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TEST REPORT

Report No. : **CHTEW19010054** Report verification : 

Project No...... : **SHT1812059701EW**

FCC ID..... : **2AR5AWMLP2018M**

Applicant's name..... : **U-lovelife(Shenzhen)technology limited Co.,Ltd**

Address..... : 3 Floor, 1 Building, Anhaorui Industrial Park, No. 1 Jian'an Road, Fuyong Street, Baoan District, Shenzhen City

Manufacturer..... : U-lovelife(Shenzhen)technology limited Co.,Ltd

Address..... : 3 Floor, 1 Building, Anhaorui Industrial Park, No. 1 Jian'an Road, Fuyong Street, Baoan District, Shenzhen City

Test item description : **iK8 Wireless Microphone**

Trade Mark : -

Model/Type reference..... : LP-2018M

Listed Model(s) : -

Standard : **FCC CFR Title 47 Part 74 Subpart H**

Date of receipt of test sample..... : Dec.27, 2018

Date of testing..... : Dec.27, 2018- Jan.09, 2019

Date of issue..... : Jan.10, 2019

Result..... : **PASS**

Compiled by
(position+printed name+signature)... : File administrators Fanghui Zhu

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Approved by
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Testing Laboratory Name : **Shenzhen Huatongwei International Inspection Co., Ltd**

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[FCC Rules Part 74 Subpart H](#): Low Power Auxiliary Stations.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-01-10	Original

2. TEST DESCRIPTION

Test Item	Section in CFR 47	Result	Test Engineer
Carrier Power	74.861(e)(1)	Pass	Xiaokang Tan
Operating Bandwidth and Emission Mask	74.861(e)(5)(6)	Pass	Xiaokang Tan
Modulation Deviation	74.861(e)(3)	N/A	N/A
Frequency Stability	74.861(e)(4)	Pass	Xiaokang Tan
Radiated Spurious Emissions	74.861(e)(6)(iii)	Pass	Baojin Lin

Note: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	U-lovelife(Shenzhen)technology limited Co.,Ltd
Address:	3 Floor, 1 Building, Anhaorui Industrial Park, No. 1 Jian'an Road, Fuyong Street, Baoan District, Shenzhen City
Manufacturer:	U-lovelife(Shenzhen)technology limited Co.,Ltd
Address:	3 Floor, 1 Building, Anhaorui Industrial Park, No. 1 Jian'an Road, Fuyong Street, Baoan District, Shenzhen City

3.2. Product Description

Name of EUT:	iK8 Wireless Microphone
Trade Mark:	-
Model No.:	LP-2018M
Listed Model(s):	-
Power supply:	DC 3.7V
RF Specification	
Operation frequency:	494MHz ~ 608MHz
Channel number:	4
Modulation type:	Pi/DQPSK
Antenna type:	Internal Antenna
Antenna gain:	1 dBi

3.3. Operation state

➤ Test frequency list

According to ANSI C63.10 section 5.6.2:

Measurements of unlicensed wireless devices shall be performed and, if required, reported for each band in which the EUT can be operated with the device operating at the number of frequencies in each band specified in Table 4.

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	590.00	3	596.00
2	593.00	4	599.00

➤ EUT operation mode

The EUT has been tested under typical operating condition. Keep the EUT in continuous transmitting mode for testing.

3.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

/	Manufacturer :	/
	Model No. :	/
/	Manufacturer :	/
	Model No. :	/

3.5. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Phone: 86-755-26748019 Fax: 86-755-26748089

4.2. Test Facility

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

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.:3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. 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 762235.

IC-Registration No.: 5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

MRA designation No.: CN1181

4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Voltage	VN=Nominal Voltage	DC 3.70V
	VL=Lower Voltage	DC 3.60V
	VH=Higher Voltage	DC 4.20V
Temperature	TN=Normal Temperature	25 °C
	Extreme Temperature	From -30° to + 50° centigrade
Humidity	30~60 %	
Air Pressure	950-1050 hPa	

4.4. 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 TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection 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 Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.63 dB	(1)
Transmitter power Radiated	2.38 dB	(1)
Conducted spurious emissions 9kHz~40GHz	0.63 dB	(1)
Conducted Disturbance 150kHz~30MHz	3.35 dB	(1)
Radiated Emissions below 1GHz	4.28 dB	(1)
Radiated Emissions above 1GHz	5.16 dB	(1)
Occupied Bandwidth	18 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4.5. Equipments Used during the Test

● Radiated Spurious Emission						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	SAC-3m-01	N/A	2018/09/30	2021/09/29
●	Spectrum Analyzer	R&S	FSP40	100597	2018/10/27	2019/10/26
●	Loop Antenna	R&S	HFH2-Z2	100020	2017/11/20	2020/11/19
●	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	538	2017/04/05	2020/04/04
●	Horn Antenna	SCHWARZBECK	9120D	1011	2017/04/01	2020/03/31
○	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2017/03/27	2020/03/26
○	Pre-amplifier	BONN	BLWA0160-2M	1811887	2018/11/14	2019/11/13
●	Pre-amplifier	CD	PAP-0102	12004	2018/11/14	2019/11/13
●	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-248	2018/04/28	2019/04/27
●	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	2018/11/15	2019/11/14
●	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	2018/11/15	2019/11/14
●	EMI Test Software	Audix	E3	N/A	N/A	N/A
●	Turntable	MATURO	TT2.0	N/A	N/A	N/A
●	Antenna Mast	MATURO	TAM-4.0-P	N/A	N/A	N/A

Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2018/10/28	2019/10/27
○	Spectrum Analyzer	Agilent	N9020A	MY50510187	2018/09/29	2019/09/28
○	Radio communication tester	R&S	CMW500	137688-Lv	2018/09/29	2019/09/28
○	Test software	Tonscend	JS1120-1(LTE)	N/A	N/A	N/A
○	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A
○	Test software	Tonscend	JS1120-3(WCDMA)	N/A	N/A	N/A
○	Test software	Tonscend	JS1120-4(GSM)	N/A	N/A	N/A

● Auxiliary Equipment						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Climate chamber	ESPEC	GPL-2	N/A	2018/11/08	2019/11/07
●	DC Power Supply	Gwinstek	SPS-2415	GER835793	2018/10/28	2019/10/27

