



**CENTRE OF TESTING SERVICE
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

FCC ID TEST REPORT

TEST REPORT NUMBER : CGZ3150206-00152-EF



CENTRE OF TESTING SERVICE CO., LTD.

A101, No.65, Zhuji Highway, Tianhe District, Guangzhou, China



TEST REPORT For FCC ID

47 CFR PART 15 OCT, 2014

Report Reference No. CGZ3150206-00152-EF

Date of issue 09 February 2015

Testing Laboratory Name CENTRE OF TESTING SERVICE CO., LTD.

Address..... A101, No.65, Zhuji Highway,Tianhe District, Guangzhou, China

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

Applicant's name Shenzhen Hastech industries Co., Ltd.

Address..... G-A1 BLDG, Democracy West Industry Park, Shajing Town, Baoan District, Shenzhen, China

Test specification

Standard 47 CFR PART 15 OCT, 2014

Test Report Form No. CTSEMC-1.0

TRF Originator CENTRE OF TESTING SERVICE CO., LTD.

Master TRF Dated 2009-01

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Test item description..... : Bluetooth Keyboard

Trade Mark..... /

Manufacturer..... Shenzhen Hastech industries Co., Ltd.

Model/Type reference HB103

Ratings..... DC3.7V power supply by Battery

Output : 5V Charging by USB Port

Operating Frequency 2402.0MHz ~2480.0MHz

Result Positive

Compiled by:

Kate zhang / Fileadministrators

Supervised by:

Duke yang / Technique principal

Approved by:

Vincent yao / Manager

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FCC ID -- T E S T R E P O R T

Test Report No. : CGZ3150206-00152-EF
09 February 2015

Date of issue

Type / Model..... HB103

EUT..... Bluetooth Keyboard

Applicant..... Shenzhen Hastech industries Co., Ltd.

Address..... G-A1 BLDG, Democracy West Industry Park, Shajing Town, Baoan District, Shenzhen, China

Telephone..... +86-13723466464

Fax..... +86-0755-29542655

Contact..... Jiangwei

Manufacturer..... Shenzhen Hastech industries Co., Ltd.

Address..... G-A1 BLDG, Democracy West Industry Park, Shajing Town, Baoan District, Shenzhen, China

Telephone..... +86-13723466464

Fax..... +86-0755-29542655

Contact..... Jiangwei

Factory..... Shenzhen Hastech industries Co., Ltd.

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Telephone..... +86-13723466464

Fax..... +86-0755-29542655

Contact..... Jiangwei

Test Result according to the standards on page 1: **PASSED**

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. TEST STANDARDS

The tests were performed according to following standards:

- 47 CFR PART 15 OCT, 2014
- ANSI C63.4-2009

2. SUMMARY

2.1 GENERAL REMARKS

Date of receipt of test sample	06 February 2015
Testing commenced on	06-09 February 2015
Testing concluded on	09 February 2015

2.2 FINAL ASSESSMENT

The FCC requirements pertaining to the technical standards and tested operation modes are

- - fulfilled.
- - **not** fulfilled.

The equipment under test

- - fulfils the FCC requirements cited on page 1.
- - **does not** fulfil the FCC requirements cited on page 1.

3. EQUIPMENT UNDER TEST

3.1 Power supply system utilised

- Power supply voltage :
- 3.7V by Battery
 - Charging by Notebook

3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: **1**

Serial number: Prototype

3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

- - Standby
- TX- Y position
- TX- Z position
- TX- X position
- Charging

Operation mode 1: TX-X Position Low (2402MHz) , TX-X Position Middle (2440MHz) ,
TX-X Position High (2480MHz)

Operation mode 2: Charging

Note: Operation mode 1 TX -X position of EUT is the radiated test worst case; so only these test results be recorded in the test report.

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3.4 EUT configuration

3.4.1. Description of configuration (EUT)

Description	:	Bluetooth Keyboard
Model Number	:	HB103
Operation frequency	:	2402~ 2480 MHz ISM Band
Radio Technology	:	V3.0
Modulation Technology	:	GFSK
Antenna	:	PCB antenna, met requirement of FCC 15.203

3.4.2. Tested Supporting System Details

3.4.2.1. Notebook

M/N	:	F83VF
S/N	:	N/A
Manufacturer	:	AUSU
Power Cord	:	/
FCC ID	:	ID

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4. TEST ENVIRONMENT

4.1 Address of the test laboratory

A101, No.65, Zhuji Highway, Tianhe District, Guangzhou, China

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4.2 Test facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L3394

CENTRE OF TESTING SERVICE CO., LTD has been assessed and proved to be in compliance with CNAS-CL01: 2006 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

IC-Registration No.: 8374A

The 3m Alternate Test Site of CENTRE OF TESTING SERVICE CO., LTD has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 8374A on June 6, 2011.

FCC-Registration No.: 971995

CENTRE OF TESTING SERVICE CO., LTD, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration No. 971995, July 13, 2012.

4.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 ° C
Humidity:	25~75 %
Atmospheric pressure:	86~106 kPa

4.4 Definitions of symbols used in this test report

- - The black square indicates that the listed condition, standard or equipment is applicable for this report.
- - The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

4.5 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 CTS 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.

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4.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	$\pm 1.22\text{dB}$	(1)
Power disturbance	30MHz~300MHz	$\pm 1.38\text{dB}$	(1)
Radiation emission (3m)	30MHz~300MHz	$\pm 3.14\text{dB}$	(1)
	300MHz~1000MHz	$\pm 3.18\text{dB}$	(1)
	1GHz~26.5GHz	$\pm 3.54\text{dB}$	(1)

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

5. Summary of standards and results

5.1. 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
Conducted Emission Test	FCC Part 15 : 15.207 ANSI C63.4-2009	PASSED
Radiated Emission Test	FCC Part 15 C: 15.249 FCC Part 15 : 109 ANSI C63.4-2009	PASSED
Band Edge Compliance Test	FCC Part 15 C: 15.249 ANSI C63.4-2009	PASSED
N/A is an abbreviation for Not Applicable.		

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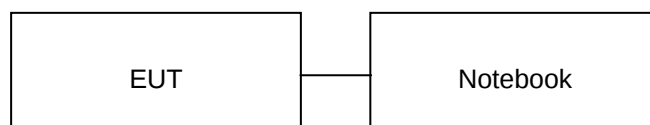
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6. Power Line Conducted Emission Test

6.1. Test Equipment

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESHS10	842884/012	2014/11
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2014/11
3	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/026	2014/11
4	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100301	2014/11
5	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2014/11

6.2. Block Diagram of Test Setup



(EUT: Bluetooth Keyboard)

6.3. Power Line Conducted Emission Test Limits

Standard: RSS-Gen: 7.2.4, FCC Part 15 : 15.207, ANSI C63.4-2009

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

6.4. Test Procedure

The Notebook connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). This provides a 50 ohm coupling impedance for the EUT. Please refer the block diagram of the test setup and photographs. The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#1). Power on the PC and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC Part 15C on Conducted Emission Test.

6.5. Power Line Conducted Emission Test Results

PASSED.

The frequency range from 150KHz~30MHz is investigated. Please see the following pages.

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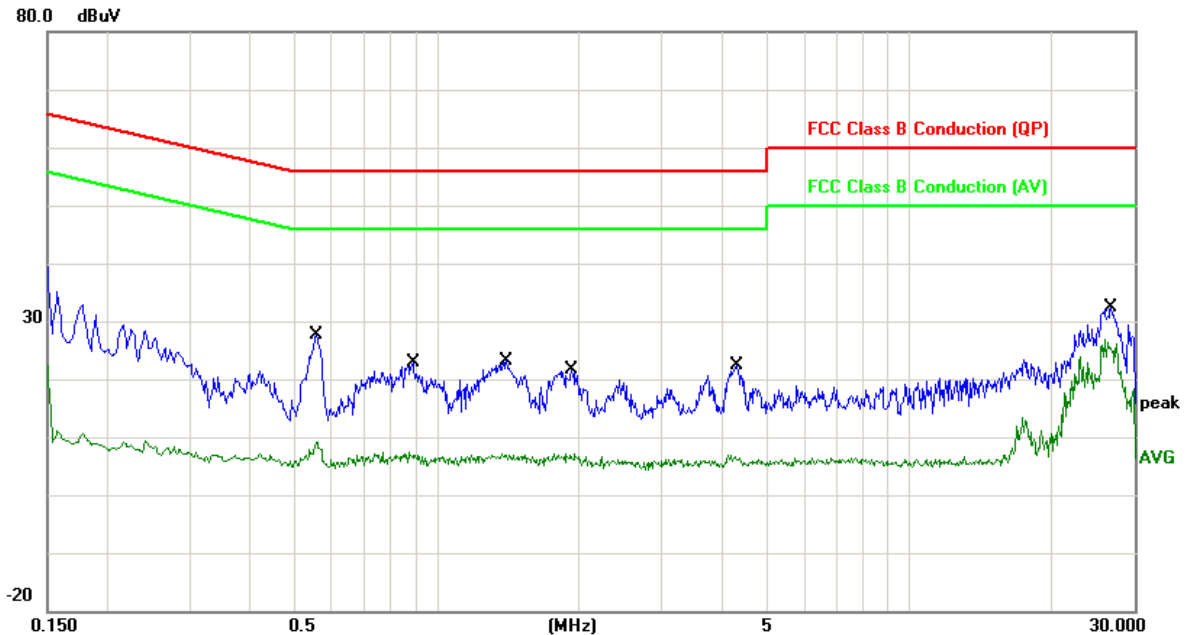
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Test point:	L	Result:	☒ - passed
Frequency range:	0.15MHz~30MHz		☐ - not passed

EUT	Bluetooth Keyboard
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test Date:	06~09 February 2015
Operator	Duke
MODEL NO	HB103



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.5580	9.84	12.51	22.35	56.00	-33.65	QP
2	0.5580	9.84	-1.31	8.53	46.00	-37.47	AVG
3	0.8900	9.83	5.59	15.42	56.00	-40.58	QP
4	0.8900	9.83	-3.29	6.54	46.00	-39.46	AVG
5	1.4100	9.84	5.93	15.77	56.00	-40.23	QP
6	1.4100	9.84	-3.17	6.67	46.00	-39.33	AVG
7	1.9380	9.86	3.79	13.65	56.00	-42.35	QP
8	1.9380	9.86	-3.50	6.36	46.00	-39.64	AVG
9	4.3180	9.91	4.90	14.81	56.00	-41.19	QP
10	4.3180	9.91	-4.20	5.71	46.00	-40.29	AVG
11	26.8300	10.07	15.11	25.18	60.00	-34.82	QP
12	26.8300	10.07	11.15	21.22	50.00	-28.78	AVG

Remark: Other frequency mini margin all >6 dB of Limit

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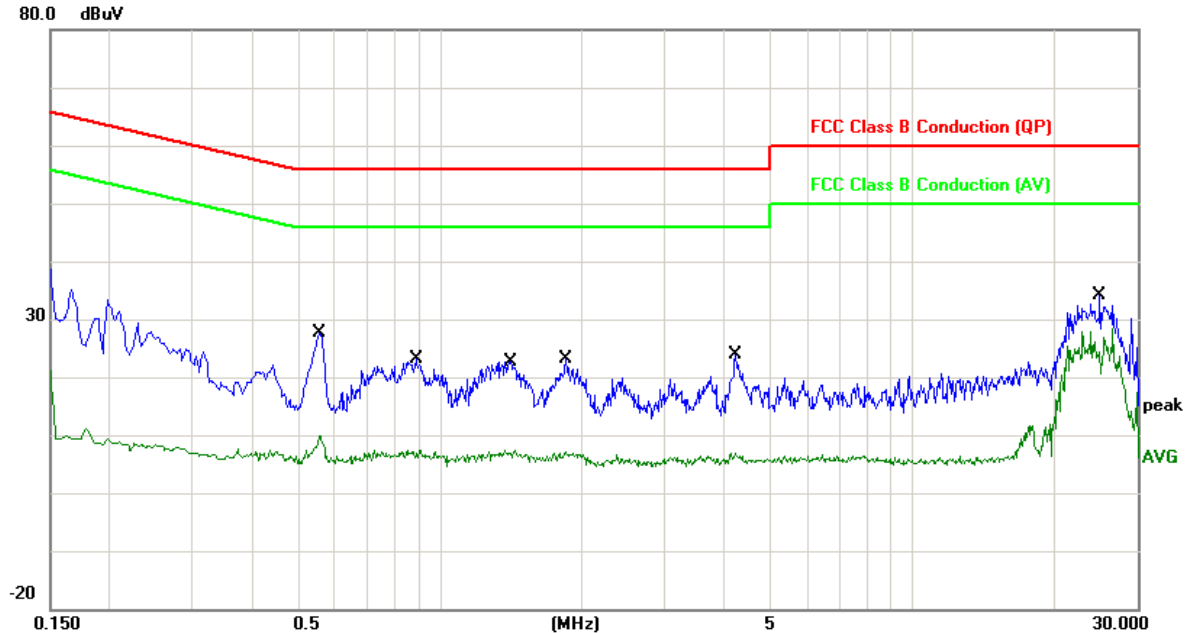
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Test point:	N	Result:	☒ - passed
Frequency range:	0.15MHz~30MHz		☐ - not passed



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.5580	9.84	12.49	22.33	56.00	-33.67	QP
2	0.5580	9.84	-1.29	8.55	46.00	-37.45	AVG
3	0.8900	9.83	5.63	15.46	56.00	-40.54	QP
4	0.8900	9.83	-3.31	6.52	46.00	-39.48	AVG
5	1.4180	9.84	5.78	15.62	56.00	-40.38	QP
6	1.4180	9.84	-3.24	6.60	46.00	-39.40	AVG
7	1.8580	9.86	3.97	13.83	56.00	-42.17	QP
8	1.8580	9.86	-3.51	6.35	46.00	-39.65	AVG
9	4.2420	9.91	4.94	14.85	56.00	-41.15	QP
10	4.2420	9.91	-4.12	5.79	46.00	-40.21	AVG
11	24.9700	10.05	18.49	28.54	60.00	-31.46	QP
12	24.9700	10.05	13.04	23.09	50.00	-26.91	AVG

Remark: Other frequency mini margin all >6 dB of Limit

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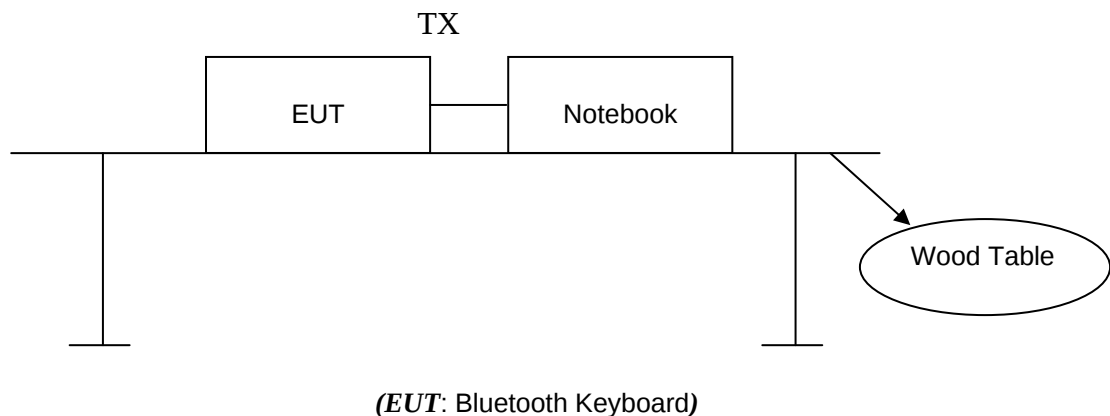
7. Radiated disturbance (electric field)

7.1. Test Equipment

Radiated disturbance (electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2014/11
2	Biconical Antenna	ROHDE & SCHWARZ	HK116	100221	2014/03
3	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2014/03
4	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2014/03
5	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2014/03
6	Loop Antenna	A.R.A	PLA-1030/B	1030	2014/11

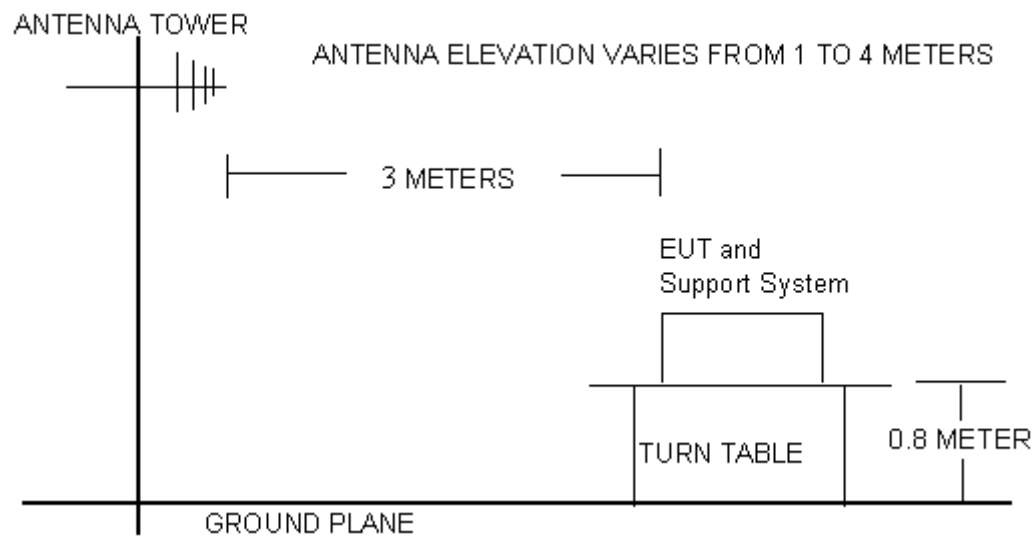
7.2. Block Diagram of Test Setup

7.2.1 Block Diagram of connection between EUT and simulators





7.2.2 Anechoic Chamber Setup Diagram



7.3.Radiated Emission Limit :

Standard:FCC 15.249 , FCC 15.209.

Except as provided in paragraph (a) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (mV/m)	Field Strength of Harmonics (µV/m)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		µV/m	dB(µV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
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 1000	3	Other: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.

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7.4. 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 C63.4-2009 on radiated emission Test.

The frequency range from 30MHz to 1000MHz and above 1GHz. is investigated. Please see the following pages.

All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 120kHz RBW below 1GHz and a Peak and Average detector with 2MHz RBW above 1GHz,

All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 300kHz VBW below 1GHz and a Peak detector with 1MHz VBW above 1GHz, A average detector with 10Hz VBW above 1GHz

Pretest x, y, z position of EUT, final, select the worst case x position test and record the test results in the report.

The test modes (TX Mode) is tested in Anechoic Chamber and all the scanning waveforms are reported on section 7.5

7.5. Radiated Emission Test Results

PASSED.

The frequency range from 9KHz~30MHz, 30MHz to 230MHz, 230MHz to 1000MHz and above 1GHz. is investigated. Please see the following pages.



Test Mode:	TX –X Position Mode	Result:	☒ - passed
Frequency range:	9KHz~30MHz		☐ - not passed

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
Remark: The test result reading value is to low, margin all > 10dB of the limit.							

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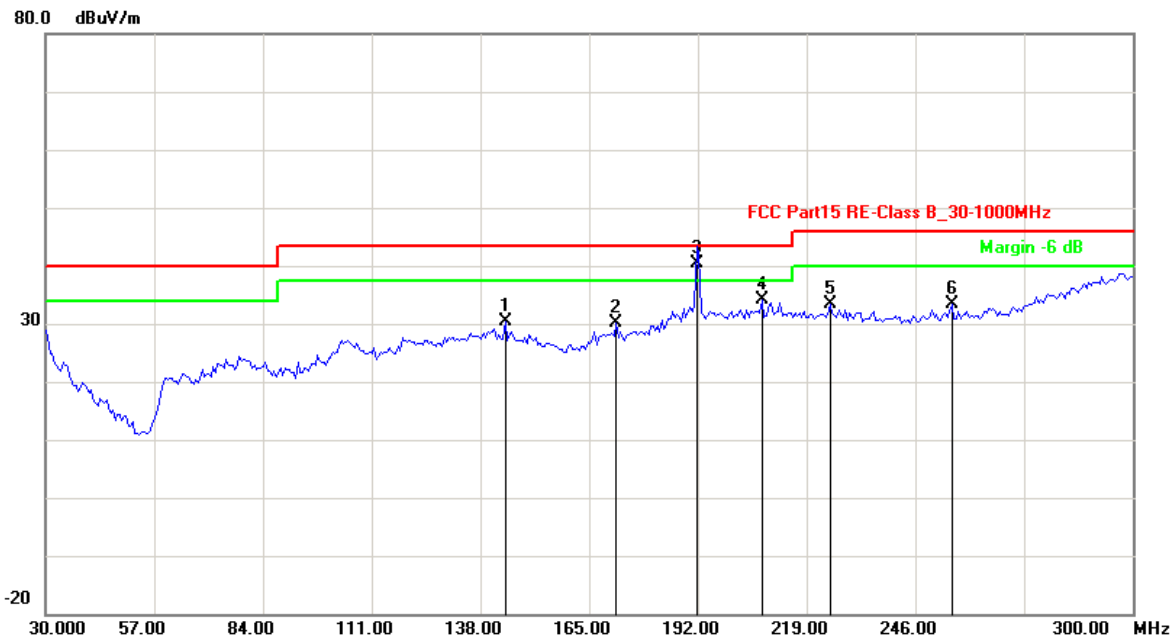
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Channel:	TX -X Position	Result:	☒ - passed
Test point:	Horizontal		☐ - not passed
Frequency range:	30MHz-1GHz		

EUT	Bluetooth Keyboard
Test Condition	Ambient Temperature: 25°C Humidity: 56%
Test distance	3 Meter
Test Date:	06~09 February 2015
Operator	Duke
MODEL NO	HB103



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	144.1683	-22.78	53.10	30.32	43.50	-13.18	QP
2	171.7635	-22.44	52.53	30.09	43.50	-13.41	QP
3	191.7836	-18.13	58.61	40.48	43.50	-3.02	QP
4	208.0160	-18.18	52.33	34.15	43.50	-9.35	QP
5	224.7896	-18.39	51.65	33.26	46.00	-12.74	QP
6	255.0902	-18.69	52.06	33.37	46.00	-12.63	QP
Remark: Other frequency mini margin all >6 dB of Limit							

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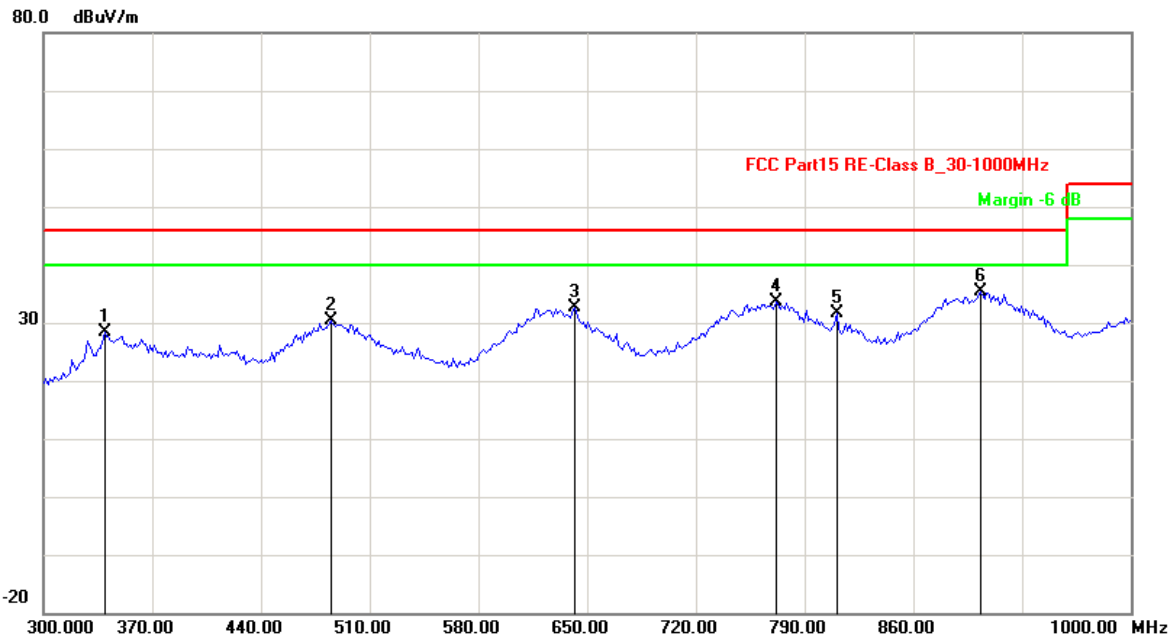
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No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	339.2786	-23.26	51.56	28.30	46.00	-17.70	QP
2	485.1703	-18.80	49.22	30.42	46.00	-15.58	QP
3	642.2846	-16.43	49.02	32.59	46.00	-13.41	QP
4	771.3427	-14.19	47.75	33.56	46.00	-12.44	QP
5	810.6212	-17.17	48.71	31.54	46.00	-14.46	QP
6	903.2064	-11.53	46.79	35.26	46.00	-10.74	QP
Remark: Other frequency mini margin all >6 dB of Limit							

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Channel:	TX -X Position Low CH	Result:	☒ - passed
Test point:	Horizontal		☐ - not passed
Frequency range:	1GHz-26.5GHz		

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2402.00	-5.48	98.97	93.49	114.00	-20.51	Peak
2	2402.00	-5.48	96.6	91.12	94.00	-2.88	AVG

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2891.667	-2.46	43.90	41.44	74.00	-32.56	peak
2	2891.667	-2.46	29.12	26.66	54.00	-27.34	AVG
3	5475.000	5.21	36.47	41.68	74.00	-32.32	peak
4	5475.000	5.21	21.81	27.02	54.00	-26.98	AVG

Remark: Other frequency mini margin all >6 dB of Limit

Channel:	TX -X Position Middle CH	Result:	☒ - passed
Test point:	Horizontal		☐ - not passed
Frequency range:	1GHz-26.5GHz		

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2440.00	-5.13	97.88	92.75	114.00	-21.25	Peak
2	2440.00	-5.13	95.76	90.63	94.00	-3.37	AVG

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3241.667	-1.10	40.85	39.75	74.00	-34.25	peak
2	3241.667	-1.10	25.50	24.40	54.00	-29.60	AVG
3	5175.000	4.24	36.46	40.70	74.00	-33.30	peak
4	5175.000	4.24	20.92	25.16	54.00	-28.84	AVG

