
FCC Test Report

Report No.: AGC10862210401FE03

FCC ID : 2AVVD-AC123

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : Remote

BRAND NAME : A-OK

MODEL NAME : AC123-01, AC123-02, AC123-06, AC123-01D,
AC123-02D, AC123-06D

APPLICANT : Guangdong A-OKTECHNOLOGY GRAND
DEVELOPMENTCO, LTD

DATE OF ISSUE : Apr. 30, 2021

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	/	Apr. 30, 2021	Valid	Initial Release

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY.....	4
2. GENERAL INFORMATION.....	5
2.1. PRODUCT DESCRIPTION.....	5
2.2. RELATED SUBMITTAL(S) / GRANT (S).....	5
2.3. TEST METHODOLOGY.....	5
2.4. SPECIAL ACCESSORIES.....	5
2.5. EQUIPMENT MODIFICATIONS.....	5
3. MEASUREMENT UNCERTAINTY.....	6
4. DESCRIPTION OF TEST MODES.....	6
5. SYSTEM TEST CONFIGURATION.....	6
5.1. EQUIPMENT USED IN EUT SYSTEM.....	6
5.2. SUMMARY OF TEST RESULTS.....	6
6. TEST FACILITY.....	7
7. ANTENNA REQUIREMENT.....	8
8. PROVISION FOR MOMENTARY OPERATION.....	9
8.1 MEASUREMENT PROCEDURE.....	9
8.2 TEST SETUP.....	9
8.3 TEST RESULT.....	10
9. Duty Cycle Correction factor.....	11
9.1 MEASUREMENT PROCEDURE.....	11
9.2 TEST SETUP.....	11
9.3 TEST RESULT.....	12
10. RADIATED EMISSION.....	14
10.1. MEASUREMENT PROCEDURE.....	14
10.2. TEST SETUP.....	16
10.3. TEST RESULT.....	17
11. BANDWIDTH.....	21
11.1. MEASUREMENT PROCEDURE.....	21
11.2. TEST SETUP.....	21
11.3. TEST RESULT.....	22
APPENDIX A: PHOTOGRAPHS OF TEST SETUP.....	23
APPENDIX B: PHOTOGRAPHS OF EUT.....	24

1. VERIFICATION OF CONFORMITY

Applicant	Guangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD
Address	Hexing Road South side Sanhe Economic Development Zone, Huiyang, Huizhou, China
Manufacturer	Guangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD
Address	Hexing Road South side Sanhe Economic Development Zone, Huiyang, Huizhou, China
Factory	Guangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD
Address	Hexing Road South side Sanhe Economic Development Zone, Huiyang, Huizhou, China
Product Designation	remote control
Brand Name	A-OK
Test Model	AC123-01
Series Model	AC123-02, AC123-06, AC123-01D, AC123-02D, AC123-06D
Difference Description	All the series models are the same as the test model except for the model names, and the number of Indicator light.
Date of test	Apr. 02, 2021 to Apr. 30, 2021
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



Kelly Cheng
(Project Engineer)

Apr. 30, 2021

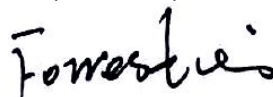
Reviewed By



Max Zhang
(Reviewer)

Apr. 30, 2021

Approved By



Forrest Lei
(Authorized Officer)

Apr. 30, 2021

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: 74.62dBuV/m(PK)@3m 433.92MHz: 66.58dBuV/m(AV)@3m
Modulation	ASK
Number of channels	1
Hardware Version	V4.1
Software Version	200409B
Antenna Designation	PCB antenna
Antenna Gain	0.1dBi
Power Supply	DC 3V by battery

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

This submittal(s) (test report) is intended for **FCC ID: 2AVVD-AC123** 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.

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. 4.The EUT was transmitted manually.	

5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Remote	A-OK	2AVVD-AC123	N/A

5.2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.231(a)(1)	Activated manually	Compliant
§15.231(b)	Average Factor	Compliant
15.231(c)	-20dB Bandwidth	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

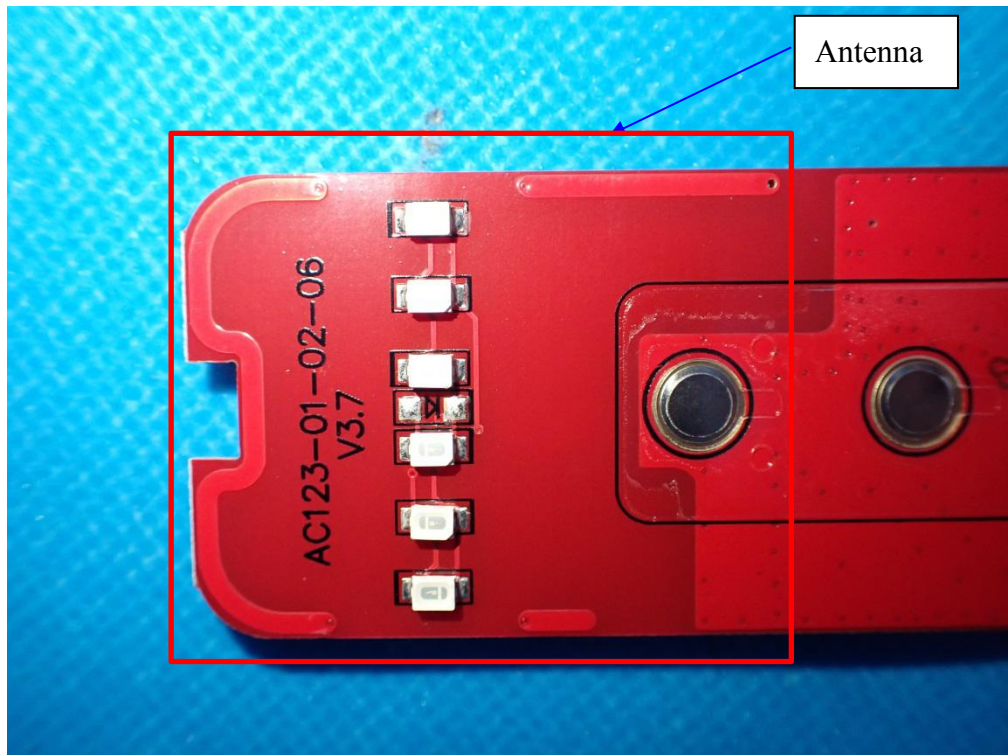
TEST EQUIPMENT OF RADIATED EMISSION TEST

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 PCB antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.



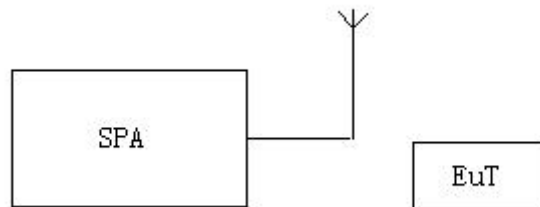
The requirements of section 15.203 are **FULFILLED**.

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.