5. TEST CONDITIONS AND RESULTS

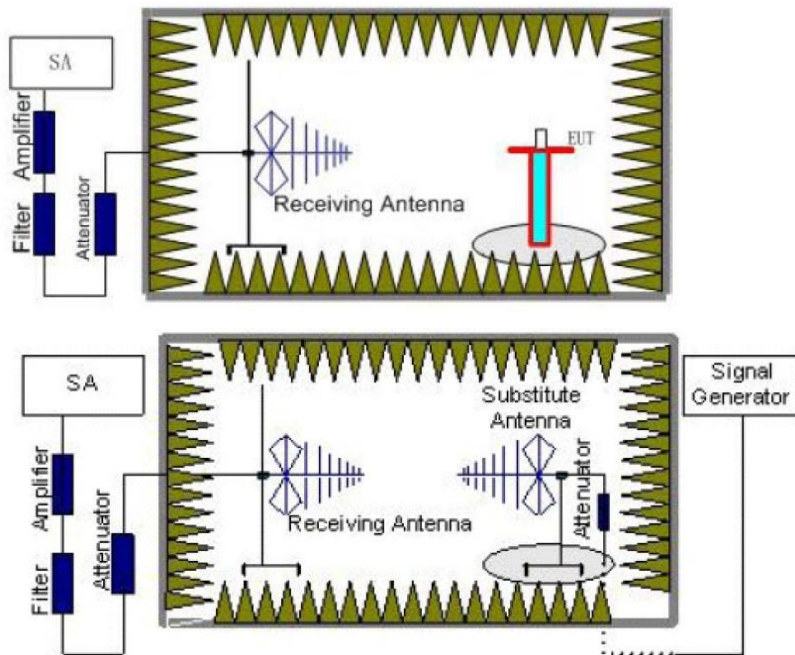
5.1. Carrier Power

LIMIT

FCC CFR Title 47 Part 74 Subpart H Section 861(e)(1):

Frequency range (MHz)	Limit
54-72MHz, 76-88MHz, and 174-216 MHz	50mW(EIRP)
470-608MHz and 614-698MHz	250mW(Conducted power)
600 MHz duplex gap	20mW(EIRP)

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 0.8 meter for below 1GHz and 1.5 meter for above 1GHz high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.0m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:
 $\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$
 We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:
 $\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
 ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

Passed **Not Applicable**

Channel	Conducted Output Power (dBm)	Limit (dBm)	Result
CH _L	-8.73	24.00	Pass
CH _M	-8.81		
CH _H	-9.15		

5.2. Operating Bandwidth and Emission Mask

LIMIT

FCC CFR Title 47 Part 74 Subpart H:

Section 861(e) (5)

The operating bandwidth shall not exceed 200 kHz.

Section 861(e) (6)

The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

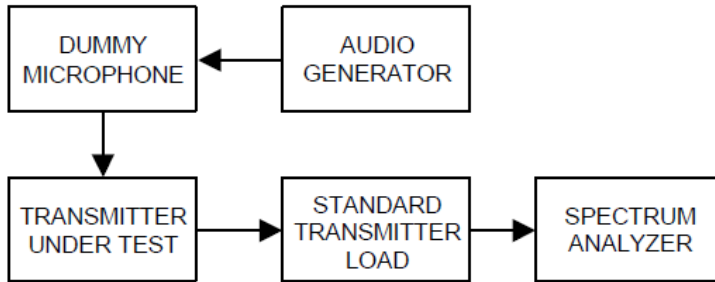
(i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;

(ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;

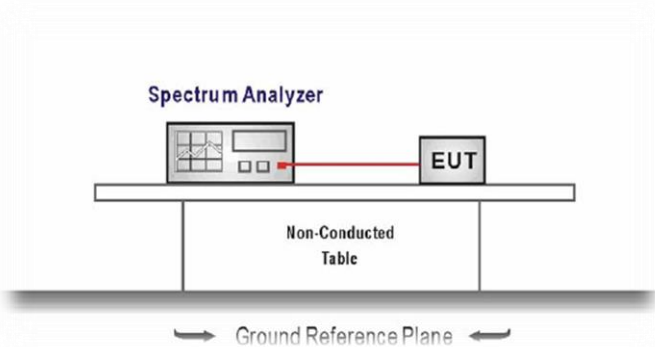
(iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43 + 10\log_{10}$ (mean output power in watts) dB.

TEST CONFIGURATION

For analog devices:



For digital devices:



TEST PROCEDURE

For analog devices:

Input 2500Hz signal to the microphone, find the 50% rated deviation, add the level 16dB, test this status the 99% occupied bandwidth and record it.

For digital devices:

Connect directly to the spectrum for testing.

TEST MODE:

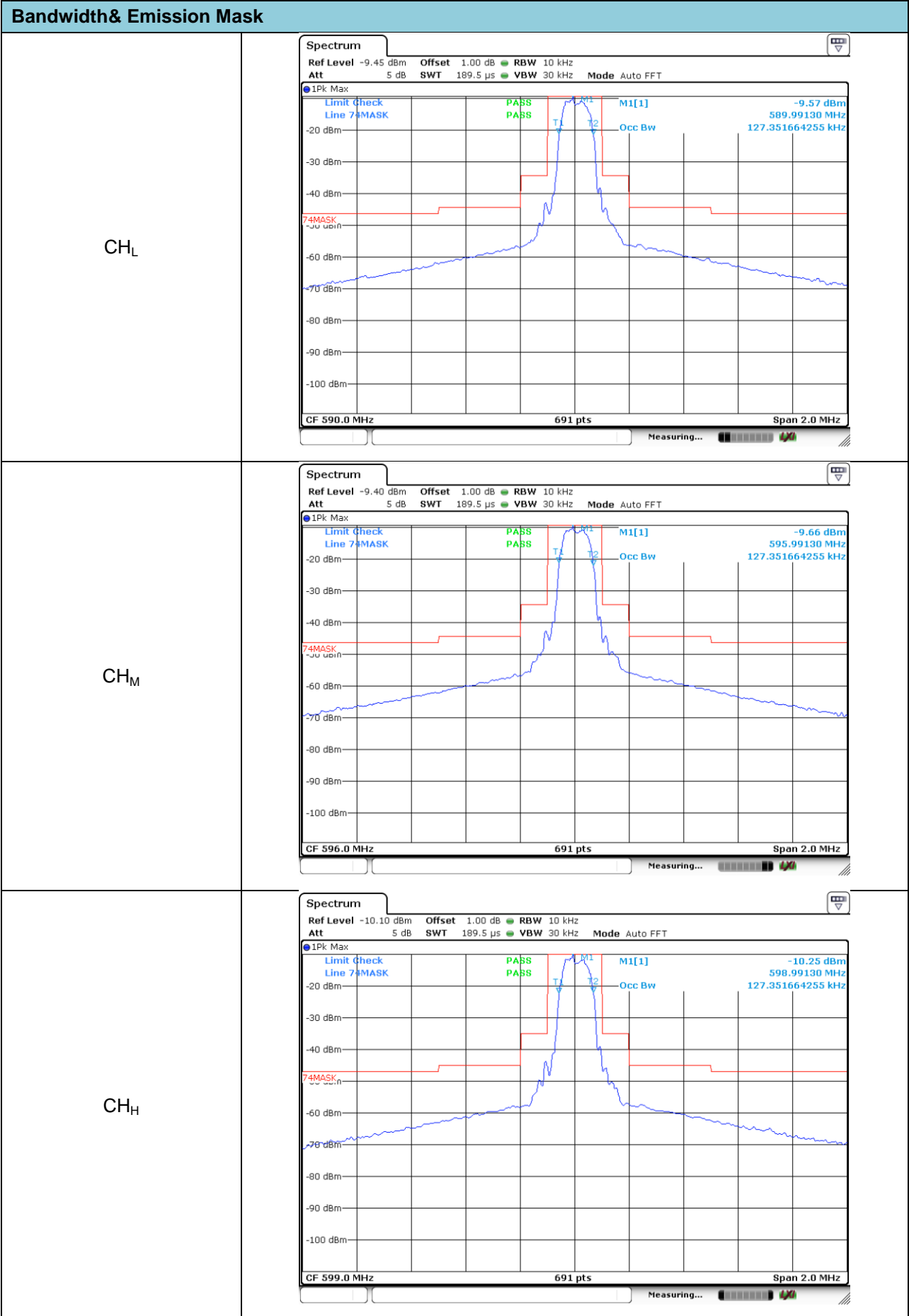
Please refer to the clause 3.3

TEST RESULTS

Passed Not Applicable

Bandwidth:

Channel	Bandwidth(KHz)	Limit(KHz)	Test Result
CH _L	127.35	200.00	Pass
CH _M	127.35	200.00	Pass
CH _H	127.35	200.00	Pass



5.3. Modulation Deviation

LIMIT

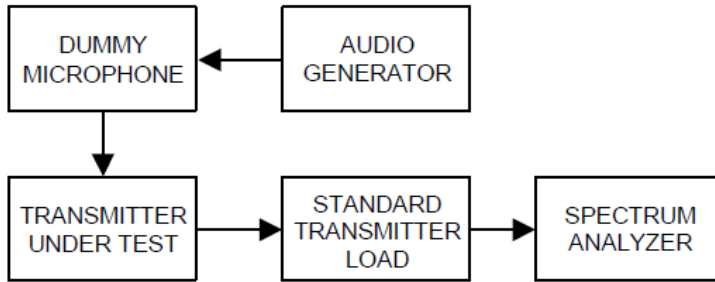
FCC CFR Title 47 Part 74 Subpart H Section 861(e):

For low power auxiliary stations operating in the 600 MHz duplex gap and the bands allocated for TV broadcasting, the following technical requirements apply:

Section 861(e) (3)

Any form of modulation may be used. A maximum deviation of ± 75 kHz is permitted when frequency modulation is employed.

TEST CONFIGURATION



TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- 3) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 0.25 Hz to $\geq 15,000$ Hz. Turn the de-emphasis function off.
- 4) Apply Input Modulation Signal to EUT according to Section 3.4 and vary the input level from -20 to $+20$ dB.
- 5) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level
- 6) Repeat step 4-5 with input frequency changing to 300Hz, 1004Hz, 1500Hz and 2500Hz in sequence.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

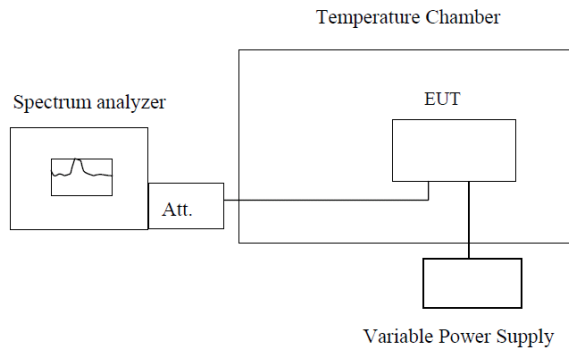
Passed Not Applicable

5.4. Frequency Stability

LIMIT

FCC CFR Title 47 Part 74 Subpart H Section 861(e)(4):
Less than 0.005%(50ppm)

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The equipment under test was connected to an external power supply.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST MODE:

Transmitting with unmodulation

TEST RESULTS

Passed **Not Applicable**

Voltage VS Frequency stability

Test Frequency: 590.00MHz				
Temperature (°C)	Voltage (V)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
25	3.6	4134	7.0068	Pass
25	3.7	4125	6.9915	Pass
25	4.2	4176	7.0780	Pass

Temperature VS Frequency stability

Test Frequency: 590.00MHz				
Voltage (V)	Temperature (°C)	Frequency Deviation (Hz)	Frequency Deviation (ppm)	Result
3.7	-20	4156	7.0441	Pass
	-10	4143	7.0220	Pass
	0	4124	6.9898	Pass
	10	4127	6.9949	Pass
	20	4122	6.9864	Pass
	30	4138	7.0136	Pass
	40	4136	7.0102	Pass
	50	4167	7.0627	Pass

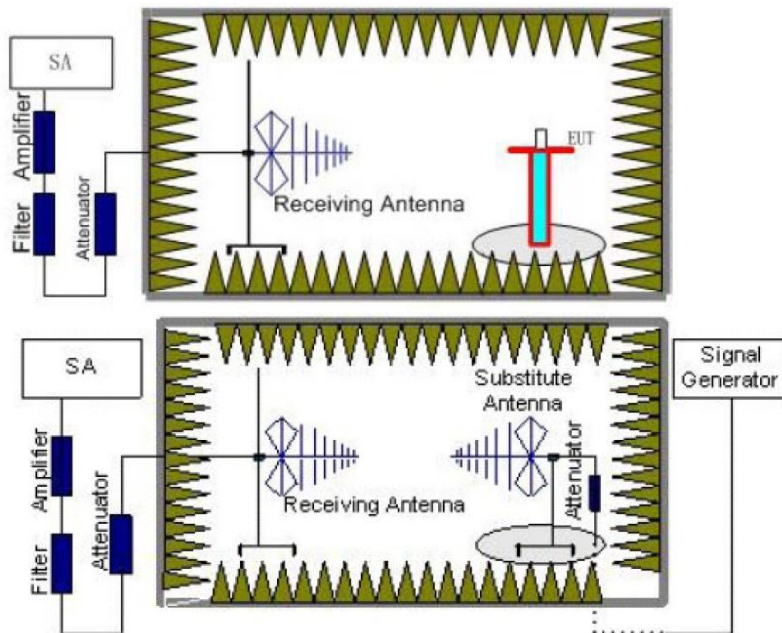
5.5. Radiated Spurious Emission

LIMIT

FCC CFR Title 47 Part 74 Subpart H74 Section 861(e)(6)(iii)

On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43 + 10\log_{10}$ (mean output power in watts) dB.

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 0.8 meter for below 1GHz and 1.5 meter for above 1GHz high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.0m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is placed at the reference point of the chamber with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

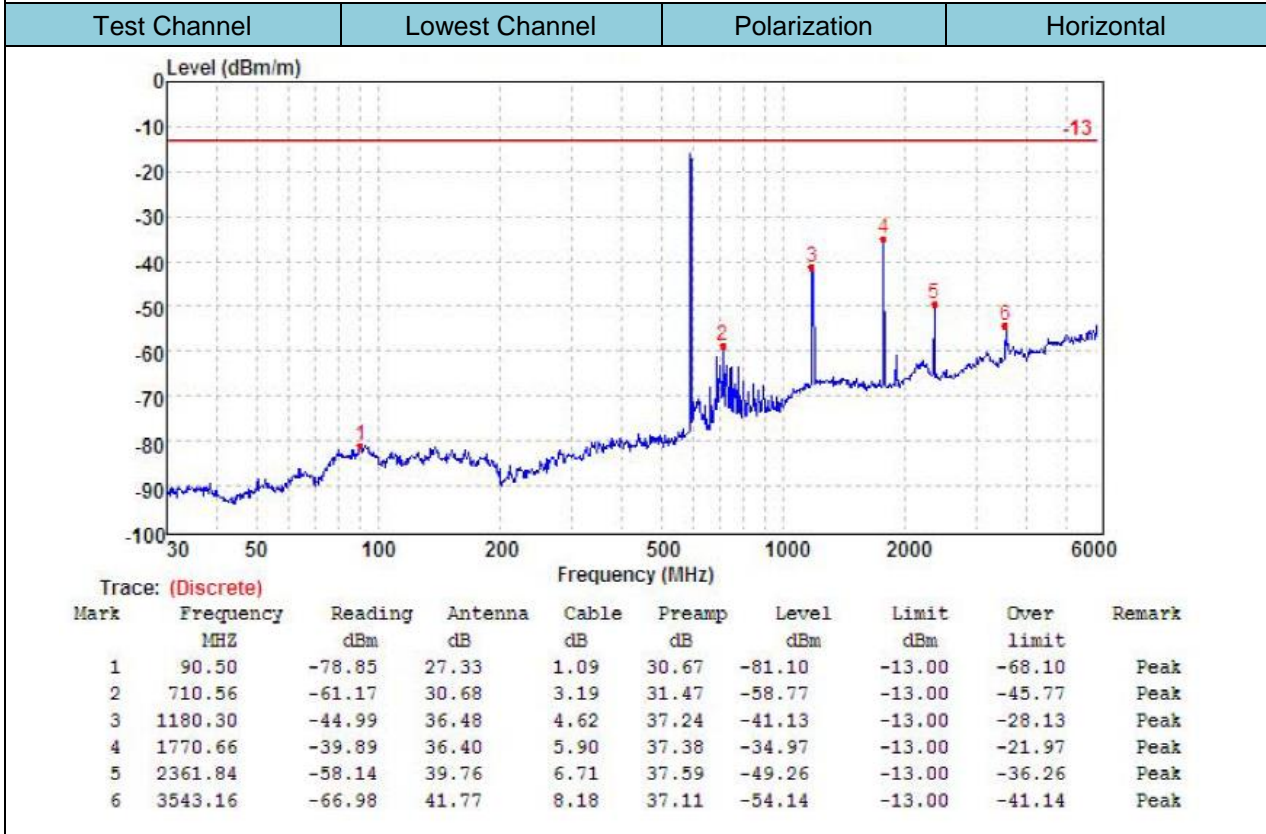
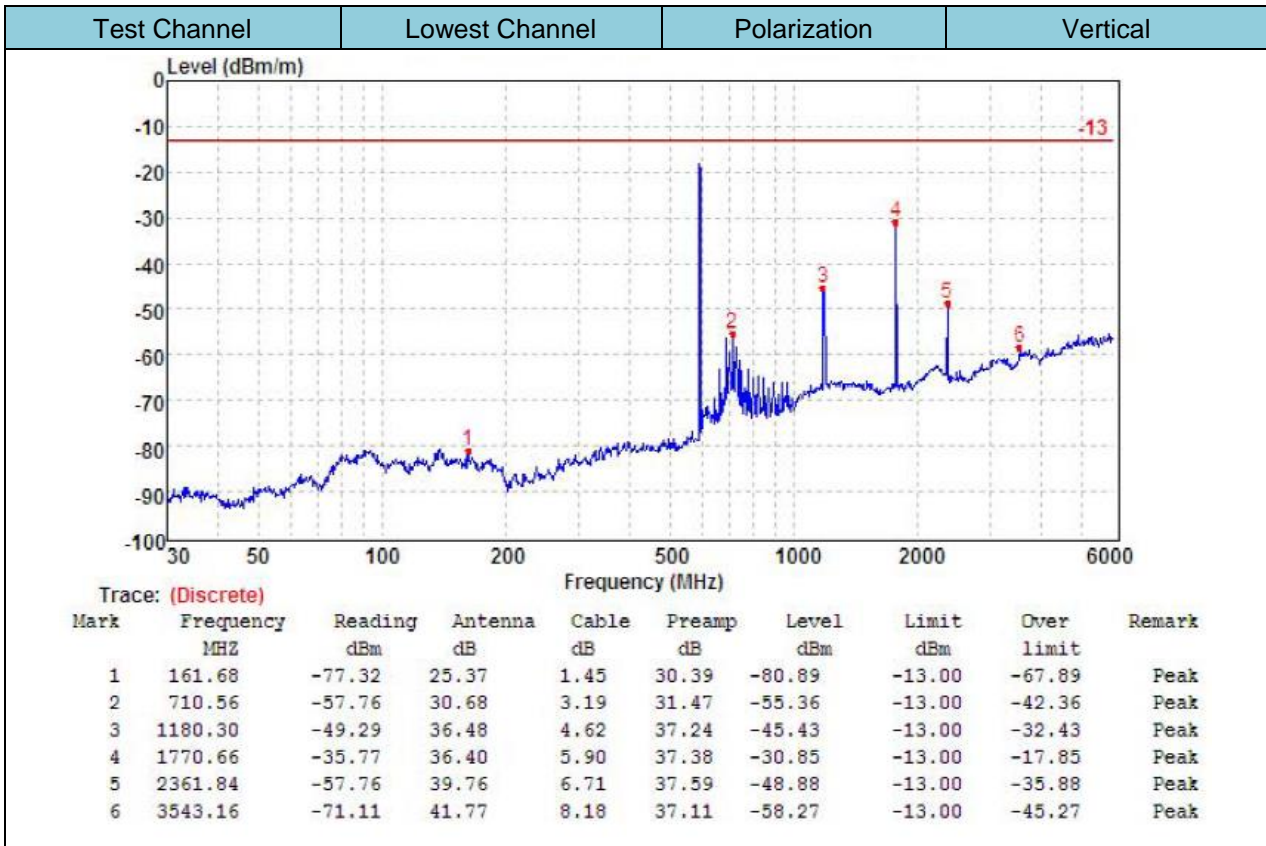
6. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAg - Pcl + Ga
We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

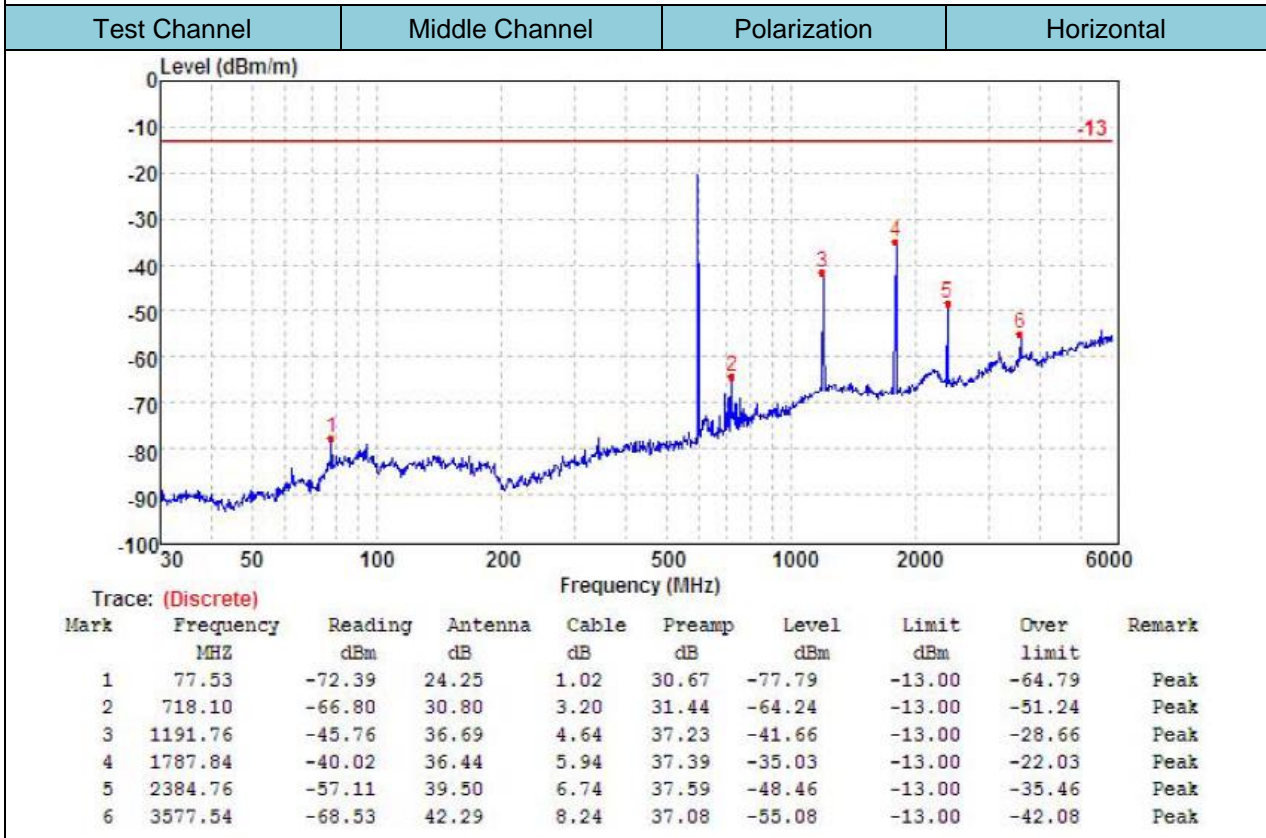
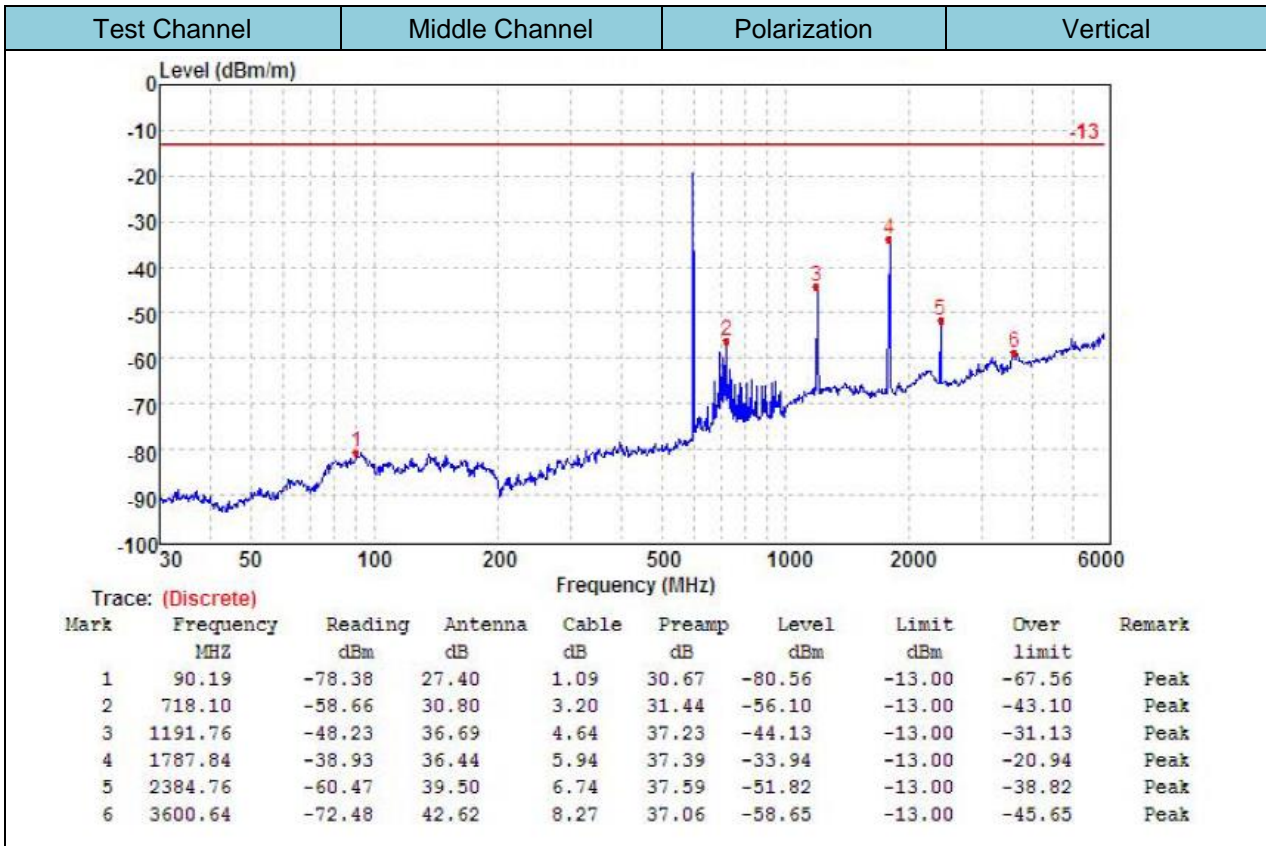
TEST MODE:

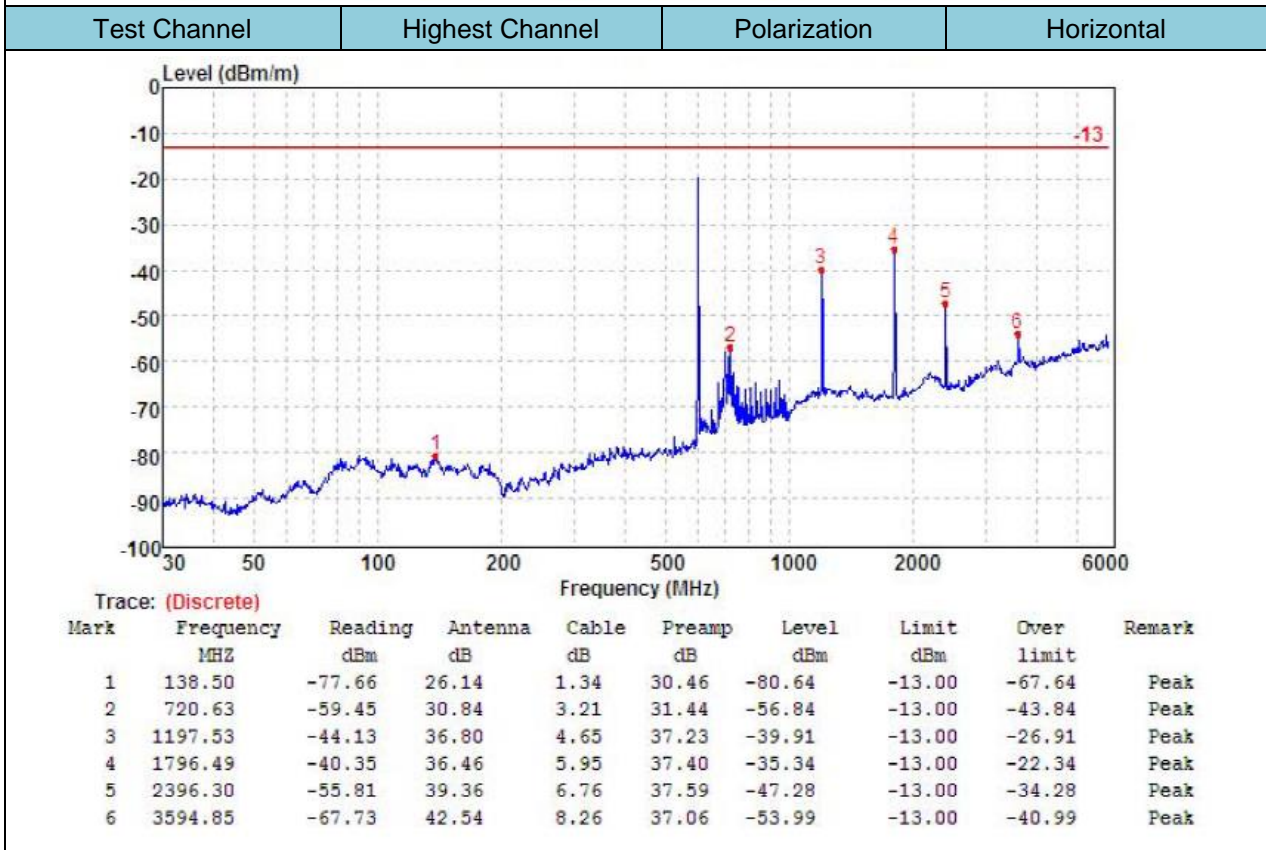
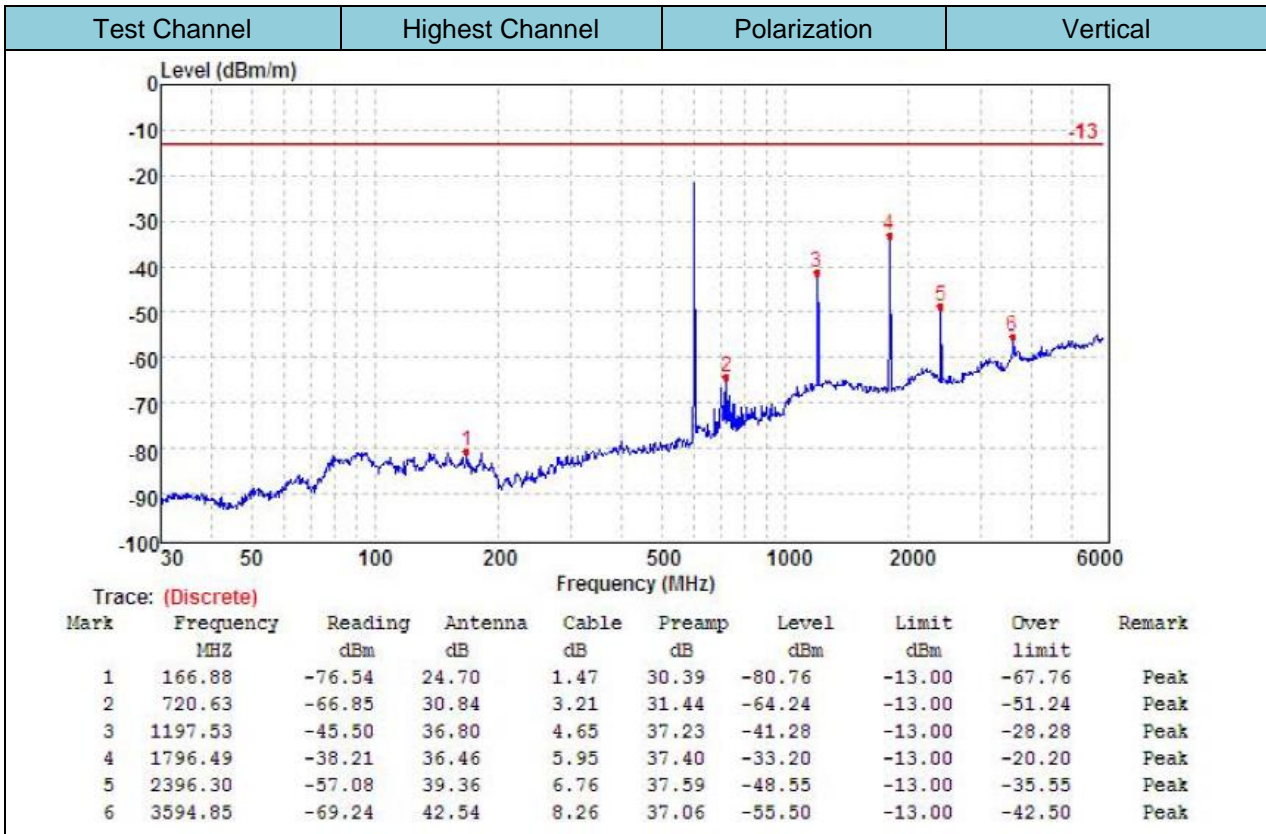
Please refer to the clause 3.3

