
FCC Test Report

Report No.: AGC10969200802FE03

FCC ID : 2AX3F-4098

APPLICATION PURPOSE : remote control

PRODUCT DESIGNATION : SKG

BRAND NAME : 4098, 4353, 4098(RED)

MODEL NAME : GUANGDONG SKG INTELLIGENT TECHNOLOGY CO.,LTD

APPLICANT : Dec. 16, 2020

DATE OF ISSUE : Aug. 02, 2019

STANDARD(S) : FCC Part 15 Rules

REPORT VERSION : V1.0

Attestation of *Global Compliance* (Shenzhen) Co., Ltd



Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 16, 2020	Valid	Initial Release

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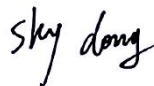
1. VERIFICATION OF CONFORMITY

Applicant	GUANGDONG SKG INTELLIGENT TECHNOLOGY CO.,LTD
Address	No.1, 7/F, Yingfeng Business Center, No.8 Yixing Road, Beijiao Town, Shunde District, Foshan City, Guangdong Province, China
Manufacturer	GUANGDONG SKG INTELLIGENT TECHNOLOGY CO.,LTD
Address	No.1, 7/F, Yingfeng Business Center, No.8 Yixing Road, Beijiao Town, Shunde District, Foshan City, Guangdong Province, China
Factory	GUANGDONG SKG INTELLIGENT TECHNOLOGY CO.,LTD
Address	No.1, 7/F, Yingfeng Business Center, No.8 Yixing Road, Beijiao Town, Shunde District, Foshan City, Guangdong Province, China
Product Designation	remote control
Brand Name	SKG
Test Model	4098
Series Model	4353, 4098(RED)
Difference Description	All the series models are the same as the test model except for the model names and the color of appearance.
Date of test	Dec. 11, 2020 to Dec. 16, 2020
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF (2013-03-01)

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.231.

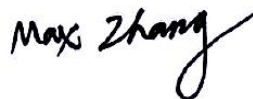
Prepared By



Sky Dong
(Project Engineer)

Dec. 16, 2020

Reviewed By



MaxZhang
(Reviewer)

Dec. 16, 2020

Approved By



Forrest Lei
(Authorized Officer)

Dec. 16, 2020

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	433.92MHz
Field Strength(3m)	433.92MHz: 73.48dBuV/m(PK)@3m 433.92MHz: 62.44dBuV/m(AV)@3m
Modulation	ASK
Number of channels	1
Hardware Version	V1.1
Software Version	V1.0
Antenna Designation	Integral antenna
Power Supply	TX: DC 3V by battery RX: DC 3.7V by battery or DC 5V by adapter

2.2. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AX3F-4098** filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules.

2.3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2010). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.4. SPECIAL ACCESSORIES

Refer to section 5.1.

2.5. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.6. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, $U_c = \pm 3.2$ dB
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB
- Uncertainty of Occupied Channel Bandwidth: $U_c = \pm 2$ %

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting mode
Note: 1. The test modes can be supply by battery or adapter, only the result of the worst case was recorded in the report, if no other cases. 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode. 3. For battery operated equipment, the equipment tests are performed using a new battery.	

5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	remote control	SKG	2AX3F-4098	N/A

5.2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.231(a)(2)	Activated automatically	Compliant
§15.231(b)	Average Factor	Compliant
§15.231(e) & §15.209	Field Strength of Fundamental and Spurious Emission	Compliant
15.207	Conducted Emission	Not applicable

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

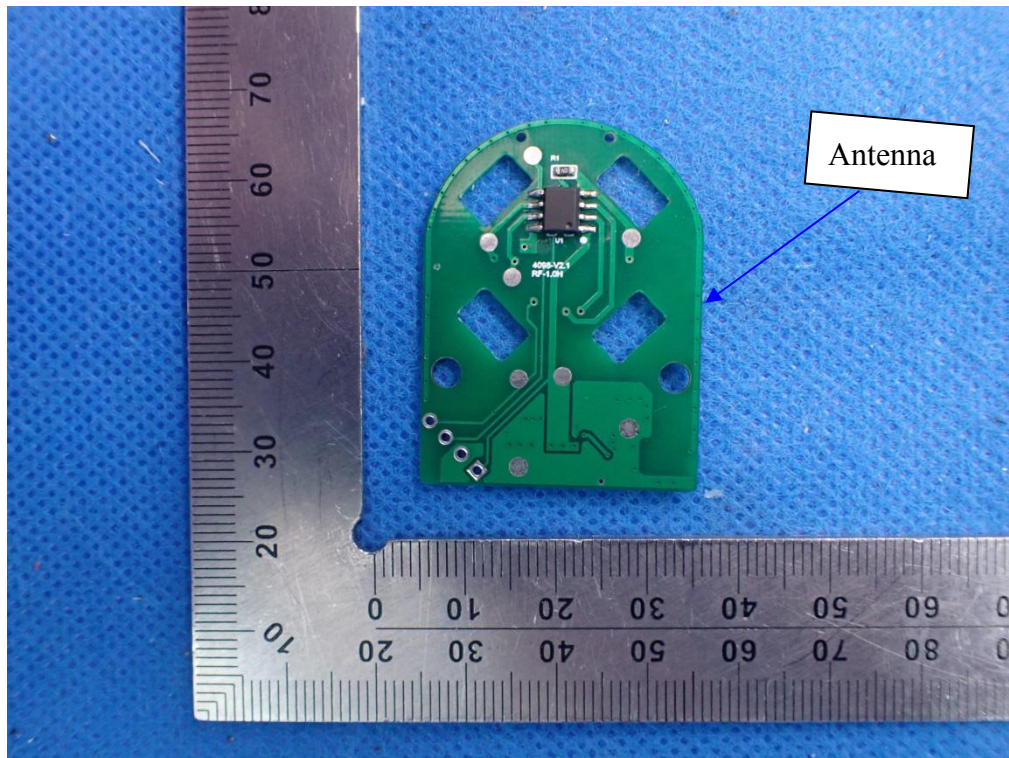
TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Sep. 20, 2019	Sep. 19, 2021
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

7. ANTENNA REQUIREMENT

According to §15.203, 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 EuT has fixed antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EuT photo for details.



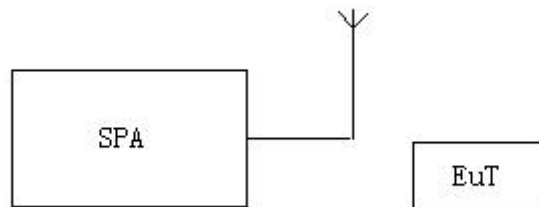
The requirements of section 15.203 are **FULFILLED**.

