

FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name: 2.4G Transmitter

Model Number : FRT-01A

Brand Name : Flying Hobby

FCC ID : TS3-FHEPRC-24G08A

Prepared for Flying Hobby Co., Ltd.

According to FCC Part 15 Subpart C 15.249

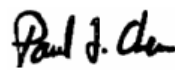
Test Report #: FLY-0810-8077-FCC

Prepared by: Chris Huang

Reviewed by: Harry Zhao

QC Manager: Paul Chen

Test Report Released by:



Paul Chen

2008, December 16

Date

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location: ECMG Worldwide Certification Solution,
Inc. (China)
Building 2, 1298 Lian Xi Road, Pu
Dong New Area, Shanghai, P.R.
China 201204

Tel: 86-21-51909300

Fax: 86-21-51909333

FCC Registration Number: 172634

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Administrative Data

Test Sample : 2.4G Transmitter

Model Number : FRT-01A

Brand Name : FLYING HOBBY

Date Tested : 2008, November 4th & November 11th

Applicant : Flying Hobby Co., Ltd.
388, Da Miao Cun, Zhang Ze, Songjiang,
Shanghai 201608

Telephone : 86-21-57888210

Fax : 86-21-57888163

Manufacturer : Shanghai Height Electrics Co., Ltd.
1500, Hui Rne Road, Jiading, Shanghai
201800

Telephone : 86-21-51652018

Fax : 86-21-51652358

EUT Description

Flying Hobby Co., Ltd. Model number FRT-01A (referred to as the EUT in this report) is a 2.4G Transmitter.

*As the EUT is power on, it will search channels and choose a random channel to transmit signal. It will transmit two signals with a frequency space of 40MHz simultaneously.
See the channel list below:*

<i>Channel</i>	<i>Signal #1</i>	<i>Signal #2</i>
<i>1</i>	<i>2404</i>	<i>2444</i>
<i>2</i>	<i>2406</i>	<i>2446</i>
<i>3</i>	<i>2408</i>	<i>2448</i>
<i>4</i>	<i>2410</i>	<i>2450</i>
<i>5</i>	<i>2412</i>	<i>2452</i>
<i>6</i>	<i>2414</i>	<i>2454</i>
<i>7</i>	<i>2416</i>	<i>2456</i>
<i>8</i>	<i>2418</i>	<i>2458</i>
<i>9</i>	<i>2420</i>	<i>2460</i>
<i>10</i>	<i>2422</i>	<i>2462</i>
<i>11</i>	<i>2424</i>	<i>2464</i>
<i>12</i>	<i>2426</i>	<i>2466</i>
<i>13</i>	<i>2428</i>	<i>2468</i>
<i>14</i>	<i>2430</i>	<i>2470</i>
<i>15</i>	<i>2432</i>	<i>2472</i>
<i>16</i>	<i>2434</i>	<i>2474</i>

Test Summary

The Electromagnetic Compatibility requirements on model FRT01A for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

EMC Test Items			
<i>Reference FCC Part 15 (2007), Subpart C</i>			
<i>Specification</i>	<i>Description</i>	<i>Test Results</i>	<i>Remark</i>
<i>FCC Part 15.203</i>	<i>Antenna Requirement</i>	<i>Compliance</i>	<i>Integral Antenna</i>
<i>FCC Part 15.205</i>	<i>Restricted Band of Operation</i>	<i>Compliance</i>	<i>Attachment 1</i>
<i>FCC Part 15.209</i>	<i>Radiated Emission Limits</i>	<i>Compliance</i>	<i>Attachment 1</i>
<i>FCC Part 15.249 (a)</i>	<i>Fundamental and Harmonics</i>	<i>Compliance</i>	<i>Attachment 2</i>
<i>FCC Part 15.249 (d)</i>	<i>Band Edge</i>	<i>Compliance</i>	<i>Attachment 3</i>

Test Mode Justification

The EUT is handheld product, so the test modes (Lie, Side, Stand) were done for testing.

*Note: Lie mode means let EUT put flat;
Side mode means let EUT put side;
Stand mode means let EUT stand up.*

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

EUT Exercise Software

The EUT doesn't use software during test.

Equipment Modification

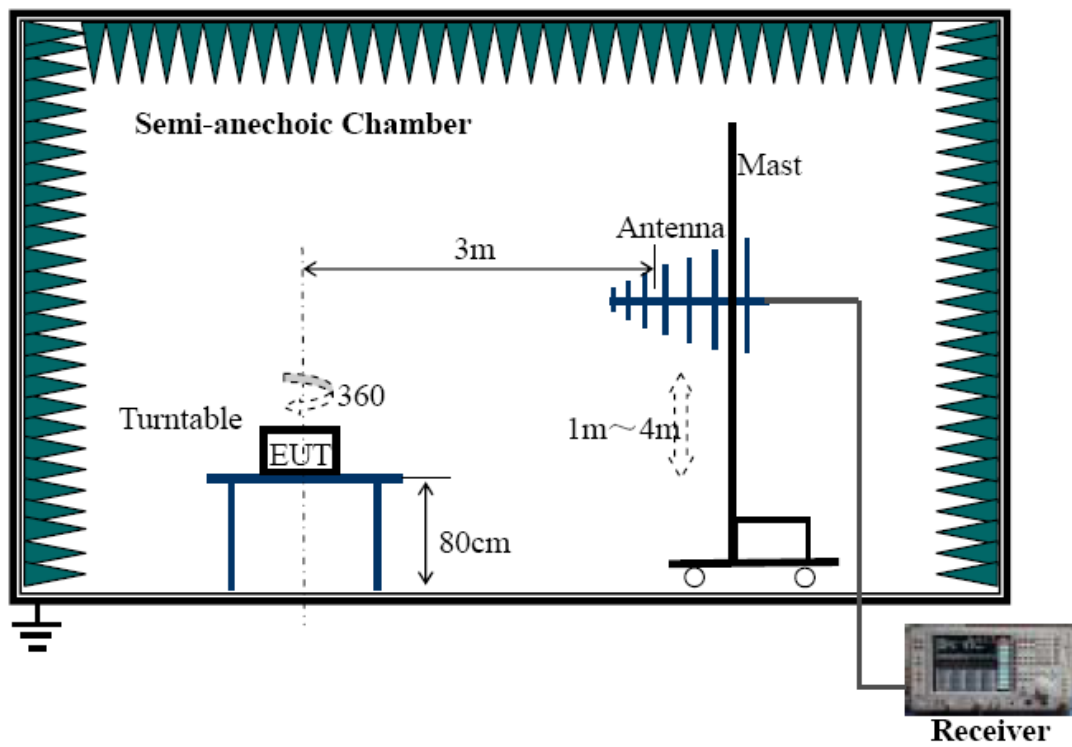
Any modifications installed previous to testing by Flying Hobby Co., Ltd. will be incorporated in each production model sold or leased in United States.

There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel.

Test System Details

<i>EUT</i>	
<i>Model Number:</i>	<i>FRT-01A</i>
<i>Brand Name:</i>	<i>Flying Hobby</i>
<i>Serial Number:</i>	<i>Engineering Sample</i>
<i>Input Voltage:</i>	<i>6V DC</i>
<i>Description:</i>	<i>2.4G Transmitter</i>
<i>Manufacturer:</i>	<i>Flying Hobby Co., Ltd.</i>
<i>EUT Power Supply</i>	
<i>AA battery *4</i>	
<i>Support Equipment</i>	
<i>None</i>	
<i>Cable Description</i>	
<i>None</i>	

Configuration of Tested System



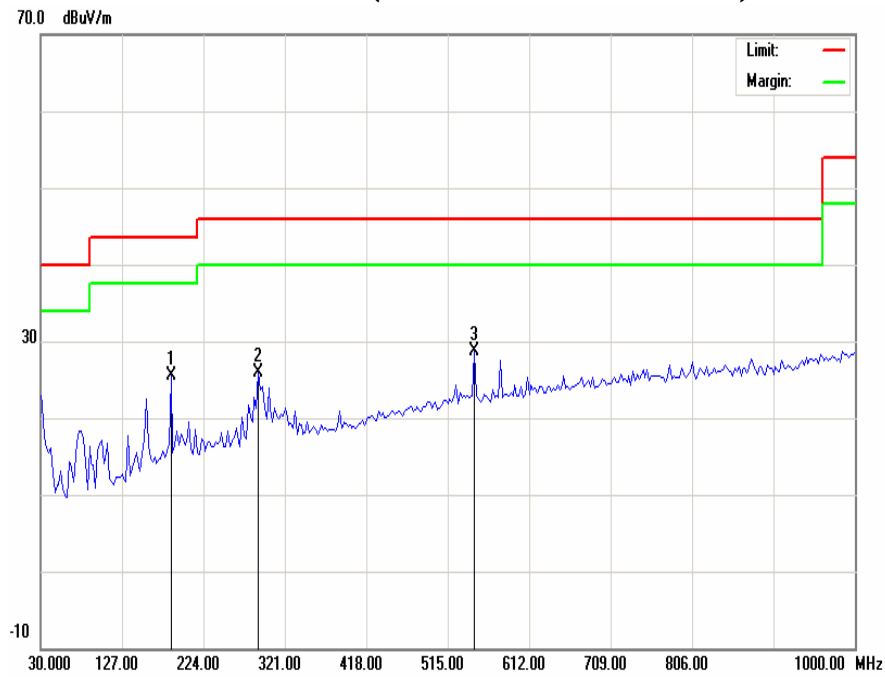
ATTACHMENT 1 – RADIATED EMISSION TEST RESULTS

CLIENT:	Flying Hobby Co., Ltd.	TEST STANDARD:	FCC Part 15.209 FCC Part 15.205
MODEL NUMBER:	FRT-01A	PRODUCT:	2.4G Transmitter
SERIAL NO.:	Engineering Sample	EUT DESIGNATION:	RF Equipment
TEMPERATURE:	21°C	HUMIDITY:	53%RH
ATM PRESSURE:	101.6 kPa	GROUNDING:	No Grounding
TESTED BY:	Cloud Feng	DATE OF TEST:	2008, November 4
SETUP METHOD:	ANSI C63.4 : 2003		
TEST PROCEDURE:	<p>a. The EUT was placed on a rotatable table with 0.8 meters above ground.</p> <p>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement.</p> <p>d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading.</p> <p>e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> <p>f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz.</p> <p>g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz</p> <p>Explanation of the Correction Factor are given as follows:</p> $FS = RA + AF + CF - AG$ <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p>		
TESTED RANGE:	30MHz to 24000MHz for the transmitter		
TEST VOLTAGE:	120V/60Hz		

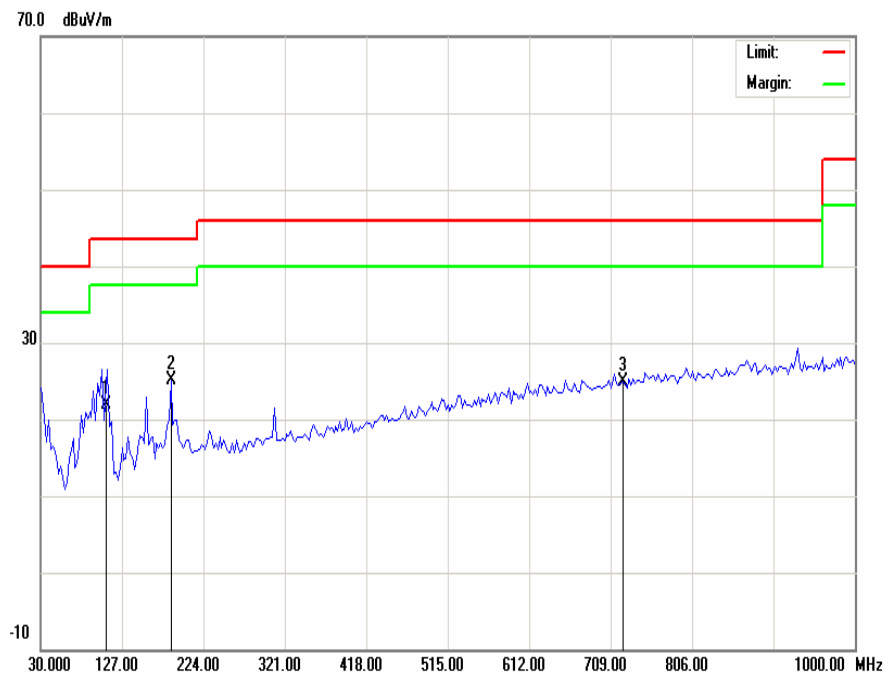
CONTINUE ON THE NEXT PAGE...

TEST STATUS:	For transmitter, keep Tx in normal continuous transmission mode, modulated
RESULTS:	The EUT meets the requirements of field strength test. The test results relate only to the equipment under test provided by cli
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel.
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB

Model: FRT-01A
Low Channel (2404MHz & 2444MHz)



Radiated Emission Plot -Horizontal Polarization
(Peak, Max Hold Mode)



Radiated Emission Plot -Vertical Polarization
(Peak, Max Hold Mode)

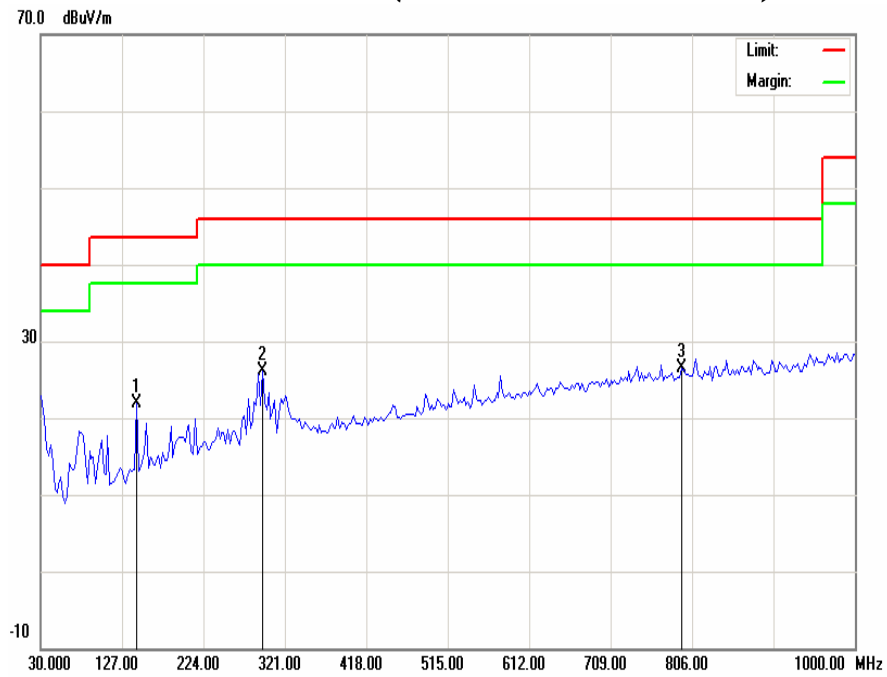
Test Results (30MHz~1GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	185.1999	12.41	13.02	25.43	43.50	-18.07	203	123
2	289.4750	10.52	15.31	25.83	46.00	-20.17	132	186
3	546.5249	8.32	20.43	28.75	46.00	-17.25	74	190
<i>Vertical</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	107.5000	11.60	10.30	21.90	43.50	-21.60	314	100
2	185.1999	12.09	13.02	25.11	43.50	-18.39	293	135
3	723.5498	1.89	23.03	24.92	46.00	-21.08	134	176
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

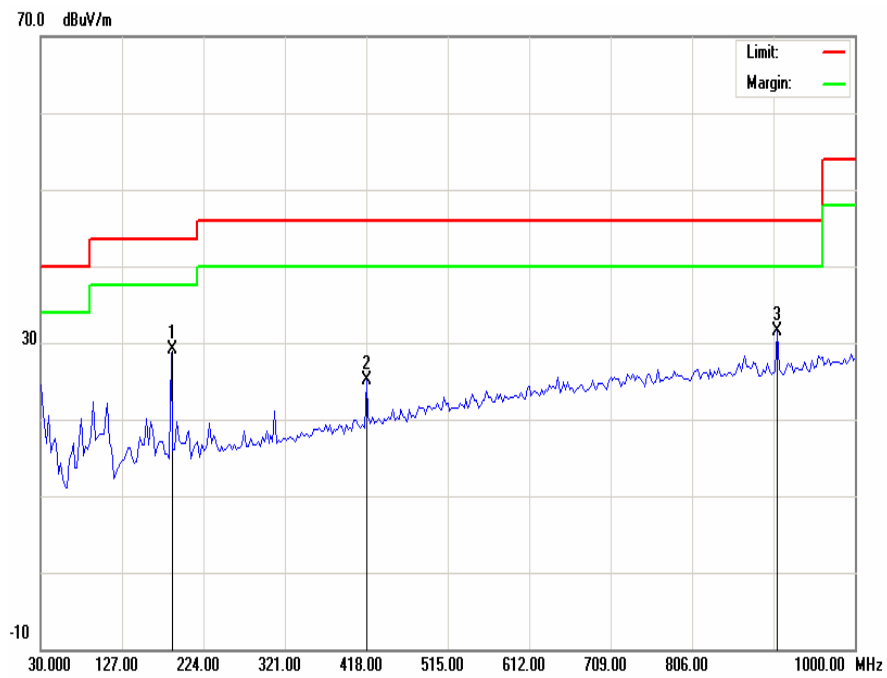
Test Results (1GHz~24GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1025	23.16	35.95	54.00	-18.05	44.86	74.00	-29.14
2	1380	25.39	33.94	54.00	-20.06	45.10	74.00	-28.90
3	1540	26.40	37.95	54.00	-16.05	46.23	74.00	-27.77
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1067	23.43	33.84	54.00	-20.16	43.90	74.00	-30.10
2	1540	26.40	36.36	54.00	-17.64	45.76	74.00	-28.24
3	6539	36.02	38.92	54.00	-15.08	49.18	74.00	-24.82
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Model: FRT-01A
Middle Channel (2418MHz & 2458MHz)



Radiated Emission Plot -Horizontal Polarization
(Peak, Max Hold Mode)



Radiated Emission Plot -Vertical Polarization
(Peak, Max Hold Mode)

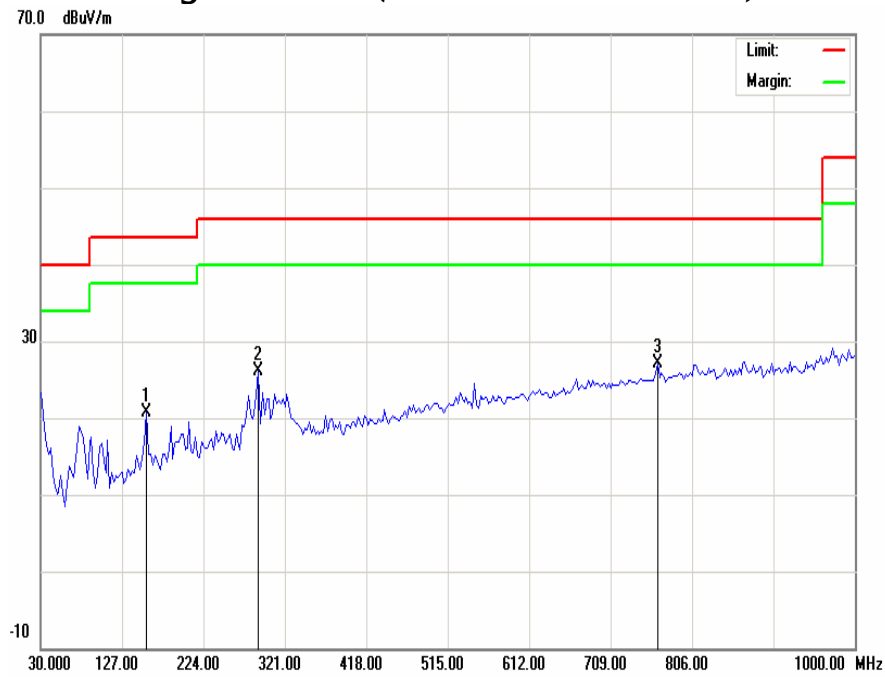
Test Results (30MHz~1GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	143.9749	10.25	11.72	21.97	43.50	-21.53	213	105
2	294.3249	10.80	15.40	26.20	46.00	-19.80	182	174
3	793.8750	2.50	24.01	26.51	46.00	-19.49	163	135
<i>Vertical</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	185.2500	16.00	13.02	29.02	43.50	-14.48	340	104
2	418.0000	6.99	18.13	25.12	46.00	-20.88	274	100
3	907.8500	6.27	25.21	31.48	46.00	-14.52	145	174
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

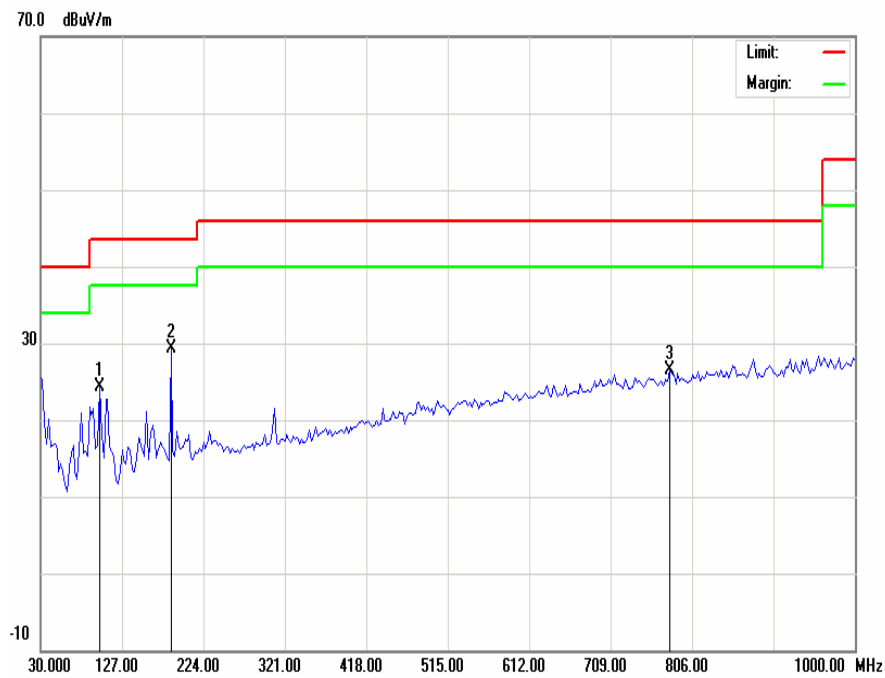
Test Results (1GHz~24GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1595	26.75	36.18	54.00	-17.82	45.88	74.00	-28.12
2	3759	29.16	38.53	54.00	-15.47	47.23	74.00	-26.77
3	6599	36.02	39.10	54.00	-14.90	48.95	74.00	-25.05
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1837	28.18	34.15	54.00	-19.85	45.37	74.00	-28.63
2	3956	29.42	35.83	54.00	-18.17	45.26	74.00	-28.74
3	4739	31.45	37.42	54.00	-16.58	47.55	74.00	-26.45
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Model: FRT-01A
High Channel (2434MHz & 2474MHz)



Radiated Emission Plot -Horizontal Polarization
(Peak, Max Hold Mode)



Radiated Emission Plot -Vertical Polarization
(Peak, Max Hold Mode)

Test Results (30MHz~1GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	156.0999	8.50	12.13	20.63	43.50	-22.87	128	104
2	289.4750	10.82	15.31	26.13	46.00	-19.87	94	115
3	764.7749	3.49	23.60	27.09	46.00	-18.91	318	176
<i>Vertical</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	100.3250	14.32	10.01	24.33	43.50	-19.17	285	103
2	185.1999	16.27	13.02	29.29	43.50	-14.21	274	120
3	779.3250	2.71	23.81	26.52	46.00	-19.48	104	110
Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used.								

Test Results (1GHz~24GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1896	28.24	36.18	54.00	-17.82	46.23	74.00	-27.77
2	3356	28.89	38.53	54.00	-15.47	48.00	74.00	-26.00
3	10376	39.23	41.03	54.00	-12.97	53.23	74.00	-20.77
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1374	25.84	33.28	54.00	-20.72	43.29	74.00	-30.71
2	4344	31.16	36.28	54.00	-17.72	46.76	74.00	-27.24
3	4822	31.54	38.04	54.00	-15.96	49.44	74.00	-24.56
Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/07	11/28/08
EMI Test Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/07	11/28/08
EMI Test Receiver Display Unit	R&S	ESAI-D	825035/005	11/29/07	11/28/08
Broadband Antenna	Sunol	JB5	A110503	11/29/07	11/28/08
Horn Antenna	R&S	HF906	4044.4507.02	05/13/08	05/12/09
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: Cloud Feng
ENGINEER

REVIEWED BY: Hany Zhao
SENIOR ENGINEER

ATTACHMENT 2 – FUNDAMENTAL AND HARMONIC FIELD STRENGTH TEST RESULTS

CLIENT:		Flying Hobby Co., Ltd.	TEST STANDARD:		FCC Part 15.249 (a)			
MODEL NUMBER:		FRT-01A	PRODUCT:		2.4G Transmitter			
SERIAL NO.:		Engineering Sample	EUT DESIGNATION:		RF Equipment			
TEMPERATURE:		21°C	HUMIDITY:		53%RH			
ATM PRESSURE:		101.6 kPa	GROUNDING:		No Grounding			
TESTED BY:		Cloud Feng	DATE OF TEST:		2008, November 4			
SETUP METHOD:		ANSI C63.4 : 2003						
TEST PROCEDURE:		<p>a. The EUT was placed on a rotatable table with 0.8 meters above ground.</p> <p>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement.</p> <p>d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading.</p> <p>e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> <p>f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz.</p> <p>g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz</p> <p>Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG</p> <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p> <p>FCC 15.249 limit</p> <p>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:</p> <table><tr><td>Fundamental Frequency</td><td>Field Strength of Fundamental</td><td>Field Strength of Harmonics</td></tr></table>				Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics
Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics						

		(milivolts/meter)	(microvolts/meter)
	902-928MHz	50	500
	2400-2483.5MHz	50	500
	5725-5875MHz	50	500
	24.0-24.25GHz	250	2500
TESTED RANGE:	2.4GHz to 24GHz for the transmitter		
TEST VOLTAGE:	6V DC		
TEST STATUS:	Set transmitter to generate signal at low, middle and high channels continually		
RESULTS:	<p>The EUT meets the requirements of the fundamental and harmonic field strength.</p> <p>The test results relate only to the equipment under test provided by client.</p>		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc.(China) test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB		

Peak Field Strength=Peak Read Level + Factor

Factor = Antenna Factor + Cable Loss - Preamp Factor

Average Field Strength=Peak Field Strength - Duty Cycle Correction Factor

Duty Cycle Correction Factor is calculated by averaging the sum of the pulse train. Correction factor is measured as follows:

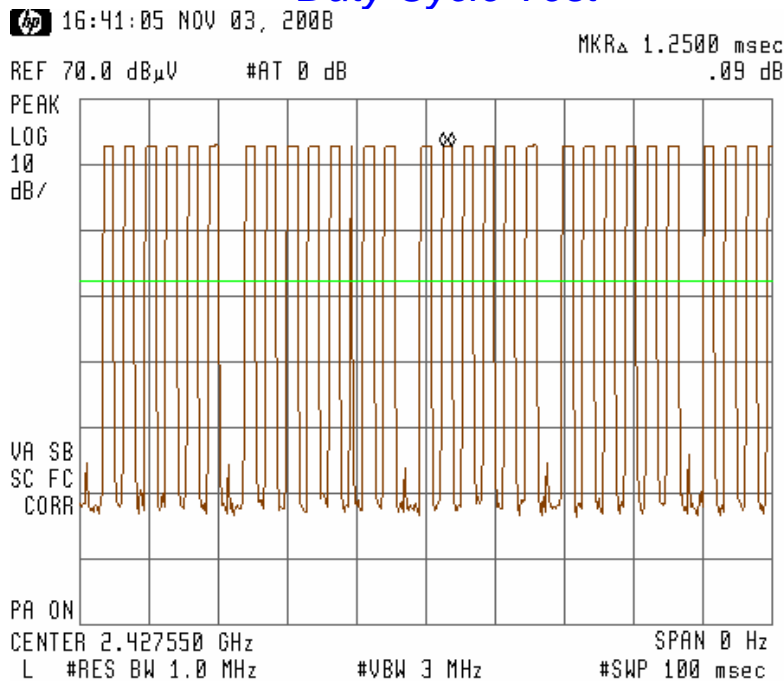
Keep the EUT in continuous transmission mode (modulated), and set the spectrum to the fundamental frequency and set the span width to 0 Hz. Then connect a storage oscilloscope to the video output of the spectrum that is used to detect the pulse train. Adjust the oscilloscope settings to observe the pulse train and determine the number and width of the pulses, as well as the period of the train.

Duty cycle = $1.25\text{ms} \times 29 / 100\text{ms} = 36.25\%$

So the Duty Cycle Correction Factor= $20|\log 36.25\%| = 8.81\text{dB}$

(See the plot in next page)

Duty Cycle Test



Test Plot

*For transmitter of LR4
For Channel 1 (2404MHz & 2444MHz) Lie mode
Test Results (2.4GHz~24GHz)*

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2404	28.40	85.94	114.00	-28.06	77.13	94.00	-16.87
2	4808	30.05	53.02	74.00	-20.98	44.21	54.00	-9.79
3	7212	36.96	52.10	74.00	-21.90	43.29	54.00	-10.71
4	9616	38.23	51.02	74.00	-22.98	42.21	54.00	-11.79
5	12020	41.47	49.23	74.00	-24.77	40.42	54.00	-13.58
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2404	28.40	86.94	114.00	-27.06	78.13	94.00	-15.87
2	4808	30.05	55.92	74.00	-18.08	47.11	54.00	-6.89
3	7212	36.96	53.94	74.00	-20.06	45.13	54.00	-8.87
4	9616	38.23	54.25	74.00	-19.75	45.44	54.00	-8.56
5	12020	41.47	53.03	74.00	-16.97	44.22	54.00	-9.78
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Test Results (2.4GHz~24GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2444	28.48	87.29	114.00	-26.71	78.48	94.00	-15.52
2	4888	31.34	53.29	74.00	-20.71	44.48	54.00	-9.52
3	7332	37.15	51.28	74.00	-22.72	42.47	54.00	-11.53
4	9776	38.43	50.93	74.00	-23.07	42.12	54.00	-11.88
5	12220	42.23	50.23	74.00	-23.77	41.42	54.00	-12.58
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2444	28.48	85.29	114.00	-28.71	76.48	94.00	-17.52
2	4888	31.34	54.33	74.00	-19.67	45.52	54.00	-8.48
3	7332	37.15	53.94	74.00	-20.06	45.13	54.00	-8.87
4	9776	38.43	52.27	74.00	-21.73	43.46	54.00	-10.54
5	12220	42.23	52.65	74.00	-21.35	43.84	54.00	-10.16
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

*For transmitter of LR4
For Channel 8 (2418MHz & 2458MHz) Side mode
Test Results (2.4GHz~24GHz)*

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2418	28.42	85.72	114.00	-28.28	76.91	94.00	-17.09
2	4836	30.10	52.56	74.00	-21.44	43.75	54.00	-10.25
3	7254	36.99	53.05	74.00	-20.95	44.24	54.00	-9.76
4	9672	38.28	52.85	74.00	-21.15	44.04	54.00	-9.96
5	12090	41.60	50.23	74.00	-23.77	41.42	54.00	-12.58
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2418	28.42	86.76	114.00	-27.24	77.95	94.00	-16.05
2	4836	30.10	53.04	74.00	-20.96	44.23	54.00	-9.77
3	7254	36.99	54.93	74.00	-19.07	46.12	54.00	-7.88
4	9672	38.28	55.29	74.00	-18.71	46.48	54.00	-7.52
5	12090	41.60	55.29	74.00	-18.71	46.48	54.00	-7.52
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Test Results (2.4GHz~24GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2458	28.48	85.64	114.00	-28.36	76.83	94.00	-17.17
2	4916	31.40	54.28	74.00	-19.72	45.47	54.00	-8.53
3	7374	37.33	53.83	74.00	-20.17	45.02	54.00	-8.98
4	9832	38.58	51.28	74.00	-22.72	42.47	54.00	-11.53
5	12290	42.28	52.84	74.00	-21.16	44.03	54.00	-9.97
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2458	28.53	84.38	114.00	-29.62	75.57	94.00	-18.43
2	4916	31.40	53.27	74.00	-20.73	44.46	54.00	-9.54
3	7374	37.33	54.24	74.00	-19.76	45.43	54.00	-8.57
4	9832	38.58	54.11	74.00	-19.89	45.3	54.00	-8.70
5	12290	42.28	54.09	74.00	-19.91	45.28	54.00	-8.72
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

*For transmitter of LR4
For Channel 16 (2434MHz & 2474MHz) Standing mode
Test Results (2.4GHz~24GHz)*

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2434	28.42	86.09	114.00	-27.91	77.28	94.00	-16.72
2	4868	31.36	53.28	74.00	-20.72	44.47	54.00	-9.53
3	7302	37.30	53.32	74.00	-20.68	44.51	54.00	-9.49
4	9736	38.45	53.29	74.00	-20.71	44.48	54.00	-9.52
5	12170	42.04	52.10	74.00	-21.9	43.29	54.00	-10.71
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2434	28.42	84.93	114.00	-29.07	76.12	94.00	-17.88
2	4868	31.36	55.23	74.00	-18.77	46.42	54.00	-7.58
3	7302	37.30	53.48	74.00	-20.52	44.67	54.00	-9.33
4	9736	38.45	54.28	74.00	-19.72	45.47	54.00	-8.53
5	12170	42.04	53.90	74.00	-20.1	45.09	54.00	-8.91
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Test Results (2.4GHz~24GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2474	28.58	85.47	114.00	-28.53	76.66	94.00	-17.34
2	4938	31.52	53.04	74.00	-20.96	44.23	54.00	-9.77
3	7422	37.54	52.58	74.00	-21.42	43.77	54.00	-10.23
4	9896	38.69	51.39	74.00	-22.61	42.58	54.00	-11.42
5	12370	42.40	52.38	74.00	-21.62	43.57	54.00	-10.43
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2474	28.58	85.96	114.00	-28.04	77.15	94.00	-16.85
2	4938	31.52	53.94	74.00	-20.06	45.13	54.00	-8.87
3	7422	37.54	53.89	74.00	-20.11	45.08	54.00	-8.92
4	9896	38.69	54.15	74.00	-19.85	45.34	54.00	-8.66
5	12370	42.40	54.38	74.00	-19.62	45.57	54.00	-8.43
HIGHER HARMONICS		--	<60	74.00	-14.00	<40	54.00	-14.00
Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used.								

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/07	11/28/08
EMI Test Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/07	11/28/08
EMI Test Receiver Display Unit	R&S	ESAI-D	825035/005	11/29/07	11/28/08
Broadband Antenna	Sunol	JB5	A110503	11/29/07	11/28/08
Horn Antenna	R&S	HF906	4044.4507.02	05/13/08	05/12/09
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: Cloud Feng
ENGINEER

REVIEWED BY: Hany Zhao
SENIOR ENGINEER

ATTACHMENT 3 – Band Edge Test

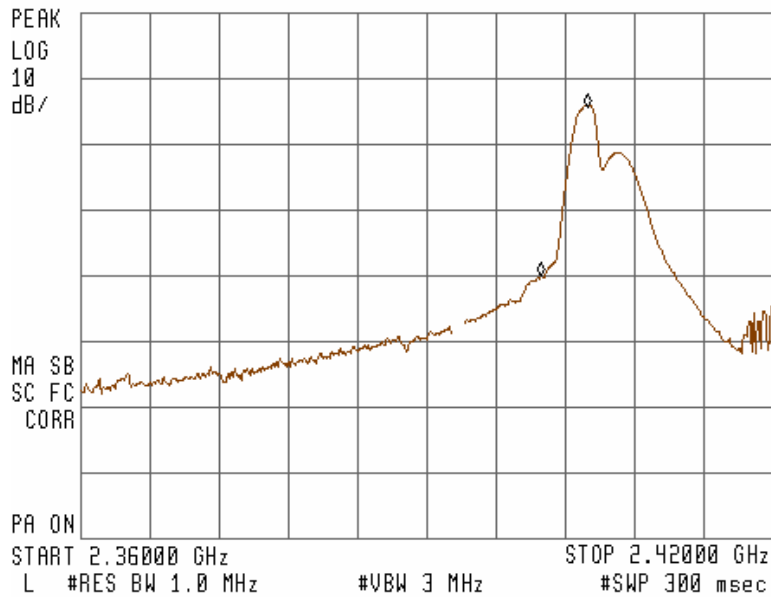
CLIENT:	Flying Hobby Co., Ltd.	TEST STANDARD:	FCC Part 15.249 (d)
MODEL NUMBER:	FRT-01A	PRODUCT:	2.4G Transmitter
SERIAL NO.:	Engineering Sample	EUT DESIGNATION:	RF Equipment
TEMPERATURE:	21°C	HUMIDITY:	53%RH
ATM PRESSURE:	101.6 kPa	GROUNDING:	No Grounding
TESTED BY:	Cloud Feng	DATE OF TEST:	2008, November 11 th
SETUP METHOD:	ANSI C63.4 - 2003		
BANDEDGE REQUIREMENT:	FCC 15.249 (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 general radiated emission limits in Section 15.209, which is the lesser attenuation.		
TEST PROCEDURE:	<p>Set the spectrum as follow:</p> <p>Span=wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.</p> <p>RBW=1000kHz; VBW\geqRBW; Sweep=Auto; Detector=Peak; Trace=Maxhold;</p> <p>Allow the trace to stabilize and use the search peak function to set the marker to the peak of the useful emission, then use delta-mark function to mark the maximum emission outside of the band, record the delta level to see if it's more than 50dB. Or see if the emissions outside the operating frequencies can satisfy the limit 15.209.</p>		
TEST VOLTAGE:	6V DC		
TEST STATUS:	Channel 1 for low and Channel 16 for high		
RESULTS:	The EUT meets band edge requirement. The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc.(China) test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB		

Model FRT-01A

11:14:47 NOV 11, 2008

MKR 2.39990 GHz
29.95 dBμV

REF 70.0 dBμV #AT 0 dB

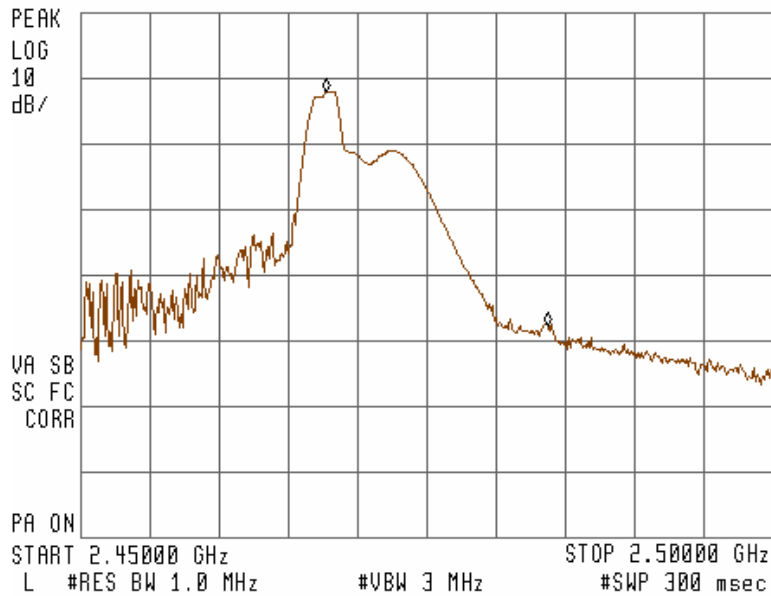


Channel 1 (2404MHz)

11:43:16 NOV 11, 2008

MKR 2.48375 GHz
22.24 dBμV

REF 70.0 dBμV #AT 0 dB



Channel 16 (2474MHz)

Band Edge Test Plot with antenna horizontal

Band Edge Test Table

Antenna Horizontal								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2400	28.21	58.16	74.00	-15.84	46.21	54.00	-7.79
2	2483.5	28.70	50.94	74.00	-23.06	38.85	54.00	-15.15
Antenna Vertical								
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2400	28.21	56.95	74.00	-17.05	44.55	54.00	-9.45
2	2483.5	28.70	53.29	74.00	-20.71	42.37	54.00	-11.63
Note #1: The peak and average readings are using a resolution bandwidth of 1MHz and video bandwidth of 3MHz.								
Note #2: Corrected level = Reading level + Factor; Factor = Antenna Factor + Cable Factor – Preamp Gain.								

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/07	11/28/08
EMI Test Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/07	11/28/08
EMI Test Receiver Display Unit	R&S	ESAI-D	825035/005	11/29/07	11/28/08
Broadband Antenna	Sunol	JB5	A110503	11/29/07	11/28/08
Horn Antenna	R&S	HF906	4044.4507.02	05/13/08	05/12/09
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: Cloud Feng
ENGINEER

REVIEWED BY: Hany Zhao
SENIOR ENGINEER