



## *FCC COMPLIANCE TEST REPORT*

Technical Statement of Conformity  
in accordance with 47 CFR Part 15 Subpart C

### **The product**

<b>Equipment Under Test</b>	: WIRELESS REMOTE CONTORL
<b>Model Number</b>	: 60565XR
<b>Product Series</b>	: 60585x series, 60565x series, 60555x series, 60545x series
<b>Report Number</b>	: HA230503-RA
<b>Issue Date</b>	: 26-Dec-2023
<b>Test Result</b>	: Compliance

is produced by  
Trusty Products, Inc.  
137 South 8th Ave., #D, City of Industry, California, United States



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SL2-IS-E-0023, SL2-R1-E-0023,  
SL2-R2-E-0023, SL2-L1-E-0023

**FCC Designation No.:** TW1071  
**TAF Accreditation No.:** 1163  
**VCCI Registration No.:** R-2156, C-2329, T-219

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# Test Result Certification

**Applicant** : Trusty Products, Inc.

**Address of Applicant** : 137 South 8th Ave., #D, City of Industry, California,  
United States

**Manufacturer** : KHAN'S ENTERPRISE CO., LTD.

**Address of Manufacturer** : No.1921, Chun Ri Road, Taoyuan, Taiwan

**Trade Name** : 

**Equipment Under Test** : WIRELESS REMOTE CONTROL

**Model Number** : 60565XR

**Product Series** : 60585x series, 60565x series, 60555x series, 60545x  
series

**FCC ID** : 2AAWR60565XR

**Filing Type** : Certification

**Sample Received Date** : 21-Jul-2023

**Test Standard** :

☒ FCC Part 15 Subpart C §15.231

**Deviations from standard test methods & any other specifications : NONE**

## Remark:

1. This report details the results of the test carried out on one sample.
2. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.203, 15.207, 15.209, 15.231.
3. This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd.

**Documented by:**



**Cherry Chi/ ADM. Dept Staff**

**2023-12-26**


**Tested by:**



**Andrew Lin/ ENG. Dept. Staff**

**2023-10-06**

**Approved by:**



**Adam Yang/ Authorized Reviewer**

**Date:**

**2023-12-26**



## Summary of Test Result

	Test Item	Applicable Standard	Test Result
1	Antenna Requirement	FCC part 15 subpart C §203	Compliance
2	Conducted limits	FCC part 15 subpart C §207	N/A
3	Radiated emission limits	FCC part 15 subpart C §209	Compliance
4	Conditions of Intentional radiators to comply with periodic operation	FCC part 15 subpart C §231(a)(1)	Compliance
		FCC part 15 subpart C §231(a)(2)	N/A
		FCC part 15 subpart C §231(a)(3)	N/A
		FCC part 15 subpart C §231(a)(4)	N/A
		FCC part 15 subpart C §231(a)(5)	N/A
5	Field Strength	FCC part 15 subpart C §231(b)	Compliance
6	Emission Bandwidth	FCC part 15 subpart C §231(c)	Compliance
7	Requirements for devices operating within 40.66~40.70MHz band	FCC part 15 subpart C §231(d)	N/A
8	Conditions for intentional radiators to comply with periodic operation	FCC part 15 subpart C §231(e)	N/A

## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Test Item	Expanded Uncertainty
Conducted emission, 9kHz – 150kHz	$\pm 2.77\text{dB}$
Conducted emission, 150kHz – 30MHz	$\pm 2.88\text{dB}$
Radiated emission, 30MHz – 1GHz	$\pm 3.03\text{dB}$
Radiated emission, 30MHz – 1GHz (Horizontal)	$\pm 4.86\text{dB}$
Radiated emission, 30MHz – 1GHz (Vertical)	$\pm 5.01\text{dB}$
Radiated emission, 1GHz – 6GHz	$\pm 4.52\text{dB}$
Radiated emission, 6GHz – 18GHz	$\pm 4.49\text{dB}$
Radiated emission, 18GHz – 40GHz	$\pm 4.54\text{dB}$
Output power	$\pm 0.93\text{dB}$
Power spectral density	$\pm 1.71\text{dB}$
Occupied bandwidth	$\pm 0.01\%$
Frequency stability with respect to ambient temperature	$\pm 5.27\text{Hz}$
Frequency stability when varying supply voltage	$\pm 0.15\%$
Duty cycle	$\pm 0.02\%$
Conducted unwanted emission, 30MHz – 1GHz	$\pm 1.91\text{dB}$
Conducted unwanted emission, 1GHz – 40GHz	$\pm 1.08\text{dB}$

This reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of  $k = 2$ , providing a level of confidence of approximately 95%.

# 1 General Description

## 1.1 Description of EUT

Equipment Under Test	:	WIRELESS REMOTE CONTROL
Model Number of EUT	:	60565XR
Product Series	:	60585x series, 60565x series, 60555x series, 60545x series
Power Supply	:	A23 Battery
Frequency Range	:	433.947MHz
Number of Channels	:	1
Channel List	:	433.947MHz
Channel Spacing	:	N/A
Antenna Specification	:	Chip Antenna, 0.5 dBi Gain
Modulation Technique	:	FSK
Specification	:	<b>Dimensions</b> : 960 mm (L) X 46 mm (W) X 19 mm (H) <b>Function</b> : The EUT is a wireless remote controller. Its transmitting frequency is 433.947 MHz. ※For more detail specification, please refer to the User Manual.



## 1.2 Test Instruments

### 1.2.1. Instruments Used for Measurement

HA2

Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI7	100931	24-Mar-2023	23-Mar-2024
Spectrum Analyzer	R&S	FSV 40	101296	11-Apr-2023	10-Apr-2024
Preamplifier	SCHAFFNER	CPA 9231A	0405	15-Dec-2022	14-Dec-2023
Preamplifier(1~18GHz)	EMCI	EMC051845SE	980692	02-Dec-2022	01-Dec-2023
Preamplifier(18~40GHz)	EMCI	EMC184045SE	980699	12-May-2023	11-May-2024
Loop Antenna	EMCO	6502	9202-2717	04-Sep-2023	03-Sep-2024
Bilog Antenna(3m)	TESEQ	CBL6111D	58161	27-Dec-2022	26-Dec-2023
Bilog Antenna(10m)	TESEQ	CBL6111D	58161	27-Dec-2022	26-Dec-2023
Horn Antenna	EMCO	3115	9912-5992	24-Feb-2023	23-Feb-2024
Horn Antenna	Com-Power	AH-840	101042	15-May-2023	14-May-2024
Cable	HongAn	8D-FB	HA2-10MSite	31-Aug-2023	30-Aug-2024
RF Cable(1~18GHz)	EMCI	EMC104-SM-NM-1000	191104	30-Nov-2022	29-Nov-2023
RF Cable(1~18GHz)	EMCI	EMC104-SM-NM-8000	191103	30-Nov-2022	29-Nov-2023
RF Cable(18~40GHz)	EMCI	EMC102-KM-KM-1000	200301	12-May-2023	11-May-2024
RF Cable(18~40GHz)	WiSPEC	291LKA2292-8000	WSP-C-202205-001	12-May-2023	11-May-2024
Signal Generator	R&S	SMB100A	110549	24-Aug-2023	23-Aug-2024
Software	Audix	e3 (ver 6.101006a)	N/A	N/A	N/A

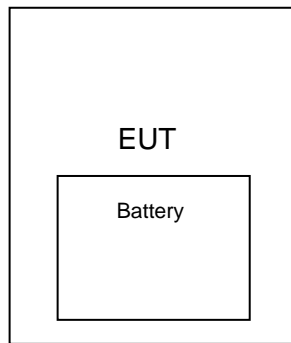
※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.



### 1.3 Auxiliary Equipments

- 1.3.1. Provided by HongAn Technology Co., Ltd. for Emission Test.  
N/A
- 1.3.2. Provided by the Manufacturer  
N/A

### 1.4 EUT SETUP



Note: Main Test Sample: 60565XR

### 1.5 Identifying the Final Test Mode

- 1. Mode 1: EUT in X axes. Transmitting Channel set at 433.947 MHz.

Note:

- 1. During radiated emission pre-test, rotation of the EUT through three orthogonal axes has been evaluated.
- 2. After pre-test, we identified that the TX X Position was most likely to cause maximum disturbance. Therefore, the Final Assessment was performed for the worst case.
- 3. The only Channel (433.947 MHz) was chosen for full testing.
- 4. According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.207, 15.209 and 15.231 under the FCC Rules Part 15 Subpart C.
- 5. New **A23 Battery** was used during whole testing.

### 1.6 Final Test Mode

- 1. Radiated Emission (30~1000MHz): Mode 1
- 2. Field Strength (Fundamental): Mode 1
- 3. Field Strength (Harmonics): Mode 1
- 4. Conducted Emission: N/A. The EUT is designed to use Battery.



## **1.7 Condition of Power Supply**

A23 Battery

## **1.8 EUT Configuration**

1. Setup the EUT as shown in Sec.1.4 Block Diagram.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode.

## **1.9 Test Methodology**

The tests documented in this report were performed in accordance with ANSI C63.10-2013 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.203, 15.205, 15.207, 15.209 and 15.231.

## **1.10 General Test Procedures**

### **Conducted Emissions**

The EUT is set according to the requirements in Section 6.2 of ANSI C63.10 (2013).

### **Radiated Emissions**

The EUT is set according to the requirements in Section 6.3 of ANSI C63.10 (2013).

## **1.11 Modification**

N/A

## 1.12 FCC Part 15.205 restricted bands of operations

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37635-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

## 1.13 Qualification of Test Facility

**BSMI Certificate No.** : SL2-IS-E-0023, SL2-IN-E-0023, SL2-R1-E-0023, SL2-R2-E-0023, SL2-A1-E-0023, SL2-L1-E-0023.

**FCC Designation No.** : TW1071

**TAF Accreditation No.** : 1163

**VCCI Certificate No.** : R-2156, C-2329, T-219

## 2 Power line Conducted Emission Measurement

### 2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 2.2 Test Arrangement and Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### 2.3 Limit (§ 15.207)

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency (MHz)	Limits (dBuV)	
	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### 2.4 Test Result

N/A.