Remark: Other frequency mini margin all >6 dB of Limit

Channel:	TX -X Position High CH	Result:	☒ - passed
Test point:	Horizontal		☐ - not passed
Frequency range:	1GHz-26.5GHz		

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2480.00	-4.76	97.60	91.88	114.00	-22.12	Peak
2	2480.00	-4.76	95.06	89.11	94.00	-4.89	AVG

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1600.000	-11.57	51.32	39.75	74.00	-34.25	peak
2	1600.000	-11.57	37.19	25.62	54.00	-28.38	AVG
3	3333.333	-0.81	41.04	40.23	74.00	-33.77	peak
4	3333.333	-0.81	26.98	26.17	54.00	-27.83	AVG

Remark: Other frequency mini margin all >6 dB of Limit

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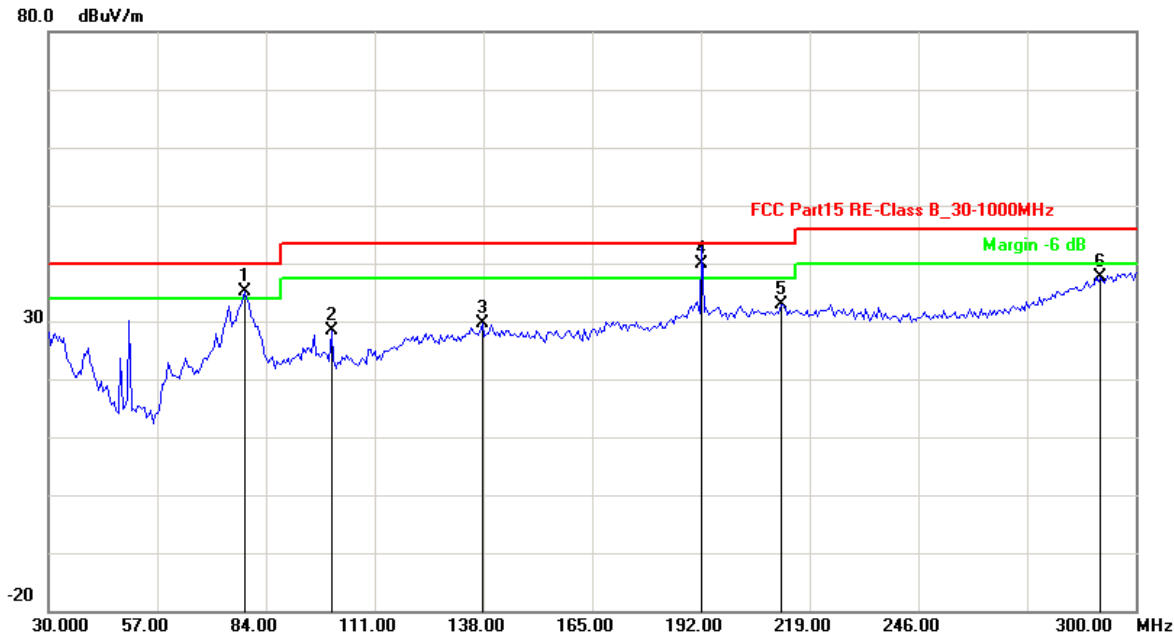
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Channel:	TX -X Position	Result:	■ - passed
Test point:	Vertical		□ - not passed
Frequency range:	30MHz-1GHz		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	78.6974	-27.42	62.63	35.21	40.00	-4.79	QP
2	100.3407	-29.06	57.55	28.49	43.50	-15.01	QP
3	137.6754	-22.54	52.25	29.71	43.50	-13.79	QP
4	192.3246	-18.16	58.06	39.90	43.50	-3.60	QP
5	211.8036	-18.13	50.95	32.82	43.50	-10.68	QP
6	291.3427	-12.86	50.45	37.59	46.00	-8.41	QP
Remark: Other frequency mini margin all >6 dB of Limit							

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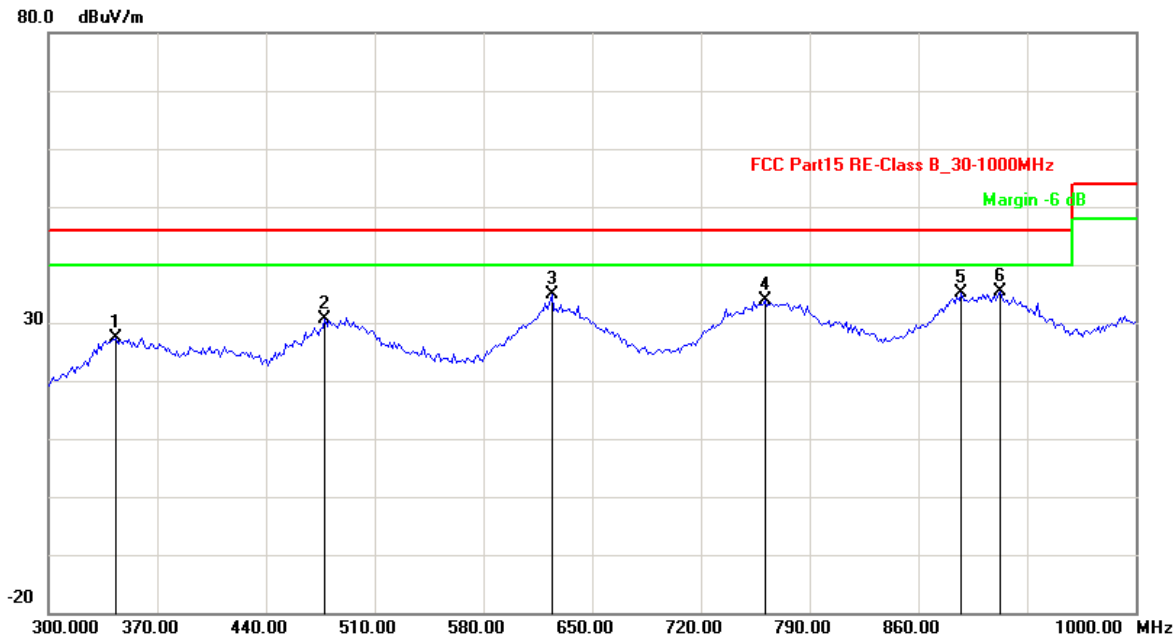
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No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	343.4870	-23.16	50.52	27.36	46.00	-18.64	QP
2	478.1563	-19.03	49.77	30.74	46.00	-15.26	QP
3	624.0481	-15.70	50.62	34.92	46.00	-11.08	QP
4	761.5230	-13.92	47.73	33.81	46.00	-12.19	QP
5	887.7756	-11.87	46.91	35.04	46.00	-10.96	QP
6	913.0261	-12.01	47.37	35.36	46.00	-10.64	QP
Remark: Other frequency mini margin all >6 dB of Limit							

Channel:	TX -X Position Low CH	Result:	☒ - passed
Test point:	Vertical		☐ - not passed
Frequency range:	1GHz-26.5GHz		