8. PROVISION FOR MOMENTARY OPERATION

8.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=1MHz, VBW=3MHz
Span: 0Hz
Sweep time: 10S
2. Set the EUT to transmit by manually operated. Use the “View” function of SPA to find the transmission time of being released.
3. Record the data and Reported.

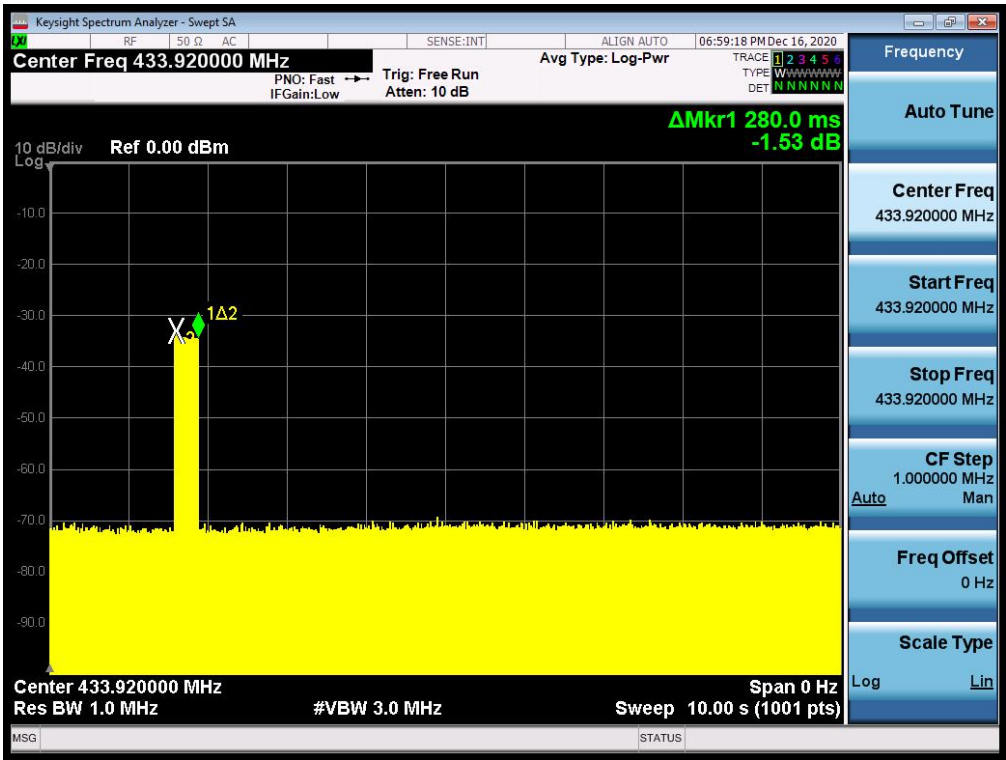
8.2 TEST SETUP



8.3 TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

The time of stopping transmission after automatically activation by alarm sensor(s)	Limit (s)
0.28	5.00



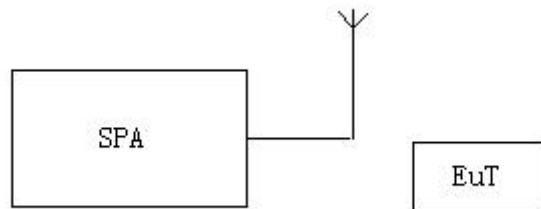
RESULT: PASS

9. DUTY CYCLE CORRECTION FACTOR

9.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=1MHz, VBW=3MHz
Span: 0Hz
Sweep time: more than two pulse trains or more than each type of pulse occupancy time
2. Set the EUT to transmit by manually operated. Use the “Delta mark” function of SPA to find the period time between two pulse trains and each type of pulse occupancy time.
3. Record the plots and Reported.

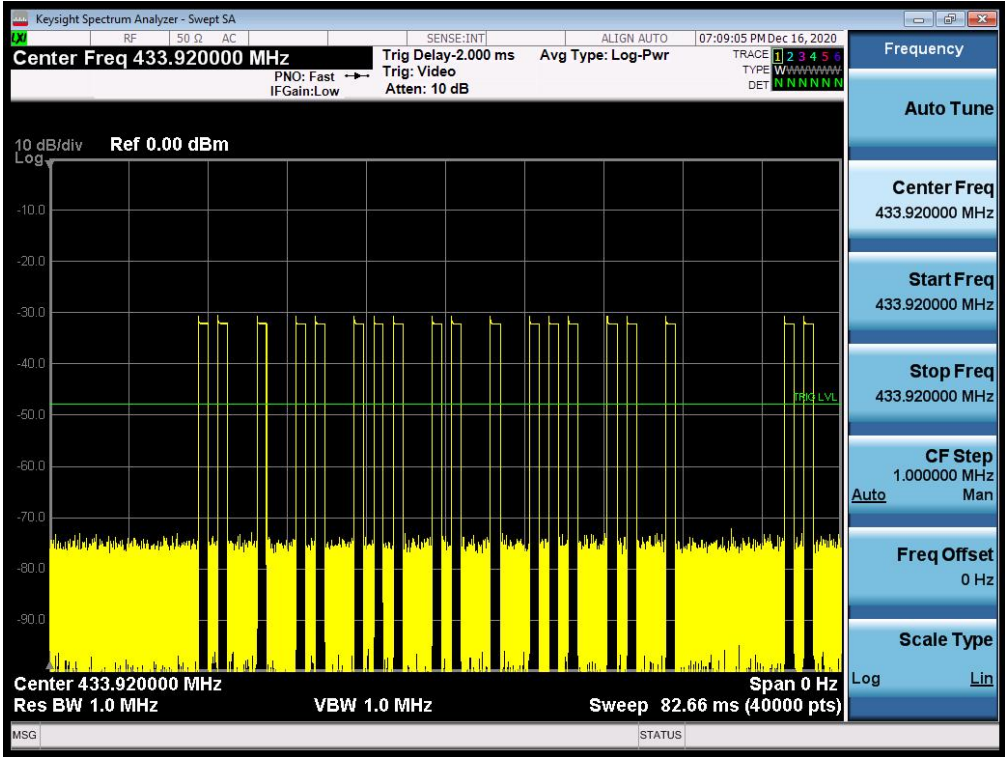
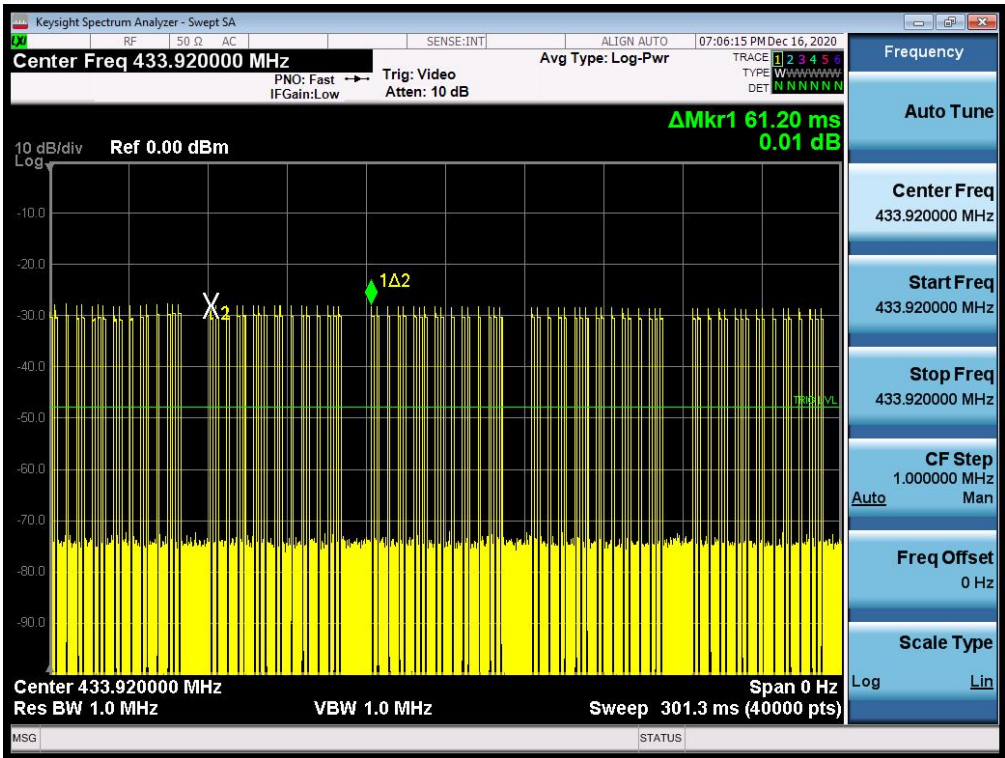
9.2 TEST SETUP