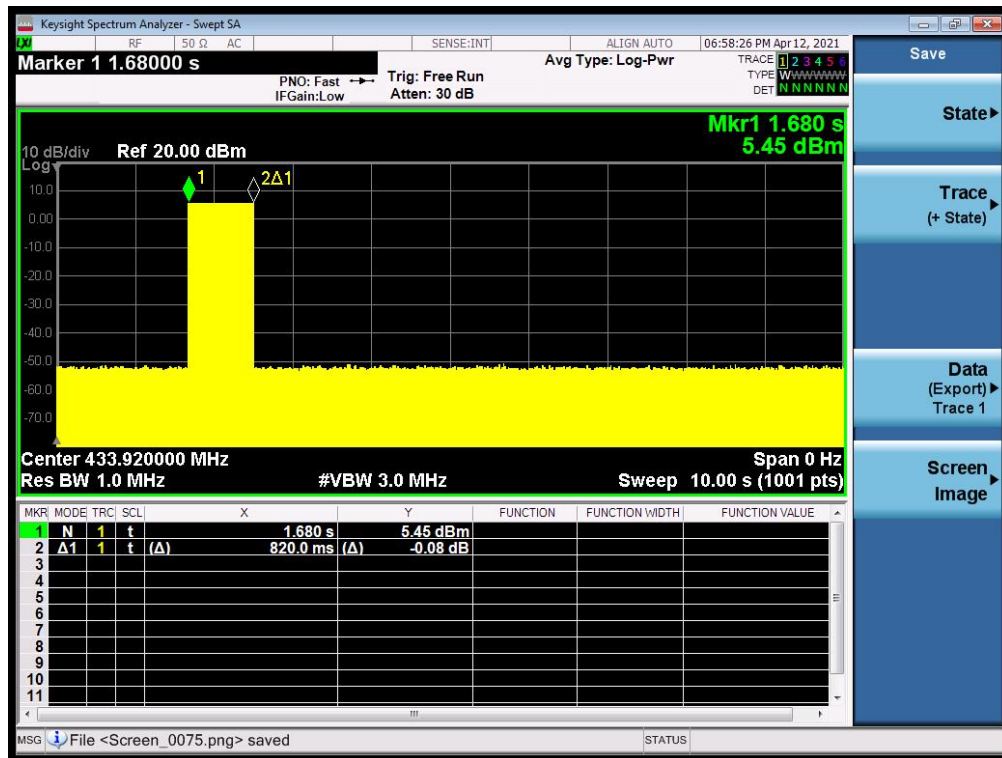
8.2 TEST SETUP



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)
0.82	5.00



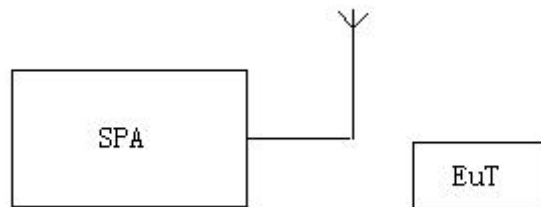
RESULT: PASS

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.

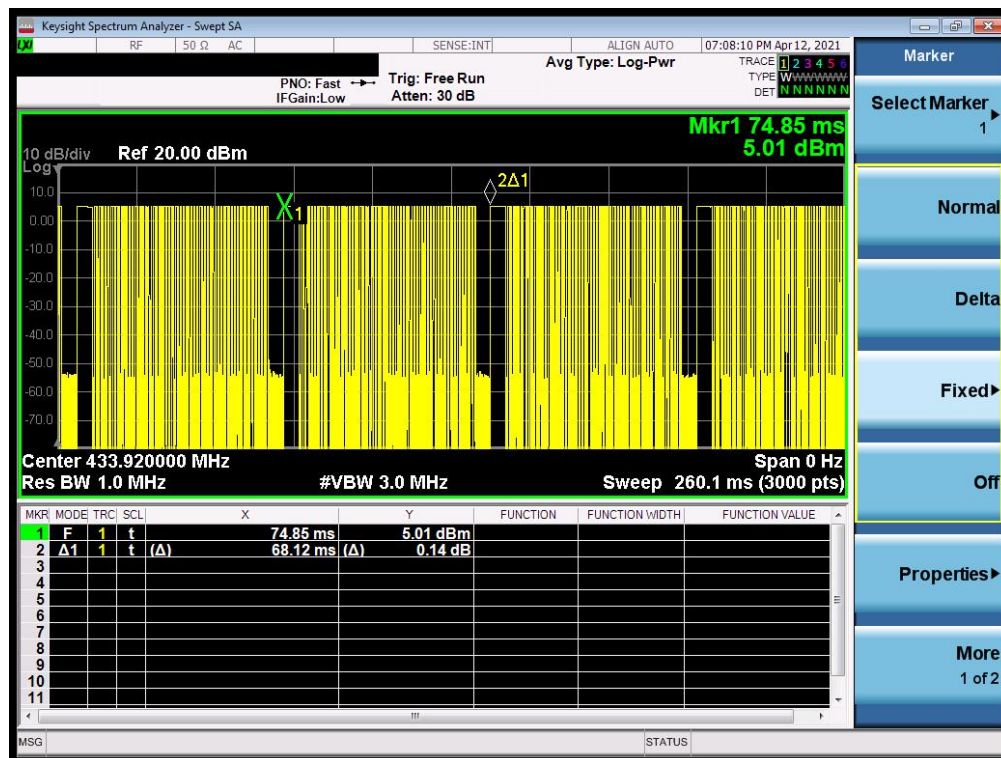
9.2 TEST SETUP

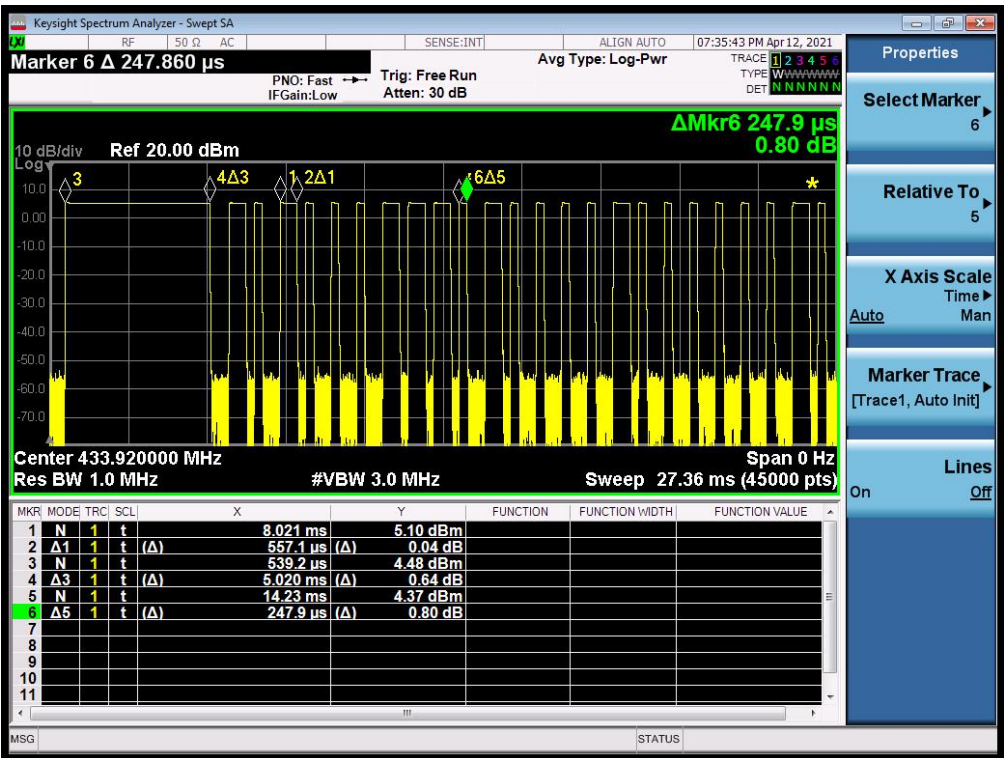
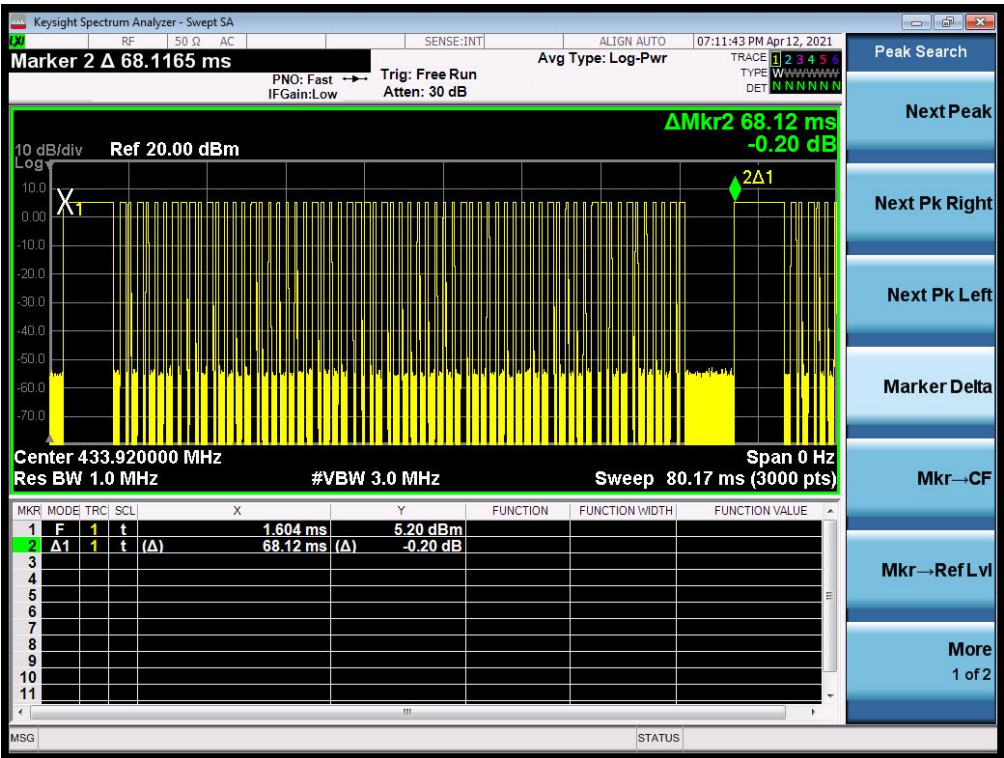


9.3 TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

Duty Cycle:	$(5.02 + 0.5571 \cdot 19 + 0.2479 \cdot 46) \text{ms} / 68.12 \text{ms} = 27.0083 \text{ms} / 68.12 \text{ms} = 0.3965$
Duty Cycle Correction Factor:	$20 \lg(0.3965) = -8.04 \text{dB}$





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.

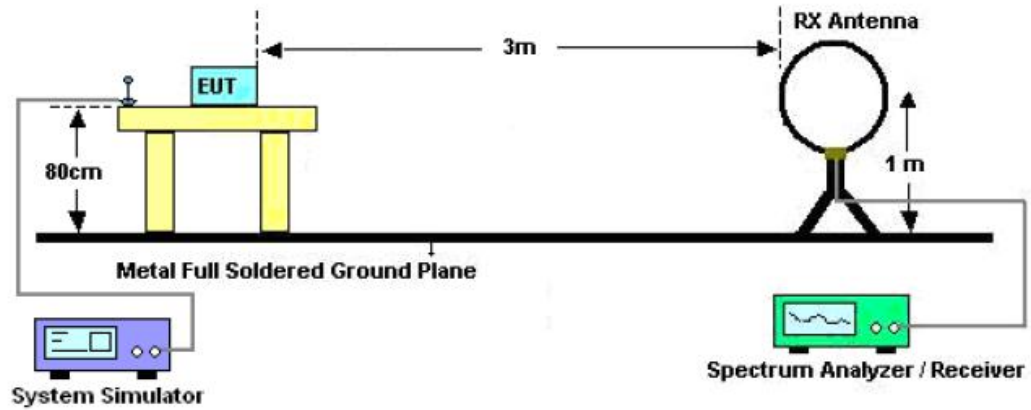
The following table is the setting of spectrum analyzer and receiver.

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

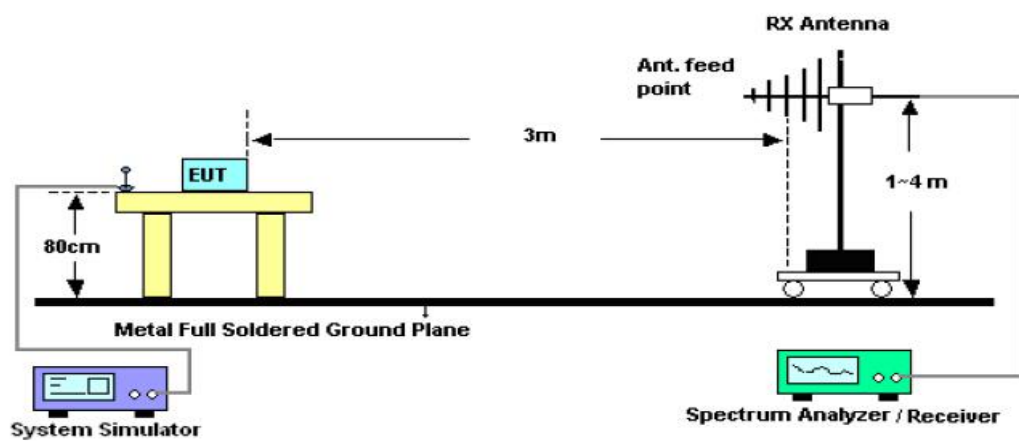
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

10.2. TEST SETUP

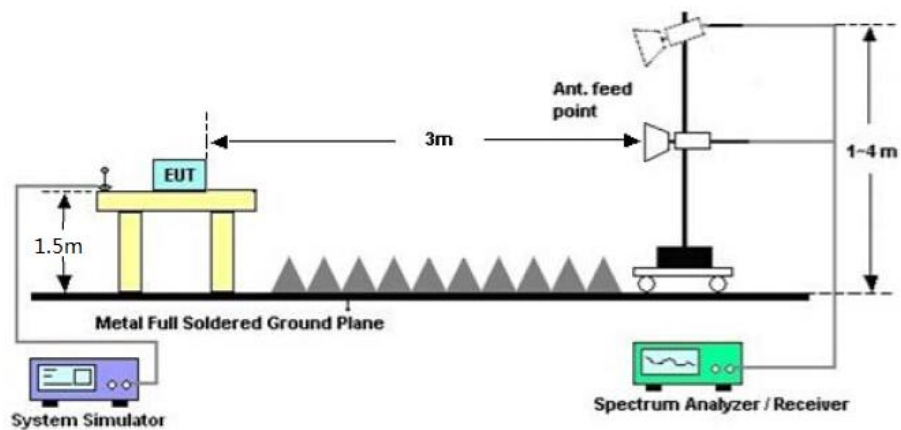
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



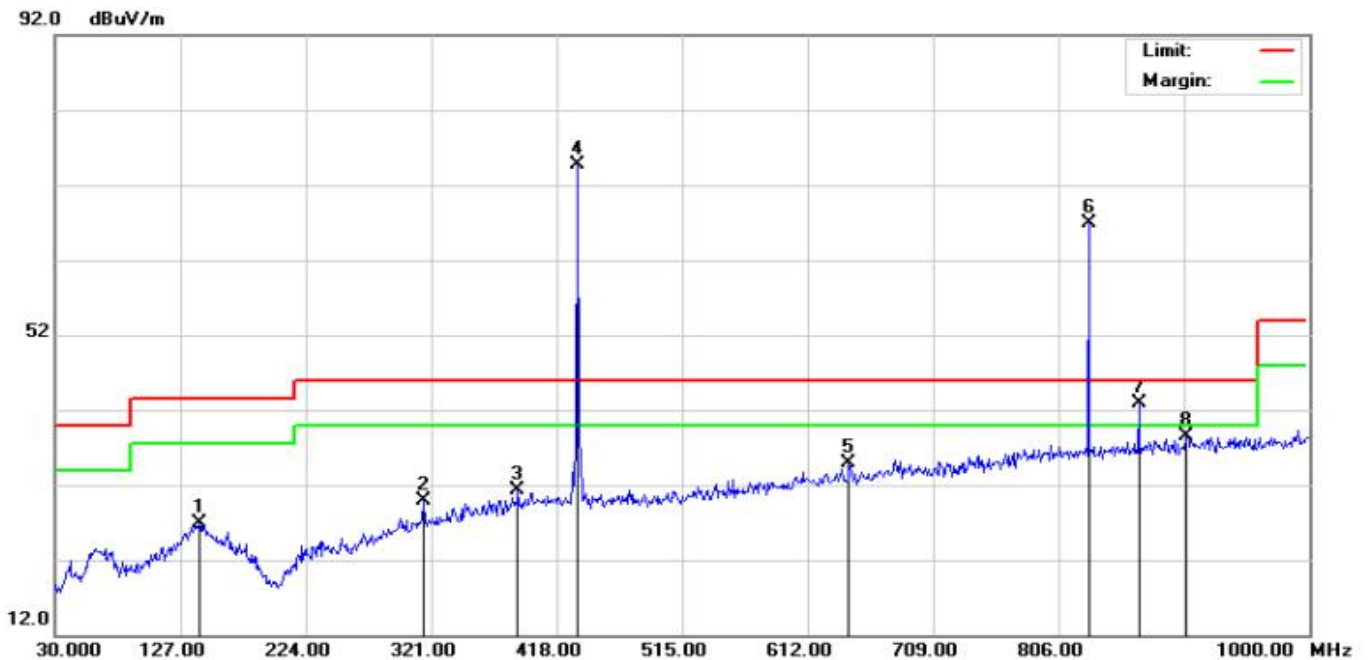
10.3. TEST RESULT

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

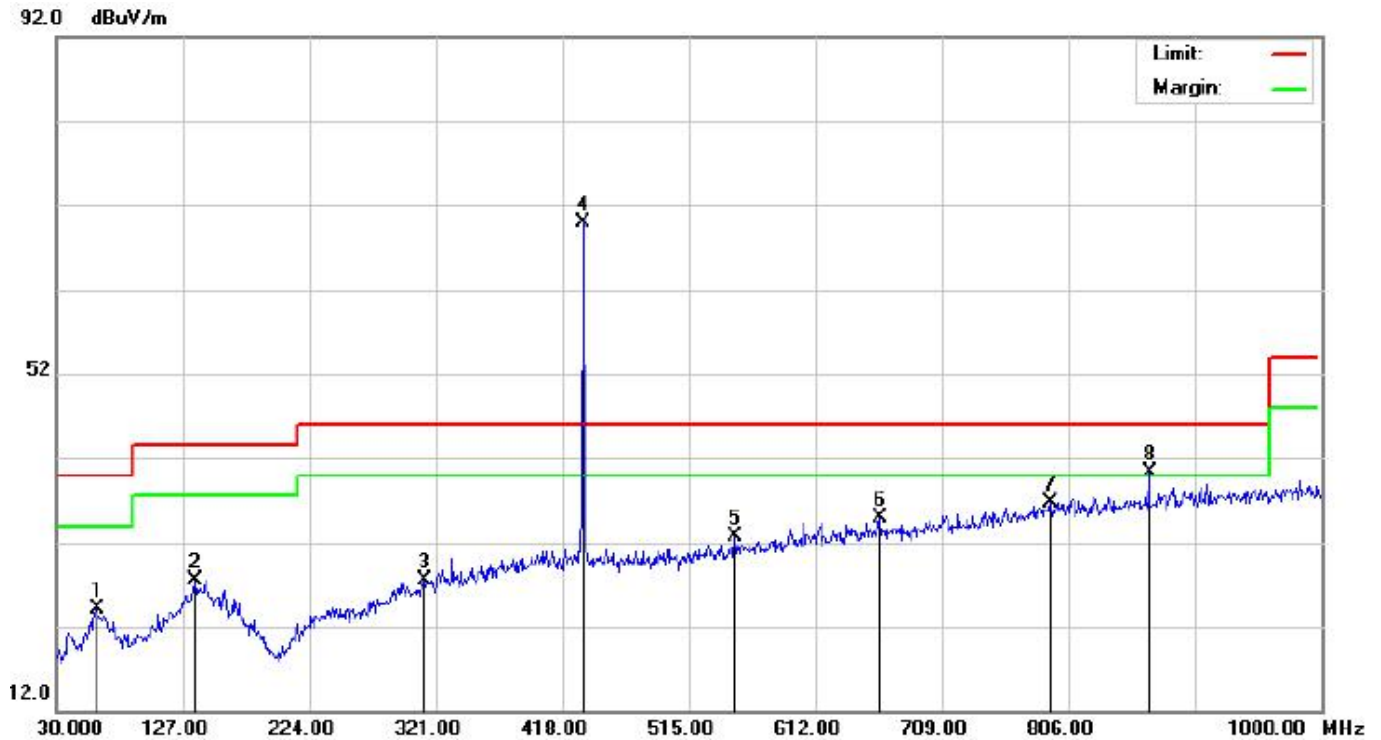


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		141.5500	5.79	21.07	26.86	43.50	-16.64	peak
2		315.1800	7.93	22.00	29.93	46.00	-16.07	peak
3		387.9300	6.71	24.56	31.27	46.00	-14.73	peak
4		433.9200	49.64	24.98	74.62	100.82	-26.20	peak
5		644.0100	7.43	27.48	34.91	46.00	-11.09	peak
6		868.2800	33.27	30.79	64.06	80.82	-16.76	peak
7		892.0800	11.60	31.29	42.89	46.00	-3.11	peak
8		904.9400	6.73	31.74	38.47	46.00	-7.53	peak

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	74.62	-8.04	66.58	80.82	-14.24	Horizontal
868.2800	64.06	-8.04	56.02	60.82	-4.80	Horizontal

RADIATED EMISSION BELOW 1GHZ-Vertical

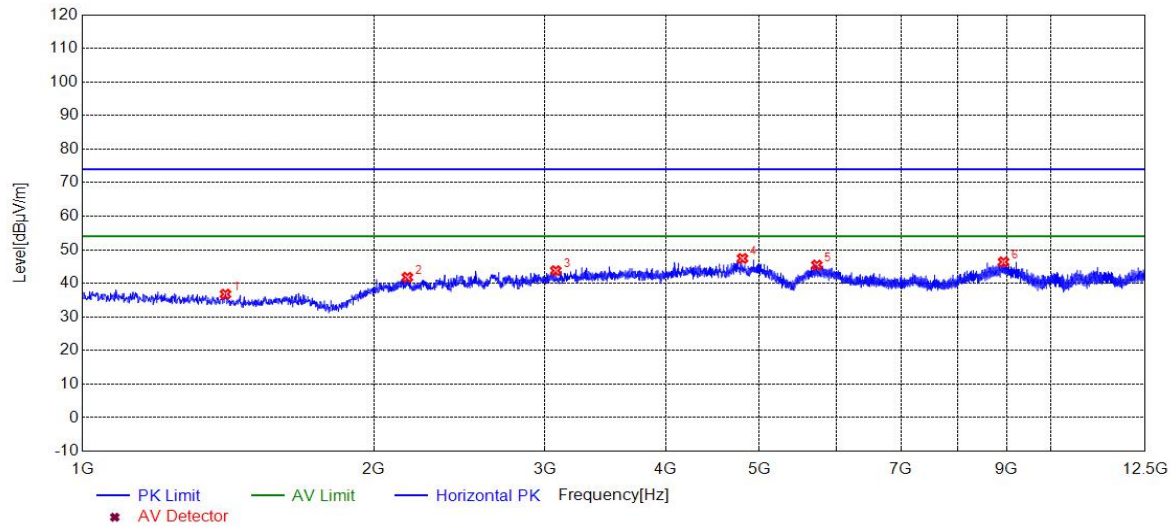


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		61.0399	6.40	17.79	24.19	40.00	-15.81	peak
2		136.7000	6.85	20.69	27.54	43.50	-15.96	peak
3		312.2699	5.62	21.90	27.52	46.00	-18.48	peak
4		433.9200	45.02	24.98	70.00	100.82	-30.82	peak
5		550.8899	6.70	25.99	32.69	46.00	-13.31	peak
6		661.4699	7.22	27.69	34.91	46.00	-11.09	peak
7		792.4199	6.39	30.24	36.63	46.00	-9.37	peak
8		868.0800	8.97	31.29	40.26	80.82	-40.56	peak

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	70.00	-8.04	61.96	80.82	-18.86	Vertical
868.0800	40.26	-8.04	32.22	60.82	-28.60	Vertical

RADIATED EMISSION ABOVE 1GHZ-Horizontal

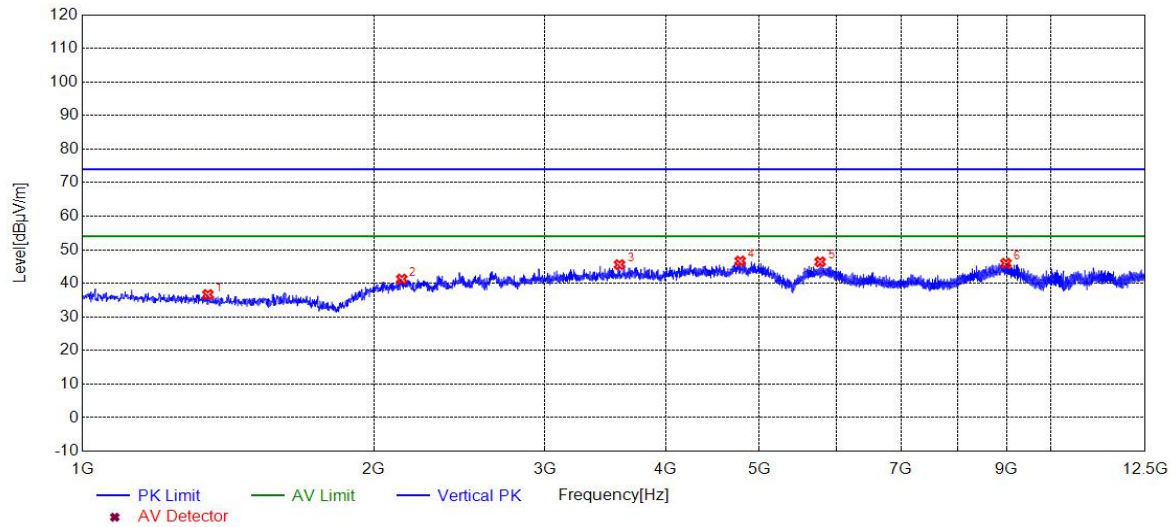


Peak data list

PK Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1404.8405	36.78	-17.04	80.82	44.04	100	170	Horizontal
2	2165.0665	41.81	-11.13	80.82	39.01	100	130	Horizontal
3	3080.5581	43.79	-9.05	80.82	37.03	100	310	Horizontal
4	4801.1301	47.42	-4.91	74.00	26.58	100	70	Horizontal
5	5730.4230	45.44	-4.55	80.82	35.38	100	100	Horizontal
6	8931.1931	46.38	1.13	80.82	34.44	100	100	Horizontal

AV data list

Freq. [MHz]	Peak Level (dBμV/m)	Duty cycle factor(dB)	AV Level (dBμV/m)	FCC Limit (dBμV/m)	Margin (dB)	Polarization
1404.8405	36.78	-8.04	28.74	60.82	32.08	Horizontal
2165.0665	41.81	-8.04	33.77	60.82	27.05	Horizontal
3080.5581	43.79	-8.04	35.75	60.82	25.07	Horizontal
4801.1301	47.42	-8.04	39.38	54.00	14.62	Horizontal
5730.4230	45.44	-8.04	37.4	60.82	23.42	Horizontal
8931.1931	46.38	-8.04	38.34	60.82	22.48	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	1347.3347	36.68	-16.98	74.00	37.32	100	230	Vertical
2	2136.3136	41.27	-11.25	80.82	39.55	100	180	Vertical
3	3584.3084	45.57	-7.41	80.82	35.25	100	70	Vertical
4	4775.8276	46.64	-4.94	74.00	27.36	100	260	Vertical
5	5775.2775	46.41	-4.41	80.82	34.41	100	180	Vertical
6	8980.6481	45.99	1.49	80.82	34.83	100	260	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
1347.3347	36.68	-8.04	28.64	54.00	25.36	Vertical
2136.3136	41.27	-8.04	33.23	60.82	27.59	Vertical
3584.3084	45.57	-8.04	37.53	60.82	23.29	Vertical
4775.8276	46.64	-8.04	38.6	54.00	15.40	Vertical
5775.2775	46.41	-8.04	38.37	60.82	22.45	Vertical
8980.6481	45.99	-8.04	37.95	60.82	22.87	Vertical

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

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

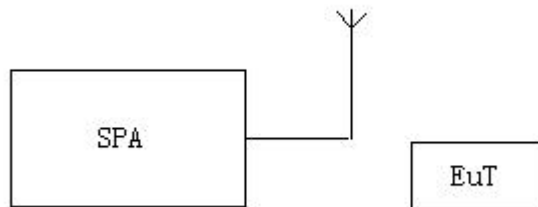
RESULT: PASS

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.

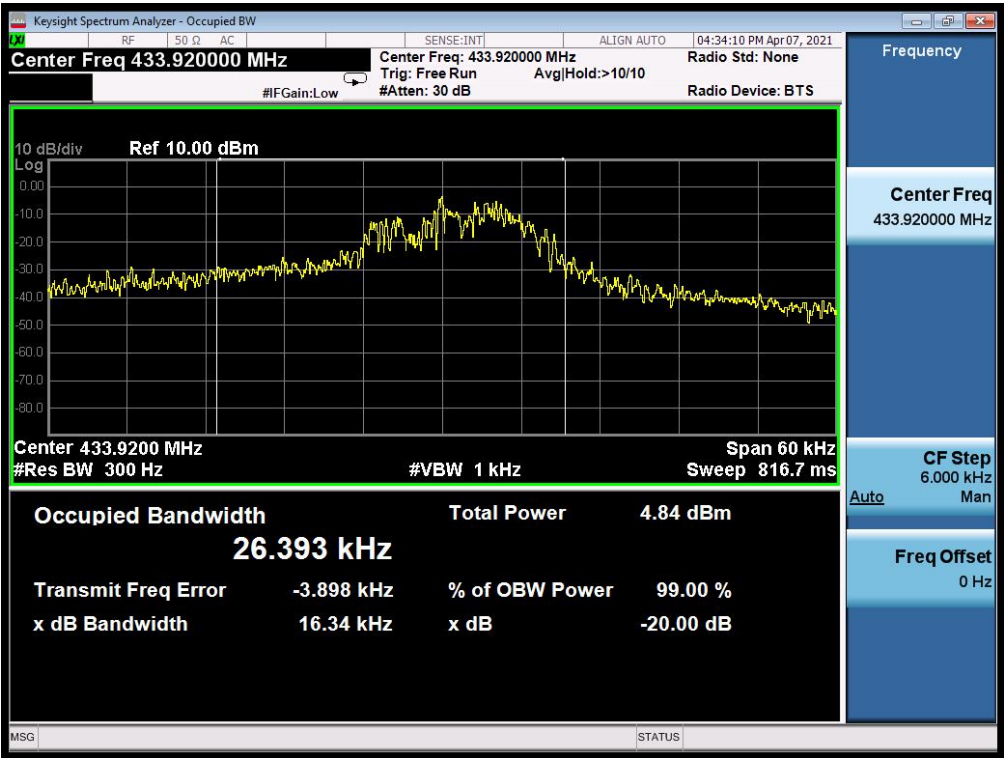
11.2. TEST SETUP



11.3. TEST RESULT

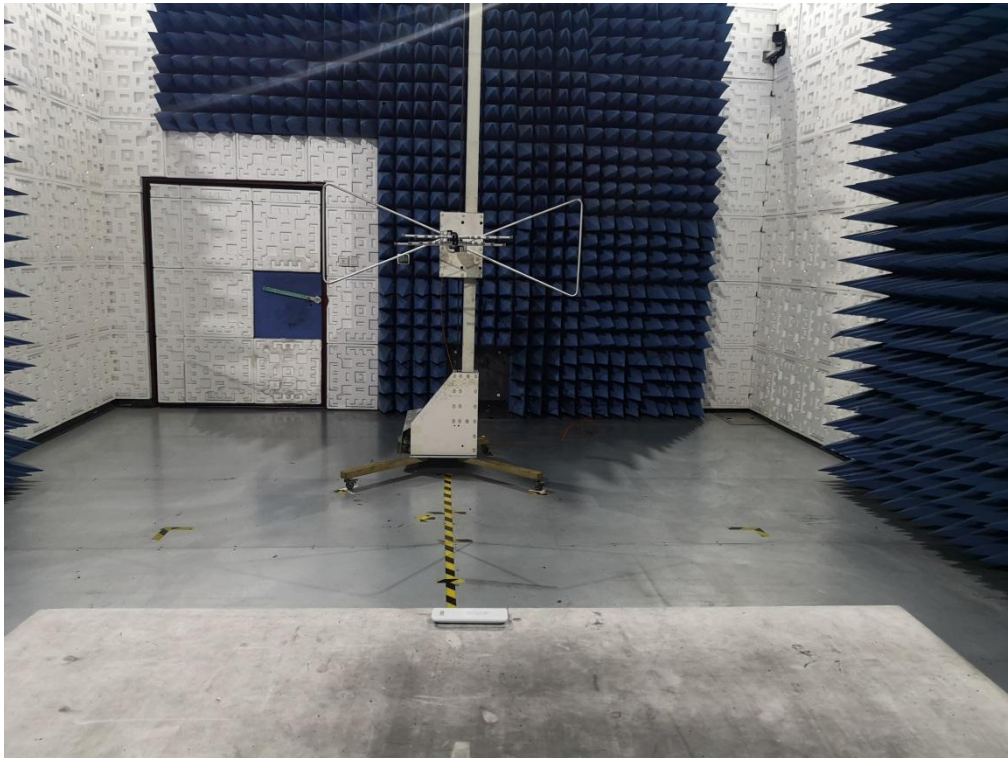
Test Mode: EUT @ 433.92MHz for RF Transmitter

-20dB bandwidth	LIMIT	RESULT
16.34KHz	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

Test Model:

ALL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



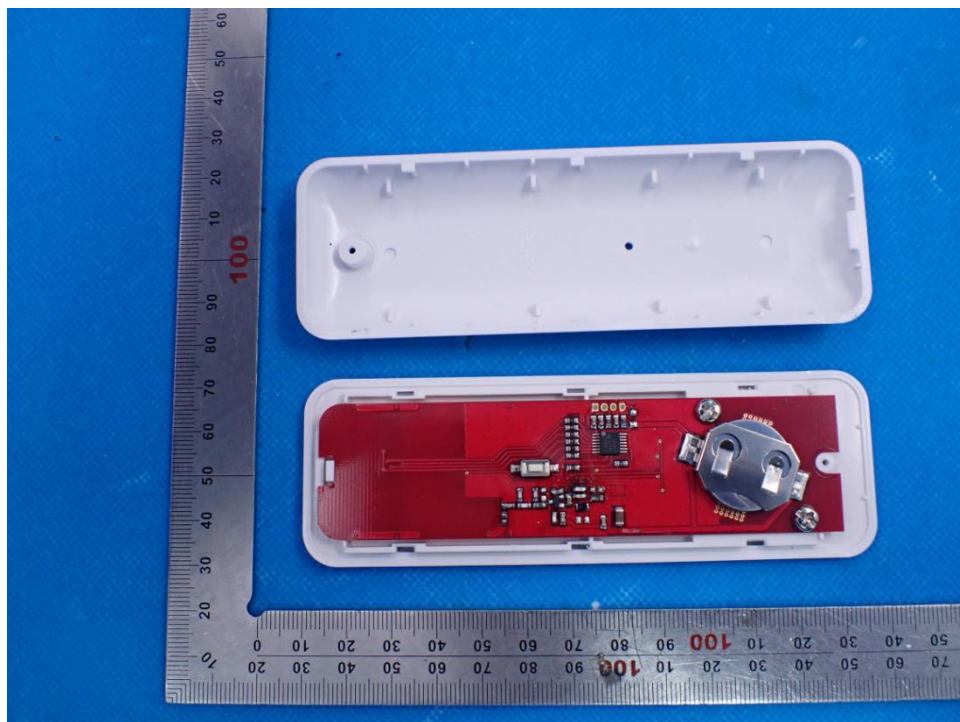
LEFT VIEW OF EUT



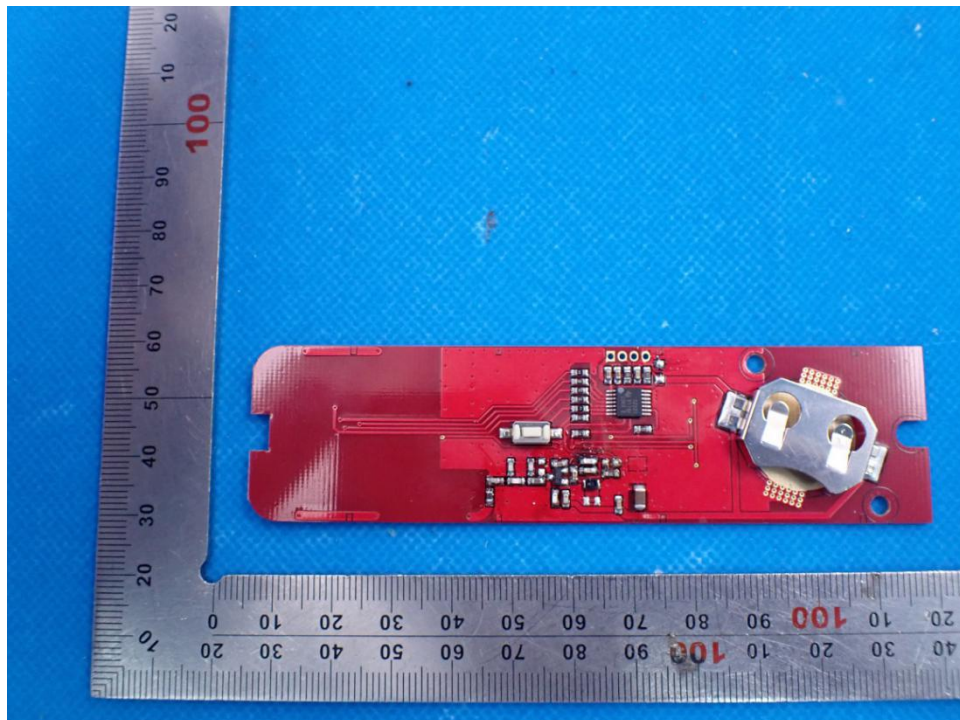
RIGHT VIEW OF EUT



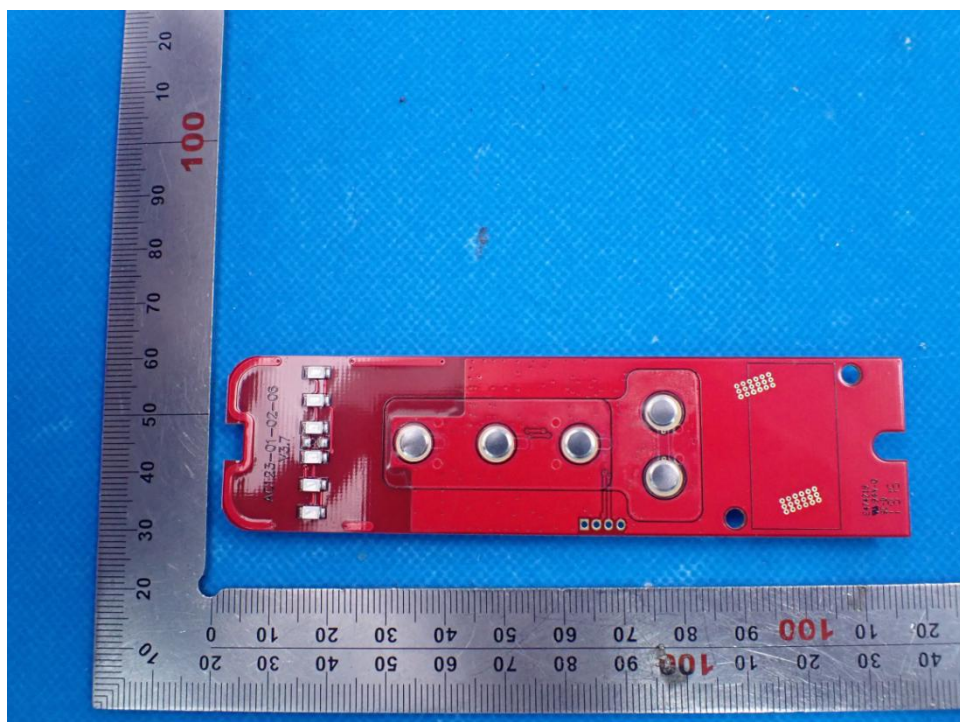
OPEN VIEW OF EUT



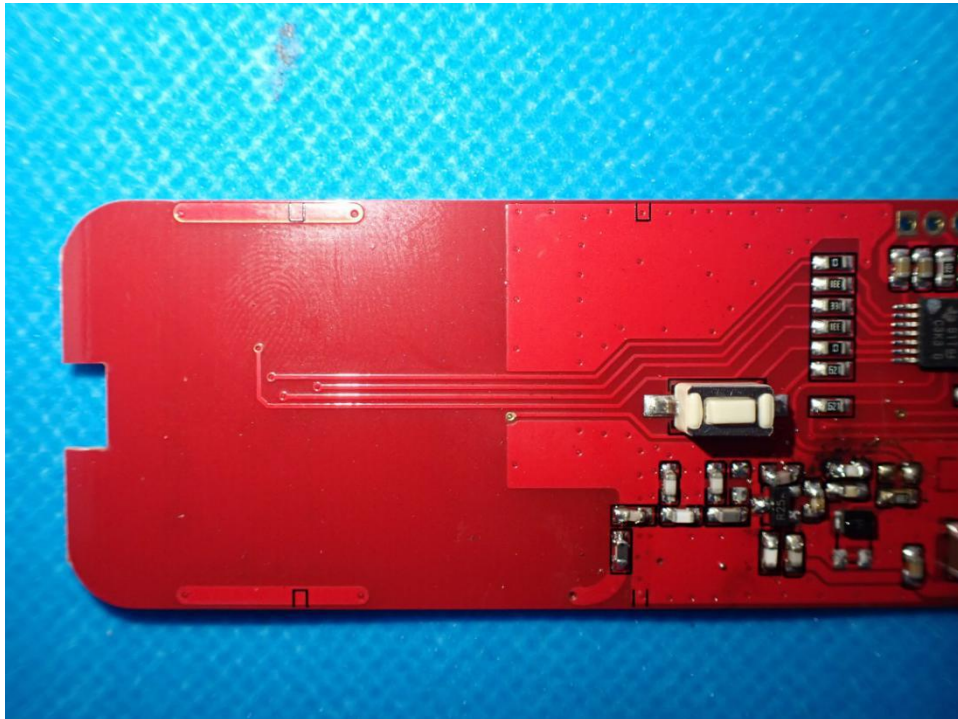
INTERNAL VIEW-1 OF EUT



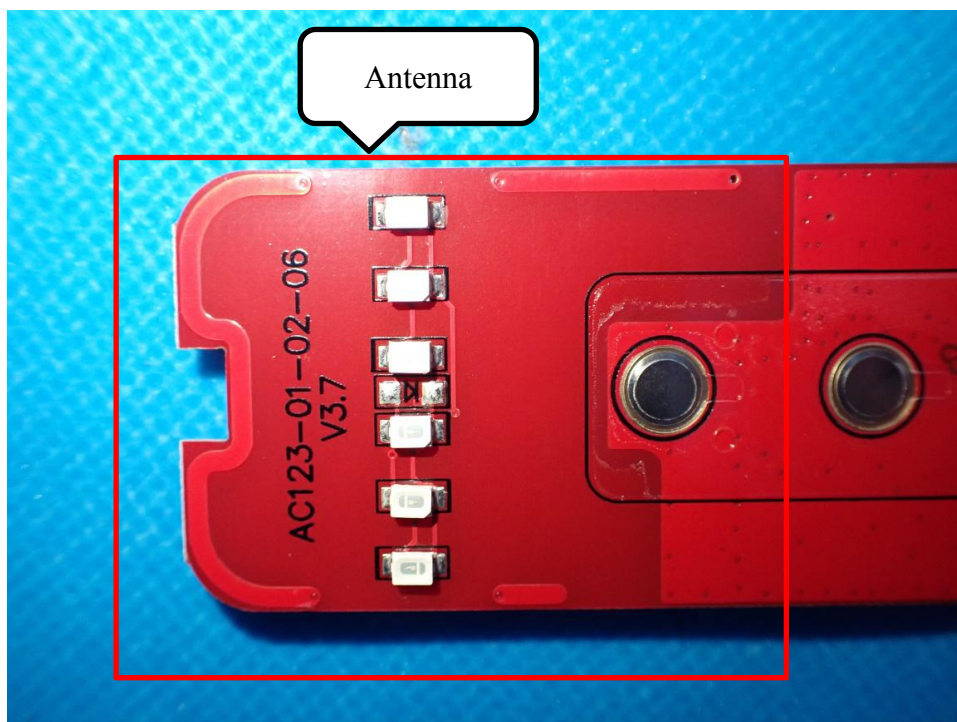
INTERNAL VIEW-2 OF EUT



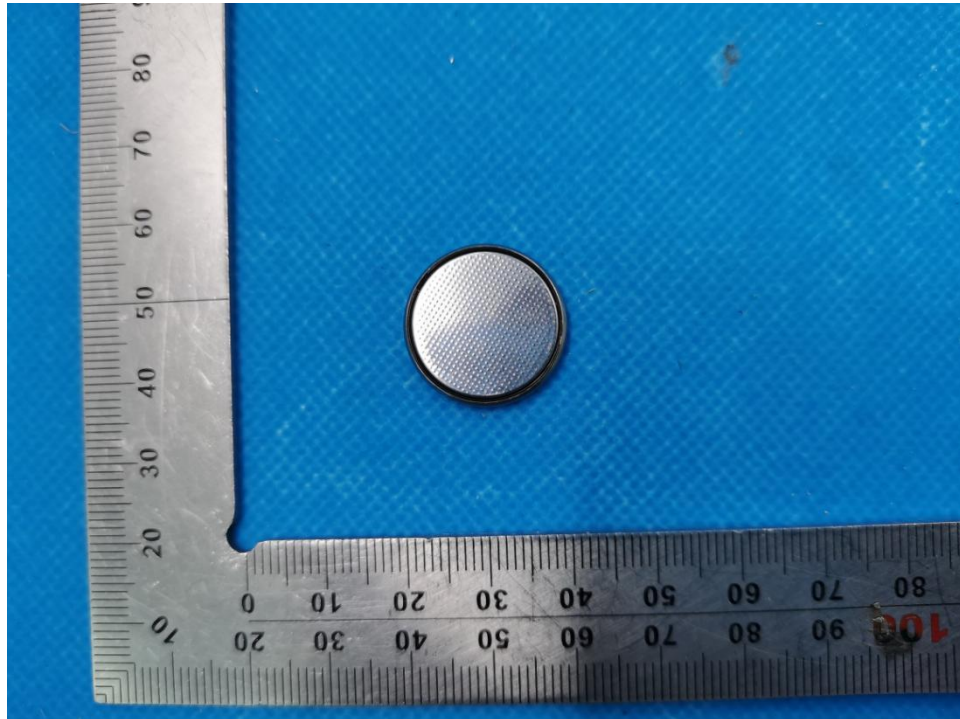
INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



VIEW OF BATTERY

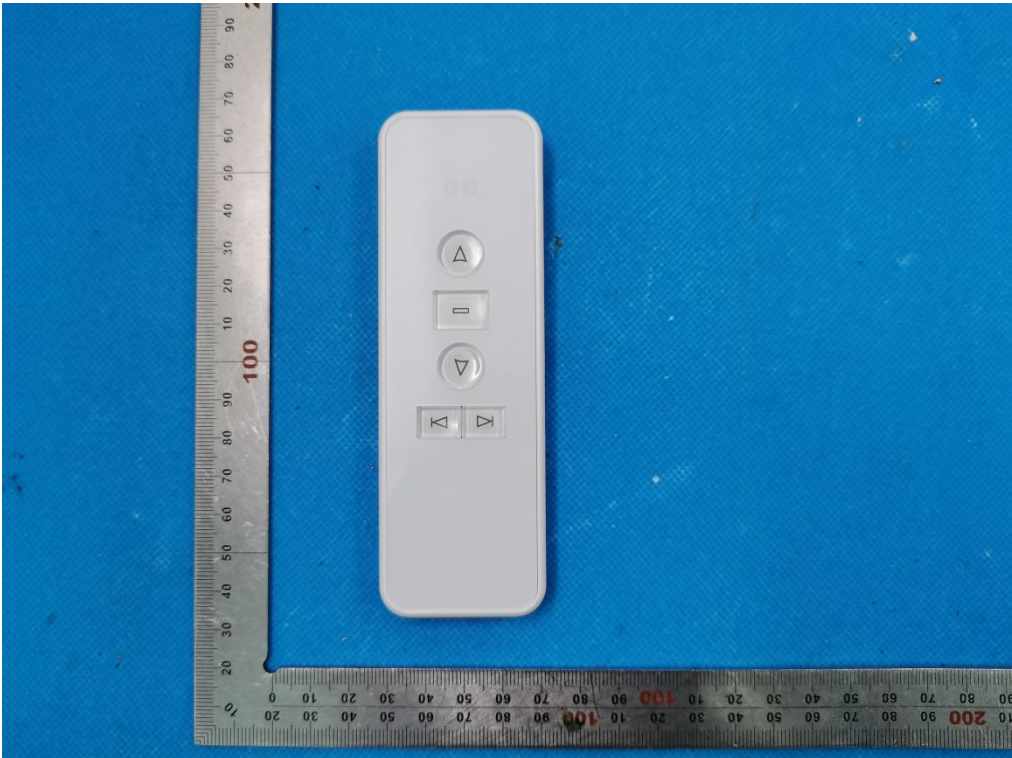


Series Model:

ALL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



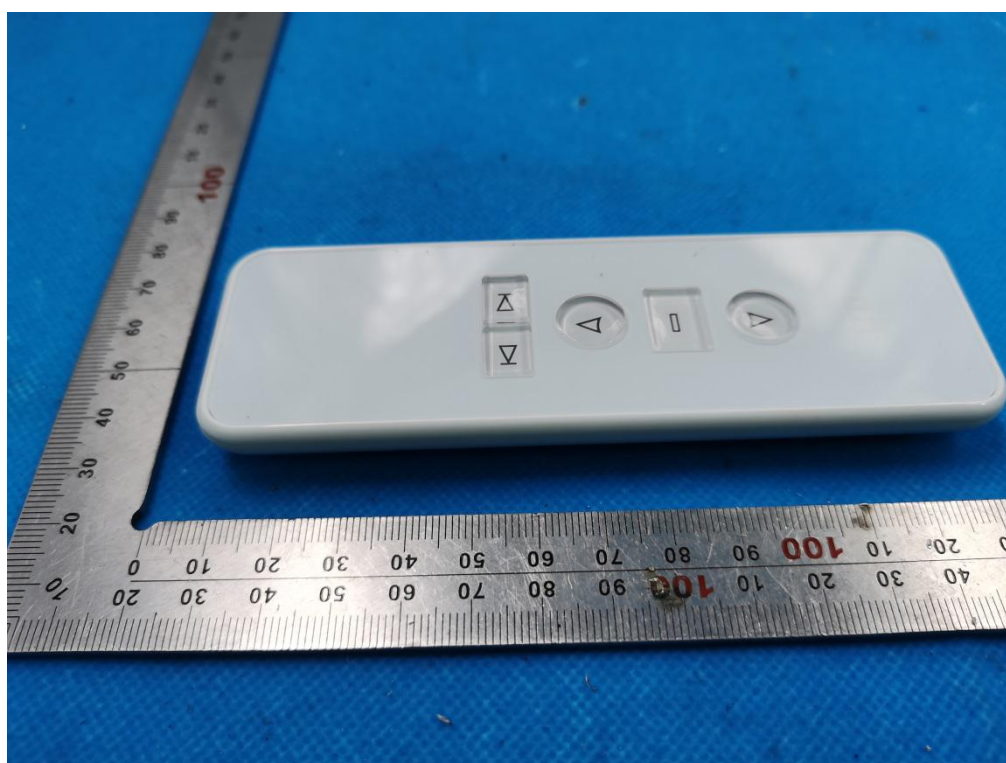
BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



-----END OF REPORT-----