FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

G. tech Technology Ltd.

2.4GHz Wireless Keyboard

Model Number: GK390

FCC ID: OO9GK390

Prepared for : G. tech Technology Ltd.
No.21, Jinding Industrial Park, West Jinfeng Road,
Tangjiawan Town, Xiangzhou District Zhuhai
Guangdong China

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-F14287
Date of Test	:	Sep.21~23, 2014
Date of Report	:	Sep.30, 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. EUT Configuration and operation conditions for test. 2-1
2.3. Test Facility 2-2
2.4. Measurement Uncertainty (95% confidence levels, k=2) 2-2
3. RADIATED EMISSION TEST 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 and 15.249 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. 20 DB BANDWIDTH TEST 4-1
4.1. Test Equipment 4-1
4.2. Limit 4-1
4.3. Test Results 4-1
5. BAND EDGE COMPLIANCE TEST 5-1
5.1. Test Equipment 5-1
5.2. Limit 5-1
5.3. Test Produce 5-1
5.4. Test Results 5-1
6. ANTENNA REQUIREMENT 6-1
7. RADIO FRREQUENCY EXPOSURE COMPLIANCE 7-1
8. TEST SOFTWARE 8-1
9. DEVIATION TO TEST SPECIFICATIONS 9-1
10. PHOTOGRAPH OF TEST 10-1
10.1. Photos of Radiated Emission Test 10-1
11. PHOTOGRAPH OF EUT 11-1

TEST REPORT CERTIFICATION

Applicant	:	G. tech Technology Ltd.
Manufacturer	:	G. tech Technology Ltd.
EUT Description	:	2.4GHz Wireless Keyboard
FCC ID	:	OO9GK390

(A) MODEL NO. : GK390
(B) SERIAL NO. : N/A
(C) POWER SUPPLY : DC 1.5V
(D) TEST VOLTAGE : DC 1.5V

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. This report contains data that are not covered by the NVLAP accreditation. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

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 : Sep.21~23, 2014 Report of date: Sep.30, 2014

Prepared by : Cindy Zhu (for) Reviewed by :

Kayli He / Assistant Sunny Lu / Assistant Manager

AUDIX® 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 9.30

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 15C: 15.207 ANSI C63.10-2009	N/A
Radiated Emission Test	FCC Part 15C: 15.209 FCC Part 15C: 15.249 ANSI C63.10-2009	PASS
Band Edge Compliance Test	FCC Part 15: 15.249 ANSI C63.10-2009	PASS
20dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10-2009	PASS
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

Product Name	:	2.4GHz Wireless Keyboard
Model Number	:	GK390
FCC ID	:	OO9GK390
Operation frequency	:	2402MHz-2479MHz
Antenna	:	Integrated PCB antenna, 0dBi gain
Modulation	:	GFSK
Power Supply	:	DC 1.5V
Applicant	:	G. tech Technology Ltd. No.21, Jinding Industrial Park, West Jinfeng Road, Tangjiawan Town, Xiangzhou District Zhuhai Guangdong China
Manufacturer	:	G. tech Technology Ltd. No.21, Jinding Industrial Park, West Jinfeng Road, Tangjiawan Town, Xiangzhou District Zhuhai Guangdong China
Date of Test	:	Sep.21~23, 2014
Date of Receipt	:	Sep.19, 2014
Sample Type	:	Prototype production

2.2. EUT Configuration and operation conditions for test.

EUT

(EUT: 2.4GHz Wireless Keyboard)

2.3.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: Dec.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

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

Test Item	Uncertainty
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	3.57dB
Uncertainty for Conduction Spurious emission test	2.00 dB
Uncertainty for Output power test	0.73 dB
Uncertainty for Power density test	2.00 dB
Uncertainty for Frequency range test	$7x10^{-8}$
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 TEST

3.1.Test Equipment

Frequency rang: 30~1000MHz

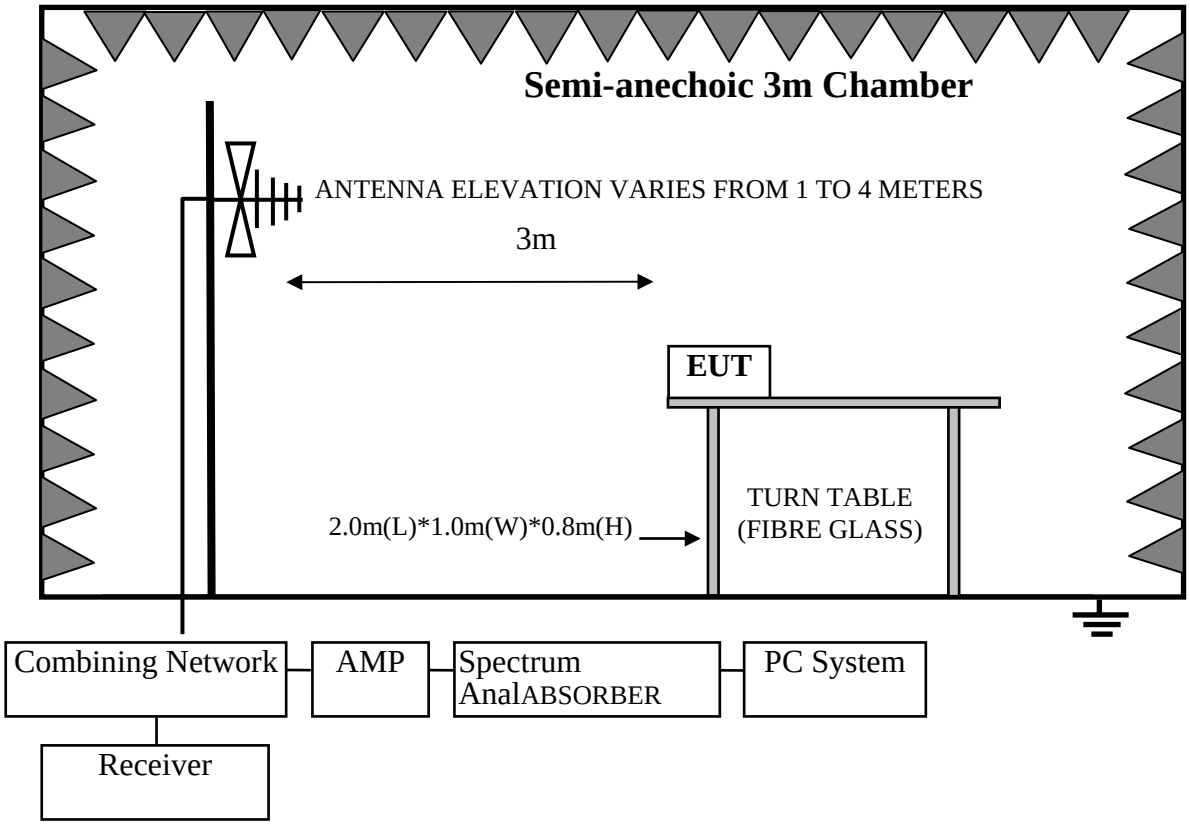
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Nov.24, 13	1 Year
2.	EMI Spectrum	Agilent	E4407B	MY41440292	Apr. 28,14	1 Year
3.	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	Apr. 28,14	1 Year
4.	Amplifier	HP	8447D	2648A04738	Apr. 28,14	1 Year
5.	Bilog Antenna	TESEQ	CBL6112D	35375	Jun. 18, 14	1 Year
6.	RF Cable	MIYAZAKI	CFD400-NL	3# Chamber No.1	Apr. 28,14	1 Year
7.	Coaxial Switch	Anritsu	MP59B	6200313662	Apr. 28,14	1 Year

Frequency rang: above 1000MHz

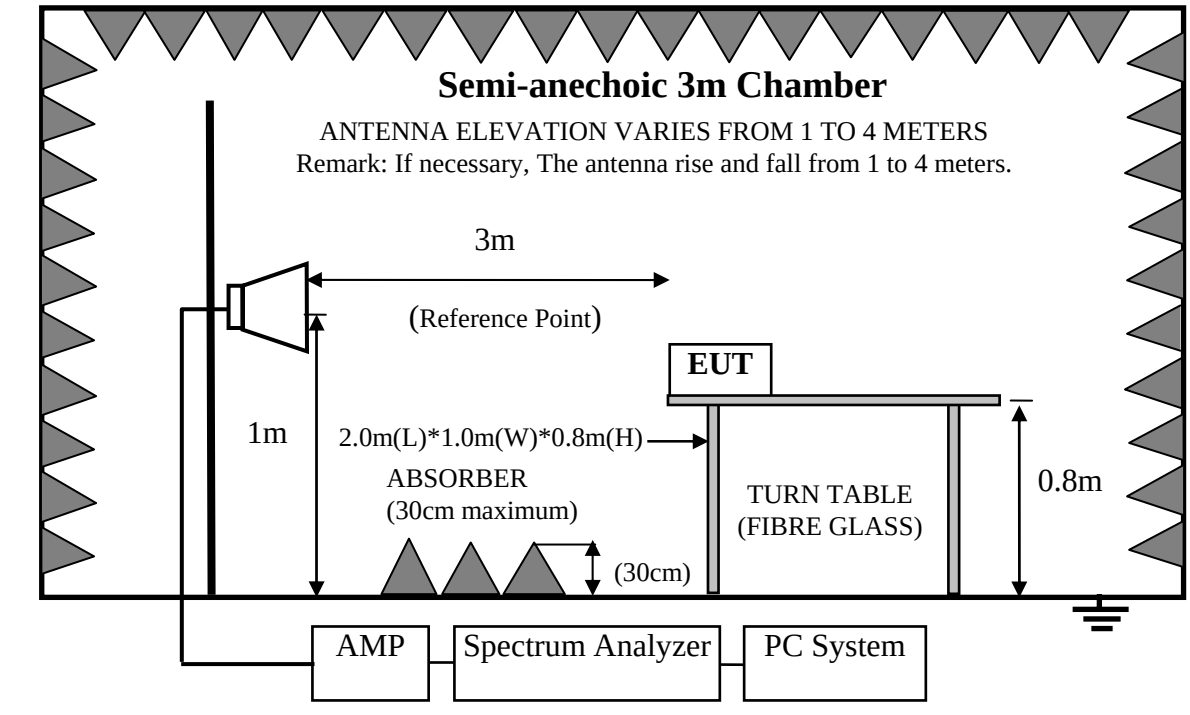
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Nov.03, 13	1 Year
2.	Spectrum Analyzer	Agilent	E4407B	MY41440292	Apr. 28,14	1 Year
3.	Horn Antenna	ETS	3115	9607-4877	Aug.27, 14	1 Year
4.	Amplifier	Agilent	8449B	3008A00863	Apr. 28,14	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	Apr. 28,14	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX106	28616/2	Apr. 28,14	1 Year
7.	Horn Antenna	ETS	3116	00060089	Aug.27, 14	1 Year

3.2.Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency above 1GHz



3.3. Radiated Emission Limit Standard: FCC 15.209 and 15.249

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)	
Field Strength of fundamental emissions for 2.4GHz-2.4835GHz	3	114.0 dB(μV)/m (Peak) 94.0 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.

3.5.Operating Condition of EUT

3.5.1.Setup the EUT and simulator as shown as Section 3.2.
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.

During the pretest the EUT was rotated through three orthogonal axes to determine the attitude that maximizes the emissions.

After that the EUT was manually handled to find the orientation that has the maximum emission, which is the orientation show in the test setup photos.

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 above 1GHz

This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level.

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

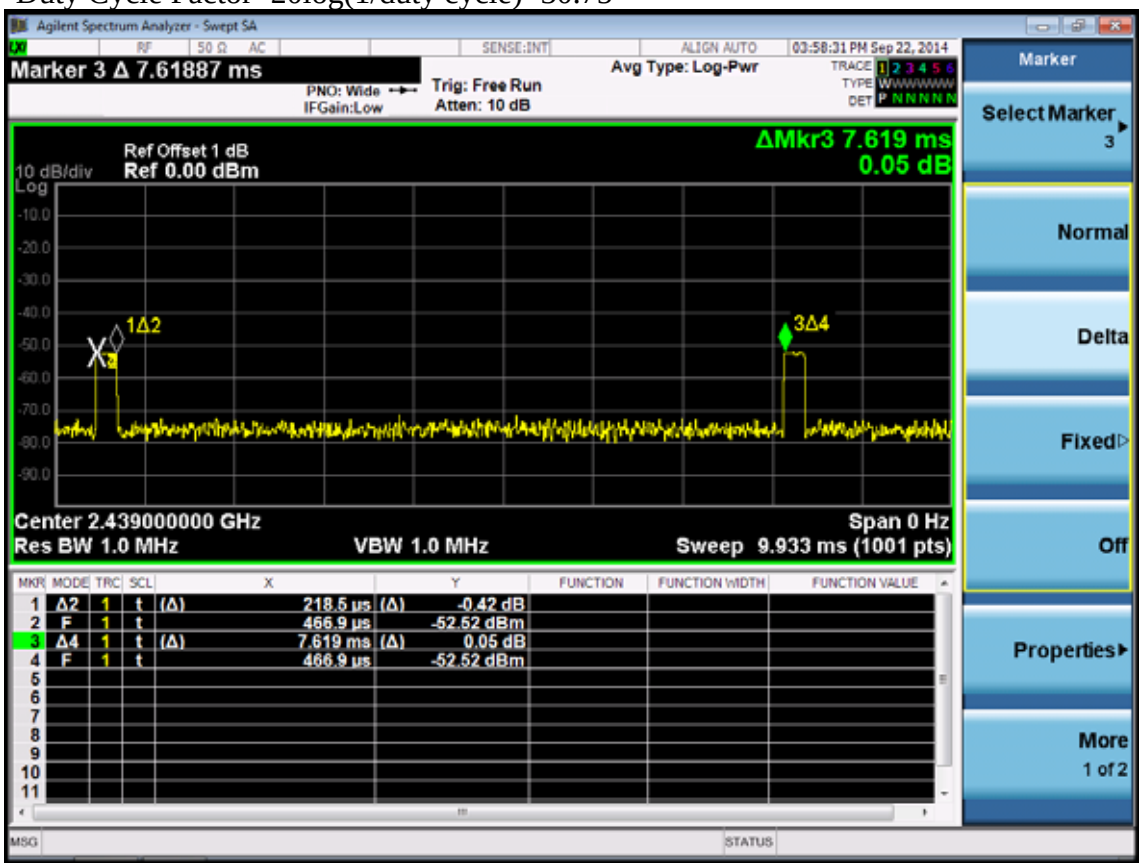
PASS.

All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

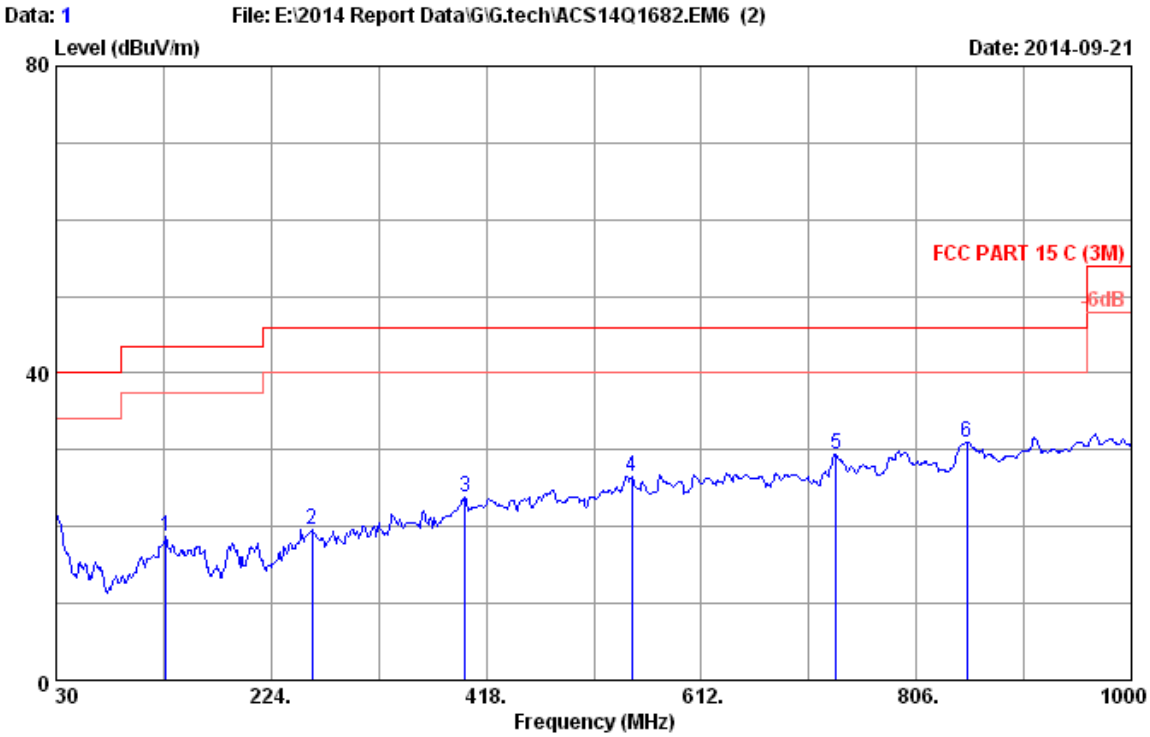
Note: The duty cycle factor for calculate average level is 30.75 dB, and average limit is 20dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.

Duty cycle=0.2185/7.619=2.9%

Duty Cycle Factor=20log(1/duty cycle)=30.75



Frequency: 30MHz~1GHz

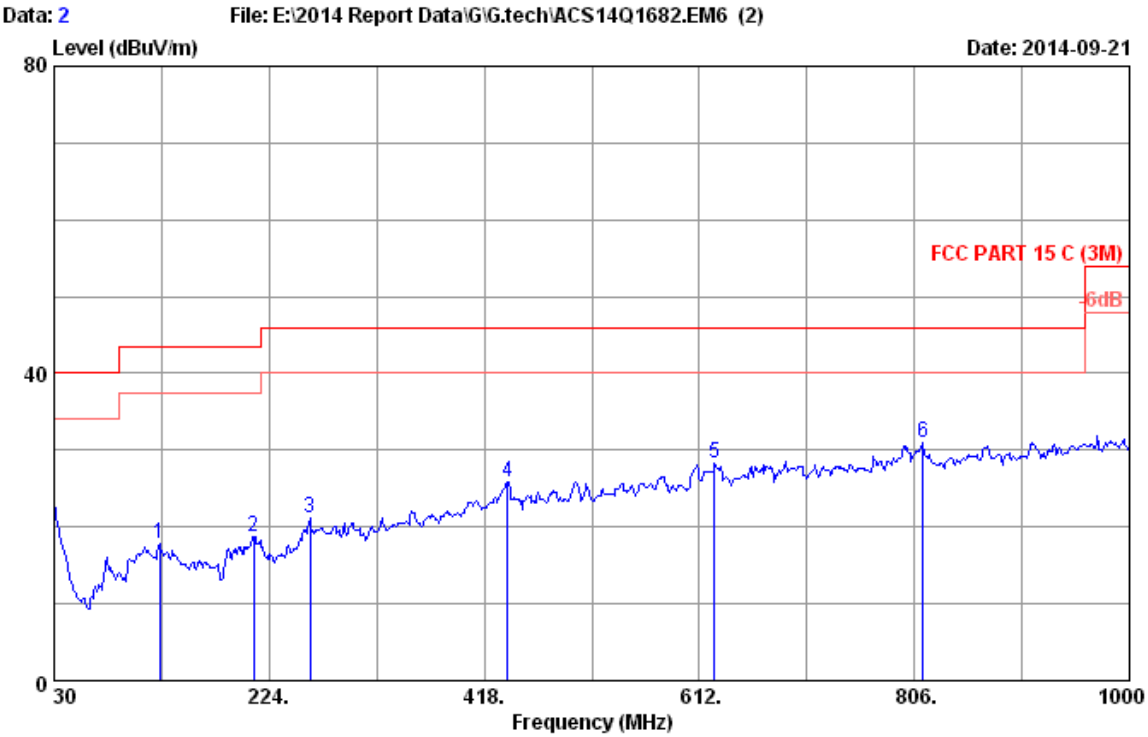


Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 CBL6112D 35375
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.5*C/53%
EUT : 2.4GHz Wireless Keyboard
Power rating : DC 1.5V
Test Mode : Tx Mode
GK390

Data no. : 1
Ant. pol. : HORIZONTAL
Engineer : Kobe

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	128.940	12.71	1.38	32.39	18.76	43.50	24.74	QP
2	260.860	14.04	2.12	30.63	19.59	46.00	26.41	QP
3	398.600	16.62	2.80	32.12	23.85	46.00	22.15	QP
4	548.950	18.80	3.47	32.47	26.59	46.00	19.41	QP
5	733.250	20.47	4.25	32.76	29.48	46.00	16.52	QP
6	851.590	21.56	4.69	32.45	31.06	46.00	14.94	QP

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



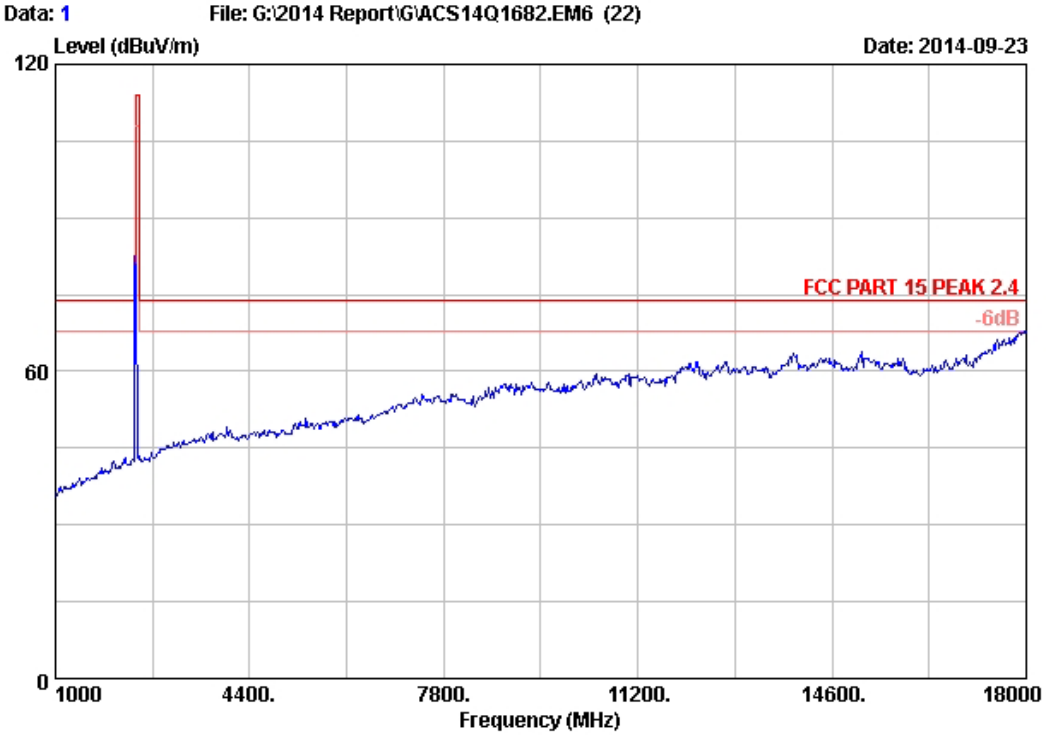
Site no. : 3m Chamber
Dis. / Ant. : 3m 2014 CBL6112D 35375
Limit : FCC PART 15 C (3M)
Env. / Ins. : 23.5*C/53%
EUT : 2.4GHz Wireless Keyboard
Power rating : DC 1.5V
Test Mode : Tx Mode
GK390

Data no. : 2
Ant. pol. : VERTICAL
Engineer : Kobe

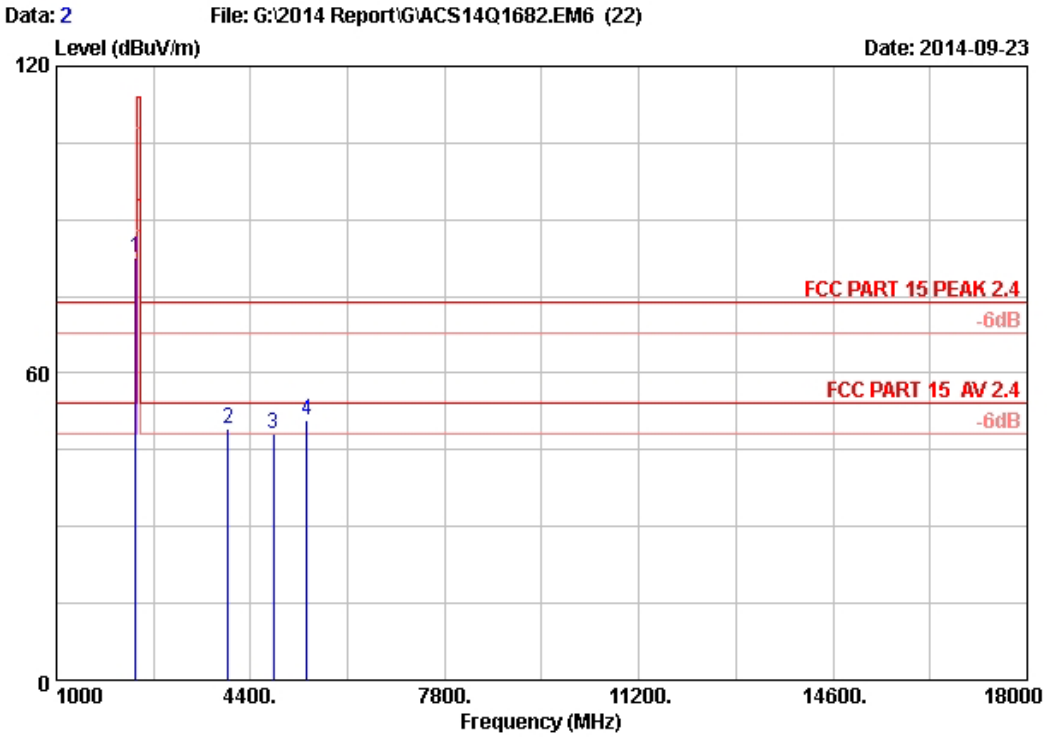
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	125.060	12.85	1.35	31.41	17.87	43.50	25.63	QP
2	210.420	10.58	1.90	33.68	18.80	43.50	24.70	QP
3	260.860	14.04	2.12	32.11	21.07	46.00	24.93	QP
4	439.340	17.19	2.98	33.53	25.83	46.00	20.17	QP
5	625.580	19.71	3.82	32.85	28.21	46.00	17.79	QP
6	813.760	21.00	4.54	33.29	31.07	46.00	14.93	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