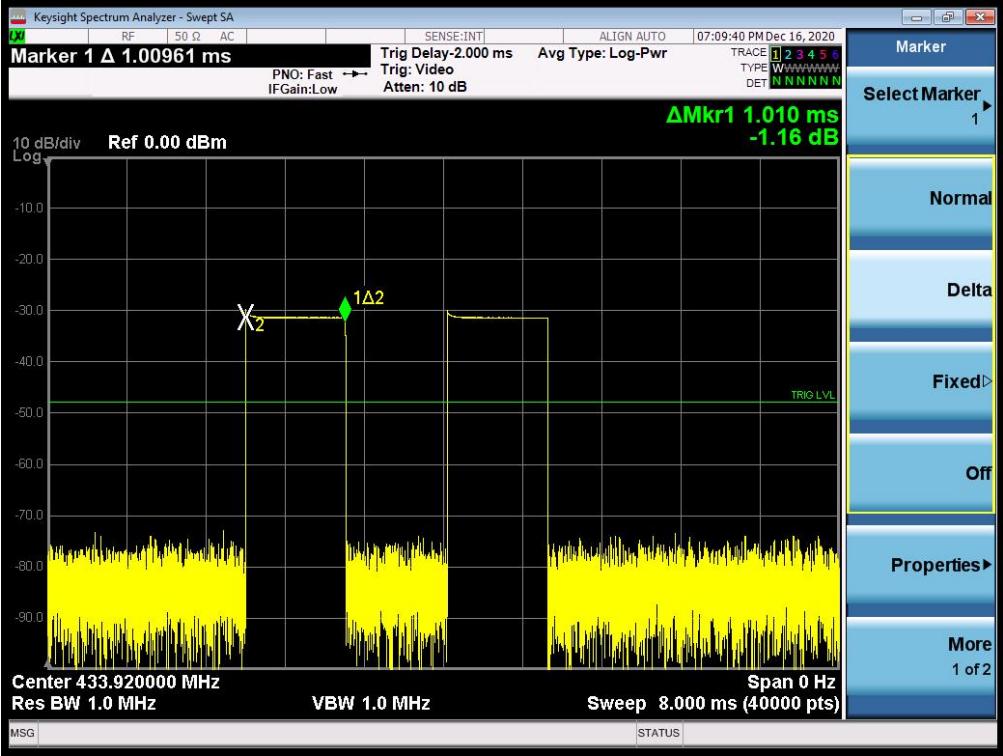


9.3 TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

Duty Cycle:	$1.01\text{ms} \times 17 / 61.20\text{ms} = 0.2806$
Duty Cycle Correction Factor:	$20\lg(0.2806) = -11.04\text{dB}$





10. RADIATED EMISSION

10.1. MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions below 1GHz, use 120KHz RBW and VBW $\geq$ 3RBW for QP reading.
7. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
8. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
9. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
10. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
11. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.
12. Only the worst case is reported.

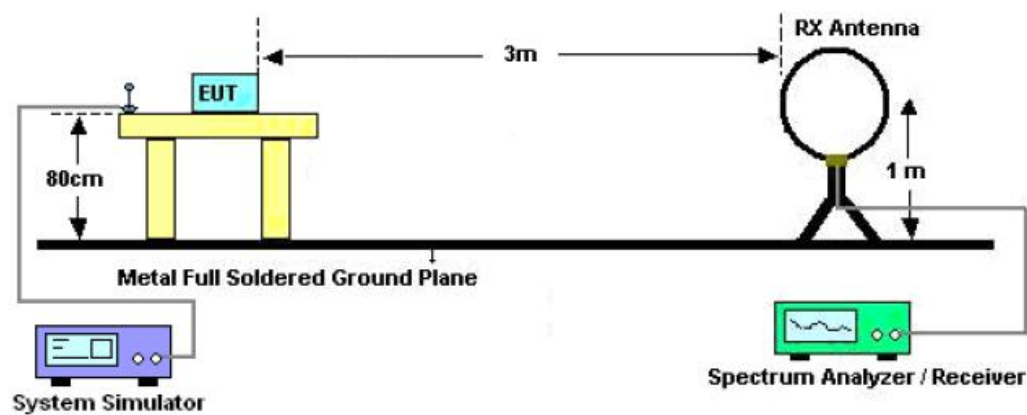
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
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
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average