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2402.00	-5.48	95.71	90.23	114.00	-23.77	Peak
2	2402.00	-5.48	93.55	88.07	94.00	-5.93	AVG

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3125.000	-1.48	42.97	41.49	74.00	-32.51	peak
2	3125.000	-1.48	28.71	27.23	54.00	-26.77	AVG
3	5625.000	5.69	36.55	42.24	74.00	-31.76	peak
4	5625.000	5.69	22.25	27.94	54.00	-26.06	AVG

Remark: Other frequency mini margin all >6 dB of Limit

Channel:	TX -X Position Middle CH	Result:	☒ - passed
Test point:	Vertical		☐ - not passed
Frequency range:	1GHz-26.5GHz		

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2440.00	-5.13	94.32	89.19	114.00	-24.81	Peak
2	2440.00	-5.13	92.35	87.22	94.00	-6.78	AVG

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	1491.667	-12.19	51.46	39.27	74.00	-34.73	peak
2	1491.667	-12.19	36.78	24.59	54.00	-29.41	AVG
3	3833.333	0.79	40.61	41.40	74.00	-32.60	peak
4	3833.333	0.79	26.98	27.77	54.00	-26.23	AVG

Remark: Other frequency mini margin all >6 dB of Limit

Channel:	TX -X Position High CH	Result:	☒ - passed
Test point:	Vertical		☐ - not passed
Frequency range:	1GHz-26.5GHz		

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	2480.00	-4.76	93.40	88.64	114.00	-25.36	Peak
2	2480.00	-4.76	91.35	86.59	94.00	-7.41	AVG

No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	3383.333	-0.65	41.04	40.39	74.00	-33.61	peak
2	3383.333	-0.65	27.27	26.62	54.00	-27.38	AVG
3	4450.000	2.39	38.07	40.46	74.00	-33.54	peak
4	4450.000	2.39	24.58	26.97	54.00	-27.03	AVG

Remark: Other frequency mini margin all >6 dB of Limit

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8. Band Edge Compliance test

8.1. Test Equipment

Band Edge Compliance test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	10868	2014/11
2	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2014/03
3	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2014/03

8.2. Test procedure

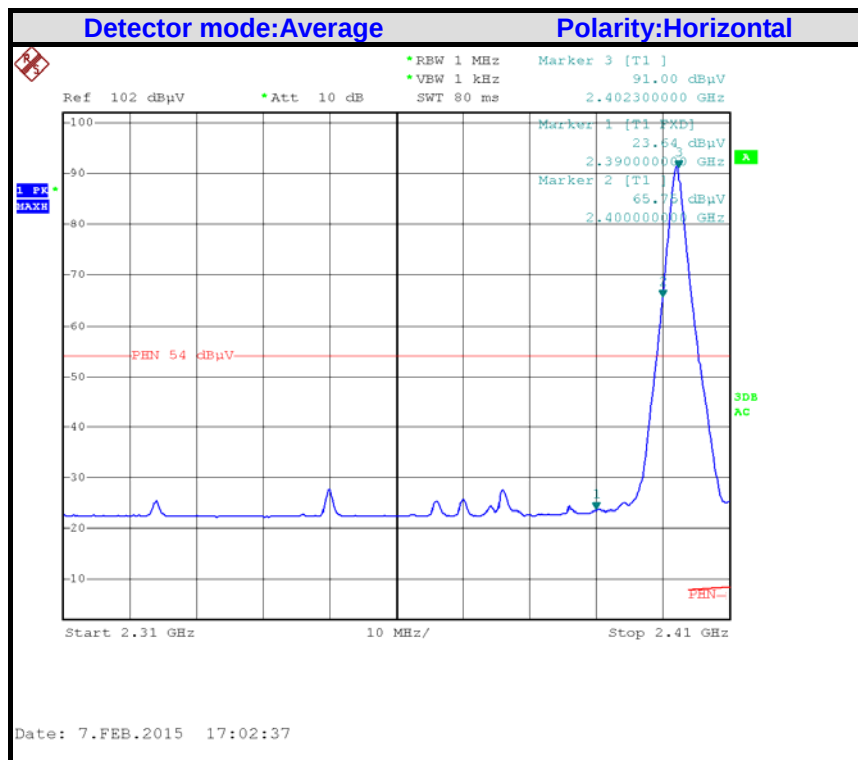
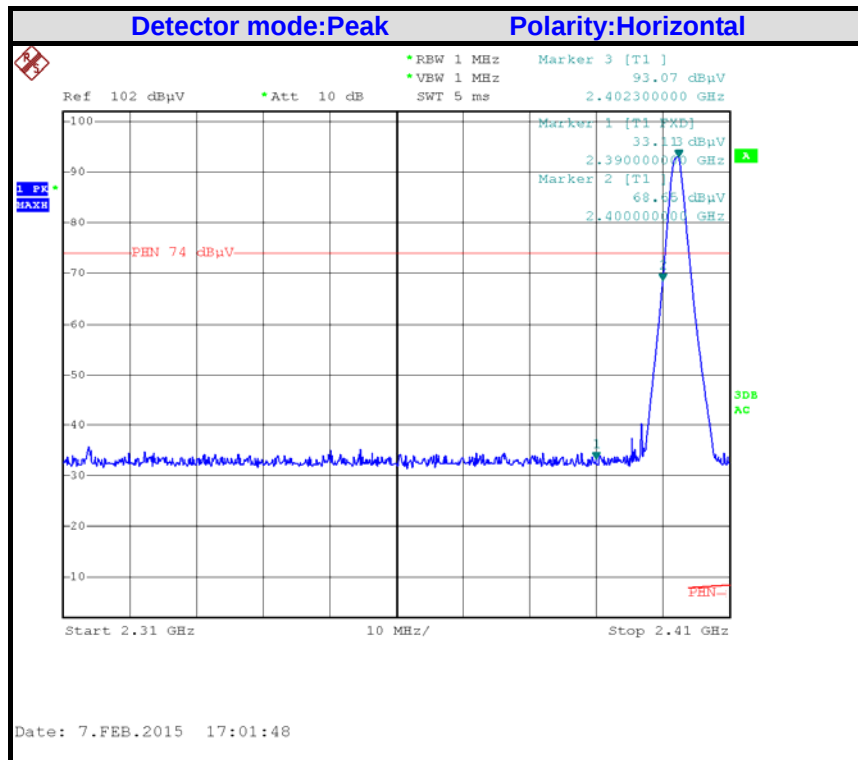
- The EUT operates at hopping-off test mode. The lowest or highest channels are tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.
- Max hold the trace of the setp 1, and the EUT operates at hopping-on test mode to verify the largest spurious emissions power.
- 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
 - AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

8.3. Test Results

PASSED.

The EUT operates at hopping-off test mode. The lowest and highest channels are tested to verify the band edge emissions.

