

FCC REPORT

Application No: GTSE110800673RF
Applicant: Shenzhen Chuangjiexing Electronics
Address of Applicant: 3/F., Bldg. A6, Laodong 1st Industrial Zone, Xixiang, Shenzhen, China
Equipment Under Test (EUT)
EUT Name: Remoter for Wireless Remoter Switch
Model No. YD620T, YD620T-1, YD620T-2
Trademark: N/A
Operation Frequency: 433.92MHz
FCC ID: R3X2011081268
Standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231: 2010
Date of Receipt: 20 August, 2011
Date of Test: 20 to 28 August, 2011
Date of Issue: 30 August, 2011
Test Result : **PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Robinson Lo
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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3 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	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

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

4 General Information

4.1 Client Information

Applicant:	Shenzhen Chuangjiexing Electronics
Address of Applicant:	3/F., Bldg. A6, Laodong 1st Industrial Zone, Xixiang, Shenzhen, China
Manufacturer/ Factory:	Shenzhen Chuangjiexing Electronics
Address of Manufacturer/ Factory:	3/F., Bldg. A6, Laodong 1st Industrial Zone, Xixiang, Shenzhen, China

4.2 General Description of E.U.T.

Product Name:	Remoter for Wireless Remoter Switch
Model No.:	YD620T, YD620T-1, YD620T-2
Operation Frequency:	433.92MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	Integral(Rod antenna)
Antenna gain:	2dBi
Power supply:	Battery 3V

Remark:

Model No: YD620T, YD620T-1, YD620T-2

Only the model No. YD620T was tested, Their electrical circuit design, PCB layout, components and internal wiring are identical, only the appearance ,keys number and crust's colour is different.

4.3 E.U.T Operation mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	63 % RH
Atmospheric Pressure:	1050 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

GTS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Pre-Test Mode:

Axis	X	Y	Z
Field Strength(dBuV/m)	75.14	80.16	77.38

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”

Y axis

4.4 Test Facility

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

- **FCC —Registration No.: 600491**

Global United Technology Service 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 600491, July 20, 2010.

4.5 Test Location

All tests were performed at:

Global United Technology Service Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

Tel: 0755-27798480

Fax: 0755-27798960

4.6 Other Information Requested by the Customer

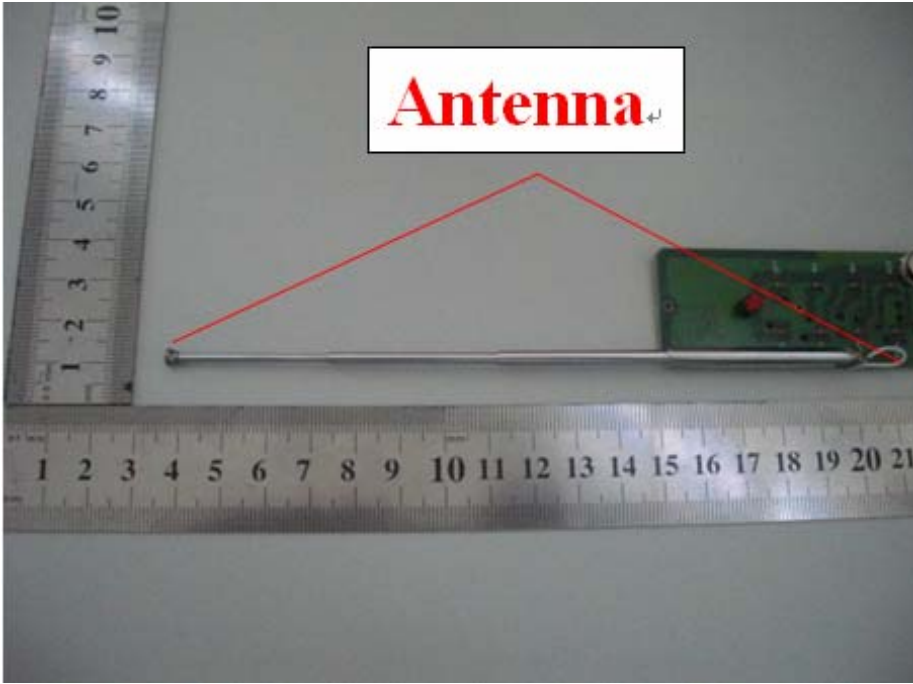
None.

4.7 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2012
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Sept. 10 2010	Sept. 09 2011
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 26 2011	Feb. 25 2012
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	Aug. 03 2011	Aug. 02 2012
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Aug. 03 2011	Aug. 02 2012
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Apr. 01 2011	Mar. 31 2012
9	Coaxial Cable	GTS	N/A	GTS211	Apr. 01 2011	Mar. 31 2012
9	Coaxial cable	GTS	N/A	GTS210	Apr. 01 2011	Mar. 31 2012
11	Coaxial Cable	GTS	N/A	GTS212	Apr. 01 2011	Mar. 31 2012
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Aug. 03 2011	Aug. 02 2012
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Aug. 03 2011	Aug. 02 2012
14	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Aug. 03 2011	Aug. 02 2012
15	Band filter	Amindeon	82346	GTS219	Aug. 03 2011	Aug. 02 2012

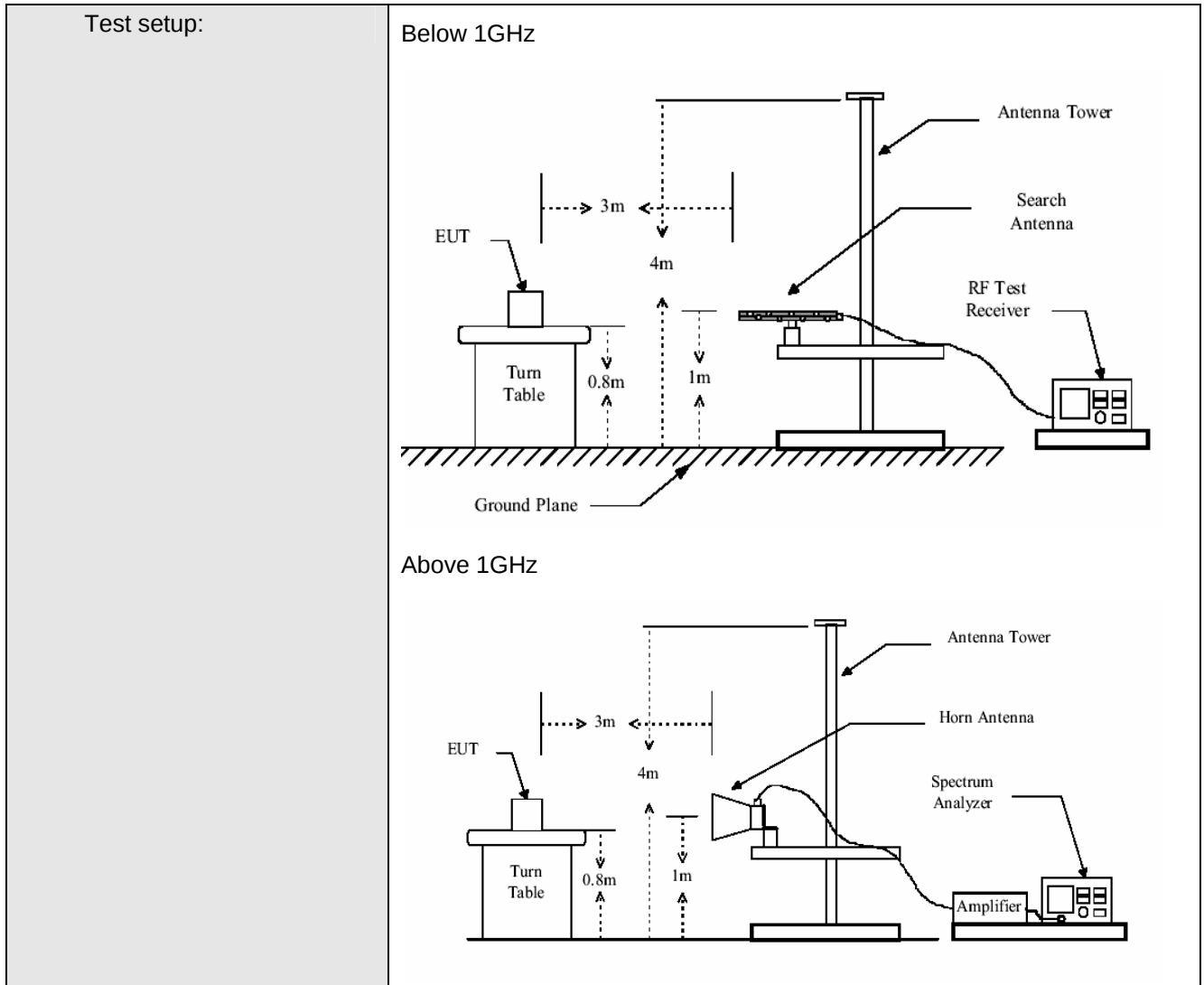
5 Test results and Measurement Data

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 EUT make use of an external rod antenna, The typical gain of the antenna is 2dBi.	
	

5.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.231(b) and 15.209																								
Test Method:	ANSI C63.4: 2003																								
Test Frequency Range:	30MHz to 5000MHz																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><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></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value					
Frequency	Detector	RBW	VBW	Remark																					
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Above 1GHz	Peak	1MHz	3MHz	Peak Value																					
Limit: (Field strength of the fundamental signal)	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td rowspan="2">433.92MHz</td><td>80.8</td><td>Average Value</td></tr><tr><td>100.8</td><td>Peak Value</td></tr></table>					Frequency	Limit (dBuV/m @3m)	Remark	433.92MHz	80.8	Average Value	100.8	Peak Value												
Frequency	Limit (dBuV/m @3m)	Remark																							
433.92MHz	80.8	Average Value																							
	100.8	Peak Value																							
Limit: (Spurious Emissions)	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><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 rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>74.0</td><td>Peak Value</td></tr></table> Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.					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																							
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																							
Test Procedure:	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. 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.																								
Test Instruments:	Refer to section 4.7 for details																								
Test mode:	Transmitting mode																								
Test results:	Passed																								



Note:

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

Measurement Data

5.2.1 Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.92	2.31	19.09	25.56	77.19	73.03	100.8	-27.77	Horizontal
433.92	2.31	17.84	25.56	85.57	80.16	100.8	-20.64	Vertical

Average value:

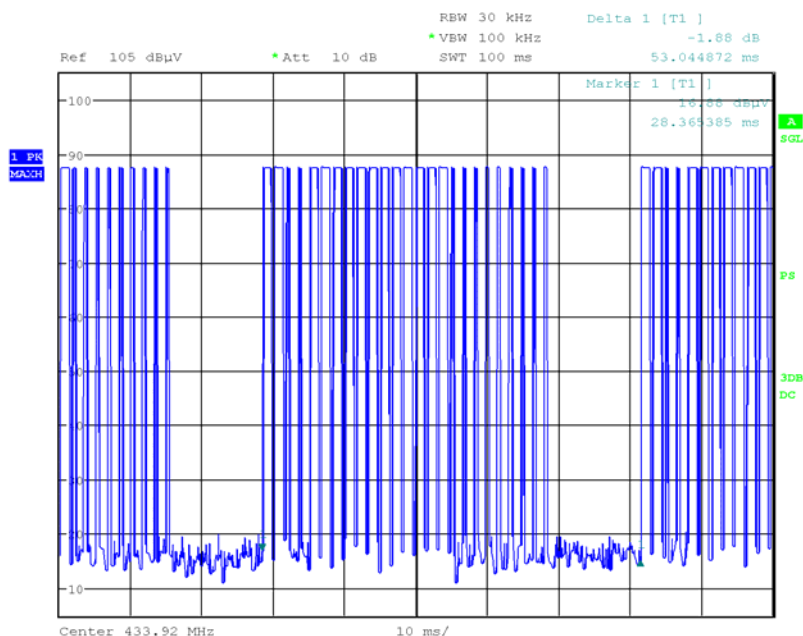
Frequency (MHz)	Level (dBuV/m)	PDCF	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.92	73.03	-6.79	66.24	80.8	-14.56	Horizontal
433.92	80.16	-6.79	73.37	80.8	-7.43	Vertical

Average value:

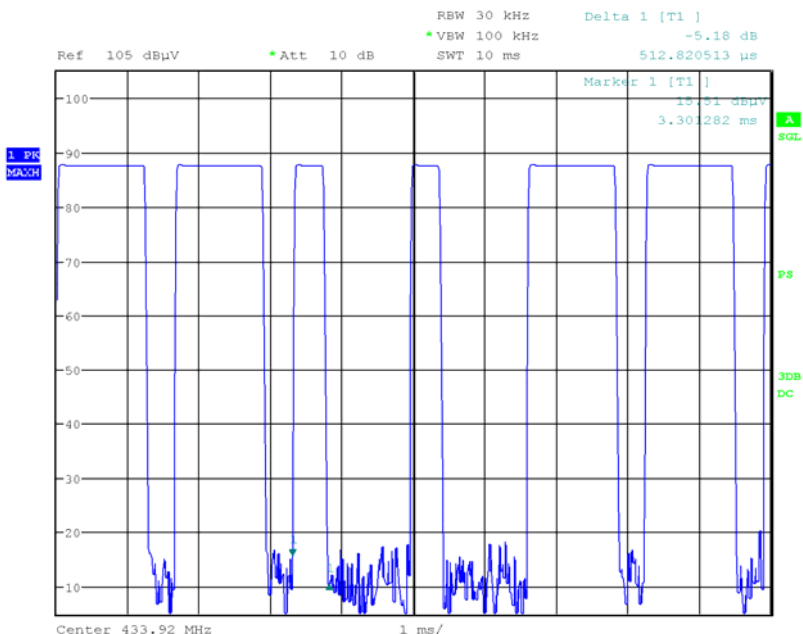
Calculate Formula:	Average value=Peak value + duty cycle factor
	Duty cycle factor=20 log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	Ton time =24.26
	T period =53.04
	Duty cycle= 45.74%
	Duty cycle factor = -6.79

Test plot as follows:

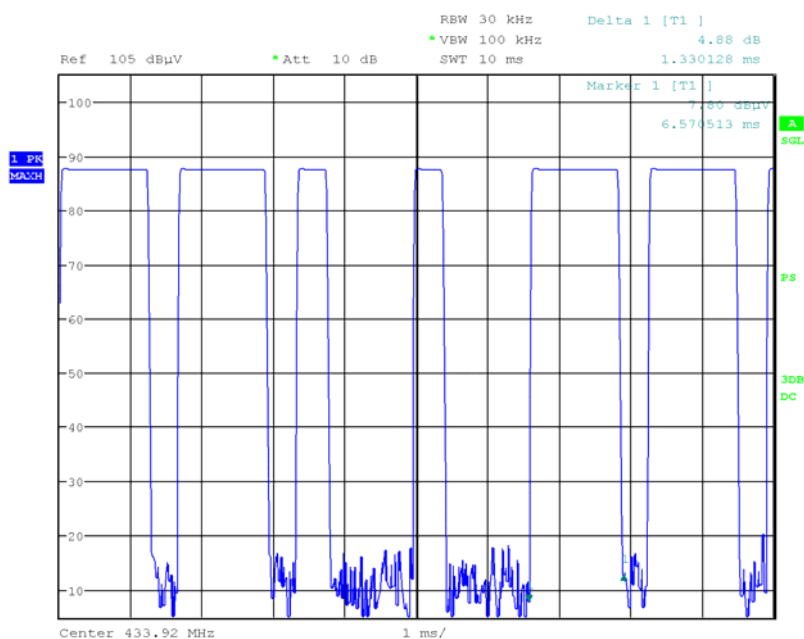
T period:



T on time slot-1:



T on time slot-2:



5.2.2 Spurious Emissions

QP 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
39.854	0.64	15.36	25.73	25.46	15.73	40	-24.27	Horizontal
106.759	1.21	12.37	25.66	26.73	14.65	43.5	-28.85	Horizontal
277.094	2.02	13.71	25.59	26.14	16.28	46	-29.72	Horizontal
478.846	2.37	20.83	25.55	27.01	24.66	46	-21.34	Horizontal
616.372	2.73	24.32	25.54	25.98	27.49	46	-18.51	Horizontal
729.358	3.01	29.37	25.52	27.07	33.93	46	-12.07	Horizontal
31.289	0.61	13.64	25.75	28.92	17.42	40	-22.58	Vertical
42.9	0.65	14.41	25.73	26.8	16.13	40	-23.87	Vertical
178.133	1.67	14.63	25.62	26.78	17.46	43.5	-26.04	Vertical
294.114	2.06	16.51	25.59	26.25	19.23	46	-26.77	Vertical
558.73	2.58	19.62	25.54	26.6	23.26	46	-22.74	Vertical
801.786	3.14	23.93	25.52	26.61	28.16	46	-17.84	Vertical

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
867.84	3.28	29.23	25.51	50.79	57.79	80.8	-23.01	Horizontal
1301.76	2.4	25.63	28.04	47.12	47.11	74	-26.89	Horizontal
1735.68	2.6	25.05	28.36	46.1	45.39	80.8	-35.41	Horizontal
2169.6	2.96	27.67	30.77	45.26	45.12	80.8	-35.68	Horizontal
2603.52	3.63	27.82	30.58	45.1	45.97	80.8	-34.83	Horizontal
3037.44	3.94	28.61	29.8	44.18	46.93	80.8	-33.87	Horizontal
3471.36	4.13	28.9	27.99	43.14	48.18	80.8	-32.62	Horizontal
867.84	3.28	24.11	25.51	60.65	62.53	80.8	-18.27	Vertical
1301.76	2.4	25.63	28.04	47.82	47.81	74	-26.19	Vertical
1735.68	2.6	25.05	28.36	45.93	45.22	80.8	-35.58	Vertical
2169.6	2.96	27.67	30.77	43.16	43.02	80.8	-37.78	Vertical
2603.52	3.63	27.82	30.58	42.17	43.04	80.8	-37.76	Vertical

3037.44	3.94	28.61	29.8	40.38	43.13	80.8	-37.67	Vertical
3471.36	4.13	28.9	27.99	40.26	45.3	80.8	-35.5	Vertical

Average value:						
Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
867.84	57.79	-6.79	51	60.8	-9.8	Horizontal
1301.76	47.11	-6.79	40.32	54	-13.68	Horizontal
1735.68	45.39	-6.79	38.6	60.8	-22.2	Horizontal
2169.6	45.12	-6.79	38.33	60.8	-22.47	Horizontal
2603.52	45.97	-6.79	39.18	60.8	-21.62	Horizontal
3037.44	46.93	-6.79	40.14	60.8	-20.66	Horizontal
3471.36	48.18	-6.79	41.39	60.8	-19.41	Horizontal
867.84	62.53	-6.79	55.74	60.8	-5.06	Vertical
1301.76	47.81	-6.79	41.02	54	-12.98	Vertical
1735.68	45.22	-6.79	38.43	60.8	-22.37	Vertical
2169.6	43.02	-6.79	36.23	60.8	-24.57	Vertical
2603.52	43.04	-6.79	36.25	60.8	-24.55	Vertical
3037.44	43.13	-6.79	36.34	60.8	-24.46	Vertical
3471.36	45.3	-6.79	38.51	60.8	-22.29	Vertical

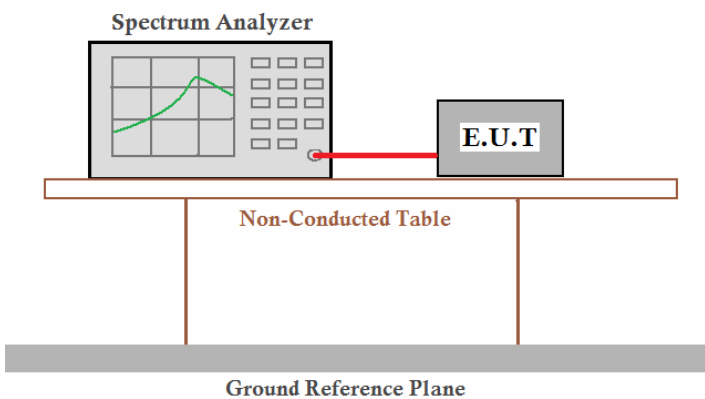
Note:

Peak Limit=Average Limit+20dB

Average value=Peak value + Duty cycle factor

Duty cycle factor =20log(Duty cycle)

5.3 20dB Bandwidth

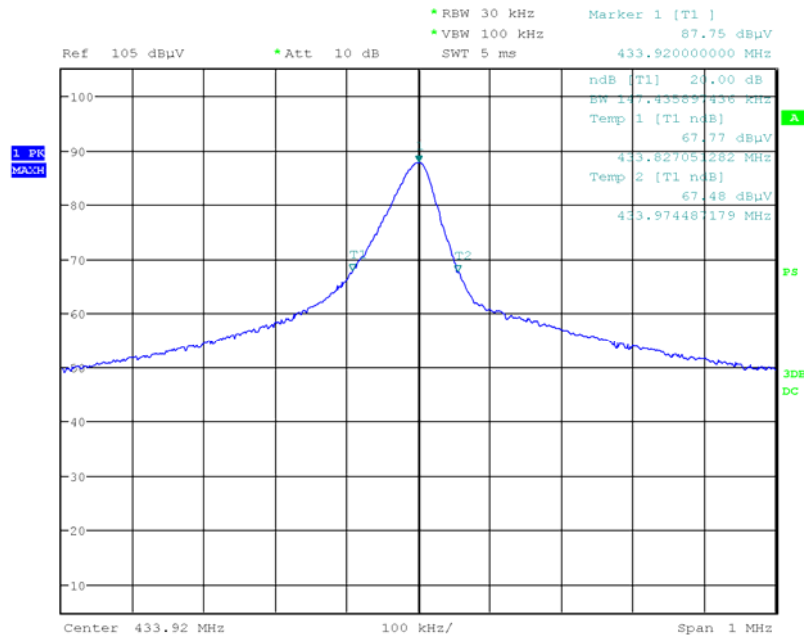
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=30KHz, VBW=100KHz, detector: Peak
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 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:	Transmitting mode
Test Procedure:	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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 4.7 for details
Test results:	Passed

Measurement Data

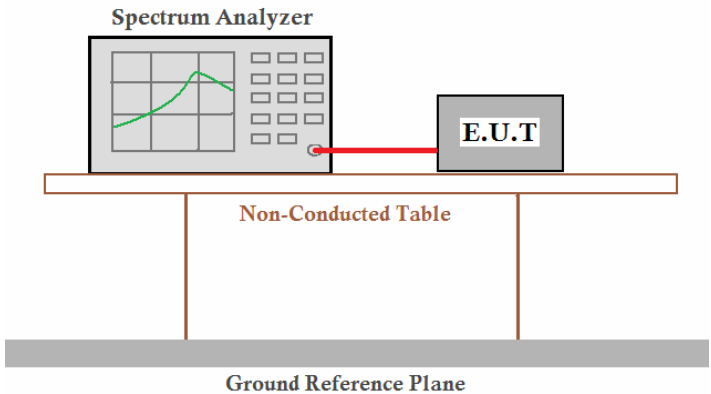
20dB bandwidth (MHz)	Limit (MHz)	Results
0.147MHz	1.085 MHz	Passed

Note: Limit= Fundamental frequency×0.25%=433.92×0.25%=1.085MHz

Test plot as follows:



5.4 Dwell Time:

Test Requirement:	FCC Part15 C Section 15.231 (a)
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test mode:	Transmitting mode
Test Procedure:	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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane, which is represented by a thick grey bar at the bottom.
Test Instruments:	Refer to section 4.7 for details
Test results:	Passed

Measurement Data

Test item	Test data	Limit (second)
Transmitting time	0.160s	<5s

Test plot as follows:

