300KHz, Sweep time=Span/RBW, Then Max hold, read out each mode and each chain's Power density.

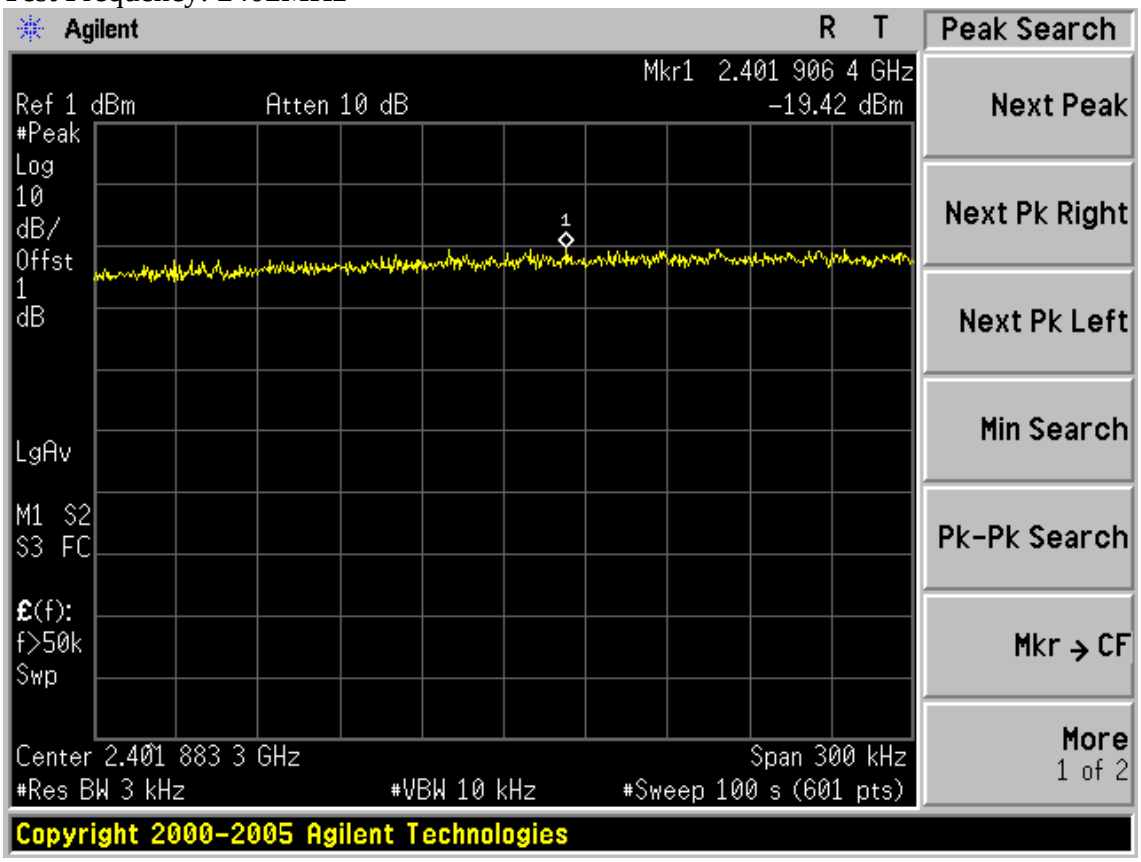
Note: The cable loss and attenuator loss were offset into measure device as an amplitude

8.4.Test Results

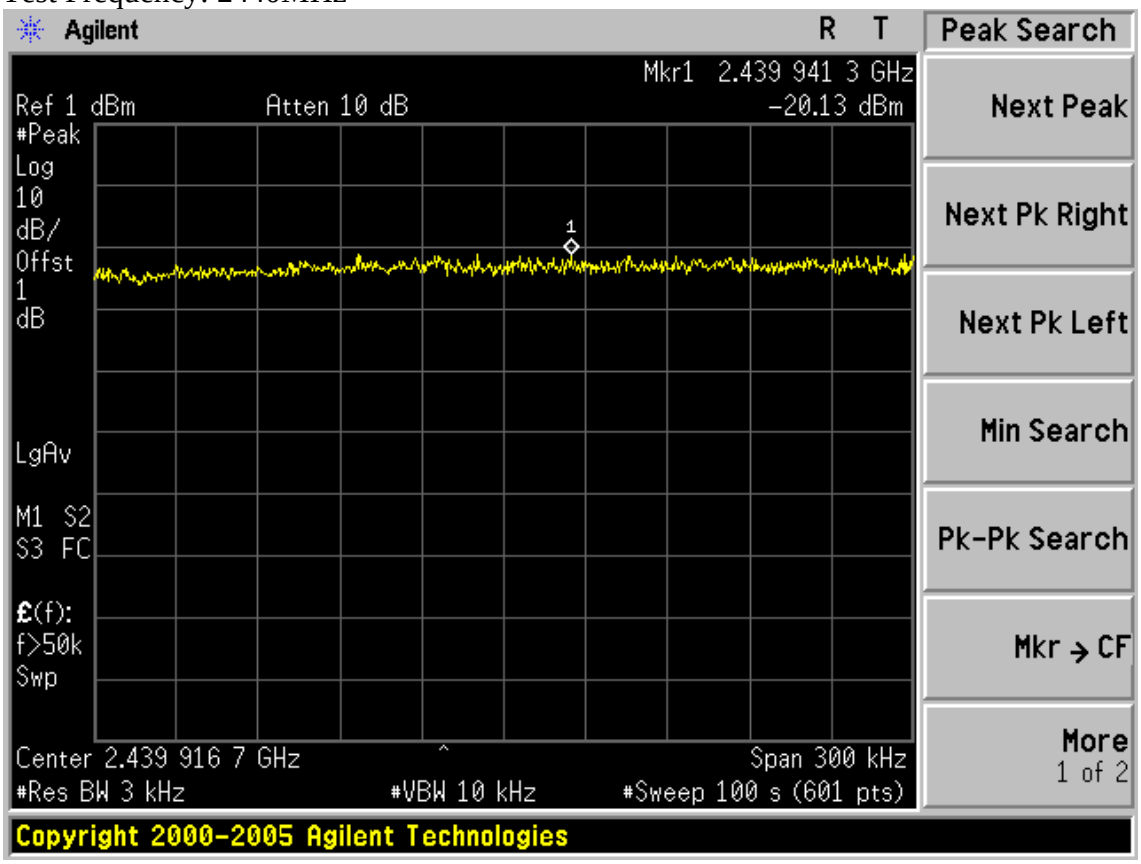
EUT: Bluetooth Timer Remote Control		
M/N: BG-100		
Test date: 2014-04-18	Pressure: 101.7±1.0kpa	Humidity: 52.8±3.0%
Tested by: Leo-Li	Test site: RF site	Temperature: 23.5±0.6℃

