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Report Template Version: V03
Report Template Revision Date: Mar.1st, 2017

FCC Test Report

Report No. :	CQASZ20181000069E-01
Applicant:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Applicant:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China
Manufacturer:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Manufacturer:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China
Factory:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Factory:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China

Equipment Under Test (EUT):

Product:	Remote control
Model No.:	HCY-63A
Brand Name:	N/A
FCC ID:	2AOBUHCY-63A
Standards:	47 CFR Part 15, Subpart C
Date of Test:	2018-10-25 to 2018-11-10
Date of Issue:	2018-11-10
Test Result :	**PASS***

Tested By: Tiny You

(Tiny You)

Reviewed By: Aaron Ma

(Aaron Ma)

Approved By:

(Jack Ai)

SHENZHEN HUAXIA TESTING TECHNOLOGY CO., LTD
华夏准测
APPROVED

* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20181000069E-01	Rev.01	Initial report	2018-11-10

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2013)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS

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4 General Information

4.1 Client Information

Applicant:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Applicant:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China
Manufacturer:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Manufacturer:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China
Factory:	Shenzhen HCY Electrics and Technology Co., Ltd
Address of Factory:	The 1st building , No 2 Gangbei Road, Bogang Village Shajing Town, Baoan, Shenzhen, China

4.2 General Description of EUT

Name:	Remote control
Model No.:	HCY-63A
Trade Mark :	N/A
Hardware Version:	V1.0
Software Version:	V11
Frequency Range:	2430MHz
Modulation Type:	GFSK
Number of Channels:	1 (declared by the client)
Sample Type:	Portable production
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Power Supply:	Battery, DC3.7V, charge by USB

4.3 Test Environment and Mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar
Test Mode:	Use test software (RF test) to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
Adapter	Samsung	EP-TA50CBC	Provide by lab	Verification

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 **Shenzhen Huaxia Testing Technology Co., Ltd** 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.

Hereafter the best measurement capability for **CQA** laboratory is reported:

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	±5.12dB	(1)
Radiated Emission	Above 1GHz	±4.60dB	(1)
Conducted Disturbance	0.15~30MHz	±3.34dB	(1)

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

4.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.7 Test Facility

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

- **CNAS (No. CNAS L5785)**

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **ISED Registration No.: 22984-1**

The 3m Semi-anechoic chamber of Shenzhen Huaxia Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

- **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen 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.:522263

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Other Information Requested by the Customer

None.

4.11 Equipment List

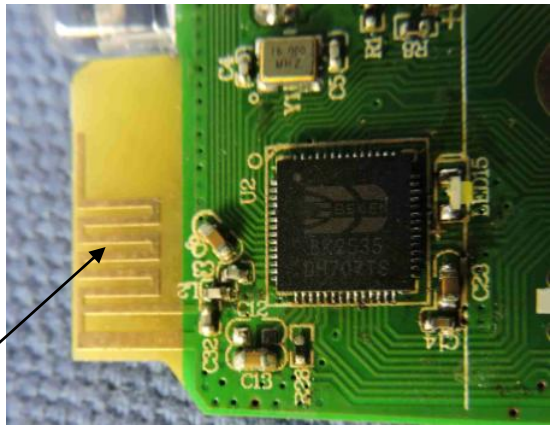
Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/26	2019/9/25
Spectrum analyzer	R&S	FSU26	CQA-038	2018/10/28	2019/10/27
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2018/9/26	2019/9/25
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2018/11/2	2019/11/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2018/9/26	2020/9/25
Bilog Antenna	R&S	HL562	CQA-011	2018/9/26	2020/9/25
Horn Antenna	R&S	HF906	CQA-012	2018/9/26	2020/9/25
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2018/9/26	2020/9/25
Coaxial Cable (Above 1GHz)	CQA	N/A	C019	2018/9/26	2019/9/25
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2018/9/26	2019/9/25
Antenna Connector	CQA	RFC-01	CQA-080	2018/9/26	2019/9/25
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2018/9/26	2019/9/25
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2018/9/26	2019/9/25
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2018/9/26	2019/9/25
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2018/9/26	2019/9/25
EMI Test Receiver	R&S	ESPI3	CQA-013	2018/9/26	2019/9/25
LISN	R&S	ENV216	CQA-003	2018/11/5	2019/11/4
Coaxial cable (9KHz~300MHz)	CQA	N/A	CQA-C009	2018/9/26	2019/9/25

Note:

The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

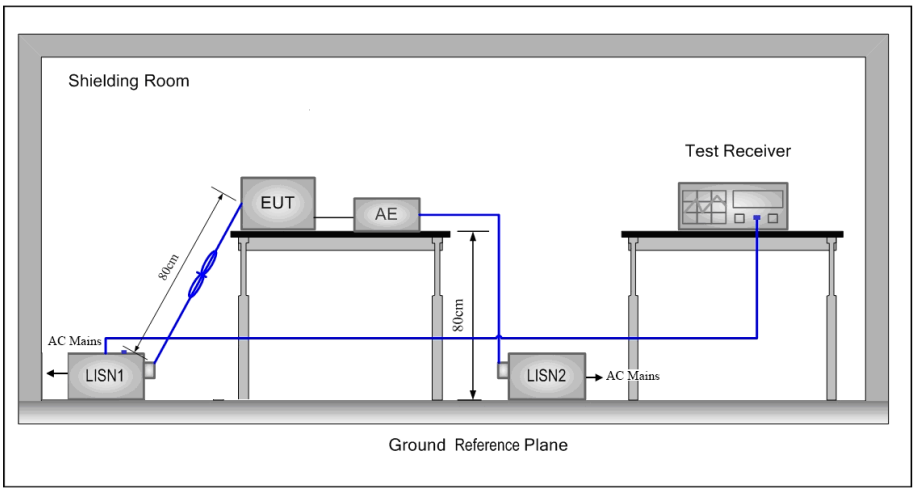
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.	

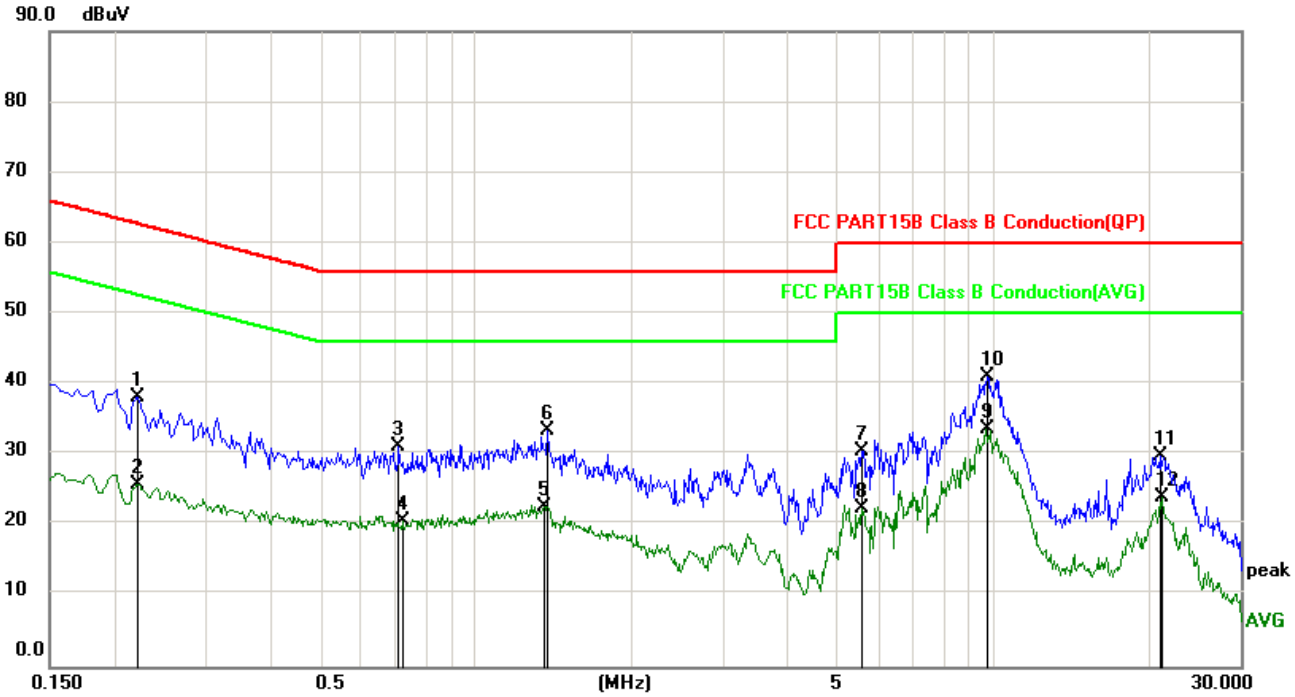
5.2 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>47 CFR Part 15C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Test Frequency Range:</td><td>150kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test Procedure:</td><td>1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</td></tr>
</table>

