




## Shenzhen Huaxia Testing Technology Co., Ltd

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

Telephone: +86-755-26648640  
Fax: +86-755-26648637  
Website: [www.cqa-cert.com](http://www.cqa-cert.com)

Report Template Version: V04  
Report Template Revision Date: 2018-07-06

# Test Report

**Report No. :** CQASZ20190700645E-01  
**Applicant:** AKSys Co., Ltd.  
**Address of Applicant:** A706, Ace Cheonggye Tower, 53 Seonggogae-ro, Uiwang-si, Gyeonggi-do, Korea  
**Equipment Under Test (EUT):**  
**Product:** WIRELESS CONTROLLER  
**Model No.:** Gamepad S1  
**Brand Name:**   
**FCC ID:** 2AQKJ-S1  
**Standards:** 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2019-07-29  
**Date of Test:** 2019-07-29 to 2019-07-30  
**Date of Issue:** 2019-07-30  
**Test Result :** **PASS\***

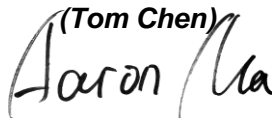
\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:**



(Tom Chen)

**Reviewed By:**



(Aaron Ma)

**Approved By:**

  
( Jack Ai)



## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190700645E-01	Rev.01	Initial report	2019-07-30

## 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

### 3 Contents


	Page
<b>1 VERSION .....</b>	<b>2</b>
<b>2 TEST SUMMARY .....</b>	<b>3</b>
<b>3 CONTENTS .....</b>	<b>4</b>
<b>4 GENERAL INFORMATION.....</b>	<b>5</b>
4.1 CLIENT INFORMATION.....	5
4.2 GENERAL DESCRIPTION OF EUT .....	5
4.3 TEST ENVIRONMENT AND MODE .....	7
4.4 DESCRIPTION OF SUPPORT UNITS .....	7
4.5 STATEMENT OF THE MEASUREMENT UNCERTAINTY .....	8
4.6 TEST LOCATION .....	9
4.7 TEST FACILITY.....	9
4.8 DEVIATION FROM STANDARDS.....	9
4.9 ABNORMALITIES FROM STANDARD CONDITIONS .....	9
4.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	9
4.11 EQUIPMENT LIST .....	10
<b>5 TEST RESULTS AND MEASUREMENT DATA.....</b>	<b>11</b>
5.1 ANTENNA REQUIREMENT .....	11
5.2 CONDUCTED EMISSIONS .....	12
5.3 RADIATED EMISSION.....	16
5.4 20DB BANDWIDTH.....	24
<b>6 PHOTOGRAPHS .....</b>	<b>27</b>
6.1 RADIATED EMISSION TEST SETUP.....	27
6.2 CONDUCTED EMISSION TEST SETUP .....	28
6.3 EUT CONSTRUCTIONAL DETAILS .....	29
<b>END OF THE REPORT .....</b>	<b>35</b>

## 4 General Information

### 4.1 Client Information

Applicant:	AKSys Co., Ltd.
Address of Applicant:	A706, Ace Cheonggye Tower, 53 Seonggogae-ro, Uiwang-si, Gyeonggi-do, Korea
Manufacturer:	AKSys Co., Ltd.
Address of Manufacturer:	A706, Ace Cheonggye Tower, 53 Seonggogae-ro, Uiwang-si, Gyeonggi-do, Korea

### 4.2 General Description of EUT

Name:	WIRELESS CONTROLLER
Model No.:	Gamepad S1
Trade Mark :	
Hardware Version:	V1.3
Software Version:	170706
Frequency Range:	2402 MHz ~ 2480MHz
Modulation Type:	GFSK
Number of Channels:	79 (declared by the client)
Sample Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	-2.21dBi
Power Supply:	lithium battery:DC3.7V, Charge by DC5.0V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz

### 4.3 Test Environment and Mode

<b>Operating Environment:</b>	
<b>Radiated Emissions:</b>	
Temperature:	25.3 °C
Humidity:	53 % RH
Atmospheric Pressure:	1001 mbar
<b>Conducted Emissions:</b>	
Temperature:	23.0 °C
Humidity:	51 % RH
Atmospheric Pressure:	1001 mbar
<b>Radio conducted item test (RF Conducted test room)</b>	
Temperature:	28.8 °C
Humidity:	59 % RH
Atmospheric Pressure:	1001 mbar
<b>Test mode:</b>	
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
/	/	/	/	/

## 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:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	5.12dB	(1)
2	Radiated Emission (Above 1GHz)	4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	3.34dB	(1)
4	Radio Frequency	$3 \times 10^{-8}$	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8°C	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(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

- **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

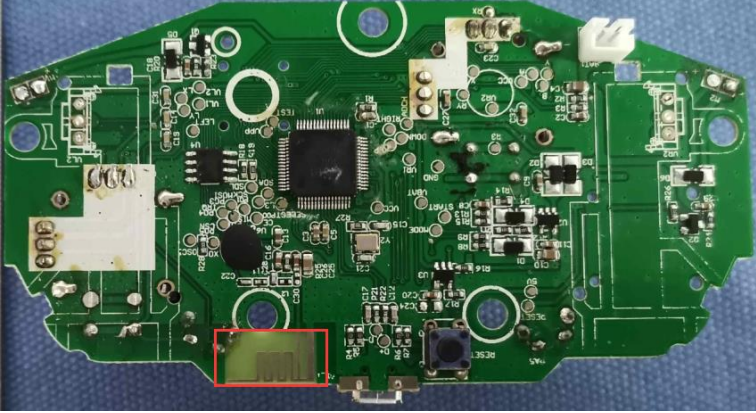
Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/26	2019/9/25
Spectrum analyzer	R&S	FSU26	CQA-038	2018/10/28	2019/10/27
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2018/9/26	2019/9/25
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2018/11/2	2019/11/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2018/10/28	2020/10/27
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 divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2018/9/26	2019/9/25
EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/26	2019/9/25
LISN	R&S	ENV216	CQA-003	2018/11/5	2019/11/4
Coaxial cable	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

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203
<p>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.</p>	
<b>EUT Antenna:</b>	
<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -2.21dBi.</p>	

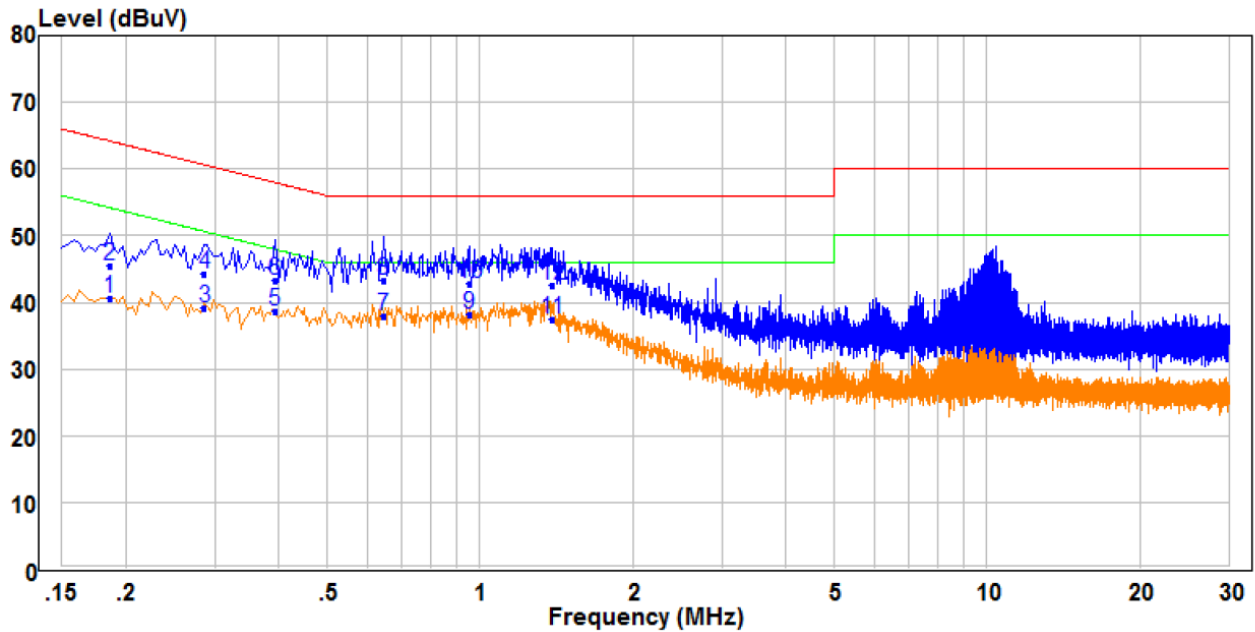
## 5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207;		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>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.</li> <li>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,</li> <li>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.</li> <li>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.</li> </ol>		

<p>Test Setup:</p>	<p>The diagram illustrates the test setup within a Shielding Room. It shows a table with an EUT (Equipment Under Test) and an AE (Antenna) on top. A Test Receiver is positioned on a separate table to the right. LISN1 (Line Impedance Stabilization Network) is connected to AC Mains on the left, and LISN2 is connected to AC Mains on the right. A Ground Reference Plane is established at the bottom. Dimensions of 80cm are marked for the distance from the AC Mains to LISN1 and the height of the table from the Ground Reference Plane.</p>
<p>Exploratory Test Mode:</p>	<p>Transmitting with FSK at lowest, middle and highest channel.</p>
<p>Final Test Mode:</p>	<p>Through Pre-scan, find at highest channel is the worst case.  Only the worst case is recorded in the report.</p>
<p>Test Voltage:</p>	<p>AC120V/60Hz</p>
<p>Test Results:</p>	<p>Pass</p>

Measurement Data

Live Line:

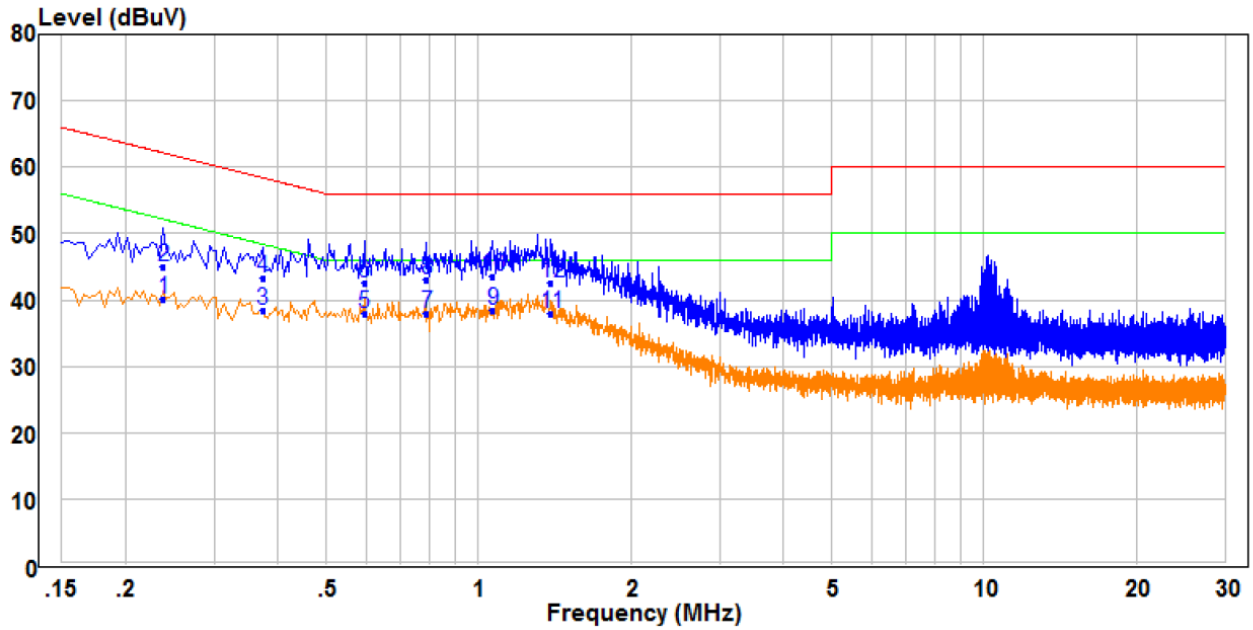


	Freq	Read	Factor	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.186	31.08	9.49	40.57	54.21	-13.64	Average	Line
2	0.186	36.09	9.49	45.58	64.21	-18.63	QP	Line
3	0.286	29.77	9.49	39.26	50.64	-11.38	Average	Line
4	0.286	34.78	9.49	44.27	60.64	-16.37	QP	Line
5	0.394	29.05	9.51	38.56	47.98	-9.42	Average	Line
6	0.394	33.77	9.51	43.28	57.98	-14.70	QP	Line
7	0.646	28.26	9.78	38.04	46.00	-7.96	Average	Line
8 QP	0.646	33.59	9.78	43.37	56.00	-12.63	QP	Line
9 PP	0.954	28.63	9.58	38.21	46.00	-7.79	Average	Line
10	0.954	33.33	9.58	42.91	56.00	-13.09	QP	Line
11	1.386	28.00	9.53	37.53	46.00	-8.47	Average	Line
12	1.386	33.00	9.53	42.53	56.00	-13.47	QP	Line