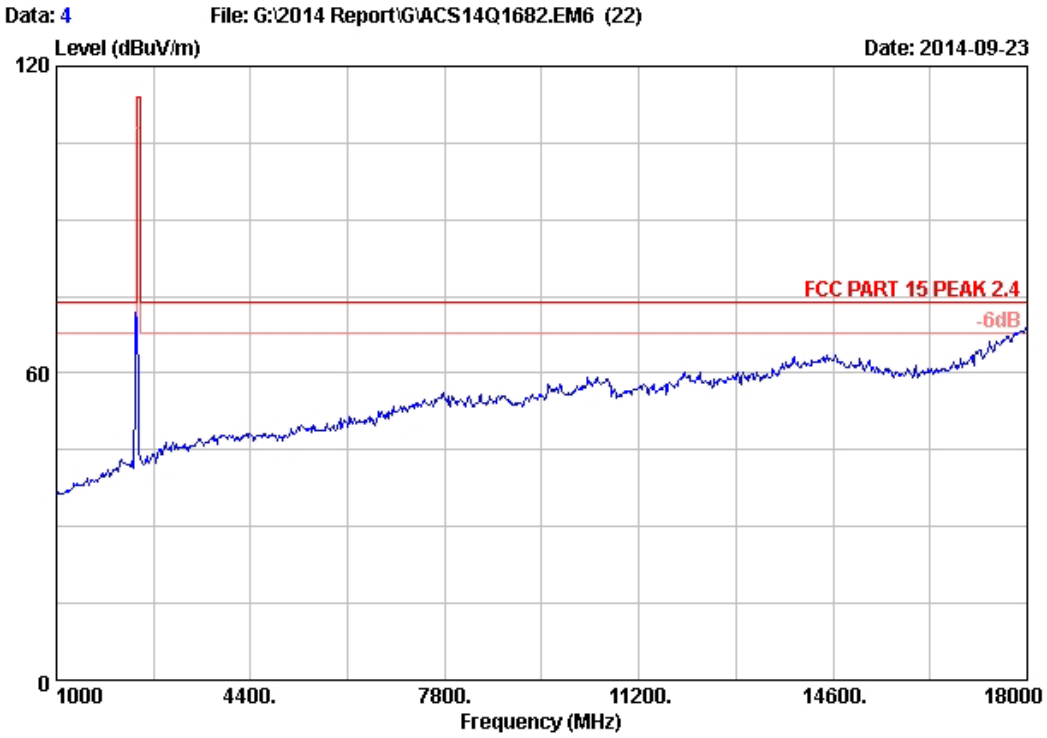

```
Site no.      : 3m Chamber                    Data no.   : 1
Dis. / Ant.   : 3m   2014 3115 (4580)       Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2402MHz
M/N           : GK390
```



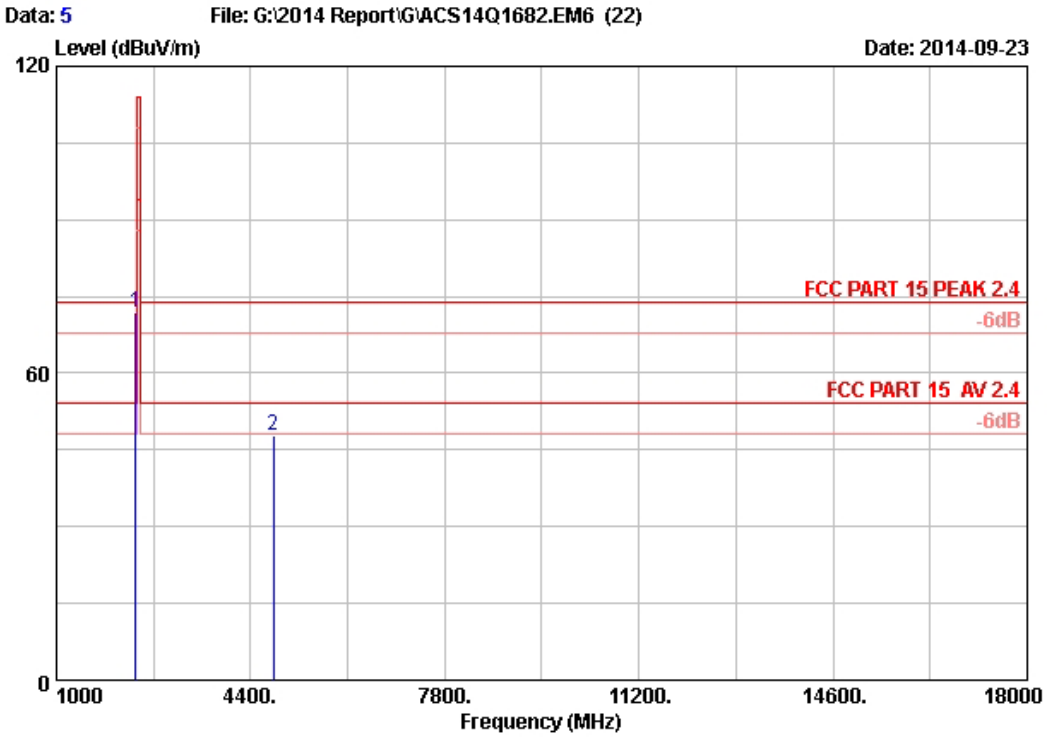
Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2402MHz
M/N : GK390

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	2394.000	28.17	5.79	35.70	84.42	82.68	74.00	-8.68	Peak
2	4009.000	32.59	7.73	35.70	44.63	49.25	74.00	24.75	Peak
3	4804.000	32.85	8.56	35.70	42.37	48.08	74.00	25.92	Peak
4	5386.000	33.82	9.17	35.70	43.48	50.77	74.00	23.23	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.



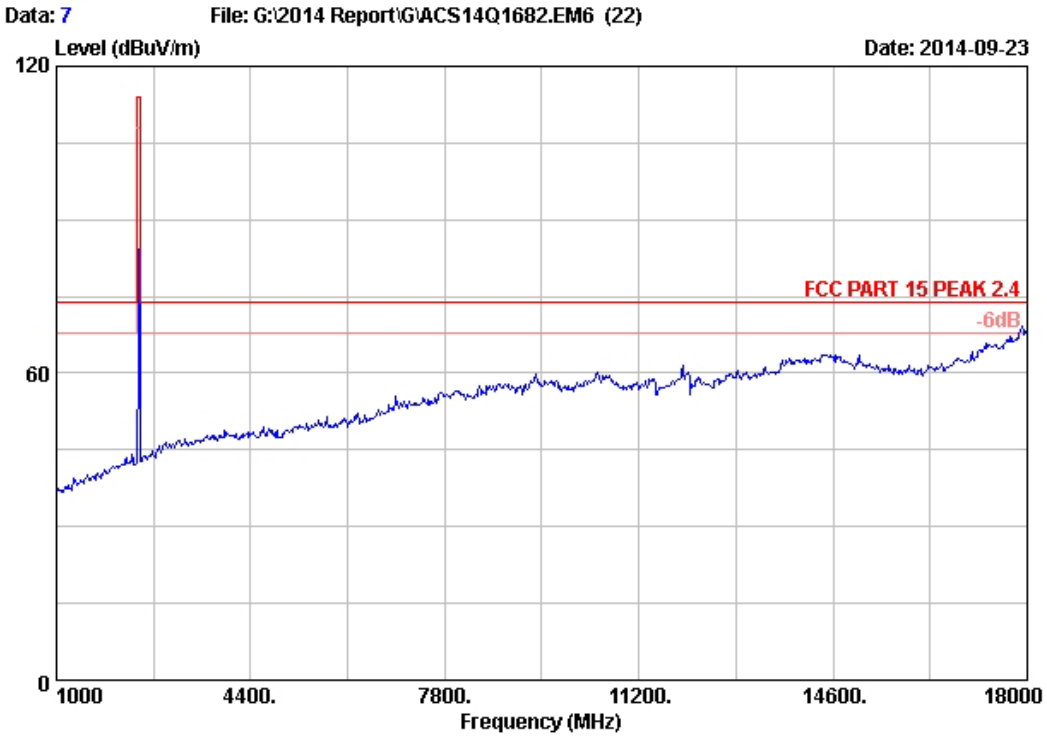

```
Site no.      : 3m Chamber                    Data no.   : 4
Dis. / Ant.   : 3m   2014 3115 (4580)       Ant. pol. : VERTICAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2402MHz
M/N           : GK390
```



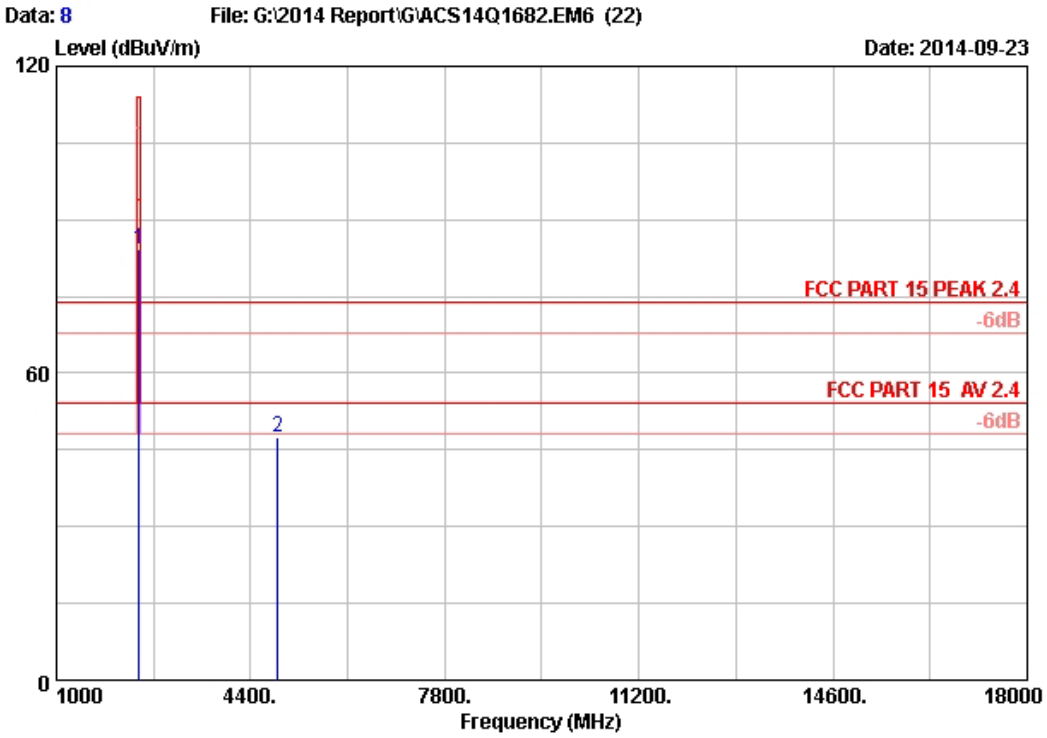
Site no. : 3m Chamber Data no. : 5
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2402MHz
M/N : GK390

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	2394.000	28.17	5.79	35.70	73.49	71.75	74.00	2.25	Peak
2	4804.000	32.85	8.56	35.70	42.23	47.94	74.00	26.06	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.



