

# 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: Wireless energy bridge

Model No.: RCS-Z31C

**FCC ID:** ZF9RCS- Z31C

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

**Date of sample receipt:** 03 May, 2013

**Date of Test:** 04 May, to 17 May, 2013

**Date of report issue:** 20 May, 2013

**Test Result :** PASS \*

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

Authorized Signature:



Bruce Zhang  
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.

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## 2 Version

| Version No. | Date         | Description |
|-------------|--------------|-------------|
| 00          | 20 May, 2013 | Original    |
|             |              |             |
|             |              |             |
|             |              |             |
|             |              |             |

**Prepared by:**



**Report Clerk**

**Date:**

20 May,2013

**Reviewed by:**



**Project Engineer**

**Date:**

20 May,2013

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## 4 Test Summary

| Test Item                                | Section in CFR 47 | Result |
|--|-------------------|--------|
| Antenna requirement                      | 15.203            | Pass   |
| Conducted emissions                      | 15.207            | N/A    |
| 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:            | Shenzhen Sailwider Electronics Co., Ltd.  |
| Address of Manufacturer: | Unit Y-Z, 25th Floor, Bldg. A, Fortune Plaza, No.7002 Shennan Road, Futian District, Shenzhen 518040, China |
| Factory:                 | Dongguan Richtek Electronics Co.,Ltd.   |
| Address of Factory:      | No.11 Kuiqing Road, Qingxi Town, Dongguan City, China.  |

### 5.2 General Description of E.U.T.

|                      |  |
|----------------------|--|
| Product Name:        | Wireless energy bridge   |
| Model No.:           | RCS-Z31C   |
| Operation Frequency: | 433.92MHz  |
| Modulation type:     | ASK  |
| Antenna Type:        | Omni-directional   |
| Antenna gain:        | Internal antenna:0dBi<br>External antenna:3dBi   |
| AC adapter:          | Input:100-240V AC,50/60Hz 0.2A<br>Output:5.0V DC MAX 1A  |
| Remark:              | The EUT have types of antenna, Internal Omni-directional antenna, which antenna gain is 0 dBi, and external Omni-directional antenna, which antenna gain is 3 dBi. |

### 5.3 Test mode

|  |  |
|--|--|
| Transmitting mode:                                     | Keep the EUT in transmitting mode with modulation. |
| Remark: The EUT was placed in typical use during test. |  |

## 5.4 Description of Support Units

| Manufacturer | Description              | Model          | FCC ID/DoC               |
|--------------|--------------------------|----------------|--------------------------|
| Sailwider    | 2-way sensor plug socket | RCS-J02D       | FCC ID: ZF9RCS-J02D      |
| Sailwider    | 1-Way Transmitter        | RCS-S22Asensor | FCC ID:ZF9RCS-S22ASENSOR |
| MERCURY      | Wireless router          | MW-150R        | N/A                      |

## 5.5 Laboratory Facility

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

● **FCC - Registration No.: 817957**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. 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 out files. Registration 817957, February 27, 2012.

● **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

## 5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,  
Bao'an District, Shenzhen, Guangdong, China

Tel: 0755-23118282

Fax: 0755-23116366


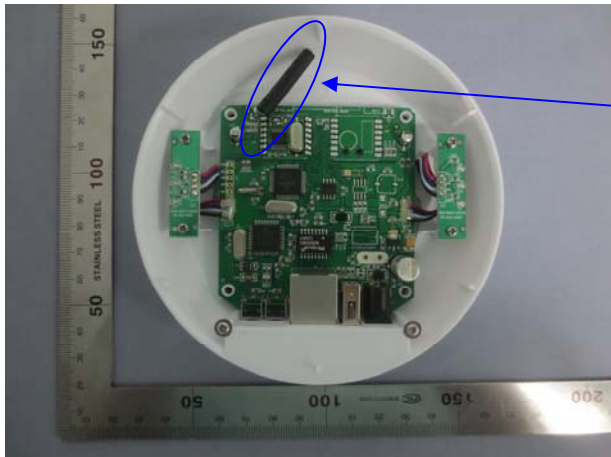
## 5.7 Test Instruments list

| 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     | SAEMC                                | 9(L)*6(W)* 6(H)             | CCIS0001      | June 09 2012         | June 08 2013             |
| 2                  | Control Room                  | ZhongYu Electron                     | 6.2(L)*2.5(W)* 2.4(H)       | CCIS0002      | N/A                  | N/A                      |
| 3                  | BiConiLog Antenna             | SCHWARZBECK<br>MESS-ELEKTRONIK       | VULB9163                    | CCIS0005      | June 04 2012         | June 03 2013             |
| 4                  | Double -ridged waveguide horn | SCHWARZBECK<br>MESS-ELEKTRONIK       | BBHA9120D                   | CCIS0006      | May 30 2012          | May 29 2013              |
| 5                  | EMI Test Software             | AUDIX                                | E3                          | N/A           | N/A                  | N/A                      |
| 6                  | Coaxial Cable                 | CCIS                                 | N/A                         | CCIS0016      | Apr. 01 2013         | Mar. 31 2014             |
| 7                  | Coaxial Cable                 | CCIS                                 | N/A                         | CCIS0017      | Apr. 01 2013         | Mar. 31 2014             |
| 8                  | Coaxial cable                 | CCIS                                 | N/A                         | CCIS0018      | Apr. 01 2013         | Mar. 31 2014             |
| 9                  | Coaxial Cable                 | CCIS                                 | N/A                         | CCIS0019      | Apr. 01 2013         | Mar. 31 2014             |
| 10                 | Coaxial Cable                 | CCIS                                 | N/A                         | CCIS0087      | Apr. 01 2013         | Mar. 31 2014             |
| 11                 | Amplifier(10kHz-1.3GHz)       | HP                                   | 8447D                       | CCIS0003      | Apr. 01 2013         | Mar. 31 2014             |
| 12                 | Amplifier(1GHz-18GHz)         | Compliance Direction<br>Systems Inc. | PAP-1G18                    | CCIS0011      | June 09 2012         | June 08 2013             |
| 13                 | Pre-amplifier (18-26GHz)      | Rohde & Schwarz                      | AFS33-18002<br>650-30-8P-44 | GTS218        | Apr. 01 2013         | Mar. 31 2014             |
| 14                 | Horn Antenna                  | ETS-LINDGREN                         | 3160                        | GTS217        | Mar. 30 2013         | Mar. 29 2014             |
| 15                 | Printer                       | HP                                   | HP LaserJet P1007           | N/A           | N/A                  | N/A                      |
| 16                 | Positioning Controller        | UC                                   | UC3000                      | CCIS0015      | N/A                  | N/A                      |
| 17                 | Spectrum analyzer 9k-30GHz    | Rohde & Schwarz                      | FSP                         | CCIS0023      | May. 29 2012         | May. 28 2013             |
| 18                 | Loop antenna                  | Laplace instrument                   | RF300                       | EMC0701       | Aug. 12 2012         | Aug. 11 2013             |
| 19                 | EMI Test Receiver             | Rohde & Schwarz                      | ESPI                        | CCIS0022      | Apr 01 2013          | Mar. 31 2014             |
| 20                 | Spectrum analyzer             | Agilent                              | E4440A                      | CCIS0152      | Jan.11.2013          | Jan.10.2014              |

| Conducted Emission: |                   |                    |                       |               |                      |                          |
|---------------------|-------------------|--------------------|-----------------------|---------------|----------------------|--------------------------|
| Item                | Test Equipment    | Manufacturer       | Model No.             | Inventory No. | Cal. Date (mm-dd-yy) | Cal. Due date (mm-dd-yy) |
| 1                   | Shielding Room    | ZhongShuo Electron | 11.0(L)x4.0(W)x3.0(H) | CCIS0061      | June 09 2012         | June 08 2013             |
| 2                   | EMI Test Receiver | Rohde & Schwarz    | ESCI                  | CCIS0002      | May 25 2012          | May 24 2013              |
| 3                   | LISN              | CHASE              | MN2050D               | CCIS0074      | Apr 01 2013          | Mar. 31 2014             |
| 4                   | Coaxial Cable     | CCIS               | N/A                   | CCIS0086      | Apr. 01 2013         | Mar. 31 2014             |
| 5                   | EMI Test Software | AUDIX              | E3                    | N/A           | N/A                  | N/A                      |

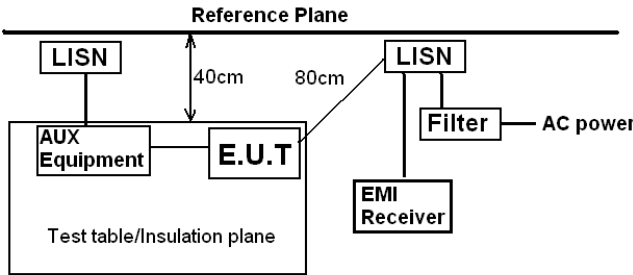
## 6 Test results and Measurement Data

### 6.1 Antenna requirement:

|   |                             |
|---|-----------------------------|
| <b>Standard requirement:</b>  | FCC Part15 C Section 15.203 |
| <p>15.203 requirement:<br/> <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></p> |                             |
| <b>E.U.T Antenna:</b>   |                             |
| <p>The EUT makes use of an external omni antenna whose antenna jack type is R-SMA.<br/> Please refer to the photo .The typical gain of the antenna is 3dBi.</p>   |                             |
| <p>Exterior Antenna:</p>    |                             |
| <p>The antenna is integrated on the main PCB and no consideration of replacement. The typical gain of the antenna is 0dBi.</p>  |                             |
| <p>Interior Antenna:</p>   |                             |

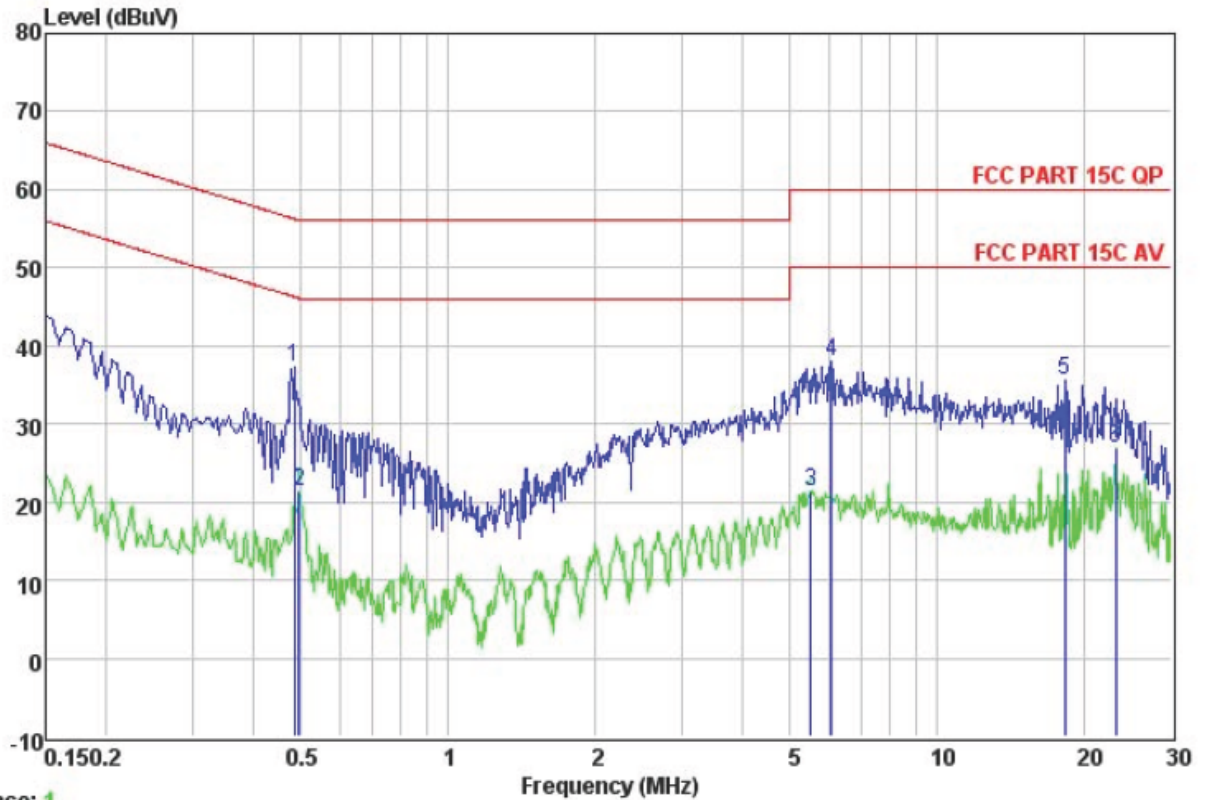


## 6.2 Conducted Emission

|  |  |              |           |           |
|--|--|--------------|-----------|-----------|
| Test Requirement:                                | FCC Part15 C 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, Sweep time=auto   |              |           |           |
| Limit:   | Frequency range (MHz)  | Limit (dBuV) |           |           |
|  |  | Quasi-peak   | Average   |           |
|  |  | 0.15-0.5     | 66 to 56* | 56 to 46* |
|  |  | 0.5-5        | 56        | 46        |
|  |  | 5-30         | 60        | 50        |
| * Decreases with the logarithm of the frequency. |  |              |           |           |
| Test setup:                                      |   |              |           |           |
|  | <p>Remark:<br/>E.U.T: Equipment Under Test<br/>LISN: Line Impedance Stabilization Network<br/>Test table height=0.8m</p>   |              |           |           |
| Test procedure:                                  | <ol style="list-style-type: none"><li>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li><li>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 refer to the block diagram of the test setup and photographs).</li><li>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 on conducted measurement.</li></ol> |              |           |           |
| Test Instruments:                                | Refer to section 5.7 for details   |              |           |           |
| Test mode:                                       | Transmitting mode  |              |           |           |
| Test results:                                    | Pass   |              |           |           |

### Measurement Data

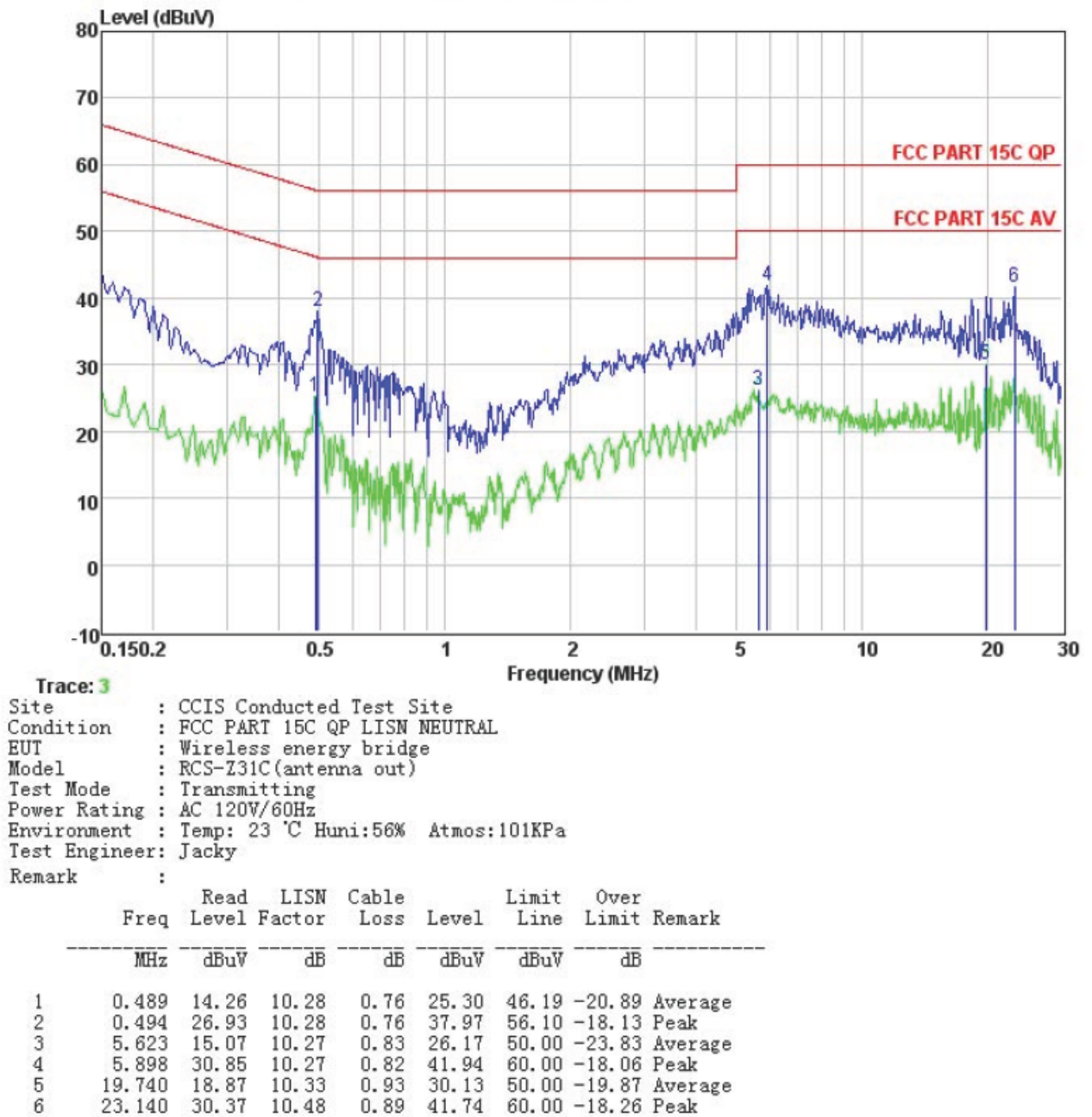
Line:



Trace: 1  
 Site : CCIS Conducted Test Site  
 Condition : FCC PART 15C QP LISN LINE  
 EUT : Wireless energy bridge  
 Model : RCS-Z31C  
 Test Mode : Transmitting  
 Power Rating : AC 120V/60Hz  
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa  
 Test Engineer: Jacky  
 Remark :

|   | Freq   | Read Level | LISN Factor | Cable Loss | Level | Limit Line | Over Limit | Remark  |
|---|--------|------------|-------------|------------|-------|------------|------------|---------|
|   | MHz    | dBuV       | dB          | dB         | dBuV  | dBuV       | dB         |         |
| 1 | 0.484  | 26.30      | 10.27       | 0.76       | 37.33 | 56.27      | -18.94     | Peak    |
| 2 | 0.494  | 10.25      | 10.27       | 0.76       | 21.28 | 46.10      | -24.82     | Average |
| 3 | 5.505  | 10.35      | 10.28       | 0.83       | 21.46 | 50.00      | -28.54     | Average |
| 4 | 6.056  | 27.03      | 10.28       | 0.82       | 38.13 | 60.00      | -21.87     | Peak    |
| 5 | 18.232 | 24.29      | 10.30       | 0.92       | 35.51 | 60.00      | -24.49     | Peak    |
| 6 | 23.140 | 15.62      | 10.47       | 0.89       | 26.98 | 50.00      | -23.02     | Average |

Neutral:

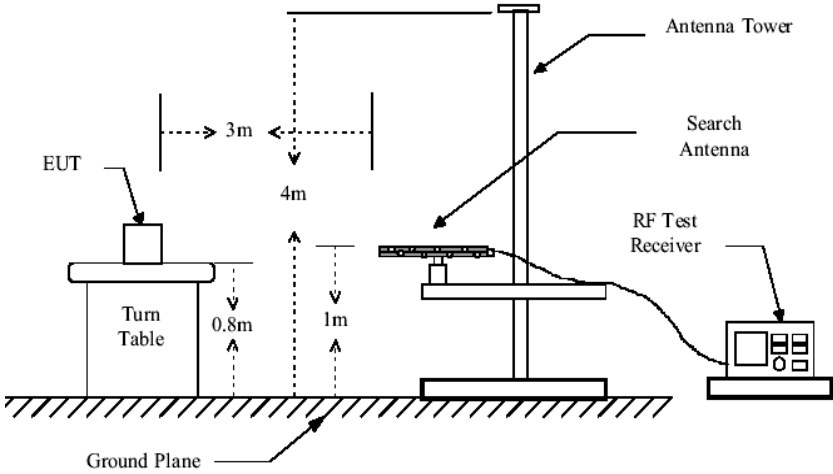
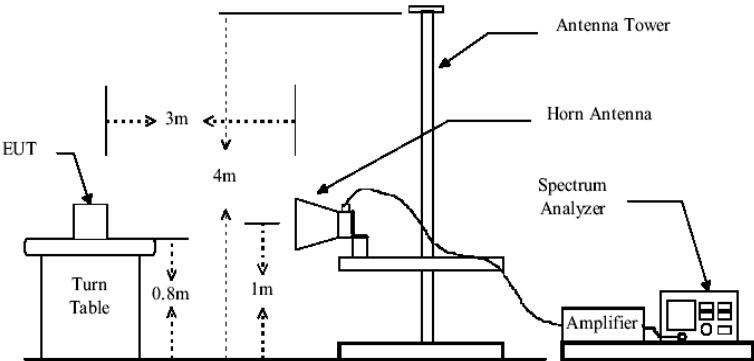


**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + 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:<br>(Field strength of the<br>fundamental signal) |   |            |                    |            |                  |
|   | Frequency   |            | Limit (dBuV/m @3m) |            | Remark           |
|   | 433.92 MHz  |            | 72.87              |            | Average Value    |
|   |   |            | 92.87              |            | Peak Value       |
| Limit:<br>(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 higher field strength.  |            |                    |            |                  |
| Test Procedure:   | <div>1. 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.</div> <div>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</div> <div>3. 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.</div> <div>4. 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.</div> <div>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</div> <div>6. 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.</div> |            |                    |            |                  |

|                   |   |
|-------------------|---|
| 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

Exterior Antenna:

#### 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 |
|-----------------|-------------------|-----------------------|-----------------|--------------------|----------------|---------------------|-----------------|--------------|
| 433.92          | 60.48             | 15.53                 | 3.16            | 0.00               | 79.17          | 92.87               | -13.70          | Horizontal   |
| 433.92          | 54.94             | 15.53                 | 3.16            | 0.00               | 73.63          | 92.87               | -19.24          | 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          | 79.17          | -8.13             | 71.04                  | 72.87               | -1.83           | Horizontal   |
| 433.92          | 73.63          | -8.13             | 65.50                  | 72.87               | -7.37           | Vertical     |

Interior Antenna:

#### 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 |
|-----------------|-------------------|-----------------------|-----------------|--------------------|----------------|---------------------|-----------------|--------------|
| 433.92          | 58.48             | 15.53                 | 3.16            | 0.00               | 77.17          | 92.87               | -15.70          | Horizontal   |
| 433.92          | 52.94             | 15.53                 | 3.16            | 0.00               | 71.63          | 92.87               | -21.24          | Vertical     |

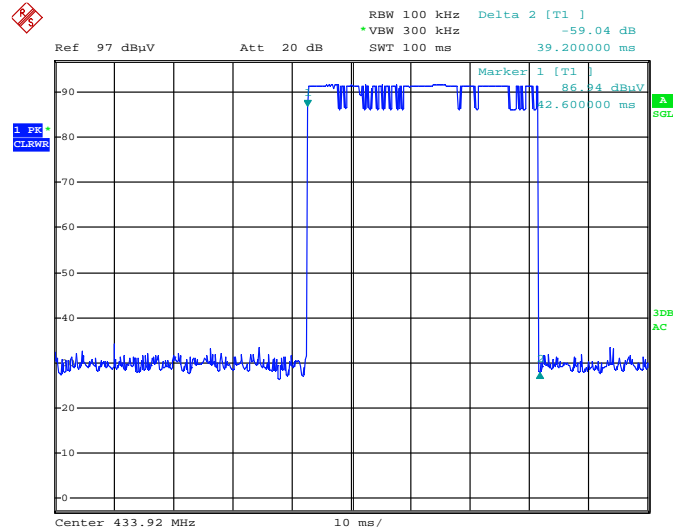
#### Average value:

| Frequency (MHz) | Level (dBuV/m) | Duty cycle factor | Average value (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|-----------------|----------------|-------------------|------------------------|---------------------|-----------------|--------------|
| 433.92          | 77.17          | -8.13             | 69.04                  | 72.87               | -3.83           | Horizontal   |
| 433.92          | 71.63          | -8.13             | 63.50                  | 72.87               | -9.37           | 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 = 39.2ms                             |
|                    | T period =100ms                               |
|                    | Duty cycle=39.20%                             |
|                    | Duty Cycle Factor = 20 log(Duty cycle)= -8.13 |

Test plot as follows:



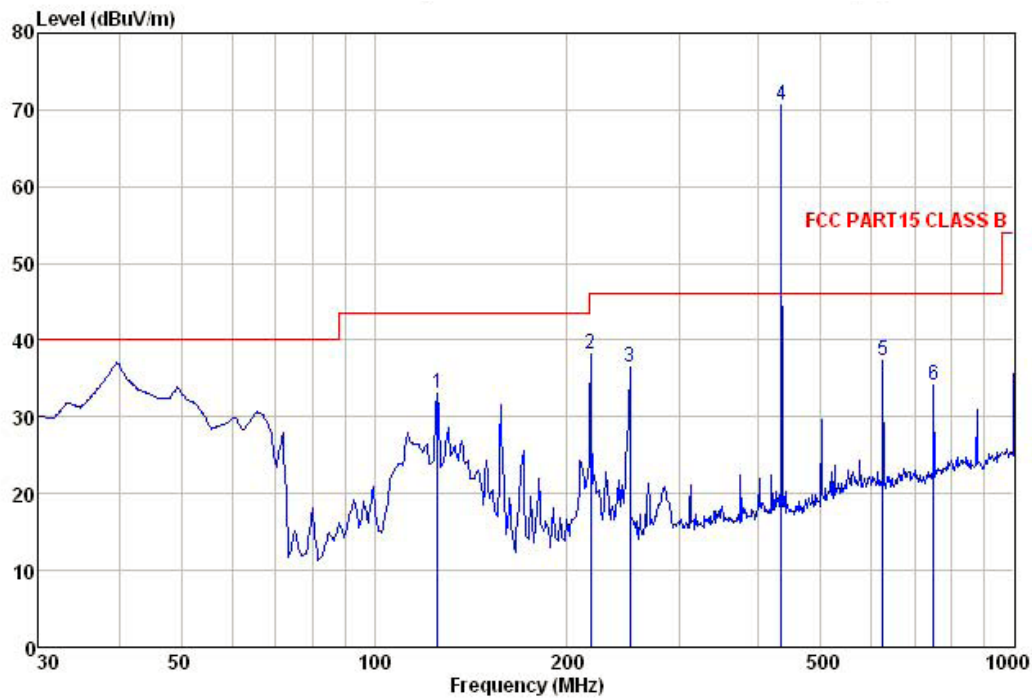
Date: 12.MAY.2013 14:03:19



## 6.3.2 Spurious Emissions

Exterior Antenna:

Vertical



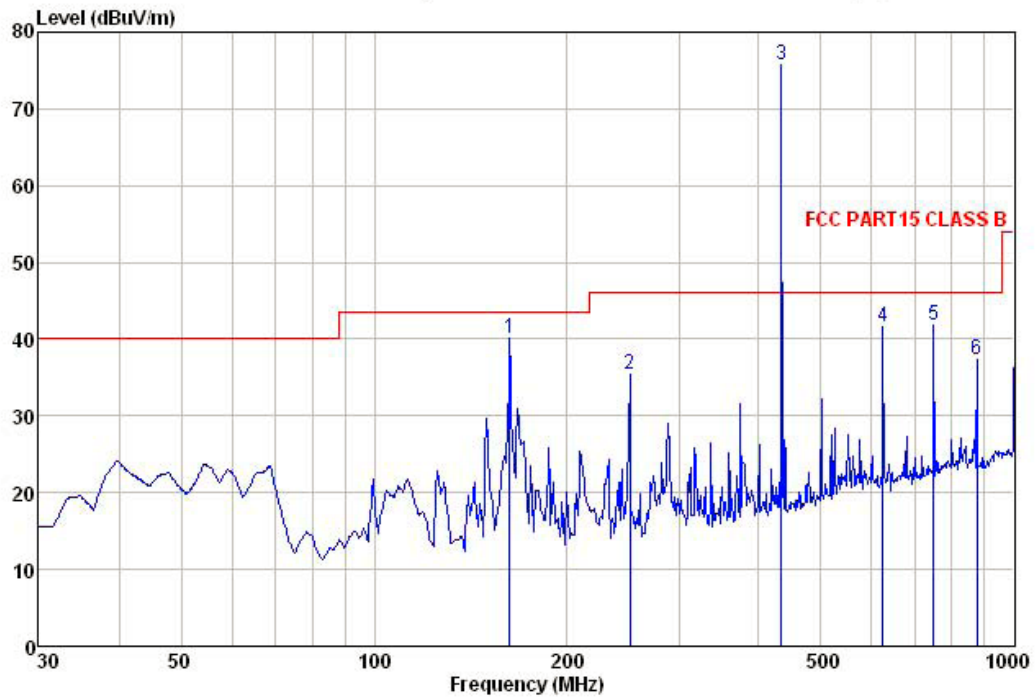
Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL  
 Job NO. : 125RF  
 EUT : NETBRIDGE(antenna out)  
 Test mode : TX Mode  
 Power Rating : AC 120V /60Hz  
 Environment : Temp:24°C Humi:65% Atmos:101Kpa  
 Test Engineer: jacky

|     | Freq    | ReadAntenna | Cable  | Preamp | Limit | Over   |              |
|-----|---------|-------------|--------|--------|-------|--------|--------------|
|     | MHz     | Level       | Factor | Loss   | Level | Line   | Limit Remark |
|     | MHz     | dBuV        | dB/m   | dB     | dB    | dBuV/m | dBuV/m       |
| 1   | 125.446 | 50.93       | 9.61   | 2.24   | 29.61 | 33.17  | 43.50 -10.33 |
| 2   | 217.544 | 53.87       | 11.10  | 2.85   | 29.73 | 38.09  | 46.00 -7.91  |
| 3   | 250.301 | 51.16       | 12.07  | 2.81   | 29.60 | 36.44  | 46.00 -9.56  |
| 4 * | 434.065 | 82.32       | 15.53  | 3.16   | 30.33 | 70.68  | 46.00 24.68  |
| 5   | 625.078 | 45.44       | 18.54  | 3.90   | 30.57 | 37.31  | 46.00 -8.69  |
| 6   | 750.108 | 40.88       | 19.43  | 4.36   | 30.50 | 34.17  | 46.00 -11.83 |

Remark: The strong signal is fundamental.



Horizontal



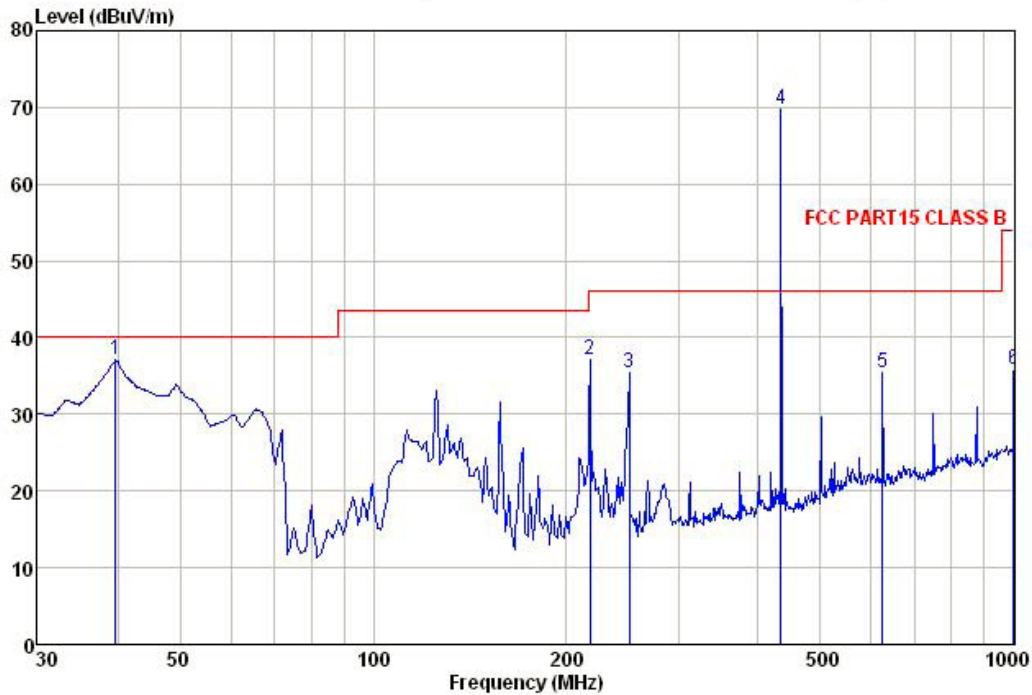
Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL  
 Job NO. : 125RF  
 EUT : NETBRIDGE(antenna out)  
 Test mode : TX Mode  
 Power Rating : AC 120V /60Hz  
 Environment : Temp:24'C Humi:65% Atmos:101Kpa  
 Test Engineer: jacky

|     | Freq    | ReadAntenna | Cable | Preamp | Limit | Over   |        |
|-----|---------|-------------|-------|--------|-------|--------|--------|
|     |         | Level       | Loss  | Factor | Line  | Limit  | Remark |
|     | MHz     | dBuV        | dB/m  | dB     | dB    | dBuV/m | dBuV/m |
| 1   | 162.611 | 58.43       | 8.74  | 2.61   | 29.64 | 40.14  | 43.50  |
| 2   | 250.301 | 50.16       | 12.07 | 2.81   | 29.60 | 35.44  | 46.00  |
| 3 * | 434.065 | 87.37       | 15.53 | 3.16   | 30.33 | 75.73  | 46.00  |
| 4   | 625.078 | 49.65       | 18.54 | 3.90   | 30.57 | 41.52  | 46.00  |
| 5   | 750.108 | 48.60       | 19.43 | 4.36   | 30.50 | 41.89  | 46.00  |
| 6   | 875.247 | 42.62       | 20.87 | 3.95   | 30.20 | 37.24  | 46.00  |

Remark: The strong signal is fundamental.

Interior Antenna:

Vertical

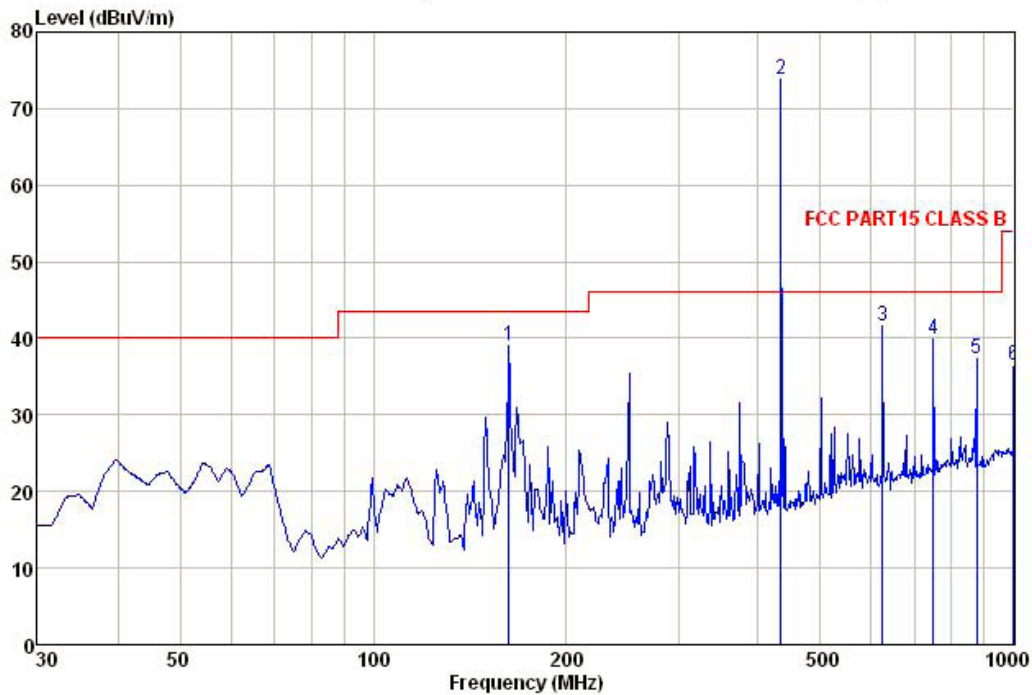


Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL  
 Job NO. : 125RF  
 EUT : NETBRIDGE  
 Test mode : TX Mode  
 Power Rating : AC 120V /60Hz  
 Environment : Temp:24°C Humi:65% Atmos:101Kpa  
 Test Engineer: jacky

|     | Freq     | ReadAntenna | Cable  | Preamp | Level  | Limit  | Over   |        |
|-----|----------|-------------|--------|--------|--------|--------|--------|--------|
|     | MHz      | Level       | Factor | Loss   | Factor | Line   | Limit  | Remark |
|     | MHz      | dBuV        | dB/m   | dB     | dB     | dBuV/m | dBuV/m | dB     |
| 1   | 39.715   | 49.70       | 13.49  | 1.21   | 27.22  | 37.18  | 40.00  | -2.82  |
| 2   | 217.544  | 52.87       | 11.10  | 2.85   | 29.73  | 37.09  | 46.00  | -8.91  |
| 3   | 250.301  | 50.16       | 12.07  | 2.81   | 29.60  | 35.44  | 46.00  | -10.56 |
| 4 * | 434.065  | 81.32       | 15.53  | 3.16   | 30.33  | 69.68  | 46.00  | 23.68  |
| 5   | 625.078  | 43.44       | 18.54  | 3.90   | 30.57  | 35.31  | 46.00  | -10.69 |
| 6   | 1000.000 | 39.30       | 21.74  | 4.47   | 29.76  | 35.75  | 54.00  | -18.25 |

Remark: The strong signal is fundamental.

Horizontal



Site : 3m chamber  
 Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL  
 Job NO. : 125RF  
 EUT : NETBRIDGE  
 Test mode : TX Mode  
 Power Rating : AC 120V /60Hz  
 Environment : Temp:24°C Humi:65% Atmos:101Kpa  
 Test Engineer: jacky

|     | Freq     | ReadAntenna | Cable  | Preamp | Limit  | Over   |        |
|-----|----------|-------------|--------|--------|--------|--------|--------|
|     |          | Level       | Factor | Loss   | Factor | Line   | Limit  |
|     | MHz      | dBuV        | dB/m   | dB     | dB     | dBuV/m | dBuV/m |
| 1   | 162.611  | 57.43       | 8.74   | 2.61   | 29.64  | 39.14  | 43.50  |
| 2 * | 434.065  | 85.37       | 15.53  | 3.16   | 30.33  | 73.73  | 46.00  |
| 3   | 625.078  | 49.65       | 18.54  | 3.90   | 30.57  | 41.52  | 46.00  |
| 4   | 750.108  | 46.60       | 19.43  | 4.36   | 30.50  | 39.89  | 46.00  |
| 5   | 875.247  | 42.62       | 20.87  | 3.95   | 30.20  | 37.24  | 46.00  |
| 6   | 1000.000 | 40.04       | 21.74  | 4.47   | 29.76  | 36.49  | 54.00  |

Remark: The strong signal is fundamental.

### Above 1GHz:

Exterior Antenna:

| 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 |
| 1301.76         | 49.06             | 25.52                 | 3.61            | 40.92                    | 37.27          | 74.00               | -36.73          | Horizontal   |
| 2603.52         | 48.68             | 27.80                 | 6.12            | 40.18                    | 42.42          | 74.00               | -31.58          | Horizontal   |
| 1301.76         | 49.51             | 25.52                 | 3.61            | 40.92                    | 37.72          | 74.00               | -36.28          | Vertical     |
| 2603.52         | 49.34             | 27.80                 | 6.12            | 40.18                    | 43.08          | 74.00               | -30.92          | Vertical     |

| Average value:  |                |                   |                        |                     |                 |              |  |
|-----------------|----------------|-------------------|------------------------|---------------------|-----------------|--------------|--|
| Frequency (MHz) | Level (dBuV/m) | Duty cycle factor | Average value (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |  |
| 1301.76         | 37.27          | -8.13             | 29.14                  | 54.00               | -24.86          | Horizontal   |  |
| 2603.52         | 42.42          | -8.13             | 34.29                  | 54.00               | -19.71          | Horizontal   |  |
| 1301.76         | 37.72          | -8.13             | 29.59                  | 54.00               | -24.41          | Vertical     |  |
| 2603.52         | 43.08          | -8.13             | 34.95                  | 54.00               | -19.05          | Vertical     |  |

Interior Antenna:

| Peak value:     |                     |                       |                 |                          |                |                     |                 |              |
|-----------------|---------------------|-----------------------|-----------------|--------------------------|----------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV/m) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
| 1301.76         | 48.44               | 25.52                 | 3.61            | 40.92                    | 36.65          | 74.00               | -37.35          | Horizontal   |
| 2603.52         | 48.28               | 27.80                 | 6.12            | 40.18                    | 41.98          | 74.00               | -32.02          | Horizontal   |
| 1301.76         | 48.99               | 25.52                 | 3.61            | 40.92                    | 37.20          | 74.00               | -36.80          | Vertical     |
| 2603.52         | 48.36               | 27.80                 | 6.12            | 40.18                    | 42.10          | 74.00               | -31.90          | Vertical     |

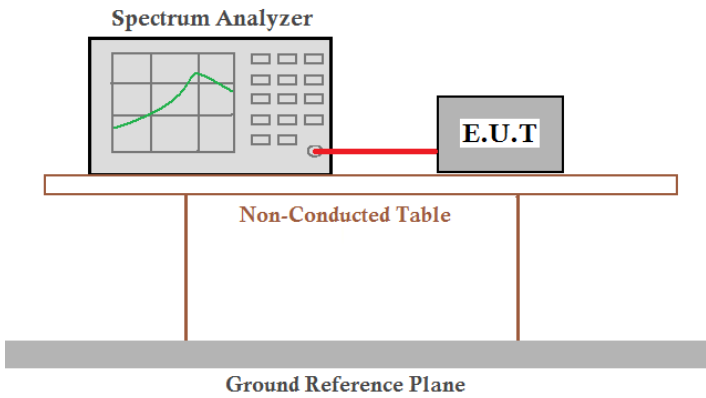
| Average value:  |                |                   |                        |                     |                 |              |  |
|-----------------|----------------|-------------------|------------------------|---------------------|-----------------|--------------|--|
| Frequency (MHz) | Level (dBuV/m) | Duty cycle factor | Average value (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |  |
| 1301.76         | 36.65          | -8.13             | 28.52                  | 54.00               | -25.48          | Horizontal   |  |
| 2603.52         | 41.98          | -8.13             | 33.85                  | 54.00               | -20.15          | Horizontal   |  |
| 1301.76         | 37.20          | -8.13             | 29.07                  | 54.00               | -24.93          | Vertical     |  |
| 2603.52         | 42.10          | -8.13             | 33.97                  | 54.00               | -20.03          | Vertical     |  |

Remark:

Average Limit = Peak Limit -20dB, Duty cycle factor=20 log (Duty cycle)

Average value=Peak value + Duty cycle facto

## 6.4 20 dB Bandwidth

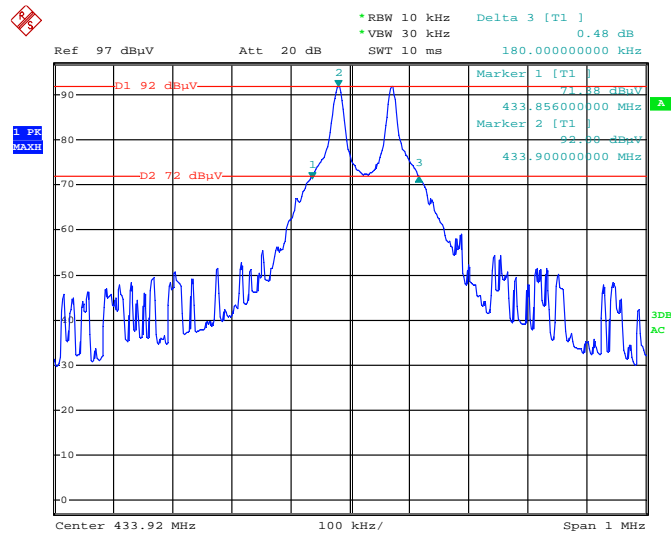
|                   |   |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.231 (c)   |
| Test Method:      | ANSI C63.4:2003   |
| Receiver setup:   | RBW=10KHz, VBW=30KHz, detector: Peak  |
| Limit:            | The bandwidth of the emission shall be no wider than 0.25% of the 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"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set the EUT to proper test channel.</li> <li>3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points.</li> <li>4. Read 20dB bandwidth.</li> </ol> |
| 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 mode:        | Refer to section 5.3 for details  |
| Test Instruments: | Refer to section 5.7 for details  |
| Test results:     | Passed  |

### Measurement Data

| 20dB bandwidth (MHz) | Limit (MHz) | Results |
|----------------------|-------------|---------|
| 0.180                | 1.0848      | Pass    |

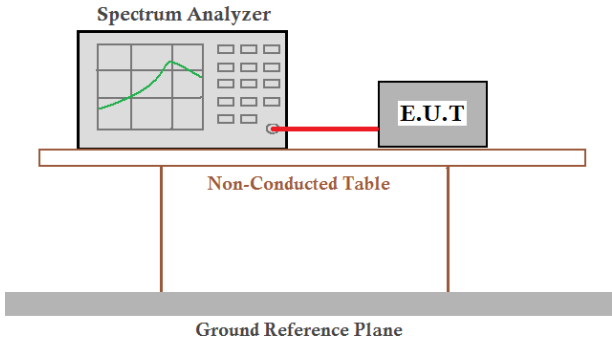
Note: Limit= Fundamental frequency $\times$ 0.25%=433.92 $\times$ 0.25%=1.0848MHz

Test plot as follows:



Date: 12.MAY.2013 14:00:55

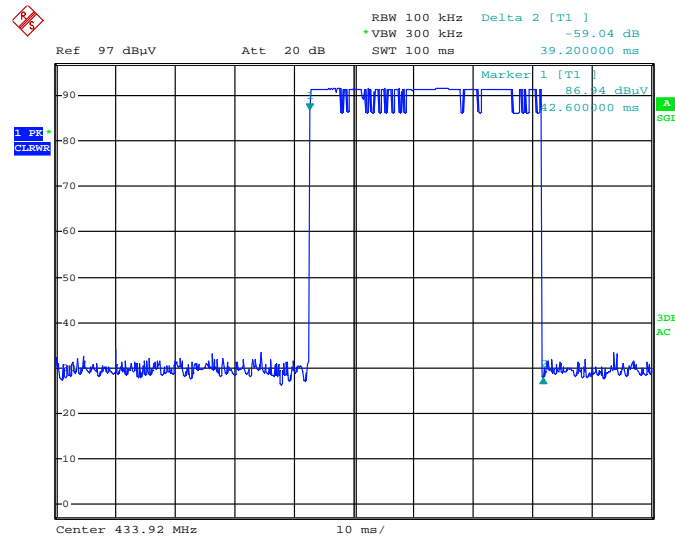
## 6.5 Duration time:

|                   |   |
|-------------------|---|
| 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"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set the EUT to proper test channel.</li> <li>3. Single scan the transmit, and read the transmission time.</li> </ol>                           |
| 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 5.7 for details  |
| Test results:     | Passed  |

### Measurement data:

| Dwell time (second) | Limit (second) | Result |
|---------------------|----------------|--------|
| 0.0392              | <1.0           | Pass   |

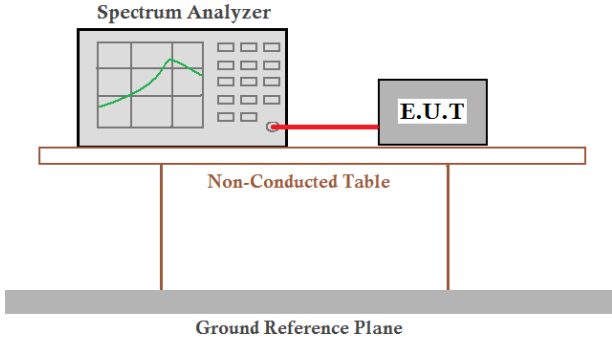
Test plot as follows:



Date: 12.MAY.2013 14:03:19



## 6.6 Silent period:

|                   |   |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.231 (e)   |
| Test Method:      | ANSI C63.4:2003   |
| Receiver setup:   | RBW=3MHz, VBW=3MHz, span=0Hz, detector: Peak  |
| Limit:            | at least 30 times the duration of the transmission<br>and more than 10 seconds  |
| Test mode:        | Transmitting mode   |
| Test Procedure:   | <ol style="list-style-type: none"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set the EUT to proper test channel.</li> <li>3. Single scan the transmit, and read the transmission time.</li> </ol>                           |
| 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 5.7 for details  |
| Test results:     | Passed  |

### Measurement data:

| Silent period (second) | Limit (second) | Result |
|------------------------|----------------|--------|
| 12.03                  | >10            | Pass   |

Test plot as follows:

