

## RF - TEST REPORT

Report Number : **64.790.13.02590.01- FCC** Date of Issue: 2013-11-04

Model : A0-RC01

Product Type : Remote Control

FCC ID : 2AAUHA0-RC01REMOTE

Applicant : SHANGHAI ETIGER DIGITAL TECHNOLOGY CO.,LTD

Address : 1905,Greenland bld, 1258 YuYuan rd, ChangNing District  
Shanghai, 200050 China

License Holder : SHANGHAI ETIGER DIGITAL TECHNOLOGY CO.,LTD

Address : 1905,Greenland bld, 1258 YuYuan rd, ChangNing District  
Shanghai, 200050 China

Test Result : ☒ **Positive** ☐ **Negative**



Total pages including  
Appendices : 35

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## 1. DETAILS ABOUT THE TEST LABORATORY

### Details about the Test Laboratory

#### Test Site 1

Company name: Jiangsu TÜV Product Service Ltd. Guangzhou Branch

5F, Communication Building, 163 Pingyun Rd, Huangpu West Ave.  
Guangzhou 510656 P. R. China

TEL: +86 20 3832 0668

FAX: +86 20 3832 0478

#### Test Site 2

Company name: Neutron Engineering Inc.  
No.3.JinShaGang 1st Road,  
ShiXia,DaLang Town,  
DongGuan, China

Telephone: 86 769 83183000


Fax: 86 769 83196000

January 24, 2005 File on  
Federal Communications Commission  
Laboratory Division  
7435 Oakland Mills Road  
Columbia, MD 21046

Registration  
Number: 319330

## 2. DESCRIPTION OF THE EQUIPMENT UNDER TEST

Test Standards	
FCC Part 15 Subpart C (10–1–12 Edition)	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Equipment	Remote Control	
Model Name.	A0-RC01	
Product Description	Product Type	Remote Control
	Operation Frequency:	2420MHz
	modulation Type:	FSK
	Number Of Channel	1
	Antenna Designation:	PCB layout
	Antenna Gain(Peak)	0.5 dBi max.
	Maximum Field strength	91.03dBuV/m
	More details of EUT technical specification. Please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Power Source	DC 3V("CR2032")	
Connecting I/O Port(s)	N/A	
Products Covered	N/A	
Antenna	PCB layout 	

### 3. SUMMARY OF TEST RESULTS

Technical Requirements			
Transmit mode			
Test Items	Test Result		
	Pass	Fail	Test site
15.249 (a) Field Strength of Fundamental	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Site 2
15.249 (a) & 15.249 (d) Field Strength of Unwanted Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Site 2
15.215 (c) Occupied Bandwidth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Site 2



China

## 4. GENERAL REMARKS

This submittal(s) (test report) is intended for

FCC ID: 2AAUHA0-RC01REMOTE

filing to comply with

- Section 15.215, 15.209, 15.249 of the FCC Part 15, Subpart C Rules. Tests have been carried out in accordance with FCC rules Part 15 Subpart C, ANSI C63.4 (2009).

### SUMMARY:

All tests according to the regulations cited on page 7 were

☒ - Performed

☐ - **Not** Performed

The Equipment Under Test

☒ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Testing Start Date: 2013-08-14

Testing End Date: 2013-08-18

- JIANGSU TÜV PRODUCT SERVICE LTD. GUANGZHOU BRANCH-

Reviewed by:

Prepared by:

Tony Liu

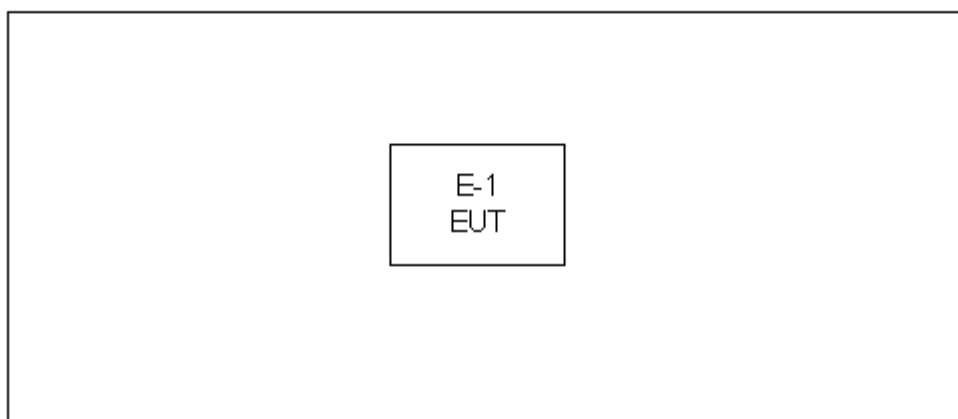
Celia Xiang

## 5. DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Final Test Mode	Description
Mode 1	Continuously transmitting at 2420MHz.

### 5.1 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 5.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note



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Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in m in 『Length』 column.

## 6. TEST RESULTS

### 6.1 MEASUREMENT UNCERTAINTY

For a 95% confidence level( $k=2$ ), the measurement expanded uncertainties for defined systems accordance with the recommendations of ISO 17025 as following:

Test item		expanded uncertainty
Bandwidth	Magnitude (%)	$U = 0.5\%$
Radiated spurious emission	Filed strength (dBuV/m)	$U = 2.61\text{dB}(30\text{MH}\sim 1\text{GHz})$ $U = 2.6\text{dB}(\text{above } 1\text{GHz})$



## 6.2 FIELD STRENGTH OF FUNDAMENTAL& UNWANTED EMISSIONS

### 6.2.1 Limits

FCC Part 15.249(a)		
Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m @ 3m)	Field Strength of Harmonics (dBuV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0
FCC Part 15.249(d)		
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.		

### 6.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Apr. 25, 2014
2	Amplifier	HP	8447D	2944A09673	Apr. 25, 2014
3	Test Receiver	R&S	ESCI	100382	Apr. 25, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 02, 2014
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	Apr. 25, 2014
7	Amplifier	Agilent	8449B	3008A02274	Apr. 25, 2014
8	Spectrum	Agilent	E4408B	US39240143	Nov. 16, 2013
9	Test Cable	HUBER+SUHNER	C-45	N/A	Apr. 30, 2014

Remark: " N/A" denotes No Model Name. / Serial No. and No Calibration specified.

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1GHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1 MHz / 1 MHz for Peak, 1MHz/10Hz for average

### 6.2.3 TEST PROCEDURE

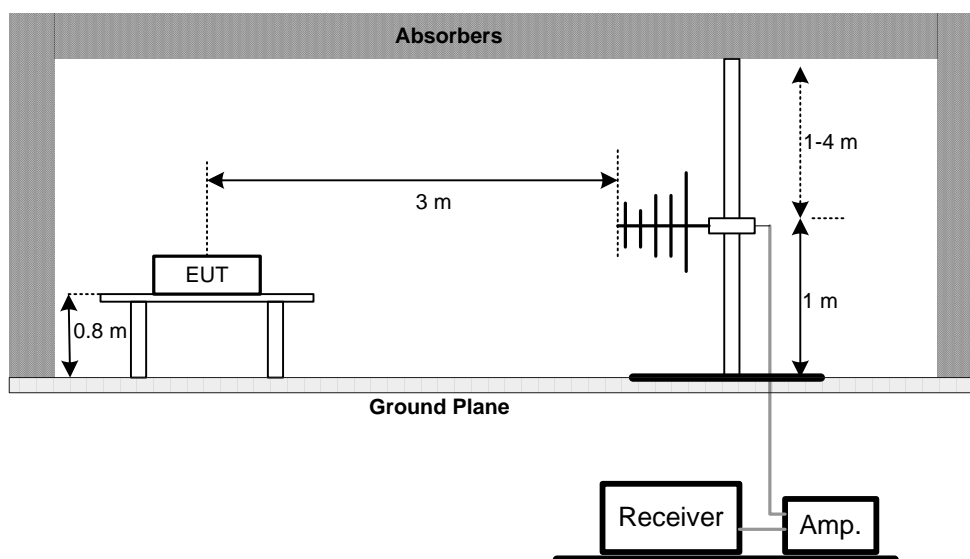
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item – EUT Test Photos.

