

FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

APLUS MOULDINGS LIMITED

LED LIGHT(Remote)

GLRB-W; GLRB

FCC ID: 2AUSTAPLUSMDG02

Prepared for : APLUS MOULDINGS LIMITED

Bdg. 14 , Buyong Industrial C area , Shajing Town, Baoan
District , Shenzhen ,China

Prepared By : Audix Technology (Shenzhen) Co., Ltd.

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Report Number : ACS-F19183

Date of Test : Oct.09~12,2019

Date of Report : Nov.01,2019

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TEST REPORT CERTIFICATION

Applicant : APLUS MOULDINGS LIMITED
Manufacturer : APLUS MOULDINGS LIMITED
Product : LED LIGHT(Remote)
FCC ID : 2AUSTAPLUSMDG02
(A) Model No. : GLRB-W; GLRB
(B) Power Supply : DC 3V
(C) Test Voltage : DC 3V

Tested for comply with:
FCC CFR47 Part 15 Subpart C

Test procedure used:
ANSI C63.10: 2013

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements.

The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. This report contains data that are not covered by the NVLAP accreditation. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Oct.09~12,2019 Report of date: Nov.01,2019

Prepared by : Brave Zhang
Brave Zhang / Assistant

Reviewed by : Sunny Lu
Sunny Lu / Deputy Manager

Approved & Authorized Signer :



1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

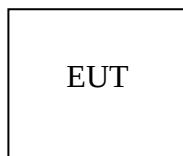
EMISSION		
Description of Test Item	Standard	Results
Conducted Emission Test	FCC Part 15C: 15.207 ANSI C63.10: 2013	N/A
Radiated Emission Test	FCC Part 15C: 15.231(b) ANSI C63.10: 2013	PASS
Stop Transmitting Time Test	FCC Part 15C: 15.231(a)(1)	PASS
20 dB Bandwidth Test	FCC Part 15C: 15.231(c)	PASS
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product	: LED LIGHT(Remote)
Model No.	: GLRB-W; GLRB Only the color is different.
Test Model	: GLRB-W
FCC ID	: 2AUSTAPLUSMDG02
Operation frequency	: 433.92MHz
Modulation Type	: ASK
Applicant	: APLUS MOULDINGS LIMITED Bdg. 14 , Buyong Industrial C area , Shajing Town, Baoan District , Shenzhen ,China
Manufacturer	: APLUS MOULDINGS LIMITED Bdg. 14 , Buyong Industrial C area , Shajing Town, Baoan District , Shenzhen ,China
Power Adapter	: M/N: LQ-Y050100A Input:100-120VAC~ 50/60Hz 0.2A Output:5.0V, 1.0A Manufacture: FOSHAN CITY SHUNDE DISTRICT YANGWEI ELECTRONIC APPLIANCE CO., LTD.
Date of Test	: Oct.09~12,2019
Date of Receipt	: Sep.17,2019
Sample Type	: Prototype production
Remark	: There are four buttons for press and wireless connection, we choose the one which has the maximum power as the representative for the test.

2.1. EUT Configuration and operation conditions for test



(EUT: LED LIGHT(Remote))

2.2. Test Facility

Site Description

Audix Technology (Shenzhen) Co., Ltd.

Name of Firm

: No. 6, Kefeng Road, Science & Technology Park,
Nanshan District , Shenzhen, Guangdong, China

EMC Lab.

Certificated by Industry Canada
: Registration Number: IC 5183A-1
Valid Date: May.07, 2020

Certificated by DAkkS, Germany
: Registration No: D-PL-12151-01-00
Valid Date: Dec.07, 2021

Accredited by NVLAP, USA
: NVLAP Code: 200372-0
Valid Date: Mar.31, 2020

Certificated by FCC USA.
: Designation No.: CN5022
Valid Date: Mar.31, 2020

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

Test Item	Uncertainty
Uncertainty for Radiation Emission test in 3m chamber	3.6dB(30~200MHz, Polarization: H)
	4.0dB(30~200MHz, Polarization: V)
	3.6dB(200M~1GHz, Polarization: H)
	3.8dB(200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 3m chamber	5.0dB(1~6GHz, Distance: 3m)
	5.0dB(6~18GHz, Distance: 3m)
	5.0dB(18~40GHz, Distance: 3m)
Uncertainty for Radiated Spurious Emission test in RF chamber	3.7dB(30MHz-1000MHz)
	3.3dB(1GHz-26.5GHz)
Uncertainty for Conduction Spurious emission test	2.0dB
Uncertainty for Output power test	0.8dB
Uncertainty for Bandwidth test	83kHz
Uncertainty for DC power test	0.1 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

3. POWER LINE CONDUCTED EMISSION TEST

According to Paragraph (c) of FCC Part 15 section 15.231, Tests to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

4. RADIATED EMISSION TEST

4.1. Test Equipment

Frequency range: 30~1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber(NSA)	AUDIX	N/A	N/A	May.10,19	1 Year
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	3 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.14,19	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR7	101547	Apr.14,19	1 Year
5.	Amplifier	HP	8447D	2648A04738	Apr.14,19	1 Year
6.	Tri-log-Broadband Antenna	Schwarzbeck	VULB 9168	493	Jul.24,19	1 Year
7.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3	Dec.01,18	1 Year
8.	Coaxial Switch	Anritsu	MP59B	6201397222	Apr.14,19	1 Year
9.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A

Note: N/A means Not applicable.

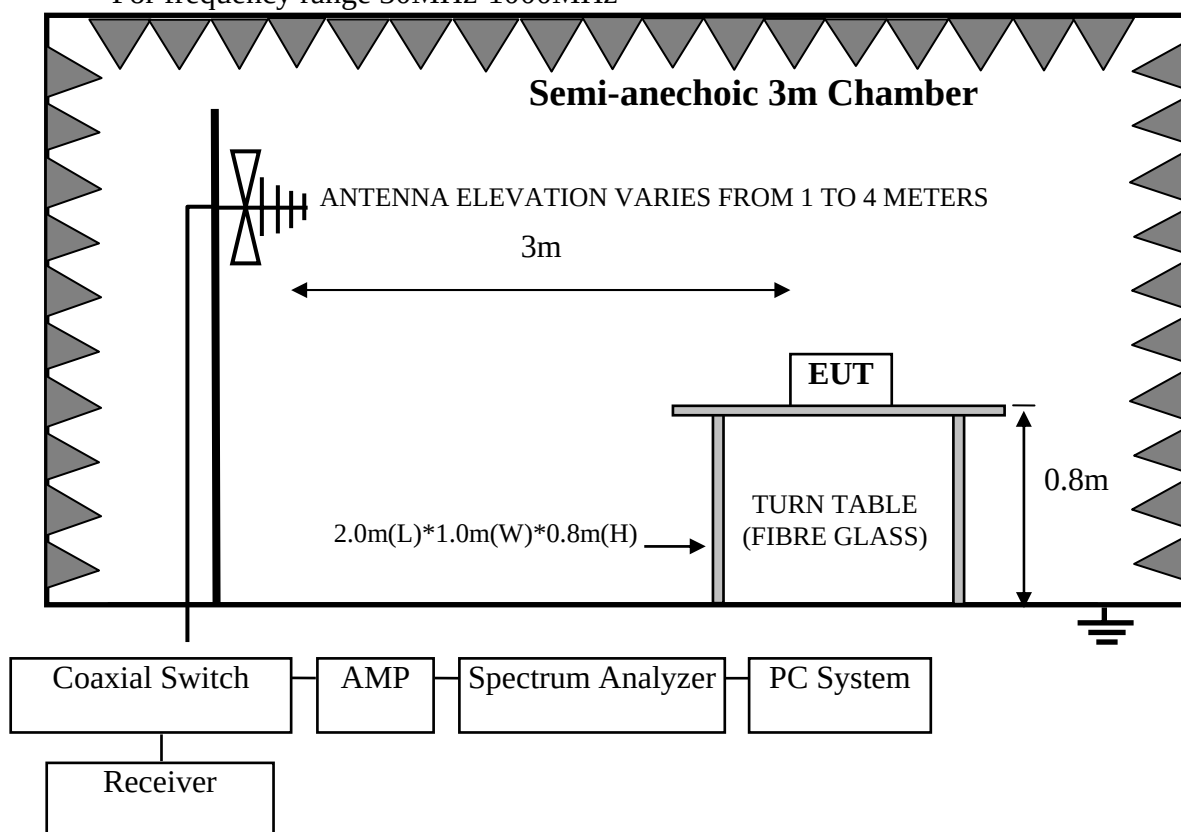
Frequency range: above 1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber(Svswr)	AUDIX	N/A	N/A	Apr.18,19	1 Year
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	3 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.14,19	1 Year
4.	Horn Antenna	ETS	3115	9607-4877	Dec.13,18	1 Year
5.	Amplifier	Agilent	83017A	MY53270084	Oct.14,18	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX106	505238/6	Apr.13,19	1 Year
7.	Test Software	AUDIX	e3	6.2009-5-21a(n)	N/A	N/A