Test Setup:	
Test Mode:	Transmitting mode.
Test Voltage:	AC120V/60Hz
Test Results:	Pass

Measurement Data

Live Line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2220	28.45	9.74	38.19	62.74	-24.55	peak	
2		0.2220	16.12	9.74	25.86	52.74	-26.88	AVG	
3		0.7100	21.41	9.74	31.15	56.00	-24.85	peak	
4		0.7220	10.89	9.74	20.63	46.00	-25.37	AVG	
5		1.3540	12.93	9.75	22.68	46.00	-23.32	AVG	
6		1.3779	23.56	9.75	33.31	56.00	-22.69	peak	
7		5.5900	20.67	9.79	30.46	60.00	-29.54	peak	
8		5.5900	12.67	9.79	22.46	50.00	-27.54	AVG	
9	*	9.7020	23.91	9.81	33.72	50.00	-16.28	AVG	
10		9.7420	31.36	9.81	41.17	60.00	-18.83	peak	
11		21.0140	19.96	9.88	29.84	60.00	-30.16	peak	
12		21.1780	14.16	9.88	24.04	50.00	-25.96	AVG	

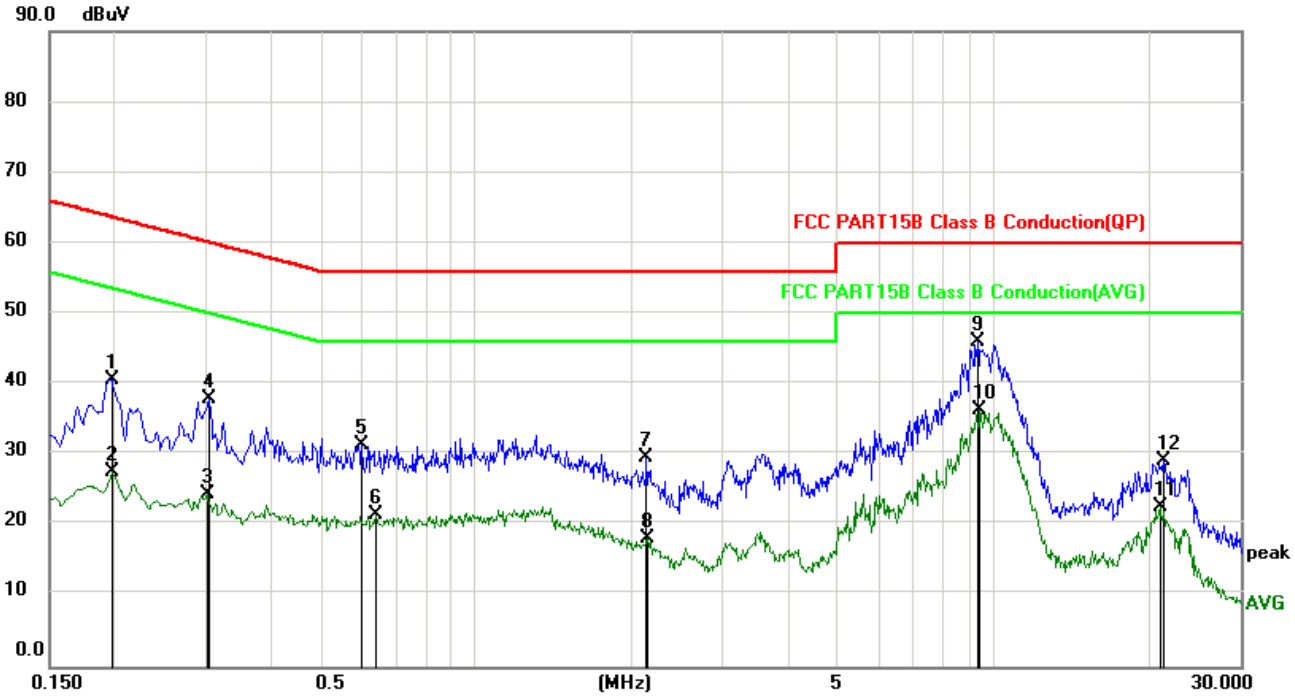
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral Line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1980	30.80	9.80	40.60	63.69	-23.09	peak	
2		0.1980	17.70	9.80	27.50	53.69	-26.19	AVG	
3		0.3020	14.57	9.80	24.37	50.19	-25.82	AVG	
4		0.3060	28.05	9.80	37.85	60.08	-22.23	peak	
5		0.6020	21.54	9.80	31.34	56.00	-24.66	peak	
6		0.6419	11.59	9.80	21.39	46.00	-24.61	AVG	
7		2.1380	19.80	9.88	29.68	56.00	-26.32	peak	
8		2.1500	8.14	9.87	18.01	46.00	-27.99	AVG	
9		9.3340	36.14	9.87	46.01	60.00	-13.99	peak	
10	*	9.4300	26.40	9.87	36.27	50.00	-13.73	AVG	
11		20.9700	12.80	9.90	22.70	50.00	-27.30	AVG	
12		21.3620	19.27	9.91	29.18	60.00	-30.82	peak	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

3. If the Peak value under Average limit, the Average value is not recorded in the report.

5.3 Radiated Emission

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209 and 15.205
Test Method:	ANSI C63.10: 2013
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Note: For fundamental frequency, RBW=5MHz, VBW=5MHz, Peak detector is for PK value, RMS detector is for Average value.