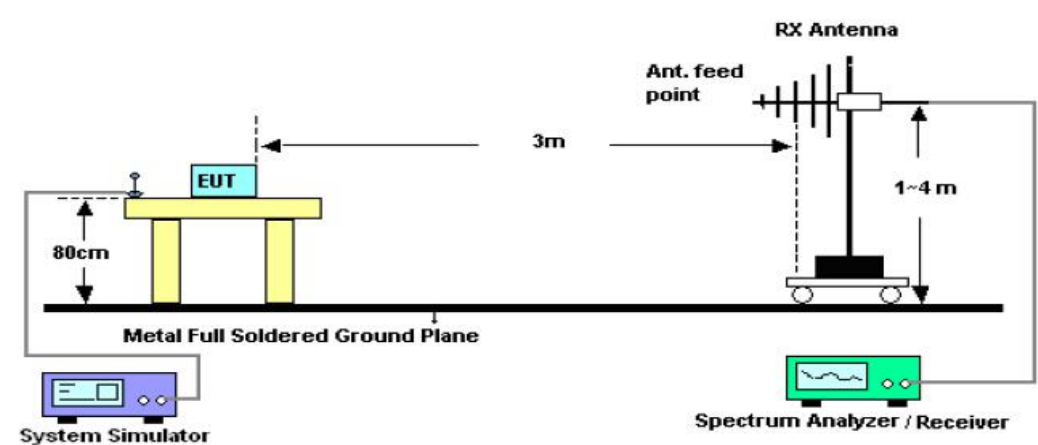
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

10.2. TEST SETUP

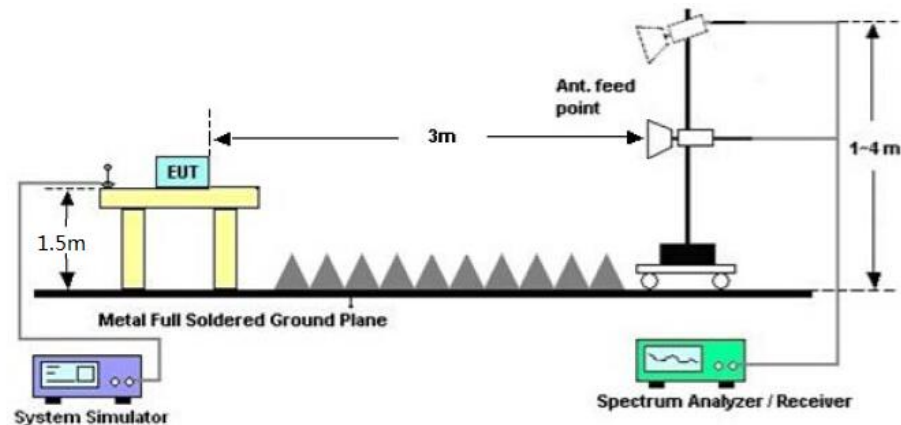
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



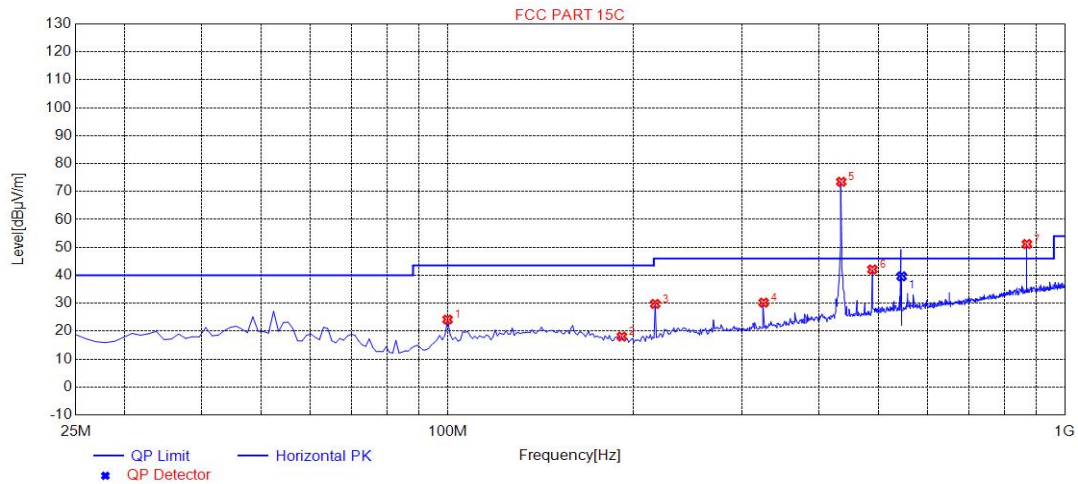
10.3. TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ-Horizontal



Peak data list

Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	100.0750	24.14	11.38	43.50	19.36	150	167	Horizontal
2	191.7250	18.08	12.45	43.50	25.42	150	230	Horizontal
3	217.0750	29.74	13.10	46.00	16.26	150	349	Horizontal
4	325.3000	30.21	16.90	46.00	15.79	150	140	Horizontal
5	433.9200	73.48	20.63	100.82	27.34	150	87	Horizontal
6	488.1250	42.08	21.90	46.00	3.92	150	183	Horizontal
7	868.3750	51.19	29.57	80.82	29.63	150	1	Horizontal

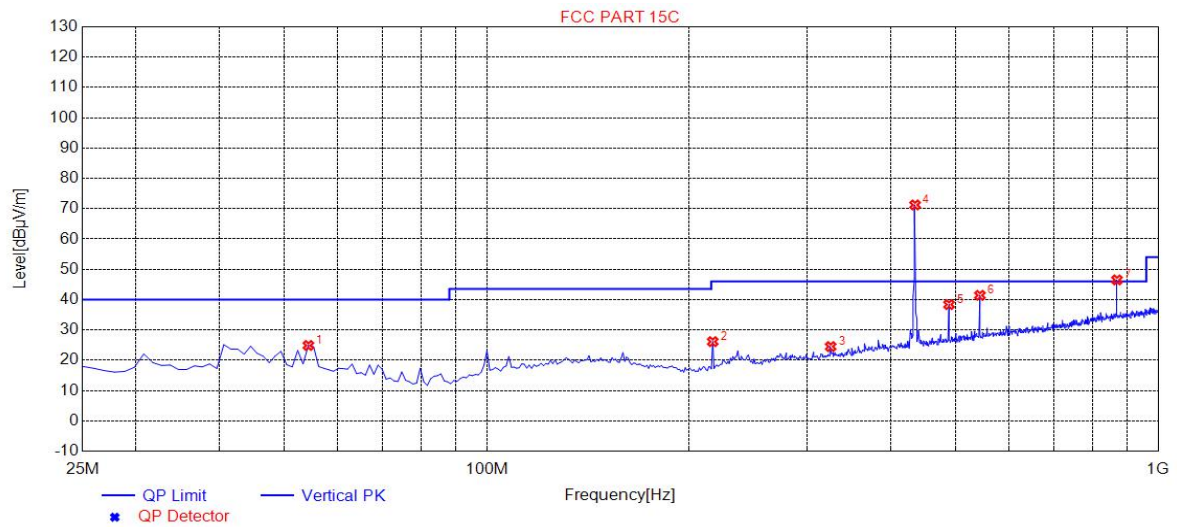
QP data list

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	544.1361	23.14	39.62	46.00	6.38	122.5	136.6	Horizontal

AV data list

Freq. [MHz]	Peak Level (dBuV/m)	Duty cycle factor(dB)	AV Level (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Polarization
433.9200	73.48	-11.04	62.44	80.82	18.39	Horizontal
868.3750	51.19	-11.04	40.15	60.82	20.68	Horizontal

RADIATED EMISSION BELOW 1GHZ-Vertical



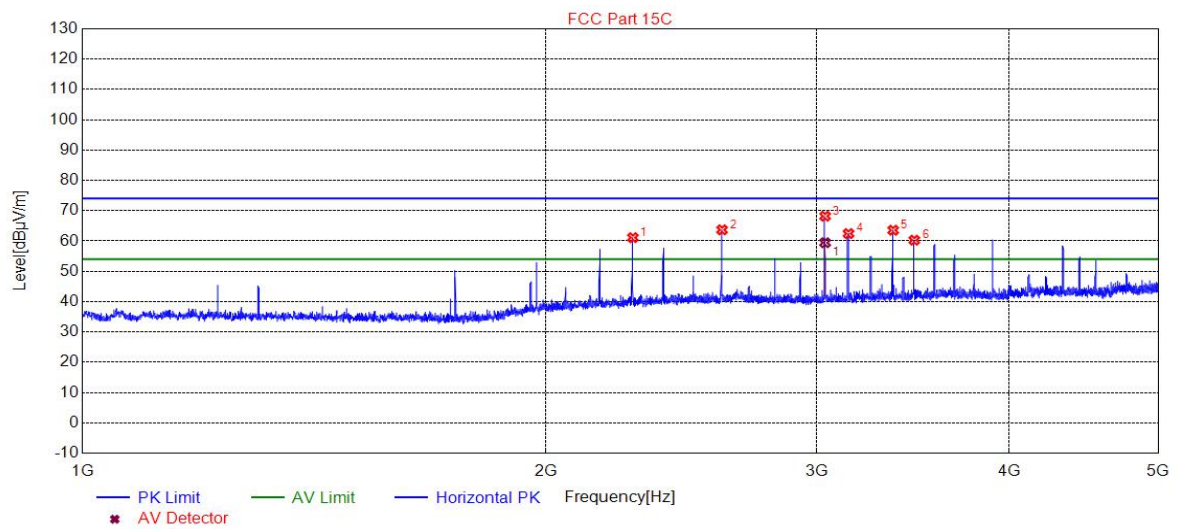
Peak data list

Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	54.2500	24.88	11.35	40.00	15.12	150	359	Vertical
2	217.0750	26.14	13.10	46.00	19.86	150	38	Vertical
3	325.3000	24.51	16.90	46.00	21.49	150	42	Vertical
4	433.9200	71.24	20.63	100.82	29.58	150	42	Vertical
5	488.1250	38.37	21.90	46.00	7.63	150	48	Vertical
6	542.7250	41.41	23.11	46.00	4.59	150	114	Vertical
7	868.3750	46.50	29.57	80.82	34.32	150	293	Vertical

AV data list

Freq. [MHz]	Peak Level (dBuV/m)	Duty cycle factor(dB)	AV Level (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Polarization
433.9200	71.24	-11.04	60.20	80.82	20.63	Vertical
868.3750	46.50	-11.04	35.46	60.82	25.37	Vertical

RADIATED EMISSION ABOVE 1GHZ-Horizontal

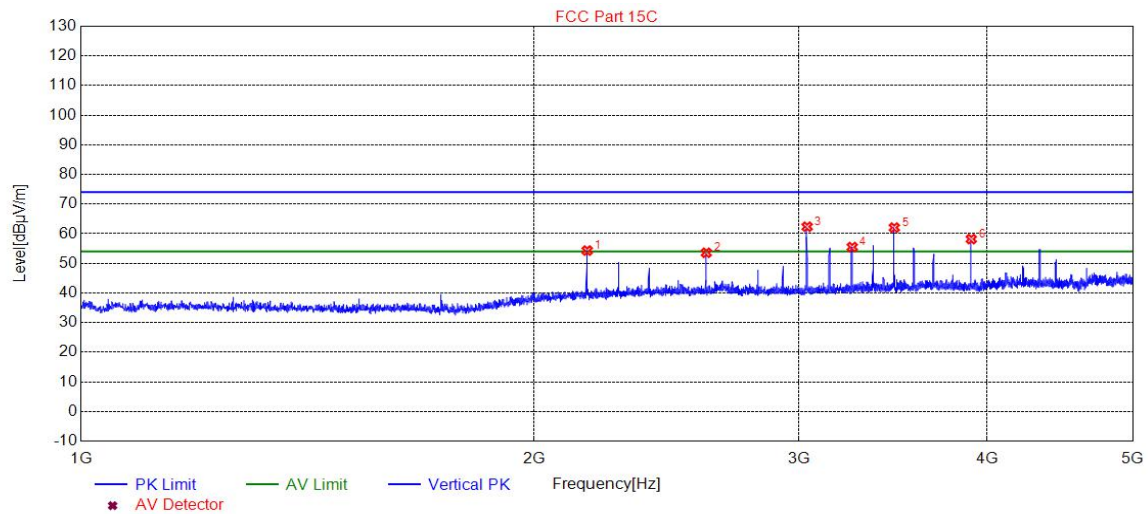


Peak data list

PK Data List								
NO	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2278.5279	61.11	-10.65	74.00	12.89	150	110	Horizontal
2	2603.7604	63.68	-9.64	80.82	17.14	150	70	Horizontal
3	3037.8038	68.18	-9.20	80.82	12.64	150	4	Horizontal
4	3146.2146	62.44	-8.82	80.82	18.38	150	54	Horizontal
5	3363.4363	63.55	-8.07	80.82	17.27	150	54	Horizontal
6	3471.4471	60.26	-7.70	80.82	20.56	150	102	Horizontal

AV data list

Freq. [MHz]	Peak Level (dBuV/m)	Duty cycle factor(dB)	AV Level (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Polarization
2278.5279	61.11	-11.04	50.07	54.00	3.93	Horizontal
2603.7604	63.68	-11.04	52.64	60.82	8.18	Horizontal
3037.8038	68.18	-11.04	57.14	60.82	3.68	Horizontal
3146.2146	62.44	-11.04	51.40	60.82	9.42	Horizontal
3363.4363	63.55	-11.04	52.51	60.82	8.31	Horizontal
3471.4471	60.26	-11.04	49.22	60.82	11.60	Horizontal

RADIATED EMISSION ABOVE 1GHZ-Vertical

Peak data list

PK Data List								
NO	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2169.7170	54.30	-11.11	80.82	26.52	150	265	Vertical
2	2603.7604	53.56	-9.64	80.82	27.26	150	2	Vertical
3	3038.2038	62.34	-9.20	80.82	18.48	150	2	Vertical
4	3255.0255	55.48	-8.45	80.82	25.34	150	2	Vertical
5	3471.4471	62.05	-7.70	80.82	18.77	150	304	Vertical
6	3905.4905	58.18	-6.71	74.00	15.82	150	123	Vertical

AV data list

Freq. [MHz]	Peak Level (dBuV/m)	Duty cycle factor(dB)	AV Level (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Polarization
2169.7170	54.30	-11.04	43.26	60.82	17.56	Vertical
2603.7604	53.56	-11.04	42.52	60.82	18.30	Vertical
3038.2038	62.34	-11.04	51.30	60.82	9.52	Vertical
3255.0255	55.48	-11.04	44.44	60.82	16.38	Vertical
3471.4471	62.05	-11.04	51.01	60.82	9.81	Vertical
3905.4905	58.18	-11.04	47.14	54.00	6.86	Vertical

Note: Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.