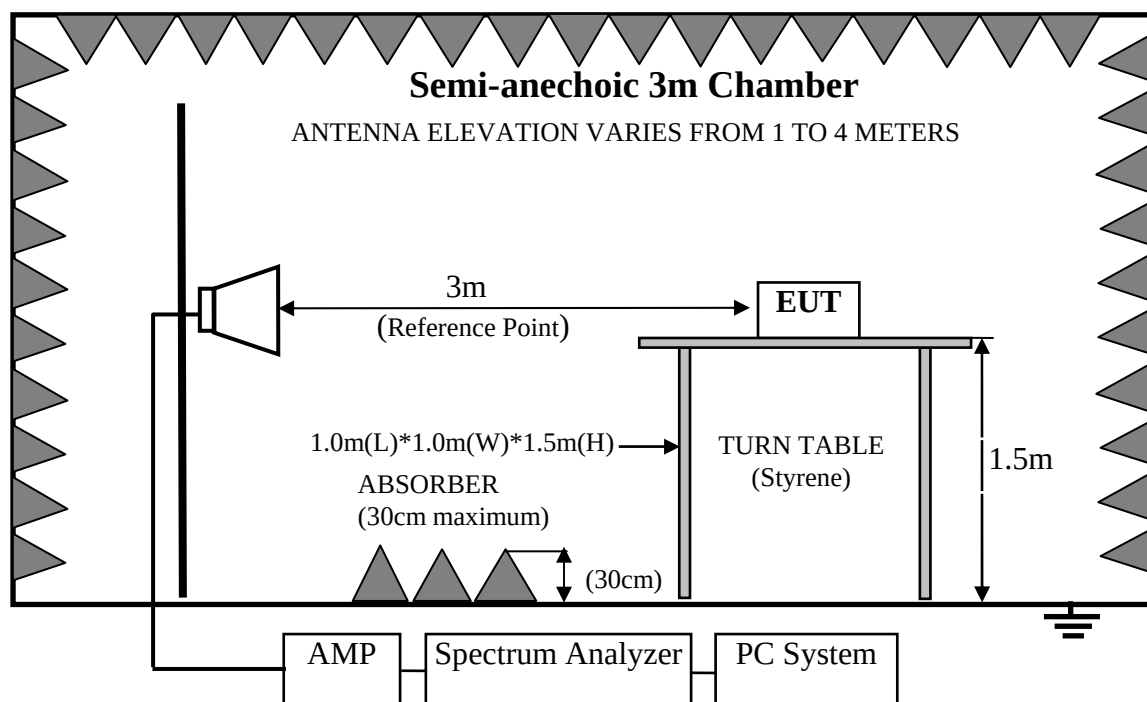
Note: N/A means Not applicable.

4.2. Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range above 1GHz



4.3.Radiated Emission Limit

All emanations from a Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Fundamental Frequency(MHz)	Field Strength of Fundamental	Field Strength of Spurious emissions
433.92	QP:80.83dBuV/m at 3m distance	AV:60.83dBuV/m at 3m distance (Above 1GHz) PK:80.83dBuV/m at 3m distance (Above 1GHz) QP:60.83dBuV/m at 3m distance (Below 1GHz)

Note: The spurious emissions appearing within the frequency band listed in 15.205 Shall also comply with limits shown in section 15.209

4.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.5.Operating Condition of EUT

4.5.1.Setup the EUT and simulator as shown as Section 4.2.

4.5.2.Turn on the power of all equipments.

4.5.3.Let EUT work in Tx mode.

4.6.Test Procedure

The EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2013 on radiated emission Test.

During the pretest the EUT was rotated through three orthogonal axes to determine the attitude that maximizes the emissions.

After that the EUT was manually handled to find the orientation that has the maximum emission, which is the orientation show in the test setup photos.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as the test photo indicated.

The bandwidth of the EMI test receiver (R&S ESR7) is set at 120kHz for frequency range from 30MHz to 1000MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz.

This device is pulse modulated; a duty cycle factor was used to calculate average level based measured peak level.