Limit:
(Spurious Emissions and band edge)

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 1) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

2) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Limit:
(Field strength of the fundamental signal)

Frequency	Limit (dBuV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

Test Setup:	

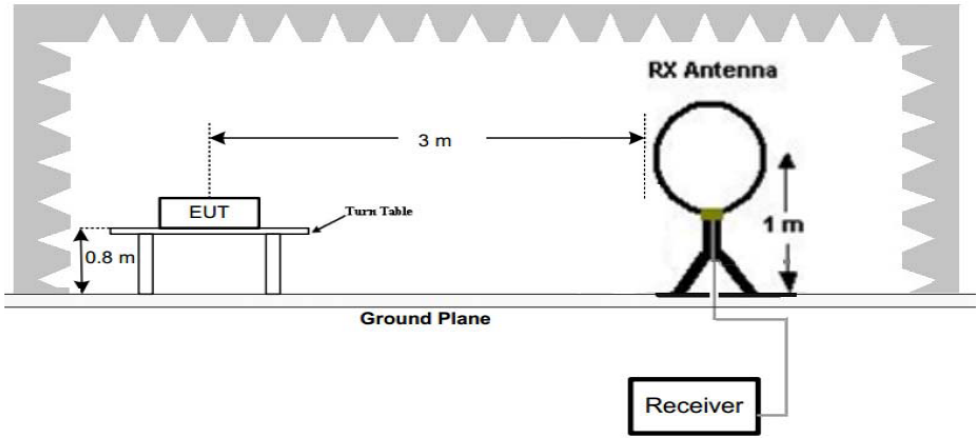


Figure 1. Below 30MHz

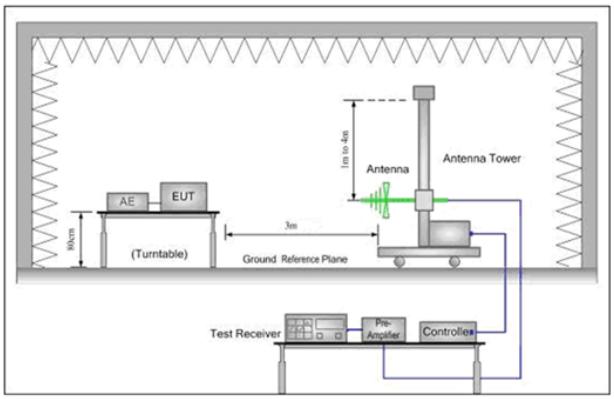


Figure 2. 30MHz to 1GHz

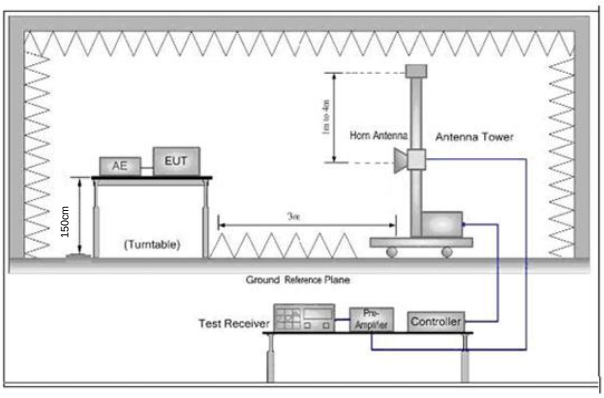


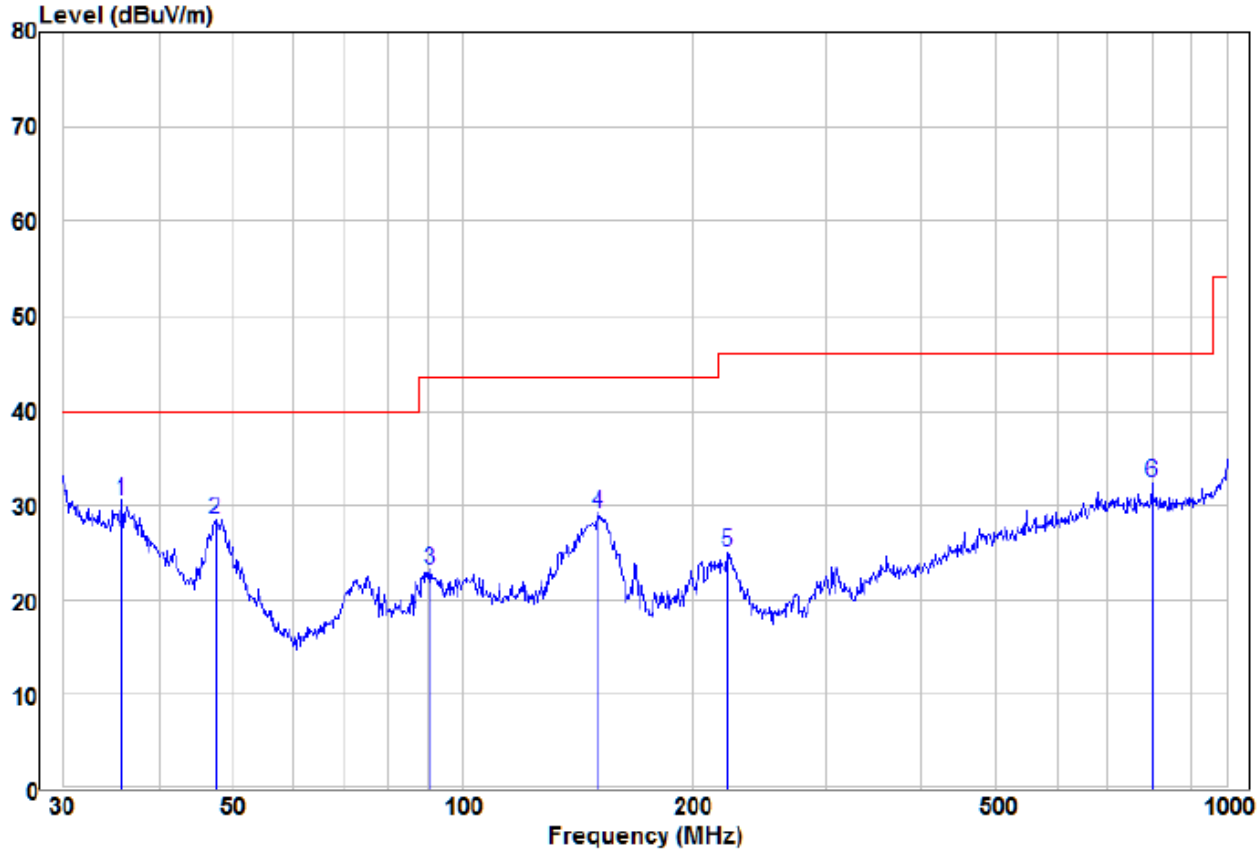
Figure 3. Above 1 GHz

Test Procedure:	a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of

	below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel,the middle channel,the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.11 for details
Exploratory Test Mode:	Charging + Transmitting mode
Final Test Mode:	Pretest the EUT at Transmitting mode, For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Voltage:	AC120V/60Hz
Test Results:	Pass

