

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C AND CANADIAN RSS-210 ISSUE 6 REQUIREMENT**

*OF*

**Wii Remote**

**MODEL No.: LBI-023**

**FCC ID: X5NLBI-023**

**REPORT NO: E0912161F**

**ISSUE DATE: January 25, 2010**

*Prepared for*  
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## VERIFICATION OF COMPLIANCE

|                      |                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Applicant:           | SHENZHEN XINGDASHINE ELECTRONICS CO., LTD.<br>D3 East Xintang Industrial Zone, Baishixia, Fuyong, Baoan, Shenzhen, Guangdong, China |
| Product Description: | Wii Remote                                                                                                                          |
| Model Number:        | LBI-023                                                                                                                             |
| File Number:         | E0912161F                                                                                                                           |
| Date of Test:        | December 24, 2009 to January 22, 2010                                                                                               |

### We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. 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 EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249. also, the model complies with Canadian RSS-210 Issue 6 standard.

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

*Approved By*



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*David Lee / Q.A. Manager*  
SHENZHEN EMTEK CO., LTD.

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## 1. GENERAL INFORMATION

### 1.1 Product Description

The SHENZHEN XINGDASHINE ELECTRONICS CO., LTD. Model: LBI-023 (referred to as the EUT in this report) The EUT is an short range, lower power, Wii Remote designed as an “Input Device”. It is designed by way of utilizing the GFSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2402MHz-2480MHz
- B). Modulation: GFSK
- C). Number of Channel: 79
- D). Antenna Designation: PCB trace antenna
- E). Duty cycle: 100%
- F). Transmitter power: max 0dBm
- G).Power Supply: DC 2\*1.5V Battery

### 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: X5NLBI-023 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules and RSS-210, The composite system (receiver) is compliance with Subpart B is authorized under a DoC procedure.

### 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters. The customer requested FCC tests for a Wii Remote for Notebook.

### 1.4 Special Accessories

Not available for this EUT intended for grant.

### 1.5 Equipment Modifications

Not available for this EUT intended for grant.

## 1.6 Test Facility

### Site Description

#### EMC Lab.

: Accredited by CNAS, 2005.11.02  
The certificate is valid until 2010.11  
The Laboratory has been assessed and proved to be in  
compliance with CNAS-CL01: 2006 (identical to  
ISO/IEC17025: 2005)  
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2008.3  
The Laboratory has been assessed according to the  
requirements ISO/IEC 17025.

Accredited by FCC, March 18, 2008  
The Certificate Registration Number is 709623.

Accredited by Industry Canada, May 24, 2008  
The Certificate Registration Number is 46405-4480.

#### Name of Firm

: SHENZHEN EMTEK CO., LTD

#### Site Location

: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

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

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table 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 max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

### 2.4 Limitation

#### (1) Conducted Emission (Not apply in the report)

| Frequency(MHz) | Quasi-peak | Average |
|----------------|------------|---------|
| 0.15-0.5       | 66-56      | 56-46   |
| 0.5-5.0        | 56         | 46      |
| 5.0-30.0       | 60         | 50      |

**Note:**

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

## (2) Radiated Emissions

### FCC Rule: 15.249(d)(e)

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

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

Rem 1. Emission level in  $\text{dB}\mu\text{V}/\text{m} = 20 \log (\mu\text{V}/\text{m})$

ark: 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

### FCC Part 15, Section 15.35(b) limit of radiated emission for frequency above 1000MHz

| Frequency(MHz) | Class A( $\text{dB}\mu\text{V}/\text{m}$ )(at 3m) |         | Class B( $\text{dB}\mu\text{V}/\text{m}$ )(at 3m) |         |
|----------------|---------------------------------------------------|---------|---------------------------------------------------|---------|
|                | PEAK                                              | AVERAGE | PEAK                                              | AVERAGE |
| Above 1000     | 80.0                                              | 60.0    | 74.0                                              | 54.0    |

### Peak Output Power(Transmitter)

FCC Part 15, Subpart C Section 15.249. The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Frequency(MHz) | Filed Strength of Fundamental(at 3m) |         | Filed Strength of Harmonics(at 3m) |         |
|----------------|--------------------------------------|---------|------------------------------------|---------|
|                | PEAK                                 | AVERAGE | PEAK                               | AVERAGE |
| 902-928        | 114                                  | 94      | 74.0                               | 54.0    |
| 2400-2483.5    | 114                                  | 94      | 74.0                               | 54.0    |
| 5725-5875      | 114                                  | 94      | 74.0                               | 54.0    |
| 24000-24250    | 128                                  | 108     | 88.0                               | 68.0    |

