

# FCC Test Report

Report No.: AGC11160230201FE10

FCC ID	: 2A92KUS271-0001
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: DIY solar RC car
BRAND NAME	: Ugestem
MODEL NAME	: US271-0001
APPLICANT	: SkyCorp Distributions PTY LTD
DATE OF ISSUE	: Apr. 18, 2023
STANDARD(S)	: FCC Part 15 Subpart § 15.227
REPORT VERSION	: V1.0
<u>Attestation of <b>G</b></u>	bbai compliance (Shenzhen) Co., Ltd





## **REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 18, 2023	Valid	Initial release



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## **1. VERIFICATION OF CONFORMITY**

Applicant	SkyCorp Distributions PTY LTD		
Address	10 Rabie street unit12 Vanderbjilpark, Vanderbjilpark 1911, South Africa		
Manufacturer	DONGGUAN XIANG YI QI WAN INDUSTRIAL CO., LTD		
Address	rd Floor, Bld 2, Xinxing Industrial Park, Qiantou Community, Niushan, Dongcheng Dist., Dongguan, Guangdong Province, 523000		
Factory	DONGGUAN XIANG YI QI WAN INDUSTRIAL CO., LTD		
Address	d Floor, Bld 2, Xinxing Industrial Park, Qiantou Community, Niushan, ongcheng Dist., Dongguan, Guangdong Province, 523000		
Product Designation	DIY solar RC car		
Brand Name	Ugestem		
Test Model	US271-0001		
Date of receipt of test item	Feb. 20, 2023		
Date of test	Feb. 20, 2023 to Apr. 13, 2023		
Deviation from Standard	No any deviation from the test method		
Test Result	Pass		
Test Report Form No	AGCTR-ER-FCC-SRDV1.0		

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Apr. 18, 2023



# 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

<b>Operation Frequency</b>	27.145MHz	
Field Strength(3m)	63.20dBuV/m(AV)@3m	
Modulation	GFSK	
Number of channels	1 Channel	
Hardware Version	GS-V1.0	
Software Version	TXM-V2.0	
Antenna Designation	Carbon steel Antenna	
Antenna Gain	0dBi	
Power Supply	DC 3V (alkaline dry battery AAA*2)	



# **3. MEASUREMENT UNCERTAINTY**

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard

uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.9 dB
- Uncertainty of Occupied Channel Bandwidth:  $Uc = \pm 2 \%$



## **4. DESCRIPTION OF TEST MODES**

NO.	TEST MODE DESCRIPTION	
1	Operate mode	
Note:1.The battery is full-charged during the test.		
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.		

# **5. SYSTEM TEST CONFIGURATION**

## **5.1. CONFIGURATION OF EUT SYSTEM**

# Configure 1:

EUT

#### 5.2. EQUIPMENT USED IN EUT SYSTEM

ltem	Equipment	Model No.	Identifier	Note
1	DIY solar RC car	US271-0001	2A92KUS271-0001	EUT

## 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.227&15.209	Radiated Emission	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Not applicable

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation



# 6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd	
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China	
Designation Number	CN1259	
FCC Test Firm Registration Number	975832	
A2LA Cert. No.	5054.02	
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA	

# 7. LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
EXA Signal Analyzer	Agilent	N9010A	MY53470504	Aug. 04, 2022	Aug. 03, 2023
Attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024
Active Loop Antenna (9K-30Mhz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Wideband Antenna	SCHWARZBEC K	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Test Software	FARA	EZ-EMC	Ver.RA-03A	N/A	N/A



# 8. RADIATED EMISSION

## 8.1 TEST LIMIT

#### Standard FCC 15.209

Frequency	Distance	Field Strengths Limit	
(MHz)	Meters	ա <b>V/m</b>	dB(µV)/m
0.009 ~ 0.490	300	2400/F(kHz)	
0.490 ~ 1.705	30	24000/F(kHz)	
1.705 ~ 30	30	30	
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m	
		(Average)	

Remark: (1) Emission level dB  $\mu$  V = 20 log Emission level  $\mu$  V/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.

#### 15.227(a) Limit in the below table has to be followed:

Fundamental Frequency	Field Strength of Fundamental (microvolts/meter)	
26.96-27.28MHz	10000	

## 8.2. MEASUREMENT PROCEDURE

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.



- 6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

Spectrum Parameter	Setting		
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP		
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP		
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP		
Start Stan Fraguanay	1GHz~26.5GHz		
Start ~Stop Flequency	1MHz/1MHz for Peak, 1MHz/10Hz for Average		

The following table is the set	ting of spectrum	analyzer and receiver.
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Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP



## 8.2. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP 30MHz-1000MHz





## 8.3. TEST RESULT

# RADIATED EMISSION BELOW 30MHZ

EUT	DIY solar RC car	Model Name	US271-0001
Temperature	22.5°C	Relative Humidity	56.1%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Face/Side

Frequency MHz	Polarization	Reading (dBuV) AV	Factor (dB/m)	Level (dBuV/m) AV	Limit (dBuV/m) AV	Margin dB	Pass/Fail
27.145	Face	38.82	24.38	63.20	80	16.80	Pass
27.145	Side	31.83	24.38	56.21	80	23.79	Pass

#### Note:

1. The level of peak emission is less than the average limit, so the level of average emission need not to be tested. Other emissions from 9kHz to 30MHz are considered as ambient noise. No recording in the test report.

2: Level(dBuV/m)=Reading(dBuV)+Factor(dB/m)

Factor(dB/m)=Antenna Factor(dB/m)+Cable loss(dB)+Attenuation(dB)for Attenuator

Margin=Level-Limit





#### **RADIATED EMISSION BELOW 1GHZ-Vertical**

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		54.4515	7.88	17.04	24.92	40.00	-15.08	peak
2		72.5916	6.88	16.97	23.85	40.00	-16.15	peak
3		145.8610	6.44	18.20	24.64	43.50	-18.86	peak
4		440.1963	5.62	26.09	31.71	46.00	-14.29	peak
5		719.1994	6.68	28.77	35.45	46.00	-10.55	peak
6	*	938.8325	6.29	30.84	37.13	46.00	-8.87	peak

#### **RESULT: PASS**





#### **RADIATED EMISSION BELOW 1GHZ-Horizontal**

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		54.6428	10.19	14.34	24.53	40.00	-15.47	peak
2		101.2885	6.63	15.08	21.71	43.50	-21.79	peak
3		459.1144	6.43	27.25	33.68	46.00	-12.32	peak
4		638.3686	6.55	25.29	31.84	46.00	-14.16	peak
5		721.7259	6.14	26.46	32.60	46.00	-13.40	peak
6	*	896.9965	5.96	31.42	37.38	46.00	-8.62	peak

## **RESULT: PASS**

Note: 1. Factor=Antenna Factor + Cable loss, Over=Measurement-Limit

2. All test modes had been pre-tested. The mode 1 is the worst case and recorded in the report.

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



# 9. BANDWIDTH

#### 9.1. MEASUREMENT PROCEDURE

- 1. Set the parameters of SPA as below: Centre frequency = Operation Frequency RBW=1KHz VBW=3KHz Span: 60kHz Sweep time: Auto
- 2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the "N dB down" function of SPA to define the bandwidth.
- 3. Record the plots and Reported.

## 9.2. TEST SETUP





#### 9.3. TEST RESULT

Test Data of Bandwidth Measurement							
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (KHz)	-20dB Bandwidth (KHz)	Limits (MHz)	Pass or Fail		
GFSK	27.145	14.766	6.997	N/A	Pass		

# Test Graphs of Occupied Bandwidth&-20dB Bandwidth





# APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC11160230201AP02

# **APPENDIX B: PHOTOGRAPHS OF EUT**

Refer to the Report No.:AGC11160230201AP03

# ----END OF REPORT---



# Conditions of Issuance of Test Reports

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2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.