4.7. Radiated Emission Test Results

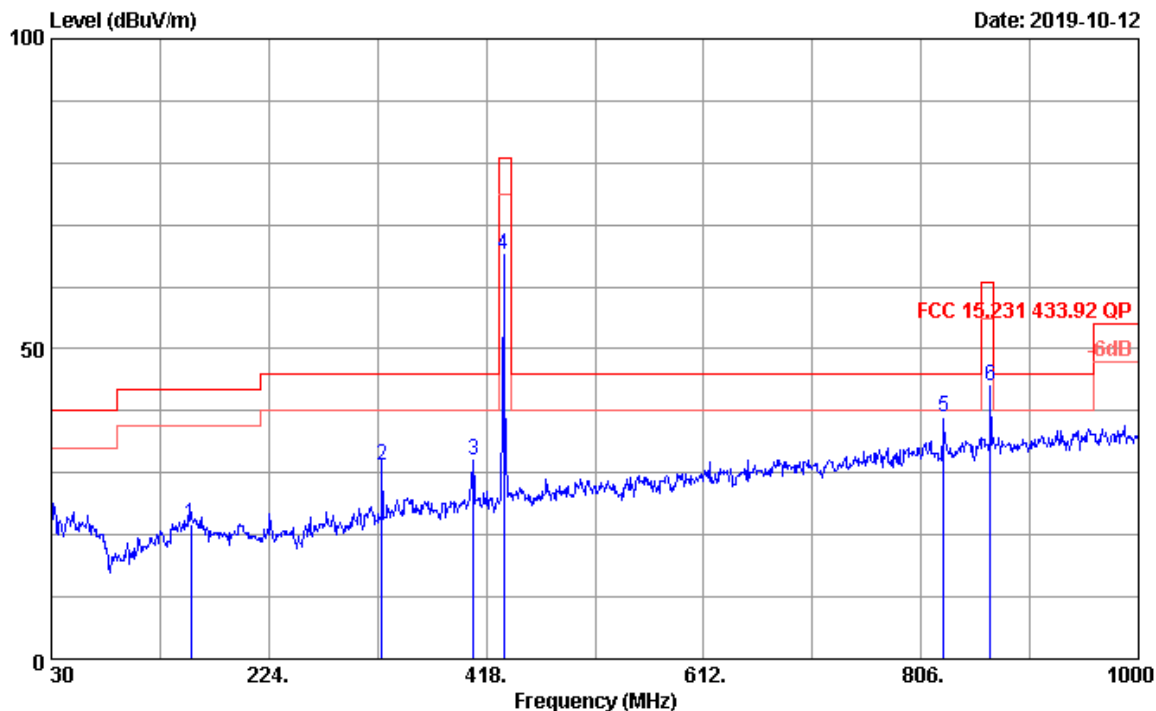
PASS.

Frequency: 30MHz~1GHz

Data: 2

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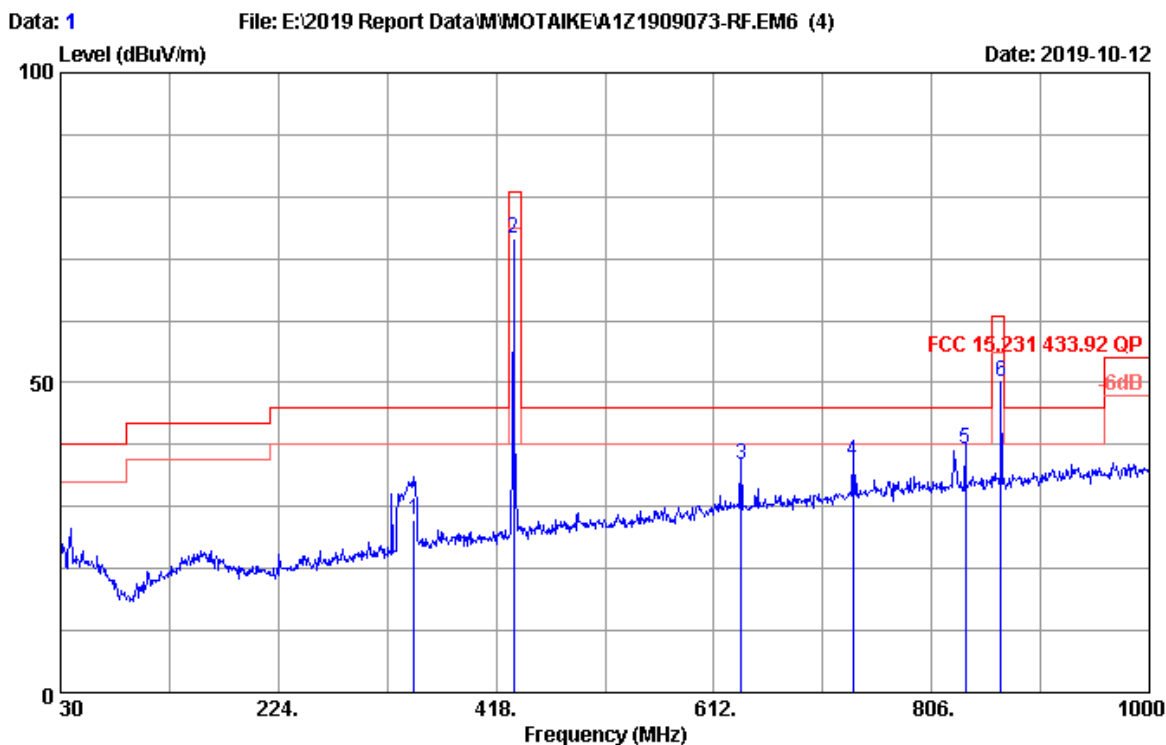
Date: 2019-10-12