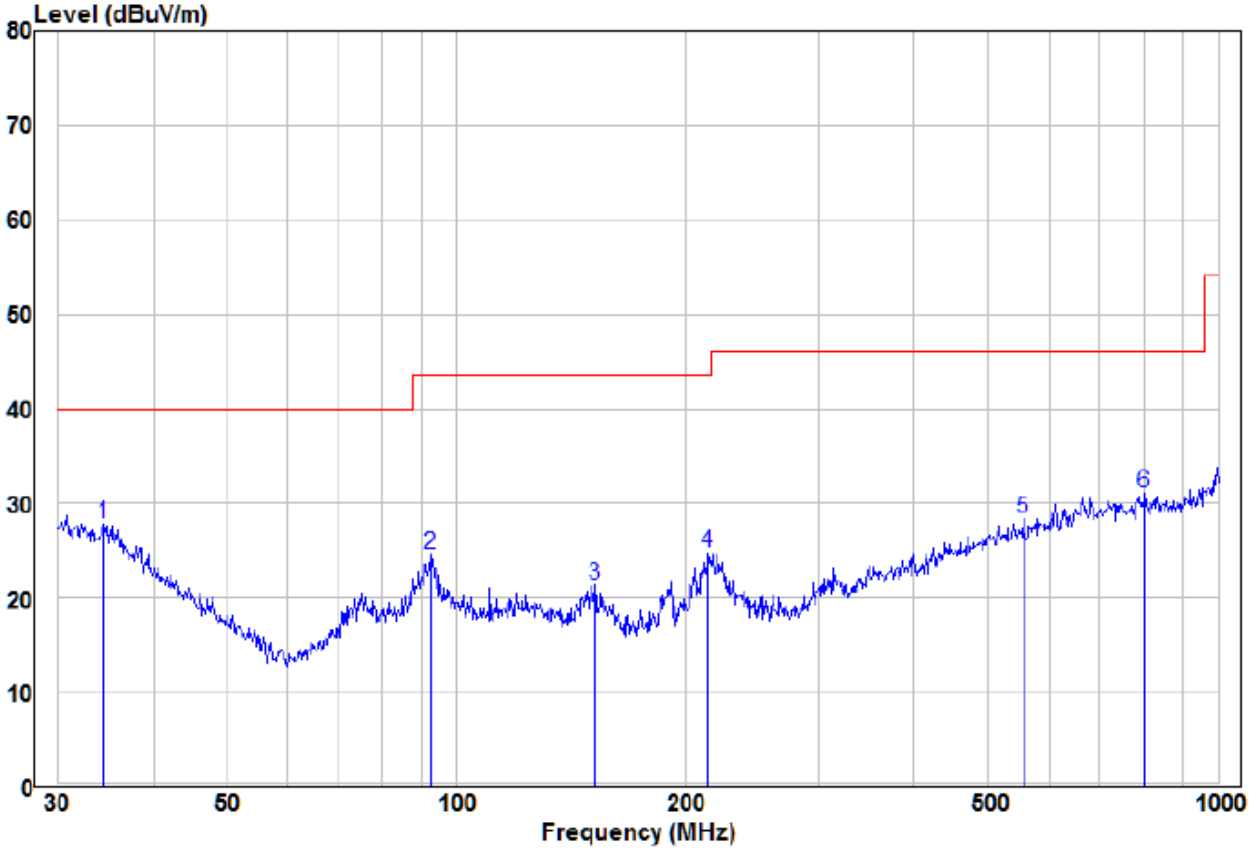
Measurement Data

30MHz~1GHz		
Test mode:	Charging + Transmitting mode	Vertical



	Freq	Read Level	Ant Factor	Cable Loss	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dB	dB/m	dBuV/m	dBuV/m	dB		
1 pp	35.87	12.57	17.59	0.30	17.89	30.46	40.00	-9.54	Peak	VERTICAL
2	47.49	17.86	10.35	0.29	10.64	28.50	40.00	-11.50	Peak	VERTICAL
3	90.86	13.13	9.73	0.42	10.15	23.28	43.50	-20.22	Peak	VERTICAL
4	151.07	20.91	7.74	0.57	8.31	29.22	43.50	-14.28	Peak	VERTICAL
5	222.17	15.43	8.96	0.71	9.67	25.10	46.00	-20.90	Peak	VERTICAL
6	798.98	11.73	19.19	1.52	20.71	32.44	46.00	-13.56	Peak	VERTICAL

Test mode:	Charging + Transmitting mode	Horizontal



		Freq	Read Level	Ant Factor	Cable Loss	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB/m	dB	dB/m	dBuV/m	dBuV/m	dB		
1	pp	34.40	9.27	18.25	0.31	18.56	27.83	40.00	-12.17	Peak	HORIZONTAL
2		92.46	14.35	9.80	0.43	10.23	24.58	43.50	-18.92	Peak	HORIZONTAL
3		152.13	13.12	7.67	0.58	8.25	21.37	43.50	-22.13	Peak	HORIZONTAL
4		214.51	14.70	9.31	0.70	10.01	24.71	43.50	-18.79	Peak	HORIZONTAL
5		554.83	10.85	16.27	1.25	17.52	28.37	46.00	-17.63	Peak	HORIZONTAL
6		801.79	10.35	19.19	1.52	20.71	31.06	46.00	-14.94	Peak	HORIZONTAL

Above 1GHz			
Test mode:	Charging + Transmitting mode	Test channel:	2430MHz

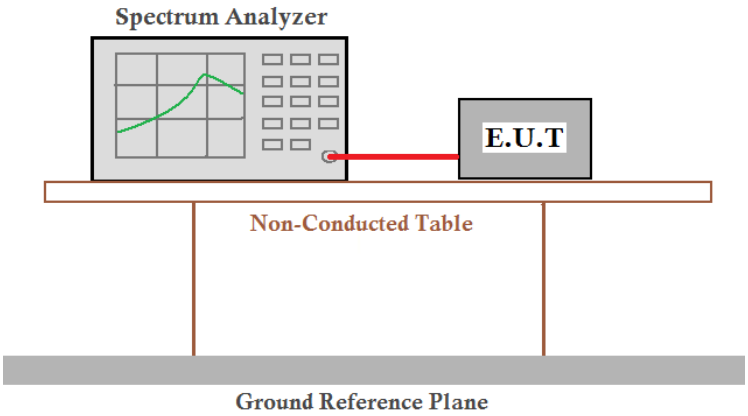
Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Over (dB)	Detector Type	Ant. Pol. H/V
2390	59.09	-9.2	49.89	74	-24.11	Peak	H
2390	44.71	-9.2	35.51	54	-18.49	AVG	H
2400	60.23	-9.39	50.84	74	-23.16	Peak	H
2400	46.86	-9.39	37.47	54	-16.53	AVG	H
2430	105.56	-9.33	96.63	114	-17.37	peak	H
2430	98.99	-9.33	89.66	94	-4.74	AVG	H
2483.5	57.85	-9.29	48.56	74	-25.44	Peak	H
2483.5	44.05	-9.29	34.76	54	-19.24	AVG	H
4820	53.54	-4.28	49.26	74	-24.74	peak	H
4820	42.57	-4.28	38.29	54	-15.71	AVG	H
7230	50.13	1.13	51.26	74	-22.74	peak	H
7230	36.78	1.13	37.91	54	-16.09	AVG	H
2390	58.43	-9.2	49.23	74	-24.77	peak	V
2390	44.40	-9.2	35.20	54	-18.80	AVG	V
2400	60.05	-9.39	50.66	74	-23.34	peak	V
2400	46.04	-9.39	36.65	54	-17.35	AVG	V
2430	**106.83**	**-9.33**	**97.5**	**114**	**-16.5**	**peak**	**V**
2430	99.12	-9.34	89.78	94	-4.22	AVG	V
2483.5	57.75	-9.29	48.46	74	-25.54	peak	V
2483.5	46.11	-9.29	36.82	54	-17.18	AVG	V

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz,The disturbance above 10GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .

5.4 20dB Bandwidth

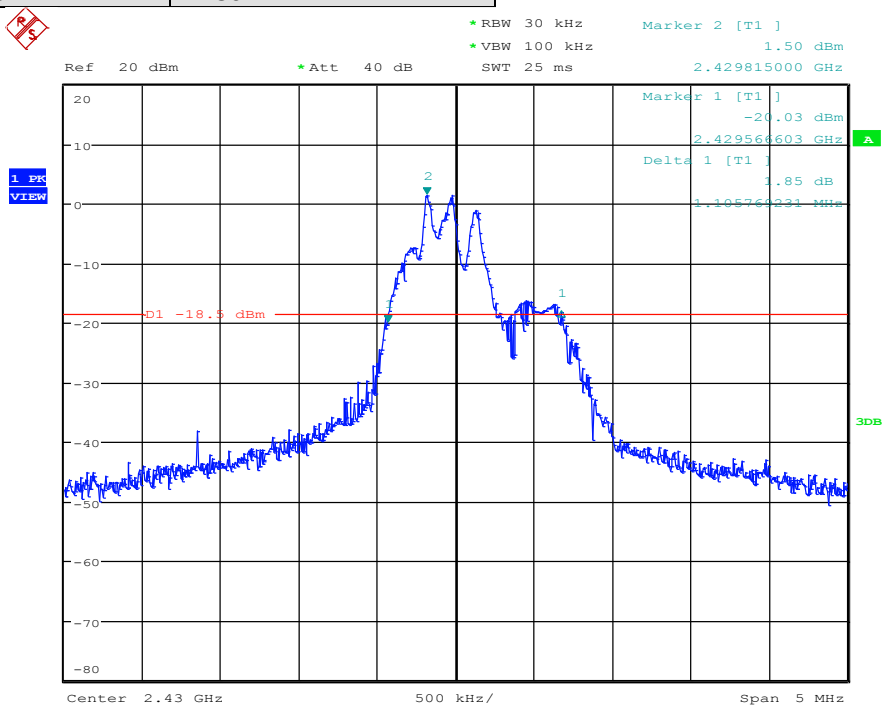
Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013
Test Setup:	
Instruments Used:	Refer to section 5.11 for details
Test Mode:	Transmitting with GFSK modulation.
Limit:	N/A
Test Results:	Pass