The "Factor" value can be calculated automatically by software of measurement system.

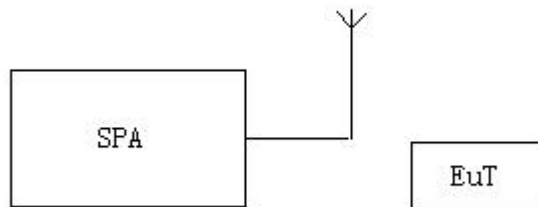
RESULT: PASS

11. BANDWIDTH

11.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:
Centre frequency = Operation Frequency
RBW=0.3KHz
VBW=1.0KHz
Span: 60kHz
Sweep time: Auto
2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the "N dB down" function of SPA to define the bandwidth.
3. Record the plots and Reported.

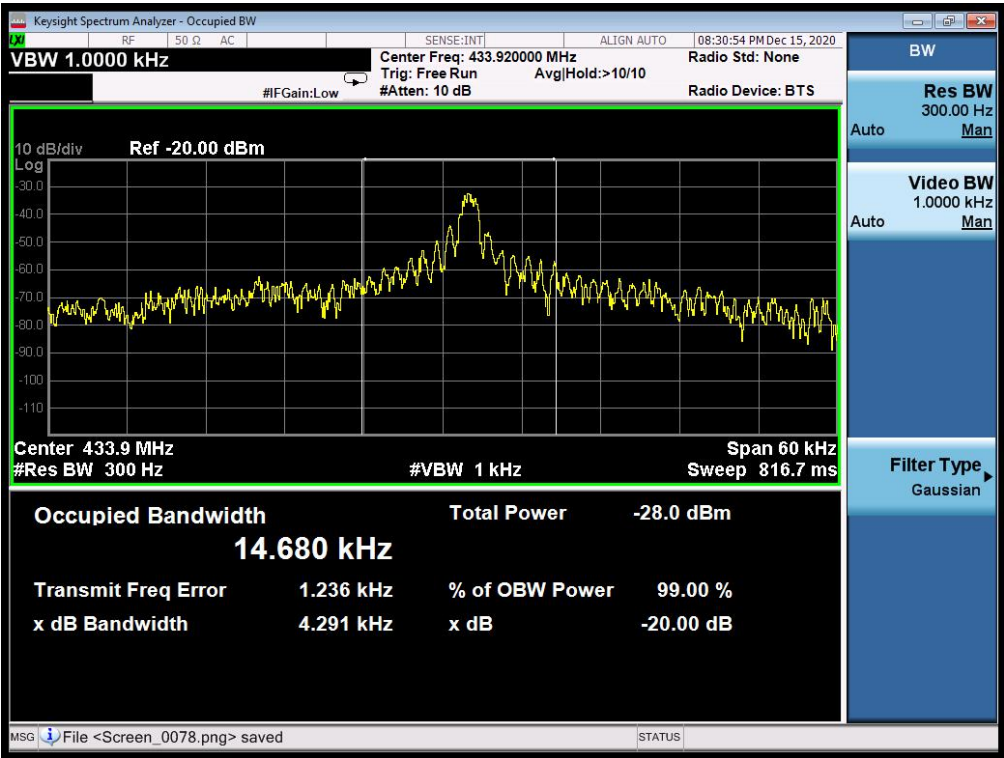
11.2. TEST SETUP



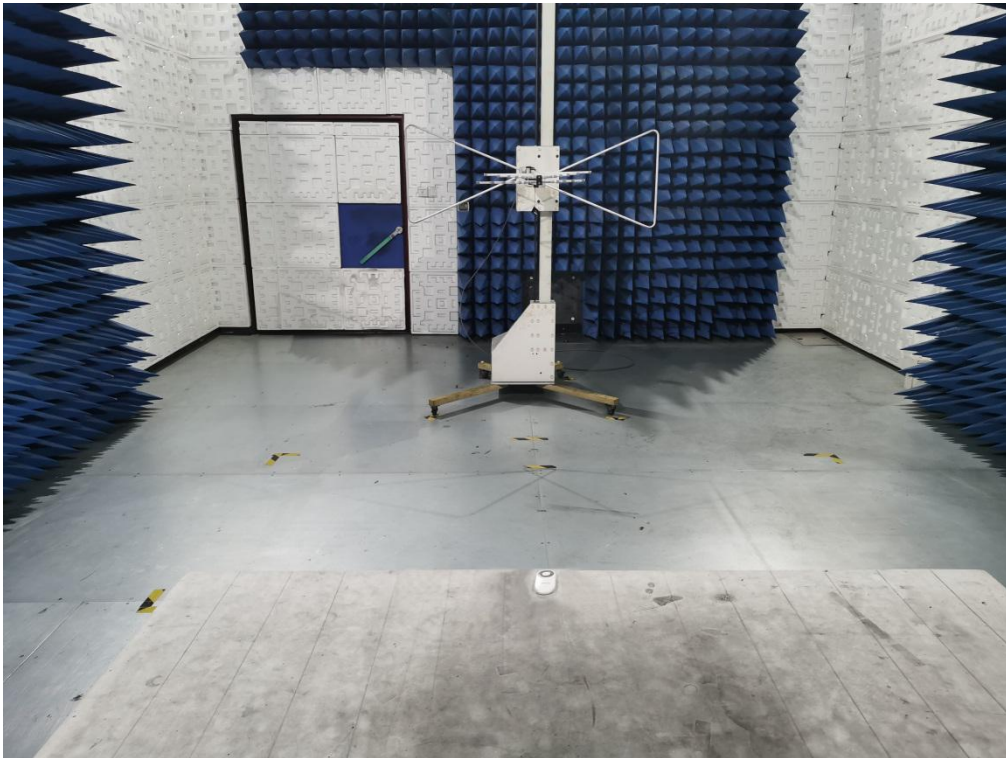
11.3. TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

-20dB bandwidth	LIMIT	RESULT
4.291KHz	1084.8KHz	Pass
Note: Limit= Operation Frequency x0.25%		



APPENDIX A: PHOTOGRAPHS OF TEST SETUP
FCC RADIATED EMISSION TEST SETUP-BELOW 1GHz



FCC RADIATED EMISSION TEST SETUP-ABOVE 1GHz

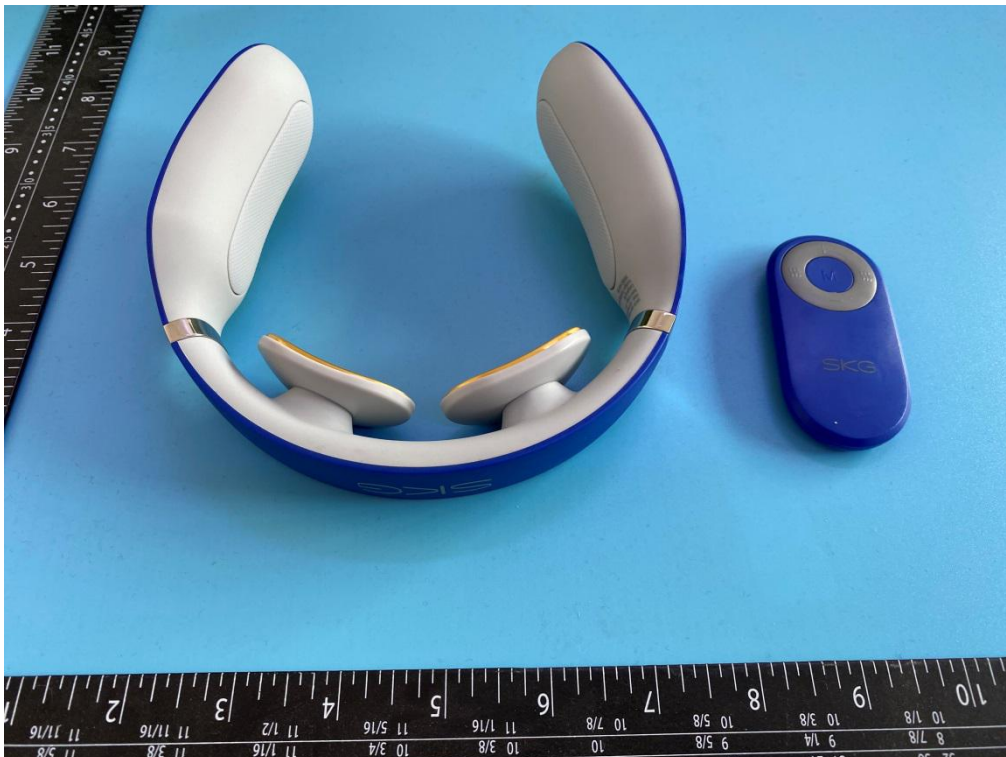


APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT-1



ALL VIEW OF EUT-2



ALL VIEW OF EUT-3



