

FCC CFR47 PART 15 SUBPART C (15.247)
CERTIFICATION
TEST REPORT

FOR

KOBIAN CANADA INC.

Wireless Keyboard

Model No.: HS-KB050

Prepared for : KOBIAN CANADA INC.
Address : 560 Denison Street, Unit#5 Markham, Ontario L3R 2M8 Canada

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,
Bao'an District, Shenzhen, Guangdong, China

Report Number : LCS1112083362F
Number of tested sample : 1
Serial number : Prototype
Date of Test : December 08, 2011 - December 27, 2011
Date of Report : December 27, 2011

**TEST REPORT
FCC CFR 47 PART 15 C(15.247)**

Report Reference No. : **LCS1112083362F**

Date of issue : December 27, 2011

Testing Laboratory Name..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address : 1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd.,
Bao'an District, Shenzhen, Guangdong, China

Testing location/ procedure : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's name : **KOBIAN CANADA INC.**

Address : 560 Denison Street, Unit#5 Markham, Ontario L3R 2M8 Canada

Test specification

Standard : FCC CFR 47 PART 15 Subpart C: 2011, ANSI C63.4-2009

Test Report Form No...... : LCSEMC-1.0

TRF Originator : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF : Dated 2011-03

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Test item description. : **Wireless Keyboard**

Trade Mark : HIPSTREET

Manufacturer..... : KOBIAN CANADA INC.

Model/Type reference..... : HS-KB050

Ratings : DC 3V (Frequency Range:2402.00-2480.00MHz)

Result : **Positive**

Compiled by:

Bobo Li

Supervised by:

Vito Cao

Approved by:

Gavin Liang

Bobo Li/ File administrators

Vito Cao/ Technique principal

Gavin Liang/ Manager

EMC -- TEST REPORT

Test Report No. : LCS1112083362F	<u>December 27, 2011</u> Date of issue
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Type / Model.....	: HS-KB050
EUT.....	: Wireless Keyboard
Applicant.....	: KOBIAN CANADA INC.
Address.....	: 560 Denison Street, Unit#5 Markham, Ontario L3R 2M8 Canada
Telephone.....	: /
Fax.....	: /
Contact.....	: /
Manufacturer.....	: KOBIAN CANADA INC.
Address.....	: 560 Denison Street, Unit#5 Markham, Ontario L3R 2M8 Canada
Telephone.....	: /
Fax.....	: /
Contact.....	: /
Factory.....	: /
Address.....	: /
Telephone.....	: /
Fax.....	: /
Contact.....	: /

Test Result:	Positive
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The test report merely corresponds to the test sample.
 It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	: Wireless Keyboard
Model Number	: HS-KB050
Power Supply	: DC 3V
Frequency Range	: 2402.00-2480.00MHz, GFSK

1.2 Description of Test Facility

Site Description	
EMC Lab.	: Accredited by CNAS, June 04, 2010 The Certificate Registration Number. is L4595. Accredited by FCC, July 14, 2011 The Certificate Registration Number. is 899208. Accredited by Industry Canada, May. 02, 2011 The Certificate Registration Number. is 9642A-1

1.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.4 Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
		200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
Conduction Uncertainty	:	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance	:	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.209 and 15.247.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3 General Test Procedures

2.3.1 Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

2.3.2 Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4

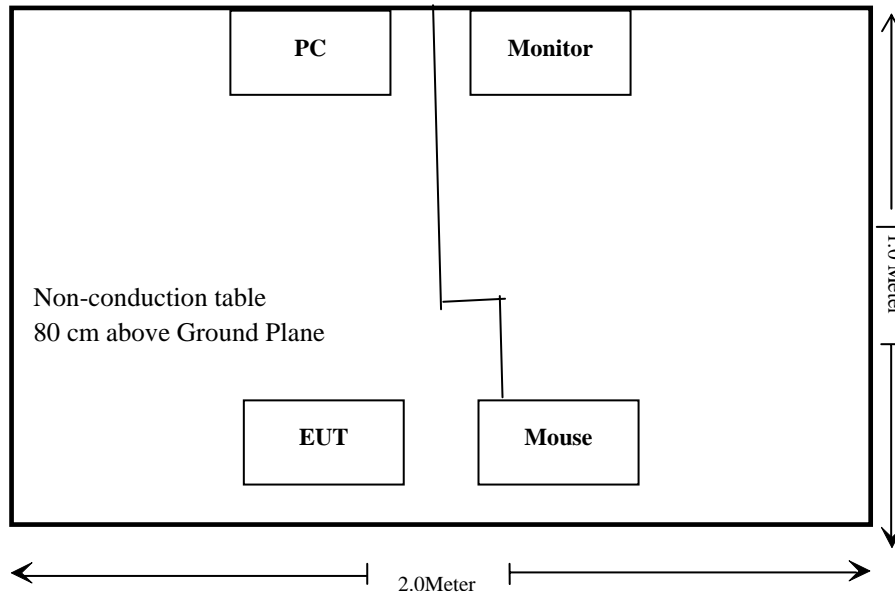
2.4 Description Of Test Modes

The EUT has been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

Then, the worst case is FHSS Channel Low (2402MHz), Mid (2441MHz) and High (2480MHz), these were chosen for full testing.

3. RADIATION DIAGRAM OF TEST SYSTEM



PC Information

M/N : Optiplex 380 MT
S/N : 2YK643X
Manufacturer : Dell Inc
Power Cord : Unshielded, Detachable, 1.8m
FCC ID : By DoC

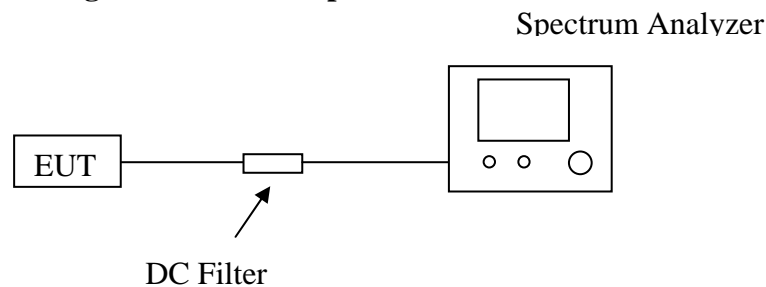
4. FCC PART 15.247 REQUIREMENTS

4.1 Peak Power

4.1.1 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	Power Sensor	Agilent	E9327A	US40441788	2011-06	2012-06
3	Power Meter	Agilent	E4416A	QB41292714	2011-06	2012-06
4	DC Filter	MPE	23872C	N/A	2011-06	2012-06

4.1.2 Block Diagram of Test Setup



4.1.3 Limit

According to § 15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.

4.1.4 Test Procedure

The transmitter output is connected to the Power Meter or spectrum analyzer.

4.1.5 Test Results

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2402	0.93	0.00124	1.0	Pass
Mid	2441	-0.22	0.00095	1.0	Pass
High	2480	0.29	0.00107	1.0	Pass

4.2 Band Edges Measurement

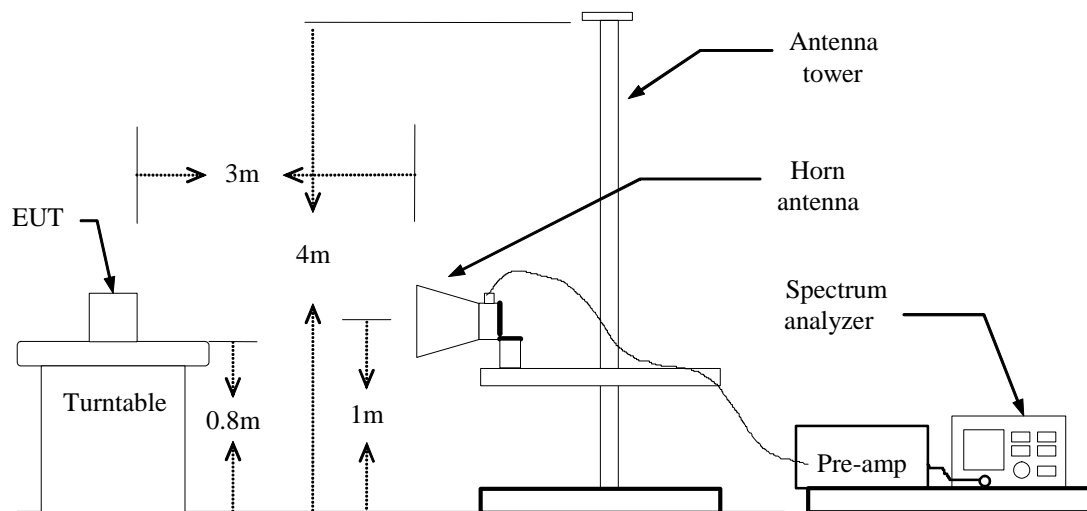
4.2.1 Limit

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

4.2.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	Antenna	Schwarzbeck	VULB9163	142	2011-06	2012-06
3	Horn-antenna	Schwarzbeck	BBHA9120D	D:266	2011-06	2012-06
4	DC Filter	MPE	23872C	N/A	2011-06	2012-06

4.2.3 Block Diagram of Test Setup



4.2.4 Test Procedure

The EUT is placed on a turntable, which is 0.8m above the ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

Peak: RBW=VBW=1MHz / Sweep=AUTO

Repeat the procedures until the peak versus polarization are measured.

4.2.5 Test Results

CH Low

Frequency (MHz)	Ant Pol H/V	PK Value (dBuV)	Ave Value (dBuV)	PK Limit (dBuV)	Ave Limit (dBuV)	PK Margin (dB)	Ave Margin (dB)
2390.00	V	43.19	33.27	74.00	54.00	30.81	20.73
2390.00	H	43.22	33.56	74.00	54.00	30.78	20.44

CH High

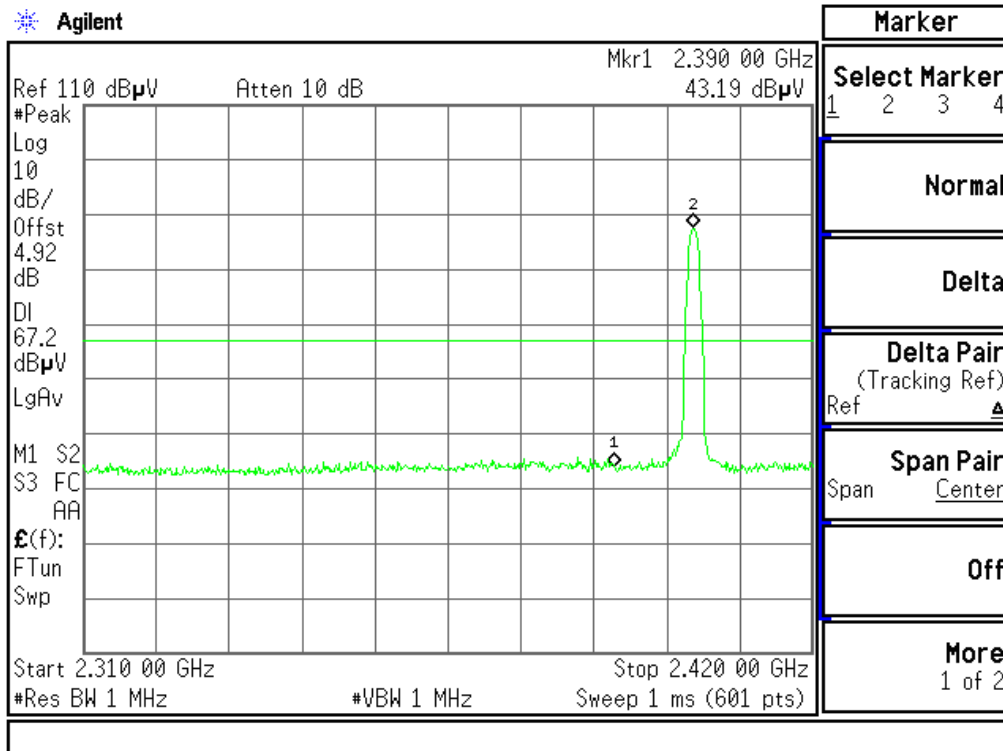
Frequency (MHz)	Ant Pol H/V	PK Value (dBuV)	Ave Value (dBuV)	PK Limit (dBuV)	Ave Limit (dBuV)	PK Margin (dB)	Ave Margin (dB)
2483.50	V	42.38	33.48	74.00	54.00	31.62	20.52
2483.50	H	43.15	33.62	74.00	54.00	30.85	20.38

* The test data graph please refer to the following page.

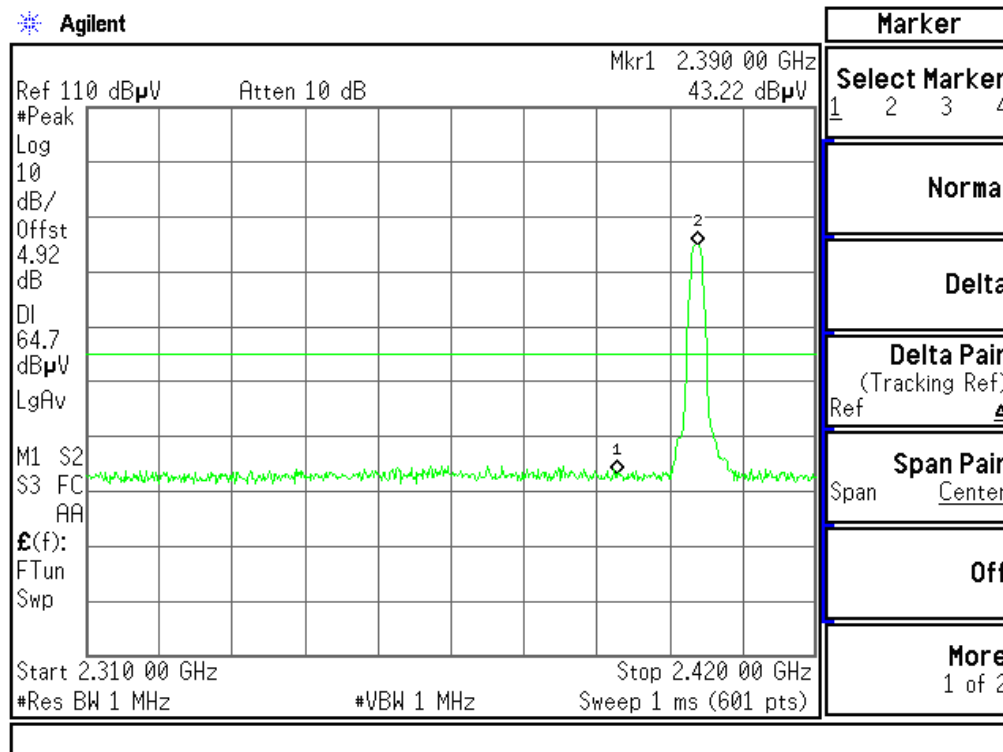
Note : The attenuate 20 below fundamental level is less then FCC 15.209 limit, the attenuate 20 below fundamental level is marked in the test data graph.

Band Edges (CH Low)

Detector mode: Peak Polarity: Vertical



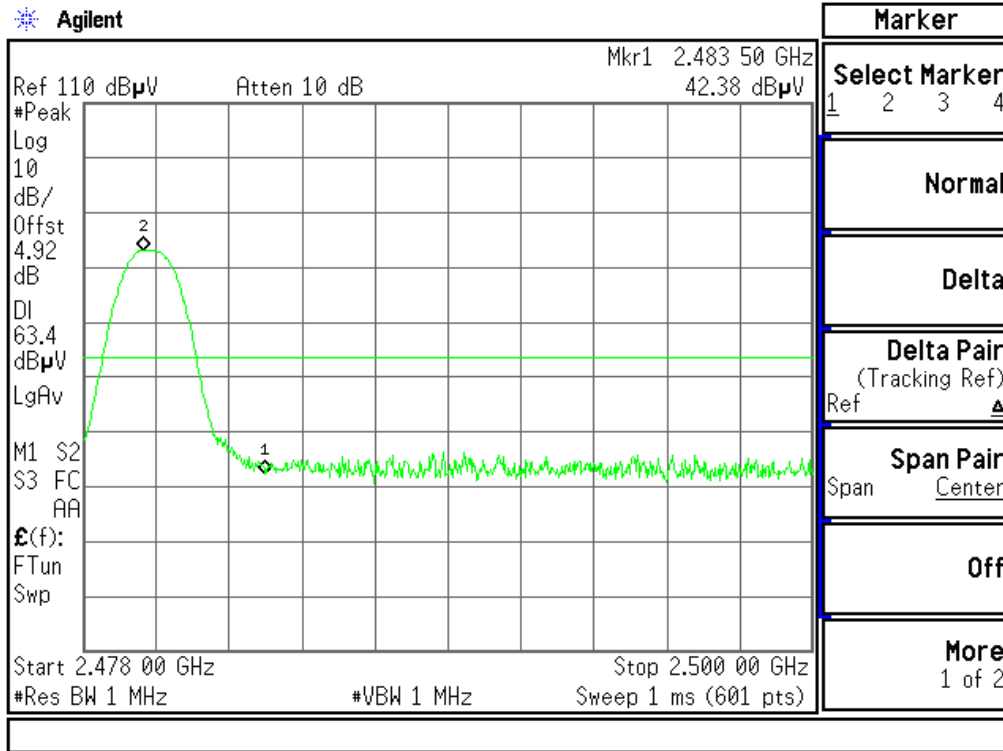
Detector mode: Peak Polarity: Horizontal



Band Edges (CH High)

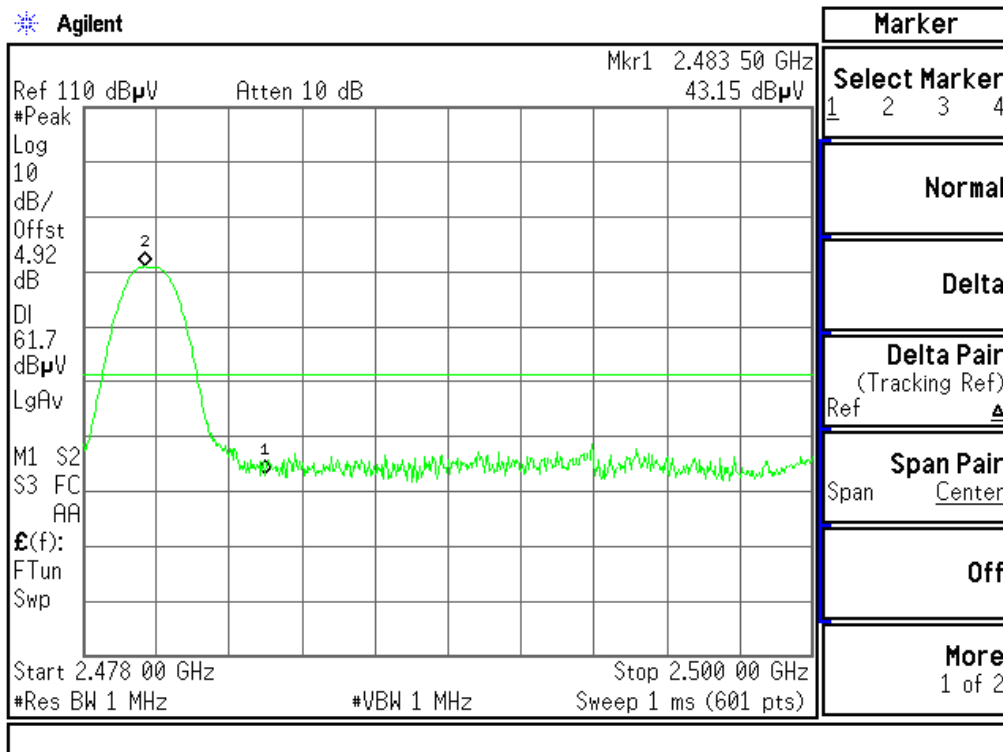
Detector mode: Peak

Polarity: Vertical



Detector mode: Peak

Polarity: Horizontal



4.3 Frequency Separation

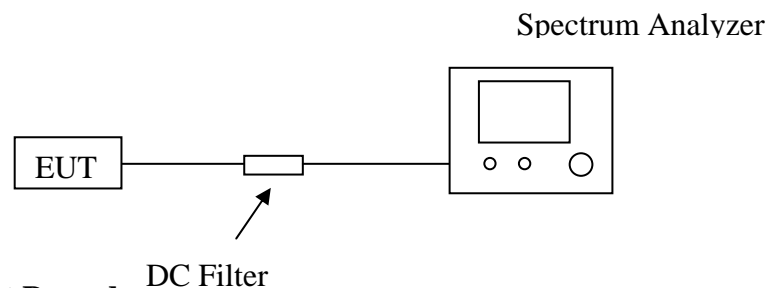
4.3.1 Limit

According to § 15.247(a)(1), Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

4.3.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2011-06	2012-06
3	DC Filter	MPE	23872C	N/A	2011-06	2012-06

4.3.3 Block Diagram of Test Setup



4.3.4 Test Procedure

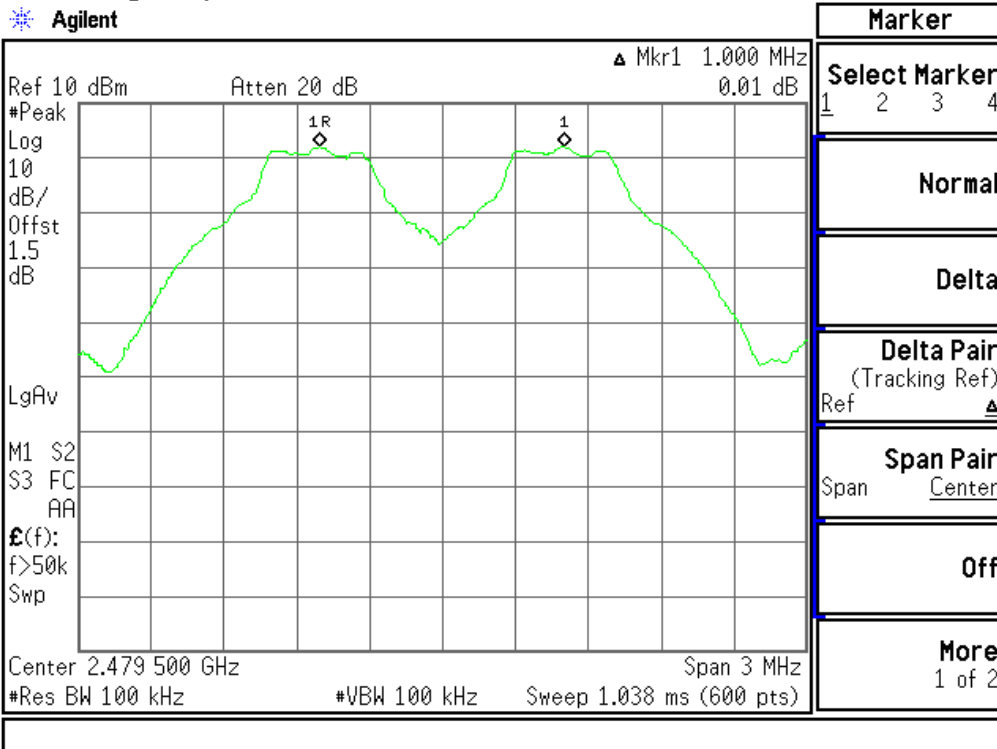
- A. Place the EUT on the table and set it in transmitting mode.
- B. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.
- C. Set center frequency of Spectrum Analyzer = middle of hopping channel.
- D. Set the Spectrum Analyzer as RBW = 30kHz, VBW = 100kHz, Span = 4MHz, Sweep = auto.
- E. Max hold, mark 2 peaks of hopping channel and record the 2 peaks frequency.

4.3.5 Test Results

CH	Channel Separation (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Result
Low	1.000	871.9222	>the 20dB Bandwidth or 25kHz (whichever is greater)	Pass
Mid	1.000	868.3955		
High	1.000	873.2332		

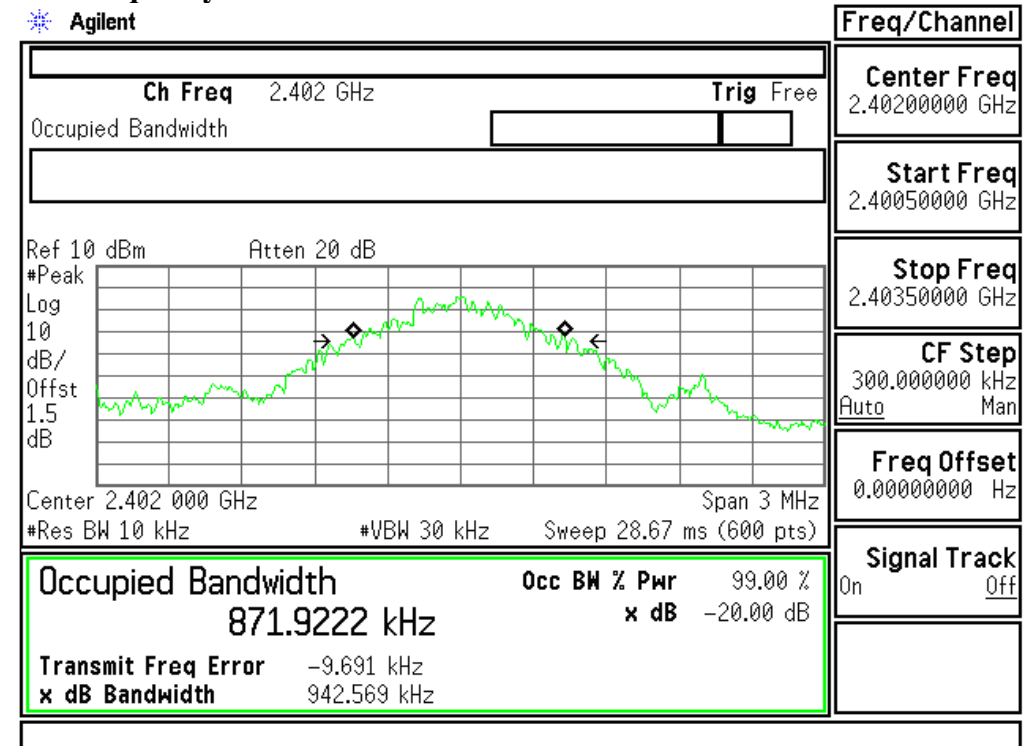
The test data graph please refer to the following page.

Test frequency: 2480MHz



Measurement of 20dB Bandwidth

Test frequency: 2402MHz



Test frequency: 2441MHz



Ch Freq 2.441 GHz		Trig Free														
Occupied Bandwidth																
Ref 10 dBm Atten 20 dB																
<div style="display: flex; justify-content: space-between;"> #Peak Log 10 dB/ Offst 1.5 dB </div>																
Center 2.441 000 GHz		Span 3 MHz														
#Res BW 10 kHz	#VBW 30 kHz	Sweep 28.67 ms (600 pts)														
Occupied Bandwidth Occ BW % Pwr 99.00 % 868.3955 kHz x dB -20.00 dB																
Transmit Freq Error -9.516 kHz x dB Bandwidth 936.278 kHz																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">Freq/Channel</td> </tr> <tr> <td style="text-align: center;">Center Freq</td> <td style="text-align: center;">2.44100000 GHz</td> </tr> <tr> <td style="text-align: center;">Start Freq</td> <td style="text-align: center;">2.43950000 GHz</td> </tr> <tr> <td style="text-align: center;">Stop Freq</td> <td style="text-align: center;">2.44250000 GHz</td> </tr> <tr> <td style="text-align: center;">CF Step</td> <td style="text-align: center;">300.000000 kHz Auto Man</td> </tr> <tr> <td style="text-align: center;">Freq Offset</td> <td style="text-align: center;">0.00000000 Hz</td> </tr> <tr> <td style="text-align: center;">Signal Track</td> <td style="text-align: center;">On Off</td> </tr> </table>			Freq/Channel		Center Freq	2.44100000 GHz	Start Freq	2.43950000 GHz	Stop Freq	2.44250000 GHz	CF Step	300.000000 kHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																
Center Freq	2.44100000 GHz															
Start Freq	2.43950000 GHz															
Stop Freq	2.44250000 GHz															
CF Step	300.000000 kHz Auto Man															
Freq Offset	0.00000000 Hz															
Signal Track	On Off															

Test frequency: 2480MHz



Ch Freq 2.48 GHz		Trig Free														
Occupied Bandwidth																
Ref 10 dBm Atten 20 dB																
<div style="display: flex; justify-content: space-between;"> #Peak Log 10 dB/ Offst 1.5 dB </div>																
Center 2.480 000 GHz		Span 3 MHz														
#Res BW 10 kHz	#VBW 30 kHz	Sweep 28.67 ms (600 pts)														
Occupied Bandwidth Occ BW % Pwr 99.00 % 873.2332 kHz x dB -20.00 dB																
Transmit Freq Error -11.134 kHz x dB Bandwidth 935.031 kHz																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center;">Freq/Channel</td> </tr> <tr> <td style="text-align: center;">Center Freq</td> <td style="text-align: center;">2.48000000 GHz</td> </tr> <tr> <td style="text-align: center;">Start Freq</td> <td style="text-align: center;">2.47850000 GHz</td> </tr> <tr> <td style="text-align: center;">Stop Freq</td> <td style="text-align: center;">2.48150000 GHz</td> </tr> <tr> <td style="text-align: center;">CF Step</td> <td style="text-align: center;">300.000000 kHz Auto Man</td> </tr> <tr> <td style="text-align: center;">Freq Offset</td> <td style="text-align: center;">0.00000000 Hz</td> </tr> <tr> <td style="text-align: center;">Signal Track</td> <td style="text-align: center;">On Off</td> </tr> </table>			Freq/Channel		Center Freq	2.48000000 GHz	Start Freq	2.47850000 GHz	Stop Freq	2.48150000 GHz	CF Step	300.000000 kHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																
Center Freq	2.48000000 GHz															
Start Freq	2.47850000 GHz															
Stop Freq	2.48150000 GHz															
CF Step	300.000000 kHz Auto Man															
Freq Offset	0.00000000 Hz															
Signal Track	On Off															

4.4 Number Of Hopping Frequency

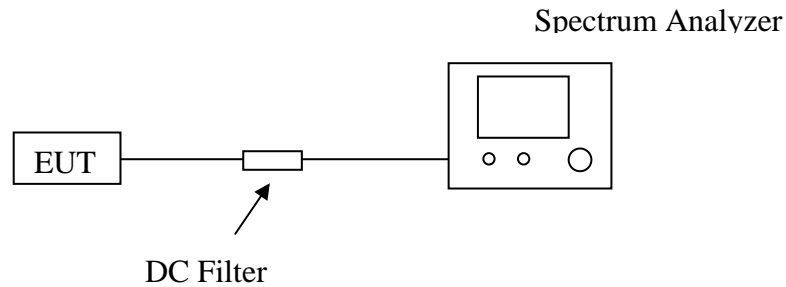
4.4.1 Limit

According to § 15.247(a)(1)(ii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 75 hopping frequencies.

4.4.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2011-06	2012-06
3	DC Filter	MPE	23872C	N/A	2011-06	2012-06

4.4.3 Block Diagram of Test Setup



4.4.4 Test Procedure

- Place the EUT on the table and set it in transmitting mode.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.
- Set Spectrum Analyzer Start=2400MHz, Stop = 2483.5MHz, Sweep = auto.
- Set the Spectrum Analyzer as RBW, VBW=100kHz.
- Max hold, view and count how many channel in the band.

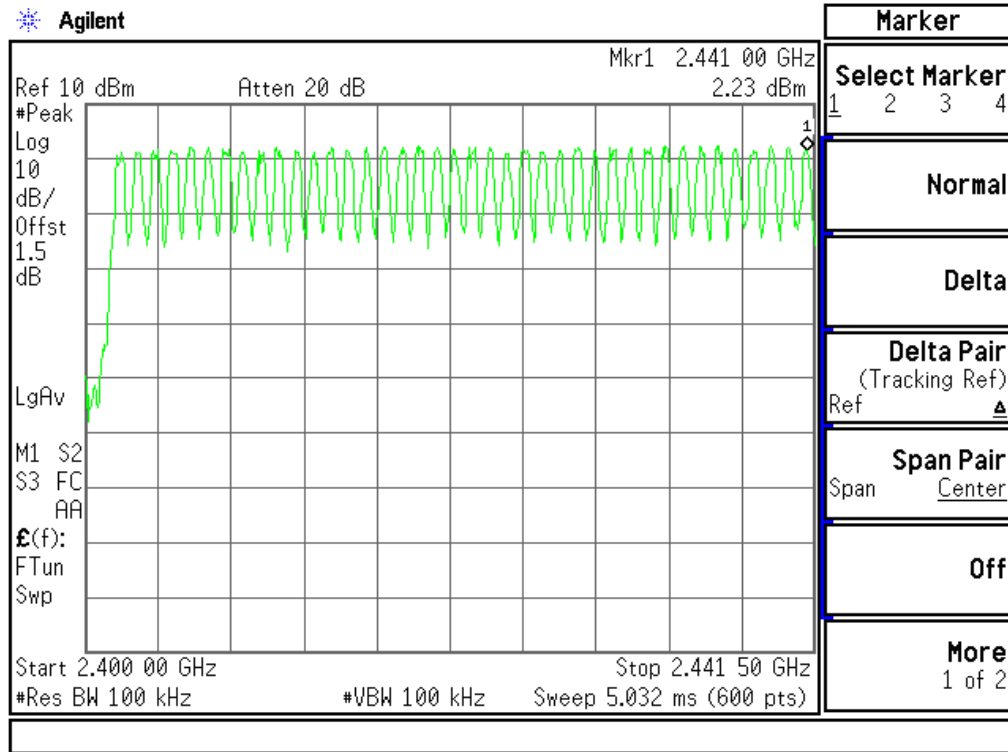
4.4.5 Test Results

Result (No. of CH)	Limit (No. of CH)	Result
79	>75	PASS

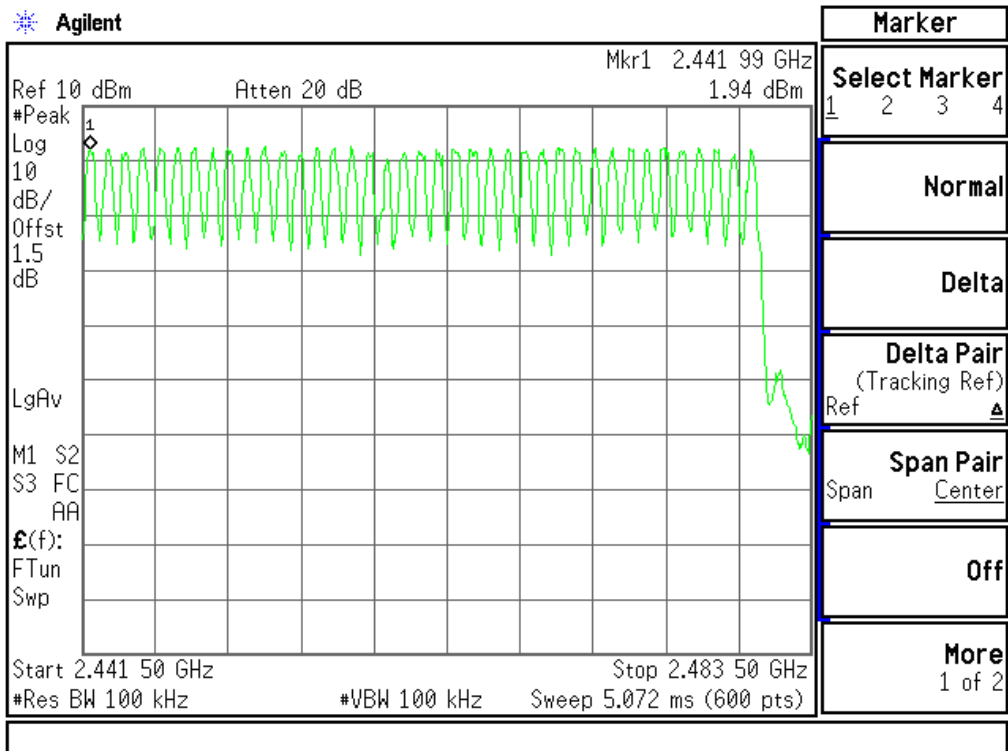
The test data graph please refer to the following page.

Channel Number

2.4 GHz – 2.4415 GHz



2.4415 GHz – 2.4835 GHz



4.5 Time Of Occupancy (Dwell Time)

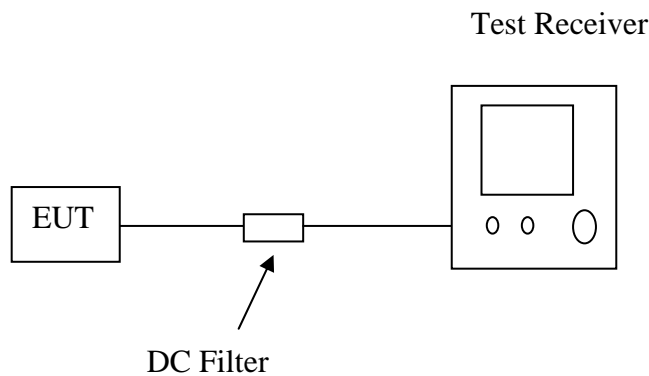
4.5.1 Limit

According to § 15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz bands. The average time of occupancy on any channels shall not greater than 0.4 s within a period 0.4 s multiplied by the number of hopping channels employed.

4.5.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2011-06	2012-06
3	DC Filter	MPE	23872C	N/A	2011-06	2012-06

4.5.3 Block Diagram of Test Setup



4.5.4 Test Procedure

- A. Place the EUT on the table and set it in transmitting mode.
- B. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Test Receiver.
- C. Set center frequency of Test Receiver = operating frequency.
- D. Set the Test Receiver as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.
- E. Repeat above procedures until all frequency measured were complete.

4.5.5 Test Results

DH 1

$$0.400 * (1600/2)/79 * 31.6 = 128.00 \text{ (ms)}$$

DH 3

$$1.64 * (1600/4)/79 * 31.6 = 262.40 \text{ (ms)}$$

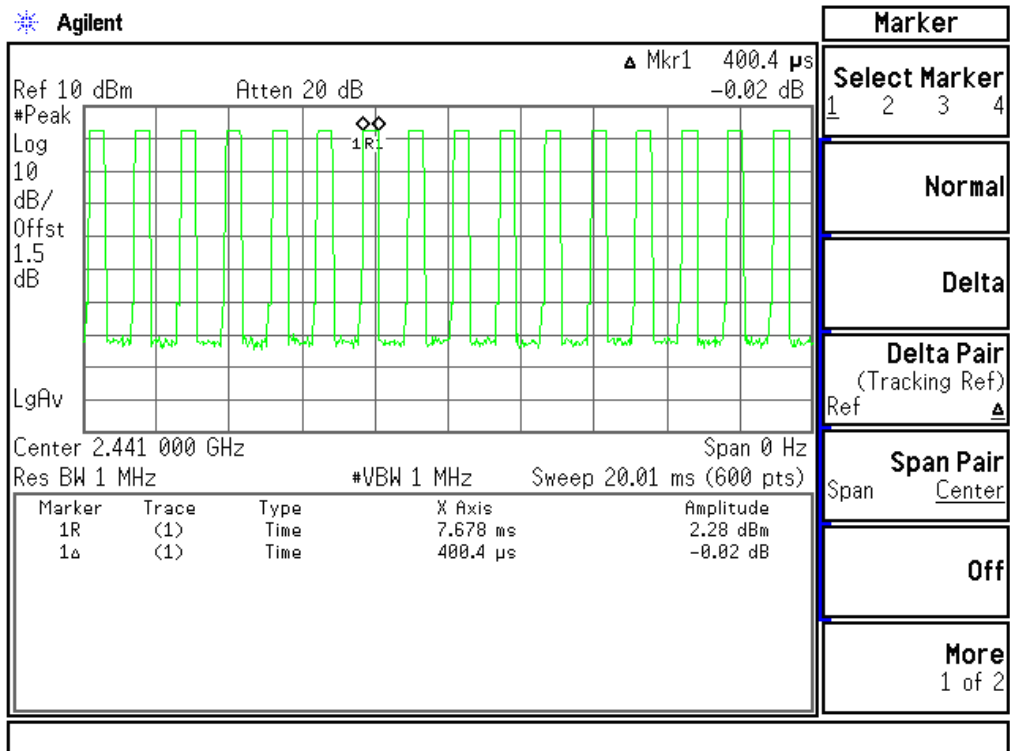
DH 5

$$2.932 * (1600/6)/79 * 31.6 = 312.77 \text{ (ms)}$$

The test data graph please refer to the following page.

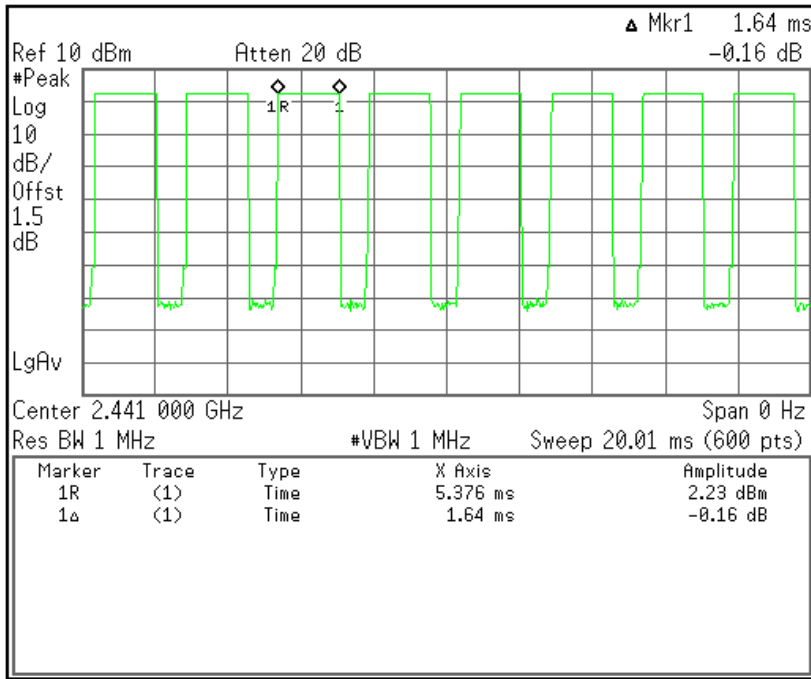
Test Plot

DH 1



Middle Channel For DH3

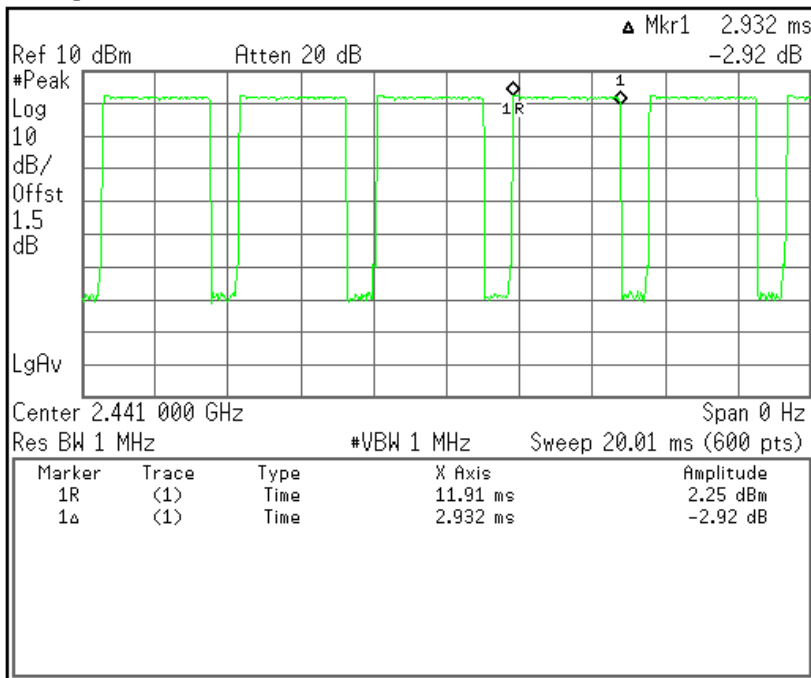
Agilent



Marker			
Select Marker	1	2	3 4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref	Δ		
Span Pair			
Span	Center		
Off			
More 1 of 2			

Middle Channel For DH5

Agilent



Marker			
Select Marker	1	2	3 4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref	Δ		
Span Pair			
Span	Center		
Off			
More 1 of 2			

4.6 Spurious Emissions

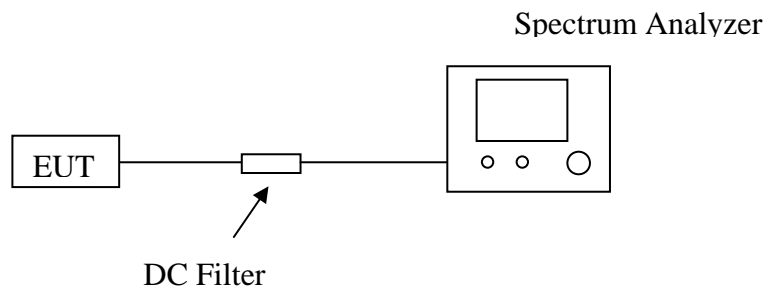
4.6.1 Limit

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 the 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)).

4.6.2 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2012-06
2	RF Cable	Hubersuhne	Sucoflex104	FP2RX2	2011-06	2012-06
3	DC Filter	MPE	23872C	N/A	2011-06	2012-06

4.6.3 Block Diagram of Test Setup



4.6.4 Test Procedure

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 KHz. The video bandwidth is set to 100 KHz.

Measurements are made over the 30MHz to 26.5GHz range with the transmitter set to the lowest, middle, and highest channels.

4.6.5 Test Results

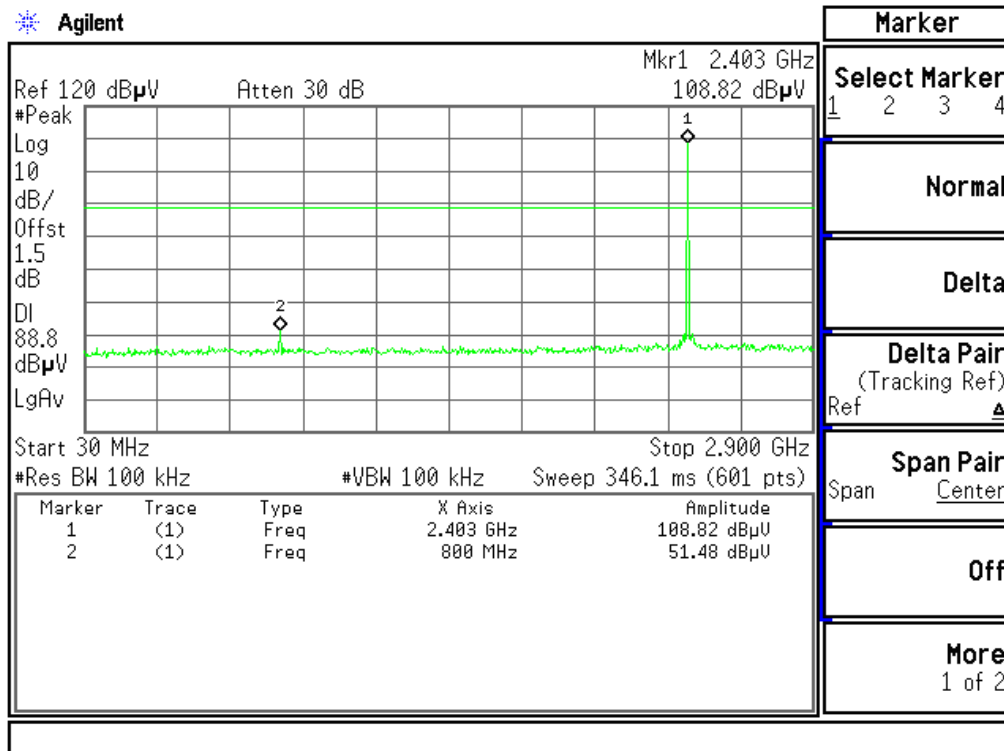
No non-compliance noted

The test data graph please refer to the following page.

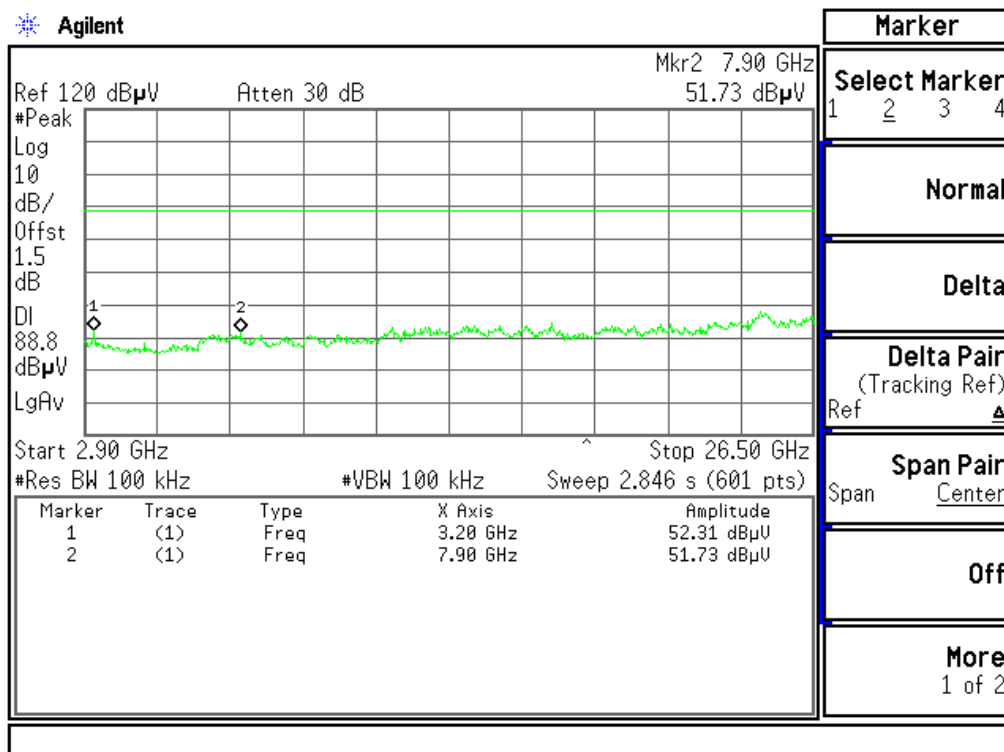
Test Plot

CH Low

30MHz ~ 2.9GHz

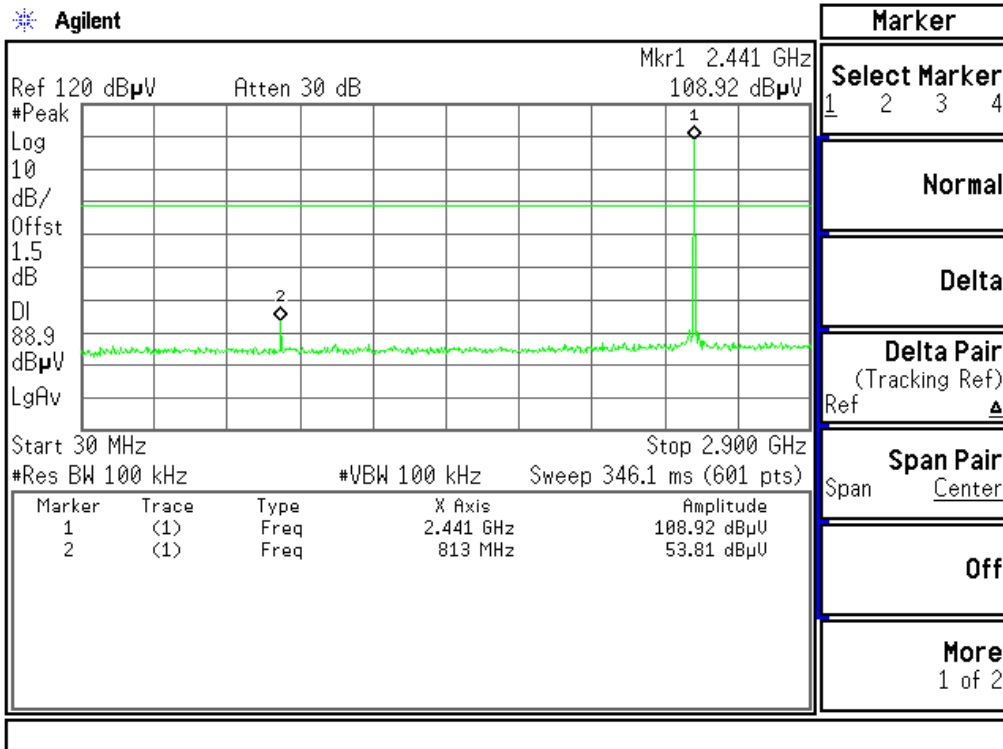


2.9GHz ~ 26.5GHz

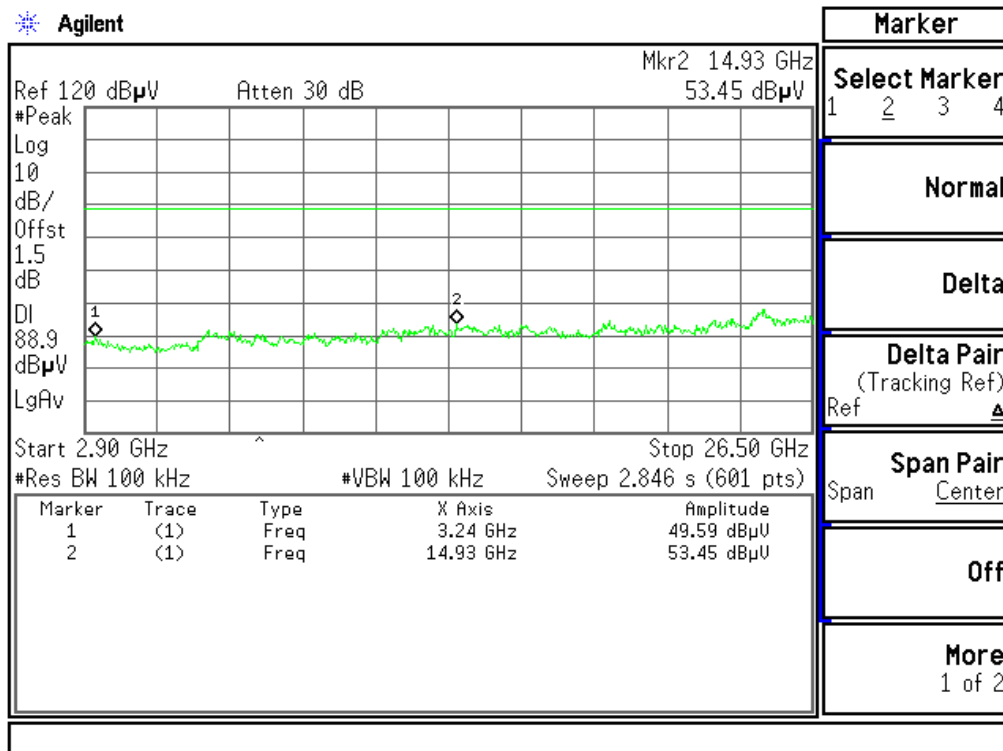


CH Mid

30MHz ~ 2.9GHz

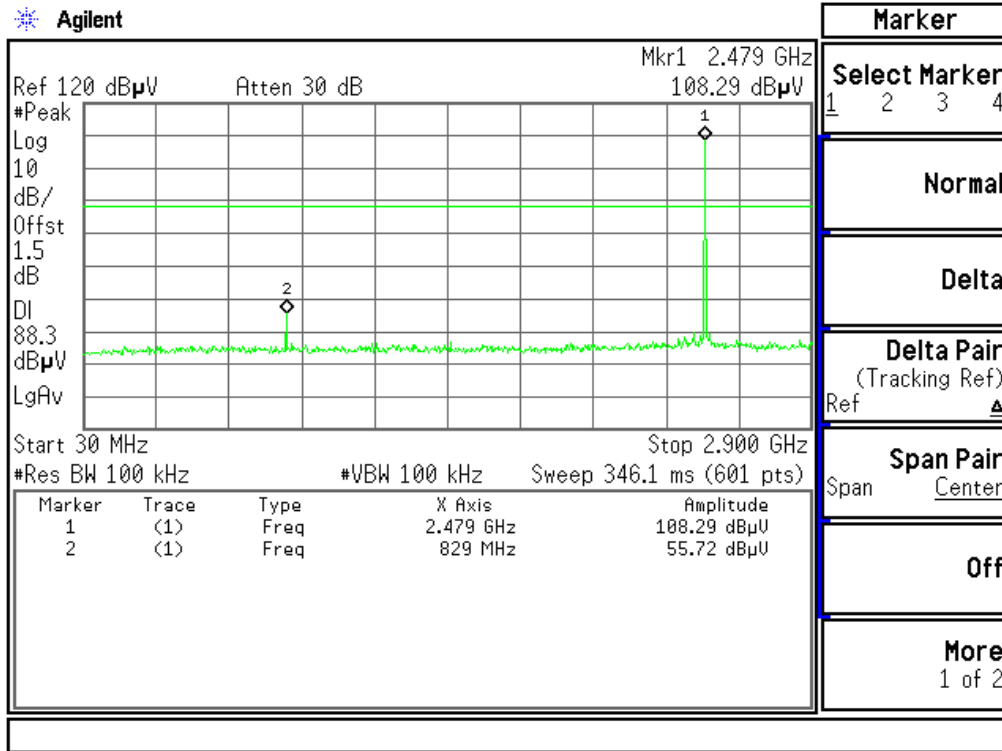


2.9GHz ~ 26.5GHz

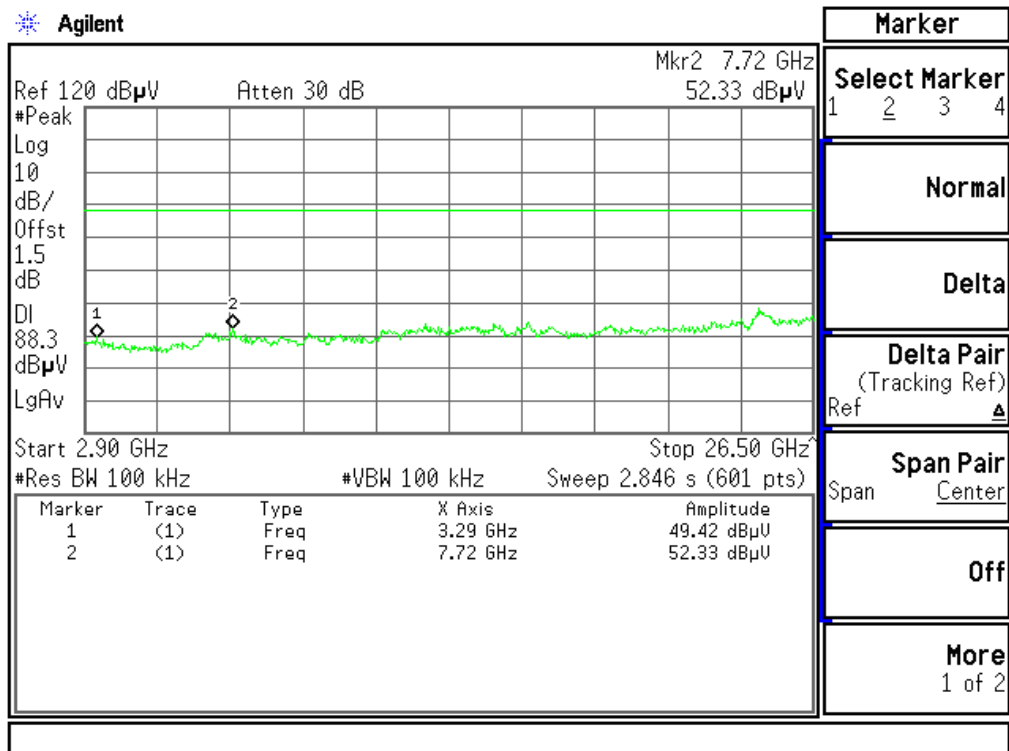


CH High

30MHz ~ 2.9GHz



2.9GHz ~ 26.5GHz

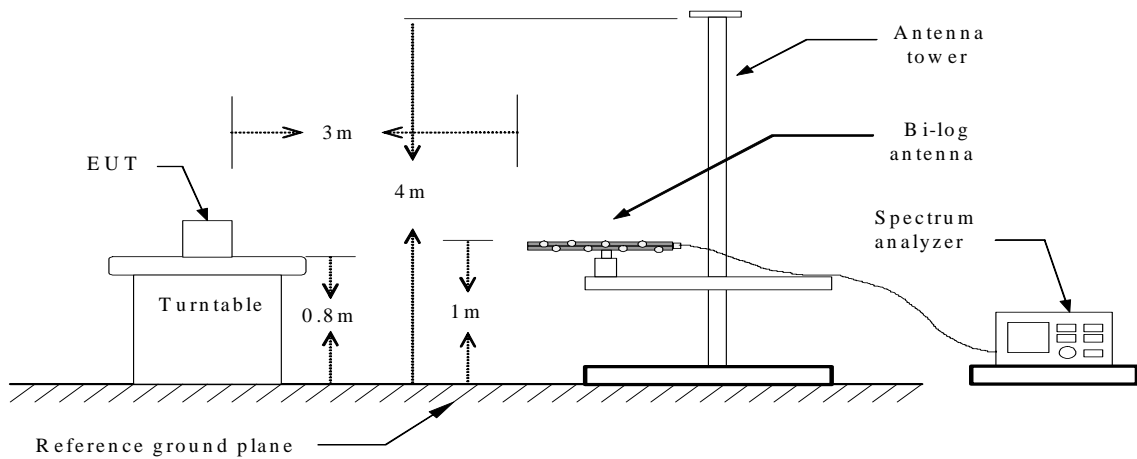


5. RADIATED EMISSION MEASUREMENT

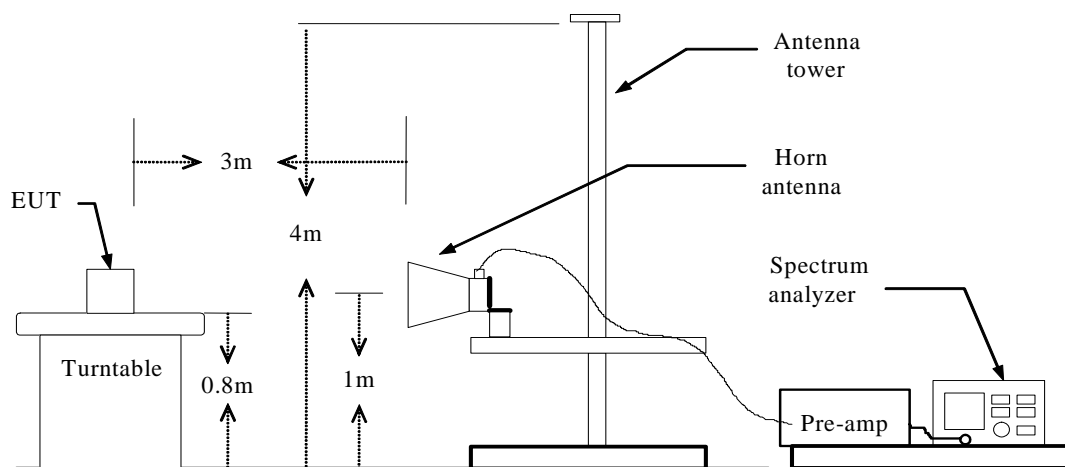
5.1 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due date
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	2011-06	2011-06
2	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	2011-06	2011-06
3	Antenna	Schwarzbeck	VULB9163	142	2011-06	2011-06
4	Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	2011-06	2011-06
5	DC Filter	MPE	23872C	N/A	2011-06	2012-06

5.2 Block Diagram of Test Setup



Below 1 GHz



Above 1 GHz

5.3 Radiated Emission Limit

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

Part 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector.

Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

Part 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

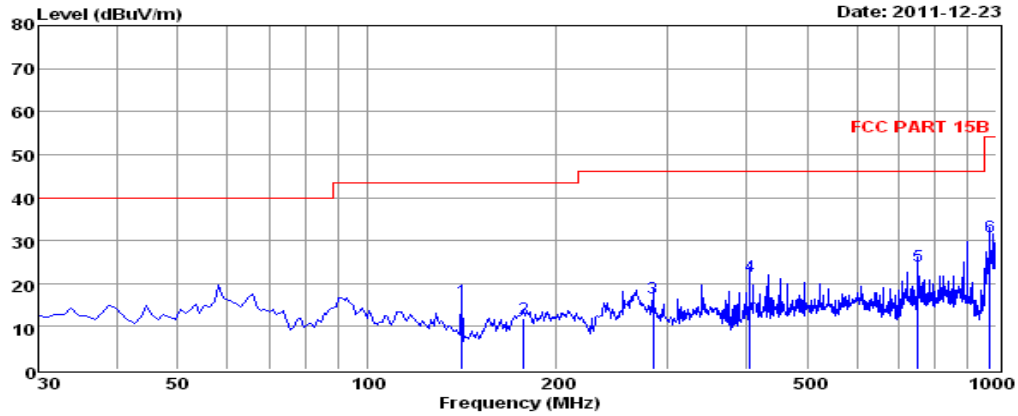
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

5.4 Test Results

PASS.

The test data please refer to following page.

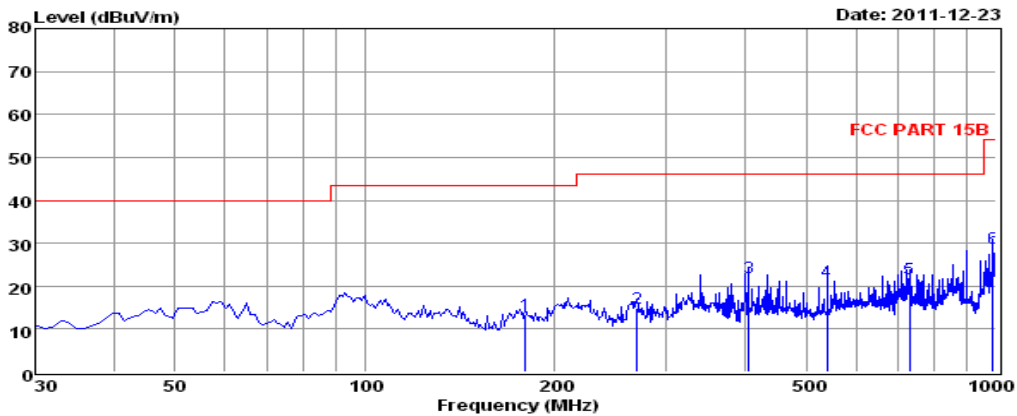
Below 1GHz (Normal Link)



Env. / Ins: 24°C/56%
 EUT: Wireless Keyboard
 M/N: HS-KB050
 Power Rating: DC 3V
 Test Mode: On
 Operator: Willis
 Memo:
 pol: VERTICAL

Freq.	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1 141.55	37.21	0.71	8.20	30.20	15.92	43.50	-27.58	QP
2 177.44	31.83	0.89	9.50	30.20	12.02	43.50	-31.48	QP
3 285.11	33.09	1.00	12.77	30.16	16.70	46.00	-29.30	QP
4 405.39	35.47	1.32	15.17	30.10	21.86	46.00	-24.14	QP
5 750.71	33.00	1.79	19.44	30.08	24.15	46.00	-21.85	QP
6 975.75	37.73	1.85	21.58	30.14	31.02	54.00	-22.98	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.
 3. The emission levels that are 20dB below the official limit are not reported.



Env. / Ins: 24°C/56%
 EUT: Wireless Keyboard
 M/N: HS-KB050
 Power Rating: DC 3V
 Test Mode: On
 Operator: Willis
 Memo:
 pol: HORIZONTAL

Freq.	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1 179.38	32.93	0.89	9.64	30.20	13.26	43.50	-30.24	QP
2 269.59	31.70	0.99	12.35	30.17	14.87	46.00	-31.13	QP
3 405.39	35.74	1.32	15.17	30.10	22.13	46.00	-23.87	QP
4 540.22	32.36	1.34	17.33	30.03	21.00	46.00	-25.00	QP
5 730.34	31.10	1.62	19.19	30.07	21.84	46.00	-24.16	QP
6 990.30	35.40	2.01	21.68	30.14	28.95	54.00	-25.05	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.
 3. The emission levels that are 20dB below the official limit are not reported.

Above 1GHz**Operation Mode:** TX/ CH Low**Test Date:** 12-23-2011**Temperature:** 23°C**Humidity:** 50 % RH

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Min. Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4804.23	V	42.37	29.46	10.98	53.35	40.44	74	54	-13.56	Avg
7207.74	V	33.28	20.75	18.54	51.82	39.29	74	54	-14.71	Avg
4804.48	H	42.13	30.52	10.98	53.11	41.5	74	54	-12.5	Avg
7206.62	H	34.27	22.67	18.53	52.8	41.2	74	54	-12.8	Avg

Operation Mode: TX/ CH Mid**Test Date:** 12-23-2011**Temperature:** 23°C**Humidity:** 50 % RH

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Min. Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4882.78	V	41.22	27.52	10.98	52.2	38.5	74	54	-15.5	Avg
7324.49	V	31.64	21.93	18.54	50.18	40.47	74	54	-13.53	Avg
4882.72	H	41.68	30.17	10.98	52.66	41.15	74	54	-12.85	Avg
7324.13	H	34.16	22.43	18.53	52.69	40.96	74	54	-13.04	Avg

Operation Mode: TX/ CH High**Test Date:** 12-23-2011**Temperature:** 23°C**Humidity:** 50 % RH

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Min. Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4960.11	V	42.06	28.24	10.98	53.04	39.22	74	54	-14.78	Avg
7441.69	V	32.16	21.69	18.54	50.7	40.23	74	54	-13.77	Avg
4960.25	H	39.45	27.61	10.98	50.43	38.59	74	54	-15.41	Avg
7440.00	H	32.21	21.36	18.53	50.74	39.89	74	54	-14.11	Avg

Notes:

1. *Measuring frequencies from 30 MHz to the 1GHz, No emission found between lowest internal used/generated frequency to 30 MHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

6. ANTENNA REQUIREMENT

6.1 Standard Applicable

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the re-sponsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

6.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 1.84 dBi, and the antenna connector is de-signed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

8. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

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Belong to the tested device:

Product description : Wireless Keyboard
Model name : HS-KB050

No additional models were tested.

----- END of RRPORT -----