Measurement Data

Test channel	20dB bandwidth (MHz)	Results
2430MHz	1.106	Pass

Test plot as follows:

Test channel:	2430MHz



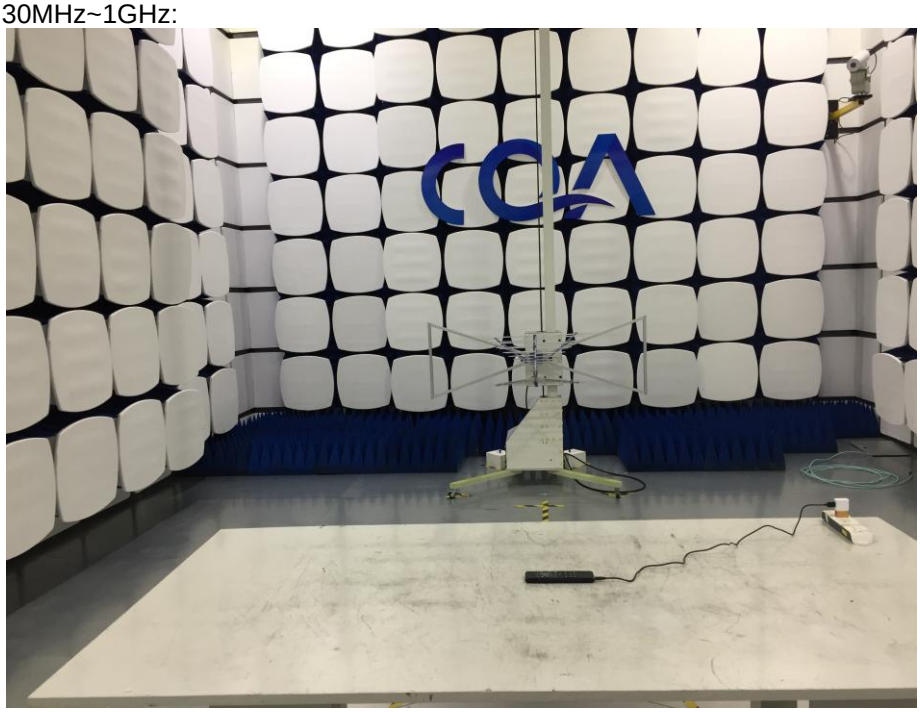
Date: 5.NOV.2018 17:57:12

6 Photographs

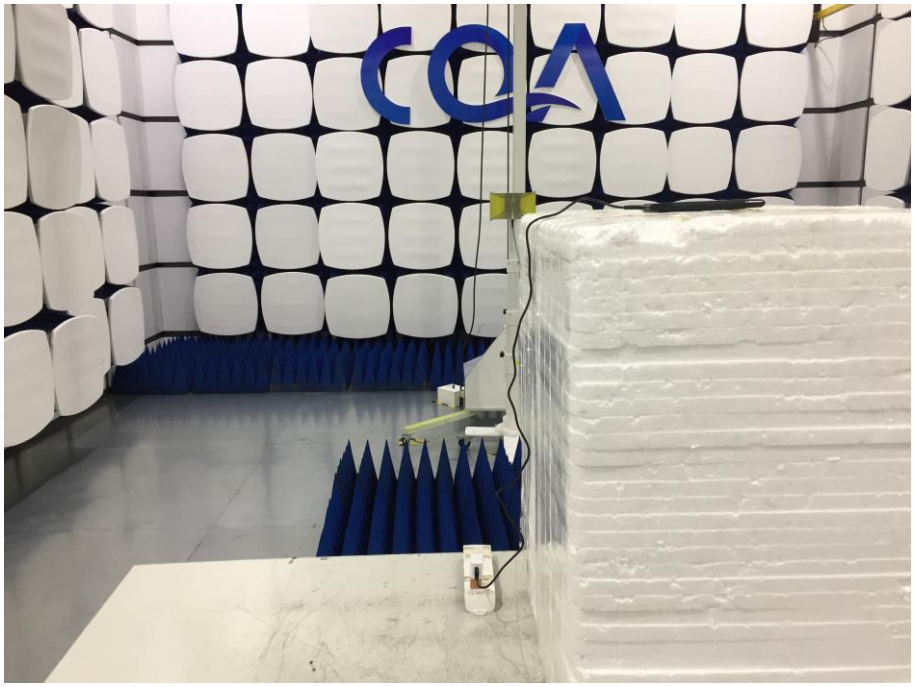
6.1 Radiated Emission Test Setup

9KHz~30MHz

30MHz~1GHz:

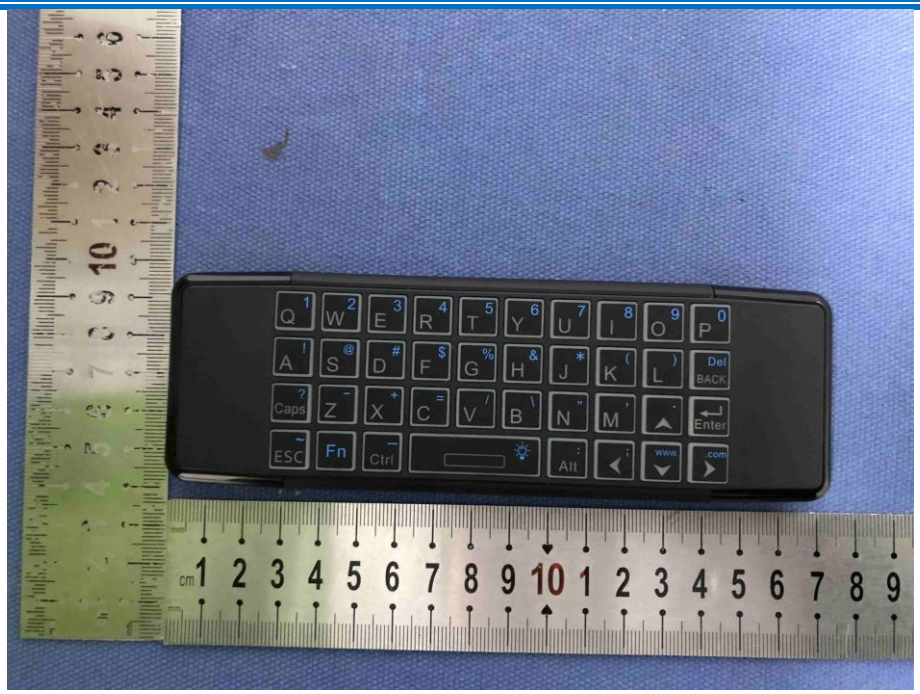


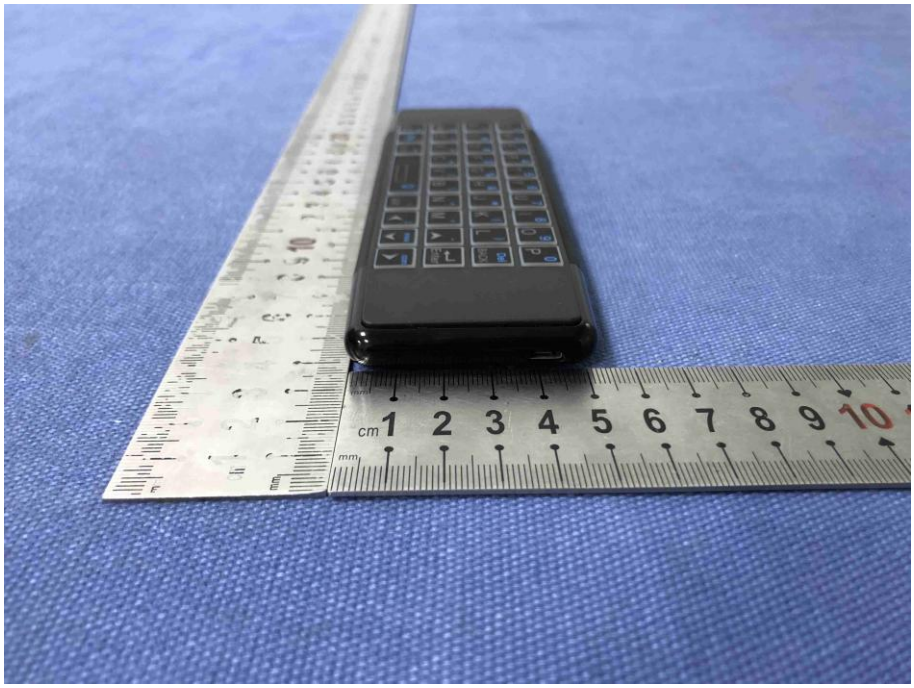
Above 1GHz:

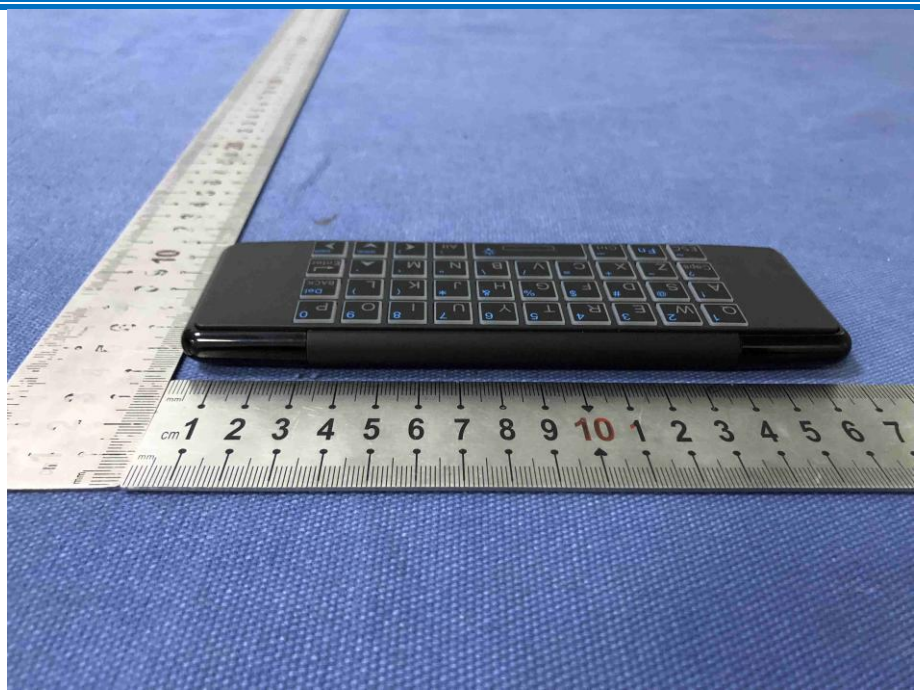


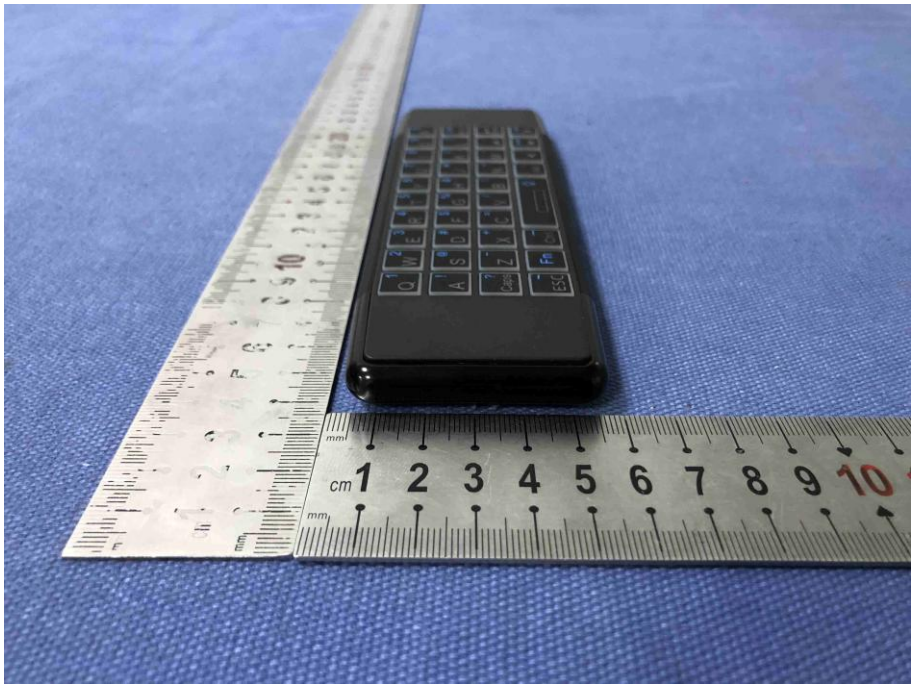
6.2 Conducted Emission

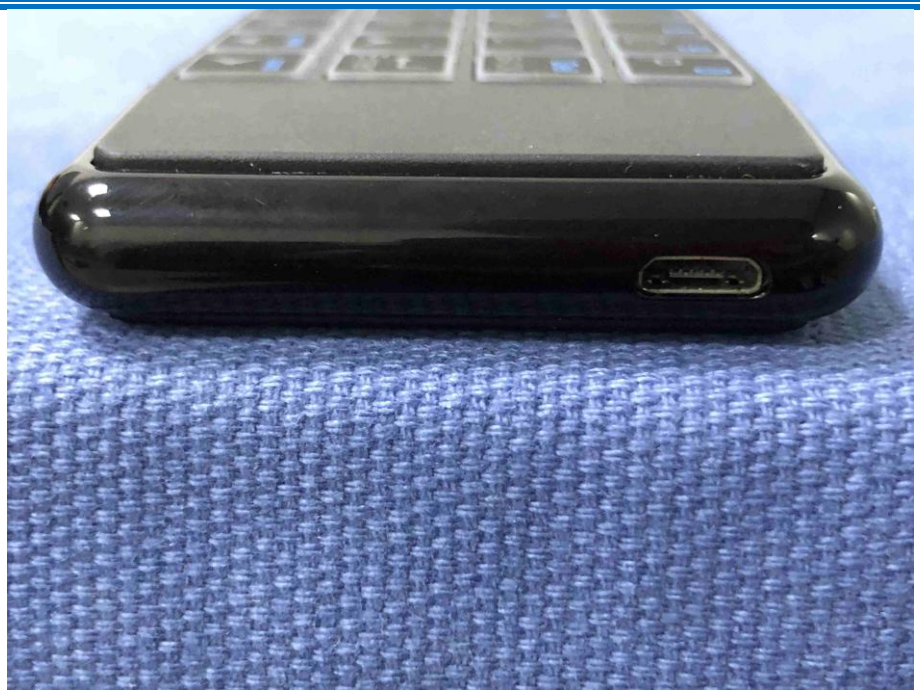
6.3 EUT Constructional Details

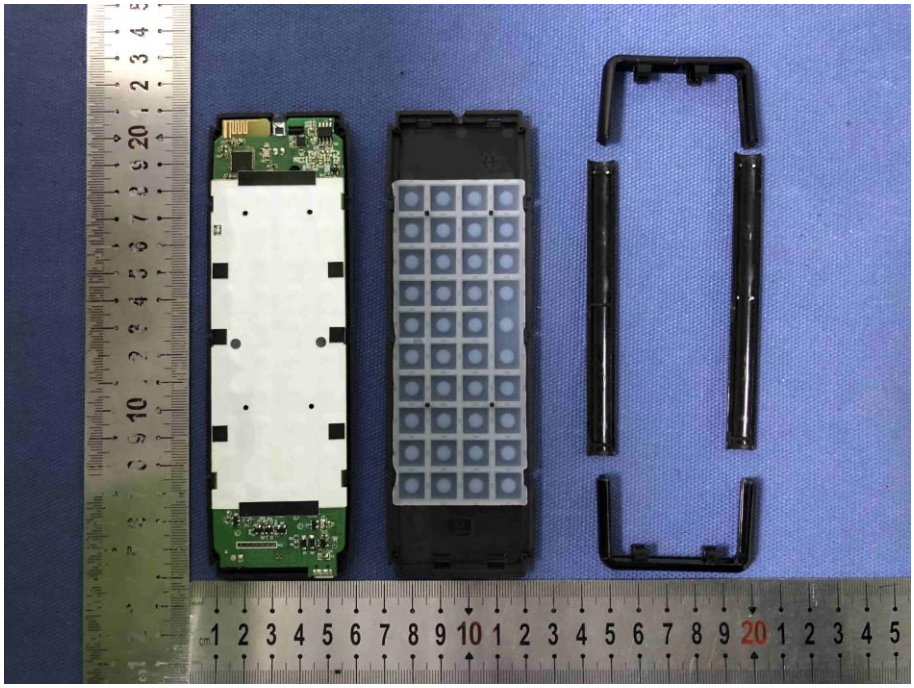


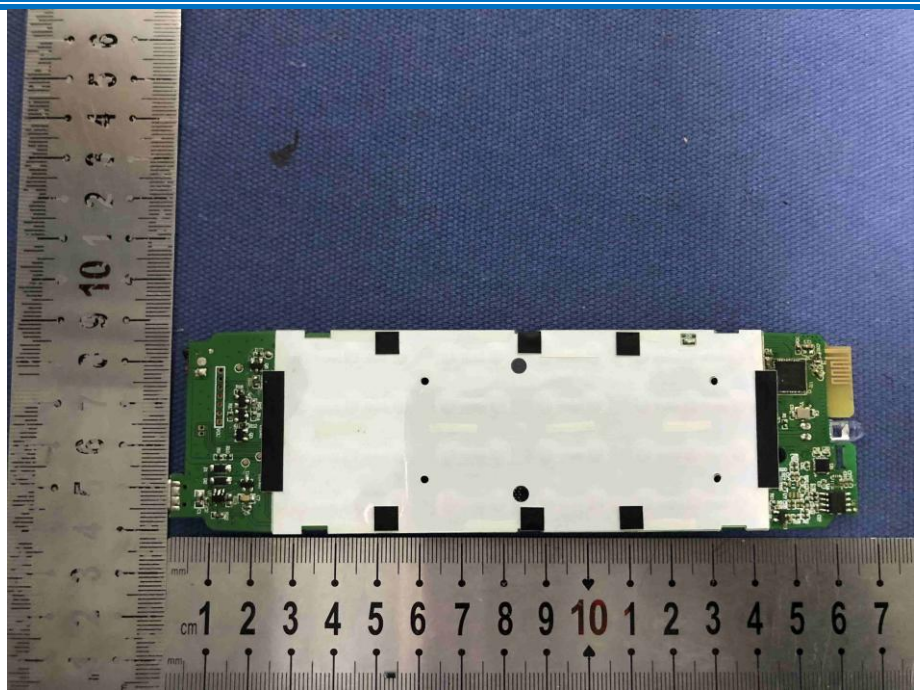