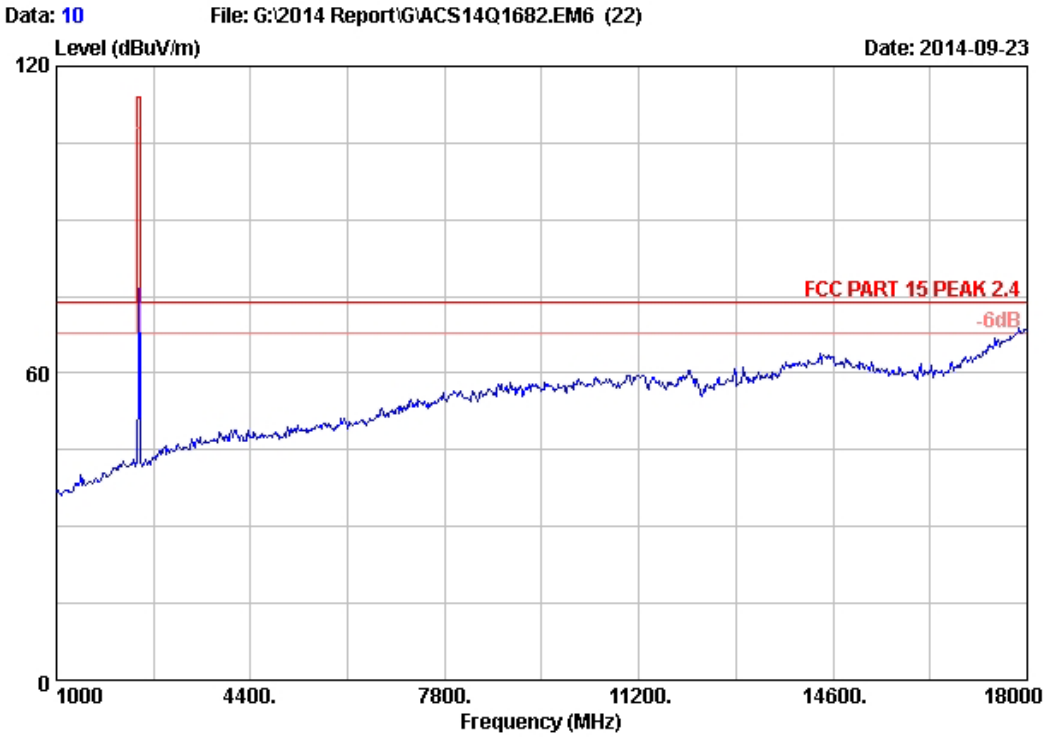

```
Site no.      : 3m Chamber                    Data no.   : 7
Dis. / Ant.   : 3m   2014 3115 (4580)       Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2439MHz
M/N           : GK390
```



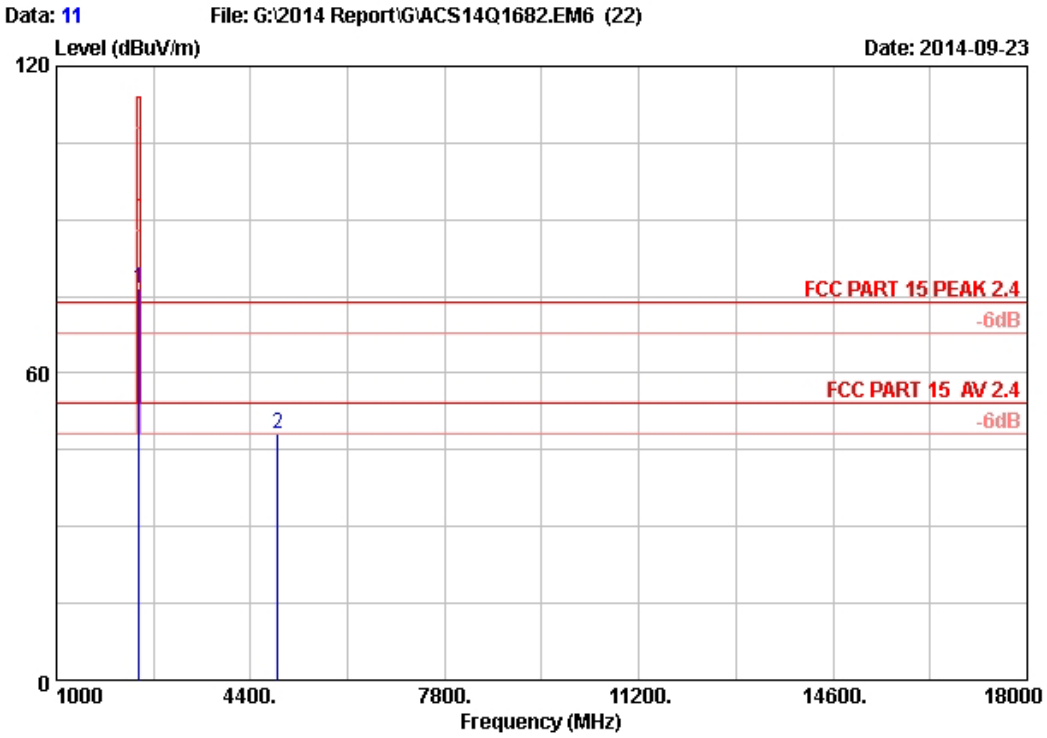
Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2439MHz
M/N : GK390

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	2445.000	28.28	5.86	35.70	85.88	84.32	114.00	29.68	Peak
2	4878.000	32.98	8.64	35.70	41.51	47.43	74.00	26.57	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.



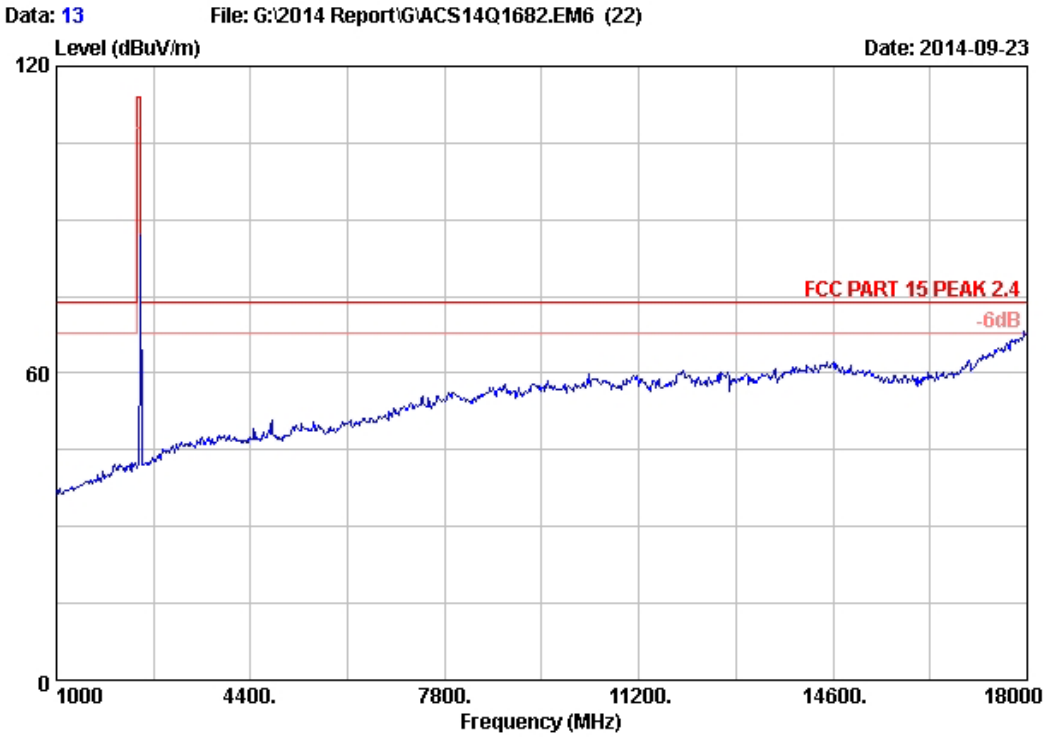

```
Site no.      : 3m Chamber                    Data no.   : 10
Dis. / Ant.   : 3m   2014 3115 (4580)       Ant. pol. : VERTICAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2439MHz
M/N           : GK390
```