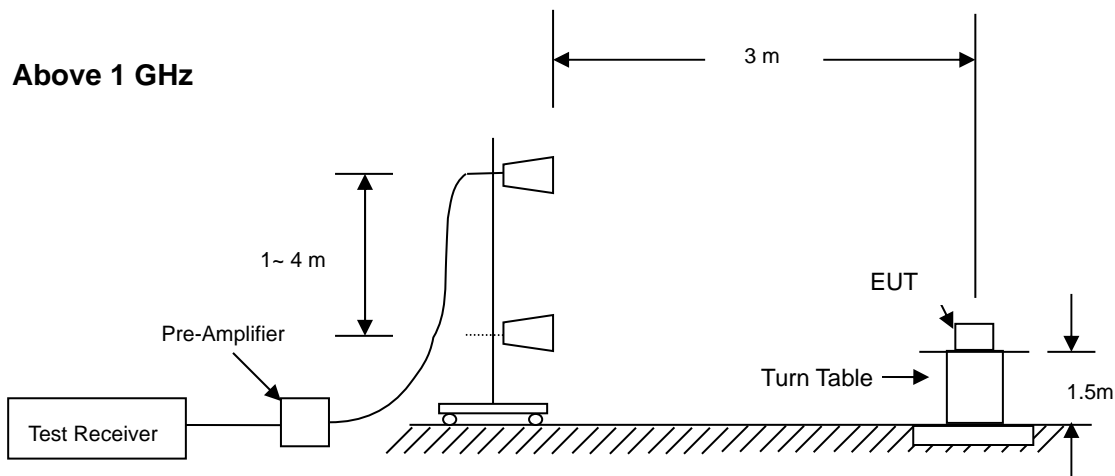
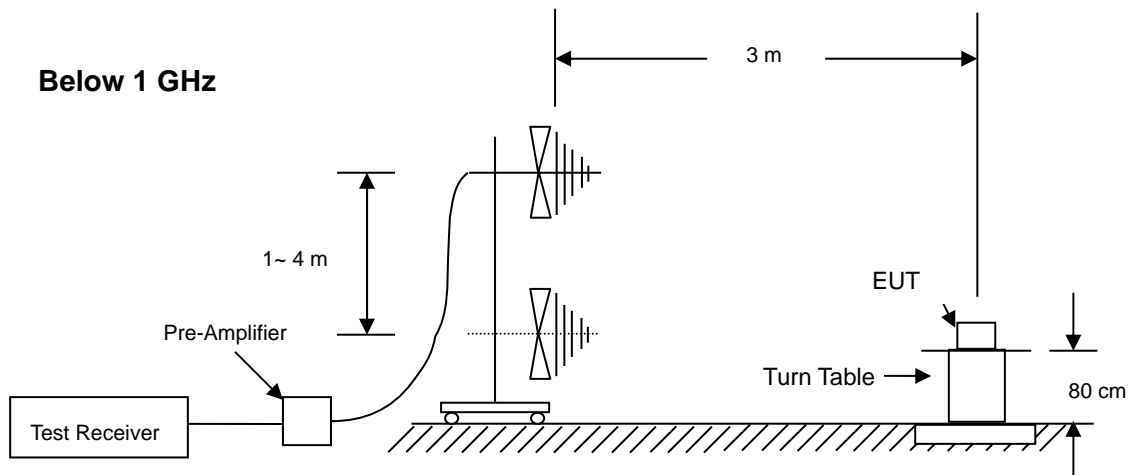
The EUT applied an A23 Battery; therefore, no conducted emission measurement is required.

### 3 Radiated Emission Test

#### 3.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

#### 3.2 Test Arrangement and Procedure



1. The EUT is placed on a turntable, which is 0.8m (below 1GHz) or 1.5 m (above 1GHz) above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
4. Maxium procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
  - (a) Below 1 GHz: RBW =100 kHz/ VBW = 300 kHz/ Sweep = AUTO.



(b) Above 1 GHz: Peak: RBW = VBW = 1MHz/ Sweep = AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.

### 3.3 Limit of Field Strength of Fundamental (§ 15.231(b))

The field strength of emissions from intentional radiators operated under these frequency bands shall not exceed with the following:

Fundamental Frequency (MHz)	Field strength of fundamental (microvolts/ meter)	Field strength of spurious emission (microvolts/ meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	<sup>1</sup> 1,250 to 3,750	<sup>1</sup> 125 to 375
174-260	3,750	375
260-470	<sup>1</sup> 3,750 to 12,500	<sup>1</sup> 375 to 1,250
Above 470	12,500	1,250

Remark: 1. Linear interpolations.

The transmitting frequency of the EUT is 433.947MHz. According to Linear interpolations, the limits for fundamental and spurious are in the following table:

Transmitting Frequency (MHz)	Field strength of fundamental		Field strength of spurious emission	
	(microvolts/ meter)	dBuV/m	(microvolts/ meter)	dBuV/m
433.947	10,997	80.82	1,099	60.82

Note:

1. Field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.
2. Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in § 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of § 15.205 shall be demonstrated using the measurement instrumentation specified in that section.
3. The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

### 3.4 Limit of Spurious Emission (§ 15.209)

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 § 15.209, whichever is lesser attenuation.

Frequency (MHz)	Field strength (microvolts/ meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

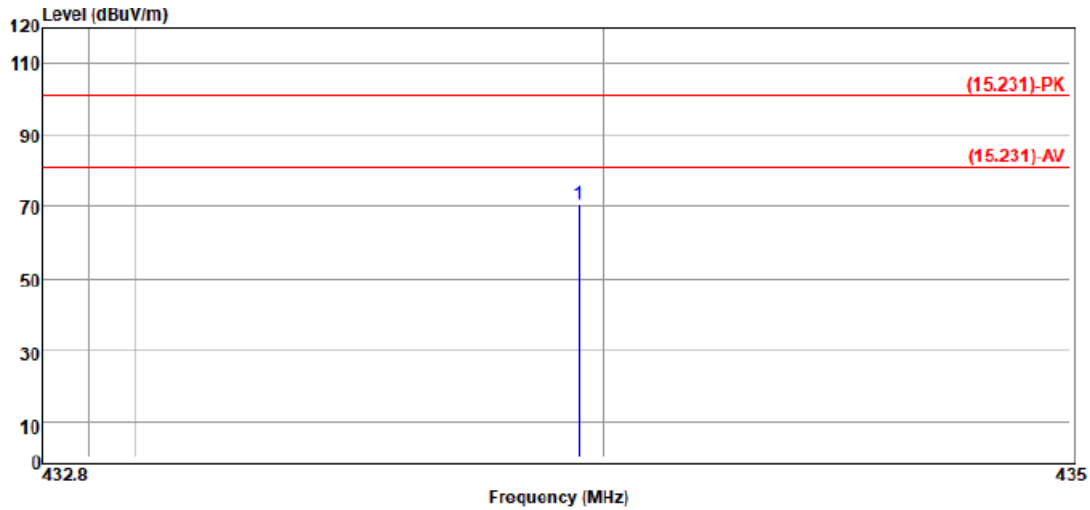
### 3.5 Test Result

#### Compliance

The final test data are shown on the following page(s).

**Radiated Emission Test Data (Field Strength of Fundamental)**

Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Polarization	: Horizontal	Channel	: 433.947 MHz
Test Mode	: Mode 1		



No.	Freq MHz	Reading dB $\mu$ V	C.F dB/m	Result dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Antenna Pol.	Remark
1	433.947	76.89	-6.39	70.50	100.82	-30.32	HORIZONTAL	Peak

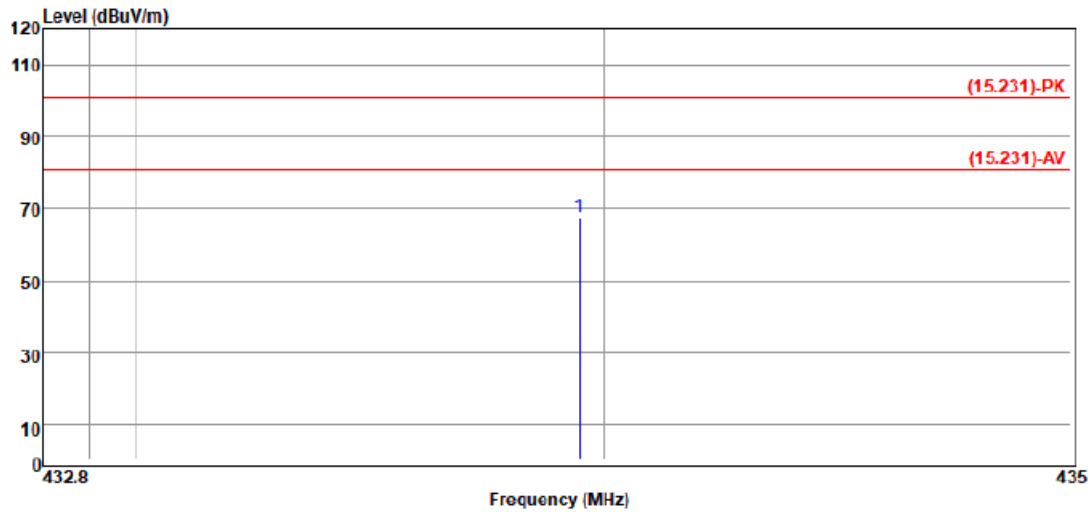
Remark :

1. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
2. Spectrum setting: Peak Setting, RBW = 100kHz, VBW = 300kHz



**Radiated Emission Test Data (Field Strength of Fundamental)**

Temperature : 25°C Humidity : 56%  
Test Date : 06-Oct-2023 Tested by : Andrew Lin  
Polarization : Vertical Channel : 433.947 MHz  
Test Mode : Mode 1



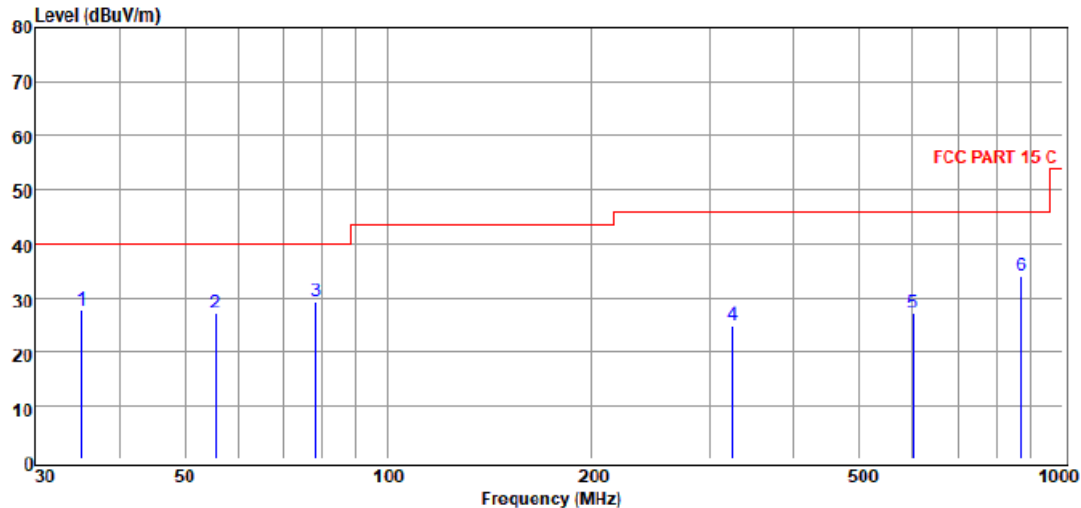
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Antenna Pol.	Remark
1	433.947	74.26	-6.39	67.87	100.82	-32.95	VERTICAL	Peak

Remark :

1. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
2. Spectrum setting: Peak Setting. RBW = 100kHz, VBW = 300kHz

### Radiated Emission Test Data (below 1GHz)

Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Polarization	: Horizontal	Channel	: 433.947 MHz
Test Mode	: Mode 1		



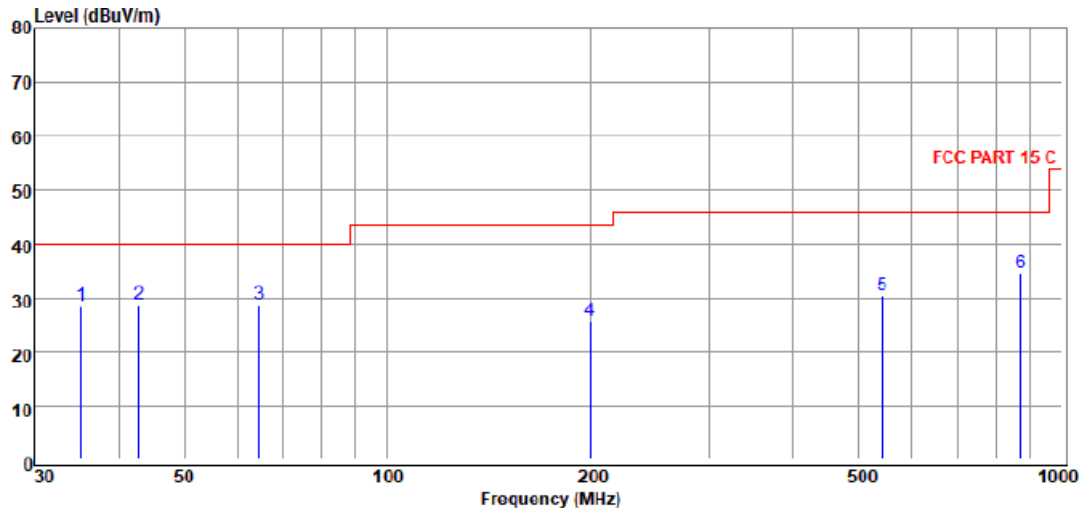
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Antenna Pol.	Remark
1	35.128	34.24	-6.52	27.72	40.00	-12.28	HORIZONTAL	Peak
2	55.609	44.38	-17.22	27.16	40.00	-12.84	HORIZONTAL	Peak
3	78.413	45.54	-16.13	29.41	40.00	-10.59	HORIZONTAL	Peak
4	324.456	33.97	-9.04	24.93	46.00	-21.07	HORIZONTAL	Peak
5	601.427	30.22	-3.02	27.20	46.00	-18.80	HORIZONTAL	Peak
6	867.890	32.17	1.84	34.01	46.00	-11.99	HORIZONTAL	Peak

Remark :

- Measuring frequencies from 1 GHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
- Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
- Spectrum setting:
  - Peak Setting 1GHz to 10<sup>th</sup> harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

### Radiated Emission Test Data (below 1GHz)

Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Polarization	: Vertical	Channel	: 433.947 MHz
Test Mode	: Mode 1		



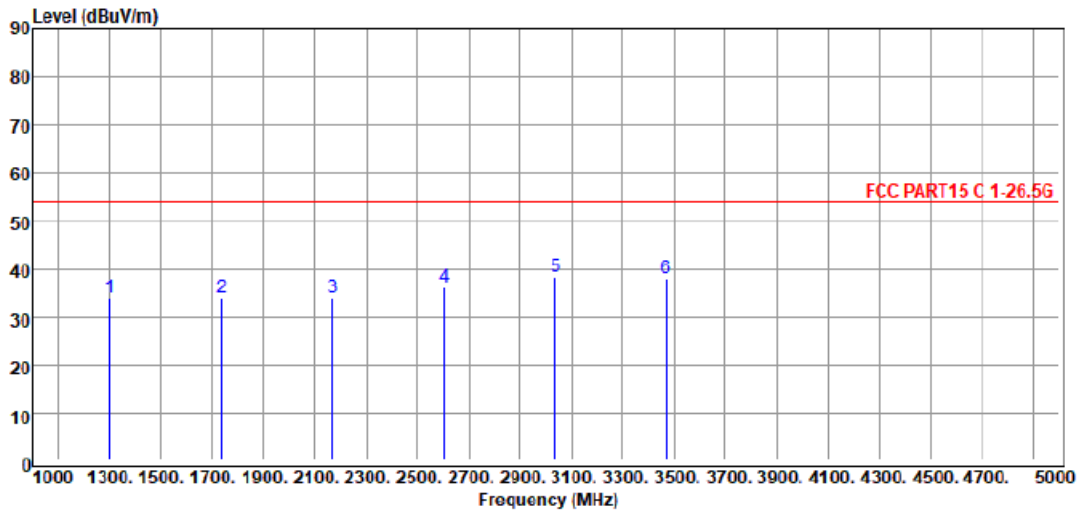
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Antenna Pol.	Remark
1	35.128	34.99	-6.52	28.47	40.00	-11.53	VERTICAL	Peak
2	42.900	39.67	-10.82	28.85	40.00	-11.15	VERTICAL	Peak
3	64.659	46.68	-17.94	28.74	40.00	-11.26	VERTICAL	Peak
4	199.986	39.26	-13.56	25.70	43.50	-17.80	VERTICAL	Peak
5	541.373	35.25	-4.77	30.48	46.00	-15.52	VERTICAL	Peak
6	867.890	32.73	1.84	34.57	46.00	-11.43	VERTICAL	Peak

Remark :

- Measuring frequencies from 1 GHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
- Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
- Spectrum setting:
  - Peak Setting 1GHz to 10<sup>th</sup> harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

## Radiated Emission Test Data (Above 1GHz and Field Strength to 10th Harmonic)

Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Polarization	: Horizontal	Channel	: 433.947 MHz
Test Mode	: Mode 1		



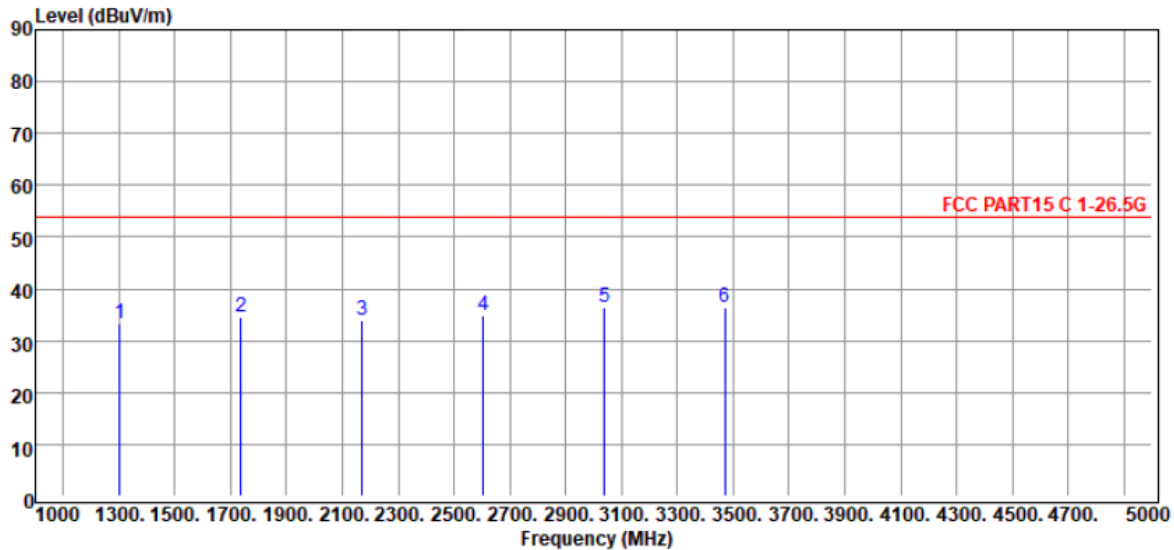
No.	Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Antenna Pol.	Remark
1	1301.841	53.97	-20.05	33.92	54.00	-20.08	HORIZONTAL	Peak
2	1735.788	52.07	-18.01	34.06	54.00	-19.94	HORIZONTAL	Peak
3	2169.735	50.56	-16.72	33.84	54.00	-20.16	HORIZONTAL	Peak
4	2603.682	51.26	-15.17	36.09	54.00	-17.91	HORIZONTAL	Peak
5	3037.629	51.58	-13.41	38.17	54.00	-15.83	HORIZONTAL	Peak
6	3471.576	50.01	-11.94	38.07	54.00	-15.93	HORIZONTAL	Peak

Remark :

- Measuring frequencies from 1 GHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
- Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
- Spectrum setting:
  - Peak Setting 1GHz to 10<sup>th</sup> harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

## Radiated Emission Test Data (Above 1GHz and Field Strength to 10th Harmonic)

Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Polarization	: Vertical	Channel	: 433.947 MHz
Test Mode	: Mode 1		



No.	Freq MHz	Reading dBUV	C.F dB/m	Result dBUV/m	Limit dBUV/m	Margin dB	Antenna Pol.	Remark
1	1301.841	53.26	-20.05	33.21	54.00	-20.79	VERTICAL	Peak
2	1735.788	52.49	-18.01	34.48	54.00	-19.52	VERTICAL	Peak
3	2169.735	50.79	-16.72	34.07	54.00	-19.93	VERTICAL	Peak
4	2603.682	50.09	-15.17	34.92	54.00	-19.08	VERTICAL	Peak
5	3037.629	49.70	-13.41	36.29	54.00	-17.71	VERTICAL	Peak
6	3471.576	48.40	-11.94	36.46	54.00	-17.54	VERTICAL	Peak

Remark :

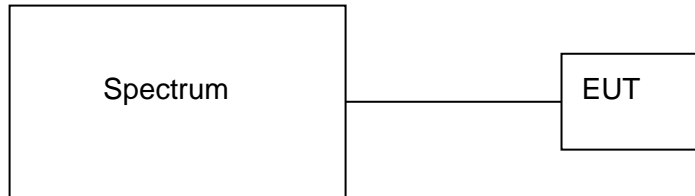
1. Measuring frequencies from 1 GHz to the 10<sup>th</sup> harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
  - (a) Peak Setting 1GHz to 10<sup>th</sup> harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

## 4 Conditions for intentional radiators to comply with periodic operation

### 4.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 4.2 Test Arrangement and Procedure



1. The transmitter output was connected to the spectrum analyzer (through an attenuator, if it's necessary).
2. The transmitting duration time was measured by spectrum analyzer with 1MHz RBW and 3MHz VBW. Swept time set at 10 seconds.
3. The EUT is a manually operated transmitter which employs a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
4. Push down the manual switch. Then, release the manual switch to see if the transmitter deactivate within not more than 5 seconds.

### 4.3 Limit (§ 15.231(a))

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.



- (4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

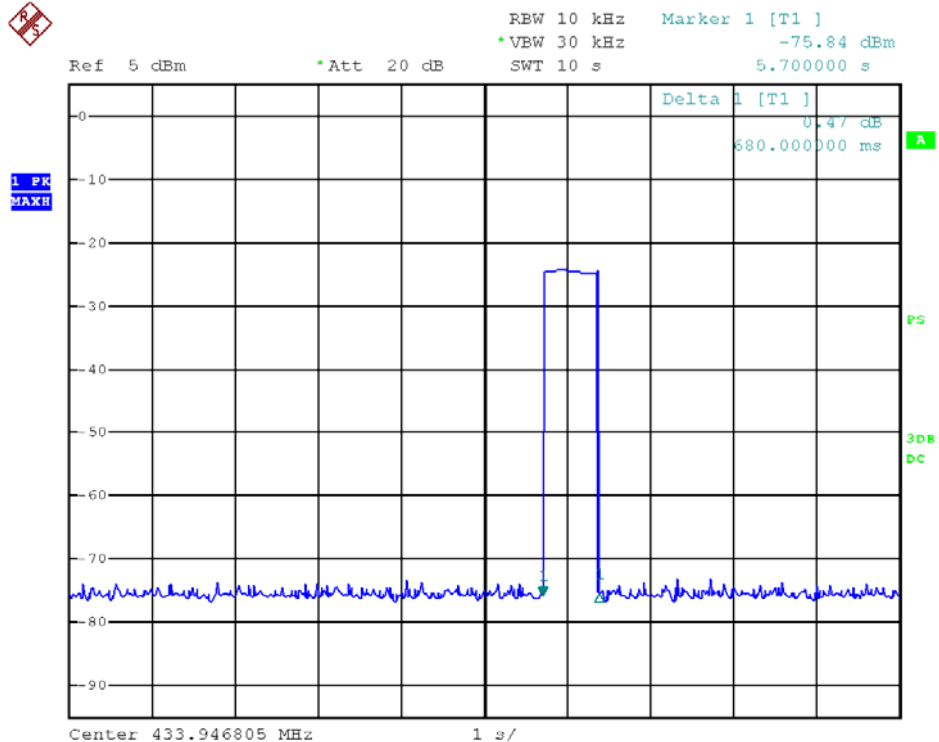
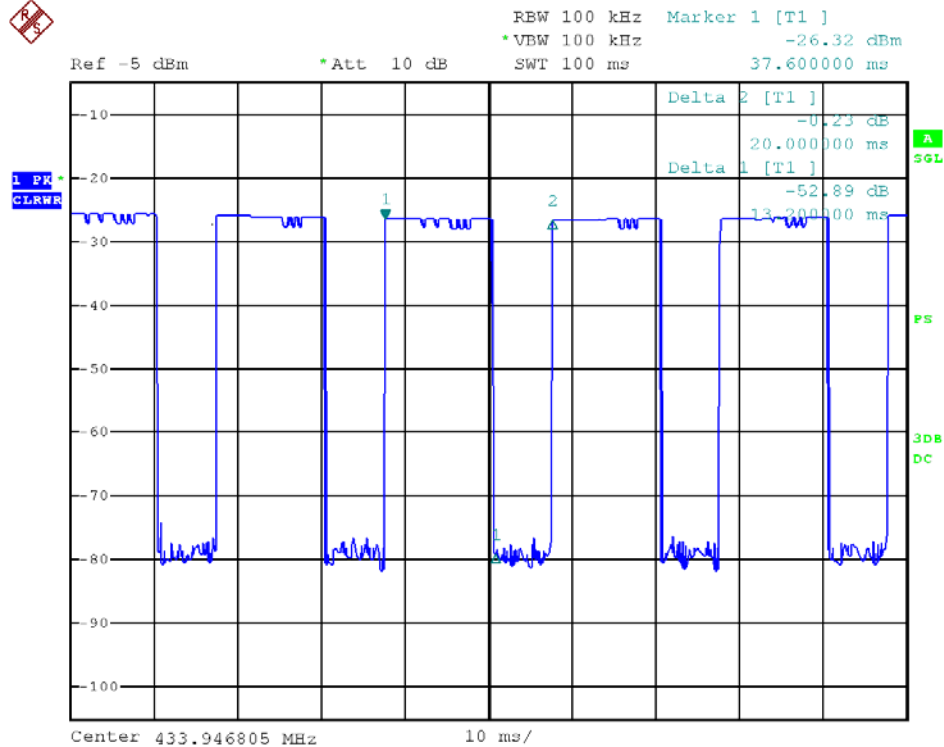
#### **4.4 Test Result**

##### **Compliance**

The final test data are shown on the following page(s).



Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Test Mode	: Mode 1	Channel	: 433.947 MHz



Duration of being released (sec)	Limit of duration (sec)	Result
0.68	5	Pass



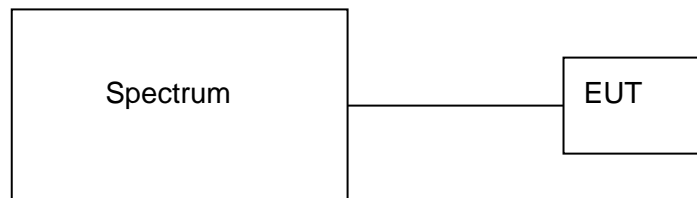


## 5 Emission Bandwidth

### 5.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

### 5.2 Test Arrangement and Procedure



1. The transmitter output was connected to the spectrum analyzer (through an attenuator, if it's necessary).
2. The transmitting duration time was measured by spectrum analyzer with 10 kHz RBW and 30 kHz VBW. Measured the -20 dB bandwidth and plotted the graph.

### 5.3 Limit (§ 15.231(c))

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

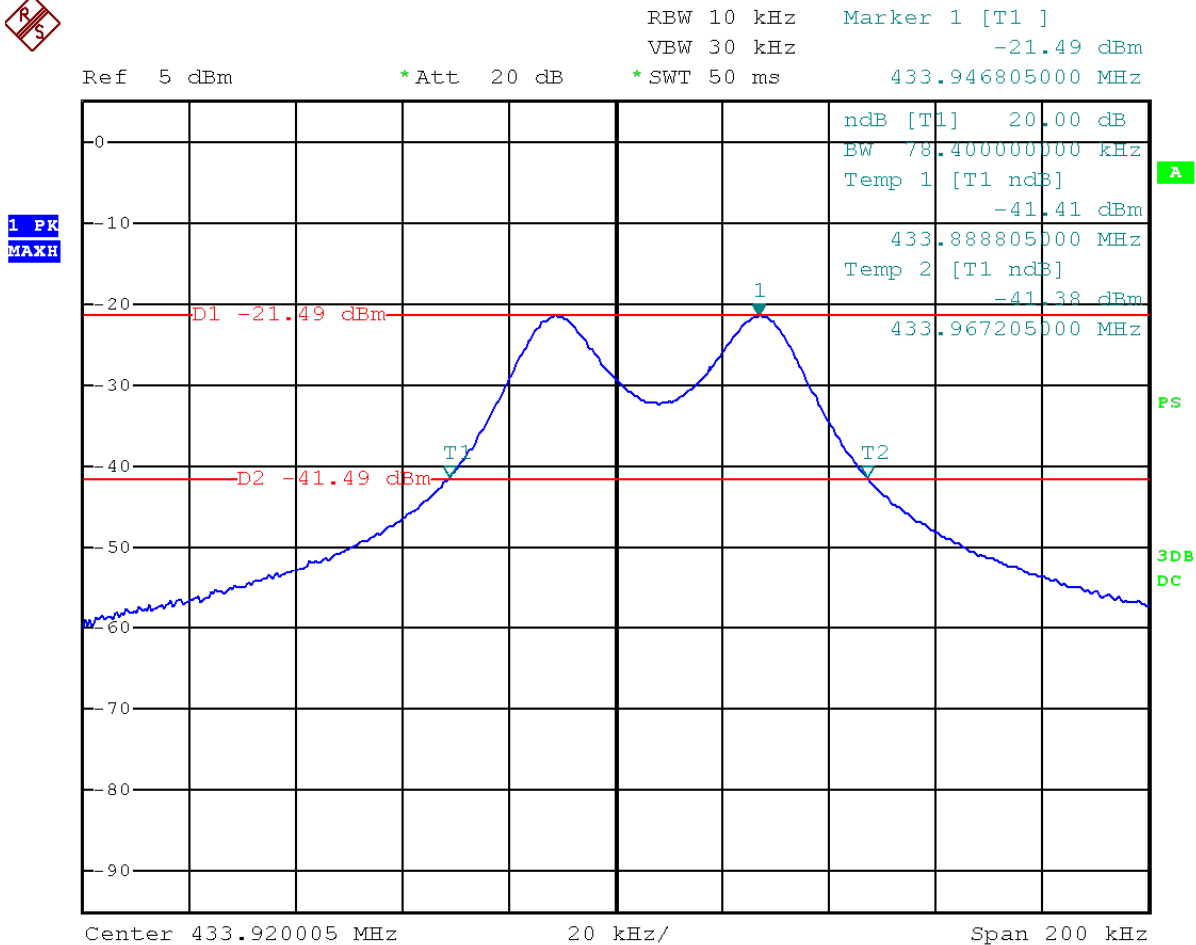
### 5.4 Test Result

#### Compliance.

The final test data are shown on the following page(s).



Temperature	: 25°C	Humidity	: 56%
Test Date	: 06-Oct-2023	Tested by	: Andrew Lin
Test Mode	: Mode 1	Channel	: 433.947 MHz



Date: 6.OCT.2023 13:55:06

-20 dB Bandwidth (kHz)	Maximum Limit (kHz)	Result
784.00	1084.8675	Pass
Limit = 0.25% of 433.947MHz is 1084.8675kHz		



## **6 Antenna requirement**

### **6.1 Limit (§ 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 use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### **6.2 Test Result**

#### **Compliance.**

The EUT applies a Chip antenna with 0.5 dBi gain.



## 7 Photographs of the Tests

### 7.1 Radiated Disturbances Emission Test (Below 1GHz) and (Above 1 GHz)



Front View (X axes)



Front View (X axes)



## 8 Photographs of the EUT



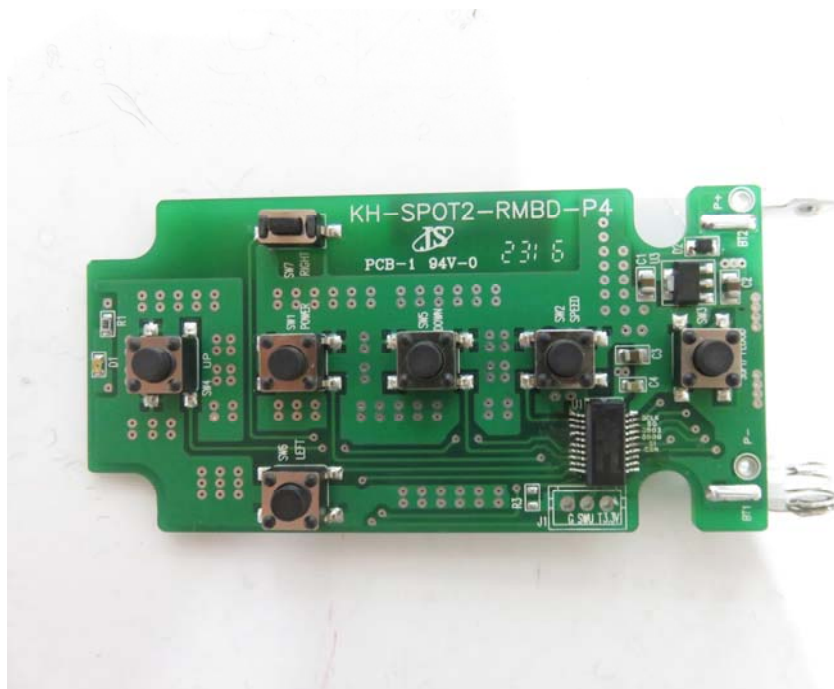
Front View of the EUT



Rear View of the EUT

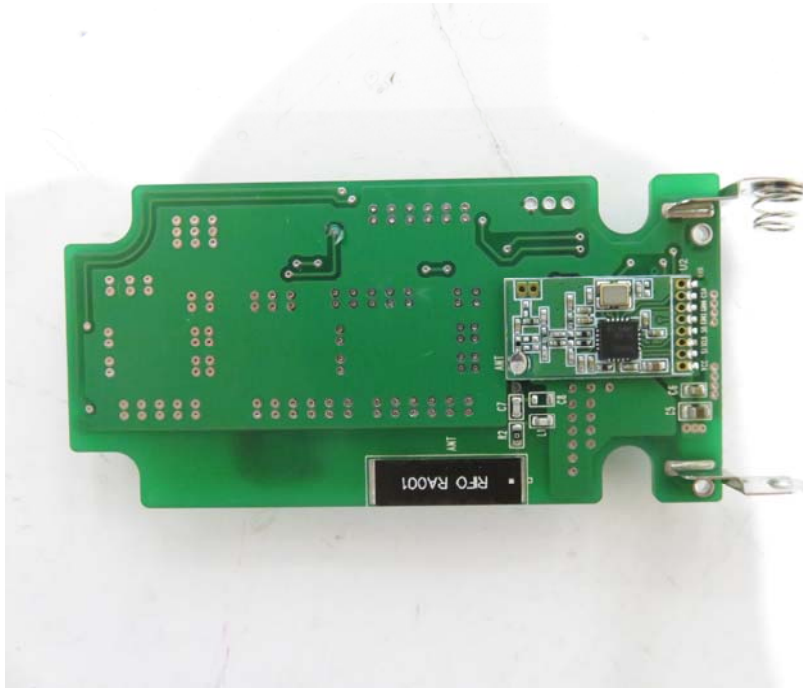


Inside View of the EUT



Front View of the PCB





Rear View of the PCB

Chip antenna



Closer view of the Chip antenna