

TEST REPORT

Product	: RV Door Lock
Trade mark	: N/A
Model/Type reference	: GS-YS-RVL-01, GS-YS-RVL-02
Serial Number	: N/A
Report Number	: EED32Q81346001
FCC ID	: 2BKVT-GSYSRVL0102
Date of Issue	: Oct. 31, 2024
Test Standards	: 47 CFR Part 15 Subpart C
Test result	: PASS

Prepared for:

Zhuhai GuanSeng Electronics Technology Co., Ltd.
3rd Floor, Room 3104, Building F, No. 3047, Qianshan Mingzhu South
Road, Zhuhai City, Guangdong Province, China

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China

TEL: +86-755-3368 3668**FAX: +86-755-3368 3385**

Compiled by:

Keven Tan

Reviewed by:

Frazer Li

Approved by:

Aaron Ma

Date:

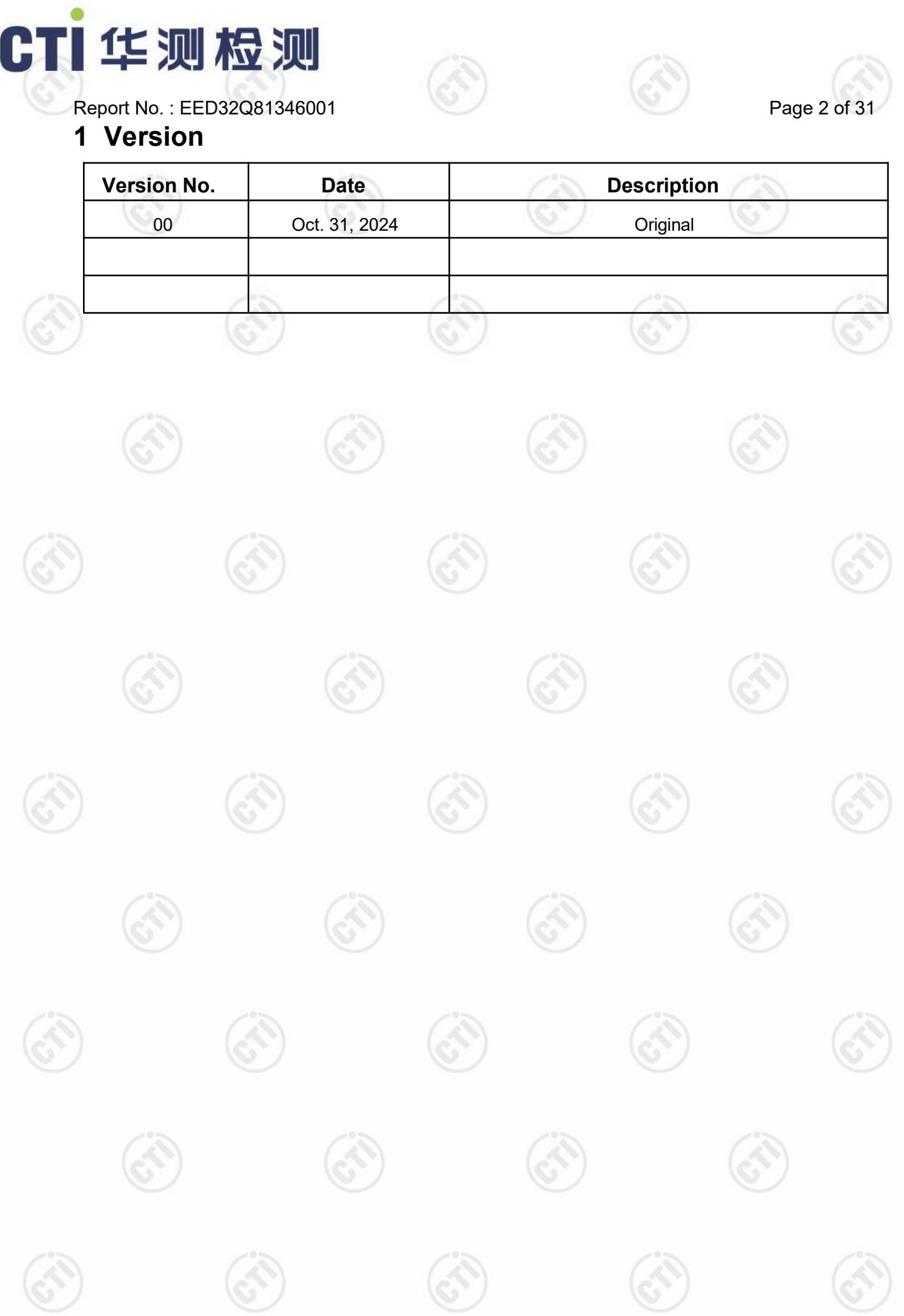
Oct. 31, 2024

Check No.: 8027300824



1 Version

Version No.	Date	Description
00	Oct. 31, 2024	Original



2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10:2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10:2013	N/A
Field Strength of the Fundamental Signal	47 CFR Part 15 Subpart C Section 15.231 (b)	ANSI C63.10:2013	PASS
Spurious Emissions	47 CFR Part 15 Subpart C Section 15.231 (b)/15.209	ANSI C63.10:2013	PASS
20dB Bandwidth	47 CFR Part 15 Subpart C Section 15.231 (c)	ANSI C63.10:2013	PASS
Dwell Time	47 CFR Part 15 Subpart C Section 15.231 (a)	ANSI C63.10:2013	PASS

Remark:

N/A: The EUT does not have any power ports and is not tested.

Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

Model No.: GS-YS-RVL-01, GS-YS-RVL-02

Only the model GS-YS-RVL-01 was tested. Their electrical circuit design, layout, components used and internal wiring are identical, Only the shape of the appearance is different.

3 Contents

1 VERSION	2
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 CLIENT INFORMATION	5
4.2 GENERAL DESCRIPTION OF EUT	5
4.3 TEST ENVIRONMENT AND MODE	6
4.4 DESCRIPTION OF SUPPORT UNITS	6
4.5 TEST LOCATION	6
4.6 DEVIATION FROM STANDARDS	6