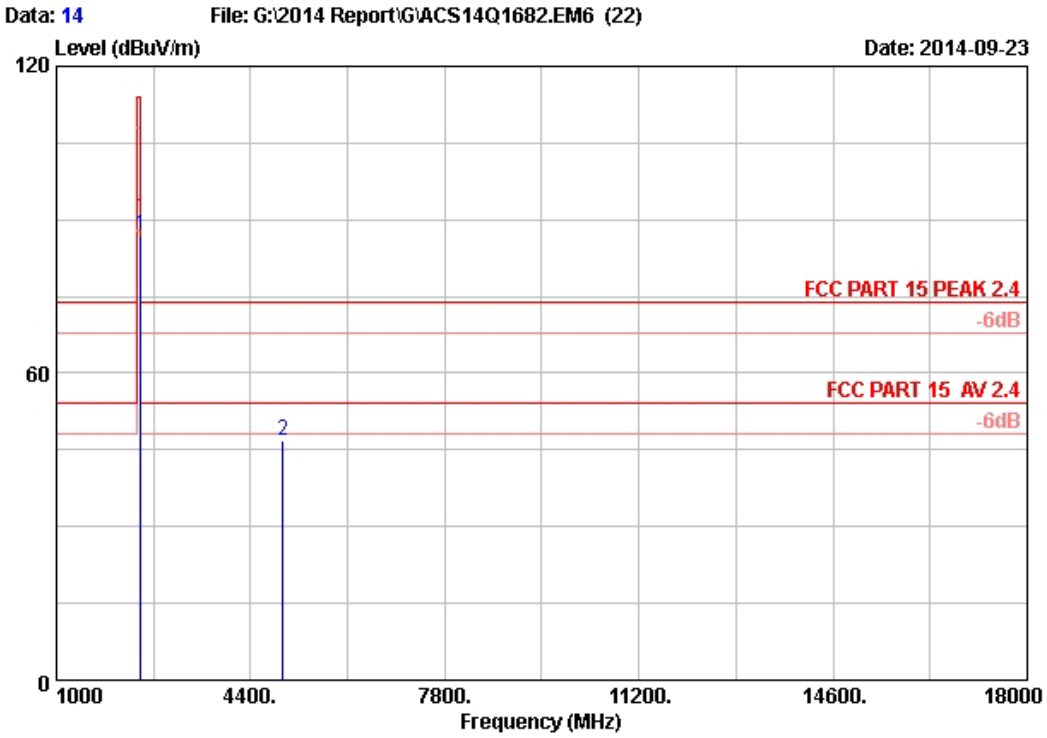
Site no. : 3m Chamber Data no. : 11
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2439MHz
M/N : GK390

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	2445.000	28.28	5.86	35.70	78.08	76.52	114.00	37.48	Peak
2	4878.000	32.98	8.64	35.70	42.09	48.01	74.00	25.99	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.



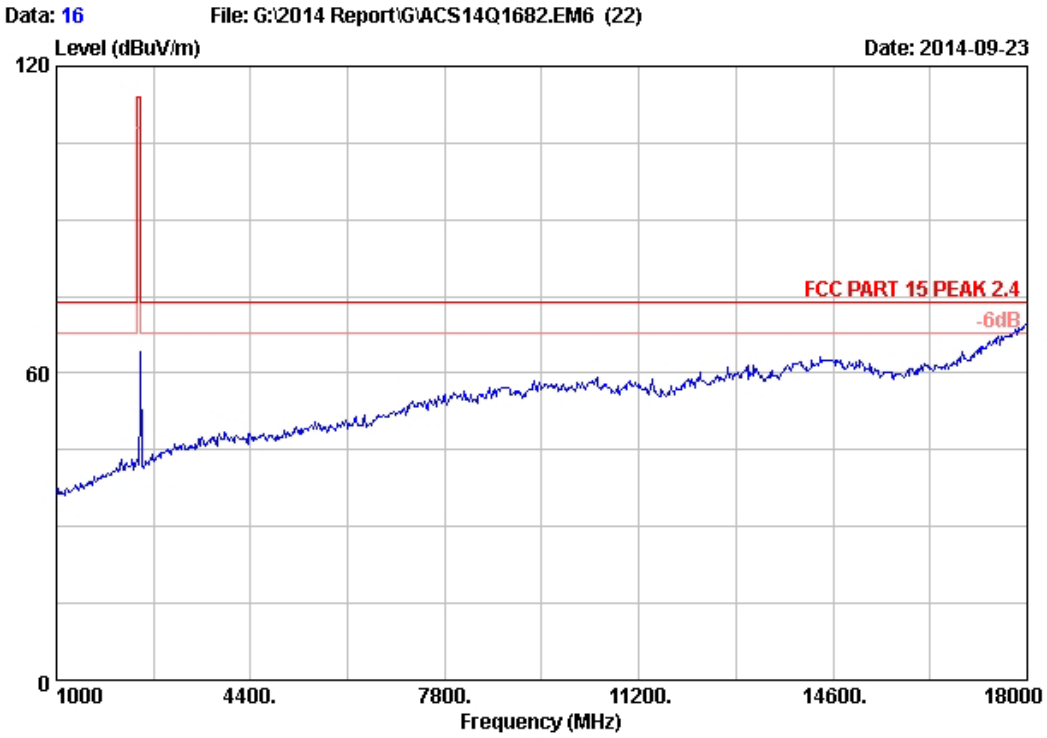

```
Site no.      : 3m Chamber                    Data no.   : 13
Dis. / Ant.   : 3m   2014 3115 (4580)       Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2479MHz
M/N           : GK390
```



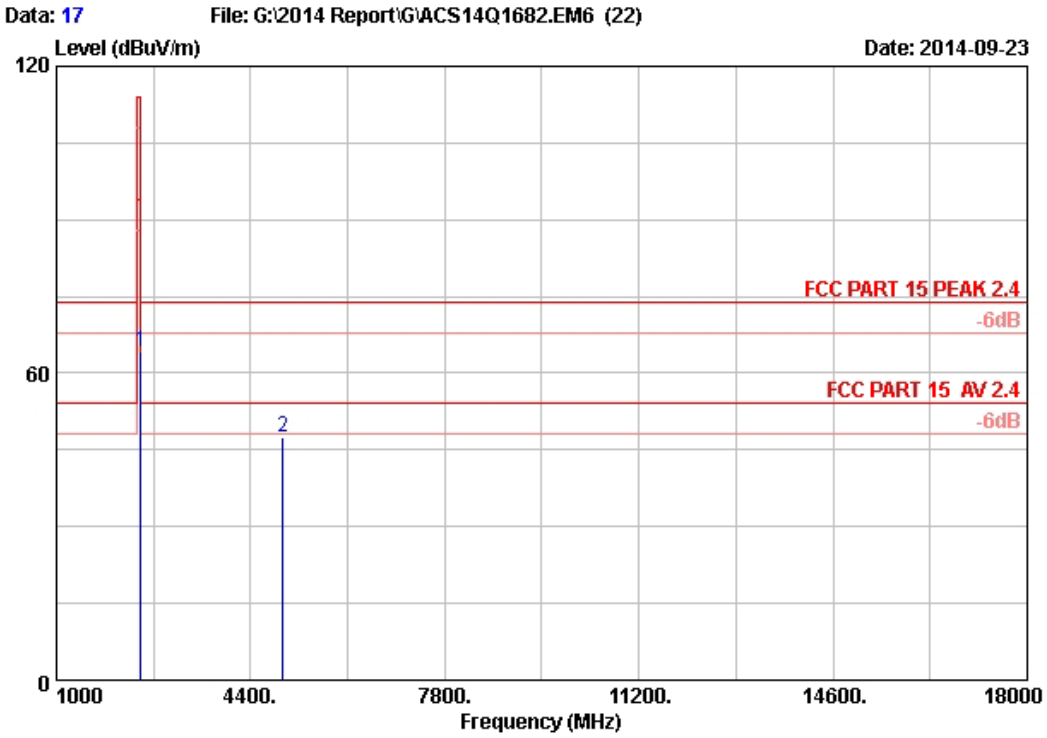
Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2479MHz
M/N : GK390

