FCC Test Report

Report No.: AGC01680151102FE01

FCC ID	:	2AC9LHB099-A
PRODUCT DESIGNATION	:	Bluetooth Keyboard
BRAND NAME	:	N/A
MODEL NAME	:	HB099-A
CLIENT	:	Shenzhen Hastech industries Co., Ltd.
DATE OF ISSUE	:	Nov.27,2015
STANDARD(S)	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov.27,2015	Valid	Original Report

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1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Hastech industries Co., Ltd.
Address	3rd, 4th floor G-A1 Bldg &1st, 2nd floor G-A2 Bldg, Democracy West Industry Park, Shajing Town, Bao'an District, Shenzhen, China.
Manufacturer	Shenzhen Hastech industries Co., Ltd.
Address	3rd, 4th floor G-A1 Bldg &1st, 2nd floor G-A2 Bldg, Democracy West Industry Park, Shajing Town, Bao'an District, Shenzhen, China.
Product Designation	Bluetooth Keyboard
Brand Name	N/A
Test Model	HB099-A
Measurement Procedure	ANSI C63.4: 2009
Date of test	Nov.19,2015 to Nov.23,2015
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-IT/AC(2013-03-01)

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2009. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested By 

Time Huang(Huang Nanhui) Nov.27,2015

Reviewed By 

Forrest Lei(Lei Yonggang) Nov.27,2015

Approved By 

Solger Zhang(Zhang Hongyi) Authorized Officer Nov.27,2015

2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION	
NO.	**TEST MODE DESCRIPTION**
1	USB

3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB

Radiated measurement: +/- 3.2dB

4. PRODUCT INFORMATION

Housing Type	Plastic and metal
Power Supply	DC 3.7V by battery

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Number**	**Cable Description**	**Tested With**
USB port	1	--	1

5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
PC	SONY	E1412AYCW	--	--	--

6. TEST FACILITY

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009.

TEST EQUIPMENT

FOR RADIATED EMISSION TEST (BELOW 1GHZ)

Radiated Emission Test Site					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2015	July 3, 2016
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2015	July 3, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2015	June 5, 2016
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2015	June 5, 2016

Conducted Emission Test Site					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Artificial Mains Network	Narda	L2-16B	000WX31025	July 8, 2015	July 7, 2016
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 8, 2015	July 7, 2016
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2015	July 3, 2016
Shielded Room	CHENGYU	843	PTS-002	June 6,2015	June 5,2016

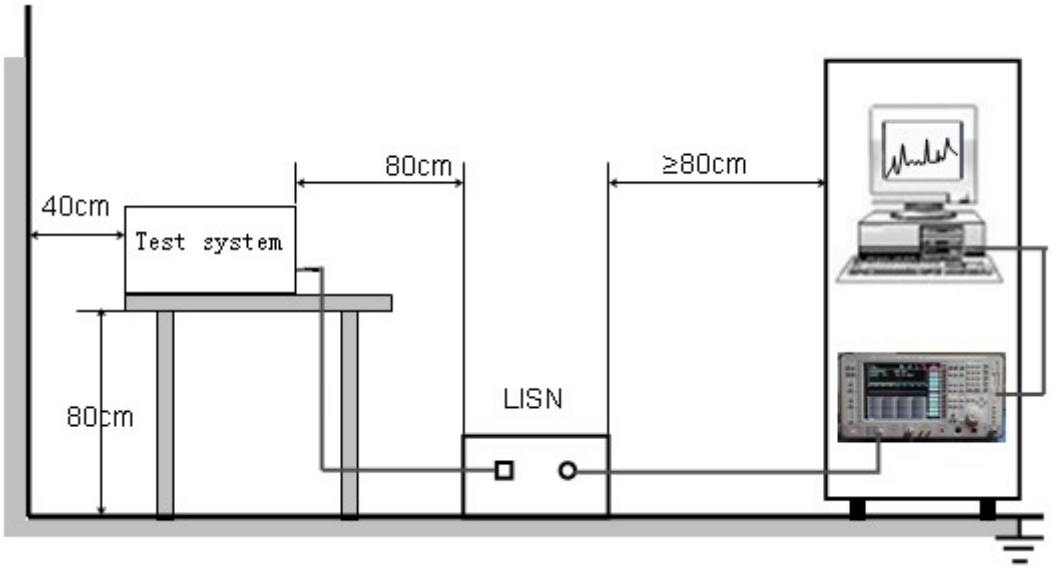
7. FCCLINE CONDUCTED EMISSION TEST

7.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

Note:
1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

7.2. BLOCK DIAGRAM OF TEST SETUP



7.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

(2) Support equipment, if needed, was placed as per ANSI C63.4.

(3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

(4) The EUT received DC5V power from PC with receive 120V/60Hz power from a LISN.

(5) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.

(6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

(7) During the above scans, the emissions were maximized by cable manipulation.

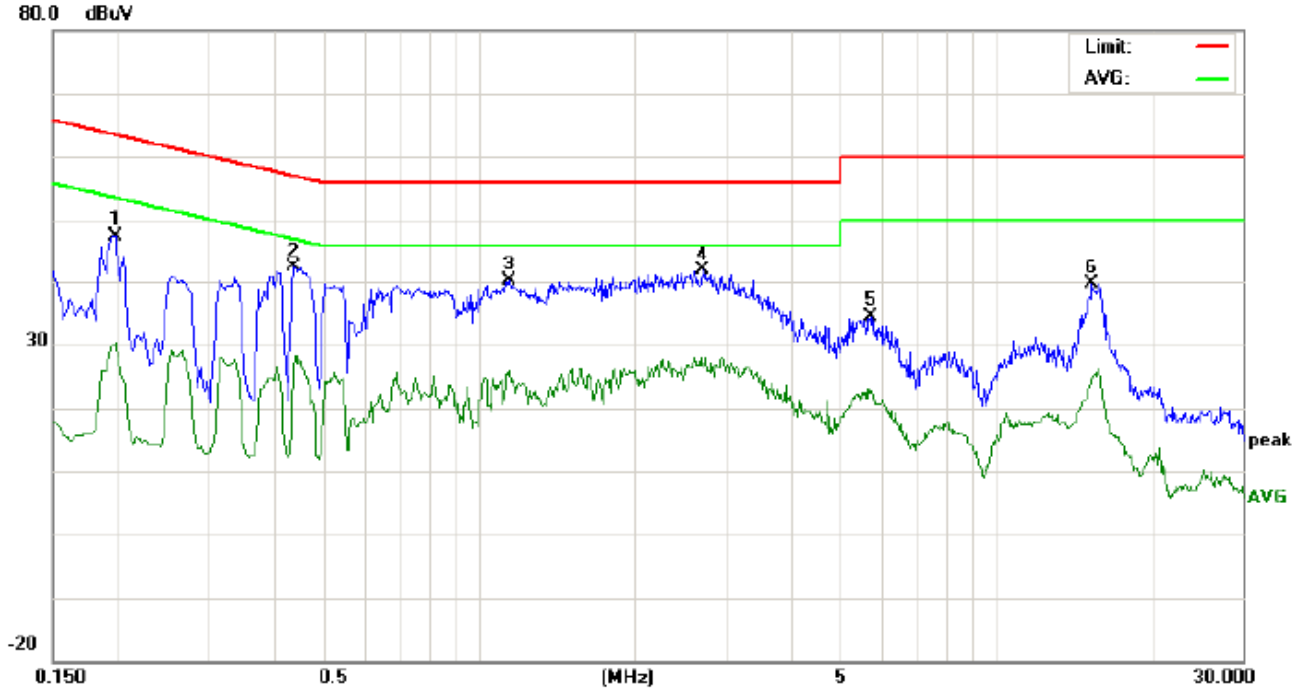
(8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.

(9) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition (mode 1) was reported on the Summary Data page.

7.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth Keyboard
M/N: HB099-A
Mode: USB
Note:

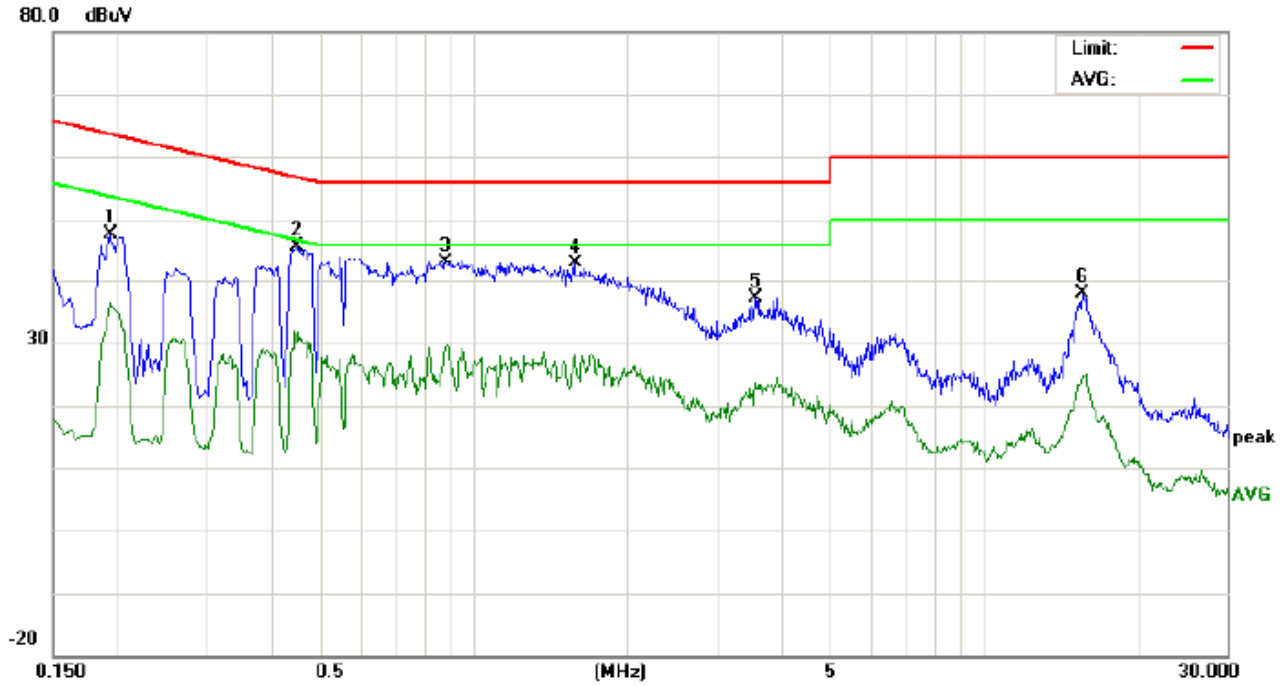
Phase: *L1*
Power:

Temperature: 23.1
Humidity: 54.7 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1980	37.12		20.08	10.21	47.33		30.29	63.69	53.69	-16.36	-23.40	P	
2	0.4380	31.91		15.80	10.36	42.27		26.16	57.10	47.10	-14.83	-20.94	P	
3	1.1420	29.65		15.58	10.37	40.02		25.95	56.00	46.00	-15.98	-20.05	P	
4	2.7100	31.30		16.14	10.48	41.78		26.62	56.00	46.00	-14.22	-19.38	P	
5	5.7260	24.00		12.25	10.26	34.26		22.51	60.00	50.00	-25.74	-27.49	P	
6	15.3140	29.55		14.39	10.12	39.67		24.51	60.00	50.00	-20.33	-25.49	P	

RESULT: PASS

LINE CONDUCTED EMISSION TEST-N



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth Keyboard
M/N: HB099-A
Mode: USB
Note:

Phase: *N*
Power:

Temperature: 23.1
Humidity: 54.7 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1940	37.52		26.23	10.21	47.73		36.44	63.86	53.86	-16.13	-17.42	P	
2	0.4500	35.13		19.39	10.37	45.50		29.76	56.87	46.87	-11.37	-17.11	P	
3	0.8820	32.72		18.80	10.39	43.11		29.19	56.00	46.00	-12.89	-16.81	P	
4	1.5780	32.45		17.71	10.36	42.81		28.07	56.00	46.00	-13.19	-17.93	P	
5	3.5660	26.58		13.00	10.50	37.08		23.50	56.00	46.00	-18.92	-22.50	P	
6	15.6300	27.67		14.71	10.11	37.78		24.82	60.00	50.00	-22.22	-25.18	P	

RESULT: PASS

8. FCC RADIATED EMISSION TEST

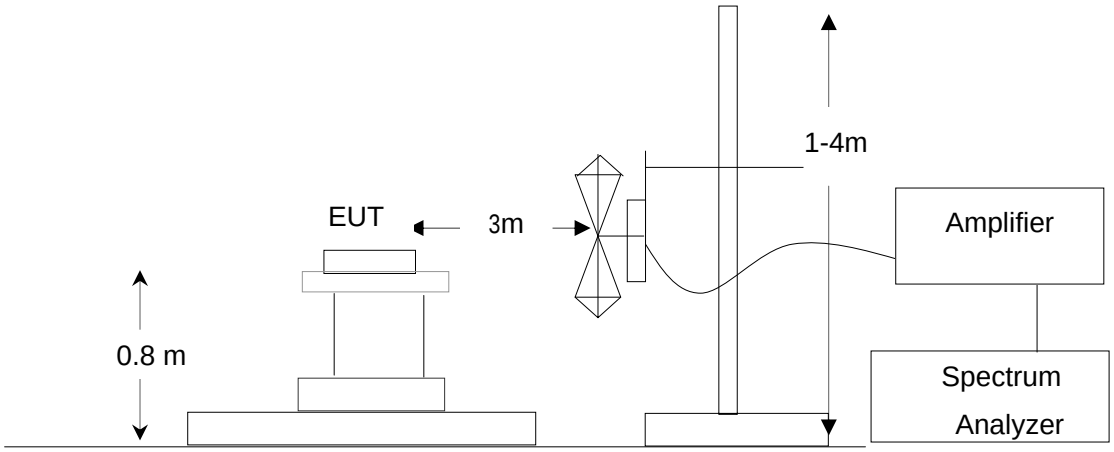
8.1. LIMITS OF RADIATED EMISSION TEST

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30~88	3	40.0
88~216	3	43.5
216~960	3	46.0
Above 960	3	54.0

Note: The lower limit shall apply at the transition frequency.

8.2. BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



8.3. PROCEDURE OF RADIATED EMISSION TEST

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

(2) Support equipment, if needed, was placed as per ANSI C63.4.

(3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

(4) The EUT received DC 5V power from PC with receive 120V/60Hz power from socket under the turntable through a LISN.

(5) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.

(6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

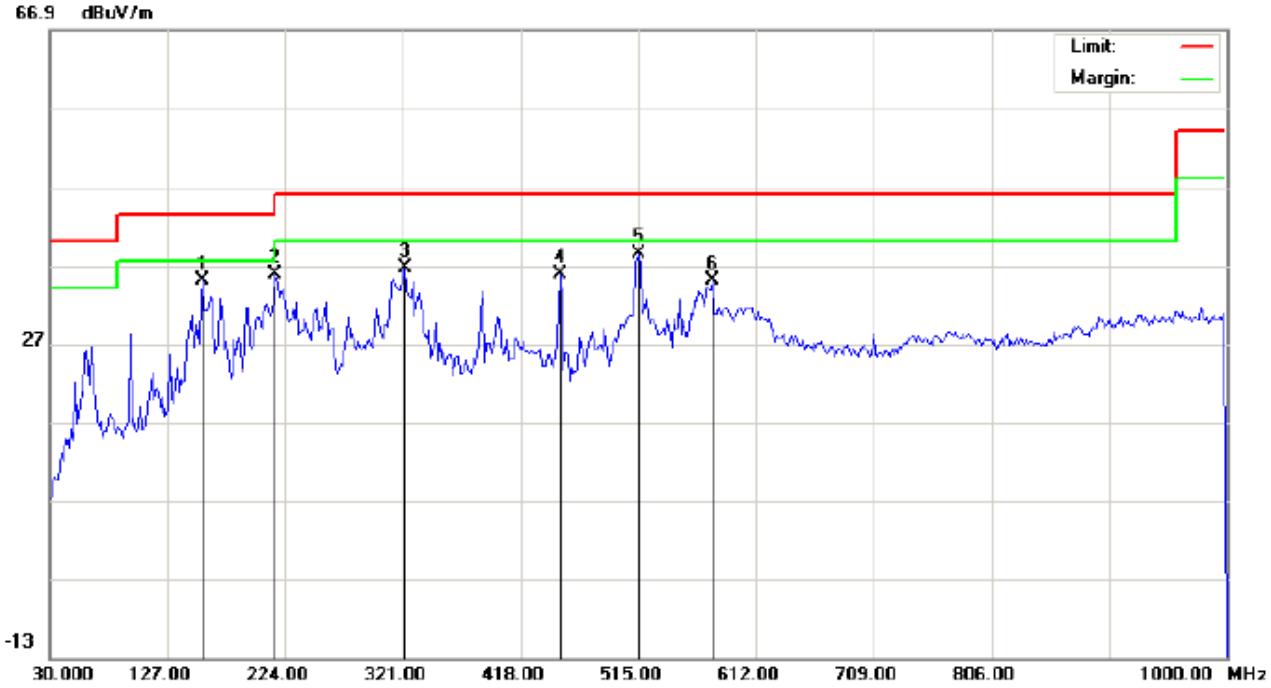
(7) The test mode(s) were scanned during the test:

(8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position,polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

The test data of the worst case condition (mode 1) was reported on the Summary Data page.