### 6.2.4 DEVIATION FROM TEST STANDARD

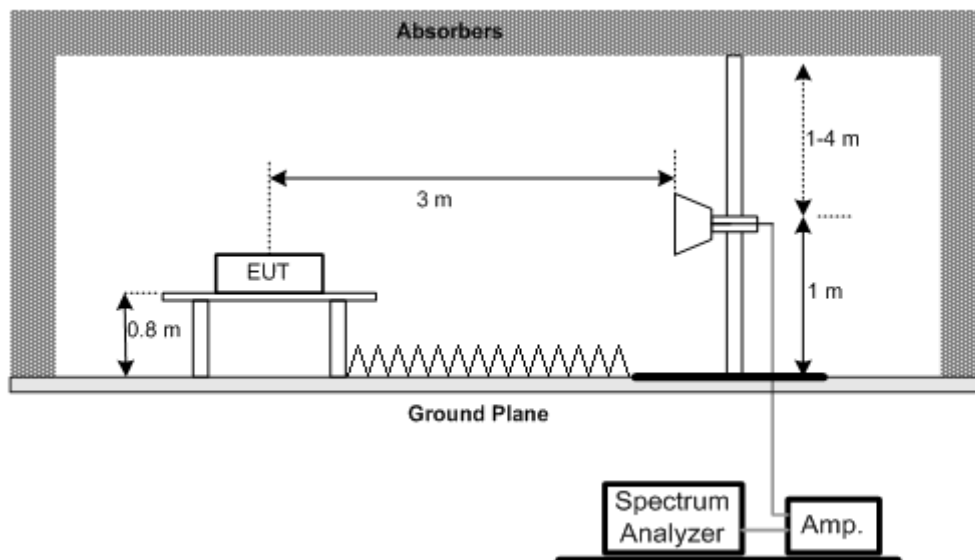
No deviation

### 6.2.5 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



## (B) Radiated Emission Test Set-Up Frequency Above 1 GHz



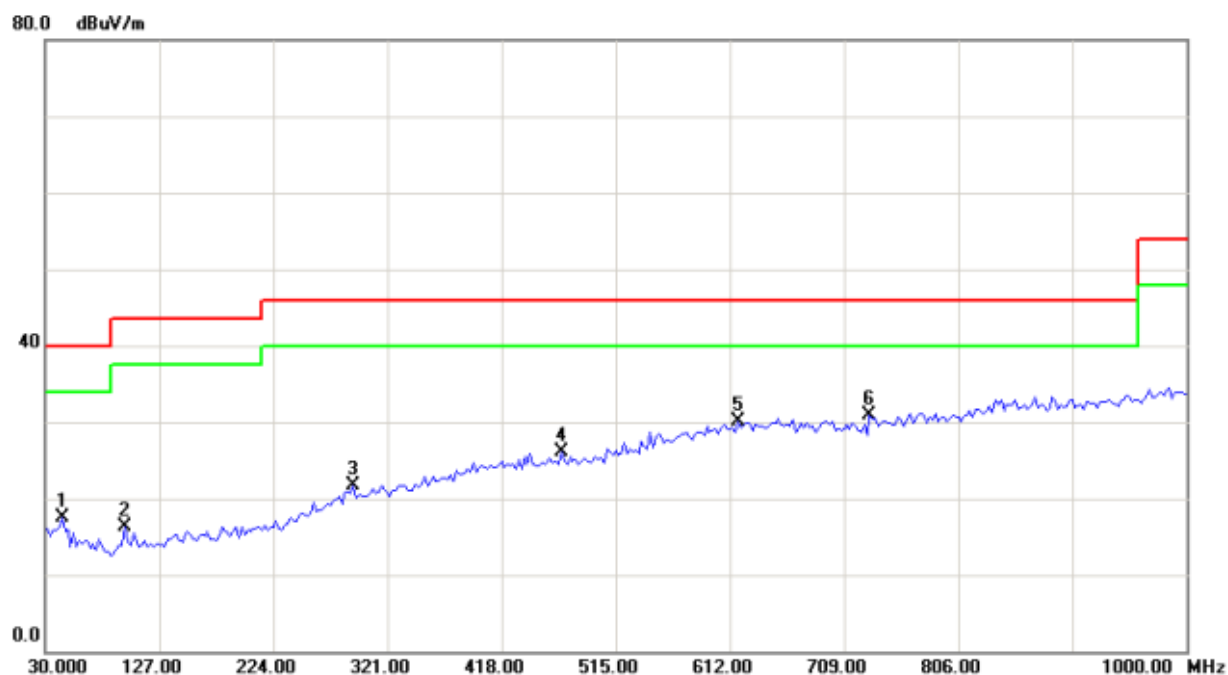
### 6.2.6 EUT OPERATING CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

## 6.2.7 TEST RESULTS

Below 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	23°C	Relative Humidity:	51 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Vertical – X axis



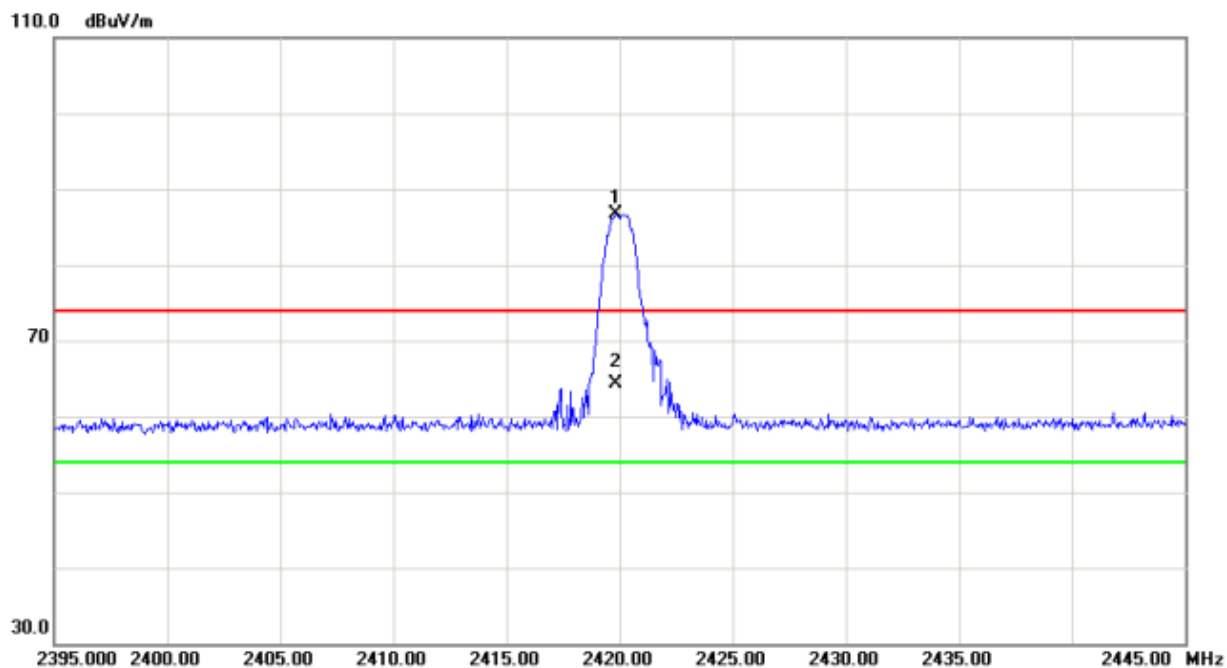
No significant emission was detected within 10 dB to limit



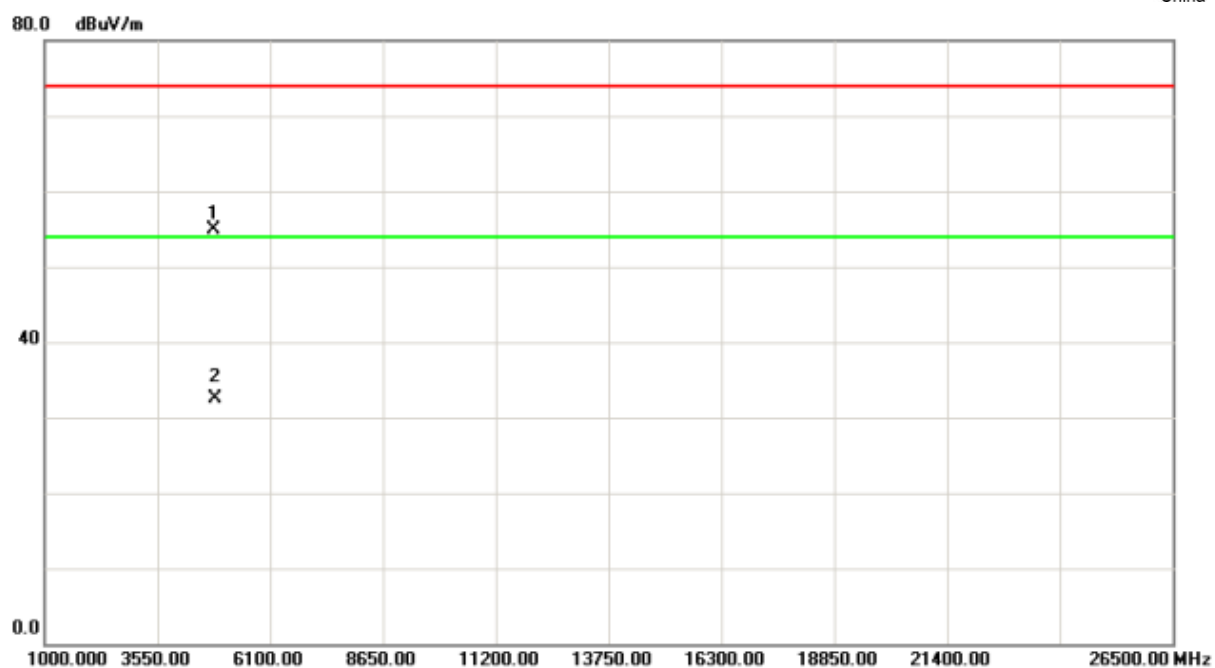
China

Above 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1009 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Vertical – X axis



Frequency	Reading level	Correct factor	measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
2420	52.58	34.18	86.76	114	-27.24	Peak
2420	30.20	34.18	64.38	94	-29.62	AVG

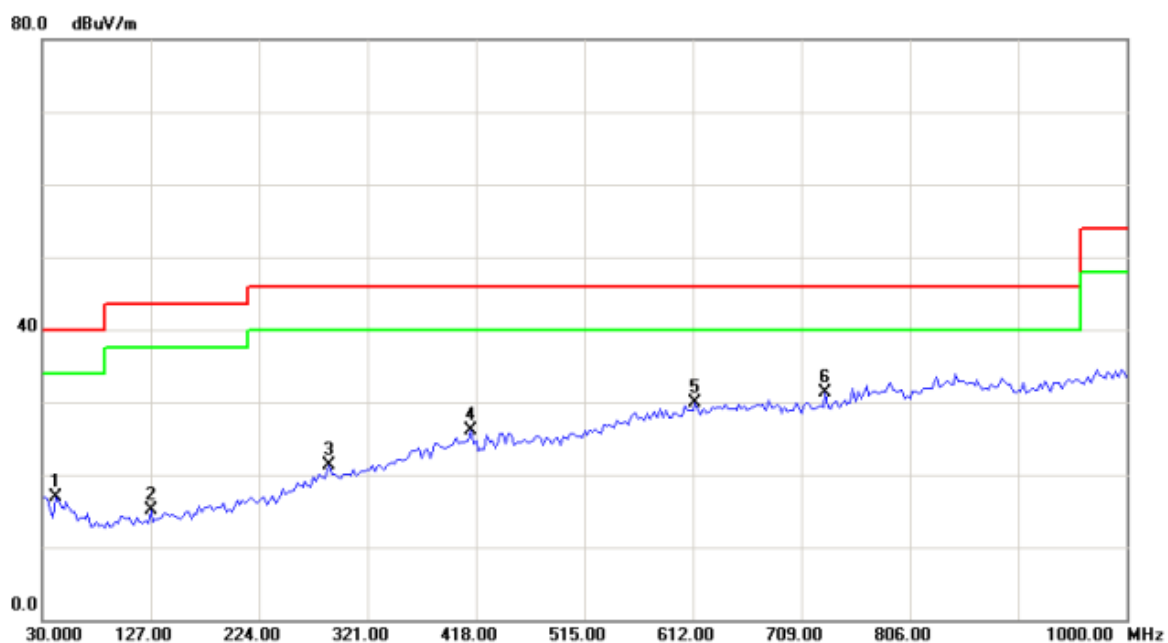


Frequency	Reading level	Correct factor	Measure ment	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4840	48.45	6.49	54.94	74	-19.06	Peak
4840	26.07	6.49	32.56	54	-21.44	AVG

No significant emission except harmonics was detected within 10 dB to limit of section 15.209.

Below 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	23°C	Relative Humidity:	51 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Horizontal – X axis



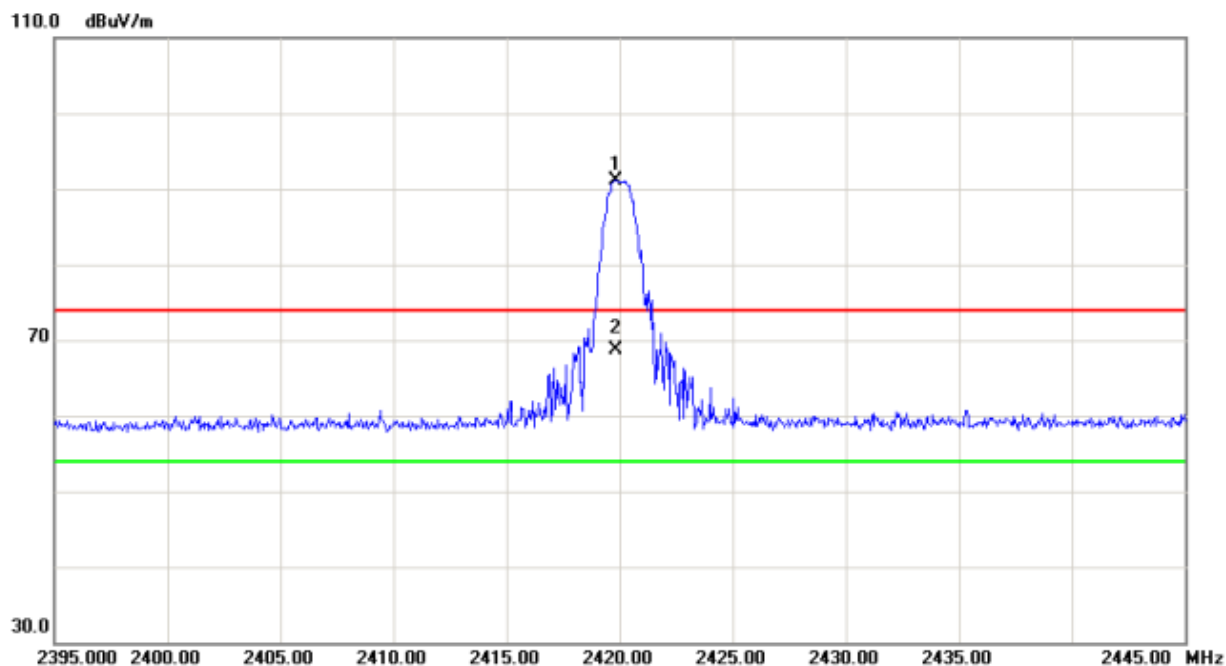
No significant emission was detected within 10 dB to limit



