FCC Test Report

Report No.: AGC01680170512FE01

FCC ID		2AKHJHD192-1
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Bluetooth+2.4G Dongle
BRAND NAME	:	N/A
MODEL NAME	:	HD192-1, HD193-1
CLIENT	:	Shenzhen Hangshi Technology Co., Ltd
DATE OF ISSUE	:	Jul. 08, 2017
STANDARD(S)	:	FCC Part 15 Subpart B
REPORT VERSION	:	V1.0

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

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 08, 2017	Valid	Original Report

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY

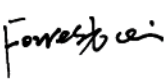
Applicant	Shenzhen Hangshi Technology Co., Ltd
Address	Hangshi Technology Park, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China
Manufacturer	Shenzhen Hangshi Technology Co., Ltd
Address	Hangshi Technology Park, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China
Product Designation	Bluetooth+2.4G Dongle
Brand Name	N/A
Test Model	HD192-1
Series Model	HD193-1
Difference description	All the same except for the appearance shape.
Date of test	Jun. 26, 2017 to Jun. 29, 2017
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-IT/AC

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 C63.4:2014. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

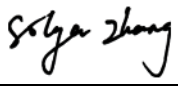
The test results of this report relate only to the tested sample identified in this report.

Tested By 

Time Huang(Huang Nanhui) Jun. 29, 2017

Reviewed By 

Forrest Lei(Lei Yonggang) Jul. 08, 2017

Approved By 

Solger Zhang(Zhang Hongyi) Jul. 08, 2017
Authorized Officer

2. SYSTEM DESCRIPTION

EUT set up procedure:

1. Connect the EUT to PC .
2. Make sure the EUT operates normally during the test.

Test Mode

TEST MODE DESCRIPTION		
NO.	**TEST MODE DESCRIPTION**	**WORST**
1	Data Transmission	V
Note: V means EMI worst mode		

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in Measurement” (GUM) published by ISO.

Conducted measurement: +/- 2.75dB

Radiated measurement: +/- 3.2dB

Summary Of Test Results

FCC Rules	Description Of Test	Result
§15.107	Conduction Emission	Compliant
§15.109	Radiated Emission	Compliant

4. PRODUCT INFORMATION

Housing Type	Plastic and metal
Voltage	DC 5V by USB

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

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
USB Port	1	0	1

5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Power Cable
PC	SONY	E1412AYCW	A.E	N/A
PC Adapter	SONY	VGP-AC19V36	A.E	3m unshielded

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

6. TEST FACILITY

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D, Baoding Technology Park, Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,
FCC Registration No.	371540
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2014.

7. TEST EQUIPMENT LIST

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, 2016	July 3, 2017
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2016	July 3, 2017
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2016	July 3, 2017
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2016	July 3, 2017
MULTI-DEVICE Positioning Controller	MAX-FULL	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	SCHWARZBECK	FMZB1519	1519-038	June 6, 2017	June 5, 2018
Spectrum analyzer	AGILENT	E4407B	MY46185649	June 6, 2017	June 5, 2018
Radiation Cable 1	MXT	RS1	R005	June 6, 2017	June 5, 2018
Radiation Cable 2	MXT	RS1	R006	June 6, 2017	June 5, 2018
temporary antenna connector	N/A	S100	--	July 4, 2016	July 3, 2017

FOR RADIATED EMISSION TEST (1GHz ABOVE)

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, 2016	July 3, 2017
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2016	July 10, 2017
Spectrum Analyzer	AGILENT	E4411B	MY4511453	July 4, 2016	July 3, 2017
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 7, 2016	July 6, 2017
RF Cable	SCHWARZBECK	AK9515H	96220	July 8, 2016	July 7, 2017
MULTI-DEVICE Positioning Controller	MAX-FULL	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	SCHWARZBECK	BBHA 9170	9170-181	June 6, 2017	June 5, 2018
Radiation Cable 1	MXT	RS1	R005	June 6, 2017	June 5, 2018
Radiation Cable 2	MXT	RS1	R006	June 6, 2017	June 5, 2018

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, 2016	July 3, 2017
Artificial Mains Network	NARDA	L2-16B	000WX31025	July 8, 2016	July 7, 2017
Artificial Mains Network (AUX)	NARDA	L2-16B	000WX31026	July 8, 2016	July 7, 2017
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2016	July 3, 2017
Shielded Room	CHENGYU	843	PTS-002	June 6, 2017	June 5, 2018
Conduction Cable	MXT	SE1	S003	June 6, 2017	June 5, 2018

8. FCCLINE CONDUCTED EMISSION TEST

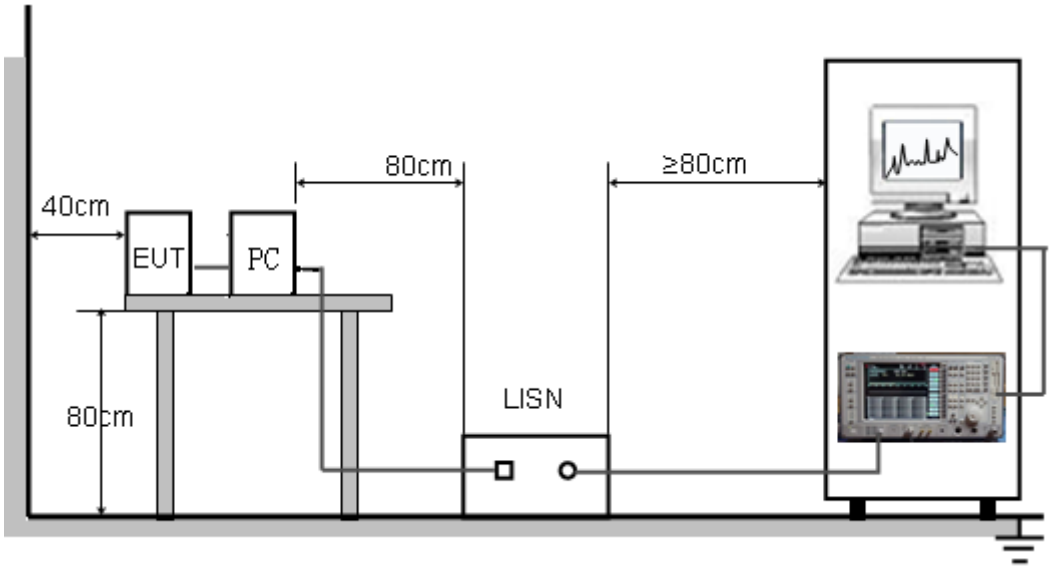
8.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

8.2. BLOCK DIAGRAM OF TEST SETUP



8.3. 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 voltage by PC which receive AC120V/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.

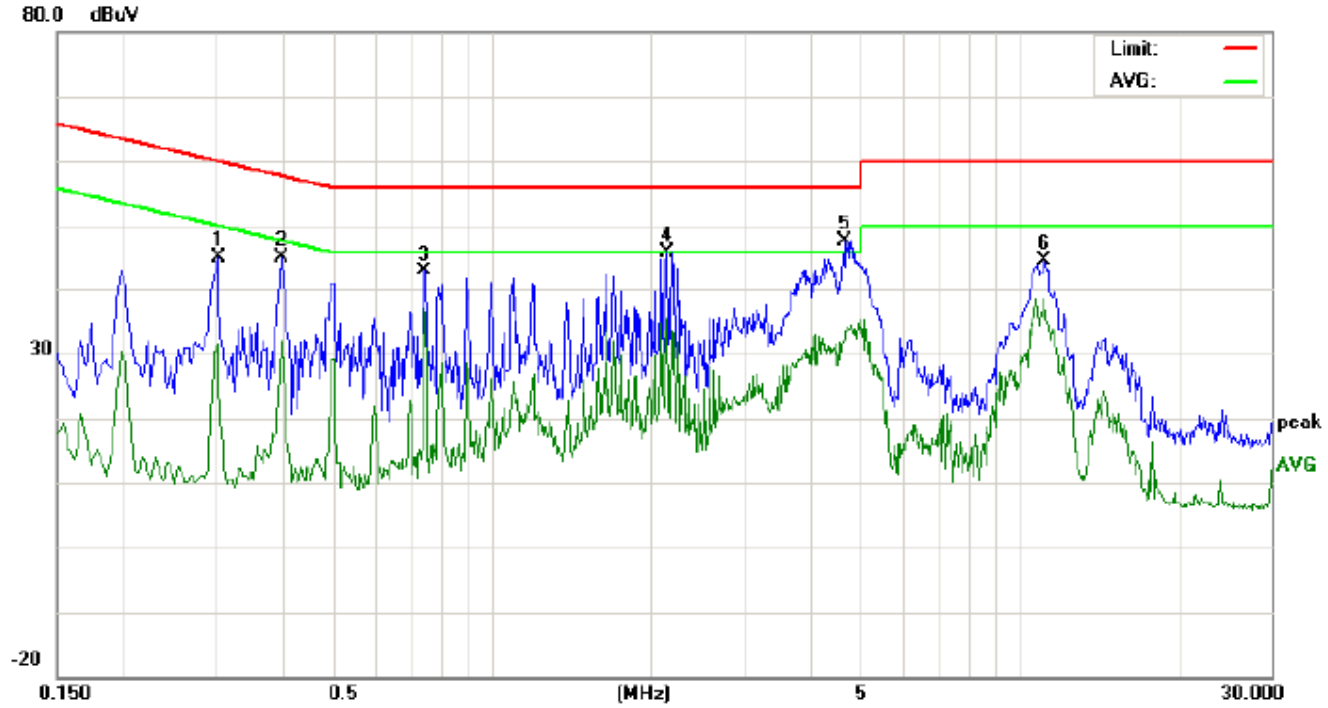
(8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.

(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.

8.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



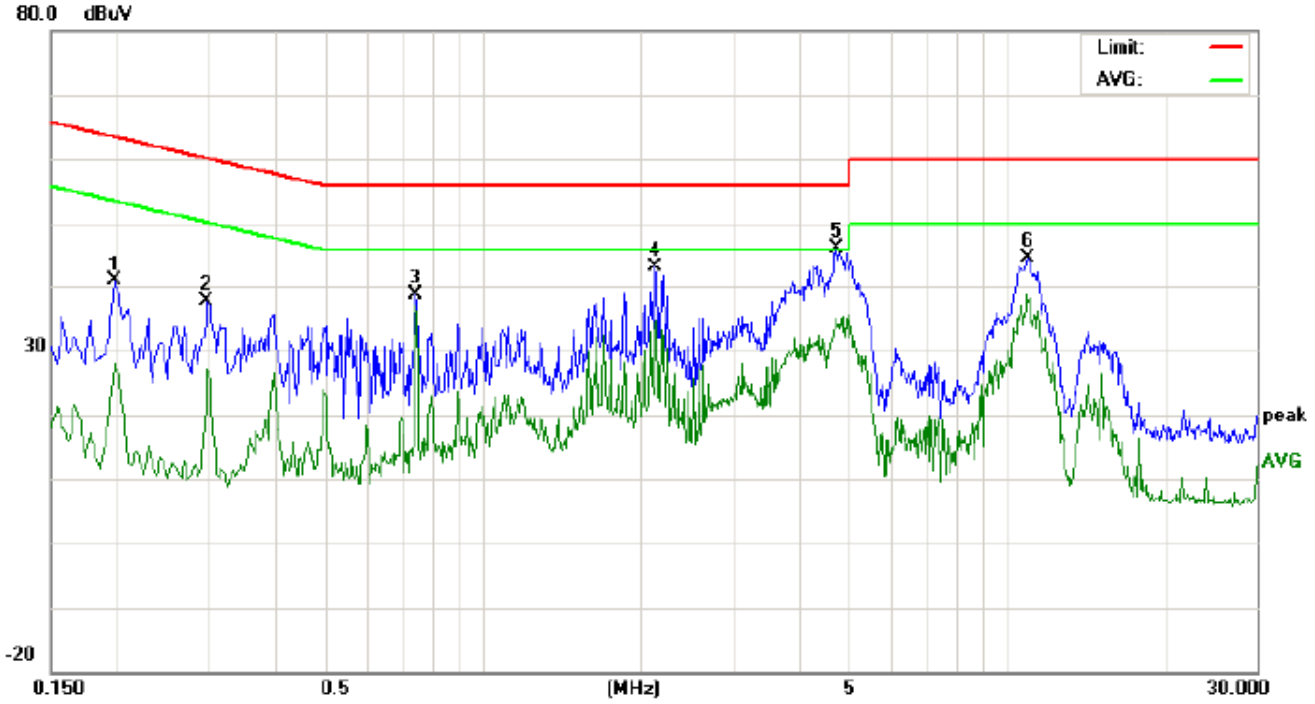
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth +2.4G Dongle
M/N: D192-1
Mode: Data Transmission
Note:

Phase: *L1*
Power:

Temperature: 26
Humidity: 60 %

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	0.3020	34.93		21.07	10.29	45.22		31.36	60.19	50.19	-14.97	-18.83	P	
2	0.3980	34.73		21.52	10.33	45.06		31.85	57.89	47.89	-12.83	-16.04	P	
3	0.7460	32.67		26.65	10.32	42.99		36.97	56.00	46.00	-13.01	-9.03	P	
4	2.1460	35.52		25.13	10.28	45.80		35.41	56.00	46.00	-10.20	-10.59	P	
5	4.6740	37.33		23.13	10.22	47.55		33.35	56.00	46.00	-8.45	-12.65	P	
6	11.1660	34.43		28.29	10.11	44.54		38.40	60.00	50.00	-15.46	-11.60	P	

LINE CONDUCTED EMISSION TEST-N



Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: Bluetooth +2.4G Dongle
M/N: HD192-1
Mode: Data Transmission
Note:

Phase: *N*
Power:

Temperature: 26
Humidity: 60 %

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	30.72		17.68	10.21	40.93		27.89	63.69	53.69	-22.76	-25.80	P	
2	0.2980	27.25		16.88	10.29	37.54		27.17	60.30	50.30	-22.76	-23.13	P	
3	0.7460	28.32		26.50	10.32	38.64		36.82	56.00	46.00	-17.36	-9.18	P	
4	2.1420	32.92		23.85	10.28	43.20		34.13	56.00	46.00	-12.80	-11.87	P	
5	4.7340	35.86		24.59	10.22	46.08		34.81	56.00	46.00	-9.92	-11.19	P	
6	10.9940	34.64		27.63	10.10	44.74		37.73	60.00	50.00	-15.26	-12.27	P	

RESULT: PASS

9. FCC RADIATED EMISSION TEST

9.1. 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
960~1000	3	54.0

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

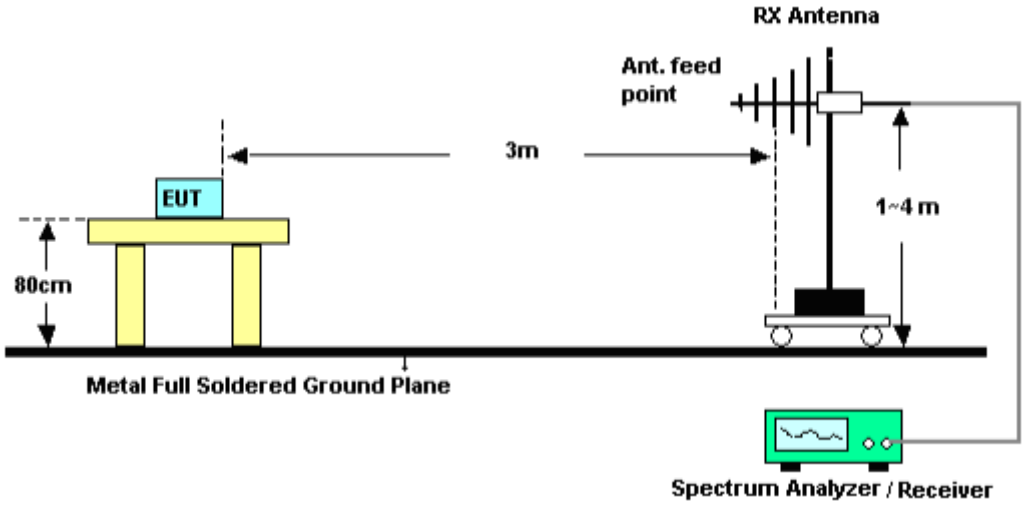
9.1.1 The following table is the setting of spectrum analyzer and receiver:

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~13GHz RBW 1MHz/ VBW 3MHz for Peak, RBW 1MHz/VBW 10Hz for Average

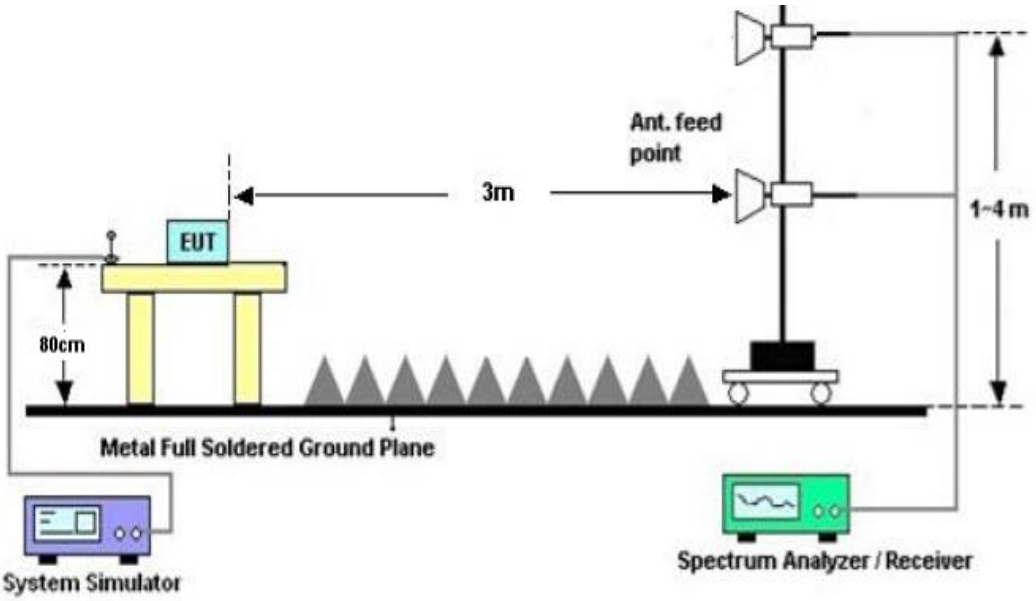
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

9.2. BLOCK DIAGRAM OF TEST SETUP

RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz

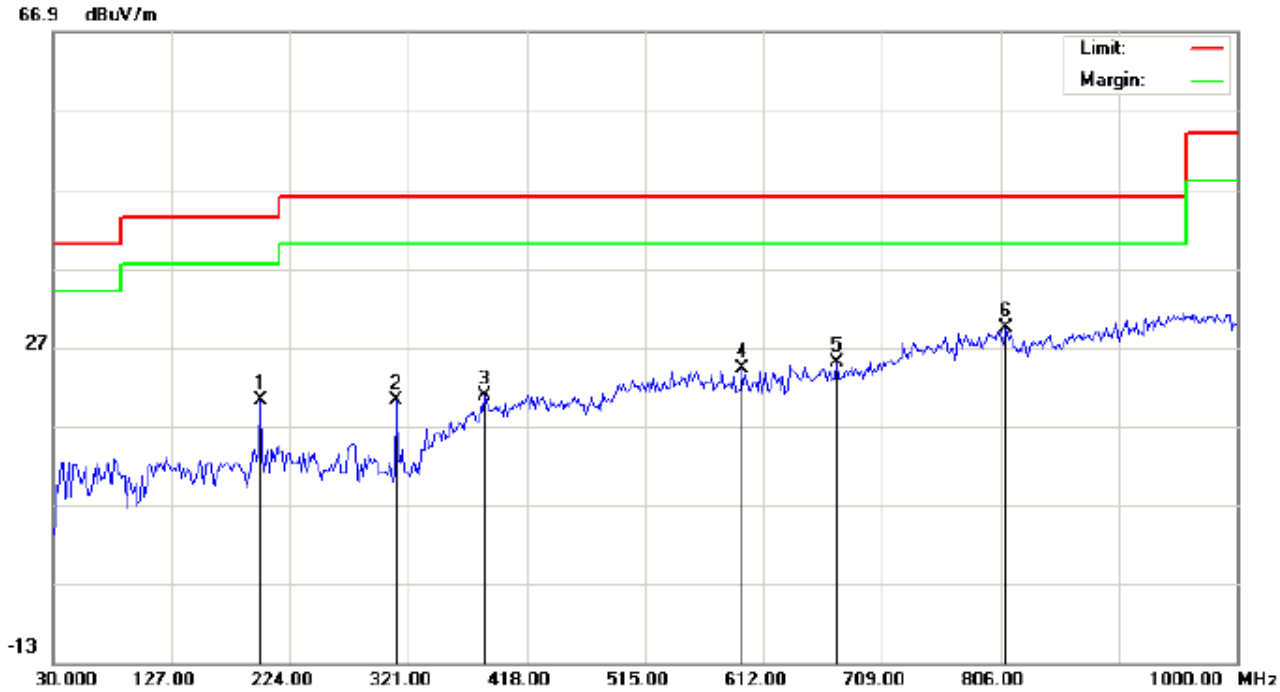


9.3. PROCEDURE OF RADIATED EMISSION TEST

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.

9.4. TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance(Below 1G)-Horizontal



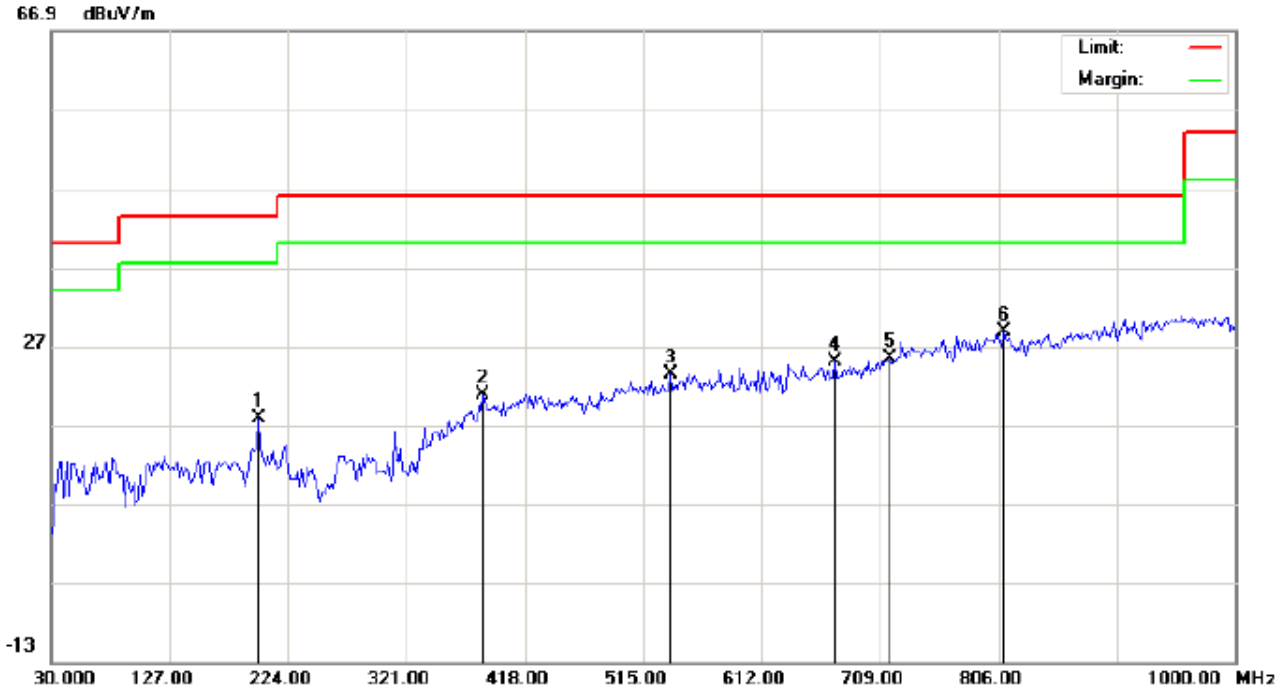
Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth +2.4G Dongle
M/N: HD192-1
Mode: Data Transmission
Note:

Polarization: *Horizontal*
Power:
Distance:

Temperature: 22.4
Humidity: 52.5 %

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		199.7500	8.22	11.99	20.21	43.50	-23.29	peak			
2		311.3000	4.06	16.16	20.22	46.00	-25.78	peak			
3		384.0500	1.91	18.96	20.87	46.00	-25.13	peak			
4		594.2166	0.66	23.59	24.25	46.00	-21.75	peak			
5		671.8167	0.54	24.43	24.97	46.00	-21.03	peak			
6	*	810.8500	2.06	27.32	29.38	46.00	-16.62	peak			

Radiated Emission Test at 3m Distance(Below 1G)-Vertical



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: Bluetooth +2.4G Dongle
M/N: HD192-1
Mode: Data Transmission
Note:

Polarization: *Vertical*
Power:
Distance:

Temperature: 22.4
Humidity: 52.5 %

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		199.7500	5.72	11.99	17.71	43.50	-25.79	peak			
2		384.0500	1.91	18.96	20.87	46.00	-25.13	peak			
3		537.6333	1.19	22.15	23.34	46.00	-22.66	peak			
4		671.8167	0.54	24.43	24.97	46.00	-21.03	peak			
5		717.0833	-0.27	25.68	25.41	46.00	-20.59	peak			
6	*	810.8500	1.56	27.32	28.88	46.00	-17.12	peak			

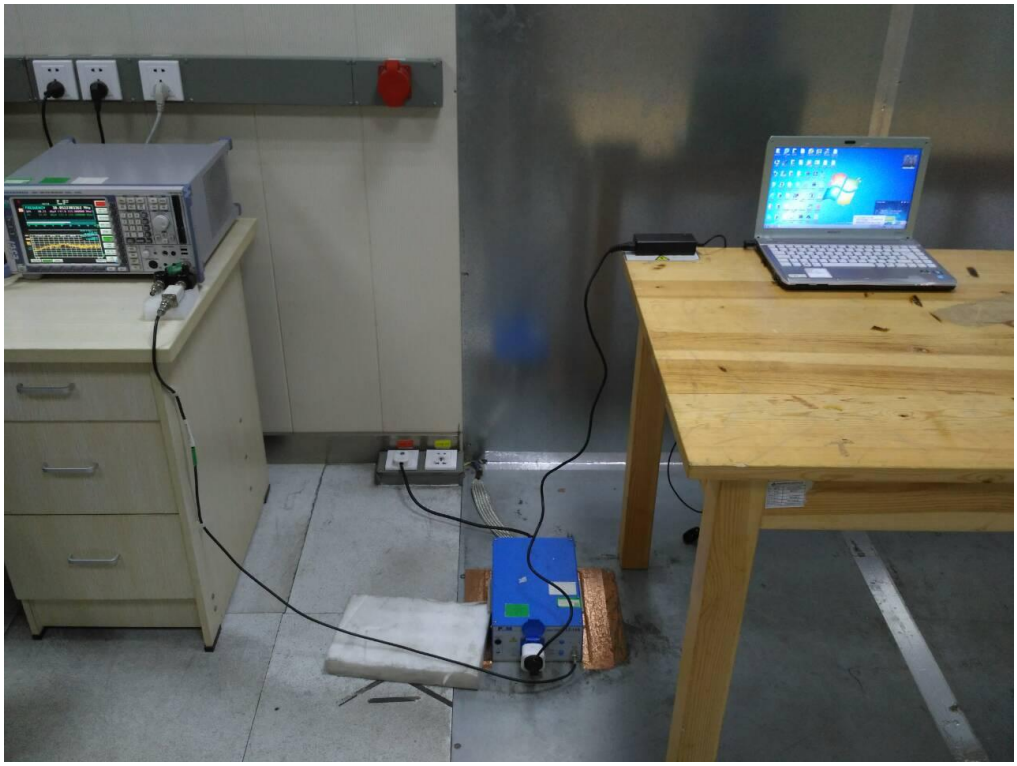
RESULT: PASS

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

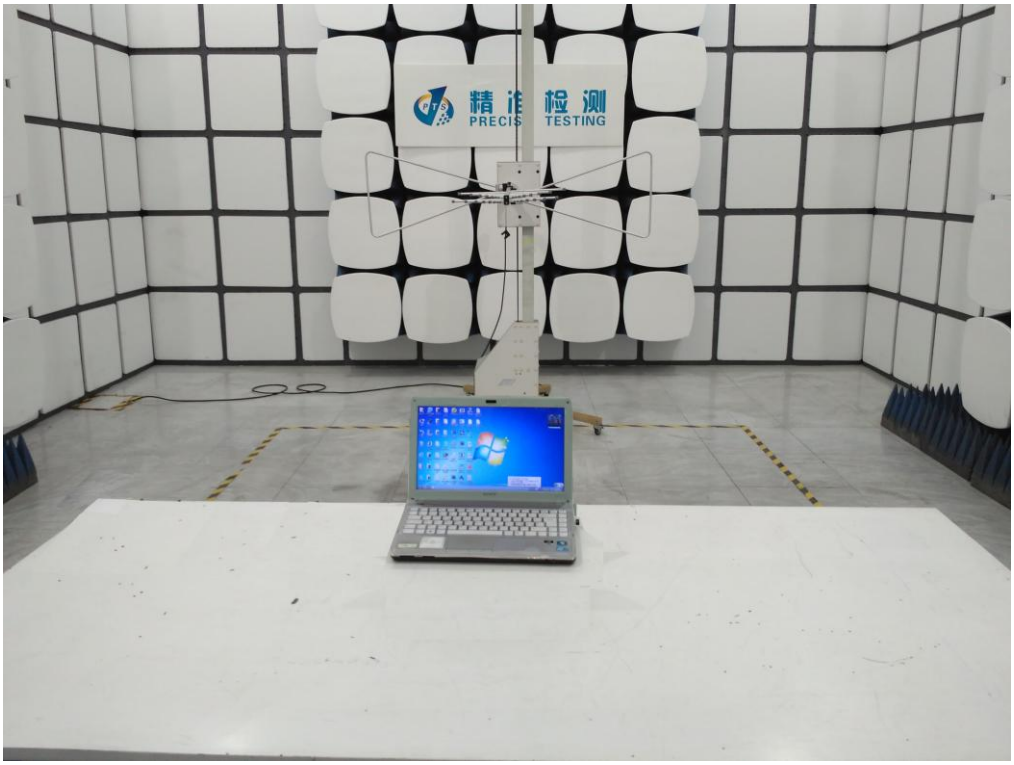
1~13GHz at least have 20dB margin. No recording in the test report.

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

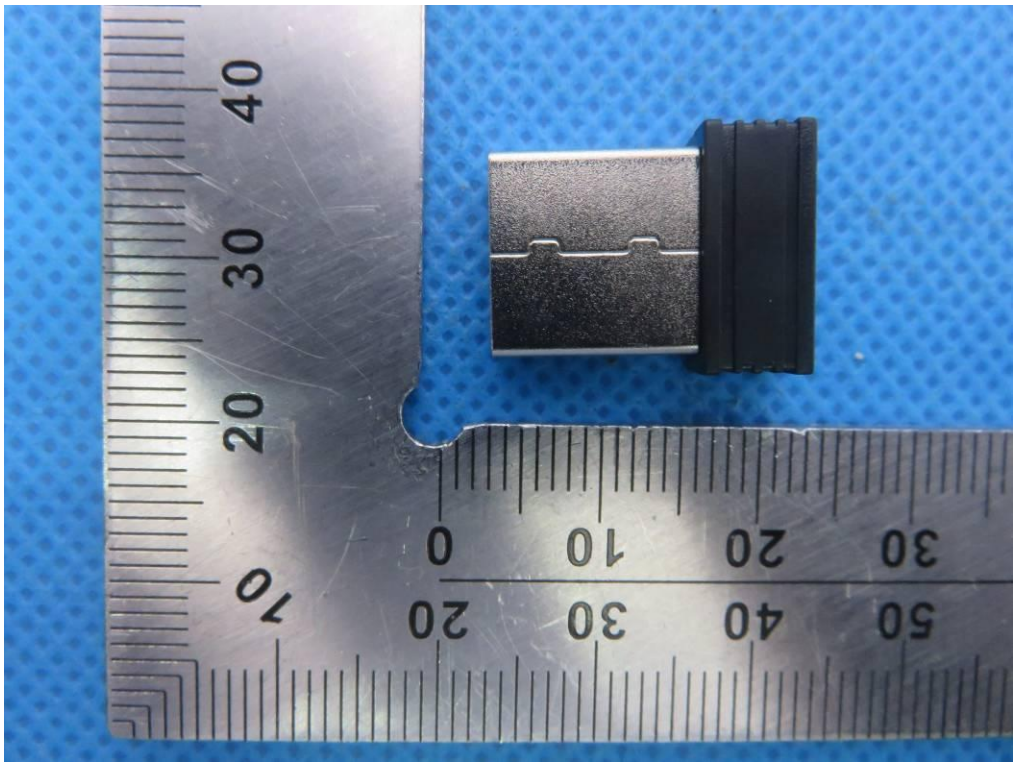


FCC RADIATED EMISSION TEST SETUP

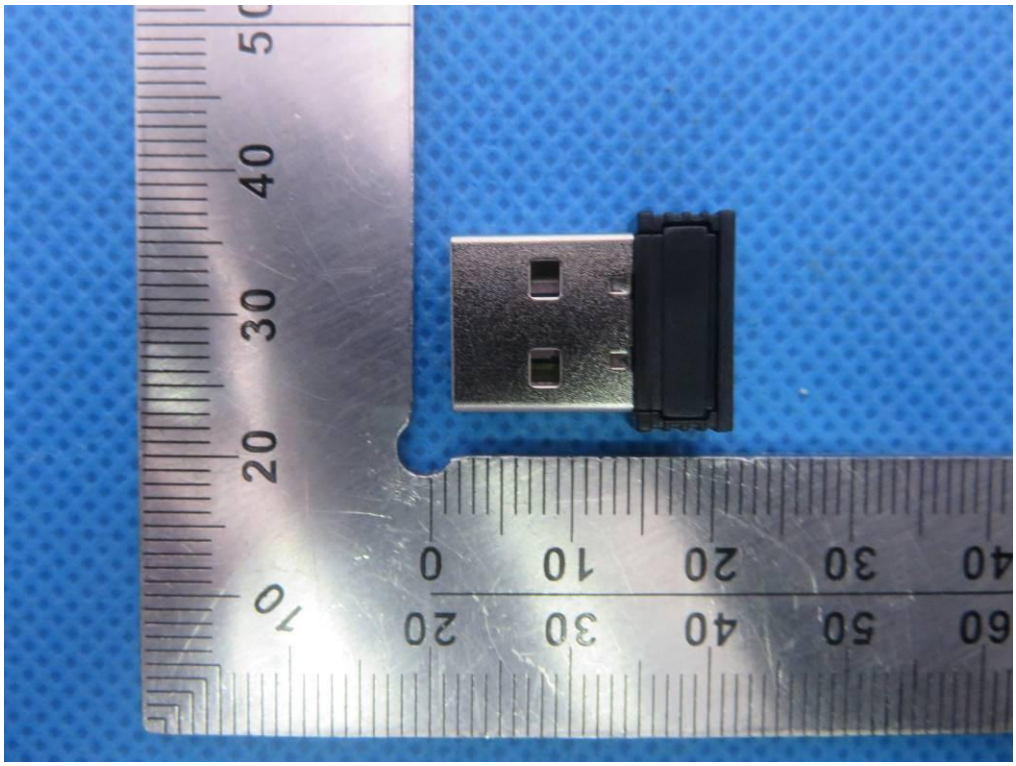


APPENDIX B: PHOTOGRAPHS OF EUT

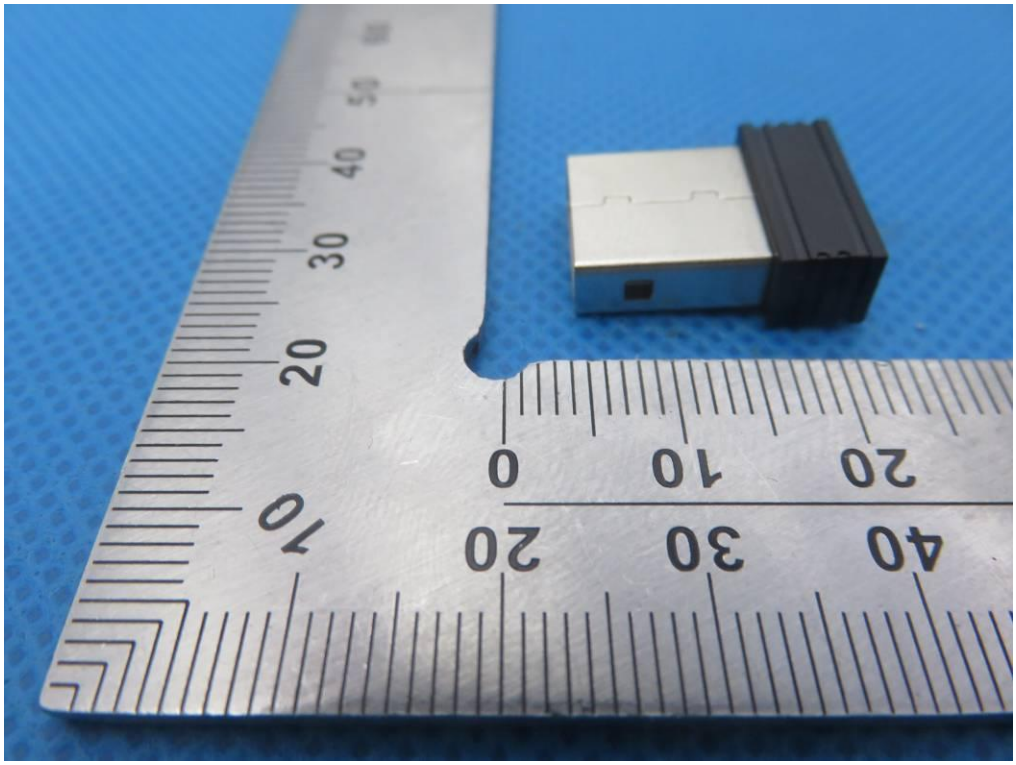
TOP VIEW OF EUT



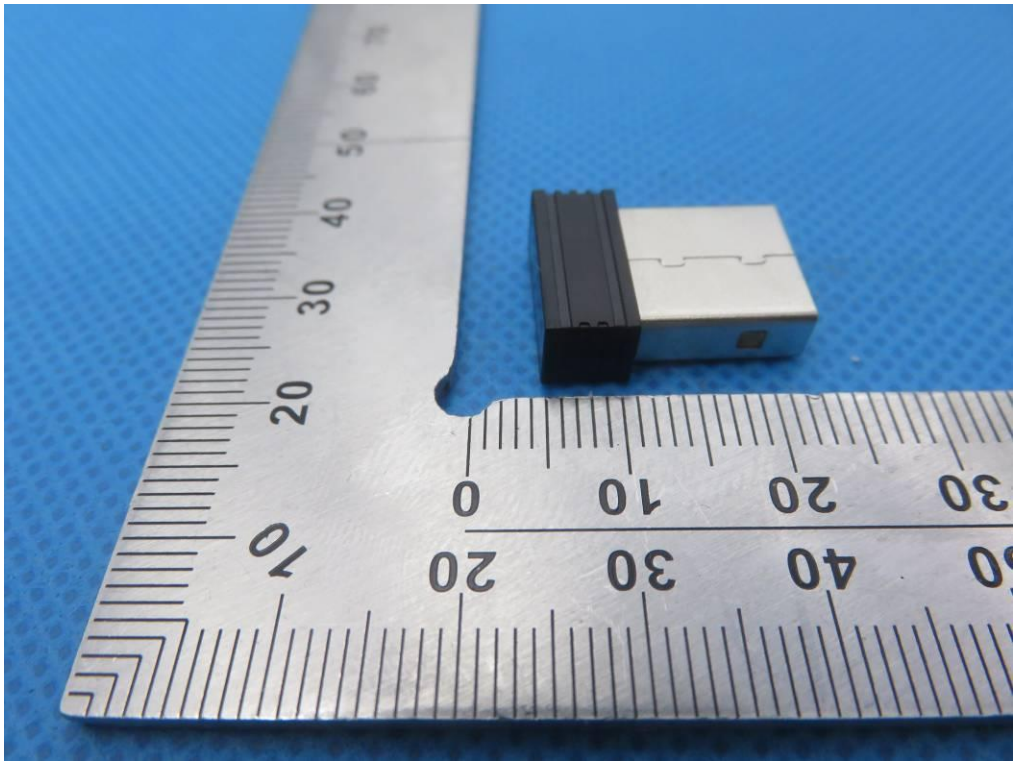
BOTTOM VIEW OF EUT



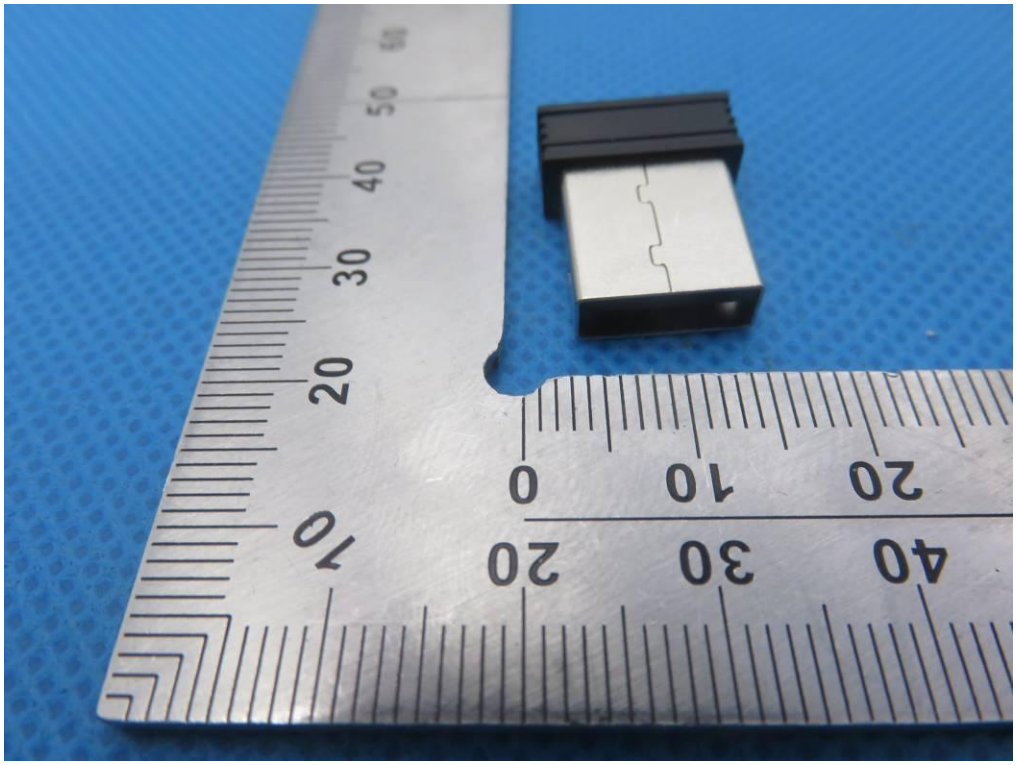
FRONT VIEW OF EUT



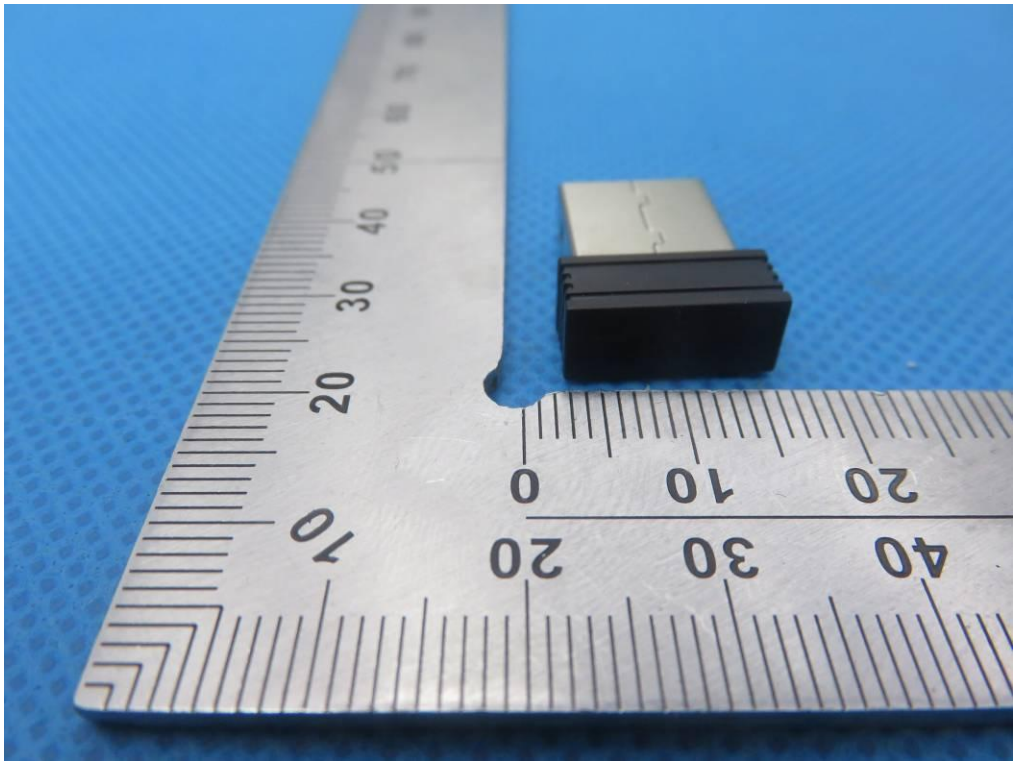
BACK VIEW OF EUT



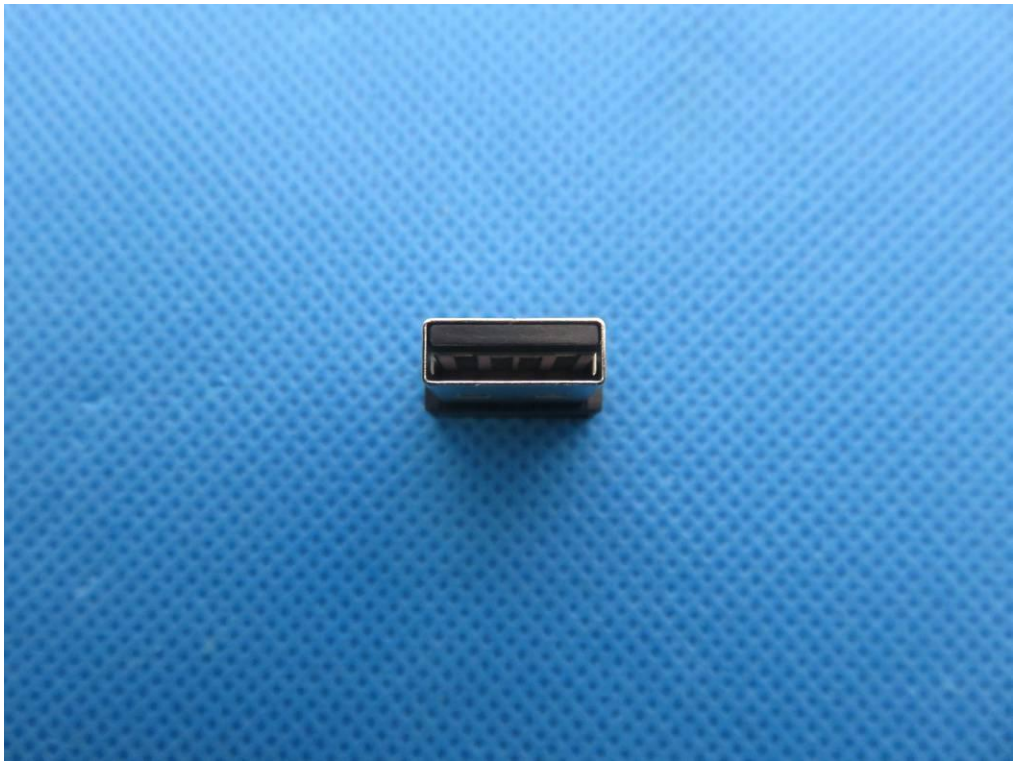
LEFT VIEW OF EUT



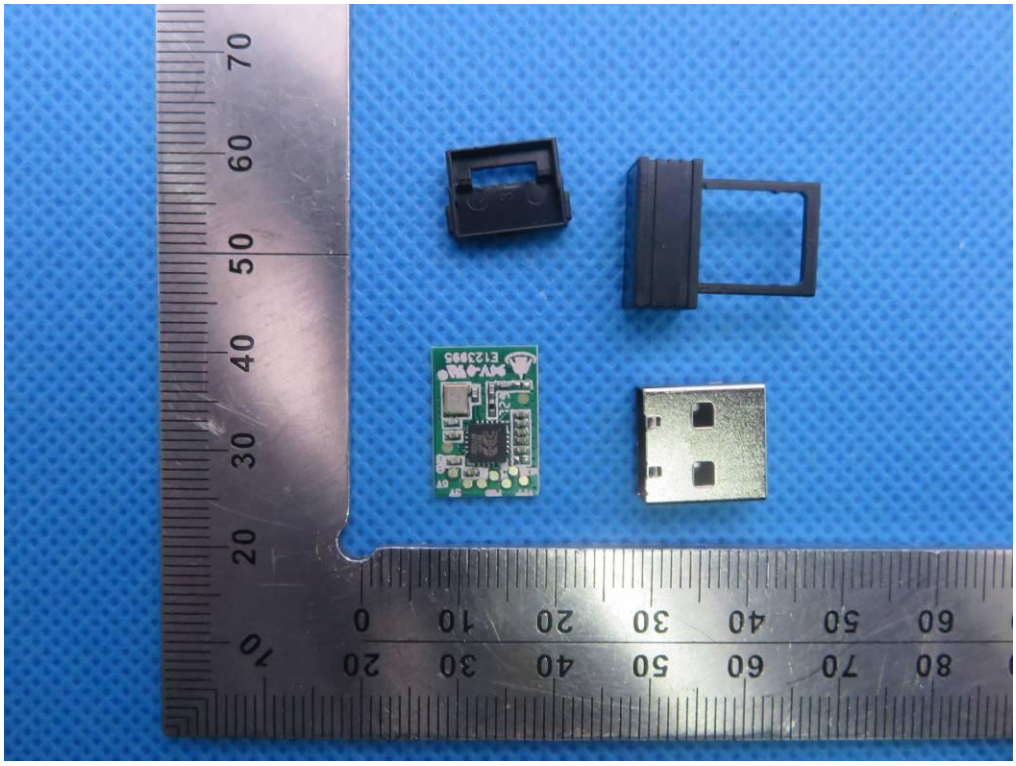
RIGHT VIEW OF EUT



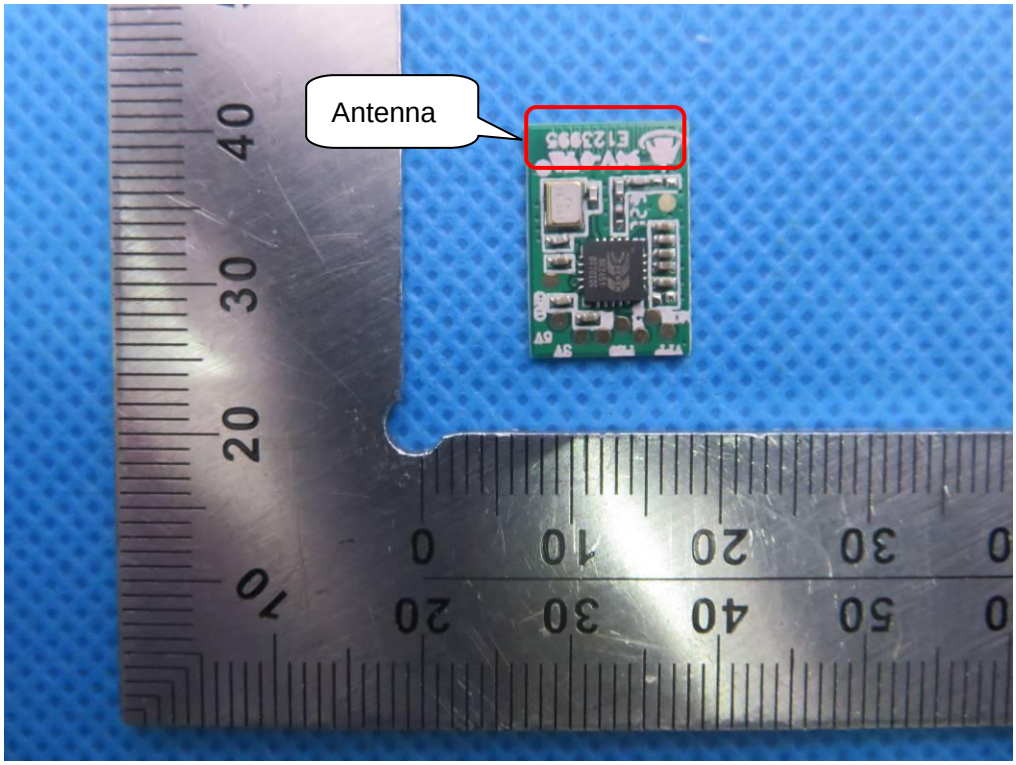
VIEW OF EUT (PORT)



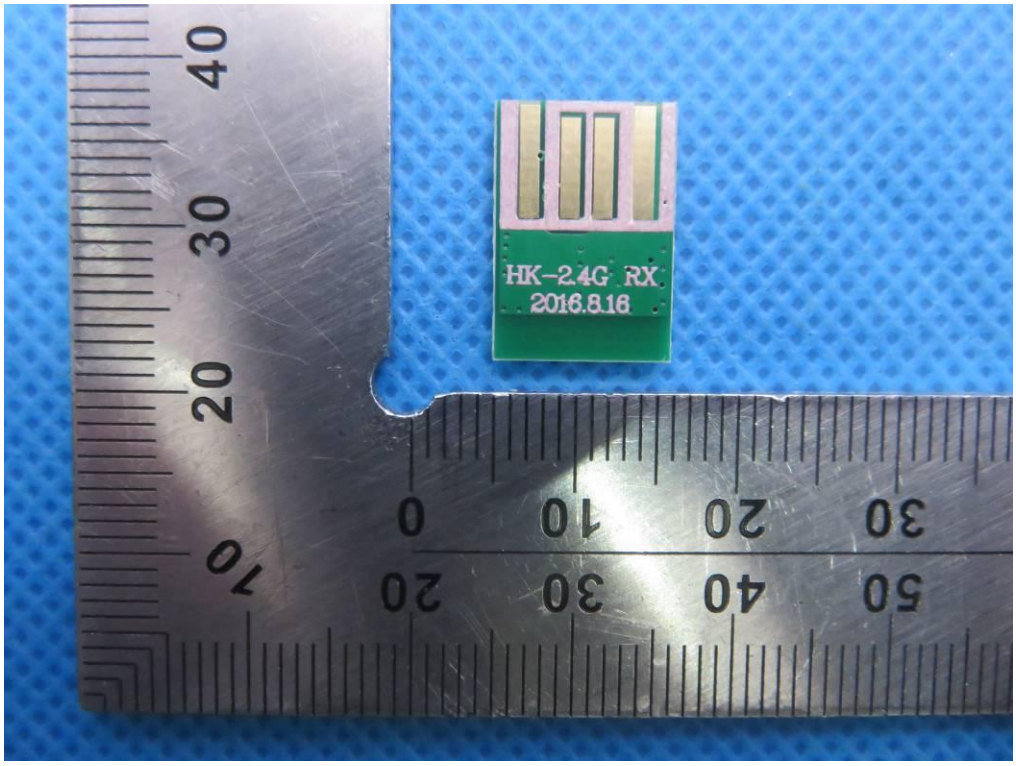
OPEN VIEW OF EUT



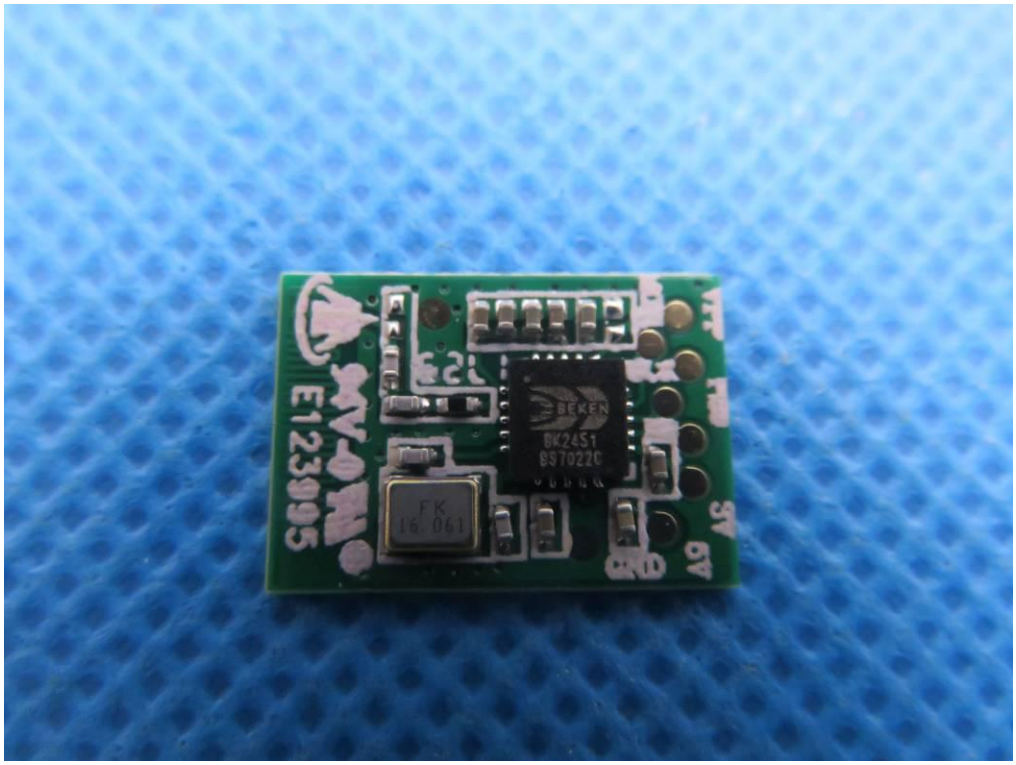
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



----END OF REPORT----