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	2479.000	28.35	5.91	35.70	88.34	86.90	114.00	27.10	Peak
2	4958.000	33.12	8.72	35.70	40.78	46.92	74.00	27.08	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   2014 3115 (4580)       Ant. pol. : VERTICAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2479MHz
M/N           : GK390
```



Site no. : 3m Chamber Data no. : 17
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2479MHz
M/N : GK390

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	2479.000	28.35	5.91	35.70	65.64	64.20	114.00	49.80	Peak
2	4958.000	33.12	8.72	35.70	41.17	47.31	74.00	26.69	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. 20 DB BANDWIDTH TEST

4.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 13	1Year

4.2. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

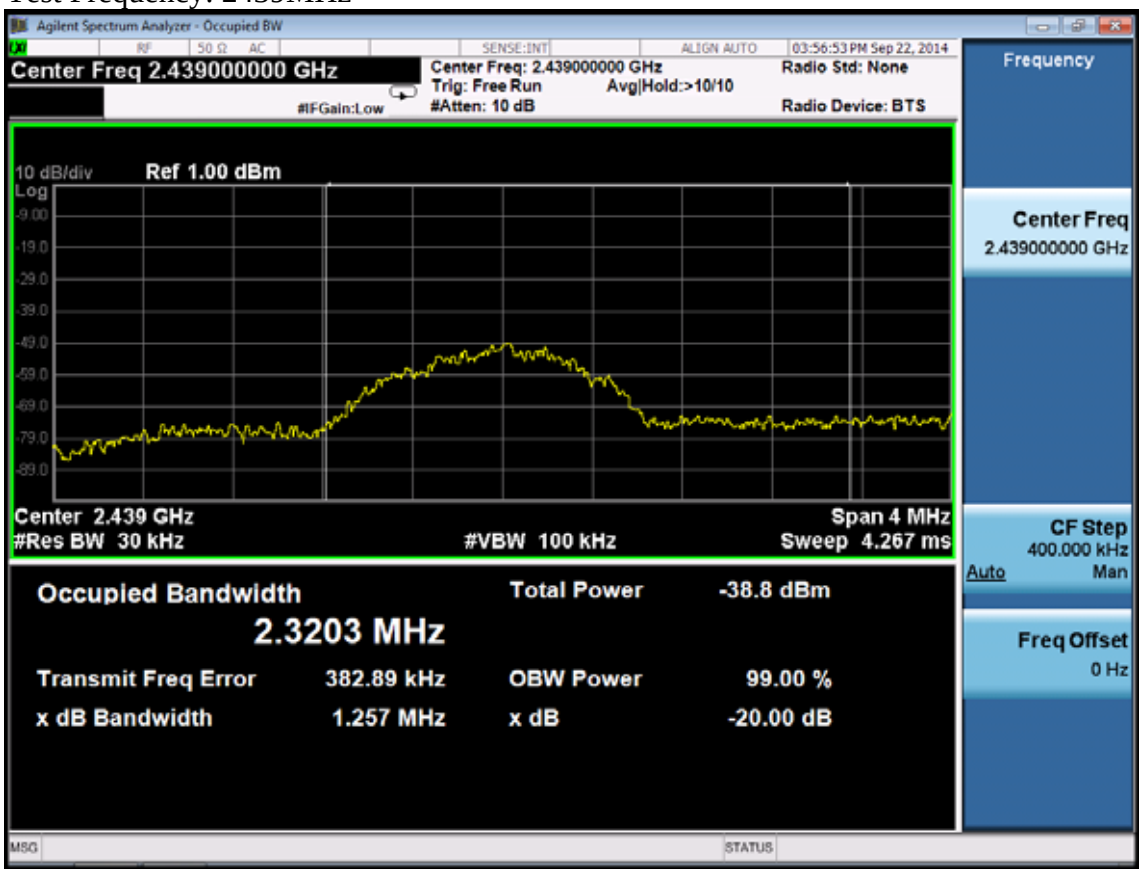
4.3. Test Results

EUT: 2.4GHz Wireless Keyboard		
M/N: GK390		
Test date: 2014-09-22	Pressure: 101.6±1.0kpa	Humidity: 50.1±3.0%
Tested by: Kobe	Test site: RF Site	Temperature：21.8±0.6℃

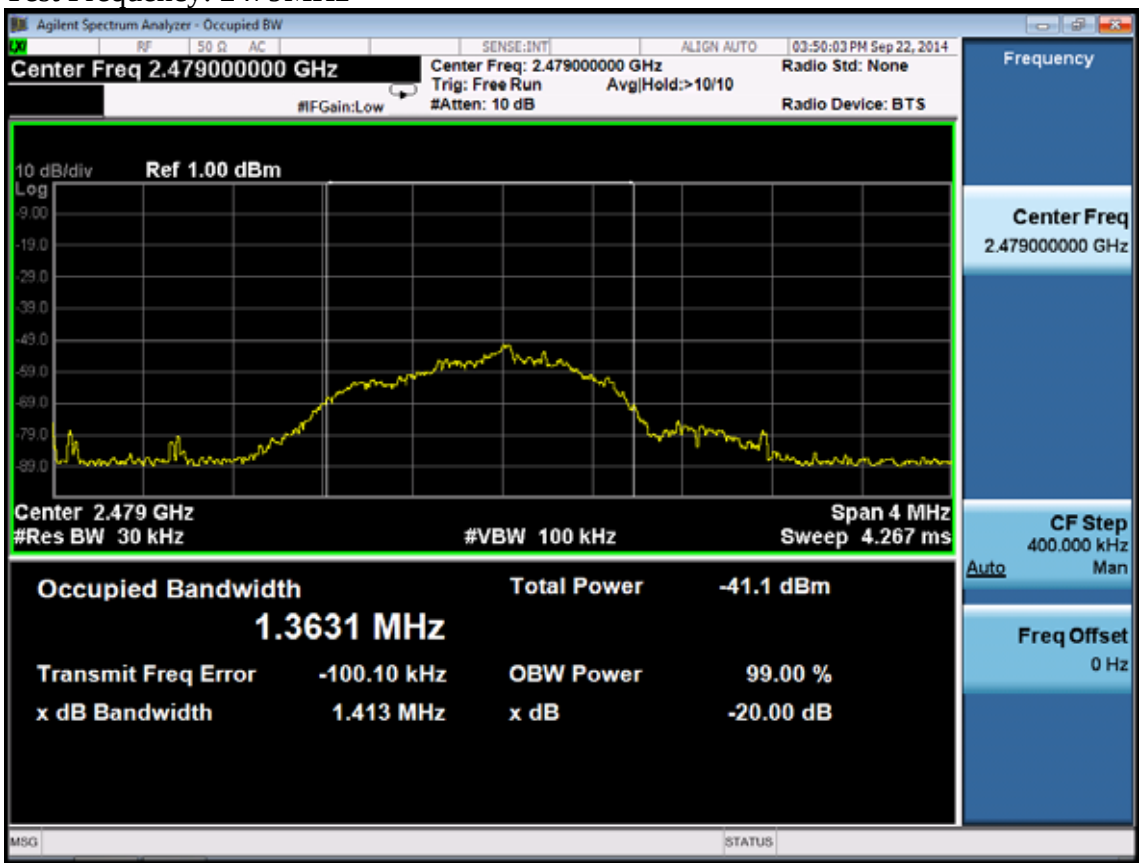
Frequency	20% Bandwidth (KHz)	Limit (KHz)
2402	1.264	N/A
2439	1.257	N/A
2479	1.413	N/A
Conclusion: Pass		

Test Frequency: 2402MHz

Test Frequency: 2439MHz



Test Frequency: 2479MHz



5. BAND EDGE COMPLIANCE TEST

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	US44300459	Apr. 28,14	1 Year
2.	Amp	HP	8449B	3008A02495	Apr. 28,14	1 Year
3.	Horn Antenna	EMCO	3115	9607-4877	Aug.27, 13	1 Year
4.	HF Cable	Hubersuhner	Sucoflex104	274094/4	Apr. 28,14	1 Year
5	RF Cable	Hubersuhner	Sucoflex102	28610/2	Apr. 28,14	1 Year

5.2. 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.

5.3. Test 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:

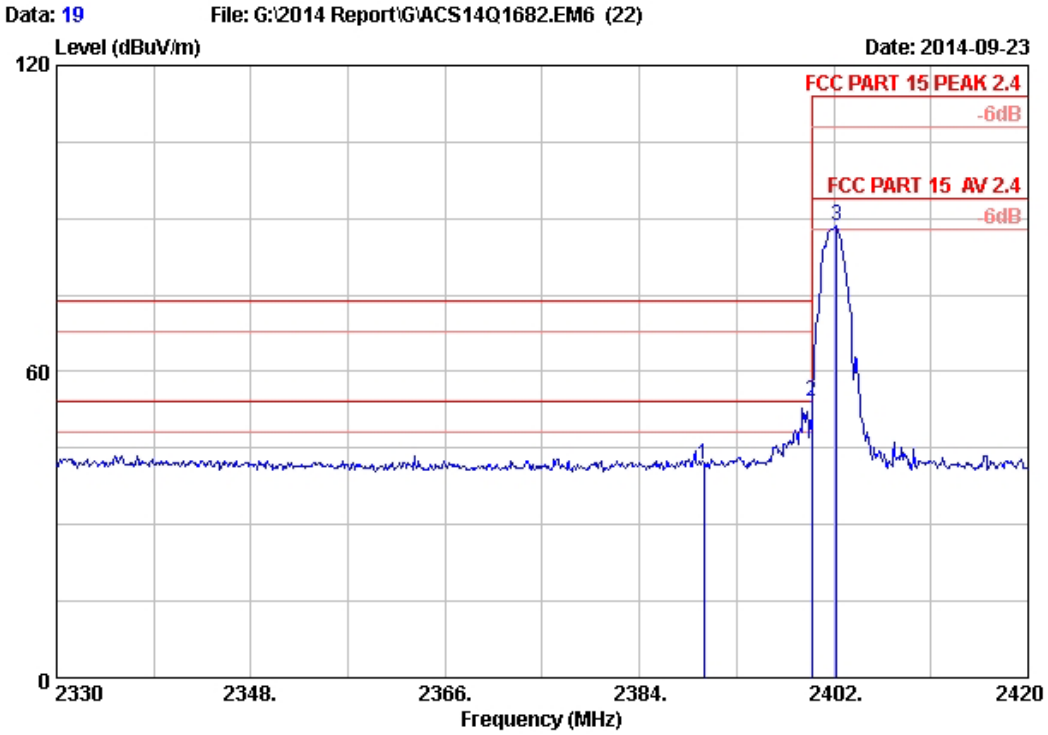
(a) PEAK: RBW=1MHz ;VBW=3MHz, PK detector, Sweep=AUTO

(b)This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level

5.4. 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.

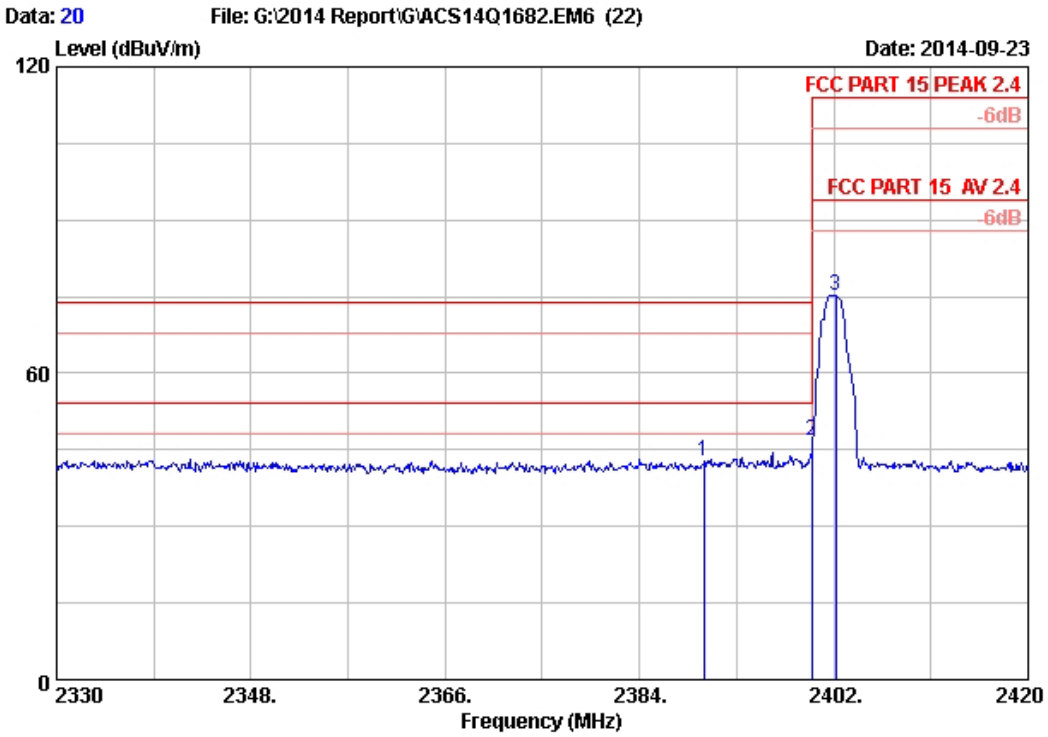