Cable loss: 1 dB		Attenuator loss: 20 dB	
Test Mode	CH (MHz)	Power density（dBm/3KHz）	Limit (dBm/3KHz)
GFSK	2402	-19.42	8
	2440	-20.13	8
	2480	-21.00	8
Conclusion：PASS			

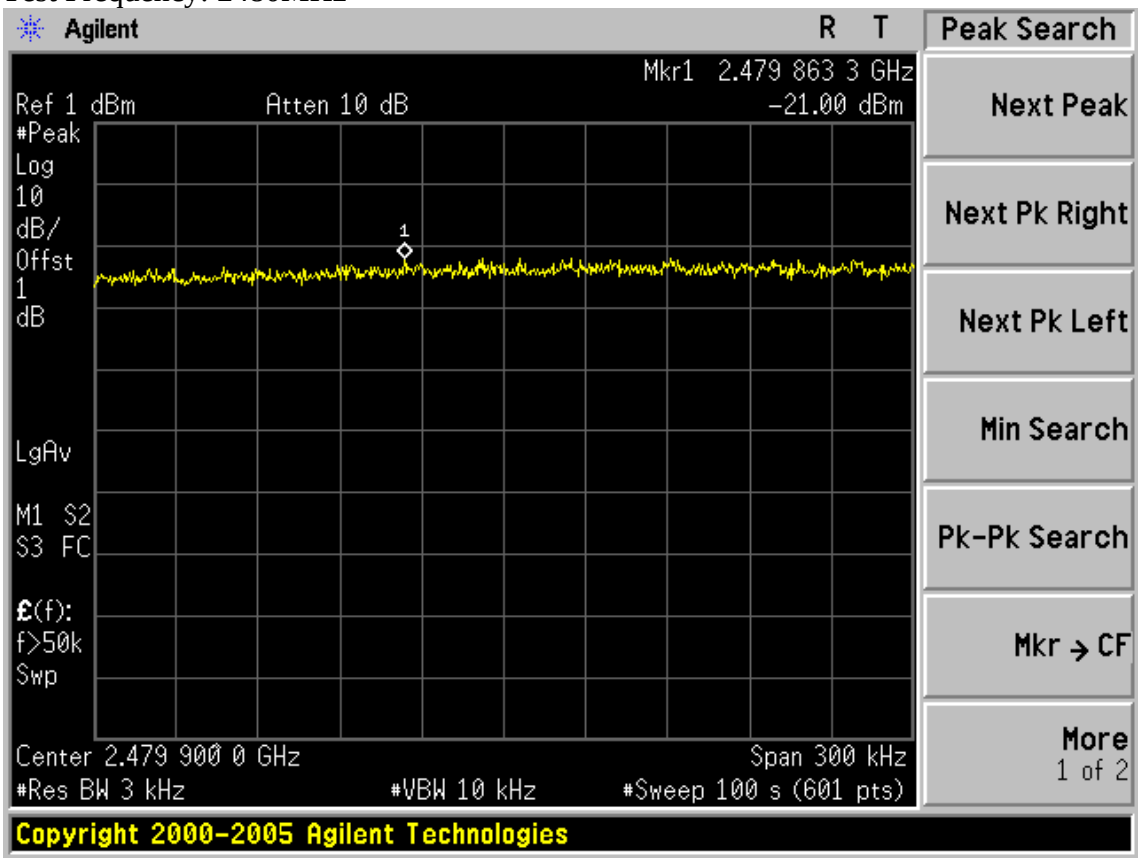
Test Frequency: 2402MHz



Test Frequency: 2440MHz



Test Frequency: 2480MHz



9. DEVIATION TO TEST SPECIFICATIONS

[NONE]