APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
China Industries Ltd T/A Wow! Stuff

RFX Racing system
Model No.: FX-1001

FCC ID: YCR-RFX-1001

Prepared for	:	China Industries Ltd T/A Wow! Stuff
Address	:	Creative Industries Centre, Wolverhampton Science Park, Wolverhampton, WV10 9TG UK
Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
Address	:	F1, Bldg. A, Chan Yuan New Material Port, Keyuan Rd. Science & Industry Park, Nan Shan, Shenzhen, Guangdong P.R. China
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Report Number	:	ATE20160039
Date of Test	:	Jan 07, 2016--Jan 10, 2016
Date of Report	:	Jan 11, 2016

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Description Page

Test Report Certification

Applicant	:	China Industries Ltd T/A Wow! Stuff
Address	:	Creative Industries Centre, Wolverhampton Science Park, Wolverhampton, WV10 9TG UK
Manufacturer	:	China Industries Ltd T/A Wow! Stuff
Address	:	Creative Industries Centre, Wolverhampton Science Park, Wolverhampton, WV10 9TG UK
Product	:	RFX Racing system
Model No.	:	FX-1001
Trade Name	:	Wow! Stuff

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249
ANSI C63.10: 2013

The EUT was tested according to FCC 47CFR 15.249 for compliance to FCC 47CFR 15.249 requirements

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.249 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Jan 07, 2016--Jan 10, 2016
Date of Report : Jan 11, 2016

Prepared by : Tim Zhang
(Tim.zhang, Engineer)

Approved & Authorized Signer : Sean Liu
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	RFX Racing system
Model Number	:	FX-1001
Power Supply	:	4.5V DC (batteries 3×)
Operate Frequency	:	2405-2463.5MHz
Antenna Gain	:	0dBi
Antenna type	:	PCB Antenna
Applicant	:	China Industries Ltd T/A Wow! Stuff
Address	:	Creative Industries Centre, Wolverhampton Science Park, Wolverhampton, WV10 9TG UK
Manufacturer	:	China Industries Ltd T/A Wow! Stuff
Address	:	Creative Industries Centre, Wolverhampton Science Park, Wolverhampton, WV10 9TG UK
Date of sample received	:	Jan 07, 2015
Date of Test	:	Jan 07, 2016-Jan 10, 2016

1.2. Special Accessory and Auxiliary Equipment

N/A

1.3.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.4.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 10, 2015	One Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 10, 2015	One Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 10, 2015	One Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 10, 2015	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2015	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2015	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2015	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan. 15, 2015	One Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 10, 2015	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 10, 2015	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 10, 2015	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 10, 2015	One Year

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2405MHz
Middle Channel: 2433.5MHz
High Channel: 2463.5MHz

3.2.Configuration and peripherals

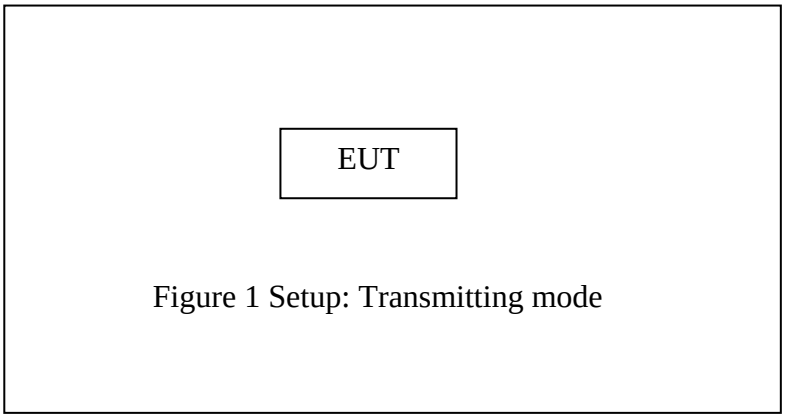


Figure 1 Setup: Transmitting mode

3.3.Remarks

FCC Permissive II Change Request for Company: China Industries Ltd T/A Wow! Stuff

Original FCC ID: YCR-RFX-1001

The transmitter module itself has not changed. Changes are made to the board layout (including component changes) near the Power supply circuit for product. So many of the data in the report is a reference to the previous report(report number:ATE20150918). We have added Radiated Spurious Emission Test and recorded in the report.