8.4. TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Keyboard
M/N: HB099-A
Mode: USB
Note:

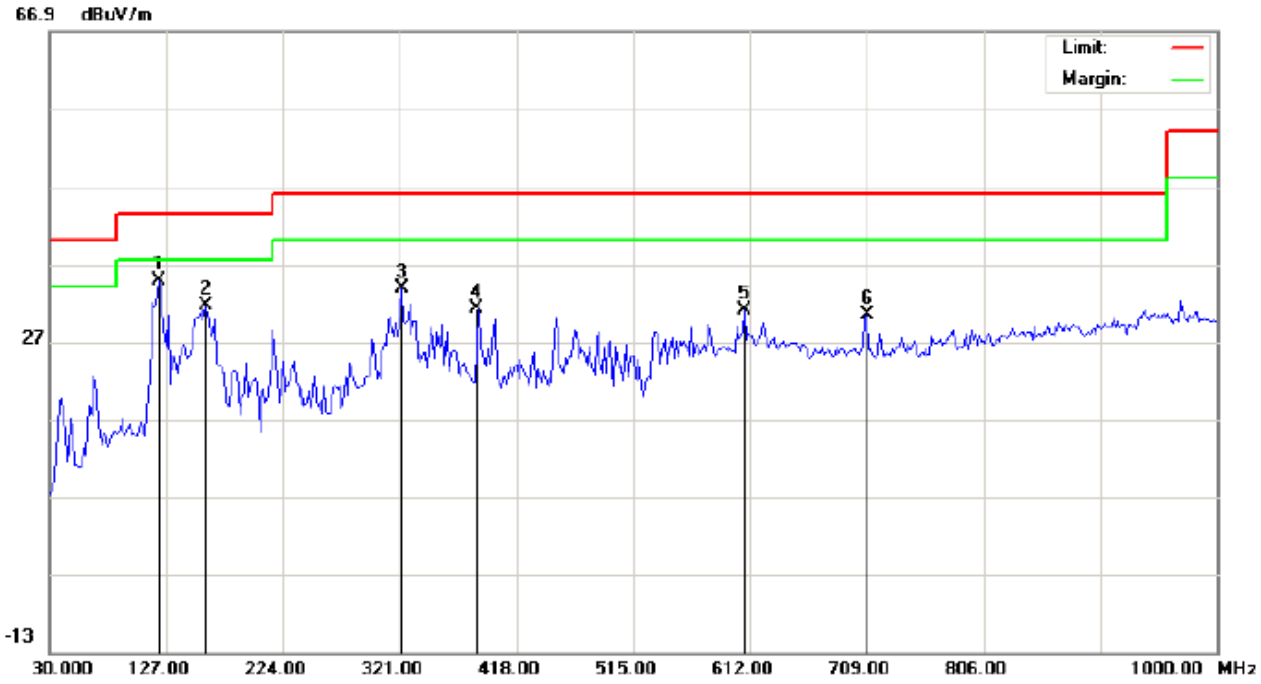
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 22.5
Humidity: 53.6 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		156.0999	19.77	15.30	35.07	43.50	-8.43	peak			
2		215.9166	23.27	12.60	35.87	43.50	-7.63	peak			
3		322.6166	19.71	16.92	36.63	46.00	-9.37	peak			
4		450.3333	15.18	20.59	35.77	46.00	-10.23	peak			
5	*	515.0000	16.85	21.53	38.38	46.00	-7.62	peak			
6		576.4333	11.92	23.14	35.06	46.00	-10.94	peak			

RESULT: PASS

Radiated Emission Test at 3m Distance-Vertical



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth Keyboard
M/N: HB099-A
Mode: USB
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 22.5
Humidity: 53.6 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	120.5333	27.69	7.08	34.77	43.50	-8.73	peak			
2		159.3333	16.19	15.33	31.52	43.50	-11.98	peak			
3		322.6167	16.79	16.92	33.71	46.00	-12.29	peak			
4		385.6666	12.16	18.98	31.14	46.00	-14.86	peak			
5		607.1500	8.14	22.89	31.03	46.00	-14.97	peak			
6		709.0000	4.98	25.45	30.43	46.00	-15.57	peak			

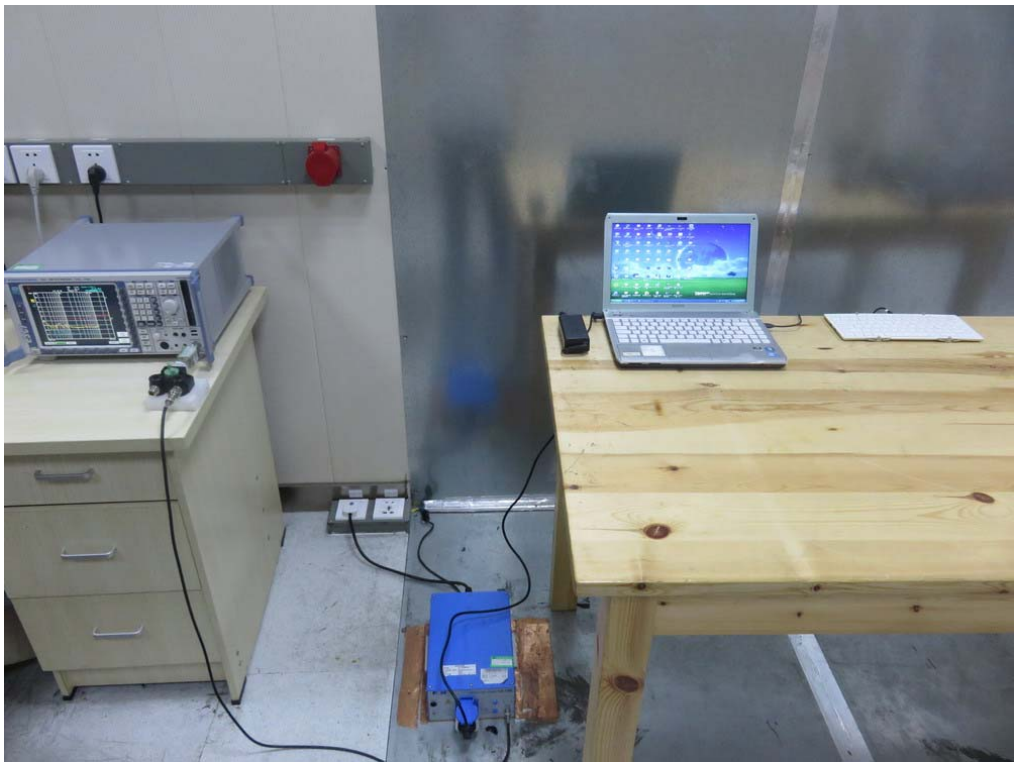
RESULT: PASS

Note: Above 1GHz have more than 20db margin, no recording in the report

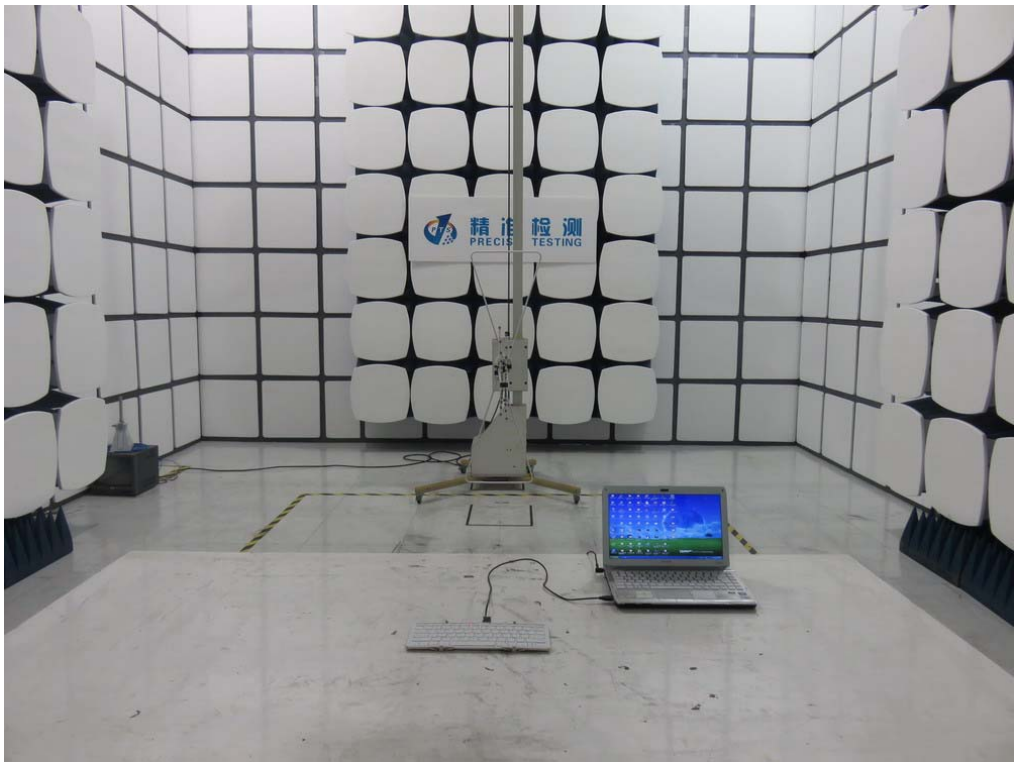
Measurement = Reading + Factor, Over = Measurement – Limit.