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



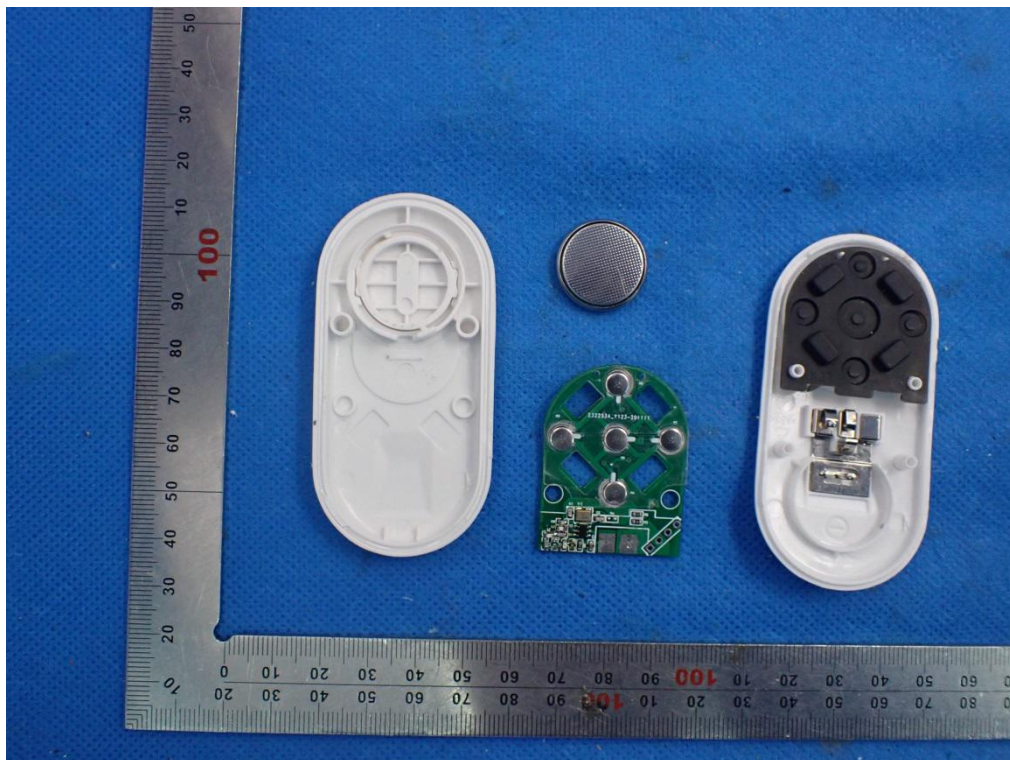
LEFT VIEW OF EUT



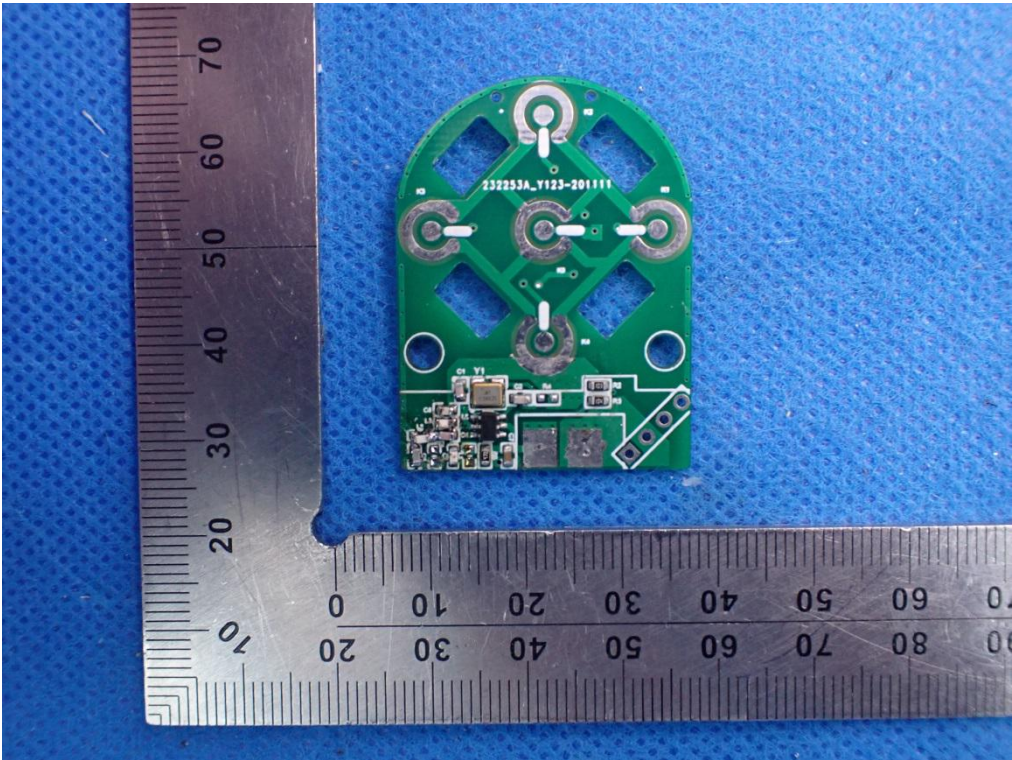
RIGHT VIEW OF EUT



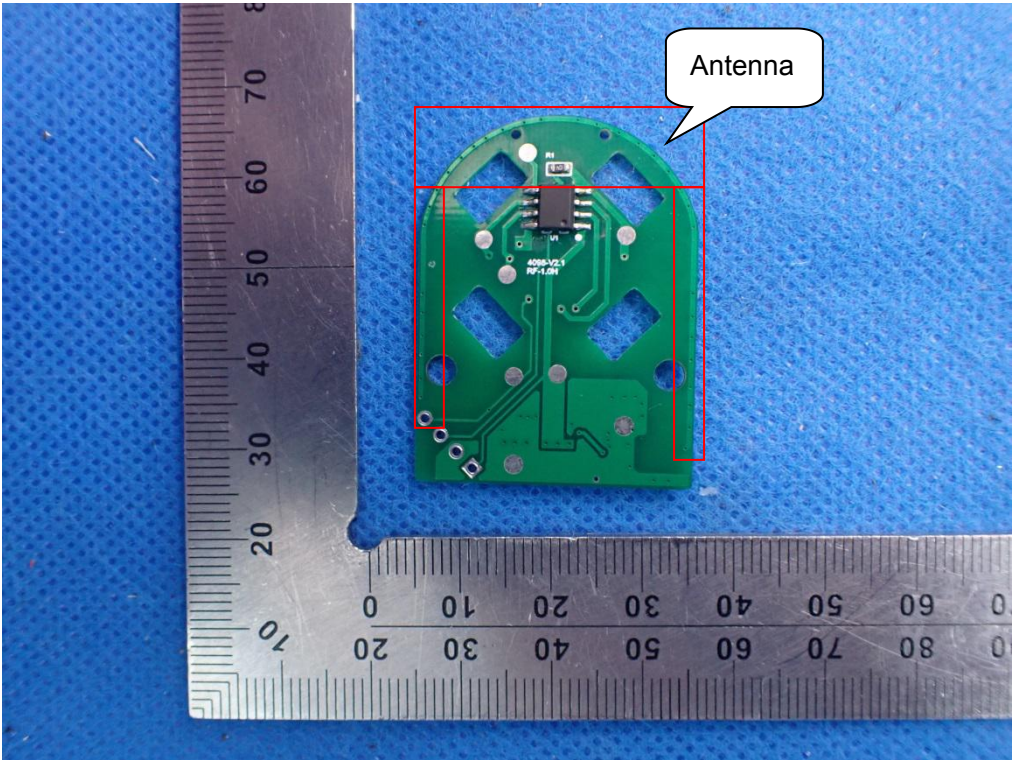
OPEN VIEW OF EUT



INTERNAL VIEW-1 OF EUT



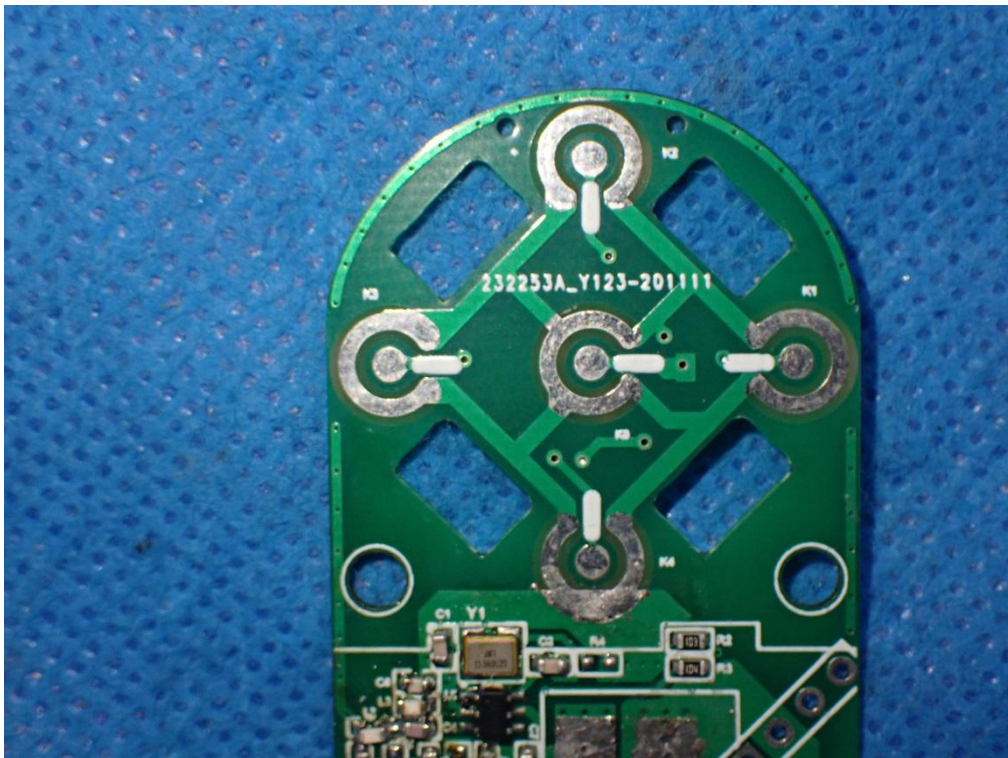
INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



VIEW OF BATTERY



----END OF REPORT----