



**FCC 47 CFR PART 15 SUBPART C  
&  
INDUSTRY CANADA RSS-310**

**TEST REPORT**

**For**

**Wireless Keyboard**

**Model: 6309URF**

**Trade Name: EMPREX, BTC**

*Issued to*

**BEHAVIOR TECH COMPUTER CORP.  
20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City,  
Taipei County 22102, Taiwan (R.O.C.)**

*Issued by*



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## 1. TEST RESULT CERTIFICATION

**Applicant:** BEHAVIOR TECH COMPUTER CORP.  
20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City,  
Taipei County 22102, Taiwan (R.O.C.)

**Equipment Under Test:** Wireless Keyboard

**Trade Name:** EMPREX, BTC

**Model:** 6309URF

**Date of Test:** January 16 ~ March 10, 2008

| APPLICABLE STANDARDS                                                             |                         |
|----------------------------------------------------------------------------------|-------------------------|
| STANDARD                                                                         | TEST RESULT             |
| FCC 47 CFR Part 15 Subpart C,<br>Industry Canada RSS-310 Issue 1 September, 2005 | No non-compliance noted |

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.227 and Industry Canada RSS-310.

The test results of this report relate only to the tested sample identified in this report.

*Approved by:*

*Reviewed by:*

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Rex Lai  
Section Manager  
Compliance Certification Services Inc.

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Amanda Wu  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

|                              |                                             |
|------------------------------|---------------------------------------------|
| <b>Product</b>               | Wireless Keyboard                           |
| <b>Trade Name</b>            | EMPREX, BTC                                 |
| <b>Model Number</b>          | 6309URF                                     |
| <b>Model Difference</b>      | N/A                                         |
| <b>Power Supply</b>          | Powered by AA batteries $\times$ 2 (DC: 3V) |
| <b>Frequency Range</b>       | 27.195 MHz                                  |
| <b>Modulation Technique</b>  | FSK                                         |
| <b>Antenna Specification</b> | Gain: -20.85 dBi                            |
| <b>Antenna Designation</b>   | Loop Antenna                                |

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **E5XKB6309URF** filing to comply with Section 15.227 of the FCC Part 15, Subpart C Rules.



### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4, FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.227, IC RSS-310, IC RSS-Gen, and IC RSS-212.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane according to the requirements in Section 13.1.4.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.

### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                 | MHz             | GHz              |
|----------------------------|---------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423      | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475 | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67        | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25        | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6           | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2         | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94        | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138           | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05      | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 -         | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.52525           | 2655 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 156.7 - 156.9       | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 162.0125 - 167.17   | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 167.72 - 173.2      | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 240 - 285           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              | 322 - 335.4         |                 |                  |

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

### 3.5 DESCRIPTION OF TEST MODES

The EUT (model: 6309URF) had been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

*Remark: Each piece of equipment is scheduled for calibration once a year.*

| 3M Semi Anechoic Chamber |                 |                   |                            |                 |
|--------------------------|-----------------|-------------------|----------------------------|-----------------|
| Name of Equipment        | Manufacturer    | Model             | Serial Number              | Calibration Due |
| Spectrum Analyzer        | Agilent         | E4446A            | US42510252                 | 09/11/2008      |
| Test Receiver            | Rohde&Schwarz   | ESCI              | 100064                     | 11/12/2008      |
| Switch Controller        | TRC             | Switch Controller | SC94050010                 | 05/04/2008      |
| 4 Port Switch            | TRC             | 4 Port Switch     | SC94050020                 | 05/04/2008      |
| Horn-Antenna             | TRC             | HA-0502           | 06                         | 06/05/2008      |
| Horn-Antenna             | TRC             | HA-0801           | 04                         | 06/20/2008      |
| Horn-Antenna             | TRC             | HA-1201A          | 01                         | 08/12/2008      |
| Horn-Antenna             | TRC             | HA-1301A          | 01                         | 08/12/2008      |
| Bilog- Antenna           | Sunol Sciences  | JB3               | A030205                    | 03/29/2008      |
| Turn Table               | Max-Full        | MFT-120S          | T120S940302                | N.C.R.          |
| Antenna Tower            | Max-Full        | MFA-430           | A440940302                 | N.C.R.          |
| Controller               | Max-Full        | MF-CM886          | CC-C-1F-13                 | N.C.R.          |
| Site NSA                 | CCS             | N/A               | FCC: 965860<br>IC: IC 6106 | 09/25/2008      |
| Test S/W                 | LABVIEW (V 6.1) |                   |                            |                 |

*Remark: The measurement uncertainty is less than  $\pm 2.0065\text{dB}$  (30MHz ~ 1GHz),  $\pm 3.0958\text{dB}$  (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*



## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☒ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### **5.3 LABORATORY ACCREDITATIONS AND LISTING**

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324C-3 for OATS #3, IC 2324C-5 for OATS-5.



## 5.4 TABLE OF ACCREDITATIONS AND LISTINGS

| Country | Agency          | Scope of Accreditation                                                                                                                                                                                                                                                                                                                                                                               | Logo                                                                                                                                                                                        |
|---------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USA     | A2LA            | EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001 | <br>ACCREDITED<br>TESTING CERT #0824.01                                                                  |
| USA     | FCC             | 3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements                                                                                                                                                                                                                                                                            | <br>93105, 90471<br>965860                                                                               |
| Japan   | VCCI            | 3/10 meter Open Area Test Sites to perform conducted/radiated measurements                                                                                                                                                                                                                                                                                                                           | <br>R-393/1066/725/879<br>C-402/747/912                                                                  |
| Norway  | NEMKO           | EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2                                                                          | <br>ELA 124a<br>ELA 124b<br>ELA 124c                                                                     |
| Taiwan  | TAF             | EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3                                                                                                                                                                | <br>Testing Laboratory<br>0363                                                                         |
| Taiwan  | BSMI            | CNS 13438, CNS 13783-1, CNS 13439, CNS 14115                                                                                                                                                                                                                                                                                                                                                         | <br>SL2-IS-E-0014<br>SL2-IN-E-0014<br>SL2-A1-E-0014<br>SL2-R1-E-0014<br>SL2-R2-E-0014<br>SL2-L1-E-0014 |
| Canada  | Industry Canada | 3/10 meter Open Area Test Sites (IC 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106)                                                                                                                                                                                                                                                                                                        | <br>IC 2324C-3<br>IC 2324C-5<br>IC 6106                                                                |

\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

| No. | Device Type | Brand | Model | Series No. | FCC ID | Data Cable | Power Cord |
|-----|-------------|-------|-------|------------|--------|------------|------------|
|     | N/A         | N/A   | N/A   | N/A        | N/A    | N/A        | N/A        |

**Remark:**

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



## 7. APPLICABLE RULES

### RSS-310 §3 Applications and Technical Standards

#### RSS-310 §3.8 26.96-27.28 MHz

The field strength shall not exceed 10 millivolts/m measured at 3 metres (equivalent to 30  $\mu$ W e.i.r.p.) with an averaging or a CISPR quasi-peak detector (equivalent to 30  $\mu$ W e.i.r.p.).  
Outside of this band, Tables 2 and 3 limits shall apply.

#### RSS-310 §3.12 Tables

**RSS-310 Table 1: Restricted Frequency Bands** <sup>(Note)</sup>

| MHz             | MHz                | MHz                 | MHz           | GHz         |
|-----------------|--------------------|---------------------|---------------|-------------|
| 0.090-0.110     | 8.37625-8.38675    | --                  | 1718.8-1722.2 | 9.0-9.2     |
| --              | 8.41425-8.41475    | 156.52475-156.52525 | 2200-2300     | 9.3-9.5     |
| 2.1735-2.1905   | 12.29-12.293       | 156.7-156.9         | 2310-2390     | 10.6-12.7   |
| 3.020-3.026     | 12.51975-12.52025  | --                  | --            | 13.25-13.4  |
| 4.125-4.128     | 12.57675-12.57725  | --                  | 2655-2900     | 14.47-14.5  |
| 4.17725-4.17775 | 13.36-13.41        | 240-285             | 3260-3267     | 15.35-16.2  |
| 4.20725-4.20775 | 16.42-16.423       | 322-335.4           | 3332-3339     | 17.7-21.4   |
| 5.677-5.683     | 16.69475-16.69525  | 399.9-410           | 3345.8-3358   | 22.01-23.12 |
| 6.215-6.218     | 16.80425-16.80475  | 608-614             | 3500-4400     | 23.6-24.0   |
| 6.26775-6.26825 | 25.5-25.67         | 960-1427            | 4500-5150     | 31.2-31.8   |
| 6.31175-6.31225 | 37.5-38.25         | 1435-1626.5         | 5350-5460     | 36.43-36.5  |
| 8.291-8.294     | 73-74.6; 74.8-75.2 | 1645.5-1646.5       | 7250-7750     | Above 38.6  |
| 8.362-8.366     | 108-138            | 1660-1710           | 8025-8500     |             |

**Note:** Certain frequency bands listed in Table 2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard as well as RSS-210.

**RSS-310 Table 2: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz**

| Frequency (MHz) | Field Strength microvolts/m at 3 metres (watts, e.i.r.p.) |              |
|-----------------|-----------------------------------------------------------|--------------|
|                 | Transmitter <sup>(Note)</sup>                             | Receiver     |
| 30-88           | 100 (3 nW)                                                | 100 (3 nW)   |
| 88-216          | 150 (6.8 nW)                                              | 150 (6.8 nW) |
| 216-960         | 200 (12 nW)                                               | 200 (12 nW)  |
| above 960       | 500 (75 nW)                                               | 500 (75 nW)  |

**Note:** Transmitting devices are not permitted in Table 1 bands or in TV bands (i.e. 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz).

**RSS-310 Table 3: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz**

| <b>Frequency<br/>(fundamental<br/>or spurious)</b> | <b>Field Strength<br/>(microvolts/m)</b> | <b>Magnetic<br/>H-Field<br/>(microamperes/m)</b> | <b>Measurement<br/>Distance<br/>(metres)</b> |
|----------------------------------------------------|------------------------------------------|--------------------------------------------------|----------------------------------------------|
| 9-490 kHz                                          | 2,400/F<br>(F in kHz)                    | 2,400/377F<br>(F in Hz)                          | 300                                          |
| 490-1.705 kHz                                      | 24,000/F<br>(F in kHz)                   | 24,000/377F<br>(F in kHz)                        | 30                                           |
| 1.705-30 MHz                                       | 30                                       | N/A                                              | 30                                           |

*Note: The emission limits for the 9-90 kHz and 110-490 kHz bands are based on measurements employing an average detector.*

**RSS-Gen §2 General Information**

Unless otherwise indicated, radiocommunications equipment is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act*.

**RSS-Gen §2.1.2 Category II Equipment**

Category II equipment comprises radio devices where a standard has been prescribed but for which a TAC is not required, that is, equipment certification by Industry Canada or a Certification Body (CB) is not required (certification exempt), pursuant to subsection 4(3) of the *Radiocommunication Act*. The manufacturer or importer shall nevertheless ensure that the standards are complied with. A test report shall be available on request and the device shall be properly labelled.

**RSS-Gen §2.2 Receivers**

Radiocommunication receivers are defined as Category I equipment or Category II equipment by the characteristics outlined below.

**RSS-Gen §2.2.1 Category I Equipment Receivers**

A receiver is classified as Category I equipment if it meets one of the following conditions:

- (a) is a stand-alone receiver that is tunable to any frequency in the band 30-960 MHz;
- (b) is a receiver that is associated with Category I transmitters; or
- (c) is a scanner receiver.

Except for scanner receivers, which have their own RSSs, Category I receivers shall comply with the limits for receiver spurious emissions set out in Section 6 of this RSS-Gen, and shall be certified under the RSS applicable to the transmitter type with which the receiver is associated or designed to operate (NOT under RSS-Gen).

**RSS-Gen §2.2.2 Category II Equipment Receivers**

A receiver is classified as Category II equipment if it is not meeting the conditions of Section 2.2.1.

**RSS-Gen §2.2.3 Licence-exempt Receivers**

Paging receivers, “receive-only” earth stations operating with satellites approved by Industry Canada, and stand-alone receivers which are exempted from licensing, can be classified as either Category I or Category II according to the condition specified in sections 2.2.1 and 2.2.2 above. These receivers shall comply with the requirements of RSS-210 or RSS-310.

**RSS-Gen §2.3 Licence-exempt Low-power Radiocommunication Devices (LPDs)**

Licence-exempt low-power radiocommunication devices are devices which have intentional and unwanted emissions of very low signal levels such that they can co-exist with licensed radio services. LPDs are required to operate on a “**no-interference, no-protection**” basis (i.e. they may not cause radio interference and cannot claim protection from interference). The requirements for LPDs are generally described in Section 7.

**RSS-Gen §4.6 Bandwidth****RSS-Gen §4.6.1 Occupied Bandwidth**

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

**RSS-Gen §6 Receiver Spurious Emission Standard**

The following receiver spurious emission limits shall be complied with:

(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

**RSS-Gen Table 1 - Spurious Emission Limits for Receivers**

| <b>Frequency<br/>(MHz)</b> | <b>Field Strength<br/>microvolts/m at 3 metres</b> |
|----------------------------|----------------------------------------------------|
| 30-88                      | 100                                                |
| 88-216                     | 150                                                |
| 216-960                    | 200                                                |
| Above 960                  | 500                                                |

(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

**RSS-Gen §7.1.4 Transmitter Antenna**

A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 or RSS-210 Annex 9, the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

**RSS-Gen §7.2.2 Transmitter and Receiver AC Power Lines Conducted Emission Limits**

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radiocommunication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

**RSS-Gen Table 2 – AC Power Lines Conducted Emission Limits**

| Frequency Range<br>(MHz) | Conducted limit (dBµV) |           |
|--------------------------|------------------------|-----------|
|                          | Quasi-peak             | Average   |
| 0.15 to 0.5              | 66 to 56*              | 56 to 46* |
| 0.5 to 5                 | 56                     | 46        |
| 5 to 30                  | 60                     | 50        |

*\*Decreases with the logarithm of the frequency*

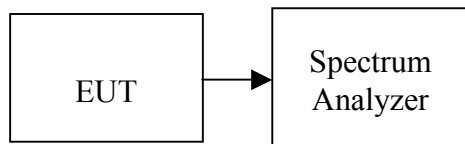
**RSS-Gen §7.2.3 Receiver Spurious Emission Limits****RSS-Gen §7.2.3.2 Radiated Measurement**

All spurious emissions shall comply with the limits of Table 1 (see Section 6).



## 7.1 99% BANDWIDTH

### Test Configuration



### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=160Hz, VBW = 470Hz, Span = 10kHz, Sweep = auto.
4. Record the max. reading.

### TEST RESULTS

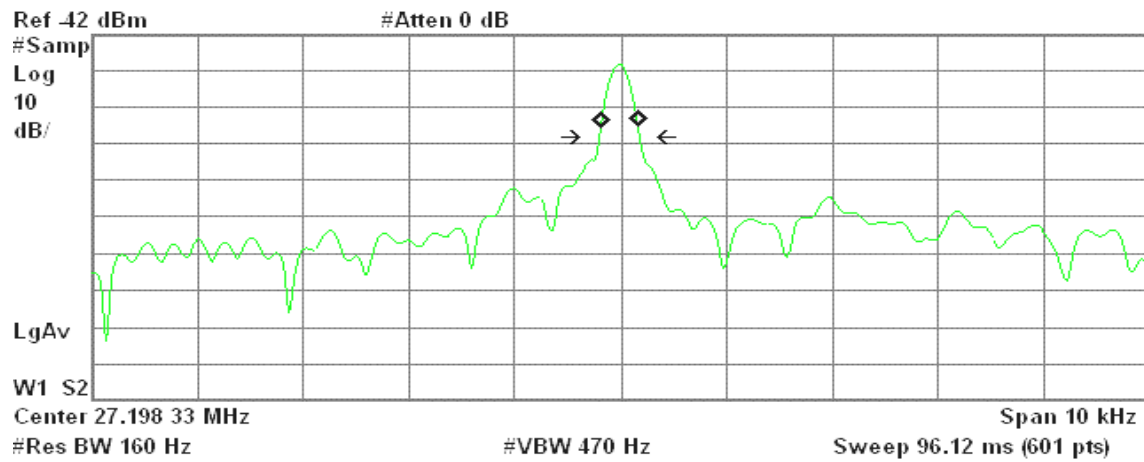
| Frequency<br>(MHz) | Bandwidth<br>(Hz) |
|--------------------|-------------------|
| 27.195             | 366.2232          |



## Test Plot

Agilent 09:09:46 Mar 10, 2008

R T



Occupied Bandwidth  
366.2232 Hz

Occ BW % Pwr 99.00 %  
x dB -20.00 dB

Transmit Freq Error -17.782 Hz  
Occupied Bandwidth 394.491 Hz\*





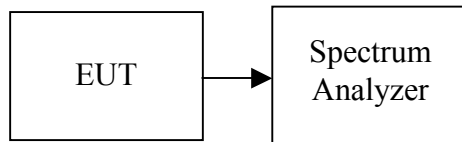
## 8. FCC PART 15.227 REQUIREMENTS

### 8.1 20 DB BANDWIDTH

#### LIMIT

None; for reporting purposes only.

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=160Hz, VBW = 470Hz, Span = 100kHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

#### TEST RESULTS

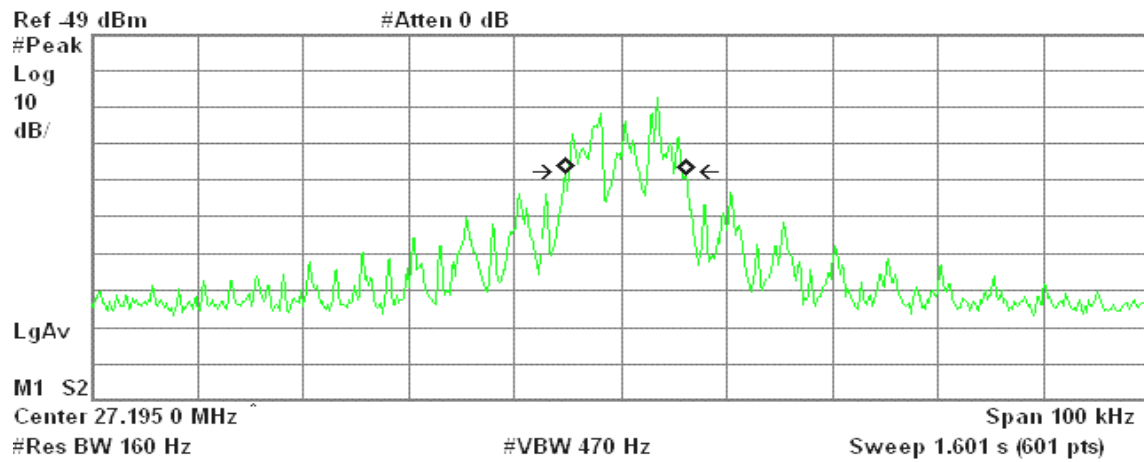
*No non-compliance noted.*



## Test Plot

\* Agilent 06:28:45 Jan 16, 2008

R T



Occupied Bandwidth  
11.3173 kHz

Occ BW % Pwr 99.00 %  
x dB -20.00 dB

Transmit Freq Error 456.571 Hz  
x dB Bandwidth 10.615 kHz



## 8.2 RADIATED EMISSIONS

### LIMIT

According to §15.227 & RSS-310 Table 2 & Table 3:

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (mV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 30-88           | 100*                  | 3                        |
| 88-216          | 150*                  | 3                        |
| 216-960         | 200*                  | 3                        |
| Above 960       | 500                   | 3                        |

**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the above emission table, the tighter limit applies at the band edges.

| Frequency (MHz) | Field Strength ( $\mu$ V/m at 3-meter) | Field Strength (dB $\mu$ V/m at 3-meter) |
|-----------------|----------------------------------------|------------------------------------------|
| 30-88           | 100                                    | 40                                       |
| 88-216          | 150                                    | 43.5                                     |
| 216-960         | 200                                    | 46                                       |
| Above 960       | 500                                    | 54                                       |

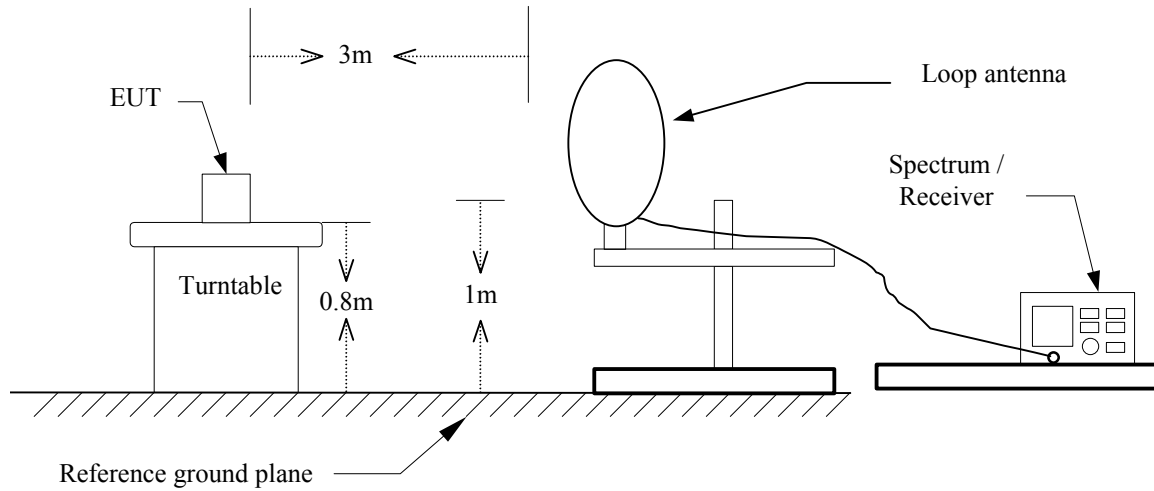
3. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength ( $\mu$ V/m at meter) | Measurement Distance (meter) |
|-----------------|--------------------------------------|------------------------------|
| 0.009 – 0.490   | 2400 / F (kHz)                       | 300                          |
| 0.490 – 1.705   | 24000 / F (kHz)                      | 30                           |
| 1.705 – 30.0    | 30                                   | 30                           |
| 30 - 88         | 100**                                | 3                            |
| 88-216          | 150**                                | 3                            |
| 216-960         | 200**                                | 3                            |
| Above 960       | 500                                  | 3                            |

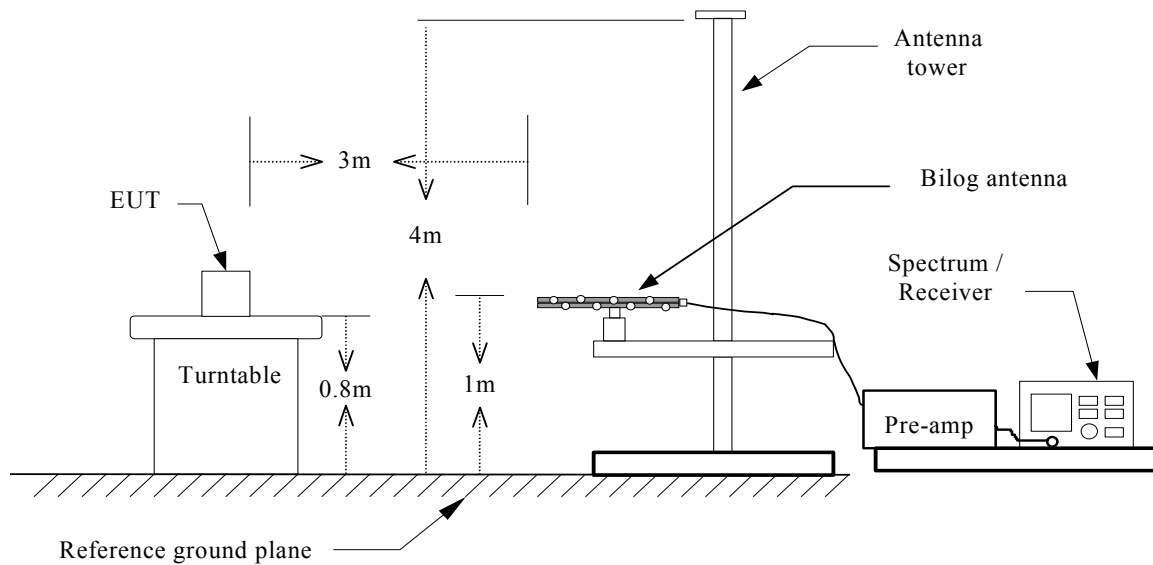
\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

## Test Configuration

### **9kHz ~ 30MHz**



### **30MHz ~ 1 GHz**





## **TEST PROCEDURE**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:  
RBW=100kHz / VBW=300kHz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**TEST RESULTS**

**Operation Mode:** TX mode                      **Test Date:** January 21, 2008  
**Temperature:** 23°C                              **Tested by:** Wolf Huang  
**Humidity:** 51 % RH                              **Polarity:** Ver. / Hor.

| Frequency (MHz) | Ant.Pol. (H/V) | Detector Mode (PK/QP/AVG) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) |
|-----------------|----------------|---------------------------|----------------|--------------------------|-----------------|-------------------|-------------|
| 27.19           | V              | Peak                      | 46.96          | 5.94                     | 52.90           | 80.00             | -27.10      |
| 38.08           | V              | Peak                      | 41.48          | -11.60                   | 29.89           | 40.00             | -10.11      |
| 89.82           | V              | Peak                      | 40.25          | -19.39                   | 20.86           | 43.50             | -22.64      |
| 122.15          | V              | Peak                      | 37.14          | -12.95                   | 24.19           | 43.50             | -19.31      |
| 133.47          | V              | Peak                      | 36.99          | -13.41                   | 23.58           | 43.50             | -19.92      |
| 448.72          | V              | Peak                      | 32.31          | -8.76                    | 23.54           | 46.00             | -22.46      |
| 885.22          | V              | Peak                      | 28.83          | -2.27                    | 26.56           | 46.00             | -19.44      |
| 27.19           | H              | Peak                      | 49.92          | 5.94                     | 55.86           | 80.00             | -24.14      |
| 38.08           | H              | Peak                      | 41.73          | -11.60                   | 30.14           | 40.00             | -9.86       |
| 120.53          | H              | Peak                      | 35.55          | -12.88                   | 22.67           | 43.50             | -20.83      |
| 201.37          | H              | Peak                      | 32.84          | -13.60                   | 19.24           | 43.50             | -24.26      |
| 385.67          | H              | Peak                      | 31.86          | -10.06                   | 21.80           | 46.00             | -24.20      |
| 663.73          | H              | Peak                      | 30.15          | -4.96                    | 25.19           | 46.00             | -20.81      |
| 957.97          | H              | Peak                      | 29.21          | -1.08                    | 28.12           | 46.00             | -17.88      |

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
4.  $\text{Margin (dB)} = \text{Result (dBuV/m)} - \text{Limit (dBuV/m)}$ .



### 8.3 POWERLINE CONDUCTED EMISSIONS (FOR RSS-310 REPORT PURPOSE ONLY)

#### LIMIT

According to §15.207(a) & RSS-Gen §7.2.2, except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency Range<br>(MHz) | Limits<br>(dB $\mu$ V) |           |
|--------------------------|------------------------|-----------|
|                          | Quasi-peak             | Average   |
| 0.15 to 0.50             | 66 to 56*              | 56 to 46* |
| 0.50 to 5                | 56                     | 46        |
| 5 to 30                  | 60                     | 50        |

\* Decreases with the logarithm of the frequency.

#### Test Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

#### TEST RESULTS

*Since this EUT is battery powered, this test item is not applicable.*