TECHNICAL REPORT

卓時檢測 TIMEWAY TESTING LABORATORY

TESTING CNAS L2292

ISO/IEC17025 Accredited Lab.

Report No: FCC1102041
File reference No: 2011-03-18

Applicant: JOYSWAY HOBBY (HK) LIMITED

Product: radio control speed boat

Model No: 8206

Brand Name: Joysway

Test Standards: FCC Part 15 Subpart C, Paragraph 15.249

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: March 18, 2011

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

East 5/Block 4, Anhua Industrial Zone, No.8,Tairan Rd. CheGongMiao, FuTian District, Shenzhen, CHINA.
Tel (755) 83448688 Fax (755) 83442996

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-01

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-01.

Test Report Conclusion

Content

1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: JOYSWAY HOBBY (HK) LIMITED

Address: No. 141, Guanhui Road, Wanjiang, Dongguan, China

Telephone: +86-769-23296899

Fax: +86-769-88735015

1.3 Description of EUT

Product:	radio control speed boat
FCC ID:	ZDTJH80002
Manufacturer:	JOYSWAY HOBBY (HK) LIMITED
Brand Name:	Joysway
Model Number:	8206
Additional Model Name	8203, 8205, 8207, 8208, 8209, 8103, 8105, 8106, 8107, 8108, 8109, 8301, 8302, 8303, 8306, 8308
Additional Trade Name	N/A
Rating:	DC 9V batteries
Modulation Type:	GFSK
Operation Frequency	2403-2450MHz
Antenna Designation	Dipole antenna and the maximum gain is 2.5dBi.

1.4 Submitted Sample

1 Sample

1.5 Test Duration

2011-02-21to 2011-03-18

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

The sample tested by Terry Tang

Print Name: Terry Tang

2.0	**Test Equipments**				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2010-12-05	2011-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2010-12-05	2011-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2010-12-05	2011-12-04
Ultra Broadband ANT	Schwarebeck	VULB9163	9163/340	2011-2-22	2012-02-21
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2011-03-30	2012-03-29
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2011-02-18	2012-02-17
Power meter	Anritsu	ML2487A	6K00003613	2011-02-18	2012-02-17
Power sensor	Anritsu	MA2491A	32263	2011-02-8	2012-02-17
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2011-02-18	2012-02-17
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2010-08-15	2011-08-14
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2010-07-02	2011-07-01
Loop Antenna	EMCO	6507	102615	2011-04-26	2012-04-25

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	N/A	Not applicable
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	PASS	Complies
FCC Part 15, Paragraph 15.209	Radiated Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	PASS	Complies

3.2 Test Standards

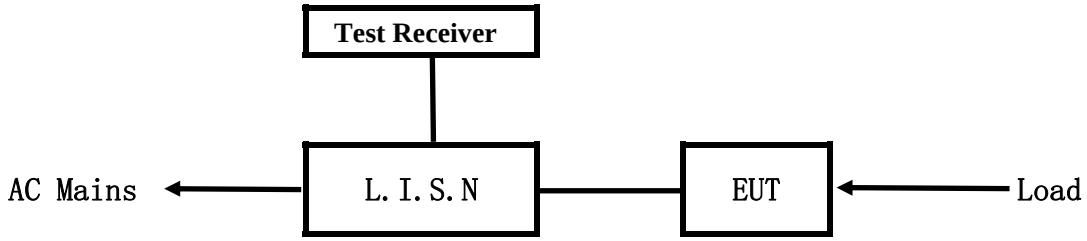
FCC Part 15 Subpart C, Paragraph 15.249

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

5. Power Line Conducted Emission Test

5.1 Schematics of the test

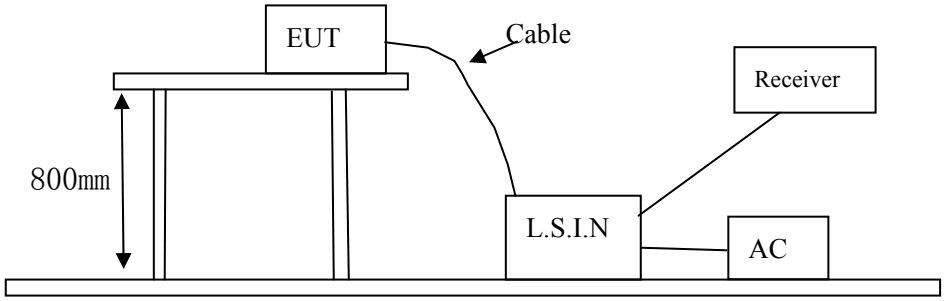


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

A. EUT

Device	Manufacturer	Model	FCC ID
radio control speed boat	JOYSWAY HOBBY (HK) LIMITED	8206	ZDTJH80002

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency(MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Note: Due to DC Operation, this test item not applicable

6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

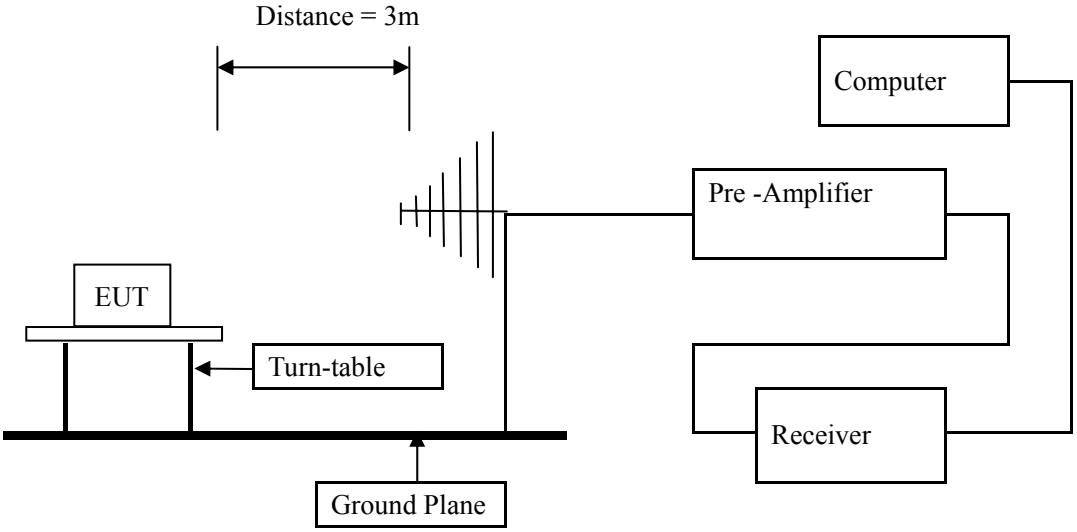
(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.

(3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with RBW=VBW=1 MHz and PK detector. AV values with RBW=1MHz, VBW=10Hz and PK detector Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



Configuration of The EUT

Same as section 5.3 of this report

EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental (3m)			Field Strength of Harmonics (3m)		
	mV/m	**dBuV/m**		**uV/m**	**dBuV/m**	
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

Note: 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009-0.490	3	20log 2400/F (kHz) + 40
0.490-1.705	3	20log 24000/F (kHz) + 20
1.705-30	3	20log 30 + 20
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

5. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK and AV detector.

6. If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula Ld1 = Ld2 * (d2/d1)

7. New battery was used during the test

6.5 Test result

A Fundamental & Harmonics Radiated Emission Data

Product:	radio control speed boat	Test Mode:	Low Channel
Test Item:	Fundamental Radiated Emission Data	Temperature:	25℃
Test Voltage:	9VDC	Humidity:	56%
Test Result:	Pass		

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz / Vert	Limits PK/AV (dBuV/m)	Margin (dB)
2403	86.5 (PK)	H	114/94	--
2403	95.3 (PK)/82.8(AV)	V	114/94	--
4806	--	H/V	74/54	--
4806	--	H/V	74/54	--
7209	--	H/V	74/54	--
9612	--	H/V	74/54	--
12015	--	H/V	74/54	--
14418	--	H/V	74/54	--
16821	--	H/V	74/54	--
19224	--	H/V	74/54	--
21627	--	H/V	74/54	--

TEST REPORT

Product:	radio control speed boat	Test Mode:	Middle Channel
Test Item:	Fundamental Radiated Emission Data	Temperature:	25℃
Test Voltage:	9VDC	Humidity:	56%
Test Result:	Pass		

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz / Vert	Limits PK/AV (dBuV/m)	Margin (dB)
2425	85.3 (PK)	H	114/94	--
2425	94.3 (PK)/81.5 (AV)	V	114/94	--
4850	--	V	74/54	--
4850	--	H	74/54	--
7275	--	H/V	74/54	--
9700	--	H/V	74/54	--
12125	--	H/V	74/54	--
14450	--	H/V	74/54	--
16975	--	H/V	74/54	--
19400	--	H/V	74/54	--
21825	--	H/V	74/54	--
24250	--	H/V	74/54	--

TEST REPORT

Product:	radio control speed boat	Test Mode:	High Channel
Test Item:	Fundamental Radiated Emission Data	Temperature:	25℃
Test Voltage:	9VDC	Humidity:	56%
Test Result:	Pass		

Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz / Vert	Limits PK/AV (dBuV/m)	Margin (dB)
2450	86.2 (PK)	H	114/94	--
2450	94.9 (PK)/82.3(AV)	V	114/94	--
4900.	--	V	74/54	--
4900.	--	H	74/54	--
7350	--	H/V	74/54	--
9800	--	H/V	74/54	--
12250	--	H/V	74/54	--
14700	--	H/V	74/54	--
17150	--	H/V	74/54	--
19600	--	H/V	74/54	--
22050	--	H/V	74/54	--
24500	--	H/V	74/54	--

Note: (1) PK= Peak, AV= Average

(2) Emission Level = Reading Level + Probe Factor + Cable Loss.

(3)Margin=Emission-Limits

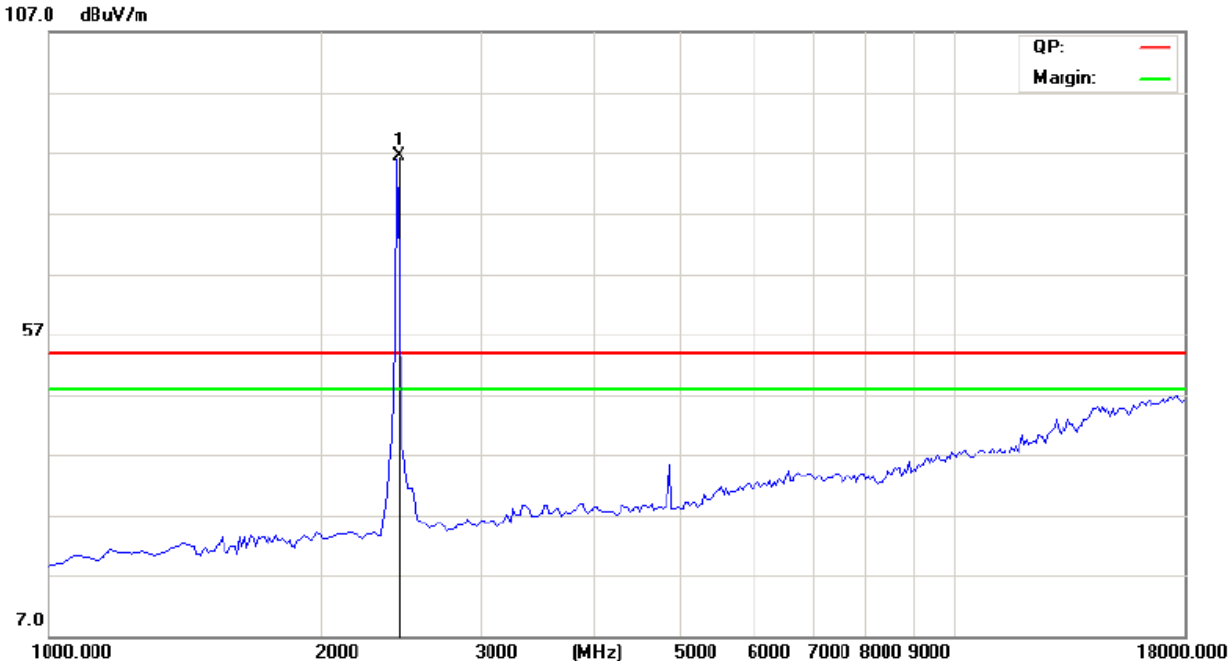
(4)According to section 15.35(b), the peak limit is 20dB higher than the average limit

(5) The measured PK value less than the AV limit.

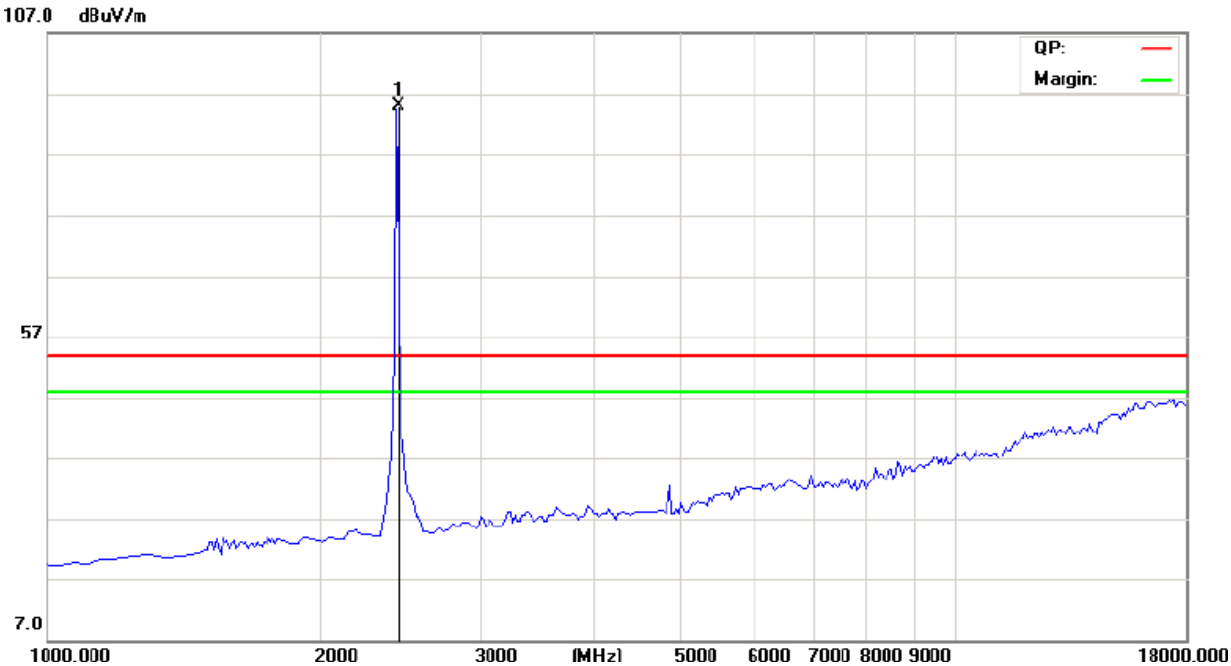
Please refer to following diagram for individual

Low Channel

H

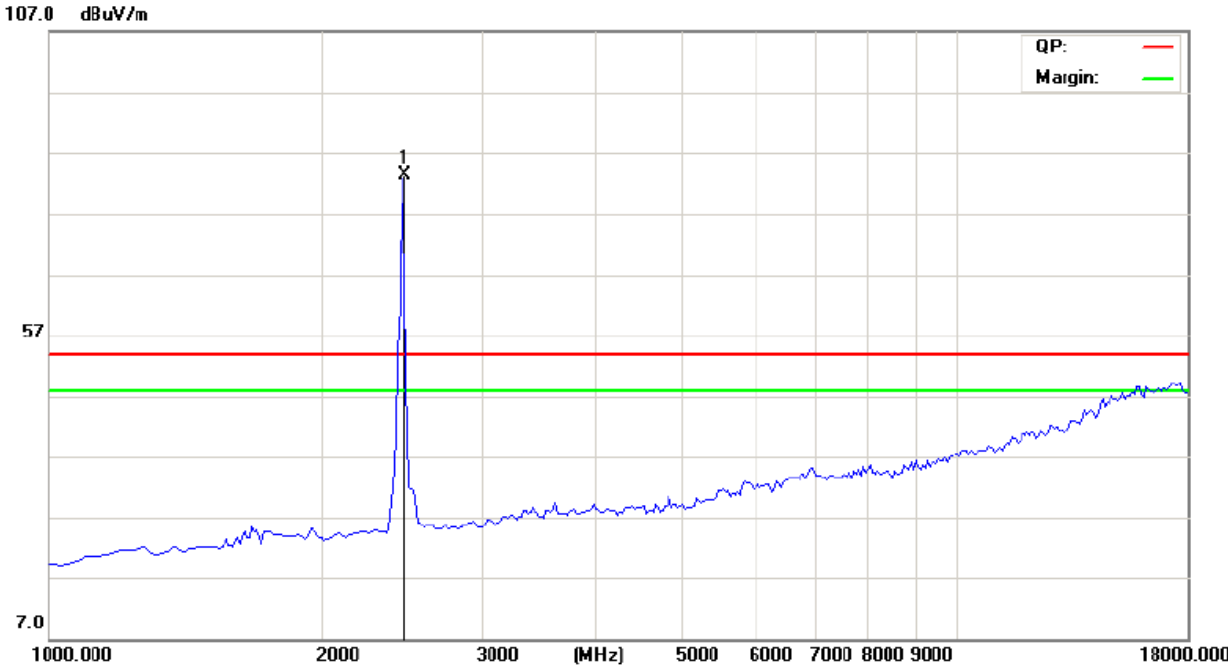


V

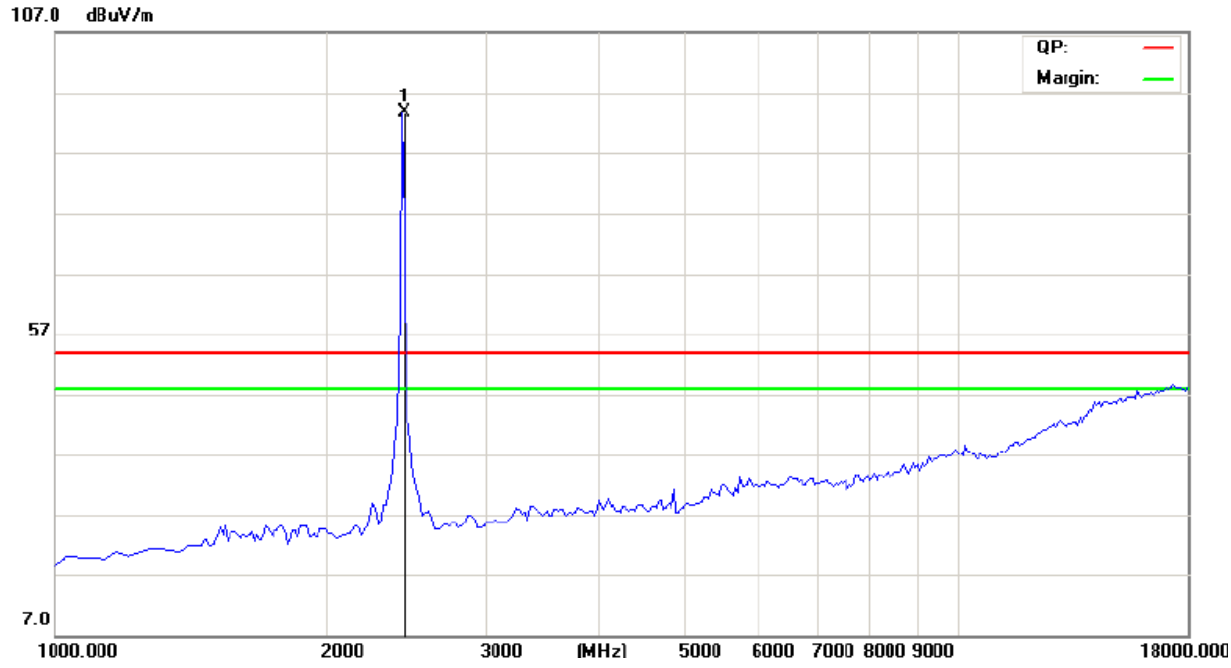


Please refer to following diagram for individual
Middle Channel

H



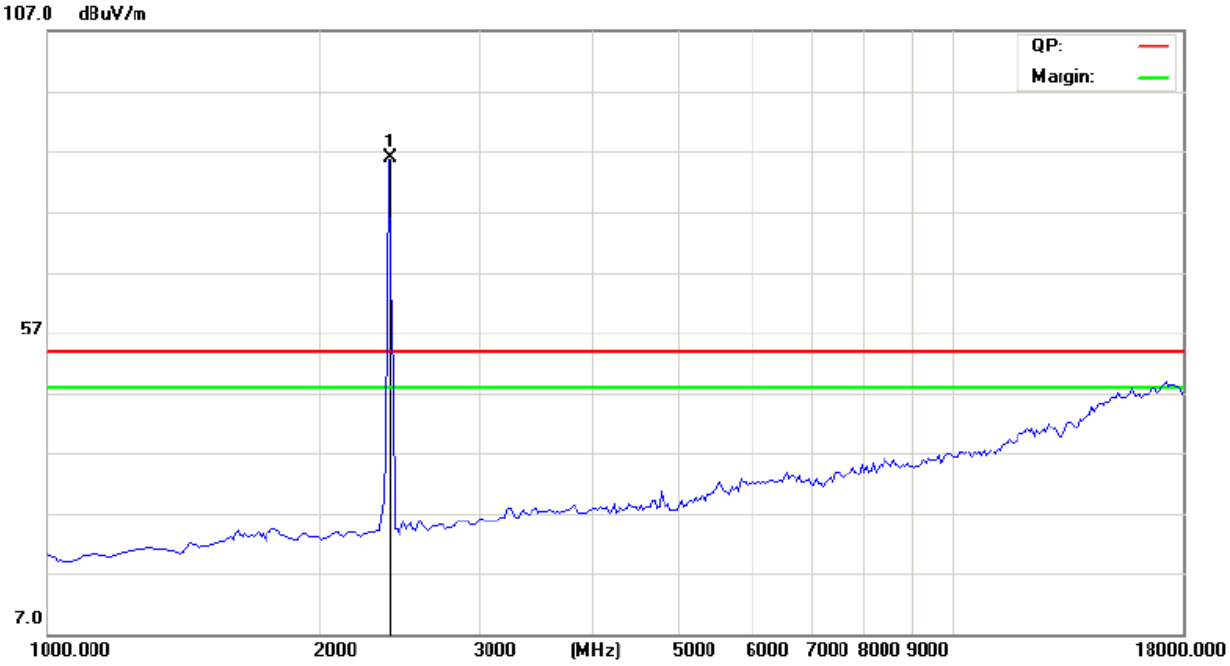
V



Please refer to following diagram for individual

High Channel

H



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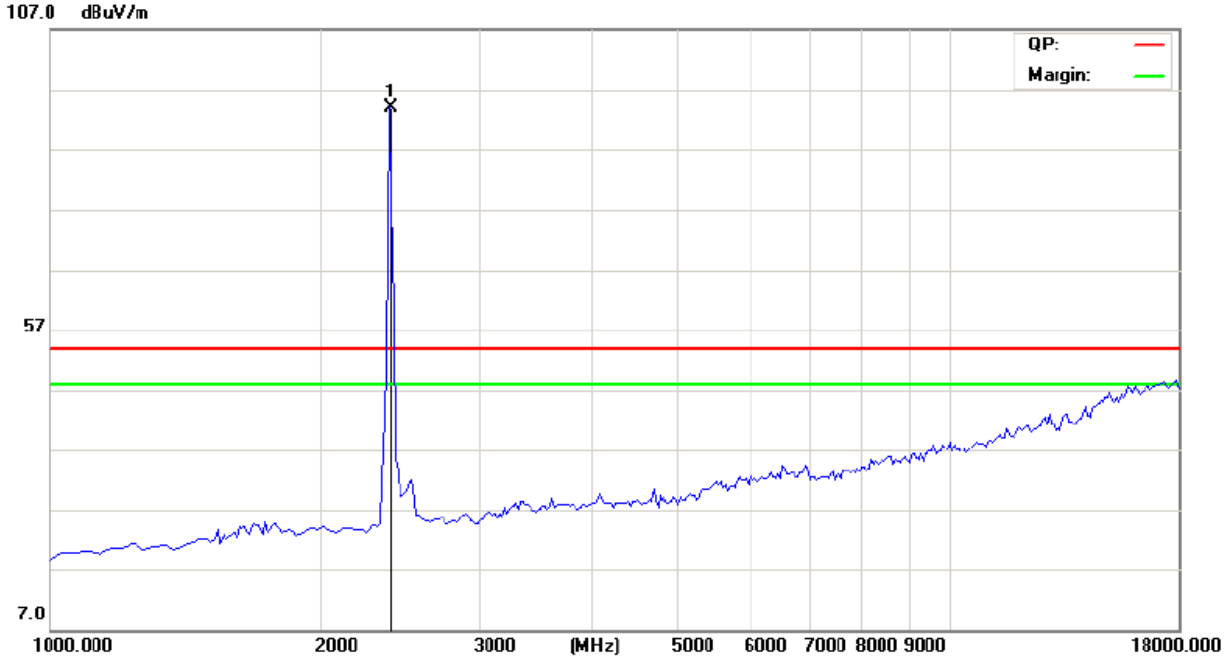


Note: For the radiated emissions from 18GHz-25GHz, it is the floor noise that meets the requirement of FCC rule.

B. **General Radiated Emission Data**

Radiated Emission In Horizontal (30MHz----1000MHz)

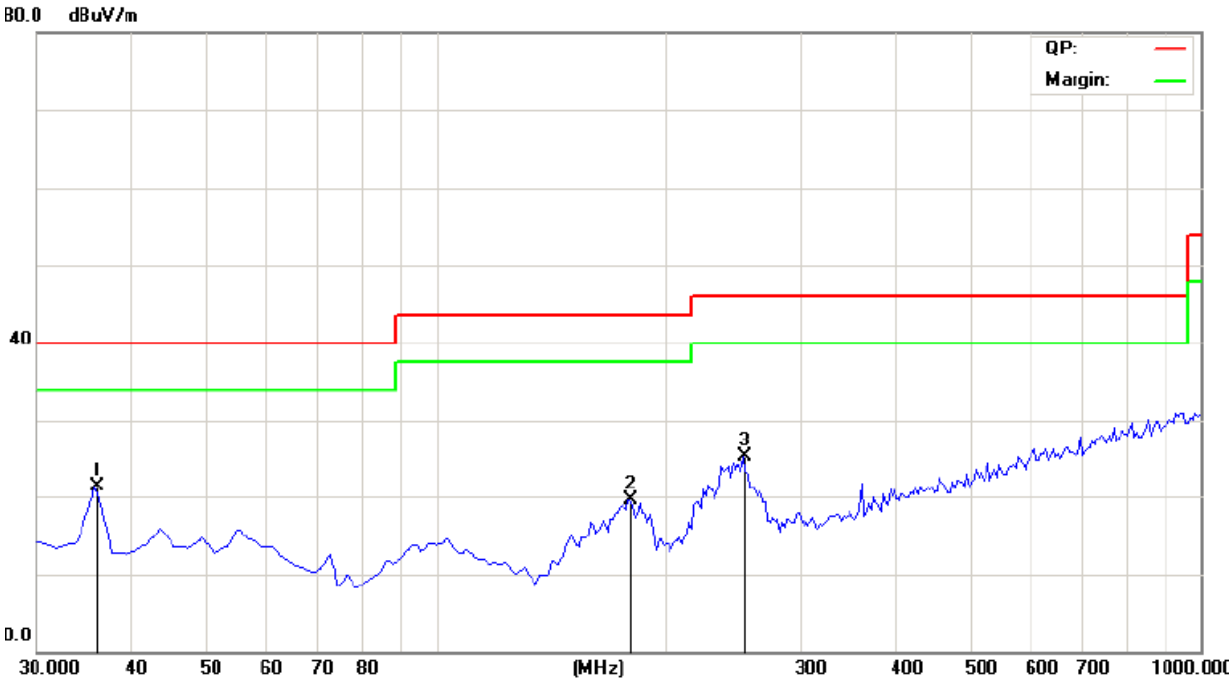
Model: 8206

EUT set Condition: Keep transmitting

Mode: Normal work

Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
--	--	H	--

Radiated Emission In Vertical (30MHz---1000MHz)

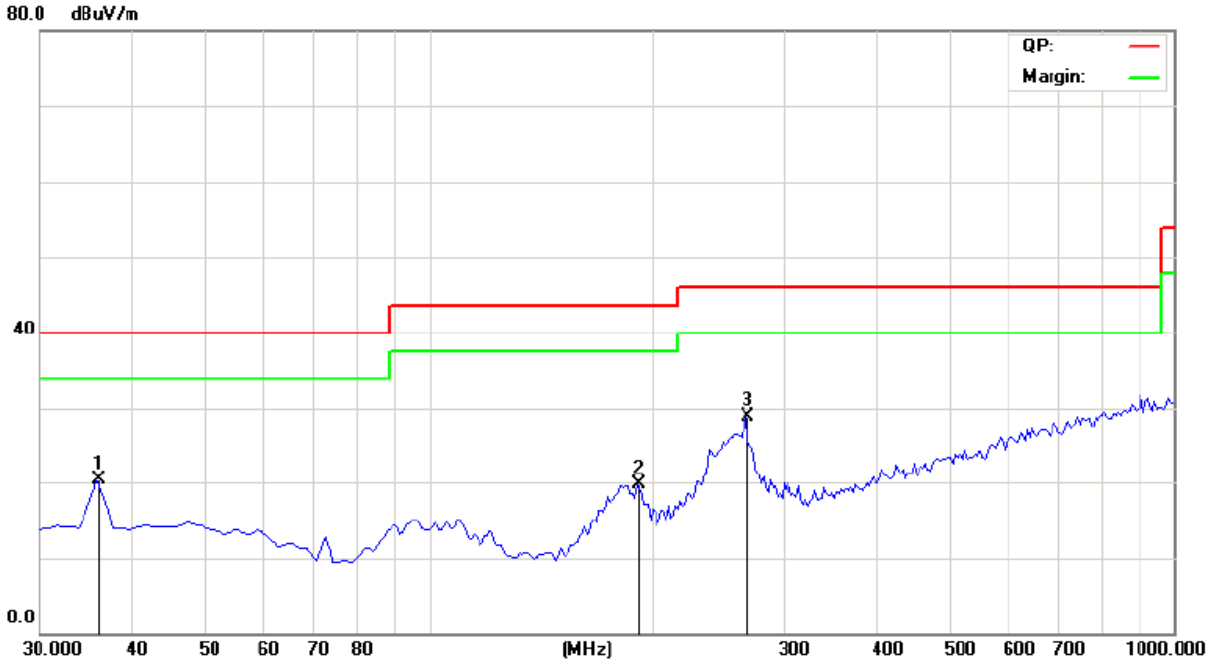
Model: 8206

EUT set Condition: Keep transmitting

Mode: Normal work

Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
--	--	V	--

7. Band Edge

7.1 Test Method and test Procedure:

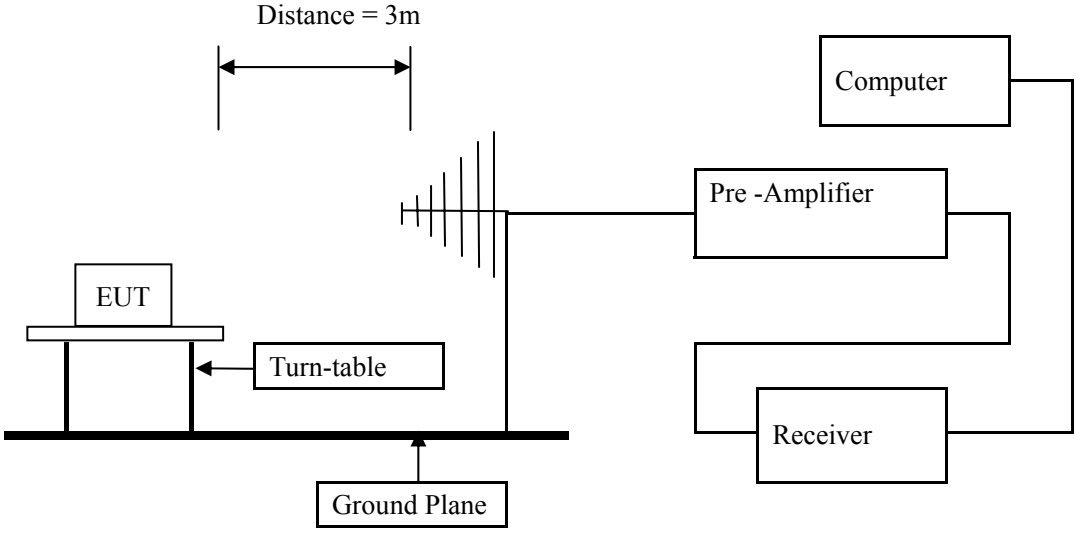
(1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

(2) Set Spectrum as RBW=VBW=1MHz and Peak detector used

(3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(4) The antenna polarization: Vertical polarization and Horizontal polarization.

7. 2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing

7.3 Configuration of The EUT

Same as section 5.3 of this report

7.4 EUT Operating Condition

Same as section 5.4 of this report.

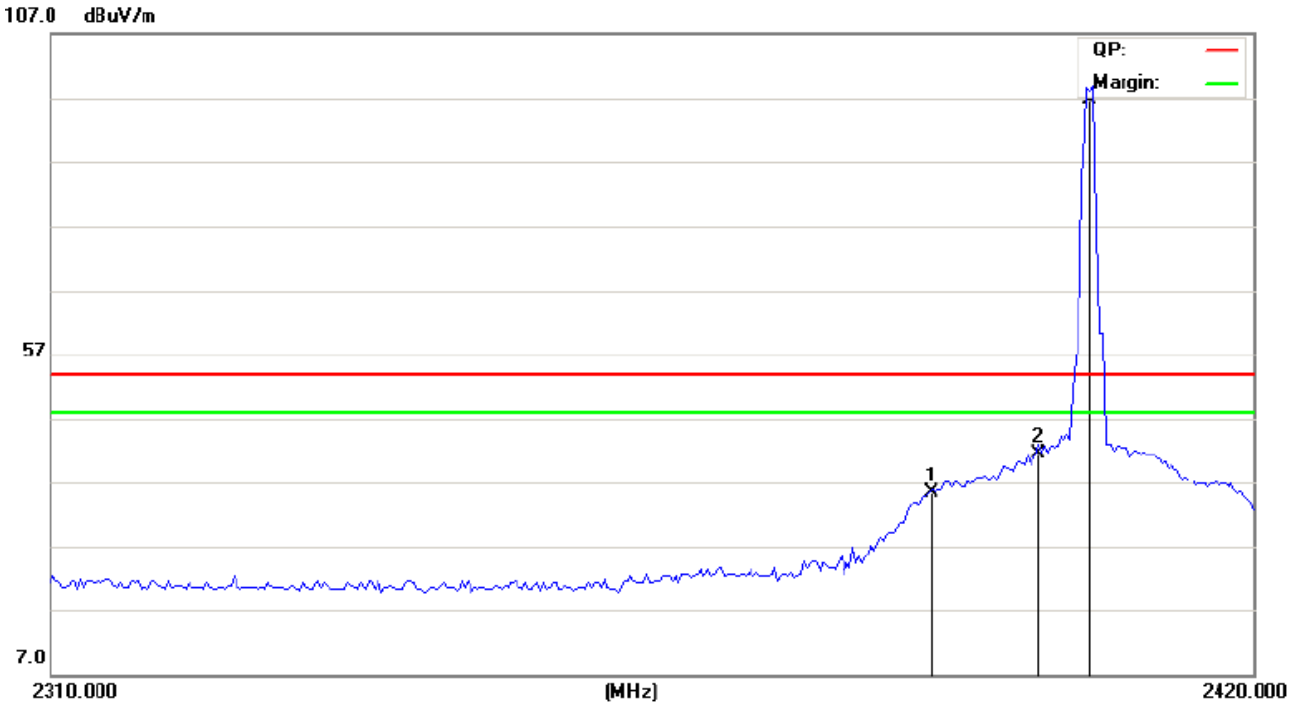
7.5 Band Edge Limit

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 Section 15.209, whichever is the lesser attenuation.

7.6 Test Result

Product:	radio control speed boat		Test Mode:	Low Channel
Mode	Keeping Transmitting		Test Voltage	DC9V
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
2390MHz	PK (dBμV/m)	35.57(V)/33.38(H)	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)
2400MHz	PK (dBμV/m)	40.66(V)/39.58(H)		74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

V



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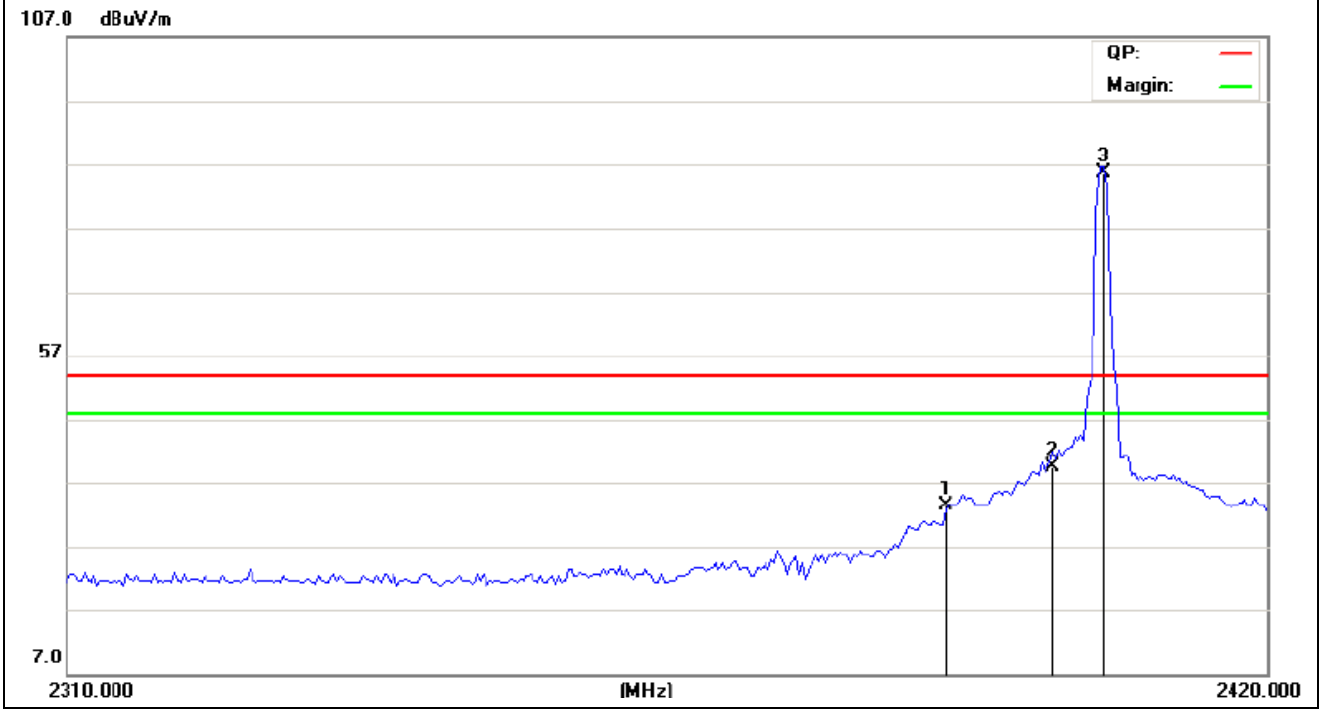
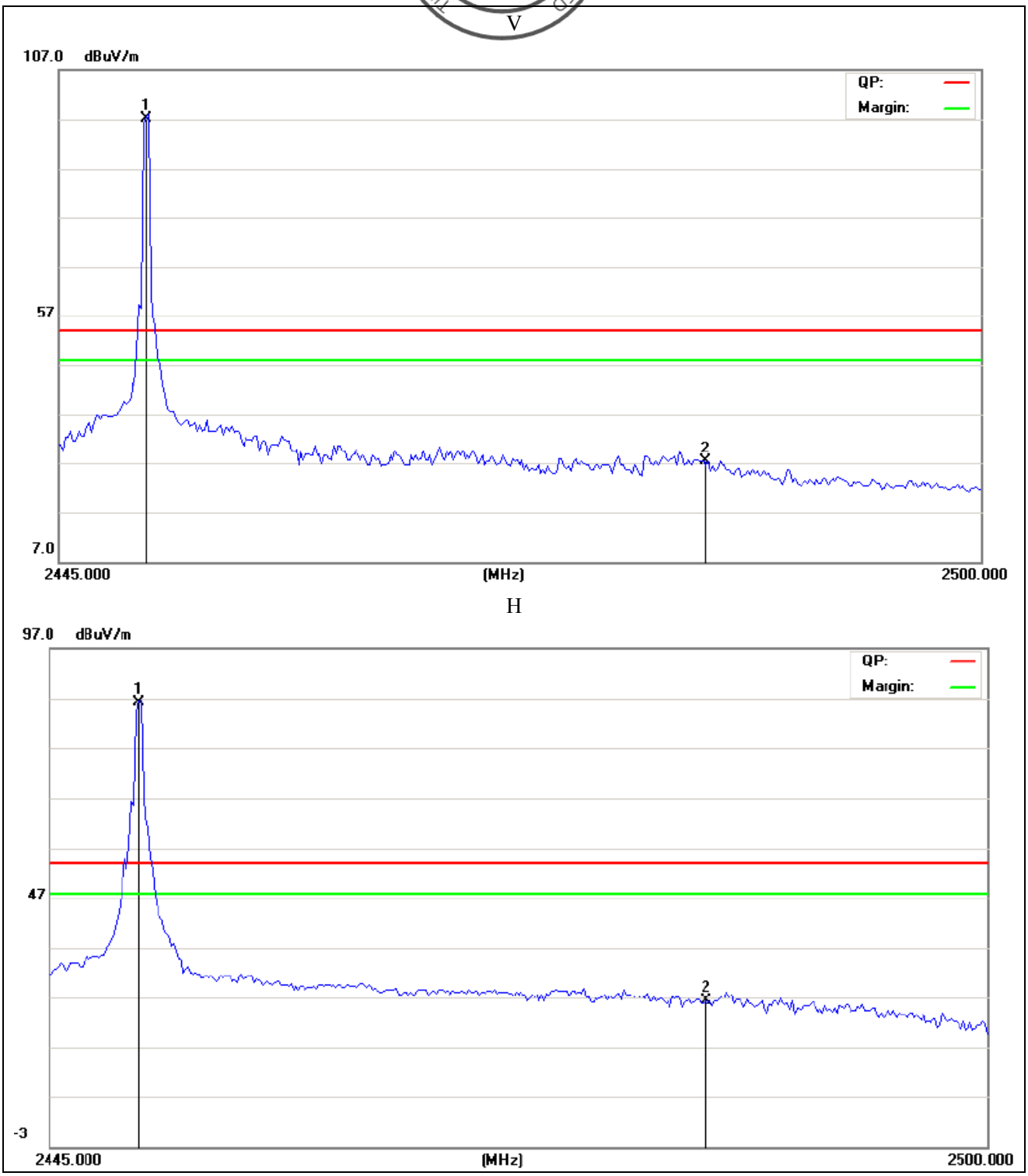


Note: Field Strength in restrict band measured in conventional manner

TEST REPORT

Product:	radio control speed boat		Test Mode:	High Channel
Mode	Keeping Transmitting		Test Voltage	DC9V
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5MHz	PK (dBμV/m)	27.56(V)/27.24(H)	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

V



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Note: 1. Field Strength in restrict band measured in conventional manner

2. Emission Level = Reading Level + Probe Factor + Cable Loss.

8.0 Antenna Requirement

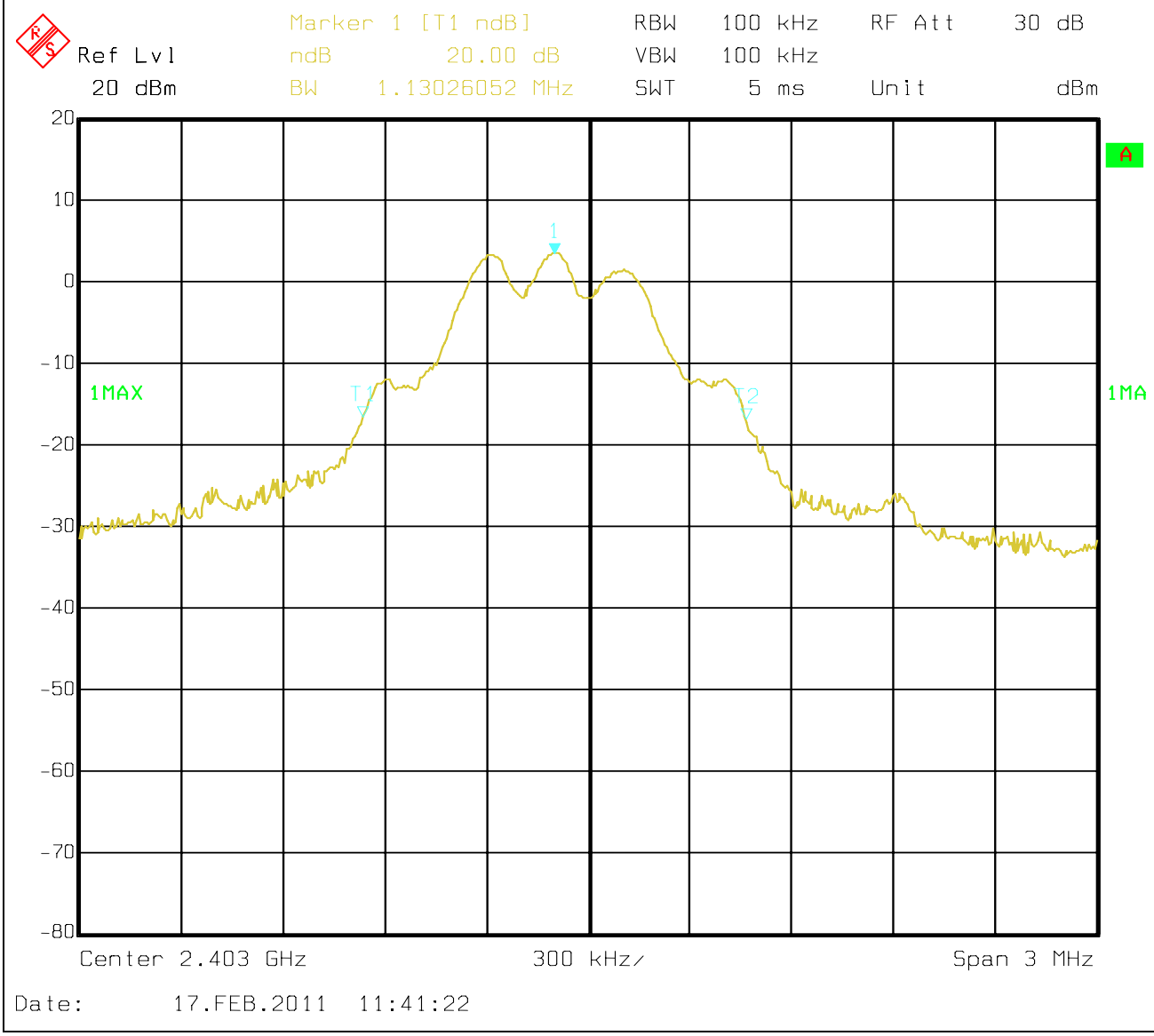
Applicable Standard

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

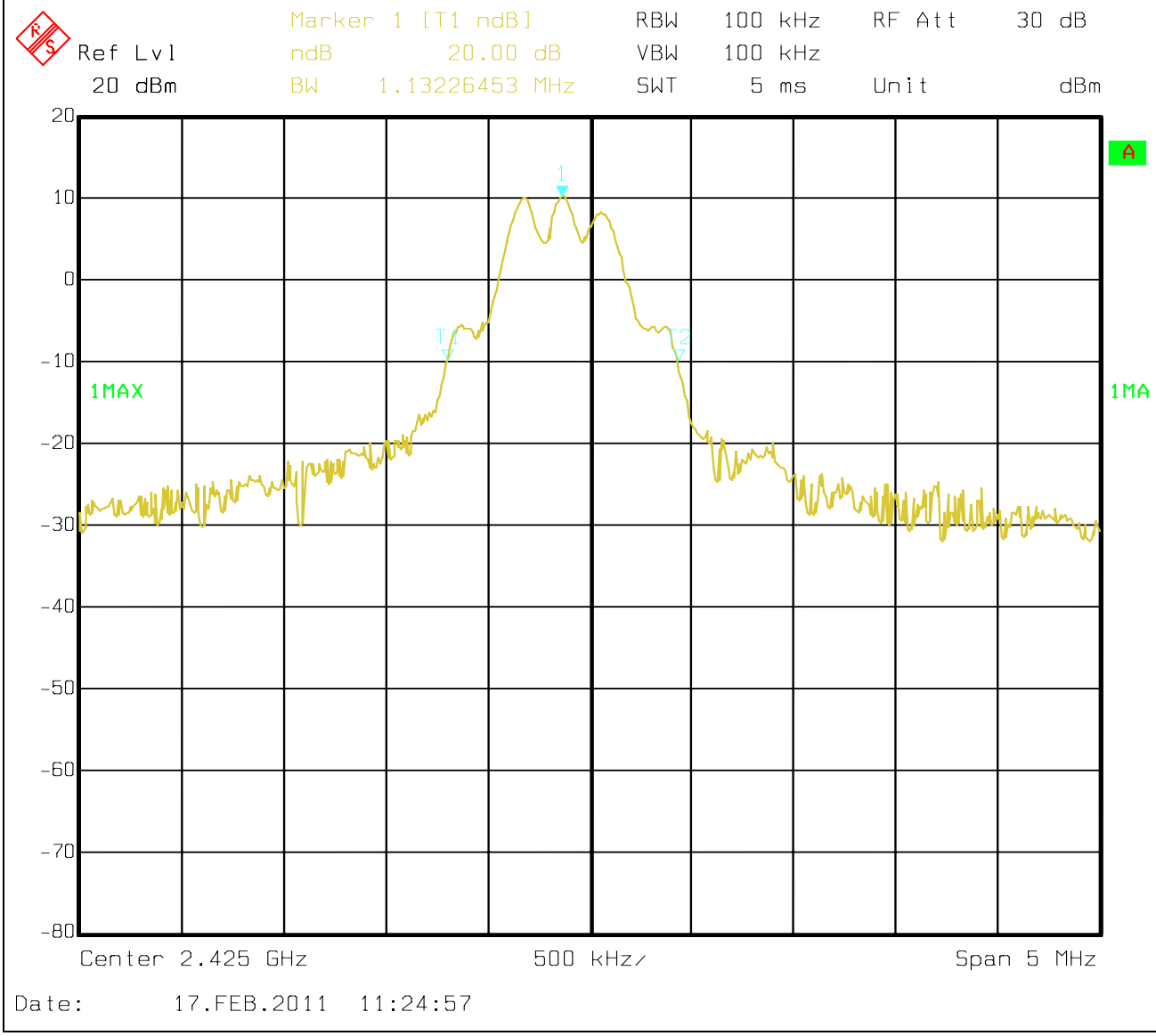
Dipole antenna with RF cable connected to RF board by means of soldering. The maximum Gain of the antennas is 2.5dBi.

Test Result: Pass

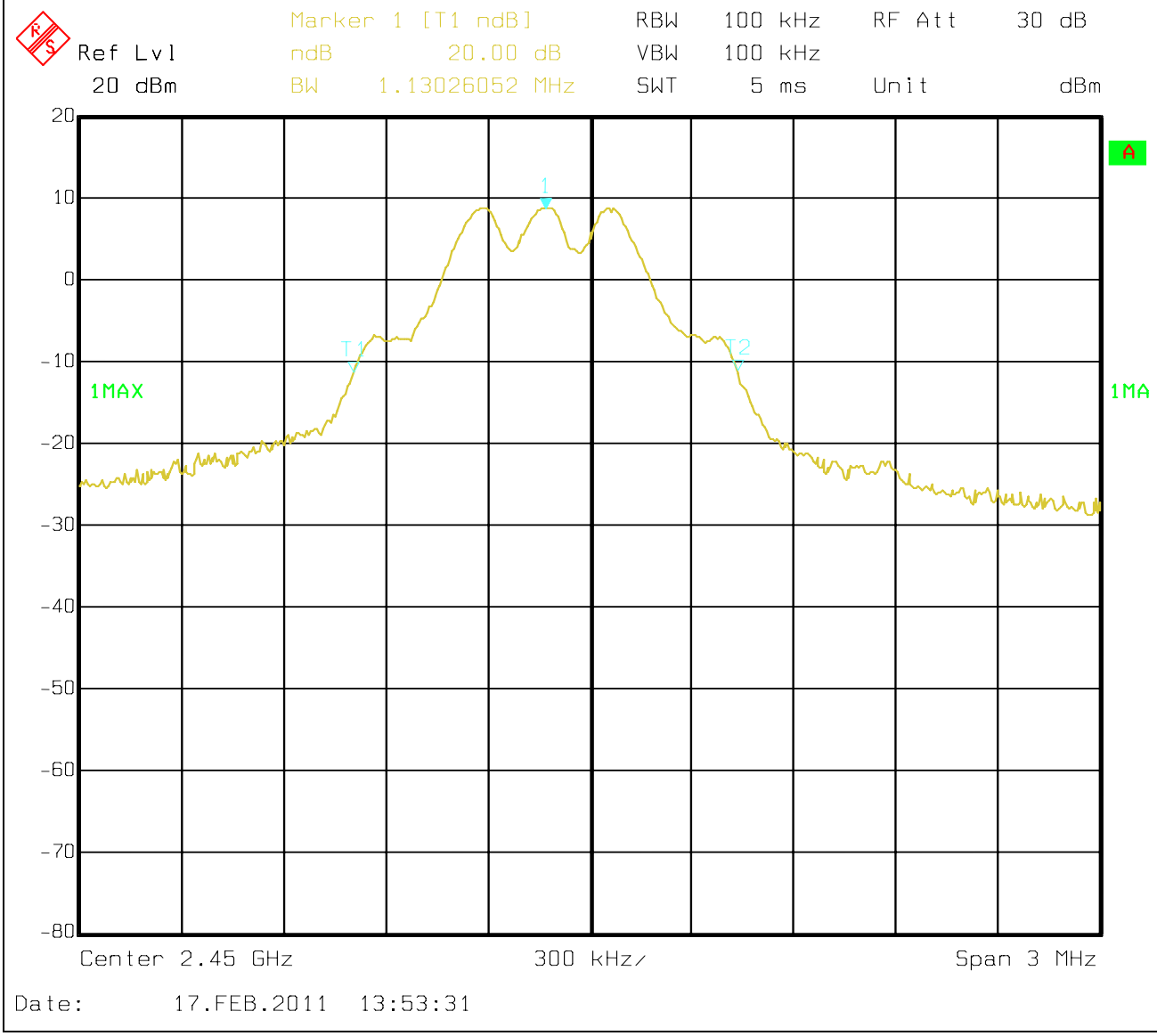
9.0 20dB Bandwidth Measurement			
Product:	radio control speed boat	Test Mode:	Low Channel
Mode	Keeping Transmitting	Test Voltage	DC9V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1130.3KHz	--	--



9.1 20dB Bandwidth Measurement			
Product:	radio control speed boat	Test Mode:	Middle Channel
Mode	Keeping Transmitting	Test Voltage	DC9V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1132.3KHz	--	--



9.2 20dB Bandwidth Measurement			
Product:	radio control speed boat	Test Mode:	High Channel
Mode	Keeping Transmitting	Test Voltage	DC9V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	1130.3KHz	--	--



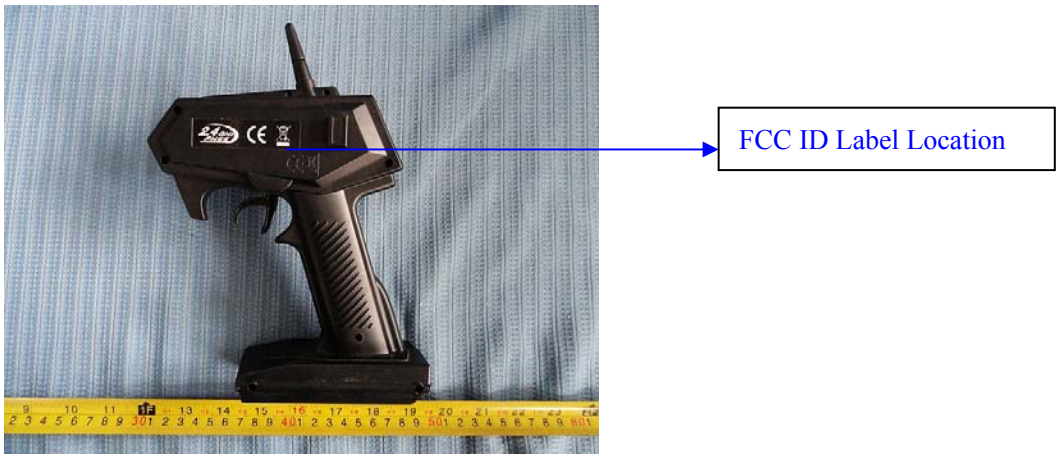
10.0 FCC ID Label

FCC ID: ZDT80002

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.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



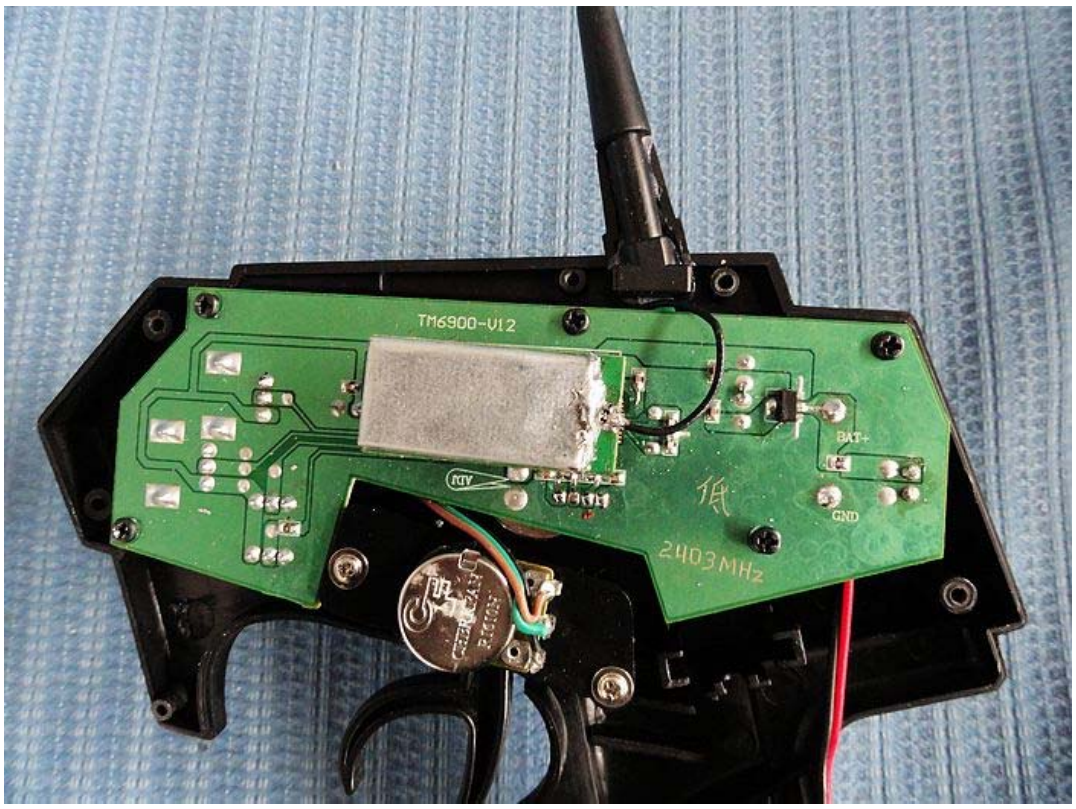
11.0 Photo of testing

11.2 Radiated emission test view

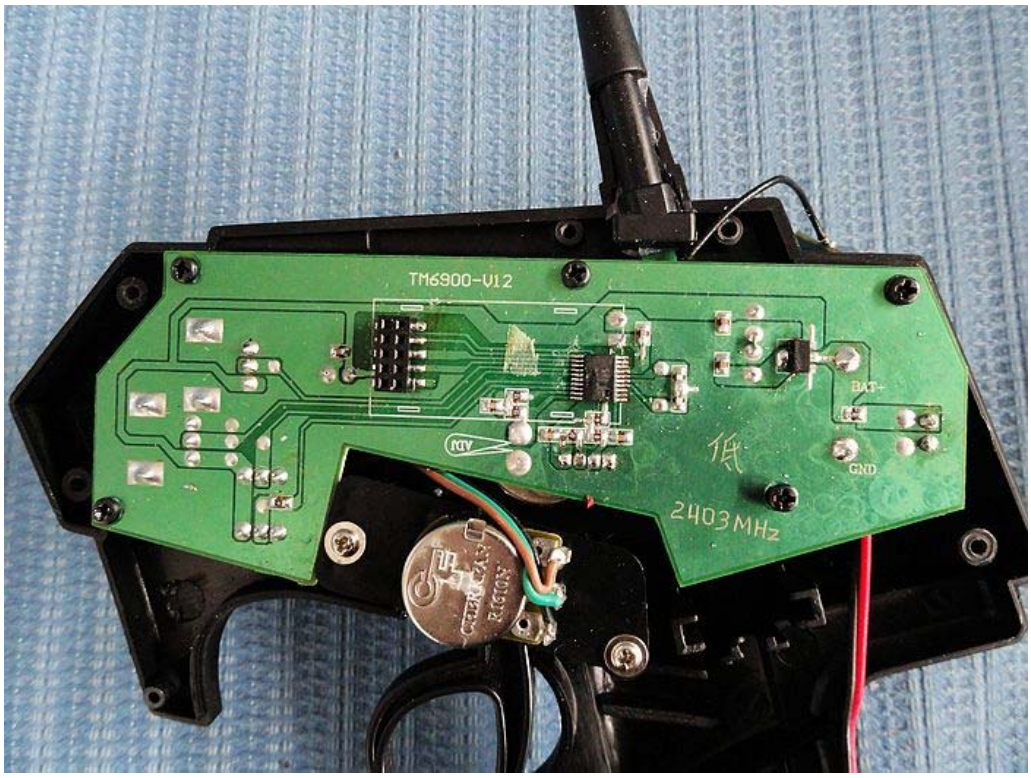
11.3 Photo for the EUT

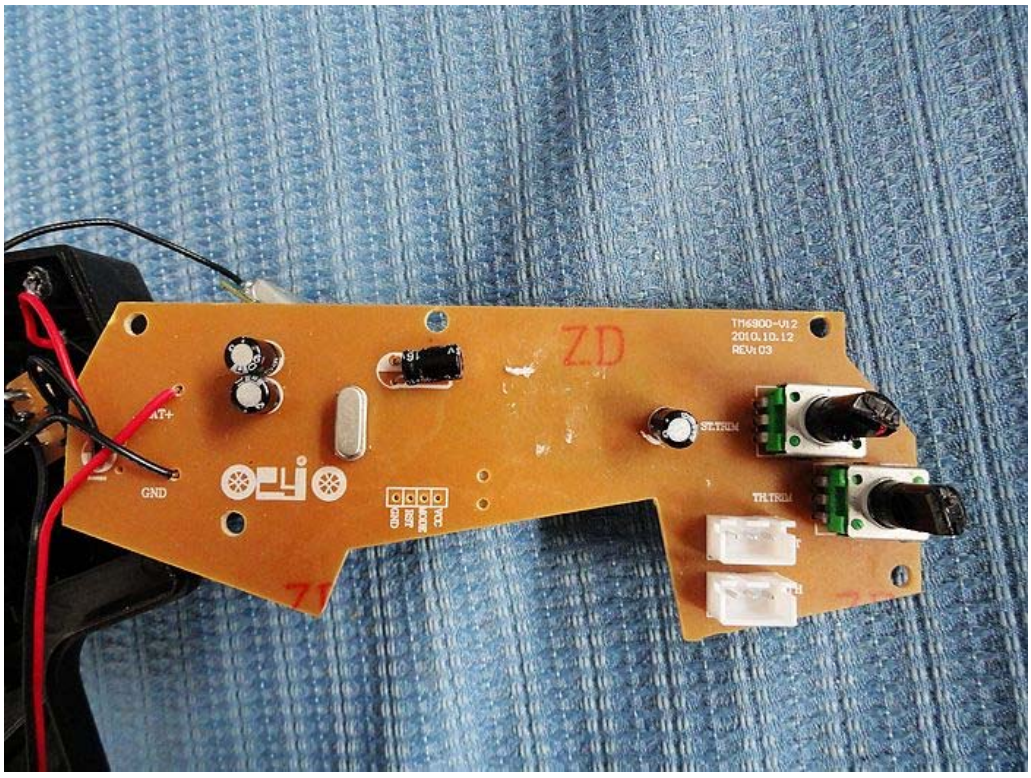
Outside View

Inside View

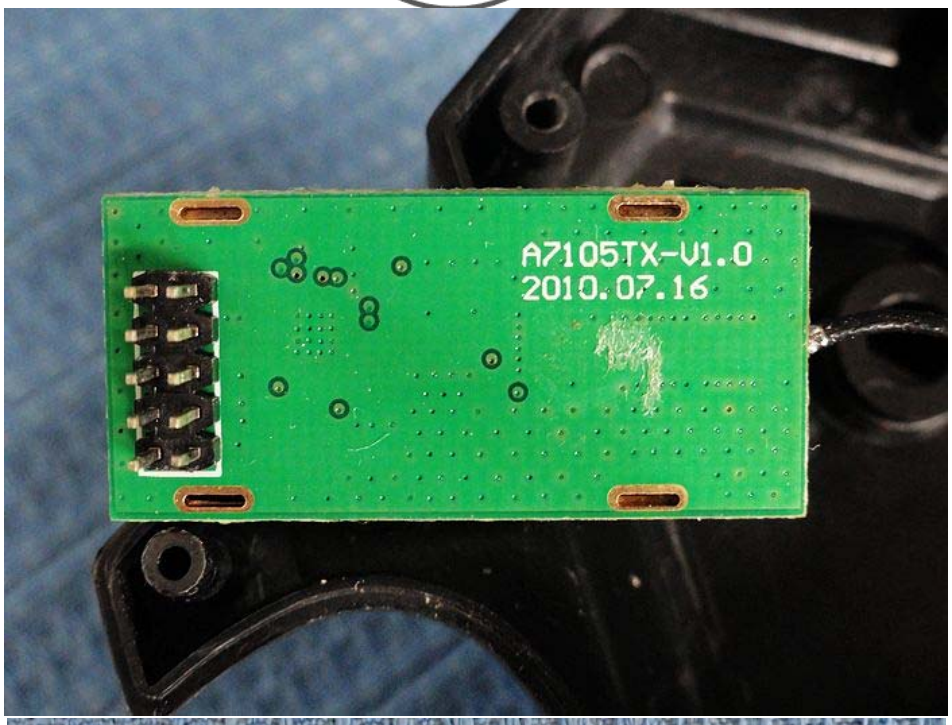


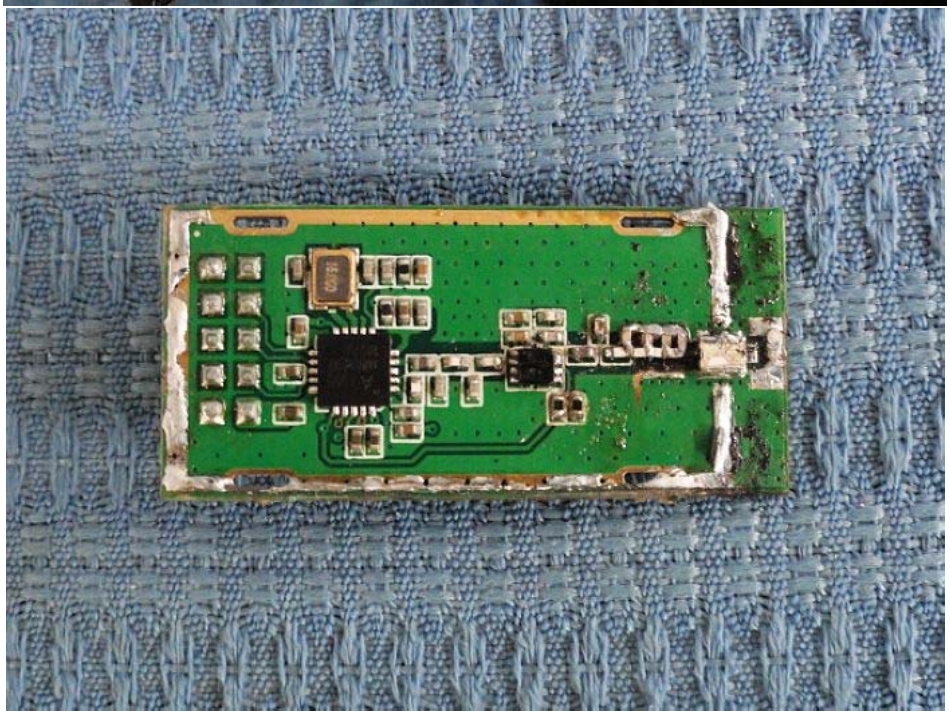
Inside View





Inside View





--End of the report--