FCC PART 15.249

TEST REPORT

For

Weccan Industrial Limited

Rm209, 2/F, Building W1-A, No.34 Gaoxin South 4th St Hi-Tech Industrial Park, Nanshan District, Shenzhen China

FCC ID: Z3CWECCANDRONE

Report Type:	Product Type:
Original Report	2.4G control RC quadcopter/helicopter

Test Engineer:	William Li
Report Number:	RSZ150610014-00
Report Date:	2015-07-09
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Weccan Industrial Limited* 's product, model number:*SG-F88 (FCC ID:Z3CWECCANDRONE)* or the "EUT" in this report was a *2.4G control RC quadcopter/helicopter*, was measured approximately:32.5 cm (L) × 32.5 cm (W) × 7.0 cm (H) for the RC helicopter; 15.0 cm (L) × 20.0 cm (W) × 6.5 cm (H) for the controller, rated input voltage: DC 3.7V Li-Ion battery.

Note: *The series product, model SG-F25, SG-F05, SG-F15, SG-F33, SG-F35, SG-F36, SG-F55, SG-F46, SG-F48, SG-F66, SG-F77, SG-F75, SG-F78, SG-F89, SG-F5700, SG-H5701, SG-H5331, SG-H4305, DR775R and SG-F88 are electrically identical, they are just different from model number due to marketing purposes, and detailed information is stated and guaranteed by the applicant which was explained in the attached declaration letter.*

**All measurement and test data in this report was gathered from production sample serial number: 1505366 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2015-06-10.*

Objective

This type approval report is prepared on behalf of *Weccan Industrial Limited* in accordance with Part 2-Subpart J, and Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in an engineering mode.

Equipment Modifications

No modifications were made to the unit tested.

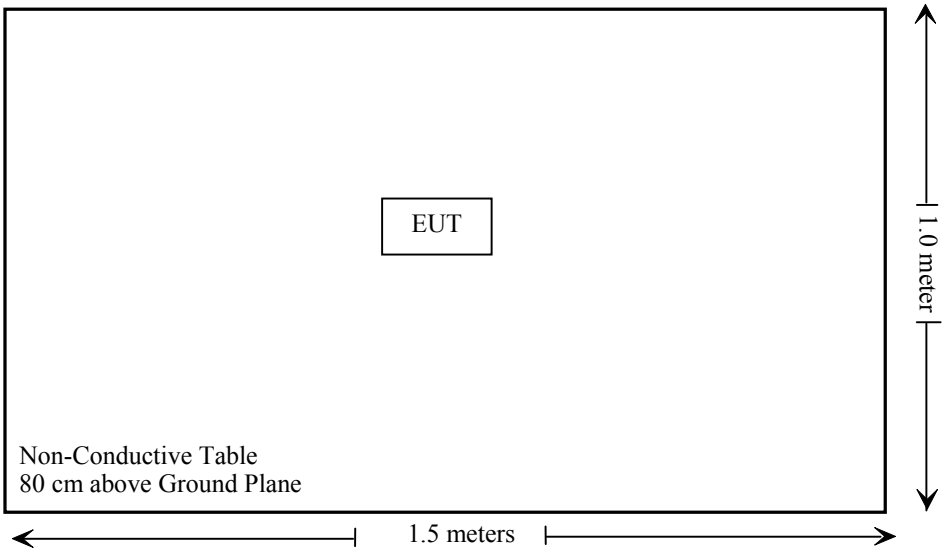
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

Support Cable Descriptions

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207(a)	Conduction Emissions	Not Applicable
15.205, §15.209, §15.249	Radiated Emissions	Compliance
§15.215(c)	20dB Emission Bandwidth	Compliance

Not Applicable: The EUT is powered by the battery.

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, 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.