China

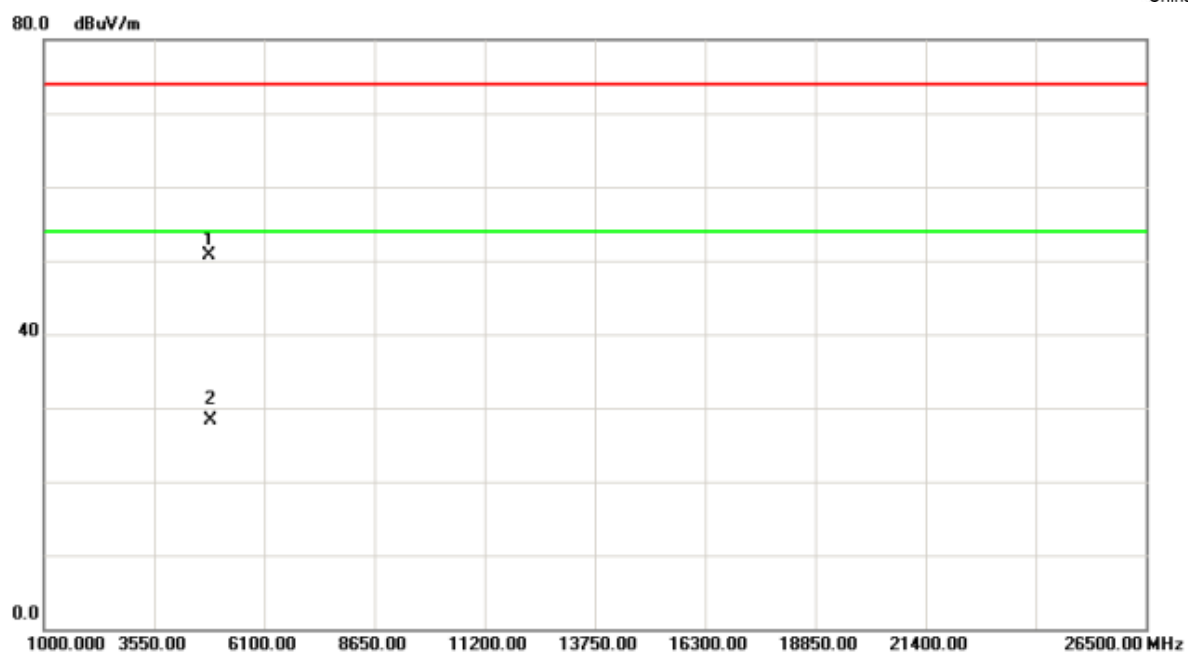
Above 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1009 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Horizontal – X axis



Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/	dB	
2420	56.85	34.18	91.03	114	-22.97	Peak
2420	34.47	34.18	68.65	94	-25.35	AVG



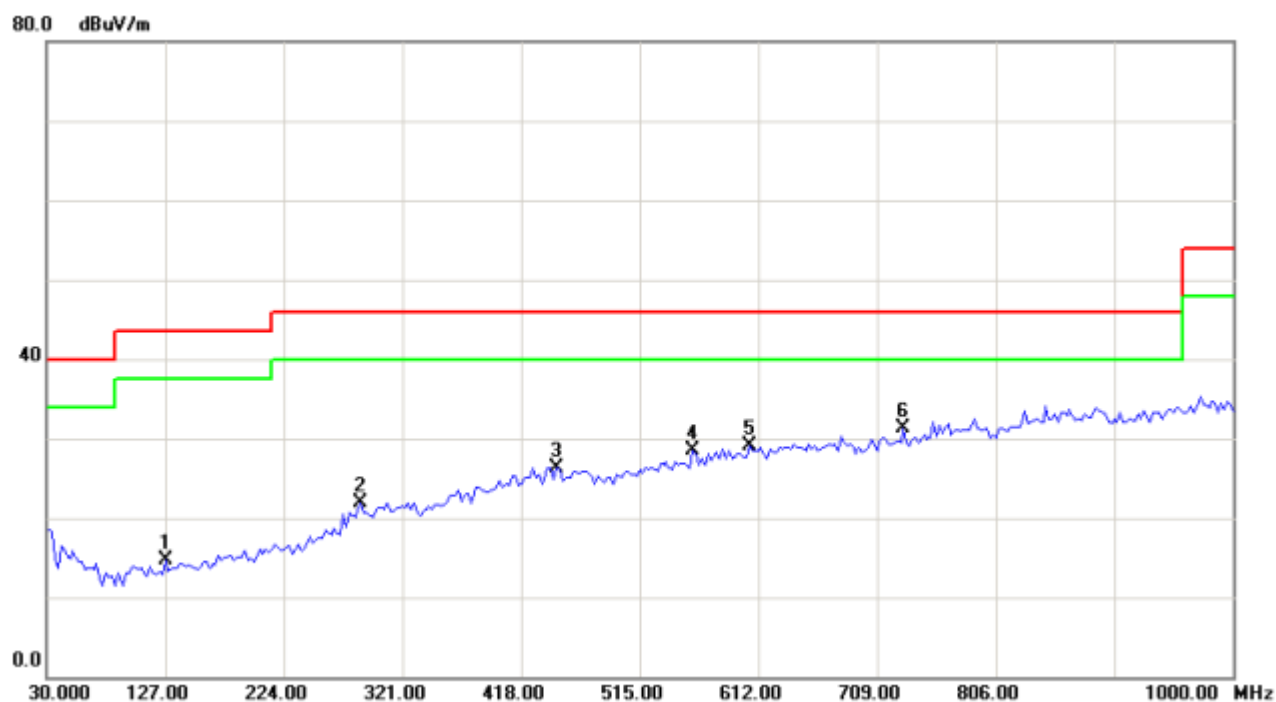


Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4840	44.25	6.49	50.74	74	-23.26	Peak
4840	21.87	6.49	28.36	54	-25.64	AVG

No significant emission except harmonics was detected within 10 dB to limit of section 15.209.

Below 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	23°C	Relative Humidity:	51 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Horizontal – Y axis



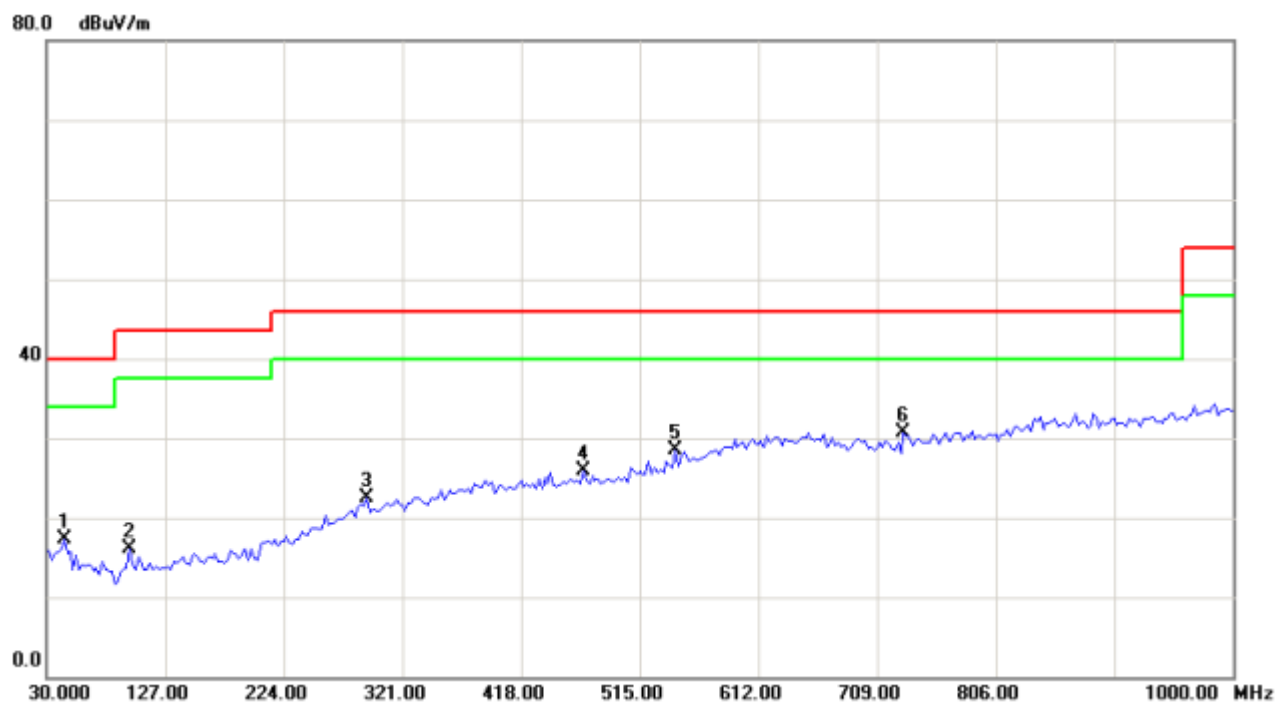
No significant emission was detected within 10 dB to limit



China

Below 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	23°C	Relative Humidity:	51 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Vertical – Y axis



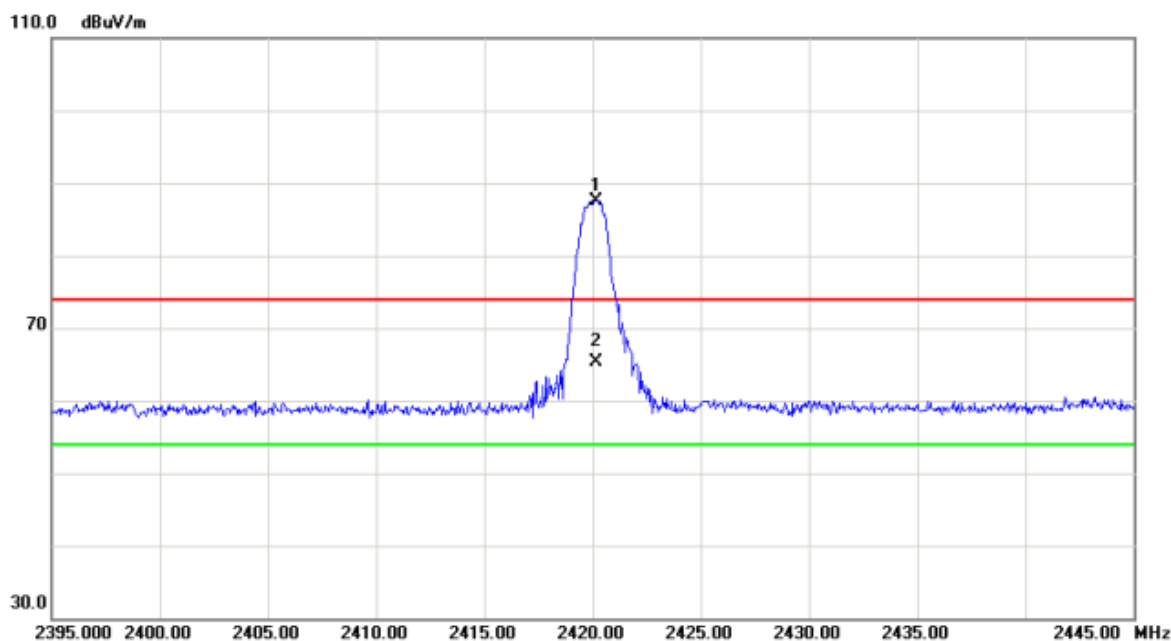
No significant emission was detected within 10 dB to limit



China

Above 1GHz:

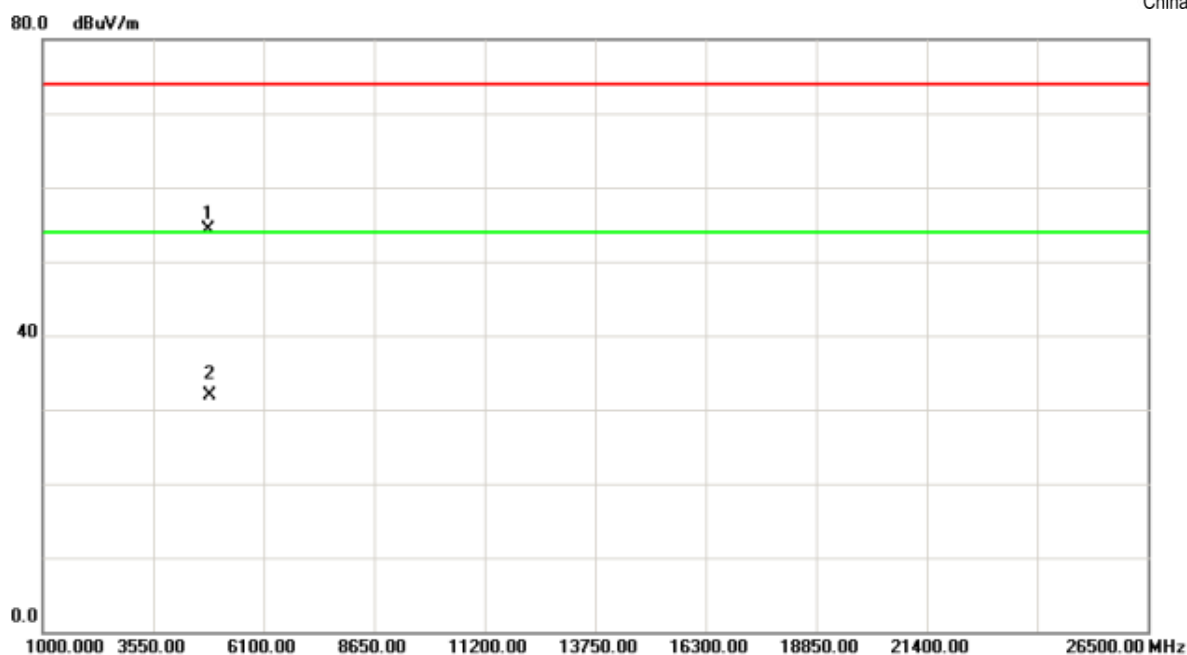
Model:	A0-RC01	Result:	PASS
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1009 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Horizontal – Y axis



Frequency	Reading level	Correct factor	measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
2420	53.42	34.18	87.6	114	-26.4	Peak
2420	31.04	34.18	65.22	94	-28.78	AVG



China



Frequency	Reading level	Correct factor	measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4840	47.76	6.49	54.25	74	-19.75	Peak
4840	25.38	6.49	31.87	54	-22.13	AVG

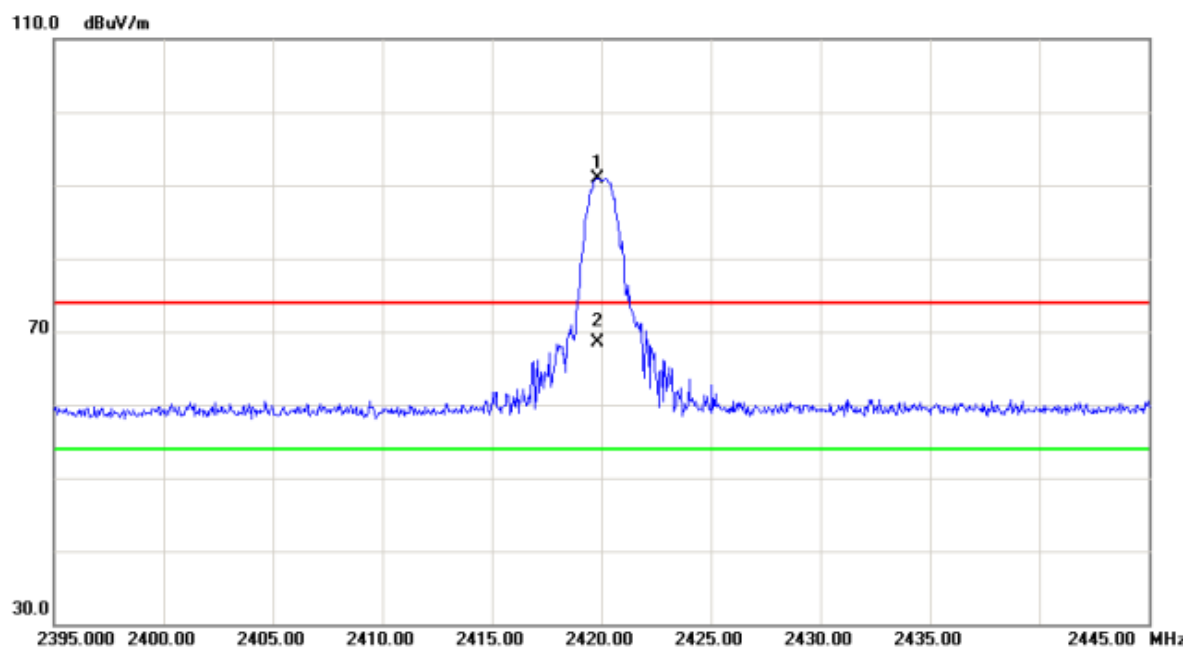
No significant emission except harmonics was detected within 10 dB to limit of section 15.209.