**(3) Band edge**

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in section 15.209, whichever is the lesser attenuation.

| <b>Frequency</b>  | <b>Limit(dBuV/m)</b> |           |
|-------------------|----------------------|-----------|
| <b>Range(MHz)</b> | <b>Peak</b>          | <b>AV</b> |
| 902-928           |                      |           |
| 2400-2483.5       | 74                   | 54        |
| 5725-5850         |                      |           |
| 24000-24250       |                      |           |

## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**

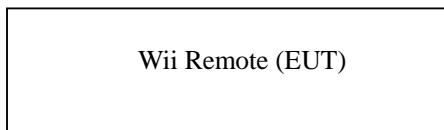


Table 2-1 Equipment Used in Tested System

| Item | Equipment  | Mfr/Brand | Model/Type No. | FCC ID     | Series No. | Note       |
|------|------------|-----------|----------------|------------|------------|------------|
| 1.   | Wii Remote | XINGDASHI | LBI-023        | X5NLBI-023 | N/A        | <b>EUT</b> |

**Note:**

(1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.

### 3. Summary Of Test Results

| FCC Rules                  | Description Of Test | Result    |
|----------------------------|---------------------|-----------|
| § 15.249(e), (b), § 15.209 | Radiated Emission   | Compliant |
| § 15.203                   | Antenna Requirement | Compliant |

### 4. Description of test modes

The EUT (Wii Remote) has been tested under normal operating condition.

Three channels of EUT (the lowest channel, the middle channel and the highest channel) have been chosen for testing under Normal Operating condition. In this report, all the measured datum of the three channels have been reported. No software used to control the EUT for staying in continuous transmitting mode for testing.

| Channel | Frequency(MHz) |
|---------|----------------|
| 1       | 2402MHz        |
| 2       | 2441MHz        |
| 3       | 2480MHz        |

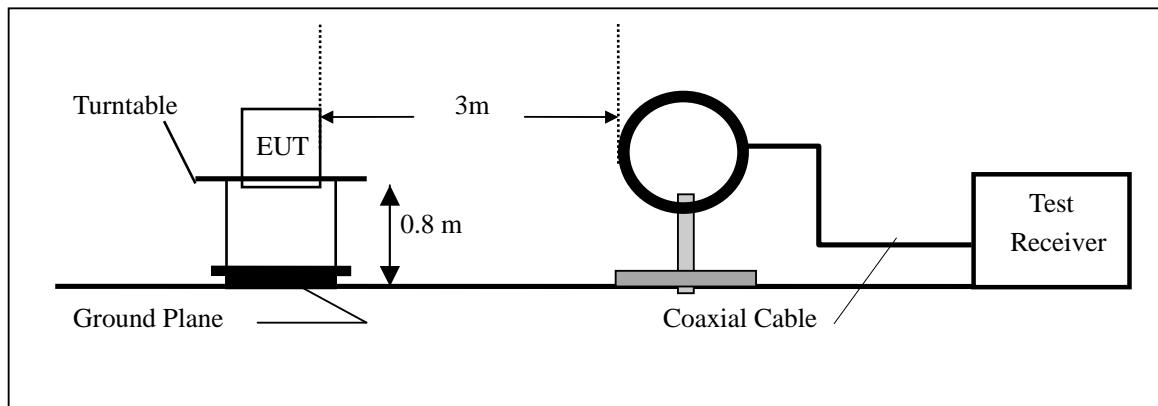
## 5. Radiated Emission Test

### 5.1 Measurement Procedure

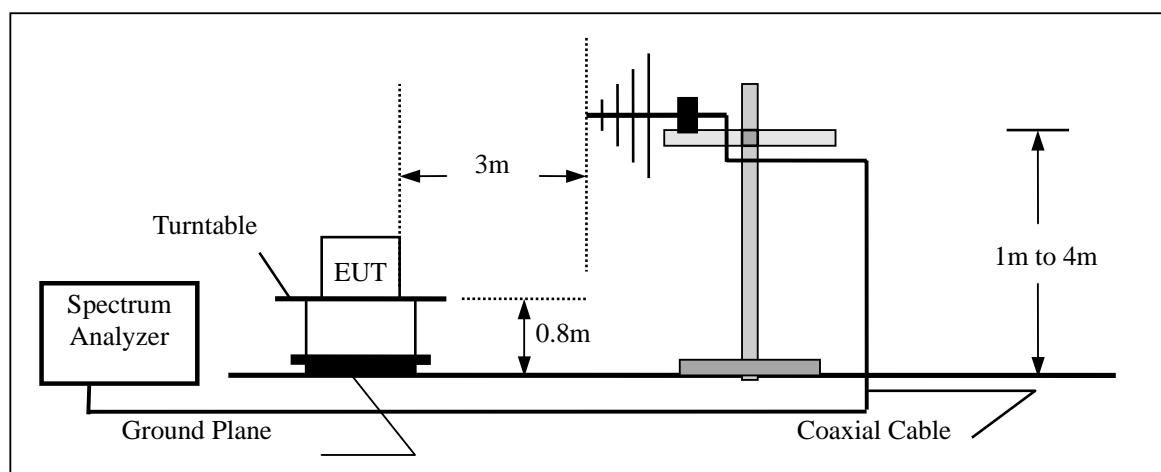
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



### 5.3 Measurement Equipment Used:

| EQUIPMENT TYPE    | MFR             | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
|-------------------|-----------------|--------------|---------------|------------|------------|
| Spectrum Analyzer | Rohde & Schwarz | FSP7         | 839511/010    | 05/29/2009 | 05/29/2010 |
| EMI Test Receiver | Rohde & Schwarz | ESCS30       | 828985/018    | 05/29/2009 | 05/29/2010 |
| Pre-Amplifier     | HP              | 8447D        | 2944A07999    | 05/29/2009 | 05/29/2010 |
| Bilog Antenna     | Schwarzbeck     | VULB9163     | 142           | 05/29/2009 | 05/29/2010 |
| Loop Antenna      | ARA             | PLA-1030/B   | 1029          | 05/29/2009 | 05/29/2010 |

### 5.4 Out of Band Radiated Measurement Result

Operation Mode: TX(2402MHz) Test Date : December 30, 2009  
Frequency Range: 30~1000MHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: King

| Freq. (MHz) | Ant.Pol. H/V | Emission Level (dBuV) | Limit 3m (dBuV/m) | Margin (dB) | Note |
|-------------|--------------|-----------------------|-------------------|-------------|------|
| 98.52       | V            | 30.24                 | 43.50             | -13.26      | PK   |
| 186.30      | V            | 29.67                 | 43.50             | -13.83      | PK   |
| 287.61      | V            | 31.53                 | 46.00             | -14.47      | PK   |
| 442.58      | V            | 32.16                 | 46.00             | -13.84      | PK   |
| 480.80      | V            | 29.43                 | 46.00             | -16.57      | PK   |
| 696.00      | V            | 35.82                 | 46.00             | -10.18      | PK   |
| 92.52       | H            | 33.76                 | 43.50             | -9.74       | PK   |
| 186.16      | H            | 31.82                 | 43.50             | -11.68      | PK   |
| 288.04      | H            | 35.01                 | 46.00             | -10.99      | PK   |
| 336.23      | H            | 34.92                 | 46.00             | -11.08      | PK   |
| 480.80      | H            | 32.15                 | 46.00             | -13.85      | PK   |
| 696.00      |              | 30.07                 | 46.00             | -15.93      | PK   |

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(2441MHz) Test Date : December 30, 2009  
Frequency Range: 30~1000MHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: King

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 95.28          | V               | 26.49                    | 43.50                | -17.01         | PK   |
| 288.04         | V               | 30.20                    | 46.00                | -15.8          | PK   |
| 455.92         | V               | 32.16                    | 46.00                | -13.84         | PK   |
| 696.00         | V               | 35.73                    | 46.00                | -10.27         | PK   |
| 95.28          | H               | 32.95                    | 43.50                | -10.55         | PK   |
| 288.04         | H               | 36.47                    | 46.00                | -9.53          | PK   |
| 336.23         | H               | 36.96                    | 46.00                | -9.04          | PK   |
| 384.42         | H               | 33.35                    | 46.00                | -12.65         | PK   |
| 455.92         | H               | 34.08                    | 46.00                | -11.92         | PK   |
| 480.80         | H               | 30.12                    | 46.00                | -15.88         | PK   |

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(2480MHz) Test Date : December 30, 2009  
Frequency Range: 30~1000MHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: King

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission Level<br>(dBuV) | Limit 3m<br>(dBuV/m) | Margin<br>(dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 186.30         | V               | 28.53                    | 43.50                | -14.97         | PK   |
| 288.04         | V               | 29.67                    | 46.00                | -16.33         | PK   |
| 455.92         | V               | 31.22                    | 46.00                | -14.78         | PK   |
| 696.00         | V               | 34.96                    | 46.00                | -11.04         | PK   |
| 95.28          | H               | 31.26                    | 43.50                | -12.24         | PK   |
| 288.04         | H               | 34.69                    | 46.00                | -11.31         | PK   |
| 336.23         | H               | 34.74                    | 46.00                | -11.26         | PK   |
| 384.42         | H               | 33.60                    | 46.00                | -12.4          | PK   |
| 455.92         | H               | 34.41                    | 46.00                | -11.59         | PK   |
| 480.80         | H               | 32.86                    | 46.00                | -13.14         | PK   |

**Note:** (1) All Readings are Peak Value.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(2402MHz) Test Date : December 30, 2009  
Frequency Range: 1-10GHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: King

| Freq.<br>(GHz) | Ant.Pol.<br>H/V | Emission Level(dBuV) |       | Limit 3m(dBuV/m) |    | Margin(dB) |        |
|----------------|-----------------|----------------------|-------|------------------|----|------------|--------|
|                |                 | PK                   | AV    | PK               | AV | PK         | AV     |
| 2402.00        | V               | 80.43                | 79.93 | 114              | 94 | -33.57     | -14.07 |
| 4786.00        | V               | 48.93                | 33.23 | 74               | 54 | -25.07     | -20.77 |
| 7211.00        | V               | 51.28                | 36.27 | 74               | 54 | -22.72     | -17.73 |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| 2402.00        | H               | 83.53                | 82.83 | 114              | 94 | -30.47     | -11.17 |
| 4786.80        | H               | 49.93                | 34.83 | 74               | 54 | -24.07     | -19.17 |
| 7211.50        | H               | 54.49                | 40.79 | 74               | 54 | -19.51     | -13.21 |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| --             | --              | --                   | --    | --               | -- | --         | --     |

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(2441MHz) Test Date : December 30, 2009  
Frequency Range: 1-10GHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: King

| Freq.<br>(GHz) | Ant.Pol.<br>H/V | Emission Level(dBuV) |       | Limit 3m(dBuV/m) |    | Margin(dB) |        |
|----------------|-----------------|----------------------|-------|------------------|----|------------|--------|
|                |                 | PK                   | AV    | PK               | AV | PK         | AV     |
| 2441.00        | V               | 79.45                | 78.95 | 114              | 94 | -34.55     | -15.05 |
| 4868.00        | V               | 54.03                | 36.23 | 74               | 54 | -19.97     | -17.77 |
| 7320.00        | V               | 49.86                | 38.54 | 74               | 54 | -24.14     | -15.46 |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| 2441.00        | H               | 83.45                | 82.75 | 114              | 94 | -30.55     | -15.25 |
| 4686.00        | H               | 53.23                | 36.23 | 74               | 54 | -20.77     | -17.77 |
| 7320.00        | H               | 54.00                | 40.70 | 74               | 54 | -20        | -13.3  |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| --             | --              | --                   | --    | --               | -- | --         | --     |

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(2480MHz) Test Date : December 30, 2009  
Frequency Range: 1-10GHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: King

| Freq.<br>(GHz) | Ant.Pol.<br>H/V | Emission Level(dBuV) |       | Limit 3m(dBuV/m) |    | Margin(dB) |        |
|----------------|-----------------|----------------------|-------|------------------|----|------------|--------|
|                |                 | PK                   | AV    | PK               | AV | PK         | AV     |
| 2480.00        | V               | 77.88                | 77.48 | 114              | 94 | -36.12     | -16.52 |
| 4950.00        | V               | 54.05                | 36.65 | 74               | 54 | -19.95     | -17.35 |
| 7429.00        | V               | 52.06                | 39.07 | 74               | 54 | -21.94     | -14.93 |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| 2480.00        | H               | 83.38                | 82.58 | 114              | 94 | -30.62     | -11.42 |
| 4950.00        | H               | 53.55                | 36.35 | 74               | 54 | -20.45     | -17.65 |
| 7429.00        | H               | 52.66                | 40.56 | 74               | 54 | -21.34     | -13.44 |
| --             | --              | --                   | --    | --               | -- | --         | --     |
| --             | --              | --                   | --    | --               | -- | --         | --     |

**Note:** (1) All Readings are Peak Value and AV.  
(2) Emission Level= Reading Level+Probe Factor +Cable Loss  
(3) The average measurement was not performed when the peak measured data under the limit of average detection.

**5.5 Radiated Measurement Photos:**



## **6. Antenna Application**

### **6.1 Antenna requirement**

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and 15.240.

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by responsible party shall be used with the device.

The EUT has a built in antenna which is a short wire solder on the PCB, this is permanently attached antenna and meets the requirements of this section.