

TEST REPORT FOR CERTIFICATION
On Behalf of

VTECH ELECTRONICS LTD.

SMART STUNTS RC RACER

Model Number: 1615

FCC ID : G2R-1615

Prepared for : VTECH ELECTRONICS LTD.
23/F Block 1, Tai Ping Industrial Centre, 57 Ting Kok Road, TaiPo,
Hong Kong

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Report Number: ESTE-R1503014
Date of Test : March 03, 2015 ~ March 19, 2015
Date of Report : March 20, 2015

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Test Report Verification

Applicant:	VTECH ELECTRONICS LTD.		
Address:	23/F Block 1, Tai Ping Industrial Centre, 57 Ting Kok Road, TaiPo, Hong Kong		
Manufacturer:	VTECH ELECTRONICS LTD.		
Address:	23/F Block 1, Tai Ping Industrial Centre, 57 Ting Kok Road, TaiPo, Hong Kong		
E.U.T:	SMART STUNTS RC RACER		
Model Number:	1615 Note: ("1615", only TX.)		
Power Supply:	DC 3V		
Test Voltage:	DC 3V		
Trade Name:	VTECH	Serial No.:	-----
Date of Receipt:	March 03, 2015	Date of Test:	March 04, 2015 ~ March 19, 2015
Test Specification:	FCC Rules and Regulations Part 15 Subpart C:2014 ANSI C63.10:2013		
Test Result:	The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. Date: March 20, 2015		
Prepared by:	Tested by:	Approved by:	
 _____ Ada / Assistant	 _____ Tony.Tang/ Engineer	 _____ IcemanHu / Manager	
Other Aspects:	None.		
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.			



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	: SMART STUNTS RC RACER
Model Number	: 1615
FCC ID	: G2R-1615
Operation frequency	: 2408-2475 MHz
Number of channel	: 28
Antenna	: Integrated antenna, 0 dBi gain
Modulation	: GFSK
Power Supply	: DC 3V
Sample Type	: Prototype production

2. SUMMARY OF TEST

2.1. Summary of test result

Description of Test Item	Standard	Results
Power Line Conducted Emissions	FCC Part 15C: 15.207 ANSI C63.10-2013	N/A
Radiated Emission Test	FCC Part 15C: 15.209 FCC Part 15C: 15.249 ANSI C63.10-2013	PASS
20 dB Bandwidth Test	FCC Part 15: 15.249 ANSI C63.10-2013	PASS
Band Edge Compliance Test	FCC Part 15: 15.215 ANSI C63.10-2013	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
N/A is an abbreviation for Not Applicable.		

2.2. Test Facilities

EMC Lab : Certificated by CNAL, CHINA
 Registration No.: L5288
 Date of registration: Nov 23, 2014

 Certificated by FCC, USA
 Registration No.: 989591
 Date of registration: November 20, 2013

 Certificated by Industry Canada
 Registration No.: 9405A-1
 Date of registration: January 03, 2013

 Certificated by VCCI, Japan
 Registration No.: R-3663 & C-4103
 Date of registration: July 25, 2011

 Certificated by TUV Rheinland, Germany
 Registration No.: UA 50195514 0001
 Date of registration: January 07, 2011

 Certificated by TUV/PS, Shenzhen
 Registration No.: SCN1017
 Date of registration: January 27, 2011

 Certificated by Intertek ETL SEMKO
 Registration No.: 2011-RTL-L1-18
 Date of registration: April 28, 2011

 Certificated by Siemic, Inc.
 Registration No.: SLCN021
 Date of registration: November 8, 2011

 Certificated by Nemko, Hong Kong
 Registration No.: 175193
 Date of registration: May 4, 2011

Name of Firm : EST Technology Co., Ltd.

Site Location : San Tun Management Zone, Houjie District, Dongguan,
 Guangdong, China

2.3. Assistant equipment used for test

2.3.1. N/A

2.4. Block Diagram



(EUT: SMART STUNTS RC RACER)

2.5. Test mode

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode

Mode	Channel	Frequency
TX	Low	2408MHz
	Middle	2445MHz
	High	2475MHz

2.6. Channel List for GFSK

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2408	2	2411
3	2414	4	2417
5	2420	6	2423
7	2426	8	2429
9	2430	10	2432
11	2435	12	2438
13	2441	14	2444
15	2445	16	2447
17	2450	18	2453
19	2456	20	2459
21	2460	22	2462
23	2465	24	2468
25	2471	26	2472
27	2474	28	2475

2.7. Test Equipment

2.7.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	June,28,14	1 Year
Artificial Mains Networ	Rohde & Schwarz	ENV216	101260	June,28,14	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101100	June,28,14	1 Year

2.7.2. For radiated emission test(30-1000MHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESVS10	100004	June,28,14	1 Year
Spectrum Analyzer	Agilent	E4411B	MY50140697	June,28,14	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	June,28,14	1 Year
Signal Amplifier	Agilent	310N	187037	June,28,14	1 Year

2.7.3. For radiated emission test(above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	SCHWARZB ECK	BBHA 9120 D	BBHA9120D1 002	June,28,1 4	1 Year
Signal Amplifier	SCHWARZB ECK	BBV9718	9718-212	June,28,1 4	1 Year
Spectrum Analyzer	Agilent	E4408B	MY44211139	June,28,1 4	1 Year
RF Cable	Hubersuhner	RG 214/U	513423	June,28,1 4	1 Year

3. RADIATED EMISSIONS

3.1. Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

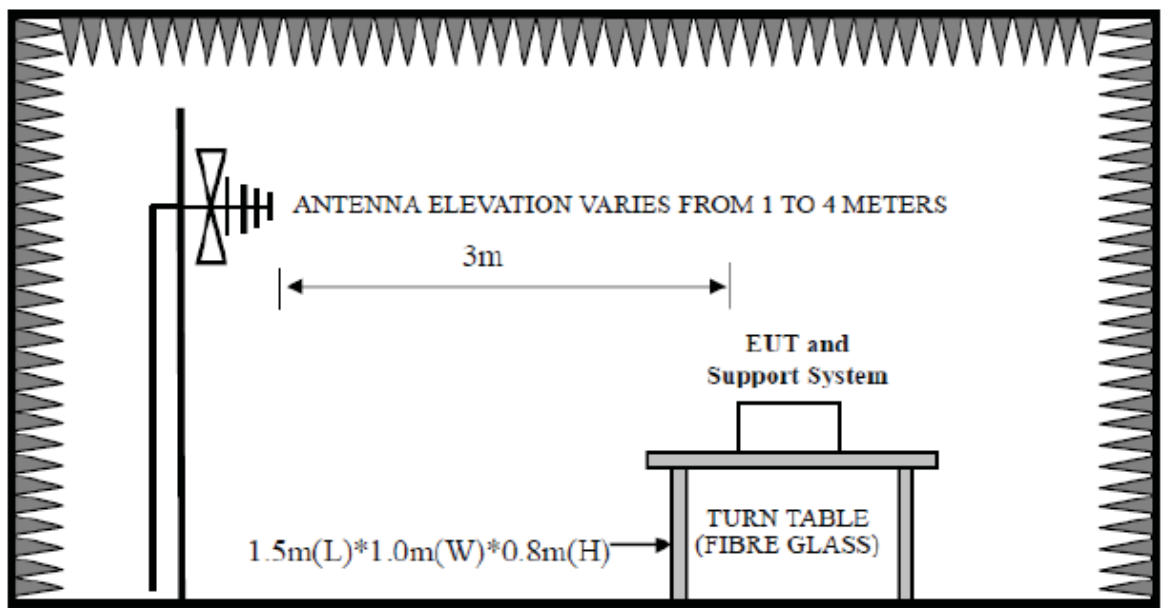
Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

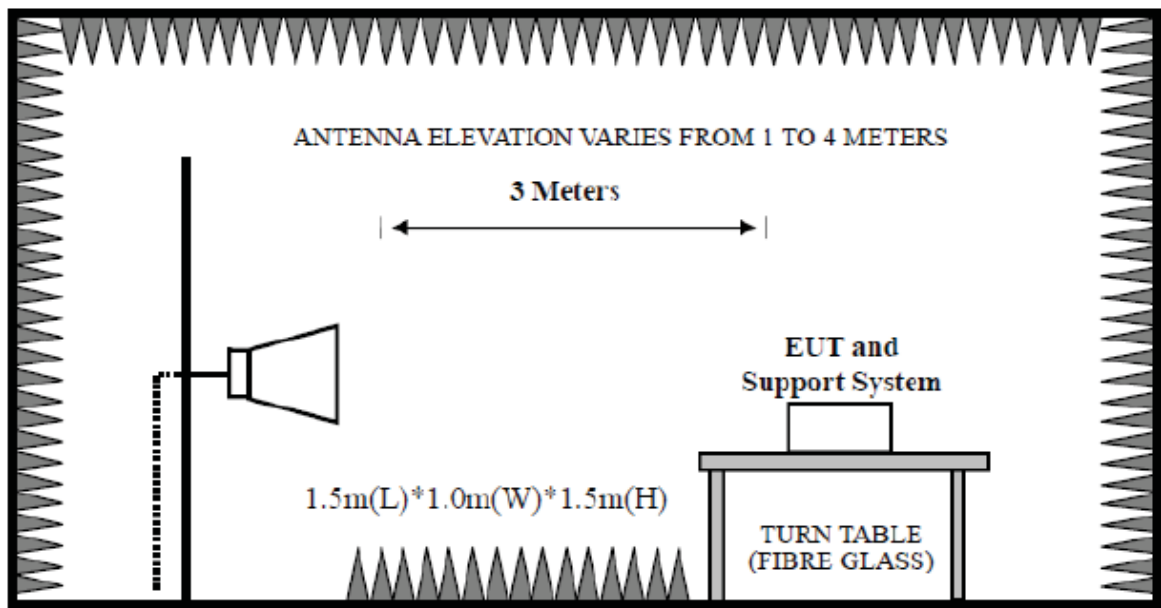
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system

3.2. Block Diagram of Test setup

30~1000MHz



Above 1GHz



3.3. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver (R&S FSU) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,

PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10th harmonic (25GHz) are checked.

3.4. Test Result

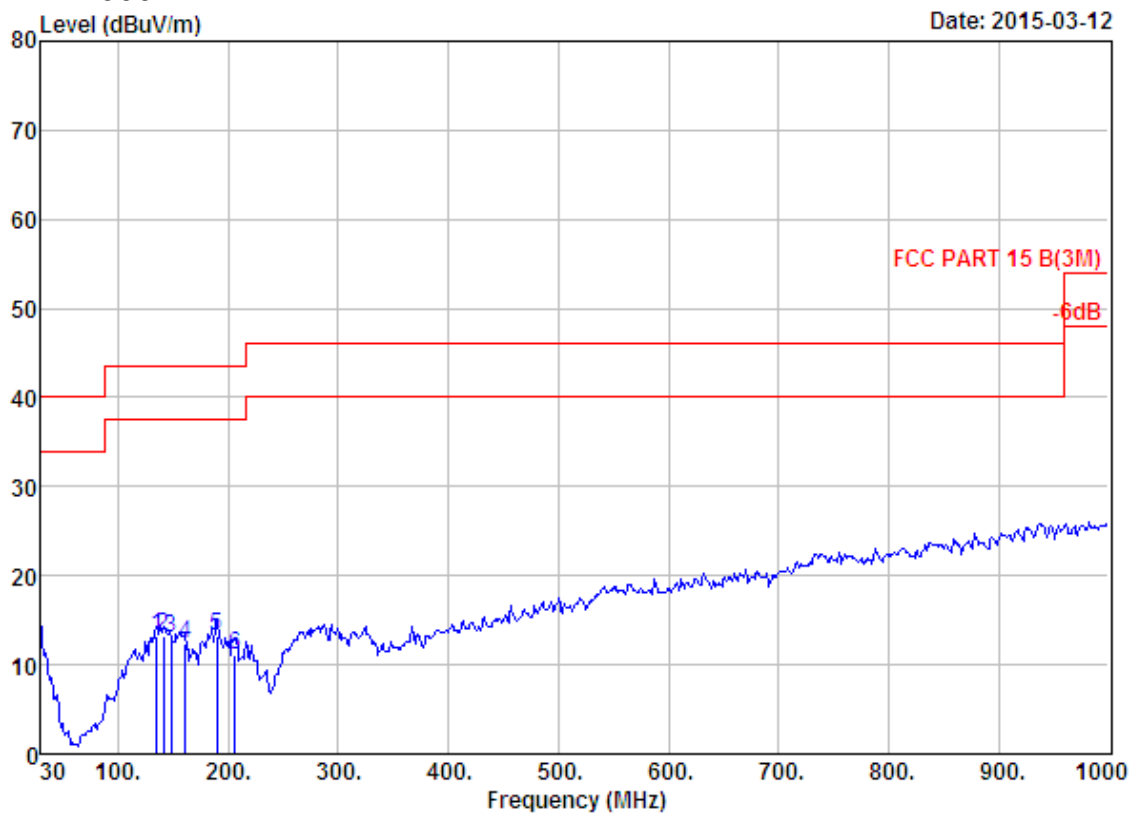
30MHz—25GHz Radiated emissison Test result	
EUT: SMART STUNTS RC RACER	M/N: 1615
Power: DC 3V	
Test date: 2015-03-08~2015-03-12 Test site: 3m Chamber Tested by: Tony Tang	
Test mode: Tx	
Pass	

Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

- 2、 The frequency 2408MHz 、 2445MHz and 2475MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