Site no. : 3m Chamber Data no. : 2
 Dis. / Ant. : 3m 2019 VULB9168-493 Ant. pol. : HORIZONTAL
 Limit : FCC 15.231 433.92 QP
 Env. / Ins. : 25.3°C/55% Engineer : Andy
 EUT :
 Power rating : DC 3V
 Test Mode : Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	154.160	20.00	1.20	0.55	21.75	43.50	21.75	QP
2	324.880	20.50	1.82	8.82	31.14	46.00	14.86	QP
3	406.360	22.32	2.03	7.62	31.97	46.00	14.03	QP
4	433.920	23.07	2.11	40.11	65.29	80.83	15.54	QP
5	826.370	28.62	3.17	7.27	39.06	46.00	6.94	QP
6	867.840	29.10	3.26	11.79	44.15	60.83	16.68	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no.	: 3m Chamber	Data no.	: 1
Dis. / Ant.	: 3m 2019 VULB9168-493	Ant. pol.	: VERTICAL
Limit	: FCC 15.231 433.92 QP		
Env. / Ins.	: 25.3°C/55%	Engineer	: Andy
EUT	:		
Power rating	: DC 3V		
Test Mode	: Tx Mode		

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission		Limits (dBuV/m)	Margin (dB)	Remark
				Reading (dBuV)	Level (dBuV/m)			
1	345.250	20.90	1.87	4.97	27.74	46.00	18.26	QP
2	433.920	23.07	2.11	48.11	73.29	80.83	7.54	QP
3	636.250	26.20	2.70	7.76	36.66	46.00	9.34	QP
4	736.160	27.70	2.95	6.58	37.23	46.00	8.77	QP
5	836.070	28.70	3.19	7.40	39.29	46.00	6.71	QP
6	867.840	29.10	3.26	17.79	50.15	60.83	10.68	QP

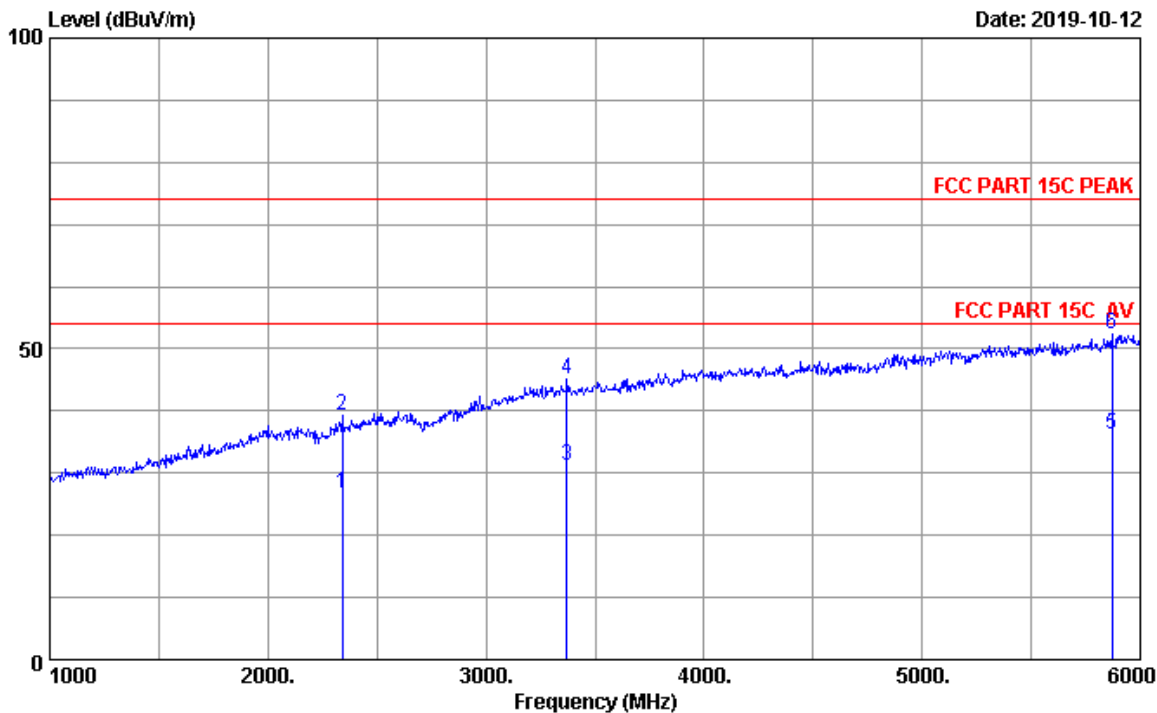
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 1GHz~6GHz