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:



	Read	Limit	Over					
	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.238	30.74	9.48	40.22	52.17	-11.95	Average	Neutral
2	0.238	35.47	9.48	44.95	62.17	-17.22	QP	Neutral
3	0.374	28.91	9.53	38.44	48.41	-9.97	Average	Neutral
4	0.374	33.79	9.53	43.32	58.41	-15.09	QP	Neutral
5	0.594	28.17	9.70	37.87	46.00	-8.13	Average	Neutral
6	0.594	32.83	9.70	42.53	56.00	-13.47	QP	Neutral
7	0.790	28.21	9.80	38.01	46.00	-7.99	Average	Neutral
8	0.790	33.22	9.80	43.02	56.00	-12.98	QP	Neutral
9 PP	1.066	28.65	9.72	38.37	46.00	-7.63	Average	Neutral
10 QP	1.066	33.70	9.72	43.42	56.00	-12.58	QP	Neutral
11	1.394	28.31	9.72	38.03	46.00	-7.97	Average	Neutral
12	1.394	32.92	9.72	42.64	56.00	-13.36	QP	Neutral

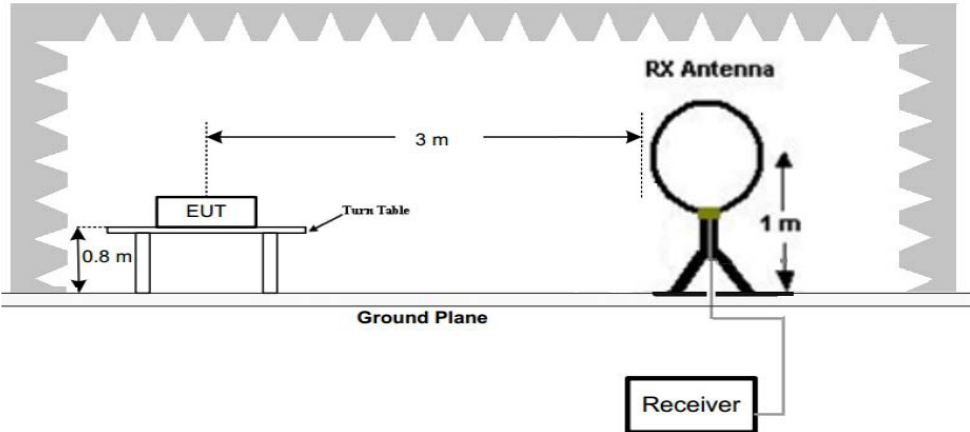
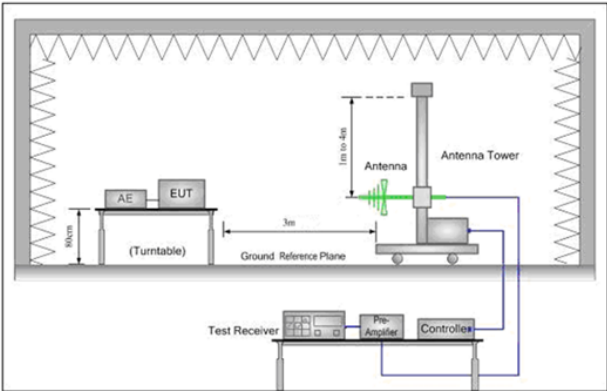
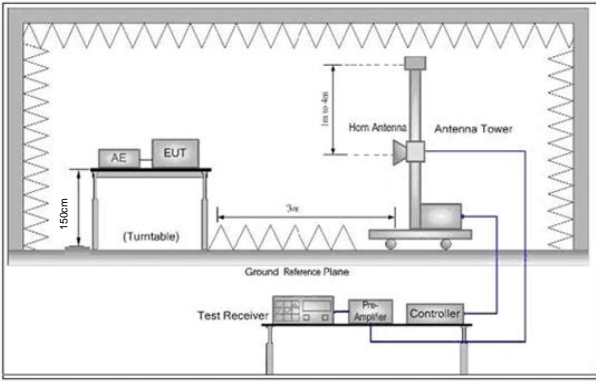
Remark:

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	

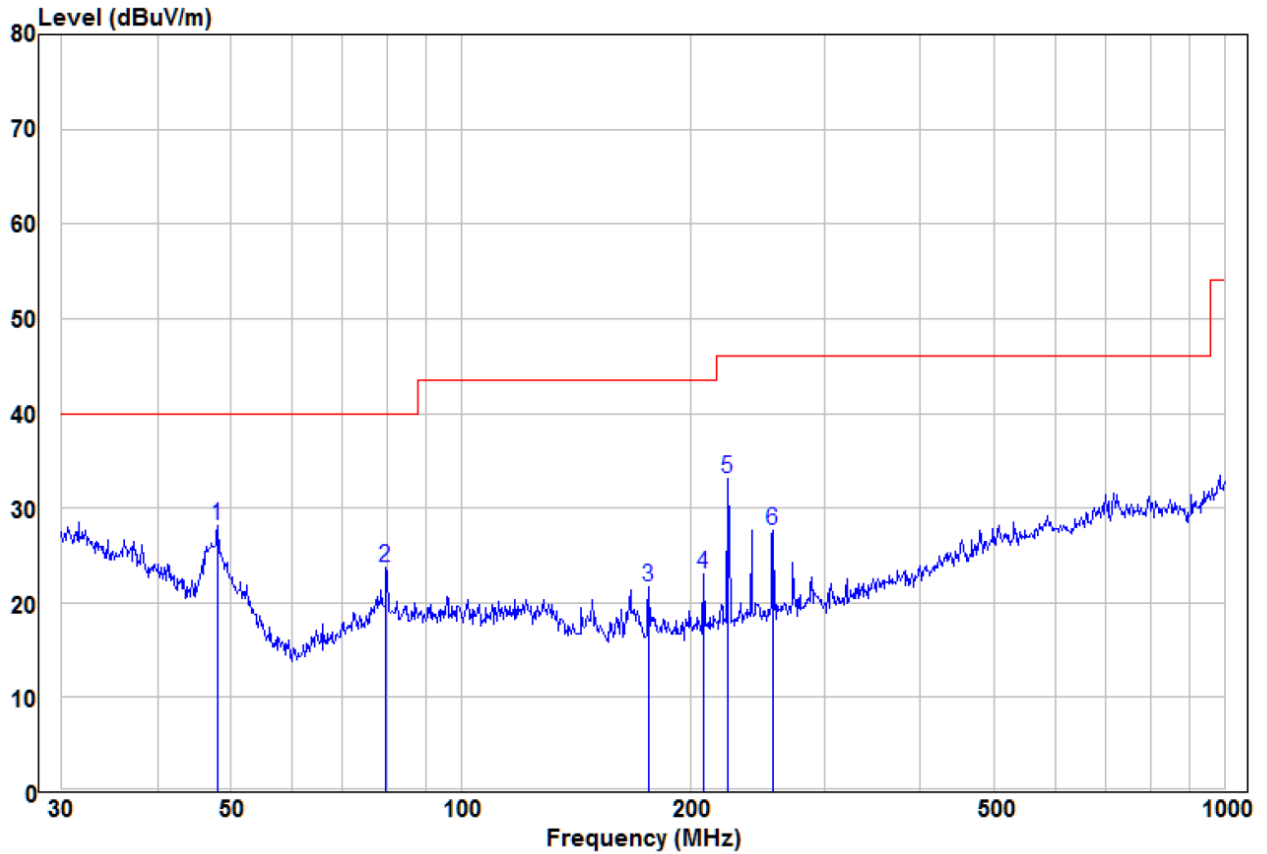


<p>Test Setup:</p>		
		
<p>Figure 1. Below 30MHz</p>		
		
<p>Figure 2. 30MHz to 1GHz</p>		<p>Figure 3. Above 1 GHz</p>
<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>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 chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> </ol> <p>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.</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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</li> </ol>	

	<p>was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>g. Test the EUT in the lowest channel,the middle channel,the Highest channel</p> <p>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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	<p>Pretest the EUT at Transmitting mode, For below 1GHz part, through pre-scan, the worst case is the highest channel.</p> <p>Only the worst case is recorded in the report.</p>
Test Voltage:	DC5V
Test Results:	Pass

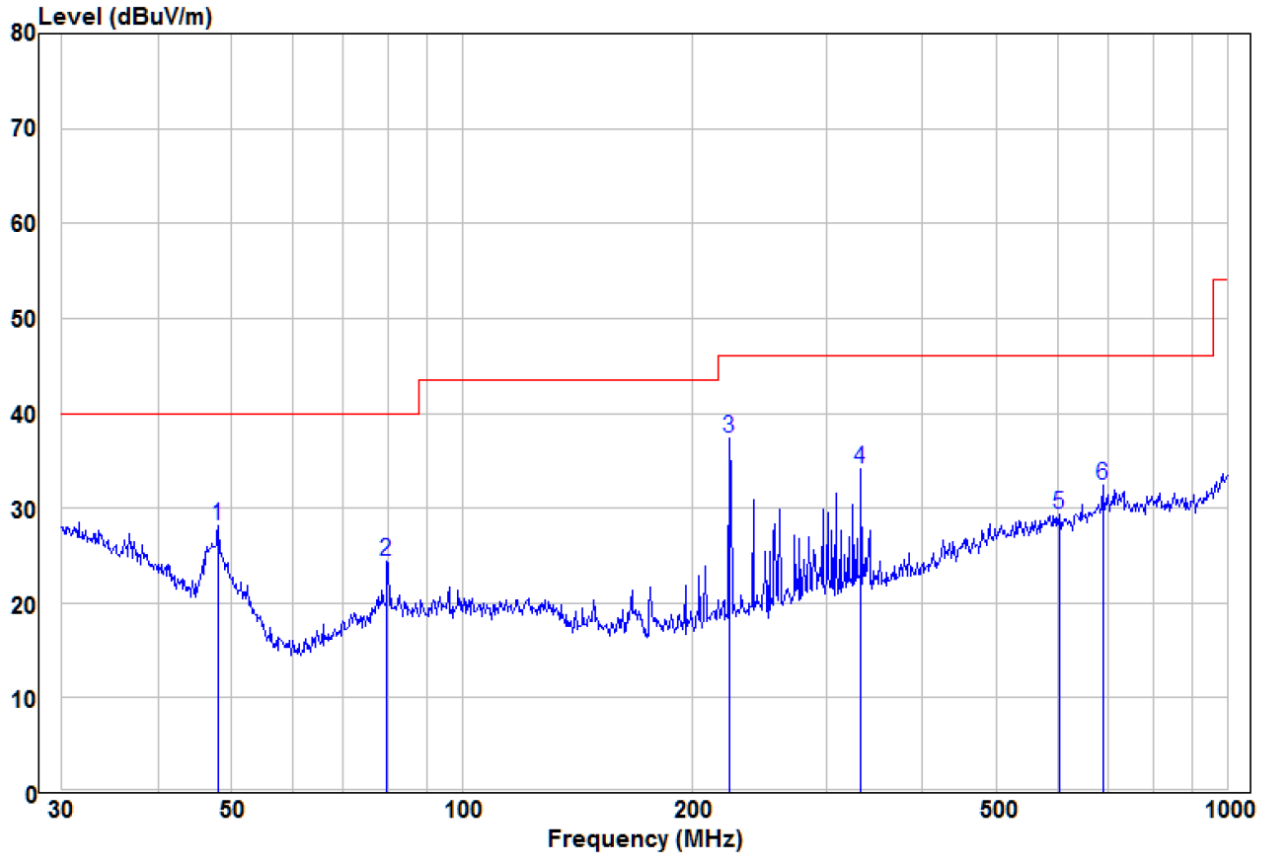
Measurement Data

30MHz~1GHz		
Test mode:	Transmitting	Vertical



	Read Freq	Read Level	Factor	Limit Level	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 pp	47.99	17.95	10.23	28.18	40.00	-11.82 Peak	VERTICAL
2	79.80	13.87	9.76	23.63	40.00	-16.37 Peak	VERTICAL
3	176.27	13.67	8.07	21.74	43.50	-21.76 Peak	VERTICAL
4	207.85	14.28	8.74	23.02	43.50	-20.48 Peak	VERTICAL
5	223.73	23.77	9.25	33.02	46.00	-12.98 Peak	VERTICAL
6	256.52	17.37	10.29	27.66	46.00	-18.34 Peak	VERTICAL

Test mode:	Transmitting	Horizontal
------------	--------------	------------



	Read Freq	Read Level	Factor	Limit Level	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	47.99	17.95	10.23	28.18	40.00	-11.82 Peak	HORIZONTAL
2	79.80	14.65	9.76	24.41	40.00	-15.59 Peak	HORIZONTAL
3 pp	223.73	28.13	9.25	37.38	46.00	-8.62 Peak	HORIZONTAL
4	332.52	21.61	12.53	34.14	46.00	-11.86 Peak	HORIZONTAL
5	603.54	10.94	18.36	29.30	46.00	-16.70 Peak	HORIZONTAL
6	687.15	12.57	19.85	32.42	46.00	-13.58 Peak	HORIZONTAL

Above 1GHz							
Test mode:		Transmitting		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)		H/V
2390	60.24	-9.2	51.04	74	-22.96	Peak	H
2390	44.67	-9.2	35.47	54	-18.53	AVG	H
2400	61.39	-9.39	52	74	-22	Peak	H
2400	45.04	-9.39	35.65	54	-18.35	AVG	H
2402	94.35	-9.42	84.93	114	-29.07	peak	H
2402	91.62	-9.42	82.2	94	-11.8	AVG	H
4804	57.09	-4.33	52.76	74	-21.24	peak	H
4804	42.14	-4.33	37.81	54	-16.19	AVG	H
7206	51.34	1.01	52.35	74	-21.65	peak	H
7206	37.12	1.01	38.13	54	-15.87	AVG	H
2390	61.86	-9.2	52.66	74	-21.34	peak	V
2390	44.23	-9.2	35.03	54	-18.97	AVG	V
2400	61.59	-9.39	52.2	74	-21.8	peak	V
2400	43.97	-9.39	34.58	54	-19.42	AVG	V
2402	95.81	-9.42	86.39	114	-27.61	peak	V
2402	92.21	-9.42	82.79	94	-11.21	AVG	V
4804	56.47	-4.33	52.14	74	-21.86	peak	V
4804	41.73	-4.33	37.4	54	-16.6	AVG	V
7206	52.83	1.01	53.84	74	-20.16	peak	V
7206	36.47	1.01	37.48	54	-16.52	AVG	V

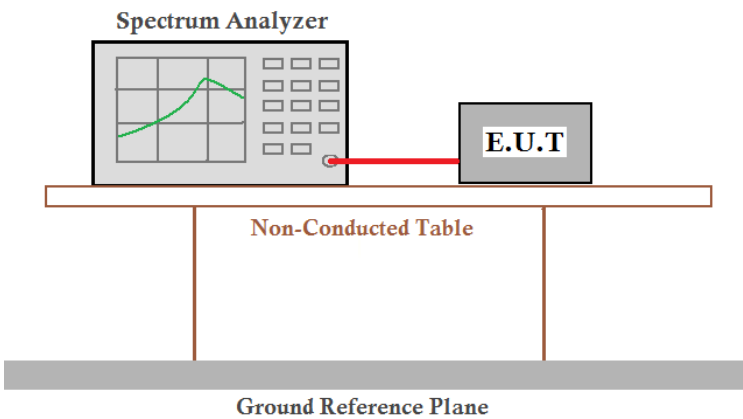
Test mode:		Transmitting		Test channel:		Middle	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)		H/V
2440	96.90	-8.96	87.94	114	-26.06	peak	H
2440	93.68	-8.96	84.72	94	-9.28	AVG	H
4880	55.11	-4.11	51	74	-23	peak	H
4880	41.66	-4.11	37.55	54	-16.45	AVG	H
7320	52.31	1.51	53.82	74	-20.18	peak	H
7320	37.33	1.51	38.84	54	-15.16	AVG	H
2440	94.49	-8.96	85.53	114	-28.47	peak	V
2440	92.29	-8.96	83.33	94	-10.67	AVG	V
4880	55.66	-4.11	51.55	74	-22.45	peak	V
4880	43.41	-4.11	39.3	54	-14.7	AVG	V
7320	51.42	1.51	52.93	74	-21.07	peak	V
7320	38.36	1.51	39.87	54	-14.13	AVG	V

Test mode:		Transmitting		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)		H/V
2480	97.54	-9.27	88.27	114	-25.73	peak	H
2480	96.25	-9.27	86.98	94	-7.02	AVG	H
2483.5	61.66	-9.29	52.37	74	-21.63	Peak	H
2483.5	43.93	-9.29	34.64	54	-19.36	AVG	H
4960	56.80	-4.04	52.76	74	-21.24	peak	H
4960	42.80	-4.04	38.76	54	-15.24	AVG	H
7440	52.91	1.57	54.48	74	-19.52	peak	H
7440	37.64	1.57	39.21	54	-14.79	AVG	H
2480	96.54	-9.27	87.27	114	-26.73	peak	V
2480	94.67	-9.27	85.4	94	-8.6	AVG	V
2483.5	59.66	-9.29	50.37	74	-23.63	peak	V
2483.5	45.53	-9.29	36.24	54	-17.76	AVG	V
4960	57.40	-4.04	53.36	74	-20.64	peak	V
4960	42.43	-4.04	38.39	54	-15.61	AVG	V
7440	51.64	1.57	53.21	74	-20.79	peak	V
7440	38.14	1.57	39.71	54	-14.29	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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane.</p>
Test Mode:	Transmitting with GFSK modulation.
Limit:	N/A
Test Results:	Pass

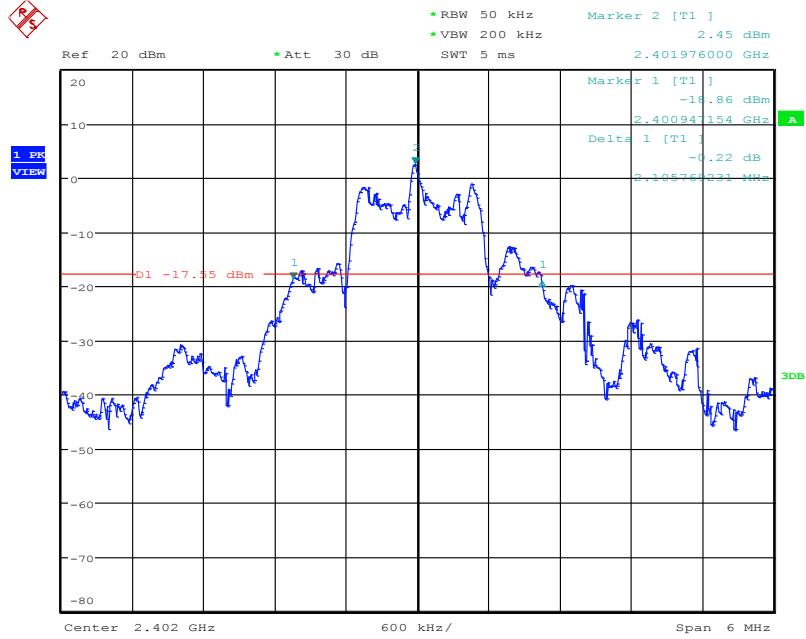
### Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	2.106	Pass
Middle	2.096	Pass
Highest	2.375	Pass



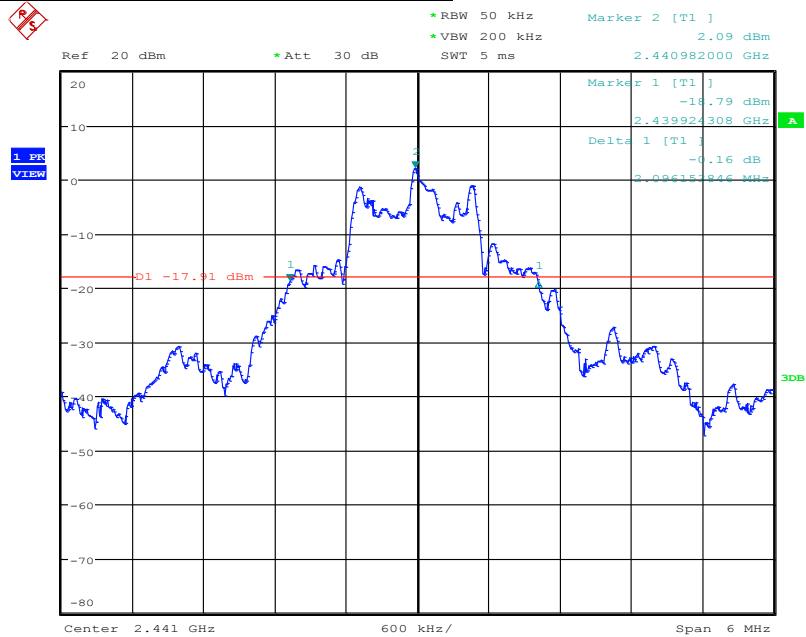
Test plot as follows:

Test channel: Lowest



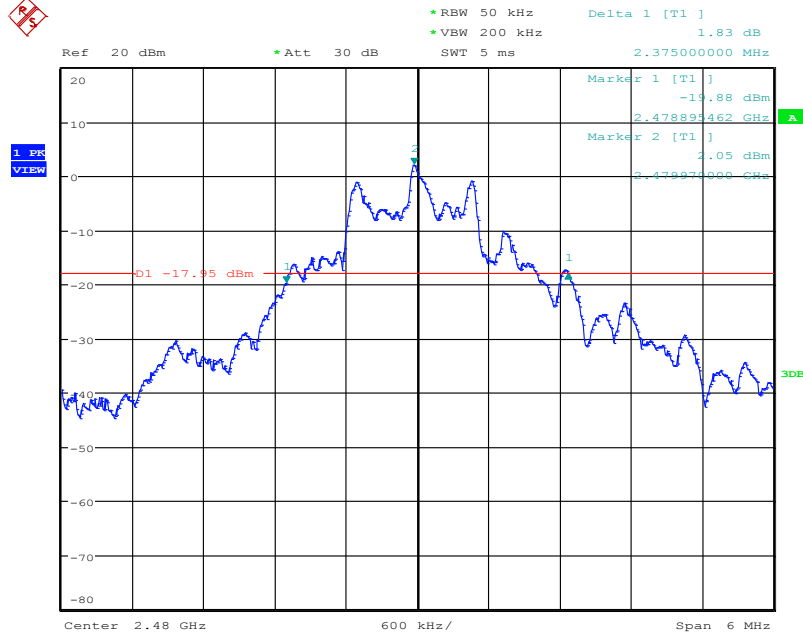
Date: 29.JUL.2019 15:55:55

Test channel: Middle



Date: 29.JUL.2019 15:44:12

Test channel: Highest

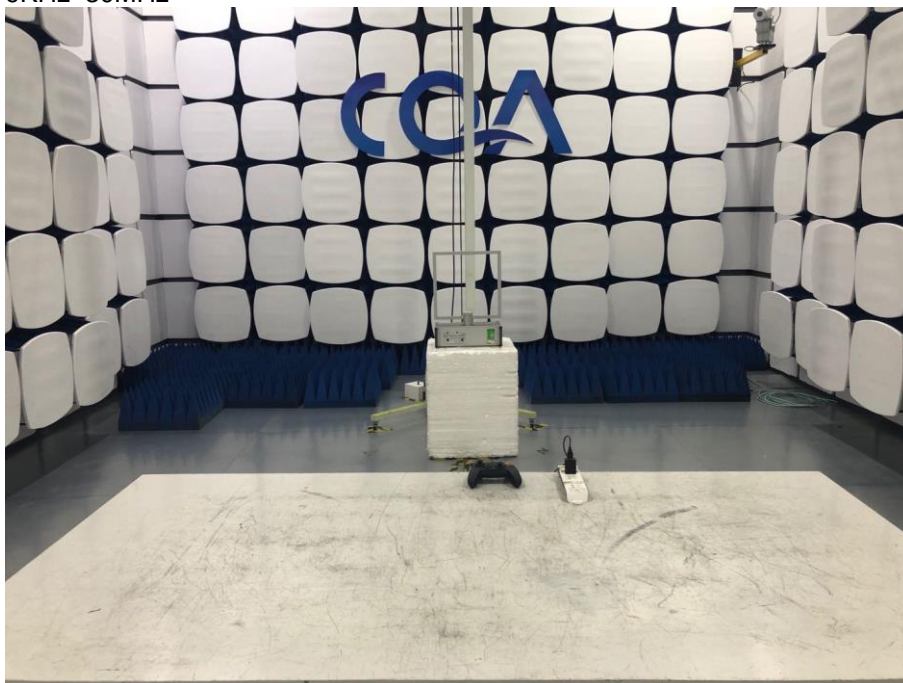


Date: 29.JUL.2019 16:08:28

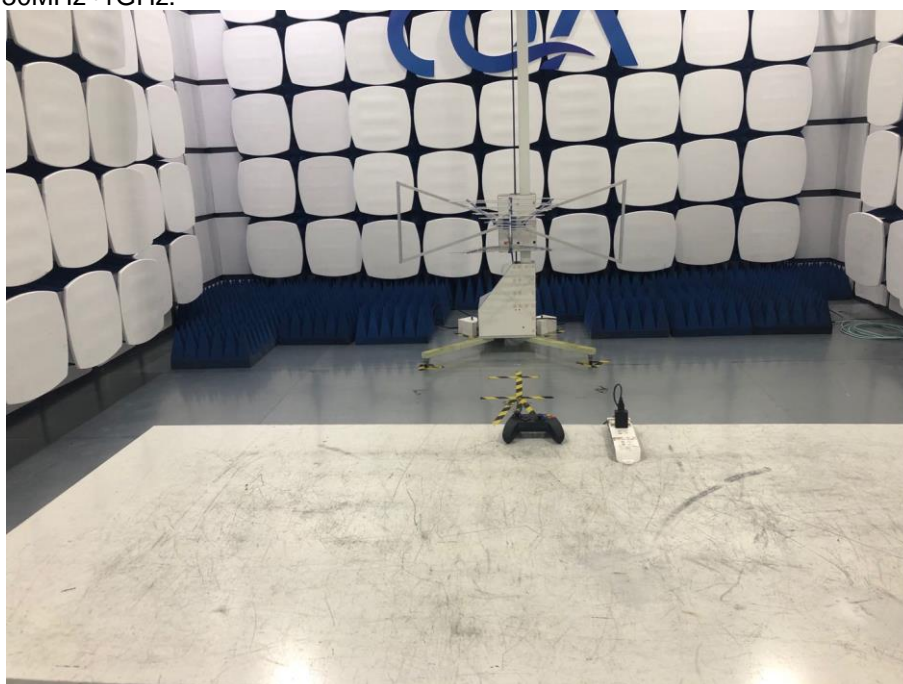
## 6 Photographs

### 6.1 Radiated Emission Test Setup

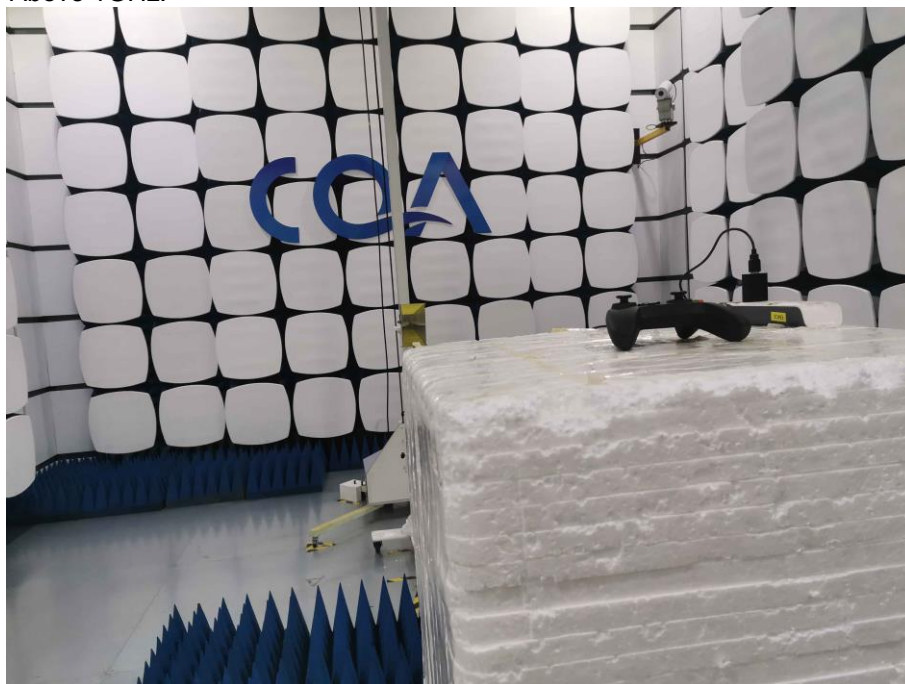
9KHz~30MHz



30MHz~1GHz:



Above 1GHz:



## 6.2 Conducted Emission Test Setup



### 6.3 EUT Constructional Details

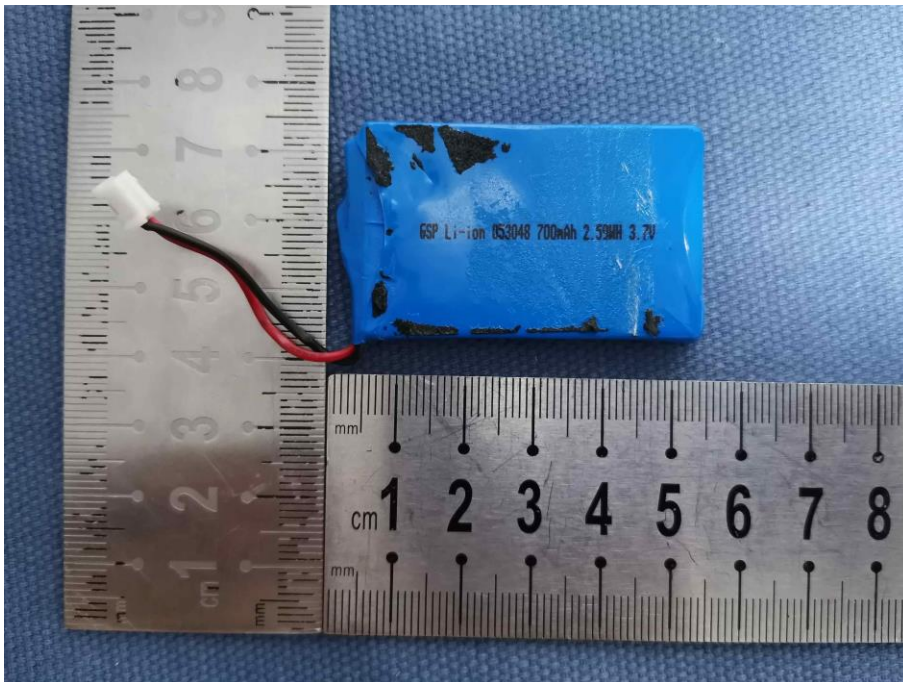


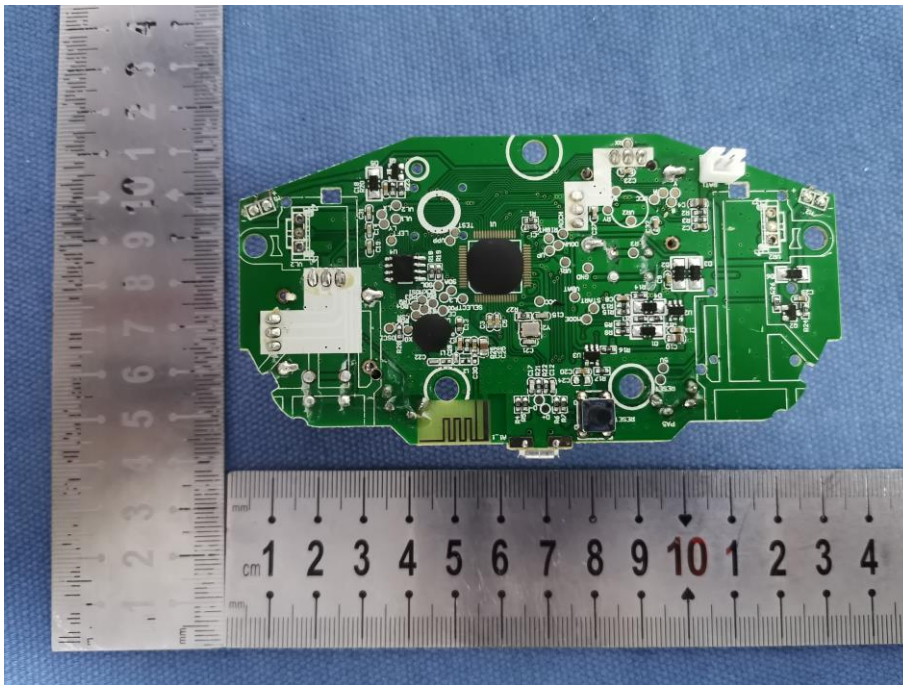
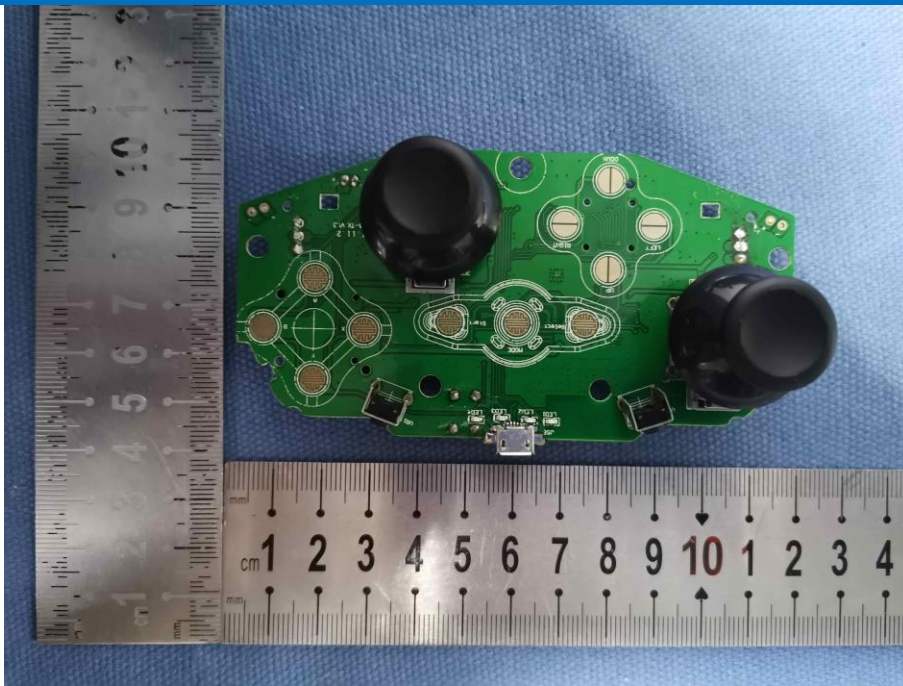


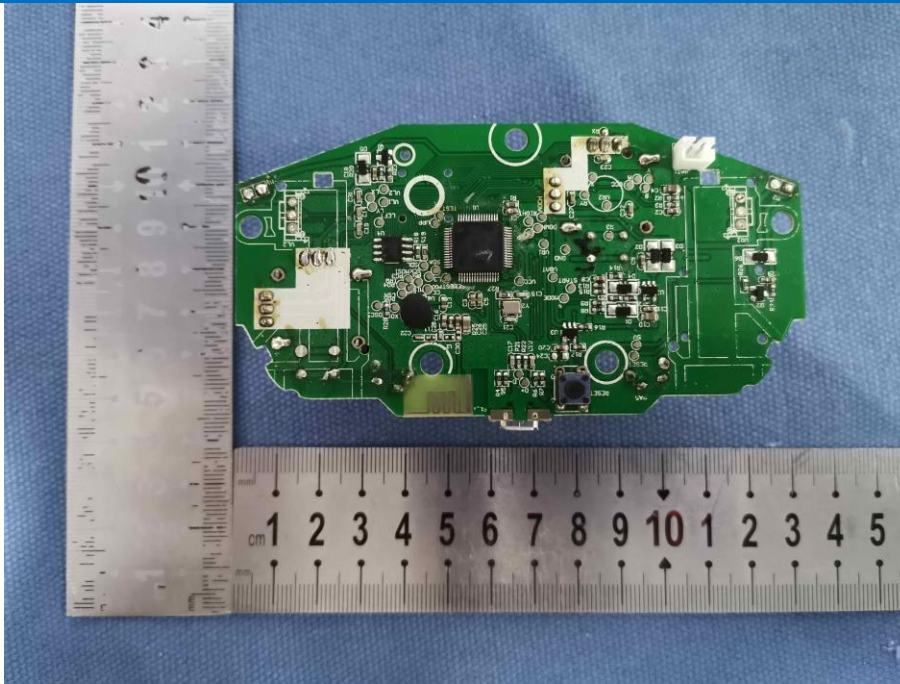












**END OF THE REPORT**