Antenna Connector Construction

The EUT has one PCB antenna arrangement which was permanently attached and the antenna gain is 0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FCC§15.205, §15.209 & §15.249 - RADIATED EMISSIONS

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is 5.91 dB for 30MHz-1GHz, 4.92 dB for above 1GHz, and it will not be taken into consideration for the test data recorded in the report

Test Equipment Setup

The spectrum analyzer or receiver is set as:

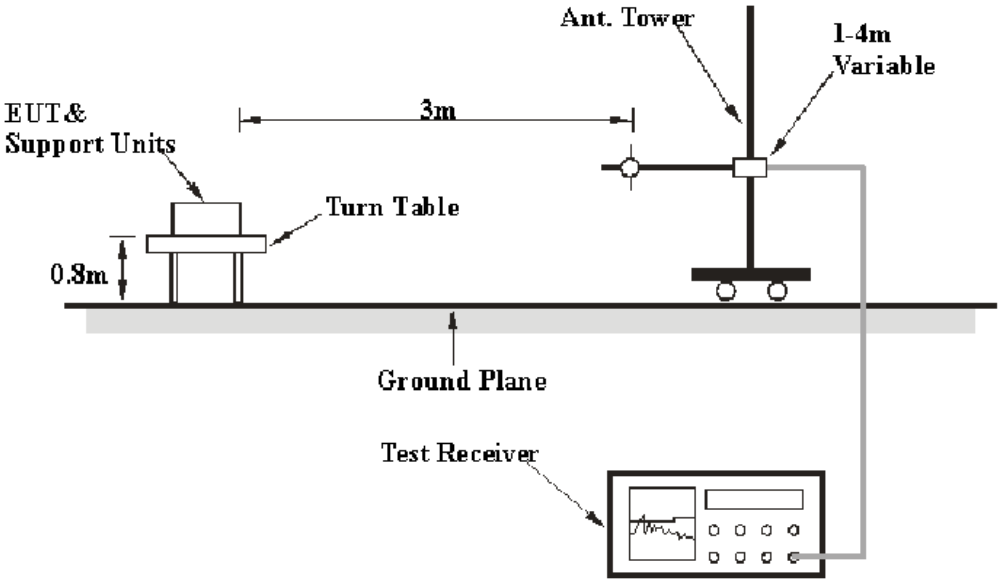
Below 1000MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000MHz:

Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	HP8447E	1937A01046	2015-05-06	2016-05-06
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2014-11-03	2015-11-03
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
A.H. System	Horn Antenna	SAS-200/571	135	2013-02-10	2016-02-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2014-12-11	2015-12-11
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2015-06-13	2016-06-13
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2015-04-03	2016-04-03
DUCOMMUN	Pre-amplifier	ALN-22093530-01	991373-01	2014-08-03	2015-08-03
EMCO	Horn Antenna	3115	9903-5766	NCR	NCR
Rohde & Schwarz	Auto test Software	EMC32	V9.10	NCR	NCR

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the data in the following table, the worst margin reading as below:

5.09 dB at **2483.51 MHz** in the **Horizontal** polarization for **High Channel**

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr}, if L_m is less than L_{lim}, it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

Temperature:	27 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by William Li on 2015-07-08.

Test Mode: Transmitting

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
Low Channel (2402 MHz)									
273.44	48.28	QP	27	1.5	H	-14.8	33.48	46	12.52
2402.00	90.63	PK	67	1.4	H	4.27	94.90	114	23.37
2402.00	90.44	PK	67	1.4	V	4.17	94.61	114	23.56
2385.67	54.57	PK	265	1.5	H	4.27	58.84	74	15.16
2385.67	53.38	PK	265	1.5	V	4.17	57.55	74	16.45
2390.00	55.35	PK	272	2.2	H	4.27	59.62	74	14.38
2390.00	54.26	PK	272	2.2	V	4.17	58.43	74	15.57
2486.47	39.86	PK	142	1.8	H	7.99	47.85	74	26.15
2486.47	38.97	PK	142	1.8	V	7.59	46.56	74	27.44
4804.00	40.89	PK	53	1.3	H	24.81	65.70	74	8.30
4804.00	41.66	PK	53	1.3	V	25.01	66.67	74	7.33
7206.00	37.43	PK	194	1.9	H	22.28	59.71	74	14.29
7206.00	36.98	PK	194	1.9	V	22.28	59.26	74	14.74
9608.00	34.41	PK	303	2.4	H	25.02	59.43	74	14.57
9608.00	35.60	PK	303	2.4	V	25.22	60.82	74	13.18
Middle Channel (2433 MHz)									
273.10	48.21	QP	27	1.5	H	-14.8	33.41	46	12.59
2433.00	91.69	PK	59	1.5	H	4.27	95.96	114	22.31
2433.00	91.45	PK	59	1.5	V	4.17	95.62	114	22.55
2385.51	43.31	PK	135	1.6	H	4.27	47.58	74	26.42
2385.51	42.98	PK	135	1.6	V	4.17	47.15	74	26.85
2389.19	43.45	PK	321	1.3	H	4.27	47.72	74	26.28
2389.19	42.78	PK	321	1.3	V	4.17	46.95	74	27.05
2482.46	46.53	PK	27	2.3	H	7.99	54.52	74	19.48
2482.46	45.82	PK	27	2.3	V	7.59	53.41	74	20.59
4866.00	41.22	PK	225	1.7	H	22.71	63.93	74	10.07
4866.00	40.68	PK	225	1.7	V	22.91	63.59	74	10.41
7299.00	37.78	PK	281	1.4	H	22.60	60.38	74	13.62
7299.00	38.18	PK	281	1.4	V	22.60	60.78	74	13.22
9732.00	34.64	PK	132	1.9	H	25.02	59.66	74	14.34
9732.00	35.12	PK	132	1.9	V	25.22	60.34	74	13.66