Test Mode	Channel Marked Frequency	Test Result Highest Emission (dBuV/m)			
		Horizontal		Vertical	
		Peak	Average	Peak	Average
Low Channel	2390MHz	33.11	23.64	32.30	22.90
	2400MHz	68.65	65.75	64.96	62.38
High Channel	2483.5MHz	53.61	51.27	50.68	48.29
	2500MHz	32.49	22.72	32.18	22.15

Band Edges (Low)

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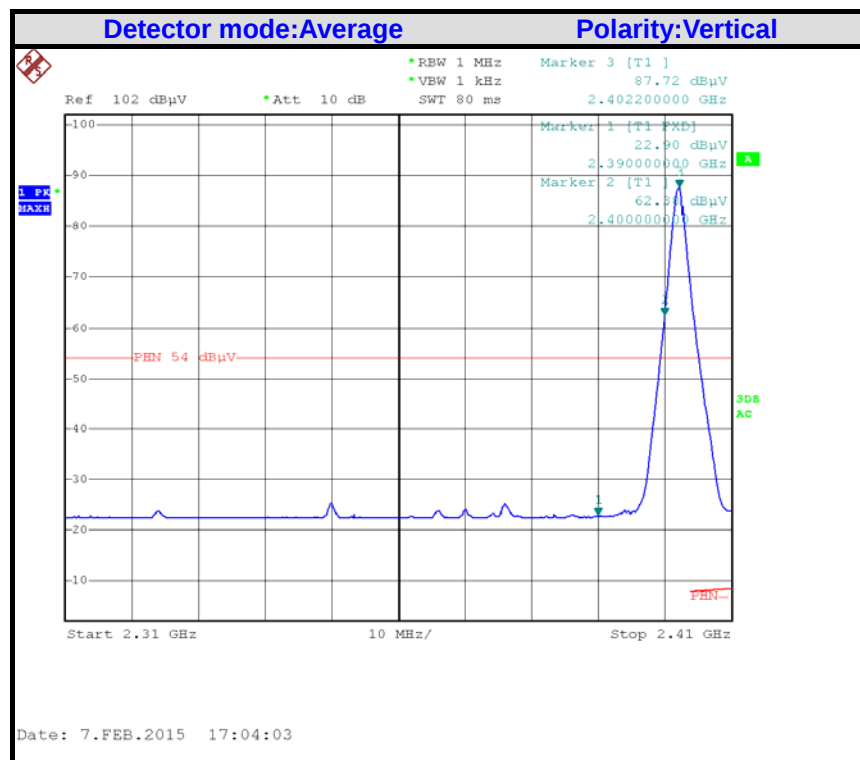
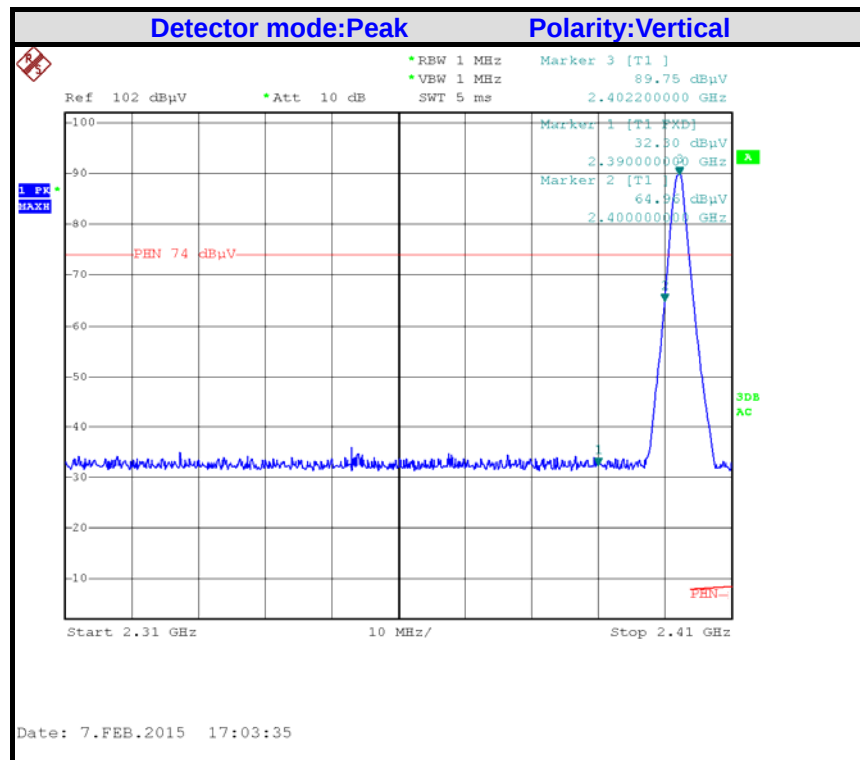
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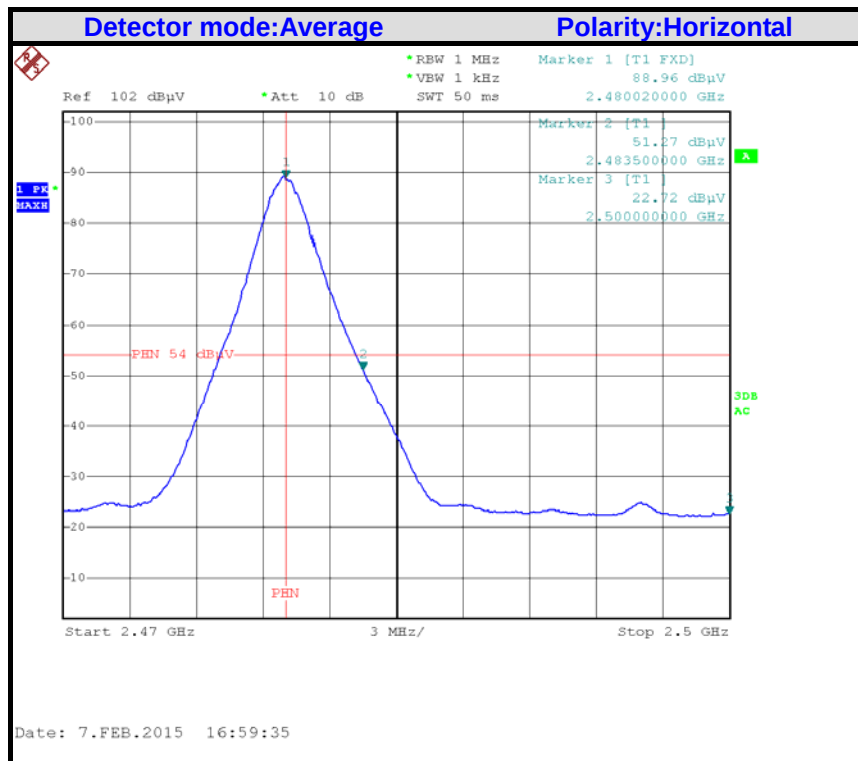
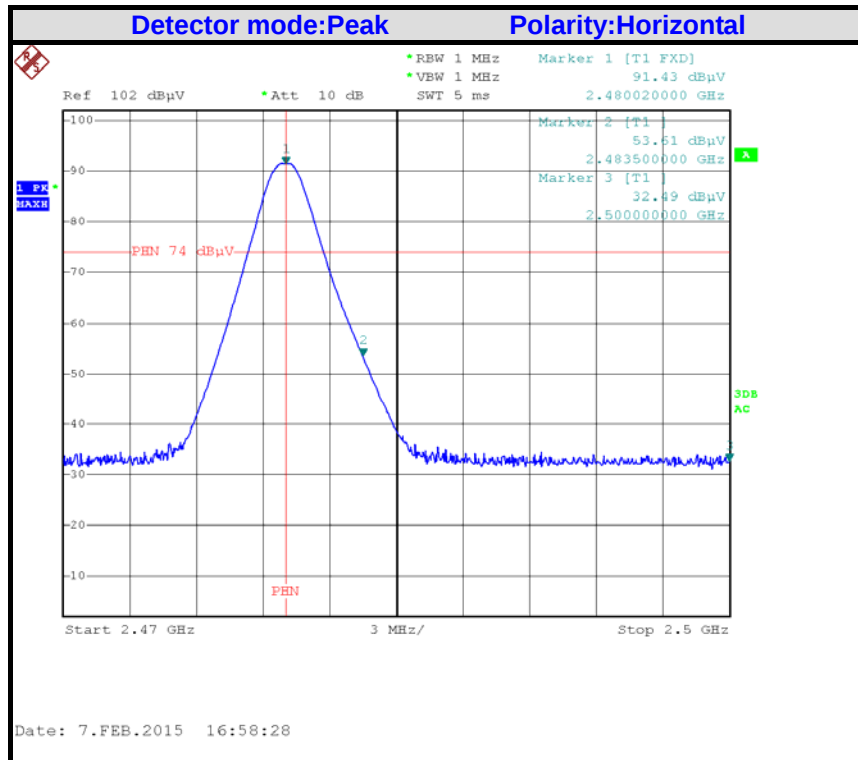
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Band Edges (High)