```
Site no.      : 3m Chamber                    Data no.   : 19
Dis. / Ant.   : 3m   2014 3115 (4580)       Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : 24*C/56%                    Engineer   : Kobe
EUT           : 2.4GHz Wireless Keyboard
Power Rating  : DC 1.5V
Test Mode     : TX  2402MHz
M/N           : GK390
```

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	43.65	41.89	74.00	32.11	Peak
2	2400.000	28.18	5.80	35.70	55.85	54.13	74.00	19.87	Peak
3	2402.270	28.18	5.80	35.70	90.17	88.45	114.00	25.55	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.

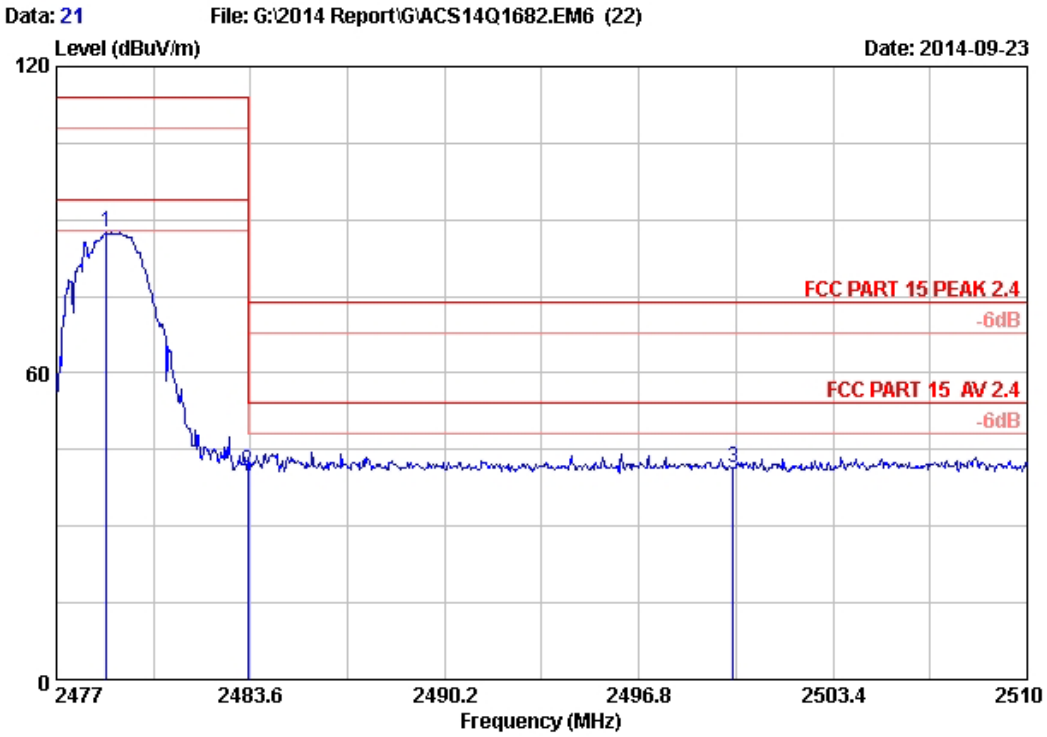
Frequency（MHz）	Peak level（dBuv/m）	Duty cycle factor (dB)	AV level (dBuv/m)	Limit(dBuv/m)	Conclusion
2400	54.13	30.75	23.38	54	Pass



Site no. : 3m Chamber Data no. : 20
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2402MHz
M/N : GK390

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	44.41	42.65	74.00	31.35	Peak
2	2400.000	28.18	5.80	35.70	48.64	46.92	74.00	27.08	Peak
3	2402.180	28.18	5.80	35.70	77.04	75.32	114.00	38.68	Peak

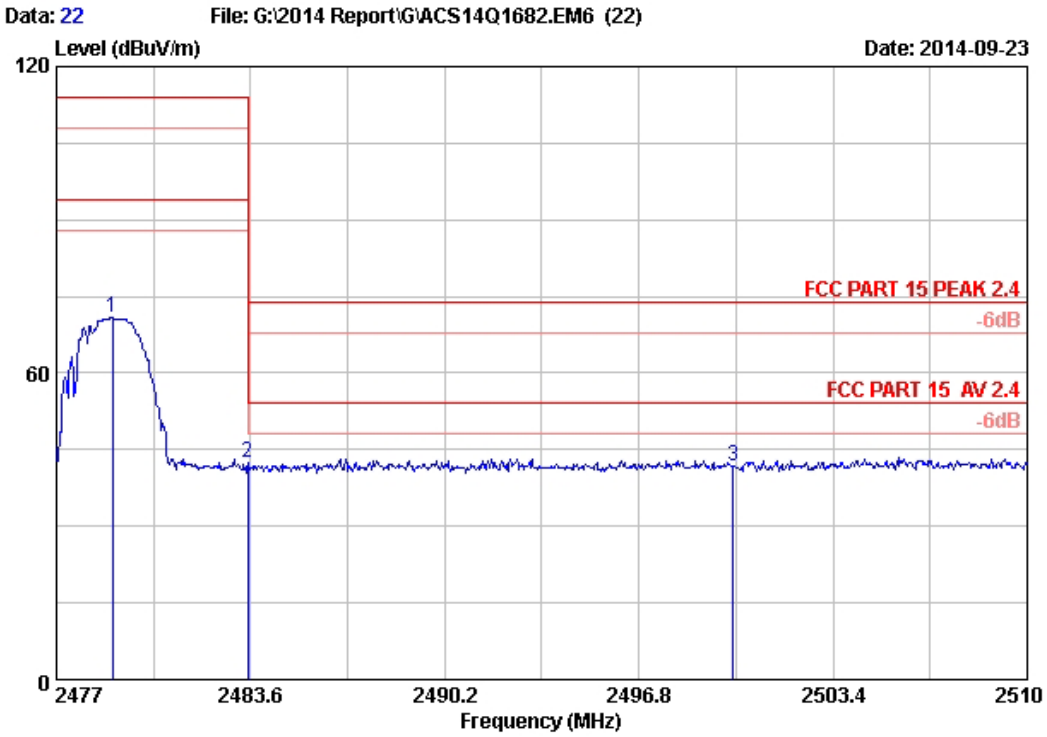
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp Factor
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 21
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2479MHz
M/N : GK390

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	2478.716	28.35	5.91	35.70	88.86	87.42	114.00	26.58	Peak
2	2483.500	28.36	5.92	35.70	42.36	40.94	74.00	33.06	Peak
3	2500.000	28.40	5.94	35.70	42.90	41.54	74.00	32.46	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. : 22
Dis. / Ant. : 3m 2014 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 24*C/56% Engineer : Kobe
EUT : 2.4GHz Wireless Keyboard
Power Rating : DC 1.5V
Test Mode : TX 2479MHz
M/N : GK390

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	2478.914	28.35	5.91	35.70	72.17	70.73	114.00	43.27	Peak
2	2483.500	28.36	5.92	35.70	43.71	42.29	74.00	31.71	Peak
3	2500.000	28.40	5.94	35.70	43.16	41.80	74.00	32.20	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.

6. ANTENNA REQUIREMENT

RESULT : PASS

Test Date : Sep.21~23, 2014

Test standard : FCC Part 15.203

Limit : the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 0dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply the provision.

7. RADIO FRREQUENCY EXPOSURE COMPLIANCE

RESULT : PASS

Test standard : FCC KDB Publication 447498 D01 V05

Since maximum peak output power of the transmitter is<10mW, i.e.0.009346mW<10mW, hence the EUT is excluded from SAR evaluation according to FCC KDB Publication 447498 D01:General RF Exposure Guidance V05.

8. TEST SOFTWARE

Manufacturer **:** G. tech Technology Ltd.

Version **:** Fuhlen Bind V1.1

The test software is used to control EUT work in TX mode and to change the test channel.

9. DEVIATION TO TEST SPECIFICATIONS

[NONE]