4.7 ABNORMALITIES FROM STANDARD CONDITIONS	6
4.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	6
4.9 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2)	7
5 EQUIPMENT LIST	8
6 TEST RESULTS AND MEASUREMENT DATA	10
6.1 ANTENNA REQUIREMENT	10
6.2 SPURIOUS EMISSIONS	11
6.2.1 <i>Duty Cycle</i>	11
6.2.2 <i>Spurious Emissions</i>	13
6.3 20DB BANDWIDTH	19
6.4 DWELL TIME	20
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP	22
APPENDIX 2 PHOTOGRAPHS OF EUT	23

4 General Information

4.1 Client Information

Applicant:	Zhuhai GuanSeng Electronics Technology Co., Ltd.
Address of Applicant:	3rd Floor, Room 3104, Building F, No. 3047, Qianshan Mingzhu South Road, Zhuhai City, Guangdong Province, China
Manufacturer:	Zhuhai GuanSeng Electronics Technology Co., Ltd.
Address of Manufacturer:	3rd Floor, Room 3104, Building F, No. 3047, Qianshan Mingzhu South Road, Zhuhai City, Guangdong Province, China
Factory:	Zhuhai GuanSeng Electronics Technology Co., Ltd.
Address of Factory:	3rd Floor, Room 3104, Building F, No. 3047, Qianshan Mingzhu South Road, Zhuhai City, Guangdong Province, China

4.2 General Description of EUT

Product Name:	RV Door Lock	
Model No.(EUT):	GS-YS-RVL-01, GS-YS-RVL-02	
Test Model No.:	GS-YS-RVL-01	
Trade Mark:	N/A	
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location	
Frequency Range:	433MHz	
Modulation Type:	FSK	
Number of Channels:	1 (declared by the client)	
Antenna Type:	PCB Antenna	
Antenna Gain:	0 dBi	
Power Supply:	Battery:	DC 3V
Test voltage:	DC 3V	
Sample Received Date:	Sep. 03, 2024	
Sample tested Date:	Sep. 09, 2024 to Oct. 23, 2024	

4.3 Test Environment and Mode

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Conducted Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar

Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

4.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.