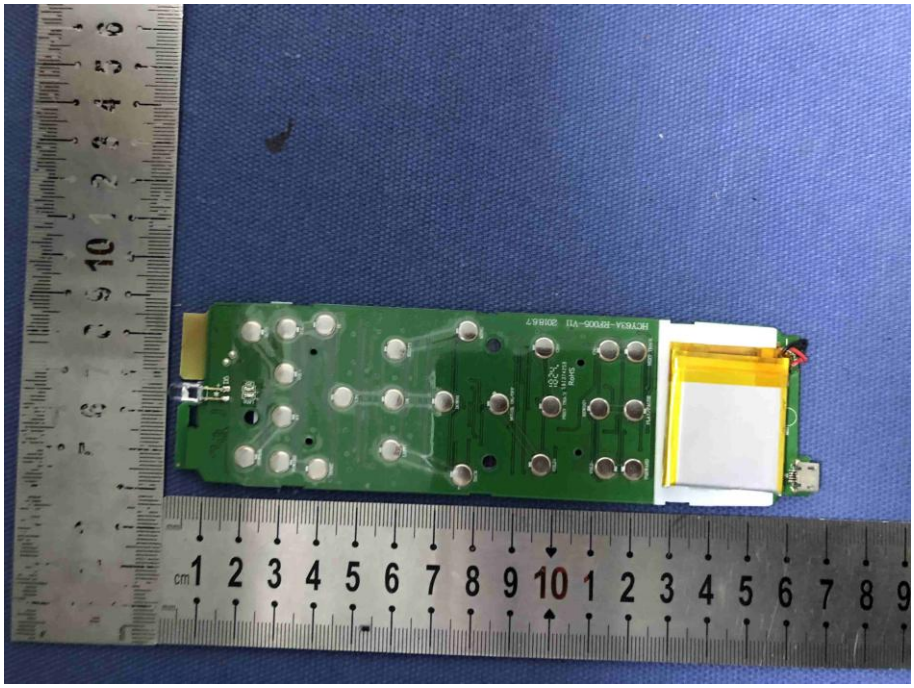


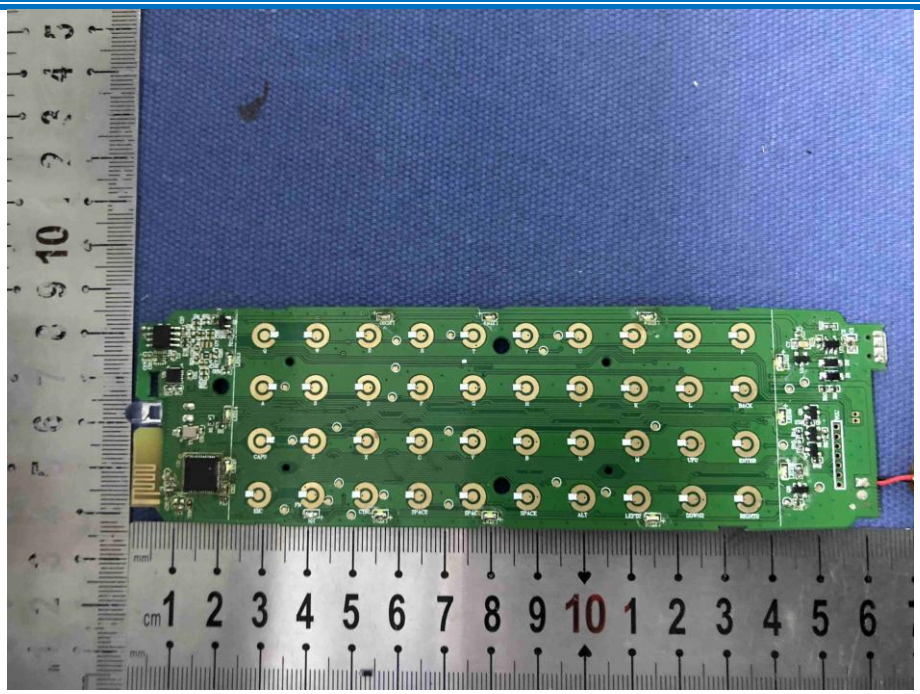


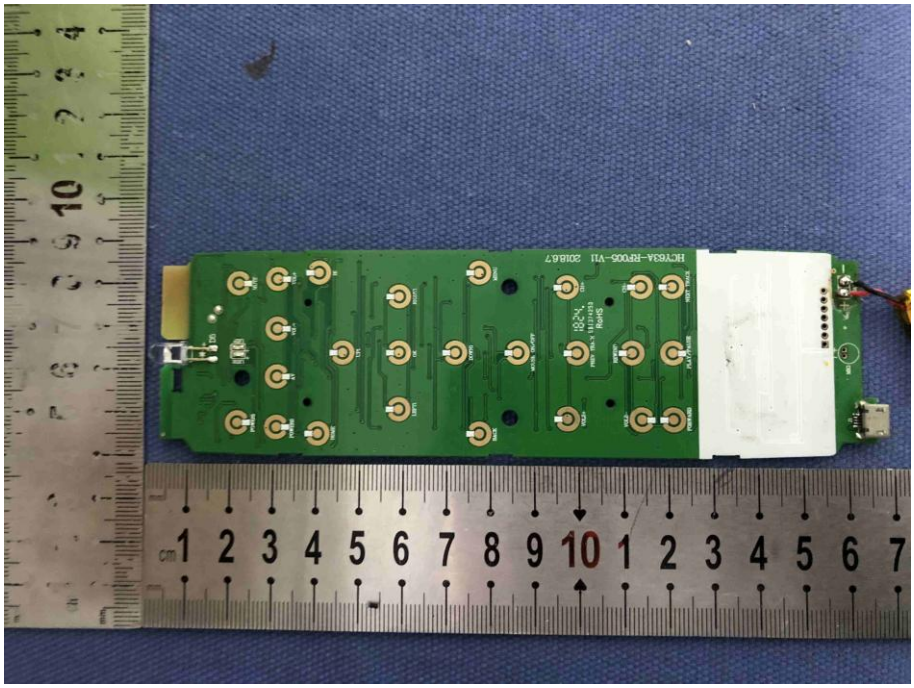


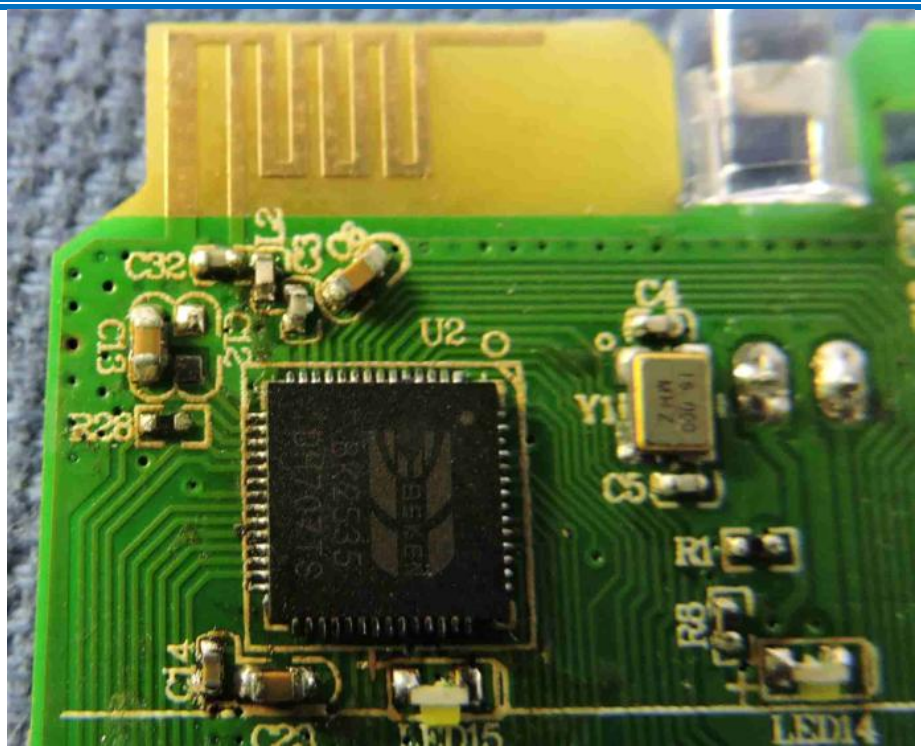


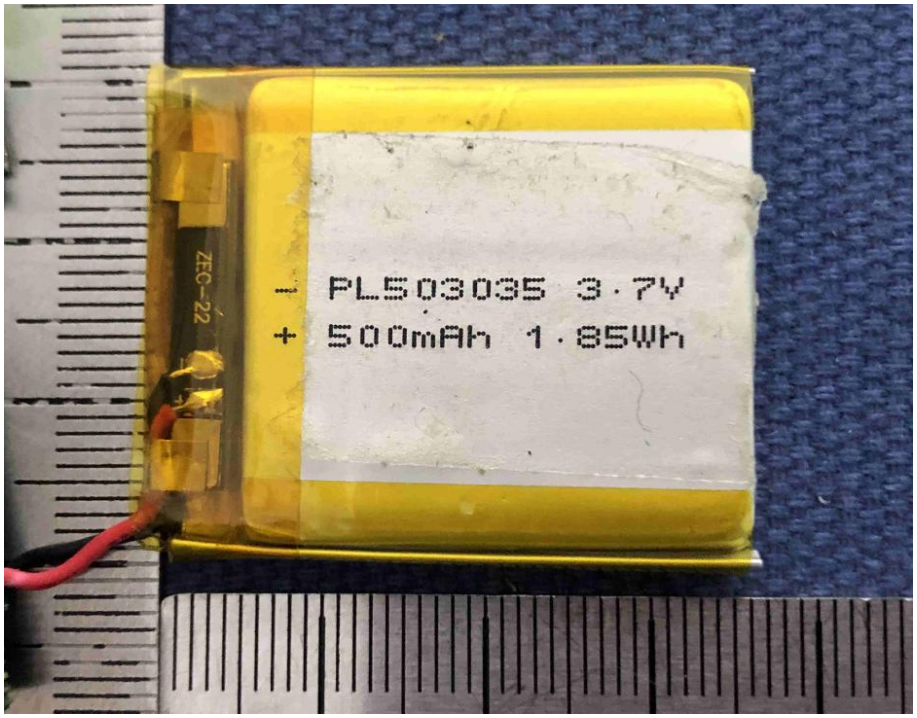












END OF THE REPORT