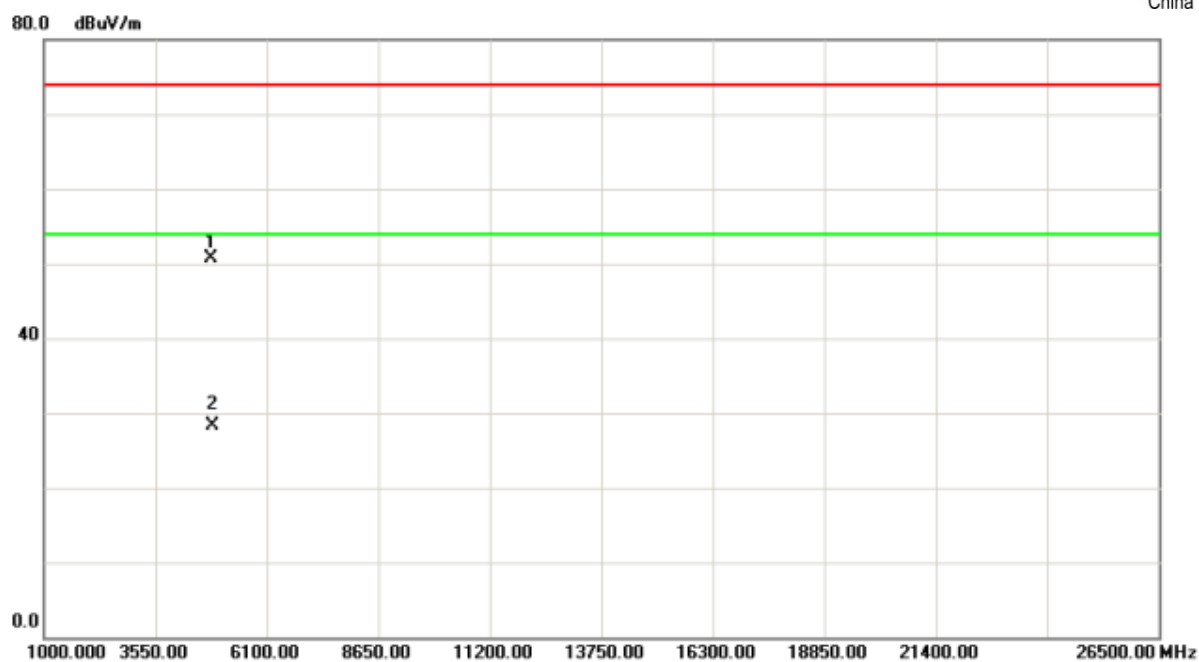
China

Above 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1009 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Vertical – Y axis



Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
2420	56.67	34.18	90.85	114	-23.15	Peak
2420	34.29	34.18	68.47	94	-25.53	AVG



Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4840	44.15	6.49	50.64	74	-23.36	Peak
4840	21.77	6.49	28.26	54	-25.74	AVG

No significant emission except harmonics was detected within 10 dB to limit of section 15.209.



China

Below 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	23°C	Relative Humidity:	51 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Vertical – Z axis



No significant emission was detected within 10 dB to limit

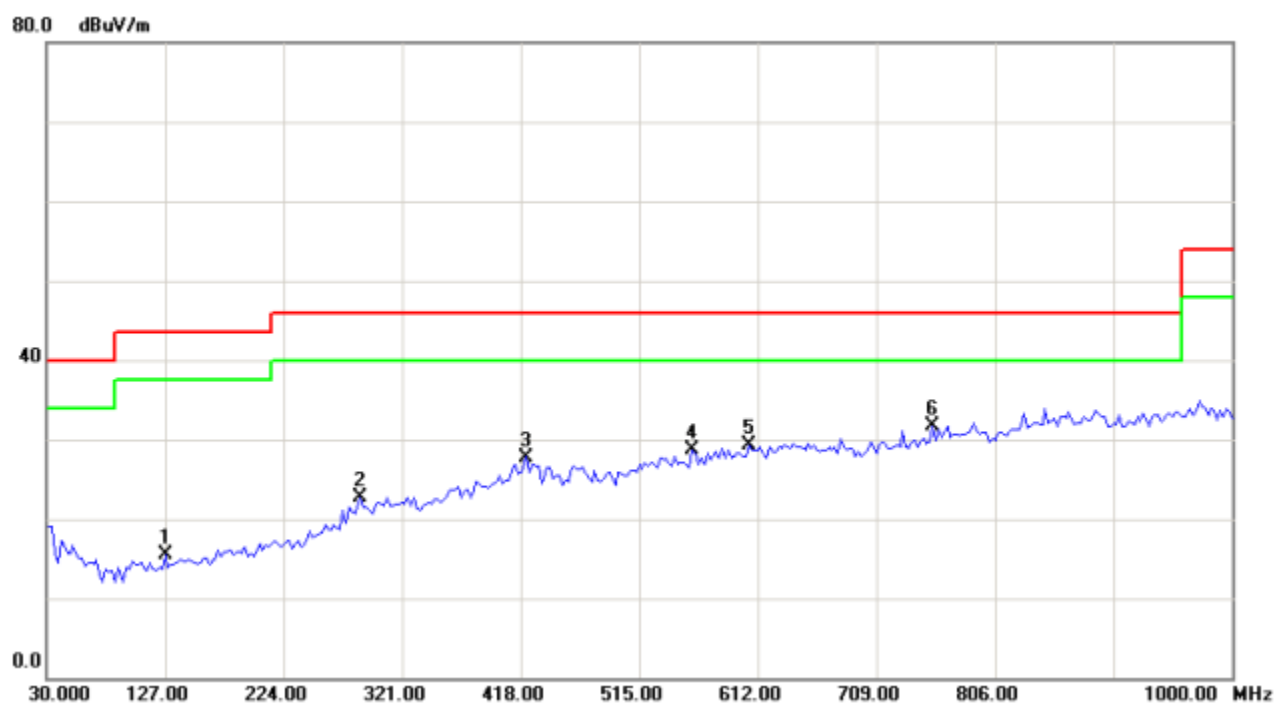




China

Below 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	23°C	Relative Humidity:	51 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Horizontal – Z axis



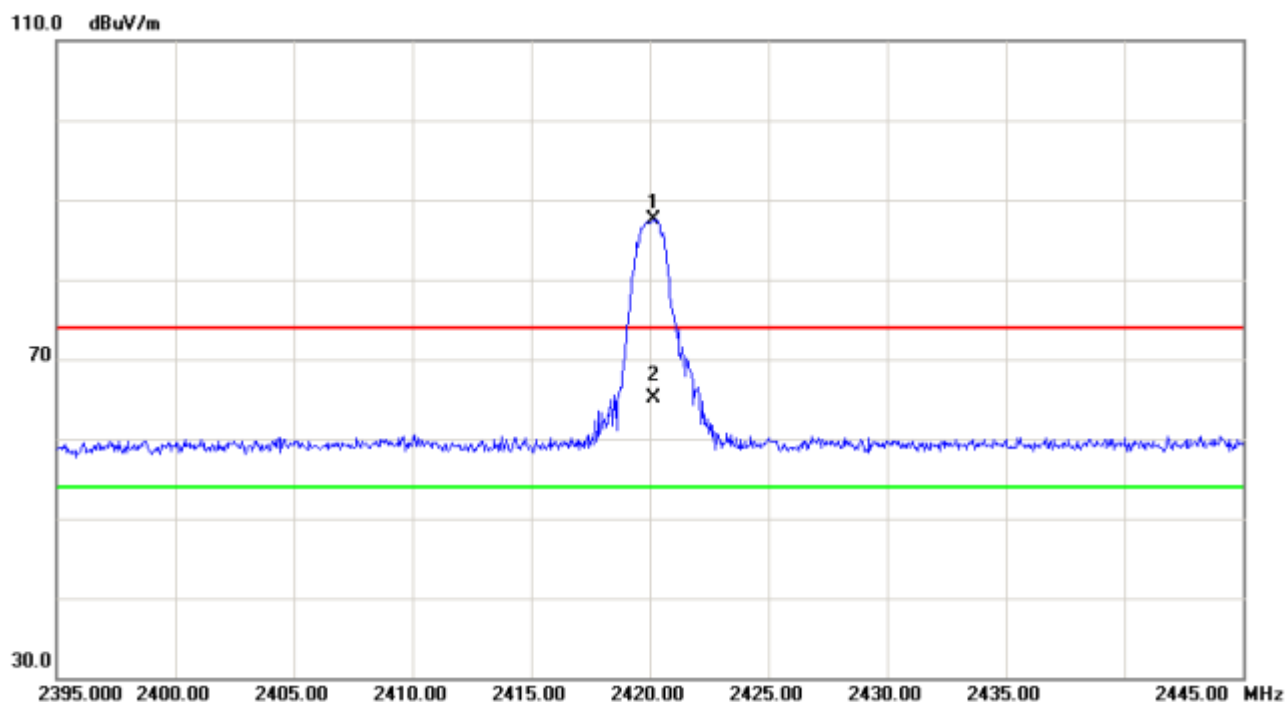
No significant emission was detected within 10 dB to limit



China

Above 1GHz:

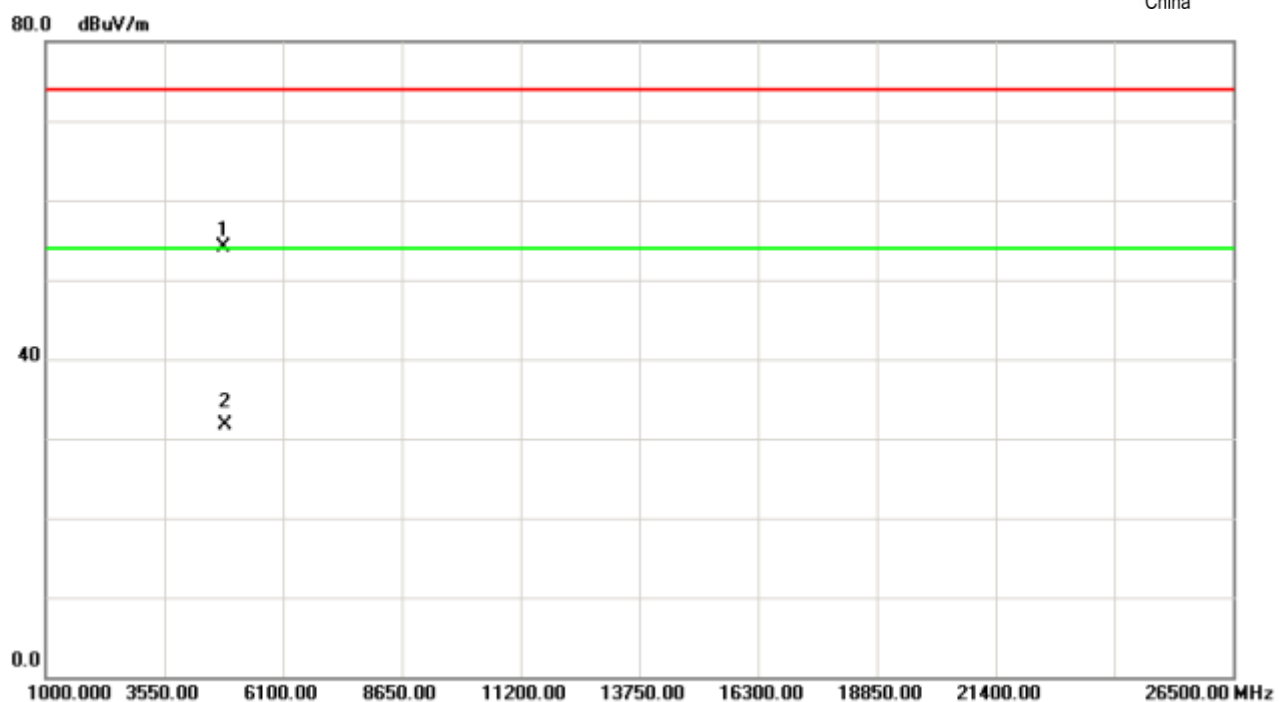
Model:	A0-RC01	Result:	PASS
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1009 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode.	Antenna polarity:	Horizontal – Z axis



Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detect r
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
2420	53.24	34.18	87.42	114	-26.58	Peak
2420	30.86	34.18	65.04	94	-28.96	AVG



China



Frequency	Reading level	Correct factor	measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4840	47.65	6.49	54.14	74	-19.86	Peak
4840	25.27	6.49	31.76	54	-22.24	AVG

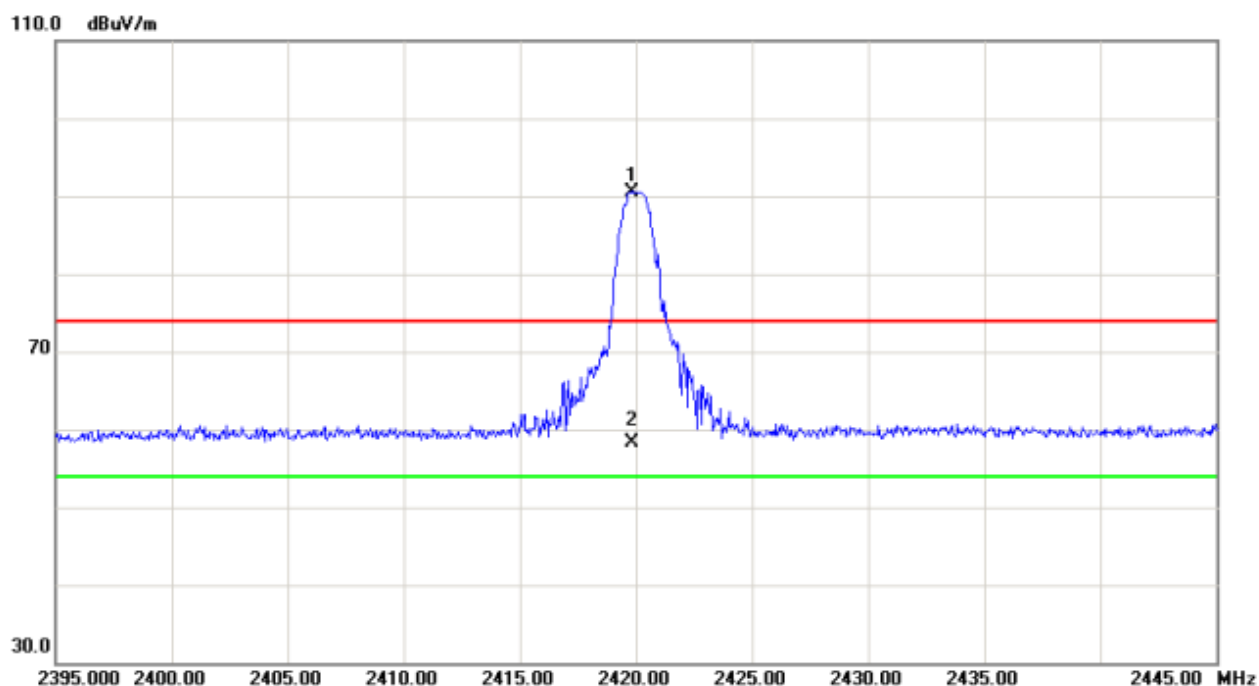
No significant emission except harmonics was detected within 10 dB to limit of section 15.209.



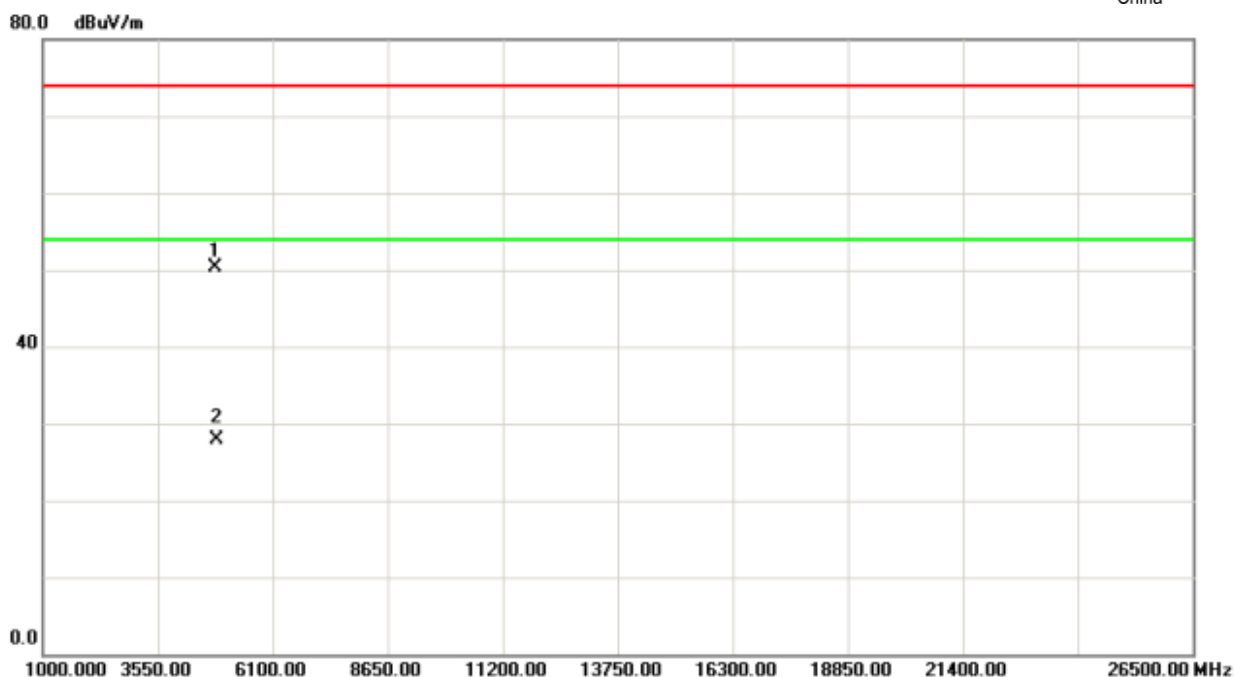
China

Above 1GHz:

Model:	A0-RC01	Result:	PASS
Temperature:	25°C	Relative Humidity:	58 %
Pressure:	1009 hPa	Test voltage:	DC 3V
Test Mode :	Transmitting mode	Antenna polarity:	Vertical – Z axis



Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
2420	56.42	34.18	90.60	114	-23.4	Peak
2420	24.04	34.18	58.22	94	-35.78	AVG



Frequency	Reading level	Correct factor	Measurement	Limit	Over	Detector
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
4840	43.87	6.49	50.36	74	-23.64	Peak
4840	21.49	6.49	27.98	54	-26.02	AVG

No significant emission except harmonics was detected within 10 dB to limit of section 15.209.

#### Remark:

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)  
From 30MHz to 1GHz, read the field strength of the emissions with RBW=120KHz.
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .  
Read the Peak field strength through RBW=1MHz, VBW=3MHz in spectrum analyzer setting.  
Read the Average field strength through RBW=1MHz, VBW=10Hz in spectrum analyzer setting.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

## 6.3 OCCUPIED BANDWIDTH

### 6.3.1 APPLIED PROCEDURES / LIMIT

15.215(c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that, the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 6.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2013

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

### 6.3.3 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 30KHz, VBW=100KHz, Sweep time = 10 ms.

### 6.3.4 DEVIATION FROM STANDARD

No deviation.

### 6.3.5 TEST SETUP

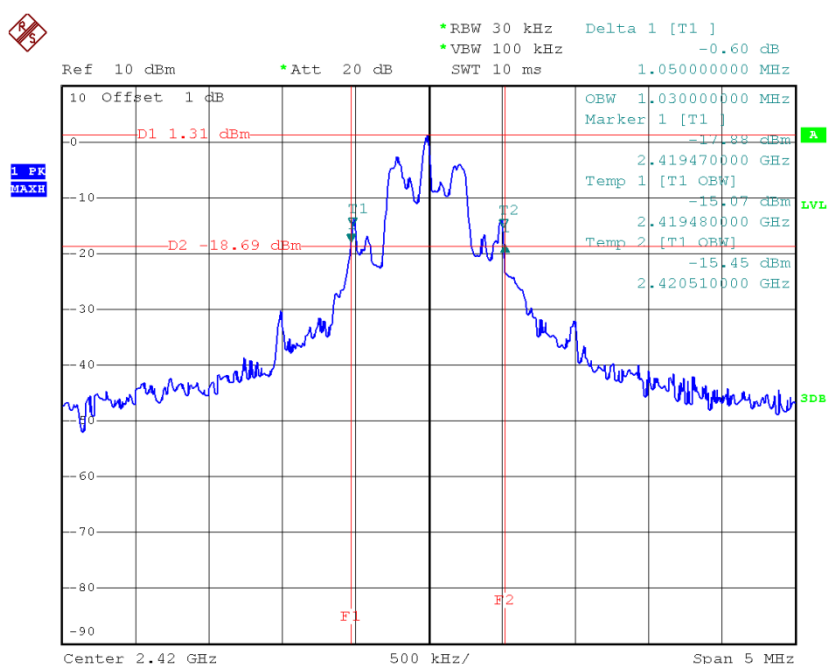


### 6.3.6 EUT OPERATION CONDITIONS

The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

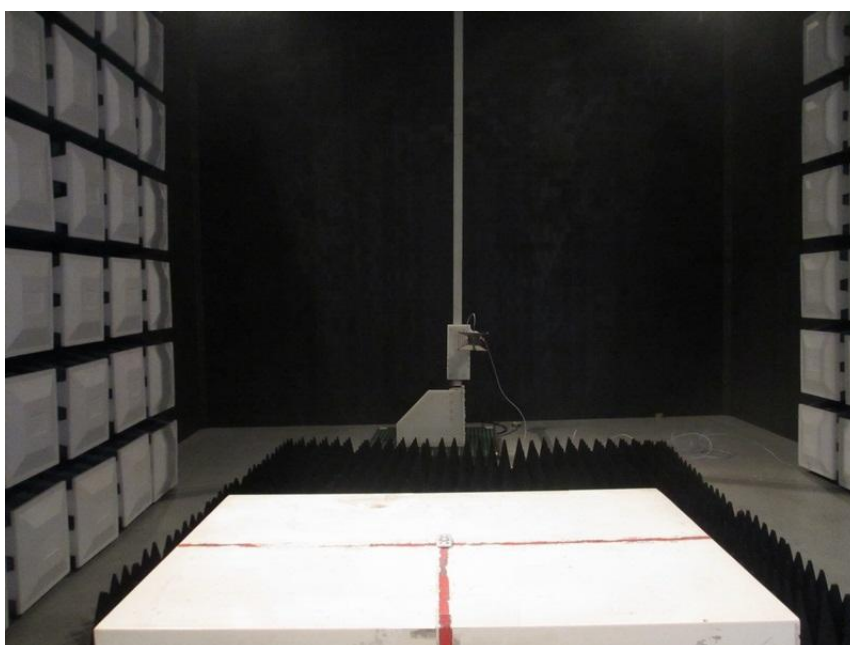
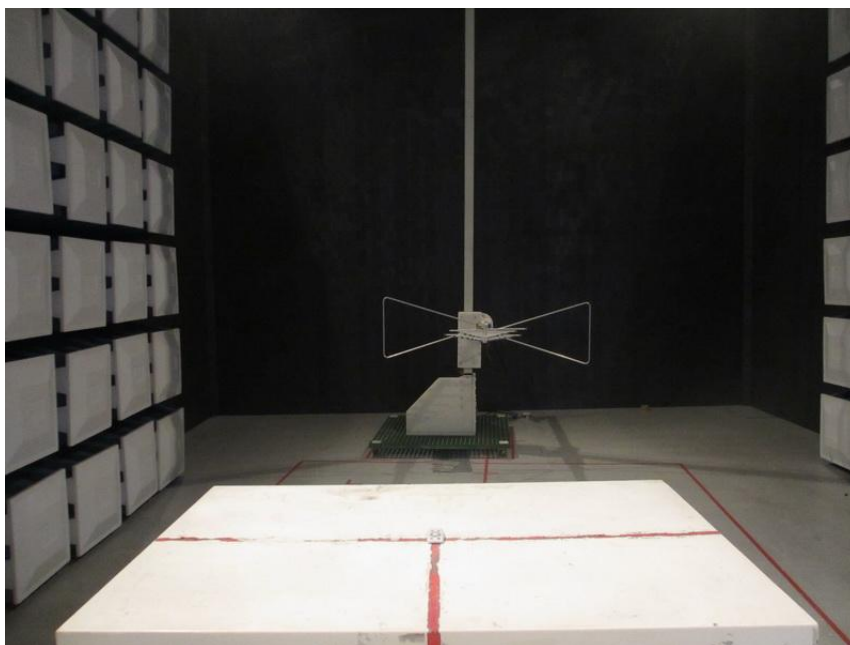
Model:	A0-RC01	Result:	PASS
Temperature:	20°C	Relative Humidity:	55 %
Pressure:	1001 hPa	Test voltage:	DC 3V
Test Mode :	Continuously transmitting mode.		

Frequency	20dB Bandwidth
2402MHz	1.03MHz



## 7. Appendix A - TEST SETUP PHOTOS

### Radiated Emissions Test





## 8. Appendix B - EUT PHOTOS



