

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053

Fax: +86 (0) 755 2671 0594

Email: sgs_internet_operations@sgs.com

Report No.: SZEMO10100668001

Page : 1 of 19

FCC REPORT

Application No. :

SZEMO101006680RF

Applicant:

Shenzhen Xinzhenheng electronics CO LTD

Product Name:

RF Remote Controller

Model No.:

CM6623

Operation Frequency :

433.92MHz

FCC ID:

VZB-CM6623R

Standards:

FCC CFR Title 47 Part 15 Subpart C Section 15.231: 2009

Date of Receipt:

2010-10-27

Date of Test:

2010-10-27 to 2010-11-05

Date of Issue:

2010-11-05

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
Laboratory 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 International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS.....	2
3 TEST SUMMARY	3
4 GENERAL INFORMATION.....	4
4.1 CLIENT INFORMATION	4
4.2 GENERAL DESCRIPTION OF E.U.T	4
4.3 E.U.T OPERATION MODE.....	5
4.4 TEST FACILITY	6
4.5 TEST LOCATION	6
4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	6
4.7 TEST INSTRUMENTS LIST	7
5 TEST RESULTS AND MEASUREMENT DATA.....	8
5.1 ANTENNA REQUIREMENT:	8
5.2 RADIATED EMISSION.....	9
5.2.1 <i>Field Strength Of The Fundamental Signal</i>	11
5.2.2 <i>Spurious Emissions</i>	13
5.3 20dB BANDWIDTH	16
5.4 DWELL TIME:.....	18-19

3 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Passed
AC Power Line Conducted Emission	15.207	Passed
Field strength of the fundamental signal	15.231 (b)	Passed
Spurious emissions	15.231 (b)/15.209	Passed
20dB Bandwidth	15.231 (c)	Passed
Dwell time	15.231 (a)	Passed

Remark: Passed: The EUT complies with the essential requirements in the standard.

Failed: The EUT does not comply with the essential requirements in the standard.

4 General Information

4.1 Client Information

Applicant:	Shenzhen Xinzhensheng electronics CO LTD
Manufacturer:	Ready2light limited
Factory:	SHENZHEN XINZHENSHE ELECTRONICS CO., LTD
Address of Applicant:	Building 49, Baotian Industrial Zone Xixiang Town, Shenzhen, China
Address of Manufacturer:	FLAT/RM604-7 DOMINION CENTRE43-49 QUEEN' S ROAD EAST HONG KONG CHINA
Address of Factory:	Building 49, Baotian Industrial Zone Xixiang Town, Baoan District, Shenzhen, China

4.2 General Description of E.U.T.

Product Name:	RF Remote Controller
Trade Name:	N/A
Model No.:	CM6623
Operation Frequency:	433.92MHz
Antenna Type:	Integral
Antenna gain:	0dBi
Power supply:	DC 12V
Remark:	The product include transmitter and receiver, only the transmitter testing result recorded in this report, the receiver testing result recorded in the other report.

4.3 E.U.T Operation mode

Operating Environment:

Temperature: 24.0 °C
Humidity: 52 % RH
Atmospheric Pressure: 1008 mbar

Test mode:

Tx mode: EUT transmitted the continuous modulation signal at the specific channel

4.4 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 556682, June 27, 2008.

- **Industry Canada (IC)**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.

4.7 Test Instruments list

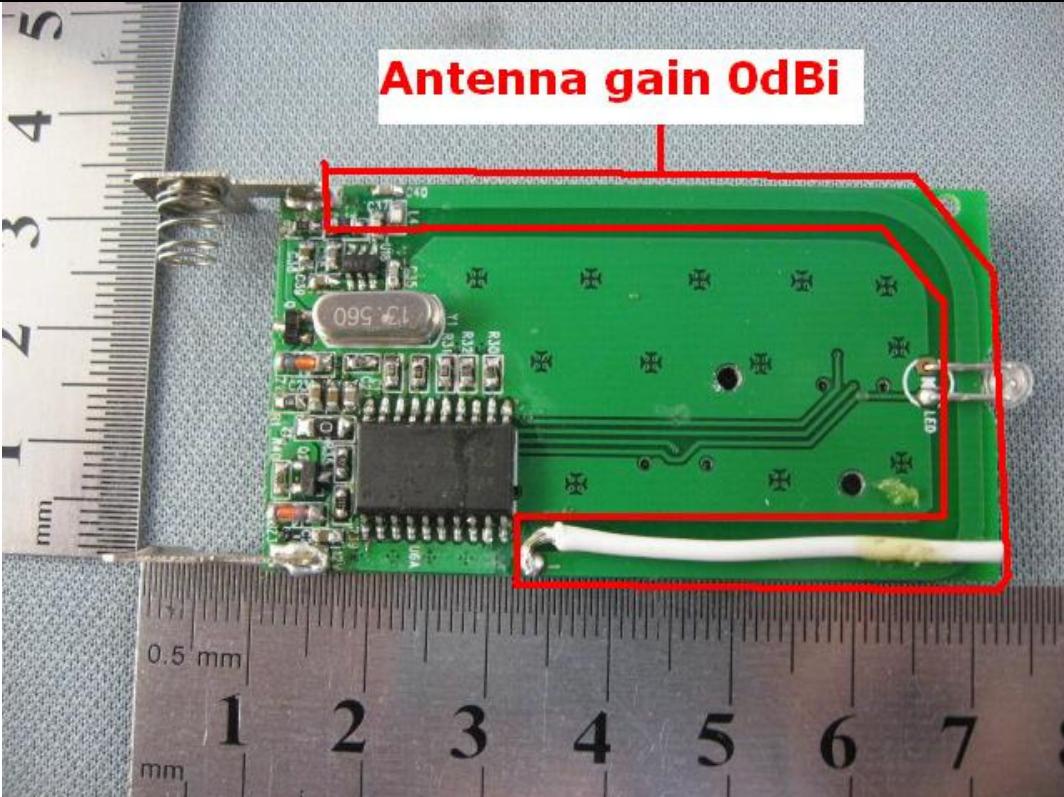
RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2010-06-17	2011-06-17
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2009-11-05	2010-11-05
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	2008-06-18	2011-06-18
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2009-11-05	2010-11-05
6	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2009-11-10	2011-11-10
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2010-06-02	2011-06-02

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	N/A	N/A
2	LISN	ETS-LINDGREN	3816/2	SEL0021	2010-06-02	2011-06-02
3	Two-Line V-Network	Rohde & Schwarz	ENV216	SEL0152	2010-09-27	2011-09-27
4	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2010-06-02	2011-06-02
5	Coaxial Cable	SGS	N/A	SEL0024	2008-06-18	2011-06-18

RF conducted						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Spectrum Analyzer	Rohde & Schwarz	FSP 30	SEL0154	2009-10-22	2010-10-22
2	Coaxial cable	SGS	N/A	SEL0028	2008-06-18	2011-06-18

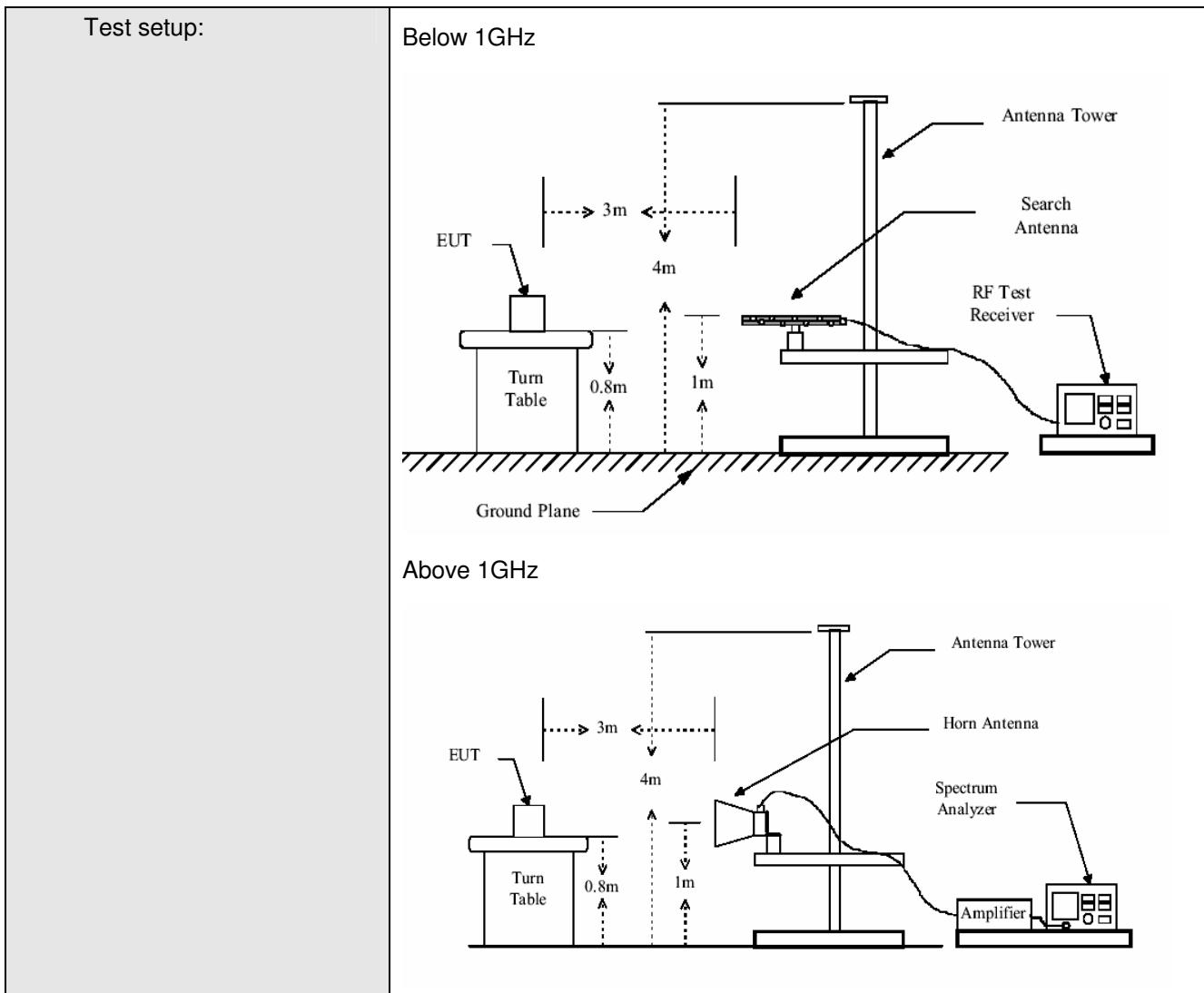
5 Test results and Measurement Data

5.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: <i>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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</i>	
E.U.T Antenna:	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.	
	

5.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.231(b) and 15.209																									
Test Method:	ANSI C63.10: 2009																									
Test Frequency Range:	30MHz to 5000MHz																									
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																									
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr> <tr> <td>Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value						
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Limit: (Field strength of the fundamental signal)	<table border="1"> <thead> <tr> <th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>433.92MHz</td><td>80.83</td><td>Average Value</td></tr> <tr> <td></td><td>100.83</td><td>Peak Value</td></tr> </tbody> </table>					Frequency	Limit (dBuV/m @3m)	Remark	433.92MHz	80.83	Average Value		100.83	Peak Value												
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Limit: (Spurious Emissions)	<table border="1"> <thead> <tr> <th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr> <tr> <td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr> <tr> <td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr> <tr> <td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr> <tr> <td>Above 1GHz</td><td>54.0</td><td>Average Value</td></tr> <tr> <td></td><td>74.0</td><td>Peak Value</td></tr> </tbody> </table> <p>Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.</p>					Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Above 1GHz	54.0	Average Value		74.0	Peak Value
Frequency	Limit (dBuV/m @3m)	Remark																								
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960MHz-1GHz	54.0	Quasi-peak Value																								
Above 1GHz	54.0	Average Value																								
	74.0	Peak Value																								
Test Procedure:	<p>The E.U.T and its simulators are placed on a turn table which is 0.8meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.</p> <p>Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.</p> <p>The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report</p>																									
Test Instruments:	Refer to section 4.7 for details																									
Test mode:	Tx mode																									
Test results:	Pass																									



Measurement Data

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

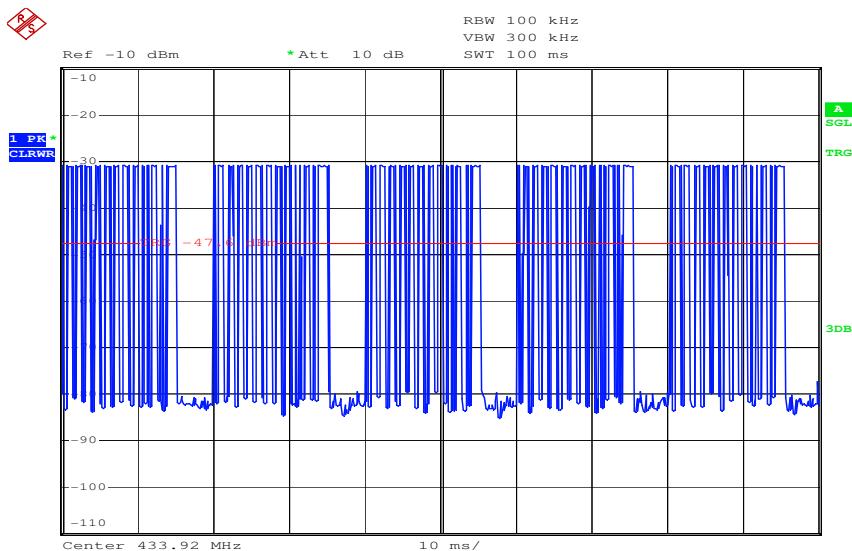
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

5.2.1 Field Strength Of The Fundamental Signal

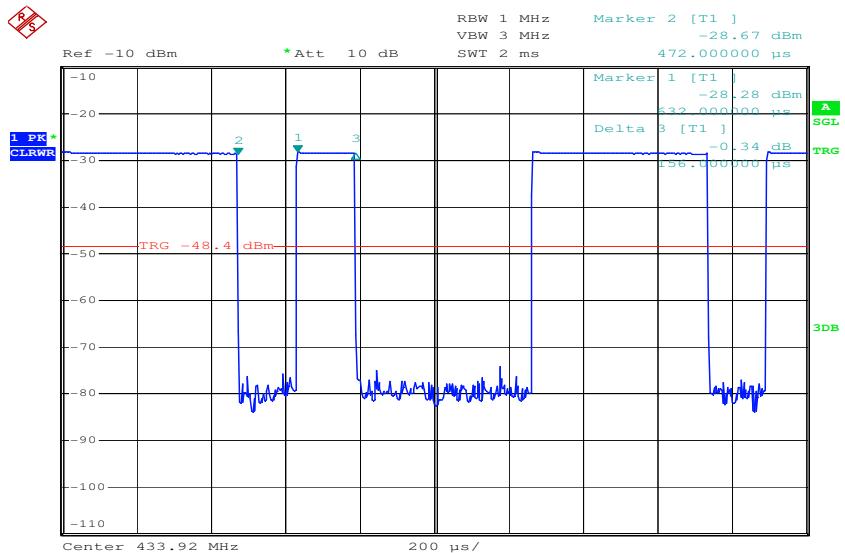
Peak value:								
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.920	2.35	16.59	27.52	73.88	65.30	100.83	-35.53	Horizontal
433.920	2.35	16.59	27.52	88.68	80.10	100.83	-20.73	Vertical

Average value:	
Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20 log(Duty cycle)=-8.71dB
	Duty cycle= T on time / T period
Test data:	Ton time =7.376ms
	T period =20.10ms
	Average value= 71.39 dBuV/m
Average Limit	80.83 dBuV/m
Test result	Pass

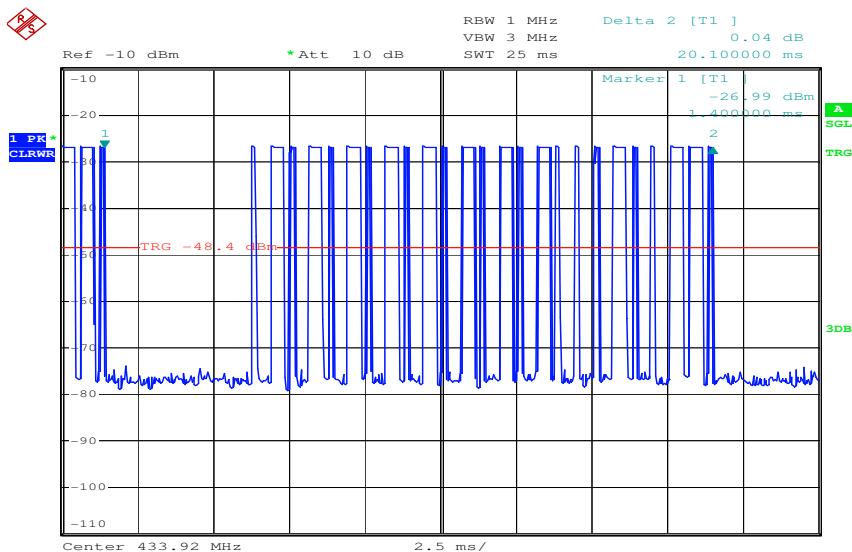
Test plot as follows:



Date: 1.NOV.2010 09:40:18



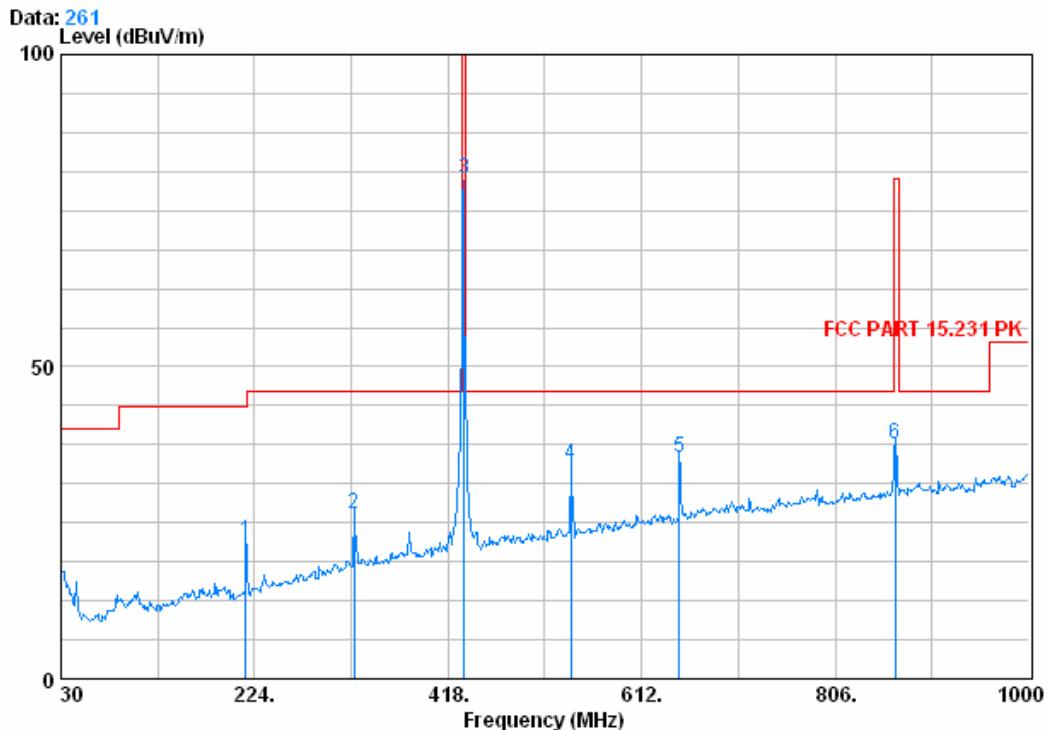
Date: 1.NOV.2010 09:58:09



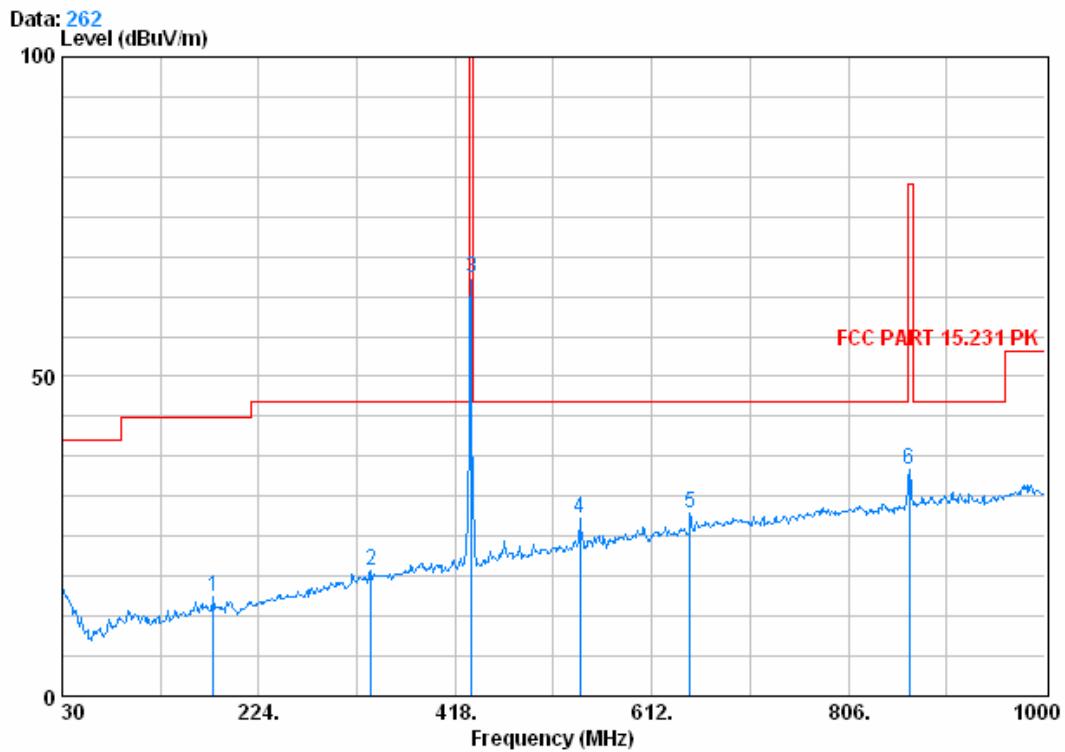
Date: 1.NOV.2010 10:22:40

5.2.2 Spurious Emissions

30MHz~1GHz



Freq	Cable		Antenna	Preamp	Read	Limit	Over	Remark
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	215.270	1.49	11.01	27.07	36.73	22.16	43.60	-21.44 QP
2	323.910	1.98	14.76	26.91	36.60	26.43	46.00	-19.57 QP
3	433.920	2.35	16.59	27.52	88.68	80.10	100.00	-19.90 Peak
4	541.190	2.64	18.78	27.67	40.47	34.22	46.00	-11.78 QP
5	649.830	2.81	20.60	27.44	39.51	35.47	46.00	-10.53 QP
6	866.140	3.48	22.78	26.60	38.03	37.68	80.00	-42.32 QP



Freq	Cable/antenna		Preamp Factor	Read Level	Limit Level	Line Limit	Over Remark		
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	179.380	1.37	9.87	27.26	31.43	15.41	43.60	-28.19	QP
2	334.580	2.02	15.04	26.98	29.61	19.68	46.00	-26.32	QP
3	433.920	2.35	16.59	27.52	73.88	65.30	100.00	-34.70	Peak
4	541.190	2.64	18.78	27.67	34.03	27.78	46.00	-18.22	QP
5	649.830	2.81	20.60	27.44	32.56	28.52	46.00	-17.48	QP
6	866.140	3.48	22.78	26.60	35.68	35.33	80.00	-44.67	QP

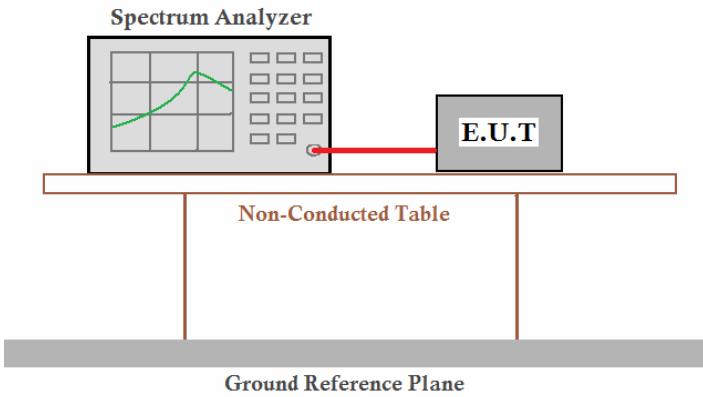
Above 1GHz
Peak Level measurement:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1301.900	4.54	26.45	39.64	55.00	46.35	74.00	-27.65	Vertical
1731.000	5.24	27.81	39.58	54.34	47.81	80.83	-33.02	Vertical
2169.000	5.51	29.18	38.93	58.00	53.76	80.83	-27.07	Vertical
2603.000	6.08	30.71	38.98	49.31	47.12	80.83	-33.71	Vertical
3037.000	7.00	31.95	39.32	59.69	59.32	80.83	-21.51	Vertical
3472.000	7.26	32.51	39.44	46.06	46.39	80.83	-34.44	Vertical
1301.880	4.54	26.45	39.64	47.94	39.29	74.00	-34.71	Horizontal
1736.000	5.27	27.83	39.51	53.47	47.06	80.83	-33.77	Horizontal
2169.000	5.51	29.18	38.93	55.64	51.40	80.83	-29.43	Horizontal
2603.000	6.08	30.71	38.98	45.95	43.76	80.83	-37.07	Horizontal
3037.000	7.00	31.95	39.32	54.61	54.24	80.83	-26.59	Horizontal
3472.000	7.26	32.51	39.44	49.26	49.59	80.83	-31.24	Horizontal

Average Level measurement:

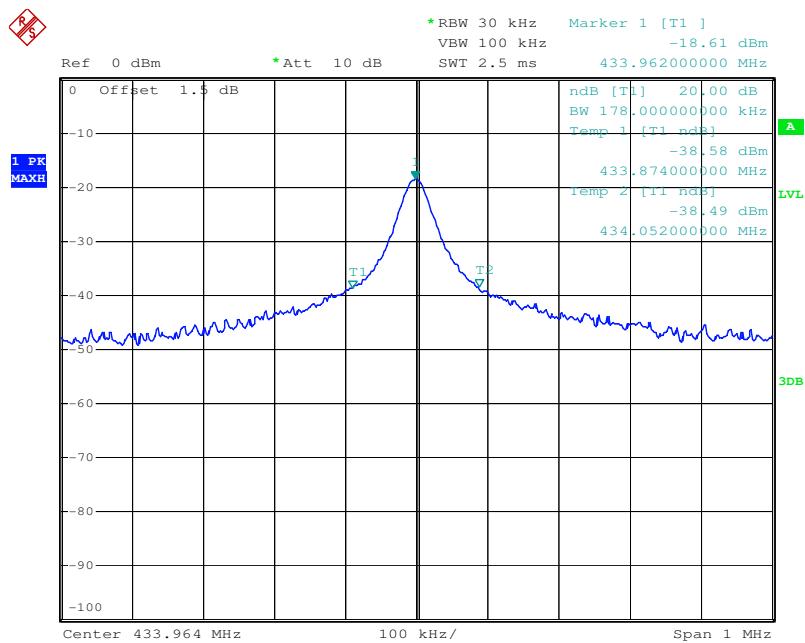
Frequency (MHz)	Peak level (dBuV/m)	PDCF (dB)	Average Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1301.900	46.35	-8.71	37.64	54.00	-16.36	Vertical
1731.000	47.81	-8.71	39.10	60.83	-21.73	Vertical
2169.000	53.76	-8.71	45.05	60.83	-15.78	Vertical
2603.000	47.12	-8.71	38.41	60.83	-22.42	Vertical
3037.000	59.32	-8.71	50.61	60.83	-10.22	Vertical
3472.000	46.39	-8.71	37.68	60.83	-23.15	Vertical
1301.880	39.29	-8.71	30.58	54.00	-23.42	Horizontal
1736.000	47.06	-8.71	38.35	60.83	-22.48	Horizontal
2169.000	51.40	-8.71	42.69	60.83	-18.14	Horizontal
2603.000	43.76	-8.71	35.05	60.83	-25.78	Horizontal
3037.000	54.24	-8.71	45.53	60.83	-15.30	Horizontal
3472.000	49.59	-8.71	40.88	60.83	-19.95	Horizontal

5.3 20dB Bandwidth

Test Requirement:	FCC Part15 C Section 15.231 (c)	
Test Method:	ANSI C63.10: 2009	
Receiver setup:	RBW=10KHz, VBW=30KHz, detector: Peak	
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.	
Test mode:	Tx mode	
Test Procedure:	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth. 	
Test setup:		
Test Instruments:	Refer to section 4.7 for details	
Test results:	Passed	

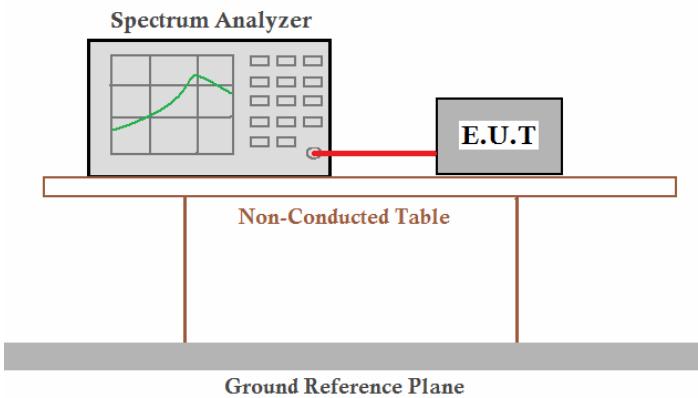
Measurement Data

20dB bandwidth (kHz)	Limit (kHz)	Results
434.052	<1084.8	pass

Test plot as follows:


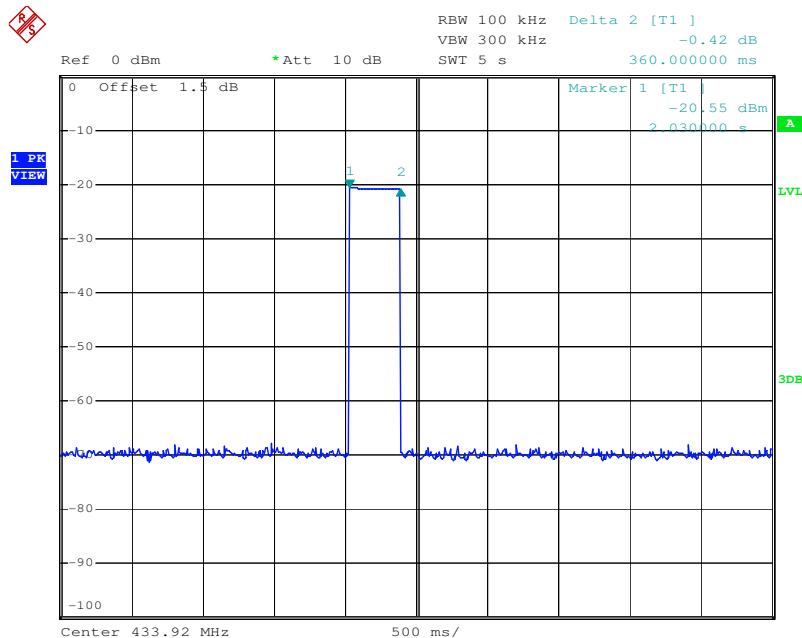
Date: 2.NOV.2010 15:54:18

5.4 Dwell Time:

Test Requirement:	FCC Part15 C Section 15.231 (a)
Test Method:	ANSI C63.10: 2009
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test mode:	Transmitting mode
Test Procedure:	<ol style="list-style-type: none">1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.2. Set the EUT to proper test channel.3. single scan the transmit, and read the transmission time.
Test setup:	
Test Instruments:	Refer to section 4.7 for details
Test results:	Passed

Measurement Data

Dwell Time (s)	Limit (s)	Results
0.360	≤ 5 s	Pass

Test plot as follows:


Date: 2.NOV.2010 16:01:40