# FCC TEST REPORT

## For

## Shantou Chenghai Lihuang Plastic Toys Co.,Ltd

## RC Car

## Test Model: LH-C022

Additional Model No.: LH-C008, LH-C010, LH-C011, LH-C012, LH-C013, LH-C014, LH-C015, LH-C016, LH-C017, LH-C018, LH-C019, LH-C020, LH-C021, LH-C023, LH-C024, LH-C025, LH-C026, LH-C027, LH-C028

Prepared for Address	:	Shantou Chenghai Lihuang Plastic Toys Co.,Ltd No.1, 1 Road, Huaihe Industrial park, Lianxia, Chenghai, Shantou, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Tel	:	(+86)755-82591330
Fax	:	(+86)755-82591332
Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com
Date of receipt of test sample	:	August 12, 2020
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	August 12, 2020 ~ August 18, 2020
Date of Report	:	August 18, 2020

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 1 of 22

-	FCC TEST REPORT
	CC CFR 47 PART 15C(15.227)
Report Reference No	: LCS200812028AEA
Date of Issue	: August 18, 2020
Testing Laboratory Name	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	. 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	<ul> <li>Full application of Harmonised standards ■</li> <li>Partial application of Harmonised standards □</li> <li>Other standard testing method □</li> </ul>
Applicant's Name	: Shantou Chenghai Lihuang Plastic Toys Co.,Ltd
Address	No.1, 1 Road, Huaihe Industrial park, Lianxia, Chenghai, Shantou, China
Test Specification	
Standard	: FCC CFR 47 PART 15 Subpart C
Test Report Form No	: LCSEMC-1.0
TRF Originator	: Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	: Dated 2011-03
This publication may be reproduced Shenzhen LCS Compliance Testing material. Shenzhen LCS Complianc	ng Laboratory Ltd. All rights reserved. I in whole or in part for non-commercial purposes as long as the Laboratory Ltd. is acknowledged as copyright owner and source of the re Testing Laboratory Ltd. takes no responsibility for and will not ing from the reader's interpretation of the reproduced material due to its
Test Item Description	: RC Car
Trade Mark	: N/A
Test Model	: LH-C022
Ratings	: DC 3V By 2*AA Battery
Result	: Positive
Compiled by:	Supervised by: Approved by:

Lh Li

Jin Wang

Jains Fiang

Lh Li/ Administrators

Jin Wang/ Technique principal

Gavin Liang/ Manager

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 2 of 22

Т

# FCC TEST REPORT

Ι

Test Report No. :	LCS200812028AEA	<u>August 18, 2020</u> Date of issue
Test Mode	: LH-C022	
EUT	: RC Car	
Applicant	-	nuang Plastic Toys Co.,Ltd
Address	No.1, 1 Road, Huaihe li China	ndustrial park, Lianxia, Chenghai, Shantou,
Telephone	: /	
Fax	: /	

Manufacturer	: Shantou Chenghai Lihuang Plastic Toys Co.,Ltd
Address	No.1, 1 Road, Huaihe Industrial park, Lianxia, Chenghai, Shantou, China
Telephone	:/
Fax	:/
Factory	: Shantou Chenghai Lihuang Plastic Toys Co.,Ltd
Factory Address	: Shantou Chenghai Lihuang Plastic Toys Co.,Ltd No.1, 1 Road, Huaihe Industrial park, Lianxia, Chenghai, Shantou, China
-	No.1, 1 Road, Huaihe Industrial park, Lianxia, Chenghai, Shantou, China
Address	No.1, 1 Road, Huaihe Industrial park, Lianxia, Chenghai, Shantou, China : /

Test Result Positive
----------------------

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# **Revision History**

Revision	Issue Date	Revisions	Revised By
000	August 18, 2020	Initial Issue	Gavin Liang

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 4 of 22

# **TABLE OF CONTENTS**

1. GENERAL INFORMATION	6
1.1. DESCRIPTION OF DEVICE (EUT)	
1.2. OBJECTIVE	
1.3. Environmental Conditions 1.4. Host System Configuration List and Details	6
1.5. EXTERNAL I/O PORT	
1.6. DESCRIPTION OF TEST FACILITY	7
1.7. STATEMENT OF THE MEASUREMENT UNCERTAINTY	7
2. TEST METHODOLOGY	8
2.1. EUT CONFIGURATION	8
2.2. EUT Exercise	
2.3. GENERAL TEST PROCEDURES	8
2.4. INSTRUMENT CALIBRATION	
3. SYSTEM TEST CONFIGURATION	
3.1. JUSTIFICATION	
3.3. Special Accessories	
3.4. BLOCK DIAGRAM/SCHEMATICS	9
3.5. EQUIPMENT MODIFICATIONS	
3.6. TEST SETUP	
4. SUMMARY OF TEST RESULTS	
5. TEST ITEMS AND RESULTS	11
5.1. TRANSMITTER FIELD STRENGTH OF EMISSIONS	11
5.2. AC POWER LINE CONDUCTED EMISSIONS (NOT APPLICABLE) 5.3. 20DB BANDWIDTH EMISSIONS	18
5.3. ZODB BANDWIDTH EMISSIONS	
6. LIST OF MEASURING EQUIPMENTS	
7. TEST SETUP PHOTOGRAPHS OF EUT	
8. EXTERIOR PHOTOGRAPHS OF THE EUT	22
9. INTERIOR PHOTOGRAPHS OF THE EUT	22

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

FCC ID: 2AJGILH-C022

Report No.: LCS200812028AEA

# **1. GENERAL INFORMATION**

## 1.1. Description of Device (EUT)

EUT Test Model List Model No.	::	RC Car LH-C022 LH-C022, LH-C008, LH-C010, LH-C011, LH-C012, LH-C013, LH-C014, LH-C015, LH-C016, LH-C017, LH-C018, LH-C019, LH-C020, LH-C021, LH-C023,
Model Declaration	:	LH-C024, LH-C025, LH-C026, LH-C027, LH-C028 PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Hardware version	:	V1.0
Software version	:	V2.0
Power Supply	:	DC 3V By 2*AA Battery
Remote		
Transmit Frequency	:	27.15MHz
Number of Channels	:	1
Modulation Type	:	AM
Antenna Description	:	Internal Antenna, 4 dBi(Max.)

### 1.2. Objective

The primary objective of the manufacturer is compliance with Subpart C of Part 15 of FCC Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

## 1.3. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

### - Temperature: 15-35°C

- Humidity: 30-60 %
- Atmospheric pressure: 86-106kPa

## 1.4. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 6 of 22

### 1.5. External I/O Port

I/O Port Description	Quantity	Cable

1.6. Description of Test Facility

NVLAP Accreditation Code is 600167-0. FCC Designation Number is CN5024. CAB identifier is CN0071. CNAS Registration Number is L4595.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

### 1.7. Statement of The Measurement Uncertainty

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with NAMAS document NIS 81.

Test Item		Frequency Range	Uncertainty	Note
		9KHz~30MHz	3.10dB	(1)
Rediction Uncortainty	l.	30MHz~200MHz	2.96dB	(1)
Radiation Uncertainty	-	200MHz~1000MHz	3.10dB	(1)
		1GHz~26.5GHz	3.80dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	1.63dB	(1)
Power disturbance	:	30MHz~300MHz	1.60dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

# 2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10: 2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen LCS Compliance Testing Laboratory Ltd.

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT was operated in the normal operating mode. The TX frequency that was fixed which was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.227 under the FCC Rules Part 15 Subpart C.

### 2.3. General Test Procedures

### 2.3.1 Conducted Emissions (Not Applicable)

According to the requirements in Section 6.2 of ANSI C63.10: 2013, AC power-line conducted emissions shall be measured in the frequency range between 0.15 MHz and 30MHz using Quasi-peak and average detector modes.

### 2.3.2 Radiated Emissions

The EUT is placed on a turn table and the turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.3 of ANSI C63.10: 2013.

### 2.4. Instrument Calibration

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

### 2.5. Test Mode

The EUT has been tested under engineering mode. The field strength of radiation emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis).

The worst case of X axis was reported.

Press the button on the EUT can transmit 27.15MHz control signal. Only recorded the worst test case in this report.

\*\*\*Note: Using a temporary antenna connector for the EUT when conducted measurements are performed.

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 8 of 22

# **3. SYSTEM TEST CONFIGURATION**

## 3.1. Justification

The system was configured for testing in a continuous transmit condition.

3.2. EUT Exercise Software

N/A

3.3. Special Accessories

N/A

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

# **4. SUMMARY OF TEST RESULTS**

Applied Standard: FCC Part 15 Subpart C: §15.227			
FCC Rules	Description of Test	Result	
§15.227 (a)	Field Strength of Fundamental and Harmonics	Compliant	
§15.215 (c)	20dB Bandwidth	Compliant	
§15.205(a), §15.209(a), §15.227(b)	Radiated Emissions Measurement	Compliant	
§15.207	AC line conducted	N/A*	

N/A\* - Not Applicable

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 10 of 22

# 5. TEST ITEMS AND RESULTS

5.1. Transmitter Field Strength of Emissions

5.1.1. Limit

According to §15.227 (a): The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

15.205 (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
\1\ 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
8.37625-8.38675	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	(\2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

Frequencies (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

5.1.2. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10 <sup>th</sup> carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 11 of 22

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

#### 5.1.3. Test Procedures

### 1) Sequence of testing 9 kHz to 30 MHz

#### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

#### Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna height is 1.5 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

### Final measurement:

--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

### 2) Sequence of testing 30 MHz to 1 GHz

### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 12 of 22 --- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

#### Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

#### Final measurement:

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm$  45°) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

#### 3) Sequence of testing 1 GHz to 18 GHz

#### Setup:

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

#### Premeasurement:

--- The turntable rotates from 0° to 315° using 45° steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height is 1.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 13 of 22 to find the maximum of all emissions.

## Final measurement:

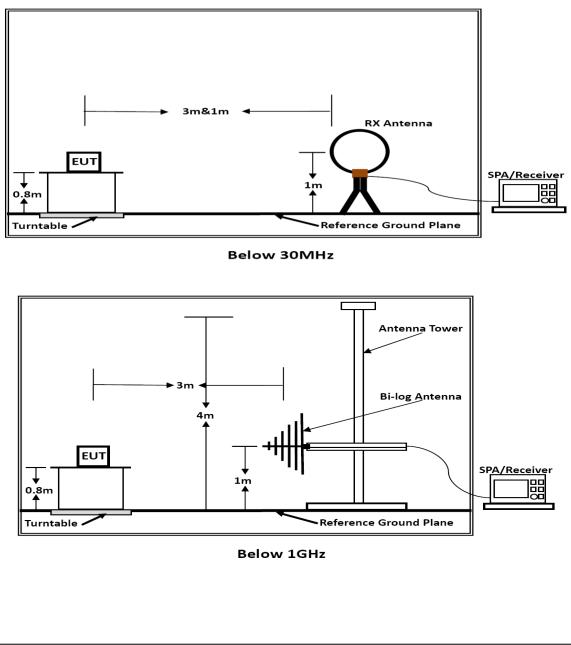
--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum found antenna polarisation and turntable position of the premeasurement the software maximizes the peaks by rotating the turntable position (0° to 360°). This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps). This procedure is repeated for both antenna polarisations.

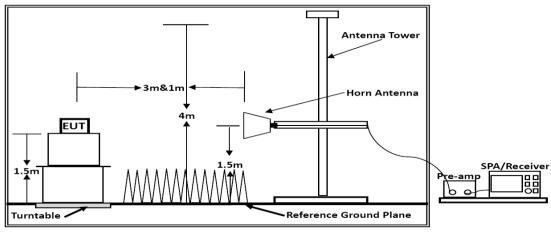
--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

## 5.1.4. Test Setup Layout



This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 14 of 22



Above 1GHz

### 5.1.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 5.1.6. Results of Radiated Emissions (9 KHz~30 MHz)

Temperature	24.6°C	Humidity	54.1%	
Test Engineer	CARL FU	Pol	Horizontal	
Test Mode	Tx(27.15MHz)			

### 9 KHz~30MHz

Note: Only recorded the worst test result.

Freq. MHz	Ántenna Pol.	Reading dBuV	Factor dB	Measured dBuV/m	Limit dBuV/m	Margin dB	Remark
0.1346	Н				80.00		
0.1635	Н				80.00		
3.3635	Н	23.86	19.16	43.02	80.00	-36.98	QP
6.9394	Н	19.38	19.39	38.77	80.00	-41.23	QP
8.8268	Н	24.70	18.06	42.76	80.00	-37.24	QP
10.5285	Н	23.64	18.37	42.01	80.00	-37.99	QP
27.1500	Н	48.40	19.02	67.42	80.00	-12.58	QP
28.3635	Н	23.86	18.80	42.66	80.00	-37.34	QP

\*Note: Emission Level= Reading Level + Antenna Factor + Cable Loss

Margin = Emission Limit – Emission Values

"--" means noise floor.

Note: Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

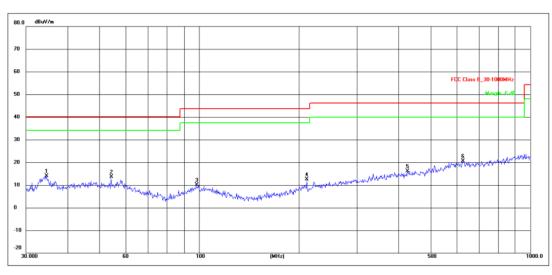
Limit line = specific limits (dBuV) + distance extrapolation factor.

This report shall not be reproduced except in full, without the written approval of Shenzhen LCS Compliance Testing Laboratory Ltd. Page 15 of 22

## 5.1.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	24.6°C	Humidity	54.1%
Test Engineer	CARL FU	Pol	Horizontal
Test Mode	Tx(27.15MHz)		

Horizontal



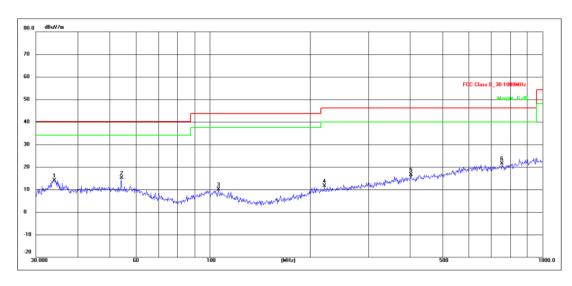


No.	Frequency	Reading	Factor	Level	Limit	Margin	Det.
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	34. 6385	33.46	-19.31	14. 15	40.00	-25.85	QP
2	54. 2610	29.70	-16.11	13. 59	40.00	-26. 41	QP
3	98. 1419	27.79	-17.66	10. 13	43.50	-33. 37	QP
4	211.5264	29.38	-16.83	12. 55	43.50	-30. 95	QP
5	426. 5210	27.94	-11.89	16.05	46.00	-29.95	QP
6 *	627. 2737	29.00	-8.35	20. 65	46.00	-25.35	QP

	Harmonics Average Result						
Frequency (MHz)	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
54.30	13.59			40		PASS	

Temperature	<b>24.6</b> ℃	Humidity	54.1%
Test Engineer	CARL FU	Pol	Vertical
Test Mode	Tx(27.15MHz)		

Vertical



Limit:	FCC Class B_30-1000MHz	Antenna::Vertical	Temperature(C):24.6(C)
Power Rating:	DC 3. OV		Humidity(%):54.1%

No.	Frequency	Reading	Factor	Level	Limit	Margin	Det.
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	34. 0365	33. 32	-19.34	13. 98	40.00	-26. 02	QP
2	54. 2610	31.36	-16.11	15. 25	40.00	-24. 75	QP
3	106. 3850	27.68	-17.60	10. 08	43.50	-33. 42	QP
4	221.3921	28.10	-16.51	11.59	46.00	-34. 41	QP
5	403. 2500	28.65	-12.16	16.49	46.00	-29. 51	QP
6 *	755. 3873	29.48	-7. 87	21.61	46.00	-24. 39	QP

Fundamental and Harmonics Average Result           Frequency         Peak Level         AV Factor(dBµV/m)         Average Level         Limit(dBµV/m)         Margin(dB)         Conclusion           (MHz)         (dBuV/m)         (see Section 5.4)         (dBuV/m)         (average)         Margin(dB)         Conclusion						
Frequency (MHz)	Peak Level (dBuV/m)	AV Factor(dBµV/m) (see Section 5.4)	Average Level (dBuV/m)	Limit(dBµV/m) (average)	Margin(dB)	Conclusion
	(ασμν/π)		(ασμν/π)	(average)		
54.30	15.25			40		PASS

Remark:

AVG is not evaluated when the Peak value is far below the limit, and the evaluation is skipped instead, see "--". Average values = Peak + DC Factor Margin = Average values - Limit

## 5.2. AC Power Line Conducted Emissions (Not Applicable)

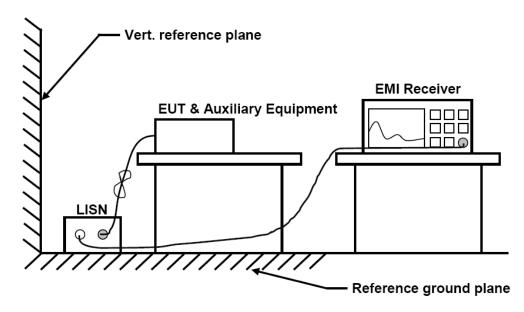
## 5.2.1 Standard Applicable

According to §15.207 (a): 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 Range	Limits (dBµV)				
(MHz)	Quasi-peak	Average			
0.15 to 0.50	66 to 56	56 to 46			
0.50 to 5	56	46			
5 to 30	60	50			

### \* Decreasing linearly with the logarithm of the frequency

### 5.2.2 Block Diagram of Test Setup



## 5.2.3 Test Results

### Not Applicable!!

The device was powered by AA battery!

## 5.3. 20dB Bandwidth Emissions

## 5.3.1. Limit

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

## 5.3.2. Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyser with the START and STOP frequencies set to the EUT's operation band.

## 5.3.3. Test Data

Temperature	<b>23.4</b> ℃	Humidity	53.5%
Test Engineer	CARL FU	Test Mode	ТХ

Transmit Frequency	99% Bandwidth	20dB Bandwidth	Result
(MHz)	(kHz)	(kHz)	
27.15	22.884	6.226	PASS

Keysight Spectrum Analyzer - Occupied		SENSE:INT r Freq: 27.145000 MHz	ALIGN AUTO 07:22:29 P Radio Std	M Aug 17, 2020	Trace/Detector
-20.00 dB	Trig: I		d:>10/10 Radio Dev	rice: BTS	
5 dB/div Ref -20.00 d	Bm				
35.0					Clear Wri
65.0		$\Lambda$			
110	www.www.www	~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mannen	www.www	Avera
110				F	
140					Max Ho
Center 27.15 MHz Res BW 1 kHz	#	VBW 3 kHz		n 200 kHz 246.8 ms	Min Ho
Occupied Bandwid	dth	Total Power	-54.2 dBm		
:	22.884 kHz				Detect Average
Transmit Freq Error	-159 Hz	OBW Power	99.00 %	A	<u>uto</u> M
x dB Bandwidth	6.226 kHz	x dB	-20.00 dB		
G			STATUS		

# 5.4. Antenna Requirement

## 5.4.1. Standard Applicable

According to antenna requirement of §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 re-placed 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 Sections 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 Section 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.

### 5.4.2. Antenna Connected Construction

### 5.4.2.1. Standard Applicable

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.

### 5.4.2.2. Antenna Connector Construction

The gains of antenna used for transmitting is 4 dBi, and the antenna is an Internal Antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.4.2.3. Results: Compliance.

# 6. LIST OF MEASURING EQUIPMENTS

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.	
1	Power Meter	R&S	NRVS	100444	2020-06-22	2021-06-21	
2	Power Sensor	R&S	NRV-Z81	100458	2020-06-22	2021-06-21	
3	Power Sensor	R&S	NRV-Z32	10057	2020-06-22	2021-06-21	
4	Test Software	Tonscend	JS1120-2	/	N/A	N/A	
5	RF Control Unit	Tonscend	JS0806-2	N/A	2020-06-22	2021-06-21	
6	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2019-11-22	2020-11-21	
7	DC Power Supply	Agilent	E3642A	N/A	2019-11-14	2020-11-13	
8	EMI Test Software	EZ	EZ-EMC	/	N/A	N/A	
9	3m Full Anechoic Chamber	MRDIANZI	FAC-3M	MR009	2019-09-27	2020-09-26	
10	Positioning Controller	MF	MF7082	MF78020803	2020-06-22	2021-06-21	
11	Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00005	2018-07-26	2021-07-25	
12	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26	2021-07-25	
13	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02	2021-07-01	
14	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2017-09-21	2020-09-20	
15	Broadband Preamplifier	SCHWARZBECK	BBV9745	9719-025	2020-06-22	2021-06-21	
16	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22	2021-06-21	
17	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2019-11-14	2020-11-13	
18	Broadband Preamplifier	/	BP-01M18G	P190501	2020-06-22	2021-06-21	
19	RF Cable-R03m	Jye Bao	RG142	CB021	2020-06-22	2021-06-21	
20	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2020-06-22	2021-06-21	
21	6dB Attenuator	/	100W/6dB	1172040	2020-06-22	2021-06-21	
22	3dB Attenuator	/	2N-3dB	/	2020-06-22	2021-06-21	
23	EMI Test Receiver	R&S	ESPI	101840	2020-06-22	2021-06-21	
24	Artificial Mains	R&S	ENV216	101288	2020-06-22	2021-06-21	
25	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2020-06-22	2021-06-21	
	Note: All equipment is calibrated through CHINA CEPREI LABORATORY and GUANGZHOU LISAI CALIBRATION AND TEST CO., LTD.						

# 7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

# 8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

# 9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

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