

# TEST REPORT

of

## FCC Part 15 Subpart C

New Application;  Class I PC;  Class II PC

**Product :** RocketIN  
**Brand:** Qun-Tong  
**Model:** S306  
**Model Difference:** N/A  
**FCC ID:** SUGROCKETIN  
**FCC Rule Part:**

## VERIFICATION OF COMPLIANCE

**Applicant:** Qun-Tong Technology CO. LTD.  
**Product Description:** RocketIN  
**Brand Name:** Qun-Tong  
**FCC ID:** SUGROCKETIN  
**FCC Rule Part:**

## Version

Version No.	Date	Description
00	2016/06/15	Initial creation of document

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## 1. GENERAL INFORMATION

### 1.1 Product Description

Product Name                      RocketIN

#### 1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013. FCC Registration Number is: 872200; Designation Number is: TW1036, Canada Registration Number: 4067B-3.

#### 1.5 Special Accessories

Not available for this EUT intended for grant.

#### 1.6 Equipment Modifications

Not available for this EUT intended for grant.

## 2. SYSTEM TEST CONFIGURATION

### 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 which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The EUT (Transmitter) was tested with a test program to fix the Tx frequency that was for the purpose of the measurements. For more information please see test data and APPENDIX 1 for set-up photographs.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10: 2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m/1.5m(Frequency above 1GHz) above ground plane. The turn table 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 max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 6 and 11 of ANSI C63.10: 2013.

## 2.4 Limitation

### (1) Conducted Emission

According to section RSS-Gen §8.8 Conducted Emission Limits is as following.

Frequency range MHz	Limits dB (uV)	
	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
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

**(2) Radiated Emission**

According to (e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

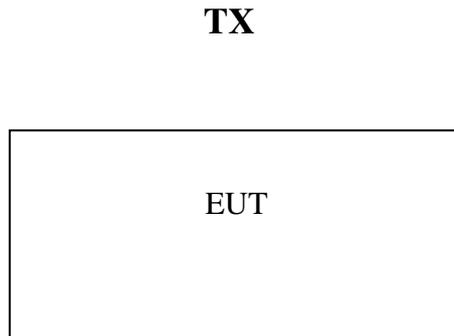
Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500 <sup>1</sup>	50 to 150 <sup>1</sup>
174-260	1,500	150
260-470	1,500 to 5,000 <sup>1</sup>	150 to 500 <sup>1</sup>
Above 470	5,000	500

<sup>1</sup>Linear interpolations.

- Remark:
1. Emission level in dBuV/m=20 log (uV/m)
  2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205
  4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of §15.205, then the general radiated emission limits in § 15.209 apply.
  5. For the band 130-174MHz, uV/m at 3meters = 22.72727 \* F(MHz) – 2454.545;  
For the band 260-470MHz uV/m at 3meters = 16.6667 \* F(MHz) – 2833.333;  
Where F is the frequency in MHz.
  6. 433.92MHz AV limit = 16.6667 \* 433.92(MHz) – 2833.333= 4398.68 uV/m  
= 72.86dBuV/m
  7. 433.92MHz Peak limit = AV Limit + 20dB = 92.86MHz

## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



**Table 2-1 Equipment Used in Tested System**

<b>Item</b>	<b>Equipment</b>	<b>Mfr/Brand</b>	<b>Model/ Type No.</b>	<b>Series No.</b>	<b>Data Cable</b>	<b>Power Cord</b>
1.	N/A					

### 3. SUMMARY OF TEST RESULTS

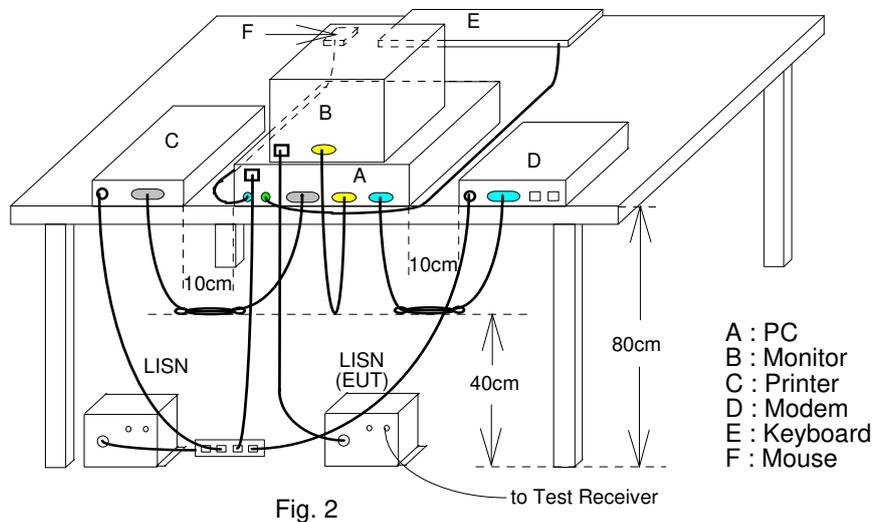
FCC /IC Rules	Description Of Test	Result
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## 5. AC CONDUCTED EMISSIONS TEST

### 5.1 Measurement 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.

### 5.2 Test SET-UP (Block Diagram of Configuration)



### 5.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Conduction 04-3 Cable	WOKEN	CFD 300-NL	Conduction 04 -3	07/28/2015	07/27/2016
EMI Receiver 17	Rohde & Schwarz	ESCI 7	100887	09/08/2015	09/07/2016
LISN 18	ROHDE & SCHWARZ	ENV216	101424	02/11/2016	02/10/2017
LISN 19	ROHDE & SCHWARZ	ENV216	101425	03/12/2016	03/11/2017
Test Software	Farad	EZEMC Ver:ISL-03A2	N/A	N/A	N/A

### 5.4 Measurement Result:

N/A

## 6. RADIATED EMISSION TEST

15.231 (e) Intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) of this section and may be employed for any type of operation, including operation prohibited in paragraph (a) of this section, provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this section, except the field strength table in paragraph (b) of this section is replaced by the following:

### 6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8/1.5m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

## 6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz

### 6.3 Measurement Equipment Used:

Chamber 14					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer 21(26.5GHz)	Agilent	N9010A	MY49060537	07/30/2015	07/29/2016
Spectrum Analyzer 20(6.5GHz)	Agilent	E4443A	MY48250315	05/20/2016	05/19/2017
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	06/17/2015	06/16/2017
Bilog Antenna30-1G	Schaffner	CBL 6112D	37873	06/16/2015	06/15/2016
Horn antenna1-18G	ETS	3117	00066665	11/27/2015	11/26/2016
Horn antenna18-26G(04)	Com-power	AH-826	081001	07/24/2015	07/23/2017
Preamplifier9-1000M	HP	8447D	NA	03/09/2016	03/08/2017
Preamplifier1-18G	MITEQ	AFS44-001018 00-25-10P-44	1329256	07/28/2015	07/27/2016
Preamplifier1-26G	EM	EM01M26G	NA	03/10/2016	03/09/2017
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	12/02/2015	12/01/2016
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	10/02/2015	10/01/2016
SUCOFLEX 1GHz~40GHz cable	HUBER SUHNER	Sucoflex 102	27963/2&3742 1/2	11/03/2015	11/02/2017

### 6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Average Value = Peak Value + 20 Log (Ton/Tp) .....Pulse Modulation Duty Cycle Correction Factor

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

## 6.5 Measurement Result

### Fundamental Measurement Result

Operation Mode:            Transmitting Mode  
Fundamental Frequency:   433.92MHz  
Temp:                        25

Test Date:                2016/06/02  
Test By:                  Dino

**Radiated Spurious Emission Measurement Result (below 1GHz)**

Operation Mode:            Transmitting Mode

Test Date:    2016/06/02

Fundamental Frequency: 433.92MHz

Test By:     Dino

Temperature :            25

**Radiated Spurious Emission Measurement Result (above 1GHz)**

Operation Mode:	Transmitting Mode	Test Date:	2016/06/02
Fundamental Frequency:	433.92MHz	Test By:	Dino
Temperature :	25		

## 7. 20DB OCCUPIED BANDWIDTH

### 7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW= 10KHz, VBW= 30KHz, Span =3MHz.
4. Set SPA Max hold. Mark peak, -20dB. 99% Bandwidth

### 7.2 Test SET-UP (Block Diagram of Configuration)

Same as 6.2 Radiated Emission Measurement.

### 7.3 Measurement Equipment Used:

Same as 6.3 Radiated Emission Measurement.

### 7.4 Measurement Results

Refer to attached data chart.

The center frequency  $f_c$  is **433.92MHz**, according to the Rules, section 15.231(C), the Bandwidth of Center Frequency at-20dB should be calculated as following:

$$433.92 \times 0.0025 = 1.0848(\text{MHz})$$

So, the Uper/Lower frequencies limit should be specified as:

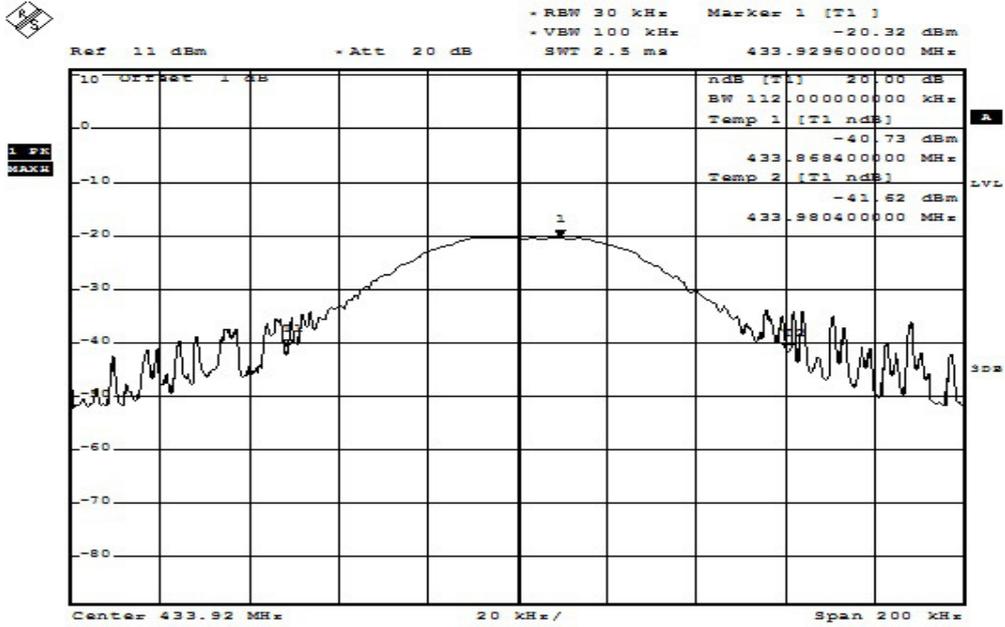
$$f_{(U)} = f_c + \Delta f/2 = 433.92 + 0.5424 = 434.46(\text{MHz})$$

$$f_{(L)} = f_c - \Delta f/2 = 433.92 - 0.5424 = 433.377 (\text{MHz})$$

### 7.5 Measurement Result:

112 KHz < limit 1.0848MHz

**20dB Band Width Test Data**



Date: 2.JUN.2016 10:35:42

## **8. DUTY CYCLE (AVERAGE CORRECTION FACTOR) MEASUREMENT**

### **8.1 Measurement Procedure**

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 1.0MHz, Span =0 Hz. Adjacent sweep.
4. Set SPA View. Mark delta.

### **8.2 Test SET-UP (Block Diagram of Configuration)**

Same as 6.2 Radiated Emission Measurement.

### **8.3 Measurement Equipment Used:**

Same as 6.3 Radiated Emission Measurement.

### **8.4 Measurement Results:**

N/A

## 9. SILENT PERIOD TIME MEASUREMENT:

15.231 (e)

devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

RSS 210 A1.1.5

(2) In addition, devices operated under the provisions of this section (A1.1.5) shall be capable of automatically limiting their operation so that the duration of each transmission shall not be greater than 1 second and the silent period between transmissions shall be at least 30 times the duration of the transmission, but in no case less than 10 seconds. However, devices that are designed for limited use for the purpose of initial programming, reprogramming or installation, and not for regular operations, may operate up to 5 seconds provided that such devices are used only occasionally in connection with each unit being programmed or installed.

### 9.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 1MHz, Span =0Hz
3. Set EUT Power on as normal operation
4. Set SPA Max hold. Delta Mark.

### 9.2 Test SET-UP (Block Diagram of Configuration)

Same as 6.2 Radiated Emission Measurement.

### 9.3 Measurement Equipment Used:

Same as 6.3 Radiated Emission Measurement.

### 9.4 Measurement Results

Total transmission time of transmissions calculation:

Ton: 13.08 ms,

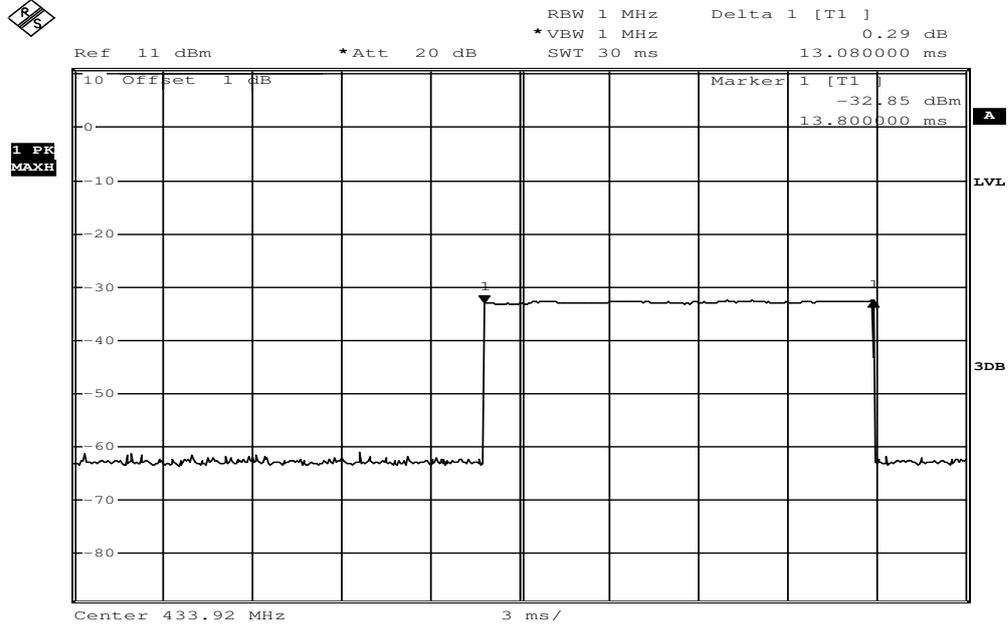
Tp: 30.24s

silent period limit(which one is lower): 10s or  $13.08(\text{ms}) * 30 = 392(\text{mS})$ ,

T silent period =  $30.24\text{s} - 13.08\text{ms} = 30.11\text{s} > 10\text{s}$

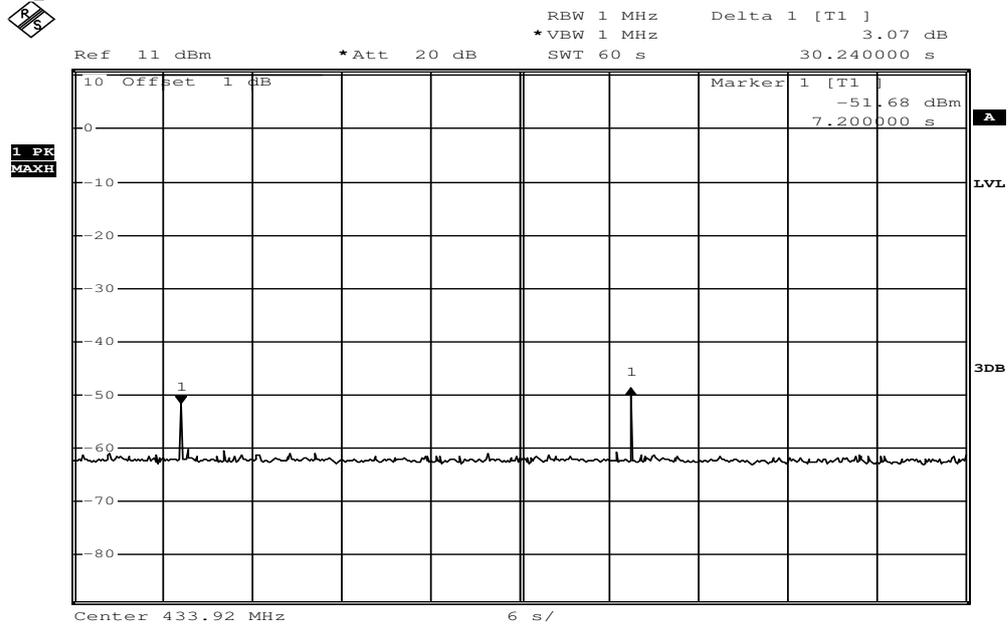
The result : PASS.

**Ton:**



Date: 15.JUN.2016 18:10:46

**Tp:**



Date: 15.JUN.2016 18:23:02