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

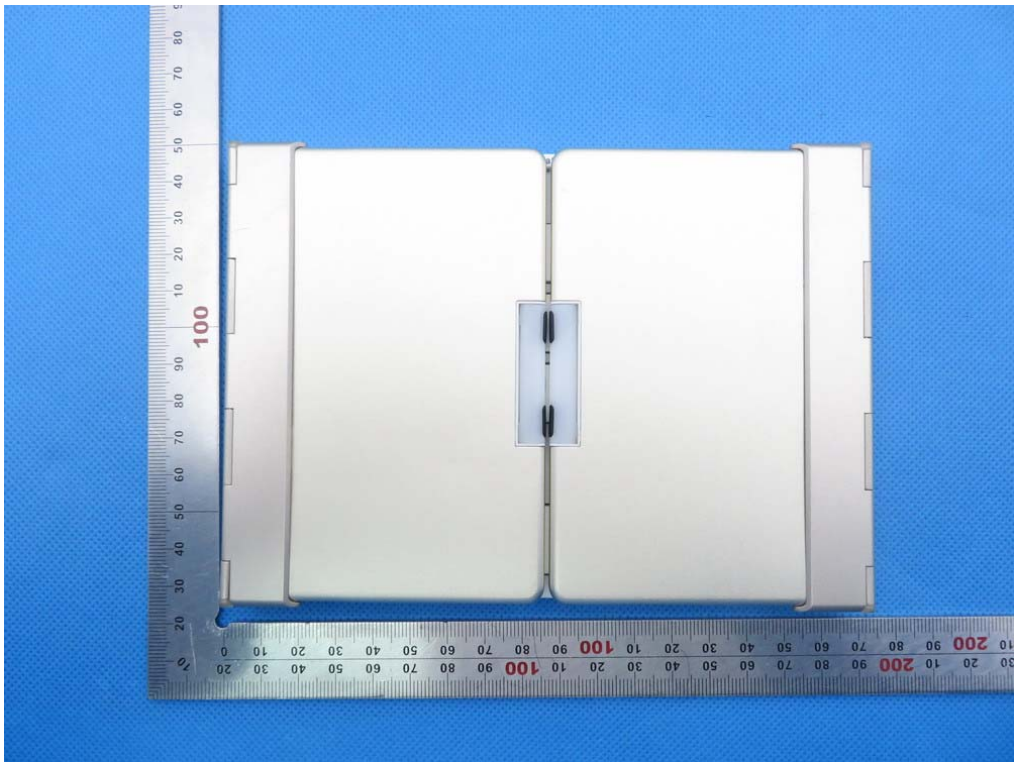


FCC RADIATED EMISSION TEST SETUP



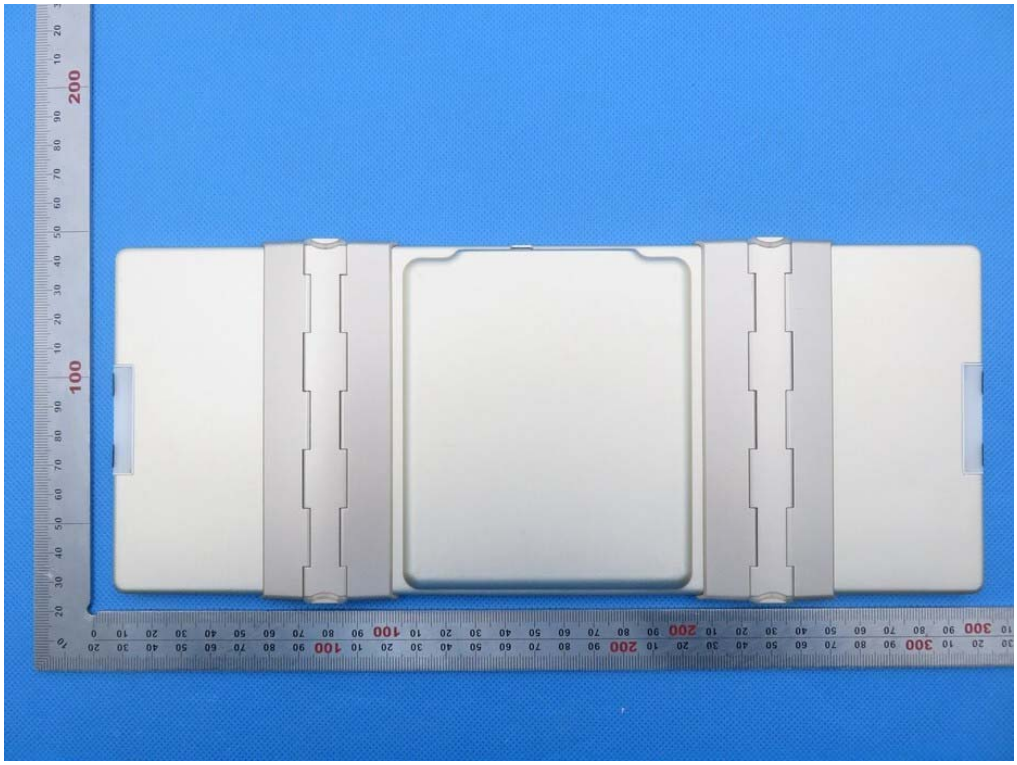
APPENDIX B: PHOTOGRAPHS OF EUT

WHOLE VIEW OF EUT



TOP VIEW OF EUT

BOTTOM VIEW OF EUT



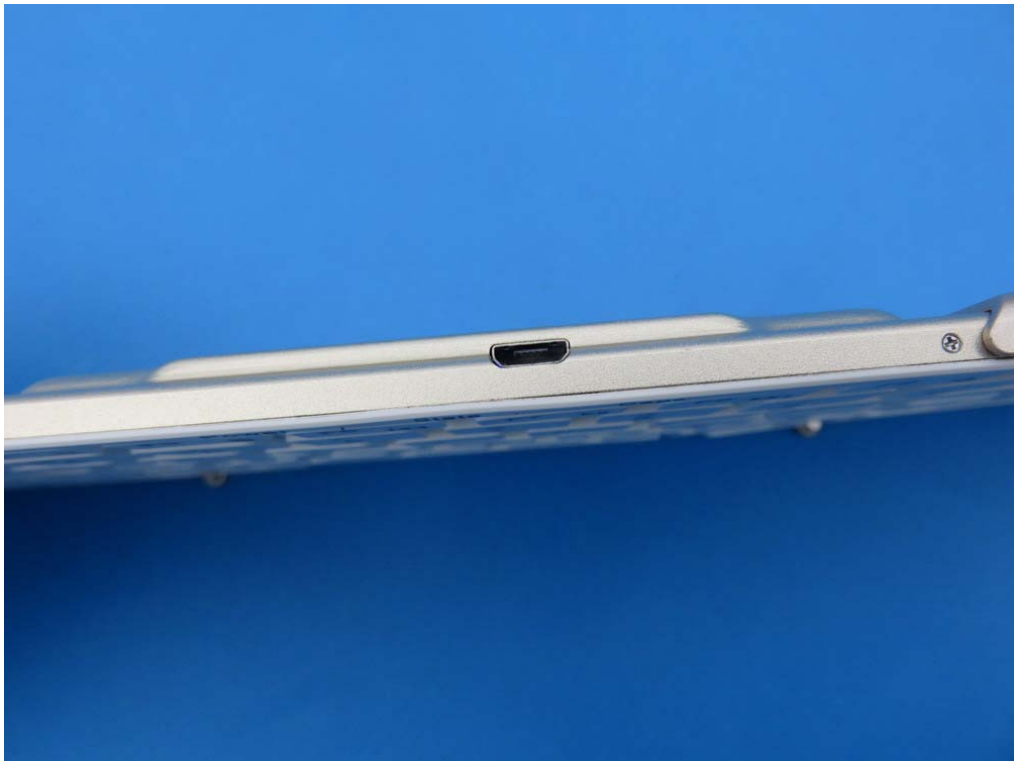
FRONT VIEW OF EUT

BACK VIEW OF EUT

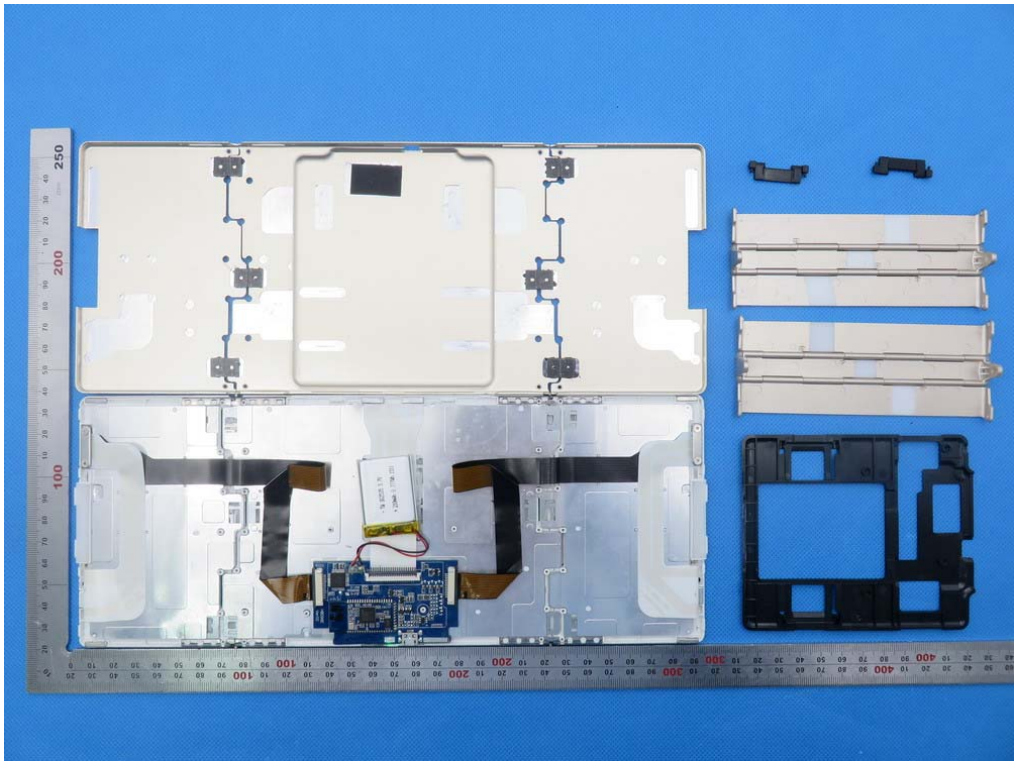
LEFT VIEW OF EUT

RIGHT VIEW OF EUT

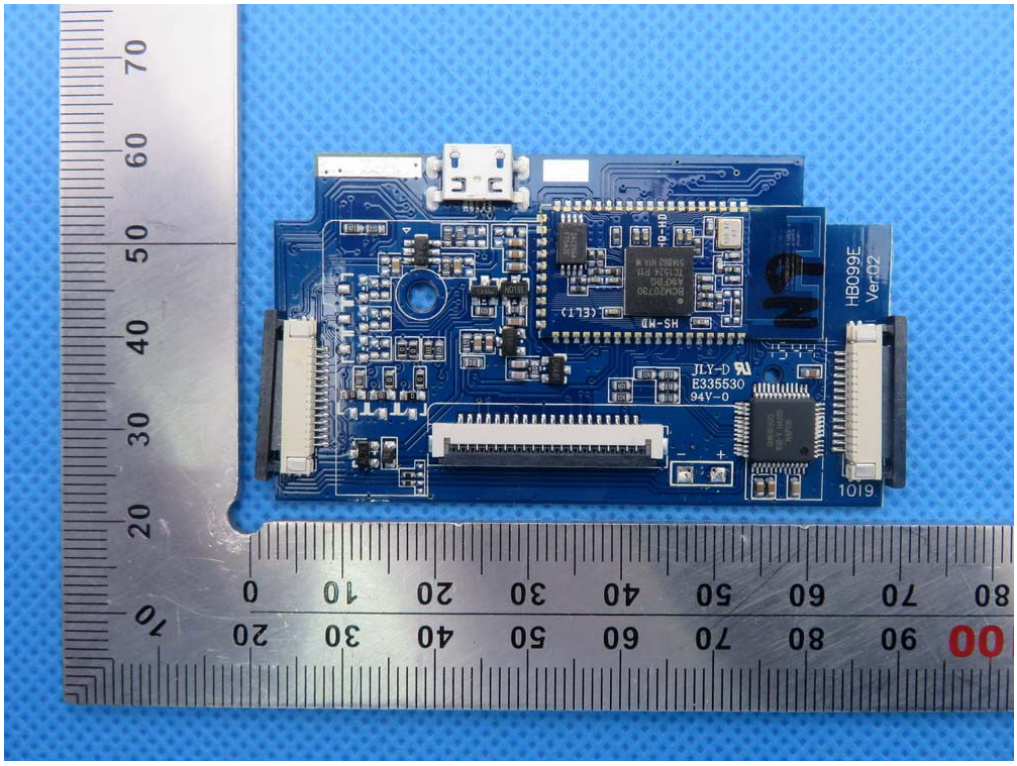
VIEW OF EUT (Port)