Data: 3

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Date: 2019-10-12



Site no. : 3m Chamber

Data no. : 3

Dis. / Ant. : 2018 3115-4877

Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

Env. / Ins. : 25.3°C/55%

Engineer : Andy

EUT :

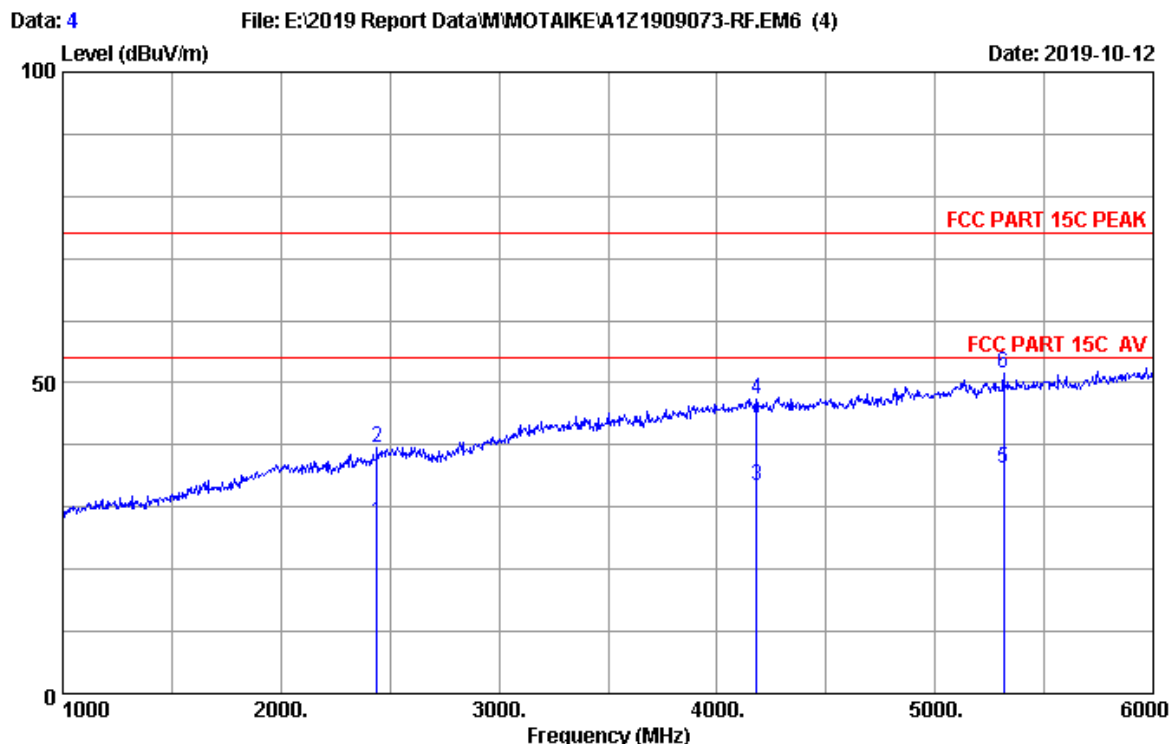
Power rating : DC 3V

Test Mode : Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2340.000	27.42	3.05	32.04	28.27	26.70	54.00	27.30	Average
2	2340.000	27.42	3.05	32.04	40.83	39.26	74.00	34.74	Peak
3	3370.000	30.38	3.95	31.34	28.22	31.21	54.00	22.79	Average
4	3370.000	30.38	3.95	31.34	42.21	45.20	74.00	28.80	Peak
5	5870.000	33.16	5.27	30.77	28.66	36.32	54.00	17.68	Average
6	5870.000	33.16	5.27	30.77	44.66	52.32	74.00	21.68	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
-Amp Factor

2. The emission levels that are 20dB below the official
limit are not reported.



Site no. : 3m Chamber Data no. : 4
 Dis. / Ant. : 2018 3115-4877 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 25.3°C/55% Engineer : Andy
 EUT :
 Power rating : DC 3V
 Test Mode : Tx Mode