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.205(a), Section 15.209(a), Section 15.249, Section 15.35	Radiated Spurious Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. RADIATED SPURIOUS EMISSION TEST

5.1.Block Diagram of Test Setup

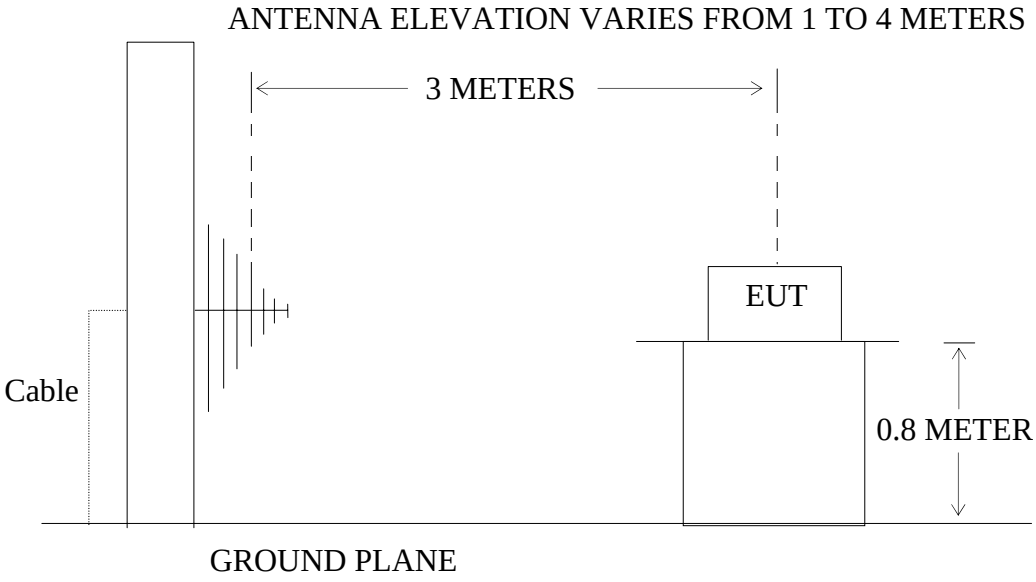
5.1.1.Block diagram of connection between the EUT and peripherals

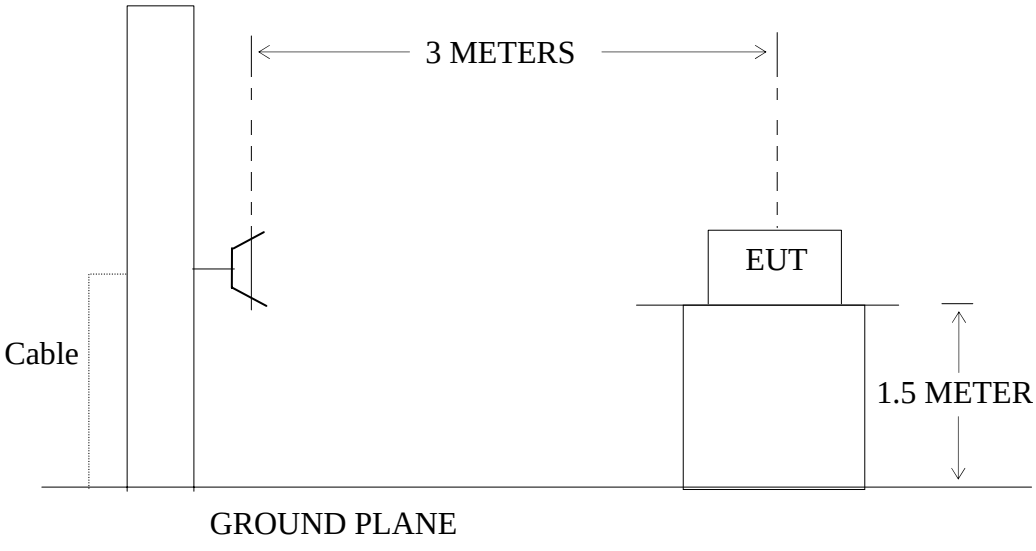
EUT

Setup: Transmitting mode

(EUT: FX-1001)

5.1.2.Semi-Anechoic Chamber Test Setup Diagram





5.2.The Limit For Section 15.249

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph A8.4(4), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

5.3.Restricted bands of operation

5.3.1.FCC Part 15.205 Restricted bands of operation

(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
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section

15.35 apply to these measurements.

5.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.5.Operating Condition of EUT

5.5.1.Setup the EUT and simulator as shown as Section 7.1.

5.5.2.Turn on the power of all equipment.

5.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 2405, 2433.5, 2463.5MHz.

5.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter(Below 1GHz) and 1.5m(above 1GHz) high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9 kHz to 25GHz is checked.
The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz
Peak detector above 1GHz
RBW (1 MHz), VBW (3MHz) for Peak measurement
RBW (1 MHz), VBW (10Hz) for AV measurement

The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

5.7.The Field Strength of Radiation Emission Measurement Results

PASS.

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission in three axes. The worst emissions are reported in all channels.

4. The radiation emissions from 18-25GHz are not reported, because the test values lower than the limits of 20dB.
5. The average measurement was not performed when peak measured data under the limit of average detection.
6. The 18-25GHz emissions are not reported, because the levels are too low against the limit

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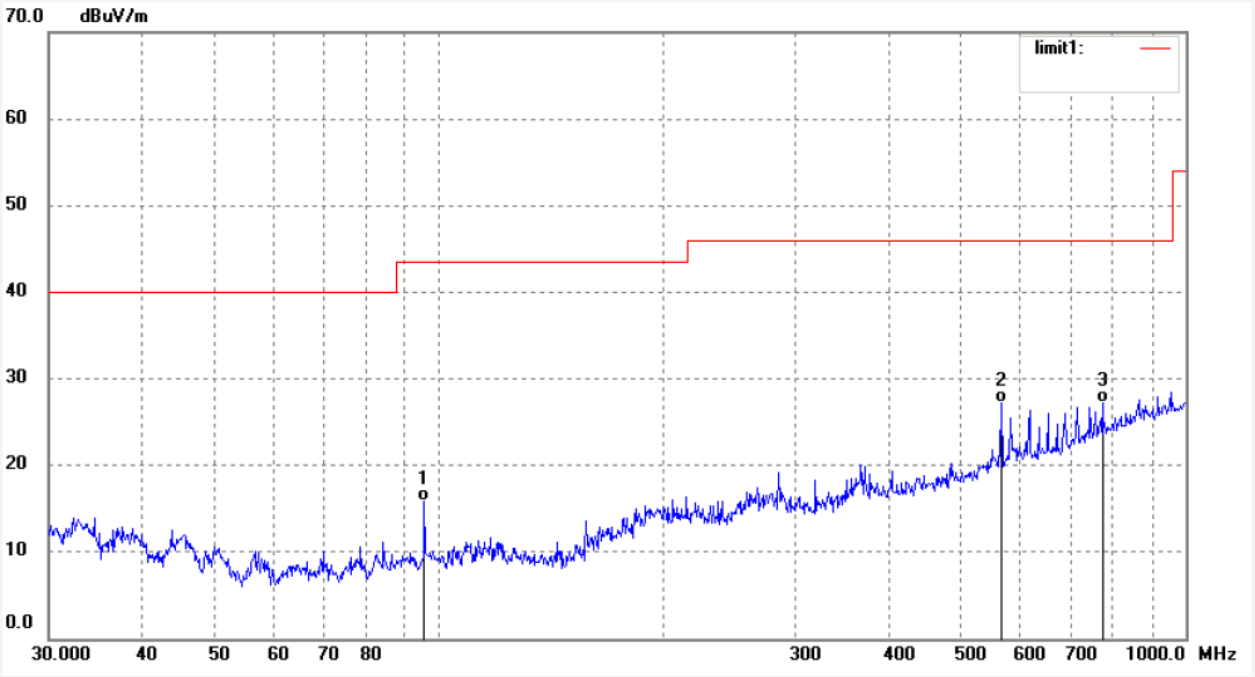
Job No.: star2016 #91	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 4.5V
Test item: Radiation Test	Date: 16/01/08/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 16/48/57
EUT: RFX Racing system	Engineer Signature: star
Mode: TX 2405MHz	Distance: 3m
Model: FX-1001	
Manufacturer: China Industries Ltd T/A Wow! Stuff	

Note: Report No.:ATE20160039



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6484	37.71	-21.94	15.77	43.50	-27.73	QP			
2	565.9776	39.67	-12.47	27.20	46.00	-18.80	QP			
3	773.7612	35.51	-8.22	27.29	46.00	-18.71	QP			

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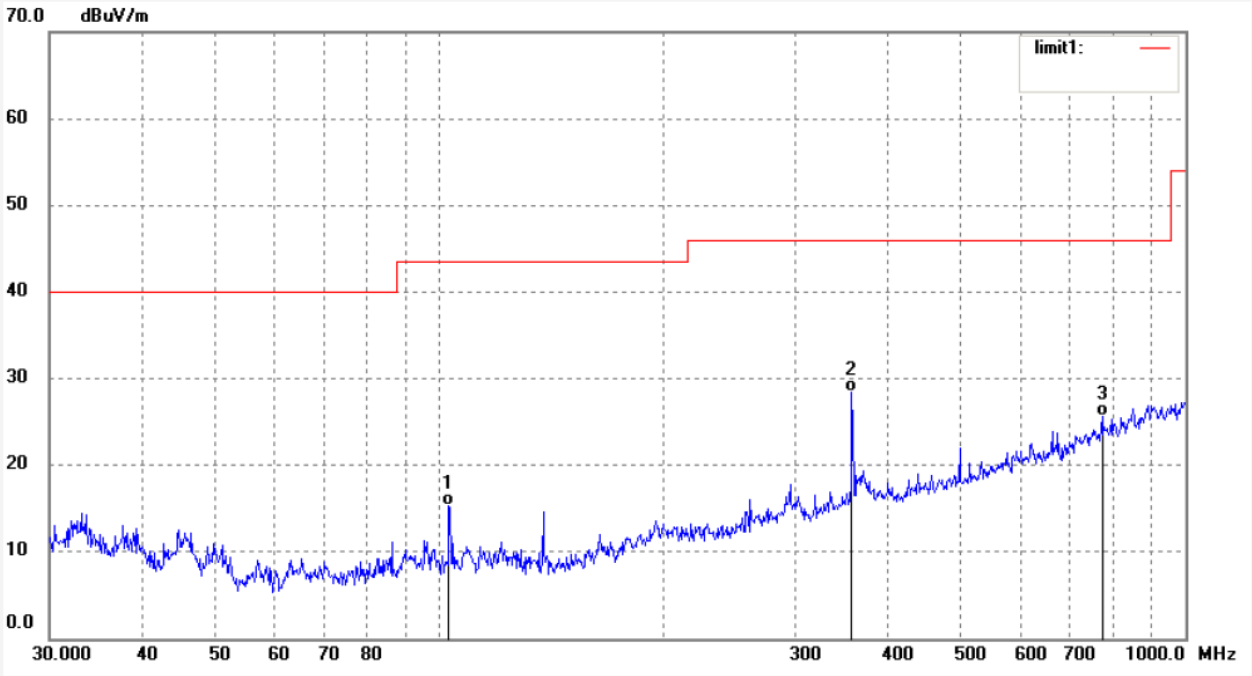
Job No.: star2016 #92
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFX Racing system
Mode: TX 2405MHz
Model: FX-1001
Manufacturer: China Industries Ltd T/A Wow! Stuff

Polarization: Vertical
Power Source: DC 4.5V
Date: 16/01/08/
Time: 16/50/52
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20160039



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	102.9728	38.18	-22.85	15.33	43.50	-28.17	QP			
2	357.1923	44.47	-16.02	28.45	46.00	-17.55	QP			
3	773.7612	33.87	-8.22	25.65	46.00	-20.35	QP			

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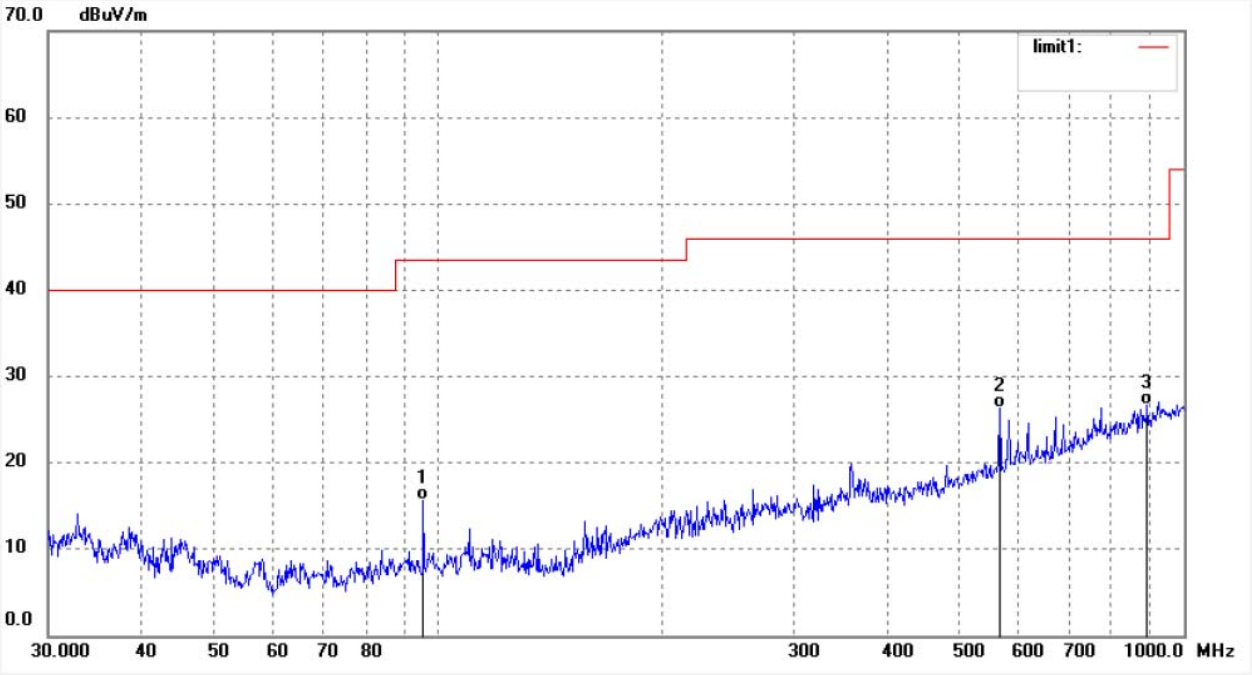
Job No.: star2016 #94
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFX Racing system
Mode: TX 2433.5MHz
Model: FX-1001
Manufacturer: China Industries Ltd T/A Wow! Stuff

Polarization: Horizontal
Power Source: DC 4.5V
Date: 16/01/08/
Time: 16/52/22
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20160039



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6484	37.66	-21.94	15.72	43.50	-27.78	QP			
2	565.9776	38.83	-12.47	26.36	46.00	-19.64	QP			
3	893.6557	32.85	-6.22	26.63	46.00	-19.37	QP			

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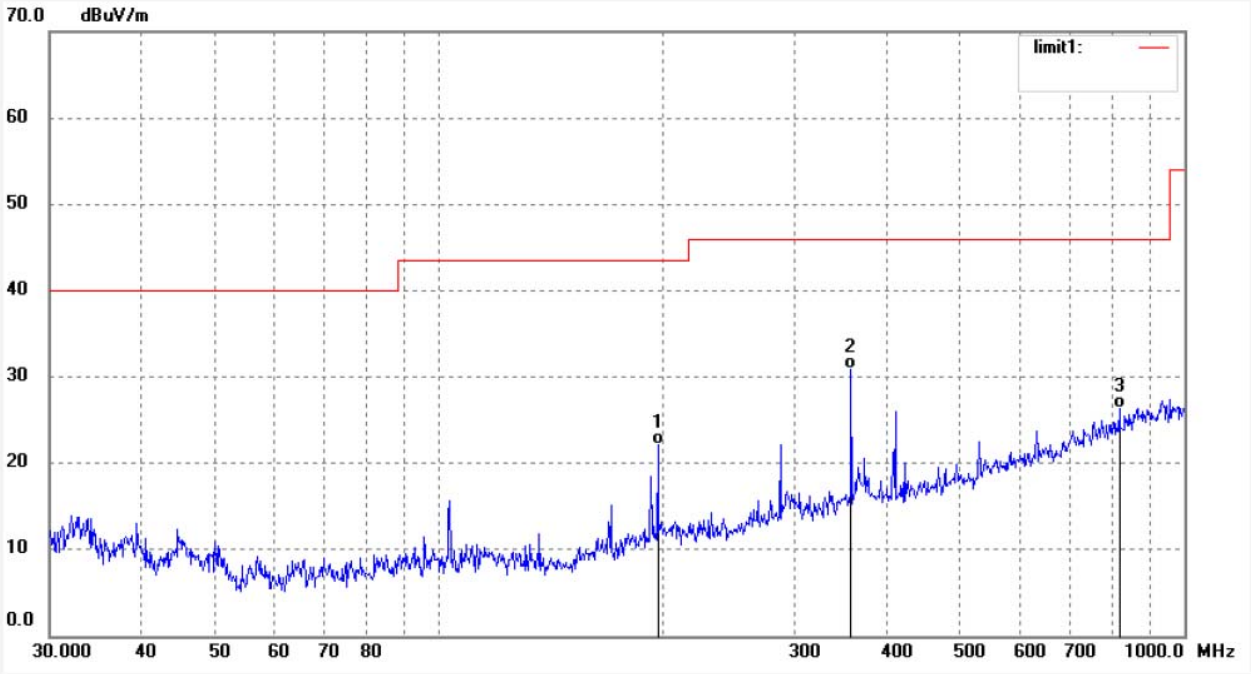
Job No.: star2016 #93
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFX Racing system
Mode: TX 2433.5MHz
Model: FX-1001
Manufacturer: China Industries Ltd T/A Wow! Stuff

Polarization: Vertical
Power Source: DC 4.5V
Date: 16/01/08/
Time: 16/51/41
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20160039



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	196.5595	42.55	-20.42	22.13	43.50	-21.37	QP			
2	357.1923	46.85	-16.02	30.83	46.00	-15.17	QP			
3	818.5062	33.86	-7.47	26.39	46.00	-19.61	QP			

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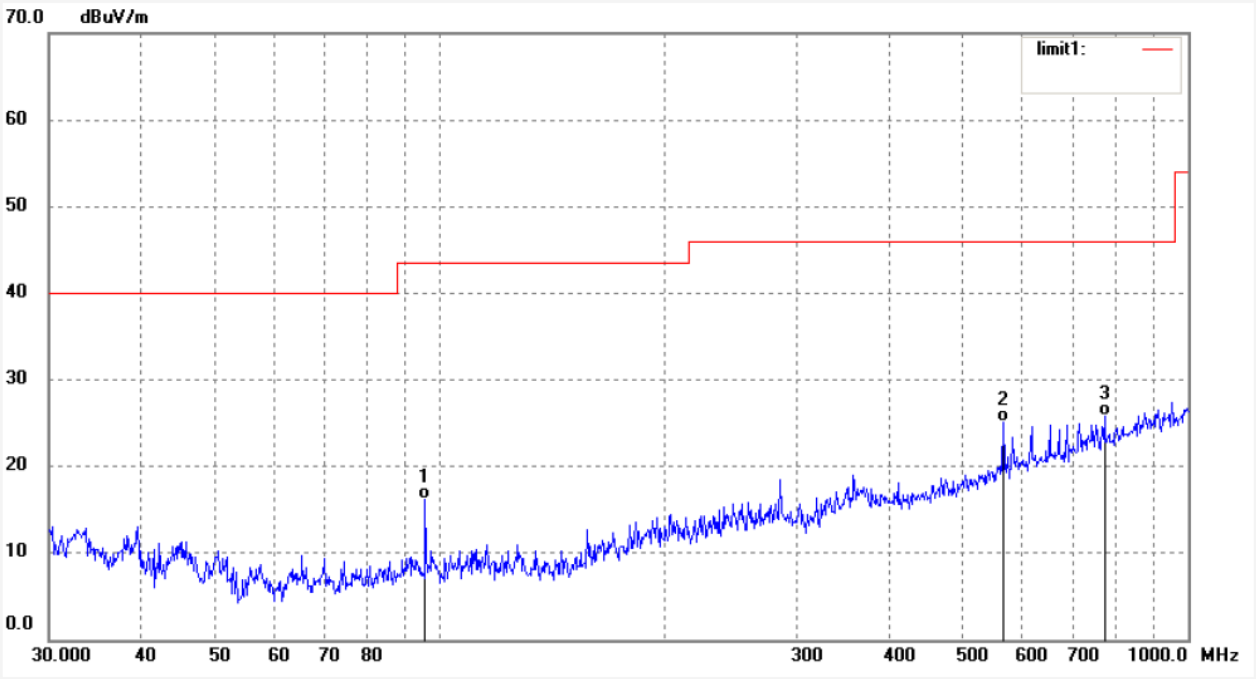
Job No.: star2016 #95	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: DC 4.5V
Test item: Radiation Test	Date: 16/01/08/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 16/53/01
EUT: RFX Racing system	Engineer Signature: star
Mode: TX 2463.5MHz	Distance: 3m
Model: FX-1001	
Manufacturer: China Industries Ltd T/A Wow! Stuff	

Note: Report No.:ATE20160039



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	95.6485	38.08	-21.94	16.14	43.50	-27.36	QP			
2	565.9776	37.55	-12.47	25.08	46.00	-20.92	QP			
3	773.7614	34.06	-8.22	25.84	46.00	-20.16	QP			

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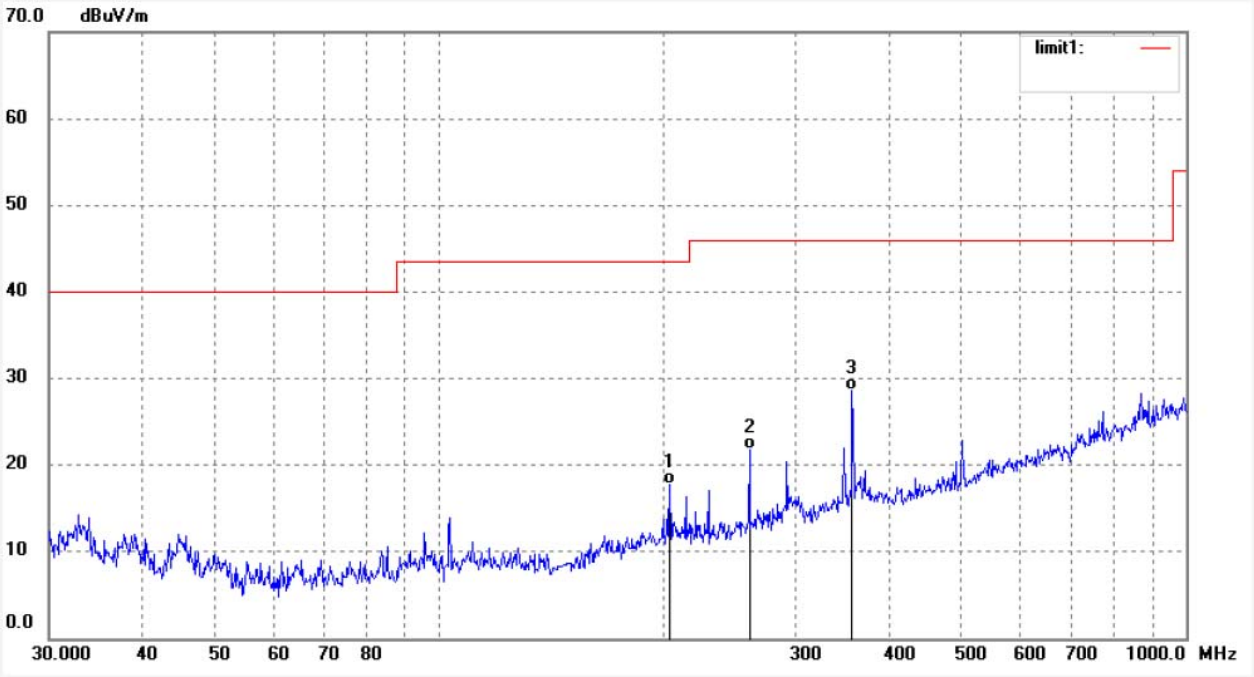
Job No.: star2016 #96
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: RFX Racing system
Mode: TX 2463.5MHz
Model: FX-1001
Manufacturer: China Industries Ltd T/A Wow! Stuff

Polarization: Vertical
Power Source: DC 4.5V
Date: 16/01/08/
Time: 16/53/58
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20160039



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	203.5886	37.90	-20.11	17.79	43.50	-25.71	QP			
2	260.3566	40.84	-19.11	21.73	46.00	-24.27	QP			
3	357.1923	44.61	-16.02	28.59	46.00	-17.41	QP			

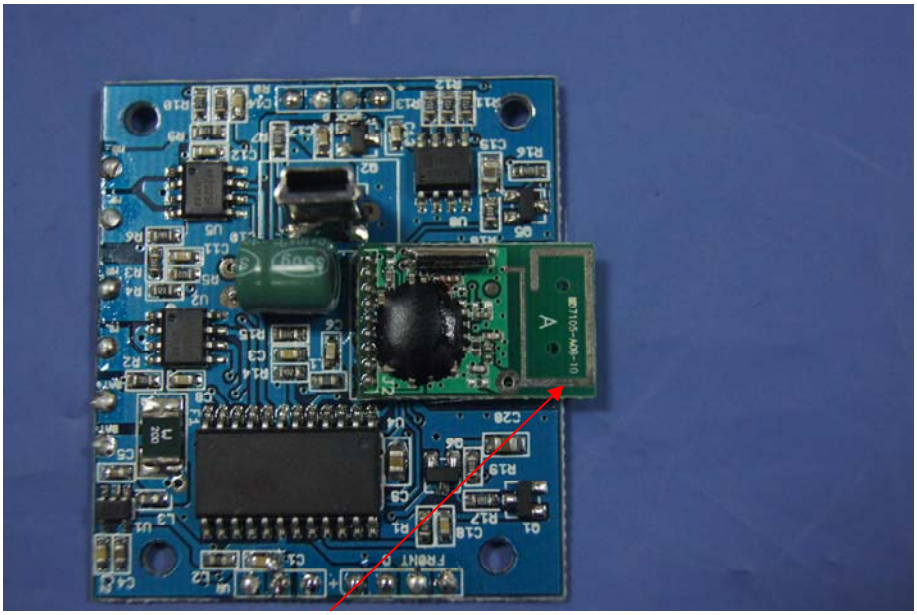
6. ANTENNA REQUIREMENT

6.1.The Requirement

According to Section 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.

6.2.Antenna Construction

Device is equipped with PCB antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna