

FCC REPORT

Applicant: Shenzhen Sailwider Electronics Co., Ltd.

Address of Applicant: Unit Y-Z, 25th Floor, Bldg. A, Fortune Plaza, No.7002 Shennan Road, Futian District, Shenzhen 518040, China

Equipment Under Test (EUT)

Product Name: 2-way Sensor Plug Socket

Model No.: RCS-J02D, RCS-S01D

Trade mark: Sailwider Electronics

FCC ID: ZF9RCS-J02D

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231:2010

Date of sample receipt: Mar. 19, 2012

Date of Test: Mar. 21 to Apr.19, 2012

Date of report issue: Apr.19, 2012

Test Result : PASS *

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

Authorized Signature:



Stephen Guo
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 CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. 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 CCIS International Electrical Approvals or testing done by CCIS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by CCIS International Electrical Approvals in writing.

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2 Version

Version No.	Date	Description
00	Apr.19, 2012	Original

Prepared By:

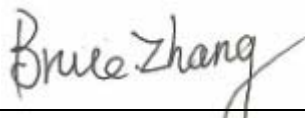


Date:

Apr.19, 2012

Project Engineer

Check By:



Date:

Apr.19, 2012

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Conducted emissions	15.207	Pass
Field strength of the fundamental signal	15.231 (e)	Pass
Spurious emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell time	15.231 (e)	Pass
Silent Period	15.231 (e)	Pass

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

5 General Information

5.1 Client Information

Applicant:	Shenzhen Sailwider Electronics Co., Ltd.
Address of Applicant:	Unit Y-Z, 25th Floor, Bldg. A, Fortune Plaza, No.7002 Shennan Road, Futian District, Shenzhen 518040, China
Manufacturer/ Factory:	Dongguan Richtek Electronics Co.,Ltd.
Address of Manufacturer/ Factory:	No.11 Kuiqing Road, Qingxi Town, Dongguan City, China.

5.2 General Description of E.U.T.

Product Name:	2-way Sensor Plug Socket
Model No.:	RCS-J02D, RCS-S01D
Trade mark:	Sailwider Electronics
Operation Frequency:	433.92MHz
Channel numbers:	1
Modulation type:	ASK
Antenna Type:	Internal monopole antenna
Antenna gain:	8dBi
Power supply:	AC 120V/60Hz, 15A
Remarks:	Just the test the mode No. RCS-J02D RCS-J02D and RCS-S01D are identical in the same PCB layout, interior structure and electrical circuits. The difference is RCS-J02D more than RCS-S01D has a relay.

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation.		
Pre-Test Mode:			
CCIS 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:			
Axis	X	Y	Z
Field Strength(dBuV/m)	78.64	79.75	76.71
Final Test Mode:			
According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”: Y axis (see the test setup photo)			

5.4 Identification of Accessory Equipment

Model	Manufacturer	Serial. No	Comments
Energy Assistant	Aclarity, LLC	N/A	FCC ID: G9ORCS-J34B

5.5 Test Facility

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

● **FCC —Registration No.:** 817957

China Certification & Inspection 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 817957, February 27, 2012

● **Industry Canada (IC)**

The 3m Semi-anechoic chamber of China Certification & Inspection Services Co., Ltd. Has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

5.6 Test Location

All tests were performed at:

China Certification & Inspection Services Co., Ltd.

Address: 1st Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

5.7 Other Information Requested by the Customer

None.

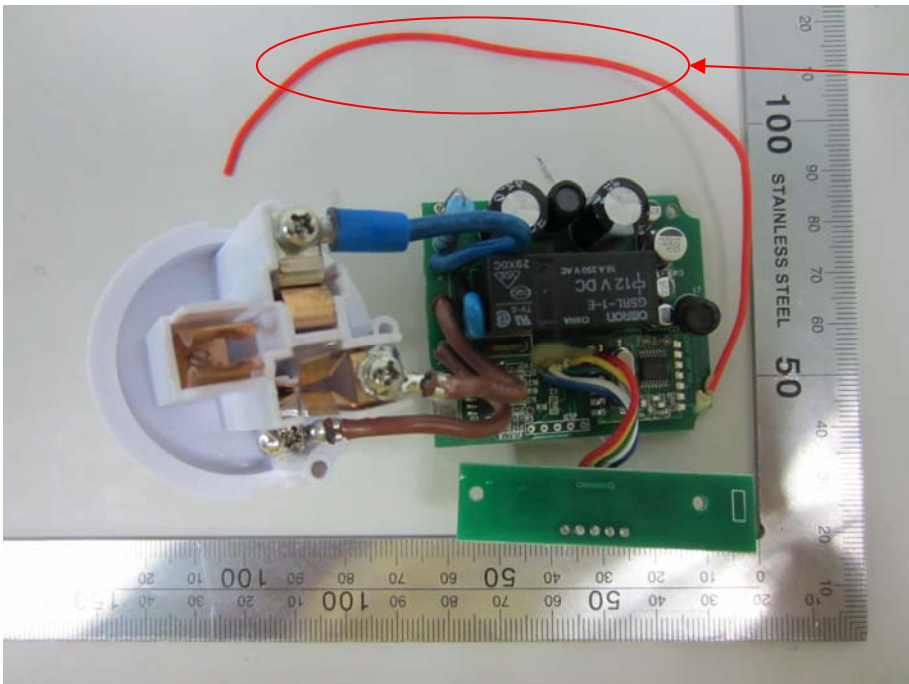
5.8 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	June 16 2011	June 16 2012
2	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	June 09 2011	June 09 2012
3	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	June 09 2011	June 09 2012
4	Amplifier(10KHz-1.3GHz)	HP	8447D	CCIS0003	Aug. 03 2011	Aug. 03 2012
5	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	Aug. 05 2011	Aug. 05 2012
6	Spectrum analyzer	Rohde & Schwarz	FSP	CCIS0023	June 22 2011	June 22 2012

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	June. 16 2011	June.16 2012
2	LISN	CHASE	MN2050D	CCIS0074	Apr.14 2012	Apr.14 2013

6 Test results and Measurement Data

6.1 Antenna requirement:

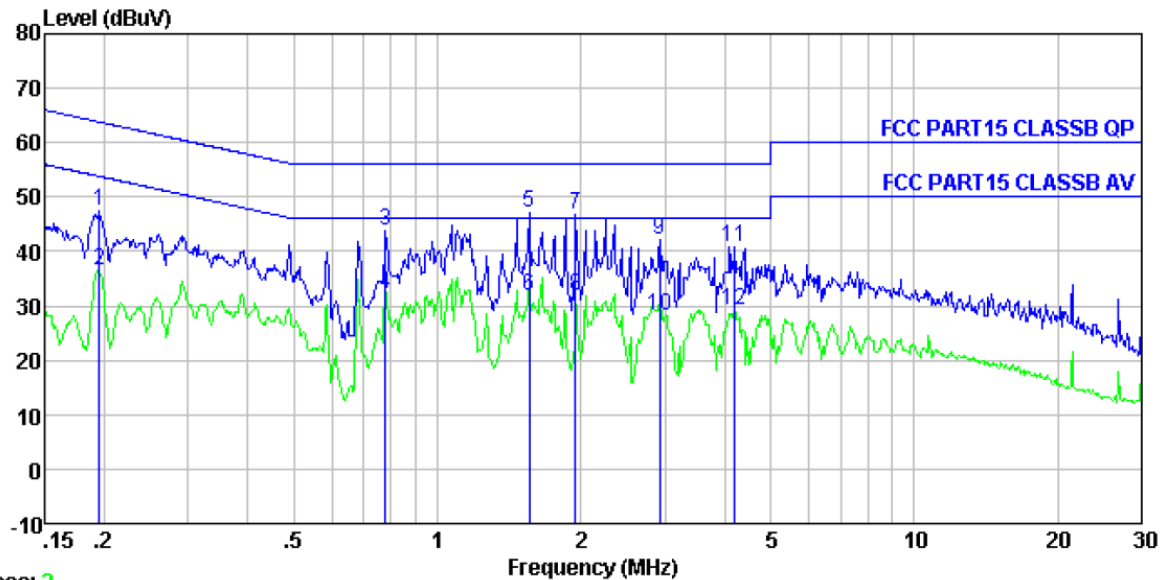
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique 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 internal monopole antenna, The typical gain of the antenna is 8dBi.	
	

6.2 Conducted Emissions

Test Requirement:	FCC Part15C Section 15.207																
Test Method:	ANSI C63.4:2003																
Test Frequency Range:	150kHz to 30MHz																
Class / Severity:	Class B																
Receiver setup:	RBW=9kHz, VBW=30kHz																
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>0.5-30</td><td>60</td><td>50</td></tr></table>			Frequency range (MHz)	Limit (dBμV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	0.5-30	60	50
Frequency range (MHz)	Limit (dBμV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
0.5-30	60	50															
Test setup:	<div><p style="text-align: center;">Reference Plane</p><p style="text-align: center;">Test table/Insulation plane</p><p><i>Remark:</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p></div>																
Test procedure	<div><div>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs).</div><div>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003</div><div>4. on conducted measurement.</div></div>																
Test environment:	Temp.:	25 °C	Humid.: 52%														
Measurement Record:	Press.:	1 012mbar	Uncertainty: ± 3.45dB														
Test Instruments:	Refer to section 6 for details																
Test mode:	Refer to section 5.3 for details																
Test results:	Pass																

Measurement data:

Line:

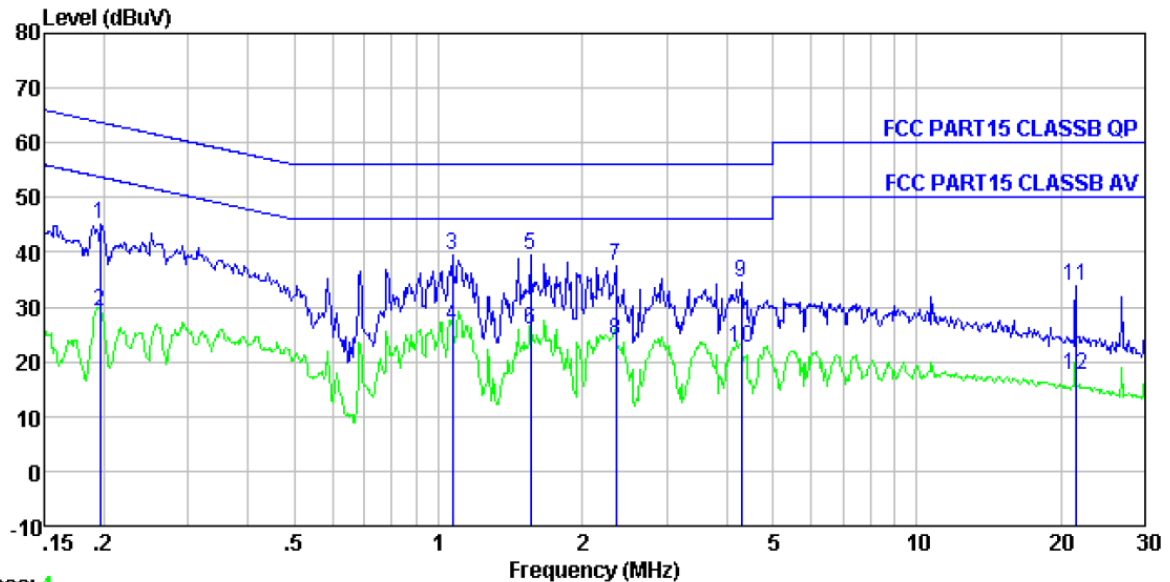


Trace: 2

Condition : FCC PART15 CLASSB QP LISN(2011) LINE
 Job No. : 035RF
 Test Mode : TX mode
 Test Engineer: Joe

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.195	46.76	0.66	0.10	47.52	63.80	-16.28	QP
2	0.195	35.62	0.66	0.10	36.38	53.80	-17.42	Average
3	0.779	43.05	0.50	0.10	43.65	56.00	-12.35	QP
4	0.779	31.50	0.50	0.10	32.10	46.00	-13.90	Average
5	1.560	46.70	0.43	0.10	47.23	56.00	-8.77	QP
6	1.560	31.24	0.43	0.10	31.77	46.00	-14.23	Average
7	1.949	46.34	0.40	0.10	46.84	56.00	-9.16	QP
8	1.949	31.24	0.40	0.10	31.74	46.00	-14.26	Average
9	2.931	41.61	0.36	0.10	42.07	56.00	-13.93	QP
10	2.931	27.62	0.36	0.10	28.08	46.00	-17.92	Average
11	4.202	40.50	0.32	0.10	40.92	56.00	-15.08	QP
12	4.202	28.62	0.32	0.10	29.04	46.00	-16.96	Average

Neutral:



Trace: 4
 Condition : FCC PART15 CLASSB QP LISN(2011) NEUTRAL
 Job No. : 035RF
 Test Mode : TX mode
 Test Engineer: Joe

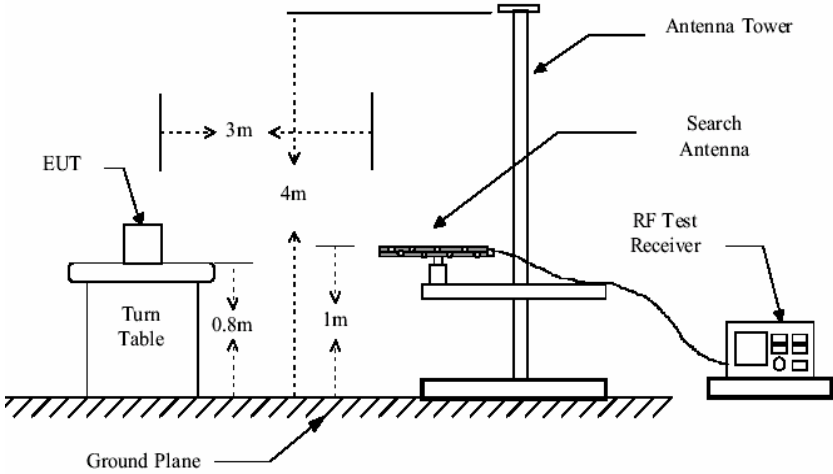
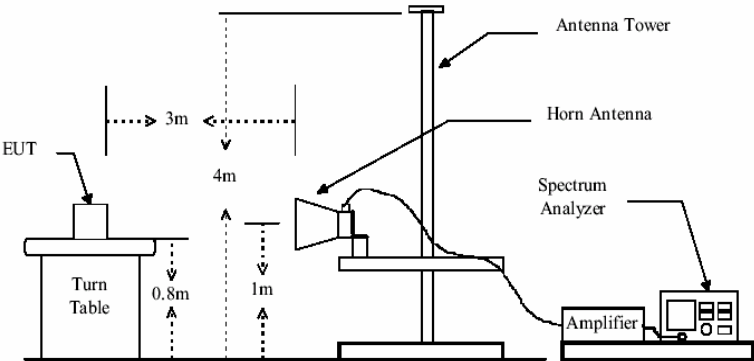
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.197	44.25	0.66	0.10	45.01	63.76	-18.75	QP
2	0.197	28.32	0.66	0.10	29.08	53.76	-24.68	Average
3	1.071	39.07	0.47	0.10	39.64	56.00	-16.36	QP
4	1.071	26.12	0.47	0.10	26.69	46.00	-19.31	Average
5	1.560	38.87	0.43	0.10	39.40	56.00	-16.60	QP
6	1.560	25.34	0.43	0.10	25.87	46.00	-20.13	Average
7	2.346	37.16	0.38	0.10	37.64	56.00	-18.36	QP
8	2.346	23.25	0.38	0.10	23.73	46.00	-22.27	Average
9	4.292	34.17	0.32	0.10	34.59	56.00	-21.41	QP
10	4.292	22.15	0.32	0.10	22.57	46.00	-23.43	Average
11	21.486	33.48	0.14	0.21	33.83	60.00	-26.17	QP
12	21.486	17.24	0.14	0.21	17.59	50.00	-32.41	Average

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

6.3 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.231(e) 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:					
	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit: (Field strength of the fundamental signal)					
	Frequency		Limit (dBuV/m @3m)		Remark
	433.92 MHz		72.87		Average Value
			92.87		Peak Value
Limit: (Spurious Emissions)					
	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	
	Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.				
Test Procedure:	<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p>				

Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

6.3.1 Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	90.32	15.49	1.32	27.38	79.75	92.87	-13.12	Horizontal
433.92	89.35	15.49	1.32	27.38	78.78	92.87	-14.09	Vertical

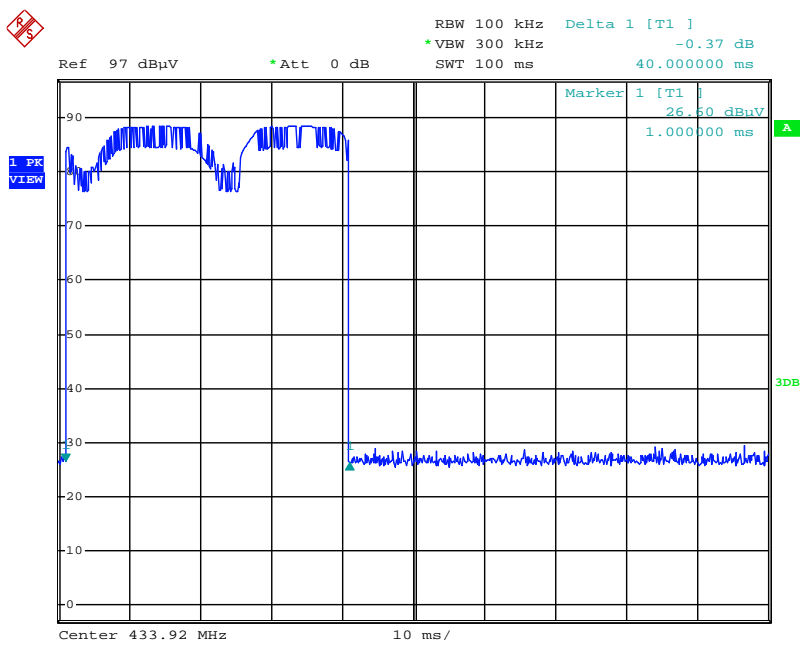
Average value:

Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	79.75	-7.96	71.79	72.87	-1.08	Horizontal
433.92	78.78	-7.96	70.82	72.87	-2.05	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 = 40ms
	T period =100ms
	Duty cycle=40%
	Duty Cycle Factor = 20 log(Duty cycle)= -7.96

Test plot as follows:



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6.3.2 Spurious Emissions

Below 1GHz (30MHz-1000MHz) :

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	polarization
54.07	37.91	13.08	0.33	31.99	19.33	40.00	-20.67	QP	Horizontal
105.64	38.10	12.63	0.50	31.72	19.51	43.50	-23.99	QP	Horizontal
867.80	56.62	21.08	2.16	27.39	52.47	52.87	-0.40	Peak	Horizontal
80.08	51.48	11.70	0.43	27.00	36.61	40.00	-3.39	QP	Vertical
383.93	51.82	14.68	1.22	27.07	40.65	46.00	-5.35	QP	Vertical
867.80	55.18	21.08	2.16	27.39	51.03	52.87	-1.84	Peak	Vertical

Above 1GHz:

Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1301.70	51.32	25.52	2.75	34.58	45.01	74.0	-28.99	Horizontal
1735.60	53.26	25.04	3.25	34.66	46.89	74.0	-27.11	Horizontal
2169.50	47.32	27.66	3.65	34.76	43.87	74.0	-30.13	Horizontal
2603.40	51.32	27.80	3.97	34.90	48.19	74.0	-25.81	Horizontal
3037.30	48.16	28.59	4.40	35.01	46.14	74.0	-27.86	Horizontal
1301.70	50.32	25.52	2.75	34.58	44.01	74.0	-29.99	Vertical
1735.60	51.32	25.04	3.25	34.66	44.95	74.0	-29.05	Vertical
2169.50	49.52	27.66	3.65	34.76	46.07	74.0	-27.93	Vertical
2603.40	47.32	27.80	3.97	34.90	44.19	74.0	-29.81	Vertical
3037.30	43.26	28.59	4.40	35.01	41.24	74.0	-32.76	Vertical

Average value:						
Frequency (MHz)	Level (dBuV/m)	Duty cycle factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1301.70	45.01	-7.96	37.05	54	-16.95	Horizontal
1735.60	46.89	-7.96	38.93	54	-15.07	Horizontal
2169.50	43.87	-7.96	35.91	54	-18.09	Horizontal
2603.40	48.19	-7.96	40.23	54	-13.77	Horizontal
3037.30	46.14	-7.96	38.18	54	-15.82	Horizontal
1301.70	44.01	-7.96	36.05	54	-17.95	Vertical
1735.60	44.95	-7.96	36.99	54	-17.01	Vertical
2169.50	46.07	-7.96	38.11	54	-15.89	Vertical
2603.40	44.19	-7.96	36.23	54	-17.77	Vertical
3037.30	41.24	-7.96	33.28	54	-20.72	Vertical

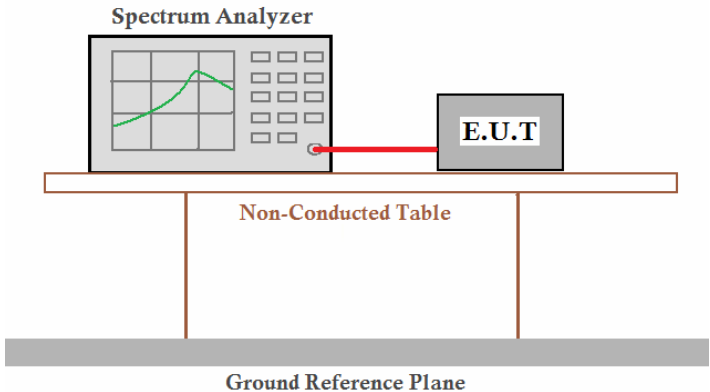
Remark:

Average Limit = Peak Limit-20dB

Average value=Peak value + Duty cycle factor

Duty cycle factor=20 log(Duty cycle)

6.4 20dB Bandwidth

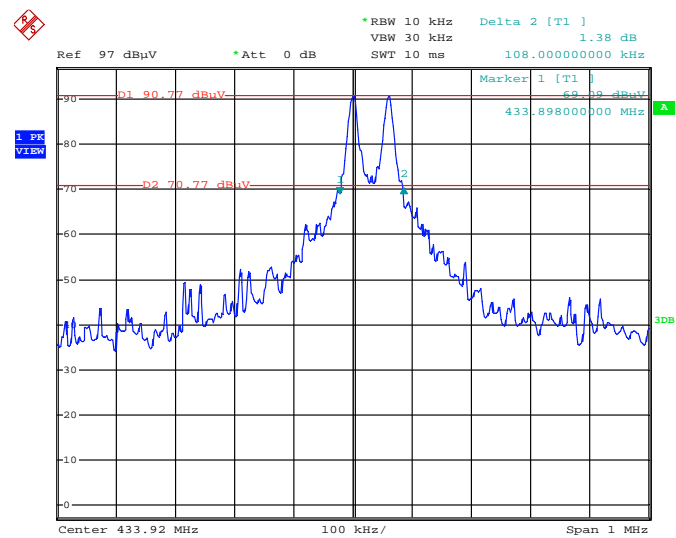
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=10KHz, VBW=30KHz, detector: Peak
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 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 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:	 <p>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.</p>
Test mode:	Refer to section 5.3 for details
Test Instruments:	Refer to section 4.7 for details
Test results:	Passed

Measurement Data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.108	1.0848	Passed

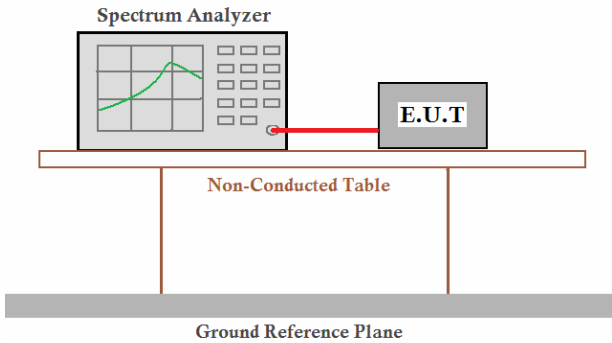
Note: Limit= Fundamental frequency \times 0.25%=433.92 \times 0.25%=1.0848MHz

Test plot as follows:



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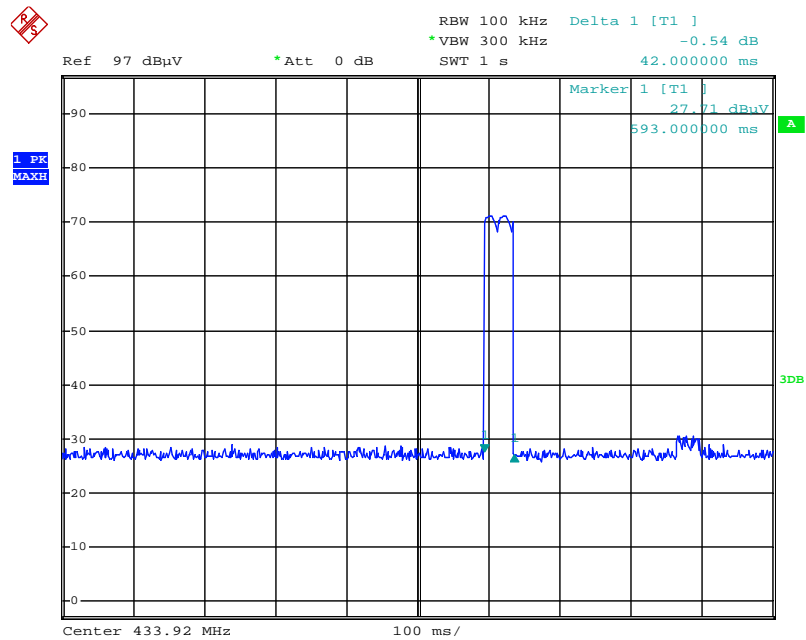
6.5 Dwell Time:

Test Requirement:	FCC Part15 C Section 15.231 (e)
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 1 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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 4.7 for details
Test results:	Passed

Measurement Data

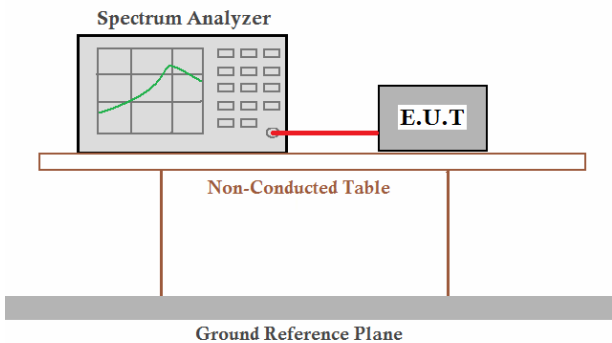
Dwell time (second)	Limit (second)	Result
0.042	<1.0	Pass

Test plot as follows:



Date: 19.APR.2012 04:10:07

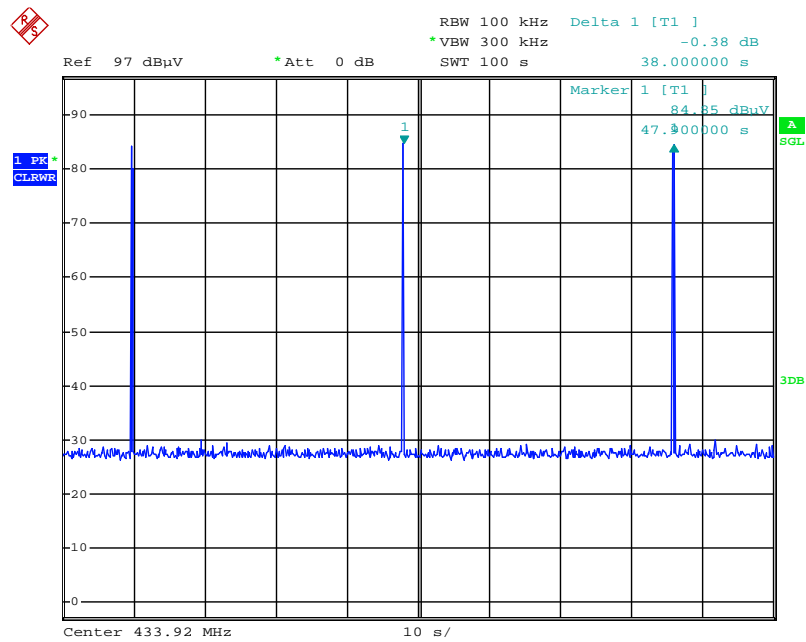
6.6 Silent period:

Test Requirement:	FCC Part15 C Section 15.231 (e)
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	at least 30 times the duration of the transmission and more than 10 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:	 <p>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.</p>
Test Instruments:	Refer to section 4.7 for details
Test results:	Passed

Measurement data:

Silent period (second)	Limit (second)	Result
38	>10	Pass

Test plot as follows:



Date: 17.APR.2012 08:37:51