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	AMP factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.000	27.87	3.13	31.97	28.62	27.65	54.00	26.35	Average
2	2440.000	27.87	3.13	31.97	40.59	39.62	74.00	34.38	Peak
3	4180.000	31.40	4.76	30.88	28.15	33.43	54.00	20.57	Average
4	4180.000	31.40	4.76	30.88	42.11	47.39	74.00	26.61	Peak
5	5315.000	33.05	5.23	30.81	28.64	36.11	54.00	17.89	Average
6	5315.000	33.05	5.23	30.81	43.93	51.40	74.00	22.60	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp Factor
 2. The emission levels that are 20dB below the official
 limit are not reported.

5. STOP TRANSMITTING TIME TEST

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year

5.2. Limit

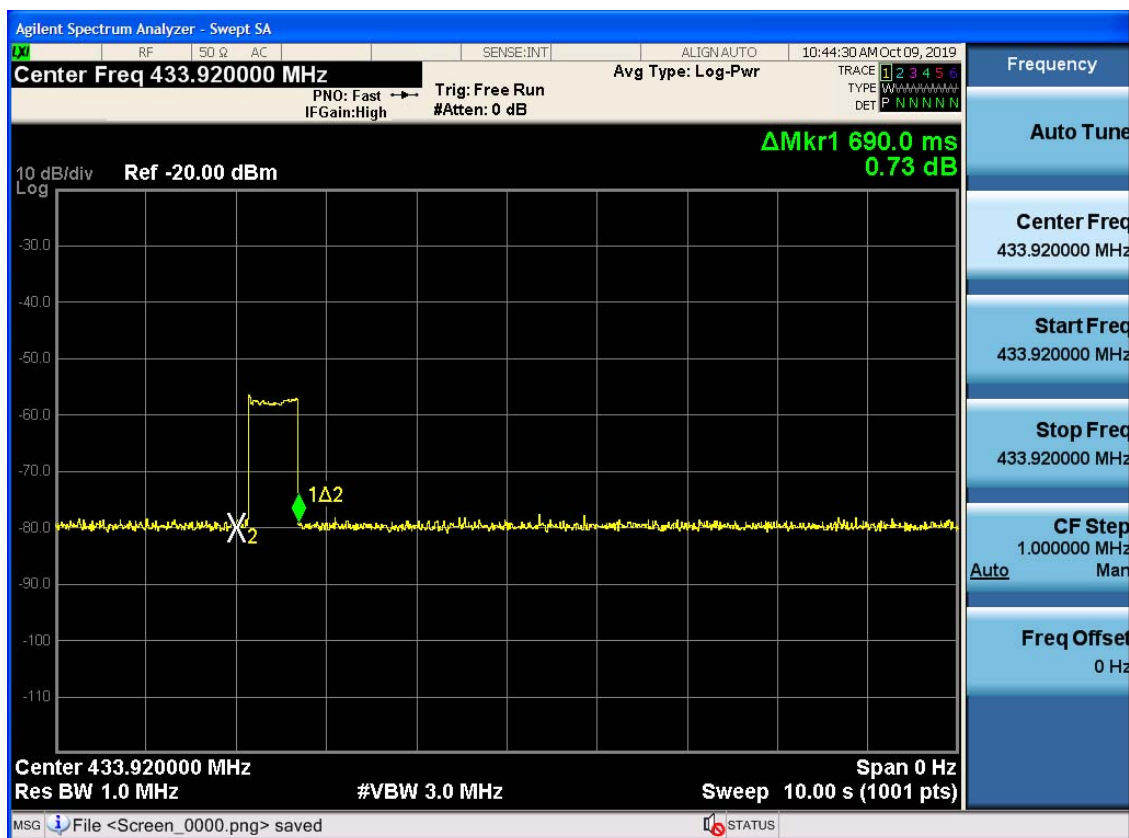
Per Part 15.231(a)(1): A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

5.3. Test Results

EUT: LED LIGHT(Remote)			
M/N: GLRB-W			
Test Date: 2019-10-09	Pressure: 101.2±1.0 kpa	Humidity: 52.1±3.0%	
Tested By: Lynn	Test Site: RF site	Temperature:22.9±0.6℃	

Frequency (MHz)	Test Mode	Stop Transmitting Time (s)	Limit (s)
433.92	Tx	0.69	<5

Conclusion : PASS			
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6. 20 DB BANDWIDTH TEST

6.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Jun.30,19	1 Year
2.	Attenuator	Agilent	8491B	MY39262165	Oct.14,18	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX106	505238/6	Apr.13,19	1 Year

6.2. Limit

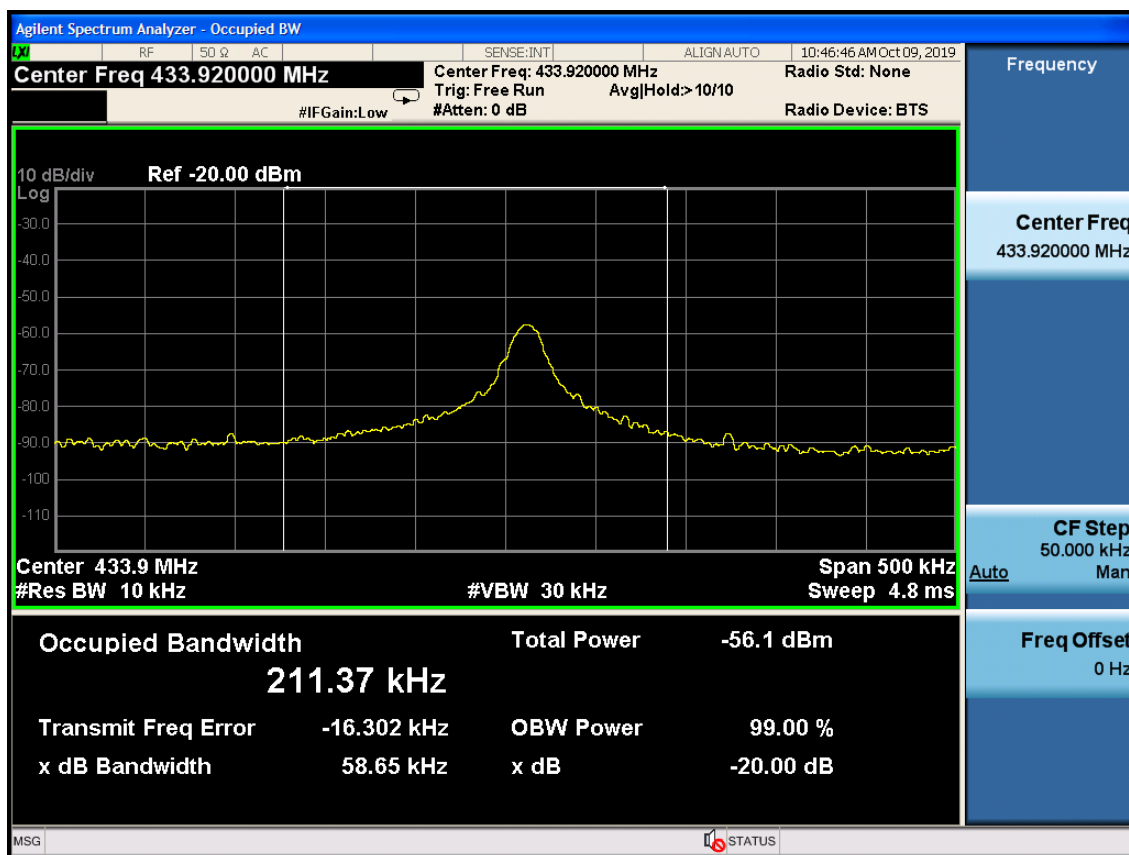
The bandwidth of the emission shall be no wider than 0.25% of the center frequency.

6.3. Test Results

EUT: LED LIGHT(Remote)			
M/N: GLRB-W			
Test Date: 2019-10-09	Pressure: 101.2±1.0 kpa	Humidity: 52.1±3.0%	
Tested By: Lynn	Test Site: RF site	Temperature:22.9±0.6℃	

Frequency (MHz)	Test Mode	-20dB Bandwith (kHz)	Limit (MHz)
433.92	Tx	58.65	<1.0848

Conclusion : PASS



7. ANTENNA REQUIREMENT

RESULT : **PASS**

Test Date : Jan.29~Apr.15, 2019

Test standard : FCC Part 15.231

Limit : the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an Helical Antenna, the directional gain of antenna is 1dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply the provision.

8. RADIO FRREQUENCY EXPOSURE COMPLIANCE

RESULT : PASS

Test standard : FCC KDB Publication 447498 D01 V06

Since maximum peak output power of the transmitter is $<10\text{mW}$, i.e. $0.0366\text{mW} < 10\text{mW}$, hence the EUT is excluded from SAR evaluation according to FCC KDB Publication 447498 D01: General RF Exposure Guidance V06.

9. DEVIATION TO TEST SPECIFICATIONS

[NONE]