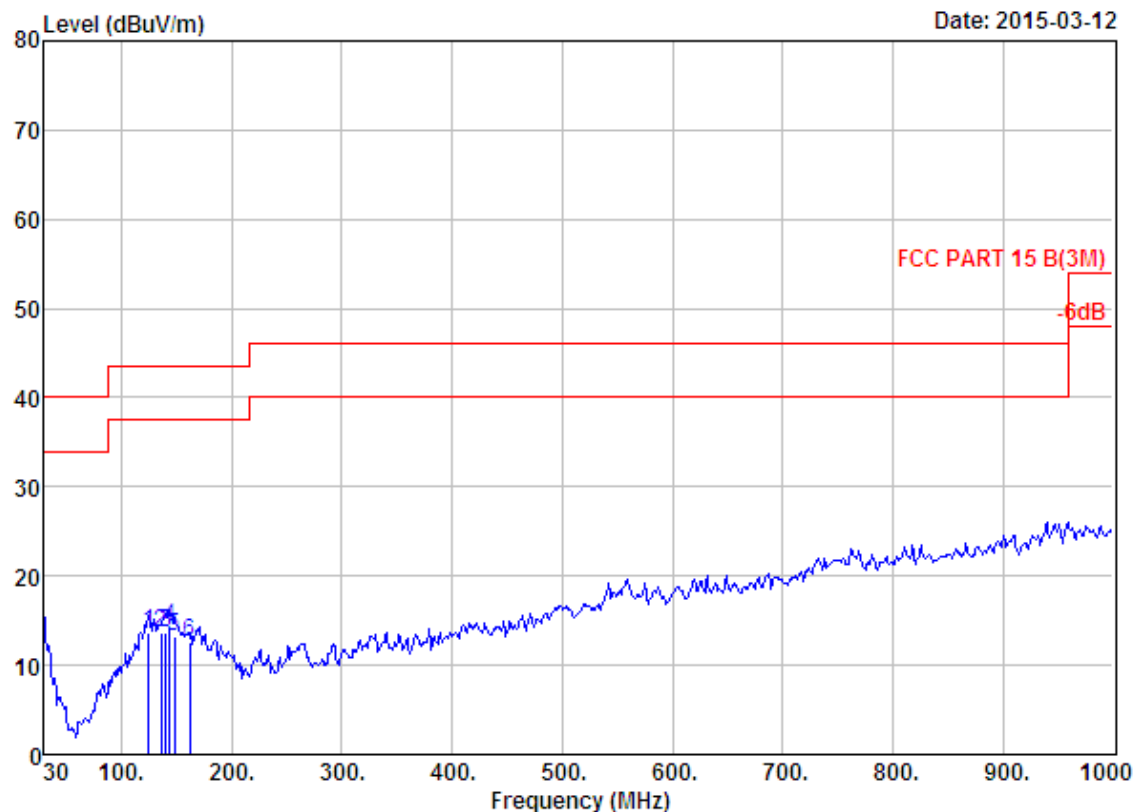
3.5. Test Data

30 MHz – 1000 MHz



Site no. : 1# 966 chamber Data no. : 81
 Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

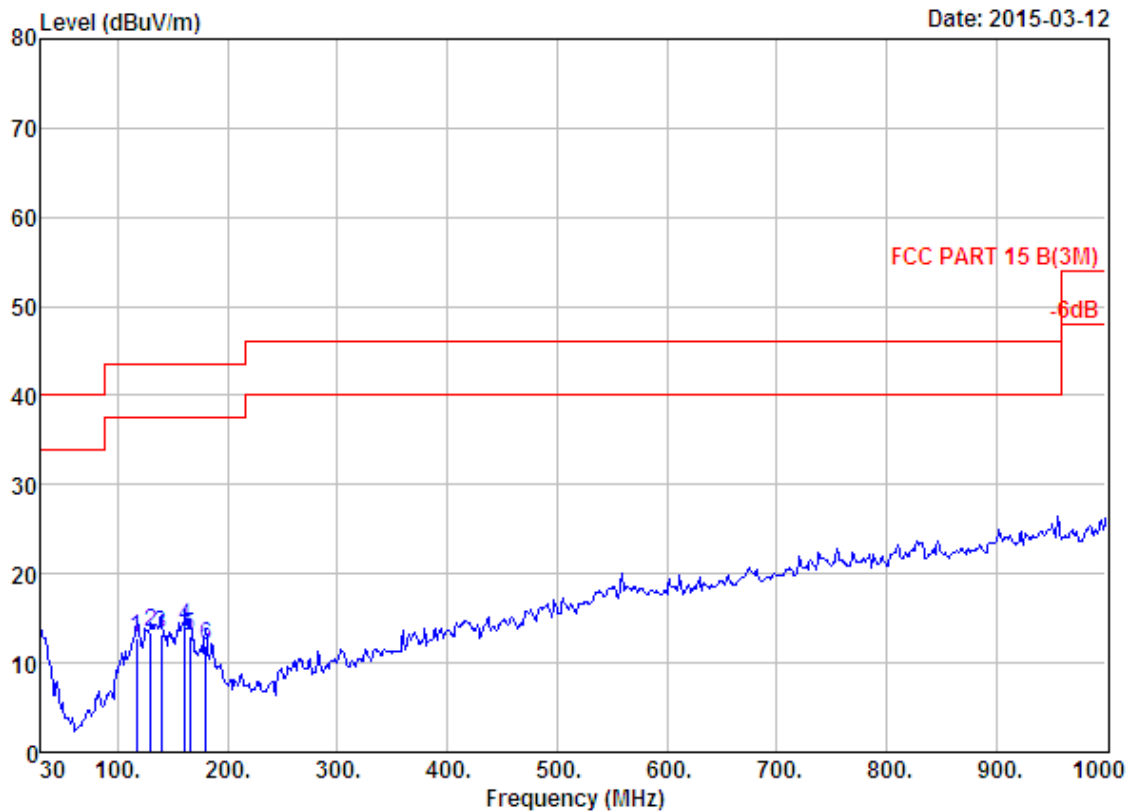
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	134.76	11.37	1.57	0.26	13.20	43.50	30.30	QP
2	141.55	11.36	1.51	0.43	13.30	43.50	30.20	QP
3	148.34	11.00	1.69	0.29	12.98	43.50	30.52	QP
4	160.95	10.24	1.70	0.46	12.40	43.50	31.10	QP
5	190.05	7.94	1.76	3.45	13.15	43.50	30.35	QP
6	206.54	8.09	1.81	1.12	11.02	43.50	32.48	QP



Site no. : 1# 966 chamber
 Dis. / Ant. : 3m 27137
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

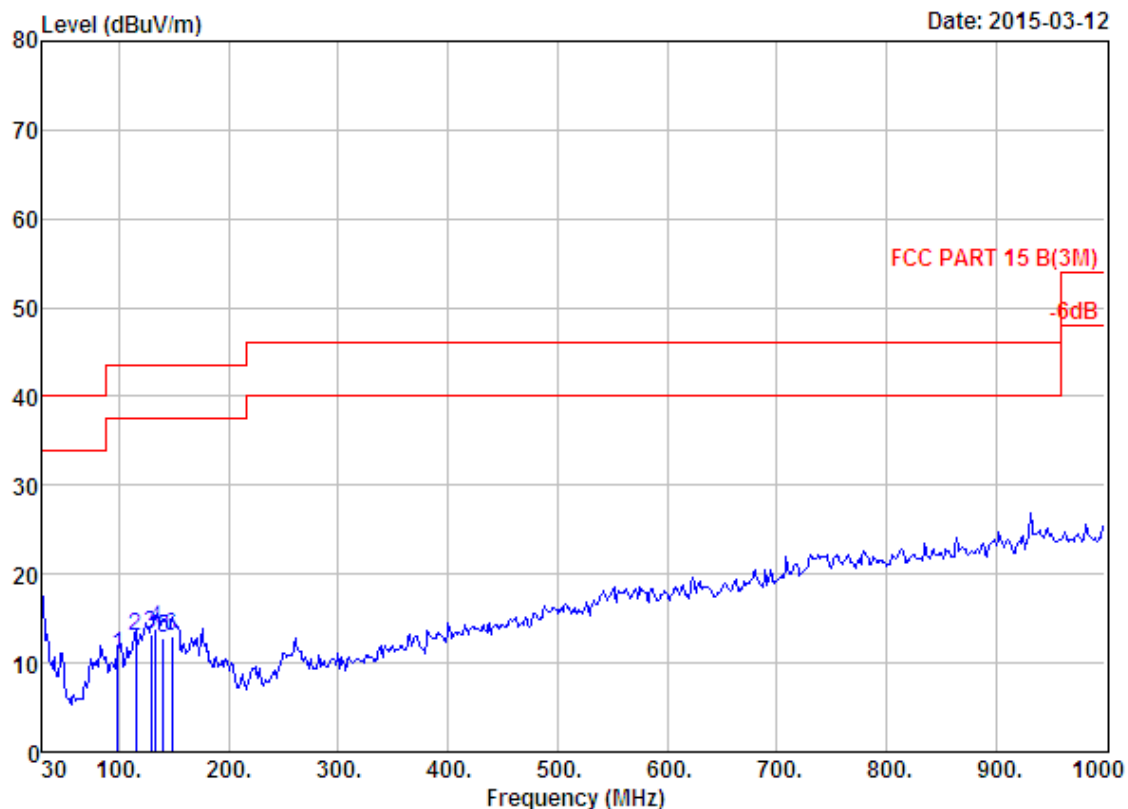
Data no. : 82
 Ant. pol. : VERTICAL

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	125.06	11.35	1.52	0.69	13.56	43.50	29.94	QP
2	135.73	11.38	1.59	0.74	13.71	43.50	29.79	QP
3	140.58	11.40	1.49	0.85	13.74	43.50	29.76	QP
4	143.49	11.29	1.55	1.35	14.19	43.50	29.31	QP
5	148.34	11.00	1.69	0.63	13.32	43.50	30.18	QP
6	161.92	10.12	1.69	0.79	12.60	43.50	30.90	QP



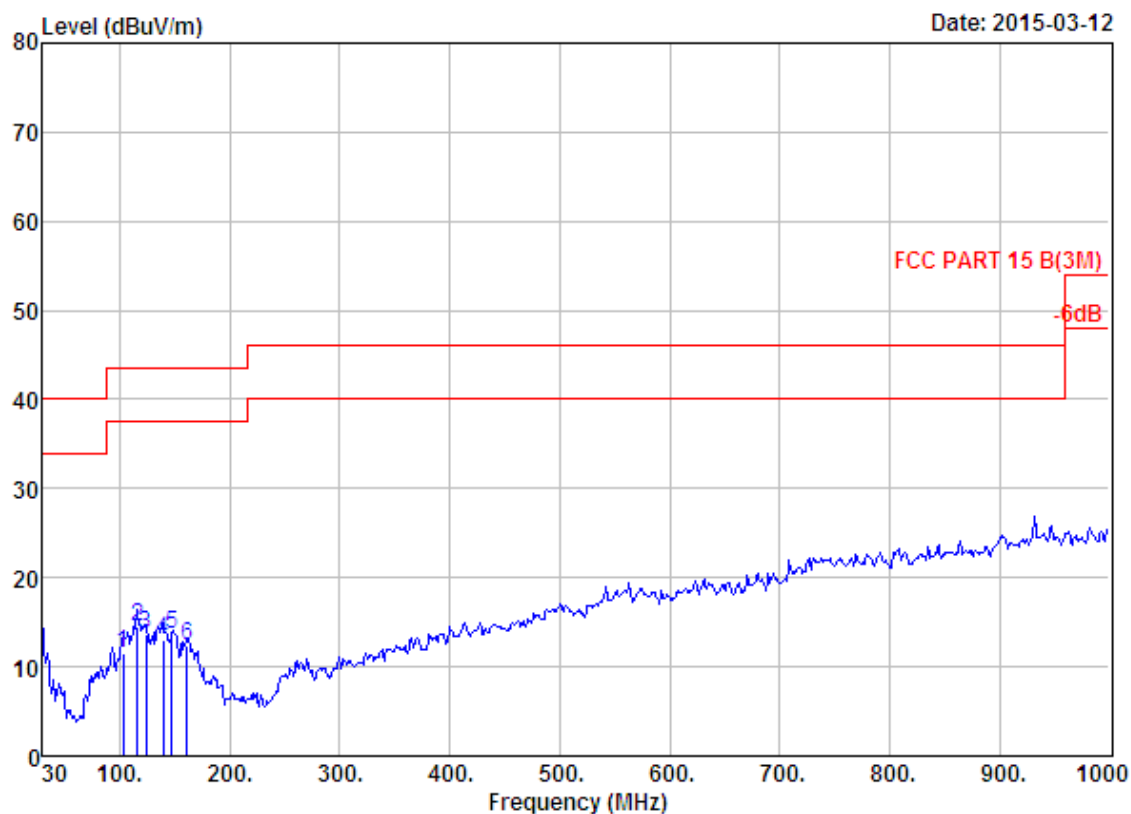
Site no. : 1# 966 chamber Data no. : 83
 Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2445MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	117.30	11.02	1.47	0.32	12.81	43.50	30.69	QP
2	129.91	11.32	1.47	0.71	13.50	43.50	30.00	QP
3	139.61	11.43	1.51	0.34	13.28	43.50	30.22	QP
4	160.95	10.24	1.70	2.04	13.98	43.50	29.52	QP
5	165.80	9.66	1.68	1.64	12.98	43.50	30.52	QP
6	180.35	8.95	1.70	1.31	11.96	43.50	31.54	QP



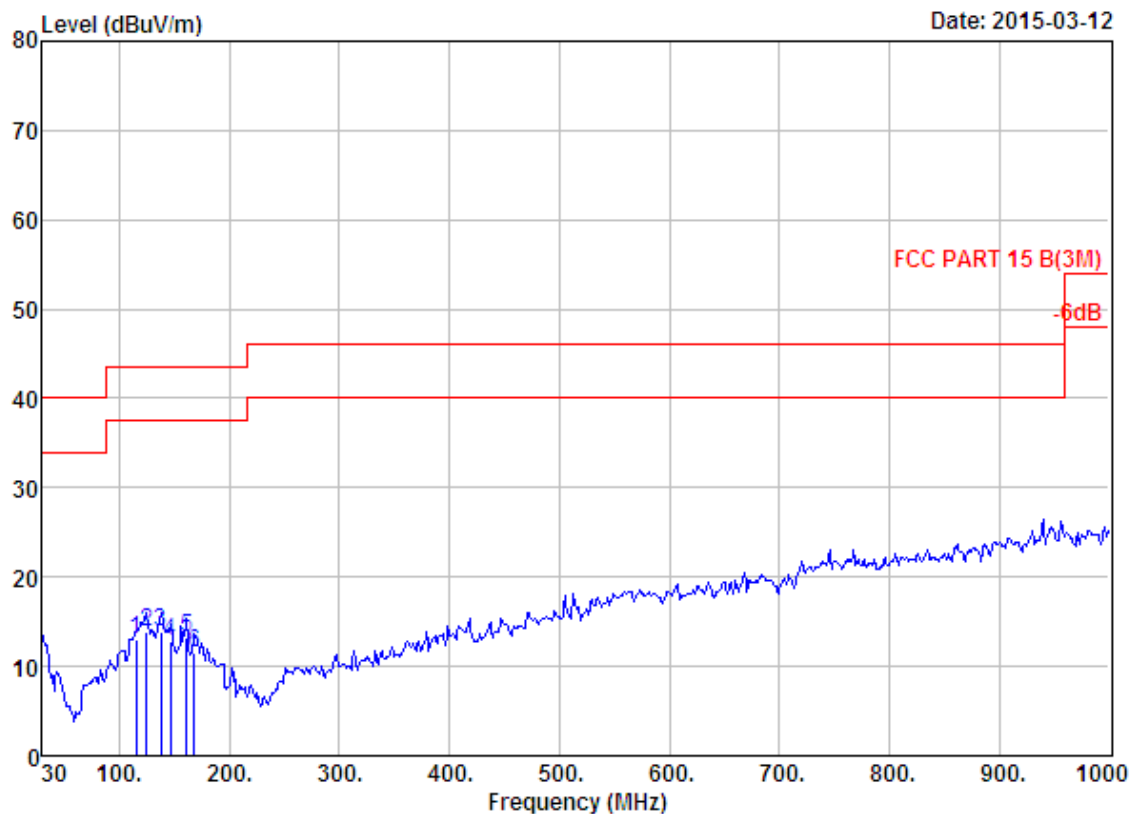
Site no. : 1# 966 chamber Data no. : 84
 Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2445MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	98.87	9.29	1.34	0.27	10.90	43.50	32.60	QP
2	115.36	10.93	1.46	0.57	12.96	43.50	30.54	QP
3	128.94	11.33	1.47	0.48	13.28	43.50	30.22	QP
4	133.79	11.36	1.56	0.99	13.91	43.50	29.59	QP
5	140.58	11.40	1.49	0.00	12.89	43.50	30.61	QP
6	148.34	11.00	1.69	0.36	13.05	43.50	30.45	QP



Site no. : 1# 966 chamber Data no. : 85
 Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

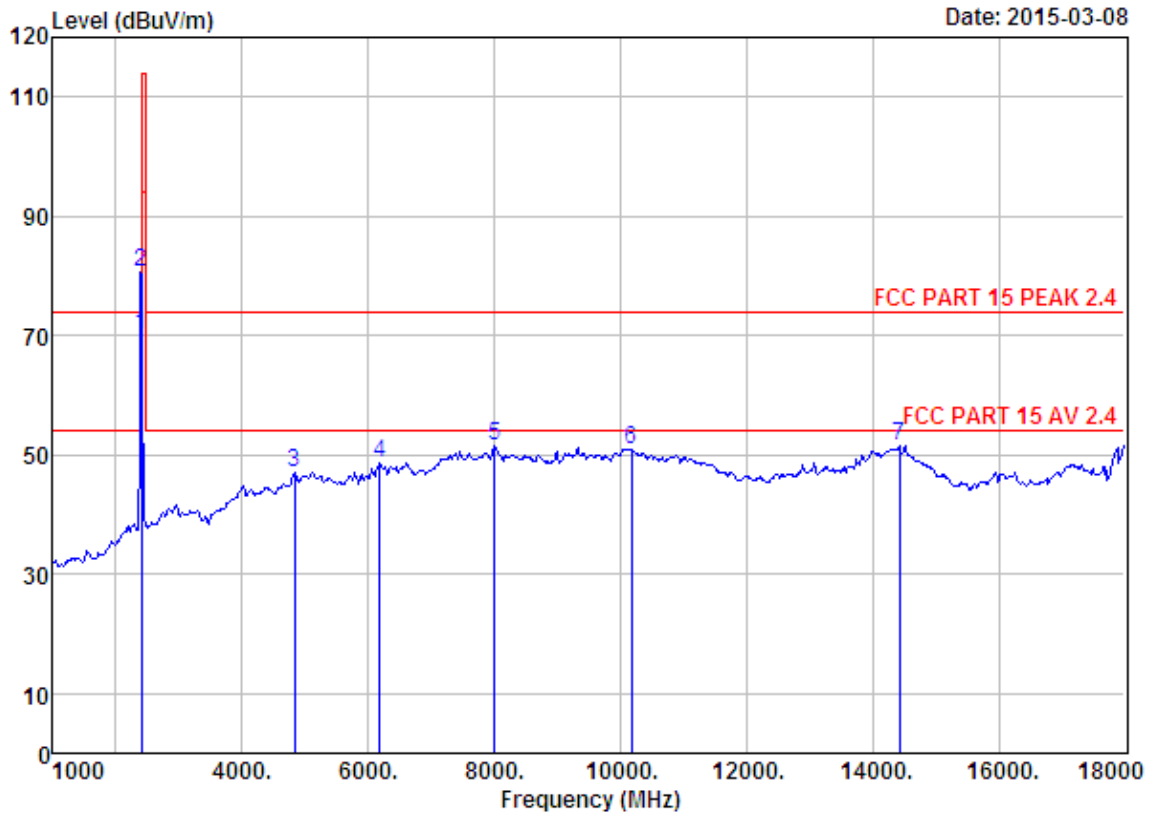
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	102.75	9.75	1.35	0.39	11.49	43.50	32.01	QP
2	116.33	10.98	1.50	1.94	14.42	43.50	29.08	QP
3	124.09	11.31	1.53	0.82	13.66	43.50	29.84	QP
4	139.61	11.43	1.51	0.02	12.96	43.50	30.54	QP
5	147.37	11.08	1.64	0.85	13.57	43.50	29.93	QP
6	160.95	10.24	1.70	0.39	12.33	43.50	31.17	QP



Site no. : 1# 966 chamber Data no. : 86
 Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B(3M)
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	115.36	10.93	1.46	0.69	13.08	43.50	30.42	QP
2	125.06	11.35	1.52	1.03	13.90	43.50	29.60	QP
3	137.67	11.41	1.56	0.93	13.90	43.50	29.60	QP
4	146.40	11.15	1.58	0.01	12.74	43.50	30.76	QP
5	160.95	10.24	1.70	1.33	13.27	43.50	30.23	QP
6	167.74	9.43	1.71	0.48	11.62	43.50	31.88	QP

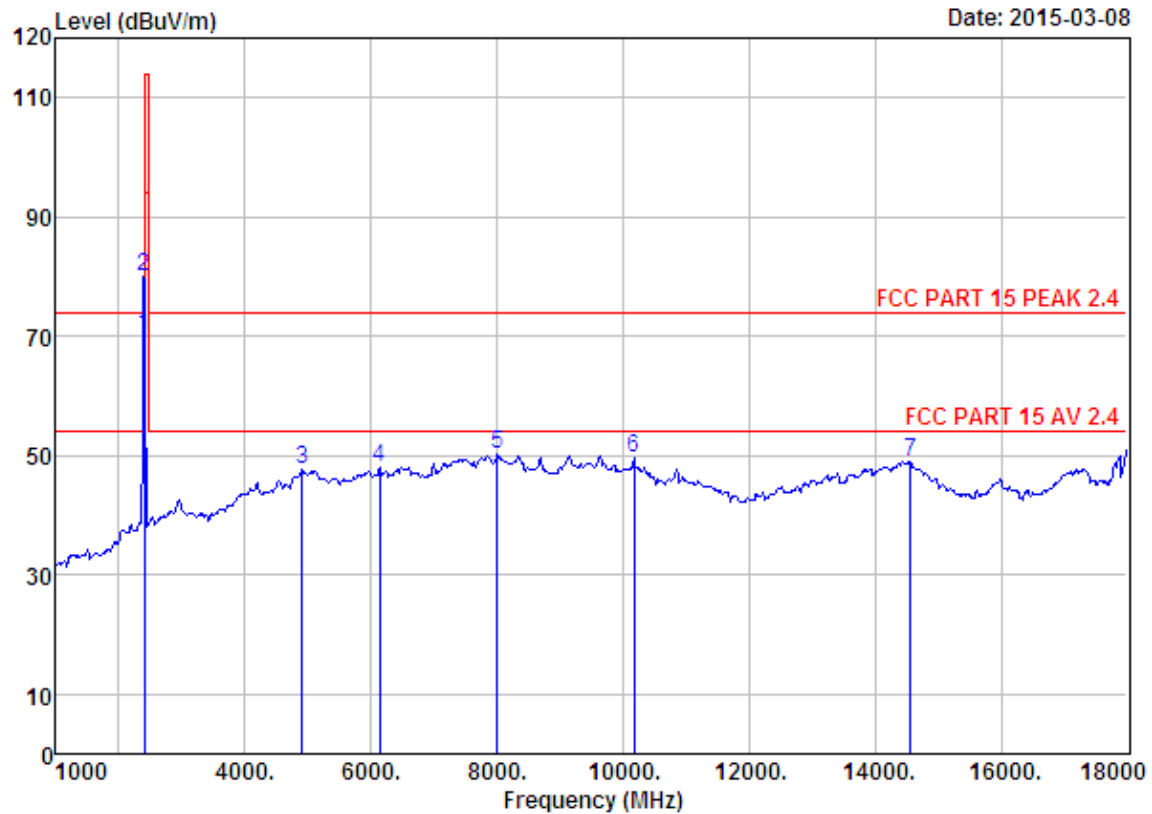
1000-18000MHz



Site no. : 1# 966 chamber Data no. : 65
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2405.00	27.61	6.64	34.18	70.15	70.22	94.00	23.78	Average
2	2405.00	27.61	6.64	34.18	80.66	80.73	114.00	33.27	Peak
3	4825.00	31.28	11.84	31.83	35.77	47.06	74.00	26.94	Peak
4	6185.00	33.19	12.16	32.03	35.43	48.75	74.00	25.25	Peak
5	8004.00	37.01	11.40	31.22	34.44	51.63	74.00	22.37	Peak
6	10180.00	38.42	11.49	32.11	33.19	50.99	74.00	23.01	Peak
7	14430.00	41.82	10.93	32.84	31.60	51.51	74.00	22.49	Peak

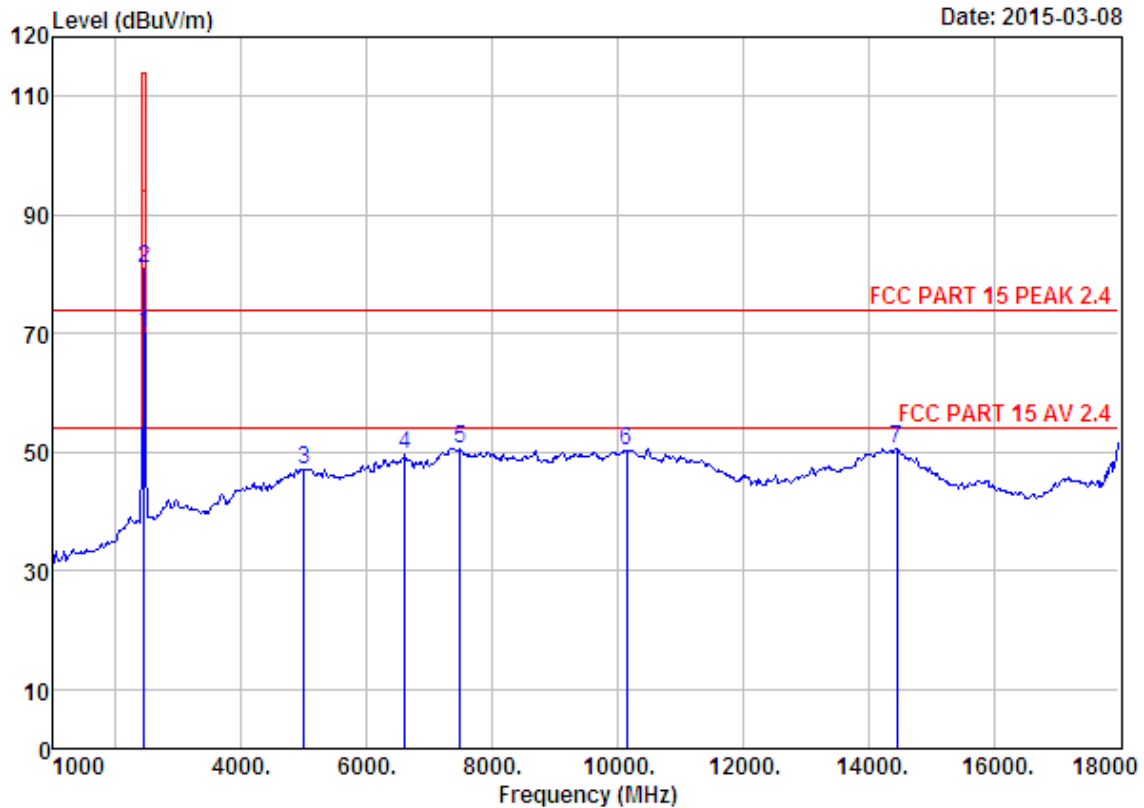
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 66
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2405.00	27.61	6.64	34.18	70.09	70.16	94.00	23.84	Average
2	2405.00	27.61	6.64	34.18	80.06	80.13	114.00	33.87	Peak
3	4910.00	31.42	12.22	31.93	35.91	47.62	74.00	26.38	Peak
4	6134.00	33.08	12.15	32.13	34.87	47.97	74.00	26.03	Peak
5	8004.00	37.01	11.40	31.22	32.96	50.15	74.00	23.85	Peak
6	10180.00	38.42	11.49	32.11	31.67	49.47	74.00	24.53	Peak
7	14566.00	41.71	10.92	33.32	29.79	49.10	74.00	24.90	Peak

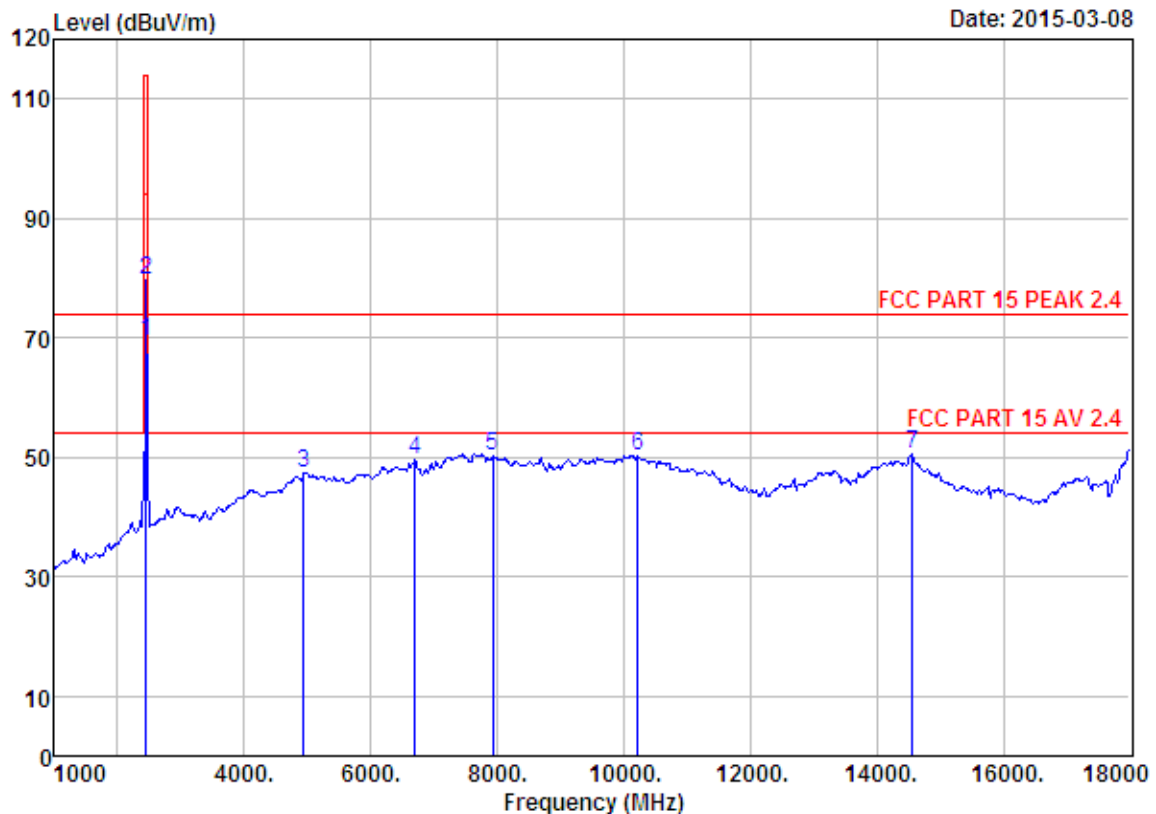
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 69
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2445MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2445.00	27.59	6.67	34.09	70.01	70.18	94.00	23.82	Average
2	2445.00	27.59	6.67	34.09	80.79	80.96	114.00	33.04	Peak
3	4995.00	31.54	12.59	32.00	34.92	47.05	74.00	26.95	Peak
4	6610.00	34.47	12.07	32.18	35.12	49.48	74.00	24.52	Peak
5	7494.00	36.48	11.62	31.87	34.48	50.71	74.00	23.29	Peak
6	10146.00	38.36	11.51	32.05	32.53	50.35	74.00	23.65	Peak
7	14464.00	41.85	10.93	32.96	30.65	50.47	74.00	23.53	Peak

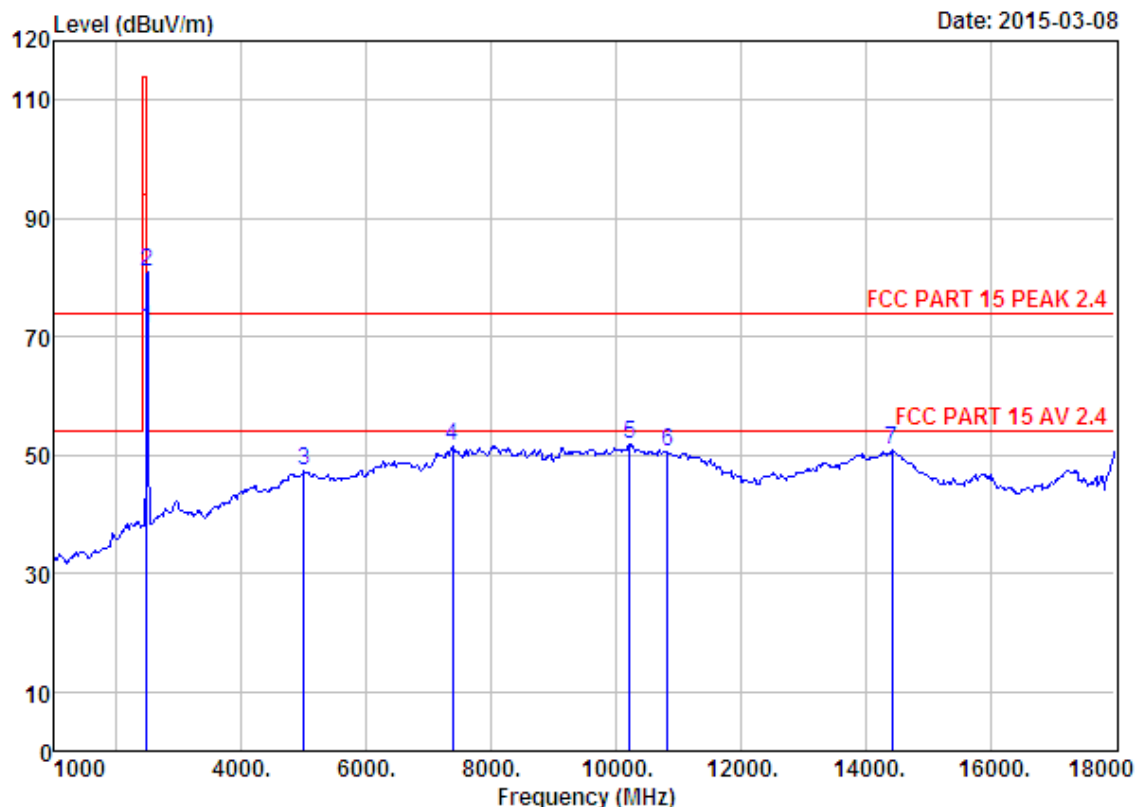
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 70
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2445MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2445.00	27.59	6.67	34.09	69.11	69.28	94.00	24.72	Average
2	2445.00	27.59	6.67	34.09	79.66	79.83	114.00	34.17	Peak
3	4944.00	31.47	12.37	31.96	35.49	47.37	74.00	26.63	Peak
4	6695.00	34.49	11.95	32.23	35.54	49.75	74.00	24.25	Peak
5	7936.00	36.88	11.43	31.28	33.10	50.13	74.00	23.87	Peak
6	10214.00	38.48	11.47	32.17	32.38	50.16	74.00	23.84	Peak
7	14566.00	41.71	10.92	33.32	31.17	50.48	74.00	23.52	Peak

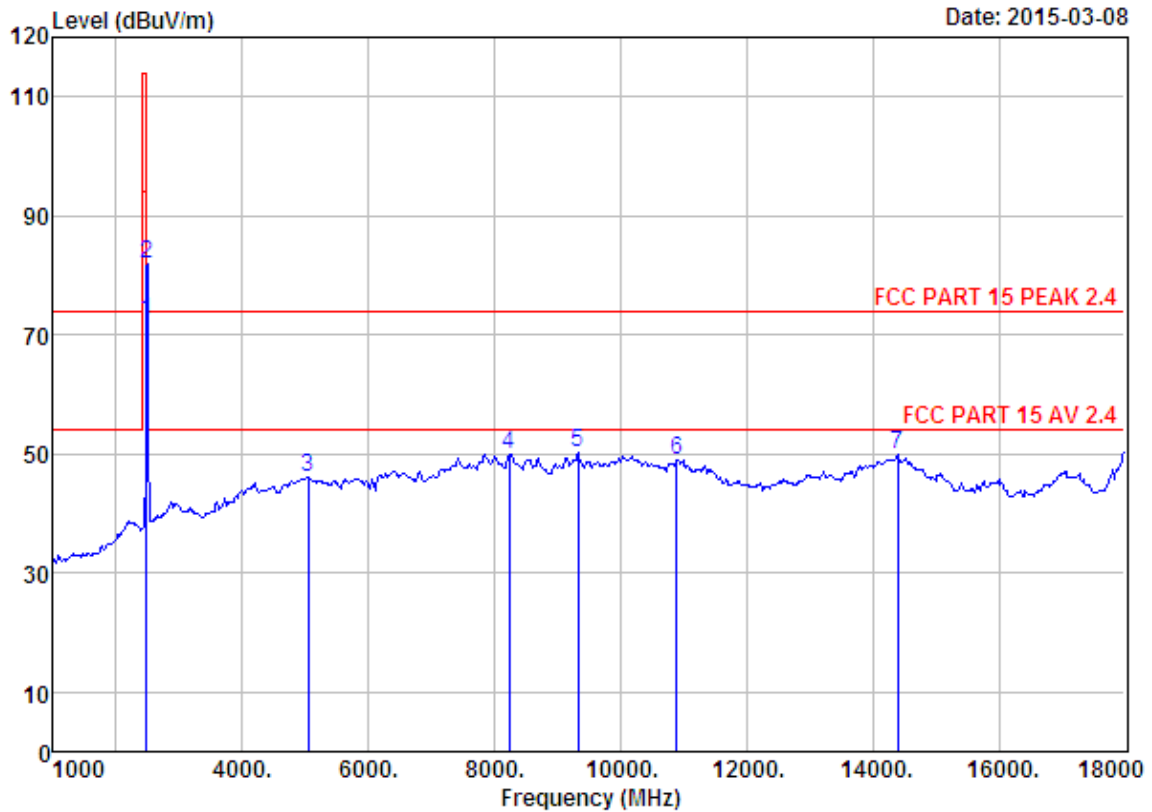
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 71
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2475.00	27.58	6.71	34.06	71.01	71.24	94.00	22.76	Average
2	2475.00	27.58	6.71	34.06	80.74	80.97	114.00	33.03	Peak
3	4995.00	31.54	12.59	32.00	35.15	47.28	74.00	26.72	Peak
4	7375.00	36.57	11.59	31.98	35.25	51.43	74.00	22.57	Peak
5	10214.00	38.48	11.47	32.17	34.08	51.86	74.00	22.14	Peak
6	10826.00	39.33	11.30	33.33	33.22	50.52	74.00	23.48	Peak
7	14430.00	41.82	10.93	32.84	31.04	50.95	74.00	23.05	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

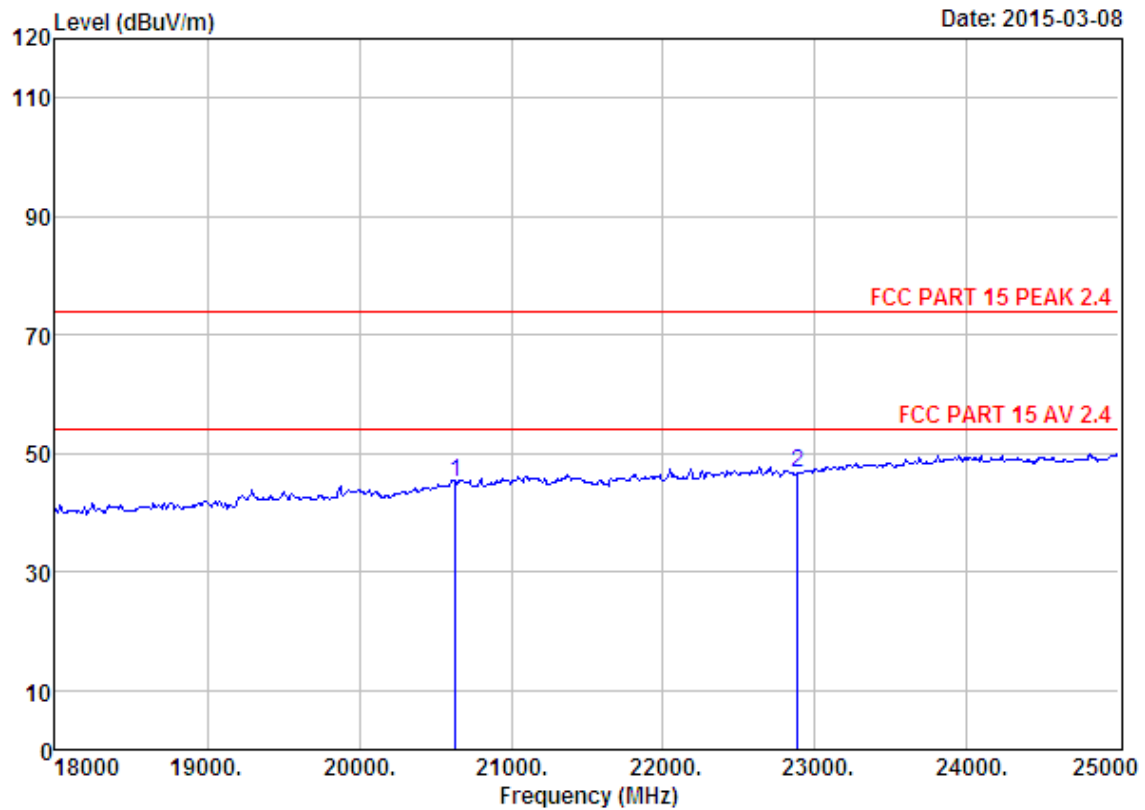


Site no. : 1# 966 chamber Data no. : 72
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2475.00	27.58	6.71	34.06	72.16	72.39	94.00	21.61	Average
2	2475.00	27.58	6.71	34.06	81.57	81.80	114.00	32.20	Peak
3	5046.00	31.57	12.53	32.08	34.20	46.22	74.00	27.78	Peak
4	8225.00	36.66	11.42	31.48	33.40	50.00	74.00	24.00	Peak
5	9330.00	37.97	11.62	32.12	32.82	50.29	74.00	23.71	Peak
6	10894.00	39.41	11.29	33.46	31.85	49.09	74.00	24.91	Peak
7	14396.00	41.79	10.92	32.83	29.97	49.85	74.00	24.15	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

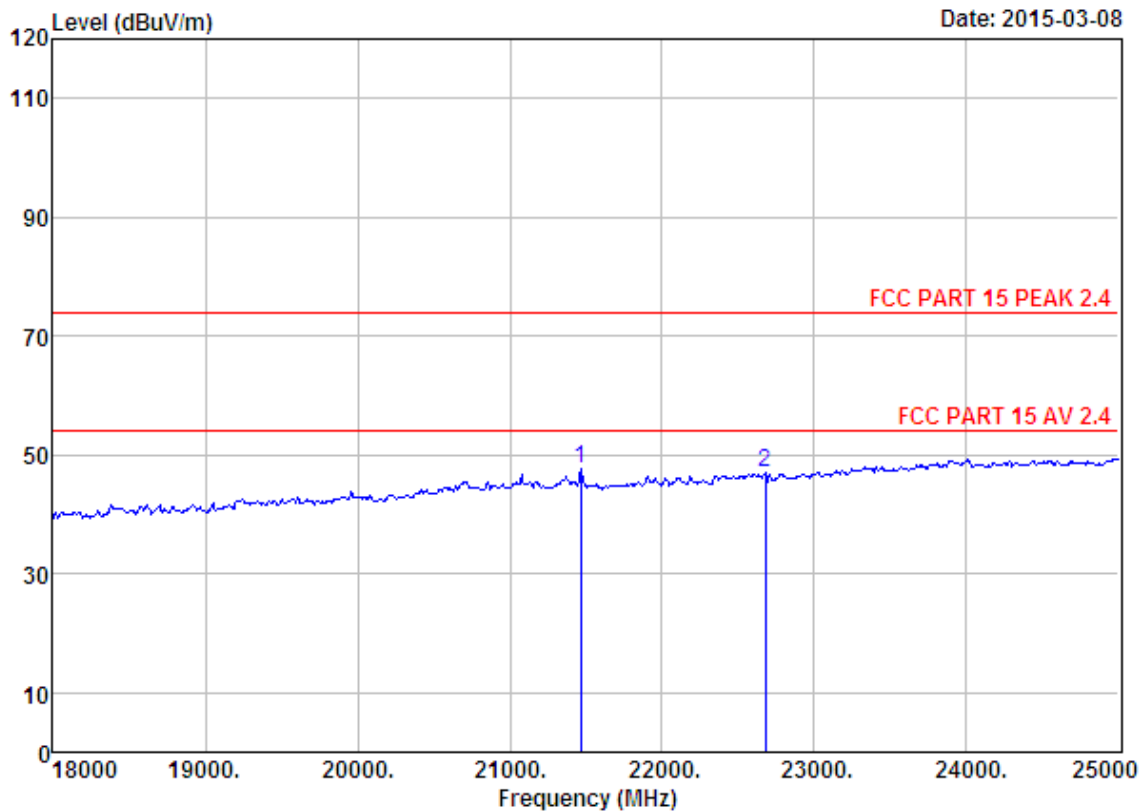
18000MHz-25000MHz



Site no. : 1# 966 chamber Data no. : 75
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20632.00	46.08	19.96	36.14	15.33	45.23	74.00	28.77	Peak
2	22886.00	45.65	21.08	33.98	13.82	46.57	74.00	27.43	Peak

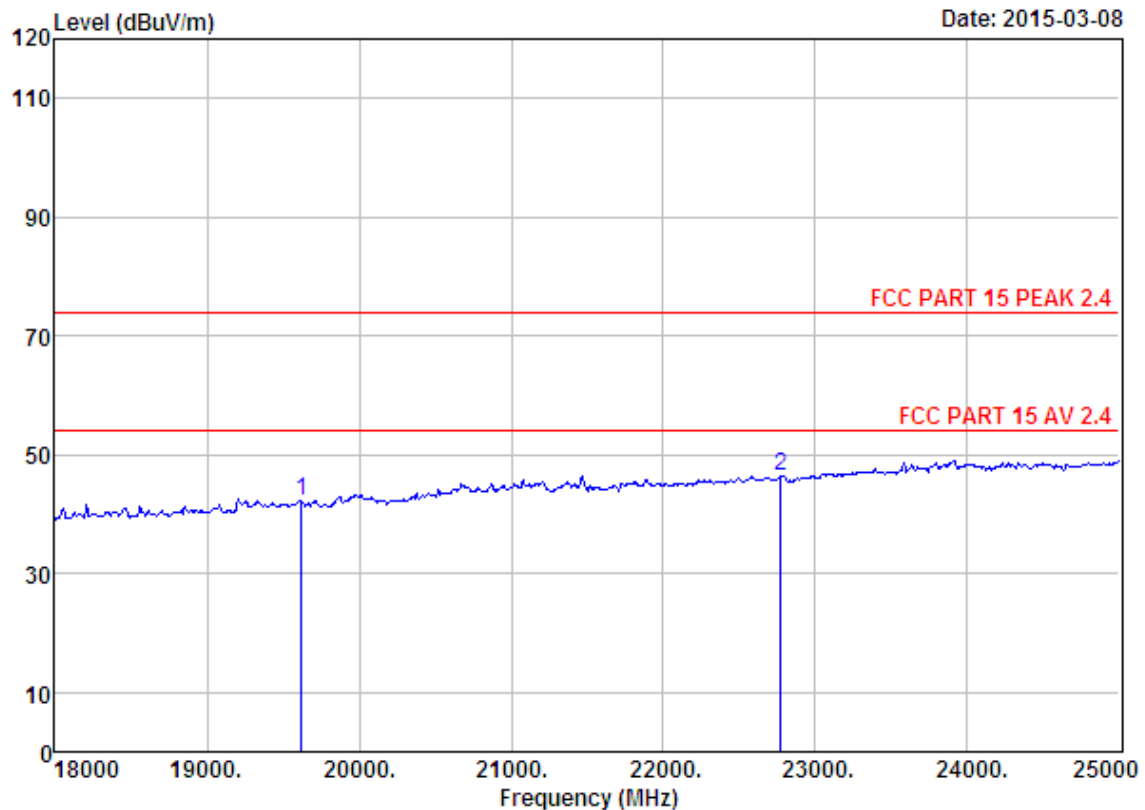
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 76
 Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	21465.00	46.01	20.33	35.37	16.59	47.56	74.00	26.44	Peak
2	22676.00	45.73	20.96	34.19	14.45	46.95	74.00	27.05	Peak

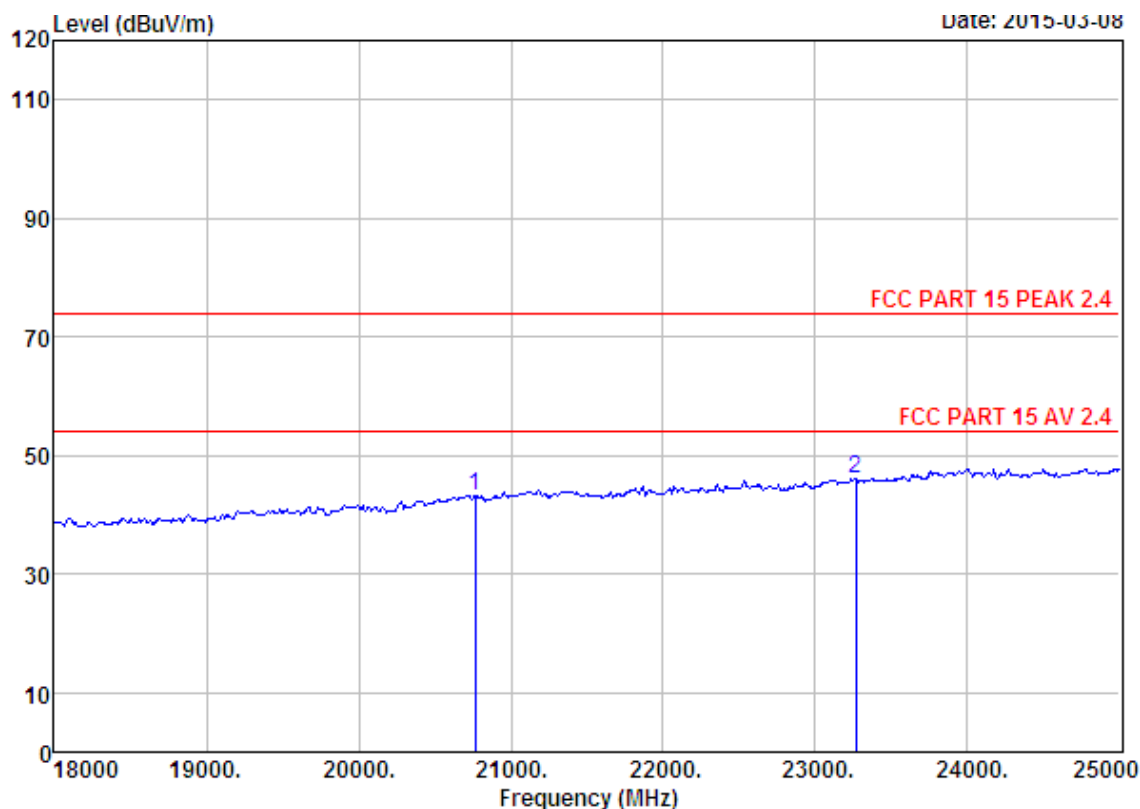
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 77
 Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2445MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	19624.00	45.95	19.25	36.38	13.47	42.29	74.00	31.71	Peak
2	22774.00	45.69	21.01	34.09	13.81	46.42	74.00	27.58	Peak

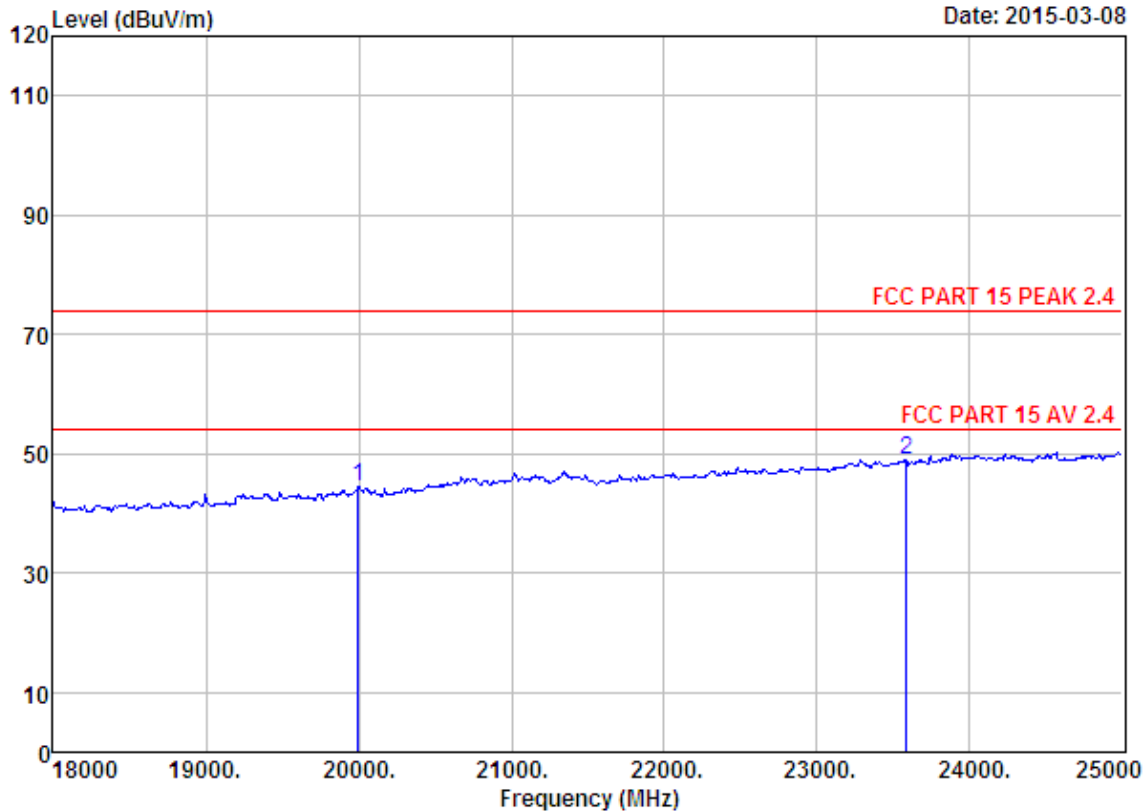
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 78
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2445MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20765.00	46.16	20.02	36.00	13.14	43.32	74.00	30.68	Peak
2	23264.00	45.65	21.39	33.56	12.73	46.21	74.00	27.79	Peak

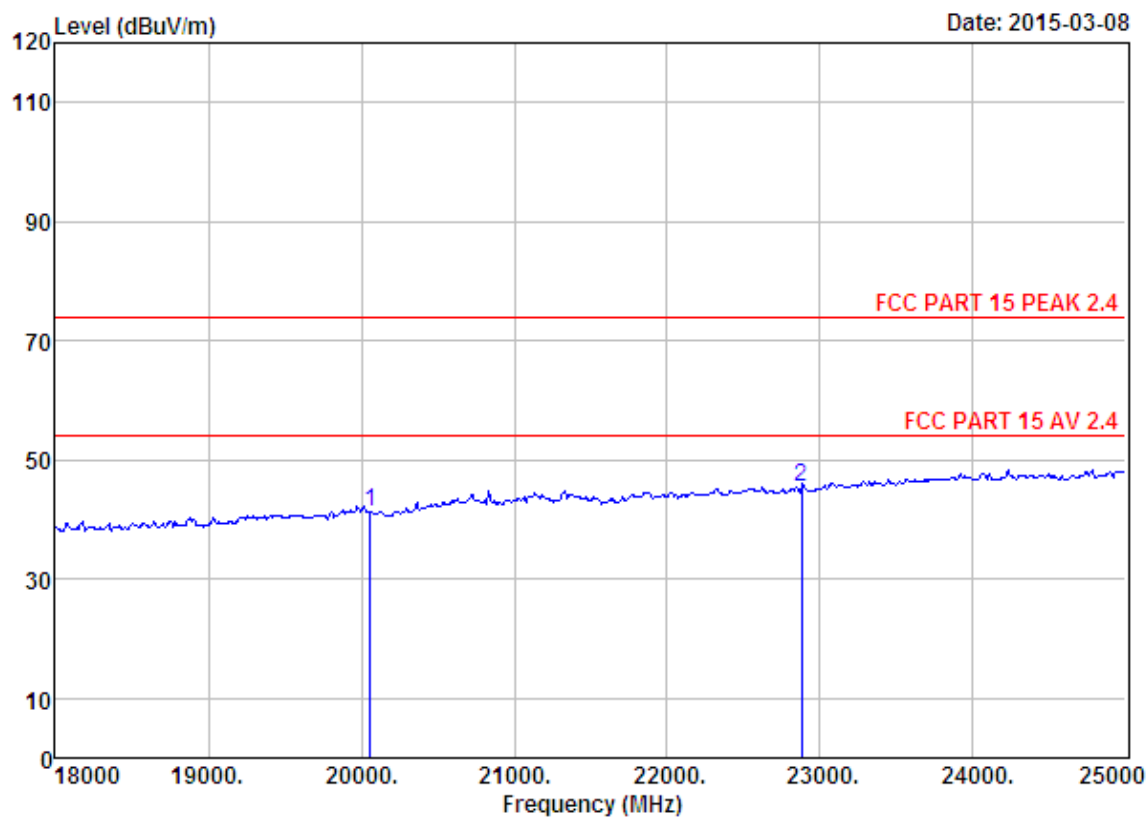
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 79
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	19995.00	46.10	19.68	36.70	15.55	44.63	74.00	29.37	Peak
2	23586.00	45.68	21.68	33.25	14.78	48.89	74.00	25.11	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 80
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20058.00	46.09	19.71	36.66	12.08	41.22	74.00	32.78	Peak
2	22879.00	45.65	21.08	33.98	12.78	45.53	74.00	28.47	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

4. 20 DB BANDWIDTH

4.1. Test Procedure

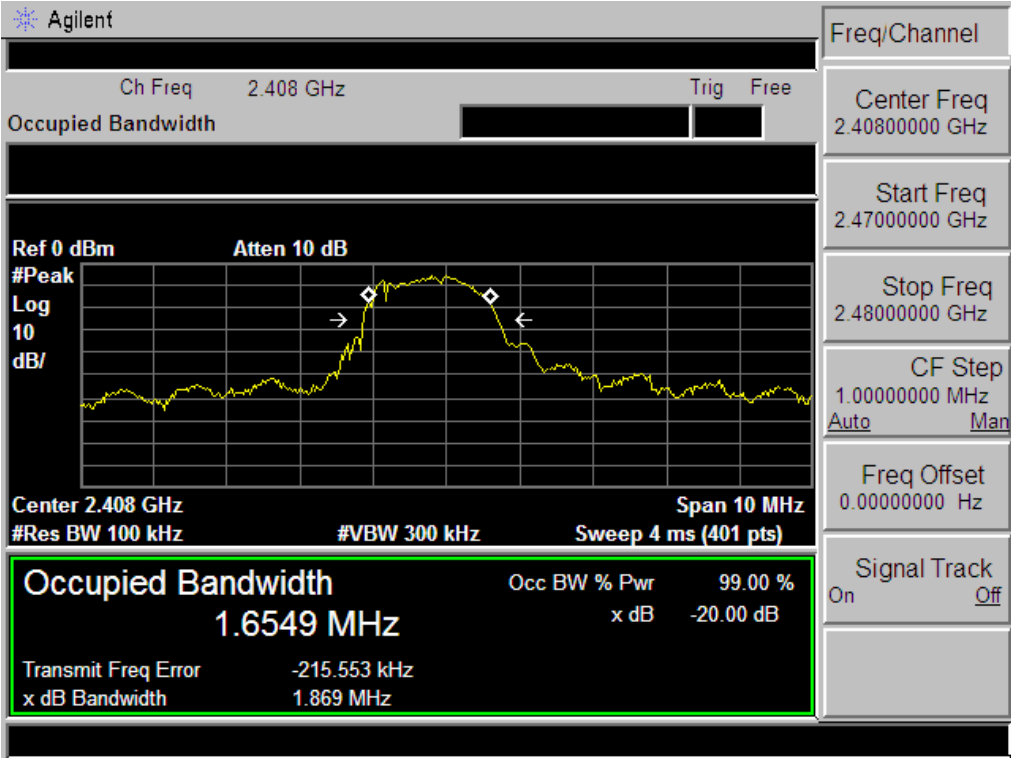
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.2. Test Result

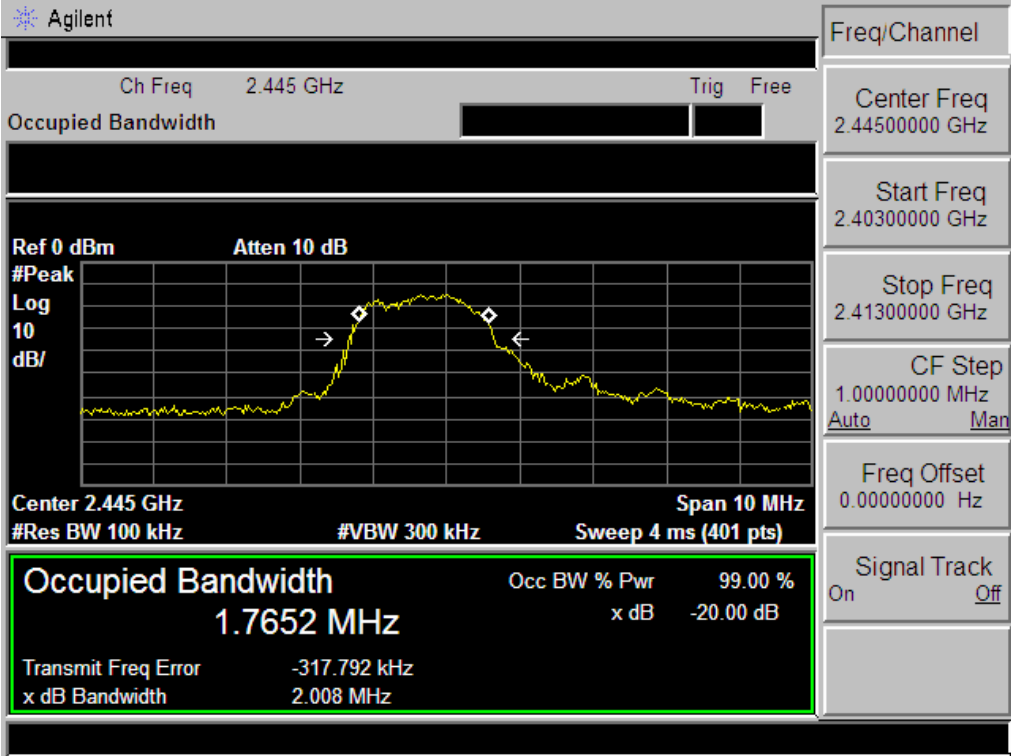
EUT: SMART STUNTS RC RACER				
M/N: 1615				
Test date: 2015-03-13		Test site: RF site		Tested by: Tony Tang
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
TX	2408	1.869	/	PASS
	2445	2.008	/	PASS
	2475	1.910	/	PASS

4.3. Test Data

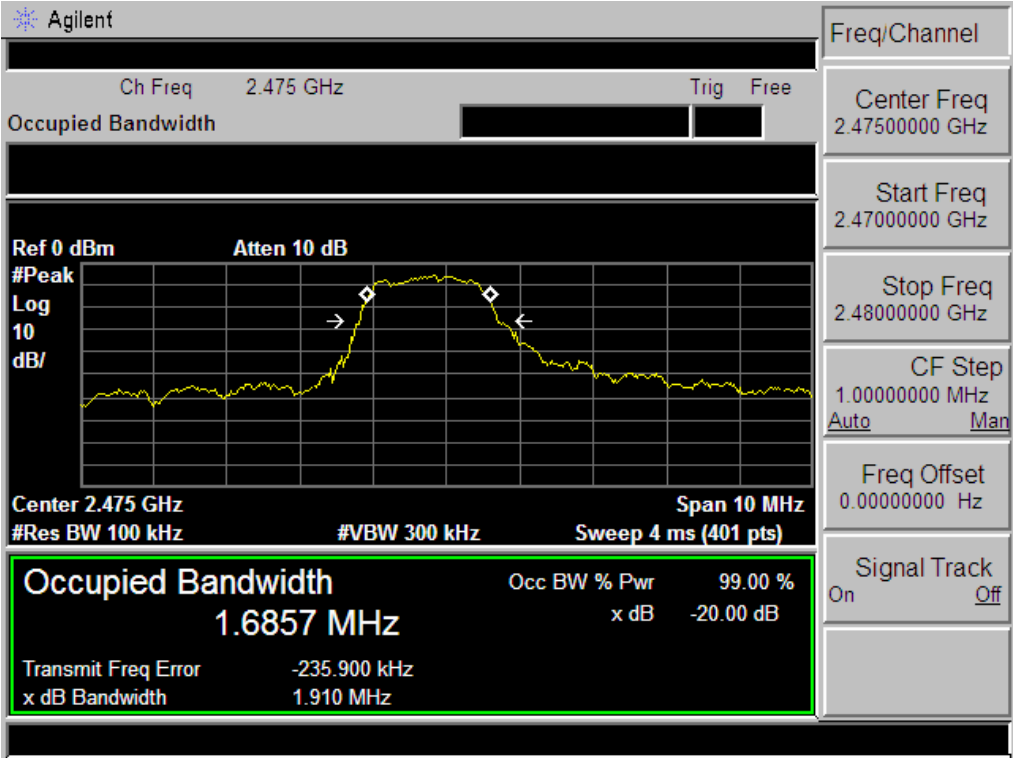
TX 2408 MHz



TX 2445 MHz

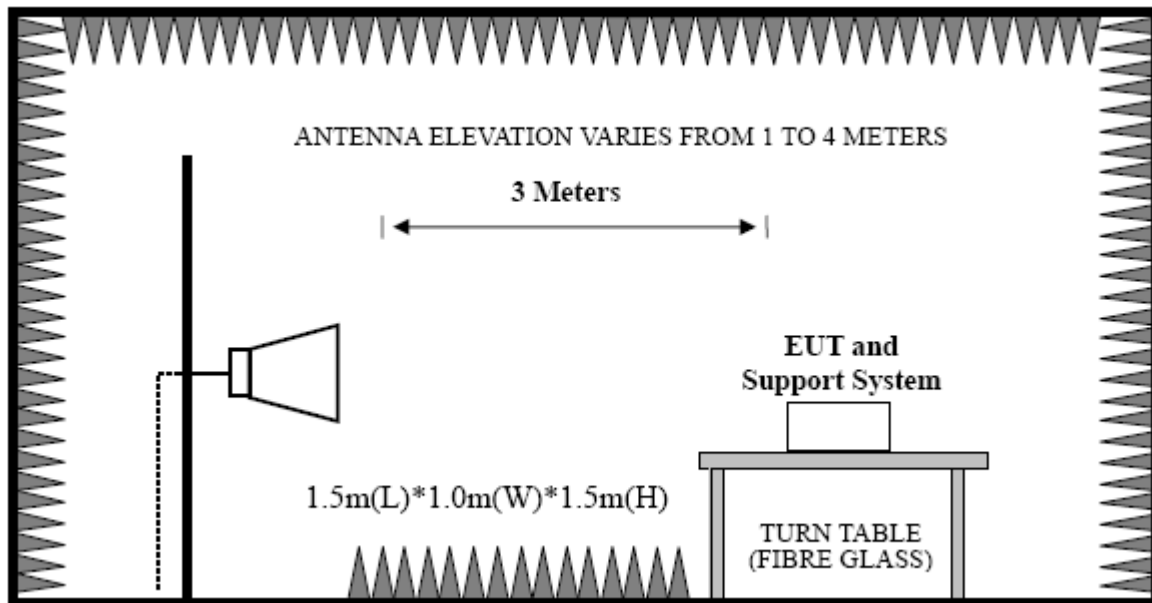


TX 2475 MHz



5. BAND EDGE COMPLIANCE

5.1. Block Diagram of Test setup



5.2. Test Procedure

EUT was placed on a turn table, which is 1.5 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of emissions

Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto.

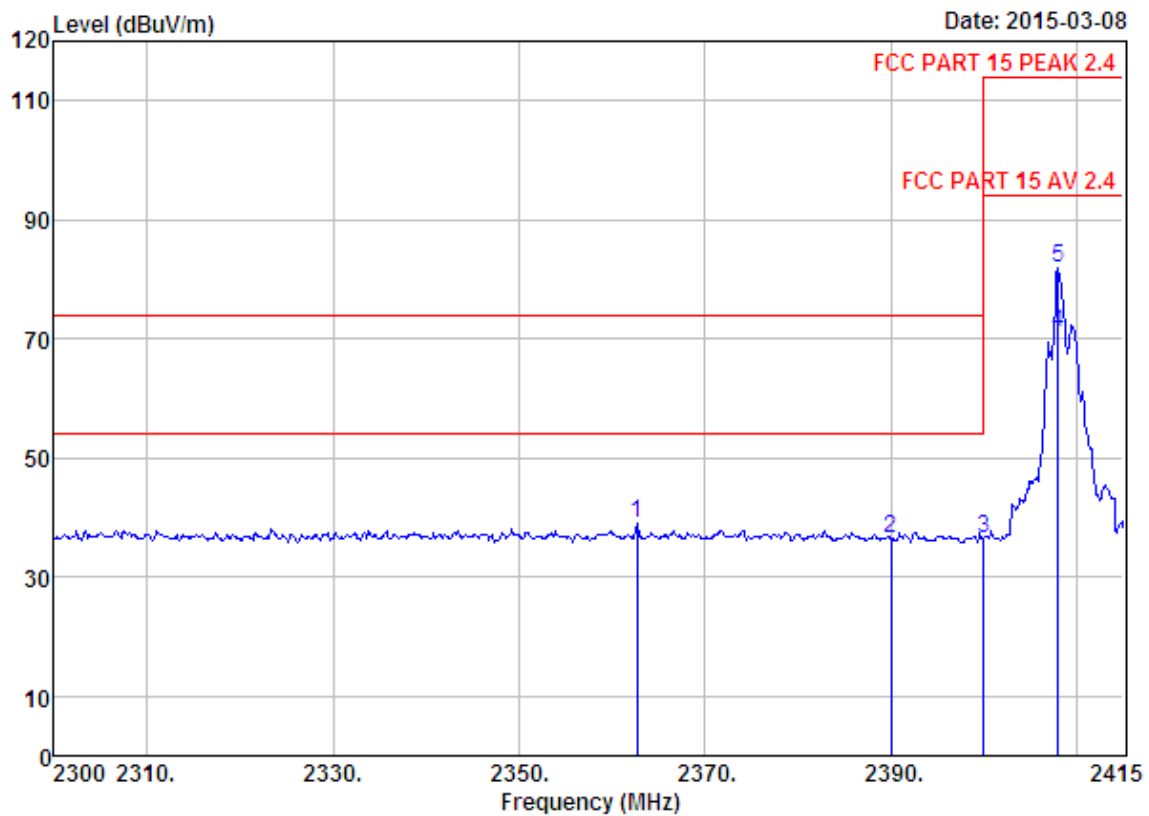
AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto .

5.3. Test Result

EUT: SMART STUNTS RC RACER	M/N: 1615
Power: DC 3V	
Test date: 2015-03-08	Test site: 3m Chamber Tested by: Tony Tang
Test mode: Tx Mode	
Pass	

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

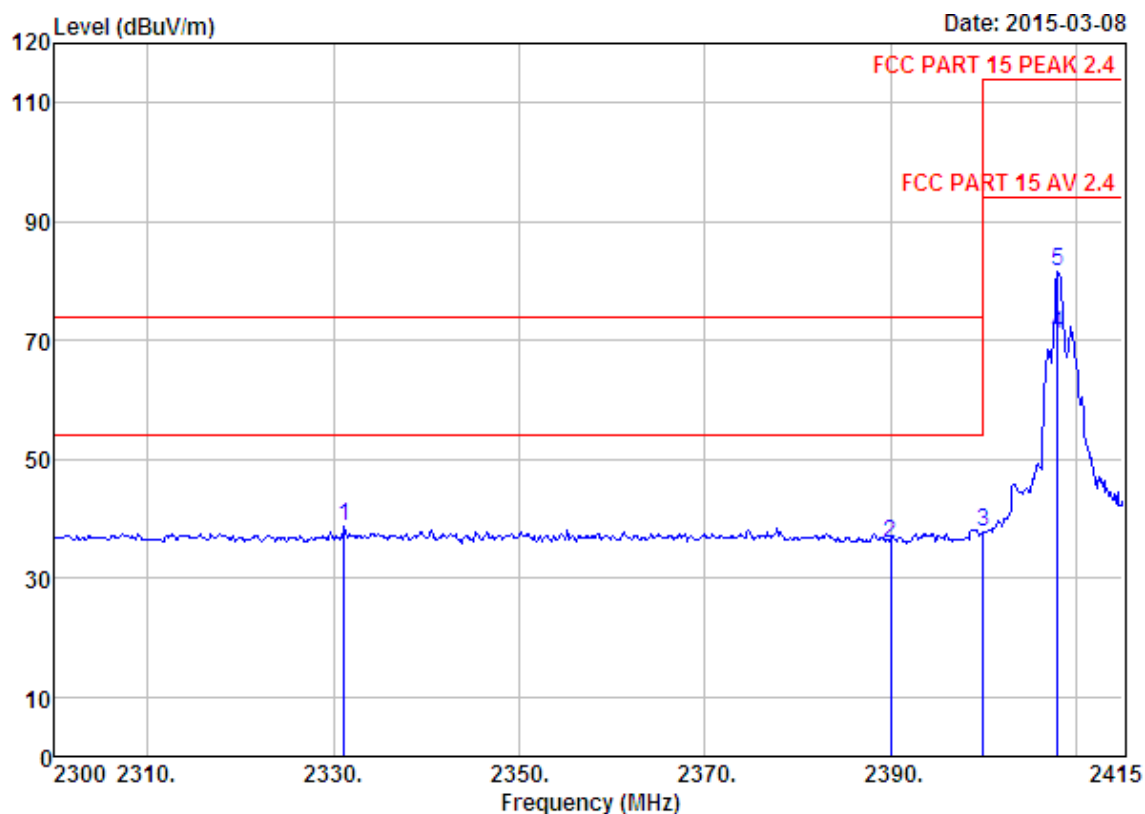
5.4. Test Data



Site no. : 1# 966 chamber Data no. : 67
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2362.64	27.67	6.58	34.20	39.05	39.10	74.00	34.90	Peak
2	2390.00	27.64	6.62	34.19	36.47	36.54	74.00	37.46	Peak
3	2400.00	27.61	6.62	34.18	36.37	36.42	74.00	37.58	Peak
4	2408.00	27.61	6.64	34.18	71.08	71.15	94.00	22.85	Average
5	2408.00	27.61	6.64	34.18	81.88	81.95	114.00	32.05	Peak

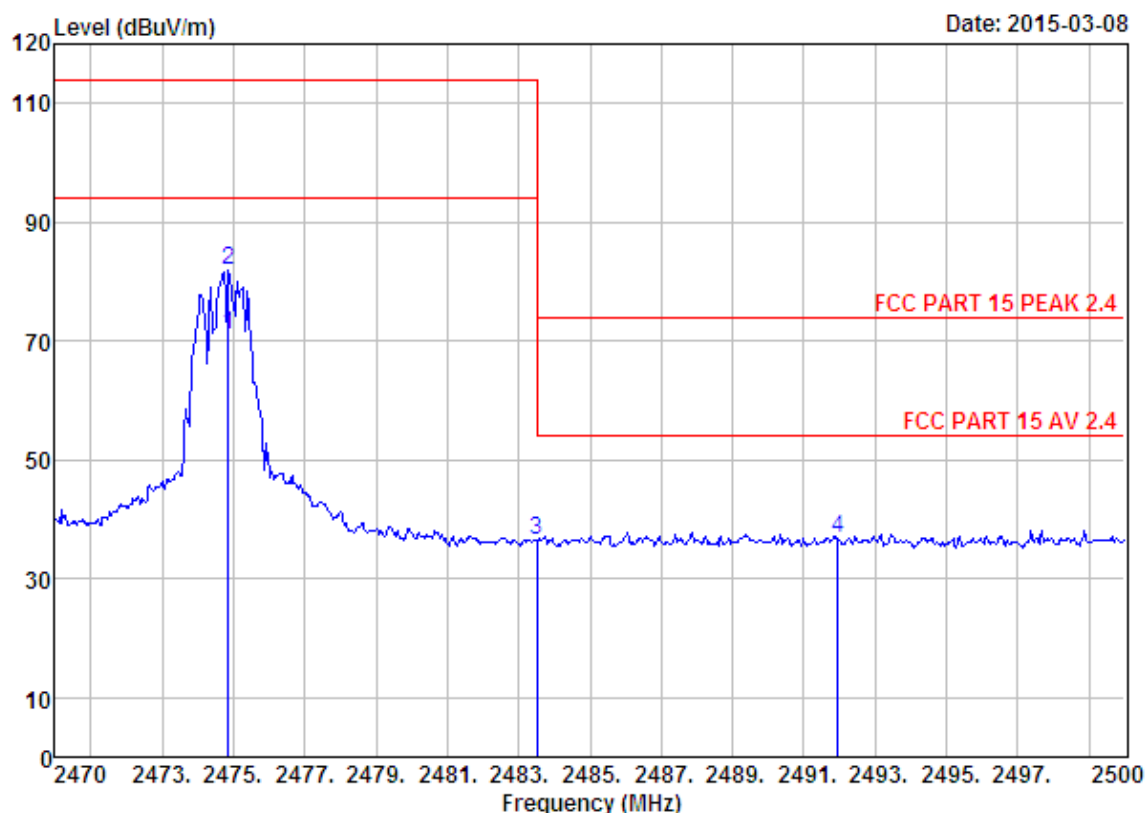
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 68
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2408MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2331.20	27.73	6.54	34.23	38.59	38.63	74.00	35.37	Peak
2	2390.00	27.64	6.62	34.19	35.80	35.87	74.00	38.13	Peak
3	2400.00	27.61	6.62	34.18	37.74	37.79	74.00	36.21	Peak
4	2408.00	27.61	6.64	34.18	71.10	71.17	94.00	22.83	Average
5	2408.00	27.61	6.64	34.18	81.47	81.54	114.00	32.46	Peak

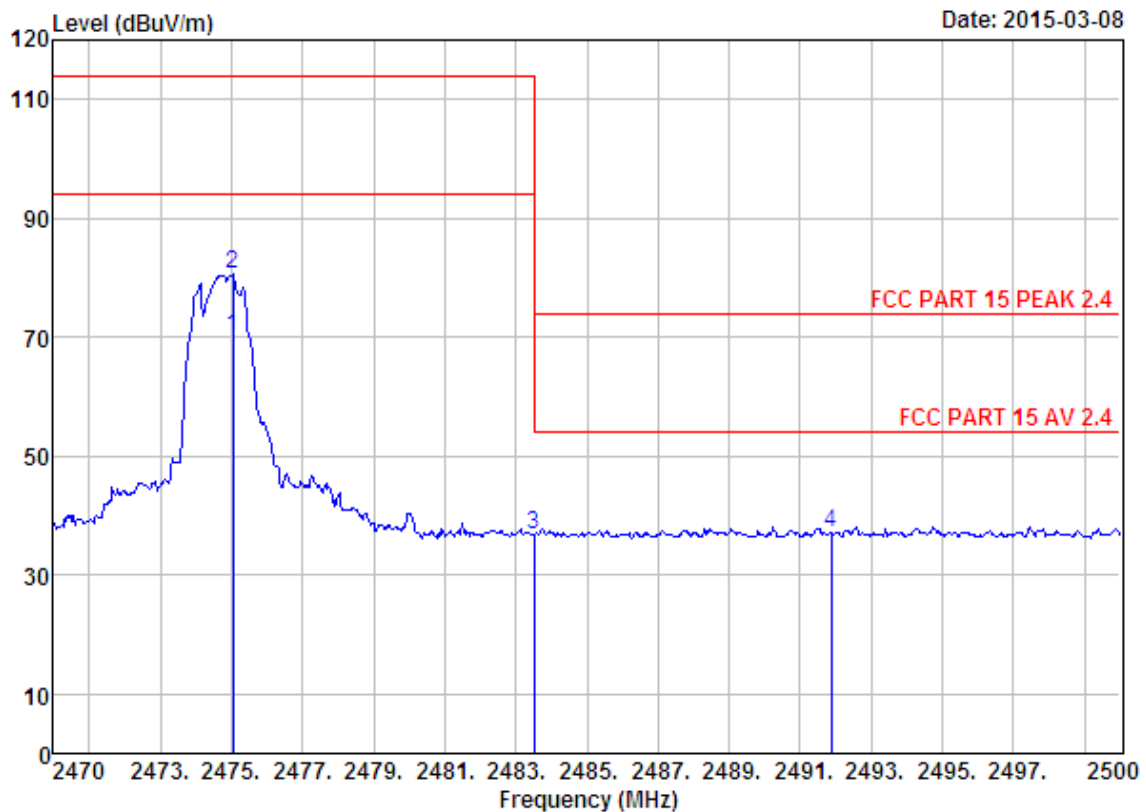
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 73
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6%;Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2474.86	27.58	6.71	34.06	70.96	71.19	94.00	22.81	Average
2	2474.86	27.58	6.71	34.06	81.67	81.90	114.00	32.10	Peak
3	2483.50	27.58	6.71	34.03	36.12	36.38	74.00	37.62	Peak
4	2491.96	27.58	6.73	34.03	36.54	36.82	74.00	37.18	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 chamber Data no. : 74
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : SMART STUNTS RC RACER
 Power : DC 3V
 M/N : 1615
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2475.04	27.58	6.71	34.06	70.01	70.24	94.00	23.76	Average
2	2475.04	27.58	6.71	34.06	80.30	80.53	114.00	33.47	Peak
3	2483.50	27.58	6.71	34.03	36.51	36.77	74.00	37.23	Peak
4	2491.87	27.58	6.73	34.03	36.70	36.98	74.00	37.02	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

6. ANTENNA REQUIREMENTS

6.1. Limit

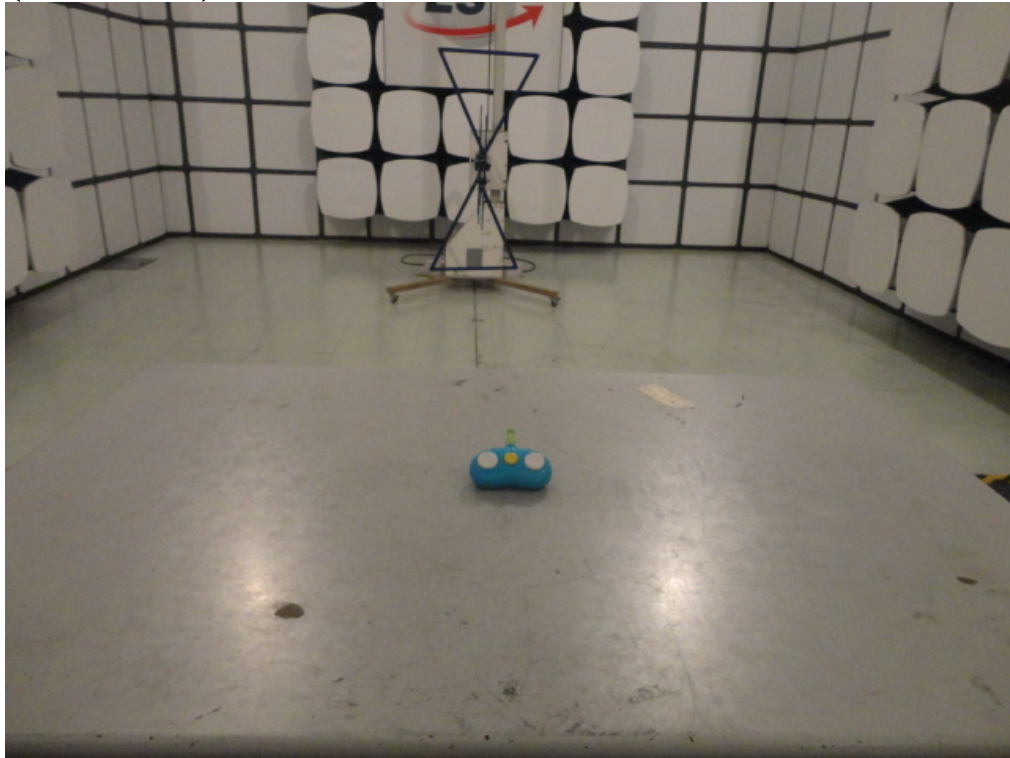
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.2. Result

The antennas used for this product are integral Patch Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 0dBi.

7. TESTSETUP PHOTO

Radiated Test (30-1000 MHz)



Radiated Test (1000-25000 MHz)



Photos of EUT

External Photos

M/N: 1615



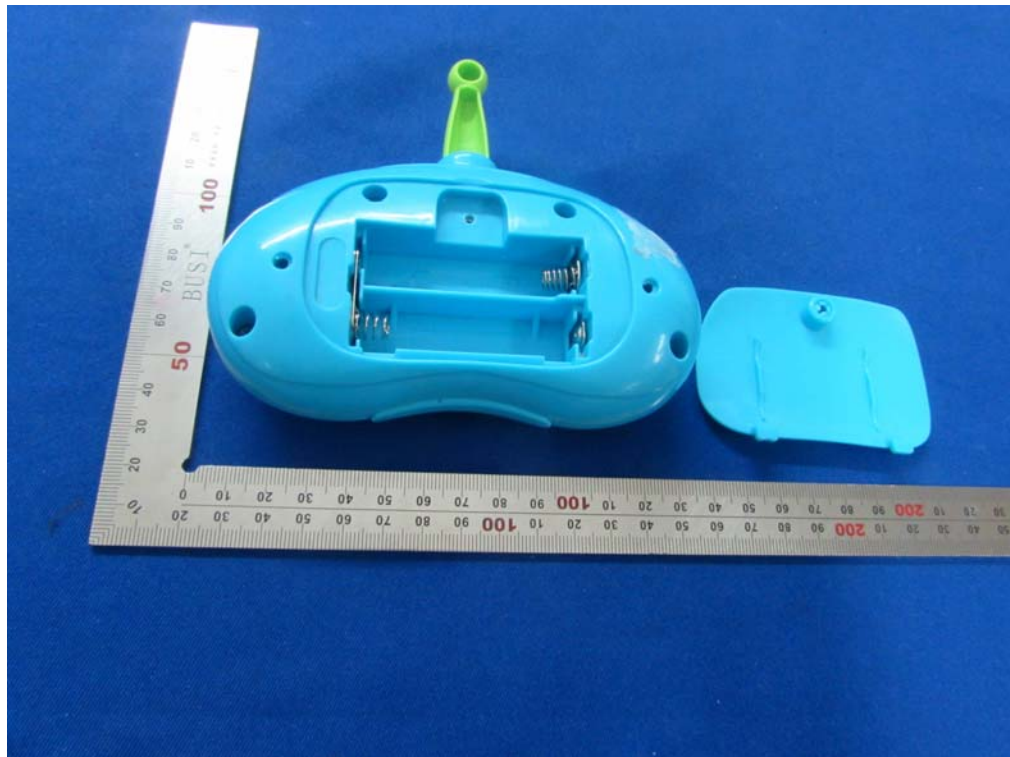
External Photos
M/N:1615



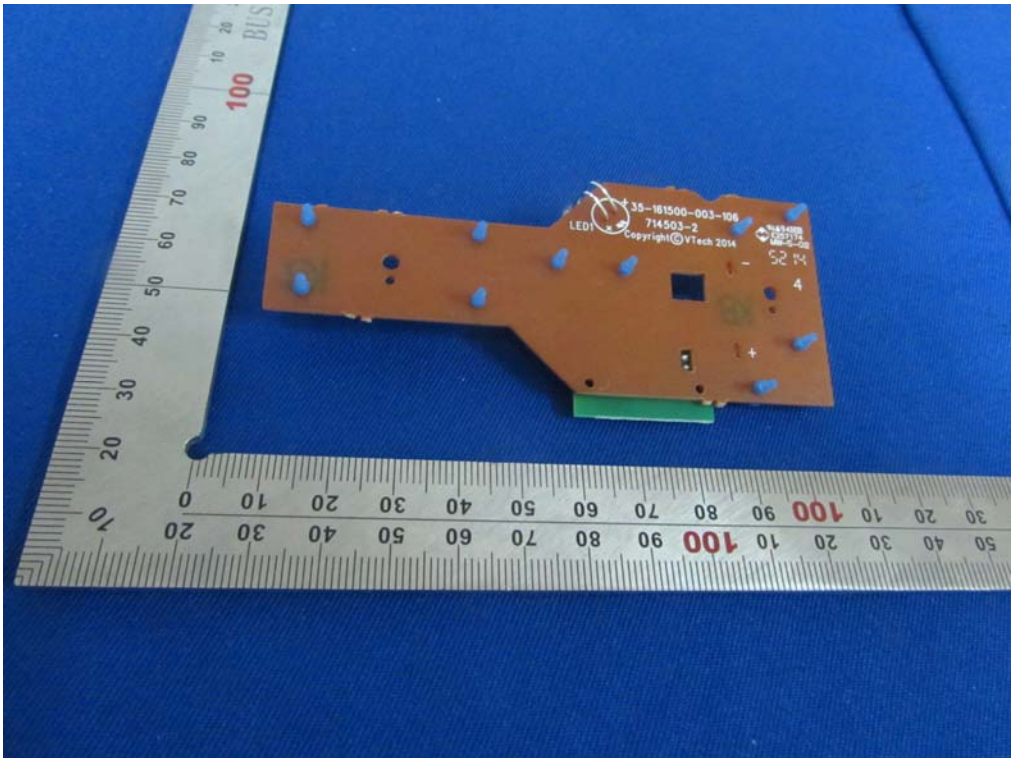
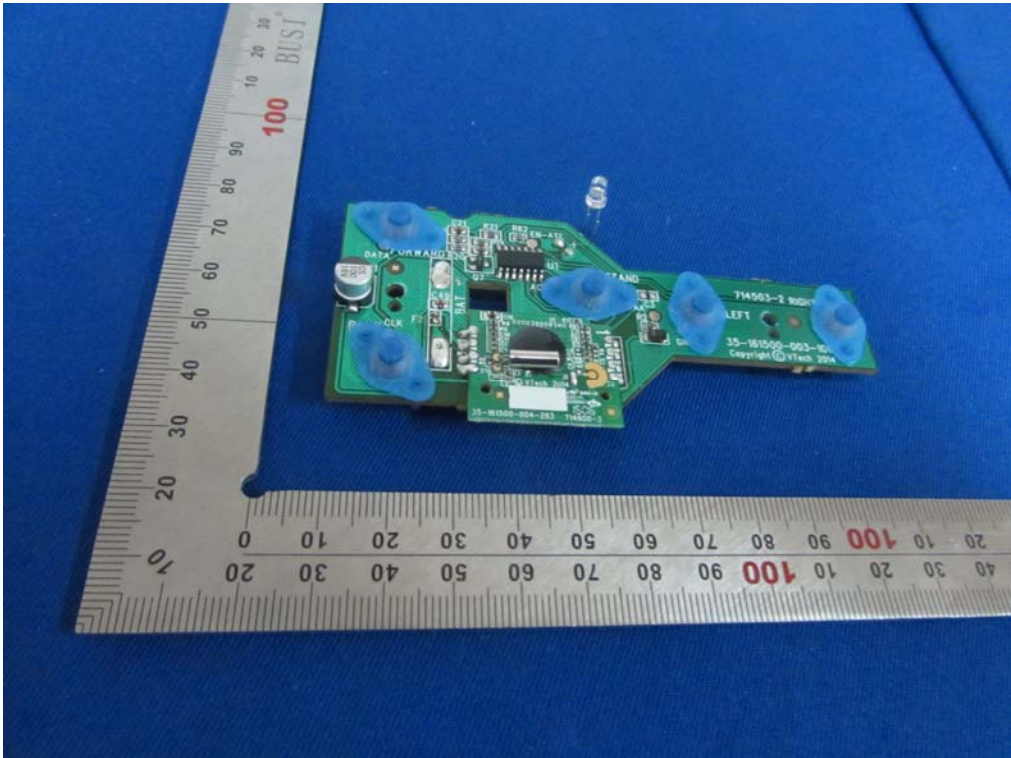
External Photos
M/N: 1615



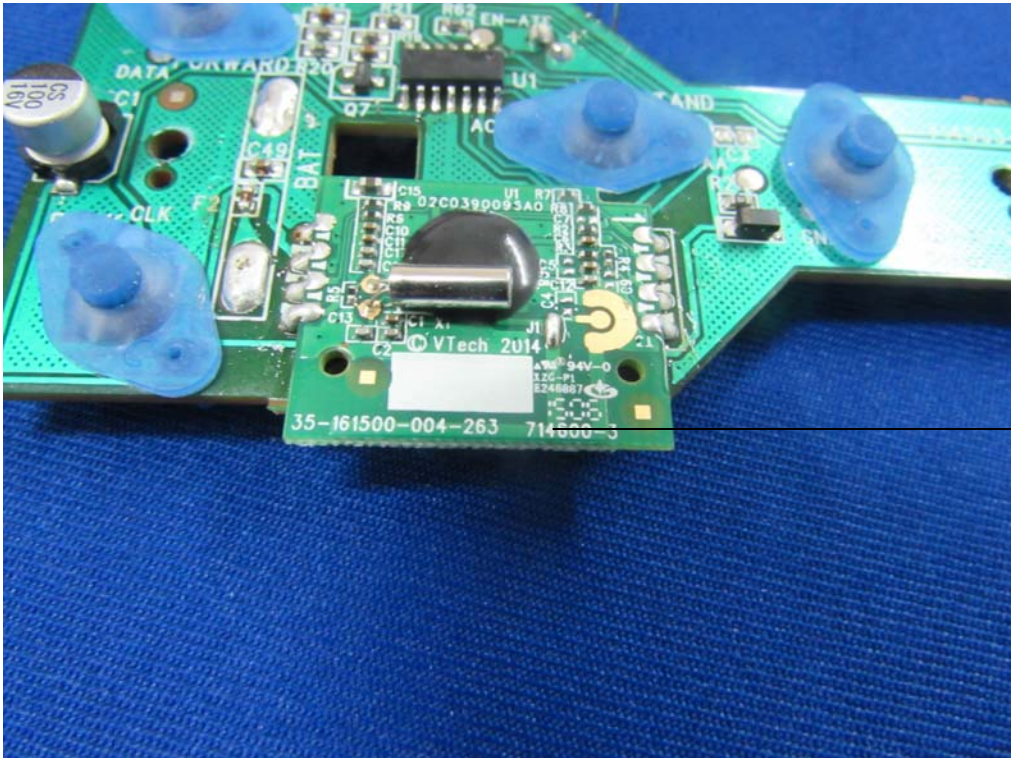
Internal Photos
M/N: 1615



Internal Photos
M/N: 1615



Internal Photos
M/N: 1615



TX
Antenna