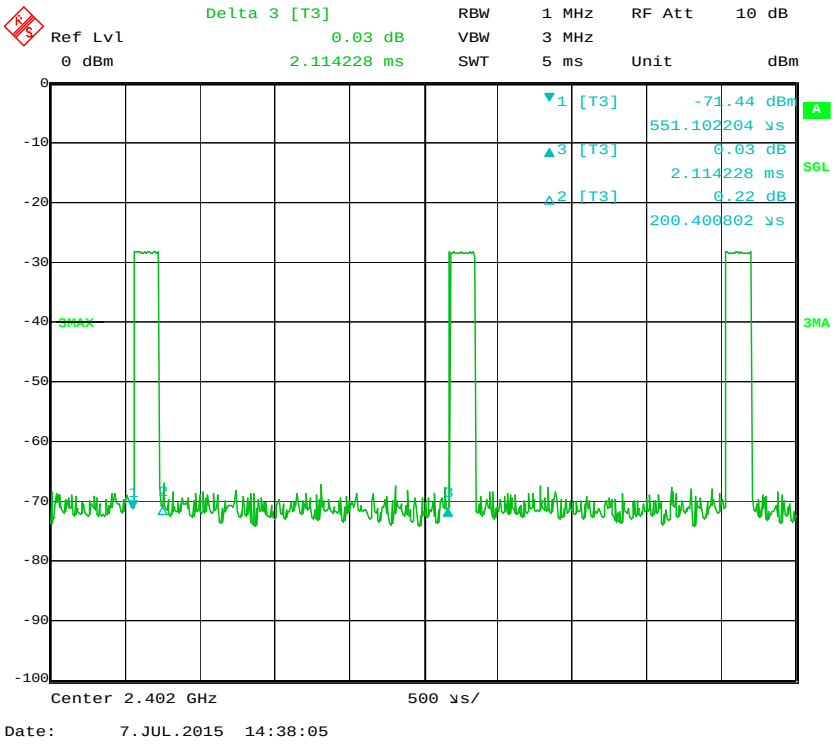
Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dBμV/m)	FCC Part 15.249/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
High Channel (2475 MHz)									
273.10	47.93	QP	27	1.5	H	-14.8	33.13	46	12.87
2475.00	94.31	PK	109	2.3	H	7.99	102.30	114	19.69
2475.00	92.43	PK	109	2.3	V	7.59	100.02	114	21.57
2389.36	39.17	PK	308	1.6	H	4.27	43.44	74	30.56
2389.36	38.89	PK	308	1.6	V	4.17	43.06	74	30.94
2483.51	60.92	PK	100	1.2	H	7.99	68.91	74	5.09
2483.51	58.87	PK	100	1.2	V	7.59	66.46	74	7.54
2486.27	58.77	PK	1	2.1	H	7.99	66.76	74	7.24
2486.27	57.62	PK	1	2.1	V	7.59	65.21	74	8.79
4950.00	39.87	PK	343	1.7	H	22.21	62.08	74	11.92
4950.00	40.83	PK	343	1.7	V	22.01	62.84	74	11.16
7425.00	37.60	PK	76	1.1	H	21.54	59.14	74	14.86
7425.00	36.57	PK	76	1.1	V	21.54	58.11	74	15.89
9900.00	34.42	PK	193	2.5	H	26.09	60.51	74	13.49
9900.00	33.94	PK	193	2.5	V	26.29	60.23	74	13.77

Field Strength of Radiated Emission Average							
Frequency (MHz)	Receiver		Corrected Factor (dB)		Corrected Amplitude Average (dBμV/m)	FCC Part 15.249/15.205/15.209	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H / V)	Duty Cycle Factor		Limit (dBμV/m)	Margin (dB)
Low channel (2402 MHz)							
2402.00	94.90	Ave.	H	-20.46	72.91	94	21.09
2402.00	94.61	Ave.	V	-20.46	72.62	94	21.38
2385.67	58.84	Ave.	H	-20.46	36.85	54	17.15
2385.67	57.66	Ave.	V	-20.46	35.67	54	18.33
2390.00	59.62	Ave.	H	-20.46	37.63	54	16.37
2390.00	58.26	Ave.	V	-20.46	36.27	54	17.73
2486.47	46.87	Ave.	H	-20.46	24.88	54	29.12
2486.47	47.45	Ave.	V	-20.46	25.46	54	28.54
4804.00	58.92	Ave.	H	-20.46	36.93	54	17.07
4804.00	60.17	Ave.	V	-20.46	38.18	54	15.82
7206.00	59.71	Ave.	H	-20.46	37.72	54	16.28
7206.00	58.66	Ave.	V	-20.46	36.67	54	17.33
9608.00	58.77	Ave.	H	-20.46	36.78	54	17.22
9608.00	60.82	Ave.	V	-20.46	38.83	54	15.17

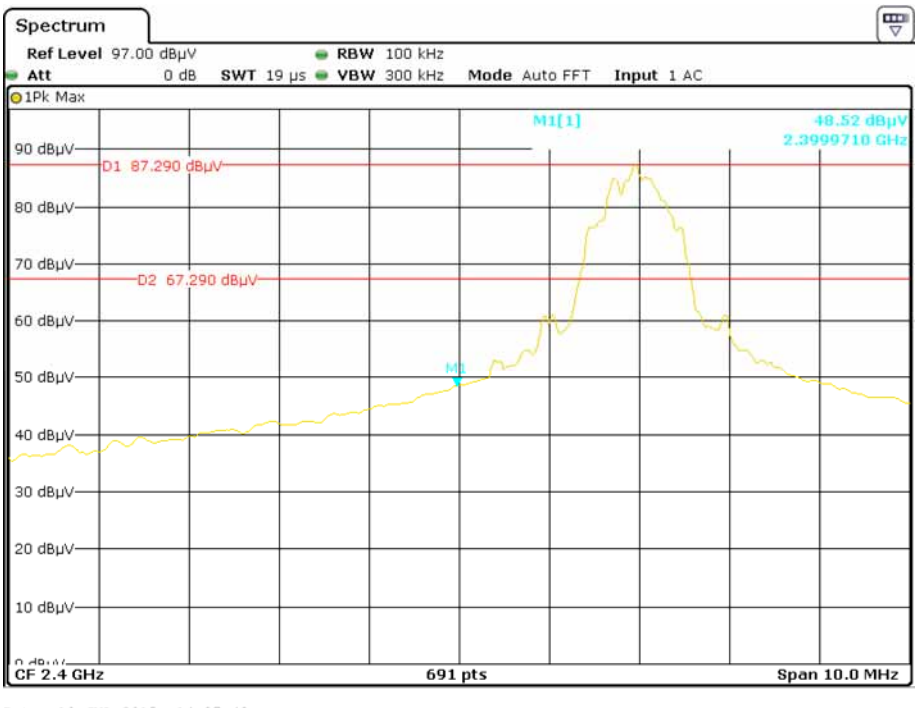
Field Strength of Radiated Emission Average							
Frequency (MHz)	Corrected Amplitude Peak (dBμV/m)		Corrected Factor (dB)		Corrected Amplitude Average (dBμV/m)	FCC Part 15.249/15.205/15.209	
			Polar (H / V)	Duty Cycle Factor		Limit (dBμV/m)	Margin (dB)
Middle Channel (2433 MHz)							
2433.00	95.96	Ave.	H	-20.46	73.97	94	20.03
2433.00	95.62	Ave.	V	-20.46	73.63	94	20.37
2385.51	47.58	Ave.	H	-20.46	25.59	54	28.41
2385.51	46.61	Ave.	V	-20.46	24.62	54	29.38
2389.19	47.72	Ave.	H	-20.46	25.73	54	28.27
2389.19	45.89	Ave.	V	-20.46	23.90	54	30.10
2482.46	54.52	Ave.	H	-20.46	32.53	54	21.47
2482.46	53.44	Ave.	V	-20.46	31.45	54	22.55
4866.00	60.43	Ave.	H	-20.46	38.44	54	15.56
4866.00	58.96	Ave.	V	-20.46	36.97	54	17.03
7299.00	59.26	Ave.	H	-20.46	37.27	54	16.73
7299.00	60.78	Ave.	V	-20.46	38.79	54	15.21
9732.00	59.66	Ave.	H	-20.46	37.67	54	16.33
9732.00	60.34	Ave.	V	-20.46	38.35	54	15.65
High Channel (2475 MHz)							
2475.00	102.30	Ave.	H	-20.46	80.31	94	13.69
2475.00	100.02	Ave.	V	-20.46	78.03	94	15.97
2389.36	43.44	Ave.	H	-20.46	21.45	54	32.55
2389.36	42.68	Ave.	V	-20.46	20.69	54	33.31
2483.51	60.92	Ave.	H	-20.46	38.93	54	15.07
2483.51	58.77	Ave.	V	-20.46	36.78	54	17.22
2486.27	66.76	Ave.	H	-20.46	44.77	54	9.23
2486.27	65.52	Ave.	V	-20.46	43.53	54	10.47
4950.00	58.92	Ave.	H	-20.46	36.93	54	17.07
4950.00	60.24	Ave.	V	-20.46	38.25	54	15.75
7425.00	59.14	Ave.	H	-20.46	37.15	54	16.85
7425.00	58.77	Ave.	V	-20.46	36.78	54	17.22
9900.00	60.51	Ave.	H	-20.46	38.52	54	15.48
9900.00	59.68	Ave.	V	-20.46	37.69	54	16.31

Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor = Antenna Factor (Rx) + Cable Loss – Amplifier Factor
Margin = Limit - Corr. Amplitude
Duty Cycle = Ton/Tp*100%, Ton =163.77 μs, Tp= 7.93 ms
Duty Cycle Factor = 20lg (Duty Cycle) = -33.70
Average = PK + 20*lg (Duty Cycle)

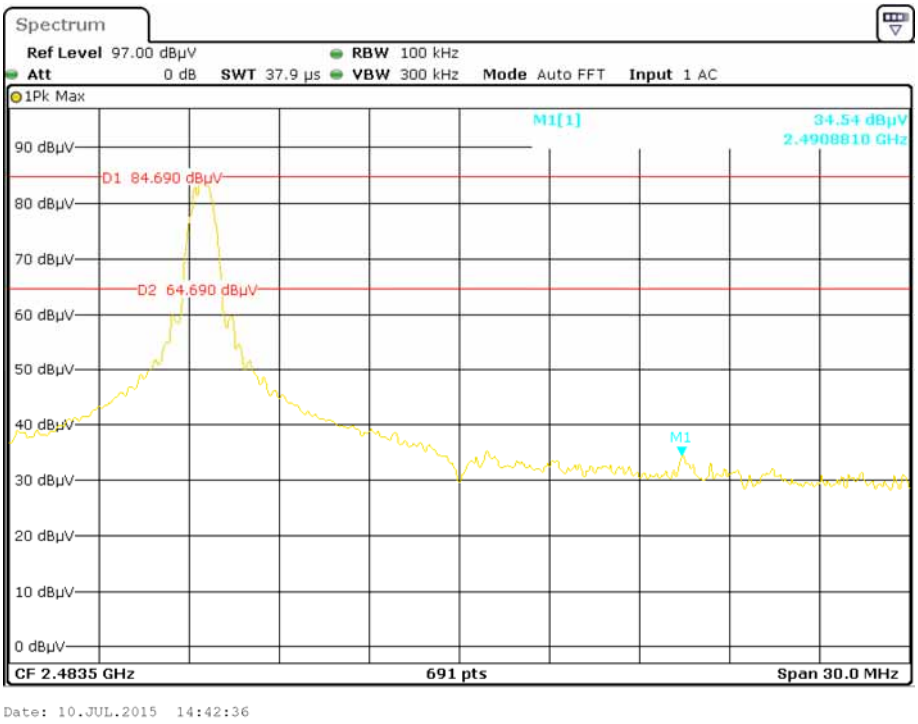
Duty Cycle



Band edge -Left Side



Band edge –Right Side



FCC§15.215(c) - 20dB EMISSION BANDWIDTH

Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Measure the frequency difference of two frequencies that indicated 20dB bandwidth.

4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	837405/023	2014-08-22	2015-08-22

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

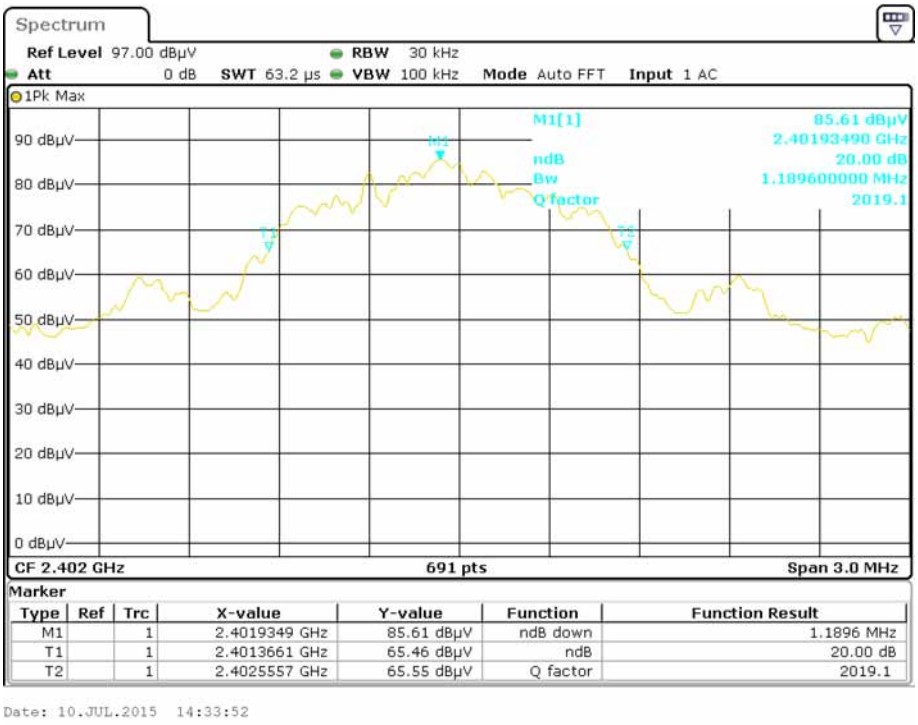
The testing was performed by William Li on 2015-07-07.

Test Mode: Transmitting

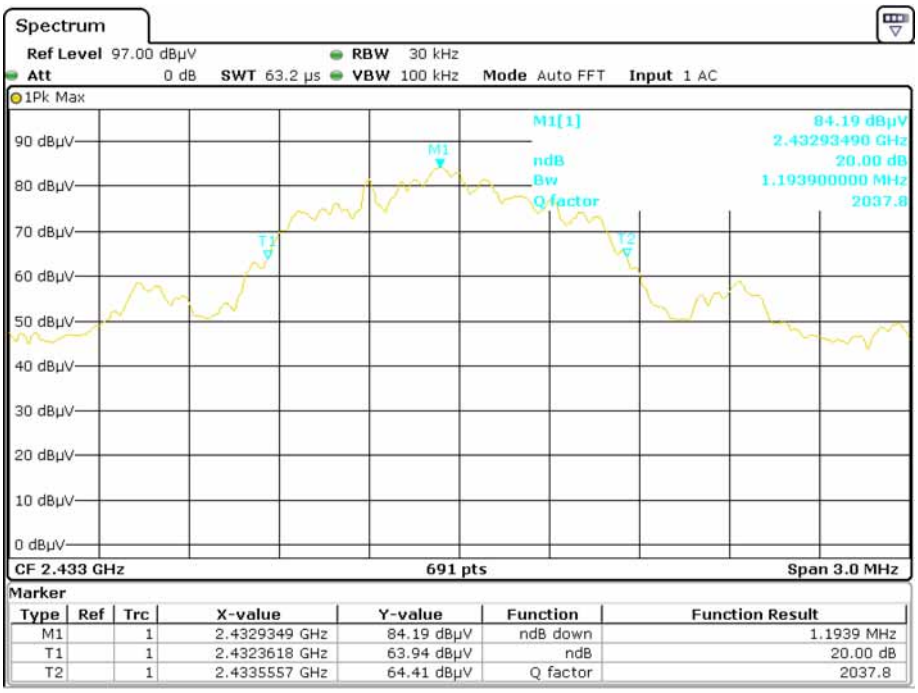
Pleas refer to the following table and plots.

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
Low	2402	1.190
Middle	2433	1.194
High	2475	1.194

Low Channel



Middle Channel



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4329349 GHz	84.19 dBµV	ndB down	1.1939 MHz
T1		1	2.4323618 GHz	63.94 dBµV	ndB	20.00 dB
T2		1	2.4335557 GHz	64.41 dBµV	Q factor	2037.8

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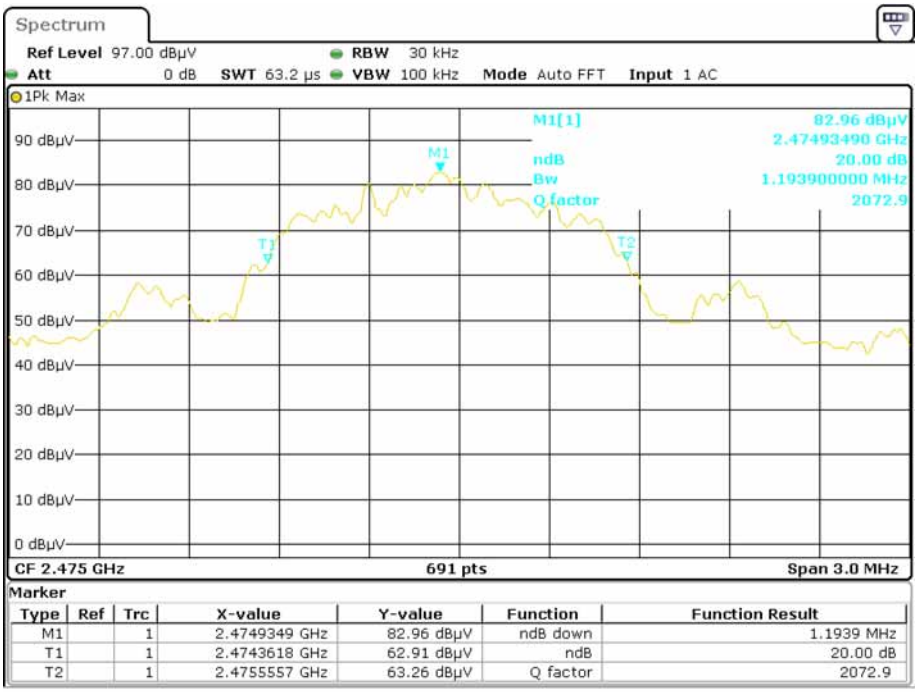
High Channel

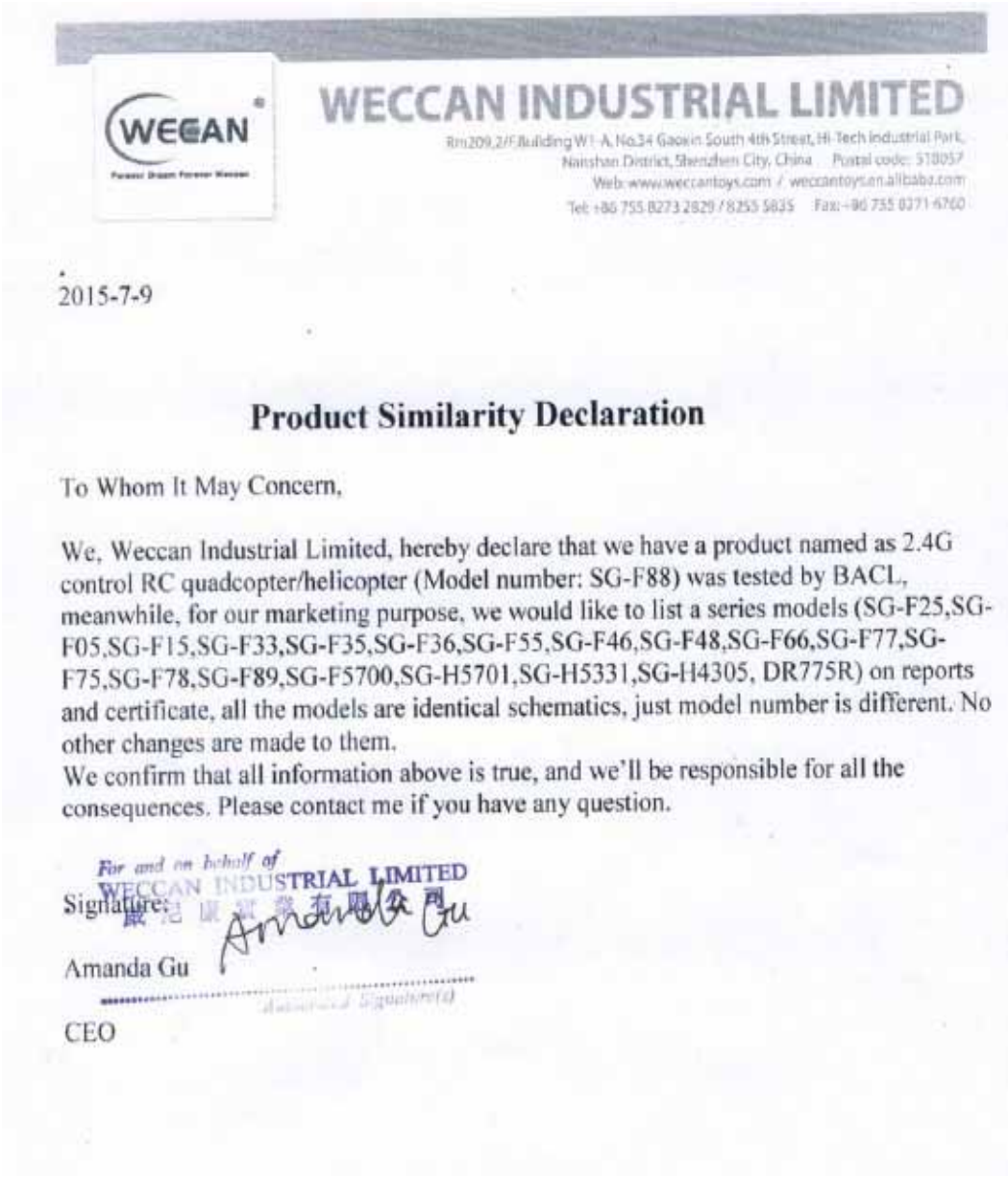


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4749349 GHz	82.96 dBµV	ndB down	1.1939 MHz
T1		1	2.4743618 GHz	62.91 dBµV	ndB	20.00 dB
T2		1	2.4755557 GHz	63.26 dBµV	Q factor	2072.9

Date: 10.JUL.2015 14:33:21

PRODUCT SIMILARITY DECLARATION LETTER



WECCAN INDUSTRIAL LIMITED

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2015-7-9

Product Similarity Declaration

To Whom It May Concern,

We, Weccan Industrial Limited, hereby declare that we have a product named as 2.4G control RC quadcopter/helicopter (Model number: SG-F88) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (SG-F25,SG-F05,SG-F15,SG-F33,SG-F35,SG-F36,SG-F55,SG-F46,SG-F48,SG-F66,SG-F77,SG-F75,SG-F78,SG-F89,SG-F5700,SG-H5701,SG-H5331,SG-H4305, DR775R) on reports and certificate, all the models are identical schematics, just model number is different. No other changes are made to them.
We confirm that all information above is true, and we'll be responsible for all the consequences. Please contact me if you have any question.

For and on behalf of
WECCAN INDUSTRIAL LIMITED

Signature:

Amanda Gu

CEO

******* END OF REPORT *******