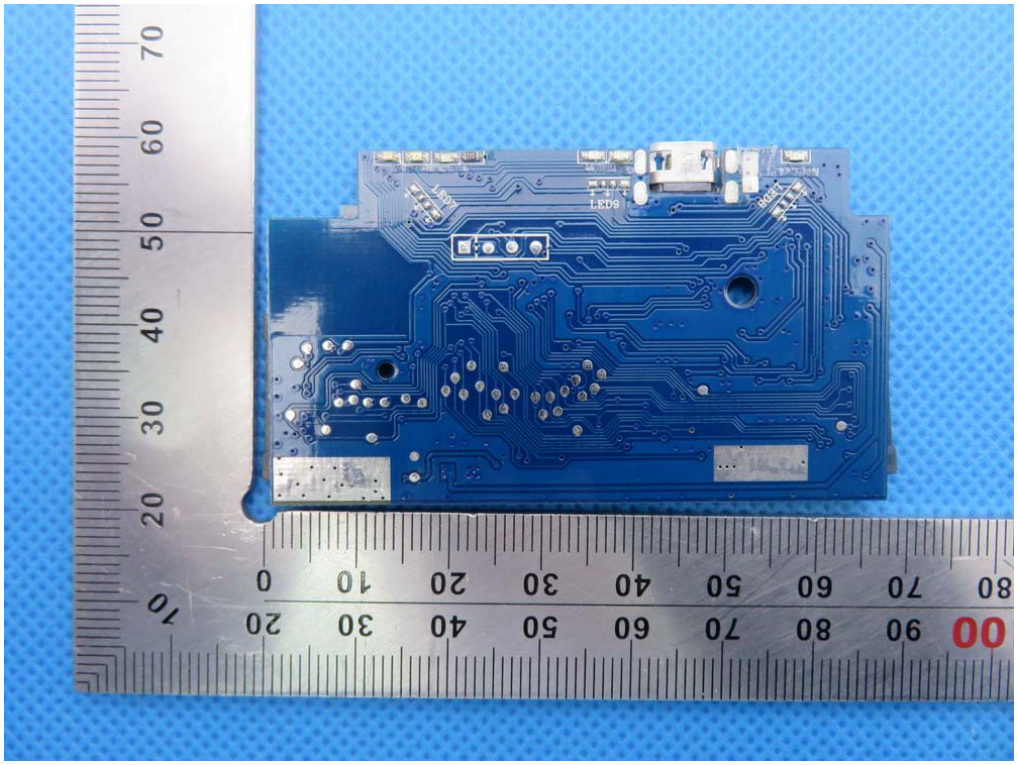
OPEN VIEW OF EUT



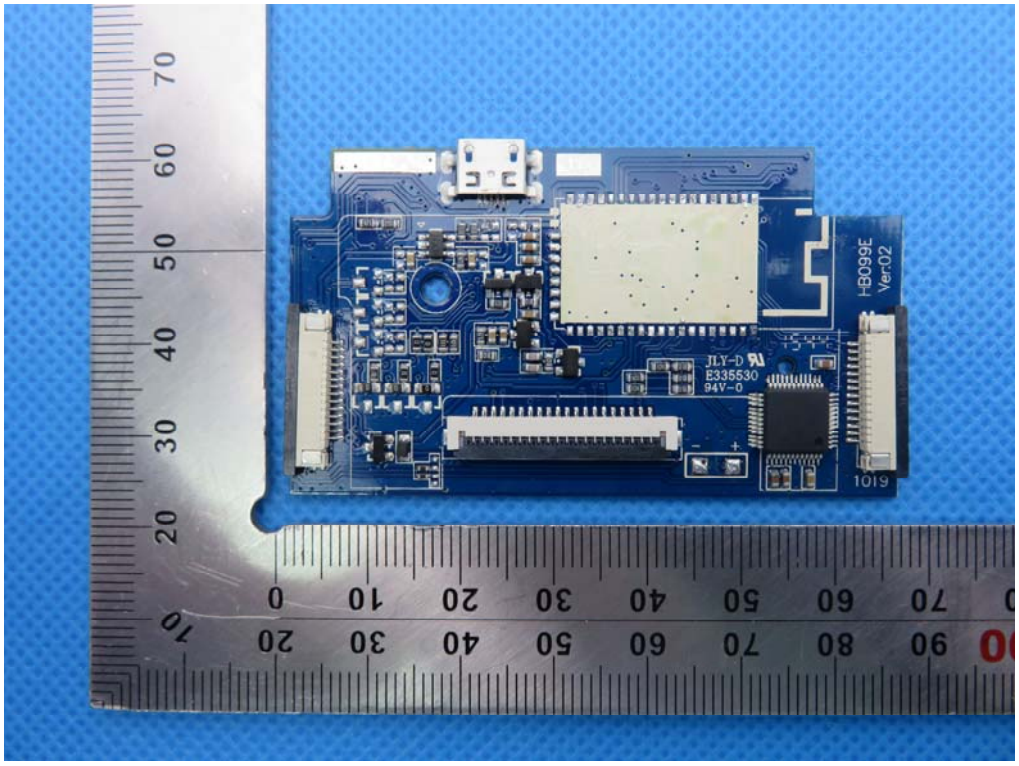
INTERNAL VIEW OF EUT-1



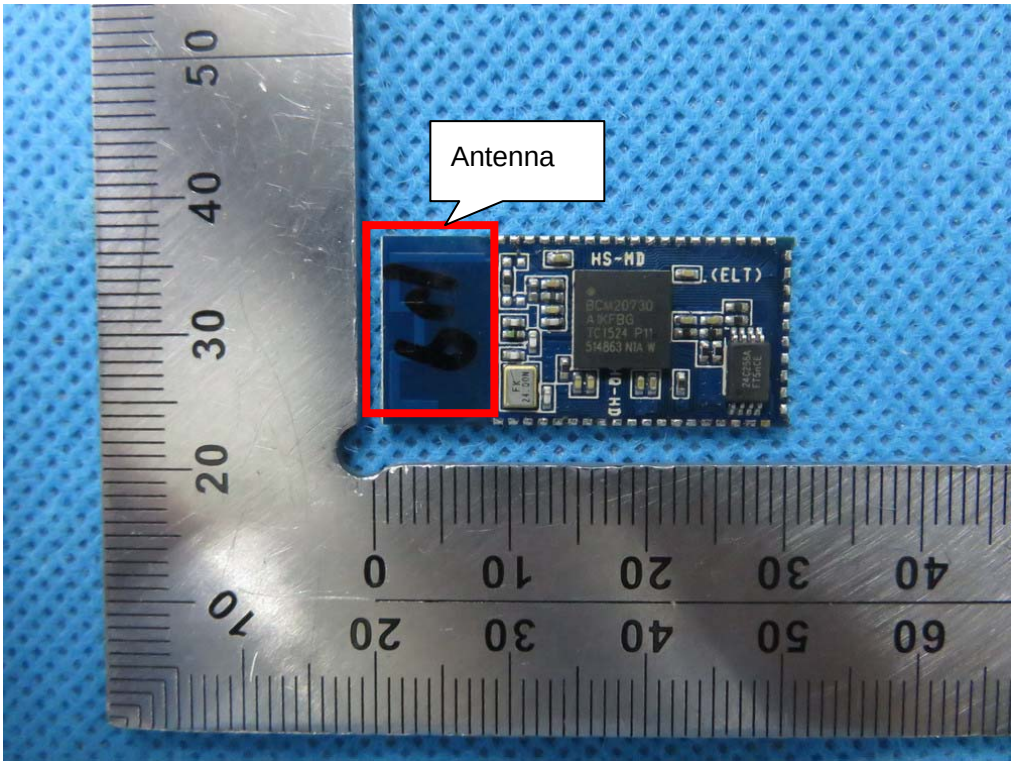
INTERNAL VIEW OF EUT-2



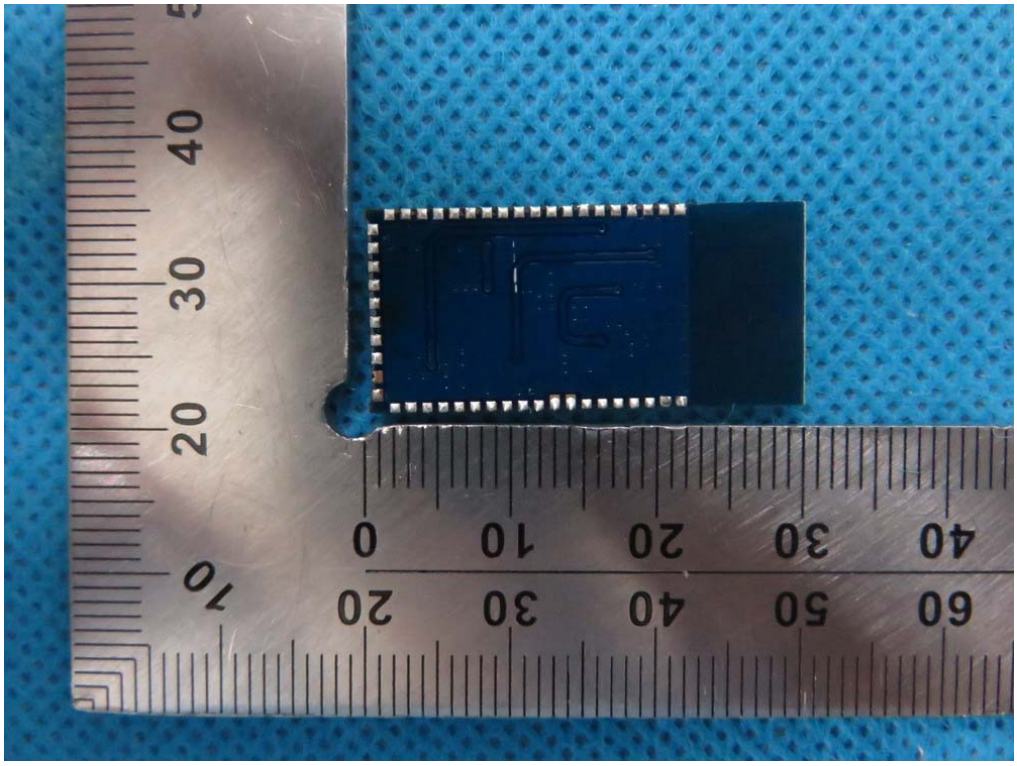
INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



INTERNAL VIEW OF EUT-5



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