Address: Units 303-305, 3/F., 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong
Telephone: +852 23052570
Fax: +852 27564480
Email: info@iecc.com.hk

FCC Test Report

Application No.:	57817
Applicant:	CREATE TOYS FACTORY
Address:	1-2 Floor, No. 6 Building, Longtian Guanghua Industrial Park Chengjiang Road, Chenghai District, Shantou City, Guangdong China
Product Information:	
Product Description:	R/C Series
Model:	6003, 6004, 6005, 6006, 6007, 6008, 6009, 6910, 6011, 6012, 6013, 6014, 3372, 3382, 3392 ♣
♣	Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Product Class :	Low Power Communication Device – Transmitter (2.4 GHz)
FCC ID number:	YEJSHENQIWEI-5
Requirement:	CFR 47 FCC PART 15 SUBPART C, 2011 - Intentional Radiators.
Date of Receipt:	August 31, 2012
Date of Test:	September 10, 2012 to September 12, 2012 October 25, 2012
Date of Issue:	October 25, 2012

Test Result :	**PASS***

* In the configuration tested, the EUT complied with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above.

Authorized Signature:

Stephen C.N. Wong
Technical Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS IECC Limited or testing done by SGS IECC Limited in connection with, distribution or use of the product described in this report must be approved by SGS IECC Limited in writing.

2 Test Summary

Test	Test Requirement	Test Method	Result
Conducted Emission (150KHz to 30MHz)	FCC PART 15, SUBPART C: 2011	ANSI C63.4:2003	N/A[1)]
Radiated Emission below 30MHz	FCC PART 15, SUBPART C: 2011	ANSI C63.4:2003	PASS
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART C: 2011	ANSI C63.4:2003	PASS
Radiated Emission above 1 GHz	FCC PART 15, SUBPART C: 2011	ANSI C63.4:2003	PASS
Band edge / 20 dB Bandwidth	FCC PART 15, SUBPART C: 2011	ANSI C63.4:2003	PASS

Remark :

1) Please refer to section 6.1 of this report for explanation

♣ **Item no.:** 6003, 6004, 6005, 6006, 6007, 6008, 6009, 6910, 6011, 6012, 6013, 6014, 3372, 3382, 3392

According to the confirmation from the applicant, the above models are identical in all electrical aspects in relating to the circuit design, PCB layout, electrical components used, internal wiring and function. The differences are only the color and decorations.

Therefore only the model 6004 was tested in this report.

3 Contents

4 General Information

4.1 General Description of EUT

EUT Name:	R/C Series
Model:	6004
Serial No.:	--

4.2 Details of EUT

Power Supply:	DC 6V (AA battery x4)
Power Cord:	--
Antenna Length	25 mm

4.3 Conditions of EUT

The received sample was under good condition.

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

CFR 47, FCC Part 15, Oct 2011
ANSI C63.4:2003

4.6 Test Location

The Radiated Emission test (below 1GHz) was performed at:

SGS IECC Limited (Member of the SGS Group (SGS SA))

Units 303-305, 3/F., 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480

The Radiated Emission test (over 1GHz) was sub-contracted to :

Hong Kong Productivity Council

HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong

4.7 Test Facility

SGS IECC Limited :

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (FCC Registration No. : 97774).

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

FCC – CAB Registration No.: 446297

Measurement facility located at Fanling (Hong Kong), accredited as a Conformity Assessment Body (CAB) and was designated by FCC to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules.

Hong Kong Productivity Council :

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules (FCC Registration No. : 90656).

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Declaration of Family Grouping

None.

4.11 Abbreviations

N/A: Not Applicable
EUT: Equipment Under Test

5 Equipments Used during Test

Radiated Emission (SGS IECC Limited)				
Equipment	**Manufacturer**	**Model / Serial No.**	**Cal. Date**	**Cal. Due Date**
3m Semi-Anechoic Chamber (pre-test)	--	--	--	--
3m / 10m Open Aera Test Site	--	--	2012-02-24	2015-02-23
Test Receiver	Rohde & Schwarz	ESCS 30 / 100388	2011-12-28	2012-12-27
Antenna, 30MHz – 300MHz	Schwarzbeck	BBA9106 / --	2011-11-12	2014-11-11
Antenna, 300MHz – 1000MHz	Schwarzbeck	UHALP9107 / --	2011-11-12	2014-11-11
Loop Antenna	Rohde & Schwarz	HFH2-Z2 / 871336/48	2009-11-17	2012-11-16
Coaxial Cable	--	E167	2012-08-01	2013-07-31
Antenna Mast System	Schwarzbeck	AM9104 / -	--	--
Turntable with Controller	Drehtisch	DT312 / -	--	--

Radiated Emission (HKPC)				
Equipment	**Manufacturer**	**Model / Serial No.**	**Cal. Date**	**Cal. Due Date**
Semi-Anechoic Chamber	Frankonia	--	2012-04-12	2013-04-11
Test Receiver	Rohde & Schwarz	ESU26 / 100050	2012-01-05	2013-01-04
Bi-conical Antenna	Rohde & Schwarz	HK116 / 100242	2010-05-05	2013-05-04
Log Periodic Antennna	Rohde & Schwarz	HL223 / 841516/020	2011-05-06	2013-05-05
Horn Antenna	EMCO	3115 / 9002-3351	2011-05-11	2013-05-10
Coaxial cable	Rosenberger	RTK81-05S-05S-10m / LA2-001-10M-001	2011-05-15	2013-05-14
Microwave amplifier	HP	83017A / 3123A00437	2011-10-03	2013-10-02
High Pass Filter	Trilithic	23042 / 9829213	2011-10-28	2013-10-27

General Use Equipment				
Equipment	**Manufacturer**	**Model / Serial No.**	**Cal. Date**	**Cal. Due Date**
Digital Multimeter	Fluke	189 / 83640020	2012-05-17	2013-05-16
Temperature / Humidity meter	-	E160	2011-10-11	2012-10-10

6 Test Results

6.1 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15 C Section 15.207

Test Method: ANSI C63.4:2003

Test Date: Not Applicable

Remark:

The product is battery operated and this test is not applicable.

6.2 Radiated Emissions below 30MHz

Test Requirement: FCC Part15 Subpart C Section 15.209 & 15.249(d)

Test Method: ANSI C63.4:2003

Test Date: September 12, 2012

Frequency Range: 9kHz to 30MHz

Measurement Distance: 3 m

Detector: Peak for pre-scan
(200Hz resolution bandwidth for measurement between 9kHz – 150kHz)
(9kHz resolution bandwidth for measurement between 150kHz – 30MHz)
Quasi-Peak for final measurement

Limits :

Frequency range (MHz)	Field strength limits (μV/m)	Measurement distance (m)
0.009 to 0.490	2400/F(kHz)	300
0.490 to 1.705	24000/F(kHz)	30
1.705 to 30.0	30	30
Note: At transitional frequencies the lower limit applies.		

6.2.1 EUT Operation

Operating Environment:

Temperature: 23 °C Humidity: 50 % Atmospheric Pressure: 1005 mbar

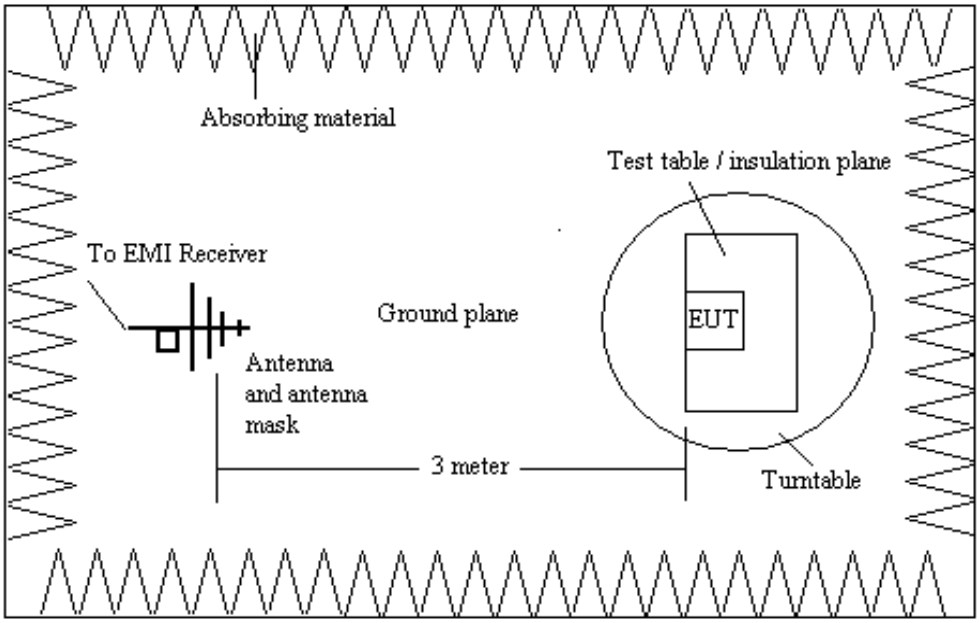
EUT Operation: Pre-test with Peak detector with the following mode(s):

1. Transmission for difference code for controlling different directions and speed

Final test with Quasi-Peak detector with the following mode(s):

1. Transimission for controlling forward direction with maximum speed.

6.2.2 Test Setup and Procedure



1. The pre-test of the radiated emissions test was conducted in a semi-anechoic chamber and the final measurement was conducted in the open area test site.
2. The EUT was operated with new batteries. The EUT was placed upon a non-metallic table 0.8m above the floor.
3. A loop antenna for the frequency range 9kHz - 30MHz, connected with 10 meters coaxial cable to the test receiver was used for measurement. The center of the loop was 1 m above the floor, positioned with its plane vertical at the specified distance and rotated about its vertical axis and placed horizontal for maximum response at each azimuth about the EUT.

4. An initial pre-scan was performed to find out the maximum emission level of the sample placed at 3 orthogonal planes and with the turntable rotated 360°. Final measurement was then performed to record the data under worst-case condition for combination of the antenna orientation and turntable position.

6.2.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by loop antenna with 3 orthogonal polarities. Final measurement was conducted in the open area test site with data as follows:

Measurement result :

The spurious radiated emissions measured by the loop antenna was negligible (more than 20dB below limit).

6.3 Radiated Emissions, 30MHz to1GHz

Test Requirement:	FCC Part15 Subpart C Section 15.209 and 15.249(d)
Test Method:	ANSI C63.4:2003
Test Date:	September 12, 2012
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

Limit：

Frequency range MHz	Quasi-peak limits dB (μV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54
Note: At transitional frequencies the lower limit applies.	

6.3.1 EUT Operation

Operating Environment:

Temperature: 23 °C Humidity: 50 % Atmospheric Pressure: 1005 mbar

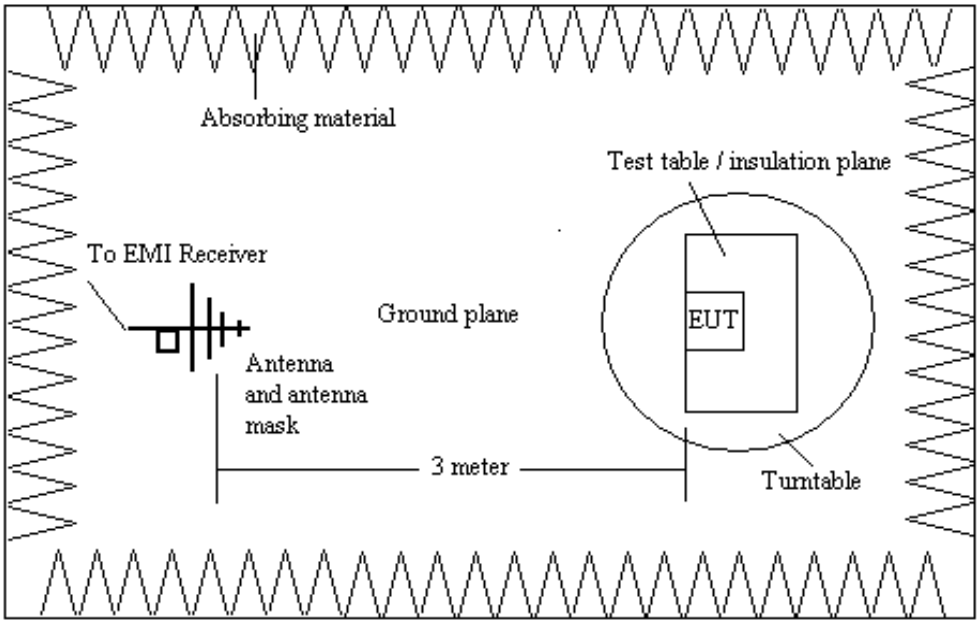
EUT Operation: Pre-test with Peak detector with the following mode(s):

1. Transmission for difference code for controlling different directions and speed

Final test with Quasi-Peak detector with the following mode(s):

1. Transimission for controlling forward direction with maximum speed.

6.3.2 Test Setup and Procedure



1. The pre-test of the radiated emissions test was conducted in a semi-anechoic chamber and the final measurement was conducted in the open area test site.
2. The EUT was operated with new batteries. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane.
3. Bilog antenna was used for the frequency range from 30MHz to 1GHz
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT with located frequencies.
5. The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

6.3.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and frequencies of peak emissions from the EUT were detected within 6dB of the limit line. Final measurement was conducted in the open area test site with data as follows:

Test results on operation with Transimission for controlling forward direction with maximum speed :

(1) Operation Frequency : 2405.570 MHz

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver QP Reading (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)
30.125	H	20.3	2.4	22.7	40.0	-17.3
100.000	V	11.9	4.6	16.5	43.5	-27.0
200.000	H	10.8	4.4	15.2	43.5	-28.3
400.000	V	18.6	4.4	23.0	46.0	-23.0
600.000	H	22.2	4.2	26.4	46.0	-19.6
1000.000	V	27.9	2.7	30.5	54.0	-23.5

Note:

1) All readings are Quasi-Peak values.

2) Correction Factor = Antenna Factor + Cable Loss.

3) The above results were the worst case results with the EUT positioned in all 3 axis during the test. The EUT was positioned vertically and horizontally on the table for vertical and horizontal measurement respectively.

(2) Operation Frequency : 2443.365 MHz

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver QP Reading (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)
30.000	V	20.4	2.1	22.5	40.0	-17.5
100.000	H	11.9	4.6	16.5	43.5	-27.0
200.000	H	10.8	4.5	15.3	43.5	-28.2
400.000	V	18.6	4.2	22.8	46.0	-23.2
600.000	H	22.2	4.3	26.5	46.0	-19.5
1000.000	V	27.9	2.7	30.6	54.0	-23.4

Note:

1) All readings are Quasi-Peak values.

2) Correction Factor = Antenna Factor + Cable Loss.

3) The above results were the worst case results with the EUT positioned in all 3 axis during the test. The EUT was positioned vertically and horizontally on the table for vertical and horizontal measurement respectively.

(3) Operation Frequency : 2474.583 MHz

Frequency (MHz)	Antenna Polarization	Correction Factor (dB/m)	Receiver QP Reading (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over Limit (dB)
30.000	V	20.4	2.5	22.9	40.0	-17.1
100.000	V	11.9	4.4	16.3	43.5	-27.2
200.000	V	10.8	4.5	15.3	43.5	-28.2
400.000	V	18.6	4.2	22.8	46.0	-23.2
600.000	H	22.2	4.3	26.5	46.0	-19.5
1000.000	V	27.9	2.7	30.6	54.0	-23.4

Note:

1) All readings are Quasi-Peak values.

2) Correction Factor = Antenna Factor + Cable Loss.

3) The above results were the worst case results with the EUT positioned in all 3 axis during the test. The EUT was positioned vertically and horizontally on the table for vertical and horizontal measurement respectively.

6.4 Radiated Emissions above 1 GHz

Test Requirement:	FCC Part15 Subpart C Section 15.209 & 15.249(a) & (d)
Test Method:	ANSI C63.4:2003
Test Date:	September 10, 2012
Frequency Range:	1GHz – 26GHz
Measurement Distance:	3m
Detector:	Peak for pre-scan (1MHz resolution bandwidth)
	Average and Peak detector for final test

Limit :

Fundamental Frequency :

Frequency range MHz	Limits (Peak) dB (μV/m)	Limits (Average) dB (μV/m)
2400 to 2483.5	114	94

Spurious Emission :

Frequency range MHz	Limits (Peak) dB (μV/m)	Limits (Average) dB (μV/m)
Over 1000	74	54

6.4.1 EUT Operation

Operating Environment:

Temperature: 23 °C Humidity: 50 % Atmospheric Pressure: 1005 mbar

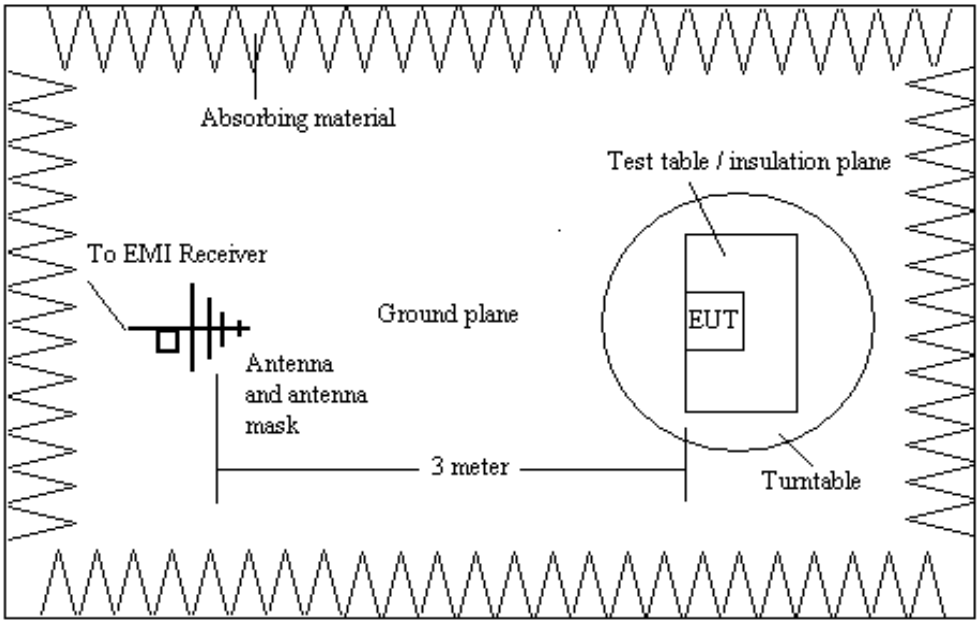
EUT Operation: Pre-test with Peak detector with the following mode(s):

1. Transmission for difference code for controlling different directions and speed

Final test with Average and Peak detector with the following mode(s):

1. Transimission for controlling forward direction with maximum speed.

6.4.2 Test Setup and Procedure



1. The pre-test and final measurement of the radiated emissions test were conducted in a semi-anechoic chamber.
2. The EUT was operated with new batteries. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane.
3. Horn antenna was used for the frequency over 1GHz
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT with located frequencies.
5. The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

6.4.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured with 2 orthogonal polarities and frequencies of average emissions from the EUT were measured as follows:

Test results on operation with Transimission for controlling forward direction with maximum speed :

(1) Fundmental Frequency

Frequency (MHz)	Antenna Polarization	Emission Level (dBμV/m)		Limit (dBμV/m)		Remark
		Peak	Average	Peak	Average	
2405.570	H	84.5	46.8	114	94	Pass
2405.570	V	82.7	45.6	114	94	Pass
2443.365	H	78.2	44.7	114	94	Pass
2443.365	V	77.7	42.9	114	94	Pass
2474.583	H	80.2	45.4	114	94	Pass
2474.583	V	79.1	45.3	114	94	Pass

(2) Spurious Emission

Operation Frequency : 2405.570 MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBμV/m)		Limit (dBμV/m)		Remark
		Peak	Average	Peak	Average	
3000.000	H	43.1	23.0	74	54	Pass
4807.916	H	63.3	37.8	74	54	Pass
6000.000	H	45.2	25.0	74	54	Pass
7000.000	H	46.3	26.0	74	54	Pass
9000.000	H	50.5	30.0	74	54	Pass
12000.000	H	53.1	33.0	74	54	Pass

Operation Frequency : 2443.365 MHz

Frequency (MHz)	Antenna Polarization	Emission Level (dBµV/m)		Limit (dBµV/m)		Remark
		Peak	Average	Peak	Average	
3000.000	H	43.1	23.0	74	54	Pass
4887.516	H	56.8	38.9	74	54	Pass
6000.000	H	45.4	25.0	74	54	Pass
7330.705	V	60.2	40.2	74	54	Pass
9000.000	H	50.5	30.0	74	54	Pass
12000.000	H	53.2	33.0	74	54	Pass

Operation Frequency : 2474.583 MHz

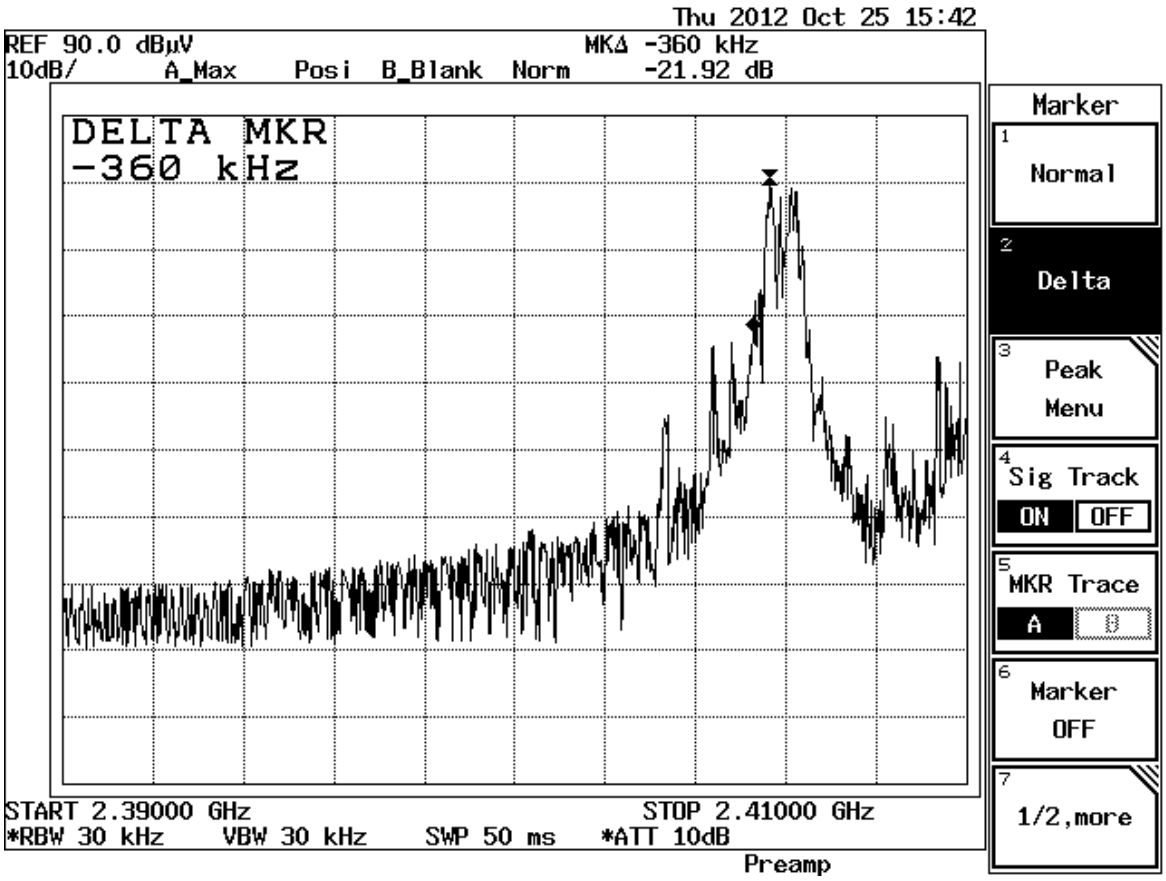
Frequency (MHz)	Antenna Polarization	Emission Level (dBµV/m)		Limit (dBµV/m)		Remark
		Peak	Average	Peak	Average	
3000.000	H	43.2	23.0	74	54	Pass
4949.166	H	62.2	37.8	74	54	Pass
6000.000	H	45.3	25.0	74	54	Pass
7423.782	H	56.2	39.7	74	54	Pass
9000.000	H	50.5	30.0	74	54	Pass
12000.000	H	53.4	33.0	74	54	Pass

6.5 Band edge / 20 dB Bandwidth

Test Requirement:	FCC Part15 Subpart C Section 15.215, 15.249(d)
Test Method:	ANSI C63.4:2003
Test Date:	October 25, 2012
Result:	Pass

Test Plot :

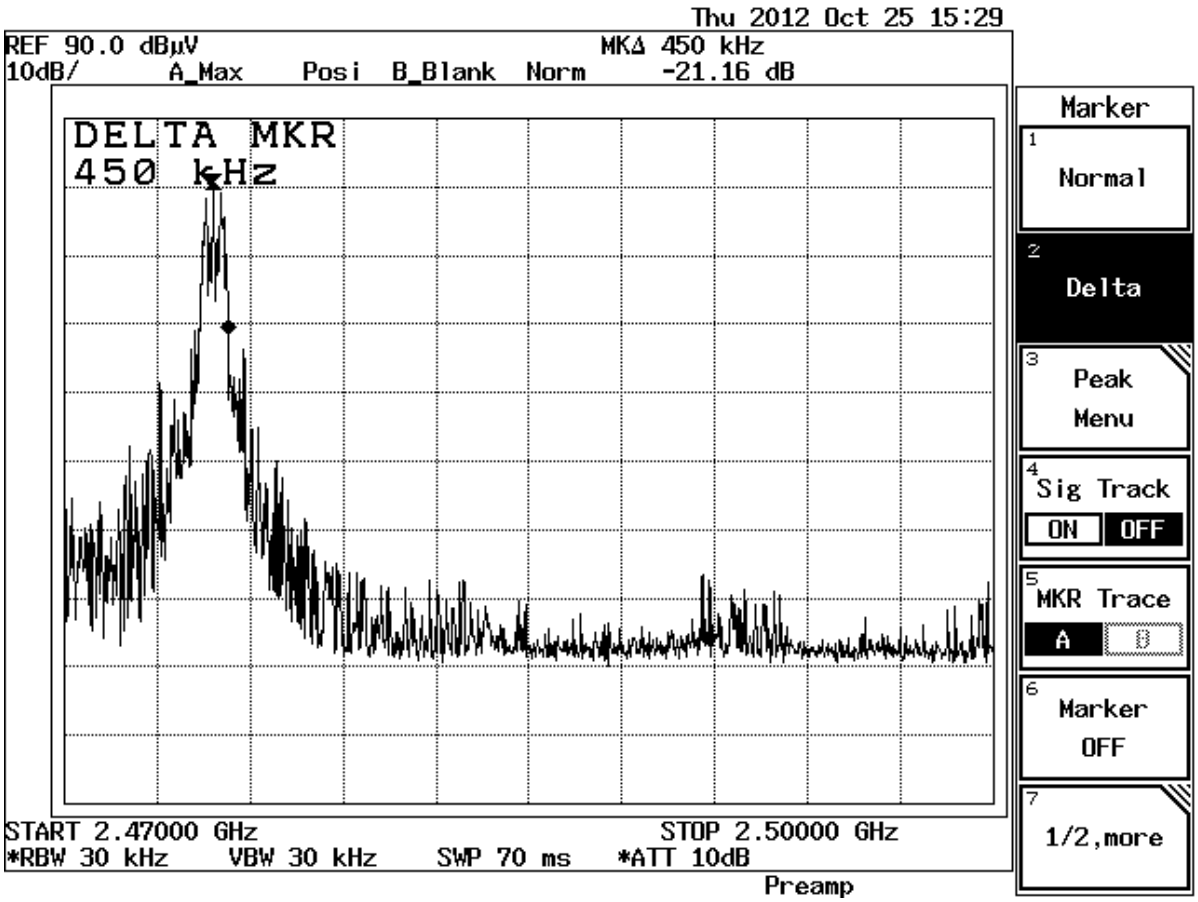
Operation frequency : 2405.00 MHz



According to the page 17 of this report, the emission of the fundamental frequency 2405MHz is 84.5dBuV/m and 46.8dBuV/m for peak and average level respectively. Based on the delta method, the emission at the bandedge, 2400MHz, is more than 20dB below the fundamental. It is deemed to comply with section 15.215. Besides, it is below the limit of 74dBuV/m and 54dBuV/m for peak and average level under 15.209. It is deemed to comply with section 15.249(d).

Test Plot :

Operation frequency : 2475.00 MHz



According to the page 17 of this report, the emission of the fundamental frequency 2475MHz is 80.2dBuV/m and 45.4dBuV/m for peak and average level respectively. Based on the delta method, the emission at the bandedge, 2483.5MHz, is more than 20dB below the fundamental. It is deemed to comply with section 15.215. Besides, it is below the limit of 74dBuV/m and 54dBuV/m for peak and average level under 15.209. It is deemed to comply with section 15.249(d).

7 Photographs

7.1 Radiatd Emission Test Setup

Measurement : Below 30MHz

Measurement : 30MHz – 1000MHz

Measurement : Above 1000MHz

7. 2 EUT Constructional Details

- END -