TEST RESULTS

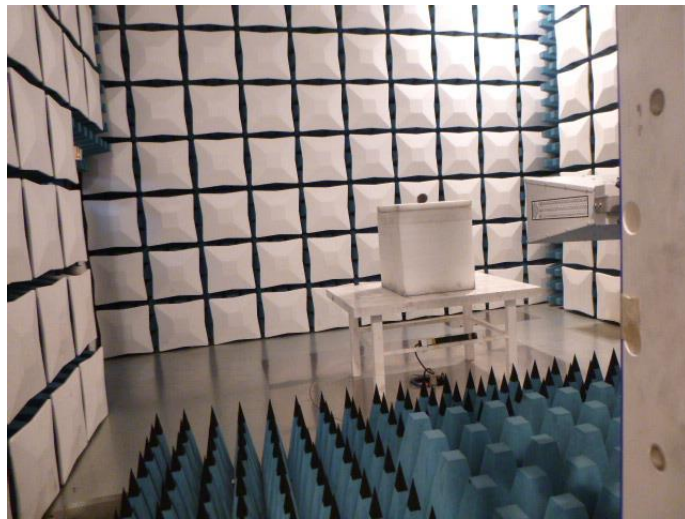
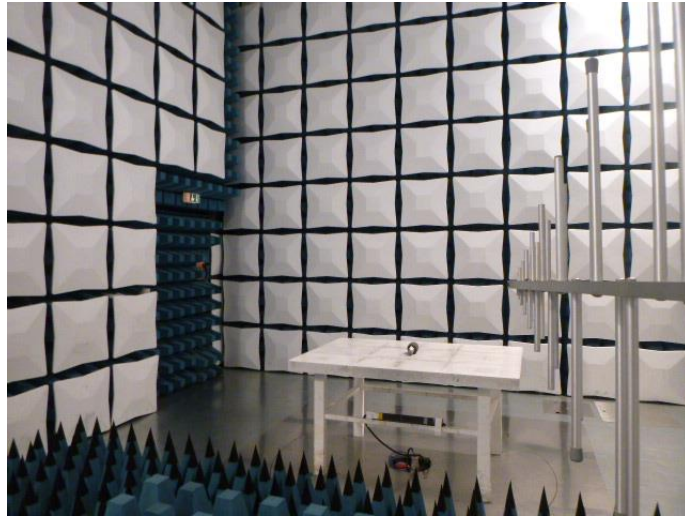
Passed **Not Applicable**





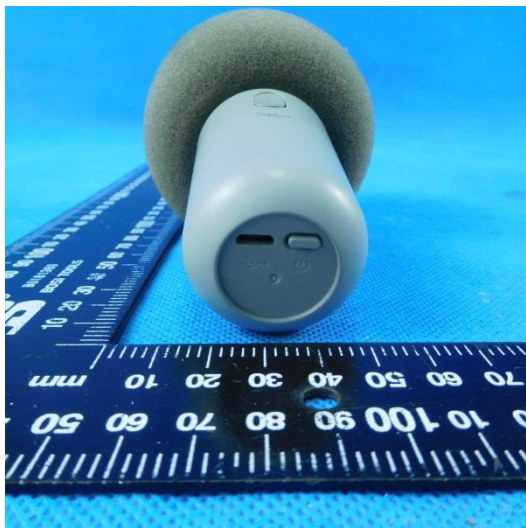
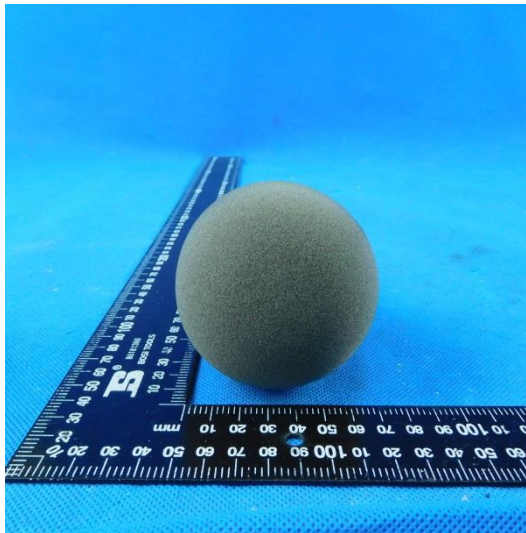


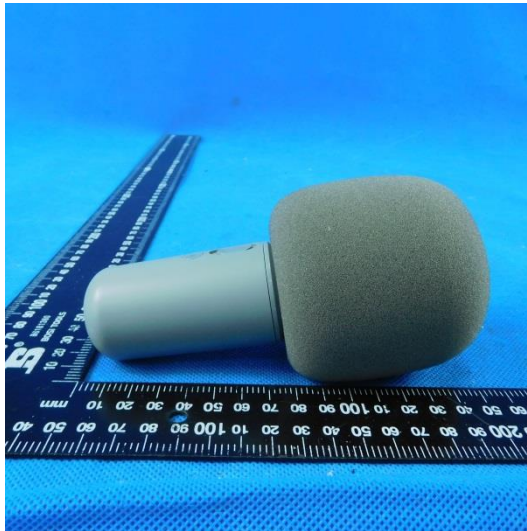
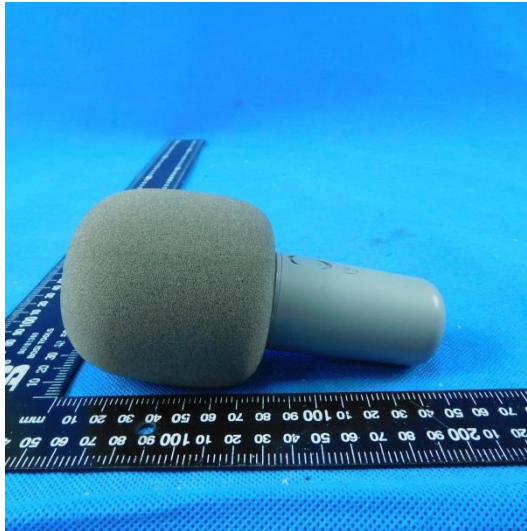
6. Test Setup Photos of the EUT



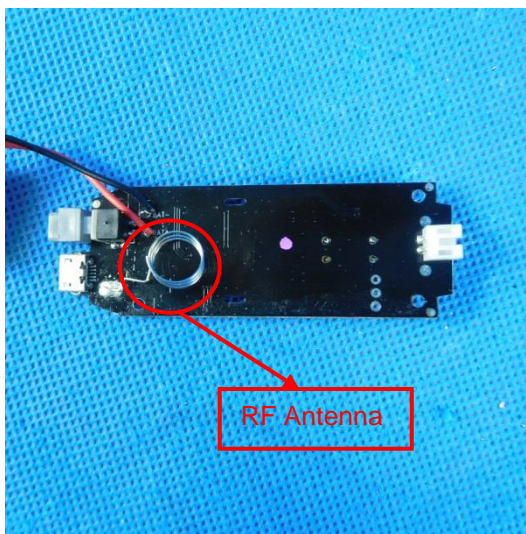
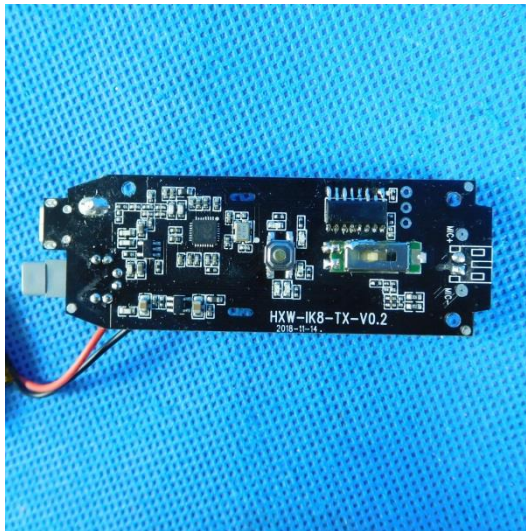
7. External and Internal Photos of the EUT

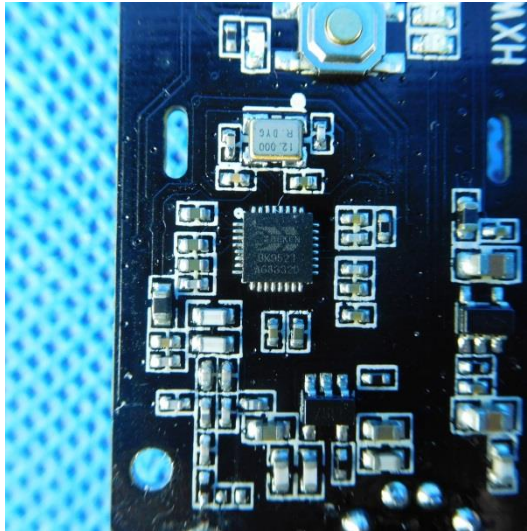
External photos of EUT





Internal photos of EUT





.....End of Report.....