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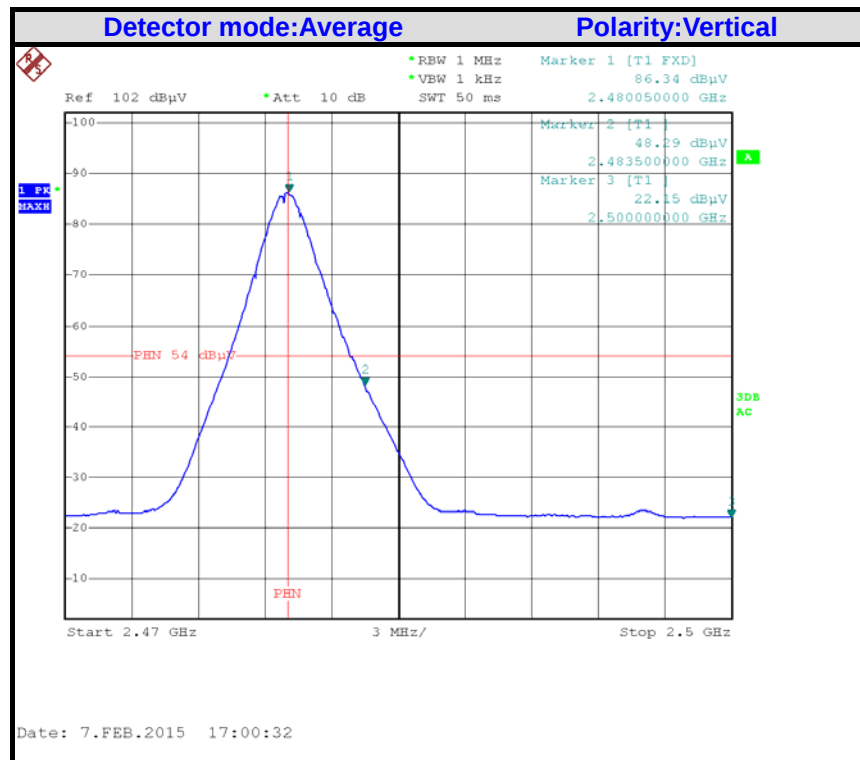
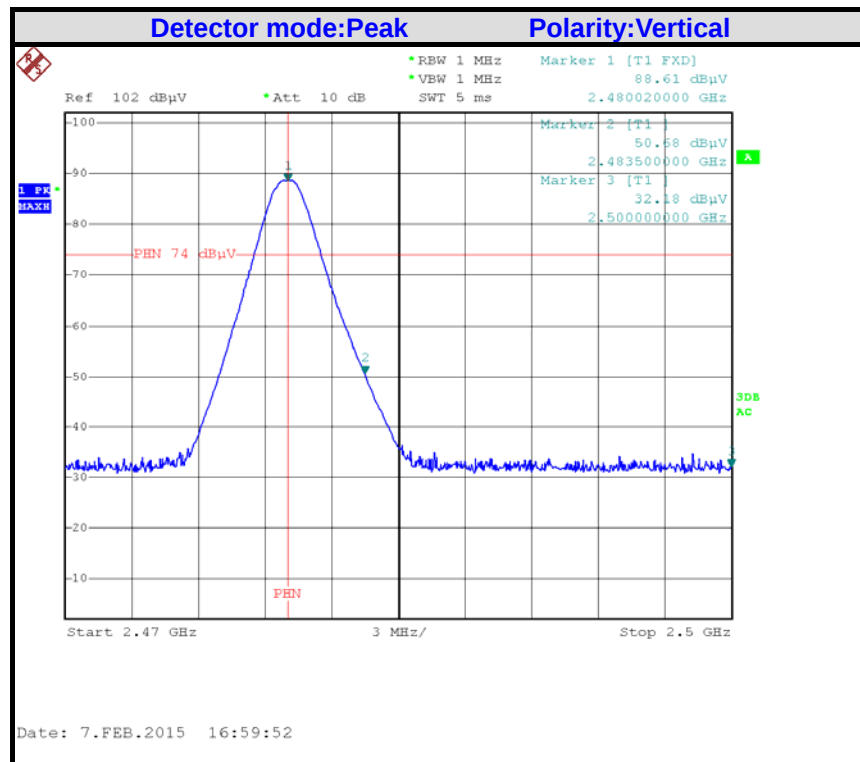
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9.Deviation to test specifications

The following identical model(s):

N/A

Belong to the tested device:

Product description: **Bluetooth Keyboard**
Model name: **HB103**

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