4.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz) 0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz) 4.3dB (30MHz-1GHz) 4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz) 3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

5 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Communication test set	R&S	CMW500	107929	06-26-2024	06-25-2025
Signal Generator	R&S	SMBV100A	1407.6004K02-262149-CV	09-02-2024	09-01-2025
Spectrum Analyzer	R&S	FSV40	101200	07-18-2024	07-17-2025
RF control unit(power unit)	MWRF-test	MW100-RFCB	MW220620CTI-42	06-25-2024	06-24-2025
High-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	11-12-2023	12-10-2024
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	05-29-2024	05-28-2025
BT&WI-FI Automatic test software	MWRF-test	MTS 8310	V2.0.0.0	---	---
Spectrum Analyzer	R&S	FSV3044	101509	01-17-2024	01-16-2025

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due Date
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05/22/2022	05/21/2025
Receiver	R&S	ESCI7	100938-003	09/22/2023 09/07/2024	09/21/2024 09/06/2025
Spectrum Analyzer	R&S	FSV40	101200	07/18/2024	07/17/2025
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022	05/21/2025
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/16/2024	04/15/2025
Microwave Preamplifier	Tonscend	EMC051845SE	980380	12/14/2023	12/13/2024
Horn Antenna	A.H.SYSTEM S	SAS-574	374	07/02/2023	07/01/2026
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/16/2024	04/15/2025
Preamplifier	Agilent	11909A	12-1	03/22/2024	03/21/2025
Preamplifier	CD	PAP-1840-60	6041.6042	06/19/2024	06/18/2025
Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: 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, 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.	
EUT Antenna:	Please see Internal photos
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0 dBi.	

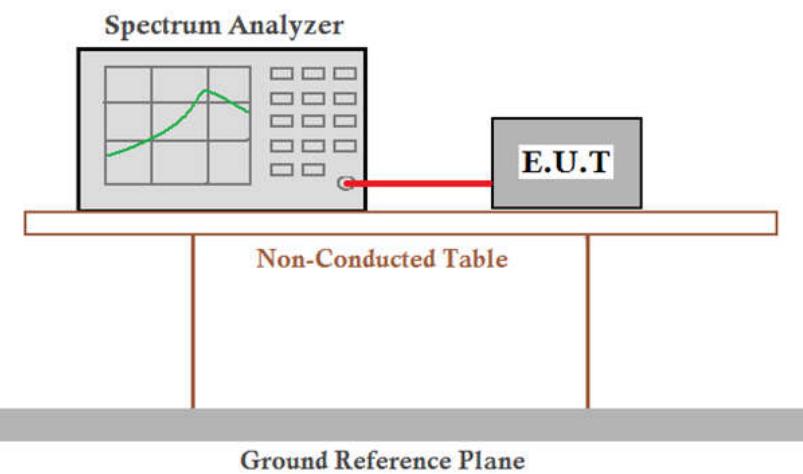
6.2 Spurious Emissions

6.2.1 Duty Cycle

Test Requirement: 47 CFR Part 15C Section 15.35 (c)

Test Method: ANSI C63.10:2013

Test Setup:



Limit: N/A

Test Mode: Transmitting mode

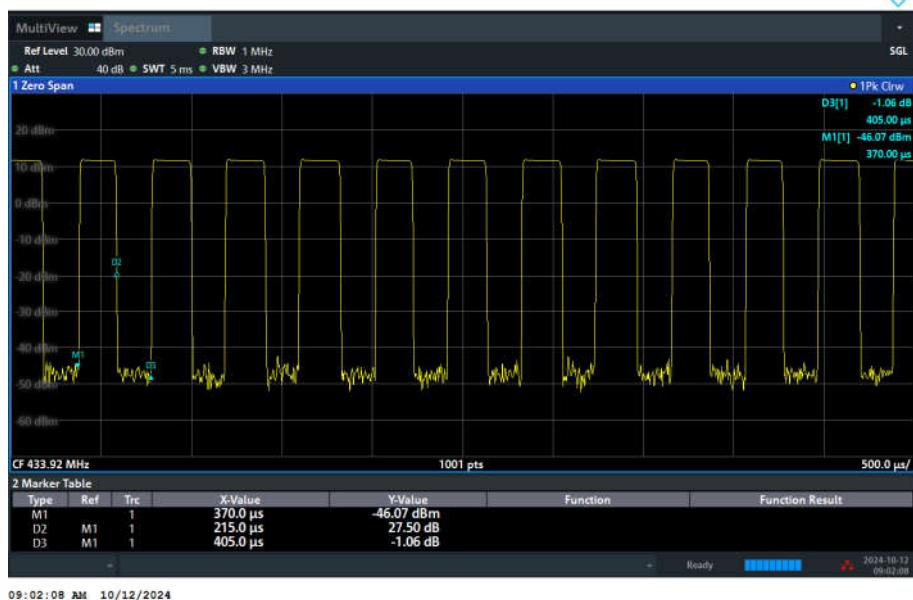
Test Results: Pass

Duty cycle numbers	T period (ms)	T on time (ms)	Duty cycle
12	5	0.215	0.516

Note: $T_{on\ time} = 0.215 \times 12 = 2.58\text{ms}$,
Duty cycle = $T_{on\ time} / T_{period}$

Test plot as follows:

Time slot:



6.2.2 Spurious Emissions

Test Requirement: 47 CFR Part 15C Section 15.231(b) and 15.209

Test Method: ANSI C63.10: 2013

Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

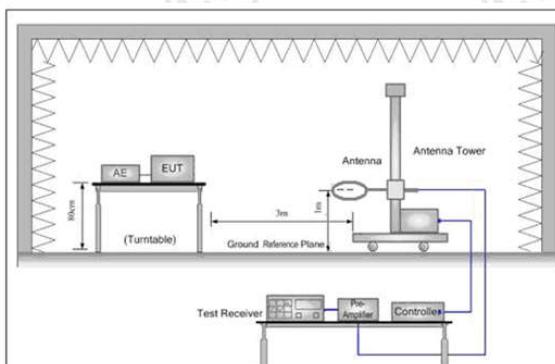


Figure 1. Below 30MHz

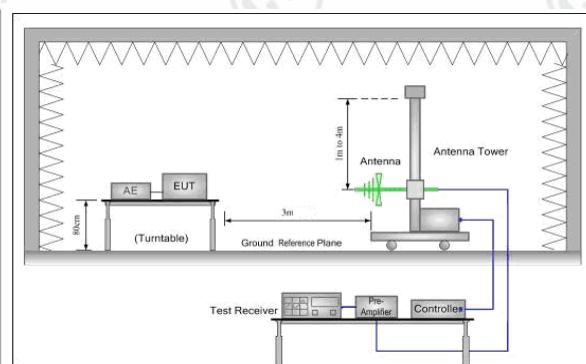


Figure 2. 30MHz to 1GHz

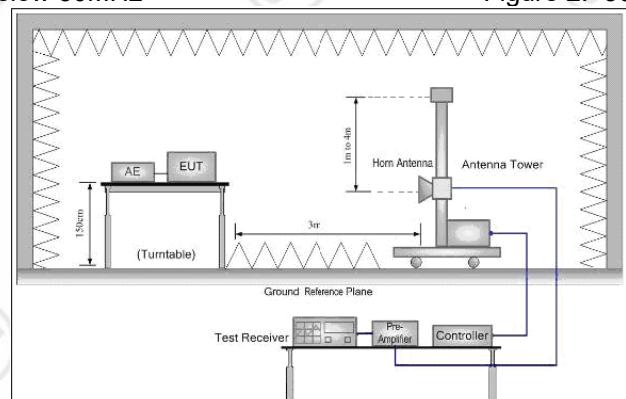


Figure 3. Above 1GHz

Test Procedure:

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the 433MHz channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
- j. Repeat above procedures until all frequencies measured was complete.

Frequency	Field strength (microvolt/meter)	Limit (dB μ V/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Frequency	Limit (dB μ V/m @3m)	Remark
433.92MHz	80.8	Average Value
	100.8	Peak Value

**Limit:
(Spurious Emissions)**

**Limit:
(Field strength of the fundamental signal)**

Test Mode:

Transmitting mode

Test Results:

Pass

Test data**Field Strength of the Fundamental Signal**

Average value:	
Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20 log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time =0.215ms
	T period =5ms
	PDCF= -5.747

Antenna polarization: Horizontal

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	64.46	18.65	83.11	108.8	-25.69	Peak
433.92	-	-	77.363	80.8	-3.437	Average

Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	54.64	16.41	71.05	108.8	-37.75	Peak
433.92	-	-	65.303	80.8	-15.497	Average

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

Spurious Emissions

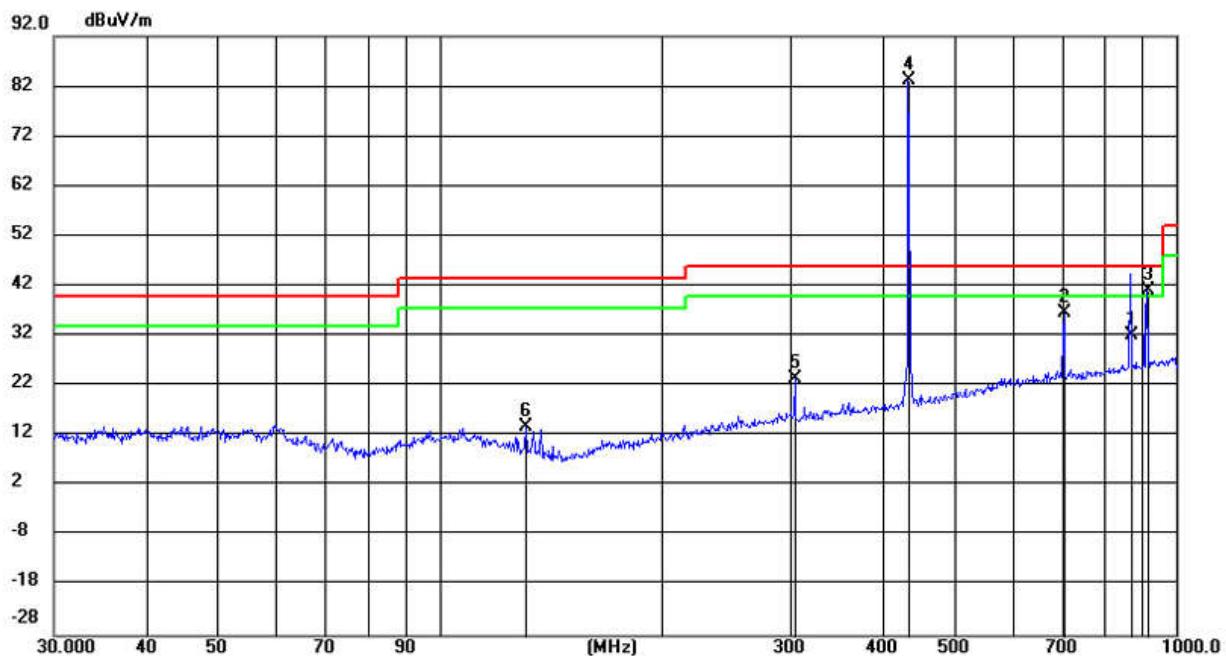
9KHz-30MHz

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

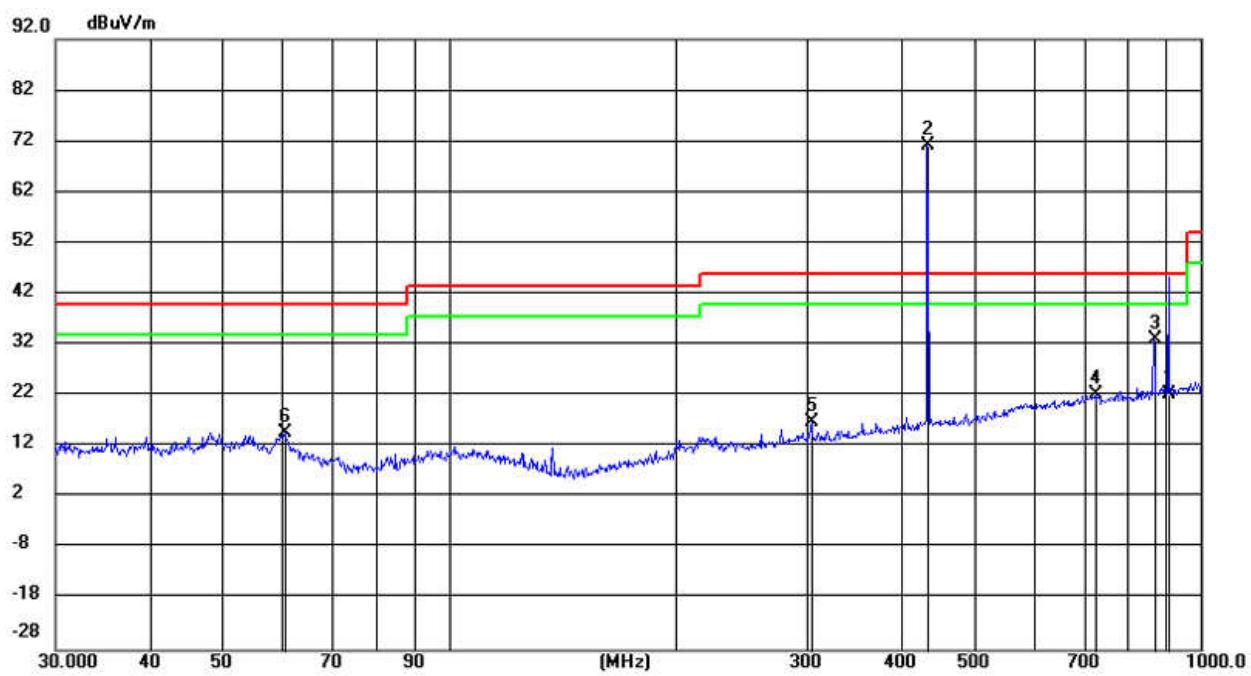
30MHz-1GHz

Horizontal:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table			
			Level	Factor	ment					Height	Degree	
			MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		867.9120	6.84	25.46	32.30	46.00	-13.70	QP	100	97		
2		704.5966	13.52	23.07	36.59	46.00	-9.41	QP	100	169		
3	!	913.5024	15.21	26.00	41.21	46.00	-4.79	QP	199	312		
4	*	433.9129	64.46	18.65	83.11	46.00	37.11	QP	100	219		
5		304.2363	7.34	16.23	23.57	46.00	-22.43	QP	100	353		
6		131.2504	4.19	9.80	13.99	43.50	-29.51	QP	100	281		

Vertical:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		908.5509	-0.44	22.64	22.20	46.00	-23.80	QP	100	352	
2	*	433.9129	54.64	16.41	71.05	46.00	25.05	QP	200	7	
3		867.9120	10.99	22.18	33.17	46.00	-12.83	QP	200	7	
4		725.9136	1.84	20.41	22.25	46.00	-23.75	QP	100	352	
5		304.2363	2.59	14.27	16.86	46.00	-29.14	QP	100	352	
6		60.6405	2.53	12.13	14.66	40.00	-25.34	QP	200	351	

Above 1GHz

Horizontal value:

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	1301.6868	-25.69	76.68	50.99	74.00	23.01	PK	P
2	2170.078	-22.68	62.99	40.31	54.00	13.69	AV	P
3	2603.7736	-20.77	60.27	39.50	54.00	14.50	AV	P
4	3037.8025	-19.10	58.58	39.48	54.00	14.52	AV	P
5	3471.8315	-17.87	56.46	38.59	54.00	15.41	AV	P
6	3905.527	-15.15	54.96	39.81	54.00	14.19	AV	P

Vertical value:

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	1302.0201	-25.69	69.69	44.00	54.00	10.00	PK	P
2	2169.4113	-22.67	71.40	48.73	54.00	5.27	PK	P
3	2604.1069	-20.77	61.42	40.65	54.00	13.35	PK	P
4	3037.8025	-19.10	62.64	43.54	54.00	10.46	PK	P
5	3471.8315	-17.87	57.95	40.08	54.00	13.92	PK	P
6	3905.527	-15.15	60.60	45.45	54.00	8.55	PK	P

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} - \text{Correct Factor}$$

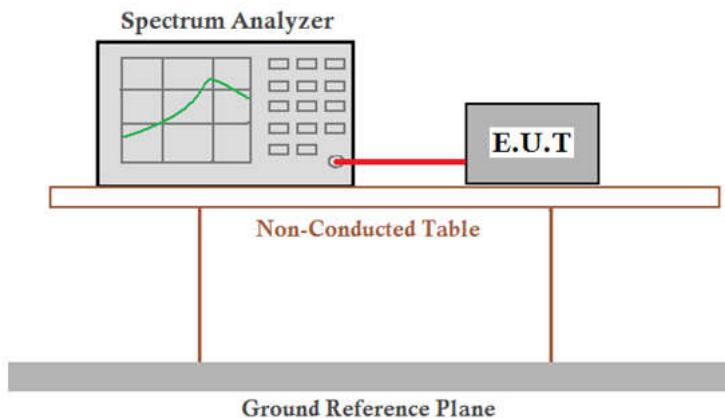
$$\text{Correct Factor} = \text{Preamplifier Factor} - \text{Antenna Factor} - \text{Cable Factor}$$
- 2) Scan from 9kHz to 6GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

6.3 20dB Bandwidth

Test Requirement: IEC 15.231 (c)

Test Method:

Test Setup:



Limit:

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.

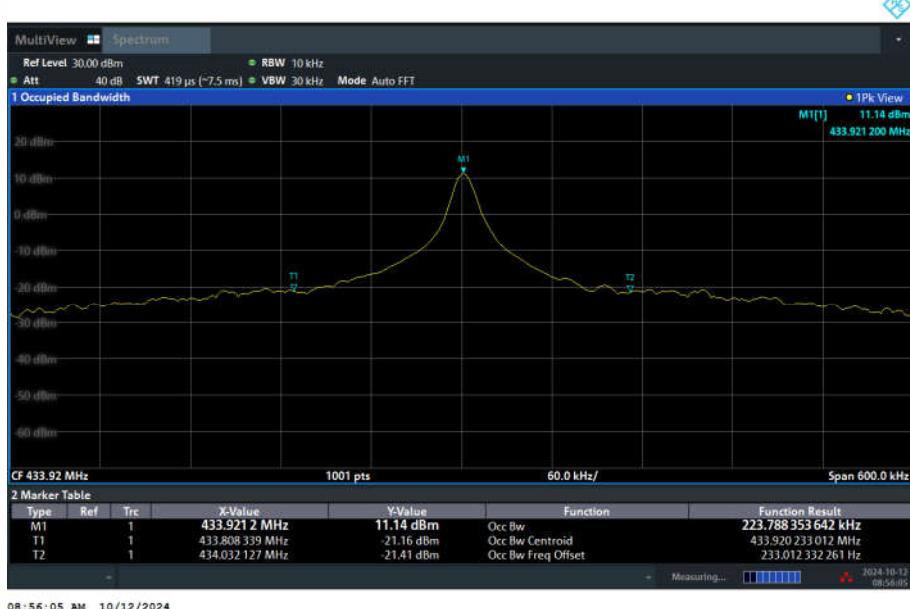
Test Mode: Transmitting mode

Test Results: Pass

Test data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.22379	21.696	PASS

Test plot as follows:

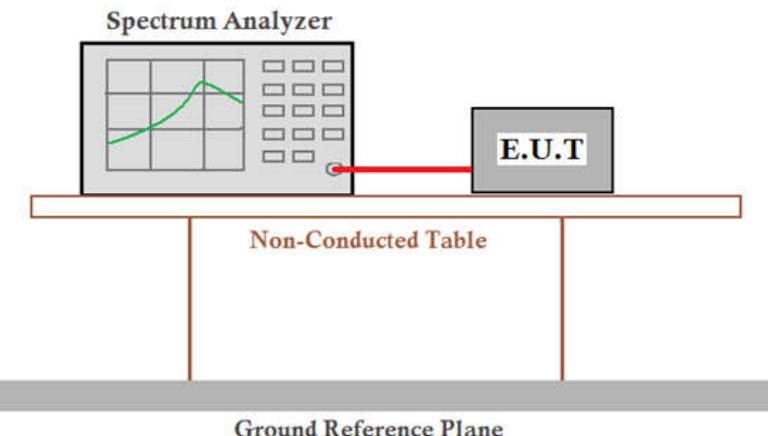


6.4 Dwell Time

Test Requirement: 47 CFR Part 15C Section 15.231 (a)

Test Method: ANSI C63.10:2013

Test Setup:



Limit: Not more than 5 seconds

Test Mode: Transmitting mode

Test Results: Pass

Requirements:

1. Regulation 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. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

Result:

The EUT is a remote switch without audio or video transmitted.

The EUT meets the requirements of this section.

2. Regulation 15.231 (a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result:

Test item	Limit (MHz)	Results
Transmitting time	≤5S	0.220S

Test plot as follows:



3. Regulation 15.231 (a2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Result:

The EUT does not have automatic transmission.

4. Regulation 15.231 (a3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

Result:

The EUT does not employ periodic transmission.

5. Regulation 15.231 (a4) 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.

Result:

This section is not applicable to the EUT.